START

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Vol. 1103 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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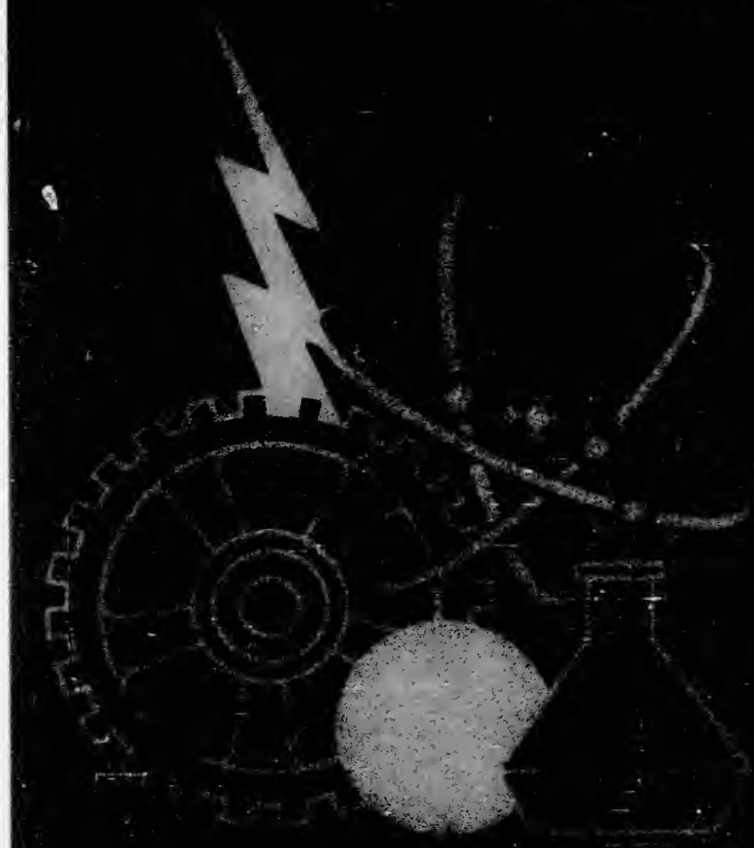
PATENTS

June 6, 1989



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OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE
June 6, 1989 Volume 1103 Number 1

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed.
THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $10.00 each; copies of TRADEMARKS at $1.50 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1101 O.G. 56 on Apr. 25, 1989.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 80 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	550.00
—Corresponding prior U.S. national application filed:	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority.	400.00
—Additional examination fee, per additional invention	130.00
—Searching Authority not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee:	436.00
Basic Supplemental fee (for each page over 30) :	9.00
Designation fee per country or region for the first 10 national or regional offices:	106.00
Designation fee for 11th and subsequent designations :	No Charge
Handling fee:	134.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	165.00	330.00
USPTO was ISA but no IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	30.00	30.00

May 3, 1989. DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on June 3, 1986, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,592,096 through 4,593,414
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on June 1, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,332,033 through 4,333,178
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small entity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MARCH 19,1989
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,504,977	06/489996	03/19/85
4,504,983	06/625561	03/19/85
4,504,986	06/508346	03/19/85
4,504,987	06/460959	03/19/85
4,504,988	06/508013	03/19/85
4,504,996	06/376706	03/19/85
4,505,011	06/467163	03/12/85
4,505,034	06/400342	03/19/85
4,505,037	06/422683	03/19/85
4,505,044	06/531578	03/19/85
4,505,046	06/495138	03/19/85
4,505,050	06/471840	03/19/85
4,505,055	06/426271	03/19/85
4,505,057	06/490048	03/19/85
4,505,058	06/578201	03/19/85
4,505,061	06/492702	03/19/85
4,505,063	06/490193	03/19/85
4,505,064	06/464688	03/19/85
4,505,066	06/388822	03/19/85
4,505,067	06/496852	03/19/85
4,505,070	06/536682	03/19/85
4,505,080	06/542143	03/19/85
4,505,086	06/558452	03/19/85
4,505,089	06/357255	03/19/85
4,505,095	06/474052	03/19/85
4,505,101	06/560451	03/19/85
4,505,104	06/539380	03/19/85
4,505,109	06/415485	03/19/85
4,505,111	06/399339	03/19/85
4,505,116	06/314276	03/19/85
4,505,124	06/534996	03/19/85
4,505,126	06/617717	03/19/85
4,505,136	06/447669	03/19/85
4,505,138	06/572510	03/19/85
4,505,139	06/441622	03/19/85
4,505,146	06/505017	03/19/85
4,505,156	06/506499	03/19/85
4,505,157	06/520680	03/19/85
4,505,166	06/363457	03/19/85
4,505,167	06/447246	03/19/85
4,505,169	06/451613	03/19/85
4,505,171	06/516876	03/19/85
4,505,175	06/568884	03/19/85
4,505,178	06/426675	03/19/85
4,505,182	06/624032	03/19/85
4,505,185	06/367702	03/19/85
4,505,189	06/455752	03/19/85
4,505,191	06/598163	03/19/85
4,505,208	06/526495	03/19/85
4,505,224	06/529026	03/19/85
4,505,229	06/558494	03/19/85
4,505,230	06/387876	03/19/85
4,505,234	06/450525	03/19/85
4,505,238	06/621429	03/19/85
4,505,241	06/559655	03/19/85
4,505,245	06/391963	03/19/85
4,505,249	06/605274	03/19/85
4,505,250	06/469533	03/19/85
4,505,255	06/550710	03/19/85
4,505,257	06/442242	03/19/85
4,505,258	06/439987	03/19/85
4,505,259	06/293137	03/19/85
4,505,261	06/562844	03/19/85
4,505,262	06/531153	03/19/85
4,505,265	06/406256	03/19/85
4,505,268	06/467317	03/19/85
4,505,272	06/468484	03/19/85
4,505,283	06/423632	03/19/85
4,505,285	06/399714	03/19/85
4,505,291	06/522335	03/19/85
4,505,292	06/511457	03/19/85
4,505,294	06/537543	03/19/85
4,505,296	06/622890	03/19/85
4,505,312	06/491418	03/19/85
4,505,327	06/252402	03/19/85
4,505,333	06/298882	03/19/85
4,505,337	06/439061	03/19/85
4,505,344	06/424967	03/19/85
4,505,345	06/442914	03/19/85
4,505,346	06/362877	03/19/85
4,505,354	06/387815	03/19/85

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Patent Number	Serial Number	Issue Date
4,505,356	06/470939	03/19/85
4,505,364	06/218565	03/19/85
4,505,366	06/420231	03/19/85
4,505,383	06/328637	03/19/85
4,505,384	06/599635	03/19/85
4,505,390	06/554388	03/19/85
4,505,395	06/518382	03/19/85
4,505,400	06/477773	03/19/85
4,505,408	06/556131	03/19/85
4,505,414	06/541155	03/19/85
4,505,419	06/331770	03/19/85
4,505,424	06/600116	03/19/85
4,505,425	06/471683	03/19/85
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4,505,433	06/425509	03/19/85
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4,505,454	06/555691	03/19/85
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4,505,658	06/551825	03/19/85
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4,505,675	06/443570	03/19/85
4,505,678	06/554117	03/19/85
4,505,683	06/491893	03/19/85
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4,505,826	06/436641	03/19/85
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4,505,852	06/445280	03/19/85
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4,505,912	06/410008	03/19/85
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4,505,926	06/532525	03/19/85
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4,505,933	06/470970	03/19/85
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4,505,958	06/378473	03/19/85
4,505,973	06/559502	03/19/85
4,506,014	06/435243	03/19/85
4,506,042	06/471204	03/19/85
4,506,075	06/485086	03/19/85
4,506,095	06/476450	03/19/85
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4,506,103	06/529793	03/19/85
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4,506,113	06/491834	03/19/85
4,506,116	06/514395	03/19/85
4,506,120	06/442527	03/19/85
4,506,135	06/459868	03/19/85
4,506,181	06/585474	03/19/85
4,506,185	06/367320	03/19/85
4,506,188	06/444107	03/19/85
4,506,199	06/454037	03/19/85
4,506,227	06/380312	03/19/85
4,506,235	06/351493	03/19/85
4,506,265	06/496079	03/19/85
4,506,269	06/382070	03/19/85
4,506,271	06/424005	03/19/85
4,506,303	06/423482	03/19/85
4,506,317	06/577973	03/19/85
4,506,328	06/403454	03/19/85
4,506,333	06/400490	03/19/85
4,506,337	06/395839	03/19/85
4,506,348	06/388057	03/19/85
4,506,373	06/460398	03/19/85

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,555,021, Re. S.N. 340,561, Filed Apr. 19, 1989, Cl. 2906/387, CASING FOR MAGNETIC TAPE CASSETTE, Tatsuo Fujii, et al., Owner of Record: *TDK Corp., Tokyo, Japan*, Attorney or Agent: Charles L. Gholz, Ex. Gp.: 241

4,577,509, Re. S.N. 174,787, Filed Mar. 24, 1989, Cl. 73/658, ARRANGEMENT FOR DETERMINING THE TRAVEL OF A PISTON, Bernd Moser, Owner of Record: *Boge GMBH Greensburg, Pa.*, Attorney or Agent: Nils H. Ljungman, Ex. Gp.: 265

4,630,195, Re. S.N. 285,827, Filed Dec. 16, 1988, Cl. 364/200, DATA PROCESSING SYSTEM WITH CPU REGISTER TO REGISTER DATA TRANSFER OVERLAPPED WITH DATA TRANSFER TO AND FROM MAIN STORAGE, Phillip D. Hester, et al., Owner of Record: *International Business Machine Corp., Armonk, N. Y.*, Attorney or Agent: Thomas E. Tyson, Ex. Gp.: 231

4,645,725, Re. S.N. 315,473, Filed Feb. 23, 1989, Cl. 429/179, BATTERY COMPRISING DUAL TERMINAL BUSHINGS, William H. Kump, et al., Owner of Record: *G.N.B. Inc., St. Paul, Minn.*, Attorney or Agent: Gordon R. Coons, Ex. Gp.: 114

4,659,496, Re. S.N. 340,537, Filed Apr. 18, 1989, Cl. 252/90, DISPENSING POUCH CONTAINING PREMEASURED LAUNDERING COMPOSITION, Steven R. Klemm, et al., Owner of Record: *Amway Corp., Ada, Mich.*, Attorney or Agent: James A. Mitchell, Ex. Gp.: 115

4,660,766, Re. S.N. 343,815, Filed Apr. 24, 1989, Cl. 239/222.17, ROTARY SPRINKLER HEAD, Barton R. Nelson, et al., Owner of Record: *Nelson Irrigation Corp., Walla Walla, Wash.*, Attorney or Agent: Michael J. Keenan, Ex. Gp.: 314

4,664,407, Re. S.N. 341,089, filed Apr. 20, 1989, Cl. 280/689, AIR RIDE VEHICLE FRONT SUSPENSION ASSEMBLY, Arthur D. Griffin, Sr., Owner of Record: *Inventor*, Attorney or Agent: John J. Kane, Ex. Gp.: 316

4,779,023, Re. S.N. 341,507, Filed Mar. 17, 1989, Cl. 313/402, COMPONENT MOUNTING MEANS FOR A TENSION MASK COLOR CATHODE RAY TUBE, Paul Starauss, Owner of Record: *Zenith Electronics Corp Glenview, Ill.*, Attorney or Agent: John H. Coult, Ex. Gp.: 266

4,791,416, Re. S.N. 339,564, Filed Apr. 17, 1989, Cl. 340/712, TOUCH CONTROL SYSTEM FOR CONTROLLABLE APPARATUS, Robert Adler, Owner of Record: *Zenith Electronics Corp., Glenview, Ill.*, Attorney or Agent: John H. Coult, Ex. Gp.: 266

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,194,509, Reexam. No. 90/001,761, Requested Apr. 24, 1989, Cl. 128/350, PRECONNECTED CATHETER DRAINAGE SYSTEM, Keldon S. Pickering, et al., Owner of Record: *C. R. Bard Inc., Murray Hill, N. J.*, Attorney or Agent: R. H. Zaitlen, Ex. Gp.: 330, Requester: The Kendall Co., Boston, Mass.

4,203,639, Reexam. No. 90/001,762, Requested Apr. 25, 1989, Cl. 339/22, PANEL WIRING SYSTEM, Harold Vandenhoek, et al., Owner of Record: *Steelcase Inc., Grand Rapids, Mich.*, Attorney or Agent: Price, Heneveld, Cooper, et al., Ex. Gp.: 320, Requester: Owner

4,303,721, Reexam. No. 90/001,764, Requested Apr. 27, 1989, Cl. 428/213, CLOSED CELL FOAM PRINTING BASKET, Jorge M. Rodriquez, Owner of Record: *W. R. Grace & Co-Conn., Lexington, Ma.*, Attorney or Agent: J. D. Hubbard, Ex. Gp.: 150, Requester: Owner

4,455,654, Reexam. No. 90/001,763, Requested Apr. 26, 1989, Cl. 371/20, TEST APPARATUS FOR ELECTRONIC ASSEMBLIES EMPLOYING A MICROPROCESSOR, Kasi S. Bhaskar, et al., Owner of Record: *John Flute Mftg. Co., Inc., Everett, Va.*, Attorney or Agent: Unknown, Ex. Gp.: 230, Requester: Owner

4,522,022, Reexam. No. 90/001,760, Requested Apr. 24, 1989, Cl. 57/401, ROLLERS FOR FRICTION SPINNING APPARATUS, Alan Parker, et al., Owner of Record: *Hollingsworth (U.K.) Ltd., Accrington, England*, Attorney or Agent: Unknown. Ex. Gp.: 240, Requester: Owner

Federal Register Notice
U. S. Department of Commerce
Announcement of Board Meeting for the Biotechnology Institute

Agency: Patent and Trademark Office, Commerce.
Action: Notice of Initial Board meeting for the Biotechnology Institute at the Patent and Trademark Office.
Summary: The first meeting of the Board of the Biotechnology Institute will be held on June 23, 1989, from 10:00 a.m. to 1:00 p.m. in Room 502A on the 5th floor of Crystal Park, Building 1, located at 2011 Crystal Drive, Arlington, Virginia.

Interested members of the public are welcome to observe the Board meeting, subject to space limitation. Anyone desiring to sit as an observer at the meeting must contact the Patent and Trademark Office by June 16, 1989.

Addresses: Parties interested in observing the Board meeting should address their name request to the Commissioner of Patents and Trademarks; Washington, D. C. 20231; Attention: John E. Kittle, Director, Group 180.

For Further Information Contact: John E. Kittle, Director, Group 180, by telephone at (703) 557-3637, or by mail to his attention and addressed to the Commissioner of Patents and Trademarks, Washington D. C. 20231.

Supplementary Information: The establishment and solicitation for Board members of the Biotechnology Institute was announced on February 22, 1989 in the Federal Register (54 FR 7580). The Patent and Trademark Office has selected the Board Members from the many nominees received in response to the February 22 announcement. All nominees and their nominating organizations have been informed as to their status.

The proposed agenda for the first Board meeting has been sent to the Board members and their nominating organization for comments.

The proposed agenda is:

1. Board and Institute Organization
2. Patent Examiner Technical Education
3. Patent Examiner Legal Training
4. Information Resources to Evaluate Patent Applications
5. Identification of Trends in Biotechnology Research
6. Non-Agenda Business from Board Members
7. Setting Timing of next meeting for completion of agreed upon actions.

May 19, 1989

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

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PATENT NOTICES

Certificates of Correction for Week of June 6, 1989

RE32,771	4,759,311	4,780,923	4,794,135
D299,081	4,759,475	4,780,956	4,794,143
4,629,620	4,759,814	4,782,486	4,794,201
4,632,942	4,760,045	4,782,565	4,794,280
4,657,811	4,760,502	4,783,235	4,794,655
4,659,475	4,762,474	4,783,728	4,794,771
4,659,802	4,762,829	4,783,956	4,794,990
4,705,740	4,762,891	4,783,998	4,795,268
4,707,856	4,764,369	4,784,662	4,795,454
4,716,342	4,764,447	4,785,287	4,795,668
4,718,818	4,764,497	4,786,380	4,795,801
4,720,223	4,765,823	4,787,616	4,795,893
4,720,410	4,767,790	4,787,963	4,795,924
4,721,105	4,767,844	4,787,968	4,796,233
4,728,727	4,768,370	4,788,020	4,796,332
4,728,979	4,768,782	4,788,229	4,796,511
4,730,403	4,769,122	4,788,521	4,796,541
4,730,632	4,771,041	4,789,038	4,796,553
4,730,870	4,771,569	4,789,076	4,796,578
4,731,866	4,773,045	4,789,140	4,796,582
4,733,209	4,773,204	4,789,375	4,796,858
4,734,126	4,773,755	4,789,421	4,797,460
4,735,649	4,773,817	4,789,524	4,797,552
4,736,271	4,774,133	4,790,153	4,797,720
4,737,542	4,774,205	4,790,200	4,797,829
4,737,804	4,774,631	4,790,272	4,797,840
4,738,864	4,774,998	4,790,858	4,798,468
4,742,792	4,775,689	4,791,125	4,798,814
4,743,512	4,775,938	4,791,315	4,798,870
4,744,828	4,776,210	4,791,583	4,799,349
4,749,592	4,776,366	4,791,734	4,799,662
4,749,992	4,776,377	4,791,743	4,799,970
4,750,164	4,776,947	4,791,746	4,800,017
4,750,965	4,777,126	4,792,108	4,800,101
4,751,138	4,778,353	4,792,520	4,800,552
4,753,945	4,779,137	4,792,651	4,801,674
4,756,179	4,779,503	4,792,777	4,801,942
4,756,906	4,779,753	4,792,898	4,804,958
4,757,085	4,780,292	4,793,807	
4,758,384	4,780,639	4,793,950	
4,758,860	4,780,716	4,794,114	

Disclaimers

4,225,607.—*Joachim E. Goring, Peter P. Ochlich*, both of Gronau, Fed. Rep. of Germany. PHARMACEUTICAL COMPOSITION CONTAINING A XANTHINE DERIVATIVE. Patent dated Sept. 30, 1980. Disclaimer filed Sept. 2, 1988, by the assignee, Beecham-Wulfing GmbH & Co. KG.

Hereby enters this disclaimer to claim 8 of said patent.

4,299,102.—*Ernesto Aro*, Torrance, Calif. LOCKING FUEL CAP WITH PLASTIC MECHANISM. Patent dated Nov. 10, 1981. Disclaimer filed Mar. 29, 1989, by the assignee, Mr. Gasket Co.

Hereby enters this disclaimer to the entire term of said patent.

4,331,382.—*Henry W. Graff*, Elgin, Ill. WIDE-ANGLE MIRROR FOR AUTOMOBILES AND THE LIKE. Patent dated May 25, 1982. Disclaimer filed Mar. 29, 1989, by the assignee, Mr. Gasket Co.

Hereby enters this disclaimer to the entire term of said patent.

4,448,005.—*Julian P. Vochelli*, Huntington Beach, Calif. INTERIOR AUTOMOTIVE SUNSHADE WITH RING HINGES. Patent dated May 15, 1984. Disclaimer filed Mar. 29, 1989, by the assignee, Mr. Gasket Co.

Hereby enters this disclaimer to the entire term of said patent.

4,495,552.—*Henry W. Graff*, Elgin, Ill. FORWARD SHINING VEHICLE LAMP. Patent dated Jan. 22, 1985. Disclaimer filed Mar. 29, 1989, by the assignee, Mr. Gasket Co.

Hereby enters this disclaimer to the entire term of said patent

4,535,397.—*Richard L. May*, Manhattan Beach, Calif. PORTABLE SPOTLIGHT. Patent dated Aug. 13, 1985. Disclaimer filed Mar. 29, 1989, by the assignee, Mr. Gasket Co.

Hereby enters this disclaimer to the entire term of said patent

4,712,397.—*Don L. Niskanen*, Livonia, Mich. PARKLOCK CONTROL. Patent dated Dec. 15, 1987. Disclaimer filed Apr. 6, 1989, by the assignee, Teleflex Inc.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

Dedication

4,487,801.—*Everett M. Turnbull*, Hastings, Minn; and *Jack W. Charbonneau*, Sommerset, Wis. FRAGRANCE-RELEASING PULL-APART SHEET. Patent dated Dec. 11, 1984. Dedication filed Jan. 30, 1989, by the assignee, Minnesota Mining and Manufacturing Co.

Hereby dedicates to the public the remaining term of said patent.

SPECIAL BOXES FOR MAIL

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Box 13	Mail for the Employee and Labor Relations Division.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box FWC	Requests for File Wrapper Continuation Applications.
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Box OED	Mail for the Office of Enrollment and Discipline.
Box Pat. Ext.	Applications for patent term extension.
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Box Reexam	Mail related to Reexamination.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent application *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").
PATENT APPLICATION	New patent application and associated papers and fees.
TRADEMARK APPLICATION	New trademark application and associated papers and fees.

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Reference Collection of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries (PDLs), receive current issues of U.S. Patents and maintain collections of earlier-issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

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Since there are variations in the scope of patent collections among the PDLs and in their hours of service to the public, anyone contemplating use of the patents at a particular library is urged to contact that library, in advance, about its collection and hours in order to avert possible inconvenience.

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Alabama	Auburn University Libraries	(205) 844-1747
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Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3200
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2347
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 451-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 636-5060
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	Miami-Dade Public Library	(305) 375-2665
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Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
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	New York Public Library (The Research Libraries)	(212) 714-8529
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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State University	(503) 378-4239
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	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8027
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext.2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 367-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin --Madison	(608) 262-6845
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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF May 6, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. M. ZAHARNA, Director	8-21-86
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	3-31-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	5-4-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-31-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. SHAW, Acting Director	11-24-86
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	3-2-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	8-11-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	2-19-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	1-12-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—D. G. KELLY, Director	1-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	1-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	7-22-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-4-88

Expiration of patents: The patents within the range of numbers indicated below expire during May 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,659,294 to 3,667,068, inclusive
Plant Patents ..... 3,143 to 3,204 inclusive

REEXAMINATIONS

JUNE 6, 1989

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,267,195 (1069th)
DOG FOOD FLAVORS
James C. Boudreau, and Thomas D. White, both of Houston, Tex., assignors to University of Texas, Tex.
Reexamination Request No. 90/000,906, Nov. 13, 1985.
Reexamination Certificate for Patent No. 4,267,195, issued May 12, 1981, Ser. No. 888,795, Mar. 21, 1978.
Continuation of Ser. No. 722,103, Sep. 10, 1976, abandoned.
Int. Cl.⁴ A23K *1/00*
U.S. Cl. 426—2

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **6** is confirmed.

Claims **1**, **3–5** and **7–9** are cancelled.

Claims **2** and **10** are determined to be patentable as amended.

New claims **11–14** are added and determined to be patentable.

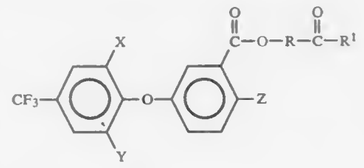
6. A process according to claim **1** wherein the palatability improving material is L-lysine.

B1 4,311,515 (1070th)
SUBSTITUTED DIPHENYL ETHERS HAVING HERBICIDAL ACTIVITY
William S. Grove, Doylestown, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.
Reexamination Request No. 90/000,586, Jul. 9, 1984.
Reexamination Certificate for Patent No. 4,311,515, issued Jan. 19, 1982, Ser. No. 172,319, Jul. 25, 1980.
Int. Cl.⁴ A01N *37/40;* **C07C** *79/46*
U.S. Cl. 71—108

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

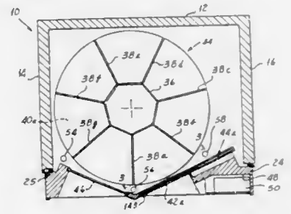
The patentability of claims **1–8** is confirmed.

1. A compound represented by the formula:



wherein:
X is hydrogen or halogen;
Y is hydrogen, halogen, cyano, trifluoromethyl, or alkyl containing up to 4 carbon atoms;
Z is nitro, halogen, or cyano;
R is alkylidene or monosubstituted alkylidene containing 1 to 3 carbon atoms wherein the substituent is alkyl containing 1 to 4 carbon atoms; and
R^1 is hydrogen or alkyl containing 1 to 10 carbon atoms.

B1 4,317,604 (1071st)
ALL-PURPOSE MERCHANDISER
Merrill Krakauer, 1 Deer Path, Short Hills, N.J. 07078
Reexamination Request No. 90/001,528, Jun. 20, 1988.
Reexamination Certificate for Patent No. 4,317,604, issued Mar. 2, 1982, Ser. No. 146,313, May 5, 1980.
Int. Cl.⁴ A47F *1/00;* **A47B** *49/00*
U.S. Cl. 312—97.1



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–9**, **11–16**, **18**, **23** and **24** is confirmed.

Claims **10**, **17**, **19–22** and **25** are determined to be patenable as amended.

New claims **26–33** are added and determined to be patentable.

1. An all-purpose merchandiser adapted to vend articles over a wide range of shapes and sizes including in combination a cabinet having a front, a generally circular merchandise carrier within said cabinet, said carrier comprising a center column, a plurality of vertically extending partitions of trasparent material supported on said carrier at substantially equal spaced locations therearound to divide said carrier into a plurality of sectors, a plurality of respective merchandise receiving trays, means removably supporting said trays between adjacent pairs of said panels, a plurality of said trays being supported on said panels at vertically spaced locations to divide said carrier into a plurality of levels, window of transparent material on said front, said window being located in a plane inclined rearwardly from a line relatively adjacent to the center of said front and being substantially parallel to a plane which is tangent to said carrier, a plurality of transparent access doors mounted in said front for movement between open positions and closed positions at levels corresponding to said carrier levels, said doors in said closed positions lying in a plane inclined rearwardly from a line relatively adjacent to the center of said front and generally parallel to a plane tangent to said carrier each of said window and said doors having a width approximately equal to the length of a chord subtended by the space occupied by one of said trays, each of said doors having a normal ambit of movement from closed to open position approximately equal to the length of said chord for permitting access to a tray positioned therebehind, means for dividing circumferentially into two compartments the trays at selected levels, means for limiting the opening movement of the doors at said selected levels to substantially half the normal ambit, means responsive to the deposit of coins aggregating the purchase price of articles at a certain level for freeing said doors for movement toward open positions, means for stepping said carrier in a number of steps equal to twice the number of trays

at a level and for accurately stopping said carrier at the end of a step and means for inhibiting opening of a door at a level other than one of said selected levels when said carrier stops at a mid tray point, said supporting means comprising vertically spaced locating and supporting openings in said columns, extensions on said trays adapted to be received in said openings, respective bosses on each of said trays adjacent to the front sides thereof, respective lugs on adjacent partitions adjacent to the outer edges thereof for receiving said bosses, said bosses having portions adapted to engage said lugs in response to a force applied to a tray in a direction radially of the axis of rotation of said carrier to prevent movement of the tray, channel-shaped members having side openings adapted to receive front edge portions of said trays and manually releasable interengageable means on said channel-shaped members and said partitions for holding said members in positions at which the side openings thereof receive portions of said trays to lock said trays in position.

B1 4,339,268 (10[illegible]2nd)
HERBICIDAL NITROALKYL 5-[2-CHLORO-4-(TRIFLUOROMETHYL)PHENOXY]-2-NITROBENZOATES

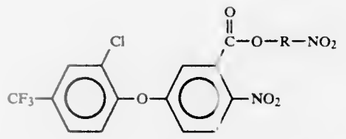
Robert J. Theissen, Bridgewater, N.J., assignor to Rhone-Poulenc Agrochimie, Lyons, France

Reexamination Request No. 90/000,575, Jun. 14, 1984.
Reexamination Certificate for Patent No. 4,339,268, issued Jul. 13, 1982, Ser. No. 271,143, Jun. 8, 1981.
Continuation-in-part of Ser. No. 117732, Feb. 1, 1980, abandoned.
Claims priority, application Argentina, Jan. 30, 1981, 284163
Int. Cl.[4] A01N *37/36*; C07C *79/46*
U.S. Cl. 71—108

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–8** is confirmed.

1. A herbicidal compound of the formula



where R is an alkylene group having **1–4** carbon atoms.

B1 4,343,480 (10[illegible]7th)
PIPE BELL AND GASKET

Efrain D. Vassallo, Ponce, P.R., assignor to Industrias Vassallo, Inc., Ponce, P.R.

Reexamination Request No. 90/001,264, Jun. 18, 1987.
Reexamination Certificate for Patent No. 4,343,480, issued Aug. 10, 1982, Ser. No. 162,377, Jun. 23, 1980.
Int. Cl.[4] F16J *15/32*
U.S. Cl. 277—207 A

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **13–17** is confirmed.

Claims **1** and **12** are determined to be patentable as amended.

Claims **2–11**, dependent on an amended claim, are determined to be patentable.

New claims **18–48** are added and determined to be patentable.

1. A pipe bell in the cylindrical body of a pipe or fitting, the pipe or fitting having a longitudinal axis comprising

an enlarged, generally cylindrical, one piece hub formed in the forward end of the said body, the hub having a cylindrical *non-gasketed* section of a first diameter suitable to overfit an end of an adjacent length of pipe, the hub including an integral, radially inward open, internal *gasket-receiving* groove of a second diameter, the second diameter being greater than the first diameter,

the internal groove being defined forwardly by an integral, radially inward bent retainer,

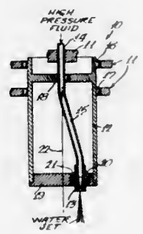
the internal groove being defined rearwardly by an integral, circular, angular corner,

the bent retainer and the hub being of unitary construction.

B2 4,369,850 (1073rd)
HIGH PRESSURE FLUID JET CUTTING AND DRILLING APPARATUS

Clark R. Barker, Rolla, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Reexamination Request No. 90/001,663, Dec. 12, 1988.
Reexamination Certificate for Patent No. 4,369,850, issued Jan. 25, 1983, Ser. No. 173,264, Jul. 28, 1980.
Reexamination Certificate B1 4,369,850, issued Jul. 12, 1988.
Int. Cl.[4] E21B *10/60*
U.S. Cl. 175—393



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **10–16** is confirmed.

Claims **1–9** were previously cancelled.

10. A high pressure fluid jet drilling and cutting system comprising:

a non-rotating fluid supply conduit in communication with a source of high pressure fluid in excess of 10,000 p.s.i.,

a high pressure fluid jet nozzle having a converging flowpath therethrough terminating in a restricted orifice of substantially smaller cross-section than the inside diameter of said supply conduit,

an elongated cylindrical rotatable case having a longitudinal axis,

a main frame,

means mounting said case on said main frame for rotation of said case about said longitudinal axis thereof,

said fluid jet nozzle flowpath having a longitudinal axis offset with respect to said longitudinal axis of said case,

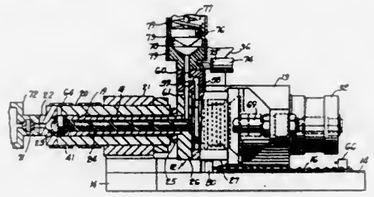
bearing means interposed between said fluid jet nozzle and said case and permitting relative rotational movement therebetween, and

a flexible conduit having upstream and downstream ends and fixed at said upstream end to said non-rotating supply conduit in direct communication therewith and at said downstream end to said jet nozzle.

B1 4,557,683 (1074th)
ROTARY PLASTICATOR RAM INJECTION MACHINE

Gregory W. Meeker, Webster, and Norris E. Bleck, Rochester, both of N.Y., assignors to Farrel Corporation, Ansonia, Conn.

Reexamination Request No. 90/001,488, Apr. 12, 1988.
Reexamination Certificate for Patent No. 4,557,683, issued Dec. 10, 1985, Ser. No. 612,678, May 22, 1984.
Int. Cl.[4] B29C *45/02*
U.S. Cl. 425—147



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **4** is cancelled.

Claims **1**, **3**, **5**, **7** and **8** are determined to be patentable as amended.

Claims **2** and **6**, dependent on an amended claim, are determined to be patentable.

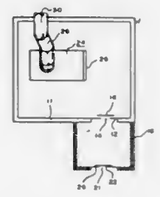
New claims **9–13** are added and determined to be patentable.

1. Apparatus for injection molding plastic articles including the combination of: a rotary processor for plasticating plastic and polymeric material comprising a rotor mounted for rotation in a housing, the rotor having a plurality of annular channels, which provide moving surfaces of a plurality of annular passages which are closed by a mating surface of the housing, the housing having an inlet through which material to be plasticated is fed into at least one of the passages, and fixed members projecting from the housing into the channels for restraining the material to be acted on by the moving surfaces and to direct the material to successive passages and toward an outlet, and motor means for rotating the rotor for plasticating and otherwise operating on the material fed through the inlet and successive passageways and through the outlet in substantially continuous fashion; an injection unit comprising a barrel, an injector ram reciprocable in the barrel in a first direction to enlarge a chamber at one end of the barrel to receive a predetermined charge of plasticated material and reciprocable in a second direction to force the charge from the *barrel* chamber into a mold, an accumulator comprising a cylinder having **[**a**]** *an accumulator* chamber adapted to receive plasticated material from the processor outlet and a piston in the cylinder biased toward a reduced volume condition in the accumulator chamber so as to receive material from the processor and to force material from the accumulator chamber into the barrel chamber; a valve interconnecting said rotary processor, said injection unit, and said accumulator, said valve *communicating with said barrel chamber through a passage downstream from said valve, and said valve* in a first condition connecting the outlet of the processor and the accumulator chamber *through said downstream passage* to the barrel chamber and in a second condition closing off the **[**barrel chamber**]** *downstream passage* and connecting the outlet of the processor only to the accumulator chamber; and means effective when the barrel chamber has received a predetermined charge, for driving the injector ram in said **[**other**]** *second* direction to force plasticated material from the barrel chamber into the mold whereby said valve in said first condition provides for flow of material *through said downstream passage* to said barrel from both said processor and said accumulator during receiving of a charge of material in said barrel chamber, and said valve in said second condition provides for flow of material only to said accumulator during reciprocation of said ram to force the charge of material into a mold and thereby allow substantially continuous operation of said rotary processor during operation of the apparatus.

B1 4,604,111 (1075th)
PARTICULATE CONTAMINATION CONTROL METHOD AND FILTRATION DEVICE

Anthony Natale, 450 S. Fork Landing Rd., Maple Shade, N.J. 08052

Continuation of Ser. No. 323,730, Nov. 23, 1981, abandoned.
Int. Cl.[4] B01D *46/42*
U.S. Cl. 55—97



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–17** is confirmed.

New claims **18–29** are added and determined to be patentable.

1. A method of establishing a negative pressure environment within an existing building for removing dangerous solid materials from the building, said method comprising:

(1) defining an enclosed space within said building using existing wall structure to define at least a portion of said enclosed space;

(2) establishing at least one flow path for air to enter said enclosed space;

(3) continuously evacuating air from said enclosed space through a filter means to remove dangerous solid materials from said evacuated air and to establish a negative air pressure in said enclosed space so that air exiting said space passes through said filter means; and

(4) sealing said flow path against air exiting from said air space to the exterior of said enclosed space in the event of loss of negative air pressure in said enclosed space.

STATUTORY INVENTION REGISTRATIONS

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B1 4,721,809 (10th)
ALKYLSULFONAMIDO OR PERFLUOROALKYLSULFONAMIDO BENZENESULFONAMIDES
George C. Buzby, Jr., Blue Bell, and Thomas J. Colatsky, Paoli, both of Pa., assignors to American Home Products Corporation, New York, N.Y.
Reexamination Request No. 90/001,618, Sep. 30, 1988.
Reexamination Certificate for Patent No. 4,721,809, issued Jan. 26, 1988, Ser. No. 909,133, Sep. 18, 1986.
Int. Cl.[4] C07C *147/72*
U.S. Cl. 564—82

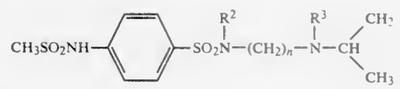
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 2, 4–6 and 8–10 are cancelled.

Claim 3 is determined to be patentable as amended.

Claim 7, dependent on an amended claim, is determined to be patentable.

3. A compound of the formula:



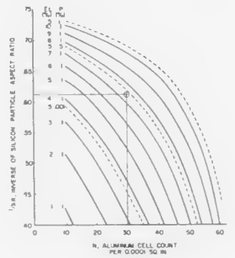
in which
R^2 is [hydrogen or] isopropyl;
R^3 is hydrogen [or isopropyl]; and
n is one of the integers 2 or 3;
or a pharmaceutically acceptable salt thereof.

STATUTORY INVENTION REGISTRATIONS

PUBLISHED JUNE 6, 1989

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H633
METHOD OF PREDICTING DUCTILITY OF A METALLIC CAST EUTECTIC ALLOY AND EQUATION THEREFOR
Dale L. McLellan, Bellevue, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Sep. 28, 1983, Ser. No. 536,753
Int. Cl.[4] G01N *17/00*
U.S. Cl. 73—87 2 Claims

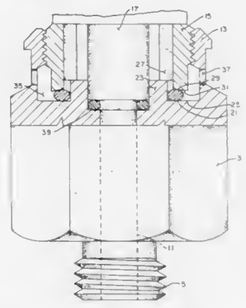


1. A method for nondestructively determining ductility of a casting of a metallic eutectic ally comprising a primary metal and eutectic particles, said method comprising the steps of:
(a) selecting a surface area of said casting for determination of ductility;
(b) determining the number metal cells of said primary metal within said surface area of said casting;
(c) measuring the aspect ratio of the eutectic particles and the porosity within said surface area of said casting;
(d) determining ductility of said casting by relating the number cells of said primary metal per unit area with the measured said aspect ratio of said eutectic particles and the measured said porosity according to the following relationship:

$$EL=10\{[C_1(N^{0.5})-C_2(N^{0.5}/AR)+C_3(-1/AR)-C_4(P^{0.5})-C_5-]/(k+b)\}$$

where
EL is the total average elongation (ductility of said casting in percent;
N is the number of cells of said primary metal of said casting per unit area;
$C_1(N^{0.5})$ is the solidification rate (SR);
$C_2(N^{0.5}/AR)$ is the SR and eutectic modification (EM) interaction; AR is said aspect ratio of said eutectic particles;
$C_3(1/AR)$ is the EM from alloying and solution heat treatment;
$C_4(P^{0.5})$ is the porosity, percent coverage, ductility reduction;
C_5 is a coefficient characteristic of the chemistry of said alloy; and
c, k, and b are empirical constants for said alloy and C_1, C_2, C_3, and C_5 are coefficients from statistical multiple regression of said alloy.

H634
FLOWMETER PRESSURE RELIEVING DEVICE
Dario Nieri, and Cesare Zanon, both of Pianoro, Italy, assignors to Emerson Electric Company, St. Louis, Mo.
Filed Sep. 8, 1988, Ser. No. 241,489
Int. Cl.[4] G01F *15/00*
U.S. Cl. 73—272 R 17 Claims



1. A flowmeter for measuring the flow of fluid through a conduit, said flowmeter including a body mounted relative to said conduit and having a passageway therethrough communicating with said conduit, a cover assembled to said body and containing a flowmeter device therein for measuring the flow of liquids in said passageway, an O-ring compressed between said body and cover to seal the flowmeter device relative to said passageway, one of said body and cover being provided with inside vent openings communicating with and permitting said O-ring to be exposed to the fluid pressure in said passageway, sufficient fluid pressure within said passageway circumferentially enlarging and moving said O-ring out of compressive engagement between said body and cover, and outside vent openings provided on one of said body and cover which communicates with said inside vent openings through the area evacuated by the O-ring for venting the excess fluid pressure therethrough to atmosphere without causing any damage to the flowmeter.

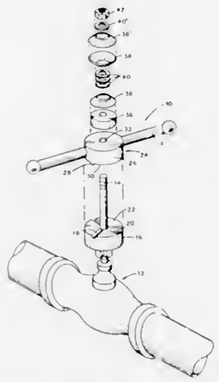
H635
INJECTION MANDREL
Dale V. Johnson, 6312 Schouest, Metairie, La. 70003, and John R. Gordon, 2513 Eton St., New Orleans, La. 70114
Filed Apr. 3, 1987, Ser. No. 35,950
Int. Cl.[4] E21B *43/00*
U.S. Cl. 166—310 1 Claim

1. A center pocket injection mandrel for circulating treating fluid from a supply of such fluid in the annulus of a well through a separate chemical injection valve having a lower end and into a fluid produced from said well, comprising:
a body having a longitudinal flow conduit therethrough for the produced fluid and a port through the body communicating with the annulus of the well, and adapted to be attached to a tubing string;
a valve housing in the body in fluid communication with the flow conduit in the body and the port through the body, defining a valve pocket in the body adapted to receive a separate chemical injection valve; and
a check valve connected to the body for permitting flow of the treating fluid from the annulus to the valve pocket

through the port in the body and for preventing reverse flow, whereby when a chemical injection valve is in the valve pocket, treating fluid may be flowed through the check valve and the chemical injection valve into contact

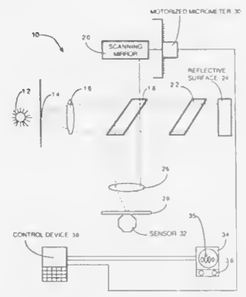
with the produced fluid and when there is no chemical injection valve in the pocket, the check valve prevents flow of produced fluids through the check valve into the annulus of the well.

H636
TORQUE LIMITED DRIVE FOR MANUAL VALVES
Philip G. Elliott, Metropolis, Ill., and Daniel E. Underwood, Paducah, Ky., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Sep. 15, 1988, Ser. No. 248,224
Int. Cl.[4] F16K *31/44*
U.S. Cl. 251—81 4 Claims



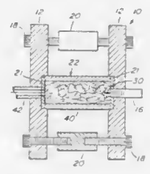
1. In a manually operated valve assembly including a rotatable valve stem for opening and closing the valve assembly, the improvement comprising a torque-limiting handwheel for preventing damage to said valve assembly caused by the excessive application of torque to said stem, said handwheel comprising:
a first plate fixably attached to said stem and rotatable therewith, said first plate having a generally planar surface disposed orthagonal to the longitudinal axis of said stem and defining at least one radially extending groove;
a second plate rotatably attached to said stem having a generally planar surface disposed orthagonal to the longitudinal axis of said stem and defining at least one radially extending ridge shaped to mate with said groove in said first plate, said planer surfaces in said first and second plates being disposed in a continuous manner with said ridge and channels in said respective plates being engaged when said valve is operating within defined torque limits;
means for manually imparting torque to said second plate to rotate said second plate during valve operation;
means urging said first and second plates together to maintain said ridge and grove in mating relationships during normal valve operation.

H637
METHOD AND APPARATUS FOR RAPID OPTICAL PHASING
Mark G. Baciak, Albuquerque, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Apr. 30, 1986, Ser. No. 857,621
Int. Cl.[4] G01B *11/00, 9/02*
U.S. Cl. 356—363 13 Claims



1. An apparatus for establishing zero optical path difference between optical devices so that they can be operated in phase, utilizing an interferometer comprising a light source, a beam splitter for splitting a light beam from the light source and a reference mirror for reflecting a portion of the light beam split by the beam splitter, and wherein the apparatus for phasing optical devices further comprises:
(a) a reflecting mirror positioned in a known fixed relationship with the optical device for which zero optical path difference is to be established and which reflects a portion of the light beam split by the beam splitter and wherein said optical device comprises an optical path distance adjuster;
(b) an optical receiver for displaying combined light reflected from said reference mirror and said reflecting mirror;
(c) an electro-optical sensor for sampling light at said optical receiver as the optical path between said optical receiver and said reflecting mirror is changed by said optical path distance adjuster on said optical device; and
(d) an amplification and display device for amplifying and displaying signals from said electro-optical sensor in order to discern a predetermined light intensity variation at said optical receiver which signifies zero optical path difference between said optical receiver and both said reference mirror and said reflecting mirror.

H638
RAPID FLASH LAMP
Thomas L. Gavenonis, 544 Sand Hill Rd., R.D. #3, Montoursville, Lycoming County, Pa. 17754, and William H. Hewitt, 24 G Acres Dr., Essex County, Bradford, Mass. 01830
Continuation of Ser. No. 687,640, Dec. 31, 1984, abandoned.
This application Jul. 28, 1986, Ser. No. 890,940
Int. Cl.[4] F21K *5/02*
U.S. Cl. 431—358 13 Claims



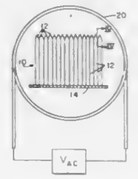
1. A primer-less rapid flash lamp system comprising:
(a) a light transparent envelope;
(b) a pair of electrodes spaced apart on or within said envelope;
(c) a pressurized gas for supporting combustion within said envelope;
(d) a shredded non-adhesive electrically conductive combustible means, in electrically conductive contact with each electrode, for providing an electrically conductive path between said electrodes to cause a rapid simultaneous ignition of substantially all shreds of the combustible means solely upon application of a substantially high energy pulse to one of said electrodes without the use of a primer; and
(e) means for applying said high energy pulse to said electrodes.

H639
METHOD OF MAKING A FERRITE ELEMENT
Richard A. Stern, Allenwood, and Richard W. Babbitt, Fair Haven, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed May 2, 1988, Ser. No. 188,934
Int. Cl.[4] B29C *35/02, 67/00*
U.S. Cl. 264—80 4 Claims

1. Method of making a ferrite element for millimeter-wave ferrite control devices from a mold type cavity having the configuration of the desired ferrite element, said method comprising coating the surface of the cavity with a mold release solution so as to allow easy removal of the completed ferrite element, filling the cavity with ferrite by arc-plasma-spraying, removing the ferrite element from the cavity and annealing the ferrite element to optimize the ferrite magnetic properties.

H640
INDUCTIVE SINTERING OF POLYMERS TO BLADES
Jonathan Nizel, Natick, Mass., assignor to The Gillette Company, Boston
Filed Apr. 29, 1988, Ser. No. 188,423
Int. Cl.[4] B05D *3/02*
U.S. Cl. 427—45.1 6 Claims

1. A method of manufacturing a razor blade having a coating of polymeric material disposed on the edge surface thereof which includes the steps of providing a chamber having an oxygen-free atmosphere therein and a means for creating a rapidly changing magnetic field within said chamber, applying a polymeric material to the edge surface of the blade, and retaining said blade in said magnetic field whereby the current induced by said magnetic field is effective to raise the temperature of said blade and to cause sintering of said polymeric material to said blade edge surfaces.

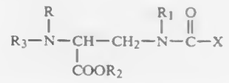


H641
PROCESS FOR MAKING COATINGS ON GRAPHITE USING INTERCALATED SPECIES
Barry W. McQuillan, San Diego, and George H. Reynolds, San Marcos, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jul. 5, 1988, Ser. No. 220,135
Int. Cl.[4] B05D *3/00*
U.S. Cl. 427—299 4 Claims

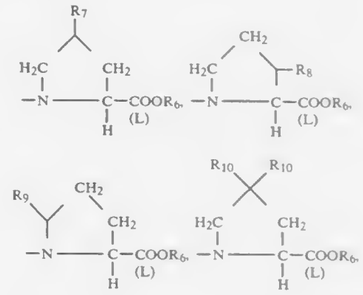
1. A method for coating a graphitic carbon fiber, comprising the steps of:
(a) intercalating a metal chloride into the carbon fiber; and,
(b) deintercalating the chlorine from the carbon fiber by hydrolysis to form a metal oxide on the fiber surface.

H642
SUBSTITUTED URIDO AMINO AND IMINO ACIDS AND ESTERS
David Floyd, and Melanie J. Loots, both of Pennington, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.
Filed Aug. 20, 1984, Ser. No. 642,278
Int. Cl.[4] C07D *207/00*
U.S. Cl. 514—423 12 Claims

1. A compound of the formula:



including a pharmaceutically acceptable salt thereof wherein:
X is



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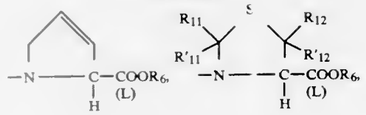

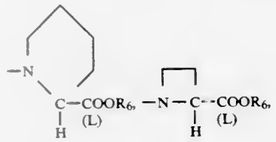

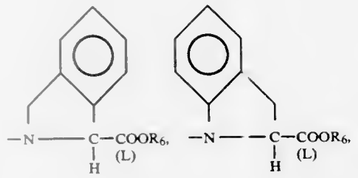

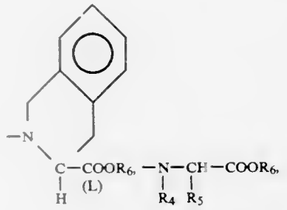

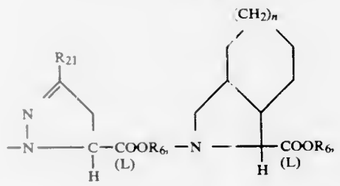

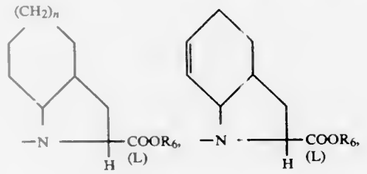

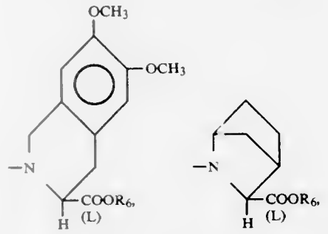

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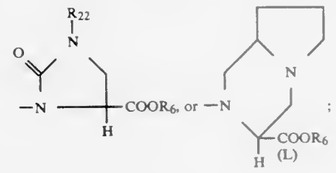
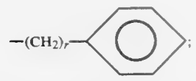
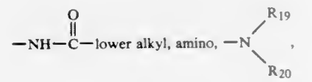
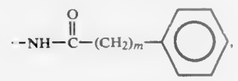


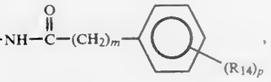
n is zero one, or two;
R_{22} is lower alkyl of 1 to 4 carbons or

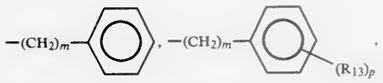


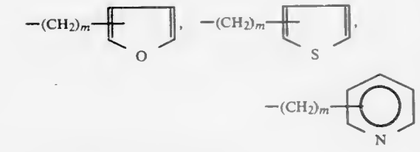
R_7 is hydrogen, lower alkyl, halogen, hydroxy,



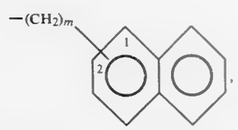




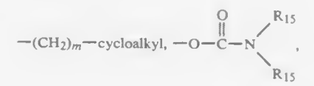


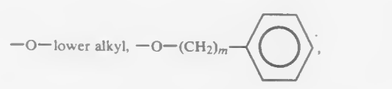


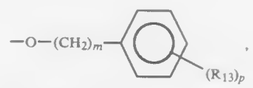
a 1- or 2-naphthyl of the formula



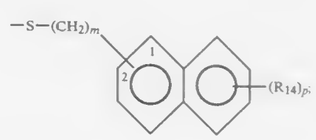
a substituted 1- or 2-naphthyl of the formula



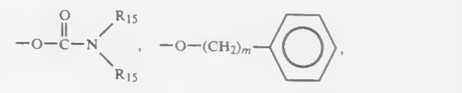


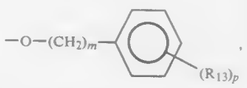


a 1- or 2-naphthyloxy of the formula

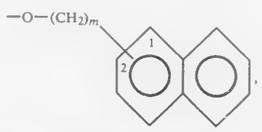


R_8 is halogen,

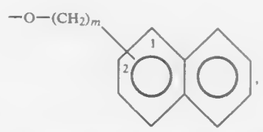




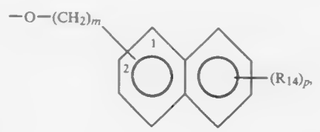
—O—lower alkyl, a 1- or 2-naphthyloxy of the formula

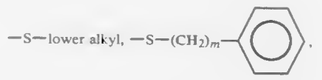


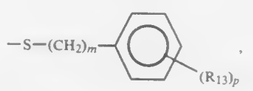
a substituted 1- or 2-naphthyloxy of the formula



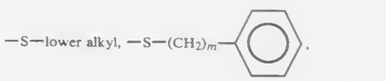
a substituted 1- or 2-napthyloxy of the formula

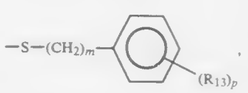




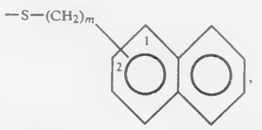


a 1- or 2-naphthylthio of the formula

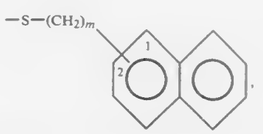




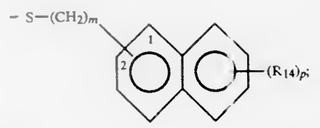
a 1- or 2-naphthylthio of the formula



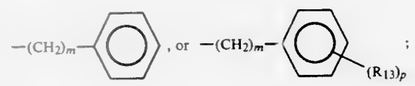
or a substituted 1- or 2-naphthylthio of the formula



or a substituted 1- or 2-naphthylthio of the formula

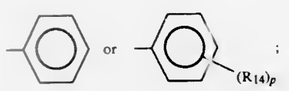


R_9 is keto



R_{10} is halogen or —Y—R_{16};

R_{11}, R'_{11}, R_{12} and R'_{12} are independently selected from hydrogen and lower alkyl or R'_{11}, R_{12} and R'_{12} are hydrogen and R_{11} is



R_{13} is lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, hydroxy, phenyl, phenoxy, phenylthio, or phenylmethyl;

R_{14} is lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl or hydroxy;

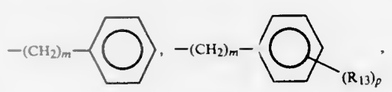
m is zero, one two, three, or four;

p is one, two or three provided that p is more than one only if R_{13} or R_{14} is methyl, methoxy, chloro, or fluoro;

R_{15} is hydrogen or lower alkyl of 1 to 4 carbons;

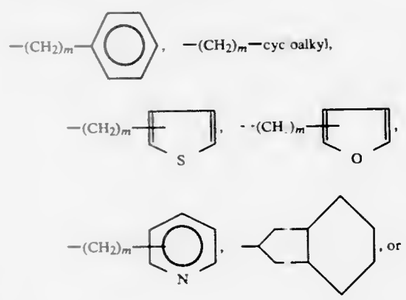
Y is oxygen or sulfur;

R_{16} is lower alkyl of 1 to 4 carbons,



or the R_{16} groups join to complete an unsubstituted 5- or 6-membered ring or said ring in which one or more of the carbons has a lower alkyl of 1 to 4 carbons or a di(lower alkyl of 1 to 4 carbons) substituent;

R_4 is hydrogen, lower alkyl



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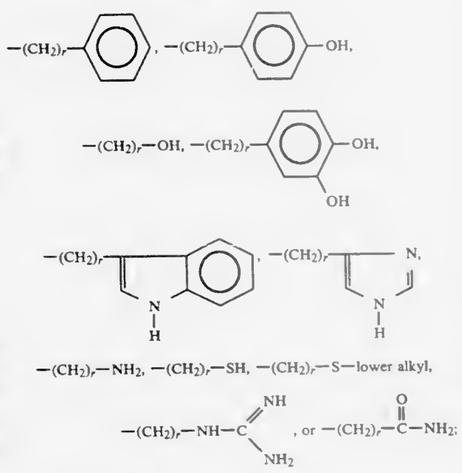
R_5 is hydrogen, lower alkyl,

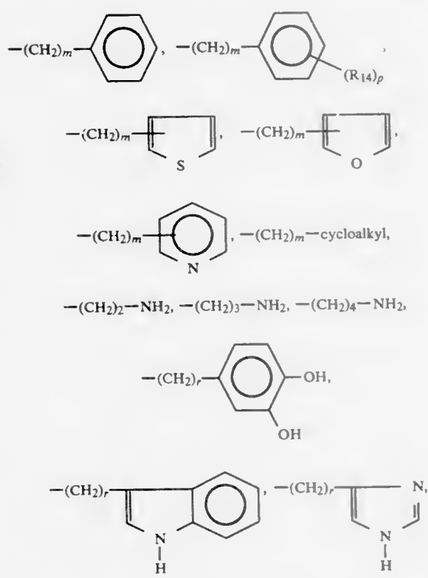


r is an integer from 1 to 4;

R_{19} is lower alkyl, benzyl, or phenethyl;

R_{20} is hydrogen, lower alkyl, benzyl or phenethyl;

R_1 is hydrogen, lower alkyl, halo substituted lower alkyl



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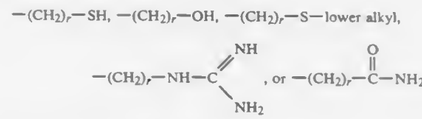
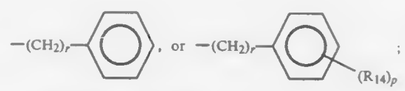
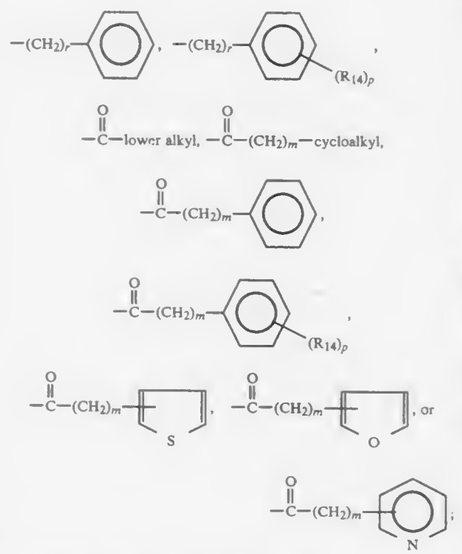


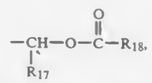
R is hydrogen, lower alkyl



R_3 is hydrogen, lower alkyl,



R_2 and R_6 are independently selected from hydrogen, lower alkyl, benzyl, benzhydryl,

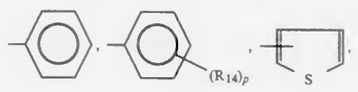


and salt forming ion;

R_{17} is hydrogen, lower alkyl, cycloalkyl, or phenyl;

R_{18} is hydrogen, lower alkyl, lower alkoxy, or phenyl; and

R_{21} is hydrogen, lower alkyl,



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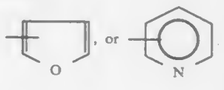


H643

PROCESS FOR THE PREPARATION OF GLYCOSIDE-CONTAINING POLYESTER RESIN MATERIALS

Raymond L. Drury, Jr., Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed May 17, 1985, Ser. No. 735,939
Int. Cl.⁴ C08G *65/00, 59/42, 59/40*
U.S. Cl. 536—119 **18 Claims**

1. In a process for preparing a polyester resin by the reaction of an aromatic polybasic acid or anhydride with a polyol reactant containing at least a minor proportion of an alkyl, alkenyl or aryl glycoside or polyglycoside material at an elevated temperature, the improvement comprising:

a. replacing a minor proportion of said aromatic polybasic acid or anhydride with an aliphatic polybasic acid or anhydride; and

b. conducting said reaction in a fashion such that the reaction temperature is maintained below about 185° C. until at least about 50 percent of the total carboxyl groups of the combined acid or anhydride components have been reacted to form ester functionalities.

H644

METHOD FOR PREPARING 2,2,2-TRINITROETHYL 2-NITROXYETHYL ETHER

Michael E. Sitzmann, Adelphi, and Horst G. Adolph, Burtonsville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 27, 1988, Ser. No. 226,335
Int. Cl.⁴ C07C *77/00, 77/02, 79/00*
U.S. Cl. 558—483 **6 Claims**

1. A method of preparing 2,2,2-trinitroethyl 2-nitroxyethyl ether by

(1) reacting iodomethyl 2-(trimethylsilyloxy)ethyl ether with nitroform to produce a crude mixture of 2,2,2-trinitroethyl 2-hydroxyethyl ether and byproducts;

(2) treating the crude 2,2,2-trinitroethyl 2-hydroxyethyl ether mixture with concentrated hydrochloric acid at a temperature of from about 50° C. to about 80° C. for at least one hour;

(3) separating 2,2,2-trinitroethyl 2-hydroxyethyl ether along with a byproduct, which is the formate of 2,2,2-trinitroethyl 2-hydroxyethyl ether, from the treated mixture of step (2);

(4) nitrating the 2,2,2-trinitroethyl 2-hydroxyethyl ether and its formate to produce 2,2,2-trinitroethyl 2-nitroxyethyl ether; and

(5) isolating the product 2,2,2-trinitroethyl 2-nitroxyethyl ether.

H645

PROCESS FOR THE CONVERSION OF MALEIC ACID DERIVATIVES TO THEIR CORRESPONDING FUMARIC ISOMERS

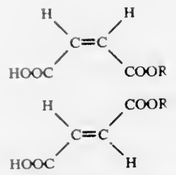
Hugh L. Dryden, Jr., Deerfield, Ill., assignor to The NutraSweet Company, Deerfield, Ill.

Filed Jul. 16, 1987, Ser. No. 74,102
Int. Cl.⁴ C07C *51/353, 102/00, 103/66*
U.S. Cl. 560—41 **11 Claims**

1. A process for converting a maleyl monoester compound

according to formla II to the corespondi ng fumaryl monoester compound of formula IIa;

wherein R is a C_2–C_7 alkyl, benzyl or phenyl,



II

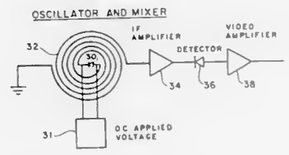
IIa

said process comprising treating the maleyl compound with a substituted or unsbstituted thiourea inversion agent in an acid solution under anhydrous conditions.

H646
WIDEBAND SELF MIXING MILLIMETER WAVE RECEIVER

James B. Y. Tsui, Centerville, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 7, 1987, Ser. No. 46,752
Int. Cl.[4] H01Q *1/36*; H04B *1/26*
U.S. Cl. 343—895 **4 Claims**



3. A self-mixing antenna-mixer millimeter wave receiver having a local oscillator and a mixer combined in a single unit, comprising a spiral antenna having two arms, each having an inner end and an outer end, a semiconductor device having at least two terminals connected directly to the inner ends of the two arms at the center of the spiral antenna, means for coupling a source of direct current to said device via leads used only for the direct current and connected directly to the inner ends of the two arms at the center of the spiral antenna, so that the device becomes an oscillator, and at the same time the device functions as a mixer for input signals received by the spiral antenna.

REISSUES

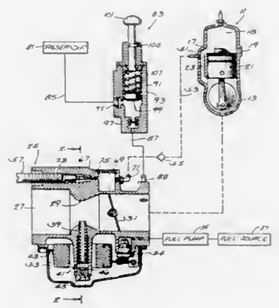
JUNE 6, 1989

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in *italics* indicates additions made by reissue.

Re. 32,938
DUAL FUEL SYSTEM FOR INTERNAL COMBUSTION ENGINE

David F. Haman, Waukegan, and Dale M. Needham, Zion, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Original No. 4,462,346, dated Jul. 31, 1984, Ser. No. 406,446, Aug. 9, 1982. Continuation of Ser. No. 816,404, Jan. 2, 1986, abandoned. Application for reissue Sep. 1, 1987, Ser. No. 93,122
Int. Cl.[4] F02M *1/16*
U.S. Cl. 123—73 B **6 Claims**

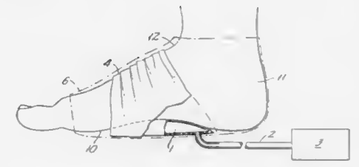


1. An internal combustion engine comprising a crankcase, a cylinder extending from said crankcase and defining a combustion chamber having an inlet port, a transfer passage communicating between said crankcase and said inlet port, a carburetor having an air induction passage communicating with said crankcase and including a venturi *and a float bowl adapted to contain fuel for normal operation, a throttle valve intermediate said venturi and said crankcase,* [and] a high speed nozzle communicating between said venturi and [a source of operating fuel for normal operation] *said float bowl, a low speed fuel nozzle communicating with said transfer passage adjacent said inlet port, a fuel line communicating between said low speed nozzle and said* [source of operating fuel] *float bowl for delivering fuel unmixed with air from said float bowl through said low speed nozzle to said transfer passage, said fuel line including check valve means for preventing flow from said combustion chamber and permitting flow to said combustion chamber and also including fuel flow metering means separate from said check valve means, a reservoir for a primer fuel different from said operating fuel, and a primer fuel pump communicating with said primer fuel reservoir and with one of said induction passage, said crankcase, said transfer passage and said combustion chamber, said primer fuel pump being manually operable to deliver primer fuel to said one of said induction passage, said crankcase, said transfer passage, and said combustion chamber.*

Re. 32,939
MEDICAL APPLIANCE

Arthur M. N. Gardner, and Roger H. Fox, both of Devon, England, assignors to Electro-Biology, Inc., Parsippany, N.J.

Original No. 4,614,180, dated Sep. 30, 1986, Ser. No. 763,686, Aug. 8, 1985. Continuation-in-part of Ser. No. 621,499, Jun. 18, 1984, abandoned. Application for reissue May 16, 1988, Ser. No. 194,438
Claims priority, application United Kingdom, Jun. 22, 1983, 8316959; Nov. 11, 1983, 8330138
Int. Cl.[4] A61H *7/00*
U.S. Cl. 128—64 **28 Claims**



1. A medical appliance comprising an inflatable bag of flexible material having two like panels peripherally sealed to each other, at least one panel being of porous material or of a puncturable material, said panels each having a plantar-aspect sole area configurated to longitudinally lap essentially only the region of a foot between adjacent plantar limits of the heel and ball of the foot and to extend transversely into substantial register with lateral-edge limits of the sole of the foot, said panels integrally including within the same peripheral seal a dorsi-medial area extending transversely from one lateral edge of the sole area to a transverse extent substantially as great as the longitudinal extent of the sole area and being of width very substantially less than the longitudinal extent of the sole area, whereby with said sole area positioned in the plantar area of the foot, the dorsi-medial area may be applied over the medial inner side of the foot, and a supply-tube connection to said bag within said second area.

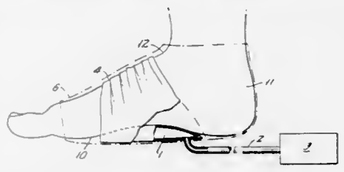
Re. 32,940
MEDICAL APPLIANCE

Arthur M. N. Gardner, Ipplepen, and Roger H. Fox, Totnes, both of England, assignors to Electro-Biology, Inc., Parsippany, N.J.

Original No. 46,141,792, dated Sep. 30, 1986, Ser. No. 794,443, Nov. 4, 1985. Continuation of Ser. No. 763,686, Aug. 8, 1985, Pat. No. 4,614,180, which is a continuation-in-part of Ser. No. 621,499, Jun. 18, 1984, abandoned, and a continuation-in-part of Ser. No. 751,150, Jul. 2, 1985, abandoned, which is a division of Ser. No. 621,499, Jun. 18, 1984, abandoned. Application for reissue May 16, 1988, Ser. No. 194,519
Claims priority, application United Kingdom, Jun. 22, 1983, 8316959; Nov. 11, 1983, 8330138
Int. Cl.[4] A61H *7/00*
U.S. Cl. 128—64 **16 Claims**

1. The method of promoting venous pump action in the leg of a living body, which method comprises simultaneously applying (a) upward and spreading force at longitudinally spaced plantar regions of the sole of the foot, said regions being essentially limited by and between the ball and heel of the foot and (b) downward force at the region of the midtarsal joint, said forces being applied in a cyclical pattern of relatively rapid increase to a predetermined upper limit before relaxation for a period substantially exceeding the application time,

whereby the arch of the foot is caused to flatten periodically and thus to stretch and neck down the internal local sectional



area of the veins of the lateral plantar complex, with resulting venous-pump action.

Re. 32,941

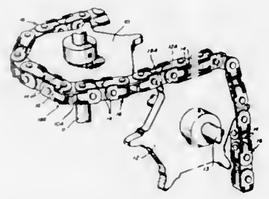
DRIVE CHAIN

Alan R. Newton, 67 Bluebird Ave., East Wareham, Mass. 02538

Original No. 4,459,124, dated Jul. 10, 1984, Ser. No. 202,477, Oct. 31, 1980. Application for reissue Dec. 4, 1987, Ser. No. 130,321

Int. Cl.[4] F16G *13/02*

U.S. Cl. 474—210 **33 Claims**



1. A chain adapted for right angle sprocket drive and comprising;

at least two successive sets of planar links with each set having at least one link,

a separate pivot link having opposite first and second ends,

means for pivotally securing the planar links to the pivot link comprising a first pivot pin member associated with the first end of the pivot link for disposing one planar link of a first set in a first direction and a second pivot pin member associated with the second end of the pivot link for disposing a second planar link of a second set in a second direction substantially alternated at a 90° angle to the first direction,

[and**]** a second pivot link including a third pivot pin member supporting an opposite end of said second planar link of said second set

each said pivot link having at each of said opposite first and second ends means defining an arcuate sprocket tooth engaging surface extending substantially circumferentially about the axis of said pivot pin member to enclose said pivot pin member,

and a third pivot link including a fourth pivot pin member supporting an opposite end of said one planar link,

the pivot pin members at opposite said ends of planar link set having a spacing therebetween,

the pivot pin members at opposite ends of said second planar link set having a spacing therebetween,

the spacing between pivot pin members at opposite ends of said one planar link set being substantially the same as the spacing between pivot pin members at opposite ends of said second planar link set,

and orthogonally driven sprockets of the same construction are engageable between respective orthogonally disposed planar link sets.

Re. 32,942

LOW THERMAL EXPANSIVITY AND HIGH THERMAL CONDUCTIVITY SUBSTRATE

Sheldon H. Butt, Godfrey, Ill., assignor to Olin Corporation, New Haven, Conn.

Original No. 4,569,692, dated Feb. 11, 1986, Ser. No. 539,449, Oct. 6, 1983. Application for reissue May 15, 1986, Ser. No. 863,655

Int. Cl.[4] C22C *29/12*

U.S. Cl. 75—235 **40 Claims**

25. A composite adopted to be a substrate for an electronic application, comprising a mixture of:

first material particles having a coefficient of thermal expansion in the range of about -20×10^{-7} to about 50×10^{-7} in-/in/°C.;

second material particles mixed with said first material particles having a coefficient of thermal expansion in the range of about 100×10^{-7} to about 274×10^{-7} in/in/°C.; and

a bonding agent to adhere the first and second material particles into a coherent composite having a coefficient of thermal expansion of about 1×10^{-7} in/in/°C. to about 274×10^{-7} in/in/°C.

Re. 32,943

PROCESS FOR COOKING LIGNOCELLULOSIC MATERIAL IN THE PRESENCE OF HYDROXYANTHRACENES AND DERIVATIVES THEREOF

Masato Nakamura; Yoshika Nomura, both of Tokyo, and Iwahiro Uchimoto, Chiba, all of Japan, assignors to Honshu Seishi Kabushiki Kaisha, Tokyo, Japan

Original No. 4,181,565, dated Jan. 1, 1980, Ser. No. 940,582, Sep. 8, 1978. Continuation-in-part of Ser. No. 758,837, Jan. 12, 1977, abandoned. Application for reissue Feb. 12, 1981, Ser. No. 233,962

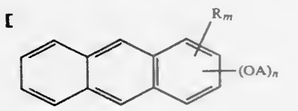
Claims priority, application Japan, Dec. 10, 1976, 51-148492

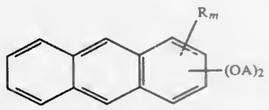
Int. Cl.[4] D21C *3/20*

U.S. Cl. 162—76 **10 Claims**

1. An improved cooking process for the production of pulp from lignocellulosic material comprising cooking lignocellulosic material in a cooking liquor,

the improvement comprising admixing in said cooking liquor an amount, sufficient to increase the cooking rate of said lignocellulosic material, of a cooking aid comprising at least one member selected from the group consisting of compounds having the formula:

[ **]**



[wherein m is 0, 1 or 2, n is 1, or 2, R is COOA, SO_3A or H, and A is H or Na; providing that when m is 1, R is at least one of COOA or SO_3A and R cannot attach to the middle ring; when m is 0 or 2, R is H; and**]**

wherein, m is 1 when R is COOA or SO_3A and R cannot attach to the middle ring, m is 2 when R is H, and A is H or Na; and

when R is H and m is 2, two carbon atoms of the anthracene nucleus lose their double bonds, and each such carbon atom takes the form of CH_2 instead of CH, in which case one H of each CH_2 is not counted as an R and may be substituted by OA.

Re. 32,944

AROMATIC CARBOXYLIC AMIDE DERIVATIVES

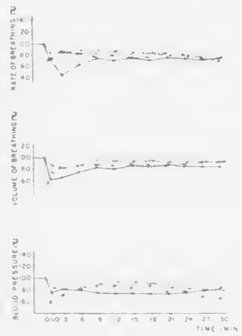
Kozaburo Harita, Osaka; Yukiyoshi Ajisawa, Nagano; Kinji Iizuka, Nagano; Yukibiko Kinoshita, Nagano; Tetsuhide Kamijo, Nagano, and Michihiro Kobayashi, Nagano, all of Japan, assignors to Kissel Yakuhin Kogyo Kabushiki, Kaisha, Japan

Original No. 3,940,422, dated Feb. 24, 1976, Ser. No. 434,252, Jan. 17, 1974. Application for reissue Jun. 1, 1977, Ser. No. 802,486

Claims priority, application Japan, Jan. 18, 1973, 48-7359

Int. Cl.[4] C07C *101/54*; A61K *31/195*

U.S. Cl. 562—455 **3 Claims**



8. A compound comprising N-(3',4'-dimethoxycinnamoyl)-anthronilic acid.

Re. 32,945

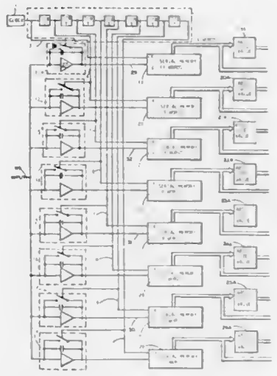
SYNCHRONIZATION SYSTEM FOR DIGITAL DATA

Richard A. Smithson, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Original No. 4,328,588, dated May 4, 1982, Ser. No. 169,583, Jul. 17, 1980. Application for reissue Feb. 12, 1987, Ser. No. 13,981

Int. Cl.[4] H04L *7/08*

U.S. Cl. 375—106 **17 Claims**



1. A digital signal synchronization system comprising:

a signal source for supplying an input signal;

an analog to digital converter having an input connected to said signal source; and an output;

a plurality of substantially identical **[**summing circuits**]** *integrators*, each connected to said output of said analog to digital converter for summing a plurality of successive signals for a predetermined time;

a plurality of clock sources, each connected to a corresponding one of said **[**summing circuits**]** *integrators* so that each **[**summing circuit**]** *integrator* begins summing said digital signal beginning at a different time; **[**and**]**

a plurality of memories, each of which is coupled to one of said integrators for storing a plurality of words, each of said words being representative of an output of the associated integrator;

a plurality of summing circuits, each of which is coupled to one of said memories for combining words from said memory; and

decision means connected to the output of each of said summing circuits for selecting one of said summing circuits according to a predetermined criteria, so that said clock signal associated with said one of said summing circuits is selected as the synchronized clock signal associated with said input signal.

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PLANT PATENTS

GRANTED JUNE 6, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,827
PEACH TREE
Ed Clendining, Sewell, N.J., assignor to Adams County Nursery Inc., Aspers, Pa.
Filed Mar. 10, 1988, Ser. No. 166,244
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—43 1 Claim

1. A new and distinct variety of yellow freestone peach tree, substantially as illustrated and described, characterized as to novelty by its strong vigorous growth habit, regular productivity and the ability to yield large, round, firm, globose, deep and fully red colored peaches with a rich and delicious flavor, ripening two weeks before Loring.

6,828
PEACH TREE
James M. Harman, Woolwine, Va., assignor to Adams County Nursery, Inc., Aspers, Pa.
Filed Mar. 10, 1988, Ser. No. 166,565
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—43 1 Claim

1. A new and distinct variety of yellow freestone peach, substantially as illustrated and described, characterized as to novelty by a vigorous growth habit, regular bearing and the ability to yield large to very large, firm, round, globose, deep to bright red color, slow softening fruit, having a superior sweet flavor which commonly ripens three to four days after the Rio Oso Gem and Encore varieties.

6,829
GRAPEVINE, "AMERICAN ROSE"
John Paboojian, Jr., 1005 Gleason Ave., Fowler, Calif. 93625
Filed Dec. 28, 1987, Ser. No. 140,777
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—47 1 Claim

1. A new and distinct variety of grapevine to be denominated varietally as the "American Rose" substantially as illustrated and described and which is characterized principally as to novelty by its production of a seeded substantially reddish brown colored berry which is mature for harvesting and shipment approximately September 15 through October 15 in Fresno County, Calif., said grapevines maturing in approximately the same season as the Emperior, Ribier and Queen varieties of grapevines (all unpatented) with which it is remotely related in its date of harvesting but from which it is distinguished therefrom and characterized principally as to novelty by producing berries which have a noteworthy firm texture, good eating qualities and a large size, and which further has an attractive reddish brown skin coloration with a greenish white halo, the vines of the subject variety further producing leaves which typically have a width dimension greater than the length dimension.

6,830
ORCHID LAELIOCATTLEYA BALLET FOLKLORICO 'ELOQUENCE'
Ernest E. Hetherington, Arcadia, Calif., assignor to Stewart Orchids, Carpioteria, Calif.
Filed Feb. 17, 1987, Ser. No. 15,371
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct variety in the hybrid genus Laeliocattleya, discovered as a superior variety of the grex Lc. Ballet Folklorico, named 'Eloquence', characterized by a combination of clearness of coloring, superior flower substance, size, shape and further characterized by its exceptional vigor, reliability of bloom, cold tolerance and lasting qualities.

6,831
IMPATIENS PLANT NAMED LUCINE
Ludwig Kientzler, Bad Kreuznach, Fed. Rep. of Germany, assignor to Paul Ecke, Jr., Encinitas, Calif.
Filed Nov. 12, 1987, Ser. No. 119,440
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Impatiens plant named Lucine, as illustrated and described, and parts thereof.

6,832
BOUVARDIA NAMED INGRID
John M. F. de Jong, Floraweg 67, 2371 AM Roelofarendsveen, Netherlands
Filed Dec. 1, 1987, Ser. No. 127,101
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive Bouvardia cultivar, substantially as herein shown and described, characterized by the distinctive coloration and form of its profusely blooming flowers.

6,833
BOUVARDIA NAMED JOREDA
John M. F. de Jong, Floraweg 67, 2371 AM Roelofarendsveen, Netherlands
Filed Dec. 1, 1987, Ser. No. 127,102
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinctive Bouvardia cultivar, substantially as herein shown and described, characterized by the distinctive coloration and form of its profusely blooming flowers.

6,834
CHRYSANTHEMUM PLANT NAMED WHITE DELIGHT
Peter S. Hesse, Bradenton, Fla., assignor to Ball Seed Company, W. Chicago, Ill.
Filed Jan. 29, 1988, Ser. No. 150,062
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named White Delight, as illustrated and described, and parts thereof.

6,835
CHRYSANTHEMUM PLANT NAMED CARNIVAL
Peter S. Hesse, Bradenton, Fla., assignor to Ball Seed Company, W. Chicago, Ill.
Filed Jan. 29, 1988, Ser. No. 150,063
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named Carnival, as illustrated and described, and parts thereof.

6,836
CHRYSANTHEMUM PLANT NAMED SAMBA
Peter S. Hesse, Bradenton, Fla., assignor to Ball Seed Company, Chicago, Ill.
Filed Jan. 29, 1988, Ser. No. 150,064
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named Samba, as illustrated and described, and parts thereof.

6,837
CHRYSANTHEMUM PLANT NAMED PEKOE
Leonard H. Shoesmith, deceased, late of Westfield, United Kingdom (by May Victoria Shoesmith, executrix), and Peter S. Hesse, Bradenton, Fla., assignors to Ball Seed Company, Chicago, Ill.
Filed Jan. 29, 1988, Ser. No. 150,066
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—74 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named Pekoe, as illustrated and described, and parts thereof.

6,838
CHRYSANTHEMUM PLANT NAMED CINDY
Peter S. Hesse, Bradenton, Fla., assignor to Ball Seed Company, W. Chicago, Ill.
Filed Jan. 29, 1988, Ser. No. 150,067
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—76 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named Cindy, as illustrated and described, and parts thereof.

6,839
CHRYSANTHEMUM PLANT NAMED VENETIAN
Leonard H. Shoesmith, deceased, late of Westfield, England (by May V. Shoesmith, executor), and Peter S. Hesse, Bradenton, Fla., assignors to Ball Seed Company, Chicago, Ill.
Filed Jan. 29, 1988, Ser. No. 150,065
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—77 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named Venetian, as illustrated and described, and parts thereof.

6,840
CHRYSANTHEMUM PLANT NAMED VENOY
Peter S. Hesse, Bradenton, Fla., assignor to Ball Seed Company, W. Chicago, Ill.
Filed Jan. 29, 1988, Ser. No. 150,068
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—77 1 Claim

1. A new and distinct cultivar of Chrysanthemum plant named Venoy, as illustrated and described, and parts thereof.

6,841
CYNODON DACTYLON GRASS PLANT CT-2
Hubert F. Whiting, 3771 Mattei Rd., Santa Ynez, Calif. 93460
Filed Nov. 30, 1987, Ser. No. 129,783
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—88 1 Claim

1. A new and distinct variety of Cynodon Dactylon grass plant herein described and illustrated, a new variety that I developed, discovered and asexually repropagated; this new variety of Cynodon Dactylon grass plant having a very dark green leaf blade color, with newly formed anthers before dehiscence of light yellow green color, with stolon and culm internodal spaces farther apart, than the closest known variety of Cynodon Dactylon grass plant C84-135; this new claimed variety CT-2 being entirely pubescent and producing a significant lack of thatch build-up, when compared to the closest known variety C84-135; this new claimed variety of Cynodon Dactylon grass plant CT-2, showing distinct uniqueness with the electrophoresis isoenzyme banding patterns herein shown, when compared to the closest known variety of Cynodon Dactylon grass plant C84-135.

6,842
AGLAONEMA 'QUEEN OF SIAM'
B. Frank Brown, Palm Bay, Fla., assignor to Weyerhaeuser Company, Tacoma, Wash.
Filed Feb. 8, 1988, Ser. No. 153,735
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—88 1 Claim

1. A new and distinct variety of Aglaonema substantially as shown and described, characterized by:

a compact and full appearance with leaves having a four color variegation on the upper surfaces with dark green margins, also blotches and spots of this color; a light gray-green central area that occupies about 50% to 70% of the leaf surface; medium gray-green blotches and spots between the margins and central area; and bright yellow-green markings and spots on the midrib;

the lower leaf surfaces being a bright green with small yellow-green blotches and a similarly colored midrib, the midrib having small green blotches about the same as or somewhat lighter in color than the principal undersurface green.

PATENTS

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ERRATA

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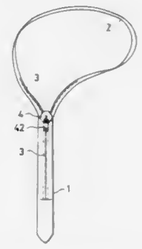
PATENTS

GRANTED JUNE 6, 1989

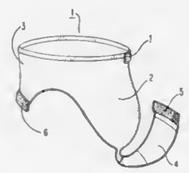
GENERAL AND MECHANICAL

4,835,794
PRESET NECKTIE
Jiann-Jong Chen, and Ching-Hwa Chen, both of 21, Alley, Lane 244, Sec. 5, Yen-ping North Road, Taipei, Taiwan
Filed Mar. 3, 1988, Ser. No. 163,592
Int. Cl.[4] A41D *25/02*
U.S. Cl. 2—150 **3 Claims**



1. A preset necktie comprising an outer tie, an inner tie, a zipper, a zipper slider having a pull tab, and a support body, the outer tie being present into a knot, the inner tie being inserted through the support body, the pull tab of the zipper slider being secured to the support body, a pressing spring plate being provided on the backside of said zipper slider, and said spring plate being bent inwardly to press against the zipper to thereby prevent inadvertent sliding movement of said zipper.

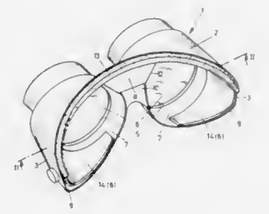
4,835,795
BODY SUIT AND UNDERPANTS WITH SELF-GRIPPING FASTENERS
Edward M. Lonon, 155 Sanford St., East Orange, N.J. 07018
Filed Apr. 4, 1988, Ser. No. 177,177
Int. Cl.[4] A41B *9/00*
U.S. Cl. 2—408 **3 Claims**



1. An undergarment comprising in combination front and back body panels, and a seat flap substantially narrower than said front and back body panels and constructed to be connected between the centers of said front and back body panels to provide leg openings, wherein at least one end of said flap is opened and closed to the front body panel of said garment by pressing together a first and a second mating strip of a self-gripping fastener of a type known by the trademark VELCRO (brand), said first strip being secured transversely to the underside of the end of said seat flap and said second strip being secured transversely to the lower center of said front body panel and

wherein a third strip of a self-gripping fastener constructed to mate with said first strip of said self-gripping fastener, is sewn, or otherwise secured, transversely across the upper center of said back body panel, thereby enabling the end of said flap in open position to be folded backwards and fastened to said third strip.

4,835,796
GOGGLES FOR PROTECTION AGAINST LASER RADIATION
Klaus Wiedner, Furth/Bay, Fed. Rep. of Germany, assignor to UVEX Winter Optik GmbH, Fuerth/Bay, Fed. Rep. of Germany
Filed Oct. 1, 1987, Ser. No. 104,114
Int. Cl.[4] A61F *9/02*
U.S. Cl. 2—431 **3 Claims**



1. Protective goggles against laser radiation comprising:

a frame including side shields and containing at least one protective lens;

wherein said goggles comprise a light weight frame, having a generally box-like configuration and said shielding extends across the side shields and the area of the bridge of the nose;

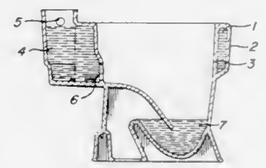
wherein the inside of said frame is at least partially covered with a layer of a flexible graphite shielding material;

wherein said flexible graphite shielding material is formed of pressed flakes of pure graphite;

wherein said flexible graphite shielding layer is covered with aluminum foil; and

wherein the shielding is glued to the inside of the goggle frame.

4,835,797
LOW PROFILE SIPHONIC FLUSH CLOSET
Cesare Castelli, Rua Otapoa s/n, Manguinhos, Serra Stato di Spirito Santo, Brazil
Filed Nov. 9, 1987, Ser. No. 118,559
Int. Cl.[4] E03D *1/28*
U.S. Cl. 4—332 **1 Claim**



1. A low profile flush closet comprising a bowl having a siphonic outlet, a rim, and a water tank located at the rear of the bowl, said bowl, said siphonic outlet, said rim, and said water tank being a unitary ceramic structure, flush valve

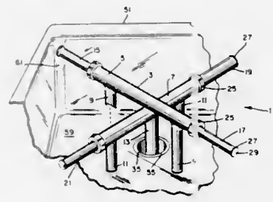
means located at the lower portion of the water tank for discharging water from the tank into the bowl, wherein the improvement comprises a cavity formed within said rim, said cavity being in communication with the water tank and extending substantially completely around the rim, whereby substantially all of the flushing water for said flush closet accumulates and is stored in said tank and in said cavity said cavity further including a lower boundary declining continuously from the front of the bowl toward the rear whereby water stored within the cavity can be rapidly and substantially completely discharged through the flush valve upon opening thereof.

4,835,798

BASKET SINK STRAINER CENTERING TOOL

Benito B. Hernandez, 4241 NW. 27th St., Fort Lauderdale, Fla. 33313

Filed May 17, 1988, Ser. No. 194,895
Int. Cl.[4] E03C *1/00*
U.S. Cl. 4—661 **18 Claims**



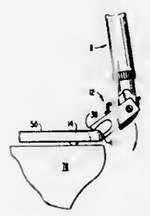
1. A centering tool for disposing and maintaining a basket sink strainer having a bottom well with slots in concentric and superposed parallel relationships with respect to a sink drain hole of a sink having a bottom surface and walls defining corners for subsequent securement of the basket sink strainer with the sink drain hole; said centering tool comprising spider means and prong means connected to said spider means; said spider means having adjustably positionable and lockable extensible means adapted to engage said corners of said sink while said prong means engages said slots whereby said spider means is adjustable to center said strainer in said drain hole.

4,835,799

APPARATUS FOR MANIPULATING A HINGED MEMBER

Joseph H. Beelart, Jr., 103 Quarry Rd., #108, Point Richmond, Calif. 94801

Filed Jun. 5, 1987, Ser. No. 58,450
Int. Cl.[4] A47K *13/10*; B25J *1/00*
U.S. Cl. 4—661 **19 Claims**



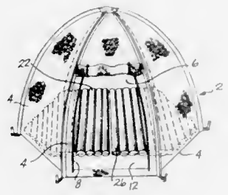
1. An apparatus for manipulating a free end of a hinged member comprising:
a handle;
a jaw having first and second jaw members spaced apart for receiving the free end of the hinged member therebetween; and
jaw connecting means for pivotally connecting both the first and second jaw members to an end of the handle so that the first and second jaw members pivot simultaneously relative to the handle.

4,835,800

SECTIONAL MATTRESS FOR TENT

Terrance D. Johnson, 301 N. Rogers, Aberdeen, Wash. 98520

Filed Dec. 17, 1987, Ser. No. 134,015
Int. Cl.[4] A46G *9/06*; A47C *27/00*
U.S. Cl. 5—420 **13 Claims**



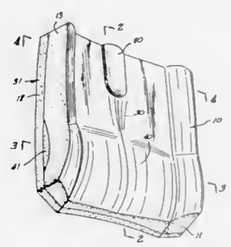
1. A sectional mattress for a tent having sidewalls with an entry opening therein and lower portions that define a floor area, said mattress comprising a first section, a second section, and a third section separate from said first and second sections; said first second, and third sections each having a use position on said floor area; said first, second, and third sections being shaped and dimensioned to cover substantially the entire extent of said floor area when they are in said use positions; and said third section being shaped and dimensioned to cover, when it is in its use position, a portion of said floor area adjacent to said opening; said portion of said floor area extending laterally at least substantially all the way across said opening, and inwardly from said opening a distance sufficient to allow a person entering the tent, when the first and second sections are in their use positions and the third section is away from its use position, to step into the tent without stepping on said first and second sections.

4,835,801

BACK SUPPORT CUSHION

Arline Walpin, and Lionel A. Walpin, both of Los Angeles, Calif., assignors to Roloke Co., Culver City, Calif.

Filed Nov. 19, 1987, Ser. No. 122,902
Int. Cl.[4] A47C *20/00, 7/02*
U.S. Cl. 5—432 **3 Claims**



1. A cushion comprised of a front pad, a back pad, a bottom edge and a first side edge and a second side edge, wherein a first insert is bonded between said front pad and said back pad

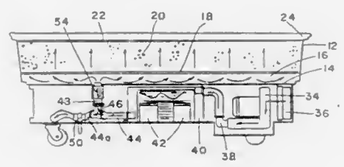
located in a central portion of said cushion creating a raised mound in said front pad; a second insert between said front pad and said back pad extending the width of the pad forming a raised strip in the front pad below said raised mound; said front pad has decreasing cross sectional thickness gradients extending from said first side edge and said second side edge which thickness gradients converge in the central portion of said cushion to form a central trough which extends from said raised mound transversely across said raised strip to said bottom edge.

4,835,802

FLUIDIZATION PATIENT SUPPORT CONTROL SYSTEM

Larry J. Purcey, Grandville; Douglas A. VanderHoff; Robert H. Vreeland, both of Grand Rapids; James P. Nielsen, Greenville, all of Mich., and Iowa Ueno, Chigasaki, Japan, assignors to The KMW Group, Inc., Grand Rapids, Mich. and Keisei Medical Industrial Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1988, Ser. No. 158,692
Int. Cl.[4] A47C *27/08*; A61G *7/00*
U.S. Cl. 5—453 **3 Claims**



1. A fluidization patient support system without excess air flow that causes "pinging" around the patient comprising:
an elongated fluidization tank having an open top;
a porous, flexible filter sheet secured over said open top;
fluidizable granular material below said sheet to support a patient thereon when fluidized;
a diffuser beneath said granular material to diffuse pressurized fluid flowing to said granular material and to support said granular material when not fluidized;
a plenum beneath said diffuser to receive air to be diffused;
a compressor-blower having an air inlet to the ambient atmosphere and having an outlet;
conduit means from said outlet to said plenum for conducting compressed air to said plenum and thence to said diffuser;
variable control valve means in said conduit means for controlling the flow of compressed air to said plenum;
a diversionary discharge outlet from said conduit means at said control valve means to divert air from flow to said plenum, said variable control valve means being shiftable over a variety of positions enabling control of the ratio of air flow to said plenum with respect to air flow to said diversionary discharge outlet; and
actuator means for said control valve means, allowing regulation of said ratio of air flow to said plenum and said diversionary discharge outlet and thereby flow of air through said porous sheet to be regulated for providing adequate patient support while preventing excessive flow through said porous sheet causing unpleasant pinging sensations for the patient.

4,835,803

PROCESS FOR PRODUCING A SHAPE-MEMORIZING WOOL AND ANIMAL HAIR

Shigesaburo Mizushima, Ishikawa, Japan

Filed Jul. 21, 1987, Ser. No. 76,189
Claims priority, application Japan, Jul. 24, 1986, 61-174254
Int. Cl.[4] D06M *3/02*
U.S. Cl. 8—128.1 **4 Claims**

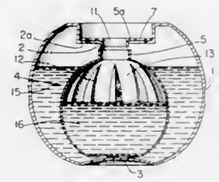
1. A process for permanently waving the fibers of wool and animal hair, comprising the sequential steps of (a) subjecting said fibers to steam, (b) crimping the steamed fiber by crimping means, (c) contacting the crimped fibers with a reducing agent whereby cystine bonds are cleaved and washing the cleaved fibers with water, (d) modifying the cleaved fibers by contacting with an aqueous solution of guanidine carbonate or guanidine phosphate, and protein derived from collagen, keratin or fibroin and washing the modified fibers with water, (e) contacting the modified fibers with an oxidizing agent and removing said crimping means.

4,835,804

MULTIPLE COMPARTMENT CONTAINER LAUNDERING METHOD

José L. Arnau-Munoz, Montigny-Le-Bretonneux, and Henri Cornette, Pontoise, both of France, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 25, 1988, Ser. No. 173,484
Int. Cl.[4] D06F *39/02*
U.S. Cl. 8—158 **6 Claims**



1. Process for the machine washing of laundry in which there is introduced into the drum of a washing machine a container containing a predetermined quantity of a detergent composition and adapted to permit the gradual diffusion of the latter during the washing operation, said process being characterized in that the constituents of the detergent composition which do not have a satisfactory mutual compatibility are packaged separately in individual compartments of said container, each of the said compartments having openings such that, when the container is placed in the drum, the constituents of the detergent composition diffuse simultaneously and separately during the washing operation.

4,835,805

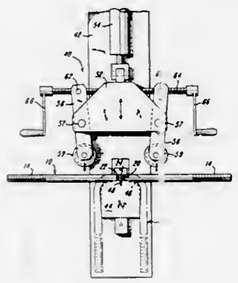
PRODUCTION OF THREADED METAL RODS FOR MAKING U-BOLTS

John C. Gray, 3050 Dryden Rd., Dayton, Ohio 45439

Continuation-in-part of Ser. No. 31,599, Mar. 30, 1987, Pat. No. 4,748,707, which is a continuation of Ser. No. 876,739, Jun. 20, 1986, Pat. No. 4,654,912, which is a continuation of Ser. No. 651,796, Sep. 18, 1984, abandoned, which is a continuation of Ser. No. 412,998, Aug. 30, 1982, abandoned, which is a continuation-in-part of Ser. No. 173,639, Jul. 30, 1980, abandoned. This application Jun. 6, 1988, Ser. No. 203,241
The portion of the term of this patent subsequent to Apr. 7, 2004, has been disclaimed.
Int. Cl.[4] B21K *1/74*; B21D *9/08*
U.S. Cl. 10—27 UB **5 Claims**

1. A method of efficiently producing heavy duty U-bolts of different sizes, wherein each U-bolt has two legs of substan-

tially equal length, the method comprising the steps of forming a supply of elongated straight cylindrical metal rods having opposite ends, smooth cylindrical outer surfaces and different predetermined lengths, forming helical threads on opposite end portions of each rod, successively feeding the straight metal rods into a marking machine having means for applying to the rods adhesive labels with visually perceptible marks, successively marking the outer surfaces of the rods with the applying means by attaching adhesive labels having marks located at substantially the radially extending center plane of each rod to produce a visually perceptible mark at the longitudinal center of each rod, successively transferring the rods from the marking machine, inserting each rod for bending into a forming machine having a mandrel supported between two



bending members, the mandrel and the bending members being relatively movable with respect to each other, the mandrel having a surface for supporting the center portion of each rod during bending, locating each rod within the forming machine with the visually perceptible mark on the longitudinal center of the rod aligned with a visual reference indicative of a center plane of the forming machine, and moving the mandrel and the bending members with respect to each other to bend each rod around the mandrel surface, with the bending members engaging the rod in an area spaced longitudinally from the visually perceptible mark on each rod, thereby producing a U-bolt having two legs of substantially equal length from each rod and a supply of U-bolts differing in leg length size from each other, and with minimum scrap resulting from differing leg lengths in a single U-bolt.

4,835,806

TRANSFER BRIDGE FOR A DOCK

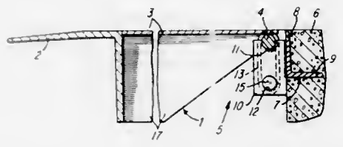
Kurt Alten, Ringstr. 14, D-3015 Wennigsen, Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 175,529

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710773

Int. Cl.⁴ E01D *1/00*

U.S. Cl. 14—71.1 **12 Claims**



1. A transfer bridge for a dock said bridge including a bridge plate having a back end that is pivotably mounted on said dock via a horizontal shaft of said bridge plate, and a free front end that in operational positions of said bridge plate is adapted to be placed on a platform that is to be loaded or unloaded, with said shaft of said bridge plate resting upon one or more supports that are secured to said dock wherein each of said supports has an upwardly open recess for receiving said shaft; said bridge further comprises:

at least one locking element that prevents said shaft from lifting out of said recesses of said supports when said bridge plate is in its operational positions, with said at least one locking element extending about said shaft from above, and therebelow is detachably connected to said dock.

4,835,807

CLEANING BRUSH

Joseph A. Swift, Ontario, N.Y., assignor to Xerox Corporation Stamford, Conn.

Filed Jan. 28, 1988, Ser. No. 149,341

Int. Cl.⁴ G03G *21/00*

U.S. Cl. 15—1.5 R **14 Claims**

1. A cleaning brush for use in an electrostatographic reproducing apparatus comprising electroconductive fibers, said individual brush fibers comprising a filamentary polymer substrate having finely divided electrically conductive particles of carbon black suffused through the surface of the filamentary polymer substrate and being present inside the filamentary polymer substrate as a uniformly dispersed phase independent of the polymer substrate in an annular region located at the periphery of the filament and extending inwardly along the length thereof, the electrically conductive carbon black being present in an amount sufficient to render the electrical resistance of the fiber from about 1×10^3 ohms/cm to about 1×10^9 ohms/cm.

4,835,808

PROBE FOR REMOVING DUST FROM MOVING WEBS

Ernst-August Hahne, Allschwil, Switzerland, and Hermann Künzig, Weil am Rhein, Fed. Rep. of Germany, assignors to Eltex-Elektrostatik Gesellschaft mbH, Weil am Rhein, Fed. Rep. of Germany

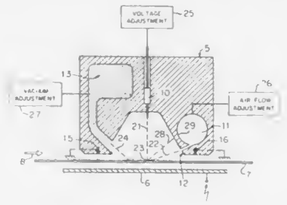
Filed Apr. 27, 1987, Ser. No. 43,186

Claims priority, application European Pat. Off., Apr. 29, 1986, 86105867.5

Int. Cl.⁴ B08B *5/04*

U.S. Cl. 15—1.5 R **30 Claims**

1. A probe for removing dust from moving paper webs, comprising at least on electrostatic high-voltage electrode; at least one air blower oriented against the direction of web movement; a vacuum channel for suctioning up dust-laden air; said high-voltage electrode comprising subsidiary electrodes lying in a first plane substantially perpendicular to said web; said blower having a row of nozzles blowing along a direction lying in a second plane inclined with respect to said first plane; said blower being located downstream of said high-voltage electrode in web-travel direction; said two planes intersecting at a line lying in a plane of the web and extending across said web; and openings onto said vacuum channel being positioned upstream of said high-voltage electrode web-travel direction; said air blower blowing air in a direction opposite to direction of web movement for breaking up an air stream of substantially laminar flow moving with said web to produce turbulence that picks up dust through the turbulence; said nozzles on said



bolwer having a direction to apply an air stream onto said openings in said vacuum channel for producing maximum suction of air particles carried by the turbulence; said electrostatic high-voltage electrode being located in vicinity of the dust picked up by the turbulence.

4,835,809

APPARATUS FOR AUTOMATIC CLEANING PARTICULARLY OF THE BOTTOM OF A SWIMMING POOL

Max Roumagnac, 7, rue Berlioz, F-33127 Martignas, France

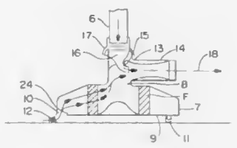
PCT No. PCT/FR86/00279, § 371 Date Apr. 6, 1987, § 102(e) Date Apr. 6, 1987, PCT Pub. No. WO87/00883, PCT Pub. Date Feb. 12, 1987

PCT Filed Aug. 5, 1986, Ser. No. 46,883

Claims priority, application France, Aug. 6, 1985, 85 12183

Int. Cl.⁴ E04H *3/20*

U.S. Cl. 15—1.7 **37 Claims**



1. Apparatus for the automatic cleaning of a bottom surface of a pool comprising a generally cylindrical aspiration container having a substantially vertical axis during operation provided with a removable bottom defining therewith an aspiration orifice situated in a plane substantially parallel to and spaced a small distance from said bottom surface to be cleaned, and an outlet orifice, a filter positioned in said container between said aspiration orifice and said outlet orifice, a means integral with said container for aspirating the water from said container, said apparatus further comprising propulsive means comprising a pipe connected to said means for aspirating said water to thereby send said water into said pipe along a predetermined axis, said pipe carried by said container and oriented substantially parallel to said surface to be cleaned, said apparatus further comprising a deflector wing positioned in a predetermined plane and attached to said container, said axis of said pipe being laterally offset to thereby not intersect said vertical axis of said container and intersecting said plane of said deflector wing.

4,835,810

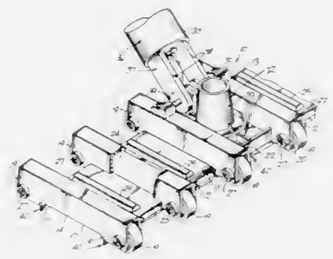
WHEELED POOL VACUUM HEAD WITH VACUUM ENHANCING SEAL

Donald G. Hugo, Palm Springs, Calif., assignor to Rainbow Lifegard Products, Inc., El Monte, Calif.

Filed Jan. 6, 1988, Ser. No. 141,206

Int. Cl.⁴ E04H *3/20*

U.S. Cl. 15—1.7 **5 Claims**



1. A flexible vacuum head for use in cleaning the submerged surfaces of swimming pools and the like which includes:

an elongate unitary flexible body having a substantially flat bottom surface when the body is disposed on a flat supporting surface and lengthwise front and rear edges spaced along a width of the body, the body bottom surface extending continuously without interruption between opposite ends of the body spaced along the length of the body, the body being defined for flexing along a line in a lengthwise direction transverse to its width but not significantly along a line in a widthwise direction transverse to its length;

a plurality of wheels carried by the body forwardly of the front and rearwardly of the rear body edges for supporting the body bottom surface a selected distance above a support surface in substantially parallel relation of the body bottom surface to the support surface;

suction port through the body substantially centrally of the length and width thereof including means carried on an upper surface of the body for connecting a pool water suction line to the port means; and

flexible liquid flow seal means carried by the body and extending essentially said selected distance below the body bottom surface for close, substantially sealing cooperation with a support surface engaged by the wheels, the seal means being present along substantially the entire lengthwise extent of the body adjacent the front and rear edges of the body for defining between the support surface and the body an elongate chamber which is essentially closed along its sides and top, to which the suction port means opens, and which is open at its ends, the chamber being of substantially constant transverse area and configuration along the length thereof at and between its open ends;

whereby in use of the vacuum head the flow of water into the chamber is at least predominantly through the open ends of the chamber and thence at substantially constant velocity along the chamber to the port means.

4,835,811

BRUSHING AND WASHING MACHINE

Arthur G. Crowhurst, P.O. Box 511, Waikerie, South Australia, Australia 5330

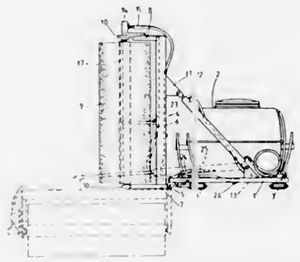
Filed Mar. 22, 1988, Ser. No. 171,832

Int. Cl.⁴ A47L *11/38*

U.S. Cl. 15—21 E **1 Claim**

1. A mobile brushing and washing machine for brushing and

washing vertical and horizontal surfaces comprising: a base; means on the base for receiving the forks of a forklift truck; a vertically disposed cylindrical brush rotatable about its axis for contacting a vertical surface to be brushed and washed, said brush having an axle means mounting the axle of the brush to a frame so that the brush protrudes from the base; a tank mounted on the base for containing wash liquid carried by the base; a pump mounted on the base and having an inlet connected to said tank and an outlet connected to a line which returns to the tank and which is connected to the bottom of the tank through a fitting which agitates liquid in the tank as pumped liquid flows through the fitting; a plurality of spray nozzles disposed adjacent the brush and connected to the line for spraying wash liquid onto a vertical or horizontal surface to

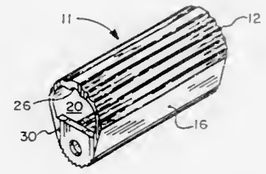


be brushed and washed; an adjustable valve in the line at a location between the fitting and the spray nozzles for adjusting the pressure in the line and in the spray nozzles; a hydraulic motor mounted on the framework and axially above the axis of the brush and directly connected to the upper end of the axle of the brush for rotating the latter, a further hydraulic motor drivingly connected to the pump; hydraulic lines connected at one end to the hydraulic motors and having opposite ends connectable to a hydraulic pump on a fork lift truck; said frame being pivoted at its lower end to said base, a hydraulic ram extending between an upper portion of said frame and said base so that the frame and brush can be pivoted from a vertical position to a horizontal position to wash the upper surfaces of a transport vehicle.

4,835,812
PAINT ROLLER
Kou-Hwa Su, 1125 Fu Shing Rd., Chu Pa Hsiang, Hsin Chu Hsieng, Taiwan
Filed Apr. 6, 1988, Ser. No. 178,186
Int. Cl.[4] A47L 13/12
U.S. Cl. 15—105 **4 Claims**

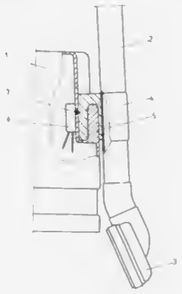
1. An improved paint roller comprising a frame having a first end and a second end, a roller core rotatably engaged on the first end of said frame, a pad carried on said roller core and a handle connected to the second end of said frame, characterized in that said handle comprises an end portion, a ring-shaped element detachably engaged on said end portion and a tongue protruding from said ring-shaped element; said tongue including a plate-shaped body portion that extends away from the handle end portion along the longitudinal axis of the handle and terminates in a free tongue end portion that is bent outwardly and away from the longitudinal axis of the handle.

4,835,813
PROTECTIVE COVER FOR TOOTHBRUSH
Moises B. Lorenzana, 601 Lake Hinsdale Dr., Willowbrook, Ill. 60559, and Vance A. Lorenzana, 698 Spring Hill Cir., Naperville, Ill. 60540
Filed Mar. 18, 1988, Ser. No. 170,006
Int. Cl.[4] A46B 17/04
U.S. Cl. 15—184 **7 Claims**



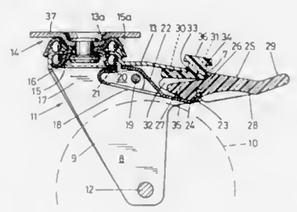
1. A protective cover for a toothbrush of the type having a handle connected to a head portion with bristles extending from one side thereof comprising a housing forming an elongated chamber which is of a size to enclose the head portion of said toothbrush, said housing having an elongated generally cylindrical portion, said cylindrical portion having a first end which is open to provide a first opening and having a second end which is closed by a first transverse wall which extends normal to the axis of said cylindrical portion, a pair of converging walls which are generally tangential to said cylindrical portion and form a bristle enclosing portion of said housing which is in open communication with said cylindrical portion, said bristle enclosing portion having a second transverse wall which is parallel to said first transverse wall and adjacent the first end of said cylindrical portion, said bristle enclosing portion of said housing having one end which is adjacent said first transverse wall and open to provide a second opening in said elongated chamber, a pair of parallel spaced inwardly directed ribs on opposed faces of said converging walls to support the bristles of said toothbrush, said first opening in said first end of said cylindrical portion being of a size to receive said head portion of said toothbrush and said second opening in said bristle enclosing portion being sufficiently small to prevent said head portion of said toothbrush from passing therethrough, said bristle enclosing portion of said housing having an elongated cylindrical edge which interconnects said converging walls, said cylindrical edge having an axis which is parallel to and spaced from the axis of said cylindrical portion of said housing, said spaced inwardly directed ribs supporting said bristles in spaced relationship to said cylindrical edge and retaining the head portion and bristles on one side of the ribs to increase the exposure of the bristles to air for drying said bristles after brushing.

4,835,814
VACUUM CLEANER
Jacques Bonnet, Besancon, France, assignor to Rowenta-Werke GmbH, Offenbach am Main, Fed. Rep. of Germany
Filed Dec. 21, 1987, Ser. No. 135,669
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 8634311[U]
Int. Cl.[4] A47L 9/28
U.S. Cl. 15—339 **5 Claims**



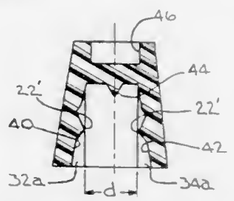
1. A vacuum cleaner including a main body, a suction tube and a suction nozzle including;
(a) a hook means adapted to support said nozzle mounted with said suction tube,
(b) a hook shaped mount on said main body,
(c) a switch in electrical communication with a motor of said vacuum cleaner including a depressible switch operating button mounted on one of said mount and said hook means, and
(d) the other of said hook means and hook shaped mount depressing said switch operating button when said hook means engages with said hook shaped mount.

4,835,815
CASTER WITH BLOCKING DEVICE AND DEPRESSIBLE RELEASING MEMBER FOR THE BLOCKING DEVICE
Dieter Mellwig, and Hans-Willi Lange, both of Wermelskirchen, Fed. Rep. of Germany, assignors to Albert Schulte Söhne GmbH & Co., Wermelskirchen, Fed. Rep. of Germany
Filed May 26, 1988, Ser. No. 199,114
Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3717896
Int. Cl.[4] B60B 33/02
U.S. Cl. 16—35 R **19 Claims**



1. A caster comprising a support; a frame member having an opening and mounted on said support for angular movement about a first axis; a wheel member mounted in said frame member for angular movement about a second axis extending substantially at right angles to said first axis; a blocking device mounted in said frame member for movement between an operative position in which said device opposes or prevents angular movement of at least one of said members about the respective axis, and an inoperative position in which said at least one member is movable about the respective axis; a pedal mounted in said frame member, engaging said device and movable from a first to a second position to thereby move said device to the operative position; and displacing means for moving said pedal from said second position, including a pusher mounted in said frame member for movement in substantial parallelism with said first axis, said pusher having a first portion which extends through and is reciprocable in the opening of said frame member, said portion of said pusher having an enlargement which limits the extent of movability of said pusher relative to said frame member in one direction.

4,835,816
TWIST-OFF KNOB
John T. Graef, Erwinna, Pa., assignor to Lutron Electronics Co., Inc., Coppersburg, Pa.
Filed Jun. 2, 1988, Ser. No. 201,502
Int. Cl.[4] E05B 1/00
U.S. Cl. 16—114 R **6 Claims**

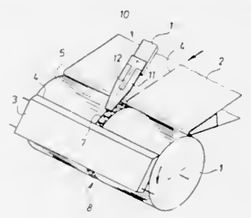


1. A knob for mounting on an end of an elongated-cross-section shaft of a slidable element comprising
(a) a crown and
(b) a skirt extending from said crown, at the top of said skirt, to an open bottom, said skirt having a first interior side and a second interior side generally facing said first interior side, each side having a pair of generally parallel elongated raised ribs
(i) extending at least a part of the distance from said crown to said bottom of said skirt,
(ii) having a separation slightly greater than the lateral dimension of said shaft, and
(iii) being raised from said sides by a height that is great enough to guide said knob as it is slid onto said shaft but not so great that said ribs or shaft are substantially inelastically deformed if said knob is twisted off said shaft after being slid onto said shaft.

4,835,817
APPARATUS FOR SKINNING DOUBLE FILLETS OF FISH HAVING A HIGHLY SENSITIVE SKIN
Michael Jürs, Lübeck, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH + CO KG, Lubeck, Fed. Rep. of Germany
Filed Sep. 1, 1988, Ser. No. 239,437
Claims priority, application European Pat. Off., Sep. 10, 1987, 87113219.7
Int. Cl.[4] A22C 25/17
U.S. Cl. 17—62 **20 Claims**

1. An apparatus for processing, by skinning, double fillets of fish having a highly sensitive skin, for example, due to cooking, such as herb-seasoned fillets, said apparatus comprising
(a) entraining roller means driven in a rotary manner and defining a circumferential surface designed to cause a non-skid engagement with said double fillets to convey them in a conveying direction;
(b) skinning knife means opposing said circumferential surface at a settable distance, being resiliently displaceable with regard to said entraining roller and defining a cutting edge extending transversely to said conveying direction;

(c) a presser surface extending below said skinning knife means and facing said circumferencial surface; (d) at least one radial groove of defined depth and width provided in said entraining roller means to extend around said circumferential surface;
(e) auxiliary conveying means arranged in said at least one radial groove and comprising a plurality of elastic vanes



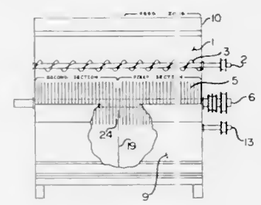
distributed over the circumferential extension of said at least one groove, each vane projecting from the bottom of said groove approximately up to said entraining roller means external diameter defined by said circumferential surface; and
(f) resilient hold-down means arranged above said at least one radial groove and upstream of said cutting edge.

4,835,818

DIFFERENTIAL GINNING PROCESS AND APPARATUS

Eugene P. Columbus, Leland, Miss. assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 4, 1988, Ser. No. 140,470
Int. Cl.[4] D01B *1/08*
U.S. Cl. 19—55 R **10 Claims**



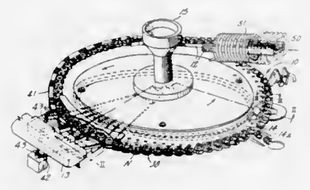
1. An apparatus for ginning comprising,
a saw gang including at lest two saw sections, each said saw section including at least one saw blade,
support means rotatably supporting said saw gang,
roll box means operatively associated with said saw gang for retaining material to be ginned in contact with said saw gang,
conveying means operatively associated with said roll box means for conveying material to be ginned successively to each said saw section for ginning in each said saw section,
means defining a lint chamber adjacent said saw gang,
doffing means, operatively associated with said saw gang and said means defining a lint chamber, for removing lint from each said saw section and for transporting said lint through said lint chamber, and
separating means, partitioning said lint chamber and extending between said at least two saw sections, operatively associated with said saw gang and doffing means for keeping substantially separate lint removed from each said saw section.

4,835,819

COATED FASTENERS AND PROCESS FOR MAKING THE SAME

Richard Duffy, Utica, Mich., assignor to Nylok Fastener Corporation, Rochester, Mich.

Continuation-in-part of Ser. No. 907,582, Sep. 15, 1986, Pat. No. 4,775,555. This application Sep. 30, 1986, Ser. No. 913,339
Int. Cl.[4] B05D *1/02, 3/02;* **F16B** *37/00*
U.S. Cl. 427—195 **30 Claims**



1. A process of directing at least one of a thermoplastic masking, insulating and lubricating type material to the threads of an internally threaded article having an opening on at least one end, comprising the steps of:
supporting said threaded article for treatment;
heating said threaded article to a temperature sufficient to enable said material to adhere to the threads of said threaded article;
inserting said nozzle into the opening of said threaded article;
discharging a gaseous jet containing said material from said nozzle toward the threads of said threaded article; and
depositing said material onto the heated threads of said threaded article and accumulating said material on the threads to form at least one of a substantially uniform masking, insulating and lubricating coating.

23. A substantially uniform coating of Teflon type material on a threaded article the product prepared by directing a stream of thermoplastic type Teflon powder to the threads of said threaded article, said product prepared in accordance with a process comprising the steps of:
supporting said threaded article in a position to receive said Teflon type powder;
heating said threaded article to a temperature sufficient to enable said Teflon type powder to adhere to the threads of said threaded article;
discharging said stream of Teflon type powder toward the threads of said threaded article; and
depositing said Teflon type powder onto the heated threads of said threaded article for a length of time sufficient to create a substantially uniform Teflon type layer resistant to the deposition of corrosion resistant material for at least one of masking, lubricating and insulating the threads of said threaded article.

4,835,820

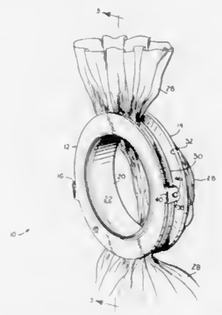
BAG CLOSURE DEVICE

Edward S. Robbins, III, 459 N. Court St., Florence, Ala. 35630

Filed Feb. 1, 1988, Ser. No. 151,271
Int. Cl.[4] B65D *77/10*
U.S. Cl. 24—30.5 R **30 Claims**

1. A bag closure device comprising:
a pair of annular closure members;
one of said closure members being substantially L-shaped in cross-sectional configuration thereby establishing a flange and a seating surface;
the other of said closure members being substantially U-shaped in cross-sectional configuration thereby establishing a pair of upright wall sections joined to one another at their bottoms so as to define an engagement surface;

said pair of annular closure members being nestable with one another such that said engagement surface of said other closure member is annularly adjacent said seating surface of said one closure member thereby capturing a portion of a bag disposed therebetween, and such that said flange of said one closure member is adjacent one of said wall sections of said other closure member thereby capturing a



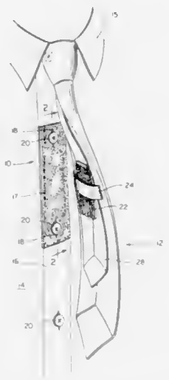
remaining portion of said bag therebetween, whereby said bag is closed; and wherein
said bag closure device further comprises hinge means joining said one and other of said closure members to permiit same to be foldable into and out of a nested relationship with one another so as to respectively close and open said bag.

4,835,821

NECKTIE FASTENING DEVICE WITH HIDDEN POCKET

Alan J. Durante, 702 N. Victoria Ave., Ventnor City, N.J. 08406

Filed Jan. 12, 1988, Ser. No. 143,018
Int. Cl.[4] A41D *25/04*
U.S. Cl. 24—49 CF **2 Claims**



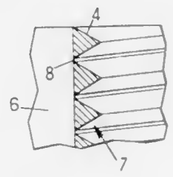
1. In combination with a shirt having a collar and a front opening formed by overlapping vertical edges releasably retained in closed relation by a plurality of vertically spaced buttons engaged through correspondingly spaced button holes, a necktie extending under the collar and formed into a knot at the upper end of the front opening with depending wide and narrow ends of the tie overlying the front opening, said wide end of the tie having a label strip disposed transversely on the inner surface thereof and secured to the inner surface of the wide end of the tie at spaced points to enable the narrow end of the tie to be inserted under the label strip to retain the tie ends in aligned overlying relation, a fastening device releasably securing the tie ends to the front of the shirt, said fastening device comprising a generally rectangular strip of flexible material having a pair of spaced upper and lower button holes therein receiving a pair of spaced buttons on the front opening of the shirt, a rectangular strip of material connected with the ends of the tie, one of said strips having loop pile on the outer surface thereof and the other strip having hook pile on the outer surface thereof with the loop pile and hook pile releasably connecting the strips together when pressed into surface-to-surface contact thereby securing both the narrow and wide ends of the tie in overlying relation to the front opening on the shirt, said strip having the button holes therein including a rectangular panel attached to the inner surface of said strip having stitching along the bottom and side edges of the panel with the upper edge of the panel being free of the inner surface of the strip to form an open topped pocket, the free upper edge of the panel being disposed closely adjacent to and slightly below the upper button hole to retain items in the pocket when a button extends through the upper button hole in the strip.

4,835,822

FRUSTOCONIC ANCHORING JAWS FOR CABLES AND THEIR METHODS OF MANUFACTURE

Jose Savall, Chartres; Claude Parmentier, and Bernard Amelot, both of Epernon, all of France, assignors to Freyssinet International (Stup), Coignieres, France

Continuation of Ser. No. 893,282, Aug. 5, 1986, Pat. No. 4,707,890. This application Aug. 11, 1987, Ser. No. 84,083
Claims priority, application France, Aug. 12, 1985, 85 12290
Int. Cl.[4] F16G *11/00*
U.S. Cl. 24—122.6 **3 Claims**



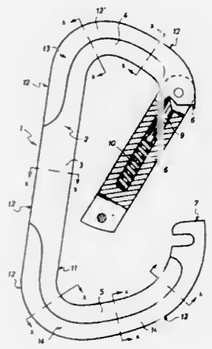
1. A split frustoconic jaw intended for anchoring a cable comprising:
keys composing said jaw, each key including lateral faces having a wide, smooth, external part obtained by sawing,
burrs obtained by breakage at a narrow internal part of each key, wherein the totality of said keys which compose said jaw come from the same original part bounded externally by a frustoconic surface and hollowed by a cylindrical axial channel whose inner surface is advantageously striated and made of a surface hardened metal, sawings intended to decompose said original part into said keys having remained intentionally incomplete so as to leave initially subsisting connection bridges of small thickness between said keys along the cylindrical axial channel, said bridges being subsequently broken to form said burrs.

4,835,823

SNAP-HOOK, PRIMARILY FOR ROCK-CLIMBING, AND ITS PROCESS OF MANUFACTURE

Bernard Contat, Cluses, France, assignor to Etablissements Contat Frères (S.A.), France

Continuation of Ser. No. 883,025, Jul. 10, 1986, abandoned, which is a continuation of Ser. No. 523,672, Aug. 16, 1983, abandoned. This application Mar. 29, 1988, Ser. No. 175,594
Claims priority, application France, Aug. 18, 1982, 82 14271
Int. Cl.[4] A44B *13/02*
U.S. Cl. 24—234 1 Claim



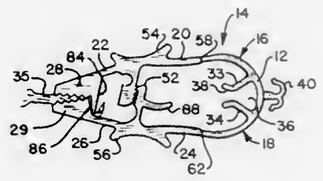
1. A snap-hook for rock-climbing for use with ropes and comprising a body in the shape of a "C" including a straight rear central portion and upper and lower curved arms extending therefrom, and a pivoted finger for joining the free ends of said curved arms, upon closing of the snap-hook, said straight rear central portion having a circular cross-section, and said upper and lower arms having an overall cross sectional area less than that of said circular cross section, the cross section of said upper and lower arms including an internal periphery of a semi-circular cross section having a radius equal to that of the circular cross section of said straight rear central portion, and an external periphery which is formed, along the whole length of said upper and lower arms, by a rib of uniform cross section designed to lighten the weight of the snap-hook without loss in the strength and the safety thereof and presenting curved concave surfaces, in the shape of an arc of circle in cross section, which are symmetrical with respect to the mid-plane of the body, a convex surface joining the curved concave surfaces and a middle portion, extending along the whole length of the said upper and lower arms, joining the said internal and external peripheries and including a pair of oppositely disposed convex curved surfaces which are symmetrical with respect to the mid-plane of the body, the curvature of said oppositely disposed curved surfaces and of all other convex surfaces of said peripheries being such that the ropes cannot be damaged by abrading when the ropes come into contact with either the external surface or the internal surface of said arms, during use of the snap-hook as the rope slides therein when tensioned by the weight of the body of a rock-climber using the snap-hook.

4,835,824

MEDICAL CLAMP

Vaughn L. Durham, 41 Trumbull Rd., Waterford, Conn. 06385, and Jeffrey S. Goldblatt, 18 Huntington La., Norwich, Conn. 06360

Filed Apr. 13, 1988, Ser. No. 181,093
Int. Cl.[4] A61B *17/12*; A44B *21/00*
U.S. Cl. 24—339 18 Claims



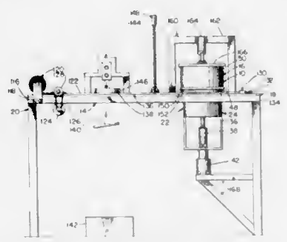
1. A medical clamp comprising:
a unitary plastic strip including two connected legs moveable toward each other about a center point, the legs forming opposed jaws for attachment to an object;
each jaw having a pincer member including a toothed portion facing the toothed portion of the other jaw, and a rear portion facing the center point;
the rear portion of one pincer member including a stop surface and the rear portion of the other pincer member including means projecting toward the stop surface for interacting with the stop surface to limit the movement of one pincer member relative to the other pincer member in a direction parallel to the legs as the legs are moved toward each other; and
means for securing the legs together in a closed position while the projecting means interact with the stop surface.

4,835,825

MACHINE FOR MANUFACTURING A ROOF VENT HAVING A LEAD BASE

Kenneth M. Warner, P.O. Box 152, Southworth, Wash. 98386

Filed Apr. 7, 1988, Ser. No. 179,959
Int. Cl.[4] B23D *23/04*
U.S. Cl. 29—33 K 6 Claims



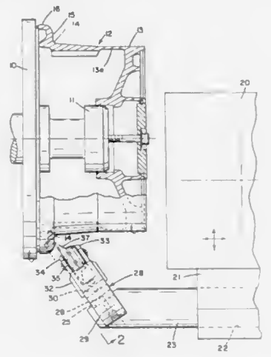
1. A machine for manufacturing a lead base metal roof vent which is installed during and after roofing a dwelling with overlapping tiles, comprising:
(a) a bench height structure having a base frame and an elongated surface structure with two spaced holes, in turn having a starting end, to receive a roll of lead, an adjacent lead cutting area with one of the two spaced holes, and an adjacent lead forming area with the other of the two spaced holes, to receive a modified metal roof vent, selected from several available types, however, not having a base, but having a cylindrical body, having in turn an open top end and an open bottom end, an inside entry circular recess structure positioned above this open bottom, and a weather cover secured at a spaced distance above the open top end;
(b) a lead roll supporting assembly secured to the bench height structure at the starting end of the elongated surface to rotatably support a roll of lead;
(c) a lead hole cutting assembly positioned on the bench height structure over the lead cutting area to cut holes of various specified diameters;
(d) a lead cross cut cutting assembly positioned on the bench height structure at the end of the cutting area to create specified lengths of the lead, then with center holes;
(e) a hole down assembly positioned on the bench height structure over the lead forming area, to be operated to hold a modified metal roof vent down on the lead placed on the elongated surface structure, while centered about the other of the two spaced holes in the lead forming area; and
(f) a lead forming assembly positioned on the bench height structure under the lead forming area, in line with the other of the two spaced holes in the lead forming area, to be operated to move portions of the lead, about the center hole, up into the cylindrical body beyond the inside entry circular recess, and then to circumferentially move these raised portions of the lead to create an inside entry circular recess of the lead, which complementary fits the inside entry circular recess of the cylindrical body of the modified metal roof vent, thereby creating a lead base metal roof vent.

4,835,826

METHOD OF BURNISHING

Martin E. Wilson, Covington, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 936,573, Dec. 1, 1986, abandoned. This application Apr. 25, 1988, Ser. No. 185,576
Int. Cl.[4] B21C *37/30*
U.S. Cl. 29—90.01 9 Claims



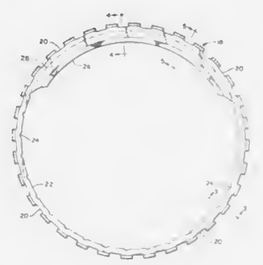
1. A method of burnishing a hollow workpiece having a generally horizontally linear extending bead ledge of at least a first and a second thickness wherein said first thickness is less than said second thickness, said workpiece having a fillet adjacent said second thickness,
rotating said hollow workpiece about a central axis,
moving a slide with a resiliently held a tool holder with a burnishing tool thereon in a longitudinal direction parallel to said axis and transversely to said axis,
maintaining a first preselected force between said burnishing tool and said first thickness of said ledge as said slide moves horizontally, maintaining a second preselected force between said burnishing tool and said second thickness of said ledge as said slide moves longitudinally wherein said first preselected force is smaller than said second preselected force as said burnishing tool works said horizontally extending linear bead ledge of different thicknesses.

4,835,827

METHOD OF BALANCING A ROTOR

John J. Marra, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 94,214, Sep. 8, 1987, Pat. No. 4,784,012.
This application Aug. 5, 1988, Ser. No. 228,898
Int. Cl.[4] F16F *15/22*; B21K *3/00*
U.S. Cl. 29—156.8 R 1 Claim



1. A method of balancing an integrally bladed gas turbine engine rotor having a plurality of integrally bladed disks comprising:
spinning each disk without a balance ring and determining the initial unbalance;
shrink fitting within each disk an eccentrically weighted balance ring in a manner to compensate for the initial unbalance;
spinning each disk together with the balance ring individually to determine the residual unbalance;
correcting the residual unbalance by removal of material only from the balance ring;
assembling a plurality of bladed disks to form a rotor;
spinning the assembled rotor to determine the unbalance and correcting the unbalance by adding weights at selected locations within the balance ring.

4,835,828

AUTOMATIC TUBE EXPANDER FOR A HEAT EXCHANGER

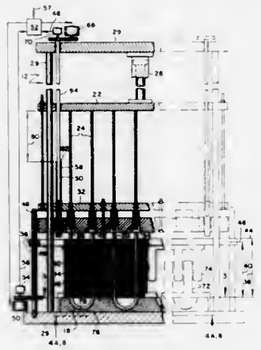
John D. York, Clarksville; Edward M. Peppard, Woodlawn, both of Tenn., and Bruce A. Haugen, Owatonna, Minn., assignors to American Standard Inc., New York, N.Y.

Filed Sep. 22, 1988, Ser. No. 247,987
Int. Cl.[4] B23P *15/26*
U.S. Cl. 29—157.3 C 16 Claims

1. An apparatus for expanding heat exchanger tubes of various length heat exchangers, comprising:
a frame;
a plurality of tube expanding rods;
a rod pusher slideably connected to said frame and said tube expanding rods, said rod pusher providing a driving force to push said rods through said heat exchanger tubes, thereby radially expanding said tubes into an interference fit against a plurality of heat transfer fins traversing said tubes;
a plurality of flaring sleeves slidably disposed around said plurality of rods and being adapted to further radially expand an end portion of said heat exchanger tubes be-

yond the extend to which said rods expand said heat exchanger tubes;

a flaring sleeve pusher slidably disposed around said plurality of rods and adjacent to said plurality of flaring sleeves, said sleeve pusher being adapted to push said plurality of sleeves into said end portion of said plurality of heat exchanger tubes under said driving force of said rod pusher;



an adjustable stop positioned to mechanically limit the travel of said plurality of rods and said plurality of flaring sleeves with respect to said frame;

a stop drive coupled to said adjustable stop for automatically repositioning said adjustable stop; and

a control for controlling said stop drive in response to an input representing various lengths of said heat exchangers to be acted upon by said apparatus.

4,835,829

HUB ASSEMBLY

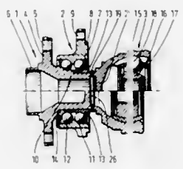
Hans-Heinrich Welscbof, Rodenbach; Rudolf Beier, Offenbach am Main, and Norbert Hofmann, Hodgau, all of Fed. Rep. of Germany, assignors to Löhr & Bromkamp GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed May 29, 1987, Ser. No. 57,278

Claims priority, application Fed. Rep. of Germany, May 30, 1986, 3618139

Int. Cl.[4] B21K *1/40*

U.S. Cl. 29—159.3 **34 Claims**



1. A method of manufacturing a hub assembly comprising an axially extending hub member, a double row rolling-element bearing having at least one separate inner bearing ring received on the hub member, the hub member having a radially outer surface extending rectilinearly in the axial direction at one end thereof with the at least one separate inner bearing ring located on the rectilinearly extending outer surface, a wheel flange member and a constant velocity ratio universal joint member, said method comprising connecting the hub member and either the wheel flange member or the universal joint member by a welding and upsetting operation, and enlarging radially outwardly the rectilinearly extending outer surface at the end of the hub member for engaging said inner bearing ring as a result of such welding and upsetting operation to hold the bearing ring in position and to set the bearing.

4,835,830

METHOD OF MANUFACTURING AN EMBODIMENT OF MEASURE

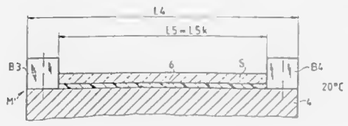
Walter Miller, Traunstein, Fed. Rep. of Germany, assignor to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Division of Ser. No. 117,663, Nov. 5, 1987, Pat. No. 4,793,049. This application Oct. 27, 1988, Ser. No. 225,539

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1986, 3637628

Int. Cl.[4] B23P *11/02*

U.S. Cl. 29—447 **3 Claims**



1. A method of manufacturing an embodiment of measure, including a bending resistant graduation carrier member having end faces, and a base member and fastening elements for fastening the graduation carrier member on the base member, the material of the graduation carrier member having a lower temperature expansion coefficient than the material of the base member, comprising cooling the graduation carrier member to a predetermined temperature, fixing at least the end faces of the cooled graduation carrier member by means of the fastening elements to the base member having normal temperature, so that the graduation carrier member is in compressed state after warming to normal temperature.

4,835,831

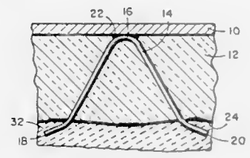
METHOD OF PROVIDING A REFRACTORY COVERING TO A FURNACE WALL

Sidney H. Melton, 804 Millwood Rd., Broken Arrow, Okla. 74011

Filed Jul. 15, 1988, Ser. No. 219,148

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—460 **11 Claims**



1. A method of providing on a surface of a furnace a refractory covering, comprising the steps of:

affixing to a surface of a furnace individual batts of fiber blankets in substantially continuous placement to form a fiber blanket layer(,the fiber blankets being of material selected from the group comprising mineral wool, fiber glass and ceramic fibers, and mixtures thereof);

spraying onto the blanket layer a castable refractory; and

permitting the refractory to harden into a continuous refractory covering.

4,835,832

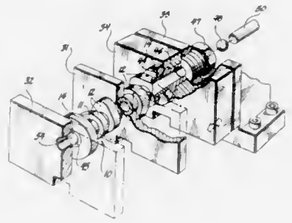
METHOD OF ASSEMBLING TUBULAR SHAFT ASSEMBLIES

Philip D. Arnold, Bloomfield Hills, and Roy G. Kaywood, Stockbridge, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 23,320, Mar. 9, 1987, abandoned. This application Jun. 24, 1988, Ser. No. 211,178

Int. Cl.[4] B21D *39/14*

U.S. Cl. 29—523 **14 Claims**



1. A method of manufacturing a camshaft assembly said method including the steps of:

providing a plurality of cam and journal elements formed to final dimensions except for finish grinding, said elements each including an axial opening,

securing said elements in predetermined fixed orientation and spacing with said openings aligned on a common axis,

inserting an essentially straight hollow tube having opposite ends into said elements in close fitting relation with said openings,

longitudinally restraining one end of the tube while providing diametral clearance around portions adjacent said elements,

longitudinally loading the other end of the tube to prevent elongation thereof

expanding the hollow tube into mechanical interference engagement with all the element openings and radially outward thereof adjacent the elements to secure the elements permanently onto the shaft in said predetermined orientation and spacing while forming within the tube a uniform smooth sided interior cross-sectional configuration, by forcing through the tube in a direction toward said restrained one end an expanding element sufficiently larger than the tube inner diameter to outwardly deform the tube wall in the required degree, and

finish grinding the outer surfaces of the cam and journal elements.

4,835,833

METHOD OF MOUNTING A POTENTIOMETER

Gerald H. McDonald, Coon Rapids, Minn., assignor to Resistance Technology, Inc., Arden Hills, Minn.

Filed Dec. 2, 1987, Ser. No. 127,446

Int. Cl.[4] B23P *19/02*

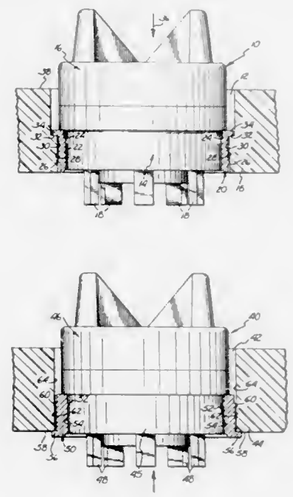
U.S. Cl. 29—525 **4 Claims**

1. A method of mounting a potentiometer for use in a hearing aid, the method comprising:

providing a hearing aid mounting base having a potentiometer receiving aperture;

providing a potentiometer having a housing with a circumferentially disposed metal band internally secured thereon, said band having external surface means for mechanically engaging a surface of the aperture; and

axially press-fitting the potentiometer with the metal band into the aperture such that the external surface means for mechanically engaging the surface of the aperture engages



the surface of the aperture securing the potentiometer within the aperture.

4,835,834

METHOD OF SHAPING AND HOLDING A SHEET OF MATERIAL ABOUT A FLOWER POT WITH A COLLAR

Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.

Continuation of Ser. No. 876,405, Jun. 20, 1986, abandoned. This application Aug. 11, 1988, Ser. No. 232,541

Int. Cl.[4] B23P *19/02*

U.S. Cl. 29—525 **2 Claims**

1. A method for shaping and holding a sheet of material about the base and outwardly tapered outer peripheral surface of a flower pot, comprising:

providing a collar constructed of a relatively rigid material and having an opening formed therethrough;

positioning the sheet of material generally about the base and outwardly tapered outer peripheral surface of the flower pot; and

extending the positioned sheet of material and the flower pot base through the opening in the collar and pressing the collar around and along the positioned sheet and outwardly tapered outer peripheral surface of the flower pot with the sheet of material and the flower pot extending through the opening in the collar so the sheet of material

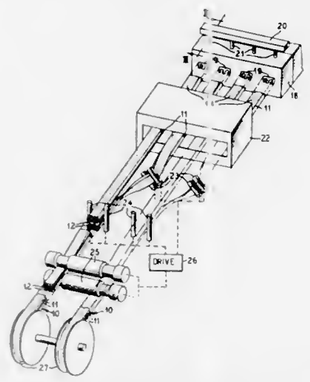
is held between the collar and the flower pot near an end there of remote from said base.

4,835,835

METHOD AND APPARATUS FOR MAKING EXTRUDED SEPARABLE FASTENER WITH REACTIVATABLE ADHESIVE

Russell J. Gould, Mt. Prospect, Ill., assignor to Minigrip, Inc., Orangeburg, N.Y.

Division of Ser. No. 894,669, Aug. 8, 1986, Pat. No. 4,731,911.
This application Dec. 24, 1987, Ser. No. 137,732
Int. Cl.[4] B23P *17/00;* **B29B** *00/00*
U.S. Cl. 29—527.2 **25 Claims**



1. A method of prefabricating a synthetic resin elastically deformable resiliently flexible, separable fastener profile strip adapted for subsequent attachment to a substrate, comprising:
thermoplastically extruding the strip and providing the extruded strip with a base surface;
applying reactivatable adhesive in a fluent state to said base surface during extrusion of the strip and before said strip is cured;
thereafter chill curing the extruded strip;
concurrently with said chill curing of the strip curing said adhesive on said base surface into a nonsticky dormant inactive state; and
handling the strip by direct contact with said nonsticky dormant adhesive and thereby preparing the strip to be stored without protective cover over the adhesive, until used at a later time by reactivating said adhesive to permit adhesively bonding of the strip to a substrate.

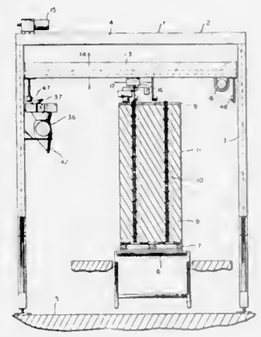
20. Apparatus for prefabricating a synthetic resin elastically deformable resiliently flexible separable fastener profile strip adapted for subsequent attachment to a substrate, and comprising:
die means for thermoplastically extruding the strip and for providing the extruded strip with a base surface;
means for applying adhesive in a fluent state to the base surface during extrusion of the strip and before curing of the strip;
means, downstream from said die means and said adhesive applying means, for curing the extruded strip and concurrently curing said adhesive on said base surface into a nonsticky dormant state so that no cover is needed for the adhesive to permit handling of the strip before its intended use;
and means for placing said strip and adhesive into condition to be stored until used at a later time by reactivating the dormant adhesive to permit adhesively bonding the strip to a substrate, and this means including handling means directly contacting the nonsticky dormant adhesive.

4,835,836

DEVICE FOR THE CUTTING AND REMOVAL OF THE STRAPPING BANDS FROM AN OBJECT

Johannes H. van Uitert, Vaartweg 33, 5109 RB 's-Gravenmoer, Netherlands

Filed Dec. 30, 1987, Ser. No. 139,794
Int. Cl.[4] B23P *19/00;* **B65B** *69/00*
U.S. Cl. 29—564.3 **14 Claims**



1. A device for cutting and removal of the strapping bands from an object having at least one wall, said device comprising:
a framework adapted to be placed over a conveying track for supplying the object to the device;
support means carried by the framework and movable with respect thereto;
at least one clamping-cutting means carried by said support means for gathering, cutting and removal of said strapping bands, said clamping-cutting means having clamping means for clamping a band to be cut and cutting means for cutting the clamped band, and said clamping-cutting means being movable with said support means so that said clamping-cutting means may be brought into operative relationship with strapping bands wrapped around said object for gathering, cutting and removal of said strapping bands;
means on said clamping-cutting means to search for and sense the location of strapping bands lying against said object and to position the clamping-cutting means for clamping and cutting a band one located;
a band-receiving station fixedly positioned in said framework and having means for receiving the cut-off end of a strapping band clamped by said clamping means; and
said clamping means being movable away from the object toward the band-receiving station to convey the cut-off end of the band to said band-receiving station after the band is cut, whereby said band is gathered and removed.

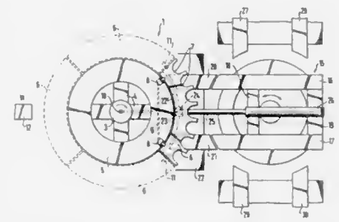
4,835,837

TOOL MAGAZINE

Werner Babel, Achweg, Fed. Rep. of Germany, assignor to MAHO Aktiengesellschaft, Pfronten, Fed. Rep. of Germany

Filed Mar. 27, 1987, Ser. No. 31,532
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1986, 3613206
Int. Cl.[4] B23Q *3/157*
U.S. Cl. 29—568 **2 Claims**

1. A tool magazine apparatus for program-controlled machine tools having a working tool holder in a working spindle, and a changing unit to transfer a tool between said working tool holder and said magazine, said apparatus comprising:
a program-controlled electrical drive mechanism;
supporting structure comprising a rotatably driven disk having a supporting ring movably coupled to said drive mechanism;
tool holder means mounted to said supporting structure for rotation therewith, said tool holder means comprising a plurality of exchangeable accurate tool holder segments mounted radially of said supporting ring to thereby form an annular ring with respect thereto, said annular ring of segments having an outer circumference;
a plurality of tool receptacles formed in the outer circumference of each said too holder segment, said drive mechanism moving said supporting structure to selectively align said receptacles with a predetermined changing position with respect to the working spindle, each tool in said tool holder means being equally accessible to the changing unit



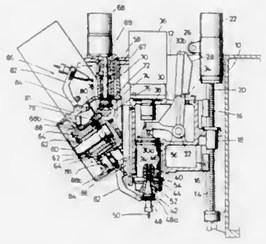
for transfer to the working spindle by the changing unit selective rotation of said supporting structure;
transfer assembly means configured to selectively disassemble one of said tool holder segments from said supporting structure, transfer said disassembled segment to a storage location distinct from said transfer assembly means, fetch a replacement annular tool holder segment from storage and to assemble said replacement tool holder segment into said supporting structure to make tools selectively available to said working spindle tool holder; and
means for rotating said transfer assembly means about an axis parallel to said supporting structure;
said transfer assembly means being selectively rotatable and further comprising guide means for supporting said tool holder segments when they are being exchanged.

4,835,838

AUTOMATIC TOOL CHANGER IN MACHINE TOOL

Noboru Hirose, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 20, 1988, Ser. No. 183,992
Claims priority, application Japan, Apr. 25, 1987, 62-102345
Int. Cl.[4] B23Q *3/157*
U.S. Cl. 29—568 **9 Claims**



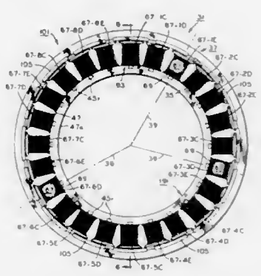
1. An automatic tool changer for use in a machine tool for automatically changing a tool, the machine tool including a main frame, a main spindle head movably provided with respect to the main frame, a main spindle rotatably disposed in the main spindle head with the main spindle head being movable in an axial direction of the main spindle, and a tool magazine provided with a rotatable magazine base for holding a plurality of tool holders and for rotationally indexing one of the tool holders such that one of the rotationally indexed tool holders may be interchanged with a tool holder provided at the main spindle, the automatic tool changer comprising:
a plurality of tool holder gripping means radially arranged on and pivotably supported by said magazine base, said tool magazine being secured to a stationary portion of said main frame; and,
means for pivoting one of said tool holder gripping means independently of the remaining tool holder gripping means, said pivoting means including a moving means for moving said one of said tool holder gripping means toward and away from said main spindle, said moving means being operative to move said one of said tool holder gripping means away from said main spindle at times when said main spindle head is moved towards a work piece for machining.

4,835,839

METHOD OF FABRICATING A SALIENT POLE ELECTRONICALLY COMMUTATED MOTOR

Franklin L. Forbes, and Harold B. Harms, both of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 796,779, Nov. 12, 1985, Pat. No. 4,712,035.
This application Sep. 28, 1987, Ser. No. 103,852
Int. Cl.[4] H02K *15/02*
U.S. Cl. 29—596 **25 Claims**



1. A method of fabricating a salient pole electronically commutated motor with the salient pole electronically commutated motor including a lanced strip of generally thin ferromagnetic material having a pair of generally opposite edges extending generally lengthwise thereof, and a plurality of lanced pole piece laminations of generally thin ferromagnetic material with each lanced pole piece lamination having a pair of opposite faces, the method comprising the steps of:
edgewise winding the lanced strip into a plurality of generally helical convolutions thereof and accumulating the belical convlutions generally in aligned relation in a generally annular stack defining a yoke section of the salient pole electrically commutated motor with the opposite side edges on the edgewise wound lanced strip forming radially spaced apart inner and outer circumferential surfaces on the yoke section extending generally axially entirely thereacross, respectively;
arranging the lanced pole piece laminatins in a plurality of generally axial stacks with the opposite faces of the lanced pole piece laminations being disposed in interfacing relation in each axial stack and securing together the lanced pole piece laminations in their interfacing relation in each axial stack thereby to define a set of salient pole pieces for the salient pole electronically commutated motor;

interlocking the salient pole pieces with only the yoke section at least generally adjacent its outer circumferential surface in displacement preventing engagement and extending the salient pole pieces on a set of preselected pitches axes therefor generally radially outwardly from the outer circumferential surface on the yoke section, respectively; and

retaining the salient pole pieces on respective preselected pitch axes therefor on the yoke section in response to the interlocking in displacement preventing engagement between the salient pole pieces and only the yoke section.

4,835,840

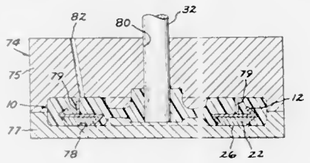
METHOD OF MAKING AN IMPROVED DISC ROTOR ASSEMBLY

Vijay K. Stokes, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 874,908, Jun. 16, 1986, Pat. No. 4,704,555. This application Aug. 20, 1987, Ser. No. 87,285

Int. Cl.[4] H02K *15/02*

U.S. Cl. 29—598 **9 Claims**



1. A method of manufacturing a disc rotor assembly comprising the steps of:

providing a ring of magnetic flux conducting material including an axially facing surface, said ring of magnetic flux conducting material comprising a plurality of adjoining arcuate segments;

fastening to said ring surface a generally ring shaped magnetizable body having a substantially flat and axially facing ring shaped rotor surface, said magnetizable body comprising a plurality of adjoining arcuate magnetizable body segments, each of said magnetizable body segments being disposed on one of the arcuate segments of said ring of magnetic flux conducting material;

providing a mold including at least one flat surface;

placing said ring of magnetic flux conducting material and said magnetizable body in said mold such that said rotor surface is adjoining the flat surface of said mold; and

molding a matrix in said mold about said ring and said magnetizable body.

4,835,841

METHOD OF MAKING A COIL ASSEMBLY

William F. Gunnels, Hendersonville, Candler A. Willis, and Mitchell M. Osteen, both of Zirconia, all of N.C., assignors to General Electric Company, Schenectady, N.Y.

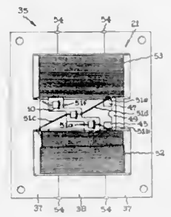
Division of Ser. No. 125,657, Nov. 27, 1987, Pat. No. 4,771,257, which is a division of Ser. No. 92,562, Aug. 31, 1987, Pat. No. 4,730,178, which is a continuation of Ser. No. 912,676, Sep. 25, 1986, Pat. No. 4,721,935, which is a continuation of Ser. No. 652,233, Sep. 19, 1987, abandoned. This application Jun. 13, 1988, Ser. No. 205,516

Int. Cl.[4] H01F *41/06*

U.S. Cl. 29—605 **1 Claim**

1. A method of making a coil assembly of the kind comprising insulated wire coiled on a bobbin provided with terminals to which the winding is connected, comprising the steps of:

providing a bobbin having two spaced apart drum-like coil support portions with side flanges and a bridging section extending between the support portions, said bridging section having three terminal housings each having walls projecting outwardly and defining inwardly extending axially displaced terminal-receiving cavities, each of said support portions surrounding a winding axis and said flanges extending radially outward relative to said axis, at least one of said flanges including a rim and having an outward portion, at least two of said terminal-receiving cavities having slotted walls allowing a wire to extend through each of the cavities in a substantially circumferential direction relative to said axis,



winding a number of turns of insulated wire under tension on said bobbin, wherein the winding of the wire is started in one of said cavities next to one support portion and wound into a coil on said one support portion, guided across said bridging section and passed through an intermediate one of said three cavities, wound into a coil on the other support portion, then guided into the cavity next to said other support portion

and inserting a terminal having insulation penetrating means into each of said cavities to provide connections for said coil.

4,835,842

METHOD OF ASSEMBLING A MOLDED CASE CIRCUIT BREAKER OPERATING MECHANISM

Roger N. Castonguay, Terryville, and David J. Meiners, Southington, both of Conn., assignors to General Electric Company, New York, N.Y.

Division of Ser. No. 41,566, Apr. 23, 1987, Pat. No. 4,736,174. This application Jan. 14, 1988, Ser. No. 143,889

Int. Cl.[4] H01H *11/00*

U.S. Cl. 29—622 **4 Claims**

1. A method of assembling a molded case circuit breaker comprising the steps of:

forming a hinged link and cradle assembly hingeably connected with a support plate;

providing a metal support frame having a pair of sides and an intermediate apertured back piece;

inserting the support plate within the back piece aperture to attach said hinged link and cradle assembly to said support frame;

attaching a slotted handle yoke to said support frame by inserting ends of a pair of legs depending from said handle yoke within corresponding slots formed in said support frame;

rotating said hinged link and cradle assembly in a furthermost clockwise direction toward said support plate in a predetermined position;

connecting a pair of operating springs to said cradle assembly and said handle yoke by inserting first hooked ends of said operating springs within corresponding slots in said handle yoke and encompassing second hook ends of said operating springs around a pin that passes through said hinged link and cradle assembly; and

rotating said hinged link and cradle assembly in a furthermost counterclockwise direction toward said support

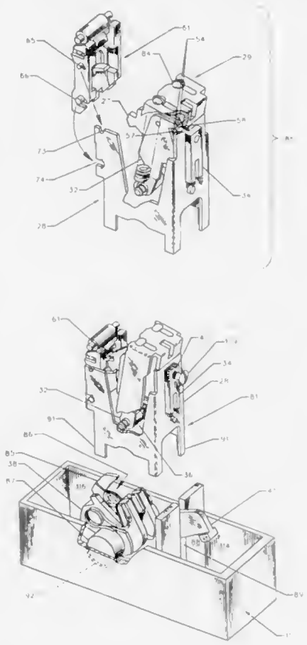


plate until an edge of said support plate interferes with a projection on said hinged link and cradle assembly.

4,835,843

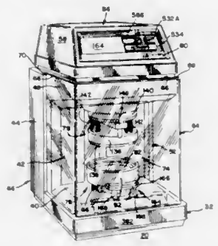
AUTOMATIC BADGE MAKING MACHINE

David W. Wendt, Monona; Robert W. Higbee, Madison; Alan E. Kemp, Janesville, and Ed Gisske, Verona, all of Wis., assignors to Badge-A-Minit, Ltd., LaSalle, Ill.

Filed Apr. 7, 1988, Ser. No. 178,552

Int. Cl.[4] B23P *11/00*

U.S. Cl. 29—708 **31 Claims**



1. An automatic badge maker comprising:

first and second relatively movable dies;

drive means for relatively moving said first die in an operating cycle comprising a plurality of successive strokes toward and away from said second die to form a badge between facing surfaces of said dies;

a housing for safely enclosing said dies and said drive means including an access opening for loading and unloading said dies with badge parts and a finished badge, respectively;

safety cover means movable between an open position relative to said access opening for loading and unloading said dies and a closed position for completely closing said access opening during an operating cycle to prevent injury to persons and/or objects around said dies and drive means; and

safety means for preventing operation of said drive means whenever said safety cover means is in said open position.

4,835,844

BLOCK LOADING APPARATUS

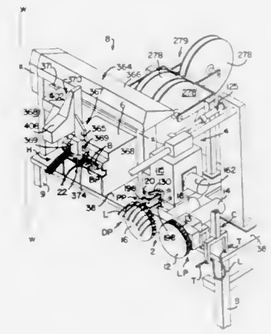
Michael Gerst, Worms; Horst J. T. Knapp, Gross-Zimmern, and Werner Maack, Seeheim, all of Fed. Rep. of Germany, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 19, 1988, Ser. No. 158,198

Claims priority, application United Kingdom, Apr. 7, 1987, 8708280

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—747 **17 Claims**



1. Apparatus for loading electrical terminals, each connected to an end of an electrical lead, into respective terminal receiving cavities provided in rows in an electrical connector block, the apparatus comprising:

an elongate frame;

a connector block support on the frame;

a lead clamp support mounted for movement along the frame;

a lead clamp on the lead clamp support;

first means on the lead clamp support for actuating the lead clamp to grip a lead presented thereto, at a position back from the terminal, and to release said lead, second means on the lead clamp support for aligning the lead clamp with a predetermined row of cavities of a connector block positioned on the connector block support, and third means on the lead clamp support for moving the lead clamp through a loading stroke towards such block and a return stroke away therefrom; and

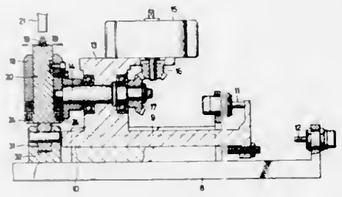
drive means on the frame for moving the lead clamp along the frame relative to said connector block on said connector block support, and lengthwise of said rows of cavities, to align the lead clamp with any cavity of a row, and for moving said lead clamp support along the frame to transfer the lead clamp to, and from, a lead pick-up location to pick up a lead, intermediate each return stroke and the next following loading stroke of the lead clamp.

4,835,845

PARTS APPLICATOR FOR SLIDE FASTENERS

Yusel Sassa, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 3, 1988, Ser. No. 227,635
Claims priority, application Japan, Aug. 4, 1987, 62-195977
Int. Cl.[4] A41H 37/06
U.S. Cl. 29—767 8 Claims



1. An apparatus for applying a fastener part to a slide fastener chain, comprising:

(a) a vertically reciprocating punch,

(b) an oscillatable holder angularly movable between an applying position in which said holder is upstanding directly below said punch, and a standby position in which said holder is reclined, said holder being further reciprocably movable toward and away from the path of movement of said punch when said holder is in the inclined position;

(c) an anvil slidably mounted in the holder and having a fixed lower jaw and a movable upper jaw defining therebetween a pocket for receiving therein the fastener part, said upper jaw being movable toward and away from said lower jaw for releasably holding said fastener part in said pocket; and

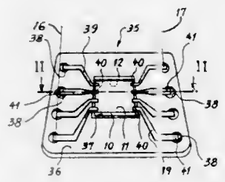
(d) a cam mechanism acting on said anvil when said holder performs a part of its angular reciprocation adjacent to said applying position, for causing said anvil to reciprocate linearly relative to said holder while moving angularly together with said holder.

4,835,846

METHOD OF MANUFACTURING OF ELECTRONIC MODULES FOR CARDS WITH MICROCIRCUITS

Alain Juan, Chézard, and Jean-Claude Vuilleumier, Cressier, both of Switzerland, assignors to EM Microelectronic Marin SA, Marin, Switzerland

Filed Sep. 13, 1988, Ser. No. 243,857
Claims priority, application France Sep. 14, 1987, 87 12739
Int. Cl.[4] H05K 3/39
U.S. Cl. 29—840 11 Claims



1. A method of manufacture of an electronic module, in particular for a card provided with microcircuits, such module including a plurality of electrodes intended to come into contact with an apparatus into which the card is introduced, at least one integrated circuit chip exhibiting a front face provided with connection terminals and a back face and a set of conductors coupling said electrodes to the connection terminals of the chip, comprising the following steps:

fabricating a first unit including an insulating substrate bearing a plurality of electrodes, each electrode overlaying a hole provided in the substrate;

fabricating a second unit by the successive operations of:

(a) obtaining an integrated circuit chip and an insulating substrate,

(b) coating the substrate with adhesive material,

(c) forming a rectangular opening in the substrate of dimensions slightly greater than the peripheral dimensions of the chip,

(d) perforating the substrate with second holes corresponding in number to the first mentioned holes provided in the first unit, said second holes being arranged to be substantially coaxial to the first holes when said first and second units are superposed,

(e) applying a metallic leaf onto said adhesive material,

(f) chemically engraving said leaf so as to form a network of conductors in a manner such that one of the first free ends of each of said conductors falls directly over a connection terminal of the chip and that each of the second free ends of each of said conductors falls directly over a corresponding second hole of the second unit,

(g) introducing the front face of said chip into said rectangular opening from below the substrate,

(h) soldering the chip terminals onto said first free ends of said conductors,

(i) coating with glue either the face of the second unit bearing the conductors or the back face of the first unit,

applying the first unit to the second unit so that the holes of said first unit are turned towards the conductors borne by the second unit, and

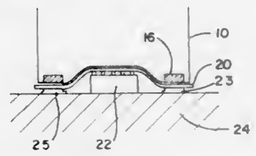
introducing the conductors of the second unit into the respective holes of the first unit and soldering said conductors to the corresponding electrodes borne by said first unit.

4,835,847

METHOD AND APPARATUS FOR MOUNTING A FLEXIBLE FILM ELECTRONIC DEVICE CARRIER ON A SUBSTRATE

James S. Kamperman, Endicott, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Apr. 20, 1988, Ser. No. 183,948
Int. Cl.[4] H05K 3/34; B23P 19/00
U.S. Cl. 29—840 13 Claims



1. A method for mounting a flexible film electronic device carrier on a substrate which comprises:

(a) obtaining a flexible film electronic device carrier in a support frame with an electronic device mounted on said flexible film electronic device carrier and having lead bonding pads formed on the flexible film electronic device;

(b) placing said flexible film electronic device carrier in contact with a fixture wherein said electronic device is maintained within a cavity of said fixture, and wherein said fixture has a heating element for contact with the lead bonding area of said flexible film electronic device carrier, and a surface having openings through which a vacuum can be drawn;

(c) drawing a vacuum through said fixture to hold said flexible film electronic device carrier in desired position;

(d) then removing said support frame from said flexible film electronic device carrier;

(e) placing said flexible film electronic device carrier in contact with a substrate to which said carrier is to be connected;

(f) heating the lead bonding area of the flexible film electronic device carrier to bond said carrier to said substrate; and

(g) releasing said vacuum and thereby obtaining the flexible film electronic device carrier mounted on said substrate.

13. A fixture for mounting a flexible film electronic device carrier on or for separating a flexible film electronic device carrier from a substrate which comprises:

a body portion having a recessed cavity deep enough to contain an electronic device attached to a flexible film carrier with the surface of the cavity for contact with the flexible film carrier, and the perimeter of the body portion for contact with a lead bonding area of the flexible film, the perimeter of said body portion including openings around it through which a vacuum can be established and the outer periphery of said cavity including openings around it through which a vacuum can be established for holding the flexible film carrier and electronic device attached thereto in the cavity; and

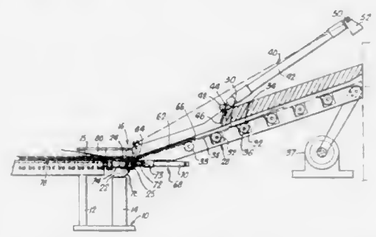
a heating element in the perimeter of the body portion.

4,835,848

APPARATUS FOR FEEDING RIGID SPACERS INTO TRAVELLERS FOR A VERTICAL BLIND

Petrus J. C. Schimmel, Delft, and Gerhardus J. Spikker, Hasksbergen, both of Netherlands, assignors to Hunter Douglas International N.V., Curacao, Netherlands Antilles

Filed Feb. 25, 1988, Ser. No. 160,549
Claims priority, application United Kingdom, Feb. 27, 1987, 8704649
Int. Cl.[4] B23P 19/04
U.S. Cl. 29—24.5 8 Claims



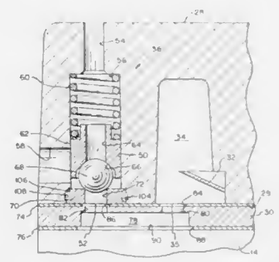
1. Apparatus for feeding a plurality of rigid, ferro-magnetic metallic, elongate prefabricated spacers, one into each of a plurality of travellers for a vertical blind, said apparatus comprising a holding station, a retractable holding member in said station, means for feeding a single traveller into said holding station to be retained by said holding member, a linear guide means for guiding said elongate spacers to said holding station in a lengthwise direction, a first feed means for feeding said spacers individually and separately along said guide means to a position with the leading edge of a spacer adjacent said holding station, a second feed means for pushing a spacer, so positioned, positively into and through a co-operating slot in a traveler held in said holding station by said holding member, and a discharge means for discharging a traveller and its associated spacer from said holding station, when said holding member has been retracted, in a direction parallel to the length of the associated spacer and away from said guide means.

4,835,849

METHOD OF MAKING AN INTEGRAL INTERNAL PRESSURE RELIEF VALVE

Robert L. Morse, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Division of Ser. No. 64,770, Jun. 22, 1987, Pat. No. 4,459,692.
This application Mar. 21, 1988, Ser. No. 171,015
Int. Cl.[4] B21K 1/20
U.S. Cl. 29—156.7 R 4 Claims



1. A method of assembling a compressor including a crankcase having a top surface, a cylinder head having a bottom surface for cooperatively engaging with the top surface of the crankcase, and a pressure relief valve comprising a valve body and a valve mechanism for relieving pressure from a discharge pressure chamber in the cylinder head, the method comprising the steps of:

providing a bore in the cylinder head having an opening in the bottom surface thereof, the bore defining the valve body and the bore being capable of receiving the valve mechanism through the bore opening;

introducing the valve mechanism into the valve body through the bore opening, the valve mechanism being operatively oriented in the valve body to respond to pressures being introduced through the bore opening; and

retaining the valve mechanism within the valve body until the cylinder head is operatively mounted to the crankcase and the top surface of the crankcase causes the valve mechanism to be positively captured within the valve body.

4,835,850

APPARATUS FOR JOINING PIECES OF SHEET METAL

Gerd-Juergen Eckold, Silberbutte 11, D-3424 St., Andreasberg, Fed. Rep. of Germany, and Hans Maass, Germelmannstr. 12, D-3422, Bad Lauterberg, Fed. Rep. of Germany

Filed Nov. 24, 1987, Ser. No. 124,585
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1986, 3640896
Int. Cl.[4] B23P 11/00
U.S. Cl. 29—243.52 27 Claims

1. An apparatus for joining a plurality of overlapping pieces of sheet metal comprising:

(a) a punch member for engaging and drawing parts of the sheet metal material,

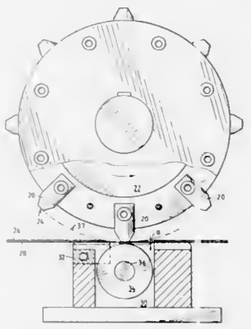
(b) first and second work stations for treating the sheet metal material are mounted,

(c) drive means for driving said punch member through said first and second stations,

(d) said first station including a die member defining a cavity engaging said punch to draw the sheet metal material into said cavity,

(e) said second station including an anvil member positioned to cooperate with said punch member to laterally extrude the drawn material positioned between said punch and anvil,

(f) said drive means driving said punch member along a path to produce a first force component in a direction required for drawing and extruding the sheet metal material and a



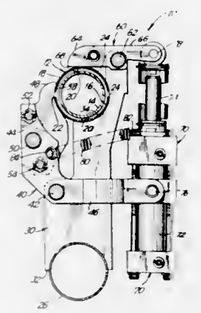
second force component substantially orthogonal to said first component to transport the overlapping sheet metal pieces from said first station to said second station.

4,835,851

CLAMP APPARATUS FOR TUBULAR MEMBERS

Camille Peele, Pikeville, and Franklin D. Carnley, Goldsboro, both of N.C., assignors to AP Parts Manufacturing Company, Toledo, Ohio

Filed Mar. 1, 1988, Ser. No. 162,667
Int. Cl.[4] B25P *27/14*
U.S. Cl. 29—272 **17 Claims**



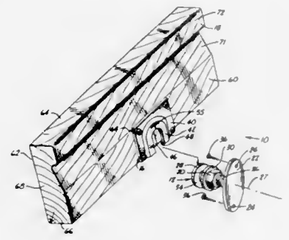
1. A clamp apparatus for clamping opposed longitudinal halves of a pipe in alignment with one another to define first and second opposed longitudinally extending seams between the pipe halves, said clamp apparatus comprising:
- a support having a recess for receiving portions of the pipe halves generally adjacent said first seam;
- first and second clamping levers each having opposed gripping and actuating ends, said clamping levers being pivotably connected to said support at locations on said clamping levers intermediate said gripping and actuating ends thereof, said gripping end of said first clamping lever being dimensioned to be pivotable into contact with portions of said pipe halves generally adjacent said second seam, said gripping end of said second clamping lever being dimensioned to be pivotable into contact with one said pipe half intermediate said seams;
- a piston and cylinder assembly for selectively rotating said first and second clamping levers about the respective pivotable connections to said support such that the gripping ends of said first and second clamping levers are urged into contact with the pipe halves mounted in the recess of said support to align the pipe halves and urge the aligned pipe halves into abutting relationship, the piston and cylinder assembly comprising a cylinder pivotably connected to one of said first and second clamping levers and a piston pivotably connected to the other of said first and second clamping levers; and
- spring means extending between the gripping end of said first clamping lever and the piston and cylinder assembly for urging said piston and cylinder assembly and said first clamping lever into a selected alignment relative to one another.

4,835,852

METHOD OF INSTALLATION OF HARDWARE

Timothy K. Asplund, 431 Lark Ave., Maplewood, Minn. 55117, and Andrew P. Hektner, 2204 4th Ave. N., #4, Menomonie, Wis. 54751

Division of Ser. No. 99,114, Sep. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 36,493, Apr. 9, 1987, abandoned. This application Jun. 6, 1988, Ser. No. 203,338
Int. Cl.[4] E04F *11/18*
U.S. Cl. 29—464 **1 Claim**



1. A method of mounting a rail to a wall, comprising the step of providing at least two sets of hardware, each set including:
- (a) a wall piece including a wall mounting plate, a threaded shank extending integrally outwardly from the plate on a shank axis, a rail piece mounting head integral with the threaded shank at an outer end of the shank and extending radially from said axis to position beyond the periphery of the shank, and a rail piece clamping nut threadably mounted on the shank between the plate and head, wherein the mounting head is partially defined by a circular outer surface having a plurality of scribe lines inscribed thereon extending radially outwardly from the shank axis,
- (b) means to fixedly attached the wall mounting plate to a wall,
- (c) a rail piece including a rail mounting plate, and a rail piece mounting head receiving plate integral with and offset outwardly from a central portion of the rail mounting plate to define with the rail mounting plate a mounting head receiving cavity open to a lower edge of the rail piece, said mounting head receiving plate being provided with a shank receiving slot open to the lower edge of the rail piece, extending centrally of the mounting head receiving cavity and terminating at an intermediate portion of the cavity, the slot having an axis extending longitudinally thereof, the construction of the rail piece being such that said cavity is of configuration to receive and encompass the mounting head as the shank is being installed in the shank receiving slot, and wherein an outer face of the mounting head receiving plate is inscribed with a scribe line in alignment with the axis of the shank receiving slot, and

- (d) means to fixedly attach the rail mounting plate to a rail to be mounted;

the method further including the steps of:
- first, attaching the wall mounting plates to the wall in position to determine the final position and angle of the rail;
- second, holding a surface of the rail which will eventually face the wall in an upwardly facing position below the mounting heads of the wall pieces, and bringing said rail surface into adjacent relation to the underside of each mounting head;
- third, using the mounting head scribe lines most nearly perpendicular to the said rail surface as guides, marking on said rail surface rail guide lines at right angles to the longitudinal axis of the rail;
- fourth, positioning each rail piece on the rail to have its receiving plate scribe line lie in a plane which is perpendicular to the longitudinal axis of the rail and which includes one of the rail guide lines, and attaching each rail mounting plates to the rail while so positioned;
- fifth, with each clamping nut backed off, setting the rail down on the wall pieces, thereby causing each rail piece mounting head receiving plate to encompass one of the shanks and one of the mounting heads and
- sixth, tightening each clamping nut, thereby clamping each rail piece mounting head receiving plate between one of the nuts and one of the mounting heads.

4,835,853

METHOD FOR ELECTRICALLY CONNECTING CONDUCTORS & ELECTRODES IN AN IMPLANTABLE ELECTRODE LEAD

Jakub Hirschberg, Taeby, Sweden, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 26, 1988, Ser. No. 199,252
Claims priority, application European Pat. Off., May 27, 1987, 8710760.8
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—854 **5 Claims**

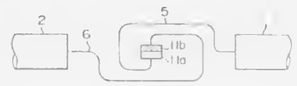
1. A method for preparing an implantable lead for connection to an electrode, said lead having at least one conductor to be connected to said electrode and at least one insulating sheath, said method comprising the steps of:
- arranging said at least one conductor to form one pole in a high voltage circuit in which a puncturing element forms the other pole;
- puncturing, at a selected electrode position, said at least one insulating sheath by initiating an electric arc between said poles of said high voltage circuit;
- burning, by maintaining said arc, the insulation where punctured to form a hole through which the conductor is exposed; and
- forming a connecting end of the exposed conductor for attachment to said electrode.

4,835,854

CABLE SPLICING METHOD

Terrance L. Markwardt, Cedar Park, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 5, 1988, Ser. No. 152,457
Claims priority, application Japan, Feb. 20, 1987, 62-37719
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—857 **2 Claims**



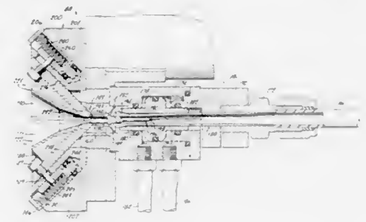
1. A wiring method using a plurality of connectors, said method comprising the steps of:
- preparing two lengths of cables each containing a number of wire pairs:
- removing the outer sheaths of the respective cable ends to expose free ends of the wire pairs of a predetermined length;
- installing connectors on said free ends of the wire pairs with a plurality of wire pairs in each connector, the connectors installed on one cable end being pluggable with corresponding connectors installed on the other cable end;
- plugging said connectors on one cable end together with said connectors on the other cable end;
- rotating said connectors 180 degrees and positioning said connectors in their proper bank locations; and
- bundling said connectors.

4,835,855

METHOD AND APPARATUS FOR CRIMPING

Homer L. Eaton, Leucadia; Kenneth G. Selesky, San Juan Capistrano, and Goro Kambara, Valley Center, all of Calif., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Filed Jun. 29, 1987, Ser. No. 67,552
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—863 **46 Claims**



40. Wire crimping apparatus comprising
- crimping means having a crimping region for receiving a contact to be attached to a wire end and for crimping a contact at said wire region, and
- contact locator and wire guide means connected to said crimping means, said contact locator and wire guide means comprising
  - a contact locator housing having a housing axis and having first and second inclined guide means extending toward said axis from opposite sides of said axis,
  - first and second contact locator elements slideably mounted to said guide means for motion along said axis and toward and away from each other and toward and away from said axis,
  - each said contact locator element having a contact locator

member and a wire entry funnel member forming a part thereof,

said contact locator elements being movable along said guide means between a first position in which said elements are juxtaposed to one another with said contact locator members positioned in mutually mating relation to form a contact receiving seat adjacent said crimping region and to block passage of a contact from said seat to said entry funnel members, and with said wire entry funnel members positioned adjacent one another in mating relation to form a wire end receiving funnel aligned with said contact receiving seat, and a retracted position in which said contact locator elements are displaced from said crimping region and from each other to allow a contact to pass from said seat to said funnel, and

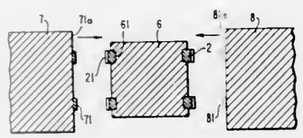
means for selectively driving said contact locator elements between said first and second positions.

4,835,856

PISTON RING MANUFACTURING METHOD

Katsumasa Azami, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Jul. 1, 1987, Ser. No. 68,580
Claims priority, application Japan, Jul. 5, 1986, 61-157199
Int. Cl.⁴ B23P *15/06*
U.S. Cl. 29—156.6 **7 Claims**



1. A method for manufacturing a piston ring with at least one groove transverse to said piston ring to permit passage of blow-by gas when said piston ring is installed on a piston, the method comprising the steps of:

securing a pre-formed piston ring on a fixed holder, said pre-formed piston ring having a substantially uniform shape with opposing top and bottom surfaces and inner and outer annular side surfaces;

pressing said pre-formed piston ring while secured on said fixed holder with a press to cause at least one projection extending perpendicular in the axial direction to the surface of said pre-formed piston ring being pressed to deform said pre-formed piston ring to form at least one groove on said pre-formed piston ring without otherwise significantly externally deforming said pre-formed piston ring, wherein after said pressing step said at least one groove is formed on one of said top and bottom surfaces;

removing said pre-formed piston ring from said fixed holder; and

twisting said pre-formed piston ring so that said opposing top and bottom surfaces become inner and outer annular side surfaces and said at least one groove faces outwardly of said preformed piston ring.

4,835,857

BICYCLE DISK WHEEL AND PROCESS FOR THE CONSTRUCTION THEREOF

Guido Michelotti, Vicenza, Italy, assignor to Micromag S.P.A., Vicenza, Italy

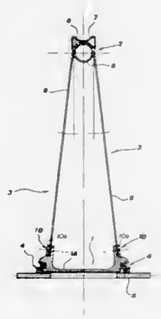
Division of Ser. No. 763,262, Aug. 6, 1985. This application Apr. 16, 1987, Ser. No. 40,167
Claims priority, application Italy, Sept. 10, 1984, 22586 A/84
Int. Cl.⁴ B21K *1/32*
U.S. Cl. 29—159 R **1 Claim**

1. A process for the construction of a wheel for bicycles, especially sports and competition bicycles, of the type comprising a hub rotatable on a pin fixed to a bicycle fork, a rim carrying a tire and means connecting the hub and the rim, said process comprising:

forming said connection means of two inclined flat sidewalls made of synthetic resin reinforced with radial fibers;

firmly anchoring said sidewalls to the hub and to the rim; and tension stressing said sidewalls between the hub and the rim, said process further comprising:

forming each of said sidewalls with a desired inclination by applying a plurality of triangular elements of textile fiber pre-impregnated with resin side by side and overlapping on a mold, so as to obtain a truncated cone with outwardly projecting edges;



applying at the center of each of said sidewalls a counterflange for connection to a corresponding flange of the wheel hub;

compressing said wheel rim until its radius has been reduced by a desirable degree;

fitting said two sidewalls onto said compressed rim by enveloping said compressed rim with said outwardly projecting edges and fixing them thereto;

polymerizing said resin by heating the same in an oven while maintaining said compression of said rim;

removing said compression from said rim; and

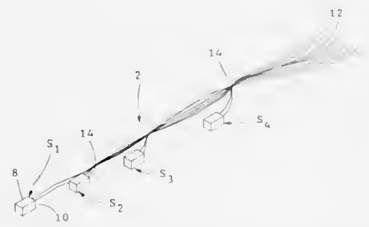
inserting the hub into said wheel by connecting said flanges to said counterflanges so as to draw said flanges and said counterflanges mutually apart.

4,835,858

METHOD AND APPARATUS FOR ASSEMBLING ELECTRICAL HARNESSES

Daniel T. Adlon, Harrisburg, and William C. Arbogast, Jr., Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 25, 1988, Ser. No. 173,505
Int. Cl.⁴ H01R *43/00*
U.S. Cl. 29—868 **20 Claims**



1. Apparatus for assembling a harness, the harness comprising first and second harness subassemblies, each of the subassemblies comprising a group of conductors which are generally parallel to each other and which are held together as a group at one location, the harness having a harness leading end and a harness trailing end, each harness subassembly having a subassembly leading end and a subassembly trailing end, the subassembly leading end of the first subassembly being at the harness leading end, the subassembly leading end of the second subassembly being between the harness leading end and the harness trailing end, the groups of conductors in the first and second subassemblies being bound into a single bundle at least one binding location which is between the subassembly leading end of the second subassembly and the harness trailing end, the apparatus comprising:

a staging zone having staging fixture means therein for holding the subassembly leading ends of the first and second subassemblies with the conductors extending from the staging zone in a first direction,

first and second subassembly transporters for the first and second subassemblies respectively, the transporters being initially positioned proximate to the staging zone and being independently movable from the staging zone along a transporting path, the transporting path extending away from the staging zone in a second direction, each of the transporters having subassembly holding means for releasably holding its respective harness subassembly during movement along the transporting path, and

actuating and control means for moving the first transporter along the transporting path a distance equal to the distance between the harness leading end

and the subassembly leading end of the second subassembly, and thereafter moving the first and second transporters in unison along the transporting path a distance sufficient to move the completed harness onto the transporting path.

18. A method of assembling a harness of the type comprising first and second subassemblies which are designated as S_1 and S_2, each of the subassemblies comprising a group of conductors which are generally parallel to each other and which are held together as a group at one location, the harness having a harness leading end and a harness trailing end, S_1 and S_2 each having a subassembly leading end and a subassembly trailing end, the subassembly leading end of S_1 being at the harness leading end, the subassembly leading end of S_2 being between the harness leading end and the harness trailing end, the groups of conductors in S_1 and S_2 being bound into a single bundle at least one location which is between the harness leading end and the harness trailing end, the method comprising the steps of:

positioning the subassembly leading ends of S_1 and S_2 in a staging zone with the conductors extending from the staging zone in a first direction,

axially moving S_1, leading end first, away from the staging zone along a transporting path, which extends away from the staging zone in a second direction, a distance equal to the distance between the harness leading end and the subassembly leading end of S_2 in the completed harness,

axially moving S_1 and S_2 in unison a further distance along the transporting path,

binding the groups of conductors in S_1 and S_2 into a bundle, and thereafter removing the completed harness from the transporting path.

4,835,859

METHOD OF FORMING A CONTACT BUMP

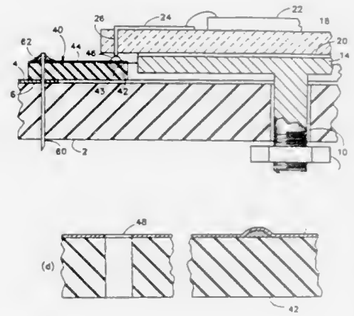
Frederick J. Beckett, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 3, 1987, Ser. No. 128,366
Int. Cl.⁴ H05K *3/00*
U.S. Cl. 29—846 **4 Claims**

1. A method of forming a contact bump on a sheet of electrically-conductive material, comprising:

(a) plastically deforming the sheet of electrically-conductive material so as to form a depression on one side of the sheet and a corresponding protrusion on the opposite side thereof,

(b) placing solid material in the depression, and



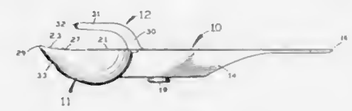
(c) securing the sheet of electrically-conductive material to a support member of elastomeric material.

4,835,860

CARTON-OPENING TOOL

Andrew L. Infeld, 9220 SW. 146th St., Miami, Fla. 33176

Continuation-in-part of Ser. No. 60,061, Jun. 9, 1987. This application Sep. 16, 1988, Ser. No. 245,213
Int. Cl.⁴ B67R *7/00*
U.S. Cl. 30—2 **16 Claims**



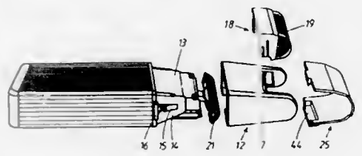
1. A hand tool for opening a paperboard carton which has a top panel and a side panel extending down from said top panel and forms a substantially 90 degree top corner of the carton therewith, said side panel having a push-in tab extending down from said corner and defined by lines of weakened material of said side panel, said tool comprising:

a generally spoon-shaped body having a generally ovoid bowl and a handle joined to and extending from one end of said bowl;

said body, when in a position with its handle substantially horizontal and its bowl open at the top, presenting a well-defined corner on the top at the distal end of the bowl away from the handle;

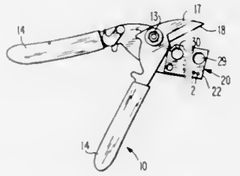
and a rigid arm which, in said position of said body, extends up from said handle at said one end of the bowl and continues through a substantially 90 degree bend and extends centrally over said bowl for at least substantially half the length of the bowl from said handle to said distal end, said arm terminating in a free end spaced above the top of said bowl.

4,835,861
ELECTRIC SHAVER
Gotthard Mahlich, Solingen, Fed. Rep. of Germany, assignor to Robert Krups Stiftung & Co. KG, Solingen, Fed. Rep. of Germany
Filed Jan. 29, 1988, Ser. No. 150,393
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1987, 3702998
Int. Cl.[4] B26B *19/20*
U.S. Cl. 30—43.92 **23 Claims**



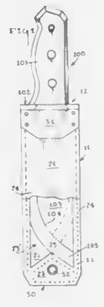
1. An electric shaver comprising a motor housing having a front portion; a mobile cutter mounted in said housing and extending from said front portion; a hollow frame having a front end and an open rear end, said frame and said housing being movable relative to each other in directions to introduce said cutter into and to withdraw said cutter from said frame by way of said rear end; means for separably connecting said frame to said housing so that the frame confines said front portion; a hollow casing including an apertured foil and being insertable into said frame substantially transversely of said directions in separated condition of said frame so that the foil overlies said cutter when said frame is reconnected to said housing and said casing is inserted into said frame, said foil being disposed at the front end of said frame in inserted position of said casing; and means for separably coupling said casing to said frame.

4,835,862
COAXIAL CABLE CUTTER/STRIPPER
Daniel B. Phillips, 3936 Terra Vista Way, Sacramento, Calif. 95821
Filed Jul. 25, 1986, Ser. No. 889,201
Int. Cl.[4] B21F *13/00*
U.S. Cl. 30—90.1 **3 Claims**



1. A combination coaxial cable cutter/stripper capable of precision cutting of a coaxial cable, comprising crossing levers pivotally attached together, a handle at one end of each said lever, a cutting blade with one flat side on the other end of one lever, a block with a cradle sized to the coaxial cable being cut and positioned at right angles, from the flat side of the cutting blade is affixed to the end of the other lever, the block also has a notch the length of the block shaped and sized the same as the cutting blade, permitting the blade to enter the block when the blade is closed, the combination of the cradle and flat side of the cutting blade produce near perfect longitudinally cuts maintaining the coaxial cables round shape and nominal impedance; said block also includes two transverse holes for selectively receiving a coaxial cable, the holes are so positioned in the block that when the blade is fully closed it will penetrate into each of these holes a predetermined depth, the width of the block is used as a gauge for determining the exact distance from the end of the cable to start the stripping sequence, the other hole incorporates a window cut thru the wall of the hole to view when the cable has been inserted deep enough to locate the second cut required in the stripping process.

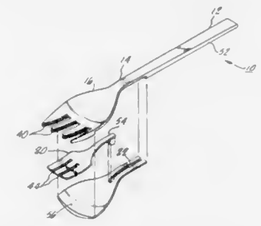
4,835,863
SINGLE CATCH KNIFE SHEATH CONSTRUCTION
Stephen M. Salandre, 10413 Baldwin NE., Albuquerque, N. Mex. 87112
Filed May 3, 1988, Ser. No. 189,866
Int. Cl.[4] B26B *29/02*
U.S. Cl. 30—143 **8 Claims**



1. A sheath construction for knives having knife handle, a hand guard, and a single edged knife blade having a curved point wherein the sheath construction comprises:
a sheath unit comprising a sheath member having an outer sheath layer, an inner sheath layer, and an intermediate sheath layer which are joined together by securing means; wherein, the intermediate sheath layer defines the dimensions of the sheath opening and has an elongated generally U-shaped configuration; and, wherein the base of the generally U-shaped intermediate heath layer is further provided with a generally triangular raised central portion; whereby, the curved point of the knife lade will rest on the said raised central portion of the of the intermediate sheath layer when the knife is inserted in either a right handed or a left handed disposition.

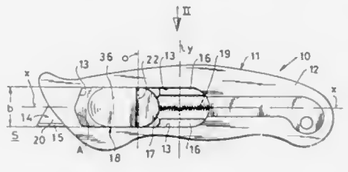
4,835,864
COMBINATION FORK/SPOON UTENSIL
Hua H. Tang, 1511 S. Los Robles Ave., Pasadena, Calif. 91106
Filed Feb. 22, 1988, Ser. No. 159,112
Int. Cl.[4] A47J *43/28*
U.S. Cl. 30—150 **13 Claims**

1. A convertible utensil capable of being used as a fork or spoon, the utensil comprising:
(a) an elongated handle;
(b) a spoon-shaped head attached to the handle, the head having at its forward end a cut out portion providing at least two tines, and the head having a slot therein, the slot being in communication with the cut out portion of the head; and
(c) a movable plate movably positioned within the slot, the plate being capable of being moved to (i) a first position so that the plate substantially covers the cut out portion of the head, the utensil thereby forming a spoon, and (ii) a second position so that the cut out portion of the head is



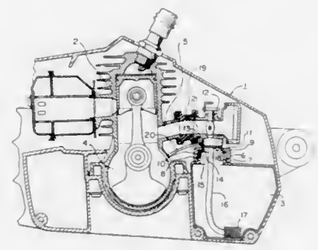
substantially uncovered, the utensil thereby forming a fork.

4,835,865
HOLLOW-HANDLE UTILITY KNIFE REPLACEABLE BLADE
Heinz-Peter Knoop, Solingen, Fed. Rep. of Germany, assignor to Martor-Argentax E.H. Beermann KG, Solingen, Fed. Rep. of Germany
Filed Jun. 22, 1987, Ser. No. 65,337
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1986, 3622343
Int. Cl.[4] B26B *1/08*
U.S. Cl. 30—162 **15 Claims**



13. A knife comprising:
a substantially hollow handle provided with a longitudinal-slide slot on one side of said handle;
a short knife blade movable longitudinally in a knife blade guide track insertable in said knife blade guide track at least indirectly through said longitudinal-slide slot which fits the spatial requirements of said knife blade;
at least one guided slider member coupled indirectly with a handle end of said longitudinally movable knife blade;
a slider operating piece associated with said slider member comprising a slider cover on an outer broad side of said knife blade pivotally mounted on said one side on said slide member, said slider cover being at least partially removable from said knife blade guide tract and releasably lockable with and engaged with said knife blade; and
snap lock means for holding said slider cover on said slider member.

4,835,866
DEVICE FOR MOUNTING CARBURETOR ON INTERNAL COMBUSTION ENGINE
Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan
Filed Dec. 11, 1987, Ser. No. 131,834
Claims priority, application Japan, Dec. 17, 1986, 61-194298
Int. Cl.[4] B27B *17/02*
U.S. Cl. 30—381 **6 Claims**



1. A device for mounting a carburetor comprising:
means for fixing said carburetor to a fuel tank comprising:
an upward projection formed integrally with the fuel tank and defining an upwardly directed opening;
a cylindrical clamping member detachably secured to said upward projection and having a flange directed radially inwardly on an upper end thereof, said flange adapted to confront said upward projection when said clamping member is secured thereto;
a disk-shaped mounting seat fixed to an underside of the carburetor, said seat comprising a cylindrical skirt portion formed from an outer peripheral portion of said mounting seat bent downwardly and a flange portion formed from a lower end of said skirt portion which is bent to extend radially outward, wherein said skirt portion is extended through an aperture formed in said flange which extends radially inward from said clamping member and said radially outward flange portion is maintained in contact with an inner surface of said flange, whereby as said clamping member is secured onto said upward projection, said flange portion is clamped between the upper end of said upward projection and the inner surface of said flange for fixing the carburetor to the fuel tank; and
a resilient heat-insulating pipe through which the mixture delivery side of said carburetor is connected to a mixture suction port of an internal combustion engine.

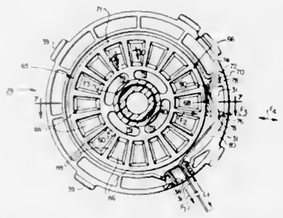
4,835,867
APPARATUS FOR CUTTING VEGETATION
Imack L. Collins, Shreveport, La.; Jerry E. Stuart, Des Plaines, Ill., and Gary H. Foster, Austin, Tex., assignors to White Consolidated Industries, Inc., Cleveland, Ohio
Continuation-in-part of Ser. No. 631,000, Jul. 16, 1984, which is a continuation of Ser. No. 245,459, Mar. 19, 1981, abandoned, which is a continuation of Ser. No. 891,666, Mar. 30, 1978, abandoned. This application Sep. 17, 1986, Ser. No. 908,214
Int. Cl.[4] B26B *7/00*
U.S. Cl. 30—276 **42 Claims**

1. Apparatus for cutting vegetation comprising:
a head rotatable about an axis of rotation, said head having at least one aperture near the periphery thereof and a cavity for storing a coiled supply of flexible cutting line;
drive means capable when operative of effective rotation of said head;
a coil of flexible cutting line in the cavity and extending outward through said aperture to a free end which provides a cutting length of line swinging in a cutting plane

disposed normal to the axis of rotation of the head when the head is driven;

feed means operable for controlling line feed from the coiled supply to the free end for maintaining a desired length of cutting line, said means being responsive to a function of the difference between the centrifugal force acting on a reference mass and the centrifugal force acting on the line in the cutting plane to prevent payout of the line until a force representative of the centrifugal force produced on the reference mass is greater than a force representative of the centrifugal force produced on the cutting line at which time additional line is controllably payed out until the centrifugal force on the line exceed the centrifugal force on the reference mass to maintain a suitable length of line in the cutting plane, said feed means including:

pivoting means having a predetermined reference mass



unbalance tending to produce pivotal movement in one direction to a line release position upon rotation of the head;

line engagement means on the pivoting means for engagement by the line between the coil of line and the free end of the line and operative to pivot the pivoting means in the opposite direction to a line release position in response to tension in the line such that the centrifugal force on the line is compared to the centrifugal force of the reference mass imbalance;

payout control means cooperable with and responsive to movement of the pivoting means to the line locked position for preventing payout the line, and for permitting controlled payout of the line when the member moves toward the line release position as a result of the centrifugal force of the reference mass imbalance being greater than the centrifugal force on the line.

4,835,868

SAW CHAIN TENSIONER OF CHAIN SAW

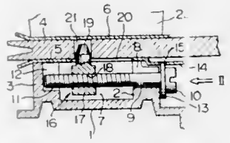
Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Dec. 11, 1987, Ser. No. 131,836

Claims priority, application Japan, Dec. 17, 1986, 61-194299[U]

Int. Cl.⁴ B27B *17/14*

U.S. Cl. 30—386 **3 Claims**



1. A saw chain tensioner comprising: a threaded rod member rotatably received in a frame of a chain saw; and a pin member screwed onto a threaded portion of the threaded rod member and having a portion which is extended through a lateral guide slot formed in a side plate which is disposed between a chain guide bar and the chain saw frame into engagement with the chain guide bar, whereby, when the threaded rod member is rotated, the pin member is moved back and forth in the axial direction of the threaded rod member so as to displace the chain guide bar in the longitudinal direction thereof, thereby adjusting the level of tension applied to a saw chain wherein the improvement comprises a head (**10**) at an end of said rod member (**9**), said head (**10**) being outside of said frame, a flange portion (**13**) extending radially outward from the threaded rod member (**9**) adjacent said head (**10**), and an engaging portion (**15**) formed on the side plate and engaging with the flange portion (**13**) on the threaded rod member (9).

4,835,869

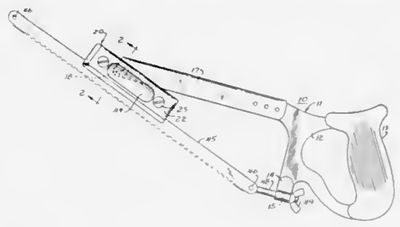
HACKSAW FRAME AND BLADE HOLDER

Arthur Waldherr, 201 Freeport Dr., Bloomingdale, Ill. 60108

Filed Jul. 25, 1988, Ser. No. 223,434

Int. Cl.⁴ B27B *21/06*

U.S. Cl. 30—507 **11 Claims**



1. A hacksaw comprising, a frame member having two longitudinally extending sides interconnected by a bight, a handle attached thereto at one end thereof and stud mounting means at the other end thereof, a blade holder removably and pivotally mounted on said stud mounting means between said sides and having clamping mechanism for securely holding a blade, said blade holder when mounted on said main frame member maintaining a hacksaw blade at an acute angle with said main frame member, and a blade extending between the one end of said frame and said blade holder.

4,835,870

DEVICE FOR MEASURING THE DISTANCES AND DIRECTIONS OF DESTINATIONS ON ROAD MAPS

Hans Rauch, Fürth; Eva Osterkamp, Burgthann, and Norbert Stepper, Berg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE86/00247, § 371 Date May 5, 1987, § 102(e) Date May 5, 1987, PCT Pub. No. WO87/01442, PCT Pub. Date Mar. 12, 1987

PCT Filed Jun. 13, 1986, Ser. No. 50,296

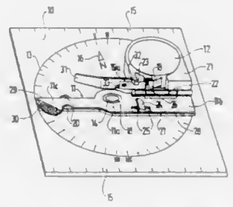
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1985, 3532016

Int. Cl.⁴ G01B *3/10*; G01C *21/00*

U.S. Cl. 33—1 C **8 Claims**

1. In a device for measuring the distance and direction of destinations on road maps from a starting point for the input of intermediate destinations in navigation devices, comprising a transparent angle measuring plate (**10**) which has a central borehole (**14**) and a 360-degree scale (**13**) arranged concentrically relative to the central borehole and having a mark for the north direction for the beginning of said degree scale; a bracket (**11**) having one end area, another end area and a middle area and being supported at said central borehole (**14**) of said angle measuring plate (**10**) by said middle area (**11***a*) so as to be rotatable and so as to extend in a plane-parallel manner relative

to the angle measuring plate, said bracket carrying a measuring tape case (**12**) positioned at said one end area (**11***b*); means for fastening said measuring tape case (**12**) on said bracket in such a way that said measuring tape case can be folded down out of a vertical working position toward said angle measuring plate (**10**), the improvement comprising said bracket (**11**) having a guide (**20**) at said another end area (**11***c*) for the measuring tape (**19**) which can be drawn out of said measuring tape case (**12**), said guide (**20**) being arranged in such a way that said measuring tape (**19**), when drawn out, extends away radially in an outward direction with its one lateral edge over a center of said scale (**13**) on said angle measuring plate (**10**); means to lock said measuring tape case in the vertical working position on said bracket, said lock means including a projection (**24**) provided on said bracket, said fastening means including a housing accommodating said measuring tape case and supported on said bracket and being lockable by said lock means in said working position at said projection of said bracket.



4,835,871

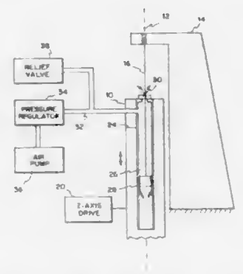
COUNTERWEIGHT FOR COORDINATE MEASURING MACHINE

Vitaly I. Pesikov, Providence, R.I., assignor to Brown & Sharpe Manufacturing Co., North Kingstown, R.I.

Filed Oct. 31, 1986, Ser. No. 925,323

Int. Cl.⁴ G01B *5/20*

U.S. Cl. 33—1 M **1 Claim**



1. Apparatus for counterbalancing a vertically movable element of a machine comprising:

a cylinder defining an elongated cylindrical space attached to the movable element with its axis parallel to the direction of movement of said movable element and having a small axial opening at its upper end, said opening in said cylinder being defined by a low friction jewel;

a piston located in said cylindrical space for axial movement therein;

a machine element fixed in the vertical direction and having a portion aligned with the axis of said cylinder;

connection means passing through said opening in said cylinder for connecting said piston and said portion of said fixed machine element while substantially eliminating friction and wear at said opening caused by misalignment between said movable element and said fixed machine element, said connection means comprising an elongated, thin stranded wire that is nonelastic in a longitudinal direction and is free to bend and flex in a transverse direction; and

means for supplying air under pressure to the portion of said cylindrical space between said piston and said opening in said cylinder sufficient to counterbalance the weight of said movable element.

4,835,872

AUTOMATIC APPARATUS FOR DRAWING ON AND SCORING OF SHEET MATERIAL

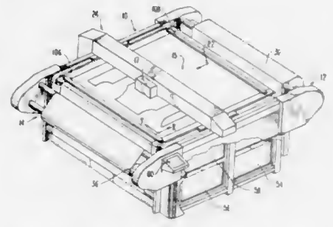
Bernardo P. Alcantara; Fernando Diaz-Zorita, and Rodrigo C. Becerra, all of Madrid, Spain, assignors to Investronica, S.A., Madrid, Spain

Filed Dec. 18, 1986, Ser. No. 943,196

Claims priority, application Spain, Dec. 20, 1985, 550267

Int. Cl.⁴ B43L *15/00*; G01D *15/02*

U.S. Cl. 33—18.1 **6 Claims**



1. An automatic apparatus for drawing on sheet material such as paper and for scoring the surface of sheet material such as plastic, comprising:

table means for supporting the sheet material;

tool means disposed above said table means for selectively drawing on or scoring the surface of the sheet material supported on said table means;

tool support means disposed above said table means for supporting said tool means, said support means being movable in any direction in a plane parallel to the surface of the sheet material supported on said table means;

control means operatively connected to said tool means and to said tool support means for moving said tool support means and for causing said tool means to effect drawing on or scoring the surface of the sheet material when said tool means is moved by said tool support means; and

said tool means including a frame mounted on said tool support means, a drawing instrument movably mounted on said frame, means disposed on said frame for moving said drawing instrument from a nonworking to a working position, a scoring instrument having a conically shaped scoring tip movably mounted on said frame, means for moving said scoring instrument form a nonworking to a working position, said means for moving said drawing instrument and said means for moving said scoring instrument each being operatively connected to said control means whereby either said drawing instrument or said scoring instrument can be moved into a working position to effect either drawing on or scoring of the sheet material, said means for moving said drawing instrument including a first tool carriage attached to said drawing instrument, means biasing said first tool carriage in a first position corresponding to the nonworking position of said drawing instrument and first electromagnetic means mounted on said frame and connected to said first tool carriage for moving said first tool carriage from said first

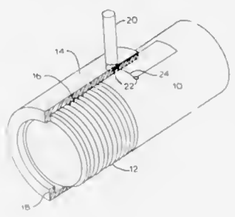
position to a second position corresponding to said working position of said drawing instrument, said means for moving said scoring instrument including a second tool carriage attached to said scoring instrument, means biasing said second tool carriage in a first position corresponding to the nonworking position of said scoring instrument and second electromagnet means mounted on said frame and connected to said second tool carriage for moving said second tool carriage from said first position to a second position corresponding to said working position of said scoring instrument, said first tool carriage being connected to said drawing instrument at a position between said frame and said table means, said first electromagnet means comprising an electromagnet supported by said frame and a plunger shaft movably mounted in said electromagnet for movement towards and away from said table means, said plunger shaft extending through an opening in said first tool carriage and having a head at a free end thereof, said plunger shaft further having a nut threadedly engaged therewith at a position between said frame and said first tool carriage for limiting movement of said first tool carriage with respect to said frame.

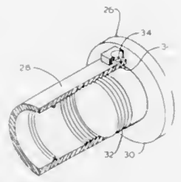
4,835,873

GAUGING DEVICE AND METHOD FOR COUPLING THREADED, TUBULAR ARTICLES AND A COUPLING ASSEMBLY

Craig C. Weems, Houston, Tex., assignor to Tuboscope, Inc., Houston, Tex.

Filed Sep. 16, 1987, Ser. No. 97,183
Int. Cl.[4] B43L 9/00
U.S. Cl. 33—21.3 **10 Claims**





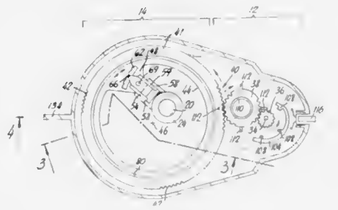
1. A gauging device for use in coupling threaded, tubular articles including a pin and a coupling adapted for relative threaded engagement, said device comprising a first gauge adapted for engagement with said pin and having internal projections terminating at an internal flange with a longitudinal distance from said internal annular flange to a first marking location on said first tubular gauge equaling a preselected thread coupling distance of said threaded engagement of said pin and coupling, means for marking said pin at said first marking location with said end of said pin abutting said internal flange of said first gauge, a second gauge adapted for engagement with said coupling and having external projections terminating at an external flange on one end of said gauge with a longitudinal distance from said external flange to an opposite end of said second gauge equaling a preselected thread coupling distance during said threaded engagement of said pin and coupling, and means for marking said coupling at a second marking location on said second gauge with said end of said coupling abutting said external flange of said second tubular gauge, whereby during threaded engagement of said pin and coupling registration of markings provided on said pin and said coupling ensures the preselected coupling distance to reduce connection stress and provide good coupling sealing.

4,835,874

DRIVEN MARKING SYSTEM FOR CREATING A PLURALITY OF VARIED LINE DESIGNS

Steven Ellman; Fred Ellman; Julius Ellman, all of 1672 E. 7th St., Brooklyn, N.Y. 11230, and George Lerner, 14820 Naran-Ja Lakes Blvd., Naran-Ja, Fla. 33032

Filed Jan. 5, 1988, Ser. No. 140,824
Int. Cl.[4] B43L 11/00
U.S. Cl. 33—27.11 **12 Claims**



1. A system for marking a surface, comprising, in combination,

a housing forming a hole opening to said surface,

marking means for drawing upon the surface,

holder means positioned in said hole for removably gripping said marking means,

gear means rotatably mounted to said housing and connected to said holder means, said gear means being for rotating said holder means about said hole,

drive means for rotating said gear means, and

power means for energizing said drive means,

said holder means including pivot means for joining said holder means to said gear means so that said holder means rotatably bears said marker means downwardly by gravitational force in operational relationship with the surface to be marked;

said marking means including an elongated marking member including a marking tip in operative relationship with the surface to be marked, said surface to be marked being in a generally horizontal orientation, said marking member being generally vertical;

said holder means being moved in a circular pattern about an imaginary center in said hole;

wherein said holder means further includes swivel means joining said holder means with said gear means, said swivel means being for allowing said holder means to be moved in a horizontal arc which is disposed eccentrically relative to said center of said at least one circle so that said marking member can be moved along said arc to varied distances from said center of said circle, wherein said at least one circle is a plurality of circles of selected radii;

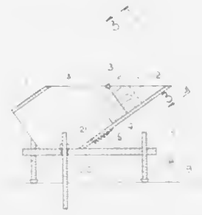
whereby when said system is moved manually relative to the surface, said marking means draws a configuration upon the surface.

4,835,875

CYLINDRICAL SUNDIAL WITH INSTALLATION INDICIA

George L. Fuller, 444 E. Park Dr., Spartanburg, S.C. 29302

Filed Feb. 26, 1988, Ser. No. 161,465
Int. Cl.[4] G01C 17/34, 21/02; G04B 49/02
U.S. Cl. 33—270 **4 Claims**



1. A cylindrical sundial comprising:

(a) a hollow right cylinder with one end in the form of an ellipse in a plane inclined about 35° to the axis of the cylinder, with a longitudinal index line on the inner surface of said cylinder in the plane also containing the axis of said cylinder and the major axis of the elliptical end, and with a circumferential index line on the inner surface of said cylinder in a plane at right angles to the axis of said cylinder and also containing the minor axis of the elliptical end:

(b) a spherical gnomon with means to adjust and secure said gnomon at the point where the axis of said cylinder intersects the plane containing said circumferential index line;

(c) latitude indicia lines on the inner surface of said cylinder with said circumferential index line a basis, representing zero latitude—such that when a vertical line from the center of the gnomon intersects the latitude indicium line representing the latitude of the site, the axis of said cylinder will be inclined to the horizontal at an angle equal to the degrees latitude of the site;

(d) Longitude displacement indicia lines on the inner surface of said cylinder with said longitudinal index line a basis, representing zero longitude displacement—such that when a vertical line from the center of the gnomon intersects the longitude displacement indicium line for the site, the plane containing the axis of said cylinder and said longitudinal index line will be inclined to a vertical plane through the axis of the cylinder at an angle equal to the difference between the longitude of the site meridian and the longitude of the time zone meridian; and

(e) time indicia lines on the inner surface of said cylinder with said circumferential index line a basis representing zero sun declination, and with said longitudinal index line a basis representing 12 o'clock noon apparent zone time—such that when the gnomon is vertically above the site longitude displacement indicium line and the axis of the cylinder is parallel to the axis of the earth, the correct zone time will be indicated by the shadow of the gnomon from the sun;

4,835,876

INSTRUMENT CHASSIS AND BODY SUPPORTS FOR PIPELINE SURVEY PIG

Steven G. Petermann, Plano; Michel L. Cabiran, Allen, and John D. Cooper, Garland, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 26, 1987, Ser. No. 67,511
Int. Cl.[4] E21B 47/022; G01C 9/06
U.S. Cl. 33—313 **9 Claims**

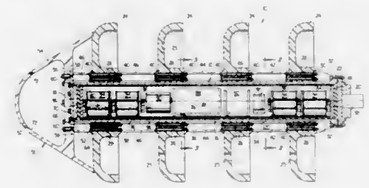
1. A pipeline survey pig for determining the curvature or lateral displacement of a pipeline utilizing signals generated by an inertial reference unit mounted on said pig, said pig comprising:

an elongated pig body having an interior cavity defining a space for supporting an instrument chassis;

an instrument chassis adapted to be supported in said pig body and including an inertial reference unit for sensing changes in course of a pipeline representing curvature or lateral displacement of portions of said pipeline;

a plurality of support members for supporting said pig in a section of pipeline, said support members being spaced apart and supporting said pig body in said pipeline, said support members being adapted to permit limited lateral excursion of said pig body in said pipeline;

means for selectively positioning said support members longitudinally with respect to said pig body such that the



center of stiffness of said pig is in a predetermined position relative to the center of buoyancy of said pig when said pig is disposed in a fluid in a section of pipeline;

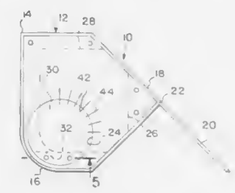
support means for supporting said reference unit in said chassis, said support means including a metal block contiguous with a portion of said chassis for transferring heat from said reference unit to said pig body through said chassis, said chassis including an elongated chassis body member and means for securing said chassis body member in said pig body in forcible engagement with said pig body including a pair of opposed doors hinged to said chassis body member and means engageable with said doors for urging said doors to be moved into forcible engagement with said pig body and to prevent rotation of said chassis within said pig body and to improve the heat transfer capability of said chassis with respect to said pig body.

4,835,877

TRY SQUARE PROTRACTOR

Daniel Roach, 1230 St Lawrence Ave., Bronx, N.Y. 10472, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007

Filed Sep. 30, 1988, Ser. No. 252,384
Int. Cl.[4] B43L 7/06
U.S. Cl. 33—426 **5 Claims**



1. A combined try square and protractor which comprises:

(a) a home plate shaped housing that includes a square corner, a curved corner, an opposite diamond shaped side in a 45° angle and a guide arm extending downwardly at a 45° angle from tip of said diamond shaped side, said housing having an aperture therethrough at said curved corner, a first edge slot extending inwardly through said tip of

said diamond shaped side and a second C-shaped slot extending inwardly through said square corner and said curved corner;

(b) a protractor dial carried in said aperture in said housing, said protractor dial having an edge slot therein; and

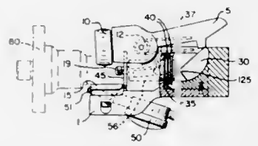
(c) a blade removably attached within said second C-shaped slot to said housing at said square corner so as to measure right angles therefrom, said blade removably attached within said first edge slot to said housing at said tip of said diamond shaped side so as to measure center of a pipe when the pipe is placed between said guide arm and said diamond shaped side and said blade removably attached within said slot of said protractor dial so as to measure various angles from said curved corner of said housing.

4,835,878

STABLE MEASURING PLATFORM

Donald L. Bartley, Willoughby, Ohio, assignor to Kennametal Inc., Latrobe, Pa.

Filed Apr. 20, 1988, Ser. No. 183,942
Int. Cl.[4] B27G *23/00*; G01B *5/00*
U.S. Cl. 33—637 **19 Claims**



1. A stable measuring platform for aligning the position of a cutting insert mounted on an exterior surface of a boring apparatus comprising:

(a) a gauge body;

(b) internal support means within the gauge body for insertion into a bore of the boring apparatus and for maintaining the gauge body in a fixed position relative to the boring apparatus;

(c) external support means mounted on the gauge body engaging the exterior of the boring apparatus for retaining the gauge body in a fixed position relative to the boring apparatus; and

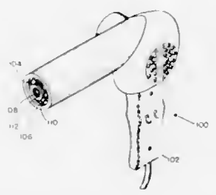
(d) measuring means mounted on the gauge body; wherein the platform is adapted to accurately measure the location of the cutting insert relative to the gauge body while the gauge body is affixed to the boring apparatus.

4,835,879

SCENTED PAD FOR HAND-HELD HAIR DRYERS

Randi K. Egelstad, 1006 First St., Snohomish, Wash. 98290

Filed Apr. 5, 1988, Ser. No. 177,965
Int. Cl.[4] F26B *21/06*
U.S. Cl. 34—97 **10 Claims**



1. Apparatus for providing a scent to areas wherein a hair dryer is used, the hair dryer being of the standard, hand-held type having an aperture for supplying a stream of heated air and including a barrier for preventing objects from entering into or passing out of the aperture, the barrier including an outer portion which is securely attached to the hair dryer aperture and an interior portion through which the heated air stream passes, said apparatus comprising:

a disc shaped pad made of a flame retardant material which at least partially absorbs liquid, said pad having a circular shape sized to fit within the aperture of the hair dryer and having at least one aperture through which a portion of the air stream can pass, said pad having a first side which faces outward from the hair dryer when said pad is mounted to the hair dryer and a second side which faces the hair dryer when said pad is mounted thereto;

a backing attached to said second side of said pad, said backing being sized and shaped to match said second side of said pad and having an outer surface which faces away from said pad, said outer surface having an adhesive material disposed thereon such that when pressed against the barrier of the hair dryer aperture said backing attaches said pad to the barrier by said adhesive, said backing including at least one aperture being aligned with said at least one aperture of said pad to allow a portion of the heated air stream to pass therethrough;

a protective covering attachable to said outer surface of said backing to protect said adhesive and prevent said pad from being inadvertently attached to objects other than the hair dryer barrier, said protective covering being sized and shaped to match said backing and being removable from said backing prior to mounting of said pad to the barrier of the hair dryer; and

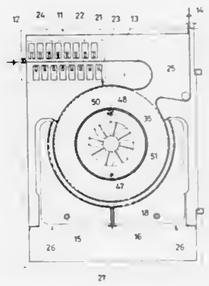
an oil based, scented liquid disposed within and absorbed by said pad.

4,835,880

AIR PERCUSSION AND AIR SUCTION DRYER FOR MACHINES FOR CONTINUOUS TEXTILE TREATMENT

Gino D. Vecchia, Santorso, Italy, assignor to Sperottn Rimar S.p.A., Vicenza, Italy

Filed Oct. 23, 1987, Ser. No. 112,677
Claims priority, application Italy, Nov. 28, 1986, 22511 A/86
Int. Cl.[4] F26B *13/30*
U.S. Cl. 34—115 **11 Claims**



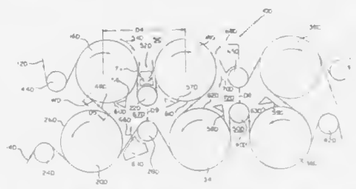
1. An air percussion and air suction dryer for appratus for continuous textile treatment comprising a rotatable, perforated, cylindrical drum, means for guiding fabric for travel around said drum, a pair of opposed tanks at least partially surrounding said drum and the fabric traveling thereon, said tanks inlcuding walls facing said drum which are perforated, fan means for blowing air through the tanks to the drum to dry the fabric on the drum, means providing a suction flow passage for the air into and through said drum, and control means for controlling the air flow through said tanks and into said drum to selectively control the flow and distribution of the air to and through the fabric to be dried, said control means comprising displaceable elements including perforated sector-shaped plates facing said walls of the tank movable between open and closed positions for selectively opening and blocking air flow through said tanks to said drum.

4,835,881

DRYER SECTION APPARATUS

John Welsby, Shevington, England, assignor to Beloit Corporation, Beloit, Wis.

Filed Oct. 19, 1987, Ser. No. 110,405
Claims priority, application United Kingdom, Jul. 23, 1987, 8717387
Int. Cl.[4] A26B *25/00*
U.S. Cl. 34—117 **13 Claims**



1. A dryer section apparatus for drying a web extending therethrough, said apparatus having a plurality of lower dryer drums and a plurality of upper dryer drums, said apparatus comprising:

a lower felt partially wrapping each lower dryer drum of the plurality of lower dryer drums;

a plurality of lower intermediate rolls, each lower intermediate roll being disposed between adjacent lower dryer drums such that only each alternate lower intermediate roll guides both the web and said lower felt;

an upper felt partially wrapping each upper dryer drum of the plurality of upper dryer drums; a

plurality of upper intermediate rolls, each upper intermediate roll being disposed between adjacent upper dryer drums such that only each alternate upper intermediate roll guides both the web and said upper felt so that the web is transferred in open draw between adjacent upper and lower dryer drums thereby minimizing the length of said open draw and inhibiting web flutter during transfer between upper and lower dryer drums;

each alternate lower intermediate roll which guides both the web and said lower felt being disposed adjacent to an upper intermediate roll which is partially wrapped by only said upper felt, each of said alternate lower intermediate rolls being a vacuum roll; and

said lower intermediate roll which guides both the web and said lower felt being disposed at a first distance relative to said upper intermediate roll which is partially wrapped by only said upper felt, each of said lower intermediate rolls which are partially wrapped by said lower felt only being disposed a second distance relative to adjacent upper intermediate rolls partially wrapped by both the web and said upper felt, said second distance being greater than said first distance.

4,835,882

DRYER FLOW SEPARATOR

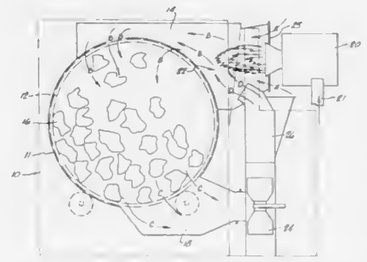
Anthony A. Dongelmans, Upland, Calif., assignor to Challenge Cook Bros., Inc., Industry, Calif.

Filed Oct. 30, 1987, Ser. No. 115,758
Int. Cl.[4] F26B *11/02*
U.S. Cl. 34—131 **13 Claims**

1. A drying unit flow separator comprising: an inlet duct having walls forming a curvature with an outside wall on an outer radius of the curvature and an inside wall on an inner radius of the curvature; a recirculation duct;

an exhaust duct, said recirculation duct and said exhaust duct connected to said inlet duct at a junction with said recirculation duct continuing from the inside wall on the inner radius and said exhaust duct continuing from the outside wall on the outer radius; and

a recirculation damper disposed adjacent to the junction and projecting at least partially into said inlet.

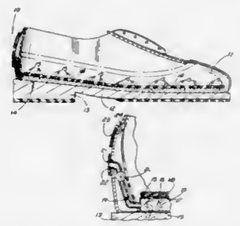


4,835,883

VENTILATED SOLE SHOE CONSTRUCTION

Edward J. Tetrault, and Larry D. Land, both of 16757 Vasser St., Forest Lake, Minn. 55025

Filed Dec. 21, 1987, Ser. No. 135,593
Int. Cl.[4] A43B *7/06*
U.S. Cl. 36—3 R **2 Claims**



1. A ventilating sole construction for use in combination with a shoe comprising,

a sole means including a ventilating sole contiguously positioned to an outer sole lasted to an upper of said sole, and

said ventilating sole including a conduit means formed with two ends secured to said ventilating sole within the interior of said shoe at one end and to a source of air exteriorly of said shoe at its other end, and

said ventilating sole including a plurality of chambers separated by vane means, and

intercommunicating means enabling air introduced into said ventilating sole to be directed into said plurality of chambers, and

wherein said intercommunicating means comprises a plurality of openings formed in each of said vane means, and

wherein said vane means is formed in a generally "V" shaped memory retentent flexible material with said plurality of openings aligned and conformed at the apex of each of said vane means, and

wherein a porous cushioned inner sole is secured in overlying relationship to said ventilating sole to enable air within said chambers to be directed through said porous inner sole to the interior of said shoe, and

wherein said vane means are rearwardly directed with each apex rearwardly directed and positioned medially of said inner sole and said outer sole, said conduit means is formed with a screen overlying said conduit at its other end to prevent debris from entering said conduit, and

wherein said conduit means includes a check valve to prevent air introduced into said ventilated sole from escaping from the plurality of chambers, and

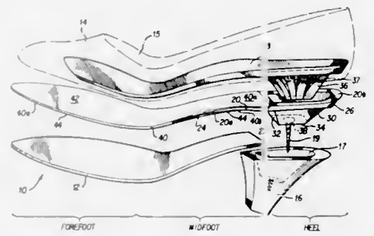
wherein a plug means is secured to a support boss overlying and proximate said other end of said conduit to enable said plug means to be manually positioned over said other end to plug same when ventilation of said ventilated sole is not desired.

4,835,884

SHOE STRUCTURE

William L. Bianchini, Elmwood; Robert Infantino, Newton, both of Mass., and Vicent Musarra, Fort St. Lucie, Fla., assignors to The Rockport Company, Marlboro, Mass.

Filed Apr. 8, 1988, Ser. No. 179,363
Int. Cl.[4] A43B *13/40, 13/14*
U.S. Cl. 36—24.5 **16 Claims**



1. A shoe structure for a high heel shoe, said shoe structure comprising:

a shank member having a midfoot portion and a heel portion;

a heel pad;

a basket for receiving said heel pad, said basket integral with said heel portion of said shank member;

a shank stiffener embedded in said shank member; and

a two-layer insole board having a forefoot portion and a midfoot portion, said midfoot portion of said insole board having an upper layer and a lower layer wherein said midfoot portion of said shank member is enclosed between said upper layer and said lower layer of said insole board.

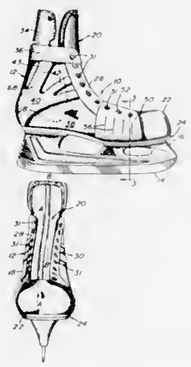
4,835,885

SKATE BOOT

Thomas B. Hoshizaki, Ville St. Pierre; Kenneth Hall, Pointe Claire, and Rene Bourque, Duvernay, all of Canada, assignors to Warrington, Inc., Montreal, Canada

Filed Feb. 6, 1987, Ser. No. 11,529
Claims priority, application Canada, Dec. 29, 1986, 526377
Int. Cl.[4] A43B *5/16, 23/26, 13/38*; **A43C** *11/00*
U.S. Cl. 36—115 **8 Claims**

1. A skate boot comprising a sole and an upper fixed to the sole, a runner support mounting a linear runner attached to the sole such that the linear runner is in a plane extending longitudinally, centrally and normally to the median plane of the sole, the sole including a toe portion, a shank portion and a heel portion, the sole including a medial edge at the juncture of the upper and sole and a lateral edge on the other side of the upper, the upper including a pair of eyelet band means defining a tongue opening, lacing means between the eyelet bands, tongue means extending between the eyelet bands covered by the lacing means, a single tension band attached only at the medial edge between the shank and toe portions in the area of the ball of the foot and overlapping the corresponding upper wall to terminate at the corresponding eyelet band, the tension band having eyelet means to be engaged by the lacing means such that the lacing means extends between the eyelet means on the tension band and eyelet band on the lateral upper wall whereby the tension band when engaged by said lacing will



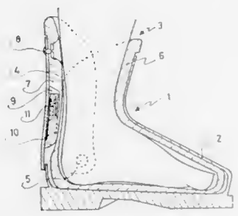
apply tension to said medial edge of the sole and thus to said runner when the skate boot is under compression by a foot during supination motion thereof with the foot pressing on the lateral edge portion of the sole and simultaneously on the tongue means and lacing thereof during the skating pattern.

4,835,886

APPARATUS FOR WEDGING THE HEEL OF THE FOOT OF A SKIER IN A SKI BOOT

Jean-Pierre Chemello, Annecy-le-Vieux, and Michel Mabboux, Seynod, both of France, assignors to Salomon S.A., Annecy Cedex, France

Filed Dec. 15, 1987, Ser. No. 133,349
Claims priority, application France, Dec. 17, 1986, 86 18302
Int. Cl.[4] A43B *5/04, 7/14, 19/00*
U.S. Cl. 36—119 **23 Claims**



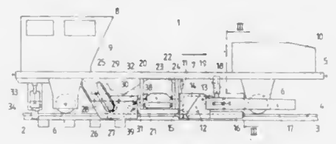
1. An apparatus for wedging the heel of the foot of a skier in a ski boot, said ski boot having an upper, said apparatus comprising at least one support having a thickened portion, said support having at least one recess in said thickened portion and at least one plate which at least partially covers said at least one recess, said apparatus further comprising at least one wedge adapted to be positioned within said at least one recess in said support, said wedge being substantially U-shaped and having two arms, said arms having different thicknesses and being spaced apart from each other by a predetermined distance, wherein said wedge can be selectively positioned over an upper edge of said plate.

4,835,887

MOBILE MACHINE FOR DISTRIBUTING AND SHAPING THE BALLAST BED OF A RAILROAD TRACK

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Jun. 24, 1988, Ser. No. 210,922
Claims priority, application Austria, Oct. 20, 1987, 2768/87
Int. Cl.[4] E01B *27/04*
U.S. Cl. 37—104 **11 Claims**



1. A mobile machine for distributing and shaping the ballast bed of a railroad track consisting of two rails fastened to ties, which comprises:

(a) a machine frame,

(b) two undercarriages supporting the machine frame on the track for mobility thereon in an operating direction,

(c) a ballast plow arrangement comprising

(1) a ballast planing plow including two vertically adjustable center plowshares arranged between the rails and

(2) a respective rail-bridging tunnel-shaped element associated with each rail and embracing the associated rail,

(d) drive means for vertically adjustably connecting the ballast plow arrangement to the machine frame,

(e) a vertically adjustable, transversely extending ballast scraping and damming wall connected to the machine frame and arranged between the tunnel-shaped elements immediately behind the center plow blades in the operating direction, the wall having an upper edge, and

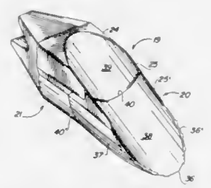
(f) means connected to the machine frame and arranged immediately behind the ballast scraping and damming wall for removing any ballast flowing over the upper edge of the wall.

4,835,888

EXCAVATING TOOTH AND HOLDER THEREFOR

Charles W. Hemphill, 1106 Green Valley La., Duncanville, Tex. 75137

Filed May 1, 1987, Ser. No. 44,603
Int. Cl.[4] F02F *9/28*
U.S. Cl. 37—141 T **17 Claims**



1. A digging tooth and holder therefor for use in an excavating machine;

said tooth has a working art opposed to a shank; said holder has a shank receiving pocket, means by which said holder can be affixed to and thereby form part of an excavating machine; said tooth and shank having a bottom surface, a top surface, opposed sides, a forward and a rear end;

the bottom surface of said holder and tooth is upwardly curved in lateral cross-section, the top surface of said holder and tooth is upwardly curved in lateral cross-section; the bottom and top surfaces intersect at the forward end of the tooth and diverge from one another towards the shank;

a plurality of parallel, longitudinally arranged ribs form the bottom of said tooth, said ribs commence at the forward end of said working part and terminate adjacent said shank;

a first lateral shoulder is formed on said tooth at a location where said shank and said working part of said tooth are joined, another lateral shoulder is formed on said holder and defines the entrance into said pocket, said first lateral shoulder and said another lateral shoulder are arranged in confronting relationship respective to one another;

said shank has a concave upper surface and an upwardly curved lower surface which converge towards one another rearwardly; said pocket is made complementary respective to said shank whereby the pocket slidably receives the shank therewithin; and,

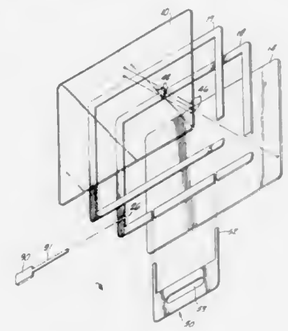
retainer means by which the tooth and holder are removably assembled together.

4,835,889

SIGN HOLDER

Bruce J. McClymonds, 18778 San Pasqual, Fountain Valley, Calif. 92708

Filed Jan. 30, 1987, Ser. No. 8,850
Int. Cl.[4] G09F *7/02*
U.S. Cl. 40—611 **12 Claims**



1. A sign holder displaying a plurality of sign elements, the sign holder having opposed sides, a top and a bottom and comprising:

(a) an optically transparent planar front element;

(b) a planar rear element parallel to the front element;

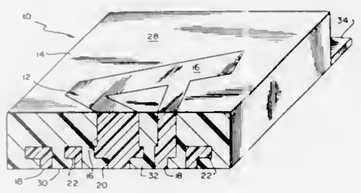
(c) a peripheral frame situated between the front and rear elements and attached thereto, forming a display space between the front and rear elements within the circumference of the frame;

(d) an access slot in one of the sides proximate to the bottom, the height of the access slot being less than the height of the frame so that each of the sign elements is shorter than the access slot and is removably disposed in the display space between the front and rear elements by passing through the access slot;

(e) a side hole in the side of the sign holder opposite from the access slot, so that a pusher can be inserted into the side hole for pushing one of the sign elements out of the display space via the access slot, the side hole being shorter in height than the access slot; and

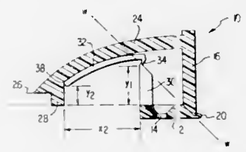
(f) at least one bottom hole in the bottom of the sign holder for receiving a tool for pushing one of the sign elements upwardly in the display space so another of the sign elements can be inserted into the display space via the access slot.

4,835,890
INTERBLOCKING PLASTIC DISPLAY
Kenneth W. Nelson, 15 Beach St., Staten Island, N.Y. 10304, and Stanley L. Roggenburg, Jr., Staten Island, N.Y., assignors to Kenneth W. Nelson, Staten Island, N.Y.
Filed Jun. 26, 1987, Ser. No. 67,098
Int. Cl.[4] G09F 7/16
U.S. Cl. 40—616 37 Claims



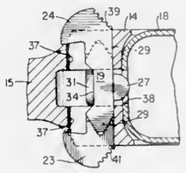
1. A display device comprising:
a display member having a top surface and a bottom surface, said display member including indicia disposed on said top surface, and further including first locking means disposed beneath said top surface; and
a background member also having a top surface and a bottom surface, said background member including second locking means configured to interlock
with said first locking means;
said first locking means including a portion having a bottom surface disposed closer to the top surface of said display member than said bottom surface of the remainder of said first locking means; and
said second locking means substantially underlying said portion of said first locking means
whereby said display member and said background member are locked together by the interlocking of said first and second locking means, particularly by the underlying of said portion of said first locking means by said second locking means.

4,835,891
MOLDED SHEET HOLDING CLAMPS AND FRAMES
Edward J. Joffe, 940 Park Ave., Linden, N.J. 07036
Filed Feb. 11, 1988, Ser. No. 155,104
Int. Cl.[4] G09F 3/20
U.S. Cl. 40—647 9 Claims



1. An elongated, molded plastic, one piece clamp member for use with a backing panel to form frames and sheet holders comprising;
an elongated planar base portion adapted for attachment to the backing panel;
outer and front wall portions rigidly connected to one another, said outer wall portion being connected to one lateral edge of said base portion by a web of reduced thickness forming a first hinge, said front wall having a free edge;
an inner wall portion rigidly connected to said front wall portion adjacent the free edge thereof;
at least one post rigidly connected to said base portion adjacent the opposite lateral edge from said hinge, said post having a free end; and
a rectangular spring member connected to the free end of said post by a web of reduced thickness forming a second hinge, said spring member being of greater length than the minimum distance between the line of juncture of said front and inner wall portions and said second hinge whereby said spring member exerts a force biasing said front wall portion toward the plane of said base portion when said line of juncture is closer to said plane than a plane containing the axes of said first and second hinges.

4,835,892
MAGAZINE LATCH FOR PISTOL
William B. Ruger, Croydon, N.H., and Lawrence L. Larson, Branford, Conn., assignors to Sturm, Ruger & Company, Inc., Southport, Conn.
Filed Jun. 25, 1984, Ser. No. 624,200
The portion of the term of this patent subsequent to Dec. 6, 2004, has been disclaimed.
Int. Cl.[4] F41C 25/06
U.S. Cl. 42—7 7 Claims

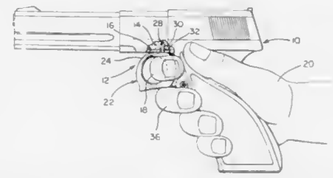


1. In a pistol having a barrel, a frame which extends along an edge of and forms part of a pistol handle frame portion, a magazine on one side of the pistol handle frame portion, an opening in the magazine, a latch extending in a plane generally parallel to the barrel into the opening in the magazine, the magazine latch operating arrangement having a latch position and an unlatch position comprising
(a) a planar surface area on the pistol handle frame portion such planar surface being generally perpendicular to a plane parallel to the barrel;
(b) a hand-operable pivotal cross lever normally positioned against the planar surface; the lever having a central area and ends; and the lever ends protruding on each side of the frame portion, such cross lever being pivotal about spaced-apart pivot points on such planar surface;
(c) a recess in the central area of the cross lever; and
(d) resilient means in the recess for controlling movement of the cross lever as the latch operating arrangement is operated through cross lever pivoting while such resilient means normally urges the lever to its latch position;
whereby movement of either lever end causes the lever to pivot on such planar surface as the resilient means yields to movement by the lever and its latch means moves perpendicular to such planar surfaces out of the opening in the magazine thus releasing the magazine for removal from the pistol handle.

4,835,893
FIREARM WITH REMOVABLE TRIGGER
John H. Kelso, P.O. Box 1175, Fort Myers, Fla. 33902
Filed Mar. 3, 1988, Ser. No. 163,775
Int. Cl.[4] F41C 19/00
U.S. Cl. 42—69.01 7 Claims

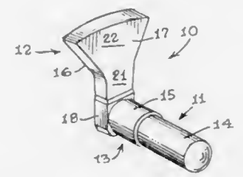
1. In combination with a firearm of the type including a frame and a trigger assembly incorporating a body portion shiftably supported from the frame for movement between a firing position and a release position and yieldingly biased

toward said release position, said trigger assembly also incorporating a finger engageable portion projecting outwardly from said body portion and a marginal portion of said frame for engagement by a "trigger finger" of a user of the firearm, said body portion and finger engageable portion including coacting



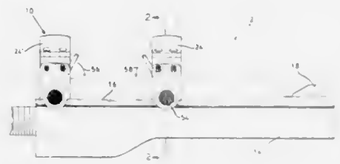
means removably connecting said finger engageable portion to said body portion, said finger engageable portion defining a finger receiving opening formed therethrough adapted to receive an index finger therein, said opening including an unbroken periphery.

4,835,894
SAFETY DEVICE FOR AUTOMATIC FIREARMS
Jack Libassi, 568 Pyrite Dr., Rio Rancho, N. Mex. 87124
Filed Jun. 7, 1988, Ser. No. 203,854
Int. Cl.[4] F41C 27/00
U.S. Cl. 42—70.11 1 Claim



1. A safety plug device for firearms characterized by a firing chamber, a cylindrical bore, a slide bolt mechanism, and including pistols and rifles wherein the safety plug device consists of:
a plug unit comprising a stepped shoulder generally cylindrical plug member having a reduced diameter leading cylindrical bore element and an enlarged diameter trailing cylindrical bore element; wherein, the reduced diameter leading cylindrical bore element is dimensioned to be received in the firing chamber of a pistol in one orientation of said plug unit and the reduced diameter leading cylindrical bore element and the enlarged diameter trailing cylindrical bore element are dimensioned to be received respectively in the firing chamber and the cylindrical bore of a rifle in an opposite orientation to said one orientation of said plug unit; and,
a tab unit secured to one end of the enlarged diameter trailing cylindrical bore element of the plug member; wherein, the tab unit comprises an elongated generally flat tab member disposed in a generally perpendicular fashion to the longitudinal axis of the generally cylindrical plug member; and, wherein the tab member comprises: an enlarged generally flat upper flag portion provided with a reduced width neck element and an enlarged width fan element; and, a reduced dimension lower portion; wherein the tab member is dimensioned such that the enlarged upper flag portion will project a substantial distance above the slide bolt mechanism of a pistol and a rifle, when the plug unit is disposed within the firing chamber of those respective firearms.

4,835,895
HAND OPERABLE TELESCOPIC SIGHT MOUNTING SYSTEM
Hamilton S. Bowen, P.O. Box 67, Louisville, Tenn. 37777
Continuation-in-part of Ser. No. 939,354, Dec. 8, 1986, abandoned. This application Jan. 5, 1988, Ser. No. 240,988
Int. Cl.[4] F41G 1/38
U.S. Cl. 42—101 10 Claims



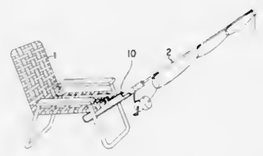
1. A hand operable scope ring system for repetitively mounting a scope sight in a zeroed position on the barrel of a firearm having a rib with cross-cuts, each cross-cut having oppositely disposed surfaces, which define base portions having a dovetailed cross-sectional outline and spaced cuts opening on the upper surface of said rib, said scope ring system comprising:
a front ring member and a rear ring member, each ring member including
(a) a ring portion which releasably engages a scope sight,
(b) a mount portion which is releasably mounted on said rib of said barrel, said mount portion defining a channel to receive said rib, said mount portion having an alignment stud extending into said channel for being received by a registering cut opening on said upper surface of said rib, one side of said channel defining a dovetailed surface for engagement with one of said oppositely disposed surfaces of said cross-cuts,
(c) securement means for releasably securing said mount portion to said barrel, said securement means including a first securement member defining a surface for engagement with a second of said oppositely disposed surfaces of said cross-cuts, said first securement member having an externally threaded bolt portion passing through said mount portion, and a second securement member threadably engaged with said bolt portion for movement into engagement with said mount portion for securing said ring member in a zeroed position on said rib, said first securement member having an exposed surface provided with a knurled portion of parallel ridges, said knurled portion providing for engagement by a finger of a user to facilitate rocking said ring member into position prior to said movement of said second securement member into engagement with said mount portion, and
(d) a lever arm operatively associated with said second securement member at a selected orientation for use in threadably advancing said second securement member on said bolt portion;
said selected orientation of said lever arm of said front ring member and said lever arm of said rear ring member chosen whereby when said ring members are placed in said zeroed position on said rib said lever arms have a similar rotational attitude.

4,835,896
LAWN CHAIR FISH FIGHTER
Paul D. Bowen, P.O. Box 454, Filer, Id. 83328
Filed May 10, 1988, Ser. No. 192,186
Int. Cl.[4] A01K 97/10; A47B 96/06; A47C 7/62; F16M 13/02
U.S. Cl. 43—21.2 6 Claims

1. An apparatus for pivotally attaching a fishing rod and reel to a folding lawn chair comprising:
an elongated hollow member having a first end being of

large enough cross sectional area to receive the handle of a fishing rod;

an inverted J-shaped chair hook attached to said elongated hollow member at a point aft of the center of gravity, for



pivotally engaging the front cross bar of the seat of a folding lawn chair;

means for biasing said elongated hollow member at an upward incline for holding a fishing rod at an upward incline.

4,835,897
FISHING LURE
John H. Rudolph, 1685 Arroyo Dr., Laguna Beach, Calif. 92651
Filed Jan. 17, 1989, Ser. No. 296,934
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.06 **17 Claims**

1. A fishing lure comprising:

a generally tubular body portion having a front edge and a back edge, a top, a bottom, a maximum outside diameter, an outer surface, an inner passageway having an inner surface, a longitudinal axis within said inner passageway;

a generally planar, longitudinal partition positioned within said inner passageway, said longitudinal partition being parallel to said longitudinal axis and said longitudinal partition being held to the inner surface of said inner passageway;

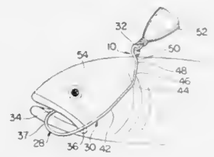
hook means affixed to said lure near the back edge at the bottom thereof;

an outwardly directed flare surrounding the front edge of said tubular body at the outer surface thereof; and

an outwardly directed flare surrounding the back edge of said tubular body at the outer surface thereof whereby when said lure is pulled through the water the lure will exhibit an oscillating motion in the same plane as that of the longitudinal partition.

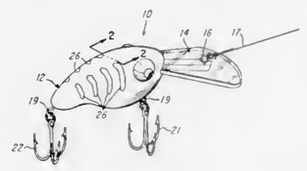
4,835,898
FISH HOOK CONSTRUCTION
Robert B. Pond, South Attleboro, Mass., assignor to Atom Mfg. Co., Inc., South Attleboro, Mass.
Filed May 31, 1988, Ser. No. 200,044
Int. Cl.[4] A01K *87/00*
U.S. Cl. 43—43.16 **8 Claims**

1. A fish hook comprising integrally formed hook, shank and eyelet portions, said hook portion being of generally U-shaped configuration and including a pointed tip portion, a connected end portion and a bend portion therebetween, said pointed tip portion extending in an X direction which defines an axis of said hook, said connected end portion being spaced outwardly from said axis in a Y direction, said tip portion and said bend portion being disposed predominantly in an X-Y plane, said



eyelet portion being substantially aligned with said axis, said shank portion extending outwardly from said connected end portion to a point which is spaced outwardly from said connected end portion in both said Y direction and in a Z direction and thereafter extending back inwardly to said eyelet portion.

4,835,899
FISHING LURE WITH TEMPERATURE RESPONSIVE COLOR CHANGE
Doyle D. Helton, 448 Shepard Rd., Xenia, Ohio 45385
Continuation of Ser. No. 68,578, Jul. 1, 1987, Pat. No. 4,731,948.
This application Mar. 18, 1988, Ser. No. 169,823
The portion of the term of this patent subsequent to Mar. 22, 2005, has been disclaimed.
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.33 **16 Claims**

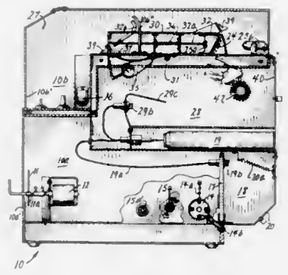


1. A fishing lure comprising a body having an outer surface forming a predetermined configuration, means for connecting a flexible fishing line to said body for pulling said body through the water, at least one hook connected to said body, means associated with said body for maintaining said body below the water surface when the body is pulled through the water by the fishing line, a layer of thermally responsive liquid crystal material covering at least a portion of said body, said liquid crystal material being effective to change in color in response to changes in temperature of the water which receives the fishing lure, means for attaching said layer of liquid crystal material to said body, and means for protecting said liquid crystal material from contact by the water.

4,835,900
MULTI-PURPOSE PEST TRAP
Shirley W. Shifflett, P.O. Box 23155 - Bluegrass Station, Lexington, Ky. 40523
Filed Feb. 12, 1988, Ser. No. 155,491
Int. Cl.[4] A01M *23/04*
U.S. Cl. 43—58 **5 Claims**

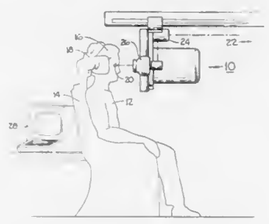
1. A multi-purpose pest trap comprising a container having a rodent receiving portion and a bug receiving portion, each of said portions including a gas chamber, bait, photoelectric means selectively serving to confine movement of the pest within said container, a source of gas, and means discharging

gas from said source into said gas chamber, where said bug receiving portion includes a bug attracting chute assembly



pivotally responsive to said photoelectric means, and where a rotatable brush within said gas chamber selectively releases a bug upon pivotal engagement by said chute assembly.

4,835,901
FISHING HOOK-LEADER HOLDER
Jerry L. Waldvogel, 306 Second Ave., Keewatin, Minn. 55753
Continuation of Ser. No. 507,742, Jun. 27, 1983, abandoned.
This application Nov. 9, 1988, Ser. No. 270,476
Int. Cl.[4] A01K *97/06*
U.S. Cl. 43—57.1 **7 Claims**



6. A fish hook and leader holder, comprising:

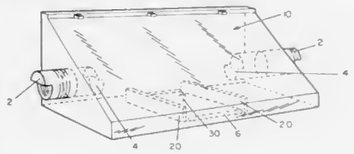
a. an elongated substantially cylindrical housing having a longitudinal axis;

b. radially extending projections, extending from the outer cylindrical surface of said housing, each of said projections being in approximate longitudinal alignment and each of said projections having an enclosed opening being large enough to permit the barbed end of a 4/0 fish hook to pass through said opening, said openings being in approximate longitudinal alignment;

c. said cylindrical housing ranging in diameter between approximately ¾ inches to approximately 2 inches to effectively hold fish hooks ranging in size between a number 8 fish hook to a number 4/0 fish hook, whereby after the barbed end of a fish hook is passed through one of said openings and the leader tied to the eyelet end of the fish hook is pulled and wrapped circumferentially about said housing, the housing contacts the shank portion of the hook, between the hook eyelet and the bail portion of the hook, causing the hook to pivot wherein the barbed end of the fish hook is forced toward and into contact with the surface of said housing to minimize accidental snagging of the barbed end of the fish hook into other tackle, the hand or clothes of the user; and

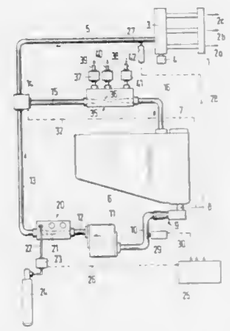
d. means for securing the wrapped leader to said housing.

4,835,902
DEFLECTIVE TAMPER RESISTANT RODENT BAIT STATION
Daniel Sherman, 1355 Bobolink Pl., Los Angeles, Calif. 90069
Filed Jun. 13, 1988, Ser. No. 25,838
Int. Cl.[4] A01M *1/20*
U.S. Cl. 43—131 **2 Claims**



1. A deflective tamper-resistant rodent bait station; said bait station having a centrally located passageway; said passageway containing an opening for rodents to enter and exit at opposing ends; said passageway containing a block of rodent bait positioned intermediate to its opposing ends; said rodent bait having a baffle structure interposed in proximity to either side of said bait block; said baffle structure presenting a barrier between the outer edge of said bait block and the nearest portal opening at each of the opposing sides; said baffle structure constructed higher then said bait block; said baffle being configured totally shield said bait block from contact with a flexible object that had been inserted from the end nearest the closest portal to the said bait block.

4,835,903
CARBONIC ACID APPLICATION TO PLANTS
Alexander Kückens, Gross Sarau, Fed. Rep. of Germany, assignor to Technica Entwicklungsgesellschaft mbH & Co. KG, Ratzeburg, Fed. Rep. of Germany
Filed Feb. 5, 1988, Ser. No. 152,642
Claims priority, application Austria, May 27, 1987, 1366/87
Int. Cl.[4] A01G *7/00*
U.S. Cl. 47—58 **3 Claims**



1. A method of preparing and applying an aqueous solution containing carbonic acid and its dissociation products, in amounts suficient to increase metabolism processes and decomposition procedures of minerals including nitrates stored within culture plants, comprising the steps of:

providing a closed fluid circuit having a fluid reservoir, conduit means and a pumping means for circulating fluid contained within said circuit;

providing at least one impregnating zone within said circuit having impregnating means for introducing carbon diox-

ide into the fluid within said circuit, the impregnating means being connected to a valved carbon dioxide source;
providing fluid distributing and applying means for delivering the carbon dioxide impregnated fluid to said culture plants;
providing a shiftable valve means in said ciruit to allow delivery of fluid from said circuit into a supply conduit connectable to said distributing and applying means;
providing means for sensing the pH-value of the fluid within said circuit;
providing a control means and means for communicating said control with said pH-valve sensing means, said valved carbon dioxide source and said shiftable valve means; and
operating the components of the system by allowing the valved carbon dioxide source to cause carbon dioxide to be introduced into said fluid and the pumping means to simultaneously recirculate the fluid through said impregnating zone for a time sufficient to almost completely ionize salts and other ionizable chemical substances which may be contained in said fluid, and impregnating said recirculating fluid with carbon dioxide up to a preselected carbon dioxide content of between 0.05 and 2.5 g/l of said fluid and until a preselected pH-value between 4.5 and 7 is sensed; then closing said valved carbon dioxide source and opening said shiftable valve means for allowing the fluid to pass into the supply conduit

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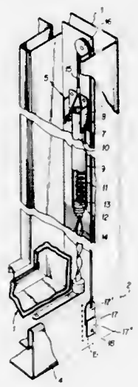
4,835,904

DEVICE FOR AUTOMATICALLY CLOSING WINDOWS

Renzo Secco, Treviso, Italy, assignor to Industrie Secco S.p.A., Treviso, Italy

Filed Dec. 28, 1987, Ser. No. 137,932
Claims priority, application Italy, Jan. 27, 1987, 84108 A/87
Int. Cl.[4] E05F *15/20*
U.S. Cl. 49—7 4 Claims



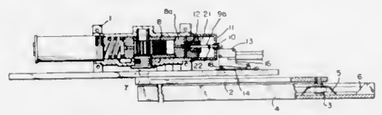
1. A device for automatically closing a vertically sliding sash installed in a window frame, and coacting with a lateral upright of the frame, in case of fire, comprising
at least one spring compensator with a lateral surface removably engaged with the lateral upright of the window frame and having an extendible cord connected to the sliding sash,
an idler pulley fixed to said window frame upright above said compensator,
a cord fixed at one end to said compensator, and attached at its other end to said window frame and passing over said idler pulley fixed to said window frame in such a manner as to remain under tension and ensure that said compensator remains engaged with said window frame,
a thermosensitive element interposed along said cord, for breaking the continuity of the cord when a predetermined temperature is exceeded,
a bracket for supporting the compensator, said bracket comprising a U-shaped plate having a central web fixed to the window frame upright and two lateral flanges having respective downwardly open slots, and
a pair of transverse pegs projecting from the lateral surface of the spring compensator, normally engaged within said slots.

4,835,905

DOOR POSITION INDICATOR FOR A DOOR CLOSER

Thomas R. Lasier, Princeton, and William L. Downey, Peru, both of Ill., assignors to Schlage Lock Company, San Francisco, Calif.

Filed Feb. 29, 1988, Ser. No. 162,188
Int. Cl.[4] G08B *13/08*
U.S. Cl. 49—14 11 Claims



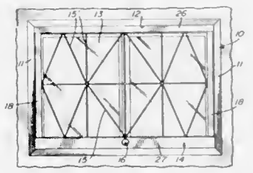
1. A closure control and position sensing device comprising:
a closure means closer device having a housing adapted for concealment in a closure frame; a force producing means within said closer device for delivering a closing force to said closure means; said force producing means moving in known relationship to said closure means; means in contact with said force producing means for sensing the poistion of said force producing means as a means for sensing the position of said closure means.

4,835,906

SECURITY GRILL FOR WINDOW OPENING

Pierre Collin, 286 Pincourt, Neufchatel, Quebec, Canada G2B 2E4

Filed Sep. 14, 1987, Ser. No. 95,890
Int. Cl.[4] E06B *3/68*
U.S. Cl. 49—57 10 Claims



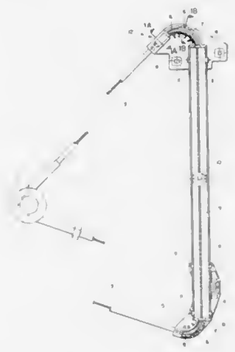
1. A security grill structure for preventing entrance through a wall opening, said grill structure comprising a metal peripheral retention frame having means for immovably securing same in a wall opening, said frame having opposed parallel channel members interconnected by opposed transverse bars, a lock in one of said channel members operable from an inside face of said retention frame, grill engaging means secured to each of said transverse bars; and a removably engageable metal grill receivable in an opening defined by said peripheral retention frame and engageable by said lock, said other channel member and said grill engaging means.

4,835,907

AUTOMOTIVE VEHICLE WINDOW DRIVE MECHANISM

Karl H. Heuchert, Sao Paulo, Brazil, assignor to Metalurgica Carto Ltda., Brazil

Filed Jan. 19, 1988, Ser. No. 145,566
Claims priority, application Brazil, Jan. 20, 1987, 6700075[U]
Int. Cl.[4] E05F *11/48*
U.S. Cl. 49—352 3 Claims



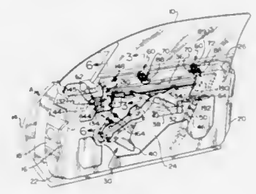
1. An automotive vehicle window drive mechanism of the type including a drum support fastened to the vehicle, door, said drum support having a drum on which a steel cable is rolled up, the cable having ends directed obliquely, one upward and other downward, toward an upper and lower support respectively, the upper and lower supports being aligned vertically and being held to the vehicle door, said mechanism comprising:
means defining a curved groove in said upper and lower supports, said groove including an interrupted wall section which is slightly flexible, said wall section being beveled at its outermost end to form a tooth projecting laterally within said groove;
a part of conforming cross-sectional shape press-fitted in said groove so as to form a lining therein, said lining including an indentation, coincident with said flexible section of said groove, positioned and dimensioned to receive said tooth, whereby said lining is retained against withdrawl from said groove;
a "car" secured to said cable between said upper and lower supports, said car being coupled to a glass pane for the vehicle window so as to drive the same;
a guide rail receiving said "car" for vertical movement therein;
means in said upper and lower supports for mounting said guide rail thereto, said mounting means defining a widened end of said groove and engaging the end of said guide rail, and including at least one pair of lugs formed on the respective support so as to engage and retain said guide rail therebetween;
a hollow section formed on at least one of said upper and lower supports so as to receive said cable therein, said hollow section being formed by opposed first and second walls projecting from a surface of said support to form a passageway therebetween, said opposed walls being shaped so that said passageway is wider at an innermost point closest to the surface of said support, a dividing wall formed in the widened portion of said passageway so as to bisect the same and extending into the portion of the passageway of lesser width;
a part having a generally U-shaped cross-section, said legs of said U-shape being formed so as to include laterally divergent projecting portions, said U-shaped part being mounted within said hollow sections so that said projecting portions extend into the widened portion of said passageway;
said cable extending through said hollow section and within said part of conforming cross-sectional shape within the grooves of said upper and lower supports and, between said supports, passing through said guide rail and being secured to said "car".

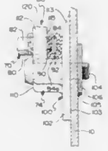
4,835,908

FRAMELESS GLASS SYSTEM FOR VEHICLE DOOR

Paul B. Londeck, Troy; Robert F. Sarti, Rochester, and Jack R. Aho, Clawson, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 4, 1988, Ser. No. 228,205
Int. Cl.[4] B60J *1/16*
U.S. Cl. 49—377 8 Claims



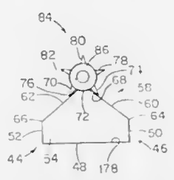


1. In a vehicle door assembly having spaced inner and outer panels having upper ends defining a top slot between them through which a frameless window is movable between open and closed positions, a window regulator mechanism carried by the door assembly and operatively connected with the window to raise and lower the same along a path which is guided by a guide means disposed within the door assembly, an upstop means carried by said vehicle door assembly to prevent movement of said window past its raised position and window stabilizing means carried by the door assembly adjacent its top slot for engaging and stabilizing the window against transverse movement when in its closed position, the improvement being that said stabilizer means comprises a catch member which is mounted on one of said panels of said door assembly closely adjacent its upper end and disposed transversely of the plane of the window, said catch member having an opening therethrough located away from its end nearest the window, means for adjusting the mounting position of the catch member on said one panel toward or away from the window, a latch member mounted on the window adjacent its lower edge, said latch member having a base abutting said window and an upwardly extending integrally formed finger spaced from the base and extending toward the catch member when the window is in its open position, said finger of said latch member being receivable within said opening of the catch member as the window nears its fully closed position whereby the catch member securely traps the window against transverse in and out movement when in its closed position.

4,835,909
SURFACE TREATMENT OF DISK-SHAPED NICKEL-PLATED ALUMINUM SUBSTRATES
Juergen Richter, Ludwigshafen; Werner Grau, Bobenheim-Roxheim; Gerd Maurer, Kaiserslautern; Friedrich Domas, Altlussheim; Werner Loeser, Ludwigshafen; Rainer Bender, Oberkirch; Axel-Ruediger Schulze, Offenburg, and Kurt Doerr, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany
Filed Aug. 6, 1987, Ser. No. 82,226
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—281 SF 1 Claim

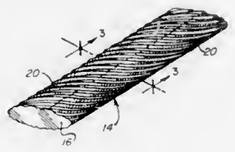
1. A process for the surface treatment of a disk-shaped nickel-plated aluminum substrate which is suitable as a base for the production of a metallic film disk having a magnetizable cobalt-phosphorus layer, by polishing and texturing the nickel layer to a peak-to-valley height R_t from 0.04 to 1.0 μm, an average peak-to-valley height R_z of from 0.04 to 0.1 μm and a center line average value R_a of from 0.0065 to 0.0095 μm, wherein the nickel-plated aluminum disk is first polished with a polishing agent, in an automatic machine which laps on both sides, with removal of from 2.0 to 4.0 μm of the surface per side, to a center line average value R_a of from 0.004 to 0.006 μm, and directly thereafter is textured in the same automatic machine with the use of a polishing agent which has from 3 to 10 times the particle size of that initially used, with the formation of arcuate radial sections.

4,835,910
HONING DEVICE
Timothy A. Roberts, Wabash, Ind., assignor to TruAngle Broadhead Hones, Inc., Wabash, Ind.
Division of Ser. No. 867,614, May 27, 1986, Pat. No. 4,696,129, which is a continuation of Ser. No. 613,896, May 24, 1984, abandoned. This application Aug. 10, 1987, Ser. No. 83,714
Int. Cl.[4] B24D *15/06*
U.S. Cl. 51—285 9 Claims



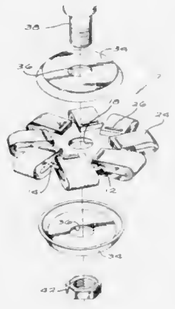
1. A method of honing a game-cutting head of a game-penetrating instrument using a honing device, comprising the steps of:
positioning adjacent to said honing device at least two of a plurality of discrete blades of said game-cutting head, said blades being spaced circumferentially about and radiating outwardly from a common ferrule of said game-penetrating instrument;
placing in simultaneous engagement with each of at least two separate inclined honing surfaces on said honing device a cutting edge on each of said at least two of said plurality of discrete blades, said each cutting edge being tapered transversely relative to its said respective blade and longitudinally relative to said common ferrule of said game-penetrating instrument; and
moving longitudinally along said honing device said common ferrule of said game-penetrating instrument so as to maintain said cutting edges of said at least two discrete blades in engagement with said respective at least two honing surfaces of said honing device to simultaneously hone said longitudinally and transversely tapered cutting edges.

4,835,911
METHODS OF MAKING STEEL ABRADING ELEMENTS FOR MASS FINISHING OF WORKPIECES AND FOR USING SAME
Roger A. L. Bond, Farmington, and Stephen J. Nigro, Wethersfield, both of Conn., assignors to The Abbott Ball Company, West Hartford, Conn.
Division of Ser. No. 31,691, Mar. 27, 1987. This application Dec. 24, 1987, Ser. No. 137,717
The portion of the term of this patent subsequent to Apr. 12, 2005, has been disclaimed.
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—313 4 Claims



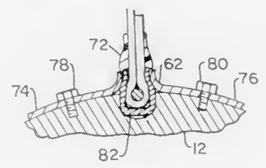
1. In the method of mass finishing of workpieces, the steps comprising:
(a) placing into a mass finishing apparatus a volume of abrading elements each comprising an elongated metallic rod of generally curvilinear cross section, said rod having serrations over substantially its entire periphery along its elongated axis, said serrations providing cutting edges along the outer surfaces thereof and recesses therebetween, the metal of said rod being hardened at least adjacent the surface thereof;
(b) placing a workpiece to be treated in said abrading elements in said apparatus;
(c) agitating said abrading elements to cause them to contact the surface of the workpiece and the cutting edges of said serrations to abrade the surface of said workpiece to effect abrasion thereof.

4,835,912
ABRASIVE WHEEL
Aleck Block, 800 Warner Ave., Los Angeles, Calif. 90024
Filed Nov. 30, 1987, Ser. No. 126,623
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—332 19 Claims



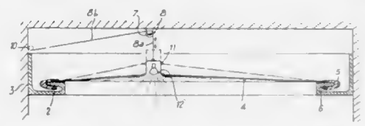
1. In combination in an abrasive wheel,
a support disc having a central opening and a periphery and having opposite side surfaces and having substantially a planar configuration,
a plurality of abrasive packs each formed from a plurality of abrasive sheets disposed in stacked relationship, each of the sheets being thin and having opposite surfaces and having one of the surfaces facing outwardly and having abrasive particles on its outwardly facing surfaces, the abrasive packs being disposed in spaced relationship to one another on the periphery of the support disc and being bent into a horseshoe shape against the opposite side surfaces of the support disc at a position between the central opening and the periphery of the support disc, and
fastening means extending through the opposite ends of the abrasive packs and the support disc to hold the abrasive packs in fixed relationship on the support disc.

4,835,913
DEBURRING APPARATUS
Albert G. Blanton, Old Hickory, Tenn., assignor to Avco Corporation, Nashville, Tenn.
Continuation of Ser. No. 88,820, Aug. 24, 1987, abandoned, which is a continuation of Ser. No. 874,951, Dec. 31, 1986, abandoned, which is a continuation of Ser. No. 668,419, Nov. 5, 1984, abandoned. This application Jul. 6, 1988, Ser. No. 215,613
Int. Cl.[4] B24D *13/06*
U.S. Cl. 51—336 6 Claims



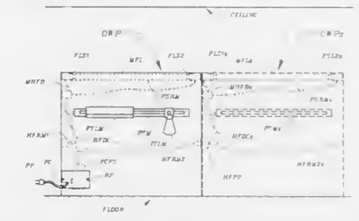
1. An improved brush for use in combination with apparatus for deburring a workpiece having structural length and surface complexity including one or more edges, said apparatus comprising:
a rotatable brush having a plurality of radially extending discrete groups of long flexible bristles of fibrous material, said material having abrasive particles imbedded therein and distributed throughout said bristles, each of said bristles having tips and an elongated working section extending from said tips and terminating in a root;
means for rotating said brush and for moving said workpiece and the working sections of said bristles into contact such that an elongated portion of each working section contacts said workpiece and is dragged across the workpiece when the brush is rotated, and when the brush and workpiece are linearly moved with respect to one another,
whereby the working sections of said bristles are slapped against and dragged over the workpiece and wipe said edge and the surface forming said edge;
said improved brush comprising a hub rotation on its axis, said hub having a plurality of circumferentially spaced axially extending slots, the roots of said bristles being secured within said slots and spaced in a single layer along the length thereof, the population density of the bristles and the spacing between said slots permitting flexing of the working sections into contact with said workpiece in a direction transverse to the axis of rotation of the brush to provide conformance with workpiece surface contours said elongated working sections of said bristles being substantially unsupported by adjacent bristles, and an elastomeric material applied to and between the bristles at the junction of the roots and hub, said elastomeric material extending a short distance from said root toward said working section, said bristles being bounded together by said elastomeric material only at said roots.

4,835,914
FALSE CEILING CONSTITUTED BY A STRETCHED SHEET FIXED ALONG ITS EDGES TO A SUPPORT FRAME
Fernand Scherrer, 2, rue Georges Bizet, 68170 Rixheim, France
Filed Feb. 22, 1988, Ser. No. 158,769
Claims priority, application France, Feb. 27, 1987, 87 02690
Int. Cl.[4] E04F *13/00*
U.S. Cl. 52—28 20 Claims



1. A false ceiling comprising:
a horizontal support frame;
a stretched sheet made of a relatively elastic material having means along spaced edges for hooking to said horizontal support frame, said horizontal frame including an abutting section for each of the spaced edges fixed to the walls of a room to define a space between the ceiling and the space above the sheet between the sheet and the ceiling and to have said sheet extend in a substantially horizontal direction relative to the walls;
said support frame including a first and a second leg, with said second leg being substantially horizontal and parallel to the ceiling and said first leg abutting said wall; and
sheet provoking deformation means operatively associated with said ceiling and said wall and said sheet for exerting onto the sheet, at at least one point thereof, an adjustable effort for provoking a deformation of the sheet, said provoking deformation means including a first means exerting an adjustable vertical effort along a vertical axis downwardly or upwardly, at at least one point of the sheet, and second means and at least one of said wall, said ceiling and said support frame for exerting a manoeuvering effort onto said sheet through the intermediation of said first means.

4,835,915
INDIRECT OFFICE LIGHTING SYSTEM
Ole K. Nilssen, Caesar Dr., Barrington Hills, Ill. 60010
Filed Oct. 24, 1986, Ser. No. 922,745
Int. Cl.[4] F21S *1/14*; E04F *17/08*
U.S. Cl. 52—28 20 Claims



1. A partition means adapted for partitioning use in an office or similar location and operative to provide at least partial enclosure of an area within this office or similar location, the office or similar location having a floor and a ceiling, the partition means: (i) having a shape that is characterized as substantially being a rectangular prism having two of its mutually parallel rectangular surfaces separated by a distance that is very much smaller than the longest dimension of one of these surfaces, (ii) being positioned on the floor in such manner that a substantially straight vertical line may be drawn on one of the mutually parallel rectangular surfaces, (iii) having a height substantially less than that of the ceiling, and (iv) comprising:

terminal means operative to connect with an ordinary electric utility power line and to provide in a substantially unaltered form, at a primary output means, the power line voltage from the ordinary electric utility power line;

altering means connected between the primary output means and a secondary output means, the altering means being: (i) at least in part, contained within the mutually parallel surfaces, and (ii) operative to provide at the secondary output means a conditioned output voltage that is substantially altered in at least one of its electrical characteristics with respect to the corresponding characteristic of the unaltered power line voltage; and

lighting means connected with the conditioned output and operative to be properly powered therefrom, the lighting means being located within the two mutually parallel rectangular surfaces and operative to emit its light principally toward the ceiling.

4,835,916

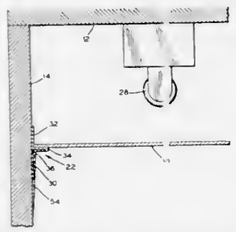
FRAME FOR LIGHTED CEILINGS

Earl J. Steadman, P.O. Box 13, Toledo, Ohio 43692

Filed Jan. 14, 1988, Ser. No. 143,662

Int. Cl.[4] E04F *19/06*

U.S. Cl. 52—28 **20 Claims**



12. In combination, a light-transmitting panel in a ceiling, which panel extends to a side wall of a room, a light fixture located above said panel, a supporting frame for said panel comprising a side frame member located along the side wall for supporting an edge of the light-transmitting panel, said frame member having a vertical flange extending at least the length of the edge of said panel, and extending downwardly from said panel, a horizontal flange extending at least the length of the edge of said panel and extending outwardly from said vertical flange at an upper edge thereof to support the edge of the panel relative to said side wall, said horizontal flange being smooth and unbroken throughout its length and width, and being exposed below said panel, fastener means affixing said vertical flange to said side wall, said vertical flange having means to aid in affixing joint compound or the like thereto, and joint compound or the like covering said vertical flange and extending over adjacent portions of the surface of the side wall.

4,835,917

MEMBRANE SUPPORTED ROOFING SYSTEM

Harold G. Simpson, Mustang, Okla., assignor to Harold Simpson, Inc., Oklahoma City, Okla.

Continuation-in-part of Ser. No. 713,319, Apr. 22, 1985, Pat. No. 4,620,397, Ser. No. 503,299, Jun. 10, 1983, Pat. No. 4,534,148, Ser. No. 487,614, Apr. 22, 1983, Pat. No. 4,520,610, and Ser. No. 745,320, Jun. 14, 1985. This application Nov. 4, 1986, Ser. No. 927,315

The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.

Int. Cl.[4] E04B *1/00*

U.S. Cl. 52—63 **18 Claims**

1. An improved roofing system for support over an underlying support surface, comprising:

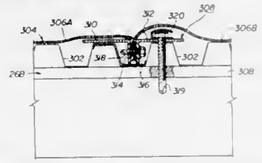
a plurality of adjustable roofing support spacers, each of which comprises:

a first beam;

a second beam supported by the support surface;

connector means for connecting the second beam to the support surface; and

adjustable web means for interconnecting the first and second beams and for supporting the first beam above the second beam in a selected plane independent of the slope of the support surface, the adjustable web means comprising a plurality of spacer webs and attaching means for attaching the spacer webs to the first and second beams and determining the relative disposition of the first and second beams so that the first beam is supported at a selected height along the length thereof above the support surface;



a plurality of roofing members supported on the first beams of the support spacers; and

membrane means secured over the roofing members for providing a protective roof layer thereover,

the membrane means comprising:

plural strips of elastomeric flexible membrane material strips supported by the roofing members disposed to be sealingly interconnected at adjacent edges of the membrane strips and

fastener means disposed beneath the membrane strips along adjacent edges thereof for sealingly engaging such adjacent edges.

4,835,918

DEVICE FOR SHADING SPACES

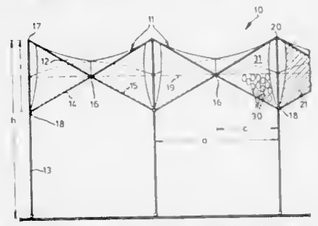
Hans-Jurgen Dippel, Uhningen-Kattenhorn, Fed. Rep. of Germany, assignor to MWB Messwandler-Bau AG, Bamberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 914,812, Oct. 3, 1986, abandoned. This application Sep. 9, 1988, Ser. No. 242,719

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1984, 3427574

Int. Cl.[4] E04H *15/00*; **E04D** *13/18*

U.S. Cl. 52—63 **9 Claims**



1. A device for shading spaces, especially for shading areas or plazas where people can walk, which comprises: roof support pillars; roof support means affixed to said pillars spaced from the surface to be shaded, said roof support means comprising rods or bars which cross at a central point of intersection in the configuration of an X and horizontal screw rods or bars forming a transversely extending stiffening system joined to each point of intersection; flexible roof skin or membrane means stretched on said roof support means for forming a roof surface, said roof surface having an outward side, said roof skin or membrane means being supported on said support means in a synclastically tentered manner; and said roof skin or membrane means including photovoltaic means for converting sunlight into electrical energy.

4,835,919

IMPERVIOUS SHELTER MADE OF MODULES

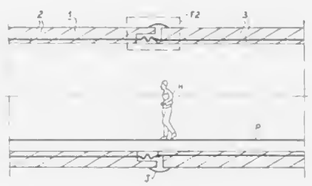
Solly Side, Arnouville les Gonesse, France, assignor to Societe Gerac, Toulouse, France

Filed Nov. 2, 1987, Ser. No. 116,052

Claims priority, application France, Nov. 4, 1986, 86 15327

Int. Cl.[4] E04H *9/02, 9/04*

U.S. Cl. 52—79.9 **3 Claims**



1. An impervious shelter made of tube-shaped modules, wherein each module has two ends and comprises at least one thick and resistent outer shell with an inner wall and two ends, and a shell made of solid sheet metal covering the inner wall of the outer shell nearly up to the ends of said outer shell, wherein the modules define at their ends a space which separates completely two facing ends of two connected modules, at each of the two facing ends of two connected modules a metal collar is provided extending from said outer shell and which comprises solid sheet metal, said metal collars of the two facing ends are joined to each other and at least one of the two collars corresponding to the two facing ends comprises a part which is grooved and flexible along an intermediate portion of its length and wherein the grooved and flexible part is lined, at least externally, with a thick layer of a flexible material arranged in said space and said space is closed, at least externally, with concrete.

4,835,920

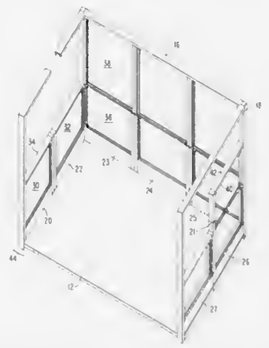
GUARDRAIL WINDOW ASSEMBLY WITH MOVABLE CROSSHEADER

Carole Posner, 10180 W. Bay Harbor Dr., Bay Harbor Island, Fla. 33154, and Angelo S. Gasparri, 8551 NW. 18th Pl., Coral Springs, Fla. 33071

Filed Aug. 1, 1988, Ser. No. 226,998

Int. Cl.[4] E04B *1/04*

U.S. Cl. 52—207 **21 Claims**



1. A guardrail window assembly with a window subassembly movable between floor and ceiling sections of a patio or balcony, the guardrail window assembly comprising:

a stationary support having two foreshortened vertical supports rising from said floor only partially towards said ceiling section;

a frame movably retained between said two vertical supports, said frame encased by said stationary support in a first position, said frame extending from and framing an area between said stationary support and said ceiling in a second position;

a window movably retained within said frame and said stationary support, said window disposed within said stationary support in said first and second positions, said window encased by said frame and thereby closing said framed area in a third position; and,

means for sequentially moving said frame and said window through said first, second and third positions with respect to said stationary support.

4,835,921

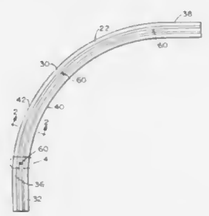
RACEWAY FRAME AND METHOD FOR CURVED MODULAR WALL PANEL

George E. Baggett, Jr., Oswego, and Robert W. DeRoss, Naperville, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Jul. 1, 1988, Ser. No. 214,075

Int. Cl.[4] E04F *19/04*

U.S. Cl. 52—220 **1 Claim**



1. A raceway frame for a curved modular wall panel, said raceway frame including an elongated body having an arc-shaped segment lying in a curved path along the lengthwise direction of said body, said path having a radius of curvature;

said body having a substantially uniform cross-section throughout the length of said arc-shaped segment;

said cross-section including a first portion generally parallel, to said radius of curvature, a second portion generally perpendicular to said radius of curvature, and a third portion generally parallel to said first portion;

said first, second and third portions defining a generally I-shaped configuration with the second portion comprising the central column of the I, said second portion including a pair of longitudinally extending sections, said sections being secured to one another by means of an ultrasonically welded joint formed between the sections.

4,835,922

CONTAINER

Pierre Bersani, Bursinel, Switzerland, assignor to PARTEUROSA, Société Anonyme, Luxembourg

Continuation of Ser. No. 847,154, Apr. 1, 1986, abandoned. This application Aug. 20, 1987, Ser. No. 88,488

Claims priority, application Luxembourg, Apr. 17, 1985, 85855

Int. Cl.[4] E04B *1/56*

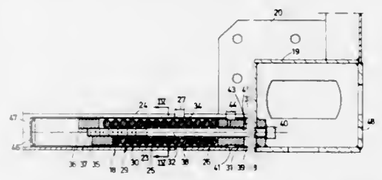
U.S. Cl. 52—228 **9 Claims**

1. A container of parallelepipedal shape, having six faces, twelve edges and eight corners, comprising:

(a) wall members having external surfaces forming the faces of the container;

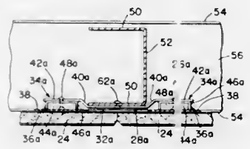
(b) first assembly means for preventing said wall members from disengaging and collapsing in a direction inwardly of the container;

(c) second assembly means for preventing said wall members from disengaging and collapsing in a direction outwardly of the container; said second assembly means comprising a plurality of frame elements; each frame element extending along and covering a separate edge of said container from corner to corner; at least some of said frame elements being formed of first and second parts movable relative to one another in a direction parallel to an associated said



edge and being normally spaced from one another by a predetermined distance; said first and second parts being movable relatively to adjacent said wall members;
(d) resilient means for urging said first and second parts toward one another in said direction parallel to an associated edge; and
(e) means located at said corners for rigidly connecting to one another the frame elements converging in each said corner.

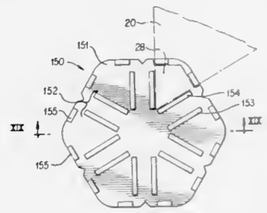
4,835,923
MOVABLE WALL ASSEMBLY
Robert Ybarra, 553 W. Comstock Ave. Glendora, Calif. 91740
Filed Jul. 9, 1987, Ser. No. 71,374
Int. Cl.[4] E04B *2/10*
U.S. Cl. 52—238.1 **15 Claims**



1. In a wall assembly, the combination comprising:
a stud,
a wall panel,
at least one magnetic clip on said stud including a non-magnetic bracket fixed to said stud, and magnetic means mounted on said bracket,
magnetic means on said panel magnetically secured to said magnetic clip, and wherein
said clip magnetic means is loosely mounted on said bracket for limited floating movement relative to the bracket edgewise of said panel.

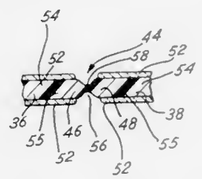
4,835,924
SELF-GRIDDING FLOORING SYSTEM
Peter A. Blacklin, Baltimore, and Jonathan D. Bell, Ellicott City, both of Md., assignors to Tate Access Floors, Jessup, Md.
Filed Dec. 17, 1986, Ser. No. 942,704
Int. Cl.[4] E04B *5/02*
U.S. Cl. 52—263 **6 Claims**

1. A self-gridding access flooring system comprising:
a plurality of access flooring panels adapted to be contiguously and removably installed above a sub-floor so as to create a chamber between said sub-floor and undersides of said panels, said plurality of panels having a plurality of leg members connected thereto having first, second and third side portions and having nominal dimensions, individual panels of said plurality having actual dimensions falling within known ranges of tolerance with respect to said nominal dimensions; and
gridding means comprising
means for establishing a gridding of said flooring system by contacting, positioning and spacing said panels from one another during installation of said panels above a sub-floor so as to create said chamber,
means for assuring that said spacing is such that any one of said panels may be removed and replaced by any geometrically similar replacement panel having the same nominal dimensions and the same known tolerance ranges without



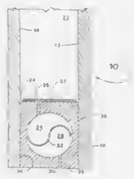
interference between the replacement panel and the panels contiguous thereto; and
support means upon which said leg members are mounted wherein said means for assuring said spacing comprises deformable spacer means fixedly mounted on said support means for engaging first and second side portions of said leg members and being deformed to accommodate any replacement panel having the nominal dimensions and the same known tolerance ranges, said support means including at least one retainer for engaging said third side portion of said leg members and retaining said leg members in position.

4,835,925
FLEXIBLE CORNER BEAD STRIP
Dennis Hoffmann, Sr., Hoffman Estates, Ill., assignor to PRO Patch Systems, Inc., Palatine, Ill.
Continuation-in-part of Ser. No. 88,796, Aug. 24, 1987, abandoned. This application May 23, 1988, Ser. No. 197,522
Int. Cl.[4] E04F *19/02, 13/06*
U.S. Cl. 52—288 **17 Claims**



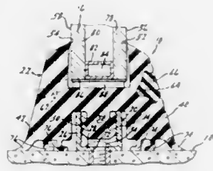
1. An improved flexible corner bead strip for reinforcing a dry wall corner, said corner bead strip comprising:
first and second plastic strips, each having a substantial longitudinal dimension corresponding with the length of the dry wall corner to be reinforced, and each having a transverse dimension defining a corner line formed from the respective central and abutting edges of each of said first and second plastic strips, said first and second plastic strips formed from a first polymeric material having substantial rigidity;
flexible joinder means disposed at said respective central and abutting edges forming said corner line for substantially flexibly securing said first and second plastic strips together and for permitting each of said first and second plastic strips to be bent at a selected angle corresponding to the angle of said dry wall corner for securement thereto to reinforce said dry wall corner, said flexible joinder means comprising a plastic hinge formed from a second polymeric material having substantial flexibility in both lateral directions;
adhesive means disposed upon at least one side of said first and second plastic strips for permitting application thereof to the corner to be reinforced and for adhesion thereto; and
dry wall compound adhering surface means disposed upon at least one of said first and second plastic strips for adhesion of the dry wall compound to the exposed surface in situ of said first and second plastic strips, whereby the dry wall corner may readily, stably and securely be reinforced substantially independently of and regardless of the angle of such corner.

4,835,926
SPACER ELEMENT FOR MULTIGLAZED WINDOWS AND WINDOWS USING THE ELEMENT
Richard T. King, 101 N.E. 62nd, Seattle, Wash. 98115
Filed Aug. 18, 1988, Ser. No. 233,535
Int. Cl.[4] E06B *7/12*
U.S. Cl. 052—171 **35 Claims**



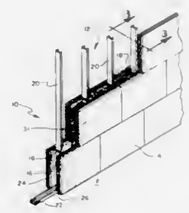
1. A spacer element for glass sheets in a multiglazed window which comprises:
a flexible resilient elongated body member of generally rectangular cross section, said body member having first and second face portions and parallel spaced-apart sidewall portions,
the body member having an elongated interior chamber generally located along its longitudinal axis,
said interior chamber being partitioned by a flexible diaphragm means into two separate chambers not in fluid communication with each other, said diaphragm being of generally sinuous configuration, the ends of the diaphragm being anchored across a diameter of the interior chamber so as to divide the interior chamber into two portions of essentially equal cross sectional area;
a multiplicity of longitudinally spaced-apart first apertures which pass between one of the separate chambers and the first face portion; and
a multiplicity of longitudinally spaced-apart second apertures which pass between the other separate chamber and the second face portion,
so that when the spacer element is in place to separate the glass sheets of a multiglazed window, one of the chambers is in fluid communication with the interior volume between the glass sheets and the other chamber is in fluid communication with the external environment, the diaphragm means being moveable to equalize pressure differences between the interior volume of the window and the external environment.

4,835,927
PREFABRICATED GLAZING GASKET
John J. Michlovic, Avon Lake, Ohio, assignor to The Standard Products Company, Cleveland, Ohio
Filed Feb. 19, 1987, Ser. No. 16,751
Int. Cl.[4] E06B *1/68*
U.S. Cl. 52—400 **23 Claims**



1. A glazing system comprising:
a window opening having a perimeter surface;
a prefabricated gasket continuously extending around the perimeter surface of said window opening; said gasket having a lite-receiving channel and sealing wings abutting said perimeter surface;
nonembedded means for mounting said gasket secured on or above said perimeter surface such that said nonembedded means is covered by said gasket and said sealing wings are in sealing relationship against said window perimeter surface; and
means for fastening said mounting means to said perimeter surface.

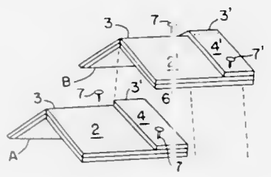
4,835,928
COMPOSITE WALL CONSTRUCTION
Samuel C. Scott, 4575 Joliet St., Denver, Colo. 80239
Continuation of Ser. No. 578,362, Feb. 8, 1984, abandoned. This application Jan. 31, 1986, Ser. No. 824,446
Int. Cl.[4] E04B *2/00*
U.S. Cl. 52—426 **4 Claims**



1. A reinforced composite wall structure comprising:
(a) a framework means formed from a number of structural members arranged generally vertical and spaced from each other, said structural members being joined together by cross members to form a rigid structure, said framework means being arranged to be fixedly anchored to a supporting structure;
(b) a single wall surface formed from stacked preformed concrete building panels, each panel having interlocking means formed along each peripheral edge whereby as the panels are stacked one upon the other to form said wall surface the interlocking means holds each panel secure with the associated panels to form the integral wall surface, a space being formed between said wall surface and said framework means; and
(c) a plurality of cross tie brackets arranged to interconnect and hold the edge of each of said wall panels to properly support and align said panels with respect to said framework means, said cross tie brackets having positioning

means for contacting and being fastened to said framework means whereby the wall surface is held a predetermined distance from said framework means so that the wall surface is properly positioned with respect to the framework means whereby the entire composite wall structure can be positioned in place and fixedly anchored to said supporting structure.

4,835,929
LAMINATED ROOFING HIP
Alfredo A. Bondoc, So. Bound Brook; William R. Carroll, Sussex, and Bobbie J. Lloyd, Kinnelon, all of N.J., assignors to GAF Corporation, Wayne, N.J.
Filed Jan. 25, 1988, Ser. No. 148,249
Int. Cl.[4] E04D 1/00
U.S. Cl. 52—518 18 Claims



1. A laminated composite roofing hip unit comprising
(a) a foldable generally flat panel member having a horizontal fold line along its entire length, a leading edge disposed perpendicular to the length of said panel and a rear edge disposed perpendicular to the length of said panel and
(b) a separate foldable riser strip member of approximately the same height as said panel and a length of from about 1/7 to about ⅓ of said panel, and having a continuous leading edge disposed perpendicular to the length of said riser strip and a continuous rear edge disposed perpendicular to the length of said riser strip, a horizontal fold line mateable with the fold line of said panel said riser strip being laminated in a fractional portion of its height to said panel in a restricted 0.5 to 3 inch area so as to provide non-laminated and laminated portions of said riser strip, said riser strip being mounted on said panel member in a manner such that the rear edge of said riser strip is conterminous with the rear edge of said panel and in a manner so as to allow free planar movement of the non-laminated portions of said riser strip over the surface of said panel when subjected to deformation

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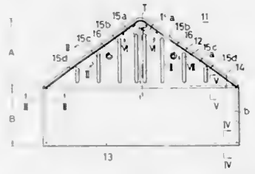
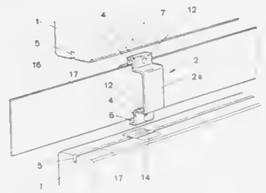
4,835,930
METAL ROOFING AND SIDING PANEL
Hiroshi Shida, Tokyo, Japan, assignor to Sky Aluminium Co., Ltd., Tokyo, Japan
Filed Jun. 24, 1988, Ser. No. 211,037
Claims priority, application Japan, Jun. 24, 1987, 62-96811[U]
Int. Cl.[4] E04D 1/06
U.S. Cl. 52—539 4 Claims



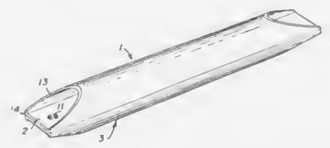
1. A metal roofing and siding panel comprising:
a first part having the shape of an isosceles triangle, having a rising rib formed along the sides of said isosceles triangle by folding the sides in an upper inward direction, and having plural pairs of oblong reinforcing protuberances formed on the obverse side thereof and arranged in parallel with a line perpendicular to the base of said triangle; and
a second part having the shape of a rectangle, having a falling rib formed along the two short sides and one long side of said rectangle by folding the two short sides and one long side in a lower inward direction;
the base of said isosceles triangle and the other long side of said rectangle being connected with a folded structure;
one of said plural pairs of oblong reinforcing protuberances nearest the perpendicular of said triangle having a space substantially equal to twice the width of said falling rib,
wherein a plurality of said metal roofing and siding panels may be arrayed in a plurality of rows so that the reverse sides of respective halves of the second parts of two of said plurality of roofing and siding panels in a second row are caused to contact the obverse side of the first part of any one of said plurality of metal roofing and siding panels in a first row, with the falling ribs on the opposed respective short sides of the second parts of two panels in the second row fitted in the space between the pair of oblong reinforcing protuberances on the first part of the one panel in the first row and with the respective halves of the falling ribs on the other respective long sides being held by the folded structure of the one panel in the first row to leave the obverse sides of the second parts exposed.

4,835,931
ARRANGEMENT FOR A WALL
Ove Eckerud, Linköping, Sweden, assignor to Conforex AB, Linkoping, Sweden
PCT No. PCT/SE86/00564, § 371 Date May 25, 1988, § 102(e) Date May 25, 1988, PCT Pub. No. WO87/03635, PCT Pub. Date Jun. 18, 1987
PCT Filed Dec. 10, 1986, Ser. No. 199,264
Claims priority, application Sweden, Dec. 11, 1985, 8505862
Int. Cl.[4] E04B 2/82
U.S. Cl. 52—586 3 Claims



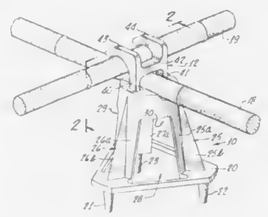
1. A wall arrangement comprising:
a plurality of panel sheets, each panel sheet including an edge having a longitudinal channel formed therein;
means, disposed intermediately and engaging respective edges of adjacently arranged panel sheets, for securing said panel sheets one to another in spaced relationship to define a space therebetween, said means comprising at least two connecting elements including internal opposing grooves disposed within said channels, whereby when said connecting elements are installed intermediate two panel sheets a strip-shaped decorative element is capable of being inserted in the said channels and said corresponding grooves, thereby occupying said space.

4,835,932
D-SECTION STRUCTURAL TUBES
John H. Leete, II, Manhattan Beach, and William J. Skinner, Redondo Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.
Filed May 13, 1988, Ser. No. 194,066
Int. Cl.[4] E04H 12/00
U.S. Cl. 52—648 8 Claims



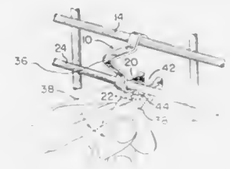
1. A structural member comprising: first and second substantially identical elongate generally tubular members; each of said tubular members having a relatively planar wall of predetermined length; adhesive means joining said tubular members together along said planar walls to form an integral unitary assembly with said planar walls oriented in opposed facing relationship each of said tubular members containing an outer wall portion in opposed relation to the respective planar wall and said outer wall having a wall portion terminating short of each of the right and left ends of said planar wall by a predetermined length to expose the underlying planar wall end permitting said planar wall end to form an end lug.

4,835,933
REBAR SPACER ASSEMBLY
Fernand P. Yung, 927 S. Laurel St., Santa Ana, Calif. 92704
Filed Feb. 11, 1988, Ser. No. 155,223
Int. Cl.[4] F04C 5/16
U.S. Cl. 52—685 29 Claims



1. In a spacer assembly for use in construction applications for supporting reinforcement bar members relative to a supporting surface for concrete construction, the combination comprising:
a spacer member configured for positioning relative to the supporting surface, said spacer member having saddle means for receiving a reinforcement bar member at least partially thereon;
a separate unitary clamp member having first and second leg portions;
coacting means on said clamp member and said spacer member for attaching said leg portions of said clamp member to said spacer member adjacent said saddle means, said clamp member including first means including said leg portions for fastening a first bar member at least partially within said saddle means, and second hook means for fastening a second bar member to said spacer member in intersecting relation to and atop said first bar member.

4,835,934
HEAVY-DUTY SPACER FOR REINFORCING MESH
Richard A. Swenson, 760 Norman Dr., Ridgewood, N.J. 07450
Filed Jul. 5, 1988, Ser. No. 214,946
Int. Cl.[4] E04C 5/16
U.S. Cl. 52—687 3 Claims

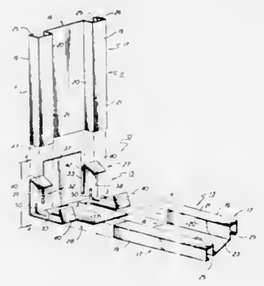


1. A spacer for positioning in spaced apart relation to a surface a wire reinforcement mesh including spaced parallel wires, comprising an elongate unitary member of relatively stiff heavy gauge flat metal band spring steel material having at one end thereof hook means for receiving a first wire of the reinforcing mesh, and having at the other end thereof a generally S-shaped portion including a concave surface defining a seat for gripping a second, substantially parallel wire of the reinforcing mesh and terminating in a generally U-shaped portion; the member being positionable with its length crosswise to the first and second mesh wires and extending therebetween as a single leg; means defining a convex curved surface on the member adjacent the concave surface, the convex curved surface projecting relative to the seat of the concave surface towards said one end of the member and being adapted to be resiliently lowered relative to said one end by an applied force, so that the second mesh wire rides along the convex curved surface and rests in the seat of the concave surface; an extending part of the U-shaped portion forming a lever arm, the lever arm defining with the opposed leg of the U-shaped portion a receiving space for a conforming force-applying tool, which lever arm is capable of withstanding a force applied by the tool necessary to resiliently lower the convex curved surface below the second mesh wire; and a projection on the member extending substantially normal to the mesh when the first and second wires are securely engaged by the hook means and the seat, respectively, and forming an apex, which apex acts to abut said surface spaced apart from the wire mesh and which apex has a relatively wide radius, ball-bearing shape to provide a substantially point contact between the apex and said surface.

4,835,935
SUPPORT STRUCTURE INCLUDING RIGHT ANGLE STUD BRACKET
Wesley T. Murphy, 94 Prospect St., Auburn, N.Y. 13021
Filed Dec. 10, 1987, Ser. No. 131,132
Int. Cl.[4] E04C 3/30
U.S. Cl. 52—721 8 Claims

1. A building support structure that includes, at least one elongated stud having a planar web having a predetermined width and rectangular flanges having a predetermined inside width that is joined to opposing longitudinal edges of the so that a bottom surface of each flange is co-planar with said web,
a right angle corner bracket having a pair of legs joined at a bend line, each leg of which contains a pair of parallel slots that pass downwardly from a top edge of the leg an equal distance to divide the leg into a center section having a width that is about equal to said width of the web, and two end sections each having a width that is about equal to said width of the flanges, the top portion of each end section being turned inwardly at an angle greater than 90 degrees to form a locking tab that is receivable inside one of said flanges,
said corner bracket being slidably received in one end of said

stud with said center section of a leg being positioned over the bottom surface of the stud web between the flanges



and the locking tabs of said leg being positioned inside opposing flanges of said stud.

4,835,936

PROCESS FOR OBTAINING HOLLOW STRUCTURES SUCH AS CONDUITS, SILOS OR SHELTERS

Marcel Matiere, 17 Avenue Aristide Briand, 15000 Aurillac, France

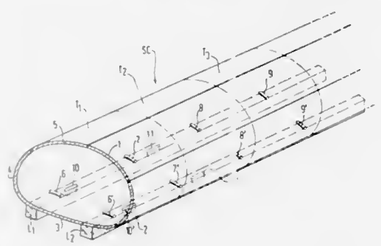
PCT No. PCT/FR84/00132, § 371 Date Apr. 24, 1987, § 102(e) Date Apr. 24, 1987, PCT Pub. No WO84/04753, PCT Pub. Date Nov. 22, 1984

PCT Filed May 16, 1984, Ser. No. 700,885

Claims priority, application France, May 17, 1983, 83 08167; Jun. 20, 1983, 83 10181; Feb. 8, 1984, 84 01957

Int. Cl.[4] E04B *1/00*

U.S. Cl. 52—741 **5 Claims**



1. A method for assembling an elongated hollow body composed of a plurality of hollow sections adapted to be juxtaposed end-to-end to form said hollow body, comprising the steps of:

(a) providing a plurality of elongated supports arranged in parallel relation;

(b) positioning a plurality of movable members on said supports;

(c) seating a plurality of said sections of said movable members in end-to-end relationship to each other;

(d) providing a series of cables extending lengthwise of said sections; and

(e) prestressing said sections by drawing said sections into tight engagement with each other by means of said cables, said prestressing step being carried out with relative displacement of said sections in relation to said supports.

4,835,937

APPARATUS FOR PROVIDING INERT ATMOSPHERE IN AIRTIGHT PACKAGES FOR FOOD PRODUCTS

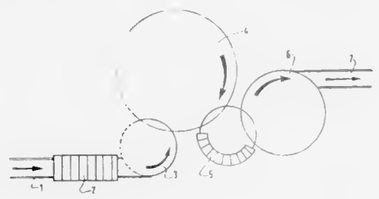
Jean-Marc Meyer, Versailles, and Jean-Luc Mizandjian, Igny, both of France, assignors to L'Air Liquide, Paris, France

Filed Mar. 30, 1988, Ser. No. 175,507

Claims priority, application France, Mar. 30, 1987, 87 04367

Int. Cl.[4] B65B *55/04*

U.S. Cl. 53—88 **14 Claims**



1. An apparatus for producing airtight packages having an inert atmosphere, comprising:

an inerting minitunnel having an inlet end and an outlet end and comprising a hood covering the upper part of said packages with sidewalls extending at least partially vertically down the sides of said packages;

said hood being fitted close to the profile of said packages and adapted and constructed so that the passage of the profile of the packages is free on the inside of the inerting minitunnel;

means for moving said packages through said minitunnel;

said inerting minitunnel further comprising a purge distributor for feeding gaseous medium for purging any oxygen in said packages, said purge distributor having a maximum length relative to the hood of the minitunnel and being fastened to an upper part of said inerting tunnel;

said purge distributor comprising a feed duct for inerting gas and a plurality of injectors placed immediately above and centered over said packages;

an inerting distributor for providing a continuous stream of inerting gas in said minitunnel, said inerting distributor being of a length equal to said hood of said minitunnel and fastened to an upper lateral part of said minitunnel;

said minitunnel comprising in an upper part a device separate from said purge distributor and said inerting distributor for injection of inerting gas, directed downwardly, and covering said inlet end of said inerting minitunnel;

means for filling said packages downstream of said minitunnel.

4,835,938

METHOD AND APPARATUS FOR DELIVERING AND WINDING PACKING PAPER

Tomonari Sakurai, Saitama, Japan, assignor to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Division of Ser. No. 15,988, Feb. 18, 1987, Pat. No. 4,729,211. This application Nov. 9, 1987, Ser. No. 118,053

Claims priority, application Japan, Feb. 28, 1986, 61-43456

Int. Cl.[4] B65B *11/04*

U.S. Cl. 53—212 **4 Claims**

1. An apparatus for delivering and winding packing paper in a coin stacker, said apparatus comprising:

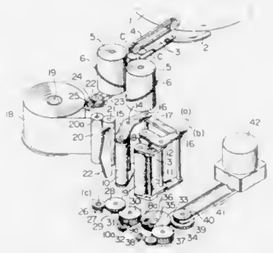
packing roller means for receiving stacked coins and for holding the stacked coins to cause a rotative movement of the stacked coins and for winding a sheet of packing paper about the stacked coins while providing the packing paper with a certain tensional force,

feed roller means for delivering the packing paper between the stacked coins and said packing roller means,

low speed drive means connected with said feed roller means and said packing roller means for driving said feed roller means and said packing roller means at a constant, relatively low speed,

high speed drive means connected with said packing roller means for driving only said packing roller means at a relatively high speed,

sensing means for sensing a length of the packing sheet fed through said feed roller means for winding around the stacked coins, and



control means for receiving a signal form said sensing means and actuating said low speed drive means for initial feeding of a predetermined length of packing paper around the stacked coins and actuating said high speed drive means when said sensing means detects said predetermined length of packing paper has been fed through said feed roller means and wrapped around the stacked coins.

4,835,939

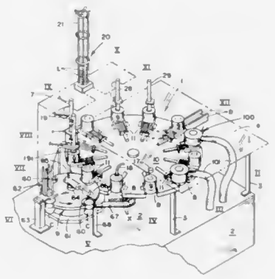
PACKAGING SYSTEM

Richard D. Thomas, Winston-Salem, and Cecil R. Bell, Jr., Pinnacle, both of N.C., assignors to Sara Lee Corporation, Winston-Salem, N.C.

Filed Jan. 7, 1988, Ser. No. 141,580

Int. Cl.[4] B65B *5/04*

U.S. Cl. 53—248 **21 Claims**



1. An article packaging apparatus including a support frame, turret means mounted on said frame for indexable rotation about a vertical axis, means for indexing said turret means, a plurality of upstanding open-ended canisters spaced about and secured to said turret means for displacement along an arcuate path, a plurality of gate means mounted adjacent said canisters, means for individually displacing said gate means through the walls of said canister between a first position for effectively closing the lower end of an associated canister to retain an article therein, and a second position where said gate means is withdrawn to open the lower end of the associated canister to permit an article to be discharged therefrom, article loading means located above and in the path of said canisters for placing articles therein when said gate means is in said position, container supporting means positioned adjacent each canister for supporting a container for vertical displacement relative to said associated canister, container supplying means for presenting sequentially generally cup-shaped containers to said container supporting means beneath said canisters as said canisters are indexed past said container supplying means, means for displacing said container supporting means vertically to urge a container supported thereby into engagement with the lower end of an associated canister with the associated canister reaches a predetermined location along said path, and means for applying a closure member to each cup-shaped container.

4,835,940

APPARATUS FOR CLOSING BOTTLES

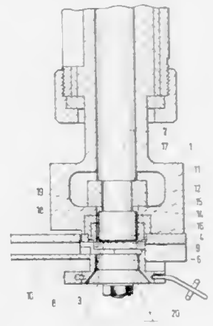
Dieter Unger, Waltrop, Fed. Rep. of Germany, assignor to Holstein und Kappert Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Jul. 31, 1987, Ser. No. 80,748

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1986, 3626008

Int. Cl.[4] B65B *7/28*

U.S. Cl. 53—342 **5 Claims**



1. An apparatus for closing bottles by means of closure caps, including a closing machine, a closing member and a bell-type centering member connected to the closing member, the closing member and the centering member rotating along the periphery of the closing machine, a spring-biased pressure die mounted in the closing member so as to be movable in axial direction, a cap transfer station arranged at one point of the cycle of rotation of the closing machine, wherein the improvement comprises that the centering member including a cap support member is movable relative to the pressure die and the closing member, the centering member including the cap support member, when in a cap transfer position, being fixably supported on the closing member by means of the pressure die and by means of control members of the centering member.

4,835,941

MECHANISM FOR OPENING THE COVER OF AN IMAGE RECORDING MEDIUM CASSETTE

Shumpeita Torii, and Yutaka Isozaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 12, 1988, Ser. No. 143,101

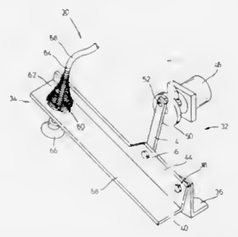
Claims priority, application Japan, Jan. 12, 1987, 62-5738; Jan. 29, 1987, 62-18920

Int. Cl.[4] B65B *43/38, 43/30*

U.S. Cl. 53—382 **9 Claims**

1. A mechanism for opening the cover of an image recording medium cassette, comprising:

an actuator;
an arm swingable in response to energization of said actuator;
a support member angularly movably supported at one end thereof and coupled to said arm, said support member having a hole defined in the opposite end thereof;
a coil spring mounted on said support member in surrounding relation to said hole;
a tube extending through said coil spring and said hole and communicating with a suction device;

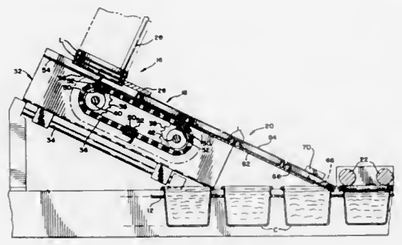


a suction cup attached to an end of said tube which is disposed on one side of said support member; and
the arrangement being such that said suction cup is disposed in facing relation to the cover of the cassette storing at least one image recoridng medium therein, and then said actuator is operated to turn said arm to cause said suction cup to attract and open said cover upon activation of said suction device.

4,835,942
SEAFOOD VACUUM-PACK SYSTEM
Raphael Q. Skrmetta, 4314 Bancroft Dr., New Orleans, La. 70122
Filed Jun. 26, 1987, Ser. No. 67,715
Int. Cl.[4] H05B *6/80;* **B65B** *55/06*
U.S. Cl. 53—453 **15 Claims**

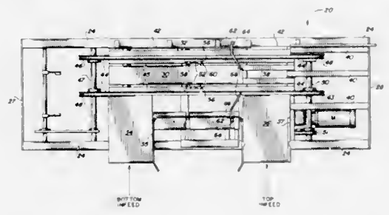
11. A method of vacuum packaging highly heat sensitive, separate pieces of relatively movable food products, such as shrimp or other like seafood or other relatively moveable, fungible food products, comprising the following step(s):
(a) packaging the shrimp or other relatively moveable, separate pieces of food products one piece above the other in a micro-waveable food package in which the food product is distributed with a greater number of separate pieces in its surrounding, relatively peripheral areas in comparison to it central area, producing a varying density of food product within the package; and
(b) tightly sealing the packaging material about the food product holding it in its varying density distribution for ultimate micro-waveing in such density varying distribution.

4,835,943
APPARATUS FOR APPLYING CONTAINER LIDS
Martin J. Mueller, 319 Crosswinds Dr., Palm Harbor, Fla. 34683
Filed Mar. 31, 1988, Ser. No. 175,913
Int. Cl.[4] B65B *7/28;* **B67B** *3/22*
U.S. Cl. 53—485 **9 Claims**



1. An apparatus for applying lids to a series of containers being conveyed by associated conveyor means, comprising:
stack holding means for holding at least one stack of said lids;
destacking means for destacking the lowermost one of said lids from the respective one of said stacks with said one lid maintained in a generally upright orientation, comprising at least one continuously moving destacking finger engageable with the lowermost one of said lids in each stack for moving said one lid from beneath the remaining lids of the respective stack, said destacking finger disengaging said one lid after said one lid is moved from beneath the remaining lids of the respective stack; and
feed magazine means positioned generally above said conveyor means for receiving said destacked lids in the generally upright orientation from said destacking means, and for applying each said lid to a respective one of said containers being conveyed by said conveyor means, said feed magazine means being positioned relative to said destacking means such that as said destacking finger disengages said one lid, the destacking finger simultaneously urges the downstream-most lid in said feed magazine means into position for application to the respective one of said containers.

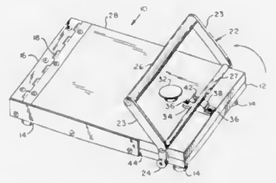
4,835,944
CARTON NESTING APPARATUS AND METHOD
Robert M. Herrin, 2469 John Young Parkway, Ste. H, Orlando, Fla. 32804
Filed Nov. 2, 1987, Ser. No. 115,199
Int. Cl.[4] B31B *13/00, 17/00*
U.S. Cl. 53—485 **10 Claims**



1. A method for nesting a carton bottom with an open-sided carton top in which the bottom is dimensioned to fit closely within the top, comprising the steps of:

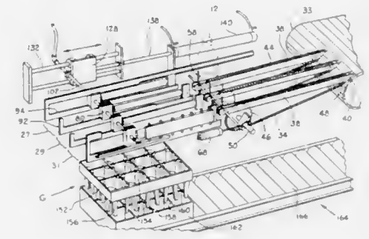
feeding a carton bottom onto a work surface at a first feed station near a first end of said work surface;
feeding an open-sided carton top onto said work surface at a second feed station which is between said first feed station and an opposing end of said work surface, said top being fed onto said work surface with the open side thereof facing toward said first end of said work surface;
engaging said carton bottom near said first feed station and moving said carton bottom in a first direction along said work surface toward said opposing end;
providing a pair of flaps, said flaps mounted along opposing sides of said work surface between said first and second feed stations and pivoted about an axis which is generally normal to said work surface, whereby the forward edge of said carton bottom engages said flaps during movement of said bottom therebetween;
centering said carton bottom with said flaps during its travel along said work surface in said first direction, so that said bottom is aligned with said carton top whereby the continued travel of said bottom in said first direction causes said bottom to nest within said top; and
after nesting said carton top and bottom, thereafter moving the nested carton top and bottom to the opposing end of said work surface.

4,835,945
REDI PAK PRESSURE PRESS AND METHOD
Murray Perloff, 2 Ramondo La., Smithtown, N.Y. 11787
Filed Mar. 7, 1988, Ser. No. 164,761
Int. Cl.[4] B65B *7/28*
U.S. Cl. 53—485 **3 Claims**



1. A pressure press for the assembly and sealing without the application of heat of apparatus for dispensing individual doses of medication and the like comprising:
a. an extended sheet having formed therein spaced pockets into which unit does are placed;
b. a stationary base plate on which said sheet is placed and having perforations to accomodate said pockets;
c. a cavity card placed on said sheet for enclosing said pockets, said card having perforated closures aligned with said pockets to permit access to each of said pockets, said card being coated with pressure sensitive adhesive on the side making contact with said sheet only in areas other than those above said pockets;
d. a cover plate pivotally mounted on said base plate for coming into contact with said cavity card thereby sandwiching said card and sheet between said cover plate and base plate;
e. actuator means to cause said cover plate to apply sufficient pressure for a sufficient length of time to cause said cavity card to adhere to said extended sheet thereby sealing each of said doses in a pocket; said actuator means comprising a pressure bar assembly independently pivoted on said base plate to come into contact with said cover plate to exert sufficient force to cause the adhesive to be effective; and
f. said cover plate being provided with a block having a camming surface to receive contact from said pressure bar assembly to transmit said force to said cover plate and means to prevent excessive force from being applied.

4,835,946
ARTICLE TRANSPORT APPARATUS
Thomas S. Hartness, Greenville, and Robert G. Hartness, Greer, both of S.C., assignors to Hartness International, Greenville, S.C.
Continuation-in-part of Ser. No. 7,795, Jan. 28, 1987, Pat. No. 4,709,536. This application Nov. 30, 1987, Ser. No. 126,362
The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.
Int. Cl.[4] B65B *35/36, 35/44, 39/02*
U.S. Cl. 53—539 **57 Claims**



1. A case packing apparatus for loading groups of articles into cases, the articles having top, bottom, and side portions, the case packing apparatus comprising:
conveying means for supplying a stream of articles in a plurality of aligned rows in a predetermined direction;
a receiving station for receiving articles supplied by said conveying means in said plurality of aligned rows;
stop means for stopping articles upstream thereof in said plurality of aligned rows at said receiving station;
a loading station for loading articles in said plurality of aligned rows into cases;
a carriage movable between said receiving station and said loading station for carrying predetermined number of articles in said plurality of aligned rows from said receiving station to said loading station, said carriage defining a receiving end having article passageways throgh whci articles may be received;
carriage transfer means for moving said carriage to a receiving position in a direction opposite said pretermined direction of said stream of articles supplied by said conveying means for causing said receiving end of said carriage to receive said articles upstream of said stop means at said receiving station, thereby allowing said carriage to encompass said pretermined number of articles at said receiving station upstream of said stop means;
articles engagement means carried by said carriage for selectively engaging articles encompassed by said carriage and for subsatntially fixing the articles to said carriage for movement therewith;
said carriage transfer means moving said carriage to said loading station in substantially said pretermined direction of said stream of articles supplied by said conveying means, after engagement of said articles engagement means with said group of articles encompassed by said carriage;
means for disengaging said article engagement means for depositing said group of articles carried by said carriage at said loading station; and
loading means associated with said loading station for loading said group of articles deposited at said loading station into cases.

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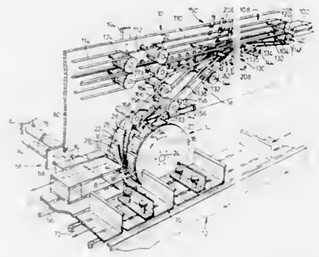
4,835,947

LOAD ACCUMULATOR FOR CARTON LOADING MACHINE

Marinus J. M. Langen, Toronto, and Peter Guttinger, Milton, both of Canada, assignors to H. J. Langen & Sons Limited, Mississauga, Canada

Filed Dec. 16, 1987, Ser. No. 133,609
Int. Cl.[4] B65B *35/30*
U.S. Cl. 53—542 1 Claim



1. In a carton loading machine, a load accumulator for accumulating a load which consists of a plurality of items and transferring the accumulated load into a receptacle comprising;

(a) a load accumulator spool mounted for rotation about a first axis, said spool having a plurality of pockets formed therein at circumferentially spaced intervals about its perimeter, said pockets each having an entrance opening at the perimeter of the spool and extending inwardly from the entrance along a generally spiral path and having an inner end which is radially spaced from said first axis,

(b) a transfer channel extending circumferentially of the spool from its perimeter to a radial depth which is greater than that of the inner end of each pocket,

(c) load delivery means for delivering load items one at a time to said spool to load each pocket as the spool is rotatably driven,

(d) a load accumulating platform having a front end and a back end, said platform having a load arresting extension which is located circumferentially downstream of said load delivery means with respect to the perimeter of the spool, said load arresting extension extending into said transfer channel to a depth which is greater than that of the inner ends of the pockets whereby the movement of the load articles carried by the spool is arrested by the load arresting extension and the load items are discharged onto said platform in a side-by-side relationship,

(e) backstop means slidably mounted on said platform for movement toward and away from said spool, said backstop means being normally urged toward said spool and serving to maintain the load items in a side-by-side relationship when they are removed from the spool by the load arresting extension,

(f) front stop means arranged opposite the backstop means and mounted for movement between a retracted position in which it is located within said transfer channel inwardly of said inner end of said pockets and an advanced position in which it overlies said platform and is located outwardly from the perimeter of said spool to cooperate with the backstop to form lateral guideways for guiding the lateral transfer of the accumulated load from the platform into a receptacle,

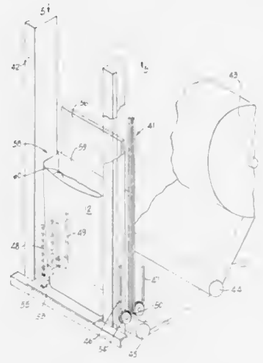
(g) pusher means at one side of said platform for pushing the accumulated load along the lateral guideways into a receptacle located at the other side of the platform.

4,835,948

BAG FILLING MACHINE

Brian Humphrey, Ridgeville, Ohio, assignor to Basic Packaging Systems, Inc., Avon Lake, Ohio

Division of Ser. No. 835,722, Mar. 3, 1986, Pat. No. 4,764,030.
This application Aug. 12, 1988, Ser. No. 231,515
Int. Cl.[4] B65B *43/30*
U.S. Cl. 53—567 9 Claims



1. A bag filling machine for use with a chain of bags which have side gussets established by front and rear side gusset panels and successive bags joined together top to bottom, said chain of bags having a transverse bottom seal for each bag which seals together the front and rear panels in the central portion and also seals together all four thicknesses of the front and rear panels and an inner portion of the lateral width of each side gusset panel but leaves the rear side gusset panels unsealed to the front side gusset panels at the outer portions of at least the rear gusset panels;

said bag filling machine comprising, in combination:

a frame;

first and second grippers on said frame to grip opposite sides of the chain of bags at only the rear panel and outer portion of said rear gusset panels;

indexable means to move said grippers along said frame to propel the chain of bags to a filling station with an opening of each bag uppermost; and

the filled bag being removable from said filling station.

4,835,949

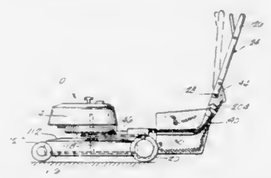
OPERATOR PRESENCE CONTROL FOR SELF-PROPELLED IMPLEMENTS

Carl E. Seyerle, Cordova, Tenn., assignor to Outboard Marine Corporation, Waukegan, Ill.

Division of Ser. No. 818,351, Jan. 9, 1986, Pat. No. 4,689,939, Continuation-in-part of Ser. No. 746,938, Jun. 20, 1985, abandoned, Continuation of Ser. No. 697,681, Feb. 1, 1985, abandoned, Continuation of Ser. No. 490,960, May 2, 1983, abandoned. This application Jun. 29, 1987, Ser. No. 66,990
Int. Cl.[4] A01D *69/00, 34/68, 69/08*
U.S. Cl. 56—10.8 42 Claims

1. A self-propelled, walk behind lawn mower comprising a frame having a rearward end, a drive wheel which supports said frame for movement over the ground, an engine supported by said frame, said engine operating at a relatively constant rpm, a rotary cutting blade driven by said engine, a handle extending rearwardly from said frame, said handle including a lower portion having a lower end connected to said frame, and an upper end, and said handle also including a rearmost portion pivotally mounted on said upper end of said handle lower portion, extending substantially above said upper end of said

lower portion and adapted to be held by a mower operator for guiding said lawn mower, and transmission means operably connected between said engine and said drive wheel for variably and controllably effecting sustained rotation of said drive wheel at any speed within a speed range between zero and substantially above zero, said transmission means including an output element mounted on said frame in spaced relation to and drivingly connected to said drive wheel, an input element mounted on said frame and driven by said engine, means biasing said elements away from each other, cable means operbly



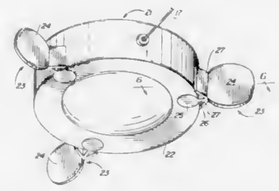
connected between said handle rearmost portion and one of said elements, said cable means having an upper end and a lower end, a spring connected between said upper end of said cable means and said handle rearmost portion such that movement of said handle rearmost portion toward said forward position causes elongation of said spring, and means for connecting said lower end of said cable means to said one of said elements such that the force exerted by said spring on said upper end of said cable means is translated into a load biasing said elements into engagement.

4,835,950

FILAMENT TRIMMER INCLUDING A BLOWER

Jonathan D. Cerreta, 5637 W. Poinsetta, Glendale, Ariz. 85304

Filed Aug. 1, 1988, Ser. No. 226,935
Int. Cl.[4] A01D *34/63*
U.S. Cl. 56—12.8 14 Claims



1. A blower attachment for use with a filament line trimmer which has a shaft and means for rotatably driving the shaft, the shaft further having means thereon for normally securing a filament line spool thereto, comprising:

at least a pair of blades for detachably mounting around said spool for rotation therewith,

said blades being extendable laterally therefrom,

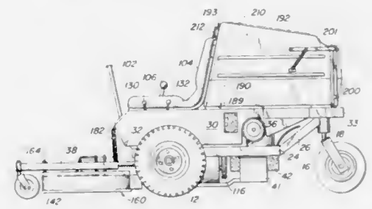
said blades when extended and upon rotation of said spool blowing air and the grass clippings and debris cut by said trimmer away from the trimmed area.

4,835,951

MOWER APPARATUS

Dean M. Walker, Fort Collins, Colo., assignor to Walker Manufacturing Company, Fort Collins, Colo.

Filed May 3, 1984, Ser. No. 606,530
Int. Cl.[4] A01D *61/00*
U.S. Cl. 56—16.6 5 Claims



1. A mower comprising:

a vehicle controllably powered to be steerably moved over an area to be mowed;

a cutter assembly mounted on said vehicle for mowing;

a closed hopper mounted on top of said vehicle;

means including a conduit for delivery cuttings from said cutter to said hopper;

an outlet mounted within the upper interior of said hopper, and coupled in use to said conduit by a further conduit portion that continues internally and upwardly through said hopper, for distributing received cuttings on into the upper interior of said hopper;

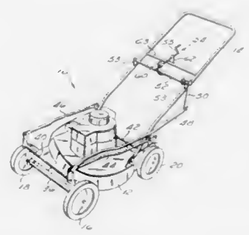
and driving means mounted with respect to said hopper for continuously moving said outlet reciprocally in a horizontal pattern that varies the direction of distribution of said received cuttings into the hopper.

4,835,952

LAWN MOWER HEIGHT ADJUSTMENT LINKAGES

Frank E. McLane, 309 Regatta Way, Seal Beach, Calif. 90740

Continuation-in-part of Ser. No. 758,094, Jul. 23, 1985, abandoned. This application Nov. 18, 1987, Ser. No. 121,943
Int. Cl.[4] A01D *34/74*
U.S. Cl. 56—17.2 21 Claims



1. A height adjustment apparatus for raising and lowering the deck of a lawn mower relative to the ground, said lawn mower including a deck, a pair of front wheels, a pair of rear wheels and a handle, said apparatus comprising:

a rotatable hand crank mounted on the handle, said hand crank having a threaded stem for adjusting the height of the deck through a continuous range to an unlimited number of desired settings;

a pivot arm having first and second ends, said first end rotatably attached to said handle of said lawn mower at a pivot location such that said arm extends downwardly

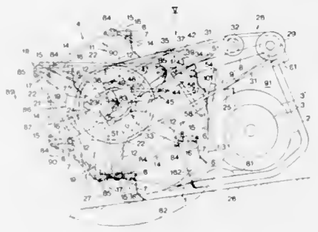
from said handle, with said second end disposed substantially below said pivot location;
a threaded member into which said hand crank stem feeds;
means for mechanically coupling said threaded member to said pivot arm to transmit rotation of said hand crank into rotation of said pivot arm;
a connecting rod pivotably secured to said second end of said pivot arm, said connecting rod oriented substantially horizontally, wherein a rotational force is applied to said first end of said pivot arm so that rotation of said pivot arm about arm about said pivot location drives said connecting rod to move in a generally horizontal direction;
a pair of L-shaped bell cranks for mounting said pair of front wheels, respectively, and a pair of rear L-shaped bell cranks for mounting said pair of rear wheels, respectively, each of said cranks including first and second legs joined at an apex, each of said cranks pivotably pinned to the deck at said apex and having a respective one of said wheels rotatably mounted on said first leg, said horizontally oriented connecting rod being pivotably secured to the second leg of one of said bell cranks, said second leg extending substantially vertically upward from said apex so that said horizontal driving movement of said connecting rod drives said one of said bell cranks to pivot relative to the deck; and
means for mechanically interconnecting said bell cranks to transmit the motion of said connecting rod from said one of said bell cranks to the other bell cranks so that, upon rotation of the hand crank, all wheels move simultaneously through a continuous range of positions to raise and lower the entire deck evenly, said transmitting means comprising plural rods which connect each of said bell cranks with another of said bell cranks, wherein one of said rods is substantially rigid and is pivotably secured at one end of one of said front bell cranks and is pivotably secured at another end to one of said rear bell cranks so that said front and rear wheels are raised and lowered together.

4,835,953

DRIVE NEUTRALIZING MEANS FOR HEADER REEL FOR AGRICULTURAL MACHINE

Adrianus Naaktgeboren; Jan R. Van Steelant, and Frans J. G. C. Decoene, all of Zedelgem, Belgium, assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Mar. 1, 1988, Ser. No. 162,704
Claims priority, application European Pat. Off., Mar. 2, 1987, 87.200,366.0
Int. Cl.[4] **A01D** *57/03*
U.S. Cl. 56—226 **16 Claims**



1. A header for an agricultural machine comprising:
a cutterbar operable to cut standing crop;
a rotatable reel having a transverse shaft defining a main axis of rotation thereof and including a plurality of crop-engaging members rotatably mounted thereon to be rotatable about respective pivot axes disposed around the main axis of rotation;
first drive means for rotatably driving the reel in one direction;
inclination control means for controlling the orientation of the crop-engaging members with respect to said pivot axes, said inclination control means including steering means operable, during rotation of the reel in said one direction, to rotate the crop-engaging members around the respective pivot axes in a second direction opposite to said one direction so as to maintain the crop-engaging members at a fixed orientation relative to the horizontal such that the free ends of the crop engaging members define a circularly shaped locus;
second drive means associated with the steering means for oscillating said steering means during rotation of the reel whereby the crop-engaging members are oscillated around their respective pivot axes on the reel and the locus defined by the path of movement of the free ends of said crop-engaging members deviates from said circular shape; and neutralizing means operably connected to said second drive means to permit a selective disengagement of said second drive means to prevent an oscillation of said steering means.

4,835,954

COMBINE HEADER WITH SKID PLATES

Michael H. Enzmann, Blue Springs, Mo., assignor to Deutz-Allis Corporation, Milwaukee, Wis.

Filed Feb. 3, 1988, Ser. No. 151,952
Int. Cl.[4] **A01D** *41/14*
U.S. Cl. 56—303 **4 Claims**

1. In combination with a combine having an adjustable height header with a horizontal platform and a pair of longitudinally extending crop dividers connected, respectively, to laterally opposite ends of the platform,
a floating cutterbar in front of and extending laterally across the width of said platform, said floating cutterbar being connected to said platform for upward and downward swinging movement relative thereto,
a pair of flat longitudinally extending flexible skid plates having horizontally disposed rear portions rigidly secured, respectively, to the undersides of the laterally opposite ends of said floating cutterbar and front portions extending forward and upward in relation to said floating cutterbar and beneath said dividers and
a pair of resiliently yieldable connectors interconnecting, respectively, said forward portions of said skid plates with forward parts of said dividers.

4,835,955

HAND-OPERATED FRUIT PICKER

Alfred E. Gaubis, P.O. Box 597, Fruitland Park, Fla. 32731

Filed May 5, 1988, Ser. No. 190,356
Int. Cl.[4] **A01D** *46/24*
U.S. Cl. 56—333 **20 Claims**

1. In a hand-operated fruit picker of the type employing a first jaw defining a fruit gathering chamber having a fruit receiving frontal opening; and a second jaw hinged to said first jaw for selective movement between a jaw open position in which said second jaw is pivoted away from said first jaw so that fruit can be brought into said chamber through said open-

ing, and a jaw closed position in which said second jaw is pivoted toward said first jaw so that fruit brought into said chamber can be securely grasped therein for picking, said second jaw being dimensioned and configured to be received within said opening, the improvement comprising:

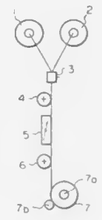
said first jaw having an outwardly and upwardly diverging scoop-like extension formed marginally of said opening to provide a widened mouth extending beyond said opening and which is operable as an said to gather fruits into said chamber.

4,835,956

BULKY FLAT YARN OF SILKY TOUCH AND A PROCESS FOR MANUFACTURING THE SAME

Yoshiyuki Sasaki, Takatsuki, and Katsuyuki Kasaoka, Ibaraki, both of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 565,134, Dec. 27, 1983, abandoned, which is a continuation of Ser. No. 249,490, Mar. 31, 1981, abandoned. This application Aug. 31, 1984, Ser. No. 647,252
Claims priority, application Japan, Apr. 2, 1980, 55-41941; Apr. 17, 1980, 55-49525
Int. Cl.[4] **D02G** *3/04*; **D02J** *1/04, 1/06*
U.S. Cl. 57—245 **9 Claims**



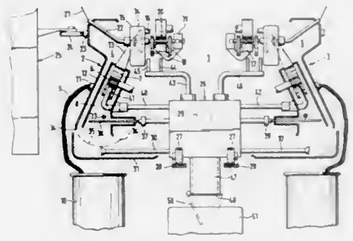
1. A process for manufacturing a bulky flat yarn, wherein during said process a single type of spin finish is applied to said yarn, said process comprising the steps of:
a. providing a first polyester yarn which has been produced at a spinning speed of less than 2000 m/min and which has a birefringence of at most 0.018,
b. providing a second polyester yarn which has been produced at a spinning speed of more than 2800 m/min and which has a birefringence of at least 0.023,
c. interlacing said first and second yarns in a not fully drawn state,
d. subjecting said yarns to different stresses by simultaneously drawing the interlaced polyester yarns at a draw ratio at least equal to the smallest natural draw ratio of said yarns and not exceeding the lesser of:
i. the largest natural draw ratio of said yarns, and
ii. the smallest breaking elongation of said yarns while they are being subjected to said drawing step; and
e. relaxing the drawing tension on said yarns so that when the drawing tension is relieved, the filaments of one of said yarns contrast less than the filament of the other of said yarns, and the filaments of said one of said yarns bulge out at a pitch not greater than the distance between adjacent interlace points, giving the composite yarn an apparent bulkiness.

4,835,957

OPEN-END SPINNING MACHINE

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, both of Fed. Rep. of Germany

Filed Nov. 10, 1987, Ser. No. 119,032
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1986, 3640001; Feb. 25, 1987, 3705924
Int. Cl.[4] **D01H** *11/00, 7/885*
U.S. Cl. 57—301 **34 Claims**



1. Open-end spinning machine, comprising:
a first row of a plurality of spinning units adjacently aligned in a longitudinal direction of said machine;
a second row of a plurality of spinning units adjacently aligned in said longitudinal direction and spaced from said first row with the spinning units of said second row facing away from the spinning units of said first row,
each of said spinning units including an opening device for opening up individual fibers from a sliver, each of said opening devices including an impurity separation opening;
stationary collecting means associated with impurity separation openings for collecting any impurities from said spinning units; and
cleaning means for sucking away and removing said impurities from said stationary collecting means, said cleaning means being disposed between said first row and said second row and being movable in said longitudinal direction, said cleaning means including at lease one suction means that extends to said stationary collecting means at the spinning units of both said first and second rows for drawing said impurities into said cleaning means.

4,835,958

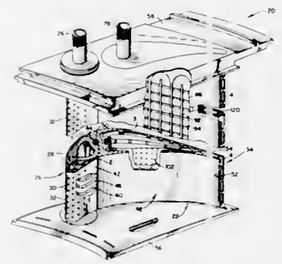
PROCESS FOR DIRECTING A COMBUSTION GAS STREAM ONTO ROTATABLE BLADES OF A GAS TURBINE

Ivan G. Rice, 1007 Lynwood - P.O. Box 213, Spring, Tex. 77383

Continuation of Ser. No. 931,058, Nov. 17, 1986, abandoned, which is a division of Ser. No. 716,373, Mar. 26, 1985, Pat. No. 4,638,628, which is a division of Ser. No. 486,334, Apr. 19, 1983, Pat. No. 4,545,197, which is a continuation-in-part of Ser. No. 274,660, Jun. 17, 1981, Pat. No. 4,384,452, which is a division of Ser. No. 47,571, Jun. 11, 1979, Pat. No. 4,314,442, said Ser. No. 486,334, is a continuation-in-part of Ser. No. 224,496, Jan. 13, 1981, Pat. No. 4,438,625, which is a division of Ser. No. 954,832, Oct. 26, 1978, Pat. No. 4,272,953. This application Mar. 16, 1988, Ser. No. 170,647

Int. Cl.[4] F02C 7/10

U.S. Cl. 60—39.05 8 Claims



1. A process for directing a combined steam and combustion gas stream onto the surfaces of rotatable blades to produce work comprising; passing said combustion gas stream through a gas nozzle positioned upstream of said blades, said gas nozzle comprising a plurality of spaced air-foil shaped vanes, cooling said vanes by introducing a coolant consisting essentially of a vapor-comprising steam into the interior of said vanes, passing said coolant steam through a duct contained in the interior of the trailing edge of said vanes and into said combustion gas stream to direct heat from said vanes into the gas stream, providing a throat in said duct to increase the velocity of said steam in said duct to at least about sonic velocity, providing said duct with a sufficient diameter downstream of said throat to form a coolant steam laminar film on the surfaces of said duct downstream of said throat and sufficiently expanding said duct downstream of said throat to provoke the disruption of said laminar film to expose the surfaces of said duct to the coolant steam passing therethrough and increase heat transfer.

4,835,959

MULTIPLE-PROPELLANT AIR VEHICLE AND PROPULSION SYSTEM

George A. Coffinberry, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 918,217, Oct. 14, 1986, abandoned. This application Apr. 13, 1988, Ser. No. 183,391

Int. Cl.[4] C06D 5/00

U.S. Cl. 60—212 6 Claims

1. A propulsion system comprising:

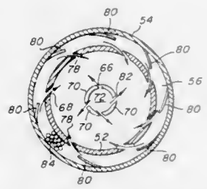
(a) a rocket casing having a combustor chamber with a combustor liner and a nozzle throat chamber with a nozzle throat liner;

(b) a fuel passageway adjacent to and surrounding the combustor liner and the nozzle throat liner which form the inner wall of the fuel passageway, the outer wall of the fuel passageway being spaced from the inner wall to form the passageway;

(c) means for providing fuel flow in the fuel passageway;

(d) a plurality of fuel injection holes in the combustor liner which inject fuel into the combustion chamber in a direction which promotes circumferential motion of the fuel; and

(e) means for introducing oxidizer through oxidizer injection



holes to the center of the combustion chamber to inject oxidizer into the combustion chamber in a direction which promotes circumferential motion of the oxidizer; whereby the fuel and the oxidizer are mixed in the chamber prior to and during combustion.

4,835,960

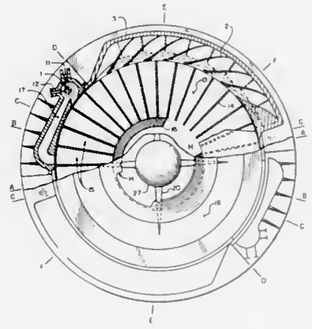
HIGH COMPRESSION GAS TURBINE ENGINE

Andzej M. Skoczkowski, 919 N. Campbell Ave., Chicago, Ill. 60622, and Andrew P. Rychlak, 5300 S. Central Ave., Chicago, Ill. 60638

Filed Jul. 22, 1982, Ser. No. 400,759

Int. Cl.[4] F02C 3/16, 5/04

U.S. Cl. 60—39.34 10 Claims



1. A gas turbine engine comprising a housing,

a fresh air inlet,

a separate fuel supply remote from said fresh air inlet,

means including power rotor means rotatably mounted in said housing for generating high pressure hot combustion gases, said power rotor means having inlets for fresh air and having outlets,

power output means in said housing,

receptor means in said housing for receiving said high pressure hot gases including stators asnd driven rotor means coupled in driving relation to said power output means, said receptor means having passages for conducting said hot combustion gases therethrougbh for powering said driven rotor means,

means for drawing fresh air from said fresh air inlet into said power rotor means through said inlets and dicharging it through said outlets pursuant to rotation of said power rotor means,

and means providing a purging stage for the engine for diverting a portion of said fresh air from said fresh air inlet and passing said fresh air portion directly through said power rotor means into said hot combustion gas passages of said receptor means and exhausting the same for purging the engine and internally cooling it.

4,835,961

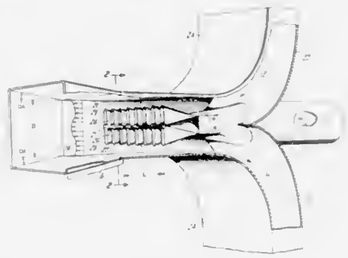
FLUID DYNAMIC PUMP

Walter M. Presz, Jr., Wilbraham, Mass.; Robert W. Paterson, Simsbury, and Michael J. Werle, W. Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 30, 1986, Ser. No. 857,908

Int. Cl.[4] F02K 3/04

U.S. Cl. 60—264 12 Claims



1. A fluid dynamic pump comprising wall means defining a bounded primary flow passage having an outlet, a bounded secondary flow passage having an outlet, a bounded mixing region of length L having a substantially constant cross-sectional area and initiating at said flow passage outlets and a diffuser having its inlet at the downstream end of said mixing region for receiving fluid therefrom, said primary flow passage adapted to carry a high-energy primary fluid stream and said secondary flow passage adapted to carry a low-energy secondary fluid stream, said primary and secondary flow passages being separated over at least a portion of their length by a common wall portion comprising a plurality of adjoining lobes, each lobe extending lengthwise in a downstream direction to said primary and secondary flow passage outlets, alternate lobes penetrating, respectively, into said primary passage and said secondary passage to define a wave-like downstream end of said common wall portion, wherein said lobes which penetrate into each of said passages define corresponding troughs in the other of said passages, said lobe contours being selected such that streamwise two-dimensional boundary layer separation from the surfaces of said lobes and troughs does not occur over their entire length, and wherein the ratio of the length L of said mixing region to the effective height D of said diffuser inlet is between 0.5 and 3.0.

4,835,962

FUEL ATOMIZATION APPARATUS FOR GAS TURBINE ENGINE

Stephen D. Rutter, Stratford, Conn., assignor to Avco Corporation, Providence, R.I.

Filed Jul. 11, 1986, Ser. No. 884,737

Int. Cl.[4] F02C 1/00

U.S. Cl. 60—737 4 Claims

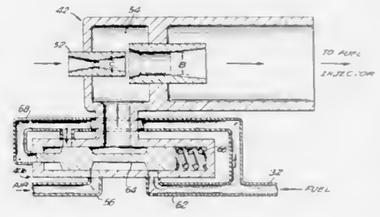
1. A fuel delivery assembly for a gas turbine engine, said engine comprising a source of fuel, a source of air and a combustor in communication with said sources of fuel and air, said fuel delivery assembly comprising:

a fuel injector mounted to said combustor and in communication with said sources of fuel and air, said fuel injector being provided with aperture means for creating an atomized dispersion of fuel and air in the combustor at rates of flow of fuel at or above a preselected rate;

a main fuel supply line for providing a first means of communication between said source of fuel and said fuel injector;

a bypass fuel line providing a second means of communication between said source of fuel and said fuel injector; a nozzle is communication with said bypass fuel line for producing a drop in pressure of fuel passing therethrough;

a mixing chamber in communication with said nozzle and disposed in said bypass fuel line intermediate said nozzle



and said fuel injector, said mixing chamber being in communication with said source of air for creating a dispersion of air and fuel therein from said source of air and fuel passing through said nozzle ; and

valve means in communication with said main fuel line for selectively blocking the flow of fuel therethrough at fuel flow rates below the preselected rate and directing the fuel through said bypass fuel line.

4,835,963

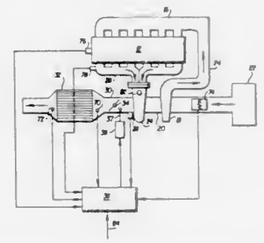
DIESEL ENGINE PARTICULATE TRAP REGENERATION SYSTEM

James A. Hardy, Playa Del Rey, Calif., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Aug. 28, 1986, Ser. No. 901,483

Int. Cl.[4] F01N 3/02; F02B 37/00; F02D 9/06

U.S. Cl. 60—274 19 Claims



1. A method of regenerating an exhaust gas particulate trap in an exhaust gas engine system comprising the steps of:

regulating the exhaust gas flow to maintain a desired trap inlet temperature, by sensing rack position, air flow upstream of said trap, temperature at the inlet to said trap and engine speed; comparing the sensed parameters with a map of the same engine parameter for a constant engine speed; and adjusting a back pressure valve located in the exhaust gas engine system in response to the relative values of the sensed parameters and mapped engine parameters.

4,835,964

DIESEL PARTICULATE OXIDIZER REGENERATION SYSTEM

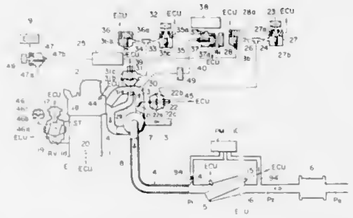
Satoru Kume, Otsu; Michiyasu Yoshida, Kyoto; Tateo Kume, Kyoto; Hiroki Oshima, Kyoto; Mitsuhiro Kawagoe, Kyoto, and Kazuo Koga, Otokuni, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 717,848, Mar. 29, 1985, Pat. No. 4,719,751. This application Jan. 19, 1988, Ser. No. 145,772

Claims priority, application Japan, Mar. 31, 1984, 59-64144; Mar. 31, 1984, 59-64145; Apr. 9, 1984, 59-70521; Apr. 25, 1984, 59-82434

Int. Cl.[4] F01N 3/18

U.S. Cl. 60—285 1 Claim



1. In a diesel engine having an exhaust system, a fuel injection pump and a fuel control means for controlling the injection volume or injection timing of said fuel injection pump, a diesel particulate oxidizer regeneration system including:

a diesel particulate oxidizer disposed in said exhaust system of the diesel engine and having a trap carrier for collecting unburnt fine particles contained in exhaust gas, said trap carrier supporting an oxidation catalyst;

a regeneration means for burning the unburnt fine particles collected in said diesel particulate oxidizer;

a regeneration timing control means for detecting the quantity of the unburnt fine particles deposited in said diesel particulate oxidizer and providing a signal to said regeneration means for operating the latter when the detected value is above a predetermined value; and

a regeneration end control means for detecting that the quantity of the unburnt fine particles collected and deposited in the diesel particulate oxidizer has become less than the predetermined value after combustion of unburned fine particles, and producing a signal for stopping the operation of said regeneration means,

said regeneration end control means comprising a clock, a temperature sensor for detecting at least one of upstream side, internal and downstream side temperatures of said diesel particulate oxidizer; a computing means for taking the product of an addition coefficient responsive to a temperature signal from said temperature sensor and a time width of a clock signal from said clock and calculating a cumulative value of said product; and an operation end detecting means for providing to said regeneration timing control means a signal for termination of the operation of said regeneration means when said cumulative value calculated by said computing means exceeds a predetermined value.

4,835,965

"Y" EQUAL LENGTH EXHAUST SYSTEM FOR TWO-CYCLE ENGINES

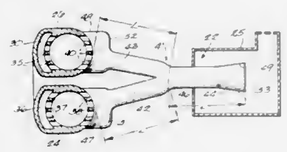
Arthur G. Poehlman, West Bend, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed May 21, 1987, Ser. No. 53,112

Int. Cl.[4] F02B 27/02

U.S. Cl. 60—313 34 Claims

1. A two-cycle internal combustion engine operable at a given speed and including a rotatable crankshaft, first and second cylinders firing 180° apart, and first and second exhaust ports communicating with said first and second cylinders respectively, a substantially Y-shaped hollow exhaust pipe having first, second and third branches each having an open end and each being substantially equal in length to the distance an



exhaust acoustical wave will travel through said exhaust pipe during an interval in which said crankshaft rotates through substantially ten to twenty degrees of rotation at the given engine speed, said open ends of said first and second branches being coupled to said exhaust ports of said first and second cylinders respectively.

4,835,966

CONTROL SWITCHING ARRANGEMENT FOR A HYDRAULIC POWER LIFT

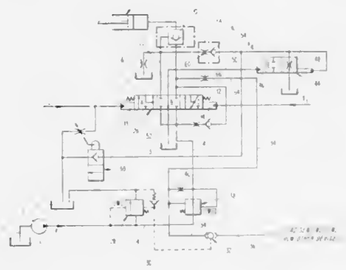
Wolfgang Kauss, Lohr-Wombach, and Heinz Schulte, Marktheidenfeld, both of, assignors to Mannesmann Rexroth GmbH, Lohr am Main, Fed. Rep. of Germany

Filed Jun. 16, 1987, Ser. No. 62,621

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1986, 3621854

Int. Cl.[4] F16D 31/02

U.S. Cl. 60—376 16 Claims



1. A control switching arrangement for a hydraulic power lift control system comprising a power lift control valve controlled via control lines in a low pressure section and which in turn controls a main hydraulic section via a check valve which is hydraulically openable at least for carrying out lowering movement by the power lift; wherein the check valve is opened via the power lift control valve which transmits neutral circulation pressure of the main hydraulic section to a switching line; and wherein means are provided by which pump circulation pressure can be raised in a switching state of the power lift control valve corresponding to a lowering movement of said power lift, said means including a throttle in a connecting line positioned between the switching line and a load-sensing line of the control valve.

4,835,967

HYDRAULIC BOOSTER EQUIPPED WITH EMERGENCY ACCUMULATOR

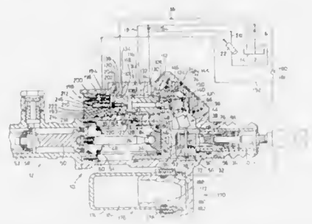
Yoshihisa Nomura, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jun. 27, 1988, Ser. No. 212,223

Claims priority, application Japan, Jul. 7, 1987, 62-168969

Int. Cl.[4] F16D 31/02; F15B 13/10, 21/00

U.S. Cl. 60—404 12 Claims



1. A hydraulic booster equipped with an emergency accumulator, comprising:

a housing;

a reaction piston and a power piston which are fluid tightly and slidably fitted in said housing, such that said reaction and power pistons cooperate with said housing to define a power chamber;

a control valve having a normally closed power chamber passage formed therethrough so as to communicate with said power chamber, and a normally open passage connecting a pump and a reservoir, said control valve being operated in response to an operation of said reaction piston, so as to restrict a flow of a working fluid through said normally open passage from said pump toward said reservoir, thereby raising a pressure of said working fluid delivered from said pump, and open said power chamber passage to apply the raised pressure of the fluid to said power chamber;

pressure reducing means provided in said power chamber passage, for reducing a pressure of the fluid in said power chamber passage and applying the thus reduced pressure to said power chamber, at least while a rate of flow of the fluid through said power chamber passage is higher than a predetermined limit; and

an accumulator connected as said emergency accumulator between said pressure reducing means and said pump, for storing a portion of the working fluid whose pressure is raised by said control valve, and supplying said power chamber with the stored working fluid, in the event of a failure where a pressurized working fluid cannot be fed from said pump.

4,835,968

HYDRAULIC CIRCUIT IN AN INDUSTRIAL VEHICLE

Yutaka Yamaguchi, Kariya, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Continuation of Ser. No. 894,778, Aug. 8, 1986, abandoned. This application May 9, 1988, Ser. No. 196,834

Claims priority, application Japan, Aug. 13, 1985, 60-123609

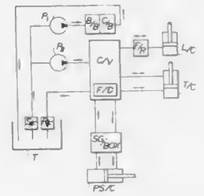
Int. Cl.[4] F15B 13/09

U.S. Cl. 60—422 7 Claims

1. Hydraulic circuit in an industrial vehicle, which comprises:

a cargo handling and steering first hydraulic circuit, the flow rate of which is large and pressure of which is high, said circuit including cargo lifting and vehicle steering apparatus; and a separate and independent booster hydraulic second circuit, the flow rate of which is smaller than that of said first circuit and pressure of which is less than that of said first circuit, said second circuit including vehicle movement controlling apparatus;

said hydraulic circuits being independent from each other and without a fluid flow connection therebetween so that a substantial amount of working fluid is relieved from the cargo handling and steering first hydraulic circuit when the booster hydraulic circuit is working;



said cargo handling and steering first hydraulic circuit having a hydraulic pump, the flow rate of which is large and pressure of which is high; and

said booster hydraulic second circuit having a hydraulic pump, the flow rate of which is smaller than that of the pump of said first circuit and pressure of which is high.

4,835,969

ERROR DETECTION MEANS FOR AN OVERSPEED GOVERNOR

Jack A. Tallman, Niles, Mich., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Oct. 5, 1987, Ser. No. 104,137

Int. Cl.[4] F02C 9/28

U.S. Cl. 60—39.281 8 Claims

1. In a fuel management system having a source of supply fuel with a substantially constant fluid pressure, Ps, a metering valve responsive to an input from an electronic computer for supplying fuel under pressure P_2 to a combustion chamber in an engine, a bypass valve responsive to the fluid pressure P_2 for allowing a portion of the supply fuel to return to the source while a fluid differential pressure P_1–P_2 develops across the metering valve, a turbine responding to the combustion of fuel in said combustion chamber by rotating to drive a compressor in said engine and a mechanical governor having a speed sensor responsive to a rotational speed of the turbine above a preselected rotation for lowering the pressure differential P_1–P_2 across the metering valve by opening a governor valve to allow operational fluid to flow to a return having a fluid pressure P_B and modify the fluid pressure P_2 presented to the bypass valve to P_2P to allow additional fuel to return to the source resulting in a corresponding reduction in the fuel supplied to said combustion chamber independent of the operation of the metering valve by the electronic computer to prevent an overspeed condition in the turbine, the improvement comprising:

speed detection means connected to said governor valve for preventing the fluid pressure P_2P of the operational fluid from reaching P_B to assure that a minimum quantity of operational fluid is available to the combustion chamber.

4,835,970

PNEUMATIC POWER BRAKE SYSTEM

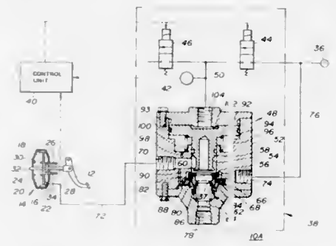
Morihiko Shimamura, Higashimatsuyama; Jun Kubo, Hino; Hitoshi Kubota, Minamiashigara; Norio Fujiki, Yokohama; Yoshio Tobisawa, Higashimatsuyama; Yasuki Ishikawa, and Kazuyoshi Fukawa, both of Yokosuka, all of Japan, assignors to Nissan Motor Co. Ltd., Japan

Filed Aug. 7, 1986, Ser. No. 894,368

Claims priority, application Japan, Aug. 13, 1985, 60-178001; Aug. 13, 1985, 60-177996; Aug. 13, 1985, 60-177997; Aug. 13, 1985, 60-177999; Aug. 13, 1985, 60-178000

Int. Cl.[4] F15B 7/00

U.S. Cl. 60—545 8 Claims



1. A pneumatic power brake system comprising:
a pressurized air source;
a brake booster with a work chamber and an input means for receiving brake pedal force;
a pedal force detecting means for detecting a brake pedal force applied to the input means of said brake booster;
a relay valve pneumatically connected to both said pressurized air source and said work chamber and interposed therebetween, said relay valve having a pilot chamber, said relay valve being connected to supply pressurized air to said work chamber, the pressure of the pressurized air corresponding to that of a pressure applied to said pilot chamber;
an electromagnetically operated valve means connected to selectively connect said pilot chamber with said pressurized air source and the atmosphere thereby applying a pressure to the pilot chamber;
an electronic control unit connected to control said electromagnetically operated valve means to supply to said pilot chamber pressurized air, the pressure of which being determined in accordance with said brake pedal force; and
a pressure sensor connected to detect the pressure in said pilot chamber and to provide said electronic control unit with pressure data for feedback control.

4,835,971

ADJUSTABLE NON-PILOTED AIR BLAST FUEL NOZZLE

Russell P. Romey, and Lonny R. Green both of Jacksonville, Fla., assignors to Allied Corporation, Morristown, N.J.

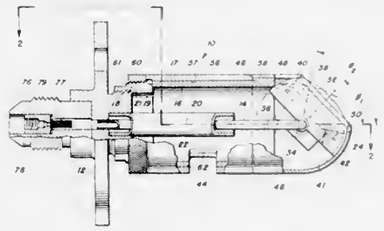
Division of Ser. No. 20,304, Mar. 2, 1987, Pat. No. 4,761,959.

This application Feb. 29, 1988, Ser. No. 161,922

Int. Cl.[4] F02C 1/00; B05B 15/08

U.S. Cl. 60—740 6 Claims

1. An apparatus for adjusting the position and size of an air inlet to a fuel nozzle comprising:
a first sheath having a cylindrical outer surface of a first diameter concentric with a first axis,
a second sheath having a cylindrical inner surface of a second diameter concentric with said first axis, said second diameter greater than said first diameter,
a first opening formed in said first sheath,
a second opening formed in said second sheath,
first means for supporting said first and second sheaths while said first and second sheaths are rotated around said concentric axis to a first position to position said first opening of said first sheath and for securing said first sheath at said first position,
second means for supporting said second sheath while said second sheath is rotated with respect to said first sheath to a second position to adjust the size of the opening formed



by the overlap of said first and second openings and for securing said second sheath at said second position, and
a nozzle tip body positioned at the end of said first sheath to receive the air passing through said first and second overlapped openings.

4,835,972

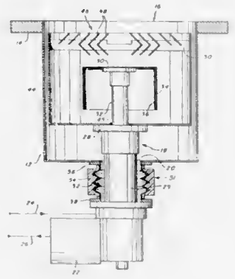
FLEX-LINE VIBRATION ISOLATOR AND CRYOPUMP WITH VIBRATION ISOLATION

Halil Tugal, Windham, N.H., and Peter W. Gaudet, Chelmsford, Mass., assignors to Helix Technology Corporation, Waltham, Mass.

Continuation-in-part of Ser. No. 839,693, Mar. 13, 1986, abandoned. This application Nov. 14, 1986, Ser. No. 931,432

Int. Cl.[4] F17C 7/02

U.S. Cl. 62—50.1 17 Claims



1. A cryopump adapted to be mounted to a chamber to be evacuated, the cryopump comprising:
a vacuum vessel;
a refrigerator having a cold finger extending through the vacuum vessel and connected to cryopanels at which gas is condensed;
a motor for driving the refrigerator; and,
vibration isolated pressure lines for introducing and exhausting helium gas into and out of the cold finger, the vibration isolated pressure lines comprising bellows having corrugations and damping material secured to the corrugations of the bellows for absorbing vibrations transmitted through the bellows.

4,835,973

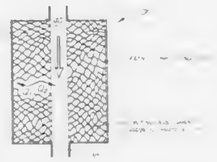
CRYOGENIC REGENERATOR INCLUDING SARANCARBON HEAT CONDUCTION MATRIX

Jack A. Jones, Los Angeles; S. Walter Petrick, La Canada, and Michael J. Britcliffe, Palmdale, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 31, 1987, Ser. No. 140,186

Int. Cl.[4] F25B 9/00

U.S. Cl. 62—6 16 Claims



1. A cryogenic regenerator comprising:
a first port for allowing a fluid to be cooled to flow therethrough;
a second port, displaced from the first port, for allowing the fluid to be cooled to flow therethrough.
a first heat storage matrix which includes a monolithic adsorbent material;
a fluid flow pathway coupling the first and second ports; and
means, displaced along at least a portion of the fluid flow pathway, for thermally coupling the first heat storage matrix and the fluid to be cooled.

4,835,974

PROCESS FOR THE REMOVAL OF IMPURITIES FROM EXHAUST GASES

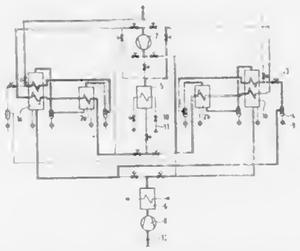
Walter Spahn, Frankfurt am Main, Fed. Rep. of Germany, assignor to Messer, Griesheim GMBH, Fed. Rep. of Germany

Filed Jan. 19, 1988, Ser. No. 145,607

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1987, 3701544

Int. Cl.[4] F25J 5/00

U.S. Cl. 62—12 1 Claim



1. In a process for the removal of impurities from exhaust gases by cooling the exhaust gas and a resulting condensing out of the impurities in two groups of reversible heat exchangers, whereby the low temperature is supplied by a gaseous cooling agent circulated with a circulation blower and the condensed out impurities after each reversal of the heat exchanger groups are thawed by utilizing the heat content of the crude gas, the improvement being in that the process is conducted in heat exchanger groups each of which consists only of a precooler and a low temperature cooler and after reversal of the operation takes place in three phases, in the first phase which is a thawing phase the crude gas enters as an outside gas and successively flows through the appropriate precooler and low temperature cooler after which the crude gas which is an inside gas again flows through the precooler and is supplied to the other heat exchanger group for the condensing out of the impurities, at the same time a hot cooling agent is supplied from the circulation gas blower as an inside gas and successively flows through the appropriate low temperature cooler and precooler before the cooling agent is cooled off and supplied as inside gas to the second heat exchanger group, after which in a second phase which is a precooling phase only a partial flow of the cooled off cooling agent as an inside gas flows through the appropriate low temperature cooler and precooler while the other partial flow of the cooling agent and the crude gas are directly supplied to the other heat exchanger group, after which in a third phase which is a cooling phase the appropriate heat exchanger group is charged with the cooling agent depending on the process method in the second phase and with the crude gas depending on the process method in the first phase.

4,835,975

CRYOGENIC TANK

Robert J. Windecker, Box 219, Farm Rd., Belle Grade, Fla. 33430

Filed Oct. 18, 1983, Ser. No. 542,979

Int. Cl.[4] F17C 1/00

U.S. Cl. 62—45.1 4 Claims

1. In a transport container having
a. an insulated compartment,
b. at least one pressure vessel in the compartment,
c. cryogenic liquid coolant and boil of gas therefrom contained under greater than ambient pressure within the pressure vessel, and
d. a temperature control means fluidly connected to the pressure vessel for releasing the cryogenic liquid coolant and the boil off gas from the pressure vessel into the compartment;

WHEREIN IMPROVEMENT COMPRISES IN COMBINATION WITH THE ABOVE:
e. the pressure vessel having
f. a metal inner liner wrapped by
g. a plurality of synthetic, resin-coated, filament windings,
h. the metal liner having a coefficient of thermal expansion that is substantially equal to the coefficient of thermal expansion of the synthetic filament windings within a temperature range from ambient to cryogenic,
i. said pressure vessel being insulated with a thick layer of polyurethane foam enclosing the synthetic filament windings,
j. the thickness of said layer being such that the heat transfer through the layer, the synthetic filament windings, and the inner metal liner, to the cryogenic liquid produces boil off gas in greater quantity than is released by the temperature control means into the compartment.

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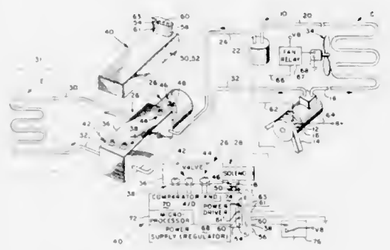
4,835,976

CONTROLLING SUPERHEAT IN A REFRIGERATION SYSTEM

Robert J. Torrence, Addison, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 14, 1988, Ser. No. 168,041
Int. Cl.[4] F25B *41/04*
U.S. Cl. 62—115 12 Claims



1. A system for refrigerating or conditioning air in a compartment comprising:

(a) pump means having an inlet and outlet and operative for compressing a charge of refrigerant gas and discharging the compressed gas at said outlet

(b) exothermic heat exchanger means connected for receiving a flow of said compressed refrigerant from said pump means outlet and operative to cool and condense said gas to liquid;

(c) expansion valve means connected for receiving said liquid at the inlet thereof and operative upon electrical energization to provide a pressure drop in said liquid refrigerant and to control flow thereof to the valve outlet;

(d) endothermic heat exchanger means connected for receiving a flow of said liquid refrigerant from said expansion valve means outlet and operative to absorb sufficient heat from the compartment to be refrigerated or conditioned to heat said refrigerant and to cause said refrigerant to vaporize and including conduit means returning said vaporized refrigerant to the inlet of said pump means;

(e) temperature sensing means including resistance means disposed to directly sense the temperature of said refrigerant discharging from said endothermic heat exchanger for returning to said pump inlet means;

(f) means operative to provide a limited electrical current through said resistance means;

(g) first circuit means operative to sense the voltage drop across said resistance means responsive to said current with said refrigerant flowing therethrough and operative to determine the change in resistance thereof;

(h) second circuit means operative in response to said change in resistance of said resistance means to generate an electrical pulse signal having the pulse time or width thereof corresponding to said resistance;

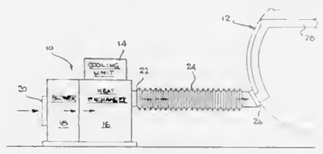
(i) driver circuit means operative in response to receiving said pulse time signal to generate a periodic control signal having the ratio of "ON" time and "OFF" time in said period determined from said pulse time and a predetermined table of values, for a desired amount of superheat of refrigerant flowing over said temperature sensing means including means operative to apply said control signal to said expansion valve means for controlling refrigerant flow to modulate superheat about said desired value.

4,835,977

APPARATUS AND METHOD OF AIR-CONDITIONING PARKED AIRCRAFT

Richard A. Haglund, Hawthorne, and Robert E. Tupack, Hermosa Beach, both of Calif., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 91,546, Aug. 31, 1987, abandoned, which is a continuation of Ser. No. 889,091, Jul. 1, 1986, abandoned, which is a continuation of Ser. No. 753,705, Jul. 10, 1985, abandoned, which is a continuation of Ser. No. 553,439, Nov. 18, 1983, abandoned. This application Apr. 14, 1988, Ser. No. 183,459
Int. Cl.[4] F25D *17/06*
U.S. Cl. 62—89 80 Claims



1. A method of maintaining, for a prescribed cabin heat flow rate, the temperature in the interior of the passenger cabin of a parked aircraft at approximately 75° F., where the aircraft has an external air inlet for the introduction of cooling air into ductwork communicating with the cabin, the method comprising the steps of:

reducing the temperature of a portion of the ambient air external to the aircraft to a first level of temperature which is at least 5° F. below the freezing point of water, using electrically-powered vapor-compression cycle cooling apparatus located external to the airplane; and

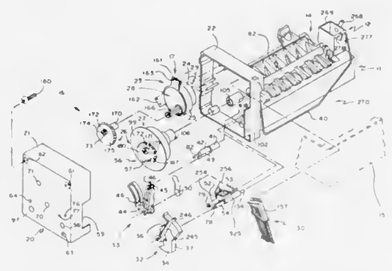
providing to the aircraft external air inlet at a second level of temperature which is below the freezing point of water the air cooled by the cooling apparatus at a cooling air flow rate established by an electric motor driven blower whose power requirement is more than 10 percent of the power required by the cooling apparatus and which compresses the air cooled by the cooling apparatus to a pressure of at least 13 inches of water, where the cooling air flow rate is such that the ratio of the cabin heat flow rate, in units of BTUs per hour, to the cooling air flow rate, in units of pounds per mintue, is greater than 600.

4,835,978

ICEMAKER WITH IMPROVED BAIL MECHANISM

Ronald E. Cole, Greenwood, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed May 3, 1988, Ser. No. 189,757
Int. Cl.[4] F25C *5/18*
U.S. Cl. 62—137 10 Claims



1. In an icemaker of the type comprising water holding means for holding water in a cold area to form ice bodies, water delivery means for delivering water to said water holding means, ice mover means for moving ice from said holding means into an ice storage bin, and control means for controlling the operation of the icemaker, the control means including bail means for moving between a position for operating the icemaker and a position for stopping the icemaker, bias means for biasing the bail means towards the position for operating the icemaker, drive means for moving the bail means to the stopping position and returning it to the operating position provided the bin is not filled to a predetermined level, and latching means for latching said bail means in stopping position to thereby deeenergize the icemaker regardless of the amount of ice in the storage bin, the improvement wherein said bias means comprises a compound bias means for biasing said bail means towards said operating position with a first bias force over a first range of movement of said bail means and for biasing said bail means towards said operating position with a second bias force qualitatively greater than said first bias force over a second range of movement, said first range including the range of movement over which the drive means moves said bail means, and said second range including a range over which said bail means moves just prior to the position at which said latching means operates.

4,835,979

SURGE CONTROL SYSTEM FOR A CLOSED CYCLE CRYOCOOLER

Roger P. Murry, San Pedro; Alexander Silver, Tarzana, and Richard L. Fischer, Rolling Hills Estates, all of Calif., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 18, 1987, Ser. No. 136,162
Int. Cl.[4] F25B *9/00*
U.S. Cl. 62—172 12 Claims

1. A closed Brayton cycle, cryogenic refrigeration system for cooling at least one load comprising:

a compressor section having an inlet and outlet, including

a first compressor and a second compressor mounted on a common shaft and driven by a first motor;

a third compressor and a fourth compressor mounted on a common shaft and driven by a seocnd motor; and

an aftercooler located downstream of each compressor,

a cooling section, having an inlet and an outlet for high and low pressure sides, including a plurality of recuperators in parallel relationship, each having an inlet and an outlet for high and low pressure sides and at least one expansion turbine; said inlet to said cooling section flow connected to the outlet of the compressor section and said cooling section outlet flow connected to the inlet of said compressor section; and including means for generating electrical power, said means powered by the working fluid bled off the high pressure side of said plurality of recuperators, and means for controlling surge in said compressor section including

a bypass passage between said compressor section inlet and outlet;

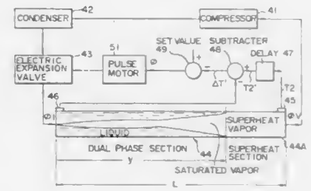
a surge control valve in said bypass passage; and means responsive to a variable condition in said compressor section for opening and closing said valve.

4,835,980

METHOD FOR CONTROLLING REFRIGERATING SYSTEM

Reinosuke Oyanagi, and Hazime Tanaka, both of Yokohama, Japan, assignors to Fuji Koki Mfg. Co. Ltd., Tokyo, Japan

Filed Dec. 27, 1987, Ser. No. 136,338
Claims priority, application Japan, Dec. 26, 1986, 61-308617
Int. Cl.[4] F25B *41/04*
U.S. Cl. 62—212 7 Claims



1. A method for controlling a refrigerating system which includes an evaporator for evaporating refrigerant by reducing pressure of the refrigerant supplied into the evaporator and electric-driven means for controlling a flow rate of the refrigerant supplied into the evaporator, comprising the steps of:

obtaining a first signal representing an evaporating temperature of the refrigerant;

obtaining a second signal representing a superheated temperature of the refrigerant at an outlet of the evaporator;

processing the second signal by a phase lag element to obtain a processed signal;

obtaining a difference signal representing a difference between the processed signal and the first signal; and

controlling a flow rate of the refrigerant in accordance with the difference signal.

4,835,981

AIR CONDITIONER WITH IMPROVED THERMOSTATING OPERATION

Robert K. Rinholen, Blairstown, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Filed Mar. 31, 1988, Ser. No. 175,983
Int. Cl.[4] F25B *1/00*
U.S. Cl. 62—229 7 Claims

1 An air conditioner comprising:

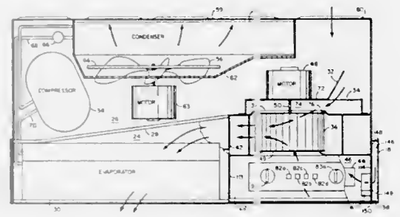
a partition separating outside fresh air from room air;

an evaporator and an air intake chamber positioned on the room air side of said partition;

a blower for recirculating room air through said evaporator, said blower having an inlet communicating with said air intake chamber for drawing air from the room into said blower via said air intake chamber, said blower further having an outlet directed to said evaporator;

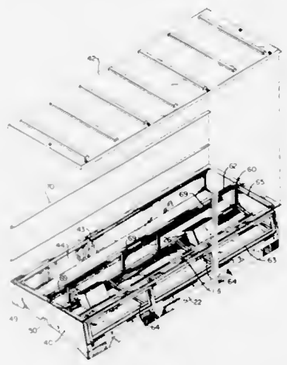
means for mixing outside fresh air into said recirculating room air, said mixing means comprising a vent in said partition and a door for closing said vent, said vent communicating with said blower wherein, when said door is

open and said blower is activated, said outside fresh air is drawn through said vent into said blower;
a temperature sensor positioned in said air intake chamber for sensing the temperature of room air;
means responsive to said temperature sensor for cycling said air conditioner on and off; and



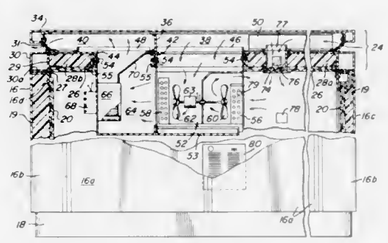
means for inhibiting said temperature sensor from being biased by outside fresh air when said door is open, said inhibiting means comprising a thermally insulated pocket housing said temperature sensor, said pocket comprising means for enabling said recirculating room air to be drawn through said pocket over said temperature sensor before being drawn into said blower.

4,835,982
EVAPORATIVE COOLING SYSTEM
Houshang Ferdows, Boulder, Colo., assignor to Suetrak Air Conditioning Sales Corporation, Commerce City, Colo.
Filed Sep. 2, 1986, Ser. No. 902,673
Int. Cl.[4] B60H *1/32*
U.S. Cl. 62—239 **17 Claims**



1. In an evaporated cooling unit mounted on the roof of a motor vehicle wherein a plurality of air blowers are arranged in tandem to deliver cooled air through discharge ducts communicating with the interior of said motor vehicle, the improvement comprising:
an elongated, low-profile housing mounted on the roof of said motor vehicle and extending lengthwise thereof, said housing having a base panel conforming to the contour of the roof of said motor vehicle, said base panel including ribs having raised horizontal surfaces, said ribs projecting upwardly from said base panel and forming interruptions therein, said blowers including attaching means affixing said blowers to said ribs in spaced relation to said roof, and an internal frame member in said housing including frame supporting means cooperating with said ribs in rigidly affixing said blowers with respect to said housing.

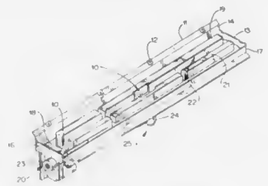
4,835,983
KIOSK WITH AIR CONDITIONING
Rupert P. Chandler, Jr., Stuarts Draft; Fred R. McDavid, Harrisonburg; Jimmie D. Lough, Verona, and Gary E. Dove, Waynesboro, all of Va., assignors to Hopeman Brothers, Inc., Waynesboro, Va.
Filed Aug. 10, 1988, Ser. No. 220,469
Int. Cl.[4] F25D *23/12*
U.S. Cl. 62—259.1 **25 Claims**



1. An air conditioned enclosure, comprising, in combination:
a base for supporting said enclosure;
upright panel means having a flat exterior with a lower border attached to said base around the perimeter thereof, and an upper border;
ceiling means connected to the upper border and across the top of said panel means and having a perimeter substantially flush with the exterior for enclosing a space within said panel means;
roof means disposed in spaced relation above said ceiling means and having a perimeter substantially flush with the exterior;
coving means secured between said ceiling means and said roof means and recessed within the perimeters thereof, and including a grid along a selected portion of said coving forming thereby a ventilated plenum;
divider means connected between said ceiling means and said roof means across said plenum forming thereby separate ventilated intake and exhaust compartments; and
a vapor compression air conditioner means having a condenser and evaporator with separate air ducts therethrough, said conditioner supported beneath said ceiling means with said air inlet and outlet ducts of said condenser communicating with respective ones of said intake and exhaust compartments, and with said air inlet and outlet ducts of said evaporator communicating with said space.

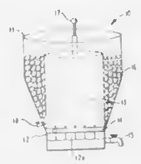
4,835,984
EVAPORATOR CONDENSATE PAN WITH INTEGRAL TRAP
Dilip Y. Vyavaharkar, Liverpool, and Rudy C. Bussjager, Chittenango, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Oct. 3, 1988, Ser. No. 251,738
Int. Cl.[4] F25D *21/14*
U.S. Cl. 62—285 **6 Claims**

1. An air conditioning system of the type having an evaporator coil, a fan blowing air thereover, a condensate pan with bottom and side walls for collecting condensate forming on the coil and a drainage opening formed in the condensate pan, an improved trap structure associated with said drainage opening and forming a part of said condensate pan comprising:
a bottom wall and side walls formed integrally with said condensate pan bottom wall, said trap structure bottom wall being at a lower elevation than the remaining portion of said condensate pan bottom wall and at least a portion of said side wall rising upwardly to define a vertical barrier over which the condensate must flow in order enter the drainage opening; and
a suspended wall structure attached to the condensate pan



and extending downwardly towards, but not to, said trap lower wall, wherein said side wall portion and said suspended wall structure cooperate to form a conduit for conducting the flow of condensate from the condensate pan to the discharge opening while maintaining a vertical column of condensate therein to prevent the flow of air from the discharge opening to the condensate pan.

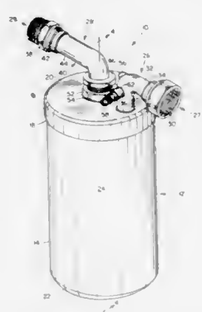
4,835,985
ICE ACCOMMODATING SLEEVE APPARATUS FOR COOLING KEGS
Robert Ilvento, 29 Maple Ave., West Long Branch, N.J. 07764
Filed Jun. 3, 1988, Ser. No. 201,831
Int. Cl.[4] F25D *3/08*
U.S. Cl. 62—372 **7 Claims**



1. A portable cooler apparatus for cooling a keg having generally cylindrical sides, comprising:
a sleeve member made of semi-rigid water-proof material which is open at its upper and lower ends, wherein its lower end is slipped over the keg and clamped to a lower portion of the keg; and
clamping means for clamping said lower end of said sleeve member to the lower portion of the keg, whereby said clamping means creates a water-tight seal between said sleeve member and said keg,
wherein said upper end of said sleeve member faces upward and is flared open around the sides of the keg thereby forming a pouch into which material can be packaged around the sides of the keg.

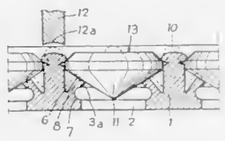
4,835,986
UNIVERSAL ACCUMULATOR
Billy M. Cartisle, Jr., 6415 Jetty, San Antonio, Tex. 78239
Filed Dec. 30, 1987, Ser. No. 139,858
Int. Cl.[4] F25B *43/00*
U.S. Cl. 62—503 **13 Claims**

8. An accumulator, comprising:
a housing having a top, a bottom, and a side wall intermediate said top and said bottom;
inlet means connected to said top of said housing and in fluid communication with a cavity within said housing, said inlet means having an inlet port;
outlet means adapted to be connected to said top of said housing in fluid communication with said cavity within said housing, said outlet means having an outlet port;
a fitting connected to approximately the center of said housing top for adjustably connecting said outlet means to said housing top so as to permit variable positioning of said outlet port relative to said inlet port;



suction means within said housing in fluid communication with said cavity and said outlet means;
dehydration means within said cavity; and
a plurality of fittings connected to said inlet means.

4,835,987
PROCESSES FOR THE MECHANIZED MANUFACTURE OF JEWELLERY COMPRISING A PLURALITY OF SMALL CONTIGUOUS STONES SET IN A SUPPORT MADE OF PRECIOUS METAL, AND JEWELLERY OBTAINED BY THESE PROCESSES
Emile G. Magnien, and Alain M. Plantureux, both of Montpellier, France, assignors to Diamant Applications, Montpellier, France
Division of Ser. No. 911,741, Sep. 26, 1986, Pat. No. 4,748,728.
This application Jan. 19, 1988, Ser. No. 145,773
Int. Cl.[4] A44C *17/02*
U.S. Cl. 63—28 **2 Claims**



1. Jewels comprising a metal mounting having an external upper face, a plurality of identical contiguous cylindrico-conical housings machined in said mounting, each housing comprising an upper and a lower cylindrical bore joined together through a deformable conical seating and seating claws situated on the periphery of said housing which claws have top situated in said external upper face of the mounting, which jewels further comprise a plurality of small contiguous stones each placed in one of said housings and having a plane upper face and a conical lateral face which rests on said deformable conical seatings of said housing, wherein all the stones are calibrated stones having same diameters but different heights of the part of the stones situated above the conical seatings and wherein said conical seatings have been deformed so that the upper faces of all the stones are positioned in a surface parallel

to said external face of said metal mounting when the stones have been set in said housings.

4,835,988

TWO WHEEL DEVICE FOR POSITVE FEEDING OF YARN TO KNITTING MACHINE

Kurt A. G. Jacobsson, Ulricehamn, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

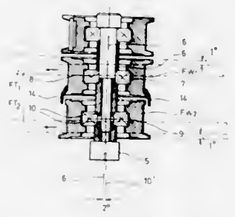
PCT No. PCT/EP86/00587, § 371 Date Jun. 12, 1987, § 102(e) Date Jun. 12, 1987, PCT Pub. No. WO87/02395, PCT Pub. Date Apr. 23, 1987

PCT Filed Oct. 14, 1986, Ser. No. 74,457

Claims priority, application Sweden, Oct. 14, 1985, 8504766

Int. Cl.[4] D04B *15/48*

U.S. Cl. 66—132 T 14 Claims



1. In a device for the positive feeding of yarn to a knitting machine, including:

a first freely rotatable yarn feeding wheel;

a first feeding tape arranged to run over a part of the periphery of said first yarn feeding wheel, which first feeding tape is driven at a first speed in synchronism with the operation of the knitting machine

a yarn guiding element adapted for selectively bringing the yarn into engagement with said first yarn feeding wheel and said first feeding tape so as to positively feed the yarn at the speed of the first feeding tape or bringing the yarn out of engagement with said first yarn feeding wheel for terminating the positive feeding of the yarn; and

a second yarn feeding wheel adapted to be rotated at a speed which is different from the speed of the first yarn feeding wheel,

the improvement comprising:

said second yarn feeding wheel being adapted to be rotated independent from said first yarn feeding wheel,

a second feeding tape arranged to run over a part of the periphery of said second yarn feeding wheel, which second feeding tape is driven at a second speed different from said first speed, said second speed being in synchronism with the operation of the knitting machine,

said second yarn feeding wheel being arranged adjacent to said first yarn feeding wheel, the axes of said yarn feeding wheels extending in approximately the same direction, and

said yarn guiding element being adapted for selectively bringing said yarn into engagement with said second yarn feeding wheel and said second feeding tape so as to positively feed the yarn at the speed of the second feeding tape or bringing the yarn out of engagement with said second feeding tape for terminating said positive feeding, and for moving the yarn from one yarn feeding wheel to the other yarn feeding wheel and vice versa.

4,835,989

MACHINE KNITTED FABRICS

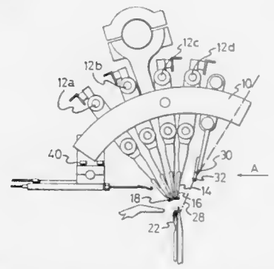
John H. Hall, Main South Road, Katikati, and Robert N. Watson, Flat 5, 73 Wintere Road, Papatoetoe, Auckland, both of New Zealand

Filed Jul. 5, 1988, Ser. No. 215,587

Claims priority, application New Zealand, Jul. 9, 1987, 221022; Feb. 26, 1988, 223675

Int. Cl.[4] D04B *23/00*

U.S. Cl. 66—203 12 Claims



1. A method of laying a drawthread into a fabric knitted on a machine provided with one or more yarn guides for guiding one or more yarns to be knitted into the fabric at a switch-forming station, including the steps of causing an unlaid portion of the drawthread extending from a position at which it joins the fabric to be located in a first disposition on one side of said one or more yarns during a first predetermined number of stitch-forming cycles of the machine and causing the unlaid portion of the drawthread to be located in a second disposition in which during a second predetermined number of stitch-forming cycles of the machine the unlaid portion of the drawthread passes from the position at which it joins the fabric to a position on an opposite side of said one or more yarns and from the latter position clear of the stitch-forming station back to the one side.

4,835,990

PULLING DEVICE FOR WARP YARNS IN CROCHET GALLOON LOOMS

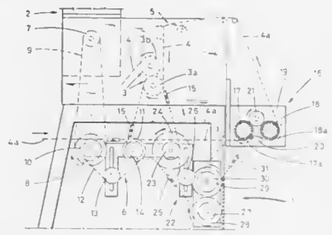
Luigi O. Zorini, Cilavegna, Italy, assignor to COMEZ, S.p.A., Cilavegna, Italy

Filed Aug. 5, 1988, Ser. No. 229,218

Claims priority, application Italy, Oct. 13, 1987, 22260 A/87

Int. Cl.[4] D04B *27/10*

U.S. Cl. 66—209 2 Claims



1. A pulling device for warp yarns in crochet galloon looms comprising a main shaft operated in rotation, at least a pair of pulling rollers engaging a manufactured article downstream of knitting means designed to produce said manufactured article by interlacing weft yarns with warp yarns and at least a first driving mechanism transmitting the rotatory motion of the main shaft to the pulling rollers, wherein said device further comprises a feed unit disposed upstream of the knitting means and including at least two feed rollers which engage said warp yarns and are taken in rotation by a second driving mechanism connected to the first driving mechanism in order to give an appropriate and constant tensioning to the warp yarns in the length thereof disposed between said pulling rollers and feed units.

4,835,991

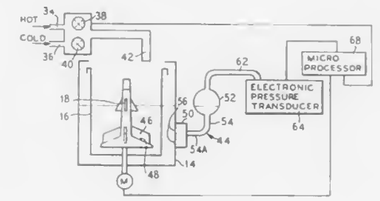
AUTOMATIC WATER LEVEL CONTROL SYSTEM FOR AN AUTOMATIC WASHER

Donald E. Knoop, Longview, Tex., and John K. Paustian, Benton Township, Berrien County, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Dec. 24, 1987, Ser. No. 137,604

Int. Cl.[4] D06F *33/02, 39/08*

U.S. Cl. 68—12 R 18 Claims



1. An automatic washing machine having a tub to receive washing liquid and a load of clothes to be washed therein including a vertical axis agitator and an automatic liquid fill control system comprising:

supply means for supplying washing liquid to said tub;

means for determining when an initial liquid depth has been achieved in said tub;

means for oscillating said agitator when said initial liquid depth has been attained;

means for sensing rotational movement of said tube caused by oscillation of said agitator;

means for determining when a predetermined change in successive amplitudes of rotational movement of said tub has occurred; and

means for terminating the supply of liquid to said tub after determination of said predetermined change in successive amplitudes of rotational movement of said tub.

4,835,992

METHOD AND APPARATUS FOR THE TREATMENT OF CONTINUOUSLY MOVING TUBULAR FABRIC IN THE WET STATE

Werner Koch, Wald-Michelbach, Fed. Rep. of Germany, assignor to Bruckner Apparatebau GmbH, Fed. Rep. of Germany

Filed Jul. 10, 1987, Ser. No. 72,349

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1986, 3624406

Int. Cl.[4] D06B *3/36*

U.S. Cl. 68—13 R 7 Claims

1. An apparatus useful in the wet treatment of a continuously moving wet tubular fabric in a plurality of wet treatment stages, in which:

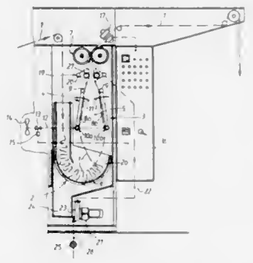
(i) in an expansion zone having a beginning and an end, compressed air is blown into the wet tubular fabric which has been sealed against the escape of air at the beginning and at the end of the expansion zone, the tubular fabric being deliberately expanded thereby;

(ii) behind the expansion zone, the width of the tubular fabric is measured; and the actual value obtained for the fabric width is compared with a predetermined theoretical value; and in the event of differences between the actual value and the theoretical value, a correction value is formed;

(iii) an adjustment is carried out in the region of the expansion zone as a function of the magnitude of the correction value;

(iv) the tubular fabric is expanded in step (i) directly after the last wet treatment stage, and the wet tubular fabric is delivered from this last wet treatment stage to the expansion zone free of tension and in such a quantity that the beginning of the expansion zone is sealed against the escape of air by the material store; and

(v) the correction value obtained from the comparison between the actual value and the theoretical value is converted into a correction output signal which controls the quantity of air blown into the expansion zone in order to achieve the necessary width correction of the tubular fabric; the apparatus comprising:



(a) an expansion zone which is defined by an upper sealing point and a lower sealing point adapted to prevent the escape of air from the tubular fabric, the expansion zone comprising a nozzle arrangement in the region between the upper and lower sealing points;

(b) a width measuring arrangement which is arranged behind the upper sealing point of the expansion zone for the tubular fabric in its flat state;

(c) a transition region disposed between the last wet treatment stage and the expansion zone adapted to form the lower sealing point; and

(d) the nozzle arrangement being connected to the width measuring arrangement for control purposes via a computer in such a way that the action of air on the nozzle arrangement can be controlled as a function of the difference between the actual value and the theoretical value of the fabric width.

4,835,993

COMMERCIAL/INDUSTRIAL WASHING MACHINE

Adolph E. S. Dreher, Wichita Falls, Tex., assignor to Washex Machinery Corporation, Wichita Falls, Tex.

Filed Apr. 23, 1987, Ser. No. 41,726

Int. Cl.[4] D06F *37/06*

U.S. Cl. 68—142 34 Claims

14. Washing machined apparatus comprising:

a washing drum circumscribing an axis and having a front end opening through which launderable items may be loaded into and unloaded from said washing drum, a rear end wall, and an interior side wall surface, said washing drum having a washing position in which said axis is downwardly and rearwardly inclined at a predetermined angle relative to horizontal;

drive means selectively operable to continuously rotate said washing drum in a selected single direction about said axis or to rotationally oscillate said washing drum in opposite directions about said axis; and

rib means associated with said interior side wall surface of said washing drum, said rib means comprising a circumferentially spaced series of essentially straight breaker ribs each projecting radially inwardly from said interior side wall surface and extending longitudinally of said washing drum at an angle relative to said axis, each of said breaker ribs having a radially inner side edge which tapers rearwardly and radially outwardly from a front end portion of the rib to a rear end portion thereof, said rib means being operative to:

engage launderable items entering said front end opening and automatically draw the engaged items rearwardly into the interior of said washing drum, in response to continuous rotation thereof in said selected single direction about said axis, to facilitate loading of said washing drum, and

cause axial oscillation of launderable items disposed within said washing drum, during rotational oscillation thereof about said axis when said washing drum is in its washing position, to facilitate cleaning of such items,

the downward and rearward inclination of said washing drum in its washing position further facilitating the cleaning of such items by causing items dropped from an upper interior portion of said washing drum to land upon a lower interior portion thereof rearwardly displaced from said upper interior portion, thereby augmenting the axial movement of the items caused by said rib means during rotational oscillation of said washing drum about said axis;

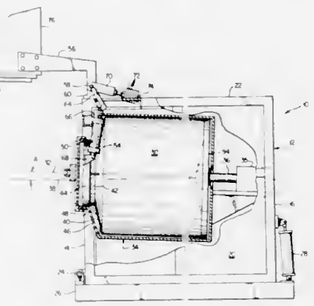
a body internally carrying said washing drum;

chute means, communicable with the interior of said washing drum, for receiving launderable items;

water supply means for selectively flowing water from a source thereof through said chute means and into said washing drum to west and compress launderable items disposed in said chute means, and to assist in carrying the wetted and compressed items through said chute means into said washing drum during loading of said washing drum;

mounting means for pivotally mounting said chute means on an upper front end portion of said body for movement relative thereto between a first position in which said chute means are spaced apart from said front end opening of said washing drum, and a second position in which said chute means are in operative communication with the interior of said washing drum, and said chute means essentially cover said front end opening; and

actuating means for selectively pivoting said chute means between said first and second positions thereof.



4,835,994

WASHING MACHINE

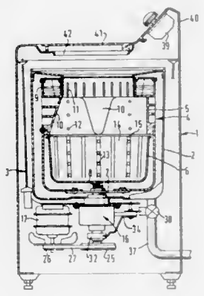
Katsuyuki Ishida; Fumio Torita, both of Nagoya, and Yoshio Kohsaka, Aichi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 2, 1984, Ser. No. 606,265

Claims priority, application Japan, Jun. 9, 1983, 58-104505; Jun. 27, 1983, 58-115453

Int. Cl.[4] D06F *21/08*

U.S. Cl. 68—174 **13 Claims**



I. A washing machine comprising:

a housing;

a washing tub, installed on said housing;

a fixed drum, mounted on the upper side of said washing tub, for contacting clothes during washing cycles, said fixed drum having a plurality of agitating projection parts over the inner wall thereof for providing clothes with a contact friction force during the washing cycles, each of said projecting parts being in the shape of an upside-down triangle which decreases in thickness from an upper surface thereof to a lower surface thereof; and

a movable drum receiving said clothes and a washing liquid and disposed under said fixed drum so as to rotate horizontally in alternating directions of rotation within said washing tub; said movable drum having no upside-down triangular shaped agitating projecting parts thereof.

4,835,995

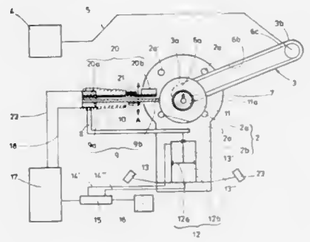
MACHINING DEVICE, ESPECIALLY FOR A ROBOT USED FOR THE CARDING OF LEATHER

Andre Vacant, Tiffauges, France, assignor to GEP Groupe Pasquier, Saint Germain Sur Moine, France

Filed Jun. 4, 1987, Ser. No. 58,084

Int. Cl.[4] C14B *1/44*

U.S. Cl. 69—6.5 **2 Claims**



I. Machining device intended especially to be fastened to the end of a robot arm and having a cutter serving for carding in the shoe industry or for the clipping or polishing of pieces of complicated shapes, comprising:

a toolholder head (**11**, *11a*) for receiving a driven rotary tool (**24**),

a movable assembly (**12**, **8**, **9**, **20**) adjustable in the effective direction of the tool (A, B), provided with a rigid arm (**8**) carrying the head (**11**, **11a**) and equipped with strain-gauge sensors (**10**)for measuring the force exerted by the tool (**24**) on the workpiece,

a support (**2**) connected to the end (**1**) of the robot arm and carrying the movable assembly (**12**, **8**, **9**, **20**),

a control circuit (**17**) receiving the signals from the strain-gauge sensors (**10**) and controlling the movement of the movable assembly in order to make the pressure exerted by the tool on the workpiece subject to a nominal value,

and a device (**20**)for measuring accelerations in the direction of the force to be exerted, in order to take into account forces due to inertia, including the disruptive component of the weight of the movable assembly.

4,835,996

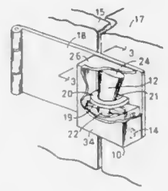
TAPERED SHACKLE PADLOCK

Robert W. Loughlin, 1261 Rahway Rd., Scotch Plains, N.J. 07076, and Thomas G. Loughlin, 400 Cold Springs Rd., Apt. D414, Rocky Hill, Conn. 06067

Continuation of Ser. No. 000,205, Jan. 2, 1987, abandoned, which is a continuation of Ser. No. 673,181, Nov. 19, 1984, abandoned. This application Apr. 12, 1988, Ser. No. 180,394

Int. Cl.[4] E05B *67/06*

U.S. Cl. 70—53 **23 Claims**



I. In combination:

a hasp device having a hasp opening therethrough of a predetermined lateral dimension;

a shackle padlock for being secured to said hasp device, said shackle padlock comprising (a) an elongated shackle member having a tapered section, said tapered section including a first end and a second end, said first end of said tapered section having a lateral dimension less than said predetermined lateral dimension of said hasp opening and said second end of said tapered section having a lateral dimension greater than said predetermined lateral dimension of said hasp opening, said tapered section gradually increasing in lateral dimension from said first end to said second end of said tapered section, and (b) a lock body having a shackle recess therein and having releasable engagement means for releasably engaging said shackle member when said first end of said tapered section is inserted into said shackle recess; and

said hasp device and said shackle padlock being arrangeable in locked engagement so that said hasp device is sandwiched between said lock body and a hasp contact surface of said tapered section of said shackle member when said first end of said tapered section is passed through said hasp opening and inserted into said shackle recess and said shackle member is engaged by said releasable engagement means.

4,835,997

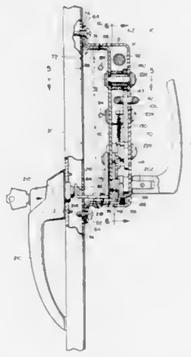
TWO-WAY ROTARY LOCK

Michael V. Akright, Lake Villa, Ill., assignor to A. L. Hansen Manufacturing Company, Gurnee, Ill.

Filed Mar. 14, 1984, Ser. No. 589,650

Int. Cl.[4] E05B *63/00*; E05C *3/06*

U.S. Cl. 70—141 **25 Claims**



I. A two-way rotary lock for an automotive vehicle of the type defining a door opening bounded laterally by first and second side frames, a sliding door mounted to slide between an open position, in which the door exposes the door opening, and a closed position, in which in door closes the door opening, a first striker secured to the first side frame, and a second striker secured to the second side frame, said lock comprising:

a lock body defining first and second recesses positioned on opposed sides of the lock body to receive the first and second strikers, respectively;

a first tang positioned within the lock body;

means for rotatably mounting the first tang to the lock body such that the first tang pivots in a first direction to capture a portion of the first striker which has passed through the first recess into the interior of the lock body;

a second tang positioned within the lock body;

means for rotatably mounting the second tang to the lock body such that the second tang pivots in the first direction to capture a portion of the second striker which has passed through the second recess into the interior of the lock body;

means for automatically locking the first and second tangs in place against rotation in a second direction, opposite to the first direction, to capture the first and second strikers, respectively, in the lock body; and

means for selectively, manually overriding the locking means to allow rotation of the first and second tangs in the second direction to release the first and second strikers from the lock body.

4,835,998

REMOVABLE HANDLE FOR T-HANDLE LOCK ASSEMBLY

Robert Steinbach, Glendale Heights, Ill., assignor to Chicago Lock Company, Chicago, Ill.

Filed May 23, 1988, Ser. No. 197,347

Int. Cl.[4] E05B *13/10*

U.S. Cl. 70—208 **4 Claims**

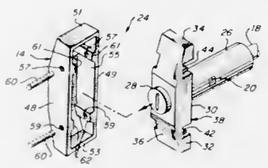
I. In a popout T-handle lock assembly of the type having a cylinder front handle formed by a front surface, opposed side walls, and a top and bottom wall having an open back end, which mates with a cylinder housing which, in turn, houses a cylinder lock and related extension rod therein, the cylinder front handle and related cylinder housing and cylinder lock

with extension rod being reciprocable and engageable within a handle housing, the improvement comprising in combination,

inner handle means secured to a cylinder housing at the front end thereof and adapted to receive the cylinder front handle in mounting engagement therewith,

said inner handle means having attachment means associated therewith for accommodating the attachment of the cylinder front handle thereto in disengageable engagement,

said cylinder front handle provided with a pair of opposed threaded apertures in spaced apart relation traversing each of the side walls thereof and positioned to be in registry with said attachment means formed in said inner



handle means when the cylinder front handle is mounted onto said inner handle means,

and a pair of threaded screws for removably engaging the cylinder front handle to said inner handle means,

said threaded screws traversing through corresponding threaded apertures in each of the cylinder front handle side walls and engaging said attachment means in said inner handle means thereby to removably engage the cylinder front handle to said inner handle means,

whereby the cylinder front handle may be easily engaged and disengaged from said inner handle means to permit easy access to the lock assembly carried in the cylinder housing for servicing purposes

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4,835,995

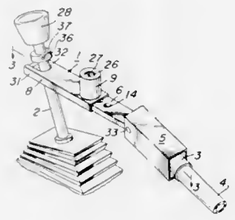
ANTI-THEFT DEVICE FOR AUTOMOBILES

Philip Chant, North Wales, Pa., assignor to Bluepoint Industries, Inc., Chalfont, Pa.

Continuation of Ser. No. 914,245, Oct. 2, 1986, abandoned. This application Aug. 10, 1988, Ser. No. 230,371

Int. Cl.[4] E05B *55/12*

U.S. Cl. 70—238 **11 Claims**



1. An anti-theft device for locking the shaft of an auto gear-shift lever to a parking brake which comprises:

(1) an elongated hollow body having a longitudinal chamber which includes a concavity for receiving the grip portion of a hand brake;

(2) a solid flat extension member of rectangular configuration hingedly secured within said chamber, said member having an upper surface, a lower surface, opposing sidewalls and opposing endwalls and including:

(a) a plurality of apertures which are serially arranged along a line to extend into said member;

(b) a longitudinal bore extending for about half the length of said member and having an axis parallel to and spaced from said aperture line and terminating in a bore opening which is adapted to receive the circular rod of the member described in (3) infra;

(c) a set screw and a threaded bore which is adapted to receive the set screw in perpendicular communication with said longitudinal bore;

(3) a generally F-shaped retaining member consisting essentially of a flat segment having an arcuate cutout to which has been joined a circular rod which is slidingly engaged within said longitudinal bore and which may be held in place by threadedly engaging said set screw within said threaded bore;

(4) a hollow elongated sleeve which slidingly receives said extension member, said sleeve having an upper surface, a lower surface and sidewall surfaces, including on said upper surface a lock equipped with a depressable plunger for engaging an aperture in said extension member and further including on said upper and lower surfaces at their terminal ends, arcuately shaped cutouts which lie in registry to receive the shaft of said gear shift lever.

4,836,000

LEVER TUMBLER LOCK

Jorma Hirvi, Eskilstuna, Sweden, assignor to AB Fas Lasfabrik, Eskilstuna, Sweden

Filed May 26, 1988, Ser. No. 199,669

Claims priority, application Sweden, Jun. 23, 1987, 8702599

Int. Cl.[4] E05B *25/02*

U.S. Cl. 70—352 **7 Claims**

1. A lever tumbler lock of the kind which includes a plurality of tumblers (2) which are displaceably mounted in a lock housing (1); a lock bolt (5) which, through the intermediary of a link arm mechanism 6 which is actuable by a key bit (13) can be displaced perpendicularly to the displacement direction of the tumblers between a first position, in which the bolt (5) projects from the housing (1), and a second position, in which the bolt is located fully within the housing; and a stop pin (7) which co-acts with the tumblers (2) in a manner to prevent movement of the bolt (5) when not all of the tumblers (2) have been displaced to their respective determined positions, displacement of respective tumblers (2) being effected responsive to the rotation of a key bit (13) inserted into a keyhole provided in the lock housing (1), said key bit during part of one revolution of the key co-acting with a cam surface (10) on respective tumblers in a manner to hold said tumblers in their determined positions for displacement of the bolt (5), and in which lock scrape marks caused by the key bit as it displaces the various tumblers will not divulge complete information concerning the configuration of the key bit, characterized by a device (11) which when a key bit (13) inserted in the lock housing (1) is turned will scrape against at least a part of the cam surface (10) of at least one tumbler (2) such as to produce on said cam surface (10) or cam surfaces (10) scrape marks which cover the scrape marks caused by corresponding cams (16, 17) on the key bit when the key is turned in the lock, at least at the beginning and the end of said scrape marks caused by said key bit.

4,836,001

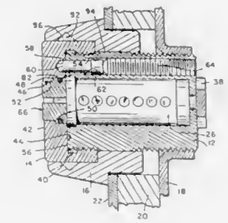
HIGH SECURITY LOCK

William R. Foshee, Noblesville, Ind., assignor to Best Lock Corporation, Indianapolis, Ind.

Continuation of Ser. No. 718,538, Apr. 1, 1985, abandoned. This application May 28, 1987, Ser. No. 55,185

Int. Cl.[4] E05B *27/00, 29/00*

U.S. Cl. 70—368 **11 Claims**



1. A lock comprising

a lock cylinder having an outer face, the cylinder being formed to include a bore having an opening in the outer face,

a key plug rotatably received in the bore and formed to include a key slot,

a cylinder cap having an inner face, the cylinder cap being mounted on the lock cylinder to position the inner face of the cap in closely-confronting relation to the outer face of the lock cylinder to protectively cover a portion of the outer face, the cylinder cap being formed to include a disc-receiving passageway extending between the outer and inner faces for alignment with a key plug, the cylinder cap having a radially inwardly projecting lip extending into the passageway, the cylinder cap further including flange means for lockably engaging the lock cylinder to block axial movement of the cylinder cap in relation to the lock cylinder,

a rotatable key-way disc including a cylinder member having an exterior cylindrical wall and being formed to include a second key slot for alignment with the first key slot of the key plug, the second key slot opening radially outwardly through the exterior cylindrical wall, and flange means for engaging the radially inwardly projecting lip of the cylinder cap to rotatably mount the key-way disc in the disc-receiving passageway adjacent to the key plug, the flange means including a rib member extending radially outwardly from the exterior cylindrical wall of the cylinder member and a bridge member coupled to the rib member to cover a portion of the key slot opening in the exterior cylindrical wall of the cylinder member, and

a cylinder ring having an interior wall for surrounding the exterior surfaces of the lock cylinder and cylinder cap to protect the cylinder and cap from external attack, the interior wall being provided by a layer of hardened material and formed to include a groove having an opening in the interior wall such that the cylinder ring groove opens toward at least one of the exterior surfaces of the lock cylinder and the cylinder cap when said cylinder and cap are surrounded by the cylinder ring.

8. A lock comprising

a lock cylinder having an exterior surface,

a cylinder cap mounted on the lock cylinder, the cylinder cap having a radially outward presented exterior surface, and

a cylinder ring having an interior wall for surrounding the exterior surfaces of the lock cylinder and cylinder cap to protect the cylinder and cap from external attack, the interior wall being formed to include a groove opening toward the exterior surface of the cylinder cap, the groove being defined by first and second walls, each wall being oriented at an acute angle with respect to the exterior surface of the cylinder cap.

4,836,002

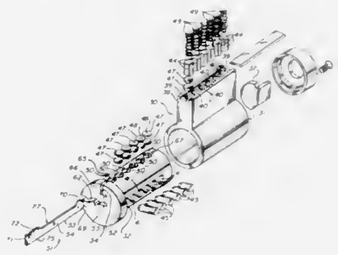
PROGRAMMABLE LOCK APPARATUS AND METHOD

Brian J. Monahan, 28895 Cragmont Dr., Evergreen, Colo. 80439

Filed Jul. 1, 1987, Ser. No. 70,350

Int. Cl.[4] E05B *25/00*

U.S. Cl. 70—382 **45 Claims**



1. In a randomly programmable lock for use with a first change key and a second randomly selectable change key, said lock including latch means controlled by said lock, a housing, means movable in said housing for operating said latch means, said housing and said movable means having therein first pinway means for forming a plurality of first pinways intersected by a shear interface, said first pinway means having housing pinway portions extending in said housing, and first pin means received in said plurality of pinways for selective movement across said shear interface to prevent and permit movement of said movable means in said housing; the improvement comprising:

second pin means for randomly selectable movement across said shear interface;

second pinway means formed in said movable means corresponding to each of said first pinways means in said housing for receiving said second pin means; and

means intersecting said second pinway means for randomly and selectively moving said second pin means across said shear interface into at least one randomly selectable one of said first pinways in said housing to interpose said randomly selectable one of said second pin means between said first pin means received in a randomly selectable one of said first pinways to require use of said randomly selectable second change key to permit movement of said movable means in said housing and to render said first change key ineffective to move said movable means in said housing.

4,836,003

SYSTEM FOR PROVIDING A LIQUID TO A BLIND RIVET SETTING MECHANISM

Jeffrey T. Blake, Milford, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Sep. 14, 1988, Ser. No. 244,751

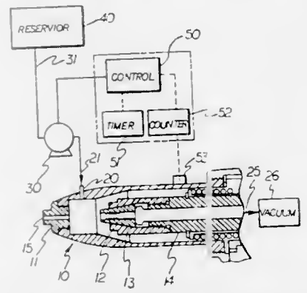
Int. Cl.[4] B21C *9/00*

U.S. Cl. 72—44 **8 Claims**

1. A system for providing a liquid to a rivet setting mechanism of a blind rivet setting tool for lubricating, cleaning, or cooling said mechanism which system comprises:

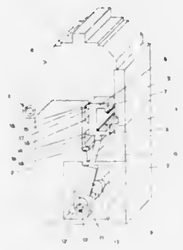
a reservoir of a liquid;

metering means for providing a predetermined amount of liquid to said rivet setting mechanism;
control means for controlling the intervals at which said predetermined amount of liquid is provided to said rivet setting mechanism; and



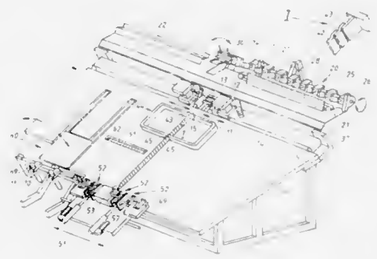
vacuum means for dispersing the liquid throughout the rivet setting mechanism, and removing used liquid and contaminants from said rivet setting mechanism.

4,836,004
FOLDING PRESS FOR PLATES
Antonio Codatto, Via Alcide de Gasperi 20, Lonigo (Vicenza), Italy
Filed Jul. 1, 1988, Ser. No. 214,413
Claims priority, application Italy, Jul. 3, 1987, 85572 A/87
Int. Cl.[4] B21D *5/04*
U.S. Cl. 72—323 4 Claims



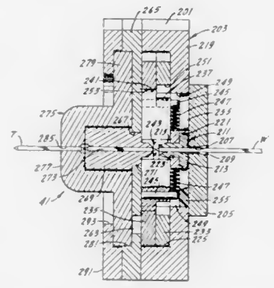
1. A folding press for a plate which comprises a fixed lower counterblade (1) and an upper counter blade (5) which is movable in the vertical direction with respect to said lower counterblade, said counterblade (1) and said counterblade (5) being adapted to hold a plate (19) therebetween, a cutter block (6) having a rear surface and being movable in the vertical direction with respect to said counterblades, a pair of folding blades (7), (8) capable of manufacturing panels folded along at least one side by action on a portion of the plate and protruding from said upper and said lower counterblades, said folding blades being supported by said cutter block at its extremities, a fixed L-shaped structure (2) defined by a vertical part and a horizontal part in the rear of said press, said structure (2) having a vertical extension (2') at the end of its horizontal part, said vertical extension being fixed to said lower counterblade (1), a support (4) in the upper part of said press pivoted at the rear thereof to said fixed structer (2'), said upper counterblade (5) being fixed in the front part thereof to said structure (2), said cutter block (6) being located in the space comprised between said fixed structure (2), said support (4) and said counterblades (1) and (5), said cutter block (6) being C-shaped and being actuated in the vertical direction by at least one essentially vertical shaft (10), said shaft (10) being actuated by a fluid-dynamic cylinder (9) located in the horizontal part of said L-shaped structure (2), said shaft (10) being pivoted at its upper end onto the lower surface of said cutter block, said cutter block having on the rear surface thereof a plurality of rolling elements (14) and (15) having a radius of curvature, at least one track (16) and (17) disposed essentially in the verticle direction behind said rolling elements and on said vertical part of said fixed L-shaped structure, said rolling elements travelling on said track, said track having portions of curved shape at the extemites, said portions at said extremities (18) of said track having a curved profile, said curved profile having a radius of curvature which is greater than the radius of curvature of said rolling elements (15), said portions of the extremities of said track being placed at such a level whereby a curvilinear motion of the cutter block (6) results when the upper blade (7) or the lower blade (8) is placed in front of said counterblades, said cylinder (9) having a lower extremity, said press comprising means capable of continuously varying the position of the lower extremity of said cylinder (9).

4,836,005
APPARATUS FOR THE PRODUCTION OF SPACER FRAMES
Peter Lisec, Bahnhofstrasse 34, A-3363 Amstetten-Hausmening, Austria
Filed Apr. 12, 1988, Ser. No. 180,827
Claims priority, application Austria, May 11, 1987, 1182/87
Int. Cl.[4] B21D *7/02, 43/00*
U.S. Cl. 72—306 11 Claims



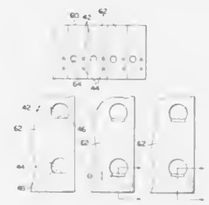
1. Apparatus for the production of spacer frames for insulating glass from a hollow molding, comprising a plate (10), two bending heads (12) positioned along an edge portion of said plate (10), said bending heads capable of being displaced along an axis both toward and away from one another along said edge portion to position said bending heads relative to said hollow molding at spaced locations, a clamp (13) for the hollow molding between said bending heads, means (20) for the conveying of said hollow moldings along a conveying direction parallel to said axis, said conveying means extending parallel to said edge portion of the plate (10) on which the bendings heads (12) are arranged, and a gripper (30) for transferring hollow moldings from the conveying means (20) to the clamp (13) and the bending heads (12), said gripper being rotatable about an axis (33) parallel to both the longitudinal axis of said hollow moldings and the conveying direction so as to move said hollow molding through an arc from said conveying means to said clamp.

4,836,006
TERMINAL FORMING APPARATUS
Maurice H. Brown, 11700 S. Mayfield, Worth, Ill. 60482
Filed Dec. 30, 1987, Ser. No. 139,660
Int. Cl.[4] B21F *45/00*
U.S. Cl. 721—338 16 Claims



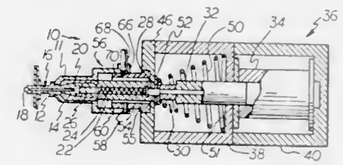
1. A method of continuously forming pointed terminals from a length of wire having a leading end, including the steps of:
moving the length of wire in the direction of its leading end to a position wherein a portion of the length of the wire located at a predetermined distance rearwardly of the leading end of the wire is positioned between at least one pair of opposed swedges,
closing the pair of swedges to engage and deform the portion of the wire positioned therebetween,
moving the length of wire in the direction of its leading end to locate the deformed portion of the wire at a wire severing location and a trailing portion of the length of the wire between the pair of opposed swedges,
twisting the wire about its axis relative to the deformed portion at said wire severing location to separate the section of wire extending from the leading end of the length of wire to the deformed portion to form a pointed terminal,
simultaneously with said twisting step, closing the pair of swedges to engage and deform the trailing portion of the wire positioned therebetween, and
repeating the foregoing steps.

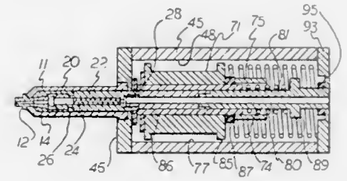
4,836,007
METHOD OF FORMING A NUT-LIKE MEMBER
August J. Saccoccio, 126 Phenix Ave., Cranston, R.I. 02920
Division of Ser. No. 904,460, Sep. 8, 1986, Pat. No. 4,756,168.
This application May 2, 1988, Ser. No. 189,299
Int. Cl.[4] B21D *53/24*
U.S. Cl. 72—379 6 Claims



1. The method of forming a nut-like member from an elongated strip of formable sheet material such as sheet metal comprising cutting a pair of vertically spaced openings in said strip, said openings being generally circular, forming at least one flat chordally extending across the inner periphery of each of said openings, progressively reforming said flats so as to form generally V-shaped running edges thereon and thereafter bending said strip into a generally U-shaped loop having two opposed generally flat, sheet-like, and generally rigid leg segments such that each of said openings are positioned in one of said leg segments and said openings are axially aligned for receipt of a threaded screw therethrough in a manner wherein said V-shaped running edges threadably engage said screw at at least two axially spaced points therealong.

4,836,008
SOLENOID POWERED RIVETING TOOL
Richard G. Weber, Ridgefield, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.
Continuation of Ser. No. 139,356, Dec. 30, 1987, abandoned.
This application Jan. 23, 1989, Ser. No. 300,147
Int. Cl.[4] B21J *15/24*
U.S. Cl. 72—391 13 Claims





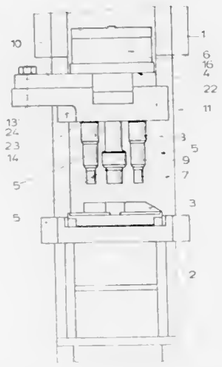
1. An electromagnetically powered blind rivet setting tool comprising:
rivet engaging means for engaging a rivet mandrel
sliding element means for moving with said rivet engaging means between advanced and retracted positions, said sliding element means comprising a nose housing in which said rivet engaging means is located;
stop means for colliding with said sliding element means when said rivet engaging means reaches the retracted position to provide an impulse force, said stop means comprising a sleeve, said nose housing being slideably mounted thereto;
solenoid means linked to said rivet engaging means for moving said rivet engaging means and sliding element means and adapted such that upon energizing said solenoid means, said sliding element means moves with said rivet engaging means from the advanced to the retracted position;
wherein said sliding element means and rivet engaging means have sufficient mass, and said solenoid means has sufficient pulling force to accelerate said sliding element means and rivet engaging means such that upon collision with said stop means a sufficiently large impulse force is created to break the rivet mandrel.

4,836,009

UPPER TOOL SUPPORT FOR A STAMPING MACHINE OR THE LIKE

Karl-Heinz Schulte, Lennestadt, Fed. Rep. of Germany, assignor to Muhr und Bender, Atterdorn, Fed. Rep. of Germany

Filed Oct. 22, 1987, Ser. No. 111,723
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1986, 3637486
Int. Cl.[4] B21D *37/04, 28/14, 28/34*
U.S. Cl. 72—446 8 Claims



1. An upper tool support for a stamping machine or the like, supporting at least two adjacently located stamping tools for stamping in a stamping direction, comprising

a support body having a power transfer area, and

a locking cap supported by and fastened to said support body, said locking cap being removable from said support body in a plane perpendicular to said stamping direction,

wherein said locking cap carries a receiving plate extending in said perpendicular plane including tool guides disposed next to each other therein for movably guiding upper ends of said stamping tools in said stamping direction, said tool guides extending in said stamping direction and being annularly closed in said perpendicular plane with respect to said stamping direction, and

wherein said stamping tools are insertable into and removable from said tool guides in said receiving plate of said locking cap by moving each said stamping tool in said stamping direction, which is in a direction perpendicular to said receiving plate, when said locking cap is removed from said support body.

4,836,010

FLOOR PULLER TO STRAIGHTEN A BENT MEMBER

Thomas S. Papesh, 1915 N. Broadway, Crest Hill, Ill. 60435

Filed Feb. 10, 1988, Ser. No. 154,541
Int. Cl.[4] B21D *01/12*
U.S. Cl. 72—447 19 Claims

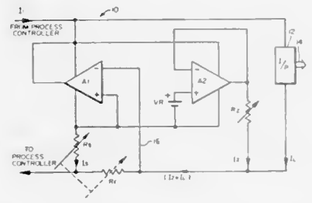
1. A pulling device to straighten a bent member, comprising a vertically extending support member, a pulling mechanism supported thereon, said pulling mechanism including an elongated reciprocating member mounted for reciprocating movement between an extended position for connection to said bent member and a retracted position for pulling said bent member to straighten it, said elongated reciprocating member including a pulling end for connection to said bent member and an operating end connected to a power source, including first connecting means to connect said pulling end to said bent member and second connecting means to connect said operating end to a power source, including a said power source to move said reciprocating member from its said extended position toward its said retracted position, said reciprocating member being also mounted for movement of its said pulling end and operating end into alignment with the direction of pull when said pulling end is connected to said bent member and said power source connected to said operating end moves said reciprocating member from its said extended position toward its said retracted position, holding means to hold said support member against movement in the direction toward said bent member which is being pulled when said reciprocating member supported on said support member is being moved from its said extended toward its said retracted position, said power source including a ram member having a pivotal end and an opposite end, said opposite end of said ram being connected to said operating end of said elongated reciprocating member, a pivot pin supported on said vertically extending support member to extend horizontally in a direction normal to that of said vertically extending support member, said pivotal end of said ram member being positioned for arcuate movement around said horizontally extending pivot pin, said elongated reciprocating member including pivot connection means to pivotally connect said elongated reciprocating member on said horizontally extending pivot pin whereby external rotational forces applied to said elongated reciprocating member will center on the same horizontally extending pivot axis as that of said horizontally extending pivot pin.

4,836,011

ZERO AND SPAN ADJUSTMENT CIRCUIT FOR CURRENT/PRESSURE TRANSDUCER

Ferdinand Dombrowski, Marshalltown, Iowa, and Dieter Forster, Haan, Fed. Rep. of Germany, assignors to Fisher Controls International, Inc., Clayton, Mo.

Filed Nov. 12, 1987, Ser. No. 119,836
Int. Cl.[4] G01L *27/00*
U.S. Cl. 73—4 R 8 Claims



1. In a current/pressure transducer for responding to an input current signal (Ii) and providing a corresponding output pressure, the improvement of a zero and span circuit for adjusting the zero setting of the output pressure and for adjusting the span of the output pressure in response to the input current signal, said improvement comprising:

a first current source coupled to said input current signal;

a second current source coupled to said input current signal;

means for connecting said first and second current sources in parallel with each other and with said current/pressure transducer to bypass combined respective currents (IZ +IS) forming a first current portion (IZ +IS) of said input current signal (Ii) around said current/pressure transducer and to enable a second current portion (IL) of said input current signal (Ii) to pass through said current/-pressure transducer;

said first current source including zero adjustment means for adjusting the level of said respective current (IZ) and thereby of said second current portion (IL) to correspond with said adjusting of the zero setting of the output pressure; and

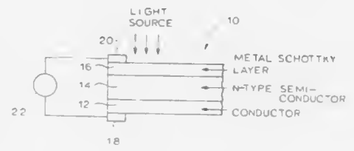
said second current source including span adjustment means for adjusting the level of said second current portion (IL) to correspond with said adjusting of the span of the output pressure in response to the input current signal (Ii).

4,836,012

GAS SENSOR

Mitchell E. Doty, Chalfont, and Ferenc J. Schmidt, Bryn Mawr, both of Pa., assignors to Ametek, Inc., Harleysville, Pa.

Filed May 26, 1988, Ser. No. 199,123
Int. Cl.[4] G01N *27/00*
U.S. Cl. 73—23 64 Claims



1. A gas sensing device comprising a photovoltaic cell which, upon exposure to light, develops a photovoltage or photocurrent which varies as a function of the type of gas sorbed, included in order:

(i) a conductor,

(ii) an N-type light-absorbing semiconductor,

(iii) a light-transmitting gas-absorbing insulating layer of a dielectric having an electrical property which varies with the type of gas sorbed therein, said dielectric being selected from the group consisting of phthalocyanine and clathrating agents; and

(iv) a light-transmitting gas-penetrable metal Schottky layer.

30. A method of sensing gas comprising the steps of:

(A) providing a photovoltaic cell which, upon exposure to light, develops a photovoltage or photocurrent which varies as a function of the type of gas sorbed, including in order, a conductor, an N-type light-absorbing semiconductor, and a light-transmitting gas-absorbing metal Schottky layer having an electrical property which varies with the type of gas absorbed therein;

(B) exposing the gas-absorbing metal Schottky layer to the gas and the N-type light-absorbing semiconductor to the light; and

(C) correlating the photovoltage or photocurrent as a function of the type of gas sorbed by the metal Schottky layer.

4,836,013

DEVICE INTENDED FOR TESTING THE MECHANICAL STRENGTH OF PRESSURIZED CONTAINERS IN A HOT CONDITION

Daniel Constantin, Paris, France, assignor to L'Oreal, Paris, France

Filed Oct. 14, 1987, Ser. No. 109,262
Claims priority, application France, Oct. 31, 1986, 86 15173
Int. Cl.[4] G01M *3/04*
U.S. Cl. 73—41 15 Claims

1. In a device for the continuous hot testing of the mechanical strength of each pressurized container of a series of pressurized containers, said device comprising:

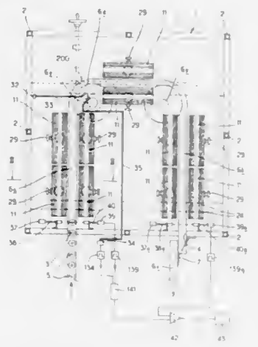
(a) a fixed enclosure;

(b) a conveyor for displacing the containers to be tested translationally in relation to the fixed enclosure; and

(c) heating means within the enclosure, the containers traversing said enclosure in use of the conveyor so that their internal temperature is raised by said heating means up to a predetermined value;

the improvement wherein:

said enclosure traversed by the containers to be tested forms a tunnel;



said heating means within said enclosure are constituted by a plurality of infrared lamps, each of which is protected by a casing having one side transparent to the emitted radiation; and

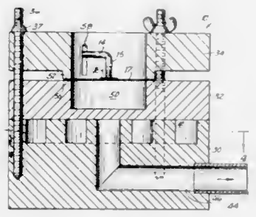
said device includes an automatic monitoring device effective to ensure that each container which enters the tunnel emerges therefrom after a given advance of the conveyor and to trigger a safety device in the absence of such a container.

4,836,014

SIMULATED IN VIVO MEASUREMENT OF SKIN CHARACTERISTICS

Peter Hilliard, Bethel, Conn., assignor to Clairol Incorporated, New York, N.Y.

Filed Mar. 22, 1988, Ser. No. 171,594
Int. Cl.[4] G01N *5/04*
U.S. Cl. 73—76 13 Claims



1. In a method of measuring a characteristic property of a sample of skin comprising the step of determining a predetermined parameter associated with said characteristic, the improvement comprising the steps of:

(a) supporting the skin sample over a chamber having an open top and containing a predetermined liquid, the liquid being contiguous with one side of the skin sample, and

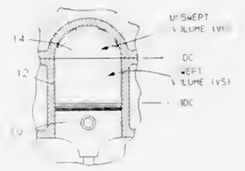
(b) maintaining the liquid at a predetermined temperature for a predetermined time.

4,836,015

METHOD AND APPARATUS FOR DETERMINING THE COMPRESSION RATIO OF AN ENGINE CYLINDER

Mark K. Krage, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 14, 1988, Ser. No. 206,444
Int. Cl.[4] G01M *1/00*
U.S. Cl. 73—117.2 4 Claims



1. A method of determining the compression ratio of a cylinder of an internal combustion engine, the steps comprising, driving the engine, while the engine is being driven sensing the pressure in the cylinder and consecutively occurring positions of the piston of the engine as the piston moves a distance corresponding to the distance between the bottom dead center and top dead center positions of the piston, developing and storing an electrical waveform in response to the sensing of the pressure and in response to the sensing of the consecutively occurring piston positions that represent cylinder pressure values as a function of piston position, said engine having an unswept volume VU and a swept volume VS corresponding to movement of the piston between said positions, said the equation $PV^n=C$, where n and C are constants, where P equals cylinder pressure and where V equals cylinder volume, said volume V for a given piston position being equal to VU+VSD where VSD is a piston dependent volume that has a piston position dependent relationship to the swept volume VS of the cylinder, determining VSD for each piston position, determining a value of VU which would cause a hypothetical waveform to be developed that substantially coincides with the developed waveform where the hypothetical waveform is defined by the equation $P(VSD+VU)^n=C$, and then computing compression ratio utilizing the determined value of VU.

4,836,016

METHOD AND APPARATUS FOR DETECTING ABNORMAL STATE IN PULSE TRAIN GENERATING SENSOR

Jiro Nakano, Okazaki, and Yoshizo Ito, Toyota, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

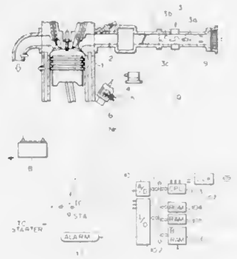
Continuation of Ser. No. 894,897, Aug. 8, 1986, abandoned. This application Apr. 14, 1988, Ser. No. 183,520
Claims priority, application Japan, Aug. 10, 1985, 60-174999; Sep. 2, 1985, 60-191899; Apr. 14, 1985, 61-84060
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—118.1 24 Claims

13. An apparatus for detecting an abnormal state of an airflow sensor which generates a pulse signal according to a flow rate of engine intake air in an internal combustion engine, comprising:

means for detecting a rotational speed of said engine;

means for measuring a first time period during which said engine rotational speed is larger than a reference speed;

means for resetting said first time period at every rise or fall of said pulse signal; and



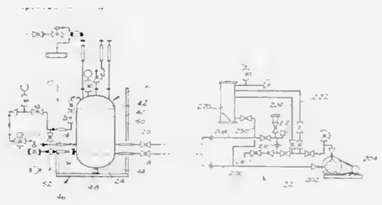
means for generating an abnormal state signal when said first time period is larger than a predetermined time period.

4,836,017

METHOD AND APPARATUS FOR DETERMINING OIL CONTENT OF OIL WELL PRODUCTION

Daryn S. Bozek, Lloydminster, Canada, assignor to Universal Industries Ltd., Lloydminster, Canada

Filed Jun. 8, 1987, Ser. No. 59,668
Int. Cl.[4] C21B *47/00*
U.S. Cl. 73—155 31 Claims



1. A method of measuring the oil content in the gross oil production of an oil well in which the percentage of solids content thereof is known, said method comprising the steps of:

a. introducing a predetermined weight of well production into said vessel;

b. determining the weight of the vessel and the time interval required to introduce said predetermined weight of well production into said vessel;

c. determining the total well production flow rate of said well production into said vessel during said time interval;

d. electromagnetically determining through the use of an electromagnetic monitoring device the percentage water content in said well production;

e. determining from said percentage water content the water flow rate into said vessel during said time interval; and

f. determining from said known percentage solids content the solids flow rate into said vessel during said time interval; and

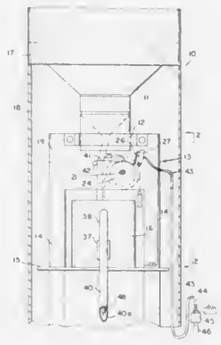
g. determining the percentage oil content in said well production by deducting said solids flow rate from said total well production flow rate.

4,836,018

RAIN GAUGE WITH IMPROVED SYPHON DISCHARGE

Charles Dispenza, 78-B Newark Way, Maplewood, N.J. 07040

Filed Oct. 17, 1988, Ser. No. 258,806
Int. Cl.[4] G01W *1/14*
U.S. Cl. 73—171 9 Claims



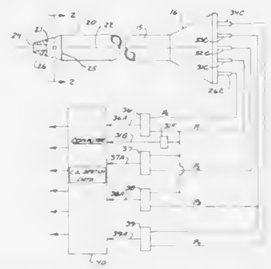
1. A rain gauge comprising a large rain collector feeding collected rain into a cylindrical receptacle having 1/5 the cross-sectional area, a float within said receptacle and counterweight externally thereof connected by a flexible strand passing over a pulley mechanism which through micro switch and relay creates electrical impulses with each 1/100 inch of rainfall added to the receptacle, said receptacle having connected to the lower portion thereof the short intake leg of a generally U-shaped syphon tube having a longer discharge leg extending substantially below the base of said receptacle, wherein complete emptying of the syphon tube is facilitated by incorporating within the discharge leg thereof a small diameter tube, closed at the top end, open at the bottom end, and having a plurality of small holes spaced longitudinally thereof, whereby air entering the small tube and passing through the longitudinally spaced holes therein, serves to equalize air pressure and permit the full discharge of liquid from the syphon tube.

4,836,019

COMPACT AIR DATA SENSOR

Floyd W. Hagen, Edeo Prairie, and Richard V. DeLeo, Hopkins, both of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Filed Aug. 27, 1987, Ser. No. 89,971
Int. Cl.[4] G01C *21/00*
U.S. Cl. 73—180 21 Claims



1. A longitudinally shortened pressure sensing probe comprising a barrel having first and second ends, means for supporting the second end of said barrel relative to an air vehicle in a desired orientation, said barrel having a longitudinal axis, and the first end of said barrel having a tapered leading end section, said tapered leading end section being generated about said longitudinal axis and extending for an axial length of not substantially greater than six times the minimum lateral dimension of a main part of said barrel downstream of the tapered leading end section measured perpendicular to said longitudinal axis;

a pitot port defined in the barrel and opening at a leading end of the tapered leading end section, said pitot port being defined by surface means extending at an angle with respect to the longitudinal axis to form a sharp peripheral edge on the pitot port, the surface tapering toward the axis in downstream direction;

a plurality of port means formed through the tapered leading end section ahead of the junction of the tapered leading end section and the main part of the barrel, said port means comprising at least two oppositely facing ports means that are centered on axes perpendicular to the longitudinal axis of the barrel, with the port means sensing pressures on opposite sides of the barrel, the common axis being oriented in a desired manner when the barrel is mounted on an air vehicle; and

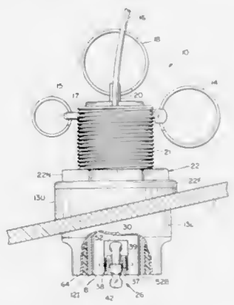
said leading end section comprising an enclosing surface formed so that cross sections taken through the longitudinal axis show the enclosing surface to have a longitudinal axial length of at least 1½ times the minimum radial dimension at the location of the port means and to smoothly expand throughout the longitudinal length of the tapered leading end section.

4,836,020

MARINE INSTRUMENT

Stephen G. Boucher, Amherst, N.H., assignor to Airmar Technology Corporation, Milford, N.H.

Continuation of Ser. No. 7,527, Jan. 28, 1987, abandoned. This application Mar. 31, 1988, Ser. No. 178,898
Int. Cl.[4] G01C *21/12*
U.S. Cl. 73—187 20 Claims



1. A marine speed sensor comprising:

(a) a housing having an upper vertically extending portion and a lower horizontally extending portion, said horizontally extending portion including an aft, a bow, and an intermediate section;

(b) means for mounting the housing through an opening in the hull of a marine vehicle, such that the upper portion extends through the hull into the vessel and the lower portion projects below the hull;

(c) a paddlewheel having a plurality of magnetized paddles extending from a central hub, said paddlewheel being mounted within a cavity formed within the lower portion of the housing for rotation about an axle extending through said hub along an axis transverse an axis extending longitudinally between the bow and aft sections, the

lowest portion of the periphery of said hub being located within the cavity and tangentially aligned with or vertically above the bottom surface of the lowest portion of said housing; and

(d) sensor means for sensing variations in the magnetic field as the paddles rotate.

4,836,021

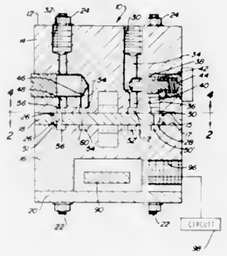
FLUID FLOW METER

Lars O. Rosaen, Plymouth, Mich., assignor to Universal Flow Monitors Inc., Hazel Park, Mich

Filed Mar. 19, 1987, Ser. No. 27,849

Int. Cl.[4] G01F *3/04*

U.S. Cl. 73—259 **6 Claims**



1. A flow meter comprising

a housing having an inlet, and outlet, and a substantially cylindrical chamber, said inlet and said outlet being open to said housing chamber at angularly spaced positions so that said housing chamber is fluidly connected in series between said inlet and said outlet, said chamber having an outer wall,

a rotor rotatably mounted to said housing within said chamber, said rotor having an axis of rotation offset from the center of said housing chamber,

a plurality of vanes, each vane being radially slidably mounted to said rotor, each vane having an inner end and an outer end, said outer end of each vane adapted to contact said outer chamber wall,

means for urging said vanes radially outwardly from said rotor,

means for detecting rotation of said rotor,

wherein said urging means comprises means for creating a differential fluid pressure between the inner and outer ends of said vanes so that the fluid pressure at the inner ends of said vanes exceeds the fluid pressure at the outer ends of said vanes,

wherein said inlet is open to a first passageway and a second passageway, said first passageway being open to the inner ends of said vanes along a portion of said housing chamber and said second passageway being open to an outer periphery of said rotor along a portion of said housing chamber, and wherein said differential pressure creating means comprises a check valve between said passageways.

4,836,022

BI-COLOR FLUVIOGRAPH OF TRANSMISSION AND REFLECTION TYPE

Long N. Zhang, Man Rong Cun, Hun He Zhan Xiang, Dong Ling Qu, Shen Yang City, Liao Ning Province, China

Filed Jul. 9, 1987, Ser. No. 71,499

Int. Cl.[4] G01I *23/02*

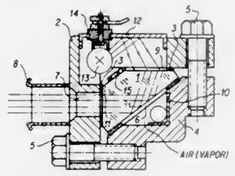
U.S. Cl. 73—293 **7 Claims**

1. A bi-color fluviograph of a transmission and reflection type comprising:

a housing;

a viewing window disposed on one side of the housing;

a prism disposed in said housing, said prism having the cross-sectional shape on a non-equilateral right triangle having first and second sides and a base with said first side facing said viewing window, wherein the apex of said right triangle prism is beveled to form a small plane parallel to the base of the prism; and



a light source disposed in said housing for projecting light onto said second side and said small plane of said prism, and

wherein an interior wall of said housing, on an opposite said of said prism from said viewing window, is red, and said second side of the prism is green, wherein fluid to be measured flows into said housing between said base and said red colored wall.

4,836,023

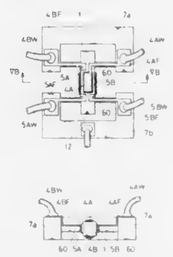
VIBRATIONAL ANGULAR RATE SENSOR

Takahiro Oikawa, Susono, Japan, assignor to Yazaki Corporation, Japan

Filed Mar. 9, 1988, Ser. No. 165,797

Int. Cl.[4] G01P *9/04*

U.S. Cl. 73—505 **4 Claims**



1. A vibrational angular rate sensor, comprising:

(a) a vibrator of square pillar shape;

(b) means for node-supporting said vibrator at two vibration nodes of said vibrator;

(c) means for external support of said vibrator via said vibrator node-supporting means;

(d) said vibrator, said vibrator mode-supporting means, and said vibrator external support means all being formed integral with each other from a single material block;

(e) at least three piezoelectric elements attached to at least three side surfaces of said square pillar shaped vibrator; and

(f) at least three thin film conductive layers each extending along one of said vibrator node-supporting means from one of said at least three piezoelectric elements to said external vibrator supporting means so as to be connectable to an external fine conductive wire.

4,836,024

IMPACT SENSOR FOR MOTOR VEHICLES OR THE LIKE

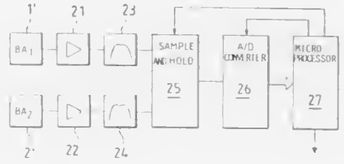
Alfons Woehrl, and Peter Hora, both of Schrobenhausen, Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow Blohm GmbH, Munich, Fed. Rep. of Germany

Filed May 20, 1988, Ser. No. 196,328

Claims priority, application Fed. Rep. of Germany, May 23, 1987, 3717427

Int. Cl.[4] B60R *21/08*

U.S. Cl. 73—514 **10 Claims**



1. An impact sensor, especially for sensing a collision of a motor vehicle or the like travelling in a forward driving direction (R), comprising a plurality of acceleration detectors each having a sensitivity axis oriented in a different direction and each generating an output signal in response to an impact, a separate signal evaluating circuit means connected to each detector for individually evaluating each of said output signals to determine whether it exceeds a preliminary threshold value (a, a') and then to generate an evaluated output signal (V, V'), means for providing a first threshold value and means for providing a second threshold value, whereby said first threshold value is larger than said second threshold value, and signal validating means connected to said signal evaluating means for generating a control signal for activating passive safety devices if an evaluated output signal generated by at least one of said signal evaluating circuit means is larger than said first threshold value and simultaneously a further evaluated output signal generated by another signal evaluating circuit means is larger than said second threshold value.

4,836,025

ACCELEROMETER

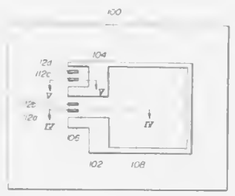
Teruyoshi Mihara, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 13, 1987, Ser. No. 25,713

Claims priority, application Japan, Mar. 14, 1986, 61-54974

Int. Cl.[4] G01P *15/12*

U.S. Cl. 73—517 R **8 Claims**



1. In an accelerometer.

a body formed of a semiconductive material;

means defining an aperture in said body;

first and second tongue-like portions extending from said body into said aperture, said first and second portions having the same thickness, said thickness being less than the thickness of said body;

a mass formed at the end of said first portion;

strain measuring piezo resistance formed on said first portion, said piezo resistances being subject to strain when said accelerometer is subject to an accelerative force which acts on said mass element and causes said first portion to flex; and

temperature compensating piezo resistances formed on said second portion, said temperature compensating resistances being free from strain when said strain measuring resistances are flexed by said accelerative force.

4,836,026

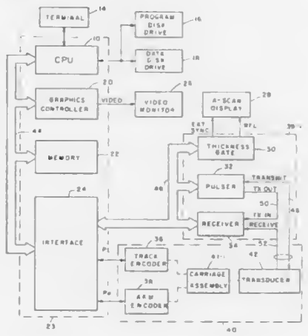
ULTRASONIC IMAGING SYSTEM

Charles T. Phan, Mystic; Dean E. Christie, Ledyard, and Robert H. Grills, New London, all of Conn., assignors to Science Applications International Corporation, LaJolla, Calif.

Filed Jun. 1, 1984, Ser. No. 616,351

Int. Cl.[4] G01N *29/00*

U.S. Cl. 73—620 **11 Claims**



1. A method for video contrast imaging a workpiece in real time with ultrasonic scanning means positioned in proximity to the workpiece and carrying transducer means which are adapted to scan an area of the workpiece with ultrasonic pulses and which are adapted to detect ultrasonic echoes caused by said pulses, said scanning means adapted to convert said echoes into values of image data, said imaging method comprising:

(a) storing an image data value for a grid position, taken in real time from a scanning movement of said scanning means, in a scan data memory cell;

(b) comparing the stored image data value with a programmable range of contrast values ordered such that different values of the stored image data correspond to different contrast values;

(c) selecting the contrast value corresponding to a stored value of image data;

(d) storing that contrast value in real time in a video memory;

(e) storing a pixel position in said video memory corresponding to said element position;

(f) displaying the stored contrast values on a video display at the pixel locations stored in said video memory; and

repeating steps a-f for every grid position scanned by said scanning means during a scan movement.

4,836,027

CIRCUIT FOR A SENSOR

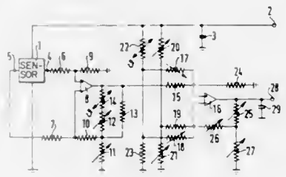
Joachim Hannappel, Waldbrunn, and Thomas Pfeifer, Eppstein, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Framkfurt am Main, Fed. Rep. of Germany

Filed Nov. 20, 1987, Ser. No. 123,974

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1986, 3640242

Int. Cl.[4] G01L *1/04*

U.S. Cl. 73—708 **8 Claims**



1. A compensation circuit for a sensor, the sensor having an output signal dependent on temperature as well as on a variable to be measured, the circuit comprising
an amplifier having a temperature-dependent amplification factor and being connected to an output of the sensor;
an adder circuit;
a source of a temperature dependent voltage, an output of the amplifier being connected to the adder circuit, and the temperature-dependent voltage being fed to the adder circuit for outputting a compensated sensor signal from the adder circuit; and wherein
said amplifier is a differential amplifier having a feedback branch comprising a temperature-dependent resistor; and
the sensor has two terminals which form the output of the sensor and are connected to to an inverting input and a non-inverting input of the differential amplifier; the circuit further comprising
a first adjustable resistor connected in series with the temperature-dependent resistor; and
a second adjustable resistor connected in parallel with the first adjustable resistor.

4,836,028

PRESSURE TRANSDUCER

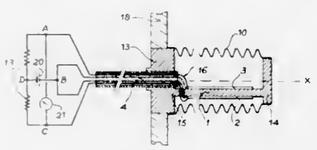
Bernard Voituriez, Grenoble, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Aug. 3, 1987, Ser. No. 81,297

Claims priority, application France Aug. 4, 1986, 86 11272

Int. Cl.[4] G01L *7/10, 9/04*

U.S. Cl. 73—726 **6 Claims**



1. A pressure transducer comprising:
an elastic material strip (1) having a rectangular section, whereof the bending or deflection is dependent on the pressure to be measured, which supports two active extensometric gauges (2, 3) or extensometers and is extended at one end by a first solid part (13) and at the other by a second solid part (14) in such a way that the strip (1) is off centered or offset with respect to said solid parts, whereof the first solid part (13) is used for maintaining the strip in the transducer and whereof the second solid part (14) is subject to the pressure to be measured and tranmits compressive and bending deformations to the strip, said deformations being substantially uniform over the length of the strip, said strip and parts being made from a single block of elastic material; and
an envelope (10) insulating the strip from the external medium and fixed to the two solid parts (14, 13) defining a hermetic space around the strip (1) and a portion of said second solid part (14), the envelope having a negligible rigidity with respect to the bending of the strip (1), but being able to withstand the pressure of the external medium on its outer surface.

4,836,029

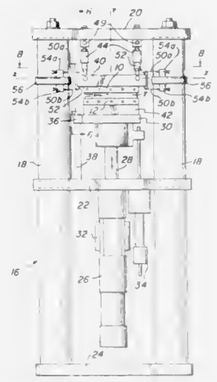
METHOD AND APPARATUS FOR MEASURING CRACK GROWTH

Dennis P. Skala, Fairview, and John W. Kloss, North East, both of Pa., assignors to Lord Corporation, Erie, Pa.

Filed Mar. 25, 1988, Ser. No. 173,341

Int. Cl.[4] G01N *19/08*

U.S. Cl. 73—799 **17 Claims**



1. A method for testing an elongate elastomeric specimen of a preselected length, comprising the steps of:
fixing the long edges of the specimen contiguous to parallel rigid members;
fixing one of the members at two points adjacent the respective ends of the specimen;
inducing a crack in the specimen;
stretching the specimen with a tensile force applied to the other of the members, the stretching force being uniformly distributed along the length of the uncracked portion of the specimen;
measuring the respective tensile forces at said points; and
computing the crack length as a function of the specimen length and the measured forces.

4,836,030

METHOD OF TESTING COMPOSITE MATERIALS FOR STRUCTURAL DAMAGE

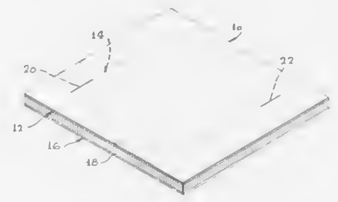
David A. Martin, St. Petersburg, Fla., assignor to Lockheed Corporation, Calabasas, Calif.

Filed May 20, 1985, Ser. No. 735,619

Int. Cl.[4] G01L *1/24*

U.S. Cl. 73—800 **9 Claims**

1. A method of detecting non-molded defects or damage in structural components of composite construction, comprising the steps of
embedding a predetermined length of at least one optical fiber within a composite component, comprising the steps of:
forming at least one layer of film adhesive having at least one optical fiber of a predetermined length embedded therein;
thereafter forming said composite component having said at least one layer of film adhesive incorporated therein;
introducing electromagnetic radiation of a known intensity into a first end of said at least one optical fiber,



detecting and measuring the intensity of the radiation emitted from said at least one optical fiber at a second end thereof,
and comparing the intensity of the detected radiation with the intensity of a reference or detecting the presence or absence of radiation emitted from said at least one optical fiber at a second end thereof.

4,836,031

METHOD AND APPARATUS FOR MEASURING DEFORMATIONS OF TEST SAMPLES IN TESTING MACHINES

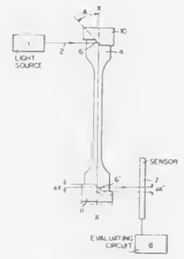
Ralf Jatho, Seeheim-Jugenheim; Gerhart Hintz, Rossdorf, and Guenter Keller, Modautal, all of Fed. Rep. of Germany, assignors to Carl Schenck AG, Darmstadt, Fed. Rep. of Germany

Filed Jun. 16, 1988, Ser. No. 207,729

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1987, 3740227

Int. Cl.[4] G01L *1/24*

U.S. Cl. 73—800 **14 Claims**



7. An apparatus for measuring deformations of test samples in testing machines, comprising first and second force transmission means for engaging a test sample, light source means for emitting a light beam, first mirror means arranged in a first mirror plane on said first force transmission means, second mirror means arranged in a second mirror plane on said second force transmission means, whereby said first and second mirror planes extend in parallel to one another and at angle (A) relative to a lengthwise axis of said test sample, said angle (A) being defined between any one of said mirror planes and said lengthwise axis, and further comprising position detector means arranged to receive said light beam at a point of light impingement after said light beam is reflected from said second mirror means, and electronic evaluating circuit means connected to said detector means for determining and evaluating a location movement of said point of light impingement as a measure of said deformations.

4,836,032

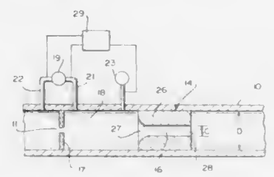
METHOD OF DETERMINING THE QUALITY OF STEAM FOR STIMULATING HYDROCARBON PRODUCTION

Clifford L. Redus, Katy; Sze-Foo Chien, and Peter L. Sigwardt, both of Houston, all of Tex., assignors to Texaco, Inc., White Plains, N.Y.

Filed Mar. 7, 1988, Ser. No. 164,682

Int. Cl.[4] G01F *1/74*

U.S. Cl. 73—861.04 **5 Claims**



1. Apparatus for determining the mass flow rate and the quality of pressurized steam flowing through a conduit which comprises
a choke member in said conduit having a flow passage of a diameter to constrict the flow of steam in the conduit to critical flow,
an orifice plate in said conduit positioned upstream of said choke member to define an intermediate passage, and having an orifice diameter therethrough,
means for measuring the pressure differential across said orifice plate,
means for measuring the steam pressure in said intermediate passage, and
means for determining the mean flow rate and the quality of the steam in said conduit in accordance with said pressure differential across the orifice plate and the pressure in said intermediate passage.

4,836,033

CAPACITIVE MEASURING ASSEMBLY FOR DETERMINING FORCES AND PRESSURES

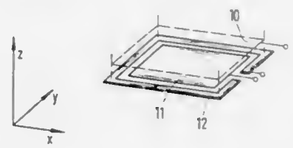
Peter Seitz, Mohlstrasse 29, D-8000 Munchen 80, Fed. Rep. of Germany

Filed Sep. 30, 1987, Ser. No. 102,722

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1986, 3634855

Int. Cl.[4] G01D *7/02*

U.S. Cl. 73—862.04 **23 Claims**



1. An assembly for producing signals corresponding to forces and pressures, comprising:
at least three capacitor surfaces situated in two planes substantially opposite to each other;
a dielectric material between the surfaces in the two planes;

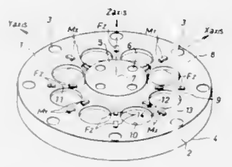
the surfaces in one plane being movable relative to the surfaces in the other plane against elastic resetting elements;
one main capacitor surface in one plane lying opposite to all remaining capacitor surfaces in the other plane with intercalation of said dielectric material therebetween and said main surface at least partly covering said remaining surfaces;
said main surface being movable both normally and parallel relative to said remaining surfaces so that forces that act both normally between said main surface and said remaining surfaces and parallel with said capacitor surfaces can be measured or eliminated from separate capacity valves between said main and remaining surfaces; and
said remaining surfaces include a smaller surface situated opposite to and completely covered by the main surface and a surrounding surface surrounding said smaller surface, said surrounding surface having an outer edge projecting beyond said main surface so that a differential between capacities of said surrounding surface and said main surface gives a standard for horizontal forces which can be compensated by means of the capacity value between said main surface and said smaller surface in relation to the vertical force component, or vice versa.

4,836,034

FORCE SENSING APPARATUS

Kohji Izumi; Hirotoshi Eguti; Eiichi Ohta; Yuhji Kimura, and Yutaka Ebi, all of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 14, 1987, Ser. No. 73,290
Claims priority, application Japan, Jul. 15, 1986, 61-166391; Jul. 15, 1986, 61-166392; Sep. 18, 1986, 61-219968
Int. Cl.[4] G01L *5/16, 3/02*
U.S. Cl. 73—862.04 **7 Claims**



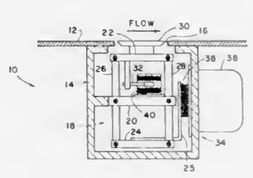
1. A force sensing apparatus comprising:
(a) a plate-like body, said plate-like body comprising:
(i) a central portion disposed integrally at the center of said plate-like body and having a first rigidity;
(ii) a thin flat plate portion disposed integrally around said central portion and having a second rigidity lower than the first rigidity; and
(iii) a peripheral portion disposed integrally along the periphery of said platelike body and having a third rigidity higher than the second rigidity;
(b) a plurality of sensing elements formed on a planar surface of said plate-like body and having an electric resistance variable in accordance with a deformation thereof in order to simultaneously sense mutually orthogonal X, Y, and Z axial components of an external force applied to said plate-like body via said central portion or said peripheral portion; and
(c) a plurality of holes provided along a circumference of a circle located on said thin flat plate portion, the number of said holes being 8 or a multiple of 8,
wherein:
(d) each one of said plurality of sensing elements is formed on an expanding portion of said plate-like body defined by two adjacent holes and in which, during use of said force sensing apparatus, the distribution of stresses is uniform.
3. A force sensing apparatus comprising:
(a) a plate-like body, said plate-like body comprising:
(i) a central portion disposed integrally at the center of said plate-like body and having a first rigidity;
(ii) a thin flat plate portion disposed integrally around said central portion and having a second rigidity lower than the first rigidity; and
(iii) a peripheral portion disposed integrally along the periphery of said plate-like body and having a third rigidity higher than the second rigidity;
(b) a plurality of first sensing elements provided on an X axis on said plate-like body and having electric resistances variable in accordance with deformation thereof for sensing a moment around a Y axis on said platelike body orthogonal to the X axis on said platelike body;
(c) a plurality of second sensing elements provided on the Y axis having electric resistances variable in accordance with deformation thereof for sensing a moment around the X axis; and
(d) a plurality of third sensing elements provided on a Z′ and a Z″ axes on said plate-like body in the plane defined by the X and Y axes at angles of 45° to the X and Y axes, respectively, for sensing a force in the direction of a Z axis perpendicular to the surface of said plate-like body,
(e) said plurality of first, second, and third sensing elements being co-planar.

4,836,035

SKIN FRICTION BALANCE

Ping Tcheng, Norfolk, and Frank H. Supplee, Jr., Hampton, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 23, 1988, Ser. No. 210,487
Int. Cl.[4] G01L *1/08*
U.S. Cl. 73—862.61 **9 Claims**



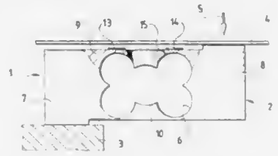
1. A skin friction balance comprising:
a parallel linkage mechanism including a housing having two opposite sides, a stationary plate having two opposite sides and two opposite ends and being fixedly mounted by the two opposite ends thereof between the two opposite sides of the housing, at least one link pivotally connected to each of the two opposite sides of the stationary plate, each link having a center and two opposite ends, the stationary plate being pivotally connected at the center of each link, an upper movable plate pivotally connected to one of the two ends of each link, a lower movable plate pivotally connected to the opposite of the two ends of each link;
a sensing element fixedly connected to the upper movable plate and being movable with the upper movable plate in response to sensed skin friction;
a linear variable differential transformer outputting a signal indicative of a position of the sensing element and having a body connected to the stationary plate and an armature movable in response to movement of the lower and upper movable plates;
a motor having a magnet fixedly connected to the housing and coil windings fixedly connected to the lower movable plate; and
control means for processing the transformer signal and for outputting a nulling current to the coil windings of the motor at a level sufficient to maintain the sensing element in a null position, the current level being indicative of skin friction.

4,836,036

BENDING FORCE RECEIVER, IN PARTICULAR, FOR BALANCES

Hans Jetter, Balingen-Engstlatt, Fed. Rep. of Germany, assignor to Bizerba-Werke Wilhelm Kraut GmbH & Co. KG, Fed. Rep. of Germany

Filed Jan. 25, 1988, Ser. No. 147,886
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1987, 3702271
Int. Cl.[4] G01L *1/22*; G01G *3/08*
U.S. Cl. 73—862.65 **6 Claims**



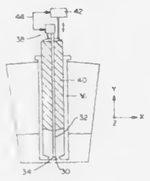
1. A bending force receiver, in particular, for balances, with two parallelogram links (**9**, **10**) which can be subjected to a load-dependent bending force (**5**) by means of a load plate (**4**), and with strain gauge strips (**11**, **12**, **13**, **14**) which are arranged on one essentially rectangular outer side of one of these links which are interconnected to form an electric bridge circuit for delivering load-dependent measurement signals, the outer side of the one parallelogram link being equipped with the strain gauge strips comprises a midpoint which is predetermined by the point of intersection of one longitudinal axis (L) and one transverse axis (Q) of this side, characterized in that at least one opening (**15**; **16**, **17**; **19**, **20**) between the strain gauge strips is formed on the parallelogram link supporting the strain gauge strips (**11**, **12**, **13**, **14**), that all strain gauge strips (**11**, **12**, **13**, **14**) are arranged as closely as possible to the at least one opening and symmetrically to the midpoint of the outer side on this side, and that the strain gauge strips (**11**, **12**, **13**, **14**) are arranged facing the direction of the longitudinal axis (L) before and behind the at least one opening (**15**; **16**, **17**; **19**, **20**).

4,836,037

SAMPLE METERING VALVE FOR A SAMPLE PREPARATION SYSTEM

Andre J. Nohl, Menlo Park; Vance J. Nau, Cupertino, both of Calif., and Andre Metzger, Le Verger, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 942,201, Dec. 16, 1986. This application Jun. 16, 1987, Ser. No. 63,493
Int. Cl.[4] B01L *3/02*
U.S. Cl. 73—864.16 **6 Claims**



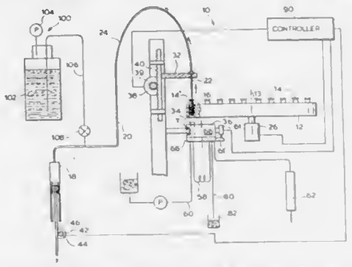
1. A sample metering valve apparatus for samples having gas bubbles therein comprising:
a cylinder having at least one aperture in one end;
valve means for moving into and out of sealing engagement with said aperture under the influence of forces applied to a valve shaft;
piston means in said cylinder for movement therein independently of movement of said valve means and having an aperture therein through which said valve shaft passes.

4,836,038

AUTOMATED SAMPLER-INJECTOR APPARATUS AND METHOD FOR SAMPLING A QUANTITY OF SAMPLE AND TESTING PORTIONS OF SAID QUANTITY

Einar D. N. Baldwyn, Calgary, Canada, assignor to Aim Instruments Ltd., Calgary, Canada

Filed Mar. 18, 1988, Ser. No. 169,876
Int. Cl.[4] B01L *3/02*
U.S. Cl. 73—864.21 **10 Claims**



1. An automated sample-injector apparatus for use with a liquid chromatograph column, comprising:
(a) a carousel means which holds and retains therein a plurality of sample containers;
(b) syringe means connected by tubing means to an injector tube to form a syringe-loop;
(c) means for positioning a selected one of the sample containers immediately beneath the injector tube;
(d) means for lowering the injector tube into the selected sample container and withdrawing a quantity of sample therefrom into said syringe-loop, and for raising the injector tube from with the sample container;
(e) means for positioning the carousel means to allow direct insertion of the injector tube into a multi-port injector valve having a tube-receiving passage therein;
(f) means for operating the syringe means to inject a portion of the sampled quantity from the syringe-loop into the injector valve when the injector tube is positioned in the tube-receiving passage, and further into a sample loop connected at both its ends to the injector valve; and
(g) means for switching the valve by rotating one portion of the valve and keeping another portion of the valve containing the tube-receiving passage stationary to switch the sample loop from being in fluid communication with the tube-receiving passage to being connected at one end thereof to a supply of pressurized solvent, and at the other end thereof to a liquid chromatograph column;
wherein the pressurized solvent flushes the portion of sample contained in the sample loop and injects it into the liquid chromatograph column for analysis.

4,836,039

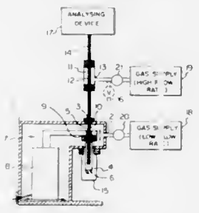
METHOD AND APPARATUS FOR INTRODUCTION OF A PARTICULATE SAMPLE FOR ANALYSIS

K. Nimalasiri de Silva, Ottawa, and Roger Guevremont, Bedford, both of Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed Sep. 10, 1987, Ser. No. 95,123
Int. Cl.[4] G01N *1/00*
U.S. Cl. 73—864.81 **5 Claims**

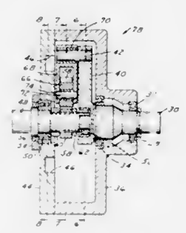
1. An apparatus for introducing a particulate sample to an analyzing device comprising:
a substantially gas-tight enclosure having an inlet for a first

carrier gas, and an outlet for gas entrained sample particles;
a sample container disposed within the enclosure, said container having an opening for receiving said first carrier gas supplied at a relatively low flow rate to the enclosure;
agitating means for fluidizing a sample contained by the sample container;
support means connected with the agitating means for removably attaching the sample container thereto;



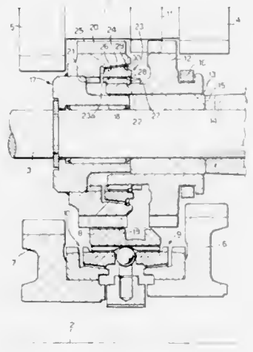
conduit means communicating with the interior of the sample container, said conduit defining the outlet for the enclosure of a sample entrained by carrier gas supplied to the container; and
a combining chamber connected to said conduit, said combining chamber including an inlet for receiving a second carrier gas, of relatively high flow rate, and an outlet for connection to an analyzing device

4,836,040
DIFFERENTIAL ROTARY-TO-ROTARY CAM SYSTEM TO ACHIEVE LONG DWELL PERIODS WITH CONTINUOUS ROTARY INPUT
John H. Brems, 2800 S. Ocean Blvd., Apt. 16-D, Boca Raton, Fla. 33432
Continuation of Ser. No. 449,241, Dec. 13, 1982, abandoned. This application Jul. 12, 1985, Ser. No. 754,407
Int. Cl.[4] F16H *21/12*
U.S. Cl. 74—63 **6 Claims**



1. In a rotary motion control mechanism involving a predetermined variable angular relationship between two rotating members, capable of providing a wide variety of kinematic objectives in the movement of an output shaft relative to the movement of an input shaft, including a very long dwell of said output shaft during the rotation of said input shaft, a tandem drive system comprising:
(a) a frame,
(b) a first drive system comprising a rotary motion control mechanism in said frame comprising
1. a varying ratio gear train driven by said input shaft,
2. an output shaft journalled in said frame and driven by said varying ratio gear train,
(c) a second drive system comprising:
1. an input shaft member journalled in said frame, rotating on a first axis, and driven by the output shaft of said first drive system,
2. offset driving means mounted on said input shaft member,
3. an output shaft member journalled in said frame and rotating on a second axis substantially parallel to said first axis,
4. offset driven means mounted on said output shaft member,
5. stationary annular plate cam means mounted on said frame in a plane substantially perpendicular to said first axis and said second axis and encompassing said first axis and said second axis, and
6. cam follower means operatively associated with said plate cam means and interconnecting said offset driving means and said offset driven means,
whereby a movement generated by said plate cam means in said cam follower means creates a substantially proportional movement of said driven means relative to said driving means.

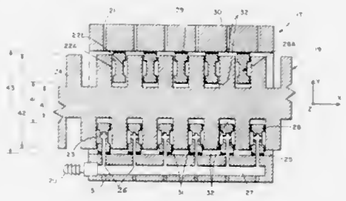
4,836,041
MOTOR VEHICLE GEARBOX WITH A DEVICE FOR SYNCHRONISED ENGAGEMENT OF REVERSE
GianLuigi Falzoni, Torino, and Valter Pastorello, Moncalieri, both of Italy, assignors to Fiat Auto S.p.A., Torino, Italy
Filed Jul. 13, 1988, Ser. No. 218,185
Claims priority, application Italy, Jul. 13, 1987, 67602 A/87
Int. Cl.[4] F16H *3/38*
U.S. Cl. 74—339 **2 Claims**



1. A gearbox for motor vehicles, including a main shaft and a driven shaft carrying respective meshed gears of which those carried by the driven shaft can be made fast for rotation therewith by means of respective slidable coupling sleeves, and an intermediate reversing shaft carrying an idle reversing gear which is slidable to couple corresponding gears carried by the main shaft and the driven shaft for the engagement of reverse, and means for synchronizing the engagement of reverse, characterized in that the synchronizing means (**22**, **23**, **24**, **25**, **28**) are carried by the intermediate shaft (**3**), wherein the synchronizing means include:
a gear (**17**) mounted rotatably on the intermediate shaft (**3**) beside the idle reversing gear (**12**) and having a seat (**25**) with an internal conical synchronizing surface (**26**) followed by a restraining ring gear (**21**),
a ring gear (**19**) provided on one of the slidable coupling sleeves (**8**) and meshing with the said gear (**17**),
a toothed hub (**22**) fixed to the idle reversing gear (**12**) for meshing with the restraining ring gear (**21**) of the said gear (**17**) and carrying a partially-toothed (**23***a*) synchronizing ring (**26**) with an external conical synchronizing surface (**24**) inserted into the seat (**25**) of the gear (**17**) having the internal conical synchronizing surface (26),

a resilient presynchronizing ring (**28**) arranged in correspondence with a circumferential groove (**27**) in the toothed hub (**22**) of the reversing gear (**12**) and operatively associated with the synchronizing ring (**23**).

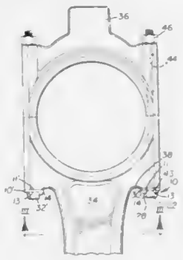
4,836,042
SYSTEM TO CONVERT ROTARY MOTION TO LINEAR MOTION
Alexander H. Slocum, McLean, Va., assignor to Advanced Engineering Systems, Operations & Products, Inc., Concord, N.H.
Filed Jul. 27, 1987, Ser. No. 77,804
Int. Cl.[4] F16H *25/24*
U.S. Cl. 74—424.8 R **19 Claims**



1. A leadscrew and nut system wherein rotation of the leadscrew about its axis effects parallel linear movement therealong of the nut, the cooperative threadforms of the leadscrew and nut being shaped to provide for a small degree of pitch and yaw and relative radial movement of the nut out of parallelity with the leadscrew without generating or transmitting forces and moments as a result of such pitch and yaw and relative radial movement, i.e., self coupling, means for continuously supplying pressurized fluid as a continuous flow between the cooperative threads of the leadscrew and the nut, and means for controlling the fluid pressure and fluid flow continuously to provide high axial stiffness with substantially zero stiffness in yaw, pitch, rotation and radial motion while inhibiting mechanical contact between the cooperative threads, thereby to maintain the linear movement of the nut parallel to the leadscrew axis, each said cooperative threadform for the leadscrew and the nut having a depth that is equal to or greater than the width of the threadform and said depth being or the order of half the leadscrew shaft outer radius.

4,836,043
CONNECTING ROD ASSEMBLY
Leslie C. Morris, Washington, and John K. Amdall, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Continuation of Ser. No. 433,472, May 10, 1982, abandoned. This application Nov. 27, 1985, Ser. No. 802,088
Int. Cl.[4] G05G *1/00*
U.S. Cl. 74—579 E **1 Claim**

1. A connecting rod assembly comprising:
a connecting rod having a longitudinal axis, a flat surface, a large fillet intersecting the flat surface and positioned between the flat surface and the longitudinal axis, and a pair of fastening holes disposed on the same side of the longitudinal axis and passing through the flat surface:
a bearing cap defining a pair of fastening holes disposed in line with the pair of fastening holes in the connecting rod;
a retainer plate having parallel faces, a pair of holes through the faces, and a fixed upstanding abutment portion substantially perpendicular to said faces and spaced from said holes, said retainer plate being positioned in contact with the flat surface of the connecting rod and being free of contact with all other portions of the connecting rod, said pair of holes through the faces being aligned with said pair of fastening holes in the connecting rod;
a pair of elongate bolts each having a head and a flat edge formed on the head, said elongate bolts extending through the pair of fastening holes of the connecting rod and retainer plate and said edge of the head abutting the upstanding abutment portion of the retainer plate wherein the bolts prevent rotation of the retainer plate and the plate prevents rotation of the bolts; and



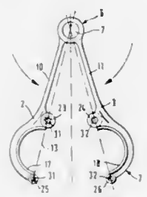
a pair of nuts threadedly attached to the bolts so that said bearing cap and said retainer plate are attached to the connecting rod assembly when said nuts are tightened on the bolts while the fixed upstanding abutment portion of the retainer plate prevents rotation of the bolts during said tightening.

4,836,044
CONNECTING ROD
Arnold Löbig, Rüsselsheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.
Filed Jun. 16, 1988, Ser. No. 207,472
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1987, 8710328
Int. Cl.[4] G05G *1/00*
U.S. Cl. 74—579 E **4 Claims**

1. A connecting rod having a split lower eye including a crankpin opening, wherein said eye comprises a bearing yoke including first and second spaced legs, a bearing bracket received in the yoke between said legs and forming with the yoke said crankpin opening, said bearing bracket having an angled wedge surface on a side opposite the crankpin opening and inclined away from said opening in a direction toward said first leg, a wedge member disposed between the legs on said opposite side of the bearing bracket and having an angled counter surface engaging said angled wedge surface of the bearing bracket, said wedge member being the sole means for

urging said bearing bracket against the yoke in a direction toward said crankpin opening, the wedge member being substantially shorter than the distance between said legs to permit lateral adjusting movement of the wedge member between the legs and being initially installed in a position spaced from said first leg to permit subsequent lateral adjustment of the wedge member toward said first leg to urge said bearing bracket member toward said crankpin opening, and a bolt extending laterally through coaxial bores in said wedge member and said legs to retain said wedge member between said legs and having means for restraining lateral motion of the bolt in a direction from said first leg toward said second leg, said bolt and said bore of the wedge member having coacting threaded portions with interengaging threads to laterally adjust the wedge member toward said first leg upon prescribed rotation of said bolt in said bores.

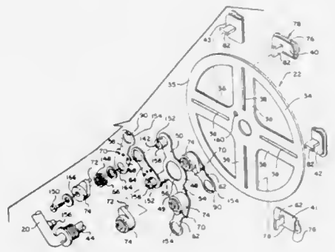
4,836,045
CONNECTING ROD
Arnold Löbig, Russelsheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.
Filed May 26, 1988, Ser. No. 199,896
Claims priority, application Fed. Rep of Germany, Jun. 6, 1987, 3719112
Int. Cl.[4] G05G 1/00
U.S. Cl. 74—579 E **4 Claims**



1. A connecting rod having split bearing bosses disposed at longitudinally opposite ends including a crankpin boss and a piston pin boss, the bosses defining bearing bores disposed on parallel bearing axes, said connecting rod comprising two rod components primarily located on opposite sides of a central longitudinal plane defined by the bearing axes and wherein
the crankpin boss is axially split along a dividing plane through its bearing axis, and
the piston rod is laterally split along a dividing plane normal to its bearing axis and includes extensions of the two rod components overlapping the central plane and linearly arranged along its bearing axis for receiving a piston pin,
said connecting rod further comprising securing means, including at least one pair of additional extensions overlapping the central plane and having openings aligned on an axis parallel with the central plane, and a securing pin received in each said pair of openings.

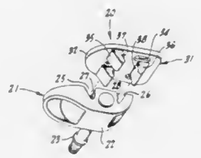
4,836,046
AUTOMATIC BICYCLE TRANSMISSION
Gilmore H. Chappel, 6100 City Ave., Executive House, Apt. 1718, Philadelphia, Pa. 19131
Filed May 4, 1987, Ser. No. 45,310
Int. Cl.[4] G05G 1/14; F16H 9/00, 1/02
U.S. Cl. 74—594.2 **11 Claims**

1. An automatic transmission for use with a bicycle of the type including a frame, a front wheel, a rear wheel, a driven gear connected to the rear wheel and pedal cranks supplying input power comprising
a sprocket wheel assembly rotatably mounted relative to the frame and being adapted for rotation by the pedal cranks, the sprocket wheel assembly comprising a reference wheel and a plurality of chain contacting elements radially movable relative to the reference wheel between radial inward positions and radial outward positions,
the sprocket wheel assembly further comprising a star rotatably mounted relative to the frame adjacent to the reference wheel, the star having a plurality of radially extending fingers and a plurality of cranks, each crank being pivotally interconnected at one end with a finger and at its other end with a chain contacting element, the star being indirectly rotated by the pedal cranks;
and a spring operatively mounted at the pivotal interconnection between each of the star fingers and the cranks, the springs continuously urging the chain contacting elements toward their said radial outward positions;
a drive chain movable relative to the frame to rotate the driven gear, the drive chain being rotatably driven by at lease some of the chain contacting elements;
chain take-up means secured to the frame to maintain the chain taut in response to all radial movements of the chain contacting elements,
the chain take-up means comprising a pivotal assembly having pivotal movement relative to the frame; and
damping means secured in stationary relationship to the frame to provide hydraulic damping forces to the pivotal assembly as the pivotal assembly is pivotally moved relative to the frame,
the damping means comprising a hydraulic cylinder, the hydraulic cylinder comprising a body, hydraulic fluid within the body, a piston reciprocal within the body and a cable connector movable within the body in response to reciprocal movements of the piston;
the damping means further comprising a flexible control cable, the control cable having one end connector to the hydraulic cylinder cable connector and its other end connected to a portion of the pivotal assembly;
the piston being provided with a first hydraulic fluid passage and a one-way valve to close the fluid passage when the piston is reciprocated in a first direction, the end of the control cable being moved toward the pivotal assembly when the piston is moved in the said first direction, and
a spring continuously biasing the piston in a direction to move the end of the control cable away from the pivotal assembly;
whereby the hydraulic damping forces are transmitted through the chain to apply hydraulic damping forces upon the chain contacting elements as the chain contacting elements radially move.



6. In an automatic bicycle transmission of the type having a sprocket wheel assembly comprising a rotatable reference wheel and a plurality of chain contacting elements reciprocal relative to the reference wheel between radial inward and outward positions to vary the gear ratio between the input at the reference wheel and the output at a rear driven gear, a frame, an endless chain rotated relative to the frame by the sprocket wheel assembly to turn the driven gear and a spring normally urging the chain contacting elements toward their radial outward positions, the improvement comprising
a star indirectly rotated by the reference wheel, the star comprising a finger indirectly connected to each chain contacting element;
a link respectively pivotally connected to each star finger and pivotally connected to one of the chain contacting elements; and
a spring interposed at each pivotal connection between a star finger and a link
each spring being connected to continuously bias its associated link in a direction tending to urge a chain contacting element toward its radial outward position.

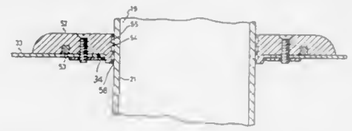
4,836,047
BICYCLE PEDAL SYSTEM
John M. Alcamo, 2336 Bolton Ct., Modesto, Calif. 95356
Filed Apr. 28, 1988, Ser. No. 187,193
Int. Cl.[4] G05G 1/14
U.S. Cl. 74—594.6 **4 Claims**



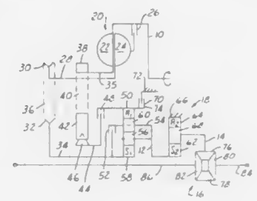
1. A bicycle pedal system comprising: a pedal formed of rigid material and being adapted for mounting along a rotational axis thereof to a bicycle and having a pair of lateral grooves therein, each groove being defined by two faces oriented in a V-shaped configuration and having lateral serrations of negative undercut configuration in at least one face thereof; and a shoe clip formed of rigid somewhat flexible material and being adapted for attachment to a shoe and having a pair of lateral tongues of generally triangular configuration extending downwardly therefrom, the tongues having lateral serrations of negative undercut configuration extending along at least one face thereof corresponding to said at least one groove face, and the tongues and the serrations thereof being of selected size and configuration for closely fitting within the associated grooves and to the serrations of said associated grooves.

4,836,048
INDUSTRIAL ROBOT HAVING DUST-PROOF STRUCTURE
Nobutoshi Torii, Hachioji; Susumu Ito, Hino; Hiroshi Wakio, Hachioji, and Kyoji Iwasaki, Tokyo, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan
PCT No. PCT/JP86/00562, § 371 Date Jul. 2, 1987, § 102(e) Date Jul. 2, 1987, PCT Pub. No. WO87/02927, PCT Pub. Date May 21, 1987
PCT Filed Nov. 6, 1986, Ser. No. 80,509
Claims priority, application Japan, Nov. 6, 1985, 60-247270
Int. Cl.[4] F16P 1/00; B25J 17/00
U.S. Cl. 74—608 **3 Claims**

1. An industrial robot having a dust-proof structure comprising:
at least one dust cover having an opening;
a linearly moving unit extending through said opening of said dust cover and moved back and forth in the longitudinal direction thereof;
a suction unit for exerting suction on an interior of said dust cover to cause an air stream to flow from outside said dust cover into said dust cover through said opening; and
a ring member disposed at said opening of said dust cover in such a manner as to encompass the outer periphery of said linearly moving unit through a gap, said ring member being formed at the inner peripheral surface thereof with at least one annular groove for reserving air, encompassing said outer periphery of said linearly moving unit.



4,836,049
CONTINUALLY VARIABLE TRANSMISSION HAVING FIXED RATIO AND VARIABLE RATIO MECHANISMS
Richard D. Moan, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Dec. 7, 1987, Ser. No. 129,264
Int. Cl.[4] F16H 37/00, 37/08
U.S. Cl. 74—689 **29 Claims**



1. A transmission for producing a stepless, continually variable range of ratios of the speed of its output to its input comprising:
a fluid coupling having an impeller adapted for connection to a power source and a turbine hydrodynamically connected to the impeller;
as planetary gearset having a ring gear, a sun gear, a first set of planet pinions meshing with the sun gear, a second set of planet pinions meshing with the first set of pinions and with the ring gear, and a pinion carrier on which the first and second sets of pinions are rotatably supported;
first drive means drivably connecting the turbine and the sun gear for producing a variable speed ratio therebetween having a range between an underdrive ratio and an overdrive ratio;
second drive means drivably connecting the impeller and the ring gear for producing a fixed speed ratio therebetween;
a first clutch means for drivably connecting and disconnecting the ring gear and the second drive means; and
a second clutch means for drivably connecting and disconnecting the first drive means and the pinion carrier.

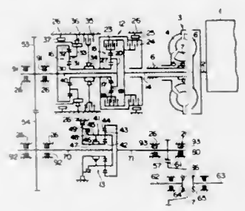
4,836,050
TRANSVERSE TYPE AUTOMATIC TRANSMISSION WITH TWO SEPARATE LAY SHAFT ELEMENTS
Akio Numazawa, Nagoya; Seitoku Kubo, Toyota, and Koujiro Kuramochi, Okazaki, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan
Filed Nov. 22, 1982, Ser. No. 443,693
Int. Cl.[4] F16H 37/08
U.S. Cl. 74—695 **9 Claims**

1. An automatic transmission for an automotive vehicle, comprising:
(a) a fluid torque converter, comprising a rotational power input member and a rotational power output member, said

rotational power input member and said rotational power output member both being rotatable about a first axial line;

(b) a first gear transmission mechanism, comprising a first rotational power input member and a first rotational power output member, which can be selectively controlled to produce any one of a plurality of speed ratios between said first rotational power input member and said first rotational power output member, said first rotational power input member and said first rotational power output member both being rotatable about said first axial line; said first rotational power input member of said first gear transmission mechanism being rotationally connected to said rotational power output member of said fluid torque converter;

(c) a second gear transmission mechanism having a driving side an an opposed driven side, comprising a second rotational power input member and a second rotational power output member, which can be selectively controlled to produce any one of a plurality of speed ratios between said second rotational power input member and said second rotational power output member, said second rotational power input member and said second rotational power output member both being rotatable about a second axial



line parallel to said first axial line and displaced laterally therefrom;

(d) a first lay shaft element which extends along and is rotatable about said second axial line, one end of which is coupled to said second rotational power input member of said second gear transmission mechanism, and which extends outwardly and away from the driving side of said second gear transmission mechanism;

(e) a second lay shaft element separate from said first lay shaft, which extends along and is rotatable about said second axial line, one end of which is coupled to said second rotational power output member of said second gear transmission mechanism, and which extends outwardly and away from the driven side of said second gear transmission mechanism;

(f) a rotational power transfer mechanism which transfers rotational power between said first rotational power output member of said first gear transmission mechanism and said first lay shaft element;

and

(g) a power output gear wheel which is fixedly supported by said second lay shaft element so as to be rotatable about said second axial line.

4,836,051

DIFFERENTIAL TRANSMISSION DEVICE IN PARTICULAR FOR A MOTOR VEHICLE

Pierre L. Guimbretie e, Neauphle-le-Chateau, France, assignor to Glaenzer-Spicer, Poissy, France

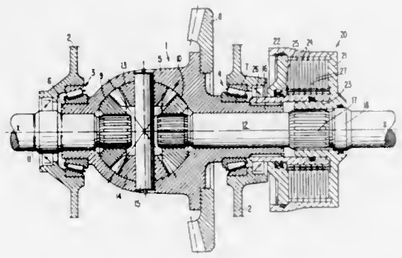
Filed Sep. 17, 1987, Ser. No. 98,057
Claims priority, application France, Sep. 19, 1986, 86 13187
Int. Cl.[4] F16H 1/14
U.S. Cl. 74—711 17 Claims

1. A transmission device comprising

a differential mechanism including a fixed frame, an input element and two output elements, said input element including an elongated hollow shaft section on one side thereof, one of said output elements extending in said hollow shaft section and said two output elements comprising shafts adapted to be connected to driving wheels of a vehicle;

two bearings rotatably supporting said input element and said output elements in said fixed frame for rotation about an axially extending rotation axis, said differential mechanism being axially located between said bearings;

a limiting device for controlling and/or limiting differential rotation between said output elements, said limiting device including two parts rotatable relative to each other and coupled together by alternating discs enclosed within a housing containing viscous fluid and located exteriorily of said fixed frame; and



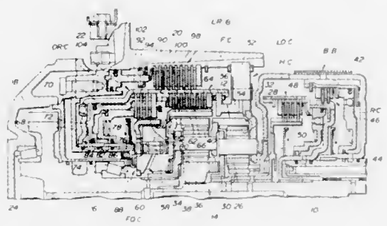
connecting means for coupling at least two of said input element and said output elements with said two parts of said limiting device, said connecting means being axially located exteriorily of said fixed frame and with one of said bearings being axially located between said connecting means and said input element, said connecting means comprising splines on said hollow shaft section engaging with corresponding splines on one of said parts of said limiting device and splines on said one of said output elements extending in said hollow shaft section engaging with corresponding splines on the other one of said parts of said limiting device.

4,836,052

COMPACT CHANGE SPEED TRANSMISSION

Kazuyoshi Iwanaga, Atsugi, and Toshio Yamaguchi, Zama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 23, 1987, Ser. No. 29,122
Claims priority, application Japan, Mar. 24, 1986, 61-65268
Int. Cl.[4] F16H 57/10
U.S. Cl. 74—759 31 Claims



1. A change speed transmission, comprising:

a stationary part;

an input member;

an output member;

first and second planetary gear sets;

clutch and brake means for selectively controlling said first and second planetary gear sets to provide a plurality of forward speed rations and a reverse speed ratio between said input and output members;

said clutch and brake means including a first clutch, a first one-way clutch, and a second one-way clutch which, when said first clutch is engaged, provide a path of transmission of reaction to said stationary part thereby establishing a path of transmission of torque through at least a part of said first and second planetary gear sets to achieve a predetermined one speed ratio of said plurality of forward speed ratios;

said clutch and brake means including also a brake and a second clutch which, when both of said brake and said second clutch are engaged, hinder the action of said second one-way clutch and that of said first one-way clutch, respectively, thereby providing engine braking during running with said predetermined one speed ratio;

said first clutch including means forming a drum-shaped member disposed radially outwardly of and receiving at least one of said first and second planetary gear sets, and an actuating piston of said first clutch; and

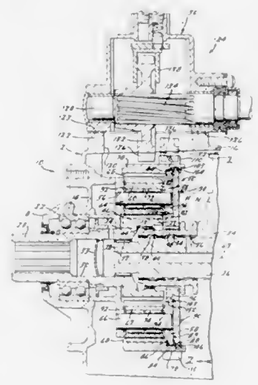
said second clutch including an actuating piston slidably disposed within said actuating piston of said first clutch.

4,836,053

TRANSFER CASE WITH DUAL PLANETARY GEAR REDUCTION UNIT

Richard E. Eastman, Central Square, N.Y., and Anand M. Jagani, Sepulveda, Calif., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed May 23, 1988, Ser. No. 197,497
Int. Cl.[4] F16H 3/44, 37/06
U.S. Cl. 74—789 1 Claim



1. In a transfer case apparatus including a housing having an end wall defining an opening, said housing having outer wall means extending in an inboard direction from said end wall, axial bearing means journally supporting an input shaft in said end wall opening, said input shaft having one end terminating within said housing in an annular end flange portion joined by an intermediate stepped radially extending flange portion, said input shaft annular end flange portion formed with a predetermined number of external helical sun gear teeth defining an integral sun gear, an output shaft journally supported in said housing, said output shaft having a clutch collar axially slidable thereon by means of collar internal splines engaged with external splines on said output shaft, said input shaft having an axial counterbore formed in said input shaft annular end flange, internal clutch teeth formed in said input shaft counterbore, external clutch teeth formed on said clutch collar slidably engageable with said input shaft counterbore internal teeth when said clutch collar is moved axially into a high-range drive position, a helical dual planetary gear assembly comprising a carrier in the form of outboard and inboard axially spaced rings, said carrier rings supporting first inner and second outer sets of planet pinion gears rotatably supported on inner and outer sets of respective pins, said pins having their ends fixedly supported between said carrier rings at first and second radial distances, respectively, outward from the central axis of said output shaft; wherein said first radial distance is a predetermined lesser distance than said second radial distance, helical teeth of each said inner set pinion gear in meshing engagement with said helical sun gear teeth and helical teeth of each said outer set pinion gear in meshing engagement with internal helical teeth of an annulus gear concentrically disposed around said second set pinion gears, said first and second sets of pinion gears disposed in paired relation such that the teeth of each first set of pinion gear in meshing engagement with the teeth of a corresponding second set pinion gear, said annulus gear formed with a predetermined number of internal gear teeth exactly twice the number of said sun gear teeth, said carrier outboard and inboard rings fixed to said housing, said carrier inboard ring extending radially outward a predetermined distance beyond said second set of pinion gears, said annulus gear including an axially extending inboard cylindrical extension formed with an internal annular counterbored race receiving in a spaced concentric manner the outer periphery of said inboard carrier ring, said annulus gear extension formed with internal splines, an annulus plate positioned on the inboard side of said inboard carrier ring having its outer periphery formed with external splines engaged with said annulus gear extension internal splines, said annulus plate formed with a central hub portion extending outboard from said annulus plate, said hub portion formed with an axial internally splined bore concentrically encircling said clutch collar, said hub portion internally splined bore adapted to be engaged by said clutch collar external splines upon said clutch collar being moved axially to a low drive range position, said inboard carrier ring formed with an axial bore encircling said annulus plate hub portion defining an annular clearance therebetween, an annular bushing interposed in said annular clearance concentrically positioning said annulus plate for rotation about said output shaft central axis, whereby said transfer case operative upon said clutch collar being shifted into its low-range drive position to transfer power at a two-to-one gear ratio reduction ratio.

4,836,054

REDUCTION RATIO CONTROL FOR CONTINUOUSLY VARIABLE TRANSMISSION

Haruyoshi Kumura, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 24, 1986, Ser. No. 934,106
Claims priority, application Japan, Nov. 25, 1985, 60-262650
Int. Cl.[4] B60K 41/12
U.S. Cl. 74—866 9 Claims

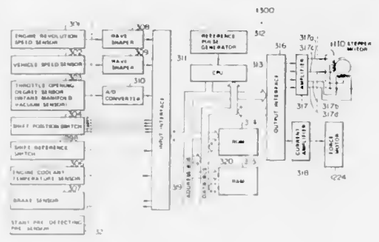
1. A reduction ratio control for a continuously variable transmission of a motor vehicle, the continuously variable transmission being connected to an engine of the motor vehicle to be driven thereby, the reduction ratio control comprising:

means for carrying out a reduction ratio change of the continuously variable transmission in such a manner as to decrease a difference between an actual value in a predetermined operating variable and a target value in said predetermined operating variable toward zero;

means for determining a deceleration which the motor vehicle is subject to;

means for changing said target value to a new target value in response to said deceleration after said deceleration which the motor vehicle is subjected to is determined; and

the means for carrying out said reduction ratio change causes the actual value to approach the new target value



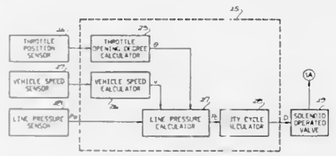
quicker than it controlled the actual value to approach the target value.

4,836,055

SYSTEM FOR CONTROLLING A LINE PRESSURE IN AN AUTOMATIC TRANSMISSION FOR MOTOR VEHICLES

Hosei Suzuki, Musashino, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1988, Ser. No. 177,493
Claims priority, application Japan, Apr. 13, 1987, 62-091544
Int. Cl.[4] B60K *41/18*
U.S. Cl. 74—866 7 Claims



1. A system for controlling line pressure in a hydraulically operated automatic transmission for a motor vehicle having an engine operatively connected to the transmission comprising:

a single engine load detector for producing a load signal dependent on load on the engine of the vehicle;

a vehicle speed detector for producing a vehicle speed signal dependent on speed of the vehicle

a line pressure calculator responsive to the load signal and vehicle speed signal for producing a line pressure signal representing necessary line pressure;

control signal generating means responsive to the line pressure signal for producing a control signal corresponding to the line pressure signal;

an electromagnetic valve operated by the control signal, for controlling pressure of control oil in a hydraulic circuit of the automatic transmission;

a pressure regulator valve provided in the hydraulic circuit and operated by the control oil to control the line pressure in the transmission;

said line pressure calculator being arranged to produce the line pressure signal representing the necessary line pressure which increases with the load signal and decreases with the vehicle speed signal and has a constant value when the load signal and the vehicle speed signal exceed respective predetermined values, so as to approximate the line pressure to torque of the engine.

4,836,056

CONTROL APPARATUS FOR VEHICLE POWER TRANSMITTING SYSTEM INCLUDING CONTINUOUSLY VARIABLE TRANSMISSION

Yasunori Nakawaki, Susono; Akio Numazawa, Nagoya, and Takashi Hayashi, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Nov. 30, 1987, Ser. No. 126,886
Claims priority, application Japan, Dec. 11, 1986, 61-295394
Int. Cl.[4] B60K *41/14*
U.S. Cl. 74—866 7 Claims

1. A control apparatus for a power transmitting system for an automotive vehicle, including a continuously variable transmission whose speed ratio is continuously variable, wherein power is transmitted from an engine of the vehicle to drive wheels of the vehicle, comprising:

first detector means for detecting a currently required output of said engine;

second detector means for detecting a running speed of the vehicle;

mode selector means responsive to said first detector means, for selecting one of a continuously variable speed mode in which said speed ratio of the continuously variable transmission is continuously changed, and a stepping shift mode in which said speed ratio is changed in a plurality of steps, said continuously variable transmission having a plurality of speed-ratio positions which correspond to said plurality of steps, said mode selector means selecting said continuously variable speed mode while the currently required output of the engine detected by said first detector means is equal to or smaller than a predetermined reference value, and selecting said stepping shift mode when said currently required output of the engine exceeds said predetermined reference value during an increase in the detected required output of the engine;

first control means operable when said continuously variable speed mode is selected, for continuously changing said speed ratio of said continuously variable transmission so as to operate said engine according to an optimum fuel consumption curve; and

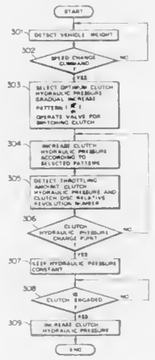
second control means operable when said stepping shift mode is selected, for selecting one of said plurality of speed-ratio positions, maintaining the selected speed-ratio position, and selecting another of said speed-ratio positions for reducing the speed ratio of said transmission so as to permit a speed of said engine to be lowered, based on the detected currently required output of the engine and the running speed of the vehicle detected by said second detector means.

4,836,057

METHOD OF CONTROLLING SPEED CHANGE CLUTCHES IN A TRANSMISSION

Yoshio Asayama, Chigasaki; Makio Tsubota, Hiratsuka; Yukitaka Takitani, Ischara, and Yasunori Okura, Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Japan

PCT No. PCT/JP86/00076, § 371 Date Dec. 16, 1986, § 102(e) Date Dec. 16, 1986, PCT Pub. No. WO86/04969, PCT Pub. Date Aug. 28, 1986
PCT Filed Feb. 19, 1986, Ser. No. 923,168
Claims priority, application Japan, Feb. 19, 1985, 60-31097; Dec. 2, 1985, 60-271055
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—867 8 Claims



1. A method of controlling a plurality of speed change clutches which are to be incorporated in a transmission of a vehicle, said method being adapted to be applied to said transmission, characterized in that said speed change clutches are controlled by the following steps:

(a) establishing a target value of jerk value;

(b) predetermining, for each speed change stage, a relation among a clutch hydraulic pressure to be applied to one of said plurality of speed change clutches to be brought into the engaged state when an intended speed stage is selected, a clutch disc relative revolution number of said one of the speed change clutches and an amount of throttling for causing said jerk value to be said target value;

(c) sensing vehicle weight and determining an increase gradient of a clutch hydraulic pressure to be applied to said one of the speed change clutches in accordance with said vehicle weight and a speed stage to be selected such that jerk value becomes said target value;

(d) causing said clutch hydraulic pressure applied to said one of the speed change clutches to be brought into the engaged state to gradually increase in accordance with said increase gradient;

(e) sensing said clutch hydraulic pressure, said disc relative revolution number and said amount of throttling, and maintaining said clutch hydraulic pressure at a value as measured at a first time point when said clutch hydraulic pressure, said disc relative revolution number and said amount of throttling establish said predetermined value; and

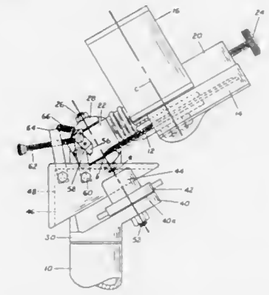
(f) causing said clutch hydraulic pressure to increase to a level of specified pressure at a second time point when said disc relative revolution number is decreased to a level of zero.

4,836,058

SAW CHAIN GRINDING MACHINE

James E. Shepherd, 1231 Dutton Rd., Eagle Point, Oreg. 97524

Filed Dec. 7, 1987, Ser. No. 129,535
Int. Cl.[4] B23D *63/16*
U.S. Cl. 76—25 A 6 Claims



1. A grinding machine for a chisel bit type saw chain having alternate right and left cutter elements with side and top surfaces meeting at a sharp corner and with portions thereof to be ground being beveled, said grinding machine comprising;

a machine base,

a disc-shaped rotatable grinding wheel having a peripheral grinding edge,

said base including means mounting said grinding wheel for rotation about a central axis perpendicular to the plane of said wheel,

saw chain holder means for holding a saw chain with the cutter elements adjacent the grinding edge of said wheel,

and pivot support means for supporting said saw chain holder means,

said pivot support means having a pivot axis parallel with the axis of said grinding wheel,

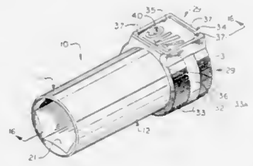
said saw chain holder means being pivotal between a pair of identically opposite angular positions and grinding right and left cutter elements at the same radial point on the edge of said grinding wheel upon relative movement of said grinding wheel and said saw chain holder means.

4,836,059

ELASTOMERIC SLEEVE FOR CONVENTIONAL WRENCH SOCKETS

Robert L. Arnold, Lancaster, Pa., assignor to Easco Corporation, Baltimore, Md.

Division of Ser. No. 930,249, Nov. 13, 1986, which is a continuation-in-part of Ser. No. 804,533, Dec. 4, 1985. This application Sep. 30, 1988, Ser. No. 254,603
Int. Cl.[4] B21K *5/16*
U.S. Cl. 76—114 3 Claims



1. Method of forming a sleeve secured on a wrench socket, comprised of the steps of:

forming an elastomeric material into a sleeve including a boss having a recess formed therein;
forming a laminated label having indicia thereon and having adhesive disposed thereon;
axially orienting and slidably positioning the sleeve on a portion of the socket;
positioning adhesive between at least a portion of the sleeve and the socket, whereby the sleeve is adhesively secured thereto;
disposing the label in the recess with the adhesive contacting the boss, whereby the label is adhesively secured therein with the indicia visible.

4,836,060

ENERGY EFFICIENT CORK EXTRACTOR

Robert J. Klefbeck, 3 Dresden Ct., Albany, N.Y. 12203

Filed May 2, 1988, Ser. No. 189,476
Int. Cl.[4] B67B *7/02*
U.S. Cl. 81—3.29 6 Claims

1. A cork or stopper extractor which comprises:
a partially threaded cylindrical shaft, a ball having an internally threaded bore sized to accept said shaft threadings, said ball also being provided with means to grasp the extremities of a pin, said pin being positioned at the threadless portion of the shaft's end and placed through and extending from the shaft's diameter, a common corkscrew tip attached to said shaft's opposite end;
a threadless tubular housing adapted to move freely along the length of said shaft and having one end designed to conform to varying sized container rims;
a common spring is provided and positioned between said tubular housing and said ball;
whereby upon the ball and pin involvement, a limited clockwise rotation of said ball is initiated, thus rotating the entire threaded cylindrical shaft and its accompanying corkscrew tip, resulting in a partial installation of the corkscrew in the cork; while rotating, said ball is pushed downward slightly to disengage from said pin and begin a communication with said cylindrical shaft threadings, a continuation of said clockwise ball rotation allows a resistance to embody said tubular housing and the container rim, thus in opposition, said threaded cylindrical shaft and its accompanying corkscrew tip are drawn upwards to provide a simple and effortless cork or stopper extraction.

4,836,061

KEYLESS DOOR UNLOCKING APPARATUS FOR AUTOMOBILES

Adam Weinraub, 2760 South Harbor Blvd., #H, Santa Ana, Calif. 92704

Filed Oct. 27, 1988, Ser. No. 263,080
Int. Cl.[4] E05B *19/20*
U.S. Cl. 81—15.9 28 Claims

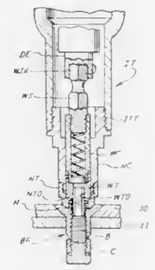
1. Apparatus for the keyless unlocking of locked doors of automobiles and the like from outside the door when the door window is closed and without damaging the door or window, said door having a door-locking switch or lever mounted on the inside door panel, the inside door panel window sill or an arm rest on the inside door panel, the apparatus comprising a slender, stiff rod formed having a tight U-bend defining an elongate, first leg portion and a shorter, second leg portion; said second leg portion having at the upper end thereof a relatively large, inverted U-shape portion with a relatively short depending third leg portion which terminates in a short hook which projects inwardly towards said first and second leg portions.

4,836,062

UNIVERSAL TOOL ADAPTES FOR BLIND FASTENER INSTALLATION TOOLS AND A UNIVERSAL METHOD FOR INSTALLATION OF BLIND FASTENERS

Joseph S. LaTorre, Santa Ana, Calif., assignor to Lok-Fast, Inc., Newport Beach, Calif.

Filed Mar. 11, 1987, Ser. No. 24,418
Int. Cl.[4] B25B *13/50*
U.S. Cl. 81—55 14 Claims



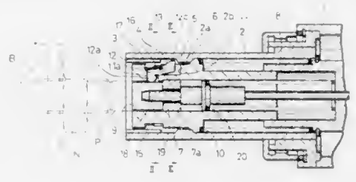
1. Blind fastener installation apparatus for making a plurality of different blind fastener installation tools capable of installing a plurality of types and sized of blind fasteners of the kind having a stationary head element and a coaxial rotatable bolt element with a protruding wrenching end, said installation apparatus comprising:
a plurality of tubular nose connecting elements, each having body connecting means proximate one of its ends for establishing a releasable stationary connection with the body of a respective said installation tool, and each having nose tip connecting means proximate its other end for establishing a releasable stationary connection with a nose tip adapting element;
a plurality of nose tip adapting elements selectively operatively connectable with said nose connecting means of each of said nose connecting elements and adpated to hold a variety of said blind fastener head elements stationary against rotation during installation events;
a plurality of wrench connecting elements, each being adapted to be generally coaxially located within a said nose connecting element, each of said wrench connecting elements having torque input means proximate one of its ends for establishing a releasable connection with rotary drive means of a respective said installation tool, and each having torque output means proximate its other end for establishing a releasable connection with a wrench tip adapting element; and
a plurality of wrench tip adapting elements selectively releasably operatively connectable with said torque output means of each of said wrench connecting elements and adapted to rotationally drive a variety of said blind fastener bolt element wrenching ends.

4,836,063

BOLT TIGHTENING TOOL

Fusao Fushiya, Anjo, Japan, assignor to Makita Electric Works, Ltd., Anjo, Japan

Filed Jul. 22, 1987, Ser. No. 76,856
Claims priority, application Japan, Jul. 28, 1986, 61-115587[U]
Int. Cl.[4] B25B *17/00*
U.S. Cl. 81—55 5 Claims



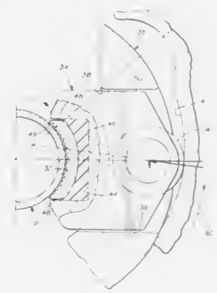
1. A bolt tightening tool for tightening a nut onto a bolt, of the type driven by a motor, comprising:
an outer sleeve rotatably coupled to said motor and having a nut receiving bore for fitting therein a nut to be tightened, said outer sleeve having an engaging groove of a predetermined width formed adjacent said nut receiving bore;
an inner sleeve axially movably mounted within said outer sleeve and having a tip receiving bore for fitting therein a tip of a bolt to be sheared therefrom, said inner sleeve having an axial recess formed in the outer periphery of the forward end thereof in generally opposed relation to said engaging groove of said outer sleeve, and having an aperture formed in the forward end of said axial recess and communicating radially with said tip receiving bore;
a stopper tiltably mounted within said axial recess of said inner sleeve, said stopper having a base portion projectable into said tip receiving bore of said inner sleeve, an engaging portion projectable into said engaging groove of said outer sleeve, and a first horizontal portion formed between said base portion and said engaging portion, said first horizontal portion contacting the bottom of said axial recess of said inner sleeve, the contact point of said first horizontal portion being a fulcrum of tilting movement of said stopper; and
biasing means for urging said base portion of said stopper to project radially into said tip receiving bore of said inner sleeve, for urging said engaging portion of said stopper to project into said engaging groove of said outer sleeve, and for urging said first horizontal portion of said stopper against the bottom of said axial recess of said inner sleeve;
whereby when a tip of a bolt is received in said tip receiving bore, said base portion of said stopper is pushed directly by the tip of the bolt in a radial direction so that said stopper is tilted and said engaging portion of said stopper is disengaged from said engaging groove of said outer sleeve.

4,836,064

JAWS FOR POWER TONGS AND BACK-UP UNITS

Damon T. Slator, 5629 Sugar Hill, Houston, Tex. 77056

Continuation-in-part of Ser. No. 36,592, Apr. 10, 1987. This application Jul. 16, 1987, Ser. No. 74,143
Int. Cl.[4] B25B *17/00*
U.S. Cl. 81—57.18 11 Claims



1. In a power tong or back-up unit having a plurality of jaws, each jaw having a roller mounted thereon adapted to engage a camming surface, each jaw guided by guideways in a spider, whereupon relative movement between the camming surface and the spider results in radial movement of said jaws toward a pipe, the improvement in each jaw comprising:
said jaw having a cavity whose opening is oriented toward the pipe to be gripped;
a pipe-gripping die movably mounted in said cavity effectively closing off said cavity, said die having a gripping surface adapted to contact the pipe;
an elastomer means disposed within and filling said cavity behind said die for providing a substantially even distribution of forces, equivalent to force distribution in a confined hydraulic medium, along the entire length of said die upon an uneven force being applied on said die when there is contact between said die and the pipe;
whereupon the pressure applied by said die on the pipe is resultantly substantially uniform over the said gripping surface of said die.

4,836,065

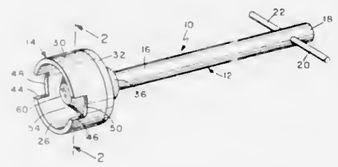
RADIATOR CAP REMOVAL TOOL

Tyrus W. Setliff, 625 E. Estavan, Apache Junction, Ariz. 85219

Filed May 2, 1988, Ser. No. 188,920
Int. Cl.[4] B25P *13/02*
U.S. Cl. 81—124.2 11 Claims

1. A radiator cap removal tool comprising:
a handle;
a housing open at one end and closed at an other end, said handle attached to said housing at said housing closed end,

and said housing having notches formed at said open end each for engaging a radiator cap gear; and



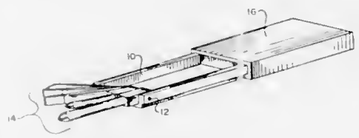
a pressure relief valve engagement means disposed within said housing for engaging a radiator cap pressure relief valve.

4,836,066

SELF-STORING TOOL SET

Charles H. Graham, Lava Hot Springs, Id., and George A. Matthews, Salt Lake City, Utah, assignors to GLI Industries, Inc., Salt Lake City, Utah

Filed Dec. 1, 1986, Ser. No. 936,457
Int. Cl.[4] B25B *13/10*
U.S. Cl. 81—177.4 16 Claims



1. A self-storing tool set, comprising

a drawer with a bottom support and a pair of side supports upstanding from said bottom supports;

an axle connected between said side supports;

a plurality of elongated tools, mutually adapted and configured to rest in a stored position in side-by-side relation to each other atop said bottom support between said side supports, each said tool including a working end and a shank portion opposite said working end, said shank portions being pivotally mounted on said axle so that each tool may selectively be moved from its said stored position to a use position in which its working end extends beyond said drawer, and its shank portion is rotated approximately 180° with respect to its stored position;

a cover slidingly connected to said drawer for movement between a closed position in which it covers said drawer and an open position exposing said tools to view, thereby enabling the movement of a selected said tool between its stored and use positions;

guide means associated with said cover and said drawer for providing alignment and sliding engagement between said cover and said drawer; and

stop means associated with said cover for precluding said cover from hyperextending beyond said open position as it moves from said closed position toward said open position;

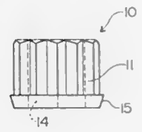
said drawer, cover, and shanks being cooperatively adapted so that when said cover is in its closed position, said shanks are locked against pivoting movement so that said cover and drawer cooperatively form a rigid handle assembly sized and configured for grasping by the hand of an individual whereby forces may be exerted upon a tool in its use position with the fingers in close proximity of said axle.

4,836,067

PROTECTIVE SOCKET INSERT

Dale R. Rogers; Delton F. Rogers, and Larry L. Rogers, all of 3144 S. 1200 West, Salt Lake City, Utah 84119

Continuation-in-part of Ser. No. 571,101, Jan. 16, 1984, abandoned. This application May 20, 1985, Ser. No. 735,562
Int. Cl.[4] B25B *13/58*
U.S. Cl. 81—185 7 Claims



1. A nut and bolt protecting means comprising: wrench means of accepted size having an opening therein for receiving and engaging nuts and bolts of accepted size, a hexagonal wrench insert formed from a nonmetallic material including a continuous open-ended wall structure defining a nut and bolt receiving area therein so proportioned as to convert said opening from one standard size to a smaller standard size and an integrally formed flange portion at one end of side wall structure opposite the insert end of said wall structure, said wall structure (being) including an exterior surface tapered inwardly from said flange portion so that the exterior surface of said wall structure will increasingly engage said wrench as said insert is pressed into said opening therein and an interior surface tapered inwardly from said flange so that said interior surface of said wall structure will increasingly engage said nuts and bolts as the same are inserted into said nut and bolt receiving area, whereby finely finished nuts and bolts can be manipulated with standard wrench means without marring or otherwise damaging the surface of such nuts and bolts and whereby surfaces adjacent to said nut and bolt being manipulated will be protected from marring by said flange portion of said insert.

4,836,068

LOCK ROD AND APPARATUS FOR HOLDING A TOOLHOLDER

Robert A. Erickson, Raleigh, N.C., assignor to Kennametal Inc., Latrobe, Pa. and Krupp Widia GmbH, Essen, Fed. Rep. of Germany

Division of Ser. No. 7,169, Jan. 27, 1987, Pat. No. 4,708,040. This application Oct. 1, 1987, Ser. No. 103,614
Int. Cl.[4] B23B *29/04*
U.S. Cl. 82—160 4 Claims

1. A lock rod comprising:

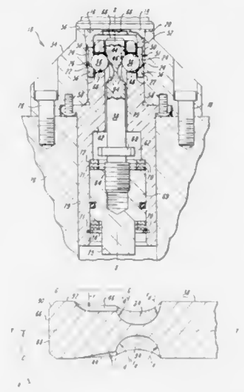
a rod having a first end and an oppositely facing second end, said first and second ends joined by a side surface, and a central axis Y—Y extending between said first and second ends;

a first depression in said side surface;

a ramp in said side surface having a concave cylindrical surface joining and extending away from said first depression, wherein said concave cylindrical surface has an axis of rotational symmetry, R—R, which recedes from said axis Y—Y at an acute angle while extending away from said first depression in a first direction;

a second depression in said side surface circumferentially spaced from said first depression;

a groove in said side surface having a concave cylindrical surface joining and extending away from said second depression in said first direction, wherein said concave cylindrical surface of said groove has an axis of rotational symmetry, G—G, which lies parallel to axis Y—Y;



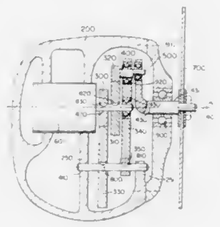
and wherein said cylindrical surface of said groove joins said second depression above the maximum radial depth of said second depression.

4,836,069

PROCESS AND MEANS FOR CUTTING HARD OBJECTS OR MATERIALS WITHOUT CUTTING SOFTER OBJECTS OR MATERIALS

Can Tran Dinh, 23, avenue Neil, 75017 Paris, France

Filed Aug. 20, 1987, Ser. No. 87,289
Claims priority, application France, Aug. 20, 1986, 86 11886
Int. Cl.[4] A61F *15/02*
U.S. Cl. 83—13 6 Claims



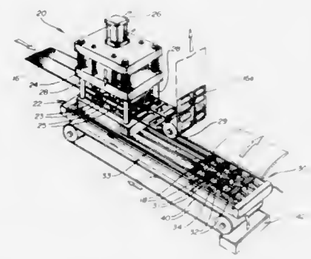
1. A process for cutting material with a saw blade having cutting teeth by placing the teeth of said blade against said material in cutting contact therewith while simultaneously moving said blade in first and second periodic motions, said first motion having a relatively long period and high amplitude and said second motion having a relatively short period and low amplitude, and causing the teeth of said blade to move along the same line in said second motion as it is moved along in said first motion, whereby relatively hard materials may be cut without cutting relatively soft materials when both hard and soft materials are in contact with said blade.

4,836,070

METHOD AND APPARATUS FOR PRODUCING FIBROUS WEB PIECES

John D. Spano, Bordentown Township, Burlington County, N.J., and Michael J. Menard, Doylestown, Pa., assignors to Personal Products Company, Milltown, N.J.

Filed Aug. 15, 1986, Ser. No. 897,166
Int. Cl.[4] B26D *7/18*
U.S. Cl. 83—27 9 Claims



1. An apparatus for die cutting multiple pieces of fibrous material for incontinent pads or the like, the apparatus comprising:

(a) means for feeding forward a continuous fibrous web to a cutting and transfer station;

(b) a cutting die assembly at said cutting and transfer station, said cutting die assembly including a lower body unit having a plurality of shaped openings therein and a vertically movable upper body unit having a plurality of punch members each adapted to closely interfit into one of said die body openings with total clearance less than about 0.001 inch, so as to punch out a plurality of individual web pieces from the continuous web and thereby form a scrap material web;

(c) shuttle conveyor means located below said die assembly and adapted to receive the punched out web pieces, said shuttle conveyor being adapted to move the web pieces forward to a further processing station; means associated with said shuttle conveyor means for increasing the spacing between adjacent punched out web pieces as they are moved to said further processing station by said shuttle conveyor means; and

(d) means for withdrawing the scrap material web.

4,836,071

MODULAR PUNCH APPARATUS FOR PUNCHING COMPLEX SHAPES FROM A METAL RIBBON OR TAPE

Metin Ersoy, Walluf, Fed. Rep. of Germany, assignor to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Jan. 29, 1988, Ser. No. 150,088
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1987, 3703649
Int. Cl.[4] B26D *7/18*
U.S. Cl. 83—140 22 Claims

1. Punch press apparatus for sequentially punching shapes, particularly complex shapes, from a workpiece comprising a metal strip or ribbon (13), having

a die plate (1);

a punch element (P);

a stripper plate (2) located above the die plate;

a punch holer plate means (3, 3') carrying the punch element (P), located above the stripper plate;

a plurality of posts (6) retaining and stacking said plates and guiding relative movement of the die plate (1), the stripper plate (2) and the punch holder plate means (3, 3') when carrying out a punching stroke;

workpiece guide elements (**9**) located on the die plate (**1**) for guiding the workpiece in a predetermined path over the die plate between the die plate and the stripper plate; and wherein

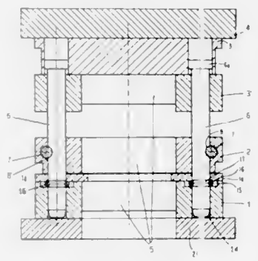
said stripper plate (**2**), when in a rest position between punching strokes and when out of engagement with the workpiece (**13**), is sapced from the top surface of the die plate by a distance which is only up to twice the thickness of the workpiece;

at least the die plate (**1**) and the punch holder plate means are, in plan view, frame shaped and defined an open window or chamber (**5**) centrally of said plates for reception of modular inserts corresponding to the shapes to be punched;

the stripper plate (**2**) is connected to at least two of said posts (**6**);

resiliently yielding holding spring means (**16, 916**) are provided, positioned for coupling the die plate (**1**) to said at least two posts in predetermined position relative to the stripper plate (**2**) and spaced from the stripper plate sufficient to provide just enough clearance for the workpiece to move across the die plate between punching strokes;

and force means (**F, 4, 3, 29, 26**) are provided acting on said punch holder plate means (**3, 3'**) and on at least said two posts (**6**) and of sufficient strength for overriding said



yielding holding means (**16, 916**) for moving said stripper plate into engagement with the workpiece to clamp the workpiece (**13**) during a punching stroke and further for moving the punch holder plate means and thus the punch element (P) against the workpiece (**13**);

wherein the guide elements (**9**) are located at least in part below the workpiece (**13**), and

said guide element define the lateral dimensions of said guide path only while leaving free the surface of the strip or ribbon first engaged by the punch element during a punching operation;

guide spring means (**10**) are provided, coupled to the guide means (**9**) and positioned for biassing the guide means upwardly against the workpiece, and

wherein the sum of the spring forces of the guide spring means (**10**) acting on said guide elements corresponds at least approximately to the weight of the stripper plate; and

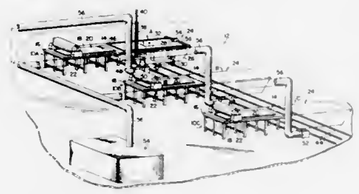
the guide spring means (**10**) compression path corresponds at least approximately to the distance (d) between the top surface of the die plate and a facing surface of the stripper plate (**2**) when the stripper plate is out of engagement with the workpiece (**13**) and between punching strokes, and the stripper plate, upon withdrawal of the punch element (P), is raised above the die plate (**1**) by a distance which is only up to twice the thickness of the workpiece.

4,836,072

VACUUM SUPPLY SYSTEM FOR MOVABLE CUTTER

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., West Tolland, Conn.

Filed Apr. 21, 1988, Ser. No. 184,209
Int. Cl.[4] B25B *11/00;* **B26D** *7/01*
U.S. Cl. 83—152 **11 Claims**



1. In a sheet material cutting plant, the combination comprising:

a generally horizontal floor having a number of different cutting stations,

a plurality of vacuum outlets each located at a respective one of said cutting stations,

a vacuum generator,

duct means connecting all of said vacuum outlets to said vacuum generator so that vacuum produced by said generator is available at each of said outlets,

a sheet material cutter including a cutting table,

means supporting said cutting table for movement over said floor to any selected one of said cutting stations, and

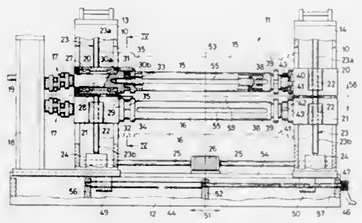
means for releasably connecting said cutting table to the vacuum outlet associated with the cutting station at which said table is positioned to supply vacuum from said generator to said table through such outlet.

4,836,073

MACHINE FOR SLITTING CONTINUOUS TAPES INTO STRIPES, IN PARTICULAR WITH CUTTING CYLINDERS HAVING VARIABLE SIZE

Giovanni P. Castiglioni, Castellanza, Italy, assignor to F.I.C.I. Finanziaria Industriale Commerciale Immobiliare SpA, Milan, Italy

Continuation of Ser. No. 933,977, Nov. 24, 1986, abandoned. This application Sep. 1, 1988, Ser. No. 249,244
Claims priority, application Italy, Dec. 11, 1985, 23170 A/85
Int. Cl.[4] B23D *19/06;* **B26D** *1/24*
U.S. Cl. 83—344 **20 Claims**



1. A machine for slitting a tape into strips comprising a pair of mandrels adapted to carry cutting elements thereon, each of said pair of mandrels having axially opposite end portions, means at and axially outboard of said axially opposite mandrel end portions and in generally axially alignment therewith for journaling said mandrels for rotation about generally parallel axes, a pair of stands contiguous said mandrel axial opposite

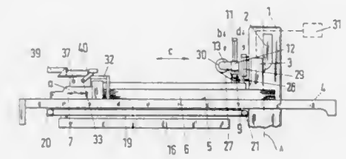
end portions, said journaling means being carried by said stands, means for adjustably slidably connecting each of said mandrel end portions to an associated stand whereby said mandrels can be spaced different radial distances from each other to accommodate different sizes of cutting elements, means for relatively moving said stands toward and away from each other to effect removal and assembly of said mandrel relative to said stands, coupling means disposed generally axially between at least one end portion of each mandrel and its adjacent journaling means, each of said coupling means including a projection and a cradle, one of said projection and cradle being carried by one of said mandrel at least one end portion and said adjacent journaling means, the other of said projection and cradle being carried by the other of said mandrel at least one end portion and said adjacent journaling means, and means disposed generally axially between at least one end portion of each mandrel and its adjacent journaling means for releasably locking said projection in said cradle.

4,836,074

MACHINE FOR CUTTING STACKS OF PAPER SHEETS AND THE LIKE

Wolfgang Mohr, Hundshager Weg 42, D-6238 Hofheim, Fed. Rep. of Germaoy

Filed Jun. 24, 1987, Ser. No. 66,089
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1986, 3623004
Int. Cl.[4] B26D *7/02*
U.S. Cl. 83—379 **23 Claims**



1. A guillotine type machine for cutting stacked sheets of paper and similar stock, comprising a table having a stock supporting surface; a knife movable up and down to sever the stock on said table in a predetermined cutting plane; means for feeding the stock along said surface in a direction toward and substantially at right angles to said plane; means for expelling air from the stock on said table; means for moving said expelling means along and on top of the stock on said table between spaced-apart first and second positions; a hold-down device adjacent said expelling means in the first position of said expelling means and arranged to engage the stock during movement of the expelling means from one to the other of said positions; cover means; and means for interposing said cover means between the stock on said table and said expelling means prior to movement of said expelling means from said one to said other position.

4,836,075

MUSICAL CUBE

Tchaun Armstrong, Nothglenn, Colo., assignor to Stone Rose Limited, Golden, Colo.

Filed Oct. 14, 1987, Ser. No. 108,112
Int. Cl.[4] G10H *1/00, 1/34, 5/04*
U.S. Cl. 84—1.01 **8 Claims**

1. An improved musical cube comprising:

(a) a six-sided substantially cubical housing made of a material allowing light transmission therethrough, each side having a face;

(b) an electrical circuit mounted in said housing including:

(i) a microprocessor having memory means for storing six unique sound sequences, each sound sequence including at least a first sound followed by a pause followed by at least a second sound;

(ii) three two-axis switches, each said switch including a moving contact having three positions, a first position closing a first subcircuit and opening a second subcircuit, a second position closing said second subcircuit and opening said first subcircuit and a third position opening said first and second subcircuits, said electrical circuit including three first subcircuits and three second subcircuits with each subcircuit corresponding to one of said six faces, each said switch being gravity operated, said switches being mounted in said housing in mutually perpendicular relation with respect to one another, each said subcircuit being connected with said microprocessor memory means to access one particular said sound sequence;

(iii) whereby as said housing is moved, at any given instant, one of said faces may face in a predetermined

direction with respect to the direction of the force of gravity, and whereby whenever any one of said faces is facing in said predetermined direction, a said switch corresponding to said one of said faces moves under the force of gravity to one of said first and second positions to thereby close a corresponding one of said six subcircuits, thereby causing at least a portion of one of said unique sound sequences to be played, said circuit causing others of said sound sequences to be played as respective others of said faces are caused to face in said predetermined direction during movements of said housing;

(iv) further wherein whenever a said subscriber is closed for a time period less than a predetermined time period, only a respective said first sound is played, and whenever a said subcircuit is closed for a time period greater than said predetermined time period, at least a portion of said second sound is played.

4,836,076

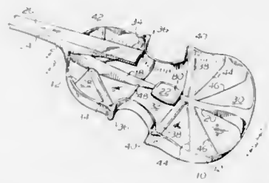
MOLDED SOUND BOX FOR VIOLIN AND THE LIKE

Michel M. Bernier, 42, St-Michel, St-Elie-D'Orford, Quebec, Canada J0B 2S0

Filed Jul. 1, 1988, Ser. No. 214,485
Int. Cl.[4] G10D *1/02*
U.S. Cl. 84—275 **11 Claims**

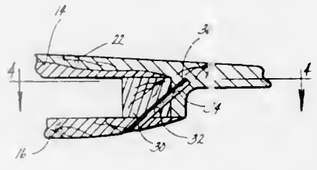
1. A sound box and a handle for violin or the like made of molded plastic, said box comprising a lower and an upper sound board and an intermediate surrounding sidewall sealed to the lower and upper sound boards, each of said sound boards having an upper and a lower box connected by a neck portion delineated by a C-shape forming corners with the

upper and lower boxes, said lower board having a generally uniform thickness, a large rib sealed on said lower board and to said sidewall along the longitudinal axis of the violin, the height of the large rib adjacent the sidewall being substantially equal to the height of the sidewall, the cross-section of said



large rib tapering down from both ends to the center portion of the lower board, said handle being molded with said lower sound board and said large rib and integrally extending from said large rib, two series of secondary ribs sealed to the lower board, each series irradiating from the large rib, displaying a similar pattern on both sides of the large rib.

4,836,077
METHOD FOR REINFORCING THE NECK OF A VIOLIN
John H. Hogue, 436 S. Saginaw St., Flint, Mich. 48501
Filed Oct. 3, 1988, Ser. No. 251,799
Int. Cl.[4] G10D *1/02*
U.S. Cl. 84—293 **3 Claims**



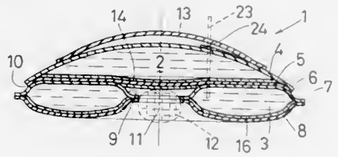
1. In a violin having a wooden sound box, including a wooden belly board and a wooden back board, a wooden neck connected to the sound box, and string means, first means connecting one end of the string means to the sound box and second means connecting the opposite end of the string means to the neck, and a neck block mounted in the sound box and attached to the neck, the improvement comprising:
the neck block having a first dowel receiving opening;
the neck having a second dowel-receiving opening;
a wooden dowel tightly received in the first opening in the neck block and the second opening in the neck to reinforce the joint between the neck and the sound box in response to a force applied by the string means.

4,836,078
MULTIFUNCTIONAL AMMUNITION CASE RELOADING DIE
Richard J. Lee, 3146 Kettle Morraine Rd., Hartford, Wis. 53027
Filed Oct. 3, 1988, Ser. No. 252,660
Int. Cl.[4] F42B *33/02, 33/10, 33/12, 11/02*
U.S. Cl. 86—24 **10 Claims**

1. A multifunctional ammunition case reloading die assembly adapted for being mounted to the die holder of an ammunition reloading apparatus, comprising:
an elongated generally cylindrical die body having first and second ends, a bore extending from end to end, and an external thread for mounting to said die holder,
a case sizer element and means for uncoupling said sizer element to and from, respectively said second end of the die body, said element having a hole disposed coaxial with said bore into which hole an ammunition case is pressed to size it and from which said case is withdrawn while said sizer element remains coupled to said die body, said die

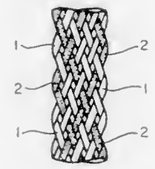
body being adapted to remain mounted in said holder for performing at least one other reloading operation after said sizer element is uncoupled from the holder.

4,836,079
BOMB BLAST INHIBITOR AND METHOD OF BOMB BLAST INHIBITION
Garth J. M. Barrett, Northcliff, South Africa, assignor to Cube Overseas Trading Ltd, Channel Islands
Filed Jan. 11, 1988, Ser. No. 141,849
Claims priority, application South Africa, Jan. 14, 1987, 87/0235
Int. Cl.[4] F42B *33/00;* **C06B** *21/00*
U.S. Cl. 86—50 **17 Claims**



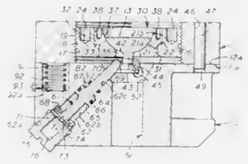
1. A method of diminishing the deleterious effects of a bomb comprising locating a closed, frangible container of a size and shape to cover said bomb when filled with non-flammable liquid
said container being formed with a plurality of closed compartments for said liquid with a first compartment forming a closed top of the inhibitor and a second compartment thereunder extending around at least a part of the periphery of the upper compartment and forming a supporting sidewall of said container;
each of said compartment being made of a sheet material joined together at seams to define the closed container, said container being located relative to a bomb so as to substantially cover same and substantially obscure the bomb from all surrounding open spaces.

4,836,080
VIBRATION ABRASIVE RESISTANT FABRIC COVERING
Joseph S. Kite, III, West Chester, and Marie C. Tresslar, Plymouth Meeting, both of Pa., assignors to The Bentley-Harris Manufacturing Company, Lionville, Pa.
Filed Jul. 29, 1987, Ser. No. 79,737
Int. Cl.[4] D04C *1/02;* **F16L** *11/02*
U.S. Cl. 87—9 **7 Claims**



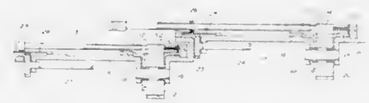
1. A flexible fabric sleeve type covering suitable for protecting and covering of products used under abrasive and vibrating conditions, which comprises:
a first yarn of a flexible strand of a material selected from the group consisting of ceramic, quartz, glass, and engineering plastic polymer, and mixtures thereof, a second yarn of a flexible strand of a metallic wire selected from the group comprising stainless steel, black iron, inconel and copper, the number of strands of second yarn are from two (2) to twenty-five (25) percent of the total number of strands of both yarns, the second yarn having a diameter of about 3 to 8 mils, and said sleeve type covering having a flexibility substantially equal to the flexibility of a sleeve type covering made from only the first yarn, the second yarn being equally distributed throughout the covering in a matrix which protects the first yarn under abrasive, vibrating conditions.

4,836,081
TOGGLE RELEASE
Thomas J. Graves; Robert A. Yang, and Christopher W. Brown, all of Houston, Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Feb. 11, 1988, Ser. No. 154,712
Int. Cl.[4] B64D *1/12*
U.S. Cl. 89—1.14 **7 Claims**



7. A fault tolerant releasable fastener for releasably joining separable structures, said fastener comprising:
a fastener plate and a fastener body, each of which is separately attachable to a different one of the structures to be joined;
a toggle member for releasably fastening the fastener plate to the fastener body,
said toggle member being supported at a first end by the fastener plate and mounted thereon by a swivel coupling for universal pivotal movement about said first end, said fastener body having an opening in the face disposed towards the fastener plate of a size sufficient to receive a second end of the toggle member while allowing limited pivotal movement of the toggle member about the first end which is supported by the fastener plate;
three retractable latching pins slidably mounted in latch pin receiving bores provided on the fastener body in symmetrical equiangular spacing about the second end of the toggle member received in said opening, said second end portion having contact shoulders symmetrically located about the axis of the toggle member, each latching pin being positionable with an end portion thereof in contact with a different one of said contact shoulders and in latching engagement with the second end portion of the toggle received in the opening of the fastener body whereby said toggle is engaged and restrained by the latching pins at engagement points symmetrical with respect to the axis of the toggle member; and
means for individually retracting each of said latching pins from latching engagement with the second end of the toggle member retraction of at least one of the latching pins resulting in release of the toggle member and said fastener plate from said fastener body by virtue of pivotal movement of the toggle member.

4,836,082
CLOUD GUN
David Dardick, 211 E. 70th St., New York, N.Y. 10021
Filed Aug. 6, 1987, Ser. No. 82,191
Int. Cl.[4] F41D *10/30*
U.S. Cl. 89—1.41 **18 Claims**



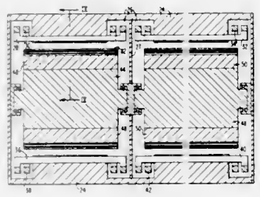
1. A multiple barrel gun for high rate of fire comprising:
means for rotating at high speed a first series of gun barrels in a circular path,
means for oppositely rotating at that speed a second series of gun barrels in a circular path concentric with the first series but axially displaced therefrom,
means for feeding cartridges to the first series of gun barrels from a lesser number of fixed firing stations equally spaced along said circular path,
means for feeding cartridges to the second series of gun barrels from fixed firing station along said second path,
means forming an open sided firing chamber for each of the gun barrels in both series of barrels,
said firing chambers being triangular in cross section and receiving and ejecting triangularly shaped cartridges in a direction transverse to the gun barrels and free of any axial movement of the cartridges during feeding, firing, and ejection.

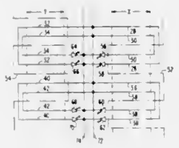
4,836,083
ALTERNATOR FOR RAPID REPETITIVE PULSING OF AN ELECTROMAGNETIC LAUNCHER
David M. Triezenberg, Wilkins Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Aug. 2, 1982, Ser. No. 403,955
Int. Cl.[4] F41F *1/02;* **H02K** *16/00, 19/16*
U.S. Cl. 89—8 **16 Claims**

1. An electromagnetic projectile launcher comprising:
a pair of conductive projectile launching rails;
a source of alternating current including: a stator structure having an internal space, a first pair of single layer concentric coil portions disposed adjacent to the circumference of said space, and means for producing a first rotating magnetic field within said space, thereby inducing a voltage in said first pair of coil portions;

means for electrically connecting said first pair of concentric coil portions in parallel;

wherein each of said coil portions includes a conductor which extends longitudinally along a first portion of said stator structure, loops back, and extends longitudinally along a second portion of said stator structure, said second stator portion being circumferentially displaced from said first stator portion;





means for conducting current between said projectile launching rails and for propelling a projectile along said rails; and

means for switching current from said current source to said projectile launching rails, said current being switched at a preselected phase angle such that said current goes to zero as said projectile exits from said projectile launching rails.

4,836,084

ARMOUR PLATE COMPOSITE WITH CERAMIC IMPACT LAYER

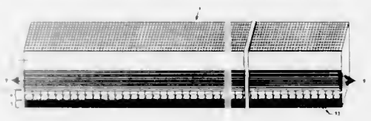
Laurens B. Vogelesang, Nieuwkoop; Marcel L. C. E. Verbruggen, Arnhem, and Cornelis G. Pasvast, Vlaardingen, all of Netherlands, assignors to Akzo nv, Arnhem, Netherlands

Filed Feb. 20, 1987, Ser. No. 16,728

Claims priority, application Netherlands, Feb. 22, 1986, 8600449

Int. Cl.[4] F41H 5/04

U.S. Cl. 89—36.02 **15 Claims**



1. An armor plate composite comprising:

a hard impact layer based on ceramic material; and

an energy absorbing sub-layer attached to the impact layer and containing fiber layers impregnated with a bonding material;

the sub-layer being formed by a laminate of alternating fiber layers and metal plates;

said laminate comprising at least three metal plates;

at least one fiber layer being attached to and interposed between each pair of subsequent metal plates;

each metal plate being formed of an aluminum alloy;

said ceramic impact layer having a total thickness of more than 3 mm;

said fiber layers in the sub-layer laminate being in the form of a woven fabric;

the fibers in said fiber layers in the sub-layer laminate having a modulus of elasticity in the range of 1×10^4 up to $25\times10^4 N/mm^2$; and

said ceramic impact layer having a thickness which is greater than the thickness of each of said metal plates.

4,836,085

MAGAZINE ARRANGEMENT FOR A TANK

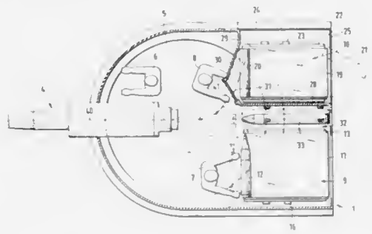
Gert Winkler, Meerbusch, and Adolf Nordmann, Erkrath, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jan. 22, 1988, Ser. No. 148,175

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1987, 3701713

Int. Cl.[4] F41F 9/06; F41D 10/34

U.S. Cl. 89—45 **6 Claims**



1. In a tank turret having a crew chamber and a tubular weapon disposed in a front portion of the turret, and first and second magazine units disposed within a rear portion of the turret, with said first magazine unit receiving projectiles and said second magazine unit being receiving propelling charges for the projectiles, and with one of said magazine units being laterally disposed on the left side of a vertical plane containing the longitudinal axis of the weapon and the other of said magazine units being disposed on the right side of the vertical plane containing the longitudinal axis of the weapon; the improvement wherein:

said first and second magazine units are disposed and oriented in said turret to receive and support the projectiles and the propelling charges with their longitudinal axes transverse to said vertical plane containing the longitudinal axis of said weapon and with the front ends of the projectiles facing inwardly toward said vertical plane;

said second magazine unit for the propelling charges is disposed in a closed chamber formed by a plurality of interior armored walls disposed within said turret and separating said second magazine unit from said crew chamber and the portions of the exterior walls of said turret adjacent said second magazine unit;

said interior armored walls are more strongly armored than said portions of the exterior walls of said turret; and

one of said interior armored walls which is disposed at the front of said chamber and facing said weapon is provided with a door to permit propelling carges to be removed from said second magazine unit and supplied to said weapon.

4,836,086

APPARATUS AND METHOD FOR THE MIXING AND DIFFUSION OF WARM AND COLD AIR FOR DISSOLVING FOG

Angelo Cecconi, Via Degas, 21, 00133 Rome, Italy

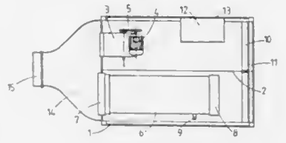
PCT No. PCT/IT87/00006, § 371 Date Oct. 13, 1987, § 102(e) Date Oct. 13, 1987, PCT Pub. No. WO87/05065, PCT Pub. Date Aug. 27, 1987

PCT Filed Jan. 30, 1987, Ser. No. 121,968

Claims priority, application Italy, Feb. 13, 1986, 47654 A/86

Int. Cl.[4] E01H 13/00

U.S. Cl. 98—1 **3 Claims**



1. A method for dissolving fog on large open areas, such as landing strips for aircrafts, stadia, harbors and the like, comprising the subdivision of the area in sub-areas, in each of which a directional jet of a mixture of warm and hot air is discharged, characterized by the fact that each jet is obtained by a predetermined mixture of a slightly forced stream of hot air and of a more strongly forced stream of un-heated air, said discharged jet, having a duly adjustable amplitude, being discharged in a direction substantially parallel to the ground, said discharged jet being such as to contain about 10 kcal per m^3, while the jet speed is less than or equal to about 20 m/sec.

4,836,087

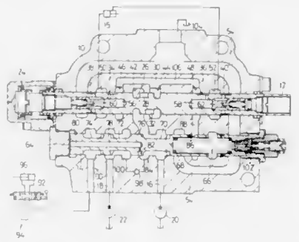
HYDRAULIC CONTROL APPARATUS FOR VEHICLE

Yukinao Nakagomi, Saitama, Japan, assignor to Kayaba Industry Co., Ltd., Japan

Filed Nov. 3, 1987, Ser. No. 116,623

Int. Cl.[4] F15B 13/04

U.S. Cl. 91—29 **12 Claims**



1. A hydraulic control apparatus for a vehicle comprising:

a steering cylinder;

a first pump and a second pump each connected to said steering cylinder;

a first flow passage arranged between said first pump and said steering cylinder;

a variable construction provided in said first flow passage;

a steering spool for changing over said first flow passage and controlling the degree of opening of said variable constriction;

an implement circuit;

a second flow passage arranged between said second pump and said implement circuit;

a single flow control valve spool which changes over depending on a variation of pressure on an upstream side of said variable constriction and varies the degree of opening of said second flow passage depending on a variation of pressure on said upstream side of said variable constriction.

4,836,088

DIRECTIONAL CONTROL VALVE AND REGENERATION VALVE

David T. Seabaugh, Goose Creek, S.C., assignor to Rome Industries, Inc., Cedartown, Ga.

Filed Aug. 21, 1985, Ser. No. 767,764

Int. Cl.[4] F15B 11/08

U.S. Cl. 91—436 **14 Claims**

1. A system having a plurality of double acting hydraulic piston/cylinder assemblies which are to be operated individually and at selected times, comprising the combination of:

an operator-controlled valve adapted to be connected both to a source of pressurized hydraulic fluid and to drain therefor, and having first and second outlets respectively connected to the source and drain in one position of the operator-controlled valve and vice versa in another position of the operator-controlled valve;

a control unit including first and second fluid inlet ports connected respectively to said first and second outlets to receive pressurized fluid at said first inlet port while said second fluid inlet port is connected to drain, and vice versa, dependent upon the position of said operator-controlled valve;

said control unit also including first and second fluid outlet ports adapted to supply the base end and the rod end of a first double acting piston/cylinder assembly respectively with pressurized fluid and drain connection, and vice versa, dependent upon the position of said operator-controlled valve;

said control unit further including third and fourth fluid outlet ports adapted to supply the base end and the rod end of a second double acting piston/cylinder assembly respectively with pressurized fluid and drain connection, and vice versa, dependent upon the position of said operator-controlled valve; and

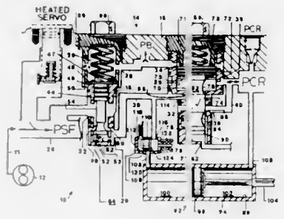
said control unit including directional flow control valve means for selectively blocking flow from said first and second inlet ports either to said first and second outlet ports or to said third and fourth outlet ports, said flow control valve means comprising pilot fluid controlled valve means for normally allowing flow only from said first and second fluid inlet ports to said first and second outlet ports, a pilot fluid pressure line and a pilot fluid drain line, and solenoid operated valve means for allowing said pilot fluid pressure line to communicate with said pilot fluid drain line while actuating said pilot fluid controlled valve means to allow flow only from said first and second inlet ports to said third and fourth outlet ports.

4,836,089

SERIES SPOOL PRESSURE REGULATOR ARRANGEMENT FOR A DOUBLE ACTING HYDRAULIC ACTUATOR

Robert G. Moore, Jr., Granger, Ind., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Oct. 16, 1987, Ser. No. 108,889
Int. Cl.[4] F15B *13/042;* F16K *31/122*
U.S. Cl. 91—446 7 Claims



1. A regulator arrangement for supplying a servo system with secondary operational fluid having a substantially constant fluid pressure, comprising:

a housing having a first bore and a second bore, said first bore having a supply port connected to a source of fluid having a fluid pressure $P_{(s)}$ and a first outlet port, said second bore having an entrance port connected to said first outlet port and a second outlet port connected to said servo system, said first and second bores having first and second reference ports connected to a reference fluid having a fluid pressure $P_{(B)}$, and said second bore having a bypass port connected to said second outlet port;

first piston means located in said first bore having a first diameter section for separating said supply port from said first reference port and a second diameter section for separating said supply port from said first outlet port;

first resilient means opposing the movement of said first piston means by a first pressure differential force produced across said first piston means to position a first surface on said second diameter section with respect to a first seat and thereby regulate the flow of the supply fluid through said first outlet port to produce primary operational fluid having a fluid pressure P_c;

second piston means located in said second bore, said second piston means having a third diameter section for separating said second outlet port from said second reference port, a first groove located between a first land and said third diameter section and a second groove between the first land and a second land;

a second resilient means for positioning said second piston means to allow primary operational fluid to flow through said entrance port to said second outlet port by way of said first groove, said primary operational fluid acting on said third diameter to develop a second pressure differential force to oppose the movement of said second piston means by said second resilient means to restrict the flow of said primary operational fluid through said first groove and create said secondary operational fluid having a fluid pressure P_{cr};

control means responsive to an operational signal for selective connecting a control port with the primary operational fluid and the reference fluid;

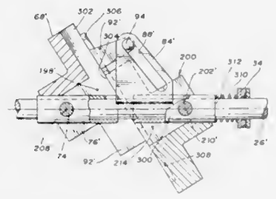
load means having a movable wall that separates a first chamber from a second chamber, said first chamber being connected to said control means and said second chamber being connected to said second outlet port, said control means responding to an operational signal to selectively allow primary operational fluid (P_c) or reference fluid $P_{(B)}$ to flow to said first chamber to establish a fluid pressure $P_{(x)}$ therein and develop a pressure differential (P_x–P_{cr}) across the movable wall, said pressure differential (P_x–P_{cr}) acting on said movable wall to modify the fluid pressure P_{cr} in said second chamber to $P_{(crx)}$, said fluid pressure $P_{(crx)}$ being communicated to said second bore to develop a corresponding pressure differential (P_{crx}–P_B) across said third diameter and allow said second resilient means to move either the first groove to a position which allows additional primary operational fluid to flow through the entrance port or the second groove to a position which allows secondary operational fluid to flow through the bypass valve until the fluid pressure of the secondary operational fluid returns to P_{cr}.

4,836,090

BALANCED VARIABLE STROKE AXIAL PISTON MACHINE

Richard H. Smith, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 148,850, Jan. 27, 1988. This application Jun. 13, 1988, Ser. No. 206,070
Int. Cl.[4] F04B *1/26*
U.S. Cl. 92—12.2 2 Claims



1. A variable stroke axial piston machine having a shaft, a swash plate centrally received on said shaft, means operatively connecting said swash plate to said shaft for rotation therewith and relative axial movement and tilting relative thereto about an axis at right angles to and intersecting with the axis of said shaft, a wobble plate centrally received on said shaft and operatively contacting one side of said swash plate, means preventing said wobble plate from rotating so that said wobble plate is caused to rotate by operative contact with said one side of said swash plate on shaft rotation through an angle determined by that of said swash plate, a plurality of pistons spaced about and axially movable relative to said shaft, a connecting rod connecting each said piston to said wobble plate, characterized by a balance disk centrally received on said shaft opposite the other side of said swash plate, means mounting said balance disk on said shaft for relative axial movement and tilting relative thereto about an axis at right angles to and intersecting with the axis of said shaft at a point spaced from that of said swash plate, contacting flat faces on said swash plate and balance disk for causing planes passing through the tilt axis and mass centroid of the respective balance disk and balance disk to be and remain parallel, drive means for drivingly connecting said balance disk to said swash at said faces for rotation therewith, and spring means for causing said flat faces to remain in contact.

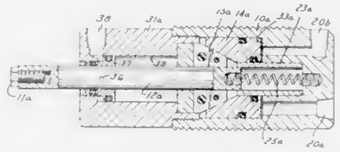
4,836,091

HYDRAULIC WORK SUPPORT

Warren G. Taylor, Rochester, Mich., assignor to De-Sta-Co Division, Dover Resources, Inc., Troy, Mich.

Filed Mar. 17, 1980, Ser. No. 131,073
Int. Cl.[4] B23B *31/30*
U.S. Cl. 92—26 15 Claims

1. Hydraulic work support comprising a housing, an axially displaceable cylindrical plunger having a work support extension projecting from said housing, said hydraulic piston actuated collet means within said housing for clamping said plunger in a fixed axial position characterized by segmented resiliently preloaded collet means having a bare clearance free fit with said plunger upon release of hydraulic actuating pressure while said collet means remains preloaded.

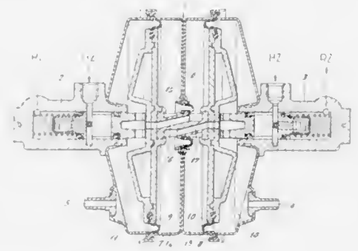


4,836,092

PNEUMATIC-HYDRAULIC PRESSURE TRANSDUCER

Wilhelm Heubner, Itzgrund, and Wolfgang Reeb, Baunach, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed Feb. 25, 1988, Ser. No. 160,168
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1987, 8703884
Int. Cl.[4] F01B *19/00*
U.S. Cl. 92—48 10 Claims



1. A pneumtic and hydraulic pressure transducer, adapted to exert a force in either of two opposite directions, the transducer comprising:

a pressure capsule with an open interior;

a partition wall in the capsule across the axis of the capsule dividing the open interior of the capsule into first and second sections along the axis of the capsule;

a respective first and second axially displaceable diaphragm extending across the first and second sections and across the capsule axis for respectively dividing each of the first and second sections into third and fourth pressure chambers, such that one of the third and fourth pressure chambers enlarges when the other of the third and fourth pressure chambers becomes smaller due to axial displacement of the respective diaphragms in the respective sections;

an axially displaceable intermediate member joining the first and the second diaphragms for shifting axially together in each axial direction;

first means pressure connecting the third pressure chambers of the first and second chambers of the first and second sections;

second means pressure connecting the fourth pressure chambers of the first and second sections;

a first hydraulic cylinder connected to one of the third pressure chambers; and

a second hydraulic cylinder connected to one of the fourth pressure chambers; and

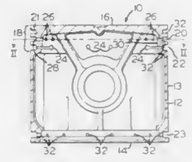
a fifth pressure connection to one of the third pressure chambers and a sixth pressure connection to one of the fourth pressure chambers.

4,836,093

PISTON ASSEMBLY

Daniel G. Wagner, Etna, Pa., assignor to American Standard Inc., Wilmerding, Pa.

Continuation of Ser. No. 642,277, Aug. 20, 1984, abandoned. This application Jul. 3, 1986, Ser. No. 881,757
Int. Cl.[4] F01B *31/10*
U.S. Cl. 92—160 27 Claims



1. A piston assembly for reciprocal movement within a bore of an operating air compressor which bore in combination with such piston assembly forms a variable volume air pressure chamber of said operating air compressor, said air compressor piston assembly comprising:

(a) a piston having a head portion disposed at one end of said piston to form a boundary of such variable volume air chamber and a hollow skirt portion adjacent said head portion for maintaining said piston assembly in substantial axial alignment with an interior sidewall of such bore of said operating air compressor during reciprocal movement of said piston assembly, said head portion and said skirt portion of said piston being formed from a single piece;

(b) a pair of wrist pin connecting means formed on diametrically opposed sides of said interior sidewall of said hollow skirt portion for connecting said piston assembly to a connecting rod of said air compressor;

(c) at least two annular lubricating ring grooves formed in an outer sidewall of said piston, a first of said annular lubricating ring grooves formed intermediate said head portion and an upper surface of said wrist pin connecting means and a second of said annular lubricating ring grooves formed adjacent an open end of said hollow skirt portion, each of said at least two lubricating ring grooves provided to receive and retain therein a lubrication control ring;

(d) each of said at least two annular lubricating ring grooves having at least one aperture disposed in fluid communication with an interior surface of said hollow skirt portion for communicating such lubricating agent gathered in each of said at least two lubricating grooves into said interior of said hollow skirt portion so that such lubricating agent can return to a crankcase of said operating air compressor through said open end of said hollow skirt portion of said piston;

(e) at least two annular compression ring grooves formed in said outer sidewall of said piston, each of said compression ring grooves being disposed intermediate said first of said at least two annular lubricating grooves and said head portion, each of said compression ring grooves provided to receive and retain therein a compression ring;

(f) a compression ring disposed in each of said at least two annular compression ring grooves for sealing said piston assembly against said interior sidewall of said bore during such reciprocal movement of said piston; and

(g) at least one of said compression ring grooves having at least one aperture disposed in fluid communication with said interior of said hollow skirt portion for communicating such lubricating agent gathered in said at least one compression ring groove into said interior of said hollow

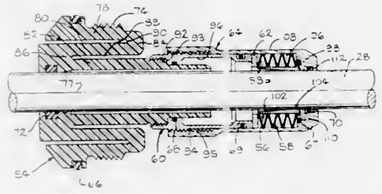
skirt portion so that such lubricating agent can return to said crankcase of said operating air compressor through said open end of said hollow skirt portion of said piston.

4,836,094

YIELDABLY MOUNTED LUBRICANT CONTROL ASSEMBLIES FOR PISTON RODS

Roelf J. Meijer, and Benjamin Ziph, both of Ann Arbor, Mich., assignors to Stirling Thermal Motors, Inc., Ann Arbor, Mich.

Filed Mar. 10, 1988, Ser. No. 166,319
Int. Cl.[4] F16J *15/18*
U.S. Cl. 92—167 **15 Claims**



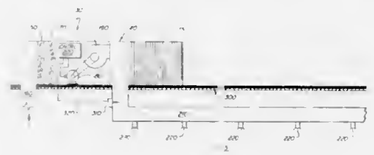
1. In an engine having a housing comprising a cylinder within which a piston reciprocates and a piston rod extending from the piston through a bore which extends in said housing from said cylinder to a crankcase and a lubricant control assembly which is disposed within said bore in cooperative arrangement with said piston rod and functions to separate the cylinder from the crankcase while allowing the piston rod to reciprocate axially through a lubricant control portion of the lubricant control assembly which is in forceful contact around the piston rod, the improvement which comprises annular disk means having an axial aperture positioned peripherally about said lubricant control portion, said disk means being operable in response to an axial force to axially compress causing said aperture to radially contract and forcefully urge the lubricant control portion into forceful contact around the piston rod.

4,836,095

STATIC PRESSURE CONTROL IN VARIABLE AIR VOLUME DELIVERY SYSTEM

Edward F. Wright, Jr., Clay, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 936,424, Dec. 1, 1986, abandoned. This application Mar. 28, 1988, Ser. No. 173,010
Int. Cl.[4] F24F *7/08*
U.S. Cl. 98—31.6 **9 Claims**



1. The method of supplying variable amounts of air to an air volume delivery system including a blower, a multi-speed motor for driving said blower, a motor controller for controlling the speed of said motor in a step-wise manner, a return duct bringing air to the blower, and a supply duct including room terminals, for moving variable quantities of air from the blower to selected rooms through corresponding room terminals, said blower effective for controllably blowing air from said return duct into said supply duct and through selected ones of said room terminals, said method comprising the steps of:

(a) blowing air into the supply duct with said blower being driven at a first selected motor speed and within a predetermined static pressure operating range including upper and lower limits, with said blower being susceptible to increasing static pressures within said operating range, and

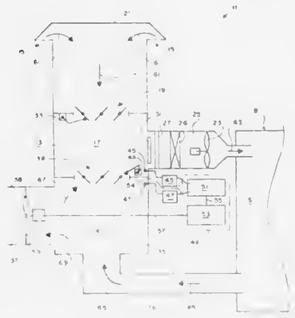
(b) when the static pressure reaches the upper limit of said static pressure operating range, switching to a lower motor speed with an associated blower static pressure which is above said lower limit.

4,836,096

VARIABLE AIR VOLUME AIR DISTRIBUTION SYSTEM

Gil Avery, P.O. Box 341165, Memphis, Tenn. 38184

Filed Nov. 18, 1988, Ser. No. 273,094
Int. Cl.[4] F24F *7/08*
U.S. Cl. 98—34.5 **4 Claims**



1. An improved variable air volume air distribution system for distributing air within the interior conditioned space of a building, said distribution system including an air supply plenum for providing a supply of air to be transferred into the conditioned space of a building; a supply fan for drawing air into the interior of the air supply plenum and for transferring air from the interior of the air supply plenum into the conditioned space of the building; a return air plenum for receiving air from the conditioned space of the building; and an exhaust fan for exhausting air from the return air plenum to the outside atmosphere; and improvement comprising:

(a) a first pressure sensor means for sensing the air pressure within the air supply plenum;

(b) a second pressure sensor means for sensing the air pressure within the return air plenum; and

(c) control means for causing the exhaust fan to exhaust air from the return air plenum at a rate proportional to the ratio of the air pressures within the air supply plenum and the return air plenum.

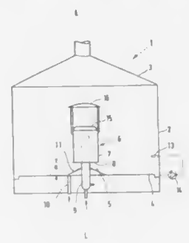
4,836,097

WHIRLPOOL FOR COARSE SLUDGE SEPARATION IN BREWING OF BEER

Hans Tretter, Freising, Fed. Rep. of Germany, assignor to Anton Steinecker Maschinenfabrik GmbH, Fed. Rep. of Germany

Filed Nov. 19, 1987, Ser. No. 122,391
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 8631029
Int. Cl.[4] C12C *7/10*
U.S. Cl. 99—277.1 **5 Claims**

1. A whirlpool receptacle for coarse sludge separation from wort in brewing of beer, said whirlpool being constructed as a circular receptacle provided with a base on which sludge deposits after separation from the wort, said receptacle being further provided with a heating means for heating the wort and a tangential inlet for whirlpool circulation of the wort, characterized in that an inner boiler is provided within said circular receptacle as a heating means and is symmetrical with said circular receptacle, said inner boiler being arranged in the



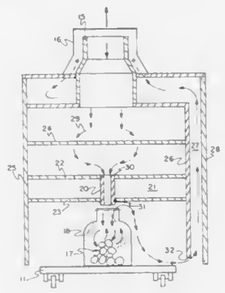
interior of the receptacle such that it is concentric with the longitudinal center axis of the receptacle and such that its lower side extends in spaced relationship with the base of the receptacle.

4,836,098

METHOD AND APPARATUS FOR COOKING AND PACKING FOOD IN GLASS CONTAINERS

Jagdish C. Shah, 126 Mill Spring Ln., Stamford, Conn. 06903

Continuation of Ser. No. 906,477, Sep. 12, 1986, abandoned. This application Sep. 14, 1988, Ser. No. 244,604
Int. Cl.[4] A23L *3/00*
U.S. Cl. 99—360 **6 Claims**



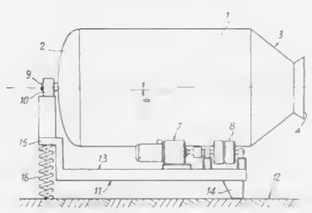
1. An apparatus for heat treating material comprising a tunnel furnace, conveyor means extending axially the length of the furnace for conveying the material to be heat treated along the length of the tunnel, container means having a closeable top opening for carrying the material to be heat treated on the conveyor means, a plurality of gas duct means arranged axially along the conveyor means and positioned above the closeable top opening of the container means, the cross-section area of said gas duct means being smaller than the cross-section area of the closeable top opening of the container means, and means for providing a flow of controlled temperature gas through said duct means whereby the flow of controlled temperature gas is directed into the closeable top opening of the container means to heat treat the material contained therein.

4,836,099

DEVICE FOR PICKLING MEAT BY MIXING UNDER VACUUM

Pierre Thirode, 80 Boulevard Bourdon, 92200 Neuilly-sur-Seine, France

Filed Feb. 4, 1988, Ser. No. 152,217
Claims priority, application France, Feb. 5, 1987, 87 01410
Int. Cl.[4] A23B *4/02;* **B01F** *13/06*
U.S. Cl. 99—472 **5 Claims**



1. A device for pickling meat by mixing under vacuum, comprising

a tank that is approximately cylindrical over at least a main part of its length,

drive means for rotating said tank in either direction around its longitudinal axis,

said tank having an opening at one of its ends for filling and emptying purposes,

a cover associated with the opening through which evacuation of the tank and, if necessary, injection of brine may be done,

a support frame upon which the tank is mounted for rotation, and

means for changing the inclination of said frame relative to a supporting surface on which it rests, so as to change the inclination of said longitudinal axis, the improvement wherein

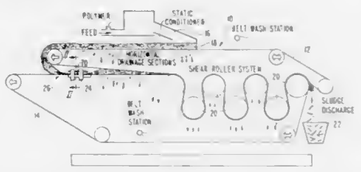
said inclination changing means comprises at least one elastic element inserted between said frame and said support surface at one end of the frame, and disposed so as to be gradually compressed by the weight of the tank from the first position when the tank is empty to a second position when the tank is full, whereby said elastic elements return gradually to said first position as the tank is emptied.

4,836,100

APPARATUS FOR REGULATING FEED THICKNESS IN A BELT PRESS

Harold W. Johnson, Kingwood; James M. Mastel, Spring, and Alan L. Scott, Kingwood, all of Tex., assignors to Asbbrook-Simon-Hartley Corporation, Houston, Tex.

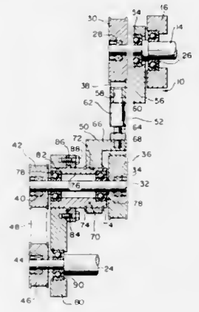
Filed Nov. 17, 1987, Ser. No. 121,715
Int. Cl.[4] B30B *9/24;* **B01D** *33/00*
U.S. Cl. 100—118 **12 Claims**



1. An apparatus for regulating the thickness of feed material

which is fed between two moving belts of a belt press, comprising:
- a squeeze plate for squeezing the feed material against one of the belts; and
- means for adjustably supporting the squeeze plate between the belts, said supporting means comprising:
  - a tube positioned between the belts in an orientation transverse to the direction of movement of the belts, the tube supporting the squeeze plate above the belt carrying the feed material;
  - means for rotating the tube about its longitudinal axis;
  - means interconnecting the tube and the squeeze plate, for varying the distance of the squeeze plate above the belt carrying the feed material in response to the rotation of the tube; and
  - means for locking the tube in a rotational position corresponding to a desired height of the squeeze plate above the feed carrying belt.

4,836,101
PRESSING MACHINE
Heizaburo Kato, Shizuoka, Japan, assignor to Sankyo Manufacturing Co., Tokyo, Japan
Filed Dec. 23, 1987, Ser. No. 137,024
Claims priority, application Japan, Apr. 21, 1987, 62-60465[U]
Int. Cl.[4] B30B *15/30*, F16H *7/10*
U.S. Cl. 100—215 **3 Claims**



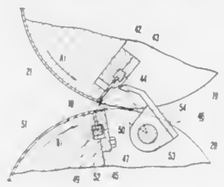
1. A pressing machine including a press crank shaft rotatably supported by a press housing and driven by a motor, a material feeding device for feeding a material in synchronization with the rotation of said crank shaft and capable of moving toward and away from said crank shaft, and a torque transmission device for drivingly connecting said crank shaft and an input shaft of said material feeding device, said pressing machine comprising:
- a drive pulley secured to one end of said crank shaft;
- an intermediate shaft disposed parallel to said crank shaft and said input shaft of said material feeding device, said intermediate shaft being rotatably supported by a tension adjusting device having one end rotatably supported by said crank shaft and the other end rotatably supported by said input shaft of said material feeding device;
- a first intermediate pulley secured to one end of said intermediate shaft and disposed at a position corresponding to said drive pulley, said first intermediate pulley being drivingly connected to said drive pulley through first endless torque transmission means; and
- a second intermediate pulley secured to the other end of said intermediate shaft and drivingly connected to an input pulley secured to said input shaft of said material feeding device through second endless torque transmission means;
- said tension adjusting device including a first arm member capable of effecting expansion and contraction and having one end rotatably supported by said crank shaft, a second arm member having one end rotatably supported by said input shaft of said material feeding device; and eccentric body having an inner hole formed in an eccentric relationship with an outer circumference thereof, said eccentric body rotatably supporting said intermediate shaft in said inner hole and being inserted into the other end of said first arm member and the other end of said second arm member in such a manner that the position of the eccentric body relative to the first and second arm members can be adjusted in the direction of rotation, and wherein a change in the distance between said input shaft and said crank shaft does not effect changes in the distance between said intermediate and crank shafts and between said intermediate and input shafts.

4,836,102
INK TRANSFER WITH PARTIAL CURING
Thomas Cicci, Columbia, Md., assignor to Fusion Systems Corporation, Rockville, Md.
Filed Oct. 1, 1987, Ser. No. 103,160
Int. Cl.[4] B41M *1/00*, *7/00*; B41F *17/00*
U.S. Cl. 101—41 **14 Claims**

1. A process for printing a printable substrate comprising:
(a) inking a patterned surfae of a printing plate with a wet, radiation-curable ink;
(b) contacting the resulting inked surface with an ink transfer surface of a print pad under conditions which result in a transfer of ink from said surface of said printing plate to said ink transfer surface to form a patterned layer of ink thereon;
(c) exposing the resulting layer of ink on said ink transfer surface to radiation and providing conditions under which said radiation is carried out to cure the ink at the interface of said ink layer and said transfer surface of said print pad to a greater extent than at the outer surface of said ink layer; and
(d) bringing the outer surface of the resulting partially-cured ink-layer on said transfer surface into contact with said printable substrate, whereby said patterned layer of ink transfers from said pad to said printable substrate.

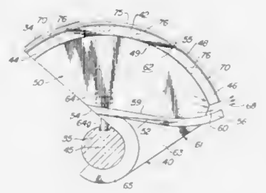
4,836,103
CYLINDER APPARATUS OF SHEET-FED ROTARY PRESS
Tatsuo Komori, and Hiroyuki Sugiyama, both of Toride, Japan, assignors to Komori Printing Machinery Co., Ltd., Tokyo, Japan
Filed Sep. 20, 1984, Ser. No. 653,372
Claims priority, application Japan, Apr. 14, 1983, 58-65904
Int. Cl.[4] B41F *21/04*
U.S. Cl. 101—231 **5 Claims**

1. In a cylinder apparatus of a sheet-fed blanket-to-blanket perfecting rotary printing press having grippers which are pivotally supported inside a recess in a blanket cylinder having a blanket brought into rolling contact with a plate cylinder and which are located in the vicinity of a leading edge of a printing plate on said plate cylinder the improvement wherein phases of rotation of said plate and blanket cylinders are arranged such that the leading edge of said printing plate opposes a trailing end of the recess formed in said blanket cylinder at an advanced position with respect to a leading edge of said blanket,



and a cam surface of a cam for controlling the operative position of said grippers is shaped in such a manner that said grippers are kept opened when said leading edge of said printing plate opposes the trailing end of the recess formed in said blanket cylinder.

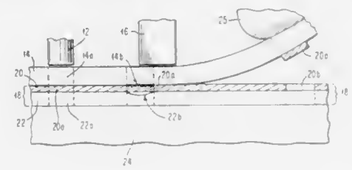
4,836,104
SHEET TRANSFER MECHANISM FOR A FRESHLY PRINTED SHEET
Eduardo Duarte, Irving, Tex., assignor to Duarte Products, Inc., Irving, Tex.
Filed Jun. 5, 1987, Ser. No. 58,892
Int. Cl.[4] B41F *13/08*
U.S. Cl. 101—420 **8 Claims**



1. A sheet transfer mechanism comprising: sheet gripper means; means to move the gripper means along a curved path about an axis; a sheet guide member rotatable about said axis; an arcuate guide surface having a leading edge and a trailing edge on said guide member; a vane having a leading edge and a trailing edge spaced from said leading and trailing edges on said guide surface, said vane being positioned relative to said guide surface to form a chamber having an entrance opening between said leading edges and having an air dispensing passage between said trailing edges; and means rotating said sheet guide member in synchronized relation to said gripper means to guide a printed sheet along said path, said entrance opening and said dispensing passage being positioned to form a stream of air to prevent physical contact between the sheet and the guide surface.

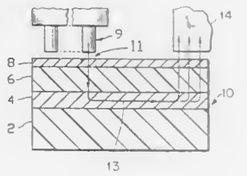
4,836,105
DIRECT NEGATIVE AND OFFSET MASTER PRODUCTION USING THERMAL LIFTOFF
Bradford J. Factor, Palo Alto, Calif.; Jan-Pieter Hoekstra, Carmel, and Keith S. Pennington, Somers, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 10, 1987, Ser. No. 131,144
Int. Cl.[4] B41N *1/08*; B41C *1/10*
U.S. Cl. 101—453 **13 Claims**

1. A printing member for use in a system of the type wherein a current source in combination with a resistive ribbon produces heating in selected regions in said ribbon for effecting the formation of printing patterns on the printing member, said printing member comprising:
- a first layer of a material selected to have a melting temperature below that of said resistive ribbon; and
- a second layer on said first layer comprising heat conductive means for receiving heat from said resistive ribbon in a manner defining a pattern to be printed, said second layer being of a material selected to be adhering to said first layer when at temperatures below, and releasing from said first layer when at temperatures above, the melting temperature of said resistive ribbon, and to be adhering to said



resistive ribbon at temperatures above said melting temperature such that when said second layer is heated to a temperature level above said resistive ribbon melting temperature in selected regions forming a pattern to be printed, said selected regions will adhere to said resistive ribbon and release from said first layer, whereby when said resistive ribbon is in contact with said second layer while at said temperature level above said melting temperature and is then drawn away from said second layer said selected regions will be removed from said heat conductive means forming the pattern to be printing therein.

4,836,106
DIRECT OFFSET MASTER BY RESISTIVE THERMAL PRINTING
Ali Afzali-Ardakani, White Plains, and Keith S. Pennington, Somer, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 30, 1987, Ser. No. 115,232
Int. Cl.[4] B41N *3/00*
U.S. Cl. 101—467 **24 Claims**



22. A direct offset master for offset printing on which an image is formed by using a thermal transfer printer without a ribbon, which printer has styli for generating electrical pulses, said master comprising:
(a) a substrate layer of plastic;
(b) a layer of aluminum on said substrate layer;
(c) a layer of thermoplastic material having an amount of leukodye, said material being coated on said layer of aluminum; and
(d) a layer of tin oxide sputtered on top of said layer of thermoplastic material, selected regions on the surface of said film being converted to hydrophobic regions when some of said thermoplastic layer diffuses through said film when, in response to electrical pulses from said styli,

electrical current flows through said oxide layer, through said thermoplastic layer and to said aluminum layer.

4,836,107

ARRANGEMENT OF MODULAR SUBASSEMBLIES

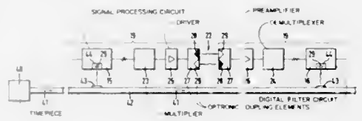
Bernhard Lang, Feucht, and Matthias Selders, Ruckersdorf, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Nov. 2, 1987, Ser. No. 116,046

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1986, 3640099

Int. Cl.[4] F42C *19/06*; H01R *23/68*

U.S. Cl. 102—293 **11 Claims**



1. A compact arrangement of modular subassemblies of mutually interconnected circuit boards, especially for the assembly of a complex signal processing circuit in ammunition equipped with search fuzes or in airborne target-tracking bodies; the improvement comprising in that said circuit boards are arranged in succession; optronic serial intersecting connections being formed between coupling elements intermediate respectively two successive of said circuit boards, in the functional positioning of said circuit boards a transmitting diode and a receiving detector being respectively arranged opposite each other, and which are respectively connected to a multiplexer and to a demultiplexer.

4,836,108

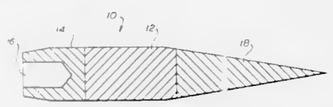
MATERIAL FOR MULTIPLE COMPONENT PENETRATORS AND PENETRATORS EMPLOYING SAME

Andrew J. Kegel, Albany, Oreg.; James R. Spencer, Sayre, Pa.; James S. Smith, Towanda, Pa.; Russell H. Rhodes, Monroeton, Pa., and James A. Mullendore, Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 845,108, Mar. 27, 1986, and a continuation-in-part of Ser. No. 580,985, Feb. 16, 1984, which is a continuation-in-part of Ser. No. 297,702, Aug. 31, 1981. This application Jun. 6, 1988, Ser. No. 202,355

Int. Cl.[4] F42B *1/02, 11/08*

U.S. Cl. 102—306 **1 Claim**



1. A penetrator comprising a body component of a frangible material selected from the group consisting of (a) an annealed tungsten having from about 5 to about 20 grains per square millimeter and a hardness of from about 31 to about 35 on the Rockwell C hardness scale, (b) a tungsten alloy consisting essentially of 98% by weight of tungsten and 2% by weight of nickel, (c) a tungsten alloy consisting essentially of 90% by weight of tungsten and 10% by weight of molybdenum and (d) tungsten doped with about 400 parts per million of nickel, a heavy alloy tail component joined to one end of the body component.

4,836,109

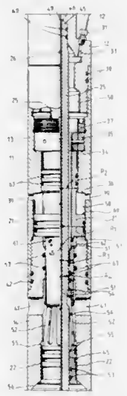
CONTROL LINE DIFFERENTIAL FIRING HEAD

David S. Wesson, Katy, and Kevin R. George, Columbus, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Sep. 20, 1988, Ser. No. 248,329

Int. Cl.[4] F42B *3/12*

U.S. Cl. 102—312 **6 Claims**



1. A firing head assembly for use with a well bore perforating gun, comprising:

a generally cylindrical housing;

a first detonation cord extending through the housing, the first cord having a first detonation booster on one end;

a firing pin spaced radially from the longitudinal axis of the housing;

a firing mechanism for actuating the firing pin;

a second detonation cord for actuation by the firing pin, the second cord having a second detonation booster on one end;

a third detonation booster positioned opposite the first and second boosters;

the first and second boosters being located adjacent one another, each being positioned opposite the third booster such that each of the first and second boosters will actuate the third booster.

4,836,110

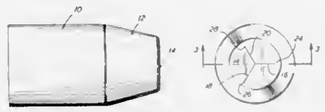
BULLET HAVING SECTIONS SEPARABLE UPON IMPACT AND METHOD OF FABRICATION

Thomas J. Burczynski, P.O. Box 248, 107 Main St., Odessa, N.Y. 14869

Filed Jan. 4, 1988, Ser. No. 140,587

Int. Cl.[4] F42B *11/10*

U.S. Cl. 102—508 **10 Claims**



1. A bullet comprising a body of malleable material, symmetrical about a central, longitudinal axis, having an outer periphery defined by a substantially cylindrical base portion extending from the back end of said body for a first portion of the axial length thereof, and a nose portion extending integrally from said base portion for the remainder of the axial length of said boy, to the front end thereof, said nose portion tapering from the diameter of said base portion to a smaller diameter at said front end, and at least three parting lines extending from said front end within said body radially outwardly from, and axially parallel to said central axis, said parting lines defining opposing surfaces terminating radially and axially within said body, the axial terminations lying in a common plane perpendicular to said central axis and within said base portion, the portions of said body on opposite sides of said common plane being integrally joined at said common plane, said opposing surfaces within said body on opposite sides of said parting lines being in mutual contact but physically unattached, said parting lines terminating radially inwardly of said outer periphery of said body a distance sufficient to prevent separation of said body into separate portions during flight, but insufficient to prevent such separation upon impact with a fluidic target, whereby upon impact with such a target said body separates into a plurality of separate portions with those portions laterally adjacent said parting lines separating from one another and from the part of said base portion rearward of said common place to travel separately and create a plurality of impinging pressure zones within said target.

4,836,111

THREE DIMENSIONAL MOVEMENT OF A ROBOT MANIPULATOR

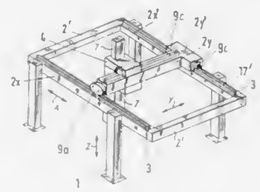
Karl-Ernst Kaufmann, Wetter, Fed. Rep. of Germany, assignor to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 9, 1987, Ser. No. 71,634

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1986, 3623506

Int. Cl.[4] E01B *25/00*

U.S. Cl. 104—89 **12 Claims**



10. In a system for moving a manipulator mounted on a carriage, a track system comprising:

a first and a second rail carrier mounted and interconnected to extend parallel to each other in spaced apart relationship;

a carrier carriage;

a plurality of nonstraightness compensating support bars mounted on the rail carriers, at least two per carrrier, as well as on the carrier carriage and in aligned relationship as to each carrier to establish straight rail mounting facilities;

a first, second, and third rail bar means respectively mounted to said first and second rail carriers, and the carrier carriage by means of the support bars;

the carrier carriage having one portion with two rollers running on the first rail bar means and another portion with a single roller running on the second rail bar means;

a drive motor driving said one portion; and

the carriage running on the third rail bar means.

4,836,112

HYDRAULIC INCHING DRIVE SYSTEM

Andrew L. Moore, Chicago, Ill., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 19, 1988, Ser. No. 158,244

Int. Cl.[4] B41L *1/02*

U.S. Cl. 101—486 **8 Claims**

1. A method of rotating a plate cylinder in a printing press, said method comprising the steps of:

providing means for transmission of power, said power transmission means including a transmission input member and a transmission output member and a plurality of gear members therebetween;

providing power input means operatively coupled to said transmission input member, said power input means including an electrically actuated hydraulic motor and a hydraulic control valve mounted on and operatively connected to said hydraulic motor;

providing power output means operatively coupled to said plate cylinder, said power output means including a driving cup member and an output gear member, said driving cup member being fixedly mounted to said output gear member, said driving cup member including a plurality of tooth members and an annular housing;

providing clutch system means for driving engagement of said transmission output member with said power output means, said clutch system means including at least one clutch plate member, a clutch housing enclosing said clutch plate member, a clutch shaft having a first end fixedly mounted to said clutch housing and a second end operatively connected to said transmission output member;

activating said hydraulic motor;

transmitting power from said hydraulic motor to said transmission input member;

transmitting power through said power transmission means to said transmission output member;

engaging said clutch system means; and,

transmitting power from said transmission output member to said power output means.

4,836,113

DETACHABLE TRAYS FOR WATER BEDS

Troy Waddell, and Jerry Walker, both of P.O. Box 1164, Hereford, Tex. 79045

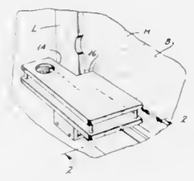
Filed Feb. 25, 1988, Ser. No. 160,312

Int. Cl.[4] A47B *23/00*

U.S. Cl. 108—49 **14 Claims**

1. A detachable bedside tray for use with water beds having a bed frame which includes a side rail which extends along the length of the water bed and which is defined by a given width dimension, the tray comprising a primary shelf means, said primary shelf means having upper and lower surfaces, first and second sections, and two end portions, each of said first and

second sections of said primary shelf means having inner and outer edges, said outer edges being in continuous alignment, said inner edge of said second section being offset with respect to said inner edge of said first section so as to be spaced in closer proximity to said outer edges said inner edges connected by an edge wall perpendicular to said inner edges, bracket means depending from said lower surface of said first section of said primary shelf means, said bracket means including first and second leg members which are oriented in generally opposing relationship with respect to one another and which are spaced apart a distance which is substantially equal to or greater than the width of a side rail of a water bed frame, said first leg being positioned adjacent said inner edge of said first section whereby said primary shelf means may be selectively supported on a side rail of a water bed frame so that said first section thereof is in overlying relationship with respect to the side rail with said first and second leg members of the bracket means extending adjacent to the side rail and on opposite sides thereof.

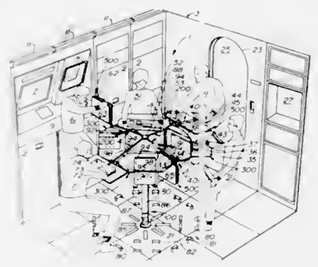


4,836,114

SPACE STATION WARDROOM TABLE

Marc M. Cohen, Menlo Park, Calif.; Jan Kaplicky, London, United Kingdom, and David A. Nixon, Los Angeles, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 13, 1988, Ser. No. 143,416
Int. Cl.[4] A47B *1/04, 57/00*
U.S. Cl. 108—77 **18 Claims**



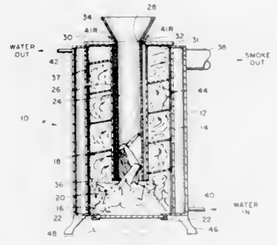
17. A table top for use in constricted areas comprising:
a hub;
a plurality of support arms radiating from said hub and having distal ends further from said hub and arranged in equidistant, spaced-apart relation to each other;
a plurality of work surface leaves each mounted between a pair of support arms; and
a plurality of distal leaves, each attached to the distal end of one of said arms.

4,836,115

VERTICAL FURNACE

Charles E. MacArthur, 4 Vaughn St., Dover-Foxcroft, Me. 04426

Filed Jun. 23, 1988, Ser. No. 210,659
Int. Cl.[4] F23B *7/00*
U.S. Cl. 110—234 **12 Claims**



1. A gravity fed bio-mass solid fuel burning furnace which comprises
an upright cylindrical housing,
said housing having a top cover and a fire resistant floor and defining with the said floor a combustion chamber within the lower portion of said housing,
a pair of concentric mutually spaced vertically arranged tubes within said housing,
the inner tube comprising a fuel feed tube having a fuel receiving opening through said top cover and a fuel discharge opening spaced above said floor through which fuel may drop onto said floor,
the outer tube
defining with the inner surface of said housing an annular smoke passage for the upward flow of the hot gaseous products of combustion, and
defining with said inner tube an annular air intake passage surrounding said feed tube and having an air inlet at its upper end and an annular air discharge opening at its lower end into said combustion chamber above said floor for directing an annular current of air from said opening downwardly into said combustion chamber while simultaneously insulating at least in part said fuel feed tube from the heat of said smoke passage,
means preventing the entry of air into said combustion chamber except through said intake passage, and
means permitting escape of said gaseous products from said housing,
whereby solid fuel dropping onto said floor from said feed tube may burn while forming a generally truncated conical pile of burning fuel and ash the conical surface of which is continuously swept by said downwardly directed annular current of air.

4,836,116

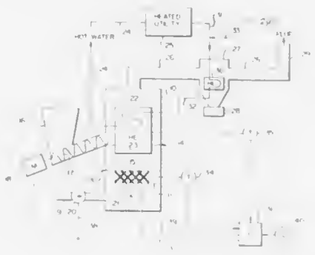
FLUIDIZED BED COMBUSTION SYSTEM

G. David M. MacKay, Halifax, and Gordon S. Trivett, Chester, both of Canada, assignors to The Technical University of Nova Scotia, Nova Scotia, Canada

Filed Dec. 17, 1987, Ser. No. 134,038
Int. Cl.[4] F23G *5/00*
U.S. Cl. 110—245 **20 Claims**

1. A fluidized bed furnace, particularly a residential or light industrial furnace for use in heating a single family dwelling or the like, comprising, in combination:
(a) a combustion chamber provided with heat exchange means and including generally horizontal and planar distributor Plate having a plurality of air passages therein;
(b) a generally horizontal layer of particulate silica material

disposed on said distributor plate, said layer also being generally horizontal;
(c) fuel feeding means operatively associated with the combustion chamber and adapted to supply particulate fuel to an area at the top of said layer;
(d) combustion air supply means communicating with a chamber below the distributor plate, said plate separating the chamber from the said layer;
(e) elongated rod-shaped electrical resistance heating elements protruding into said layer and disposed at an angle of about 30° to 90° relative to a normally generally horizontal plane defined by said distributor plate;
(f) means for selectively controlling (11) the amount of air blown by said air supply means through said distributor plate and (2) the amount of fuel supplied by said fuel feeding means;
(g) temperature control means adapted to maintain the temperature of the heating elements at the surface thereof at below about 900° C.

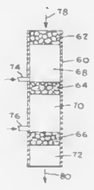


4,836,117

OXIDATION CATALYST AND PROCESSES USING SAME

Raymond G. Teller, Aurora; Ann M. Ebner, Lyndhurst; Christopher Bodolus, and Victor R. Gupta, both of Cleveland Hts., all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 15, 1988, Ser. No. 144,800
Int. Cl.[4] F23B *7/00*
U.S. Cl. 110—342 **17 Claims**



1. A process for combusting an organic material comprising contacting said organic material with a catalyst in the presence of an oxygen source under reaction conditions for an effective period of time to provide for the combustion of said organic material, said catalyst being represented by the formula

$$AMO_w[(DO_x)(EO_y)_a]_z$$

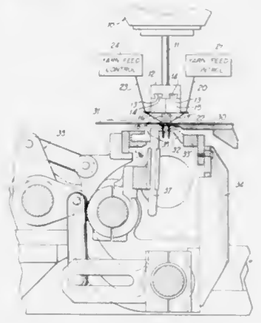
wherein
A is an alkali or alkaline earth metal:
M is V, Cr, Mo, Mn, Fe, Co, Ni, Cu or a mixture of two or more thereof;
D is Zr, Ti, Hf, Ce=, Th, Pr, Nb, Ta, W, Re or a mixture of two or more thereof;
E is Ca, Mg, Sr, Ba, Y, La, Yb, Sm, Gd, Nd, Sc, V, Bi, Ce, Pr, Eu, Tb, Dy, Ho, Er, Tm, Lu or a mixture of two or more thereof;
a is a number in the range of zero up to about 0.2;
w is the number of oxygens needed to fulfill the valence requirement of AM;
x is the number of oxygens needed to fulfill the valence requirements of D;
y is the number of oxygens needed to fulfill the valence requirements of E; and
z is a number in the range of about 10 to about 100.

4,836,118

APPARATUS AND METHOD FOR PRODUCING A CUT LOOP OVERLAY OF A LOOP PILE BASE FABRIC IN A SINGLE PASS OF THE BASE FABRIC THROUGH THE TUFTING MACHINE

Roy T. Card, and Joseph L. Card, both of Chattanooga, Tenn., assignors to Card-Monroe Corporation, Chattanooga, Tenn.

Filed Jan. 12, 1988, Ser. No. 142,926
Int. Cl.[4] D05C *15/30*
U.S. Cl. 112—80.41 **10 Claims**



1. A tufting machine through which backing material is fed, comprising:
(a) a needle bar support on one side of said backing material;
(b) means for reciprocating said needle bar support;
(c) a bed adjacent to said needle bar support over which said backing material is passed;
(d) a front needle bar carried by said needle bar support;
(e) a back needle bar carried by said needle bar support;
(f) front needles protruding from said front needle bar for inserting yarns through said backing material when said front needle bar reciprocates so as to produce successive loops of yarns in said backing material;
(g) rear needles protruding from said rear needle bar for inserting successive loops of yarns through said backing material when said rear needle bar is reciprocated; so as to sew successive loops of yarns through said backing material;
(h) a first yarn control for controlling the feed of yarns to said front needles;
(i) a second yarn control for controlling the feed of yarns to said rear needles;
(j) a plurality of loop pile loopers disposed on the other side of said backing material for catching loops of yarn sewn by said front needles;
(k) a plurality of cut-loop loopers disposed on the other side of said backing material to catch the loops of yarn sewn by said backing needles; said second yarn control selectively determining through the feed of yarns to said back needles whether the cut-loop loopers cut or release without cutting selected loops from said cut-loop loopers;
(l) yarn feed controls for feeding yarn to said back needles; and

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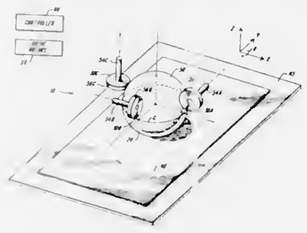
(m) a shift control for shifting one of the needle bars laterally to cause the needles of the selected needle bar to cooperate selectively with selected ones of a plurality of loopers which are capable of cooperating with the needles of the selected needle bar.

4,836,119

SPERICAL BALL POSITIONING APPARATUS FOR SEAMED LIMP MATERIAL ARTICLE ASSEMBLY SYSTEM

Frank J. Siraco, Malden, and David S. Barrett, Needham, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Mar. 21, 1988, Ser. No. 171,263
Int. Cl.[4] D05B *21/00*, *27/14*
U.S. Cl. 112—306 **32 Claims**



1. Apparatus for controlling the position of a sheet member slidingly supported on a work surface with a relatively low coefficient of friction, comprising:

A. a spherical ball member having a diameter D,

B. at least one drive wheel, each of said drive wheels having a diameter less than D,

C. a housing including an open-ended interior cavity adapted to receive said ball member, and further including:

a ball support assembly including means for captively supporting said ball member in said cavity with a spherical segment of said ball member extending from said open end and whereby said ball member is rotatable within said cavity, and

a drive wheel support assembly including means for positioning each of said wheels so that its peripheral surface is in contact with said outer surface of said ball member, whereby the coefficient of friction between said peripheral surface of said wheel and said outer surface of said ball member is greater than the coefficient of friction between said sheet member and said work surface,

D. a housing support including means for supporting said housing whereby said ball member, said drive wheels, and said housing are on the same side of said work surface, and said spherical segment is positioned opposite and adjacent to said work surface with the coefficient of friction between the outer surface of said ball member and said sheet member being greater than the coefficient of friction between said sheet member and said work surface.

4,836,120

SELF-RIGHTING WATERBORNE CRAFT

William Murphy, 2142 N. Magnolia, Chicago, Ill. 60614

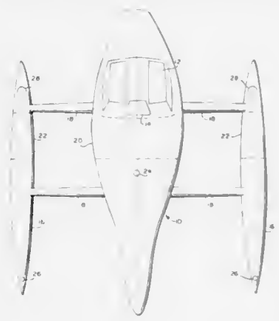
Filed Oct. 18, 1984, Ser. No. 662,131
Int. Cl.[4] B63B *1/00*
U.S. Cl. 114—61 **10 Claims**

1. A self-righting waterborne craft having a center of gravity, said craft being capable of floating when awash, comprising:

at least one hull;

means for partially floooding said at least one hull when said craft is floating inverted; and

buoyancy means, located substantially amidships in an upper portion of and internal to the hull, for displacing the center of buoyancy of said craft below and to one side of the center of gravity of said craft when said craft is inverted



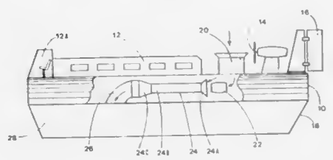
with said at least one hull at least partially flooded, wherein said means for partially flooding and said buoyancy means comprise the sole means for rotating said hull to a non-inverted position at which water at least partially flooding said one hull can be removed from said hull.

4,836,121

SURFACE EFFECT SHIP

Moon J. Kordon, 2942 W. 33rd St., Apt. 11-C, Brooklyn, N.Y. 11224

Filed May 19, 1988, Ser. No. 195,618
Int. Cl.[4] B63B *1/34*
U.S. Cl. 114—67 A **4 Claims**



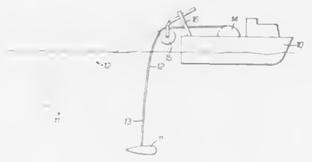
1. A surface effect ship and a system of cushion pressurization by forcing into a cushion chamber a homogeneous mixture of air and gas therethrough, comprising a hull, having: a cabin, a pilot's compartment, propulsion means associated with rudders, a skirt attached to said hull thereby forming a cushion chamber beneath the ship, and a combination of a source of highly energetic gas with a gasdynamical converter, as a lift system, said converter comprising at its front end a subsonic narrowing nozzle, said source of gas and the gasdynamical converter being mounted coaxially aligned, allowing to enter into said gasdynamical converter said highly energetic gas simultaneously with inhaling of additional mass of said air, forming a homogeneous air and gas mixture with appropriate pressure and volume, said gasdynamical converter being in sealed connection with said cushion chamber into which a flow of required volume and pressure of said homogeneous air and gas mixture is directed to keep said surface effect ship hovering.

4,836,122

FAIRING SECTIONS

James F. Henderson, Bristol, and Philip J. Wingham, Bath, both of Great Britain, assignors to University of Bath, Bath, United Kingdom

Continuation of Ser. No. 732,824, May 2, 1985, abandoned. This application Apr. 27, 1987, Ser. No. 48,465
Claims priority, application United Kingdom, Sep. 13, 1983, 8324431
Int. Cl.[4] F15D *1/10*
U.S. Cl. 114—243 **16 Claims**



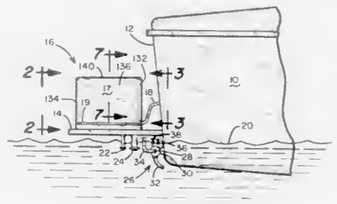
1. Fairing section comprising a leading edge portion having a pair of forwardly projecting lips and a recess defined between the lips for receiving a part of a cylindrical element so that the lips straddle the element, a trailing edge and a body interconnecting said leading edge portion and said trailing edge; said body comprising a pair of oppositely disposed, continuous surfaces each being initially convex and then concave as they extend from the leading edge portion to the trailing edge such that they approach each other as they approach the trailing edge.

4,836,123

COMPACT MOTOR/GENERATOR SET FOR PROVIDING ALTERNATING CURRENT POWER TO A MARINE CRAFT

James E. Grinde, Anoka, Minn., and Kazuo Kuroda, Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha and Sanshin Kogyo Kabushiki Kaisha, both of, Japan

Filed Apr. 7, 1988, Ser. No. 178,534
Int. Cl.[4] B63B *35/00*
U.S. Cl. 114—270 **24 Claims**



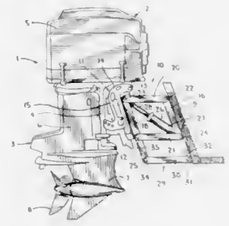
9. A motor/generator set for providing auxiliary electric power to a marine craft of the type having a hull with a transom across the aft portion thereof and a horizontal swim platform projecting rearward from said transom at an elevation immediately above the water line on said hull wherein said motor/generator set is contained in a box-like enclosure substantially impervious to the undesired influx of floatation water and is affixed to said swim platform.

4,836,124

MOUNTING ASSEMBLY WITH TRIM PLATE FOR OUTBOARD MOTORS

William D. Haasl, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Oct. 1, 1987, Ser. No. 103,508
Int. Cl.[4] B63H *5/12*
U.S. Cl. 114—285 **8 Claims**



1. A mounting assembly for a marine propulsion device comprising:

motor mounting means attached to a boat transom for supporting a marine propulsion device having a propeller wholly aft of the boat transom, said motor mounting means includes a first bracket attachable to the boat transom, said first bracket having upper and lower ends, a second bracket spaced aft of said first bracket and adapted to support the marine propulsion device, said second bracket having upper and lower ends, an upper link pivotally connected at its ends to said upper ends of said first and second brackets, and a lower link pivotally connected at its ends to said lower ends of said first and second brackets;

trim means disposed beneath said motor mounting means and above said propeller, said trim means pivotally attached at one end to said boat transom and pivotally connected at its other end to the lower link of said motor mounting means for movement therewith to provide a lifting force on the rear of a boat during forward movement of the boat; and

means for moving said motor mounting means to raise and lower the marine propulsion device relative to the boat transom, and for fixing the position of said motor mounting means and said trim means at a desired location relative to the boat transom.

4,836,125

ANCHORING SYSTEM FOR FLOATING STRUCTURE

Ronald Ballantyne, Burlington, and Martin Murray, Toronto, both of Canada, assignors to John T. Hepburn Limited, Mississauga, Canada

Continuation of Ser. No. 59,768, Jun. 8, 1987, abandoned, which is a continuation of Ser. No. 911,673, Sep. 25, 1986, abandoned, which is a continuation of Ser. No. 773,611, Sep. 9, 1985, abandoned. This application Jun. 16, 1988, Ser. No. 208,785
Claims priority, application Canada, May 10, 1985, 481238
Int. Cl.[4] F16G *15/08*
U.S. Cl. 114—294 **5 Claims**

1. An anchoring system for a floating structure, comprising:

an anchor;

an anchor line including a chain cable and a wire rope, the chain cable being connected to the anchor;

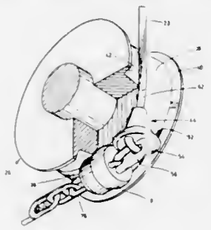
a fairlead sheave mounted on the floating structure, the fairlead sheave having a central hub defining a wire rope groove, a broader groove extending from opposing sides of the wire rope groove, and a pair of circumferential flanges extending radially outwardly from opposing sides of the broader groove;

winch and windlass means mounted on the structure for

hauling in and paying out the anchor line over the fairlead sheave;

a connector having a narrow end portion in which an end of the rope is rigidly retained, a broad end portion at which an end link of the chain cable is pivotally retained, and a radially symmetric outer surface portion extending between the narrow and broad end portions;

the connector being so shaped that the narrow end portion and the broad end portion can simultaneously seat against the central hub in a predetermined orientation in which a predetermined bend angle is formed between the connector and the wire rope end whenever the outer surface portion of the connector engages the central hub; and,

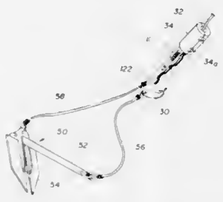


biasing means for biasing movement of the connector relative to the fairlead sheave at least during paying out of the anchor line such that the connector seats against the central hub in the predetermined orientation whenever the connector engages the fairlead sheave and the wire rope engages the wire rope groove, the biasing means including a collar fitted about the chain cable a predetermined distance from the connector and dimensioned to maintain the broad connector end portion displaced from the fairlead sheave whenever the collar engages the fairlead sheave during paying out of the chain cable over the fairlead sheave until the outer surface portion is drawn by the wire rope into engagement with the fairlead sheave.

4,836,126
ANCHOR RETRIEVING DEVICE

Satoru Kobayashi, 33-8 Taishido 5-chome, Setagaya-ku, Tokyo-to, 154, Japan

Filed Apr. 15, 1988, Ser. No. 182,175
Claims priority, application Japan, Jun. 19, 1987, 62-151368
Int. Cl.[4] B63B *21/24*
U.S. Cl. 114—297 5 Claims



1. An anchor retrieving device adapted to be interposed between an anchor and one end of a main anchoring line, an anchor including a shank having a crown end and at least one fluke, said anchor retrieving device comprising:

a lock assembly having an upper end connected to said one end of said main anchoring line and a lower end connected to said crown end of said anchor through an anchor-retrieving line;

a releaseable hook member having one end normally locked by said lock assembly and the other end normally housed in said lock assembly at a position adjacent to said lower end of said lock assembly, said other end being connected through a connection line to the end of said shank opposite to said crown end; and

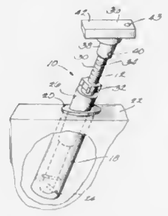
a weight slidably engaging said main anchoring line and adapted to be dropped downwardly along said main anchoring line to strike said lock assembly;

said lock assembly including a housing for accommodating said releaseable hook member during the normal anchoring operation, a movable locking block housed in said housing for movement between a locking position and an unlocking position along an axial direction of said housing, and biasing means normally biasing said movable locking block into its locking position and releasing said releaseable hook member when struck by said weight to allow said releaseable hook member to come out of said housing.

4,836,127
ROD HOLDER ADAPTOR FOR BOAT

Mark E. Wille, 133 Saeger Ave., Oconomowoc, Wis. 53066

Filed Jun. 15, 1988, Ser. No. 207,286
Int. Cl.[4] B63B *35/00*
U.S. Cl. 114—343 2 Claims



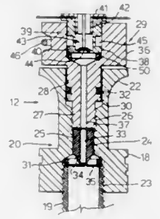
1. In combination a rod holder sleeve and an adapter for mounting platform for supporting marine accessories, comprising a rod holder sleeve having a cross pin forming a stop in said rod holer sleeve, an adapter mounting post having a slot for connection to said cross pin in said rod holer sleeve, a tapered sleeve on said post, locking means on said post loosely fitted for pressing said tapered sleeve into a press fit in said rod holder sleeve to maintain the pin in engagement with said slot.

4,836,128
IDENTIFICATION MEANS

Kevin J. Walker, 2/23 Nicklin Way, Warana Beach, Queensland, Australia 4575

PCT No. PCT/AU86/00095, § 371 Date Feb. 10, 1987, § 102(e) Date Feb. 10, 1987, PCT Pub. No. WO86/06041, PCT Pub. Date Oct. 23, 1986
PCT Filed Apr. 11, 1986, Ser. No. 2,603
Claims priority, application Australia, Apr. 12, 1985, PH 0132; Nov. 18, 1985, PH 3462
Int. Cl.[4] B64B *1/40*
U.S. Cl. 716—210 5 Claims

1. In position indicating device of the type employing a tethered elevated inflated balloon to indicate position, said device comprising a balloon having a one-way valve, a tether for the balloon, an elongate container housing the balloon in one end, a capsule of compressed light-than-air gas in the other end of the container and a connection and release assembly between the balloon and the capsule, a frangible seal closing the capsule, the improvement wherein the capsule connection and release assembly comprises a valve receiver, a quick-release mechanism for retaining the valve in sealing engagement with the valve receiver and being manually operable to release the valve from the valve receiver, a capsule connector member sealingly engaged with the capsule and connected to the valve receiver, means defining an uninterrupted passage from the capsule connector member to the valve receiver for the passage of gas between the capsule and the one-way valve,

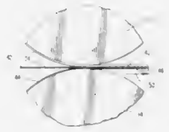


and a hollow piercing member movable relative to the capsule connector member in response to movement of said valve receiver toward said frangible seal, for piercing the frangible seal and releasing the gas from the capsule whereupon gas passes along the passage and through the one-way valve to inflate the balloon.

4,836,129
APPARATUS FOR COATING A WEB WITH WET INK THEREON

Harvey W. Dahlgren, Irving, Tex., assignor to Epic Products International Corp., Dallas, Tex.

Filed Jun. 26, 1987, Ser. No. 66,479
Int. Cl.[4] B05C *11/00*
U.S. Cl. 118—46 15 Claims



1. A convertible coating apparatus for use in one and to side coating of webs having wet ink thereon comprising:

web supplying means for supplying a web having wet ink thereon;

a coating applicator roller having an applicator roller surface,

a back-up roller forming a couple with said applicator roller and having a back-up roller surface which repels ink and is hard relative to said applicator roller surface, the web having ink thereon which is wet when the web is received at the couple from the web supplying means,

means for supplying coating to said applicator roller,

means for supplying water to said back-up roller when a one side coating operation is being performed to prevent wet ink on the web from being smudged by the back-up roller, wherein the water supplying means has water therein, and for supplying coating to said back-up roller when a simultaneous two side coating operation is being performed at the couple,

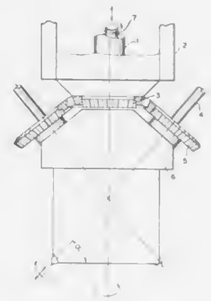
first drive means for driving said applicator roller, and

second drive means for driving said back-up roller.

4,836,130
DEVICE FOR COATING METALLIC INTERNAL SURFACES

Eberhard Neubert, Kraeheoweg 7, 9560 Zwickau; Hans-Michael Wardenga, Karl-Keil-Str. Wohnheim I, 9500 Zwickau; Gottlieb Polzer, Seminarstr. 14, 9550 Zwickau; Juergen Lange, Gneisenaustr. 16, 9620 Werdau; Klaus Schrader, Str. d. Jungen Pioniere 3, 9500 Zwickau; Frank Junker, Rostenstr. 16, 8122 Radebeul; Norbert Dittmann, Augustusweg 103 e, 8122 Radebeul; Ullrich Spevacek, Hermann-Matern-Str. 3 c, 8270 Coswig, and Hans-Juergen Tappert, Heinrich-Rau-Str. 4 c, 8270 Coswig, all of German Democratic Rep.

Filed Aug. 28, 1987, Ser. No. 98,031
Claims priority, application German Democratic Rep., Aug. 29, 1986, 293967.6
Int. Cl.[4] B05C *11/00*
U.S. Cl. 118—76 5 Claims



1. A device for coating metallic internal surfaces of stationary cylindrical objects, particularly cylindrical sliding sleeves, by rubbing materials onto said surfaces, the device comprising at least one rubbing head having a head axis and including rubbing pins positioned in said rubbing head at an acute angle relative to each other and also relative to said head axis, each of said pins having a pin axis, said rubbing head being displaceable along said axis; means for displacing said rubbing head along said head axis; a rotationally-fixed housing carrying a bevel gear, said rubbing head being rotational and provided with pinions meshed with said bevel gear; and means for rotating said rubbing head about said head axis so that said pinions are rotated due to the meshing with said bevel gear and thereby rotate said rubbing pins so that each of said rubbing pins rotates about said head axis and about its pin axis and is displaced along said head axis.

4,836,131
SOLDER COATING APPARATUS

Shigeaki Kataoka, Shizuoka, Japan, assignor to Fuji Seiki Machine Works, Ltd., Shizuoka, Japan

Filed Sep. 23, 1987, Ser. No. 100,189
Claims priority, application Japan, Oct. 24, 1986, 61-251925
Int. Cl.[4] B05C *1/08*
U.S. Cl. 118—220 7 Claims

1. In a solder coating machine for simultaneously applying thin solder coatings to opposite sides of lead sections which project outwardly from resin packages as associated with I.C. devices mounted in longitudinally spaced relationship on an elongate lead frame so as to define a lead frame assembly, said machine comprising:

a housing;

wall means defining an upwardly extending passage terminating at its upper end in a narrow upwardly opening slot for permitting lead frame assemblies to pass vertically therethrough;

tank means including first and second sidewardly spaced chambers containing a molten liquid solder bath therein and disposed closely adjacent and on opposite sides of said passage, the surface level of the molten solder bath in said chambers being at an elevation slightly below the elevation of said slot;

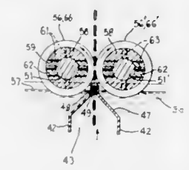
roller means for simultaneously applying a uniform coating of molten solder to opposite side surfaces of lead sections which project outwardly from opposite side of the respective resin package without subjecting the resin package to contact with the molten solder;

said roller means including first and second horizontally-opposed roller assemblies respectively having first and second shafts which are horizontally sidewardly disposed to extend in generally parallel and generally horizontal relationship, said first and second shafts being disposed on opposite sides of said slot and in upwardly spaced relationship from the surface level of the solder bath;

drive means interconnected to said first and second roller assemblies for effecting simultaneous rotation thereof in opposite directions;

said first and second roller assemblies respectively including first and second roller arrangements supported for rotation about the longitudinally extending axis of the respective shaft, each of said first and second roller arrangements including first and second rollers disposed in axially aligned and axially spaced relationship with one another so as to define an annular space of predetermined axial dimension therebetween so as to accomodate the resin package and prevent application of molten solder thereto, the first rollers of said first and second arrangements being disposed directly adjacent one another to define a first narrow nip therebetween which is vertically aligned above said slot, and said second rollers of said first and second arrangements being disposed directly adjacent one another to define a second narrow nip therebetween which is vertically aligned above said slot; and

the rollers of said first and second roller arrangements being disposed so that only lower portions thereof as disposed below the respective shafts dip into the molten solder bath associated with said first and second chambers respectively, whereby a lead frame assembly can be fed vertically through the slot so that the lead sections pass through the nips between the opposed pairs of first and second rollers to permit application of a solder coating to opposite sides of the lead sections associated with the lead frame assembly, while permitting the resin package to pass through the annular space defined axially between the first and second rollers.



4,836,132

WICK CARTRIDGE ASSEMBLY

Joseph H. Marzullo, Danbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 21, 1988, Ser. No. 222,675

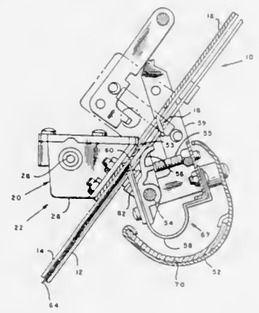
Int. Cl.[4] B05C *1/06*

U.S. Cl. 118—264 **15 Claims**

1. A wick cartridge assembly, comprising:

a cage having openings at opposite ends thereof;

a water permeable, mesh surface secured to the interior of said cage and defining an enclosure at one of said openings; and



a length of moistening, wick material having one end thereof abutting said mesh enclosure.

4,836,133

COATING DEVICE

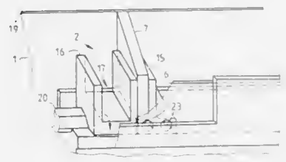
Albert Wohrle, deceased, Heidenheim, Fed. Rep. of Germany (by Ingrid Wohrle, executor), assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Mar. 24, 1986, Ser. No. 843,141

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, 3513790

Int. Cl.[4] B05C *5/02*

U.S. Cl. 118—410 **8 Claims**



1. A coating device for a web passing over a rotatable roll and extending essentially across the width of a coating mixture application space defined at the trailing end by a blade element provided with a coating edge for smoothing the coating mixture remaining on the web and at the leading end by a restrictor plate extending parallel to the coating edge of the blade element and at each side by a respective coating deckle adjustable within a range in a direction parallel to the coating edge of the blade element, the restrictor plate including a pair of recesses, each coating deckle comprising:

a sealing element ;

a holder means for holding the sealing element toward the rotatable roll,

a collecting space disposed outwardly of said sealing element and communicating with a respective one of said pair of recesses of the restrictor plate to receive excess coating mixture issued out of the application space by way of the sealing element and direct the excess coating mixture through the respective recess of the restrictor plate, and

a sealing tongue fixed to the coating deckle and extending inwardly of said sealing element parallel to the restrictor plate for a distance at least corresponding to the range of adjustment of the coating deckle, said sealing tongue bearing flat on the restrictor plate and covering the respective recess of the restrictor plate inwardly of said sealing element.

4,836,134

DEVICE FOR COATING A WEB OF MATERIAL

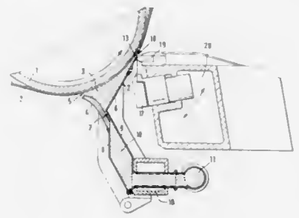
Reinhard Knop, Bochum, Fed. Rep. of Germany, assignor to Jagenberg Altiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 22, 1988, Ser. No. 171,582

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1987, 3709295

Int. Cl.[4] B05C *5/02*

U.S. Cl. 118—413 **5 Claims**



1. In a device for coating a web of paper that travels around a backing roller, the device having a coating chamber that opens toward the backing roller, and a liquid-coating intake, the chamber having an overflow gap at the paperintake end and being closed off by a metering unit at the paper-exit end, the improvement wherein the metering unit pivots independently of the coating chamber (3) around an axis that parallels that of the backing roller and is sealed off by a sealing structure (12) for the coating chamber.

4,836,135

DEVELOPING APPARATUS HAVING ONE-COMPONENT DEVELOPING AGENT

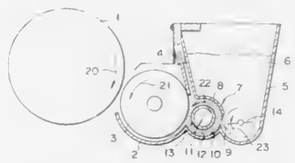
Mitsuaki Kohyama, Tokyo; Naruhito Yoshida, Yokohama, and Osamu Takagi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 7, 1987, Ser. No. 82,507

Claims priority, application Japan, Aug. 11, 1986, 61-188315

Int. Cl.[4] G03G *15/08*

U.S. Cl. 118—653 **6 Claims**



1. A developing apparatus comprising:

storing means for storing a one-component toner;

a rotatable developing roller having a surface on which a toner layer of the one-component toner is formed, for transferring the toner along with rotation thereof;

rotatable photosensitive drum means facing said developing roller with a gap therebetween, an electrical field being formed between said developing roller and said photosensitive drum means and an electrostatic latent image formed on said photosensitive drum means being developed by the toner which is caused to fly through the gap by force of the electrical field formed between said rotatable developing roller and said photosensitive drum means;

charging and transferring means, disposed between said developing roller and said storing means, for transferring the toner from said storing means to said roller and charging the transferred toner, said charging and transferring means having an elastic brush member and a partition plate, the elastic brush member being rotated and brought into contact with said developing roller and the partition plate, thereby transferring and charging the toner; and

additional charging means for additionally charging the toner on said developing roller, said additional charging means having a plate with a distal end contacting the toner layer on said developing roller, the plate regulating the thickness of the toner layer and charging the toner.

4,836,136

DEVELOPER SUPPLYING MEMBER

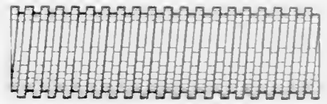
Toshiya Natsuhara, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

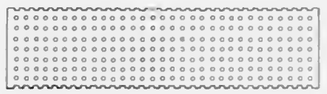
Filed Mar. 4, 1988, Ser. No. 164,448

Claims priority, application Japan, Mar. 5, 1987, 62-51791; Mar. 5, 1987, 62-51792; Mar. 5, 1987, 62-51793; Mar. 5, 1987, 62-51794; Mar. 5, 1987, 62-51795; Mar. 5, 1987, 62-51796; Mar. 5, 1987, 62-51797; Mar. 5, 1987, 62-51798; Mar. 5, 1987, 62-51799

Int. Cl.[4] G03G *15/09*

U.S. Cl. 118—657 **15 Claims**





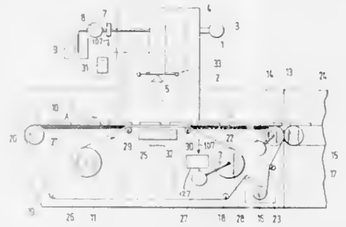
1. A developer supplying member which comprises a surface on which developer is transported, said surface being formed with an overcoat layer of an amorphous carbon film containing fluorine.

4,836,137

APPARATUS FOR ELECTROSTATICALLY SPRAY COATING WORKPIECES WITH AIR IONIZING NEUTRALIZING DEVICE

Werner Heine, and Helmut Kurz, both of Winnenden, Fed. Rep. of Germany, assignors to Kopperschmidt-Mueller GmbH & Co. KG, Bielefeld, Fed. Rep. of Germany

Filed Sep. 10, 1987, Ser. No. 95,319
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1986, 3631270
Int. Cl.[4] B05C *11/00*; B05B *5/02*
U.S. Cl. 118—663 24 Claims



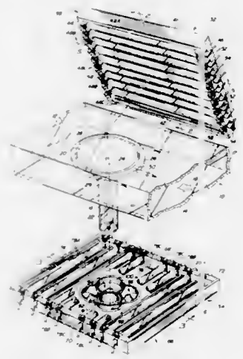
1. Apparatus for spray coating workpieces, comprising an endless apertured conveyor arranged to advance workpieces along a predetermined path; an electrostatic spray generator disposed above said path and having means for directing a spray against the workpieces in said path; a spray intercepting web disposed beneath said path; drive means for said conveyor; and means for effecting a contactless discharge of workpieces including an air ionizing neutralizing device disposed beneath the web opposite the locus of impingement of coating material upon the workpieces in said path.

4,836,138

HEATING SYSTEM FOR REACTION CHAMBER OF CHEMICAL VAPOR DEPOSITION EQUIPMENT

McDonald Robinson, Paradise Valley, Ariz., and Albert E. Ozias, Aumsville, Oreg., assignors to Epsilon Technology, Inc., Tempe, Ariz.

Filed Jun. 18, 1987, Ser. No. 63,409
Int. Cl.[4] B05C *11/00*
U.S. Cl. 118—666 37 Claims



1. A heating system for use with chemical vapor deposition equipment said heating system comprising:

(a) a reaction chamber for receiving a gas flow in a horizontal flow path, said reaction chamber including a planar top wall and an planar bottom wall, a tubular shaft depending from said bottom wall and a susceptor supporting and rotating mechanism extending through said tubular shaft;

(b) a rotatable susceptor secured to said susceptor supporting and rotating mechanism for supporting a substrate and upon which substrate the gas flow deposits materials;

(c) upper heating element means placed in upwardly spaced overlaying relationship with said top wall of said reaction chamber for directing heat energy downwardly onto said susceptor and into the area proximate the periphery of said susceptor and onto the substrate supported thereon;

(d) lower heating element means placed in downwardly spaced underlying relationship with said bottom wall of said reaction chamber for directing heat energy upwardly onto said susceptor and into the area proximate the periphery of said susceptor; and

(e) heat concentrator means for placement beneath said reaction chamber in the proximity of said tubular shaft for directing concentrated heat energy upwardly into the area at the center of said susceptor.

4,836,139

ADHESIVE-APPLYING APPARATUS

John Davies, Syston, England, assignor to British United Shoe Machinery Ltd, Leicester, England

Filed Jan. 21, 1988, Ser. No. 146,412
Claims priority, application United Kingdom, Jan. 30, 1987, 8702151
Int. Cl.[4] B05C *11/00*
U.S. Cl. 118—696 18 Claims

1. Adhesive-applying apparatus whereby adhesive is applied to marginal portions of components, comprising:

a support for supporting a component with a surface thereof exposed to marginal portions of which adhesive is to be applied;

an adhesive applicator device,

means for effecting relative movement of approach and separation between the support and the device to bring the device into operative engagement with a component supported by the support;

means for effecting relative movement between the support and device in directions both lengthwise and widthwise of the exposed surface of a component supported by the support whereby the device is caused to follow a desired path along a marginal portion of said surface, wherein the device comprises:

a nozzle having an end face providing an outlet through which adhesive can flow and which is provided with control means for controlling the flow of adhesive therethrough, said end face constituting an abutment which is moved into operative engagement with the surface of the component when relative movement of approach is effected between the support and the device as aforesaid;

a brush assembly comprising bristles which extend in a direction lengthwise of the nozzle, which are disposed about the whole of the periphery of the nozzle, and which project beyond the end face of the nozzle such that when said end face is brought into operative engagement with the component surface, the bristles are caused to deflect; and

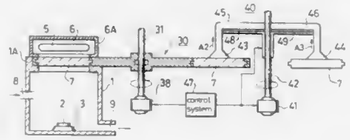
drive means for effecting rotation of the brush assembly about an axis extending lengthwise of the nozzle whereby the bristles are deflected, generally in a direction according to the direction of rotation of the brush, thus to spread over the marginal portions of the component the adhesive supplied onto the component surface through the outlet of the nozzle.

4,836,140

PHOTO-CVD APPARATUS

Masashi Koji, Tokyo, Japan, assignor to Hoshin Kagaku Sangyosho Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 941,789, Dec. 15, 1986, abandoned.
This application Sep. 16, 1988, Ser. No. 245,936
Claims priority, application Japan, Dec. 23, 1985, 60-197957
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—722 13 Claims



1. A photo-CVD (chemical vapor deposition) apparatus comprising:

(a) a gas reaction chamber accommodating therein a substrate and through which a reaction gas flows, said gas reaction chamber having a gate opening in one wall thereof;

(b) a light source communicating with said reaction chamber through said gate opening and for emitting a light to said substrate to cause a reaction in said reaction gas in said gas reaction chamber,

(c) at least two light transmission plates;

(d) means for carrying said light transmission plates;

(e) means for indexing said carrying means between a first position with said gas chamber such that one of said light transmission plates is inserted into said gas reaction chamber to close in air-tight manner said gate opening while permitting said light source to pass into said gas reaction chamber to irradiate said substrate and a second position such that at least one of the other of said light transmission plates is exterior of said gas reaction diameter; and

(f) means located exterior of said gas reaction chamber including vacuum means for automatically removing said other polluted plate from said carrying means at said second position and for supplying to said carrying means a non-pollution plate to replace it with a new and clean light transmission plate.

4,836,141

ODOR CONTROL PET EXCREMENT PAN

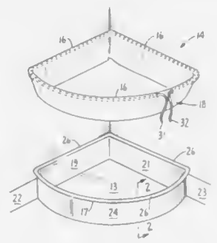
Roxana R. Whitfield, 1359 Miramonte Ct., Berkeley, Calif. 94703

Filed Nov. 3, 1987, Ser. No. 116,227
Int. Cl.[4] A01K *23/00*
U.S. Cl. 119—1 12 Claims

1. An odor control pet excrement container, comprising

a substantially flat pan of substantially rigid material having an upstanding wall rimming a central area,

a liner of flexible sheet material formed to fit within said pan and having a peripheral area formed for removable engagement over the rim of said wall,



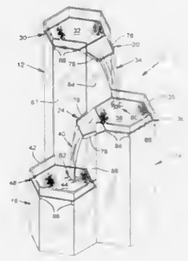
and means for removably securing said peripheral area over the rim of said wall.

4,836,142

AQUARIUM AND WATERFALL SYSTEM

Clyde L. Duback, 1210 NE. 95th Ave., Vancouver, Wash. 98664

Filed Dec. 8, 1986, Ser. No. 939,414
Int. Cl.[4] A01K *63/00*
U.S. Cl. 119—5 4 Claims



1. An aquarium system, comprising:

a first tank constructed and arranged to provide an aquatic environment suitable for marine life, a trough having an imperforate and essentially flat bottom and sides bounding the bottom and which has an upper end joining with the interior of the tank and inclines downwardly from said upper end to a lower end spaced outwardly from the side of the tank, said trough providing a spillway over which water leaves the upper end of the tank with such water flowing as a continuous flat stream of undispersed water which cascades over the lower end of the trough;

retaining means mounted in proximity to the upper end of said trough and constructed to strain all water flowing out of said first tank through said trough for retaining aquatic life within the first tank as water flows out over the trough;

a second tank constructed and arranged to provide an aquatic environment suitable for marine life, the second tank having an upper end positioned lower than the lower end of the trough and being positioned for receiving the stream of water cascading over the lower end of the trough;

dispersing means for dispersing the stream of water received into the second tank, the dispersing means comprising a screen mounted within the second tank in a position spaced horizontally below the lower end of the trough in proximity to the upper level of the water in the second tank and substantially covering the second tank; and

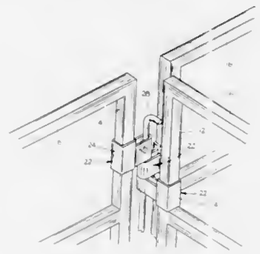
means for circulating water from the second tank to the first tank.

4,836,143

PORTABLE LIVESTOCK HANDLING PANEL

George W. Shadbolt, Jr., 217 Maverick, Gordon, Nebr. 69343

Filed Feb. 8, 1988, Ser. No. 153,342
Int. Cl.[4] A01K *1/02*
U.S. Cl. 119—20 5 Claims



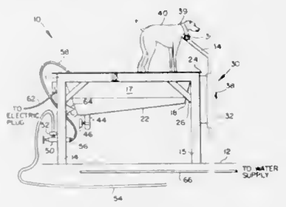
1. A portable livestock handling panel comprising,
first and second, spaced-apart upstanding end members having upper and lower ends,
a plurality of horizontally disposed, vertically spaced side members secured to said end members and extending therebetween,
each of said end members having at least first and second connector members selectively vertically movably positioned thereon which extend horizontally outwardly therefrom,
each of said connector members comprising a sleeve means which is loosely connected to the associated end member for a freely slidable vertical mount, and a U-shaped member secured thereto and extending outwardly therefrom which is adapted to receive a vertically disposed rod means therein whereby a plurality of the panels may be secured together in an end-to-end relationship or in substantially any other angular relationship with respect thereto.

4,836,144

METHOD AND APPARATUS FOR WASHING AND TREATING ANIMALS WITH A RECIRCULATING FLUID SYSTEM

John B. Cole, P.O. Box 9354, Lago Vista Tex. 78766

Filed Sep. 5, 1986, Ser. No. 904,023
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—158 5 Claims



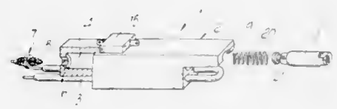
1. A device for a user to hand wash an animal with a liquid, comprising:
container means for receiving and holding a predetermined amount of the liquid, said container means having a bottom surface which is elevated at a first end above a second end thereof with respect to a horizontal ground reference, said container means also having a porous inner surface positioned above the bottom surface and substantially parallel to the horizontal ground reference for supporting the animal;
a vertically adjustable neck clamp attached to one of the first or second ends of the container means, for containing the animal at a predetermined location in the container means by strapping a neck area of the animal to the clamp; and
recirculation means coupled to the container means, for moving the liquid thru a user held hose to the animal held in the container means when washing the animal, said recirculation means recirculating the liquid between the container means and the held animal, thereby using a substantially constant amount of liquid when hand washing the animal.

4,836,145

INSTANT STEAM GENERATOR FOR DOMESTIC AND PROFESSIONAL USE

Elena Ronchi née Marchesin, via Umberto Giordano 5, 20090 Trezzano Sul Naviglio (Prov. di Milano), Italy

Filed Aug. 5, 1987, Ser. No. 82,005
Int. Cl.[4] F22B *1/00*
U.S. Cl. 122—4 A 5 Claims



1. Instant steam generator for domestic and professional use, comprising a body accommodating a heater element and defining a cavity, said cavity having a first end, a second end, and defining a vaporization chamber, said vaporization chamber having a useful surface, said cavity being connected to a water injection coupling and a steam emission coupling, said water injection coupling being arranged at said first end coaxially to said steam emission coupling said steam emission coupling being arranged at said second end, in said cavity there being removably accommodated a drop-breaker device said drop-breaker device being adapted for causing complete vaporization of the water introduced into said vaporization chamber and for increasing said useful surface of said vaporization chamber.

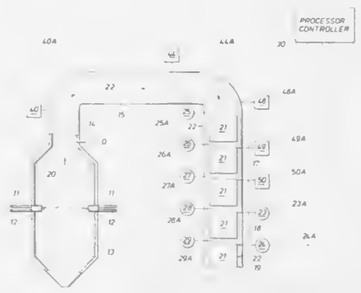
4,836,146

CONTROLLING RAPPING CYCLE

Paul F. Russell, Houston; Egon L. Doering, Pasadena; Clifford C. Segerstrom, Houston, all of Tex.; Jacob H. Stil; Gerd Harenslak, both of The Hague, Netherlands, and Matheus M. van Kessel, Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 19, 1988, Ser. No. 195,939
Int. Cl.[4] F22B *37/18, 37/48*
U.S. Cl. 122—379 78 Claims

1. A method for controlling the rapping of heat exchanging surfaces used to cool gas having fouling deposits thereon, said method comprising:
(a) removing heat from a gas in a heat exchanging zone by indirect heat exchange with a heat transfer cooling system, said heat exchanging zone comprising a plurality of sections, at least one of which sections is a one- or two-phase heat transfer section, and in which fouling deposits accumulate on the surfaces thereof at different rates in the various sections because of different conditions which occur in the sections and each section including rappers for removing said deposits;
(b) determining the overall heat transfer coefficient of said deposits for each section of said zone, said determining includes determining mass flow rates of said gas and cooling system within said heat exchanging zone, determining temperatures of said gas and cooling system within said heat exchanging zone, and determining heat fluxes of said gas and cooling system within said heat exchanging zone;
(c) determining the relative change of the overall heat transfer coefficient of the heat transfer surfaces, including any fouling deposits thereon for each section as a function of time;
(d) comparing the relative change of the overall heat transfer coefficient due to the change of the thickness of the fouling deposits for each section from (c) with a preselected reference section, said reference section being the section of least fouling and which is rapped based on its current overall heat transfer coefficient as compared to its initial overall heat transfer coefficient;
(e) removing said fouling deposits from each section of said zone using rapping means, said rapping means having separate and independently controllable rapping parameters for each section of said zone; and
(f) adjusting said rapping parameters of each section of said zone based on (d), said adjusting includes one or more of (1) adjusting a time interval between rapping of individual rappers in said section, (2) adjusting rapping force of individual rappers, (3) adjusting the number of strikes of an individual rapper in its cycle, (4) adjusting the time interval for rapping an individual rapper, and (5) adjusting the time interval between complete rapping cycles of rappers in a said section.



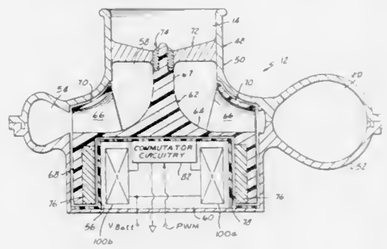
4,836,147

COOLING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Peter T. Morris, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 14, 1987, Ser. No. 132,748
Int. Cl.[4] F01P *5/12;* F04B *35/04*
U.S. Cl. 123—41.44 8 Claims

1. A liquid cooling system for circulating a liquid coolant through a radiator and an internal combustion engine having a cylinder head thermally communicating with a cooling head jacket and an engine block thermally communicating with a cooling block jacket, the head jacket being coupled to the block jacket for circulating the liquid coolant through the engine, the liquid cooling system comprising:
a centrifugal coolant pump having an outlet coupled to the head jacket and an inlet coupled to the radiator, said pump comprising a housing having both said inlet and said outlet positioned therein, a water-tight partition dividing said housing into a water-tight first compartment and a second compartment, said first compartment being coupled to both said inlet and said outlet, said partition including a substantially tubular membrane constructed of a nonmagnetic material and having one closed end contiguous to said first compartment and an open end contiguous to said second compartment, and an impeller assembly rotatably mounted within said first compartment and axially aligned with said tubular membrane, said impeller assembly including a rotatable collar adapted to partially surround said tubular membrane;



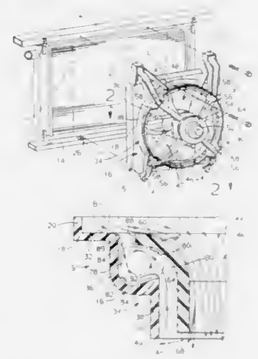
an electric motor coupled to said pump for rotating said pump to force the liquid coolant from the radiator into the head jacket and from the head jacket into the block jacket;
a temperature sensor coupled to the engine for providing an indication of engine temperature; and
electrical power means connected to said electric motor for supplying electrical power to said electric motor in a direct relation to said engine temperature.

4,836,148

SHROUDING FOR ENGINE COOLING FANS

John R. Savage, Kettering, and Robert C. Mellin, Centerville, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 13, 1988, Ser. No. 205,718
Int. Cl.[4] F01P *7/10*
U.S. Cl. 123—41.49 5 Claims



1. Shrouding for an engine cooling fan for operative mounting adjacent to a radiator through which engine coolant is circulated, comprising a stationary shroud secured with respect to said radiator, said stationary shroud having a forward face and large diameter generally cylindrical portion extending rearwardly from said forward face and having a reduced diameter generally cylindrical ejector portion extending rearwardly

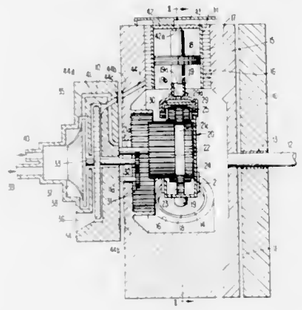
from said large diameter portion to define a stepped diameter opening through said fixed shroud, a rotatable fan having a centrally located hub and a plurality of fan blades extending radially from said hub to terminal tip portions, support means operatively mounting said fan for operation within said cylindrical opening, a rotatable shroud for said fan, said rotatable shroud comprising a bellmouth inlet section disposed within the large diameter portion of the fixed shroud and a small diameter skirt portion extending rearwardly from said bellmouth fixed to the tips of said blads, the improvement comprising an annular vortex chamber defined by cooperating convexly curved walls of said bellmouth and said large diameter portion of said fixed shroud, said fixed and rotating shrouds defining restricted forward and rear openings leading into of said chamber whereby a vortex of air is formed therein in response to the rotational drive of said fan and the pumping of air therethrough to provide a high pressure zone to block the flow of recirculating air from said the discharge of said fan to said bellmouth to thereby increase fan pumping efficiency and reduce fan generated noise.

4,836,149

ROTATING CYLINDER BLOCK PISTON-CYLINDER ENGINE

Vernon D. Newbold, Fort Collins, Colo., assignor to Future Power Inc., Greeley, Colo.

Filed Apr. 7, 1988, Ser. No. 178,649
Int. Cl.[4] F02B *57/06, 5 7/08*
U.S. Cl. 123—44 R 19 Claims



1. A rotating cylinder block piston-cylinder engine, comprising:

a stator means;

a hollow rotor housing rotatably mounted on said stator means for rotation around a rotor housing axis of rotation;

a plurality of cylinders radially positioned in the peripheral wall of said hollow rotor housing;

a piston slidable in each of said cylinders and having a piston rod rigidly mounted thereon and extending radially of said rotor into said hollow rotor housing;

means connected to said cylinders and the pistons therein for supplying a gas into said cylinders which is caused to expand for driving pistons radially inwardly in said cylinders and for exhausting the expanded gas from said cylinders;

a rotatable reaction member in said hollow rotor housing and rotatably mounted on said stator means for rotation around a fixed axis offset from the rotor housing axis of rotation and having radially spaced peripherally extending rolling engagement surfaces around the periphery thereof; and

differential rolling engagement means on the inner ends of each of said piston rods in rolling engagement with said rolling engagement surfaces for transmitting the force from said pistons to said reaction member and reaction force from said reaction member to said pistons and for causing said reaction member to rotate.

4,836,150

COMBINED FLUID PUMP AND TWO-CYCLE, INTERNAL COMBUSTION ENGINE

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Division of Ser. No. 791,461, Oct. 25, 1985, Pat. No. 4,745,886.
This application Mar. 24, 1988, Ser. No. 173,112
Int. Cl.[4] F02B *75/40*
U.S. Cl. 123—59 BS 3 Claims

1. A combined fluid pump and two-cycle internal combustion engine, comprising:

a block including an upper cylinder portion having a first diameter, and including a lower cylinder portion having a second diameter, the second diameter being larger than the first diameter,

a bi-diameter piston including an upper piston portion received in said upper cylinder portion, and including a lower piston portion received in said lower cylinder portion,

a crankcase connected to said block adjacent to said lower cylinder portion, said crankcase, said lower cylinder portion, and said lower piston portion defining a crankcase chamber,

an upper engine chamber defined by said upper cylinder portion and said upper piston portion,

an ignition means for igniting gas/air mixture in said upper engine chamber,

one-way gas/air inlet means for admitting a gas/air mixture into said crankcase chamber,

piston outlet means, located in said upper piston portion, for permitting the gas/air mixture in said crankcase chamber to exit from said crankcase chamber,

gas/air mixture channel means for receiving gas/air mixture through said piston outlet means from said crankcase chamber and for channeling the gas/air mixture to said upper engine chamber,

channel port means for permitting gas/air mixture from said channel means to enter said upper engine chamber,

exhaust port means for exhausting combusted gas/air mixture from said upper engine chamber,

a ring-like pumping chamber defined by said bi-diameter piston and said block, said pumping chamber being circumferential with respect to said upper piston portion,

one-way inlet means joined to said lower cylinder portion for admitting fluid to be pumped into said pumping chamber,

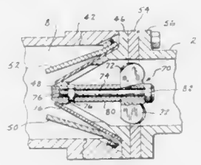
one-way outlet means joined to said lower cylinder portion for discharging pumped fluid from said pumping chamber.

4,836,151

TWO CYCLE ENGINE WITH TURBULENCE GENERATOR AT REED VALVES

John J. Litjens, Omro; John M. Griffiths, Fond du Lac, and Robert J. Baumhardt, Eden, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Mar. 31, 1988, Ser. No. 175,845
Int. Cl.[4] F02B *33/04;* F16K *15/14*
U.S. Cl. 123—65 V 8 Claims



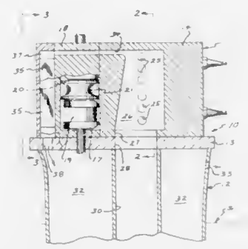
1. A two cycle internal combustion engine comprising a piston reciprocal in a cylinder between a combustion chamber and a crankcase, a reed block mounted to said crankcase and having one or more reed valves and admitting a fuel-air mixture to said crankcase, a fuel-air supply system supplying said fuel-air mixture to said reed block, a turbulence generator in the fuel-air stream to said reed block and generating turbulence to provide more uniform distribution of said fuel-air mixture, said turbulence generator being movable relative to said crankcase and being moved by flow of said fuel-air stream therepast.

4,836,152

EXHAUST HEATED CRANKCASE FOR 2-CYCLE MARINE ENGINE

Stephen B. Riese, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Feb. 19, 1988, Ser. No. 158,212
Int. Cl.[4] F02B *75/02*
U.S. Cl. 123—65 EM 13 Claims



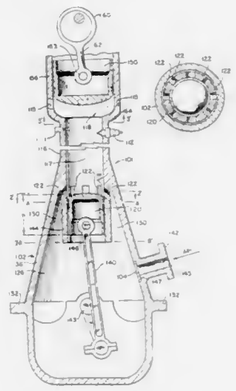
1. In an outboard boat motor having a two-cycle internal combustion engine and a driveshaft housing attached to and extending downwardly from the engine, an engine exhaust housing adjacent to the combustion chamber, said exhaust housing having a primary exhaust discharge passage extending into the driveshaft housing for discharge below the outside water level and an auxiliary exhaust passage extending into the driveshaft housing for discharge to atmosphere, and system for supplying fuel to the combustion chamber including an engine crankcase and fuel inlet manifold, improved apparatus for eliminating fuel puddling in the fuel supply system comprising an integral extension of the auxiliary exhaust passage, said extension positioned to lie adjacent to and in heat exchanging contact with the fuel supply system.

4,836,153

TWO-PISTON INTERNAL COMBUSTION ENGINES

John Velencei, Daly Rd., Far Hills, N.J. 07931

Continuation-in-part of Ser. No. 674,944, Nov. 26, 1984, Pat. No. 4,683,845. This application Jul. 27, 1987, Ser. No. 78,226
The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.
Int. Cl.[4] F02B *33/04*
U.S. Cl. 123—73 PP 22 Claims



1. An internal combustion engine cylinder assembly comprising a first cylinder having substantially vertically disposed interior walls defining a firing chamber therein; first piston means housed within said firing chamber and adapted for vertical reciprocation within said firing chamber; gas inlet channels means in the lower portion of said firing chamber; a crankcase housing having a gas compression chamber disposed therein; valve means adapted to permit fresh air to be charged into said gas compression chamber upon the depressuring of said chamber; fuel introduction means for introducing fuel into the upper portion of said firing chamber to form fuel/air mixtures therein; fuel ignition means for igniting a compressed fuel/air mixture in said firing chamber; second cylinder means positioned at the upper end of said first cylinder and having an exhaust chamber therein and a second piston means disposed within said exhaust chamber and adapted for vertical reciprocation therein, said exhaust chamber communicating with the upper end of said firing chamber; said second cylinder means being provided in the lower portion thereof with at least one exhaust gas port adapted for cyclic opening and closing to permit removal of exhaust gases from said firing chamber; at least a portion of said first cylinder extending downwardly into said gas compression chamber and being adapted to house at least a portion of said first piston means during the full downstroke of said first piston means; the upper portion of said crankcase having inwardly converging walls to define a converging gas space in the upper portion of said gas compression chamber annularly about said downwardly extending first cylinder portion, said gas inlet channels providing gaseous communication between said firing chamber and said converging gas space; said first piston means being arranged to cyclically open and close said gas inlet channels to permit said gaseous communication with said converging gas space; said second piston means being adapted to cyclically open and close said gas exhaust ports to control the removal of exhaust gases from said firing chamber; said first piston means cooperating with said second piston means, said fuel introduction means and said fuel ignition means for controlling the charging of fresh air and fuel into said firing chamber from said gas compression chamber and the pressurization and ignition

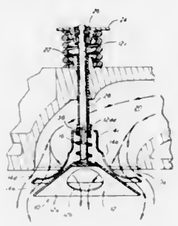
thereof in said firing chamber to generate power and to remove from said firing chamber the thus formed exhaust gases.

4,836,154

POPPET VALVE ASSEMBLY WITH APERTURES

Charles W. Bergeron, 3841 Crawford Ave., Coconut Grove, Fla. 33133

Filed Aug. 18, 1987, Ser. No. 86,604
Int. Cl.[4] F01L 1/28
U.S. Cl. 123—79 C **4 Claims**



1. An intake valve assembly for use in a four cycle internal combustion engine, the valve assembly being disposed in an intake port which opens into a combustion chamber, the valve assembly comprising:

a primary poppet valve in fluid communication with said engine cylinder, said primary poppet valve having a primary valve body and at least one aperture disposed through said primary valve body, and a primary valve stem;

a secondary poppet valve means having a body and a cylindrical stem centrally connected to said body, said secondary valve means moveably mounted on said primary valve stem and shaped to be sealed when engaged with said primary valve body, said secondary valve means body having at least one aperture formed by said secondary valve stem and having at least one aperture in said secondary valve means body disposed therethrough;

means for moving said primary poppet valve to an open position relative to said intake port;

resilient means for moving said secondary poppet valve body away from said primary poppet valve body during said primary poppet valve movement to an open position relative to said port opening; and

means for stopping the movement of the secondary poppet valve body during the movement of said primary poppet valve;

whereby when the valve assembly is opening and in the fully open position relative to the intake port, intake charge may flow through the primary and secondary valve body apertures in said valve assembly.

4,836,155

VARIABLE DURATION VALVE OPENING MECHANISM

Michael W. Slagley, and M. Kathy W. Slagley, both of 11661 Flamingo Dr., Garden Grove, Calif. 92641

Filed Jan. 11, 1988, Ser. No. 141,947
Int. Cl.[4] F01L 1/20
U.S. Cl. 123—90.16 **4 Claims**

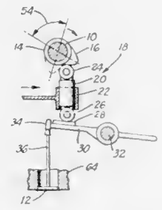
1. A variable duration valve opening mechanism comprising:

a camshaft, a cam on said camshaft, said cam having a lobe;

a valve movable from a closed position to an open position along a path;

a valve lifter engaged by said cam lobe, said valve lifter being movable by said cam lobe in a direction having a component of direction along said path, said valve lifter being connected to said valve so that motion of said lifter opens said valve;

a rocker arm pivotally carried on a rocker arm shaft, said rocker arm having a contact point engaging with said valve to open said valve and said rocker arm being engaged by said valve lifter so that said valve lifter engages on said rocker arm and said rocker arm engages on said valve to move said valve along its path, said rocker arm engaging only on its pivot, said valve and said valve lifter; and



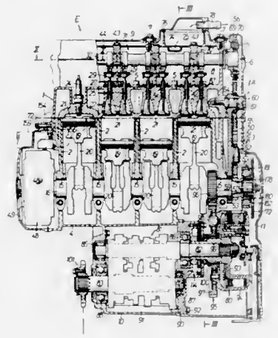
means for moving said valve lifter comprising a valve lifter guide which slidably receives said valve lifter, said valve lifter guide being movably mounted with respect to said camshaft for moving said valve lifter in a direction laterally of said path so as to be acted upon by said lobe at a different rotative position of said camshaft and for moving the contact point of said valve lifter onto said rocker arm to control the point of opening and closing of said valve with respect to camshaft rotation.

4,836,156

TIMING TRANSMISSION DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Takashi Inagaki; Kouji Okazaki, and Tsugio Ikeda, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1987, Ser. No. 121,882
Claims priority, application Japan, Nov. 19, 1986, 61-275754
Int. Cl.[4] F01L 1/04
U.S. Cl. 123—90.31 **6 Claims**



1. An internal combustion engine comprising:

an engine body;

a crankshaft rotatably supported on said engine body;

a camshaft rotatably supported on said engine body in spaced, parallel relation to said crankshaft;

a drive gear on said crankshaft;

a driven gear on said camshaft;

a support plate pivotably mounted at one end to one of said crankshaft and said camshaft;

the other end of said support plate being loosely secured to said engine body to accommodate thermal expansion thereof; and

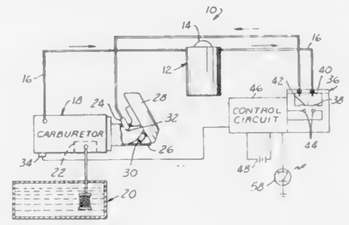
an idler gear rotatably mounted on said support plate for drivingly connecting said drive gear to said driven gear

4,836,157

COLD-START ENGINE PRIMING AND AIR PURGING SYSTEM

James K. Miller, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Continuation-in-part of Ser. No. 118,629, Nov. 9, 1987. This application Jul. 11, 1988, Ser. No. 217,462
Int. Cl.[4] F02M 1/16
U.S. Cl. 123—187.5 R **19 Claims**



1. A system for purging and priming an internal combustion engine which includes a carburetor having an air intake, said system comprising:

pump means including a fuel line coupled through said carburetor to a fuel supply and responsive to an operator for selectively drawing fuel through said carburetor from said supply and thereby purging air from said fuel line and carburetor,

means coupled by said fuel line to said pump means and positioned at said air intake for feeding fuel under pressure from said pump means into said air intake, and

priming control means including means responsive to pressure of fluid in said fuel line for distinguishing between pumping of air and pumping of fuel by pump means at said intake-positioned means, means coupled to said pressure-responsive means for timing duration of fuel pumping at said intake-positioned means, means for comparing said time duration to a time threshold, and means for indicating completion of a priming operation when said duration exceeds said threshold.

4,836,158

MOTORCYCLE GASKET AND ASSEMBLY

Ignatius J. Panzica, Morgan Hill, Calif., assignor to Custom Chrome, Inc., Morgan Hill, Calif.

Filed Mar. 28, 1988, Ser. No. 174,506
Int. Cl.[4] F02F 1/00
U.S. Cl. 123—193 CH **17 Claims**

1. In combination with an internal combustion engine cylinder block, head and case, the block located between the head and case, there being passages in the block and head to pass fluid therebetween, outwardly of a cylinder bore, an improved sealing system comprising

(a) a thin metal sheet gasket between the block and case,

(b) a thin composite gasket between block and head, said composite gasket including a metal annulus extending about the cylinder bore and exposed to said bore, and a non-metallic sheet gasket extending about the metal annulus,

(c) and bolt means clamping the head and case to the block creating compression loading transmitted by the metal

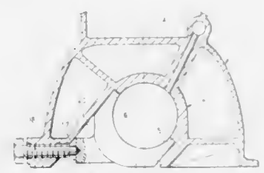
sheet gasket and by the metal annulus, the non-metallic sheet gasket also clamped to seal off about said passages.

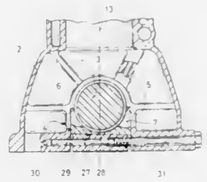
4,836,159

ENGINE CRANKSHAFT SUPPORTS

Arnold Löbig, Ruesselsheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 9, 1988, Ser. No. 242,932
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1987, 3730925
Int. Cl.[4] F02F 7/00
U.S. Cl. 123—195 H **14 Claims**





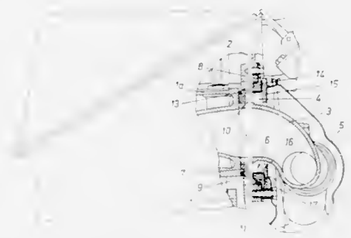
1. An internal combustion engine with a crankshaft bearing support comprising bearing web and a bearing cap bolted onto contact surfaces of the bearing web, characterized in that at an angle to the cylinder axis (13) on the bearing web (4) is provided a supporting surface (11) against which the bearing cap (7) abuts by a corresponding guide surface (12) and only on the side of the bearing cap (7) opposite the guide surface (12) and the supporting surface (11) there is provided a screw (8) for securing the bearing cap (7) against the contact surfaces (5, 6).

4,836,160

INTERNAL COMBUSTION ENGINE PROVIDED WITH A SOUND-INSULATING ENCLOSURE

Assen Valev, Perchtoldsdorf, Austria, assignor to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Sep. 8, 1988, Ser. No 241,859
Claims priority, application Austria, Sep. 9, 1987, 2276/87
Int. Cl.[4] F02B *77/11*; G10K *11/00*
U.S. Cl. 123—198 E 13 Claims



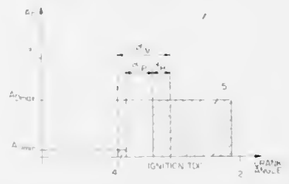
1. In an internal combustion engine comprising
an engine block,
a sound-insulating enclosure, which surrounds said engine block and defines a passage extending through said enclosure,
an engine part extending from said engine block in said passage through said enclosure, and
sealing means associated with said passage and comprising an inner flanged ring secured to said engine block, an outer flanged ring secured to said enclosure adjacent to said passage, and a sealing ring made of a rubber-elastic material and held between said inner and outer flanged rings and having an inside surface which surrounds and faces said engine part,
the improvement residing in that
said inner flanged ring carries a protective shield, which extends between said engine part and said inside surface and defines a clearance with and entirely covers said inside surface, and
said clearance contains a heat-resisting and sound-absorbing insulating material.

4,836,161

DIRECT FUEL INJECTION METHOD FOR A DIESEL ENGINE

Jörg Abthoff, Plüderhausen; Manfred Fortnagel, Korb; Ludwig Fricker, Stuttgart; Immanuel Kutschera, Neuhausen; Michael Krämer, Notzingen, and Michael Kühn, Filderstadt, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Oct. 8, 1987, Ser. No. 105,582
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1986, 3634295
Int. Cl.[4] F02B *3/12*
U.S. Cl. 123—299 8 Claims



1. Direct fuel injection method for a diesel engine, in which a preset quantity of fuel is introduced into a combustion space by a fuel injection nozzle in two separate injection quantities as pre and main injection quantity during the compression phase at different intervals from top dead center, the preinjection taking place within the last sixth of the compression phase with a preinjection quantity which is small in relation to the main injection quantity and the injection of the main injection beginning thereafter at a short interval after the preinjection end, wherein the beginning of the preinjection at idling speed is within the range of 10°–16° crank angle and at a rotational speed at maximum power within the range of 20°–30° crank angle, before top dead center, wherein the beginning of the main injection at idling speed is 2° crank angle after top dead center and at a rotational speed at maximum power within the range 15° crank angle, before top dead center, wherein the interval $\alpha_{p)}$ between the end of preinjection and beginning of main injection at idling speed is within the range of 10° to 16° crank angle and at a rotational speed at maximum power within the range of 2° to 13° crank angle and wherein the preinjection quantity at idling is about 10°–20° and at full load about 1%–5% of the quantity of fuel preset in each case.

4,836,162

ENGINE BRAKE OF AN INTERNAL COMBUSTION ENGINE

Helmut Melde-Tuczai; Johann Aigner, and Othmar Skatsche, all of Graz, Austria, assignors to AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik M.B.H. Prof.Dr.Dr.h.c. Hans List, Graz, Austria

Filed Oct. 28, 1987, Ser. No. 113,662
Claims priority, application Austria, Oct. 30, 1986, 2898/86
Int. Cl.[4] F01L *13/06*; F02D *13/04*
U.S. Cl. 123—321 13 Claims

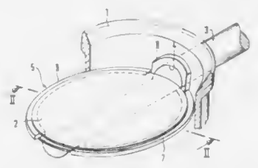
1. An engine brake of an internal combustion engine for motor vehicles, comprising an exhaust valve controlled by a cam via a follower lever situated in a cylinder head, said follower lever comprising a support bearing which is adjustable in the direction of a supporting force between two extreme positions, forming a device for leaving said exhaust valve open by a small gap during compression strokes, one of said extreme positions corresponding to normal operation and the other to braking, such that on braking said exhaust valve is lifted by 0.3 to 3 mm, during the phase in which the base circle of said cam is in contact with said follower lever, said support bearing of said follower level being provided by a plunger, which is located in a housing inserted in said cylinder head, said plunger being permitted to move axially in the direction of said supporting force of said follower lever within a given travel range, said plunger having an end facing away from said support bearing of said follower lever which is acted upon by pressurized oil, which will force said plunger into said extreme position corresponding to braking.

4,836,163

THROTTLE-BUTTERFLY CONNECTOR PIECE FOR AN INTERNAL COMBUSTION ENGINE

Gerald Muschalik, Frankfurt am Main, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 21, 1987, Ser. No. 135,659
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643948
Int. Cl.[4] F02D *9/10*; F02M *3/08*
U.S. Cl. 123—337 6 Claims



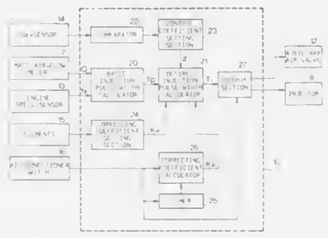
1. In a throttle-butterfly valve for an internal combustion engine, the valve comprising
a housing, a shaft rotatably supported by the housing, and a throttle butterfly which is held by the shaft for rotation in the housing; the improvement wherein
the butterfly comprises an expansion element located in the region of the edge of the throttle butterfly, said expansion element, upon an opening of the throttle butterfly valve, moving out of the circumferential edge of the throttle butterfly as a function of angular position of the throttle butterfly.

4,836,164

ENGINE SPEED CONTROL SYSTEM FOR AN AUTOMOTIVE ENGINE

Takuro Morozumi, Mitaka, and Masanori Sakamoto, Hamura, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 9, 1987, Ser. No. 107,653
Claims priority, application Japan, Oct. 16, 1986, 61-246155
Int. Cl.[4] F02D *41/04*
U.S. Cl. 123—339 7 Claims



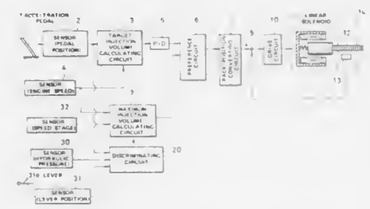
1. In a system for controlling speed of an engine for a motor vehicle having an air-conditioner, the engine having a fuel injection system for injecting fuel for the engine, a bypass provided around a throttle valve, an auxiliary air valve in the bypass, and a control unit for controlling the fuel injection system for injecting the fuel and the auxiliary air valve and being responsive to closing of an air-conditioner switch for the air-conditioner upon starting of the air-conditioner for opening the auxiliary air valve, the improvement of the system, wherein the control unit comprises:
first means responsive to the closing of the air-conditioner switch for setting an initial correcting coefficient for controlling the fuel injection system for injecting the fuel so as to increase amount of the injecting fuel;
timer means responsive to the closing of the air-conditioner switch for setting a set time and for producing a set time signal; and
said first means responsive to the set time signal for calculating a decrement based on the initial correcting coefficient and said set time and for continuously decreasing the initial correcting coefficient so as to gradually decrease the correcting coefficient with time by the decrement for controlling the fuel injection system for injecting the fuel to obtain a stable operation at the starting of the air-conditioner.

4,836,165

ENGINE CONTROLLING APPARATUS FOR A WHEELED TYPE CONSTRUCTION MACHINE

Yasuhiko Kubota, and Shigeyuki Tate, both of Kawagoe, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Japan

PCT No. PCT/JP87/00204, § 371 Date Nov. 24, 1987, § 102(e) Date Nov. 24, 1987, PCT Pub. No. WO87/05968, PCT Pub. Date Oct. 8, 1987
PCT Filed Apr. 1, 1987, Ser. No. 138,375
Claims priority, application Japan, Apr. 1, 1986, 61-75129
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—357 3 Claims



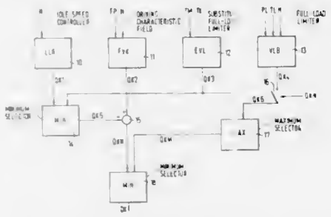
1. An engine controlling apparatus for a wheeled construction machine adapted to control an engine in such a manner as to generate a torque in accordance with a predetermined torque performance with reference to an extent of actuation of an acceleration pedal and a rotational speed of the engine, characterized in that said apparatus comprises,
torque performance setting means for setting first and second torque performances conformable to a time of working and a time of moving of the wheeled type construction machine as a torque performance,
discriminating means including first detecting means for detecting that hydraulic pressure in a hydraulic circuit for driving a working section of said construction machine is lower than a preset one, second detecting means for detecting that an extent of actuation of an acceleration pedal is more than said preset one, third detecting means for detecting that means for commanding forward movement and rearward movement of the construction machine commands forward movement of the latter and a logical circuit adapted to take a logical sum of detected outputs of said first, second, and third detecting means, said discriminating means for discriminating on the basis of the output of the logical circuit whether the wheeled type construction machine is kept in a working state or in a moving state, and
means for controlling the engine in accordance with said first torque performance when it is discriminated by the discriminating means that the construction machine is kept in a working state and controlling the engine in accordance with said second torque performance when it is discriminated by the discriminating means that the construction machine is kept in a moving state

4,836,166

ARRANGEMENT FOR CONTROLLING THE METERING OF FUEL TO AN INTERNAL COMBUSTION ENGINE

Jürgen Wietelmann, Ditzingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 784,264, Oct. 4, 1985, abandoned. This application Jan. 20, 1987, Ser. No. 4,893
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1984, 3436338
Int. Cl.⁴ F02M *39/00*
U.S. Cl. 123—358 **14 Claims**



1. An arrangement for controlling fuel metered to an internal combustion engine, the arrangement comprising:
first full-load limiting means for generating a limit signal (QK4) to limit the quantity of fuel metered to the engine during full-load operation in dependence upon at least the rotational speed of the engine and only during predetermined operating conditions thereof,
substitute full-load limiting means for generating a limit signal (QK3) to limit the quantity of fuel metered to the engine during idle and the values of said limit signal (QK3) being dependent solely upon the operating temperature of the engine and the temperature of the fuel thereby preventing the engine from stalling when cold;
idle-speed controller means for generating an output signal (QK1);
minimum selector means for receiving said output signal (QK1) and said limit signal (QK3) for generating an output signal (QK5) in dependence upon said signals (QK1 and QK3);
driving characteristic field means for generating an output signal (QK2);
summing means for combining said output signal (QK5) and said output signal (QK2) to generate signal (QKN);
means for comparing said signal (QKN) to said limit signal (QK3) and permitting said limit signal (QK4) to be generated only when said signal QKN is equal to or greater than said signal (QK3); and,
means for applying said substitute full-load limiting means for limiting the quantity of fuel when the engine is in an operating condition for which the fuel to be metered to the engine is above the lower limit (Q_{K3MIN}) of the substitute full-load limit and below the upper limit (Q_{K3MAX}) of the substitute full-load limit.

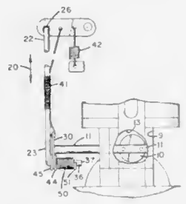
4,836,167

ENGINE GOVERNOR FRICTION DAMPER AND METHOD

Paul F. Huffman, Ham Lake, Minn., and Ron L. Bardell, Mountain View, Calif., assignors to Onan Corporation, Minneapolis, Minn.

Filed Aug. 31, 1987, Ser. No. 91,396
Int. Cl.⁴ F02M *39/00*
U.S. Cl. 123—376 **26 Claims**

1. A dampened governor mechanism for selectively adjusting a speed of an associated engine in response to variations in engine load, the engine including a throttle control; said dampened governor mechanism comprising:
(a) a crank arm constructed and arranged to selectively adjust the throttle control, for accelerating and decelerating the engine; said crank arm comprising a link having a first end portion with an aperture therein;
(b) a governor rod mechanism including a governor member; said governor member comprising a governor rod including an end portion with a lateral extension projecting through said crank arm first end aperture; said governor rod being constructed and arranged to adjust a rotational orientation of said throttle control, as selected;
(c) means for detecting variations in engine speed and adjusting a position of said governor rod in response thereto, in a manner selectively accelerating and decelerating the engine as necessary to substantially maintain a desired engine speed; and,



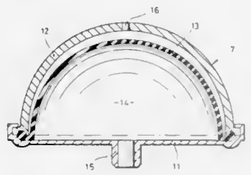
(d) a friction damper mechanism constructed and arranged to provide selected, operable, resistance to movement of said crank arm by said governor rod; said friction damper mechanism including: a first friction washer member; and, a biasing member;
(i) said first friction washer member and said crank arm being biased toward one another by said biasing member;
(ii) said biasing member being mounted on said governor rod and being operatively positioned so that pressure of said biasing member against said first friction washer member generates selected frictional resistance to movement of said crank arm by said governor rod; said selected friction inhibiting searching of the governor mechanism for a desired speed, in response to varying loads placed on the engine.

4,836,168

LIQUID COOLING SYSTEM

Michael Polster, Wiesbaden, and Ortwin Schamber, Klein-Gerau, both of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 25, 1988, Ser. No. 172,872
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1987, 3712686
Int. Cl.⁴ F01P *11/02*
U.S. Cl. 123—41.5 **4 Claims**



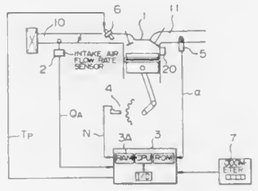
1. Liquid cooling system for an internal combustion engine, in which cooling liquid is circulated in a closed circuit from an engine block with a cooling jacket, through a radiator, and which has an expansion device for equalizing variations in volume arising as a result of thermal expansion, characterized in that the expansion device is formed separate from the closed circuit between the engine block and radiator exclusively by an expansion tank mounted directly on the engine block, the tank having a liquid chamber permanently communicating with the cooling liquid at the cooling jacket and bounded by a flexible diaphragm separate from the closed circuit between the engine block and radiator.

4,836,169

ENGINE CONTROL APPARATUS

Hideaki Ishikawa, Katsuta, and Taiji Hasegawa, Nakaminato, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 24, 1988, Ser. No. 159,904
Claims priority, application Japan, Mar. 13, 1987, 62-56614
Int. Cl.⁴ F02D *41/10*; F02M *51/00*
U.S. Cl. 123—480 **4 Claims**



1. An engine control apparatus comprising:
a plurality of sensors for detecting selected states of an engine;
first calculating means for calculating, on the basis of signals produced from said sensors, a correction amount which corrects a predetermined controllable quantity;
second calculating means for calculating a learning correction amount by averaging values of said correction amount at a predetermined reference occurrence frequency of sampled correction amount values;
means for controlling said second calculating means, in response to detection of a predetermined condition, by changing the occurrence frequency at which sampled values of the correction amount are averaged to an occurrence frequency which is smaller than said predetermined reference occurrence frequency; and
means for correcting said controllable quantity in accordance with said correction amount and said learning correction amount.

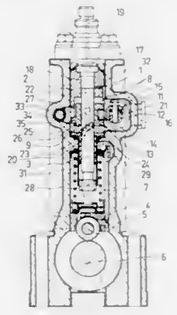
4,836,170

FUEL INJECTION PUMP FOR AN INTERNAL COMBUSTION ENGINE

Walter Hafele, Fellbach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 14, 1987, Ser. No. 108,503
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1986, 3637073; Jul. 23, 1987, 3724409
Int. Cl.⁴ F02M *34/00*
U.S. Cl. 123—503 **31 Claims**

1. A fuel injection pump for internal combustion engines having a pump housing a plurality of pump elements in a line in said pump housing and driven by a common camshaft, each pump element having one pump piston having a longitudinal axis and one pump cylinder which defines one pump work chamber,
a control slide axially displaceable on each pump piston, controlling at least one control opening that extends in the pump piston and which communicates with said pump work chamber and which discharges in a jacket face of the pump piston, a torque shaft interconnecting each of said control slides is provided for a simultaneous actuation of all of said control slides for controlling the fuel quantity and/or the supply onset or the end of supply, said torque shaft being supported in said pump housing, torque shaft driver tangs are provided that are adjustable with respect to said torque shaft for varying the stroke position of the control slide, and
having one each transverse groove extending transversely to the pump piston axis, on each control slide, which transverse groove is engaged by said driver tangs for axially actuating each respective control slide,



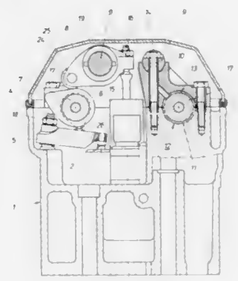
each drive tang (**14**) has a fastening part (**15**; **15'**; **50**; **115**) for fastening said driver tang to said torque shaft (**12**; **112**; **212**; **312**; **412**), said fastening part having an adjusting face (**44**; **144**; **244**) oriented toward said torque shaft (**12**; **112**; **212**; **312**; **412**) and extending transversely to the pump piston longitudinal axis, and spacer means (**21**; **45**; **45'**) for adjusting a spacing between said adjusting face (**44**; **144**; **244**) and the torque shaft (**12**; **112**; **212**; **312**; **412**) for adjusting the stroke position of the respective control slide (**9**).

4,836,171

INJECTION-TYPE INTERNAL COMBUSTION ENGINE

Helmut Melde-Tuczai; Othmar Skatsche, and Josef Rachholz, all of Graz, Austria, assignors to A V L Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik M.B.H., Prof. Dr. Dr. h.c. Hans List, Graz, Austria

Filed Mar. 21, 1988, Ser. No. 171,439
Claims priority, application Austria, Mar. 23, 1987, 690/87
Int. Cl.⁴ F02M *39/00*
U.S. Cl. 123—508 **5 Claims**



1. An injection-type internal combustion engine, comprising even and odd alternating numbers of cylinders arranged in line and a cylinder head with a first and a second overhead camshaft, each of said cylinders comprising four valves and a central pump nozzle, detachable rocker arms being provided

on said cylinder head above said first and second overhead camshaft, for actuation of said pump nozzles via cams secured to said first and second overhead camshaft, wherein each of said rocker arms is mounted separately and said rocker arms of adjacent pump nozzles are operable from corresponding cams of different ones of said camshafts, such that said first overhead camshaft actuates said rocker arms of said pump nozzles of said even numbers of cylinders and said second overhead camshaft actuates said rocker arms of said pump nozzles of said odd numbers of cylinders.

4,836,172

CANISTER DEVICE FOR USE IN GASOLINE TANK

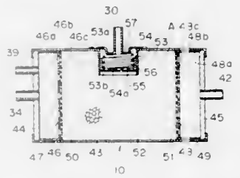
Kazumi Haruta, Obu, and Yutaka Yamada, Hekinan, both of Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Ohbu, Japan

Filed Oct. 2, 1987, Ser. No. 103,671

Claims priority, application Japan, Oct. 6, 1986, 61-238735; Oct. 9, 1986, 61-241805

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—520 **11 Claims**



1. A canister device for use with a gasoline tank of a vehicle driven by a gasoline engine comprising

a canister having a top wall and perforated partitions dividing the interior thereof into a chamber for containing a vapor-absorbing material and an intake chamber and an air chamber on the opposite sides of said material-containing chamber;

said intake chamber having a purge port and a first intake port in a wall of said canister, said first intake port being adapted to communicate with the interior of the filter neck of the gasoline tank;

said material-containing chamber having a second intake port in the top wall of said canister adapted to communicate with the vapor space in the gasoline tank;

said air chamber having an air port for communicating with ambient air outside of said canister

an upright tubular guide at the inner end of said second intake port;

perforated plunger means reciprocable in said guide for engaging material in said material-containing chamber;

spring means urging said plunger inwardly of said second intake port; and

filter means covering the inner end of said plunger.

4,836,173

FUEL VAPORIZATION DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Sylvester Stires, Jr., 9405 Elm Ave., Fontana, Calif. 92335

Filed Mar. 21, 1988, Ser. No. 170,894

Int. Cl.[4] F02M *17/22*

U.S. Cl. 123—522 **10 Claims**

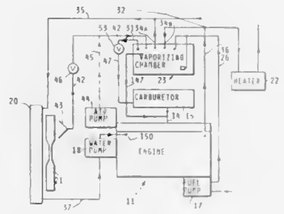
1. Apparatus for improving the fuel economy and performance of an internal combustion engine having a fuel atomizing device for atomizing liquid fuel to be ignited by said engine and provided with a source of liquid fuel for said atomizing device, comprising:

an enclosed fuel vaporizing chamber

means for maintaining a body of said liquid fuel in said vaporizing chamber at a predetermined level below an open space therein;

a heating tube extending below said predetermined level in said chamber;

means for conducting a heating fluid through said tube whereby to heat said body of liquid fuel;



means for injecting air into said body of liquid fuel whereby to form upwardly rising air bubbles which absorb the fuel in vaporized form to provide a source of air enriched with the vaporized fuel in said open space; and

vacuum means for conveying the mixture of air and vaporized fuel from said chamber to admixture with the atomized fuel from said atomized device.

4,836,174

ENGINE CONTROL SYSTEM

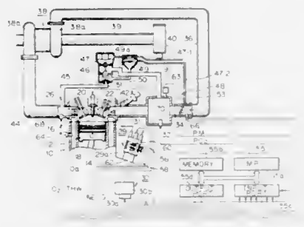
Yoshiki Chujo; Tokuta Inoue, both of Mishima; Toshiaki Konomi, and Yoshihiko Hyodo, both of Susono, all of Japan, assignors to Toyota Jidosha Kahushiki Kaisha, Aichi, Japan

Filed Feb. 2, 1988, Ser. No. 151,576

Claims priority, application Japan, Feb. 6, 1987, 62-24825; Feb. 6, 1987, 62-24826

Int. Cl.[4] F02M *25/06*

U.S. Cl. 123—571 **8 Claims**



3. An internal combustion engine comprising:

an engine body;

an intake system connected to the engine body for introducing air thereto, the system including a throttle valve for controlling the amount of air introduced;

an exhaust system connected to the engine body for removing resultant combustion gas therefrom;

passageway means for connecting the exhaust system and the intake system for recirculating an amount of exhaust gas from the exhaust system to the intake system;

first sensor means arranged in the intake system at a position downstream of the throttle valve for detecting intake pressure;

first calculating means for calculating, from the detected intake pressure, a basic value of an engine characteristic concerning an amount of new air introduced into the engine for obtaining a predetermined value of said engine characteristic as desired;

second sensor means arranged in the intake system at a position downstream of the throttle valve, said sensor providing an electric signal indicating the partial pressure of oxygen in the introduced air;

second calculating means for calculating a target value of a partial pressure of oxygen from the value of the intake pressure detected by the first sensor means;

means for comparing the value of the partial pressure of the oxygen detected by the second sensor means with the target value of the partial pressure of the oxygen calculated by the second calculating means and issuing a signal indicating a correction of the basic characteristic value;

correcting means, responsive to the outputs of the first calculating means and the comparing means for obtaining a corrected basic value of said engine operational characteristic to attain a precise control of the engine characteristic to the desired value; and

control means for controlling the engine operational characteristic in response to the correcting means to obtain the corrected engine operating characteristic value.

4,836,175

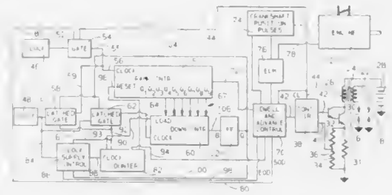
IGNITION SYSTEM DWELL CONTROL

Mark C. Hansen, Kokomo, and Walter K. Kosiak, Lafayette, both of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Aug. 1, 1988, Ser. No. 226,711

Int. Cl.[4] F02P *3/045*

U.S. Cl. 123—609 **6 Claims**



1. The method of developing a digital signal for use in a dwell control system of an electronic internal combustion engine ignition system, the ignition system having an ignition coil including primary and secondary windings, the steps comprising, applying constant frequency clock pulses to an up-counter for a period of time beginning with energization of the primary winding of the ignition coil and ending when primary winding current increases to a sensed current limit value whereby the count magnitude attained by said counter is a function of the duration of said period of time, and then processing said count magnitude attained by said up-counter during said period of time to produce a digital signal the magnitude of which is equal to said count magnitude added to a fixed percentage of said count magnitude.

4,836,176

IGNITION APPARATUS OF ELECTRONIC DISTRIBUTION TYPE FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Yasunori Fujino, Hiroshima; Noboru Sugiura, Mito, and Ryoichi Kobayashi, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 22, 1988, Ser. No. 147,284

Claims priority, application Japan, Feb. 23, 1987, 62-37982

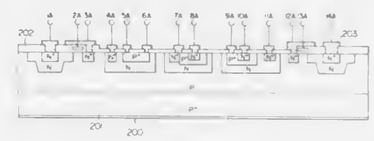
Int. Cl.[4] F02P *5/15, 1/00*

U.S. Cl. 123—640 **5 Claims**

1. An ignition apparatus of electronic distribution type for use with a multi-cylinder engine, said apparatus comprising:

a plurality of spark generators, each provided in a respective cylinder of the engine;

a plurality of ignition circuits each provided for no more than two of the cylinders of the engine and each including an ignition coil and a power switching element connected to the spark generator of an associated cylinder, said ignition circuits being divided into a plurality of groups, each group including at least two ignition circuits; and



a plurality of current-limiting circuits each connected to a respective one of said groups of ignition circuits, each current-limiting circuit being connected in common to the power switching elements of the associated group of ignition circuits for controlling currents flowing through the power switching elements of those ignition circuits, so that if a power switching element of an ignition circuit in one group malfunctions, the current-limiting circuit of said one group will not affect the operation of power switching elements in the other groups of ignition circuits.

4,836,177

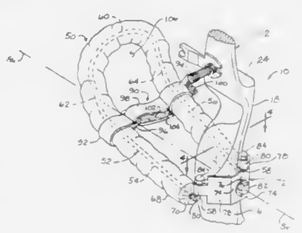
ARCHERY BOW WRIST BRACE APPARATUS

Bill R. Williams, Durant, Okla., assignor to Larry B. Wills, Durant, Okla., a part interest

Filed Jun. 2, 1988, Ser. No. 202,120

Int. Cl.[4] F41B *5/00*

U.S. Cl. 124—89 **22 Claims**



1. For use with an archery bow having an elongated body with a central handle portion adapted to be gripped by an archer's bow hand having an associated wrist and forearm, and a bow string operatively intersecured between opposite ends of said body and adapted to be rearwardly drawn by the archer's string hand and then released to forwardly propel an arrow operatively engaged by said bow string, the draw and release of said bow string creating undesirable torques on said body in opposite directions about horizontal and vertical axes passing through said handle portion being gripped by said bow hand, a wrist brace operative to inhibit flexure of said wrist to thereby inhibit undesirable pivoting of said body about said axes, said wrist brace comprising:

a rigid portion having first and second ends;

connecting means for rigidly anchoring said first end of said body in a manner such that said rigid portion extends rearwardly from said body to one side of said bow string with said second end positioned rearwardly of said wrist; and

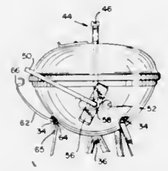
engagement means, secured to said second end of said rigid portion, for encirclingly engaging said forearm and lock-

ing it against appreciable transverse movement relative to said rigid portion in a manner such that all movements of said body about horizontal and vertical axes passing through said handle are resisted by said forearm.

4,836,178
INSET FOR A TOOL
Peter N. Tomlinson, 315 Enford Road, Mondeor, Johannesburg, Transvaal, South Africa
Filed Feb. 25, 1987, Ser. No. 18,615
Claims priority, application South Africa, Feb. 28, 1986, 86/1515
Int. Cl.[4] B28D *5/04*
U.S. Cl. 125—39 **7 Claims**

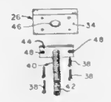
1. An abrasive tool comprising a working surface in which is mounted at least one cutting insert, the cutting insert comprising an elongate pin, one end of which is located in a socket formed in the working surface, the other end of which protrudes from the working surface and an intermediate elongate portion connecting the ends, the protruding end of said pin having secured to it an abrasive element which presents a cutting edge, the intermediate portion being substantially cylindrical in shape and being substantially completely located in the socket, the end of said pin located in the socket having a substantially conical shape, and the socket having a complementary shape to both the intermediate portion and conical end of the pin located in it such that said pin and socket are in intimate engagement along the entire surfaces of said intermediate portion and conical end of the pin when said pin is located within said socket, and wherein said intermediate portion comprises two sections of different diameter, the section of larger diameter being located at the protruding end of said pin.

4,836,179
PORTABLE BARBECUE GRILL WITH COVER SUPPORT
Erich J. Schlosser, Barrington, and James C. Stephen, Arlington Heights, both of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.
Filed Aug. 12, 1988, Ser. No. 231,874
Int. Cl.[4] A47J *37/00*
U.S. Cl. 126—25 R **6 Claims**



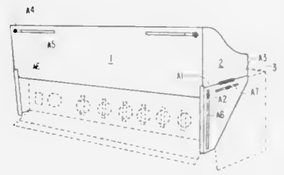
1. A portable barbecue grill comprising a bowl having an open top and a cover on said bowl with a gripping handle on said cover and a carrying handle pivoted on said bowl and adapted to be locked on said gripping handle, the improvement of an elongated latch member for said carrying handle, said latch member having one end secured to said bowl adjacent a bottom portion thereof and an opposite free end adjacent said open top, said free end having a friction gripping means thereon, said friction gripping means consisting of a substantially C-shaped element opening away from said bowl for receiving said carrying handle, and said free end being deflectable toward and away from said bowl so that said handle can be locked onto said friction gripping means and said carrying handle and latch member define a cradle for said cover.

4,836,180
GAS BURNER ADAPTOR MANIFOLD ASSEMBLY
Jon S. Walters, St. Louis, Mo., and Neil Boatwright, Warrick, Ind., assignors to American General Products, Inc., Maryland Heights, Mo.
Filed Apr. 18, 1988, Ser. No. 182,343
Int. Cl.[4] F24C *3/00*
U.S. Cl. 126—41 R **5 Claims**



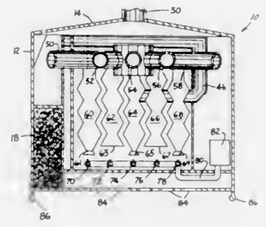
1. In a gas fired cooking grill having a twin burner element with spaced openings in a lower face thereof initially adapted for dual gas supply lines for the twin burner element, the improvement comprising: an adaptor manifold for converting the twin burner element to a single burner element having a single gas supply line source, said adaptor manifold defining an enclosed chamber having an upper end mounted to the lower face of said burner element and covering said spaced openings within the enclosed chamber, and said adaptor element further having a lower end connected to a single gas supply line source.

4,836,181
SAFETY-DEVICE FOR STOVES
Halvor Saga, N-3740 Lunde, Lunde, Norway
Filed Feb. 22, 1988, Ser. No. 158,601
Claims priority, application Norway, Feb. 23, 1987, 870707; Nov. 2, 1987, 874556
Int. Cl.[4] F24C *3/12*
U.S. Cl. 126—42 **8 Claims**



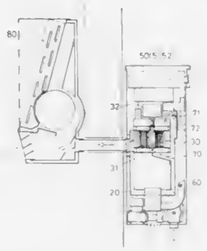
1. A children safety device for cookers/stoves having a switch panel and heating plates comprising at least one plane, vertical, first front panel (**1**), side walls (**2**) pivotably secured to said stove and slidably engaging said front panel, said front panel (**1**) slidably engaging securing plates (**4**) mounted on said stove so that said front panel (**1**) is capable of being selectively moved into (a) a down-folded position extending downward and covering at least said switch panel of said stove, and (b) into an upfolded position comprising at least a partly peripheral obstacle to prevent accessibility to said heating plates of said stove, said side walls (**2**) cooperating with said vertical front panel (**1**) by slidably engaging said front panel (**1**) to selectively provide said down-folded and upfolded positions.

4,836,182
GAS BURNING HEATING DEVICE
Daniel W. Trowbridge, 12212 Cliffwood Ave., Garden Grove, Calif. 92640
Filed Jun. 8, 1988, Ser. No. 203,878
Int. Cl.[4] F24D *15/02*
U.S. Cl. 126—109 **5 Claims**



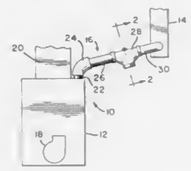
1. A gas burning heating device, comprising:
a housing;
a gas burner in a lower portion of said housing;
a heated air space within said housing and above said gas burner;
a roof at a top portion of said housing;
an exhaust flue in said roof;
a room air intake opening in said housing;
an air intake blower means adjacent to and in fluid flow communication with said room air intake opening to draw room air from exterior of said housing through said room air intake opening;
a room air inlet conduit within said housing having a first end connected in fluid flow communication to said air intake blower means;
an air filter disposed over said first end of said room air inlet conduit;
said room air inlet conduit extending back and forth across said heated air space within said housing;
a room air distribution chamber in an upper portion of said housing;
said room air inlet conduit having a second end connected to and in fluid flow communication with said room air distribution chamber;
a plurality of room air outlet conduits extending from and in fluid flow communication with said distribution chamber across said heated air space and through a front wall of said housing;
a heat exchanger suspended from each of said room air outlet conduits and in said heated air space;
each of said heat exchangers having a hollow body portion in fluid communication with one of said air outlet conduits, said hollow body portion having therein an enclosed longitudinally extending corrugated heat conductive metal plate, said hollow body portion having a bottom heat conductive metal plate disposed adjacent said gas burner and connected to said corrugated heat conductive metal plate; and
a combustion air inlet formed in a bottom portion of said housing.

4,836,183
ROTARY BODY ROOM AIR HEATER
Masaharu Okuno, Osaka; Toshihiro Ishibashi, Kosai; Satoshi Naitou, Kosai, and Tatsuyoshi Sasaki, Hamamatsu, all of Japan, assignors to Osaka Gas Company, Ltd., Osaka and Kabushiki Kaisha Hamatech, Shizuoka, both of, Japan
Filed Mar. 21, 1988, Ser. No. 171,344
Int. Cl.[4] F24H *3/06*
U.S. Cl. 126—110 R **2 Claims**



1. A heater adapted to provided heat for heating a room by effecting heat exchange in a heat exchange section which is between a combustion section and a ventilation section,
said heat exchange section comprising a rotary body positioned across said combustion section and said ventilation sections as to rotate at that position, said rotary body having air flow passages extending in the same direction as the axis of rotation of said rotary body,
said heat exchange section, said combustion section and said ventilation section being all contained in a heat exchange cylinder, and air at a high temperature resulting from the heat exchange in said heat exchange cylinder being discharged to the interior of the room while mixing with and having its temperature reduced by an air current blown against the heat exchange cylinder by a ventilation fan.

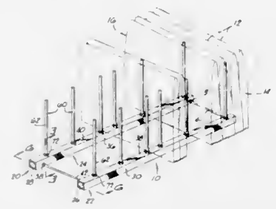
4,836,184
METHOD FOR FUEL ECONOMY
Dennis R. Senne, 3124 Leon Rd., Jacksonville, Fla. 32216
Continuation of Ser. No. 267,601, May 27, 1981, abandoned, which is a division of Ser. No. 88,166, Oct. 25, 1979, Pat. No. 4,291,671, which is a continuation-in-part of Ser. No. 909,839, May 26, 1978, abandoned. This application Mar. 20, 1984, Ser. No. 591,555
Int. Cl.[4] F23L *3/00*
U.S. Cl. 126—292 **4 Claims**



1. The method of improving the efficiency of combustion of hydrocarbon fuel in a heat-exchanger automatic furnace system, having an exhaust conduit for the venting of the products of combustion that includes:
(1) retarding the flow of said products of combustion by interposing a fixed baffle in said exhaust conduit,
(2) providing an unrestricted area of flow around said baffle

substantially equal to or greater than that of said exhaust conduit, and in stream with the latter, while
(3) excluding ambient and other extraneous gases therefrom,
(4) said retardation of flow effecting a dwell in the exhaust of waste heat and products of combustion from said system, thereby
(5) augmenting the combustion cycle by enhancing its temperature and time parameters, thus
(6) converting an essential part of the residual CO to CO_2, so as further to augment the heat in the heat-exchanger system, while
(7) reducing condensate in the products of combustion ultimately vented through the exhaust conduit.

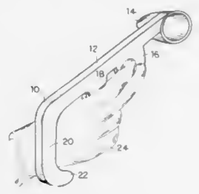
4,836,185
FIREPLACE NEWSPAPER HOLDER
David A. Kudija, 1348 Beech Hill Ave., Hacienda Heights, Calif. 91745
Filed May 16, 1988, Ser. No. 194,332
Int. Cl.[4] F23H *13/10*
U.S. Cl. 126—540 6 Claims



1. A fireplace newspaper holder to be positioned within a fireplace having a floor and adapted to receive a plurality of newspapers to be ignited, said holder comprising:
a base member having a pair of channel members with at least an outer face and a pair of parallel upper and lower faces extending between said outer face, and spacer cross bar members mounted through said outer face of said channel members forming a frame and said frame adapted to rest upon said floor;
a first row of a plurality of vertical rods maintained in said base member in spaced relationship one from the other;
a second row of a plurality of vertical rods maintained in said base member each in alignment with one of the plurality of vertical rods in said first row, wherein spaces are created therebetween to receive said newspapers in a folder vertical position resting upon said base; and
the height of each of said vertical rods is sufficient to retain said folded newspapers in a generally vertical position, whereby said newspapers may be ignited to give off heat and esthetic visual effects.

4,836,186
BODY COMPRESSION DEVICE FOR PATIENTS UNDER FLUOROSCOPIC EXAMINATION
Francis J. Scholz, 32 Grand Hill Rd., Dover, Mass. 02030
Filed Jan. 16, 1987, Ser. No. 3,756
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—897 18 Claims

1. A device held in a hand of a user and extending over a wrist, the device being used for exerting force on a body of a patient wherein the device comprises
a lever arm having a forward end and a rearward end;
a handle extending from the lever arm at a position between the forward end and the rearward end;
a wrist cuff extending from the lever arm in the same direction as the handle, the wrist cuff being positioned closer to the rearward end than the handle and;

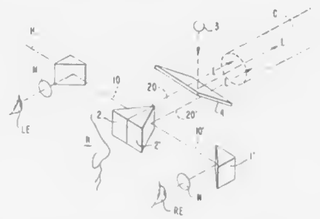


a work element positioned at the forward end, the work element exerting force on a body of a patient.

4,836,187
CONSTANT PRESSURE APPARATUS OF AN ENDOSCOPE
Keiichi Iwakoshi, Nasu; Mitsuru Sato, Shibuya; Hiroyuki Umeda, Kasukabe, and Toshinori Nishizawa, Mitaka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Kabushiki Kaisha Machidaseisakujyo, Tokyo, both of, Japan
Filed Dec. 28, 1987, Ser. No. 137,943
Claims priority, application Japan, Dec. 27, 1986, 61-311892
Int. Cl.[4] A61B *1/00*
U.S. Cl. 128—4 13 Claims

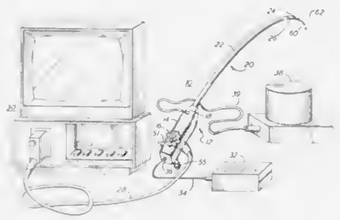
1. A system for regulating the gas pressure within a cavity, comprising:
a probe for insertion into the cavity;
a suction line having one end disposed within the probe for removing gas from the cavity;
a valve connected to the other end of the suction line;
a first gas supply line also having one end disposed within the probe;
a valve connected to the other end of the gas supply line;
a pressure detecting means connected to the other end of the gas supply line between the valve and the probe;
a second gas supply line having one end disposed within the probe;
a valve connected to the other end of the second gas supply line; and
a control means for receiving an indication of the pressure detected by the pressure detecting means when the first gas supply line is closed and selectively opening and closing the valves in the suction line and the second gas supply line to achieve the desired gas pressure within the cavity.

4,836,188
INSTRUMENT FOR ILLUMINATED STERESCOPIC VIEWING OF BODY CAVITIES
Yale J. Berry, 134 Clinton Rd., Brookline, Mass.
Filed May 6, 1986, Ser. No. 860,043
Int. Cl.[4] A61B *1/06*; G02B *23/02, 27/14*
U.S. Cl. 128—6 5 Claims



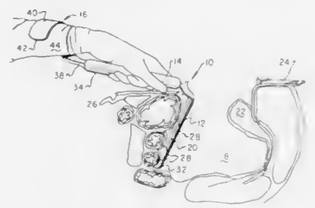
1. An instrument for illuminated stereoscopic examination of body cavities and the like, comprising a source of light, an optical system, and headgear means for supporting said source of light and said optical system on the head of an examiner, said optical system including means for directing a cone of light from said source away from the head of the examiner and toward a body cavity along a path substantially midway between the eyes of the examiner, means for splitting light reflected from said body cavity toward the head of the examiner along said path into two beams of light, means for directing said two beams of light toward the eyes of the examiner, respectively, said source of light being disposed relative to sad optical system so as to avoid obstruction of the examiner's view of said body cavity through said optical system, and means for positioning said cone of light directing means and said light splitting means so that the examiner's view of said body cavity is along the center of said one of light in both horizontal and vertical planes extending between the examiner and the body cavity.

4,836,189
VIDEO HYSTEROSCOPE
Jimmie B. Allred, III; Richard A. Kokosa, both of Skaneateles; Allan I. Krauter, Syracuse, and Richard W. Newman, Auburn, all of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.
Filed Jul. 27, 1988, Ser. No. 224,482
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 14 Claims



1. A flexible video hysteroscope for the observation and treatment of abnormalities in the uterus of a female patient, comprising an insertion tube which includes a flexible elongated tubular member having a flexible outer sheath; a viewing head at the distal end of the tubular member and including imaging means in said head for viewing from said head; a biopsy channel extending within said tubular member to the distal and thereof and through said head, in which channel an elongated flexible laser fiber cable can be inserted to pass up to and out from said head, said laser fiber cable and biopsy channel defining a substantially annular fluid drainage channel that extends from the head to the proximal end of said elongated tubular member; a saline injection channel extending within said flexible tubular member to the distal end thereof and having means to receive a continuous flow of aqueous saline solution and an outlet port in said head directing the flow of saline solution distally therefrom; and an articulation section joining the head and the flexible tubular member and permitting controlled bending of the head with respect to the flexible tubular member, the bending being limited to a maximum angular deflection that corresponds to an angle at which horns of the uterus attach to the body thereof.

4,836,190
VISCERAL RETRACTOR
Christian R. Zwick, R.R. 7, Box 46, Quincy, Ill. 62301
Filed Mar. 4, 1988, Ser. No. 164,460
Int. Cl.[4] A61B *17/02*
U.S. Cl. 128—20 7 Claims

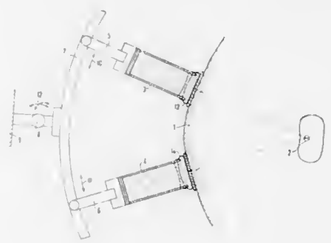


1. Surgical retractor means tiltable in response to movement of the forearm of an operator, comprising:
(a) an elongated manually grippable handle;
(b) a viscera engaging blade affixed to that end of said handle projecting forwardly of the operator's hand;
(c) rigid handle extension means attached to that end of said handle projecting rearwardly of the operator's hand, said extension means extending rearwardly from said handle sufficiently for engagement with the forearm when said handle is gripped; and,
(d) said extension means including an open helical portion having a longitudinal axis generally parallel with the longitudinal centerline of said handle and laterally spaced therefrom.

4,836,191
LITHOTRIPSY WORK STATION
Erich Noske, Weiher; Manfred Pfeiler, Erlangen, and Helmut Reichenberger, Eickental, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jan. 20, 1988, Ser. No. 145,984
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1987, 8701218[U]
Int. Cl.[4] A61B *17/22*
U.S. Cl. 128—24 A 5 Claims

1. A lithotripsy work station comprising a frame, a plurality of shockwave generators for irradiating a patient with shockwaves, and common mounting means for adjustably positioning said plurality of shockwave generators relative to said frame, said mounting means being constructed so that the shockwave generators of said plurality of shockwave generators are adjustable to simultaneously engage the patient for irradiating the patient with shockwaves under respective dif-

ferent irradiation angles, and said mounting means being further constructed so that said respective irradiation angles are



individually adjustable for each shock wave generator of said plurality of shockwave generators in a common plane.

4,836,192

VACUUM GENERATOR FOR STIMULATING THE SCALP

Mariarosa Abbate, Via Camperio, 8-20052 Monza, Italy, assignor to Mariarosa Abbate and Giulio Corti, both of Monza, Italy

Continuation-in-part of Ser. No. 813,069, Jul. 8, 1986, abandoned, and a continuation-in-part of Ser. No. 145,652, Jan. 7, 1988, abandoned, said Ser. No. 145,652, is a continuation of Ser. No. 815,800, Jan. 6, 1986, abandoned, which is a continuation of Ser. No. 531,504, Sep. 12, 1983, abandoned. This application Jul. 28, 1988, Ser. No. 225,281

Claims priority, application Italy, Sep. 20, 1982, 2338 A/82; Jul. 17, 1985, 22525 B/85

Int. Cl.[4] A61H *9/00, 1/00*

U.S. Cl. 128—38 **14 Claims**

1 An apparatus for trichologic treatment of the scalp under variable partial vacuum which comprises:

(a) a plurality of sliding suction means each having an elongated shape of diameter from 10 to 20 mm, a wall thickness of 2–4 mm and a rounded edge at an end intended to contact the scalp thus forming a frustoconical cup;

(b) a plurality of cup-shaped stationary suction means (5) capable of creating a pulsating vacuum, each stationary suction means having a diameter between 25 and 50 mm, a wall thickness of 4 mm, a rounded edge and a bead (7) along the inner circumference; and

(c) a vacuum generator (40) having two pneumatic circuits (41, 42), one circuit being connected to the sliding suction means for creating a vacuum between 0.3 and 0.75 kg/cm^2 under a thrust of 2–15 kg, the other circuit being connected to the stationary suction means for creating a pulsating vacuum varying alternately between 0.1 and 0.75 kg/cm^2 under a thrust of 2–15 kg;

(d) regulating means (43, 44) with vacuum gauges (45, 46) connected with each pneumatic circuit for regulating the source intensity of each circuit;

(e) regulating means (47) connected to the circuit of the stationary suction means for regulating the pulsating action intensity of vacuum and the period of time of action of said stationary suction means, and a timer for applying first said sliding suction means for a predetermined period of time and then said stationary suction means for a predetermined period of time.

4,836,193

SKULL TO SPINE FIXATION DEVICE

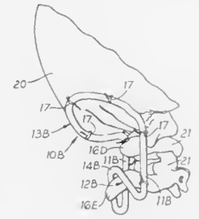
Andrew O. Ransford, London, England, assignor to A. W. Showell (Surgicraft) Limited, Redditch, England

Filed Nov. 3, 1987, Ser. No. 116,457

Claims priority, application United Kingdom, Nov. 5, 1986, 8626409

Int. Cl.[4] A61F *5/04, 5/08*

U.S. Cl. 128—69 **1 Claim**



1. A spinal fixation device for fixation of a skull to adjacent bones of the spine consisting of a rod of biocompatible material formed into a loop having two straight spaced coplanar portions intermediate two bights which extend in planes that are not parallel to each other and are not perpendicular to the plane of the straight intermediate portions, wherein one of said bights is substantially circular in a curved plane starting generally perpendicular to the plane of the straight intermediate portions and curving away therefrom, and having the other bight generally V-shaped with its apex extending towards the substantially circular bight, whereby the apex of that V-shaped bight can be accommodated between the adjacent pair of spinous processes closest to the skull against which the substantially circular bight lies.

4,836,194

THERAPEUTIC LUMBOSACRAL APPLIANCE

Peter R. Sebastian, Salisbury, Md.; John L. Stump, Daphne, Ala., and Thomas V. Sebastian, Reading, Pa., assignors to Safeguard Industrial Corporation, Leesport, Pa.

Continuation-in-part of Ser. No. 901,559, Aug. 29, 1986, Pat. No. 4,703,750. This application Aug. 17, 1987, Ser. No. 86,316

The portion of the term of this patent subsequent to Nov. 3, 2004, has been disclaimed.

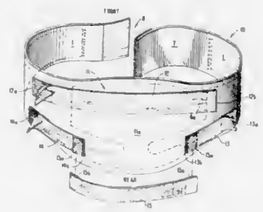
Int. Cl.[4] A61F *5/02*

U.S. Cl. 128—78 **24 Claims**

23. A therapeutic appliance for application to the lumbar spine and which follows the contours of the iliac crests and overlies the sacrum and sacroiliac joints as well as anchors below the posterior superior iliac spines of the human body, the appliance comprising:

an external shell having a length in a longitudinal direction sufficient to extend around and encircle the abdominal region of the body, said shell having closure means at opposite ends thereof for attaching said ends together;

an air bladder disposed on said external shell, said air bladder having a plurality of air chambers located centrally between said opposite ends of said shell, said air chambers including elongated air chambers which extend transversely to said longitudinal direction, said air chambers each having a lower end, and anchoring air chamber means for preventing upward riding of said therapeutic appliance when said air bladder is inflated and in place on a human body and providing support to the sacroiliac



joints, said anchoring air chamber means comprising at least one anchoring air chamber extending arcuately between said lower ends of said transversely extending air chambers and a longitudinally extending outer edge of said bladder, said anchoring air chamber means extending from said central portion of said air bladder toward said opposite ends of said shell and positioned to lie below the posterior superior iliac spines; and

air conduit means for inflating said air chambers with air.

4,836,195

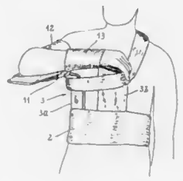
DEVICE FOR ABDUCTION OF UPPER LIMBS

Mohamed Berrebail, Chemin de Beausejour, Le Charlaix, 38240 Meylan, France

Filed Aug. 24, 1987, Ser. No. 89,043

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—83 **19 Claims**



1. A device for abduction of an upper limb which supports both the upper arm and the forearm which supports of a patient comprising:

a belt for surrounding the trunk of the patient;

at least one unitary plate, initially of generally planar form, made of a semi-rigid material capable of being deformed for maintaining an upper limb in a desired position of abduction, each plate having a base portion which is adapted to lie against the trunk of the patient, and an elongated portion adapted to extend along the trunk of the patient in a form-fitting manner and being connected to said base portion substantially perpendicular thereto, each elongated portion being adapted to be deformed so as to form an angle of approximately 90° with respect to the trunk of the patient and to extend outwardly from the trunk of the patient for supporting a portion of the upper limb;

pocket means for supporting said base portion of said at least one plate disposed on an inside surface of said belt.

4,836,196

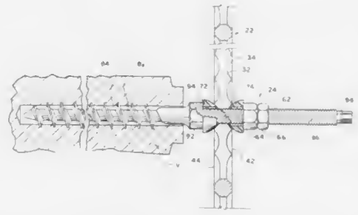
SURGICALLY IMPLANTABLE SPINAL CORRECTION SYSTEM

Joon B. Park; James N. Weinstein, and Vijay K. Goel, all of Iowa City, Iowa, assignors to AcroMed Corporation, Cleveland, Ohio

Filed Jan. 11, 1988, Ser. No. 142,493

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 YM **11 Claims**



1. A surgically implantable apparatus for connecting together a pair of vertebral bodies of the spinal column wherein bone graft is located between the pair of vertebral bodies, said apparatus comprising:

a structure for transmitting load between the pair of vertebral bodies so the bone graft is substantially free from load immediately after surgery;

fastener means for connecting said structure with each one of the pair of vertebral bodies; and

means for increasing the load transmitted through the bone graft as the bone graft heals, said means being locatable between said structure and said fastener means for transmitting load therebetween and for increasing the load transmitted through the bone graft by decreasing the load transmitted between said structure and said fastening means as a function of time.

4,836,197

FOLDED PROTECTIVE HOOD HAVING AN OXYGEN MASK

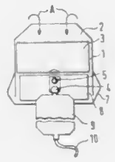
Holmer Röbling, Reinfeld; Frank Schulz, Lübeck, and Wolfgang Marqardt, Lübeck, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Jun. 10, 1988, Ser. No. 205,074

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1987, 3719426

Int. Cl.[4] A62B *17/04, 18/02*

U.S. Cl. 128—201.23 **3 Claims**



1. A folded protective hood to be worn on the head and over the neck of a wearer, the protective hood comprising:

a head portion extending downwardly to a neck region and then terminating in a lower edge defining a hood opening;

said head portion and said neck region conjointly defining a forward portion and a rearward portion with the lower

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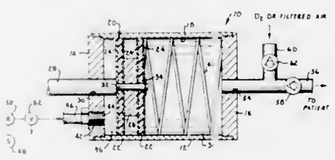
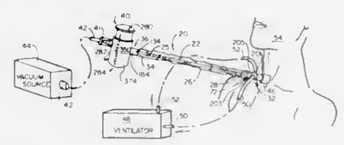
part of said rearward portion being a nape region corresponding to the nape of the neck of the wearer;
a viewing window mounted in said head portion of said forward portion;
an oxygen mask mounted in said forward portion directly beneath said viewing window and including a breathing gas connector for connecting the mask to a supply of breathing gas;
said hood having an inner wall surface disposed in surrounding relationship to said breathing gas connector and said breathing mask;
first holding means formed on said inner wall surface adjacent said connector;
second holding means formed on said nape region;
said head portion starting at said nape region being rolled up toward said connector to define a first roll;
said neck region at said forward portion being rolled up toward said connector to define a second roll;
said first and second rolls each having respective ends folded in toward said connector so as to expose said first holding means; and,
said second holding means being folded over to engage said first holding means thereby holding said protective hood as a folded package with said breathing mask being accessible to the wearer while said hood is in the folded condition.

4,836,198
PORTABLE VENTILATING DEVICE
William M. Gates, Atchison, Kans., assignor to Stein-Gates Medical Equipment, Inc., Atchison, Kans.
Filed Jul. 27, 1987, Ser. No. 78,162
Int. Cl.[4] A62B *7/00*; F04B *17/00*
U.S. Cl. 128—205.18 **14 Claims**



1. A gas powered ventilating device for ventilating a patient, said device comprising:
a substantially enclosed cylinder;
a piston mounted for reciprocation in said cylinder and dividing the cylinder into a pressure chamber disposed within the cylinder on one side of the piston and a spring chamber disposed within the cylinder on the other side of the piston;
a ventilation port in said cylinder for receiving ventilating gas to be delivered to the patient;
a ventilation line extending from said ventilation port for delivering gas therefrom to the patient upon movement of the piston toward the ventilation port to force gas out of the cylinder through said ventilation port and into the ventilation line;
a compression spring located within said spring chamber inside of the cylinder, said spring acting against the piston to urge same in one direction with increasing force upon progressive compression of the spring; and
means for supplying gas pressure to said pressure chamber to effect movement of the piston in a direction opposite said one direction until the spring is compressed sufficiently to apply a force to the piston sufficient to move the piston in said one direction, whereby the piston is reciprocated in the cylinder to force gas through said ventilation line during the part of the stroke carrying the piston toward said ventilation port.

4,836,199
ASPIRATING/VENTILATING APPARATUS AND METHOD
Darrel Palmer, Sandy, Utah, assignor to Ballard Medical Products, Midvale, Utah
Division of Ser. No. 916,341, Oct. 7, 1986, Pat. No. 4,696,296, which is a division of Ser. No. 767,400, Aug. 20, 1985, Pat. No. 4,638,539, which is a division of Ser. No. 633,570, Jul. 23, 1984, Pat. No. 4,569,344. This application May 14, 1987, Ser. No. 49,376
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—207.16 **11 Claims**



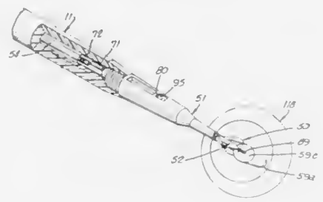
1. A ventilating and aspirating assembly for use in the evacuation of fluid from a patient comprising:
an aspirating catheter tube initially internally disposed within a surrounding flexible collapsible sterility preserving envelope, the catheter tube comprising a proximal end and a distal end;
connector means by which ventilating air is involuntarily delivered and exhausted from the lungs of said patient, said connector means comprising means accommodating the manual insertion and removal of the distal end of the catheter tube into the trachea/bronchi of said patient to facilitate aspirating of undesired respiratory fluids; and
normally closed valve structure means by which aspirating vacuum pressure is selectively manually communicated to the interior of the catheter tube for evacuation of said fluids, said valve structure means being connected to the proximal end of the catheter tube and comprising means functioning to isolate said aspirating vacuum pressure from the atmosphere, said normally closed valve structure means comprising self-biasing means for normally self-biasing and sealing the valve structure means in said normally closed position but accommodating manual displacement of the self-biasing means counter to the self-bias into an open position.

4,836,200
OXYGEN TUBE SUPPORT STRAP
Rodney D. Clark, Egan, S. Dak., assignor to Edward H. Lacey, Trent, S. Dak., a part interest
Filed Feb. 29, 1988, Ser. No. 161,721
Int. Cl.[4] A61M *15/08*; A62B *7/00*
U.S. Cl. 128—207.18 **3 Claims**

1. In combination with a nasal cannula having tubes adapted to be draped over the ears of the user; strap means formed entirely of a pressure-fastening fabric, said strap means extending from above one ear of the user, across the top of the user's head and ending above the other ear of the user, the ends of said strap being adapted to be looped back adjacent said strap means to provide a loop above each ear of the user, means

holding said tubes within the loops formed between said strap means and said ends so as to substantially prevent sliding movement of said tubes through said loops, said means including fastening tabs of double surfaced mating fabric material provided near said ends, the lengths of the portion of said strap means forming each of said loops, being substantially equal to the circumference of one of said tubes so as to hold said tubes between said strap means and said ends, to substantially prevent sliding movement of said tubes through said loops.

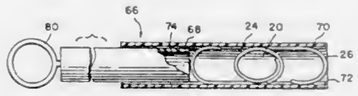
4,836,201
"ENVELOPE" APPARATUS FOR INSERTING INTRA-OCULAR LENS INTO THE EYE
Douglas M. Patton, Irvine, and Matthew F. Duncan, Mission Viejo, both of Calif., assignors to Patton Medical Technologies, Inc., Costa Mesa, Calif.
Filed Mar. 24, 1988, Ser. No. 172,371
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—303 R **7 Claims**



1. Apparatus for inserting a flexible lens into an eye through an incision in the eye comprising
lens holder means for receiving and holding a flexible lens, said holder means including a holder having substantially a flower petal shape when the holder is in an opened condition thereof in which a lens can be placed when the lens is in a normal flat state, the holder being formed of a molded thin tubular section of plastic material having an open tip area with outwardly extending sides thereby forming a holder for the lens, said holder sides being curlable to essentially the form of a closed hollow cylinder with a cylindrical inner surface when in a closed condition to curl a lens therein into a generally confined tubular shape,
sleeve means having a thin cylindrical end for slidably engaging said lens holder means for moving the sides of the holder means together for curling said lens,
barrier means within said holder means and said sleeve means and movable with respect to said sleeve means and said holder means, said barrier means having a distal end for normally engaging the lens when the lens is in the holder of the holder means, and
control means for moving said lens holder means and barrier means with respect to and out of said sleeve means, and for retracting said holder means into said sleeve means, for injecting the lens into an eye.

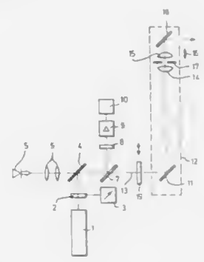
4,836,202
INSTRUMENT FOR MANIPULATING COMPRESSIBLE INTRAOCULAR LENSES
Gary N. Krasner, Irvine, Calif., assignor to CooperVision, Inc., Palo Alto, Calif.
Division of Ser. No. 925,909, Nov. 3, 1986. This application Oct. 23, 1987, Ser. No. 111,581
Int. Cl.[4] A61B *17/00*; A61F *2/16*
U.S. Cl. 128—303 R **9 Claims**

1. An instrument for inserting into an eye a compressible intraocular lens having a soft optic and two loop-haptics connected to the soft optic comprising:
a tubular member having a free distal member end, and defining a channel in which the compressible intraocular lens can slide when the lens is in a lens sliding position, wherein the lens is compressed and the loop haptics are positioned longitudinally from the soft optic along the longitudinal axis of said channel, and



a pushing means for passing underneath the proximal haptic of the lens, when in the lens sliding position, to push the soft optic thereof and for then pushing the lens out of said distal channel opening, when said distal member end is in an eye, and into the eye and, said pushing means is tubular and adapted to fit under the proximal loop haptic of an intraocular lens in the lens sliding position.

4,836,203
DEVICE FOR THERAPEUTICAL IRRADIATION OF ORGANIC TISSUE BY LASER RADIATION
Gerhard Müller, Berlin, and Peter Greve, Essingen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany
PCT No. PCT/EP87/00053, § 371 Date Oct. 1, 1987, § 102(e) Date Oct. 1, 1987, PCT Pub. No. WO87/04632, PCT Pub. Date Aug. 13, 1987
PCT Filed Feb. 3, 1987, Ser. No. 124,931
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1986, 3603156
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—203.1 **6 Claims**



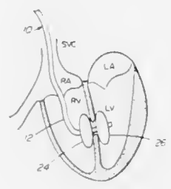
1. Device for therapeutical irradiation of organic tissue with laser radiation, the apparatus comprising:
a HeNe-laser for generating a first laser beam;
an ancillary laser operable in continuous-wave operation in the near infrared range for emitting radiation in the wavelength range of 800 to 870 nm in the form of a second laser beam;
optical means for guiding said first and second beams along a beam path from said lasers to the location to be irradiated;
a housing for accommodating said optical means therein and having an exit opening through which said beams pass out of said housing and toward said location; and,
said optical means including: beam widening means for widening said beams so as to cause the same to have a desired diameter at said location of irradiation; and, mirror means mounted in said beam path for deflecting said beams between said lasers and said exit opening.

4,836,204

METHOD FOR EFFECTING CLOSURE OF A PERFORATION IN THE SEPTUM OF THE HEART

Roderick W. Landymore, R.R. #2, Spruce Court, Three Fathom Harbour, N.S., Canada (B0J 1N0), and Allan E. Marble, 6366 South Street, Halifax, N.S., Canada (B3H 1T9)

Filed Jul. 6, 1987, Ser. No. 69,870
Int. Cl.[4] A61M *25/00*; A6 B *17/04*
U.S. Cl. 128—334 R 8 Claims



1. A method for effecting transvenous closure of acquired ventricular septal perforations comprising:

(A) providing a catheter including:

(a) an elongated, firm, flexible shaft member having a proximal end and a distal end and defining a plurality of lumens commencing adjacent said proximal end;

(b) a first expandable balloon and a second expandable balloon located adjacent said distal end of the shaft member, both of said balloons being constructed, arranged, and positioned relative to one another such that they are inflatable;

(1) from an unexpanded condition wherein they have diameter(s) sufficiently small as to permit passage of the catheter distal end portion through a vein and into a ventricle of the heart and through the perforation in the septum of the heart to position said first and second balloons on opposing sides of the septum;

(2) to an inflated condition wherein said balloons are in snug leak-resistant engagement with the opposing walls of the septum all around said perforation therein;

(c) first and second ones of said lumens communicating with said first and second balloons, respectively, to permit said balloons to be inflated and deflated independently of each other;

(B) introducing a steering catheter via said vein into the right atrium and through the tricuspid valve into the right ventricle of the heart and steering, and passing the steerable catheter through the perforation in the septum, then feeding a guidewire through the steerable catheter and into the left ventricle, with the steerable catheter being thereafter removed while leaving the guidewire in position and then passing the distal end of said first mentioned catheter, with said balloons deflated along said guide wire and through said vein and into the right ventricle of the heart and thence through the perforation in the septum of the heart whereby to position the deflated balloons on opposing sides of the septum,

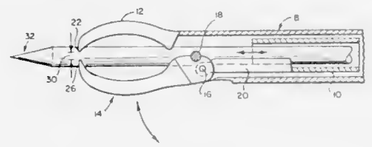
(C) inflating the balloons thereby to cause the balloons to snugly engage the opposing walls of the septum around said defect and wherein that balloon most closely adjacent the distal end of the catheter is inflated first and brought into close engagement with the one wall of the septum following which the other balloon is inflated to bring it into close engagement with the other wall of the septum to prevent leakage through the perforation.

4,836,205

GRASPER-STITCHER DEVICE FOR ARTHROSCOPIC ANTERIOR CRUCIATE LIGAMENT REPAIR

Gene R. Barrett, Mississippi Sports Medecine and Orthopaedic Center, 1080 River Oaks Office Pl., Jackson, Miss. 39208

Filed Mar. 21, 1988, Ser. No. 171,074
Int. Cl.[4] A61B *17/04, 17/06, 17/28*
U.S. Cl. 128—340 5 Claims



1. A grasper-stitcher device adapted to grasp tissue, and permit passage of sutures through the grasped tissue comprising, in combination:

a longitudinal, elongated housing, having a proximate end connected to a handle means and a distal end comprising a jaw assembly means;

an inner hollow tubular member capable of axial motion within the elongated housing assembly, with a proximate end attached to said handle means, and a distal end connected to a proximate end of at least one movable first jaw member of said jaw assembly means at the distal end of the tubular housing;

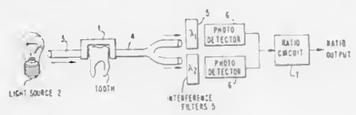
said jaw assembly means further comprising said movable first jaw member laterally opposed from a fixed second jaw member, wherein each jaw member further comprises a pair of arcuate finger-like elements that are laterally spaced and parallel to a longitudinal axis of the housing, distal ends of each jaw member laterally are spaced apart when said first jaw member is in a relatively closed position, and an axially open passage is provided between an entrance at the proximate end of the elongated housing through the hollow inner tubular member and out through the arcuate jaw members at the distal end of the housing, even when said jaw members are in a relatively closed position, whereby a long surgical needle may be inserted into the proximate end of the housing, pass through the hollow inner tubular member and exit through the jaw assembly means and suture a tissue grasped within said jaw assembly.

4,836,206

METHOD AND DEVICE FOR DETERMINING VIABILITY OF INTACT TEETH

G. Maret Maxwell, Wheaton, and Richard L. Webber, Myersville, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Feb. 25, 1987, Ser. No. 19,185
Int. Cl.[4] A61B *5/00*
U.S. Cl. 128—633 42 Claims



1. A device for testing the viability of a patient's teeth, comprising

mouth insertion means for being inserted into the mouth of the patient, for introducing into each selected tooth light of at least two different wavelengths and for receiving respective output light scattered from within said tooth of said at least two different wavelengths,

means for determining a value indicating the relative amounts of the received output light of said at least two different wavelengths,

said mouth insertion means including fixation means for being successively located in the vicinity of each of a plurality of selected teeth of the patient the viability of which is to be assessed, said fixation means including a first respective part from which said light is introduced into each respective selected tooth and a second respective part for receiving the respective output light scattered from within said tooth,

an external source for said input light,

a flexible input pipe connected at a first end to said first respective part of said fixation means and to said external source, so that said input light is introduced from said first respective part into each respective selected tooth in the vicinity of which said fixation means is successively located for assessing the tooth,

a flexible output light pipe connected at a first end to said second respective part of said fixation means for receiving said output light scattered from within the respective tooth, and

said means for determining including a ratio circuit providing an output corresponding to a ratio of the amounts of light at said two different wavelengths in said output light scattered by each said selected tooth and received by said flexible output light pipe,

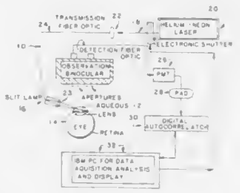
wherein said first and second parts of said mouth insertion means with said ends of said flexible input and output light pipes are provided so that said received output light essentially excludes any light from said first end of said flexible input light pipe and not scattered from within the tooth.

4,836,207

METHOD AND APPARATUS TO MONITOR CHOLESTEROL LEVELS WITH PHOTON CORRELATION SPECTROSCOPY

Sven-Erik Bursell, Newton, and Juan R. Serur, Newton Center, both of Mass., assignors to The Beth Israel Hospital Association, Boston, Mass.

Filed Sep. 9, 1987, Ser. No. 95,052
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—633 2 Claims



1. Apparatus for monitoring serum cholesterol levels in a non-invasive manner comprising:

(a) a slit lamp biomicroscope including an illumination optical system comprising a laser beam, an attenuator for reducing the power of said laser beam, and a microscope objective lens for focusing said laser beam onto an optical fiber for delivering said laser beam to said slit lamp biomicroscope;

(b) illumination optics mounted on said slit lamp biomicroscope such that light from said laser beam is backscattered from a focal point in the aqueous of a patient's eye and collected through a collecting fiber optic at an approximately 130% angle with said laser beam;

(c) a photon counting photomultiplier (PMT) for detecting said backscattered light;

(d) a preamplifier discriminator for converting said backscattered light from said PMT to a digital photopulse output;

(e) a digital autocorrelator for measuring temporal time dependent fluctuations and scattered light intensity in said digital photopulse output;

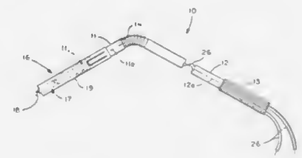
(f) a means for normalizing scattered light intensity from the aqueous with respect to scattered intensity measured from the lens of a patient's eye and means for correlating said normalized scattered light intensity measurement to a serum cholesterol level wherein a patient's serum cholesterol level is measured b correlating a normalized scattered light intensity from the aqueous of the patient's eye to a serum cholesterol level.

4,836,208

ELECTRODE ASSEMBLY FOR SENSING HEART ACTIVITY

Paul Ulbrich, San Ramon, Calif., assignor to American Home Products Corporation (Del.), New York, N.Y.

Continuation of Ser. No. 892,600, Aug. 1, 1986, Pat. No. 4,686,996, Continuation-in-part of Ser. No. 812,967, Dec. 24, 1985, abandoned. This application Aug. 14, 1987, Ser. No. 85,571
The portion of the term of this patent subsequent to Sep. 8, 2004, has been disclaimed.
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—642 9 Claims



1. A fetal electrode product comprising:

an electrode assembly having a spiral electrode extending from its forward end;

a guide tube having a forward end and including means for releasably engaging said electrode assembly for rotating said spiral electrode, said guide tube having at least a flexible, pleated, intermediate section so that the guide tube can conform to the contour of the birth canal of a woman in labor, said flexible, pleated, intermediate section functioning as a universal joint so that said guide tube can be rotated within the birth canal to attach the spiral electrode to the fetus;

a protective sleeve covering said spiral electrode and the forward end of said guide tube, the length of the sleeve relative to said guide tube being short enough that the sleeve does not affect the ability of the guide tube to conform to the curve of the birth canal.

4,836,209

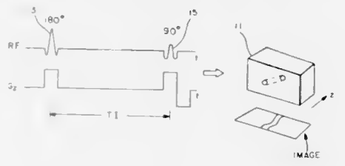
NMR IMAGING OF MOVING MATERIAL USING VARIABLE SPATIALLY SELECTED EXCITATION

Dwight G. Nishimura, Palo Alto, Calif., assignor to Stanford University, Stanford, Calif.

Continuation of Ser. No. 894,319, Aug. 7, 1986, abandoned. This application May 11, 1988, Ser. No. 193,212
Int. Cl.[4] A61B *5/05*
U.S. Cl. 128—653 10 Claims

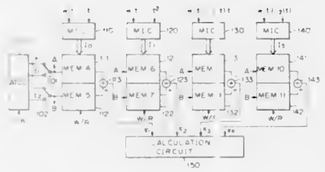
1. A method of projection imaging moving material in a three-dimensional slab through a body using magnetic resonance techiniques comprising the steps of

(a) placing said body in a magnetic field including a first magnetic gradient (z) for slab selection,
(b) applying a first rf pulse to said body at a frequency band and of sufficient strength to flip by a first angle nuclear spins limited essentially to said slab,
(c) allowing moving material outside of said slab to flow into said slab,
(d) applying at least a second rf pulse to said body at a frequency band and of sufficient strength to flip nuclear spins in said slab by a second angle suitable for generating a signal, thereby flipping nuclear spins of moving material that moves into said slab during step c,
(e) obtaining first projection image data in an X-Z plane from said nuclesr spins flipped by said second rf pulse,



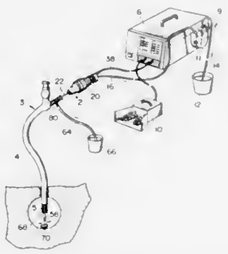
(f) applying a third rf pulse to said body at a frequency band and of sufficient strength to flip nuclear spins in said body, including said slab but not limited to said slab by said first angle,
(g) repeating step c,
(h) repeating step d with a fourth rf pulse identical to said second pulse,
(i) obtaining second projection image data in said X-Z plane from said nuclear spins flipped by said fourth rf pulse,
(j) subtracting said first projection image data from said second projection image data to obtain a third image data of moving material moved to said slab, and
(k) imaging said X-Z plane with said third image data.

4,836,210
ULTRASONIC ANALYZER
Akira Shiba; Isamu Yamada, and Keiichi Murakami, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Jun. 10, 1988, Ser. No. 204,908
Claims priority, application Japan, Jun. 15, 1987, 62-148406; Jun. 15, 1987, 62-148407; Jun. 19, 1987, 62-152923
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660.06 17 Claims



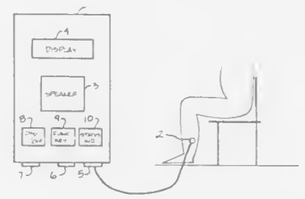
1. An ultrasonic analyzer used in an ultrasonic diagnosis instrument capable of launching signals into and receiving time-series signals reflected from a media, comprising:
analysis means for receiving a time signal and an analysis selection signal;
first means for determining a start point and an end point of an analysis interval, to be analyzed based on the analysis selection signal and the time signal, of the time-series signal;
second means for generating a plurality of integration values based on multiplication signals, including means for providing said multiplication signals by multiplying said analysis selection signal by at least one of said time signal, a square of said time signal, a product of said time signal an said time-series signal, and said time-series signal;
third means for storing each of said integration values in accordance with said time signal; and
fourth means for calculating a slope of a regression curve, including means for determining differences between said integration values based on said start point and said end point, and said slope being based on said differences.

4,836,211
ULTRASONIC TREATMENT APPARATUS FOR PERFORMING MEDICAL TREATMENT BY USE OF ULTRASONIC VIBRATIONS
Naomi Sekino, 3-10-1, Motoyokoyama-cho, Hachioji-shi, Tokyo, and Yoshio Tashiro, 4-23-3, Koyasu-machi, Hachioji-shi, Tokyo, both of Japan
Filed Sep. 11, 1987, Ser. No. 95,778
Claims priority, application Japan, Sep. 17, 1986, 61-218453; Oct. 30, 1986, 61-258854
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—662.05 5 Claims



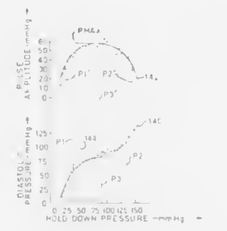
1. A medical treatment apparatus for use in combination with an endoscope including an insertion portion having a channel, said apparatus comprising:
ultrasonic vibration generation means including an oscillator having means for defining a first through-hole;
liquid supply means in communication with one end of the first through-hole;
a horn having means for defining a second through-hole, said second through-hole being in communication with the other end of the first through-hole, said horn being coupled to, and adapted to amplify vibration generated by, said ultrasonic vibration generation means;
a transmission member connected to said horn for transmitting the amplified vibration, said transmission member having means defining an internal hole extending axially therethrough and in communication with said second through-hole for accommodating liquid flow from the liquid supply means in an outward direction;
a tubular member surrounding said transmission member, thus defining a passage therebetween, and said transmission member protruding from a distal end of said tubular member; and
coupling means for communicating said passage with the second through-hole for supplying liquid from the liquid supply means to flow through said passage in said outward direction.

4,836,212
APPARATUS FOR THE NONINVASIVE DETERMINATION AND ACOUSTICAL REPRESENTATION OF THE DYNAMIC BEHAVIOR OF PERIPHERAL VENOUS HEMODYNAMIC
Hans J. Schmitt, and Vladimir Blazek, both of Aachen, Fed. Rep. of Germany, assignors to Fa Nattermann Arneimittel GmbH, Cologne, Fed. Rep. of Germany
Filed Mar. 17, 1987, Ser. No. 26,606
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1986, 3609073
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—667 6 Claims



1. A measuring apparatus for the noninvasive determination of peripheral outflow and flow disturbances in the extremities of human beings, having at least one light transmitter and one light receiver as well as an evaluation and read-out unit to ascertain the temporal course of the outflow and inflow of blood in the veins by means of measuring the change in light reflection, whereby said evaluation and read-out circuit is provided with a digitally controlled tone generator and an electroacoustic transducer for emitting a first signal to indicate that the apparatus is ready to measure, a second succession of tones, the frequency of which follows the changes in the intensity of the light reflection until termination of blood outflow or inflow, and a third signal, which indicates the end of the measurement.

4,836,213
PRESSURE CONTROL SYSTEM FOR CONTINUOUS BLOOD PRESSURE MONITOR TRANSDUCER
Dennis J. Wenzel; Dean C. Winter, and Kevin S. Honeyager, all of San Antonio, Tex., assignors to Nippon Colin Co., Ltd., Komaki, Japan
Filed Feb. 25, 1988, Ser. No. 160,134
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—672 5 Claims

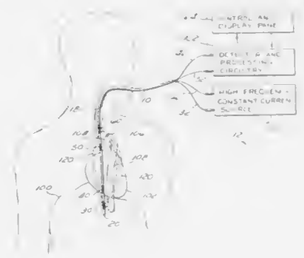


1. A method for determining the optimum hold-down pressure for use in a blood pressure measuring system comprising steps of
applying a minimum hold-down pressure to an external pressure transducer that includes a pressure sensitive element and obtaining a continuous measurement of pulse pressure in an underlying artery,
obtaining a set of diastolic and systolic pressure measurements corresponding to a single hold-down pressure as the hold-down pressure is incremented;
computing a set of pulse amplitudes corresponding to each hold-down pressure by subtracting the corresponding diastolic from the corresponding systolic pressure;
fitting a first polynomial to the set of pulse amplitudes versus hold-down pressure, said polynomial describing the pulse amplitude as a function of the hold-down pressure designated herein as P(h);
fitting a second polynomial to the set of diastolic pressures versus hold-down pressures, said second polynomial describing the diastolic pressure as a function of the hold-down pressure and designated herein as D(h);
taking a first derivative with respect to the hold-down pressure of the polynomial D(h), designated herein as D (h);
computing, for each discrete hold-down pressure, a function designated herein as G(h), wherein

$$G(h) = \frac{P(h)}{D'(h) + 1}$$

selecting as the optimum hold-down pressure that pressure for which the computed G(h) is a maximum.

4,836,214
ESOPHAGEAL ELECTRODE ARRAY FOR ELECTRICAL BIOIMPEDANCE MEASUREMENT
Bohumir Sramek, Irvine, Calif., assignor to Bomed Medical Manufacturing, Ltd., Irvine, Calif.
Filed Dec. 1, 1986, Ser. No. 936,324
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—693 10 Claims



1. An electrode array for determining the cardiac output of a patient, said electrode array being insertable into the esophagus of the patient so that bioimpedance measurements relating to cardiac output can be made when said electrode array is inserted into the esophagus of a patient, said electrode array comprising:
flexible tube having a first end and second end, and having an outside surface, said outside surface having an outside diameter selected so that said flexible tube is easily insertable into esophagus of a patient;
at least first, second, third and fourth circumferential electrodes positioned on said outside surface of said tube and spaced apart from each other along the length of said tube, each said electrode having an outer surface, each said outer surface having an outside diameter at least as large as large as the inside diameter of said esophagus;
said second electrode and said third electrode positioned along the length of said flexible tube between said first electrode and said fourth electrode, said second electrode

separated from said third electrode by a distance of at least a multiple of said outside diameter of said tube; and

first, second, third, and fourth wires connected to said first, second, third and fourth electrodes, respectively, said wires extending out of said second end of said flexible tube.

4,836,215

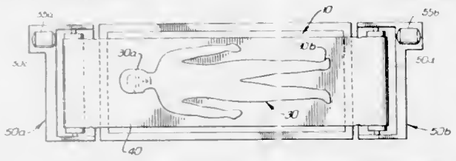
METHOD FOR PREPARING A BALLISTOCARDIOGRAM

Arnold St. J. Lee, 2008 Cotner Ave., Los Angeles, Calif. 90025

Continuation of Ser. No. 73,640, Jul. 15 1987, abandoned, which is a division of Ser. No. 786,746, Oct. 11, 1985, Pat. No. 4,681,098. This application Oct. 11, 1988, Ser. No. 256,116

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—714 **7 Claims**



1. A method for preparing a ballistocardiogram of a human subject comprising the steps of:

placing the human subject in a supine position on a substantially rigid body mold which is mounted for motion in response to the heartbeat of the subject, the body mold having an impression intimately matching the entire length of the dorsal portion of the subject's body and keeping the subject's body stationary relative to the mold and with respect to a given direction;

connecting a motion transducer to the body mold for permitting the transducer to respond to motion of the mold in the given direction; and

recording the output from the motion transducer over a period of time.

4,836,216

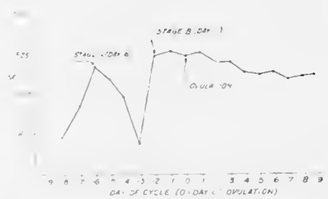
METHOD FOR PREDICTING OPTIMUM TIME FOR INSEMINATION

Ranjit S. Fernando, and Jennine Regas, both of Aurora, Colo., assignors to Zetek, Inc., Aurora, Colo.

Continuation-in-part of Ser. No. 43,107, Apr. 27, 1987, which is a division of Ser. No. 713,866, Mar. 20, 1985, Pat. No. 4,685,471. This application Nov. 3, 1987, Ser. No. 116,624

Int. Cl.[4] A61B *5/04*

U.S. Cl. 128—734 **9 Claims**



1. A method for determining the optimum time for insemination, comprising monitoring the SR-VR cycle of a subject daily, and ascertaining the optimum time for insemination as the day on which a VR rise is observed when said day of VR rise is within six days following the day of an SR peak.

4,836,217

HYPERSENSITIVITY TEST MEANS

Torkel I. Fischer, Rosenvägen 57, S-752 52 Uppsala, Sweden

PCT No. PCT/SE85/00361, § 371 Date Apr. 11, 1986, § 102(e) Date Apr. 11, 1986, PCT Pub. No. WO86/01994, PCT Pub. Date Apr. 10, 1986

PCT Filed Sep. 23, 1985, Ser. No. 871,420

Claims priority, application Sweden, Oct. 1, 1984, 8404895

Int. Cl.[4] A61B *15/00*

U.S. Cl. 128—743 **12 Claims**

1. In a test strip having at least one patch thereon and intended for use in occlusive epicutaneous testing in order to detect contact allergy, the improvement comprising that a dry film is adhered to one surface of said patch, said film containing as the film-forming substance a film-forming polymer which has incorporated therein a contact allergy test substance and said film-forming polymer being capable of adsorbing moisture from the tested skin area when the test strip is in use.

4,836,218

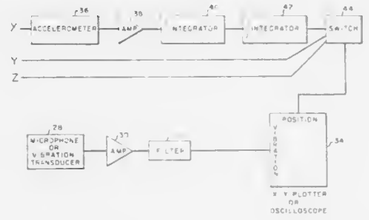
METHOD AND APPARATUS FOR THE ACOUSTIC DETECTION AND ANALYSIS OF JOINT DISORDERS

Thomas Gay, West Hartford, Conn.; Charles N. Bertolami, Saugus, Mass., and David J. Solonche, West Hartford, Conn., assignors to Arthrotek, Inc., Hartford, Conn.

Continuation-in-part of Ser. No. 598,089, Apr. 9, 1984, abandoned, and a continuation-in-part of Ser. No. 598,265, Apr. 9, 1984, abandoned. This application Mar. 4, 1988, Ser. No. 164,358

Int. Cl.[4] A61B *7/00*

U.S. Cl. 128—773 **48 Claims**



1. A procedure for diagnosing temporomandibular joint (TMJ) disorders, including the steps of:

detecting in timed sequence sound patterns propagated at the temporomandibular joint and defined as TMJ propagated sound patterns;

detecting in corresponding timed sequence time varying mandibular bone displacement in three dimensions with respect to the detected TMJ propagated sound patterns; and

correlating the TMJ propagated sound patterns and the occurrence and duration thereof to the duration and displacement of the corresponding mandibular bone movement whereby joint disorders are diagnosed.

4,836,219

ELECTRONIC SLEEP MONITOR HEADGEAR

J. Allan Hobson, Brookline; Adam Mamelak, Boston; Rita Helfand, Cambridge, all of Mass., and Peretz Lavie, Haifa, Israel, assignors to President & Fellows of Harvard College, Cambridge, Mass.

Filed Jul. 8, 1987, Ser. No. 70,988

Int. Cl.[4] A61B *5/10*

U.S. Cl. 128—782 **20 Claims**

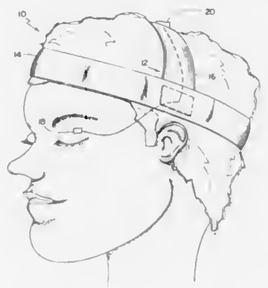
1. Apparatus for reporting an individual's sleep state comprising:

(a) means responsive to the individual's eye movement generating a first analog signal;

(b) means responsive to the first analog signal for producing a first output signal having a first value during substantial eye movement and a second value in the absence of substantial eye movement;

(c) means responsive to said first output signal value for designating a time period of predetermined duration as an eye-movement period or a non-eye-movement period;

(d) means responsive to body movements of said individual for generating a second analog signal;



(e) means responsive to said second analog signal for producing a second output signal having a first value during substantial body movement and a second value in the absence of substantial body movement;

(f) means responsive to said second output signal for designating a time period of predetermined duration as a body-movement period or a non-body-movement period; and

(g) means responsive both to the eye-movement period designation and the body-movement period designation for producing an electronic signal representative of sleep state.

4,836,220

TOBACCO LEAF-STRIPPING MACHINE

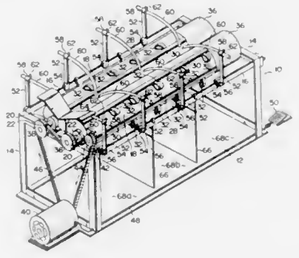
Yasubiko Miyake, Oyama, and Katsuyuki Manzawa, Tochigi, both of Japan, assignors to Japan Tobacco, Inc., Tokyo, Japan

Filed Mar. 26, 1987, Ser. No. 30,737

Claims priority, application Japan, Sep. 24, 1986, 61-223678

Int. Cl.[4] A01O *45/16*

U.S. Cl. 460—130 **8 Claims**



1. A leaf-stripping machine for stripping tobacco leaves off a stalk of a tobacco plant, comprising:

a pair of leaf-stripping rollers having substantially the same length as the stalk of the tobacco plant, the rollers extending longitudinally parallel to each other, the rollers being supported in such a manner that they are rotatable in rolling contact with each other;

a holding frame which is so located above the paired leaf-stripping rollers as to be spaced therefrom by a predetermined distance, the holding frame allowing the tobacco stalk to be held in parallel to the leaf-stripping rollers, and permitting the tobacco leaves on the stalk to hang down to be stripped off by the leaf-stripping rollers;

drive means for rotating the paired leaf-stripping rollers in opposite directions, so as to draw the tobacco leaves therebetween, whereby the tobacco laves are drawn in further, by the rotation of the leaf-stripping rollers and are finally stripped off the stalk; and

a plurality of holding rods, on said holding frame, arranged at predetermined intervals in the longitudinal direction of the leaf-stripping rollers, and which extend perpendicular to the longitudinal direction.

4,836,221

DEVICE FOR CONTROLLING CONTENTS OF TOBACCO ON CIGARETTE MANUFACTURING MACHINE

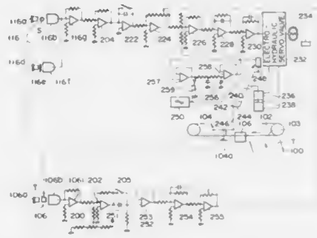
Yutaka Okumoto, Musashino, Japan, assignor to Japan Tobacco Inc., Tokyo, Japan

Filed Oct. 30, 1987, Ser. No. 116,016

Claims priority, application Japan, Oct. 31, 1986, 61-258185

Int. Cl.[4] A24C *5/14*

U.S. Cl. 131—84.1 **7 Claims**



1. A system for controlling content of tobacco on a cigarette manufacturing machine, comprising:

conveying means for attracting and conveying shredded tobacco thereon;

trimming means for removing an excessive amount of shredded tobacco conveyed by said conveying means, to regulate an amount of shredded tobacco;

tobacco wrapping means for transferring the tobacco trimmed by said trimming means onto continuous tobacco roll paper and for wrapping the trimmed tobacco in the tobacco roll paper to make a stick-like cigarette;

first radiometric density detecting means for continuously detecting a density of the shredded tobacco by means of radiation rays, before the tobacco enters said trimming means, to generate a first detection signal representing a difference between a measured density of shredded tobacco and a first reference density;

second radiometric density detecting means for detecting a density of the stick-like cigarettes continuously formed by said tobacco wrapping means, to generate a second detection signal representing a difference between a measured density of the stick-like cigarette and a second reference density;

a feedforward open loop control means connected to said first radiometric density detecting means, for generating a feedforward control signal corresponding to an instantaneous change of the first detection signal;

a feedback loop control means connected to said second radiometric density detecting means, for generating a

feedback control signal corresponding to an average change of the second detection signal; and

driving means for driving said trimming means in response to said feedforward control signal and said feedback control signal.

4,836,222

PROCESS FOR TREATING TOBACCO

Larry J. Livingston, 4768 Hermitage Rd., Virginia Beach, Va. 23455

Filed Jul. 6, 1988, Ser. No. 215,522
Int. Cl.[4] A24B *15/30*
U.S. Cl. 131—310 44 Claims

1. A process for coloring tobacco, comprising the steps of:

placing the tobacco within an enclosure containing air;

exposing the tobacco to ethylene gas in the concentration range of approximately 25–75 parts per million; and

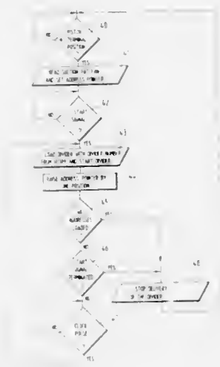
continuously exchanging the air within said enclosure approximately 10–110 times per 24-hour period for a time sufficient to produce the desirable color.

4,836,223

CIGARETTE SMOKING DEVICE

Heiner Burghart, Holm, and Hans Beincke, Hamburg, both of Fed. Rep. of Germany, assignors to Heinrich Burghart Elektro- und Feinmechanik GmbH, Fed. Rep. of Germany

Filed Oct. 17, 1986, Ser. No. 927,587
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1985, 3537287
Int. Cl.[4] A24C *5/60*
U.S. Cl. 131—329 14 Claims



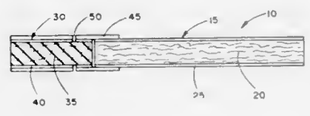
1. A cigarette smoking device comprising a smoking cylinder with an inlet and an outlet valve, means including a smoke separator for connecting a cigarette to be smoked to an inlet side of the cylinder, a piston in the smoking cylinder, a linear stepping electric motor and a post-connected transmission for imparting reciprocating movement to the piston and an electrical control system for generating a variable feed voltage for the electric motor, wherein the control system generates a frequency-modulated series of pulses for its suction stage, the total number of pulses, the mean frequency and the modulation pattern being adjustable to allow adjustment of the suction volume, of the suction period and of the suction pattern.

4,836,224

CIGARETTE

Jerry W. Lawson, Clemmons; Bruce R. Bullings, and Thomas A. Perfetti, both of Winston-Salem, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation-in-part of Ser. No. 12,922, Feb. 10, 1987. This application Dec. 24, 1987, Ser. No. 137,987
Int. Cl.[4] A24D *1/00, 1/02*
U.S. Cl. 131—336 36 Claims



1. A cigarette having smokable material contained in a circumscribing outer wrapping material, the cigarette having (i) a nicotine content greater than about 2 percent, based on the dry weight of the smokable material, and (ii) levulinic acid in dissociated and/or nondissociated form incorporated therein in an amount greater than about 1 percent, based on the dry weight of the smokable material.

4,836,225

SHREDDED TOBACCO LEAF PELLET AND PRODUCTION PROCESS THEREOF

Kunio Sudoh, Tokyo, Japan, assignor to Kowa Display Co., Inc., Tokyo, Japan

Filed Aug. 3, 1987, Ser. No. 80,919
Claims priority, application Japan, Dec. 11, 1986, 61-293381; Mar. 25, 1987, 62-069097
Int. Cl.[4] A24B *13/00, 15/18, 15/28*
U.S. Cl. 131—352 3 Claims

1. An air permeable shredded tobacco leaf pellet for inhaling without lighting, comprising:

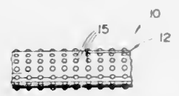
tobacco leaf shreds bound together with a resin binder selected from the group consisting of starch, casein, gelatin, gum arabic, polyvinyl alcohol, polyacrylamide, polyvinylpyrrolidone, a polyacrylic acid, a water-soluble salt thereof, polyvinyl acetate, vinyl acetate-acrylic ester polymer, a polyacrylic ester, an epoxy resin, a phenol resin, a melamine resin, an alkyd resin, natural rubber, synthetic rubber and polyurethane rubber, and impregnated with nicotine.

4,836,226

ENDLESS ARTICLE FOR CLEANING TEETH

Ronald G. Wolak, 221 Parkland, Rochester Hills, Mich. 48063

Filed Nov. 20, 1987, Ser. No. 123,558
Int. Cl.[4] A61C *15/00*
U.S. Cl. 132—321 18 Claims



1. An endless article (**10**) for cleaning between teeth, comprising: an endless segment (**12**) of an elastic material and having a generally uniform cross section; said segment (**12**) having a directionally effective abrasive cleaning surface (**14**) including dimples forming rows (**15**) situated essentially perpendicular to the circumference of the article (**10**) to allow the article to be easily inserted between the teeth, said dimples also forming rows situated parallel to the circumference of the article to provide abrasion for cleaning as a section of the article is moved parallel to its circumference; said article (**10**) being graspable by a pair of hands; said article (**10**) being stretchable between a relaxed position and a stretched position for positioning a section thereof between the teeth; said cross section being proportionately reducible in area as the article (**10**) is stretched for facilitating positioning of the segment between the teeth; said cross section also being returnable to the relaxed position size as the article (**10**) is relaxed, said article (**10**) being movable between the teeth for cleaning proximal areas and also being repositionable in the hands to allow an unused section to be used for cleaning after a used section of the directionally effective abrasive cleaning surface becomes soiled or worn out.

4,836,227

ORAL HYGIENE DEVICE

Norman Charatan, 22 Varady Dr., Fords, N.J. 08863

Filed Jul. 30, 1987, Ser. No. 79,694
Int. Cl.[4] A61C *15/04*
U.S. Cl. 132—324 2 Claims

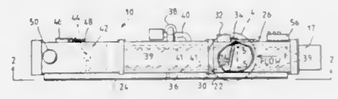
1. An oral hygiene device comprising a unitary housing, said housing defining a cavity therewithin, means to separate said housing into at least two portion, a flexible elongatable material, said material being capable of being permanently elongated once said material is stretched, said material being disposed within said cavity when un-elongated, said material having a pair of ends, one said pair of ends being secured within said cavity to one of said at least two portions of said housing, the other of said pair of ends being secured within said cavity to another of said at least two portions of said housing, said material being elongatable so as to have an exposed length equal to the spaced apart distance separating each said pair of ends when housing is separated into said at least two portions and disposed spaced apart from one another, said housing having two openings therein, said two openings having cross-sectional dimensions substantially smaller than the cross-sectional dimensions of the interior portions of each of said housing portions, said two openings being disposed substantially at the location formed in each of said pair of ends adjacent and opposite each other when said housing is separated into said spaced apart relationship, said flexible elongatable material passing through both said two openings when said housing is in unitary form and when said housing is separated into said at least two portions, a dentifrice-like material residing within said cavity, said dentifrice-like material covering said elongatable material before said housing is separated into said at least two portions, means to dispense said dentifrice-like material outwardly from said cavity when said housing is separated into said at least two portions.

4,836,228

CONTAINER CLEANING APPARATUS

Richard F. Julius, Silver Spring, Md., assignor to S. J. Industries, Inc., Alexandria, Va.

Filed Dec. 5, 1986, Ser. No. 938,436
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—72 2 Claims



1. Container cleaning apparatus for cleaning containers having a long axis comprising means for transporting said containers along a predetermined path in the direction of said long axis, spraying means associated with said container transporting means for subjecting said containers to a fluid spray during at least a portion of the time said containers are being transported by said transporting means comprising means for subjecting said containers to a high pressure fluid spray and means for subjecting said containers to a lower pressure fluid spary, said high pressure fluid spray means comprising a manifold, a first series of nozzles located on said manifold for emitting a substantially flat fluid spary with the flat fluid spray lying substantially in a plane to exert a force against said container being cleaned that pushes said container in the direction said container is moving and a second series of nozzles located on said manifold for emitting a substantially flat fluid spray with the flat fluid spray lying substantially in a plane to exert a rearward force against said container being cleaned with the nozzles of said first and second series of nozzles being located in order that the planes of the substantially flat fluid sprays are separated and substantially parallel and form angular relationships of less then ninety degrees with the long axis of said container transporting means with the first series of nozzles located to cause the fluid from the nozzles to push against the container being cleaned prior to the fluid from the second series of nozzles whereby said first series of nozzles causes a pushing force to be exerted on said container by fluid in the direction said container is moving prior to said rearward fluid force being applied from said second series of nozzles.

4,836,229

DISHWASHING APPARATUS INCLUDING A FLIP-TOP SOLID DETERGENT DISPENSER

Haresh C. Lakhan, Eagan, and Lawrence W. Switala, Minneapolis, both of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Continuation of Ser. No. 44,434, Apr. 30, 1987, abandoned. This application Dec. 22, 1988, Ser. No. 290,885
Int. Cl.[4] A47L *15/44*
U.S. Cl. 134—93 4 Claims

1. A dishwashing apparatus comprising:

(a) a first water access means having a valve and a vacuum breaker, said water access means leading into;

(b) a main container, said main container having a means to

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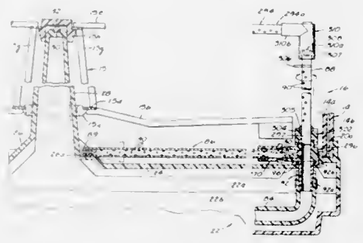
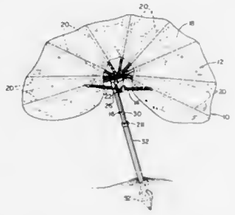
access said main container in order to insert and remove dishware, and a sump with a bottom portion, said sump situated in a bottom portion of said main container wherein water and debris can collect in said sump;
(c) a first nozzle positioned within said main container in a manner such that pressurized water directed through said first nozzle would serve to contact dishware contained in said main container;
(d) a self cleaning first filter wherein said self cleaning first filter comprises a perforated cylindrical filter encased in a cylindrical metal casing having an open top portion and an open bottom portion wherein said top portion of said self cleaning first filter is attached top said bottom portion of said sump in a manner which would allow the flow of water and debris from said sump into said first filter by gravity and would allow the flow of water across said perforated cylindrical filter when access from said bottom portion of said first filter is closed by means of a drain valve;
(e) a drain valve attached to the bottom portion of said self cleaning first filter wherein said drain valve when opened would allow the downward flow of water and debris out through the bottom portion of said self cleaning first filter in order to empty said dishwasher apparatus of all water and debris contained therein;
(f) a main pump connected to said self cleaning first filter by;
(g) a second water access means wherein water which has collected in said sump can be pumped by said main pump through said perforated cylindrical filter and through said second water access means;
(h) a third water access means leading from said main pump to said first nozzle and also to a second self cleaning filter, wherein said second self cleaning filter is designed such that water and debris can flow by gravity through said third water access means into said main container when said main pump is deactivated;
(d) a fourth water access means having a valve and extending from said second self cleaning filter and leading to a second nozzle positioned in a solid additive container; said second nozzle positioned such that pressurized water directed through said second nozzle would spray against a solid additive contained in said solid additive container in order to form an additive solution; and
(j) a fifth water access means leading from said solid additive container into said main container in order to allow the flow of additive solution into said main container.

4,836,230
NON-ELECTRIC DISHWASHER
Janet Elliott, El Toro, Calif., assignor to Hart Industries, Inc., Laguna Hills, Calif.
Filed Dec. 28, 1987, Ser. No. 138,817
Int. Cl.[4] B08B 3/02; A47L 15/32
U.S. Cl. 134—138 **5 Claims**



1. A dishwasher adapted to be interconnected with a source of water under pressure, comprising:
(a) a base;
(b) a closure housing carried by said base, said closure housing having interconnected top and side walls;
(c) a rack having upper and lower peripheral portions interconnected upstanding portions adapted to support articles to be washed;
(d) rack suspension means for supporting said rack for rotation within said housing including a rigid generally vertically extending column;
(e) jeet means interconnected with the source of water under pressure for directing jets of water in the direction of said rack to impart rotational movement thereto, said jet means comprising:
(1) a spray jet means for urging rotation of said rack, said spray jet means comprising a first conduit extending beneath said rack, a second generally vertically extending conduit interconnected with said first conduit and disposed proximate the periphery of said rack and a third conduit connected to said second conduit, said second conduit being rotatable about the vertical axis thereof to control the speed of rotation of said rack and said third conduit being fixedly positioned relative to said closure housing so as to extend over said vertically extending column;
(2) a collimated jet means for emitting a collimated stream of water in the direction of said rack; and
(3) control means comprising:
(i) valve means for regulating the flow of water from the source of water under pressure to said jet means; and
(ii) diverter means for selectively diverting the flow of water between said collimated jet means and said spray jet means, said diverter means being adjustable to direct said collimated stream of water in a first direction urging counter lockwise rotation of said rack and in a second direction urging clockwise rotation of said rack and being further adjustable to divert all of the flow of water to said spray jet means.

4,836,231
BEACH SHADE
William R. Peterson, 20 Barclay Dr., Turnersville, N.J. 08102
Filed Mar. 25, 1988, Ser. No. 173,258
Int. Cl.[4] E04H 15/28
U.S. Cl. 135—98 **3 Claims**



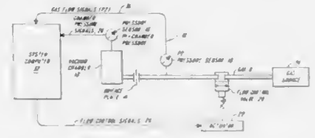
1. A beach shade comprising a mounting pole, a user selective deployable and callapsible planar fan-like structure supported on said pole, said fan-like structure supported on said pole by locking means, said locking means being user selective angle adjusting and locking and unlocking, said fan-like structure comprising a plurality of ribs, each of said ribs being pivoted at one end thereof to said locking means, said ribs being covered with a flexible sheet, said locking means comprising a pole cap on one end of said pole and a fan base at said pivoted end of said ribs, said pole cap and said fan base having mutually user selectively engageable means, said engageable means comprising an inner serrated disk on said pole cap and an outer serrated disk on said fan base, and a tightenable angle lock bolt being provided to selectively engage and disengage said disks, said fan base including a fork, said pivoted ends of said ribs being retained within said fork by a ribbed spread lock bolt passing through said fork and said ribs, and a stop lug extending from said fan base and intercepting said pole cap, and flexible retaining bands extending from each side of said pole to an adjacent end of a deployed said fan-like structure to add additional stability to said deployed beach shade.

4,836,232
FOLD-UP UMBRELLA
R. James De Rosa, and Gary C. Brestle, both of 20822 Sugar Loaf La., Boca Raton, Fla. 33428
Filed Jul. 21, 1988, Ser. No. 222,713
Int. Cl.[4] E04H 15/26, 15/48, 15/02
U.S. Cl. 135—99 **10 Claims**

1. A fold-up umbrella comprising
a flexible cover having a plurality of panels arranged in a generally circular pattern,
a plurality of ribs having mounting ends and opposite ends carrying said plurality of panels,
a mounting block centrally disposed relative to and being attached to the mounting ends of said ribs,
a central support tube having pivot means at one end secured to said mounting block for rotating said mounting block from a fold-up position to a selected operating position,
pivotal means on said mounting block securing the mounting ends of said ribs, and
means for adjusting said pivotal means whereby said ribs and panels may be spread in the generally circular pattern.

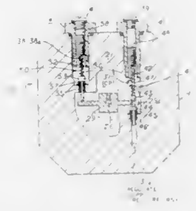
4,836,233
METHOD AND APPARATUS FOR VENTING VACUUM PROCESSING EQUIPMENT
Robert W. Milgate, III, Gloucester, Mass., assignor to Eclipse Ion Technology, Inc., Beverly, Mass.
Filed Jun. 6, 1988, Ser. No. 203,009
Int. Cl.[4] F16K 24/04
U.S. Cl. 137—14 **16 Claims**

9. In a semiconductor processing method, including the steps of alternatively evacuating and venting a process chamber, an improvement comprising the steps of:
A. sensing gas conditions in the chamber, and
B. responding to said sensed gas conditions to attain a venting rate approaching a selected maximal venting rate



threshold of sonically choked flow, thereby attaining enhanced non-sonically-choked venting.

4,836,234
ELECTRICALLY OPERATED FLUID CONTROL VALVE
Weldon R. Hicks, 12630 Marble Dr., Houston, Tex. 77070
Filed Dec. 18, 1987, Ser. No. 134,988
Int. Cl.[4] G05D 16/00
U.S. Cl. 137—596.17 **18 Claims**



1. A signal responsive fluid pressure control system for providing a controllable output pressure proportional to an electrical control signal comprising;
a valve housing having a pressure control chamber,
a torque motor mounted in said housing for connection to an electrical source providing voltage to the motor and having an output shaft projecting into said control chamber,
a control arm secured on said output shaft to be rotated thereby and having opposed ends extending laterally to each side of said shaft within said control chamber.
inlet means connected to an unregulated fluid pressure source and having a passageway extending into said chamber,
an outlet port having a passageway connected with said chamber for conducting controlled output pressure therefrom,
a first adjustable regulating means adjacent said inlet means for selectively regulating the fluid pressure supplied to the chamber through the inlet passageway,
a passageway leading from said chamber to said first adjustable regulating means remote from said inlet means passageway for communicating fluid pressure between said chamber and said first regulating means,
manually adjustable inlet control/relief valve means in said inlet passageway movably connected to one end of said control arm,
whereby selected voltage applied to said torque motor will rotate said control arm to open said adjustable inlet control/relief valve means proportional to the applied current and said adjustable inlet control/relief valve means providing metered flow of the regulated supply pressure through the inlet passageway of the control chamber and to said outlet port as a controlled fluid pressure, and
the controlled fluid pressure communicated through said remote passageway to said first regulating means becoming a reference pressure to regulate the fluid pressure supplied to the chamber through the inlet passageway.

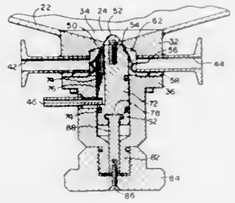
thus maintaining a differential pressure through said adjustable inlet control/relief valve means to provide a controlled output pressure through said outlet port.

4,836,235
VALVE
Ezio Pagani, Bergamo, Italy, assignor to Bridge Products, Inc., Northbrook, Ill.
Filed Mar. 3, 1987, Ser. No. 21,141
Claims priority, application Italy, Mar. 4, 1986, 21126/86[U]
Int. Cl.[4] F16K *15/20*
U.S. Cl. 137—223 18 Claims

1. A valve comprising:
a valve body which defines an outside part, an inside part, a through passageway, and a constriction at an intermediate portion of the passageway;
a valve pin slideably disposed in the passageway and carrying a sealing member positioned to bear against a sealing surface defined by the constriction to seal the passageway, wherein at least one of the valve body and the valve pin is formed of a resilient material;
a flange defined on the valve pin adjacent the sealing member, said flange having an external diameter slightly larger than the minimum diameter of the passageway at the constriction,
said valve body, valve pin and flange sized and configured to allow the flange to pass from the outside part through the constriction to the inside part without destruction of the pin or the valve body through elastic deformation of at least one of the valve body and the valve pin;
means for defining an annular step surface in the valve body around the passageway adjacent to the constriction on the same side of the constriction as the sealing surface; and
means for defining an annular shelf surface on the flange shaped and positioned to provide abutting surface to surface contact with the annular step surface to prevent the pin from being expelled out of the passageway;
said sealing member positioned and configured to remain in contact with the sealing surface when the shelf engages the step.

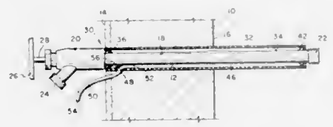
4,836,236
FLUSH SEALING TANK VALVE WITH DIAPHGRAM
Thomas P. Ladisch, Box 558, R.D. 1, Alburtis, Pa. 18011
Filed Jul. 29, 1987, Ser. No. 79,656
Int. Cl.[4] A16K *7/12*
U.S. Cl. 137—241 8 Claims

1. A valve, comprising:
a valve housing having an outer wall defining the first inlet to the valve, the first inlet having an inlet axis, the housing having an inner chamber and a first outlet, the first inlet and the first outlet communicating with the inner chamber;
a valve body movably mounted in the housing, the valve body being movable along the axis of the first inlet at least partly through the inner chamber, toward and away from the first inlet;
a diaphragm sealing across the valve chamber between the valve body and the first inlet, the diaphragm being movable by movement of the valve body along the axis of the first inlet, to seal the first inlet, and retractable to permit connection of the first inlet and the first outlet;



means defining a second inlet to the inner chamber, the second inlet being disposed on a side of the diaphragm facing the first inlet, and means defining a second outlet located on an opposite side of the diaphragm from the first inlet, the second outlet defining a path for a sterilizing fluid;
a shaft movable in a cylinder and connected to the valve body for advancing and retracting the valve body along the axis of the first inlet, the valve body defining an opening running parallel to the inlet axis and the valve body having a slot directed axially along an outer surface thereof, the second outlet being defined by a conduit extending radially of the axis into the slot.

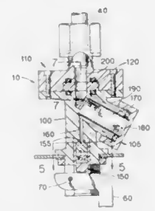
4,836,237
COMBINATION SILLCOCK AND LEAKAGE RELIEF SYSTEM
Frederick L. McCullough, 209 N. Division, Cleveland, Okla. 74020
Filed Sep. 30, 1988, Ser. No. 251,328
Int. Cl.[4] F16L *5/00*
U.S. Cl. 137—312 2 Claims



1. An apparatus for use with a building wall subject to freezing ambient temperature to provide a source of water pressure exterior of the building wall from a piping source within the interior of the wall, and having improved means of preventing damage to the structure in the event of rupture, comprising:
a generally horizontally extending sillcock having a tubular portion with a spigot at the first end and a plumbing connection means at the second end for connection to a source of water pressure, the sillcock having a length to extend through a wall of a structure whereby the spigot is positionable exterior of the wall and the plumbing connection means is interior of the wall, the spigot having a handle means for turning water ON and OFF;
a tubular member having a first and second end and in which the internal diameter is greater than the external diameter of said sillcock tubular portion and of length substantially

that between said sillcock spigot and said plumbing connection means, the tubular member having a small diameter opening therein adjacent said first end and the tubular member being received on said sillcock and providing an annular area between the interior of the tubular member and the exterior of said sillcock tubular portion;
a first elastomeric member having an opening therethrough received on said sillcock tubular portion adjacent said first end thereof and sealably engaging said tubular member adjacent said first end thereof;
a second elastomeric member having an opening therethrough received on said sillcock tubular portion adjacent said second end thereof and sealably engaging said tubular member adjacent said second end thereof;
a flexible flow tube of reduced diameter compared to said sillcock tubular portion, the flow tube having a first and second end, the flow tube being received in said tubular member small diameter opening with said first end received in said annular area between the exterior of said sillcock tubular portion and the interior of said tubular member, the flow tube second end being exterior of said tubular member and below said spigot whereby any leakage of water from said sillcock tubular portion will be captured within said tubular member and drained exteriorly of a building wall through said drain tube; and
adhesive means within said tubular member and exterior of said drain tube to retain the drain tube within said tubular member small diameter opening.

4,836,238
UNITARY VALVE FILTER COMBUSTION
William L. Wright, Ontario, and Benjamin D. Mendoza, Fontana, both of Calif., assignors to Robert Manufacturing Co., Rancho Cucamonga, Calif.
Filed Feb. 12, 1988, Ser. No. 155,168
Int. Cl.[4] F16K *43/00, 3/02*
U.S. Cl. 137—315 2 Claims



2. A unitary fluid valve and filter assembly for coupling fluid between an inlet passage and an outlet passage, comprising:
a first housing portion formed of plastic material;
said first housing portion containing: a top wall, outer said walls, an underside wall, a first fluid passage extending axially through said underside wall; a seal receiving annular goove within said underside wall located coaxial with said axial passage; first o-ring seal means seated within said annular groove of said first housing portion;
a first cylindrical projecting portion containing a fluid passage; said first cylindrical portion being integral with said top wall portion of said first housing portion and being located coaxial with said fluid inlet passage to form an extension of said fluid inlet passage, said projection portion containing a threaded outer wall for permitting coupling to an internal threaded coupling member;
a second housing portion formed of plastic material;
said second housing portion containing: outer side walls, a top inner wall; a bottom wall, an axial fluid passage extending through said top inner wall; a seal receiving annular groove coaxial with said top inner wall; second o-ring seal means seated within said annular groove of said second housing portion;
said second housing portion further containing a second extending hollow cylindrical portion extending from said bottom wall of said second housing portion, said hollow interior thereof defining a fluid outlet passage; said second extending hollow cylindrical portion and said first cylindrical projection portion being oriented coaxially;
said first and second housing portions adapted to matingly engage in a position with said underside wall of said first housing portion facing the upperside wall of said second housing portion and with said fluid passages in each portion being in alignment to define a fluid passage and further defining therebetween a rectangular shaped passage through and between the right and left side walls, said passage being located orthogonol to and traversing said fluid passages in each of said first and second housing portions;
an elonganted rectangular member formed of plastic material having a rectangular cross section shape; said rectangular member being located within said rectangular shaped passage defined by said housing members and being sandwiched between said first and second housing portions in slidable engagement with each of said first and second o-ring seals; each of said first and second o-ring seal means being coated with a lubricating means for facilitating sliding movement or said rectangular member;
said first and second housing portions being joined together with the fluid passages in said first and second portions being in alignment to define a portion of the fluid passage through said housing and with said rectangular member sandwiched therebetween;
said rectangular member containing a passage therethrough located asymmetrically between the ends of said rectangular member, the distance between one end of said rectangular member and the center of said rectangular member passage being equal to the distance between an outer side wall of said second housing portion and said axial passage in said second housing portion; whereby slidable movement of said member in one direction aligns said rectangular member passage with axial passage to complete a fluid passage therethrough and movement in the opposite direction positions a surface of said member confronting said axial passage to close the fluid passage therethrough;
first and second finger operable push members located at the ends of said rectangular member for permitting sliding movement of said member responsive to finger pressure applied to said push members; said push members being larger than the cross section of said rectangular shaped passage for limiting the movement of the member upon contact of a respective one of said push members with the respective adjacent wall of a housing portion;
said second housing portion further containing a third hollow cylindrical protruding portion extending at an angle of approximately sixty degrees to said second extending hollow cylindrical portion, said third hollow cylindrical protruding portion being integrally joined to said second cylinderical portion, said third cylindrical protruding portion defining a cylindrical internal compartment;
said cylindrical internal compartment having an internal end containing a central opening and an annular wall surrounding said central opening for allowing fluid to pass between said compartment and said defined fluid passage in said second housing portion, and, further having an internal cylindrical side wall bordering said annular wall, said internal cylindrical side wall including an opening located adjacent said annular wall for allowing fluid to pass between said compartment and said defined fluid outlet passage;
said third protruding portion further containing a threaded outer wall and a circular end rim;
cap means for closing an end of said third protruding portion; said cap means containing a threaded internal cylindrical wall for threadingly engaging the threads on the

outer wall of said protruding portion and further including an inside end surface; said cap means being hand grippable by a hand to permit manual application and removal thereof with one hand;

means within said cap means for engaging a portion of said circular end rim of said third projecting portion to provide a seal for preventing fluid leakage from said cylindrical internal compartment;

a mesh filter of hollow cylindrical shape, said mesh filter being of a predetermined diameter and having first and second ends; said mesh filter being located within said cylindrical internal compartment with said first end of said mesh filter engaging said annular wall and with said opposed second end of said mesh filter engaging said inside end surface of said cap means; said cap means inside end surface including a short circular shaped recessed portion for receiving an end of said filter means; said recessed portion being of said cap means being of an outer diameter slightly larger than said predetermined diameter of said filter means for permitting said mesh filter end to fit within said recessed portion.

4,836,239

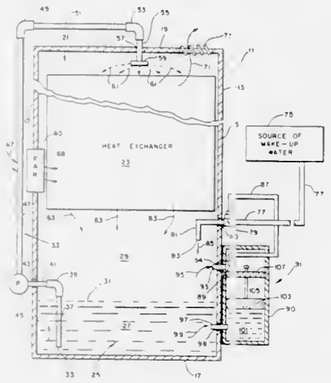
WATER COOLING TOWER AND WATER LEVEL CONTROL SYSTEM THEREFOR

Clifford W. Kinkead, 3801 W. Port Royal La., Phoenix, Ariz. 85023

Continuation-in-part of Ser. No. 870,727, Jun. 4, 1986, Pat. No. 4,724,552, Division of Ser. No. 715,383, Mar. 25, 1985, Pat. No. 4,686,718. This application Feb. 5, 1988, Ser. No. 152,654

Int. Cl.[4] F16K *31/34, 43/00*

U.S. Cl. 137—413 **31 Claims**



1. An improved water cooling tower system including a water cooling tower structure having a top portion, a bottom portion, an intermediate portion therebetween, a water-collecting basin operatively disposed in said bottom portion of said structure, a heat exchange means operatively disposed in the intermediate portion of said structure, means for recirculating the water from said water-collecting basin to the top portion of said structure and feeding the recirculated water into the top of said heat exchange means, means for moving air through said heat exchange means drawing heat from said water for evaporating a portion of said water while cooling the non-evaporated water, means for utilizing the cooled water for at least one of air-conditioning and water-cooling purposes, conduit means operatively coupling a source of fresh water to said water-collecting basin for restoring the water lost in the evaporation process, said conduit means including a signal-responsive hydraulic valve means operatively coupled therein, said hydraulic valve means including a water inlet, a water outlet, a control port, and means responsive to the control signals at said control port for opening and closing said hydraulic valve means, said hydraulic valve means being responsive to an "ADD WATER" control signal for passing said fresh make-up water through said fresh water conduit to said water-collecting basin and being further responsive to a "DON'T ADD" control signal for preventing the passage of fresh make-up water through said conduit means, the water in said water-collecting basin having a predetermined desired water level, the improvement comprising:

a float chamber assembly operatively coupled to the exterior of said water-collecting basin, said float chamber assembly having a float chamber, an air conduit operatively coupled to an air space above said water-collecting basin, and a water conduit operatively coupled to said basin a given distance below said predetermined desired water level;

a float means operatively disposed within said float chamber between said air conduit and said water conduit for monitoring the water level in said float chamber as a measure of the actual water level in said water-collecting basin of said water cooling tower structure; and

air valve means including an air signal conduit operatively coupled between said air valve means and said control port of said hydraulic valve means, said air valve means responsive to the position of said float means within said float chamber for generating and transmitting said "ADD WATER" signal to said hydraulic valve means via said air signal conduit whenever said monitored water level is a first predetermined distance below said predetermined desired water level and for continuing to generate and transmit said "ADD WATER" signal until said monitored water level is a second predetermined distance above said predetermined desired water level, said air valve means responsive to the position of said float means within said float chamber for terminating said "ADD WATER" signal by generating and transmitting said "DON'T ADD" signal to said hydraulic valve means via said air signal conduit whenever the monitored water level has risen to a water level a second predetermined distance above said predetermined desired water level and for continuing to generate said "DON'T ADD" signal until said monitored water level has again fallen a first predetermined distance below said predetermined desired water level, the changing of said generated signals at said predetermined distances above and below said predetermined desired water level preventing oscillations back and forth in the operation of said hydraulic valve means.

4,836,240

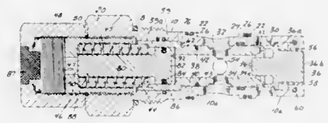
PILOT-ASSISTED PRESSURE RELIEF VALVE

Daniel J. Elliott, Delavan, Wis., assignor to Webster Electric Company, Inc., Racine, Wis.

Filed Mar. 31, 1988, Ser. No. 175,922

Int. Cl.[4] F16K *17/18*

U.S. Cl. 137—493 **7 Claims**



1. In a pilot-assisted pressure relief valve of the type having: a valve body with an axial bore, first and second axially-spaced radial ports, and a pilot port; a valve seat at one end thereof; a tubular piston in the valve body slidable with respect to the valve seat to control fluid flow from the first radial port into the piston, the piston having a first end engagable with the valve seat, an opposite second end, an effective pressure area at the first end exposed to pressure at the first radial port which urges the piston away from the valve seat, a piston port adjacent to the second radial port, and an external shoulder adjacent to the pilot port such that pilot pressure urges the piston away from the valve seat; and a spring extending between the valve body and the piston second end to urge the piston toward engagement with the valve seat, the improvement comprising:

the tubular piston having an annular wall which forms an axial opening at the second end of the tubular piston; a vent piston having a head slidably received within and engaged with the annular wall;

hydraulic seal means between the head and the annular wall thereby dividing the valve body interior into a hydraulic fluid chamber and an air-containing spring chamber; means venting the spring chamber to atmosphere; and

said hydraulic seal means being an annular seal having a diameter placing it at a radial location equal to the radial location of engagement between the tubular piston and the valve seat thereby hydraulically balancing the tubular piston,

whereby back pressure is eliminated entirely for both faster reaction to pressure impulses and improved accuracy in preload setting in a compact valve assembly.

4,836,241

VALVE FOR THE CONTROLLING OF A PRESSURE DIFFERENTIAL

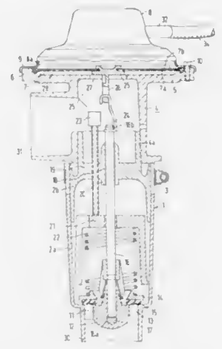
Siegfried Schoenwald, Bad Neustadt/Herschfeld, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 18, 1987, Ser. No. 86,600

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1986, 3628523; Aug. 22, 1986, 8622554[U]

Int. Cl.[4] F16K *31/365*

U.S. Cl. 137—494 **6 Claims**



1. A valve for controlling a pressure in a medium, said valve comprising a valve housing having an interior transfer port dividing the housing into a first chamber and a second chamber, said housing having a first port in communication with the first chamber and a second port in communication with the second chamber, a valve disc positioned in the first chamber and movable to a first position closing the transfer port and being movable to a position inward from the first position to open the transfer port, spring means for biasing the valve disc to the first position to close the transfer port, said first chamber having a connection opening and a flange with a membrane secured thereon surrounding said opening, one side of the membrane being acted on by the pressure in said first chamber passing through said connecting opening, a cap being clamped on the opposite side of the membrane to form a third chamber, said cap having a port to enable applying a pressure to said third chamber, and connecting means extending through the connecting opening in a non-contacting fashion for coupling a tension force from the membrane to said valve disc so that when a pressure differential between the first chamber and third chamber exceeds the force of the spring means, said valve disc is lifted from the transfer port to enable flow from the first chamber into the second chamber and out of the second port, said connecting means including a guide rod secured to the valve disc and connecting parts, said connecting parts including a coupling element being secured to the membrane and having an eyelet, and a hook being articulatedly hinged to the end of the guide rod and being engagable in said eyelet.

4,836,242

PRESSURE REDUCER FOR PURE GASES

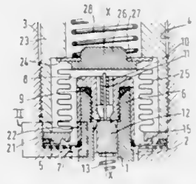
Eric Coffre, Trappes; Daniel Gary, Versailles; Christophe di Giulio, Neuilly-sur-Seine; Gérard Loiseau, Bois D'Arcy, and Gérard Torelli, Vanves, all of France, assignors to L'Air Liquide, Paris, France

Filed May 12, 1988, Ser. No. 193,076

Claims priority, application France, May 15, 1987, 87 06815

Int. Cl.[4] F16K *31/126, 51/00*

U.S. Cl. 137—505.42 **6 Claims**



1. A pressure reducer comprising an axial tubular part defining an axial inlet, an annular outlet concentric with the inlet, a bellows surrounding the axial tubular part and defining an annular volume communicating with the outlet, an inlet valve biased closed within the tubular part, and a filter disposed between the bellows and the outlet.

4,836,243

GATE VALVE WITH HYDRAULIC ACTUATOR

Kent W. Ferrell, Blooming Grove, Tex., assignor to Otis Engineering Corporation, Carrollton, Tex.

Filed Feb. 29, 1988, Ser. No. 162,163

Int. Cl.[4] F16K *37/00, 31/143*

U.S. Cl. 137—556 **7 Claims**

1. A valve actuator for use in combination with a fluid flow control valve of the type including a valve body having a fluid flow passage and a valve closure member movable between

first and second positions for opening and closing said fluid flow passage, respectively, said valve actuator comprising:

a housing adapted for connection to the valve body, said housing having a pressure chamber and a flow port communicating with said pressure chamber for permitting the flow of control fluid into and out of said chamber;

a piston disposed in said pressure chamber for extension and retraction, said piston having an axially extending bore defining a pocket and having an axially extending threaded counterbore enlarging said pocket;

a valve stem coupled to said piston, said valve stem being adapted for attachment to said valve closure member; and,

positioning means disposed within said piston pocket for coupling said piston to said valve stem, said positioning means including a threaded coupling rod and a piston coupling collar disposed within the piston pocket, said piston coupling collar having inside diameter threads and outside diameter threads, said piston coupling collar being disposed in threaded engagement with said threaded rod and threaded piston counterbore, respectively, and said threaded rod being connected to said valve stem.

4,836,244

DEVICE FOR THE INJECTION OF VERY SMALL AMOUNTS OF SAMPLES INTO CELLS

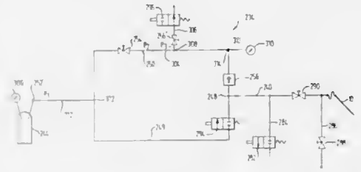
Wilhelm Ansorge, Gaiberg, Fed. Rep. of Germany, assignor to Europaisches Laboratorium fur Molekularbiologie, Fed. Rep. of Germany

Division of Ser. No. 460,101, Jan. 21, 1983, Pat. No. 4,532,205. This application Jun. 7, 1985, Ser. No. 742,713

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 3204040

Int. Cl.[4] F17D *3/05*

U.S. Cl. 137—557 **5 Claims**



1. A device for supplying constant pressures to a microcapillary to carry out a process of controlled injection of small fluid samples through the microcapillary, said device comprising:

(A) a main line **240** connected to said microcapillary **10**;

(B) a pressure source **244**;

(C) an injection pressure feed line **249** communicating between said pressure source and said main line;

(D) a high pressure feed line **249** communicating between said pressure source and said main line, said injection pressure and high pressure feed lines being connected in parallel;

(E) a first valve **294** in said high-pressure feed line;

(F) a pressure regulating device **254** in said injection pressure feed line;

G) a pressure regulating line **306**;

(H) a second valve **296** connected to said injection pressure feed line;

(I) a pressure regulating device **266"** inserted in said regulating line between said second valve **296** and said injection pressure feed line;

(J) a non-return valve **356** inserted in said injection pressure feed line between the point of attachment of said regulating line and said main line;

said high pressure feed line being blocked from said main line when said first valve **294** is in a first valve position;

pressure flow through said pressure regulating device in said regulatory line being permitted when said second valve **296** is in a first valve position, thereby establishing a holding pressure in said main line,

pressurized flow through said pressure regulating line being blocked when said second valve **296** is in a second valve position, thereby establishing in said main line an injection pressure, and,

pressurized flow being permitted through said first valve when said first valve **294** is in a second valve position, thereby establising in said main line a high pressure.

4,836,245

CONTROL VALVE

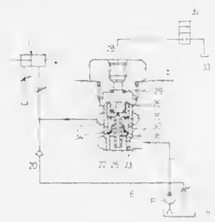
Yoneaki Takahashi, and Keiji Sekikawa, both of Saitama, Japan, assignors to Kayaba Industry Co., Ltd., Japan

Filed Oct. 12, 1988, Ser. No. 256,647

Claims priority, application Japan, Oct. 14, 1987, 62-157278

Int. Cl.[4] F15B *13/042*

U.S. Cl. 137—599 **1 Claim**



1. A control valve comprising:

a valve body provided with a parallel passage and a tandem passage;

a change-over poppet arranged in said valve body so as to operate said tandem passage and formed with a communication hole;

a load check poppet provided on a downstream side of said change-over poppet;

said change-over poppet being formed into a substantially cylindrical shape;

a guide pipe inserted into said change-over poppet;

said load check poppet being slidably fitted on said guide pipe;

a flow path provided on said valve body in a manner to extend from said parallel passage through said communication hole and guide pipe to an on-off valve; and

an orifice arranged in said flow path to generate a pressure difference which acts on said change-over poppet to open said change-over poppet to communicate said parallel passage with an actuator.

4,836,246

MANIFOLD FOR DISTRIBUTING A FLUID AND METHOD FOR MAKING SAME

Mark D. Lemp, Sterling Heights, Mich., assignor to Colt Industries Inc., New York, N.Y.

Filed Aug. 3, 1987, Ser. No. 80,990

Int. Cl.[4] F23K *5/00*

U.S. Cl. 137—561 A **34 Claims**

1. A manifold for distributing a fluid to a plurality of fluid ports, said assembly comprising:

a first tubular means forming a first tube comprising a first tube;

a second tubular means forming a second tube extending axially outwardly beyond said first tubular means;

support means connected to one end of said first tubular means for supporting said second tubular means in spaced relationship to said first tubular means;

housing means molded about said first and second tubular means for forming an integral manifold, said housing means including at least one fluid port connection integrally formed with and along said housing means for attachment to a fluid port and an aperture means forming at least one aperture in said fluid port connection and communicating with said housing means and said first tubular means to allow fluid to flow from said first tubular means to said fluid port connection, bracket supply members formed integrally with said housing means to allow attachment to a support surface, said support means comprising a first end plug disposed in one end of said first tube and having a first aperture communicating axially therethrough.

4,836,247

REGULATOR MEANS FOR AUTOMATICALLY SHUTTING THE GAS PIPELINE PASSAGE OFF DURING PRESSURE REDUCING FAILURE

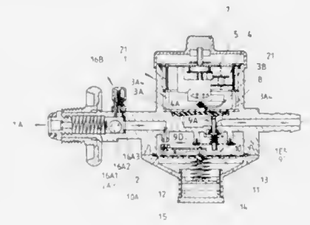
Rong-Chao Chuang, 113 Nan-Yang Rd., Nan-Tsu, Kaohsiung, Taiwan

Continuation of Ser. No. 8,764, Jan. 30, 1987, abandoned. This application Mar. 24, 1988, Ser. No. 172,376

The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.

Int. Cl.[4] F16K *31/48*

U.S. Cl. 137—624.12 **14 Claims**



13. A regulator means for automatically shutting off gas flow from a high pressure gas source during pressure reducing failure, said regulator means comprising:

a housing;

an inlet in said housing;

a pressure reducing chamber in said housing communicating with said inlet through an inlet nozzle;

means for opening and closing said inlet nozzle, said nozzle opening and closing means spring biased to predetermined pressure settings, said opening and closing means working in opposition to high pressure gas from the high pressure gas source;

an outlet opening from said pressure reducing chamber;

piston valve assembly means for opening and closing said outlet opening, said piston valve assembly means including a piston valve which directly opens and closes said outlet opening, said piston valve assembly located in said pressure reducing chamber;

a timer device in said housing for controlling the opening and closing of said piston valve, said timer device including a deformable diaphragm which urges said piston valve in the open position when normal pressures are in the pressure reducing chamber, said timer device further including a deformable transmission plate pressing against said piston valve such that when high pressure exist in the pressure reducing chamber and the high pressure urge the piston valve closed, deforming the transmission plate thereby preventing high pressure gases from exiting from the pressure reducing chamber through the outlet opening.

4,836,248

HYDRAULIC ELECTROMAGNETICALLY ACTUATED SLIDE VALVE

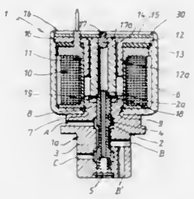
Alwin Stegmeier, Schwieberdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,671

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1982, 3224119

Int. Cl.[4] F16K *31/02*

U.S. Cl. 137—625.65 **8 Claims**



1. A hydraulic, electromagnetically actuated slide valve for electronic transmission control means, comprising a housing, an electromagnet in said housing including a carrier, a winding on said carrier, and a magnetic armature operative in said winding, a valve slide in said slide valve, said valve slide including a protrusion on one end thereof, characterized in that said magnetic armature is a hollow-cylindrical tubular element having an inner bore that forms an upper end bearing and a lower end for slidably supporting said magnetic armature via a slide element, said lower end of the magnetic armature is effected by means of an engagement with said valve slide to act upon said valve slide which is slidably guided in an associated valve bearing block of said slide valve to adjust said valve slide in said slide valve, and said magnetic armature is supported at one end by the inner bore of the armature and said protrusion on said valve slide without any relative displacement between said magnetic armature and said valve slide during movement of the magnetic armature, a compression spring applies a force on one end of said valve slide which holds said valve slide and said armature together in axial alignment, an enclosure cap for said housing, said slide element being disposed in a stationary manner on said enclosure cap, said slide element including an associated bearing slide portion which engages the inner bore of the armature for slidably supporting said magnetic armature.

4,836,249

ROTARY-ACTION DIRECTIONAL CONTROL VALVE

Ronald R. LaPointe, Taylors, S.C., assignor to Webster Electric Co.,Inc., Racine, Wis.

Filed Mar. 1, 1988, Ser. No. 162,561

Int. Cl.[4] F15B *13/04*

U.S. Cl. 137—625.23 **25 Claims**

1. A rotary-action directional flow control valve for a hydraulic motor, comprising:

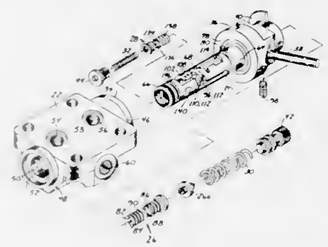
a valve body including a cylindrical wall which forms a main cavity and has axially-spaced forward and reverse ports and a middle portion therebetween having pressure and tank ports;

a main spool in the main cavity rotatable to at least one forward, a reverse and a neutral position and having a

mid-section adjacent to the middle portion of the body, first and second ends beyond the reverse and forward ports, respectively, and an inner wall forming an inner cavity extending axially from the mid-section to the first end;

a plurality of spool voids and orifices forming, with the body, flow channels between the ports, including:

at least one forward channel connecting the pressure, forward, reverse and tank ports in sequence through the motor in said at least one forward position,



a neutral channel directly connecting the pressure and tank ports in the neutral position, and

a reverse channel connecting the pressure, reverse, forward and tank ports in sequence through the motor in the reverse position; and

means in the inner cavity responsive to inlet and load pressures to maintain substantially constant flow through the reverse port when the main spool is in the reverse position.

4,836,250

DEVICE FOR CLOSING A PIPE BRANCH

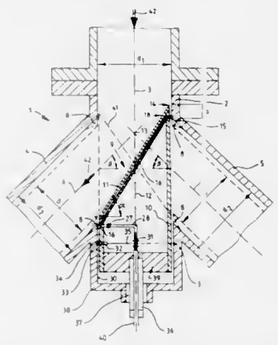
Wolfgang Krambrock, Vogt, Fed. Rep. of Germany, assignor to AVT Anlagen- und Verfahrenstechnik GmbH, Weingarten, Fed. Rep. of Germany

Filed Aug. 24, 1988, Ser. No. 235,935

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1987, 3729684; Jan. 15, 1988, 3800942

Int. Cl.[4] F16K *11/076*

U.S. Cl. 137—625.47 **18 Claims**



1. A device for closing a pipe branch, especially for closing either orifice of a Y-shaped distributor connection, with an upper inflow connection having a vertical pipe axis and at least two junction connections branching off at an angle to said vertical pipe axis and having pipe axes extending at an acute angle relative to the vertical pipe axis of the inflow connection, each said junction connection being closeable by means of a common rotary plug comprising a rotary cylinder having an oblique elliptical upper surface, a cylindrical surface connected to said upper surface, and a center axis which is aligned with the pipe axis of the inflow connection, an inflatable sealing means to seal off the entry orifice of the junction connection to be closed from the inflow connection, said inflatable sealing means continuously extending elliptically around and approximately parallel to the elliptic upper surface of the rotary plug and being disposed in a groove, said groove continuously extending around said cylindrical surface of the rotary plug, and wherein the sealing means is subjected to or relieved of pressure at a stationary end position via a valve control controlled by a control unit.

4,836,251

METHOD OF PRODUCING A SLIDE-FASTENER STRINGER ON A NEEDLE LOOM

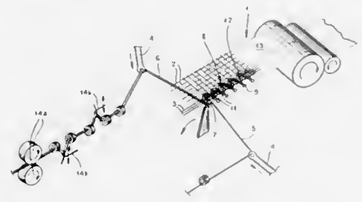
Alfons Fröhlich, Essen, Fed. Rep. of Germany, assignor to Opti-Patent, Forschungs-Und Fabrikations-AG, Riedern-Allmeind, Switzerland

Filed May 26, 1988, Ser. No. 199,013

Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3717868

Int. Cl.[4] D03D *1/00, 41/00*

U.S. Cl. 139—116 **8 Claims**



1. In a method of producing a continuous slide-fastener strip by weaving on an automatic needle loom, wherein warp yarns for support tape and warp yarns for tying in of a coupling element form sheds into which weaving needles pick weft yarns for the support tape and a synthetic resin monofilament yarn forming the coupling element, and wherein a weaving needle reciprocates continuously at a weaving station between an outside position and an inside position being operative to loop the synthetic resin monofilament yarn around a former for forming continuously coupling members in a row, the coupling members of such row each comprising a coupling loop and being joined together by connecting parts, said row being tied into the evolving support tape by means of the tying-in warp yarns and support tape weft yarns, the tension of the infed synthetic resin monofilament yarn being adjusted by means of driven feed rolls and so influenced by the reciprocation of the weaving needle that a tension peak is produced in the outside position of the weaving needle, in which position the synthetic resin monofilament yarn is drawn onto the former, the improvement wherein:

(a) said synthetic resin monofilament yarn is kinked around said former to form said members and said former is substantially rectangular in cross-section, has a thickness of from 10 to 20% less than the diameter of the synthetic resin monofilament yarn, has a rounded part for kinking extending lengthwise on the coupling head side and is of a width greater than its thickness by a factor of approximately from 1.75 to 3;

(b) the tension of the synthetic resin monofilament yarn infed to the weaving station is adjusted to be about 1500 grams per mm^2 of the cross-section of the monofilament yarn to about 300 grams per mm^2 of the cross-section of the monofilament yarn; and

(c) the outside position of the weaving is selected so as to produce an increase in the tension of the synthetic resin monofilament yarn of approximately from 1.5 to 3 times, the latter bearing on the former with the increased tension.

4,836,252

WARP YARN BREAKAGE DETECTING AND INDICATING APPARATUS

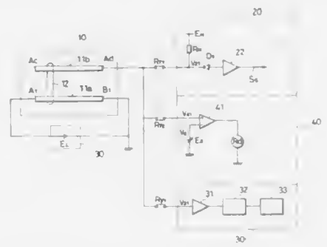
Zenji Tamura, and Katsuhiko Sugita, both of Kanazawa, Japan, assignors to Tsudakoma Kogyo Kabushiki Kaisha, Kanazawa, Japan

Filed May 20, 1988, Ser. No. 196,607

Claims priority, application Japan, May 26, 1987, 62-79594[U]; Jan. 1, 1988, 63-68

Int. Cl.[4] D03D *51/30*

U.S. Cl. 139—353 **7 Claims**



1. A warp yarn breakage detecting and indicating apparatus for a loom provided with a dropper unit comprising a dropper bar having a combination of a conductive bar and a resistive bar insulated from the conductive bar, and a plurality of droppers supported each on a warp yarn of a warp on the loom and capable of dropping on the dropper bar to short-circuit the conductive bar and the resistive bar when the associated warp yarn is broken; said warp yarn breakage detecting and indicating apparatus comprising:

a stop control circuit for stopping the loom, normally connected to the dropper unit only while the loom is in operation, having a first DC power supply, and capable of providing a stop signal to stop the loom upon the detection of the variation of an actuating signal based on the output voltage of the first DC power supply; and

an indication control circuit normally disconnected from the dropper unit while the loom is in operation, capable of being connected to the dropper unit only after the stop control circuit has been disconnected from the dropper unit when the loom is stopped, having a second DC power supply, and capable of indicating a position signal corresponding to a division of the output voltage of the second DC power supply, corresponding to the position of the dropped dropper on the resistive bar of the dropper unit.

4,836,253

CONTAINER VALVE AND FILLING MEANS

Norman H. Nye, 1348 High Bridge Rd., Cuyahoga Falls, Ohio 44223

Filed Mar. 3, 1987, Ser. No. 21,143

Int. Cl.[4] B65B *3/00*

U.S. Cl. 141—18 **4 Claims**

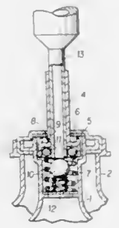
1. A container capable of receiving and retaining contents under pressure comprising;

a discharge valve mechanism for controlling the dispensing of said contents in said container comprising a sealing surface, a chamber releasably sealed against said sealing surface, a metering aperture connecting said chamber to a discharge spout;

said metering aperture is of such a size as to limit the rate of discharge of said contents that pass through said discharge valve mechanism into said discharge spout;

a tubular filling means arranged to enter into said discharge spout for the purpose of filling said container with said contents;

a check valve associated with said discharge valve mechanism for allowing said contents to flow from said tubular



filling means into said container, but preventing the discharge of said contents when said tubular filling means is removed;

sealing means adapted to engage and surround said tubular filling means located between said check valve and said metering aperture to prevent said contents from reaching said metering aperture while the filling operation is taking place.

4,836,254

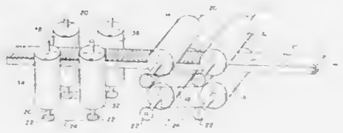
MULTIHEAD INCISOR FOR LUMBER, TIMBER AND THE LIKE

John N. R. Ruddick, West Vancouver, Canada, assignor to Forintek Canada Corporation, Vancouver, Canada

Filed Oct. 31, 1988, Ser. No. 264,845

Int. Cl.[4] B27E *9/04*; B27M *1/02*

U.S. Cl. 144—362 **13 Claims**



1. An apparatus for incising at least two sides of a piece of lumber, timber, or the like in one pass comprising:

at least two sets of incisor rolls, each set having two or more rolls spaced apart in one plane representing a side of a piece of lumber or timber moving in the one plane;

a first incisor roll in each set having incising teeth positioned to make a pattern of incisions in the one plane;

a second incisor roll in each set, downstream of the first incisor roll, positioned to make a second pattern of incisions over the first pattern of incisions in the one plane, and

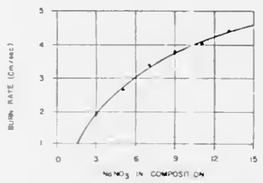
means to synchronize rotation of the first and second incisor rolls in each set to ensure combination of the first and second patterns of incisions is to a predetermined final pattern of closely spaced apart incisions on at least two sides of a piece of lumber or timber.

4,836,255

AZIDE GAS GENERANT FORMULATIONS

Fred E. Schneiter, North Ogden, and Robert D. Taylor, Hyrum, both of Utah, assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Feb. 19, 1988, Ser. No. 158,180
Int. Cl.[4] C06B 35/00
U.S. Cl. 149—35 1 Claim



1. An airbag gas generant composition consisting essentially of

A. from 65 to 74 percent by weight of an alkali metal azide;
B. from 10 to 28 percent by weight ferric oxide;
C. from 5 to 16 percent by weight sodium nitrate;
D. from 0.1 to 2 percent by weight hydrophobic fumed silica; and
E. from 0 to 2 percent by weight molybdenum disulfide;

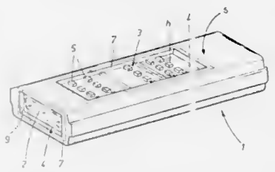
said composition having a burning rate of from about 3.0 to about 4.3 centimeters per second.

4,836,256

SHOCKPROOF PROTECTIVE SHEATH FOR REMOTE CONTROLS, IN PARTICULAR THOSE OF TELEVISION RECEIVERS

Loris Meliconi, Granarolo Emilia, Italy, assignor to Meliconi s.r.l., Bologna, Italy

Filed Jan. 25, 1988, Ser. No. 147,818
Claims priority, application Italy, Jan. 30, 1987, 3332 A/87
Int. Cl.[4] B65D 85/38; G06C 5/00
U.S. Cl. 206—523 13 Claims



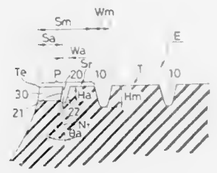
1. A shockproof protective sheath for a remote control unit having control buttons, comprising: a container and holder element, fashioned hollow from a shockproof, low density material in a shape substantially matching and hugging that of the remote control unit it ensheathes, provided with at least two openings affording access to the control buttons of the unit and allowing passage of the control pulses emitted, respectively, wherein the control button opening is covered by a window fashioned from a transparent film material, the window of film material being molded with a plurality of sockets, each one of which is designed to accommodate a respective control button, and wherein the holder element is provided with walls of a thickness sufficient to absorb the shock occasioned when the appliance is dropped or knocked accidentally against other objects.

4,836,257

PNEUMATIC RADIAL TIRE TREAD FOR REDUCING WANDERING

Mamoru Mamada, Tokyo; Mitsuhisa Yahagi, Saitama, and Masao Nakamura, Tokyo, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed May 7, 1987, Ser. No. 46,617
Claims priority, application Japan, May 8, 1986, 61-105583
Int. Cl.[4] B60C 11/06, 11/12
U.S. Cl. 152—209 R 15 Claims



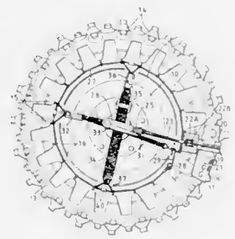
1. A pneumatic radial tire for vehicles, which comprises:
(a) a plurality of main grooves extending in a substantially circumferential direction of the radial tire;
(b) at least one auxiliary groove disposed on both shoulder ribs of the radial tire and extending in a substantially circumferential direction of the radial tire in such a way that a width of said auxiliary groove is narrower than that of the said main groove but wide enough not to bring both side walls of said auxiliary groove into contact with each other during cruising of the vehicle upon load; an outward inclination angle of said auxiliary groove is in the range of 10 to 60 degrees with respect to a normal line substantially perpendicular to an outer surface of a tire tread; and a position of said auxiliary groove is such that a distance from an outermost edge of the tire tread to the auxiliary groove is in the range of 20 to 80% of a shoulder rib with; and
(c) a plurality of sipes arranged outside said auxiliary groove disposed on both shoulder ribs at regular intervals along the circumferential direction of the tread and extending substantially in the lateral direction of the tread from the outermost edge of the tread to said auxiliary groove.

4,836,258

ATTACHMENT APPARATUS FOR A TIRE MAT

Reginald C. L. Ellis, 4 Holly Hill Road, Forest Vale Industrial Estate, Cinderford, Gloucestershire, England

Filed Jul. 5, 1988, Ser. No. 215,586
Claims priority, application United Kingdom, Jul. 10, 1987, 8716272
Int. Cl.[4] B60C 27/10
U.S. Cl. 152—213 A 10 Claims



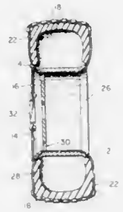
1. Traction apparatus for attachment to a tired wheel, the apparatus comprising a mat spaced around the periphery of the front side of the wheel when the mat is attached to the wheel, a front flexible elongate member for slidingly extending through attachment fittings on a mat, a rear flexible elongate member for slidingly extending through attachment fittings on the mat spaced around the periphery of the rear side of the wheel when the mat is attached to the wheel, respective front and rear sliding attachment means on each of the elongate members for attaching parts of the associated elongate member together so as to enable relative sliding movement between said parts and so as to cause said elongate member to form a respective front and rear intermediate loop portion which extends through the attachment fittings on the associated side of the wheel and a respective front and rear further portion outside said loop portion, guide means for guiding the further portion of the rear elongate member across the circumference of the wheel to the front side of the wheel, and tensioning means for connection at the front side of the wheel to the further portions of both elongate members and operable to tension the loop portions of both elongate members so as to draw the attachment fittings radially inwardly of the wheel and to thereby secure the mat firmly on the wheel.

4,836,259

SNOW AND ICE TRACTION DEVICE FOR AUTOMOTIVE VEHICLES

Henry B. Lewin, 6322 Lee Hwy., and Peter Bratic, 2304 N. Roosevelt St., both of Arlington, Va. 22205

Continuation-in-part of Ser. No. 147,875, Jan. 25, 1988. This application Sep. 29, 1988, Ser. No. 250,831
Int. Cl.[4] B60C 27/06
U.S. Cl. 152—222 27 Claims



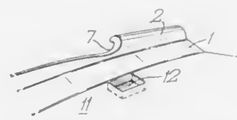
1. A traction device for an automotive vehicle wheel comprising a pair of cable members each having a closed loop formed of said respective cables at each end thereof; one of said loops on each cable being of sufficient size that the other loop on said cable and said cable can be passed therethrough and each of said cables being sized to pass through an aperture in said wheel toroidally around an automotive vehicle tire and through said one loop; a plurality of substantially cylindrical traction elements disposed around a central portion of each cable member; means for retaining said traction elements in said central portion of each cable member; and linearly adjustable means for connecting said other loop of one cable member to a corresponding other loop of the other cable member across the axis of an automotive vehicle tire upon which said traction device is mounted.

4,836,260

WHEEL RIM FOR A PNEUMATIC TIRE

Michael R. Corner, Coundon; Phillip N. Griffiths, Sutton Coldfield; Tom Holmes, Walmley, and Ian Kemp, Wilnecote, all of England, assignors to SP Tyres UK Ltd, Birmingham, England

Filed Feb. 10, 1988, Ser. No. 154,188
Claims priority, application United Kingdom, Feb. 10, 1987, 8702889
Int. Cl.[4] B60B 25/12
U.S. Cl. 152—375 13 Claims



1. A one piece wheel rim for a pneumatic tire, comprising:
a pair of axially spaced tapered bead seats;
a tire retaining flange located axially outward of of each bead seat; and
a tire fitting well located between said bead seats, wherein one flange has a reduced height portion having a length of 0.25 to 0.5 times the bead seat circumference, and the reduced height is such that the flange height, measured from its heel point, which is the point of intersection of the nominal diameter and the nominal wheel width, is in the range of 0.15 and 0.6 times the height of the remainder of the flange, for permitting tire fitting and removal.

4,836,261

SAFETY TIRE AND TAKE-APART WHEEL CONSTRUCTION

James B. Weeks, Eaton Rapids; Roger E. Payne, Okemos, and Roger E. Swartz, Holt, all of Mich., assignors to Motor Wheel Corporation, Lansing, Mich.

Filed Mar. 27, 1987, Ser. No. 30,845
Int. Cl.[4] B60C 7/24; B60B 25/02
U.S. Cl. 152—405 12 Claims

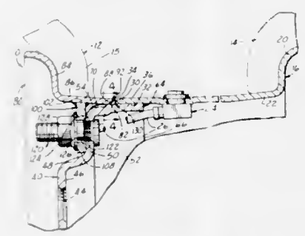
1. A wheel rim and disc assembly for use in a safety tire and wheel assembly which includes a pneumatic tubeless tire, said wheel rim and disc assembly comprising:
an inboard rim part including a rim base and an inboard tire bead retaining flange integrally carried at an inboard edge of said rim part, said inboard rim part having a cylindrical band terminating at an outboard free edge of said rim base remote from said inboard flange of said inboard rim part,
a wheel mounting disc having a central wheel mounting portion and an outer marginal flange telescoped into and secured to said cylindrical band, said disc flange having an outer surface protruding axially outboard beyond and clear of said inboard rim part free edge,
an outboard rim part comprising demountable flange means

including a cylindrical hoop adapted to be telescopically received from an axially outboard direction over said disc flange outer surface and an outboard tire bead retaining flange integrally projecting from an outboard edge of said hoop, said hoop terminating at an inboard free edge,

annular resilient sealing means disposed between said outer surface of said outer marginal flange of said disc, said inboard free edge of said hoop of said outboard rim part and said rim base band free edge of said inboard rim part,

and means for axially clamping said outboard rim part on said inboard rim part with said sealing means being captured in compression between said free edges and said outer surface of said disc flange so as to seal against air leakage from the internal cavity of a tire mounted on said wheel rim and disc assembly,

said disc having air bleed means outboard of said sealing means and normally sealed from the tire cavity by said sealing means, said clamping means being constructed and adapted to engage and exert clamping stress on said outboard rim part over a range of relative movement therebe-



tween in the axial direction of said inboard rim part which is sufficient to permit loss of sealing pressure at said sealing means prior to loss of clamping engagement at said clamping means to thereby permit air leakage past said sealing means through said air bleed means to atmosphere within said range or relative movement,

said outer surface of said disc flange comprising a generally cylindrical first sealing surface, said outboard free edge of said rim part having a second sealing surface inclined radially inwardly and in an inboard direction relative to the wheel axis, and said outboard rim part inboard edge having a third sealing surface inclined radially inwardly in an outboard direction relative to the wheel axis, said first, second and third sealing surfaces when juxtaposed to sealably compress said sealing means thereby defining an annular cavity which in radial cross-section generally defines a triangle, said sealing means being bodily movable along said first sealing surface axially of said wheel assembly by tire internal cavity air pressure upon mutual separation of said second and third sealing surfaces in response to said relative separational movement of said rim parts.

4,836,262

METAL CORDS AND PNEUMATIC TIRES USING THE SAME

Kuninori Nishizawa, Higashiyamato City; Teruo Miura, Akigawa City; Yoichi Watanabe, Kodaira City, and Hirohiko Takagi, Higashiyamato City, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

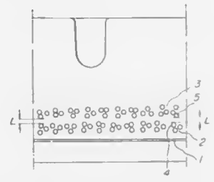
Filed Jun. 9, 1987, Ser. No. 59,983

Claims priority, application Japan, Aug. 8, 1986, 61-185261; Nov. 25, 1986, 61-278790; Dec. 18, 1986, 61-303503

Int. Cl.[4] D02G *03/48*; B60C *09/18*

U.S. Cl. 152—451 **17 Claims**

1. A metal cord constructed by twisting three metal filaments having the same filament diameter (d) in the same direction, said cord satisfying $3.0d \geqq Lmax \geqq 1.05d$, $Lmin \geqq 1.0d$ and $3.0 \geqq Lmax/Lmin \geqq 1.05$, wherein Lmax is a center distance between the longest separated metal filaments and Lmin is a center distance between the shortest separated metal filaments, and said cord containing a region having $Lmax \geqq 1.5d$ in an amount of not less than 30% per cord length of 50 mm in the



longitudinal direction, and said cord having a twisting pitch of 6.5–20 mm and an elongation of 0.2–1.2% under a load of 5.0 kg per cord.

4,836,263

WINDOW SHADE OR SCREEN APPARATUS, PARTICULARLY FOR VEHICLE WINDOWS

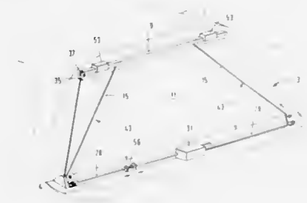
Eduard Ament, Aichwald, Fed. Rep. of Germany, assignor to Baumeister & Gatler, Aichwald, Fed. Rep. of Germany

Filed Apr. 2, 1987, Ser. No. 34,399

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1986, 3612165

Int. Cl.[4] E04F *10/06*

U.S. Cl. 160—68 **20 Claims**



1. A power operated window shade apparatus for a rear window in an automotive vehicle comprising:

a base support (4);

a screen web (11) having first and second ends;

a web wind-up roller (8) rotatably disposed on said base support, the first end of said screen web being secured to said web wind-up roller; springs means (13, 14) for biasing said web wind-up roller to wind said screen web on said web wind-up roller; and end support rail (9) to which the second end of said screen web is secured, said end support rail having a continuous groove (37) disposed therein;

web extension means engaged with said end support rail for extending said screen web and thereby defining a plane, said web extension means comprising a pair of elongated lever elements (15) having first and second ends, the first ends of said lever elements being pivotably secured to said base support and being pivotable back and forth between a retracted position and an extended position, the second ends of said lever elements having an extension element (33) disposed in and slidably retained within said continuous groove of said end support rail; said lever elements being resistant to bending in a plane perpendicular to said plane of said screen web when said screen web is extended and being movable in a plane parallel to said plane of said screen web when said screen web is extended; power operating mean (31) coupled to said lever elements, said

power operating means pivoting said lever elements in synchronism for moving said screen web in said retracted and extended positions; and said lever elements solely guiding said end support rail, moving said end support rail between said retracted positions in which said end support rail is adjacent said web wind-up roller, and said extended position in which said screen web is extended, and retaining said end support rail and hence said screen web in a predetermined orientation with respect to a plane perpendicular to said plane of said screen web when said screen web is extended and parallel to said web wind-up roller.

4,836,264

ROLLER BLIND ASSEMBLY

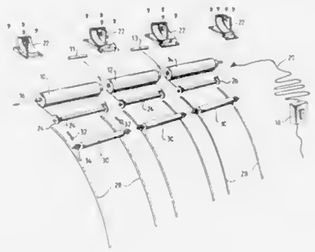
Francis Machin, London, United Kingdom, assignor to Machin Designs Limited, United Kingdom

Filed May 27, 1987, Ser. No. 128,810

Claims priority, application United Kingdom, May 27, 1986, 8612854

Int. Cl.[4] E06B *9/08*

U.S. Cl. 160—120 **7 Claims**



1. A roller blind assembly, comprising:

a roller;

a blind having one end coupled to said roller and a leading end;

said blind being wound around said roller and said roller being turnable in opposite directions respectively to raise and lower a leading end of said blind along at least two parallel tracks; and

an inertia device linked to said blind and rotatable as said blind is lowered, said inertia device including an inertia roller linked to said leading end of said blind and being spaced therefrom, said inertia roller having guide wheels, said inertia roller being mounted for rotation with said guide wheels running on said tracks.

4,836,265

TEMPORARY WINDOW SHADES

Althea J. Bussert, 610 W. Peralta Cr., Mesa, Ariz. 85202

Filed Apr. 13, 1987, Ser. No. 37,686

Int. Cl.[4] A47H *23/00*

U.S. Cl. 160—354 **9 Claims**

1. A temporary shade for covering a window in a wall of a building, said shade comprising:

(a) a sheet of relatively rugged, disposable material, said sheet including:

i. a front face for facing the interior of said building,

ii. a rear face for facing the window,

iii. a top edge folded rearwardly and secured to said rear face to form a top hem,

iv. a bottom edge folded rearwardly and secured to said rear face to form a bottom hem, and

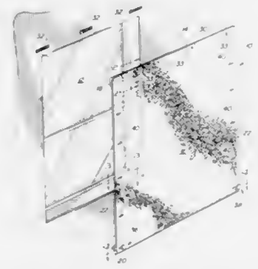
v. a pair of spaced apart, parallel side edges, each folded rearwardly and secured to said rear face to form a side hem;

(b) a top stiffener strip in said top hem to rigidify the top edge of said sheet for securing thereof to the wall adjacent the window;

(c) a bottom stiffener strip in said bottom hem for weighting the bottom edge of said sheet and ensuring that said sheet hangs properly;

(d) demountable fastener means for demountably securing said sheet to the wall adjacent the window; and

(e) elements of a demountable interconnection on said bottom stiffener strip and intermediate portions of said sheet for selectively and temporarily securing said bottom edge of said sheet to said intermediate portions of said sheet in a folded configuration to vary the effective length of said sheet said demountable interconnection including:



i. a pair of hook means secured to said bottom stiffener strip, each of said hook means being secured proximate a different opposite end of said bottom stiffener strip, each of said hook means comprising a double hook including an upturned portion projecting from one face of said sheet and a downturned portion projecting from the opposite face of said sheet to allow said sheet to be folded twice; and

ii. a plurality of pairs of transversely aligned slits, each slit of each pair of slits being formed through a different one of the side hems of said shade proximate a side edge thereof, each of said pairs corresponding to a different effective length of said sheet.

4,836,266

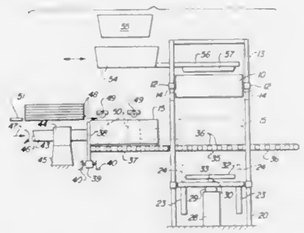
METHOD AND APPARATUS FOR REGISTERING FLASKLESS SAND COPE AND DRAG MOLDS

Thomas E. Wuepper, Au Gres, and Terry L. Franklyn, Fruitport, both of Mich., assignors to CMI International, Inc., Southfield, Mich.

Filed Jun. 23, 1988, Ser. No. 210,403

Int. Cl.[4] B22C *17/00*

U.S. Cl. 164—29 **17 Claims**



1. A method for registering the cope and the drag molds of a flaskless sand casting mold formed by compacting sand within vertically aligned cope and drag flasks against a pattern arranged upon a pattern board located between the vertically

aligned cope and drag flasks, with portions of the pattern located upon the upper surface of the pattern board within the cope flask, and with portions of the pattern located upon the lower surface of the pattern board within the drag flask for forming vertically aligned mold casting cavities in the sand cope and drag molds, comprising:

closing the bottom of the drag flask with a support board and closing the top of the cope flask with a plate;

squeezing the support board and the plate relatively towards the pattern board to compact the sand within the cope and drag flasks and to form compacted sand cope and drag molds contained within the flask;

lowering the support board vertically downwardly for lowering the sand drag mold relative to the drag flask while holding the drag flask immovably against the cope flask;

then lowering the drag flask relative to the cope flask;

next, stopping the lowering movement of the drag flask and laterally moving the drag flask, with the pattern board, from between the sand drag mold and the cope flask;

vertically raising the support board until the sand drag mold engages the sand cope mold still contained in the cope flask to form the complete sand mold;

vertically lowering the support board for lowering the complete sand mold below the cope flask; and

laterally moving the complete sand mold from beneath the cope flask to a different location for subsequent use in casting molten metal therein.

4,836,267

VERTICAL DIE CASTING METHOD AND APPARATUS

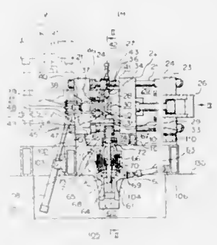
Toyoaki Ueno, and Sadayuki Dannoura, both of Ube, Japan, assignors to Ube Industries, Ltd., Japan

Filed Jun. 24, 1988, Ser. No. 210,903

Claims priority, application Japan, May 8, 1987, 62-110656

Int. Cl.[4] B22D *17/12, 17/26*

U.S. Cl. 164—113 **11 Claims**



1. A vertical die casting method using an apparatus composed of: a machine base; a mold clamping unit having a mold axis, incorporated with a mold half movable along the mold axis and another mold half stationary relative to the mold axis so that both mold halves are joined at parting faces thereof to form a mold defining a mold cavity to be filled with a melt through a mold gate formed at the parting faces to extend perpendicular to the mold axis, and mounted swingably on the machine base at a side of the stationary mold half for rotation about a rotation axis perpendicular to the mold axis on a horizontal plane; and a tilting or laterally movable injection unit for injecting the melt upwardly into the mold cavity through the mold gate at a lateral or horizontal axis position where the mold extends horizontally,

comprising, at every casting shot, the steps of: swinging the mold clamping unit about the rotation axis from said horizontal axis position to a vertical axis position where the mold axis extends vertically; providing the mold with at least one mold core therein at said vertical axis position; returning the mold clamping unit to said horizontal position; and injecting the melt upwardly by said injection unit into the mold cavity through the mold gate from below at said horizontal axis position.

4. A die casting machine comprising: a machine base; a mold clamping unit having a mold axis, incorporated with a platen and mold half detachably mounted thereto and stationary relative to said mold axis, and a counterpart platen and mold half detachably mounted thereto and movable along the mold axis for combining both said mold halves at parting faces thereof to form a mold defining a mold cavity to be filled with a melt; and an injection unit for injecting the melt into said mold cavity,

characterized in that: said mold forms a mold gate, at the parting faces, extending perpendicularly to said mold axis, through which gate the melt is supplied to said cavity; said mold clamping unit is swingably mounted on said machine base for rotation about a rotation axis provided at said stationary platen to extending perpendicularly to said mold axis on a horizontal plane, from a horizontal axis position where said mold axis extends horizontally and said mold clamping unit lies on said machine base at both said stationary and movable platens to receive an upward injection of the melt into said cavity through said mold gate to a vertical axis position where said mold axis extends vertically and said mold clamping unit stands on said machine base at said stationary platen; a means connected rotatably to both said machine base and said stationary platen for driving said mold clamping unit for rotation about said rotation axis; said injection unit having a casting sleeve through which the melt is injected and is swingably mounted on said machine base; and a tilting means connected rotatably to both said injection unit and machine base for tilting said injection unit from a vertical position where the melt is to be injected upwardly to a tilted position where a fresh melt is supplied to said casting sleeve.

4,836,268

METHOD OF ENHANCING THE LEACHING RATE OF A GIVEN MATERIAL

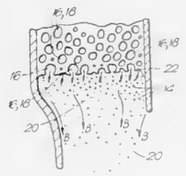
Keerthi Devendra, Bristol, England, assignor to Rolls-Royce plc, London, England

Filed Dec. 23, 1987, Ser. No. 137,527

Claims priority, application United Kingdom, Jan. 17, 1987, 8700968

Int. Cl.[4] B22D *29/00*

U.S. Cl. 164—132 **2 Claims**



1. A method of enhancing the leaching rate of a core for use in casting articles having intricate internal voids, comprising:

providing a leachable core consisting essentially of a plurality of closed cellular pores each having a gas contained therein; and

releasing said gas into a leaching solution at a leaching solution/core interface, such that the leaching solution proximate said leaching solution/core interface is agitated, thereby enhancing the leaching rate of said core wherein the agitation provides diffusion of a leaching reaction product into the bulk of the leaching solution and the introduction of fresh leaching solution to the solution/-core interface.

4,836,269

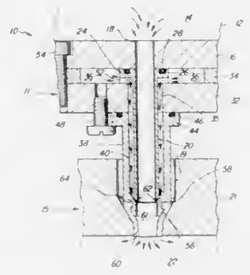
FORMING APPARATUS HAVING CATALYST INTRODUCTION SIMULTANEOUS WITH SAND INJECTION

Kenneth E. Bellis, Maple Heights, Ohio; Jackson E. Brown, Sterling Heights; Pheroze J. Nagarwalla, Rochester, both of Mich., and James Rea, Parma, Ohio, assignors to Roberts Corporation, Lansing, Mich.

Continuation of Ser. No. 885,361, Jul. 14, 1986, abandoned. This application Apr. 21, 1988, Ser. No. 186,672

Int. Cl.[4] B22C *15/24, 9/12*

U.S. Cl. 164—200 **8 Claims**



1. Apparatus for forming a part from chemically curable, particulate material such as treated sand, including a source (**12, 72, 122**) of said particulate material, a source (**36, 102, 136**) of a curing additive for curing said particulate material, a form (**21, 100, 132**) having a forming cavity (**22, 110, 146**) therein for forming said part and an inlet (**19, 103, 140**) through which the particulate material can be introduced from the source (**12, 72, 122**) of particulate material into the forming cavity (**22, 110, 146**) and an injector (**11, 71, 112**) connected with said source (**12, 72, 122**) of particulate material for simultaneously introducing said particulate material and said curing additive into said forming cavity (**22, 110, 146**), said injector (**11, 71, 112**) comprising a conduit (**20, 104, 142**) having a discharge end insertable into said inlet (**19, 103, 140**) for directing particulate material from said source (**12, 72, 122**) through said discharge end portion into said cavity (**22, 110, 146**), characterized by a passage (**40, 103, 144**) concentrically surrounding said conduit (**20, 104, 142**) and being connected with said source (**36, 102, 136**) of curing additive said passage (**40, 103, 144**) terminating at the discharge end of said conduit and discharging said additive into a region (**61, 109, 145**) at the discharging end of said conduit (**20, 104, 142**) whereby causing intermixing of said particulate material and additive in said region (**61, 109, 145**) as said particulate material is introduced into said cavity (**22, 110, 146**).

4,836,270

CONSUMABLE DEFLECTOR TENT

Jack L. Smith, South Bend, Ind., assignor to Design Packaging, Inc., South Bend, Ind.

Filed Feb. 16, 1988, Ser. No. 163,480

Int. Cl.[4] B22D *7/12*

U.S. Cl. 164—412 **3 Claims**

1. A tent adapted to cover a metal pouring mold, said tent comprising a sheet, means for supporting said sheet above a metal pouring mold, said sheet formed of durable and consumable material and defining a first and second divergent faces angled downwardly with respect to said mold, said sheet formed of corrugated paper material having multiple corrugated layers defined by corrugations running longitudinally through the sheet, said sheet defining a center opening means for allowing pouring of molten metal therethrough into said mold, and a cover positioned over said opening, said cover formed of readily collapsible and consumable material and overlying said sheet first and second faces and supported by said sheet, said cover constituting deflector means for deflecting sand and other impurities away from said mold prior to

pouring of said molten metal, said means for supporting said sheet above said metal pouring mold including a consumable bar extending through the sheet and positioned atop said metal pouring mold.

4,836,271

CASTING APPARATUS FOR CASTING METAL STRIP, IN PARTICULAR, STEEL STRIP

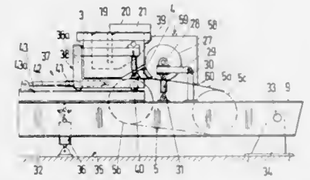
Wolfgang Reichelt, Moers; Matthias Scheulen, Jünkerath; Klaus Schwerdtfeger, Goslar; Peter Voss-Spilker, Kempen, and Ewald Feuerstacke, Dorsten, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 11, 1988, Ser. No. 166,969

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1987, 3707897

Int. Cl.[4] B22D *11/06*

U.S. Cl. 164—417 **19 Claims**



1. A continuous casting apparatus for casting metal strip, said casting apparatus comprising:

means for containing molten metal;

said molten metal containing means having a casting nozzle;

a conveyor belt disposed in proximity of said casting nozzle for receiving molten metal from said casting nozzle;

means for cooling and thus solidifying said molten metal on said conveyor belt;

said means for cooling said molten metal disposed in proximity of said conveyor belt;

means for driving said conveyor belt past said casting nozzle;

support means for supporting said conveyor belt at least under said molten metal on said conveyor belt;

means for mechanically making contact with and mechanically working at least an upper surface of said metal discharged from said casting nozzle; and

means for disposing said conveyor belt in selectable posi-

tions, said means for disposing said conveyor belt in a selectable position including means for varying the inclination, from horizontal, of said belt.

4,836,272

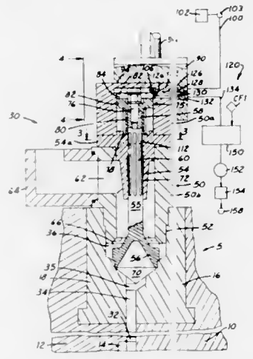
MOLD CAVITY GAS REMOVAL SYSTEM WITH VALVE POSITION SENSOR

Barry L. Priem, Bedford, Ind., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 132,076, Dec. 11, 1987, abandoned. This application Oct. 19, 1988, Ser. No. 262,157

Int. Cl.[4] B22D *17/14*

U.S. Cl. 164—457 **13 Claims**



1. A gas removal system incorporated with a mold for removing gas from the mold cavity, said system comprising a valve movable to an open position where the mold cavity is interconnected with gas discharge means or to a closed position where the mold cavity is not so interconnected, means for moving the valve to the closed position or open position, and a valve position sensing mechanism having means for forming a chamber in which the valve is movable to a first position representative of the valve closed position or a second position representative of the valve open position, a fluid pressure supply having an inlet to the chamber and relative to which inlet the valve moves to establish a first pressure condition in the supply when the valve is in the first position in the chamber and a second pressure condition when the valve is in the second position in the chamber, and means for sensing the established pressure condition in the supply as a result of said valve being moved to the closed position or the open position and for thereby sensing valve position.

11. In a method for removing gas from a mold cavity by moving a valve to an open position where the mold cavity is interconnected with gas discharge means or to a closed position where the mold cavity is not so interconnected, the step of sensing the position of the valve in the open position or closed position by supplying fluid pressure to an inlet, moving the valve relative to the inlet such that the valve established a first pressure condition when it is in the closed position and a second pressure condition when it is in the open position, and sensing the established pressure condition to determine valve position.

4,836,273

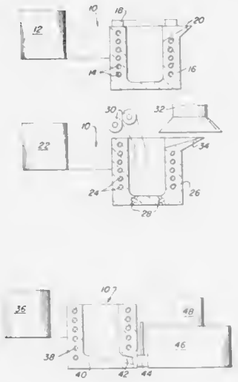
MICRO MILL CONTINUOUS STEEL PROCESS

Nicolas P. Cignetti, Canton, Ohio; John H. Mortimer, Medford, N.J., and Richard U. Swaney, Tarentum, Pa., assignors to Inductotherm Corp., Rancocas, N.J.

Continuation-in-part of Ser. No. 928,768, Nov. 10, 1986, abandoned. This application Oct. 13, 1988, Ser. No. 258,068

Int. Cl.[4] B22D *11/04, 11/10;* **C21C** *5/52*

U.S. Cl. 164—471 **2 Claims**



1. A method consisting essentially of the steps:

continuously refining steel utilizing induction melting furnaces sized for use in micro mills, said refining excluding addition of carbon and decarburization, by

(a) charging a first medium frequency coreless induction melting furnace having a production rate up to 50 tons per hour with pre-refined steel and melting the steel in said first furnace;

(b) transferring the melted steel to and refining the steel in a second medium frequency coreless induction melting and stirring furnace having a production rate up to 50 tons per hour; and

(c) transferring the refined steel to a tundish for a continuous casting operation.

4,836,274

LIQUID ALKALI METAL-WATER, TUBE-IN-SHELL STEAM GENERATORS

George F. Firth, Cheshire, and Owen Hayden, Greater Manchester, both of England, assignors to National Nuclear Corporation Limited, Cheshire, England

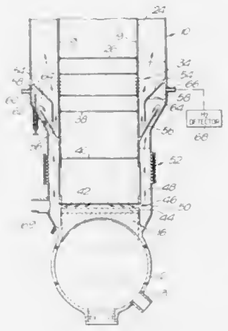
Filed Jun. 16, 1987, Ser. No. 62,595

Claims priority, application United Kingdom, Apr. 7, 1987, 8708260

Int. Cl.[4] G01M *3/04;* **F28F** *13/08;* **G21C** *17/00*

U.S. Cl. 165—11.1 **7 Claims**

1. In an liquid alkali metal-water, tube-in-shell steam generator with tube-to-tubeplate connections for water entry ends of the tubes immersed in the liquid alkali metal, the improvement comprising means for forming in the vicinity of said tube-to-tubeplate connections a gas space constituting a bubble collection zone above a localized surface of the liquid alkali metal, which localized surface is separate from any other surface level of the liquid alkali metal in the steam generator, means for directing any hydrogen bubbles arising in the region of said immersed tube-to-tubeplate connections to said surface for



escape as gas into the collection zone, and means for monitoring for the presence of hydrogen in the collection zone.

4,836,275

CORRUGATED HEAT PIPE

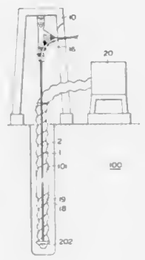
Masuji Sakaya, Narashino; Tsuneaki Motai, Yachiyo; Masataka Mochizuki, Nagareyama, and Kouichi Mashiko, Tokyo, all of Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed Mar. 7, 1988, Ser. No. 164,560

Claims priority, application Japan, Mar. 11, 1987, 62-53975; Apr. 10, 1987, 62-86989; May 15, 1987, 62-117168

Int. Cl.[4] F28D *15/02*

U.S. Cl. 165—46 **6 Claims**



1. A corrugated heat pipe sealed at both ends, having a longitudinally corrugated peripheral wall and containing operating liquid therein, said corrugated heat pipe comprising inside a rope-like tension member extending therethrough in its longitudinal direction and secured at both ends.

4,836,276

HEAT EXCHANGER FOR ENGINE OIL

Yasutoshi Yamanaka; Teruo Izumida, both of Kariya, and Kazuya Nomura, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 23, 1987, Ser. No. 66,340

Claims priority, application Japan, Mar. 9, 1987, 62-53694

Int. Cl.[4] F01P *11/08*

U.S. Cl. 165—51 **10 Claims**

1. An oil cooler comprising:

a cylindrical wall having end plates to define a housing having an inner space therein;

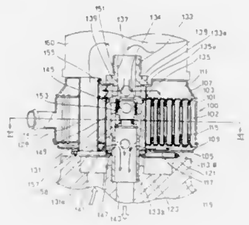
an engine coolant inlet pipe connected to said wall to introduce engine coolant into said housing;

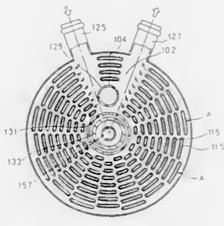
an engine coolant outlet pipe connected to said wall near said inlet pipe to remove engine coolant from within said housing;

radial partition means within said housing between said inlet and outlet pipes so that engine coolant will flow circularly within said housing from said inlet pipe to said outlet pipe;

first means including one of said end plates defining a first oil-containing space at one end of said housing;

second means including the other of said end plates defining a second oil-containing space at the other end of said housing; and





a plurality of tube members within said housing extending between and opening through said end plates to communicate said oil-containing spaces with each other through said tube members, the cross sectional shape of each of said tube members being generally elliptical with the short axis thereof being arranged generally radially of said circular wall, said tube members being arranged in groups with the members in each group being aligned generally radially and with the long axes of the group members gradually decreasing from the radially outermost member so that each group defines a sectorial or fan-shaped core, said cores being arranged circularly within said housing.

4,836,277

HEAT EXCHANGER APPARATUS HAVING HEAT EXCHANGER PIPES AND SHEETMETAL PLATES

Juergen Koehler, Schwalmstadt, Fed. Rep. of Germany, assignor to Konvekta, GmbH, Schwalmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 893,394, Aug. 5, 1986, abandoned. This application Mar. 30, 1988, Ser. No. 178,773

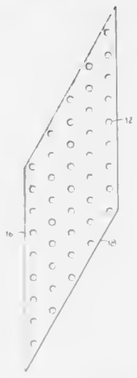
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1985, 3528499

Int. Cl.[4] E21B *23/00*

U.S. Cl. 165—151 **12 Claims**

1. A heat exchanger apparatus of increased efficiency and reduced height, comprising heat exchanger pipes (**20**) and sheet-like plates (**10**) each of which has bores (**12**) and whose edge configuration comprises the side edges (**16**) of an elongate strip and parallel base edges (**18**) which cut through the strip

inclinedly beside the bores (**12**), wherein the heat exchanger pipes (**20**) extend through the bores (**12**) whose diameter (da) comprises the outside diameter of the heat exchanger pipes (**20**) and which are arranged in a rectangular grid whose longitudinal grid lines (**22**) extend in parallel relationship to the side edges (**16**) of said edge configuration and whose transverse



grid lines (**24**) extend in normal relationship to said side edges (**16**), wherein the grid lines (**22, 24**) are at constant pitches (s_2, s_1) in the two mutually perpendicularly grid directions, and wherein adjacent grid lines (**24**) are displaced relative to each other by half the grid line pitch ($s_1/2$), characterized in that the base edge (**18**) includes with the side edge (**16**) an angle (A) which is given by the following formula

$$A = \text{arc } tg \frac{2\,s_2}{3\,s_1}$$

and that the base edge (**18**) lies between the bores (**12**) in a strip region (**26**) whose width (c) is given by the following formula:

$$c = \frac{s_1}{\sqrt{1 + \left(\frac{3\,s_1}{2\,s_2}\right)^2}} - da$$

wherein the diameter (da) and the pitches (s_1, s_2) are related in such a relationship that the following applies:

$$da < \frac{s_1}{\sqrt{1 + \left(\frac{3\,s_1}{2\,s_2}\right)^2}},$$

wherein an increased number of bores (**12**) are located along spaced apart lines parallel to said side edges (**16**) for a given height (**H**).

10. A method of forming a heat exchanger apparatus from a metal strip having two spaced apart parallel side edges with bores formed through said strip and arranged along longitudinal grid lines which are spaced apart and parallel to each other and to said edges with the centers of adjacent bores along each of said longitudinal grid lines being spaced apart by a distance s_1 and adjacent longitudinal grid lines being spaced apart by a distance s_2 and with the longitudinal grid lines next to said two side edges being spaced from said two side edges respectively, said bores being arranged along transverse grid lines normal to said longitudinal grid lines with alternate transverse grid lines being spaced apart by a distance s_1 and adjacent transverse grid lines being spaced apart by a distance $s_1/2$, the centers of adjacent bores along each transverse grid line being spaced apart by a distance $2s_2$, all of said bores having substantially the same size and being of dimensions such that parallel spaced apart straight strip regions extend diagonally between said two side edges and between said bores, each strip region forms equal acute angles with said two side edges and extends between a pair of adjacent bores along each of said longitudinal grid lines wherein the pairs of adjacent bores of adjacent longitudinal grid lines between which a given strip region extends are longitudinally spaced from each other with the centers of the closest bores of adjacent pairs of bores of adjacent longitudinal grid lines between which a given strip region extends being longitudinally spaced from each other by a distance of $s_1/2$, said method comprising the steps of:

cutting said metal strip along two of said spaced apart strip regions to form a sheet metal plate having two base edges defined by said two cut strip regions with one of said base edges defining the height of said sheet metal plate relative to the other of said base edges,

wherein an increased number of bores are located along spaced apart lines parallel to said side edges for a given height of said sheet metal plate, and

inserting pipes through said bores of said sheet metal plate to form said heat exchanger apparatus arranged such that the direction of flow of fluid through said heat exchanger apparatus exterior of said pipes will be generally parallel to said two base edges.

4,836,278

APPARATUS FOR ISOLATING A PLURALITY OF VERTICALLY SPACED PERFORATIONS IN A WELL CONDUIT

Patrick C. Stone, Houston; Mike A. Luke, Pasadena, and Gary D. Ingram, Sugarland, all of Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Division of Ser. No. 115,517, Nov. 2, 1987, which is a division of Ser. No. 922,355, Oct. 23, 1986, Pat. No. 4,735,266. This application Feb. 4, 1988, Ser. No. 152,348

Int. Cl.[4] **E21B** *23/06, 33/124, 33/128*

U.S. Cl. 166—115 2 Claims

1. A packer for use with a well conduit defining an annular locking recess in the conduit bore at the desired packer location, comprising, in combination:

a tubular body insertable in the conduit;

means on the upper end of said tubular body for connection to a tubing string;

a lock support sleeve surrounding a portion of said tubular body;

a plurality of locking dogs radially shiftably mounted on said lock support sleeve in peripherally spaced relation;

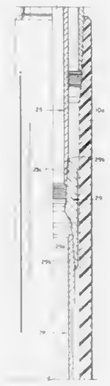
resilient means in said lock support sleeve urging said locking dogs radially outwardly to frictionally engage the bore of the conduit and to enter said conduit locking recess when aligned therewith;

said tubular body having a radially enlarged external surface engagable with said locking dogs by upward movement of said tubular body relative to said lock support sleeve to secure said locking dogs in the conduit recess;

J-slot and pin means operatibely interconnecting said tubular body and said lock support sleeve, whereby in one angular position of the tubing string, said tubular body and said lock support sleeve are locked together for co-movement in an axial direction, and in another angular position of the tubing string, asid tubular body is axially movable relative to said lock support sleeve;

a radially expandable, annular packing element surrounding said tubular body below said lock support sleeve;

an annular abutment shearably shearably secured to said tubular body below said packing element, whereby upward movement of said tubular body after said locking dogs enter the conduit locking recess effects a compression of said packing element into sealing engagement between the conduit bore and the lower exterior of said tubular body, thereby setting the packer and the application of a predetermined upward force to said tubular body by the tubing string severs said shearable securement and releases the compressive force on said annular packing element; and



an external annular recess on said tubular body below said radially enlarged external surface; said external annular recess being alignable with said locking dogs to release said locking dogs from said annular locking recess by upward movement of said tubular body following the release of compressive force on said annular packing element.

4,836,279

NON-ROTATING PLUG

T. Austin Freeman, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Nov. 16, 1988, Ser. No. 272,608

Int. Cl.[4] **E21B** *17/14, 33/16*

U.S. Cl. 166—153 9 Claims

1. An anti-rotation plug set comprising:

an upper plug including:

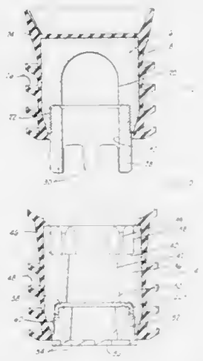
a body member having a cavity in the bottom thereof;

an elastomeric wiper covering disposed about a portion of the body member and retained thereon; and

an anti-rotation insert retained within the cavity in the bottom of the body member, the insert having a plurality of downwardly facing elongated projections thereon; and

a bottom plug including:

a body member having a bore therethrough having, in turn, a plurality of longitudinal recesses in the upper portion thereof adapted to receive the downwardly facing elongated projections of the upper plug;



an elastomeric wiper covering disposed about a portion of the body member and retained thereon;

an diaphragm sealing the bore through the body member, the diaphragm located below the longitudinal recesses in the upper portion of the bore in the body member; and

a anti-rotation insert retained within the lower portion, the bore through the body member, the lower anti-rotation insert having a plurality of downwardly facing teeth thereon.

4,836,280

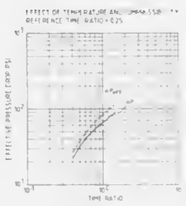
METHOD OF EVALUATING SUBSURFACE FRACTURING OPERATIONS

Mohamed Y. Soliman, Lawton, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 29, 1987, Ser. No. 102,406

Int. Cl.[4] **E21B** *47/06*

U.S. Cl. 166—250 13 Claims



1. A method of determining parameters of a subsurface operation fracturing an earth formation, comprising:

fracturing said formation with a fracturing fluid;

determining a first pressure decline value representative of the observed pressure decline of said fractured formation over a time interval, said first pressure decline value func-

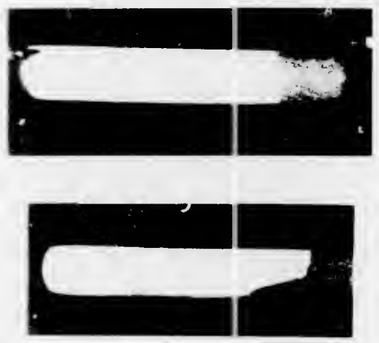
tionally related to the properties of said fracturing fluid during said fracturing of said formation;
determining a second pressure decline value representative of the pressure decline which should have been observed if said fracturing fluid was incompressible; and
determining said parameters of said fracturing operation in response to said second pressure decline value.

4,836,281

PROCESS FOR IMPROVING THE GAS SWEEPING OF AN OIL FORMATION, USING FOAMS MAINLY CONTAINING SURFACTANTS WITH PERFLUORIC GROUPS

Michel Robin, Poissy, and Claude Dalmay, Voisins Le Bretonneux, both of France, assignors to Institut Francais du Petrole, Rueil Malmaison and Atochem, Puteaux, both of, France

Filed Jan. 20, 1988, Ser. No. 146,159
Claims priority, application France, Jan. 20, 1987, 87 00705
Int. Cl.[4] E21B 43/22
U.S. Cl. 166—272 **18 Claims**



1. A process for enhanced recovery of hydrocarbons present in a subsurface reservoir comprising injecting through at least one injection well a plug of a solution of at least one surfactant and a gas, so as to form a foam, and wherein at least a part of said reservoir is swept by said foam and hydrocarbons are recovered from at least one producing well, wherein the surfactant has the formula (I)

$$R_F—Y—X \quad (I)$$

wherein R_F is a perfluoric carbon radical, Y is a divalent hydrocarbon radical or a divalent radical containing at least one oxygen, sulfur or nitrogen atom, and X is a hydrophilic group.

4,836,282

ENHANCED OIL RECOVERY METHOD EMPLOYING AN AQUEOUS POLYMER

Wen-Ching Hsieh, Chino Hills, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 751,570, Jun. 27, 1985, Pat. No. 4,753,973, which is a continuation-in-part of Ser. No. 673,421, Nov. 20, 1984, Pat. No. 4,808,648. This application Apr. 8, 1988, Ser. No. 179,264
Int. Cl.[4] E21B 43/22
U.S. Cl. 166—273 **20 Claims**

1. A method for recovering petroleum from a subterranean petroleum-containing formation penetrated by at least one injection well and by at least one spaced-apart production well, both wells being in fluid communication with the formation comprising:
injecting a sufficient amount of an aqueous polymer solution through the injection well into the formation so as to displace the petroleum in the formation towards the production well, said aqueous polymer solution comprising:
water;
at least one polymer comprising from about 45 to about 65 weight percent ethylacrylate monomer residue, from about 10 to about 45 weight percent methylacrylic acid residue, and from about 10 to about 30 weight percent acrylic acid monomer residue;
from about 2 to about 10 parts per 100 part of monomer of a co-surfactant system comprising:
(a) at least one nonylphenol polyethylene oxide ether sulfate, wherein the polyethylene oxide adduct of the nonylphenol polyethylene oxide ether sulfate is comprised of at least about 20 moles of ethylene oxide monomer residue; and
(b) at least one propoxylated, ethoxylated propylene glycol nonionic surfactant block polymer, wherein the ratio of said ether sulfate to said block polymer is from about 1:2 to about 10:1.

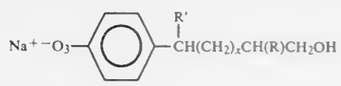
4,836,283

DIVALENT ION TOLERANT AROMATIC SULFONATES

Roman Loza, Solon; Arthur J. Cooper, Garfield Heights, and Gerald P. Coffey, Lynnhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jun. 8, 1988, Ser. No. 204,061
Int. Cl.[4] E21B 43/22
U.S. Cl. 166—225 **2 Claims**

1. The process of recovery of hydrocarbons present in a subterranean formation comprising injecting a surfactant composition containing a compound having the formula:



where
x=0 to 4
R′=H or CH_3
R=$CH_3(CH_2)y$ and y=1–15 into an injection well whereby said composition causes said hydrocarbon present in said injection well to be displaced into one or more production wells, and
(b) recovering said displaced hydrocarbon from at least one of said production wells.

4,836,284

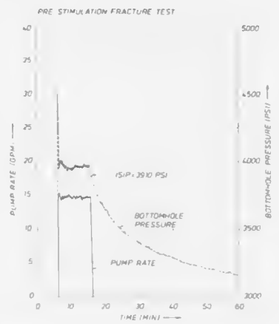
EQUILIBRIUM FRACTURE ACIDIZING

Steven J. Tinker, Houston, Tex., assignor to Shell Western E&P Inc., Houston, Tex.

Filed Jan. 26, 1988, Ser. No. 148,525
Int. Cl.[4] E21B 41/02, 43/267, 43/27
U.S. Cl. 166—279 **40 Claims**

1. A method for acidizing a formation penetrated by a well comprising:
injecting acid into the formation at a pressure sufficient to initiate and propagate a fracture in the formation;
reducing the injection rate of the acid into the fracture to a rate sufficient to hold the fracture open without significant further extension, such that the acid contacts and etches the fracture; and
reducing the injection rate of the acid into the fracture to a rate that is insufficient to hold the fracture open.

38. A method for placing a fluid within a fractured formation penetrated by a well, by reopening the fracture and then holding the fracture open without significant extension while a fluid is placed in the fracture, comprising:
injecting a fracturing fluid into the formation at a rate sufficient to reopen the fracture in the formation;



reducing the injection rate of the fracturing fluid to a rate sufficient to replace any fluid which leaks off from the fracture; and
injecting a flow-enhancing fluid into the fracture at a rate sufficient to replace any fluid which leaks off from the fracture.

4,836,285

COMPOSITION AND METHODS FOR REDUCING THE PERMEABILITY OF UNDERGROUND STRATA

Martin Navratil; Mark S. Mitchell, both of Scarborough, and Mojmir Sovak, Toronto, all of Canada, assignors to Borden Company Limited, West Hill, Canada

Division of Ser. No. 746,540, Jul. 15, 1988, Pat. No. 4,743,633, which is a continuation of Ser. No. 590,034, Mar. 15, 1984, abandoned. This application May 9, 1988, Ser. No. 191,690
Claims priority, application Canada, Nov. 18, 1983, 441430
Int. Cl.[4] E02B 3/12
U.S. Cl. 166—295 **36 Claims**

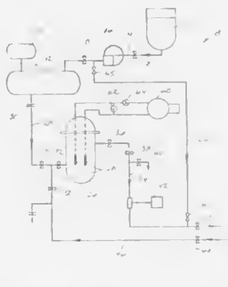
1. A method for decreasing the fluid permeability of a segment of a formation containing an oil-bearing stratum, said segment having a moderately elevated temperature and having greater fluid permeability than the surrounding segments of said formation, which method comprises:
injecting into said formation via a well penetrating said formation an aqueous gelable solution having a pH of at least about 9.0, said gelable solution consisting essentially of an alkaline material which is capable of providing said pH, a lignin containing extract derived from the black liquor by mild acid precipitation, said black liquor derived as a by-product of the separation of cellulosics from the ligninous material in the Kraft and Soda pulping process of manufacturing products, and a source of formaldehyde selected from the group consisting of hexamethylenetetramine, paraformaldehyde, an aqueous formaldehyde solution and a formaldehyde-donating phenol-formaldehyde resole resin, the weight ratio of lignin to formaldehyde available in said source for reaction with said lignin-containing extract is 2:1–10:1, the total weight of said alkaline material, lignin extract and source of formaldehyde being from about 5 to about 30 percent by weight of said solution, said composition being a liquid having a viscosity not in excess of about 30mPa.s. at 20° C. when first formed, and said viscosity remaining substantially unchanged for a relatively long period of time prior to a very rapid increase to form a gel of substantial mechanical strength, said composition being stable and undergoing minimal viscosity changes for at least 30 days upon storage at 25° C. or below, being capable of flowing substantial distances into said segments from the point of injection before gelling and undergoing a transformation to a solid gel over at least part of the temperature range of about 50° to about 150° C. within a period of from about one hour at 150° C. and high solids content up to about 1,000 hours at 50° C. and low solids content, said solid gel being stable to prolonged exposure to brine, residual oil and flooding liquids and further being stable over the full temperature range; the gelling time of said solution and the rate of injection thereof being such that said solution passes down said well by which it is injected and achieves substantial penetration into said high fluid permeability segment before substantial gelling of said solution occurs; and
allowing said solution to gel within said high fluid permeabilty segment and thereby reduce the fluid permeability of said segment.

4,836,286

METHOD FOR REMOVAL OF FLOW-RESTRICTING MATTER FROM HYDROCARBON PRODUCING WELLS

Lloyd Edwards, Killeen, Tex., assignor to E.F.L. Electro-Flood Ltd., Calgary, Canada

Filed Aug. 15, 1988, Ser. No. 232,157
Int. Cl.[4] E21B 37/06
U.S. Cl. 166—304 **18 Claims**



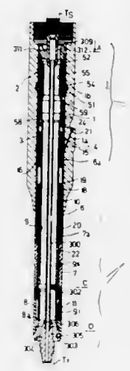
1. A method for the dispersal and removal of flow-restricting matter from hydrocarbon producing wells comprising the steps of:
making a first solvent, comprising a detergent, and a hydrocarbon solvent;
introducing the first solvent into the hydrocarbon producing well;
allowing the first solvent to remain in situ in the hydrocarbon producing well for a first predetermined period of time;
making a second solvent comprising an acid and a hydrocarbon solvent;
introducing the second solvent into the hydrocarbon producing well;
allowing the second solvent to remain in situ in the hydrocarbon producing well for a second predetermined period of time with the first solvent;
removing the mixture of first solvent, second solvent, and hydrocarbon liquid product from the well;
passing an electrical charge through the mixture of first solvent, second solvent, and hydrocarbon liquid product of sufficient energy to electrolyze the mixture; and,
returning the electrolyzed mixture back to the well.

4,836,28[illegible]

SAFETY GATE VALVE FOR PETROLEUM WELLS, PERMITTING OPERATION BY ARTIFICIAL FLOW

Couste Eric, Lons, and Jacob Jean-Luc, Lescar, both of France, assignors to Merip Oil Tools International (MOTI) S.A., Toulouse, France

Filed Oct. 15, 1987, Ser. No. 109,356
Claims priority, application France, Oct. 16, 1986, 86 14503
Int. Cl.[4] E21B *34/10, 23/04, 43/00*
U.S. Cl. 166—321 13 Claims



1. A safety valve for insertion into a production tube of an oil well for assuring the opening or closing thereof, while permitting an operation with the artificial output by a fluid injected under pressure, said valve comprising in combination:

a generally tubular valve body,

a movable closing flap (**11**) in the lower part of said body and urged toward its closed position,

a tubular slide (**9**) longitudinally slidable in the interior of the valve body for causing by its descending movement the opening of the closing flap,

a return spring (**10**) disposed in an annular groove between the slide and the valve body so as to urge said slide toward an upper position for closing of said closing flap,

means for hydraulically displacing said side downwardly comprising a control fluid inlet (**3***a*, **4***a*) across said valve body and a sealed volume between the slide and the body for receiving the control fluid, said slide having a difference in cross-section subjected to the fluid pressure contained in said sealed volume in such a manner as to undergo a downward force when said volume is under pressure,

lower (**16**) and upper (**15**) seals disposed around the valve body for assuring a seal at the interface between said valve body and a receiving sleeve (**1**) in the production tube below and above the control fluid inlet,

an internal tube (**300**) for passage of injected fluid and having a diameter less than that of the tubular slide (**9**) and mounted in the interior thereof, said internal tube being fixed to the slide by fixing means (**301, 302**), and having a lower extremity connection (**300***i*) and a length such that said lower extremity connection is positioned above the closing flap (**11**) when the slide is in the upper position and below said closing flap when said slide is in the lower position,

a lower anchoring sleeve (**303**) fixed to the bottom of the valve body and including lower injected fluid passage tubes (ti), said lower anchoring sleeve having an upper extremity connection (**306** connected to the lower extremity connection (**300***i*) of the internal tube in such a manner as to permit a selected connection of said upper and lower extremities connection while permitting their release upon displacement thereof in the direction of their separation,

an upper anchoring sleeve (**309**) in the upper portion of the valve body and including upper injected fluid passage tubes (Ts), said upper anchoring sleeve having an internal bore (**309***a*) enabling a sealed sliding of the upper extremity of the internal tube (**300**) therein,

a hydraulically actuated mechanical locking system, in the upper portion of the valve body, below the upper anchoring sleeve (**309**) for securing the valve body in the receiving sleeve (**1**), said system comprising valve body stop means (**1***bi*, **51***a*) in said receiving sleeve, radially moveable dogs (**54**) mounted in said valve body for movement between a retracted position and an extended position penetrating into an anchoring groove in the receiving sleeve above said stop means, and mechanical dog actuating and locking means slidably mounted in said valve body and responsive to the pressure of control fluid contained in said sealed volume for radially moving and locking said dogs in the anchoring groove under the effect of said pressure,

a tubular shuttle piston (**58**) slidingly mounted so as to be freely displaceable in the valve body around the upper portion of said slide (**9**), between a lower stop position and an upper stop position, said shuttle piston having a surface subjected to the pressure of the control fluid in the sealed volume in such manner as to undergo an upward force when said sealed volume is under pressure,

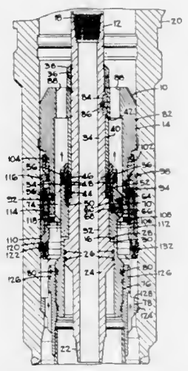
a slide bushing (**55**) in equal pressure slidingly mounted in the valve body above said shuttle piston (**58**) and independent thereof in such a manner that said shuttle piston may only exert an upward pressure on said bushing with no possibility of carrying the same downwardly, said bushing having a peripheral cam (**56**) adapted to engage said dogs (**54**) and hold said dogs in their extended position when the shuttle piston is in its upper stop position.

4,836,288

CASING HANGER AND PACKOFF RUNNING TOOL

Randy J. Wester, Spring, Tex., assignor to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 192,806, May 11, 1988, abandoned.
This application Nov. 4, 1988, Ser. No. 267,670
Int. Cl.[4] E21B *33/035, 33/043;* F16L *55/00*
U.S. Cl. 166—348 14 Claims



1. A well tool for running and installing a casing hanger and a packoff into an underwater wellhead housing during a single trip into the well, comprising

(a) a central tubular mandrel having means for attachment to a pipe string;

(b) a tubular body surrounding and secured to the mandrel for axial and rotational movement in unison therewith, said body including non-threaded means for releasably connecting it to a surrounding annular packoff;

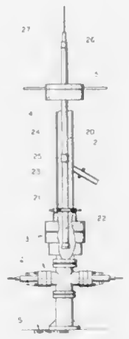
(c) a casing hanger adapter sleeve surrounding the mandrel and partially surrounded by the body, said adapter sleeve releasably connected to the mandrel by a thread latching means which can be ratcheted from an unlatched condition into a latched condition without relative rotation between the mandrel and the sleeve, said sleeve including means for releasably connecting it to a well casing hanger for support thereof on the sleeve at a position beneath the packoff.

4,836,289

METHOD AND APPARATUS FOR PERFORMING WIRELINE OPERATIONS IN A WELL

Joe A. Young, Lafayette, La., assignor to Southland Rentals, Inc., Houma, La.

Filed Feb. 11, 1988, Ser. No. 155,063
Int. Cl.[4] E21B *33/072*
U.S. Cl. 166—379 22 Claims



1. Apparatus for performing wireline operations in a well near the surface of which is a blowout preventer stack, said apparatus comprising:

a bell nipple assembly extending upwardly from said blowout preventer stack including an annular flange member by which said bell nipple assembly is attached to said blowout preventer stack and a tubular member extending upwardly from said flange member, said flange member having a central bore therein through which fluid communication may be established between said blowout preventer stack and said tubular member, said bore being provided with an upwardly facing annular support shoulder; and

a wireline lubricator assembly for central disposition within said bell nipple assembly including a centrally bore tubular mandrel the exterior of which is provided with a downwardly facing annular support surface engageable with said upwardly facing shoulder of said bell nipple flange member to support said lubricator assembly, a lower tubular extension attached to said mandrel and extending into said blowout preventer stack and an upper tubular extension attached to said mandrel and extending upwardly through said bell nipple tubular member for connection with a wireline lubricator, fluid communication being established between the interiors of said upper and lower tubular extensions through the bore of said mandrel, said mandrel also being provided with at least one passageway through the body thereof to establish fluid communication between annular spaces surrounding said upper and lower tubular extensions, said lubricator assembly being capable of receiving wireline tools for lowering into said well.

12. A method of performing wireline operations during drilling of a well at the surface of which is provided a blowout preventer stack on which is surmounted a bell nipple assembly having a centrally bore flanged at the lower end thereof, said bell nipple flange having a plurality of locking pins which are engageable externally of said bell nipple flange for radial movement between retracted positions not penetrating the bore of said bell nipple flange to extended positions penetrating said bore, said method comprising the steps of:

removing any drill pipe from said well through said bell nipple assembly while said pin members are in said retracted positions;

lowering a wireline lubricating assembly, having a wireline pack-off assembly below which are upper and lower tubular extensions coupled by a tubular mandrel, through said bell nipple assembly until downward movement of said mandrel is arrested by a stop shoulder in said bell nipple flange;

activating said locking pins by movement to said extended positions where they engage a locking shoulder of said mandrel locking said wireline lubricating assembly in place;

lowering wireline tools into said well through said wireline lubricating assembly and performing wireline operations therein; and

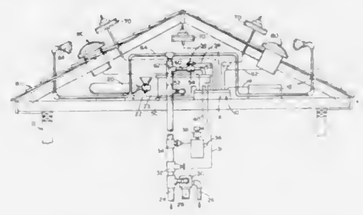
maintaining fluid communication between the annular areas surrounding said upper and lower tubular extensions by providing at least one flow passage through the body of said mandrel.

4,836,290

FIRE SUPPRESSION SYSTEM

Walter C. Le Lande, Jr., 301 N. Hart Pl., Fullerton, Calif. 92631

Filed Sep. 17, 1986, Ser. No. 908,808
Int. Cl.[4] A62C *1/20*
U.S. Cl. 169—46 9 Claims



1. A fire extinguishing system for roof fires or the like, comprising:

a fire sensor means for monitoring a condition indicative of a fire and for signaling the sensing of the condition;

a first fire extinguishing means for spraying a fire retardant fluid onto an exterior surface of an associated roof, said first fire extinguishing means comprising:

a fluid circuit,

a spray nozzle in communication with said fluid circuit,

a source of water,

a water conduit connecting said source of water to said fluid circuit,

a fire retardant fluid holding tank in communication with said fluid circuit, said tank holding a fluid other than water and

a venturi eductor located in said fluid ciruit for mixing water from said water conduit with said fire retardant fluid before said mixture exits through said spray nozzle; and,

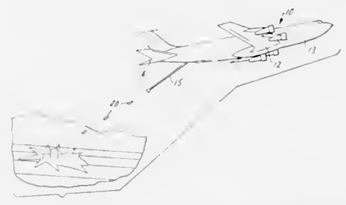
a logic circuit control means connected to said fire sensor means and said first fire extinguishing means for actuating

said first fire extinguishing means as driven by said fire sensor means.

4,836,291
PORTABLE SPRINKLER AND PROCESS FOR FIGHTING FIRES IN OIL REFINERIES AND THE LIKE
David W. Owens, and Jack E. Propp, both of Casper, Wyo., assignors to Amoco Corporation, Chicago, Ill.
Filed May 21, 1987, Ser. No. 53,139
Int. Cl.[4] A62C 1/02
U.S. Cl. 169—46 7 Claims

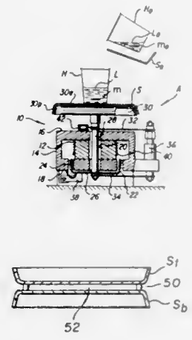
1. A process for fighting fires in oil refineries, petrochemical plants, and the like, comprising the steps of:
attaching a hose to a sprinkler;
coiling the hose about the sprinkler;
attaching the other end of the hose to a water supply source;
rolling said coiled hose toward a fire while concurrently filling said hose with water from said water supply source to uncoil said hose and remotely move the sprinkler attached to the hose
near a fire; and
spraying a mist of water from said sprinkler onto the fire.

4,836,292
METHOD FOR COOLING A NUCLEAR REACTOR AND A PRODUCT THEREFOR
Cecil R. Behringer, 4204 Mavelle Dr., Edina, Minn. 55436
Filed Mar. 31, 1987, Ser. No. 33,013
Int. Cl.[4] A62C 1/14
U.S. Cl. 169—47 8 Claims



1. The method of cooling unconta ned nuclear fission by the steps of
making sausage-shaped casings filled with gelled liquified inert gas,
placing the casings of gelled liquid inert gas aboard a tanker aircraft,
flying the tanker aircraft over the site of the nuclear fission,
discharging the casings onto said site whereupon the casings discharge the gelled liquified inert gas causing the same to gasify and fall to the lowest surface in the site and restrict oxygen from reaching the lowest portion of the area surrounding the nuclear fission.

4,836,293
SHIELDING METHOD FOR USE WITH ELECTROMAGNETIC BALANCE
Charles H. Gebo, and Bradley C. Roth, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 21, 1988, Ser. No. 273,773
Int. Cl.[4] G01G 7/00
U.S. Cl. 177—1 16 Claims

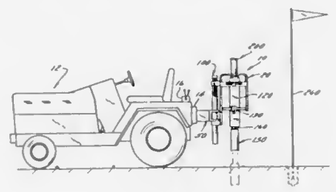


1. A method for rendering weighing apparatus of the electromagnetic-load-compensation type immune to interference by magnetic flux from a source thereof external to the apparatus, such apparatus including stationary magnet means located within the apparatus and having an air gap, a compensation coil operatively disposed for movement in said gap, carrying means supporting said coil and mounted for movement relative to said stationary magnet means away from and back to an initial position, and means responsive to carrying means movement away from said initial position for supplying current to said coil to return said carrying means to said position, said carrying means being adapted to support a load to be weighed, said method comprising:
positioning protective shield means between said carrying means and said source of magnetic flux, in flux-transmitting relation to said source, so as to shield the apparatus from said flux, said shield means being formed from ferromagnetic material having sufficient permeability to provide a path of least reluctance for transmitting said flux and thereby preventing said flux from interfering with intended operation of the apparatus.

4,836,294
MACHINE FOR DIGGING A PUTTING CUP HOLE
Michael Bencriscutto, 6121 Golf Ridge Dr., Racine, Wis. 53402
Filed Jul. 7, 1988, Ser. No. 216,003
Int. Cl.[4] E02F 5/20
U.S. Cl. 172—22 19 Claims

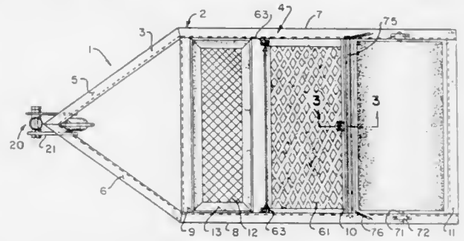
1. A machine for cutting and removing a plug of turf from a golf putting green to make a new putting cup hole and, if desired, for inserting the turf plug into an existing cup hole to fill it comprising
a main frame (**20**) having a fore and aft extent;
a first mounting means (**50**) for securing said main frame on a vehicle for
vertical raising and lowering movement relative to said vehicle, and

pivotal movement relative to said vehicle about a first vertical axis (AX1);
a first raise-lower means (**100**) secured to said main frame for raising and lowering said main frame relative to said vehicle means;
a subframe (**120**);
a second mounting means (**130**) for securing said subframe on said main frame for
pivotal movement about a second horizontal axis (AX2), and
fore and aft movement relative to said main frame;
a cutter means (**150**) for cutting said turf plug;



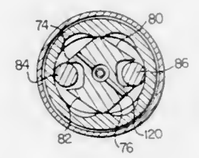
a third mounting means (**160**) for securing said cutter means on said subframe for
vertical movement to raised and lowered positions relative to said subframe; and
rotary movement relative to said subframe about a third axis (AX3);
a second raise-lower means (**200**) secured to said cutter means for moving said cutter means to said raised and lowered positions;
a drive means (**180**) secured to said cutter means for rotating said cutter means about said third axis; and
a plug ejection means (**210**) mounted on said subframe and selectively operable to eject said plug.

4,836,295
BASEBALL INFIELD CONDITIONING APPARATUS
Rodger E. Estes, 4115 Southernaire Dr., Lemay, Mo. 63125
Filed Dec. 4, 1987, Ser. No. 128,702
Int. Cl.[4] A01B 27/00, 29/04, 31/00, 49/02
U.S. Cl. 172—146 13 Claims



1. A device for conditioning of earth fields comprising:
a. A frame having a forward end including hitch means and a rearward end;
b. ground breaking means attached to the forward end of said frame for breaking the surface of the field;
c. ground engaging means including elevating means associated with the forward end of said frame for selectively raising and lower said frame for selectively adjusting the depth of cut of said ground breaking means;
d. leveling and sifting means suspended from said frame behind said ground breaking means for leveling and sifting the broken surface of the field, said leveling and sifting means being a generally planar, rigid, self-sustaining, perforate drag, said drag being suspended in a generally horizontal position in use; and
e. rolling means extending across the rearward end of said frame for compacting the field, said rolling means having a substantially horizontal axis of rotation, said frame pivoting around the axis of rotation of said rolling means.

4,836,296
FLUID PRESSURE IMPULSE NUT RUNNER
Paul A. Biek, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Aug. 22, 1988, Ser. No. 234,531
Int. Cl.[4] B25D 15/00
U.S. Cl. 173—93.5 14 Claims



1. An impulse unit, comprising:
a case defining an interior cavity of predetermined length centered on a first axis, the wall of the cavity having a generally elliptical cross section perpendicular to the first axis with mutually perpendicular minor and major axes, the wall defining first and second seal lands on opposite sides of the first axis along the minor axis, each extending the entire length of the cavity;
a spindle mounted to the case for relative rotation between the case and spindle about the first axis, the spindle extending through the cavity and having an outer surface, the outer surface defining first and second seal lands thereon on opposite sides of the first axis, the spindle further having a first recess formed therein through the outer surface, the first recess extending parallel the first axis the length of the cavity on one side of the first axis between the first and second seal lands on the spindle, and a second recess formed therein through the outer surface, the second recess extending parallel the first axis the length of the cavity on the opposite side of the first axis from the first recess between the first and second seal lands on the spindle;
a first cylindrical roller having a length equal to the length of the cavity and partly received within the first recess of the spindle for simultaneous contact with the surface of the first recess and the wall of the cavity;
a second cylindrical roller having a length equal to the length of the cavity and partly received within the second recess for simultaneous contact with the surface of the second recess and the wall of the cavity;
means for maintaining a fluid in the spaces between the wall of the cavity and the outer surface of the spindle; and
means for rotating the case and spindle relative each other about the first axis, alignment of the first seal lands on the case and spindle and the second seal lands on the case and spindle temporarily isolating a first pair of chambers formed between the spindle and case from a second pair of chambers formed between the spindle and case to fluidically couple the case and spindle for joint rotation to transfer a torque impulse therebetween until sufficient fluid passes between the first pair of chambers to the second pair of chambers to misalign the seal lands and decouple the case from the spindle.

4,836,297

HANDHELD PORTABLE TOOL HAVING AN INTERNAL COMBUSTION ENGINE

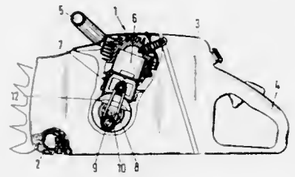
Wolfgang Dorner, Rottenburg am Neckar; Helmut Lux, Bittenfeld, and Reinhold Fink, Fellbach, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Vaiblingen, Fed. Rep. of Germany

Filed Dec. 19, 1986, Ser. No. 943,761

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1985, 3546029

Int. Cl.[4] E21B *3/00*

U.S. Cl. 173—162.1 **13 Claims**



1. A handheld portable tool such as a chain saw, cutoff machine, brushcutter or the like, comprising:
- a drive assembly wherein vibrations are generated;
- at least one handle for manually holding and guiding the tool;
- damping means interconnecting said drive assembly and said handle for attenuating said vibrations so as to transmit attenuated vibrations to a person holding the tool at said handle;
- said drive assembly including a single-cylinder internal combustion engine having a reciprocating piston and a cylinder within which said piston reciprocates during the operation thereof;
- said cylinder defining a longitudinal axis and said piston moving between a top dead center position and a bottom dead center position as it actuates said crankshaft;
- a crankshaft defining an axis of rotation and being connected to said piston and a plurality of parts fixedly attached to said crankshaft to conjointly define a unit therewith; and, a counterbalancing structure disposed on said unit for counterbalancing said piston thereby equalizing mass for said piston during operation of said engine;
- imbalance means disposed on said unit at a predetermined position thereon to effect an imbalance of said crankshaft and being of a predetermined quantity for causing a reduction of said attenuated vibrations sensed in said handle; and,
- said imbalance means being an imbalance weight mounted on said unit so as to be at an angle with respect to said longitudinal axis of from 45° to 135° when said piston is at said top dead center position.

4,836,298

BOAT OF THE CATAMARAN TYPE, PROPELLED MECHANICALLY

Jacques-Philippe Laboureau, 24, rue de la Fontainer Billenois, 21000 Dijon, France

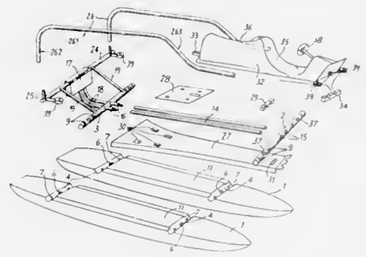
Filed Jan. 29, 1988, Ser. No. 150,399

Claims priority, application France Jan. 30, 1987, 87 01156

Int. Cl.[4] B63B *1/12*

U.S. Cl. 114—61 **20 Claims**

1. A boat of the catamaran type having an outboard motor for mechanically propelling thereof, two identical coplanar and parallel floats, and assembly means for maintaining a seat for the motor and the floats rigidly together; said assembly means comprising:
- two transverse bars disposed perpendicularly to the axis of said floats, one of said transverse bars being a front transverse bar at the front of said floats and the other of said transverse bars being a rear transverse bar at the rear of the said floats, and means for maintaining said transverse bars fast with said floats and dismounting means including slots in said floats;
- a central longitudinal member extending longitudinally between said two floats, for connecting said two transverse bars, at their centre, and dismountable fixing means for said central longitudinal member for blocking the trans-



verse bar at the rear from rotation in order to support the seat of the motor;
- two lateral bows fast with said seat and extending on either side thereof up to said front transverse bar and fixed thereto for absorbing efforts of acceleration and constituting a member for a passenger to hold; and
- lower and upper fairings completing the boat and providing a seating area to sit and control the boat.

4,836,299

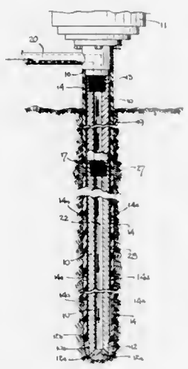
SONIC METHOD AND APPARATUS FOR INSTALLING MONITOR WELLS FOR THE SURVEILLANCE AND CONTROL OF EARTH CONTAMINATION

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Filed Oct. 19, 1987, Ser. No. 110,194

Int. Cl.[4] E21B *7/24*

U.S. Cl. 175—22 **11 Claims**



1. A system for installing monitor wells in the earth for sampling the earthen material therein comprising:
- a first elongated casing of an elastic material, said casing having top and bottom ends and an inner surface,
- a second elongated casing in concentric relationship to said first casing, and loosely held to said first casing,
- a sonic oscillator coupled to the top end of said first casing, said oscillator having a bottom end, and
- a driving end piece removably attached to the bottom end of said first casing and not attached to said second casing, said driving end piece having a top,
- said second casing being retained between the top of said driving end piece and the bottom end of said oscillator,
- said oscillator being operated at a frequency such as to effect resonant standing wave vibration of said first casing thereby to drive said casings into the ground and when said casings have been driven to the desired depth said oscillator being operated to vibrate said first casing to facilitate the removal thereof from the earth while said second casing and said driving end piece are left in place in the ground.

4,836,300

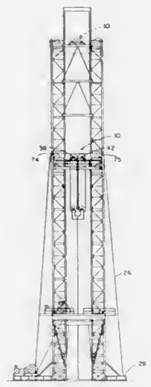
METHOD OF PERFORMING DRILLING OPERATIONS FROM A DERRICK

Lowell M. Reed, Moore, Okla., assignor to Parco Mast and Substructures, Inc., Del City, Okla.

Division of Ser. No. 922,201, Oct. 23, 1986, Pat. No. 4,796,863. This application Jun. 2, 1988, Ser. No. 201,548

Int. Cl.[4] E21B *7/00, 15/00, 19/00;* **B66C** *23/60*

U.S. Cl. 175—57 **3 Claims**



1. A method of performing drilling operations on a derrick having a lower portion and an upper portion in which the lower portion is designed to withstand a much heavier load than the upper portion which comprises:
- providing a crown block at the top of said upper portion of said derrick and supporting a traveling block with cables from said crown block and performing drilling operations;
- removing said crown block and traveling block from said upper portion and securing said crown block to the top of said lower portion of the derrick and performing heavy duty operations with the crown block in this latter position.

4,836,301

METHOD AND APPARATUS FOR DIRECTIONAL DRILLING

Johannes C. M. Van Dongen, and Robert N. Worrall, both of Rijswijk, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 15, 1987, Ser. No. 50,975

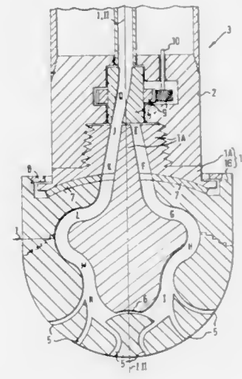
Claims priority, application United Kingdom, May 16, 1986, 8612018

Int. Cl.[4] E21B *7/08*

U.S. Cl. 175—61 **32 Claims**

1. Method of directionally drilling a borehole using a drilling assembly including an apparatus having an upper section with a longitudinal axis, and a lower section having a central axis and including at least part of a rotary drill bit, said sections being interconnected by a universal pivot mechanism, the method comprising rotating the assembly in such a manner that the upper section rotates with the drill string about said longitudinal axis and the lower section rotates about said central axis to drive the rotary drill bit and, simultaneously, during at least part of the drilling operations, tilting said lower section and rotating it in an orbital mode relative to said longitudinal axis at an equal speed and opposite direction from the rotation of the rotary drill bit, thereby orbiting the lower section about the longitudinal axis such that a plane defined by the longitudinal axis and the central axis of the tilted lower section is maintained in a predetermined orientation relative to a reference direction.

7. An apparatus for directional drilling from an end of a rotating drill string, the apparatus comprising:



an upper section having a longitudinal axis and being suitable to be coupled at the lower end of the rotating drill string;
- a lower section having a central axis and suitable for operable connection with a rotary drill bit;
- a universal pivot mechanism interconnecting said upper and lower sections in such a manner that upon pivoting of the universal pivot mechanism during drilling, said central axis of the lower section is pivoted over a small angle relative to the longitudina axis of the upper section while the rotating drill string continues to drive the drill bit; and
- a steering means for rotating the lower section in an orbital mode relative to the longitudinal axis of the upper section and for simultaneously maintaining said central axis of the lower section in a predetermined orientation relative to a reference direction.

4,836,302

APPARATUS AND METHOD FOR REMOVING AND RECOVERING OIL AND/OR OTHER OIL-BASED DRILLING MUD ADDITIVES FROM DRILL CUTTINGS

Joe K. Heilhecker, 4110 Belle Park Dr., Houston, Tex. 77072; Robert E. Williams, 4902 Milam, Houston, Tex. 77006, and William H. Marshall, 305 Mayerling, Houston, Tex. 77024

Continuation-in-part of Ser. No. 937,557, Dec. 3, 1986, abandoned. This application Oct. 5, 1987, Ser. No. 104,838

Int. Cl.[4] B01D *11/00;* **B08B** *3/08;* **C09K** *7/00;* **E21B** *21/06*

U.S. Cl. 175—66 **43 Claims**

1. A process for cleaning oil-based drilling mud from drill cuttings in order to prepare the cuttings for environmentally acceptable disposal, which comprises the steps of:
- a. collecting drill cuttings which are contaminated with drilling mud;
- b. contacting the contaminated drill cuttings with a solvent

for the drilling mud, which solvent is liquid at ambient temperature and pressure, substantially miscible with oil, and substantially immiscible with water, to dissolve drilling mud in the solvent, to provide drill cuttings which are sufficiently free of oily contamination for environmentally acceptable disposal and leaving drilling mud laden solvent;

c. moving the environmentally acceptable drill cuttings to the environment;

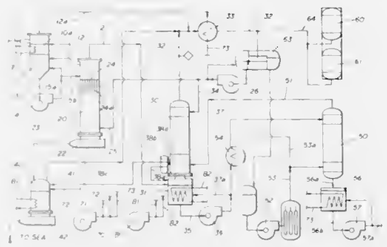
d. heating the drilling mud laden solvent to vaporize the solvent from the drilling mud;

e. recovering the drilling mud for further handling; and

f. condensing the vaporized solvent for recycle in the process by heat transfer with environmentally available fluid at ambient temperatures.

37. Apparatus for cleaning oil-based drilling mud from drill cuttings in order to prepare the cuttings for environmentally acceptable disposal, comprising:

a. means for collecting drill cuttings which are contaminated with drilling mud;



b. means for contacting the contaminated drill cuttings with a solvent which is liquid at ambient temperature and pressure, substantially miscible with oil, and substantially immiscible with water, and having a boiling point between about 100° F. and about 180° F. to dissolve drilling mud in the solvent, to provide drill cuttings which are sufficiently free of oily contamination for environmentally acceptable disposal and leaving drilling mud-laden solvents;

c. means for transporting the environmentally acceptable drill cuttings to the environment;

d. means for heating the drilling mud-laden solvent with engine coolant to vaporize the solvent from the drilling muds;

e. means for recovering the drilling mud for further handling; and

f. means for condensing the vaporized solvent for recycling in the process by heat transfer with environmentally available fluid at ambient temperatures.

4,836,303

DEVICE FOR THE REMOTE ADJUSTMENT OF THE RELATIVE ORIENTATION OF TWO SECTIONS OF A COLUMN

Jean Boulet, Paris, and Pierre Morin Levallois Perret, both of France, assignors to SMF International, Sur Loire and Institut Francais du Petrole, Malmaison, both of, France

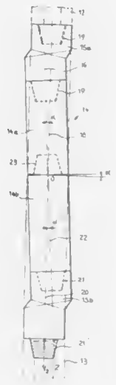
Filed Jun. 29, 1988, Ser. No. 213,088

Claims priority, application France, Jun. 30, 1987, 87 09230

Int. Cl.[4] E21B *7/08*

U.S. Cl. 175—74 **10 Claims**

1. A remote adjusting device in combination with a column comprising a first section having a longitudinal axis and an end, and a second section which has a longitudinal axis, follows on the first section and has an end, for remotely adjusting the orientation of the second section relative to said axis of the first section, said device comprising a variable-angle tubular elbow coupling interposed between and interconnecting said ends of the two sections, said elbow coupling comprising a first rectilinear tubular element having a longitudinal axis and an end portion which is fixed to said end of the first section and a second rectilinear tubular element having a longitudinal axis and an end portion which is fixed to said end of the second section and mounted relative to said first element to be rotatable about an axis making a non-zero angle with said axis of the first section of the column, the device further comprising remote control means for interconnecting in rotation said two



tubular elements, and remote control means for shifting in rotation in a regulated manner said second element relative to said first element, said axis of the first rectilinear tubular element making a non-zero angle with said axis of the first section, detachable rigid tubular elbow couplings for connecting said end portions of the first tubular element and the second tubular element to the corresponding ends of the first section and the second section and for detachably coupling said elbow couplings to each corresponding said end portions of said tubular elements, each of said end portions of the two tubular elements being radially offset relative to said axis of the second section.

4,836,304

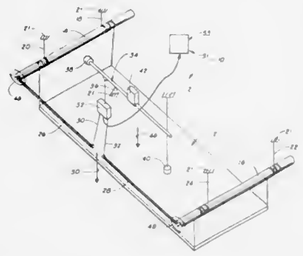
SYSTEM FOR WEIGHING NON-STATIONARY OBJECTS

John Paul, Duncan, Okla., assignor to Adrian J. Paul, Duncan, Okla.

Filed Feb. 9, 1988, Ser. No. 153,983

Int. Cl.[4] G01G *23/10, 19/52*

U.S. Cl. 177—185 **14 Claims**



1. An improvement in a torque suspension weighing scale characterized by a substantially rapid return to relatively stationary weight values to adapt the scale for weighing nonstationary objects on the scale to determine the actual weight of the non-stationary object, wherein a platform is suspended by two bars connected to the platform and to fixed surfaces by flexible cables, the improvement comprising:

a transducer connected to the scale for generating weight signals, each weight signal being indicative of the instantaneous weight at the time generated of the non-stationary object on the scale; and

a weight processor for receiving the weight signals, the weight processor sampling the weight signals at predetermined time intervals, and comparing each sampled weight signal with the next sampled weight signal to determined weight signal differences with a predetermined maximum difference value and using at least some of the weight signals associated with the weight signal difference equal to or less than the maximum difference value to determine the calculated weight of the non-stationary object on the scale, the calculated weight being about equal to the actual weight of the non-stationary object and the weight processor outputting this one calculated weight.

4,836,305

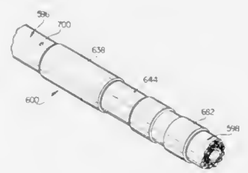
DRILL PIPES AND CASINGS UTILIZING MULTI-CONDUIT TUBULARS

Harry B. Curlett, Dallas, Tex., assignor to Pangaea Enterprises, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 730,831, May 6, 1985, Pat. No. 4,683,944. This application Jul. 30, 1987, Ser. No. 79,461

Int. Cl.[4] E21B *17/02, 17/18*

U.S. Cl. 175—215 **23 Claims**



1. A drill pipe for use in drilling subterranean formations, comprising:

an outer casing threadable at both ends thereof for connection to other similar casings, said outer casing being adapted to withstand torque and tensile loads of other pipes connected thereto;

at least one tubular conduit floating within said outer casing so as to be substantially relieved of tensile loads carried by said outer casing, said conduit adapted for carrying pressurized fluids therethrough;

a coupler for coupling said outer casing to the other similar outer casing of other drill pipes, said coupling having means for transferring torque and tensile loads from one said outer casing to another, and means for supporting the end of said conduit within said outer casing so as to prevent transfer of tensile loads through said conduit; and

means for sealing said conduit to other similar conduits in said other similar outer casing for providing a continuous sealed conduit for carrying pressurized fluids.

4,836,306

DOWN HOLE DRILL CHUCK LOCK

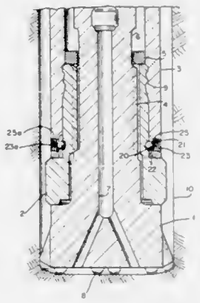
Robert E. Barrows, Fincastle, Va., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Dec. 14, 1987, Ser. No. 132,814

Int. Cl.[4] E21B *10/62*

U.S. Cl. 175—321 **6 Claims**

1. A chuck locking device comprising: a chuck member in threaded engagement with a mating member, each of said members containing a mating thread in cooperating surfaces; said chuck member being provided with a circumferential groove in the cooperating surfaces containing the mating thread; and said mating member having a complimentary and aligned mating circumferential groove opposite said circumferential groove in said chuck member forming a circumferential chamber; and said chamber having inserted therein a plurality of individual and selectively removable freely dispersed locking means whereby said locking means when inserted and freely dispersed in said chamber prevent uncoupling of said threaded engagement.



4,836,307

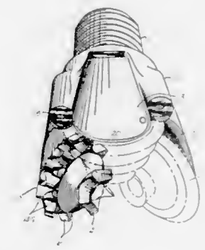
HARD FACING FOR MILLED TOOTH ROCK BITS

Madapusi K. Keshavan, Fullerton, Calif.; Lance D. Underwood, Spring, Tex.; Naresh J. Kar, Westminster, Calif.; Thomas W. Oldham, Mission Viejo, Calif.; Cary A. Roth, Moreno Valley, Calif., and Brian J. Armstrong, Seal Beach, Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Dec. 29, 1987, Ser. No. 139,602

Int. Cl.[4] E21B *10/50*

U.S. Cl. 175—374 **8 Claims**



1. A rock bit comprising:

a rock bit body having means at one end for connecting the bit to a drill string;

at least one cutter cone mounted for rotation on the opposite end of the body;

such a cutter cone comprising a steel body with a plurality of teeth protruding therefrom, at least a portion of the teeth having a wear surface coated with a hard facing composition, the hard facing composition comprising:

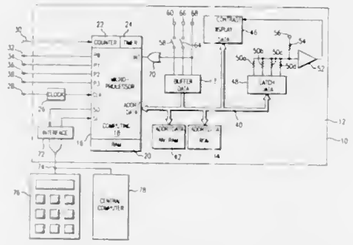
at least 68% by weight of a mixture of tungsten carbide particles and a balance of alloy steel bonding the tungsten carbide particles together and to the steel body, the tungsten carbide particle mixture comprising cemented tungsten carbide particles in the range of from 35% to 80% by weight and single crystal monotungsten carbide in the range of from 20% to 65% by weight.

4,836,308

HIGHLY ACCURATE PLATFORM WEIGHING SYSTEM

Dick E. Davis; Charles R. Brazell both of Arlington, and Jerome E. Johnston, Austin, all of Tex., assignors to General Electrodynamics Corporation, Arlington, Tex.

Filed Apr. 4, 1988, Ser. No. 177,183
Int. Cl.[4] G01G *23/01* G01L *25/00*
U.S. Cl. 177—25.14 **22 Claims**



1. A system for indicating weight of an object, said system comprising:

means for sensing said weight and providing an analog signal having an amplitude responsive to said weight;

conversion means, coupled to said sensing means, for converting said analog signal into a load oscillation signal having a frequency responsive to said weight;

counting means, coupled to said conversion means, for monitoring said oscillation signal to provide a monitored load count which is responsive to said weight;

computing means, coupled to said counting means, for converting said monitored load count into a weight code which is responsive to said weight;

display means, coupled to said computing means, for converting said weight code into a humanly perceptible indication of said weight; and

memory means, coupled to said computing means, for storing a program executable by said computing means and for storing a predetermined number of calibration load counts wherein each calibration load count has a calibration weight associated therewith, said memory means being configured so that when said computing means executes said program, said computing means generates said weight code based upon an interpolation between first and second ones of said calibration weights, said first calibration weight being associated with a first one of said calibration load counts that is greater than said monitored load count, and said second calibration weight being associated with a second one of said calibration load counts that is less than said monitored load count.

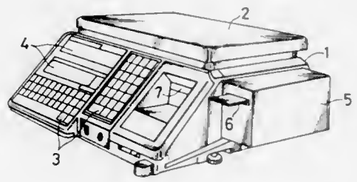
4,836,309

ELECTRONIC WEIGHING INSTRUMENT

Kunikazu Sekioka, Gotenba, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Aug. 26, 1988, Ser. No. 236,713
Claims priority, application Japan, Aug. 27, 1987, 62-213557
Int. Cl.[4] G01G *23/22*; G06K *15/00*; G06F *15/20*
U.S. Cl. 177—25.15 **3 Claims**

1. An electronic weighing instrument, comprising a load detector for detecting a load to develop a digital signal, an IC card at least having a registration memory for commodities and a preset memory provided therein, a commodity designating means for designating a commodity to be weighed, an IC card reading and writing device operable in response to designation of a commodity by said designating means for reading out and writing data of the designated commodity from and into said IC card, a price calculating means for calculating a price of the commodity from a price per unit weight of the commodity read out from said preset memory of said IC card by said reading and writing device and a weight obtained from a digital signal from said load detector, a display unit for indicating at least the weight and the price of the commodity thereon, a registration controlling means for controlling said IC card reading and writing device to register at least a commodity code, the weight, the price per unit weight, and the price of the weighed commodity into said registration memory



of said IC card, a summing up operating means for ending such registration, and a summing up processing means operable upon ending of the registration by said summing up operating means for controlling said IC card reading and writing device to read out the commodity data registered in said registration memory of said IC card and for calculating a sum total of the prices of the commodities and causing said display unit to indicate the sum total thereon.

4,836,310

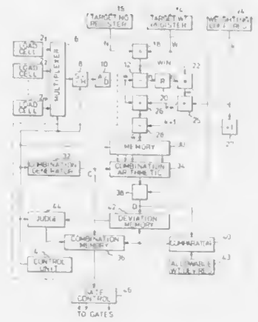
COMBINATION COUNTING AND WEIGHING SYSTEM

Shoji Yamano, Akashi, Japan, assignor to Yamato Scale Company, Limited, Japan

Filed Jun. 9, 1988, Ser. No. 204,684
Claims priority, application Japan, Jul. 3, 1987, 62-167546
Int. Cl.[4] G01G *13/00*
U.S. Cl. 177—25.18 **16 Claims**

9. A combination counting and weighing device for combining batches of articles, each batch including a plurality of articles and each article having a known reference unit weight, to select a combination of batches having a total number of articles and a total weight equal or close to a predetermined target number and a predetermined target weight, respectively, said device comprising

a plurality of weigh units for measuring respective weights of said batches, divider means for dividing the measured weights by said reference unit weight to calculate estimated numbers of articles in respective batches, means for rounding said estimated numbers of articles to convert them into integral numbers, means for weighting said integral numbers with respect to the corresponding estimated numbers to arrive at weighted numbers, and combination arithmetic means for combining said weighted



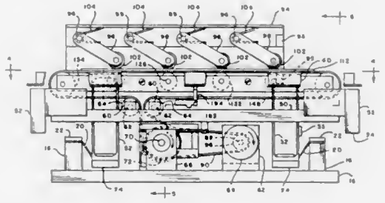
numbers to select a combination having a total number equal or close to said predetermined target number.

4,836,311

OSCILLATING AND LOCKING APPARATUS AND METHOD FOR VIBRATING TRAY WEIGHING SCALE

David W. Hubbard, Stamford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 7, 1988, Ser. No. 141,443
Int. Cl.[4] G01G *19/00, 3/14, 3/08*
U.S. Cl. 177—145 **11 Claims**



1. A scale comprising:

a frame

a base,

a plurality of springs connecting said base to said frame,

a shaft rotatably supported by said frame,

an article supporting tray,

an article conveyor supported by said tray,

at least one flexible member connecting said tray to said base,

a transducer attached to said flexible member,

a reversible motor,

a first pulley coaxially disposed upon said shaft,

a belt providing drive between said motor and said pulley,

a one way bearing mounted between said first pulley and said shaft whereby when said motor drives said first pulley in a first direction said shaft is driven thereby,

a cam mounted on said shaft,

a link supported by said base and having a cam follower in engagement with said cam,

a finger depending from said tray and engageable with said link, whereby upon rotation of said shaft in said first direction said link interacts with said finger to cause oscillation of said tray,

a second pulley disposed about said first pulley and connected to said article conveyor, and

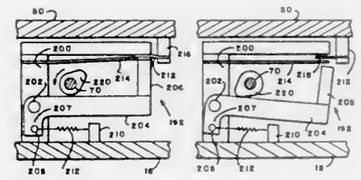
a second one way bearing mounted between said first pulley and said second pulley whereby upon rotation of said first pulley by said motor in a second direction, said second pulley will be driven by said first pulley, to drive said article conveyor whereby articles can be conveyed across said tray upon rotation of said first pulley in said second direction.

4,836,312

OSCILLATING AND LOCKING APPARATUS AND METHOD FOR VIBRATING TRAY WEIGHING SCALE

David W. Hubbard, Stamford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Division of Ser. No. 141,443, Jan. 7, 1988. This application Jan. 9, 1989, Ser. No. 294,624
Int. Cl.[4] G01G *3/14, 23/02*
U.S. Cl. 177—210 FP **4 Claims**



1. A weighing scale comprising:

a frame,

a base,

a plurality of springs connecting said base to said frame,

a shaft rotatably supported by said frame,

an article supporting tray,

a plurality of flexible members connecting said tray to said base,

a transducer attached to one of said flexible members,

a motor supported by said frame and in driving engagement with said shaft,

a cam mounted on said shaft,

a link rotatably supported by said frame, said link being in engagement with said cam,

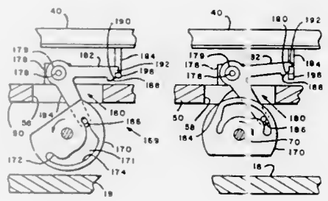
a finger depending from said base,

a leaf supported by said finger and extending between said base and said frame, and

a second leaf supported by said frame and extending between said first leaf and said link,

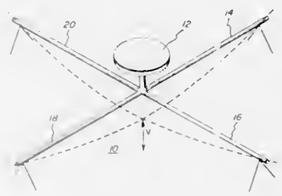
whereby upon said motor driving said shaft said cam will drive said link into engagement with said second leaf to press said first leaf into engagement with said finger.

4,836,313
OSCILLATING AND LOCKING APPARATUS AND METHOD FOR VIBRATING TRAY WEIGHING SCALE
David W. Hubbard, Stamford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.
Filed Jan. 9, 1989, Ser. No. 294,613
Int. Cl.[4] G01G *3/14;* G01L *1/10*
U.S. Cl. 177—210 FP 6 Claims



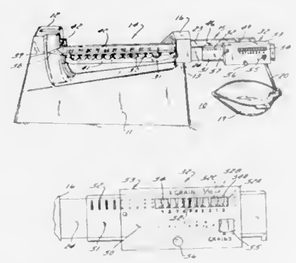
1. A weighing scale comprising:
a base,
an article supporting tray having a finger projecting therefrom,
at least one flexible member connecting said tray to said base,
a transducer operatively connected to said flexible member,
an arm pivotally connected to said base and engageable with said finger,
said arm being operative to move said finger thereby causing said tray to oscillate and generate kinetic energy in said one flexible member.

4,836,314
NOVEL GLASS ELEMENTS FOR USE IN BALANCES
Georg Rupprecht, and Harvey Patashnick, both of Voorheesville, N.Y., assignors to Rupprecht & Patashnick Co., Inc., New York, N.Y.
Filed Jul. 8, 1988, Ser. No. 216,812
Int. Cl.[4] G01G *3/14;* G01L *1/22*
U.S. Cl. 177—210 FP 8 Claims



1. An improved glass element useful in determining the mass of objects by means of measuring an elastic property of said element selected from the group consisting of:
its frequency of vibration,
its amount of bending or deflection, and
its amount of extension, first in the absence of the mass to be determined and second with said mass resting at some point on said element, determining the difference in said property and calculating the mass from said difference in said elastic property wherein said element is comprised of a glass which exhibits an average thermal coefficient of elastic modulus over the temperature range −50° to +150° C. which does not exceed about 10 ppm/°C.

4,836,315
WEIGHING SCALE
Richard J. Lee, 3146 Kettle Moraine Rd., Hartford, Wis. 53027
Filed Jun. 28, 1988, Ser. No. 212,612
Int. Cl.[4] G01G *1/36;* G01C *21/20*
U.S. Cl. 177—247 18 Claims

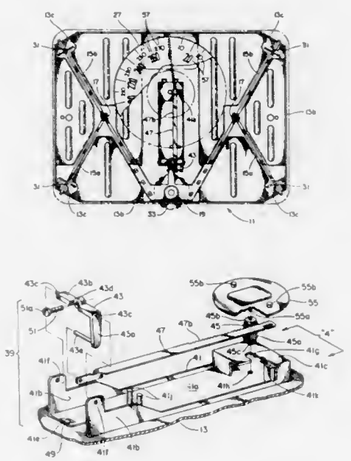


1. A weighing scale comprising:
a base and a balance beam and means supporting said beam for pivoting on said base, a first portion of said beam being on one side of the pivot and a second portion being on the other side,
means on said second portion of the beam for supporting the load to be weighed,
the first portion of said beam having a row of equally spaced apart notches extending lengthwise of said portion and a movable primary poise comprising a ball registrable in any one of said notches, said primary poise serving to counterbalance said load when deposited in a selected one of said notches, and
a second poise mounted slidably on said second portion of the beam.

4,836,316
BATH SCALE
Francesco L. Carnevale, Waynesboro, and Kirk D. Morrow, Meridian, both of Miss., assignors to Sunbeam Corporation, Downers Grove, Ill.
Filed Sep. 28, 1987, Ser. No. 101,619
Int. Cl.[4] G01G *21/08, 23/14*
U.S. Cl. 177—256 13 Claims

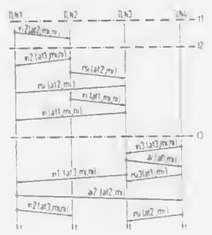
1. A thin bath scale comprising a rectangular support pan having four sides with upstanding walls along each side, a movable load platform substantially coextensive with and spaced above said pan, a load spring having a lower end supported in said pan, force collecting levers supported by said upstanding walls and engaged by said platform, said levers being connected to a spring biasing plate which engages an upper end of said load spring to compress said load spring in proportion to the load applied to said platform, a deflection sensing mechanism including an elongated molded plastic bracket secured to said pan and having a dial support at one end and a bell crank support at the other end, a pinion gear

supported for rotation about a vertical axis in spaced upper and lower bearings formed in said plastic bracket, an indicator dial mounted on said pinion gear under said platform and visible through an opening in said platform, a bell crank journaled for rotation about a horizontal axis in horizontally spaced bearings formed integrally with said other end of said plastic bracket, an



elongated rack member connected to a first arm of said bell crank at one end and having a gear rack engaged with said pinion at the other end whereby rotation of said bell crank rotates said indicator dial, a second arm on said bell crank engaging said biasing plate to cause said dial to respond to deflections of said load spring.

4,836,317
METHOD FOR DISTRIBUTING CURRENT ADDRESS TABLES IN "N" RING-SHAPED NETWORKS
Juergen Straussmann, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed May 12, 1988, Ser. No. 192,900
Claims priority, application Fed. Rep. of Germany, May 14, 1987, 3716183
Int. Cl.[4] H04J *3/00*
U.S. Cl. 178—2 R 4 Claims



1. A method for distributing address tables covering all subscriber equipment addresses of a respective ring-shaped network to all subscriber equipment in the respective ring-shaped network, as well as to n further ring-shaped networks, whereby each ring-shaped network is equipped with a subscriber equipment monitoring the respective ring-shaped network, in which a current address table is prepared after each configuring in the ring-shaped network to be respectively monitored, and each ring-shaped network is connected to a further ring-shaped network by way of at least one switching matrix device serving the purpose of physical and procedural adaptation of two ring-shaped networks, and each subscriber equipment is equipped with an access controller serving the purpose of the respective network access and with further control devices that control internal procedures of the subscriber equipment, with which information having a packet format are formed, are transmitted via ring-shaped networks and with which the received information are further processed dependent on informational content, comprising the steps of:
forming a distribution information having a packet format after the presence of a current address table in a subscriber equipment which monitors a ring-shaped network including distributing the address table, a signaling information indicating the presence of a current address table and a network information that indicates which ring-shaped network the current address table was distributed;
transmitting the distribution information to the subscriber equipment following in the transmission direction, and in that subscriber equipment copying and storing the current address table and the network information and determining whether access to further ring-shaped networks exist via the respective subscriber equipment;
after the determination of such an access, forming a further distribution information in the respective subscriber equipment comprising the current address table, signaling information and a further network information that indicates in which ring-shaped networks the current address table was distributed;
transmitting the last-formed distribution information to the subscriber equipment of the further ring-shaped networks;
copying and storing the current address table and the further network information in each subscriber equipment;
after the receipt of a distribution information, forming a reply information in a packet format in the subscriber equipment of the further ring-shaped networks that respectively monitor a ring-shaped network, including the address table of the further ring-shaped network and a signaling information indicating the reply;
transmitting the reply information to the subscriber equipment that monitors the ring-shaped network and originally forms the current address table;
after the receipt of a reply information addressed thereto, in a subscriber equipment which monitors a ring-shaped network, forming an broadcast information in packet format to include the address table indicated in the reply information and a signaling information containing a copy request;
transmitting the last-formed broadcast packet information to the subscriber equipment following in the transmission direction in the appertaining ring-shaped network and copying and storing in each of the subscriber equipment the last-formed address table.

4,836,318
TRACK ROLLER FRAME ASSEMBLY
Andrew J. Tonsor, East Peoria; David E. Nelson, Peoria; James E. Gee, Washington, and Samuel B. Stevens, Pekin, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.
Continuation-in-part of Ser. No. 90,476, Aug. 28, 1987, Pat. No. 4,781,257. This application Jun. 30, 1988, Ser. No. 213,744
Int. Cl.[4] B62D *55/00*
U.S. Cl. 180—9.5 23 Claims

1. A track roller frame assembly of the type adapted to be connected to a vehicle main frame and adapted to be supported by a plurality of roller wheels, comprising:
a main body including an elongate channel-shaped base

supported by the roller wheels when in use and having first and second end portions, a tubular casing overlyingly connected to the first end portion, and plate means overlyingly connected to the second end portion of the channel-shaped base for forming a tubular beam of increased elevational depth in cross section thereat and a back-up shoulder for strengthening connection with the tubular casing; and

a collar connected to the tubular beam of the main body and defining a transverse opening therethrough.

4,836,319

STEERING CONTROL APPARATUS FOR MOTOR VEHICLES

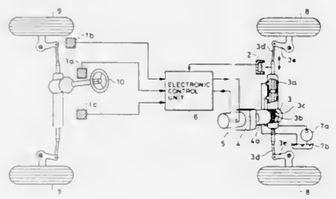
Satoshi Haseda, Oobu; Yoshihiko Tsuzuki, Toyota; Yoshimune Konishi, Okazaki, and Motoshi Suzuki, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 20, 1987, Ser. No. 75,837

Claims priority, application Japan, Jul. 22, 1986, 61-172448; Aug. 9, 1986, 61-187158

Int. Cl.[4] B62D *5/04*

U.S. Cl. 180—142 **14 Claims**



1. A steering apparatus for use in a motor vehicle, comprising:

steering mechanism means for regulating a steering angle of a wheel of said motor vehicle in accordance with an input signal thereto;

first detection means for detecting a travelling state of said motor vehicle and generating a signal indicative of the detected vehicle travelling state;

second detection means for detecting an actual steering angle made by said steering mechanism means and for generating a signal indicative of the detected actual steering angle;

target steering angle setting means responsive to the vehicle travelling state signal for determining a target steering angle on the basis of the detected vehicle travelling state and for generating a signal indicative of the determined target steering angle;

error calculating means responsive to the actual steering angle signal and the target steering angle signal for obtaining the difference (X1) between the determined target steering angle and the detected actual steering angle and for generating a signal indicative of the obtained difference (X1);

angular velocity calculating means for calculating a steering angular velocity (X2) on the basis of the actual steering angle signal from said second detection means and for generating a signal indicative of the calculated steering angular velocity (X2);

control means responsive to said difference indicating signal from said error calculating means and said steering angular velocity indicating signal from said angular velocity calculating means for outputting a control signal representing a command value (If), said control means including:

first calculating means for calculating the relative relationship on a coordinate axis between the obtained difference (X1) and the calculated steering angular velocity (X2), the relative relationship being expressed by a line which passes through the origin of said coordinate axis to allow both the obtained difference (X1) and calculated steering angular velocity (X2) to assume zero; and

second calculating means for calculating said command value (If) so that both the obtained difference (X1) and calculated steering angular velocity (X2) are respectively converged to zero in accordance with said line representing the relative relationship therebetween; and

drive circuit means responsive to said control signal from said control means for outputting a drive current as said input signal to said steering mechanism means so as to regulate the steering angle of said motor vehicle wheel.

4,836,320

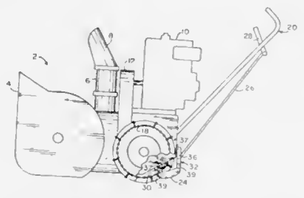
TURNING APPARATUS FOR HANDLE-OPERATED EQUIPMENT

George H. Sundin, 2612 Anderson Rd., Duluth, Minn. 55811

Continuation-in-part of Ser. No. 886,118, Jul. 16, 1986, abandoned. This application Jan. 25, 1988, Ser. No. 148,117

Int. Cl.[4] B62B *1/16*

U.S. Cl. 180—19.1 **23 Claims**



22. Turning apparatus for equipment including a pair of coaxially mounted support wheels and at least one of which support wheels is power driven comprising:

(a) a ground engageable pad mounted to said equipment; and

(b) means coupled to an equipment power source for selectively extending said pad into ground-contacting engagement to raise at least one of said support wheels from ground contact such that a ground engaging power driven support wheel drives said equipment about a substantially fixed pivot axis formed at a point of contact between the pad and the ground, to vary the direction of apparatus travel, said point of contact being located in the ground area defined substantially between the boundaries of said support wheels.

4,836,321

BRACING OF VEHICLE BODY STRUCTURES ON A RESILIENTLY MOUNTED FRONT ENGINE MOTOR VEHICLE

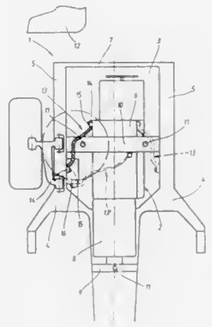
Karl-Heinz Baumann, Bondorf, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 22, 1988, Ser. No. 171,804

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710808

Int. Cl.[4] B60K *28/00*

U.S. Cl. 180—232 **9 Claims**



1. Bracing structure for a vehicle having a resiliently front mounted engine and vehicle body structures which are deformed with absorption of energy upon collision and which has a longitudinally extending tension band means fastened at one end to the engine and at another end to the vehicle body structure located laterally adjacent the engine for resisting excess deformation of the vehicle body structure by a collision;

said tension band means comprising a flexible tension cable at least along a part of its length and being tensioned between its end fastenings by absorption of collision forces after an initial partial deformation of the vehicle body structure to which the other end is connected.

4,836,322

POWER TRANSMISSION SYSTEM FOR A FOUR-WHEEL DRIVE VEHICLE

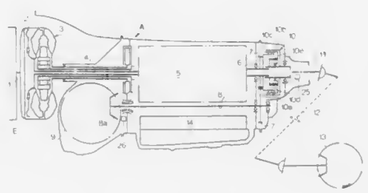
Ryuzo Sakakiyama, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1988, Ser. No. 159,640

Claims priority, application Japan, Feb. 27, 1987, 62-046600

Int. Cl.[4] B60K *17/34*

U.S. Cl. 180—247 **8 Claims**



1. In a power transmission system for a four-wheel drive vehicle powered by an engine, having an automatic transmission for operatively transmitting power of the engine to main and auxiliary driving wheels of the four-wheel drive vehicle, vehicle driving condition detecting means for detecting driving conditions of the engine and transmission, shift range detecting means to detect a shift range of the transmission, idle speed detecting means to detect idling speed of the engine, throttle position detecting means for detecting opening degree of a throttle valve mounted on the engine, oil temperature detecting means for detecting oil temperature of the engine, and first and second vehicle speed calculating means for calculating vehicle speed responsive to speed of the main and auxiliary driving wheels, respectively, and transfer clutch means for continuously and variably transmitting the power of the engine to the auxiliary driving wheels simultaneously with transmission of the power to the main driving wheels via the transmission in dependency on the driving conditions to provide four-wheel driving, the improvement of the system which comprises,

fail safe control means for producing an output signal to disengage said transfer clutch means when at least one of said detecting means breaks down, so as to establish two-wheel driving at a malfunction of said at least one detecting means.

4,836,323

VEHICULAR VOLTAGE REGULATING SYSTEM

Sachiro Kataoka, Ebina; Yoichi Iizima; Masaji Kuwahara, both of Tokyo; Seiei Takeoka, and Kazuzi Katsutani, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Niles Parts Co., Ltd., Tokyo, both of, Japan

Filed Sep. 24, 1987, Ser. No. 100,375

Claims priority, application Japan, Sep. 26, 1986, 61-227823

Int. Cl.[4] B60R *21/00*

U.S. Cl. 180—270 **8 Claims**

8. A vehicle voltage regulating system for a vehicle having an ignition switch and an on-board electronic control device required to operate even when the ignition switch is in an OFF state, said vehicle voltage regulating system comprising:

means for supplying a first voltage directly from an on-board battery of the vehicle during the OFF state of the ignition switch;

means for detecting a starting operation for the on-board electronic control device during the OFF state of the ignition switch and outputting a first signal, said detecting means including a switch which is adapted to be turned ON upon the starting operation for the on-board electronic control device;

means for commanding voltage regulation by outputting a second signal for a predetermined time from a time at which said detecting means outputs said first signal, said voltage regulation commanding means including at least one capacitor connected to said switch and a line connected to the battery and said first voltage regulating means; and

means for regulating the first voltage fed from said first voltage supplying means into a second voltage at a predetermined level and supplying the second voltage to the on-board electronic control device in response to the

second signal from said voltage regulation command means.

4,836,324

SADDLE TYPE VEHICLE RUNNING ON UNEVEN GROUND

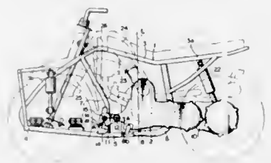
Masataka Morita, Hamamatsu; Masao Ishihara, Innasa, and Mitsuru Tachikawa, Hamamatsu, all of Japan, assignors to Suzuki Motor Co., Ltd., Japan

Continuation of Ser. No. 934,174, Nov. 20, 1986, abandoned. This application May 12, 1988, Ser. No. 195,452

Claims priority, application Japan, Nov. 27, 1985, 60-266618; Jan. 21, 1986, 61-10740

Int. Cl.[4] B60K *5/00*

U.S. Cl. 180—291 **7 Claims**



3. A saddle type vehicle comprising a support frame having a front and rear end and including a right and left upper frame part each having a downwardly extending front end part, a right and left lower part connected to said upper frame part adjacent the lower end of said upper frame part said left and right lower part being connected together at a rear end proximate a longitudinal central axis of the vehicle and a bridge part connected between the rear end of said lower parts proximate said central axis and the rear end of said upper frame part, front and rear wheels connected to said frame adjacent said front and rear ends, and a rear drive unit including a drive motor and an engine case, a rear wheel shaft axle driven by said motor, an axle housing, a shock absorber connected to said upper frame part pivotally supporting said axle housing on said frame, a chain drive connected between said shaft axle and said motor and a chain case, said drive unit being mounted on the frame at only two axial locations by the engine case having a rear portion connected to the axle housing and a front portion pivotally connected to said support frame by a bracket at a location forward of the wheel base center.

4,836,325

OFF-ROAD VEHICLE

Akito Enokimoto; Eiji Hosoya; Keiji Kasa; Akio Handa; Makoto Ishiwatari, and Kousei Mizumoto, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1987, Ser. No. 112,817

Claims priority, application Japan, Oct. 23, 1986, 61-253379; Oct. 23, 1986, 61-253380; Oct. 23, 1986, 61-253381

Int. Cl.[4] B60K *26/00*

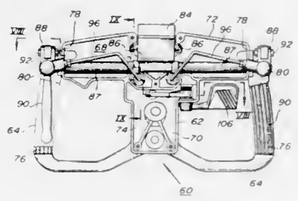
U.S. Cl. 180—333 **3 Claims**

1. A combination steering handle and hydraulic brake operating assembly on an off-road vehicle, comprising:

a steering handle having a base, a rectangular handle portion integral with said base, and a cover covering said base;

a brake operating assembly having a brake oil reservoir, two brake levers pivotally supported on lateral sides of said handle portion for braking front and rear wheels, respectively, and two brake master cylinders communicating with said brake oil reservoir through hoses and responsive to operation of said brake levers for generating hydraulic pressure;

said brake oil reservoir being centrally fixedly mounted on said rectangular handle portion; and



said brake master cylinders being fixedly mounted respectively on said lateral sides of said handle portion.

4,836,326

OPTIMAL SHADOW OMNIPHONIC MICROPHONE AND LOUDSPEAKER SYSTEM

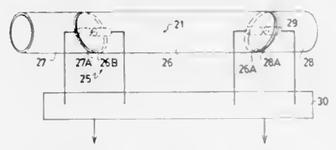
Raymond Webner, 241 Eveline Street, Selkirk, Manitoba, Canada R1A 1L7

Filed Jul. 14, 1987, Ser. No. 73,146

Claims priority, application United Kingdom, Jul. 23, 1986, 8617953

Int. Cl.[4] H05K *5/00*

U.S. Cl. 181—144 **14 Claims**



1. An optimal shadow omniphonic microphone and loudspeaker system comprising in combination an omniphonic microphone component, a speaker component and electronic means coupling the microphone and speaker components for processing signals from the microphone component and transmitting signals to the speaker component said microphone component including a substantially cylindrical module with a longitudinal axis and comprising a centre section with two elliptical outer end faces and two end sections at opposite ends of the centre section in longitudinal alignment therewith, each end section having an elliptical inner end face confronting a respective one of the outer end faces of the centre section each said inner end face and the outer end face confronted thereby lying in substantially parallel, spaced planes oriented at an angle of approximately 35° 16' to the axis of the module, the planes containing the outer end faces of the centre section being oriented at an angle of approximately 70° 32' with respect to one another and each elliptical end face of the centre section and the end sections having a long axis oriented at approximately 45° to a horizontal plane, and a transducer situated centrally in each of said outer end faces of said centre section and said inner end faces of each of said end sections.

4,836,327

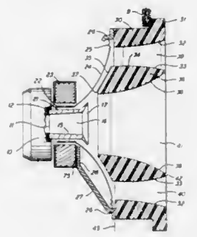
SOUND REINFORCEMENT ENCLOSURE EMPLOYING CONE LOUDSPEAKER WITH ANNULAR CENTRAL LOADING MEMBER AND COAXIALLY MOUNTED COMPRESSION DRIVER

Anthony J. Andrews, Capel; Toby C. Hunt, Rusper, and John Newsham, London, all of England, assignors to Turbosound Limited, England

Filed Nov. 12, 1986, Ser. No. 929,987

Int. Cl.[4] H05K *5/00*

U.S. Cl. 181—152 **12 Claims**



1. A sound projection assembly comprising a housing defining a longitudinally extending channel enclosing a free space, said channel having an acoustically open front end and an acoustically closed rear end and acoustically closed sides; a loudspeaker having a centerdriven cone diaphragm, said cone diaphragm defining a substantially frustoconical shape thereby defining a substantially frustoconical volume and operating into the channel at the rear end of said channel; and a coaxial longitudinally extending member within the channel directly in front of the loudspeaker to restrict the free space within the channel, said member having a longitudinal axis and further having exterior sides, said exterior sides and said acoustically closed sides of said housing defining an annular region extending from said volume to said acoustically open front end, said channel increasing in cross-sectional area toward said open front end, said member having a rear portion, which is tapered towards said loudspeaker and projects into said volume, said member further including at least one coaxial longitudinally extending passageway, said passageway increasing in cross-sectional area toward said open front end and extending between said volume and said acoustically open front end, said passageway opening rearwardly centrally into said volume along the longitudinal axis of said member.

4,836,328

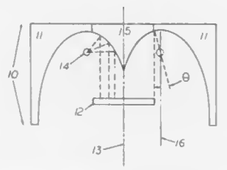
OMNIDIRECTIONAL ACOUSTIC TRANSDUCER

Michael W. Ferralli, 10580 East Lake Rd., North East, Pa. 16428

Filed Apr. 27, 1987, Ser. No. 42,981

Int. Cl.[4] H05K *5/00*

U.S. Cl. 181—155 **9 Claims**



1. A transducer which comprises, in combination, an acoustic transducing means for generating acoustic radiation and an acoustically reflective shell wherein said shell comprises at least a section that forms a parabolic structure having a focus and vertex, that generates a continuum of parabolas when rotated about a straight line, defined as an axis of rotation, which is parallel to and distinct from a separate straight line which passes through both the focus and the vertex of said parabolic structure, said separate straight line being defined as a major axis of the parabolic structure, and such that one resultant surface of said acoustically reflective shell is that of at least a section of a surface formed by the continuum of said parabolas radially distributed about said axis of rotation, said axis of rotation being parallel to the said major axis of said parabolic structure, and such that focal points of the continuum of said parabolas, being distinct from one another, form a curve, said curve being referred to as a distinct focal curve, and such that the said major axis of the parabolic structure, being rotated about the said axis of rotation forms a continuum of major axes, and wherein said acoustic transducing means is located about the said distinct focal curve so that the acoustic radiation produced therefrom travels from any point on said transducer to the acoustically reflective shell and thence forms an acoustic wave charcterized by a wavefront which constitutes a plane surface, referred to as a plane wavefront, and such that all acoustical radiation emanating from any point on said transducer, being in phase, produces acoustic radiation characterized by a plane wavefront.

4,836,329

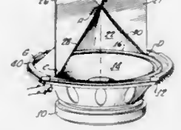
LOUDSPEAKER SYSTEM WITH WIDE DISPERSION BAFFLE

Arnold I. Klayman, Huntington Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 21, 1987, Ser. No. 76,242

Int. Cl.[4] H05K *5/00*

U.S. Cl. 181—155 **36 Claims**



1. A wide angle dispersion speaker system comprising:

a speaker having a sound radiating element defining a speaker aperture having a plane, said sound radiating element having a circular periphery of a first diameter and having a radiation axis normal to said plane along which axis sound is projected from the sound radiating element, and

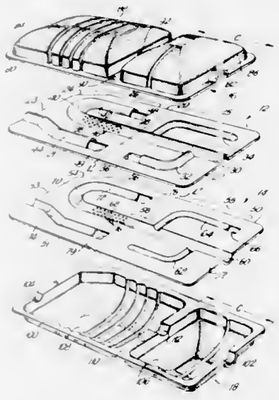
reflector means connected to the speaker of redirecting sound from the speaker in a plurality of directions extending at an angle to said radiation axis, said reflector means comprising a reflective surface having a convex section spaced from the speaker aperture and a concave section extending substantially from the speaker aperture to said convex section, said concave section having an inner edge extending along part of a circle having a diameter not less than said first diameter.

4,836,330

PLURAL CHAMBER STAMP FORMED MUFFLER WITH SINGLE INTERMEDIATE TUBE

Jon W. Harwood, and Mark S. Kimmet, both of Toledo, Ohio, assignors to AP Industries, Inc., Toledo, Ohio

Filed Aug. 3, 1988, Ser. No. 227,759
Int. Cl.[4] F01N *1/02, 7/18*
U.S. Cl. 181—282 17 Claims



1. A stamp formed muffler comprising:

first and second plates secured in face-to-face relationship, said plates being stamp formed to define arrays of channels disposed in generally opposed relationship such that the channels of one plate and the channels of the other plate define first and second spaced apart arrays of tubes and a single intermediate tube extending between and connecting said first and second arrays, one said array of tubes comprising an inlet tube to the muffler, and the other of said arrays comprising an outlet tube from the muffler; and

at least one external shell having a peripheral portion secured to said internal plates, said external shell being formed to define a plurality of chambers extending from said peripheral portion, said chambers being separated from one another by a crease connecting spaced apart peripheral portions on said external shell, said crease being characterized by only one outwardly convex portion disposed to engage said intermediate tube, portions of said crease being generally planar intermediate said convex portion and said peripheral portion of the shell.

4,836,331

LADDER SAFETY DEVICE ANTISLIP

Paul T. Foradori, 7427 Lincolnshire La., Parma, Ohio 44134

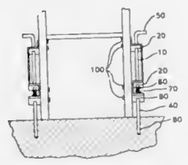
Filed May 12, 1988, Ser. No. 192,969
Int. Cl.[4] E06C *5/36*
U.S. Cl. 182—107 5 Claims

1. A device attachable to the stiles of a ladder to stabilize said ladder against slipping, said device comprising:

a. a ground-penetrating spike of substantially circular cross-section and having a keylike protruberance at a point along the length thereof;

b. an elongated bent metal strip attachable to the stiles of a ladder, said strip having openings to receive attaching bolts and openings to guide said spike for axial and rotational motion thereof, one of said openings having a keyway to selectively permit or prevent passage of said keylike protuberance;

c. a compression harbor formed by said metal strip, said harbor comprising a retaining ring surrounding said spike and adjacent said keywayed opening, wherein said ring is biased by a spring means to engage said protruberance and to hold it against a surface of said strip when said spike is in a retracted non-use position, thereby to frictionally restrict rotational motion of said spike thus to stabilize said spike in a non-use position;



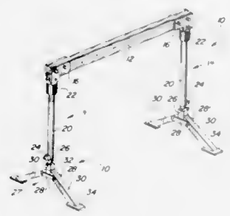
d. a handle fixedly attached to said spike substantially orthogonal thereto and useful for moving said spike in axial and rotational motion, said handle may be formed by bending said spike.

4,836,332

FOLDABLE SAWHORSE

Robert M. Henson, 9170 State Hwy. 208, San Angelo, Tex. 76905

Filed Apr. 22, 1988, Ser. No. 184,674
Int. Cl.[4] B27B *21/00*; B25H *1/06*
U.S. Cl. 182—155 14 Claims



1. A sawhorse of the type having a horizontal central member supported by a support assembly at each end thereof; each said support assembly having an upper end hinged to the marginal end of the horizontal member, each support assembly is foldable towards one another from a load bearing into a storage configuration to present a small compact package;

each said support assembly comprises a bracket at the upper end thereof which is removably attached to the opposed ends of said horizontal member; an extension member pivotally attached to said bracket, means latching said extension member to said bracket to selectively prevent relative movement therebetween;

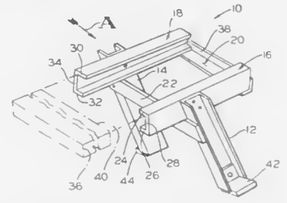
said support assembly terminates in a base, said base includes a pair of legs, a toggle assembly by which said legs are pivotally attached to the lower end of said extension member; the legs of each base are pivotally attached to the end of the extension and are foldable towards the extension.

4,836,333

SUPPORTING ELEMENT

Ronald T. Twigger, 19 Adelaide Close, Durrington, Worthing, England

Continuation-in-part of Ser. No. 76,042, Jul. 21, 1987, Pat. No. 4,757,877. This application Apr. 15, 1988, Ser. No. 182,164
Claims priority, application United Kingdom, Feb. 2, 1988, 1048192
Int. Cl.[4] B27B *21/00*
U.S. Cl. 182—186 12 Claims



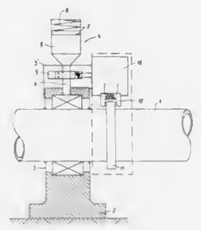
1. A support element for an end of an elongate board or the like, comprising a pair of legs and a pair of elongate channel-section bars each having a medial web and a pair of flanges perpendicular thereto, the said bars extending generally horizontally in use with their webs in vertical planes spaced by a distance substantially equal to the width of the board and their flanges in two horizontal planes spaced by a distance substantially equal to the thickness of the board, a transverse end stop positioned between said horizontal planes at one end of the said pair of parallel bars, and said legs extending downwardly from the respective bars, in use, to terminate in, or pass through, a vertical plane transverse to the bars which passes through the end stop, said legs being joined by a transversely extending member positioned intermediate the lengths of the legs.

4,836,334

LUBRICATING DEVICE

Johan C. M. Bras, Tricht, Netherlands, assignor to SKF Industrial Trading and Development Co., B.V., Netherlands

Filed Jun. 1, 1987, Ser. No. 56,043
Claims priority, application Netherlands, Jun. 25, 1986, 8601665
Int. Cl.[4] F16N *11/04*
U.S. Cl. 184—45.1 1 Claim



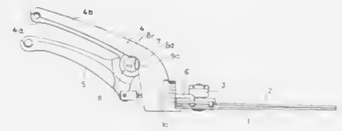
1. Device for supplying a lubricant to a mechanism, in particular a rolling bearing, comprising a container for holding a quantity of lubricant under pressure, which container at its lower edge is provided with a discharge channel for the lubricant to lubricate said mechanism and wherein a spring-loaded piston-like element is located in said container in such a fashion that the force of the spring presses this element in the direction of the discharge channel, characterized in that in the discharge channel (6) is mounted a valve member (9), normally found in the closed position to cooperate with said piston-like element to form a pressurized container, which valve member (9) is coupled with an electrical circuit timing control means (10) which upon excitation controls the valve member using a timer at intervals bringing this valve member into the open and again into the closed position to thereby deliver a quantity of said lubricant from said pressurized container, said electrical circuit being energized solely by means (11, 12) on the bearing shaft assembly (3) for generating, upon rotation of the shaft (1), electrical energy for feeding the circuit (10), characterized in that about the shaft (1) is mounted a ring (11) having magnets, and the housing (3') of the bearing (3) is connected with a coil (12) cooperating with this ring to generate said electrical energy only during rotation of the shaft, whereby said device supplies lubricant to said mechanism during said intervals only when said shaft is rotating for sufficient time to generate electrical energy.

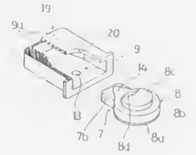
4,836,335

ARRANGEMENT FOR HOLDING OIL SUPPLY IN SHARP-EDGED TOOLS

Kimikazu Ishida, and Tsuneo Ishida, both of Miki, Japan, assignors to Saboten Co., Ltd., Hyogo, Japan

Filed May 23, 1988, Ser. No. 197,687
Claims priority, application Japan, Feb. 25, 1988, 63-24804[U]
Int. Cl.[4] F16N *19/00*
U.S. Cl. 184—102 5 Claims





1. An arrangement for holding an oil supply in a sharp-edged tool characterized in that said arrangement comprises:

an oil supply including an oil absorber and a holder, said holder holding therein said oil absorber such that at least a part of said oil absorber extends out of said holder, said oil absorber being made from materials which absorb oil; and

a recess provided in said sharp-edged tool so that said oil supply is removably set therein, said recess of said sharp-edged tool comprising:

a top wall a part of which is cut away so that a part of the upper surface of said holder can be seen from the outside;

a concave or convex area provided on the bottom surface of said holder;

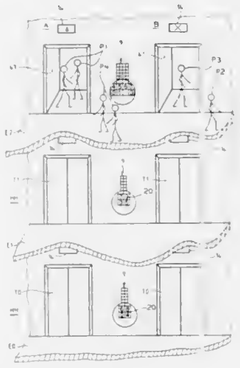
a convex or concave area provided on the bottom of said recess so that said convex or concave area meshes with the concave or convex area formed on the bottom surface of said holder.

4,836,336

ELEVATOR SYSTEM FLOOR CALL REGISTERING CIRCUIT

Joris Schroder, Lucerne, Switzerland, assignor to Inventio AG, Hergiswil, Switzerland

Filed Jul. 12, 1988, Ser. No. 217,833
Claims priority, application Switzerland, Jul. 13, 1987, 02663/87
Int. Cl.[4] B66B 1/18
U.S. Cl. 187—121 16 Claims



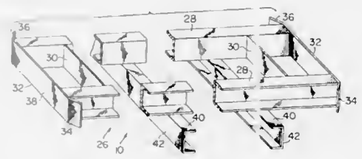
1. In an elevator installation which includes at least one elevator having a car provided with at least one compartment, wherein at least one main stopping location and a number of adjacent floors are provided, and command input devices are present for the calling of cars to the floors and for the input of travel destination wishes and the elevator carries out only travel wishes to one certain group of destination floors, the improvement comprising: the command input devices are call registering circuits arranged externally of the car on the floors and including circuit means for the prevention of the execution of travel wishes at least in the direction of travel away from the main stopping location to destination floors lying outside the certain group of destination floors.

4,836,337

VEHICLE CHOCKING DEVICE FOR FLATBED CARRIER

Robert E. Borrelli, 11 Timothy Dr., North Haven, Conn. 06473

Filed Apr. 17, 1987, Ser. No. 40,180
Int. Cl.[4] B60P 7/08; B60T 3/00
U.S. Cl. 188—32 17 Claims



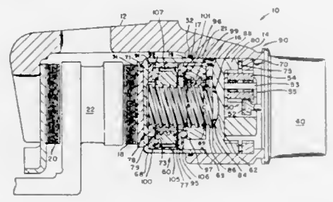
1. A chocking device for restraining a vehicle against lateral movement relative to a flatbed carrier having a horizontal vehicle supporting deck including an upwardly facing deck surface and having an opening therethrough, a pair of parallel support beams extending longitudinally of said carrier below and in supporting relation to the deck, the support beams being laterally spaced apart and defining opposing laterally inwardly facing abutments, said chocking device comprising a frame for positioning adjacent the deck surface to extend laterally of the deck and across the opening, chocking members supported at laterally opposite ends of said frame and defining laterally outwardly facing chocking surfaces for engaging the inner surfaces of a pair of laterally opposite wheels or tracks on a vehicle supported on the deck, and restraining means attached in fixed position to said frame and depending from said frame for extending through the opening and engaging the abutments to restrain said frame against lateral movement relative to the deck whereby said frame restrains the vehicle against lateral movement relative to the flatbed carrier.

4,836,338

ELECTRICALLY OPERATED DISC BRAKES

Alistair G. Taig, Edwardsburg, Mich., assignor to Allied-Signal Inc., Morristown, N.J.

Filed Apr. 19, 1988, Ser. No. 183,129
Int. Cl.[4] F16D 55/08
U.S. Cl. 188—72.1 17 Claims



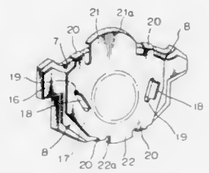
1. A disc brake that may be operated by motor means, comprising a caliper having a bore with an actuating mechanism disposed therein, the actuating mechanism and caliper actuatable to displace a pair of friction elements into engagement with a rotor, the actuating mechanism including a one way clutch mechanism connected with a drive shaft of said motor means, the clutch mechanism comprising the drive shaft having a transverse drive pin extending therefrom, the drive shaft and drive pin received within a drive member which has radially extending drive slots, the drive pin extending through said drive slots, a cage member disposed about said drive member and having therein a pair of oppositely disposed radial cage slots, the drive pin extending into the radial cage slots, the drive member including cam surfaces thereabout receiving bearing means thereat, and a housing disposed about said cage member and having an interior surface engaged by said bearing means, whereby rotation in one direction of said drive member by the actuating mechanism causes said bearing means to engage between said cam surfaces and interior surface of the housing in order to fix nonrotatably the drive member, and rotation of the drive member by the drive shaft in the one direction causes said drive pin to engage radial abutment surfaces of the radial cage slots to effect rotation of the cage member and cause said bearing means to move to non-engagement with said housing and permit continual rotation of said drive member in the one direction to effect operation of the actuating mechanism.

4,836,339

DISC BRAKE HAVING SHIELD PORTIONS FOR SHIELDING A BOOT

Kinzo Kobayashi, Kanagawa, and Shinichi Nakayama, Tokyo, both of Japan, assignors to Tokico Ltd., Kanagawa, Japan

Filed Aug. 6, 1987, Ser. No. 82,357
Claims priority, application Japan, Sep. 18, 1986, 61-143428[U]
Int. Cl.[4] F16D 65/02, 65/14, 65/78
U.S. Cl. 188—73.1 4 Claims



1. A disc brake comprising:
a carrier member;
a disc, and a pair of friction pads each of which is disposed on a respective side of said disc,
said friction pads slidably supported by said carrier member for sliding in an axial direction extending coincident with a central axis of said disc, one of said friction pads having a backing member;
a caliper having a cylinder portion, said caliper slidably mounted to said carrier member and straddling said disc for sliding in said axial direction, and support pins slidably mounting said caliper to said carrier member, a sliding contact area over which said caliper is slidable being defined between the support pins and said caliper;
a piston slidably mounted in the cylinder portion of said caliper for sliding along a sliding contact area defined between said cylinder portion and the piston, said piston facing said one of said respective friction pads at a side thereof opposite the side of said disc on which said one of said friction pads is disposed;
boot means shielding at least one of said sliding contact areas;
a shim means clamped to said backing member, said shim means consisting of an elastic shim member and a cover shim, said elastic shim member disposed between said cover shim and said backing member,
said elastic shim member including a projection extending from a surface thereof, and
said cover shim having a portion engaging the projection of said elastic shim member, a plurality of leg portions extending toward said backing member and clamping said shim means to said backing member, and a shielding portion shielding said boot means from matter generated by contact between said disc and said pads and scattering therefrom.

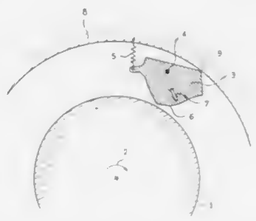
4,836,340

ANTI-BACKLASH DEVICE FOR A PUMP SHAFT

Jean-Jacques Falbierski, Jeumont, France, assignor to Jeumont-Schneider Corporation, Puteaux Cedex, France

Continuation of Ser. No. 318,592, Nov. 5, 1981, abandoned. This application Apr. 13, 1984, Ser. No. 599,218
Claims priority, application France, May 6, 1980, 80 10032
Int. Cl.[4] F16D 63/00
U.S. Cl. 188—82.34 3 Claims

1. In a pump having a fixed member, a pump shaft disposed within and spaced from the fixed member, and rotatable in a predetermined direction relative to the fixed member to cause fluid to flow in the space between the fixed member and the pump shaft, an anti-backlash device having, in combination, asymmetrical idler means pivotable about a fixed axis within said space, resilient means producing a restoring force tending to press the idler means against the pump shaft, and fin means secured to the idler means and extending into the path of said fluid flow and adjusted to cause the fluid flow to produce a force upon the fin means sufficient to generate a moment with respect to said axis of the idler means that slightly exceeds that generated in the opposite direction by the said restoring force, said moment being sufficient to maintain the idler means away from the pump shaft and thus to prevent friction between the pump shaft and the idler means, the restoring force of the resilient means pressing the idler means against the pump shaft, in the absence of said moment, in order to brake the pump shaft.

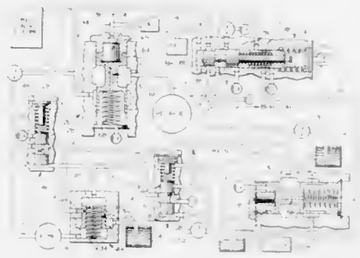


4,836,341

CONTROL SYSTEM FOR A HYDRAULIC RETARDER

Arthur Hall, III, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 27, 1988, Ser. No. 213,021
Int. Cl.[4] A61D 57/00; B60T 13/16, 41/24
U.S. Cl. 188—290 3 Claims



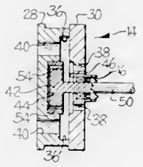
1. A hydraulic retarder and control in a vehicle having an output drive means, said control comprising: a fluid reservoir; hydraulic pump means having a fluid inlet and a fluid outlet and being drivingly connected with the output drive means for providing hydraulic fluid; hydraulic retarder means for assisting in braking the vehicle when an operator brake demand is present; retarder valve means for directing fluid from said fluid outlet of said hydraulic pump means to said hydraulic retarder means when the brake demand is present; and control valve means for connecting said pump means fluid inlet with said retarder means and said pump means fluid outlet with said reservoir when the brake demand is not present, and for connecting said fluid inlet to said reservoir and said fluid outlet to said retarder valve means when the brake signal is present, said pump means drawing fluid for lubrication through said retarder means and causing a pressure less than atmospheric to be present in said retarder means when the brake demand is not present.

4,836,342

CONTROLLABLE FLUID DAMPER ASSEMBLY

Paul T. Wolfe, Apex, N.C., assignor to Lord Corporation, Erie, Pa.

Filed Aug. 7, 1987, Ser. No. 83,701
Int. Cl.[4] F16F 9/34
U.S. Cl. 188—319 7 Claims



1. In a controllable fluid damper assembly of the type having a cylinder, a piston mounted within said cylinder for reciprocatory movement along the central axis of said assembly, said piston having a peripheral side wall closely adjacent the inner surface of said cylinder and having opposite ends facing respective ones of the opposite ends of said cylinder, and a piston rod connected to one of said opposite ends of said piston and extending from an end of said cylinder, the improvement comprising:

said piston having therewithin

(a) at least one elongated fluid passageway having opposite sides, said passageway extending transversely of said central axis of said assembly and having terminal opposite end portions adjacent to and spaced inwardly from said peripheral side wall of said piston;

(b) fluid inlet/outlet ports opening from one of said ends of said piston and extending to and communicating with respective ones of said opposite end portions of said passageway;

(c) an outlet/inlet port opening from the other one of said opposite ends of said piston and communicating with said passageway at a location along the length thereof intermediate said opposite end portions of said passageway and spaced from said inlet/outlet ports

(d) a pair of valve seats located upon and recessed within opposite sides of said passageway intermediate the length thereof, said valve seats being in spaced confronting relationship to each other;

valve means for controlling fluid flow through said passageway, said valve means including a valve element mounted within said passageway for movement transversely thereof between said valve seats and between an open-valve position and a closed-valve position, said valve element when in said open-valve position being received by one of said seats and spaced from the other of said seats and permitting relatively free flow of fluid through said passageway between said inlet/outlet ports and said outlet/inlet ports, and said valve element when in said closed-valve position thereof extending between and being received by both of said valve seats and obstructing flow of fluid through said passageway between said inlet/outlet ports and said outlet/inlet port;

said valve element being substantially pressure-balanced in orthogonal directions, having opposite major surfaces extending transversely of said axis of said assembly and confronting respective ones of said valve seats, and having pressure-equalizing opening means extending between and opening from said surfaces for substantially equalizing fluid pressures upon said valve element surfaces;

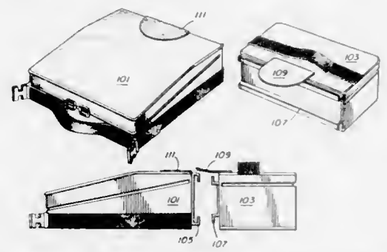
and powered actuator means for controlling said movement of said valve element.

4,836,343

APPARATUS FOR TEMPORARILY ATTACHING ONE ITEM OF LUGGAGE TO ANOTHER

Michel D. Arney, Lowell, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Continuation of Ser. No. 837,694, Feb. 21, 1986, abandoned.
This application Mar. 9, 1988, Ser. No. 166,839
The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.
Int. Cl.[4] A45C 5/06, 13/00, 15/00
U.S. Cl. 190—108 14 Claims



11. Apparatus for temporarily attaching one item of luggage to another item of luggage comprising:

a channel connected to the one item;

channel engaging means connected to the other item for slidably engaging the channel when inserted therein;

a flap which has a first end and a second end, the first end being connected to one of the items; and

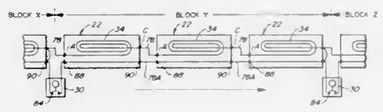
releasable flap engaging means connected to the other item for engaging the second end, the flap bending when the channel engaging means has engaged the channel and the second end is being engaged or disengaged on a line substantially parallel to the line of the motion required to slidably engage the channel engaging means in the channel means.

4,836,344

ROADWAY POWER AND CONTROL SYSTEM FOR INDUCTIVELY COUPLED TRANSPORTATION SYSTEM

John G. Bolger, Orinda, Calif., assignor to Inductran Corporation, Berkeley, Calif.

Filed May 8, 1987, Ser. No. 47,284
Int. Cl.[4] B60L 9/00
U.S. Cl. 191—10 17 Claims



1. An electrical roadway adapted for transmitting power to and controlling inductively coupled vehicles traveling thereon comprising:

a plurality of elongated inductor modules arranged in an aligned end to end spaced apart order to form a vehicle path, each of said modules being disposed within the roadway adjacent to its upper surface and responsive to an electric current flowing therethrough to generate a magnetic field extending above said surface; and

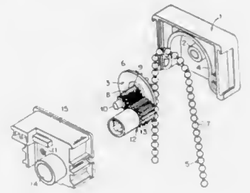
inductively controllable means connected to said modules for preventing full operating electric current from flowing through a selected one or more of said plurality of modules and thereby temporarily deactivating the field generating capacity thereof.

4,836,345

CLUTCH SYSTEM FOR GEAR DRIVE

Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas Inc., Upper Saddle River, N.J.

Filed Mar. 25, 1987, Ser. No. 30,208
Int. Cl.[4] F16D 43/20; E06B 9/36
U.S. Cl. 192—20 10 Claims



1. A clutch system for a gear drive, said clutch system being employed in a vertical blind system, the gear drive having a driving gear and a driven gear which is driven by said driving gear by engagement between the respective teeth of the two gears, each of said gears being rotatable about a respective axis, the clutch system comprising:

(a) a first mount for rotatably supporting one of said gears for rotation about its axis;

(b) a second mount for rotatably supporting the other of said gears for engagement with said one gear and for rotation about its axis, said second mount including:

(i) slot means for supporting said other gear for movement along said slot means in a direction toward and away from said one gear and between a first position engaging said one gear and a second position where said gears are disengaged, the longitudinal axis of said slot means extending in a direction permitting sliding movement of the other gear away from said one gear when the respective teeth of the two gears are in driving engagement with each other;

(c) biasing means for urging said other gear in one direction along said slot means and into said first position; and

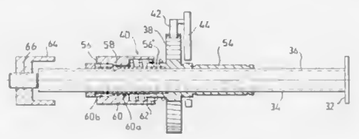
(d) means for rotating said other gear to produce a force urging said other gear along said slot means and towards said second position, said force being of sufficient magnitude to move said other gear toward said second position and out of engagement with said one gear when said one gear is maintained in a static position.

4,836,346

QUICKLY-RELEASABLE CLUTCH

Moshe Berger, Hadera, Israel, assignor to Ariel and Berger Industries Ltd., Hadera, Israel

Filed Dec. 17, 1987, Ser. No. 134,383
Claims priority, application Israel, Apr. 10, 1987, 82156
Int. Cl.[4] F16D 11/06
U.S. Cl. 192—27 5 Claims



1. A quickly-releasable clutch, comprising: a feed screw formed with a spiral thread on its outer surface;

an inner sleeve to be coupled to said feed screw; said sleeve being formed with a hole;

a ball received in the hole of said sleeve for coupling same to said feed screw;

operator means movable to a first position for forcing said ball into the spiral thread of the feed screw to couple the feed screw to said sleeve, and to a second position to permit said ball to disengage from said thread of the feed screw and thereby to decouple same from the sleeve;

said operator means comprising an outer sleeve overlying said inner sleeve and axially movable with respect thereto; said outer sleeve being formed with a first inner annular surface dimensioned to force the ball into the spiral thread of the feed screw in the first position of said operator means to couple said feed screw to said inner sleeve, and with a second inner annular surface dimensioned to permit said ball to disengage from said spiral thread and thereby to decouple same from the inner sleeve in the second position of said operator means; and

a spring normally urging said outer sleeve to said first position wherein its first inner annular surface engages said ball and thereby couples the inner sleeve to the feed screw;

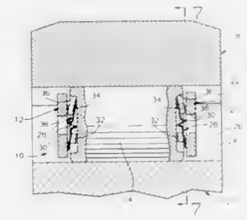
said feed screw including a limit engageable by said outer sleeve for moving said outer sleeve to its decoupling position at a predetermined limit of travel of the feed screw; said outer sleeve including an outer annular surface exposed for manual gripping by the user to permit manual decoupling of the clutch.

4,836,347

ROLLER CLUTCH WITH ROLLER SPIN CONTROL

Albert D. Johnston, Huron, and Frederick E. Lederman, Sandusky, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 31, 1988, Ser. No. 238,793
Int. Cl.[4] F16D 41/06, 15/00
U.S. Cl. 192—45 3 Claims



1. In an overruning roller clutch of the type that has a clutch cage adapted to be fixed between a race with a cylindrical pathway and another race having a series of cam ramps confronting said pathway to form a plurality of wedging pockets with a wide end and a narrow end, and in which said cage locates a cylindrical roller in each of said pockets that is continually spring urged toward the narrow end of said wedging pocket, so as to alternately wedge between said pathway and cam ramps to lock up said races and slip between said pathway and cam ramps to allow said races to freely overrun, and in which said rollers tend to turn slightly in one circumferential direction toward the narrow end of said pockets as said clutch changes from overrun to lock up, the improvement comprising,

ratchet means selectively engageable between each of said rollers and said cage that freely allows said rollers to rotate relative to said cage only in said one direction, thereby allowing said rollers to turn freely as they wedge between the pathway and cam ramps as the clutch changes from overrun to lock up, but preventing said rollers from spinning in the other direction and wearing said cam ramps during overrun.

4,836,348

SYNCHRONIZING MECHANISM FOR SHIFTING CLUTCHES

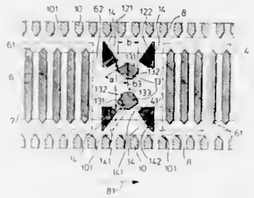
Gunter Knödel, Mühlacker, and Helga Heazler, Murr, both of Fed. Rep. of Germany, assignors to Getrag Getriebe und Zahnradfabrik GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Jun. 30, 1987, Ser. No. 68,847

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1986, 3622464

Int. Cl.[4] F16D *23/06*

U.S. Cl. 192—53 F 6 Claims



1. A synchronizing mechanism for clutches, particularly for manual gearboxes for motor vehicles, comprising:

a rotatable shaft defining an axis;

a guide sleeve fixed to said shaft and being provided with a first external toothing;

a pinion rotatably seated on said shaft adjacent said guide sleeve;

a clutch body rigidly connected to said pinion to rotate therewith and provided with a second external toothing;

a gearshift sleeve surrounding said guide sleeve and provided with an internal toothing engaging said first external toothing; and

a synchronizer ring arranged between said guide sleeve and said clutch body, said synchronizer ring engaging circumferentially said gearshift sleeve in a form-locking relationship therewith for allowing its limited rotation and further circumferentially engaging said clutch body in a frictional relationship;

said gearshift sleeve including first coupling teeth provided internally thereon and arranged to be brought into engagement with said second external toothing upon axial displacement of said gearshift sleeve, said first coupling teeth having a first axial length and being provided at their axial ends with first wedge faces inclined at a first angle with respect to said axis;

said second external toothing forming second coupling teeth provided at their axial ends facing said gearshift sleeve with second wedge faces inclined at said first angle with respect to said axis;

said gearshift sleeve including first locking teeth provided internally thereon in a circumferentially offset position with respect to said first coupling teeth and having a second axial length smaller than said first axial length, said first locking teeth being provided with third wedge faces facing towards a first axial direction and being inclined at a second angle with respect to said axis, said first locking teeth being further provided with first cut-back flanks adjacent said third wedge faces, said first cut-back flanks facing towards a second axial direction and extending parallel to said first wedge faces;

said synchronizer ring including second locking teeth provided externally thereon, said second locking teeth having fourth wedge faces facing towards said second axial direction and being inclined at said second angle with respect to said axis, said second locking teeth being further provided with second cut-back flanks adjacent said fourth wedge faces, said second cut-back flanks facing towards said first axial direction and extending parallel to said first wedge faces;

said third wedge faces contacting said fourth wedge faces upon axial displacement of said gearshift sleeve during gearshift until attainment of synchronism with a rigid frictional connection established between said synchronizer ring and said clutch body, said third wedge faces clearing said fourth wedge faces upon further axial displacement of said gearshift sleeve to bring said first and second cut-back flanks in contact with each other and slide on each other until contact of said first and second wedge faces with said frictional connection is still established.

4,836,349

CLUTCH TYPE TIGHTENING APPARATUS FOR ALLOWING FREE ADJUSTMENT OF TIGHTENING FORCE

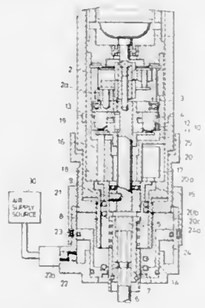
Junshin Sakamoto; Shun Suzuki, both of Katsuta, and Akinori Tsushima, Matsudo, all of Japan, assignors to Hitachi Koki Company, Ltd., Japan

Filed Oct. 5, 1987, Ser. No. 104,087

Claims priority, application Japan, Oct. 9, 1986, 61-240744

Int. Cl.[4] F16D *43/20*

U.S. Cl. 192—56 R 6 Claims



1. A tightening apparatus including a drive motor and a bit which are coupled to each other by engagement of a clutch mechanism, the engagement thereof being maintained by a force of spring means a first end of which is coupled to said clutch mechanism, wherein said drive motor is released from the engagement with said bit when the tightening torque of said bit exceeds a value corresponding to the force of said spring means, comprising:

cylinder means for encasing said spring means;

plunger means encased in said cylinder means for holding a second end of said spring means, said plunger means being movable within said cylinder means to move said second end so that the force of said spring means is thereby varied;

drive means for moving said plunger means, whereby the tightening torque of said bit is adjusted in accordance with a position of said plunger as determined by said drive means; and

a first adjustment ring which is movable along the axis of said tightening apparatus by its rotation, said first adjustment ring having stopper means whose position is varied in accordance with the rotation of said first adjustment ring, said stopper means restricting the movement of said plunger means in one direction along the axis so that a maximum force of said spring means is determined in accordance with the position of said stopper means.

4,836,350

DISC-SHAPED BODY FOR USE IN CLUTCH PLATES

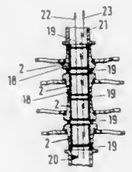
Manfred Kübel, Bühl/Baden, and Gerhard Maisch, Achern, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Dec. 11, 1986, Ser. No. 940,673

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1985, 3544089

Int. Cl.[4] F16D *3/14;* C23C *22/08;* B05D *7/22*

U.S. Cl. 192—106.1 15 Claims



1. A composite hub for use in a disc-shaped body, such as clutch plate for use in friction clutches of motor vehicles, comprising: a sleeve having internal torque transmitting means; a flange surrounding said sleeve; and a coat of nickel on a portion only of said sleeve, said portion including said internal torque transmitting means.

11. A method of making a hub for use in a disc-shaped body, such as a clutch plate, wherein the hub is a composite hub having a sleeve and a flange which surrounds the sleeve and the sleeve has internal torque transmitting means, comprising the steps of applying a coat of nickel to at least one first portion of the sleeve, said at least one first portion including the internal torque transmitting means; and phosphatizing at least one second portion of the sleeve.

4,836,351

MOTOR VEHICLE CLUTCH

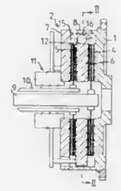
Grzegorz Janiszewski, Angered, Sweden, assignor to AB Volvo, Goteborg, Sweden

Filed May 18, 1288, Ser. No. 194,934

Claims priority, application Sweden, May 18, 1987, 8702031

Int. Cl.[4] F16D *13/42, 21/06*

U.S. Cl. 192—48.91 6 Claims



1. A clutch for motor vehicles, particularly for a mechanical automatic gear box, comprising a first clutch plate which is non-rotatably connected to a first input shaft of the gear box; a first pressure plate which is linearly displaceable but not rotatable relative to the engine flywheel of the vehicle; a second pressure plate which is stationarily connected to the flywheel; a second clutch plate which is located between the first and second pressure plates and non-rotatably connected to a second input shaft journalled concentrically with the first input shaft, and in which clutch the first pressure plate can be alternately urged against the clutch plates and set to an intermediate position in which none of the clutch plates is loaded by the first pressure plate, characterized in that the first pressure plate (6) is provided around its outer circumference with uniformly spaced axially extending grooves (12); in that the flywheel (1) or a member (8) firmly connected to the flywheel, is provided with internal, axially extending grooves (15) which lie opposite external grooves in the pressure plate such as to form with said external grooves axially extending channels having at least a substantially circular cross-sectional shape; and in that at least one spherical element (16) is located in each channel and functions as a means for transmitting torque between the flywheel (1) and the first pressure plate (6).

4,836,352

EXPRESS PACKAGE COLLECTION LOCKER

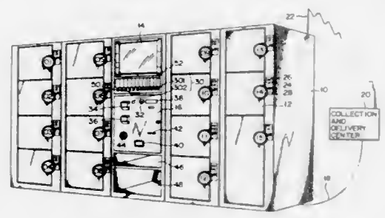
Kunio Tateno, Ibaraki, and Yoshio Shimotori, Funabashi, both of Japan, assignors to UPL Co. Ltd, Oyama and Koto Electronics Co. Ltd., Ibaraki, both of, Japan

Filed Apr. 14, 1988, Ser. No. 181,714

Claims priority, application Japan, Apr. 16, 1987, 62-91981

Int. Cl.[4] G06K *1/12, 19/00*

U.S. Cl. 194—215 20 Claims



1. An express package collection locker capable of calculating the portage fees of packages, said locker comprising:

a plurality of boxes for storing packages, each having a door;

a plurality of weight-measuring means incorporated within said boxes, respectively, for weighing the packages stored in said boxes;

destination-input means for inputting data representing destinations of the packages stored in said boxes;

portage-fee calculating means for calculating portage fees of each of the packages stored in said boxes, in accordance with the weight of the package measured by said weight-measuring means and the destination input represented by operating said destination-input means;

display means for displaying the portage fee calculated by said portage-fee calculating means and instructions as to how to use the locker;

detector means for detecting whether the portage fee has been paid into the locker;

locking means for locking the door of the box when said detector means detects that the portage fee has been paid for the package stored in the box; and

voucher-issuing means for printing and issuing a voucher when said detector means detects that the portage fee has been paid and said locking means has locked the door of the box.

4,836,353

GUIDE FOR MOVING HANDRAIL

Willy Adrian, Obernkirchen, and Martin Mehlert, Nienstaedt, both of Fed. Rep. of Germany, assignors to Otis Elevator Company, Farmington, Conn.

Filed Sep. 18, 1987, Ser. No. 99,179

The portion of the term of this patent subsequent to Apr. 21, 2004, has been disclaimed.

Int. Cl.[4] B66B *23/24*

U.S. Cl. 198—335 6 Claims

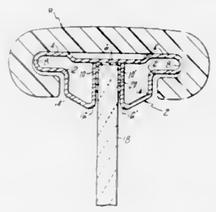
1. In a passenger transporting structure, a handrail assembly

for supporting and guiding a moving handrail, said handrail assembly comprising:

(a) a glass balustrade having a top marginal portion which is continuous and uninterrupted and which terminates in a top free edge;

(b) a gasket sheet disposed across said top free edge of said balustrade and extending down over opposite sides of said top marginal portion of said balustrade;

(c) a stationary handrail guide formed from a sheet of springy metal which has been worked into a cross-sectional configuration including an upper medial portion over which the handrail slides, a pair of curved side portions at opposite margins of said medial portion, said



curved side portions forming a pair of opposed spring wings and a pair of planar clamping portions formed by opposite side edge parts of the sheet from which the handrail guide has been formed, the planar clamping portions overlying opposite outer surfaces of the gasket and being biased into clamping relationship with the balustrade with the entirety of the biasing force being generated by internal stressing of the handrail guide caused by outward deflection of the clamping portions to enable the latter to be positioned in overlying relationship with the gasket and balustrade; and

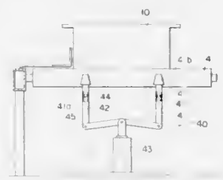
(d) a handrail overlying said handrail guide and disposed in sliding relationship therewith.

4,836,354

TRAY POSITIONING ARRANGEMENT FOR DELIVERY SYSTEM

Kenro Motoda, Tokyo, Japan, assignor to Motoda Electronics Co., Ltd., Tokyo, Japan

Division of Ser. No. 852,354, Apr. 15, 1986, Pat. No. 4,757,890.
This application Apr. 22, 1988, Ser. No. 184,941
Claims priority, application Japan, Apr. 19, 1985, 60-84225; Apr. 19, 1985, 60-84226
Int. Cl.[4] B65G *21/20*
U.S. Cl. 198—345 4 Claims



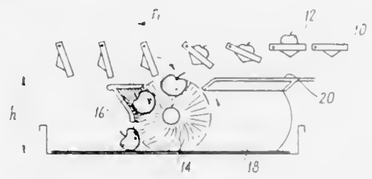
1. A tray assembly positioning arrangement for use in an article delivery system, which comprises a positioning device provided beneath an article delivering and receiving portion of the delivery system and adapted to be movable up and down; a tray assembly formed of a casing and an article receptacle member accommodated in the casing and adapted to hold articles therein, said casing having at least one opening formed on the bottom side thereof and said article receptacle member having at least one abutment portion at the bottom side thereof at a position which corresponds to the opening of the casing; and a positioning member provided on the tip end of the positioning device and adapted to engage with the abutment portion of the article receptacle member through the opening of the casing.

4,836,355

DEVICE FOR TRANSFER OF FRAGILE OBJECTS FROM A CONVEYOR TO A TRANSPORTER

Philippe Blanc, Montauban, France, assignor to Societe Montalbanaise de Constructions/Mecaniques, Montauban, France

Filed Mar. 30, 1988, Ser. No. 175,378
Int. Cl.[4] B65G *47/54, 47/74*
U.S. Cl. 198—418.6 5 Claims



1. A device for transferring fragile objects from a receptacle conveyor to a transport belt, the device comprising:

a rotatable brush located transversely of the conveyor and including bristles having sufficient length and required stiffness to form protective cavities for objects delivered from the conveyor to the brush, each cavity being deep enough to receive an entire object and prevent its touching another object being transferred; and

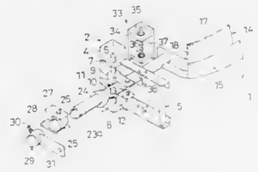
a stationary brush confronting a section of the rotatable brush for retaining an object in its respective protective cavity until the object contacts the transport belt with virtually zero initial horizontal velocity.

4,836,356

CLEANER FOR CONVEYOR BELT

Hideki Mukai, Amagasaki, and Yasuhiro Atari, Neyagawa, both of Japan, assignors to Nippon Tsusho Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1987, Ser. No. 130,312
Claims priority, application Japan, May 7, 1987, 62-111388
Int. Cl.[4] B65G *45/00*
U.S. Cl. 198—499 11 Claims



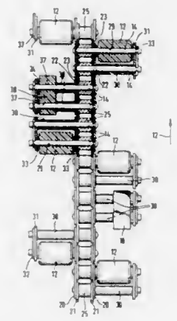
1. A cleaner for a conveyor belt having a scraper and holder means for holding said scraper, wherein said scraper and holder means have a lengthwise extent for spanning the width of the conveyor belt, said scraper and said holder means being adjustably supported for rotary displacement about an axis extending parallel to their lengthwise extent and being deflected in a transverse direction from said axis to form an arch-shaped curvature having an apex at a point midway between ends thereof, said scraper being detachably mounted to said holder means in a manner having a scraping portion projecting normal to said transverse direction.

4,836,357

CONTINUOUS CONVEYOR, ESPECIALLY A CARRYING CHAIN CONVEYOR

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., Verden, Fed. Rep. of Germany

Continuation of Ser. No. 844,256, Mar. 24, 1986, abandoned, Continuation of Ser. No. 525,924, Aug. 24, 1983, abandoned.
This application Dec. 30, 1987, Ser. No. 145,636
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1982, 3232319; Sep. 27, 1982, 3235756
Int. Cl.[4] B65G *17/00*
U.S. Cl. 198—779 4 Claims



1. A continuous carry-chain conveyor for transporting piece goods such as cigarette packs, said chain conveyor comprising freely rotatable pile-up rollers which are moved in the direction of conveyance, and upon which the piece goods rest, and, in situations of an accumulation of the piece goods, continuously move underneath the piece goods, in a rotating manner including:

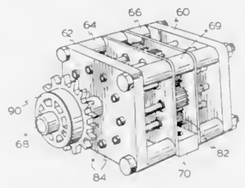
a sheathed chain, wherein the pile-up rollers are arranged on both sides of said sheathed chain, said sheathed chain having a plurality of links comprising inner and outer plates arranged sequentially and attached together by chain bolts which are arranged successively in equally laterally protruding pairs, characterized in that each of said pile-up rollers is arranged on a cantilever portion of a first chain bolt of one of said pairs of chain bolts; and further comprising an end plate arranged on the free cantilevered ends of said one pair of chain bolts, each end plate connecting the free cantilevered ends of said one of said pairs of chain bolts.

4,836,358

CONVEYOR DRIVE UNIT

Frederick E. Fauth, Sr., Towson, and Paul E. Barkley, Sykesville, both of Md., assignors to American Bottlers Equipment Co., Inc., Owings Mills, Md.

Filed May 26, 1987, Ser. No. 53,644
Int. Cl.[4] B65G *13/06*
U.S. Cl. 198—789 18 Claims



1. A drive unit for an article transfer system having a plurality of sets of parallel rollers disposed in a planar array and forming a conveyor, comprising:

(A) a pair of spaced apart heat sink plates;

(B) a drive shaft journalled for rotation in said heat sink plates and extending at one end thereof through one of said plates;

(C) a sprocket wheel which operates on a tangetial drive fixed to said one end of said drive shaft; and a drive gear fixed to said drive shaft intermediate said plates; and

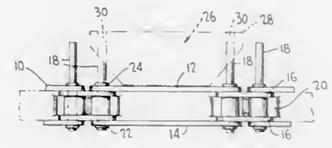
(D) a plurality of pinion gears disposed in a circular array around said drive gear to be driven thereby, said pinion gears being mounted on pinion shafts, said pinion shafts being fully extended and journalled for rotation in said pair of spaced apart heat sink plates, and said rollers being connected to said pinion shafts by connectors which are inserted and engaged into said pinions shafts.

4,836,359

CONVEYOR CHAIN FOR CONTAINER NEST

John Walter, Evergreen Park, Ill., assignor to Continental Can Company, Inc., Norwalk, Conn.

Filed Jun. 16, 1988, Ser. No. 207,508
Int. Cl.[4] B65G *29/00*
U.S. Cl. 198—803.01 14 Claims



1. A conveyor chain particularly adapted to support a nest for a container in a container closing apparatus, said conveyor chain comprising sets of elongated links and sets of shorter links joined together by pins, there being one pin at each end of each set of elongated links, and there being a roller carried by each pin between said sets of links for engaging sprocket teeth, said pins freely extending above associated upper links of said sets of elongated links and pairs of said pins at opposite ends of said sets of elongated links forming means for removably and replaceably mounting a nest.

4,836,360

CONTINUOUS PROOFING AND BAKING APPARATUS HAVING MAGNETIC CONVEYOR SYSTEM

John P. Kasik, Dallas, Tex., assignor to Stewart Systems, Inc., Plano, Tex.

Filed Jun. 8, 1987, Ser. No. 59,600
Int. Cl.[4] B65G *29/00*
U.S. Cl. 198—803.6 13 Claims

1. A conveyor system for use in a continuous proofing and baking apparatus, the conveyor system comprising:

an elongated track;

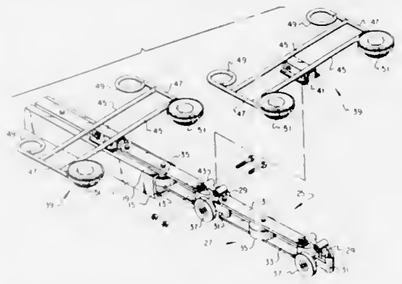
a conveyor chain, mounted for movement through the track;

a product supporting grid, carried along the track by the conveyor chain;

a pole piece;

means for mounting the pole piece on the product supporting grid, so that the pole piece can move a limited distance

in any horizontal direction relative to the supporting grid; and



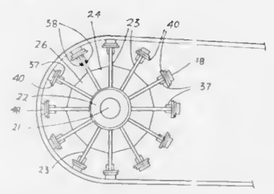
connection means for releasably connecting a product pan to the pole piece.

4,836,361

REPLACEABLE DEVICE FOR OUTER SPOKE EDGE OF PULLEY WHEEL

Harold L. Herren, 802 Main St., Platteville, Colo. 80651

Filed Feb. 25, 1985, Ser. No. 704,717
Int. Cl.[4] B65G *39/10*
U.S. Cl. 198—843 **5 Claims**



1. A replaceable repair device for the terminal edge of the flat spoke of a pulley wheel comprising:

a T-cross-sectional elongated rigid bracket member adapted for securement to said terminal edge, said wheel being cylindrical about an elongated axis of rotation, said bracket member having an upper cross bar surface portion and a bifurcated downward extending spaced apart parallel pair of T-legs with the T-legs pair secured centrally under and to the cross-bar-portion normal to said cross-bar and adapted to be placed over and closely abut the outer sides of a flat spoke adjacent the spoke terminal edge;

means for replaceably securing the mounting bracket to said spoke including said parallel spaced-apart pair of the T-legs adapted to closely overlap and abut the sides of the flat spoke on which said bracket member is placed adjacent the spoke terminal edge; and

a rubber friction strip pad replaceably attached to said T-member-cross-bar upper surface portion and disposed outwardly therefrom, whereby substantially complete wear of the thickness of the friction strip is allowed before the rubber strip must be replaced;

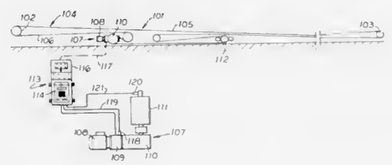
and means for replaceably attaching the rubber strip pad to said cross-bar of the bracket member.

4,836,362

ENDLESS DRIVE TRANSMISSION

Lewis R. B. Bower, Huddersfield, England, assignor to Fletcher Sutcliffe Wild Limited, Wakefield, Great Britain

Continuation-in-part of Ser. No. 785,968, Oct. 20, 1985, abandoned. This application Mar. 23, 1987, Ser. No. 29,459
Claims priority, application United Kingdom, Oct. 17, 1984, 8426283
The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.
Int. Cl.[4] B65G *23/36*
U.S. Cl. 198—854 **23 Claims**



1. A mine conveyor, for use in hazardous atmospheres, comprising an endless conveying means; an electric motor; and a torque transmission arrangement located between said electric motor and said endless conveying means, said torque transmission arrangement incorporating an input shaft connectable to said electric motor, a wet clutch drivable by said input shaft, an output means of said wet clutch, a torque converter drivable by said output means, at least one torque input disc and at least one torque output disc incorporated in said wet clutch, which is engageable under hydraulic control with engagement pressure of said clutch discs being modulated to control the output torque of said clutch between zero and 100% with no clutch slip at full torque output, and with an output from said torque converter in driving relationship with torque transmission gearing, and drive means drivable by said transmission gearing and adapted to make driving relationship with said endless conveying means; and a control system for controlling said torque transmission arrangement, said system comprising an electro-hydraulic control circuit incorporating an intrinsically safe unit to monitor and control said conveyor, at least one microprocessor incorporated in said intrinsically safe unit, the microprocessor incorporating a memory whereby control commands for said conveyor are preprogrammable into said microprocessor, at least one transducer included in said electro-hydraulic control circuit to monitor at least one condition of said conveyor, said transducer being electrically connected to said intrinsically safe unit to relay to said unit electrical signals in accordance with the condition monitored; and valve means also incorporated in said electro-hydraulic control circuit said valve means being adapted to control the supply of pressure fluid to effect clutch modulation in response to the condition monitored.

4,836,363

PACKING PLATTER FOR FOODS, WITH DECORATIVE TAB-ENGAGED STRIP

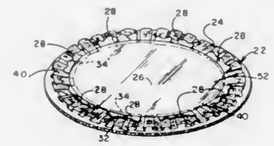
Howard Reisman, Moorestown, N.J., assignor to Boca Foods Inc., Harrison, N.J.

Filed Aug. 9, 1988, Ser. No. 230,311
Int. Cl.[4] B65D *25/02*
U.S. Cl. 206—44 R **10 Claims**

1. A platter for display of goods, comprising:

a planar member defining a central area and a periphery, at least one receptacle tab being formed between the central area and the periphery, the receptacle tab having a proximal end attached to the platter and a distal end, the tab and the planar member together defining a receptacle opening; and,

a border strip extending at least around a portion of the periphery of the planar member, the border strip being



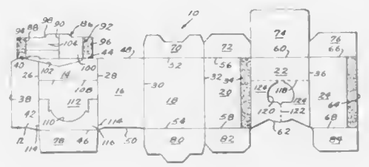
captive in the receptacle opening, whereby the border strip defines a decorative edging around the goods.

4,836,364

SHADOW BOX CARTON WITH STRUT IMPROVEMENT

Jimmy J. Hanko, Lexington, Ky., and Lawrence V. Brom, Hickory, N.C., assignors to Gulf States Paper Corporation, Tuscaloosa, Ala.

Filed Mar. 1, 1988, Ser. No. 162,944
Int. Cl.[4] B65D *5/50*
U.S. Cl. 206—45.14 **23 Claims**



1. In an erectable carton comprising a flat blank of carton material cut and scored to form an array of side-by-side panels joined along common sides, each defined by four sides including one or two of said common sides, a strut cut from the carton material, and side flaps cut from the carton material extending from certain of the remaining sides of said panels other than said common sides, said blank being folded along said common sides and secured in lapped relation in a flattened preform condition so as to form a first pair of side-by-side panel structures disposed in abutting coextensive relation with a second pair of side-by-side panel structures, said blank being erectable from said flattened preform condition into a rectangular tubular condition wherein each pair of side-by-side panel structures are moved from said side-by-side relation into a perpendicular relationship with one another and said strut is moved within a side portion of the space defined by said pairs of perpendicularly related panel structures with said side flaps being foldable about their associated panel sides into side-closing relation with respect to said space, one of said panel structures being cut and scored to permit entry of an object therethrough into the remaining portion of said space and to retain the object in shadow box fashion against unwanted movement in a direction outwardly through said one panel structure while said strut prevents movement in a direction between the closed side flaps, the improvement which comprises

said strut being cut from the carton material extending from a corresponding pair of said remaining non-common sides of two of said side-by-side panels which are retained in side-by-side relation as part of one pair of said side-by-side panel structures when said blank is in said flattened preform condition,

said strut including a first end portion having an integral hinge connection with one of said two panels along said corresponding side thereof, a substantial central portion free of connection with said corresponding sides of said two panels and a second end portion having an integral hinge connection with the other of said two panels along said corresponding side thereof,

said strut being foldes along said hinge connections so as to bring said first end portion into surface-to-surface engagement with the one of said two panels and said second end portion into surface-to-surface engagement with the other of said two panels, and

means for securing said first and second strut end portions in said surface-to-surface engagement.

4,836,365

PORTABLE COIN HOLDER AND DISPENSER

Morley Hall, Woodmancote, England, assignor to Minverose Limited, Hampshire, England

Filed Jan. 28, 1988, Ser. No. 149,543
Claims priority, application United Kingdom, Feb. 5, 1987, 8702597
Int. Cl.[4] A45C *11/28*
U.S. Cl. 206—0.83 **2 Claims**

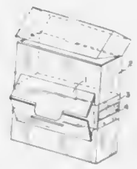
1. A dispensing holder for discs of a given size (such as coins), comprising a single middle plate and two face plates which sandwich and are joined to the middle plate, each face plate and the middle plate defining between them disc-receiving slots having mouths open to edges of the middle plate and respective face plate for insertion and removal of discs, each face plate having at each slot a face hole of a size less than the given disc diameter, the middle plate having for each slot a finger spring acting towards the face hole to hold a disc in the slot but allow it to be dispensed by manual depression against the spring and sliding through the slot mouth, and the middle plate and face plates being intersecured by tubular spigots on one face plate passing through holes in the middle plate and engaging by snap-action sockets on the other face plate.

4,836,366

CIGARETTE PACKS AND BOXES WITH ATTACHED MATCHES

Ameer G. Mikhail, 945 Riverside Dr., Unit #15-A, Methuen, Mass. 01844

Filed Sep. 30, 1982, Ser. No. 429,790
The portion of the term of this patent subsequent to May 25, 2003, has been disclaimed.
Int. Cl.[4] B65D *85/10*
U.S. Cl. 206—94 **1 Claim**



1. A cigarette pack-matches combination package that comprises of the common, and separable cigarette hard top box which is made of thin cardboard, or the soft cigarette pack which is made of paper and a separable common ordinary match book, where the match stems are parallel and are attached with a staple to a thin cardboard cover which is then bent over to completely cover the match stems and match heads, and a thin paper or cardboard strip that wrapps around

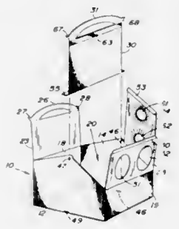
the cigarette box or cigarette soft pack and the inner cover of the match book, with the end of the paper strip being then gummed together to hold tight both the cigarette box or cigarette soft pack and the match book which is then has its cover clipped on in place but with the paper strip still allowing the removal and insertion of the match book while the strip is in place, and where a spot of a geometrical shape of an abrasive material may be laid on the paper strip to give added striking surface for the matches.

4,836,367

COMPARTMENTED FOOD CONTAINER WITH HANDLED PARTITION

Homayun Golkar, 9041 Pacific, #4, Anaheim, Calif. 92804

Filed Dec. 31, 1987, Ser. No. 139,902
Int. Cl.[4] B65D *5/46, 5/48*
U.S. Cl. 206—200 18 Claims



1. A food container comprising:

a first sheet member formed in a blank of paperboard material and having a pair of side walls, a pair of end walls, a plurality of bottom portions and first, second and third top portions, foldable relative to one another, and attachable at selected locations, to form an enclosure, at least one of said top portions including a first handle portion;

a second sheet member, of paperboard material and at least partially formed of an insulating material, having a first end means for attachment to the bottom of said enclosure and extending along a plane in a direction generally perpendicular to said bottom for forming two compartments within said enclosure, and having a second handle portion at a second end thereof for coaction with the said first handle portion of said at least one top portion for providing handle means for carrying said food container; and

wherein two of said top portions are positioned for overlying relation, with at least one beverage container receiving opening formed in each of said two top portions, so that the openings are in aligned relationship upon overlying of the one top portion with the other.

4. A food container comprising a first sheet of paperboard material formed in a blank, said blank including:

(a) a first end wall of generally rectangular configuration;

(b) a first top cover portion contiguous with and foldably connected to said first end wall along the edge opposite the folding line for its respective bottom portion, said first top cover portion including first handle means for carrying said food container and oppositely disposed, generally outwardly extending tab portions;

(c) a pair of generally identical side walls in contiguous relation to opposite edges of said first end wall, and foldably connected thereto, each of said side walls including aperture means for receivably coacting with respective ones of said tab portions;

(d) a second generally rectangular end wall in contiguous relation to an edge of one of said side walls, the lower edges of each of said end walls and each of said side walls being colinear;

(e) a bottom flap portion connected in foldable relation to each of said end walls and side walls with the fold lines along said colinear line;

(f) a second generally rectangular top cover portion contiguous with and foldably connected to said second end wall along the edge opposite the folding line for its respective bottom portion;

(g) a third top cover portion contiguous with and foldably connected to one of said side walls along a portion of the edge generally opposite the folding line for its respective bottom portion, said third top cover portion having a rectangular configuration for coacting relationship with said second top cover portion; and

(h) means on said blank for enabling attachment of said end walls, said side walls, said bottom flap portions, and said top cover portions at selected locations when folded relative to one another to form an enclosure with a bottom, said end walls, said side walls, said bottom flap portions, and said top cover portions being so dimensioned, configured and arranged that said second and third top cover portions overly one another to close a portion of said enclosure and said first top cover portion closes the other portion of said enclosure with said tab portions engaging said aperture means and with said handle means accessible for carrying said food container.

11. A food container comprising a first sheet of paperboard material formed in a blank, said blank including:

(a) a first end wall of generally rectangular configuration;

(b) a pair of generally identical side walls in contiguous relation to opposite edges of said first end wall, and foldably connected thereto;

(c) a second generally rectangular end wall in contiguous relation to an edge of one of said side walls, the lower edges of each of said end walls and each of said side walls being colinear;

(d) a bottom flap portion connectd in foldable relation to each of said end walls and side walls with the fold lines along said colinear line;

(e) a first top cover portion contiguous with and foldably connected to said first end wall along the edge opposite the folding line for its respective bottom portion;

(f) a second top cover portion contiguous with and foldably connected to said second end wall along the edge opposite the folding line for its respective bottom portion;

(g) a third top cover portion contiguous with and foldably connected to one of said side walls along a portion of the edge generally opposite the folding line for its respective bottom portion; and

(h) means on said blank for enabling attachment of the various parts at selected locations when folded relative to one another to form an enclosure with a bottom, the parts being so dimensioned, configured and arranged that said second and third top cover portions overly one another to close a portion of said enclosure and said first top cover portion closes the other portion of said enclosure and wherein each of said overlying second and third top cover portions include a pair of aligned beverage container receiving openings.

17. A food container comprising:

a first sheet of paperboard material formed in a blank and having a pair of generally identical side walls, a pair of generally rectangular end walls, a plurality of bottom portions configured for overlapping securement to form a bottom, and first, second and third top portions, all foldable relative to one another, and attachable at selected locations, to form an enclosure, at least one of said top portions including first handle means for carrying said food container;

a second sheet member, having a first end means attachable to opposite bottoms of said side walls in proximate relation to the bottom of said enclosure, said second sheet member having other means for attachment to said side walls adjacent the upper end thereof with said second sheet member extending in a direction generally perpendicular to said bottom for forming two compartments within said enclosure, two of said top portions being configured in rectangular form and overlying one of said compartments, with the other of said top portions overlying the other of said compartments, said second sheet member having second handle means for coaction with said first handle means of said other of said top portions for providing means for carrying said food container; and

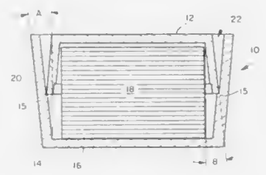
two of said top portions overly one another, with at least one beverage container receiving opening formed in each of said two top portions in aligned relationship upon overlying.

4,836,368

PREPARATION AND DISPENSING CONTAINER FOR HOT, MOIST TOWELS

James D. Cotton, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 29, 1988, Ser. No. 187,694
Int. Cl.[4] B65D *81/22*
U.S. Cl. 206—205 11 Claims



1. A container adapted to be used in storing, moistening, heating and dispensing hot, moist towels comprising,

a bottom formed at least partially of a heat insulating material having sufficient rigidity to retain its shape under use conditions and having a cavity that is of a size and shape to receive a plurality of towels and having self-supporting sidewalls forming a top opening, and

a cover having a size and shape to engage said bottom sidewalls and having sidewalls that are tapered so that the exposed top surface is smaller than said top opening so that, when inverted, said cover can extend into said bottom cavity top opening and contact such towels without sealing engagement between said bottom sidewalls and said top sidewalls.

4,836,369

OUT-DOOR FURNITURE AND RECEPTACLE

Frank C. Pickering, Derwentside, England, assignor to SPONS-A-TEE Limited, Durham City, England

Filed Sep. 3, 1986, Ser. No. 903,272
Claims priority, application United Kingdom, Sep. 7, 1985, 8522251
Int. Cl.[4] B65D *91/00;* B65F *1/16*
U.S. Cl. 206—216 3 Claims

1. A furniture unit for outdoor locations, which comprises:

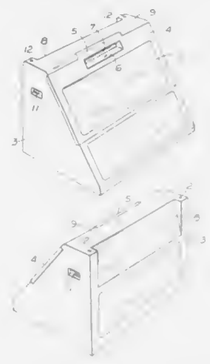
(a) a one-piece shell formed of a synthetic polymeric material, said shell having an interior space;

(b) a substantial first aperture in said shell, through which a litter container may be inserted into the interior space of said shell;

(c) a lid, which is pivoted about an essentially horizontal pivot upon said shell for movement about said pivot between a first position in which said first aperture is exposed to permit insertion of said container through said first aperture, and a second position in which said lid covers said first aperture;

(d) a second aperture, which is substantially smaller than said first aperture and is located in said lid, whereby litter may be placed through said second aperture into said container within said shell when said lid is in said second position;

(e) a first surface, which is at least partly included to the vertical, located within the upper region of said shell at a predetermined height to afford some support to an adult person leaning upon said furniture unit; and



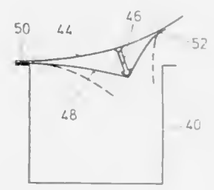
(f) a second surface located upon the exterior of said lid, said second surface being generally flat and inclined to the vertical for ready visibility to persons near to said furniture unit, said second surface capable of receiving an information display thereon.

4,836,370

DUAL CHAMBER CONTAINER AND METHOD FOR FORMING AN OPENING BETWEEN THE CHAMBERS OF THE CONTAINER

Alexander Bosshard, Winterthur, Switzerland, assignor to Steigmühle Töss AG, Switzerland

Filed Feb. 3, 1987, Ser. No. 9,824
Claims priority, application Switzerland, Feb. 3, 1986, 405/86
Int. Cl.[4] B65D *81/32*
U.S. Cl. 206—222 4 Claims



1. A dual container comprising:

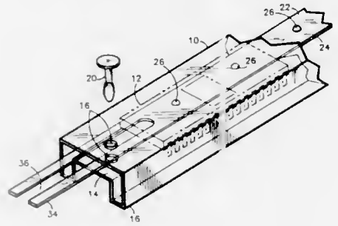
an outer container and an inner container, said inner container having a surrounding said partition wall; and

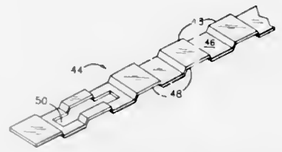
a preformed opening in said partition wall, a sealing seat which forms part of said container, and said seat being placed for normally closing said opening and wherein said sealing seat is removed from said opening so as to form a passageway;

a foil like lid coupled to said partition wall in such a manner that said preformed opening is removed from said sealing seat and said passageway is formed in said partition wall in response to the at least partial removal of said lid from said container, said tops of said containers are both normally coupled to said foil like lid to close each of said containers, and wherein said inner container with said partition wall

remains fully coupled to said lid when said lid is at least partially removed from said outer container.

4,836,371
FILLER STRIPS
Kenneth J. Long, Hutto, and Bobby W. Formby, Round Rock, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 19, 1987, Ser. No. 109,564
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—334 15 Claims

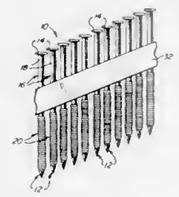


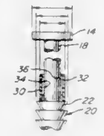


13. A filler strip and packing tube assembly for temporarily securing a plurality of individual electronic components in a tube, comprising:
a hollow, elongated tube having
at least first and second walls; and two open ends,
the tube to longitudinally contain the plurality of individual components, wherein the ends have means for closing the end for securing the components within the tube; and
a removable filler strip comprising
a flat, elongated, resilient body sufficiently thin to fit between the components and the first wall;
at least one surface feature of sufficient thickness to temporarily clinch the components against the second wall; and
two ends, each having a passage providing clearance for the tube closure means.

4,836,372
NON-FLAGGING COLLATED NAIL STRIP
Lawrence S. Shelton, Morton Grove, Ill., assignor to Paslode Corporation, Lincolnshire, Ill.
Filed Sep. 12, 1988, Ser. No. 242,594
Int. Cl.[4] B65D *85/24*
U.S. Cl. 206—344 10 Claims

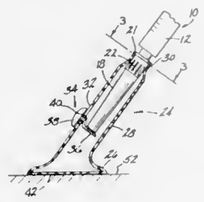
1. A strip of collated nails, each nail having a head and a shank, which comprises a cylindrical portion adjoining the head and being of a given diameter and a ringed portion adjoining the cylindrical portion so as to be axially spaced from the head by the cylindrical portion and having an axial array of rings of an outer diameter greater than the diameter of the cylindrical portion, the nails being collated by a pair of tapes, each tape extending across the shanks of the nails and being adhered to a respective one of diametrically opposed areas on the cylindrical portion of the shank of each nail by an adhesive layer between such tape and the shanks of the nails, each tape and the adhesive layer adhering such tape having a combined thickness covering, on one side of the shanks of the nails, less than one-half of the difference between the outer diameter of





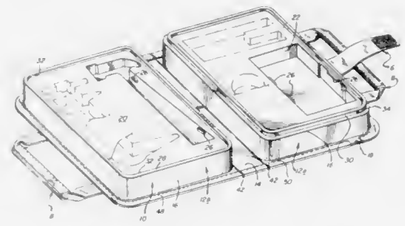
the rings and the diameter of the cylindrical portions of the shanks, whereby a nail driven from the strip into a workpiece tends to carry into the workpiece, along with the driven nail, such portions of the tapes and the adhesive layers as are torn from the strip with the driven nail.

4,836,373
HYPODERMIC SYRINGE AND COVER HANDLING DEVICE
Boris Goldman, 20 Gail Rd., Farmington, Conn. 06032
Filed Oct. 3, 1988, Ser. No. 251,777
Int. Cl.[4] B65D *83/10*
U.S. Cl. 206—366 9 Claims



1. A device for handling a hypodermic syringe and a syringe cover, said device comprising a base, a tubular body projecting from said base to an open end for receiving and frictionally engaging the cover, and a longitudinal slot through the wall of said body, and an expelling member having a shelf portion within said body, a knob portion outside said body and an intermediate portion rigidly joining said shelf portion and said knob portion and passing through said slot, said shelf portion being between said base and said open end is movable toward said open end by thumb or finger force applied to said knob portion in the direction away from said base for engaging the cover to break the frictional engagement between the cover and said body.

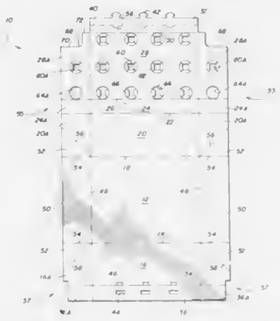
4,836,374
FITTED TOOL CASE
Walter J. Hutchins, West Hartford, Conn., and Randall K. Cooper, Kansas City, Mo., assignors to The Stanley Works, New Britain, Conn.
Filed Sep. 2, 1988, Ser. No. 240,749
Int. Cl.[4] B65D *81/04, 81/16*
U.S. Cl. 206—373 19 Claims



1. A fitted tool case comprising:
(a) a pair of synthetic resin platform members each having a peripheral sidewall, a base flange about the lower end of said sidewall, and a transverse top wall extending across the top of the cavity peripherally defined by said sidewall, said top wall having a multiplicity of depending pockets formed therein providing recesses configured and dimensioned to snugly receive a multiplicity of tools;
(b) a pair of support members of relatively rigid material seated snugly within each of said cavities of said platform members, said support members having recesses in their upper surfaces closely conforming to the pockets of said platform members to provide support therefor;
(c) an elongated base sheet member underlying said platform members and extending therebetween to provide a spacer section, said platform members being secured to the inner surface of said base sheet member and being spaced apart thereon a distance substantially equal to the combined height of the two platform members to permit said base sheet member to be folded about said spacer section to dispose said platform members in abutting relationship;
(d) a fabric covering on the outer surface of said base sheet member;
(e) means securing said fabric covering, platform members and base sheet member in assembly;
(f) releasable closure means to secure said tool case in closed position with said platform members in abutting relationship; and
(g) handle means for carrying said tool case.

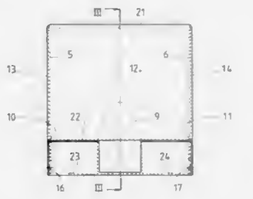
4,836,375
WRAP-AROUND CARRIER
Richard L. Schuster, Monroe, La., assignor to Manville Corporation, Denver, Colo.
Filed Aug. 28, 1987, Ser. No. 90,811
Int. Cl.[4] B65D *85/20, 5/46*
U.S. Cl. 206—427 4 Claims

1. A wrap-around article carrier, comprising:
a bottom panel having side edges and end edges;
side panels connected to the side edges of the bottom panel by fold lines;
end panels connected to the end edges of the bottom panel by fold lines;
a top panel connecting the side panels;
end portions of the top panel being folded under to form areas of double thickness of sufficient strength to engage the carrier to be lifted by the end portions of the top panel;
tuck flaps connected to the end panels along fold lines and end portions connected to the side panels along fold lines, the side panel end portions being connected to the tuck flaps along diagonal fold lines;
the side panel end portions being folded in to form areas of double thickness, the folded-in portions of the side panels being connected to the folded-under portions of the top panel;
at least one of the side panels having an angled upper portion adjacent the top panel, the angled portions forming an obtuse angle with the associated side panel and an obtuse angle with the top panel, the angled portion being connected to the top panel;



the top panel containing a plurality of neck retainer openings for receiving the necks of bottles contained in the carrier, the neck retainer openings nearest the connection between the top panel and the angled upper portion of said one side panel being larger than the neck retainer openings more distant from said connection to enable the top panel to be closed over the tops of bottles positioned on the bottom panel during formation of the carrier; and
each of the folded-under portions of the top panel containing at least one neck retainer opening, the neck retainer openings of the folded-under portions of the top panel being aligned with neck retainer openings in the top panel.

4,836,376
CASE OF MOLDED SYNTHETIC MATERIAL FOR FLAT, THIN OBJECTS
Patrick P. Posso, Lausanne, Switzerland, assignor to Gefitec S.A., Switzerland
Filed Oct. 20, 1988, Ser. No. 260,240
Claims priority, application Switzerland, Dec. 8, 1987, 4780/87
Int. Cl.[4] B65D *85/57*
U.S. Cl. 206—45.23 2 Claims



1. A case of molded synthetic material for flat, thin objects, such as disks, fiches or cards, comprising a box (1) which is intended to receive the flat objects and to which is pivoted a part (3) intended to close the box and to serve as support for the box in the open, oblique position, and also a retaining

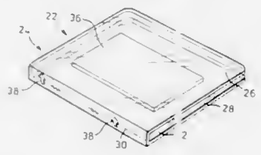
member (2) hinged on one side of the box to enable the flat objects to be fanned out for consultation, the turning movement of said retaining member (2) being limited on each side of the box by the interaction of a pin and a slot or aperture, wherein the part (3) intended for closing the box (1) is in the form of a lid which is pivoted on the box and whose face (12) is interrupted at its pivotally connected end so that the lid can pivot about its pivot joint through an angle greater than 270°, while in the open position the box (1) comes to bear against the edge (22) of the interruption in the face of the lid, in such a manner that with the lid lying horizontally the box (1) is supported in an oblique position, and wherein the box (1) and the retaining member (2) are integrally molded, the articulation of these two parts being formed by a reduction (8) of the thickness of the material.

4,836,377

COVER CLIP FOR PHOTOGRAPHIC SLIDES

Harold G. Heron, R.R. #3, Newcastle, Ontario, L0A 1H0, Canada

Filed Feb. 9, 1988, Ser. No. 154,018
Int. Cl.[4] B65D *85/48; G03B 21/64*
U.S. Cl. 206—456 **16 Claims**



1. A photographic slide assembly comprising:
(a) a photographic slide of the type having a photographic film set in a window of a mounting frame and wherein the window comprises first and second rectangular shaped recesses formed on opposite sides of the frame and each recess having side edges which extend inwardly from first and second side faces of the mounting frame to said photographic film,
(b) a transparent folio having first and second oppositely disposed cover panels which are located in an overlapping face-to-face relationship and are each proportioned to completely cover the window of said photographic slide and thereby prevent direct contact with the photographic film during handling of the folio, said cover panels being connected to one another along a spine so as to be normally urged toward on another to releaseably clamp said slide therebetween,
(c) rectangular shaped detent means projecting from an inner face of at least one of said cover panels toward the other of said panels, said rectangular shaped detent means being arranged on said inner face to mate with and proportioned to fit within one of said recesses of said slide in a closed fitting relationship and having side edges which are arranged to butt against the side edges of the recess in which the detent is located to releasably retain said slide in and prevent lateral movement of the slide relative to said folio when seated therein.

9. A clip for a photographic slide of the type having a photographic film set in a window of a mounting frame and wherein the window comprises first and second rectangular shaped recesses formed on opposite side of the frame and each recess having side edges which extend inwardly from first and second side faces of the mounting frame to the photographic film, comprising:
(a) a transparent folio having first and second oppositely disposed cover panels which are located in an overlapping face-to-face relationship and are each proportioned to completely cover the window of said photographic slide and thereby prevent direct contact with the photographic film during handling of the folio, said cover panels being connected to one another along a spine so as to be normally urged toward one another to clamp said slide therebetween in use,
(b) rectangular shaped detent means on an inner face of at least one of said cover panels and projecting toward the other of said panels, said rectangular shaped detent means being arranged on said inner face to mate with and proportioned to fit within one of said recesses of said slide in a close fitting relationship and having side edges which are arranged to butt against the side edges of the recess in which the detent is located to releasably retain said slide in and prevent lateral movement of the slide relative to said folio when seated therein.

14. A photographic slide assembly comprising;
(a) a photographic slide of the type having a photographic film set in a window of a mounting frame and wherein first and second side recesses extend inwardly from first and second side faces of the mounting frame to said photographic film,
(b) a transparent folio having first and second oppositely disposed cover panels connected to one another along a spine so as to be normally urged toward one another to releaseably clamp said slide therebetween,
(c) first and second detent means on the inner face of the first and second cover panels and arranged to fit in register within first and second recesses of said mounting frame respectively, said first and second detent means being arranged and proportioned with respect to one another to be out of register with the second and first recesses if said slide is incorrectly inserted into a cover with its first recess facing the second detent thereby to prevent incorrect orientation of said slide.

4,836,378

PACKAGE HAVING MAGNETICALLY CODED TEAR TAPE OR SEALING STRIP

John O. Lephardt, Mechanicsville, Va., assignor to Philip Morris, Incorporated, New York, N.Y.

Filed Nov. 18, 1987, Ser. No. 122,229
Int. Cl.[4] B65D *75/58; B07C 5/00*
U.S. Cl. 206—459 **23 Claims**

1. A package comprising a carton or container overwrapped with thin, flexible sheet packaging material, said sheet material comprising a tear tape having at least one substrate strip coated on at least one side with a magnetizable metal oxide material carrying magnetically coded information, said tear tape laminated to said sheet of thin flexible packaging material.

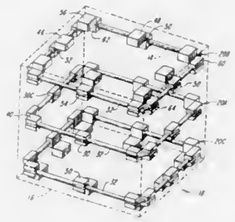
14. A package comprising a carton or container having adjacent parts defining a closure wherein said adjacent parts are sealed together by a removable tape comprising at least one substrate strip coated on at least one side with a magnetizable metal oxide material carrying magnetically coded information and having an adhesive layer located on the surface of said tape which engages said adjacent parts defining a closure.

4,836,379

MODULAR SHOCK-ABSORBING SHIPPING PACK

William H. Shaw, 12 Jersey La., Manchester, Mass. 01944

Filed Jul. 8, 1987, Ser. No. 71,278
Int. Cl.[4] B65D *85/030*
U.S. Cl. 206—523 **13 Claims**



1. A shipping pack for cushionably protecting an object, said pack comprising:
a plurality of shock-absorbing cushioning elements of resilient material defining an integral recess along the length of at least one side thereof, said recess having a restriction of a first dimension and a central portion of a second greater dimension for receiving a cord; and
a stretchable continuous elastomeric cord when exhibits resilient elongation during stretching of at least twenty percent and is interfitted within the central portion of said recess and held therein by said restriction;
said plurality of cushioning elements being removably and adjustably positionable in spaced-apart relation along said elastomeric cord, whereby said cord may be stretched manually to surround an object to be protected and said cushioning elements may be adjusted to provide spaced-apart cushioned regions on a said object.

4,836,380

PACKAGE, IN PARTICULAR, A RECEPTACLE, MADE OF DEEP-DRAWN MATERIAL

Kurt Walter, and Jochen Weihe, both of Glauburg, Fed. Rep. of Germany, assignors to Hassia Verpackungsmaschinen GmbH, Ranstadt, Fed. Rep. of Germany

Filed May 11, 1988, Ser. No. 192,479
Claims priority, application Fed. Rep. of Germany, May 30, 1987, 3718255
Int. Cl.[4] B65D *1/34, 6/04*
U.S. Cl. 206—561 **7 Claims**

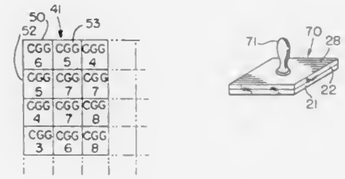
1. A package, in particular, a receptacle, made of deep-drawn plastic material, comprising at least two compartments suitable to accommodate dry feedstock, on the one hand, and pasty feedstock, on the other, and a sealing rim flange extending in the plane of the compartment opening and also extending between the two openings of the compartments sealed by a cover foil, wherein a thin intermediate foil is provided between the cover foil and the sealing rim flange at least over the compartment for pasty feedstock, which cover foil when arranged also over the dry-stock compartment, is provided with a hole leading to the interior of the dry-stock compartment.

4,836,381

PATTERNED ART APPARATUS AND METHOD

James J. Edwards, 2139 W. Royalton Rd., Broadview Heights, Ohio 44147, and Richard C. Singerman, Jr., 10501 Halcyon Dr., Parma, Ohio 44130

Filed Feb. 22, 1985, Ser. No. 704,273
Int. Cl.[4] B65D *69/00*
U.S. Cl. 206—575 **21 Claims**



1. A kit for making a composite picture of plural symbols according to a prescribed pattern and without restriction to colors or symbols, comprising a surface medium on which the composite picture is to be made, plural pad-like application means for applying color media to said surface medium to form respective symbols thereon creating such composite picture, said application means including symbol means for forming the shape of a respective symbol, each of a plurality of said application means having a different respective symbol means for forming different respective shapes by said respective application means, and said symbol means including surface means for holding color media and for applying such color media to said surface medium in the shape formed by said symbol means, and indicia pattern means for identifying locations on said surface medium, said indicia pattern means including indicia identifying means in a pattern design for relatively identifying the application means and symbol means for applying color media to respective identified loactions on said surface medium to form respective symbols thereon to create such composite picture, whereby said indicia pattern means defines placement of symbols on said surface medium to complete a specific composite picture design thereon while permitting creativity in the selection of respective symbols and colors for correspondence with said identifying means of said indicia pattern means.

4,836,382

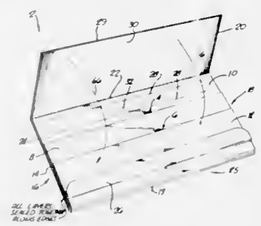
PHOTO PRINT ENVELOPE CONTAINING COUPON POUCH

Michael A. Schreiber, Riverside, Conn., assignor to Photo Industry Coupon Systems, Stamford, Conn.

Filed Jul. 9, 1987, Ser. No. 71,461
Int. Cl.[4] B65D *27/08*
U.S. Cl. 206—610 **9 Claims**

1. An envelope comprising:
a pouch structure having an exterior formed from at least first and second surfaces disposed in generally planar relationship to each other and secured completely around

the edges thereof to seal off an interior volume for carrying materials;
an opening disposed in one of said first and second surfaces, said opening providing access to said interior volume of said pouch structure;
a releasable sealing structure which covers said opening to close off temporarily said interior volume of said pouch means; and
a pocket means joined to said exterior of said pouch structure for carrying additional material, said pocket means including at least a first pocket structure formed from a third surface disposed over said second surface in generally planar relationship thereto, said third surface having at least one edge joined to said second surface to create a first pocket between said second and third surfaces, and third surface also having a second edge which overlies said second surface but is not joined thereto in order to provide an open end in said first pocket for insertion of the additional material.

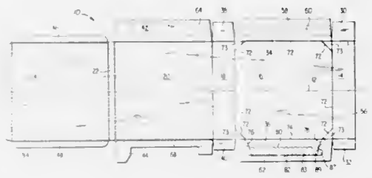


4,836,383

MICROWAVE FOOD CARTON WITH DIVIDER PANEL

Robert L. Gordon, Monroe, and Linda A. Bernstein, Campbell Hall, both of N.Y., assignors to International Paper Company, Purchase, N.Y.

Filed Jun. 7, 1988, Ser. No. 203,773
Int. Cl.[4] B65D *5/48, 5/54*
U.S. Cl. 206—611 **8 Claims**



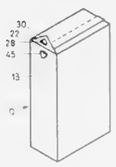
1. A carton formed from a one piece blank of foldable, resilient, flexible and non-electrically conducting sheet material, such as paperboard, the carton being in the form of a rectangular parallelepiped having top, bottom, front, rear, and side panels, the carton also having a food supporting panel which is vertically spaced upwardly from said bottom panel and parallel thereto, said food supporting panel having a sheet of microwave interactive material over at least a portion of its area, the front panel having a tear strip which extends across the major portion of its length, the major portion of the periphery of the top panel provided with joined tear perforation lines, the remainder of said top panel periphery defined by a fold line, said fold line bordering a tongue portion of said front panel which is located above said tear strip, whereby ripping of the tear strip exposes an edge of the tongue portion of the front panel to thus permit the tongue to be grasped and pulled to thereby rip off the major portion of the top panel and gain access to a foodstuff adapted to be placed on the food supporting panel.

4,836,384

CARTON, PARTICULARLY FOR LIQUIDS AND BLANK THEREFOR

Heinz J. Tüns, Dachsen, and Herbert Hiss, Diessenhofen, both of Switzerland, assignors to Sig Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Continuation of Ser. No. 942,983, Dec. 17, 1986, abandoned. This application Dec. 16, 1988, Ser. No. 285,385
Claims priority, application Switzerland, Dec. 19, 1985, 5416/85
Int. Cl.[4] B65D *5/72*
U.S. Cl. 206—621.3 **12 Claims**



1. In a carton for storing flowable material therein; said carton being formed of a cardboard sheet sandwiched between a sealable layer and a liquid-impervious layer; said carton including a side face having an exterior surface and being formed of a side panel and an adjoining top face formed of top flaps and a triangular ear constituting a pocket flap; said triangular ear having an inferior surface and being formed from one of the top flaps and being situated in a zone where said side face and said top face adjoin, the improvement comprising a weakening line provided solely in said cardboard in the inferior surface of said triangular ear and enclosing an area portion of said triangular ear; at least one of the layers between which the cardboard sheet is sandwiched uninterruptedly covering said weakening line; said triangualr ear being of double-thickness of material and being folded flat against said side panel whereby the sealable layer on said side panel is in a face-to-face contacting relationship with the sealable layer on the flat-folded triangular ear; the sealable layer within said area portion of said triangular ear being, in a sealed unbroken state of the carton, firmly bonded to the sealable layer on the exterior surface of said side face; in said sealed, unbroken state said at least one layer hermetically separating an interior of the carton from the environment in the zone of contact between the triangular ear and the side panel; the sealable layer on said triangular ear being free from a firm bond with the sealable layer on said side face externally of said area portion, whereby upon lifting said triangular ear away from said side face, said area portion tears out of said triangular ear along said weakening line while remaining bonded to said exterior surface of said side face for obtaining a pouring aperture in said triangular ear, delimited by said weakening line.

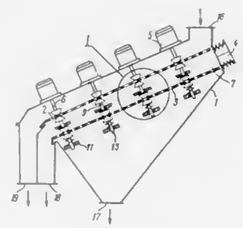
4,836,385

VIBRATORY SCREENING MACHINE

Vladimir F. Slesarenko, ulitsa Grazhdanskaya,4,kv.72; Leonid A. Vaisberg, prospekt Nauki, 24,korpus 1,kv.30; Leonid K. Balabatko, Sofiiskaya ulitsa,37,korpus 1,kv.6; Veniamin I. Sozykin, ulitsa Raziezzhaya,42,kv.2, all of, Leningrad, and Amiran F. Gasseev, ulitsa Isaka,58,korpus3,kv.37, Tskhinvali, all of U.S.S.R.

Filed Aug. 12, 1988, Ser. No. 231,705
Int. Cl.[4] B07B *1/28*
U.S. Cl. 209—315 **5 Claims**

1. A vibratory screening machine comprising:
a frame,
an upper screen mounted in said frame,
a lower screen mounted in said frame and placed below said upper screen so that an interscreen space is formed between said screens,
pushers of a first set, contacting one of said screens,
electromagnetic vibrating drives for imparting vibrations to said pushers,



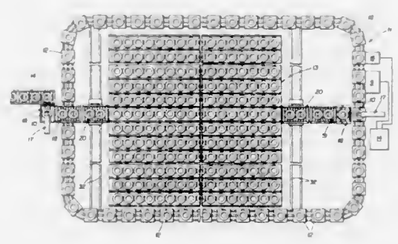
pushers of a second set disposed in said interscreen space in alignment with said pushers of the first set and making contact with both the screens,
guides for displacement of said pushers of the second set, disposed in said interscreen space and rigidly secured in relation to said frame,
stops rigidly secured in said frame, said pushers of the second set being spring-loaded against said stops in the direction of said pushers of the first set.

4,836,386

SORTING SYSTEM

Charles L. Smith, Barberton, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Aug. 10, 1983, Ser. No. 521,869
Int. Cl.[4] B07C *3/02, 5/36;* **B65G** *25/10, 57/10*
U.S. Cl. 209—564 **4 Claims**



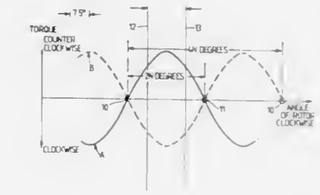
1. An apparatus for sorting substantially horizontally disposed tires having vertically spaced upper and lower annular beads from a conveying means having tires of various types disposed on said conveying means comprising:
(a) identifying means adapted to determine the types of tires on said conveying means; and
(b) generally horizontally moveable transport means responsive to said identifying means for removing a tire in a generally horizontally sliding movement from said conveying means wherein said transport means includes a pivotally mounted arm member which engages an area of the upper bead of said tire and causes a slight lifting of one side only of said tire beneath the engaged upper bead area to enable lateral sliding movement of said tire from the conveying means with a reduction of frictional resistance due to said lifting of said one side without completely lifting the tire from the conveying means when displaced by said transport means.

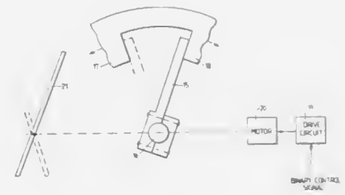
4,836,387

DEFLECTION GATE DRIVEN BY STEPPER MOTOR

Ronald A. Cottrell, Portsmouth, England, assignor to De La Rue Systems, Limited, England

Filed Jul. 23, 1986, Ser. No. 889,425
Claims priority, application United Kingdom, Jul. 24, 1985, 8518703
Int. Cl.[4] B07C *5/36;* **H02P** *8/00*
U.S. Cl. 209—657 **4 Claims**





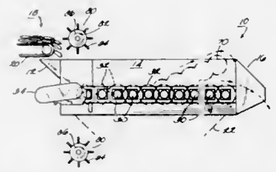
1. Sorting apparatus comprising a deflector movable between first and second positions and located in a path of movement of the articles to be sorted, the position of the deflector ensuring that each article will follow one of two paths; and means for positioning the deflector, the positioning means including:
a stepping motor having two windings which are connected in parallel between two transistor circuits, each of which comprises two series-connected transistors;
a circuit for energising the stepping motor for angular movement in a first direction or in a second opposite direction;
means limiting the angular movement of the stepping motor shaft to a first angular position in one direction and a second angular position in the other direction, the angular interval between the first and second angular positions being less than and lying within the angular interval defined by a shaft position of stable equilibrium in the first direction of energisation of the stepping motor windings and an immediately adjacent shaft position of stable equilibrium in the second direction of energisation of the stepping motor windings; and means coupling the shaft of the stepping motor to the deflector such that the deflector is in its first and second positions when the stepping motor shaft is in its first and second angular positions, respectively; and wherein the control circuit is connected to receive a binary signal representing the required direction of rotation of the stepping motor and providing two output signals of opposite logic levels, the conductivity types of the transistors and the connections from the outputs of the control circuit to the transistor gates being such that when said binary signal is at a first logic level current flows through the two windings in a first direction and

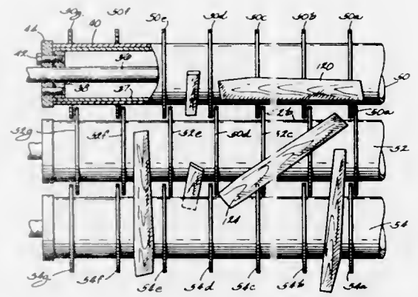
when said binary signal is at a second logic level current flows through the two windings in the opposite direction.

4,836,388
APPARATUS FOR SEPARATING MATERIAL BY LENGTH

Joseph Bielagus, Tualatin, Oreg., assignor to Beloit Corporation, Beloit, Wis.

Filed Apr. 27, 1988, Ser. No. 186,541
Int. Cl.[4] B07C *13/04*
U.S. Cl. 209—672 **15 Claims**





1. An apparatus for separating a volume of material into first and second fractions, said first fraction including material longer than a specified length, and said second fraction including material shorter than a specified length, said apparatus comprising:

a screening bed for effecting the separation into said first and second fractions;

inlet means for providing a flow of material to be separated on said screening bed;

a first receiving means for receiving said first fraction which passes over said screening bed;

a second receiving means for receiving said second fraction which passes through said screening bed; and

said screening bed including;

a plurality of adjacently disposed substantially parallel shafts;

each of said shafts having a plurality of disks disposed thereon, the spacing between adjacent disks on a shaft being approximately equal to one-half said specified length;

said disks on adjacent shafts being positioned to form pairs of minimally spaced disks including one disk from each of the adjacent shafts;

adjacent pairs of disks being spaced a distance approximately one-half said specified length;

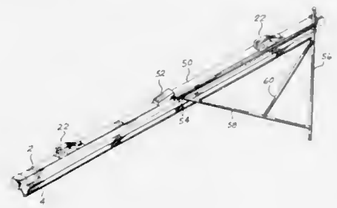
the diameters of said shafts, and the spacing between adjacent shafts being selected to cause material longer than said specified length to ride along the surfaces of said shafts from one to another, as said shafts rotate, while causing material shorter than said specified length to fall between adjacent shafts; and

drive means for rotating said shafts as material is fed onto said screening bed.

4,836,389
SELF-LOCKING CAM LEVER

Richard G. Poulton, Olympia, Wash., assignor to David A. Clayton, Bothell, Wash.

Continuation-in-part of Ser. No. 354,237, Mar. 3, 1982, abandoned. This application Nov. 14, 1983, Ser. No. 551,088
Int. Cl.[4] A47F *7/16*
U.S. Cl. 211—45 **3 Claims**



1. A system for vertically filing sheet material, comprising:

a clamp having a top member with a horizontal web and an essentially planar vertical flange extending downwardly from each side of such web to form an essentially rectangular downwardly-opening chanel, two generally vertical clamping members hinged together at their upper ends, a pull member that closes the clamp by pulling the clamping members upwardly into the channel and against the flanges to pivot the clamping members into clamping engagement with each other, and means for biasing the clamping members away from each other and the clamp into an open position, said pull member including a threaded shaft that projects upwardly through a hole in the web;

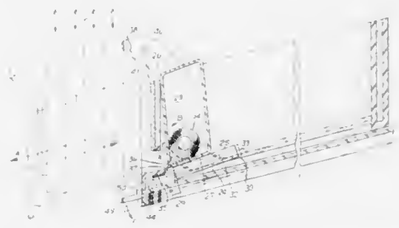
a self-locking cam lever for activating the pull member, comprising a rotary cam member having a peripheral surface disposed about a pivot axis, and a cylindrical hole extending axially therethrough; said cylindrical hole having an axis that coincides with the pivot axis of the cam member and that is perpendicular to the longitudinal axis of the threaded shaft of the pull member; said peripheral surface including a first portion that is a first radial distance from the pivot axis, a second portion that is a second radial distance from the pivot axis, a third portion that is a third radial distance from the pivot axis, a flattened area that surrounds and includes said first portion, and a rounded area that is adjacent to the flattened area and that includes said third portion, said first radial distance being greater than said second radial distance and less than said third radial distance, and said third portion being positioned circumferentially between said first portion and said second portion; said cam member having an open position in which said second portion contacts an upper surface portion of the web, and a closed position in which said flattened area contacts said upper surface portion; and said cam member comprising a self-lubricating plastic to form a non-abrasive peripheral surface; a handle for pivoting said cam member back and forth between its open and closed positions and for rotating the cam member about said longitudinal axis; and means for engaging said pull member and for pulling it along said longitudinal axis to close the clamp when said cam member is pivoted into its closed position, said means for engaging including a barrel nut rotatably received in said cylindrical hole and threadedly engaging said shaft of the pull member; wherein said handle projects from a portion of the peripheral surface of the cam member substantially circumferentially opposite the third portion of said peripheral surface, and said handle is dimensioned to be sufficiently long to provide the leverage required to close the clamp but not long enough to provide excessive leverage that would strip the threaded connection between the shaft and the barrel nut during normal hand rotation of the handle and nut for the purpose of effecting final clamping pressure; and

support means for supporting the clamp in a horizontal position, said support means including portions that engage the cam lever.

4,836,390
RACK FOR DISPENSING ARTICLES

Dennis J. Polvere, 151 Prospect Ave., Apt. 15C, Hackensack, N.J. 07601

Filed Oct. 15, 1987, Ser. No. 108,763
Int. Cl.[4] A47F *1/00*
U.S. Cl. 211—59.3 **9 Claims**



1. Apparatus for dispensing articles comprising: a substantially rectangular compartment having front, rear, bottom and opposed side walls;

at least one divider wall section extending longitudinally between said front and rear walls for dividing said compartment into a plurality of longitudinal channels;

a longitudinal slot in each of said channels extending through said bottom wall; and

pusher means movable longitudinally in each of said channels for urging articles within the respective one of said channels in a forward direction towards said front wall;

each said pusher means including an upper pusher body within the respective channel adapted to bear against a rearmost article in said channel and having a lower surface, a lower foot portion below said bottom wall having an upper surface spaced from said lower surface of said pusher body by a distance greater than a thickness of said bottom wall, a connecting element extending through the respective slot for connecting said pusher body and said foot portion and biasing means for urging said pusher means in said forward direction and acting above said lower surface thereof to tip said pusher body and thereby bring a rear portion only of said foot portion into substantially line contact with said bottom wall.

4,836,391
PIANO ROLL CABINET

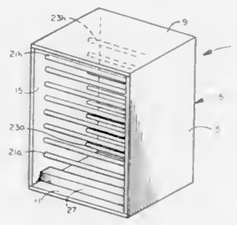
Jan E. Bell, 222 S. Hubbard, Horicon, Wis. 53032

Filed Jul. 6, 1987, Ser. No. 69,650
Int. Cl.[4] A47F *5/00*
U.S. Cl. 211—60.1 **3 Claims**

1. A piano roll cabinet comprising:

a. a housing having five generally orthogonal walls to form a five-sided enclosure with an open front that defines a vertical plane, the distance between the open front and the opposed back wall being approximately 12.75 inches to thereby accommodate a piano roll with the longitudinal axis thereof generally perpendicular to the open front plane;

b. an array of generally horizontal support rods fixedly mounted in the housing for supporting a plurality of piano rolls inside the housing with the piano roll longitudinal axes generally perpendicular to the housing open front, the support rods being arranged into first and second generally vertically aligned columns with the first column being supported adjacent the housing open front and the second column being mounted adjacent the housing opposed back wall, the vertical spacings between the respective support rods in the first and second columns being approximately 2.5 inches to receive the piano rolls therebetween; and

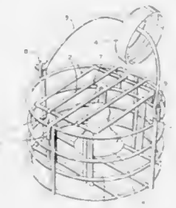


c. a brace extending along the housing bottom wall in vertical alignment with the first column of support rods and extending a predetermined distance above the housing bottom wall to support one end of a piano roll adjacent the housing open front, the housing bottom wall supporting the piano roll second end adjacent the housing back wall, so that a piano roll can be inserted completely into the housing open front and stably supported near the ends thereof by selected ones of the support rods in the first and second arrays thereof.

4,836,392
UPRIGHT BABY-NIPPLE SANITIZER

Cynthia L. Constantino, P.O. Box 10464, Torrance, Calif. 90505

Filed Dec. 23, 1988, Ser. No. 289,811
Int. Cl.[4] B65D *6/08*
U.S. Cl. 211—181 **2 Claims**



1. A baby-nipple sanitizer device comprising: a cylindrical wire basket, a wire lid and a wire handle; said cylindrical wire basket being formed from approximately 0.10 inch diameter wire, coated with a rubberized material suitable for dishwasher heating temperatures, said wire basket having a cylindrical shape, open at its top end, and measuring approximately 4½ inches in diameter by 2¼ inches high, said wire basket having a multiplicity of wire prongs, soldered or welded to the bottom rungs of said wire basket, and arranged vertically and equally spaced apart to accommodate baby nipples, one on each wire prong, said wire basket having two hooked portions of wire 180 degrees apart, attached protruding above the top rim of said basket and serving as hook fastenings for said wire handle; said wire lid being hingedly connected to said wire basket by two hooked portions that extend from one longitudinal end and serve a hinge, said wire lid having a third hooked portion

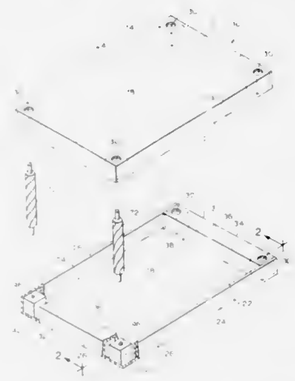
extending at the distal end from the hinge and serving to hold said lid closed when said third hooked portion is pushed over the top wire of said wire basket, said wire lid being formed from approximately 0.10 inch diameter wire, coated with a rubberized material suitable for dishwasher heating temperatures, said wire lid being rectangularly shaped, approximately 3 inches ling by 2¼ inches wide and sized to fit the diameter of said basket so that said lid will close tightly when pushed in place; said handle being made of a single piece of the same wire used for said basket contruction, said handle being curved in an arc approximately 2¼ inches in radius, and having one end shaped in a partly closed hook for fastening securely to one of the basket structure hooked portions, and the other end open straight for insertion in the opposing basket hooked portion; said wire basket prongs being sized and shaped to hold baby nipples upright so that when said lid is closed there is only approximately one quarter inch space between the top of the nipples and the lid, permitting nipple movement for cleansing but preventing them from toppling and filling with water; said wire basket having sufficient space between its bottom rungs, allowing the dishwasher rack prongs to be inserted for securing the device to the rack; said baby-nipple sanitizer being shaped and sized to allow its placing in any convenient position on the dishwasher rack.

4,836,393

MODULAR DISPLAY STAND

Robert Maye, 70A Greenwich Ave., New York, N.Y. 10011

Filed Aug. 11, 1988, Ser. No. 231,152
Int. Cl.[4] B66C *23/42*
U.S. Cl. 211—188 12 Claims



1. A modular display stand for exhibition of articles of manufacture, which is readily assembled and disassembled without the use of tools and which is stable when loaded with relatively heavy loads of articles to be exhibited, and which when assembled comprises;

at least one shelf member which is a planar sheet having a top planar surface, a bottom planar surface, a peripheral edge between top and bottom surfaces, said peripheral edge defining the outer boundaries of the planar sheet, and a flange on the peripheral edge of the sheet, projecting away from the peripheral edge on an axis transverse to the axial plane of the sheet, said flange being integrally joined to the planar sheet;

a plurality of apertures piercing the planar sheet to provide open communication between the upper and the lower surfaces of the planar sheet at positions proximal to the flange;

a washer fixedly mounted on a planar surface of the sheet at the site of each aperture, in a manner whereby the opening of each washer is in axial alignment with the associated aperture, said mounted washer having a first surface adjacent the planar surface and a second, exposed face surface;

a pin fixedly mounted in each aperture, each of said pins having a first end extending above the plane of the top planar surface of the planar sheet and a second end extending below the plane of the bottom planar surface of the planar sheet;

a recessed seat in the exposed face of each washer, radially disposed about the pin mounted in each aperture;

a spiral-wound paper tube support member having an end adapted by size and configuration to engage in a frictional fit with the seat, said tube end being mounted in the seat, whereby the tube is in an erect vertical position perpendicular to the plane of the planar sheet; and

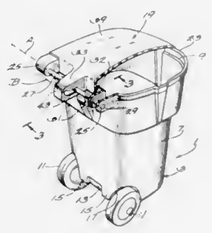
means fixed in the tube end for coupling with an end of the pin.

4,836,394

REFUSE CONTAINER WITH TWO-POSITION LID

Norman J. Glomski, Chattanooga, Tenn., assignor to The Heil Co., Milwaukee, Wis.

Filed May 9, 1988, Ser. No. 192,002
Int. Cl.[4] B65D *90/00*
U.S. Cl. 220—1 T 5 Claims



1. A container comprising:

a. an open top container body having a back wall and adapted to hold a quantity of refuse or the like, the container body being formed with spaced ribs extending from the back wall near the open top;

b. a shaft retained within and extending between the container body ribs at a location spaced from the container body back wall; and

c. lid means pivotally fixed to the shaft for being selectively pivoted between a closed position wherein the lid means covers the container body open top and first open position wherein the lid means cooperates with the container body to be maintained at a first predetermined angle relative to the closed position and a second open position wherein the lid means is maintained at a second predetermined angle with respect to the closed position, the lid means comprising:

i. a cover portion adapted to interfit over the container body open end; and

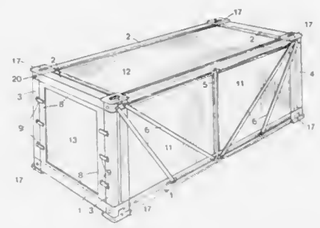
ii. a hinge joined to the cover portion and extending therefrom and being generally coplanar therewith, the hinge being generally coplanar with the container body ribs when the cover portion is pivoted to the closed position, the hinge defining an enclosed elongated slot therethrough for pivotally receiving the shaft, the slot being generally coplanar with the plane of the hinge.

4,836,395

LARGE DISPOSABLE CONVERTIBLE PACKING CASE

Maurice Goutille, Lamorlaye, France, assignor to Weidmann & Pittet S.A., Geneva, Switzerland

Continuation of Ser. No. 828,450, Feb. 11, 1986, abandoned.
This application Mar. 30, 1988, Ser. No. 180,709
Claims priority, application France, Feb. 14, 1985, 85 02109
Int. Cl.[4] B65D *87/00*
U.S. Cl. 220—1.5 8 Claims



1. A large disposable convertible packing case which has a rigid load-bearing metal framework consisting of elements assembled by mechanical fixing means, and designed to withstand by itself all the mechanical stresses due to a contained load, handling and transportation, the case structure comprising:

a rectangular shaped bottom frame (**1**) made of four side pieces and a plurality of cross pieces (**29**) rigidly attached to two opposite side pieces, said bottom frame (**1**) having a corner piece (**17**) rigidly attached at each corner thereof;

a rectangular shaped top frame (**2**) made of four side pieces and a plurality of metallic cross bars (**16**) welded to two opposite side pieces, said top frame (**2**) having a corner piece rigidly attached at each corner thereof;

four vertical corner supports (**3,4**) joining together said bottom and top frames, said corner supports each being removably attached to the corner pieces by at least one locating peg (**22**) and at least one screw fastener (**21**);

stiffeners (**5, 6, 10**) being provided for additional joining said bottom and top frames (**1,2**) together and for distributing the loading forces therebetween, the sides and the top of the case structure being closed with a plurality of panels (**11,12,13,14**) each fixed to the metal structure by fasteners located near the panel edges and driven through the panels into the metal elements forming the structure, each said stiffener (**6**) being removably attached to said bottom frame (**1**) and said top frame (**2**) external to said panels by a stud (**20**) rigidly attached to each said frame, a opening in each end of the stiffener being fitted over the stud and held by a pin (**28**).

4,836,396

COMBINATION CANISTER COVER AND COOKIE CUTTER

Jane Ancona, and Bruce Ancona, both of New York, N.Y., assignors to M. Kamenstein, Inc., White Plains, N.Y.

Filed Jul. 8, 1988, Ser. No. 222,068
Int. Cl.[4] A47J *43/18*
U.S. Cl. 220—212 8 Claims

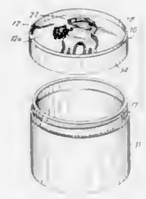
1. A combination canister cover and cookie cutter, comprising:

a central member having an upper surface and a lower surface;

a lower cylindrical skirt extending downwardly from said central member;

a raised image forming pattern formed on the upper surface of said central member;

a cookie cutting rim extending from the upper surface of said central member in surrounding relation to said raised image forming pattern and at a height greater than the height of said raised image forming pattern; and



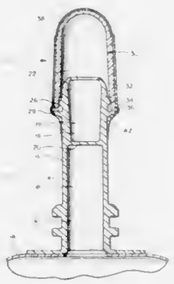
means for releasably securing said combination cover and cookie cutter onto a canister.

4,836,397

CLOSURE FOR SEALING A PORT

Thomas A. Fowles, McHenry, Ill., assignor to Baxter International Inc., Deerfield, Ill.

Filed Nov. 13, 1984, Ser. No. 670,502
Int. Cl.[4] B65D *41/32*
U.S. Cl. 220—214 17 Claims



1. A port and closure assembly for a solution container comprising:

a port including an opening, a tubular bore, an outer wall defining the tubular bore, and a rib circumscribing the outer wall;

a closure including a cap having an inner circumference substantially equal to the outer circumference of the rib of the outer wall of the port so that a friction fit is produced when the cap seals the opening of the port; and

the closure further including a coating sealing the cap to the port.

4,836,398

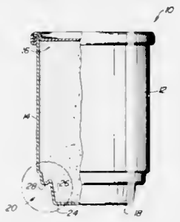
INWARDLY REFORMABLE ENDWALL FOR A CONTAINER

Charles J. Leftault, Jr., Murrysville, and W. Coy Willis, Verona, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 29, 1988, Ser. No. 150,228
Int. Cl.[4] B65D *1/16*
U.S. Cl. 220—66 13 Claims

12. A thin-walled metal container comprising a cylindrical body and an integral endwall closing one end of the cylindrical body, said endwall including a frustoconical wall portion with its smaller end projecting from the end of the container and closed by a central panel portion and the larger end of said frustoconical wall portion connected to a relatively narrow

rim outwardly surrounding said wall portion with said rim connected at its outer peripheral edge to the body of the container so that said central panel portion can be displaced toward said container by mechanical force exceeding the elas-



tic limit of the metal in said container wall to reduce the length of said frustoconical wall portion in a controlled manner and thereby reduce the volume in a container on which said end wall is secured.

4,836,399

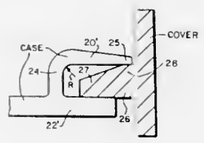
IMPROVED LIQUID TIGHT TRANSFORMER CASING

Frank J. Zoladz, Morristown, Tenn., assignor to North American Philips Consumer Electronics Co., New York, N.Y.

Continuation of Ser. No. 97,485, Sep. 15, 1987, abandoned, which is a continuation of Ser. No. 842,055, Mar. 18, 1986, Pat. No. 4,709,828, which is a continuation of Ser. No. 746,488, Jun. 19, 1985, abandoned. This application Oct. 17, 1988, Ser. No. 259,470

Int. Cl.[4] B65D *6/34*

U.S. Cl. 220—76 **4 Claims**



1. A transformer casing comprising:

a first transformer casing part having at least one side surface and a projecting member extending in a first direction relative to said side surface, said projecting member having a first engagement surface extending in said first direction, and a second engagement surface extending in a direction substantially parallel thereto; and

a second transformer casing part having a substantially U-shaped receiving member for receiving said projecting member of said first transformer casing part, said receiving member having an arm and a side, said arm being flexible relative to said side and relative to said projecting member, and said side and said projecting member being rigid relative to said arm, said flexible arm and rigid side having, respectively, a first and a second receiving surface for contacting said first and second engagement surface of said projecting member, respectively, engagement of said projecting member and said U-shaped receiving member causing said relatively flexible arm to deflect, said relatively rigid side remaining relatively underflected, with resilient pressure of said relatively flexible arm on said relatively rigid member creating a first and second liquid tight seal at the so-contacting surfaces.

4,836,400

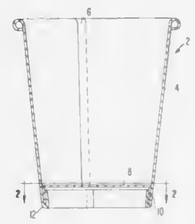
CAULKING METHOD FOR FORMING A LEAK FREE CUP

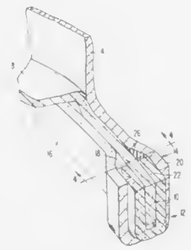
Wayne P. Chaffey, 8710 Royal Ridge, Fort Smith, Ark. 72903; Joseph J. Vaxmonsky, 1245 41st Ave., Vero Beach, Fla. 32960; David L. Wagner, 1384 Inverness La., Neenah, Wis. 54956, and Warren G. Wiedmeyer, 5223 Hwy. 150, Larsen, Wis. 54947

Filed May 13, 1988, Ser. No. 193,796

Int. Cl.[4] B65B *53/06*

U.S. Cl. 220—81 R **21 Claims**





1. A method for forming a leak free container from a sidewall blank and a bottom wall blank, comprising the steps of

(a) joining together a pair of generally opposed edges of said sidewall blank in overlapping relationship to form a sidewall lap joint including an inner sidewall edge and an outer sidewall edge,

(b) joining the peripheral edge of said bottom wall to the bottom edge of said sidewall in overlapping relationship to form a bottom wall lap joint incorporating a portion of said sidewall lap joint in a manner to create a void volume bounded by said bottom wall and said sidewall adjacent the inner sidewall edge of the portion of said sidewall lap joint incorporated in said bottom wall lap joint,

(c) prior to step (b), applying caulking material to at least one of said sidewall blank and said bottom wall blank at a location and in an amount which causes said caulking material to block and seal said void volume formed during step (b) to prevent said void volume from becoming a leak path for liquids placed in said container, and

(d) sealing said sidewall lap joint and said bottom wall lap joint.

4,836,401

CONTAINER FOR LIQUIDS AND METHOD FOR FILLING AND SEALING THE CONTAINER

Ole Ingemann, Ryslinge, Denmark, assignor to PLM AB, Malmo, Sweden

PCT No. PCT/SE87/00284, § 371 Date Feb. 9, 1988, § 102(e) Date Feb. 9, 1988, PCT Pub. No. WO87/07879, PCT Pub. Date Dec. 30, 1987

PCT Filed Jun. 17, 1987, Ser. No. 156,925

Claims priority, application Sweden, Jun. 19, 1986, 8602744

Int. Cl.[4] B65D *21/00*

U.S. Cl. 220—83 **14 Claims**

1. A container comprising a container body having a lower standing surface and an upper open mouth, a lid sealingly connected to said container body to close said open mouth, a sealing joint on said container body disposed continuously around said mouth; said lid being sealingly connected to the container body by said sealing joint, said sealing joint being disposed in a plane which forms an acute angle with a plane containing said standing surface, said container body including an internal shoulder extending at least partially around said open mouth, at least a portion of said sealing joint being on said shoulder, at least a portion of said internal shoulder being positioned below said open mouth in an arrangement such that said lid forms an angle with a plane containing said open mouth.

4,836,402

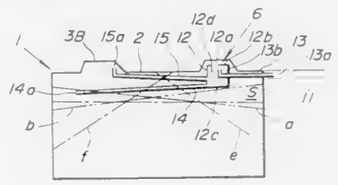
FUEL TANK VENT SYSTEM FOR AUTOMOTIVE VEHICLES

Michiaki Sasaki, Hadano, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 883,248, Jul. 9, 1986, abandoned. This application Jun. 14, 1988, Ser. No. 220,969

Int. Cl.[4] B65D *25/00*

U.S. Cl. 220—85 VS **11 Claims**



1. A fuel tank vent system for a vehicle comprising:

a rectangular fuel tank having a first pair of horizontally opposite sides and a second pair of horizontally opposite sides, said fuel tank also having a top wall and a vacant space between said top wall and the surface of fuel filled therein, said top wall having a pair of opposite first and second edges coinciding with said first pair of sides, said vacant space having a first corner portion adjacent one longitudinal end of said first edge and a second corner portion adjacent one longitudinal end of said second edge and diagonally opposite to said first corner portion;

a separator disposed in said vacant space adjacent said second edge and said second corner portion, said separator having a separator chamber, said separator having a top wall and a bottom wall, said top wall being formed with an orifice for providing communication between said vacant space and said separator chamber;

a first vent pipe in communication with said separator chamber at a portion adjacent said top wall and having an end outside of said fuel tank; and

a second vent pipe disposed in said vacant space and in communication with said separator chamber at a portion adjacent said bottom wall, said second vent pipe having an end disposed adjacent said first corner portion of said vacant space whereby said second vent pipe extends diagonally between said first corner and said second corner portion.

4,836,403

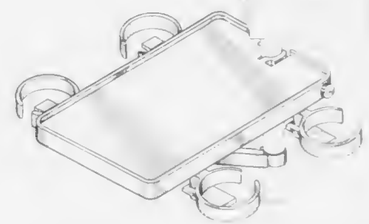
MULTI-USE TRAY WITH ACCESSORIES

Laura M. Blackmon, 420 San Saba, El Paso, Tex. 79912

Filed Dec. 3, 1987, Ser. No. 128,427

Int. Cl.[4] A47G *29/00*

U.S. Cl. 220—85 H **7 Claims**



1. A tray for attachment to diverse surfaces and projections comprising a generally flat, planar surface adapted to be horizontally disposed, said surface being provided with at least one clip means formed integrally therewith for attachment to one of said projections, said clip means being a resilient bracket adapted to be tightened onto said projection by applying pressure to one side thereof by means of a screw passing through a portion of said tray to engage said bracket, elongated bracket support means pivotally attached at one end to the underside of said surface at a point remote from said clip means, the other end of said bracket means being provided with means for engaging at an acute angle the same or a different projection or surface as said clip means.

4,836,404

VALVED CONTAINER CLOSURE

Peter Coy, 2677 South Ave., Box 229, Bryn Athyn, Pa. 19009

Continuation of Ser. No. 152,537, Feb. 5, 1988, Pat. No. 4,782,975. This application Jun. 15, 1988, Ser. No. 207,293

Int. Cl.[4] A47F *19/22*

U.S. Cl. 220—90.4 **3 Claims**

2. A container closure for selectively dispensing a liquid, said closure comprising:

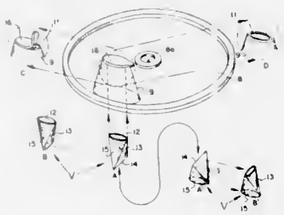
a lid portion for closing an open container and generally defining the top plane of the container, a valved spout integral with and extending from the lid portion above the top plane, said spout comprising:

outer and inner resilient portions nested one within the other;

the outer portion is generally tubular and defines the exterior of the spout, said outer portion has inlet and outlet ends with the inlet end presented toward the container; and

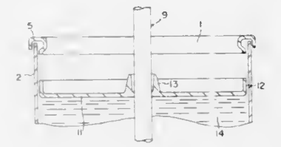
the inner portion has an open end presented in the same orientation as said outlet end and a valved end with

opposed terminal portions defining a normally closed valve apex yieldingly openable by application of lateral



compression in a direction edgewise to said opposed terminal portions.

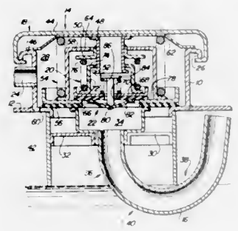
4,836,405
CONTAINER FOR THE RECEPTION OF A PUMPABLE PRODUCT
Paul Schulz, Wuppertal, and Guenther Amberg, Neuss, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany
Filed Jan. 28, 1988, Ser. No. 149,467
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1987, 3702431
Int. Cl.[4] B65D *25/10*
U.S. Cl. 220—93 **3 Claims**



1. A container for the reception of a pumpable product, said container having a prism-shaped or cylindrical wall and end portions constructed respectively as a base and a lid, said lid comprising a lid section and an encircling closure ring placeable on the upper edge of said wall, wherein said lid section is connected at its circumferential edge adjoining the inside of said wall by a first frangible line portion with said closure ring and has a second closed frangible line portion located in the central area of said lid which is adapted to the size of the shaft of a barrel pump and to be pierced by said shaft, so that the inner part of said lid is surrounded by said first frangible line portion and forms a closely fitting follower plate for said barrel pump.

4,836,406
CLOSURE FOR A PRESSURIZED FLUID-FILLED CONTAINER
Friedrich Benning, Schwetzingen, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.
Filed Sep. 17, 1987, Ser. No. 98,102
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1986, 3631528
Int. Cl.[4] B65D *15/15*
U.S. Cl. 220—203 **9 Claims**

9. A closure for a container generally filled with fluid, where the fluid is subject to varying pressures and temperatures, the closure comprising:
a filler neck extending into the container to about the desired fluid level and having a sealable end outside the container;
a U-shaped tube having a first open in an uppermost part of said container and a second open end inside said filler neck, said tube being closed between said ends;
a bleed line connected to said filler neck;
a closure cap for selectively sealing said sealable filler neck end, said cap having:
a bleed seal for sealably engaging said sealable filler neck end, said bleed seal having a central opening therein;

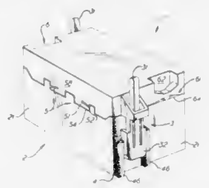


a high pressure relief seal for sealably engaging the edge of said bleed seal central opening, said high pressure relief seal having a central opening therein; and
a low pressure relief seal for sealably engaging the edge of said high pressure relief seal central opening, each of said seals being biased towards a sealing position and cooperating to seal said filler neck when said closure cap is attached thereto.

4,836,407
TAMPER-EVIDENT, DIFFERENTIAL PRESSURE-THERMOFORMED LIDDED PLASTIC CONTAINER
Robert Bruce, and Robert W. Whitney, both of Litchfield, Ill., assignors to CPC-Rexcel, Inc., St. Louis, Mo.
Filed Aug. 4, 1987, Ser. No. 81,695
Int. Cl.[4] B65D *17/40*
U.S. Cl. 220—276 **11 Claims**

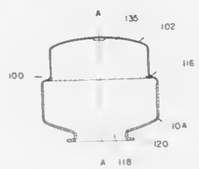
1. A lid for a tamper-evident lidded container, comprising:
a disk-like central portion made of thermoplastic sheet material integrally perimetrically surrounded by an inverted U-shaped channel portion having a radially inner wall, a top wall and a radially outer wall;
means providing a circumferentially extending radially inwardly projecting barb in said outer wall having an obliquely axially upwardly and radially outwardly facing, radially inner engagement surface arranged to catch under a lower end of a downwardly directed rim of a container body as the lid is pushed, in use, onto the container body so as to enclose the rim from above, so as to position said barb for engagement with a radially inner sidewall surface of the rim at a radially inner corner of said lower end of said rim and thereby normally prevent non-destructive removal of the lid from the container body;
said channel portion having an angularly extending line of weakness molded into said top wall thereof so as to extend thereon around at least a major proportion of the circumference of said channel portion, said line of weakness lying radially intermediate said inner wall and said outer wall of said channel member, said line of weakness having an inverted V-shaped profile in transverse cross-section.

4,836,408
INTEGRAL LATCHING ARM
Dhirendra C. Roy, Canton, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.
Division of Ser. No. 107,818, Oct. 13, 1987, Pat. No. 4,771,910. This application Sep. 16, 1988, Ser. No. 245,856
Int. Cl.[4] B65D *41/16*
U.S. Cl. 220—306 **4 Claims**



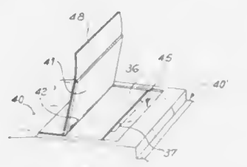
1. An interface between a housing and a top mounted thereon, comprising;
a housing element;
a top element located on and opposed to said housing element;
a facing area on one of said elements; and
latching means connected between said housing element and said top element for latching the top to the housing with a force providing a relatively rattle-free interface between the top and the housing to which it is latched, said latching means including a pivoting arm having a distal end and being integrally formed with its respective element by means of a clamped junction.

4,836,409
INTEGRAL DIAPHRAGM-LINER BLADDER FOR HYDROPNEUMATIC TANK
Joseph A. Lane, Taunton, Mass., assignor to Amtrol Inc., West Warwick, R.I.
Filed Feb. 18, 1988, Ser. No. 156,974
Int. Cl.[4] F16L *55/00*
U.S. Cl. 220—403 **13 Claims**



1. A diaphragm/liner structure adapted for mounting in a cylindrical tank, comprising a resilient, deformable, integral wall structure having a first cylindrical portion and a section cylindrical portion, the thickness of the first portion being less than the thickness of the second portion the first portion being molded to the second portion by a transition portion, the first portion having an internal diameter which is less than the internal diameter of the second portion even when the diaphragm/liner is in its expanded, but not deformed, position, the diaphragm/liner, when the first portion is folded with the second portion, being adapted to expand under pressure from within whereby the first portion is moved out of the second portion in a non-rolling manner, and the diaphragm/liner, when the first portion is positioned outside of the second portion, being adapted to flex or fold under pressure from without whereby the first portion is moved into the second portion, the second cylindrical portion conforming to the involved internal portion of the cylindrical tank, whereby creases in the second portion are prevented when the inside of the diaphragm/liner is pressurized.

4,836,410
DISPENSABLE TOWELS AND THEIR RELATING CONTAINER
Alma Mastrobuoni, 6 Via Roccolo, Lecco (Como), Italy 22053
Filed Jul. 13, 1987, Ser. No. 72,523
Claims priority, application Italy, Jul. 15, 1986, 22523/86[U]; Jul. 15, 1986, 21129 A/86; May 5, 1987, 20377 A/87
Int. Cl.[4] A47K *10/24*
U.S. Cl. 221—47 **8 Claims**



1. A disposable sanitary towel for storage in a container dispenser having a wall defining a slot area through which said towel dispensed, said towel being imbued with one or more substances selected from the group consisting of disinfectants, deodorizer and detergents, said towel being folded traversely, said traverse fold providing two horizontally superposed layers, the edges of which are offset from each other, wherein said towel is capable of being stacked independently in said container with one of said offset edges of the towel to be dispensed retained by said wall defining a slot area, and said other offset edge located in the slot area and provided with two protruding parts, said protruding parts being located on the same side of the open towel.

4,836,411
MULTI-PURPOSE HEAVY DUTY CARGO CONTAINER
J. Leslie Jones, P.O. Box 233, Pasadena, Calif. 91102
Filed Sep. 11, 1984, Ser. No. 649,522
Int. Cl.[4] B65D *87/00*
U.S. Cl. 220—1.5 **3 Claims**

1. In a heavy duty product transportation container having a rectangular box having an axial length of from 10 to 40 feet, having a box width of from 7 to 12 feet, and a box depth of from 7 to 12 feet, said rectangular box having two long opposed flat rigid panel sides, a fixed flat rigid front end, a full rear flat rigid door, equivalently equal in area to said front end, and a flat rigid box bottom, said box area components disposed and integrally secured at the area perimeters, forming a commercial box structure, the combination comprising:
a full length flat rigid top hinged lid, said lid having at least one hinge means securing said lid to one said long panel side,

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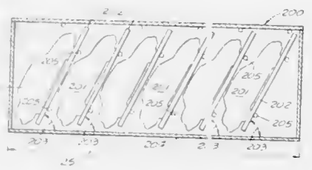
a flat rigid box bottom having bottom structural trusses disposed lengthwise under said bottom and integrally secured thereto, said bottom integral structural trusses having securing means for crane hoists,

at least one tension reinforcement truss means permanently securing said two long panel sides together in place overhead on said panel sides and adjacent said top full length



hinged lid and one said truss means disposed adjacent said rear door, preventing said panel side from wobbling, and,

multiple reinforcement truss members, each member having cross sections free of flat exterior surfaces and two opposed terminal edges capable of retaining product thereon, said truss members continuously welded and interiorily secured to said container panels.

4,836,412

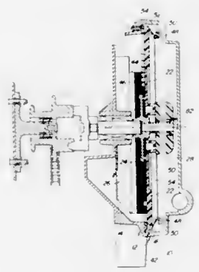
CONTINOUS LOOP FLEXIBLE LIP VACUUM SEAL

Jerry D. Webber, Moline; Jay H. Olson, Rock Island, and Richard F. Gallens, Moline, all of Ill., assignors to Deere & Company, Moline, Ill.

Continuation of Ser. No. 788,518, Oct. 18, 1985, abandoned, which is a continuation of Ser. No. 734,253, May 14, 1985, abandoned, which is a continuation of Ser. No. 546,830, Oct. 31, 1983, abandoned. This application Aug. 5, 1986, Ser. No. 894,079

Int. Cl.[4] B65H *3/08*; A01C *7/04*; F16J *15/32, 15/34*

U.S. Cl. 221—211 **20 Claims**



1. A seal of resilient material, the seal being generally continuous configuration and having a base portion extending along the length thereof, a hinge portion extending along the length thereof and a relatively thin lip portion extending along the length thereof, the relatively thin lip portion being joined to the base portion by the hinge portion along the length of the seal, the lip portion being substantially thinner than the base portion and the hinge portion being thinner than the lip portion, the base, hinge and lip portions being formed from a single, integral element of the same material, the seal having a first portion of the length thereof lying along substantially more than half the circumference of a circle between opposite first and second ends thereof and a second portion of the length thereof extending between the first and second ends and lying inside of the circle.

10. In a seed meter, the combination comprising:

a seed disk mounted for rotation about an axis and having a side surface facing outwardly in the direction of the axis, the disk also having a plurality of apertures extending through the thickness of the disk from the side surface thereof;

a housing member disposed adjacent the seed disk and having an inside configured to form a compartment therein at the side surface of the seed disk, substantially the entire side surface of the seed disk forming a boundary of the compartment;

an elongated seal mounted on the inside of the housing member and having a lip portion along the length thereof which projects in the axial direction into contact with the side surface of the seed disk radially outwardly of the axis as the seed disk rotates relative to the seal, the seal forming a generally continuous loop extending around a substantial portion of the compartment and forming a vacuum chamber therein together with a portion of the side surface of the seed disk and a portion of the inside of the housing member; and

means for creating a reduced pressure within the vacuum chamber of the housing member.

4,836,413

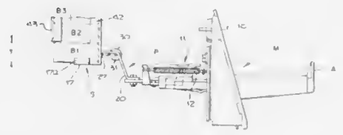
METHOD AND APPARATUS FOR DISPENSING BOXED GOODS

Jim M. Monfredi, 12460 Fern, Chino, Calif. 91710, assignor to PWS Company and Jim M. Monfedi, both of Monterey Park, Calif.

Continuation of Ser. No. 41,982, Apr. 24, 1987, abandoned. This application Aug. 8, 1988, Ser. No. 230,730

Int. Cl.[4] G07F *11/16*

U.S. Cl. 221—270 **7 Claims**



2. A coin vending machine for vending boxed goods by removing the lowermost box from a stack of boxes in response to the insertion of coins, characterized by concurrently lowering the stack of boxes in three separate and successive steps, said machine comprising:

a horizontal shelf for supporting the stack of boxes;

means for restraining all but the lowermost box in the stack against horizontal movement;

a horizontally movable coin slide having a return spring;

an elongated rigid pushing member having one end thereof rigidly affixed to said coin slide for coextensive horizontal reciprocal movement therewith, said pushing member at its other end being smoothly curved in the vertical plane so as to provide a vertical pusher face as well as a curved surface above that face and a curved surface below it;

said shelf and said pushing member being so positioned relative to each other that said pusher face normally engages a vertical wall of the bottommost box of the stack at about its vertical and horizontal centers;

a roller supported upon said pushing member for rotation about an axis which is parallel to said pusher face, said roller being set back somewhat from said pusher face so as to provide an upwardly facing horizontal support surface between said pusher face and said roller, and the upper surface of said roller being above said horizontal support surface;

so that when coins are inserted into said coin slide and said coin slide is advanced

(a) said pusher face engages the bottommost box at about its vertical and horizontal centers,

(b) the bottommost box falls off the shelf, thereby allowing the remaining stack of boxes to drop down until the next-to-bottom box becomes supported by said roller,

(c) said coin slide and pushing member are retracted by said return spring and the remaining stack of boxes are supported by the rolling engagement of said roller with the under side of what was previously the next-to-bottom box,

(d) said previously next-to-bottom box then falls from said roller onto said horizontal support surface and therefore allows the remaining stack of boxes to be lowered accordingly, and

(e) finally a corner of the previously next-to-bottom box slides along the vertically rounded surface of the pusher face until that box comes to rest upon said shelf and thereby itself becomes the bottommost box of the stack.

4,836,414

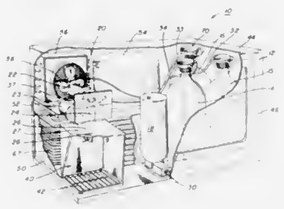
PREMIX DISPENSING SYSTEM

William S. Credle, Jr., Stone Mountain, and Jonathan Kirschner, Marietta, both of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 859,112, May 2, 1986, abandoned. This application Jul. 14, 1987, Ser. No. 73,041

Int. Cl.[4] B67D *5/56*

U.S. Cl. 222—1 **14 Claims**



1. A premix dispenser comprising:

(a) a housing;

(b) a refrigeration system mounted in said housing and including a plurality of beverage cooling coils;

(c) a CO_2 cylinder;

(d) a plurality of beverage dispensing valves and a plurality of buttons for actuating a respective one of said valves to dispense a beverage;

(e) a plurality of adaptors for connecting to an opening in a respective one of a plurality of premix beverage containers, said containers being completely open to atmosphere through aid openings;

(f) CO_2 conduit means connecting said CO_2 cylinder to each of said adapters;

(g) a plurality of beverage conduits connected one each between a respective one of said adapters and a respective one of said cooling coils;

(h) a plurality of beverage valve conduits connected one each between a respective one of said cooling coils and a respective one of said valves;

(i) regulator means for controlling the pressure of CO_2 applied to said adaptors;

(j) each of said adapters including:

(i) a beverage passageway having an external fitting for connecting to one of said beverage container conduits and having a dip tube for extending down into average container; said beverage passageway including only a check valve therein for preventing beverage from flowing backwards through said passageway and dip tube;

(ii) a CO_2 passageway including only a single valve means therein movable between a normally closed first position closing said CO_2 passageway, and a second, open position opening said CO_2 passageway; and

(iii) connecting means for matingly connecting said adapter to a premix beverage container connecting means.

13. A method for dispensing any one of a plurality of cold beverages comprising the steps of:

(a) pressurizing a plurality of premix containers with CO_2 gas at a pressure of about 55 psi to both dispense beverage therefrom and to maintain their carbonation;

(b) feeding beverage from each of said containers through a respective adapter and a beverage conduit connected to said adapter to a beverage dispensing valve;

(c) cooling the beverage in said conduits; and

(d) said pressurizing step comprising connecting a CO_2 conduit to said adapter having a normally closed CO_2 valve, having coupling means for connecting said adapter to an opening of a beverage container through which opening said container is completely container through which opening said container is completely open to atmosphere, and having valve actuating means for automatically opening said CO_2 conduit when said adapter is connected to a container, and connecting said adapter to a container to pressure said container.

4,836,415

DENTAL TIMER

Stephen M. Grussmark, 2901 S. Bayshore Dr., #15C, Coconut Grove, Fla. 33134

Filed Nov. 2, 1987, Ser. No. 115,803

Int. Cl.[4] B67D *5/32*

U.S. Cl. 222—39 **1 Claim**

1. A toothpaste dispenser and timer means in combination whereby a person is provided with a signal to indicate the time period during which the teeth are being brushed; and, said toothpaste dispenser including a dispenser lever means to selectively cause discharge of toothpaste from said dispenser, whereby said dispenser and said dispensing lever each include switch contacts arranged and positioned so that when the lever is depressed, said contacts are in electrical engagement with one another, and further, circuit means including said switch contacts and (a) battery means, (b) electronic timer means, and (c) signal means in series with one another whereby, when said switch contacts are in electrical engagement with one another the circuit is closed and a signal is emitted after a time delay of predetermined length.

4,836,416

FLEXIBLE CONTAINER WITH STOPPER VALVE

Asaf Shalgi, Kibbutz Nachshon, and Juval Limon, Tel Aviv, both of Israel, assignors to Aran Arizot Nachshon, Shimshon, Israel

Filed Aug. 5, 1987, Ser. No. 82,089

Claims priority, application Israel, Jan. 8, 1987, 81210

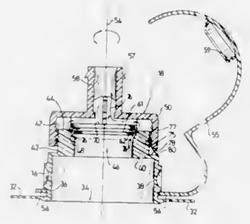
Int. Cl.[4] A45F *3/20*; B65D *37/00*; B67D *3/00*

U.S. Cl. 222—48 **17 Claims**

1. A flexible container for liquid storage, said container comprising:

a collapsible bag element enclosed within an outer bag and integrally formed with a substantially circular neck defining an opening for liquid flow therethrough, the interior of said neck having a recessed annular lip formed at the top end thereof; and

valve means for controlling the flow rate of stored liquid through said neck, said valve means comprising a substantially cylindrical outer cap and an inner valve plug retained in a centrally located opening thereof, said inner valve plug being shaped to form at least one surface flow channel adjacent thereto said outer cap and said neck having respective matching interior and exterior threads



for providing shut-off and flow positions upon rotation of said outer cap, wherein said inner valve plug is respectively seated on and spaced apart from said recessed annular lip for blocking and enabling liquid flow through said at least one adjacent surface flow channel for discharge through the central opening in said outer cap, said flexible container being further characterized in that protrusions are formed both on the lower edge of said outer cap and on the upper edge of said neck and arranged such that rotation of said outer cap relative to said neck from a fully closed position to a flow position causes engagement of said protrusions and a user-sensible resistance to rotation.

4,836,417

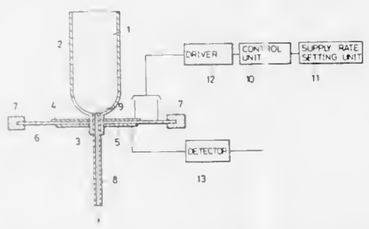
APPARATUS FOR CONTINUOUS SUPPLY OF FINE POWDER, VISCOUS FLUID OR THE LIKE AT A CONSTANT RATE

Futoshi Uchiyama, Kashiwa; Koichi Tsukamoto; Tomoyoshi Kurashige, both of Tokyo; Kaoru Furukawa, Kawasaki, and Mitsumaro Koike, Tokyo, all of Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Aug. 29, 1988, Ser. No. 237,412

Int. Cl.[4] B67D *5/08*

U.S. Cl. 222—63 **5 Claims**



1. An apparatus for continuously supplying fine powder, viscous fluid or the like at a constant rate comprising a hopper, a diaphragm for supporting the hopper, at least one first piezoelectric transducer disposed on the diaphragm of supplying vibration to the hopper, at least one second piezoelectric transducer disposed on the diaphragm for detecting the frequency of vibration of the diaphragm, and a driver for driving the first piezoelectric transducer, wherein change in the frequency of the first piezoelectric transducer resulting from change in the pressure applied to the first piezoelectric transducer by the fine powder, viscous fluid or the like in the hopper is detected by the second piezoelectric transducer and the detection signal is fed back to the driver for the first piezoelectric transducer to control the rate of discharge of the fine powder, viscuous fluid or the like from the hopper to a constant rate.

4,836,418

BULK CONTAINER AND METHOD OF MANUFACTURING AND PREPARING SAME

Wilfried Dinslage, Mühlenstrasse 16, 5161 Merzenich, Fed. Rep. of Germany

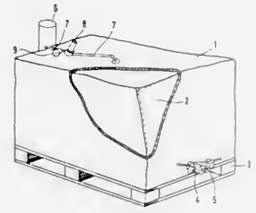
PCT No. PCT/EP85/00590, § 371 Date Jul. 7, 1986, § 102(e) Date Jul. 7, 1986, PCT Pub. No. WO86/02910, PCT Pub. Date May 22, 1986

PCT Filed Nov. 5, 1985, Ser. No. 888,321

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1984, 3440367

Int. Cl.[4] B65D *35/56*

U.S. Cl. 222—82 **14 Claims**



1. A bulk container for accommodating a fluidizable product, characterized in that a foil bag made of two foil webs welded together, one of the foil webs defining a bottom foil piece and the other foil web defining a top foil piece, the bottom and top foil pieces being of rectangular configuration and folded in parallel to an outer edge, the bottom foil piece including a pair lower outer folding edges, a pair of intermediate inner folding edges and a pair of upper lateral overstand portions which protrude beyond both the bottom piece outer and inner folding edges, the top foil piece including a pair of upper outer folding edges, a pair of intermediate inner folding edges and a pair of lower lateral overstand portions which protrude beyond the top piece inner and outer folding edges, the top and bottom piece overstand portions being (2) welded together is provided, which bag is disposed in a rigid envelope (1), with the foil bag (2) comprising a charging opening (187) and an outlet device provided in the lower part of the foil bag (2), with the outlet device extending through the envelope (1) and consisting of a draining tongue (4) rigidly connected to the foil bag (2) and a discharge mechanism (5) mountable thereon.

4,836,419

CLOSURE MECHANISM FOR LIQUID CONTAINERS

Kenneth D. Metz, Eau Claire; John W. Haggerty, Elk Mound, and Steven W. Alf, Eau Claire, all of Wis., assignors to Jennico, Inc., Eau Claire, Wis.

Filed May 2, 1988, Ser. No. 189,172

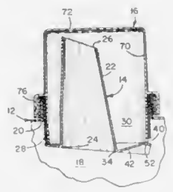
Int. Cl.[4] B67D *1/16*

U.S. Cl. 222—110 **6 Claims**

1. A closure means for a package for liquids wherein said package includes a container for housing a liquid and having opposing surfaces defining a discharge opening

exposing a container interior, said closure means comprising:

an intermediate member mounted on said container and covering said discharge opening, said member having a pour spout with a first end of said spout exposed to said interior, said spout extending away from said discharge opening and terminating at a second end, said intermediate member including wall means spaced from said spout with opposing surfaces of said spout and said wall means defining a liquid retaining volume within said interior member, a floor portion disposed within said volume adjacent said first end of said spout, a floor opening through said floor portion and providing liquid flow communication be-



tween said liquid retaining volume and said container interior,

a cap sized to be removably connected to said package and further sized to cover said spout and said liquid retaining volume when said cap is connected to said package;

blocking means for blocking flow of liquid through said floor opening when said cap is disconnected from said package, said blocking means includes a closure plate sized to cover said floor opening and movable between a first position with said opening exposed and a second position with said opening closed, said plate biased to said second position, means for urging said plate to said first position when said cap is connected to said package.

4,836,420

CLEANING IN PLACE VALVE ACTUATOR

Edward P. Kromrey, Osceola, Wis., assignor to Ecolab Inc., St. Paul, Minn.

Filed Jan. 9, 1987, Ser. No. 1,685

Int. Cl.[4] B67D *1/08*

U.S. Cl. 222—148 **13 Claims**

1. A cleaning-in-place value actuator for causing oscillating movement of a lever on a fluid dispensing machine, movement of said lever controlling a valve which controls flow to an outlet nozzle on said dispensing machine, said valve actuator comprising:

(a) an actuator support which operatively attaches to said fluid dispensing machine proximate said levers;

(b) a motor mounted to said actuator support having a rotatable output shaft;

(c) a shifting fork mounted to said actuator support, having at least one forked end which operatively attaches to said lever on said fluid dispensing machine; and

(d) conversion means for converting the rotary motion of said motor output shaft to reciprocal pivotal motion of said shifting fork, so that the reciprocal motion of said forked end causes said lever to move back and forth, thereby opening and closing said valve of said fluid dispensing machine, wherein the conversion means comprises:

i. an eccentric slider crank mounted upon said motor output shaft;

ii. a slider arm attached to and spaced apart from said activator support, said slider arm having a longitudinal slot therein which accommodates and slidably engages said eccentric slider crank;

iii. a rocker arm parallel to and spaced between said actuator support and said slider arm, having a first and second end, said first and end being pivotally connected to said slider arm;

iv. a shaft, one end operatively connected to said second end of said rocker arm, the opposite end operatively connected to said shifting fork, wherein the rotation of said motor output shaft causes said slider arm, said rocker arm, and said shifting fork to pivot reciprocally, so that the reciprocal motion of said forked end causes said levers to move back and forth, thereby opening and closing said valves of said fluid dispensing machine.

4,836,421

TRANSPORTABLE HOPPER AND TANK ASSEMBLY

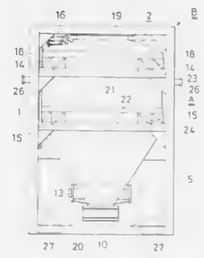
Masazumi Miyoshi, Tokyo; Muneo Isayama, Oami-shirasato; Shoichi Midorikawa, Shirako, and Akitada Ota, Sakura, all of Japan, assignors to ISE Kaguku Kogyo Kabushiki Gaisha, Tokyo, Japan

Continuation of Ser. No. 873,520, Jun. 12, 1986, abandoned. This application Aug. 31, 1988, Ser. No. 240,384

Claims priority, application Japan, Dec. 12, 1985, 60-190336[U]

Int. Cl.[4] B67D *5/64*

U.S. Cl. 222—166 **1 Claim**



1. A transportable hopper and tank assembly positionable in an upright or a reclined portion comprising:

a tank having a side wall;

a cover body located at a top end portion of said side wall when said tank is in said upright position and having an opening formed in said cover body;

a discharge port formed at a lower portion of said tank in said upright position and having an area smaller than said cover body;

a discharge valve located adjacent said discharge port wherein said side wall includes an upper and lower vertical side wall and a second lower side wall positioned

opposite said lower vertical side wall wherein said second lower side wall converges downwardly toward said lower vertically side wall when said tank is in said upright position;

a rotatable paddle plate positioned in said discharge port so as to promote discharge of material confined within said tank;

a cover plate for covering said opening in said cover body, said cover plate having a filler port;

a plug mmber removably positioned in said filler port; and

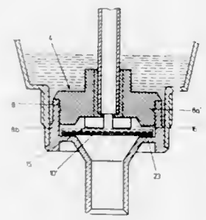
frame means connected to said tank and upon which said tank is mounted, said frame means surrounding said tank on all sides thereof and at four corners thereof in an upright position and which includes at least one pair of fork insertion members and a pair of engaging means for orienting said tank from said reclined position to said upright position.

4,836,422

PROPELLANTLESS FOAM DISPENSER

Werner Rosenberg, Vienna, Austria, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 11, 1988, Ser. No. 154,731
Claims priority, application Australia, Feb. 11, 1987, 288/87
Int. Cl.[4] B67D *5/58*
U.S. Cl. 222—190 **19 Claims**



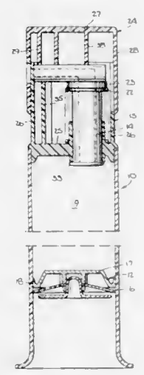
1. In a propellantless foam dispenser comprising: a container having a flexible outer wall which includes a base, side wall means, and a top end that is formed with an outlet opening, said container containing a foamable liquid and having an air space with said outer wall; a foam discharge nozzle associated with said outlet opening and having an inlet opening in said outlet opening of said container; said container being movable to an inverted position whereby said outlet opening is disposed below the level of said liquid in said container; a foam generator which is contained in said outlet opening and when said container is squeezed in said inverted position to generate a superatmospheric pressure in said container is adapted to generate foam and to deliver said foam to said inlet opening; said foam generator comprising a body having a shell member which is mounted in said outlet opening, and a bottom member connected to said shell member remote from said inlet opening; said foam generator containing a porous element which faces and covers said inlet opening; said bottom member being formed with liquid passage openings and with an air passage opening, and said foam dispenser also comprising a tubular air line which communicates with said air passage opening and extends therefrom close to said base; wherein the improvement comprises that said porous element comprises a sieve disc which defines a radial clearance with said shell member and is axially displaceable in said body between a first end position and a second end position in both positions of which said sieve disc is axially spaced apart from and defines a mixing chamber with said bottom member; said body further comprising a peripheral flange which extends radially inwardly from said shell member and surrounds said inlet opening and is engageable by said sieve disc to define said first end position; said body further comprising stop means which are engageable by said sieve disc to define said second end position; said sieve disc being adapted to move to said first end position and said second end position, respectively, in response to a superatmospheric pressure and to a subatmospheric pressure in said container, respectively; whereby at least a major part of the air which enters said foam discharge nozzle from the outside of said dispenser can flow through said radial clearance past said sieve disc into said mixing chamber and through said air passage opening and said air line into said container when said sieve disc is in said second position.

4,836,423

PUMP DISPENSER PACKAGE

Thomas H. Hayes, and Lewis C. Lo Maglio, both of Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio

Filed Apr. 26, 1988, Ser. No. 186,262
Int. Cl.[4] G01F *11/00*
U.S. Cl. 222—257 **14 Claims**



1. An improved pump dispenser package for a fluent material comprising the combination of:

a body for the fluent material;

a reciprocating pump mounted on one end of the body;

the opposite end of the body in communication with the atmosphere;

a nozzle with an outlet positioned on the pump;

a piston in said body movable against the fluent material toward said pump;

means on said piston for restricting its movement away from said nozzle;

a hollow cover mounted on said body adjacent said nozzle for rotational and reciprocal motion;

said cover operatively coupled to said pump for reciprocating said pump; and

means for moving said nozzle outlet into and out of said cover during a rotary movement of said cover.

4,836,424

CONTAINER CLOSURE AND DISPENSER FOR GRANULAR MATERIALS

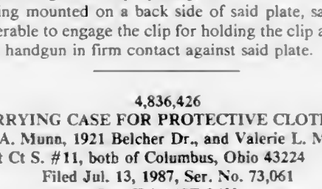
Mohammad M. Afshar, Lagasca 90, 28006 Madrid, Spain

Filed Mar. 14, 1988, Ser. No. 167,493
Claims priority, application Spain, Mar. 18, 1987, 8700909[U]
Int. Cl.[4] G01F *11/00*
U.S. Cl. 222—279 **7 Claims**

1. A closure and dispenser combination for dispensing measured product from a container and including;

the closure having means replaceably securing it to an open neck of the container and having a top with mounting means at the exterior of the closure, there being an opening in the top of the closure,

a removable seal of inverted hat shape between the top of the closure and the open end of the container and having a portion depending within the neck of the container from a rim thereof engaged between the top of the closure and the open neck of the container to seal therewith,



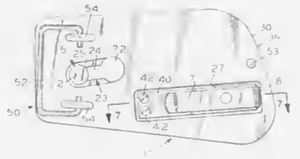
the dispenser being separate from the closure and accommodated within the seal portion depending within the container and removable therefrom when the closure is removed from the container and received by the mounting means at the exterior of the closure when the closure is replaced on the container and having a slide with a product receiving chamber shiftable between a first interior opening aligned with the aforesaid opening in the top of the closure and a second offset exterior opening to discharge the product.

4,836,425

HANDGUN HOLDER

Gary C. McClellan, 4011 Saddler La., Vale, Oreg. 97918

Filed Feb. 8, 1988, Ser. No. 153,771
Int. Cl.[4] A45C *11/00*
U.S. Cl. 224—163 **8 Claims**



1. A handgun holding plate for handguns having a retention stud and clip, said plate comprising:

a slot formed on a front face of said plate for receiving and retaining the stud;

a clip opening through said plate for insertion of the clip therethrough;

a first groove formed on the front face of said plate between said clip opening and one edge of said plate for guiding the clip through said clip opening; and

a spring mounted on a back side of said plate, said spring operable to engage the clip for holding the clip and hence the handgun in firm contact against said plate.

4,836,426

CARRYING CASE FOR PROTECTIVE CLOTHING

Robert A. Munn, 1921 Belcher Dr., and Valerie L. Minor, 700 Hyatt Ct S. #11, both of Columbus, Ohio 43224

Filed Jul. 13, 1987, Ser. No. 73,061
Int. Cl.[4] A45F *3/02*
U.S. Cl. 224—206 **12 Claims**

1. A bag for protective clothing comprising

a primary container, said primary container having a first aperture, a front panel, a rear panel and a side wall,

a secondary container, said secondary container located on said sidewall of said primary container, said secondary container having an auxiliary aperture, and

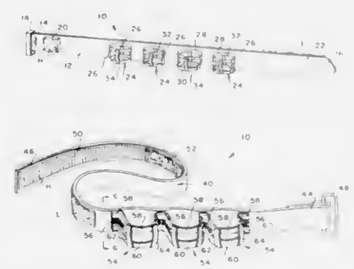
a plurality of straps including at least a first strap and a second strap, said first strap being securable about a person's waist such that said first strap is fastened to said front panel and said rear panel, said second strap being securable over a person,s shoulder and about a leg such that said second strap is fastened only to said front panel.

4,836,427

TENNIS UTILITY BELT

Phillip W. McManus, 1701 Hardy Rd., Grand Prairie, Tex. 75051

Filed Apr. 25, 1988, Ser. No. 185,847
Int. Cl.[4] A45F *3/00*
U.S. Cl. 224—224 **3 Claims**



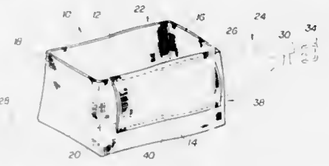
1. A tennis ball holder belt comprising:

an elongated belt of flexible material having first and second end portions thereon;

a plurality of open elastic tennis ball retainer cages secured to the belt, said retainer cages being defined by transversely connected elastic strips; and,

wherein each open elastic tennis ball retainer cage has first and second annular elastic bands defining upper and lower openings, respectively, and at least three elastic strips being connected intermediate the upper and lower annular bands, with the upper and lower annular bands and the intermediate elastic strips approximating the form of a cylinder when unexpanded, with at least one of the upper and lower annular bands being expandable to permit a tennis ball to be inserted into the cage through the upper or lower opening.

4,836,428
MAIL BAG STRUCTURE
Richard C. Evans, and William S. Schel , both of Louisville, Ky., assignors to Kally, Inc., Louisville, Ky.
Filed Aug. 12, 1985, Ser. No. 764,303
Int. Cl.[4] B65D *13/00*
U.S. Cl. 224—253 10 Claims



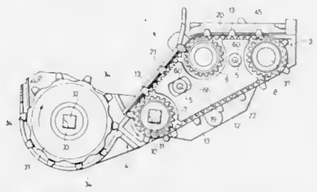
1. A mail bag structure adapted to be supported at a person's waist, comprising:
a container for the mail having a front wall, a back wall spaced from the front wall, spaced apart end walls interconnecting the front and back walls, a floor, and an open top defined by the top edges of the front wall, back wall and end walls;
a belt adapted to releasably wrap around the waist of a person to carry the container; and
belt attachment means on the back wall of the container for removably attaching the belt to the container back wall with the longitudinal axis of the belt substantially parallel to the top edge of the container back wall and with the portion of the length of the belt attached to the container back wall being less than the length of the container back wall,
said belt comprising a relatively wide middle section and two narrower end sections extending away from opposite ends of the middle section, with just the middle section of the belt being attached to said belt attachment means, and fastener means being associated with the narrower end sections for releasably and adjustably fastening the free ends of the narrower end sections together.

4,836,429
METHOD AND APPARATUS OF NON-CONTACT CONVEYANCE OF A WEB
Hiroshi Nakashima; Masayuki Kawarada, and Sanshirou Fukuhara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jul. 17, 1987, Ser. No. 74,817
Claims priority, application Japan, Jul. 17, 1986, 61-166793
Int. Cl.[4] B65H *20/14*
U.S. Cl. 226—7 5 Claims

1. A method of conveying a web, comprising the steps of:
arranging a plurality of air boxes on alternate sides of a path;
separating two edges of each box by at least 20 cm and by 30% to 80% of a width of said web;
conveying a web along said path; and
jetting air from said two edges of each of said air boxes toward said conveyed web, said air being jetted from said two edges being inclined toward each other at angles between 15° to 45° from the perpendicular of the air jetting surface of said air box.

4,836,430
PAPER FEED APPARATUS
Sadao Unuma, Yokonemachi, and Masashi Yamashita, Aichi, both of Japan, assignors to Tokai Kogyo Kabushiki Kaisha, Japan
Filed Feb. 19, 1988, Ser. No. 157,697
Claims priority, application Japan, Feb. 20, 1987, 62-24811
Int. Cl.[4] B65H *20/20;* B41J *11/26;* G03B *1/30*
U.S. Cl. 226—74 5 Claims

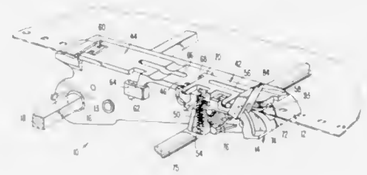
1. A paper feed apparatus for feeding paper to a printer, the paper having a row of feed perforations formed along each side edge thereof, said paper feed apparatus comprising:
a frame;
a belt type paper conveyance mechanism consisting of a driving sprocket rotatably journalled in said frame, at least one driven sprocket rotatably journalled in said frame in parallel with said driving sprocket, and an endless belt entrained about the said sprockets, said endless belt having a plurality of feed pins provided perpendicularly on the outer peripheral surface thereof at the same intervals as that of the feed perforations formed in the paper;
a ring plate disposed coaxially on at least one of both sides of said driving sprocket between said sprocket and an inner wall of said frame and mounted rotatably with respect to said sprocket and frame, said ring plate having an outer peripheral edge thereof extending beyond an outer diameter of said driving sprocket for preventing lateral movement of a portion of said endless belt engaging said sprocket and at least an anti-floating piece projecting from said outer peripheral edge toward an upper space of outer peripheral surface of an edge portion of said endless belt for preventing displacement of said portion of belt engaging said sprocket radially from said driving sprocket by virtue of centrifugal force;
a feed wheel provided in close proximity to said driving sprocket and rotatably supported by said frame about a rotational axis which is parallel to the rotational axis of the driving sprocket, said feed wheel having an outer peripheral surface portion concentric with said rotational axis thereof and also having feed pins formed at the same intervals along the peripheral surface portion thereof as that of the feed perforations of the paper and projecting radially from said outer peripheral surface portion; and
a drive source including means for driving said driving sprocket and said feed wheel synchronously in such a manner that the surface speed of said endless belt and the peripheral speed of said outer peripheral surface portion of said feed wheel are equal to each other,



whereby plural said feed pins of said endless belt and plural said feed pins of said feed wheel are simultaneously fitted in plural said feed perforations of the paper to transfer the driving force from said drive source, which is connected to said driving sprocket and said feed wheel, to the paper through the engagement of the feed pins with the feed perforations of the paper.

4. A paper feed apparatus for feeding paper to a printer, the paper having a row of feed perforations formed at intervals along each side edge thereof, said paper feed apparatus comprising:
a frame;
a belt type paper conveyance mechanism consisting of a driving sprocket having a rotational axis and an outer diameter and rotatably journalled in said frame, at least one driven sprocket rotatably journalled in said frame in parallel with said driving sprocket, and an endless belt entrained about the said sprockets, said endless belt having an outer peripheral surface and a plurality of feed pins provided perpendicularly on said outer peripheral surface at the same intervals as those of the feed perforations formed in the paper;
a ring plate disposed coaxially on at least one of both sides of said driving sprocket between said sprocket and an inner wall of said frame and mounted rotatably with respect to said sprocket and frame, said ring plate having an outer peripheral edge thereof extending beyond the outer diameter of said driving sprocket for preventing lateral movement of a portion of said endless belt engaging said sprocket and at least an anti-floating piece projecting from said outer peripheral edge toward upper space of the outer peripheral surface of an edge portion of said endless belt for preventing displacement of said portion of belt engaging said sprocket radially from said driving sprocket by virtue of centrifugal force; and
a feed wheel provided in close proximity to said driving sprocket and rotatably supported by said frame about a rotational axis which is parallel to the rotational axis of the driving sprocket, said feed wheel having an outer peripheral surface portion concentric with said rotational axis thereof and also having feed pins formed at the same intervals along the peripheral surface portion thereof as that of the feed perforations of the paper and projecting radially from said outer peripheral surface portion.

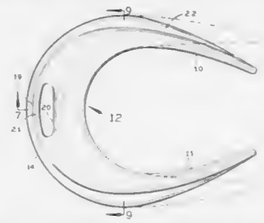
4,836,431
SEMI-AUTOMATIC LOADING PAPER FEED TRACTOR
Gregory Hirth, San Jose, Calif., and Terry L. Branson, Plano, Tex., assignors to Dataproducts Corporation, Woodland Hills, Calif.
Division of Ser. No. 863,704, May 15, 1986. This application Jan. 27, 1988, Ser. No. 148,883
Int. Cl.[4] B65H *17/40;* B41J *11/32*
U.S. Cl. 226—74 6 Claims



4. A web feeding tractor which is positionable in the axial direction of a support shaft, comprising:
a first support shaft bearing surface having first and second levels separated by a space, first and second levels each have a cylindrical surface which is bifurcated at two locations;
a torsion spring disposed within said space separating said first and second levels, said torsion spring being wound about and frictionally secured with said support shaft;
movable releasing means, operable to be moved in a first direction for unwinding said torsion spring from about said support shaft to thereby release said torsion spring from being frictionally secured with said support shaft;
wherein said torsion spring is positioned to automatically urge said releasing means in a second direction for winding said torsion spring about said support shaft so as to automatically frictionally secure said torsion spring with said support shaft;
whereby said first support shaft bearing surface is manually positionable in the axial direction of said support shaft upon the operation of said moveable releasing means in said first direction.

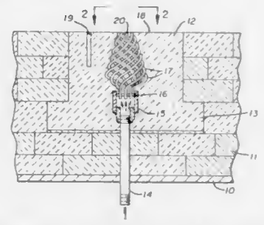
4,836,432
HOSE GUIDE
Nelson R. Violette, 1845 SW. 3rd Ave., Fort Lauderdale, Fla. 33315
Filed Dec. 18, 1987, Ser. No. 135,074
Int. Cl.[4] B05C *11/00*
U.S. Cl. 226—196 10 Claims

1. A hose guide for use with an automotive vehicle paint spray apparatus, said guide comprising a generally U-shaped body having a substantially flat bottom for engagement with a support surface for the vehicle and having opposite longitudinal legs and a curved bight segment connecting said opposite legs at one end of the body, said body being open from bottom to top at the inside of the "U" between said opposite legs for the entire length of said legs, said body being constructed to receive the tire of an automotive vehicle on the inside of the "U" between said opposite legs, said body being concave upward from said bottom on the outside of said bight segment of the "U" for slidably guiding the hose thereat;



said opposite legs being inclined toward each other along said body in a direction away from said bight segment, and said opposite legs being flexible and resilient to resiliently grip a vehicle tire between them.

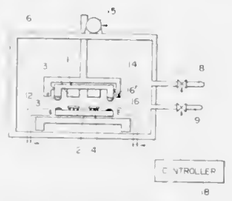
4,836,433
DEVICE FOR INTRODUCING STIRRING GAS INTO MOLTEN METAL IN METERED AMOUNT
Joseph A. Perri, Coraopolis, Pa., assignor to Insul Company, Inc., East Palestine, Ohio
Filed May 13, 1988, Ser. No. 193,566
Int. Cl.[4] C21C *5/48*
U.S. Cl. 266—266 6 Claims



1. In apparatus for introducing gas into a mass of molten metal in a container having a refractory lining, an improved device, the improved device comprising a body member of refractory material having upper and lower surfaces and an enlarged lower section forming an outwardly extending flange positioned for engagement within said refractorry lining; a plurality of passageways in said body member arranged in a spiral cone-shaped pattern, a fitting within said body member communicating with an opening in the lower surface of the body member, said plurality of passageways extending from said fitting to said upper surface of said body member, said body member forming an integral portion of said refractory lining in said container for said molten metal, said container having an opening therein in registry with said opening in the lower surface of said body member, said passageways arranged

to form a plurality of streams of gas rising in said molten metal when gas is introduced through said device whereby swirling stirring motion is imparted to said molten metal.

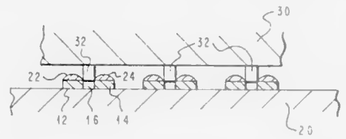
4,836,434
METHOD AND APPARATUS FOR AIRTIGHTLY PACKAGING SEMICONDUCTOR PACKAGE
Takaji Takenaka; Hideki Watanabe, both of Hadano, and Fumiyuki Kobayashi, Sagamihara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed May 30, 1986, Ser. No. 868,440
Claims priority, application Japan, May 31, 1985, 60-116408
Int. Cl.[4] H01L *21/50*
U.S. Cl. 228—179 **4 Claims**



4. An apparatus for air tightly packaging a semiconductor by sealing with solder a cap to a substrate having semiconductor devices mounted thereon, the apparatus comprising:
- a receptacle for placing one of said substrate and said cap therein;
- means for supplying gas to said receptacle and exhausting said receptacle;
- holding means accommodated in said receptacle for mechanically holding the other of said substrate and said cap;
- arm means mechanically connected to said holding means at one end thereof and said receptacle at the other end thereof and being responsive to an electrical signal for vertically moving said holding means toward said one of said substrate and said cap such that seal portions of said substrate and cap approximate each other;
- heating means for heating solder at a seal region between said substrate and said cap to melt the solder; and
- control means for controlling said gas supplying and exhausting means to control a gas supply in said receptacle, for controlling the movement of said holding means, and for controlling said heating means
- said control means having circuit means for supplying said arm means with said electrical signal designating a moving direction of the arm means, wherein after said solder has been melted, said control means control said holding means so that a gap between said substrate and said cap is changed to a value less than a predetermined value and thereafter to said predetermined value, and said control means control said heating means to start a cooling operation upon a change of said gap to said predetermined value.

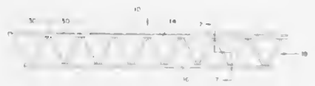
4,836,435
COMPONENT SELF ALIGNMENT
Duane T. Napp, and Kevin J. Roche, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 861,815, Mar. 12, 1986, abandoned. This application Jun. 6, 1988, Ser. No. 205,007
Int. Cl.[4] B23K *19/00*
U.S. Cl. 228—180.2 **4 Claims**

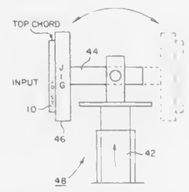
1. An improved method of attaching leaded components to surface solder pads defining generally rectangular areas on an insulating substrate for printed circuitry comprising:
- dividing each solder pad surface area on the substrate surface into three sections;
- metalizing non-adjacent ones of said sections so as to provide two metalized sections per lead;
- depositing solder only on the metalized solder pad sections;



- placing components so that each of their leads is between and touching metalized sections on a solder pad; and
- reflowing the solder.

4,836,436
METHOD OF MANUFACTURING A FABRICATED OPEN WEB STEEL JOIST
William J. Hannah, Mississauga, Canada, assignor to Gerald McDonald and Gloria H. Campbell
Continuation of Ser. No. 85,948, Aug. 17, 1987, Pat. No. 4,748,786. This application Jan. 19, 1988, Ser. No. 145,270
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—182 **6 Claims**

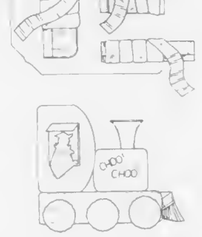




1. The process of fabricating an open web steel joist, said joist being of finite length defined by an integral number of panels along the length of the joist, which joist includes a pair of ends, a top chord at its upper extremity and a bottom chord at its lower extremity, and a web between said top and bottom chords;
- said upper and lower extremities being, respectively, at the top and bottom of the joist when the joist is vertically disposed in its normal, load-bearing, orientation;
- wherein each of said top and bottom chords comprises a pair of generally L-shaped angles, each having first and second legs, and arranged in back-to-back relation with the first leg of each "L" being horizontally disposed at the respective upper or lower extremity of the joist, and the second leg of each "L" of each pair of L-shaped angles being vertically disposed and thereby presenting a pair of vertically disposed opposite faces in said respective pair of L-shaped angles; wherein said web comprises a plurality of pre-formed bar sections, and said web is located between said vertically disposed opposed faces of each of said chords and extends vertically between said chords, and having apexes between said vertically disposed opposite faces in the respective top and bottom chords; said process comprising the steps of:

(a) pre-forming a plurality of bar sections, each in the general form of a "W", each of which will cover two of said panels along the length of the joist; and in the event that an odd number of panels is required, pre-forming a bar section in the general form of a "V";
(b) assembling the top chord components, bottom chord components, and pre-formed bar sections in a jig, so that the joist is completely assembled as to the required components for its fabrication, and clamping the jig to maintain the assembled components in place; and
(c) (i) welding the ends and apexes of said pre-formed sections which are between the vertically disposed opposite faces of the top chord;
(c) (ii) inverting the still clamped assembly of said components and said jig while said components are in an inverting machine; and
(c) (iii) welding the now upper located apexes of said preformed sections are between the verticaly disposed opposite faces of the bottom chord;
such that the steps in (c) form a fabricated joist;
wherein the assembly of said top chord components, said bottom chord components, and said pre-formed bar sections is such that adjacent ends of said pre-formed bar sections are in the top chord between the vertically disposed opposite faces thereof.

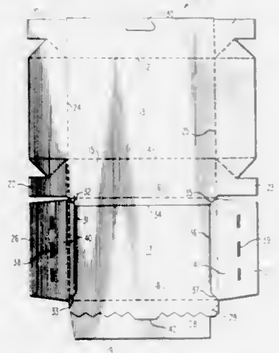
4,836,437
TOY PACKAGING
Ann S. Kirschner, St. Louis, Mo., assignor to Surprises, Inc., St. Louis, Mo.
Filed Feb. 16, 1988, Ser. No. 126,197
Int. Cl.[4] B65D *75/02*
U.S. Cl. 229—8 **5 Claims**



1. A simulated article comprising two or more units where at least some of the units have strips of material wound around a central core and have additional objects located between layers of said strips of material.

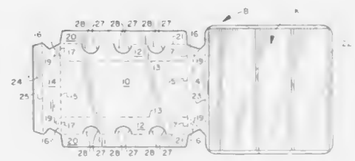
4,836,438
OVENABLE CARTON WITH HANDLES
William R. Rigby, Elton, Md., assignor to Westvaco Corporation, New York, N.Y.
Filed Oct. 11, 1988, Ser. No. 255,866
Int. Cl.[4] B65D *5/46*
U.S. Cl. 229—52 B **9 Claims**

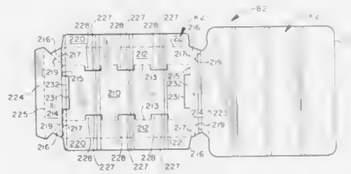
1. A package prepared from paperboard for food products and consisting essentially of a substantially polygonal shaped tray portion for supporting and confining the food products, said tray portion comprising a bottom panel with upstanding side walls and corner panels, and a top structure of substantially the same shape as the tray portion for convering the stray portion, said top structure comprising a lid panel foldably attached to one of the side walls of said tray portion along a score line and including integral side walls which are foldably attached to the lid panel along additional score lines for overlapping the side walls of the tray portion, means for adhering portions of the top structure side walls that are remote from their score lines to the corresponding side walls of the tray



portion and means in the lide panel for separating unadhered portions of at least two opposed side walls of the top structure from the lid panel to provide handle elements formed by the unadhered portions of the two opposed side walls of the top structure for said package.

4,836,439
MICROWAVE CARTON
Joseph J. Hart, Philadelphia, Pa., assignor to Container Corporation of America, Clayton, Mo.
Filed Jan. 26, 1988, Ser. No. 148,604
Int. Cl.[4] B65D *5/24*
U.S. Cl. 229—104 **1 Claim**

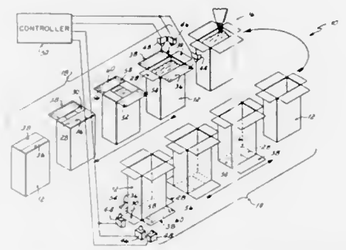




1. A disposable, collapsible, sleeve-type carton, coated on at least one surface thereof with a discontinuous layer of electrically conductive material and adapted to hold an item of food for browning a surface thereof when subjected to microwave radiation, said carton being formed from a unitary blank of foldable paperboard and comprising:
- (a) top and bottom walls foldably joined to each other by opposed end walls to form a tubular structure open at the sides;
- (b) said bottom wall having substantially the same length as but substantially less width than said top wall;
- (c) said end walls being generally trapezoidal in shape and

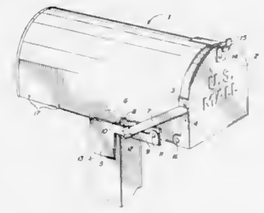
having parallel top and bottom edges and inclined side edges;
(d) a pair of side walls foldably joined to respective side edges of said bottom wall and extending upwardly to said top wall to close the sides of said tubular structure;
(e) each of said side walls being joined at each end thereof to a related end wall by a generally triangular web which is foldably joined along adjacent edges to an end edge of said side wall and to a side edge of a related end wall;
(f) each of said side walls having foldably joined to an upper edge thereof a retaining panel disposed to extend normal to said side wall and to underlie said top wall and provide additional support for said top wall;
(g) one of said bottom and side walls having at least one vent opening extending therethrough.

4,836,440
SIFT-PROOF CARTON AND METHOD OF MANUFACTURI
Gordon K. French, Atlanta, Ga., assignor to Nordson Corporation, Amherst, Ohio
Continuation-in-part of Ser. No. 848 737, Apr. 4, 1986, abandoned. This application Jan. 28, 1987, Ser. No. 7,593
Int. Cl.[4] B65D *5/66*
U.S. Cl. 229—132 **4 Claims**



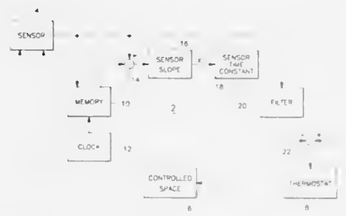
1. A method of sealing the ends of a four-sided sift-proof carton, each end of the carton having a pair of spaced minor flaps, an inner major flap and an outer major flap spaced from said inner major flap, each of said minor flaps and said inner and outer major flaps being formed with opposed ends, a fold line joining a side of the carton and a leading edge opposite said fold line, the spacing between said inner major flaps and said outer major flaps at the fold lines of the carton defining the depth of the carton, comprising:
folding said spaced minor flaps from a spread position inwardly toward the center of the carton forming an exposed surface on each of said minor flaps between said fold line and said leading edge thereof;
dispensing a strip of foamed adhesive material onto each of said opposed ends of said inner major flap between said fold line and said leading edge thereof with said inner major flap in a spread position relative to the sides of the carton;
dispensing a first strip of foamed adhesive material onto each of said opposed ends of said outer major flap between said fold line and said leading edge thereof, and a second strip of adhesive material onto said outer major flap between said first strips with said outer major flap in a spread position relative to the sides of the carton;
folding said inner major flap from said spread position toward the center of the carton so that said strips of foamed adhesive material on said inner major flap contact said exposed surfaces of said pair of minor flaps, said inner major flap having a width dimension between said leading edge and said fold line thereof which is substantially less than said depth of the carton so that a large gap is formed on said exposed surface of each of said minor flaps between said leading edge of said inner major flap and said fold line of said outer major flap with said inner major flap folded toward the center of the carton;
folding said outer major flap toward the center of the carton so that said first strip of foamed adhesive material on each end of said outer major flap contacts said exposed surface of one of said pair of minor flaps and said second strip of adhesive material contacts said inner major flap, said first strips of foamed adhesive material on said outer major flap filling said gaps on said exposed surfaces of said minor flaps between said leading edge of said inner major flap and said fold line of said outer major flap to form a sift-proof seal thereat.

4,836,441
MAILBOX DELIVERY INDICATOR
Curtis W. Crider, 1077 Robert St., Ormond Beach, Fla. 32074
Filed Mar. 15, 1988, Ser. No. 170,435
Int. Cl.[4] B65D *91/00*
U.S. Cl. 232—35 **3 Claims**



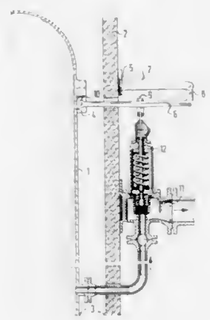
1. A mail delivery indicating device for attachment to a standard rural mailbox having a closed receptacle with a hinged front door, the device comprising:
a base mounted to the exterior bottom side of the mailbox;
an arm pivotally mounted at one end to said base, said arm having a signal portion thereon;
a trip lever attached to said arm and extending diagonally from the arm to the front door of the mailbox when the arm is in the horizontal position; and
means of holding the trip lever in the front door of the mailbox to maintain the arm in the horizontal position when said door is closed.

4,836,442
COMPENSATION CIRCUIT FOR SENSOR LAG TO REDUCE UNDERSHOOT AND OVERSHOOT
Thomas J. Beckey, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Dec. 14, 1988, Ser. No. 284,279
Int. Cl.[4] G01K *7/00*
U.S. Cl. 236—46 R **4 Claims**



1. A compensation circuit for a sensor lag of a sensor responsive to an environmental condition comprising
means for storing a prior output of a sensor,
means for comparing a present sensor output with the stored prior output to produce a difference output,
means for converting the difference output to a sensor slope,
means for multiplying the sensor slope by a predetermined sensor time constant,
filter means having a fixed time constant for filtering an output from said means for multiplying and
summing means for adding an output from said filter means to the present sensor output to produce a control signal for controlling the environmental condition.

4,836,443
TEMPERATURE-DEPENDENT PRESSURE RELEASE DEVICE FOR PRESSURE VESSELS
Johannes-Peter Wolters, Düren, and Karl-Heinz Escherich, Eschweiler, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany
Continuation of Ser. No. 51,491, May 18, 1987, abandoned. This application May 18, 1988, Ser. No. 198,636
Claims priority, application Fed. Rep. of Germany, May 24, 1986, 3617524
Int. Cl.[4] G05D *27/00*
U.S. Cl. 236—92 C **1 Claim**

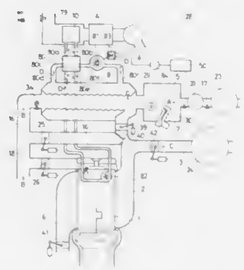


1. Apparatus for temperature-dependent pressure relief of a pressure vessel having a pressure relief channel equipped with shut-off means for closing said relief channel during normal operation of a reaction within said pressure vessel, wherein:
said pressure vessel has a first end thereof firmly fixed in position relative to a foundation and a second end oppositely located to said first end and which is free to move towards and away from said first end in response to thermal expansion and contraction of said pressure vessel;
said relief channel is mechanically connected to said pressure vessel only near said first end of said pressure vessel and extends outside said pressure vessel and spaced therefrom to said shut-off means;
mechanical means are provided which are responsive to movement of a portion of said pressure vessel near said second end thereof produced in response to thermal expansion of said pressure vessel, for forcing open said shut-off means when the temperature of said pressure vessel exceeds a predetermined temperature;
said shut-off means are located nearer to said second end than to said first end of said pressure vessel and at a location providing some protection from the effect of heat given off by said pressure vessel, and
said shut-off means and a portion of said mechanical means are mounted on a wall of a structural material of low heat conduction, spaced from said pressure vessel and separating said shut-off means from said pressure vessel.

4,836,444
DEVICE FOR CONTROLLING HEATER FOR MOTOR VEHICLE
Hideo Kawamura, Samukawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan
Filed Dec. 7, 1987, Ser. No. 129,285
Claims priority, application Japan, Dec. 10, 1986, 61-294160
Int. Cl.[4] B60H *1/02*
U.S. Cl. 237—2 A **8 Claims**

1. An apparatus for controlling a heater having a burner including an atomizing glow plug for heating and atomizing fuel and an igniting glow plug for igniting the fuel as atomized by the atomizing glow plug, a heat exchanger for recovering heat from a combustion gas emitted by combusting fuel in the burner, a combusting air blower for supplying combusting air into a heat exchanger and supplying hot air into a heating container, and a battery for supplying electric power to the glow plugs and the blowers, said apparatus comprising:
charging means for charging the battery with an AC electric power supply; and
driver means for driving the combusting and hot air blowers with the AC electric power supply.

4,836,445
VEHICLE HEATING SYSTEM
Masaki Okada, Kawasaki, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan
Filed Aug. 5, 1987, Ser. No. 82,092
Claims priority, application Japan, Sep. 12, 1986, 61-213815
Int. Cl.[4] G05D *23/00*
U.S. Cl. 237—2 A **4 Claims**



1. A vehicle heating system comprising:
an engine mounted to a vehicle, said engine being equipped with an intake pipe for sending suction air into said engine

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and with an exhaust pipe for discharging an exhaust gas generated in said engine;

a burner mounted to said vehicle, said burner being equipped with a combustion air passage for sending air for combustion into said burner and with a combustion gas passage for discharging the combustion gas generated in said burner;

said combustion gas passage of said burner being branched to a first combustion gas passage for sending the combustion gas generated in said burner into said intake pipe and a second combustion gas passage for discharging the combustion gas generated in said burner to atmosphere;

a first change-over valve that is switched to pass the combustion gas generated in said burner to either one of said first or second combustion gas passages;

a heat exchanger mounted to said vehicle and disposed at an intermediate part of said combustion gas passage of said burner, said heat-exchanger being for effecting heat exchange between the combustion gas generated in said burner and water and for heating said water to hot water;

a heater unit mounted to said vehicle, for effecting heat exchange between said heated hot water and air for heating and sending the air for heating which is heated by said hot water into a cabin of said vehicle and heating the same;

said heater unit being equipped with a first flow path for circulating the hot water, said first flow path being connected to a second flow path for circulating cooling water of said engine and to a third flow path for circulating the hot water of said heat exchanger; and

a second change-over valve that is switched to communicate said first flow path with either one of said second or third flow paths.

4,836,446

DEVICE AND METHOD FOR PRODUCING ARTIFICIAL SNOW

Pierre Chanel, "Le Chef-Lieu", Les Orres, Embrun, France (F-05200)

PCT No. PCT/FR86/00104, § 371 Date Jan. 14, 1987, § 102(e) Date Jan. 14, 1987, PCT Pub. No. WO86/05864, PCT Pub. Date Oct. 9, 1986
PCT Filed Mar. 26, 1986, Ser. No. 15,861
Claims priority, application France, Mar. 27, 1985, 85/04721
Int. Cl.[4] F25C *3/04*
U.S. Cl. 239—2.2 64 Claims

1. A snow-making apparatus for forming snow crystals comprising:

a diffuser housing;

a fan operatively associated with said diffuser housing for generating a flow of air therethrough;

a plurality of spraying ramps positioned substantially parallel to each other and mounted to said diffuser housing and within said flow of air;

a plurality of sprayers mounted on each of said spraying ramps including at least one hydraulic sprayer mounted on at least one of said spraying ramps and including at least one seeding sprayer mounted on at least one of said spraying ramps; and

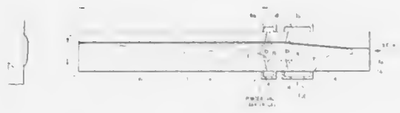
said sprayers spaced apart a predetermined amount.

4,836,447

DUCT-STABILIZED FLAME-SPRAY METHOD AND APPARATUS

James A. Browning, P.O. Box 6, Hanover, N.H. 03755

Filed Jan. 15, 1988, Ser. No. 144,345
Int. Cl.[4] B05B *7/20*
U.S. Cl. 239—8 10 Claims



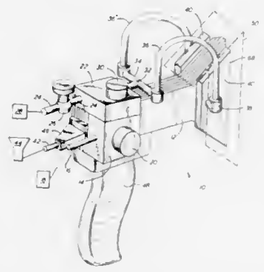
1. In a duct-stabilized flame spray method comprising the steps of feeding a metered flow of a cold fluid oxidant and a fuel into a duct in a flame spray body, mixing the oxidant and the fuel, igniting the flow mixture of said oxidant and fuel to maintain a combustion region within, through, and out of sad duct to thereby form a high-velocity, high temperature jet stream extending beyond the exit of the duct in the direction of a workpiece in the path of said jet stream, introducing particulate material to the jet stream at or near the upstream entrance to said duct, and directing the high-velocity particles against said workpiece, the improvement comprising the step of assuring nearly uniform flow of reactant oxidant and fuel mixture at the point of introduction of the particulate material into said duct by having a duct L/D ratio of at least 5-to-1 and by radially introducing the particulate material such that the nearly uniform flow of reactant oxidant and fuel mixture at the point of radial introduction of the particulate material eliminates the formatiion of eddies and recirculation regions preventing uninterrupted, even flow of the particulate material from the point of introduction to the exit end of the duct, and thereby preventing uneven heating of the particulate material.

4,836,448

THERMAL SPRAY GUN WITH FAN SPRAY

Mark F. Spaulding, Yaphank, and Richard A. Goehring, Huntington, both of N.Y., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 4, 1988, Ser. No. 152,196
Int. Cl.[4] B05B *1/24*
U.S. Cl. 239—79 10 Claims



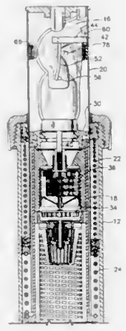
1. A thermal spray gun for projecting a fan-shaped spray stream, including first flame means for producing a first fan-shaped flame, second flame means for producing a second fan-shaped flame spaced from the first flame parallel thereto in sufficient proximity for the first flame and the second flame to commingle into a combined fan-shaped flame, and powder dispersing means for dispersing heat-fusible powder entrained in a carrier gas flow into a fan-shaped powder spray parallel to and between the first flame and the second flame such that the powder is entrained into the combined flame, the powder dispersing means comprising dividing means receptive of the powder-carrier flow for dividing the same into a first stream and a second stream, and a gun body disposed between the first flame means and the second flame means, the gun body having a first powder duct therein receptive of the first stream, a second powder duct therein receptive of the second stream, and a fan-shaped powder chamber with an open side opening forwardly from the gun body between the first flame and the second flame and with an apex location opposite the open side, the first powder duct and the second powder duct each terminating at the apex location with a common axis perpendicular to the fan-shaped chamber such as to mutually impinge the first stream and the second stream into a combined powder stream dispersing through the fan-shaped powder chamber into the fan-shaped powder spray.

4,836,449

SPRINKLER UNIT WITH STREAM DEFLECTOR

Edwin J. Hunter, 5551 Codorniz Rd., Rancho Santa Fe, Calif. 92067

Continuation-in-part of Ser. No. 49,843, May 15, 1987, Pat. No. 4,796,809. This application Apr. 29, 1988, Ser. No. 187,964
Int. Cl.[4] B05B *3/04*
U.S. Cl. 239—232 20 Claims



1. An interrupted stream rotary sprinkler unit comprising:

a housing having an inlet and an outlet and means for connecting said inlet to a source of water;

a nozzle rotatably mounted at said outlet for distributing a stream of water about said housing;

means in said housing for rotating said nozzle; and

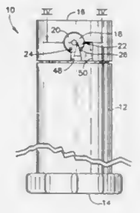
stream interrupting means mounted for rotation with said nozzle and comprising first means periodically biased into and interrupting said stream and second means rotatable about a common axis with said nozzle for periodically biasing said first means wherein said second means for periodically biasing comprises a ring mounted for rotation about said nozzle.

4,836,450

SPRINKLER UNIT WITH ALTERNATING STREAM INTERRUPTOR

Edwin J. Hunter, 5551 Codorniz Rd., Rancho Santa Fe, Calif. 92067

Filed Apr. 29, 1988, Ser. No. 187,965
Int. Cl.[4] B05B *3/04*
U.S. Cl. 239—232 20 Claims



1. An oscillating sprinkler unit having intermittent interrupting means, comprising:

a having an inlet end and an outlet end and means for attachment of the inlet to a source of water under pressure;

a nozzle rotatably mounted at said outlet for distributing a stream of water outward from said housing;

means in said housing for rotating said nozzle in alternate directions about its axis; and

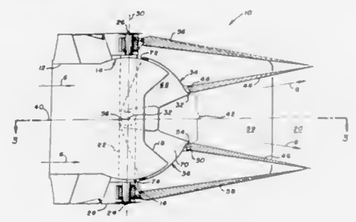
stream interrupting means moveable with said nozzle in said alternate directions and operative in one direction of rotation of said nozzle for interrupting said stream and moveable with said nozzle and inoperative in the opposite direction for non-interruption of said stream.

4,836,451

YAW AND PITCH CONVERGENT-DIVERGENT THRUST VECTORING NOZZLE

Paul W. Herrick; Edward B. Thayer, and Jim D. Stewart, all of Jupiter, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 10, 1987, Ser. No. 95,294
Int. Cl.[4] F02K *1/32, 1/60, 1/12*
U.S. Cl. 239—265.27 7 Claims



1. A thrust vectoring exhaust nozzle for directing a gas stream, comprising:

a fixed exhaust collar having a semispherical external surface, an internal passage for conducting the gas stream therethrough, and an aftward facing discharge opening;

a gimbal assembly including first and second pivots secured adjacent the spherical collar surface and defining therebetween a first gimbal axis passing through a center point defined by the collar spherical surface, and a gimbal ring, surrounding the collar and pivotally supported by the first and second gimbal pivots;

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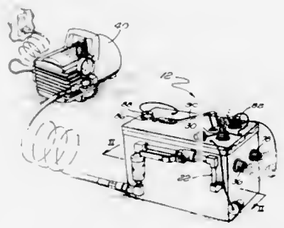
third and fourth pivots defining therebetween a second common axis perpendicular to the first gimbal axis;
a first clamshell having a spherical interior surface corresponding to the collar spherical exterior surface, the first clamshell secured between the third and fourth pivots and selectably pivotable about the second common axis;
a second clamshell having a spherical surface corresponding to the spherical exterior surface of the fixed collar, the second clamshell also secured between the third and fourth pivot points and selectably pivotable about the second common axis;
first slidable means for sealing the first clamshell to the exterior of the fixed collar;
second slidable means for sealing the second clamshell to the exterior of the fixed collar; and
means for selectably rotating the gimbal ring about the first gimbal axis.

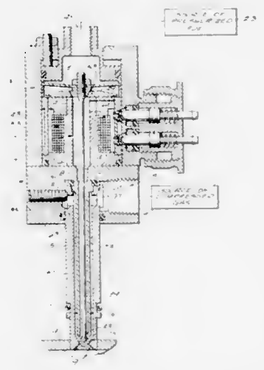
4,836,452
EFFICIENT ARTIFICIAL SMOKE GENERATOR
Jim Fox, 5606 Park Oak Pl., Hollywood, Calif. 90068
Filed Apr. 25, 1988, Ser. No. 185,514
Int. Cl.[4] A61M *11/06*
U.S. Cl. 239—338 **17 Claims**



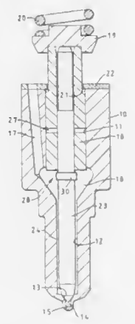
11. An efficient artificial fog generator comprising:
an oil bath;
means for spraying compressed air onto the surface of said oil bath;
means for supplying a high pressure stream consisting solely of air to said means for spraying the air onto the oil bath, to generate fine bubbles of oil;
filtering means for preventing large oil bubbles from exiting to the surrounding atmosphere;
housing means for enclosing said oil bath, spraying means and filtering means; and
fog outlet means for directing the generated cloud of fine oil bubbles out of said enclosing means;
whereby the visual effect from the resultant oil bubble cloud is maximized and the amount of oil employed is minimized.

4,836,453
FUEL INJECTOR WITH CONTINUOUS AIR FLOW
Arthur G. Poehlman, West Bend, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill
Filed Feb. 22, 1988, Ser. No. 158,943
Int. Cl.[4] B05B *7/12*
U.S. Cl. 239—408 **5 Claims**

4. A fuel injector nozzle comprising an inner member including an axially extending fuel passage adapted to communicating with a source of fuel under pressure and having an outlet end with a surface defining a valve seat, said inner member also including an outer surface extending axially outwardly and coverging to said valve seat, a valve member located in said fuel passage and movable axially thereof relative to said valve seat between open and closed positions, said valve member comprising a valve head engagable with said valve seat when said valve member is in said closed position and spaced from said valve seat when said valve member is in said open position, said valve head including an axially outwardly extending and converging surface, and an outer member surrounding said inner member and said valve head in spaced relation thereto and defining therebetween an air flow passage adapted to communicate with a source of air under pressure, said outer member including an axially outwardly extending and converging surface located in spaced relation to said outer surface of said inner member and to said converging surface of said valve head and forming, with said outer surface of said inner member and said converging surface of said valve head, an air flow passage portion which diverges axially outwardly and which communicates with said fuel passage when said valve seat is in said open position and with the environment exterior to said outer member.

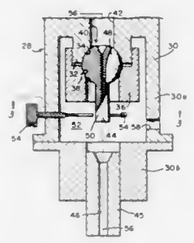


4,836,454
FUEL INJECTION NOZZLES
David J. Gaskell, Sudbury, England, assignor to Lucas Industries Public Limited Company, Birmingham, England
Filed Mar. 17, 1988, Ser. No. 169,329
Claims priority, application United Kingdom, Mar. 21, 1987, 8706757
Int. Cl.[4] F02M *47/00*
U.S. Cl. 239—533.9 **8 Claims**



1. A fuel injection nozzle for supplying fuel to an internal combustion engine comprising a valve member movable axially by fuel under pressure supplied through a fuel inlet, away from a seating to permit fuel flow from the inlet to an outlet, the valve member being slidable within a sleeve, and subject to the fuel pressure at said inlet, the sleeve being slidable in a bore in a nozzle body, a spring abutment engageable by the valve member, a coiled compression spring engaging the spring abutment for biasing the valve member into contact with the seating, the sleeve also being engageable with the spring abutment whereby when fuel under pressure is supplied through said inlet the force produced by the fuel pressure acting on the sleeve will cause the sleeve to engage the spring abutment to assist the movement of the valve member against the action of the spring, stop means for limiting the movement of the sleeve under the action of fuel pressure and abutment means on the valve member for engaging with the sleeve to limit further movement of the valve member away from the seating after the movement of the sleeve has been arrested by the stop means.

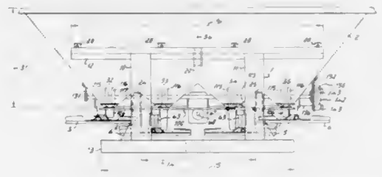
4,836,455
FLUID-JET-CUTTING NOZZLE ASSEMBLY
Jose P. Munoz, Joplin, Mo., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.
Filed Mar. 3, 1988, Ser. No. 163,490
Int. Cl.[4] B05B *1/00*
U.S. Cl. 239—590.3 **5 Claims**



1. A fluid-jet cutting nozzle assembly, comprising:
a body;
a nozzle; and
a jet orifice element; wherein
said nozzle and element each have a fluid-accommodating passage formed therethrough, and centrally thereof;
said body has a longitudinal axis, and comprises means for (a) receiving said nozzle and element therein, and (b) positioning said nozzle and element therein, in an established, spaced-apart disposition therebetween, along said axis, with said passages in substantially collinear alignment along said axis; and
means supported in said body for selectively adjusting said positioning of said element relative to said axis.

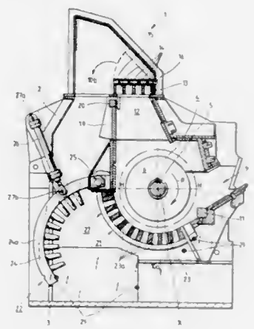
4,836,456
AGRICULTURAL SPREADER HAVING MULTIPLE DISTRIBUTION MEMBERS BROADCASTING MATERIAL SIMULTANEOUSLY TO GENERALLY THE SAME AREA
Cornelis van der Lely, 7 Brüschenrain,, Zug, Switzerland
Continuation of Ser. No. 766,410, Aug. 16, 1985, abandoned. This application Nov. 25, 1987, Ser. No. 129,322
Claims priority, application Netherlands, Aug. 17, 1984, 8402525; Aug. 17, 1984, 8402526
Int. Cl.[4] A01C *17/00*
U.S. Cl. 239—682 **58 Claims**

1. A spreader for granular or powdery material which comprises a frame, a hopper, and at least three spreader members carried by said frame which rotate about substantially vertical axes and are constructed and arranged to receive said material from said hopper, said hopper having at least three discharge outlets and an adjustable doser member for each said discharge outlet, all of said spreader members adapted to receive said material from said discharge outlets so that such material received by all of said spreader members is simultaneously broadcast onto ground and/or crop areas which substantially coincide throughout as said material is being so broadcast, two of said spreader members being disposed at the same height above the ground and at least one of said spreader members



being disposed at a lower height above the ground and overlapping as seen in plan with at least one of said two higher spreader members, and drive means connected to rotate said two higher spreader members in opposite rotational directions so that said higher spreader members closest edges are moving in the spreader's operative direction of travel, the remaining said lower spreader member arranged and constructed so that it is paired with and driven by said drive means in the same direction of rotation as one of said higher spreader members.

4,836,457
SCREEN FOR COMMINUTING MACHINES
Gabriele Greiner, Mönchen-Gladbach, Fed. Rep. of Germany, assignor to Lindemann Maschinenfabrik G.m.b.H., Dusseldorf, Fed. Rep. of Germany
Filed Jul. 22, 1987, Ser. No. 76,278
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1986, 3624826
Int. Cl.[4] B02C *13/286*
U.S. Cl. 241—73 **10 Claims**



1. In a comminuting machine, in particular for comminuting waste and recyclable materials, ores and stones, wherein a rotor having comminuting tools thereon is rotatably mounted about a horizontal axis within a housing body and the housing body has an inlet and at least one outlet region for discharging comminuted material with at least one grate being arranged in the outlet region, the improvement comprising:
said grate being formed of first and second layers, means operatively connected to said layers for relative movement between said layers, said first layer having a plurality

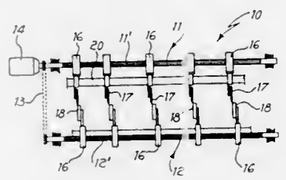
of grate openings therethrough, said second layer including at least one member capable of reducing the size of at least one of said openings when said layers are engaged with each other, said grate openings having a maximum effective size with said second layer moved by said means out of engagement from said first layer, which effective size cannot be increased by engaging said first and second layers with each other, said first layer comprising an operating element mounted for movement to said body, said at least one member comprising a punch connected to said operating element for engagement into one of said grate openings for changing the effective shape of said grate opening.

4,836,458

DEVICE FOR THE SELECTIVE OR SIMULTANEOUS TRAVERSE OF THE CUTTING MEMBERS IN A MACHINE FOR THE CHOPPING AND/OR CUTTING OF MATERIAL IN SHEET

Elio Cavagna, Piazza Piemonte, 5, 20070 Melegnano (Milano), Italy

Filed Nov. 12, 1987, Ser. No. 119,845
Claims priority, application Italy, Apr. 8, 1987, 20028 A/87
Int. Cl.[4] B02C *18/18, 18/24*; **B23D** *19/06*
U.S. Cl. 241—101.2 **5 Claims**



1. A machine for chopping and/or cutting of material in sheet form, which comprises cutting members, slip beams, each slip beam supporting respectively each of said cutting members, each beam being equipped with a rack, a device for the selective or simultaneous traverse of the position of the cutting members along said beams which comprises two substantially bar-formed elements, each parallel to said slip beams, said bar-formed elements being mechanically interconnected;

a motor connected to at least one of said bar-formed elements for actuation of said bar formed elements in rotational movement;

means for transforming the rotational movement of said bar-formed elements to rectilinear traverse movement of each cutting member along one of said slip beams; and

means for energizing and de-energizing said means for transforming and wherein, the means for transforming the rotational movement of the bar-formed elements to rectilinear traverse movement of each member comprise;

a series of connecting means, corresponding to the number of cutting members, keyed and torsionally fixed on each bar-formed element;

a substantially cylindrical vertical structure fixed to each cutting member, in which a small shaft is inserted, equipped at one end with a pinion engaged with one of said racks, said shaft having an axis;

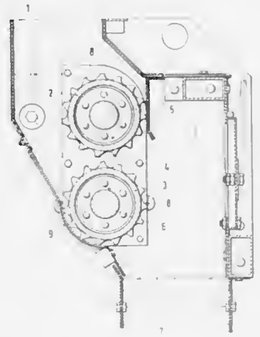
two bushes inserted in said vertical structure along said axis of small shaft, a first of which being axially stationary relative to said small shaft and being free to rotate around said small shaft and equipped with means engaged at a right angle with one of said connecting means, and the second of which being torsionally fixed relative to said small shaft and being axially mobile with respect to the first bush, the second bush moving axially and determining a torsional tie with the first bush or determining a clearance between the pair of bushes.

4,836,459

APPARATUS FOR FEEDING ROLLING MILLS, PARTICULARLY FOR OIL SEED

Wolfgang Holl, Gudehandviertel; Gerhard Weilandt, Hamburg, and Heinz Thiem, Uetersen/Holstein, all of Fed. Rep. of Germany, assignors to Gebruder Bauermeister & Co. and Verfahrenstechnik GmbH & Co., both of Hamburg, Fed. Rep. of Germany

Filed Oct. 26, 1987, Ser. No. 112,072
Claims priority, application Fed. Rep. of Germany, Oct. 25, 1986, 3636461
Int. Cl.[4] B02C *4/28*
U.S. Cl. 241—225 **16 Claims**



1. A apparatus for feeding a rolling mill, particularly for oil seed, comprising:

a feed mechanism housing having a longitudinal wall and opposite sidewalls;

upper and lower feed rollers positioned in the feed mechanism housing above a rolling mill, wherein the feed rollers are substantially vertically aligned and rotatable in opposite directions, the longitudinal wall of the housing running in the longitudinal direction of the feed rollers and engaging closely on an upwardly moving circumferential portion of the lower feed roller, the upper and lower feed rollers having a gap therebetween during feeding;

the upper and lower feed rollers being mounted on shafts, and the upper feed rollers being mounted on swing arms having fulcrums located on the side walls of the housing,

the swing arms being interconnected by a crossbar having upper and lower surfaces and including means for adjusting the gap between the feed rollers, movement of the crossbar for opening the gap being opposed by at least one spring extending between the lower surface of the crossbar and the feed mechanism housing.

4,836,460

SCREW MILL

Toyo Akazawa, Ageo, Japan, assignor to Japan M&C Trading Co., Ltd., Japan

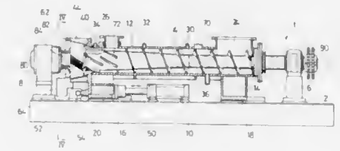
Filed Nov. 16, 1987, Ser. No. 121,358
Claims priority, application Japan, Apr. 14, 1987, 62-91346
Int. Cl.[4] B02C *23/02*
U.S. Cl. 241—247 **5 Claims**

1. A screw mill comprising:

a hollow cylindrical member having first and second inlet ports respectively for slurry and dry materials to be milled, the first and second inlet ports being arranged respectively at the rear and front sides of the cylindrical member, the materials to be milled being transferred through the front side of the cylindrical member during the milling operation thereof;

a shaft member having a diameter gradually increasing from the rear side toward the front side of the cylindrical member and formed with a continuous screw extending from the first inlet port to a position just before the second inlet port, and also formed with discontinuous vanes arranged at the front side of the cylindrical member and in front of the continuous screw, the shaft member being arranged within the hollow cylindrical member so that the continuous screw and the vanes are in contact with the inner cylindrical surface of the hollow cylindrical member;

a forwardly diverging rotor secured to the front end of the shaft member and formed on the outer periphery thereof with grooves inclined relative to an axis of the shaft member;



a hub member secured to the front end of the hollow cylindrical member around the rotor and having a forwardly diverging inner peripheral surface shaped complementary to the outer periphery of the rotor, the inner peripheral surface of the hub member being formed with grooves facing the grooves of the rotor;

a driving means for rotating the shaft member around its axis; and,

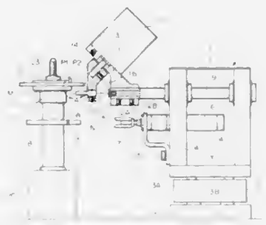
a pressure applying means for sliding the hub member together with the hollow cylindrical member along the axis of the shaft member so as to urge the hub member against the rotor.

4,836,461

WIRE WINDING MACHINE FOR STATOR CORES

Tetsuro Koizumi, Yokohami, and Masato Kamei, Tokyo, both of Japan, assignors to Kamei Machine Project Co., Ltd., Japan

Filed Jan. 25, 1988, Ser. No. 148,060
Claims priority, application Japan, Jul. 13, 1987, 62-172948
Int. Cl.[4] H01F *41/04*
U.S. Cl. 242—1.1 R **7 Claims**



1. A wire winding machine for winding a wire on a device having a plurality of members which extend in different directions, said wire winding machine comprising:

a vertically extending frame unit and a vertically extending first axis associated with said frame unit;

revolving means coupled to the frame unit and effective for causing the frame unit to revolve about said first axis;

a support tube secured to said frame unit and extending generally perpendicularly to said first axis; and

a winding unit mounted to said support tube;

means for rotating the winding unit about a second axis which second axis is inclined relative to said first axis;

said winding unit having and supporting a wire dispensing nozzle which assumes a horizontal or vertical orientation in response to rotation of said rotating means of said winding unit about said second axis, whereby said winding machine is effective for holding a wire in position for being wound on said plurality of members, regardless of whether said members extend horizontally or vertically; and

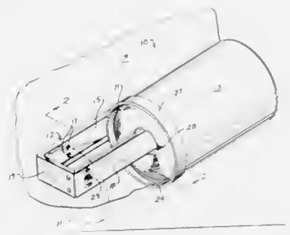
secondary rotating means for allowing relative movement between the wire dispensing nozzle and a horizontally extending member.

4,836,462

TOILET TISSUE DISPENSER

Elroy A. Bruss, N17 W5441 Garfield St., Cedarburg, Wis. 53012

Filed Oct. 21, 1988, Ser. No. 260,910
Int. Cl.[4] B65H *19/00*
U.S. Cl. 242—55.3 **8 Claims**



1. In a toilet tissue dispenser, framing means including a rearwardly disposed wall mounting member and a forwardly disposed tissue roll mounting member, said roll mounting member having a pivotal connection at one end thereof to provide for pivotal movement of said member relative to the wall mounting member between an open position providing for replenishment of tissue rolls over the free end of said member and a closed position, a roll housing slidably disposed on the roll mounting member and having an open end facing toward the free end of said member, said housing being adapted to receive spare rolls of tissue therein and being spaced from the free end of said roll mounting member to provide for a roll of tissue in the in-use position clear of said housing, said roll housing being slidable on the roll mounting member toward the free end thereof to place a new roll of tissue in the in-use position after the previous roll has been consumed.

4,836,463

ENDLESS LOOP TRANSPORT AND STORAGE SYSTEM

Richard P. Eddy, Gardena, Calif., assignor to Christie Electric Corporation, Torrance, Calif.

Continuation-in-part of Ser. No. 936,399, Dec. 1, 1986. This application Jul. 1, 1987, Ser. No. 68,325
Int. Cl.[4] B65H *17/48*
U.S. Cl. 242—55.19 R **32 Claims**

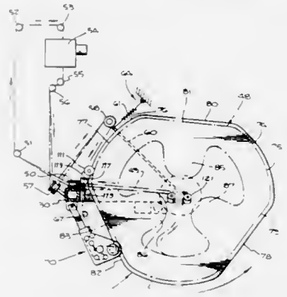
1. In an apparatus for continuously storing a strip of material in a coil, the apparatus including a flat platter and drive means for rotating said platter,

a cam mounted for rotation with said platter about its center, said cam having a cam track with alternating sections of greater distance from said center and lesser distance from said center, and

means for applying the incoming strip to the periphery of said coil of the strip on said platter as said platter rotates, said means for applying including a cam follower for engaging said cam track and varying the distance from said center to the point of application of the strip, and first roller means adjacent said platter for guiding the incoming strip onto said coil, with said means for applying moving toward and away from said center and with said coil on

said platter having inwardly directed rounded cusps with arcuate outer peripheries therebetween,

the improvement comprising second roller means fixedly



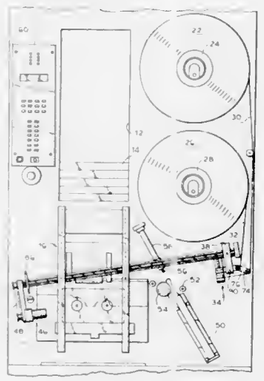
mounted adjacent said platter and positioned in engagement with said coil only at the arcuate outer peripheries thereof for urging said coil inward toward said center and relieving tension in said strip.

4,836,464

CASSETTE WINDING APPARATUS AND METHOD FOR OPERATING

Luciano Perego, Via Stefano Biffi 6, 20050 Mezzago (Milan), Italy

Filed Jan. 21, 1988, Ser. No. 146,327
Int. Cl.[4] B65H *20/16, 19/22*
U.S. Cl. 242—56 R 25 Claims



1. A cassette winding apparatus for automatically alternating between a first supply reel having a first tape and a second supply reel having a second tape, said apparatus comprising:

tape winding means for winding a predetermined length of a selected one of said first and second tapes into a cassette;

support means for holding said first and second tapes, said support means being located on a given side of said tape winding means; and

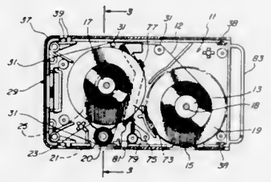
tape threading means for moving said selected tape from said given side of said tape winding means to an opposite side of said tap winding means, said tape threading means including grip means for selectively gripping and releasing said selected tape.

4,836,465

MAGNETIC TAPE TRANSPORT SYSTEM

Richard L. May, Manhattan Beach, and Kenneth J. Curran, Thousand Oaks, both of Calif., assignors to Cal R&D, Inc., Culver City, Calif.

Filed Jan. 29, 1988, Ser. No. 149,422
Int. Cl.[4] G11B *15/26, 23/087*
U.S. Cl. 242—192 3 Claims



1. A magnetic tape drive unit capable of transporting tape between a supply reel and a take-up reel over a capstan, all contained within a tape cartridge, comprising:

a chassis having a chamber capable of receiving a tape cartridge;

a bidirectional drive means;

a drive transfer member pivotably mounted to the chassis;

a pinch roller for engaging a capstan within the tape cartridge, rotatably mounted on one end of the drive transfer member;

a drive roller for engaging a projecting edge of a supply reel within the tape cartridge, rotatably mounted to the other end of the drive transfer member;

a biasing means for biasing the drive transfer member to a first position in which the pinch roller engages the capstan or to a second position in which the drive roller engages the edge of the supply reel;

a switching means for alternatively positioning the drive transfer member in the first or the second position;

means for rotationally linking the drive means with the pinch roller; and

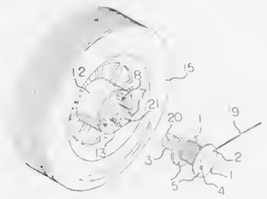
means for rotationally linking the drive means with the drive roller.

4,836,466

WINCH ATTACHMENT FOR VEHICLE WHEEL TRACTION

Bradley M. Peterson, 540 S. Huber, Casper, Wyo. 82609

Filed Oct. 26, 1987, Ser. No. 112,554
Int. Cl.[4] B65H *75/34;* B66D *3/00*
U.S. Cl. 242—95 2 Claims



1. A winch assembly for attachment to a wheel of a vehicle, the wheel being attached to the vehicle by studs, said winch assembly comprising; a first hollow drum member having an end plate with plurality of holes therein, a plurality of bolts, one end of each of said bolts being hollow with internal threads, said bolts extending through said holes and said first hollow drum with said internal threads attached to said studs, a second hollow drum member fxed to said plate and extending

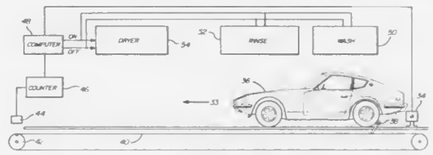
axially therefrom opposite said first hollow drum member, a cable receiving spool having spaced end plates and a shaft, said shaft having a first portion extending between said plates for receiving a cable wound thereon and a second portion extending beyond one of said plates, and means for fixing said second portion of said shaft to said second hollow drum.

4,836,467

CARWASH DRYER CONTROL SYSTEM

Lane Rodgers, Danville, Va., assignor to Bivens Winchester Corporation, Danville, Va.

Filed Sep. 12, 1988, Ser. No. 242,522
Int. Cl.[4] B60S *3/06*
U.S. Cl. 15—316 R 6 Claims



1. For use in a vehicle washer system having a wash lane;

an air blower having a continuous internal circulation path and an outlet from said path;

an electric motor driving said blower;

valve means disposed in said outlet for opening and closing same;

means for actuating said valve means independently of said motor to open said outlet and obtain air from said blower on demand only; and

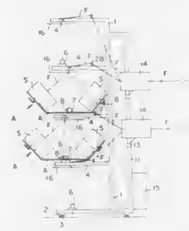
means for directing air from said outlet to the surface of a vehicle.

4,836,468

YARN PACKAGE CREEL FOR MACHINE PROCESSING YARN

Hans S. Singer, P.O. Box 5861, Greenville, S.C. 29606

Filed Sep. 23, 1986, Ser. No. 910,604
Claims priority, application Switzerland, May 28, 1986, 02161/86
Int. Cl.[4] B65H *49/10, 49/14*
U.S. Cl. 242—131 5 Claims



1. A loom creel having a plurality of vertically spaced crossbrackets each having opposed upturned arms holding a plurality of yarn packages, a package holder mounted on each upturned arm, each crossbracket being carried by a corresponding laterally extending horizontal creel extension carried by a creel frame comprising:

a vertical shaft carried by each corresponding laterally extending horizontal creel extension rotatably carrying each said crossbracket in stacked relation to feed a plurality of yarns from said yarn packages to a loom and the like;

a horizontal balloon breaker member in vertically spaced relation to each said horizontal creel extension; and

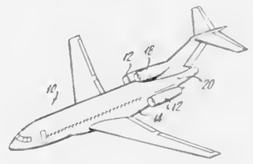
said crossbrackets being mounted to guide yarns through said balloon breaker members to said loom.

4,836,469

SYSTEM FOR REDUCING AIRCRAFT NOISE AND HUSH KIT

Robert E. Wagenfeld, New York, N.Y., assignor to Valsan Partners Limited Partnership, New York, N.Y.

Filed May 29, 1987, Ser. No. 55,635
Int. Cl.[4] B64D *29/00, 33/04*
U.S. Cl. 244—1 N 4 Claims



1. A method for quieting jet engine noise produced by an airplane having three jet engines upon take-off and landing, comprising:

(a) replacing two outboard-mounted jet engines at the rear of the fuselage with jet engines which produce lower noise and greater thrust;

(b) retaining a center fuselage-mounted jet engine, and removing a thrust reverser from the aft position thereof;

(c) mounting a forced-air mixer on the center engine at the position from which the thrust reverser was removed, the mixer being adapted to combine cold air passing around the engine with hot air passing through the engine, to reduce engine noise emitted by the center engine; and

(d) mounting an acoustic nozzle comprised of sound-attenuating material aft of the forced-air mixer on the center engine,

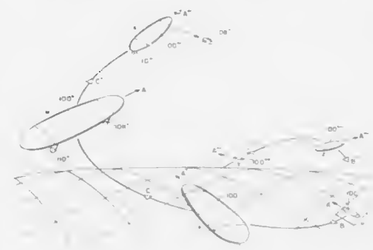
whereby the noise level produced the airplane is reduced to a sufficiently quiet level to meet governmental noise regulations while remaining airworthy and permitting operation without reduced payloads or thrust.

4,836,470

AEROSPACE VEHICLE HAVING MULTIPLE PROPULSION SYSTEMS ON A RELATIVELY ROTATABLE FLYING WING

David R. Criswell, 4003 Camino Lindo, San Diego, Calif. 92122

Continuation-in-part of Ser. No. 536,630, Sep. 28, 1983. This application Jun. 13, 1985, Ser. No. 744,491
Int. Cl.[4] B64C *37/02, 39/10;* B64G *1/14, 1/42*
U.S. Cl. 244—2 25 Claims



1. An aerospace vehicle, comprising:

an elongated, generally elliptical wing member capable of independent flight and having a central plane, top and bottom surfaces and a unique tip to tip longitudinal axis with a leading edge to trailing edge aerodynamic cross sectional shape;

a plurality of propulsion means mounted asymmetrically and non-centrally about the wing member for selectively providing thrust to said wing member; and

control means for independently controlling the direction and magnitude of thrust of each of said plurality of propulsion means to provide a net thrust vector controllable in attitude relative to the central plane of the wing member and moveable between directions transverse to the longitudinal axis of the wing member during take-off and aligned with the longitudinal axis during flight;

at least one of said propulsion means being offset from the longitudinal axis of the wing member so that it is positioned to the rear of the wing member during take-off, and at least one of said propulsion means being positioned to the rear of said wing member during flight.

4,836,471

NAVIGATIONAL VENT FOR HOT AIR BALLOONS

Don Piccard, 1445 E. River Rd., Minneapolis, Minn. 55414

Continuation-in-part of Ser. No. 904,480, Sep. 8, 1986, abandoned. This application Jun. 2[illegible], 1987, Ser. No. 66,318

Int. Cl.[4] B64B *1/64*

U.S. Cl. 244—99 7 Claims

1. In a hot air load-carrying balloon structure comprising an envelope supporting a load-carrying cargo basket, a cap valving means comprising a port formed in the envelope at the polar cap thereof, and further comprising a disc removably and releasably secured to the balloon envelope adjacent the disc periphery, and means for controllably and selectively positioning the disc in the port for opened and closed dispositions, characterized in that:

(a) cord control means coupled to said disc and providing a substantially continuous line extending from said disc to the free gripping end accessible to an individual riding in said cargo basket;

(b) said disc having a diameter which is substantially greater than the diameter of the port formed within the envelope and providing an annular sealing zone radially outwardly of the port;

(c) said control cord means comprising a clew disposed generally concentrically with said disc, and a plurality of elastic disc cords extending radially outwardly from said clew and being anchored to said disc at substantially equally arcuately spaced points therearound, said disc cords extending radially outwardly of said disc and with control segments thereof passing about a pulley means disposed radially outwardly of said disc and with said pulley means being anchored to and suspended from said envelope.

4,836,472

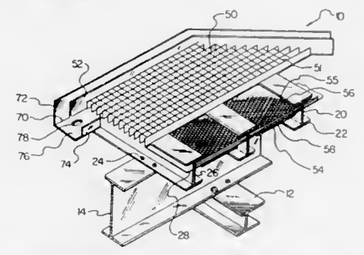
FIRE RETARDANT HELICOPTER DECK

R. Frank Sutter, 11747 Sunset Blvd., Los Angeles, Calif. 90049, and Melvyn Braithwaite, Singapore, Singapore, assignors to R. Frank Sutter, Los Angeles, Calif.

Filed Jan. 27, 1987, Ser. No. 6,997

Int. Cl.[4] B64F *1/00*

U.S. Cl. 244—114 R 10 Claims



1. In a helicopter landing deck comprising a base, a plurality of support members on the base, and an upper platform for supporting the helicopter, the support members providing a space between the base and the upper platform, the upper platform comprising a grating which permits liquid fuel to pass through it, the improvement comprising the provision of:

filler means between the base and the upper platform, basin means below the filler means, and mounting means on the support members for supporting the filler means and the basin means in the space below the upper platform, the filler means comprising spaced-apart layers of high-heat conductive material for permitting liquid fuel passing through the upper platform to pass through the filler means, the material of the filler means dissipating localized heat from the fuel at one location of the filler means by conducting said heat to a more even, lower temperature spread generally through the filler means, and thereby passively suppressing combustion of the fuel, the basin means catching liquid fuel that passes through the filler means.

4,836,473

APPARATUS FOR INFLUENCING A BOUNDARY LAYER ON THE SURFACE OF A BODY MOVING THROUGH A MEDIUM

Felix Aulehla, Ottobrunn, and Hans-Peter Genssler, Munich, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 864,593, May 16, 1986, abandoned. This application Jun. 5, 1987, Ser. No. 58,511

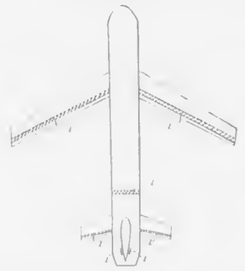
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1985, 3521329

Int. Cl.[4] B64C *23/06*

U.S. Cl. 244—130 13 Claims

1. An apparatus for influencing a boundary layer on an aircraft surface including wing surfaces, elevator surfaces, fin/rudder surfaces, and body surfaces, comprising boundary layer influencing means rigidly secured to said wing surfaces approximately along the entire wing span in a fully attached boundary layer flow downstream of the largest wing thickness as viewed in the air flow direction but upstream of any boundary layer separation point, said boundary layer influencing means being also secured to said elevator surfaces in a fully attached boundary layer flow downstream of the largest elevator thickness but upstream of any boundary layer separation point, to said fin/rudder surfaces in a fully attached boundary layer flow downstream of the largest fin/rudder thickness but upstream of any boundary layer separation point, and to said body surfaces in a fully attached boundary layer flow approximately around an entire body circumference of the aircraft tail end but upstream of any boundary layer separation point, said boundary layer influencing means having an effective height shorter than a respective displacement thickness of the corresponding fully attached boundary layer on the respective surface whereby the pressure drag component of the total drag effective on the aircraft is reduced.

11. A flush air inlet construction for an aircraft having a body with a skin, comprising flush air inlet means (15) having a given width (W) for supplying air into the aircraft, a hinged



flap (14) for opening and closing said flush air inlet means, and a boundary layer diverter (13, 13″) arranged directly upstream of a hinged end of said flap (14) of said flush air inlet means, said boundary layer diverter (13, 13″) having a diverter width corresponding at least to said given width (W) of said flush air inlet means for diverting the boundary layer substantially completely away from said flush air inlet means for effectively reducing total pressure drag and for improving air intake efficiency.

4,836,474

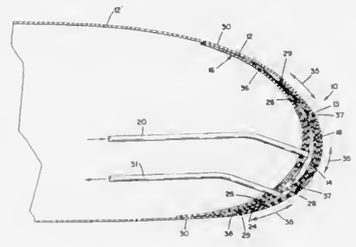
DE-ICER

James A. Briscoe; James C. Putt, both of Doylestown; Ronald W. Phillips, II, Mogadore, and Kevin L. Leffel, Akron, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 16, 1987, Ser. No. 74,107

Int. Cl.[4] B64D *15/16*

U.S. Cl. 244—134 A 36 Claims



1. In an object having a sheet-like skin formed of a material having a modulus of elasticity of at least 40,000 kPa and including an ice accreting surface, a de-icer comprising;

a support surface positioned obversely to the ice accreting surface;

at least one principal inflation tube between the support surface and the skin; and

means for introducing a fluid under pressure into the principal inflation tube at a rate and in a quantity sufficient to slowly inflate in a period of 0.5 to 5 seconds the inflation tube to a desired extent at which a desired deformation occurs to the skin to a degree sufficient to detach ice accumulations thereon and dislodge the ice accumulations into a stream of fluid flowing over the ice accreting surface without exceeding a stress level characterizing an endurance limit associated with the material forming the skin and for subsequently deflating the principal inflation tube.

4,836,475

SAFETY SYSTEM ON TRACK GUIDANCE LINES

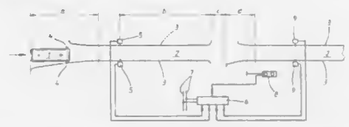
Hubertus Christ, Langenargen; Klaus Niemann, Welzheim, and Herbert Mehren, Freiberg, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 3, 1987, Ser. No. 128,183

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1986, 3641708

Int. Cl.[4] B62D *1/26*

U.S. Cl. 246—169 R 22 Claims



1. Safety system on track guidance lines for optionally track-guidable or road-going vehicles having lateral sides, with feeler rollers on each lateral side which roll along lateral transverse guide barriers of the track guidance line, the feeler rollers of both sides simultaneously being adjustable between an operating position close to the ground, used in track-guided operation and a retracted rest position, used in road operation, wherein a switch, which can be operated by the feeler rollers, is arranged on each of the two transverse guide barriers, approximately opposite each other on the same level as the feeler rollers of the vehicle when adjusted to the operating position, at the beginning of the track guidance line, after narrowing of the transverse guidance sections which are initially widened in the manner of a funnel, to normal track width, which switches, if operated together, switch via a control device an optical display device, located downstream of the switches in the direction of travel of the vehicle, and normally indicating a block signal, to "clear line"

4,836,476

DECANTING BASKET

Christoph Wolf, Therwil, Switzerland, assignor to Wolf Handels AG, Switzerland

PCT No. PCT/CH87/00119, § 371 Date Apr. 15, 1988, § 102(e) Date Apr. 15, 1988, PCT Pub. No. WO88/02231, PCT Pub. Date Apr. 7, 1988

PCT Filed Sep. 18, 1987, Ser. No. 193,649

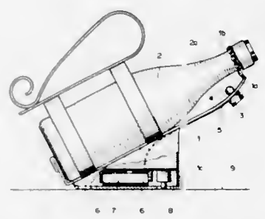
Claims priority, application Switzerland, Sep. 26, 1986, 3864/86

Int. Cl.[4] A47G *23/02*

U.S. Cl. 248—146 3 Claims

1. Decanting basket, characterized in that it comprises a holding bracket (6) adapted to hold an electrical battery (7), and—in its region (1*a*) serving to accommodate the neck (2*a*) of the bottle—it also comprises an electrical light source (4) connected by way of a switch (8) with the battery holding bracket (6), the light source (4) being adapted to transillumi-

nate the neck (2*a*) of the bottle from the bottom upward, wherein the switch is implemented as an off-switch so positioned to keep the circuit interrupted while the basket is in resting position.

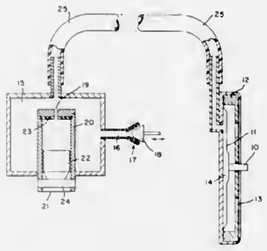


4,836,477

PARACHUTE RELEASE DEVICES

Anthony J. Baggarley, 12 Malin Road, Littlehampton, Sussex, England (BN17 6NN), and Brian R. Farthing, 6 Grange Park, Ferring, Sussex, England (BN12 5LS)

Filed May 2, 1988, Ser. No. 189,429
Int. Cl.[4] B64D *17/56*
U.S. Cl. 244—147 **9 Claims**



1. A release device for a parachute canopy, comprising a negative rate diaphragm arranged to experience atmospheric pressure on a first side and a reference pressure in a reference chamber on the opposite side of the diaphragm, an operating member which is movable between a canopy retaining position and a canopy releasing position by movement of the diaphragm, valve means arranged to selectively open the reference chamber to atmospheric pressure to inhibit operation of the diaphragm, air bleed means arranged to allow air to enter the chamber during a descent to balance the atmospheric pressure on the diaphragm, and means sensitive to rate of descent arranged to close the bleed means when a chosen rate of descent is exceeded, thus to trap said reference pressure in the reference chamber and to apply operating differential pressure to the diaphragm.

4,836,478

SUSPENSION SYSTEM FOR PERSONAL COMPUTERS AND MONITORS

Harry C. Sweere, Minneapolis, Minn., assignor to Ergotron, Inc., Bloomington, Minn.

Filed Oct. 15, 1987, Ser. No. 109,028
Int. Cl.[4] A47G *21/00*
U.S. Cl. 248—1 E **23 Claims**

23. A suspension system for positioning and supporting a display device of a personal computer above a work surface for the convenience of an operator, said suspension system comprising:

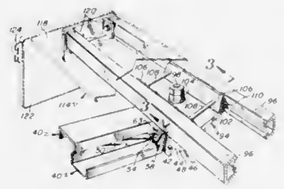
a carriage to receive the display device therein and having a front and back;

a tilt and swivel mechanism attached to and extending above said carriage, said tilt and swivel mechanism allowing said carriage to be tilted and rotated relative to the work surface;

a parallelogram linkage system including first and second substantially parallel suspension arms, each said arm having a distal end and a proximal end and said linkage system carrying said tilt and swivel mechanism adjacent said distal ends of said arms;

a pivot housing, said pivot housing being pivotably fastened to and supporting said suspension arms at said proximal ends thereof;

upward biasing means to urge the carriage and display device upwardly in a generally vertical direction away from the work surface;



a truck member pivotally mounting said pivot housing and allowing said linkage system to extend radially from said truck member;

tracking means supported above the work surface, said truck member being mounted for sliding movement along said tracking means, said carriage being movable between a first position disposed over the work surface and a second position displaced from said first position as said truck member is moved relative to said tracking means; and

said tilt and swivel mechanism being rotatable through substantially 360° and said pivot housing being rotatable relative to said tracking means through at least 180° while fully supporting the carriage over the work surface to thereby permit sliding, swinging and rotational movement of said carriage to substantially any position around and below said tracking means and within the radius defined by said linkage system while allowing the front of the carriage to confront the operator in all such positions.

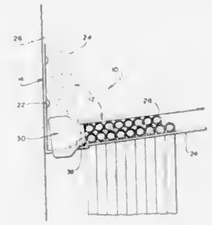
4,836,479

HOSE STORING AND DISPENSING RACK

John H. Adams, 1801 21st Ave., Kingsburg, Calif. 93631

Filed Feb. 4, 1988, Ser. No. 152,295
Int. Cl.[4] B05B *13/02*
U.S. Cl. 248—89 **15 Claims**

1. A hose rack for storing and dispensing a coiled hose, said rack comprising a hose bracket having a closed inner hose-seating end and an opposed open bracket mouth, said hose bracket including forward and rear bracket arms laterally spaced from each other to receive coils of a coiled hose therebetween, and mounting means engaging said bracket at the inner end thereof, said mounting means comprising a generally horizontal support and hinge means mounting said bracket to said support for a swinging movement of the bracket relative to the support between a substantially vertical hose storage position with the bracket mouth uppermost and upwardly opening, and a substantially horizontal hose dispensing position with the forward bracket arm lowermost and with the bracket mouth opening substantially horizontally, said mounting means further comprising a vertical member rigid with said generally horizontal support, said vertical member forming a positiondefining stop receiving the rear bracket arm thereagainst in the hose storage position of the hose bracket, said hose bracket, in the hose storage position, having a center of gravity on a vertical line between the vertical member and the hinge means and being gravity-biased over-center toward engagement with the vertical member for a stored positioning of bracket-received coils laterally between said vertical member and hinge means with the coils encircling the horizontal support, said bracket mouth, in said storage position, being unencumbered for direct vertical access thereto for the introduction of hose coils downwardly therethrough and into said bracket.

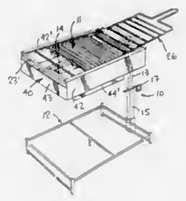


4,836,480

MULTI-PURPOSE SUPPORT FRAME FOR COOKING GRILL

Guy Besner, 552 Rue Principale, Ste. 107, P.O. Box 338, Lachute, Quebec, Canada J8H 1Y1

Filed Feb. 8, 1988, Ser. No. 153,588
Int. Cl.[4] A47G *29/00*
U.S. Cl. 248—125 **9 Claims**



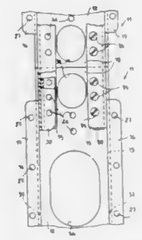
1. A multi-purpose support frame for supporting a cooking grill in an elevated position, said support frame comprising a support base, a telescopic support rod secured to said base and extending vertically above an end of said base, a support arm secured to said rod and extending above and over said support base, said support arm having spaced apart attachment means for engaging cooperating parts of said grill for retaining said grill substantially horizontally above said support base, said attachment means being comprised by a bore in a forward end of said support arm, and a pair of spaced apart hook fingers extending close to a rear end of said support arm, each finger extending rearwardly and spaced on a respective side of said support arm and above a common face of said grill, said grill being adjustably positioned in height above said support base by an adjustment member secured to said support rod, and handle means associated with said grill and having a grill section with a detachably securable end for securing same to said cooking grill to provide an extension thereof, and a handle at an opposed end of said grill section, said cooking grill having opposed substantially parallel outer edge wire rods and a plurality of spaced transverse wire rods, and an inwardly turned finger rod secured to an outer end one of said transverse wire rods and spaced substantially parallel below the horizontal plane of said cooking grill, said cooking grill being retained substantially horizontally on said support arm with some of said transverse wire rods resting in part on said support arm and said hook fingers engaging over one of said transverse wire rods and said finger rod received in engagement in said bore in said forward end of said support arm.

4,836,481

SUPPORT FOR WRITING DESKS

Pietro Ceccarelli, Massa, Italy, assignor to Olivetti Synthesis, S.p.A., Ivrea, Italy

Continuation of Ser. No. 902,707, Sep. 2, 1986, abandoned. This application Feb. 25, 1988, Ser. No. 163,143
Claims priority, application Italy, Sep. 18, 1985, 67789 A/85
Int. Cl.[4] A47B *3/06*
U.S. Cl. 248—188.1 **10 Claims**



1. A support for writing desks or tables of variable configuration, wherein each desk or table includes a horizontal worktop portion, and vertical support members, said support comprising a longitudinal support which extends below said worktop portion and which structurally connects the worktop portion with said vertical support members, wherein said longitudinal support comprises:

one lengthened modular element and another lengthened modular element, each one formed by a profiled portion with a section of open channel, inverted Omega shape including a bottom wall and two lateral walls having two upper flanges, wherein said profiled portion has an end including two first members of C-shaped section having a stiffening function for an end of the two lateral walls and the bottom walls of said one and said other lengthened modular elements and fixed internally to the end of said profiled portion, and at least one lateral connecting portion in the lateral walls of said profiled portion; and

first connecting means and second connecting means for causing said one lengthened modular element to be optionally connected with the other lengthened modular element straightward and perpendicular with respect to said other lengthened modular element, respectively;

wherein said first connecting means comprises two second members of C-shaped section connected internally with said two first members of C-shaped section of said one and said other lengthened modular elements and locking members for locking the two second members of C-shaped section with said two first members of C-shaped section to align said other lengthened modular element straightwardly with respect to said one lengthened modular element;

wherein said second connecting means comprises an interconnecting member having a first end portion and a second end portion wherein said first end portion includes two third members of C-shaped section to be connected with the two first members of C-shaped section of said

other lengthened modular element through two further second members of C-shaped configuration, and said locking members and wherein said second end portion comprises a flanged portion to be connected with said at least one lateral connecting portion of said one lengthened modular element for positioning said other modular element perpendicular with respect to said one lengthened modular element;

wherein the two upper flanges of said one and said other lengthened modular elements are fixed to a lower surface of said worktop portion and said bottom wall and said lateral walls of said one and said other lengthened modular elements are capable of internally housing power outlets and cables and are provided with openings which are sufficiently large to define passage therethrough of said power outlets and manual access to said cables; and

wherein said at least one lateral connecting portion of said one of said other lengthened modular elements and the flanged portion of said interconnecting member each define a large opening and wherein the second two C-shaped members of said first connecting means and the openings of said at least one lateral connecting portion and said interconnection member permit continuity in respect of passage of said cables.

4,836,482

HINGED SUPPORT BRACKET FOR A RADAR DETECTOR OR LIKE DEVICE

Steven Sokol, Southfield, Mich., assignor to Detroit Bracket Company, Inc., Ferndale, Mich.

Continuation of Ser. No. 895,124, Aug. 11, 1986, abandoned. This application Sep. 2, 1988, Ser. No. 253,331

Int. Cl.[4] B60R 1/02

U.S. Cl. 248—206.3 **12 Claims**

10. A bracket for supporting a radar detector or like device within a motor vehicle having a windshield, said bracket comprising:

a substantially planar mounting portion;

means for detachably securing said mounting portion to the windshield;

a substantially planar support portion having two parallel edges and at least two sides disposed substantially perpendicular to said support portion on said parallel edges;

means for removably mounting the radar detector or like device to said support portion;

hinged means for pivotably connecting an edge of said mounting portion to an edge of said support portion, whereby the angle of the support portion with respect to the mounting portion, and thus with the windshield, is variable; and

locking means for selectively arresting said hinge means thereby to lock said support portion and said mounting portion in a particular angular relationship;

wherein said means for removably mounting comprises an adapter dimensioned to frictionally engage said sides, said adapter including a flat surface having adhesive means for attaching the radar detector or like device to said flat surface.

4,836,483

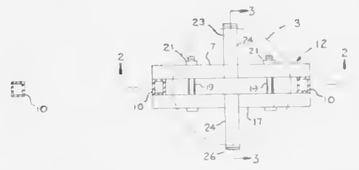
SUPPORT MECHANISM FOR INSECT REPELLANT HOLDER

William Dale, Jr., 727-B Grove St., Avoca, Pa. 18641

Filed May 26, 1988, Ser. No. 199,050

Int. Cl.[4] A47B 96/06

U.S. Cl. 248—231.6 **12 Claims**



1. In combination with an upstanding railing that includes horizontally spaced vertical posts; the improvement comprising means for supporting an insect repellant holder in the space between two adjacent posts; said support means comprising two horizontal bars spanning the post-to-post space, with end areas of the bars overlapping the posts; threaded connector means extending through the horizontal bars, whereby said bars are clamped to the posts; and an upstanding bracket carried by each bar; the two brackets and two adjacent posts circumscribing a space that is sized to accommodate an insect repellent holder.

4,836,484

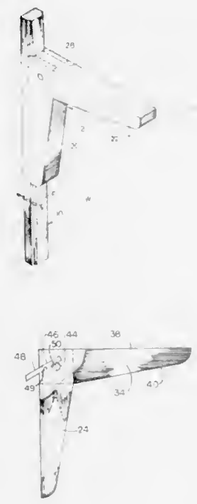
WALL BRACKET ASSEMBLY

Robert H. Reed, 25557 Snyder Ave., Conifer, Colo. 80433

Filed Apr. 4, 1988, Ser. No. 177,377

Int. Cl.[4] A47G 29/02

U.S. Cl. 248—243 **8 Claims**



5. In a wall bracket assembly wherein a support member is provided with at least one opening therein, and a fastener for mounting said support member on a vertical wall surface, the combination therewith comprising:

a wall bracket having a vertically extending portion and a first upper connecting end portion, and a horizontally extending portion having an upper support surface and a second connecting end, complementary tongue and groove portions between said first and second connecting ends, a cross pin extending through aligned bores in said first and second connecting ends to rigidly connect said horizontal bracket portion in fixed relation to said vertical bracket portion, and a support pin wedged into engagement with said cross pin including a downwardly angled projection insertable into said opening in said wall support member.

4,836,485

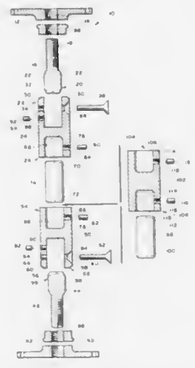
UNIVERSALLY ADJUSTABLE MOUNTING DEVICE

Gershon Cooper, Encino, Calif., assignor to Alliance Research Corporation, Chatsworth, Calif.

Continuation of Ser. No. 8,736, Jan. 30, 1987, abandoned. This application Mar. 3, 1988, Ser. No. 168,582

Int. Cl.[4] A47F 5/08

U.S. Cl. 248—278 **8 Claims**



6. A universally adjustable mounting service for supporting a body at a selected position and aspect relative to a supporting base, comprising:

a first mounting plate adapted for removable attachment to the supporting base, and having a threaded opening extending perpendicularly therein;

a first shaft having a threaded shank threadably received in said threaded opening in said first mounting plate and having a head end with flattened opposite sides, said head end of said first shaft having a passageway extending between said flattened sides thereof;

a first threaded lock nut on said threaded shank securing the position of said first shaft relative to said first mounting plate;

a first elongated joint member having a base end and a fork-shaped end opposite said base end, said fork-shaped end receiving said flattened sides of said head end of said first shaft, said fork-shaped end having tines with aligned openings therethrough, the aligned opening in one of said tines being unthreaded and the aligned opening in the other of said tines being threaded;

first bolt means passing transversely through said unthreaded opening in said one tine of said first joint member, through said passageway in said head end of said first shaft, and into said threaded opening in said other tine of said first joint member, for compressively and frictionally retaining said first joint member in a selected pivotal position relative to said first shaft;

said first joint member having a first threaded hole formed in a tine thereof;

means for locking said first joint member in its selected pivotal position relative to said first shaft, comprising a first set screw extending through said first threaded hole and having one end engaging one flattened side of said head end of said first shaft in a compressively and frictionally retaining relationship, said first threaded hole being spaced inwardly from said aligned openings of said fork-shaped end such that the axis of said first threaded hole and said first set screw is offset along the length of said first shaft from the axis of said first bolt means;

a second mounting plate for attachment to the body, said second mounting plate having a threaded opening extending perpendicularly therein;

a second shaft having a threaded shank threadably received in said threaded opening in said second mounting plate and having a head end with flattened opposite sides, said head end of said second shaft having a passageway extending between said flattened sides thereof;

a second threaded lock nut on said threaded shank of said second shaft for securing the position of said second shaft relative to said second mounting plate;

a second elongated joint member having a base end and a fork-shaped end opposite said base end, said fork-shaped end receiving said flattened sides of said head end of said second shaft, said fork-shaped end having tines with aligned openings therethrough, the aligned opening in one of said tines being unthreaded and the aligned opening in the other of said tines being threaded;

second bolt means passing transversely through said unthreaded opening in said one tine of said second joint member, through said passageway in said head end of said second shaft, and into said threaded opening in said other tine of said second joint member, for compressively and frictionally retaining said second joint member in a selected pivotal position relative to said second shaft;

said second joint member having a second threaded hole formed in a tine thereof;

means for locking said second joint member in its selected pivotal position relative to said second shaft, comprising a second set screw extending through said second threaded hole and having one end engaging one flattened side of said head end of said second shaft in a compressively and frictionally retaining relationship, said second threaded hole in said second joint member being spaced inwardly from said aligned openings of said fork-shaped end of said second joint member such that the axis of said second threaded hole and said second set screw is offset along the length of said second shaft from the axis of said second bolt means;

each of said joint members having a cylindrical opening in its base end; and

means for releasably interconnecting said base ends of said first and second joint members in a rotationally and axially adjustable manner, said interconnecting means including

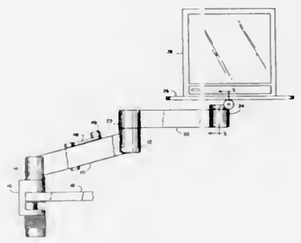
(a) a connecting rod having cylindrical ends which are slidably and rotatably received within corresponding ones of said cylindrical openings,

(b) each joint member having an additional threaded hole extending through the wall thereof and into said cylindrical opening thereof, and

(c) a separate set screw received in each of said additional threaded holes for independently retaining the corresponding joint member in its position of attachment to said connecting rod,

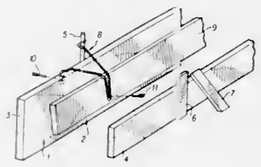
so that the body is firmly supported and retains its selected position and aspect when subjected to shocks and vibration.

4,836,486
ADJUSTABLE SUPPORT
Sohrab Vossoughi, Portland, and Marvin G. Astleford, Hillsboro, both of Oreg., assignors to Anthro Corporation, Portland, Oreg.
Continuation-in-part of Ser. No. 39,184, Apr. 16, 1987, Pat. No. 4,783,036. This application Apr. 21, 1988, Ser. No. 184,909
Int. Cl.[4] E04G *3/00*
U.S. Cl. 248—281.1 16 Claims



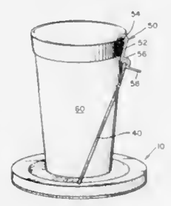
1. An adjustable support comprising:
a top member;
a bottom member;
a proximal member;
a distal member;
means coupling the top member, bottom member, proximal member, and distal member to form an articulated parallelogram structure;
a constraint link having a first end, a second end and a distal portion, the first end being rotatably coupled to the top member and the second end being rotatably coupled to the bottom member, the distal portion including a coupling point; and
means pivotally connected to said coupling point for moving said constraint link to affect the shape of the parallelogram.

4,836,487
CONCRETE CURB FORM HANGER
Michael Ringler, 3318 Foxfire Ct., Fairfield, Calif. 94533
Filed Mar. 7, 1988, Ser. No. 165,140
Int. Cl.[4] E01C *19/50*; E04G *13/00*
U.S. Cl. 248—303 5 Claims



1. A hanger for use in constructing concrete curbing to eliminate stakes within the pour volume comprising of:
a. a continuous metal rod oriented to have a first horizontal length;
b. said rod extending from one end of the first horizontal length with a first step downward to a short second horizontal length thereafter to a first 90° bend to a first vertical length downward and bent thereafter to form a first attaching means;
c. said rod extending from the other end of the first horizontal length with a second step downward to a short third horizontal length thereater to a second 90° bend to a second vertical length downward and bent thereafter to form a second attaching means;
d. from the second attaching means the rod extends with a third vertical length upward to a point slightly above the third horizontal length at which point rod is bent so that the rod, extends a diagonal length across the distance spanned by the first and third horizontal length to an obtuse bend there to extend a short fourth horizontal length and then bent to form a positioning means, said positioning means consists of said forth horizontal length joined to a third 90° bend in turn joined to a fifth horizontal length.

4,836,488
COASTER WITH ADJUSTABLE MEANS FOR RETAINING A BEVERAGE CONTAINER
Gary Ross, 140 Oxnard Ave., Oxnard, Calif. 93035
Filed May 16, 1988, Ser. No. 194,107
Int. Cl.[4] A47B *91/00*; A47G *23/02*
U.S. Cl. 248—346.1 12 Claims



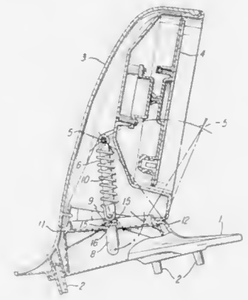
1. An apparatus for retaining a beverage container comprising:
a. a platform comprising at least one recessed area which can accommodate the lower surface of a beverage container of any desired shape and size;
b. a single flexible retaining means retained on said platform; and
c. a single movable clamping means movably attached to said single flexible retaining means to engage the upper surface of said beverage container in a manner wherein a single movable clamping means and a single retaining means creating a downward pressure on the beverage container from a single point of attachment on the beverage container retains said beverage container on said platform;
d. whereby said beverage container is placed on said platform so that lowermost portion of the beverage container rests within said at least one recessed area of the platform and said single flexible retaining means is stretched so that said single movable clamping means is attached to a portion of the upper surface of said container to thereby lock the beverage container onto said platform,
wherein said single flexible retaining means is retained on two oppositely disposed locations of said platform.

4,836,489
PAPER HOLDER
Cornet Chu, London, England, assignor to Hi Tech Industries, Ltd., London, England
Filed Mar. 25, 1987, Ser. No. 30,154
Claims priority, application United Kingdom, Feb. 11, 1987, 8703138
Int. Cl.[4] B41J *11/02*
U.S. Cl. 248—442.2 13 Claims

1. A paper holder, said paper holder comprising a single, integrally formed elongate member, said elongate member defining therein a slot, said slot being arcuate in at least one dimension and having a central linear section with terminal arcuate portions, the slot terminating at one end with an arcuate portion leading to an open mouth, the mouth being wider than the width of the slot, and means in the form of a support adapted to mount said member in position with the open mouth projecting so that a sheet of paper may be inserted in said slot

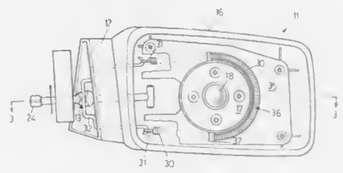
without requiring the manual opening of the slot, the elongate member defining an aperture adjacent one end thereof through which a threaded plug passes, the threaded plug extending into a threaded bore in said support so as to rotatably mount the elongate member upon said support.

4,836,490
EXTERIOR MIRROR FOR A VEHICLE
Bernhard Mittelhäuser, Am Krähenberg, D-3002 Wedemark 2, and Bernd Winkler, Burgwedel, both of Fed. Rep. of Germany, assignors to Bernhard Mittelhäuser, Wedemark, Fed. Rep. of Germany
Filed Apr. 22, 1988, Ser. No. 184,974
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1987, 3713690
Int. Cl.[4] A47G *1/16*
U.S. Cl. 248—549 12 Claims



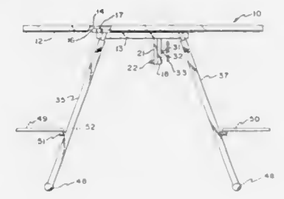
1. An exterior mirror for a motor vehicle, including a base that is adapted to be mounted on the vehicle, and a housing that accommodates a mirror body and is mounted on said base in such a way as to be pivotable to the front and to the rear, relative to the forward direction of travel of said vehicle; said mirror further comprises:
a lever arm;
first pivoting means for pivotably mounting said lever arm on said base in such a way that said lever arm is pivotable in the direction of pivot of said mirror housing;
a swivel arm having a first end that is remote from said base, and a second end that is directed toward said base;
means for hingedly connecting said second end of said swivel arm with said lever arm;
a tension spring having a first end that is connected to said first end of said swivel arm, and a second end that is connected to said base in the vicinity of where said lever arm is mounted on said base, with said housing, relative to said forward direction of travel of said vehicle, having a front edge that faces said base and a rear edge that faces said base; and
second pivoting means for connecting said housing to said swivel arm, in the vicinity of said first end thereof, in such a way that said housing is selectively pivotable about the front and rear edges thereof against the force of said tension spring.

4,836,491
BREAKAWAY MIRROR SPRING MEANS
Garry G. L. Fimeri, Lonsdale, Australia, assignor to Britax Rainsfords, Pty. Ltd., Lonsdale, Australia
Filed May 4, 1988, Ser. No. 190,012
Claims priority, application Australia, May 4, 1987, PI1723
Int. Cl.[4] G02B *7/18*
U.S. Cl. 248—549 6 Claims



1. A breakaway rear vision mirror assembly of the type having a mounting base and a pivoted assembly thereto to allow displacement of the mirror assembly both forwardly and rearwardly,
a mirror carried by the pivoted assembly,
walls defining a spring track of general 'U'-shape in the pivoted assembly, a spring contained within the spring track, the spring having two ends extending from the spring track and coupled to the mounting base and an intermediate portion bearing against the spring track walls to return the pivoted assembly to a usable position after said displacement either forwardly or rearwardly, and
a mirror mounting plate carrying said mirror and having a first element of a ball-and-socket joint extending from its rear surface, and said pivoted assembly comprising a cover, a second element of said ball-and-socket joint extending from said cover and engaged by said first element, said spring track extending part way around the ball.

4,836,492
KNITTING MACHINE STAND
Kurtis R. Kennedy, 1134 West Vailwood Dr., Murray, Utah 84123, and Lee R. Childs, 873 South 400 West, Bountiful, Utah 84010
Filed Jan. 25, 1988, Ser. No. 148,346
Int. Cl.[4] F16M *1/00*
U.S. Cl. 248—676 14 Claims



1. A stand for a knitting machine, comprising an elongate, substantially horizontal, supporting member; a set of legs adapted to be attached to said supporting member to support it above the surface upon which the stand rests; and elongate table top pivotally mounted on said supporting member for movement about an axis extending longitudinally of said member and between a first knitting position and a second knitting

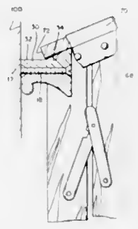
position, said table top having a substantially flat upper surface and a width wider than the supporting member and being adapted to receive and support a knitting machine, said table top including a clamp receiving means along its front longitudinal edge about which clamps on a knitting machine may be secured and wherein the distance from the clamp receiving means to the axis where the table top is pivotally mounted on the supporting member establishes a maximum possible range of tilt for said table top by means of abutment of the clamp receiving means against some portion of the stand when said table top is tilted; cooperative means between said supporting member and said table top for establishing said first knitting position; means for adjustably presetting the second knitting position by the user; and means for locking said table top in any desired position of tilt between said first and second knitting positions.

4,836,493

APPARATUS FOR HOLDING AND RETAINING A LADDER

Joseph S. Marton, 608-½ N. Sycamore Los Angeles, Calif. 90036

Filed Mar. 31, 1988, Ser. No. 176,358
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—558 **6 Claims**



1. An apparatus for holding a ladder comprising:
a. a body;
b. said body including mounting means for attaching the body to a mounting surface;
c. a first operating surface located on one surface of the body including a transverse section aligned adjacent the mounting surface and a stopping block section adjacent the end of the transverse section furthest away from the mounting surface; and
d. a second operating surface located on a second surface oppositely disposed to the surface on which the first operating surface is located, and when rotated 180 degrees in both the horizontal and vertical plain includes a transverse section aligned adjacent the mounting surface and a sloped section which slopes downwardly toward the transverse section and toward the mounting surface with the lowermost portion of the sloped section adjacent the end of the transverse section furthest from the mounting surface.

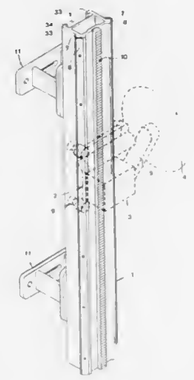
4,836,494

DEVICE FOR MOUNTING A RAIL OR THE LIKE ON A SURFACE

Anders Johnsen, Alderbäcken 35, S-781 93 Borlänge, Sweden

PCT No. PCT/SE87/00174, § 371 Date Dec. 4, 1987, § 102(e) Date Dec. 4, 1987, PCT Pub. No. WO87/06311, PCT Pub. Date Oct. 22, 1987
PCT Filed Apr. 8, 1987, Ser. No. 133,128
Claims priority, application Sweden, Apr. 8, 1986, 86015559
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—669 **16 Claims**

1. In a saw assembly comprising a rail (1), a carriage (2) movable therealong and a sawing machine (3) to be secured to said carriage for movement therewith; a device for mounting the rail on a surface (6) which is non-horizontal, said device comprising at least one mounting element (11) adapted to be secured on said surface, said rail (1) having a guide (21) extending along the rail, at least one connecting element (22) which is displaceably received in said guide (21) and an engaging arrangement having means (23,24) for mutual clamping connection of the connecting element and the mounting element to order to connect the rail (1) to the mounting element secured on said surface, wherein the engaging arrangement comprises means (23,24) of the connecting element (22) and of the mounting element (11) for provisionally coupling the connecting



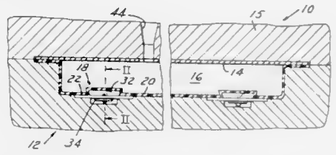
element and the mounting element secured to the surface (6) by means of a hooking movement of the connecting element having a movement component substantially parallel to said surface (6), the coupling means being designed to prevent movement of the connecting element in the direction downwardly along the surface and in the direction away from the surface in the coupled position, and the device comprises at least one locking means (38) operable independently of the engaging arrangement (23,24) for locking the connecting element (22) relative to the rail in a desired position along the guide (21) of the rail (1).

4,836,495

RETAINER MOLD FOR FORMING FOAMED AUTOMOTIVE ARTICLES

Joseph A. McCormack, Dover, N.H., assignor to Davidson Textron Inc., Dover, N.H.

Filed Oct. 11, 1988, Ser. No. 255,503
Int. Cl.[4] B29C *33/12, 33/76, 39/26*
U.S. Cl. 249—83 **6 Claims**



1. In a retainer mold having a pour mold and a mold cover defining a cavity adapted to receive a vinyl skin shell therein, a plurality of die block assemblies mounted in recesses formed in a surface of said cavity, wherein each die block assembly comprises a retainer plate secured in one of said recesses, and a die block member slidably mounted on said retainer plate for

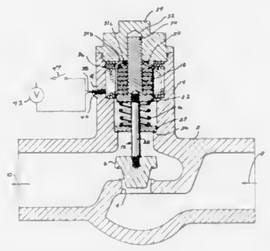
movement within predetermined limits as required to permit the vinyl skin to fit perfectly along said surface between adjacent spaced die block assemblies.

4,836,496

SME ACTUATOR

David N. Abujudom, Brookfield, and Dennis E. Miller, Greendale, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Aug. 27, 1987, Ser. No. 90,236
Int. Cl.[4] F16K *31/02, 31/64*
U.S. Cl. 251—11 **19 Claims**



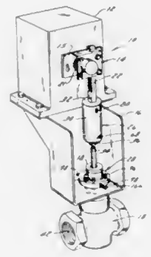
1. An actuator comprising:
housing means;
plunger means reciprocally movable in said housing means;
SME, shape memory effect, disc washer means around said plunger means and thermally deformable to move said plunger means along a travel stroke in a given direction, said SME disc washer means comprising a stack of a plurality of SME disc washers through which said plunger extends;
at least one non-SME Belleville washer in said stack biasing said plunger means in a direction aiding said thermal deformation of said SME means in said given direction and providing bias and resiliency at the end of the travel stroke of said plunger means upon thermal deformation of said SME disc washers.

4,836,497

ADJUSTABLE VALVE LINKAGE

Charles F. Beeson, Goshen, Ind., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed Mar. 8, 1988, Ser. No. 165,638
Int. Cl.[4] F16K *31/04, 31/54, 43/00*
U.S. Cl. 251—80 **12 Claims**



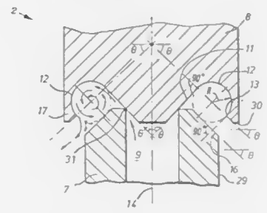
1. A valve actuating mechanism for actuating a valve having a plunger and seat, and providing a close-off force of predetermined magnitude against said seat, comprising:
(a) means for urging said plunger into engagement with said seat with a predetermined initial force, said urging means including a movable actuating shaft releasably coupled to a valve stem projecting outwardly of said valve;
(b) resistive means responsive to said urging means when said plunger is urged against said seat for generating a resistive force of a magnitude and direction such that said close-off force against said seat is less than said initial force by a predetermined amount; and
(c) adjusting means for selectively varying said resistive force by said predetermined amount, including:
a bushing having a radial flange, slidably mounted on said shaft; and
means including a stop disposed on said shaft near one end thereof for limiting movement of said bushing in one direction; and an adjustable stop disposed on said shaft; said resistive means positioned between said radial flange and said adjustable stop, said resistive means generating a force of increasing magnitude as said adjustable stop is moved closer to said bushing.

4,836,498

LIQUID FLOW CONTROL ASSEMBLY

Roger A. Heron, 30 Church Lane, Stagsden, Bedfordshire MK43 8SH; Martin L. Hughes, 6 Milton Drive, Newport Pagnell, Buckinghamshire, and Ian Hansford, 23 Longfellow Drive, Newport Pagnell, Buckinghamshire MK16 8PQ, all of England

Continuation of Ser. No. 834,126, Feb. 26, 1986, abandoned, which is a continuation of Ser. No. 561,597, Nov. 29, 1983, abandoned. This application May 9, 1988, Ser. No. 193,178
Claims priority, application United Kingdom, Apr. 7, 1983, 8210289
Int. Cl.[4] F16K *1/08, 47/00*
U.S. Cl. 251—126 **11 Claims**



1. A liquid flow control assembly for controlling the flow of liquid between a body member and a closure member in which a body member, providing at least one passage, and a closure member are relatively movable between a first position in which complementary surfaces on said body member and said closure member engage to prevent flow of liquid through said passage and a second position in which the complementary surfaces on said body member and said closure member separate to define at least one aperture, said body member having an axis, wherein said complementary surface on said closure member acts as
a first guide surface and extends downstream from said aperture and circumferentially at least partly around the axis of said body member, the outline of said first guide surface being non-convex in each cross-section containing the axis of said body member or the axis of said closure member and the axis of said passage provided by said body member and wherein there are no intervening surfaces between said aperture and said first guide surface such that said liquid uninterruptedly flows from said aperture to said first guide surface, and further comprising
a second guide surface which abuts said first guide surface and which directs liquid from a direction of flow along said first guide surface into a vortex flow path and which

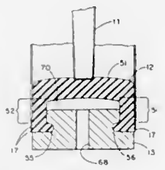
is located on the same member as said guide surface, wherein said first guide surface and said second guide surface are tangent at their point of abutment, said first and second guide surfaces forming a continuous, non-convex surface.

4,836,499

BUTTERFLY VALVES

James R. Steele, Stillwater, and Jerry W. Scherfenberg, Plymouth, both of Minn., assignors to Dynamic Air Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 95,855, Sep. 14, 1987, abandoned. This application Aug. 9, 1988, Ser. No. 229,334
Int. Cl.[4] F16K *1/226*
U.S. Cl. 251—173 14 Claims



1. A butterfly valve for opening and closing an opening in a conduit comprising:

a housing

an annular inflatable sealing member located in said housing, said annular inflatable sealing member made from an elastomer material, said annular inflatable sealing member having elastomer legs that lengthen and contract in response to pressurization and a self-cleaning elastomer sealing portion of sufficient thickness that moves radially inward and outward as a unit in response to pressurization of said inflatable sealing member, said elastomer sealing portion locally deformable to form a seal around a rotatable butterfly disk, said annular inflatable sealing member including annular means to hold said annular inflatable sealing member in position on said housing to form an air chamber between said housing and said annular inflatable sealing member;

a rotatable butterfly disk mounted on a shaft extending through said annular inflatable sealing member, said butterfly disk having an exterior edge which, when in the closed condition and when the annular inflatable sealing member is in the uninflated condition, has a clearance therebetween; and

means in said butterfly valve to prevent fluid from escaping around said shaft, so that when fluid is introduced into the chamber to inflate the annular inflatable sealing member, it expands the inflatable sealing member to form a sealing and locking engagement with said butterfly disk.

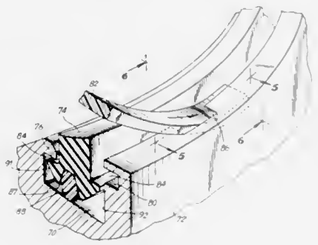
4,836,500

ASSEMBLY AND METHOD FOR INSTALLING AND RETAINING VALVE SEALS

Andrew Pupillo, and Jon A. Babcock, both of Westerly, R.I., assignors to Posi-Seal International, Inc., N. Stonington, Conn.

Continuation of Ser. No. 883,699, Jul. 9, 1986, Pat. No. 4,779,841. This application Apr. 5, 1988, Ser. No. 177,678
Int. Cl.[4] F16K *7/22*
U.S. Cl. 251—306 12 Claims

1. An assembly for retaining a seal ring in a seating surface of a valve body comprising: a circumferential groove disposed in the seating surface for receiving the seal ring, the groove having a pair of substantially opposed side walls, one of said side walls including a first retention means for retaining a portion of the seal ring in the groove the other side wall including a circumferential slot, said slot having a pair of spaced apart base surfaces and a sidewall surface disposed between said base surfaces, one of said slot surfaces including a passage therethrough comprising a cut-out along a portion of the circumference of said one slot surface for accessing said



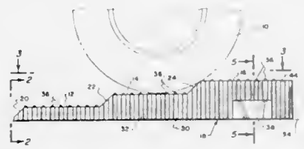
slot; and a second retention means insertable through said passage in said one surface of the slot and receivable in said slot with a portion of said second retention means extending into the groove such that said first and second retention means can retain the seal ring within the seating surface.

4,836,501

STRUCTURE LEVELING DEVICE

William F. Baer, 1509 N. Darcy St., Simi Valley, Calif. 93065

Filed Jul. 5, 1988, Ser. No. 215,392
Int. Cl.[4] E02C *3/00*
U.S. Cl. 254—88 1 Claim



1. A structure leveling device comprising:

an integral plastic member having a bottom surface and an upper surface, said bottom surface to rest on a supporting surface, said upper surface being divided into a plurality of levels of different heights, a portion of said structure being adapted to rest on one of said levels, said integral plastic member being hollow and formed of sheet material, said integral plastic member having side walls, said side walls being formed into a continuous corrugated configuration thereby enhancing the overall compressive strength characteristic of said structure leveling device, said corrugated configuration defining a plurality of grooves, all of said grooves being of the same size in transverse cross-section;

said hollow forming an internal chamber, a cross-brace arrangement formed within said internal chamber to also enhance the overall compressive strength characteristic of said structure leveling device; and

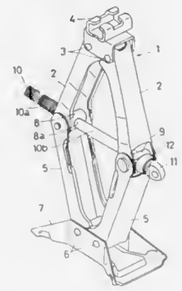
said integral plastic member having a front edge and a rear edge, said rear edge being greater in height than said front edge, locking means located directly adjacent said rear edge, said locking means being adapted to interconnect with a separate attachment providing a still further level of a different height, said locking means comprising a pair of said grooves with one of said groove being formed within one said side wall and the other said groove formed within the opposite said side wall.

4,836,502

PANTOGRAPH JACK

Nobuhiro Yamauchi, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Mar. 18, 1988, Ser. No. 170,390
Claims priority, application Japan, Mar. 21, 1987, 62-041631
Int. Cl.[4] B66F *3/22*
U.S. Cl. 254—126 3 Claims



1. A pantograph jack for lifting and lowering a vehicle chassis or the like comprising:

a pair of upper arms each having a lower end;

a pair of lower arms each having an upper end;

a cylindrically shaped metal member for pivotally connecting the lower end of one of said upper arms and the upper end of one of said lower arms, said metal member having a flat contact surface formed thereon;

said cylindrically shaped metal member having a flange portion at one end thereof and a journal portion at the opposite end thereof, said flange portion and said journal portion connecting said lower end of one of said upper arms and said upper end of one of said lower arms;

a nut member for pivotally connecting the lower end of the other of said upper arms and the upper end of the other of said lower arms; and

a manually operated rod member slidably fitted in and supporting said metal member and threadably fitted in said nut member, and having a joint portion including a bearing member for contacting said flat contact surface of said metal member.

4,836,503

METHOD FOR PULLING FIBER OPTIC CABLE THROUGH A CONDUIT

D. William Giroux, 3 Lakewood Villa, Lake Manawa, Council Bluffs, Iowa 51501

Division of Ser. No. 899,321, Aug. 22, 1986, Pat. No. 4,695,038. This application Jun. 29, 1987, Ser. No. 67,234
Int. Cl.[4] E21C *29/16*
U.S. Cl. 254—134.3 FT 1 Claim

1. A method for pulling a length of fiber optic cable through an underground conduit having an entry at one end, an exit at an opposite end, and a boosting access opening between said entry and said exit comprising the following steps:

positioning a length of fiber optic cable at said conduit entry,

placing a lead puller at said conduit exit for pulling either rope or cable through the conduit between said boosting access opening and said exit, said lead puller having a pair of puller pinch wheels rotatably mounted thereon, each of said pinch wheels being of the type having a peripheral groove therein which will pinch roper or cable placed in a portion of said groove around said wheel, to thereby pull the same,

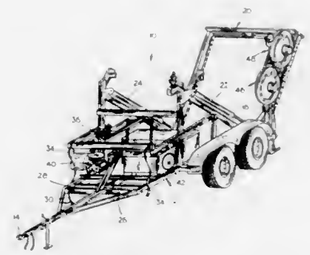
placing a booster puller at said booster access opening for pulling either rope or cable through said conduit between said conduit entry and said boosting access opening, said booster puller having a pair of puller pinch wheels rotatably mounted thereon, each of said pinch wheels being of the type having a peripheral groove therein which will pinch rope or cable placed in a portion of said groove around said wheel, to thereby pull the same,

extending a first pull rope through said conduit between said booster access opening and said conduit entry, connecting the tail end of said first pull rope to the lead end of the length of fiber optic cable,

extending said first pull rope, at said boosting access opening, around said puller pinch wheels on said booster puller,

operating said booster puller to pull said first pull rope and cable through said conduit from said entry to said boosting access opening until the lead end of said cable has reached said booster access opening,

extending a second pull rope through said conduit from said exit to said booster access opening,



connecting the tail end of said second pull rope to the lead end of said cable,

extending the lead end of said cable around one of said puller pinch wheels on said booster puller,

extending said second pull roper around both of said puller pinch wheels on said lead puller,

operating said lead puller to pull the tail end of said second pullrope and the lead end of said fiber optic cable from said booster access opening to said conduit exit,

simultaneously operating said booster puller so that said booster puller will pull said cable between said conduit entry and said booster access opening,

and feeding said cable, after said cable has been pulled outwardly of said booster access opening by said booster puller, into the downstream portion of said conduit in an untensioned state.

4,836,504

RAIL-TYPE FENCE USING ELECTRICITY

Conrad F. Fingerson, Chatfield, and Robert D. Eickhoff, Fountain, both of Minn., assignors to Amco Partnership, Chatfield, Minn.

Filed Dec. 22, 1986, Ser. No. 945,383
Int. Cl.[4] A01K *3/00*
U.S. Cl. 256—10 25 Claims

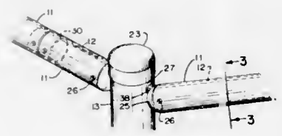
1. A high visibility electric fence, for constraining the movement of animals or persons comprising:

(a) a plurality of spaced-apart support posts;

(b) a first electrically conductive wire means being supported by and extending between individual ones of said support posts and adapted for electrical interconnection to a source of electrical energy; and

(c) enhanced visibility hollow housing means having a substantially greater cross-section than said first wire means and having a top inside wall substantially in contact with said first wire means, said housing means including electrically conductive means for conducting electricity, said

housing means further including means for electrically interconnecting said first wire means with said electrically



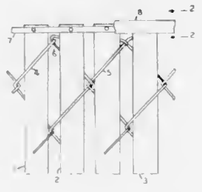
conductive means of said housing, whereby an animal is delivered a shock upon making contact with said housing means.

4,836,505

SLAT RETAINING MEANS FOR CHAIN LINK FENCES

Don A. Meglino, 85 Edwards St., Roslyn Heights, N.Y. 11577

Filed Oct. 22, 1986, Ser. No. 921,398
Int. Cl.[4] B21F *27/00*
U.S. Cl. 256—34 1 Claim



1. Slat retaining means for chain link fences of the type having a plurality of parallel slats woven through the fence wires,

a strip member extending across said slats and means connecting said strip member to each of said slats, wherein the strip member extends across the top area of the slats, and a cover mounted over the top of the slats and the strip.

4,836,506

VALVE CONTROL FOR BACK DRAFT CARBURETOR

James M. Hundertmark, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 4, 1988, Ser. No. 176,853
Int. Cl.[4] F02M *5/08*
U.S. Cl. 261—23.2 8 Claims

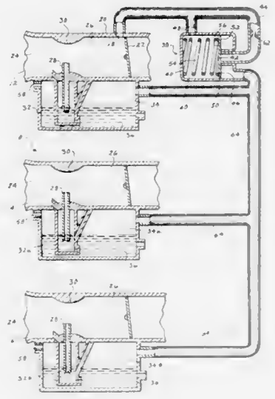
1. In a back draft carburetor of the type in which a vacuum source in the throat of the carburetor adjacent the upstream edge of the throttle valve is communicated to the air space above the fuel in the float bowl of the carburetor, a back draft control comprising:

a housing having a first port communicating with the vacuum source and a second port communicating with the air space above the fuel in the float bowl,

a sealing member disposed for slideable movement within said housing between a closed position in which communication between said first and second ports is prevented and an open position in which communication between said first and second ports is allowed, and

biasing means urging said sealing member to said closed position,

said sealing member being responsive to the vacuum level so that upon sensing a sufficient vacuum in the carburetor



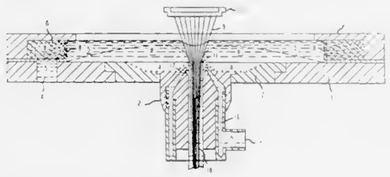
throat said sealing member overcomes said biasing means and moves to said open position.

4,836,507

ARAMID STAPLE AND PULP PREPARED BY SPINNING

Hung H. Yang, Richmond, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 10, 1987, Ser. No. 83,186
Int. Cl.[4] D01D *5/14*
U.S. Cl. 264—143 3 Claims



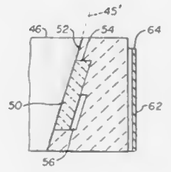
1. In a process for preparing high strength, high modulus aromatic polyamide fibrous material comprising extruding an optically anisotropic acid solution of an aromatic polyamide through at least one spinning capillary at a first velocity to form a filament, then passing the extruded filament through a layer of non-coagulating fluid into a coagulating bath, and discharging the coagulated filament through an exit tube together with overflowing coagulating liquid and a liquid jetted symmetrically about the filament in and near the entrance to the exit tube in a generally downward direction to provide a vertically downward component of jet velocity, the improvement comprising establishing a ratio of said vertically downward component to said first velocity sufficient to break the uncoagulated extruded filament intermittently into staple fibers as it leaves the capillary.

4,836,508

LADLE SHROUD WITH CO-PRESSED GAS PERMEABLE RING

Mark K. Fishler, Brussels, Belgium, assignor to Vesuvius Crucible Company, Pittsburgh, Pa.

Filed May 3, 1988, Ser. No. 189,660
Int. Cl.[4] B22D *11/10*
U.S. Cl. 266—220 14 Claims



I. A casting shroud adapted to be detachably fitted to a collector nozzle of a ladle or like vessel for use in casting molten metal comprising:

a tubular body of a dense refractory material having spaced upper and lower ends and a bore formed therethrough said bore having a frusto-conically shaped portion adjacent the upper end of the body to conform with a profile of said collector nozzle;

a porous refractory ring co-pressed and fixed with said body and forming a portion of said bore at said frusto-conically shaped portion, said body including an integral ledge interposed between said porous ring and the upper end of said body adapted to prevent gas leakage from an upper surface of said porous ring, said porous ring adapted to face a lower outer surface portion of the collector nozzle; and

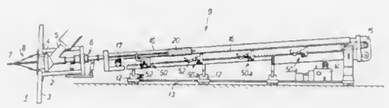
means associated with said body communicating with said porous ring for the supply of an inert gas to the porous ring, whereby, in use, inert gas is delivered to an interface area between the porous ring and said collector nozzle to prevent infiltration of air therebetween.

4,836,509

SUPPORT AND INTRODUCTION BENCH FOR AN ELONGATED RECTILINEAR PROBE, AND PROBE ADAPTED TO SAME

Jean-Claude Daverio, Ban-Saint-Martin, and Dominique Rocchi, Piennes, both of France, assignors to Institut de Recherches de la Siderurgie Francaise, Maizieres, France

Filed Oct. 22, 1987, Ser. No. 112,376
Claims priority, application France, Oct. 29, 1986, 86 15074
Int. Cl.[4] C21B *7/24*
U.S. Cl. 266—99 20 Claims



1. Bench for supporting and introducing an elongated rectilinear probe into a blast furnace following a direction parallel to its axis, comprising:

a frame having two longitudinal guide rails,

driving means guided according to a translatory movement on the bench by the longitudinal guide rails parallel to the axis of the probe, for moving the probe onto and out of the furnace, said driving means applying a thrusting force to the probe in the axis of the probe, and

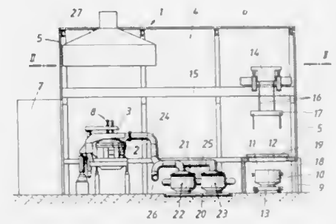
a plurality of support means connected to the frame at spaced intervals movable into a position for supporting and guiding the probe, each support means being retractable out of the supporting and guiding position when approached by the drive means.

4,836,510

METALLURGICAL PLANT

Alfred Weber, St. Georgen/Gusen; Johann Aglas, Hofkirchen, and Franz Hochgatterer, Perg, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Apr. 4, 1988, Ser. No. 176,859
Claims priority, application Austria, Apr. 9, 1987, 871/87
Int. Cl.[4] C21C *5/28*
U.S. Cl. 266—142 3 Claims



1. A metallurgical plant comprising

an open-topped metallurgical vessel provided with a cover adapted to close said vessel at its top,

an enclosure surrounding said vessel and comprising a top wall and side wall means defining at least one charging opening permitting a charging box to be moved through said side wall means from the outside of said enclosure to a stand-by position in said enclosure,

first shutter means for selectively opening and closing said charging opening, and

a charging crane for moving said charging box between said stand-by position and a charging position over said vessel,

wherein the improvement comprises

partition means contained in said enclosure and dividing the interior thereof into a main part containing said vessel and lock chamber means adjoining said charging opening and adapted to contain said charging box in said stand-by position,

said partition means comprises lock chamber top wall means spaced from said top wall of the enclosure and defines lock chamber top wall opening means, through which said lock chamber means communicates with said main part of said interior and which permits said charging box to be moved between said lock chamber means and said main part of said interior,

second shutter means for selectively opening and closing said lock chamber top wall opening means, and

said charging crane is disposed within said main part of said interior and is operable to move said charging box through said lock chamber top wall opening means between said stand-by and charging positions.

4,836,511

VEHICLE AIR SUSPENSION CIRCUIT WITH A CHANGEOVER MEANS AND A LOW PRESSURE RESERVOIR THAT SURROUNDS A HIGH PRESSURE RESERVOIR

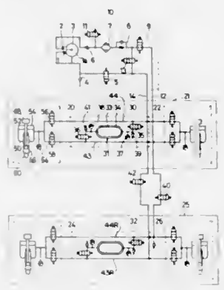
Shuuichi Buma; Nobutaka Ohwa, both of Toyota; Osamu Takeda, Susono, and Hajime Kamimae, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 21, 1988, Ser. No. 171,253

Claims priority, application Japan, Mar. 30, 1987, 62-47455[U]

Int. Cl.[4] B60G *17/04, 11/30*

U.S. Cl. 267—64.16 3 Claims



1. A vehicle air suspension circuit, comprising:
a pressurized air source having a suction port and an exhaust port;
front and rear wheel systems, each including left and right suspensions connected by a first supply pipe having two leveling valves and a first exhaust pipe having two discharge valves;
high- and low-pressure reservoir tanks disposed in each of said front and rear wheel systems and connected to said first supply pipes and said first exhaust pipes via high- and low-pressure valves respectively, said low pressure air reservoir tank having a predetermined pressure higher than atmospheric pressure;
a second supply pipe connecting said exhaust port of said pressurized source to said first supply pipe of said front and rear wheel systems;
a second exhaust pipe connecting said suction port of said pressurized source to said first exhaust pipes of said front and rear wheel systems;
a changeover means disposed on said second exhaust pipe at a position between said suction port of said pressurized air source and said first exhaust pipe of said front wheel system, said changeover means switching between air coming from said low-pressure reservoir tanks via said first and second exhaust pipes and atmospheric air;
a flow-controlling bypass valve disposed between said second supply pipe and said second exhaust pipe; and
an exhaust valve disposed on said second supply pipe.

4,836,512

HYDRAULIC MOUNT WITH RECIPROCAL PARTITION AND ORIFICE

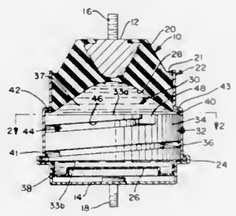
Saiman Lun, Englewood, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 25, 1988, Ser. No. 185,641

Int. Cl.[4] F16M *5/00, 13/00*

U.S. Cl. 267—140.1 1 Claim

1. A hydraulic mount comprising a pair of mounting members, an elastomeric body connecting said members, an elastomeric diaphragm connected to one of said members and cooperating with said elastomeric body to define a closed cavity, a partition dividing said cavity into a chamber that is enclosed by one side of said partition and said elastomeric body and another chamber that is enclosed by the other side of said partition and said diaphragm, a liquid filling said chambers, and a damping orifice connecting said chambers characterized by a cylindrical sleeve interconnecting said elastomeric body and said one mounting member and also sealingly peripherally clamping said diaphragm to said one mounting member independent of said partition, said partition comprising a rigid singular imperforate cylindrical body coextensive with said chambers



mounted at a cylindrical surface thereof for unrestrained reciprocal movement between spaced stops in an interior cylindrical wall on said sleeve thereby to solely separate said chambers and effect limited cyclic volumetric change in said chambers so that the liquid is then not forced to flow through said damping orifice, and said cylindrical body further having a spiral groove in said cylindrical surface cooperating with said interior cylindrical wall on said sleeve to define said damping orifice.

4,836,513

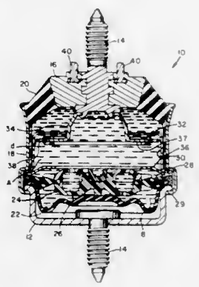
HYDRAULICALLY DAMPED ANTI-VIBRATION MOUNT WITH A FLEXIBLE FLAP AS A DYNAMIC RATE INHIBITOR

Robert H. Kramer, Celina, and Roger R. Koons, St. Marys, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 16, 1988, Ser. No. 168,832

Int. Cl.[4] F16M *5/00, 13/00*

U.S. Cl. 267—140.1 9 Claims



1. A hydraulically damped anti-vibration mount comprising: a flexible diaphragm (**22**), an outer metal casing (**18**), an annular rubber spring (**20**) and an inner metal portion (**16**), together defining a cavity filled with a fluid; a damper plate (**24**) dividing the cavity into an upper chamber (**A**) and a lower chamber (**B**) which are in fluid communication through a damper channel (**26**) located within the damper plate (**24**); and a cup-shaped bumper (**34**) attached to the inner metal portion (**16**) and extending axially inward into the upper chamber (A), having a radially outwardly extending flange (**37**) located at an end distal to the inner metal portion (**16**); the improvement comprising having a flexible flap (**38**) selected from a group consisting of a wishbone cross-sectional shape and an h-shape extending radially outwardly from the flange (**37**) toward the outer metal casing (**18**) to inhibit the dynamic rate of the mount.

4,836,514

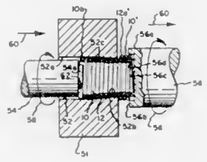
PRELOADED SPRING, METHOD AND APPARATUS FOR FORMING SAME

Otmar M. Ulbing, Fairport, N.Y., assignor to Windwinder Corporation, Tipp City, Ohio

Division of Ser. No. 814,234, Dec. 30, 1985, Pat. No. 4,719,683. This application Jan. 11, 1988, Ser. No. 141,961

Int. Cl.[4] F16F *1/06*

U.S. Cl. 267—166 12 Claims



1. A preloaded, close-wound tension spring of one hand formed by a method including the steps of changing the radial dimension of a compression spring of the opposite hand and then reverse wining said compression spring upon itself in a direction opposite to the direction in which said radial dimension is changed, characterized in that said tension spring has no or comparatively less yield than a tension spring subject to yielding as a result of being formed by reverse winding said compression spring upon itself without first changing the radial dimension thereof in a direction opposite to the direction in which reverse winding occurs.

4,836,515

TWO-CHAMBER ENGINE MOUNT HAVING VARIABLE DISC STOPS AND VARIABLE CHOKE CANAL MEANS

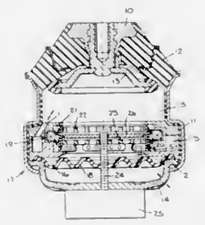
Rainer Franz, Mannheim; Werner Idigkeit; Hartmut Löschmann, both of Weinheim; Gerhard Röhner, Hemsbach, and Klaus Kurr, Weinheim, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/Bergstrasse, Fed. Rep. of Germany

Filed Mar. 17, 1987, Ser. No. 26,822

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1986, 3619687

Int. Cl.[4] B60G *15/04;* F16M *5/00, 13/00*

U.S. Cl. 267—219 5 Claims



1. In a two-chamber engine mount having hydraulic damping comprising:
means for defining a working space;
means for defining an equilization space;
partition means disposed between said working space and said equalization space, with said partition means having a first sub-area and a second sub-area;
said first sub-area of said partition means being defined by first and second stops spaced from one another at a preselected distance;
a disc member disposed and movable between said first and second stops;
said second sub-area of said partition means being penetrated by a choke canal means having a length for providing choked liquid communication between said working space and said equalization space;
the improvement comprising:
motor means for varying said preselected distance between said first and second stops thereby varying the available movement of said disc member between said first and second stops; and
motor actuated choke means in association with said choke canal means for varying the length of said choke canal means providing choked liquid communication between said working space and said equalization space.

4,836,516

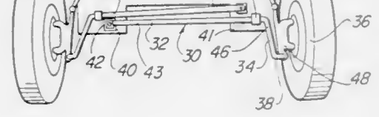
FILLED TUBULAR TORSION BAR AND ITS METHOD OF MANUFACTURE

Joseph Wycech, Grosse Pointe Woods, Mich., assignor to Essex Composite Systems, Fraser, Mich.

Filed Apr. 25, 1988, Ser. No. 185,729

Int. Cl.[4] B60G *11/22;* F16F *1/48*

U.S. Cl. 267—279 21 Claims



1. A torsion bar for a suspension system comprising:
an elongated tubular bar having a bore coextensive therewith;
a solid core closely received within the bore of said elongated tubular bar;
first means in association with one end of said elongated tubular bar for connecting said one end of said elongated tubular bar to a first portion of said suspension system;
a second means in association with the other end of said elongated tubular bar for connecting said other end of said elongated bar to another portion of said suspension system; and
said solid core is a substantially uniform mixture of a resin and a non-metallic filler.

4,836,517

FASCIA BOARD INSTALLING APPARATUS

Carl M. Vossler, 3895 Pershing La., Carson City, Nev. 89701

Filed Jan. 11, 1988, Ser. No. 141,917

Int. Cl.[4] B25B *1/20;* B27M *3/02*

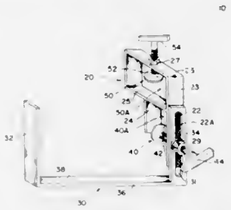
U.S. Cl. 269—41 4 Claims

1. A fascia board installing apparatus adapted to be temporarily attached to a support of a roof, or a structure attached thereto, comprising:
a U-shaped frame;
a rectangular shaped frame,
means for cooperatively engaging said U-shaped frame to said rectangular shaped frame,
said U-shaped frame including a base between a first substantially perpendicularly disposed arm and a second substan-

tially perpendicularly disposed arm, said first substantially perpendicularly disposed arm adapted to receive an end or intermediate part of the fascia board.

said rectangular shaped frame including an upper wall, a lower wall, a first side wall and a second side wall; said walls thereby forming a first channel providing means for temporarily attaching said apparatus to said structure attached to said support of said roof, said first channel of said rectangular shaped frame also having adjustable clamping means thereon,

said rectangular shaped frame further including a first substantially vertically disposed member and a second substantially vertically disposed member extending downwardly from said lower wall of said rectangular shaped frame; said first substantially vertically disposed member extending linearly from said first side wall, said second substantially vertically disposed member extending symmetrically from said lower wall, said members thereby providing a second channel, said second channel providing means for temporarily attaching said apparatus to said support of said roof,



said means for cooperatively engaging said U-shaped frame to said rectangular shaped frame including said first substantially vertically extending arm of said rectangular shaped frame engagedly juxtaposed along said first substantially perpendicularly disposed arm of said U-shaped frame, thereby clasping said U-shaped and said rectangular shaped frame cooperatively.

whereby upon attaching said apparatus to said support of said roof, or said structure attached thereto, said fascia board is supported while said fascia board is being installed; and after said fascia board is installed said apparatus providing yieldable means for removing said apparatus.

4,836,518

FIXTURE FOR WORKPIECES

Reinhard Janutta, Geesthacht, Fed. Rep. of Germany, assignor to Körber AG, Hamburg, Fed. Rep. of Germany

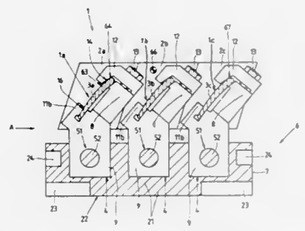
Filed Oct. 6, 1987, Ser. No. 106,378

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1986, 3634268

Int. Cl.[4] B23Q *1/04*

U.S. Cl. 269—43 24 Claims

1. A fixture for maintaining workpieces particularly turbine blades - in predetermined positions, comprising a work holding element including a first section having work retaining means and a second section, and a support including hardened casting material in which said second section is at least partially embedded during casting of the support but which is out of contact with said first section.



4,836,519

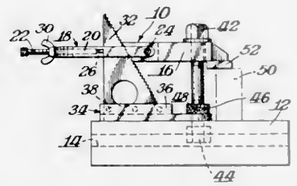
MACHINIST'S CLAMP

Michael J. Duncan, 41 Commodore Estates, Middletown, Del. 19709

Filed Apr. 4, 1988, Ser. No. 177,136

Int. Cl.[4] B23G *3/02*

U.S. Cl. 269—91 7 Claims



1. Clamp apparatus comprising a step clamp having a forward end for holding a workpiece and a rear end having means for affixing said step clamp to a forward vertical face of a step block, and separate means for longitudinally and vertically adjusting said forward end of said step clamp to provide for securing and releasing said workpiece to and from a work surface, wherein said means for affixing said step clamp to said step block comprises a generally "U"-shaped holder assembly having a "U"-bend, said holder assembly affixed to the rear end of said step clamp which enables said holder and step clamp to be removeably attachable to said step block, said holder having thumbscrew means threadingly inserted through the "U"-bend, said thumbscrew means having a thumb adjustment external to the "U"-bend and having a resilient endpiece affixed internal to the "U"-bend adjacent a rear vertical face of said step block, whereby, when said step clamp is adjusted to a desired height on said step block and said thumbscrew assembly is advanced such that said resilient endpiece thereof is forced into tight holding contact with the rear vertical face of said step block and said rear end of said step clamp is affixed to said forward vertical face of said step block, and whereby a rigid combination of step clamp, step block and holder is provided, such that, when a workpiece is removed from said apparatus, the step clamp does not fall away from the step block, thereby avoiding unnecessary time delays in re-setup.

4,836,520

RADIOLOGY PATIENT SUPPORT

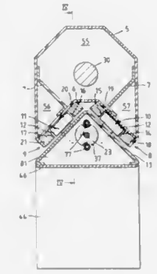
Francis J. Span, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 16, 1987, Ser. No. 133,583

Claims priority, application United Kingdom, Dec. 19, 1986, 8630411

Int. Cl.[4] A61G *13/00*

U.S. Cl. 269—322 9 Claims



1. Radiology patient support system for radiography, radiotherapy or treatment simulation, including a fundamental support, a patient support table top mounted on a vertically displaceable carriage, and box section vertical supporting pillar means mounted on the fundamental support and provided with guide means and lifting means arranged to support, locate and vertically displace the vertically displaceable carriage, wherein the box section vertical supporting pillar means is formed by a single pillar of rigid closed box construction such that the side walls thereof form a closed cross section at substantially all locations along its length, and the guide means is formed by two longitudinal guide tracks adjacently situated with lateral directions at a mutual angle to one another on a supporting surface having a correspondingly angled open V-shaped transverse section, which is rigidly connected to the pillar, the vertically displaceable carriage being provided with bearing members which engage the respective longitudinal guide tracks so as to locate and support the carriage in a vertically displaceable manner relative to the pillar.

4,836,521

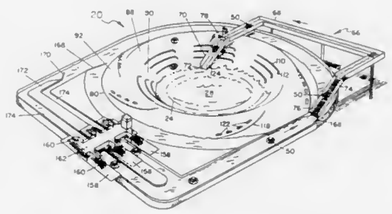
WHIRLPOOL AMUSEMENT RIDE

Gerald L. Barber, 10 Whittington Ct., Greenville, S.C. 29615

Filed Sep. 23, 1988, Ser. No. 249,365

Int. Cl.[4] A63G *3/00*

U.S. Cl. 272—32 33 Claims



1. An amusement ride simulating passage out of a whirlpool comprising:

(a) a disk-shaped member;

(b) said disk-shaped member having a sloping surface which extends radially outwardly and terminates in an outer edge;

(c) a passenger vehicle supportable on said sloping surface of said disk-shaped member;

(d) means for depositing said passenger vehicle on said disk-shaped member;

(e) means for rotating said disk-shaped member and so forcing passenger vehicle by centrifugal force to said outer edge of said disk-shaped member;

(f) means for receiving said passenger vehicle from said outer edge of said disk-shaped member and returning said passenger vehicle to said means for depositing said passenger vehicle on said disk-shaped member; and

(g) means for supplying water to said sloping surface.

4,836,522

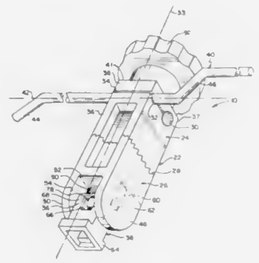
SINGLE KNOB ADJUSTMENT APPARATUS

Thomas J. Smith, 1722 Asharoken Blvd., Bay Sbore, N.Y. 11706

Filed Nov. 23, 1987, Ser. No. 123,919

Int. Cl.[4] B23Q *3/00*

U.S. Cl. 269—72 11 Claims



1. A single knob adjustment apparatus for simultaneously securing and adjusting a pair of members in a predetermined positional relationship comprising:

(a) an elongated housing member having

(i) a first centrally disposed through aperture along its longitudinal axis,

(ii) a second through aperture disposed proximate an upper position of said housing perpendicular to said longitudinal axis, and

(iii) a slotted opening extending from a longitudinal edge through said second through aperture terminating proximate the opposite longitudinal edge, and

(b) slotted T-bracket means having;

(i) an elongated base portion disposed perpendicular to said housing longitudinal axis,

(ii) first and second ear portions on said base portion having third and fourth through apertures respectively, said third and fourth through apertures adapted to receive a pivot pin therein;

(c) eyebolt means, said eyebolt means;

(i) having an elongated portion on one end,

(ii) adapted to be slidably received within said first through aperture with said one end of the elongated portion extending beyond said housing, and

(iii) being provided with an eye portion on the other end, said eye portion having an opening adapted to receive a pivot pin therethrough and dimensional to be received between said pair of ear portions of said T-bracket means;

(d) pivot pin means disposed within said third and fourth through apertures and the eye portion of said eyebolt with ends of said pivot pin means retained in a lower portion of said housing member;

(e) coil spring means circumscribing said eyebolt means and

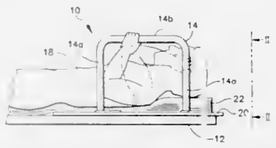
disposed between a top portion of said T-bracket means ear portions and said lower portion of said member;
(f) sensing rod means disposed within said second through aperture; and
(g) means for receiving the elongated portion of said eyebolt means, whereby tightening said means for receiving secures said eyebolt means said sensing rod means and said housing member in a fixed position.

4,836,523

MEDICAL OPERATING TABLE ATTACHMENT FOR SUPPORTING A PATIENT'S ARMS

Abe Englander, 12827 League St., North Hollywood, Calif. 91605

Filed Jul. 15, 1988, Ser. No. 219,211
Int. Cl.[4] A61G *13/00*
U.S. Cl. 269—328 11 Claims



1. A patient arm support loosely attached for medical operating type tables for reducing arm fatigue during operating procedures comprising:
two vertical posts;
said posts being attached to a base support for maintaining said posts in a spaced-apart upright position sufficient to receive the head of the patient therebetween;
said base support positionable on the operating table;
each of said posts having a horizontal portion spaced above the operating table sufficiently to be gripped by the hands of the patient during the operating procedures in a position besides the patient's head.

4,836,524

CARRIAGE WITH TURRET SUPPORT FOR BOLTS OF FABRIC FOR SPREADING ON THE BEDPLATE OF AUTOMATIC SPREADERS

Flavio Cattini, Bergamo, Italy, assignor to FK Arma S.R.l., Bergamo, Italy

Filed Aug. 28, 1987, Ser. No. 90,329
Claims priority, application Italy, Nov. 4, 1986, 5232 A/86
Int. Cl.[4] B65H *29/66*
U.S. Cl. 270—31 3 Claims

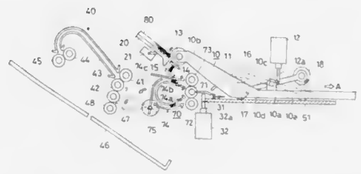
1. An automatic fabric-spreading carriage, reciprocally displaceable on a bedplate and comprising at least one turret support rotating about a vertical axis, the carriage carrying a bolt of fabric to be unfolded when the axis of the bolt is oriented transversely with respect to the bedplate and to the direction of displacement of the carriage, characterized in that said turret support is rotatingly resting, by means of a foot step basing, on a pair of horizontal cross members attached to said carriage; said cross members defining therebetween on said turret support a vertical opening perpendicular to and beneath said bolt of fabric and oriented transversely with respect to said bedplate; said foot step basing having a passing diametral opening that positions itself in correspondence with said vertical opening when said turret support is in readiness for spreading said fabric on said bedplate, said fabric thus passing through said foot step basing.

4,836,525

AUTOMATIC ORIGINAL FEEDING AND DISCHARGING UNIT

Masayuki Mizuno, Osaka, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed May 19, 1988, Ser. No. 195,846
Claims priority, application Japan, May 20, 1987, 62-123246; Sep. 17, 1987, 62-233520
Int. Cl.[4] B65H *5/00*
U.S. Cl. 271—3 31 Claims



1. An automatic original feeding and discharging unit comprising;
a feed roller which contacts to an original fed on an original table of a copying machine and transfers said original in a prescribed direction,
a discharge roller which contacts to the original on the original table and transfers said original in a direction counter to the transferring direction of said feed roller,
a selecting mean which selectively contacts either said feed roller or discharge roller to the original on the original table,
a positioning member which is possible to project from the upper surface of the original table so as to contact to the front edge in the transferring direction of the original transferred by said discharge roller, and possible to plunge in from the upper surface of the original table so as to enable the original transferred by said discharge roller to pass thereabove,
a driving means which drives said positioning member to project and plunge from the original table, and
a reversing means which reverses the upper and underside of the original passing above the positioning member and feeds it on the original table.

4,836,526

SHEET SORTERS

Peter Melink, Rushden, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 29, 1987, Ser. No. 102,177
Int. Cl.[4] B65H *31/00*
U.S. Cl. 271—209 8 Claims

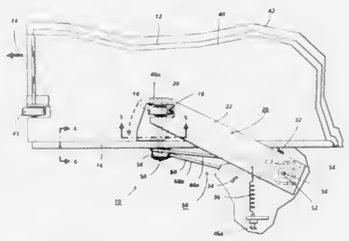
1. In a sorting apparatus having a series of opposing bins with each having a support surface and wing portions of the support surface that are inclined with respect to the support surface, said opposing bins being in inclined at a an acute angle with respect to a vertical plane, the improvement wherein said series of opposing bins are positioned such that copy sheets fed by feed means between opposing bins and into a respective one of said series of opposing bins will have their side as well as lead edges a contact said wings such that a central portion of the lead edge of each copy sheet contacts the bottom surface of the opposing bin such that the bottom surface of the opposing bin push down on the center of the lead edge of each copy sheet while the side edges of the copy sheets are pushed upwardly by contact with the respective wings in order to induce curvature in the copy sheets to aid in increasing the beam strength of the copy sheets and thereby enhance the stacking of copy sheets of various lengths without having the ends of the copy sheets droop over the ends of said bins.

4,836,527

SIDE EDGE REGISTRATION SYSTEM

Lam F. Wong, Walworth, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 18, 1988, Ser. No. 182,699
Int. Cl.[4] B65H *9/16*
U.S. Cl. 271—251 9 Claims



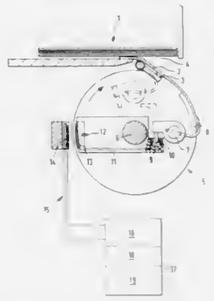
1. In a system for side registration and deskewing of a delicate or flimsy sheet being driven downstream in a sheet path in a primary direction of movement by a roller drive system, by driving the sheet sideways (transversely) against a side registration edge guide, the improvement wherein;
said roller drive system comprises a mating pair of rollers mounted on opposite sides of the sheet path to form a non-slip nip therebetween for non-slip engagement of the sheet;
said rollers not being skewed relative to one another;
said rollers being angularly mounted on an elongated pivotal arm unit extending over said sheet path;
said arm unit being pivotally mounted about a pivot axis;
said rollers being mounted out on said arm unit substantially spaced from said pivot axis;
positioning means for engaging said arm unit for positioning said arm unit so that said nip of said angularly mounted rollers is positioned substantially downstream in said sheet path from said pivot axis, and so that said nip is only at a small maximum angle to said side registration edge guide, to provide a high ratio of driving force in said primary direction to said sideways driving of the sheet;
said positioning means comprising limit means for limiting the range of free pivotal movement of said arm unit to a relatively small angle;
biasing means for biasing said arm unit towards said side registration edge guide with a controlled force;
and driving means for rotatably driving said rollers so that said arm unit can pivot appropriately in response to driving a sheet in said nip to automatically control said sideways driving of the sheet;
wherein said arm unit is freely pivotable in a preset maximum pivotal range limited to approximately 15 degrees, said limited range being defined by said limit means being positioned to impede pivoting of said arm unit outside of said limited range.

4,836,528

APPARATUS FOR MANIPULATING SHEET-LIKE COMMODITIES IN GATHERING MACHINES

Peter Geiser, Matzingen, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland

Filed Sep. 23, 1987, Ser. No. 100,088
Claims priority, application Switzerland, Sep. 24, 1986, 3830/86
Int. Cl.[4] B65H *7/12*
U.S. Cl. 271—263 9 Claims



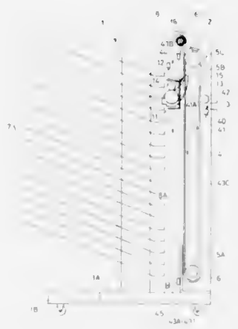
1. Apparatus for manipulating sheet-like commodities, comprising a source of commodities; a conveyor including transfer means movable along an endless path having a first portion where said transfer means is arranged to accept commodities from the source and a second portion where the transfer means is arranged to release accepted commodities; input means cooperating with said transfer means and movable with reference to the conveyor between a plurality of positions depending on the parameters of commodities; monitoring means provided on said conveyor and arranged to generate signals denoting the positions of said input means, said monitoring means including an oscillatory circuit and the impedance of said circuit being variable as a function of changes of the position of said input means, said circuit including a first winding; means for evaluating said signals; and means for transmitting signals from said monitoring means to said evaluating means, including signal receiving means adjacent said path and connected with said evaluating means, said signal receiving means including trigger means out of contact with said monitoring means and said trigger means comprising a second winding adjacent the path of movement of said first winding with said conveyor.

4,836,529

SORTING MACHINE

Kenji Kosaka, Naka, and Yoshikazu Yasu, Katsuta, both of Japan, assignors to Ikegami Tsushinki Co., Ltd., Tokyo, Japan

Filed Aug. 28, 1987, Ser. No. 90,506
Claims priority, application Japan, Sep. 9, 1986, 61-210671; Sep. 9, 1986, 61-210672; Sep. 9, 1986, 61-137364
Int. Cl.[4] B65H *39/11*
U.S. Cl. 271—296 14 Claims



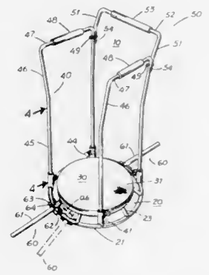
1. A sorting machine comprising:
a plurality of trays;
transport means for vertically transporting a recorded sheet introduced through a feed opening, said transport means comprising a transport belt for transporting said recorded sheet by friction, drive means for driving said transport belt, a lower guide plate secured on a side plate adjacent to said feed opening for guiding said recorded sheet from said feed opening to said transport belt, and a feed roller rotatably mounted on a shaft which is supported on a shaft support member formed integrally with said lower guide plate, for sandwiching said recorded sheet between said feed roller and said transport belt and feeding said recorded sheet;
discharge means for discharging said recorded sheet to one of said plurality of trays;
guide means for guiding said recorded sheet to said discharge means after transporting by said transport means;
shifting means for shifting said discharge means and said guide means upwardly and downwardly to a tray into which said recorded sheet is to be discharged;
hold means, being retractile in opposite directions along a transport direction of said recorded sheet in response to a shifting of said discharge means, for holding said recorded sheet between said transport means and hold means;
said hold means comprising a spiral spring of elastic strip metal material which has one end wound around a rotatable member rotatably mounted on a shaft and the other end fastened to said discharge means
said spiral spring functioning so as to rewind with constant force around said rotatable member under its own spring force upon shifting of said discharge means upwardly;
a shaft support member formed integrally with said lower guide plate for rotatably supporting said feed roller; and
fixing means for detachably and adjustably fixing said shaft support member to said side plate adjacent to said feed opening in a transport direction of said transport belt, and in a direction so as to make said feed roller contact said transport belt.

4,836,530

TRAMPOLINE-LIKE AEROBIC EXERCISE APPARATUS AND METHOD

Bedford F. Stanley, Jr., 8422 E. Indianola, Scottsdale, Ariz. 85251

Filed May 16, 1988, Ser. No. 194,308
Int. Cl.[4] A63B *5/00, 21/00*
U.S. Cl. 272—65 8 Claims



1. A trampoline-like aerobic exercise apparatus, said apparatus comprising:
(a) a base member means for supporting said apparatus, said base member means being substantially a circular structure comprising:
(i) a first base ring member,
(ii) a second base ring member, said second base ring member being latitudinally spaced above said first base ring member,
(iii) a plurality of brace support members for mechanically interconnecting said first base ring member to said second base ring member,
(iv) a plurality of lower handle receiver member means, said plurality of lower handle receiver member means being fixedly attached to said first base ring member at selected locations where said plurality of brace support members are fixedly attached, and
(v) an upright positioning ring member, said upright positioning ring member having a wall portion fixedly attached to said second base ring member and extending upward therefrom;
(b) a resilient mat member means for conducting aerobic exercises;
a removable pneumatic retaining means for retaining and tensioning said mat member means onto said base member means utilizing said upright positioning ring member; and
(c) a railed handle member means attached to said plurality of lower handle receiver member means for balancing during exercising by a user of said exercise apparatus.

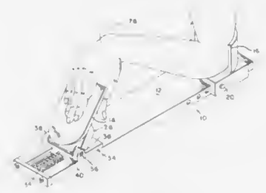
4,836,531

HAND AND WRIST EXERCISING MEANS

Mikhail Niks, 1434 Fulbright Ave., Redlands, Calif. 92373

Filed Apr. 11, 1986, Ser. No. 180,158
Int. Cl.[4] A63B *23/00*
U.S. Cl. 272—67 14 Claims

1. Exercising means particularly suitable for exercising the hands and wrists of keyboard instrument players, comprising:
base means;
elbow stop means adapted for use on said base means to prevent substantial sideways and backward movement of the elbow of one using the exercising means;
relatively flat hand rest means adapted to receive a user's hand palm down with the thumb tucked under a rear edge, so that the hand is at a suitable angle with the horizontal for exercise of the wrist when said elbow stop means is properly positioned for this;
supporting means for said hand rest mens slidable on said base means between a rearmost position thereon in spaced apart relationship with said elbow stop means, and a forwardly disposed position spaced farther away than said rearmost position from said elbow stop means;
hinge means hingedly connecting said hand rest means and said supporting means so as to permit upward tilting movement of the hand rest means about a transverse hinge axis at the distal end of the hand rest means relative to said elbow stop means;
resilient means in contact with said base means and said supporting means in a manner to normally urge said supporting means to said rearmost position and yieldably resist forward movement thereof toward said forwardly disposed position;
said exercising means serving to permit a user to position an elbow at said elbow stop means, extend the forearm forwardly toward said hand rest means and place the hand with the fingers extending straight ahead on top of said hand rest means with the thumb hooked around its rear edge and under it to position the hand at said suitable angle with the horizontal, whereby the user can repeatedly press downwardly on the hand rest means against the yieldable resilient means then relax the hand to permit the resilient means to return said slidable means to said rearmost position for wrist exercising purposes.

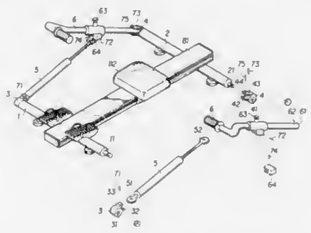


4,836,532

ROWING EXERCISER

Hai P. Kuo, Che-Lu-Chien N.30, Pao-An-Tsun, Jen-Teh Hsiang, Tainan County, Taiwan

Filed Dec. 4, 1986, Ser. No. 937,791
Int. Cl.[4] A63B *69/06*
U.S. Cl. 272—72 2 Claims



1. A rowing exerciser comprising:
a front rod having a protuberance at each end thereof;
a rear rod having a protuberance at each end thereof;
a frame connected across the front rod and the rear rod;
a seat movably mounted on the frame
a pair of front connectors each having two lugs separated by a slot, each said front connector being rotatably connected respectively with one of said protuberance of the front rod;
a pair of rear connectors each having two lugs separated by a slot, each said rear connector being rotatably connected respectively with one of said protuberance of the rear rod;
a pair of hydraulic cylinders each having one end pivoted on a front connector;
a pair of swivel arms each having one end pivoted on a rear connector;
a pair of adjustable members each being provided at the middle of a swivel arm;
a pair of U-shaped blocks each pivoted respectively on one of said adjustable member in one direction and rotatably connected with the other end of the swivel arm in another direction;
whereby the swivel arms can be easily moved in three dimensions.

4,836,533

VARIABLE TENSION LOADED STRIKING APPARATUS

Jimmy Dong, P.O. Box 452, Tahoe Vista, Calif. 95732

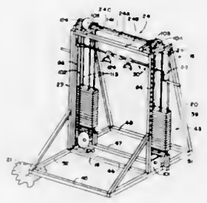
Filed Apr. 10, 1986, Ser. No. 850,094
Int. Cl.[4] A63B *69/00*
U.S. Cl. 272—76 3 Claims

1. A martial arts tension loaded striking apparatus comprising:
(a) a generally rectangular base optionally closed off at the front thereof, and having an upper and lower wall, and a pair of spaced side walls;
(b) a pair of spaced ears mounted at the forward end of said base at the top of each side wall, each ear having a bore therethrough which pair of bores are aligned;
(c) a generally rectangular holster for receiving a striking surface having a front and rear wall, and being open at the top and having a shaft secured along the bottom thereof, and extending outwardly beyond the sides of said holster, said shaft being positionable within the bores of said ears to pivotally mount said holster in a generally upright position,
(d) a first U bracket mounted at the rear of said base on the upper wall thereof,
(e) a second U bracket mounted on the rear wall of said holster, and
(f) an hydraulic/air compression device secured to each of said U brackets,
whereby upon application of an impact to said striking surface disposed within said holster, the holster pivots rearwardly said pivoting action being resisted by the compression device.

4,836,534
BACK SUPPORT APPARATUS
Trevor A. Lewis, 5 John Street, Milpara, Albany, Western Australia, Australia
Filed Oct. 6, 1987, Ser. No. 105,719
Claims priority, application Australia, Oct. 7, 1986, PH8376
Int. Cl.[4] A63G 9/00
U.S. Cl. 272—85 12 Claims

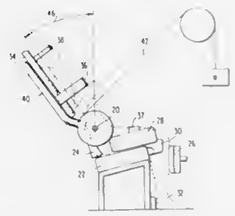
1. A back support comprising; a frame of generally curvilinear shape having a first end and a second end, a gap formed between said first and said second ends of said frame and dimensioned to allow a user to pass into and out of said frame through said gap, a resilient member attached adjacent said first end and arranged to resiliently support said frame with said first end disposed above said second end, a belt having a first end attached to said frame intermediately between said first end of said frame and said second end of said frame and said belt having a second end attached to said frame adjacent said second end of said frame such that said first end of said belt and said second end of said belt are fixed at substantially equal heights along said frame and said belt is disposed directly underneath said first end of said frame.

4,836,535
UPPER BODY BUILDING MACHINE
Bruce E. Pearson, 409 W. Woodruff, Apt. , Searcy, Ark. 72143
Filed Jan. 25, 1988, Ser. No. 148,372
Int. Cl.[4] A63B 21/06
U.S. Cl. 272—118 19 Claims



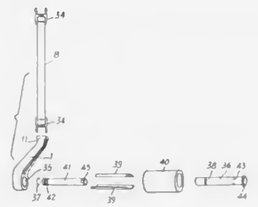
1. A body building machine for enabling a user such as an athlete, gymnast or body builder to exercise the chest, back shoulders and other upper body muscles said machine comprising:
- a rigid frame adjusted to be disposed upon a supporting surface such as a gymnasium floor, the frame comprising a bottom, a top, and a pair of spaced-apart, generally parallel sides extending upwardly from said bottom said top;
- each of said sides including rigid, elongated guide rod means extending between said frame bottom and said frame top;
- weight bar means operationally extending generally horizontally across said machine between said sides for generally vertical displacement by a user of said machine, said weight bar means comprising mounting means restrained by said guide rod means and ends adapted to be stressed by suitable weights;
- handle means operatively coupled to said weight bar means, said handle means comprising bearing collar portions coaxially, slidably coupled to said weight bar means permitting horizontal movement with respect thereto and twistable portions associated with said collar portions adapted to be grasped by the hands of said user, thereby concurrently permitting generally horizontal hand/arm movement and hand/wrist rotation with up and down vertical displacements of said weight bar means; and,
- said weight bar means comprising:
- cable means for synchronizing horizontal movements of said handle means along said weight bar means;
- a central segment which is selectively rotatable relative to said mounting means for permitting said handle means to be oriented either in a position pointed toward said frame bottom or an opposite position pointing toward said frame top; and
- means for preventing relative rotation of said handle means collar portions relative to said weight bar means central segment.

4,836,536
APPARATUS FOR EXERCISING MUSCLES OF THE LOWER TRUNK OF THE HUMAN BODY
Arthur Jones, 1155 NE. 77th St., Ocala, Fla. 32670
Filed Jun. 11, 1987, Ser. No. 60,679
Int. Cl.[4] A63B 21/00
U.S. Cl. 272—134 14 Claims



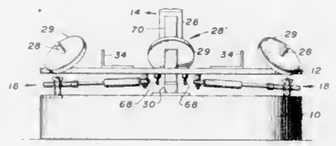
1. Apparatus for exercising the muscles of the lower trunk of a human body, the apparatus comprising in combination, a seat for receiving a person in sitting position, means associated with the seat for restraining against movement the pelvis of a person seated on said seat, a movement arm extending above the seat and being mounted for pivotal movement relative to the seat about a generally horizontal axis, said movement arm having an upper portion engageable by an upper trunk portion of the body for applying with the muscles of said lower trunk a force to the movement arm to pivot the movement arm about said axis, and a freely movable resistance weight connected to the movement arm to be lifted when a force is applied to the movement arm by said muscles to pivot the movement arm in one direction and to be lowered when the force is released to pivot the movement arm in a direction opposite to said one direction, the movement of said weight being controlled solely by the application and release of said force relative to said movement arm and means for fixing the positions of the arms and head of the body relative to the movement arm during movement of said movement arm.

4,836,537
HANDLE FOR AN EXERCISER DEVICE
Gilbert Moreno, 50 Avenue Louis Blanc, 94210 La Varenne Saint Hilaire, France
Filed Oct. 13, 1987, Ser. No. 107,587
Claims priority, application France, Oct. 17, 1986, 86 14444
Int. Cl.[4] A63B 21/30
U.S. Cl. 272—143 4 Claims



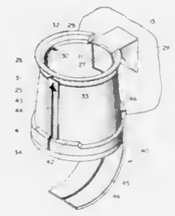
1. A handle having a generally C-shaped configuration for use with an exercise device, comprising
- (a) a rigid half hoop member;
- (b) a fixing device arranged at one end of said half hoop member for connection with at least one flexible resilient resistance device;
- (c) a relatively short bar arranged at the other end of said half hoop member, said bar having a longitudinal axis, the perpendicular of which at the center of said bar passes through said fixing device;
- (d) a sleeve mounted on said bar; and
- (e) a cylindrical member telescopically connected with and coaxially arranged relative to said bar, said cylindrical member protruding beyond said sleeve and including interlocking means at the remote end thereof for connection with the cylindrical member of a second handle to connect the handles together.

4,836,538
EXERCISE MACHINE WITH NON-LINEAR HYDRAULIC RESISTANCE
Max Rice, Seattle, Wash., assignor to The Max Rice Corporation, Seattle, Wash.
Filed Aug. 25, 1987, Ser. No. 89,483
Int. Cl.[4] A63B 23/02
U.S. Cl. 272—146 13 Claims



1. An exercise machine, comprising:
- a stationary base means;
- a rotatable turntable mounted on said base means, said turntable having a single degree of freedom about an axis perpendicular thereto; and
- plural resistance means, each having an outboard portion pivotally mounted on the base means, and an inboard portion pivotably mounted on the turntable inboardly of the outboard portion and outboardly of the turntable's axis, said resistance means resisting longitudinal movement of one portion thereof relative to the other portion proportionally to the rate of such movement, with rotation of said turntable causing said longitudinal movement, said resistance means comprising two hydraulic cylinders interconnected between said base means and said turntable in a manner permitting rotation of the turntable relative to the base in each direction up to about 120° from a dead center position, said hydraulic cylinders each having a unidirectional loading action and being arranged to effect relatively little loading on rotation of the turntable as the turntable moves from either extreme toward positions about 45° away from dead center and to effect relatively greater loading on rotation of the turntable through positions of the turntable within about 45° of dead center.

4,836,539
AIMING APPARATUS FOR USE IN THE GAME OF BASKETBALL
Daniel K. Knapp, 9930-4 Sepulveda Blvd., Mission Hills, Calif. 91345
Filed Mar. 28, 1988, Ser. No. 172,809
Int. Cl.[4] A63B 63/08, 69/00
U.S. Cl. 273—1.5 A 3 Claims

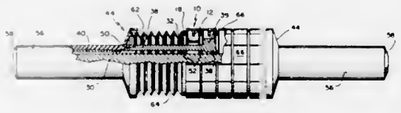


1. A basketball aiming apparatus mountable on a basket rim for use in practice, comprising the combination of:
- an open-ended conical member having a top end and a bottom end disposed between a vertical passageway gradually tapering downwardly and outwardly from said top end to said bottom end for conducting the travel of a basketball therethrough;
- said member top end having a continuous and unbroken outwardly flared flange including a tapered inner surface leading into said passageway;
- means carried on the interior of said member within said passageway for releasably supporting and stabilizing said member on the basket rim;
- said conical member includes a plurality of exposed visual target markers carried along the external peripheral edge of said flared flange;
- an exposed visual circular band disposed on the external surface of said conical member indicative of the basket rim location; and
- said flared flange having an outer diameter substantially equal to the outer diameter of said member bottom end.

4,836,540
ROTATING RING GAME
Jeffrey W. Bean, 27 Minerva Ave., Sanford, Me. 04073
Filed May 24, 1988, Ser. No. 198,452
Int. Cl.[4] A63F 9/00
U.S. Cl. 273—1 G 11 Claims

1. In a two player game combining an assembly of components in modifiable form by the rotation and sliding of two handles, said handles being separated by a series of equally spaced rotating game rings, each ring being covered with a unique pattern of selected indicia about its circumference, means for rotating selected ones of said rings to align selected ones of said indicia on adjacent rings by the pushing, pulling and rotating said handles about a center shaft on a central common axis, each rotating ring being free to rotate about its

axis and held secure by a series of stationary spacer rings ridgedly connected to said center shaft, the improvement wherein



said spacer rings are provided with means for interlocking them to each other within the neighboring game rings so as to retain said game rings in position, said spacer rings being so dimensioned as to be non-binding with said game rings to permit free rotation thereof.

4,836,541

LEAD ARM DEVELOPMENT BAT

Douglas R. Henley, Rte. 1, P.O. Box 16, Chunky, Miss. 39323

Filed Jul. 14, 1987, Ser. No. 73,215
Int. Cl.[4] A63B 69/20
U.S. Cl. 273—26 B **16 Claims**

1. A one-piece batting practice bat for developing the lead arm of a ballplayer comprising:

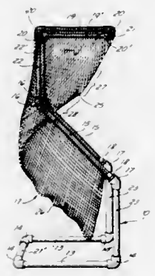
a barrel portion about fourteen inches in length which tapers continuously inwardly from an outermost edge having a first diameter, to an inner edge having a second diameter; and a handle portion about six inches in length adjacent the second diameter portion of the barrel, wherein the handle portion has a third diameter which is substantially one-half of said second diameter, said barrel and handle portions connected by a relatively short and sharply tapered connector portion.

4,836,542

FOOTBALL KICKING PRACTICE DEVICE

Matthew J. Crawley, 63 Montclair Ave. Montclair, N.J. 07042

Filed May 31, 1988, Ser. No. 200,134
Int. Cl.[4] A63B 67/10
U.S. Cl. 273—55 B **10 Claims**



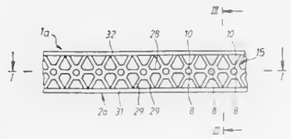
1. A football kicking practice device comprising a frame structure having two similar frame parts joined by a front top transverse member to be disposed in parallel vertical orientation, said frame parts including horizontal rearwardly extending portions joining vertical downwardly extending portions, in turn joining downwardly inclined portions extending to a point of vertical alignment with the top transverse member, and further joining downwardly extending vertical portions terminating with means at the lower ends for supporting the frame in vertical orientation, and a large rectangular net with a peripheral sleeve along three sides thereof slidably engagable with the frame structure, whereby the net as assembled to the frame hangs in a manner to provide a forwardly and downwardly bulged upper portion, blending with a lower hanging and forwardly inclined trough portion, such net configuration providing a unique shock absorbing action as the net intercepts a kicked football.

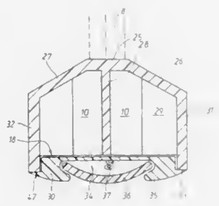
4,836,543

TENNIS RACQUET FRAME

Walter Holzer, Drosteweg 19, D-7758 Meersburg, Fed. Rep. of Germany

PCT No. PCT/EP84/00389, § 371 Date Oct. 2, 1985, § 102(e) Date Oct. 2, 1985, PCT Pub. No. WO85/02548, PCT Pub. Date Jun. 20, 1985
Continuation of Ser. No. 767,287, Oct. 2, 1985, abandoned. This PCT application Dec. 5, 1984, Ser. No. 214,869
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1983, 3343945; Mar. 5, 1984, 3416377
Int. Cl.[4] A63B 49/10
U.S. Cl. 273—73 C **11 Claims**





1. A frame for tennis racquet, comprising:

(a) a loop-shaped section having a radially-outwardly-open U-shaped profile and comprising first and second lateral branch portions connected by a connecting bridge portion, a base of said U-shaped profile being formed by said connecting bride portion and first and second legs of said U-shaped profile being formed by said first and second lateral branch portions;

(b) a protective member secured to said lateral branch portions to thereby close off said loop-shaped section, at least a portion of said protective member being removable;

(c) a plurality of spaced hollow support sleeves integrally connected at one end to said connecting bridge portion, said support sleeves being located inside the U-shaped profile spaced along the length thereof and extending radially outward from the bridge portion and spaced from the lateral branch portions and each forming with an

aligned hole in the bride portion a bore for receiving a racket string therethrough; and

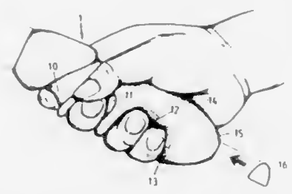
(d) a first plurality of pairs of spaced reinforcement ribs located within the U-shaped profile, each pair comprising a first rib integrally connected to a corresponding one of said support sleeves and said first lateral branch portion and a second rib integrally connected to the same said corresponding one of said support sleeves and said second lateral branch portion, said first and second ribs of each pair of reinforcement ribs extending on opposite sides of said corresponding one of said support sleeves and integrally connecting said support sleeve to the adjacent lateral branch portions.

4,836,544

STRUCTURE OF RACKET HANDLES

Genhone Lai, 1F, No. 46, Alley 3, Lane 187, Sec. 3, Cheng Kung Rd., Taipei City, Taiwan

Filed Jan. 11, 1988, Ser. No. 142,197
Int. Cl.[4] A63B 49/00
U.S. Cl. 273—73 J **1 Claim**



1. A racket handle for grasping by the fingers and palm of a user so as to enhance performance and minimize injury during playing of racket sports, which handle comprises:

(a) an elongate body for attachment to a racket body and provided with a free end, the body including first and second opposed longitudinal sides;

(b) The first longitudinal side having a substantially symmetrical configuration defined by:

(i) a first concave arc segment configured for engagement by an index finger;

(ii) a second concave arc segment configured for engagement by a middle finger;

(iii) a third concave arc segment configured for engagement by both a ring and a little finger; and

(iv) the third concave arc segment terminating in an outwardly protruding portion adjacent the end of the handle for providing a checking point against the force produced when the handle is grasped by the user;

(c) The second longitudinal side having a substantially symmetrical configuration defined by a protruding arcuate section for engagement by the center of a palm; and

(d) the free end of the handle tapering to a bottom face having a substantially triangular configuration.

4,836,545

TWO PIECE METALLIC AND COMPOSITE GOLF SHAFT

J. Benedict Pompa, 4805 U.S. Alt. 19 N., #412, Palm Harbor, Fla. 34683

Filed Nov. 7, 1988, Ser. No. 267,849
Int. Cl.[4] A63B 53/10; D02G 3/00
U.S. Cl. 273—80 B **5 Claims**

1. A hollow two piece golf shaft of circular cross section, comprising: in combination, a lower metallic tip section having parallel or tapered sides, and a plurality of diametrally expanding steps at the upper end portion of said lower metallic tip section, the length of said lower metallic tip section comprising approximately 0.25 to 0.45 of the total shaft length; an upper composite butt section of larger diameter having a lower end reduced in diameter and slidingly fitted into and bonded to the inside wall of the last step of said lower metallic tip section, said last step being elongated to approximately 1.50 inches in length, the junction between said lower metallic tip section and said upper composite butt section being flush, and from whence the upper composite butt section tapers progressively outwardly to its upper terminal end, the length of said upper composite butt section comprising approximately 0.55 to 0.75 of total shaft length.

4,836,546

GAME WITH MULTIPLE WINNING WAYS

Felix M. DiRe, 5155 Clearview Dr., Williamsville, N.Y. 14221, and Joseph Carlisi, 3717 Evansdale Dr., Doraville, Ga. 30340

Continuation-in-part of Ser. No. 85,751, Aug. 17, 1987, Pat. No. 4,756,531. This application Jul. 8, 1988, Ser. No. 216,815
Int. Cl.[4] A63B 71/04
U.S. Cl. 273—138 A **6 Claims**

1. A novel game apparatus having the following winning means:

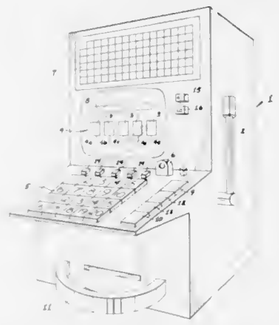
(1) means for preselecting up to "Y" possible winning numbers from a given group of numbers, "Y" being an amount of indicators in said apparatus, a number of said group of numbers in a winning number if it appears on one of said indicators;

(2) means for awarding a win when the number selected at a given location corresponds to the winning location; and

(3) means for preselecting said numbers in which said number of (1) occurs in at least two of said winning indicators;

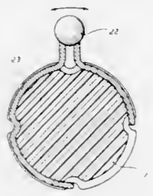
said winning indicators comprising at least two independent means having identical numbers indicated thereon and having identical stopping positions provided thereon, a final stopping position on each of said indicators substantially simultaneously providing the winning numbers of at least two winning means of 1-3 above and display means for displaying said final stopping positions, and means for

freezing at least one of said indicators, means for respinning at least one of said indicators, means for determining



the sum of said numbers on all the indicators, and means for selecting a high or low value for said sum.

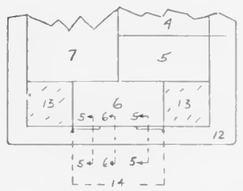
4,836,547
GAME ARTICLE
Zurab Krikheli, 99-05 63 Dr., Rego Park, N.Y. 11374
Filed Sep. 19, 1988, Ser. No. 246,220
Int. Cl.[4] A63F 9/08
U.S. Cl. 273—153 S **16 Claims**



3. A game article, comprising a spherical main body having a spherical outer surface, a plurality of groove-shaped guides on said spherical surface, and a plurality of lands formed between said guides; a plurality of auxiliary members arranged to be radially spaced from said peripheral surface of said body and located around the latter; and a plurality of carriers formed as thin wire-like elements, each carrying a respective one of said auxiliary members and movable in said groove-shaped guides so as to move said auxiliary members over said peripheral surface in spaced relationship therewith.

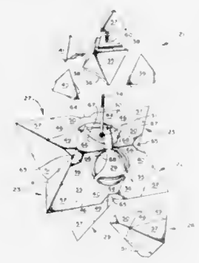
4,836,548
ESCAPE MECHANISM FOR SLIDING BLOCK PUZZLES
Duane R. Chittenden, 305 El Mar Dr., Rochester, N.Y. 14616
Filed Aug. 21, 1987, Ser. No. 87,864
Int. Cl.[4] A63F 9/08
U.S. Cl. 273—153 S **2 Claims**

1. In a sliding block puzzle comprising a game which includes a plurality of frame members and a plurality of blocks slidable within the frame, the blocks mating with each other and the frame by means of tongues and grooves disposed in complementary relationship on adjoining ones of said blocks and by grooves in the inwardly facing walls of selected ones of said frame members and by tongues on the inwardly facing walls of the remaining ones of said frame members, said tongues and grooves cooperating to retain the blocks within the frame, wherein the improvement comprises the modification of the tongue along a section of one of said remaining frame members and the modification of the groove of one of the blocks, the modifications being such that when said one



block is positioned adjacent said frame member section the block can be removed from the frame.

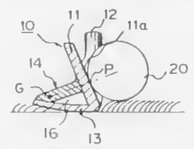
4,836,549
MULTI-FACETED PUZZLE TOY
James T. Flake, 274 Mountain Rd., Evanston, Wyo. 82930
Filed Oct. 16, 1985, Ser. No. 788,126
Int. Cl.[4] A63F 9/08
U.S. Cl. 273—153 S **8 Claims**



1. A multi-faceted toy comprising
eight heptahedrons;
a central sphere;
axle means mounting four of the said heptahedrons to the central sphere, whereby said four heptahedrons are each rotatable about an axle;
at least four convex base plates, each mounted to orbit around the central sphere; and
axle means mounting one of said heptahedrons to one of the base plates, whereby said one heptahedron is movable with said base plate and is rotatable about said axle means.

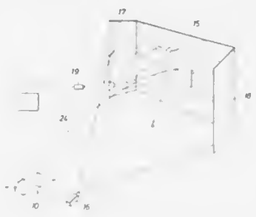
4,836,550
CLUB HEAD FOR AN IRON-TYPE GOLF CLUB
Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Co., Ltd., Tokyo, Japan
Filed Jan. 25, 1988, Ser. No. 147,488
Claims priority, application Japan, Jan. 26, 1987, 62-15864
Int. Cl.[4] A63B 53/04
U.S. Cl. 273—167 H **9 Claims**

1. A club head for an iron-type golf club, comprising:
a front wall having a front side for hitting a ball, said front wall being inclined backward from the bottom end thereof toward the top end thereof:
a sole wall connected at the front end thereof to the bottom end of said front wall and extending backward from said bottom end of said front wall;
a back wall connected at the top end thereof to the back side of said front wall behind an impact point at which said front wall is initially in contact with a ball when said club head is normally swung and at the bottom end thereof to said sole wall, and extending in substantially perpendicular to said front wall between said front wall and said sole



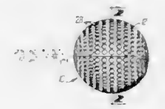
wall, said top and bottom ends of said back wall extending between the heel and toe ends of said front and sole walls, respectively; and
a toe wall connected to said front, sole, and back walls for defining a closed cavity therebetween.

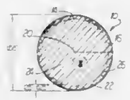
4,836,551
GOLF GAME UTILIZING A SHORTENED FAIRWAY HAVING FULL SCALE REALISM
Lowell L. LaSalle, 212 Courtland Cir., Carthage, Tex. 75633
Filed Jan. 25, 1988, Ser. No. 147,744
Int. Cl.[4] A63B 69/36
U.S. Cl. 273—185 B **14 Claims**



1. A system providing a simulated golf game for a user comprising:
(a) at least one building having an indoor driving section ending at an upright screen;
(b) a tee area positioned in said indoor driving section of said building, said tee area enabling a user to hit a ball using the full range of clubs customarily available for tee shots, said building confining the tee shot with an overhead ceiling and said ceiling has a first section positioned over said tee area and substantially parallel to the floor, a second angled section connected to said first section and positioned immediately in front of said tee area to deflect golf balls away from said tee area and towards said screen, a third section connected to said second section positioned opposite from said tee area and substantially parallel to said floor;
(c) said upright screen having an image forming surface facing said indoor driving section of said building wherein said screen is spaced from said tee area to intercept the tee shot;
(d) a simulated approach section at the end of a fairway positioned remote from said driving section of said building;
(e) a green area having a cup therein, said green area positioned adjacent to said end of fairway of said approach section;
(f) trajectory computing means for determiming the flight of the ball hit from said tee area said trajectory computing means operative in said indoor driving section of said building; and
(g) said trajectory computing means determining the position of the ball after the tee shot dependent on the range and direction of the tee shot, said means further determining ball position relative to said green area as part of a simulated golf hole having a tee area and green area, said means indicating a specific ball placement prior to completion of the simulated golf hole by the user.

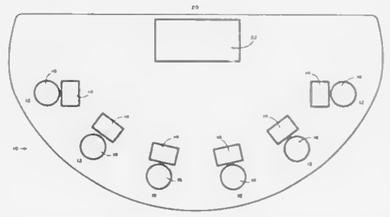
4,836,552
SHORT DISTANCE GOLF BALL
Troy L. Puckett, and Lauro C. Cadornigs, both of Albany, Ga., assignors to MacGregor Golf Company, Albany, Ga.
Continuation-in-part of Ser. No. 588,190, Mar. 12, 1984, abandoned. This application Nov. 7, 1985, Ser. No. 795,803
Int. Cl.[4] A63B 37/00
U.S. Cl. 273—218 **11 Claims**





1. A one-piece golf ball in the shape of a sphere having a center, a radius, and a surface, and comprising a thermoplastic polymer and a filler material wherein the filler material is uniformly distributed in the polymer and the polymer is foam-molded so that the polymer and filler within the ball have a continuously increasing density gradient along the ball's radius from its center to its surface which density gradient is characterized by a relatively dense outer skin and a cellular core, and wherein the ball has a rebound of between 50% and 80%, weighs between 15 and 35 grams, and is 1.68 inches in diameter.

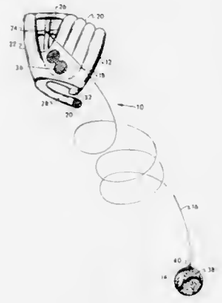
4,836,553
POKER GAME
James P. Suttle, Las Vegas, Nev., and Daniel A. Jones, Louisville, Ky., assignors to Caribbean Stud Enterprises, Inc., Las Vegas, Nev.
Filed Apr. 18, 1988, Ser. No. 182,374
Int. Cl.[4] A63F 1/00
U.S. Cl. 273—292 **35 Claims**



1. A method of playing a poker game comprising the steps of:
(a) a player anteing a first bet means,
(b) a dealer dealing a hand comprising a predetermined number of cards to each of the player and the dealer,

(c) the player either folding in which case the player loses his first bet means to the dealer, or betting a second bet means,
(d) the player comparing his hand to the hand of the dealer using poker rank as the criterion for comparison,
(e) if the dealer's hand is not at least a predetermined rank, the player wins a preselected amount based on the player's first bet means and the player keeps his second bet means,
(f) if the dealer's hand is at least a predetermined rank, and the dealer's hand is higher than the player's hand, the player loses both his first bet means and his second bet means,
(g) if the dealer's hand is at least a predetermined rank, and the player's hand is higher than the dealer's hand, then the player wins a first predetermined amount on his first bet means and the player wins a second predetermined amount on his second bet means based on the type of poker hand combination that the player has, said second predetermined amount having a potential return of at least twenty times the amount of the second bet means.

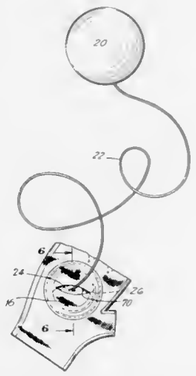
4,836,554
GLOVE-AND-BALL SPORTS TOY
William D. Robbins, Succasunna, N.J., assignor to Sports & Toys Concepts, Inc., Hackensack, N.J.
Filed May 10, 1988, Ser. No. 192,303
Int. Cl.[4] A63B *67/00*
U.S. Cl. 273—321 **7 Claims**



1. A glove-and-ball sports toy comprising, in combination, (1) a glove having a pocket, fingers, and a thumb, (2) a ball formed from a soft, lightweight material, and (3) a flexible, elastic cord connecting said ball with said glove, said glove having a patch of burr material attached thereto solely in the area of said pocket and said ball being covered with pile material effective to adhere to said burr material when said ball and said patch come into contact.

4,836,555
COMBINATION GLOVE AND SLAP BALL
Howard Wexler, 300 E. 40th St., New York, N.Y. 10016
Filed Mar. 28, 1988, Ser. No. 174,218
Int. Cl.[4] A63B *67/00*
U.S. Cl. 273—330 **12 Claims**

1. In combination,
a glove to be worn on the hand,
a ball,
a stretchable member having two ends, one end fixedly attached to the ball and the other end fixedly attached to an anchor member, said glove comprising slot means to removably attach said anchor member to said glove in said slot means to permit said stretchable member and ball to be separated from said glove and also to permit said ball to be elastically attached to said glove, whereby the user can

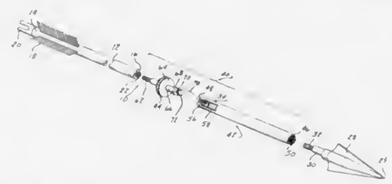


slap the ball repeatedly assured it will return to the gloved hand.

4,836,556
DART GAME TARGET CONSTRUCTION
Donald P. DeVale, Sycamore; Robert J. Brejcha, and Gregory W. Lantz, both of St. Charles, all of Ill., assignors to Kidde Recreational Products Inc., Bay City, Mich.
Filed Dec. 11, 1987, Ser. No. 131,950
Int. Cl.[4] F41J *3/02*
U.S. Cl. 273—376 **33 Claims**

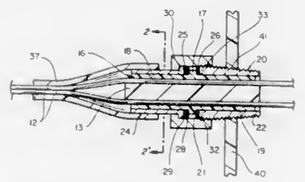
1. A game target comprising a base; a plurality of individual, relatively movable target members each of which has and inner face confronting said base and an outer face; a divider interposed between adjacent members; means securing said divider to said base; and cooperable retaining means reacting between said divider and each adjacent member at a level wholly inward of the outer face thereof enabling movements of each of said members in directions toward and away from said base and limiting movement of said members in a direction away from said base.

4,836,557
GAME TRACKING ARROW
Scott A. Polando, 137 Waterview, Lake Orion, Mich. 48035
Filed Apr. 4, 1988, Ser. No. 177,340
Int. Cl.[4] F41B *5/02*
U.S. Cl. 273—416 **15 Claims**



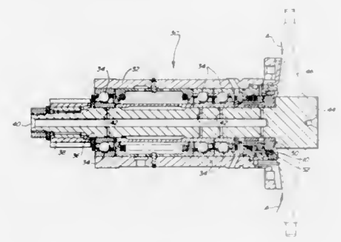
9. A game tracking arrow comprising:
a hollow shaft;
a point;
first and second separably attachable members mountable between the shaft and the point of the arrow;
the first member having first and second ends, the first end being attached to the point;
the second member having first and second ends, the first end being attached to the shaft, a collar formed intermediate the first and second ends of the second member, the collar having a cross section larger than the cross section of the first member;
means for separably attaching the second member to the first member; and
line means disposed within one of the first and second members, the line means having a first end secured to the other of the first and second members to move with the game after the point and the first member have penetrated the game and the shaft and the second member have separated from the point and the first member to track the location of the game from the location of the shaft.

4,836,558
BULKHEAD SEAL
Milo D. Anderson, Fremont; Neil L. Holt, Foster City; Peter L. Larsson, Los Altos, and Anthony R. W. Richardson, Los Altos Hills, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.
Continuation of Ser. No. 111,963, Oct. 20, 1987, abandoned. This application Aug. 18, 1988, Ser. No. 233,971
Int. Cl.[4] F16J *9/00;* **H01B** *17/26*
U.S. Cl. 277—1 **9 Claims**



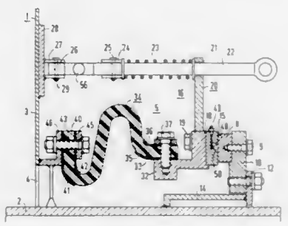
9. A sealed feedthrough in which a supply line extends through a bulkhead aperture which comprises:
a. a supply line extending through an aperture in a bulkhead;
b. a heat recoverable tubular article recovered onto said supply line and having a radial flange extending from an intermediate portion thereof, dividing said tubular article into said first and second longitudinal segments;
c. a first fitting positioned around the second segment of the article, one end thereof abutting the flange and the other end thereof sealingly secured to the bulkhead aperture;
d. a second fitting positioned around the second segment of the article, one end thereof abutting the flange so that the flange is positioned between the first and second fittings;
e. a resilient annular member positioned between said fisrt fitting and said flange;
f. urging means positioned between said second fitting and said flange urging said flange, said resilient member and said first fitting into sealing engagment; and
g. means retaining said first and second fittings in their respective positions.

4,836,559
SEAL ASSEMBLY WITH MELTABLE METAL BINDER LAYER
John A. Bihlmaier, Marengo, Ill., assignor to Sundstrand Corporation, Rockford, Ill.
Filed Dec. 30, 1987, Ser. No. 139,656
Int. Cl.[4] F16J *15/28*
U.S. Cl. 277—26 **25 Claims**



1. In a dynamic machine having a rotary component or the like which is mounted for rotation in a housing having an interior wall, a seal assembly comprising:
a seal member having an inner sealing surface and an outer surface;
a coating of metal electroplated to the outer surface of the seal member; and
a meltable metal binder layer bonded between the metal coating and the interior wall of the housing.

4,836,560
SEAL
Vitus Haberberger, Herzogenaurach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Aug. 4, 1987, Ser. No. 81,233
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1986, 3626383
Int. Cl.[4] F16J *15/54;* **F27B** *7/24*
U.S. Cl. 277—88 **9 Claims**



1. Seal for a housing with a housing wall enclosing a rotatable tubular body, comprising a first sealing ring concentri-

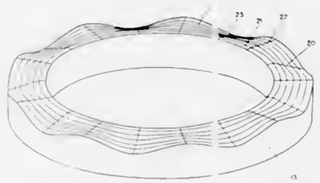
cally surrounding and secured to the tubular body, said first sealing ring having a sealing surface disposed at a right angle to the axis of the tubular body, retaining means secured on the housing and movable parallel to the axis of the tubular body, a second opposing sealing ring secured on said retaining means and spaced from the housing wall defining an interspace therebetween, spring means biasing said second sealing ring away from the housing wall and against said sealing surface of said first sealing ring in axial direction of the tubular body, and a bellows surrounding the tubular body and tightly closing off said interspace, said retaining means including a retaining ring supporting said second sealing ring and a plurality of rods distributed about the circumference of the tubular body, said rods being secured on the housing wall and extended parallel to the axis of the tubular body through bores formed in said retaining ring, said spring means being mounted on said rods and having one end braced on the housing wall and another end braced on said retaining ring.

4,836,561

WAVY-TILT-DAM SEAL RING

Alan O. Lebeck, Albuquerque, and Lionel A. Young, Edgewood, both of N. Mex., assignors to University of New Mexico, Albuquerque, N. Mex.

Filed Feb. 17, 1987, Ser. No. 15,863
Int. Cl.[4] F16J *15/34*
U.S. Cl. 277—93 SD **9 Claims**



1. An annular face seal ring having a sealing ring face on an axially facing surface of said ring and made of a material having a high Young's modulus, said face seal ring comprising:

a dam on said sealing ring face comprising a generally flat, axially facing annular circumferential surface, said dam having a finite radial width narrower than the radial width of said sealing ring face, said dam projecting axially further than the remaining radial width of said sealing ring face;

at least two circumferentially disposed preformed waves which increase in amplitude radially away from said dam, thereby decreasing in amplitude radially towards said dam, said preformed waves comprising high areas and low areas on said sealing ring face; and

preformed tilted regions which tilt in a direction axially opposite the direction said dam faces and radially away from said dam, the lowest area of said tilted regions generally coinciding with the lowest areas of said preformed waves.

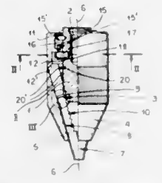
4,836,562

LAMINATED METALLIC GASKET

Nobuo Yoshino, Saitama, Japan, assignor to Nihon Metal Gasket Kabushiki Kaisha, Kumagaya, Japan

Filed Aug. 31, 1988, Ser. No. 238,924
Claims priority, application Japan, Sep. 5, 1987, 62-222258; Sep. 11, 1987, 62-227931
Int. Cl.[4] F16J *15/08*
U.S. Cl. 277—235 B **2 Claims**

1. A laminated metallic gasket provided with two base plates each made from an elastic metal plate on which a bead is formed so as to surround a combustion chamber hole, an intermediate constituent member interposed between said two base plates, characterized in that said beads of said respective base plates are disposed symmetrically with respect to said intermediate constituent member, a peripheral edge portion of said intermediate constituent member that is adjacent to said combustion chamber hole is bent to form a compensation portion having a predetermined thickness, and a compensation bent portion is formed in said intermediate constituent member so



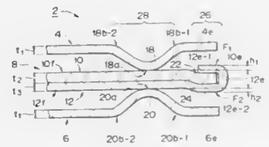
that a first step formed between one surface of the bent peripheral edge portion of said intermediate constituent member that is adjacent to said combustion chamber hole and one surface of said intermediate constituent member is made approximately equal to a second step formed between the other surface of said bent peripheral edge portion of said intermediate constituent member that is adjacent to said combustion chamber hole and the other surface of said intermediate constituent member.

4,836,563

SELFTIGHTENING DRILL CHUCK

Günter H. Röhm, Heinrich-Röbm-Strasse 50, D-7927 Sontheim, Fed. Rep. of Germany

Filed May 13, 1988, Ser. No. 194,411
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1987, 3727147; European Pat. Off., Mar. 8, 1988, 88103566.1
Int. Cl.[4] B23B *31/12*
U.S. Cl. 279—63 **20 Claims**



1. In a selftightening drill chuck comprising a chuck body having a chuck thread forming a socket or receptacle for a drill spindle, a chuck sleeve guided rotatably on said chuck body, further a plurality of clamp jaws supported axially in said chuck body which are guided slidably inclined to a chuck axis in said chuck sleeve and form between themselves a clamping opening coaxial with said chuck axis so that said clamp jaws move radially toward said chuck axis during the adjustment of said clamp jaws and change the diameter of said clamping opening, a locking ring which is rotatable on said chuck body against a spring force between two rotational end positions in a circumferential direction and is axially slidable and couplable in said circumferential direction by two tooth rings which are engaged in an axial end position corresponding to a coupled state, the improvement wherein said chuck body has a conical surface with straightline generatrices on which said chuck thread is located parallel to the feed direction of said clamp jaws, said chuck thread being engaged with a transverse set of thread-engaging teeth on each of said clamp jaws, said transverse set of thread-engaging teeth extending parallel to said feed direction of said clamp jaw, the sides of a thread flight of said chuck thread facing said clamping opening and the teeth

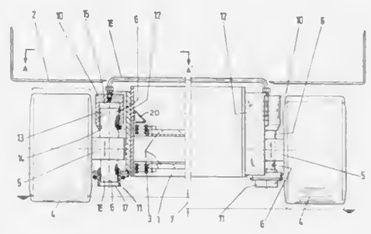
sides of said transverse set of said thread-engaging teeth contacting said sides of said thread flight being oriented substantially perpendicularly to said feed direction of said clamp jaw, each of said clamp jaws being formed with a portion of a substantially cylindrical bolt acting as a guide running in a feed passage in said chuck sleeve fixed from axial sliding on said chuck body, said feed passages opening on the rear facing surface of said chuck sleeve and being covered by said locking ring and said spring force acting on said locking ring in a rotational direction corresponding to opening of said drill chuck.

4,836,564

ROAD-FINISHING MACHINE

Dirk Helms, Bad Münder, Fed. Rep. of Germany, assignor to ABG Werke GmbH, Hameln, Fed. Rep. of Germany

Filed Feb. 22, 1988, Ser. No. 158,935
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1987, 8702877[U]
Int. Cl.[4] B60G *19/00*; E01C *19/18*
U.S. Cl. 280—6.12 **5 Claims**



1. In a road-finishing machine, a level adjustment arrangement to maintain the road-finishing machine level, comprising:

a frame;

two cylinder housings secured, respectively, to two opposed sides of the frame, and each of said cylinder housings having a vertical bore therein with a downwardly facing opening;

two vertically extending pins each having a piston-shaped upper end slidably accomodated, respectively, within the bore of said cylinder housings;

means to secure a lower end of said pins, respectively, to each of the sides of said frame for enabling movement of said pins along and around a respective vertical axis of said pins;

a chamber in each of said cylinder housings defined, respectively, by said bore and said piston-shaped upper end of the pins;

a hydraulic line communicating the chamber on one of the opposed sides of the frame with the chamber on the other side of the frame;

hydraulic fluid filling the chamber in both said cylinder housings and the hydraulic line; and

means for coupling two directional wheels, respectively, to said pins to enable rotation of said directional wheels around the respective longitudinal axes of the pins and to transmit vertical motion of the directional wheels to a respective one of the piston-shaped upper end of said pins, each of said pins being positioned within said respective cylinder housings to have its upper end normally spaced from an upper wall of said chambers;

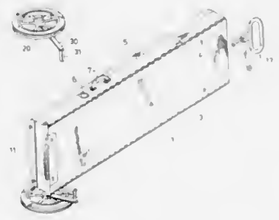
whereby vertical displacement of a directional wheel is transmitted via the hydraulic fluid to the other directional wheel to cause an equal and opposite displacement thereof.

4,836,565

SUITCASE FOR ARRANGING GOLF EQUIPMENT, CONVERTIBLE TO A GOLF CART

Irénée Catalo, 4, avenue de l'Egalité , 81300 Graulhet, France

Filed Dec. 15, 1987, Ser. No. 132,973
Claims priority, application France, Dec. 15, 1986, 8617628
Int. Cl.[4] B62B *1/04*
U.S. Cl. 280—37 **11 Claims**



1. A suitcase for golf equipment convertible to a cart for transporting said equipment over a golf course, said suitcase comprising in combination:

a covering defining a rectangular parallelepipedic volume of a height less that its length and its width and including opposed upper and lower faces, the upper face (1) being provided with disengageable opening means (3) adapted to be disengaged from said upper face, two opposed lateral faces (5) each having an opening (6) arranged in the lower half thereof, and opposing top and bottom end faces, said top end face including opening means (3) disengageable from said upper face (1),

two internal transverse walls (9, 10) extending between the lateral faces (5) and spaced a distance from each other less than the length of a club, the internal wall (10) near the bottom end face (11) being spaced a distance from said end face to house the heads of clubs (12),

support and retaining members (23, 24, 25) adapted to arrange the clubs (12, 13) parallel to each other in two planes essentially parallel to the upper and lower faces, said support members comprising notches (24) in the upper edge of the internal walls, (9, 10), and of forms adapted to permit securing the clubs (12) in such a manner that the head of the clubs is housed in the space defined by the internal wall (10) and the bottom end face (11),

a plurality of tubular elements (25) carried by the internal walls (9, 10) and extending parallel to each other in proximity to the lower face, said tubular elements each being of a form such as to house a club (32),

an internal reinforcing structure (8) for maintaining the covering in a substantially rectangular parallelepipedic form, said structure being connected to said internal walls (9, 10),

a longitudinal standard (15) fixed to the internal walls, (9, 10) and extending between said end faces (2, 11), said standard being provided, toward one end opposite the top end face (2), with securing means for rapidly mounting a gripping and maneuvering member,

an axle (19) fixed on a portion of the standard (15) situated between the internal walls (9, 10), in such a manner as to extend transversely between the openings (6) of the lateral faces (5), said axle comprising a transverse tubular member provided with securing means (21, 22) for rapidly mounting wheel members (20) on opposite sides of the suitcase in such a manner that the bottom end face (11) is situated above the plane of rolling of said wheels in a inclined pulling position,

said securing means for each wheel comprising a suspension member including a hollow member (21) mounted at the

extremities of the axle (19) and maintained therein by means of elastic seals (22), and

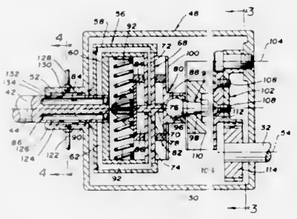
each wheel (20) being carried by an arm (30) having an angled end (31) with a cross-section complementary to the internal section of the member (21).

4,836,566

FOUR-WHEEL STEERING SYSTEM

Joel E. Birsching, Sebewaing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 8, 1988, Ser. No. 203,849
Int. Cl.[4] B62D 5/06
U.S. Cl. 280—91 6 Claims



1. In an automotive vehicle, a four-wheel steering system comprising:

a front steering gear for steering a pair of front wheels of said vehicle in response to rotation of a steering wheel of said vehicle and including a rear steer control shaft rotatable about a first axis of said vehicle in a direction corresponding to the direction of rotation of said steering wheel and at a predetermined ratio relative to said steering wheel rotation,

a rear steering gear for steering a pair of rear wheels of said vehicle in response to rotation of a rear pinion shaft of said rear steering gear about a second axis of said vehicle parallel to and spaced from said first axis,

means defining a housing on said vehicle into which each of said control shaft and said rear pinion shaft extends,

a gear on said rear pinion shaft within said housing rotatable as unit with said rear pinion shaft,

a gear sector meshing with said gear on said rear pinion shaft and supported on said housing for rotation about a third axis parallel to each of said first and said second axes,

said second and said third axes being disposed in a common plane containing said first axis and on opposite sides of said first axis,

means on said gear sector defining a track extending radially relative to said third axis,

a crank assembly on said control shaft within said housing rotatable as a unit therewith about said first axis having a wrist pin assembly thereon movable radially relative to said first axis through a plurality of eccentric positions relative to said first axis from a null position on said first axis,

a connecting means on said wrist pin assembly received in said track on said gear sector and slidable therealong so that said gear sector rotates in a negative steer phase direction when said wrist pin assembly is displaced in a negative phase direction relative to said first axis from said null position and rotates in a positive steer phase direction when said wrist pin assembly is displaced in a positive phase direction relative to said first axis from said null position, and

control means operative to selectively locate said wrist pin assembly in one of said null position and said plurality of eccentric positions displaced from said null position.

4,836,567

ROLLER SKIS

Engelbert Schmid, Seitenstr. 2, Gelsenkirchen-Buer, Fed. Rep. of Germany

PCT No. PCT/EP87/00245, § 371 Date Jan. 19, 1988, § 102(e) Date Jan. 19, 1988, PCT Pub. No. WO87/07169, PCT Pub. Date Dec. 3, 1987
PCT Filed May 9, 1987, Ser. No. 155,724
Claims priority, application Fed. Rep. of Germany, May 22, 1986, 3617245
Int. Cl.[4] A63C 17/04
U.S. Cl. 280—842 3 Claims

1. A pair of roller skis, each roller ski adapted to be utilized in association with a user's foot, each roller ski comprising:

(a) a longitudinal support extending in the direction of movement equipped with a binding for a ski boot and defining an inner lateral boundary of the support facing the other of said pair of roller skis;

(b) a rubber tired running wheel at the front of said longitudinal support;

(c) two parallel rubber tired running wheels at the rear of said longitudinal support, the inner rear running wheel facing the other of said pair of roller skis and arranged behind the heel of the ski boot on the longitudinal support in the direction of movement, the outer rear running wheel being laterally, outwardly offset behind the heel of the ski boot on the longitudinal support, the longitudinal support being bent at the rear therof to accommodate the two rear wheels;

(d) a brake lining laterally mounted on the inner rear running wheel projecting slightly inwardly toward the other of said pair of roller skis beyond the inner lateral boundary of the longitudinal support; and

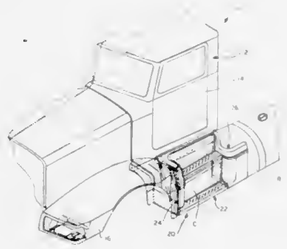
(e) a counterbrake surface provided on the inner lateral boundary of the longitudinal support extending substantially in a direction parallel to the brake lining of the rear running wheel.

4,836,568

AERODYNAMICALLY STREAMLINED STEP ASSEMBLY FOR A TRUCK

Theresa D. Preslik, and Ross Sasamura, both of Fremont, Calif., assignors to Paccar Inc., Bellevue, Wash.

Filed Sep. 14, 1987, Ser. No. 96,728
Int. Cl.[4] B60R 3/00; B62D 35/00
U.S. Cl. 280—164.1 4 Claims



1. In a truck having a cab including entry doors on either side, a fender below and spaced in front of each entry door, and a fuel tank below and spaced behind each entry door, the improvement comprising a combination storage box and step assembly mounted on each side of said cab below and in vertical alignment with the entry door on that side and between the adjacent fender and fuel tank, each of said combination storage box and step assemblies including:

(a) a generally rectangular storage box and a pair of steps mounted thereon, said storage box having access means providing direct access to an interior space of said storage box from outside the truck;

(b) a first fairing panel mounted on said combination storage box and step assembly, said first fairing panel having a front fairing surface extending from the adjacent fender to a front edge of the combination storage box and step assembly, said front fairing surface curving generally rearwardly and inwardly from the adjacent fender, and a second fairing panel mounted on said combination storage box and step assembly, said second fairing panel having a back fairing surface extending from a back edge of said combination storage box and step assembly to a front edge of the adjacent fuel tank, said second fairing panel curving generaliy rearwardly and outwardly with respect to combination storage box and step assembly, whereby said first and second fairing panels cover spaces between said combination storage box and step assembly and the adjacent fender and fuel tank, respectively, and provide an aerodynamic path for the flow of air as the truck moves forward;

(c) said combination storage box and step assembly including a hinge mounted door serving as said access means, said door being located between said pair of steps and movable between an opened position for gaining access to said storage box from outside the truck and a closed position for enclosing said storage box from outside the truck; and

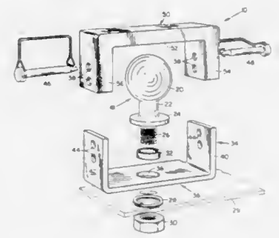
(d) a top fairing surface extending between said front fairing surface and said back fairing surface and between said combination storage box and step assembly and said cab just below the adjacent entry door.

4,836,570

TRAILER HITCH

Alfred G. Lopez, 2906 Darwin, San Antonio, Tex. 78228, and Arthur F. Lopez, 1739 Sacramento, San Antonio, Tex. 78201

Filed Apr. 7, 1988, Ser. No. 178,656
Int. Cl.[4] B60D 1/06, 1/12
U.S. Cl. 280—507 13 Claims



1. An apparatus for use with a ball and socket type coupling as may be used in a coupling between a tongue of a trailer and a tow plate of a towing vehicle, comprising

a tow ball characterized by a ball, a shank, a shoulder, a threaded shaft and a nut therefor,

a bushing interposed between the shoulder and the tow plate,

bracket means having a central bore through which rests the bushing so that said bracket means will rotate freely about the bushing in conjunction with the trailer tongue,

the bushing further comprising means for retaining the shoulder and the tow plate in spaced relation to each other for retaining a part of the bracket means between the shoulder and the tow plate,

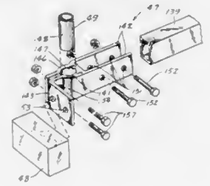
cap means placed over the trailer tongue and removably affixed to said bracket means so that when the cap means is coupled to said bracket means a ball socket of the trailer tongue cannot become disengaged from the ball of the tow ball and said cap means will rotate about said tow ball in unison with the bracket means.

4,836,569

LOAD GUIDE FOR A BOAT TRAILER

Byron L. Godbersen, Lake LaJune Estates, Ida Grove, Iowa 51445

Division of Ser. No. 112,476, Oct. 26, 1987. This application Mar. 31, 1988, Ser. No. 176,209
Int. Cl.[4] B60Q 1/30
U.S. Cl. 280—414.1 2 Claims



1. A post load guide unit for use with a boat trailer having a wheeled frame with a pair of rearwardly extended frame members each having a rear end, the guide unit comprising:

L-shaped means including a first leg adapted to engage a frame member rear end, a second leg extended angularly relative to said first leg, and a portion intermediate said first and second legs and forming a socket;

taillight means engaged to said second leg; and

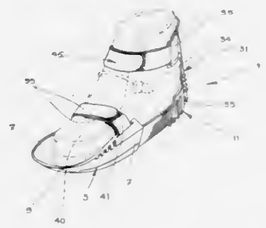
post means inserted in said socket.

4,836,571

LENGTH-ADJUSTABLE TOY SKI

Salvatore Corbisiero, 3539 Bressani, Montreal, Quebec, Canada H1Z 1H2

Filed Mar. 2, 1988, Ser. No. 163,291
Claims priority, application Canada, Mar. 6, 1987, 531317
Int. Cl.[4] A63C 9/08
U.S. Cl. 280—600 12 Claims



1. A length-adjustable short ski for mounting on a boot, said ski comprising:

a front sole-receiving portion having a ground-engaging sole platform and a rear heel-receiving portion having a

ground-engaging heel platform overlapping said sole platform;

means extending lengthwise of and interconnecting said portions to hold the said portions in assembled condition and for relative sliding displacement thereof for adjusting the length of said ski to an adjusted length corresponding to said boot for mounting said ski on said boot, said interconnecting means consisting of elongated tongue-and-groove joints projecting downwardly from said sole and heel platform, at least some of said joints being formed by tongue and grooves of essentially dovetail cross configuration,

means releasably locking said portions in said adjusted length; and

means for attaching said portion to said boot, whereby the ski presents a substantially unbroken ground-engaging platform extending the length of the ski in all adjusted lengths.

4,836,572

SKI BINDING, PARTICULARLY FOR CROSS-COUNTRY SKIING

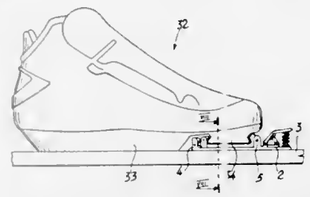
Alessandro Pozzobon, Treviso, Italy, assignor to Nordica S.p.A., Montebelluna TV, Italy

Filed Apr. 21, 1987, Ser. No. 43,580

Claims priority, application Italy, Apr. 30, 1986, 41562 A/86

Int. Cl.[4] A63C 9/08

U.S. Cl. 280—613 **7 Claims**



1. In combination, a ski binding particularly for cross-country skiing and a ski boot, said ski boot comprising

a sole having a downwardly protruding lug, and,

tabs rigidly associated with said lug; said ski binding comprising

a base having a first end and a second end and being attachable to a ski,

a first pair of shoulders rigidly connected to said first end of said base,

a second pair of shoulders rigidly connected to said second end of said base,

a plate having lateral edges, at least one first end and at least one second end, said first end being pivotally connected to said second pair of shoulders, said second end being oscillable with respect to said base,

means for blocking oscillation of said plate with respect to said base,

control means adapted for operation of said means for blocking oscillation,

a third pair of shoulders rigidly connected to said second end of said plate,

at least one bar pivotally connected to said third pair of shoulders and being adapted for engagement with said lug for locking said ski boot to said plate, said bar having a substantially oval cross section and a mild longitudinal axis, and being pivotally connected to said third pair of shoulders at a pivot axis, said pivot axis being arranged eccentrically with respect to said mid longitudinal axis,

a surface defined on said bar and being arranged facing said first end of said plate and adjacent to said lateral edges,

seats provided on said surface defined on said bar and being adapted for engagement with said tabs,

means for adjusting oscillation of said bar, and

at least one arrestor tooth, projecting from said base and being adapted for cooperation with said bar for limiting rotation of said bar about said pivot axis.

4,836,573

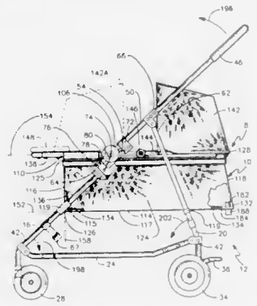
COMBINATION INFANT STROLLER AND BABY BASSINET

Albert W. Gebhard, Denver, Colo., assignor to Gerico, Inc., Denver, Colo.

Filed Jan. 29, 1988, Ser. No. 150,020

Int. Cl.[4] B62B 7/10, 7/14

U.S. Cl. 280—644 **17 Claims**



1. A carrier for supporting a child in a reclining position and in a sitting position comprising:

a rectangular support member comprising first and second side members and first and second end members;

a first substantially planar support member having first and second side edges, first and second end edges and first and second surfaces;

means for attaching said first substantially planar member to said rectangular support member such that said first substantially planar member is movable between first and second positions, said first and second end edges of said first planar member, in said first position, being spaced from said first and second end members of said support member, said first end edge of said first planar member being substantially adjacent to said first end member of said rectangular support member when said first planar member is in said second position;

a second substantially planar member substantially extending between said second end member of said rectangular support member and said second end edge of said first planar member, said second planar member movable between third and fourth positions, said second planar member being in said third position when said first planar member is in said first position and said second planar member moving to said fourth position at the same time said first planar member is moving to said second position; and

means for releasably attaching said first planar member in said second position.

4,836,574

ASSSEMBLY FOR ADJUSTING WHEEL ALIGNMENT, AND METHOD

William E. Ingalls, Longmont, Colo., assignor to Thomas W. O'Rourke, Boulder, Colo., a part interest

Filed Mar. 14, 1988, Ser. No. 167,775

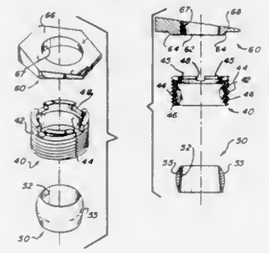
Int. Cl.[4] B62D 17/00

U.S. Cl. 280—661 **10 Claims**

1. In a vehicle suspension assembly for supporting a movable suspension member to a fixed suspension member by means of a ball joint having a base portion and a ball joint stud threaded at the end thereof, the ball joint base being carried in a first of the suspension members and the ball joint stud extending through a hole defined in the second of the suspension members with the thread portion extending beyond the hole and carrying a ball joint nut, the improvement comprising:

a tilt bearing surface defined circumferentially around the ball joint stud;

a tilt bearing receiving surface defined in the suspension member hole and configured to engage the tilt bearing surface to form a journalled interface therewith; and



a wedge washer having opposed nonparallel faces and an opening defined therethrough, the wedge washer being positioned around the ball joint stud and interposed between the ball joint nut bearing on one face and the surface of the second suspension member adjacent the hole therethrough;

whereby the ball joint stud is free to rotate at the journal between the tilt bearing surface on the ball joint stud and the tilt bearing receiving surface defined in the second suspension member receiving hole, but confined to a preselected position determined by the angle between the opposed faces of the wedge washer.

4,836,575

VEHICLE FLUID SUSPENSION CIRCUIT

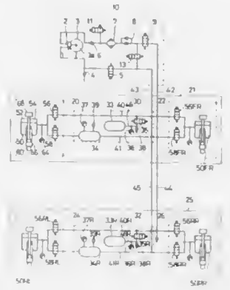
Shuuichi Buma; Nobutaka Ohwa, both of Toyota; Osamu Takeda, Susono, and Hajime Kamimae, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 28, 1988, Ser. No. 172,801

Claims priority, application Japan, Mar. 30, 1987, 62-47456[U]

Int. Cl.[4] B60G 11/30, 19/04

U.S. Cl. 280—702 **5 Claims**



1. A vehicle fluid suspension circuit comprising:

high pressure fluid sources disposed respectively at front and rear sides of a vehicle;

fluid passages disposed respectively at front and rear sides of said vehicle, said fluid passages connecting said high pressure fluid sources to fluid suspensions of left and right wheels at front and rear sides of said vehicle and having valves between said respective high pressure fluid sources and said respective fluid suspensions; and

a front-to-rear passage connecting said high pressure fluid source at the front side of said vehicle to said high pressure fluid source at the rear side of said vehicle, the effective sectional area of said front-to-rear passage being smaller than the effective sectional areas of said fluid passages at the front and rear sides of said vehicle, respectively.

4,836,576

SAFETY STEERING WHEEL

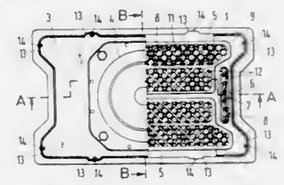
Heribert Werner, Kahl; Klaus Grothe, Aschaffenburg, and Martin Kreuzer, Kleinwallstadt, all of Fed. Rep. of Germany, assignors to Kolbenschmidt Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed Mar. 4, 1988, Ser. No. 164,278

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1987, 3707370

Int. Cl.[4] B60R 21/16

U.S. Cl. 280—731 **11 Claims**



1. In a safety steering wheel comprising a cover composed of soft elastic plastic and an impact protector on a hub of the steering wheel and including a gas bag in a collapsed rest position, means for inflating the bag in response to an impact, a housing for the inflating means and the cover disposed over the gas bag and composed of soft elastic plastic and an embedded reinforcing layer having a rated breaking line, the improvement comprising: a carrier for the housing, a frame secured to the carrier and surrounding the housing and the gas bag and having a plurality of retaining members integrally joined to the frame and wherein at least one retaining member is attached to an edge of the frame facing a driver and is bendable from a rest position wherein it extends in front of the collapsed gas bag in its rest position to a position toward a driver along a straight line when the bag is inflated, wherein the reinforcing layer is connected to the at least one retaining member and is composed of hard plastic and the rated breaking line of the cover extends along sides of said reinforcing layer, said retaining members being disposed over the gas bag to an extent which is considerably less than the upper surface of the entire gas bag in its collapsed rest position.

4,836,577

AUTOMOBILE SUSPENSION

Masaru Abe; Takashi Kohata, and Yoshimichi Kawamoto, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1987, Ser. No. 137,961

Claims priority, application Japan, Dec. 26, 1986, 61-314681

Int. Cl.[4] B62D 6/02

U.S. Cl. 280—773 **14 Claims**

1. An automobile suspension comprising:

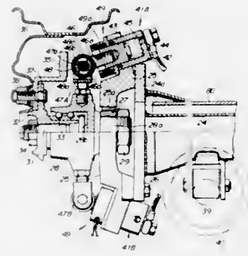
a suspension member coupled to a vehicle body;

a disc-shaped actuator mechanism detachably supported on said suspension member and disposed adjacent a rotatable wheel;

a knuckle having a swingable support shaft swingably supported for swinging movement about a central pivot through which the axis of said disc-shaped actuator mechanism passes, said knuckle being adapted to support said wheel rotatably; and

said disc-shaped actuator mechanism including a pair of actuator means disposed thereon at respective positions spaced substantially equally from the central pivot and

located on at least one straight line passing through said central pivot, said actuator means pivotally supporting



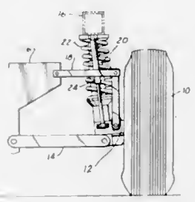
said knuckle, respectively, for causing said knuckle to be angularly moved about said central pivot.

4,836,578

HIGH RESOLUTION DIGITAL SUSPENSION POSITION SENSOR FOR AUTOMOTIVE VEHICLE

Michael W. Soltis, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1987, Ser. No. 138,266
Int. Cl.[4] B60G *17/00*
U.S. Cl. 280—840 **11 Claims**



1. A sensor for determining the operational position of an automotive suspension including two suspension members relatively movable with respect to one another, comprising:

an assembly including a first sensor component movable with respect to a second sensor component;

means for attaching said first sensor component to one of said relatively movable suspension members and said second sensor component to the other of said relatively movable suspension members such that said first and second sensor components will be caused to move with respect to one another when said suspension members move with respect to one another;

digital signal generation means associated with said first and second sensor components for generating a plurality of non-unique digital position signals.

4,836,579

SUBSEA CASING HANGER SUSPENSION SYSTEM

Randy J. Wester, Spring; Bob C. Hopkins, Nassau Bay, both of Tex., and Don C. Underwood, Rio de Janeiro, Brazil, assignors to FMC Corporation, Chicago, Ill.

Filed Apr. 27, 1988, Ser. No. 186,848
Int. Cl.[4] E21B *33/00, 33/04, 33/047*; F16L *39/00*
U.S. Cl. 285—3 **3 Claims**

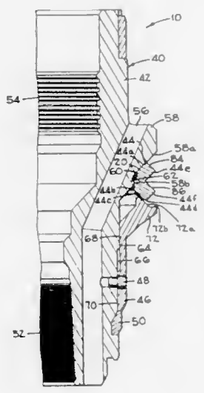
1. A well casing suspension system for supporting a plurality of concentric casing strings in a wellhead, comprising:

(a) an annular wellhead housing having at least one annular groove in its inner surface, said groove including a pair of annular frusto-conical upwardly and inwardly facing support surfaces and at least one annular frusto-conical downwardly and inwardly facing cam surface;

(b) a casing hanger assembly comprising:

(1) a tubular body having means for attaching a well casing string, means for attaching a hanger running tool, an upper annular external shoulder with a first downwardly-facing frusto-conical surface, a first cylindrical surface extending axially downward from said first frusto-conical surface, an annular groove in said first cylindrical surface intermediate its ends, and stop means on the outer surface of said tubular body below said first cylindrical surface;

(2) an expandable, split, multi-shouldered load ring surrounding said tubular body beneath said external shoulder, said load ring having a first inner frusto-conical surface complementary to said first frusto-conical surface of said tubular body, an inner cylindrical surface extending axially downwardly from said first inner frusto-conical surface, an annular flange extending inwardly from said inner cylindrical surface, a second



inner frusto-conical surface extending downwardly and outwardly from said inner cylindrical surface, an annular radial surface extending outwardly from said second inner frusto-conical surface, a first frusto-conical load supporting surface extending upwardly and outwardly from said annular radial surface, and a first frusto-conical load ring camming surface extending upwardly and inwardly from said first load supporting surface;

(3) sleeve-like trigger means surrounding and axially slidable on said tubular body between said load ring and said stop mean, said trigger means including a frusto-conical surface complementary to said second inner frusto-conical surface of said load ring, and an annular radial surface in opposed position with respect to said load ring radial surface; and

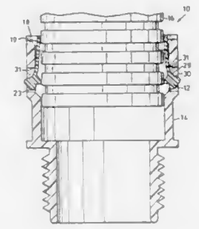
(c) an annular packoff assembly positioned within the wellhead housing, said packoff assembly comprising a stop shoulder upon which said trigger means comes to rest as said casing hanger assembly is lowered into said wellhead housing, said packoff stop shoulder functioning to prevent further downward movement of said trigger means.

4,836,580

CONDUIT CONNECTOR

Grant D. Farrell, Mississauga, Canada, assignor to Scepter Manufacturing Company Limited, Toronto, Canada

Filed Mar. 1, 1988, Ser. No. 162,478
Int. Cl.[4] F16L *35/00*
U.S. Cl. 285—24 **22 Claims**



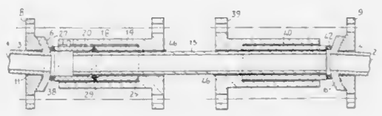
1. A connection device for securing an exteriorly corrugated pipe end within a fitting having an internal shoulder portion comprising, an array of spaced finger portions arranged arcuately about a central polar axis for insertion axially within the fitting, each finger portion having an enlarged head portion thereon including a radially inwardly extending transverse butiress in use to engage an exterior corrugation of the pipe; a first radially outwardly inclined transverse cam portion, forming a first angle with the axis, for a first engagement axially against an internal shoulder portion of the fitting, in use to force the buttress radially inwardly to engage the corrugation while the cam portion engages the fitting internal shoulder portion; and a second outwardly inclined transverse cam portion extending radially outwardly from the first cam portion and forming a second angle with the axis, the second angle being greater than the first angle, for second engagement axially against the internal shoulder portion of the fitting; in use to force the buttress radially inwardly to engage the pipe corrugation while the second cam portion engages said fitting internal shoulder portion, to preclude withdrawal of the device from the fitting.

4,836,581

DEVICE FOR MAKING A SEALED CONNECTION

René Guilloteau, Verrieres le Buisson, France, assignor to Societe Generale Pour les Techniques, Nouvelles, France

Filed Aug. 5, 1987, Ser. No. 81,511
Claims priority, application France, Aug. 11, 1986, 86 11593
Int. Cl.[4] F16L *27/06*
U.S. Cl. 285—31 **4 Claims**



1. A device for making a sealed connection which is adaptable in length and in orientation between two pipes whose ends are at a distance apart by a length which is not precisely determined and whose axes need not be aligned, comprising:

the end of each of the pipes having a pipe-mounted end flange having an end face and an opposite face, each of said faces including a spherical bearing surface;

a central tube which is slightly shorter than the distance between the facing end faces of the two end flanges and whose diameter is substantially equal to the diameter of the pipe to be connected;

two thrust members telescoping over said central tube and each thrust member facing one of the ends of the tube, each thrust member including a flange for clamping purposes and a tube including a void whose opening is directed towards the end of said central tube, said void being dimensioned to receive at least one spacer, said thrust member dimensioned for enabling a sealing ring to be crushed between the outside surface of the free end of said spacer and the end face of said pipe-mounted flange by clamping the flange of the thrust member to a backing flange disposed against said opposite face of the pipe-mounted flange and including a spherical surface of said opposite face, at least one of said surfaces or faces having a spherical bearing surface;

said spherical bearing surfaces at each pipe end being disposed in such a manner as to have the same spherical center when the device is clamped; and

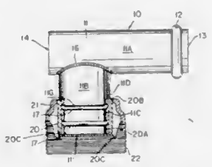
the spacer of at least one of said thrust members being constituted by two spacers one of which comes into abutment against the end of the void in said thrust member and the other of which projects beyond the end of said central tube, with the facing ends of said two spacers having frustoconically-shaped surfaces whose faces face towards said central tube, a sealing ring being disposed between the facing ends of these two spacers in such a manner that said sealing ring is clamped between said ends and against the central tube when said thrust member is clamped to the corresponding backing flange.

4,836,582

FLUID COUPLING FOR ENGINE

Thomas S. Krause, deceased, late of Howell, Mich. (by Barbara A. Krause, executor), assignor to Barbara A. Krause, Fenton, Mich.

Continuation of Ser. No. 416,963, Sep. 13, 1982, abandoned. This application Aug. 10, 1984, Ser. No. 639,489
Int. Cl.[4] F16L *41/00*
U.S. Cl. 285—158 **9 Claims**



1. A fluid coupling in a motor vehicle engine which comprises:

(a) tubular conduit means connected to flexible hose supplying fluid to the engine at one end with a clamp adjacent an integral lip and having a cylindrical exterior surface at the other end, wherein the conduit means has an integral outside shoulder intermediate the ends;

(b) connector means having a housing with a bushing inside the housing secured against movement to and depending from and spaced from the housing which provides a cylindrical interior surface adapted for a precision rotational fit to the exterior surface of the conduit means, the housing having an exterior threaded surface fitted to a mating threaded opening in the engine and having an exterior wrench engaging means for threading the connector means into the engine opening such that there is a fluid connection with the flexible hose connection end of the conduit means, wherein the shoulder on the conduit means abuts on the outside of the connector means;

(c) retaining means on the other end of the conduit means supporting the connector means for rotatably holding the conduit means and connector means together; and

(d) seal means between the exterior surface of the conduit means and the interior surface of the connector means.

4,836,583

PIPE CONNECTION FOR INSTRUMENTS OR MACHINES

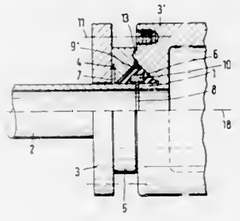
Hans P. Maier, and Nikolay Vlaykovski, both of Villingen-Schwenningen, Fed. Rep. of Germany, assignors to Agintec AG, Pfaeffikon, Switzerland

Filed Mar. 10, 1986, Ser. No. 837,771

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1985, 3508287

Int. Cl.⁴ F16L *17/00*

U.S. Cl. 285—336 **12 Claims**



1. A pipe connection for connecting an instrument or machine to a pipe end, said connection comprising:
(a) a free socket having an outer periphery and connected to a machine, said free socket forming a butt joint with a pipe end;
(b) a chamber member surrounding said pipe end and including a first seal chamber;
(c) a first flange fitted on said pipe end adjacent said first chamber member at a side opposite said butt joint;
(d) a second flange surrounding said free socket and being fixed to said machine and supporting said chamber member;
(e) a second seal chamber formed in said second flange and forming said free socket and mating to said first seal chamber;
(f) a seal received in said first and second seal chambers;
(g) a clamp chamber formed between said first chamber member and said first flange and having a clamp surface;
(h) a clamp element positioned in said clamp chamber and having inner and outer clamp edges defining respectively inner and outer diameters, said inner clamp edge being engageable with said pipe end, said first clamp element having a longitudinal cross-section which projects axially out of said clamp chamber in an uncompressed form and which increases its outer diameter and decreases its inner diameter when axially compressed; and
(i) means for applying an axial pressure to said clamp element, thereby increasing said outer diameter and decreasing said inner diameter to form a clamping seal on said pipe end.

4,836,584

SERVICEABLE THREADED CONDUIT COUPLING

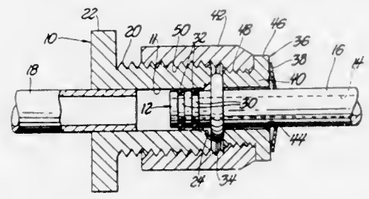
James A. Baker, Williamsville, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 18, 1988, Ser. No. 220,284

Int. Cl.⁴ F16L *19/03*

U.S. Cl. 285—351 **1 Claim**

1. A fluid conduit coupling comprising;
a tubular member defining a socket and having external threads,
a tubular plug member slidably received in the socket for movement between a sealing position and a release position, the plug member including seal means for sealingly engaging the socket when in sealing position therein and for releasing the sealing engagement when in release position,
a nut secured to the plug member and mounted for rotation in a fixed axial position on the plug member, the nut having a threaded portion engaging the tubular member for moving the plug member upon nut rotation from the sealing position to the release position for pressure release,



and for detaching the plug member from the tubular member upon further nut rotation beyond the release position, the seal means comprising a pair of axially spaced O-rings, the socket having a chamfered opening to facilitate insertion of the plug means into the socket means, and
pressure vent means at the chamfered opening to prevent pressure build-up between the O-rings during insertion of the O-rings into the socket.

4,836,585

SHAPED FLANGE FOR CONNECTING AIR DUCT SEGMENTS

Markfield Schauer, Am Vogelbrink 3, D-3013 Barsinghausen, Fed. Rep. of Germany

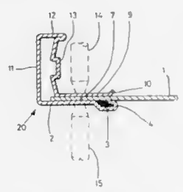
PCT No. PCT/DE87/00249, § 371 Date Feb. 2, 1988, § 102(e) Date Feb. 2, 1988, PCT Pub. No. WO87/07700, PCT Pub. Date Dec. 17, 1987

PCT Filed May 29, 1987, Ser. No. 157,574

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1986, 3618822

Int. Cl.⁴ F16L *17/00*

U.S. Cl. 285—363 **19 Claims**



1. A flange for connecting a pair of air ducts to one another, comprising a pair of legs designed to embrace a wall of an air duct, one of said legs having a portion which is plastically deformed so as to define a cavity, and said one leg having a surface which confronts the other of said legs, said cavity being open to said surface; and a resilient seal in said cavity, said portion of said one leg maintaining said seal in an elastically deformed condition to thereby retain said seal in said cavity, and said seal projecting from said cavity beond said surface.

4,836,586

COMPOSITE COUPLING

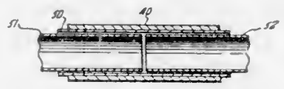
Charles L. Martin, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 572,838, Jan. 23, 1984, abandoned, which is a continuation of Ser. No. 118,867, Feb. 6, 1980, Pat. No. 4,469,357, which is a continuation of Ser. No. 608,209, Aug. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 404,723, Oct. 9, 1973, abandoned, and a continuation-in-part of Ser. No. 404,724, Oct. 9, 1973, abandoned. This application Oct. 20, 1987, Ser. No. 113,321

Claims priority, application Sweden, Apr. 9, 1975, 7504071

Int. Cl.⁴ F16L *25/00*

U.S. Cl. 285—381 **69 Claims**



1. A composite device for securely engaging at least one substrate which comprises:
(a) at least one tubular, heat-recoverable, metallic compression sleeve; and
(b) at least one tubular, metallic insert snugly and concentrically disposed within, adjacent to, and in contact with the compression sleeve so that when the compression sleeve is heat-recovered by being heated above its transition temperature, the insert is altered in at least one of its dimensions and is driven inwardly by the heat-recovered sleeve for securely engaging and forming a gas-tight seal with the substrate.

4,836,587

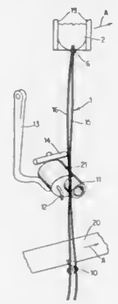
APPARATUS FOR MAKING KNOTS IN DRAWSTRINGS OF CATAMENIAL TAMPONS

Alfred Hinzmann, Weems, Va., assignor to Hauni Richmond, Inc., Richmond, Va.

Filed Dec. 23, 1987, Ser. No. 137,511

Int. Cl.⁴ B65H *69/04*

U.S. Cl. 289—2 **9 Claims**



1. Apparatus for making a knot in an elongated flexible element, such as the drawstring of a catamenial tampon, comprising means for forming in the element a closed loop between the ends of the element, including means for overlapping two intermediate portions of the element; means for pneumatically threading one end of the element through the loop to thus form a relatively loose knot; and means for tightening the knot, including means for pulling one end of the element away from the other end until the loop closely surrounds an intermediate portion of the element.

4,836,588

AUTOMATIC DOUBLE-ACTION CASEMENT BOLT

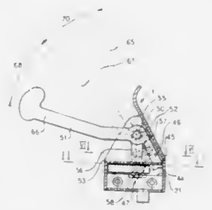
Philippe Simoncelli, Sarrebourg, and Gérard Prevot, Willerwald, both of France, assignors to Ferco International Usine de Ferrures de Batiment, Sarrebourg, France

Filed Mar. 16, 1987, Ser. No. 26,388

Claims priority, application France, Apr. 10, 1986, 86 05252

Int. Cl.⁴ E05C *9/14*

U.S. Cl. 292—34 **17 Claims**



1. A double-action casement bolt comprising:
(a) a casing comprising a surface;
(b) opposed levers pivotally mounted on said casing surface;
(i) for pivoting apart to a first position, to project locking elements to a locking position; and
(ii) for pivoting together to a second position, to retract locking elements to an unlocking position; said opposed levers returning to said first position when not pivoted to said second position, and each of said opposed levers comprising a peripheral surface for engagement to pivot said levers to said second position;
(c) an actuable means, mounted on said casing, for engaging said peripheral surfaces to pivot said levers to said second position when actuated, and for withdrawing from engagement with said peripheral surfaces when not actuated, said actuatable means comprising at least one control rod for pivoting, in an arc substantially perpendicular to said casing surface;
(i) toward said opposed levers to contact said peripheral surfaces; and
(ii) away from said peripheral surfaces to withdraw from contact with said peripheral surfaces; said at least one control rod comprising two catches, one for contacting each of said peripheral surfaces; and
(d) resilient means mounted on said actuable means for urging said actable means to withdraw from engagement with said peripheral surfaces when said actuable means is not actuated.

4,836,589

DOOR LOCK

Russel R. Mohr, 103 Vallage Ave., Cannon Falls, Minn. 55009

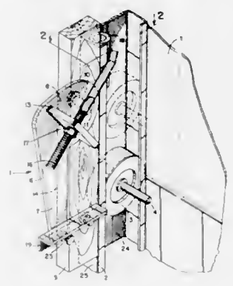
Filed Dec. 18, 1986, Ser. No. 943,570

Int. Cl.⁴ E05C *5/02*

U.S. Cl. 292—113 **7 Claims**

1. A locking device for use with a track mounted door, comprising;
(a) a first member, the first member being formed as an elongated bar having a longitudinal axis;
(b) a second member, the second member being formed as having a longitudinal axis;
(c) an arm, the arm being integrally formed as a longitudinally tapered portion and rounded segment, the longitudinally tapered portion and the rounded segment being oppositely disposed; and
(d) interconnecting means, the interconnecting means linking the first member and the second member such that rotation of the arm urges the first member toward the second member, said interconnecting means comprising a

plate, and a partially-threaded rod, the plate being rigidly mounted to the arm, and containing a centrally-located orifice, the rod being rigidly attached to the first member, the rod passing through the centrally-located orifice, the



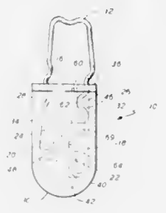
rod being confined within the orifice by a nut such that by adjusting the nut a particular dimensional relationship is established between the first member and the second member when the arm is rotated into a locked position.

4,836,590

SECURITY SEAL WITH TAMPERING INDICATOR

Allan W. Swift, Denville, N.J., assignor to E. J. Brooks Company, Newark, N.J.

Filed Apr. 27, 1988, Ser. No. 186,572
Int. Cl.[4] B65D *33/34*
U.S. Cl. 292—320 5 Claims



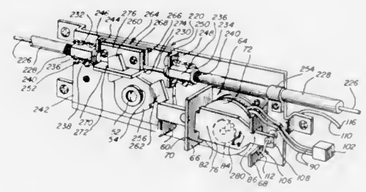
1. A security seal comprising:
a U-shaped resilient shackle having first and second legs each having a reversely bent end portion;
a hollow seal body having an aperture in one side thereof;
an insert mounted in the hollow interior of said hollow seal body;
said insert and said hollow seal body defining elongated first and second chambers contiguous with said aperture;
said insert having first and second cup-shaped grooves on opposed sides thereof;
each said first and said second groove having opaque walls with an opening therein contiguous with a different one of said elongated chambers; and
a tab frangibly mounted in said second groove between the opaque walls thereof and forming a partition frangibly separating said first and second grooves.

4,836,591

ANTI-THEFT VEHICLE HOOD LOCK RELEASE BLOCKER MECHANISM

James H. Faust, Hoffman Estates, Ill., assignor to ABC Auto Alarms, Inc., Elk Grove Village, Ill.

Continuation-in-part of Ser. No. 37,210, Apr. 10, 1987, Pat. No. 4,752,092. This application Mar. 25, 1988, Ser. No. 173,073
Int. Cl.[4] E05C *9/10*
U.S. Cl. 292—336.3 20 Claims



1. An anti-theft vehicle hood release blocker assembly for a vehicle having a hood latch and a sheathed cable secured thereto, said cable being manipulatable to release said latch, said assembly comprising:
a base plate mounted along a length of said cable;
a rotatable platform provided with cable engaging means and journaled on said base plate for rotation thereon between a first condition wherein said latch is locked and a second condition wherein said latch is released;
said cable engaging means including a connector flange fastened to and projecting from said platform to matingly engage a cable connector fastened to a bared portion of said length of said cable so that when said flange engages said connector, said platform moves in relation to said cable;
blocker means intermediate said locked condition and said released condition for preventing said platform from reaching said released condition, said blocker means including a blocker member disposed between a first condition interferent with the movement of said platform and a second condition permitting the movement of said platform to said release condition; and
means operable upon said blocking member for selectively placing same in said first condition or said second condition.

4,836,592

COFFEE FILTER SELECTOR

Robert E. Roberts, 2033 N. Sunset Rd., Apache Junction, Ariz. 85219

Filed Apr. 18, 1988, Ser. No. 182,409
Int. Cl.[4] A47F *13/04;* A47L *13/00*
U.S. Cl. 294—1.1 7 Claims

1. Apparatus for adhesively removing an element from a stack of elements, comprising, in combination:

base means for supporting elements secured thereto;
tape means secured to and movable on the base means, including
a length of tape having an ashesive side for contacting the element and for adhering to the contacted elements, and
takeup roller means secured to the length of tape for advancing the length of tape, including
a takeup roller, and
a takeup wheel secured to the takeup roller and movement of the takeup wheel causes movement of the takeup roller to advance the length of tape; and
means for advancing the takeup roller means a predetermined distance to advance the length of tape, including
a plurality of spaced apart notches on the takeup wheel, with the space between the notches corresponding to the predetermined distance which the length of tape advances, and
means extending into a notch for limiting the movement of the takeup wheel.

4,836,593

PIZZA UTENSIL

John Cooley, 208 Haystack Rd., Zephyrhills, Fla. 34249

Filed Mar. 10, 1988, Ser. No. 166,320
Int. Cl.[4] B65D *5/36, 85/00*
U.S. Cl. 294—1.1 2 Claims

1. A pizza utensil comprising a folded sheet of material having a generally triangular shape when folded, said generally triangular shape truncated at the smaller end, said generally triangular shape having a top and a bottom side, said bottom side bearing dependent therefrom a keel formed from a downfolded portion of said folded sheet, said keel of a size to be grasped by a persons fingers, the base of said generally triangular shape having cut therein a slot, said slot axially aligned with said keel, said slot extending from said base toward said truncated smaller end, said slot suitable for the insertion of a finger therein, said slot of such length that a piece of pizza lying on the top side of the utensil may be slid toward the truncated end by action of said finger.

4,836,594

APPARATUS FOR HYGIENICALLY COLLECTING FECES AND METHOD OF MANUFACTURING SAME

Franz Spreiter, Höhenweg 3, CH-4612 Wangen, Switzerland

Filed Mar. 15, 1988, Ser. No. 168,371
Int. Cl.[4] A01K *29/00*
U.S. Cl. 294—1.3 13 Claims

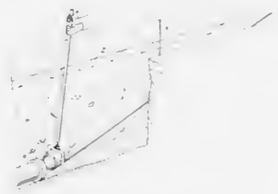
1. An apparatus for collecting feces comprising a glove bag and a receiving container shaped in one piece from a common film tube, said film tube having a channel which is closed by two transversely directed welds, one of said welds closing a distal end of the film tube, the second of said welds closing an intermediate portion of said film tube so that the size of the receiving container is defined by length of the common film tube between said two transversely directed welds, the receiving container having a receiving opening with a reinforcing rim about said opening.

4,836,595

PIPE HANDLING APPARATUS

Frank DiCarlo, 2580 Harvest La., Springfield, Oreg. 97477

Filed May 5, 1988, Ser. No. 190,673
Int. Cl.[4] B25J *1/02;* B65G *7/00*
U.S. Cl. 294—15 1 Claim



1. Pipe handling apparatus comprising,
an elongate handle for grasping by both hands of a worker,
a pipe engaging member of inverted U-shape at one end of said handle for contact with the pipe being laid during positioning of same by a mechanized instrumentality, and
coupling means attaching said handle to said pipe engaging member , said coupling means including a plate, means mounting said plate on said U-shaped member, a cap including an ear to which said handle is pivotally attached, an upright threaded spindle on said plate and extending upwardly through said cap and receiving a nut element to permit locking of the cap to said plate in a selected relationship about said spindle for positioning of said handle to facilitate pipe positioning.

4,836,596

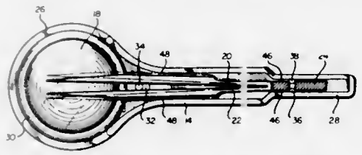
TWEEZERS AND MAGNIFIER

Ronald C. Owen, 6614 W. Diversey Ave., Chicago, Ill. 60636

Continuation of Ser. No. 38,738, Apr. 15, 1987, abandoned. This application Nov. 23, 1988, Ser. No. 275,606
Int. Cl.[4] B25B *9/02*
U.S. Cl. 294—99.2 4 Claims

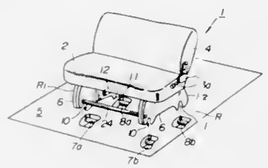
1. A combined tweezers and magnifier instrument comprising a plastic casing forming a handle for the instrument and having a top closing wall with a holding ring at the front end thereof and depending side walls at least along the opposite rear end thereof; a magnifier lens mounted in said holding ring; tweezers with the free ends of resilient arms disposed selectively beneath said magnifier lens and with the opposite rear

ends thereof joined as an integral rear end structure pivotally mounted between the adjacent side walls of the casing and spaced forwardly of the terminal end of the rear end structure of the tweezers; and paired inwardly projecting surfaces on



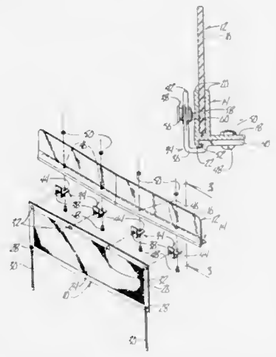
opposite side walls of the casing and disposed adjacently fore and aft of the pivotal mounting of the tweezers for frictional engagement with the integral rear end structure of the tweezers for preventing inadvertent bodily side motion of the tweezers during operation.

4,836,597
FOLDABLE AND DETACHABLE SEAT FOR MOTOR VEHICLE
Satoshi Izumida, Kanagawa, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan
Filed Nov. 24, 1987, Ser. No. 125,007
Claims priority, application Japan, Nov. 28, 1986, 61-283697
Int. Cl.[4] B60N *1/0*
U.S. Cl. 296—63 **12 Claims**



1. A seat adapted to be detachably mounted on a floor, having first and second spaced apart recesses formed therein, said seat comprising:
- first and second spaced apart pins, one of said pins being in each of said recesses;
- a seat cushion;
- a seatback pivotally mounted on said seat cushion;
- a first seat detaching device mounted beneath the seat cushion, said device including;
- a base member secured to said seat cushion and defining at spaced portions thereof first and second cuts each of which is correspondingly sized and arranged to mate with the first and second pins respectively;
- first and second latching mechanisms mounted on said base member to cooperate with said first and second cuts respectively, said latching mechanisms being capable of latching the spaced portions of said base member with said first and second pins when the pins are properly put into said first and second cuts;
- a connecting rod extending between said first and second latching mechanisms to allow synchronous operation of the mechanisms; and
- an operation handle held by said base member and connected to said connecting rod, so that upon manipulation of the operation handle, said connecting rod is moved in a given direction to cause said first and second latching mechanisms to assume their pin unlatching positions.

4,836,598
INSECT SCREEN ATTACHMENT APPARATUS FOR VEHICLES
Ronald D. Mastin, Allerton, Iowa, assignor to DFM Corporation, West Des Moines, Iowa
Filed May 4, 1987, Ser. No. 45,402
Int. Cl.[4] B60K *11/02*
U.S. Cl. 296—91 **3 Claims**

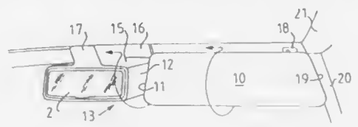


1. Attachment means for attaching a protective screen to a bug shield which is mounted on a vehicle, the bug shield having a shield member mounted in an elongated shield bracket, the shield bracket having a channel for receiving the shield member and a support member for mounting the bug shield on a motor vehicle, the attachment means comprising:
- a plurality of female snap means on the screen;
- a plurality of male snap means to which the female snap means are snapped; and
- mounting means for mounting the male snap means on the shield bracket without penetrating the shield member whereby the shield bracket supports the screen on the vehicle;
- the mounting means include a plurality of spaced apart screen brackets each having a first leg adapted to be secured to the support member of the shield bracket and a second leg connected to the first leg, one male snap means being mounted on the second leg of each screen bracket;
- wherein the support member of the shield bracket and the first leg of each screen bracket are substantially horizontally disposed and the channel of the shield bracket and the second leg of each screen bracket are substantially vertically disposed;
- the shield bracket includes a lip extending rearwardly below the support member and each screen bracket includes a lip extending forwardly from the first leg, said lips overlapping one another to interlock each screen bracket with the shield bracket;
- wherein said second leg of each screen bracket is spaced from and positioned in front of said shield bracket.

4,836,599
VEHICLE VISOR INSTALLATION
E. Gunnar Svensson, Malung, Sweden, assignor to Autopart Sweden AB, Malung, Sweden
Filed Mar. 21, 1988, Ser. No. 171,024
Claims priority, application Sweden, Apr. 3, 1987, 8701409
Int. Cl.[4] B60J *3/00*
U.S. Cl. 296—97.5 **3 Claims**

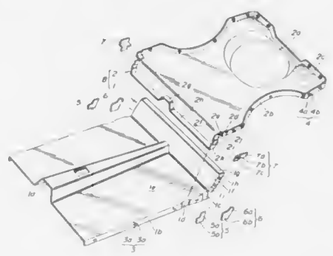
1. A motor-vehicle visor installation comprising two visor panels which are pivotally mounted on the upper edge of a windscreen on respective sides of a rear view mirror, characterized in that the extension of respective visor panels (10) in

the transverse direction of the vehicle is greater than the distance between the side edges of the rear view mirror (2) and the outwardly located edges of the vehicle ceiling; in that the visor panels are laterally displaceable in a manner to afford movement between a panel raised position, in which the inwardly located side edges (11) of respective panels lie inwardly of the side edges of the rear view mirror, and a panel lowered position, in which the inwardly located edges lie externally of the side edges of the rear view mirror, and in that an auxiliary



screening element (13) is arranged in the proximity of the rear view mirror and is effective in screening that part of the windscreen located between the inwardly located edges of respective panels and, together with the panels, of forming a continuous screen across an upper part of the vehicle windscreen, the auxiliary screening element (13) comprising two vertical wall parts (12) which form part of the rear mirror mounting and/or are connected thereto and which extend from the side edges of the mirror to the proximity of the windscreen.

4,836,600
FLOOR STRUCTURE FOR MODULAR VEHICLE BODY
Kenichi Miyazaki, Sagamihara; Katsumi Nakamura, Fujisawa; Taro Hagiwara, and Keizo Inoue, both of Sagamihara, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Apr. 21, 1988, Ser. No. 184,566
Claims priority, application Japan, Apr. 21, 1987, 62-98130; Apr. 30, 1987, 62-107388
Int. Cl.[4] B62D *25/20*
U.S. Cl. 296—197 **6 Claims**

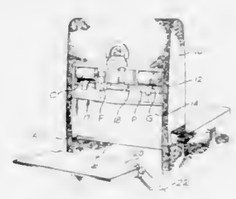


1. A floor structure for a modular vehicle body having a body side assembly, comprising:
- a front floor panel having a first flange for joining with the body side assembly;
- a rear floor panel having a second flange for joining with the body side assembly; and
- a patch plate extending between said first and second flanges to interconnect the same;
- in which said first and second flanges are formed with first and second recesses, respectively; and
- in which said patch plate is fitted in said first and second recesses and cooperates with said first and second flanges to form a smooth, continuous joining surface.

4,836,601
FOLDING CHAIR
Richard E. Cone, Dayton, Ohio, assignor to U.S. Brands, Worthington, Ohio
Filed Dec. 18, 1987, Ser. No. 134,850
Int. Cl.[4] A47C *4/00*
U.S. Cl. 297—16 **12 Claims**

1. A foldable, portable chair comprising: a seat portion for supporting a human torso, a support portion operatively connected to said seat portion, wherein said support portion comprises a first and a second foldable V shaped section, each V shaped section having a pair of arms, the arms of the first V shaped section being pivotally connected to the arms of the second V shaped section at their midsections, the apex of the first V shaped section being downwardly depending and the apex of the second V shaped section being upwardly depending, wherein said first and second V shaped sections are further interconnected to each other via at least one brace means which restrains the pivotal movement of the arms of said first and second V shaped sections and a means for limiting the extent to which said first and second V shaped sections can move in relation to each other.

4,836,602
APPARATUS FOR STORING FOOD AND BEVERAGES IN A PASSENGER SEATBACK
Miguel A. d'Almada Remedios, Bothell, and Thomas R. Riedinger, Mercer Island, both of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Sep. 23, 1988, Ser. No. 248,503
Int. Cl.[4] A47C *7/62*
U.S. Cl. 297—191 **2 Claims**



1. Apparatus for storing material in a back of a seat, the apparatus comprising:
- a. a container for the material, the container including (i) a lower upwardly extending wall having an upper end and a lower end, (ii) a rounded portion which is formed by a rounded wall which is attached to the upper end of the lower wall at an lower end of the rounded wall, (iii) a horizontal segment having a first end, which is attached to an upper end of the rounded wall, and a second end; and
- b. a holder which is fastened to the seatback and which removably engages the container, the holder including (i) a lower upwardly extending wall having an upper end and a lower end, (ii) a rounded portion which is formed by a rounded wall which is attached to the upper end of the lower wall at a lower end of the holder rounded wall, (iii)

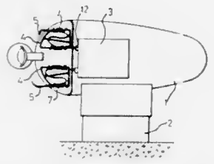
a horizontal segment having a first end which is attached to an upper end of the rounded wall, and a second end; and (iv) a downwardly extending lip portion which is attached to the second end of the holder horizontal segment in a manner that when the rounded portion of the container is inserted within the rounded portion of the holder and the lower wall of the container is moved adjacent to the lower wall of the holder, the container is caused to rotate so that the second end of the container horizontal segment engages the lip of the holder such that the container is held in an interference fit between the rounded portion of the holder and the lip of the holder.

4,836,603

TREATMENT CHAIR ASSEMBLY

Daryl R. Beach, Atami, and Kazuo Hayashi, Kyoto, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed May 4, 1988, Ser. No. 190,000
Claims priority, application Japan, May 29, 1987, 62-137189
Int. Cl.[4] A47C *7/62*
U.S. Cl. 297—193 **3 Claims**



1. A treatment chair assembly comprising a treatment chair and a chair base in which a chair elevating mechanism is housed, said treatment chair elevating characterized in that said treatment chair is pivotally connected to said chair base so that said chair can be turned upward from and downward to said chair base; and wherein:

said treatment chair is pivotally connected to said chair base via a hinge on one longitudinal side of said treatment chair to thereby allow said treatment to take two postures, an upward posture almost vertical to said chair base and a lying posture over said chair base;

said treatment chair has an almost horizontal bed-like form;

treatment instruments and instruments are held at a shoulder section on the bottom of said treatment chair; and

a holder section for securing said treatment instruments and instrument tubes which slides back and forth in removal and installation at the shoulder section on the bottom of the treatment chair is provided.

4,836,604

SADDLE PILLAR FOR BICYCLES AND THE LIKE, PROVIDED WITH MEANS FOR ADJUSTING THE ATTITUDE OF THE SADDLE

Antonio Romano, Padova, Italy, assignor to Campagnolo S.p.A., Vicenza, Italy

Filed Jun. 16, 1988, Ser. No. 207,485
Claims priority, application Italy, Jun. 16, 1987, 67518 A/87
Int. Cl.[4] B62J *1/00*
U.S. Cl. 297—195 **8 Claims**

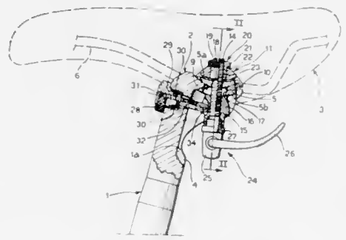
1. A saddle pillar for bicycles and the like, comprising:

a support element which can be fixed to the bicycle frame and has a head on which the saddle can be mounted,

an auxiliary bracket adjustably mounted on the head of the support element, with a part of the load-bearing structure of a saddle adapted to be interposed between the head of said support element and said auxiliary bracket,

clamping means operably connected to said auxiliary bracket for urging said auxiliary bracket toward the head of the support element to clamp said part of the load-bearing structure of the saddle,

adjustment means for effecting a variation of the position of said auxiliary bracket and said clamping means relative to the head of said support element so as to vary accordingly



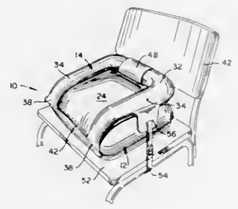
the position of the saddle, said adjustment means comprising an adjustment member operatively connected to said clamping means, said adjustment member being operable after the release of said clamping means to vary the position of the saddle relative to the head of the support element.

4,836,605

INFLATABLE BOOSTER SEAT

Mark H. Greenwood, Arlington Heights, and Alan P. Sherman, Wheeling, both of Ill., assignors to Children On the Go, Inc., Wheeling, Ill.

Filed Mar. 28, 1988, Ser. No. 174,106
Int. Cl.[4] A47D *1/10*
U.S. Cl. 297—250 **15 Claims**



1. A booster seat comprising:

an inflatable lower portion having a first flap means;

an inflatable upper portion which includes outer peripheries and an interior surface having a second flap means connected thereto; and

hinge means connecting the outer peripheries of the upper portion to the lower portion whereby folding the upper portion over the hinge means and securing the first flap means to the second flap means defines a seat pocket.

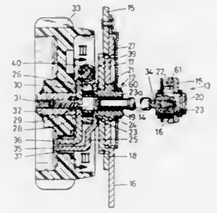
4,836,606

SEAT WITH ADJUSTABLE BACK REST

Heinz Werner, Remscheid-Hasten, Fed. Rep. of Germany, assignor to Keiper Recaro GmbH & Co., Remscheid, Fed. Rep. of Germany

Filed Jul. 7, 1988, Ser. No. 216,368
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1987, 3723204
Int. Cl.[4] A47C *1/24*
U.S. Cl. 297—362 **24 Claims**

1. A seat, particularly for use in motor vehicles, comprising a body supporting portion; a back rest; first and second hinge joints adjustably coupling said back rest to said body supporting portion, each of said hinge joints comprising a first component rigid with said body supporting portion, a second component rigid with said back rest, and a pintle angularly movably mounting the second component on the respective first component, said pintles being coaxial with each other; and means for changing the inclination of said back rest relative to said body



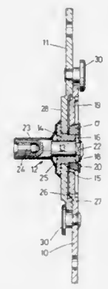
supporting portion including a rotary driving member, a first torque transmitting element non-rotatably mounted on one of said pintles and rotatable by said driving member, a second torque transmitting element non-rotatably mounted on the other of said pintles, rotatable by said driving member and turnable relative to said first torque transmitting element, and means for yieldably biasing said torque transmitting elements toward predetermined angular positions relative to each other.

4,836,607

HINGE JOINT FOR THE SEATS OF MOTOR VEHICLES AND THE LIKE

Bernd Klüting, Radevormwald, Fed. Rep. of Germany, assignor to Keiper Recaro GmbH & Co., Remscheid, Fed. Rep. of Germany

Filed Apr. 14, 1988, Ser. No. 181,557
Claims priority, application Fed. Rep. of Germany, Apr. 14, 1987, 8705554
Int. Cl.[4] B60N *1/06*
U.S. Cl. 297—355 **14 Claims**



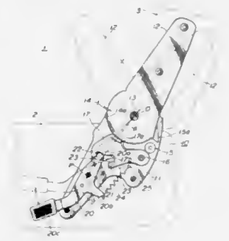
1. A hinge joint, particularly for changing the mutual positions of two portions of a seat, comprising first and second components; means for pivotally connecting said components with each other including a coupling member defining a pivot axis and comprising a first portion journalled in one of said components and a second portion eccentric to said first portion and having a conical external surface, the other of said components having a hole for said second portion and a conical internal surface bounding said hole and substantially complementary to said external surface, said one component having a substantially cylindrical extension and said second portion having an eccentric recess for said extension; and means for biasing said second portion substantially axially into said hole.

4,836,608

RECLINING DEVICE OF SEAT

Hiroshi Sugiyama, Kanagawa, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Dec. 30, 1987, Ser. No. 139,827
Claims priority, application Japan, Mar. 12, 1987, 62-57286
Int. Cl.[4] A47C *1/025*; B60N *1/06*
U.S. Cl. 297—367 **9 Claims**



1. A reclining device of a seat which has a seat cushion and a seatback, said reclining device comprising:

a base member secured to said seat cushion;

a hinge arm secured to said seatback and pivotally connected through a first pivot pin to said base member so that said seatback is pivotal relative to said seat cushion;

a lock plate member movable with said hinge arm, said lock plate member being formed with a first toothed portion;

a lock lever pivotally connected through a second pivot pin to said base member, said lock lever being formed with a second toothed portion which is latchingly engageable with said first toothed portion of the lock plate member when said lock lever assumes a given angular position;

an operation lever pivotally connected through a third pivot pin to said base member for actuating said lock lever, said operation lever being pivotal between a first position to render said lock lever to achieve a latched engagement with said lock plate member through said first and second toothed portions and a second position to render said lock lever to cancel said latched engagement;

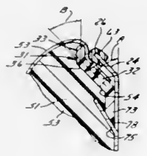
first means for biasing said operation lever in a direction to bias said lock lever to achieve said latched engagement with said lock plate member;

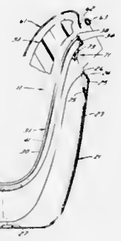
second means for urging said lock lever to keep the latched engagement between said lock lever and said lock plate member when, with said operation lever assuming said first position, an external force is applied to said lock lever in a direction to separate said lock lever from said lock plate member, said second means comprising a part of said lock lever, said part being formed with a recess which leaves at both sides thereof first and second lugs, and arm section integrally and non-movably formed on said operation lever, said arm section extending into said recess of the lock lever, wherein due to the work of said first means, said arm section is pressed against said first lug of said lock lever thereby to bias said lock lever in a direction to achieve the latched engagement with said lock plate member; and

said hinge arm, said lock lever and said operation lever are so arranged that when said operation lever assumes said first position, said arm section of said operation lever is placed on an opposite side of said second pivot pin of the lock lever with respect to an imaginary line which passes through both said first pivot pin of the hinge lever and said third pivot pin of said operation lever and, when said operation lever assumes said second position, said arm

section of said operation lever is placed on the same side as said second pivot pin with respect to said imaginary line.

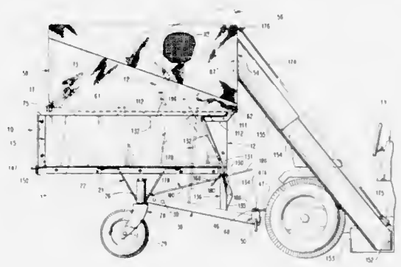
4,836,609
VEHICLE SEAT
Kevin E. Hill, Milwaukee, Wis., assignor to Milsco Manufacturing Company, Milwaukee, Wis.
Filed Apr. 18, 1988, Ser. No. 182,906
Int. Cl.[4] A47C *7/02*
U.S. Cl. 297—452 **15 Claims**





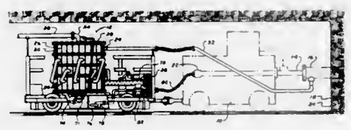
10. A seat assembly for use on a vehicle comprising:
a seat pan (21) having inward and outward facing sides, a flange (24) extending inward toward said inward facing side and a contoured edge (26) on said flange;
a channel shaped finishing strip (62) mounted on said contoured edge;
a seat and backrest cushion (51) supported by said seat pan inward facing side and having an outer margin (54);
an inner support ring (31) mounted on said outer margin of said cushion in face-to-face relation to said flange and having
a periphery (30) matching the contour of said contoured edge, and
a lock rim portion (32) extending outwardly from said cushion margin in overlying relation to said contoured edge;
an upholstery (61) covering said cushion and having a selvage edge (62) extending beyond said cushion to overlay said lock rim portion (33) and extending between said lock rim and said finishing strip; and
a mounting means (71) for securing said support ring (31) to said seat pan to clamp said selvage edge and finishing strip between said contoured edge and said lock rim so that forces on said outward facing side of said seat pan directed toward said support ring will further compress and secure said selvage edge between said lock rim portion and said flange and edge finishing means.

4,836,610
COLLECTOR CART
Charles W. Doering, Louisville; Garland E. Caudill, Bardstown, both of Ky.; Henry L. Johnson, Memphis, Ind., and Bruce A. Thomas, LaGrange, Ky., assignors to Brinly-Hardy Co., Inc., Louisville, Ky.
Filed Jan. 15, 1988, Ser. No. 144,039
Int. Cl.[4] A01D *34/12;* **B60P** *7/02*
U.S. Cl. 298—6 **23 Claims**



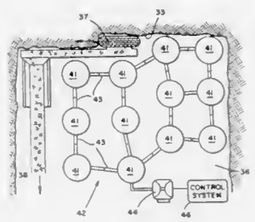
1. A collector cart for towing by pulling means including:
a body having a bottom wall, side walls, a front wall, and an open rear end;
wheel means;
body mounting means for mounting said body for pivotal movement relative to said wheel means and for support thereby;
a canopy including:
a frame;
and a cover mounted on said frame;
frame mounting means to mount said frame on said body for both longitudinal and pivotal movement of said canopy between a closed position and a dumping position;
sad cover of said canopy having means to receive debris into its interior and the interior of said body when said canopy is mounted on said body;
said frame including means to close said open rear end of said body when said canopy is in its closed position when mounted on said body;
actuating means to cause longitudinal shifting of said frame relative to said body prior to causing pivoting of said body relative to said wheel means;
and first causing means for causing pivoting of said frame relative to said body during pivoting of said body relative to said wheel means by said actuating means.

4,836,611
METHOD AND APPARATUS FOR DRILLING AND SEPARATING
Ahmed A. El-Saie, Venetia, Pa., assignor to Consolidation Coal Company, Pittsburgh, Pa.
Filed May 9, 1988, Ser. No. 191,455
Int. Cl.[4] E21F *7/00;* **B01D** *25/38*
U.S. Cl. 299—7 **6 Claims**



1. Apparatus for developing a borehole and separating a liquid and solid mixture collected from the borehole comprising:
(a) a drilling machine for drilling a borehole and removing at least the solid and liquid from the borehole;
(b) a separator for receiving the solid and liquid mixture from the drilling machine;
(c) said separator including a housing with an upper portion having a first intake stage for receiving the mixture; a second separator stage for separating the solid from the liquid and a third reservoir stage for separately collecting the liquid and the solid;
(d) means to transport the collected liquid to the drilling machine for recycling;
(e) means to discharge the collected solids from said separator;
(f) said housing includes a plurality of vertically stacked interconnected cylindrical segments with each separating stage being located in one of said segments;
(g) horizontal screens positioned between each of said segments, each of said segments having liquid outlets connected to said reservoir stage; and
(h) each of said screens having solids discharge outlets, the outlet of one screen being vertically staggered from the outlet in the adjacent screen.

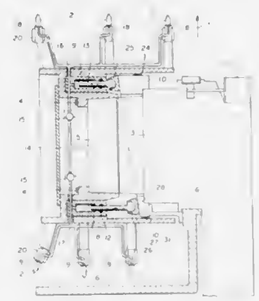
4,836,612
STRESS CONTROL MINING METHOD AND APPARATUS
Shosei Serata, Richmond, Calif., assignor to Serata Geomechanics, Inc., Richmond, Calif.
Filed Aug. 25, 1987, Ser. No. 89,322
Int. Cl.[4] E21L *27/24;* **E21D** *15/44*
U.S. Cl. 299—11 **32 Claims**

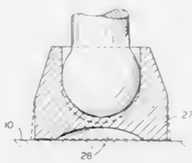


1. A mechanized, stress control mining method, comprising the steps of continuously excavating through an underground formation and advancing a mine face to form a mine opening having a low height/width ratio to enable the formation of an ambient stress envelope about the opening in the underground formation and to protect the medial portions of the roof and floor of the opening from failure, providing a stress control machine directly adjacent to the mine face to exert superlifting force in the range of 5,000–10,000 tons upon the mine roof to support the roof adjacent to the mine face and to displace the ambient stress envelope away from the roof and floor of the opening, and self-locomoting the stress control machine to move with the mine face as it is advanced.

20. A mechanized, stress control mining method, comprising the steps of continuously excavating through an underground formation and advancing a mine face to form a mine opening having a low height/width ratio to promote the formation of an ambient stress envelope spaced from the opening in the underground formation to protect the medial portions of the roof and floor of the opening from failure, providing a plurality of expandable column assemblies directly adjacent to the mine face to exert superlifting force directly between the mine roof and the mine floor to support the roof adjacent to the mine face, providing a plurality of vehicles to which said expandable column assemblies are secured for transport and positioning, expanding selected column assemblies of some of said plurality of vehicles to support the roof while advancing other of said plurality of vehicles to translate other retracted column assemblies connected thereto with the advancing mine face, thereby to advance said expandable column assemblies with said advancing mine face.

4,836,613
CUTTERHEAD FOR WATER JET ASSISTED CUTTING
Roger F. J. Adam, 1351 Washington Rd., Pittsburgh, Pa. 15228
Continuation-in-part of Ser. No. 658,982, Oct. 9, 1984. This application Jan. 21, 1988, Ser. No. 146,305
Int. Cl.[4] E21C *35/22, 35/20*
U.S. Cl. 299—81 **4 Claims**





1. A cutter head for water jet assisted cutting comprising at least one generally cylindrical and rotatable drum having a plurality of cutting tools mounted externally thereof, each having a water jet nozzle directing a high pressure water jet outwardly and directly to the tip of the said tools to assist mechanical action, means including an even number of hydraulic cylinders and corresponding plungers mounted on the inside of and rotatable with said drum, a stationary but rotatably adjustable annular cam coaxial with said drum and having an annular camming surface, said hydraulic cylinders and corresponding plungers having axes parallel to the axis of said drum, each of said plungers having one end reciprocating in the associated cylinder and the other end fitted with a flexible shoe engaging said camming surface, the plungers reciprocat-

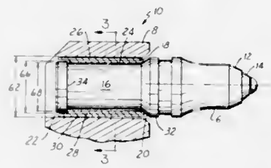
ing movement being controlled by the cam through said flexible shoes, said flexible shoes having a cup shaped sole having an external cavity containing lubricant and designed such that the cup shaped sole is elastically flattened against the cam surface at least once at each drum revolution to create an hydrodynamic lubrication of the interface between the cam and shoe by alternatively sucking surrounding lubricant into the cup shaped sole cavity of the shoe when the pressure on the shoe is released and ejecting said lubricant when the pressure on the shoe increases.

4,836,614

RETAINER SCHEME FOR MACHINE BIT

Randall W. Ojanen, Bristol, Tenn., assignor to GTE Products Corporation, Danvers, Mass.

Filed Nov. 21, 1985, Ser. No. 800,589
Int. Cl.[4] E21C 35/18
U.S. Cl. 299—86 **9 Claims**



1. A rotatable cutting tool which comprises: a cutting bit,
a bit holder having a cylindrical bore for receipt of said bit, said bore having a first diameter,
said cutting bit comprising a head portion including a conical tip and a depending shank portion and first and second retaining portions spaced from each other by an intermediate section,
said first portion positioned axially forward from said second portion toward said head portion, said retaining portions having a second diameter less than said first diameter,
said intermediate section having a third diameter less than said second diameter,
a cylindrical sleeve member rearwardly extending in an axial direction from said first retaining portion to abut with and pass over the second one of said retaining protecting said shank portion from wear,
said sleeve member having an unactivated- fourth diameter greater than said first diameter.

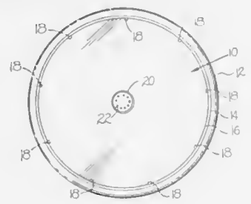
4,836,615

DEMOUNTABLE DISC COVERS FOR SPOKED WHEELS AND THE LIKE

Roger M. Berg, and Francis H. Scott, both of Beaverton, Oreg., assignors to Uni-BMX, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 18,796, Feb. 19, 1987, Pat. No. 4,712,838, which is a continuation of Ser. No. 811,503, Dec. 19, 1985, abandoned. This application May 25, 1987, Ser. No. 54,020
The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.
Int. Cl.[4] B60B 7/04, 7/06
U.S. Cl. 301—37 SA **7 Claims**

1. A demountable disc cover for a bicycle wheel having a rim, an axle, and a multiplicity of spokes interconnected therebetween, consisting essentially of:
a. hoop means of substantially the circumference of said rim but fitting inside thereof, said hoop means being of relatively stiff springy material and having circumferential adjustment means therein;
b. cover means fabricated of a woven fabric imperious to the passage of air therethrough, removably fitting over said hoop means, and having:
1. an axial opening therein the receive said axle; and
2. a circumferential casing thereon;
c. a loop of stretch cord of less length than said circumference threaded in said casing;



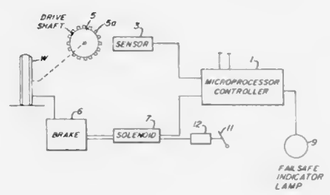
d. a multiplicity of fastening means:
1. removably affixed to said spokes; and
2. removably holding said hoop means adjacent said rim.

4,836,616

ANTILOCK BRAKE SYSTEM

Daniel W. Roper, Rochester; Dennis A. Kramer, Troy; Mark E. Malinowski, Farmington Hills, and John Dombrowski, Redford, all of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Division of Ser. No. 824,750, Jan. 31, 1986, abandoned. This application Jul. 7, 1988, Ser. No. 216,918
Int. Cl.[4] B60T 8/88
U.S. Cl. 303—92 **24 Claims**



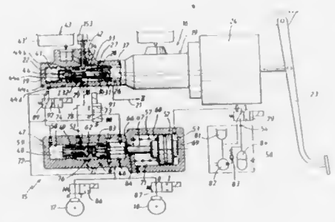
1. In an antilock mechanism for a vehicle having an input rotatable drive shaft which is mounted in a carrier housing for rotating at least one wheel mounted thereon, said vehicle and axle being subject to mechanical vibrations from said wheel, a sensor for measuring a quantity indicative of the rate of rotation of said wheel and generating an input signal, said sensor being subject to mechanical vibrations or electromagnetic interference or environmental interference, and a microprocessor for receiving said input signal, processing said signal and generating an input signal, said sensor being subject to mechanical vibrations or electromagnetic interference or environmental interference, and a microprocessor for receiving said input signal, processing said signal and generating a brake force release signal to release a brake, the improvement comprising:
a shielded metal housing for said sensor and microprocessor;
means for mounting said sensor on said carrier housing in said shielded metal housing at a location next to said drive shaft at a location remote from said wheel;
means for mounting said microprocessor adjacent to said sensor in said shielded metal housing on said carrier housing; and
said input drive shaft for the wheel having spaced magnetic elements for cooperation with said wheel speed sensor.

4,836,617

ANTILOCKING SYSTEM (ABS) AND PROPULSION CONTROL SYSTEM (ASR) FOR A ROAD VEHICLE

Reinhard Resch, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Aug. 1, 1988, Ser. No. 227,106
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1987, 3725594
Int. Cl.[4] B60T 8/44
U.S. Cl. 303—100 **28 Claims**



1. A breaking control system for a road vehicle, providing for:
normal braking, as well as antilocking ABS and propulsion braking control ASR and having hydraulic multi-circuit brake systems, in which brakes on driven vehicle wheels form a part of a static brake circuit which is connected via a brake pressure valve or valves by a main brake line to an outlet pressure space of a brake unit actuable by a pedal;
an antilocking ABS brake system means controlling actuating brake pressure reduction and build-up phases at said brakes by respectively increasing or decreasing an ABS control space volume, which space is connected to the brakes of the driven wheels;
a propulsion ASR system means controlling deceleration of a driven vehicle wheel tending to spin by activating its wheel brake until drive slip of the driven vehicle wheel remains within a range of values compatible both with good propulsion acceleration and with good driving stability;
wherein there is provided an activatable brake pressure regulating valve means for controlling pressure reduction, pressure build-up and pressure holding phases of both the antilocking ABS control and the propulsion ASR control, which is movable out of a through flow position relating to the pressure reduction and pressure build-up phases of the antilocking ABS control and to normal braking not subjected to antilocking control, into a blocking position, related to brake pressure holding phases on the respective wheel brake;
a hydraulic cylinder means having a displaceable piston means for as a pressure build-up and pressure reduction regulating of the antilocking ABS control;
a drive pressure space alternatively connectable by said activatable brake pressure regulating valve means to an outlet pressure of an auxiliary pressure source and to a pressureless tank;
said piston means being displaceable between end positions by pressure in said drive pressure space to define with said hydraulic cylinder, minimum and maximum volumes of an ABS control space which, during normal braking and in pressure reduction and pressure build-up phases of the antilocking ABS control, is connected by said activatable brake pressure regulating valve means with at least one of the wheel brake or wheel brakes of the static brake circuit;
said hydraulic cylinder means having an ASR outlet pressure space as a pressure build-up and pressure reduction regulating means of the propulsion ASR control, which is connectable by said activatable brake pressure regulating valve means to the outlet pressure space of the brake unit and to the brake circuit of the driven vehicle wheels;
the ASR outlet space having a variable area being defined by said hydraulic cylinder means and by a piston means of said hydraulic cylinder means being displaceable in the direction of a brake pressure build-up when said drive pressure space is connected to the outlet pressure of the auxiliary pressure source and to a pressure reduction when drive pressure space is connected to a non-pressure source;
ABS and ASR function control valve means, which in the sequence, connects the drive pressure space with said non-pressure source and with said pressure outlet of the auxiliary pressure source for providing pressure reduction and pressure build-up at the wheel brakes for respective control phases of the antilocking ABS and propulsion ASR control, the improvement comprising:
that said hydraulic cylinder and piston means includes at least one hydraulic cylinder which is designed as a step cylinder;
a movable regulating piston which has two piston flanges of differing diameter;
one piston flange cooperating with the step cylinder to define said ASR outlet pressure space;
movable drive piston means for moving the regulating piston to decrease in volume the ASR outlet pressure space and build up the brake pressure in said at least one wheel brake;
the other of said piston flanges cooperating with the step cylinder to define said ABS control space;
said drive piston means moving the regulating piston to increase in volume the ABS control space and reduce the brake pressure in the at least one wheel brake;
the regulating piston being coupled via a piston rod passing displaceably in a pressure tight manner through an intermediate wall of the cylinder housing to said drive piston means;
said drive piston means with said hydraulic cylinder movably defines the drive pressure space;
connection means for connecting said output pressure of said auxiliary pressure source to said drive pressure space to build up the pressure therein and to connect said drive pressure space to said non-pressure source to relieve the pressure therein;
the drive piston means being responsive to increased pressure in said drive pressure space to move the regulating piston in a direction to increase the ABS control space and decrease the ASR outlet-pressure space and, in response to said release of pressure in said drive pressure space, to move the regulating piston in a direction to decrease the ABS control space and increase the ASR outlet-pressure space,
the drive piston means being biased by a restoring spring into a basic position corresponding to the minimum volume of the ABS control space; and wherein:
the regulating control valve means performs the following functions:
in normal braking not subjected to the antilocking ABS control, the regulating control valve means connects all three of the outlet pressure space of the brake unit, the ASR outlet pressure space, and the ABS control space of the hydraulic cylinder to the main brake line of the brake circuit leading to the wheel brakes;
in braking by the antilocking ABS control, the regulating control valve means connects only the ABS control space to the main brake line of the brake circuit and connects the ASR outlet pressure space to the outlet pressure space of the brake unit;
in braking by the propulsion ASR control, the regulating control valve means cuts off the connection of the outlet pressure space of the brake unit to the main brake line of wheel brakes, while connecting the ABS control space to a non-pressure brake fluid storage tank and the ASR

outlet pressure space to the brake line leading to the wheel brakes.

4,836,618

BRAKE CONTROL SYSTEM FOR CONTROLLING A BRAKING FORCE TO EACH WHEEL OF A MOTOR VEHICLE

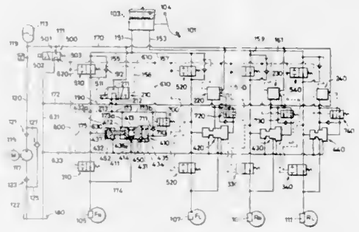
Hideo Wakata, Nagoya; Toshihiro Takei, Okazaki; Yoshiyuki Hattori, Toyoake; Haruhiko Uno, Anjo, and Yuzo Imoto, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 2, 1987, Ser. No. 69,515

Claims priority, application Japan, Jul. 4, 1986, 61-158170; Jul. 4, 1986, 61-158171

Int. Cl.[4] B60T *8/66, 8/40, 3/58, 8/62*

U.S. Cl. 303—103 **10 Claims**



1. A brake control system for use in a motor vehicle, comprising:

braking means including a master cylinder for generating a pressure in response to a depression of a braking pedal of said motor vehicle and applying the generated pressure through first and second braking passages to first and second wheel braking cylinders respectively associated with first and second wheels of said motor vehicle, said first braking passage being coupled to said first wheel braking cylinder and said second braking passage being coupled to said second wheel braking cylinder;

braking pressure source means for generating a hydraulic pressure independent of said braking means;

first and second pressure control means respectively coupled to said braking pressure source means for causing braking pressures to be generated therefrom and for allowing the braking pressures to be regulated independent of each other, said first pressure control means being coupled through said first braking to said first wheel braking cylinder and said second pressure control means being coupled through said second braking passage to said second wheel braking cylinder, said first and second pressure control means being responsive to the pressure from said master cylinder for respectively regulating braking pressures to said first and second wheel braking cylinders as an amount which is magnified by a predetermined amount as compared with the pressure from said master cylinder, by regulation of the pressure from said braking pressure source means;

first detection means for detecting a condition of each of said first and second wheels;

second detection means for detecting a running condition of said motor vehicle;

third detection means for detecting a pressure generated in said master cylinder;

fourth detection means for detecting a pressure applied to each of said first and second wheel braking cylinders;

target braking pressure setting means connected to said first to third detection means for determining first and second target braking pressures to said first and second wheel braking cylinders in accordance with the conditions of said first and second wheels detected by said first detection means, the running condition of said motor vehicle detected by said second detection means and the master cylinder pressure detected by said third detection means; and

control means connected to said target braking pressure setting means for generating first and second control signals to said first and second pressure control means so that the hydraulic pressures in said first and second wheel braking cylinders detected by said fourth detection means are respectively equal to said first and second target braking pressures set in said target braking pressure setting means, said first and second control signals thereto controlling magnification ratios of the pressure from said master cylinder and the pressures to said first and second wheel braking cylinders.

4,836,619

ANTI-LOCK CONTROL METHOD FOR VEHICLE

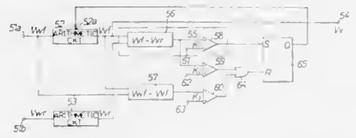
Tetsuji Muto, Tochigi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1988, Ser. No. 148,764

Claims priority, application Japan, Jan. 26, 1987, 62-15477

Int. Cl.[4] B60T *8/66, 8/70*

U.S. Cl. 303—109 **3 Claims**



1. An anti-lock control method for a vehicle equipped with wheels including a driving wheel and a follower wheel, the method comprising the steps of integrating a wheel speed to estimate a vehicle speed, comparing said wheel speed with a reference value derived from said estimated vehicle speed to judge whether the wheels are entering a locked state, and reducing a brake pressure to a wheel brake when said wheels are entering a locked state, wherein said vehicle speed comprises a first vehicle speed and a second vehicle speed, said first vehicle speed being estimated on the basis of a speed of at least one wheel including at least said driving wheel, said second vehicle speed being estimated on the basis of a speed of said follower wheel, wherein said driving wheel is judged to be in a racing state when said first estimated vehicle speed is larger than said second estimated vehicle speed above a predetermined value, thereby utilizing the result of said judgment in controlling of said brake pressure, and wherein when said driving wheel is judged to be in a racing state, said first estimated vehicle speed is kept constant and such constant vehicle speed is used to determine said reference value.

4,836,620

ANTI-SKID CONTROL APPARATUS FOR A VEHICLE BRAKING SYSTEM

Tetsuro Arikawa, Kanagawa, Japan, assignor to Nippon A B S, Ltd., Tokyo, Japan

Filed Jun. 5, 1987, Ser. No. 58,548

Claims priority, application Japan, Jun. 11, 1986, 61-135578

Int. Cl.[4] B60T *8/62*

U.S. Cl. 303—111 **11 Claims**

1. In an anti-skid control apparatus for a vehicle braking system including:

(A) a pair of front wheels, and a pair of rear wheels;

(B) wheel speed sensors associated with said wheels, respectively;

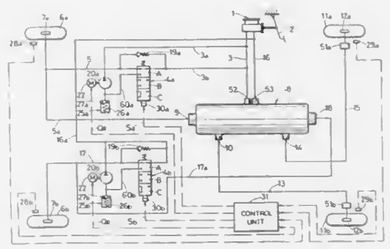
(C) a first fluid pressure control valve device for controlling the brake fluid pressure of the wheel cylinder of one of said front wheels, arranged between a first fluid pressure generating chamber of a tandem master cylinder and said wheel cylinder of the one front wheel;

(D) a second fluid pressure control valve device for controlling the brake fluid pressure of the wheel cylinder of another of said front wheels, arranged between a second fluid pressure generating chamber of said tandem master cylinder and said wheel cylinder of the other front wheel, the improvement comprising:

a control unit receiving outputs of said wheel speed sensors for measuring of judging the skid conditions of said front and rear wheels and for generating instruction for controlling said first and second fluid pressure control valve devices, said control unit including wheel speed signal generators receiving the outputs of said wheel speed sensors and calculating rotational speeds of said wheels, the control unit including

a substractor receiving the outputs of the corresponding ones of said wheel speed signal generators for the front and rear wheels on the same side of the road, and calculating the rotational speed difference between said front and rear wheels on the same side,

a first comparator comparing said rotational speed difference with a reference value and generating output when said rotational speed difference becomes larger than said reference value,



wheel deceleration signal generators receiving the outputs of said wheel speed signal generators and calculating decelerations of said wheels,

a second comparator receiving the output of the rear wheel decelerator signal generator of said wheel deceleration signal generators, comparing the rear wheel deceleration as said output with a reference deceleration value which is smaller than another reference deceleration value for the front wheel, and generating output when said rear wheel deceleration becomes higher than said reference deceleration value; and

a logic part generating the instruction which controls said first or second fluid pressure control valve device for said same side so as the maintain the brake fluid pressure to the wheel cylinder at constant or to reduce the rising gradient of the brake fluid pressure to the wheel cylinder, on the basis of the output of said first or second comparator, before said one front or rear wheel one said same side first generates a brake relieving signal as the measuring or judging result of the skid condition; and

(F) a valve apparatus for generating a fluid pressure in accordance with the lower one of the brake fluid pressures of said front wheels controlled with said first and second fluid pressure control valve devices, being arranged between said wheel cylinders of the front wheels and those of the rear wheels.

4,836,621

DISK FILE APPARATUS

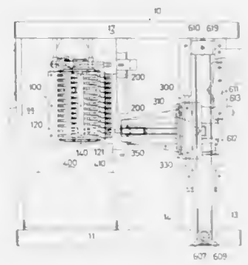
Shunichi Teranishi, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi Pref., Japan

Filed Oct. 26, 1987, Ser. No. 113,685

Claims priority, application Japan, Oct. 24, 1986, 61-254356

Int. Cl.[4] G11B *5/012*

U.S. Cl. 360—98.05 **1 Claim**



1. A disk file apparatus comprising:

(a) an accommodating shelf having a multiplicity of accommodating spaces provided therein in a vertical column;

(b) a multiplicity of cartridges disposed in said accommodating spaces, respectively, each having a disk with two sides A and B received therein and further having a forward extending groove formed in the rear portion thereof;

(c) a coder which writes or reads information in relation to either side A or side B of the disk received in each of said cartridges;

(d) a transfer member movable in the horizontal direction and normally disposed at the upper side of said accommodating shelf, said transfer member having lever means for contacting the rear portion of a cartridge inserted into said transfer member to detect whether or not there is a groove formed in the rear portion of said cartridge;

(e) a carrier mounted in said apparatus for vertical movement along the respective front surfaces of said transfer member and said accommodating shelf and having means for drawing out a cartridge from said transfer member, inserting said cartridge into an empty accommodating space in said accommodating shelf, drawing out a designated one from the multiplicity of cartridges accommodated in said accommodating shelf, and loading said cartridge into said coder;

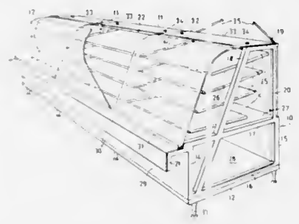
(f) control means arranged such that, when said lever means detects the groove formed in the rear portion of the cartridge inserted in said transfer member, said controller activates said carrier to turn said cartridge through 180 degrees while said cartridge is being moved from said transfer member to an empty accommodating space in said accommodating shelf, and when the downward side of the disk received in the selected cartridge is not coincident with the side which is to be subjected to writing or reading of information in said coder, said controller activates said carrier to turn said selected cartridge through 180 degrees before it is loaded into said coder;

(g) a casing enclosing said shelf, said coder, said transfer member, and said carrier;

(h) an opening formed in said casing in opposed relation to said transfer member; and

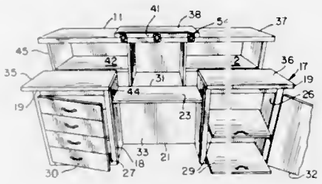
(i) shutter means provided at said opening for closing said opening and adapted to be opened by said transfer member to permit insertion or removal of a cartridge to or from said transfer member.

4,836,622
DISPLAY CABINET
John W. Ferguson, 193 Prospect St., Wynnum North, Queensland, Australia (4178)
Filed Jan. 21, 1988, Ser. No. 146,545
Claims priority, application Australia Jan. 21, 1987, PH9955
Int. Cl.[4] A47F 3/00
U.S. Cl. 312—114 4 Claims



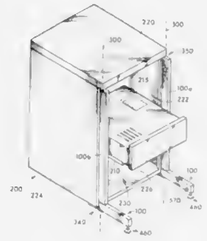
1. A display cabinet comprising:
at least one transparent front panel;
at least one top section;
a plurality of generally similar upright frames rigidly interconnected in parallel spaced apart relationship supporting said front panel and said top section;
said frames including standards set back from the front of said cabinet and inclining rearwards from bottom to top;
means fixed to said standards for supporting shelf means;
shelf means supported in said support means, said shelf means being cantilevered forwardly and rearwardly of said standards, the front edges of said shelf means being aligned substantially in a plane parallel to said standards;
said transparent front panel being disposed in front of said shelf means and inclining rearwards from bottom to top in a plane substantially parallel to said standards.

4,836,623
EXECUTIVE DESK CONVERTIBLE INTO A COMPUTER CENTER
Robert C. Holland, 931 State Rd., 434 - Ste. 1201, Altamonte Springs, Fla. 32714
Filed Mar. 29, 1988, Ser. No. 174,871
Int. Cl.[4] A47B 17/00
U.S. Cl. 312—195 6 Claims



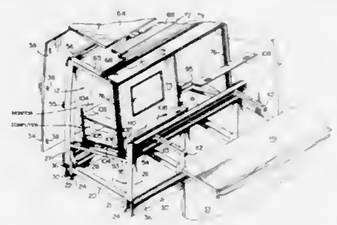
1. An executive desk convertible into a computer center, accomodating at least a computer, a display screen and a keyboard, comprising
(a) a substantially horizontal flat top,
(b) front and two side panels extending vertically and positioned along edges of said top,
(c) said top comprising a plurality of sectional edge mating surfaces,
(d) said plurality of surfaces including a front surface having an edge positioned adjacent said front panel and extending between said side panels, a center surface, positioned to have an edge mating with the said front surface, a first side surface positioned adjacent a second edge of said center surface, and a second side surface positioned adjacent a third edge of said center surface, and said plurality of surfaces forming a substantially flat plane,
(e) a rectangular well formed in said desk, said well extending along the front of said desk adjacent said front panel and between said side panels,
(f) a cabinet mounted within said well, said front sectional surface of said top also forming the top of said cabinet,
(g) said cabinet including shelves for supporting equipment such as a computer and a display screen,
(h) means for selectively raising and lowering said cabinet relative to said said first and second side surfaces,
(i) first and second groups of drawer compartments respectively mounted adjacent said first and second side panels,
(j) a knee opening formed in said desk intermediate said drawer compartments,
(k) said first and second side surfaces respectively positioned over said first and second groups of drawer compartments,
(l) a platform positioned in said knee opening, said platform being at a lower position relative to said top,
(m) said center surface comprising a cover for said platform, and,
(n) hinge means, said cover center surface cover being mounted by said hinge means to said front surface, and being selectively pivotable to a first position to fold back on top of the center portion of said front surface, and to a second position to cover said platform.

4,836,624
ANTI-TIP DEVICE
Bruce R. Schwickrath, Thornton, Colo., assignor to Intellistor, Inc., Longmont, Colo.
Filed Apr. 5, 1988, Ser. No. 177,658
Int. Cl.[4] E05G 65/46
U.S. Cl. 312—216 7 Claims



1. An anti-tip device for a free-standing, cabinet, said cabinet having side supports, a floor, and an open front, said cabinet further containing a sliding shelf mounted on conveying means affixed to the interior of said side supports so that said sliding shelf moves horizontally through said open front along said conveying means, said anti-tip device comprising:
a pair of upright, L-shaped members, each of said L-shaped members having a vertical leg and a horizontal arm, said vertical leg and horizontal arms being substantially rectangular hollow shafts having at least two narrow sides and one wider side, said vertical leg being substantially as long as the height of said cabinet and said horizontal arm being half as long as the width of said cabinet, said vertical leg terminating in a closed top end having a formed hole and a closed bottom end and said horizontal arm having upper and lower narrow sides, said closed bottom end of said vertical leg abutting and affixed to a longitudinal end of said narrow upper side of said horizontal arm, said horizontal arm terminating in a proximal closed end near the attachment of said vertical leg to said horizontal arm and a distal closed end opposite from said proximal closed end, said distal end of said horizontal arm further having a threaded hole in said lower narrow side, said wider side of said vertical leg and said wider side of said horizontal arm being oriented in a vertical plane forming a closed front face of said L-shaped member when said L-shaped members are in a retracted position in which said L-shaped members are adjacent to the front edges of said side supports and said floor of said cabinet, said L-shaped members having a rear face opposite said closed front face;
a pair of detachable pivoting means, each of said detachable pivoting means comprising a pin affixed to said lower narrow side of said proximal end of said horizontal arm, and said pair of detachable pivoting means further comprising a substantially rectangular, thin, horizontal bracket affixed to opposite front corners of the underside of said cabinet, each of said brackets extending in a forward direction for a distance approximately equal to the width of said narrow side of said horizontal arm, each of said brackets having a formed lower hole for receiving said pin, said pair of pivoting means further comprising a thin, friction-reducing washer, each of said washers having a diameter substantially equal to said width of said narrow side of said horizontal arm, said pins having a length slightly greater than the thickness of the combination of said bracket and said washer so that, when said pins are downwardly inserted respectively through said washer and into said lower hole in said brackets, removable attachment of said L-shaped members to said cabinet at the junctions of said proximal ends of said horizontal arms of said L-shaped members with said lower front corners of said cabinet is permitted and rotation of said L-shaped members on axes parallel to the front edges of said side supports is allowed;
a pair of releasable pivoting means accessible through said rear face of said L-shaped members, each of said releasable pivoting means having a bolt mounted through a pair of cylindrical guides, said guides affixed in alignment on the inner surface of said hollow shaft of said vertical legs so that said bolt moves through said guides in a vertical direction, said bolt extending through said formed hole in said closed top end of said vertical leg, said cabinet having opposite front upper corners each having an upper hole in vertical alignment with said lower hole in said brackets, said upper hole having a size appropriate to receive the upper end of said bolt, said bolt encircled by a spring between said guides, said bolt having a stopping means, said stopping means being able to hold the upper end of said spring so that compression of said spring is caused by downward motion of said bolt and relaxation of said spring coincides with upward motion of said bolt, said bolt further having a handle means, said handle means being located at the lower end of said bolt so compression of said bolt may be easily accomplished;
a pair of adjustable support members, each of said adjustable support members having a smooth disk of a diameter greater than said width of said narrow side of said horizontal arm, said adjustable support members further each having a centrally attached threaded shaft for adjustable attachment of said support members to said horizontal arms of said L-shaped members, so that said distal ends of said horizontal arms are firmly supported when in an extended position; and
a pair of magnetic holding means, said magnetic holding means each attached near said distal ends of said horizontal arms so releasable contact is made between said L-shaped members and the front edge of said floor of said cabinet.

4,836,625
CONSOLE STRUCTURE
David Catta, Calgary, Canada, assignor to 221241 Alberta Ltd., Calgary, Canada
Filed Jul. 24, 1987, Ser. No. 77,237
Claims priority, application Canada, Apr. 13, 1987, 534590
Int. Cl.[4] A47B 48/00
U.S. Cl. 312—257 SK 30 Claims

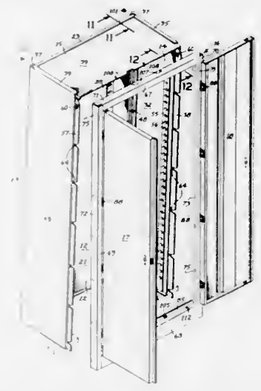


1. A console structure for supporting one or more pieces of equipment, comprising:
a plurality of horizontally-spaced, vertically upright gable members each of said gable members including a lower substantially horizontal cross member, rear post means extending upwardly from one end of said cross member, front post means extending upwardly from the other end of said lower cross member, a cantilevered beam extending forwardly from the upper end of said rear post means, leaving a gap between the forward end of said cantilevered beam and the upper end of said front post means, and crossbar means extending between said front and rear post means,
stringer means interconnecting said gable members to provide a self-supporting structure defining therein a continuous unobstructed cavity within which at least some of said pieces of equipment may be supported, said stringer means including therein at least one continuous longitudinally extending alot adapted for connection to fastening means joining said stringer means to said gable members, and
means for supporting said pieces of equipment within said cavity.

4,836,626
KNOCK-DOWN CABINET
Homer L. Taylor, Centerville, and Peter Katz, Nashville, both of Tenn., assignors to Tennsco Corporation, Dickson, Tenn.
Filed Apr. 15, 1988, Ser. No. 182,376
Int. Cl.[4] A47B 43/00
U.S. Cl. 312—257 SM 10 Claims

1. A knock-down cabinet comprising:
(a) a rear wall having front and rear surfaces, top and bottom edges and opposite sides terminating in forward projecting, upright side flanges,
(b) a pair of said walls, each side wall having top, bottom, front, and rear edge portions and inside and outside surfaces, an upright rear flange projecting inboard from each said rear edge portion, and a top flange projecting inboard from each said top edge portion,
(c) a rear retainer flange mounted on and spaced from said inside surface of each of said side walls adjacent said rear edge portion to form a rear retainer slot opening rearward and spaced from said rear flange on said corresponding side wall to receive said corresponding side flange in an operative assembled position,
(d) a top retainer flange mounted on and spaced from said inside surface of each of said side walls adjacent said top edge portion to form a top retainer slot opening upward and spaced from said top flange of said corresponding side wall,

(e) a top wall, having top and bottom surfaces, front and rear edge portions and opposite sides terminating in depending side flanges adapted to be received in said top retainer slots in said operative assembled position,
(f) each of said front edge portions of said corresponding side walls comprising an elongated front connector strip having opposite end portions,
(g) a key-way in one end portion of each of said front connector strips,



(h) a door frame having a pair of upright side frame members,
(i) a shoulder stud projecting inboard from each of said side frame members for insertion and engagement in a corresponding key-way in said one end portions of said front connector strips, and
(j) means for securing said door frame to said side walls in said operative assembled position.

4,836,627

Patent Not Issued For This Number

4,836,628

HOLOGRAPHIC FILM MATERIAL

James Doyle, Wilmslow; Anthony J. Bord, Leigh, and Fiona E. Davidson, Henbury, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Apr. 6, 1987, Ser. No. 35,024

Claims priority, application United Kingdom, Apr. 4, 1986, 8608278

Int. Cl.⁴ G03H *1/04*

U.S. Cl. 350—3.61 **9 Claims**

1. Holographic film material which comprises coated on a light transparent base at least one light-sensitive gelatine silver halide emulsion layer the silver halide grains of which have a median grain size of less than 0.1 μm there being present in the emulsion layer from 0.1 to 1.0 g of a water-soluble compound per gram of silver present in the emulsion, the water-soluble compound being a compound which (1) does not afffect the photographic properties of silver halide emulsion, (2) which is non-light scattering and (3) can be leached out from the emulsion layer during processing of the exposed holographic film material.

4,836,629

DEVICE TO CONTROL A LIGHT BEAM IN A WIDE ANGLE FIELD AND APPLICATION TO A SENSING DEVICE

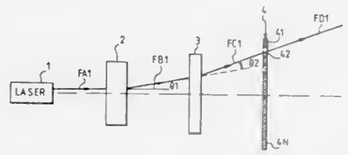
Jean Pierre Huignard, Paris, and Jean Louis Meyzonnette, Jouy En Josas, both of France, assignors to Thomson-CSF, Paris, France

Filed May 17, 1988, Ser. No. 195,134

Claims priority, application France, May 19, 1987, 87 06991

Int. Cl.⁴ G02B *5/32*; G02F *2/00, 2/02*; H04B *9/00*

U.S. Cl. 350—3.73 **13 Claims**



1. A device to control the direction of a first light beam, emitted by a laser source comprising the following different, successive elements aligned in the direction of this first light beam:

A low-deflection, controlled deflection device, that receives the first light beam and transmits a second beam along a second direction which is chosen from among several directions and makes an angle with the direction of the first beam;

a holographic multiplexer comprising several recorded zones, each giving, for each beam received by each zone along said second direction, a third beam, the direction of which depends on said second direction;

shutters with open/close control, each placed in one possible direction of the third beam, enabling the choice of transmission of one or more defined third beams.

4,836,630

OPTICAL SCANNING SYSTEM HAVING A SURFACE INCLINATION CORRECTION FUNCTION

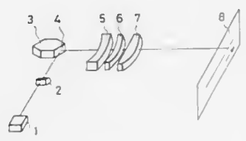
Kenichi Takanashi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 22, 1987, Ser. No. 111,257

Claims priority, application Japan, Oct. 23, 1986, 61-250722

Int. Cl.⁴ G02B *26/10*

U.S. Cl. 350—6.1 **5 Claims**



1. An optical scanning system, comprising:

a light source for emitting a light flux;

first image forming means for forming a first image at a predetermined location from the light flux emitted from said light source;

a rotating polygon mirror having at least one reflecting surface in the vicinity of said first image, said reflecting surface reflecting said light flux from said light source, thereby causing said light flux to be deflected over a predetermined angle; and

second image forming means for forming a second image on a scanning surface from said light source deflected by said rotating polygon mirror, said second image forming means defining a conjugate relationship in terms of geometrical optics between said reflecting surface and said scanning surface, said second image forming means including a first single spherical meniscus lens having a negative refracting power, a second single spherical meniscus lens having a positive refracting power, and a third single lens having a cylindrical surface facing said second lens and a toric surface at its opposite surface, said first, second and third lenses being arranged in the order mentioned between said rotating polygon mirror and said scanning surface;

whereby, designating a lateral magnification of said conjugate relationship by β, an inradius of said rotating polygon mirror by R, and a focal distance of said second image forming means by f_M, the following conditions are satisfied:

$$-4.7 < \beta < -2.7; \text{ and} \quad (1)$$

$$-34.2 < \beta \cdot \frac{f_M}{R} < -9.3. \quad (2)$$

4,836,631

LASER SCANNING MOTOR HAVING A ROTATING POLYGONAL MIRROR AND METHOD OF MANUFACTURING THE SAME

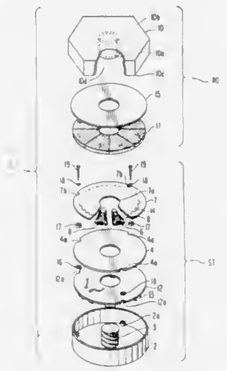
Kikuo Shimazu, Yokohama; Kazuo Suzuki, Ohtsu; Manabu Shiraki, Yamato, and Osami Miyao, Sagamihara, all of Japan, assignors to Kanegafuchi Chemical Industry Co., Ltd., Osaka and Shicoh Engineering Co., Ltd., Yamato, both of, Japan

Filed Jul. 23, 1986, Ser. No. 888,425

Claims priority, application Japan, Jul. 23, 1985, 60-112741; Oct. 24, 1985, 60-162137

Int. Cl.⁴ G02B *26/10*; H02K *37/00*

U.S. Cl. 350—6.8 **20 Claims**



4. A laser scanning motor having a rotatable polygonal outer mirror for deflecting light beams incident thereon, said laser scanning motor comprising:

a base;

a rotor assembly rotatably supported on said base and including a main portion supporting on a side thereof the rotatable mirror for deflecting said light beams, said rotor assembly having an axially defined doughnut-shaped cavity;

rotor magnetic poles made of a plastic magnetic material and disposed on a side wall of said cavity with a rotor yoke therebetween;

stator coils dispersed in said cavity in confronting relation to said rotor magnetic poles; and a cup-shaped coil yoke having a bottom surface secured to said base and disposed in confronting relation to said rotor magnetic poles having said stator coils disposed therebetween.

4,836,632

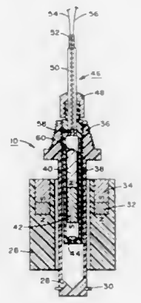
FIBER OPTIC LIQUID LEVEL SENSOR

Robert J. Bardoorian, New Britain, Conn., assignor to National Magnetic Sensors Inc., Plantsville, Conn.

Filed May 16, 1988, Ser. No. 194,397

Int. Cl.⁴ G02B *6/36, 7/26*

U.S. Cl. 350—96.20 **6 Claims**



1. A liquid level sensor, comprising:

(a) tube means;

(b) connector means at one end of said tube means, said connector means adapted to connect to said tube means first and second optical fibers terminating in said tube means, said first optical fiber being connected to a source of light and said second optical fiber being connected to a light detector;

(c) mirror means movable within said tube means such that, at a selected point of movement of said mirror means, said mirror means will reflect light from said first optical fiber to said second optical fiber; and

(d) means responsive to changes in said liquid level to effect movement of said mirror means.

4,836,633

OPTICAL CONNECTING ARRANGEMENTS

Peter J. Morgan, Allen, Tex.; Andrew C. Carter, Northamptonshire, England; Richard Davis, Northamptonshire, England, and Frederick A. Randle, Northamptonshire, England, assignors to Plessey Overseas Limited, Ilford, England

PCT No. PCT/GB86/00166, § 371 Date Jan. 23, 1987, § 102(e) Date Jan. 23, 1987, PCT Pub. No. WO86/05596, PCT Pub. Date Sep. 25, 1986

PCT Filed Mar. 24, 1986, Ser. No. 939,518

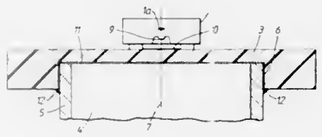
Claims priority, application United Kingdom, Mar. 22, 1985, 8507560

Int. Cl.⁴ G02B *6/32, 6/36*

U.S. Cl. 350—96.18 **4 Claims**

1. An optical coupling arrangement between an optical device and an optical fibre, comprising an optically transparent substrate to one surface of which the optical device is attached by means of an array of boned connections made between corresponding precisely positioned metal bonding pads provided on the optical device and substrate, the other surface of the substrate having formed therein a cylindrical recess located in precise positional relationship with the boned connections between the optical device and the substrate and receiving one end of a GRIN rod lens so that the end of the lens is located in

very close proximity and centralized with respect to an active surface of the optical device, the other end of the GRIN rod



lens having the optical fibre coupled thereto in abutting precise optical alignment.

4,836,634

WAVELENGTH MULTIPLEXER/DEMULTIPLEXER USING OPTICAL FIBERS

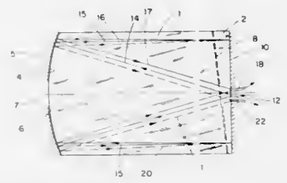
Jean-Pierre Laude, St Cyr la Riviere, France, assignor to Instruments SA, Paris, France

Continuation of Ser. No. 816,724, Jan. 7, 1986, which is a continuation of Ser. No. 452,481, Dec. 23, 1982, Pat. No. 4,583,820, which is a continuation-in-part of Ser. No. 247,440, Mar. 25, 1981. This application Dec. 21, 1987, Ser. No. 140,937

Claims priority, application France, Apr. 8, 1980, 80 07849; Sep. 26, 1980, 80 20710; Dec. 12, 1980, 80 26465; Dec. 24, 1981, 81 24211

Int. Cl.[4] G02B *6/34*; H04B *9/00*

U.S. Cl. 350—96.19 **5 Claims**



1. A device comprising:

(a) a solid transparent member having a length and defining first and second ends at opposite extremes of said length, said first end being configured and dimensioned to form a support for a focusing surface having curvature along two orthogonal axes;

(b) reflective means, adjacent said first end, for forming a reflective focusing surface;

(c) first light conducting means positioned proximate said second end and positioned at a first end of a path along which light is sent or received, said path extending toward said reflective focusing surface said light conducting means being positioned to form a glass-to-glass interface with said solid transparent member;

(d) diffraction grating means disposed adjacent said second end, for diffracting light incident on said grating means along said path from said reflective means and reflecting it further along said path back toward said reflective means; and

(e) second light conducting means positioned proximate said second end and positioned at the end of said path opposite said first end of said path, said path extending from said first light conducting means to said reflective means, from said reflective means to said grating means, from said grating means to said reflective means, and from said reflective means to said second light conducting means, said second light conducting means comprising a plurality of optic fibers, positioned at first and second opposite path ends of said path and each positioned to form a glass-to-glass interface with said solid transparent member at respective points corresponding to said opposite path ends, each of said opposite path ends corresponding to light of different wavelengths, said opposite path ends being coincident with the paths followed by light of different wavelengths passing through said first light conducting means, said first path end and said first opposite path end corresponding to conjugate object image points for light of a first wavelength, and said first path end and said second opposite path end corresponding to conjugate object image points for light of a second wavelength.

4,836,635

ACTIVE BASE FOR AN OPTICAL CONNECTOR

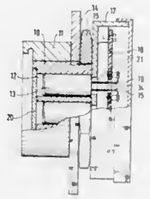
Lionel De Amorim, Lannion, France, assignor to Alcate Cit, Paris, France

Filed Feb. 24, 1988, Ser. No. 159,999

Claims priority, application France, Feb. 26, 1987, 87 02558

Int. Cl.[4] G02B *6/42*

U.S. Cl. 350—96.20 **8 Claims**



1. An active connector base for engagement with a plug having an optical fiber, said base comprising a body having a cylindrical hole, an optical module inserted within said hole as a unit, said module being removable from said hole as a unit and being constituted by a socket having a longitudinal axis XX', a cylindrical support fitted with one of a light-emitting and light-receiving diode encapsulated in a package having a flange, said cylindrical socket being tight fitted in one end of the socket, the improvement wherein:

said cylindrical support is a hollow support having a bottom with a hole, the diameter of said hole being greater then the diameter of the package and said flange being pressed against said bottom, inside the support,

the support and the package constituting an assembly set inside the socket,

said hole through the hollow support allowing the package to be moved perpendicularly to the axis XX' of the socket in order to position the diode on said axis XX', and

holding means for keeping said package in position after the diode has been positioned by insertion in the support, allowing said diode positioning to be performed during manufacture of the optical module.

4,836,636

OPTICAL SWITCH AND OPTICAL KEYBOARD UTILIZING THE SAME

Yuichi Obara; Kenichi Fuse; Yosbihiro Onuma, all of Hitatsuka; Takao Toya, and Kazuo Chiba, both of Ichihara, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1987, Ser. No. 118,065

Claims priority, application Japan, Nov. 13, 1986, 61-173392; Nov. 13, 1986, 61-173393; Nov. 13, 1986, 61-173394; Nov. 13, 1986, 61-268673; Nov. 29, 1986, 61-284874; Mar. 24, 1987, 62-43022; Apr. 14, 1987, 62-56599; Oct. 3, 1987, 62-250072; Oct. 3, 1987, 62-250073

Int. Cl.[4] G02B *6/36*; H01J *5/16*; B41J *5/08*

U.S. Cl. 350—96.20 **8 Claims**

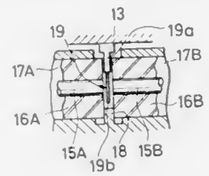
1. An optical switch, comprising:

a pair of large diameter optical fibers;

a housing having an opening at each end thereof;

sleeves into which the ends of the fibers are inserted, each sleeve being fitted into one opening of the housing, the sleeves so fitted being positioned on the same longitudinal axis;

a stopper on the inner surface of the housing, the stopper



projecting inwardly to form an abutment for each sleeve and thereby provide a predetermined space between each sleeve and fiber end face: and

a light shielding plate moveable into or out of the space between the end faces of the optical fibers in the sleeves for selectively interrupting or permitting optical continuity between the fibers in each sleeve.

4,836,637

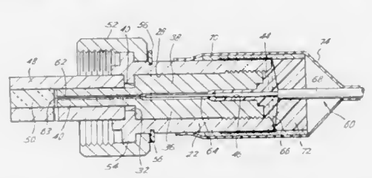
EXPANDED-BEAM FIBER-OPTIC CONNECTOR

Thomas J. Poorman, 9797 Meadowglen, #2005, Houston, Tex. 77042; Josephine Lopez, 602 N. Broadway, McAllen, Tex. 78501, and Christine L. Behrens, Rte. 1, Box 51E6, Rosenburg, Tex. 77471

Continuation of Ser. No. 865,449, May 21, 1986, abandoned. This application Jan. 11, 1988, Ser. No. 144,627

Int. Cl.[4] G02B *6/38*

U.S. Cl. 350—96.21 **9 Claims**



1. A fiber-optic connector assembly, comprising in combination:

a body having a bore axially extending therethrough, defining a first and a second end, said bore having a restriction at said second end;

an aligning sleeve having a converging axial hole, received and threadably anchored in said bore, said aligning sleeve having a neck portion extending through said restriction and out from said second end;

a lens ferrule in intimate contact with said second end of said body, said neck portion of said aligning sleeve extending into said ferrule;

a self-focusing microlens concentrically disposed within said lens ferrule and adjacent an end of said neck portion;

an optical fiber having a stress member, received in said first end of said body, and axially disposed within said aligning sleeve, so that an end of said optical fiber is with said self-focusing microlens axially aligned at a focal point thereof;

means for coupling said stress member to said first end of said body, fixing said optical fiber within said aligning sleeve; and

means for coupling said fiber-optic connector assembly in axial alignment to a like connector assembly.

4,836,638

CONNECTOR ELEMENT FOR LIGHT WAVEGUIDES

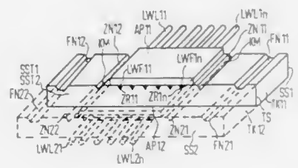
Lothar Finzel, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 13, 1987, Ser. No. 107,341

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1986, 3635274

Int. Cl.[4] G02B *6/38*

U.S. Cl. 350—96.21 **9 Claims**



1. In a connector element for optical fibers, said connector element comprising two carrier members being arranged in alignment with their end faces abutting, each of the carrier members having a plurality of V-shaped centering grooves proceeding parallel to each other and containing said optical fibers, guide channels proceeding on both sides of the centering grooves for receiving guide rails which extend between the two carrier members, a cover plate lying on the optical fibers of the grooves of each member, an adhesive material for mutually fastening the optical fibers, cover plate and respective carrier member together, and an immersion fluid being introduced adjacent the abutting end faces of the members, the improvements comprising means for preventing a flow of both excess adhesive material and immersion fluid into the guide channels, said means for preventing including auxiliary grooves in each of the carrier members extending between the centering grooves and each guide channel, said auxiliary grooves providing collecting surfaces adjacent each side of the centering grooves.

4,836,639

OPTICAL FIBER CABLE HAVING A NEUTRAL AXIS DEFINING A ZERO STRESS

Naoki Shamoto, Sakura; Hideo Suzuki, Funabashi; Yasuyuki Sugawara, Shisui; Masaaki Kawase, Mito, and Hiromichi Shinohara, Tokyo, all of Japan, assignors to Fujikura Ltd. and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan

Filed Mar. 3, 1987, Ser. No. 21,097

Claims priority, application Japan, Mar. 4, 1986, 61-46766

Int. Cl.[4] G02B *6/44*

U.S. Cl. 350—96.23 **13 Claims**

1. An optical fiber cable comprising:

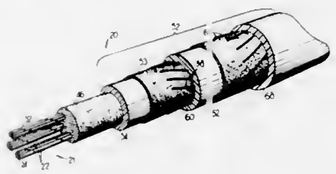
(a) a flexible pipe of a plastics material defined by a peripheral wall and having an axial bore therethrough;
(b) a group of optical fibers loosely mounted within said bore and movable into contact with an inner surface of said peripheral wall of said pipe, and
(c) at least one elongated flexible reinforcing member embedded in the peripheral wall of said pipe and extending along a longitudinal axis of said cable, said reinforcing member being disposed in the vicinity of said group of optical fibers and made of a material having a higher Young's modulous than that of the plastics material; wherein a cross-section of said optical fiber cable has a neutral axis extending through said bore defining a line of zero stress when said cable is bent longitudinally in a first direction to dispose said reinforcing member radially inwardly of said group of optical fibers, and said group of optical fibers is disposed on said neutral axis.

4,836,640

DEPRESSED CLADDING OPTICAL FIBER CABLE

Charles H. Gartside, III, Gwinnett County; Paul F. Glodis, Fulton County, and Parbhubhai D. Patel, DeKalb County, all of Ga., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 27, 1986, Ser. No. 879,703
Int. Cl.⁴ G02B 6/44
U.S. Cl. 350—96.23 **16 Claims**



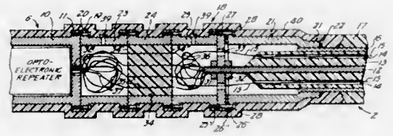
6. An optical fiber cable, which comprises:
a plurality of units, each of the units comprising a plurality of optical fibers which are assembled together without intended stranding to form a unit which extends along the cable and a binder wrapped about the unit, each of said optical fibers including a core, an outer cladding and an inner cladding having an index of refraction which is less than that of said outer cladding and being characterized by a difference between the indices of refraction of said core and of said inner cladding which is sufficiently high to cause each fiber to be substantially insensitive to microbending with the ratio of the cladding diameter to the core diameter, which ratio is sufficiently large to avoid affecting dispersive properties of the optical fiber, and the ratio of the difference in the indices of refraction of the inner and outer claddings to the overall difference in indices of refraction between the core and the inner cladding being such that each said optical fiber is capable of operation in a single mode fashion at a predetermined wavelength;
a tube which is made of a plastic material and which encloses the plurality of units with the ratio of the cross-sectional area of the plurality of optical fibers to the cross-sectional area within the tube not exceeding a predetermined value, said tube being substantially parallel to the longitudinal axis of the cable;
a waterblocking material which is disposed within the tube and which fills substantially the interstices between the optical fibers of the units within the tube and between the units and the tube, the waterblocking material having a critical yield stress and a shear modulus which allow movement of the units within the tube when the waterblocking material is subjected to a predetermined stress;
a strength member system; and
a jacket which encloses said tube and which is made of a plastic material.

4,836,641

SUBMARINE OPTICAL FIBER LINE WITH INTERCONNECTED DIFFERENT CABLE TYPES

Paolo G. Priaroggia, Milan, Italy, assignor to Societa' Cavi Pirelli S.p.A., Milan, Italy

Filed Jul. 11, 1988, Ser. No. 217,565
Claims priority, application Italy, Jul. 27, 1987, 21448 A/87
Int. Cl.⁴ G02B 6/44; H02G 3/00
U.S. Cl. 350—96.23 **8 Claims**



1. A submarine optical fiber cable line comprising:
an opto-electronic repeater having a water-tight envelope, said envelope being made of materials and having dimensions which permit it to withstand stresses imparted to it while it is being laid underwater and after it is laid underwater;
at least two submarine optical fiber cables connected at their ends to, respectively, one end of said repeater and the other end of said repeater, at least one of said cables connected to said repeater being an optical fiber cable having a central rope capable of withstanding the stresses imparted to the cable during laying, having longitudinally extending optical fibers disposed around said rope and having a sheath around said optical fibers, said one cable being without armor outside said optical fibers capable of withstanding, by itself, the stresses imparted to said one cable during laying and after it is laid; and
a tubular body intermediate and interconnecting said one cable with said repeater, said tubular body being mechanically connected at one end to said envelope, being mechanically connected at its other end to said sheath and having a strength sufficient to withstand the stresses imparted thereto by said repeater and said one cable and by the water in which it is laid, said tubular body having a rigid partition secured thereto and extending transversely to the bore of said tubular body, said partition being mechanically connected to said rope and having a strength sufficient to withstand the stresses imparted to said rope during the laying of said one cable and after it is laid and said partition having at least one through-opening for the passage of said optical fibers of said one cable.

4,836,642

CLADDING MATERIAL FOR OPTICAL FIBER

Tsuruyoshi Matsumoto; Katsuhiko Shimada, and Yoshihiro Uozu, all of Otake, Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 225,734
Claims priority, application Japan, Jul. 30, 1987, 62-188818; Sep. 18, 1987, 62-232043
Int. Cl.⁴ G02B 6/00; G01N 21/00; B05D 5/06; C08F 120/18
U.S. Cl. 350—96.34 **20 Claims**

1. A cladding material for an optical fiber, which consists essentially of a fluorine-containing polymer comprising (A) 10 to 90% by weight of a long-chain fluoroalkyl group-containing monomer represented by the following general formula:

$$CH_2=C(Y)-COO(CH_2)_2(CF_2)_nCF_3$$

wherein Y if F, CH_3 or CF_3, and n is an integer from 5 to 11, (B) 5 to 90% by weight of a short-chain fluoroalkyl group-containing monomer represented by the following general formula:

$$CH_2=C(Y)-COOCH_2(CF_2)_mX$$

wherein Y is as defined above, X is F, CH_3 or CF_3, and m is an integer of from 1 to 4. and (C) 0 to 50% by weight of other copolymerizable monoethylenically unsaturated monomer, wherein the melt flow index indicating the amount in gram of the polymer extruded for 10 minutes from a nozzle with an orifice having an inner diameter of 2 mm and a length of 8 mm under conditions of a temperature of 230° C. and a load of 5 kg, is not larger than 30.

9. A core-clad optical fiber in which the light transmittance retention ratio Ia/Io when wound satisfies the requirement represented by the following formula:

$$Ia/Io \times 100 \geqq 20\%$$

wherein Io stands for the intensity of transmitted light measured when parallel light having a specific wavelength is made incident from one end of the optical fiber having a length of 10 m and emitted from the other end thereof, and Ia stands for the intensity of transmitted light obtained when the optical fiber is wound by 100 turns on a rod-shaped mandrel having a diameter of 10 mm and the measurement is conducted in the same manner as described above.

4,836,643

HALIDE FIBRE WITH HIGH NUMERICAL APERTURE

Paul W. France, Newbourn, and John R. Williams, Ipswich, both of England, assignors to British Telecommunications public limited company, United Kingdom

Filed Feb. 2, 1988, Ser. No. 151,677
Claims priority, application United Kingdom, Feb. 16, 1987, 8703501
Int. Cl.⁴ G02B 6/16
U.S. Cl. 350—96.34 **14 Claims**

9. An optical fiber having a numerical aperture of at least 0.05 measured at wavelength 589nm which comprises a fluoride cladding glass and a fluoride core glass, wherein the two glasses have the compositions:

Compound	Cladding (mole %)	Core (mole %)
ZrF_4	a	T
BaF_2	b	U
LaF_3	c	V
AlF_3	d	W
NaF	e	X
HfF_4	f	Y
PbF_2	g	z

wherein each of the following expressions lies within the range specified:

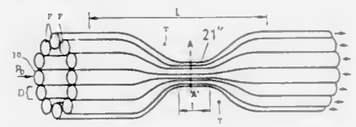
$45 < a + f < 55$	$45 < T + Z < 55$	$3 < f - Y < 55$
$15 < b < 25$	$15 < U < 25$	$0.5 < Z - g < 8$
$3 < c < 6$	$3 < V < 6$	
$2 < d < 5$	$2 < W < 5$	
$15 < e < 30$	$10 < X < 25$	
$3 < f < 55$	$0.5 < Z < 10$	

4,836,644

FIBER OPTIC STAR COUPLER

Michael Eisenmann, Ulm, and Edgar Weidel, Senden, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 25, 1988, Ser. No. 185,383
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1987, 3713658
Int. Cl.⁴ G02B 6/26, 6/28, 6/36
U.S. Cl. 350—96.16 **17 Claims**



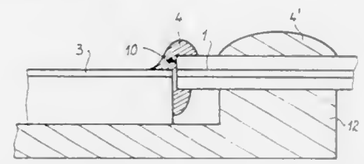
1. A fiber optic star coupler, comprising:
at least one input optical fiber;
a plurality of output optical fibers; and
a hollow coupling region at which the fibers are fused together, the coupling region having a generally cylindrical configuration.

4,836,645

DEVICE FOR THE CONNECTION OF OPTIC FIBERS TO AN INTEGRATED OPTIC CIRCUIT AND METHOD FOR MAKING THE SAID DEVICE

Hervé Lefevre, Paris, and Sambath Bann, Massy, both of France, assignors to Thomson-CSF, Paris, France

Filed Dec. 18, 1987, Ser. No. 135,083
Claims priority, application France, Dec. 19, 1986, 86 17889
Int. Cl.⁴ G02B 6/30
U.S. Cl. 350—96.17 **9 Claims**



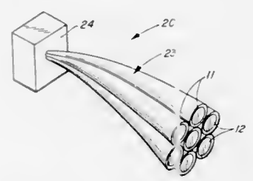
1. A device for the connection of optic fibers to an integrated optic circuit, by which it is possible to connect an end of an optic fiber to an end of an optic guide which is flush with one side of an integrated optic circuit, the said device comprising:
a transparent connecting block in which the optic fiber is held, the said connection block including a first polished side flush with the said end of the fiber and positioned parallel to said side of the integrated optic circuit, and a second side inclined with respect to the first side, enabling the entry into or exit from the said connecting block of a light beam which illuminates, at a defined angle, the interface located between the first side of the connecting block and the side of the integrated optic circuit;
a layer of bonder placed between the first side of the connecting block and the side of the integrated optic circuit.

4,836,646

PLASTIC OPTICAL FIBER FOR IN VIVO USE HAVING A BIO-COMPATIBLE POLYUREASILOXANE COPOLYMER, POLYURETHANE-SILOXANE COPOLYMER, OR POLYURETHANEUREASILOXANE COPOLYMER CLADDING

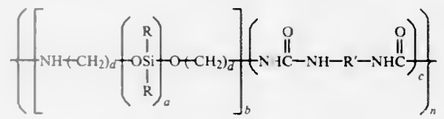
Theodore L. Parker, and G. Robert Collins, both of Walnut Creek, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 29, 1988, Ser. No. 161,622
Int. Cl.[4] G02B *6/00 6/10*
U.S. Cl. 350—96.34 13 Claims



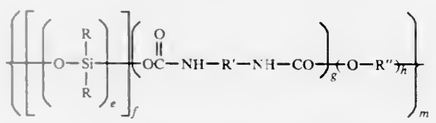
1. A biocompatible organic resin coated flexible optical fiber comprising an organic polymeric core and an organic cladding wherein the biocompatible organic polymeric cladding is selected from:

(a) a polyureasiloxane copolymer of the formula:



wherein
R is a alkyl group having from 1 to 19 carbon atoms,
R' is selected from a straight chain alkylene, a branched alkylene or a cyclic alkylene having from 1 to 19 carbon atoms,
a is an integer between 2 and 20,
b and c are each about the same integer between about 50 and 10,000,
d is the integer 2, 3 or 4,
n is an integer selected so that the total molecular weight of the polymer is about 25,000 daltons or greater,

(b) a polyurethane-siloxane copolymer of the formula:

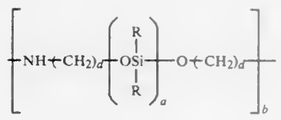


R and R' are as defined hereinabove,
R'' is an alkylene having from 1 to 10 carbon atoms;
e is an integer between 2 and 20,
f and h are each integers where n the sum of f and h is about equal to g which is an integer between about 50 and 10,000, m is an integer greater than 100 such that the total weight of the polyurethane-siloxane cladding about is 25,000 daltons or greater; or

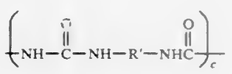
(c) a polyurethaneureasiloxane copolymer of the formula:

$$-(Q)_q(X)_r(Y)_s(Z)_t-_p$$

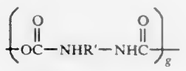
wherein
Q is



X is



Y is $-(OR'')_h-$, and
Z is



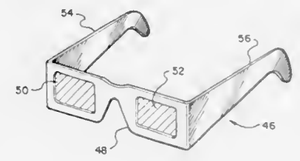
wherein R, R', R'', a, b, c, d, g and h are defined hereinabove,
q, r, s, t and p are each integers between about 50 and 10,000 such that the sum of r and t is about equal to the sum of q and s, and p is an integer greater than 100 such that the total molecular weight of the polymeric cladding is about 25,000 daltons or greater, and
the organic polymer optical fiber core is selected from optically clear organic polymers having a refractive index of between about 1.4 and 1.7.

4,836,647

LOW DIFFERENTIAL 3-D VIEWER GLASSES AND METHOD WITH SPECTRAL TRANSMISSION CHARACTERISTICS TO CONTROL RELATIVE INTENSITIES

Terry D. Beard, 1407 North View Dr., Westlake Village, Calif. 91362

Filed Feb. 9, 1988, Ser. No. 154,068
The portion of the term of this patent subsequent to Nov. 10, 2004, has been disclaimed.
Int. Cl.[4] G02B *27/22;* G03B *21/32*
U.S. Cl. 350—132 25 Claims



1. A 3-D television system for creating a stereoscopic effect when viewing a television image in which at least portions of the image exhibit a lateral movement, comprising:
a television which includes a television screen having a spectral-energy emission characterized by at least three radiant energy peaks at spaced wavebands along the spectrum, and
viewer glasses for viewing said television screen, said viewer glasses comprising:
first means for transmitting light from the television screen to the viewer's left eye,

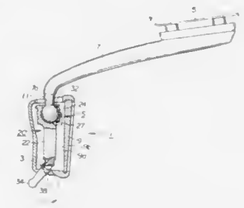
second means for transmitting light from the television screen to the viewer's right eye,
one of said light transmitting means being darker than the other light transmitting means and having a spectral transmission characterized by a substantially reduced transmissivity at wavelengths corresponding to each of said energy peaks, relative to both its transmissivity at other wavelengths within the visible spectrum and to the transmissivity of the other light transmitting means at said peak energy wavelengths, whereby the differential in light transmission between said first and second light transmitting means is greater when viewing the television screen than in normal ambient light, and
means for holding said first and second light transmitting means in place on a viewer's face in front of his or her respective eyes.

4,836,648

ANTI-GLARE REARVIEW ASSEMBLY FOR MOTOR VEHICLES

Toshikazu Niwayama, Saitama, Japan, assignor to Kabushiki Kaisha Matsuyama Seisakusho, Tokyo, Japan

Filed Mar. 3, 1988, Ser. No. 163,767
Claims priority, application Japan, Mar. 6, 1987, 62-33723[U]; Mar. 6, 1987, 62-33724; Mar. 6, 1987, 62-33725
Int. Cl.[4] B60R *1/04;* G02B *5/08*
U.S. Cl. 350—281 11 Claims



1. An anti-glare rearview mirror assembly for a motor vehicle having a vehicle body, comprising:
bracket means adapted to be mounted on one end of an external support member with the other end thereof coupled to the vehicle body;
a housing swingably supported on said bracket means;
a mirror fitted in an inner peripheral edge of said housing;
mirror position selecting means coacting with said bracket means for angularly moving said housing with respect to said bracket means to shift said mirror between first and second positions; and
disengagement preventing means disposed near an area where said housing is supported on said bracket means, for preventing said bracket means and said housing from being released from mutual engagement.

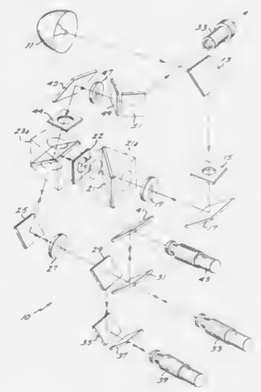
4,836,649

OPTICAL LAYOUT FOR A THREE LIGHT VALVE FULL-COLOR PROJECTOR EMPLOYING A DUAL RELAY LENS SYSTEM AND A SINGLE PROJECTION LENS

Arno G. Ledebuhr, Fullerton, and Donald E. Sprothbery, Orange, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 19, 1985, Ser. No. 754,799
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—331 R 12 Claims

1. A liquid crystal light valve image projection system comprising:
(a) an illumination source for providing unpolarized white light;
(b) polarizing means disposed in the path of said unpolarized light, said polarizing means including a prepolarizer for transmitting light of a first polarization and reflecting light of a second polarization away from the optical path of the transmitted light of said first polarization, said polarizing means further including a polarizer/analyzer for reflecting light of said first polarization and transmitting light of said second polarization, said polarizer/analyzer being disposed in the optical path of the transmitted light from said prepolarizer;



(c) relay lens means for relaying images along the optical path of said image projection system;
(d) projection optics for projecting image data; and
(e) light valve means disposed in the optical path of the polarized light that is reflected by said polarizer/analyzer, said light valve means modulating the polarization state of the light reflected by said polarizer analyzer and reflecting polarization-modulated light back along the optical path of the polarized light that is reflected by said polarizer/analyzer, said polarization-modulated light that is reflected by said light valve being being passed by said polarization-/analyzer to said projection optics.

4,836,650

PROCESS FOR THE PRODUCTION OF A DIODE ARRAY AND LIQUID CRYSTAL DISPLAY SCREEN

Francois Morin, Le Carpont, Lanmerin, and Michel Le Contellec, 3, Haineau du chêne, both of 22300 Lannion, France

PCT No. PCT/FR86/00084, § 371 Date Nov. 7, 1986, § 102(e) Date Nov. 7, 1986, PCT Pub. No. WO86/05893, PCT Pub. Date Oct. 9, 1986
PCT Filed Mar. 13, 1986, Ser. No. 934,613
Claims priority, application France, Mar. 26, 1985, 85 04480
Int. Cl.[4] G02F *1/13;* H01L *21/205*
U.S. Cl. 350—334 8 Claims

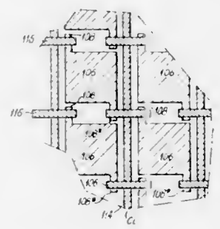
1. A process for the production of the diode array and liquid crystal display screen in which:
an upper plate is produced by depositing on a first substrate transparent conductive control rows,
a lower plate is produced by depositing on a second substrate a transparent conductive material layer, followed by a first conductive material layer and carrying out a first photogravure process on these two layers for forming a matrix of electrode segments, said matrix being constituted by rows of electrode segments and columns of electrode segments, each electrode segment having at least one projection, each electrode segment constituting an

elementary display point, as well as for forming control columns placed between the column of electrode segments,

each electrode segment is connected to an adjacent control column by a bridge having two diodes,

the two plates obtained are assembled with a liquid crystal material therebetween in such a way that the control rows covering the first substrate of the upper plate cover the rows of electrode segments of the matrix, said control rows covering the first substrate of said upper plate being perpendicular to the columns of the lower plate,

wherein, for producing a bridge between each electrode segment and the adjacent control column, the following operations are performed:



an intrinsic hydrogenated amorphous silicon layer aSi:H(i) is deposited on the lower plate following the first photogravure operation,

a second conductive material is deposited, the first and second conductive materials being chosen in such a way that the stack constituted by these two materials and the interposed aSi:H(i) layer has a diode-type structure,

a second photogravure operation is performed for freeing each electrode segment, but leaving between each projection and the adjacent column a bridge formed by the stack of the layer of the first conductive material, the aSi:H(i) layer and the layer of the second conductive material, said bridge being electrically equivalent to two diodes connected in head to head manner.

4,836,651

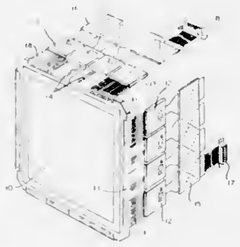
FLEXIBLE CIRCUIT INTERCONNECTION FOR A MATRIX ADDRESSED LIQUID CRYSTAL PANEL

Richard A. Anderson, 101 Channing Rd., Belmont, Mass. 02178

Filed Dec. 3, 1987, Ser. No. 128,651

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—334 **6 Claims**



1. A Liquid Crystal Display packaging arrangement comprising;

(a) A flat panel Liquid Crystal Display element having a plurality of Liquid Crystal cells disposed in an X-Y matrix, connector pads for said matrix extending to the edge of said display element,

(b) A multi-layer, flexible connector containing at least one layer having a plurality of conductive tracks and at least two (2) flexible insulating layers on either side of said track layer,

(c) At least one chip carrier supporting an electronic chip for supplying signals to said display mounted on said flexible connector,

(d) Means for connecting the circuit chip in said chip carrier to one or more of said conductive tracks,

(e) Means for connecting the flexible connector to at least one edge of said display; the conductive tracks, in said connector being individually connected to the matrix connector pads at the edge of said display,

(f) Said flexible connector being sent out of the plane of said display beyond the point of connection to said connector pads whereby the space occupied by said display and the connector is minimized.

4,836,652

LIQUID CRYSTAL SHUTTER ARRAY HAVING MICROLENSES CORRESPONDING TO THE PIXEL ELECTRODES

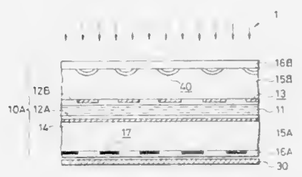
Hisao Oishi; Kazuhiko Yanagihara; Tadashi Miyakawa, all of Kanagawa; Takeshi Nakamura, Osaka; Kazuhiko Akimoto, Osaka, and Mitsuaki Shioji, Osaka, all of Japan, assignors to Fuji Photo Film Co., Ltd. and Sharp Kabushiki Kaisha, both of, Japan

Filed Nov. 13, 1987, Ser. No. 120,450

Claims priority, application Japan, Nov. 13, 1986, 61-270534

Int. Cl.[4] G02F *1/13;* **G02B** *17/02*

U.S. Cl. 350—334 **7 Claims**



1. A liquid crystal shutter array comprising:

a matrix of pixel electrodes, a common electrode disposed in opposition to said pixel electrodes with a gap therebetween filled with a liquid crystal, a pair of transparent substrates for supporting said pixel electrodes and said common electrode by sandwiching said pixel electrodes and said common electrode therebetween, polarization plates stacked on the respective outside of said transparent substrates, photomasks embedded in one of said polarization plates disposed at the light output side of said liquid crystal, said one of the polarization plates having opening portions between adjacent embedded photomasks, the opening portions corresponding to pixel electrodes, microlenses formed in at least one of said transparent substrates such that said microlenses correspond to said pixel electrodes, a refractive index of light of each of said microlenses being set in a manner so that an incident angle θ of light incident on said liquid crystal through said microlenses satisfies:

$$\theta \leqq \tan^{-1}\left(\frac{P-a}{d}\right)$$

where P, a, and d respectively represent a length of each of said photomasks, a length of a portion where each of

said photomasks and corresponding ones of said pixel electrodes overlap each other, and a thickness of said one transparent substrate at the light output side of said liquid crystal.

4,836,653

FERROELECTRIC LIQUID CRYSTAL CELL AND ITS MANUFACTURING METHOD

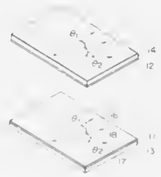
Katsumi Yoshino, Kishiwada, and Yasuhiro Shigeno, Asbiya, all of Japan, assignors to Hosiden Electronics Co., Ltd., Osaka, Japan

Continuation of Ser. No. 861,217, May 9, 1986, abandoned. This application Jul. 26, 1988, Ser. No. 224,280

Claims priority, application Japan, May 27, 1985, 60-114478

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—341 **8 Claims**



2. In a method for fabricating a ferroelectric liquid crystal cell having a bistable memory effect in which a pair of plates, each having one surface thereof coated with a conductive layers, are disposed in adjacent but spaced relation to one another with their conductive layers facing each other, ferroelectric liquid crystal cell is then cooled to cause a change in the phase of the liquid crystal, the improvement wherein a surface rubbing treatment is conducted in at least two directions on one of said plates and in at least one further direction different from said two directions on either one of said pair of plates thereby effecting three rubbing directions as a whole on said pair of plates prior to the sealing of the ferroelectric liquid crystal therebetween, said three directions being so selected that the angles between each two adjacent ones of the three rubbing directions are substantially equal to each other.

4,836,654

DRIVE METHOD FOR A DUAL-FREQUENCY, DIELECTRIC ANISOTROPY LIQUID CRYSTAL OPTICAL DEVICE

Koh Fujimura; Masakatsu Higa, and Hisashi Aoki, all of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1987, Ser. No. 66,720

Claims priority, application Japan, Jun. 30, 1986, 61-153539; Nov. 27, 1986, 61-282471; Dec. 26, 1986, 61-308645

Int. Cl.[4] G02F *1/133, 1/137;* **G09G** *3/36*

U.S. Cl. 350—346 **26 Claims**

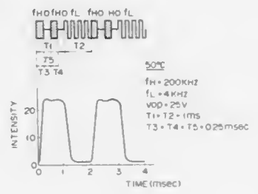
1. A method of driving a liquid crystal optical device whose birefringency is controlled electrically comprising:

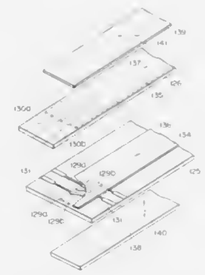
providing a pair of substrates having electrodes which at least partially face each other and are formed on opposing inner surfaces;

providing a liquid crystal material which is sealed between said pair of substrates, and whose molecules are aligned in directions parallel to each other in initial state, in accordance with an aligning treatment subjected to said inner surfaces of said substrates, and an alignment state of the molecules being controlled by an electric field applied across said electrodes, said liquid crystal material having a crossover frequency at which its dielectric anisotropy becomes "0", and exhibiting a dielectric dispersion phenomenon wherein the polarity of the dielectric anisotropy is inverted in an electric field of a frequency lower than the crossover frequency and in an electric field of a frequency higher than the crossover frequency;

providing a pair of polarizing means arranged outside said liquid crystal material, polarizing axes of said polarizing means being substantially perpendicular to each other, and at least one polarizing axis intersecting the direction of the aligning treatment of said inner surfaces of said pair of substrates, at an angle falling within the range of 35° to 45°; and

selectively applying an ON electric field and an OFF electric field to the liquid crystal material, to control an ON





state and OFF state of the liquid crystal device, the ON electric field having an electric field for applying a force for obliquely aligning liquid crystal molecules relative to the substrate and a non-electric field for releasing the liquid crystal molecules from said force-applying electric field, the ON electric field obliquely aligning the liquid crystal molecules and maintaining this state to hold the optical device in an ON state, and the OFF electric field aligning the liquid crystal molecules homeotropically with respect to said substrates, to obtain an OFF state of the device.

4,836,655

FERROELECTRIC LIQUID CRYSTAL DEVICE WITH A CHARGE STORAGE STRUCTURE

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed Feb. 17, 1987, Ser. No. 15,787

Claims priority, application Japan, Feb. 17, 1986, 61-32365; Feb. 17, 1986, 61-32366; Feb. 17, 1986, 61-32367

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—350 S **14 Claims**

1. A liquid crystal device comprising:

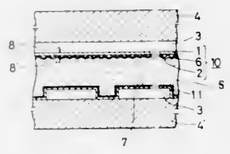
a pair of substrates; said substrates being in a spaced, substantially parallel relationship;

a ferroelectric liquid crystal layer interposed between said substrates, said layer having optical characteristic changes in response to an electric field induced therein;

an electrode arrangement, said electrode arrangement con-

structed to define pixels of said device in matrix form and to induce an electric field perpendicular to said pair of substrates and across said liquid crystal layer at a particular pixel; and

a charge storage lever adjacent to the interior surface of at



least one of said pair of substrates and overlying each pixel and positioned to be subjected to the electric field along with said liquid crystal layer, said charge storage layer being provided an electric charge when said electric field is induced so that bistability of said ferroelectric liquid crystal layer is enhanced.

4,836,656

DRIVING METHOD FOR OPTICAL MODULATION DEVICE

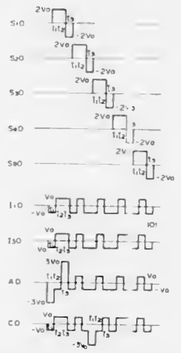
Akihiro Mouri, Kokubunji; Tsutomu Toyono, Yokohama; Shuzo Kaneko, Tokyo; Yutaka Inaba, Kawaguchi, and Junichiro Kanbe, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1986, Ser. No. 942,716

Claims priority, application Japan, Dec. 25, 1985, 60-295304; Dec. 25, 1985, 60-295305; Dec. 25, 1985, 60-295308; Jan. 7, 1986, 61-001186

Int. Cl.[4] G02F *1/137*; G09G *3/36*

U.S. Cl. 350—350 S **23 Claims**



1. A driving method for an optical modulation device comprising scanning electrodes, signal electrodes disposed intersecting the scanning electrodes so as to form a pixel at each intersection of the scanning electrodes and signal electrodes, and an optical modulation material disposed between the scanning electrodes and the signal electrodes and assuming different orientation states when supplied with voltage so different polarities exceeding threshold voltages;

said driving method comprising a first phase, a second phase and a third phase, wherein said driving method comprises the steps of:

sequentially applying voltages to all or prescribed pixels on a selected scanning electrode to write in said all or prescribed pixels in a writing period for the selected scanning electrode, the third phase in the writing period for the selected scanning electrode preceding the first phase in the writing period for a subsequently selected scanning electrode;

applying to said all or prescribed pixels voltages of one polarity sufficient for causing the optical modulation material to assume a first orientation state in the first and second phases, said voltages of one polarity having different amplitudes in the first and second phases; and

applying to a selected pixel a voltage of the other polarity sufficient causing the optical modulation material to assume a second orientation state in the third phase, and applying a voltage of the other polarity, not causing the optical modulation material to assume the second orientation state, to the other pixels, respectively of said all or prescribed pixels on the selected scanning electrode in the third phase.

4,836,657

OPTICAL CHANGE-OVER SWITCH UTILIZING FERROELECTRIC LIQUID CRYSTAL MATERIAL

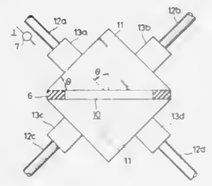
Yasuhiro Gunji, Hitachi; Sadayuki Okada, Katsuta; Masato Isogai; Katsumi Kondo, both of Hitachi; Masahiko Ibamoto, Katsuta; Kazuhiro Kuwabara, and Atsushi Kanke, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 10, 1986, Ser. No. 940,491

Claims priority, application Japan, Dec. 12, 1985, 60-277916; Dec. 27, 1985, 60-292753; Feb. 4, 1986, 61-21194

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—350 S **9 Claims**



1. An optical change-over switch comprising,

an input port and an output port for a light beam having at least one of S and P polarization components;

a liquid crystal cell for reflection and transmission of the light beam, said liquid crystal cell including a pair of spaced-apart first and second transparent substrates having respective opposed first and second parallel surfaces, a ferroelectric liquid crystal layer confined between said first and second transparent substrates, and means for controlling orientation of molecules in the ferroelectric liquid crystal layer into a first molecule orientation inducing a first refractive index of the ferroelectric liquid crystal layer to the respective polarization components of the incidence light beam so as to transmit at least one of said S and P polarization components of the incidence light beam and into a second molecule orientation inducing a second refractive index of the ferroelectric liquid crystal layer to the respective polarization components of the incidence light beam so as to reflect at least one of said S and P polarization components of the incidence light beam; and

means for propagating the light beam from said input port to said liquid crystal cell and therefrom to said output port, the angle of the optical incidence plane defined by said light beam propagating means with respect to helical axes of the ferroelectric liquid crystal in said liquid crystal cell is so selected that the difference between the first and second refractive index ensures the change-over of at least

one of said S and P polarization components of the incidence light beam.

4,836,658

OPTICAL DEVICES FOR FORMING IMAGE AND REFERENCE BEAMS WITH A POLARIZING BEAMSPLITTER AND A SPATIAL LIGHT MODULATOR

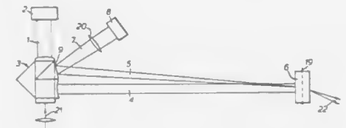
Leslie C. Laycock, Amersham, England, assignor to The General Electric Company, p.l.c., England

Filed Apr. 11, 1988, Ser. No. 180,247

Claims priority, application United Kingdom, Apr. 21, 1987, 8709336

Int. Cl.[4] G02F *1/01*; G03H *1/04*; G02B *27/28*

U.S. Cl. 350—384 **6 Claims**



1. An optical device for use in forming a holographic record of an image comprising a polarizing beam splitter which is arranged to derive from a single coherent-light incident beam two orthogonally polarized beams, one of which is used to form a reference beam while the other is arranged to be modulated in polarization by means of a spatial light modulator in dependence upon the image and reflected back to the beam splitter, where a component of the modulated beam is separated out to form an image beam.

4,836,659

LENS

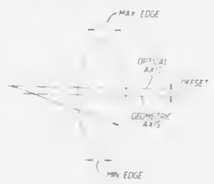
Robert J. Roote, High Wycombe; Ian K. Pasco, Warfield; Ian J. Smithers, Taplow, Nr. Maidenhead, and Paul J. Fisher, Slough, all of England, assignors to Combined Optical Industries Limited, Slough, England

Filed Jan. 28, 1988, Ser. No. 149,281

Claims priority, application United Kingdom, Jan. 28, 1987, 8701879

Int. Cl.[4] B29D *7/60*; G02B *3/00*

U.S. Cl. 350—409 **2 Claims**



1. A lens comprising a body of transparent injection molded plastics material defining a convex lens having a geometric axis (an axis passing through the lens at a central point normal to the general plane of the lens), an optical axis (an axis passing through the lens between its focal points) spaced from said geometric axis, and a circumferential edge having an axial thickness and including an injection molding feed point which during molding aligns with the feed point of a mold, said feed point of said lens being nearer to the optical axis than to the geometric axis and lying on a plane passing through said two axes, the axial thickness of said edge at a point diametrically opposite said feed point being less than the axial thickness of said edge at said feed point.

4,836,660

ZOOM LENS SYSTEM FOR COMPACT CAMERA

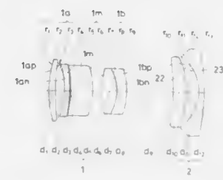
Takayuki Ito, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 21, 1987, Ser. No. 135,417

Claims priority, application Japan, Dec. 19, 1986, 61-302921

Int. Cl.[4] G02B *15/14, 9/62*

U.S. Cl. 350—423 **6 Claims**



1. A zoom lens system for use with a compact camera, which comprises, in order from the object side, a first lens group having a positive focal length and a second lens group having a negative focal length and which achieves zooming between a wide angle position and a narrow angle position by changing the distance between the first and second lens groups, said first lens group comprising a front lens unit having a negative focal length comprising at least one positive lens element and at least one negative lens element, a rear lens unit having a positive focal length positioned on the image side of said first lens group and which comprises at least one negative lens element and at least one positive lens element, and a middle lens unit positioned between said front and rear lens units and which comprises at least one positive lens element having a convex surface directed toward the image side, said lens system satisfying the following conditions:

(1) $1.35 < f_s/f_1 < 1.7$;

(2) $1.69 < N_{1an}$;

(3) $34 < \nu_{1an}$;

(4) $-2.0 < f_s/f_{1bn} < -0.7$;

(5) $9 < \nu_{1bp} - \nu_{1bn}$;

(6) $0.23 < f_{BS}/f_s < 0.5$;

(7) $-1.5 < r_6/f_s < -0.4$; and

(8) $-0.2 < f_s/f_{1am} < 0.2$

where

f_s: focal length of the overall lens system at the wide angle position;

f_1: focal length of said first lens group;

N_{1an}: refractive index at the d line of said negative lens element in said front lens unit;

ν_{1an}: Abbe number of said negative lens element in said front lens unit;

f_{1bn}: focal length of said negative lens element in said rear lens unit;

ν_{1bp}: Abbe number of said positive lens element in said rear lens unit;

ν_{1bn}: Abbe number of said negative lens element in the rear lens unit;

f_{BS}: back focus at the wide angle position;

r_6: radius of curvature of the surface on the image side of said middle lens unit; and

f_{1am}: composite focal length of the combination of said front to middle lens units;

said second lens group being of a two-unit two-element configuration comprising, in order from the object side, a positive meniscus lens element having a convex surface with a large curvature on the image side and a negative meniscus lens element having a concave surface with a large curvature on the object side, said second lens group having at least one aspheric surface and satisfying the following condition:

(9) $1.7 < N_{2n}$

where

N_{2n}: refractive index at the d line of said negative lens element in said second lens group.

4,836,661

OPTICAL SYSTEM OF VARIABLE MAGNIFICATION POWER

Keiji Ikemori, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1983, Ser. No. 556,705
Claims priority, application Japan, Dec. 1, 1982, 57-210909; Dec. 24, 1982, 57-230448; Dec. 24, 1982, 57-230449; Dec. 24, 1982, 57-230450
Int. Cl.[4] G02B *15/14, 1/06*
U.S. Cl. 350—423 27 Claims

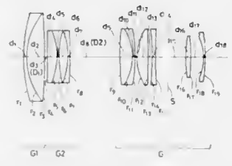
1. An optical system of variable magnification power comprising, from an object side to an image side:
a first lens component of variable refractive power from a negative power to a positive power; and
a second lens component of variable refractive power from a positive power to a negative power, wherein an image is maintained at a predetermined place.

4,836,662

TELEPHOTO ZOOM LENS SYSTEM

Yasuji Ogata, and Takanori Yamanashi, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1986, Ser. No. 853,766
Claims priority, application Japan, Apr. 19, 1985, 60-82286; Apr. 19, 1985, 60-82287
Int. Cl.[4] G02B *15/16*
U.S. Cl. 350—427 12 Claims



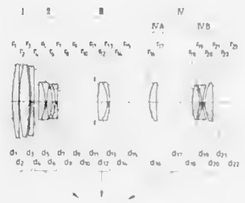
1. A telephoto zoom lens system comprising:
a first lens group arranged on the extreme object side, consisting of a positive lens and a negative lens, and having positive refractive power as a whole;
a second lens group having negative refractive power;
a third lens group arranged on the extreme image side, and including a first subgroup having positive refractive power and a second subgroup having negative refractive power arranged consecutively from the object side with a substantial airspace reserved therebetween;
said first subgroup including a cemented doublet,
said second subgroup including a negative lens,
said airspace reserved between the first and second subgroups being fixed,
a stop being fixedly spaced a distance from any lens in the third lens group, and
the first lens group, the third lens group and the stop being moved in the same direction for varying the focal length of the telephoto zoom lens system.

4,836,663

TELEPHOTO ZOOM LENS SYSTEM

Jun Hirakawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1988, Ser. No. 247,145
Claims priority, application Japan, Sep. 21, 1987, 62-236689
Int. Cl.[4] G02B *15/14, 9/64*
U.S. Cl. 350—427 4 Claims



1. A telephoto zoom lens system comprising, in order from the object side, a first lens group I having a positive refractive power, a second lens group II having a negative refractive power, a third lens group III having a positive refractive power together with a diaphragm stop provided for adjusting the quantity of light, and a fourth lens group IV having a positive refractive power which consists of lens unit IVA having a positive refractive power and lens unit IVB having a negative refractive power, said lens system performing zooming by moving the first, second and fourth lens groups along the optical axis, with the third lens group bring fixed, and performing focusing by moving the first lens group along the optical axis, said lens system being further characterized by satisfying the following conditions:

$$1.3 < |\Delta D_{(I\text{-}II)}/f_{II}| < 3.0,\ f_{II} < 0 \quad (1)$$

$$0.1 < \Delta D_{(III\text{-}IV)}/f_{IV} < 0.5 \quad (2)$$

$$0.5 < f_{IVA}/f_{IV} < 0.8 \quad (3)$$

where
$\Delta D_{(I\text{-}II)}$: change in the distance between the first and second lens groups during zooming,
f_{II}: focal length of the second lens group,
$\Delta D_{(III\text{-}IV)}$: change in the distance between the third and fourth lens groups during zooming,
f_{IV}: focal length of the fourth lens group, and
f_{IVA}: focal length of the lens unit IVA.

4,836,664

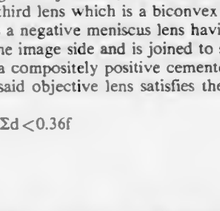
LENS SYSTEM FOR A COPIER

Kiichiro Nishina, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 29, 1988, Ser. No. 150,295
Claims priority, application Japan, Jan. 29, 1987, 62-17220
Int. Cl.[4] G02B *9/62*
U.S. Cl. 350—464 3 Claims

1. A lens system having a six unit and eight element structure, comprising, in the order mentione from an object side;
a first unit including a first lens which is a double-convex lens;
a second unit including a second lens which is a double-concave lens;
a third unit including a third lens which is a concave meniscus lens arranged with its convex surface directed to the object side and a fourth lens which is a convex meniscus lens cemented to said third lens and arranged with its convex surface directed to the object side;
a stop;
a fourth unit including a fifth lens which is a convex meniscus lens identical to said fourth lens and arranged with its concave surface directed to the object side of a sixth lens which is a concave meniscus lens identical to said third lens and cemented to said fifth lens with its concave surface directed to the object side;
a fifth unit including a seventh lens which is a double-concave lens identical to said second lens; and
a sixth unit including an eighth lens which is a double-convex lens identical to said first lens;
whereby the conditions of

$$0.05 < |f_{3,4}/f_{1,2}| < 0.27;$$



$$10 < \nu_4 - \nu_3 < 30;\ \text{and}$$

$$n_1 > 1.67;$$

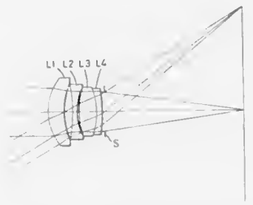
are satisfied;
where, $f_{1,2}$: combined focal distance for the first (sixth) and second (fifth) units;
$f_{3,4}$: combined focal distance for the third (fourth) unit;
ν_3: Abbe number of the third (sixth) lens;
ν_4: Abbe number of the fourth (fifth) lens; and
n_1: Refractive index of the first (eight) lens.

4,836,665

OBJECTIVE LENS

Koichi Wakamiya, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Sep. 9, 1988, Ser. No. 242,684
Claims priority, application Japan, Sep. 26, 1987, 62-242298
Int. Cl.[4] G02B *9/20*
U.S. Cl. 350—476 8 Claims



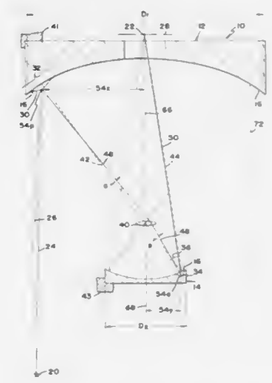
1. An objective lens having a stop provided most adjacent to the image side, comprising, in succession from the object side, a first lens which is a positive meniscus lens having its convex surface facing the object side, a second lens which is a biconcave lens, a third lens which is a biconvex lens, and a fourth lens which is a negative meniscus lens having its convex surface facing the image side and is joined to said third lens and formed into a compositely positive cemented lens, characterized in that said objective lens satisfies the following conditions:
(1) $0.28f < \Sigma d < 0.36f$
(2) $1.58 < n2 < 1.745$
(3) $n1 > n2$
(4) $0.24 < n3 - n4 < 0.30$
(5) $0.6f < f1 < 1.0f$
(6) $0.30f < -r6 < 0.40f$
(7) $f < -r7 < 2f$
(8) $10 < \nu4 - \nu3 < 25$
(9) $2 < (d5 + d6)/d3 < 9.9$
(10) $0.18f < d1 + d5 + d6 < 0.24f$
(11) $0.28f < r1 < 0.31f$
where
Σd: the full length of the lens system
f: the focal length of the lens system
ri: the radius of curvature of the ith surface from the object side
di: the spacing of the ith surface from the object side
ni: the refractive index of the ith lens from the object side
νi: the Abbe number of the ith lens from the object side
f1: the focal length of the first lens.

4,836,666

COMPENSATION FOR PRIMARY REFLECTOR WAVEFRONT ERROR

Aden B. Meinel; Marjorie P. Meinel, both of Pasadena, and John E. Stacy, Canyon Country, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 29, 1986, Ser. No. 867,986
Int. Cl.[4] G02B *23/06, 17/00*
U.S. Cl. 350—504 8 Claims



1. An instrument comprising:
an actual primary reflector having a surface approximately the same, and approximately coincident with, the surface of an ideal primary reflector;
an actual auxiliary reflector having a surface approximately the same and approximately coincident with the surface of an ideal auxiliary reflector;
means for directing electromagnetic radiation, said means being constructed so it can direct said radiation from said ideal primary surface onto said ideal auxiliary surface and from said ideal auxiliary surface precisely toward a focal point, but wherein the actual primary and auxiliary reflector surfaces each deviates from the ideal primary and auxiliary reflector surface, the ideal primary and auxiliary surfaces having a cross-section which is precisely symmetrical about an axis, but the real primary and auxiliary surfaces having a corresponding cross-section which is not symmetrical about a corresponding axis;
said directing means substantially forms an image of said

actual primary reflector onto said actual auxiliary reflector, with each real point on the actual primary reflector corresponding to an imaged point on the actual auxiliary reflector; and

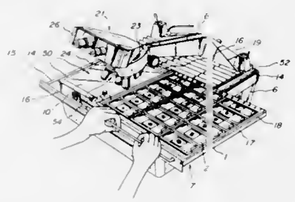
each imaged point on the actual auxiliary reflector lies a distance away from said ideal auxiliary reflector along a line normal to the ideal auxiliary reflector and intersectin the ideal auxiliary reflector at a corresponding normal point, said distance being substantially equal to the distance between each corresponding real point on the actual primary reflector and the ideal primry reflector surface along a line normal to the ideal primry reflector surface and intersecting the ideal primary reflector at a corresponding normal point.

4,836,667

MICROSCOPE

Jiro Ozeki, Tokyo, Japan, assignor to Silidex Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 860,023, May 6, 1986, abandoned. This application May 4, 1987, Ser. No. 45,584
Claims priority, application Japan, Apr. 9, 1987, 62-85636
Int. Cl.[4] G02B *21/26*
U.S. Cl. 350—531 15 Claims



1. A microscope comprising:

a base frame including a planar plate,

illumination means for irradiating said planar plate,

a stage mounted on said base frame,

a file page having a plurality of rows and columns, said file page being located on said stage and adapted for supporting a plurality of preparations on a common plane,

an arm extending from said base frame above said stage,

magnifying optical means mounted on said arm and including an optical axis directed perpendicular to said stage for viewing of said plurality of samples, and

retaining means for retaining said file page on said stage and for preventing curvature of said page, said retaining means including guide frame members for engaging two opposite side edge portions of said file page, a rod member interconnecting said guide frame members, a projection extending from said base frame to engage a front edge of said file page and means biased toward said planar plate and extending between said rod member and said projection and spaced to engage channels of said file page located between adjacent columns for pushing said file page to said planar plate, and

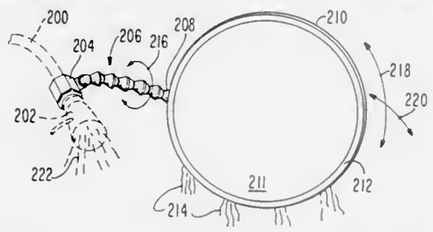
said stage being movably mounted on said base frame for movement in the lateral and longitudinal directions so as to view preparations supported by said file page retained on said stage by said retaining means.

4,836,668

SELF-SUPPORTED, ADJUSTABLE, CONDENSATION-FREE SHOWER MIRROR

Thomas R. Christianson, Palo Alto, Calif., assignor to Shower Tek, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 76,494, Jul. 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 899,265, Aug. 22, 1986, abandoned. This application Dec. 4, 1987, Ser. No. 128,995
Int. Cl.[4] G02B *7/18*
U.S. Cl. 350—588 35 Claims



1. A mirror assembly for use in a shower enclosure having a water-dispensing showerhead, comprising:

a mirror;

an elongated arm, one end of which is attached to said mirror, the other end of which includes attachment means for attaching said arm to said showerhead, said arm being flexible and bendable such that when said other end of said arm is attached to said showerhead, said mirror can be positioned stably in any position within a range of positions with respect to said showerhead, and

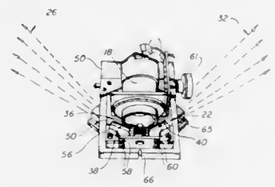
supply means for supplying heated water from said showerhead to said mirror and directing said water against a rear surface of said mirror so as to heat said mirror and thereby prevent it from fogging, said means comprising a lumen in said elongated arm and a flexible inner tube positioned in said lumen.

4,836,669

APPARATUS AND METHOD FOR PROJECTION OF REFERENCE PLANES OF LIGHT

Ted L. Teach, Dayton, Ohio, assignor to Spectra-Physics, Inc., San Jose, Calif.

Filed Nov. 16, 1987, Ser. No. 120,817
Int. Cl.[4] G02B *5/10;* G01B *11/26*
U.S. Cl. 350—618 14 Claims



1. Apparatus for projecting light in two orthogonal planes to provide reference planes of light for use in laying out a construction site or the like, comprising:

light means for providing a source beam of light, and

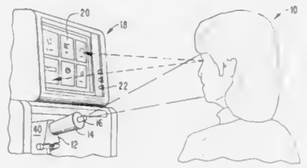
passive light diverting means for diverting a first portion of said source beam of light to project a first thin stationary reference fan beam of light substantially in a first reference plane, and for diverting a second portion of said source beam of light to project a second thin stationary reference fan beam of light substantially in a second reference plane which is substantially perpendicular to said first reference plane.

4,836,670

EYE MOVEMENT DETECTOR

Thomas E. Hutchinson, Ivy, Va., assignor to Center for Innovative Technology, Herndon, Va.

Filed Aug. 19, 1987, Ser. No. 86,809
Int. Cl.[4] A61B *3/14*
U.S. Cl. 351—210 31 Claims



1. An eye movement detector comprising:

a display to be viewed by an operator;

a camera with a lens located near said display and directed in a manner to obtain an image of an operator's eye when the display is being viewed;

a small illuminator mounted in front of said camera lens and not further from the axis of said lens than one-half the distance from the center of said lens and the edge thereof and out of said lens' focus directed towards the position of an operator's eye so that the reflected illumination causes the operator's pupil to be brighter than the surrounding part of the eye due to the bright eye effect; and

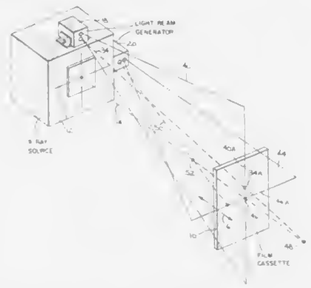
a computer for analyzing the image of an operator's eye to determine the center of the pupil and utilize said information to detect the eye position and correlate said position with whether or not the operator is gazing at the display.

4,836,671

LOCATING DEVICE

Val Bautista, Spring Grove, Ill., assignor to Charles Lescrenier, Wauwatosa, Wis.

Continuation of Ser. No. 720,710, Apr. 8, 1985, abandoned. This application Jan. 22, 1988, Ser. No. 147,593
Int. Cl.[4] G01C *3/00;* A61B *6/08;* G03B *13/20*
U.S. Cl. 356—I 7 Claims



1. A device for determining location of a point in space with respect to an object, the point lying on an axis of projection extending from the object, said device comprising:

a first generator means generating a first plane of light, said first generator means being located with respect to the object such that said first generator means is spaced from the axis of projection in a direction normal to the axis of projection, said plane of light containing the axis of projection of the object, said first generator means also generating a beam of light lying in said first plane of light, sad beam being visibly distinguishable from said first plane of light and oriented at an angle to the axis of projection so as to intercept the axis at the point in space to be located; and

a second generator means generating a second plane of light, said second generator means being located with respect to the object such that said second generator means is spaced from the axis of projection in a direction normal to the axis of projection, said second plane of light containing the axis of projection, said second generator means being located with respect to said first generator means such that said second plane of light intersects said first plane of light at an angle, thereby to mark the position of the axis projection,

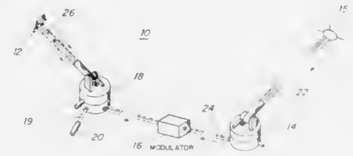
the coincidence of the beam and whereby the intersection of said first and second planes of light indicates that the point in space has been located with respect to the object.

4,836,672

COVERT OPTICAL SYSTEM FOR PROBING AND INHIBITING REMOTE TARGETS

Charles S. Naiman, Brookline, Mass.; Marvin King, New York, and Michael Greenbaum, Brooklyn, both of N.Y., assignors to Riverside Research Institute, New York, N.Y.

Filed May 2, 1980, Ser. No. 148,750
Int. Cl.[4] G01C *3/08;* F41F *5/00;* G01J *1/20;* H04B *9/00*
U.S. Cl. 356—5 8 Claims



1. A system for sensing optical characteristics of equipment located on a remote target, said equipment including at least one optical sensor oriented to receive optical illumination from directions which include said sensing system, comprising:

target illumination means for directing a time controlled burst transmission of solar radiation from said sensing system in the direction of said target, to illuminate said target with solar radiation, said illumination means including a solar radiation collector, an optical modulator and an optical projector for emitting solar radiation modulated by said modulator in said target direction;

retro-reflection receiving means for detecting solar radiation from said illumination means which is retro-reflected in a focused beam from the optical components of said optical sensor, said receiving means including means for collecting said retro-reflected light and providing said light on an optical path;

and radiation measuring means, responsive to said light on said optical path, for measuring selected properties of said light representative of characteristics of the optical components of said optical sensor, thereby to determine said characteristics.

4,836,673

WAVELENGTH ACCURACY TEST SOLUTION AND METHOD

J. Benjamin Esquivel H., Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

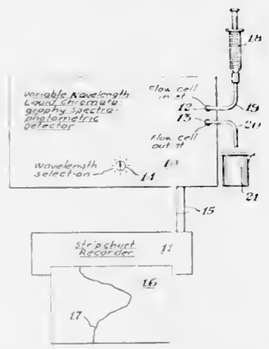
Continuation of Ser. No. 946,251, Dec. 24, 1986, abandoned. This application Aug. 5, 1988, Ser. No. 230,670
Int. Cl.[4] G01J *3/00*
U.S. Cl. 356—300 9 Claims

1. A method for determining the wavelength accuracy of a variable wavelength liquid chromatography spectrophotometric detector having a flow thorugh detection cell, an optical

bandpass of from 2 to 6 nm and a means to vary the indicated wavelength of detection, which method comprises the steps of:

(a) flowing a liquid solution of erbium III ions into the cell, the solution having a concentration or erbium III ions of more than 0.01 molar;

(b) varying the indicated wavelength of detection of the detector to find the indicated wavelength of maximum absorbance of the solution in a wavelength region around a reference wavelength selected from the group consisting of 254.6 nm, 378.9 nm, 522.3 nm, and 652.5 nm, with a



wavelength shift of plus or minus 0.3 nm or less around these reference wavelengths despite the optical bandpass of from 2 to 6 nm of the detector; and

(c) calculating the difference, in units of nm, between the indicated wavelength of maximum absorbance of step (b) and the reference wavelength selected in step (b) to determine the accuracy of the detector at the wavelength selected in step (b), the concentration of erbium III ions in excess of 0.01 molar effective to result in the ability to perform step (b) without the maximum absorbance exceeding 2.

4,836,674

METHOD AND APPARATUS FOR DETERMINING COLOR, IN PARTICULAR OF A DENTAL PROSTHESIS

Michel Lequime, Eguilles, and Jocelyn Millet, Perthuis, both of France, assignors to Bertin & Cie, Plaisir, France

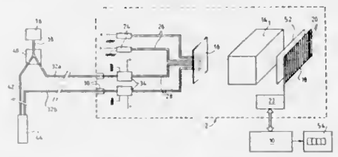
PCT No. PCT/FR86/00433, § 371 Date Aug. 13, 1987, § 102(e) Date Aug. 13, 1987, PCT Pub. No. WO87/03470, PCT Pub. Date Jun. 18, 1987

PCT Filed Dec. 12, 1986, Ser. No. 96,354

Claims priority, application France, Dec. 13, 1985, 8518540

Int. Cl.[4] G01J *3/42, 3/36*

U.S. Cl. 356—319 **9 Claims**



1. A method for determining a color for a dental prosthesis by referencing the color of an adjacent tooth in the mouth of a patient, comprising the steps of:

inserting instrument means hving at least one optical fiber in the mouth of the patient;

illuminating through the instrument means at least one tooth adjacent to an area of emplacement for a dental prosthesis;

picking up through the instrument means color information formed by the illuminating light reflecting off the adjacent tooth;

transmitting through the optical fiber the reflected light to a spectrocolorimeter;

determining a diffuse spectral reflectance of the adjacent tooth;

calculating various colorations for the dental prothesis from the diffuse spectral reflectance, the various colorations corresponding to different types of light by which the dental prothesis may be illuminated; and

displaying a set of teeth representing the adjacent tooth and the dental prothesis with respective colorations under the different types of light.

4,836,675

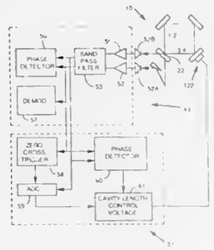
APPARATUS AND METHOD FOR DETECTING ROTATION RATE AND DIRECTION OF ROTATION AND PROVIDING CAVITY LENGTH CONTROL IN MULTIOSCILLATOR RING LASER GYROSCOPES

Sami T. Hendow, and Graham J. Martin, both of Canoga Park, Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jun. 29, 1987, Ser. No. 67,254

Int. Cl.[4] G01C *19/64*

U.S. Cl. 356—350 **43 Claims**



1. A multioscillator ring laser gyroscope, comprising:

frame means for forming a cavity that encloses a closed optical path;

means for producing four circularly polarized optical waves inside the cavity;

means for combining the waves to produce an interference pattern;

a pair of photodetectors arranged to be in an out of quadrature relation with respect to the interference pattern for producing signals indicative of the interference pattern;

means for monitoring the phase difference of the signals indicative of the interference pattern to determine the direction of the rotation of the multioscillator ring laser gyroscope; and

means for processing the signals to provide a cavity length control signal.

4,836,676

PHASE READING FIBER OPTIC INTERFEROMETER

Byoung Y. Kim, and Herbert J. Shaw, both of Stanford, Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

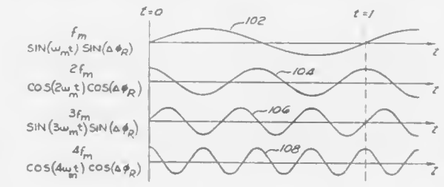
Continuation of Ser. No. 603,630, Apr. 25, 1984, abandoned. This application Dec. 29, 1986, Ser. No. 946,628

Int. Cl.[4] G01B *9/02;* **G01C** *19/64*

U.S. Cl. 356—350 **43 Claims**

1. In a method of detecting shifts in phase difference of interfering light waves which propagate within an interferometer formed of optical fiber, and the interferometer being of the

type which produces an optical output signal comprised of the interferring light waves, wherein the phase difference between the interfering light waves is dependent upon the respective optical path lengths traveled by the light waves within the interferometer and upon the influence of external forces applied to the interferometer, and wherein the intensity of the optical output signal is dependent upon the phase difference of the interfering light waves, the improvement comprising the steps of:



combining the interfering light waves to form an output having a waveform which corresponds to the phase difference of said light waves;

passing the output through an amplitude modulator to mix the output waveform with a modulating waveform which is at a modulation frequency; and

selecting a predetermined frequency from the amplitude modulated output to produce a signal which is representative of shifts in said phase difference, wherein said predetermined frequency is a harmonic of the modulation frequency.

4,836,677

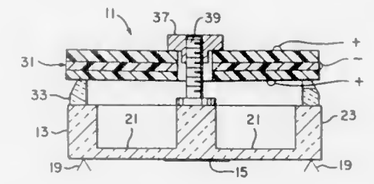
RING LASER CAVITY LENGTH CONTROL MIRROR ASSEMBLY

Robert A. Doran, Oakland, and Joseph P. Ficalora, Oak Ridge, both of N.J., assignors to Allied-Signal Inc., Morris Township, N.J.

Filed Sep. 16, 1987, Ser. No. 97,563

Int. Cl.[4] G01C *19/64;* **H01L** *41/10*

U.S. Cl. 356—350 **5 Claims**



1. Ring laser in which a mirror assembly has an optical path length adjustment feature characterized by:

(a) a frame having a ring laser cavity therein:

(b) a mirror support comprising a front surface normal to a center axis of mirror deflection and rearwardly facing extensions, the front surface having a center portion and a perimetric portion;

(c) the rearwardly facing extension including a perimetric extension capable of communicating axial force about a perimeter of the mirror support and including a center post capable of communicating axial force along the center axis;

(d) the mirror support being capable of distorting so that a center portion of the front surface axially shifts with respect to the perimetric section of the front surface;

(e) a piezoelectric plate;

(f) means to axially support the piezoelectric plate against the perimetric extension, said means contacting the piezoelectric plate along a surface of the plate which is substantially normal to the center axis, without restraining the piezoelectric plate radially;

(g) tension means, the tension means fixing the piezoelectric plate to the center post and applying an axial preload to the plate against the means to axially support the piezoelectric plate to the perimetric extension;

(h) electrical means to cause the piezoelectric plate to deflect, said deflection changing axial force applied by the piezoelectric plate against the mirror support;

(i) a mirror located at the center portion;

(j) means to mount the mirror support to the frame within the cavity in a manner which places the mirror within an optical path of the ring laser, the means to mount being located at the perimetric portion of the front surface.

4,836,678

DOUBLE-PATH INTERFEROMETER

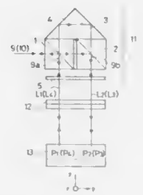
Masahiro Okaji, Ibaraki, Japan, assignor to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Mar. 26, 1987, Ser. No. 30,349

Claims priority, application Japan, Mar. 26, 1986, 61-68057

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—351 **6 Claims**



1. An interferometer comprising:

(a) a first polarized beam splitter disposed on a light path from a light source for splitting an incident light beam into a transmitted light beam and a light beam reflected by 90 degrees relative to said transmitted light beam;

(b) a half-wave plate disposed on a light path of said first polarized beam splitter for rotating a polarization plane in said transmitted light beam by 90 degrees;

(c) a second polarized beam splitter disposed on a light path of said half-wave plate for reflecting by 90 degrees the transmitted light beam having its polarization plane rotated by 90 degrees;

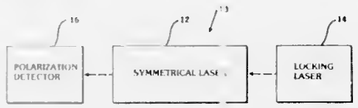
(d) reflecting means disposed on a position in a direction at right angles relative to the light paths of said first and second polarized beam splitters for reflecting the respective reflected light beams from said first and second polarized beam splitters, said reflecting means consisting of a light path conversion means for modifying the light beam paths and transmitting said light beams therethrough to a reflecting mirror wherein said light beams are reflected back to said path conversion means;

(e) a quarter-wave plate interposed between said first and second polarized beam splitters and said reflecting means for rotating polarization planes in the transmitted light beams from said first and second polarized beam splitters by 90 degrees; and

(f) a cube corner prism disposed on the light path of said reflecting means on a side of said first and second polarized beam splitters opposite the side thereof on which said quarter-wave plate is disposed for inverting the direction of progress of the transmitted light beam from said first polarized beam splitter by 180 degrees to lead it to said second polarized beam splitter and also inverting the direction of progress of the transmitted light beam from

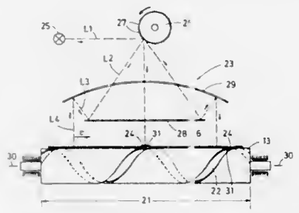
said second polarized beam splitter by 180 degrees to lead it to said first polarized beam splitter.

4,836,679
ROTATION SENSORS BASED ON SYMMETRICAL ELECTRO-MAGNETIC OSCILLATORS
Bruce J. Bartholomew, Poway, Calif., assignor to General Dynamics Corporation, San Diego, Calif.
Filed May 16, 1988, Ser. No. 194,604
Int. Cl.[4] G01C *19/58, 19/64*
U.S. Cl. 356—364 **5 Claims**



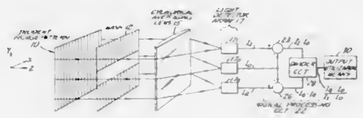
1. A rotation sensor for measuring the rotational position of a body relative to a fixed inertial coordinate system comprising:
an electro-magnetic oscillator having symmetry about at least one axes that can be locked into a mode of oscillation corresponding to said fixed inertial coordinate system;
a locking oscillator for locking said electro-magnetic oscillator into said mode of oscillation corresponding to said fixed inertial coordinate system; and
a rotation detector for detecting the rotational position of said electro-magnetic oscillator about said symmetrical axes relative to said fixed inertial system.

4,836,680
FLATNESS MEASURING DEVICE FOR STRIP-SHAPED ROLLED MATERIAL
Josef Tröster, Kurfürst-Heinrich-Strasse 27, D-5960 Olpe, and Axel Barten, Im Gensterfeld 20, D-5900 Siegen-Sohlbach, both of Fed. Rep. of Germany
Filed Jan. 7, 1988, Ser. No. 141,970
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1987, 3701267
Int. Cl.[4] G01B *11/30;* **B21B** *37/00*
U.S. Cl. 356—371 **14 Claims**



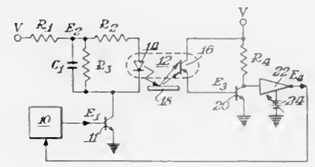
1. Flatness measuring device for strip-shaped rolled material in cold rolling mills, comprising a measuring roller (13) arranged transversely to the strip travel direction (a) and across the strip width (b), and detecting the rolled strip (6), this measuring roller having at least one surface groove (22) extending over the entire roller length (21), as well as a scanner (23) with a light beam (L4) for scanning strip wavinesses (24) that may occur in the strip that overlies the surface groove (22) of the measuring roller (13) on account of a differing strip tension distribution over the strip width (b)

4,836,681
FRINGE PATTERN PHASE DETECTION SYSTEM
John G. Van Saders, Asbury, N.J.; Andrew Tarasevich, Forrest Hills, N.Y., and Michael C. Reichenbach, Huntsville, Ala., assignors to Lockheed Electronics Co., Inc., Plainfield, N.J.
Filed May 27, 1986, Ser. No. 867,026
Int. Cl.[4] H01J *3/14, 40/14;* **G02B** *27/44;* **G01B** *11/14*
U.S. Cl. 356—374 **13 Claims**



1. In combination in apparatus for detecting the phase of an incident light fringe pattern, first and second mask means each having an alternating array of light passing and light blocking area corresponding to the incident light fringe patterns, the light passing and blocking array of said second mask means being quadrature offset with respect to the array of said first mask means, first and second light detectors, and averaging light collecting means disposed intermediate said first and second mask means and said first and second light detectors for coupling the fringe pattern light passing through said first and second mask means onto said first and second light detectors, respectively; and divider means connected to said first and second light detectors for determining the quotient of the output signals of said light detectors.

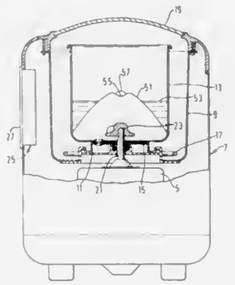
4,836,682
METHOD AND APPARATUS FOR CALIBRATING OPTICAL SENSORS
Paul C. Keenan, III, Newark, Del., assignor to E. I. DuPont De Nemours and Company, Wilmington, Del.
Filed Jul. 2, 1986, Ser. No. 881,238
Int. Cl.[4] G01N *21/55*
U.S. Cl. 356—445 **8 Claims**



1. A method for automatically calibrating the response of an optical sensor having a photoemitter portion and a photodetector portion and for determining the presence of different backgrounds comprising the steps of:
(a) applying an energizing pulse to the photoemitter portion, the energizing pulse having a predetermined time duration which is substantially controlled by a time duration of a first driving pulse;
(b) directing from the photoemitter portion to a reference background a first light pulse caused by the energizing pulse, the light pulse having a predetermined time duration substantially controlled by the time duration of the driving pulse and a predetermined time varying intensity characteristic that first gradually increases and then gradually decreases;
(c) sensing the time varying intensity characteristic of the light pulse from the reference background by the photodetector portion;
(d) measuring the time duration of the light pulse from the reference background at or above a predetermined intensity level;

(e) automatically storing the measured time duration;
(f) repeating the above steps (a) through (d) using another driving pulse having a time duration which is the same as the time duration of the first driving pulse to generate a light pulse having the same predetermined time duration and time varying intensity as the first light pulse for another background and in step (d) measuring the time duration of the light pulse from the another background at or above the same predetermined intensity level to provide another measured time duration; and
(g) automatically comparing the stored time duration and the another time duration to determine if like backgrounds were measured.

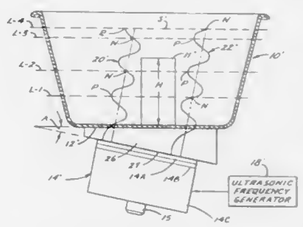
4,836,683
KNEADING MACHINE
Michishige Aoyama, Aichi, Japan, assignor to Kabushiki Kaisha Toshiba, Japan
Filed Mar. 8, 1988, Ser. No. 165,604
Claims priority, application Japan, Mar. 11, 1987, 62-35398[U]
Int. Cl.[4] B28C *1/16;* **B29B** *1/06*
U.S. Cl. 366—98 **20 Claims**



1. A kneading machine including a main material and an ancillary material to be kneaded while being mixed together, said kneading machine comprising:
kneading means for kneading the main material and the ancillary material;
timer means for starting a kneading operation by actuating the kneading means in accordance with a set time;
start means for actuating the timer means to start a time count;
cancelling means for resetting the timer means and the start means; and
control means for enabling the cancelling means to function for a prescribed period of time after the start means is operated when no operation of the timer means to set the time therein has occurred.

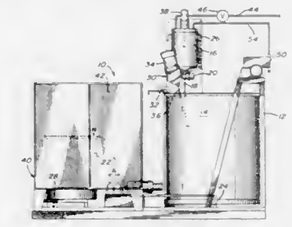
4,836,684
ULTRASONIC CLEANING APPARATUS WITH PHASE DIVERSIFIER
Laszlo J. Javorik, Oregon, and Peter J. Puskas, Freeport, both of Ill., assignors to Ultrasonic Power Corporation, Rockford, Ill.
Filed Feb. 18, 1988, Ser. No. 161,457
Int. Cl.[4] B08B *3/12;* **B01F** *11/02*
U.S. Cl. 366—114 **10 Claims**

1. Apparatus comprising a container for holding a bath of liquid, a transducer located in atmosphere adjacent the outer side of said container and operable when energized to produce vibrational energy waves which are transmitted through said container and into said bath, and means located between said transducer and said bath for causing energy waves which are of the same phase when initially produced to be of diverse



phases as such waves pass into said bath, different portions of said means having different physical characteristics.

4,836,685
PROCESS AND AN APPARATUS FOR MIXING SUBSTANCES
Laurent Verreault, Quebec, Canada, assignor to Le Groupe Laperriere & Verreault, Inc., Trois Riviere, Canada
Filed Jul. 23, 1987, Ser. No. 76,904
Claims priority, application Canada, Jul. 8, 1987, 541608
Int. Cl.[4] B01F *15/04;* **G05D** *11/04;* **G01G** *13/02, 17/06*
U.S. Cl. 366—141 **6 Claims**



1. An apparatus for preparing a paper coloring solution by blending in accordance with a certain formula first and second substances, namely color pigments and a diluting agent, and for delivering said coloring solution to a paper machine, said apparatus comprising:
a mixing vessel for preparing a batch of said coloring solution;
a storage tank for said coloring solution;
first conduit means establishing a first fluid path from said mixing vessel to said storage tank for discharging a batch of coloring solution from said mixing vessel in said storage tank;
flow control means in said first fluid path;
second conduit means establishing a second fluid path from said storage tank to said paper machine for supplying coloring solution to said paper machine;
first weighing means operatively connected to said mixing vessel for generating a first signal representative of the weight of material present in said mixing vessel;
second weighing means operatively connected to said storage tank for generating a second signal representative of the weight of coloring solution in said storage tank;
discharge means adapted to be connected to a supply of color pigments and of diluting agent, said discharge means being in fluid communication with said mixing vessel for selectively discharging therein controlled amounts of color pigments and diluting agent;
electronic controller means in operative relation with said

first and second weighing means, with said flow control means and with said discharge means, said electronic controller means comprising:

(a) memory means in which is stored said formula; and

(b) calculating means,

said controller means receiving said second signal and signaling said discharge means to deliver in said mixing vessel an amount of said first substance when said second signal indicates that the quantity of coloring solution in said storage tank is below a predetermined level,

said controller means receiving said first signal and determining the weight of said amount of said first substance actually delivered in said mixing vessel,

from the weight of said first substance actually delivered in said mixing vessel and from said formula stored in said memory means, said calculating means calculating an amount of said second substance to be delivered in said mixing vessel,

said controller means signaling said discharge means to deliver in said mixing vessel an amount of said second substance in accordance with the calculated amount of said second substance in the previous step,

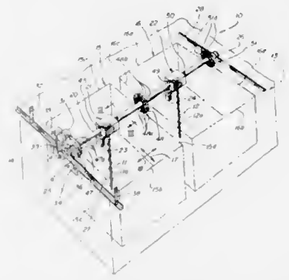
upon completion of a batch of coloring solution in said mixing vessel, said controller means signaling said flow control means to enable discharge of said batch of coloring solution in said storage tank.

4,836,686

APPARATUS FOR STIRRING GRAIN IN RECTANGULAR BIN REGIONS

Eugene G. Sukup, Beeds Lake, Hampton, Iowa 50441

Filed Jun. 10, 1988, Ser. No. 205,382
Int. Cl.[4] B01F *7/08*
U.S. Cl. 366—261 10 Claims



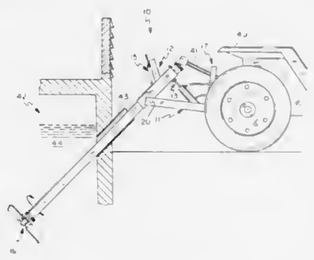
1. Apparatus for stirring grain stored in a grain bin, comprising: a stirrer for extending downwardly into grain in said bin and rotating about a generally vertical axis, a traversing mechanism for supporting and journaling an upper end portion of said stirrer and for effecting back and forth movements of said stirrer in a first horizontal direction between opposite ends of a region within said bin while effecting back and forth movements of said stirrer in a second horizontal direction between opposite sides of said region, first electric drive motor means for driving said stirrer to effect rotation thereof about said generally vertical axis, second electric drive motor means for driving said traversing mechanism to effect said back and forth movements of said stirrer, forces applied between the grain and the lower end of said stirrer as a result of said back and forth movements in said first horizontal direction being effective to apply torques tending to rotate said stirrer about a horizontal tilt axis parallel to said second horizontal direction and in the vicinity of said upper end portion of said stirrer, first sensing means responsive to a first torque applied about said tilt axis in one rotational direction during movement toward one end of said region, second sensing means responsive to a second torque applied about said tilt axis in an opposite rotational direction during movement toward the opposite end of said region, and energizing means for supplying operating voltages to said first and second electric drive motor means, said energizing means being coupled to and controlled by said first and second sensing means to deenergize said second electic drive motor means when either said first torque or said second torque exceeds a certain value while continuing to energize said first electric drive means.

4,836,687

WASTE PIT STIRRER

Oliver A. Kardoes, R.R. 1, Box 63, Titonka, Iowa 50480; Richard T. Kardoes, Wesley, Iowa, and David A. Bonestroo, Lake Elmo, Minn., assignors to Oliver A. Kardoes, Titonka, Iowa

Filed Apr. 16, 1986, Ser. No. 852,632
Int. Cl.[4] B01F *7/06*
U.S. Cl. 366—286 20 Claims



1. A portable, adjustable and collapsible stirring device for agitating and homogenizing to a slurry state the solid and liquid components of waste materials contained in an enclosure having an angularly positioned ingress/egress port of a tubular structure and having a predetermined diameter, said device being connectible to a power source comprising:

(a) a rigid frame structure, said rigid frame structure having a substantially horizontal support structure with a frontal end, said frame structure being connectible to conveyance means, said frame structure having a rotatable shaft mounted at said frontal end;

(b) an adjustable, hollow positioning sleeve having first and second open ends, said sleeve being mounted at said first end to said rotatable shaft and being constructed and arranged so that said positioning sleeve is pivotable through an angle range of approximately 50 degrees with respect to said horizontal support structure to thereby align said positioning sleeve with the ingress/egress port, said positioning sleeve further having a base portion mounted thereon;

(c) an adjustable linear force means pivotally mounted to said horizontal support structure and being pivotally and directly connected to said positioning sleeve adjacent said second open end thereof for rotating said sleeve through said predetermined angle range to align said positioning sleeve with the ingress/egress port;

(d) an elongated, sealed drive shaft assembly having a central axis and being smaller in diameter than that of the ingress/egress port movably disposed in said positioning sleeve, said shaft assembly having a hollow housing structure and an axial shaft member mounted for rotation therein, said drive shaft assembly further having a first end extending outwardly from said first open end of said positioning sleeve for insertion into the ingress/egress port of the enclosure and a second end extending outwardly from said second open end of said positioning sleeve for connection to the power source, said drive shaft assembly being pivotable with said rotatable shaft whereby said central axis is closely spaced to said frontal end of said frame structure;

(e) an adjustable winch assembly connected to said base portion of said positioning sleeve and further being connected to said drive shaft assembly by a cable, said cable being attached generally at said first end of said drive shaft assembly and movably coupled with and aligned on the exterior of said positioning sleeve at a predetermined angle for inserting and removing said drive shaft assembly into and from the enclosure ingress/egress port; and

(f) a collapsible agitator assembly having a diameter in its collapsed state smaller than the predetermined diameter of the ingress/egress port and being connected to said first end of said drive shaft assembly, said collapsible agitator assembly having a plurality of propellor blades and a central hub for affixing said agitator assembly to said axial shaft member, said blades being pivotally attached to said hub and being constructed and arranged to expand by centrifugal force to an operative diameter greater than that of the ingress/egress port upon the rotation of said agitator assembly by said drive shaft assembly, whereby said stirring device is usable through the tubular port by only the insertion of said drive shaft assembly and said collapsible agitator assembly therethrough.

4,836,688

WHISK

Peter K. Bayly, Melbourne, Australia, assignor to Kingsley Nominees Pty. Ltd., Balwyn, Australia

Filed Apr. 5, 1988, Ser. No. 177,776
Claims priority, application Australia, Apr. 8, 1987, PI1309
Int. Cl.[4] B01F *13/00*
U.S. Cl. 366—342 9 Claims

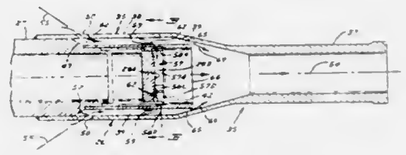
1. A whisk comprising an elongate handle, an operative section and a flexible means connecting said operative section to one end of said handle, said operative section including a plurality of blades which are arranged side by side in laterally spaced relationship, each said blade having a relatively broad surface facing generally towards a corresponding broad surface of an adjacent said blade, the thickness of said blades measured in a direction perpendicular to said broad surfaces being small compared with the distance said blades are spaced apart so as to permit the flow of viscous material between said blades, said blades being in the form of fingers each having a distal end, said fingers being joined together at a position remote from their distal ends, said fingers having further blades formed on the distal ends thereof arranged angularly relative to the broad surfaces of the fingers, flexible means forming at least part of the connection between said blades and said handle whereby said blades are able to move to a limited degree relative to said handle.

4,836,689

ASYMMETRIC PURGE AIR SYSTEM FOR CLEANING A LENS

Richard J. O'Brien, Burnsville, and Douglas C. Myhre, Eden Prairie, both of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Continuation-in-part of Ser. No. 833,976, Feb. 27, 1986, Pat. No. 4,786,188. This application Sep. 4, 1987, Ser. No. 93,475
Int. Cl.[4] G01J *05/08*
U.S. Cl. 374—125 9 Claims



1. An instrument for sensing radiation representative of a parameter in a particle suspension and for providing an output indicative of the parameter, the instrument receiving a supply of pressurized fluid, comprising:

port means disposed on the instrument and opening to the parameter source for receiving the radiation;

sensing means coupled to the port means for sensing the received radiation and for providing the output;

window means disposed between the port means and the sensing means for transmitting the radiation therethrough and for shielding the sensing means from the particle suspension, the window means having a window surface with a central axis normal to the window surface, for transmitting radiation to the sensing means exposed to the suspension; and

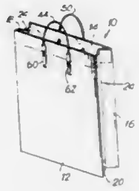
purge means disposed in the instrument for receiving the pressurized fluid and having openings arranged around the circumference of the window surface for directing flows of the pressurized fluid having an axially asymmetric flow pattern onto the window surface, generating an unstable flow pattern of the pressurized fluid on the window surface such that particles are removed from substantially all of the window surface.

4,836,690

CARRIER CONTAINER WITH IMPROVED CLOSURE

Peter S. C. Cheng, 5 Ross Street, Toronto, Ontario, Canada M5T 1Z8

Filed May 27, 1988, Ser. No. 199,753
Int. Cl.[4] B65D *33/06, 33/16*
U.S. Cl. 383—6 15 Claims



1. A carrier container, comprising:

(A.) a bag having an open mouth, a closed bottom, and a plurality of panels bounding an interior for receiving an object to be carried,

(i) two of said panels being spaced apart of each other along a transverse direction, at least one of said panels having a flap at the mouth manually positionable to a

folded state to close the mouth and form the bag with a box-like configuration in which the two panels are generally parallel to each other;

(B) a pair of carrying handles at opposite sides of the bag, for carrying the object, and for uniformly distributing the weight of the object during carrying; and

(C) closure means for maintaining the box like configuration for the bag during carrying, including at least one closure member at the mouth and movable to a closed position in which said one closure member extends from one carrying handle along said transverse direction to the other carrying handle and overlaps, and maintains said flap in the folded state.

4,836,691

MEDICAL BAG AND METHOD FOR PREPARING THE SAME

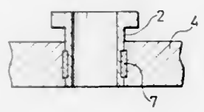
Tatsuo Suzuki, Tokyo, and Keinosuke Isono, Kawaguchi, both of Japan, assignors to Material Engineering Technology Laboratory Inc., Tokyo, Japan

Filed Mar. 2, 1988, Ser. No. 163,299

Claims priority, application Japan, Mar. 4, 1987, 62-50650

Int. Cl.[4] B65D *33/16*; B32B *31/00*

U.S. Cl. 383—80 **9 Claims**



1. A medical bag made from a thermoplastic resin and having a mouth portion and a receiving portion which is prepared by prepositioning a ferromagnetic heating element between the mouth portion and the receiving portion, and causing the heating element to generate heat by high frequency induction heating, whereby the mouth portion and the receiving portion are fused together.

4,836,692

SHAFT SUPPORT COMPRISING STATIC FLUID BEARINGS

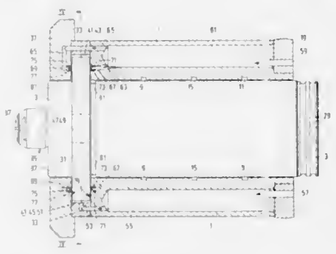
Johannes L. M. Hagen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 125,028, Nov. 24, 1987, abandoned. This application Dec. 9, 1988, Ser. No. 282,847

Claims priority, application Netherlands Nov. 24, 1986, 8602973

Int. Cl.[4] F16C *32/06*

U.S. Cl. 384—107 **12 Claims**



1. A bearing system, comprising:

a housing;

a shaft rotatably disposed within said housing;

a first radial bearing for radially centering and supporting said shaft in said housing;

a static thrust bearing comprising said shaft having a flange with opposing thrust surfaces, said housing having a pair of walls with bearing surfaces complimenting said flange thrust surfaces, and means comprising a plurality of fluid restrictors circumferentially arranged in said pair of housing walls for introducing a fluid at a first pressure between each thrust surface and the complimenting bearing surface; and

a second radial bearing for producing a radial force on said flange for counteracting radial forces applied to said shaft during bearing operation, said second radial bearing being a static bearing and comprising said annular flange having a circumferential surface, said housing having a circumferential wall defining a recess opposite said circumferential flange surface, and means for supplying a fluid to said recess at a second pressure lower than said first pressure for exerting a radial force on said flange, said radial force being substantially equal to the product of said second pressure and the surface area of said circumferential flange surface when projected in the direction of the radial force, said fluid restrictors being radially spaced from said circumferential flange surface such that the region between each thrust surface and the complimenting bearing surface bounded by said restrictors and said recess has a pressure higher than the second pressure and lower than the first pressure during bearing operation.

4,836,693

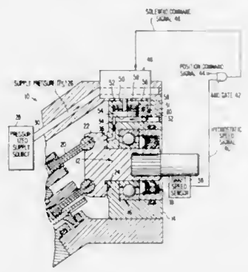
INTERMITTENTLY ASSISTED HYDROSTATIC BEARING

Mark S. Stroze, Rockford, Ill., assignor to Sundstrand Corp., Rockford, Ill.

Filed May 20, 1988, Ser. No. 196,264

Int. Cl.[4] F16C *32/06*

U.S. Cl. 384—121 **21 Claims**



1. An intermittently assisted hydrostatic bearing having opposed bearing surfaces with periodic assistance being provided to increase pressure balance from less than 100% to a pressure balance greater than 100% with the pressure balance being a measure of a percentage of an overall load supported by a fluid film, comprising:

a pressurized fluid supply source for supplying a pressurized fluid;

a supply channel, communicating with the pressurized fluid supply source, for supplying the pressurized fluid from the pressurized fluid supply source to a point between the opposed bearing surfaces; and

pressure producing means coupled to the supply channel for intermittently applying a pressure pulse to the bearing surfaces in response to a pulse command signal to produce a pressure balance greater than 100% between the bearing surfaces by increasing the pressure of the pressurized fluid which is supplied to the point between the opposed bearing surfaces from a pressure produced by the pressurized fluid supply source, to establish a hydrodynamic bearing between the opposed bearing surfaces when the rotational speed of the rotating member is less than the rotational speed required for achieving a hydrodynamic bearing at the opposed bearing surfaces.

4,836,694

BEARING SEAL

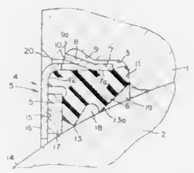
Peter R. Schmehr, Bubingen, and Edmund Sander, Riegelsberg, both of Fed. Rep. of Germany, assignors to SKF Gleitlager GmbH, Fed. Rep. of Germany

Filed Apr. 7, 1988, Ser. No. 178,607

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1987, 8705293

Int. Cl.[4] F16C *33/74*; F16J *15/32, 15/54*

U.S. Cl. 384—145 **6 Claims**



1. Seal for bearings having inner and outer ring (1, 2) comprising a sealing ring (6) mounted in a cylindrical recess (3) in one of the bearing rings, means defining an unobstructed air space between an axially oriented shank (7) of a retaining ring (4) having an L-shaped cross section and bore surface of said cylindrical recess (3) defining a radial clearance to permit radial adjustment of said sealing ring, said sealing ring (6) being fixed in a bore (7a) of the retaining ring (4) and projecting laterally from said retraining ring (4) and resting with axial pretension against a radial surface (11) of said one bearing ring (1).

5. Seal for bearings having inner and outer ring (1, 2) comprising a sealing ring (6) mounted in a cylindrical recess (3) in one of the bearing rings, means defining a radial clearance between an axially oriented shank (7) of a retaining ring (4) having an L-shaped cross section and bore surface of said cylindrical recess (3), said sealing ring (6) being fixed in a bore (7a) of the retaining ring (4) and projecting laterally from said retaining ring (4) and resting with axial pretension against a radial surface (11) of said one bearing ring (1) and sliding wiper ring (5) between an outer sealing lip (13) of the sealing ring (6) and an inner surface (15) of the radially oriented shank (16) of the retaining ring (4).

4,836,695

COMPOSITE SLIDING SURFACE BEARING

Hans-Paul Baureis, Dielbeim-Horrenberg; Wolfgang Bickle, Reilingen, and Wilhelm Lankreijer, Bruchsal, all of Fed. Rep. of Germany, assignors to Kolbenschmidt Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

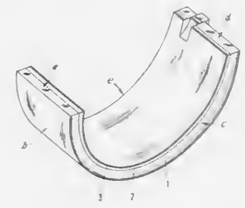
Filed Aug. 3, 1988, Ser. No. 227,860

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1987, 3727468

Int. Cl.[4] F16C *33/04*

U.S. Cl. 384—276 **1 Claim**

1. A composite sliding surface bearing for use in highly loaded internal combustion engine or associated power trains, comprising: a backing layer of steel, a bearing alloy layer, which has been applied to said backing layer and is composed of an aluminum alloy of the type AlSi12CuMgNi, AlSn6Cu, AlZn5SiCuPb or AlZn4.5SiCuPb, and a sliding surface layer, which is composed of zinc phosphate deposited in a thickness of between 2 and 8 μm on the aluminum bearing alloy layer, wherein those surfaces of the bearing which is disposed outside the sliding surface, including the rear surface of the backing layer of steel, are provided in a thickness between 0.5 and 5 μm



with a protective layer of tin, cadmium, cobalt, copper zirconium, lead, silver, titanium, tungsten or chromium.

4,836,696

PRINTER HAVING A PIVOTALLY SUPPORTED PLATEN

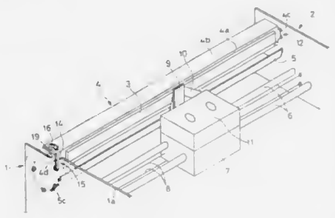
Takashi Okumura; Koshiro Yamaguchi, and Yoshiaki Yuki, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Feb. 26, 1988, Ser. No. 161,151

Claims priority, application Japan, Mar. 3, 1987, 62-30955[U]

Int. Cl.[4] B41J *11/20*

U.S. Cl. 400—58 **12 Claims**



11. A printing apparatus wherein a print head is operable in a printing position thereof to perform a printing operation on a recording medium supported by a substantially flat support surface of a platen, comprising:

a pair of side frames spaced apart from each other in a longitudinal direction of said platen;

one of said side frames having an aperture formed through a thickness thereof, said one side frame including a first part which defines one of opposite ends of said aperture, and a pair of opposed spaced-apart second parts which define a narrowest portion of said aperture intermediate between said opposite ends;

the other of said side frames having a cutout formed through a thickness thereof, and a detent portion disposed adjacent to said cutout, said cutout being aligned with said aperture and being open at an open end thereof at an edge of said other side frame, said other side frame including a third part which defines a closed end of said cutout aligned with said one end of said aperture, and a pair of opposed spaced-apart fourth parts which define a narrowest portion of said cutout intermediate between said closed and open ends; and

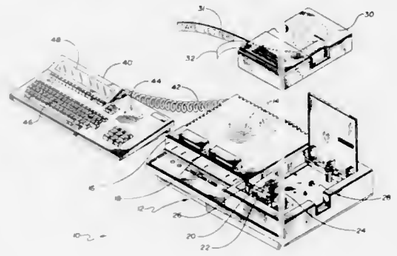
a support member extending to support said platen, and including a first flat engaging portion at one of opposite ends thereof and a second flat engaging portion at the other end thereof, said first flat engaging portion engaging said first and second parts of said one side frame while said second flat engaging portion engaging said third and

fourth parts of said other side frame, such that said support member is freely pivotable due to contact of said print head with said platen upon movement of said print head to said printing position, said support member further including a third engaging portion which engages said detent portion, thereby preventing said second engaging portion from being disengaged from said cutout at through said open end of the cutout.

4,836,697
AUTOMATED THERMAL TRANSFER DEVICE AND CONTROL SYSTEM THEREFOR

Michael A. Plotnick, Southampton, Pa.; Paul J. Shapiro, New York, and Fred R. Stolfi, Shrub Oak, both of N.Y., assignors to Kroy Inc., Scottsdale, Ariz.

Filed Mar. 21, 1988, Ser. No. 170,796
Int. Cl.[4] B41J *3/02*; H05D *1/00*
U.S. Cl. 400—120 **15 Claims**



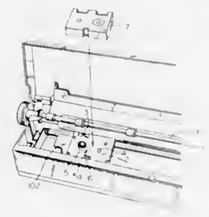
1. A control system for an automated thermal transfer device having an image transfer station defined by a printhead for transferring a selected image comprised of a set of columns of pixel data from a ribbon to a tape and having a tape-ribbon drive means for advancing said ribbon and tape past said image transfer station, comprising:
- detector means for detecting the speed and position of tape and ribbon past said image transfer station;
- feedback means operably connected to said detector means and said drive means for controlling the speed of said tape and ribbon past said image transfer station; and
- processing means operably connected to said detector means and said printhead for transferring said columns of pixel data to said printhead in response to a position of said tape and ribbon.

4,836,698
INVERTIBLE RIBBON CARTRIDGE

Kazuhiko Takagi, Nagoya, and Yoshihito Monomura, Gifu, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Sep. 8, 1987, Ser. No. 94,378
Claims priority, application Japan, Sep. 8, 1986, 61-137575[U]
Int. Cl.[4] B41J *32/00*
U.S. Cl. 400—208 **6 Claims**

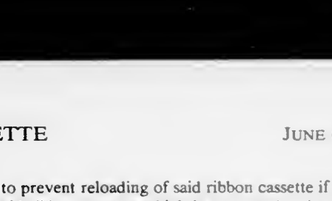
1. A printing apparatus having a carriage movable along a platen and a ribbon cassette having a first side and an opposite second side, said cassette being configured to be loaded on a cassette mounting surface of said carriage so that either of its sides may face upward in an invertible manner, said printing apparatus comprising:
- a projection vertically protruding from said cassette mounting surface;
- indicating means provided on said ribbon cassette and including a blocking member engageable with said projection and capable of being displaced between two different positions in said vertical direction;
- whereby said projection and said blocking member cooperate to prevent reloading of said ribbon cassette if the side of said ribbon cassette which is attempted to be directed upward in reloading said ribbon cassette after once removed from said mounting surface is not the same side that faced upward before being removed.



4,836,699
OPERATOR PANEL FOR PRINTERS

Alfred Babsch, Ulm-Soeflingen, and Lorenz Fromme, Oepfingen, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 11, 1987, Ser. No. 24,417
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1986, 3607945
Int. Cl.[4] B41J *5/10*
U.S. Cl. 400—479 **3 Claims**

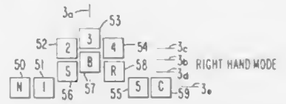


1. Operator panel for printers which includes visible function indicators as well as trigger elements for controlling printer functions comprising:
- an operating and indicating field arranged in a matrix fashion with lines and columns wherein the lines indicate classes of printer functions, and wherein a particular column includes designations as well as indications for the classes of the printer functions;
- an intersection of a line of a column including at the most one indication and/or one designation;
- a single key separated from and associated with each of the columns whereby keys associated with the particular column select only designations and indications associated with that column and keys associated with columns other than the particular column select the respective column with which such a key is associated; and
- said key in said particular column operating a step switch to run through the line class indications one by one and on a cyclic basis to thereby select the respective line.

4,836,700
DATA ENTRY SYSTEM

Paul S. Jensen, P.O. Box 563, Los Altos, Calif. 94022

Continuation of Ser. No. 596,161, Apr. 2, 1984, abandoned. This application Apr. 10, 1986, Ser. No. 850,475
Int. Cl.[4] B41J *5/10, 5/28*
U.S. Cl. 400—489 **7 Claims**

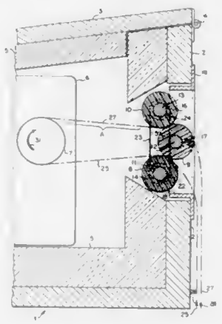


1. A data entry system of capable of operating in either a processing state or a watching state comprising:
- a keyboard having a plurality of keys, each capable of being in either a depressed or a released state;
- means for monitoring and detecting the depressed or released state of each of said plurality of keys;
- means responsive to said monitoring and detecting means for causing said dat entry system to enter its watching state from its processing state for a period of predetermined initial duration whenever one of said keys is found to be in its depressed state;
- means for extending said duration of said period each time another one of said plurality of keys becomes depressed, so long as said other key becomes depressed before the expiration of said period and said other key was not previously in its depressed state during said period; and
- means responsive to the expiration of said period for providing a data or control signal corresponding to the key or keys found depressed during said period, independent of when said key or keys were placed in the depressed state, and causing said data entry system to revert to its processing state from which it can again enter the watching state upon detection of a depressed key.

4,836,701
PAPER TRANSPORT DEVICE FOR PRINTING-INSTALLATIONS

Jeffrey L. Gates, 101210 Herb Rd., Windsor, Calif. 95492

Filed Feb. 27, 1987, Ser. No. 19,637
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1986, 3606670
Int. Cl.[4] B41J *15/04*
U.S. Cl. 400—617 **8 Claims**

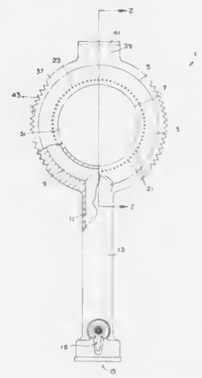


1. A printing system having a paper input port and a paper output port; said printing system comprising:
- (a) a printing cylinder;
- (b) an input cylinder;
- (c) an output cylinder; and
- (d) a compression cylinder;
- (e) the axes of said printing cylinder, said input cylinder, said output cylinder, and said compression cylinder being parallel;
- (f) said input cylinder and said output cylinder being remote from each other;
- (g) said compression cylinder being loaded for compression against both said input cylinder and said output cylinder;
- (h) whereby said system establishes a paper path from said input port, between said input cylinder and said compression cylinder, around said printing cylinder, and between said output cylinder and said compression cylinder to said output port;
- (i) said input cylinder, said output cylinder and said compression cylinder being powered only by said printing cylinder and only when a length of paper extends through said path.

4,836,702
CLEANING DEVICE FOR PAINT BRUSHES AND ROLLERS

Donavan J. Allen, Taylors, S.C., assignor to Torus Corporation, Greenville, S.C.

Filed Nov. 23, 1987, Ser. No. 124,051
Int. Cl.[4] B08B *3/02*
U.S. Cl. 401—10 **4 Claims**



1. A cleaning device for paint brushes and rollers comprising:
- an annular sleeve open in the center thereof with unrestricted access through said open center, said annular sleeve having an outer surface and an inner surface, defining an annular liquid passage means within said sleeve between said inner and outer surfaces;
- a longitudinal sleeve defining an unperforated liquid entry means communicating with said liquid passage means, said longitudinal sleeve including a threaded connection for accepting a conventional hose fitting for purposes of connecting said liquid passage means with a source of liquid under pressure;
- liquid outlet means disposed in a circle about said inner surface of said annular sleeve and communicating with said liquid passage means wherein said liquid outlet means comprises a plurality of ports each disposed at an angle with respect to an axial centerline (29) of said annular sleeve to point outward from said annular sleeve; and
- an external flange disposed circumferentially around the outer surface of said annular sleeve and projecting perpendicularly to said axial centerline of said annular sleeve,

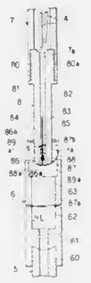
including means for scraping and loosening paint or other deposits from said paint brushes and rollers.

4,836,703

LEAD CARTRIDGE OPENING AND CLOSING UNIT

Hidebei Kageyama; Yoshihide Mitsuya, and Saburo Kobayashi, all of Kawagoe, Japan, assignors to Kotobuki & Co., Ltd., Kyoto, Japan

Filed Jun. 12, 1987, Ser. No. 61,293
Claims priority, application Japan, Aug. 29, 1986, 61-204692; Dec. 29, 1986, 61-199672; Dec. 29, 1986, 51-199673
Int. Cl.[4] B43K 21/00
U.S. Cl. 401—65 2 Claims



1. A lead cartridge opening and closing unit for a lead cartridge having an axis detachably fittable within a lead guide of a mechanical pencil in order to supply and/or exchange lead members, said opening and closing unit comprising:

a chuck type opening and closing mechanism mounted on said lead cartridge, said chuck type opening and closing mechanism being divided in a diametrical direction, relative to said axis, and having inward elastic force, said opening and closing mechanism being provided with elastic opening and closing piece portions the whole of which is divided in an axial direction of said mechanical pencil, these divided piece portions being coaxially combined and incorporated with each other, and said opening and closing piece portions being elastically deformable in the direction opposite to each other, said opening and closing piece portions defining a lead conducting hole therebetween, said lead conducting hole being open when said opening and closing piece portions are deformed opposite to each other and closed when said opening and closing piece portions are undeformed; and

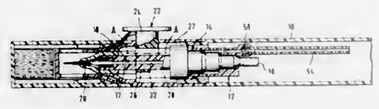
outward engaging piece portions provided on respective opening and closing piece portions said outward engaging piece portions moving inwardly against said inward elastic force to elastically deform said opening and closing piece portions in the direction opposite to each other to open said lead conducting hole in case of forcible insertion into and engagement with said lead guide, said outward engaging piece portions returning elastically to move outwardly to close said lead conducting hole in case of release from said forcible insertion and engagement.

4,836,704

APPLICATOR DEVICE

Georg Roeder, Schwabach, Fed. Rep. of Germany, assignor to Schwan-Stabilo Schwanhaeusser GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Nov. 16, 1987, Ser. No. 121,406
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1986, 3641390
Int. Cl.[4] B43K 5/08; A46B 11/02
U.S. Cl. 401—146 7 Claims



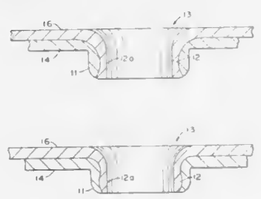
1. An applicator device comprising a container for containing a viscous material to be applied by the device, the container including an outlet opening for the material to issue therefrom, an applicator means for applying the viscous material, feed duct means having an inlet opening for receiving the viscous material from the container and adapted to feed it to the applicator means, a pressure compensating duct means for communicating the interior of the container with the exterior thereof separately from the path for the viscous material between the container and the applicator means, a vent duct means adjoining the pressure compensating duct means and extending in the interior of the container, a check valve in said vent duct means and adapted to open towards the interior of the container, a control valve operatively disposed between said outlet opening of the container and said inlet opening of the feed duct means to control the flow of said visous material and also operatively disposed between the pressure compensating duct means and the vent duct means, the control valve being also adapted to close the pressure compensating duct means when the control valve is in a non-actuated condition and open the pressure compensating duct means when the control valve is in an actuated condition, and means for actuating the control valve in the direction of opening thereof from the exterior of the device for viscous material to pass from said container through said feed duct means to said applicator means.

4,836,705

HOLLOW INTEGRAL RIVET

Robert L. La Barge, Ben Avon Borough, and Ronald J. Ewing, Allegheny Township, Armstrong County, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 863,453, May 15, 1986, Pat. No. 4,688,316, which is a continuation-in-part of Ser. No. 684,694, Dec. 21, 1984, Pat. No. 4,611,381. This application Jun. 29, 1987, Ser. No. 68,569
Int. Cl.[4] B25G 3/28; F16G 11/00
U.S. Cl. 403—282 8 Claims



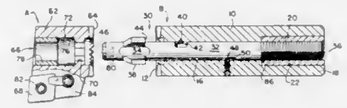
1. An assembly of at least two components joined together by at least one mechanical connection in sheet-like portions of the components and in an area of faying contact between the components comprising an inner integral collar projecting from one of the components and an outer integral collar projecting from the other component circumscribing and intimately engaging said first collar, with the inner collar having a cylindrical inner surface portion and a wall of varying thickness, at least a portion of the inner collar is of increasing thickness toward the outboard open end of the collar to lock said intimately engaged portions of the collars together.

4,836,706

QUICK CHANGE TOOL HOLDER

James L. Mitchell, Rogers, Ark., assignor to Rogers Tool Works, Inc., Rogers, Ark.

Continuation of Ser. No. 699,529, Feb. 8, 1985, Pat. No. 4,665,631. This application Apr. 3, 1987, Ser. No. 33,694
Int. Cl.[4] F16B 1/00
U.S. Cl. 403—24 18 Claims



1. A tool holder assembly comprising a mounting shank member and a tool nose member said shank member and said nose member comprising cooperating teeth elements, and connecting means for releasably maintaining said shank member and said nose member drivingly engaged at an interface plane, said connecting means comprising: a bayonet subassembly, first means for attaching said bayonet subassembly to said shank so as to extend a first distance from interface plane, second means for selectively attaching said bayonet subassembly to tool nose members a second distance from the interface plane with said bayonet subassembly extending through said interface plane, said first and second distances preferably being generally equal to each other, and first attaching means comprising adjustment means for adjusting the associated said first distance for substantially equalizing said first distance with the said second distance.

4,836,707

RELEASABLE CLAMPING APPARATUS

W. Neill Myers, Huntsville, Ala., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 4, 1987, Ser. No. 93,417
Int. Cl.[4] F16B 21/02; E05C 9/10
U.S. Cl. 403—322 8 Claims

1. An apparatus for selectively clamping a sized lifting member comprising

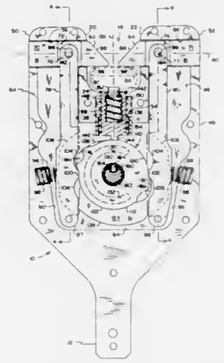
a generally hollow housing having an end wall provided with a pair of extending side walls defining a clamping region, said side walls each having an opening therethrough, with said openings aligned about a common axis, and said end wall having a bore disposed normal to said axis;

an inwardly biased latch member reciprocally mounted in each said opening and including a latch portion extending into said clamping region, said latch portions each having a tapered outer face for engagement by said lifting member for urging said latch portions out of said clamping region, whereby said lifting member is then received into said clamping region, after which said latch portions enclose said lifting member therein, and said latch portions each further including an inwardly facing first clamping face generally normal to said first bore, for clamped engagement with said lifting member;

a pair of elongated linkage members mounted in spaced relation in said housing and having first and second ends, each linkage member being pivotally secured at said first end to one of said latch members and pivotally secured at said second end in said hollow housing, said linkage members each having an inwardly facing linkage cam follower disposed between said first and second ends;

a clamp member disposed for selected movement in said bore and having a clamp cam follower on one end and a second clamping face on an opposite end for clampably engaging said lifting member;

a cam member rotatably disposed in said housing and having a pair of first, like, opposed cam lobes disposed to bear on each said linkage cam follower, for simultaneously moving each said latch portion in said opening out of said clamping region, and further having a pair of second, dissimilar, opposed cam lobes positioned generally 90° from said pair of first cam lobes so that a selected one of said pair of second cam lobes bears on said clamp cam follower of said clamp member, for selectively moving



said clamp member a predetermined distance into said clamping region, clamping a selected said lifting member between said first and second clamping faces of said latch member and said clamp member; and

rotation means including a handle, connected to said cam member for rotating said cam member in a selected direction, said rotation means including means for decoupling said handle from said cam member while maintaining rotational bias thereon, said handle including locking means for locking said handle in a predetermined position over said housing, whereby as said handle is rotated to a selected side of said housing, decoupled from said cam member and locked in a said predetermined position, a lifting member of one thickness is clamped, and as said handle is rotated to the opposite side of said housing, decoupled and locked in another predetermined position, a lifting member of different thickness is clamped

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4,836,708

SELF-LOCKING, ANTI-ROTATIONAL RETAINING WASHER FOR A "D" SHAPED SHAFT

Randall P. Chambers, Fort Launderdale; John C. Dzung, Sunrise, and Donald F. Gatto, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1988, Ser. No. 214,988
Int. Cl.[4] B25G 3/28
U.S. Cl. 403—358 4 Claims

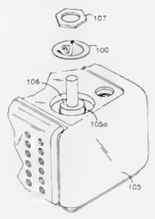
1. An assembly comprising in combination:

a housing having a hole, providing a wall;

a shaft inserted through the hole of said housing, said shaft having a substantially D-shaped cross section providing a flat portion; and

a retaining washer including:

a substantially flat washer having a hol :;
a tab being connected to said flat washer such that said tab is substantially perpendicular to said flat washer; and
a gusset connected between said tab and said flat washer, said gusset having an edge, said edge forming an obtuse angle with said flat washer;



said shafts being inserted into the hole of said flat washer, and said tab being inserted into the hole of said housing with said gusset being indented into the wall of said housing such that said tab is forced against the flat portion of said D-shaped shaft, thereby inhibiting rotation of said shaft within the hole of said housing

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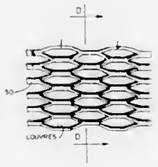
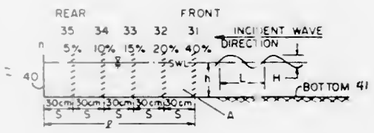
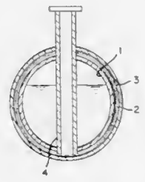
4,836,709
WATER WAVE ABSORBER
Jozinus Ploeg, Gloucester, and Wayne V. Jamieson, Ottawa, both of Canada, assignors to Canadian Patents and Development Limited, Ontario, Canada
Filed Jun. 15, 1987, Ser. No 61,560
Int. Cl.[4] E02B *3/06*
U.S. Cl. 405—31 17 Claims





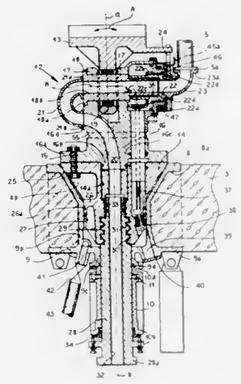
1. A water wave absorption device comprising a plurality of absorption elements each formed from at least one sheet of unflattened expanded material having louvred apertures, the elements being positioned one behind the other in spaced relationship and arranged in generally decreasing porosity from the front to the rear of the device.

4,836,710
UNDERGROUND TANK WITH LEAK DETECTION MECHANISM
Koji Sawada, Tokyo, Japan, assignor to Nippon Engineer Service Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 31, 1987, Ser. No. 91,036
Claims priority, application Japan, Feb. 10, 1987, 62-27099
Int. Cl.[4] B65G *5/00*
U.S. Cl. 405—54 6 Claims



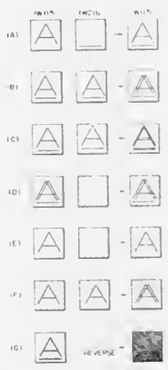
1. An underground tank having a leak detection mechanism, comprising an inner tank having an outside surface and in which a fluid is to be contained; an outer tank having an interior surface and covering said inner tank; a thin sheet having holes therein wound on said outside surface of said inner tank and in contact with said interior surface of said outer tank so that a narrow gap is defined between said inner tank and said outer tank; a conduit opened into said gap between said inner tank and said outer tank; means for applying prescribed pressure of gas to said gap through said conduit; means for detecting a change in the pressure of gas in said conduit, and means for detecting a change in the pressure of gas in said inner tank.

4,836,711
HINGE-ASSEMBLY, PARTICULARLY FOR UNDERWATER MOUNTING
Oneglio Sala, Bologna, and Paolo Montanari, San Lazzaro, both of Italy, assignors to Riva Calzoni S.p.A., Milan, Italy
Filed May 25, 1988, Ser. No. 198,327
Claims priority, application Italy, May 25, 1987, 20666A87
Int. Cl.[4] E02B *7/20*
U.S. Cl. 405—92 15 Claims



1. A separable hinge, especially for underwater mounting of equipment on a base, comprising:
a fixed portion rigidly affixed to said base and having an upwardly widening concave seat at an upper end of said fixed portion and a tubular lower part at an opposite end of said fixed portion opening into a passage in said base;
a shaped body matingly receivable in said concave seat and is provided with sealing means cooperating with said tubular lower part for sealing thereagainst;
a support element on said shafted body provided with a pivot;
a movable member connected to said equipment and mounted for angular displacement on said pivot;
a tierod inserted through said tubular lower part of said fixed portion upwardly into engagement with said shaped body 16 and formed with a releasable coupling therewith adapted to withstand force along a vertical axis and means for bracing said tierod along said axis against said fixed portion for drawing mating surfaces of said shaped body and said concave seat against one another to lock said shaped body to said fixed portion;
means forming a rotating joint between said movable member and said support element and extending through said body and said fixed portion for pneumatic communication with said equipment;
means traversing said fixed portion and said body for effecting a flexible electrical connection with said equipment; and
mechanical transmission means extending through said body and operatively connected to said movable member for signalling an angular position of said movable member about said pivot.

4,836,712
ELECTRONIC WORD PROCESSING WITH SEQUENTIAL CHARACTER ATTRIBUTE COMPOUNDING
Hiroki Atsumi, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 786,876, Oct. 11, 1985, abandoned. This application Aug. 24, 1987, Ser. No. 89,906
Claims priority, application Japan, Dec. 29, 1984, 59-280853
Int. Cl.[4] B41J *5/30, 29/26*
U.S. Cl. 400—22 1 Claim



1. A method of obtaining a compounded pattern of at least one attribute which includes at least an enhancement for a character to be printed by an electronic word processing apparatus comprising keys character keys and attribute keys for adding at least one selected attribute to a character and including a code key for pattern enhancements, a character pattern memory, an attribute pattern memory, a control means and a printing section,
the method comprising:
inputting, to said control means by operation of said keys, at least one attribute pattern including an enhancement code in a predetermined sequence of key operations;
reading out from said character pattern memory a character pattern in accordance with the character input by one of said character keys;
generating a compounded pattern by combining the read-out character pattern and those of said attribute patterns which were inputted by said keys before the inputting of said enhancement code, and performing enhancement on the compounded pattern as obtained prior to inputting of said enhancement code in accordance with said inputted enhancement code;
outputting the enhanced compounded pattern, obtained responsive to all of said inputted attribute patterns including said inputted enhancement code in said compounded pattern generating step, to said printing section.

4,836,713
FLEXIBLE SHEET DAMS
Tateo Muramatsu, Yokohama; Hideaki Saito, Chigasaki; Mamoru Takasaki, Tokyo, and Yasushi Enami, Yokohama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Oct. 14, 1986, Ser. No. 918,441
Claims priority, application Japan, Oct. 12, 1985, 60-225991; Jan. 14, 1986, 61-4387; Jan. 30, 1986, 61-16905
Int. Cl.[4] E02B *7/04*
U.S. Cl. 405—115 13 Claims

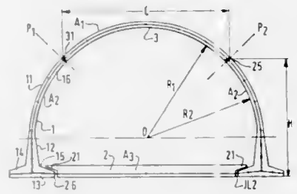
1. A dam comprising: a collapsible, flexible air inflated sheet placed across a flow of water having a predetermined water level at a downstream side, said dam having a length and extending transversely across and secured to a riverbed by two securing means, one of said securing means located on the upstream side of the flow of water and the other of said securing means located at a position separated from the upstream side toward the downstream side at a given interval, wherein a region of said flexible dam extending between said two securing means on the riverbed is a combination of a concave form and a convex form extending in a direction parallel to said securing means over substantially the entire length of said flexible dam.

4,836,714
ENCLOSED STRUCTURES OF VERY LARGE CROSS-SECTION, SUCH AS CONDUITS, SILOS OR SHELTERS
Marcel Matiere, 17 Avenue Aristide Briand, 15000 Aurillac, France
Continuation-in-part of Ser. No. 522,169, Jul. 15, 1983, Pat. No. 4,693,635. This application Jun. 5, 1987, Ser. No. 58,567
Claims priority, application France, Nov. 17, 1981, 81 21510; Jun. 11, 1982, 82 10266; Jun. 6, 1986, 86 08237
Int. Cl.[4] E21D *9/00*
U.S. Cl. 405—134 31 Claims

1. An enclosed structure of very large cross-section, such as that exceeding 100 m^2, comprising tubular sections placed end to end along a longitudinal axis on a flattened bottom provided in an excavation, each of said sections comprising an assembly of prefabricated components of reinforced concrete, each of said components corresponding to a portion of the cross-section of said structure and having correspondingly shaped edges

for engaging its neighboring components when each of said components is in said assembly, the radii of curvature of said components being such that each of said components connects tangentially to its neighboring component at the junction of said edges, said edges forming lengthwise joints, each defining respective support planes, said components comprising:

(a) two side components, each having (1) a substantially vertical wall, (2) an upper edge, and (3) a lower end provided with a portion constituting a stabilizing member having a widened, substantially planar bottom;



(b) at least one upper component in the shape of a substantially circular sector, said upper component having lower edges engaging corresponding upper edges of said two side components along upper lengthwise joints to form a vault to close said tubular section; the width of the widened, substantially planar bottom of said stabilizing member of each of said side components being of such magnitude that each of said side components can stand upright by itself both when placed on said flattened bottom of said excavation and when said side components support said upper component.

4,836,715

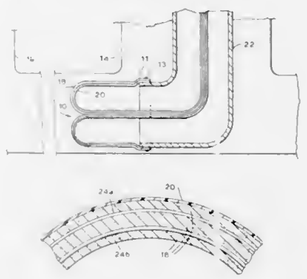
PASSAGEWAY LINING MATERIAL

Eric Wood, Castletown, United Kingdom, assignor to Insituform International N.V., Curacao, Netherlands Antilles

Filed Feb. 11, 1987, Ser. No. 13,590

Int. Cl.[4] E21D *11/00;* **E02B** *9/06;* **F16L** *55/10, 55/16*

U.S. Cl. 405—150 **8 Claims**



1. A conduit lining impregnated with a settable resin and flexible so as to be insertable into a pipe and then by internal pressure to be urged against the inner surface of said pipe and then rigidifiable in situ through the setting of said resin contained therein comprising a flexible and relatively thick first layer having area and thickness and comprising fibers with their lengths generally extending in the direction of said thickness and containing said settable rigidifying resin, the fibers of said first layer defining a felt, and, within said first layer, a second layer comprising elongated generally unidirectional flexible fibers of much greater length and of much higher tensile strength than the fibers of said first layer with their lengths generally extending substantially at right angles to said thickness, thereby to produce relatively great tensile strength in directions corresponding to the orientation of said elongated fibers.

4,836,716

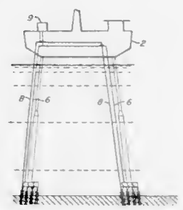
METHOD AND APPARATUS FOR PILED FOUNDATION IMPROVEMENT THROUGH FREEZING USING SURFACE MOUNTED REFRIGERATION UNITS

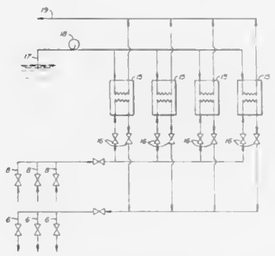
August V. Spalding, Pinole; Mahmoud H. Sabet, Hayward; Ronald O. Hamburger, Pacifica, and Martin H. Luk, Fremont, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Feb. 25, 1986, Ser. No. 833,292

Int. Cl.[4] E02D *5/46*

U.S. Cl. 405—224 **13 Claims**





1. An offshore platform anchored to the seafloor by at least one tubular pile which seafloor is incapable of supporting design loads comprising:

a. an offshore structure connected to the seafloor by at least one tubular pile;

b. a plug contained within said tubular pile, said tubular pile being initially inserted into unfrozen ground, said plug located generally near the bottom of said pile;

c. an insulating divider closing off said tubular pile, above said plug, such that said divider defines the top of a cylindrical reservoir, the bottom of which is defined by said plug and the sides of which are defined by said tubular pile;

d. cooling fluid filling said reservoir;

e. means for cooling said cooling fluid to a temperature of −20° C. to −30° C. whereby a frozen mass of soil is formed around said tubular pile, said means for cooling said cooling fluid further comprising a compressor/expander combination, said compressor/expander combination located on a deck of said offshore structure supported by said tubular pile;

f. an insulated cold conduit means tubularly connecting said reservoir and said compressor/expander;

g. an insulated warm conduit means extending from said reservoir to said compressor/expander combination for fluid flow; and

h. a pump for circulating said cooling fluid there between through said cold conduit and said warm conduit means.

4,836,717

MEANS FOR JOINING CONCRETE PILES

Kjell Landaeus, Chemin des Meillières Est, Vence, France (F-06140), and Bertil Borg, Kastberga 2, Eslöv, Sweden (S-241 00)

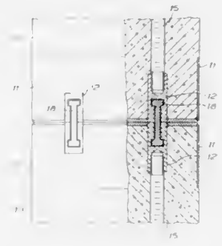
PCT No. PCT/SE86/00492, § 371 Date Jun. 29, 1987, § 102(e) Date Jun. 29, 1987, PCT Pub. No. WO87/02726, PCT Pub. Date May 7, 1987

PCT Filed Oct. 28, 1986, Ser. No. 74,699

Claims priority, application Sweden, Oct. 28, 1985, 8505068

Int. Cl.[4] E02D *5/10*

U.S. Cl. 405—252 **8 Claims**



1. An arrangement for joining together two concrete piles in end-to-end relationship; said arrangement comprising:

(a) first and second end shoes one each of which is fixed to each pile to be joined together at adjacent ends thereof;

(b) a plurality of guide elements at least one each of which is attached to each end shoe; said guide elements defining guide passages extending transversely of an associated pile; said guide passages each having an opening at an outside of the associated pile;

(i) each guide element attached to said first shoe being operatively positioned in opposing relationship to a guide element attached to said second shoe, two opposed guide elements defining a set of opposed guide elements, each set of opposing guide elements defining a key member-receiving passageway comprising opposing guide passages;

(ii) said guide elements having first abutment surfaces therein adjacent an associated guide passageway opening; and, said guide elements having second abutment surfaces therein positioned inwardly along said guide passages from said first abutment surfaces;

(iii) a distance between the first abutment surfaces of two opposite guide elements of a set of opposed guide elements, in a longitudinal direction of the piles, being shorter than a distance between second abutment surfaces of said guide elements of said set of opposed guide elements;

(c) a key member operably receivable in each key member-receiving passageway and sized to span a joint between the adjacent piles;

(i) said key member having opposite abutment surfaces oriented for respective engagement with said first and second abutment surfaces of said guide elements, when said key element is received with said key-receiving passageway;

(ii) said distance between said first abutment surfaces and said distance between said second abutment surfaces being dimensioned in relation to a distance between said key member opposite abutment surfaces so as to provide for plastic stretching of said key member as same is driven into said key receiving passageway from association with said first abutment surfaces into engagement with said second abutment surfaces.

4,836,718

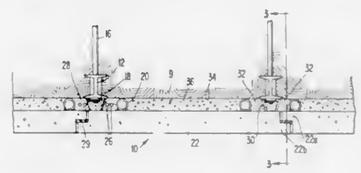
EARTH RETAINING METHOD AND STRUCTURE WITH IMPROVED CORROSION PROTECTION AND DRAINAGE

Hubert Deaton, Plano, Tex., assignor to Schnabel Foundation Company, Bethesda, Md.

Filed Mar. 21, 1988, Ser. No. 171,377

Int. Cl.[4] E02D *5/20, 24/00*

U.S. Cl. 405—262 **18 Claims**



1. A method of constructing a wall for retaining an earthen mass comprising;

installing a plurality of laterally spaced beam members in the earth along a predetermined position of the wall to be constructed;

excavating earth adjacent to said beam members to a desired depth;

installing and anchoring a plurality of tiebacks in the earthen mass;

connecting said tiebacks to said beam members by first connecting means;

positioning elongated, inflatable members between the earthen mass and a precast panel to be fixed to said beam members;

positioning and attaching precast panels to said beam members by second connecting means;

inflating said inflatable members thereby creating first sealed vertical channels surrounding said first connecting means and said second connecting means, said first channels being between the earthen mass and said panels, said inflatable members further creating second sealed vertical channels between adjacent beam members between the earthen mass and said panels; and

filling said first channels with a cementitious material to encase and protect said first connecting means and said second connecting means.

4,836,719

METHOD AND APPARATUS FOR MACHINING VALVE SEATS AND VALVE STEM GUIDES IN A DEEP-WALLED ENGINE MONOBLOCK WORKPIECE

Nathaniel L. Field, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1987, Ser. No. 137,994

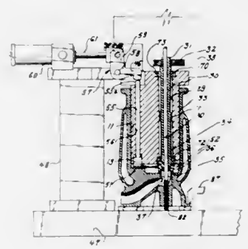
Int. Cl.[4] B23B *41/12*

U.S. Cl. 408—1 R **5 Claims**

1. A method of machining valve seats at the end of an axially deep and narrow cavity of a workpiece having an axially clampable surface within the cavity adjacent one or more of said valve seats, comprising:

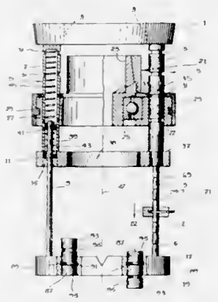
(a) supporting a rotary driven spindle of sufficient length to extend through the axial extent of the cavity and reach the valve seat, the spindle carrying a cutting tool at its extremity, the support being in a nonrotatable housing effective to fit closely to the interior of the cavity and effective to move along the axis of the cavity to bring the cutting tool into machining contact with the valve seat;

(b) securing a radially rigid but axially resilient diaphragm to the end of the housing, said diaphragm extending transversely across the interior of said cavity;
(c) after inserting the housing and spindle into the cavity so that the cutting tool is proximate to the valve seat but out of contact therewith, axially clamping a portion of the



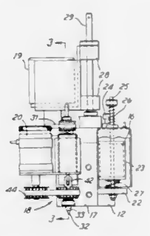
diaphragm, remote from the spindle, against the axially clampable surface; and
(d) moving the rotary driven spindle assembly axially toward the valve seat to conduct machining contact of the cutting tool therewith, the axially resilient diaphragm providing accurate supporting alignment for the tool under even high speed machining conditions.

4,836,720
DRILL GUIDE
Terrence B. Hadden, 1745 De Séve, apt. 3, Montreal, Quebec, Canada H4B 2B1
Filed Jun. 22, 1988, Ser. No. 209,931
Int. Cl.[4] B23B 45/14
U.S. Cl. 408—112 17 Claims



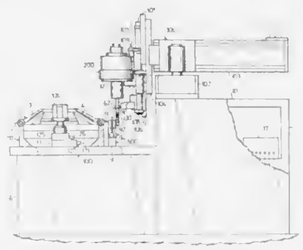
1. In a hand drill guide of the type comprising:
an annular base provided with a central bore large enough to allow displacement thereacross of a collar and chuck of a hand drill;
a plurality of telescopic leg assemblies distributed along said base and projecting perpendicularly therefrom, each leg assembly comprising a hollow cylinder having one end fixed to and closed by said base and another end closed by an end wall provided with a central opening, and a rod having an upper end, a lower end and having an upper portion slidably mounted in said cylinder, said rod extending out of the cylinder through the opening in the end wall thereof;
an annular positioning head suitable for lying firm against a surface of a member to be drilled, said positioning head having a central bore and being connected to the lower ends of the rods and extending parallel to the base;
an annular drill holding assembly; and
means for mounting said drill holding assembly between said cylinders selectively at one of a plurality of locations along said cylinders; the improvement wherein, in each of said leg assemblies:
the rod comprises a retaining ring rigidly connected thereto at a given distance from the upper end of said rod inside the cylinder to prevent said rod from escaping from cylinder;
a ring is floatingly mounted around the upper portion of the rod above the retaining ring, said floating ring being snugly slidable in the cylinder;
a first spring is mounted inside the cylinder around the rod between the floating ring and the retaining ring; and
a second spring is mounted inside the cylinder between said floating ring and said one end of said cylinder closed by the base;
said first and second springs holding said floating ring in a position adjacent the upper end of said rod when the retaining ring rests against the end wall of the cylinder and said first and second springs are uncompressed.

4,836,721
ENGRAVING MACHINE
Brian Campling, Dunsfold, United Kingdom, assignor to Engraving Developments Ltd., Surrey, England
Filed Jul. 6, 1987, Ser. No. 70,027
Claims priority, application United Kingdom, Jul. 4, 1986, 8616380
Int. Cl.[4] B23C 9/00; B23B 47/26
U.S. Cl. 409—125 8 Claims



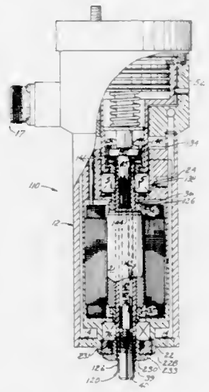
1. An engraving machine comprising
a platen for holding a workpiece,
a tool mechanism,
a support structure for said tool mechanism above the platen, the tool mechanism and platen being relatively movable in x and y directions,
the tool mechanism comprising
a mount movable in the z direction;
a cutter head movable also in the z direction on the mount;
a cutter in the cutter head, the degree of projecting of the cutter being adjustable;
first motor means controlling the position of the mount in the z direction;
second motor means for adjusting the cutter head on the mount, and for adjusting the degree of projection of the cutter from the cutter head; and
selector means which decide which adjustment the second motor means can perform.

4,836,722
METHOD AND APPARATUS FOR REMOVING FLASH OF POLYMERIC MOLDED PRODUCTS
Toshinori Kurita; Masaaki Enomoto, and Hidetoshi Nagamatsu, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan
Filed Aug. 8, 1986, Ser. No. 894,896
Claims priority, application Japan, Aug. 10, 1985, 60-123329[U]; Aug. 29, 1985, 60-191610; Aug. 30, 1985, 60-192563; Sep. 5, 1985, 60-196447; Sep. 5, 1985, 60-196446; Sep. 9, 1985, 60-199167; Jun. 27, 1986, 61-152296
Int. Cl.[4] B23C 3/00, 5/04
U.S. Cl. 409—132 14 Claims



1. An apparatus for removing flash from a flash-forming region of a polymeric molded product comprising:
(a) flash removing means, including a cutting reamer for removing the flash by being brought into contact with a flash-forming region of a polymeric molded product and a motor for rotating the cutting reamer;
(b) moving means for allowing the reamer to be in contact with the polymeric molded product within a predetermined range of pressing force toward the polymeric molded product;
(c) a supporting member for supporting the motor so that the motor is fixed against axial movement but movable in at least one direction perpendicular to its axial direction; and
(d) return members operable when the motor is moved, for allowing a position of the motor in relation to the supporting member after being displaced to return to a previous position before the displacement of the motor, the return members being at least three in number and being arranged around the motor;
said supporting member (33) including: a base plate (34) disposed around the motor (32) with a certain clearance therebetween; at least three bearings (36) fixed on the base plate (34) to allow the motor (32) to be movable not in its axial direction but in directions perpendicular to its axial direction; and a supporting plate (42) arranged on the bearings (36).
14. A method for removing flash from armoring material of a steering wheel, comprising the steps of:
(a) securing a steering wheel with polyurethane foam armoring material flash, on a base;
(b) rotating a cutting reamer using a motor, said cutting reamer having a plurality of blades each of which has a normal clearance angle which is substantially 0°, each two angularly adjacent ones of said blades having located therebetween a groove of rectangular transverse cross-sectional shape;
(c) moving a supporting member along a predetermined moving locus to move a flank of each of said blades substantially in contact with said flash-forming region, said reamer being attached to said supporting member with a clearance provided therebetween so as to be movable relative to a flash-forming region of said armoring material of said steering wheel only in a direction perpendicular to an axial direction of said motor;
(d) providing returning members between said reamer and said supporting member for allowing a position of said reamer in relation to said supporting member after being displaced to return substantially to a previous position;
said moving step (c) including a floating step for moving said reamer in to said relation supporting member due to undulation of said flash-forming region of said armoring material of said steering wheel and returning said reamer to said previous position, said moving locus being predetermined so that said cutting reamer is in contact with said flash-forming region of said armoring material of said steering wheel with a slight pressing force toward said armoring material of said steering wheel.

4,836,723
SPINDLE ASSEMBLY
John T. Flammini, 1335 W. Morgan St., Rialto, Calif. 92376
Filed Oct. 8, 1985, Ser. No. 785,832
Int. Cl.[4] B23C 5/26
U.S. Cl. 409—141 22 Claims



1. A high-speed spindle assembly for a shankdriven cutting tool comprising:
(a) a housing:
(b) a hollow spindle shaft rotatably mounted in the housing, a first end of the shaft being adapted to receive a collet for holding the cutting tool;
(c) a drawbar extending within the shaft for engaging the collet and slidingly engaging a second end of the shaft, the drawbar being operable for opening and closing the collet;
(d) means for driving the shaft for rotating the tool; and

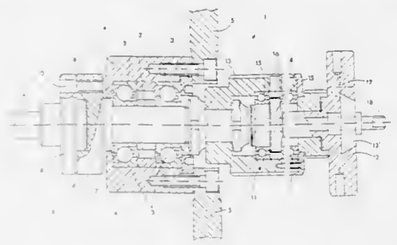
(e) a tubular member comprising a strain-energy absorbing material, the tubular member engaging to the inside of the shaft and the outside of the drawbar for centering the drawbar within the shaft and for damping vibrations of the shaft and of the drawbar.

4,836,724

CUTTING DIAMOND MACHINE FOR ORNAMENTALLY MACHINING CHAINLETS AND PROVIDED WITH A DEVICE PERMITTING A VICE SHAFT TO BE ROTATED AND/OR SHIFTED AXIALLY, AND AN ENGRAVING DEVICE EFFECTING VARIOUS MACHINING MOVEMENTS

Cassan Giuseppe, Via Monticello 4, Arcugnano (Vicenza), Italy

Filed Oct. 28, 1987, Ser. No. 114,408
Int. Cl.⁴ B23C *9/00*
U.S. Cl. 409—144 **7 Claims**



1. An actuating device, in a cutting diamond machine for ornamentally machining chainlets, connected by connecting devices to a supporting vice on said cutting diamond machine, said supporting vice holds the chainlet to be machined and is movable both latitudinally and longitudinally by the actuating device with respect to an engraving device, said actuating device comprising:

a supporting structure, attached to the machine, having a first set of ball bearing arranged in an inner portion of the supporting structure;

a shaft, rotating on said first set of ball bearing, within said supporting structure and having a first end and a second end;

a vibrating body, to move the supporting vice with respect to the engraving device, having a first independently rotatable part that is connected to the first end of the shaft and a second part connected to a secondary shaft, said second part has a first adjustment mechanism to adjust an axis of rotation of the secondary shaft with respect to an axis of rotation of said shaft, said secondary shaft contacts the connecting devices; and

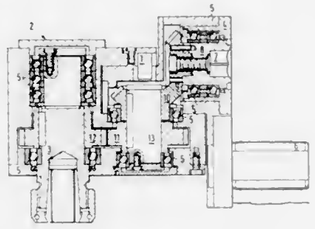
a rotating body attached to the second end of the shaft and having a hollow pulley connectable to a drive means, said pulley having a lockable coupling means positioned within an inner portion of said pulley, said coupling means is connected to an adjustable rotating part having an extension shaft that is engageable with said connecting devices, the axis of rotation of said extension shaft is movable by a second adjustment mechanism in said adjustable rotating part, with respect to the axis of rotation of said shaft, so that the pulley can drive the adjustable rotating part and the extension shaft to move the supporting vice.

4,836,725

ADJUSTABLE TOOL-HOLDER IN MACHINE-TOOLS FOR SLOT MILLING

Anton Horsky, Wangen; Siegfried Kuhn, Dürnau, and Wolf-Dietrich Voss, Boll, all of Fed. Rep. of Germany, assignors to Boehringer Werkzeugmaschinen GmbH, Offenburg, Fed. Rep. of Germany

PCT No. PCT/EP87/00102, § 371 Date Dec. 21, 1987, § 102(e) Date Dec. 21, 1987, PCT Pub. No. WO87/04959, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 24, 1987, Ser. No. 138,453
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1986, 3605913
Int. Cl.⁴ B23C *7/02, 1/12, 3/28*
U.S. Cl. 409—201 **8 Claims**



1. A power driven milling tool comprising a tool socket in a power driven tool head having a pivot pin, for a machine tool having a longitudinal rest and a cross rest, said tool being movable in a first and a second direction perpendicular to one another, said directions being directions of movement of the longitudinal and cross rests of the machine tool, and means for enabling the milling tool perform another movement which contains components of a third direction perpendicular to the first and second directions, without having the power driven tool head in its entirety accompany the other movement, said means including means for limiting movement of the milling tool in the third direction and also means for adjusting only a middle position and end positions of the third direction of movement of the milling tool including adjustable stop pins for adjusting the end positions in the third direction, the tool socket being oscillatable with part of the tool head, the pivot pin having an axis of oscillation which is parallel to the first or second direction.

4,836,726

VEHICLE WHEEL CHOCK FOR SECURING VEHICLES DURING TRANSPORT

James C. Robertson, and William R. Baker, both of Lawrenceville, Ga., assignors to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Filed Jun. 29, 1988, Ser. No. 213,188
Int. Cl.⁴ B61D *3/18;* **B60P** *3/07*
U.S. Cl. 410—9 **18 Claims**

1. Transportation equipment having at least one deck for supporting and transporting four-wheel vehicles such as automobiles and trucks;

at least one track secured to the deck;

chock blocks for a vehicle transported on the deck to secure the vehicle against longitudinal movement;

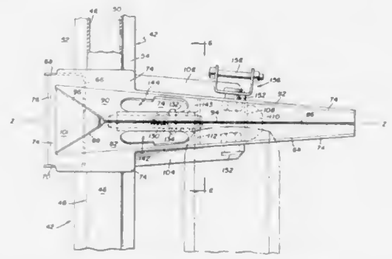
each chock block having a first member, a longitudinal second member, and means on the first member for removably securing the first member to the track;

the first member nesting with the track and being quickly removable from such nesting arrangement by upward displacement;

the second member being permanently laterally joined to the first member;

the second member having a sufficient length to extend along, and terminate beyond, the tread face of a tire of a vehicle located alongside the track;

securing means on the chock block for removably securing the first member to the track, when in nesting position therewith, to prevent the first member and chock block from horizontal movement along the track and upward movement from the track;



the second member having a longitudinal center when viewed from the top;

the securing means being located substantially along the longitudinal center of the second member when viewed from the top; and

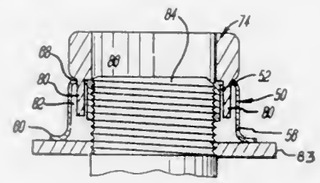
the securing means being observable and manually operable from opposite sides of the second member longitudinal center.

4,836,727

TORQUE LIMITED PRESSED AND FORGED METAL NUT MEMBERS

Josef F. Volkmann, 3520 Maricopa St., Ste. 19, Torrance, Calif. 90503

Filed Jun. 8, 1987, Ser. No. 59,627
Int. Cl.⁴ F16B *31/00*
U.S. Cl. 411—4 **10 Claims**



1. A torque limiting fastener having:

a. a nut member formed of pressed sheet metal and comprising:

(1) a central cylindrical sleeve threaded on its internal wall;

(2) an upper annular ledge outwardly dependent from the upper end of said sleeve;

() a surrounding skirt downwardly dependent from the outer edge of said annular ledge and having an outwardly flared lower edge to form an annular collar; and

(4) at least one aperture; and

b. a drive member in juxtaposition to said nut and having:

() a solid body having a central aperture of a size and shape to permit said drive member to be seated over said nut member; and

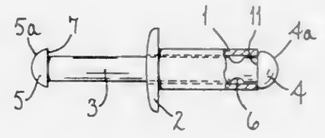
(2) at least one frangible prong oriented to be received in said aperture when said drive member is seated on said nut member.

4,836,728

BLIND-RIVETING ASSEMBLY

Dieter Mauer, Lollar, and Wolf Renner, Giessen, both of Fed. Rep. of Germany, assignors to Emhart Industries, Inc., Farmington, Conn.

Continuation of Ser. No. 898,770, Aug. 14, 1986, abandoned, which is a continuation of Ser. No. 671,327, Nov. 14, 1984, abandoned. This application Oct. 15, 1987, Ser. No. 110,643
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1983, 3341408; Nov. 15, 1983, 8332902[U]
Int. Cl.⁴ F16B *13/04, 13/06*
U.S. Cl. 411—43 **3 Claims**



1. A metal blind-riveting assembly comprising a rivet having a tubular body portion with a head flange at one end and an opposite end adapted to be deformed when the rivet is set and a mandrel having a stem of uniform cross section with a neck of reduced cross section at which the stem will break at a predetermined tension, which neck lies within the body portion of the rivet, the mandrel being upset at both ends, one of which forms a rivet-setting head while the other is a pulling head for engagement by pulling means of a rivet-setting tool, said pulling head being spaced from the rivet flange a distance substantially equal to the length of the rivet, and both the pulling head and rivet-setting head of the mandrel are of larger diameter than the diameter of the mandrel therebetween and each having an end face which is hemispherical and which terminates at a flat annular base facing the mandrel stem, said annular base joining said mandrel stem at a sharp corner, said rivet setting head having a diameter the same as that of said pulling head and being adapted to be partially enclosed in said opposite rivet end when the rivet is set to be locked therein, said reduced neck being located adjacent said rivet setting head so as to lie within the confines of the rivet body when broken upon setting the rivet, said hemispherical pulling and rivet setting heads having improved sliding properties when the blind riveting assembly is automatically fed into and through tubes or pipes.

4,836,729

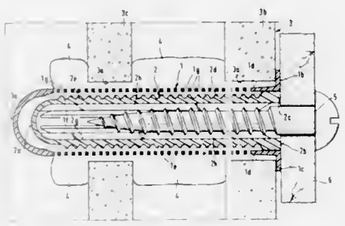
ANCHORING UNIT FOR USE IN STRUCTURES WITH INTERNAL OPEN SPACES

Heinz Bisping, Munich; Alfred Gahler, Wolfratschausen; Armin Hoffmann, Germering, and Franz Popp, Puchheim, all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft

Filed Apr. 13, 1988, Ser. No. 181,329
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1987, 3712463
Int. Cl.⁴ F16B *39/02*
U.S. Cl. 411—82 **8 Claims**

1. Anchoring unit for use in a structure with internal open spaces for securing a fastening member in the structure by means of a hardenable mass, comprising an axially extending screen-type sleeve having a leading end for insertion first into a borehole in the structure so that it extends into the open spaces within the structure and a trailing end, said screen-type sleeve being open at the trailing end with an open inner first passage extending from the trailing end toward the leading end and having openings therethrough for passage of the hardenable mass from the passage within said screen-type sleeve to outside of said screen-type sleeve, an axially elongated insert sleeve insertable into the first passage in said screen-type sleeve and having a leading end and a trailing end and an opening at

the trailing end of said insert sleeve opening into an axially elongated second passage extending from the trailing end toward the leading end thereof, said second passage arranged to receive a fastening member insertable therein, wherein the



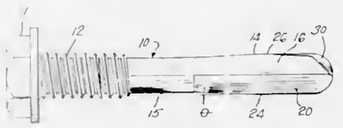
improvement comprises that said screen-type sleeve and said insert sleeve each has an axially extending inside and outside surface and each of said inside and outside surfaces have alternating projecting and recessed surfaces.

4,836,730

FASTENER

George Jesson, Campbellsville, Ky., and Larry J. Arnold, Statesville, N.C., assignors to Embart Industries, Inc., Farmington, Conn.

Filed Jan. 17, 1985, Ser. No. 692,418
Int. Cl.[4] F16B *25/00*
U.S. Cl. 411—387 5 Claims



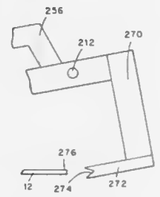
1. A drilling and thread forming fastener comprising a threaded shank and a pilot end, said pilot end having a major axis extending through the center of rotation of said fastener, and a minor axis intersecting said major axis at right angles at the fastener center of rotation and of less length than said major axis, a pair of flutes formed in said pilot end in opposed quadrants and extending longitudinally and parallel with the center of rotation of said fastener, a pair of lands disposed in opposed quadrants adjacent said flutes, said flutes being of substantially arcuate cross sections throughout the greater portion of said pilot end and said lands being of substantially arcuate cross sections throughout the greater portion of said pilot end, said arcuate cross section of a said flute and said arcuate cross section of a said land terminating at an intersection at said major axis to form a pilot cutting edge, wherein each of said cutting edges lies in a plane containing said fastener axis of rotation over substantially the length of said cutting edge and wherein said pilot end terminates at a drilling tip, said drilling tip being formed by a pair of radial tip cutting edges each extending from a said pilot cutting edge to a point at the end of said tip and being interconnected one to the other by a transverse cutting edge crossing said plane.

4,836,731

METHOD AND APPARATUS FOR CUBING STONES OF DIVERSE GEOMETRIES

Daniel P. Abrahamson, Phoenix, Ariz., assignor to Builders Equipment Company, Glendale, Ariz.

Filed Mar. 7, 1988, Ser. No. 164,788
Int. Cl.[4] B65G *57/24*
U.S. Cl. 414—789.1 9 Claims



8. Apparatus for cubing a multiplicity of tiers of stones, each such tier comprising a plurality of stones of nonrectilinear geometries and being introduced to said apparatus while supported on a flat pallet, comprising:

a gripping assembly adapted to engage opposite sides of said tier of stones on said pallet and apply a gripping force thereto that is less than that force sufficient to frictional bind said stones in said tier into a unitary unit capable of self-support within said gripping assembly,

a clamping assembly adapted to engage opposite sides of said pallet for supporting the same for lifting and positioning thereof,

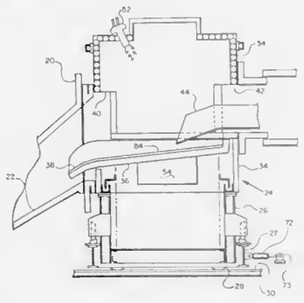
drive means associated with said gripping and clamping assemblies and operative to move said gripping assembly between positions of engagement and disengagement with said tier of stones, to move said clamping assembly between positions of engagement and disengagement with said pallet, and when said gripping assembly is in engagement with said tier, to move said pallet horizontally away from its supporting position for said tier.

4,836,732

METHOD AND APPARATUS FOR CONTINUOUSLY CHARGING A STEELMAKING FURNACE

John A. Vallomy, Charlotte, N.C., assignor to Intersteel Technology, Inc., Charlotte, N.C.

Continuation-in-part of Ser. No. 868,380, May 29, 1986, Pat. No. 4,681,537. This application Apr. 24, 1987, Ser. No. 42,208
The portion of the term of this patent subsequent to Jul. 21, 2004, has been disclaimed.
Int. Cl.[4] F27D *1/18*
U.S. Cl. 414—188 8 Claims



1. Apparatus for charging a tilting electric melting furnace,

which is tiltable about a horizontal tilting axis, from a charging conveyor, the melting furnace having a charging opening in its sidewall, the horizontal tilting axis of the furnace passing through such charging opening, such charging apparatus comprising:

a track mounted carriage;

a support frame mounted on said carriage;

vibrating means mounted on said support frame;

an elongated vibrating pan mounted on said vibrating means;

said vibrating pan having a discharge end adapted to extend into the charging opening in the furnace sidewall;

means for effecting a gas-tight seal between said apparatus and said furnace;

means for moving said discharging end of the vibrating pan into the charging opening of said furnace and to a position remote therefrom;

an independently mounted cover above said vibrating pan, and means for effecting a gas-tight seal between said vibrating pan and said cover;

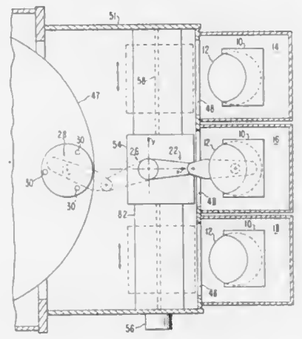
whereby said furnace is capable of tilting about said horizontal tilting axis while said vibrating pan is situated within said charging opening.

4,836,733

WAFER TRANSFER SYSTEM

Richard J. Hertel, Bradford; Adrian C. Delforge; Eric L. Mears, both of Rockport; Edward D. MacIntosh, Gloucester; Robert E. Jennings, Nethuen, and Akhil Bhargava, Reading, all of Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 856,814, Apr. 28, 1986, abandoned. This application Dec. 21, 1987, Ser. No. 135,568
Int. Cl.[4] B65H *5/08*
U.S. Cl. 414—225 38 Claims



1. Apparatus for transferring a wafer from a cassette holder to an input station of a processing system, comprising:

a single wafer transfer arm for removing a waver from the cassette holder and for transferring the waver between the cassette holder and the input station, said waver transfer arm including elongated primary and secondary section coupled together for rotation about a pivot axis, said primary section having a primary axis of rotation spaced apart from and parallel to said pivot axis, said secondary section having a wafer support pick at the opposite end from said pivot axis, said transfer arm further including linkage means for causing said secondary section to rotate about the pivot axis at a predetermined rate greater than said primary section rotates about the primary axis;

an intermediate station for sensing undesired displacement of said wafer relative to said wafer pick;

means for holding the cassette holder and for indexing said wafer into engagement with said wafer pick; and

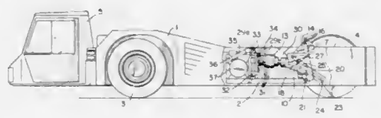
means for extending and retracting said waver transfer arm to and between the cassette holder, the intermediate station and the input station, including means for causing said wafer transfer arm to transfer said waver from said cassette holder to said intermediate station for sensing undesired displacement of said wafer relative to said wafer pick and means for causing said waver transfer arm to place said wafer in said input station in a corrected position which compensates for said undesired displacement by a correction factor equal in magnitude and opposite in direction to said undesired displacement, said correction factor being introduced as said wafer is moved by said wafer transfer arm from said intermediate station to said input station.

4,836,734

GROUND VEHICLE FOR MANEUVERING AIRCRAFT

Juergen Pollner, Munich; Gregor Trummer, Aschering, and Peter Moelzer, Schwabhausen, all of Fed. Rep. of Germany, assignors to Krauss-Maffei A.G., Fed. Rep. of Germany

Filed Mar. 28, 1988, Ser. No. 174,502
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1987, 3710045
Int. Cl.[4] B60P *3/11*
U.S. Cl. 414—430 20 Claims



1. A ground maneuvering aircraft shunting vehicle comprising:

a platform connected to a vehicle frame;

an ascent device connected to said platform comprising:

a pivoting ramp articulated to said platform;

means for lifting said ramp from an outpivoted terminal position to a raised terminal position; and

means for immobilizing an aircraft wheel comprising:

at least one pivoting cam mounted

on said ramp; and

means for pivoting said cam between a first position flush with an upper ramp surface when said ramp is in said outpivoted terminal position to a second position protruding from said ramp surface exposing a clamping surface when said ramp is in said raised terminal position.

4,836,735

LOAD POSITIONING CONTAINER CHASSIS

Michael J. Dennehy, Jr., Dalton, Pa., and Robert A. Rials, Dayton, N.J., assignors to XTRA Corporation, Boston, Mass.

Filed Mar. 11, 1988, Ser. No. 166,637
Int. Cl.[4] B60P *1/00*
U.S. Cl. 414—475 6 Claims

1. A chassis for carrying a short overweight freight container, such chassis comprising

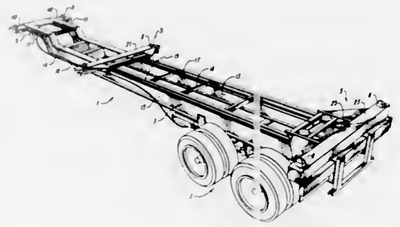
a structural frame longer than the container, and having a front mounting member for coupling to a tractor and a pair of frame members extending rearwardly from the front mounting member,

a bolster assembly dimensioned to receive and hold a said container securely thereon, said bolster assembly being slideably mounted for motion back and forth on a rearward portion of said frame members,

an axle assembly movably mounted beneath and supporting said frame members, said axle assembly being adapted for slideable movement along the frame members to permit placement at a desired axle spacing for a particular load, and

first and second power assisted means engaging said axle

assembly and said bolster assembly, respectively, for temporarily transferring the load between the frame members and each said assembly to a respective friction-reducing load bearing mechanism so that each said assembly may be



conveniently moved and repositioned along said frame member to achieve desired load location and axle spacings before securing said bolster assembly and said axle assembly to said frame members.

4,836,736

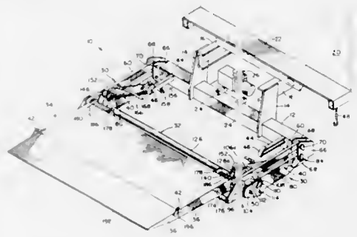
LEVEL RIDE LIFTGATE WITH RAMPING ACTION PLATFORM

Alexandru Neagu, Norwalk, Calif., assignor to Maxon Industries, Inc., Huntington Park, Calif.

Filed Jun. 9, 1987, Ser. No. 59,808

Int. Cl.[4] B60P 1/26

U.S. Cl. 414—557 **25 Claims**



1. A lift comprising:

a support means;

a linkage system pivotally supported at a first end by said support means whereby a second end of said linkage system is vertically moveable;

said linkage system comprising an upper link, a lower link means and a shackle means at said second end that is pivotally connected to said upper link and to said lower link means;

a platform;

means interconnecting said platform to said upper link at said second end of said linkage system in a manner to extend away from said linkage system while said platform gravitationally biases a lower end of said shackle means in a direction towards said linkage system to exert a compressive force on said lower link means;

said lower link means comprising a pair of members, a stop means and a pin, said pair of members being jointed together by said stop means and said pin such that when said pair of members of said lower link means is held under compression by said stop means said pair of members are misaligned and said pin is offset to one side of a straight line between the opposite ends of said pair of members of said lower link means; and

a power means interconnected between said support means and said lower link means to effect vertical movement of said linkage system and said platform,

said power means having a point of connection to said lower link means on the opposite side of said straight line from said pin.

4,836,737

WHEEL LIFT TOW ASSEMBLY

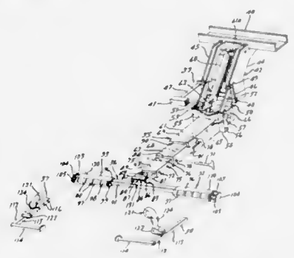
Gerald E. Holmes, Chattanooga, Tenn., and Jerry E. Pace, Rossville, Ga., assignors to Century Wrecker Corporation, Ooltewah, Tenn.

Continuation of Ser. No. 702,739, Feb. 19, 1985, Pat. No. 4,679,978, which is a continuation of Ser. No. 530,517, Sep. 9, 1983, abandoned. This application Mar. 18, 1987, Ser. No. 27,414

The portion of the term of this patent subsequent to Jul. 14, 2004, has been disclaimed.

Int. Cl.[4] B60P 3/12

U.S. Cl. 414—563 **14 Claims**



1. Apparatus for mounting to a tow truck and for lifting and towing wheeled vehicles comprising a tow bar including a forward end portion for mounting to a tow truck and a rear end portion for extending rearwardly from the tow truck, a cross arm mounted intermediate its ends to the rear end portion of said tow bar, and wheel cradles each including an L-shaped wheel support bracket having a connector arm releasably mounted to and extending transversely of said cross arm and a wheel support arm extending transversely of said connector arm, and free ends of the wheel support arms pointing toward one another such that an open interior side opposite said connector arm of each L-shaped member faces inwardly of a vehicle to be towed.

4,836,738

LOAD HANDLING VEHICLE

Kenkichi Nozaka; Yosihiro Kawahara; Yuji Kitamura; Shigeru Morita, and Sadayuki Takahashi, all of Osaka, Japan, assignors to Kubota Ltd., Osaka, Japan

Continuation of Ser. No. 910,025, Sep. 22, 1986, abandoned. This application May 3, 1938, Ser. No. 188,764

Claims priority, application Japan, Sep. 25, 1985, 60-146756[U]; Nov. 20, 1985, 60-179735[U]; Jan. 23, 1986, 61-8447[U]

Int. Cl.[4] B62D 33/06, 49/00; B66F 9/12

U.S. Cl. 414—607 **19 Claims**

1. A load handling vehicle comprising:

a vehicle body comprising a longitudinal series connection of a transmission case, a clutch housing and an engine frame;

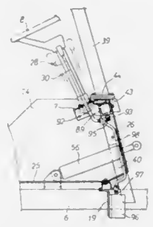
a pair of frames extending longitudinally on opposite sides of said vehicle body to reinforce said body;

a pair of front wheel fenders covering a pair of front wheels and extending upward above a step plate on said body;

a steering panel equipped with a steering wheel and other control means for operating a load handling device, and a front cover covering space under said steering panel, said panel and cover being provided between said pair of front fenders and being almost as wide as said body;

a protective device covering an operator seat, said protective device including a pair of front posts connected, in front of said seat and at inner sides of said front wheel fenders, to said pair of frames;

a load handling device secured to a front end of said body and in front of said panel;



said front posts being positioned adjacent to said front cover;

said front posts comprising lower members standing on said frames and separate upper members; and

said panel being clamped between said lower members and said upper members by bolts, passing through said panel and detachably connecting said lower members to said upper members.

4,836,739

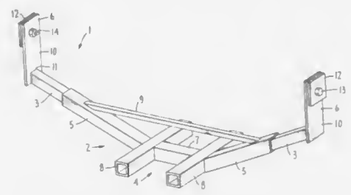
DEVICE FOR SUPPORTING AND TILTING VEHICLE BODIES

George C. Cappelletto, Site 3, Compartment 8, SS1 Trail, British Columbia, Canada V1R 2Y8 , and Richard K. O'Genski, Box 116, Trail, British Columbia, Canada

Filed Oct. 26, 1987, Ser. No. 113,259

Int. Cl.[4] B66F 7/22

U.S. Cl. 414—678 **9 Claims**



1. A vehicle-tilting device for securing to a vehicle and allowing the vehicle to be tilted and supported in the tilted position, comprising:

(a) a horizontal base member;

(b) two hollow arms secured at each end of said base member and forming an acute angle with the horizontal, each having an open end;

(c) an arm extension element associated with each of said arms and adapted to be slidably supported in and extended from said open ends of said arms; and

(d) means secured to the end of each arm extension element for securing to a vehicle body.

4,836,740

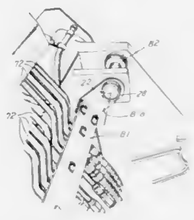
PIVOTAL ATTACHMENT STRUCTURE

Oryn B. Wagner, Bismarck, N. Dak., assignor to Clark Equipment Company, South Bend, Ind.

Filed Dec. 28, 1987, Ser. No. 137,906

Int. Cl.[4] E02F 3/00

U.S. Cl. 414—686 **6 Claims**



1. A structure for detachably securing an attachment to a vehicle which has a frame and includes a source of pressurized hydraulic fluid, comprising

a subframe forming a part of said attachment and pivotally attachable to said frame by spaced apart pins forming a transverse pivot axis;

said attachment including at least one hydraulically operated means for pivoting said subframe relative to said frame about said transverse axis,

hydraulic connections connectible between said source and said means,

said hydraulic connections including a valve for hydraulically connecting said attachment to and disconnecting said attachment from said source and a flexible hydraulic conduit,

a bracket pivotable on said pins about said axis, and

said valve and said hydraulic conduit secured to said bracket,

whereby when said subframe is detached from said frame said means and said valve remain with said attachment.

4,836,741

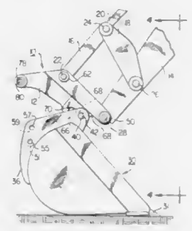
BACKHOE HITCH APPARATUS

Paul T. St. Louis, Littleton, and Charles L. Welch, Westminster, both of Colo., assignors to Consolidated Technologies, Corp., Denver, Colo.

Continuation of Ser. No. 895,808, Aug. 12, 1986, abandoned. This application May 4, 1988, Ser. No. 191,856

Int. Cl.[4] E02F 3/96

U.S. Cl. 414—723 **3 Claims**



1. In combination, a vehicle having a manipulating boom, an implement to be manipulated thereby, and a hitch means for detachably coupling the implement to the boom comprising:

first coupling means connected to one of the boom or the implement, and

second coupling means connected to the other of the boom or the implement,

one of the coupling means including bar means and a pair of eyelet means aligned along an axis spaced from and generally parallel to the bar means,

the other of the coupling means including a hook means for engaging the bar means and a bushing rotatably journaled in a cylindrical bore and including a smaller bore located eccentrically to the cylindrical bore such that upon rotation of the bushing the smaller bore is moved relative to the hook means, the bushing being positionable generally between the eyelet means of said one coupling means when the hook means operatively engages the bar means and alignable with the eyelet means by rotation of the bushing means, and

pin means insertable through the eyelet means and the bushing means when aligned to couple the implement to the boom,

the pin means and bushing means including cooperatively interacting means for rotating the bushing means into alignment with the eyelet means as the implement is being coupled to the boom.

4,836,742

SYSTEM FOR CONTROLLING A ROBOT IN ASSOCIATION WITH A ROTARY TABLE

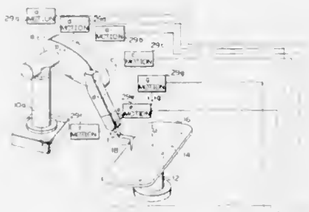
Yasuo Ishiguro; Yoshizumi Itou, both of Toyota; Osamu Shiroshita, Aichi, and Masaru Nakano, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Kabushiki Kaisha Toyota Chuo Kenkyusho, both of, Japan

Continuation of Ser. No. 710,222, Mar. 11, 1985, abandoned. This application Jun. 5, 1987, Ser. No. 59,227

Claims priority, application Japan, Mar. 14, 1984, 59-47179

Int. Cl.[4] B66C *2/00*

U.S. Cl. 414—742 **11 Claims**



1. A system for operating on a workpiece comprising:

a rotary table which rotates about a rotary table axis, the rotary table having a surface which supports a workpiece;

a plural-axis-articulated robot having a hand portion for performing operations on said workpiece; and

a control circuit which controls movement of said robot and of said rotary table, said control circuit comprising (a) memory means for storing teaching data points as coordinates for at least two points in a UVW orthogonal coordinate system having a U axis, a V axis and a W axis which define a U-V plane, a V-W plane and a U-W plane, the UVW orthogonal coordinate system being defined such that said rotary table axis is along said W axis, (b) interpolation means for deriving the coordinates in said UVW orthogonal coordinate system of a plurality of interpolation points located on an interpolation line segment having as endpoints two of said teaching data points, said interpolation points being spaced along said interpolation line segment; and (c) transformation means for (1) determining an interpolation angle for each interpolation point, said interpolation angle being the angle by which said rotary table must be rotated to bring the interpolation point into said U-W plane; (2) determining for each interpolation point the time at which the interpolation point will be in said U-W plane; (3) determining U-W plane interpolation positions, the U-W plane interpolation positions comprising the UVW coordinates of the positions in said U-W plane through which the interpolation points will pass when said rotary table has rotated corresponding interpolation angles; and (4) controlling movement of said robot and said rotary table in response to information thus derived as to the UW plane interpolation positions and as to when each interpolation point will be in the respective U-W plane interpolation position.

4,836,743

CROSS FLOW FAN

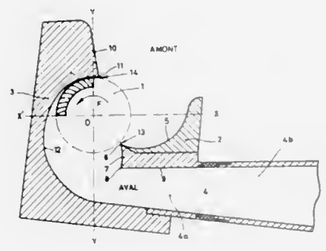
Jean-Pierre Guerou, Athis-Mons; Gilles Heid, Toulouse; Pierre Bailleux, Templeuve, and Marc Pruvost, Lille, all of France, assignors to Etat Francais, Paris Armees and Office National d'Etudes et de Recherches Aerospatiales, Chatillon/Bagneux, both of, France

Filed Aug. 4, 1988, Ser. No. 228,177

Claims priority, application France, Aug. 13, 1987, 87 11522

Int. Cl.[4] F04D *29/44*

U.S. Cl. 415—53.1 **17 Claims**



1. Cross flow fan comprising an convergent inlet demarcated by upstream face (**10**) of scroll element (**3**) and upstream face (**5**) of cross-head element (**2**), impelier (**1**) or rotor provided with blades and divergent (**4a**) demarcated by downstream face (**12**) of scroll element and downtream face (**9**) of cross-head element, said inlet and said divergent demarcating with respect to the impeller in a plane perpendicular to its axis of rotation two narrowing longitudinal passages (**13,14**) defined on the one hand by leading edges (**11**) of scroll element and on the other hand by upstreamleading edge (**6**) of cross-head element (**2**), wherein in a reference system of perpendicular axes X and Y, whose origin is placed at the axis of rotation of impeller (**1**), and whose abscissas axis X is parallel to downstream face (**9**) of the cross-head element, it features.

an upstream leading edge (**6**) of cross-head element describing an angle A_{BCAM} included between 290° and 330° at a distance from impeller or air gap (**13**) included between 2 and 8% of outside diameter De of the impeller.

a face (**7**) of cross-head element describing an angle A_{FRC} whose apex is one and the same as upstream leading edge (**6**) of cross-head included between −20° and 60° with respect to an axis (**15**) parallel to the ordinates axis concurrent with upstream axis (**6**),

a rectilinear scroll leading edge (**11**) describing an angle A_{BV} included between 76° and 112° at a distance from impeller or air gap (**14**) included between 2 and 8% of outside diameter De of the impeller,

a plane upstream face (**10**), concurrent with leading edge (**11**) of scroll, inclined with respect to the plane connecting the axis of rotation of the impeller and the scroll leading edge (**11**) by an angle A_{FABV} of a value included between 0° and 70°.

4,836,744

TAKE-AWAY DEVICE FOR TUBING FOILS

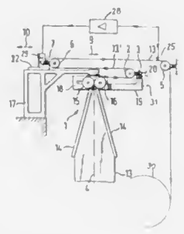
Veit-Holger Karl, Würzburg; Franz Mahler, and Josef Greisel, both of Augsburg, all of Fed. Rep. of Germany, assignors to Alpine Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed May 26, 1988, Ser. No. 199,168

Claims priority, application Fed. Rep. of Germany, May 27, 1987, 8707626

Int. Cl.[4] B29C *53/20*

U.S. Cl. 425—72.1 **10 Claims**



1. A take-away device for tubing foil produced by an extruder with a tubing head in a blowing process, in which the tubing oil is flattened between a pair of squeeze rollers which pair of rollers can turn reversingly about a vertical axis of rotation, and having at least two turning rods which are disposed downstream of the squeeze rollers, the turning rods being pivotable about at least one vertical axis, and having at least one deflecting rod, said rods being pivoted by a frame member about a vertical axis of rotation, and further including a wind-up device for receiving the flattened tubing foil from a turning rod, a measuring instrument being disposed between the final turning rod from which the tubing foil is guided to the wind-up device, and the wind-up device, the measuring instrument determining the flow position of the edge of the tubing foil and, when the flow position of the edge deviates from a normal flow position, producing a measurement signal which is dependent on the deviation, the signal being conducted to a control means which converts the measurement signal into a control signal, a frame member supporting at least one rod being connected to a servomotor for receiving the control signal and for turning the frame member about a pivot having a vertical axis of rotation in response to the control signal thereby correcting the position of the tubing foil.

4,836,745

TURBO-ENGINE WITH TRANSONICALLY TRAVERSED STAGES

Jean Hourmouziadis, Hebertshausen, Fed. Rep. of Germany, assignor to MTU Muenchen, Munich, Fed. Rep. of Germany

Filed Sep. 17, 1987, Ser. No. 97,672

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1986, 3632094

Int. Cl.[4] F01D *5/10*

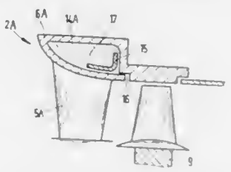
U.S. Cl. 415—119 **6 Claims**

1. A turbo-engine arrangement for a turbo-engine with transonically traversed stages, comprising:

a forward guiding grid having a plurality of circumferentially spaced guide blades; wherein the guide blades are stationary and extend across an annular space bounded on the outside by a housing and on the inside by a hub;

pressure compensation means for circumferentially balancing pressure gradients caused by compression waves at the downstream side of the guiding grid; and

a rotatable rotor disc disposed downstream of the guide grid and having rotor blades extending substantially across a downstream extension of the annular space bounded on the outside by the housing and on the inside by the hub, said annular space accommodating the main flow through the guide grid and rotor disk, wherein the compensating



means comprises an annulus arranged in the housing and having an opening connection in the direction toward the main flow, said connection including an annular blocking element in the annulus as a throttling member.

4,836,746

AXIAL FLOW ENGINE GUIDE VANE ADJUSTING DEVICE

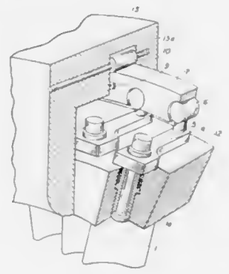
Emund Owsianny, Oberhausen; Wilfried Wengorz, Castrop-Rauxel, and Emil Aschenbruck, Duisburg, all of Fed. Rep. of Germany, assignors to Man Gutehoffnungshuette GmbH, Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 176,035

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1987, 3711224

Int. Cl.[4] F04D *29/36*

U.S. Cl. 415—160 **6 Claims**



1. An adjustment device for the guide vanes of an axial flow engine, comprising a carrier ring having a radial inner face with a radially extending carrier ring recess and having a central axis, an adjustment ring rotatably supported in said carrier ring recess for rotation about said central axis, an annular guide vane carrier positioned in said carrier ring recess about said central axis, a plurality of axial flow guide vanes having shaft portions rotatably mounted in said annular guide vane carrier, a lever connected to each of said shaft portions for rotation therewith and having a lever arm extending outwardly therefrom, a control bolt for each lever rotatably mounted in said adjustment ring and connected to respective lever arms, and means to rotate said adjustment ring so that it is displaced circumferentially relative to said guide vane carrier to cause rotation of said lever arm with said guide vanes.

4,836,747

ADJUSTING DEVICE FOR A COMPRESSOR

Stephan Hotz, Limburgerhof, Fed. Rep. of Germany, assignor to Aktiengesellschaft Kuehnle, Kopp & Kausch, Frankenthal, Fed. Rep. of Germany

Filed Jul. 6, 1988, Ser. No. 215,483

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1987, 3722253

Int. Cl.[4] F01D *17/12*; F04D *15/00*

U.S. Cl. 415—163 10 Claims

1. An adjusting device for a radial-flow compressor comprising a plurality of guide vanes arranged in a ring around a longitudinal axis, said vanes each being fixedly connected to a pivot pin an pivotally mounted in a housing, a plurality of two-armed cranks each connected to one of the pivot pins, and a plurality of coupling links each pivotably connected to corresponding crank arms of adjacent cranks, said pivot pins and guide vanes being circumferentially spaced apart at the same pitch angles and being jointly adjustable in the same direction, wherein the cranks and the coupling links are arranged in an annular space adjacent the discharge port of said compressor, the pivot pins are parallel to the longitudinal axis and protrude with their free ends into said annular space, the cranks are arranged in a radial plane, the axis of each radially inner crank arm is disposed at an angle with respect to the axis of the radially outer crank arm which angle is the same size as the pitch angle, the outer crank arms of circumferentially adjacent crank pairs are linked to each other by coupling links, the inner crank arms are disposed at an angle with respect to each other, and the outer crank arms of each crank pair are aligned substantially parallel to eachother.

4,836,748

RING PROPELLER

Leslie G. Church, Knockrow, Australia, assignor to Church Holdings, Sydney, Australia

Continuation of Ser. No. 29,384, Mar. 23, 1987, which is a continuation of Ser. No. 776,051, Aug. 7, 1985. This application Feb. 10, 1988, Ser. No. 157,110

Claims priority, application Australia, Dec. 9, 1983, PG2788

Int. Cl.[4] B63H *1/16*

U.S. Cl. 416—181 9 Claims

1. A marine ring propeller which has improved characteristics when operated in a reverse direction, comprising;

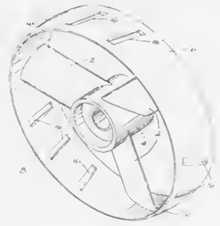
a boss having a central axis;

a frusto-conical shroud disposed co-axially about the boss, said shroud having an inner surface and an outer surface;

a plurality of blades extending between the boss and the shroud thereby dividing the shroud into equal sectors, each blade having parallel edges, a leading face, a trailing face and being of constant cross section between the boss and the shroud;

said shroud being pierced by a plurality of apertures which are disposed around the shroud there being at least one aperture per sector, the apertures extending along the shroud at an angle to the central axis of from 2° to 65°;

means for thrusting water on the trailing faces of the blades when the propeller is operated in a reverse direction to improve the reverse thrust of the impeller, said means including walls of said apertures, said walls being inclined at an angle relative to a line which extends radially from said central axis to the respective apertures, said walls



being inclined in a direction which thrusts water on the trailing faces of the blades when the propeller is operated in a reverse direction.

4,836,749

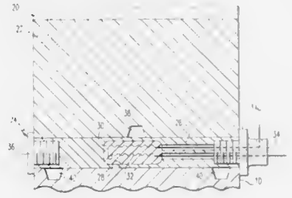
PRE-LOAD DEVICE FOR A TURBOMACHINE ROTOR

William A. Gavilan, Pfafftown, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 157,684, Feb. 19, 1988, abandoned. This application Sep. 14, 1988, Ser. No. 244,442

Int. Cl.[4] F01D *5/32*

U.S. Cl. 416—221 14 Claims



1. A device for exerting a pre-load force between a turbine rotor disk and a turbine blade root mounted therewith comprising:

(a) a shank formed of a superplastic material insertable in a shank bore defined between the blade root and the rotor disk; and,

(b) expandable means located within the shank to cause the superplastic material to expand, thereby exerting a pre-load force on the blade root.

4,836,750

ROTOR ASSEMBLY

Mario Modafferi, and Paul A. Juneau, both of St. Leonard, Canada, assignors to Pratt & Whitney Canada Inc., Quebec, Canada

Filed Jun. 15, 1988, Ser. No. 206,785

Int. Cl.[4] F01D *5/00*; F16B *4/00*

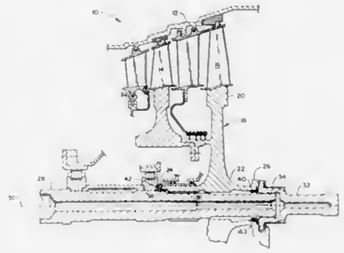
U.S. Cl. 416—244 A 6 Claims

1. A rotor assembly adapted for operation at elevated temperatures, comprising:

a generally cylindrical, elongated shaft rotatable about a longitudinal shaft axis,

a rotor having a hub portion and a disk portion, the hub portion disposed about the shaft and the disk portion extending radially outward with respect to the shaft axis, the shaft and rotor each having a corresponding overall thermal coefficient of expansion,

an annular spacer, disposed radially between the rotor hub and the shaft, the spacer having an overall thermal coefficient of expansion significantly higher than the coefficients of the hub and the shaft,



wherein the annular spacer is sized to achieve an interference fit radially between the shaft and the spacer inner diameter, and

wherein the spacer outer diameter is sized to fit closely and to slide axially within the hub at ambient temperature.

4,836,751

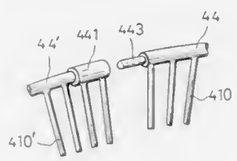
DETACHABLE ELECTRIC FAN

Ssu-Liu Liu, 2/F., No. 218, Chung Hsiao E. Rd., Sec. 4, Taipei, Taiwan

Filed Jul. 25, 1988, Ser. No. 223,823

Int. Cl.[4] F04D *29/70*

U.S. Cl. 416—247 R 3 Claims



1. A detachable electric fan composed of a stand, a fan motor, one set of fan blades, and a fan cover, characterized in that said stand comprising a detachable transverse base plate and a vertical frame plate, said transverse base plate comprising a stepped trough with an upper check edge provided at the top and a plurality of rib channels arranged on the wall surface around the four sides of the trough to match with the lower protruding portion of the vertical frame plate, said vertical frame plate comprising a closed type of control switch button set; the front and rear blade-protective cover plates of said fan cover being respectively composed of one pair of symmetric semi-cover plates, each of said semi-cover plate comprising a semi-circular central plate, the semi-circular central plate of the front blade-protective cover plate being completely closed, and the semi-circular central plate of the rear blade-protective cover plate comprising an axial hole for insertion of motor shaft, the arc portion of each semi-circular central plate comprising one set of raidal ribs around the periphery at equal intervals, said radial ribs being connected together by means of a frame ring plate, said frame ring plate comprising a socket at one end and a extending plug portion at the other end to match with the other frame ring plateof the other semi-circular central plate, each of semi-circular central plate also comprising by the straight edge a locking pin and a pin holder to reciprocally match with the pin holder and the locking pin of the other central plate for fixation of said two central plates into one circular plate to form a front blade protective cover plate or a rear blade-protective cover plates being respectively assembled, they both being connected together and respectively supported by one inner supporting plate having plurality of bolt holes and another inner supporting plate having a plurality of bolt holes and one axial hole by means of bolts through said bolt holes and the connection holes of the respective central plates and then the periphery of both blade-protective cover plates being tightly connected together by a pressure ring belt to complete the assembly.

4,836,752

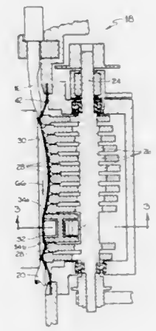
PARTIAL RESTRICTION DETECTOR

David Burkett, San Diego, Calif., assignor to Fisher Scientific Company, Pittsburgh, Pa.

Filed Nov. 2, 1987, Ser. No. 115,702

Int. Cl.[4] F04B *43/12*, *49/00*

U.S. Cl. 417—12 16 Claims



1. A device for detecting a partial restriction in a fluid line connecting a fluid source in fluid communication with a pump which comprises:

means to stop said pump for a predetermined time interval;

means for creating an occlusion of said tube;

a gauge operatively associated with said tube for determining fluid pressure changes in said tube upstream from the occlusion during said time interval;

means to establish a threshold for said pressure change; and

means for alarming when said pressure change traverses said threshold.

4,836,753

PORTABLE ELECTRIC BLOWER

Robert C. Berfield, Jersey Shore; Ronald F. Meland, Muncy, and Craig A. Seasboltz, Avis, all of Pa., assignors to Shop-Vac Corporation, Williamsport, Pa.

Division of Ser. No. 64,768, Jun. 19, 1987, Pat. No. 4,797,072. This application Feb. 5, 1988, Ser. No. 152,753

Int. Cl.[4] F04B *17/00*

U.S. Cl. 417—236 10 Claims

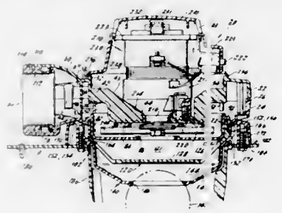
1. An air blower assembly and support means to which said assembly is removably securable;

said assembly including an external housing, an air inlet into the housing, an air outlet from the housing, a motor in the housing and a fan in the housing driven by the motor for drawing air into the housing inlet and for blowing air out the housing outlet;

a motor support located in the housing for supporting the motor and shaped and disposed in the housing for providing air separation between the motor and the fan;

the housing including a chamber around the fan and at the

fan side of the motor support, and the chamber communicating with the outlet from the housing;
cooperating securement means on the housing and on the support means for releasably holding the assembly to the



support means when the housing is at first a rotative orientation with respect to the support means and for freeing the assembly to be removed from the support means when the housing is at a second rotative orientation with respect to the support means.

4,836,754

TURBULENCE GENERATING DEVICE ADJACENT THE INLET END OF EACH DISCHARGE PORT OF A MULTI-CYLINDER PISTON-TYPE COMPRESSOR FOR PROVIDING INTERNAL PULSATION AND NOISE SUPPRESSION

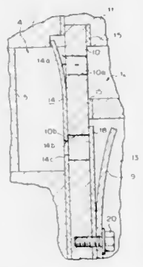
Hayato Ikeda; Satoshi Kitahama, and Hiroshi Onomura, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Nov. 2, 1987, Ser. No. 116,367

Claims priority, application Japan, Nov. 4, 1986, 61-170042[U]

Int. Cl.⁴ F04B *1/16, 1/18*

U.S. Cl. 417—269 **7 Claims**



1. A multi-cylinder piston type compressor provided with an axially extending cylinder block means having a plurality of axial cylinder bores arranged around a central axis thereof, a plurality of reciprocatory pistons received in said axial cylinder bores of said cylinder block means for drawing, compressing, and discharging a refrigerant gas, a drive mechanism for causing reciprocative movement of the pistons, at least one housing means arranged so as to close one axial end of said cylinder block means and having therein suction and discharge chambers, a valve plate means having a substantial thickness arranged between said one axial end of said cylinder block means and said housing means and having a plurality of suction ports for allowing entry of a refrigerant gas to be compressed from said suction chamber into said cylinder bores of said cylinder block means and a plurality of cylindrical discharge ports for discharging a compressed refrigerant gas from said cylinder bores of said cylinder block means toward said discharge chamber of said housing means, each of said plurality of discharge ports having an inner end adjacent to each of said plurality of cylinder bores and an outer end adjacent to said discharge chamber of said housing means, a suction valve sheet means arranged between said one axial end of said cylinder block means and said valve plate means and defining a plurality of suction valves movable to open and close said plurality of suction ports in response to reciprocation of said plurality of reciprocatory pistons and a plurality of discharge apertures for permitting the compressed refrigerant gas to flow from said cylinder bores of said cylinder block means toward said discharge ports of said valve plate means, and a discharge valve sheet means arranged between said valve plate means and said housing means and defining a plurality of discharge valve movable to open and close said discharge ports of said valve plate means in response to reciprocation of said plurality of reciprocatory pistons, wherein an improvement comprises turbulence generating means consisting essentially solely of the discharge apertures of said suction valve sheet means, said discharge apertures having an area less than the area of discharge ports of the value plate to thereby suppress pulsation in a pressure of said compressed gas flow.

4,836,755

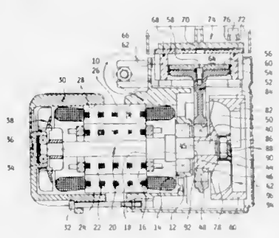
COMPRESSOR WITH BALANCED FLYWHEEL

Klaus D. Nitsche, Kirchheim, and Johann P. Zsiga, Bietigheim-Bissingen, both of Fed. Rep. of Germany, assignors to Durr Dental GmbH & Co KG, Bietigheim-Bissingen, Fed. Rep. of Germany

Filed Mar. 22, 1988, Ser. No. 171,766

Int. Cl.⁴ F04B *39/06, 17/00;* **H02K** *5/24, 9/06*

U.S. Cl. 417—368 **8 Claims**



1. A compressor comprising
(a) a cylinder,
(b) a piston arranged in said cylinder for reciprocating movement,
(c) a drive motor including a motor shaft,
(d) an eccentric crank pin mounted on said motor shaft,
(e) a connecting rod for pivotally connecting said crank pin to said piston,
(f) a balancing mass, which is diametrically opposed to the crank pin with respect to the motor shaft and which is formed integral with said crank pin, and
(g) a fan wheel carried by the motor shaft for rotation therewith,
characterized in that
(h) the crank pin is formed by an eccentric surface (**46**) of an integral hub portion (**44**) of the fan wheel (**42**);
(i) the fan wheel (**42**) is formed with an integral annular rim portion (**80**); and
(j) the balancing mass is formed by an integral circumferential balancing rib (**82**) of the fan wheel (**42**) being close to the rim portion (**80**) thereof.

4,836,756

PNEUMATIC PUMPING DEVICE

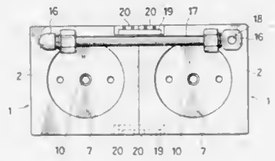
Toshiyuki Fukumoto, Toyonaka, Japan, assignor to Nippon Pillar Packing Co., Ltd., Osaka, Japan

Filed May 26, 1987, Ser. No. 53,779

Claims priority, application Japan, Aug. 28, 1986, 61-132204[U]; Aug. 28, 1986, 61-132205[U]; Aug. 28, 1986, 61-202989; Aug. 28, 1986, 61-202990

Int. Cl.⁴ F04B *43/06*

U.S. Cl. 417—394 **8 Claims**



1. A pneumatic pumping device, comprising:
a plurality of cylinder chambers;
a pumping element situated in each cylinder chamber and mounted to reciprocate therein, said cylinders and associated pumping elements being arranged in a row;
change-over control means for alternately applying pressure and vacuum to each cylinder chamber producing the reciprocal movement of each pumping element thereby effecting the intake and discharge of a liquid from said chambers, wherein the surfaces of the chambers and pumping elements in contact with the liquid are formed of at least one of the following fluororesins: PTFE, PFA and CTFE; and
a highly corrosion resistant filter, which is gas-permeable but not liquid-permeable, disposed in an air passage of the pumping device.

4,836,757

PRESSURE ACTUATED MOVABLE HEAD FOR A RESONANT RECIPROCATING COMPRESSOR BALANCE CHAMBER

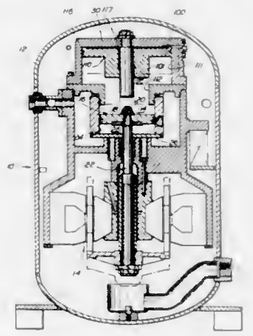
Peter W. Curwen, Ballston Spa, and Ralph Hurst, Clifton Park, both of N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Continuation-in-part of Ser. No. 14,444, Feb. 13, 1987, Pat. No. 4,750,870. This application Jun. 13, 1988, Ser. No. 206,220

Int. Cl.⁴ F04B *31/00*

U.S. Cl. 417—416 **12 Claims**

1. In a resonant piston compressor wherein a double-sided piston means is arranged for reciprocation within a cylinder and defines a valved compression space on one side of the piston means and a balance chamber volume on the other side thereof including means for adjusting the position of a movable head means of the balance chamber so as to vary the total balance chamber volume between a first position at which an extended balance chamber volume is coupled with the balance chamber and a second position where said extended balance chamber volume is decoupled from said balance chamber to vary the "gas spring" stiffness exerted on the piston means by the total balance chamber volume during reciprocal movement of said piston means, the improvement comprising:
said movable head means having a first portion arranged to be slidingly sealed within said extended balance chamber and a second portion of smaller diameter extending from said first portion and arranged to be slidingly disposed within a corresponding cylinder portion of said balance chamber whereby when said second portion is disposed within said cylinder portion said extended balance cham-



ber volume is decoupled from said total balance chamber volume and vice versa.

4,836,758

SCROLL COMPRESSOR WITH CANTED DRIVE BUSING SURFACE

John P. Elson, and Stephen F. Kramp, both of Sidney, Ohio, assignors to Copeland Corporation, Sidney, Ohio

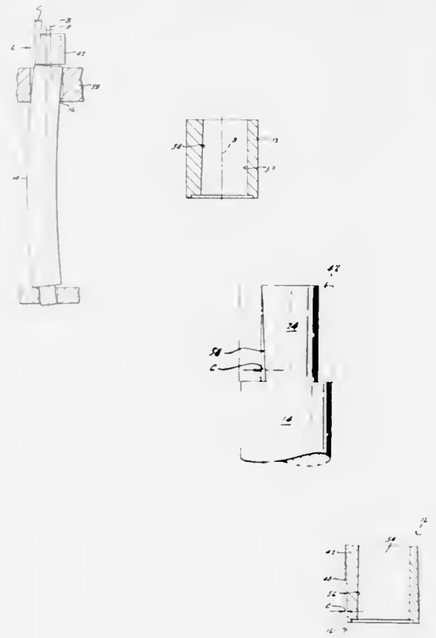
Filed Nov. 20, 1987, Ser. No. 123,184

Int. Cl.⁴ F01C *1/04, 17/06;* **F16C** *11/02, 25/02*

U.S. Cl. 418—55 **17 Claims**

1. A scroll type machine comprising an orbiting scroll member having a bore defining a journal for driving said scroll member in an orbital path, a non-orbiting scroll member mated with said orbiting scroll member, a rotatably driven axially extending crankshaft having an eccentric crank pin including an outer driving surface, and a drive bushing having an axial bore receiving said crank pin, said bore defining an inner bushing driving surface, said bushing further having an outer cylindrical bushing driving surface disposed in said orbiting scroll member journal, portions of said outer driving surface, said inner bushing driving surface, said outer cylindrical bushing driving surface and said journal cooperating with one another whereby rotation of said crankshaft is operative to effect orbital movement of said orbiting scroll member with respect to said non-orbiting scroll member characterized in that one of said outer driving surface, said inner bushing driving surface and said outer cylindrical bushing driving surface is canted at a substantially constant angle over the axial length of its cooperating portion with respect to the axis of said crankshaft when said crankshaft is at rest, said angle being chosen such that curvature of the crankshaft caused by normal driving loads on said crank pin will cause said canted cooperating portion to

mate with an opposed cooperating portion of said outer driving surface, inner bushing driving surface and outer cylindrical



bushing driving surface to a greater degree on its loaded side than when said crankshaft is at rest.

4,836,759

ROTARY PUMP WITH ORBITING ROTOR OF HARDER MATERIAL THAN STATOR

Ian Lloyd, Wynnum West, Australia, assignor to Nautical Services Pty. Ltd., Queensland, Australia

PCT No. PCT/AU86/00342, § 371 Date Jul. 8, 1987, § 102(e) Date Jul. 8, 1987, PCT Pub. No. WO87/03047, PCT Pub. Date May 21, 1987

PCT Filed Nov. 10, 1986, Ser. No. 95,606

Claims priority, application Australia, Nov. 8, 1985, PH3314

Int. Cl.[4] F04C *2/04, 5/00, 11/00, 18/04*

U.S. Cl. 418—56 **15 Claims**

1. A rotary pump including:

a pump housing with a stator having an inlet port, and an exhaust port, said stator including an inner surface and an outer surface;

a rotor, mounted within and engaging the inner surface of the stator, and being mounted on a shaft, the shaft being rotatably mounted in the housing; and

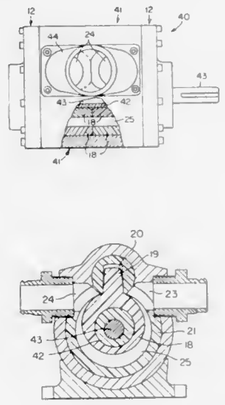
a lobe on the rotor engageable in a recess within the stator to prevent rotation of the rotor, the lobe being disposed intermediate the inlet and exhaust ports; at least the outer surface of the rotor and lobe comprising an elastomeric material of a first hardness and at least the inner surface of the stator comprising an elastomeric material of a second hardness different from said first hardness so that at least one of the rotor and lobe, and the stator, are at least partially compressed as the rotor moves in an orbital path within the stator to form two pumping chambers of variable capacity,

said shaft being mounted substantially coaxially with the stator in end plates in the housing and having an eccentric cam rotatably received in an eccentrically located bore in the rotor.

14. A rotary pump of double capacity including:

a pump housing with a stator having an inlet port, and an exhaust port, said stator including an inner surface and an outer surface;

a rotor, mounted within and engaging the inner surface of the stator, and being mounted on a shaft, the shaft being rotatably mounted in the housing; and



a lobe on the rotor engageable in a recess within the stator to prevent rotation of the rotor, the lobe being disposed intermediate the inlet and exhaust ports; at least the outer surface of the rotor and lobe comprising an elastomeric material of a first hardness and at least the inner surface of the stator comprising an elastomeric material of a second hardness different from said first hardness so that at least one of the rotor and lobe, and the stator, are at least partially compressed as the rotor moves in an orbital path within the stator to form two pumping chambers of variable capacity,

two said stators being fitted within the housing, and said housing being of twice the length of a single capacity pump; and

two said rotors being fitted on a single cam on the shaft.

4,836,760

INLET FOR A POSITIVE DISPLACEMENT PUMP

Edward N. MacLeod, Waltham, Mass., assignor to Parker Hannifin Corporation, Cleveland, Ohio

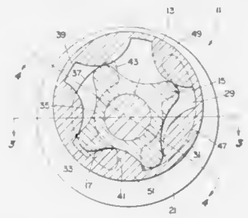
Filed Mar. 12, 1987, Ser. No. 25,232

Int. Cl.[4] F04C *2/10*

U.S. Cl. 418—166 **1 Claim**

1. An improved positive displacement pump having a high speed, single direction rotary displacement mechanism and a housing surrounding the rotary displacement mechanism and cooperating therewith to form a displacement inlet cavity which, during rotation of said rotary displacement mechanism, extends radially inwardly to a radially inner boundary, radially outwardly to a radially outer boundary, and receives fluid through an axial housing inlet disposed in said housing axially adjacent the displacement mechanism between said radially inner boundary and said radially outer boundary; the improvement comprising:

said axial housing inlet having a radially outer covering edge, a radially inner edge, a leading edge and a trailing edge; with said radially inner edge extending substantially along said radially inner boundary and said radially outer covering edge extending radially inwardly of said radially outward boundary and covering an outer section of said displacement inlet cavity such that fluid which has entered said displacement inlet cavity through said housing inlet will not exit said displacement inlet cavity through said housing inlet due to fluid pressure created in said



displacement inlet cavity by rotation of the fluid; and wherein said rotary displacement mechanism cooperates with said housing to form a displacement outlet cavity which, during rotation of said displacement mechanism extends to a radially inner outlet boundary and a radially outer outlet boundaries; and wherein said housing further comprises an axial housing outlet having a leading edge, a trailing edge and a radially outer edge which extends at least radially outwardly to said radially outer outlet boundary from said leading edge to said trailing edge.

4,836,761

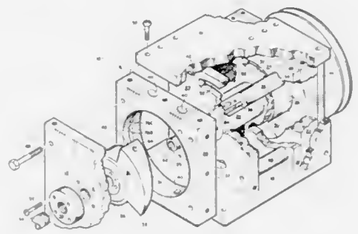
ROTARY ENGINE WITH A PAIR OF PISTON ASSEMBLIES AND SHUTTLE VALVES

Jack V. Edling, 2116 Camino Dr., Escondido, Calif. 92026

Filed Oct. 5, 1987, Ser. No. 104,401

Int. Cl.[4] F01C *11/00*

U.S. Cl. 418—188 **12 Claims**



1. A rotary external combustion engine comprising:

at least one pair of side by side vertically displaced annular chambers;

a pair, of piston assemblies, one positioned in each of said annular chambers, each of said piston assemblies comprising a pair of pistons each of said pistons having a working surface positioned 180 degrees apart, said pistons conform to said annular chambers and rotate relative thereto;

a shaft extending through said cylinders, the central portion of said shaft is tubular along a portion of its length, said pistons assemblies are fixedly connected to said shaft with the pistons of one of said piston assemblies being displaced 90 degrees from the pistons of the other piston assembly;

a plurality of discrete troughs positioned circumferentially on the inner central wall of said annular chamber remote from the horizontal center line thereof at two locations in each of said annular chambers, said two locations being substantially 180 degrees apart, each of said discrete troughs at each of said locations are of a different cross sectional area and the leading edges of the first trough encountered by both pistons of each piston assembly and the trailing edges of the last of said plurality of discrete troughs are substantially 180 degrees apart;

a source of working fluid under pressure, said source of said working fluid under pressure communicating with the open distal end of the hollow portion of said shaft;

passage means for directing said working fluid under pressure from said hollow portion to the outer central portion of each of said pistons of said piston assemblies at a discrete location in circumferential alignment with said discrete troughs;

a pair of translatable shuttle valves for simultaneous translation between a position blocking one annular chamber to a position blocking the other annular chamber, and control means of each of said shuttle valves being interconnected to said working fluid under pressure from the discrete location on said pistons when said pistons of one of said annular chambers are at a specific rotational location whereby said working fluid causes said pair of shuttle valves blocking that annular chamber to translate to a position blocking the other annular chamber;

an opening in each of said annular chambers in two locations substantially 180 degrees apart for exhausting spent working fluid from said annular chambers when said shuttle valves are translated from an annular chamber; and

an output power connection means positioned on the end of said shaft remote from hollow distal end.

4,836,762

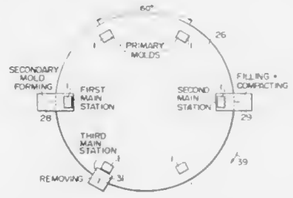
APPARATUS FOR MOLDING CONCRETE BLOCKS OR BRICKS

Lindsey B. Davis, Jr., Box 32, Cambridge, Me. 04923

Division of Ser. No. 815,382, Dec. 31, 1985, Pat. No. 4,702,877. This application Jul. 10, 1987, Ser. No. 72,178

Int. Cl.[4] B28B *7/36*

U.S. Cl. 425—89 **27 Claims**



1. An apparatus for automatically casting concrete elements, comprising a plurality of primary mold cavities, means for carrying said plurality of primary mold cavities having open mold tops and drive means operatively connected to said carrying means for stepping said carrying means in a timed sequence into cooperation with a plurality of operating stations comprising a first main station including a solid heating device having a flat surface for contacting and uniformly heating a thermoplastic film portion located on said open mold top, said flat surface having an area corresponding at least to the surface area of said open mold top for closing said open mold top when a thermoplastic film portion is being heated, means for evacuating air from said primary mold cavities to pull a heated thermoplastic film portion into said primary mold cavity, for forming a secondary mold in said primary mold cavity, means for removing said heating device from said primary mold cavity thereby opening said secondary mold, a second main

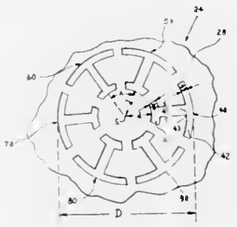
station including means for filling concrete mix into said open secondary mold inside said primary mold cavity, a third main station including means for removing a filled secondary mold from a primary mold cavity, and means for controlling said stepping drive means to provide a dwell time for each of said stations such that said removing of a filled secondary mold takes place prior to any substantially noticeable or effective hardening of said concrete mix, and wherein said means for removing a filled secondary mold from a primary mold cavity comprise a rigid suction pipe connectable to a source of reduced pressure, means connected to said rigid suction pipe for moving said suction pipe back and forth between a secondary mold pick-up position and a secondary mold discharge position, lifting plate means connected to a lower end of said rigid suction pipe for contacting a rim of said secondary mold to engage said secondary mold rim in a suction tight manner, and means for controlling an application of reduced pressure through said suction pipe and through said lifting plate means for holding said secondary mold with its content to said lifting plate means when said secondary mold with its content is removed out of the respective primary mold cavity.

4,836,763

SEVEN HOLE SPINNERET

Clarke R. Broaddus, Greenville, N.C., assignor to E. I. DuPont De Nemours and Company, Wilmington, Del.

Filed Jul. 29, 1988, Ser. No. 225,807
Int. Cl.[4] B29G *47/20*
U.S. Cl. 425—131.5 3 Claims



1. A spinneret for the production of filaments of essentially round cross-section with at least seven continuous voids along the filaments, one void being centrally located, said spinneret comprising: a plate having upper and lower surfaces connected by a capillary, said capillary being defined at said lower surface by a plurality of segments equispaced a distance from and equispaced angularly about the center of the capillary, each of said segments being defined by an inner arcuate slot, connected to an outer arcuate slot by another elongated slot located between and in communication with said inner and said outer arcuate slots.

4,836,764

MELT-PHASE THERMAL PRESSURE APPARATUS FOR FORMING OF PLASTIC BLANKS INTO RETORTABLE CONTAINERS

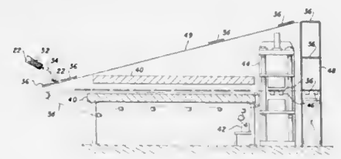
Keith Parkinson, Newport News, Va., assignor to QuesTech Ventures Inc., Williamsburg, Va.

Filed Oct. 13, 1987, Ser. No. 107,574
Int. Cl.[4] B29C *51/24*
U.S. Cl. 425—384 8 Claims

1. An apparatus for the thermal pressure forming of plastic blanks into containers that can withstand temperatures and pressures of a retort chamber without undergoing significant and permanent distortion, comprising:

a. a means for bringing plastic blanks from a solid phase to a melt phase by heating said plastic blanks to a melting temperature sufficient to relieve internal stresses in said plastic blanks;

b. means for conveying the plastic blanks through the heating means, said conveying means including means for preventing the plastic blanks in the solid phase from going into the melt phase only along outer peripheral edges thereof so that the plastic blanks maintain their hoop strength and peripheral dimensions; and



c. means for forming the plastic blanks into containers that can withstand temperatures and pressures of a retort chamber without undergoing significant and permanent distortion;

said conveying means includes a conveyor and a plurality of trays conveyed on the conveyor, each of the plurality of trays having a plurality of holes therethrough in which the preventing means are placed; and

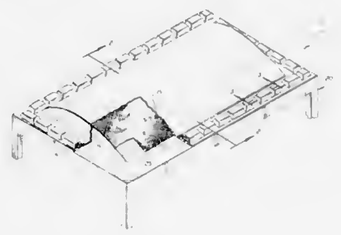
said preventing means include means for suspending the plastic blanks thereacross.

4,836,765

MOLDING APPARATUS FOR COMPOSITE MATERIALS

Michael A. Kornitzky, Branford, and Alexander C. Dublinski, Northford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 3, 1987, Ser. No. 128,306
Int. Cl.[4] B29C *43/10*
U.S. Cl. 425—388 7 Claims



1. In an apparatus for the molding of composite laminates, said apparatus comprising a cavity defined by a rigid mold over which a lay-up of said composite laminates is formed, and a vacuum bag adapted for sealed engagement with said rigid mold, over said lay-up; said apparatus further comprising means for applying negative pressure to the interior of said cavity, the improvement characterized by:

magnetic means disposed at the location of engagement of said vacuum bag with said rigid mold for sealing said vacuum bag thereto, thereby easing the assembly of said vacuum bag to, and disassembly of said vacuum bag from said rigid mold while maintaining an airtight seal therebetween;

said magnetic means comprising a plurality of juxtaposed ferromagnetic members, peripherally aligned about the outer edge of said vacuum bag;

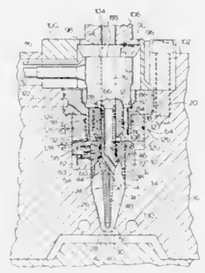
said ferromagnetic members having inwardly sloping adjacent surfaces which define angular clearances therebetween to allow relative pivotal movement between adjacent members.

4,836,766

INJECTION MOLDING VALVE GATING ONE OF TWO NOZZLES IN TANDEM

Jobst U. Gellert, 7A Prince Street, Georgetown, Ontario, Canada L7G 2X1

Filed Apr. 28, 1988, Ser. No. 187,445
Claims priority, application Canada, Apr. 13, 1988, 563980
Int. Cl.[4] B29C *45/22*
U.S. Cl. 425—549 3 Claims



1. An injection molding valve gated system comprising:

(a) a forward first elongated heated nozzle mounted in a well in a cavity plate for reciprocal motion in an axial direction, the first nozzle having a rear end, a nose portion leading to a tip at a forward end which is in axial alignment with a gate extending from the well to a cavity, and a melt bore extending therethrough, having a central portion and a diagonal portion, the central portion extending from an inlet at the rear end and the diagonal portion extending from the central portion to a sealed space surrounding the nose portion leading to the gate, the first nozzle having an integral heating element, a portion of which extends into the nose portion of the first nozzle,

(b) piston actuating means adjacent the first nozzle to drive the first nozzle axially from a retracted open position to a forward closed position wherein the tip of the nose portion is seated in the gate, and

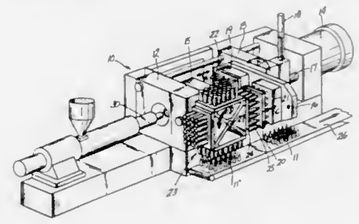
(c) a rearward second elongated heated nozzle having a rear end, a forward end, and a central melt bore extending therethrough from an inlet at the rear end of the rearward nozzle to the forward end of the rearward nozzle, the second nozzle being seated in a support plate in a fixed position axially adjacent the first nozzle wherein the central bore of the second nozzle is in axial alignment with the central portion of the melt bore through the first nozzle, one of the rear end of the forward nozzle and the forward end of the rearward nozzle having an extended portion which is received by the other, whereby the central portion of the melt bore through the first nozzle remains continuous with the central melt bore through the second nozzle as the first nozzle reciprocates between the first and second positions.

4,836,767

SWING PLATE MOLDING MACHINE

Robert D. Schad, Toronto, and John Pocock, Willowdale, both of Canada, assignors to Husky Injection Molding System, Ltd., Bolton, Canada

Filed Nov. 25, 1987, Ser. No. 125,598
Int. Cl.[4] B29C *45/40*
U.S. Cl. 425—552 10 Claims



1. An apparatus for producing molded plastic articles which comprises: an injection molding machine including a first mold portion; at least two mold portions for mating with said first portion; said mating portions being mounted to a movable carrier plate so that during a first molding cycle a first one of said mating mold portions is aligned with said first mold portion to permit the production of at least one molded plastic article and a second one of said mating portions is in a non-aligned position and during a second molding cycle said first mating molding portion with said at least one plastic article are in said non-aligned position and said second mating molding portion is aligned with said first mold portion; means for cooling said at least one plastic article in said non-aligned position; means for moving said carrier plate along a first axis so that during each molding cycle said mating molding portion in said aligned position is brought into contact with said first mold portion to form at least one plastic article and said mating molding portion in said non-aligned position is simultaneously brought into a cooling position wherein said at least one plastic article on said mating molding mean formed during a previous molding cycle contacts said cooling means; said cooling means comprising a plurality of plates connected to a rotatable hub; and each said plate having at least one cooling tube for receiving said at least one plastic article to be cooled.

4,836,768

COATED SUBSTRATES

Alan D. Wilson, Liphook; Havard J. Prosser, Royston; Anthony J. Dunsdon, Thornton Heath; John C. Skinner, Hounslow, and Pauline J. Brookman, Bordon, all of England, assignors to National Research Development Corporation, England

Continuation of Ser. No. 791,329, Oct. 25, 1985, abandoned.
This application Apr. 15, 1987, Ser. No. 39,113
Claims priority, application United Kingdom, Oct. 26, 1984, 8427138
Int. Cl.[4] B32B *15/00, 15/08, 27/06;* C04B *9/02*
U.S. Cl. 428—323 15 Claims

1. A body having a substrate surface which comprises an electrically conductive corrodible material and on which substrate surface is present a coherent protective layer of an anti-corrosion composition which comprises a solid matrix of electrical conductivity $>10^{-6}$ mho cm^{-1} and formed by reaction between a homo- or copolymer of an unsaturated carboxylic acid or a hydrolysable precursor thereof and at least one basic or amphoteric oxide or hydroxide in which matrix is incorporated an elemental metal, or an alloy thereof, the matrix and metal being effective in service as an electrolyte and sacrificial anode, respectively.

4,836,769

WATER-COOLED WINDING FOR ELECTROMAGNETIC STIRRER

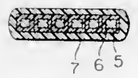
Tadashi Iwabuchi, and Takeshi Kawakami, both of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Aug. 1, 1986, Ser. No. 891,906

Claims priority, application Japan, Nov. 26, 1985, 60-263804; Nov. 26, 1985, 60-263805; Nov. 26, 1985, 60-263806; Nov. 26, 1985, 60-263807; Nov. 26, 1985, 60-263810; Nov. 26, 1985, 60-263809; Nov. 26, 1986, 60-263808

Int. Cl.[4] **D02G** *3/00;* **H01B** *7/00;* **H01F** *27/30*

U.S. Cl. 428—377 **13 Claims**



1. A compact water-cooled winding for an electrical device which comprises a coil including (a) a plurality of wound flat type wires, each wire having a wire-insulating turn insulation, and (b) a porous polyamide fiber having an air permeation rate not higher than 25 seconds/100 cm^3 of air covering an epoxy resin composition comprising a bisphenol epoxy resin, a reactive diluent, and an amine type curing agent, said epoxy resin composition being cured after impregnation.

4,836,770

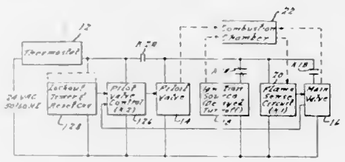
PRIMARY GAS FURNACE CONTROL

Frederick J. Geary, Holland, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 37,641, Apr. 13, 1987, Pat. No. 4,755,133, which is a division of Ser. No. 879,067, Jun. 26, 1986, Pat. No. 4,680,005, which is a division of Ser. No. 627,038, Jul. 2, 1984, Pat. No. 4,626,192. This application Apr. 22, 1988, Ser. No. 185,068

Int. Cl.[4] **F23Q** *9/08*

U.S. Cl. 431—46 **8 Claims**



1. In a primary control for gas furnaces, the combination including a low voltage circuit adapted to be connected to a source of low voltage AC current, said low voltage circuit including a thermostatic switch, an electrically operable pilot gas valve, an electrically operable main gas valve, pulse generating means, and first relay means controlling the energization of said main gas valve and said pulse generating means, a high voltage spark generating circuit including spaced electrodes disposed in the path of gas emanating from said pilot valve, means interfacing said low voltage circuit and said spark generating circuit and providing a substantially higher voltage in said spark generating circuit than in said low voltage circuit, flame sensing means including a probe disposed in the path of gas emanating from said pilot gas valve and being subjected to the heat of the gas flame when gas ignition is obtained by said spark generating circuit whereby flame rectification is effected, said flame sensing means controlling said main gas valve and said pulse generating means through said first relay means, and means operably connected to said pulse generating means and effective to maintain energization of said pulse generating means and said spark generating circuit for a predetermined period of time after flame rectification is effected by said probe.

4,836,771

GRADIENT OVEN FOR ORIENTED SOLIDIFICATION, IN PARTICULAR BY THE BRIDGMAN METHOD

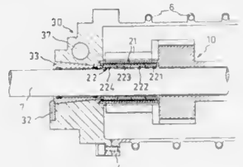
Dominique Valentian, Vernon, France, assignor to Societe Europeene de Propulsion, France

Filed Apr. 18, 1988, Ser. No. 182,796

Claims priority, application France, Apr. 27, 1987, 87 05941

Int. Cl.[4] **F27B** *14/00;* **E01C** *19/45*

U.S. Cl. 432—210 **9 Claims**



1. A gradient oven for oriented solidification in particular comprising:

an enclosure suitable for receiving a cartridge containing a sample to be melted and then solidified in oriented manner in order to constitute a monocrystalline material;

the enclosure defining in succession along the cartridge: a heating zone; and adiabatic zone; and a heat sink;

means for moving the cartridge at a predetermined speed relative to the enclosure; and

a frustoconical portion constituting a cooling ring suitable for being removably engaged in the heat sink inside the enclosure when a cartridge is inserted into the enclosure and including locking means for holding the frustoconical portion to enable the cartridge to slide relative to the frustoconical portion when the cartridge is progressively withdrawn from the enclosure;

wherein said adiabatic zone comprises an outer fixed annular portion mounted in fixed manner inside the enclosure, and a removable annular portion which is coaxial with said fixed annular portion and which is mounted inside it; and

wherein said removable annular portion is constituted by a set of components having different thermal conductivities.

4,836,772

BURNER FOR COAL, OIL OR GAS FIRING

Albert D. LaRue, Summit County, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed May 5, 1988, Ser. No. 190,734

Int. Cl.[4] **F23M** *9/06;* **F23Q** *9/00;* **F23C** *7/00;* **F23D** *1/00*

U.S. Cl. 431—285 **12 Claims**

1. A burner for the combustion if coal, oil or gas, comprising:

a tubular burner nozzle having an inlet end and an outlet end and which defines a central passageway for conveying primary air containing pulverized coal particles therethrough to an outlet end of the burner;

a gas zone sleeve having an inlet end and an outlet end, concentrically arranged around the tubular burner nozzle and partially defining an annular enclosure therebetween;

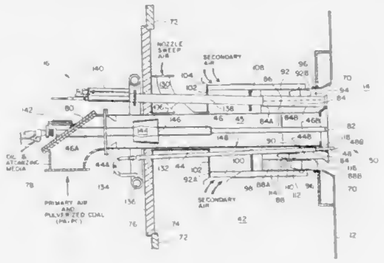
an inner zone sleeve having an inlet end and an outlet end, concentrically arranged around the gas zone sleeve and defining an inner annular passageway therebetween, for conveying a first portion of secondary air needed for combustion to the outlet end of the burner;

a burner barrel having an inlet end and an outlet end, concentrically arranged around the inner zone sleeve and defining an outer annular passageway therebetween, for conveying a second portion of secondary air needed for combustion to the outlet end of the burner;

an air separation vane, connected to an extending outwardly and circumferentially around the outlet end of the inner zone sleeve, for influencing the path of the first portion of secondary air as it exits from the burner;

a retractable oil atomizer having an inlet end and an outlet end, centrally disposed and supported within the central passageway, for conveying a mixture of oil and atomizing media to an atomizer sprayer plate located at the outlet end of the atomizer at the outlet end of the burner;

a plurality of retractable and rotatable gas elements, concentrically arranged around the tubular burner nozzle and extending through the annular enclosure, for conveying



gas to the outlet end of the burner, having outlet ends located in close proximity to the outlet end of the tubular burner nozzle, and being shielded from the secondary air when fully inserted into the burner by;

a flame stabilizing ring, attached to the outlet end of the tubular burner nozzle and which together with the tubular burner nozzle and the gas zone sleeve defines the annular enclosure therebetween, having a first portion circumferentially extending into the central passageway to define an opening therein, a second L-shaped portion attached to the first portion of the flame stabilizing ring extending circumferentially around and outwardly from the outlet end of the tubular burner nozzle, and having a plurality of openings adapted to closely receive therethrough each of the plurality of retractable gas elements.

4,836,773

STITCHLESS BURNING WICK

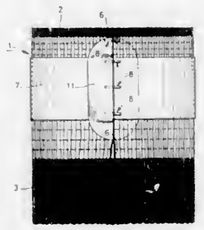
Isaburo Yamaguchi, Nigata, Japan, assignor to Kitate Sangyo Co., Inc., Nigata, Japan

Filed Aug. 30, 1988, Ser. No. 238,278

Claims priority, application Japan, Feb. 1, 1988, 63-12370[U]

Int. Cl.[4] **F23D** *3/18*

U.S. Cl. 431—325 **5 Claims**



1. A stitchless burning wick comprising a tubular wick body comprising a burner part and an oil suction part having opposite abutting edges, a plurality of channel-like connecting members which are spaced apart and straddle said opposite abutting edges of said burner part and said oil suction part, said members having legs which extend inwardly of the wick body from outside said wick body and then toward each other and then toward the outside so as to embrace yarns of said wick body; and a holding tape which is disposed over said connecting members and which has a size covering only the vicinity of said opposite abutting edges and which overlies portions of said burner part and said oil suction part along said opposite abutting edges.

4,836,774

METHOD AND APPARATUS FOR HEATING A STRIP OF METALLIC MATERIAL IN A CONTINUOUS ANNEALING FURNACE

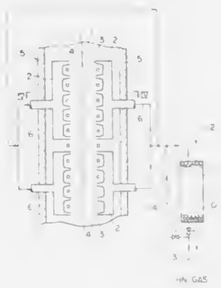
Masahiro Harada; Kenichi Yanagi; Takeo Fukushima, all of Hiroshima; Kusuo Furukawa, Chiba; Naohiko Soeda, Chiba; Norio Ohta, Chiba; Kuniaki Sato, Yotukaido, and Yasuhisa Nakajima, Chiba, all of Japan, assignors to Mitsubishi Jukogyo Kabusbiki Kaisha, Tokyo and Kawasaki Steel Corporation, Hyogo, both of, Japan

Continuation of Ser. No. 796,087, Nov. 8, 1985, abandoned. This application Jul. 20, 1987, Ser. No. 75,217

Claims priority, application Japan, Nov. 8, 1984, 59-234089; Nov. 13, 1984, 59-237661; Nov. 13, 1984, 59-237662; Nov. 13, 1984, 59-237663; Mar. 5, 1985, 60-41788

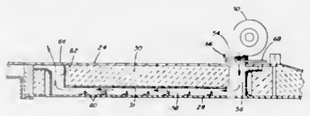
Int. Cl.[4] **F27B** *9/28*

U.S. Cl. 432—8 **5 Claims**



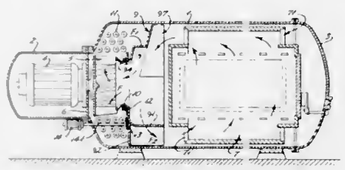
1. A method of heat-treating a strip of metallic material in a continuous annealing furnace containing a radiant heating tube system and a plurality of gas jet nozzles arranged on one or both sides of the annealing furnace which comprises continuously introducing the strip of metallic material to be treated into the annealing furnace and heat-treating said metallic material with the heat from the radiant tube system and a heating or cooling gas introduced through said gas jet nozzles to the metallic strip, whereby the introduction of the heating or cooling gas cooperates with the radiant heat from the radiant tube systems for effectively controlling the temperature of the metallic strip being treated to the annealing temperature irrespective of changes in operating conditions such as the heat cycle, line speed, thickness of the metallic strip and the width of the metallic strip, and introducing said gas to said strip for the period of time until the temperature of the radiant tube system reaches a predetermined temperature so that the strip is always treated at its proper annealing temperature.

4,836,775
AIR COOLED ROTARY KILN COLLAR
Robert B. Heithoff, and John K. Groetzinger, both of LaVale, Md., assignors to PPG Industries, Inc. Pittsburgh, Pa.
Continuation of Ser. No. 41,262, Apr. 22, 1987, abandoned, which is a division of Ser. No. 812,039, Dec. 23, 1985, Pat. No. 4,707,175. This application Jun. 16, 1988, Ser. No. 208,193
Int. Cl.[4] F27B *7/24, 7/38*
U.S. Cl. 432—112 5 Claims



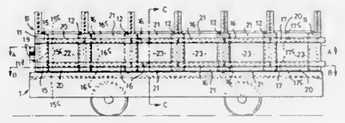
1. A heat exchanger for controlling the temperature of preheated pulverulent material at the discharge end of a rotary kiln comprising:
an outer cylindrical shell with a radially inwardly disposed cylindrical inner wall;
a refractory liner disposed radially outward from said wall and between said shell and said wall so as to form a longitudinally extending annular chamber between said liner and said wall;
cooling air inlets at a first end of said chamber;
cooling air outlets at a second end of said chamber longitudinally opposed from said inlet;
at least one blower to blow cooling air into said inlet such that said air passes through said chamber and exits said heat exchanger through said outlets wherein said air extracts heat from said material;
means to monitor the temperature of said material; and
a slide gate positioned between said blower and said air inlets such that said slide gate can regulate air flow into said air inlets so as to maintain said material below a temperature at which portions of said material will agglomerate prior to discharge from said rotary kiln.

4,836,776
FURNACE FOR HEAT TREATMENT IN VACUO WITH COOLING BY A STREAM OF GAS
Bernard Jomain, Chassieu, France, assignor to Fours Industriels B.M.I., La Verpilliere Cedex, France
Filed Apr. 13, 1988, Ser. No. 180,887
Claims priority, application France, Apr. 28, 1987, 87 06214
Int. Cl.[4] F27D *11/02*
U.S. Cl. 432—176 6 Claims



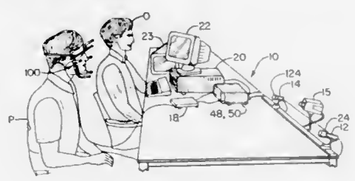
1. In a furnace for heat treating articles and in which includes a housing, an enclosure mounted within the housing in which articles are placed, a turbine rotatably mounted within the housing for circulating gas relative to a heat exchanger also mounted within the housing and the enclosure, the improvement comprising an air deflection volute means mounted within said housing between the enclosure and the turbine so that air passing between the enclosure and the turbine passes therethrough, drive means for rotating said volute means within the housing, a plurality of openings into the enclosure through which gas is circulated relative to articles placed therein, said volute means including a gas inlet and gas outlet portions for directing gas to the turbine and from the turbine toward the enclosure respectively, said gas outlet portion being reoriented with respect to the enclosure as said volute means is rotated to thereby continuously alter the direction of gas flow relative to the articles in the enclosure.

4,836,777
KILN CARS
John Elliott, Stoke-on-Trent, United Kingdom, assignor to Acme Marls Limited, Stoke-on-Trent, England
Filed Nov. 27, 1987, Ser. No. 126,054
Claims priority, application United Kingdom, Nov. 29, 1986, 8628597
Int. Cl.[4] F27B *9/26*
U.S. Cl. 432—241 10 Claims



1. A light weight refractory base for a kiln car having a plurality of upright pillars supported on a wheeled metal trolley, said refractory base comprising:
a plurality of vertically extending wall plates disposed between said pillars thereby defining a periphery of said base;
said refractory base further comprising a laterally projecting radiant heat seal baffle disposed around said periphery;
said baffle comprising a plurality of substantially flat, horizontally extending ceramic bats, said bats provided between adjacent pairs of said pillars; and
said wall plates supporting said bats.

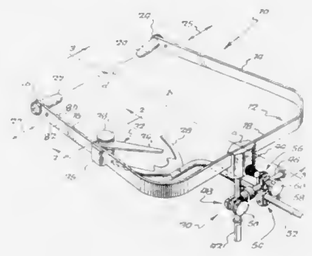
4,836,778
MANDIBULAR MOTION MONITORING SYSTEM
Sheldon Baumrind, Berkeley, Calif., and Sean Curry, Boulder, Colo., assignors to Vexcel Corporation, Boulder, Colo.
Filed May 26, 1987, Ser. No. 53,654
Int. Cl.[4] A61C *19/04*
U.S. Cl. 433—69 23 Claims



1. The method of tracing the movement of a minor body in space in relation to a major body that is also movable in space where the minor body is connected to, and supported by, the major body in such a way that movement of the major body is imparted to the minor body while the minor body is movable in relation to the major body, comprising the steps of:
positioning a first light detector and a second light detector in immovable positions and in fixed, spaced-apart relation to each other, where said first and second light detectors each has a planar light-sensitive surface that has the capability of generating electrical signals indicative of the physical location where said light is incident on said light-sensitive surface and a lens system for focusing a beam of light onto the light-sensitive surface;

defining a first planar two-dimensional coordinate system for said first detector for indicating the position of an incident light spot on the light-sensitive surface of the first detector, and defining a second planar two-dimensional coordinate system for said second detector for indicating the position of an incident light spot on the light-sensitive surface of the second detector;
defining a system frame of reference in terms of a three-dimensional coordinate system by positioning a plurality of calibraiton light-emitting sources in fixed, precisely measured spatial relation to each other in the field of vision of the first and second detectors, detecting the positions of said calibration light-emitting sources with the first and second detectors, and calibrating the image coordinate systems of said first and second detectors to correspond with the measured spatial relationships of the calibration light-emitting sources;
attaching at least three major body light-emitting sources in fixed spaced-apart relation to each other on said major body, and attaching at least three minor body light-emitting sources in fixed spaced-apart relation to each other on said minor body;
detecting the locations of said major body light-emitting sources and of said minor body light-emitting sources in the system frame of reference with said first and second detectors, and calculating three-dimensional image coordinate designations for each of those locations as a function of the respective first and second two-dimensional coordinates of the incident light spots on the respective light-sensitive surfaces of the first and second detectors;
transforming said coordinate designations of said minor body light-emitting sources to a local major frame of reference defined by the positions of said major body light-emitting sources by defining a local major coordinate system that is fixed in spatial relation to said major body light-emitting sources, defining a local minor body coordinate system that is fixed in spatial relation to said minor body light-emitting sources, and offsetting the local minor coordinates of the minor body light-emitting sources with the local major coordinate system; and
moving the minor body in relation to the major body for a period of time while detecting positions of both the major body light-emitting sources and the minor body light-emitting sources and transforming coordinates of the positions detected to the local major coordinate system.

4,836,779
DENTAL FACE BOW
Richard A. Ben, Eggertsville, N.Y., assignor to Teledyne Hanau, Buffalo, N.Y.
Continuation-in-part of Ser. No. 57,540, Jun. 2, 1987, abandoned. This application Apr. 15, 1988, Ser. No. 181,987
Int. Cl.[4] A61C *19/04*
U.S. Cl. 433—73 7 Claims



1. A dental face bow comprising:
(a) a U-shaped spring member including two opposing uniformly acting spring biased legs and a central portion, said U-shaped spring member having a cross section with vertical and horizontal cross sectional axes, said vertical axis being at least twice the length of the horizontal axis;
(b) two inwardly extending earpieces, proximate the ends of said legs, biased by the legs and adapted to fit the external acoustic meatuses of a dental patient, less than one-half kilogram of force being required at the earpieces to separate the earpieces by a distance of between 10 and 14 centimeters;
(c) a bite plate for holding a material in contact with oral structures of a dental patient; and
(d) adjusting means for rigidly securing said bite plate in a fixed relationship with said earpieces.

4,836,780
ANTI-CURVATURE DENTAL ROOT CANAL SHAPING FILE
L. Stephen Buchanan, 179 Hermosillo Rd., Montecito, Calif. 93108
Filed Aug. 22, 1986, Ser. No. 899,419
Int. Cl.[4] A61C *5/02*
U.S. Cl. 433—102 22 Claims

1. An endodontic instrument for cleaning and shaping a root canal in a tooth, comprising:
a first file having thereon a tapered portion, said tapered portion having a larger diameter at one end thereof and a smaller diameter at the other end thereof, said first file having a tip at the end of said tapered position having said smaller diameter;
cutting edges disposed on said tapered portion about the circumference thereof, with the cutting edges being altered to prevent cutting along substantially the entire extent of one longitudinal side of said tapered portion; and
a rounded surface disposed at said tip of said first file.

4,836,781
DENTAL TOOL WITH DUAL RESTORATION MATERIAL RETAINERS
Charles I. Meinershagen, Redding, Calif., assignor to NewTech Products, Inc., Palo Cedro, Calif.
Filed Jan. 27, 1988, Ser. No. 148,839
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—141 4 Claims

1. A dental tool for assisting in cavity repair in two adjacent teeth by facilitating removal of matrix bands therefrom after installation of filler restoration material, said tool comprising a shank terminating in a bifurcated end portion, each branch of said bifurcated end portion terminating in a working surface having an inner edge, the inner edges of the working surfaces being separated by a gap having a width sufficiently large to

accommodate a dental matrix band and sufficiently narrow to enable the working surfaces to maintain tight common inter-

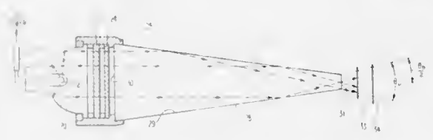
proximal contact with the filler restoration material in adjacent teeth.

4,836,782

METHOD FOR PROVIDING DIRECT COOL BEAM INCIDENT LIGHT ON DENTAL TARGET

Donald I. Gonser, York, Pa., assignor to Dentsply Research & Development Corp., Milford, Del.

Filed May 6, 1983, Ser. No 492,286
Int. Cl.[4] A61C *5/00, 3/00*
U.S. Cl. 433—229 11 Claims



1. A method of visible light curing of light curable material in a dental environment, comprising generating a low divergence collimated light beam and directing said light beam on a predetermined target area in a patient's mouth so that said light reaches pre-positioned light curable material.

4,836,783

ACTIVITY KIT

Cliff Harper, 327 Cantrell Place, S.W., Calgary, Alberta, Canada

Filed Nov. 30, 1987, Ser. No. 126,467
Int. Cl.[4] G09B *11/04*
U.S. Cl. 434—87 19 Claims

1. An activity kit comprising:

(a) a rigid case having sides circumscribing an upper surface and a lower surface, the upper surface providing a flat activity surface, the activity surface having means releasably locking it in position in the rigid case whereby the activity surface is removable and replaceable with another activity surface to permit adopting of the kit to a different activity;

(b) a cavity within the case for receiving a roll of activity medium on which the activity is to be carried out;

(c) an elongated slot in the upper surface communicating with the cavity through which slot medium from the roll is to be dispensed onto the activity surface, the length of the slot being sufficient to permit unobstructed dispensing of medium from the roll through it;

(d) medium guide means positioned on the upper surface adjacent the slot at the ends thereof and extending normal thereto in the direction of dispensing of the medium to guide and position medium from the slot over the activity surface;

(e) medium dispensing control means to restrict the amount of medium which can be dispensed at one time to only so much as is needed to cover the activity surface; and

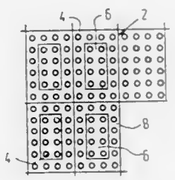
(f) a cover cooperating with the sides of the case to cover and protect the upper surface when the activity kit is not in use.

4,836,784

UNIT FOR DISPLAY OF INFORMATION ON A READING DEVICE FOR THE BLIND

Burchart Joachim, Schlangen, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Jan. 3, 1985, Ser. No. 688,583
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1984, 3400093
Int. Cl.[4] G09B *21/00*
U.S. Cl. 434—113 16 Claims



1. Apparatus for producing tactile-readable representations of graphics and alphanumeric characters comprising:

a reading board having a surface containing a dense two-dimensional array of uniformly spaced character elements therein;

each of said elements being susceptible of both raised and lower dispositions relative to said surface;

said array being divisable two-dimensionally into an integral number of multi element sub-array separated from one another by borderlines of said elements;

actuator means arranged adjacent to said board for setting the dispositions of all of said elements in said array;

input means for receiving data representing graphics and character arrays;

encoder means connecting said input means to said actuator means responsive to graphics for potentially actuating all of the elements in said array but responsive to character inputs for excluding from actuation the elements in said borderlines of elements whereby only the elements of said sub-arrays are actuable in response to character inputs;

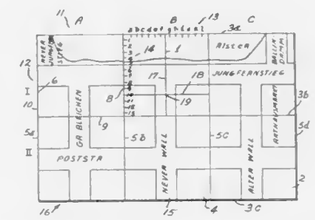
and means for clearing said board by disposing all of said elements in the lowered disposition.

4,836,785

DEVICE FOR LOCATING A DETAIL

Klaus Linder, Papenstrasse 48, D-2000 Hamburg 76, Fed. Rep. of Germany

Filed Oct. 21, 1987, Ser. No. 110,984
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1986, 3635654
Int. Cl.[4] G09B *29/10*
U.S. Cl. 434—153 4 Claims



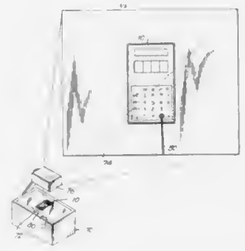
1. A device for locating a detail depicted on information material of the type having at least two edges extending at a right angle to each other on a flat sheet which is divided into at least two units of orientation by a large scale grid of lines, at least one of which contains the detail, the device comprising a first element having at least one portion for engaging one of said two edges of the sheet, said first element including spaced apart parallel sides and another portion at an end of said first element opposite said one portion, said first element having a scale of indicia located along one of said sides, said first element having selected width and length dimensions, a second element having a length dimension smaller that said selected length dimension of said first element and movably supported on said sides of said first element for movement in a direction parallel to said sides of said first element, said second element being made of a transparent material and including two lines extending at a right angle to each other, at least one of said two lines being movable with respect to the other, said first element having a scale of indicia thereon associated with the movable one of said two lines.

4,836,786

DEMONSTRATION CALCULATOR

Robert P. Wong, Kowloon, Hong Kong, assignor to Joseph Leeb Enterprises, Inc., Upper Saddle River, N.J.

Continuation-in-part of Ser. No. 83,414, Aug. 7, 1987, Pat. No. D.300539. This application Sep. 3, 1987, Ser. No. 92,672
Int. Cl.[4] G09B *19/00, 19/02;* G06C *5/02*
U.S. Cl. 434—365 4 Claims



1. A calculator for use in conducting classroom demonstrations of the operation thereof, including use of the operation instruction by key means, comprising:

a housing having a generally transparent frame and a generally transparent film overlying said frame, said housing having a keyboard section, a data processing section, and a display section;

said keyboard section including a data entry subsection and an operation instruction subsection, said data entry subsection comprising a first set of key means accessible from said film and characterized by opaque data representations thereon for affording the introduction of data into the calculator, and said operation instruction subsection comprising a second set of key means accessible from said film and characterized by opaque operation instruction representations thereon for affording the introduction of operation instructions into the calculator, said data entry subsection and said operation instruction subsection at all times being essentially transparent to light transmission therethrough except for said opaque data and operation instruction representations thereon;

said data processing section comprising means for processing the data supplied thereto from said first set of key means according to the operation instructions supplied thereto from said second set of key means;

said display section comprising means for displaying the output of said data processing means, including liquid crystal portions adapted to form numeric outputs that are opaque so as to obstruct light transmission therethrough when said liquid crystal portions are excited, said display section being essentially transparent to light transmission therethrough except for excited liquid crystal portions; and

opaque solar cell means disposed in said data processing section intermediate said film and said data processing means.

4,836,787

CONSTRUCTION KIT EDUCATIONAL AID AND TOY

William O. J. Boo, Box 714, University, Mississippi, Oxford, Miss. 38677

Filed Apr. 1, 1986, Ser. No. 847,403
Int. Cl.[4] A63H *33/04*
U.S. Cl. 434—403 3 Claims

1. A construction kit comprising several planar sheets of regular polygonal shape each having respective top and bottom surfaces, each of said sheets having straight peripheral edges of equal length and each of said edges having an elongated strip of a first type of fastening material wrapped around such edge and extending along such edge and along marginal portions of the top and bottom surfaces of its sheet from one end of such edge to approximately the center of such edge, each of said edges further having an elongated strip of a second type of fastening material, different from said first type, wrapped around such edge and extending along such edge and along marginal portions of the top and bottom surfaces of its sheet from the other end of such edge to approximately the center of the edge so that all of said sheet edges are alike, said first and second types of fastening material being complementally adherent so as to be manually connectible by engagement

with each other and being manually separable and reusable for reconnection, but said strips fo said first type of fastening material are not adherent to each other and said strips of said second type of fastening material are not adherent to each other, said strips of first and second types of fastening material alternating around the periphery of each of said planar sheets such that separate sheets are manually connectible by placing edges of said sheets in engagement with first type of fastening material strips contacting second type of fastening material strips but without requiring precisely coplanar orientation of adjacent sheets nor edges of adjacent connected sheets to be precisely registered for a secure but manually disconnectible fastening of said separate sheets.

4,836,788

PRODUCTION OF SOLID-STATE IMAGE PICK-UP DEVICE WITH UNIFORM DISTRIBUTION OF DOPANTS

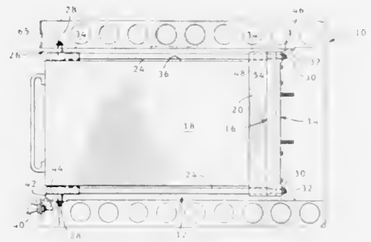
Yasaburo Kato; Toshihiko Suzuki; Nobuyuki Isawa; Hideo Kanbe, and Masaharu Hamasaki, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 5, 1986, Ser. No. 927,161

Claims priority, application Japan, Nov. 12, 1985, 60-253269; Nov. 12, 1985, 60-253270; Nov. 12, 1985, 60-253271

Int. Cl.[4] H01L *21/265, 31/18*

U.S. Cl. 437—017 **26 Claims**



1. A method for producing a solid-state image pick-up device comprising the steps of:

growing from a non-doping silicon melt a p-type silicon monocrystal with a substantially high resistance;

forming a silicon wafer from said silicon monocrystal and irradiating neutrons to said silicon wafer to form an n-type silicon substrate with a resistance smaller than that of said silicon monocrystal; and

forming said solid-state image pick-up device with a plurality of photosensor elements and shift registers on said substrate.

4,836,789

ALIGNMENT SYSTEM FOR LINE REPLACEABLE MODULES

William J. Rudy, Jr., Annville, and Howard R. Shaffer, Millersburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 16, 1987, Ser. No. 109,805

Int. Cl.[4] H01R *13/64, 9/09*

U.S. Cl. 439—64 **6 Claims**

1. A guide system for modules enabling axial movement thereof towards a respective portion of a remote panel mounted in a framework, wherein an electrical connector mounted on a leading end of a module is to be mated with a corresponding electrical connector mounted on the remote panel to establish electrical connections between the respective electrical terminals thereof, said movement being in precise lateral and axial alignment therewith, comprising:

a remote panel affixed to a framework and including a first electrical connector disposed precisely located on a portion thereof, said first connector including a plurality of first electrical terminals therewithin;

a module insertable into said framework and movable toward said remote panel, said module including on a leading end thereof a second electrical connector associated with said first electrical connector and matable therewith, said second connector including a plurality of second electrical terminals therewithin associated with respective said first terminals and matable therewith; and

a pair of opposed elongate track members each having a first end and a second end, both said first and second ends adapted to be fastened to said framework, said first end fastened to said framework forwardly of said panel portion and said second end inserted through a locating aperture of said panel portion and fastened to said framework therebehind, said first ends being fastened so that said pair of track members extend in parallel forwardly from said panel portion and perpendicular thereto;

said module having opposed side surfaces associated with said pair of track members and extending from a leading end to a trailing end of said module, each said side surface including channel portions therealong at least adjacent said leading end and said trailing end cooperating with a respective said track member, whereby said module is placeable between said track members with said track members disposed in close engagement with bottom surfaces of said channels and is movable along said pair of track members toward said panel portion and is laterally and axially aligned therewith upon being moved adjacent thereto; and

said first connector includes flanges extending over said locating apertures and include holes precisely positioned with respect to locations of said first terminals in said first connector, and said holes aligned with said locating apertures through which said track members extend prior to being fastened to said framework thereby assuring that said second ends of said track members are disposed in a precise position with respect to said first terminals of said first connector,

whereby said leading end of said module is aligned with said first connector upon being moved adjacent thereto, and said second connector is precisely aligned with said first connector at least immediately prior to mating enabling appropriate electrical engagement between said first and second terminals.

4,836,790

HEADER DEVICE

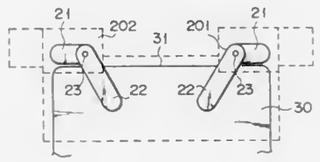
Hiroshi Narita, Tokyo, Japan, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 4, 1987, Ser. No. 116,586

Claims priority, application Japan, Nov. 7, 1986, 61-171260

Int. Cl.[4] H05K *1/00*

U.S. Cl. 439—68 **10 Claims**



1. A header device for a flat IC pack having at least one electrical terminal, comprising:

a header housing including an IC-pack holder, an opening, communicating with the IC-pack holder so that the IC pack is inserted or withdrawn through the opening, and an electrical terminal adapted to fittingly engage the electrical terminal of the IC pack in the IC-pack holder; and

at least one operating means including a first free end located inside the IC-pack holder of the header housing, a second free end located outside the IC-pack holder, and support means rotatably supporting the first and second free ends so that the second free end rotates as the first free and rotates,

said first free end being rotated as the IC pack is inserted into the IC-pack holder in a first direction, and said second free end being rotated by a force acting in the first direction in order that the IC pack in the IC-pack holder of the header housing is pushed in the direction opposite to the first direction, by the first free end.

4,836,791

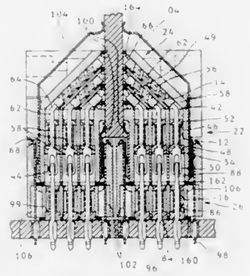
HIGH DENSITY COAX CONNECTOR

Dimitry G. Grabbe, Middletown; Richard F. Granitz, Harrisburg; Roel J. Bakker, York; Donald W. Milbrand, Jr., Mechanicsburg, all of Pa., and Earl E. Masterson, Minneapolis, Minn., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 16, 1987, Ser. No. 119,081

Int. Cl.[4] H01R *9/09*

U.S. Cl. 439—79 **20 Claims**



1. An electrical connector comprising:

a first electrically conductive housing having at least one row of first passages therein, each first passage extending from a first surface to a second surface of the first housing;

a second electrically conductive housing having at least one row of second passages therein, each second passage extending from a first surface to a second surface of the second housing, each second passage is at an angle relative to the first and the second surface of the second housing, such that as the first and second housings are brought together the passages of the respective housings align to form terminal receiving passages which extend through the connector, the terminal receiving passages having a bend at the juncture of the housings;

the first and the second housings are metallized plastic such that the properties of the surface layers of the first and the second housings have conductive characteristics;

terminals positioned in the passages, each terminal having a first end proximate the first surface of the first housing and a second end proximate the second surface of the second housing, the terminals being configured to follow the shape of the terminal receiving passages, such that bends are provided in the terminals to allow high speed transmission of a signal transmission across the terminal while minimizing reflection of the signal, thereby ensuring that the high speed signal is properly transmitted across the terminals of the connector; and

dielectric sleeves coaxially positioned around the terminals, portions of the sleeves cooperate with walls of the passages and with the terminals to provide spacing between the housing and the terminals, the dielectric sleeves having spaces provided therein, the spaces providing air gaps which allows the characteristic impedance to be such as to permit the high speed signals to be transmitted properly across the terminals.

4,836,792

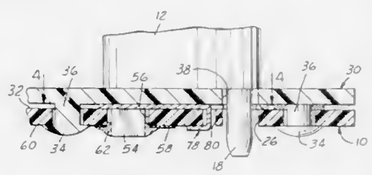
CONNECTOR

Alfred H. Glover, Decatur, Ala., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jun. 13, 1988, Ser. No. 205,873

Int. Cl.[4] H01R *9/09, 11/22*

U.S. Cl. 439—81 **7 Claims**



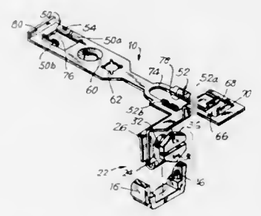
1. In combination: an electrical device with at least one pin-like contact projecting therefrom; a flat substantially two sided circuit board with a first aperture and a second aperture extending therethrough; an electrically conductive pad formed on one side of the circuit board and adjacent the second aperture; an elongated connector member of conductive material mostly overlying a second side of the circuit board, the connector having a pin receiving end portion positioned in overlying relation to the first aperture whereby a pin is extended through the first aperture and is received by the connector thereby securing the electrical device to the circuit board; the connector also having a tab extending therefrom and through the second aperture; means securing the tab to the pad in an electrically conductive manner; conductive track means extending to the pad for supplying an electrical input to the connector.

4,836,793

DUPLEX ELECTRICAL RECEPTACLE WITH ONE-PIECE MULTI-FUNCTION GROUNDING STRIP

Ronald G. Munroe, Staten Island, N.Y., assignor to Eagle Electric Mfg. Co. Inc., Long Island City, N.Y.

Filed Jun. 17, 1988, Ser. No. 208,178
Int. Cl.[4] H01R *13/652, 4/38*
U.S. Cl. 439—107 12 Claims



1. A one-piece, multi-function, grounding strip for assembly within an electrical receptacle of the type mounted in a junction box and covered by a wall plate, said strip comprising:

(a) wiper means integral with the strip, for wipingly contacting a ground prong of an electrical plug to be plugged into the receptacle;

(b) box fastener contact means integral with the strip, for contacting a box fastener operative for mounting the receptacle in the junction box;

(c) wall plate fastener means integral with the strip, for supportably engaging a wall plate fastener operative for mounting the wall plate over the receptacle;

(d) means integral with the strip, for holding the strip at a predetermined position within the receptacle during assembly; and

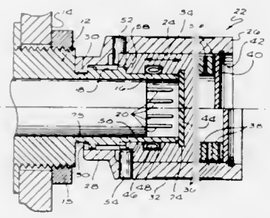
(e) screw terminal means integral with the strip, for electrically grounding the strip, including a pair of spaced-apart electrically conductive grounding plates, each having a stamped-through single screw thread bounding a hole, the hole on one plate being aligned on an axis with the hole on the other plate for receiving a grounding screw through the aligned holes, the single screw threads threadedly engaging the grounding screw at spaced-apart locations and resisting axially directed forces tending to pull the grounding screw from the plates.

4,836,794

EMI AND ENVIRONMENTALLY PROTECTED CONNECTOR CAP

John E. Barr, Brea, Calif., assignor to Kern Engineering & Mfg. Corp., Fullerton, Calif.

Filed Aug. 5, 1988, Ser. No. 209,842
Int. Cl.[4] H01R *13/44*
U.S. Cl. 439—135 20 Claims



1. An EMI and environmentally protected cap assembly for protecting exposed connectors having a cylindrical surface with radially extending coupling lugs to which a mating connector is not coupled, said cap assembly comprising:

a hollow generally cylindrical outer housing having a passageway extending through the length thereof, said housing having a large diameter rear end and a reduced diameter front end, having an inwardly directed flange at the larger rear end thereof, and a plurality of inwardly directed teeth means at the small end thereof for passing between the coupling lugs of the connector and for locking behind the coupling lugs of said connector when the housing is rotated;

an inner, generally cylindrical, substantially cupshaped, hollow body member rotatably mounted within said outer housing, said body member including recesses for receiving and engaging said lugs to hold said inner body member at a substantially fixed angular orientation with respect to the connector as the housing is rotated, and with the end of the connector extending into said inner body member;

mechanical detent means for selectively holding said inner body at either of two fixed orientations with respect to said outer housing, following rotation of said housing to lock said teeth with one of said fixed orientations being with the cap assembly separated from the connector, and the other of said fixed orientations behind the lugs of the connector;

resilient sheet means for sealing the end of the connector mounted within said inner body member toward the closed end of said cup shaped inner body member;

spring means mounted in said housing near the larger end thereof for mechanically biasing said inner body member forward toward the smaller end of said housing;

metal plate means for closing the larger end of said housing; and

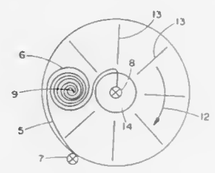
annular coil spring means mounted in an inner circumferential groove in said inner body member to bear on the outer surface of the connector, to block electromagnetic radiation between the connector and said inner body member.

4,836,795

APPARATUS FOR PROVIDING AN ELECTRICAL CONDUCTION PATH BETWEEN TWO CONTACT LOCATIONS

Friedrich Schauer, Haroldsberg, Fed. Rep. of Germany, assignor to Kabelmetal Electro GmbH, Hanover, Fed. Rep. of Germany

Filed Sep. 15, 1988, Ser. No. 244,869
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1987, 3732124
Int. Cl.[4] H01R *35/00;* H02G *11/06;* B60R *21/22*
U.S. Cl. 439—164 5 Claims



1. Apparatus for providing an electrical conduction path between a first contact location rotatable a plurality of rotations in either direction, about a longitudinal axis, and a stationay second contact location positioned radially from said first contact location, comprising:

a bifilar spiral coil spring formed of a length of a ribbon cable having at least two electrical conductors, said ribbon cable having a first portion thereof bent over, at a reversing location, onto the remaining portion thereof; said portions of said ribbon cable being of lengths greater than the distance between said first contact location and said second contact location, and being formed as a bifilar spiral coil spring with said reversing location at its center; said bifilar spiral coil spring being secured only by a first connection at one end of said ribbon cable to said first contact location, and a second connection at the other end of said ribbon cable to said second contact location;

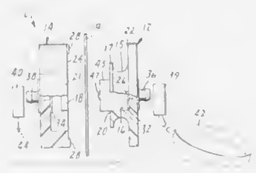
whereby, upon rotation of said first contact location through a plurality of rotations in either direction, said bifilar spiral coil spring partially uncoils and slidably moves in the direction of rotation, and upon reversal of said rotation recovers its original shape and position.

4,836,796

REPLACEABLE TUBE OF CONDUCTIVE GEL

Richard W. Burvee, Austin, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 29,340, Mar. 23, 1987, Pat. No. 4,762,497.
This application May 2, 1988, Ser. No. 189,375
Int. Cl.[4] H01R *13/24*
U.S. Cl. 439—178 4 Claims



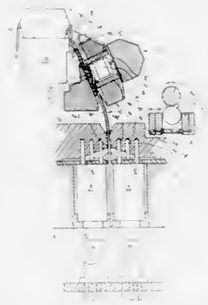
1. A tube of elastic, polymeric foam which is formed with a cavity that is open at both ends and filled with en electrically conductive gel.

4,836,797

ELECTRICAL DEVICE CONTACTOR

Bernd Riechelmann, San Diego County, Calif., assignor to Sym-Tek Systems, Inc., San Diego, Calif.

Filed Dec. 16, 1986, Ser. No. 942,244
Int. Cl.[4] G01R *31/02*
U.S. Cl. 439—264 14 Claims



1. An electrical device contactor comprising:

(a) a base member,

(b) a pair of resiliently flexible, spaced contact leaf banks each having a base portion anchored in the base member, each contact leaf bank comprising:

(1) a uniform sheet of resiliently flexible, electrically conductive material,

(2) a plurality of elongated leaves of resiliently flexible, electrically conductive material, end portions of each leaf being a contact finger,

(3) a corresponding plurality of uniformly-spaced, elongated, parallel slots defined by the sheet in which the leaves are uniformly and centrally disposed, one leaf in each slot, the leaves being generally coplanar with the sheet except for the contact fingers which diverge inboardly from the plane of the sheet, and

(4) means securing the leaves and the sheet in relation to each other,

(c) a device seating means interposed between the contact leaf banks and for seating an electrical device such that each external lead of the device is aligned with a contact finger,

(d) an actuating means cooperating with the contact leaf banks to cause the contact fingers of each contact leaf bank to alernatingly impinge and move away from device leads, and

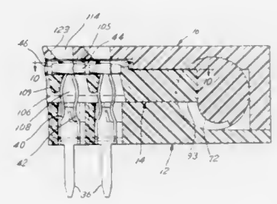
(e) an adaptor means in electrical contact with the contact leaf bank and for providing electrical communication access to the contact fingers.

4,836,798

ZERO INSERTION SOCKET WITH NORMALLY CLOSED CONTACTS

Clyde T. Carter, Shermans Dale, Pa., assignor to Wells Electronics, Inc., South Bend, Ind.

Filed Dec. 21, 1987, Ser. No. 135,731
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—268 5 Claims



1. A socket adapted for securing an electrical component having leads to a conductor, said socket comprising three plate members each defining a multiplicity of openings therethrough, said plate members each adjacently overlying one another with said openings being vertically aligned, unitary contacts carried by the lowermost plate, each of said unitary contacts including a depending leg member and first and second upwardly projecting laterally spaced opposed prongs, each of said contact leg members extending below said lowermost plate member, each of said first and second contact prongs extending upwardly through the intermediate plate member into the uppermost plate member within said aligned openings, each of said prongs including a surface for contacting a component lead positioned between said first and second opposing contact prongs when said uppermost and intermediate plate members are in a first position, each of said prongs further including an ear member projecting from its said surface, first abutment means carried by said intermediate plate member for contacting said first contact prong ear member for urging each first contact prong away from said second opposing contact prong upon said intermediate plate member being shifted from said first position into a second position, second abutment means carried by said uppermost plate member for contacting said second contact prong ear member for urging each second contact prong away from said first opposing contact prong upon said uppermost plate member being shifted from said first position into a second position, wherein said first abutment means and said second abutment means are shiftable with their respective plate member in the same plane parallel-

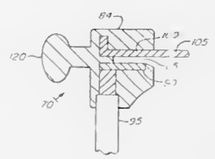
ing the intermediate plate member, camming means being shiftable from a first to a second position for shifting said uppermost and intermediate plate members from said first position and into said second positions relative to each other and said lowermost plate member, wherein said first and second opposing contact prongs are urged into an open position for said component lead insertion therebetween, said camming means being shiftable from its said second position into its said first position to allow said uppermost and intermediate plate members to shift from their said second positions into their said first position.

4,836,799

ELECTRICAL CABLE CONNECTOR

Jitendra P. Tomer, 169 Castlefrank Rd., Kanata, Ontario, Canada K2L 1T3

Continuation-in-part of Ser. No. 21,300, Mar. 4, 1987, abandoned. This application Feb. 16, 1988, Ser. No. 155,758
Int. Cl.[4] H01R *13/28*
U.S. Cl. 439—284 **7 Claims**



1. A hermaphrodite electrical cable connector configured to physically and electrically mate and connect with an identical such electrical cable connector, said cable connector comprising for each circuit to be connected a lead, a male connector and female connector spaced from one another, said male and female connectors being configured to mate physically and connect electrically with the female and male connectors respectively corresponding to the like circuit of an identical such cable connector, said male connector being electrically insulated from said lead when said cable connector is disconnected, and being electrically connected to said lead when said cable connector is electrically connected to an identical such cable connector, and wherein for each circuit the female connector is a socket comprising two closely spaced terminals electrically insulated from one another and extending no further than the entrance to the socket so as to be electrically unexposed externally of the socket, the male connector is an electrically conductive pin configured to mate with said socket, one of said terminals being electrically connected to the circuit lead, and the other of said terminals being connected to the pin, whereby in disconnected mode the pin is insulated from the circuit lead, and in the connected mode the circuit between the pin and the lead is completed by electrical contact of both terminals of the socket with the pin of an identical such cable connector.

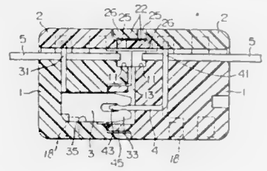
4,836,800

ELECTRICAL CONNECTOR (WITH TELESCOPING FOR SEALING)

Terrance L. Markwardt, Cedar Park, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 5, 1988, Ser. No. 152,452
Claims priority, application Japan, Feb. 20, 1987, 62-37695
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—291 **2 Claims**

1. A connector for splicing telephone cables each having at least a pair of wires therein, said connector comprises a body having four sides and ends, a cover to be placed on a first side of said body and at least a pair of contact elements held in said body, each of said contact elements having a U-shaped wire receiving portion at one end thereof and positioned at said first side, a testing tab positioned for access from a second side opposite said first side, and a terminal at the other end thereof and positioned at a third side adjacent said first side, said terminals including at least one projected male terminal and at least one retracted female terminal provided adjacent to said male terminal, said male terminal being surrounded by an insulating



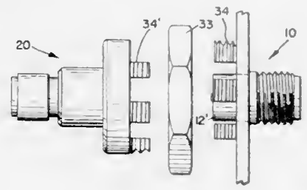
wall, said female terminal being positioned in a recess formed adjacent to said male terminal, said insulating wall surrounding said male terminal being of a configuration to fit within said recess around the female terminal so that said insulating wall may be snugly inserted into a female terminal recess of a mating connector.

4,836,801

MULTIPLE USE ELECTRICAL CONNECTOR HAVING PLANAR EXPOSED SURFACE

Ronald A. Ramirez, Damascus, Md., assignor to Lucas Weinschel, Inc., Gaithersburg, Md.

Filed Jan. 29, 1987, Ser. No. 8,374
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—322 **2 Claims**



1. An improved high frequency signal line connector establishing a continuous transmission medium, comprising:

a first connector member having a first face, and

a second connector member having a second face, wherein said first face is a low profile planar face,

said first face having a first central conductor and a first outer ring shaped conductor coaxial with said first central conductor,

said second face having a spring biased central conductor configured for electrical contact with said first central conductor, and a spring biased outer ring shaped conductor configured for electrical contact with said first outer ring conductor of said first face, and

means for releasably coupling said first connector member to said second connector member, said means exerting forces on said members only perpendicular to said faces and preventing rotation of said members relative to one another, said means including said first face having a first set of regularly spaced projections about its outer periphery,

said second face having a second set of regularly spaced projections about its outer periphery,

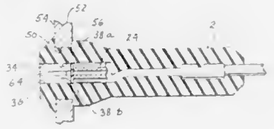
said first radial projections being tightly interleaved with said second projections upon engagement of said first and second members to establish and maintain proper alignment of said conductors of said faces, said first set of projections and said second set of projections being provided with external threaded portions which align to form a continuous set of threads upon engagement of said sets of projections.

4,836,802

SEALED FUSE HOLDER

George E. Phillips, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jun. 30, 1988, Ser. No. 213,693
Int. Cl.[4] H01R *33/95, 13/52*
U.S. Cl. 439—622 **14 Claims**



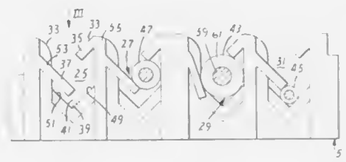
1. A sealed fuse holder adapted to receive a fuse comprising a fuse body having a pair of spaced parallel flat male blade terminals extending therefrom, comprising an electrically insulating receptacle having a front face with an opening therein defining a cavity extending rearwardly from said front face and having side walls extending from said front face at said opening rearwardly to said back wall, a pair of spaced electrically conducting female terminal-receiving clips extending rearwardly from said back wall and receiving respective said blade terminals inserted rearwardly thereinto, first sealing means in said receptacle sealing said cavity from the front, second sealing means in said receptacle sealing said cavity from the rear.

4,836,803

WIRE HOLDING DEVICE IN AN ELECTRICAL CONNECTOR

Udo Seidel, Haanbalken, Fed. Rep. of Germany, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 68,252, Jun. 30, 1987, abandoned. This application Sep. 2, 1988, Ser. No. 240,442
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1986, 3622164
Int. Cl.[4] H01R *9/00*
U.S. Cl. 439—447 **13 Claims**



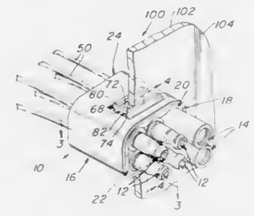
1. A wire holding device positioned at one end of an electrical connector, said device comprising at least one passageway into which a wire to be held can be moved essentially normally of its length through an outwardly enlarging entrance slot toward a closed end of the passageway, a pair of non-symmetrical barbs for holding a said wire in said passageway consisting essentially of a first barb which can be resiliently urged aside by the wire upon the introduction thereof extending from a sidewall of the passageway adjacent the entrance slot, and a second barb which can be resiliently urged aside by the wire upon the insertion thereof extending from the sidewall of the passageway that is opposite to the first barb, each barb having a root joining it to the respective sidewall, the free end of the second barb together with the closed end of her passageway partitioning off a partial passageway, whereby a large diameter wire will be resiliently contacted in the passageway by the second barb and restricted by the first barb against outward movement, a small diameter wire can be restricted against outward movement in the partial passageway by the free end of the second barb, and an intermediate diameter wire can be held between the two barbs and restricted against outward movement by the first barb.

4,836,804

ELECTRICAL CONNECTOR

Norman H. London, Rydal; Leonard S. Greene, Havertown, and Lee J. Falgoust, Hatboro, all of Pa., assignors to London Harness & Cable Corp., Philadelphia, Pa.

Filed May 24, 1988, Ser. No. 197,865
Int. Cl.[4] H01R *13/40*
U.S. Cl. 439—598 **8 Claims**



1. An electrical connector having a housing for a plurality of electrical contacts, characterized in that said housing includes an inner closure for receiving the electrical contacts therein and retaining said electrical contacts in proper position, and an outer sleeve for surrounding said inner closure, said inner closure including mating sections having locating means thereon for permitting the mating sections to be positioned in engagement with each other to close the inner closure in proper position for retaining the electrical contacts therebetween and for permitting said mating sections to be non-destructively separated from each other to open the inner closure and expose the electrical contacts; said outer sleeve having a peripheral wall at least a portion of which is circumferentially continuous for defining a central passageway, said inner closure, when in a closed condition, being receivable within said central passageway for retaining the inner closure in a closed condition, said inner closure being removable from said central passageway for permitting the mating sections of said inner closure to be non-destructively separated from each other to thereby open said inner closure, and cooperating retaining means on said sleeve and said inner closure for retaining said inner closure in a predetermined location within the sleeve while permitting the inner closure to be removed from the sleeve when desired.

4,836,805

WIRING DEVICE SYSTEM WITH SINGLE SCREW SUBASSEMBLY

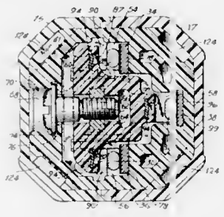
John M. Poliak, East Meadow; Juan M. Lopez, Jamaica, and Robert W. Gritz, Little Neck, all of N.Y., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.

Continuation of Ser. No. 430,631, Sep. 30, 1982, Pat. No. 4,634,211, Ser. No. 829,057, Feb. 13, 1986, abandoned, and Ser. No. 48,333, Mar. 12, 1987, abandoned. This application Nov. 10, 1987, Ser. No. 118,998

The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.

Int. Cl.[4] H01R 9/03

U.S. Cl. 439—657 14 Claims



1. An electrical wiring device comprising in combination:

a housing shell,

a plug assembly carried by said shell, said assembly including electrical contacts capable of making engagement with other electrical contacts, receiving means formed in said assembly for receiving electrical conductors which terminate in said assembly, and a single fastener means for holding said electrical conductors at their termination,

said single fastener means including movable means mounted within said assembly and positioned in proximity with a portion of each of said electrical contacts, chamber means associated with said receiving means, said chamber means being formed between said movable means and said portion of each of said contacts, said chamber means being for positioning said portion of said contacts and for receiving end portions defining terminals of said conductors, and a single fastener associated with said movable means capable of moving said movable means

said movable means being mounted for movement toward and generally perpendicular to said electrical conductors in said chamber means,

said movable means being for biasing said terminals of said conductors into electrical connection with said contacts at said chamber means upon manipulation of said single fastener.

4,836,806

PIN CONNECTOR

Michael J. Dougherty, Lansdale, and Allan S. Olshansky, Phoenixville, both of Pa., assignors to Microdot Inc., Darien, Conn.

Continuation-in-part of Ser. No. 544,484, Oct. 24, 1983, abandoned. This application May 19, 1988, Ser. No. 195,814

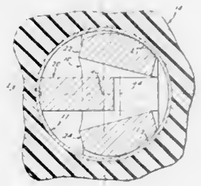
Int. Cl.[4] H01R 13/428

U.S. Cl. 439—751 9 Claims

8. An electrical connector system comprising

a mounting member having a circular aperture with an electrically-conductive sidewall; and

a pin for insertion into the aperture of said mounting member having three resilient longitudinally-extending beams radially spaced from one another about a central axis and disposed in a generally triangular array, an arcuate edge surface of each said beam engaging the aperture sidewall at a discrete location thereon, two of said locations initially being diametrically-opposed, the third location being situated midway between said initial diametrically-opposed locations, each of said initially diametrically-opposed locations being displaced, respectively, circumferentially about the aperture sidewall away from said third location upon further insertion of said pin into the aperture.



4,836,807

SCREW-PLUG-TERMINAL

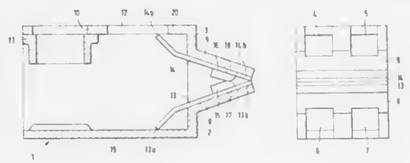
Thomas Singer, Buching, Fed. Rep. of Germany, assignor to Sft X. Settele Stanz- und Formtechnik GmbH & Co. KG, Buching, Fed. Rep. of Germany

Filed Jan. 22, 1988, Ser. No. 147,347

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 8701125

Int. Cl.[4] H01R 4/48

U.S. Cl. 439—787 9 Claims



1. A screw-plug terminal for receiving a plurality of leads, comprising:

a housing formed by housing walls and a housing end connected to said housing walls, a plurality of apertures in said housing end for receiving respective individual leads, said housing end including a plurality of end pieces, each said end piece having a spring mounting section extending obliquely and outwardly from said housing;

each said spring mounting section having a leaf spring disposed along an inner surface thereof, each said leaf spring extending from said inner surface of said spring mounting section toward the interior of said housing to a position adjacent one of said housing walls to thereby form means for clamping said respective leads received through said respective apertures against said housing wall; and

means for attaching each said leaf spring to said inner surface of said respective spring mounting section.

4,836,808

CAPTIVE NUT TERMINAL FOR ELECTRONIC MODULE POWER CONNECTORS

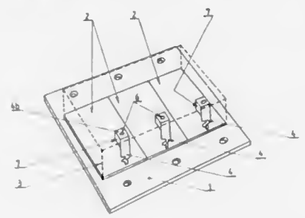
Jean-Louis Mallet, and Jean-Louis Landais, both of Merignac, France, assignors to Power Compact, Societe Anonyme, Merignac, France

Filed Apr. 22, 1988, Ser. No. 184,954

Claims priority, application France, Apr. 22, 1987, 87 05877

Int. Cl.[4] H01R 4/38

U.S. Cl. 439—813 5 Claims



1. Captive nut terminal for an electronic module power connector which connects external terminals to a resin embedded circuit module comprising a lug projecting above the resin embedding the circuits of the module, bent at right angles above the upper face of the module and having a hole for the subsequent passage of a screw for connection to an external terminal and a nut disposed under said lug in line with the hole, said terminal being characterized in that the nut is held captive in a housing of a size and shape allowing the nut a slight multidirectional play but preventing rotation thereof, said housing being formed in the upper face of a piece fixed to and positioned on the connector, under the lug, and having, on at least one of its sides, a hollow for anchoring said piece in said resin.

4,836,809

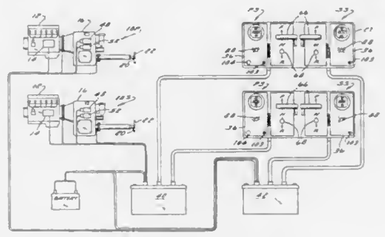
CONTROL MEANS FOR MARINE PROPULSION SYSTEM

Paul A. Pelligrino, Rockford, Ill., assignor to Twin Disc, Incorporated, Racine, Wis.

Filed Mar. 11, 1988, Ser. No. 166,702

Int. Cl.[4] B63H 21/21

U.S. Cl. 440—2 19 Claims



1. A marine propulsion system comprising:

a propeller drive shaft;

an engine having an engine throttle operable to regulate engine speed;

engine throttle control means;

a transmission, having forward and reverse clutches operable to connect said engine to said propeller drive shaft for rotation in forward and reverse directions, said clutch being modulatable to regulate the speed of said propeller drive shaft;

clutch control means;

and control means for operating said engine throttle control means and said clutch control means to effect rotation of said engine at a selected speed; and to effect rotation of said propeller drive shaft in forward or reverse directions and at a selected speed, said control means comprising:

mode selector means for operating said engine throttle to effect operation of said engine at a selected speed, one selected speed being a relatively slow troll speed and another selected speed being a relatively faster cruise speed,

said mode selector means providing output signals indicative that troll speed or cruise speed is selected; and

direction/speed control means for selecting one of said clutches to effect rotation of said propeller drive shaft in forward or reverse direction, said direction/speed control means being further operable when said troll speed has been selected to modulate the selected clutch to enable propeller shaft rotation at a troll speed less than said selected engine speed, said direction/speed control means being further operable when said cruise speed has been selected to effect full clutch engagement and to operate said engine throttle to enable propeller shaft rotation at a cruise speed proportional to engine speed,

said direction/speed control means providing output signals indicative of the direction and speed selected for said propeller shaft;

said control means further comprising:

sensing means for providing feedback signals indicative of engine speed and of propeller shaft speed and direction of shaft rotation;

and controller means for receiving and processing said output signals and said feedback signals and for providing control signals to effect operation of said engine throttle control means and said clutch control means.

4,836,810

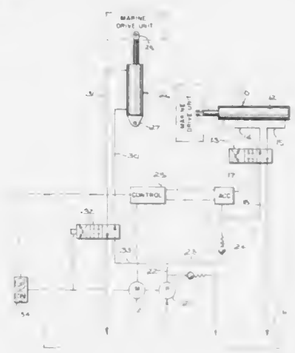
COMBINED POWER TRIM AND STEERING SYSTEM

David C. Entringer, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Apr. 4, 1988, Ser. No. 176,886

Int. Cl.[4] B63H 21/26

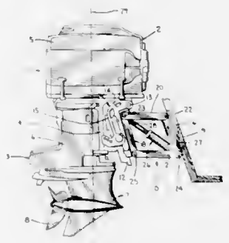
U.S. Cl. 440—61 5 Claims



1. In a watercraft having a drive unit, an hydraulically operated power steering system operatively attached to the drive unit for steering the watercraft, and an hydraulically operated trim system operatively attached to the drive unit for raising and lowering the drive unit with respect to the watercraft, a common fluid pressure supply apparatus for said systems comprising:

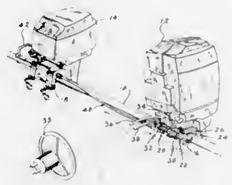
an electric motor-driven hydraulic pump including an outlet for supplying hydraulic fluid under pressure;
an accumulator for receiving hydraulic fluid from the pump outlet and for supplying pressurized fluid to the power steering system;
first control means responsive to upper and lower fluid pressure limits for periodically operating the pump to maintain the fluid pressure in the accumulator within said limits;
fluid supply means for carrying pressurized fluid to the trim system for raising and lowering the drive unit;
valve means for connecting the pump outlet with said fluid supply means;
second control means for operating the valve means and simultaneously activating the pump; and,
lock-out means for disabling the second control means during operation of the pump by the first control means.

4,836,811
TRANSOM EXTENSION MOUNTING ASSEMBLY FOR OUTBOARD MOTORS
John M. Griffiths, Fond du Lac; John J. Litjens, and Neil A. Newman, both of Omro, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.
Filed Sep. 23, 1987, Ser. No. 100,216
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—61 **2 Claims**



1. A mounting assembly for mounting a marine propulsion device on a boat, comprising:
motor mounting means for supporting a marine propulsion device including a first portion attachable to a boat and a second portion adapted to support the marine propulsion device aft of a boat transom, said first portion includes a first bracket attachable to a boat transom and having upper and lower ends, said second portion includes a second bracket spaced aft of said first bracket and adapted to support the marine propulsion device, said second bracket having upper and lower ends;
means for moving said second portion relative to said first portion during boat operation to simultaneously move the marine propulsion device between various raised, intermediate and lowered positions relative to the boat transom in a vertical plane which extends parallel to the longitudinal dimension of a boat and to rotate the marine propulsion device about a horizontal axis which extends perpendicular to the vertical plane, said moving means includes an upper link pivotally connected at one of its ends to the upper end of said first bracket to define a first pivot axis and pivotally connected at its other end to the upper end of said second bracket to define a second pivot axis, and a lower link pivotally connected at one of its ends to the lower end of said first bracket to define a third pivot axis and pivotally connected at its other end to the lower end of said second bracket to define a fourth pivot axis, wherein the distance between said first and third axes is greater than the distance between said second and fourth axes and the distance between said first and second axes is greater than the distance between said third and fourth axes so as to define a quadrilateral linkage assembly, and said moving means further includes cylinder means actuatable to move said second bracket relative to said first bracket so that said rotation results in an increase of an angle formed between a longitudinal axis of the propulsion device and a horizontal plane as the propulsion device moves from its raised position to its lowered position and a decease in said angle as the propulsion device moves from its lowered position to its raised position.

4,836,812
STEERING SYSTEM FOR AUXILIARY MARINE ENGINE
John M. Griffiths, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.
Filed Mar. 18, 1988, Ser. No. 169,817
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—61 **3 Claims**

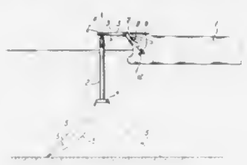


1. A steering system for controlling an auxiliary marine engine that is pivotally mounted to the stern of a boat, said system comprising:
steering means disposed on the boat at a point remote from a primary engine pivotally mounted about a first vertical axis on the stern of the boat,
a hydraulically operable cylinder unit including a cylinder member and a rod member, a first of said members being slidable in a linear direction relative to a second of said members, said cylinder unit being operably connected to the primary engine so that linear movement of said first member results in pivotal movement of said engine,
hydraulic conduit means operably connecting said steering means to said hydraulic cylinder unit so that movement of said steering means results in linear movement of said first member,
flexible steering cable means including an inner cable and an outer sleeve, said cable being operably connected to the auxiliary engine so that linear movement of said cable results in pivotal movement of the auxiliary engine about a second vertical axis spaced from said first axis,
and mounting means for operably connecting said flexible cable to one of said members and said sleeve to the other of said members whereby linear movement of said first member will cause movement of said cable relative to said sleeve to pivot said auxiliary engine about said second axis.

4,836,813
MOORING SYSTEM
Leendert Poldervaart, La Turbie, France, assignor to Single Buoy Moorings Inc., Marly, Switzerland
Filed Jun. 14, 1988, Ser. No. 206,348
Claims priority, application Netherlands, Jun. 15, 1987, 8701388
Int. Cl.[4] B63B *22/02*
U.S. Cl. 441—3 **5 Claims**

1. Mooring system, comprising a floating device such as a ship an anchor line support structure which is anchored by means of anchor chains to the water bottom, and which on

displacement away from the neutral position can produce an adjusting force which increases with the displacement, and a rigid arm between the floating device and said structure, said arm being connected to the floating device by means of a hinge which has a horizontal hinge pin standing at right angles to the longitudinal axis of the floating device, wherein the arm is



integral with a lever which is located at the sides of the horizontal hinge facing away from the anchor chains, and which is held by a downward-directed force against a stop, said force being of such magnitude that it holds said lever firmly against the stop so long as the forces occurring in the anchor chains as a result of the vertical movements of the floating device do not exceed a certain value.

4,836,814
MULTICOLORED FOAM AND METHOD FOR MAKING
John D. Bambara, Osterville, Mass.; Charles E. Flathers, Jr., Diablo, Calif.; Dennis A. Knaus, West Barnstaple, Mass., and Gregory G. Palmieri, Fresno, Calif., assignors to Packaging Industries Group, Inc., Hyannis, Mass.
Filed Nov. 10, 1987, Ser. No. 118,986
Int. Cl.[4] B29C *67/22, 47/04;* **C08J** *9/14*
U.S. Cl. 441—65 **17 Claims**

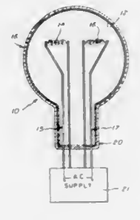
1. A surfboard or body board comprising a multicolored foam body wherein the foam body comprises a plurality of differently colored adjacent parallel layered portions in a substantially homogeneous single extruded plank of foam.

4,836,815
EMERGENCY ILLUMINATED LIFELINE
Robert L. Spurgeon, 112 W. Douglas St., Fairfield, Ill. 62837
Filed Mar. 31, 1988, Ser. No. 176,315
Int. Cl.[4] B63C *9/26*
U.S. Cl. 441—84 **7 Claims**

1. An improved lifeline device, comprising:
(a) a housing having a first chamber and a second chamber, said first chamber having flotation means therein providing sufficient flotation to allow said housing to float in a body of water;
(b) said second chamber having a wall with an opening therethrough;
(c) a flexible cord in said second chamber having a first end extended through said opening and a second end in said second chamber;
(d) said cord second end being attached to illumination means contained in said second chamber, said illumination means including actuation means to which said cord second end is connected, whereby, when said cord is pulled

through said opening, said actuation means is actuated to activate said illumination means.

4,836,816
METHOD OF TREATING TUNGSTEN CATHODES
Andre C. Bouchard, Peabody, and Paul A. Thibault, Danvers, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.
Filed May 6, 1988, Ser. No. 191,104
Int. Cl.[4] H01J *9/04*
U.S. Cl. 445—51 **20 Claims**

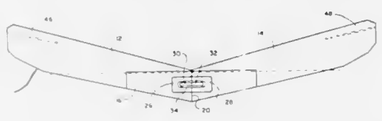


1. A method of treating a tungsten cathode comprising the steps of:
preparing a triple carbonate suspension;
coating the surface of said tungsten cathode with said triple carbonate suspension;
placing said coated tungsten cathode in a heated oxidizing environment;
heating said coated tungsten cathode in said heated oxidizing environment to a predetermined temperature for a preset period of time to form a diffuse coating of triple carbonates and tungsten oxide; and
reducing said triple carbonates to their respective oxides by passing heater current through said cathode.

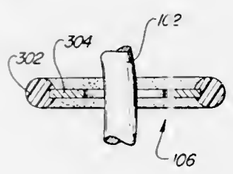
4,836,817
FOLDING WING TOY GLIDER
Steven K. Corbin, 1617 S. Fremont, Springfield, Mo. 65804
Filed Apr. 28, 1988, Ser. No. 187,354
Int. Cl.[4] A63H *27/00, 27/14*
U.S. Cl. 446—62 **28 Claims**

1. A toy glider consisting of a wing assembly comprising two elongated planar wing members each having a length extending from an inner end edge and a tip end, means hingedly connecting the wing members to each other adjacent to the inner end edges thereof for movement between a first position wherein the wing members extend outwardly from the hingedly connected inner end edges in substantially opposite directions and a second launching position wherein the wing members are moved to positions such that the wing member surfaces adjacent the hinged connection are in substantially surface-to-surface relationship over the length

thereof, and resilient means bridging the hingedly connecting means urging the wing members toward the first position, said resilient means including a projection attached to each wing member adjacent respective opposite inner end edges of each wing member and a resilient member attached to the projections.

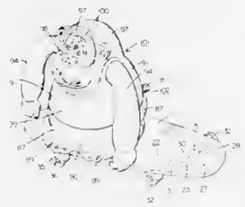


4,836,818
SPINNER TOY
Thomas P. Piolata, 1917 Stockwell Dr., Cols, Ohio 43220
Filed Sep. 4, 1987, Ser. No. 93,048
Int. Cl.[4] A63A 1/00
U.S. Cl. 446—236 **3 Claims**



1. An amusement device comprising:
a substantially circular closed main ring member; and
a plurality of substantially circular ring elements each having a central aperture surrounding the main ring member for rotation of the ring elements thereabout, each ring element further comprising a diametrically outermost substantially cylindrical outer peripheral surface, two substantially planar lateral surfaces extending inwardly from the outer peripheral surface towards the aperture, and a substantially cylindrical inner peripheral surface defining a boundary of the aperture, each ring element including a plastic trim element surrounding the outer peripheral surface and a portion of each lateral surface and not covering the inner peripheral surface, the plastic trim element providing for rounded edges enabling facile spinning of the ring elements by hand;
the ring elements being configured such that, upon initial spinning of the ring elements by hand-imparted force upon the plastic trim elements, ring element spinning may be maintained by movement of the closed ring main member through the central apertures of the ring elements.

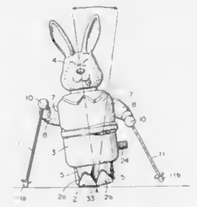
4,836,819
SKATEBOARDING TOY
Shingo Oishi, and Shohta Nishizawa, both of Tokyo, Japan, assignors to Iwaya Corporation, Tokyo, Japan
Filed May 20, 1988, Ser. No. 196,689
Claims priority, application Japan, Dec. 2, 1987, 62-305256
Int. Cl.[4] A63H 17/25, 11/00
U.S. Cl. 446—288 **6 Claims**

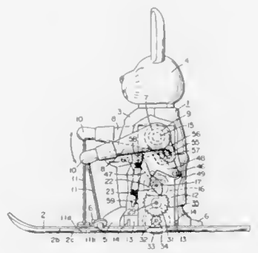


1. A skate-boarding toy comprising:
a skateboard (**1**) having top, bottom, front, rear, and side portions, a drive wheel (**14**) mounted adjacent said rear portion and steerable wheels rotatably mounted adjacent said front portion;
a mechanism frame (**38**) fixedly mounted on said top portion of said skateboard and having a vertical axis;
a rotating frame (**57**) mounted on said mechanism frame for rotation about said vertical axis;
a toy body (**99**) mounted on said skateboard to face toward said side portion and including
a lower body frame (**90**) surrounding said mechanism frame in fixed relation thereto, and
an upper body frame (**91**) mounted on said rotatable frame for rotation therewith;
an output mechanism (**102**) mounted on said mechanism frame and having a power output (**64**);
a first actuating arm (**44**) rotatably mounted on said mechanism frame and connected to be driven by said power output;
a steering rod (**22**) mounted on said skateboard and operatively connected between said first actuating arm and said steerable wheels to steer the latter; and
a second actuating arm (**45**) rotatably mounted on said mechanism frame and connected between said rotating frame and said power output to rotate said rotating frame simultaneously with steering movement of said steerable wheels.

4,836,820
MOVING ANIMAL TOY
Satoru Ebihara, and Jiro Yamaguchi, both of Tokyo, Japan, assignors to Iwaya Corporation, Tokyo, Japan
Filed Apr. 15, 1988, Ser. No. 182,304
Claims priority, application Japan, Oct. 20, 1987, 62-265061
Int. Cl.[4] A63H 11/12, 13/04
U.S. Cl. 446—289 **6 Claims**

1. A moving animal toy comprising:
a ski member including
parallel right and left skis formed into a single integral ski unit having a longitudinally extending bottom shaped transversely in the form of an arc, and
a guide slot located in the transverse center of said ski member;
a toy member mounted on said ski member above said guide slot having
right and left arms holding poles, said arms mounted on said toy member for alternate vertical oscillation relative to each other,
a single wheel member rotatably mounted thereon to partially project through said guide slot,
first and second cam plates rotatably mounted on said toy member,
first and second interlock means connected between said first and second cam plates and said right and left arms

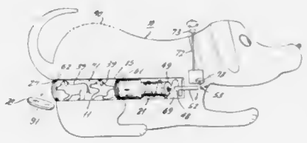


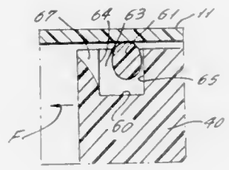


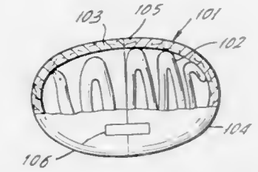
respectively to alternately oscillate said right and left arms vertically between raised and lowered positions upon rotation of said cam plates,
an output mechanism having a power output; and
a gear mechanism installed in said toy member and connected to said power output to
rotate said wheel member to move said toy member and said output mechanism simultaneously,
rotates said cam plates to alternately oscillate said right and left arms resulting in alternate shifts in the center of gravity of the toy to cause it to tilt right and left with said wheel as a pivot center and make serpentine turns while moving.

4,836,821
TOY BIRTHING APPARATUS WITH CHUGGING-LIKE DELIVERY MOTION
Douglas Raymond, R.R.I Box 2390, Freedom, Me. 04941
Filed Sep. 16, 1987, Ser. No. 97,501
Int. Cl.[4] A63H 3/20, 13/02
U.S. Cl. 446—330 **21 Claims**

17. Delivery apparatus including:
an elongated cylinder having an open front end;
a piston disposed for longitudinal movement within said cylinder;
biasing means urging said piston forward;
first means for releasably bolding said piston in a rearward reset position;
second means disposed within said cylinder forward of said piston to be driven from said cylinder through said open front end by froward movement of said piston in a working stroke under the influence of said biasing means;
third means acting on said piston in opposition to said biasing means in a manner such that said piston moves forward with a an intermittent, non-uniform chugging-like motion,

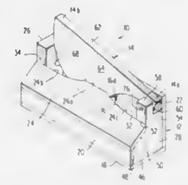






said third means comprising a fluid seal means carried by said piston and urged into engagement with the inner surface of the cylinder acting in cooperation with a fluid metering device to control entry of fluid into an expandable chamber in said cylinder behind said piston and partially bounded by the piston resulting in a partial vacuum in the chamber while the latter is expanding.

4,836,822
COMPACT HAND-HELD THUMB ACTUATED FRICTION-TYPE TURKEY CALL
Randy Finley, Chesapeake, Ohio, and Ben R. Lee, Coffeeville, Ala., assignors to Ben Lee Calls, Coffeeville, Ala.
Filed Nov. 5, 1987, Ser. No. 116,836
Int. Cl.[4] A63H 5/00
U.S. Cl. 446—397 **10 Claims**



1. A compact, hand-held friction type turkey call compris-

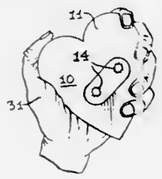
ing: a generally rectangular, elongated hollow wooden sound box assembly forming internally a sound chamber, a longitudinal slot within said sound box assembly, a striker, means for mounting said striker for movement into and out of said slot and having at least one planar surface said hollow sound box including a sounding board oblique to said at least one planar surface of said striker, extending inwardly towards said striker planar surface and having a longitudinal edge contactable by said striker planar surface during movement of the striker into and out of said slot to cause a rasping sound to be developed within said sound chamber closely imitating that of a live wild turkey.

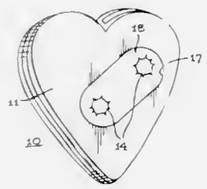
4,836,823

HEART SHAPED NOVELTY ITEM

Douglas J. Laven, 1223 N. Broad St., Mankato, Minn. 56001

Filed May 3, 1988, Ser. No. 189,864
Int. Cl.[4] A63H *33/26*
U.S. Cl. 446—485 **4 Claims**





1. A novelty item comprising:

(A) a heart shaped housing of a size suitable to allow said heart shaped housing to be held in a person's hand;

(B) a first conductor mounted exterior to said heart shaped housing along a peripheral edge thereof;

(C) a second conductor mounted exterior to said heart shaped housing along said peripheral edge, wherein said first conductor and said second conductor do not contact one another;

(D) light emitting means for emitting light that is visible exterior of said heart shaped housing, wherein said light emitting means includes at least a first and a second LED mounted within said heart shaped housing; and

(E) circuit means responsive to said first and second conductors and being disposed within said heart shaped housing for causing said light emitting means to intermittently emit said light when a conductive path exists between said first and second conductor;

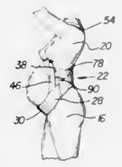
whereby when said novelty item is held in a person's hand, said hand may form said conductive path and thereby cause said light emitting means to flash on and off as a symbolic visual depiction of a heart beat.

4,836,824

PRENATAL CRADLE

Christine L. Seering, 6659 Poplar, Box 443, Hamburg, Mich. 48139, and Mona E. Seering, P.O. Box 688, Webberville, Mich. 48892

Filed Mar. 21, 1988, Ser. No. 170,746
Int. Cl.[4] A41C *1/08*; A41D *1/20*
U.S. Cl. 450—155 **13 Claims**



1. A prenatal cradle for supporting forward weight of pregnancy in a pregnant woman's uterus by redistributing around the hips and shoulders downward and forward pressures exerted by the baby and relieving strain on the woman's lower back, abdomen, and groin area, the prenatal cradle comprising:

a womb band for supporting the uterus, the womb band having:

a front portion which is positioned so as to allow unlimited growth of the uterus, and

an elongate rear portion of approxiamtely equal width to the front portion, the elongate rear portion including a center section, the womb band encircling the woman below the uterus and extending upwardly over the hips and the lower back to provide support which is distributed across the uterus and lower back when the women is standing or ambulatory;

a pair of torso bands for redistributing uterine weight across the torso, each having:

an elongate front portion including a lower end and an upper end, the lower end of the front portion being secured to the womb band proximate the associated hip, the front portion of each torso band extending diagonally and crossing below and between the breasts to distribute uterine weight without interfering with the breasts,

an elongate shoulder portion, including a front section and a back section, the front section being connected to the upper end of the front portion of the associated torso band, and

an elongate back portion including an upper section and a lower section, the upper section of the back portion being connected to the back section of the associated shoulder portion, the lower section being secured to the center section of the womb band for securement to the rear portion of the womb band and to provide lift to the womb band opposing the uterine weight; and

a pair of side members to distribute the uterine weight around the trunk of the woman, separating the torso bands and exposing the abdomen to relieve pressure in the lower groin without imposing constricting inward pressure on the uterus, each side member, including:

a forward end secured to the lower end of the front portion of the associated torso band, and

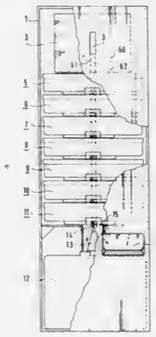
a rearward end secured to the center section of the rear portion of the womb band to help relieve back pain and to encourage correct posture, allowing free movement of the arms and legs.

4,836,825

AUTOMATIC DISPENSER AND COIN CHANGER

Jacques Smeets, Cerny; Marcel Dupuy, Issy les Moulineaux, and Paul Rossi, Courcouronnes, all of France, assignors to Compagnie Generale D'Automatisme CGA-HBS, Paris, France

Filed Jan. 6, 1988, Ser. No. 141,163
Claims priority, application France, Jan. 6, 1987, 87 00050
Int. Cl.[4] G07D *1/06*
U.S. Cl. 453—49 **5 Claims**



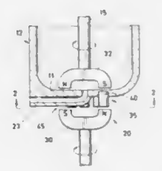
1. An automatic dispenser and coin changer comprising: a case, a single slot within said case for inserting coins, a chute to guide the coins extending from said slot to an entry to a selector, a buffer coin box, N coin stores within said case, a coin collection box and a coin return tray within said case beneath said N coin stores, the buffer box and each coin store having a bottomless and topless loading magazine, shaped as a circular crown with a vertical axis, comprising P+2 radial cells bounded by radial, vertical walls, said circular crown being arranged in a stationary cartridge having at least a bottom and a circular side wall, the buffer and each coin store having a stepping motor to rotatively drive said loading magazine within each cartridge, the N stores being placed coaxially one below another beneath the buffer, the bottom of each cartridge being provided with a radial opening beneath said cells, said opening extending over a circular width corresponding to two cells of said loading magazine, said openings in all said cartridges being all vertically aligned, means for stopping each loading magazine motor to position its associated magazine always with two consecutive cells located in front of said opening, said selector having an outlet located in front of a first column of cells of the buffer box and of the N stores enabling a coin to drop from said selector into said coin return tray, through said openings, a second, consecutive column of cells of the buffer box and stores enabling a coin to drop from said buffer into said coin box through said openings, each cartridge being equipped with a bolt at said opening, a control motor operative coupled to each said bolt for enabling the bolt to assume a first position completely blocking said opening, a second position blocking a portion of said opening corresponding to said first column of cells and a third position blocking the other portion of said opening corresponding to said second column of cells, and each cartridge comprising means for detecting the position of the loading magazine and the bolt.

4,836,826

MAGNETIC DRIVE COUPLING

Edward L. Carter, Houston, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 18, 1987, Ser. No. 135,120
Int. Cl.[4] F16D *27/00*
U.S. Cl. 464—29 **16 Claims**



1. A magnetic drive coupling, comprising:

(a) a rotatable driving magnetic member.

(b) a driven magnetic member rotatable on substantially the same axis as said driving member, said driven magnetic member being located substantially adjacent said driving member for magnetically and drivingly coupling therewith, and said magnetic members being separated by a predetermined gap therebetween,

(c) a plurality of flux pins located in said gap between said driving and driven magnetic members to reduce the reluctance of said gap, concentrate the magnetic flux in the interface between said members, reduce the torque diminishing effect of said gap, and enhance the torque transmitting capability of the coupling, and

(d) means providing at least one clearance space between a circumferentially adjacent pair of said flux pins to provide a passageway in said gap for passing components therethrough.

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4,836,827

TRIS-AZO BLACK OR GREY DYES FOR LEATHER OR PELTS

Alois Püntener, Rheinfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

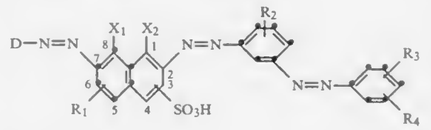
Filed Jan. 29, 1988, Ser. No. 150,346

Claims priority, application Switzerland, Feb. 10, 1987, 489/87

Int. Cl.[4] D06P *3/32, 1/39;* C09B *35/46, 31/16*

U.S. Cl. 8—437 15 Claims

1. A compound of the formula



(I)

in which

D is the radical of a diazo component,

one of the radicals X_1 and X_2 is hydroxyl and the other radical is amino,

R_1 is hydrogen or sulfo,

R_2 is hydrogen, halogen, C_1–C_4alkyl, C_1–C_4alkoxy, or carboxyl, and

R_3 is hydroxyl, amino, N-mono- or N,N-di-C_1–C_4alkylamino, phenylamino, o-, m- or p-C_1–C_4alkylphenylamino, carboxymethylamino, C_1–C_4alkoxy or aryloxy and R_4 independently has the meanings of R_3 or is unsubstituted or methyl-, chlorine- or nitro-substituted benzoylamino, C_1–C_4-alkanoylamino, C_1–C_4alkyl, halogen, nitro or sulfo.

4,836,828

CONTINUOUS THERMOSOL DYEING OF HIGH-MODULUS, HIGH-TENACITY, LOW-SHRINKAGE POLYAMIDE FABRICS WITH ACID DYES

Samir Hussamy, Lynchburg, Va., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Nov. 24, 1987, Ser. No. 124,573

Int. Cl.[4] C09B *67/00*

U.S. Cl. 8—594 18 Claims

1. A process for the continuous dyeing of fabrics constructed of high-modulus, high-tenacity low-shrinkage Polyamide fibers with acid dyes comprising the successive steps of:

(a) padding polyamide fabric in open width form in a pad bath solution maintained at a temperature not greater than about 35° C., the pad bath solution applied to the fabric as a uniform film and consisting essentially of a thickening agent, an antimigrant, an organic acid, a polyethylene glycol compound, a polyoxyethylene sorbitan fatty acid ester, a polyalkylene glycol ether, at least one acid dyestuff, and water;

(b) drying and curing the thus padded fabric under dry conditions at an elevated temperature and for a time sufficient to permeate and fix the dyestuff molecules inside the polyamide fibers, and

(c) rinsing and washing the thus cured fabric to remove any residual unfixed dye or other water-soluble components from the fabric.

4,836,829

FUEL COMPOSITION AND PROCESS FOR MULTI-PORT FUEL INJECTION SYSTEMS (PNE-509)

Abraham A. Zimmerman, Warren, N.J.; Geoffrey A. Canton, Oxfordshire UK, United Kingdom; Joel R. Siegel, Short Hills, and Joseph Vardi, Demarest, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

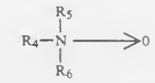
Continuation-in-part of Ser. No. 858,603, May 1, 1986, abandoned, which is a continuation-in-part of Ser. No. 840,320, Mar. 14, 1986, abandoned. This application Nov. 13, 1987, Ser. No. 120,419

Int. Cl.[4] C10L *1/18, 1/22*

U.S. Cl. 44—53 35 Claims

1. A method for reducing and/or preventing fouling in a multi-port, electronically controlled fuel injection system for an internal combustion engine, said method comprising delivering to said fuel injection system a fuel comprised of an effective amount of an anti-fouling agent comprising (A) an amine having the structural formula:

wherein: R_1 is C_6 to C_{24} alkyl, aryl, cycloaliphatic, heterocyclic, substituted alkyl or substituted aryl; R_2 and R_3 independently are C_1 to C_{24} substituted alkyl, aryl, cycloaliphatic or heterocyclic; and (B) an amine oxide having the structural formula:



where R_4 is C_6–C_{24} alkyl, aryl, cycloaliphatic, heterocyclic, substituted alkyl, substituted aryl; R_5 and R_6 independently are C_1–C_{24} alkyl, aryl, substituted alkyl or aryl, cycloaliphatic, heterocyclic and mixtures thereof.

4,836,830

RARE EARTH COMPOSITIONS FOR DIESEL FUEL STABILIZATION

Peter S. Gradeff, Pottersville, and John F. Davison, Edison, both of N.J., assignors to Rhone-Poulenc Inc., Monmouth Junction, N.J.

Continuation of Ser. No. 909,782, Sep. 19, 1986, abandoned. This application May 18, 1988, Ser. No. 106,899

Int. Cl.[4] C10L *1/18, 1/30*

U.S. Cl. 44—57 13 Claims

1. A method of inhibiting oxidation to reduce precipitation and sludge formation during storage and transportation of diesel fuel consisting essentially of adding to said diesel fuel a rare earth organometallic compound of the formula:

wherein M is one or more rare earth elements selected from the group consisting of yttrium, lanthanum, praseodymium, neodymium, samarium, europiums, gadolinium, terbium, dysprosium, holmium, erbium, promethium, thulium, ytterbium and lutetium and R is a hydrocarbon group having from 3 to 25 carbon atoms, thereby substantially inhibiting said oxidation of said diesel fuel.

4,836,831

PROCESS FOR PARTIAL OXIDATION OF A HYDROCARBON-CONTAINING FUEL

Franciscus J. A. Martens, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 22, 1988, Ser. No. 184,643

Claims priority, application United Kingdom, May 12, 1987, 8711156

Int. Cl.[4] C01B 3/36

U.S. Cl. 48—197 R **9 Claims**

1. A process for partial oxidation of a hydrocarbon-containing gaseous fuel comprising the steps of supplying an oxygen-containing gas and a hydrocarbon-containing fuel gas to a gasification zone through a multi-orifice burner comprising a concentric arrangement of two oxygen channels and two fuel channels, and producing auto-thermically a gaseous stream containing synthesis gas under appropriate conditions, and further comprising the steps of supplying oxygen-containing gas through the central channel of the concentric burner arrangement at a relatively low velocity of 5–45 m/sec; supplying hydrocarbon-containing fuel through the first concentric channel encircling said central channel and at a relatively high velocity of 50–150 m/sec; supplying oxygen-containing gas through the second concentric channel encircling said first concentric channel and at a relatively low velocity of 5–45 m/sec; and supplying a material selected from hydrocarbon-containing fuel and a moderator through a third concentric channel encircling the second concentric channel, and at a relatively low velocity of 5–45 m/sec.

4,836,832

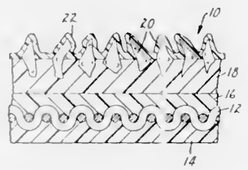
METHOD OF PREPARING COATED ABRASIVE HAVING RADIATION CURABLE BINDER

Michael L. Tumey, St. Paul; Donna W. Bange, Eagan, and Aida F. Robbins, Maplewood, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 895,315, Aug. 11, 1986, Pat. No. 4,751,138. This application Apr. 5, 1988, Ser. No. 178,067

Int. Cl.[4] B24D 3/00

U.S. Cl. 51—293 **2 Claims**



1. Method of preparing a coated abrasive product comprising a backing, a make coat, a layer of abrasive grains, and a size coat, wherein at least one of the make coat and size coat is formed from a composition curable by electromagnetic radiation comprising ethylenically-unsaturated groups and 1,2-epoxide groups, and a photoinitiator portion, in an amount sufficient to cure the composition comprising at least one polymerization photoinitiator selected from the group consisting of:

(I) salts having an onium cation and a halogen-containing anion of a metal or metalloid, and

(II) a mixture of (A) at least one salt having an organometallic complex cation and a halogen-containing complex anion of a metal or metalloid, and (B) at least one free-radical polymerization initiator, comprising the steps of

(1) providing said backing,

(2) applying said make coat over said backing,

(3) applying said layer of abrasive grains over said make coat,

(4) applying said size coat over said layer of abrasive grains,

(5) curing at least one of said make coat or said size coat by means of electromagnetic radiation.

4,836,833

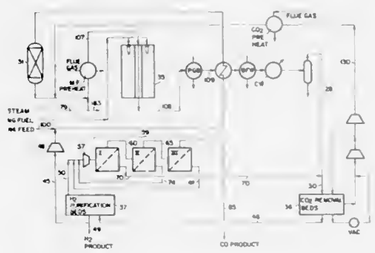
PRODUCTION AND RECOVERY OF HYDROGEN AND CARBON MONOXIDE

David M. Nicholas, New Tripoli; Stephen P. Goff, Kutztown; Thomas M. Roden, Macungie, and Joseph P. Bushinsky, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 17, 1988, Ser. No. 157,434

Int. Cl.[4] B01D 53/22, 53/04

U.S. Cl. 55—16 **16 Claims**



1. The method for individual recovery of hydrogen and carbon monoxide each at high purity, from a contaminated gas mixture containing these in association with carbon dioxide and methane, which comprises:

passing the gas mixture at superatmospheric pressure through a bed of solid adsorbent selective in adsorptive retention of carbon dioxide while discharging from said bed the unadsorbed primary effluent;

purifying said primary effluent by treatments, in either order of sequence, comprising: (a) pressure swing adsorption and (b) selective permeation through a system comprised of one or more semi-permeable membranes, thereby recovering hydrogen as a permeate stream separated from a non-permeate stream rich in carbon monoxide, said hydrogen stream having a purity of at least 99 mol% H_2 and said non-permeate stream comprising at least about 85 mol% CO.

4,836,834

AIR FILTER WITH BACK FLOW CLEANING

Gregory J. Steele, Stillwater, Minn., assignor to Dynamic Air Inc., St. Paul, Minn.

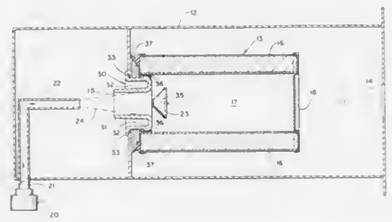
Filed Apr. 29, 1988, Ser. No. 188,433

Int. Cl.[4] B01D 46/04

U.S. Cl. 55—96 **4 Claims**

1. A method for cleaning a dust collector filter element which is cylindrical and has a hollow air passageway core closed at one end with an end plate and open at its other end and surrounded by filter medium, comprising the steps of:

injecting a momentary stream of pressurized air into the open end of the filter element core; and



diffusing the injected stream of air so that the stream of air does not impact either the filter medium or the end plate.

4,836,835

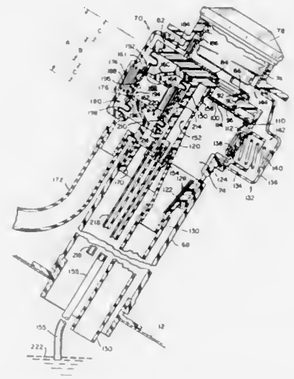
VACUUM-ACTUATED VAPOR RECOVERY SYSTEM

Robert S. Harris; Emil Szlaga, and Robert H. Thompson, all of Connersville, Ind., assignors to Stant Inc., Connersville, Ind.

Continuation-in-part of Ser. No. 106,632, Oct. 8, 1987, which is a continuation-in-part of Ser. No. 846,081, Mar. 31, 1986, Pat. No. 4,770,677. This application Aug. 26, 1988, Ser. No. 236,798

Int. Cl.[4] B01D 19/00, 53/04

U.S. Cl. 55—168 **6 Claims**



1. A system for recovering fuel vapors discharged from a vehicle fuel system during refueling, the vehicle fuel system including a fuel tank, a filler neck having a mouth and communicating with the fuel tank, and canister means for processing fuel vapor, the system comprising

delivery means for conducting fuel vapor between the fuel tank and the canister means,

valve means for normally blocking flow of fuel vapor through the delivery means, the valve means including one portion exposed to fuel vapor conducted by the delivery means and a remaining portion, the valve means being movable relative to the delivery means between a flow-blocking position and flow-delivering positions in response to exposure of the valve means to a differential pressure created by differing magnitudes of pressure communicated to the one portion and the remaining portion and exposure of the one portion to pressure having a magnitude in excess of a predetermined threshold level,

partition means for dividing the filler neck into an outer chamber communicable with the atmosphere through the filler neck mouth and an inner chamber in fluid communication with the fuel tank, the partition means including means for sealingly admitting a fuel-dispensing nozzle into the inner chamber without coupling the inner and outer chambers in fluid communication during refueling to preserve any negative pressure which develops in the inner chamber in response to introduction of liquid fuel into the inner chamber through a fuel-dispensing nozzle during refueling, and

a negative pressure-transmission conduit for communicating negative pressure in the inner chamber to the remaining portion of the valve means so that vacuum developed in the inner chamber during refueling is applied to the remaining portion of the valve means to lower the magnitude of pressure communicated to the remaining portion of the valve means by the negative pressure-transmission conduit relative to the magnitude of pressure communicated to the one portion of the valve means by the delivery means to establish the differential pressure so that a movement-inducing load resulting from the pressure communicated to the one portion having a magnitude in excess of the predetermined threshold level is applied to move the valve means to a flow-delivering position.

4,836,836

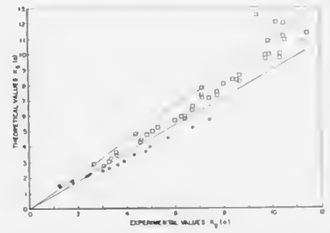
SEPARATING ARGON/OXYGEN MIXTURES USING A STRUCTURED PACKING

Douglas L. Bennett, Allentown; Keith A. Ludwig, Emmaus; George S. Witmer, Macungie, and Charles M. Woods, Germansville, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 14, 1987, Ser. No. 132,535

Int. Cl.[4] F25J 3/04

U.S. Cl. 62—22 **4 Claims**



1. In a process for the separation of mixtures, which comprise oxygen, nitrogen, and argon, by cryogenic distillation, wherein in certain regions of a distillation column system having at least one column, a liquid phase stream containing oxygen, argon and nitrogen, and a vapor phase stream containing oxygen, argon and nitrogen, are intimately contacted thereby allowing mass transfer which enriches the liquid phase stream with oxygen and strips argon from the liquid phase stream, and enriches the vapor phase stream with argon and strips oxygen from the vapor phase stream, the improvement comprising effectuating intimate contact of the liquid and vapor phase streams utilizing a structured packing in at least those regions of the distillation column system where argon concentration is within the range from about 0.6 to about 75 volume percent, and operating the process such that the densimetric superficial gas velocity in those regions is at least 0.06 feet per second.

4,836,837

METAL COATED GLASS FIBERS

Charles F. Rapp, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 16, 1987, Ser. No. 121,303
Int. Cl.⁴ C03C *2./04*
U.S. Cl. 65—3.3 **13 Claims**

1. A process for producing non crystallized, amorphous glass fibers having a metallic coating thereon comprising the steps of preparing a glass batch composition comprising at least one reducible metal oxide selected from the group consisting of CuO, Cu_2O, Ag_2O, PbO, CoO, Sb_2O_3, MnO, Cr_2O_3, Fe_2O_3, NiO and V_2O_5, and a balance of glass raw materials, melting the glass batch composition to form a substantially amorphous glass melt, fiberizing and solidifying the resulting molten glass composition, heating the resulting amorphous glass fibers in an oxidizing atmosphere at a temperature below about 700° C. for a time range from about six seconds to about six minutes whereby the metal ions of the reducible metal oxide migrate to the surface of the glass fibers and are oxidized to form a metallic oxide coating on the surface of the glass fibers under conditions which prevent the crystallization of the amorphous glass fibers, and subsequently heating the metal oxide coated glass fibers in a reducing atmosphere to convert the metal oxide coating to a metal coating on the surface of the glass fibers.

4,836,838

APPARATUS FOR MOLDING GLASS ARTICLES

Shinichiro Hirota, Hachioji; Kishio Sugawara, Hamura, and Tadayuki Fujimoto, Hachioji, all of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Sep. 26, 1988, Ser. No. 249,875
Claims priority, application Japan, Sep. 30, 1987, 62-246217
Int. Cl.⁴ C03B *11/08*
U.S. Cl. 65—308 **4 Claims**

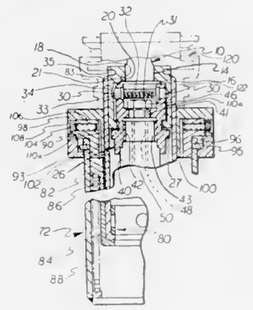
1. An apparatus for molding shaped glass articles, comprising:
a plurality of processing chambers arranged in order along a predetermined circular transport path, said processing chambers including a heating chamber, a press chamber and a cooling chamber, said processing chambers being formed in such a manner as to be surrounded by a case within a furnace body;
a rotary table rotatable intermittently about an axis thereof, said predetermined circular transport path extending in concentric relation to the axis of said rotary table, said rotary table extending radially outwardly to a position below said case forming said processing chambers;
a plurality of sample mounts mounted on said rotary table and arranged along said predetermined circular transport path in spaced relation to each other, said sample mounts extending into said processing chambers through a slit formed in a bottom wall of said case;
a plurality of molds mounted respectively on said sample mounts, each mold having accommodated therein a glass preform to be molded; and
drive means for intermittently rotating said rotary table about the axis thereof to transport said molds along said predetermined circular transport path in such a manner that said molds pass successively through said processing chambers.

4,836,839

PLUNGER ASSEMBLY FOR A GLASSWARE FORMING MACHINE

Albert J. Trahan, Vernon, and Robert J. Douglas, North Granby, both of Conn., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Jun. 15, 1988, Ser. No. 207,360
Int. Cl.⁴ C03B *11/10, 11/12*
U.S. Cl. 65—323 **3 Claims**



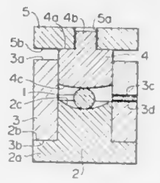
1. A plunger mechanism for use in a glassware forming machine comprising:
a hollow plunger having an elongated tapered portion and a base portion having an outwardly extending flange and an internal recess,
a plunger holder including,
a hollow cylindrical housing including means for receiving the flange of the base portion of said plunger,
an adapter assembly including a cylindrical body means for insertion into the cylindrical housing of said plunger holder, said cylindrical body means having an outer diameter which will provide a predetermined float clearance between said plunger holder and said cylindrical body means,
a vertically displaceable hollow piston,
means for threadedly securing said adapter assembly to said piston including a locking bolt having a vertical bore extending therethrough,
cooling tube means including an upper perforated section for insertion into said hollow plunger and a lower tube section for insertion into said locking bolt bore, said lower tube section including external wedge means for insertion into the internal recess of the base portion of said plunger, and said locking bolt bore having an inner diameter which will provide a predetermined float clearance between the lower tube section and the vertical locking bolt bore,
a casing including,
a cylindrical kick-up basket having an inwardly extending bottom flange,
spring retainer means having a cylindrical upper cap means with a lower surface for stopping upward displacement of said kick-up basket, said cap means having an upper surface and an inner bore extending therethrough,
cylindrical guide sleeve means for insertion into said kick-up basket and supported on said kick-up basket bottom flange, said sleeve means having an internal diameter for matingly receiving the plunger holder,
cylindrical cover means supported on the upper surface of the cap means and having a downwardly extending collar located within the inner bore of the cap means and defining an inner bore for matingly receiving said sleeve means, said collar having an outer diameter which will define a predetermined float clearance between said float cover means collar and said cap means inner bore,
the float clearance between said lower tube section and said locking bolt bore, and between said plunger holder and said cylindrical body means being at least as large as the float clearance between said float cover means collar and said cap means inner bore so that as said sleeve means is vertically displaced to engage and enter a neck ring assembly, said sleeve means and said plunger holder can float relative to said adapter assembly until said sleeve means, and hence, said plunger holder are properly centered relative to the neck ring assembly.

4,836,840

PRESS-MOLDING DEVICE FOR LENSES

Shinichiro Hirota, Hachioji, and Kishio Sugawara, Hamura, both of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Sep. 26, 1988, Ser. No. 249,874
Int. Cl.⁴ C03B *11/08*
U.S. Cl. 65—323 **7 Claims**



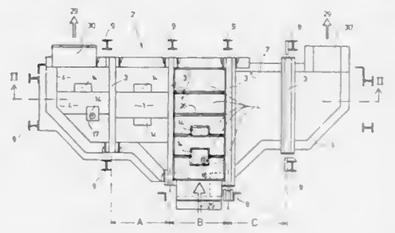
1. A press-molding device for lenses, comprising:
a drag having an upper surface formed into a molding surface;
a cope having a lower surface formed into a molding surface, and an upper surface formed into a face substantially perpendicular to a vertical central axis of said cope;
a guide mold portion having an inner peripheral surface in contact with an outer peripheral surface of said drag, said inner peripheral surface having an axial length longer than that of the outer peripheral surface of said drag so that said inner peripheral surface extends upwardly from said mold inner surface of said drag, said cope being capable of sliding along said inner peripheral surface, said guide mold portion having an upper surface formed into a face substantially perpendicular to a vertical central axis of said drag; and
a pressure plate in contact with said upper surface of said cope before pressing, and capable of being abutted against said upper surface of said guide mold portion by the pressing,
wherein a glass preform to be molded is arranged between said molding surfaces of the respective drag and cope, and said cope is pressed from above through said pressure plate, thereby molding the glass preform to a lens.

4,836,841

ROOF FOR THE WORKING AREA, MELTING AREA OR GOB FEEDER OF A GLASS MELTING FURNACE

Helmut Sorg, Johannesberg, and Matjaz Bucar, Karsbach, both of Fed. Rep. of Germany, assignors to Sorg GmbH & Co. KG, Lohr/Main, Fed. Rep. of Germany

Filed Apr. 29, 1987, Ser. No. 43,872
Claims priority, application Fed. Rep. of Germany, May 6, 1986, 3615276; Apr. 6, 1987, 3711045
Int. Cl.⁴ C03B *5/44*
U.S. Cl. 65—347 **17 Claims**



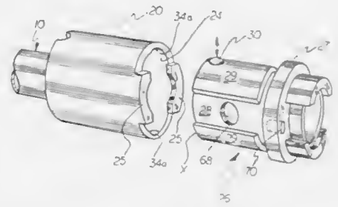
1. A roof for an area of a glass melting furnace of refractory material, comprising:
horizontal supporting elements of refractory material spanning an area of a glass melting furnace at intervals and supported on the glass melting furnace, and bearing the load of the roof; and
horizontal slabs of refractory material laid transversely between and on said supporting elements and covering said intervals between said supporting elements, in which roof said horizontal supporting elements form arches of straight construction spanning the tank at intervals and bearing the load of the roof, and in which roof said horizontal slabs cover the open intervals between the arches and are laid crosswise between the straight arches, and which includes a frame spanning the arches, which frame comprises a crosspiece and end legs pointing downwardly on both ends, in which lateral abutments are formed on said frame, and which frame includes spring-biased means for gripping the straight arches with lateral, horizontal supporting stress between lateral abutments.

4,836,842

PLUNGER ASSEMBLY FOR A GLASSWARE FORMING MACHINE

Albert J. Trahan, Vernon, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

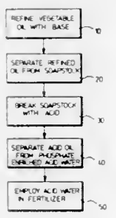
Filed Jun. 15, 1988, Ser. No. 207,359
Int. Cl.⁴ C03B *11/10*
U.S. Cl. 65—362 **3 Claims**



1. A plunger assembly for use in a glassware forming machine comprising:
a plunger having a tapered portion and a base portion,

a plunger holder including
a hollow cylindrical housing having an interior wall, a closed top and an open bottom,
aperture means in the closed top of said cylindrical housing for receiving said plunger base portion, and
a pair of opposed locking flanges extending axially downwardly and inwardly from the open bottom of said cylindrical housing,
an adapter assembly including
an annular support collar having an outer diameter,
a hollow cylindrical body, having an interior wall, a top and a smaller outer diameter than the outer diameter of said collar, extending upwardly from said collar for full insertion into the cylindrical housing through the open bottom so as to support the open bottom on the annular support collar,
a pair of opposed enlarged diameter portions extending downwardly from the top of said cylindrical body to a location vertically spaced from said collar, said portions defining with the outer diameter of said annular collar opposed, reduced diameter areas extending between the vertically spaced location and said annular collar,
said locking flanges having a vertical height corresponding to the reduced diameter areas so that cylindrical body of said adapter assembly is fully inserted into the cylindrical housing of said plunger holder, said plunger holder can be rotated 90° relative to said adapter assembly, whereby vertical separation will be prevented,
means for releasably retaining said plunger holder and said adapter assembly at the 90° rotated orientation,
means for threadedly securing said adapter assembly to the top of a vertically displaceable piston.

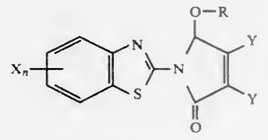
4,836,843
FERTILIZER PROCESS
Ralph S. Daniels, 226 Highland St., Worcester, Mass. 01609
Continuation of Ser. No. 26,052, Mar. 16, 1987, abandoned, which is a continuation of Ser. No. 885,937, Jul. 21, 1986, abandoned, which is a continuation of Ser. No. 738,742, May 29, 1985, abandoned, which is a continuation of Ser. No. 575,455, Jan. 31, 1984, abandoned, which is a continuation-in-part of Ser. No. 572,202, Jan. 18, 1984, abandoned. This application Apr. 8, 1988, Ser. No. 179,280
Int. Cl.[4] C05F *7/00*; C11B *1/04*
U.S. Cl. 71—25 **34 Claims**



1. A method of fertilizing plants using precision fertilizer delivery systems having small passages which would be adversely affected by insolubles, comprising the steps of:
(a) treating soapstock with an acid to form an acid oil phase and an acid water phase,
(b) separating the resulting acid oil phase from the resulting acid water phase,
(c) treating the acid water by adding sufficient materials from the group consisting of: a nitrogen source, a phosphorous source, a potassium source, a micronutrient salt source, and a micronutrient chelate source to make an appropriate fertilizer concentration for said plants, and
(d) feeding the treated acid water through the delivery system to the plants.

4,836,844
NOVEL
N-BENZOTHIAZOLYL-2,5-DIHYDROPYRROLES
Toyohiko Kume, Hino; Toshio Goto, Machida; Atsumi Kamochi, Hino; Akihiko Yanagi, Oume; Hidenori Hayakawa, Sagamihara, and Shigeki Yagi, Tokyo, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan
Filed Jun. 25, 1987, Ser. No. 66,914
Claims priority, application Japan, Jul. 9, 1986, 61-159595
Int. Cl.[4] C07D *417/02*; A01N *43/78*
U.S. Cl. 71—90 **11 Claims**

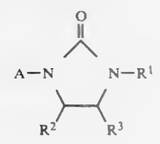
1. An N-benzothiazolyl-2,5-dihydropyrrole of the formula



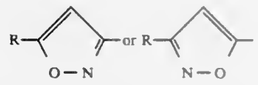
R is hydrogen or an acetyl group,
X is a halogen atom; an alkyl group, a haloalkyl group or a haloalkoxy group having 1 to 3 carbon atoms; or a phenyl group,
n is 0, 1 or 2, and
Y is methyl or ethyl.

4,836,845
HERBICIDALLY ACTIVE
ISOXAZOLYL-IMADAZOLIDINONE DERIVATIVES
James A. Schwindeman, Akron, Ohio, assignor to American Cyanamid Company, Stamford, Conn.
Continuation-in-part of Ser. No. 744,728, Jun. 14, 1985, Pat. No. 4,707,180. This application Sep. 14, 1987, Ser. No. 95,791
The portion of the term of this patent subsequent to Nov. 17, 2004, has been disclaimed.
Int. Cl.[4] A01N *43/80*; C07D *261/14*
U.S. Cl. 71—92 **6 Claims**

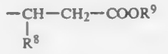
1. A compound of the formula:



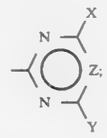
wherein
A is



wherein
R is up to C_6 alkyl, haloalkyl or cycloakyl, up to C_5 alkenyl or alkynyl; $—R^4—O—R^5$ or $—R^4—S—R^5$ wherein R^4 is up to C_6 alkylene and R^5 is up to C_6 alkyl or phenyl or benzyl;
R^1 is up to C_3 alkyl or allyl;
R^2 and R^3 are selected from hydrogen, hydroxy or $—NR^6R^7$ with the proviso that one of R^2 or R^3 must be $—NR^6R^7$, wherein R^6 is selected from hydrogen or up to C_6 alkyl or haloalkyl; and R^7 is



wherein
R^8 is selected from hydrogen, up to C_6 alkyl or haloalkyl, phenyl or benzyl and R^9 is selected from alkali metal, hydrogen, up to C_6 alkyl, haloalkyl or alkoxyalkyl, or phenyl.

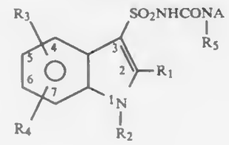


X is CH_3 or OCH_3;
Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, Cl, H, C_2H_5 or $N(CH_3)_2$; and
Z is N;
provided that
(1) when R_2 is $SO_2C_6H_5$, then R_1 and R are H or C_1–C_3 alkyl; and
(2) when m is 0, then R_9 is C_1–C_3 alkyl.

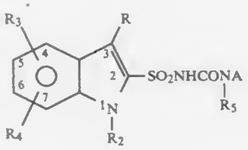
20. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim **1** and at least one of the following: surfactant, solid or liquid diluent.

4,836,846
HERBICIDAL INDOLE SULFONAMIDES
Donna F. Zimmerman, Landenberg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 911,420, Sep. 25, 1986, Pat. No. 4,764,610, which is a continuation of Ser. No. 671,071, Nov. 13, 1984, abandoned, which is a continuation of Ser. No. 382,876, Jun. 1, 1982, abandoned, which is a continuation-in-part of Ser. No. 283,928, Jul. 16, 1981, abandoned. This application Apr. 8, 1988, Ser. No. 179,558
Int. Cl.[4] C07D *403/12*; A01N *43/70, 43/66*
U.S. Cl. 71—93 **41 Claims**

1. A compound selected from



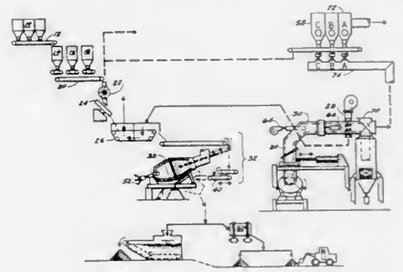
I



II

where
R is H, C_1–C_4 alkyl, $(CH_2)_mCO_2R_9$, $CH_2OC_2H_5$, SO_2R_{10}, CHO, $SO_2NR_{11}R_{12}$–, $CH_2N(CH_3)_2$ or CH_2OCH_3;
R_1 is H, C_1–C_4 alkyl, CO_2R_6, $C(O)NR_7R_8$, $C(O)R_{10}$, SO_2R_{10}, or $SO_2NR_{11}R_{12}$;
R_2 is H, C_1–C_3 alkyl or $SO_2C_6H_5$;
R_3 is H, F, Cl, Br, C_1–C_3 alkyl, C_1–C_3 alkoxy or NO_2;
R_4 is H, Cl or Br;
R_5 is H or CH_3;
R_6 is C_1–C_4 alkyl, C_3–C_4 alkenyl, CH_2CH_2Cl or $CH_2CH_2OCH_3$;
R_7 and R_8 are independently H or C_1–C_4 alkyl, provided that the total number of carbon atoms is less than or equal to 4;
R_9 is H or C_1–C_3 alkyl
R_{10} is C_1–C_3 alkyl;
R_{11} and R_{12} are independently C_1–C_3 alkyl, provided that the total number of carbon atoms is less than or equal to 4.
m is 0, 1 or 2;
A is

4,836,847
METHOD FOR RECLAIMING METAL VALUES FROM ELECTRIC ARC FURNACE FLUE DUST AND SLUDGE AND RENDERING RESIDUAL SOLIDS RECYCLABLE OR NON-HAZARDOUS
Norman G. Bishop, Ruidoso, N. Mex.; N. Edward Bottinelli, Dallas, Tex., and Norman L. Kotraba, Tega Cay, S.C., assignors to Zia Technology, Inc., Dallas, Tex.
Filed Apr. 27, 1988, Ser. No. 186,539
Int. Cl.[4] C22B *1/08*
U.S. Cl. 75—25 **6 Claims**



1. A method of a preparing non-hazardous material from waste metal-containing dust or sludge contaminated with heavy metals and oxides, comprising:
metering amounts of waste metal-containing flue dust, solid carbonaceous material, and organic binding agent;
mixing said materials to form a suitable mixture;
pelletizing said mixture to form metal oxide containing pellets;
heating said pellets to a temperature of from 600° to 1150° C. to reduce the metal oxide to metallized material; and
discharging said reduced metallized material as nonhazardous material.

4,836,848

FE-BASED SINTERED ALLOY FOR VALVE SEATS FOR USE IN INTERNAL COMBUSTION ENGINES

Osamu Mayama, and Yoshimi Ishikawa, both of Niigata, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1987, Ser. No. 103,925
Claims priority, application Japan, Mar. 12, 1987, 62-57626
Int. Cl.[4] C22C *38/08*
U.S. Cl. 75—231 7 Claims

1. An Fe-base sintered alloy for valve seats for use in internal combustion engines, consisting essentially of the following components: 0.6 to 1.3% C; 1 to 5% Cr; 4 to 15% Mo; 0.5 to 2% Ni; 2 to 8% Co; 0.2 to 2% Nb; 0.2 to 2% at least one lubricating component selected from the group consisting of CaF_2 and BaF_2; and the balance of Fe and inevitable impurities; said Fe-base sintered alloy having a structure wherein (i) particles of said at least one lubricating component and (ii) hard particles formed of other of said components, are dispersed in a matrix comprising 50 to 90 volume % of a pearlite phase, and said alloy possessing a density of at least 7.3 g/cm^3 and Rockwell hardness of 30–50 in Scale C.

4,836,849

OXIDATION RESISTANT NIOBIUM ALLOY

Robert C. Svedberg, Elizabeth Twp., Allegheny County, and Robert L. Ammon, Baldwin Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 30, 1987, Ser. No. 44,256
Int. Cl.[4] C22C *27/02*
U.S. Cl. 75—245 4 Claims

1. A mechanically alloyed powder consisting essentially of about 55% to about 90% by volume of niobium alloy, and about 10% to about 45% by volume of intermetallic compound selected from the group consisting of $NbAl_3$, $NbFe_2$, $NbCO_2$, $NbCr_2$, and mixtures thereof, where niobium alloy particles have intermetallic compound embedded on their surface.

4,836,850

IRON GROUP BASED AND CHROMIUM BASED FINE SPHERICAL PARTICLES

Preston B. Kemp, Jr., Athens, and Walter A. Johnson, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Division of Ser. No. 905,015, Sep. 8, 1986, Pat. No. 4,778,515.
This application Nov. 16, 1987, Ser. No. 121,449
The portion of the term of this patent subsequent to Jun. 3, 2003, has been disclaimed.
Int. Cl.[4] B22F *1/00*
U.S. Cl. 75—251 30 Claims

1. A powdered material consisting essentially of spherical particles selected from the group consisting of iron group based materials and chromium based materials, said powdered material being essentially free of elliptical shaped material and essentially free of elongated particles having rounded ends, and said powdered material having a particle size of less than about 20 micrometers.

4,836,851

DYES CONTAINING POLYHYDROXYL GROUPS FOR INK-JET PRINTING INKS

Norman E. Pawlowski; Steven J. Bare; Loren E. Johnson, and Suraj L. Hindagolla, all of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 11, 1988, Ser. No. 155,175
Int. Cl.[4] C09D *11/00*
U.S. Cl. 106—22 9 Claims

1. An ink composition suitable for use in ink-jet printing comprising:

(a) a vehicle comprising about 96 to 50 percent water and about 4 to 50 percent water-miscible organic solvent; and

(b) a dye comprising an aromatic dye molecule having attached to the backbone thereof from one to four polyhydroxyl-substituted groups having the formula selected from the group consisting of:

(1) CH_2OH-$(CHOH)_nCH_2O$—, where n=2 to 10;

(2) $O_{n-t}C_nH_{2n-t}$—O—, where n5 to 7; and

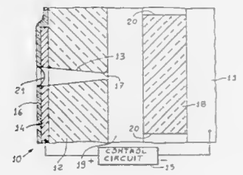
(3) $C_{6n}H_{5n+1}O_{5n}$—O—, where n=1 to about 100.

4,836,852

INK FOR AN INK JET PRINTER

Franco Knirsch; Anna M. Soudaz, and Alessandro Genova, all of Turin, Italy, assignors to Ing. C. Olivetti & Co., S.p.A., Ivrea, Italy

Filed Aug. 13, 1987, Ser. No. 84,871
Claims priority, application Italy, Sep. 1, 1986, 67683 A/86
Int. Cl.[4] C09D *11/02*
U.S. Cl. 106—22 9 Claims



1. A water based ink which is particularly suited for an ink jet printer of the type in which expulsion of the droplets of ink is caused by on-demand production of instantaneous vaporisation of a portion of ink in a nozzle to form bubbles of vapor, the ink essentially comprising an aqueous solution of a direct dye in a mixture of water and glycol wetting agents, characterised in that the ink comprises a solid material which is finely crushed so as to produce particles of dimensions between 400 and 1000 Å in a level of concentration of between 0.1 and 2% by weight of the ink, this material being held in dispersion and being capable of anchoring gaseous nuclei of gases dissolved in the ink, whereby the inertia of the ink upon change in phase is reduced and its boiling temperature is regularised, thus promoting the formation of bubbles of vapor.

4,836,853

ALGIN BASED DENTAL IMPRESSION MATERIAL CONTAINING BIOCIDAL COMPONENT

Hans-Peter K. Gribi, Uznach, Switzerland, assignor to Dentsply GmbH, Dreieich, Fed. Rep. of Germany

Continuation of Ser. No. 922,930, Oct. 24, 1986, abandoned.
This application Jul. 8, 1988, Ser. No. 217,113
Int. Cl.[4] A61K *6/10*; A61C *9/00*
U.S. Cl. 106—35 9 Claims

1. A dental impression material comprising a water soluble salt of alginic acid and a setting reactant, the improvement comprising the addition of a biocide comprising about 0.3 to about 6.5 percent by weight of said dental impression material wherein said biocide is didecyldimethyl ammonium chloride.

4,836,854

STABILIZATION OF SETTING TIMES OF PHOSPHATE-BONDED MAGNESIA CEMENTS

Laurence W. Bierman, and Samuel M. Polinsky, both of Pocatello, Id., assignors to J. R. Simplot Co., Boise, Id.

Filed Jun. 27, 1984, Ser. No. 625,443
Int. Cl.[4] C04B *9/04*
U.S. Cl. 106—85 26 Claims

1. A process for preparing a reactant for use in making a phosphate-bonded magnesia cement, comprising the step of mixing together a first ingredient consisting essentially of a source of ammonium and phosphate, wherein the ammonium and phosphate are in aqueous solution with the phosphate present as a polyphosphate, and a second ingredient consisting essentially of a solid orthophosphate, the solid orthophosphate being at least in part insoluble in the source of ammonium and phosphate and being present in an amount of from about 0.1 to about 10 percent by weight of the total of the first ingredient and the solid orthophosphate.

4,836,855

ADDITIVE OF PROTEIN NATURE FOR HYDRAULIC CEMENTS, MORTARS & CONCRETES, AND USE THEREOF IN THE FIELD CONSTRUCTION

Pierre Caillau, Paris; Paul Mogan, Bougival, and Charles D. C. De Veauce, Target, all of France, assignors to ABC Bio-Industries, France

Continuation of Ser. No. 29,211, Mar. 23, 1987, abandoned, which is a continuation of Ser. No. 876,006, Jun. 19, 1986, abandoned, which is a continuation of Ser. No. 649,315, Sep. 11, 1984, abandoned. This application Mar. 25, 1988, Ser. No. 175,673
Int. Cl.[4] C04B *24/14*
U.S. Cl. 106—91 24 Claims

1. A protein additive for hydraulic cements, mortars and concretes, useful for improving the mechanical properties and the workability and for reducing sweating and segregation, wherein the additive is a protein hydrolysate obtained from fresh protein, said hydrolysate having a pH less than or equal to 6, comprising substances selected from the group consisting of proteins, polypeptides, aminoacids and mixtures thereof, and obtained by treating 100 volumes of an aqueous composition containing at least one fresh protein substance selected from the group constituted by proteins, polypeptides and mixtures thereof, with at least one bacterial strain producing lactic acid having a population greater than or equal to 10^2 germs/cm^3, in the presence of 0.5 to 30 parts by weight of a source of carbon belonging to the family of carbohydrates, for at least 2 hours, at a temperature of between 0° and 65° C. and at a pH less than or equal to 6.

4,836,856

STABILIZING ROAD BASE COMPOSITION AND METHOD FOR PREPARING SAME

Kenneth S. Kleo, Cotopaxi, Colo., assignor to Domtar, Inc., Montreal, Canada

Filed Feb. 12, 1988, Ser. No. 155,373
Int. Cl.[4] C04B *11/00*; F01C *21/00*
U.S. Cl. 404—76 17 Claims

1. A method for preparing a stabilizing road base consisting essentially of:

mixing 30–50% by volume of gypsum fines having a diameter of less than one inch, 30–70% by volume of at least one aggregate having a diameter of less than one inch and 0–40% by volume of soil to obtain a substantially homogeneous mixture of gypsum fines, aggregate and soil, said mixture having less than 15% by volume of particles with a diameter of less than 0.02 inch,

admixing to said mixture at least one lignosulfonate diluted in an amount to saturate said mixture so that said at least one lignosulfonate substantially coats said gypsum fines, aggregate and soil.

4,836,857

ASPHALT ADDITIVE COMPOSITIONS

David L. Hopkins, Mentor on the Lake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Mar. 9, 1987, Ser. No. 24,299
Int. Cl.[4] C08L *75/00*
U.S. Cl. 106—284.4 32 Claims

1. An additive composition comprising:

(A) not more than 90 weight percent of a metallic organic strength improving compound, wherein the metal is selected from the group consisting of manganese, cobalt, copper, vanadium, molybdenum, cerium, iron, nickel, lead, zirconium, barium, calcium and zinc, and wherein the organic part of said metallic organic compound is derived from one or more organic compounds selected from the group consisting of carboxylic acids, phenols and ketones either alone or in combination with other metallic organic compounds; and

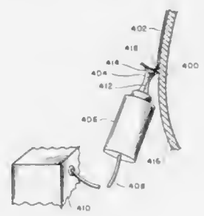
(B) at least 10 weight percent of an anti-strip compound prepared by reacting tall oil acid with an amine or polyamine containing at least one HN< group.

4,836,858

ULTRASONIC ASSISTED PAINT REMOVAL METHOD

Theodore J. Reinhart, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 902,554, Sep. 2, 1986, abandoned. This application Jul. 7, 1987, Ser. No. 70,499
Int. Cl.[4] B08B *3/12*
U.S. Cl. 134—1 18 Claims



1. A method for safely removing the paint layer from a physical damage susceptible painted surface comprising the steps of:

exciting a shaped edge scraping tool with reciprocal motion ultrasonic frequency kinetic energy;

holding said scraping tool edge in pressured contact with said painted surface; and

moving said ultrasonic energy excited scraping tool edge into successive areas of said paint layer while maintaining ultrasonic energy force transmitting contact between said tool and said paint layer and sliding contact between said tool and said damage susceptible surface.

4,836,859

METHOD FOR TREATING CONTACT LENSES

Akihiko Konishi, Kashiwa; Masamichi Mizukami, and Masanori Shimuta, both of Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 28, 1988, Ser. No. 149,628
Claims priority, application Japan, Feb. 6, 1987, 62-24767
Int. Cl.[4] B08B *3/10*
U.S. Cl. 134—1 7 Claims

1. A method for treating a contact lens with hydrogen peroxide in which the contact lens is soaked in an aqueous hydrogen peroxide in a vessel provided with electrodes to treat the contact lens and then voltage is applied across the electrodes to decompose and remove the remaining hydrogen peroxide.

4,836,860

METHOD FOR CLEANING SPACECRAFT CRITICAL SURFACES

Maurice P. Bianchi, Palos Verdes Estates, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Apr. 6, 1987, Ser. No. 34,252
Int. Cl.[4] B08B *1/04*
U.S. Cl. 134—21 10 Claims

1. The method of maintaining the surfaces of a spacecraft after conditioning to a pristine state protected against contamination when said surfaces are placed in an outer space environment comprising the steps of:

applying to said pristine surface a protective coating to intercept and contain contaminants that would otherwise deposit on and contaminate said pristine surface, said protective coating being adapted to sublime in an outerspace environment, and

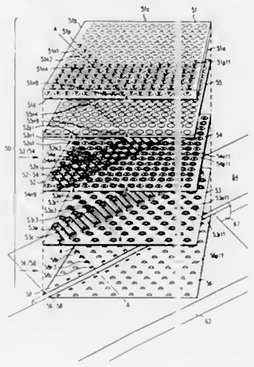
placing the pristine surfaces coated with said protective coating in said outerspace environment causing the sublimation of said protective coating and carrying with it any contaminants from said surface thereby to expose such surface in its pristine state to said outerspace enviroment.

4,836,861

SOLAR CELL AND CELL MOUNT

Douglas L. Peltzer, Cupertino; Richard L. Bechtel, Sunnyvale; Wen C. Ko, San Jose, and William T. Liggett, Hollister, all of Calif., assignors to Tactical Fabs, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 42,409, Apr. 24, 1987, abandoned. This application Apr. 11 1988, Ser. No. 174,635
Int. Cl.[4] H01L *31/03, 31/18*
U.S. Cl. 136—246 55 Claims



37. A point contact solar device comprising:

a plurality of solar cell dice, each die comprising:

a semiconductive layer in which are formed wells of p-conductivity type and n-conductivity type in an alternating pattern, said wells extending to a bottom surface of said semiconductive layer;

an insulating layer formed on the bottom surface of said semiconductive layer and patterned to expose said wells of p-conductivity type and n-conductivity type;

a conductive layer patterned to comprise a negative conductive region adjacent to approximately a first half of said insulation layer and in electrical contact with said wells of n-conductivity type in said first half of said die and a positive conductive region adjacent to approximately a second half of said insulation layer and in electrical contact with said wells of p-conductivity type in said second half of said die, said conductive layer further patterned to provide conductive pads in said first half electrically separated from said negative conductive region, and in electrical contact with said second half electrically separated from said positive conductive region, and in electrical contact with said wells of n-conductivity type;

a plurality of electrically separated bus bars, half of said bus bars being positive bus bars and half being negative bus bars;

each of said dice having said pads in said first half electrically connected to one of said positive bus bars and having said pads in said second half electrically connected to one of said negative bus bars.

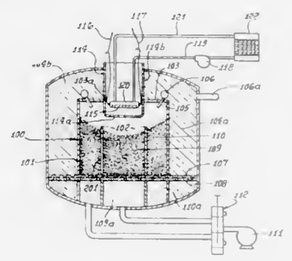
38. A point contact solar device as in claim 37 in which said electrically separated bus bars are formed from at least one layer of molybdenum and adjacent to which is formed a layer of glass, which layer of glass is attached to a heat spreader of molybdenum.

4,836,862

THERMOPHOTOVOLTAIC SYSTEM

David G. Pelka, 8315 Kenyon Ave., Los Angeles, Calif. 90045; John M. Popovich, 2742 S. La Cienega, Los Angeles, Calif. 90034, and Roc V. Fleishman, 432½ Altair Pl., Venice, Calif. 90291

Filed Apr. 28, 1987, Ser. No. 43,435
Int. Cl.[4] H02N *6/00*
U.S. Cl. 136—253 20 Claims



14. A combustor/regenerator apparatus comprising:

(a) an insulated combustion chamber containing a combustion zone,

(b) first and second beds of refractory particles exposed to said zone,

(c) means for supplying a first combustion reactant to said zone,

(d) means for flowing a second combustion reactant to said zone via one of said beds during time T_1 and via the other of said beds during time T_2,

(e) means for removing combustion products from said zone via the other of said beds during time T_1, and via the one bed during time T_2,

(f) and thermophotovoltaic cell means exposed to heat radiated from said zone.

4,836,863

WROUGHT MATERIAL OF ALUMINUM ALLOY TO BE ANODIZED GRAY AND PROCESS FOR MAKING THE SAME

Mamoru Matsuo, and Masami Furuya, both of Fukaya, Japan, assignors to Sky Aluminum Co., Ltd., Japan

Filed Nov. 18, 1987, Ser. No. 122,290
Claims priority, application Japan, Nov. 20, 1986, 61-277723
Int. Cl.[4] C22F *1/04*
U.S. Cl. 148—2 7 Claims

5. A process for making a wrought material of an aluminum alloy to be anodized gray or dark gray, comprising the steps:

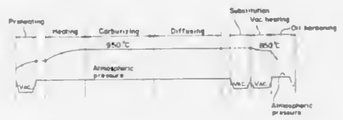
direct chill casting an aluminum alloy consisting essentially of 0.4 to 1.0 wt % Fe, 0.05 to 0.25 wt % Si, 0.3 to 1.5 wt % Mg, 0.05 to 0.7 wt % Mn, 0.10 wt % or less Ti, and 0.0003 to 0.03 wt % B, if necessary, the remainder being Al and unavoidable impurities; heating the cast ingot at a temperature ranging from 350 to 580° C. for 0.5 to 12 hours; and hot working the heated ingot at a temperature equal to or lower than the heating temperature range, wherein the resultant ingot has a total amount of intermetallic compounds which contains at least 70% of an $Al_6Fe(Mn)$ phase, such that the resultant ingot is capable of maintaining a substantially uniform anodized gray or dark gray color.

4,836,864

METHOD OF GAS CARBURIZING AND HARDENING

Koji Murakami, Settsu; Tsunao Shima, Ikoma; Yoshikazu Shimosato, Yahata, and Akira Yokoyama, Okayama, all of Japan, assignors to Chugai Ro Co., Ltd., Japan

Continuation of Ser. No. 686,207, Dec. 26, 1984, abandoned. This application Sep. 26, 1986, Ser. No. 911,738
Claims priority, application Japan, Dec. 27, 1983, 58-247174
Int. Cl.[4] C21D *1/74*
U.S. Cl. 148—16.5 3 Claims



1. A method of gas carburizing and hardening a steel article, having an initial heating step of heating said steel article under atmospheric conditions to a carburizing temperature of said steel article, and comprising:

(a) a carburizing step of holding said heated steel article at the carburizing temperature in a carburizing atmosphere at atmospheric pressure to form a desired carburized layer on the surface of said steel article;

(b) separating said carburizing step into an atmospheric carburizing period and an atmospheric diffusing period;

(c) employing a carburizing atmosphere including CO, CO_2, H_2 and H_2O maintained at first and second predetermined carbon potentials during said carburizing period and said diffusing period, respectively, said atmosphere creating oxides in chromium and manganese ingredients in said steel article;

(d) vacuum heating said steel article for at least 20 minutes in a vacuum held at a temperature corresponding to a hardening temperature of said steel article after said diffusing period for dissociating oxygen from chromium oxide and manganese oxide of said steel article; and

(e) a hardening step of cooling said steel article at atmospheric pressure to form a carburized non-discolored case on the surface of said steel article.

4,836,865

MAGNETIC NITRIDE FILM

Hiroshi Sakakima, Hirakata; Koichi Osano, Neyagawa; Yuji Omata, Ibaraki; Mitsuo Satomi, Katano, and Koichi Kugimiya, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 10, 1987, Ser. No. 24,141
Claims priority, application Japan, Mar. 12, 1986, 61-54054; Aug. 26, 1986, 61-199631
Int. Cl.[4] H01F *1/16, 10/12*
U.S. Cl. 148—306 5 Claims

3. A magnetic nitride film represented by formula:

$$T_{\overline{X}}M_{c.on/Y/}N_{c.on/Z/}$$

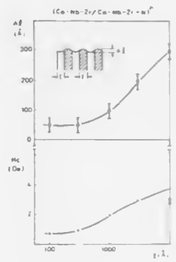
wherein

T is at least one metal selected from the group consisting of Fe, Co, Ni and Mn;

M is at least one metal selected from the group consisting of Nb, Zr, Ti, Ta, Hf, Cr, W and Mo;

N is nitrogen (N), and

$\overline{X}$, $\overline{Y}$ and $\overline{Z}$ show atomic percent of said T, M and N, and values of $\overline{X}$, $\overline{Y}$ and $\overline{Z}$ are defined by the following expressions,



$65 \leq \overline{X} < 94$,

$6 \leq \overline{Y} < 25$,

$0.1 \leq \overline{Z} \leq 20$ and

$\overline{X} + \overline{Y} + \overline{Z} = 100$, and

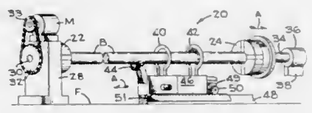
elements of T, M and N are compositionally modulated in depth direction, and the contents $\overline{X}$, $\overline{Y}$ and $\overline{Z}$ represent the average values.

4,836,866

METHOD OF IMPROVING FATIGUE LIFE OF AN ELONGATED COMPONENT

Erik Thuse, Santa Clara, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Nov. 9, 1987, Ser. No. 118,062
Int. Cl.[4] C21D *1/42*
U.S. Cl. 148—131 20 Claims



1. A method of providing an elongated component formed from material which has lower yield strength at elevated temperatures and plastic behavior over a considerable range of elevated temperatures and having an outer surface and an inner core with improved fatigue life comprising the steps of:

tensioning the elongated component for axially stretching the component a small amount;

quickly heating the outer surface of the stretched elongated component throughout substantially its entire length to soften only a thin outer annulus around the core for reducing the applied stresses and the thin outer annulus;

quickly cooling the outer annulus for regaining the high yield strength and also maintaining the core relatively cool; and

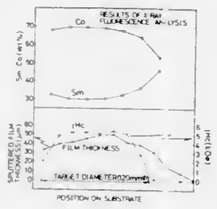
releasing the tension on the elongated component for creating high residual compressive stresses of at least 10,000 psi in said outer annulus in a direction opposite to the direction of tensioning for improving the fatigue life of the elongated component.

4,836,867

ANISOTROPIC RARE EARTH MAGNET MATERIAL

Eishu Sugawara; Taketoshi Nakayama, and Tsuyoshi Masumoto, all of Sendai, Japan, assignors to Research Development Corporation, Tokyo and Tokin Corporation, Sendai, both of, Japan

Filed Jun. 17, 1987, Ser. No. 63,334
Claims priority, application Japan, Jun. 26, 1986, 61-148159
Int. Cl.[4] C22C *19/07, 30/00*
U.S. Cl. 148—301 8 Claims



1. An anisotropic rare earth magnet material having structural and magnetic anisotropy and consisting essentially of a composition having the following formula:

$$(R_{1-a}O_a)_bM_{1-b}$$

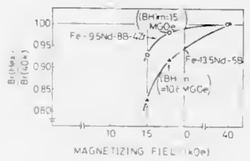
wherein R is (1) at leat one rare earth metal element selected from the group consisting of Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu or (2) a combination of Hf and at least one of said rare earth metal elements, M is (1) Co or (2) a combination of Co and at least one of Fe, Cu, Zr, Ti, Al and B, a is from 0.02 to 0.05, and b is from 0.1 to 0.5.

4,836,868

PERMANENT MAGNET AND METHOD OF PRODUCING SAME

Kohichi Yajima, Urawa; Osamu Kohmoto, Kamagaya, and Tetsuhito Yoneyama, Narashino, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Apr. 14, 1987, Ser. No. 38,195
Claims priority, application Japan, Apr. 15, 1986, 61-86850; Apr. 23, 1986, 61-94247; May 14, 1986, 61-109970; May 14, 1986, 61-109971; May 14, 1986, 61-109972; May 15, 1986, 61-111087; Feb. 5, 1987, 62-23509; Mar. 9, 1987, 62-52215; Mar. 17, 1987, 62-62198
Int. Cl.[4] H01F *1/04*
U.S. Cl. 148—302 21 Claims



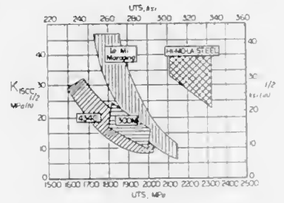
1. A permanent magnet which consists of a composition of $\{R_a(Ce_bLa_{1-b})_{1-a}\}x(Fe_{1-z}Co_z)_{100-x-y-w}B_yM_w$ (R is at least one rare earth element except for La and Ce but including Y, $5.5 \leqq x < 12$, $2 \leqq y < 15$, $0 \leqq z \leqq 0.7$, $0.1 \leqq w \leqq 10$, $0.80 \leqq a \leqq 1.00$, $0 \leqq b \leqq 1$, M is at least one element selected from the group consisting of Zr, Nb, Mo, Hf, Ta, W, Ti, and V, having a structure including fine crystals formed by a rapid cooling of a melt having said composition, and in which the presence of said at least one M element increases the maximum energy product (BH)max) to a value higher than that of a composition wherein x is higher than 12.

4,836,869

HYDROGEN-RESISTANT HIGH-STRENGTH STEELS AND THE METHOD FOR THE MANUFACTURE THEREOF

Gregory B. Olson, Winchester; John F. Watton, Belmont, and Morris Cohen, Swampscott, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 25, 1987, Ser. No. 125,487
Int. Cl.[4] C22C *38/00*
U.S. Cl. 148—331 25 Claims



1. A high-strength steel having improved resistance to hydrogen embrittlement, said steel characterized as consisting of less than 0.01 wt % manganese and having a stable rare earth oxymetalloid dispersion comprising phosphorus wherein the average particle size of the dispersion is less than one micron.

4,836,870

EMULSION-TYPE EXPLOSIVE COMPOSITIONS

Glenn R. Cunningham, Upper St. Clair, and Alex Senules, Pittsburgh, both of Pa., assignors to Mitchell Chemical Co., Upper St. Clair, Pa.

Filed Oct. 1, 1987, Ser. No. 103,511
Int. Cl.[4] C06G *45/00*
U.S. Cl. 149—2 9 Claims

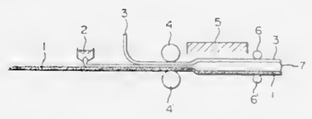
1. A method for preparing an emulsion-type explosive composition containing an oxidizer salt, comprising:
(a) pre-emulsifying a composition consisting essentially of a fuel, an emulsifier and water; and
(b) subsequently emulsifying the resultant pre-emulsion with an aqueous solution of an oxidizer salt.

4,836,871

MANUFACTURING METHOD FOR AN EXPANDED LAMINATED SHEET

Naoyuki Kato, Yokkaichi, Japan, assignor to Mitsubishi Yuka Badische Co., Ltd., Yokkaichi, Japan

Filed Nov. 27, 1987, Ser. No. 127,038
Claims priority, application Japan, Dec. 2, 1986, 286927; Jun. 11, 1987, 62-145754
Int. Cl.[4] B32B *31/24, 5/20*
U.S. Cl. 156—79 10 Claims



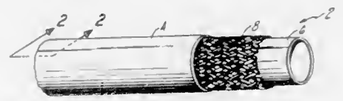
1. A manufacturing method for a laminated sheet comprising:
coating a backing coating material on a base fabric (A) which is made of a material having a thermal deformation temperature of at least 150° C., the backing material comprising
(a) a styrene-acrylic lower alkyl ester copolymer aqueous emulsion and
(b) 150–170 parts by weight of expandable styrene resin particles per 100 parts by weight of solids of said styrene-acrylic copolymer aqueous emulsion (a);
stacking a base fabric (B) which is made of a material having a thermal deformation temperature of at least 150° C. on the layer of backing coating material to form a laminate;
compressing said laminate from at least one side so as to impregnate base fabric (B) with a portion of said coating material; and
expanding said expandable styrene resin particles and drying said styrene-acrylic copolymer aqueous emulsion by heating to a temperature which is higher than the softening point of the resin of said expandable styrene resin particles and which is lower than the thermal deformation temperature of base fabrics (A) and (B), thereby expanding said expandable styrene resin particles and forming a foam layer between base fabrics (A) and (B)

4,836,872

METHOD OF MANUFACTURING A FIBER REINFORCED HEAT SHRINKABLE TUBING ARTICLE

Louis G. Landry, Somersworth, and Fabian Nunez, Dover, both of N.H., assignors to Essex Group, Inc., Fort Wayne, Ind.

Division of Ser. No. 115,289, Nov. 2, 1987, abandoned. This application Feb. 22, 1988, Ser. No. 158,436
Int. Cl.[4] B32B *31/20, 31/12*
U.S. Cl. 156—85 16 Claims



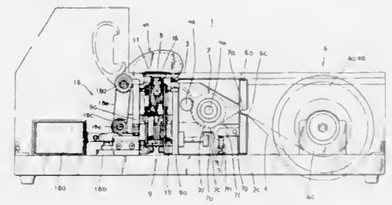
1. A method of manufacturing a unitary expanded fiber reinforced heat shrinkable tubular article comprising the steps of:
(a) forming an expanded heat shrinkable tubular article having an inner surface and an inner diameter;
(b) forming a non-cross-linked thermoplastic tubular article having an outer surface and an outside diameter smaller than the inner diameter of the heat shrinkable article;
(c) forming a fiber layer about the thermoplastic article's outer surface thereby forming a fiber covered thermoplastic article;
(d) positioning the fiber covered thermoplastic article into the expanded heat shrinkable tubular article;
(e) contacting the outer surface of the fiber layer to the inner surface of the expanded heat shrinkable tubular article;
(f) heating both articles to a temperature below the temperature at which the expanded heat shrinkable article will shrink, but sufficient to cause the thermoplastic article to flow through the fiber layer and contact the inner surface of the heat shrinkable tubular article thereby forming a combined tubular article; and
(g) cooling the combined tubular article to below the temperature required to bond the thermoplastic article to the expanded heat shrinkable article so that the thermoplastic article is bonded to the expanded heat shrinkable article with the fiber layer encapsulated therebetween.

4,836,873

AUTOMATIC PACKAGING METHOD AND APPARATUS

Makoto Mitanihara, and Tatsuo Sekine, both of Saitama, Japan, assignors to Kabushiki Kaisha Sato, Japan

Filed Aug. 28, 1987, Ser. No. 90,745
Claims priority, application Japan, Aug. 29, 1986, 61-201227
Int. Cl.[4] B65B *13/04, 13/32, 57/10*
U.S. Cl. 156—157 17 Claims



1. A binding apparatus for binding an elongate tape around an object, comprising:
a housing having a generally horizontally extending bed-plate for supporting an object to be packaged thereon, a loop forming space comprised of the space extending vertically from the bed-plate, and means for supplying binding tape to the loop forming space on the bed-plate;
a one-piece guide member defining an enclosed region and having an arc-shaped interior guiding surface which is effective for shaping binding tape passing through the guide member into a loop, the guide member having a swivel mount and being swivelable between a first position, at which the guide member is disposed on the bed-plate and within the loop forming space, and a second position at which the guide member is disposed outside the loop forming space;
guide member swivelling means for swivelling the guide member between its first and second positions along a plane vertical to the bed-plate;
tape guiding means for guiding a leading portion of the binding tape from the tape supplying means into the guide member to form an initial loop of tape in the guide member, while the guide member is at its first position;
tape conveying means for selectively conveying the tape either in a forward or in a reverse direction;
means for actuating the guide member swivelling means to move the guide member away from the first position to the second position of the guide member;
means for enlarging the initial loop after retraction of the guide member; and
binding means for tightening the enlarged loop of tape around the object, attaching a leading end and a trailing end of the loop to one another, and severing the loop of tape from the tape supplying means whereby the loop of tape remains tightly bound around the object.

16. A method for binding a tape around an object, comprising:
locating, by swivelling, a one-piece guide member having a loop shaped passage defined therein onto a bed-plate having a horizontally extending work surface for placing the object thereon, the bed-plate defining an interior region below the work surface and a loop forming space comprised of the space above the bed-plate;
guiding a binding tape forwardly from the interior region into the guide member such that a leading end of the tape enters the guide member, traverses the loop shaped passage, emerges from the guide member and reenters the interior region;
clamping the leading end of the tape;
reducing the size of the loop of tape by changing the feeding direction of the tape;
moving the guide member along a plane vertical to the work

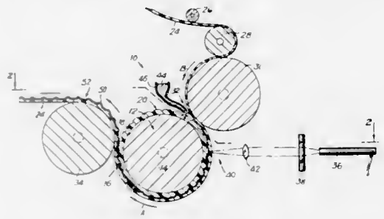
surface and outside the loop forming space to provide obstruction free access to the loop of tape;
feeding additional tape to the loop of tape to enlarge it beyond the size of the passage;
inserting an object through the enlarged loop of tape; and
tightening the loop of tape around the object, overlapping the leading end of the tape with a trailing portion of the tape while holding the loop of tape tightly around the object, joining the overlapped tape portions, and severing the tape disposed around the object from a source of tape from which the binding tape is supplied.

4,836,874

METHOD OF MASS PRODUCING DAMAGE-RESISTANT COMPACT DISCS

Michael S. Foster, 1764 Prospect Dr., Los Angeles, Calif. 90046

Filed Jan. 30, 1987, Ser. No. 9,344
Int. Cl.[4] B29D *11/00*; B32B *3/02*
U.S. Cl. 156—209 6 Claims



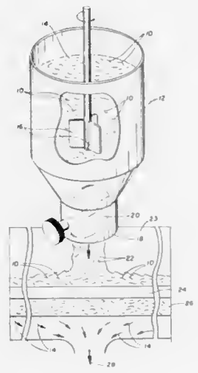
1. A method of continuously mass producing optical discs, comprising the steps of:
(a) forming at least one, generally circular, fixed pattern including a plurality of pits of an optical disc to be produced on an exterior circumferential surface of a rotary roller having an axis of rotation;
(b) continuously feeding an elongated film provided with an energy-absorbing region to the roller so that the energy-absorbing region contacts the exterior surface of the roller;
(c) continuously rotating the roller about the axis of rotation to successively position said at least one fixed pattern at successive contact locations spaced apart of one another lengthwise of the film;
(d) forming an inverse pattern opposite to said at least one fixed pattern at each contact location during each rotating step to form a carrier film along which a series of inverse patterns are formed, said forming step including the step of irradiating the energy-absorbing region with laser energy focused as a linear beam extending axially across the roller on the exterior surface of the roller to locally heat and deform the energy-absorbing region of the film, and cause the locally heated energy-absorbing region of the film to flow into the pits and assume a complementary configuration including a plurality of projections; and
(e) continuously withdrawing the carrier film from the roller.

4,836,875

METHOD OF MAKING AN ELECTRICALLY RESISTIVE SHEET

Alun L. Buttermore, Carlsbad, and Mark T. Harder, San Diego, both of Calif., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 839,183, Mar. 13, 1986, abandoned. This application Jun. 17, 1987, Ser. No. 63,014
Int. Cl.[4] B44C *1/16*; B28B *1/26*
U.S. Cl. 156—231 10 Claims



1. A method of making an electrically resistive sheet of material having a defined area comprising:
mixing a quantity of electrically conductive fibers of a selected length and having a weight in the range of about 50 to 300 milligrams for each square meter of the defined area with a volume of liquid solvent in the range of one liter for each one-half milligram to about five milligrams of fiber, said solvent and volume being selected for dispersing and suspending the fibers in a random orientation throughout the volume of solvent;
containing the mixture of randomly oriented dispersed and suspended fibers and solvent within a container having a bottom area corresponding to the defined area and having a permeable release film with a porous backing sheet corresponding to and in communication with the bottom area beneath the contained mixture;
permitting the contained mixture to lose turbulence;
applying a pressure differential between the surface of the contained mixture and the porous backing sheet for physically depositing said suspended quantity of fibers on the surface of the film while simultaneously withdrawing said volume of solvent through the film and porous backing;
removing the porous backing from the release film without effectively disturbing the random position of the deposited fibers;
placing an insulative sheet of material having a sticky surface in intimate contact with the surface of the film and deposited fibers for transferring the deposited fibers to the sticky suface; and
separating the film from the sticky surface of the insulative sheet material leaving the deposited fibers on the insulated sheet.

4,836,876

METHOD FOR MOLDING FIBRE REINFORCED LAMINATES

Roger M. Sloman, Little Eaton, and Christopher Ridgard, Oakwood, both of England, assignors to Advanced Composite Components Ltd., England

Filed Aug. 28, 1987, Ser. No. 90,590
Claims priority, application United Kingdom, Sep. 3, 1986, 8621236
Int. Cl.[4] B32B *31/14*
U.S. Cl. 156—242 13 Claims

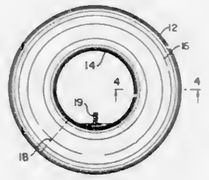
1. In a method of molding a fiber reinforced resinous material including the step of providing a fibrous reinforcement in an initially uncured resin matrix wherein a range of values is known for two out of three variables representing (1) the initially uncured resin matrix; (2) the initial and post-cure phases; and (3) the initial cure temperature, the improvement which comprises the steps of:
(a) pre-selecting a value from the known range of values for each of the two known variables;
(b) determining a value for the third variable which results in the sum of the fractional thickness change during the initial cure phase and the fractional thickness change during the post-cure phase being equal to or differing by a predetermined amount from the fractional dimensional change in the plane of the fiber reinforcement at the desired end use temperature at which greatest dimensional accuracy is required; and
(c) curing the matrix in accordance with the valves determined in sub-paragraphs (a)–(b).

4,836,877

METHOD OF MAKING A TIRE RETREADING ENVELOPE

Thad A. Perdue, Muscle Shoals, Ala., assignor to Robbins Tire and Rubber Company, Inc., Tuscumbia, Ala.

Filed Jul. 1, 1987, Ser. No. 68,966
Int. Cl.[4] B29C *47/20*
U.S. Cl. 156—244.13 2 Claims



1. A process which comprises extruding an elastomeric material in substantially tubular form of circular cross-section and having a curved circumference with portions of the curved circumference of the extruded tubing having a wall thickness substantially greater than the wall thickness of the remainder of the tubing, cutting a length of the extruded tubing from the tubing as extruded, butt-seaming the free ends of said length to form an annular tube substantially of circular cross-section, with the thickened wall portions of the extruded length in the area of its outer periphery, causing the elastomeric material in the thickened portions of the annular tube to flow under heat and pressure to give the annular tube a substantially flattened outer periphery, and partially flattened side portions joining the flattened periphery with the curved body of the annular tube, with the side portions having less curvature than said body, while curing said elastomeric material, and slitting the inner surface of the cured annular tube.

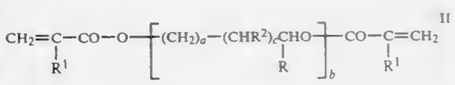
4,836,878

METHOD OF ADHERING TWO SURFACES WITH AN ANAEROBICALLY POLYMERIZABLE ACRYLIC ESTER COMPOSITION

Edward Irving, Burwell, and Terence J. Smith, Melbourn, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

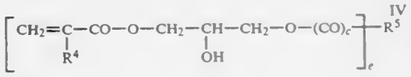
Division of Ser. No. 933,295, Nov. 20, 1986, Pat. No. 4,755,751, which is a continuation of Ser. No. 724,425, Apr. 18, 1985, abandoned. This application Apr. 1, 1988, Ser. No. 176,578
Claims priority, application United Kingdom, Apr. 28, 1984, 8410959
Int. Cl.[4] C09J *5/02*; C08L *33/08, 33/10, 63/02*
U.S. Cl. 156—307.3 2 Claims

1. A method of effecting adhesion between two impervious surfaces that comprises applying to at least one of the surfaces a curable composition which is polymerizable by excluding oxygen therefrom and which is further curable by heating, comprising
(A) an anaerobically polymerizable mixture which is stable in oxygen, but is polymerizable by excluding oxygen therefrom, comprising
(i) an acrylic ester of formula II, IV or VI



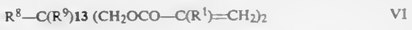
II

where
R^1 denotes —H, —Cl, —CH_3 or —C_2H_5,
R denotes H, —CH_3, —C_2H_5, —CH_2OH, or —CH_2O—CO—$C(R^1)$=CH_2
R^2 denotes H, OH, or —OCO—$C(R^1)$=CH_2
a is an integer of from 1 to 8,
b is an integer of from 1 to 20, and
c is zero or 1,



IV

where
c is zero or 1,
e is 2, 3 or 4,
R^4 denotes —H or —CH_3, and
R^5 denotes an organic radical of valency e, linked through a carbon atom thereof other than a carbon atom of a carbonyl group.

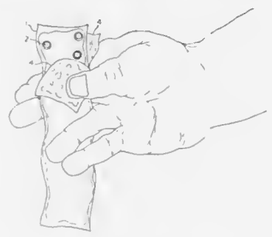


VI

where
R^1 denotes —H, —Cl, —CH_3 or —C_2H_5,
R^8 denotes CH_3—, C_2H_5—, —CH_2OH or CH_2=$C(R^1)COOCH_2$—, and
R^9 denotes —CH_2OH or —CH_2OOC—$C(R^1)$=CH_2.
(ii) an organic free radical initiator, and
(iii) an accelerator of free radical polymerization which is benzoic sulfimide, diethyl phosphoro hydrazidate, or a mixture of benzoic sulfimide and N,N-dimethyl-p-toluidine,

(B) an epoxide resin, and
(C) a basic curing agent for epoxide resins which is dicyandiamide or an imidazole, wherein the composition is subject to anaerobic polymerization by excluding oxygen therefrom and curing either at room temperature or at elevated temperature, applying a second surface to the composition, and holding the surfaces together to prevent the ingress of oxygen until the composition solidifies.

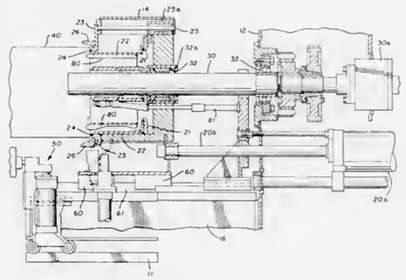
4,836,879
BINARY STRIP BONDING
Willie Edwards, 312 Kingston Dr., King, N.C. 27021
Filed May 12, 1987, Ser. No. 48,753
Int. Cl.[4] C09J *7/02, 5/04*
U.S. Cl. 156—330 3 Claims



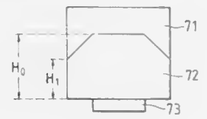
1. A method of bonding two structural surfaces together using two tape implements comprising, affixing to a first of two said structural surfaces a first plastic tape having throughout its basic dimensions perforations and upon one side of said first plastic tape having deposited on a first side a conventional sticking substance for readily affixing said first plastic tape to first of two said structural surfaces, and having deposited on an opposite side of said first plastic tape a composition of uncured epoxy bonding agent, affixing to a second of two said structural surfaces a second plastic tape having throughout its basic dimensions perforations and upon one side of said second plastic tape being deposited on a first side a conventional sticking substance for readily affixing said second plastic tape to a second of two said structural surfaces, and having deposited on an opposite side of said second plastic tape a composition of epoxy curing agent, bringing said two structural surfaces together to which said plastic tapes are affixed, rubbing said two structural surfaces against each other to mix and work two said compositions into said perforations and mechanically securing said two structural surfaces until bonding is effected.

4,836,880
TIRE ASSEMBLY MACHINE
Herbert G. Haas, 1650 Perry Dr., Canton, Ohio 44708
Filed Mar. 4, 1988, Ser. No. 164,427
Int. Cl.[4] B27D *30/24, 30/32*
U.S. Cl. 156—400 7 Claims

1. In a tire building machine having opposed support shafts for engagement with opposed ends of a tire building drum and opposed ply turn down and bead setting mechanisms movable axially along the support shafts toward and away from the drum so as to advance beads carried thereby into proximity with the ends of the drum, the improvement comprising:
(a) opposed housings, movable along the support shafts;
(b) said ply turn down and bead setting mechanisms being carried by said housings;
(c) first bearing means disposed beneath said housing; and
(d) second bearing means movable along the support shafts as the ply turn down and bead setting mechanisms move therealong with said first bearing means remaining substantially beneath said second bearing means as said mechanisms move along the shafts.



4,836,881
PROCESS FOR SYNTHESIZING LARGE DIAMOND
Shuichi Satoh, and Kazuwo Tsuji, both of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed May 9, 1988, Ser. No. 192,046
Claims priority, application Japan, May 8, 1987, 62-112862
Int. Cl.[4] C01B *31/06;* C30B *11/13*
U.S. Cl. 156—621 6 Claims

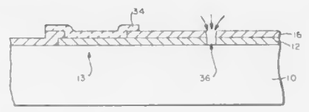


1. A process for synthesizing a single crystal diamond having a diameter of 8 mm or more by the temperature gradient method, wherein a (111) surface of a seed crystal having a diameter of 3 mm or more is used as a growing surface, the entire area of said growing surface is first dissolved in the diamond-stable region before crystal growth is started, said crystal growth is effected using a plug of a solvent in which the height of the central portion thereof is higher than the height of the peripheral portion thereof, said plug of a solvent has a planar or curved surface on the side where said plug of a solvent contacts a carbon source during said crystal growth, and said crystal growth is effected under such pressure and temperature conditions that the growth of said (111) surface is predominant.

4,836,882
METHOD OF MAKING AN ACCELERATION HARDENED RESONATOR
Arthur Ballato, Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Sep. 12, 1988, Ser. No. 243,538
Int. Cl.[4] B44C *1/22;* B05D *3/06;* C23C *14/00;* C03C *15/00*
U.S. Cl. 156—626 33 Claims

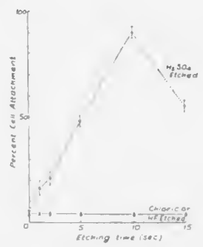
1. Method of making an acceleration hardened resonator said method including the steps of:
(A) manufacturing and mounting the resonator,
(B) performing acceleration tests to determine the acceleration sensitivity,
(C) changing the interaction of the motional distribution with the stress field of the resonator in order to reduce the acceleration sensitivity, and
(D) repeating steps (B) and (C) until a minimal acceleration sensitivity is obtained.

4,836,883
METHOD OF PERFORMING ELECTRICAL REJECT SELECTION
Owen W. Hatcher, Jr., Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.
Filed Jun. 7, 1988, Ser. No. 203,465
Int. Cl.[4] B44C *1/22;* C03C *15/00, 25/06;* C23F *1/02*
U.S. Cl. 156—627 18 Claims



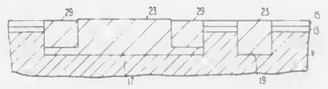
1. A method of identifying defects in a passivating layer provided on an interconnect, comprising the steps of:
(a) providing a mask on any portion of the integrated circuit intentionally exposed by the passivating layer;
(b) exposing the passivating layer to an etchant, thereby etching portions of the interconnect underlying damaged portions of the passivating layer; and
(c) testing the interconnect to detect any etching of the interconnect after said step (b).

4,836,884
IMPLANTABLE MATERIALS
Brian R. McAuslan, Clareville Beach, Australia, assignor to Telectronics N.V., Netherlands Antilles
PCT No. PCT/AU87/00043, § 371 Date Dec. 14, 1987, § 102(e) Date Dec. 14, 1987, PCT Pub. No. WO87/05038, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 17, 1987, Ser. No. 113,931
Claims priority, application Australia, Feb. 17, 1986, PH4637
Int. Cl.[4] B44C *1/22;* B29C *37/00*
U.S. Cl. 156—629 7 Claims



1. An implantable material comprising a substrate having a surface and a polyHEMA hydrogel applied to said surface which is chemically modified by means of hydrolytic etching by an acid in order to alter the condition of said surface form a non-adhesive state to an adhesive state and thereby promote the attachment and growth of cells to said surface.

4,836,885
PLANARIZATION PROCESS FOR WIDE TRENCH ISOLATION
Charles P. Breiten; David Stanasolovich, and Jacob F. Theisen, all of Manassas, Va., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 3, 1988, Ser. No. 189,863
Int. Cl.[4] H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 156—643 17 Claims



1. A method of planarizing wide dielectric filled trenches in a surface of a semiconductor substrate comprising the steps of:
depositing a first conformal dielectric layer in said wide trenches and over the surface of said semiconductor substrate, forming depressions on the surface of said first layer over said wide trenches,
depositing a second layer having etch characteristics which differ substantially from said first layer, on said first layer,
applying a thick planarizing layer on said second layer,
etching said thick planarizing layer until the portions of said second layer disposed over said surface of said semiconductor substrate are exposed but leaving portions of said thick planarizing layer in said depressions disposed over the wide trenches,
etching said exposed portions of said second layer in a etching medium with a high selectivity between said second layer to said first layer, leaving masking areas of said second layer over said first layer deposited in said wide trenches,
etching said first layer in an etching medium with a high selectivity between said first layer to said second layer to said surface of said semiconductor substrate, and
removing said masking areas of said second layer.

4,836,886
BINARY CHLOROFLUOROCARBON CHEMISTRY FOR PLASMA ETCHING
Timothy H. Daubeuspeck, Colchester, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 23, 1987, Ser. No. 123,639
Int. Cl.[4] C23F *1/02, 1/12*
U.S. Cl. 156—643 4 Claims

1. A method of etching a tungsten or tungsten alloy film, comprising the step of exposing said film to a plasma comprised of a chlorofluorocarbon gas and an oxidant gas, wherein said chlorofluorocarbon has more fluorine than chlorine, and wherein said oxidant gas comprises approximately 60%–90% of said plasma by volume.

4,836,887
CHLOROFLUOROCARBON ADDITIVES FOR ENHANCING ETCH RATES IN FLUORINATED HALOCARBON/OXIDANT PLASMAS
Timothy H. Daubenspeck, Colchester, and Faith S. Ichishita, Essex Junction, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 23, 1987, Ser. No. 123,640
Int. Cl.[4] C23F *1/02, 1/12*
U.S. Cl. 156—643 7 Claims

1. A process for etching a refractory metal layer at a rate faster than that of either a polymer layer or an insulator layer, comprising the step of exposing the layers to a gaseous plasma comprising an oxidant gas, a fluorine-based halocarbon gas selected from the group consisting of CF_4 and CHF_3, and up to approximately 20% of chlorofluorocarbon gas, said chlorofluorocarbon gas being present in an amount sufficient to en-

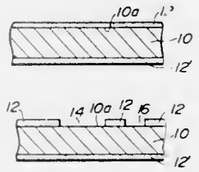
hance the refractory metal etch rate, and said fluorine-based halocarbon gas being present in an amount greater than that of said chlorofluorocarbon gas.

4,836,888

METHOD OF CHEMICALLY ETCHING SEMICONDUCTOR SUBSTRATE

Hidetoshi Nojiri, and Ryuta Hirayama, both of Yokosuka, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 17, 1988, Ser. No. 194,943
Claims priority, application Japan, Jul 23, 1987, 62-182287
Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*
U.S. Cl. 156—647 **5 Claims**



1. In a method of etching a semiconductor substrate in at least one selected area by immersing the semiconductor substrate in an etching liquid to cause oxidation-reduction reactions between the semiconductor substrate and the etching liquid,

the improvement comprising the step of forming an electrode on a surface of the semiconductor substrate in an area separate from any of said at least one selected area, wherein said electrode is a film formed on the semiconductor surface subjected to etching and is separated from any of said at least one selected area by an oxide film previously formed on the same surface before immersing the semiconductor substrate in the etching liquid, the material of said electrode being chemically stable and insusceptible to reaction with the etching liquid.

4,836,889

SURFACE TREATING METHOD FOR POLYACETAL RESIN MOLDED ARTICLES

Yoshiharu Suzuki, Shizuoka, and Tomoyuki Aketa, Fuji, both of Japan, assignors to Polyplastics Co., Ltd., Osaka, Japan

Filed Dec. 10, 1987, Ser. No. 131,060
Claims priority, application Japan, Jan. 16, 1987, 62-7526
Int. Cl.[4] C08K *9/04*
U.S. Cl. 156—667 **5 Claims**

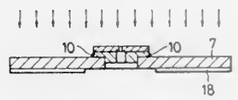
1. A method for treating a surface of a moulded article of polyacetal, which comprises the step of etching an article moulded from a polyacetyl composition comprising 80 to 99.5 parts by weight of a polyacetal resin in admixture with 20 to 0.5 parts by weight of fine particles of a metal oxide having an average particle diameter of 0.1 to 20 microns with an acidic solution containing an inorganic acid which is selected from the group consisting of sulfuric acid, hydrochloric acid, phosphoric acid and mixtures thereof.

4,836,890

METHOD FOR PRODUCING OPTICAL INFORMATION RECORDING DISK

Yasushi Murata; Kunizho Ogoshi, and Fumio Matsui, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 13, 1987, Ser. No. 106,682
Claims priority, application Japan, Oct. 13, 1986, 61-243542
Int. Cl.[4] B32B *31/04*
U.S. Cl. 156—73.1 **10 Claims**



1. A method for producing an optical information recording disk, comprising the steps of:

forming a spiral guide groove on a first main surface of a transparent circular substrate having a large circular center hole, said spiral guide groove being formed such that it is concentric with the large circular center hole of said substrate;

forming a metal lamination disk member having an outer diameter which is larger than an inner diameter of said large circular center hole, and having a small circular center hole with an inner diameter which is smaller than said inner diameter of said large circular center hole;

positioning said small circular center hole of said metal lamination disk member such that it is concentric with respect to said spiral guide groove;

adhering said metal lamination disk member to a second main surface of said transparent circular substrate with a first adhesive agent, the second main surface being opposite to the first main surface of said transparent circular substrate;

applying a second adhesive agent to a peripheral side surface portion of said metal lamination disk member in the vicinity of said first main surface of said circular substrate;

hardening said second adhesive agent before said first adhesive agent hardens to thereby temporarily fix said metal lamination disk member to said circular substrate; and

hardening said first adhesive agent.

4,836,891

SELF-CONTAINED OIL WELL SALT WATER CONCENTRATION SYSTEM

James H. Files; Donald M. Harrel; John M. Montague; Thomas L. Stansbury Sr., and Carlton T. Sikes, all of Houston, Tex., assignors to Evaporation, Inc., Houston, Tex.

Filed May 19, 1986, Ser. No. 864,508
Int. Cl.[4] B01D *1/06*
U.S. Cl. 159—28.1 **20 Claims**

1. Apparatus for concentrating salt water into a concentrated brine, comprising:

(a) a boiler vessel including a plurality of heater fire tubes vertically disposed through said boiler vessel from a fire box located at the lower ends of said tubes to a vent located at the upper ends of said tubes;

(b) said boiler vessel including upper passage means at its upper end and lower passage means at its lower end;

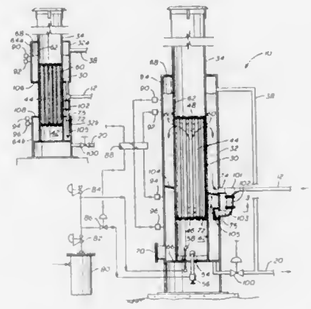
(c) weir means including an upper weir and a lower weir;

(d) conduit means connected in liquid communication with said upper passage means through said upper weir and with said lower passage means through said lower weir;

(e) said upper weir, said conduit means, said lower weir and said boiler vessel comprising a thermal syphon means arranged to recirculate said brine upwardly through said boiler vessel and downwardly through said conduit means responsive to heat applied in said firebox;

(f) said syphon means having an inlet for receiving salt water into said syphon means and mixing said salt water with brine contained within said apparatus;

(g) a magnetic water treater connected into said syphon means to magnetically treat the brine being recirculated through said syphon means; and



(h) sensing means connected to sense the brine in said lower weir and connected to actuate a control means when the density of said brine approaches a designated density occurring of a designated temperature; said control means being connected to open a valve connected with said lower weir and thereby release the concentrated brine from said lower weir in response to actuation by said sensing means.

4,836,892

PULP BLENDS FOR LINERBOARDS

Anne M. Edwards, Wrightstown, and Allen Rosen, Lawrenceville, both of N.J., assignors to Union Camp Corporation, Wayne, N.J.

Filed Oct. 9, 1986, Ser. No. 917,391
Int. Cl.[4] D21H *5/12*
U.S. Cl. 162—141 **7 Claims**

1. A method of preparing linerboard sheets which comprises;

(A) providing a pulp furnish which comprises

(i) from about 1 to about 40 percent by weight of a alkaline peroxide, high yield softwood pulp; and

(ii) from about 60 to about 99 percent by weight of a chemical pulp;

said furnish having a Canadian Standard Freeness of from about 150 to about 700;

(B) forming a wet web from the furnish;

(C) pressing the wet web to a solids content within the range of from about 30 to about 40 percent;

(D) further pressing the wet web at a press impulse of at least 7.5 psi-second, at a web temperature greater than 100° F.

4,836,893

APPARATUS FOR TREATMENT OF FIBER MATERIAL

Stig T. Gloersen, P1 45012-Edsgatan, 655 90 Karlstad, Sweden

Continuation of Ser. No. 750,223, Jun. 28, 1985, abandoned, which is a continuation of Ser. No. 204,060, Nov. 4, 1980, abandoned, which is a continuation of Ser. No. 785,543, Apr. 7, 1977, abandoned, which is a continuation of Ser. No. 592,661, Jul. 2, 1975, abandoned. This application Apr. 8, 1986, Ser. No. 850,434
Claims priority, application Sweden, Jul. 5, 1974, 7408859
Int. Cl.[4] D21C *7/00, 7/06, 9/02*
U.S. Cl. 162—237 **4 Claims**

1. Apparatus for continuously treating fiber material and the like in a first treatment chamber and in a second treatment chamber and in a second treatment located after said first chamber and in open communication therewith, said apparatus comprising

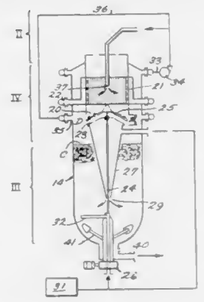
(a) a treatment vessel having a fiber inlet and a fiber outlet, said first and second chambers being defined in said treatment vessel,

(b) means for establishing a fiber column of a predetermined height in said first chamber,

(c) means establishing a liquid layer between said first and second chambers,

(d) means for re-forming a fiber column in said second chamber with fiber material from said first chamber,

(e) means for interrupting said fiber column of said first chamber, so that the weight thereof is not transferred to the fiber material in said re-formed fiber column in said second chamber while allowing passage of fiber material from said fiber column in said first chamber to said fiber column in said second chamber, said interrupting means



including a cylinder extending between said first chamber and said liquid layer and providing a fiber communicating path therebetween, said cylinder having a lowermost edge thereof, and a table having downwardly outwardly sloping conical portions and located in said liquid layer, said conical portions being vertically spaced from the lowermost edge of said cylinder and being located above the level of the re-formed fiber column in said second chamber, and

(f) means for introducing washing liquid near the bottom of said second chamber, portions of said washing liquid flowing upwardly toward and into said liquid layer and removed peripherally therefrom, said wash introducing means including a downwardly inwardly conical sloping liquid container located below said table and concentric with said second chamber and said liquid layer, said container having an outlet at the bottom thereof in communication with said second chamber.

4,836,894

PROFILING AIR/STEAM SYSTEM FOR PAPER-MAKING MACHINES

James L. Chance, Rockton, and Laurie D. Wicks, South Beloit, both of Ill., assignors to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 720,482, Apr. 9, 1985, abandoned, which is a continuation-in-part of Ser. No. 428,565, Sep. 30, 1982, abandoned. This application Apr. 27, 1987, Ser. No. 48,500
Int. Cl.[4] D21F *3/00, 5/00*
U.S. Cl. 162—253 **7 Claims**

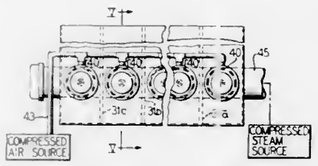
1. An apparatus for effective control of cross-machine moisture profile of a paper web in a papermaking machine, in combination:

fluid permeable pressure roll means supporting a travelling paper web undergoing press nip dewatering;

a compartmentalized steam box or air box or steam and air box positioned in working relation with said pressure roll means, said box extending in a cross-machine direction

substantially across the width of said paper web and having an open front face in fluid communication with said pressure roll means and being positioned in relatively close proximity thereot, said box having a plurality of separate compartments, each in fluid communication with said front face and each having individually controllable steam and air outlets located away from said front face, so as to selectively allow a stream of steam or air in adjustable amount to flood each respective compartment and permeate a discrete, predetermined corresponding area of the paper web over said pressure roll means;

a single control valve means in fluid communication with each compartment and operatively associated with a source of pressurized steam having a temperature higher than that of the web and means for supplying the pressurized steam and a source of compressed air having a temperature lower than that of the web and means for supplying the compressed air, and said steam and air outlets in each compartment, wherein said single valve means opens one of the means for supplying pressurized steam and the means for supplying compressed air while the other one is being closed to selectively control the proportions of steam and air in each compartment and maintain the total amount of steam or air or mixture of both in each compartment substantially the same;



means for drawing air through said web and for exhausting the air after the air has partially cooled the web, said air altering the pressing effect of said web while on said pressure roll means by means of cooling the web by adiabatic saturation; and

a water-removal means positioned in working relation with said compartmentalized box for removing water from said paper web.

4,836,895

HEADBOX FOR PAPER MACHINES OR THE LIKE

Dieter Egelhof, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Nov. 24, 1987, Ser. No. 124,901

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1986, 3640632

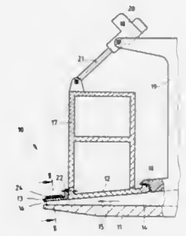
Int. Cl.⁴ D21F *1/0*

U.S. Cl. 162—259 **17 Claims**

1. A headbox for paper machines for dispensing a machine-width flow of suspension, said headbox comprising:

a pair of converging flow-control walls defining therebetween a nozzle-type discharge channel, at least one of said pair of flow-control walls having at a downstream end thereof a machine-width flexible wall section having a free end which together with the other of said pair of flow-control walls defines therebetween a machine-width discharge gap for the flow of suspension; and

means for bending by differential thermal expansion a selected zone of the flexible wall section for local fine adjustment of the discharge gap, said means including a plurality of planar heating elements arranged in a row across the machine width at least approximately coplanar



with the flexible wall section and connected in thermal communication therewith.

4,836,896

SEPARATION OF M-DIISOPROPYLBENZENE FROM P-DIISOPROYLBENZENE BY AZEOTROPIC DISTILLATION WITH ACETOPHENONE

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, assignor to Lloyd Berg, Bozeman, Mont.

Continuation-in-part of Ser. No. 270,200, Nov. 14, 1988. This application Jan. 9, 1989, Ser. No. 294,483

Int. Cl.⁴ B01D *3/38*; C07C *7/06*

U.S. Cl. 203—46 **1 Claim**

1. A process for recovering m-diisopropylbenzene from a mixture of m-diisopropylbenzene and p-diisopropylbenzene which comprises (1) distilling a mixture of m-diisopropylbenzene and p-diisopropylbenzene in a rectification column in the presence of acetophenone as an azeotrope forming agent, recovering a m-diisopropylbenzene-acetophenone azeotrope as overhead product, obtaining the p-diisopropylbenzene from the stillpot, (2) subjecting the m-diisopropylbenzene-acetophenone azeotrope to solvent extraction with propylene glycol at ambient temperature to form two immiscible liquid phases, recovering the m-diisopropylbenzene as the hydrocarbon phase and the acetophenone and the propylene glycol as the glycol phase, (3) separating the acetophenone from the propylene glycol by rectification.

4,836,897

BATHS AND PROCESS FOR ELECTROPLATING HARD,ADHERENT,SMOOTH, WEAR RESISTANT AND CORROSION RESISTANT CHROMIUM DEPOSITS

William Korbach, Howell; John A. Corsentino, Hazlet; Allen R. Jones, Belford, all of N.J., and John E. McCaskie, Merrick, N.Y., assignors to M&T ChemicalsInc., Woodbridge, N.J.

Filed Sep. 1, 1988, Ser. No. 239,565

Int. Cl.⁴ C25D *3/10*

U.S. Cl. 204—51 **13 Claims**

1. A chromium electroplating bath suitable for forming hard, adherent, smooth, wear resistant and corrosion resistant chromium electrodeposits on a substrate consisting essentially of 450–650 g/l of chromic acid 40–100 g/l of sulfoacetic acid and 0–4.5 g/l of sulfate ion wherein said bath is substantially free of other carboxylic acids, fluoride ion, iodide ion, bromide ion, and selenium ion.

4,836,898

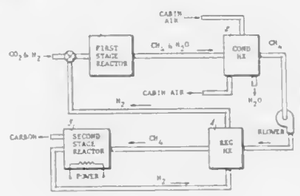
METHANE CONVERSION REACTOR

Gary P. Noyes, Broad Brook, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 3, 1987, Ser. No. 128,370

Int. Cl.⁴ C25B *1/04*

U.S. Cl. 204—129 **6 Claims**



1. A method of reclaiming oxygen from carbon dioxide exhaust comprising reacting the carbon dioxide with hydrogen to form a mixture of water and methane and electrolyzing the water to form hydrogen gas and oxygen and then introducing the methane into a methane converter having a heated reactor vessel where the methane is converted to carbon and hydrogen wherein the improvement comprises contacting the methane in said reactor vessel with a high temperature stable glass fiber material having a layer of a metallic catalyst thereon, at a temperature sufficient to cause the methane to catalytically decompose forming hydrogen gas and carbon.

4,836,899

METHOD FOR FIELD-ASSISTED ION EXCHANGE WITH ANODIC AND CATHODIC CONTACTING

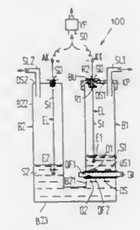
Peter Clemens, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Division of Ser. No. 108,914, Oct. 15, 1987, Pat. No. 4,786,391. This application Aug. 4, 1988, Ser. No. 228,058

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1986, 3638752

Int. Cl.⁴ C25F *5/00*

U.S. Cl. 204—130 **1 Claim**



1. In a method for a field-assisted ion exchange with anodic and cathodic contacting with a molten salt melt comprising the step of providing an arrangement including two vessels, each of said vessels having a contact opening with a sealing rim for engaging opposite surfaces of a glass member to be treated, means for changing the level of the molten salt in each vessel from a level removed from the contact opening to a level covering the entire contact opening of each vessel, and means for applying a vacuum to the interior of each vessel, lowering the level of the molten salts to not cover the openings, positioning a glass member between the two openings, creating a vacuum in each vessel to form a seal with the sealing rim of each opening, then raising the level of the molten salts to cover the openings, treating the members by conducting the ion exchange, then at the completion of treating the members by the ion exchange lowering the level, removing the treated member, positioning a second member and repeating the process of creating a vacuum, raising the level of the molten salt in each vessel and treating the member by conducting a field-assisted ion exchange with a cathodic and anodic contacting.

4,836,900

PROCESS FOR THE DECONTAMINATION OF THE SURFACE OF A METAL PORT CONTAMINATED BY TRITIUM AND APPARATUS USABLE FOR THIS PROCESS

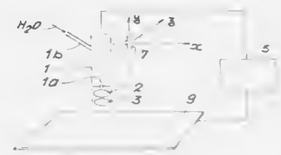
Gilbert Bellanger, Selongey, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 4, 1988, Ser. No. 141,407

Claims priority, application France, Jan. 5, 1987, 8700017

Int. Cl.⁴ C25F *1/00*

U.S. Cl. 204—140 **13 Claims**



1. Process for the decontamination of the surface of a metal part contaminated by tritium, characterized in that it comprises the following stages:

(1) connecting the part to be decontaminated to the negative pole of a direct current generator,

(2) contacting at least one portion of the surface of the part to be decontaminated with a mixture incorporating water and an electrolyte able to release hydrogen by electrolysis, and

(3) passing an electric current between the part to be decontaminated and an anode connected to the positive pole of the electric current generator and in contact with the mixture incorporating water and an electrolyte, by applying to the part to be decontaminated a current density of 10 to 50 mA/cm² in order to cathodically charge with hydrogen the surface of the part to be decontaminated and thus replace by the hydrogen the tritium adsorbed on the surface of the part to be decontaminated.

4,836,901

CORONA DISCHARGE TREATING METHOD AND APPARATUS FOR RESIN MOLDINGS

Katsuhide Manabe; Yasuhiko Ogisu; Kazuaki Goto, and Hisao Toya, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Continuation of Ser. No. 903,619, Sep. 5, 1986, abandoned. This application Feb. 26, 1988, Ser. No. 163,205

Claims priority, application Japan, Sep. 5, 1985, 60-196449; Jan. 31, 1986, 61-20461

Int. Cl.⁴ H01T *19/04*; B29C *35/00*

U.S. Cl. 204—164 **21 Claims**

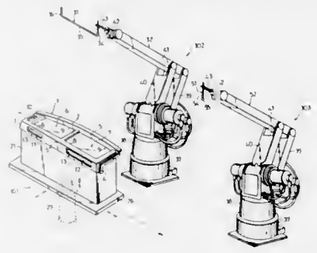
1. A corona discharge treating method for a three-dimensional resinous article having a hole and a corner, which comprises the steps of:

(a) providing a rigid corona discharge electrode having a rod-like gripped portion and a spherical discharge portion;

(b) setting said article on a jig body having a counter electrode and a buffering plate made of a dielectric material on said counter electrode in a postion corresponding to said hole of said article; and

(c) moving said spherical discharge portion of said corona

discharge electrode along a predetermined path along a surface of said article while said spherical discharge portion is generating a corona discharge, said spherical dis-



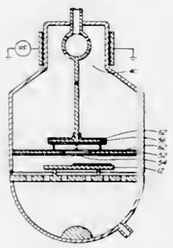
charge portion being attached to a top end of said rod-like gripped portion of said corona discharge electrode and having a diameter greater than that of said gripped portion.

4,836,902

METHOD AND APPARATUS FOR REMOVING COATING FROM SUBSTRATE

Alexander Kalnitsky, Ottawa; Joseph P. Ellul, and Sing P. Tay, both of Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 9, 1987, Ser. No. 106,214
Int. Cl.[4] H01L *21/306;* B44C *1/22;* C23C *14/22*
U.S. Cl. 204—192.32 5 Claims



1. A method for removing a layer of coating material from a silicon substrate, comprising:

activating a gas in an activation chamber; and

absorbing ultraviolet radiation generated during activation of the gas at at least one ultraviolet radiation absorbing surface which is constructed of polysilicon and passivated by oxidation, said at least one ultraviolet radiation absorbing surface being arranged to block any straight line path from the activation chamber to the silicon substrate; while

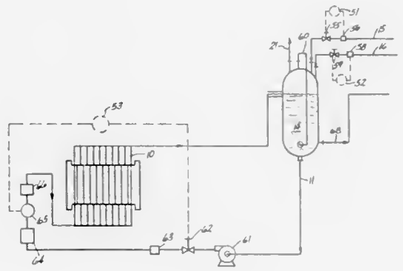
passing the activated gas from the activation chamber past the at least one ultraviolet radiation absorbing surface and into contact with the layer of coating material to break down the coating material and strip it from the silicon substrate.

4,836,903

SODIUM HYDROSULFITE ELECTROLYTIC CELL PROCESS CONTROL SYSTEM

David W. Cawlfield, Cleveland, Tenn., assignor to Olin Corporation, Cheshire, Conn.

Filed Jun. 17, 1988, Ser. No. 207,799
Int. Cl.[4] C25B *15/08, 9/00*
U.S. Cl. 204—228 11 Claims



1. A centralized controller based process control system for the operation of an electrolytic membrane cell to continuously produce an aqueous product solution in the cell which has a cathode compartment, an anode compartment, a cation exchange membrane separating the anode compartment and the cathode compartment, a porous cathode, and a separator intermediate the anode and the membrane, comprising:

(a) a core process control program to control the feed of raw materials to the catholyte in the cathode compartment and to the anolyte in the anode compartment and to maintain the feed within tolerances of desired set points for the rate of feed by initiating self-correcting instructions to actuators controlling the rate of feed of the raw materials, the core process control program also monitoring the product pH to control the product within tolerance of a desired set point and sensing alarm conditions when the rate of feed of the raw materials or the product pH is out-of-tolerance;

(b) an alarm monitoring program to receive sensings of alarm conditions of out-of-tolerance conditions from the core process control program, to analyze the sensings and data on the operation of the cell, and to issue instructions and commands in response thereto;

(c) at least one sequencer program that is put into operation by a command from the alarm monitoring program and which sends commands to the core process control program to initiate a cell shutdown procedure when any predetermined one of the alarm conditions sensed by the core process control program persists beyond a predetermined period of time; and

(d) a timer program that is initiated by the sequencer program to initiate timing an out-of-tolerance condition for the predetermined period of time and when the predetermined period of time elapses and the out-of-tolerance condition perists, activating the at least one sequencer program to initiate the cell shutdown procedure.

4,836,904

GRAPHITE ELECTRODE WITH MODIFIED SURFACE

Frazer A. Armstrong, Sarah's Cottage; Brian N. Oliver, Chapel Hill, and Hugh A. O. Hill, Cumnor, all of United Kingdom, assignors to Medisense, Inc., Cambridge, Mass.

Filed Mar. 13, 1986, Ser. No. 839,699
Claims priority, application United Kingdom, Mar. 28, 1985, 8508053
Int. Cl.[4] C25B *11/12;* G01N *27/26;* A61B *5/04*
U.S. Cl. 204—294 8 Claims

1. An electrode for use in bioelectrochemistry, said electrode comprising:

(a) a graphite surface, at least part of which is a planar surface at right angles to the direction of easy graphite cleavage; and

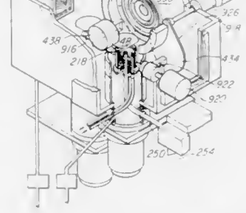
(b) complexes comprising Cr (III), said Cr (III) being attached to said electrode surface by covalent bonds to carbon-oxygen groups, and being capable of attachment by covalent bonds to a ligand that is biochemically active.

4,836,905

PROCESSING APPARATUS

Cecil J. Davis, Greenville; Joseph V. Abernathy, Wylie; Robert T. Matthews, Plano; Randall C. Hildenbrand, Richardson; Bruce Simpson, Dallas; James G. Bohlman, Forney; Lee M. Loewenstein, and John I. Jones, both of Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 74,390, Jul. 16, 1987, abandoned. This application Jul. 16, 1987, Ser. No. 75,018
Int. Cl.[4] C23C *13/34*
U.S. Cl. 204—298 12 Claims



1. An apparatus for processing of wafers, comprising:

(a) a vacuum processing chamber having a top processing chamber having means for performing a first processing step and an upper processing space having means for performing a second processing step within said vacuum processing chamber;

(b) a wafer support within said vacuum processing chamber, said wafer support being capable of supporting a wafer in a substantially face down position with substantially no damage to structures on the face of said wafer in the top processing chamber while a first processing step is being performed; and

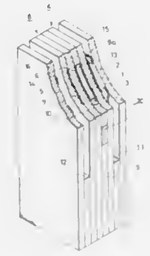
(c) said wafer support being movable to rotate said wafer from said substantially face down position in said top process chamber into a more nearly vertical position in said upper processing space where a second processing step can be performed.

4,836,906

AIR-FUEL RATIO SENSOR

Tetsusyo Yamada; Nobuhiro Hayakawa, and Kazunori Yokota, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Dec. 28, 1987, Ser. No. 138,531
Claims priority, application Japan, Dec. 27, 1986, 61-313374
Int. Cl.[4] G01N *27/58*
U.S. Cl. 204—410 15 Claims



1. An air-fuel ratio sensor for sensing a gaseous atmosphere, comprising:

a detection element having a pair of porous electrodes on an oxygen ion-conductive solid electrolyte;

a gas-diffusion limiting portion for limiting diffusion of the gaseous atmosphere into one of said pair of porous electrodes, said gas-diffusion limiting portion being provided such that said one of said pair of porous electrodes communicates with the gaseous atmosphere through said gas-diffusion limiting portion, said gas-diffusion limiting portion being made of porous material having a porosity, a mean pore size and a thickness in the ranges of 10%–30%, 1 μm–3 μm and 200 μm–1000 μm, respectively;

means for applying an electric voltage of a predetermined value between said pair of porous electrodes to transfer oxygen into and out of another one of said porous electrodes, the oxygen transmission accompanying electric current through said detection element; and

means for measuring the air/fuel ration of the gaseous atmosphere based on the current flow through said detection element.

4,836,907

ELECTROCHEMICAL MEASURING ELECTRODE DEVICE FOR SIMULTANEOUSLY MEASURING THE PARTIAL PRESSURES OF TWO GASSES

Knud G. Pedersen, Lyngby, Denmark, assignor to Radiometer A/S, Copenhagen, Denmark

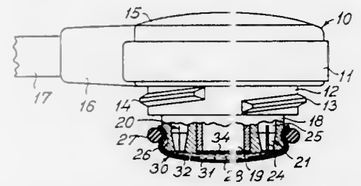
Continuation of Ser. No. 891,774, Jul. 30, 1986, abandoned, which is a continuation of Ser. No. 720,044, Apr. 4, 1985, abandoned, which is a continuation of Ser. No. 511,678, Jul. 7, 1983, abandoned. This application Nov. 25, 1987, Ser. No. 129,428
Claims priority, application Denmark, Jul. 14, 1982, 3170/82
Int. Cl.[4] G01N *27/52;* A61B *5/04*
U.S. Cl. 204—412 23 Claims

1. An electrochemical measuring electrode device for simultaneously measuring the partial pressures of two gases in a medium of limited gas availability, a first gas partial pressure being measured potentiometrically and a second gas partial pressure being measured polarographically, comprising:

(a) an electrode body;

(b) a membrane arranged in front of said electrode body, the electrode body and the membrane together defining a space therebetween;

(c) an electrolyte solution enclosed in said space;
(d) a first electrode system for potentiometric measurement arranged in said body, said first electrode system having a reference electrode and a pH-electrode;
(e) a second electrode system for polarographic measurement arranged in said body, said second electrode system having a cathode and an anode;
said electrolyte solution communicating with said two electrode systems,
said membrane comprising
(i) a first part being permeable to the first gas, arranged in front of the exposed measuring surface of the pH-electrode of said first electrode system and, together with said first electrode system and said electrolyte solution,



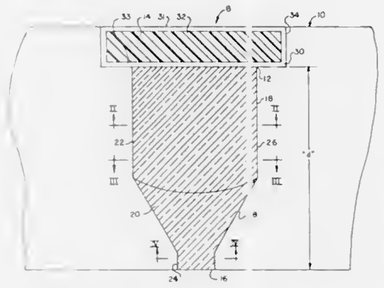
constituting a first measuring system for measuring the partial pressure of the first gas; and
(ii) a second part being permeable to the second gas, arranged in front of the exposed measuring surface of the cathode of said second electrode system and, together with said second electrode system and said electrolyte solution, constituting a second measuring system for measuring the partial pressure of said second gas;
the permeability of said second part of said membrane to the second gas being less than the permeability of said first part of said membrane to the second gas, and the permeabilities of said first and second parts of said membrane being such that said first and second measuring systems have response time characteristics differing from each other at the most by a factor of 10.

4,836,908

MINIATURIZED REFERENCE ELECTRODES

Jayme R. Ford, Mount Prospect, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Filed Dec. 22, 1987, Ser. No. 136,886
Int. Cl.[4] G01N *27/28, 27/30*
U.S. Cl. 204—435 **16 Claims**



1. A reference electrode, comprising:
a silver-silver chloride chip; and
a housing having an internal cavity filled with electrolyte, said cavity having a first opening said chip being disposed to extend across and substantially entirely cover said first opening, and said cavity having a second opening for exposure to a test medium of interest spaced from said first opening;
wherein the ratio of the area of the first opening to the area of the second opening is from about 14.0 to about 728.0, and the ratio of the distance between the first and second openings to the area of the first opening is about 2.0 cm^{-1} to about 66.0 cm^{-1}.

4,836,909

PROCESS OF THERMALLY CRACKING HEAVY PETROLEUM OIL

Itaru Matsuo, Matsudo; Yuzo Takahashi, Kimitsu; Hideo Hashimoto, Sagamihara; Toru Takatsuka, Yokohama; Takeru Iimori, Ichihara; Hitoshi Maekawa, Chiba; Tamotsu Ito, Ichihara; Yoshihiko Shohji, Yokohama; Ryuzo Watari, Yamato, and Hiroshi Aida, Tokyo, all of Japan, assignors to Research Association for Residual Oil Processing, Japan

Continuation-in-part of Ser. No. 931,075, Nov. 17, 1986, abandoned. This application Sep. 9, 1987, Ser. No. 94,492
Claims priority, application Japan, Nov. 25, 1985, 60-264119; Dec. 20, 1985, 60-288217
Int. Cl.[4] C10G *51/02, 9/16*
U.S. Cl. 208—72 **2 Claims**

1. A continuous process of thermally cracking a heavy petroleum oil wherein the heavy petroleum oil is treated with the use of a combination of one cracking furnace and one perfect mixing tank reactor, said process consisting essentially of the steps of:
(a) thermally cracking in the cracking furnace the heavy petroleum oil at a temperature at the outlet of the cracking furnace of 490°–500° C. with a conversion of 60–75% of the total conversion in both the cracking furnace and the tank reactor;
(b) discharging the thermally cracked product from the cracking furnace and introducing same into the tank reactor for thermally cracking same at a temperature of 435°–450° C. and a pressure of from ambient pressure to 0.5 kg/cm^2G for a period of time of 10–26 minutes while feeding steam having a temperature of 435°–700° C. to the tank reactor for direct contact with the thermally cracked product introduced from the cracking furnace, the feed ratio by weight of the steam fed to the tank reactor to the heavy petroleum oil fed to the cracking furnace being 0.08–0.12;
(c) discharging a portion of the liquid phase in the tank reactor to recover a pitch product;
(d) discharging a portion of the gas phase in the tank reactor and introducing same into a separation tower for fractionating same into gas, light and heavy fractions and a bottom fraction; and
(e) recycling said bottom fraction to the cracking furnace.

4,836,910

CATALYTIC DEWAXING WITH ZEOLITE THETA-1

Jacob A. van de Griend; Arend Hoek, and Tom Huizinga, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 18, 1987, Ser. No. 62,971
Claims priority, application United Kingdom, Jul. 30, 1986, 8618574
Int. Cl.[4] C10G *45/62, 45/64*
U.S. Cl. 208—120 **9 Claims**

1. A process for catalytic dewaxing of hydrocarbon oil by contacting said oil at catalytic dewaxing conditions with a crystalline alminum silicate-containing catalyst having the following composition in terms of the molar ratios of the oxides:

$$(0.9\pm0.2)Z_pO_q{:}Al_2O_3{:}xSiO_2{:}yH_2O$$

wherein Z is at least one cation, p and q are each at least one and satisfy the electroneutrality of Z_pO_q, x is at least 10 and y/x is 0–25, and which crystalline aluminum silicate has an alkaline metal content of not more than 0.1% by weight and a X-ray diffraction patent substantially as set out in the following Table A:

TABLE A

D-space (±0.1	100 × I/I_{max}
11.07	W
10.81	M
4.37	100
4.10	M
3.86	W
3.82	W
3.68	S
3.62	S
3.46	M
2.52	M
2.50	W
2.44	W

wherein:
S = 70–99
M = 30–790
W = 0–30.

4,836,911

HYDROCARBON CONVERSION USING SILICON-SUBSTITUTED ZEOLITE COMPOSITIONS

Skeels, Gary W., Brewster; Donald W. Breck, deceased, late of White Plains; by Stephen R. Breck, heir, New York, all of N.Y., and by George D. Breck, heir, Sebastopol, Calif., assignors to UOP, Des Plains, Ill.

Division of Ser. No. 700,894, Feb. 12, 1985, abandoned, which is a continuation-in-part of Ser. No. 315,853, Oct. 28, 1981, Pat. No. 4,503,023, and a continuation-in-part of Ser. No. 476,780, Mar. 18, 1983, abandoned, which is a continuation of Ser. No. 315,853, Oct. 28, 1981, Pat. No. 4,503,023, which is a continuation-in-part of Ser. No. 66,330, Aug. 14, 1979, abandoned. This application Jun. 30, 1986, Ser. No. 880,016
Int. Cl.[4] C10G *47/02*
U.S. Cl. 208—111 **19 Claims**

1. Process for hydrocarbon conversion which comprises contacting a hydrocarbon under converting conditions with a crystalline zeolitic aluminosilicate having at least some of its original framework aluminum atoms replaced by extraneous silicon atoms and having the chemical composition

$$[Al_{(a-N)}Si_{b+(N-\Delta z)}\square_z]O_2$$

wherein $Al_{(a-N)}$ represents the mole fraction of aluminum tetrahedra; "a" represents the mole fraction of aluminum tetrahedra in the original zeolite; "N" represents the mole fraction of aluminum tetrahedra removed from the original zeolite, and has a value of at least 0.3a; $Si_{b+(N-\Delta z)}$ represents the mole fraction of silicon tetrahedra; "b" represents the mole fraction of silicon tetrahedra in the original zeolite; $(N-\Delta z)$ represents the mole fraction of silicon tetrahedra resulting from the substitution of extraneous silicon into the crystal lattice; "z" represents the difference in the Defect Structure Factor between the original zeolite and the zeolite containing the extraneous silicon atoms and has a value of less than 0.08;

$$\left(\frac{N-\Delta_z}{N}\right)$$

has a value at least as great as 0.5; z represents the mole fraction of defect sites;

$$\frac{b+(N-\Delta_z)}{a-N}$$

has a value of at least 4.0; has a cation equivalent expressed as a monovalent cation species, M^+/Al of from 0.85 to 1.1; and having an x-ray powder diffraction pattern containing at least the d-spacings set forth in Table C.

4,836,912

HYDROCONVERSION PROCESS USING AROMATIC METAL CHELATE COMPOSITIONS

Richard H. Schlosberg, Bridgewater, and William N. Olmstead, Berkeley Heights, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 772,403, Sep. 4, 1985, abandoned. This application Sep. 4, 1987, Ser. No. 94,309
Int. Cl.[4] C10G *47/06;* B01J *27/047*
U.S. Cl. 208—112 **7 Claims**

1. In a hydroconversion process for treating hydrocarbonaceous oils derived from petroleum, oil-shale, tar sand and coal, conducted in the presence of hydrogen in which said hydrocarbonaceous feed is either refined without substantial change in the boiling range of the oil, or is converted to lower boiling products, the improvement which comprises performing the hydroconversion in the presence of an unsupported catalyst formed by chelating a metal component with an aromatic compound and heating said metal component and aromatic compound above about 450° C. for time sufficient to cause the aromatic compound to cross-link, said metal of the metal component being selected from Groups VB, VIB, VIIB, and VIII of the Periodic Table of the Elements, and mixtures thereof, and said aromatic compound selected from compounds having two or more heteroatoms selected from sulfur, oxygen and nitrogen, and at least one of the heteroatoms being part of a five- to six-member heterocyclic ring.

4,836,913

CATALYTIC CRACKING PROCESS EXPLOYING A ZEOLITE AS CATALYSTS AND CATALYST SUPPORTS

Roger J. Lussier, Ellicott City, and George J. Surland, Woodbine, both of Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Divisioo of Ser. No. 802,542, Nov. 27, 1985, Pat. No. 4,749,672, Continuation-in-part of Ser. No. 657,858, Oct. 5, 1984, abandoned, Continuation-in-part of Ser. No. 484,435, Apr. 13, 1983, abandoned. This application Mar. 24, 1988, Ser. No. 172,675
Int. Cl.[4] C10G *11/05*
U.S. Cl. 208—120 **10 Claims**

1. A method for cracking hydrocarbons which comprises reacting a hydrocarbon feedstock under catalytic cracking conditions in the presence of a cracking catalyst composition which comprises a crystalline zeolite, an inorganic oxide matrix, and a finely divided, calcined caustic leached aluminum silicon spinel/mullite component having a silica to alumina mole ratio of from about 0.5 to 1.7 and an acid site retention of from about 70 to 95 percent after treating at 1350° F. in the presence of saturated steam and an X-ray diffraction pattern as set forth in Tables A or B.

4,836,914

METHOD FOR REMOVING IRON CONTENT IN PETROLEUM SERIES MINERAL OIL THEREFROM

Akira Inoue; Masaru Ushio, both of Yokohama; Toru Morita, Ayase; Yasuyuki Oishi, and Hisao Sakoda, both of Yokohama, all of Japan, assignors to Nippon Oil Co., Ltd., Japan

Continuation of Ser. No. 860,542, May 7, 1986, abandoned. This application Sep. 1, 1988, Ser. No. 240,429
Claims priority, application Japan, May 8, 1985, 60-97367; May 8, 1985, 60-97368
Int. Cl.[4] C10G *45/04*
U.S. Cl. 208—251 H **12 Claims**

1. A method for decreasing the pressure drop in a fixed bed hydrogenation plant which comprises treating an atmospheric or vacuum distillation residual oil containing 5 ppm or more of iron content by the use of a high gradient magnetic separator

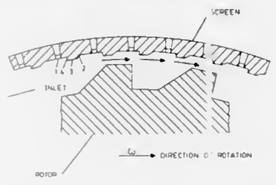
under conditions of the strength of the magnetic field being from 500 to 25,000 gauss, the temperature being from room temperature to 400° C., and the linear velocity being 0.1 to 50 cm/second, and thereafter hydrogenating said magnetically treated oil in a fixed-bed hydrogenation plant.

4,836,915

HIGH FLOW CAPACITY BARRIER TYPE SCREENING APPARATUS

Frey Frejborg, Glens Falls, N.Y., assignor to A. Ahlstrom Corporation, Noormarkku, Finland

Continuation-in-part of Ser. No. 738,743 May 29, 1985, Pat. No.
Claims priority, application Finland, Jun. 26, 1983, 830256
The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.
Int. Cl.[4] B01D *29/38;* **B07B** *1/20*
U.S. Cl. 209—273 **19 Claims**



1. An apparatus for screening pulp of low consistency which comprises a vessel having an inlet for the unscreened pulp, a first outlet for the accept, a second outlet for the reject, a screen cylinder within the vessel, said inlet and said outlets being in operative communication with said screen cylinder, a rotating element moving in the vicinity of said screen cylinder at a predetermined speed, said screen cylinder being formed of a screen plate having a contoured surface, said rotating element having a contour surface which faces the contour surface of said screen plate, the space between said screen cylinder and said rotating element define there between a screening zone, said inlet introducing said unscreened pulp in said screening zone between said contoured surface of said screen plate and said rotating element, said contoured surface of said screen plate having a bottom plane and apertures within said bottom plane, said contoured surfaces of said screen plate and said rotating element providing positive pressure inducing means causing positive pressure pulses towards the inlet of said apertures of said screen plate, whereby said positive pressure pulses force the accept through said screen plate.

4,836,916

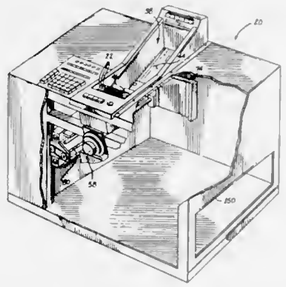
HANDLING APPARATUS FOR MAGNETIC RECORDING DISKS

Thomas J. Kondo, Phoenix; James F. Kusbel, Scottsdale, and John D. Philp, Phoenix, all of Ariz., assignors to Three Phoenix Company, Phoenix, Ariz.

Filed Dec. 23, 1983, Ser. No. 565,039
Int. Cl.[4] B07C *5/344;* **G01R** *33/12*
U.S. Cl. 209—538 **20 Claims**

1. An automated disk testing apparatus comprising, : means for assembling a plurality of disks and associated packages for testing; interface means for applying signals to and receiving signals from each of said disks; means for coupling each of said plurality of disks to said interface means; first means for conveying each of said disks, singularly, from said means for assembling to said means for coupling, said first means for conveying releasing said each disk into said means for coupling,

said means for coupling releasing said each disk after an exchange of signals; and means for receiving and conveying each of said released disks to an output location, said



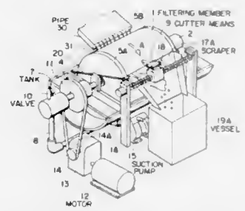
means for receiving and conveying responsive to said signals exchanged with said interface means.

4,836,917

APPARATUS FOR PERFORMING SEPARATION OF A SOLID-LIQUID MIXTURE

Yoji Tomita; Eiichi Oishi; Hiroshi Miyaji, all of Souwa; Hiroya Morimoto, Kumagaya; Tetsuo Sekigawa, Koga, and Kenichi Mitsuhashi, Souwa, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Oct. 6, 1986, Ser. No. 915,570
Int. Cl.[4] B01D *33/06, 33/36, 33/38*
U.S. Cl. 210—104 **15 Claims**



1. An apparatus for performing separation of a solid-liquid mixture including a large number of solid particles, comprising:

a filtering member having a hollow cylindrical outer configuration made of a hard porous material provided with means defining a plurality of continuous air holes, said porous material comprising a resin mixture of phenolic resin and polyvinyl acetal resin with a weight ratio of said phenolic resin with respect to said polyvinyl acetal resin being within a range of about 1/40 to ½, and further said resin mixture being provided with said plurality of air holes having an average diameter of about 0.1 to 500 μm and a porosity of about 50 to 90%;

end plates, each of which is disposed at an opposite end of said filtering member to seal end openings therein;

a rotary shaft means operatively connected to at least one of said end plates for supporting and rotating said filtering member;

a pressure reducing means for reducing a pressure in an inner space defined within said end plates and said filtering member during the rotation thereof;

a solid-liquid mixture supplying means located over one side of said filtering member for supplying said solid-liquid mixture over an outer peripheral surface of said filtering member so that the liquid component of the mixture is sucked into the inner space of said filtering member through the porous surface thereof by said pressure reducing means during the rotation of said filtering member; and

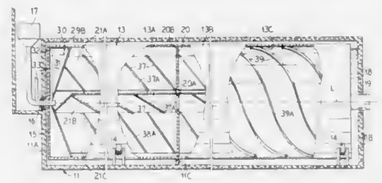
a scraping means located on another side of said filtering member for scraping a solid component of said mixture remaining on the outer peripheral surface of said filtering member.

4,836,918

APPARATUS FOR GAS-PRODUCING TREATMENT OF ORGANIC MATERIAL

Georg Szikriszt, Badstrandsvägen 12, S-112 65 Stockholm, Sweden

PCT No. PCT/SE86/00097, § 371 Date Nov. 5, 1986, § 102(e) Date Nov. 5, 1986, PCT Pub. No. WO86/05171, PCT Pub. Date Sep. 12, 1986
PCT Filed Mar. 7, 1986, Ser. No. 933,223
Claims priority, application Sweden, Mar. 8, 1985, 8501166; Mar. 8, 1985, 8501167
Int. Cl.[4] C02F *11/04;* **B01F** *9/06*
U.S. Cl. 210—151 **12 Claims**



1. Apparatus for gas-producing treatment, especially fermentation or digestion, of organic material contained in a liquid suspension, comprising an elongated horizontal treatment drum which is rotatable about its axis and which has a material inlet at one end, a material outlet at the other end, a plurality of baffles extending axially of the drum, each baffle having front side and an opposite side and being fixedly secured to the interior circumferential side of the drum and projecting therefrom towards the opposite side of the drum and material transport means comprising a plurality of guide ribs spaced apart longitudinally of the drum and including an acute angle with a transverse drum plane, said ribs being secured to said front side of each baffle and arranged such that particles settling in the drum and intercepted by a flank of the guide ribs are deflected towards the said other end of the drum by the flank.

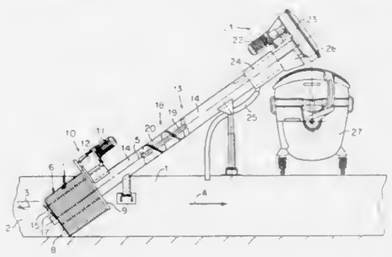
5. Apparatus for gas-producing treatment, especially fermentation or digestion, of organic material contained in a liquid suspension, comprising an elongated horizontal treatment drum which is rotatable about its axis, means for introducing and discharging the suspension and for collecting gas produced in the drum, and baffles mounted in the drum, said baffles in each of a plurality of angular drum positions defining together with the interior circumferential side of the drum a gas collection space which is spaced from the vertical plane containing the axis of the drum and which is open downwardly.

4,836,919

DEVICE FOR REMOVING WASTE MATERIAL SCREENED OR FILTERED OUT OF LIQUID FLOWING THROGH A CHANNEL

Hans-Georg Huber, Zum Rachetal 8, D-8434 Berching, Fed. Rep. of Germany

Filed Jul. 10, 1987, Ser. No. 72,111
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1986, 3630755
Int. Cl.[4] B01D *33/00*
U.S. Cl. 210—158 **10 Claims**



1. An arrangement for removing waste material within a liquid and to be screened or filtered out of the liquid flowing through a channel, comprising: a rotatable basket-shaped cylindrical interceptor in slanted position and rotating with applied power; said interceptor extending substantially into the liquid and having an upstream open face and a downstream face that is solidly closed; a conveyor positioned coaxially relative to said interceptor and leading to a waste-material deposit location outside the liquid; said conveyor having a powered conveyor screw and an intake scoop wall in vicinity of said interceptor for collecting waste material; means positioned stationary above said intake scoop wall for releasing waste material from said interceptor; said interceptor comprising a plurality of continuous annular disks distributed along an outer surface with continuous gaps between said disks; said means above said intake scoop wall for releasing waste material comprising a raker-stripper extending at least substantially through said gaps between said annular disks for cleaning said raker-stripper; said taker-stripper being positioned relative to said interceptor for increasing the intake scoop wall height above a predetermined level to raise water level and increase flow rates above predetermined values, said waste material accumulating below the water level and only on the interceptor inner surface and in vicinity of the raker-stripper for supplying said intake scoop wall regularly with waste material; said rotatable interceptor being supportable at each face; a housing with a free space between said housing and said annular disks; said intake scoop wall being displaced downward in axial direction relative to said interceptor; said intake scoop wall having an upstream wall, and a side wall; said upstream wall extending up to the height of said raker-stripper and sloping slightly in relation to a face of said interceptor.

4,836,920

RECOIL WEB POOL SKIMMER

Joseph E. Miller, Jr., 811 New Galena Rd., Doylestown, Pa. 18901

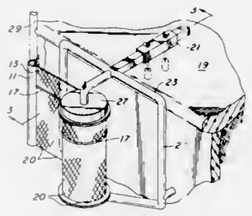
Filed Jul. 20, 1988, Ser. No. 221,530
Int. Cl.[4] E04H *3/20*
U.S. Cl. 210—169 **9 Claims**

1. A swimming pool skimmer, comprising:

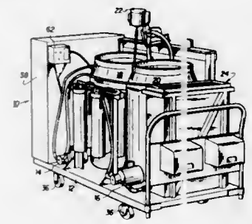
a. a swimming pool having a substantially vertical outer wall,

b. a frame affixed to said outer wall,

c. a vertically oriented, resiliently rotatable spool affixed to said frame, said spool being partially submerged in said pool,
d. a length of screening in the shape of an elongate rectangular web affixed at a first end to, and in wraps coiled about, said spool, and pl e. means for pulling said screening away from the spool while holding said screening in a vertical orientation with portions of said screening above and below the surface of water in the pool.

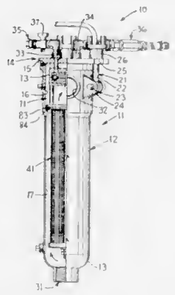


4,836,921
WASTE WATER TREATMENT APPARATUS
Joseph A. Hahn, Island Lake, and John E. House, Wheaton, both of Ill., assignors to Magnaflux Corporation, Chicago, Ill.
Filed Jan. 30, 1987, Ser. No. 8,854
Int. Cl.[4] C02F 1/52
U.S. Cl. 210—202 **3 Claims**



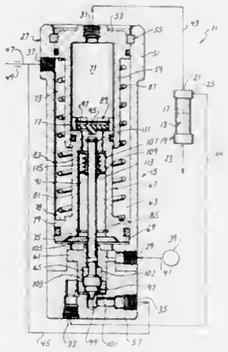
1. A compact portable wastewater treatment apparatus for treating oil contaminated waste water comprising:
a support structure having wheel means for transporting said structure to a desired location;
at least one containment means on said support structure for receiving and holding said waste water;
mixing means on said support structure arranged in said containment means for mixing said waste water with a desired amount of materials to form a flocculent containing said oil and including large, intermediate and small flock particles, and residue water wherein said containment means is constructed such that said flocculent settles to the bottom of said containment means and said residue water rises to the top of said containment means when said oil of said waste water is relatively heavy oil and the mixing time is relatively short in duration and wherein said flocculent rises to the top of said containment means and said residue water settles to the bottom of said containment means when said oil of said waste water is a relatively light oil and the mixing time is relatively long in duration;
a first filtering means for filtering large flock particles from said residue water, wherein said first filtering means further comprises a tank having a porous blanket for receiving said flocculent and said residue water, filtering said flocculent from said residue water, and holding residual water after filtering by said blanket, and wherein said tank further comprises filter paper arranged in its bottom for filtering said residual water received from said holding portion of said tank;
a second filtering means for filtering intermediate flock particles from said residue water;
a third filtering means for filtering small flock particles from said residue water;
a first valve means for receiving said residue water and said flocculent from said containment means and having a selectable first position for directing said flocculent to said first filtering means and having a selectable second position for directing said residue water to said second filtering means respectively;
a second valve means having a selectable first position for receiving said residue water from said second filtering means and having a selectable second position for receiving flocculent residue water from said first filtering means respectively and for directing both said residue water and said flocculent residue water to said third filtering means;
a first pump means for pumping said residue water and flocculent from the bottom of said containment means to and through said first valve means to said second and first filtering means respectively and for pumping said residue water through said second filtering means to and through said second valve means to and through said third filter means; and
a second pump means for pumping said flocculent residue water from said first filter means to and through said second valve means to and through said third filter means.

4,836,922
VIBRATING FILTER APPARATUS
John W. Rishel, Vicksburg, and George H. Schrink, Portage, both of Mich., assignors to Delaware Capital Formation, Inc., Wilmington, Del.
Filed Aug. 12, 1987, Ser. No. 84,644
Int. Cl.[4] B01D 29/28, 35/20
U.S. Cl. 210—232 **6 Claims**



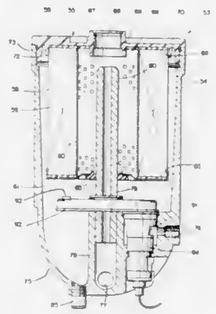
1. A vibrating filter apparatus for liquids containing sticky particles, including paint, comprising:
a housing having a removable cover at one end, an upper chamber closed by said cover, a lower chamber, a seat between said chambers, and upper and lower flow ports respectively communicating with said upper and lower chambers;
a filter unit comprising a top plate, a bottom plate, at least one filter element disposed between said top plate and said bottom plate and means fixing together said top plate, said bottom plate and said filter element;
means supporting said top plate on said seat, said filter element being received in said lower chamber;
means for locating said filter element in said lower chamber and means for laterally vibrating said filter element at an amplitude which is substantially constant along the length of said filter element, said means for laterally vibrating said filter element comprising
(1) a plurality of support rods fixed to and depending from said cover into said housing upper chamber and circumferentially distributed around a central space, said filter unit top plate being fixed to and depending from said support rods to support said filter unit therefrom within said housing, and
(2) means for laterally vibrating said support rods and said filter unit top plate depending therefrom, said means for laterally vibrating comprising a generally cylindrical vibrator laterally centered within said central space so as to be surrounded by said plurality of support rods and fixedly interconnect the same, said vibrator being axially spaced below said cover and above said filter unit top plate so that said vibrator laterally vibrates said rods and thereby said filter unit with respect to said cover,
(3) energizing means connecting through said cover to said vibrator to energize said vibrator.

4,836,924
REVERSE OSMOSIS SYSTEM AND AUTOMATIC CYCLING BOOSTER PUMP THEREFOR
Donald F. Solomon, 25666 Mosport St., Hemet, Calif. 92344
Filed Oct. 21, 1987, Ser. No. 111,697
Int. Cl.[4] B01D 13/00
U.S. Cl. 210—321.87 **18 Claims**



18. In a reverse osmosis system including a reverse osmosis filter with a reverse osmosis membrane and having a pressurized water inlet port connectable to a source of feed water under a predetermined pressure via a feed water inlet conduit, a product water outlet port for filtered product water, and a brine outlet port for brine, the improvement comprising:
a pump including a housing having a cavity, a feed water inlet port, a feed water outlet port and a reversing port coupled into the feed water inlet conduit between the source of feed water and the inlet port of the filter, a differential area piston reciprocable in said housing through pumping and return strokes and dividing the cavity of the housing into an inlet chamber communicating with the feedwater inlet port, an outlet chamber communicating with the outlet port and a reversing chamber communicating with the reversing port, said piston having a first relatively large area face in said inlet chamber, a second smaller area face in the outlet chamber and a reversing face in the reversing chamber whereby fluid in the inlet chamber can drive the piston on a pumping stroke and deliver fluid at increased pressure through the feed water outlet port to the inlet port of the reverse osmosis filter;
a brine conduit extending between the brine outlet port and the reversing port;
a brine valve in said conduit; and
means driven by the piston for operating the brine valve.

4,836,923
CARTRIDGE AND COVER ASSEMBLY FOR FLUID FILTERS
Peter Popoff; Walter H. Stone, and John F. Church, all of Modesto, Calif., assignors to Parker Hannifin Corporation, Cleveland, Ohio
Filed Dec. 23, 1987, Ser. No. 138,613
Int. Cl.[4] B01D 27/06, 27/08
U.S. Cl. 210—232 **10 Claims**

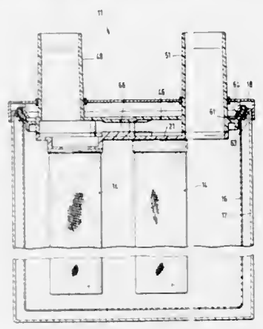


1. Fluid filter apparatus, comprising:
a generally cylindrical filter housing having an open end,
port means for routing fluid into and out of said housing,
a vertical standpipe in said housing in direct fluid communication with one of said port means,
a filter medium of annular configuration for separating out fluid contaminants disposed in surrounding relation of said standpipe, said filter medium having a first axial end and a second axial end,
an imperforate end cap secured to said second end of said filter medium , said end cap including a central opening for accepting said standpipe,
seal means for sealing said end cap and said standpipe, and
an imperforate disposable cover for closing said open end of said housing, said filter media permanently affixed at said first end to said cover and disposable therewith.

4,836,925
DEVICE FOR A FILTER DEVICE
Joachim Wolf, Malmsheimer Str. 67, 7252 Weil der Stadt, Fed. Rep. of Germany
Filed May 16, 1988, Ser. No. 194,299
Int. Cl.[4] B01D 27/08
U.S. Cl. 210—323.2 **12 Claims**

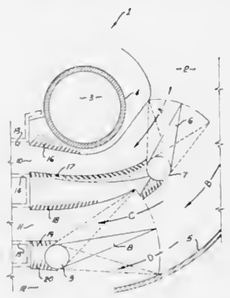
1. Device for a filter device, having
a circular adapter,
at least one connector extending downwards out of said adapter, to which connector a filter cartridge is attachable,
a feed hole in said adapter,
an outflow volume means above said adapter and communicating with said connector,
a circular head above said adapter,

a feed connector which extends upwards out of said head and communicates with said feed hole,
an outflow connector which extends upwards out of said head and communicates with said outflow volume means, and
comprising the improvement wherein:
(a) Said adapter and said head are in one piece,



(b) Said adapter and said head have circumferential regions and a circumferential wall thereat connecting said adapter and said head mechanically rigidly and tightly against a fluid medium, and
(c) An inner wall connects said adapter and said head mechanically rigidly and tightly against a fluid medium around said feed hole and around said feed connector.

4,836,926
STAGGERED SPIRAL SPLITTERS
Hans J. Grobler, Schoemansville, South Africa, assignor to Mineral Deposits Limited, Australia
Filed Jul. 17, 1987, Ser. No. 74,714
Claims priority, application Australia Jul. 21, 1986, PH7044
Int. Cl.[4] B03B 5/52
U.S. Cl. 210—512.1 **8 Claims**

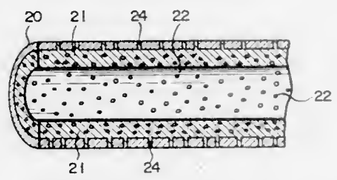


1. A spiral separator comprising a helical sluice of a generally U shaped cross section with a floor and a radial inner wall and a radial outer wall, further including a splitter assembly for dividing a flow of liquid suspended particles or slurry descending said sluice comprising a pair of pivotally mounted splitter blades each having an upstream working edge wherein the first pivotally mounted splitter blade is positioned to divert a portion of said flow onto the upstream working edge of the second splitter blade which is positioned adjacent the downstream end of the first splitter blade and spaced therefrom radially outwardly, and means for pivoting each of the splitter blades.

4,836,927
RECOVERY OF DEWAXING AID USING ASYMMETRIC POLYIMIDE ULTRAFILTRATION MEMBRANE AND METHOD FOR PRODUCING SAID MEMBRANE
Wan-Kei Wan, Sarnia, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.
Filed Mar. 28, 1988, Ser. No. 172,753
Int. Cl.[4] B01D 13/00
U.S. Cl. 210—651 **4 Claims**

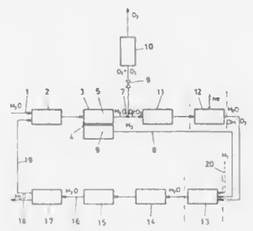
1. In a method for recovering dewaxing aids used in the solvent dewaxing of waxy hydrocarbon oils wherein the dewaxing aid is present in a dewaxed oil stream, a precipitated wax stream or both and wherein the dewaxing aid present in said dewaxed oil stream, precipitated wax stream or both is recovered by heating said stream so that the wax is in the liquid state and contacting said heated stream with an ultrafiltration polymeric membrane to selectively permeate through said membrane the oil or wax components of said heated stream while producing a retentate containing the dewaxing aid which retentate can be recycled to the solvent dewaxing process, the improvement comprising ultrafiltering said stream with a membrane made from polyimide polymer wherein the polyimide ultrafiltration membrane is produced by dissolving the polyimide polymer in a dual component solvent system comprising a pro-solvent and an anti-solvent pair used in a pro-solvent/anti-solvent ratio of between about 10:1 to 1:1 and adding 1 to 6 wt. % inorganic salt to produce a clear, non-turbid casting solution, using said casting solution to produce a thin layer of said polyimide polymer/dual solvent solution mixture, partially evaporating the solvent for from 1 to 60 seconds and thereafter quenching the film in a quenching solvent, and performing the ultrafiltration dewaxing aid recovery process at a temperature of about 70° to 250° C. and an applied pressure of about 5 to 200 psi.

4,836,928
SEPARATION METHOD, SEPARATION DEVICE AND SEPARATION APPARATUS FOR SEPARATING BODY FLUID INTO RESPECTIVE COMPONENTS
Juuro Aoyagi, Tokyo; Yuichi Yamamoto, Fujinomiya; Toshihiro Akaike, Hoya, and Yasuhiro Nozaki, Ootsu, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 26, 1985, Ser. No. 727,905
Claims priority, application Japan, Apr. 28, 1984, 59-86569
Int. Cl.[4] B01D 13/01, 15/08
U.S. Cl. 210—635 **10 Claims**



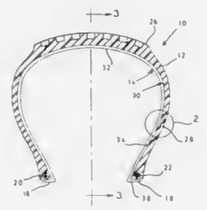
1. A method of separating a body fluid into respective components thereof, comprising the steps of:
providing a separator comprising at least one hollow fiber defining a body fluid flow path therein, said at least one hollow fiber being porous and containing at least one lipid having lipophilic groups and hydrophilic groups, and an immobilizer comprising hydrogel on an inner surface of said hollow fiber, said hydrogel having a crosslinked structure permeating into the pores of the porous hollow fiber whereby it is bonded to the porous fiber and immobilizing said at least one lipid such that the hydrophilic groups are directed towards said body fluid flow path;
flowing the body fluid through said body fluid flow path, whereby said body fluid contacts substantially only said hydrophilic groups of said lipid whereby a component of said contacted body fluid which has a strong adherent property to said hydrophilic groups adhers to said hydrophilic groups; and
collecting the residue of said body fluid, thereby separating from said body fluid said component having the strong adherent property to the hydrophilic groups.

4,836,929
PROCESS FOR BREAKING DOWN ORGANIC SUBSTANCES AND/OR MICROBES IN PRETREATED FEED WATER FOR HIGH-PURITY WATER RECIRCULATION SYSTEMS
Hans Baumann, Staretschwil, and Samuel Stucki, Nussbaumen, both of Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland
Filed Mar. 9, 1988, Ser. No. 165,902
Claims priority, application Switzerland, Mar. 11, 1987, 917/87
Int. Cl.[4] C02F 1/46
U.S. Cl. 210—638 **14 Claims**



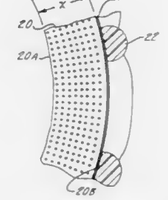
8. A process for purifying water, comprising the steps of:
(i) electrolizing water in an electrochemical cell provided with a solid electrolyte, an anode space and a cathode space, to form ozone in said anode space and hydrogen in said cathode space;
(ii) contacting said water with said ozone for sufficient time to break down any organic substances and microbes in said water to obtain an ozone treated water; and
(iii) contacting said ozone treated water with a portion of said hydrogen generated in said cathode space.

4,836,930
METHOD OF REPAIRING VEHICULAR TIRES
William R. Hill, P.O. Box 8310, Nashville, Tenn. 37207
Filed Feb. 18, 1988, Ser. No. 157,250
Int. Cl.[4] B32B 25/02, 31/20, 31/16
U.S. Cl. 156—97 **15 Claims**



1. A method for the restoration of a radial tire casing having a damage area including at least one damaged radial cord, said casing having an inner surface, an outer surface, a tread portion, side wall portions and first and further bead portions to engage a tire rim, which comprises the steps of:
removing material from said inner surface of said casing to a depth sufficient to remove all damaged radial cords from said casing to define a trough extending from said first bead portion to said further bead portion, including across both said bead portions, said trough having a peripheral contour in said side wall portions that tapers to conform to paths of radial cords in said casing;
inserting in said trough a patch unit having a peripheral contour corresponding to said peripheral contour of said trough and a thickness corresponding to said depth of said trough, said patch unit formed of uncured rubber and containing reinforcing cords substantially extending from a first end to a further end, said patch unit having a length sufficient to extend across said bead portions when inserted in said trough; and
heating said patch unit and said casing at said trough to a temperature for a time sufficient to cure said uncured rubber of said patch unit and thereby secure said patch unit in said trough whereby said reinforcing cords of said patch unit replace damaged cords of said casing to thereby restore said tire.

4,836,931
REINFORCED FILTER TUBE AND METHOD OF MAKING THE SAME
Michael R. Spearman, St. Paul; Patrick R. Spearman, and Daniel M. Spearman, both of Shoreview, all of Minn., assignors to Porous Media Corporation, St. Paul, Minn.
Filed Apr. 16, 1986, Ser. No. 852,544
Int. Cl.[4] B01D 27/08
U.S. Cl. 210—484 **20 Claims**



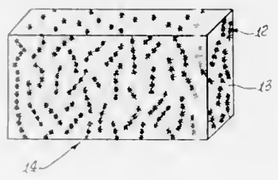
1. A filter including, in combination:
(a) a porous filter tube formed of randomly oriented glass fibers,
(b) at least one layer of a suitable thin sheet material wrapped around said porous filter tube and being in intimate contact therewith, and
(c) a seamless outer tubular support structure of sufficient rigidity to radially inwardly compress said porous filter tube and said suitable thin sheet material and having an inside diameter slightly smaller than the outside diameter of the combination of the porous filter tube and said outer layer of sheet material and completely surrounding said combination, said support structure having a low coefficient of friction in relation to said suitable thin sheet material thereby holding said combination in compression, and causing said outer layer of sheet material to be in intimate contact at virtually all points of said porous filter.

4,836,932

WATER TREATMENT USING FINE PARTICLE SUPER MAGNETS

John V. Walsh, Glendora, Calif., assignor to Micro Magnetics, Inc., Newport News, Va.

Filed Jun. 22, 1987, Ser. No. 64,505
Int. Cl.[4] B01D 35/06
U.S. Cl. 210—695 16 Claims



1. In a device useful for magnetic field treatment of water, the combination comprising:

(a) a non-magnetic solid metallic material matrix, and

(b) magnetic particles dispersed in said matrix, said particles selected from the group that includes:

(i) super ferromagnets

(ii) super para magnets,

(c) said particles being elongated and comprising agglomerations of unit particles, the unit particles comprising subparticle magnets about 1,000 Angstroms in length and agglomerated to form said unit particles, the agglomerations having lengths that are between about 10 to 20 times the lengths of the unit particles, said lengths being between about 10 to 100 microns, and the unit particles having sizes between about 2 and 10 microns, the metallic material extending between said elongated agglomerations.

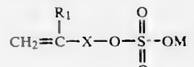
4,836,933

WATER TREATMENT POLYMER

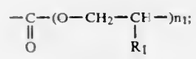
Peter G. Montague, Warwicks, and Peter Bainbridge, Northants, both of United Kingdom, assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Jan. 16, 1987, Ser. No. 4,395
Int. Cl.[4] C02F 5/10
U.S. Cl. 210—701 17 Claims

1. A method for treating aqueous systems to reduce or prevent the deposition of solid material therein comprising the addition thereto of an effective amount of a polymer or copolymer consisting essentially of 2 to 100 mole percent of a monomer of the following general structure:



where R_1 is independently H or CH_3 X is $(CH_2)n$ with n an integer of 0 to 1 or



n_1 is an integer of 1 to 10; and M is a metal cation, ammonium or hydrogen; 0 to 98% of a comonomer selected from the group consisting of acrylic acid, methacrylic acid, maleic acid and water soluble salt, thereof, acrylamide and its derivatives thereof; and 0 to 50% of a third copolymerizable comonomer.

4,836,934

SYSTEM FOR REMOVING LIQUID FROM SLURRIES OF LIQUID AND PARTICULATE MATERIAL

John C. Homer, Chardon, Ohio, assignor to General Signal Corporation, Stamford, Conn.

Filed Feb. 26, 1986, Ser. No. 833,943
Int. Cl.[4] B01D 36/00
U.S. Cl. 210—771 40 Claims

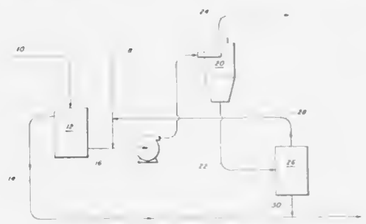
1. The method of removing liquid from a slurry of liquid and solid material particles which comprises filling a vessel with said slurry, separating liquid from the solid material of said slurry at the bottom of said vessel, collecting said separated liquid at the bottom of said vessel, discharging the collected liquid from the bottom of said vessel to remove most of the liquid from said slurry leaving a bed of wet solid material in said vessel, passing gas through said bed from the top to the bottom thereof of sufficient volume and velocity to transfer liquid adhering to said particles to the bottom of said vessel, and discharging the liquid transferred with said gas from the bottom of said vessel.

4,836,935

OIL REMOVAL FROM WATERFLOODING INJECTION WATER

Walter B. Lilienthal, Houston, Tex., assignor to Conoco Inc., Ponca City, Okla.

Filed Sep. 9, 1988, Ser. No. 242,944
Int. Cl.[4] B01D 17/038
U.S. Cl. 210—788 5 Claims



1. In a process of recovering crude oil from a subterranean formation by injecting flooding water into an injection well extending into said formation and recovering produced oil and water from at least one production well extending into said formation, and wherein said produced oil and water are separated and said water is reinjected through said injection well as flooding water, the improvement wherein:

(a) said produced oil and water is initially subjected to a rough separation step providing a produced oil stream and an oily water stream;

(b) mixing said oily water stream with a solvent for crude oil which is substantially insoluble in water and which has a specific gravity of at least 1.2;

(c) passing said oily water and solvent to a hydrocyclone;

(d) recovering substantially oil-free water from a first outlet of said hydrocyclone;

(e) recovering said solvent containing crude oil from said oily water from a second outlet of said hydrocyclone;

(f) separating said solvent from its contained crude oil;

(g) returning said recovered solvent to step (b); and

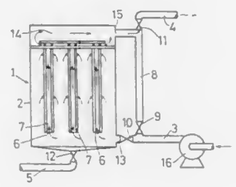
(h) reinjecting said oil-free water from step (d) as additional flooding water.

4,836,936

BATCH FILTERING METHOD

Alexander Schewitz, East London, South Africa, assignor to Al Exfiltra Company (Proprietary) Limited, South Africa

Continuation-in-part of Ser. No. 856,373, Apr. 28, 1986, abandoned. This application Apr. 8, 1987, Ser. No. 35,924
Claims priority, application South Africa, Feb. 21, 1986, 86/0724
Int. Cl.[4] B01D 29/32, 29/38
U.S. Cl. 210—791 3 Claims



1. In a method of batch filtration wherein liquid is passed through a layer of filter aid supported on a substrata therefor in a filter including a pressure vessel, and a filter cake is built up on the filter aid and wherein cleaning of the filter is carried out periodically by backwashing the filter cake and filter aid out of the filter followed by the introduction of clean filter aid into the filter, the filter having inlet and outlet means, wherein the improvement comprises a filtration cycle between successive backwashings which include a reversed pulse of liquid flow into a liquid flow outlet from the filter with all liquid inlets to the filter being closed and a drain from the filter being temporarily opened; to effect a temporary loosening and breaking up of both the layer of filter aid and the filter cake to cause the filter aid and filter cake to become at least partially admixed thereby enabling liquid to pass through the mixture more easily than before said reversed pulse, wherein filtration is carried out both before and after such reversed pulse of liquid flow, wherein the substrata for the filter aid is a flexible bag or sleeve supported on a frame therefor and the bag or sleeve is caused to billow outwardly during the reversed pulse of fluid flow to thereby assist in breaking up the filter cake and layer of filter aid and wherein the duration of the reversed pulse is about 10 seconds and the duration of the time the drain from the filter is temporarily opened is about 2 seconds such that the majority of the filter cake and filter aid remain temporarily suspended in the fluid within the pressure vessel during the reversed pulse.

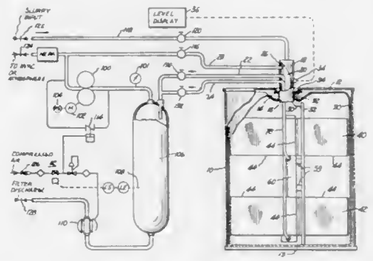
4,836,937

SYSTEM FOR REMOVING LIQUID FROM A SLURRY OF LIQUID AND POWDERED MATERIAL

John C. Homer, Chardon, Ohio, assignor to General Signal Corporation, Stamford, Conn.

Filed Mar. 4, 1986, Ser. No. 835,911
Int. Cl.[4] B01D 29/36, 37/00
U.S. Cl. 210—808 26 Claims

1. The method of removing liquid from and compacting a slurry of liquid/particulate material in a vessel which comprises the steps of forming a body of said particulate material upon a filter through which said liquid is withdrawn by applying suction to extract said liquid through said filter, compressing said body in a direction towards said filter while continuing to withdraw liquid through said filter in response to the suction, said compressing step comprising defining a chamber of variable volume in said vessel around said filter and said body,



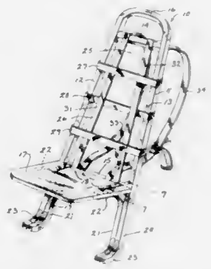
and reducing the volume of said chamber in response to the suction to compress said body.

4,836,938

MULTIPURPOSE CHAIR STRUCTURE

Timothy J. Kobasic, 814 Third Avenue South, Escanaba, Mich. 49829

Filed Sep. 19, 1986, Ser. No. 909,777
Int. Cl.[4] A47B 85/04
U.S. Cl. 224—155 7 Claims



1. In a multipurpose structure, a generally upright frame assembly having a pair of transversely spaced side rails connected by upper and lower transversely extending cross-members, said upper cross-member being disposed adjacent to the upper end of the side rails and said lower cross-member being spaced upwardly from the lower end of the side rails, a plate member hingedly connected to the frame assembly adjacent to the lower cross-member and being pivotally movable between a position generally normal to the frame assembly and a position generally paralleling the assembly, strapping means extending between the side rails and cross-members, respectively, said side rails extending beneath the lower cross-member to provide a pair of transversely spaced legs, said pair of legs supporting the structure as a chair when the frame assemble is propped up against a fixed object with the plate member disposed normal to the assembly to form a seat and with the strapping means serving as a backrest, said pair of legs alternatively supporting the structure for movement over the ground as a travois with the frame assembly and strapping means serving as a platform for carrying a load, said pair of legs further having forwardly curved lower end portions that extend well under the plate member seat to thereby enhance the stability of the structure as a chair, said curved leg end portions serving as ski-like bearing members for movement over the ground when the structure is used as a travois.

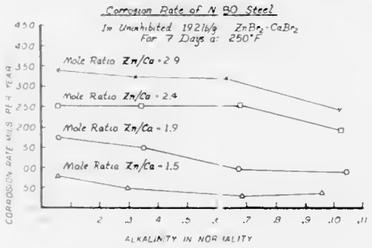
4,836,939
STABLE EXPANDABLE FOAM & CONCENTRATE & METHOD
Constance Hendrickson, Irving, Tex., assignor to Rockwood Systems Corporation, Lancaster, Tex.
Continuation of Ser. No. 889,272, Jul. 25, 1986, abandoned. This application Apr. 27, 1988, Ser. No. 188,095
Int. Cl.[4] C09K *21/00*; F42B *33/00*; B01J *13/00*; A62D *1/08*
U.S. Cl. 252—3 11 Claims

1. An aqueous concentrate composition for production of stable aqueous foam comprising:
a water carrier,
a micellar structure dispersed through said water in which the micelles include a surfactant material, a corresponding fatty alcohol and glycol,
a water soluble reactive polymer initially in anhydride form covalently bonded and cross-linked to at least one component of at least some of the micelles to form a reaction product having a greater solubility in water than said polymer and to provide stability to said concentrate and to improve the drainage of the foam formed by said concentrate, and
a biocide present in said concentrate in an amount effective to prevent bacterial damage to said surfactant material.

4,836,940
COMPOSITION AND METHOD OF CONTROLLING LOST CIRCULATION FROM WELLBORES
William Alexander, Naperville, Ill., assignor to American Colloid Company, Arlington Heights, Ill.
Filed Sep. 14, 1987, Ser. No. 95,638
Int. Cl.[4] C09K *7/00, 7/02*
U.S. Cl. 252—8.512 6 Claims

1. A composition for preventing and/or counteracting the lost circulation of a drilling mud comprising pellets of a homogeneous mixture of a water-swellable bentonite and a water-insoluble, water-absorbent cross-linked polyacrylate, wherein the weight ratio of the bentonite to the water-absorbent polymer ranges from about 1:3 to about 3:1.

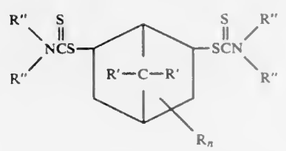
4,836,941
CLEAR BRINE FLUIDS
Robert C. Thomas, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Jan. 29, 1986, Ser. No. 823,568
Int. Cl.[4] E21B *43/00*; C09K *3/00*
U.S. Cl. 252—8.555 20 Claims

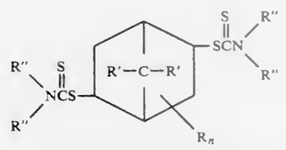


16. A method of servicing a well bore comprising introducing into the well bore a fluid comprising a solution of a zinc halide and a calcium halide in water having a density from about 15 to about 22 pounds per gallon, an alkalinity from about 0.5 to about 1 normal, and a zinc to calcium mole ratio from about 1 to about 3.

4,836,942
LUBRICANT COMPOSITION
William Y. Lam, Ballwin, Mo., assignor to Ethyl Petroleum Additives, Inc., St. Louis, Mo.
Filed Jun. 6, 1988, Ser. No. 202,319
Int. Cl.[4] C10M *135/18*
U.S. Cl. 252—47 38 Claims

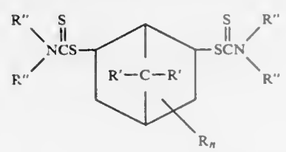
1. A lubricating composition containing a major amount of lubricating oil and a minor antiwear-antioxidant amount of an additive compound or mixtures of compounds having the general formulae:

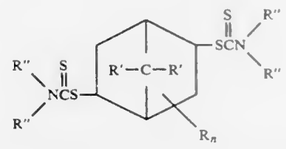

(A)


(B)

wherein R is an alkyl group containing from 1 to 20 carbon atoms, n represents a number selected from the class consisting of zero and the integers from 1 through 6, R′ represents a member selected from the group consisting of the hydrogen atom and those groups represented by R, and R″ is an aliphatic hydrocarbon group.

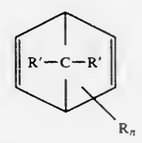
27. A process for preparing an oil-soluble compound or mixtures of compounds having the general formulae:


(A)


(B)

wherein R is an alkyl group containing from 1 to 20 carbon atoms, n represents a number selected from the class consisting of zero and the integers from 1 through 6, R′ represents a member selected from the group consisting of the hydrogen atom and those groups represented by R, and R″ is an aliphatic hydrocarbon group which comprises reacting a bicyclo(2.2.1-)hepta-2,5-diene having the general formula:

(C)



wherein R and R′ are as defined above with carbon disulfide and an amine having the general fromula:

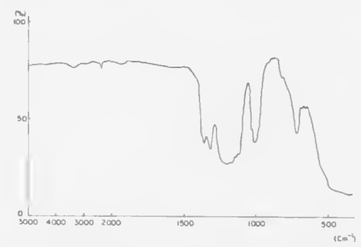
R″—NH—R″

where R″ is an aliphatic group havng up to 12 carbon atoms.

4,836,943
ANTI-OXIDANT SYSTEM
Maria M. Kapuscinski, Carmel; Christopher S. Liu, Poughkeepsie; Ronald E. Jones, Glenham, and Larry D. Grina, Hopewell, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.
Filed Jul. 15, 1987, Ser. No. 73,612
Int. Cl.[4] C10M *133/40, 129/10*
U.S. Cl. 252—50 19 Claims

1. An anti-oxidant composition comprising
(a) a hindered phenol and
(b) a N-aminohydrocarbyl pipecoline.

4,836,944
HALOGEN-CONTAINING POLYETHER AND ITS USE
Takashi Tohzuka; Sueyoshi Ishikawa; Katsuyoshi Kubo; Yoshitaka Honda; Yukio Ohmure, all of Osaka, and Norio Kataoka, Kyoto, all of Japan, assignors to Daikin Industries Ltd., Osaka, Japan
Filed Jun. 1, 1988, Ser. No. 200,962
Claims priority, application Japan, Jun. 2, 1987, 62-139516; Jun. 2, 1987, 62-139517; Jul. 24, 1987, 62-186020
Int. Cl.[4] C10M *147/04*
U.S. Cl. 252—54 6 Claims



1. A halogen-containing polyether which comprises a repeating unit structure of the formula:

$$-(CH_2CF_2CF_2O)_a-(CHClCF_2CF_2O)_b-(CCl_2CF_2CF_2O)_c-(CHFCF_2CF_2O)_d-(CFClCF_2CF_2O)_e-(CF_2CF_2CF_2O)_f- \quad (I)$$

wherein a, b, c, d, e and f are each 0 or a positive integer and satisfy the following equations:

$$2 \leqq a+b+c+d+e+f \leqq 200 \text{ and } 1 \leqq a+c+d+f$$

and at least one terminal group selected from the group consisting of groups represented by the formulas:

$-CH_2OH$, $-COOR^1$, $-CONR_2^1$, $-COOOR^2Ph$ and $-R^2Ph$

wherein R^1 is a hydrogen atom, a C_1–C_5 alkyl group or an aromatic group, R^2 is a divalent organic group and Ph is an aromatic group.

4,836,945
METHOD FOR SUPPRESSING DUST FROM BULK MATERIALS
Mark O. Kestner, Mendham, N.J., assignor to Chemicoal, Inc., Mendham, N.J.
Filed Oct. 28, 1987, Ser. No. 114,442
Int. Cl.[4] C09K *3/22, 17/00*
U.S. Cl. 252—88 8 Claims

1. A method for suppressing dust from the surface of a bulk coal material comprising:
preparing an aqueous suspension consisting essentially of between about 0.1 and 20 weight percent cellulosic fibers dispersed in water; and
applying said aqueous suspension to the surface of said coal in an amount of at least about one pound of cellulosic fiber per ton of coal so as to substantially suppress the generation of said coal dust from said coal through binding of the fibers and formation of a crust on the surface of said coal, sufficient to cause less than about a 10% reduction in the weight of coal particles below 30 mesh after 30 days of storage.

4,836,946
THIXOTROPIC CLAY AQUEOUS SUSPENSIONS CONTAINING ALKALI METAL FATTY ACID SALT STABILIZERS
Nagaraj S. Dixit, Kendall Park, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Aug. 21, 1987, Ser. No. 87,836
The portion of the term of this patent subsequent to Jan. 31, 2006, has been disclaimed.
Int. Cl.[4] C11D *3/20*
U.S. Cl. 252—97 21 Claims

1. An aqueous thixotropic automatic dishwasher composition comprising approximately by weight:
(a) 5 to 35% alkali metal tripolyphosphate;
(b) 2.5 to 20% sodium silicate;
(c) 0 to 9% alkali metal carbonate;
(d) 0.1 to 5% water-dispersible organic detergent active material;
(e) 0 to 5% foam depressant;
(f) thixotropic thickener in an amount of 0.1 to 2.5% sufficient to provide the composition with a thixotropy index of about 2 to 10;
(g) 0 to 8% of sodium hydroxide;
(h) an alkali metal or ammonium fatty acid salt as a physical stabilizer in an amount of 0.01 to 0.5% effective to increase the apparent viscosity and to increase the physical stability of the composition; and
(i) balance water.

4,836,947
AZEOTROPE-LIKE COMPOSITIONS OF 1,1-DICHLORO-1-FLUOROETHANE AND ETHANOL
Earl A. E. Lund, West Seneca; Robert G. Richard, Cheektowaga; Ian R. Shankland, and David P. Wilson, both of Williamsville, all of N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Jun. 9, 1988, Ser. No. 204,340
Int. Cl.[4] C11D *7/30, 7/50*
U.S. Cl. 252—171 6 Claims

1. Azeotrope-like compositions consisting essentially of 1,1-dichloro-1-fluoroethane and ethanol wherein said compositions have a boiling point of about 31.9° C.±0.05° C. at about 765 mm Hg.

4,836,948

VISCOELASTIC GEL DETERGENT COMPOSITIONS

Robert Corring, Rockaway Township, Delaware County, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Dec. 30, 1987, Ser. No. 139,490
Int. Cl.[4] C11D 3/12, 3/37, 17/08
U.S. Cl. 252—99 24 Claims

1. A cleaning composition in gel form having a viscosity on a Haake Rotovisco RV-100 Viscometer at 25° C. under 5 sec^{-1} shear of from about 1,000 to 20,000 cps and under 21 sec^{-1} shear of from about 200 to 5,000 cps, a pH range from 11 to 13, a steady state viscoelastic deformation compliance $J_e°$ value greater than 0.01, and a light transmittance not lower than 10% through a sample 2 cm thick said composition comprising:

(i) from 0.1 to 10% of a thickener that is a cross-linked polycarboxylic polymer; and

(ii) from 0.01 to 2% of alumina.

4,836,949

LIQUID DETERGENT COMPOSITIONS WITH PHOSPHATE ESTER SOIL UBILIZERS

Leslie J. Klajnscek, Guelph, Canada, assignor to Johnson & Johnson Consumer Products, Inc., New Brunswick, N.J.

Continuation-in-part of Ser. No. 3 ,419, Apr. 3, 1987, abandoned. This application Feb. 16, 1988, Ser. No. 156,385
Int. Cl.[4] C11D 3/04, 7/10, 11/00
U.S. Cl. 252—135 9 Claims

1. A liquid detergent composition comprising:

(a) from about 12 to 20% by weight of the total composition of an alkoxylated alcohol or alkoxylated alkyl phenol;

(b) from about 0.5 to 5.0% by weight of the total composition of a fatty acid or alkyl ether carboxylate;

(c) from about 0.5 to 5.0% by weight of the total composition of an alkyl phosphate ester or alkoxylate phosphate ester;

(d) from about 5.0 to 12.0% by weight of the total composition of a water-soluble builder; and

(e) from about 55.0 to 85.0% by weight of the total composition of water.

4,836,950

LIQUID FOR REMOVING PRINTING AND SCREEN PRINTING INKS: BUTYROLACTONE AND/OR N-METHYL-2-PYRROLIDONE AND PROPYLENE GLYCOL DERIVATIVE

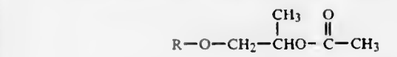
Claus H. Madsen, Vedbæk, and Charles M. Hansen, Horsholm, both of Denmark, assignors to CPS KEMI ApS, Denmark

PCT No. PCT/DK85/00119, § 371 Date Sep. 18, 1986, § 102(e) Date Sep. 18, 1986, PCT Pub. No. WO86/03766, PCT Pub. Date Jul. 3, 1986
PCT Filed Dec. 13, 1985, Ser. No. 916,494
Claims priority, application Denmark, Dec. 14, 1984, 6004/84
Int. Cl.[4] C09D 9/00
U.S. Cl. 252—153 13 Claims

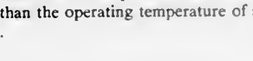
1. A liquid for removing printing and screen printing inks, characterized by consisting of an essentially anhydrous mixture comprising

(a) γ-butyrolactone and/or N-methyl-2-pyrrolidone in an amount of 1-25% v/v) as well as

(b) one or more propylene glycol derivatives selected from substituted propyl acetates of the formula



wherein R is hydrogen or alkyl having from 1 to 6 carbon atoms, and/or propylene glycol ethers of the formula



wherein R_1 is alkyl having from 1 to 6 carbon atoms, and n is 1, 2 or 3, and optionally

(c) a diluent selected from aliphatic compounds having a flash point above 22° C. and a content of aromatic compounds below 1% and/or

(d) a surfactant, the amount of components (b), (c) and (d) constituting 99-75% (v/v) of the liquid.

4,836,951

RANDOM POLYETHER FOAM CONTROL AGENTS

George E. Totten, West Haverstraw, and Gordon C. Johnson, Armonk, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 830,762, Feb. 19, 1986, abandoned. This application Mar. 9, 1987, Ser. No. 23,231
Int. Cl.[4] C11D 1/722
U.S. Cl. 252—174.21 29 Claims

1. A formulation for use in a mechanical dishwasher, said formulation having low foaming properites and which leaves a minimum of spotting and filming on articles washed in said mechanical dishwaser, said formuation containing a foam controlling amount of a copolyethers having a molecular weight of at least about 2000, and containing random ethyleneoxy groups, copolymerized with at least one other alkyleneoxy group selected from the group consisting of propyleneoxy and butyleneoxy groups, wherein said ethyleneoxy groups are present in an amount of at least about 20 percent by weight of the polyether component of said polyether, and wherein said polypropyleneoxy and butyleneoxy groups are present in an amount such that the cloud point of said foam control agent is no greater than the operating temperature of said mechanical dishwasher.

4,836,952

DEOXYGENATING COMPOSITION

Yasunobu Nasu, Fuchu, and Haruhiko Uchida, Musashimurayama, both of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1987, Ser. No. 36,782
Claims priority, application Japan, Apr. 16, 1986, 61-87763
Int. Cl.[4] C09K 15/02, 15/30, 15/32; A23B 4/14
U.S. Cl. 252—188.28 12 Claims

1. A deoxygenating composition comprising a metal-chelated resin which contains nitrogen and an iron powder, provided, however, that the metal of the metal-chelated resin is not Pb^{+2}, Cd^{+2} or Cr^{+3}.

4,836,953

PROCESSES FOR ENHANCING FLUORESCENCE OF TI:A1203 TUNABLE LASER CRYSTALS

Milan R. Kokta, Washougal, Wash., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 9, 1988, Ser. No. 154,033
Int. Cl.[4] C09K 11/36
U.S. Cl. 252—301.4 F 8 Claims

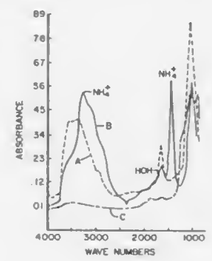
1. A method for enhancing a Ti doped Al_2O_3 crystal suitable as a laser material comprising maintaining the crystal at a temperature of about 1750° C. to 2025° C. in an inert atmosphere containing sufficient hydrogen for a time sufficient to enhance the Figure of Merit of the crystal.

4,836,954

FLUORINATED PHYLLOSILICATE AND METHOD

Hermann L. Rittler, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 22, 1987, Ser. No. 136,359
The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.
Int. Cl.[4] C04B 20/06
U.S. Cl. 252—378 R 19 Claims



1. A method of modifying a 3-layer phyllosilicate material which comprises providing a 3-layer phyllosilicate material having ion bonding sites on its surface, at least a portion of which are occupied by hydroxyl ions, and exposing the phyllosilicate material to an external source of fluoride ions, whereby fluoride ions from such source occupy said ion bonding sites in exchange for hydroxyl ions on the surface of the 3-layered phyllosilicate material without change in the phyllosilicate layered crystal structure.

4,836,955

CONDUCTIVE COMPOSITIONS

John E. Ehrreich, Acton, Mass., assignor to Ercon, Inc., Waltham, Mass.

Continuation of Ser. No. 757,061, Jul. 19, 1985, Pat. No. 4,716,081. This application Nov. 3, 1987, Ser. No. 116,025
The portion of the term of this patent subsequent to Dec. 29, 2004, has been disclaimed.
Int. Cl.[4] H01B 1/02
U.S. Cl. 252—512 37 Claims

1. A composition comprising an organic resin binder and electrically-conductive powder filler wherein said powder is a copper powder cleaned in a metal-complexing cleaning bath and thereupon plated with a silver coating in a plating solution and finally heat treated for a period of time effective to enhance its heat-aging stability when loaded into an organic polymer resin matrix.

29. An electroconductive composition comprising a conductive powder of silver-coated non-noble metal and an organic-resin matrix in which said powder is present in particle-to-particle contact, said composition having the property of increasing in volume resistivity by less than 100 times to a value of less than 100 ohms when it is heated at 195° C. for 500 hours.

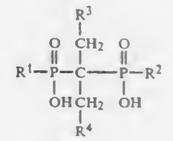
4,836,956

EXTRACTION OF POLYVALENT METALS WITH ORGANODIPHOSPHONIC ACIDS

Kenneth M. Kem, Emmaus, Pa., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation of Ser. No. 819,665, Mar. 10, 1986. This application Jul. 24, 1987, Ser. No. 77,708
Int. Cl.[4] C01G 43/00, 49/00
U.S. Cl. 252—631 7 Claims

1. In a process for selectively extracting uranium and iron cations from an aqueous phase to an organic phase, said process comprising contacting an aqueous phosphoric acid solution containing the uranium and iron cations with an extractant dissolved in an organic solvent for sufficient time to remove the cations from the aqueous solution, the improvement comprising utilizing as an extractant at least one chemical compound having the general formula



where

R^1 and R^2 are hydroxyl;

R^3 is independently selected from substituted or unsubstituted alkyl and alkylaryl groups having 1 to about 18 carbon atoms or hydrogen; and

R^4 is independently selected from alkyl and alkylaryl groups having 1 to about 18 carbon atoms, provided that the sum of the carbon atoms of R^1, R^2, R_3 and R^4 is at least 16.

4,836,957

STABILIZED ACTIVE FORMS OF VITAMIN D_3

Kaoru Nemoto; Kazuo Igusa, and Toshichika Ogasawara, all of Tokyo, Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1986, Ser. No. 828,596
Claims priority, application Japan, Feb. 14, 1985, 60-28073
Int. Cl.[4] C07J 9/00
U.S. Cl. 260—397.2 3 Claims

1. A preparation comprising:

an active form of vitamin D_3 selected from the group consisting of 1 alpha-hydroxyvitamin D_3, 1 alpha,24-dihydroxyvitamin D_3, 1 alpha,25-dihydroxyvitamin D_3; 1 alpha, 24, 25-trihydroxyvitamin D_3; 26,27-hexafluoro-lalpha, 25-dihydroxyvitamin D_3, 24-hydroxy-vitamin D_3; and 25-hydroxyvitamin D_3 and a stabilizing amount of a basic or neutral amino acid, wherein said preparation is free of acidic amino acids and salts of basic amino acids, and wherein said amino acid is free of acid amide groups and sulfur-atoms.

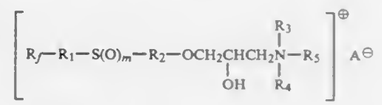
4,836,958

FLUORINATED CATIONIC COMPOUNDS

Athanasios Karydas, Brooklyn, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 31, 1986, Ser. No. 892,216
Int. Cl.[4] C07C 147/02, 147/14, 149/24
U.S. Cl. 260—501.15 16 Claims

1. A compound of the formula



(I)

wherein

R_f is a perfluoroalkyl having up to 18 carbon atoms which is unsubstituted or substituted by a C_3–C_{18} perfluoroalkoxy group;

R_1 is a C_1–C_7 alkylene which is uninterrupted or interrupted by a group selected from the group consisting of —O—, —SO—, —SO_2—, —CO_2—, —NR′—, —SO_2NR′— and —CONR′—, wherein R′ is hydrogen or C_1–C_7 alkyl;

m is 0, 1 or 2;

R_2 is a C_2–C_4 alkylene;

R_3, R_4 and R_5 are each independently C_1–C_{18} alkyl or

C_7–C_{18} aralkyl each of which is unsubstituted or substituted by hydroxy, C_1–C_4 alkoxy, halogen, cyano, or poly (C_2–C_4) alkyleneoxy having from about 3 to 50 alkyleneoxy units terminated by hydroxy or lower alkoxy; and

$A^{\ominus}$ is an anion.

4,836,959

PROCESS FOR THE PREPARATION OF 1-AMINONAPHTHALENE-2,4,7-TRISULPHONIC ACID AND 1-AMINONAPHTHALENE-7 SULPHONIC ACID

Willi Streicher; Gerhard Marzolph, both of Cologne; Horst Behre, and Heinz U. Blank, both of Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 900,560, Aug. 26, 1986. This application Jan. 26, 1988, Ser. No. 148,478

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1985, 3531921

Int. Cl.[4] **260** *50*

U.S. Cl. 260—508 **4 Claims**

1. A process for the preparation of 1-aminonaphthalene-7-sulphonic acid from 1-aminonaphthalene or 1-aminonaphthalene-2-sulphonic acid, 1-aminonaphthalene-4-sulphonic acid and/or 1-aminonaphthalene-2,4-disulphonic acid, which process comprises the steps

(a) sulphonating 1-aminonaphthalene or 1-aminonaphthalene-2-sulphonic acid, 1-aminonaphtalene-4-sulphonic acid and/or 1-aminonaphthalene-2,4-disulphonic acid, in the presence of additives selected from the group consisting of acid amides, alkali metal, alkaline earth metal or ammonium salts of acids which are displaced from their salts in sulphuric acid and (b) hydrolysing the resulting 1-aminonaphthalene-2,4,7-trisulphonic acid by warming in aqueous sulphuric acid.

4,836,960

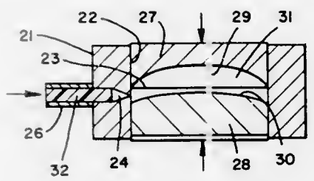
FABRICATION OF THERMOPLASTIC OPTICAL COMPONENTS BY INJECTION/COMPRESSION MOLDING

David P. Spector, Sausalito, and Jeffrey M. Kingsbury, Santa Rosa, both of Calif., assignors to Soft Lens USA, Inc., Petaluma, Calif.

Filed Oct. 5, 1987, Ser. No. 104,235

Int. Cl.[4] **B29D** *11/00*

U.S. Cl. 264—2.2 **28 Claims**



1. A method for molding a component in a molding cavity defined by a pair of axially spaced molds slidably mounted within a sleeve, which comprises the steps of spacing the molds to define a cavity having a volume in excess of that required to form the finished component, filling the cavity with a polymeric molding material at a temperature of the same order as the molds defining the molding cavity by extrusion through an inlet passage in said sleeve, at least the molds having been heated to a temperature above, but relatively close to, the glass transition temperature of the molding material, moving one or both molds to reduce the volume of the cavity to the desired size of the component plus any allowance for thermal shrinkage thereby compressing the molding material within the cavity and causing any excess molding material to be extruded out of the mold cavity, applying pressure to the molten material through one or both of the molds to form the component under conditions where shrinkage is accommodated while gradually cooling the molds, the sleeve and the component through the glass transition temperature, and removing the molds and the component from the sleeve.

10. An apparatus for molding finished ophthalmic lenses, comprising a plurality of molding assemblies, each molding assembly including a sleeve member having a bore extending therein, a pair of mold dies having contoured molding surfaces adapted to form complementary front and back surfaces of a lens, said dies further including outer peripheral surfaces dimensioned to be received in said bore with minimal clearance for sliding translation therein, said mold dies being received in said bore in spaced apart relationship to define therebetween a mold cavity; means for processing said plurality of molding assemblies individually and consecutively, including means for injecting a thermoplastic molding material in a molten state into said mold cavity, means for moving said mold dies together to compress said molding material and to squeeze excess molding material from said molding cavity.

4,836,961

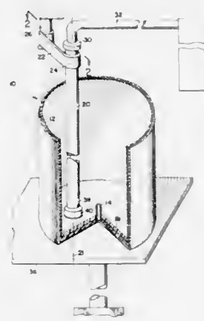
METHOD OF AND APPARATUS FOR CASTING SOLID PROPELLANT ROCKET MOTORS

Richard E. Morgan, Huntsville, and Charles B. Dye, Albertville, both of Ala., assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Jan. 2, 1987, Ser. No. 288

Int. Cl.[4] **C06B** *21/00, 45/00;* **F02K** *9/00*

U.S. Cl. 264—3.1 **10 Claims**



1. A method of casting a solid propellant rocket motor, said motor including a casing having a bottom with a short tubular receptacle therein for receiving the end of a core member, comprising the steps of:

(a) introducing uncured propellant under pressure into said motor casing through a bayonet arranged in an upright position and having at least one thin slit formed in an exit end thereof with said exit end placed between said tubular receptacle and the wall of said casing, the uncured propellant in passing through said thin slit in the exit end of said bayonet becoming more fluid thereby improving the fluidity and self-leveling behavior of the propellant, whereby the propellant flows more uniformly around said tubular receptacle and minimizes any tendency for the trapping of air in the propellant and the formation of voids therein,

(b) shifting the relative positions of said motor casing and said bayonet such that said bayonet is in an upright position with the exit end thereof positioned centrally of said motor casing when the level of the propellant therein rises above the tubular receptacle whereby to cause said propellant to be placed uniformly around the central area of the propellant in the motor casing,

(c) relatively retracting said bayonet and motor casing as the level of propellant rises in the motor casing as required to maintain the exit end of said bayonet continually in engagement with the surface of said propellant whereby to minimize any tendency for the trapping of air and the formation of voids in said propellant,

(d) introducing an elongated core member through the uncured propellant when the motor casing is filled with uncured propellant, such introduction being substantially coincident with the central axis of the motor casing with the inner end of said core member inserted into said tubular receptacle on the bottom of the motor casing,

(e) curing said propellant in said motor casing with said core member therein, and

(f) withdrawing said core member from the cured propellant in said motor casing.

4,836,962

MATERIAL INJECTING METHOD AND MATERIAL MEASURING APPARATUS IN INJECTION MOLDING MACHINE

Katashi Aoki, 6037 Ohazaminamijo, Sakakimachi, Hanishina-gun, Nagano-ken, Japan

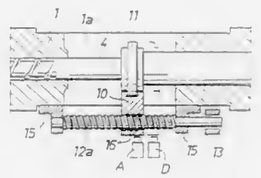
PCT No. PCT/JP86/00303, § 371 Date Feb. 12, 1987, § 102(e) Date Feb. 12, 1987, PCT Pub. No. WO86/07561, PCT Pub. Date Dec. 31, 1986

PCT Filed Jun. 17, 1986, Ser. No. 26,846

Claims priority, application Japan, Jun. 17, 1985, 60-131535; Mar. 14, 1986, 61-56560

Int. Cl.[4] **B29C** *45/23, 45/76*

U.S. Cl. 264—40.5 **10 Claims**



1. A method for controlling a dosage of injected material in an injection molding machine, comprising the steps of:

feeding a material to be injected into the injection molding machine;

enabling an injection screw of the molding machine to rotate and move backward away from a discharge nozzle of the injection machine to set the size of the dosage of material;

providing a measurement completed sensor, detecting the arrival of a predetermined portion of the injection screw at the sensor and terminating feeding of the material responsive thereto;

locating a variably positionable stop position means of a stopper means at a selected location relative to the injection screw in a manner that is effective to stop backward movement of the injection screw at a stop position, subsequent to the arrival of the injection screw at the sensor, the stop position means being movably locatable relative to the injection screw along an axial path, anywhere between two end positions on the axial path; and

stopping backward movement of the injection screw at the stop position by actuating the stopper means.

4,836,963

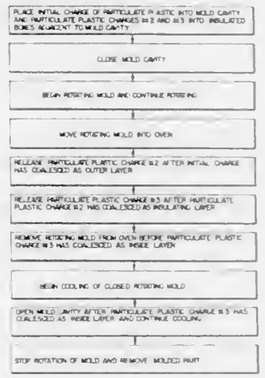
ROTATIONAL MOLDING METHOD

Llewellyn A. Gilman, Jr., Hampden, Me., assignor to Old Town Canoe Company, Old Town, Me.

Continuation of Ser. No. 606,067, May 1, 1984, abandoned. This application May 26, 1987, Ser. No. 53,542

Int. Cl.[4] **B29C** *67/22, 41/06*

U.S. Cl. 264—45.7 **10 Claims**



1. A rotational molding method for making a laminated plastic structure in a mold assembly mold cavity, comprising:

rotating the mold assembly containing a first charge of particulate thermoplastic material within the mold cavity within an oven heated to a temperature to coalesce the thermoplastic material along the cavity wall to form a first layer;

releasing into the mold cavity a second charge of a particulate thermoplastic material while continuing rotation of the mold assembly within the oven;

continuing such mold assembly rotation within the oven until the second charge begins to coalesce along the first layer to form a second layer; and

removing the mold assembly from the oven for cooling prior to completion of the coalescence of said second charge;

whereby the cooling of the mold assembly and the first layer is concurrent with completion of the coalescence of the second layer so as to shorten the elasped time during the molding process.

4,836,964

METHOD OF PRODUCING A BOW HOLDING HANDLE

Son-Kung Tsai, No. 1, 77 Alley, 71 Lane, 2 Sec. Fu Hsing Rd., Taichung, Taiwan

Continuation of Ser. No. 70,874, Jul. 2, 1987, abandoned. This application Nov. 1, 1988, Ser. No. 266,348

Int. Cl.[4] **B29C** *67/22*

U.S. Cl. 264—46.7 **1 Claim**

1. A method for producing a bow holding handle comprising the steps of:

(a) providing a first mold cavity having the same shape as said bow holding handle but in smaller size;

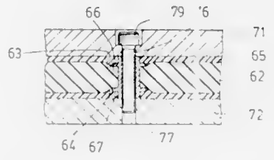
(b) placing a plurality of nuts into corresponding positions of said first mold cavity, each of said plurality of nuts including flanges at both ends thereof which engage with convex portions in a wall surface of said first mold cavity;

(c) sealing said first mold cavity

(d) injecting liquid foamable plastic into said first mold cavity;

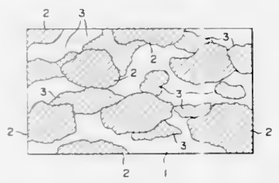
(e) activating said liquid foam plastic to cause expansion thereof and to form a core of said bow holding handle having the same shape of said first mold cavity, said core

having a plurality of concave portions which engage said convex portions;
(f) removing said core of said bow holding handle away from said first mold cavity;
(g) wrapping said core of said bow holding handle with a plurality of layers of fiber reinforced plastic;
(h) providing a second mold cavity corresponding the shape of said bow holding handle;
(i) inserting said wrapped core of said bow holding handle into said second mold cavity;
(j) sealing said second mold cavity;



(k) heating said second mold cavity to cure said layers of fiber reinforced plastic and to cause re-expansion of said core for generating pressure within said second mold cavity pressing said core against said layers of fiber reinforced plastic to thereby provide intimate bonding of said core to said layers; and
(l) removing said wrapped core from said second mold cavity as an integral fiber reinforced plastic bow holding handle
wherein when the handle is removed, the flanges of each of the plurality of nuts is fixed between the concave portions of the core and the fiber reinforced plastic layer thereby securely fixing the nuts in position in the handle.

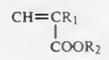
4,836,965
METHOD OF PRODUCING HEAT TREATING FURNACE MEMBER
Kenro Hayashi, Hadano, and Takashi Tanaka, Yamagata, both of Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 736,861, May 22, 1985, abandoned. This application Sep. 8, 1987, Ser. No. 97,344
Claims priority, application Japan, May 23, 1984, 59-102713
Int. Cl.[4] C04B *35/56*
U.S. Cl. 264—60 11 Claims



1. A method for producing a member of a heat-treating furnace having high-strength and high-density, consisting essentially of:
(a) forming a slip by preparing a mixture consisting essentially of SiC powder, 5–20% by weight of carbon powder based on the SiC powder, an effective amount of a deflocculating agent, and water;
(b) forming the slip into a shaped body, said shaped body having SiC and carbon substantially uniformly dispersed therein;
(c) curing the shaped body under a non-oxidizing gas atmosphere;
(d) removing impurities from the shaped body by a wet or dry process; and
(e) immersing the shaped body in molten silicon to form silicon carbide by the reaction between the impregnated silicon and the carbon contained in the raw material, to thereby form a three-dimensionally interconnected SiC structure therein.

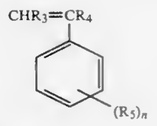
4,836,966
BINDER FOR CERAMICS
Isoo Shimuzu, 29-113 Nagahama, Kanzawa-ku, Yokohama-shi, Kanagawa-ken; Yasuo Matsumura, 3-35-4 Ohkubo, Konan-ku, Yokohama-shi, Kanagawa-ken, and Yoshihisa Inomata, 1-6-1205 Kawaracho, Saiwai-ku, Kawasaki-shi, Kanagawa-ken, all of Japan
Continuation-in-part of Ser. No. 924,143, Oct. 27, 1986, abandoned, which is a continuation of Ser. No. 711,992, Mar. 14, 1985, abandoned. This application Mar. 16, 1988, Ser. No. 168,863
Claims priority, application Japan, Mar. 15, 1984, 59-49462; Oct. 23, 1984, 59-222389
Int. Cl.[4] C04B *33/13*
U.S. Cl. 264—63 11 Claims

1. A method for producing a sintered ceramic sheet which comprises molding an aqueous slurry composition which contains a sinterable inorganic powder and 1 to 50% by weight of a water-soluble binder based on the weight of the inorganic powder to a sheet-like form, drying the molded slurry to a green sheet and sintering the green sheet by heating, said water-soluble binder comprising a copolymer of:
(A) 5 to 45 mol % of acrylic acid, methacrylic acid or mixtures thereof;
(B) 1 to 95 mol % of at least one of vinyl compound represented by the formula (I) or (II)



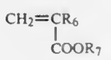
(I)

wherein R_1 is a hydrogen atom or a methyl group and R_2 is an alkyl group having 1 to 18 carbon atoms;



(II)

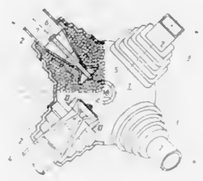
wherein each of R_3, R_4 and R_5 is a hydrogen atom, a methyl group or an ethyl group, and the total number of carbon atoms of R_3, R_4 and $(R_5)_n$ is a 2 or less and n is an integer of 0 to 2; and
(C) 0 to 54 mol % of at least one α,β-unsaturated carboxylate selected from acrylates and methacrylates containing hydroxyl groups represented by the formula (III)



(III)

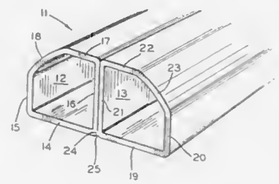
wherein R_6 is a hydrogen atom or a methyl group and R_7 is a hydroxy allsyl group having 2 to 4 carbon atoms;
at least 85 mol % of carboxyl groups contained in said copolymer being neutralized with a 6 to 9 carbon atom tertiary amine.

4,836,967
PROCESS FOR PRODUCING A JOINT FOR A FRAMED STRUCTURE
Erich Frantl, and Peter Hofstätter, both of Vienna, Austria, assignors to Manfred Beer, Modling, Austria
Filed Jan. 13, 1987, Ser. No. 2,902
Claims priority, application Austria, Jan. 14, 1986, 69/86
Int. Cl.[4] B28B *1/10*; B29C *43/00*; B32B *31/06*
U.S. Cl. 264—69 10 Claims



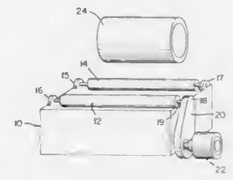
1. A process for forming a joint for connecting at least three members of a frame structure in a metal casing having a filling aperture and openings therein receiving positive-connection-forming end portions of the members, the process comprising the steps of:
introducing a compression-resistant granular solid material having a grain size from 5 millimeters to 100 millimeters into the metal casing;
providing a mandrel;
driving the mandrel into the casing, through the filling aperture, to apply pressure to the material and thereby prestess the material within the casing; and
injecting a shrinkproof hardening fluid into the casing.

4,836,968
METHOD OF MAKING FIBER OPTIC DUCT INSERT
Mehmet Y. Cakmakci, Rochester Hills, Mich., assignor to Sterling Engineered Products Inc., Maumee, Ohio
Filed Apr. 15, 1987, Ser. No. 38,505
Int. Cl.[4] B29C *47/88*
U.S. Cl. 264—177.19 5 Claims



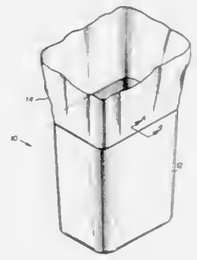
1. A method of forming a multi-chambered conduit insert comprising the steps of:
(a) forming a longitudinally extending first chamber having substantially parallel inner and outer walls connected together at respective edges by a bottom wall and a top wall;
(b) simultaneously forming a second longitudinally extending chamber substantially parallel to said first chamber and having substantially parallel inner and outer walls joined at respective edges by a bottom and a top wall;
(c) simultaneously with steps (a) and (b) forming a hinge portion connecting abutting edges of said inner walls and said bottom walls of said first and second chambers whereby said inner walls of said first and second chambers are spaced apart; and
(d) exposing exterior surfaces of said first and second chambers including said spaced apart inner walls to a cooling medium.

4,836,969
METHOD OF CASTING A STRUCTURE FROM CEMENTITIOUS
Laurence Colin, Cross River, and Vincent A. Pardiso, Scarsdale, both of N.Y., assignors to Cemtech Laboratories Inc., New Milford, Conn.
Filed Apr. 30, 1987, Ser. No. 44,349
Int. Cl.[4] B28B *1/20*
U.S. Cl. 264—311 9 Claims



1. A method of casting a hollow structure from cementitious material comprising preparing a cementitious admixture of hydraulic cement, water and particles of aggregate containing presized inorganic filler particles having a maximum size of about 50 microns in a predetermined proportion to said hydraulic cement such that said admixture is substantially non-dilatent and thixotropic, feeding said admixture onto a predetermined surface of a hollow mold having a predetermined surface geometry corresponding to the surface geometry of said hollow structure to be cast with said admixture being fed against said predetermined surface from a feeding device having throat means through which said admixture is fed with said throat means spaced a predetermined distance from said predetermined surface for controlling the hollow wall thickness of said cast structure while simultaneously rotating said mold relative to said admixture and moving said throat means axially relative to said mold to form said hollow cast structure with said predetermined surface geometry and hollow wall thickness.

4,836,970
METHOD OF EXTRUSION BLOW-MOLDING CONTAINER HAVING UPPER AND LOWER SECTIONS OF DIFFERENT THICKNESS
Edward S. Robbins, III, 459 N. Court St., Florence, Ala. 35630
Division of Ser. No. 8,658, Jan. 30, 1987, abandoned. This application Nov. 20, 1987, Ser. No. 123,325
Int. Cl.[4] B29C *47/06, 49/04, 49/22, 49/74*
U.S. Cl. 264—515 17 Claims



1. A method of making a plastic container comprising an

enclosure having integral upper and lower portions, said lower portion being generally tubular and including side walls of a plastic material of a predetermined thickness and a bottom wall, and said upper portion being a tubular extension of said lower portion, and having an open upper end, and being of a flexible, gatherable, and non-self-supporting thin film plastic material of a predetermined thickness substantially less than the thickness of the plastic material forming said lower portion, whereby the container may stand in an upright orientation with the side wall supporting said upper and lower portions, the steps comprising forming said upper and lower portions by extruding sequentially continuous first and second portion of a parison having first and second wall thicknesses, one thickness being substantially less than other, disposing said first and second parison portions in a blow mold having mold walls, urging the first and second parison portions into conformance with the mold walls to form the container, the parison portion of substantially less thickness forming said upper container portion, and removing a part of said upper portion to form said open upper end.

4,836,971

METHOD FOR MANUFACTURING HEAT RESISTANT PET CONTAINERS

Gerard Denis, Turretot, and Jean-Michel Rius, Le Havre, both of France, assignors to Sidel, Le Havre, France

Filed Oct. 31, 1986, Ser. No. 925,587
Claims priority, application France, Mar. 4, 1986, 86 03013
Int. Cl.[4] B29C *49/06, 49/18, 49/64*
U.S. Cl. 264—521 **6 Claims**

1. A two-step biorientation method for manufacturing containers of polyethyleneterephthalate (PET) which are capable of subsequently being subjected, without substantial deformation, to relatively severe heat conditions during processes such as being filled with a hot liquid or the pasteurization of their contents, comprising, in sequence, the steps of:

(a) on an amorphous PET container preform (1) comprising a body portion (5) and a neck portion (2) which is already conformed to its final shape and dimensions, heating at a first heating station only the neck to a temperature and for a time sufficient to crystallize the neck;

(b) slowly cooling the neck;

(c) at a second heating station, heating only the body (5) of the preform (9), exclusive of the neck, to the softening temperature of PET;

(d) blow molding the hot preform body in a first blow mold having mold walls maintained at a temperature of from 5° to 40° C. to form a intermediate container whose body (22) has dimensions greater by approximately 20% in height and 0 to 30% in width than the dimensions of a final container to be obtained, a first biorientation occurring during this blow molding step; thereafter,

(e) at a third heating station, heating only the body (22) of the intermediate container to a temperature of 180° to 220° C. for a period of 1 to 15 minutes, said intermediate container undergoing considerable deformation and shrinkage as a result of this heating step; and then,

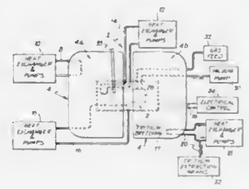
(f) transferring said hot intermediate container from step (e) to a second blow mold and blow molding said hot intermediate container to its final shape and dimensions in said second blow mold having mold walls maintained at a temperature of 80° to 100° C. for a period of 2 to 6 seconds, a second biorientation occurring during this blow molding step.

4,836,972

CONTROLLED THERMONUCLEAR FUSION DEVICE AND METHOD

Robert W. Bussard, Arlington, Va., and Bruno Coppi, Winchester, Mass., assignors to FDX Patents Holding Company, N.V., Curacao, Netherlands Antilles

Continuation of Ser. No. 408,636, Aug. 16, 1982, abandoned, which is a division of Ser. No. 158,228, Jun. 10, 1982, Pat. No. 4,363,775, which is a continuation of Ser. No. 5,104, Jan. 22, 1979, abandoned, which is a continuation of Ser. No. 755,794, Dec. 30, 1976, abandoned. This application Oct. 1, 1985, Ser. No. 782,150
Int. Cl.[4] G21B *1/00*
U.S. Cl. 376—131 **20 Claims**



1. A modular installation for generating thermal energy from fusion reactions in an ionized plasma of fusible fuel comprising:

(a) a plurality of fusion core units each including as components thereof,

1. a toroidal vacuum plasma cavity for containing said fusible fuel and

2. a plurality of toroidal field coils surrounding said plasma cavity for generating a toroidal magnetic field therein; and

3. ohmic heating means for inducing an ohmic heating current in the ionized plasma within the plasma cavity of each of said fusion core units for raising the temperature of said plasma, said ohmic heating means including a transformer means contained within an area of said core so that said toroidal plasma cavity surrounds said transformer means, and said ohmic heating current generating a poloidal magnetic field within said plasma, said components of each fusion core unit being so arranged and interconnected as to allow handling of said fusion core as a single entity;

(b) disconnectable means extending into each of said fusion core units for delivering said fusible fuel therein;

(c) a plurality of disconnectable means for transporting a cooling fluid to and through the toroidal field coils of each of said fusion core units;

(d) a power supply connected through disconnectable means to said toroidal field coils for generating a toroidal magnetic field for confining the ionized plasma within the plasma cavity of said fusion core units, said toroidal magnetic field having a strength of on the order of greater than 100 KG;

(e) said plurality of toroidal field coils comprising high-strength, non-superconducting conductors for sustaining said toroidal magnetic field and for withstanding thermal energy resulting from said fusion reactions;

(f) a plurality of blanket means, one corresponding to each of said fusion core units, each of said blanket means being positioned completely outside of and substantially surrounding said toroidal field coils, each of said blanket means comprising at least two modules;

(g) said toroidal field coils and said plasma cavity have no blanket means therebetween;

(h) means for connecting and disconnecting each of said disconnectable means, means for separating said at least two modules of each blanket means a distance sufficient to allow removal of the respective fusion core unit, means for removing and inserting a fusion core unit as a single entity between the separated modules of each blanket means;

(i) a plurality of blanket cooling fluid transport means connected to said plurality of blanket means for transporting a cooling fluid to and through each of said blanket means;

(j) means, connected to at least one of the plurality of blanket cooling fluid transport means and the plurality of toroidal field cooling fluid transport means, for extracting thermal energy therefrom whereby the means for extracting thermal energy is operable to receive thermal energy from all of said plurality of fusion core units of said modular installation which are operating at a given time;

(k) for each fusion core unit, means for controlling the density of said plasma within said cavity by adjusting the amount of fuel delivered into said cavity;

(l) said ohmic heating means operable to induce said ohmic heating current to heat said plasma to a temperature of about 4 KeV while said means for controlling the density of said plasma is operable for increasing the density of said plasma for operating said reactor below a first fusion reaction rate and in which charged particle heating from said fusion reaction substantially equals bremsstrahlung losses;

(m) said density controlling means and said ohmic heating means operable for increasing the plasma density further while further heating said plasma to maintain the temperature of said plasma above the range of approximately 4 KeV, said plasma being heated by both said ohmic heating current and said charged particle heating; and

(n) said density controlling means operable for increasing the plasma density above said first fusion reaction rate, wherein said charged particle heating increases with increasing density for raising the temperature of said plasma above the temperature at which charged particle heating from said fusion reaction substantially equals bremsstrahlung losses, whereby said reactor generates thermal energy above plasma energy losses comprising bremsstrahlung losses, cyclotron radiation losses and particle conductivity losses.

4,836,973

METHOD OF DETERMINING THE ALARM THRESHOLD OF THE OVER-HEATING RATIO, A DEVICE FOR IMPLEMENTING THE METHOD, AND A METHOD OF CONTROLLING A NUCLEAR REACTOR

Francois Foret, Courbevoie, France, assignor to Framatome, Courebevoie, France

Filed Jan. 29, 1988, Ser. No. 150,269
Claims priority, application France, Jan. 30, 1987, 87 01162
Int. Cl.[4] G21C *7/36*
U.S. Cl. 376—216 **5 Claims**

1. A method of controlling the reactor of a nuclear power station by means of a plurality of families of control rods, such a reactor comprising:

a core containing reactive fuel elements for fuelling a nuclear fission reaction which creates a neutron flux in the volume of the core, said reaction itself being engendered in each zone of said volume by the neutron flux existing in said zone, and generating nuclear power in the form of heat which varies with said flux;

a coolant circuit having one branch passing through said core to remove said power and to enable it to be used in a variable load outside the reactor;

measuring means for measuring, in particular, the temperatures of said coolant in order to provide firstly an overheating ratio representative of the ratio of a predetermined critical heat flux which would be severely damaging at whatever point it occurs in the core, to a real local heat flux at a hot point where said flux is at a maximum, and also to provide an average temperature of the coolant which should be close to a normal value in order to enable the station to operate optimally; and

control rods provided with displacement means and with control means for inserting and extracting said rods longitudinally into corresponding zones of the core thereby controlling the positions of said rods, the position of a rod being defined by its extraction percentage, each of said rods including a neutron-absorbing material distributed along its length and conferring negative reactivity thereto which diminishes said neutron flux and said nuclear power in the corresponding zone of the core over the depth to which the rod is inserted in such a manner as to enable displacement of said rods to vary the nuclear power of the core at the expense of distortions which appear in the distribution of the neutron flux and which give rise to additional wear of the core, one family of these control rods being constituted by fine control rods capable of being displaced during normal control operations over a great height in order to cause the nuclear power to follow large variations which occur relatively infrequently in said external load, another family of the control rods being constituted by regulator rods, said rod control means receiving the average temperature of the coolant and reducing or increasing the extraction percentage of the regulator rods depending on whether said temperature is respectively greater than or less than its said normal value, thereby constituting a regulation loop which automatically maintains said average temperature in the vicinity of said normal value by causing the nuclear power to follow small variations which frequently affect said external load and which would cause said temperature to vary if the nuclear power were constant, said control means limiting the displacement of said regulation rods in normal operation to within a regulation range which is defined between two high extraction percentages so as to limit wear on the core by limiting the amplitudes of the distortions which such rod displacements frequently impose on the neutron flux;

said method comprising not only the displacement of the fine control rods during said normal control operations in order to cause the nuclear power to follow major changes in the external load, but also possible additional insertion of said rods during an operation to reduce power on an alarm which occurs as soon as said overheating ratio falls below a low alarm threshold such as to raise said ratio at least as far as said threshold, said threshold being determined with a safety margin sufficiently greater than unity to ensure that n being reached, said overheating cannot be approached in a dangerous manner, even in the event that certain accidents studied in advance may occur;

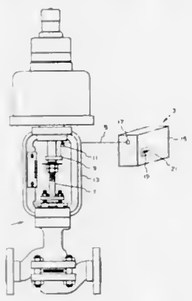
wherein different values for said low alarm threshold of the overheating ratio are chosen for different positions of the regulations rods within said regulation range, with a relatively high value being selected when the extraction percentage of said rods is relatively low, and a relatively low value being selected when the said percentage is relatively high, thereby avoiding a reduction of the nuclear power and thus of the power deliverable to said external load when the overheating ratio falls between said two threshold values while the positions of the regulation bars are such that in the event of one of said accidents being studied in advance occuring, a suitable displacement of said bars within said regulation range sufficing to avoid any risk of said overheating being approached in said dangerous manner.

4,836,974

VARIABLE LINEAR MOTION CYCLE MONITORING DEVICE

L. Ike Ezekoye, Wilkinsburg, and David R. Cavada, Lower Burrell, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 934,383, Nov. 24, 1986. This application Apr. 29, 1988, Ser. No. 188,721
Int. Cl.[4] G21D 1/10
U.S. Cl. 376—258 14 Claims



13. A pressurized water reactor nuclear power plant including feedwater flow control valve having a valve member which can be moved varying amounts in discrete movements in either direction between an open and a closed position to control feedwater flow; and apparatus for recording cycles of reciprocal movement of said valve member, said apparatus comprising: a travel translator member, means connecting said travel translator member to said valve member for reciprocal rectilinear movement in a direction corresponding to, and for a distance proportional to, the movement of said valve member, a shaft member mounted for rotation about its longitudinal axis, means for limiting angular rotation of said shaft member in each direction; means for counting cycles of reciprocal rotation of said shaft member between rotating limits set by said limiting means; a wheel mounted on said shaft member and in engagement with said travel translator member said wheel translating movement of said travel translator into rotation of said shaft member between said limits of rotation of said shaft member set by said limit means, and means permitting relative movement between said wheel and one of said members once the limits of rotation of said shaft member are reached and the travel translator member continues movement in the same direction.

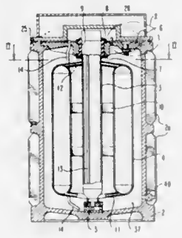
4,836,975

CONTAINER, IN PARTICULAR FOR A RADIOACTIVE SUBSTANCE

Ralf Güldner; Ingo Lasberg, both of Alzenau; Kurt Wittmann, Erlensee, and Gerd Kindleben, Frankfurt, all of Fed. Rep. of Germany, assignors to Alkem GmbH, Hanau, Fed. Rep. of Germany

Filed Nov. 5, 1987, Ser. No. 118,753
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1986, 3638702
Int. Cl.[4] G21C 19/40; G21F 5/00; B65D 85/00
U.S. Cl. 376—272 11 Claims

1. Container for a liquid substance, comprising an outer container, an inner container disposed in said outer container for receiving the substance, said inner container including a primary container and a separate, closed secondary container having upper and lower ends, said primary container having an upper end protruding beyond said upper end of said secondary container and a lower end protruding beyond said lower end of said secondary container in longitudinal direction, a first connecting tube leading continuously downward in a direction from said lower end of said secondary container toward said lower end of said primary container, and a second connecting tube leading continuously upward from said upper end of said



secondary container in a direction toward said upper end of said primary container, said outer container having a fill chamber disposed therein for filling with heat-conducting filler.

4,836,976

LIGHT WATER REACTOR CORES WITH INCREASED RESISTANCE TO STRESS CORROSION CRACKING

Alvin J. Jacobs, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Apr. 20, 1987, Ser. No. 40,017
Int. Cl.[4] G21C 9/00
U.S. Cl. 376—305 10 Claims

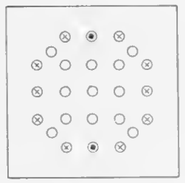
1. A method for reducing the occurrence of irradiation-assisted stress corrosion cracking in the structural components of the core of a light water nuclear reactor, said method comprising forming said structural components from an austenitic stainless steel containing a maximum of about 0.05% N, a maximum of about 0.005% P, a maximum of about 0.05% Si and a maximum of about 0.005% S.

4,836,977

STANDARDIZED REDUCED LENGTH BURNABLE ABSORBER RODS FOR A NUCLEAR REACTOR

Barry F. Cooney, Pittsburgh, and Thomas M. Camden, Jr., Washington, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 718,902, Apr. 1, 1985, Pat. No. 4,728,487.
This application Aug. 25, 1987, Ser. No. 89,202
Int. Cl.[4] G21C 7/10
U.S. Cl. 376—333 3 Claims



1. A cluster of burnable poison type control rods useful in a fuel assembly of a nuclear reactor, said cluster of rods comprising:

(a) a common support member; and

(b) a plurality of burnable poison type control rods supported by and depending from said common support member;

(c) each burnable poison type control rod being composed of an upper end portion, an intermediate portion and a lower end portion;

(d) each upper end portion including an upper end plug and an elongated upper hollow tubular extension having opposite upper and lower ends with said upper end plug sealably and rigidly connected to said upper end thereof;

(e) each lower end portion including a lower end plug and an elongated lower hollow tubular extension having opposite upper and lower ends with said lower end plug sealably and rigidly connected to said lower end thereof;

(f) each intermediate portion including an elongated middle hollow tubular section having opposite upper and lower ends and a chamber defined therein between said opposite ends, a pair of upper and lower end caps rigidly attached respectively to said upper and lower ends of said middle section so as to seal said chamber, and a burnable poison material disposed in said chamber of said middle tubular section, said upper and lower hollow tubular extensions being devoid of nuclear fuel material and burnable poison material;

(g) each burnable poison type control rod being further composed of upper and lower connections respectively fixedly connecting said upper and lower end portions of said each control rod to said intermediate portion of said each control rod by rigidly connecting said upper end portion tubular extension at said lower end thereof and said lower end portion tubular extension at said upper end thereof respectively with said upper end and said lower end of said middle tubular section adjacent said respective upper end cap and lower end cap thereof;

(h) said middle tubular sections having a multiplicity of different axial lengths,

said upper tubular extensions having a multiplicity of different axial lengths; and

said lower tubular extensions having a multiplicity of different axial lengths such that said interconnected middle tubular section and upper and lower tubular extensions of said control rods provide said control rods with the same overall axial lengths although said axial lengths of said middle tubular sections can vary from control rod to control rod whereby the axial locations of said burnable poison material in said middle tubular section chambers along control rods can also vary from rod to rod.

4,836,978

METHOD FOR MAKING VACUUM CIRCUIT BREAKER ELECTRODES

Ryuji Watanabe, Toukai; Hisashi Andoh, Hitachi; Kiyoji Iwashita, Hitachi, and Kinko Shimizu, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 2, 1987, Ser. No. 92,138
Claims priority, application Japan, Sep. 3, 1986, 61-205976
Int. Cl.[4] B22F 3/24
U.S. Cl. 419—10 18 Claims

1. A process of producing electrodes for vacuum circuit breakers, which comprises the steps of:

mixing conductive metal powder, including at least one element selected from a group consisting of Cu and Ag, and refractory material powder having a higher melting point than said conductive metal powder, to form a resultant mixture;

compacting the resultant mixture;

presintering the compact in a hydrogen atmosphere to form a presintered body; and

subjecting said presintered body to hot isostatic pressing treatment at a temperature higher than in the presintering step thereby to sinter under liquid phase so that said conductive metal is melted at the time of said hot isostatic pressing treatment.

4,836,979

MANUFACTURE OF COMPOSITE STRUCTURES

James A. E. Bell; Thijs Eerkes, both of Oakville; Carlos M. Diaz, Mississagua, all of Canada, and William L. Mankins, Huntington, W. Va., assignors to Inco Limited, Toronto, Canada

Filed Jun. 14, 1988, Ser. No. 206,305
Int. Cl.[4] G22F 3/24
U.S. Cl. 419—23 12 Claims

1. A process for making a composite of a low expansion, high electrical and heat conductive material in which the low expansion component is a nickel-iron alloy and the high electrical and heat conductive material is selected from the group consisting of copper, silver and copper-silver alloys comprising:

(a) producing a green compact of nickel-iron and a material selected from the group consisting of copper, silver, and copper-silver alloys of the chemical composition required for said composite;

(b) heating said green compact for about 2 to about 60 minutes in a protective atmosphere at a temperature of about 550° C. to 750° C.; and

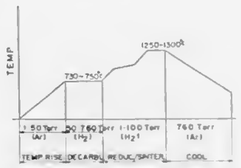
(c) working the thus heated compact within said temperature range to at least about 95% theoretical density.

4,836,980

METHOD OF SINTERING AN INJECTION-MOLDED ARTICLE

Nobuo Kashiwadani, Nara, and Hitoshi Ohta, Sakai, both of Japan, assignors to Chugai Ro Co., Ltd., Osaka, Japan

Filed Jan. 22, 1988, Ser. No. 147,345
Claims priority, application Japan, Jan. 26, 1987, 52-15583
Int. Cl.[4] B22F 1/00
U.S. Cl. 419—36 4 Claims



1. A method of sintering an injection-molded article of raw material powder and organic binder, said method comprising:

heating, within a non-oxidizing atmosphere, the injection-molded article which has already been debinderized;

decarburizing and removing residual binder from said injection-molded article at a reaction temperature up to the temperature at which said injection-molded article has been heated in the previous step, with H_2 gas or mixed gas of H_2 gas and Ar gas being supplied herein; and

reducing and sintering said injection-molded article by heating up to a sintering temperature and holding said injection-molded article at said sintering temperature under

reduced pressure for a predetermined period, with H_2 gas being supplied, wherein

the H_2 content of the atmosphere in said decarburizing step is maintained in an amount higher than that in said reducing and sintering step.

4,836,981

CONCRETE REINFORCING STEEL BAR OR WIRE

Haruo Shimada, and Yoshiaki Sakakibara, both of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 16,10[illegible], Feb. 18, 1987, abandoned. This application Jan. 25, 198[illegible], Ser. No. 148,138

Claims priority, application Japan, Feb. 25, 1986, 61-38406; May 23, 1986, 61-117540

Int. Cl.[4] C22C *38/06*

U.S. Cl. 420—79 **4 Claims**

1. A concrete reinforcing steel bar or wire having a basic steel composition consisting essentially of

C: not more than 1.0%
Si: not more than 0.25%
Mn: Not more than 2.0%
Al: 10.0 to 20.0%
Cr: 0.5 to 5.5%
P: not more than 0.015%
S: not more than 0.005%
Balance: essentially iron and unavoidable impurities.

4,836,982

RAPID SOLIDIFICATION OF METAL-SECOND PHASE COMPOSITES

John M. Brupbacher; Leontios Christodoulou, both of Baltimore, and Dennis C. Nagle, Ellicott City, all of Md., assignors to Martin Marietta Corporation, Bethesda, Md.

Continuation-in-part of Ser. No. 662,923, Oct. 19, 1984, abandoned. This application Jun. 13, 198[illegible], Ser. No. 873,889

The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.

Int. Cl.[4] C22C *1/00*

U.S. Cl. 420—129 **68 Claims**

1. A method for the production of metal-second phase composition materials containing a second phase, said method comprising precipitating at least one second phase material in a metal matrix by contacting reactive second phase forming constituents, in the presence of a substantially non-reactive solvent matrix metal in which the second phase forming constituents are more soluble that the second phase, at a temperature at which sufficient diffusion of said constituents into the solvent matrix metal occurs, to cause reaction of the reactive second phase forming constituents to increase the temperature to a temperature exceeding the melting temperature of the matrix metal, to precipitate the second phase in the solvent matrix metal, rapidly quenching the metal-second phase composite material at a rate in the range of approximately $10^{4°}$ C. per second to $10^{8°}$ C. per second and recovering a rapidly solidified metal-second phase composite material.

4,836,983

SILICON-MODIFIED TITANIUM ALUMINUM ALLOYS AND METHOD OF PREPARATION

Shyh-Chin Huang, Latham, and Michael F. X. Gigliotti, Jr., Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,407

Int. Cl.[4] C22C *14/00;* **C21D** *1/00*

U.S. Cl. 420—418 **12 Claims**

1. A silicon modified titanium aluminum alloy consisting essentially of titanium, aluminum and silicon in the following approximate atomic ratio:

$Ti_{58-54}Al_{39-41}Si_{3-5}$.

4,836,984

DENTURES AND ALLOYS FOR USE IN SAME

Rudolf Wagner, Remchingen; Harry Schiwiora; Manfred Stümke, both of Pforzheim, and Werner Groll, Alzenau-Hörstein, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 11, 1987, Ser. No. 131,465

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1986, 3642474

Int. Cl.[4] C22C *5/04*

U.S. Cl. 420—464 **3 Claims**

1. A palladium alloy containing (a) 65 to 85% palladium, (b) at least one member of the group consisting of 0 to 10% gold and 0 to 5% platinum, (c) 0.1 to 10% tin, (d) 1 to 10% gallium, (e) 1 to 12% copper and (f) at least one member of the group consisting of 0.05 to 1.5% ruthenium and 0.05 to 0.7% rhenium as well as (g) at least one member of the group consisting of 0.01 to 4% tungsten, 0.01 to 4% aluminum and 0.01 to 4% zinc, the combined percentages of these metals and unavoidable impurities being 100% and the proportion of said member of the group consisting of tungsten, aluminum and zinc being sufficient to prevent the formation of an oxide film on the alloy when melted in an oxidizing atmosphere.

4,836,985

NI-CR-FE CORROSION RESISTANT ALLOY

John H. Culling, St. Louis, Mo., assignor to Carondelet Foundry Company, St. Louis, Mo.

Filed Aug. 19, 1988, Ser. No. 234,815

Int. Cl.[4] C22C *30/02*

U.S. Cl. 420—582 **6 Claims**

1. A Nickel-Chromium-Iron alloy consisting essentially of the following in approximately the percentage ranges by weight indicated:

Ni	36–40.5
Cr	31–33
Mo	4–5.2
Cu	2.7–4
Si	2.5–6
N	0.40–0.62
Co	up to 1.2
Fe	balance

4,836,986

DISINFECTING AND PRESERVING SYSTEMS AND METHODS OF USE

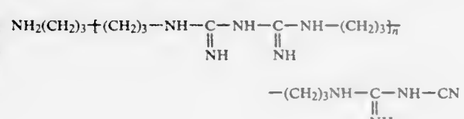
Lai Ogunbiyi, Gwynedd, Pa.; Francis X. Smith, Walworth, N.Y., and Thomas M. Riedhammer, Toms River, N.J., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Division of Ser. No. 867,405, May 14, 1986, which is a continuation of Ser. No. 680,450, Dec. 11, 1984, which is a continuation-in-part of Ser. No. 655,965, Sep. 28, 1984, Pat. No. 4,758,595. This application Aug. 8, 1988, Ser. No. 229,207

Int. Cl.[4] G01N *31/12*

U.S. Cl. 422—28 **12 Claims**

1. A method of treating a contact lens which comprises treating the lens with a solution comprising a microbiocidally or fungicidally effective amount of a biguanide or water-soluble salt thereof, in combination with a borate buffer system, said biguanide having the formula:



wherein n is from 1 to 500, said biguanide being present in an amount from 0.000001 to 0.0003 weight percent.

4,836,987

TEST TUBE ASSEMBLY FOR SERUM SEPARATION

Toshiko Shibata, Ichikawa; Hiroji Ina, Tama, and Kazuo Ina, Shizuoka, all of Japan, assignors to Nippon Paint Co., Ltd., Japan

Division of Ser. No. 841,096, Mar. 18, 1986, Pat. No. 4,803,153. This application Sep. 8, 1988, Ser. No. 242,115

Claims priority, application Japan, Mar. 19, 1985, 60-053328

Int. Cl.[4] B01L *11/00;* **A01N** *1/02;* **C12Q** *1/56*

U.S. Cl. 422—101 **8 Claims**

1. A test tube assembly for serum separation which comprises a test tube and a layer formed on the inside wall of the test tube, the layer being formed of at least one compound selected from the group consisting of d-sesamin, l-sesamin, paulownin, d-asarinin, l-asarinin, 2α-paulownin, 6α-paulownin, pinoresinol, d-eudesmin, l-pinoresinol β-D-glucoside, l-pinoresinol, l-pinoresinol monomethyl ether β-D-glucoside, epimagnolin, lirioresinol-B, syringaresinol (dl), lirioresinon-B-dimethyl ether, phillyrin, magnolin, lirioresinol-A, 2α,6α-d-sesamin, d-diaeudesmin, lirioresinol-C dimethyl ether (d-diayangambin) and sesamolin.

4,836,988

APPARATUS FOR REMOVAL OF NITROGEN OXIDES FROM FLUE GAS

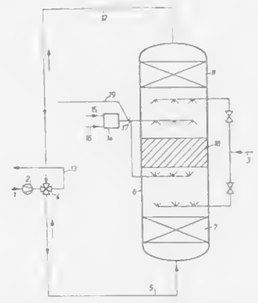
Wolfgang Kristof, Trostberg; Claus Schlebener, Strasslach, and Gerhard Linde, Gruenwald, all of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Continuation of Ser. No. 826,060, Feb. 4, 1986, abandoned, which is a division of Ser. No. 720,247, Apr. 5, 1985, Pat. No. 4,725,416. This application Jun. 2, 1987, Ser. No. 57,670

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1984, 3412870

Int. Cl.[4] B01J *8/04*

U.S. Cl. 422—171 **2 Claims**



1. Apparatus suitable for removing nitrogen oxides from flue gas flowing in a selected direction wherein the flue gas has been previously purged of deleterious components with the exception of nitrogen oxide, the apparatus comprising: a housing, contained within said housing at least one catalyst bed subdivided into several layers and first and second heat exchangers, each heat exchanger containing a ceramic regenerating mass, the catalyst bed being disposed between the first and second heat exchangers; the several layers of the catalyst bed being spaced apart from one another in the direction of flow of the flue gas and laterally overlapping one another, the layers being held in spaced relationship by gas impermeable plates, means for directing the flue gas to flow in a stream in a direction passing first through one of the heat exchangers, through the catalyst bed and then through the other heat exchanger; conduit means having first and second outlets positioned between the catalyst bed and first heat exchanger and catalyst bed and second heat exchanger, respectively for feeding NH_3 to the stream of flue gas, valve means for periodically reversing the direction of flow of the flue gas from a first direction in which the flue gas flows first through the first heat exchanger to a second direction opposite the first direction in which the flue gas flows first through the second heat exchanger, valve means in the conduit means for opening the first outlet and closing the second outlet and for closing the first outlet and opening the second outlet so that the NH_3 is fed into the stream upstream of the catalyst bed, and means for supplying supplemental heat to the reactor downstream of that heat exchanger through which the stream of flue gas first passes as the flue gas flows in one direction, whereby after the flue gas has heated the first heat exchanger and cooled the second heat exchanger, the flue gas heats the second heat exchanger and cools the first heat exchanger.

4,836,989

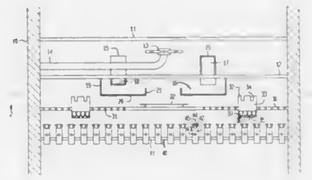
DISTRIBUTION SYSTEM FOR DOWNFLOW REACTORS

Fouad A. Aly, Newtown, Pa.; Richard G. Graven, Pennington, N.J., and David W. Lewis, Newtown, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 2, 1987, Ser. No. 69,545

Int. Cl.[4] B01J *10/00*

U.S. Cl. 422—195 **8 Claims**



1. A distributor system for distributing vapor and liquid across a downflow reactor. which comprises:

(i) a collection tray for receiving vapor and liquid,

(ii) a mixing chamber below the collection tray having a first spillway for the downward passage of vapor and liquid;

(iii) collection tray spillways providing a flow path for vapor and liquid from above the collection tray into the mixing chamber;

(iv) a first distributor tray below the mixing chamber, said first distributor tray having apertures in it for downward flow of liquid and vapor chimneys for downward flow of vapor, each vapor chimney comprising an open-topped tube extending above the first distributor tray and including an apertured plate at its lower end below the first distributor tray with vapor outlets arranged around the lower end of the chimney; and

(v) a second distributor tray having tubular downcomers for downward flow of liquid and vapor, each downcomer comprising upstanding, open-topped tubes having apertures in their sides for entry of liquid into the tube.

4,836,990

REMOVAL OF ORGANICS FROM BAYER PROCESS STREAMS

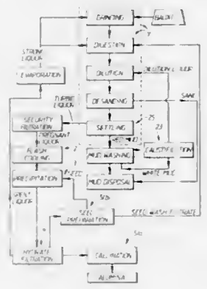
Dominicus A. Swinkels, Adamstown Heights, and Kevork Chouzadjian, Charlestown, both of Australia, assignors to The Broken Hill Proprietary Company Ltd., Victoria, Australia

Continuation of Ser. No. 824,018, Jan. 2, 1986, abandoned. This application Aug. 13, 1987, Ser. No. 88,493

Claims priority, application Australia, May 3, 1984, PG4817/84

Int. Cl.[4] C01F *7/46*

U.S. Cl. 423—130 **11 Claims**



1. In a process for making alumina including the steps of digesting bauxite containing organic impurities in sodium hydroxide solution to form a solution containing sodium aluminate and organic impurities, precipitating aluminum hydroxide from said solution containing sodium aluminate and organic impurities to form at least one solution containing organic impurities, recycling at least one solution, containing organic impurities, formed by said precipitation of said aluminum hydroxide, to said digestion step, and calcining said precipitate of aluminum hydroxide to form alumina, the improvement of comprising contacting at least one of said solutions containing organic impurities with manganese dioxide in an amount effective to oxidize said organic impurities and so limit the accumulation of organic material in said process

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4,836,991

METHOD FOR CONTROLLING WET-PROCESS FLUE GAS DESULFURIZATION

Okikazu Ishiguro, Kure; Masakatsu Nishimura, Shimizu; Shigeru Nozawa, Kure; Hiromi Kanagawa, Kure, and Shigeyoshi Kawano, Kure, all of Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1987, Ser. No. 41,224

Claims priority, application Japan, Apr. 23, 1986, 61-93592

Int. Cl.[4] C01B *17/00;* **C01F** *1/00, 11/46*

U.S. Cl. 423—242 **13 Claims**

1. A method for controlling wet-process flue gas desulfurization in a whole plant including a combustion unit and a wet-process flue gas desulfurization unit comprising an absorption column for removing sulfur dioxide from a flue gas from the combustion unit by absorption using a slurry of an absorbing agent circulating through the absorption column, recycle pumps for circulating the slurry of the absorbing agent through the absorption column, and oxidation air blowers for supplying an oxidation air to the absorption column and a recycle tank, which comprises anticipating a future pH value of the circulating slurry of the absorbing agent and a future inlet sulfur dioxide content of the flue gas from a present pH value of the circulating slurry of the absorbing agent and a present inlet sulfur dioxide content of the flue gas and their change rates by computing, anticipating a future desulfurization ratio from both the anticipated pH value and inlet SO_2 content and a recycle rate of the circulating slurry of the absorbing agent, and controlling the recycle rate of the circulating slurry of the absorbing agent on the basis of the anticipated desulfurization ratio.

4,836,992

PROCESS FOR DESULFURIZING WASTE GASES

Hans Rickert; Peter Mueller, and Guenter Holzaepfel, all of Dortmund, Fed. Rep. of Germany, assignors to Vereinigte Elektrizitätswerke Westfalen AG, Dortmund, Fed. Rep. of Germany

Filed Apr. 27, 1987, Ser. No. 43,147

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1986, 3614005

Int. Cl.[4] C01B *17/00*

U.S. Cl. 423—242 **10 Claims**

1. In a process for desulfurizing waste gas containing SO_2, in which SO_2 is absorbed in an aqueous alkaline solution and the resulting solution containing SO_3^{2-} ions is subjected to electrolysis in an electrolytic cell containing an anode and a cathode to produce O_2 at the anode and H_2 at the cathode, the improvement comprising introducing the solution containing sulfite ions to the anode compartment of an electrolytic cell having at least one anode compartment and at least one cathode compartment separated by an ion exchange membrane and passing an electric current through the electrolytic cell to effect electrochemical oxidation of SO_3^{2-} ions to SO_4^{2-} ions with the simultaneous formation of H^+ ions in the anode compartment, the formation of hydrogen and OH^- ions in the cathode compartment, and substantially without formation of oxygen.

4,836,993

PROCESS FOR REMOVING SULFUR OXIDES FROM A GAS

Ralph J. Bertolacini, Naperville; Eugene H. Hirschberg, Park Forest, and Frank S. Modica, Downers Grove, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Sep. 27, 1983, Ser. No. 536,247

Int. Cl.[4] B01J *8/00;* **C01B** *17/00*

U.S. Cl. 423—244 **20 Claims**

1. A process for removing sulfur oxides from a gas which comprises:

(a) absorbing sulfur oxides from the gas with an absorbent which comprises an inorganic oxide composition in association with at least one free or combined rare earth metal selected from the group consisting of lanthanum, cerium, praseodymium, samarium and dysprosium at a temperature in the range from about 100° to about 900° C., wherein said inorganic oxide composition comprises at least one member selected from the group consisting of $MgAl_2O_4$, and mixtures of alumina with magnesium oxide and the ratio by weight of inorganic oxide composition to rare earth metal or metals is from about 1.0 to about 1,000; and

(b) removing absorbed sulfur oxides from the absorbent as a sulfur containing gas by contacting said absorbent with a hydrocarbon in the presence of a hydrocarbon cracking catalyst at a temperature in the range from about 375° to about 900° C.

4,836,994

CALCIUM-PHOSPHORUS-APATITE HAVING NOVEL PROPERTIES AND PROCESS FOR PREPARING THE SAME

Senya Inoue, Kasukabe, and Akira Ono, Adachi, both of Japan, assignors to Kanto Kagaku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 893,324, Jul. 30, 1986, Pat. No. 4,711,769. This application Sep. 11, 1987, Ser. No. 95,222

Claims priority, application Japan, Dec. 18, 1984, 59-265270; Mar. 1, 1985, 60-38655; Sep. 20, 1985, 60-206693; Nov. 11, 1985, 60-250925

The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.

Int. Cl.[4] C01B *15/16, 25/26*

U.S. Cl. 423—308 **21 Claims**

1. A calcium-phosphorus-apatite product prepared by the process comprising:

(a) admixing a solvent system with a calcium compound and a phosphorus compound soluble in said solvent system to prepare a raw material solution, said solvent system being water, or an organic solvent compatible with water or a mixture of water and an organic solvent compatible with water;

(b) atomizing said raw material solution in a flame or heating zone at a temperature sufficient to effect thermal decomposition of said raw material solution; and

(c) recovering the thus produced calcium-phosphorus-apatite product.

4,836,995

PROCESS FOR THE MANUFACTURE OF MONOPOTASSIUM PHOSPHATE

Shalom Manor, Kiryat Haim; Grigori Pipko; Adrian Langham, both of Haifa; Nitza Friedman, Kiryat, and Amalia Steiner, Haifa, all of Israel, assignors to Haifa Chemicals Ltd., Haifa, Israel

Continuation of Ser. No. 50,536, May 15, 1987, abandoned. This application Nov. 23, 1988, Ser. No. 277,462

Claims priority, application Israel, Jun. 4, 1986, 79020

Int. Cl.[4] C01B *15/16, 25/26*

U.S. Cl. 423—309 **13 Claims**

1. A process for the manufacture of monopotassium phosphate which comprises the steps of:

(a) reacting phosphoric acid with potassium chloride in the presence of an organic solvent comprising a long chain primary amine dissolved in an inert organic solvent, said amine having 6 to 28 carbon atoms in each chain, at a temperature in the range of 40 to 80 degrees C. to obtain two phases which separate easily without any entrainment, an upper organic phase containing the organic solvent, amine-hydrochloric acid as well as impurities present in the starting reagents, and a lower aqueous phase containing monopotassium phosphate and dipotassium phosphate salts;

(b) separating the lower aqueous phase from the upper organic phase; and

(c) acidulating the phosphate salts present in said lower phase with a solution of phosphoric acid to a pH in the range of between 2 and 6, whereby crystallized monopotassium phosphate is obtained and separated.

4,836,996

METHOD OF MAKING ZEOLITE EU-2

John L. Casci, Redcar; Barrie M. Lowe, Edinburgh, and Thomas V. Lowe, Darlington, all of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 919,577, Oct. 15, 1986, Pat. No. 4,741,891, which is a continuation of Ser. No. 816,958, Jan. 6, 1986, abandoned, which is a continuation of Ser. No. 272,469, Jun. 11, 1981, abandoned. This application Nov. 13, 1987, Ser. No. 120,531

Claims priority, application United Kingdom, Jun. 12, 1980, 8019211

The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.

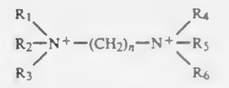
Int. Cl.[4] C01B *33/28, 35/00;* **C01F** *7/02;* **C07B** *33/20;* **C01G** *49/00, 15/00, 17/00*

U.S. Cl. 423—328 **4 Claims**

1. A method making zeolite EU-2 having a molar composition expressed by the formula:

$$0.5 \text{ to } 1.5\ R_2O{:}Y_2O_3{:}\ \text{at least } 70\ XO_2{:}0 \text{ to } 100\ H_2O$$

wherein R is a monovalent cation or 1/n of a cation of valency n, X is silicon and/or germanium, Y is one or more of aluminum, iron, gallium or boron, and H_2O is water of hydration additional to water notionally present when R is H, and having an x-ray diffraction pattern substantially as set out in Table 1, which method comprises reacting an aqueous mixture comprising a source of alkali metal or ammonium, at least one oxide XO_2, at least one oxide Y_2O_3 and at least one alkylated derivative of a polymethylene α-ω diamine having the formula:



wherein n is in the range from 3 to 12, R_1 to R_6 which may be the same or different, can be an alkyl or hydroxyalkyl group containing from 1 to 8 carbon atoms and up to five of the groups R_1 to R_6 can be hydrogen, the mixture having the molar ratio composition:

XO_2/Y_2O_3	at least 70
OH^-/XO_2	0.1 to 6.0
$(M^+ + Q)/Y_2O_3$	0.5 to 100
$Q/(M^+ + Q)$	0.1 to 1.0
H_2O/XO_2	1 to 100

where X is a silicon and/or germanium, Y is one or more of aluminum, iron, gallium, boron, M is an alkali metal or ammonium and Q is the aforesaid alkylated derivative of a polymethylene diamine, or a perscursor thereof.

4,836,997

PLASMA PRODUCTION OF TRICHOROSILANE, $SiHCl_3$

Jean-Luc Lepage, Lyon, and Gerard Simon, Villeurbanne, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Jul. 25, 1983, Ser. No. 516,843

Claims priority, application France, Jul. 26, 1982, 82 12971

Int. Cl.[4] C01B *17/00*

U.S. Cl. 423—342 **10 Claims**

1. A process for the preparation of trichlorosilane, $SiHCl_3$, which comprises (i) thermally reducing silicon tetrachloride, $SiCl_4$, with hydrogen to produce a reaction admixture comprising $SiHCl_3$ and hydrochloric acid, said thermal reduction being carried out in a thermal plasma while tempering the reaction medium with a cooling gas, (ii) reacting, said step (i) reaction admixture with elemental silicon at a temperature of

from about 250° to 350° C. to produce $SiHCl_3$ and hydrogen therefrom, and thence (iii) separating (iiia) the plasma-creating, hydrogen and cooling gases, and (iiib) product silicon chlorides therefrom.

4,836,998

PRODUCTION OF PARTIALLY CALCINED CARBONACEOUS REDUCTANT USING STEAM

Raouf O. Loutfy, Tucson, Ariz., and Kirk R. Weisbrod, Celina, both of Tex., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 21, 1984, Ser. No. 684,935
Int. Cl.[4] C09C *1/56*
U.S. Cl. 423—460 **15 Claims**

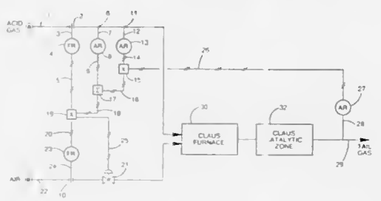
1. A method of producing a reductant useful in reductive chlorination processes from volatile hydrogen and hydrogen-containing carbonaceous material comprising heating said carbonaceous material in the presence of steam at a temperature of from about 650° C. to about 1150° C. and for a time sufficient to minimize precursors of chlorinated hydrocarbons.

4,836,999

METHOD FOR CONTROLLING CLAUS FURNACE WITH VARIABLE HYDROCARBON FEED COMPOSITION

Robert L. Reed, Houston, Tex., and David A. Holdeman, Tulsa, Okla., assignors to Amoco Corporation Chicago, Ill.

Continuation of Ser. No. 891,460, Jul. 29, 1986, abandoned. This application Mar. 24, 1988, Ser. No. 175,657
Int. Cl.[4] C01B *17/04*
U.S. Cl. 423—574 R **2 Claims**



1. A method for controlling the flow of oxygen feed to a Claus furnace in a sulfur recovery plant comprising a Claus furnace and a Claus catalytic reaction zone, said method comprising:

generating a first control signal by means sensing flow rate of a gaseous feed(s) containing hydrogen sulfide to the Claus furnace wherein hydrogen sulfide is combusted to produce a first molar ratio of hydrogen sulfide to sulfur dioxide in feed to the Claus catalytic reaction zone;

generating a second control signal representative of carbon-hydrogen bonds and composition of the hydrocarbons in the feed(s) to the Claus furnace by steps comprising:

(1) generating a first response signal representative of carbon-hydrogen bonds of hydrocarbons in the hydrogen sulfide feed(s) to the Claus furnace;

(2) responsive to a second molar ratio of hydrogen sulfide to sulfur dioxide in effluent from the Claus catalytic reaction zone, the second ratio differing from the first ratio, generating a second response signal representative of a changed hydrocarbon composition of hydrocarbons in feed(s) to the Claus furnace; and

(3) combining the first and second response signals by means generating a third response signal representative of carbon-hydrogen bonds and the changed hydrocarbon composition in the feed(s) to the Claus furnace;

(4) generating a fourth response signal representative of concentration of hydrogen sulfide in the hydrogen sulfide feed(s); and

(5) combining the fourth response signal with the third response signal by means producing the second control signal; and

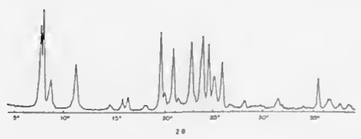
by means responsive to the first control signal and to the second control signal, controlling the flow of oxygen feed to the Claus furnace to sustain the Claus reaction in the Claus furnace and maintain the second molar ratio of hydrogen sulfide to sulfur dioxide of about 2 to 1.

4,837,000

CRYSTALLINE SILICATES AND PROCESS FOR THE PRODUCTION THEREOF

Kozo Takatsu, Sodegaura, and Noboru Kawata, Ichihara, both of Japan, assignors to Research Association for Petroleum Alternatives Development, Tokyo, Japan

Division of Ser. No. 713,086, Mar. 18, 1985, Pat. No. 4,657,750, which is a division of Ser. No. 512,996, Jul. 12, 1983, abandoned. This application Dec. 11, 1986, Ser. No. 940,578
Claims priority, application Japan, Jul. 30, 1982, 57-132143
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—328 **10 Claims**



1. A process for producing a crystalline silicate, when determined after calcination in the air at 550° C., having a composition represented by the general formula (I),

$$pM_{2/n}O.Al_2O_3.qSiO_2 \quad (I)$$

wherein M represents at least one element selected from hydrogen, alkali metals, and alkaline earth metals, n represents the valence of M, and p and q are chosen within the ranges of $0.3 \leqq p \leqq 3.0$, $q \leqq 10$, and giving a principal X-ray diffraction pattern as shown in Table 1, below:

TABLE 1

Lattice Spacing d (Å)	Relative Intensity
11.31 ± 0.2	strong
10.92 ± 0.2	very strong
7.83 ± 0.2	medium
4.51 ± 0.15	very strong
4.24 ± 0.1	strong
3.89 ± 0.1	strong
3.73 ± 0.1	medium
3.69 ± 0.1	very strong
3.61 ± 0.1	very strong
3.53 ± 0.07	medium
3.43 ± 0.07	strong
2.52 ± 0.05	medium

which process consists essentially of reacting an aqueous mixture consisting essentially of (a) a silica source, (b) an alumina source, (c) an aikali metal and/or alkaline earth metal source, and (e) monoethanolamine in the following molar ratios:

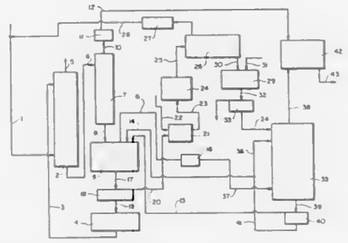
silica/alumina ≧ 10/1
monoethanolamine/water = 0.1/1 to 5/1,
monoethanolamine/silica = 2/1 to 100/1,
hydroxyl ion/silica = 0.01/1 to 0.5/1 excluding hydroxyl ions resulting from monoethanolamine, at a temperature of 100° to 300° C. until the crystalline silicate is formed.

4,837,001

PRODUCTION OF SULFUR FROM SULFUR DIOXIDE OBTAINED FROM FLUE GAS

Ralph Miller, Pleasantville, N.Y., assignor to T-Thermal, Inc., Conshohocken, Pa.

Continuation-in-part of Ser. No. 835,359, Mar. 3, 1986, abandoned, which is a continuation-in-part of Ser. No. 695,634, Jan. 28, 1985, Pat. No. 4,588,567. This application Feb. 27, 1987, Ser. No. 19,877
The portion of the term of this patent subsequent to May 13, 2003, has been disclaimed.
Int. Cl.[4] B01D *53/02*; C01B *17/04, 17/26*; C01D *7/00*
U.S. Cl. 423—574 R **8 Claims**



1. A regenerable process for recovery of elemental sulfur from a gas containing sulfur dioxide comprising the steps of:

(a) contacting said gas with an aqueous, alkaline reaction medium containing sodium sulfite in concentration sufficient so that a slurry containing solid sodium sulfite is formed in step (c), to react sulfur dioxide with sodium sulfite to form a solution containing dissolved sodium pyrosulfite and sodium sulfite;

(b) separating sulfur dioxide from the solution produced in step (a) to leave a residual mixture containing water, sodium sulfite and a sodium pyrosulfite, the amount of sulfur dioxide separated being equal to about one-third the amount of sulfur dioxide which reacted with sodium sulfite in step (a);

(c) adding, in substantial absence of air, sufficient water and sodium bicarbonate to the residual mixture formed in step (b) to react with the dissolved sodium pyrsulfite and form a slurry of solid sodium sulfite suspended in the resulting aqueous, alkaline reaction medium and gaseous carbon dioxide;

(d) separating the gaseous carbon dioxide formed in step (c);

(e) separating the solid sodium sulfite from the acqueous, alkaline reaction medium and recycling said separated reaction medium to step (a);

(f) reducing the separated sodium sulfite to sodium sulfide;

(g) adding the sodium sulfide formed in step (f) to an aqueous reaction medium containing sodium bicarbonate and, in the substantial absence of air, carbonating the resulting mixture with the gaseous carbon dioxide formed in step (c) to form a slurry of solid particles of sodium bicarbonate dispersed in an aqueous reactor medium containing sodium bicarbonate, along with a gas composed primarily of hydrogen sulfide;

(h) recovering the hydrogen sulfide formed in step (g) and reacting it with the sulfur dioxide separated in step (b) to form elemental sulfur, to be recovered, and water;

(i) separating from the slurry formed in step (g) an amount of the reaction medium containing sodium bicarbonate equal to the amount added to sodium sulfide in step (g) and recycling said separating reaction medium to step (g); and

(j) recycling to step (c) the sodium bicarbonate formed in step (g).

4,837,002

REMOVAL OF CHLORATE FROM CAUSTIC SODA

Dieter Schlaefer, Ludwigshafen; Wolfgang Kochanek, Weisenheim, and Bernd Leutner, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 22, 1988, Ser. No. 158,745
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1987, 3707713
Int. Cl.[4] C01D *1/04*
U.S. Cl. 423—641 **3 Claims**

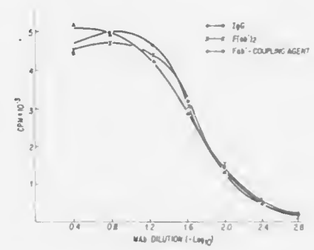
1. A process for removing chlorate from aqueous caustic soda by reducing with an iron compound and separating off the resulting iron oxide containing precipitate, which comprises using iron pentacarbonyl as reducing agent.

4,837,003

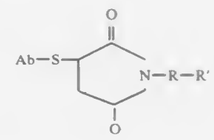
RADIOLABELED ANTIBODY FRAGMENTS

Robert A. Nicolotti, Furguson, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Sep. 13, 1984, Ser. No. 650,127
The portion of the term of this patent subsequent to Apr. 27, 2004, has been disclaimed.
Int. Cl.[4] G01N *33/534, 33/563*
U.S. Cl. 424—1.1 **17 Claims**



1. An antibody conjugate of the formula:



wherein Ab is the residue of a Fab' fragment of a monoclonal antibody, said antibody being one which retains antigen-binding activity following enzymatic removal of the F_c fragment and reductive cleavage of the disulfide bond joining the heavy chains; —S— is the residue of the free sulfhydryl group of the Fab' fragment; R is a divalent organic linker; and R' is a non-toxic, weakly acidic chelating group capable of forming a chelate with a radionuclide metal ion that is thermodynamically stable under physiological conditions and has a higher stability constant than a chelate of the radionuclide with transferrin in vivo.

4,837,004

RUMEN-STABLE PELLETS

Stephen H. W. Wu, Kingsport; Shane K. Kirk, Church Hill; Kenneth P. Perry, Kingsport; E. Philip Smith, Blountville; Yeong-Ho Chang, and Waylon L. Jenkins, both of Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 789,282, Oct. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 498,445, May 26, 1983, abandoned, and a continuation-in-part of Ser. No. 688,387, Jan. 2, 1985, abandoned. This application Jan. 29, 1988, Ser. No. 150,180

Int. Cl.[4] A61K 9/22, 9/32, 9/36

U.S. Cl. 424—438 43 Claims

1. A pellet adapted for oral administration to a ruminant comprising a core material beneficial to the ruminant postruminally, and a coating surrounding said core material which protects the core material in the rumen and releases it postruminally, said coating comprising

(a) a physiologically acceptable film-forming polymeric material comprising a polymer, or mixture of polymers, said polymeric material having basic amino groups the nitrogen content of which constitutes between about 2% and about 14% by weight of the polymeric material.

(b) between 1.5% and 121%, based on the weight of polymeric material, of a hydrophobic material dispersed in said polymeric material selected from the group consisting of waxes, resins, polymers, fatty acids having from 12 to 32 carbon atoms, aluminum salts of fatty acids having from 12 to 32 carbon atoms, and polyfunctional carboxylic acids having a ratio of from 10 to 22 carbon atoms per carboxyl group, and

(c) greater than about 200% and up to 485%, based on the weight of said polymeric material of a physiologically acceptable flake material dispersed in said polymeric material.

said polymeric material in combination with said hydrophobic material being physiologically acceptable and resistant to a pH of greater than about 5 but capable of releasing the core of the pellets at a pH of less than about 3.5, said coating making up about 5% to about 50% of the weight of said pellet, and said coating having a glass transition temperature of not more than about 60° C. as measured by TMA.

4,837,005

PARTIALLY HYDROLYZED, POLY(N-ACYL)ALKYLENIMINES IN PERSONAL CARE

George L. Brode, II, Bridgewater, N.J., and Frederick M. Merritt, II, Lockport, Ill., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1986, Ser. No. 913,407

Int. Cl.[4] A61K 7/00, 7/021, 7/06, 7/45

U.S. Cl. 424—47 19 Claims

1. A personal care composition comprising carrier and an effective managing amount of partially hydrolyzed, poly(N-acyl alkylenimine) containing repeating units represented by the structural formula:

wherein a is from about 1 to about 90 mole percent; and wherein for each repeating unit individually:

Q is an anion;

R_1 is hydrogen, alkyl, aryl, aralkyl or alkaryl;

R_2 is hydrogen or a hydrocarbyl-containing group;

R_3 is hydrogen, alkyl, aryl, aralkyl or alkaryl;

v is equal to the valence of Q;

x is 2 or 3;

y is 0 or 1; and

z is 0 or 1; provided that:

(1) when R_3 is oxygen than y is 0, R_2 is a hydrcarbyl-containing group and z is 1;

(2) when R_3 is not oxygen then y and z are 1; and

(3) when all z values are 0 then at least one R_3 group is a hydrocarbyl-containing group.

4,837,006

PHOTOSTABLE COSMETIC COMPOSITION CONTAINING TRIHYDROXYETHYLRUTIN IN COMBINATION WITH WATER-SOLUBLE SUNSCREENS DERIVED FROM BENZYLIDENECAMPHOR AND ITS USE IN THE PROTECTION OF THE SKIN AND THE HAIR

Georges Rosenbaum, Asnieres, and Jean F. Grollier, Paris, both of France, assignors to L'Oreal, Paris, France

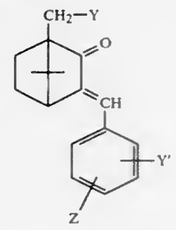
Filed Sep. 22, 1987, Ser. No. 99,770

Claims priority, application Luxembourg, Sep. 22, 1986, 86601

Int. Cl.[4] A61K 7/06, 7/42, 7/44, 9/12

U.S. Cl. 424—47 11 Claims

1. Photostable cosmetic composition for protection against UV rays with wavelengths between 280 and 400 nm, which contains, in a cosmetically acceptable aqueous or aqueous/alcoholic medium, an effective quantity of a combination of trihydroxyethylrutin and at least one other water-soluble sunscreen derived from benzylidenecamphor corresponding to the following formula:



(I)

in which:

(i)

Y denotes a hydrogen atom,

Z is in the para position of the methylidene group and represents a group $-\overset{\oplus}{N}(CH_3)_2R$ in which

R denotes a hydrogen atom or a C_1–C_{12} alkyl radical, the ionic equilibrium of the molecule being achieved by an anion $X^{\ominus}$ selected from halides, sulphonates, alkylsulphonates, camphosulphonates and alkylsulphates;

Y' denotes a hydrogen or halogen atom or a methyl radical;

(ii)

Y and Y' represent a hydrogen atom or an optionally salified SO_3H radical, on condition that at least one of the two groups is other than a hydrogen atom, Y' being in the meta position of the methylidene group;

Z represents a halogen atom or a C_1–C_4 alkyl radical;

(iii)

Y denotes a hydrogen atom or an optionally salified SO_3H radical,

Z denotes an optionally salified SO_3H and is in the para position of the methylidene group, and

Y' denotes a hydrogen atom.

4,837,007

FLUORIDATING ORAL CAVITY

Ralph M. Duckworth, Tarporley, and Andrew M. Murray, South Wirral, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Dec. 5, 1986, Ser. No. 938,218

Claims priority, application United Kingdom, Dec. 11, 1985, 8530493; Mar. 20, 1986, 8606909

Int. Cl.[4] A61K 7/18

U.S. Cl. 424—52 8 Claims

1. A method of fluoridating oral fluids which comprises introducing into the oral cavity an oral hygiene product obtained by admixing a first composition and a second composition wherein said first composition comprises a suspension of particles in a medium in which the particles are substantially insoluble which slowly releases fluoride ions in saliva in the mouth for a time greater than about 2 hours, and said second composition comprises an aqueous solution of a cationic polymer, in which method the first and second compositions are admixed in the oral cavity or at the time of usage just prior to introduction into the oral cavity.

4,837,008

PERIODONTAL COMPOSITION AND METHOD

Jerome B. Rudy; Melvin Denholtz, both of Livingston; Jeffrey R. Denholtz, Stanhope, and Peter D. Bohm, Freehold, all of N.J., assignors to Peroxydent Group, Livingston, N.J.

Continuation-in-part of Ser. No. 721,210, Apr. 9, 1985, abandoned, which is a continuation-in-part of Ser. No. 532,182, Sep. 14, 1983, abandoned. This application Jan. 12, 1987, Ser. No. 2,177

Int. Cl.[4] A61K 7/20, 33/40

U.S. Cl. 424—53 27 Claims

1. A non-aqueous paste or gel dentifrice composition, comprising:

a water soluble, non-aqueous vehicle selected from the group consisting of polyalkylene glycols, polyoxyalkylene derivatives of ethylene diamine, polyoxyethylene fatty acid esters, non-ionic surfactants, anionic surfactants, ampholytic surfactants, cationic surfactants, alkanolamides, thickened glycerol, propylene glycol or sorbitol, and mixtures thereof, having dispersed therein (a) an orally acceptable organic or inorganic peroxide; and (b) a bicarbonate salt;

said composition being substantially completely anhydrous; the quantities and relative proportions of said peroxide and bicarbonate being sufficient to provide quantities of bactericidally active oxygen upon breakdown of said peroxide by tissue contact and/or by reaction with said bicarbonate in the oral cavity; the amount of said bicarbonate being effective to provide a neutral or basic pH upon dissolution of said composition in water; and

at least one of said peroxide or bicarbonate being provided with a water-soluble barrier coating which is insoluble in said vehicle selected from the group consisting of guar gum, xanthate gum, gum arabic, gum tragacanth, locust bean gum, carob bean gum, gelatin, pectin, cellulosic polymers, polyethylene glycols, a water soluble starch, and mixtures thereof, to prevent reaction therebetween in the absence of water dissolution of said coating; whereby upon said composition being contacted with substantial quantities of water, including in the oral cavity of a user of said composition, dissolution of the said barrier coating enables reaction of said peroxide and bicarbonate to augment release of said active oxygen, to inhibit the motility of oral bacteria in said cavity, and dissolution of said bicarbonate enables neutralizing of acid secretions in the said oral cavity.

4,837,009

METHOD AND COMPOSITION FOR PREVENTION OF PLAQUE FORMATION AND PLAQUE DEPENDENT DISEASES

Perry A. Ractliff, 7125 E. Lincoln Dr., Scottsdale, Ariz. 85253

Continuation-in-part of Ser. No. 947,079, Dec. 23, 1986, Pat. No. 4,689,215, and a continuation-in-part of Ser. No. 17,241, Dec. 22, 1986, Pat. No. 4,696,811. This application Mar. 10, 1987, Ser. No. 24,329

The portion of the term of this patent subsequent to Aug. 25, 2004, has been disclaimed.

Int. Cl.[4] A61K 7/20, 33/20

U.S. Cl. 424—53 7 Claims

1. A method for retarding the formation of dental plaque, said method comprising the steps of applying a 0.005% to 0.2% stabilized chlorine dioxide solution for five to thirty seconds to the dorsal and lingual surfaces of the teeth, between the teeth and in the gingival crevices and retarding the formation of pellicle on the surface of a tooth by oxidizing the sulphide bonds of glycoproteins of salivary and other mucous gland origins.

4,837,010

LONG WAVE UV RAY ABSORBER

Hajime Hotta, Yatabe, and Michiyo Akasaka, Matsudo, both of Japan, assignors to Kao Corporation, Tokyo, Japan

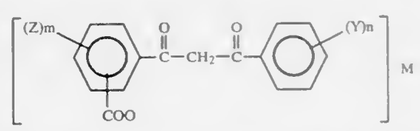
Filed Apr. 1, 1987, Ser. No. 32,577

Claims priority, application Japan, Apr. 2, 1986, 61-75923

Int. Cl.[4] A61K 7/02, 7/40, 7/42, 7/44

U.S. Cl. 424—59 4 Claims

1. A cosmetic composition comprising 0.1 to 20 weight % of a long wave UV ray absorber containing a dibenzoylmethane derivative of the following general formula (I)



(I)

in which Ys and Zs may be the same or different and represent a hydroxyl group, a linear or branched aliphatic hydrocarbon group having from 1 to 24 carbon atoms, an alkoxy group having from 1 to 24 carbon atoms or a polyoxyethylene or polyoxypropylene oxide group, m and n are independently an integer of from 0 to 3, and M represents a polyhydroxylated aluminium ion of the formula $Al_{2+\lambda}(OH)_{3\lambda+5}$, in which λ is a value of from −1 to 3, in admixture with an inert cosmetic carrier.

4,837,011

COSMETIC POWDER EMPLOYING SPHERICAL SILICA PARTICLES

Ralph A. Macchio, Monsey; Ivonne Brown, Roosevelt, and Marlene Tietjen, New York, all of N.Y., assignors to Revlon, Inc., New York, N.Y.

Continuation of Ser. No. 93,925, Sep. 8, 1987, abandoned. This application Oct. 11, 1988, Ser. No. 256,210

Int. Cl.[4] A61K 7/035

U.S. Cl. 424—69 9 Claims

1. A cosmetic powder composition comprising:

(a) essentially spherical silica having an average particle size of 6 to 20 microns, in an amount up to 15 wt.% of the composition;

(b) 25 to 80 parts by weight of material selected from the group consisting of sericite, sericite coated with mineral oil or polydimethylsiloxane having a viscosity of 5 to 100 centistokes wherein the coating comprises up to 5% by weight of the sericite and mixtures thereof;

(c) 1 to 5 parts by weight of polydimethylsiloxane having a viscosity of 5 to 100 centistokes; and

(d) 1 to 5 parts by weight of material selected from the group consisting of isostearyl malate, diisostearyl malate, and mixtures thereof.

4,837,012

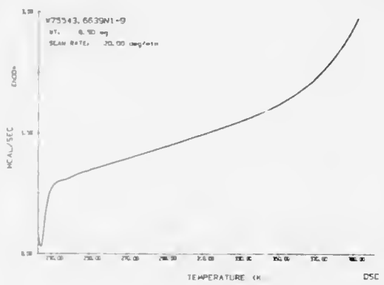
HAIR REVIVER COMPOSITION CONTAINING FILM-FORMING AMINO ACIDS

William G. Kiffel, Kenosha, and Therese M. Tyson, Racine, both of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Jun. 19, 1987, Ser. No. 63,952

Int. Cl.[4] A61K *7/06*

U.S. Cl. 424—70 **14 Claims**



9. A method of reviving unwashed oily hair to give it added body and a conditioned effect comprising applying to said hair a spray mist of a composition consisting essentially of:

(a) about 0.01 to 5% by weight of at least one film-forming amino acid metal salt selected from the group consisting of metal salts of Beta-alanine, L-alanine, L-proline, L-histidine, L-asparagine, L-threonine, L-serine, L-citrulline, L-carnosine, L-glutamic acid, L-aspartic acid, a D-stereoisomer of any of the foregoing amino acid metal salts, and mixtures thereof;

(b) about 80 to 99.99% by weight of a carrier material selected from the group consisting of water, lower alkanols, and mixtures thereof; and

(c) about 0.01 to 3% by weight of a film-forming polymer selected from the group consisting of polyvinylpyrrolidone-quaternized aminoacrylate copolymer, polyvinylpyrrolidone-quaternized aminomethacrylate copolymer, polyvinylpyrrolidone-vinylacetate copolymer, linear polymers of 1-vinyl-2-pyrrolidone monomers, octylacrylamide/acrylates/butylaminoethyl/methacrylate copolymer, hydroxyethylcellulose and diallyldimethyl ammonium chloride copolymer, and mixtures thereof,

wherein the metal of the film-forming amino acid metal salt is selected from the group consisting of magnesium, calcium, potassium, sodium, zinc, barium, and mixtures thereof.

4,837,013

QUATERNIZED NITROGEN CONTAINING COMPOUNDS

Robert B. Login, Oakland; Ratan K. Chaudhuri, Butler; David J. Tracy, Lincoln Park, and Michael W. Lelioff, Westfield, all of N.J., assignors to GAF Corporation, Wayne, N.J.

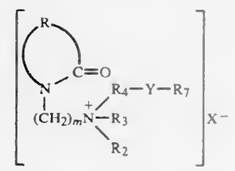
Continuation-in-part of Ser. No. 922,923, Oct. 24, 1986, Pat. No. 4,732,990. This application Aug. 28, 1987, Ser. No. 91,149

The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.

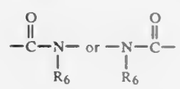
Int. Cl.[4] A61K *7/09*

U.S. Cl. 424—70 **24 Claims**

1. The quaternized compound having the formula



wherein m is an integer having a value of from 1 to 4; R is linear alkylene having from 3 to 8 carbon atoms and is optionally substituted with C_1 to C_4 alkyl; R_4 is alkylene having from 1 to 4 carbon atoms, or is phenylene or naphlylene optionally substituted with lower alkyl; Y is



where R_6 is hydrogen or lower alkyl; R_7 is alkyl of from 1 to 30 carbon atoms; R_2 and R_3 are each independently selected from the group of $—R_4—Y—R_7$, alkyl, alkyleneoxyalkyl, alkylhydroxy, aryl, aralkyl, aralkenyl and alkaryl radicals, said groups having up to 30 carbon atoms and at least one of R_7, R_2 and R_3 being a radical having at least 8 carbon atoms and X^- is a chloride, bromide or iodide anion.

4,837,014

AN IMPROVED METHOD OF TREATING SICKLE CELL ANEMIA

Robert L. Hunter, Tucker, and Alexander Duncan, Dunwoody, both of Ga., assignors to Emory University, Atlanta, Ga.

Division of Ser. No. 45,459, May 7, 1987, Pat. No. 4,801,452, which is a continuation-in-part of Ser. No. 43,888, Apr. 29, 1987, abandoned, which is a continuation of Ser. No. 863,582, May 15, 1986, abandoned. This application Jan. 13, 1989, Ser. No. 297,156

Int. Cl.[4] A61K *31/74, 37/54, 37/547*

U.S. Cl. 424—78 **4 Claims**

1. A method of treating a person with sickle cell disease comprising the step of injecting into the person with sickle cell disease a solution with a fibrinolytic composition therein, the composition comprising an effective concentration of a fibrinolytic enzyme and an effective amount of a surface-active copolymer of the following formula:

$$HO(C_2H_4O)_b(C_3H_6O)_a(C_2H_4O)_bH$$

wherein a is an integer such that the hydrophobe represented by (C_3H_6O) has a molecular weight of approximately 950 to 4000, and b is an integer such that the hydrophile portion represented by (C_2H_4O) constitutes approximately 50% to 90% by weight of the compound.

4,837,015

ALKALI METAL ION-CHARGED, CATION EXCHANGER AND USE THEREOF TO ADJUST SODIUM, POTASSIUM AND CALCIUM BODY FLUID LEVELS

James L. Olsen, Chapel Hill, N.C., assignor to Carolina Medical Products Company, Inc., Chapel Hill, N.C.

Filed Mar. 5, 1987, Ser. No. 22,021

Int. Cl.[4] A61K *31/74*

U.S. Cl. 424—79 **20 Claims**

1. A pharmaceutical composition comprising a water-insoluble, non-bioabsorbable, cation-charged, cation exchange resin charged with cations consisting essentially of about 80–40 mEq % of an alkali metal ion selected from the group consisting of sodium and potassium, about 15–50 mEq % of calcium ion, and about 5–13 mEq % of magnesium ion, and a pharmaceutically acceptable carrier; said resin being a polystyrene sulfonate.

4,837,016

PROTOZOAL ANTIGEN

Anthony A. Holder, Biggin Hill, and Robert R. Freeman, London, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 660,563, Oct. 16, 1984, abandoned, which is a continuation of Ser. No. 379,942, May 19, 1982, abandoned. This application Jul. 31, 1986, Ser. No. 891,055

Claims priority, application United Kingdom, May 21, 1981, 8115555; Aug. 3, 1981, 8123709

Int. Cl.[4] A61K *39/015;* **C12N** *5/00;* **C07K** *15/04*

U.S. Cl. 424—88 **10 Claims**

1. An protection-inducing proteinaceous antigen of a parasite of the species *Plasmodium yoelii* and *Plasmodium falciparum* characterized by an apparent molecular weight in the range of 1.8×10^5 to 2.5×10^5; and in the case of *Plasmodium yoelii* an approximate isoelectric point of 5.3–5.7 and in the case of *Plasmodium falciparum* an approximate isoelectric point of 5.8; the antigen in its native state being associated with the membrane of the erythrocytic schizont form of the parasite and being processed intraerythrocytically to discrete fragments possessing the same antigenic properties, the resulting processed antigen being associated with the membrane of the merozoite form of the parasite; or a protection-inducing functional derivative thereof.

4,837,017

UREASE ANTIGEN PRODUCT AND PROCESS

Harry H. LeVeen; Robert F. LeVeen, both of 321 Confederate Cir., Charleston, S.C. 29407, and Eric G. LeVeen, 141 South Battery, Charleston, S.C. 29401

Filed Mar. 12, 1987, Ser. No. 25,073

Int. Cl.[4] A61K *39/00*

U.S. Cl. 424—88 **17 Claims**

1. A non-enzymatic antigen which is the reaction product of urease and glutaraldehyde to form a covalently bonded molecule having an average molecular weight of about 250,000 to two million.

4,837,018

VACCINES FOR FOWL COLIBACILLOSIS

Takao Konishi, Ikeda; Giichi Sugimori, Ayama; Kazuyoshi Kato, Fuchu; Nobutake Kimura, Irima, and Kenji Shibata, Kawagoe, all of Japan, assignors to Shionogi & Co., Ltd., Osaka and Nisshin Flour Milling Co., Ltd., Tokyo, both of, Japan

Filed Jul. 31, 1987, Ser. No. 79,803

Claims priority, application Japan, Aug. 13, 1986, 61-191119

Int. Cl.[4] A61K *39/108, 39/116*

U.S. Cl. 424—92 **2 Claims**

1. A vaccine useful for the protection of poultry from colibacillosis infection, which comprises as an active ingredient ultrasonically disintegrated cells of *E. coli* which have been pre-inactivated.

4,837,019

SKIN TREATMENT COMPOSITION AND METHOD FOR TREATING BURNED SKIN

Arthur C. W. Georgalas, Leonardo, and George E. Deckner, Westfield, both of N.J., assignors to Charles of the Ritz Group Ltd., New York, N.Y.

Filed Aug. 11, 1986, Ser. No. 895,403

Int. Cl.[4] A61K *37/02, 7/48*

U.S. Cl. 424—101 **15 Claims**

1. A skin treatment composition which counteracts moisture loss and promotes healing of burned or sunburned skin, in the form of an ointment, cream, lotion or liquid, comprising water, at least one preservative and between about 2% and about 30% by weight of a moisturizing component which is comprised of polyglyceryl methacrylate, glycerine, allantoin, panthenol, fibronectin and an amino acid complex including proline, arginine, and pyrrolidone carboxylic acid.

14. The composition of claim 1, which further includes an additive selected from the group consisting of humectants, emulsifiers, thickeners and mixtures thereof.

4,837,020

DEODORANT COMPOSITION

Noritoshi Mise, Takatsuki, and Koichi Matsumura, Ibaraki, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 9, 1987, Ser. No. 94,609

Claims priority, application Japan, Sep. 9, 1986, 61-212954

Int. Cl.[4] A61K *7/38*

U.S. Cl. 424—68 **7 Claims**

1. A deodorant composition comprising (a) D-glucosacharoascorbic acid and (b) a ferrous compound and/or a cupric compound.

4,837,021

TWO PART TISSUE IRRIGATING SOLUTION

Guy Andermann, Colmar; Georges de Burlet, Kaysersberg; Michel Dietz, Kaysersberg, and Joseph Spittler, Kaysersberg, all of France, assignors to Laboratoires P.O.S., Kaysersberg, France

Filed Dec. 31, 1986, Ser. No. 948,188

Int. Cl.[4] A61K *33/00, 33/42, 33/14, 33/06*

U.S. Cl. 424—602 **16 Claims**

1. An article of manufacture containing a two-part tissue irrigating solution comprising:

(a) a package containing a stable, sterile basic solution containing bicarbonate ions, said package containing the solution under vacuum;

(b) a vial containing a stable, sterile acidic solution containing calcium ions, magnesium ions, dextrose, and glutathione, said vial being closed with a rubber stopper;

(c) a sterile double-ended needle; at least one of said solutions containing sodium ions, at least one of said solutions containing potassium ions, at least one of said solutions containing chloride ions, and at least one of said solutions containing gamma-amino butyric acid, (L)diamino-2,4-butyric acid, or a mixture of gamma-amino butyric acid and (L)diamino-2,4-butyric acid,

said acidic and basic solutions being mixed together by aseptically inserting one end of the double-ended needle into the package containing the basic solution, and the other end into the vial containing the acidic solution, and transferring the acidic solution into the basic solution by the vacuum under which the basic solution is maintained,

said acidic and basic solutions when mixed together forming the irrigating solution for irrigating body tissues during surgery, the irrigating solution containing between about 130 and about 180 mM/l sodium ions, between about 3 and about 10 mM/l potassium ions, between about 1 and about 5 mM/l calcium ions, between about 0.5 and about 4 mM/l magnesium ions, between about 10 and about 50 mM/l bicarbonate ions, between about 2 and about 10 mM/l dextrose, between about 0.03 and about 0.5 mM/l oxidized glutathione or the equivalent amount of reduced glutathione, and between about 0.001 and about 1.0 mM/L gamma-amino butyric acid, (L)diamino-2,4-butyric acid, or mixtures thereof, and said irrigating solution having a pH of between about 6.8 and about 8.0 and an osmolality of between 250 and about 350 mOsm/kg.

4,837,022

COMPOSITION CONTAINING TISSUE PLASMINOGEN ACTIVATOR

Fumio Kakimoto; Naoki Asakawa, both of Gifu; Yasuo Ishibashi, Gifu, and Yasuo Miyake, Aichi, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Sep. 10, 1986, Ser. No. 905,402

Claims priority, application Japan, Sep. 10, 1985, 60-198629; Nov. 22, 1985, 60-261397

Int. Cl.[4] A61R *37/547*

U.S. Cl. 424—94.3 11 Claims

1. A composition containing a tissue Plasminogen Activator (tPA), which comprises a partial hydrolyzate of gelatin cross-linked to a diisocyanate as an essential ingredient in an amount sufficient to increase the solubility of the tissue Plasminogen Activator (tPA) in water.

4,837,023

COMPOSITIONS CONTAINING HEXADECYLOPHOSPHOCHOLINE AND ALKYLGLYCEROLS AND USES THEREOF

Hansjörg Eibl, Bovenden, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft Zur Foederung der Wissenschaften, Goettingen, Fed. Rep. of Germany

PCT No. PCT/EP86/00705, § 371 Date Oct. 2, 1987, § 102(e) Date Oct. 2, 1987, PCT Pub. No. WO87/03480, PCT Pub. Date Jun. 18, 1987

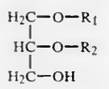
PCT Filed Dec. 4, 1986, Ser. No. 97,960

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1985, 3542893; Feb. 28, 1986, 3606631

Int. Cl.[4] A61K *9/10, 31/685;* C07F *9/09*

U.S. Cl. 424—439 13 Claims

1. Composition useful in treating cancer comprising a therapeutically effective amount of hexadecylphosphocholine and an alkylglycerol of the formula



wherein one of R_1 and R_2 is an alkyl group with 2 to 12 C-atoms and the other radical an H-atom.

4,837,024

COMPOSITIONS, ARTICLES AND MEHTOD FOR IMPROVING WOUND HEALING

Dov Michaeli, San Francisco, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 897,103, Aug. 15, 1986. This application May 13, 1988, Ser. No. 193,597

Int. Cl.[4] A61L *15/03*

U.S. Cl. 424—446 18 Claims

1. An article of manufacture for use in promoting the healing of a surface wound, which article comprises: a suspension of collagen fibrils in admixture with a minor amount of glycosaminoglycan wherein said glycosaminoglycan is chemotactic for fibroblasts or endothelial cells and the collagen is not covalently crosslinked to the glycosaminoglycan, wherein the suspension is located on the surface of a suitable carrier selected from the group consisting of a sterile bandage, a fabric, a gauze or a tape.

4,837,025

SELF-ADHESIVE DEVICE FOR THE PERCUTANEOUS ADMINISTRATION OF AN ACTIVE INGREDIENT

Alain Guillemet, Dijon; Eric Teillaud, Talant; Philippe Reginault, Fontaine les Dijon, and Bruno Bevan, Dijon, all of France, assignors to Laboratoires D'Hygiene et de Dietetique, Paris, France

Continuation-in-part of Ser. No. 174,414, Mar. 25, 1988. This application Sep. 22, 1988, Ser. No. 247,852

Int. Cl.[4] A61K *9/16*

U.S. Cl. 424—448 14 Claims

1. A self-adhesive matrix for the percutaneous administering of a pharmaceutical active ingredient comprising

a) 30 to 50 parts by weight of an ethylene/vinyl acetate copolymer material,

b) 20 to 45 parts by weight of a higher aliphatic monoalcohol compound,

c) 5 to 20 parts by weight of a cellulose derivative material,

d) 1 to 20 parts by weight of an ester compound of a polyhydric alcohol with a fatty aliphatic acid, and

e) 0.1 to 20 parts by weight of an active ingredient which can be administered percutaneously.

4,837,026

TRANSDERMAL AND SYSTEMIC PREPARATION AND METHOD

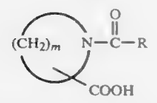
Vithal J. Rajakhyaksha, 27436 Esquina, Misslon Viejo, Calif. 92691

Filed Oct. 3, 1985, Ser. No. 783,621

Int. Cl.[4] A61F *13/00*

U.S. Cl. 424—449 3 Claims

1. A composition useful for topically administering steroids through the skin and mucous membranes of humans and animals in a transdermal device or formulation for systemic use or to the skin of humans and animals for localized use comprising an effective amount of a physiologically active agent and a non-toxic, effective penetrating amount of a compound having the structural formula



where R is an alkyl group with 1 to 19 carbon atoms, and m is 4, 5 or 6.

4,837,027

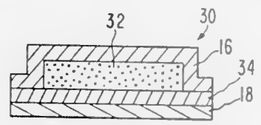
TRANSDERMAL DRUG DELIVERY DEVICE

Eun S. Lee, Redwood City, and Su I. Yum, Los Altos, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 118,577, Nov. 9, 1987, Pat. No. 4,799,613. This application Aug. 9, 1988, Ser. No. 230,211

Int. Cl.[4] A61F *13/00*

U.S. Cl. 424—449 7 Claims



1. A controlled release medical device for delivery of at least one therapeutic agent in a pre-determined delivery rate pattern to a biological environment comprising, in combination:

reservoir means containing a therapeutic agent which in a first form is suitable for storage and in a second form in suitable for absorption through the skin or mucosa, and said reservoir means having a surface substantially impermeable to said therapeutic agent in said first form and permeable to said therapeutic agent in said second form and through which the second form of said therapeutic agent is released to the biological environment; and

activating means containing a plurality of microcapsules containing an activating solution;

whereby the therapeutic agent is changed from its first to its second form by release of the activating solution from said microcapsules, and whereby the passage of therapeutic agent to the biological environment by diffusion is impeded until the therapeutic agent changes form.

4,837,028

LIPOSOMES WITH ENHANCED CIRCULATION TIME

Theresa M. Allen, Edmonton, Canada, assignor to Liposome Technology, Inc.

Filed Dec. 24, 1986, Ser. No. 946,415

Int. Cl.[4] A61K *9/66, 37/22;* B01J *13/02*

U.S. Cl. 424—450 5 Claims

1. A liposome composition having an enhanced blood circulation time when administered intravenously, comprising liposomes which contain an entrapped pharmaceutical agent and are characterized by:

(a) liposome sizes predominantly between about 0.08 and 0.5 microns,

(b) at least about 50 mole percent of a membrane-rigidifying lipid component selected from the group consisting of sphingomyelin and neutral phospholipids with predominantly saturated acyl chains, and

(c) between about 5–15 mole precent ganglioside G_{M1}.

4,837,029

LOW FOAMING, AQUEOUSLY HOMOGENIZABLE RIFAMPIN COMPOSITION

James L. Olsen, Chapel Hill, N.C., assignor to Carolina Medical Products, Inc., Chapel Hill, N.C.

Filed Apr. 6, 1987, Ser. No. 34,767

Int. Cl.[4] A61K *9/48, 31/74*

U.S. Cl. 424—451 20 Claims

1. A readily aqueously dispersable antibiotic composition devoid of any enclosing web structure and/or chelating agents, said composition consisting essentially of rifampin, a dimethyl polysiloxane polymer, and a pharmaceutically acceptable cationic or non-ionic surfactant, wherein the rifampin, dimethyl polysiloxane polymer, and pharamceutically acceptable cationic or non-ionic surfactant, are each present in amounts such that the composition is aqueously homogenizable with low foaming incident thereto.

4,837,030

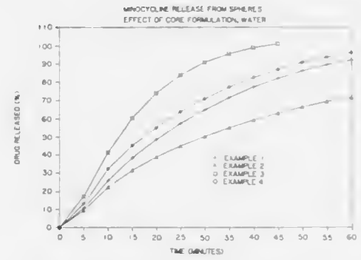
NOVEL CONTROLLED RELEASE FORMULATIONS OF TETRACYCLINE COMPOUNDS

Josepb J. Valorose, Jr., Montgomery; Raymond J. Biehl, Monsey; Nitin V. Sheth, Middletown; Walter A. Strathy, Pearl River, and Michael K. Doelling, New City, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 6, 1987, Ser. No. 104,917

Int. Cl.[4] A61K *9/64, 9/22, 9/16, 9/50*

U.S. Cl. 424—456 42 Claims



1. A spheronized pharmaceutical composition spherical comprising granules which include on or in said granules an effective antibacterial amount of a 7- or 9-(lower)alkylamino-6-deoxy-6-demethyltetracycline or a non-toxic acid addition said thereof blended with an effective amount of at least one pharmaceutically acceptable excipient, said granules being adapted to control the rate of release of said 7- or 9-(lower)alkylamino-6-deoxy-6-demethyl tetracycline in the human stomach and human intesting upon oral administration.

4,837,031

COMPOSITIONS CONTAINING IBUPROFEN

Larry E. Denton, Collinsville, Ill., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Sep. 17, 1987, Ser. No. 97,850

Int. Cl.[4] A61K *9/14*

U.S. Cl. 424—464 25 Claims

1. A free flowing particulate ibuprofen-containing granular composition capable of being directly molded into a pharmaceutically acceptable tablet having high hardness, short disintegration time and fast dissolution rate comprising as components thereof:

(a) from about 50 to about 85 percent, based on the dry weight of the composition, of ibuprofen;

(b) from about 1 to about 5 percent based on the dry weight of the composition, of an internally cross-linked alkali carboxymethylcellulose;

(c) a pharmaceutically acceptable lubricant in an amount of at least sufficient to impart effective mold release properties to the tablet;

(d) cellulose and starch binders and disintegrants; and

(e) water,

said composition having been prepared in a fluidized bed granulator-dryer by a process which comprises spraying an aqueous dispersion of a starch binder onto a fluidized powder comprising ibuprofen and a portion of the said carboxymethylcellulose, drying the resulting granules to a moisture level of from about 1 to about 5 percent based on the total weight of the composition; and thereafter blending a lubricant and the remaining portion of the said carboxymethylcellulose with the dry granules.

9. A method of building free-flowing particulate ibuprofen-containing granules capable of being directly molded into a pharmaceutically acceptable tablet having high hardness, short disintegration time, and fast dissolution rate comprising:

(a) fluidizing a finely divided powder of ibuprofen and an internally cross-linked alkali carboxymethylcellulose, each component having a particle size of about 15 to about 60 microns;
(b) during the fluidization, spraying the fluidized powder with an aqueous dispersion of a pharmaceutically acceptable compressiblilty-promoting binder in an amount effective for increasing the obtainable hardness of tablets made from the resulting composition;
(c) ceasing the spraying;
(d) continuing the fluidization until the thus-built granules have a moisture content of about 2.0 to 5.0 weight percent water based on the total weight of the composition;
(e) ceasing the fluidization; and
(f) blending the dried granules with a pharmaceutically acceptable lubricant in an amount at least sufficient to impart effective mold release properties to tablets made from the resulting granules and with additional carboxymethylcellulose, whereby free-flowing granules having a particle size of about 140–225 microns are produced and being capable of being directly formed into pharmaceutically acceptable tablets.

4,837,032

THEOPHYLLINE SUSTAINED RELEASE TABLET

Aracelis M. Ortega, Caracas, Venezuela, assignor to Farval AG, Zug, Switzerland

Filed Feb. 4, 1986, Ser. No. 825,909
Int. Cl.[4] A61K *9/22 9/26*
U.S. Cl. 424—469 **13 Claims**

1. A pharmaceutical tablet from which theophylline is released by diffusion in an amount effective for not less than about a twelve hour period from a gel-forming granulate which swells and erodes for an extended period of time, said granulate consisting essentially of:
(a) 43 to 50 weight percent theophylline;
(b) 10 to 20 weight percent water insoluble polymer selected from the group consisting of polyvinyl acetate, polyvinyl alcohol, vinyl chloride/vinyl acetate copolymers, acrylate and methacrylate polymers and copolymers, and ethyl and methyl methacrylate copolymers;
(c) 10 to 15 weight percent of polyvinyl pyrrolidone; and
(d) 5 to 15 weight percent acid insoluble polymer having carboxylic groups.

4,837,033

METHOD FOR THE PREPARATION OF A COATED SOLID MEDICAMENT

Hiroyasu Koknbo; Tohru Chiba, both of Niigata, and Fujio Sekigawa, Saitama, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1987, Ser. No. 136,864
Int. Cl.[4] A61K *9/16*
U.S. Cl. 424—494 **3 Claims**

1. A method for forming a film-coating layer on a solid medicament form with a cellulose ether soluble in cold water but insoluble in hot water which comprises the steps of:
(a) dispersing particles of the cellulose ether in hot water at a concentration of 5% to 30% by weight at a temperature higher than the solubilization temperature of the cellulose ether in water to form an aqueous dispersion;
(b) spraying the aqueous dispersion on to the surface of the solid medicament at a temperature above the solubilization temperature of the cellulose ether to form a coating layer containing the particles of the cellulose ether thereon;
(c) keeping the coating layer until the particles of the cellulose ether in the coating layer are plasticized with water and fused together to form a uniform coating layer; and
(d) drying the coating layer.

4,837,034

PREPARATION OF LOW CALORIE BEER

Joseph L. Owades, San Francisco, Calif., and Charles J. Koch, Cambridge, Mass., assignors to Boston Beer Limited Partnership, Boston, Mass.

Filed Aug. 4, 1987, Ser. No. 81,878
Int. Cl.[4] C12C *9/00, 11/04*
U.S. Cl. 426—16 **6 Claims**

1. In a method for producing beer of reduced calorie content wherein a wort is prepared by blending warm malt mash with hot water under conditions which avoid exposing the blend of hot water and the malt mash to temperatures between about 52° C. and 75° C. and the resultant wort is converted to beer by fermenting the wort with Brewer's yeast, the improvement wherein said wort extract is oxygenated with substantially pure oxygen in place of air normally used in the fermentation, and said Brewer's yeast is added to the wort extract at a rate of about 30 to 60 grams pressed yeast per 100 liters wort so as to absorb, within the yeast cells of the Brewer's yeast, substantially all harsh and grainy flavor compounds contained in the wort extract.

4,837,035

LOW FAT CUSTARD-TYPE YOGURT PRODUCT AND METHOD

Donald B. Baker, Tulsa, and Vanessa Hulett, Jenks, both of Okla., assignors to The Pro-Mark Companies, Inc., Tulsa, Okla.

Filed May 22, 1987, Ser. No. 52,988
Int. Cl.[4] A23C *9/123, 9/133;* **A23L** *1/236*
U.S. Cl. 426—43 **30 Claims**

1. A method for making a low butterfat, low total carbohydrate, low calorie custard type yogurt product containing fruit, said method comprising the steps of:
(a) admixing a butterfat-containing milk product in sufficient amount to provide a butterfat content in said yogurt product of less than about 0.2% by weight, at least one stabilizer, a first nutritive sweetener, and non-heat modified nonfat dry milk solids in an amount effective to improve texture and body and to maintain the total solids level in said yogurt product in the range 17 to 20% by weight;
(b) homogenizing said mixture at pressures in the range 500 to 5000 psig (35.15 to 351.5 kg/cm^2);
(c) heating said mixture to a temperature in the range from about 190° to 195° F. (87.7° to 90.6° C.) for a time sufficient to form a uniform, substantially homogeneous mixture and to effect pasteurization;
(d) cooling said homogenized mixture to a temperature of about 90° to 120° F. (32.3° to 48.9° C.);
(e) inoculating said cooled, homogenized mixture with a lactic acid producing bacterial yogurt culture mixture consisting essentially of, by weight, 30–50% Lactobacillus acidophilus, balance *Lactobacillus bulgaricus* and *Streptococcus thermophilus* in approximately equal propertions;
(f) maintaining said inoculated mixture at a temperatue of about 90° to 120° F. (32.2° to 48.9° C.) for a time sufficient to produce a pH in the range of about 4.3 to 4.9 for forming an acceptable taste and texture in said inoculated mixture;
(g) cooling said inoculated mixture to a temperature in the range 50° to 23.9° C.);
(h) forming said cooled inoculated mixture into a smooth textured product;
(i) blending said smooth textured product with low calorie fruit preserves to form said yogurt product, said low calorie fruit preserves comprising a second nutritive sweetener and containing not more than 1000 calories per pound (2200 calories per kilogram) thereof, said first and second nutritive sweeteners being present in amounts such that the total carbohydrate content of said yogurt product does not exceed about 12 to 13% by weight;
(j) cooling said blend of fruit preserves and smooth textured product to a temperature sufficiently low to stop fermentation; and
(k) adding said blend of fruit preserves and smooth textured product into individual yogurt cups, said yogurt product being characterized by the absence of free moisture within the cups.

4,837,036

LOW FAT THIN-BODIED YOGURT PRODUCT AND METHOD

Donald B. Baker, Tulsa, and Vanessa Hulett, Jenks, both of Okla., assignors to The Pro-Mark Companies, Inc., Tulsa, Okla.

Continuation-in-part of Ser. No. 052,988, May 22, 1987. This application Oct. 9, 1987, Ser. No. 106,359
Int. Cl.[4] A23C *9/123, 9/133;* **A23L** *1/236*
U.S. Cl. 426—43 **40 Claims**

1. A method for making a low butterfat, low calorie, high total solids, high protein content, thin-bodied yogurt product containing fruit, said method comprising the steps of:
(a) admixing a butterfat-containing milk product in sufficient amount to provide a butterfat content in said yogurt product of less than about 0.5% by weight, at least one stabilizer, a first nutritive sweetener, and non-heat modified nonfat dry milk solids for forming a yogurt base, said nonfat dry milk solids being present in an amount effective to improve texture and body, to maintain the total solids level in said fruited yogurt product in the range 21.9 to 23.9% by weight and to provide, together with said milk product, a protein content of at least 4.5% in said fruited yogurt product;
(b) homogenizing said yogurt base at pressures in the range 500 to 5000 psig (35.15 to 351.5 kg/cm^2);
(c) heating said yogurt base to a temperature in the range from about 190° to 195° F. (87.7° to 90.6° C.) for a time sufficient to form a uniform, substantially homogeneous mixture and to effect pasteurization;
(d) cooling said homogenized base to a temperature of about 90° to 120° F. (32.3° to 48.9° C.);
(e) inoculating said cooled, homogenized base with a lactic acid producing bacterial yogurt culture mixture consisting essentially of, by weight, 15–25% *Lactobacillus acidophilus,* balance *Lactobacillus bulgaricus* and *Streptococcus thermophilus* in approximately equal proportions;
(f) maintaining said inoculated base at a temperature of about 90° to 120° F. (32.2° to 48.9° C.) for a time sufficient to produce a pH in the range of about 4.3 to 4.9 for forming an acceptable taste and texture in said inoculated yogurt base;
(g) blending said inoculated base with low calorie fruit preserves, said low calorie fruit preserves comprising a second nutritive sweetener and containing not more than 1000 calories per pound (2200 calories per kilogram) thereof; and
(h) cooling said blend of fruit preserves and smooth textured product to a temperature sufficiently low to stop fermentation.

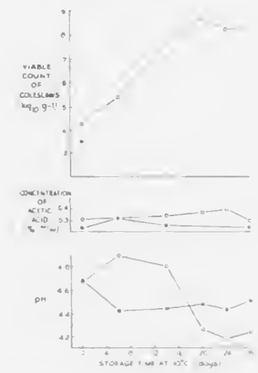
4,837,037

METHOD FOR IMPROVING THE SHELF LIFE OF A FOODSTUFF

Brian H. Kirsop, Ely, and Timothy F. Brockleburst, Norfolk, both of England, assignors to Agricultural & Food Research Council, Norwich, England

Filed Jun. 26, 1987, Ser. No. 67,607
Claims priority, application United Kingdom, Jul. 3, 1986, 8616246
Int. Cl.[4] A23B *7/16;* **A23P** *1/08*
U.S. Cl. 426—303 **30 Claims**

1. A method of treating an edible tissue of a hydrophobic nature to improve the shelf life of said tissue, said method comprising contacting the tissue with a liquid treating agent for a period of time sufficient to effect a decrease in the number of micro-organisms in the tissue, said liquid treating agent



being an aqueous solution comprising an ester of alginic acid and a food grade organic acid.

4,837,038

DECAFFEINATION PROCESS

John C. Proudley, Delaware, and William S. Symbolik, Marysville, both of Ohio, assignors to Nestec SA, Vevey, Switzerland

Filed Feb. 2, 1988, Ser. No. 151,507
Int. Cl.[4] A23F *5/20*
U.S. Cl. 426—428 **10 Claims**

1. A process for decaffeinating green coffee beans in a system having at least one vessel for contacting green coffee beans with a fatty material comprising contacting green coffee beans in at least one vessel with a substantially laminar flow of a fatty material having a superficial velocity of at least about 10×10^{-3} m/sec.

4,837,039

PROCESS OF GASIFICATION FOR OBTENTION OF GASIFIED CANDIES

Ramon Escola Gallart, C/Sebastian Altet no 6, Sant Cugat del Valles, Barcelona, Spain (08190), and Ramon Bayes Turull, C/Urgell 249,80,2a, 08036 Barcelona, Barcelona, Spain

Filed Feb. 9, 1987, Ser. No. 12,549
Int. Cl.[4] A23G *3/00*
U.S. Cl. 426—572 **10 Claims**

1. A process of gasifying to obtain gasified candy product, said process comprising:
providing a pressure vessel having an interior oriented to have a top region and a bottom region and having an agitator disposed within said interior, said pressure vessel being charged with a fused sugar mass and with a gas under pressure within a headspace above said fused sugar mass;
and producing a circulation of said gas through said fused sugar mass traversing from said bottom region to said headspace located within said top region of said interior to saturate said fused sugar mass with gas bubbles of substantially uniform size by:
withdrawing at least a portion of said gas from said headspace,
compressing said withdrawn gas,
introducing said compressed gas into said bottom region of said interior just below said agitator by a bubble forming means such that said gas is formed into a fine curtain of gas bubbles, and

agitating said curtain of gas bubbles and said fused sugar mass by means of said agitator such that gas bubbles of substantially uniform diameter are obtained and dispersed throughout said fused sugar mass.

4,837,040

CHEESE AND YAM PRODUCT

Hitoshi Yokoyama, Sennan, and Noriko Mukai, Izumi, both of Japan, assignors to Fuji Oili Company, Limited, Osaka, Japan

Filed Jun. 5, 1987, Ser. No. 58,883

Claims priority, application Japan, Jun. 12, 1986, 61-137347

Int. Cl.[4] A23C *20/00*; A23L *1/214*

U.S. Cl. 426—582 7 Claims

4. A cheese product comprising a cheese ingredient and mucous yam material or a dried material thereof in an amount of 0.5 to 50% by weight as the solids concentration thereof based on the total weight of the solid matter of the cheese product, said mucous yam material being prepared by mincing, grating or grinding the tuber of a yam belonging to Dioscorea or a dried material thereof.

4,837,041

BLOOMING RESISTANCE IMPROVER

Shouji Maruzeni, Tokyo, Japan, and Toshimichi Yanagihara, deceased, late of Tokyo, Japan (by Hiromi Yanagihara, legal representative), assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1987, Ser. No. 21,968

Int. Cl.[4] A23D *5/00*

U.S. Cl. 426—611 6 Claims

1. A blooming resistance improver for chocolates which comprises an oleaginous composition containing 80 to 99% by weight of at least one component selected from the group consisting of fats, oils and mixtures of fats and oils, which contain 5% or more fatty acid group(s) having 20 or more carbon atoms and solid fat contents of 10% or above and of 5% or above at 20° C. and 25° C., respectively, and a rising melting point of 25° C. or above, and 1 to 20% of at least one polyglycerol fatty acid ester, wherein 1 to 30% of said at least one polyglycerol fatty acid ester is condensed polyglycerol ricinoleate.

4,837,042

FRUIT-CONTAINING CHOCOLATE PRODUCTS AND PROCESS OF THEIR PREPARATION

Gabor Vajda; Laszlo Ravasz; Gaborne Vajda, and Bela Karacsonyi, all of Budapest, Hungary, assignors to Agro-Industria Innovacios Vallalat, Budapest, Hungary

Continuation-in-part of Ser. No. 767,282, Oct. 18, 1985, abandoned. This application Jul. 24, 1987, Ser. No. 77,074

Claims priority, application Hungary, Dec. 20, 1983, 4346/83

Int. Cl.[4] A23G *1/00*

U.S. Cl. 426—615 22 Claims

1. A process for the preparation of substantially homogeneous fruit-containing chocolate products, comprising the steps of:

(a) melting one part, by weight, of a chocolate component at a temperature of between about 32° to 40° C. to produce a chocolate containing melt, and

(b) adding to said melt 0.5 to 1.0 parts, by weight, of a fruit concentrate, having a temperature of about 32° to 40° C.; said concentrate containing at least 8%, by weight, of fruit dry substance, sweetener and between about 2.0–8.0%, by weight, of a lyophilic additive, said concentrate having a dry substance content of between about 62 to 68 Refractometer percent.

4,837,043

PROCESS FOR THE PRODUCTION OF TEST STRIPS BY CASTING METHOD

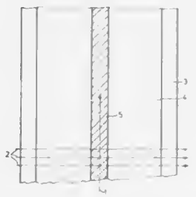
Helmut Engelmann, Leverkusen; Karlheinz Hildenbrand, Krefeld, and Günter Junkers, Leverkusen, all of Fed. Rep. of Germany, assignors to Miles Inc., Elkhart, Ind.

Filed Apr. 6, 1987, Ser. No. 34,988

Claims priority, application Fed. Rep. of Germany, May 16, 1986, 3616620; Sep. 13, 1986, 3631195

Int. Cl.[4] G01N *1/48, 21/06*; A01N *1/02*

U.S. Cl. 427—2 9 Claims



1. A process for the preparation of a diagnostic test strip, which process comprises

(a) adhering a matrix to a substrate,

(b) impregnating the matrix with an impregnating liquid having a viscosity of 0.9 to 4 mPas using an extruder casting machine or a cascade casting machine for the impregnation, and

(c) slitting the resulting reagent impregnated matrix into individual diagnostic test strips.

4,837,044

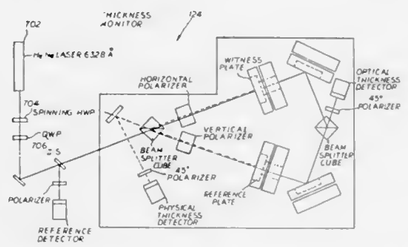
RUGATE OPTICAL FILTER SYSTEMS

Narayan P. Murarka, Hoffman Estates; Kent J. Kogler, Orland Park; Craig S. Bartholomew, Glen Ellyn, all of Ill.; Howard T. Betz, Chesterton, Ind., and Richard J. Harris, Bellbrook, Ohio, assignors to ITT Research Institute, Chicago, Ill.

Filed Jan. 23, 1987, Ser. No. 6,661

Int. Cl.[4] B05D *3/06, 5/06*

U.S. Cl. 427—10 5 Claims



1. A method for fabricating a rugate filter comprising the steps of

providing a predetermined refractive index-thickness profile for a rugate filter,

providing a plurality of at least two different compatible thin film deposition source components of different refractive index which are stoichiometrically combinable in variable proportions to form a thin film material having a refractive index which varies as a function of the proportion of said thin film components therein,

separately laser flash evaporating each of said plurality of source components and co-depositing said thin film source components on a substrate to form a coating on said substrate of varying composition and refractive index while simultaneously monitoring the physical thickness and optical thickness of the coating to provide measured physical thickness and optical thickness values of the coating,

comparing the measured physical thickness and optical thickness values with said predetermined refractive index-thickness profile during deposition, and

adjusting the respective laser flash evaporation rates of said thin film deposition components with reference to the measured physical thickness and optical thickness values and said predetermined profile to conform the physical and optical thickness profile of the deposited coating with the predetermined profile.

4,837,045

COATING METHOD

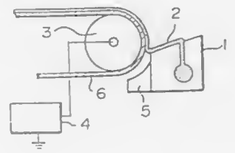
Kenji Nakajima, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 25, 1987, Ser. No. 66,272

Claims priority, application Japan, Jun. 25, 1986, 61-148399

Int. Cl.[4] B05D *1/04*

U.S. Cl. 427—13 5 Claims



1. A coating method, comprising the steps of:

undercoating a web with a layer of gelatin containing a surface active agent;

continuously advancing said web;

coating a material to said layer of gelatin undercoated on said web; and

applying an electrostatic field on said moving web during said coating step.

4,837,046

METHOD FOR FORMING FERRITE FILM

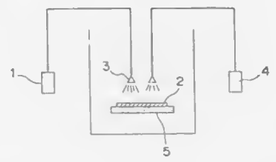
Masao Oishi, Neyagawa; Takao Saito, Toyonaka; Katsukiyo Ishikawa, Kuze; Masanori Abe, Tokyo, and Yutaka Tamaura, Yokohama, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Aug. 7, 1987, Ser. No. 82,638

Claims priority, application Japan, Aug. 8, 1986, 61-187365

Int. Cl.[4] H01F *10/02*

U.S. Cl. 427—38 9 Claims



1. A method for forming a ferrite film on a substrate comprising flowing downward or spraying an aqueous oxidizing agent solution on a substrate in an atmosphere which is substantively free of oxygen and simultaneously supplying an aqueous deoxidized solution containing at least ferrous ions under such conditions that both solutions are fluidized on the substrate so that they continuously flow over the substrate by the force of gravity or by centrifugal force, to effect a ferrite crystallization reaction on the substrate.

4,837,047

CONTAINER AND METHOD FOR STORING BLOOD

Toru Sato, Yonago; Atsuya Matsuda, Tokyo; Masaru Shibata, and Masayuki Onohara, both of Kanagawa, all of Japan, assignors to Sumitomo Bakelite Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 752,537, Jul. 8, 1985, abandoned. This application Jun. 20, 1988, Ser. No. 209,483

Claims priority, application Japan, Jul. 16, 1984, 59-145948; Jul. 16, 1984, 59-145949

Int. Cl.[4] G01N *1/00, 33/48*

U.S. Cl. 422—41 8 Claims

1. A container for storing blood comprising a laminated film type bag for storing whole blood or packaged red blood cells, having heat-resistance sufficient to withstand sterilization by steam under pressure, and having an inner blood-contacting surface and an exterior surface, said laminated film type bag being composed of at least one thermoplastic resin film layer and at least one addition polymerization type silicone rubber film layer; said inner blood-contacting surface of said laminated film type bag being made of said at least one addition polymerization type silicone rubber film layer; said at least one thermoplastic resin film layer having a permeability to carbon dioxide gas of 6,000 to 70,000 ml/m^2.24 hr. for a thickness of 0.025 mm at 25° C.; said laminated film type bag having a permeability to carbon dioxide gas of at least 5,000 ml/m^2.24 hr.atm; and said bag having a rigidity of at most 5 kg/cm of width in terms of tensile strength and a heat seal or adhesive working strength of at least 1.5 kg/cm of width.

4,837,048

METHOD FOR FORMING A DEPOSITED FILM

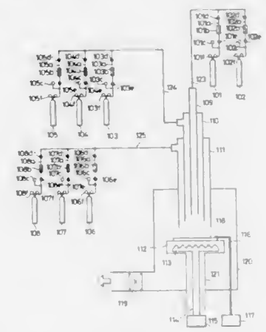
Shunichi Ishihara, Ebina; Jun-ichi Hanna, and Isamu Shimizu, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1986, Ser. No. 920,189

Claims priority, application Japan, Oct. 24, 1985, 60-238495; Oct. 25, 1985, 60-238902

Int. Cl.[4] B05D *5/06, 5/12*

U.S. Cl. 427—69 35 Claims



1. A method for forming a deposited film on a substrate in a reaction space, which comprises;

introducing (a) a gaseous starting material for formation of a deposited film, (b) a gaseous halogenic oxidizing agent (X) having the property of oxidation action on said starting material, and (c) an oxidizing agent (ON) of gaseous oxygen type or nitrogen type oxidizing agents into said reaction space to form a mixture and effect chemical contact

therebetween to thereby form a plural number of precursors containing precursors in an excited state, and

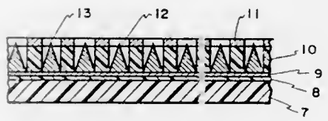
forming said deposited film on said substrate in said reaction space through a gas introducing conduit system using at least one of said precursors as the feeding source for the constituent element of the deposited film, said gas introducing conduit system including a plurality of coaxially aligned conduits each having an exit orifice with an outer conduit adapted to carry said gaseous halogenic oxidizing agent, at least one inner conduit adapted to carry said gaseous starting material, and at least one inner conduit adapted to carry said oxidizing agent, said coaxially aligned conduits extending into the film forming space such that the exit orifices of the inner conduits are set back from the exit orifice of the outer conduit to enable the gaseous halogenic oxidizing agent in the outer conduit to surround the gaseous starting material exiting said inner conduit, said substrate positioned from 5 millimeters to 15 centimeters from the exit orifice of said outer conduit.

4,837,049

METHOD OF MAKING AN ELECTRODE ARRAY

Charles L. Byers; Joseph H. Schulman, both of Granada Hills, and David I. Whitmoyer, Los Angeles, all of Calif., assignors to Alfred E. Mann Foundation for Scientific Research, Sylmar, Calif.

Filed Jun. 17, 1986, Ser. No. 875,334
Int. Cl.⁴ B05D 5/12
U.S. Cl. 427—96 **2 Claims**



1. A method for making an electrode array comprising the following steps:

step (a): obtaining a base with a non-conductive surface, then

step (b): depositing a layer of electrically conductive material atop the non-conductive surface, and

step (c): defining sites upon the layer of electrically conductive material for an array of protuberances, and then

step (d): depositing electrically conductive protuberances upon the sites for the array, the protuberances having tips, and

step (e): forming conductors for electrically connecting to the protuberances by partially removing the layer of electrically conductive material, and then

step (f): depositing a dielectric coat upon the protuberances, exclusive of the tips.

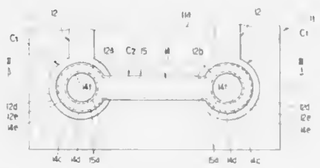
4,837,050

METHOD FOR PRODUCING ELECTRICALLY CONDUCTIVE CIRCUITS ON A BASE BOARD

Yamahiro Iwasa, Hachioji; Yoichi Oba, Higashiyamato, and Isao Morooka, Hachioji, all of Japan, assignors to Asahi Chemical Research Laboratory Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1987, Ser. No. 79,401
Claims priority, application Japan, Sep. 30, 1986, 61-233928; Sep. 30, 1986, 61-233929; Sep. 30, 1986, 61-233930
The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.
Int. Cl.⁴ B05D 5/12
U.S. Cl. 427—96 **15 Claims**

1. In a method for producing electrically conductive circuits on a base board, said base board having a first-layer circuit formed on one side face thereof, said first-layer circuit having a plurality of electrodes and being specifically adapted to receive a metal plating, an electrically conductive copper paste coated on the electrodes of the first-layer circuit and heated to be hardened, said copper paste being specifically adapted to receive a metal plating, and a metal plating coated on the first-layer circuit and the electrically conductive copper paste with a predetermined thickness to form a second-layer circuit on the first-layer circuit, said circuits being electrically connected to each other thereby to form at least two layer circuits on one side face of the base board, the improvement wherein



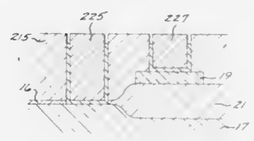
said method comprises the step of coating said electrically conductive copper paste on each of said electrodes of said first-layer circuit to form thereon an electrode of said second-layer circuit in a ring shape having a central opening provided therein as defined by outer and inner boundaries located within each of said electrodes of said first-layer circuit, such that said metal plating of a predetermined thickness electrically connects said first- and second-layer circuits with an electrically conductive path having an increased sectional area provided therein.

4,837,051

CONDUCTIVE PLUG FOR CONTACTS AND VIAS ON INTEGRATED CIRCUITS

Joseph E. Farb, Riverside, and Maw R. Chin, Huntington Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 944,641, Dec. 19, 1986, abandoned. This application Jul. 21, 1988, Ser. No. 222,308
Int. Cl.⁴ B05D 5/12
U.S. Cl. 427—97 **25 Claims**



6. A process for filling contact or via openings in an integrated circuit with electrically conductive plugs, said process comprising the steps of:

forming a plurality of openings in a planarized oxide layer, said plurality of openings being disposed over and exposing semi-insulating and conductive regions of said integrated circuit;

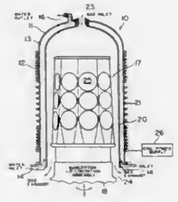
providing a blanket layer of material on which a predetermined conductive material will deposit on the exposed surfaces of the oxide layer, the semi-insulating regions, and the conductive regions; depositing the predetermined conductive material to fill the plurality of openings and cover the oxide surfaces adjacent the openings; and etching the deposited conductive material and the blanket layer to the tops of the plurality of openings to form planarized conductive plugs, and to remove the deposited conductive material and the blanket layer of material from the oxide surfaces adjacent the openings.

4,837,052

PROCESS FOR FORMING REFLECTIVE GOLD COATINGS

D'Arcy H. Lorimer, Santa Clara, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 835,610, Mar. 3, 1986, abandoned. This application May 2, 1988, Ser. No. 188,769
Int. Cl.⁴ B05B 5/00; B05D 5/12
U.S. Cl. 427—160 **5 Claims**



1. A process for forming a high reflectivity, adherent, corrosion-resistant gold-containing layered structure on a quartz base, comprising

vacuum depositing a first, relatively thin layer of gold chromium alloy on the quartz;

vacuum depositing on the first layer a second, relatively thick outer layer consisting essentially of gold for providing high infrared radiation reflectivity to the quartz; forming a third layer on the second, gold layer the third layer being of polymer material selected from silicone resin and polyimide; and

heating the resulting layered structure to enhance the adhesion of the gold layer via the gold chromium layer to the quartz and to cure the polymer.

4,837,053

DIFFUSION BARRIER FOR HIGH TEMPERATURE COMPOSITES

Wei H. Kao, Rancho Palos Verdes; Howard A. Katzman, Los Angeles, and Eric M. Slater, Redondo, all of Calif., assignors to The Aerospace Corporation, El Segundo, Calif.

Filed Aug. 23, 1988, Ser. No. 235,348
Int. Cl.⁴ B05D 7/00
U.S. Cl. 427—214 **1 Claim**

1. A continuous process for creating a uniform MgO fiber coating for use as diffusion barrier between the filaments and matrix in a metal matrix composite, comprising of steps of:

a passing the filaments through a silicon dioxide precursor solution;

b. chemically converting the silicon dioxide precursor to silicon dioxide;

c. immersing the SiO_2-coated filaments in a molten magnesium alloy bath;

d. heating the filaments in air to at least 250° C., thereby oxidizing the magnesium to magnesium oxide and creating a uniform MgO coating on the filaments.

4,837,054

THIN FILM COMPOSITE MEMBRANE PREPARED BY DEPOSITION FROM A SOLUTION

Robert C. Schucker, Baton Rouge, La., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Oct. 14, 1987, Ser. No. 108,820
Int. Cl.⁴ B05D 5/00
U.S. Cl. 427—244 **6 Claims**

1. A method for producing a composite membrane consisting of a thin active layer of polyurea/urethane on a porous backing, said method comprising producing a solution of polyurea/polyurethane polymer in a multi component solvent system consisting of (a) an aprotic solvent, (b) a cyclic ether, (c) cellosolve acetate or methyl cellosolve and (d) a wetting agent wherein the components in the solvent are used in a parts per hundred ratio of a/b/c/d in the range about 3–27/94–33–/2–33/1–7, depositing a thin film of the polyurea/urethane polymer in solvent onto a microporous support substrate, evaporating said solvent to produce a thin film of polyurea–/urethane copolymer on the support.

4,837,055

SUPPORTED MEMBRANE AND PROCESS FOR ITS PREPARATION

Johan G. A. Bitter, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 906,051, Sep. 11, 1986, Pat. No. 4,769,263. This application May 2, 1988, Ser. No. 189,280
Claims priority, application United Kingdom, Sep. 16, 1985, 8522847
Int. Cl.⁴ B32B 7/00; B05D 5/00, 3/02; B01D 13/00
U.S. Cl. 427—244 **12 Claims**

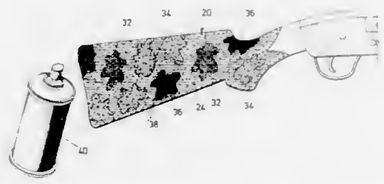
1. A process for preparing a dense hole-free membrane supported on a non-woven monofilament support layer, which process comprises coating a non-woven monofilament support layer with a solution of a polymer in a solvent, the polymer selected from the group consisting of polyalkylene, polydimethyl siloxane, polyurethane, and styrene-butadiene-styrene rubber, removing at least part of the solvent from the coated layer and forming a dense hole-free membrane having a maximum width of about 5000 μm and a thickness less than about 25 μm in areas surrounded by the monofilaments of the support layer.

4,837,056

METHOD FOR CAMOUFLAGING BOWS AND RIFLES

Samuel D. Easley, 404 N. Church, Fayette, Mo. 65248

Filed Jan. 4, 1988, Ser. No. 140,723
Int. Cl.⁴ B05D 5/00, 1/02, 1/32
U.S. Cl. 427—262 **11 Claims**



1. A method for camouflaging an object comprising the steps of:

providing an object having a preselected first color;

applying paint to said object over said first color to form a plurality of discrete images, each of said imaged being a color distinct from said first color;

directing a splatter coat of paint to said object and over said plurality of discrete images to provide a raised, three-dimensional appearance,

said splatter coat being applied substantially over all of said object without completely obscuring said first color and said images, said splattern coat being a final color distinct both from said first color and from said discrete images; and

affixing to said object a coat of relatively transparent, waterproofing material that cures to a low-luster appearance,

whereby said object acquires such coloring, shading and general visual appearance as to be rendered substantially indistinguishable against a background.

4,837,057

PROCESS FOR PREPARING HIGH NITRILE COATINGS ON METAL OR PLASTIC MATERIALS

Rosemary Bartoszek-Loza, Solon, and Richard J. Butler, Euclid, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 23, 1987, Ser. No. 137,279
Int. Cl.[4] B05D 3/02
U.S. Cl. 427—388.4 15 Claims

1. A process for producing a protective barrier coating comprising:

a. preparing a high nitrile latex composition comprising about 40% to about 90% nitrile monomer, about 5% to about 40% monovinyl monomer and about 1% to about 30% rubber component by weight,

b. precipitating the high nitrile polymer from the high nitrile latex,

c. dissolving the high nitrile polymer in a solvent selected from the group consisting of N-vinyl pyrolidone, dimethyloforamide, styrene, N-methyl pyrrolidone, ethylene carbonate, gamma-butyrolactone, dimethylsulphone and combinations thereof to form a coating composition wherein the coating composition comprises a high nitrile polymer from about 5% to about 50% of the total coating composition and a solvent from about 50% to about 95% of the total coating composition,

d. applying the high nitrile polymer coating composition onto a substrate selected from the group consisting of metal, pretreated metal, plastic and pretreated plastic, and

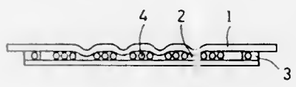
e. drying the high nitrile polymer coating composition at temperatures from about room temperature to about 500° C. to produce a tack free coating.

4,837,058

LIQUID CRYSTAL CELL

Masanobu Aizawa; Shigekazu Yamauchi, and Yuzo Hisatake, all of Tokyo, Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 809,191, May 30, 1986, abandoned. This application Aug. 19, 1987, Ser. No. 87,673
Claims priority, application Japan, Dec. 20, 1985, 60-195240
Int. Cl.[4] G02F 1/13
U.S. Cl. 428—1 3 Claims



1. An improved liquid crystal cell, which comprises:

a liquid crystal material sealed between opposing transparent substrates; and

particulate material provided between said transparent substrates comprised of particles to define spacing therebetween, said particulate material being contained in spaced-apart areas of less than 100 mm^2 defining open areas therebetween, said areas of particulate material being spaced-apart a distance of at least about 2 mm.

4,837,059

SUPPORT STRUCTURE FOR AN ORNAMENT

James A. Milne, Crystal Lake, Ill., assignor to CTI Industries, Barrington, Ill.

Filed Feb. 10, 1988, Ser. No. 154,315
The portion of the term of this patent subsequent to Mar. 8, 2005, has been disclaimed.
Int. Cl.[4] A63H 3/06
U.S. Cl. 428—12 22 Claims

1. A support structure for an ornament, said support structure comprising:

a base having an elongate stem with longitudinally spaced first and second stem parts,

said first stem part having a free end,

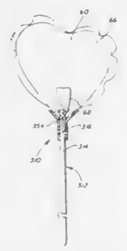
said stem including means for hingedly interconnecting the first stem part and second stem part for relative movement between

(a) a first position wherein the first and second stem parts are in substantially longitudinal alignment, and

(b) a second position wherein the first and second stem parts are folded against each other with the free end of the first stem part closely adjacent to the second stem part;

sleeve having an opening therein with first and second spaced ends;

means mounting the sleeve to the base for sliding movement lengthwise relative to the stem between



(a) a third position wherein the free end of the first stem part is exposed at the first end of the sleeve opening with the first and second stem parts in said second position, and

(b) a fourth position wherein the first stem part is at least partially within the sleeve opening with the first and second stem parts in said second position; and

means on said sleeve for maintaining the first and second stem parts in said second position with the sleeve and base in said fourth position,

whereby a flexible element associated with an ornament can be placed and captively held between the first and second stem parts with the first and second stem parts in the second position and the sleeve and base in the fourth position.

4,837,060

TUBING PLANK

John D. Bambara, Osterville, and Jack P. Erceg, Marstons Mills, both of Mass., assignors to Packaging Industries Group, Inc., Hyannis, Mass.

Filed Sep. 22, 1987, Ser. No. 99,901
Int. Cl.[4] B32B 3/20, 3/22, 3/26
U.S. Cl. 428—36.5 9 Claims

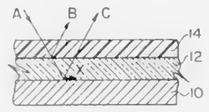
1. A plank comprising a plurality of spaced apart foamed plastic tubular members positioned in substantially parallel array and at least one sheet means secured to the tubular members for forming a substantially planar structure.

4,837,061

TAMPER-EVIDENT STRUCTURES

Paul Smits; Aron M. Rosenfeld, both of Kingston, Canada, and Howard F. DeFerrari, Louisville, Ky., assignors to Alcan International Limited, Montreal, Canada

Filed Aug. 10, 1987, Ser. No. 83,720
Int. Cl.[4] B65D 41/00
U.S. Cl. 428—40 22 Claims



1. A tamper-evident structure which comprises:

a laminate capable of generating a substantially non-dichroic colour by a light interference and absorption phenomenon, consisting of a layer of a metal of medium light reflectivity and a layer of a metal oxide, said layer of metal oxide having been formed by anodization in the presence of fluorine ions, at least in areas of the laminate where a colour change is desired; and

an overlying flexible strip of transparent or translucent material suitable for facilitating the peeling apart of said laminate, said strip having a strength of attachment to said laminate that is greater than the strength of attachment of said layers in said desired areas;

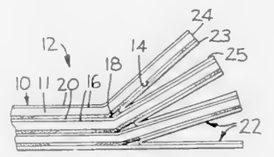
whereby peeling apart of said layers results in loss of said generated colour at least in said desired areas and re-attachment of said layers fails to re-generate said colour.

4,837,062

PRESSURE-SENSITIVE ADHESIVE COATED SHEETS AND TAPE PAD WITH EASILY SEPARABLE TABS

Wayne K. Dunshee, Maplewood, and Sydney B. Hames, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 8, 1988, Ser. No. 153,582
Int. Cl.[4] B32B 3/08
U.S. Cl. 428—41 14 Claims



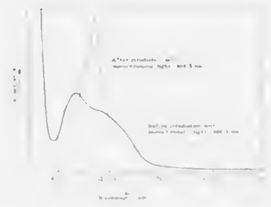
1. A single, flexible sheet comprising a backing having first and second surfaces; a coating of pressure-sensitive adhesive on the first surface of said backing; a folded liner strip forming a V-fold tab wherein the V-fold tab is prepared from polymeric tubing, one leg of said tab adhered to said pressure-sensitive adhesive on a portion of said backing, said tab extending to and coterminous with the peripheral edges of said sheet portion; the unattached leg of said tab hanging freely and forming a handle to facilitate manual separation of said tab from the sheet as the tab covered portion of said sheet is urged into contact with a receptor surface; said handle being identical in dimensions with said attached leg of said tab.

4,837,063

OPTICAL RECORDING MATERIAL

Masahiro Irie, Sakai, Japan, assignor to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 167,117
Int. Cl.[4] B32B 3/00
U.S. Cl. 428—64 20 Claims



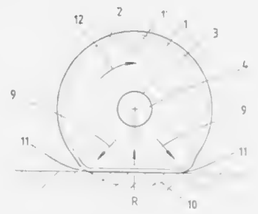
1. An optical recording material comprising a recording layer containing a substance with its optical properties changeable by irradiation with light in which information is recorded by irradiating the recording layer with light, said substance being an ethylene derivative which is ethylene having at each of its 1- and 2-positions a heterocyclic group which heterocyclic groups at the 1- and 2-positions are cyclizable by irradiation with light to form a cyclohexadiene ring and thereby change the optical properties, and wherein the other 1- and 2-positions are connected to each other to form a hydrocarbon ring of a heterocyclic ring.

4,837,064

TRANSPORT ROLLER

Rolf Tschudin-Mahrer, Lausen, Fed. Rep. of Germany, assignor to Irbit Research & Consulting AG, Fribourg, Switzerland

Filed Dec. 30, 1987, Ser. No. 139,465
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1987, 8700258[U]
Int. Cl.[4] B32B 3/26, 7/04
U.S. Cl. 428—71 6 Claims



1. A pressure-deformable transport roller comprising elastic material disposed about a shaft of inelastic material located in a central cavity of the elastic material, the roller including

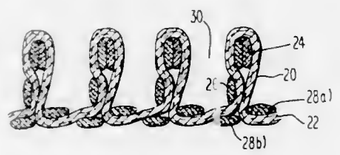
a roller body of the elastic material, the elastic material consisting of open-cell foam;

a skin of resilient material which encloses the foam and forms a cylindrical surface of the roller; and wherein

the skin is anchored to the foam by engagement into pores of the foam; and

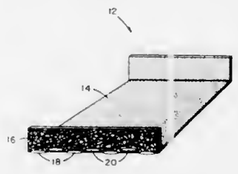
the skin fully covers the foam to form a roller with a hermetically closed, completely skin-covered roller body.

4,837,065
COMPOSITE LAMINATE WITH ENHANCED THROUGH-THE-THICKNESS PROPERTIES
Norris F. Dow, King of Prussia, Pa., assignor to Materials Sciences Corporation, Spring House, Pa.
Filed Dec. 3, 1986, Ser. No. 937,493
Int. Cl.[4] B32B 3/02 33/00
U.S. Cl. 428—86 8 Claims



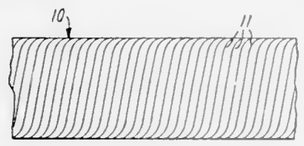
1. A woven fabric having uniformly spaced loops of yarn protruding out of the plane of the fabric, each said loop formed from at least one weft yarn and two sets of warp yarns; the two sets of warp yarns comprising a substantially in-plane set and a substantially out-of-plane set;
said loops protruding out of the plane of the fabric to the extent of at least two out-of-plane warp yarn diameters;
successive loops in the same row spaced from each other by at least two in-plane warp yarn diameters;
at least one of said out-of-plane warp yarns passing through the weft yarn loop;
the remainder of said out-of-plane warp yarns woven in a sinusoidal course about the loops in neighboring rows; and
the in-plane warp yarns alternating above and below the plane of the fabric in neighboring rows;
whereby the in-plane and out-of-plane warp yarns maintain the loops in a position substantially perpendicular to the plane of the fabric.

4,837,066
FOLDABLE RIGIDIFIED TEXTILE PANELS
Pat A. Quinn, Lewiston, and Scott C. Billings, Mechanic Falls, both of Me., assignors to Gates Formed-Fibre Products, Inc., Auburn, Me.
Filed May 29, 1986, Ser. No. 868,902
Int. Cl.[4] B32B 3/10
U.S. Cl. 428—95 26 Claims



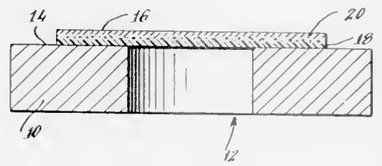
1. A foldable textile surface covering material comprising:
a textile surface layer;
a textile substrate layer attached to said textile surface layer; and
means for permitting said textile surface layer and said textile substrate layer to be folded, said fold permitting means comprising at least two substantially parallel and adjacent rows of juxtaposed slits which have been cut out of the substrate from the substrate side, each row of slits having intervals of spacing, slits of each row being staggered in relation of one row to another such that the end of a given slit in one row is not juxtaposed to a space between slits in an adjacent row.

4,837,067
NONWOVEN THERMAL INSULATING BATTS
Patrick H. Carey, Jr., Bloomington, and Joseph P. Kronzer, Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jun. 8, 1987, Ser. No. 60,041
Int. Cl.[4] B32B 5/12; D04H 1/00, 1/58
U.S. Cl. 428—108 15 Claims



1. A nonwoven thermal insulating batt having face portions and a central portion between said face portions comprising structural staple fibers and bonding staple fibers, said fibers being entangled and substantially parallel to the faces of the batt in the face portions of said batt and substantially parallel to each other and substantially perpendicular to the faces of said batt in the central portion of said batt and the bonding staple fibers being bonded to structural staple fibers and bonding staple fibers at points of contact to enhance structural stability of the batt.

4,837,068
COMPLIANT DIAPHRAGM MATERIAL
John R. Martin, Foxboro, and Richard A. Anderson, North Attleboro, both of Mass., assignors to The Foxboro Company, Foxboro, Mass.
Filed Jan. 27, 1987, Ser. No. 6,840
Int. Cl.[4] B32B 3/10, 15/08, 27/06; F16J 3/02
U.S. Cl. 428—133 24 Claims

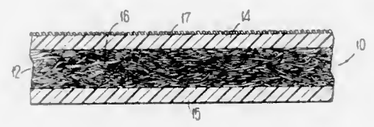


1. In a compliant diaphragm for fluid pressure transmission wherein the diaphragm is impermeable to a pressurizing fluid, the improvement wherein the diaphragm material is a compliant material, comprising:
(A) a flexible layer of polymer sheet material having a first and a second side, and
(B) a flexible metal layer adjacent and bound to the first side of the layer of polymer, the flexible metal layer having a depth and continuity to be impermeable to a pressurizing fluid.

4,837,069
TRANSPARENT ALUMINA MICROSPHERES
Terrance L. Bescup, Woodbury; Benjamin T. Fellows, Oakdale, both of Minn., and Charles J. Leedecke, Northford, Conn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jan. 7, 1987, Ser. No. 1,173
Int. Cl.[4] C01F 7/02; F21D 7/22; B32B 9/03
U.S. Cl. 428—148 10 Claims
1. A solid, transparent, polycrystalline spheroid useful as a retroreflective lens element and having a diameter less than about 500 micrometers, consisting essentially of alpha alumina having crystallites of about 5 to 200 micrometers in largest dimension.
9. A process for making transparent Al_2O_3 spheroids comprising the steps of:
(i) making an aqueous sol of a material selected from a group consisting of aluminum isopropoxide and aluminum monohydrate;
(ii) forming droplets of the sol from step (i) and dispersing said droplets in a particle forming fluid for chemical gelation which is substantially water immiscible, stirring the forming fluid to disperse the droplets and maintaining the

droplets in the forming fluid for a sufficient time for them to gel;
(iii) removing the gelled droplets from the forming fluid;
(iv) drying the wet droplets from (iii);
(v) pre-firing the dried droplets by heating gradually to a temperature of 800°–1200° C.;
(vi) firing the droplets in the following sequence:
(a) firing in dry oxygen at 1,800°–1,975° C. for 5–30 minutes followed by
(b) firing in wet hydrogen at 1,800°–1,975° C. for 10–350 minutes in order to form hardened fired Al_2O_3 spheroids; and
(vii) allowing the Al_2O_3 spheroids to cool.

4,837,070
TAPE BACKING SUBSTRATE
Robert E. Weber, Marietta, and Bruce G. Stokes, Woodstock, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Continuation of Ser. No. 128,767, Dec. 4, 1987, abandoned. This application Sep. 20, 1988, Ser. No. 248,342
Int. Cl.[4] B32B 5/14
U.S. Cl. 428—172 21 Claims



1. A flexible tape backing substrate comprising:
(a) a cellulose web of pulp fibers with a breaking length between about 0.71 km and about 2.66 km in which at least 25% by weight of the fibers have R_{10} values equal to or greater than 94% ;
(b) a soft rubber-like polymer having a glass-transition temperature of between about −50° C. and 0° C. bonding the fibers to each other to form fiber-rubber-fiber bonds within said web, said soft rubber-like polymer being present in said cellulose web to at least about 35 parts dry add-on to 100 parts fiber;
(c) a coating of thermoplastic polymer with a tensile modulus of less than 1,000 MPa on the cellulose web; and
(d) said substrate being embossed on at least one side with a fabric-like pattern.

4,837,071
INFORMATION DISPLAY MEDIUM
Izumi Tagoku, Machida, and Harumitsu Mashiko, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Nov. 24, 1987, Ser. No. 124,602
Claims priority, application Japan, Nov. 25, 1986, 61-280514
Int. Cl.[4] B41M 5/26
U.S. Cl. 428—195 8 Claims

1. An information display medium, comprising:
a thermosensitive material layer which can reversibly repeat turbid and transparent conditions by being heated to different temperatures and can keep one of said conditions stably below a particular temperature, one of the turbid and transparent conditions being selectable by a thermal print head which makes contact with said information display medium;
a colored layer, said colored layer interfaced with said thermosensitive material layer;
a turbid film substrate layer, said turbid film substrate layer interfaced with said colored layer such that said colored layer is sandwiched between said thermosensitive material layer and said turbid film substrate layer;
a background panel connected to said thermosensitive material;
at least one of a group consisting of said thermosensitive material layer, said colored layer, said turbid film substrate layer, and said background panel having a colored pattern.

4,837,072
EMBOSSING FOIL
Horst Kraetschmer, Seukendorf, Fed. Rep. of Germany, assignor to Leonard Kurz GmbH & Co., Fuerth/Bavaria, Fed. Rep. of Germany
Filed May 21, 1987, Ser. No. 52,775
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1986, 8616114
Int. Cl.[4] B32B 7/06, 7/12, 15/08; C09J 7/02
U.S. Cl. 428—201 21 Claims
1. An embossing foil, which comprises:
a decorative layer comprising at least a layer of lacquer and a layer of adhesive;
a further layer between said lacquer layer and said adhesive layer, said further layer comprising a metal layer or a color layer; and
a thermoplastic polyester triple-layer backing foil formed of outer, central and inner polyester layers, said central polyester layer having a lower melting point than said outer and inner polyester layers, an inside surface of said backing foil having a three-dimensional patterning disposed towards said decorative layer.

4,837,073

BARRIER COATING AND PENETRANT PROVIDING OXIDATION PROTECTION FOR CARBON-CARBON MATERIALS

Lawrence E. McAllister, Granger, and Norman E. Jannasch, South Bend, both of Ind., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Mar. 30, 1987, Ser. No. 31,626
Int. Cl.[4] B32B 7/02, 9/00, 15/04; B05D 3/02
U.S. Cl. 428—212 8 Claims

1. A fiber-reinforced carbon-carbon composite article adapted to resist environmental degradation, which comprises:

a. a fiber-reinforced carbon-carbon composite substrate,

b. a barrier coating of material that is thermally mismatched with the substrate and added to prevent oxidation, the coating having cracks exposing areas of the fiber-reinforced carbon-carbon composite substrate as a result of the thermal mismatch, the barrier coating comprising 92% by weight of tin and 8% by weight of nickel alloy, and

c. a penetrant which enters the cracks and protects the exposed areas of fiber-reinforced carbon-carbon composite substrate from environmental degradation.

4,837,074

THERMOFORMED POLYOLEFIN ARTICLES HAVING IMPROVED GLOSS

Richard J. Rosinski, Lake Jackson, and Robert R. Milks, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 6, 1987, Ser. No. 82,605
Int. Cl.[4] C08L 23/00, 27/16, 27/30; B32B 27/08
U.S. Cl. 428—220 14 Claims

1. An article of manufacture, comprising:

a thermoformed article having improved gloss, said article having at least a surface layer comprising a polyolefin having a melt index of from about 0.01 to about 10, as determined according to ASTM D-1238, Condition E, blended with from about 100 to about 3000 parts per million (ppm) of the blend, of a fluoroelastomer having a glass transition temperature (T_g) of 20° C. or less, and being selected from the group consisting of polymers and copolymers of hexafluouropropylene, vinylidene fluoride and blends thereof.

4. The article of claim 1, wherein said article comprises a polyolefin base layer, essentially free of fluorocarbon polymer, the polyolefin having a melt index of from about 0.01 to about 10, as determined according to ASTM D-1238, Condition E, the article having a sheet thickness of at least about 1.8 mm, with the surface layer having a thickness of at least 0.25 mm.

4,837,075

COEXTRUDED PLASTIC FILM LABEL FOR IN-MOLD LABELING

Carol A. Dudley, Heath, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 885,119, Jul. 14, 1986, abandoned. This application May 11, 1987, Ser. No. 49,035
Int. Cl.[4] B32B 27/00; C09J 7/02; B44C 00/00
U.S. Cl. 428—220 9 Claims

9. A polymeric adhesive label particularly adapted for use in the in-mold labeling of blow-molded polyethylene containers comprising: (1) a heat activatable adhesive substrate layer of a polymer selected from the group consisting of (a) homopolymers of ethylene (b) copolymers of ethylene with one or more α-olefins having from 4 to 8 carbons (c) mixtures of (a) and (b) and (d) mixtures of either (a), (b) or (c) with up to 95 percent by weight of a copolymer comprising ethylene and from about 1 percent to about 30 percent by weight of a copolymerizable ethylenically unsaturated carboxylic acid or ester containing comonomer; (2) when the heat activatable adhesive substrate layer comprises (a), (b), or (c) and interlayer of a copolymer of ethylene and from about 1 percent to about 30 percent by weight of a copolymerizable ethylenically unsaturated carboxylic acid or ester containing comonomer, and (3) a surface printable layer comprising polystyrene.

4,837,076

CARBONACEOUS FIBERS WITH SPRING-LIKE REVERSIBLE DEFLECTION AND METHOD OF MANUFACTURE

Francis P. McCullough, Jr., Lake Jackson, Tex., and David M. Hall, Auburn, Ala., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 856,305, Apr. 28, 1986, abandoned, which is a continuation-in-part of Ser. No. 827,567, Feb. 10, 1985, abandoned, which is a continuation of Ser. No. 724,440, Apr. 18, 1985, abandoned. This application Oct. 22, 1987, Ser. No. 112,353
Int. Cl.[4] D03D 3/00
U.S. Cl. 428—224 27 Claims

1. A non-flammable non-linear resilient permanently heat set elongatable carbonaceous fiber having a reversible deflection ratio of greater than 1.2:1 and an aspect ratio greater than 10:1.

4,837,077

HYDROEXPANSIBLE COMPOSITE MATERIAL, THE PREPARATION THEREOF AND A COMPOSITION FOR ITS IMPLEMENTATION AS WELL AS THE USES THEREOF

Patrice Anton, Barentin, and Denis Bergaentzle, Halluin, both of France, assignors to Intissel, Watterlos and Novacel, Deville Les Rouen, both of, France

Filed Jun. 23, 1986, Ser. No. 877,257
Int. Cl.[4] B32B 5/30, 33/00; H01B 7/28, 17/50
U.S. Cl. 428—240 27 Claims

1. A composite material for use as sealing agent in cables, including essentially a flat solid support having on at least one of its faces a coating with a high proportion of a hydroexpansible polymer powder, wherein the hydroexpansible polymer powder is fixed to the support by means of a hydrosoluble binder and the coating is essentially formed of:

95 to 55% by weight of hydroexpansible polymer powder;

5 to 23% by weight of hydrosoluble binder; and

surfactant in a positive amount of up to 22% by weight.

26. A method for the manufacturer of a composite material for use as a sealing agent in cables comprising coating on at least one surface of an essentially flat solid support with a paste homogenized by a liquid other than water, and evaporating said liquid to provide a coating on at least one surface of said support, said coating comprising hydroexpansible polymer powder in an amount of 95 to 55% by weight, hydrosoluble binder in an amount of 5 to 23% by weight, and surfactant in an amount of 0 to 22% by weight.

4,837,078

WET/DRY WIPES

James H. Harrington, Stone Mountain, Ga., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 17, 1987, Ser. No. 134,287
Int. Cl.[4] B32B 27/00
U.S. Cl. 428—284 12 Claims

1. A wipe material comprising in combination,

(A) a wet facing consisting essentially of one or more externally positioned and internally positioned fiber-and/or fibrillated film-web of blended hydrophilic/hydrophobic components totaling about 50–90/50–10 wt. % respectively, the hydrophilic component of each web of said wet facing having a denier within a range of about 0.5–2.0 dpf, and the hydrophobic component of each web of said wet facing having a denier not exceeding about 6 dpf; wherein

(a) said externally-positioned web of said wet facing contains not less than about 60 wt. % of said hydrophilic component, and fiber- and/or fibrillated film-components thereof are of about the same denier; and

(b) said internally-positioned web(s) of said wet facing contain fiber- and/or fibrillated film-components of mixed denier; secured to

(B) a dry facing consisting essentially of one or more webs comprising one or more hydrophobic fiber- and/or fibrillated film-components of mixed denier not exceeding about 6 dpf.

4,837,079

ANTIMICROBIALLY ACTIVE, NON-WOVEN WEB USED IN A WET WIPER

Thomas E. Quantrille, Blacksburg, Va., and Dale H. Johnson, Rockford, Mich., assignors to James River Corporation, Richmond, Va.

Filed Sep. 9, 1988, Ser. No. 242,421
Int. Cl.[4] D04H 1/58
U.S. Cl. 428—288 20 Claims

9. An antimicrobially active, wet wiper comprising:

(a) an antimicrobially active non-woven web comprising:

(i) bonded fibers;

(ii) a binder distributed throughout the fibers in an amount effective to bind the fibers;

(iii) polyhexamethylene biguanide hydrochloride being substantive to the fibers and to the binder when the web is either wet or dry to prevent the polyhexamethylene biguanide hydrochloride from substantially diffusing from the fibers or the binder and being present in an amount effective to act as an antimicrobial agent; and

(b) a substantially preservative free liquid in which the web is maintained in a wet condition until use.

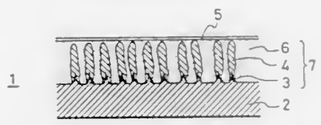
4,837,080

MAGNETIC RECORDING MEDIUMS FOR HIGH DENSITY RECORDING COMPRISING AN IMPROVED STRUCTURE OF A MAGNETIC LAYER

Akio Kuroe, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 17, 1987, Ser. No. 121,909
Claims priority, application Japan, Nov. 18, 1986, 61-274524; Dec. 16, 1986, 61-299502
Int. Cl.[4] G11B 5/70
U.S. Cl. 428—323 10 Claims

1. A magnetic recording medium which comprises a base film having a multitude of fine projections uniformly distributed over one surface thereof, and a magnetic layer formed on the base film, the magnetic layer comprising magnetic acicular particles having a length of from 500 to 5000 angstroms and extending from the individual projections in a vertical direction with respect to the base film, and a resin composition



comprising a lubricant and filling substantially all gaps formed among the vertically extending magnetic acicular particles.

4,837,081

MAGNETIC RECORDING MEDIUM

Yasuyuki Yamada; Hajime Miyatsuka; Tsutomu Okita, and Nobuo Tsuji, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 16, 1987, Ser. No. 39,123
Claims priority, application Japan, Apr. 16, 1986, 61-85858
Int. Cl.[4] G11B 5/70
U.S. Cl. 428—329 5 Claims

1. A magnetic recording medium comprising a non-magnetic support having provided thereon a magnetic layer containing CrO_2 fine particles and a binder, wherein the binder comprises a polycarbonate polyurethane, a copolymer of vinyl chloride, and a polyisocyanate in an amount of from about 50 to about 90 wt%, from 6 to 35 wt% and from 4 to 17 wt%, respectively, based on the total weight of said binder, wherein said polycarbonate polyurethane further comprises a chain extending agent and has an average molecular weight of about 10,000 to about 120,000, wherein said CrO_2 fine particles have an average length in the long axis of about 1.0 μm or less, and S_{BET} specific surface area of about 18 M^2/g or more and a particle axis ratio of about 7/1 or more, said binder being present in an amount of from about 15 to 35 wt% based on the weight of said CrO_2 fine particles.

4,837,082

FLEXIBLE MAGNETIC RECORDING MEDIA AND A METHOD USING A STABLE FLUID REACTIVE DISPERSION TO PREPARE MAGNETIC RECORDING MEDIA

Edward R. Harrell, White Bear Lake; Norman E. Rustad, Shoreview, and Deral T. Mosbey, Cottage Grove, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 31, 1986, Ser. No. 892,229
Int. Cl.[4] G11B 5/74
U.S. Cl. 428—329 29 Claims

1. A magnetic recording medium having a magnetizable layer and selected from diskettes and tapes and comprising:

(a) a flexible, non-magnetizable support base having two opposing major surfaces, and

(b) a layer on at least one of said major surfaces, which layer is comprised of a finely divided particulate solid dispersed and fixed in a crosslinked binder mixture therefor, said finely divided particulate solid being selected from magnetic particles, carbon black, and inorganic fillers suitable for back side coatings on magnetic recording tape, and said crosslinked binder mixture containing:

(1) at least 5 weight percent of a dispersing polymer having a degree of polymerization of not more than about 100 and comprised of units derived from:

(i) one or more vinyl aromatic monomers, and

(ii) one or more ethylenically unsaturated monomers having aliphatic hydroxyl functionality, which polymer is crosslinked into said crosslinked binder mixture; and

a soft-component contributing cobinder resin which is a multi-hydroxy-functional polyurethane, the weight ratio of hard-component binder resins to soft-component binder resins ranging from about 1:4 to 4:1.

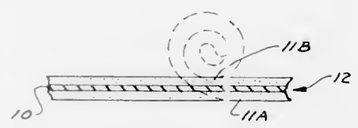
4,837,083
MAGNETIC RECORDING MEDIUM
Kazuhiro Kuroda, Nagano; Kazushi Tanaka, Komoro, and Hitoshi Azegami, Nagano, all of Japan, assignors to TDK Corporation, Tokyo, Japan
Filed Sep. 10, 1987, Ser. No. 95,298
Claims priority, application Japan, Sep. 18, 1986, 61-218084
Int. Cl.[4] G11B *5/70*
U.S. Cl. 428—329 2 Claims

1. A magnetic recording medium comprising a plastic base and a magnetic layer formed thereon by applying a dispersion of a ferromagnetic powder in a resin binder, said magnetic layer containing the ferromagnetic powder which has a BET specific surface area of at least 35 m^2/g and cube-shape αAl_2O_3 particles having a particle size not exceeding one half the mean particle diameter of the ferromagnetic powder and less than 0.1 μm in diameter, the cube shape αAl_2O_3 particles being added in an amount greater than 5% but less than 15% by weight on the basis of the weight of the ferromagnetic powder.

4,837,084
THERMOPLASTIC MULTI-LAYER PACKAGING FILM AND BAGS MADE THEREFROM
Thomas C. Warren, Greer, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.
Filed Jul. 2, 1987, Ser. No. 68,997
Int. Cl.[4] B32B *27/00*
U.S. Cl. 428—349 17 Claims

1. A thermoplastic, multilayer, heat-shrinkable packaging film comprising at least one layer of a copolymer of ethylene and an alpha-olefin with 6 or more carbon atoms per molecule, said ethylene/alpha-olefin copolymer having a density of about 0.910 g/cc or less and a melt index of about 2 or less.

4,837,085
JOINT LEAK STOP MEMBRANE
Bryan M. McGroarty, 10233 Chicago Cir., Bloomington, Minn. 55420
Filed Dec. 15, 1987, Ser. No. 132,964
Int. Cl.[4] B32B *1?/12*
U.S. Cl. 421—451 9 Claims



1. A sealing strip comprising:
a membrane of water impermeable material; and
a continuous layer of particles capable of swelling when in contact with a liquid adhered to both major surfaces of the membrane, the layers having a thickness on both major surfaces thereof sufficient to stop liquid migration between interfacing surfaces engaging the sealing strip.

4,837,086
ADHESIVE CLAD INSULATING SUBSTRATE USED FOR PRODUCING PRINTED CIRCUIT BOARDS
Hiroshi Takahashi, Kasama; Naohiro Morozumi, Hamamatsu; Shin Takanezawa, Shimodate, and Kiyoshi Nakao, Yuki, all of Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan
Filed Jan. 31, 1986, Ser. No. 824,726
Claims priority, application Japan, Feb. 4, 1985, 60-19624
Int. Cl.[4] B32B *27/08*; C08L *61/10*
U.S. Cl. 428—506 6 Claims

1. An insulating substrate having a layer of an adhesive composition comprising
(A) a modified phenolic resin produced by addition reacting a p-substituted alkylphenol and at least one of p-phenylphenol and p-cumylphenol with an aldehyde, followed by condensation with a phenol and/or an amine having higher reactivity with the aldehyde than the p-substituted alkylphenol and p-phenylphenol and/or p-cumylphenol, the p-substituted alkylphenol being present in an amount of 0.2 to 0.8 mole per mole of the total phenol components, the aldehyde being reacted in an amount of at least 1.3 moles per mole of the total phenol components in the presence of a basic catalyst and a phenol and/or amine being added to the thus-obtained addition reaction intermediate product in an amount of 0.2 to 15 parts by weight per 100 parts by weight of the intermediate product and being condensed with said intermediate product to provide said modified phenolic resin and
(B) acrylonitrile-butadiene rubber on at least one surface of a substrate; the ratio of the component (A) to component (B) being 70/30 to 15/85 in solid weight ratio.

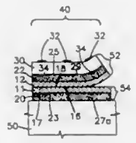
4,837,087
COATING BINDER ADDITIVE
William C. Floyd, Chester, and Sai H. Hui, Rock Hill, both of S.C., assignors to Sequa Chemicals Inc., Chester, S.C.
Division of Ser. No. 909,621, Sep. 22, 1986, Pat. No. 4,695,606. This application Jun. 25, 1987, Ser. No. 66,116
Int. Cl.[4] B32B *23/08*
U.S. Cl. 428—511 26 Claims

1. A paper coating composition comprising a pigment, a binder, and as an insolubilizer for the binder an additive which comprises a blocked glyoxal resin, which is the reaction product of a glyoxal and a blocking component, mixed with a vinyl or acrylic water soluble polymer which is reactive with free glyoxal, the amounts being within the ratio of 25:1 to 1:2 parts by dry weight of the blocked glyoxal resin to the polymer, said binder being selected from the group consisting of starch; oxidized starch; enzyme-converted starch; starches having hydroxyl, carboxyl, amido, or amino groups; proteins; polyvinyl alcohol and their mixtures.

4,837,088
COEXTRUDED CORE LAMINATES
Melvin S. Freedman, Beachwood, Ohio, assignor to Avery International Corporation, Pasadena, Calif.
Continuation of Ser. No. 699,205, Feb. 5, 1985, abandoned. This application Jun. 9, 1987, Ser. No. 61,000
Int. Cl.[4] B32B *31/04, 31/12*
U.S. Cl. 156—243 4 Claims

1. A method of providing cut-to-shape flexible labels from a multilayer laminate assembly bonded to a substrate with pressure sensitive adhesive and adapted to be peelingly separated into at least two sub-assemblies, comprising the steps of:
extruding two polymeric films of different composition and forming them in contact with each other to provide a flexible coextrusion having a pair of contacting interior faces each formed during the coextrusion by contact with the other constituting a peelable interface,
forming a divisible core by permanently combining one film of said coextrusion with a layer of pressure sensitive adhesive having an adhesion level to said one film substantially

greater than that between said two films and permanently combining the other film of said coextrusion with a second layer of pressure sensitive adhesive which in turn is permanently combined with flexible label face stock,
each of said combinings being performed either simultaneously with or subsequently to said step of extruding and forming in contact,
die cutting the combined layers into individual flexible labels and thereafter presenting said first layer of pressure sensitive adhesive to a substrate and laminating said divisible core to said substrate.



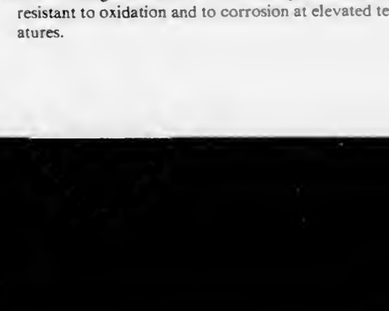
4,837,089
HIGH HARDNESS COMPOSITE SINTERED COMPACT
Masatada Araki, Handa, and Yutaka Kuroyama, Chita, both of Japan, assignors to Nippon Oil and Fats Company, Limited, Japan
Filed Dec. 14, 1987, Ser. No. 132,263
Claims priority, application Japan, Dec. 19, 1986, 61-301803
Int. Cl.[4] B22F *3/00*
U.S. Cl. 428—552 2 Claims

1. A composite sintered compact consisting essentially of:
a sintered body portion containing at least one material selected from the group consisting of high density boron nitride and diamond;
a substrate portion containing at least one material selected from the group consisting of metal and cermet; and
a crystallized metal portion interposed between said sintered body portion and said substrate portion;
wherein said sintered body portion is bonded to said substrate portion through an amorphous metal layer during a sintering operation under a pressure of about 2.5–5.5 GPa, a temperature of about 1500°–1550° C. and a sintering time of about 15 minutes, whereupon said amorphous metal layer is converted into said crystallized metal portion.

4,837,090
CORROSION RESISTANT COATING FOR FASTENERS
Jacob Hyner, Waterbury, and Steven Gradowski, Torrington, both of Conn., assignors to Whyco Chromium Company, Inc., Thomaston, Conn.
Continuation-in-part of Ser. No. 117,794, May 24, 1988, Pat. No. 4,746,408. This application May 11, 1988, Ser. No. 192,480
The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.
Int. Cl.[4] B32B *15/08*
U.S. Cl. 428—626 12 Claims

10. A corrosion resistant drill screw fastener having a ferrous metal substrate and, in sequence, the following layers over said substrate:
(a) a micro-throwing nickel based alloy plating containing less that 3 weight percent zinc and of at least 0.00005 in. thickness on the substrate;
(b) a zinc based alloy plating containing from about 85 to 92 weight percent zinc and from about 8 to 15 weight percent nickel on the nickel based alloy layer; and
(c) an organic coating of electrophoretic paint on the zinc based alloy layer.

4,837,091
DIFFUSION ALLOY STEEL FOIL
Richard A. Nickola, Munster, Ind., assignor to Inland Steel Company, Chicago, Ill.
Continuation of Ser. No. 855,331, Apr. 29, 1986, abandoned, which is a continuation-in-part of Ser. No. 733,727, May 14, 1985, abandoned, which is a continuation-in-part of Ser. No. 511,568, Jul. 7, 1983, Pat. No. 4,517,229, and a continuation-in-part of Ser. No. 617,077, Jun. 4, 1984, Pat. No. 4,624,895. This application Oct. 13, 1987, Ser. No. 107,908
Int. Cl.[4] B32B *15/04*; B05D *3/02*
U.S. Cl. 428—653 24 Claims



1. A solid solution iron-aluminum diffusion alloy foil in essentially unformed and unfabricated state , said foil being obtained in situ by providing a titanium stabilized low carbon steel strip containing an excess of uncombined titanium
, providing an aluminum coating on each side of said strip, cold reducing the coated steel strip to foil gauge, and thereafter diffusion heating the foil gauge strip,
the coated steel strip before cold reduction having a steel strip thickness selected from the range of from about 0.25 mm (0.010 inch) to about 0.76 inch (0.030 inch) with the aluminum coating on each side of said steel strip having a thickness selected from the range of from about 12.7 μm (0.0005 inch) to about 76 μm (0.003 inch),
the coated steel strip after cold reduction of from about 40% to about 99% and before diffusion heating having a foil thickness of from about 0.013 mm (0.0005 inch) to about 0.152 mm (0.006 inch) with the aluminum coating on each side thereof having a thickness of from about 1.07 μm (0.000042 inch) to about 27.9 μm (0.0011 inch), and
the thickness of the steel strip relative to the thickness of the aluminum coatings before cold reduction being controlled, within the aforementioned ranges, so as to provide in said solid solution iron-aluminum diffusion alloy foil an aluminum content in excess of about 4 wt. % and not substantially above about 12 wt. % with the aluminum fully diffused throughout the cross section of the foil,
said foil being formable at room temperature and being resistant to oxidation and to corrosion at elevated temperatures.

4,837,092

MAGNETIC RECORDING POWDER, METHOD OF MANUFACTURING THEREOF AND APPLICATION THEREOF

Hirotaka Yokoyama, Yokosuka; Tadashi Ido, Ebina; Tatsumi Maeda, and Shunji Kurisu, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 716,120, Mar. 26, 1985, Pat. No. 4,699,771. This application Aug. 12, 1987, Ser. No. 84,461

Claims priority, application Japan, May 14, 1984, 59-94607; May 14, 1984, 59-94608

Int. Cl.[4] C01F *11/46;* C01G *49/02;* C04B *35/26*

U.S. Cl. 428—694 12 Claims

7. A magnetic recording medium having a magnetic layer containing a hexagonal barium ferrite powder with a coercive force control substituting element, said magnetic layer being formed on a substrate, wherein a water insoluble compound of barium ions and sulfate ions is contained in a magnetic layer, wherein said hexagonal barium ferrite powder having said coercive force control subsituting element is represented by the formula:

$$BaO \cdot n(Fe_{1-x}M_x)_2O_3$$

wherein M is at least one member selected from the group consisting of indium, cobalt, titanium, nickel, manganese, copper, zirconium, niobium, vanadium, tantalum, zinc, chromium aluminum, germanium and antimony, x is greater than 0 to 0.2, and n is 5.0 to 6.0.

4,837,093

UNIFORMLY COATED GLASS SUBSTRATES

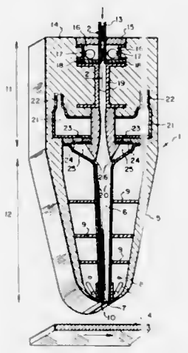
Jean-Claude Coulon, Mercurey, and Jean-Pierre Douche, Thourotte, both of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

Continuation of Ser. No. 794,364, Nov. 4, 1985, abandoned, which is a continuation of Ser. No. 588,329, Mar. 12, 1984, Pat. No. 4,562,095. This application May 5, 1987, Ser. No. 45,739

Claims priority, application France, Mar. 14, 1983, 83 04124

Int. Cl.[4] B32B *17/06, 15/00*

U.S. Cl. 428—432 35 Claims



1. A uniformly coated float glass product having a width of several meters and a continuous or indefinite length formed by a method for regularly distributing a pyrolytically decomposable powder onto a heated float glass substrate to form a metal oxide coating thereupon by pyrolytic decomposition comprising the steps of:

forming a sheet-like stream of powder suspended in a gas by introducing the powder into an elongated nozzle through a multiplicity of separate feeds that enter said nozzle at points removed from the substrate to be coated;

maintaining said powder stream in continuous flow in the direction of the substrate;

introducing gas currents into the powder stream to create turbulences therein and homogenize the mixture of gas and powder as it advances toward the substrate;

regularly accelerating the powder stream toward the substrate by entraining it in additional gas currents introduced at high velocity alongside the powder stream and aimed approximately in the direction of the substrate;

heat said float glass substrate to a temperature above that necessary to pyrolytically decompose said powder; and

forming a uniform metal oxide coating upon said float glass substrate by pyrolytic decomposition of said powder so as to form a uniform coating of a thickness of less than about 2850 Angstroms having variations in thickness of less than about 50 Angstroms across the width and along the length of the float glass substrate.

4,837,094

OXYGEN-CONTAINING FERROMAGNETIC AMORPHOUS ALLOY AND METHOD OF PREPARING THE SAME

Toshio Kudo, Tokyo, Japan, assignor to Research Development Corporation of Japan and Casio Computer Co., Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 747,132, Jun. 20, 1985, abandoned. This application Feb. 4, 1987, Ser. No. 11,646

Claims priority, application Japan, Jun. 30, 1984, 59-134105

Int. Cl.[4] G11B *5/66*

U.S. Cl. 428—694 6 Claims

1. An oxygen-containing ferromagnetic amorphous alloy, said alloy consisting of:

$M_xG_yO_z$ wherein M is one or more transition elements of Fe, Co and Ni; or a combination of said transition element or elements and one or more elements selected from the group consisting of Mn, Nb, Mo, Hf, Ta,W, Pt, Sm, Gd, Tb, Dy and Ho; G is one or more elements selected from the group consisting of B, Si Ge, As, Sb, Ti, Sn and Zr; and x, y and z are the fractional atomic percentages of M, G and O and $x+y+z=100$, the composition of said amorphous alloy being in the pentagonal hatched zone in the attached FIG. 1, said pentagonal zone being defined by the respective lines joining the points of A (80, 19, 1), B (50, 49, 1), C (36, 36, 28), D (36, 4, 60) and E (38.5, 1.5, 60) shown in said FIG. 1.

4,837,095

IN SITU ROOFING COMPOSITE AND METHOD UTILIZING WIDER POLYESTER

John P. Hageman, 42 Susan Dr., Closter, N.J. 07624

Continuation of Ser. No. 715,285, Mar. 25, 1985, abandoned, Continuation-in-part of Ser. No. 704,143, Feb. 21, 1985, abandoned, Continuation of Ser. No. 642,576, Aug. 20, 1984, Pat. No. 4,521,478. This application Apr. 21, 1986, Ser. No. 836,756

Int. Cl.[4] B32B *3/10*

U.S. Cl. 428—287 11 Claims

1. A built-up, in situ roofing composite comprising:

a first layer of water-proofing ingredients applied to a roof base sheet or substrate, said ingredients selected from a group consisting of asphalt, modified asphalt and coal tar;

at least a single ply of non-woven polyester sheeting overlaying said first layer, said sheeting comprising polyester strips layed side-by-side upon the first layer in widths of approximately fifty-four inches across;

a second layer of water-proofing ingredients applied over said polyester, said second layer flowing through said polyester and melding with said first layer to form a built-up composite membrane which is affixed to said substrate; and

an insulating, heat-resistant layer of material disposed over said built-up composite membrane forming a roofing composite that is substantially split-resistant.

4,837,096

SEMICONDUCTIVE OR CONDUCTIVE POLYMERS, METHOD OF PRODUCING THE SAME AND BATTERIES USING THE POLYMERS AS ACTIVE MATERIALS

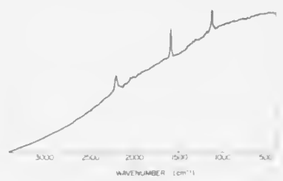
Okitoshi Kimura, Tokyo; Toshiyuki Ohsawa, Kawasaki; Toshiyuki Kabata, Yokohama; Hiroshi Nishihara, Tokyo, and Kunitsugu Aramaki, 2-23-26 Okusawa, Setagaya-ku, Tokyo, all of Japan, assignors to Ricoh Company, Ltd. and Kunitsugu Aramaki, both of Tokyo, Japan

Filed Oct. 23, 1987, Ser. No. 111,727

Claims priority, application Japan, Oct. 25, 1986, 61-254393; Feb. 17, 1987, 62-034036; Feb. 17, 1987, 62-034037

Int. Cl.[4] H01M *4/60;* C25B *3/00;* C08G *75/00*

U.S. Cl. 429—213 10 Claims



1. A method of producing a polymer having repeating units of the formula (I):

$$+Ar-C\equiv C+_n \quad (I)$$

wherein n has a value of at least 10; Ar represents an aromatic conjugated group, and X^1 and X^2 each represent hydrogen or halogen when the bond between the two carbon atoms is a double bond, and when the bond is a triple bond, neither X^1 or X^2 exists, by electrochemically reducing a monomer having the formula (II):

$$Z^1-Ar-Z^2 \quad (II)$$

wherein Ar is the same as that defined in above formula (I), and Z^1 and Z^2 each represent a methyl halide.

4,837,097

OPTICAL SHIELD FOR LIQUID CRYSTAL DEVICES AND METHOD OF FABRICATION

Ram S. Narang, Fairport; Alain E. Perregaux, Pittsford, and Eugene C. Faucz, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 17, 1987, Ser. No. 134,334

Int. Cl.[4] G02F *1/13;* G03C *9/00*

U.S. Cl. 430—5 19 Claims

1. A method of fabricating an optical shield for use in a liquid crystal image bar of the type having liquid crystal material disposed between a pair of transparent glass substrates containing transparent electrodes on confronting inner surfaces thereof, the optical shield formed on one of the glass substrate's inner surface and over the transparent electrodes thereon with an opening therethrough for passage of light, and a separate transparent alignment layer formed on each inner substrate surface covering the transparent electrodes and optical shield, the method comprising the steps of:

(a) dissolving a dye in a first liquid photoresist material, the quality of dye being sufficient to render the photoresist substantially opaque;

(b) spreading the dye-loaded photoresist of step (a) over a surface of a transparent glass substrate having at least one transparent electrode thereon to form a first opaque liquid film having a thickness of 1 to 4 micrometers;

(c) solidifying the first liquid film for a predetermined time and temperature to form a first solid opaque film;

(d) forming at least one light passing opening through the first solid film, the opening having a predetermined size; and

(e) washing the first solid opaque film with the at least one opening therethrough with methanol and forming a transparent alignment layer thereon.

4,837,098

COLOR FILTER AND METHOD OF PRODUCING THE SAME

Masayoshi Shimamura; Tadahiro Furukawa; Akiyoshi Murakami, and Toshio Haga, all of Tokyo, Japan, assignors to Kyodo Printing Co., Ltd., Japan

PCT No. PCT/JP86/00043, § 371 Date Sep. 19, 1986, § 102(e) Date Sep. 19, 1986, PCT Pub. No. WO86/04688, PCT Pub. Date Aug. 14, 1986

PCT Filed Feb. 3, 1986, Ser. No. 921,047

Claims priority, application Japan, Feb. 5, 1985, 60-20731; Feb. 5, 1985, 60-20732

Int. Cl.[4] G03C *5/00;* G03F *9/00*

U.S. Cl. 430—7 9 Claims

1. A method of producing a color filter adapted to be placed on a light-receiving surface comprising (a) a substrate having one surface parallel to the light-receiving surface, and (b) a color filter layer formed on said one surface of said substrate, said color filter layer comprising at not less than two groups of filter picture elements having different spectral characteristics, each of the groups being composed of a number of said filter picture elements, said method comprising the steps of:

(A) applying to said one surface of said substrate a coating solution comprising a polyimide precursor solution and a

first color dye dissolved in said polyimide precursor solution to form a first coating layer for forming one of said not less than two groups of filter picture elements;

(B) patterning said first coating layer by photolithography to form a pattern of a first group of filter picture elements;

(C) heat treating the patterned first group of filter picture elements at temperatures which said first dye withstands, thereby enhancing solvent resistance of said first group of filter picture elements;

(D) applying directly to said one surface of said substrate, having said first group of filter picture elements thereon, a coating solution comprising a polyimide precursor solution and a second coloring dye dissolved in said polyimide precursor solution to form a second coating layer for forming another of said not less than two groups of filter picture elements;

(E) patterning said second coating layer by photolithography to form a pattern of a second group of filter picture elements; and

(F) heat treating the patterned second group of filter picture elements at temperatures which said second dye withstands, thereby enhancing solvent resistance of said second group of filter picture elements.

6. A method of producing a color filter according to claim 1, in which the patterning of each of said first and second groups of filter picture elements is carried out by masking each coating layer with a photoresist and etching each coating layer simultaneously with the developing treatment of photoresist.

4,837,099

MULTILAYER PHOTOCONDUCTOR FOR ELECTROPHOTOGRAPHY

Masahiko Kasahara, and Mitsuru Narita, both of Matsumoto, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Sep. 16, 1988, Ser. No. 245,686

Claims priority, application Japan, Oct. 26, 1987, 62-269705

Int. Cl.[4] G03G *5/14, 5/082*

U.S. Cl. 430—58 **4 Claims**

1. A photoconductor for electrophotography comprising, in sequence:

(a) a conductive base;

(b) a carrier transport layer comprising a selenium-arsenic alloy;

(c) a carrier generation layer comprising a selenium-tellurium alloy;

(d) an electron injection-limiting layer comprising selenium and up to 10 weight percent of arsenic; and

(e) a surface protective layer comprising a selenium-arsenic alloy different in composition from said electron injection-limiting layer.

4,837,100

ELECTROPHOTOGRAPHIC DEVELOPER CONTAINING POSITIVELY CHARGEABLE TONER

Toshiaki Murofushi; Yasuhiro Ohya; Hiroshi Nakazawa, and Koichi Oyamada, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1987, Ser. No. 102,456

Claims priority, application Japan, Sep. 29, 1986, 61-228265; Sep. 29, 1986, 61-228266; Dec. 16, 1986, 61-297555

Int. Cl.[4] G03G *9/10*

U.S. Cl. 430—106.6 **13 Claims**

1. An electrophotographic developer comprising a carrier, toner particles positively chargeable by friction with the carrier, fine particles of hydrophilic alumina, and fine particles of one of tin oxide, hydrophobic silica and titanium dioxide.

4,837,101

NEGATIVELY CHARGED COLORED TONER COMPOSITIONS

Robert J. Gruber, Pittsford; John F. Knapp, Fairport; Ronald J. Koch, Webster, and Lawrence Floyd, Jr., Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 1, 1988, Ser. No. 150,584

Int. Cl.[4] G03G *9/10*

U.S. Cl. 430—109 **18 Claims**

1. A negatively charged developer composition comprised of a toner composition with an average particle diameter of from 4 to 9 microns consisting essentially of a mixture of styrene butadienes, and styrene methacrylates; pigment particles selected from the group consisting of cyan, magenta, yellow, red, blue, green, brown, and mixtures thereof; first external additive particles of colloidal silica; second external additive particles of fatty acid metal salts; and carrier particles consisting essentially of a ferrite core with a polymeric coating thereover, which coating has dispersed therein conductive particles.

4,837,102

LIQUID DEVELOPER FOR ELECTROSTATIC PHOTOGRAPHY

Shigeyuki Dan; Eiichi Kato; Kazuo Isbii; Hiroshi Ishibashi, and Hidefumi Sera, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

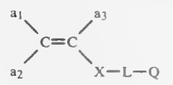
Filed Sep. 9, 1987, Ser. No. 94,612

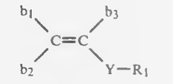
Claims priority, application Japan, Sep. 9, 1986, 61-212392; Sep. 9, 1986, 61-212393

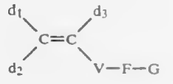
Int. Cl.[4] G03G *9/12*

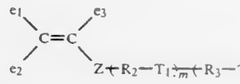
U.S. Cl. 430—114 **19 Claims**

1. A liquid developer for electrostatic photography comprising a carrier medium having an electrical resistivity of not less than 10^9 Ω·cm and a dielectric constant of not more than 3.5 having dispersed therein at least a resin, wherein said resin is a copolymer resin obtained by copolymerizing (1) a solution containing at least one copolymer having an unsaturated bond obtained by copolymerizing at least one monomer (A) represented by formula (I) shown below and at least one monomer (B) represented by formula (II) shown below, and reacting the resulting copolymer with at least one monomer (C) represented by formula (III) shown below, (2) at least one monomer (D) which is soluble in the carrier medium but becomes insoluble upon polymerization, and (3) at least one monomer (E) represented by formula (IV) shown below to obtain a resin dispersion:


(I)


(II)

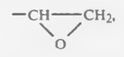

(III)


(IV)

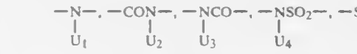
wherein a_1, a_2, a_3, b_1, b_2, b_3, d_1, d_2, d_3, e_1, e_2, and e_3, which may be the same or different, each represents a hydrogen atom, a hydrocarbon group, $-CO_2J$ or $-CH_2CO_2J$, wherein J represents a hydrogen atom or a hydrocarbon group; X, Y, V and Z, which may be the same or different, each represents

—O—, —S—, —CO—, $-CO_2-$, —OCO—, $-SO_2-$, $-CH_2OCO-$, —CONH—, $-SO_2NH-$, —NHCO—, —NHCONH—,

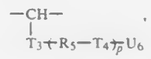
wherein W represents a hydrocarbon group or $-R_2-T_1)_m(-R_3-T_2)_nU$; L and F, which may be the same or different, each represents a hydrocarbon group or a chemical bond linking X and Q, or V and G, respectively, either directly or via a hetero atom; Q and G, which may be the same or different, each represents a group selected from $-CO_2H$,



—COCl, —OH, $-NH_2$, $-NHR_4$, wherein R_4 represents a hydrocarbon group, or —NCO, Q and G thus being capable of forming a chemical bond upon reaction; R_1 represents a hydrocarbon group having from 4 to 20 carbon atoms; U represents a hydrogen atom, an unsubstituted hydrocarbon group having up to 18 carbon atoms or a hydrocarbon group having up to 18 carbon atoms which may be substituted with a halogen atom, —OH, —CN, $-NH_2$, $-CO_2H$, $-SO_3H$ or $-PO_3H$; T_1 and T_2, which may be the same or different, each represents —O—, —S—, —CO—, $-CO_2-$, —OCO—, $-SO_2-$,



$-NHCO_2-$ or —NHCONH—, wherein U_1, U_2, U_3, U_4, and U_5 each has the same meaning as U; R_2 and R_3, which may be the same or different, each represents a substituted or unsubstituted hydrocarbon group having up to 18 carbon atoms which may contain in its main chain a group



wherein T_3 and T_4, which may be the same or different, each has the same meaning as T_1 and T_2; R_5 represents a substituted or unsubstituted hydrocarbon group having up to 18 carbon atoms; U_6 has the same meaning as U; and p represents 0 or an integer of from 1 to 4; and m and n each represents 0 or an integer of from 1 to 4.

4,837,103

NEGATIVE CHARGING LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY

Hirokazu Yamamoto, and Akira Furukawa, both of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Nov. 12, 1987, Ser. No. 119,500

Claims priority, application Japan, Nov. 13, 1986, 61-271487

Int. Cl.[4] G03G *9/02*

U.S. Cl. 430—115 **5 Claims**

1. A negative-charging liquid developer for electrostatic photography which comprises a highly insulating carrier liquid in which resin particles comprising a charge control agent are dispersed, said charge control agent being a carboxylic acid amine salt which comprises a polycarboxylic acid compound insoluble in said carrier liquid and a high molecular amino compound soluble in said carrier liquid.

4,837,104

SCAVENGING FIELD FOR ELECTROSTATOGRAPHIC PRINTING MACHINE

Douglas P. Connolly, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 2, 1988, Ser. No. 200,879

Int. Cl.[4] G03G *21/00*

U.S. Cl. 430—125 **20 Claims**

1. An imaging process where successive developed toner images are formed on successive registered areas of an endless imaging member movable through a path past a plurality of processing stations in an automatic printing machine comprising the sequential steps of forming an electrostatic latent image on an endless imaging member, developing said latent image with toner, creating an electrostatic fringe field across the width of said imaging member in advance of the lead edge of the developed toner image present in a registered area of the imaging member of sufficient magnitude to attract otherwise contaminating toner thereto as it traverses said path whereby said contaminating toner is not attracted to successive registered areas of the imaging member, transferring said toner image to an image support substrate, and cleaning said imaging member to remove residual toner in preparation for the formation of the next electrostatic latent image.

4,837,105

IMAGING PROCESS WITH PREVENTION OF TONER SPOTS

Richard D. Manca, Walworth; Thomas R. Hoffend, Webster, and Don B. Jugle, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 22, 1988, Ser. No. 158,975

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.[4] G03G *13/22*

U.S. Cl. 430—126 **28 Claims**

1. An electrophotographic imaging process which comprises the formation of a latent image on a photoconductive imaging member; thereafter developing the image with a toner composition comprised of resin particles, pigment particles, and a sulfur containing organopolysiloxane wax; subsequently transferring the developed image to a suitable substrate; and permanently affixing the image thereto, wherein there result images with an absence of unwanted toner spots thereon.

4,837,106

RECORDING MATERIALS CONTAINING PHOTOPOLYMERIZABLE COMPOSITION AND COMPONENT CAPABLE OF CAUSING A COLOR REACTION IN MICROCAPSULES

Sbun-ichi Ishikawa; Tadao Imagawa; Minoru Maeda, and Fumiaki Shinozaki, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 744,176, Jun. 13, 1986, abandoned. This application Dec. 29, 1986, Ser. No. 946,625

Claims priority, application Japan, Jun. 13, 1984, 59-121638

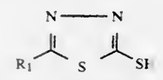
Int. Cl.[4] G03C *1/40, 1/00, 1/68*

U.S. Cl. 430—138 **8 Claims**

1. A light-sensitive and pressure-sensitive recording material comprising (i) an addition polymerizable compound having at least one ethylenic unsaturated double bond, (ii) a photopolymerization initiator composition and (iii) at least one component capable of causing a color reaction, wherein components (i), (ii) and (iii) are contained in microcapsules which cause color development upon rupturing the microcapsules in non-exposed areas, rupturing being effected by the application of pressure to the microcapsules and being after image-wise exposure of the microcapsules to light; and wherein said photopolymerization initiator composition (ii) comprises the following components (a), (b) and (c):

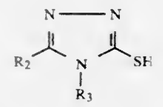
(a) a photo-absorbent having a molecular extinction coefficient of 10^3 or more at a maximum absorption wavelength;

(b) a hexaarly-biimidazole; and
(c) a heterocyclic mercapto compound selected from compounds represented by the following formula (II) and (III):



(II)

wherein R_1 is an alkyl group, an alkylthio group or a mercapto group;



(III)

wherein R_2 is a hydrogen atom or an alkyl group; R_3 is an alkyl group or an aryl group, wherein the content of component (a) is 0.1 to 10 parts by weight, that of component (b) is 0.5 to 30 parts by weight, and that of component (c) is 0.1 to 20 parts by weight, each on the basis of 100 parts by weight of said ethylenic unsaturated bond-containing compound (i), and wherein component (iii) is employed in an amount of from 0.5 to 20 parts by weight on the basis of 100 parts by weight so component (i) wherein the microcapsules have a capsule wall which is formed from urea, resorcinol and formaldehyde.

4,837,107

TONER FOR ELECTROPHOTOGRAPHIC METHODS AND PROCESS FOR PREPARING THE SAME

Anders R. Axelsson, Sundsvall; Lolo Hylander, Njurunda; Sten Porrvik, and Olof Tanner, both of Sundsvall, all of Sweden, assignors to Casco Nobel AB, Stockholm, Sweden

Continuation of Ser. No. 928,544, Nov. 10, 1986, abandoned, which is a continuation of Ser. No. 447,124, Dec. 6, 1982, abandoned. This application Mar. 25, 1988, Ser. No. 173,631
Claims priority, application Sweden Dec. 10, 1981, 8107421; Mar. 18, 1982, 8201739
Int. Cl.[4] G03G 9/08
U.S. Cl. 430—138 **12 Claims**

1. A proces for the preparation of monodisperse spherical toner particles having a coefficient of variation below 30 percent and a mean diameter between 2 and 50 μm, which includes the steps of

(A) providing monodisperse spherical base particles that have been prepared from
  (a) an aqueous dispersion of monodisperse seed particles that in addition to a polymer contain a fairly low molecular weight substance which is difficultly soluble in water but which can be absorbed by the polymer, and
  (b) a monomer which is less difficultly soluble in water than said low moecular weight substance but which can be absorbed in the seed polymer particles containing said fairly low molecular weight substance under conditions permitting molecular diffusion of the monomer to and absorption in the particles, whereafter the monomer in the particles is polymerised, and

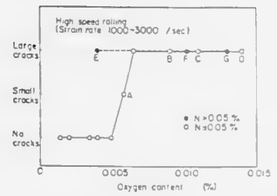
(B) forming a shell on each of said base particles, such shell forming comprising the steps of
  (1) adding slowly to the monodisperse spherical base particles a dry polymer powder and a colorant that has been prepared for drying on aqueous dispersion containing finely dispersed polymer particles having a size smaller than one tenth of that of the base particle and a colorant, which drying has been carried out at such a low temperature that the particles do not fuse together,
  (2) agitating the base particles together with said added dry polymer and colorant until a uniform distribution of the dry polymer and the colorant on the base particles is obtained,
  (3) fusing the dry polymer to the base particles by melting the dry polymer powder, and
  (4) repeating at least one of the above steps (1), (2) and (3) until a shell has been formed on the base particles which has a volume between 0.1 and 10 times the volume of the base particles.

4,837,108

AUSTENITIC FREE CUTTING STAINLESS STEELS

Atsuyoshi Kimura, Kuwana, and Noriyoshi Shibata, Nagoya, both of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 890,237, Jul. 29, 1986, abandoned. This application Jun. 13, 1988, Ser. No. 205,518
Claims priority, application Japan, Jul. 31, 1985, 60-170152
Int. Cl.[4] C22C 38/60
U.S. Cl. 420—41 **8 Claims**



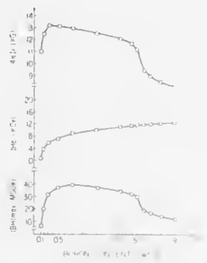
1. A bismuth-containing austenitic free cutting stainless steel consisting essentially of not more than 0.2 wt. % of C, not more than 2.0 wt. % of Si, not more than 2.0 wt. % of Mn, 7.5–30.0 wt. % of Cr, not more than 40.0 wt. % of Ni, 0.005–0.50 wt. % of Bi, 0.0003–0.10 wt. % of B, 0.002–0.40 wt. % of S, not more than 0.20 wt. % of P not more than 0.05 wt. % of N and not more than 0.005 wt. % of O, and the balance being Fe and inevitable impurities.

4,837,109

METHOD OF PRODUCING NEODYMIUM-IRON-BORON PERMANENT MAGNET

Masaaki Tokunaga, Fukaya; Kimio Uchida, and Akitoshi Hiraki, both of Kumagaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Jul. 10, 1987, Ser. No. 71,937
Claims priority, application Japan, Jul. 21, 1986, 61-171304; Oct. 29, 1986, 61-257285
Int. Cl.[4] C22C 38/00
U.S. Cl. 420—83 **12 Claims**



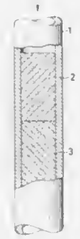
1. A method of producing a neodymium-iron-boron permanent magnet alloy consisting essentially of 25.0–50.0 weight % of neodymium, 0.3–5.0 weight % of boron and balance substantially iron, comprising the steps of adding metal calcium, calcium hydride or a mixture thereof as a reducing agent to neodymium fluoride, iron and boron (or ferroboron), and further adding thereto at least one of calcium chloride, sodium chloride and potassium chloride as a flux, melting the resulting mixture at a temperature in the range of about 1,000° C. to about 1,300° C. in an inert gas atmosphere, a reducing gas atmosphere, or substantially in vacuum, thereby reducing said neodymium fluoride to provide said alloy with an extremely small calcium content.

4,837,110

TECHNETIUM-99M GENERATOR, ITS PREPARATION AND ITS USE

Ludwig Kuhlmann, Hofheim am Taunus, and Dietrich Pütter, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 901,881, Aug. 29, 1986, abandoned. This application Jun. 29, 1988, Ser. No. 214,889
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1985, 3531355
Int. Cl.[4] G21G 4/08; C01G 57/00; A61K 43/00
U.S. Cl. 423—2 **20 Claims**



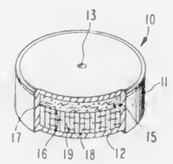
1. A technetium-99m generator comprising molybdenum-99 adsorbed on a carrier capable of binding said molybdenum-99 and copper(II) ions, at least one of the carrier materials being either silica gel modified with amino groups or a magnesium silicate.

4,837,111

DOSAGE FORM FOR DISPENSING DRUG FOR HUMAN THERAPY

Joseph C. Deters, Mountain View; Patrick S. L. Wong, Hayward; Brian L. Barclay, Sunnyvale; Felix Theeuwes, Los Altos, and David R. Swanson, Palo Alto, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed Mar. 21, 1988, Ser. No. 173,524
Int. Cl.[4] A61K 9/24
U.S. Cl. 424—473 **10 Claims**



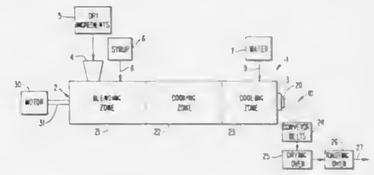
1. An osmotic device for administering a therapeutically effective amount of doxazosin to an environment of use, the osmotic device comprising:
  (a) a wall comprising in at least a part a cellulose acetate composition permeable to the passage of an exterior fluid, which wall surrounds and forms;
  (b) a compartment;
  (c) a first composition in the compartment, said first composition comprising from 1 to 25 mg of doxazosin, from 250 to 325 mg of polyethylene oxide, and from 10 to 30 mg of hydroxypropylmethylcellulose;
  (d) a second composition in the compartment, said second composition comprising from 110 to 140 mg of polyethylene oxide, from 40 to 70 mg of sodium chloride, and from 5 to 25 mg of hydroxypropylmethylcellulose; and,
  (e) at least one passageway in the wall communicating with the compartment and the exterior of the device for delivering the therapeutic drug doxazosin to the environment of use.

4,837,112

PROCESS FOR EXTRUSION OF BRAN PRODUCTS

Thomas Calandro, Paterson; Robert Straka, Pequannock, and Marsha K. Verrico, Fair Lawn, all of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

PCT No. PCT/US86/01081, § 371 Date Jan. 14, 1987, § 102(e) Date Jan. 14, 1987, PCT Pub. No. WO86/06938, PCT Pub. Date Dec. 4, 1986
Continuation-in-part of Ser. No. 737,441, May 24, 1985. This PCT application May 20, 1986, Ser. No. 16,797
The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.
Int. Cl.[4] A23P 1/12
U.S. Cl. 426—463 **46 Claims**



1. A method for continuously producing a bran cereal product comprising:
  (a) admixing at least one cereal bran with a syrup in the mixing zone of a twin screw extruder to form a wetted bran mixture,
  (b) cooking the wetted bran mixture in a cooking zone of said extruder to form a cooked bran mixture,
  (c) passing the cooked mixture through a headspace zone adjacent to an extrusion die, and
  (d) extruding said cooked bran mixture through said extrusion die, wherein the extrudate spontaneously breaks into strands having a visibly roughened surface.

4,837,113

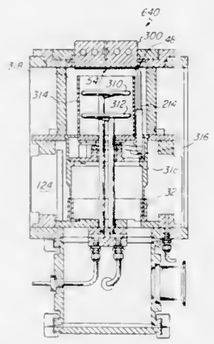
METHOD FOR DEPOSITING COMPOUND FROM GROUP II-VI

Joseph D. Luttmer, Richardson; Rudy L. York, Plano; Patricia B. Smith, Euless, and Cecil J. Davis, Greenville, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 74,111, Jul. 16, 1987, abandoned. This application May 25, 1988, Ser. No. 203,562
Int. Cl.[4] D05D 3/06
U.S. Cl. 427—38 **16 Claims**

1. A method for depositing a compound from groups II and VI on a wafer comprising:
  (a) disposing said wafer in a process chamber within a process module at low pressure;

(b) generating a remote plasma from an inert gas;
(c) illuminating said remote plasma within said chamber with additional ultraviolet light produced within said module;



(d) introducing an organometallic compound gas into said chamber and to a face of said wafer and
(e) introducing a sulfide containing gas into said chamber and to a face of said wafer.

4,837,114

PROCESS FOR PRODUCING MAGNETS HAVING IMPROVED CORROSION RESISTANCE

Takaki Hamada; Tetsuji Hayakawa, and Yutaka Matsuura, all of Osaka, Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 812,592, Dec. 24, 1985, abandoned. This application Jan. 13, 1986, Ser. No. 818,238
Claims priority, application Japan, Dec. 24, 1984, 59-278489; Jan. 18, 1985, 60-7949; Jan. 18, 1985, 60-7950; Jan. 18, 1985, 60-7951; May 23, 1985, 60-110793; May 23, 1985, 60-110794; Sep. 10, 1985, 60-200890; Nov. 20, 1985, 60-260769; Nov. 20, 1985, 60-260770; Nov. 20, 1985, 60-260771
Int. Cl.[4] B05D *5/12*
U.S. Cl. 427—127 **45 Claims**

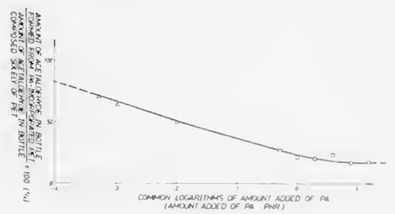
1. A process for producing a permanent magnet, comprising:
providing a sintered permanent magnet body consisting essentially of 10–30 at % R, wherein R is at least one element selected from the group consisting of Nd, Pr, Dy, Ho and Tb or a mixture of said at least one element and at least one other element selected from the group consisting of La, Ce, Sm, Gd, Er, Eu, Tm, Yb Lu, Pm and Y, 2–28 at % B and at least 42 at % Fe, and wherein at least 50 vol % of the entire magnet material body consists of a Fe-B-R type tetragonal crystal structure;
preparing the surface of the permanent magnet material body by blasting; and
then forming a low gas permeability anticorrosive coating film layer on the permanent magnet material body by means of vapor deposition so that corrosive substances do not remain in the resultant permanent magnet, thereby improving the corrosion resistance of the resultant permanent magnet.

4,837,115

THERMOPLASTIC POLYESTER COMPOSITION HAVING IMPROVED FLAVOR-RETAINING PROPERTY AND VESSEL FORMED THEREFROM

Reiko Igarashi, Tokyo; Yoshihiko Watanabe, Yokohama, and Sadao Hirata, Kamakura, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Jul. 30, 1987, Ser. No. 79,387
Claims priority, application Japan, Jul. 30, 1986, 61-177832; Apr. 23, 1987, 62-98596; Jul. 16, 1987, 62-176028
Int. Cl.[4] B65D *23/00*; **B29C** *49/06*
U.S. Cl. 428—36.92 **17 Claims**



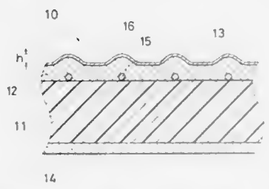
1. A heat-molded or draw-formed plastic vessel composed of a thermoplastic polyester composition comprising (A) a thermoplastic polyester having ethylene terephthalate units and (B) 3×10^{-7} to 10.0% by weight, based on the polyester, of a thermoplastic polyamide having a terminal amino group at a concentration of 0.05 to 50 millimoles per 100 g of the resin, said thermoplastic polyamide being a polymerized fatty acid polyamide obtained by polycondensation of (i) a polymerized fatty acid formed by polymerizing an unsaturated fatty acid with (ii) a diamine.

4,837,116

MAGNETIC RECORDING MEDIUM AND RECORDING/REPRODUCING METHOD THEREFOR

Hiroyuki Arioka; Masaharu Nishimatsu, and Suguru Takayama, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation of Ser. No. 22,535, Mar. 4, 1987, abandoned, which is a continuation of Ser. No. 758,433, Jul. 24, 1985, abandoned.
This application Dec. 2, 1987, Ser. No. 127,553
Claims priority, application Japan, Aug. 3, 1984, 59-163729
The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.
Int. Cl.[4] G11B *5/64*
U.S. Cl. 428—141 **11 Claims**



1. A magnetic recording medium comprising:
a flexible substrate having opposed major surfaces,
a ferromagnetic metal thin film layer on one surface of the substrate primarily comprising cobalt,
an organic topcoat layer on the surface of the metal thin film layer, and
a backcoat layer on the other surface of the substrate, the magnetic recording medium being useful in combination with a magnetic head having a gap, characterized in that
said organic topcoat layer contains a radiation-curable compound having a molecular weight of less than 2,000, an anti-oxidant, and a lubricant
said backcoat layer contains an inorganic pigment, an organic binder, and a lubricant,
said metal thin film layer contains oxygen, and
the medium has protrusions on its surface at an average density of at least $10^5/a^2$ per square millimeter of the surface, where a is the distance of the magnetic head gap as expressed in μm and is from 0.1 to 0.5 μm, said protrusions corresponding to submicron particles of a size of 30 to 300 Å within the medium, and said protrusions having a height of 30 to 300 Å.

4,837,117

COMPOSITES OF STRETCH BROKEN ALIGNED FIBERS OF CARBON AND GLASS REINFORCED RESIN

Thomas E. Armiger, Newark; David H. Edison, Hockessin; Herbert G. Lauterbach, Wilmington, all of Del.; James R. Layton, Kinston, N.C., and Richard K. Okine, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 942,441, Dec. 16, 1986, Pat. No. 4,759,985.
This application Jun. 10, 1988, Ser. No. 205,289
Int. Cl.[4] D02G *3/00*
U.S. Cl. 428—392 **3 Claims**

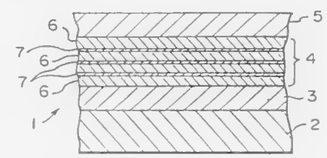
1. A cohesive sliver of stretch broken glass fibers having a coating of finish thereon, said finish comprising a mixture of a viscous lubricant and an antistatic ingredient said sliver having a cohesion of at least 0.01 grams/denier.

4,837,118

MAGNETO-OPTICAL RECORDING MEDIUM

Ryoichi Yamamoto; Masaaki Nomura; Takashi Yamada, and Akira Nahara, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 11, 1987, Ser. No. 48,676
Claims priority, application Japan, May 12, 1986, 61-108268
Int. Cl.[4] B32B *15/01*
U.S. Cl. 428—645 **7 Claims**



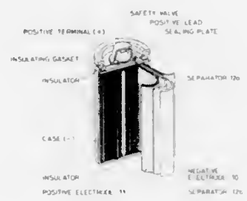
1. A magneto-optical recording medium comprising a transparent substrate and a magneto-optical recording layer overlaid on said transparent substrate wherein said magneto-optical recording layer is formed by alternately overlaying a plurality of thin layers containing a rare earth metal transition metal alloy, and a plurality of thin layers containing at least one solid solution non-formable metal selected from the group consisting of gold, silver, lead, magnesium, copper and iridium.

4,837,119

SEALED STORAGE BATTERY AND METHOD FOR MAKING ITS ELECTRODE

Munehisa Ikoma; Hiroshi Kawano; Isao Matsumoto, and Nobuyuki Yanagihara, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 8, 1987, Ser. No. 132,647
Claims priority, application Japan, Dec. 8, 1986, 61-291830; Dec. 8, 1986, 61-291832; Aug. 25, 1987, 62-210468; Aug. 26, 1987, 62-212089
Int. Cl.[4] H01M *4/36*
U.S. Cl. 429—206 **11 Claims**



1. A sealed storage battery comprising:
(a) a positive electrode including a metallic oxide;
(b) a negative electrode including hydrogen-storage-alloy powder having a crystal structure of $CaCu_5$, being provided with numerous irregularities on a surface, and having an SF-value of 2.5 or below, said SF-value representing a plateau characteristic of equilibrium pressure of released hydrogen;
(c) an alkaline electrolyte; and
(d) separator means for separating said positive electrode from said negative electrode, and for absorbing and retaining said alkaline electrolyte.

4,837,120

ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR HAVING CYLINDRICAL BASE SUPPORT OF SPECIFIC PHENOL RESIN

Hideki Akiyoshi, Numazu; Hiroshi Tamura, Fujsawa; Atsushi Kutami, and Yoshihiro Takada, both of Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 19, 1987, Ser. No. 122,449
Claims priority, application Japan, Nov. 19, 1986, 61-273983; Nov. 19, 1986, 61-273984
Int. Cl.[4] G03G *5/00*
U.S. Cl. 430—56 **9 Claims**

1. In an electrophotographic photoconductor comprising a cylindrical electroconductive support, and a photoconductive layer formed on said cylindrical electroconductive support, the improvement wherein said cylindrical electroconductive support comprises a cylindrical base support made of a phenol resin, with the releasing rate of ammonia therefrom per 48 hours being 50 ppm or less.

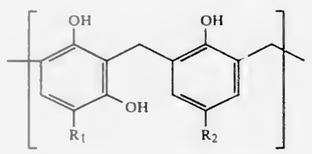
4,837,121

THERMALLY STABLE LIGHT-SENSITIVE COMPOSITIONS WITH O-QUINONE DIAZIDE AND PHENOLIC RESIN

Andrew J. Blakeney, Seekonk, Mass.; Alfred T. Jeffries, III, and Thomas R. Sarubbi, both of Providence, R.I., assignors to Olin Hunt Specialty Products Inc., East Providence, R.I.

Filed Nov. 23, 1987, Ser. No 124,227
Int. Cl.[4] G03C *1/60, 1/54*
U.S. Cl. 430—192 **20 Claims**

1. A light-sensitive composition comprising an admixture of at least one photosensitive o-quinonediazide compound and a binder resin comprising at least about 40 % by weight of units of the formula (I):



(I)

wherein R_1 is a halogen atom and R_2 is a lower alkyl group having 1 to 4 carbon atoms, the amount of said o-quinonediazide compound or compounds being about 5% to about 30% by weight and the amount of said binder resin being about 60% to 95% by weight, based on the total solid content of said photosensitive composition.

4,837,122

DELETING FLUID FOR PRINTING PLATES AND METHOD FOR DELETION

Toshiro Kondo; Eiji Kanada, and Hiroshi Nishinoiri, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills. Ltd., Tokyo, Japan

Filed Dec. 2, 1987, Ser. No. 127,475
Int. Cl.[4] G03C *5/54; G03F 7/06*
U.S. Cl. 430—204 **16 Claims**

1. A method for deleting an undesired portion of a silver image produced by exposure and development on an offset printing plate which uses the silver image as an ink receptive area which comprises treating the surface of the undesired portion of the silver image with a deletion fluid which contains a ferric complex salt of an organic acid and 0.3 mol/liter or more of at least one compound selected from the group consisting of a soluble bromide and a soluble iodide.

16. A method according to claim **1** wherein the printing plate to be treated is a printing plate made by forming silver images thereon by silver complex diffusion transfer process.

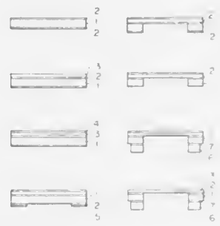
4,837,123

MASK STRUCTURE FOR LITHOGRAPHY, METHOD OF PREPARATION THEREOF AND LITHOGRAPHIC METHOD

Hideo Kato; Masaaki Matsushima, both of Yokohama; Keiko Matsuda, Machida, and Hirofumi Shibata, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 815,037, Dec. 31, 1985, abandoned. This application Mar. 14, 1988, Ser. No. 170,688
Claims priority, application Japan, Jan. 7, 1985, 60-000664; Jan. 8, 1985, 60-001772; Jan. 9, 1985, 60-001890; Apr. 25, 1985, 60-90199; Apr. 26, 1985, 60-90125
Int. Cl.[4] G03C *5/00; G03F 1/00*
U.S. Cl. 430—269 **36 Claims**

1. A mask structure for lithography having a mask material holding thin film and a holding substrate for holding the peripheral portion of said mask material holding thin film, said mask material holding thin film comprising aluminum nitride oxide.



28. A lithographic method, which comprises using a mask structure for lithography as defined in claim 1.

4,837,124

HIGH RESOLUTION PHOTORESIST OF IMIDE CONTAINING POLYMERS

Chengjiu Wu; Anne M. Mooring, both of Morristown; Michael J. McFarland, Middlesex; Christopher E. Osuch, Mine Hill, and James T. Yardley, Morristown, all of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Feb. 24, 1986, Ser. No. 832,116
Int. Cl.[4] G03C *1/495*
U.S. Cl. 430—270 **27 Claims**

1. A photoresist composition comprising a mixture of:
(a) 1 to 50 weight percent of a latent photoacid; and
(b) 50 to 99 weight percent of a film forming imide containing polymer containing succinimide residues and having a sufficient number of imide N-H groups replaced by acid labile groups to render the polymer insoluble in aqueous alkali, the composition being dissolved in a solvent which dissolves both the latent photoacid and the polymer.

12. A photoresist composition comprising a mixture of:
(a) 1 to 50 weight percent of a latent photoacid; and
(b) 50 to 99 weight percent of a film forming imide containing polymer containing acyclic imide residues and having a sufficient number of imide N-H groups replaced by acid labile groups to render the polymer insoluble in aqueous alkali, the composition being dissolved in a solvent which dissolves both the latent photoacid and the polymer.

4,837,125

ELECTRON-BEAM-SENSITIVE RESIST MATERIAL FOR MICROSTRUCTURES IN ELECTRONICS

Erwin Knapek, Unterhaching, and Helmut Formanek, Garching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 24, 1987, Ser. No. 17,982
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1986, 3610087
Int. Cl.[4] G03C *5/00*
U.S. Cl. 430—270 **12 Claims**

1. An electron-beam-sensitive resist material for the manufacture of microstructure in electronics generated on substrates of semiconductive or piezoelectric materials comprising:
a high polymer constituent chosen from the group consisting of polyvinyl dimethoxymethane, nitro-cellulose, and acetyl cellulose;

at least one dopant chosen from the group consisting of halogens, halogen compounds, and peroxides; and
the resist material includes iron (III)chloride.

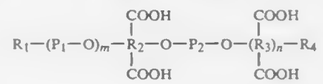
4,837,126

POLYMER COMPOSITION FOR PHOTORESIST APPLICATION

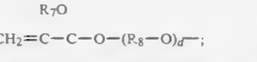
Wei Y. Lin, Marietta, Ga., assignor to W. R. Grace & Co., Lexington, Mass.

Filed Jun. 7, 1985, Ser. No. 742,261
Int. Cl.[4] G03C *1/70*
U.S. Cl. 430—284 **6 Claims**

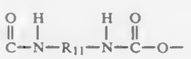
1. A photopolymerizable composition comprising 60 percent by weight polymer having the formula:



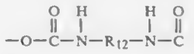
wherein R_1 is $R_5—(z)_p$; R_5 is



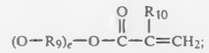
R_7 is hydrogen, methyl or ethyl; R_8 is a straight or branched chain alkyl group of from 1 to 6 carbon atoms; d is an integer from 1 to 10; z is



wherein R_{11} is alicyclic, alkyl or aryl; p is zero or 1, however p is zero when m is zero and p is 1 when m is 1; P_1 is an organic radical; m is zero or 1, however m is zero when n is 1 and m is 1 when n is zero; R_2 is an organic radical; P_2 is an organic radical; R_3 is an organic radical; n is zero or 1; R_4 is $—(v)_w—R_6$; v is



wherein R_{12} is alicyclic, alkyl or aryl; w is zero or 1, however w is zero when m is zero and w is 1 when m is 1; R_6 is



R_9 is a straight or branched chain alkyl group of from 1 to 6 carbon atoms; e is an integer from 1 to 10; and R_{10} is hydrogen, methyl or ethyl; 13.5 percent by weight 2-ethoxyethylacrylate; 20 percent by weight trimethanol propane triacrylate; 1 percent by weight flow promoting agent; 0.5 percent by weight dye; and 5 percent by weight B-carboxyethyl acrylate.

4,837,127

RECORDING MEDIUM

Shinichiro Ohara, Shizuoka, and Kyoichi Naruo, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed May 28, 1986, Ser. No. 868,126
Claims priority, application Japan, May 28, 1985, 60-114733
The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.
Int. Cl.[4] G03C *1/72*
U.S. Cl. 430—270 **14 Claims**

1. A recording medium comprising a substrate and a recording layer arranged on the substrate wherein said recording layer comprises 50 to 80% by weight of indium, 10-50% by weight of at least one metal compound selected from the group consisting of metal sulfide, metal flouride and metal oxide, and at least 0.1% by weight of at least one metal showing a high surface tension of not less than 600 dyne/cm within temperatures of the melting point thereof to a temperature higher than the melting point by 300° C. and the content of said metal showing a high surface tension varies in the depth direction of the recording layer in such manner that the content of said metal on the side facing the substrate is higher than that of said metal on the opposite side.

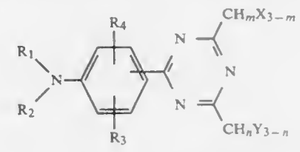
4,837,128

LIGHT-SENSITIVE COMPOSITION

Kouichi Kawamma; Yukio Abe; Tatsuji Higashi, and Yoshimasa Aotani, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

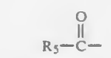
Filed Jul. 29, 1987, Ser. No. 79,137
Claims priority, application Japan, Aug. 8, 1986, 61-186238; Sep. 26, 1986, 61-227489
Int. Cl.[4] G03C *1/68, 1/60, 1/727; C07D 251/20*
U.S. Cl. 430—281 **18 Claims**

1. A light-sensitive composition comprises at least one light-sensitive s-triazine compound represented by the following general formula (I) and at leat one compound having at least one ethylenically unsaturated double bond and capable of causing addition polymerization:

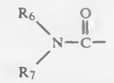


[I]

wherein R_1 and R_2 may or may not be identical with each other and represent hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, or a group represented by the following general formula (II) or (III):



[II]



[III]

(in the general formulas (II) and (III), R_5 stands for a substituted or unsubstituted alkyl group, or a substituted or unsubstituted aryl group; and R_6 and R_7 may or may not be identical

with each other and represent hydrogen atom, a substituted or unsubstituted alkyl group or a substituted or unsubstituted aryl group), provided that R_1 and R_2 may form a heterocyclic ring consisting of non-metallic atoms together with the nitrogen atom to which they are bonded; R_3 and R_4 represent hydrogen atom, a halogen atom, an alkyl group or an alkoxyl group; X and Y may or may not be identical with each other and represent chlorine atom or bromine atom; and m and n are an integer of 0, 1 or 2.

4,837,129

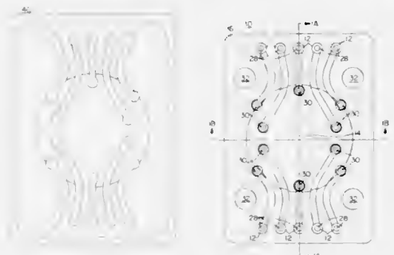
PROCESS FOR PRODUCING CONDUCTOR PATTERNS ON THREE DIMENSIONAL ARTICLES

David C. Frisch, Baldwin, N.Y.; Louis T. Manzione, Summit; Gerhard W. Poelzing, New Providence, both of N.J., and Wilhelm Weber, Hicksville, N.Y., assignors to Kollmorgen Technologies Corp., Dallas, Tex. and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 650,760, Sep. 14, 1984, abandoned. This application Nov. 7, 1986, Ser. No. 928,673

Int. Cl.[4] G03C *5/16*

U.S. Cl. 430—319 **8 Claims**



1. A process for forming a non-planar conduit pattern on at least one non-planar surface of a body which is adapted to be receptive to the formation of the conduit pattern by providing a catalyst on the surface which is chemically changed on exposure to radiation, said catalyst being a reducible salt of a non-noble metal, said process comprising steps of:

providing a mask which does not transmit said radiation and having a non-planar surface which is essentially a mirror image replica of the non-planar surface topography of a corresponding portion of the body on which the conduit pattern is to be formed, the mask having a preselected pattern of openings therein which correspond to the conduit pattern, at least one of the openings corresponding to a portion of the conduit pattern which is to be delineated on an irregular surface of the body;

placing the mirror image replica surface of the mask substantially in registry with the corresponding surface portion of said body; and

exposing the catalyst on the surface of the body to the radiation through the openings in the mask so that the preselected pattern is essentially replicated on the surface of the body.

4,837,130

OPTICAL DISK MANUFACTURING METHOD

Minemasa Ohta; Kenji Suzuki; Satoru Fukuoka; Toshihiko Takishita, and Tuyoshi Hayashi, all of Yamanashi, Japan, assignors to Pioneer Electronic Corp. and Pioneer Video Corporation, both of, Japan

Filed Aug. 27, 1987, Ser. No. 89,894

Claims priority, application Japan, Aug. 27, 1986, 61-202317

Int. Cl.[4] G03C *5/16*

U.S. Cl. 430—321 **6 Claims**

1. A method of manufacturing an optical disk having pits different in depth, comprising the steps of:

forming a first photo resist layer on a recording original board;

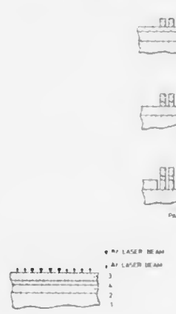
forming an intermediate resin layer on said first photo resist layer;

forming a second photo resist layer which is different in spectral sensitivity from said first photo resist layer;

selectively exposing said first and second photo resist layers to light beams having wavelengths corresponding respectively to said first and second photo resist layers;

developing said second photo resist layer; and

etching said intermediate resin layer;



wherein said step of forming said intermediate resin layer comprises applying a resin solution which is soluble with water and which is insoluble with organic solvents to said first photo resin layer, heating said applied resin solution, sand hardening said heated resin solution to form said intermediate resin layer.

4,837,131

DEVELOPING METHOD FOR PHOTOSENSITIVE MATERIAL

Kesanao Kobayashi; Hisao Ohba, and Tadao Toyama, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jun. 18, 1986, Ser. No. 875,480

Claims priority, application Japan, Jun. 27, 1985, 60-141339

Int. Cl.[4] G03F *7/08*

U.S. Cl. 430—302 **8 Claims**

1. A developing method for a photosensitive lithographic printing plate comprising a support having a photosensitive layer thereon, said photosensitive layer containing a photosensitive diazo resin or a photosensitive o-quinone diazide compound, which method comprises th steps of, in order, (i) preparatively developing for 2 seconds to 2 minutes the photosensitive lithographic printing plate which has been imagewise exposed to light with a developing liquid supplied to the plate in an amount from 10 to 1,000 ml/m^2 of the photosensitive layer and rubbing the surface of the photosensitive layer to promote the elution of the non-image portion of the photosensitive layer after application of the developing liquid, thereby removing almost all of the non-image portion of the photosensitive layer of the plate, (ii) discarding the developing liquid used in the preparatory development of step (i), and (iii) developing the photosensitive layer of said printing plate with a developing liquid which has not been used previously in a preparatory development step (i) in order to complete development, wherein said developing liquid used in step (iii) is also used for the step (i) development of subsequently processed plates.

4,837,132

METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL USING A CHELATING AGENT AND DEVELOPER WITH SUBSTANTIALLY NO BENZYL ALCOHOL

Hiroshi Fujimoto, and Takatoshi Ishikawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

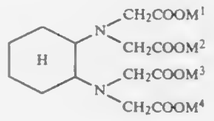
Filed May 26, 1987, Ser. No. 54,176

Claims priority, application Japan, May 23, 1986, 61-118848; May 23, 1986, 61-118849

Int. Cl.[4] G03C *5/24, 7/30*

U.S. Cl. 430—380 **10 Claims**

1. A method for processing a silver halide color photographic material after imagewise exposure, comprising color developing, desilvering, and at least one of washing and stabilizing a silver halide color photographic material, wherein a color developer which does not contain more than 2 ml/l benzyl alcohol but comprises at least one compound represented by formula (I)



(I)

wherein M^1, M^2, M^3 and M^4 each represents a hydrogen atom, an alkali metal ion, an ammonium ion, or 1/n of an n-valent cation is used for the color development.

4,837,133

PHOTOGRAPHIC FOUR-COLOR MATERIAL FOR THE SILVER DYE BLEACH PROCESS

Jakob Kuhn, Marly, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Dec. 9, 1986, Ser. No. 943,942

Claims priority, application Switzerland, Dec. 10, 1985, 5261/85

Int. Cl.[4] G03C *7/02*

U.S. Cl. 430—358 **3 Claims**

1. A process for the preparation of dotted colour separation positives for offset printing which comprises exposing a photographic material, which comprises on a support in the following order a gelatin layer containing a black dye and an IR sensitive silver halide emulsion, a silver halide free gelatin layer containing a black dye, a gelatin layer containing a cyan dye and a red sensitive silver halide emulsion, a silver halide free gelatin layer containing a cyan dye, a gelatin layer containing a magenta dye and a green sensitive silver halide layer, a silver halide free gelatin layer containing a magenta dye, a silver halide free gelatin layer containing a yellow dye and a gelatin layer containing a yellow dye and a blue sensitive silver halide emulsion, through the blue, green, red and black separation positive with blue, green, red and infra red light, respectively, then developing, silver dye bleaching and fixing the exposed material.

4,837,134

OPTICAL MEMORY CARD WITH VERSATILE STORAGE MEDIUM

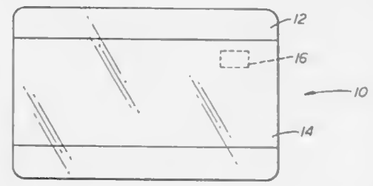
Eric W. Bouldin, Atherton, and Jerome Drexler, Los Altos Hills, both of Calif., assignors to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 896,988, Aug. 15, 1986, abandoned. This application Apr. 16, 1987, Ser. No. 39,506

The portion of the term of this patent subsequent to Jun. 28, 2005, has been disclaimed.

Int. Cl.[4] G03C *1/02, 5/32;* **G01D** *15/24, 15/26*

U.S. Cl. 430—445 **17 Claims**



1. An optical memory card for optical information comprising,

a self-supporting, wallet size, planar plastic base,

a vacuum or vapor deposited continuous metallic reflective layer over said plastic base,

a planar optical storage layer disposed over the metallic layer, said optical storage layer having a planar crust of irregular, non-filamentary oblong black silver particles substantially within the top one-half micron of the layer distal to the metallic layer, said optical storage layer having a substantially clear gelatin below the crust.

4,837,135

ELECTRON BEAM RECORDING FILM

Clifford E. Milner, Rochester, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 13, 1987, Ser. No. 85,028

Int. Cl.[4] G03C *1/30, 1/94*

U.S. Cl. 430—524 **22 Claims**

1. An electron beam recording film comprising a film support bearing, in order,

(A) a sputtered layer of indium-tin oxide, and

(B) a gelatino silver halide emulsion layer crosslinked solely with 2 to 10% by weight based on the weight of gelatin in the emulsion layer of a Cr^{+3}-containing compound.

10. A process for the preparation of an electron beam recording film comprising a film support bearing, in order:

(A) a sputtered layer of indium-tin oxide, and

(B) a gelatino silver halide emulsion layer crosslinked solely with at least 2% by weight based on the weight of gelatin in the emulsion layer of a Cr^{+3}-containing compound, the improvement wherein (a) injecting the Cr^{+3}-containing compound into a sensitized gelatino silver halide emulsion, (b) coating the support having the sputtered layer of indium-tin oxide with the emulsion having the Cr^{+3}-containing compound, and (c) drying the emulsion coating.

4,837,136

SILVER HALIDE PHOTOGRAPHIC MATERIALS COMPRISING NON-DIFFUSIBLE PHOTOGRAPHICALLY USEFUL COMPOUNDS

Seiji Ichijima; Yasuhiro Shimada, and Jun Arakawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 9, 1986, Ser. No. 917,133
Claims priority, application Japan, Oct. 9, 1985, 60-225177
Int. Cl.⁴ G03C *7/32, 7/34*
U.S. Cl. 430—543 **8 Claims**

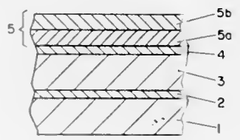
8. A silver halide photographic material as claimed in claim 1, wherein X in the general formulae (III), (IV) and (V) is —O—, —S—, —NHCO—, —OCO— or —COO—.

4,837,137

ELECTROPHOTOGRAPHIC PHOTORECEPTOR

Koichi Aizawa; Toyoki Kazama, both of Yokosuka; Yukio Takano, and Yukihisa Tamura, both of Matsumoto, all of Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 2, 1987, Ser. No. 127,921
Claims priority, application Japan, Dec. 5, 1986, 61-290678; Jan. 12, 1987, 62-18974
Int. Cl.⁴ G03G *5/082, 5/14*
U.S. Cl. 430—65 **4 Claims**



1. An electrophotographic photoreceptor comprising an electroconductive base, a photoconductive layer comprising amorphous silicon over the base, a buffer layer over the photoconductive layer, and a surface layer comprising amorphous carbon over the buffer layer, the surface layer having a hardness on the free surface side which is higher than that on the buffer layer side.

4,837,138

COLORED RESIN COMPOSITION

Shinji Horie, Yokkaichi, Japan, assignor to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Division of Ser. No. 817,438, Jan. 9, 1986, Pat. No. 4,713,310. This application Aug. 5, 1987, Ser. No. 81,995
Int. Cl.⁴ C08L *67/02*
U.S. Cl. 430—106 **6 Claims**

1. A color toner for electrophotography having a colored resin composition in micropulverized form comprising: a matrix phase comprised of a thermoplastic polyester; a dispersed phase comprised of a thermoplastic polyester dispersed in the matrix phase and separated in phase from the thermoplastic polyester matrix phase; and a colorant having greater affinity for the polyester of the dispersed phase than for the polyester of the matrix phase so that substantially the entire amount of the colorant remains in the dispersed phase.

4,837,139

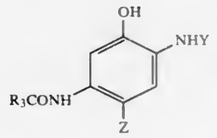
METHOD FOR PROCESSING A LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL USING AT LEAST ONE SILVER HALIDE EMULSION LAYER AND AT LEAST ONE OF A CYAN COUPLER AND MAGNETA COUPLER

Kazuhiro Kobayashi; Shigeharu Koboshi; Satoru Kuse, and Masao Ishikawa, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

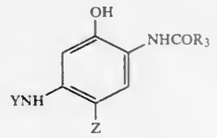
Filed Jul. 24, 1987, Ser. No. 77,336
Claims priority, application Japan, Jul. 26, 1986, 61-176303; Aug. 9, 1986, 61-187137; Aug. 9, 1986, 61-187139
Int. Cl.⁴ G03C *1/08, 1/46, 7/32, 5/24*
U.S. Cl. 430—542 **5 Claims**

1. A method for processing a light-sensitive silver halide color photographic material, comprising the steps of:

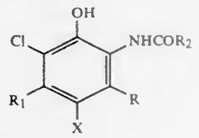
(a) imagewise exposing a light-sensitive silver halide color photographic material having at least one silver halide emulsion layer on a support, at least one of said silver halide emulsion layer containing at least one of at least one cyan coupler and at least one magenta coupler, wherein said at least one cyan coupler is selected from the group represented by the formulae (C-1), (C-2), and (C):



(C-1)



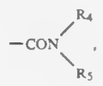
(C-2)



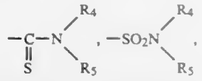
(C)

wherein

Y represents —COR_4,



—SO_2R_4,



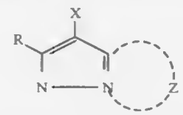
—$CONHCOR_4$ or —$CONHSO_2R_4$;

R_4 represents an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group or a heterocyclic group; R_5 represents a hydrogen atom, an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group or a heterocyclic group, and wherein R_4 and R_5 may be bonded with each other to form a 5- or 6-membered ring; R_3 represents a ballast group;

Z represents a hydrogen atom or a group eliminatable through the coupling reaction with an oxidized product of an aromatic primary amine type color developing agent; one of R and R_1 represents a hydrogen atom and the other is a straight or branched alkyl group having at least 2 to 12 carbon atoms; X represents a hydrogen atom or a group eliminatable through the coupling reaction with an oxidized product of an aromatic primary amine type color developing agent;

R_2 represents a ballast group; and

wherein said at least one magenta coupler is represented by the formula (M):



(M)

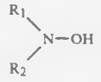
wherein

Z represents a group of nonmetallic atoms necessary for forming a nitrogen-containing heterocyclic ring which may have a substituent;

X represents a hydrogen atom or a substituent eliminatable through the reaction with an oxidized product of a color developing agent; and

R represents a hydrogen atom or a substituent; and

(b) applying a color developing solution to said exposed material, said solution containing a compound represented by the formula I:



(I)

wherein

R_1 represents an alkyl group having 1 to 5 carbon atoms substituted with an alkoxy group; and

R_2 represents an alkyl group having 1 to 5 carbon atoms or an alkyl group having 1 to 5 carbon atoms substituted with an alkoxy group.

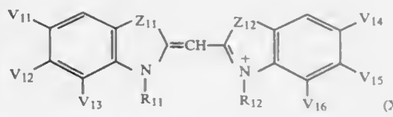
4,837,140

COLOR IMAGE-FORMING HIGH SILVER CHLORIDE COLOR PHOTOGRAPHIC MATERIAL HAVING IMPROVED SPECTRAL SENSITIVITY AND SILVER REMOVABILITY FOR USE THEREWITH

Tadashi Ikeda, and Tadashi Ogawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 8, 1987, Ser. No. 59,669
Claims priority, application Japan, Jun. 6, 1986, 61-131583
Int. Cl.⁴ G03C *1/08, 7/26, 5/38, 1/46*
U.S. Cl. 430—550 **8 Claims**

1. A silver halide color photographic material which comprises a reflective support having thereon a blue-sensitive silver halide emulsion layer containing a yellow dye-forming coupler, a green-sensitive silver halide emulsion layer containing a magenta dye-forming coupler and a red-sensitive silver halide emulsion layer containing a cyan dye-forming coupler, the total silver amount of said silver halide on said reflective support being up to about 0.78 g/m², and at least one of said emulsion layers comprising a silver halide emulsion substantially excluding silver iodide and comprising about 80 mol% or more silver chloride and containing a spectral sensitizing dye represented by general formula (I), (II) or (III):



(I)

wherein:

Z_{11} represents an oxygen atom, a sulfur atom or a selenium atom;

Z_{12} represents a sulfur atom or a selenium atom;

R_{11} and R_{12}, which may be the same or different, each represents an optionally substituted alkyl group or alkenyl group containing up to 6 carbon atoms, with at least one of R_{11} and R_{12} being a sulfo-substituted alkyl group;

when Z_{11} represents an oxygen atom, V_{11} and V_{13} each represents a hydrogen atom, and V_{12} represents an optionally substituted phenyl group, or V_{11} and V_{12}, or V_{12} and V_{13}, may be linked to each other to form a fused benzene ring;

when Z_{11} represents a sulfur atom or a selenium atom, V_{11} represents an alkyl group containing up to 4 carbon atoms, an alkoxy group containing up to 4 carbon atoms or a hydrogen atom, V_{12} represents an alkyl group containing up to 5 carbon atoms, an alkoxy group containing up to 4 carbon atoms, a chlorine atom, a hydrogen atom, an optionally substituted phenyl group or a hydroxy group, and V_{13} represents a hydrogen atom, or V_{11} and V_{12}, or V_{12} and V_{13}, may be linked to each other to form a fused benzene ring;

when Z_{12} represents a selenium atom, V_{14}, V_{15}, and V_{16} are respectively the same as defined by V_{11}, V_{12}, and V_{13} in connection with the case where Z_{11} represents a selenium atom;

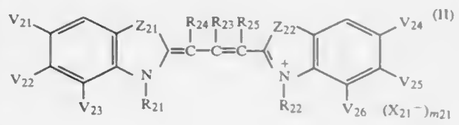
when Z_{12} represents a sulfur atom and Z_{11} represents a selenium atom, V_{14} represents a hydrogen atom, an alkoxy group containing up to 4 carbon atoms or an alkyl group containing up to 5 carbon atoms, V_{15} represents an alkoxy group containing up to 5 carbon atoms, an optionally substituted phenyl group, or an alkyl group containing up to 4 carbon atoms, a chlorine atom or a hydroxy group, and V_{16} represents a hydrogen atom, or V_{14} and V_{15}, or V_{15} and V_{16}, may be linked to each other to form a fused benzene ring;

when Z_{11} and Z_{12} both represent a sulfur atom, V_{14} and V_{16} each represents a hydrogen atom, and V_{15} represents an optionally substituted phenyl group, or V_{14} and V_{15}, or V_{15} and V_{16}, may be linked to each other to form a ring;

when Z_{11} represents an oxygen atom and Z_{12} represents a sulfur atom, V_{14} and V_{16} each represents a hydrogen atom, and V_{15} represents a chlorine atom, an optionally substituted phenyl group or an alkoxy group containing up to 4 carbon atoms, or V_{15} and V_{16} may be linked to each other to form a fused benzene ring;

X_{11}—represents an acid anion residue; and

m_{11} represents 0 or 1;



(II)

wherein:

Z_{21} represents an oxygen atom, a sulfur atom, a selenium atom, or

Z_{22} represents an oxygen atom or

R_{21} and R_{22} are the same as defined for R_{11} or R_{12} in general formula (I), or R_{21} and R_{24}, or R_{22} and R_{25}, may be linked to each other to form a 5- or 6-membered carbon ring;
R_{23} represents a hydrogen atom when at least one of Z_{21} and Z_{22} represents

or represents an ethyl group, a propyl group or a butyl group in other cases;
R_{26} and R_{27} are the same as defined for R_{11} in general formula (I), provided that R_{21} and R_{24}, and R_{22} and R_{27}, do not represent a sulfo group-containing substituent at the same time;
R_{24} and R^{25} each represents a hydrogen atom;
V_{21} represents a hydrogen atom when Z_{21} represents an oxygen atom, or represents a hydrogen atom, an alkyl group containing up to 5 carbon atoms or an alkoxy group containing up to 5 carbon atoms when Z_{21} represents a sulfur atom or a selenium atom, or represents a hydrogen atom or a chlorine atom when Z_{21} represents

V_{22} represents a hydrogen atom, an alkyl group containing up to 5 carbon atoms, an alkoxy group containing up to 5 carbon atoms, a chlorine atom or an optionally substituted phenyl group, or V_{22} may be bonded to V_{21} or V_{23} to form a fused benzene ring with Z_{21} represents an oxygen atom and Z_{22} represents

or V_{22} represents an optionally substituted phenyl group or may be bonded to V_{21} or V_{23} to form a fused benzene ring when Z_{21} and Z_{22} both represent an oxygen atom, or V_{22} represents a hydrogen atom, an alkyl group containing up to 5 carbon atoms, an alkoxycarbonyl group containing up to 5 carbon atoms, an alkoxy group containing up to 4 carbon atoms, an acylamino group containing up to 4 carbon atoms, a chlorine atom, or an optionally substituted phenyl group when Z_{21} represents a sulfur atom or a selenium atom, or may be bonded to V_{23} to form a fused benzene ring when Z_{21} represents a sulfur atom, or represents a chlorine atom, a trifluoromethyl group, a cyano group, an alkylsulfonyl group containing up to 4 carbon atoms or an alkoxycarbonyl group containing up to 5 carbon atoms when Z_{21} represents

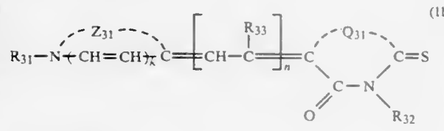
V_{24} represents a hydrogen atom when Z_{22} represents an oxygen atom, or represents a hydrogen atom or a chlorine atom when Z_{22} represents

V_{25} represents an alkoxy group containing up to 4 carbon atoms, a chlorine atom or an optionally substituted phenyl group or may be bonded to V_{24} to V_{26} to form a fused benzene ring when Z_{22} represents an oxygen atom, or is bonded to V_{24} or V_{26} to form a fused benzene ring when Z_{21} represents

an oxygen atom, a sulfur atom or a selenium atom, or, when Z_{22} represents

V_{25} represents a chlorine atom, a trifluoromethyl group, a cyano group, an alkylsulfonyl group containing up to 4 carbon atoms or a carboxyalkyl group containing up to 5 carbon atoms;
V_{26} represents a hydrogen atom;
X_{21}^- represents an acid anion residue; and
m_{21} represents 0 or 1;

(III)



wherein:
Z_{31} represents atoms forming a heterocyclic nucleus of thiazoline, thiazole, benzothiazole, naphthothiazole, selenazoline, selenazole, benzoselenazole, naphthoselenazole, benzimidazole, naphthoimidazole, oxazole, benzoxazole, naphthoxazole or pyridine, with the heterocyclic nucleus being optionally substituted;
when Z_{31} represents atoms forming benzimidazole nucleus, one or more substituents in the fused benzene ring are selected from among a chlorine atom, a cyano group, an alkoxycarbonyl group containing up to 5 carbon atoms, an alkylsulfonyl group containing up to 4 carbon atoms, and a trifluoromethyl group;
when Z_{31} represents atoms forming heterocyclic nuclei other than benzimidazole, thiazoline and selenazoline, one or more substituents in the fused benzene ring or naphthalene ring are selected from among an alkyl group containing up to 8 carbon atoms, a hydroxy group, an alkoxycarbonyl group containing up to 5 carbon atoms, a halogen atom, a carboxyl group, a furyl group, a thienyl group, a pyridyl group, a phenyl group and a substituted phenyl group;
when Z_{31} represents atoms forming a selenazoline or thiazoline nucleus, one or more substituents in the nucleus is selected from among an alkyl group containing up to 6 carbon atoms, a hydroxyalkyl group containing up to 5 carbon atoms and an alkoxycarbonylalkyl group containing up to 5 carbon atoms;
R_{31} is the same as defined for R_{11} and R_{12} in general formula (I);
R_{32} is the same as defined for R_{11} or R_{12} in general formula (I) or represents a hydrogen atom, a furfuryl group or an optionally substituted aryl group, provided that at least one of R_{31} and R_{32} represent a substituent having a sulfo or carboxy group and the other represents a substituent having no sulfo group;
R_{33} represents a hydrogen atom, an alkyl group containing up to 5 carbon atoms, a phenethyl group, a phenyl group or a 2-carboxyphenyl group;
Q_{31} represents an oxygen atom, a sulfur atom, a selenium atom or

provided that, when Z_{31} represents atoms forming a thiazoline, selenazoline or oxazole nucleus, Q_{31} represents a sulfur atom, a selenium atom or

R_{34} represents a hydrogen atom, a pyridyl group, a phenyl group, a substituted phenyl group, or an aliphatic hydrocarbyl group optionally containing an oxygen atom, a sulfur atom or a nitrogen atom in the carbon chain, optionally having a substituent or substituents, and containing a total of up to 8 carbon atoms;
k represents 0 or 1; and
n represents 0 or 1 provided that, when n represents 1 and Z_{31} represents atoms forming a pyridine nucleus, Q_{31} represents an oxygen atom.

4,837,142

THERMALLY DEVELOPABLE LIGHT-SENSITIVE MATERIAL CONTAINING A DEVELOPMENT RESTRAINER COMPOUND

Junichi Kohno; Ken Okauchi, both of Hachioji; Sohei Goto; Masaru Iwagaki, both of Hino, and Tawara Komamura, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 907,670, Sep. 15, 1986, abandoned. This application May 3, 1988, Ser. No. 191,781
Claims priority, application Japan, Sep. 17, 1985, 60-205129; Oct. 1, 1985, 60-218769; Oct. 17, 1985, 60-232263; Nov. 20, 1985, 60-262177; Nov. 22, 1985, 60-263564
Int. Cl.[4] G03C *1/06*
U.S. Cl. 430—559 **17 Claims**

1. A thermally developable light-sensitive material which has at least one light-sensitive silver halide layer containing a reducing agent and a dye-providing material on a color support and which further contains a compound represented by the general formula (I):

$$X\{(J)_m F\}_n \quad (I)$$

wherein X is a development restrainer residue capable of functioning without being released from said compound; J is a divalent linkage; F is an immobilizing group that is capable of reducing the diffusibility of the compound of formula (I) or a silver salt or silver complex thereof during thermal development; m is 0 or 1; and n is an integer of 1 to 3.

4,837,142

COLOR LIGHT-SENSITIVE MATERIAL

Kozo Sato; Masashi Takeuchi, and Takeshi Shibata, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

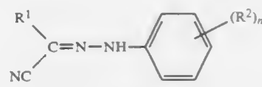
Filed May 27, 1986, Ser. No. 867,121
Claims priority, application Japan, May 27, 1985, 60-111991
Int. Cl.[4] G03C *5/54, 7/26*
U.S. Cl. 430—562 **6 Claims**

1. A color light-sensitive material which comprises a support having provided thereon at least a light-sensitive silver halide and an image-forming compound represented by general formula (I)

$$(Dye—X)_q—Y \quad (I)$$

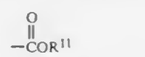
wherein
X represents a single chemical bond or a divalent linking group,
Y represents a group having the properties of causing differences in diffusibility of the dye moiety before and after reaction with the silver halide corresponding directly or inversely to the silver halide which is in imagewise latent image form,
q represents 1 or 2, and, when q represents 2, the two Dye-X groups are the same or different, and
Dye represents a yellow dye group or dye group precursor represented by formula (II)

(II)



wherein R^1 represents a cyano group or a subtituent group selected from amont the groups represented by formulae (B), (C), and (D)

(B)



(C)

(D)

wherein R^{11} and R^{12} each represents a hydrogen atom or a substituent selected from among substituted or unsubstituted alkyl, aralkyl, cycloalkyl, aryl and heterocyclic groups, and R^{11} and R^{12} together form a ring structure through a hydrocarbon chain or a hetero atom-containing hydrocarbon chain,
R^2 represents an electron attractive group having a Hammett para-sigma value of from 0 to +1.0, n represents an integer of 1 to 4 and, when n represents 2 to 4, then R^2 groups are the same or different, and Dye and X are bound to each other at either R^{11} or R^2.

4,837,143

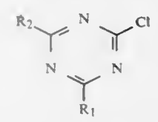
SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Kazuo Komorita, and Kaoru Onodera, both of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 38,224, Apr. 14, 1987, abandoned. This application Dec. 29, 1988, Ser. No. 292,650
Claims priority, application Japan, Apr. 24, 1986, 61-95021
Int. Cl.[4] G03C *1/30, 1/06*
U.S. Cl. 430—621 **13 Claims**

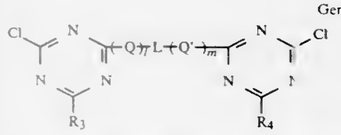
1. A silver halide photographic light-sensitive material comprising a support bearing thereon at least one silver halide emulsion layer, wherein said silver halide emulsion layer comprises silver halide grains comprising not less than 80 mol % of silver chloride and a water soluble iridium compound in an amount of from 10^{-8} to 10^{-5} mol per mol of a silver halide contained in said silver halide emulsion layer, and said silver halide emulsion layer is hardened with at least one selected from the group consisting of the compounds each represented by the following General Formula [I] and the compounds each represented by the following General formula [II]:

General Formula [I]



wherein R_1 is a chlorine atom, a hydroxy group, an alkyl group, an alkoxy group, an alkylthio group, an —OM group, in which M is a monovalent metal atom, an —NR'R" group, in which R' and R" are each a hydrogen atom, an alkyl group or an aryl group, or an —NHCOR group, in which R is a hydrogen atom, an alkyl group or a aryl group; and R_2 is a hydroxy group, an alkyl group, an alkoxy group, an alkylthio group, an —OM group, in which M is a monovalent metal atom, an —NR'R" group, in which R' and R" are each a hydrogen atom, an alkyl group or an aryl group, or an —NHCOR group, is which R is a hydrogen atom, an alkyl group or an aryl group,

General Formula [II]



wherein R_3 and R_4 are each a chlorine atom, a hydroxy group, an alkyl group, an alkoxy group or —OM group; in which M is a monovalent metal atom; Q and Q' are each an —O—, an —S—or an —NH— group; L is an alkylene group or an arylene group; and l and m are each 0 or 1.

4,837,144

METHOD OF MEASURING LIPID-BOUND SIALIC ACID

Masami Sugiyama, Tokyo, Japan, assignor to Fujirebio Kabushiki Kaisha, also trading as Fujirebio Inc., Tokyo, Japan

Filed Apr. 20, 1987, Ser. No. 40,482
Claims priority, application Japan, Apr. 25, 1986, 61-94613
Int. Cl.[4] C12Q *1/00, 1/34;* **G01N** *21/78, 31/02*
U.S. Cl. 435—4 **6 Claims**

1. A method of measuring lipid-bound sialic acid in a sample containing lipid-bound sialic acid and other sialic acid(s) which comprises contacting a predetermined amount of a lipid-bound sialic acid separating agent comprising a polar solvent selected from the group consisting of methanol, ethanol, propanol, isopropanol, dimethylformamide, acetonitrile and mixtures thereof, with a predetermined amount of a sample containing lipid-bound sialic acid and other sialic acid(s) to form a precipitate and a supernatant, separating the supernatant from the precipitate formed, and, without further treatment of the supernatent, measuring lipid-bound sialic acid in the sample by measuring the sialic acid concentration in the supernatant using neuraminidase and N-acetylneuraminic acid aldolase.

4,837,145

LAYERED IMMUNOASSAY USING ANTIBODIES BOUND TO TRANSPORT PARTICLES TO DETERMINE THE PRESENCE OF AN ANTIGEN

Lance A. Liotta, 9027 Mistwood Dr., Potomac, Md. 20854

Filed Jun. 9, 1986, Ser. No. 871,857
Int. Cl.[4] G01N *33/53*
U.S. Cl. 435—7 **16 Claims**

1. A device for determining the presence of antigens in a sample which comprises:

(a) an upper trapping zone containing material capable of capturing free flowing enzyme-linked class two antibodies, but not class one antibodies bound to a transport particle which flows freely through said trapping zone, wherein said class one antibodies and said class two antibodies are both specific to an antigen being tested for with said class one antibodies and said class two antibodies recognizing different domains on said antigens, wherein said class one antibodies are bound to a transport particle and said class two antibodies are free flowing antibodies linked to an enzyme, whereby in the presence of the antigen being tested for, the class one antibodies and the class two antibodies form complexes with said antigens comprised of the class one antibodies bound to a transport particle, the antigen being tested for, and the class two emzyme-linked antibodies; and,

(b) a lower substrate zone containing material capable of reacting with the enzyme-linked class two antibodies attached to the class one antibodies bound to the transport particle of said complexes by means of the antigen being test for to produce a reaction which indicates the presence of said antigens in the sample.

4,837,146

FORECASTING THE RISK OF SCLEROTINIA STEM ROT IN CROPS

Robin A. A. Morrall; T. K. Turkington; Richard K. Gugel, all of Saskatoon, and Sheldon V. Rude, Canwood, all of Canada, assignors to Canadian Patents & Development Ltd., Ottawa, Canada

Filed May 18, 1987, Ser. No. 50,330
Int. Cl.[4] C12Q *1/02, 1/04;* **C12N** *1/14*
U.S. Cl. 435—34 **10 Claims**

1. A method of forecasting the incidence of diseased plants in a rapeseed or canola crop, the disease being the stem rot fungus, Sclerotinia sclerotiorum, therefore comprising:

(a) selecting and sampling top non-stem plant parts from typical rapeseed or canola plants, at an early bloom stage before the disease becomes visible;

(b) inoculating the plant sample of a) in a selective medium which favours germination of spores and growth of said stem rot fungus while inhibiting most other microorganisms;

(c) incubating the inoculated medium of (b) to allow the microorganisms to grow;

(d) screening the microorganisms for the presence of the stem rot fungus in each sample; and

(e) forecasting the probable disease incidence and need for spraying a fungicide to control the disease from the frequency of the stem rot fungus observed in the samples.

4,837,147

PHO81 PROMOTOR OF *SACCHAROMYCES CEREVISIAE* AND USE THEREOF FOR HETEROLOGOUS GENE EXPRESSION

Yasuji Oshima, Takatsuki; Hiroyuki Araki, and Yoshinobu Kaneko, both of Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Aug. 13, 1986, Ser. No. 896,176
Claims priority, application Japan, Aug. 20, 1985, 60-180984
Int. Cl.[4] C12P *21/00, 21/02;* **C12N** *15/00;* **C07H** *15/12*
U.S. Cl. 435—68 **14 Claims**

1. A recombinant DNA fragment which comprises the *Saccharomyces cerevisiae* PHO81 promoter, which DNA fragment when operably linked to a structural gene is capable of regulating the transcription thereof.

4,837,148

AUTONOMOUS REPLICATION SEQUENCES FOR YEAST STRAINS OF THE GENUS PICHIA

James M. Cregg, San Diego, Calif., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 30, 1984, Ser. No. 666,577
Int. Cl.[4] C12N *15/00, 1/16, 1/00;* **C07H** *15/12*
U.S. Cl. 435—172.3 **16 Claims**

1. An isolated DNA fragment which comprises an autonomous replication sequence isolated from a strain of *Pichia pastoris;* which DNA fragment when inserted into a plasmid enables said plasmid to be maintained as an extrachromosomal element in multiple copies in a *Pichia pastoris* host, and which isolated DNA fragment when inserted into a plasmid causes increased frequency of transformation of a *Pichia pastoris* host compared to the frequency of transformation with plasmids which do not contain said isolated DNA fragment.

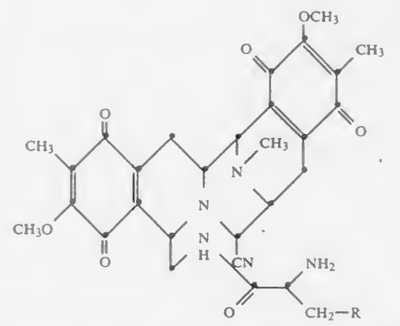
4,837,149

NOVEL SAFRAMYCIN A DERIVATIVES AND PROCESS FOR PRODUCING THE SAME

Tadashi Arai, 50-6, 6-chome, Nagata, Nakano-Ku, Tokyo, and Yuzuru Mikami, Chiba, both of Japan, assignors to Tadashi Aral, Tokyo, Japan

Continuation of Ser. No. 769,930, Aug. 27, 1985, abandoned. This application Sep. 22, 1987, Ser. No. 99,878
Claims priority, application Japan, Aug. 30, 1984, 59-179292
Int. Cl.[4] C12P *17/18, 1/04;* **C12R** *1/56*
U.S. Cl. 435—119 **15 Claims**

1. A process for the preparation of a compound of the formula



(I)

wherein R represents hydrogen or C_1–C_4-alkyl comprising

(a) suspending a biomass of a strain of streptomyces capable of producing saframycin A in an aqueous medium;

(b) adding to said suspension glycine, L-tyrosine, L-methionine, and an amino acid of the formula

$$HO_2CCH(NH_2)—CH_2—R \quad (II)$$

wherein R is as defined above, either as individual amino acids or peptides consisting of amino acids selected from glycine, L-tyrosine, L-methionine, and the amino acid of formula II, or mixtures of said amino acids and said peptides to yield an enriched suspension;

(c) incubating said enriched suspension;

(d) filtering the result of step c; and

(e) adding a cyanide salt to the filtrate obtained from step d to result in said compound of formula 1.

4,837,150

OXIDATION PROCESSES

Howard Dalton, Leamington Spa; John Colby, Burbage, both of England, and David I. Stirling, Glasgow, Wales, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 453,825, Dec. 28, 1982, Pat. No. 4,594,324, which is a continuation of Ser. No. 296,361, Aug. 26, 1981, abandoned, which is a continuation of Ser. No. 157,169, Jun. 6, 1980, abandoned, which is a continuation of Ser. No. 921,610, Jul. 3, 1987, abandoned. This application Dec. 9, 1985, Ser. No. 806,465
The portion of the term of this patent subsequent to Jun. 10, 2003, has been disclaimed.
Int. Cl.[4] C12P *17/02, 17/12, 7/26, 7/02, 7/22, 7/04, 7/16;* **C12R** *1/01, 1/26*
U.S. Cl. 435—123 **13 Claims**

1. A process for oxidizing an alkene which comprises contacting said alkene with a culture of methane-oxidizing C_1-obligate bacteria not capable of growth on said alkene, or an extract of said culture which contains a methane-oxidizing enzyme system, under conditions of medium, temperature and time required for oxidation of said alkene.

4,837,151

LIVE VACCINES COMPRISING TWO MUTATIONS AND FOREIGN ANTIGEN

Bruce A. D. Stocker, Portola Valley, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford University, Stanford, Calif.

Continuation-in-part of Ser. No. 675,381, Nov. 27, 1984, Pat. No. 4,735,801, which is a continuation-in-part of Ser. No. 415,291, Sep. 7, 1982, Pat. No. 4,550,081, which is a continuation-in-part of Ser. No. 151,002, May 19, 1980, abandoned. This application Nov. 14, 1985, Ser. No. 798,052
The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.
Int. Cl.[4] C12N *15/00;* **A61K** *39/12;* **C12R** *1/42*
U.S. Cl. 435—172.3 **16 Claims**

1. A method for preparing a live non-virulent vaccine from a virulent pathogenic bacterium, which vaccine is substantially incapable of reverting to virulence in a vertebrate host susceptible to infection with said bacterium while providing for a strong immune response, said method comprising:

(a) transducing cells of an immune response producing strain of said microorganism with a first transducing phage having at least a portion of a first gene, which first gene expresses a protein in a first biosynthetic pathway to a first essential metabolite normally unavailable in said vertebrate host, and which gene includes a non-reverting mutation, resulting in a culture of a first auxotrophic non-cirulent mutant;

(b) selecting for said auxotrophic mutant by means of said first auxotrophic mutation or other marker introduced by transduction;

(c) transducing said first auxotrophic mutant with a second transducing phage having at least a portion of a second gene, which second gene expresses a protein in a second biosynthetic pathway to a second essential metabolite normally unavailable in said vertebrate host, and which

second gene includes a non-reverting mutation, resulting in a culture of a second auxotrophic non-virulent mutant;
(d) selecting for said second auxotrophic mutant by means of said second auxotropphic mutation or other marker introduced by transduction;
(e) isolating said second auxotrophic non-reverting mutant transductants;
(f) introducing an expression cassette containing a DNA sequence encoding an antigen foreign to said pathogenic bacterium, under regulatory control of regulatory regions recognized by said pathogenic basterium, into said pathogenic basterium, first mutant, or second mutant to produce a transformed hose cell;
(g) growing said transformed hose cell; and
(h) identifying and isolating transformed host cells expressing said antigen;
wherein (f), (g), and (h) may be carried out before or after any one of (a) through (e), resulting in a culture of auxotrophic, non-reverting, non-virulent mutant bacteria capable of expressing an antigen foreign to said bacteria.

4,837,152

PROCESS FOR REGENERATING SOYBEANS

John K. Hemphill, Cupertino, and Claire A. Warshaw, Palo Alto, both of Calif., assignors to Sungene Technologies Corporation, Palo Alto, Calif.

Filed Jul. 29, 1986, Ser. No. 890,302
The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.
Int. Cl.[4] C12N 5/00
U.S. Cl. 435—240.49 **32 Claims**

1. A process for regenerating soybean plants via somatic embryogenesis which comprises:
(a) culturing a soybean embryo on a solid first medium which comprises MS mineral salts modified to contain 41.7 mg/l iron sulfate heptahydrate (ISH) and 55.9 mg/l disodium ethylenediamine tetraacetic acid (Na_2EDTA), vitamins selected from the group consisting of Nitsch's vitamins modified to contain 10.4 mg/l thiamine hydrochloride and 0.5 mg/l nicotinic acid and Nitsch's vitamins modified to contain 10.4 mg/l of thiamine hydrochloride, 2%–3% sucrose, myoinositol and 5–10 mg/l 2,4-dichlorophenoxyacetic acid (2,4-D) in the light for 25–45 days to induce callus and embryoid formation;
(b) subculturing the callus and embryoids on one or more solid second media which are selected from the group consisting of:
(i) second medium A, which comprises MS mineral salts modified to contain no ammonium nitrate, 4,524 mg/l ammonium citrate, 1,010 mg/l potassium nitrate, 41.7 mg/l ISH and 55.9 mg/l Na_2EDTA, vitamins selected from the group consisting of Nitsch's vitamins modified to contain 10.4 mg/l thiamine hydrochloride and 0.5 mg/l nicotinic acid and Nitsch's vitamins modified to contain 10.4 mg/l of thiamine hydrochloride, 2%–3% sucrose, 100 mg/l casein hydrolysate, myoinositol, 1 mg/l indoleacetic acid (IAA), 1 mg/l t-zeatin, 0.0264 mg/l abscisic acid (ABA) and 0.0096 mg/l picloram;
(ii) second medium B, which comprises MS mineral salts modified to contain 41.7 mg/l ISH and 55.9 mg/l Na_2EDTA, vitamins selected from the group consisting of Nitsch's vitamins modified to contain 10.4 mg/l thiamine hydrochloride and 0.5 mg/l nicotinic acid and Nitsch's vitamins modified to contain 10.4 mg/l of thiamine hydrochloride, 2%–3% sucrose, myoinositol, 1 mg/l IAA and 0.5 mg/l t-zeatin; and
(iii) second medium C, which comprises MS mineral salts modified to contain no ammonium nitrate, no potassium nitrate, 4,524 mg/l ammonium citrate, 41.7 mg/l ISH, and 55.9 mg/l Na_2EDTA, vitamins selected from the group consisting of Nitsch's vitamins modified to contain 10.4 mg/l thiamine hydrochloride and 0.5 mg/l nicotinic acid and Nitsch's vitamins modified to contain 10.4 mg/l of thiamine hydrochloride, 2%–3% sucrose, 100 mg/l casein hydrolysate, myoinositol, 1 mg/l IAA, 1 mg/l t-zeatin, 0.0264 mg/l ABA and 0.0096 mg/l picloram
in the light for 20–45 days per subculture, to mature the embryoids;
(c) subculturing the mature embryoids on one or more solid third media which are selected from the group consisting of:
(i) third medium A, which comprises MS mineral salts modified to contain 2,000 mg/l ammonium nitrate, 600 mg/l potassium nitrate, 41.7 mg/l of ISH and 55.9 mg/l Na_2EDTA, Sussex's vitamins, Sussex's amino acids, 2%–3% sucrose, myoinositol, 0.01 mg/l IAA, 0.1 mg/l kinetin, 0.1 mg/l ABA and 0.1 mg/l gibberellic acid (GA_3); and
(ii) third medium B, which comprises MS mineral salts modified to contain 41.7 mg/l ISH and 55.9 mg/l Na_2EDTA, vitamins selected from the group consisting of Nitsch's vitamins modified to contain 10.4 mg/l thiamine hydrochloride, and 0.5 mg/l nicotinic acid and Nitsch's vitamins modified to contain 10.4 mg/l of thiamine hydrochloride, 2%–3% sucrose, myoinositol, 0.2 mg/l benzyl adenine (BA) and 0.005 mg/l indole-3-butyric acid (IBA)
in the light for 20–45 days for subculture, to induce shoot formation; and
(d) subculturing the shoots on one or more solid fourth media which are selected from the group consisting of:
(i) fourth medium A, which comprises MS mineral salts modified to contain 41.7 mg/l ISH and 55.9 mg/l Na_2EDTA, vitamins selected from the group consisting of Nitsch's vitamins modified to contain 10.4 mg/l thiamine hydrochloride, and 0.5 mg/l nicotinic acid and Nitsch's vitamins modified to contain 10.4 mg/l of thiamine hydrochloride, 1%–2% sucrose and myoinositol;
(ii) fourth medium B, which comprises MS mineral salts modified to contain no ammonium nitrate, 300 mg/l $NH_4H_2PO_4$, 2,500 mg/l potassium nitrate, 41.7 mg/l ISH and 55.9 mg/l Na_2EDTA, vitamins selected from the group consisting of Nitsch's vitamins modified to contain 10.4 mg/l thiamine hydrochloride and 0.5 mg/l nicotinic acid and Nitsch's vitamins modified to contain 10.4 mg/l of thiamine hydrochloride, 1%–2% sucrose, myoinositol and 0.5 mg/l IAA, and;
(iii) fourth medium C, which comprises MS mineral salts modified to contain 41.7 mg/l ISH and 55.9 mg/l Na_2EDTA, vitamins selected from the group consisting of Nitsch's vitamins modified to contain 10.4 mg/l thiamine hydrochloride and 0.5 mg/l nicotinic acid and Nitsch's vitamins modified to contain 10.4 mg/l of thiamine hydrochloride, 1%–2% sucrose, myoinositol and a hormone selected from the group consisting of 0.1–0.5 mg/l IAA and 0.1–0.5 IBA
in the light for 20–45 per subculture, to induce root formation whereby plants are obtained.

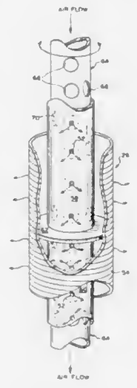
4,837,153

COMPOST AIR INJECTION AND EVACUATION SYSTEM WITH IMPROVED AIR CONTROL

John G. Laurenson, Jr., 5480 River Trail Rd. South, Jacksonville, Fla. 32211

Filed Aug. 22, 1984, Ser. No. 643,080
The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.
Int. Cl.[4] C12N 1/00; C12M 1/00, 1/04; C05F 9/04
U.S. Cl. 435—243 **6 Claims**

1. A method of controlling the fluid flow to treat compost, comprising:
injecting the fluid flow into the compost through at least one lance; and
providing said lance with an outer porous wall spaced from an inner fluid flow control insert; and providing a plurality of openings in said inner fluid flow control insert and means for separating portions of said insert and said outer wall to form separate fluid flow zones, said openings and said separating means operating to control the fluid flow



into said compost along the length of said lance and prevent internal short circuiting of said fluid flow, said separating means including a plurality of gaskets adjustably mounted on said insert to form a plurality of variable zones.

4,837,154

SELECTIVE GROWTH MEDIUM FOR ISOLATION OF MOBILUNCUS FROM VAGINAL FLUID

Carol A. Spiegel, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jan. 14, 1987, Ser. No. 3,116
Int. Cl.[4] C12N 1/20; C12Q 1/10; C12R 1/36
U.S. Cl. 435—253.6 **7 Claims**

1. A selective growth medium for the isolation of Mobiluncus comprising:
(a) a medium base including an aqueous preparation of a gelling agent and a nutrient broth effective for culturing Mobiluncus;
(b) a first antimicrobial agent in effective antimicrobial amounts, the antimicrobial agent being selected from the group consisting of colistin, nalidixic acid, and combinations of colistin and nalidixic acid, the colistin having in any event a concentration less than 32 micrograms/ml and the nalidixic acid having in any event a concentration less than 100 micrograms/ml;
(c) a second antimicrobial agent consisting of tinidazole in effective, antimicrobial amounts not greater than 1.0 micrograms/ml; and
(d) Nile Blue A in *Gardnerella vaginalis* inhibiting concentrations.

4,837,155

METHOD OF GROWING TRICHODERMA

Mordechai Tabachnik, Nes Ziona, Israel, assignor to Bio-Technology General Corp., New York, N.Y.

Continuation of Ser. No. 604,841, Apr. 27, 1984, abandoned. This application May 22, 1987, Ser. No. 53,373
Claims priority, application Israel, Apr. 29, 1983, 68523
Int. Cl.[4] C12N 1/14
U.S. Cl. 435—254 **31 Claims**

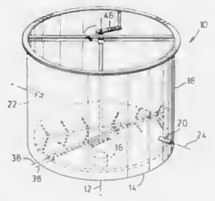
1. A method for the production of *Trichoderma harzianum* or *Trichoderma hamatum* conidia in submerged culture comprising:
(a) preparing an inoculant of *Trichoderma harzianum* or *Trichoderma harzianum* or *Trichoderma hamatum* in submerged culture in a suitable liquid culture medium, the medium being continuously aerated at a rate of 0.1 to 10.0 vvm during growth of the inoculant;
(b) placing the inoculant into a fermentor containing at least 50 liters of a suitable carbon enriched liquid medium permitting production of *Trichoderma conidia;*
(c) maintaining the inoculant-containing, carbon enriched, liquid medium under substantially constant illumination, agitation and aeration at a temperature from about 25° C. to about 30° C. and at a buffered pH from about 5.8 to about 7.0 for at least 36 hours until the density of *conidia* produced from the inoculant is at least 5×10^8conidia per ml.; and
(d) harvesting the *Trichoderma conidia* so produced.

4,837,156

TILTING LAUTER TUN

Leo K. Lampinen, 172 Paddock Cr., Mississauga, Ont., Canada L5L 3E4

Filed Dec. 22, 1986, Ser. No. 944,024
Int. Cl.[4] C12C 1/00
U.S. Cl. 435—302 **15 Claims**



1. A vessel having a lower portion, a central longitudinal axis, a pair of trunnions, and a fixed bottom and a false bottom, one of said trunnions is connected to the exterior of said vessel and the other of said trunnions is connected to the exterior of said vessel at the position opposite to said one of said trunnions so as define a tilting axis, said false bottom comprising at least two screens, each of said screens having one or more hinges, each of said hinges defining a pivotal axis, all of said pivoted axis are parallel and are located in a plane that is orthoganal to said central longitudinal axis, said hinges affixing said screens to said vessel to allow said screens to freely swing about said hinges from a first position in which said screens are positioned above said fixed bottom to a second position, in which said fixed bottom is exposed when said vessel is tilted about said tilting axis.

4,837,157

SAMPLE PREPARATION METHOD FOR LIQUID CHROMATOGRAPHY

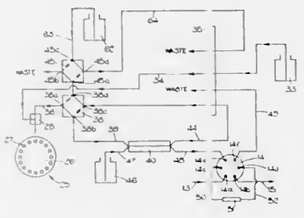
David C. Turnell, Balsall Common, and John D. H. Cooper, Sapcote, both of England, assignors to Coventry Health Authority, Coventry, United Kingdom

Continuation of Ser. No. 515,499, Jul. 20, 1983, abandoned. This application Oct. 8, 1986, Ser. No. 917,291
Claims priority, application United Kingdom, Jul. 20, 1982, 8220963
Int. Cl.[4] G01N 1/28, 30/08, 30/14, 33/02
U.S. Cl. 436—20 **10 Claims**

1. A method of selectively analyzing a plurality of analytes in a liquid biological sample containing many components which can interfere with analysis by liquid chromatography, said method comprising the steps of:
(a) passing a biological liquid sample containing a plurality of analytes of interest and molecules which can interfere

with analysis by liquid chromatography into a first passage of a dialyzer;

(b) selectively removing the molecules in the sample which can interfere with analysis by liquid chromatography from the analytes of interest by passing a first diluent through a second passage of the dialyzer, the first and second passages being separated by a semi permeable membrane having holes sufficiently large to permit the analytes of interest to pass through the membrane into the first diluent but sufficiently small to prevent passage of the molecules which can interfere with analysis by liquid chromatography, and passing the analytes of interest from the sample, through the membrane, and into the first diluent to form a dialyzed sample which still contains the molecules which can interfere with analysis by liquid chromatography;



(c) passing the first diluent containing the analytes of interest through a passage in a retaining element which contains material for temporarily retaining the analytes of interest by either adsorption, partition or both;

(d) subsequently passing a second diluent through the passage in the retaining element in order to remove the analytes of interest;

(e) passing the second diluent containing the analytes of interest through a chromatography column and detector means in order to perform chromatographic analysis of the analytes of interest; and

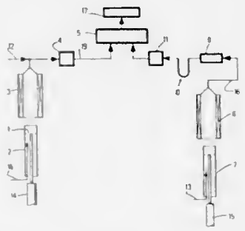
(f) passing the dialyzed sample which contains the molecules which can interfere with analysis by liquid chromatography to waste.

4,837,158

PROCESS FOR CHARACTERIZING A CATALYST BY DETERMINATION OF ITS CONVERSION AND COKING ACTIVITIES

Hervé Toulhoat, Houilles, and Anne Favre, Poissy, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed May 26, 1987, Ser. No. 53,666
Claims priority, application France, May 27, 1986, 86 07690
Int. Cl.[4] G01N *25/22 31/10*
U.S. Cl. 436—37 16 Claims



1. A process for characterizing a porous catalyst by determination of its hydrocarbon conversion and coking activities, comprising the successive steps of:

(a) impregnating the catalyst with a hydrocarbon mixture provided in a thin liquid form permitting the pore of the catalyst to be filled,

(b) heating the impregnated catalyst, in a stream of an inert gas, up to a temperature θ_2 ranging from 300° C. to 380° C., so as to produce a conversion - evaporation during this step of temperature increase, thereby separating out a conversion - evaporation effluent,

(c) subjecting said conversion - evaporation effluent, during the heating step, to a measurement, with a hydrocarbon detector, of a signal Q representative of the hydrocarbons generated during said conversion - evaporation step,

(d) progressively increasing the temperature of resultant impregnated catalyst freed of said conversion - evaporation effluent from θ_2 at a rate of temperature increase ranging from 2° C./min. to 50° C./sec to a value θ_3 ranging from 500° C. to 1000° C., under an inert gas stream, so that pyrolysis occurs during said heating step, thus producing a pyrolysis effluent and a residue,

(e) subjecting said pyrolysis effluent, during the heating step, to a measurement, by means of a hydrocarbon detector, of a signal P representative of pyrolyzed hydrocarbons generated during said pyrolysis step,

(f) subjecting said residue to combustion at a temperature θ_4 ranging from 500° C. to 1500° C., under a stream of oxidizing gas, said combustion producing a combustion gas effluent.

(g) subjecting said combustion gas effluent, by means of at least one suitable detector, to measurement of a signal R representative of the residue amount, and

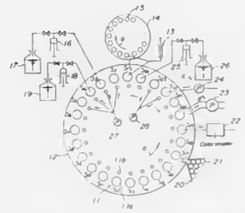
(h) deducing by signal processing means from said measured values of signals P, Q and R the conversion and coking activities of said catalyst.

4,837,159

METHOD AND APPARATUS FOR EFFECTING IMMUNOLOGICAL ANALYSIS

Takashi Yamada, Sagamihara, Japan, assignor to Olympus Optical Co., Ltd., Sagamihara, Japan

Filed Sep. 17, 1985, Ser. No. 776,889
Claims priority, application Japan, Sep. 21, 1984, 59-198054
Int. Cl.[4] G01N *33/531, 33/534, 21/05*
U.S. Cl. 436—45 16 Claims



1. In a method of automatically analyzing a plurality of different kinds of substances in samples in an immunological manner, comprising transporting in a stepwise manner at a given time period a number of reaction vessels containing carriers onto which given antibody or antigen has been fixed along a plurality of positions of an endless reaction line; delivering samples and labeled reagents into the reaction vessels to initiate antigen-antibody reactions; effecting a B-F separation by separating antigen or antibody bound with the carriers and free antigen or antibody from each other by means of a washing device for washing the reaction vessels; measuring the substances in the samples with the aid of labeling substances of the labeled reagents; and discharging the carriers out of the

reaction line; the improvement comprising: controlling said washing device in a manner such that washing is effected when a reaction time period required for said antigen-antibody reaction has elapsed, said reaction time period being set to a sum of a minimum time period and a multiple integer of a basic time period, wherein said minimum time period is equal to a period during which a reaction vessel moves from a reaction start position to a position at which the washing device is provided, and is arbitrarily adjustable within said basic time period by moving said washing device to any position of said endless reaction line, and said basic time period is equal to a period during which a reaction vessel is rotated by one revolution over said endless reaction line, and is adjustable by controlling on and off operation of said washing device at said any position of said endless reaction line.

8. An automatic analyzer for analyzing a plurality of different kinds of substances in samples in an immunological manner comprising:

a plurality of reaction vessels;

an endless reaction line having a plurality of positions;

means for transporting said reaction vessels along successive positions of said endless reaction line;

a plurality of carriers with antibody or antigen fixed thereto;

means for supplying the carriers with antibody or antigen fixed thereto into reaction vessels;

means for supplying samples into the reaction vessels at a position of said endless reaction line;

means for delivering a labeled reagent into the reaction vessels at a position of said endless reaction line;

means for measuring the substances in the samples with the aid of labeling substances of the labeled reagent;

means for washing the reaction vessels and carriers to effect a B-F separation for separating antigen or antibody bound with the carriers and free antigen or antibody, said washing means being arranged so as to be movable to any position of said endless reaction line;

means for controlling on and off operation of said washing means at said any position of said endless reaction line in accordance with a reaction time period of a current sample to be analyzed; and

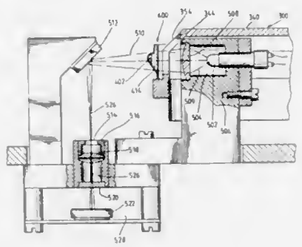
means for discharging the carriers from the reaction vessels.

4,837,160

BIOLOGICAL FLUID ASSAY SYSTEM AND METHOD

Peter M. Meserol, and Jesse Acker, both of Whippany, N.J., assignors to Gamma Biologicals, Inc., Houston, Tex.

Division of Ser. No. 660,721, Oct. 18, 1984, Pat. No. 4,683,120, which is a continuation-in-part of Ser. No. 546,345, Oct. 28, 1983, abandoned. This application Apr. 29, 1987, Ser. No. 43,876
Int. Cl.[4] G01N *33/52*
U.S. Cl. 436—45 8 Claims



1. A method for determining the reactive characteristics of a biological mixture of a specimen and reagent comprising the steps of:

(a) preparing a sample including the specimen and an appropriate reagent, the sample being at least partially opaque;

(b) introducing the sample into a light transmissive chamber and illuminating the light transmissive chamber;

(c) centrifuging the sample to compress the sample into a compact mass in the extreme radial portion of the light transmissive chamber;

(d) reducing centrifuging to approximately balance the centrifugal force and the gravitational force acting on the sample;

(e) making a first measurement of a linear dimension of an opaque portion of the compact mass when the centrifugal force on the sample is approximately equal to the gravitational force;

(f) allowing sufficient time to elapse to permit dissociation of the opaque portion of the compact mass;

(g) making a subsequent measurement of the same linear dimension of the compact mass; and

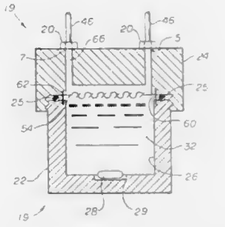
(h) evaluating the mathematical co-efficients of the measured relationship between the first measured dimension and the second measured dimension.

4,837,161

METHOD FOR REAGENT ADDITION TO A FLOWING LIQUID CARRIER STREAM

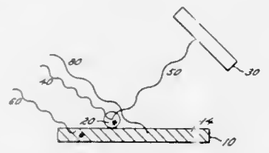
Timothy S. Stevens; Nile N. Frawley; Daniel J. Swart, all of Midland, Mich.; William C. Harris, Neshanic Station, N.J.; Deborah E. Diedering, Sanford, Mich.; Lawrence W. Nicholson, and L. David Rothman, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 725,861, Apr. 22, 1985, abandoned, and a continuation-in-part of Ser. No. 709,141, Mar. 7, 1985, abandoned, and a continuation-in-part of Ser. No. 707,772, Mar. 4, 1985, abandoned, said Ser. No. 707,772, is a continuation of Ser. No. 15,830, Feb. 18, 1987, abandoned. This application Aug. 25, 1986, Ser. No. 900,038
Int. Cl.[4] G01N *30/06, 35/08*
U.S. Cl. 436—52 8 Claims



5. In a method of reagent addition to a carrier stream in flow injection analysis wherein the stream is under pressure, comprising the steps of contacting the carrier stream with one side of a two sided liquid and reagent permeable membrane, contacting the other side of the membrane with a liquid mobile reagent contained in a chamber, wherein the improvement comprises the step of: pressurizing the mobile reagent by essentially completely filling the chamber with the mobile reagent and hermetically sealing the chamber, so that permeation of carrier across the membrane into the mobile reagent pressurizes the mobile reagent and so that the mobile reagent can be permeated into the carrier stream.

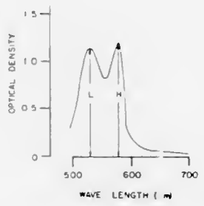
4,837,162
NON-FLUORESCING, NON-REFLECTIVE POLYAMIDE FOR USE IN DIAGNOSTIC TESTING
Isaac Rothman, Brooklyn, and Peter J. Degen, Huntington, both of N.Y., assignors to Pall Corporation, New York, N.Y.
Filed Jun. 5, 1987, Ser. No. 58,843
Int. Cl.[4] G01N *33/545, 33/546*
U.S. Cl. 436—531 **10 Claims**



1. In an assay in which the presence or quantity of an analyte is being detected by fluorescence at an emission waveband of light as a result of excitation of a fluorescent signal material at an excitation waveband of light and in which said excitation waveband of light impinges upon a polyamide, an improvement which comprises:

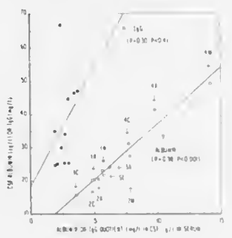
providing as said polyamide an optically passive polyamide prepared by dyeing a polyamide substrate with a reactive dye having an absorbance spectrum selected to overlap said excitation waveband or said emission waveband or both of said wavebands.

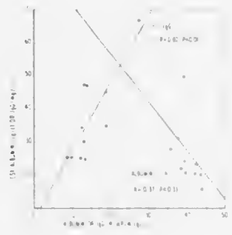
4,837,163
SIMPLE BLOOD TEST FOR DIAGNOSING MALIGNANT HYPERTHERMIA
Tsuyoshi Ohnishi, 502 King of Prussia Rd., Radnor, Pa. 19087
Filed Oct. 2, 1987, Ser. No. 104,463
Int. Cl.[4] G01N *33/48*
U.S. Cl. 436—63 **3 Claims**

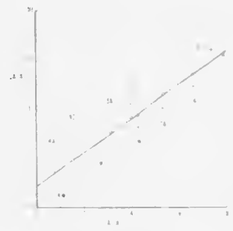


1. A method of diagnosing susceptibility to malignant hyperthermia using unpreserved blood comprising drawing under a vacuum approximately 4 ml blood from an individual by venipuncture using a vacuum tube (citrate as an anti-coaggulant); breaking the vacuum of the vacuum tube by puncturing a rubber stopper of said vacuum tube by a syringe needle for about 10 seconds; gently transfering the blood after blood collection into an optical cuvette with a light path of 0.1 mm; measuring hemoglobin absorption using a scanning type spectrophotometer by scanning between 700 and 500 nm; measuring the absorption at 542 and 578 nm, and denoting them as L and H, respectively; calculating a value of M by equation $M=(L-H)/H$; diagnosing as malignant hyperthermia susceptible, if M is positive; and diagnosing as malignant hyperthermia negative, if M is negative.

4,837,164
METHODS FOR DIAGONOSING, MONITORING AND CONTROLLING THE ONSET AND PROGRESSION OF CERTAIN DEMENTIAS AND IMPEDING MEMORY LOSS OR IMPROVING IMPAIRMENT OF MEMORY
J. Leslie Glick, Potomac, Md., assignor to Bionix Corporation, Potomac, Md.
Filed Apr. 27, 1988, Ser. No. 203,174
Int. Cl.[4] G01N *33/20, 33/00, 1/00, 33/48*
U.S. Cl. 436—88 **15 Claims**







1. A method for diagnosing the onset or monitoring the progression of dementia comprising;

(i) measuring the total serum concentration of albumin and total CSF concentration of albumin for one or more healthy individuals and one or more individuals afflicted with a dementia;

(ii) deriving default values of normal and altered albumin quotients from said measurements;

(iii) deriving concentrations of normal and altered forms of serum albumin or normal and altered forms of CSF albumin for a patient using said default values of said albumin quotients and measured albumin concentrations of the patient to determine baseline values of said normal and altered albumin concentrations for said patient; and

(iv) diagnosing the onset or monitoring the progression of dementia in a patient by tracking concentrations of said forms of albumin relative to said baseline values.

4,837,165
METHOD FOR SEQUENCING OF PEPTIDES BY CARBOXYL TERMINUS DEGRADATION
David H. Hawke, Azusa, Calif., assignor to Beckman Research Institute, City of Hope, Duarte, Calif.
Continuation of Ser. No. 780,264, Sep. 26, 1985, abandoned. This application Apr. 20, 1988, Ser. No. 186,667
Int. Cl.[4] G01N *33/68*
U.S. Cl. 436—89 **8 Claims**

1. In a method for sequencing a peptide by carboxyl terminal degradation which comprises coupling the carboxyl terminus of a peptide with a coupling reagent to form a peptidyl thiohydantoin derivative, cleaving the peptidyl thiohydantoin derivative to provide a thiohydantoin derivative of the amino acid previously at the carboxyl terminus of the peptide and a peptidyl residue lacking such an amino acid, and identifying the amino acid in the amino acid thiohydantoin derivative, wherein the improvement comrprises utilizing a silyl isothiocyanate as the coupling reagent.

4,837,166
ASSAYING METHOD FOR PRIMARY AMINES USING AROMATIC DIALDEHYDES
Pierre M. R. de Montigny, Fords, N.J.; Larry A. Sternson, Berwyn, Pa.; Arnold J. Repta, Lawrence, Kans.; John F. Stobaugh, Lawrence, Kans.; Takeru Higuchi, deceased, late of Lawrence, Kans. (Martin B. Dickinson, Jr., co-executor), and Kenji W. Higuchi, co-executor, Spokane, Wash., assignors to Oread Laboratories, Inc., Lawrence, Kans.
Continuation-in-part of Ser. No. 707,676, Mar. 4, 1985, abandoned. This application Apr. 20, 1987, Ser. No. 39,743
The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.
Int. Cl.[4] G01N *21/77, 27/26, 33/68*
U.S. Cl. 436—111 **13 Claims**

1. A method of assaying primary amines comprising the steps of:

(i) reacting a reagent that is reactive with primary amines and cyanide with cyanide ions and at least one primary amine to form an adduct amenable to fluorometric or electrochemical assaying techniques, wherein the reagent is a substituted or unsubstituted naphthalene-2,3-dicarboxyaldehyde or o-phthalaldehyde; and

(ii) fluorometrically or electrochemically assaying said adduct.

4,837,167
IMMUNOASSAY FOR MULTI-DETERMINANT ANTIGENS USING HIGH-AFFINITY
Hubert J. P. Schoemaker, Devon, Pa.; Jack R. Wands, Waban, Mass.; Barbara L. Westrick, Flourtown, and Vincent R. Zurawski, Jr., West Chester, both of Pa., assignors to Centocor, Inc., Malvern, Pa.; The General Hospital Corporation, Boston, Mass. and Centocor, Inc., Malvern, Pa.
Continuation-in-part of Ser. No. 230,175, Jan. 30, 1981. This application Apr. 24, 1984, Ser. No. 603,415
Int. Cl.[4] G01N *33/537, 33/576, 33/577*; C12Q *1/70*
U.S. Cl. 436—513 **15 Claims**

1. In an immunoassay for detecting the presence of a multideterminant antigen in a liquid sample wherein said sample is simultaneously incubated in the presence of an immunoadsorbent containing immobilized antibody for said antigen and labeled antibody for said antigen, and thereafter detecting the amount of labeled antibody bound to said immunoadsorbent as an indication of the amount of antigen present in said sample:

the improvement wherein said immobilized antibody and said labeled antibody comprise high-affinity IgM monoclonal antibodies directed against a multiply-appearing determinant of said antigen.

4,837,168
IMMUNOASSAY USING COLORABLE LATEX PARTICLES
Nikolaas C. J. de Jaeger, Hove; Marcel J. Monbaliu, Mortsel; Marcus J. M. Noppe, Kalmthout, and Frank J. Konings, Antwerpen, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium
Continuation-in-part of Ser. No. 812,586, Dec. 23, 1985, abandoned. This application Dec. 15, 1986, Ser. No. 941,446
Int. Cl.[4] G01N *33/546*
U.S. Cl. 436—533 **16 Claims**

1. A method of qualitatively or quantitatively determining a component of a complex formed between at least one specific binding protein and its corresponding bindable substance which comprises labeling at least one component of said complex with a marker characterized in that the marker used consists of colorable latex particles which are chemically converted into colored latex particles after the formation of said complex and the determination is based on the color characteristics of the colored particles derived therefrom.

11. Colorable latex particles coated with a specific binding protein, wherein said colorable latex particles can be chemically converted into colored latex particles.

4,837,169
POLYPYRIDINE FLUORESCENT LABELS FOR IMMUNOASSAY
John L. Toner, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Continuation-in-part of Ser. No. 7,024, Jan. 27, 1987, which is a division of Ser. No. 825,693, Feb. 3, 1986, Pat. No. 4,637,988, which is a continuation of Ser. No. 279,398, Jul. 1, 1981, abandoned. This application Apr. 20, 1987, Ser. No. 40,385
Int. Cl.[4] G01N *21/64*
U.S. Cl. 436—546 **16 Claims**

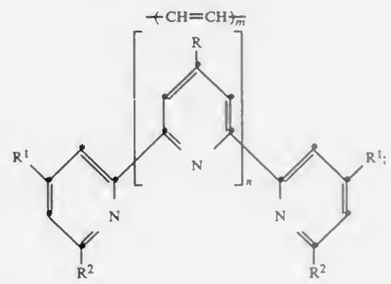
16. In a method for performing an immunoassay comprising the steps of

(a) fluorescently labeling a ligand of interest, a derivative of said ligand or some other molecular entity, to produce a fluorescently labeled immunologically binding ligand analog of said ligand of interest;

(b) adding a known amount of said fluorescently labeled ligand analog and an unknown amount of ligand to be assayed to a receptor which is capable of binding with said fluorescently labeled ligand analog and also is capable of binding with said ligand to be assayed; and

(c) determining the unknown amount of said ligand to be assayed by measuring the fluorescence of said fluorescently labeled ligand analog bound to said receptor or by measuring the fluorescence of said fluorescently labeled ligand analog remaining unbound,

the improvement wherein the labeled ligand analog comprises ligand adsorbed or covalently bound to a fluorescent label comprising a fluorescent chelate of a lanthanide metal and a chelating agent having the structure



wherein

R represents hydrogen, alkyl, alkoxy alkylthio, alkylamino, aryl, aryloxy or a heterocyclic group;
R^1 represents hydrogen, alkyl, alkoxy, alkylthio, alkylamino, substituted or unsubstituted aryl or a heterocyclic group;
R^2 represents carboxy, hydroxy, carbonyliminodiacetic acid, methyleneimino diacetic acid, hydrazinylylidene diacetic acid or a salt of such acids;
n is 0 to 4; and
m is 0 to 1
provided that m can be 1 only when n is 0.

4,837,170

MONOCLONAL ANTIBODY, MEASURING METHOD OF GLUCOSYLATED PROTEIN BY UTILIZING THE MONOCLONAL ANTIBODY, AND KIT THEREFOR

Yasuo Obe; Makiko Matsuura, both of Tokushima; Fumio Shimizu, Naruto; Yoshito Nakajima, Tokushima; Shin Sadahito, Tokushima, and Kenji Shima, Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Jan. 14, 1987, Ser. No. 3,144
Claims priority, application Japan, Jun. 20, 1986, 61-10758; Mar. 17, 1986, 61-58828
Int. Cl.[4] G01N *33/577, 33/66*
U.S. Cl. 436—548 **9 Claims**

1. A method for the measurement of a glucosylated protein in a sample, which comprises subjecting the sample to a reducing treatment and then detecting a protein having one or more reduced glucosylated lysine residual groups with a monoclonal antibody, wherein said monoclonal antibody is one produced by immunization with an antigen selected from the group consisting of reduced glucosylated polylysine, reduced glucosylated human serum albumin, and reduced glucosylated bovine serum albumin.

4,837,171

ANTI-EPIGLYCANIN MONOCLONAL ANTIBODIES

John F. Codington, West Newton, Mass., assignor to The General Hospital Corporation, Boston, Mass.

Filed Jul. 2, 1987, Ser. No. 69,311
Int. Cl.[4] G01N *33/53*
U.S. Cl. 436—548 **11 Claims**

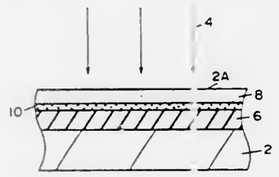
11. An antibody producing hybridoma cell capable of producing monoclonal antibodies recognizing epiglycanin glycopeptide selected from the group consisting of HAE-1, HAE-3, and HAE-4.

4,837,172

METHOD FOR REMOVING IMPURITIES EXISTING IN SEMICONDUCTOR SUBSTRATE

Bunji Mizuno, Ikoma, and Masafumi Kubota, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 15, 1987, Ser. No. 73,829
Claims priority, application Japan, Jul. 18, 1986, 61-170023; Apr. 28, 1987, 62-105123
Int. Cl.[4] H01L *21/265, 21/322*
U.S. Cl. 437—011 **4 Claims**



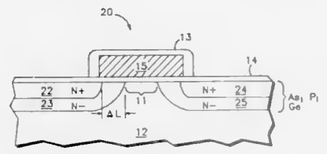
2. A method for making a silicon-on-insulator (SOI) structure having a buried oxide layer and silicon top layer thereon in a silicon substrate comprising steps of:
(a) implanting oxygen or ions which contain oxygen into a second region in said silicon substrate, which region is to be said buried oxide layer, thereby, residual oxygen remaining in said silicon top layer in this step (a);
(b) implanting hydrogen or hydrogen ions into a first region in said silicon substrate, which region is to be said silicon top layer;
(c) annealing the structure of step (b); and
(d) removing said residual oxygen from said silicon top layer.

4,837,173

N-CHANNEL MOS TRANSISTORS HAVING SOURCE/DRAIN REGIONS WITH GERMANIUM

John R. Alvis; James R. Pfiester, both of Austin, Tex., and Orin W. Holland, Oak Ridge, Tenn., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 13, 1987, Ser. No. 72,932
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—024 **9 Claims**



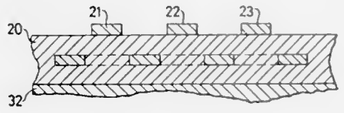
1. A process for providing a doped n-type region in a semiconductor substrate, comprising the steps of:
providing a semiconductor substrate having a surface;
introducing germanium atoms into a first region of the semiconductor substrate, and introducing phosphorus into a second region of the semiconductor substrate, where said first region and said second region are in a relationship of overlapping but not coextensive; and
annealing the semiconductor substrate.

4,837,174

METHOD FOR PRODUCING THIN CONDUCTIVE AND SEMI-CONDUCTIVE LAYERS IN MONO-CRYSTAL SILICON

Sture Peterson, Uppsala, Sweden, assignor to Stiftelsen Institutet for Microvagsteknik VID, Sweden

Filed Jul. 30, 1987, Ser. No. 79,500
Claims priority, application Sweden, Aug. 29, 1986, 8603652
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—24 **8 Claims**



1. A method for producing thin conductive or semiconductive layers embedded in silicon to form structures for integrated circuits and like devices, characterized by placing a mask on a silicon substrate and forming said mask from metallized patterned layers formed on a surface of said silicon substrate to be incorporated in the structure under construction, and implanting metal atoms in said silicon substrate to a predetermined nominal depth through said mask, embedding said metal atoms in said silicon substrate to form the layer with a

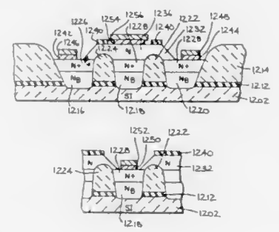
zone between said layer and said surface substantially free of said metal atoms, and thereafter subjecting said silicon substrate to heat treatment in a manner to redistribute the implanted metal atoms so as to form a separate conductive or a semiconductive layer buried in the silicon substrate, said layer being defined in its lateral dimensions by said mask.

4,837,175

MAKING A BURIED CHANNEL FET WITH LATERAL GROWTH OVER AMORPHOUS REGION

Joseph A. Calviello, Kings Park, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 128,882, Dec. 4, 1987, which is a division of Ser. No. 817,916, Jan. 10, 1986, Pat. No. 4,724,220, which is a division of Ser. No. 702,482, Feb. 19, 1985, Pat. No. 4,601,096, which is a division of Ser. No. 466,662, Feb. 15, 1983, abandoned. This application May 16, 1988, Ser. No. 194,532
Int. Cl.[4] H01L *21/265, 21/302*
U.S. Cl. 437—24 **4 Claims**



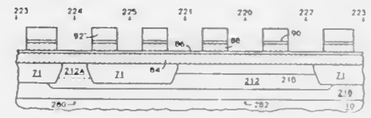
1. A process for fabricating a buried channel field effect transistor comprising:
providing a semi-insulating substrate having an upper surface, and first and second regions on said upper surface;
depositing a silicon dioxide layer on said upper surface;
removing said silicon dioxide layer over said first and second regions to expose the surface of said substrate at said first and second regions;
depositing an N semiconductor layer on said silicon dioxide layer and said exposed substrate surface to form a semi-insulating layer on said silicon dioxide layer and first and second N buffer layers on said substrate surface at said first and second regions, respectively, said N buffer layers growing upwardly and also laterally towards each other and separated by a central region of said semi-insulating layer;
epitaxially growing an N+ semiconductor layer on said semi-insulating layer and said N buffer layers to form an increased thickness said semi-insulating layer and first and second N+ layers on said first and second N buffer layers, respectively, said N+ layers growing upwardly and also laterally towards each other and separated by said central region of said semi-insulating layer;
epitaxially growing an N layer on said semi-insulating layer and said N+ layers to form a further increased thickness said semi-insulating layer and an active N layer on said first and second N+ layers and on said central region of said semi-insulating layer, the respective portions of said active N layer over said first and second N+ layers growing upwardly and also laterally towards each other and merging and epitaxially growing in single crystalline form over said central region of said semi-insulating layer;
making contact with said first and second N+ layers to form the drain and source for the field effect transistor, and making contact with said active N layer proximate said central region of said semi-insulating layer to form the gate of said field effect transistor.

4,837,176

INTEGRATED CIRCUIT STRUCTURES HAVING POLYCRYSTALLINE ELECTRODE CONTACTS AND PROCESS

Peter J. Zdebel, Mesa; Raymond J. Balda, Tempe; Bor-Yuan Hwang, Chandler, and Allen J. Wagner, Phoenix, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jan. 30, 1987, Ser. No. 9,322
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—31 **35 Claims**



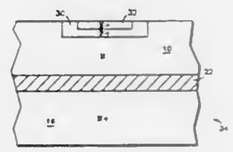
1. A process for fabricating a semiconductor device comprising the steps of:
providing a semiconductor substrate having a first surface;
forming a lateral isolation region at least partially surrounding an exposed first region of said semiconductor substrate extending to said surface;
forming on said surface a first layer wherein said first layer is of a first material which is conductive but can be locally converted to a dielectric;
forming a second layer overlying said first layer, wherein said second layer is of a second material which can protect first portions of said first layer while second portions of said first layer are converted to dielectric;
forming a third layer overlying said second layer, wherein said third layer comprises a third material which can be locally converted to a dielectric;
patterning said third layer to define first and second contact regions and an external region lying outside a perimeter surrounding and spaced apart from said first and second contact regions, said first contact region being located at least partially over said exposed region of said substrate and said second contact region being located at least partially over said lateral isolation region, whereby said third layer is removed in said first and second contact regions and outside said perimeter;
removing portions of said second layer exposed outside said perimeter to expose said second portion of said first layer;
exposing remaining portions of said third layer within said perimeter; and
converting said exposed portions of said first and third layers to form a first dielectric.

4,837,177

METHOD OF MAKING BIPOLAR SEMICONDUCTOR DEVICE HAVING A CONDUCTIVE RECOMBINATION LAYER

Israel A. Lesk, and Lowell E. Clark, both of Phoenix, Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Dec. 28, 1987, Ser. No. 138,262
Int. Cl.[4] H01L *21/461*
U.S. Cl. 437—31 **20 Claims**



1. A method of fabricating a bipolar semiconductor device

having a conductive recombination layer comprising the steps of:

providing a first doped semiconductor substrate having a first surface and a second surface.

providing a second doped semiconductor substrate having a first surface and a second surface.

forming a polycrystalline conductive recombination layer on said first surface of one of said first and second semiconductor substrates; and

bonding said first surface of the remaining one of said first and second semiconductor substrates to said conductive recombination layer.

4,837,178

METHOD FOR PRODUCING A SEMICONDUCTOR INTEGRATED CIRCUIT HAVING AN IMPROVED ISOLATION STRUCTURE

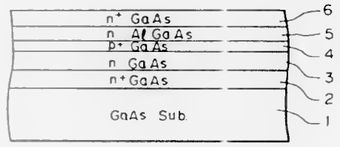
Toshio Ohshima, and Naoki Yokoyama, both of Atsugi, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

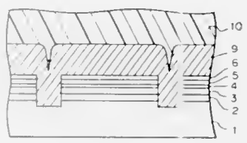
Division of Ser. No. 792,686, Oct. 29, 1985, abandoned. This application Sep. 4, 1987, Ser. No. 94,091

Claims priority, application Japan, Oct. 31, 1984, 59-229181

Int. Cl.⁴ H01L *21/31*

U.S. Cl. 437—33 **6 Claims**





1. A method for producing a semiconductor integrated circuit device comprising the steps of

(a) providing a compound semiconductor substrate having a semi-insulating compound semiconductor surface region;

(b) forming an active element laminated layer on the surface region including compound semiconductor layers having a first conductivity type and a second conductivity type opposite the first conductivity type, respectively;

(c) forming a groove extending into the surface region by etching portions of the laminated layer and the surface region;

(d) filling the groove with a semi-insulating compound semiconductor so as to form an isolation region for electrically isolating active elements from each other; and

(e) forming an active element in the isolated regions of the laminated layer.

4,837,179

METHOD OF MAKING A LDD MOSFET

David J. Foster, Northampton, and Andrew J. Pickering, Rugby, both of England, assignors to Plessey Overseas Limited, Ilford, England

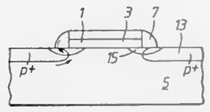
PCT No. PCT/GB86/00675, § 371 Date Aug. 31, 1987, § 102(e) Date Aug. 31, 1987, PCT Pub. No. WO87/02825, PCT Pub. Date May 7, 1987

PCT Filed Oct. 31, 1986, Ser. No. 88,108

Claims priority, application United Kingdom, Nov. 2, 1985, 8526062

Int. Cl.⁴ H01L *21/265*

U.S. Cl. 437—44 **6 Claims**



1. A method for MOS transistor manufacture comprising essentially the following steps:

firstly, defining on a substrate of silicon crystal material a mesa comprised of a gate oxide and a gate electrode;

secondly, applying to the gate oxide, gate electrode, and substrate, a deposit of dielectric material incorporating a quantity of n-type dopant, and etching same to create a narrow sidewall adjacent to both the gate oxide and the gate electrode;

thirdly, introducing a heavy implant dose of p-type dopant species, to produce a shallow implant in the substrate aligned to the side of the sidewall; and,

fourthly, annealing the substrate to regrow the silicon crystal, to activate the implanted dopant, and to drive incorporated dopant from the sidewall into the substrate to form a counter-doped region.

4,837,180

LADDER GATE LDDFET

Fung-Ching Chao, Taiwan, China, assignor to Industrial Technology Research Institute, Taiwan, China

Filed Jul. 9, 1987, Ser. No. 72,086

Int. Cl.⁴ H01L *21/265*

U.S. Cl. 437—44 **15 Claims**

1. A lightly-doped drain field effect transistor fabrication process, which comprises:

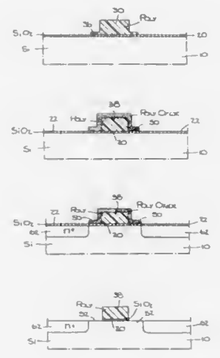
(A) forming, on a semiconductor substrate having a silicon dioxide layer grown thereon, a ladder-shaped polysilicon layer having a thick central gate region and a relatively thin peripheral step;

(B) oxidizing completely said thin peripheral step portion and the outer portion of the thick central gate region to form additional silicon dioxide, said additional silicon dioxide serving to thicken the silicon dioxide layer about the periphery of the gate region;

(C) ion-implanting a heavy N-type dose so as to form source/drain regions in said substrate;

(D) etching the resulting structure to remove the additional silicon dioxide and silicon dioxide layer; and

(E) ion-implanting the substrate with a light dose of N-type ions to form lightly doped source/drain extensions between said heavily doped source/drain regions and said gate region.



4,837,181

ROM MEMORY PROGRAMMING PROCEDURE USING MOS TECHNOLOGY WITH THIN GATE OXIDE AND JUNCTIONS

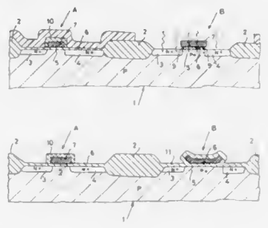
Sergio Galbiati, Treviglio, and Alessandro Comi, Bernareggio, both of Italy, assignors to SGS-Thomson Microelectronics s.r.l., Agrate Brianza, Italy

Filed May 27, 1988, Ser. No. 198,877

Claims priority, application Italy, Jun. 11, 1987, 20872 A/87

Int. Cl.⁴ H01L *21/308, 21/316;* **G11C** *17/00*

U.S. Cl. 437—45 **2 Claims**



1. ROM memory programming procedure using MOS technology with thin gate oxide and junctions in which the programming of a memory cell takes place starting with a cell already formed with source and drain junctions made in a substrate between adjacent field oxide areas, a thin layer of gate oxide overlain on the substrate between said field oxide areas, and a stirp of polycrystalline silicon gate overlain on said gate oxide and incorporated in an oxide layer subsequently grown spanning the zone between said junctions characterized in that it comprises the phases of wet isotropic etching of the cell area for removal of the oxide above, beside and partially underneath said strip of polycrystalline silicon, implantation of dopant of a type opposite to that of the source junction and drain junction through said strip of polycrystalline silicon, in the zone of the substrate underlying said strip, and reoxidation of the entire cell area.

4,837,182

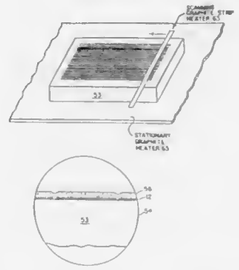
METHOD OF PRODUCING SHEETS OF CRYSTALLINE MATERIAL

Carl O. Bozler, Sudbury; John C. C. Fan, Chestnut Hill, and Robert W. McClelland, Weymouth, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 251,214, Apr. 6, 1981, Pat. No. 4,727,047, which is a continuation-in-part of Ser. No. 138,891, Apr. 10, 1980, abandoned. This application Dec. 4, 1987, Ser. No. 128,809

Int. Cl.⁴ H01L *31/324, 21/20*

U.S. Cl. 437—82 **9 Claims**



1. A method of producing a sheet of crystalline material over a substrate, comprising:

a. forming a mask of the substrate to expose single crystal areas on or in the substrate;

b. depositing crystallizable material over said substrate and mask;

c. scanning with a localized heat source to provide sufficient energy to the crystallizable material to cause lateral epitaxial crystal growth thereof; and

d. continuing lateral overgrowth until a sheet of crystalline material having desired dimensions has formed.

4,837,183

SEMICONDUCTOR DEVICE METALLIZATION PROCESS

Anthony Polito, Mesa, and Irenee M. Pages, Chandler, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed May 2, 1988, Ser. No. 189,431

Int. Cl.⁴ H01L *21/00, 21/02, 21/283, 21/441*

U.S. Cl. 437—198 **11 Claims**

1. A metallization process for semiconductor devices comprising the steps of:

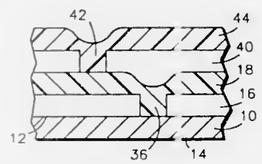
providing a wafer;

forming a first dielectric layer on said wafer;

heating said wafer; and

depositing at least one metal layer on said first dielectric layer, the temperature of said wafer during said metal deposition being equal to or greater than the temperature

of said wafer during subsequent processing steps, the wafer temperature being controlled by measuring and



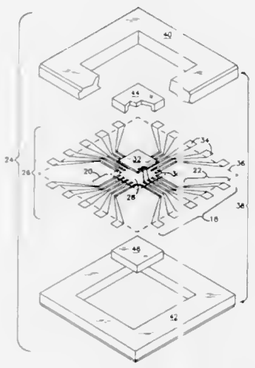
controlling the maximum grain width of said at least one metal layer.

4,837,184

PROCESS OF MAKING AN ELECTRONIC DEVICE PACKAGE WITH PERIPHERAL CARRIER STRUCTURE OF LOW-COST PLASTIC

Paul T. Lin; Michael B. McShane; Charles G. Bigler, all of Austin, and John A. Goertz, Red Rock, all of Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jan. 4, 1988, Ser. No. 141,013
Int. Cl.⁴ H01L *21/66*
U.S. Cl. 437—217 **19 Claims**



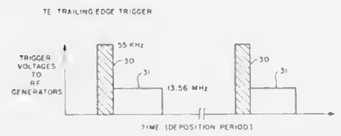
1. A method for providing a packaged electronic device having a carrier structure comprising the steps of:
providing a lead frame comprising a plurality of leads peripherally surrounding an electronic element bonding area, each lead having a proximal end near the bonding area, a distal end away from the bonding area and an intermediate portion between the proximal end and the distal end;
bonding an electronic element to the proximal ends of leads in the lead frame;
providing a package body over the electronic element and at least a portion of the proximal ends of each of the leads, the package body being a first material; and
providing a carrier structure over and adherent to at least a portion of the distal ends of at least some of the leads, the carrier structure being of a second material different from the first material;
at least a portion of the intermediate portions of the leads being exposed and not covered by either material.

4,837,185

PULSED DUAL RADIO FREQUENCY CVD PROCESS

Leopoldo D. Yau, Portland, and Galen H. Kawamoto, Beaverton, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Oct. 26, 1988, Ser. No. 262,990
Int. Cl.⁴ H01L *21/00, 21/02, 21/31, 21/469*
U.S. Cl. 437—228 **16 Claims**



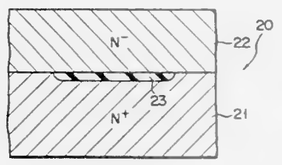
1. In the deposition of a thin film of silicon oxynitride onto a semiconductor substrate or layer formed on the semiconductor substrate by means of glow discharge or plasma in a reaction chamber, an improved method comprising:
generating a first radio frequency pulse;
striking a gas in a reaction chamber with said first pulse;
generating a second radio frequency pulse being of higher frequency than said first pulse;
applying said second pulse to said gas while said first pulse is still being generated;
switching off said first pulse after a first predetermined span of time while said second pulse is still being generated;
switching off said second pulse after a second predetermined span of time;
repeating said pulses after a third predetermined span of time over a deposition period thereby generating a series of periodic pulses.

4,837,186

SILICON SEMICONDUCTOR SUBSTRATE WITH AN INSULATING LAYER EMBEDDED THEREIN AND METHOD FOR FORMING THE SAME

Yu Ohata, Tokyo; Tsuyoshi Kuramoto, and Masaru Shimbo, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 60,979, Jun. 10, 1987, abandoned, which is a continuation of Ser. No. 770,089, Aug. 28, 1985, abandoned.
This application Aug. 12, 1987, Ser. No. 84,209
Claims priority, application Japan, Aug. 31, 1984, 59-181817
Int. Cl.⁴ H101L *21/265*
U.S. Cl. 437—228 **1 Claim**



1. A method of manufacturing the silicon semiconductor substrate with an insulating layer embedded therein comprising the steps of:
forming a first silicon dioxide layer on a first surface of a first monocrystalline silicon plate;
forming a silicon nitride layer on said first silicon dioxide layer;
removing said silicon nitride layer on a predetermined region;
forming a second silicon dioxide layer on said predetermined region;

removing the remaining silicon nitride layer;
applying a resist layer on the surfaces of said second silicon dioxide layer and said first silicon dioxide layer remaining on said first surface of said first monocrystalline silicon plate, the free surface of said resist layer being made flat;
etching said resist layer and said second silicon dioxide layer until the level of the free surface of said second silicon dioxide layer coincides with the surface level of the first silicon dioxide layer by using the reactive ion etching method;
removing a upper part of said second silicon dioxide layer and said first silicon dioxide layer until said first silicon dioxide layer is completely removed; and
uniting a second monocrystalline silicon plate with said first monocrystalline silicon plate and said second silicon dioxide layer at their mutual contacting surfaces.

4,837,187

ALUMINA-BASED CORE CONTAINING YTTRIA

Gregory R. Frank, Muskegon; Kenneth A. Canfield, Whitehall, and Thomas R. Wright, Muskegon, all of Mich., assignors to Howmet Corporation, Greenwich, Conn.

Filed Jun. 4, 1987, Ser. No. 58,129
Int. Cl.⁴ C04B *35/10*
U.S. Cl. 501—127 **13 Claims**

1. A ceramic core for use in the investment casting of metals consisting essentially of, prior to sintering, about 80 w/o to about 86 w/o of a ceramic filler material and about 14 w/o to about 20 w/o of a binder material, said filler material consisting essentially of about 66 w/o to about 95 w/o Al_2O_3 particles, about 1 w/o to about 20 w/o Y_2O_3 particles, about 1 w/o to about 5 w/o of a grain growth inhibiting agent, and the balance a carbon-bearing fugitive filler material, said ceramic core, subsequent to sintering, having a microstructure characterized by the presence of substantially unreacted Al_2O_3 particles having a polycrystalline composition consisting essentially of $3Y_2O_3.5Al_2O_3$ on the surfaces of said Al_2O_3 particles.

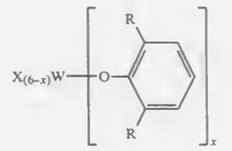
4,837,188

CATALYTIC SYSTEMS HAVING EXTENDED DURATION AND CONSERVATION FOR THE METATHESIS OF OLEFINS

Jean-Paul Laval, Roquette; Michel Leconte, Villeurbanne; Jean Ollivier, Arudy; Emile Perez, Coulommiers; Francoise Quignard, Villeurbanne, and Isabelle Rico, Ramonville Saint Agne, all of France, assignors to Societe Nationale Elf Aquitaine, France

Filed Mar. 18, 1988, Ser. No. 169,736
Claims priority, application France, Mar. 20, 1987, 87 03879
Int. Cl.⁴ C08F *4/62;* **B01J** *31/12, 31/14*
U.S. Cl. 502—107 **16 Claims**

1. A catalytic system for the metathesis of olefins, which comprises:
(a) a tungsten halide of the formula



where x is 0 or 2, X is a halogen atom, and R is a hydrocarbyl or an electronegative atom or group;
(b) an organometallic compound of Li, Mg, Ti, Al, Sn or Pb, and
(c) a fluorinated organic compound having the structure of $R_F—R''—R'_F$ in which R' is a saturated or unsaturated hydrocarbon chain having 0 to 7 carbon atoms, while R_F and R'_F are hydrocarbon chains partially or totally fluorinated, R_F having 0 to 20 carbon atoms and R'_F 2 to 20 carbon atoms.

9. A method of preparing the catalytic system according to claim 1, which comprises dissolving component (a) in an organic solvent adding component (b) to the solution thus obtained, stirring the solution while heating it to a temperature of 0° to 100° C. during 0.5 to 60 minutes, then introducing thereinto 0.5 to 20 moles of component (c) per mole of component (a) and ceasing heating and stirring.

4,837,189

SURFACTANT MODIFIED METAL CATALYSTS

Helmut Simon, Freising, and Jordanes Thanos, Munich, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Division of Ser. No. 939,118, Dec. 8, 1986, Pat. No. 4,749,670.
This application Mar. 3, 1988, Ser. No. 163,538
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1986, 3600274
Int. Cl.⁴ B01J *31/02, 31/28;* **C12P** *7/52*
U.S. Cl. 502—150 **7 Claims**

1. A modified metal catalyst, for use in hydrogenation reactions, wherein said modified metal catalyst is prepared by a process comprising the steps of:
(i) suspending a modifiable metal catalyst selected from the group consisting of nickel and noble metals in water or in a buffer solution under a hydrogen atmosphere;
(ii) adding to said suspension 2–5 times the weight, based on said metal catalyst, of a fluorine-containing surfactant, wherein said surfactant has good wetting properties on metal surfaces, to prepare a metal catalyst/surfactant mixture;
(iii) shaking or stirring said mixture to prepare said modified catalyst; and
(iv) separating out said modified catalyst.

4,837,190

ORGANIC SOLVENT SOLUBLE POLYVALENT METAL ALKOXY ALKOXIDES

William Summers, III, Peekskill, and Eric W. Burkhardt, Brewster, both of N.Y., assignors to Akzo America Inc., New York, N.Y.

Filed May 9, 1986, Ser. No. 861,392
Int. Cl.⁴ B01J *31/02*
U.S. Cl. 502—171 **1 Claim**

1. A composition comprising as essential ingredients (i) a solvent; (ii) a yttrium alkoxy alkoxide; and (iii) a zirconium alkoxide.

4,837,191

CATALYTIC MIXTURE FOR THE AMMOXIDATION OF PARAFFINS

Linda C. Glaeser, Lyndhurst; James F. Brazdil, Jr., Mayfield Village, and Mark A. Toft, Lakewood, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 194,665, May 16, 1988. This application Jun. 9, 1988, Ser. No. 204,475
Int. Cl.[4] B01J *23/20, 23/22, 27/14, 23/88*
U.S. Cl. 502—202 1 Claim

1. A catalytic mixture suitable for the ammoxidation of propane to acrylonitrile, which comprises an intimate particulate mixture of a first catalyst composition and a second catalyst composition, said feed to the reaction zone containing a mole ratio of paraffin:NH_3 in the range from 2 to 16, and a mole ratio of paraffin to O_2 in the range from 1 to 10, said first catalyst composition being 0–99 weight percent of a diluent-/support and 100–1 weight percent of a catalyst having oxygen and the cation components in the proportions indicated by the empirical formula:

$$Bi_aV_bL_lM_mT_tO_x, \qquad \text{formula (1)}$$

wherein
L is one or more of K, Cs, Rb and Tl;
M is one or more of Mo, W, Cr, Ge, Sb, Sn, P, Pb and B;
T is one or more of Zn, Nb, Ta, Fe, Co, Ni, Cu, Mn, Ti and rare earths,
a=1–25
b=1–50
l=0–1
m=0.1–20
t=0–20
x is determined by the oxidation state of the other elements in the catalyst,
(a+b):(l+m+t)=20:1 to 1:5,
a:b=1:5–5:1
with the proviso that the atomic ratio of Mo:V is zero to <10; said second catalyst composition being 0–99 weight percent of a diluent/support and 100–1 weight percent of a catalyst having oxygen and the cation components in the proportions indicated by the empirical formula:

$$Bi_kFe_lMo_{12}V_vD_dE_eF_fG_gO_x \qquad \text{formula (2)}$$

where
D is one or more of an alkali metal, Sm, Ag
E is one or more of Mn, Cr, Cu, Zn, Ce, La,
F is one or more of P, As, Sb, Te, W, B, Sn, Pb, Se
G is one or more of Co, Ni, alkaline earth metal and
k is 0.1–12, l is 0.01–12, v is 0–0.5, d is 0–0.5, e is 0–10,
f is 0–10, g is 0–12, v+k+l+d+e+f+g≦24, and x is a number determined by the valence requirements of the other elements present, wherein the weight ratio in said mixture of said first catalyst composition to said second catalyst composition is in the range of 0.001 to 2.5.

4,837,192

CATALYST COMPOSITION

John S. Roberts, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 742,818, Jun. 10, 1985, abandoned, which is a division of Ser. No. 542,960, Oct. 18, 1983, Pat. No. 4,537,994. This application Sep. 18, 1986, Ser. No. 908,558
Int. Cl.[4] B01J *21/02, 27/04, 27/188*
U.S. Cl. 502—211 8 Claims

1. A composition useful as a catalyst for interactions between organic sulfides and mercaptans which composition comprises:
a sulfided phospho Group VIB oxide acid on a moderately acidic aluminum containing support selected from the group consisting of metal aluminates,
wherein said phospho Group VIB oxide acid on said support is within the range of about 0.01 to about 10 weight percent based on the total weight of the catalyst.

4,837,193

HYDROTREATING CATALYST AND PROCESS OF MANUFACTURE

Ikuo Akizuki, Shizuoka; Hiroshi Kaya, Saitama; Shohei Okano, Saitama; Nobuo Otake, Saitama; Keiji Kumagai, Saitama, and Yoshihito Kaneko, Saitama, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 726,112, Apr. 23, 1985, abandoned. This application Aug. 10, 1987, Ser. No. 84,467
Int. Cl.[4] B01J *21/12, 23/24, 23/85, 23/88*
U.S. Cl. 502—242 7 Claims

1. A process for producing a hydrotreating catalyst which comprises the following steps:
(a) obtaining a carrier formed of silica/alumina or a silica/alumina-containing substance, said carrier comprising silica in an amount of 2 to 35 wt.%;
(b) immersing said carrier initially in a solution of an amine complex salt of at least one Group VIII metal so as to obtain an impregnated carrier containing between about 0.5 to 20 wt. %, based on the oxide, of said Group VIII metal;
(c) air drying and calcining said impregnated carrier of step (b);
(d) immersing said air-dried and calcined carrier in a solution of a salt of at least one Group VIB metal so as to obtain an impregnated carrier comprising between about 5 to 30 wt. %, based on the oxide, of said Group VIB metal.

4,837,194

PROCESS FOR IMPROVING THE PERFORMANCE OF A CATALYST FOR THE PRODUCTION OF ALKYLENE OXIDES

Percy Hayden, Guisborough, England, assignor to Imperial Chemical Industries PLC, London, England

Continuation-in-part of Ser. No. 883,763, Jul. 9, 1986, abandoned. This application Jan. 15, 1988, Ser. No. 144,107
Claims priority, application United Kingdom, Jul. 31, 1985, 8519223; Jun. 6, 1986, 8613818
Int. Cl.[4] B01J *21/04, 23/04, 23/50*
U.S. Cl. 502—348 8 Claims

1. A process of improving the performance of a catalyst for the production of alkylene oxides by the reaction of the corresponding alkene with oxygen which comprises silver supported on an α-alumina support which comprises introducing an alkali metal selected from lithium, sodium, rubidium, and/or potassium to the catalyst in a ratio of one part chemically absorbed to at most three parts physically deposited, by contacting the catalyst with a solution or colloidal solution of a compound of lithium, sodium, rubidium, and/or potassium in a solvent which has a dielectric constant of at most 8 at 20° C.

4,837,195

PROCESS FOR POROSITY CONTROL AND REHYDROXYLATIONS OF SILICA BODIES

Geoffrey B. Cox, and Richard W. Stout, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 945,792, Dec. 23, 1986, abandoned. This application Aug. 4, 1988, Ser. No. 228,761
Int. Cl.[4] B01J *20/10;* C01B *33/12;* B01D *15/08*
U.S. Cl. 502—408 2 Claims

1. A process of increasing the porosity Φ^* to a desired value Φ ranging from about 0.5 to about 0.8, cleaning the surface, and rehydroxylating porous silica microspheres having an average diameter of about 0.5 to about 34 μm, substantially all of said microspheres having a diameter ranging from about 0.5 to about 1.5 times said average diameter; said microspheres consisting essentially of a plurality of substantially uniform-size colloidal silica particles, arranged in an interconnected three-dimensional lattice; said colloidal particles occupying less than about 50 volume percent of said microspheres with the remaining volume being occupied by interconnected pores having substantially uniform pore size distribution by the steps of: calculating the quantity of $(NH_4)HF_2$ needed to provide the porosity according to the linear equation

$$\Phi=\Phi^*+m(\beta)$$

where β is the weight ratio of $(NH_4)HF_2$ to that of the silica microspheres, m ranges from about 0.10 to 0.14, treating the microspheres with water in the presence of such quantity of $(NH_4)HF_2$ to form a slurry of microspheres, filtering the slurry to recover the microspheres, and washing and drying the microspheres.

4,837,196

HEAT-SENSITIVE RECORDING PAPER

Yasuhiro Ogata, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 26, 1988, Ser. No. 160,972
Claims priority, application Japan, Feb. 27, 1987, 62-44795
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—200 11 Claims

1. A heat-sensitive recording paper comprising a paper support having thereon a heat-sensitive color forming layer comprising at least one electron-donating colorless dye precursor and at least one electron-accepting compound, wherein the paper support is made of a base paper impregnated with a cationic styrene-acryl copolymer.

4,837,197

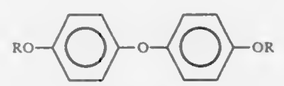
HEAT-SENSITIVE RECORDING MATERIAL

Haruhiko Ikeda; Masahiro Higuchi, and Hirokazu Ohkura, all of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Dec. 24, 1987, Ser. No. 137,679
Claims priority, application Japan, Dec. 25, 1986, 61-310728; Dec. 25, 1986, 61-310733; Apr. 6, 1987, 62-85424
The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—209 8 Claims

1. A heat-sensitive recording material comprising a support and formed thereon a heat-sensitive recording layer comprising a normally colorless or light-colored dye precursor, a color developer which forms a color by reacting with the dye precursor when heated, and a sensitizer represented by the formula:

(1)



wherein R is an alkenyl group, an alkenylcarbonyl group, an alkanesulfonyl group, an aroyl group, an aralkyl group, or a group of the formula:

in which R' is a lower alkyl group.

4,837,198

HEAT-SENSITIVE RECORDING MEDIUM

Katsumi Kuriyama, Koshigaya; Kazuyuki Hanada, Washinomiya; Susumu Nakamura, Kawagoe; Iwao Misaizu, Ageo; Masashi Kashimura, Tokyo, and Tomoko Goto, Kawaguchi, all of Japan, assignors to Dainichiseika Color & Chemicals Mfg. Co., Ltd. and Ukima Colour & Chemicias Mfg. Co., Ltd., both of Tokyo, Japan

Filed Aug. 27, 1987, Ser. No. 90,098
Claims priority, application Japan, Mar. 3, 1987, 62-46712
Int. Cl.[4] B41M *5/035, 5/26*
U.S. Cl. 503—227 3 Claims

1. In a heat-sensitive recording medium composed of a base sheet, a heat-sensitive recording layer provided on one side of the base sheet and a heat-resistant layer provided on the other side of the base sheet, the improvement wherein the heat-resistant layer is made of a film-forming resin modified with a modifier which is reaction product of a fluorine compound containing at least one organic functional group reactive with an isocyanate group selected from the group consisting of amino, carboxyl, hydroxyl and thioalcohol groups and is reacted with an organic polyisocyanate.

4,837,199

THERMAL TRANSFER RECORDING MATERIAL

Sadao Morishita, Ibaraki; Toshihiko Matsushita, Tokyo, and Mikiya Sekine, Warabi, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Division of Ser. No. 738,474, May 28, 1985, Pat. No. 4,651,117. This application Dec. 12, 1986, Ser. No. 941,177
Claims priority, application Japan, May 31, 1984, 59-111866; Jun. 22, 1984, 59-129606; Jul. 3, 1984, 59-138485
Int. Cl.[4] B41M *5/26*
U.S. Cl. 503—227 6 Claims

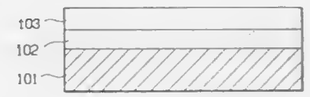
5. A method of thermal transfer recording which comprises superposing a donor sheet having a heat meltable ink layer on a support, said heat meltable ink layer having been obtained by coating on the support a coating composition comprising a colorless dye or pigment, a binder and a wax in an aqueous medium, and an image receiving sheet so that the heat meltable ink layer on the donor sheet contacts with the heat meltable substance layer of the image receiving sheet and transferring the molten ink under application of heat from a thermal head.

4,837,200

IMAGE-RECEIVING SHEET FOR THERMAL TRANSFER PRINTING

Hiromasa Kondo, Ikoma; Yoshitaka Okumura, Kyoto; Terunobu Fukui, Nishinomiya; Noritaka Egashira, Ichikawa; Tamami Iwata, Tokyo, and Naoto Satake, Tokyo, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd. and Dai Nippon Insatsu Kabushiki Kaisha, both of Tokyo, Japan

Filed Jul. 21, 1988, Ser. No. 222,168
Claims priority, application Japan, Jul. 24, 1987, 62-186095; Jul. 24, 1987, 62-186096; Oct. 15, 1987, 62-259968
Int. Cl.[4] B41M *5/035, 5/26*
U.S. Cl. 503—227 13 Claims



1. An image-receiving sheet for thermal transfer printing which comprises an intermediate layer and an image-receiving layer formed on a substrate in this order, said intermediate layer being comprised primarily of a resin insoluble in an organic solvent, said image-receiving layer being comprised primarily of a resin soluble in an organic solvent, the insoluble

resin being formed from a copolymer latex satisfying the following requirements (a) and (b):

(a) compositional constituents:
aliphatic conjugated diolefinic 20–70 wt. % monomer:
unsaturated acid monomer: 0.5–15 wt. %
olefinic monomer other than said aliphatic conjugated diolefinic monomer:

(b) gel content: 85–100 wt. %.

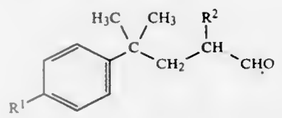
4,837,201

4-METHYL-4-PHENYL-1-PENTANALS, THEIR PREPARATION AND THEIR USE AS SCENTS

Walter Gramlich, Edingen-Neckarhausen; Norbert Goetz, Worms; Hardo Siegel, Speyer, and Gerhard Schindler, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 17, 1988, Ser. No. 194,892
Int. Cl.[4] A61K *7/46;* **C07C** *47/52*
U.S. Cl. 512—26 **9 Claims**

1. A 4-methyl-4-phenyl-1-pentanal of the formula I



(I)

where R^1 is hydrogen or C_1–C_4-alkyl and R^2 is hydrogen or methyl, with the proviso that 4-methyl-4-phenyl-1-pentanal is excluded.

4,837,202

METHOD FOR STIMULATING THE IMMUNE SYSTEM

Carl K. Edwards, III, and Libby M. Junger, both of Terre Haute, Ind., assignors to Pitman-Moore, Inc., Terre Haute, Ind.

Filed Sep. 14, 1987, Ser. No. 95,986
Int. Cl.[4] A61K *37/35*
U.S. Cl. 514—12 **11 Claims**

1. A method for stimulating the immune system by increasing the production of macrophages and augmenting the oxidative metabolism of macrophages in an animal, comprising:

administering a macrophage production increasing and macrophage oxidative metabolism augmenting amount of a protein selected from the group consisting of somatotropin and prolactin to said animal.

4,837,203

PHARMACOLOGICALLY ACTIVE COMPOUNDS AND USE

John J. Adcock; Geoffrey Allan, and Terence W. Smith, all of Beckenham, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jul. 7, 1987, Ser. No. 70,407
Claims priority, application United Kingdom, Jul. 9, 1986, 8616741
Int. Cl.[4] A61K *37/02*
U.S. Cl. 514—17 **19 Claims**

1. A method of treating neuronally-mediated bronchoconstriction in a mammal suffering from neuronally - mediated bronchostriction, which comprises administering to said mammal an effective, non-toxic, bronchodilator amount of a peptide of formula (I)

$$X—Tyr—X^2—Gly—Phe(4NO_2)—Pro—NH_2 \quad (I)$$

wherein
X is hydrogen or an amidino group, and
X^2 is D-S-methylmethionyl or D-arginyl,
or a pharmacologically acceptable salt thereof.

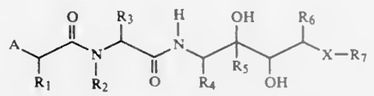
4,837,204

FUNCTIONALIZED PEPTIDYL AMINODIOLS AND -TRIOLS

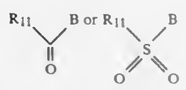
Saul H. Rosenberg; Jay R. Luly, and Jacob J. Plattner, all of Libertyville, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 943,566, Dec. 31, 1986, abandoned, which is a continuation-in-part of Ser. No. 818,715, Jan. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 693,951, Jan. 23, 1985, abandoned. This application May 9, 1988, Ser. No. 191,714
Int. Cl.[4] A61K *37/43;* **C07K** *5/08*
U.S. Cl. 514—18 **11 Claims**

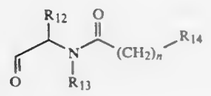
1. A compound of the formula:



wherein A is hydrogen; loweralkyl; arylalkyl; OR_8 or SR_8 wherein R_8 is hydrogen, loweralkyl or aminoalkyl; NR_9R_{10} wherein R_9 and R_{10} are independently selected from hydrogen, loweralkyl, aminoalkyl, cyanoalkyl and hydroxyalkyl;



wherein B is NH, alkylamino, S, O, CH_2 or CHOH and R_{11} is loweralkyl, cycloalkyl, aryl, arylalkyl, alkoxy, alkenyloxy, hydroxyalkoxy, dihydroxyalkoxy, arylalkoxy, arylalkoxyalkyl, amino, alkylamino, dialkylamino, (hydroxyalkyl)(alkyl)amino, (dihydroxyalkyl)(alkyl)amino, carboxylic acid- substituted alkyl, alkoxycarbonylalkyl, aminoalkyl, (dihydroxyalkyl)(alkyl)amino, N-protected aminoalkyl, alkylaminoalkyl, dialkylaminoalkyl, (N-protected)- (alkyl)aminoalkyl, (heterocyclic)alkyl or a substituted or unsubstituted heterocyclic; R_1 is loweralkyl, cycloalkylmethyl, benzyl, α-methylbenzyl, α,α-dimethylbenzyl, 4-methoxybenzyl, halobenzyl, (1-naphthyl)methyl, (2-naphthyl)methyl, (4-imidazolyl)methyl, phenethyl, phenoxy, thiophenoxy or anilino; provided if R_1 is phenoxy, thiophenoxy or anilino, B is CH_2 or CHOH or A is hydrogen; R_3 is loweralkyl, benzyl or heterocyclic ring substituted methyl; R_4 is loweralkyl, cycloalkylmethyl or benzyl; R_2, R5 and R6 are independently hydrogen or loweralkyl; X is O, NH or S; R_7 is hydrogen, loweralkyl, alkanoyl, alkylsulfonyl,



wherein R_{12} and R_{13} are independently hydrogen or loweralkyl, n is 0-2 and R_{14} is substituted or unsubstituted phenyl or heterocyclic; or XR_7 together are loweralkylsulfonyl, N_3 or Cl, and pharmaceutically acceptable salts thereof.

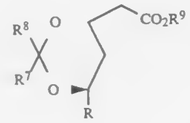
4,837,205

PRODRUGS OF ANTIHYPERCHOLESTEROLEMIC COMPOUNDS

Wasyl Halczenko, Hatfield; George Hartman, and Steven M. Pitzenberger, both of Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

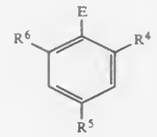
Filed Sep. 2, 1986, Ser. No. 902,894
Int. Cl.[4] A61K *31/70, 31/335;* **C07D** *319/04*
U.S. Cl. 514—25 **13 Claims**

1. A compound represented by the general structural formula (I):



(I)

wherein:
R is



wherein:
E is $—CH_2—$, $—CH_2CH_2—$ or $—CH=CH—$;
R^4 and R^5 are independently C_{1-3}alkyl, fluoro, bromo or chloro; and
R^6 is phenyl, benzyloxy, substituted phenyl or substituted benzyloxy in which the phenyl group in each case is substituted with one or more substituents selected from C_{1-3}alkyl, fluoro, bromo or chloro;
R^7 is hydrogen or C_{1-6}alkyl;
R^8 is C_{1-6}alkyl; and
R^9 C_{1-6}alkyl, C_{1-6}alkanyloxy-C_{1-6}alkyl, C_{1-6}alkoxycarbonyloxy-C_{1-6}alkyl or a group selected from
(1) (5-(1,1-dimethylethyl)-2-oxo-1,3-dioxol-4-yl)methyl; or
(2) 2-(β-D-galactosidyl)ethyl.

4,837,206

ESPERAMICIN DERIVATIVES

Jerzy Golik, Southington, Conn., assignor to Bristol-Myers Company, New York, N.Y.

Filed Apr. 29, 1987, Ser. No. 43,916
Int. Cl.[4] A61K *31/70;* **C07H** *15/04*
U.S. Cl. 514—25 **5 Claims**

4. A method for therapeutically treating an animal host affected by a microbial infection which comprises administering to said host an effective antimicrobial dose of N-acetylesperamicin A_1, N-acetylesperamicin A_2 or N-acetylesperamicin A_{1b}.

4,837,207

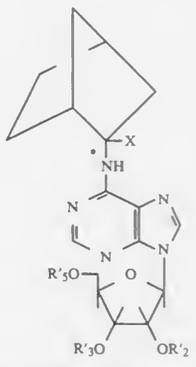
DIASTEREOISOMERS OF N^6-ENDO-BICYCLO[2.2.1]HEPTYLADENOSINE AS ANTIHYPERTENSIVES WITH SELECTIVE ACTION

Bharat K. Trivedi, Canton, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed May 13, 1987, Ser. No. 49,178
Int. Cl.[4] A61K *31/70;* **C07H** *19/167*
U.S. Cl. 514—46 **11 Claims**

1. A compound of the formula

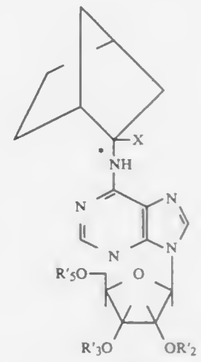
VII



wherein the stereoisomeric form is 1R-endo or 1S-endo, and R'_2, R'_3 and R'_5 are each independently H, lower alkanoyl, benzoyl, benzoyl substituted by lower alkyl, lower alkoxy, halogen or trifluoromethyl, or when R'_2 and R'_3 are taken together are lower alkylidene, or a pharmaceutically acceptable acid addition salt thereof.

7. A method for treating hypertension in a human suffering therefrom which comprises administering the compound of formula X

X



a mixture or an individual diastereomer thereof; in which NH— is endo and R'_2, R'_3 and R'_5 are each independently H, lower alkyl, lower alkoxy, halogen or trifluoromethyl, or when R'_2 and R'_3 are taken together are lower alkylidene, or a pharmaceutically acceptable addition salt thereof in a unit dosage form.

4,837,208

TREATMENT OF HUMAN VIRAL INFECTIONS

Janet L. Rideout, Raleigh; David W. Barry, Chapel Hill; Sandra N. Lehrman, Durham; Martha H. St. Clair, Durham, and Phillip A. Furman, Durham, all of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 776,899, Sep. 17, 1985, Pat. No. 4,724,423. This application Oct. 20, 1987, Ser. No. 110,377

Claims priority, application United Kingdom, Mar. 16, 1985, 8506869; May 9, 1985, 8511774

The portion of the term of this patent subsequent to Feb. 9, 2005, has been disclaimed.

Int. Cl.[4] A61K *31/70, 9/00, 9/22*

U.S. Cl. 514—50 **3 Claims**

1. A method of treating a human having antibodies to the HTLV III virus which comprises administering to said human an effective HTLV III treatment amount of 3'-azido-3'-deoxythymidine.

4,837,209

S-CYCLOALKYLMETHYL TRITHIOPHOSPHONATE INSECTICIDES

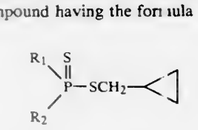
Charles G. Chavdarian, Martinez, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 6, 1987, Ser. No. 69,996

Int. Cl.[4] A01N *57/04;* **C07F** *9/32*

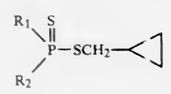
U.S. Cl. 514—141 **7 Claims**

1. A method for inhibiting or controlling insects comprising applying to an insect, the locus of an insect, or a locus at which insecticidal control is desired, an insecticidally effective amount of a compound having the formula



in which R_1 is methyl or ethyl and R_2 is C_1–C_6 alkyl.

4. A compound having the formula



in which R_1 is methyl or ethyl and R_2 is C_1–C_6 alkyl.

4,837,210

FLUORAN DERIVATIVES AND THEIR USE IN RECORDING MATERIALS

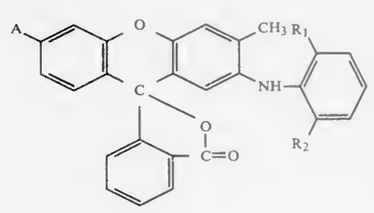
Patricia Dwyer-Hallquist, Oshkosh; William J. Becker, Appleton; Robert E. Miller, Appleton, and Kenneth D. Glanz, Appleton, all of Wis., assignors to Appleton Papers Inc., Appleton, Wis.

Filed Jan. 27, 1987, Ser. No. 7,252

Int. Cl.[4] C07D *265/30, 405/14, 311/88*

U.S. Cl. 544—150 **8 Claims**

1. A fluoran compound of the formula



wherein

R_1 and R_2, each independently of the other, are lower alkyl;

A is

or a pyrrolidinyl, piperidino, morpholino or piperazino radical; and

R_3 and R_4, each independently of the other, are a C_1–C_{12} alkyl, cycloalkyl, phenyl or phenyl substituted by a lower alkyl or a lower alkoxy.

4,837,211

SPIRONOLACTONE COMPOSITION

James L. Olsen, Chapel Hill, N.C., assignor to Carolina Medical Products, Inc., Chapel Hill, N.C.

Filed Apr. 6, 1987, Ser. No. 34,768

Int. Cl.[4] A61K *31/585, 31/34, 31/335*

U.S. Cl. 514—175 **18 Claims**

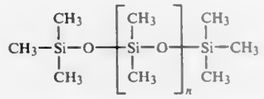
1. A pharmaceutical spironolactone composition devoid of chelating agents, which composition is of improved aqueous dispersability and has low amounts of foam, providing a spironolactone liquid dosage form for oral administration having utility as a diuretic or aldosterone antagonist, said composition comprising:

(a) spironolactone; and

(b) an aqueous homogenizingly effective amount of a mixture of:

methylcellulose, and

a dimethylpolysiloxane polymer, said dimethylpolysiloxane polymer having the formula:



wherein n is from about 200 to about 350;

wherein spironolactone is the only active ingredient, wherein constituents (a) and (b) are not combined with one another in controlled release multiple units, and wherein said constituents are devoid of an erodable coating.

4,837,212

TREATMENT OF HEMOLYTIC ANEMIA WITH DANAZOL

William J. Harrington; Yeon S. Ahn, and Ravindra Mylvaganam, all of Miami, Fla., assignors to University of Miami, Coral Gables, Fla.

Continuation of Ser. No. 671,786, Nov. 15, 1984, abandoned. This application Dec. 1, 1986, Ser. No. 936,957

Int. Cl.[4] A61K *31/58*

U.S. Cl. 514—176 **2 Claims**

1. A method of treating autoimmune hemolytic anemia which comprises administering to a person in need of such treatment, an effective amount of danazol.

4,837,213

PHARMACEUTICAL VEHICLE FOR ACTIVE SUBSTANCES IN THE FORM OF AN ANHYDROUS GEL

Daniele Caron, Valbonne, and Braham Shroot, Antibes, both of France, assignors to Centre Internatinal de Recherches Dermatologiques C.I.R.D., Valbonne, France

Continuation of Ser. No. 778,066, Sep. 20, 1985, abandoned. This application Nov. 2, 1987, Ser. No. 117,413

Claims priority, application France, Sep. 21, 1984, 84 14512

Int. Cl.[4] A61K *31/56, 31/695*

U.S. Cl. 514—179 **9 Claims**

1. A pharmaceutical vehicle comprising an anhydrous gel consisting of:

0.5% to 2% by weight of paraffin oil;

50±2.5% by weight of an alkyl ester of a fatty acid having 12 to 18 carbon atoms, the alkyl radical being straight or branched and having 2 or 3 carbon atoms; and

49±2.5% by weight of a polyvinyldimethyl siloxane-type elastomeric silicone combined with a silica binder,

said vehicle being of a sufficient viscosity to prevent it from dripping when applied to skin.

4,837,214

SUPPOSITORY AND BASE THEREOF

Yukitaka Tanaka; Minoru Nakamura, both of Ibaraki; Johshin Okada, and Kenji Mansho, both of Utsunomiya, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Sep. 19, 1986, Ser. No. 909,664

Claims priority, application Japan, Sep. 30, 1985, 60-217527

Int. Cl.[4] A61K *31/56*

U.S. Cl. 514—179 **9 Claims**

1. A suppository base which comprises 80 to 99 percent by weight of a fat composition, said fat composition having a hydroxyl value of 20 or lower and containing glycerides of fatty acids having 12 to 18 carbon atoms, and 1 to 20 percent by weight of diglycerides of fatty acids having 14 to 22 carbon atoms, with the proviso that said diglycerides do not contain a lauric acid moiety.

4,837,215

PENEM DERIVATIVES

Ettore Perrone; Marco Alpegiani; Angelo Bedeschi, all of Milan; Franco Zarini, Settimo Milanese; Giovanni Franceschi, Milan, and Costantino D. Bruna, Rho, all of Italy, assignors to Farmitalia Carlo Erba, Milan, Italy

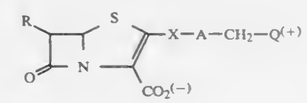
Filed Apr. 8, 1986, Ser. No. 849,388

Claims priority, application United Kingdom, Apr. 10, 1985, 8509181

Int. Cl.[4] C07D *499/00;* **A61R** *31/425*

U.S. Cl. 514—192 **35 Claims**

1. A compound of formula I:



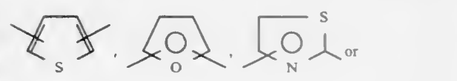
(I)

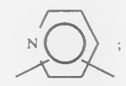
wherein:

X is a sulphur atom or an oxygen atom;

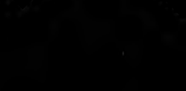
R is a hydrogen atom or a C_1–C_4 alkyl group which is unsubstituted or substituted by at least one substitute selected from the group consisting of a free hydroxy group, protected hydroxy groups and halogen atoms;

A is a Z, Z—Z—CO— or —Z—CO— residue, wherein Z is (a) a substituted or unsubstituted phenylene or naphthylene group, (b)





(c) an aralkylene radical of the formula

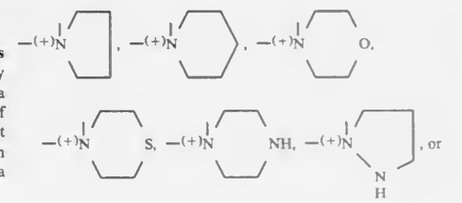


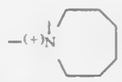
wherein

n is 1, 2 or 3; and

$Q^{(+)}$ is a $^{+}NR_1R_2R_3$ group, wherein

(i) R_1, R_2 and R_3 are each independently a substituted or unsubstituted C_{1-4}alkyl, C_{7-11} aralkyl, phenyl or naphthyl; or (ii) R_1 is as defined above under (i) and R_2 and R_3 taken together with the nitrogen atom to which they are both bound represent a substituted or unsubstituted heterocyclic ammonium radical of the formula





or (iii) R_1, R_2, and R_3 taken together with the nitrogen atom to which they are all bound, represent a substituted or unsubstituted azoniabicyclo or azoniatricyclo radical; or (iv) R_1, R_2 and R_3, taken together with the nitrogen atom to which they are all bound, represent a substituted pyridinium, pyrazinium, pyrazolium, or pyridazinium radical; or an unsubstituted pyridinium, pyrazinium pyrazolium, pyridinium, pyrazinium, pyrazolium, and

wherein the substituents for said alkyl, aralkyl, phenyl, naphthyl, azoniabicyclo, azoniatricyclo, pyridinium, pyrazinium, pyrazolium, pyridazinium, cycloalkylene, alkylene, phenylene, naphthylene and heterocyclediyl radicals are selected from the group consisting of: (a) halogen atoms; (b) hydroxy; (c) C_1-C_4 alkoxies; (d) C_1-C_4 alkylthios; (e) groups $-NR_4R_5$ where each of R_4 and R_5 is, independently, hydrogen or a C_1-C_4 alkyl; (f) sulfos; (g) $-CO_2R_4$ where R_4 is as defined above; (h) —C≡N; (i) dimethyl-formimidino; (j) groups —CO—NR_4R_5 where R_4 and R_5 are as defined above; (k) carbamoyloxies; (l) hydroxyiminomethyl (HO—N=CH—) or methoxyiminomethyl (CH_3O—N=CH—) groups; (m) formamido and acetoamido groups; (n) formyloxy and acetoxy groups; (o) C_1-C_4 alkanoyl groups; (p) phenyl or naphthyl groups; (q) nitro groups; (r) mesyloxy groups; (s) oxo groups; and (t) C_1-C_4 alkyl groups and C_1-C_4 alkyl groups substituted by a substituite chosen from (a) to (s) above.

4,837,216

AGENTS AGAINST PROTOZOA IN INSECTS

Heinz Mehlhorn, Neuss-Üdesheim, and Günter Schmahl, Bochum, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

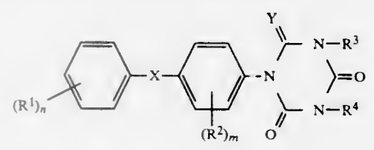
Filed Jan. 27, 1988, Ser. No. 148,814

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1987, 3703105

Int. Cl.[4] A01N 47/66

U.S. Cl. 514—241 **5 Claims**

1. A method of combating protozoa in insects which comprises applying to said infested insects an amount effective therefor of a triazinetrione of the formula



(1)

in which

X is O or S,

Y is O or S,

R^1 and R^2 each independently is a radical selected from the group consisting of halogen, nitro, CN, amino, C_{1-4}-alkyl, C_{1-4}-halogenoalkyl, C_{1-4}-alkoxy, methylenedioxy, C_{1-4}-halogenoalkoxy, C_{1-4}-alkylthio, C_{1-4}-halogenoalkylthio, C_{1-4}-alkylsulphonyl, C_{1-4}-alkylsulphinyl, C_{1-4}-halogenoalkylsulphonyl, C_{1-4}-halogenoalkylsulphinyl, C_{1-4}-acyl, carboxy, carbonylamino, carbonyl-C_{1-4}-alkoxy, carbamoyl and sulphamoyl,

n and m each independently is an integer from 0 to 3, and

R^3 and R^4 each independently is hydrogen or C_{1-4}-alkyl.

4,837,217

PYRIDAZINONE DERIVATIVES, PREPARATION THEREOF, AND INSECTICIDAL, ACARICIDAL, NEMATICIDAL, FUNGICIDAL COMPOSITIONS

Tomoyuki Ogura; Yasuo Kawamura; Masatoshi Baba, all of Funabashi, Japan; Shigeru Ishii, East Lansing, Mich.; Kiminori Hirata, Shiraoka, Japan; Masaki Kudo, Shiraoka, Japan; Yoshinori Ochiai, Shiraoka, Japan, and Masayoshi Hirose, Tokyo, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

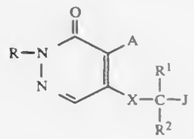
Filed Apr. 11, 1986, Ser. No. 850,533

Claims priority, application Japan, Apr. 19, 1985, 60-82297; Mar. 7, 1986, 61-50859

Int. Cl.[4] C07D 401/12, 403/12, 405/12, 409/12

U.S. Cl. 514—252 **4 Claims**

1. A 3(2H)-pyridazinone of the formula:



wherein

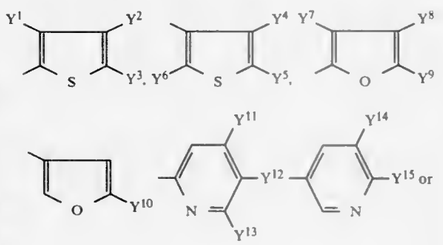
R represents an alkyl having 2 to 4 carbon atoms,

A represents an alkyl having 1 to 6 carbon atoms or a halogen atom,

X represents oxygen atom or sulfur atom,

R^1 and R^2 independently of one another represent hydrogen atomor an alkyl having 1 to 3 carbon atoms,

J respresents a radical of the formula:



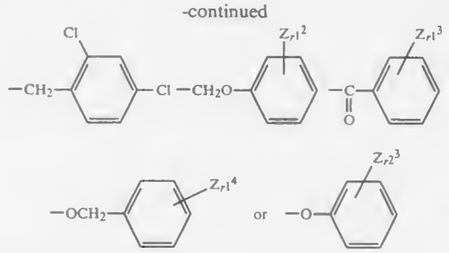
wherein

Y^1 represents a hydrogen atom, a chlorine atom or a bromine atom,

Y^2 represents a hydrogen atom, a halogen atom or an alkoxy having 1 to 4 carbon atoms,

Y^3 represents a hydrogen atom, a halogen atom, an alkyl having 1 to 6 carbon atoms, an alkoxy having 1 to 4 carbon atoms, a cyclohexyl, a haloalkylthio having 1 to 3 carbon atoms, a cyano, a nitro, a cyclohexyloxy, or a radical of the formula:

-continued



wherein

Z^1 represents a halogen atom,

Z^2 represents an alkyl having a 1 to 3 carbon atoms,

Z^3 represents a halogen atom or a haloalkyl having 1 to 3 carbon atoms

Z^4 represents a halogen atom or an alkyl having 1 to 3 carbon atoms,

r^1 is 1,

r^2 is 1 or 2, when r^2 is 2, Z^3s are different,

Y^4 represents a hydrogen atom, a chlorine atom or a bromine atom,

Y^5 represents a hydrogen atom, a halogen atom, an alkyl having 1 to 6 carbon atoms, an alkoxy having a 1 to 4 carbon atoms, an alkoxycarbonyl having 1 to 4 carbon atoms, an alkylthio having a 1 to 4 carbon atoms, or a radical of the formula:

wherein

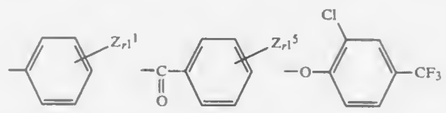
r^3 is 0 or 1,

Y^6 represents a hydrogen atom, a cholorine atom, a bromine atom or a cyclohexyl,

Y^7 represents a hydrogen atom, an alkoxy having 1 to 3 carbon atoms or an alkyl having 1 to 4 carbon atoms,

Y^8 represents a hydrogen atom, a chlorine atom, a bromine atom or an alkyl having 1 to 4 carbon atoms,

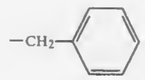
Y^9 represents a hydrogen atom, a halogen atom, an alkyl having 1 to 6 carbon atoms, a haloalkyl having 1 to 3 carbon atoms, a nitro, or a radical of the formula:



wherein

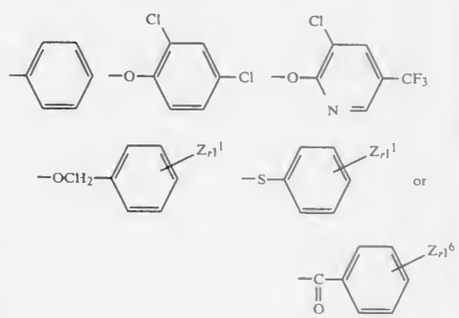
Z^5 represents a haloalkyl having 1 to 3 carbon atoms,

Y^{10} represents an alkyl having 1 to 4 carbon atoms or a radical of the formula:



Y^{11} represents a hydrogen atom, an alkyl having 1 to 4 carbon atoms or dimethylamino,

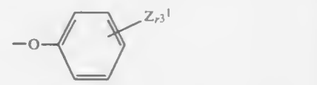
Y^{12} represents a hydrogen atom, a halogen atom, an alkoxy having 1 to 3 carbon atoms, an alkyl having 1 to 6 carbon atoms, a haloalkyl having 1 to 3 carbon atoms, trimethylsilyl, an alkenyloxy having 3 to 4 carbon atoms, a haloalkoxy having 1 to 4 carbon atoms, or a radical of the formula:



wherein

Z^6 represents a halogen atom or trifluoromethyl,

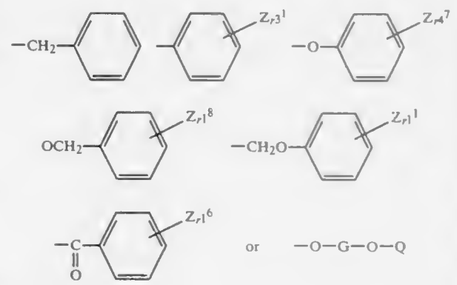
Y^{13} represents a hydrogen atom, an alkyl having 1 to 4 carbon atoms or a radical of the formula:



wherein

Y^{14} represents a hydrogen atom, a halogen atom, or an alkoxycarbonyl having 1 to 4 carbon atoms,

Y^{15} represents a hydrogen atom, a halogen atom, an alkyl having 1 to 6 carbon atoms, an alkoxy having 1 to 6 carbon atoms, a cycloalkyl having 3 to 6 carbon atoms, a cycloalkyloxy having 3 to 6 carbon atoms, a haloalkyl having 1 to 3 carbon atoms, a haloalkyloxy having 1 to 6 carbon atoms, an alkenyloxy having 3 to 4 carbon atoms, an alkylthio having 1 to 4 carbon atoms, an alkoxycarbonyl having 1 to 4 carbon atoms, or a radical of the formula:



wherein

Z^7 represents a halogen atom, trifluoromethyl, or an alkoxy having 1 to 3 carbon atoms,

Z^8 represents a halogen atom, an alkyl having 1 to 3 carbon atoms or cyclohexyl,

r^4 is 1 or 2, when r^4 is 2, Z^7s are different from each other,

G represents a straight or branched chain alkylene having 2 to 3 carbon atoms,

Q represents am alkyl having 1 to 4 carbon atoms, and Y^{16} represents a hydrogen atom.

4. Insecticidal, acaricidal, nematicidal and fungicidal compositions for agricultural and horticultural uses, and expellent compositions for ticks parasitic on animals, which comprise an effective amount of the compound of claim 1; together with a suitable carrier and a diluent.

4,837,218

ALKYLATED BICYCLOALKANEAMINES FOR TREATMENT OF NEUROTOXIC INJURY

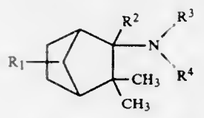
John W. Olney, Ladue, Mo., assignor to Washington University, St. Louis, Mo.

Filed Oct. 23, 1987, Ser. No. 112,850

Int. Cl.⁴ A61K *31/13, 31/135*

U.S. Cl. 514—646 **8 Claims**

1. A method to inhibit neuronal degeneration in mammals induced by anoxia, hypoxia or ischemia which method comprises treating a susceptible mammal with a therapeutically-effective amount of a compound of the formula



wherein R_1 is one or more groups independently selected from hydrido, alkyl, amino, alkoxy, hydroxyl and oxo; wherein R_2 is selected from hydrido, alkyl, alkoxy and hydroxyl; and wherein each of R_3 and R_4 is independently selected hydrido, alkyl, acyl, aldehyde, hydroxyalkyl, haloalkyl, hydroxycarbonylalkyl, alkylaminoalkyl, aminoalkyl, alkenyl, bicycloalkyliminoalkyl, phenylalkyl, phenyloxyalkylcarbonylalkyl, amino, aminocarbonylamino, guanido, aminocarbonyl, alkylcarbonyl, alkylaminocarbonyl, N-alkoxy-N-alkylamido, alkynylcarbonyl, alkyliminooxocarbonyl, carboxyalkylaminocarbonylaminoalkylcarbonyl, cycloalkylcarbonyl, phenylalkylcarbonyl, phenylalkyliminooxycarbonyl, alkylcarbonylaminoalkylcarbonyl, alkylcarbonylaminoalkylcarbonyl, aminophenylcarbonyl, alkylaminoalkylcarbonyl, haloalkylcarbonyl, bicycloalkylamidoalkylcarbonyl, tricycloalkyliminooxycarbonyl and cycloalkyliminooxycarbonyl; wherein any of one of the aforementioned R_3 and R_4 groups having one or more substitutable positions may be substituted with one or more groups selected from aldehyde, alkyl, alkoxy, acyl, hydroxyl, amino, nitro, halo, carboxyl, haloalkyl, haloalkylcarbonyl and phenyl; or a pharmaceutically-acceptable salt thereof.

4,837,219

MEDICATION FOR ALZHEIMER'S DISEASE

Jeffrey Hutterer, 67-35 Harrow St., Forest Hills, N.Y. 11375

Filed Nov. 5, 1987, Ser. No. 116,916

Int. Cl.⁴ A61K *31/195, 3 /415*

U.S. Cl. 514—400 **1 Claim**

1. A method of preparing and administering a medication for the treatment of Alzheimer's disease which comprises:

(a) adding 300 milligrams of Choline (from Choline Bitartrate), 100 milligrams of L-Tyrosine, 100 milligrams of L-Phenylalanine, 50 milligrams of L-Leucine, 15 milligrams of Zinc (from Zinc Gluconate) and 2 milligrams Copper (from Copper Gluconate) to an eight ounce glass of any fruit juice for patatibility;

(b) allowing the mixture to stand for two hours, in order for the tablets and powders to dissolve and for some predigestion to occur;

(c) stirring the formula in a blender just prior to ingestion for optimum homogenization;

(d) giving half a cup of the formula in the morning following breakfast to a person with Alzheimer's disease to drink; and

(e) giving the other half a cup of the formula after dinner to the person with Alzheimer's disease to drink.

4,837,220

INSECTICIDAL 3-SUBSTITUTED 4-FLUOROPHENYL-1-(FLUOROALKOXYPHENYLCARBAMOYL)-PYRAZOLINES

Harribert Neh; Ulrich Bühmann; Hartmut Joppien, and David Giles, all of Berlin, Fed. Rep. of Germany, assignors to Schering Akt., Fed. Rep. of Germany

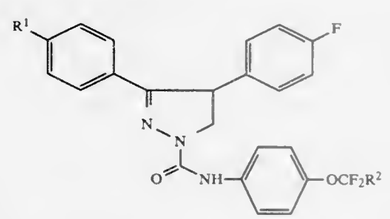
Filed Nov. 10, 1987, Ser. No. 119,191

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1986, 3638631

Int. Cl.⁴ A61K *31/345;* **C07D** *231/06*

U.S. Cl. 514—403 **15 Claims**

1. Pyrazolines of formula I



(I)

wherein

R^1 and R^2 are the same or different and are hydrogen or fluorine.

6. An insecticidal or acaricidal composition which comprises a compound claimed in claim 1, in admixture with an agriculturally acceptable diluent or carrier.

4,837,221

METHODS OF TREATING TUMORS SUSCEPTIBLE TO NECROSIS

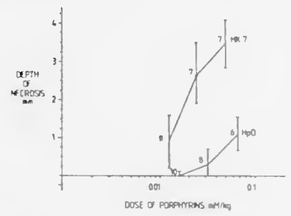
Raymond Bonnett, and Morris C. Berenbaum, both of London, United Kingdom, assignors to Efamol Ltd., Surrey, England

Continuation of Ser. No. 800,967, Nov. 22, 1985, abandoned. This application Mar. 26, 1987, Ser. No. 31,172

Claims priority, application United Kingdom, Nov. 26, 1984, 8429845

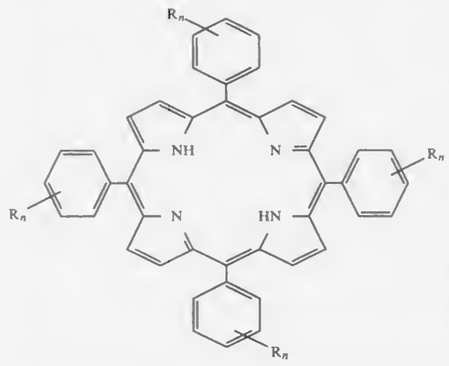
Int. Cl.⁴ A61K *31/40*

U.S. Cl. 514—410 **2 Claims**



1. A method of treating tumors in man susceptible to necrosis by a porphyrin comprising:

(a) administering to a person suffering from said tumor a pharmacologically acceptable and effective amount, within the range of 0.01 to 100 mg/kg body weight, of said porphyrin of the formula:



where n=1 to 3 and each substituent R, which may be the same or different and at the same or different position in its respective substituent phenyl ring, is hydroxy, amino or sulphydryl, in a suitable pharmaceutical diluent or carrier, to locate in the tumor, followed by

(b) illuminating the tumor with light of a wavelength in the range of 600–700 nm which is absorbed by the porphyrin.

4,837,222

XENOCOUMACINS

Richard P. Gregson, Narraweena, and Bernard V. McInerney, Concord, both of Australia, assignors to Biotechnology Australia Pty. Ltd., New South Wales, Australia

PCT No. PCT/AU85/00215, § 371 Date Apr. 28, 1986, § 102(e) Date Apr. 28, 1986, PCT Pub. No. WO86/01509, PCT Pub. Date Mar. 13, 1986

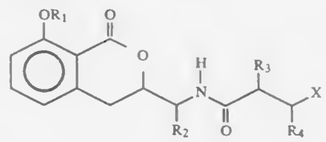
Continuation-in-part of Ser. No. 819,894, Jan. 16, 1986, Pat. No. 4,672,130, which is a continuation of Ser. No. 623,989, Jun. 25, 1984, abandoned. This PCT application Sep. 5, 1985, Ser. No. 862,217

Claims priority, application Australia, Sep. 5, 1984, PG6956; Feb. 25, 1985, PG9434

Int. Cl.⁴ A61K *31/37, 31/395;* **C07D** *207/09, 311/78*

U.S. Cl. 514—422 **26 Claims**

1. A compound of the formula



wherein:

(a) R_1 is hydrogen, straight or branched chain alkyl or alkanoyl;

(b) R_2 is straight or branched chain alkyl of at least two carbon atoms, unsubstituted or substituted by one or more substituents selected form the group consisting of hydroxy, alkanoyl, alkanoyloxy, and halogen;

(c) R_3 and R_4 are hydrogen, hydroxy, alkoxy, or alkanoyloxy and

(d) X is:

(i) a pyrrolidinyl ring; or

(ii)

wherein

R_5 is hydrogen, hydroxy, alkoxy, or alkanoyloxy, and

A is $-(CH_2)_m-B$, wherein

m is 0, 1, 2, or 3 and

B is guanidino or guanidino substituted by alkanoyloxy, and pharmaceutically acceptable salts thereof.

14. A method for treating infectious disease in a mammal, comprising administering to said mammal the compositon of matter as defined by claim 1 in a dosage effective for treating said infectious disease.

21. A method for treating ulcers in a mammal, comprising administering to said mammal the composition of matter as defined by claim 1, in a dosage effective for treating said ulcers.

4,837,223

(S)-ALPHA-ETHYL-2-OXO-1-PYRROLIDINEACETAMIDE COMPOSITIONS

Jean Gobert, Brussels; Jean-Pierre Geerts, Leglise, and Guy Dodson, Bellefontaine, all of Belgium, assignors to UCB Societe Anonyme, Brussels, Belgium

Division of Ser. No. 733,790, May 14, 1985, Pat. No. 4,696,943. This application Mar. 12, 1987, Ser. No. 25,277

Claims priority, application United Kingdom, May 15, 1984, 84/12357

The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.

Int. Cl.⁴ C07D *207/277;* **A61K** *31/40*

U.S. Cl. 514—424 **2 Claims**

1. A pharmaceutical composition comprising a therapeutically effective amount of (S)-alpha-ethyl-2-oxo-1-pyrrolidineacetamide and a pharmaceutically acceptable solid or liquid diluent or carrier therefor, said composition being substantially free of (R)-alpha-ethyl-2-oxo-1-pyrrolidineacetamide.

2. (S)-alpha-ethyl-2-oxo-1-pyrrolidineacetamide substantially free of (R)-alpha-ethyl-2-oxo-1-pyrrolidineacetamide, prepared by the process which comprises cyclizing, in an inert solvent and in the presence of a basic substance, an (S)-2-amino-butanamide of the formula

$$X-CH_2CH_2-Y-NHCH(C_2H_5)CONH_2$$

in which

X represents ZOOC— or $HalCH_2$—, wherein Z is alkyl of 1 to 4 carbon atoms and Hal a halogen atom, and

Y represents $-CH_2-$ or —CO—,

with the proviso that Y is $-CH_2-$ when X represents ZOOC—, and Y is —CO— when X represents $HalCH_2$—.

4,837,224

(R)-ALPHA-ETHYL-2-OXO-1-PYRROLIDINEACETAMIDE COMPOSITIONS

Jean Gobert; Corneliu Giurgea, both of Brussels; Jean-Pierre Geerts, Leglise, and Guy Bodson, Bellefontaine, all of Belgium, assignors to UCB Societe Anonyme, Brussels, Belgium

Divisioo of Ser. No. 733,791, May 14, 1985, Pat. No. 4,696,942. This application Mar. 12, 1987, Ser. No. 25,278

Claims priority, application United Kingdom, May 15, 1984, 84/12358

The portion of the term of this patent subsequent to Jun. 6, 2006, has been disclaimed.

Int. Cl.⁴ C07D *207/277;* **A61K** *31/40*

U.S. Cl. 514—424 **2 Claims**

1. A pharmaceutical composition comprising a therapeutically effective amount of (R)-alpha-ethyl-2-oxo-1-pyrrolidineacetamide and a pharmaceutically acceptable solid or

liquid diluent or carrier therefor, said composition being substantially free of (S)-alpha-ethyl-2-oxo-1 pyrrolidineacetamide.

2. (R)-alpha-ethyl-2-oxo-1-pyrrolidineacetamide substantially free of (S)-alpha-ethyl-2-oxo-1 pyrrolidineacetamide, prepared by a process which comprises cyclizing, in an inert solvent and in the presence of a basic substance, an (R)-2-amino-butanamide of the formula

$$X—CH_2CH_2—Y—NHCH(C_2H_5)CONH_2$$

in which

X represents ZOOC— or $HalCH_2$— wherein Z is alkyl of 1 to 4 carbon atoms and Hal a halogen atom, and

Y represents $—CH_2—$ or —CO—,

with the proviso that Y is $—CH_2—$ when X represents ZOOC—, and Y is —CO— when X represents $HalCH_2$—.

4,837,225

2,5-DIMETHYLPYRROLE DERIVATIVES, THEIR PREPARATION AND THEIR USE

Gerhard Zoller, Schöneck; Rudi Beyerle, Frankfurt am Main; Ursula Schindler, Mörfelden-Walldorf; Rolf-Eberhard Nitz, Frankfurt am Main, and Piero Martorana, Bad Homburg, all of Fed. Rep. of Germany, assignors to Cassell Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

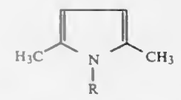
Filed Jul. 17, 1986, Ser. No. 888,050

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1985, 3527791

Int. Cl.[4] C07D *207/239;* A61K *31/40*

U.S. Cl. 514—427 4 Claims

1. 2,5-Dimethylpyrrole of the formula I



in which R denotes alkyl having 1 to 3 C atoms, which is substituted by acylamino of the formula —NH—CX—R^1; X represents an oxygen or sulphur atom, and R^1 is a radical selected from the group consisting of hydrogen; alkyl which has 1 to 5 C atoms; alkyl which has 1 to 5 C atoms and is substituted by $-NH_2$, monoalkylamino having 1 to 4 C atoms, dialkylamino having a total of 2 to 6 C atoms, alkoxy having 1 to 4 C atoms, phenoxy, or by phenoxy which in turn carries up to three substituents in the nucleus, namely an amino group, monoalkylamino having 1 to 4 C atoms, dialkylamino having a total of 2 to 6 C atoms, alkanoylamino having 1 to 6 C atoms, alkyl having 1 to 4 C atoms, alkoxy having 1 to 4 C atoms, fluorine, chlorine, bromine, hydroxyl, nitro, cyano, carboxyl or alkoxycarbonyl having 1 to 4 C atoms in the alkoxy group, as an optional second substituent of the nucleus one of the alkyl or alkoxy groups defined above or one of the above mentioned halogens and, as optional third substituent, one of the alkyl or alkoxy groups above; phenyl, phenyl which is substituted like the phenoxy radical mentioned above and their pharmacologically acceptable acid addition salts.

3. A pharmaceutical formulation which exhibits encephalotropic and psychotropic effects when administered to a host having a disorder of brain function, having as active compound from about 0.5 to 90% by weight of a compound of claim **1**, together with a pharmaceutically-acceptable vehicle and, optionally, a pharmaceutically-acceptable additive.

4,837,226

POLYCYCLIC AMINE DERIVATIVES USEFUL AS CEREBROVASCULAR AGENTS

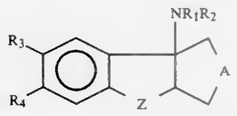
Linda L. Coughenour, and Graham Johnson, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Apr. 27, 1988, Ser. No. 186,834

Int. Cl.[4] C07D *333/76;* **A61K** *31/38*

U.S. Cl. 514—443 **11 Claims**

1. A method for treating cerebrovascular disorders which comprises administering to a patient a therapeutically effective amount of a compound of the formula



I

or a pharmaceutically acceptable acid addition salt thereof wherein:

Z is methylene, oxygen, or sulfur;

R_1 is hydrogen, lower alkyl, or lower alkoxyalkyl;

R_2 is hydrogen or lower alkyl;

R_3 and R_4 are each independently hydrogen or when taken together are methylenedioxy;

A is $—CH_2CH_2—$, —CH=CH— or when Z is methylene A is $—CMe=CMe—$, $—CHMeCHMe—$, $—CHMeCH_2—$, $—CMe=CH—$, $—CH_2CH_2—$, or —CH=CH—.

4,837,227

AMINOALKYLTHIODIBENZOXEPINS AND PHARMACEUTICAL USE

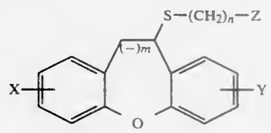
Helen H. Ong, Whippany; Vernon B. Anderson, High Bridge, both of N.J., and James A. Profitt, Goshen, Ind., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Continuation of Ser. No. 330,257, Dec. 14, 1981, abandoned, which is a continuation-in-part of Ser. No. 226,045, Jan. 19, 1981, abandoned, which is a continuation of Ser. No. 29,462, Apr. 12, 1979, abandoned, which is a continuation-in-part of Ser. No. 860,083, Dec. 13, 1977, abandoned. This application May 28, 1985, Ser. No. 738,507

Int. Cl.[4] A61K *31/335;* **C07D** *313/14*

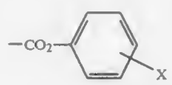
U.S. Cl. 514—450 **52 Claims**

1. A compound of the formula

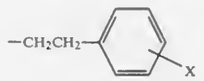


wherein X and Y are the same or different and each can be hydrogen, halogen, trifluoromethyl, loweralkoxy, loweralkyl, loweralkylthio, loweralkylsulfonyl, loweralkylsulfinyl, amino, or nitro; Z is

R^1 is hydrogen, straight or branched chain loweralkyl, cyano, cycloalkylloweralkyl wherein the cycloalkyl ring contains from 3 to 6 carbon atoms, phenoxycarbonyl of the formula



where X is defined as above, alkoxycarbonyl, loweralkenyl or loweralkynyl; R^2 is straight or branched chain loweralkyl or cycloalkylloweralkyl wherein the cycloalkyl ring contains from 3 to 6 carbon atoms, phenylethyl of the formula



wherein X is defined as above, loweralkenyl or loweralkynyl; m is the integer 1; and n is an integer from 2 to 4; and physiologically tolerable acid addition salts thereof.

45. A method of treating depression which comprises administering to a patient a pharmaceutically effective amount of a compound defined in claim 1.

46. A method of treating pain which comprises administering to a patient a pharmaceutically effective amount of a compound defined in claim 1.

47. A method of treating convulsions which comprises administering to a patient a pharmaceutically effective amount of a compound defined in claim 1.

4,837,228

ANTIINFLAMMATORY AND ANTIMICROBIAL COMPOUNDS AND COMPOSITIONS

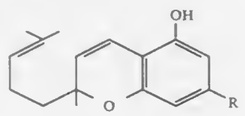
Mahmoud Elsohly, Oxford, Miss.; Carlton E. Turner, Alexandria, Va.; James C. Murphy, Oxford, Miss., and Phillip W. Wirth, Garland, Tex., assignors to The University of Mississippi, University, Miss.

Continuation-in-part of Ser. No. 136,554, Apr. 2, 1980, abandoned, which is a division of Ser. No. 44,350, May 31, 1979, Pat. No. 4,315,862. This application Aug. 2, 1982, Ser. No. 404,412

Int. Cl.[4] A61K *31/35*

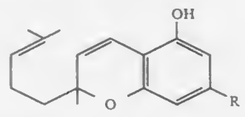
U.S. Cl. 514—456 **14 Claims**

1. A method of reducing inflammation in mammals comprising administering to said mammals a composition consisting essentially of a compound of the formula



wherein R is hydrogen, C_1–C_{10}-alkyl, or C_2–C_{10}-alkenyl in a therapeutically effective amount and a non-toxic, pharmaceutically acceptable carrier.

2. A method for inducing hypothermia in mammals comprising administering to said mammals a composition consisting essentially of a compound of the formula



where R is hydrogen, C_1–C_{10}-alkyl, or C_2–C_{10}-alkenyl in a therapeutically effective amount of a non-toxic, pharmaceutically acceptable carrier.

4,837,229

5-AMINOSALICYLIC ACID-O-SULFATES OF PHYSIOLOGICALLY ACCEPTABLE BASES, PROCESS FOR THE PREPARATION THEREOF AND DRUGS CONTAINING SAME

Hartmut Rokos; Heinz Konczak, both of Berlin, and Wolfgang Forth, Munich, all of Fed. Rep. of Germany, assignors to Henning Berlin GmbH Chemie- und Pharmawerk, Fed. Rep. of Germany

Continuation of Ser. No. 47,518, May 6, 1987, abandoned, which is a continuation of Ser. No. 875,521, Jun. 19, 1986, abandoned, which is a continuation of Ser. No. 625,620, Jun. 28, 1984, abandoned. This application Jul. 25, 1988, Ser. No. 224,238

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1983, 3323702

Int. Cl.[4] A61K *31/38;* **C07C** *71/00*

U.S. Cl. 514—517 **16 Claims**

1. A pharmacologically acceptable salt of 5-aminosalicylic acid O-sulfate.

4,837,230

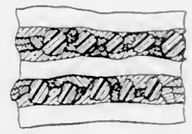
STRUCTURAL CERAMIC MATERIALS HAVING REFRACTORY INTERFACE LAYERS

Shih-Huei Chen, San Leandro, and H. O. Davis, Alameda, both of Calif., assignors to Kaiser Aerotech, San Leandro, Calif.

Continuation-in-part of Ser. No. 46,956, May 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 878,454, Jun. 25, 1986, abandoned. This application Jul. 21, 1988, Ser. No. 223,727

Int. Cl.[4] C04B *35/56, 35/76*

U.S. Cl. 501—88 **57 Claims**



21. A ceramic composite article comprising a reinforcement fabric, a plurality of ceramic matrix layers formed over the reinforcement fabric, and a refractory interface layer between at least some of the successive pairs of ceramic matrix layers.

4,837,231

SINTERED NON-OXIDE CERAMIC COMPOSITE

Hidehiro Endo; Kei Tanemoto, and Hiroshi Kubo, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 30, 1987, Ser. No. 44,298

Claims priority, application Japan, May 1, 1986, 61-101614

Int. Cl.[4] C04B *35/56*

U.S. Cl. 501—91 **9 Claims**

1. A sintered non-oxide ceramic composite having a high density, high-temperature strength of at least 650 MPa of from room temperature to 1,500° C. and a toughness of greater than 5 MPam $\frac{1}{2}$ and capable of having widely changeable electrical conductivity, which is produced by compacting and sintering a mixed powder which comprises 30–70% by weight of titanium carbide, 0.1–5% by weight of boron or boron compound on the basis of the weight of silicon carbide and, in terms of boron, 0.1–5% by weight of carbon or an organic carbon compound on the basis of the weight of silicon carbide, and in terms of residual carbon and the balance being substantially silicon carbide.

4,837,232

DENSE SKIN CERAMIC STRUCTURE AND METHOD OF MAKING THE SAME

Stanley J. Luszcz, Hockessin, Del., and Harry R. Zwicker, Elkton, Md., assignors to Lanxide Technology Company, LP, Newark, Del.

Filed Sep. 16, 1986, Ser. No. 908,117
Int. Cl.[4] C04B 35/10
U.S. Cl. 501—127 **21 Claims**

1. A method for producing a self-supporting ceramic structure comprising a polycrystalline material comprised of a first region and a terminal region integral with said first region but differing therefrom in at least one property selected from the group consisting of composition and microstructure, the method comprising the steps of:

(a) heating a parent metal to a temperature range above its melting point but below the melting point of the oxidation reaction product to form a body of molten parent metal; and

(b) within said temperature range,

(i) reacting said body of molten parent metal with an oxidant to form said oxidation reaction product,

(ii) initially maintaining at least a portion of said oxidation reaction product in contact with and between said body of molten parent metal and said oxidant to progressively transport molten parent metal from said body of molten parent metal through the oxidation reaction product and towards the oxidant, so that oxidation reaction product continues to form at the interface between the oxidant and previously formed oxidation reaction product, thereby forming a progressively thicker first region of oxidation reaction product initially containing interconnected parent metal;

(c) attenuating said transport of molten parent metal from said body of molten parent metal, and

(d) after step (c) resuming a reaction between at least a portion of said interconnected parent metal from said first region of oxidation reaction product toward a surface of said first region to form oxidation reaction product on said surface and continuing said resumed reaction for a time sufficient to form a terminal region of oxidation reaction product.

4,837,233

CATALYST SYSTEM FOR AMMOXIDATION OF PARAFFINS

Linda C. Glaeser, Cleveland Heights; James F. Brazdil, Jr., Mayfield Village, and Mark A. Toft, Lakewood, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 887,478, Jul. 21, 1986, Pat. No. 4,788,173, which is a continuation-in-part of Ser. No. 811,842, Dec. 20, 1985, abandoned. This application May 15, 1987, Ser. No. 50,268
The portion of the term of this patent subsequent to Nov. 29, 2005, has been disclaimed.
Int. Cl.[4] B01J 23/10, 23/28, 23/18, 27/198
U.S. Cl. 502—204 **7 Claims**

1. A catalytic mixture suitable for the ammoxidation of propane to acrylonitrile, which comprises an intimate particulate mixture of a first catalyst composition and a second catalyst composition, said first catalyst composition being 10–99 weight percent of a diluent/support and 90–1 weight percent of a catalyst having the components in the proportions indicated by the empirical formula:

$$VSb_mA_aH_bC_cT_fO_x, \qquad \text{formula (1)}$$

where

A is two or more of W, Sn, Mo, B, P and Ge and includes at least 0.2 atoms of W and at least 0.4 atoms of P;

H is one or more of Fe, Co, Ni, Cr, Pb, Mn, Zn, Se, Te, Ga, In and As;

C is one or more of an alkali metal and Tl;

T is one or more of Ca, Sr and Ba; and

where m is from 0.01 and up to 20; a is 0.6–10; b is 0–20; c is 0–1; t is 0–20; the ratio (a+b+c+t):(1+m) is 0.01–6; wherein x is determined by the oxidation state of the other elements, and wherein the antimony has an average valency higher than +3 and the vanadium has an average valency lower than +5, wherein said diluent/support contains 20–100 weight percent alumina and is selected from silica-alumina and alumina,

said second catalyst composition being 0–99 weight percent of a diluent/support and 100–1 weight percent of a catalyst having the components in the proportions indicated by the empirical formula:

$$Bi_nCe_pD_dE_eF_fMo_{12}W_gO_y \qquad \text{formula (2)}$$

where

D is one or more of Fe, Mn, Pb, Co, Ni, Cu, Sn, P, Cr, Y, Mg, Ca, Sr, Ba and rare earths other than Ce and Sm

E is one or more of Sb, As, Se, Te, and V

F is one or more of an alkali metal, Tl, Ag and Sm and where n is 0.01–24, p is 0.01–24, (n+p) is 0.1–24, d is 0–10, e is 0–10, f is 0–6, g is 0–8, y is determined by the oxidation state of the other elements, wherein the weight ratio in said mixture of said first catalyst composition to said second catalyst composition is in the range of 0.001 to 2.5.

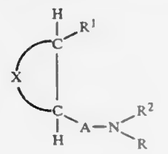
4,837,234

PROSTAGLANDINS

Robert L. Jones, and Norman H. Wilson, both of Edinburgh, Scotland, assignors to National Research Development Corporation, London, England

Division of Ser. No. 531,899, Aug. 23, 1983, Pat. No. 4,628,061. This application Jul. 22, 1986, Ser. No. 869,735
Claims priority, application United Kingdom, Dec. 23, 1981, 8138715; PCT Int'l Appl., Dec. 10, 1982, PCT/GB82/00348
Int. Cl.[4] C07D 177/00; A61K 31/557
U.S. Cl. 514—469 **36 Claims**

1. A compound of formula (I)

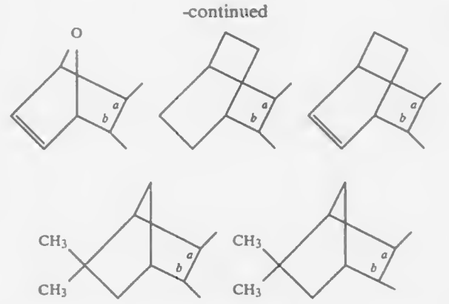


(I)

wherein

represents one of the cyclic groups shown below:

-continued



the letters a and b indicating in each case the points of attachment of the substituents R^1 and A—NR^2R, respectively; R^1 is a 6-carboxyhex-2-enyl group, or a modification thereof in which the group is altered by one, or an appropriate combination of two or more, of the following: (a) alteration of the position of the double bond from the 2,3-position to the 3,4-position, (b) reduction of the double bond, (c) replacement of a methylene group at position 2 or 3 by an oxygen or sulphur atom in conjunction with reduction of the double bond, (d) alteration of the chain length through a decrease or an increase of one or two methylene groups, and (e) formation of a derivative of the carboxy group in the form of a pharmaceutically acceptable salt, C_{1-10} alkyl ester or an amide containing a group —$CONH_2$ or such a group in which the nitrogen atom is substituted by one or two groups selected from C_{1-10} alkyl groups, phenyl and phenyl substituted by one or more substituents selected from C_{1-10} alkoxy, halogen, C_{1-10} halogen-substituted alkyl, sulfamyl, amino, hydroxyl, nitro and C_{1-10} alkyl groups, or by one group —SO_2R^6 in which R^6 is a C_{1-10} alkyl group; A is an aliphatic C_{1-10} hydrocarbon group with a chain length between the points of attachment to the divalent cyclic group and to the group NR^2R of 1 to 5 carbon atoms or such a group substituted by a group Ar, where Ar represents a phenyl, naphthyl, fluorenyl, dibenzocyclohexyl, dibenzocycloheptyl, pyridyl, benzthiazolyl, dihydrobenzthiazolyl, N-methyldihydrobenzthiazolyl, benzoxazolyl, dihydrobenzoxazolyl or N-methyldihydrobenzoxazolyl group or such a group substituted by one or more substituents selected from C_{1-10} alkoxy, halogen, C_{1-10} halogen-substituted alkyl, sulfamyl, amino, hydroxyl, nitro and C_{1-10} alkyl groups; and R^2 is hydrogen, a C_{1-10} aliphatic hydrocarbon group, a group Ar or a C_{1-10} aliphatic hydrocarbon group substituted by one or more groups Ar; and R is a group —$CO.NR^3R^4$, —$CS.NR^3R^4$, —$CNH.NR^3R^4CO.R^4$ or —$CS.R^4$ in which R^3 is hydrogen, A C_{1-10} aliphatic hydrocarbon group, a group AR or a C_{1-10} aliphatic hydrocarbon group, a group Ar or a C_{1-10} aliphatic hydrocarbon group substituted by one or more groups Ar, but with the proviso that both R^2 and R^3 may not be other than hydrogen, and R^4 is a C_{1-10} aliphatic hydrocarbon group, a group Ar or a C_{1-10} aliphatic hydrocarbon group substituted by one or more groups Ar and/or by a group OAr, SAr, OR^5 or SR^5 wherein R^5 is a C_{1-10} aliphatic hydrocarbon group substituted by one or more groups Ar.

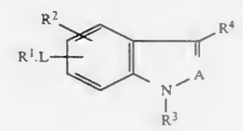
4,837,235

INDOLE AND INDAZOLE KETO SULPHONES AS LEUKOTRIENE ANTAGONISTS

Peter R. Bernstein, Wallingford, Pa.; Frederick J. Brown, Newark; Victor G. Matassa, Wilmington, both of Del., and Ying K. Yee, Kennett Square, Pa., assignors to ICI Americas Inc., Wilmington, Del.

Filed Oct. 16, 1986, Ser. No. 919,781
Claims priority, application United Kingdom, Oct. 17, 1985, 8525657; Apr. 15, 1986, 8609177
Int. Cl.[4] A61K 31/535; C07D 231/56
U.S. Cl. 514—234.5 **17 Claims**

1. A compound of formula I



I

wherein

=A— is a group of formula =C(Ra)— or =N— in which Ra is hydrogen or (1–4C)alkyl;

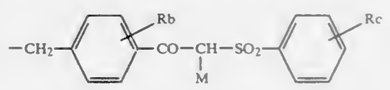
the group $R^1.L$— is an amidic radical of formula $R^1.W.CO.NH$—, $R^1.W.CS.NH$— or $R^1.NH.CO$—, in which

R^1 is selected from a group consisting of (a) (2–10C)alkyl which may contain 1 more fluorine substituents; (b) penyl-(1–6c)alkyl in which the (1–6C)alkyl moiety may bear a fluoro or (1–4C)alkoxy substituent and in which the phenyl moiety may bear a substituent selected from a group consisting of halogeno, (1–4C)alkyl, (1–4C)alkoxy and trifluoromethyl; and (c) (3–8C)cycloalkyl or (3–8C-)cycloalkyl-(1–6C)alkyl, the cyclic moiety of any of which may contain one unsaturated linkage and may bear 1 or 2 (1–4C)alkyl substituents, and

W is oxy, thio, imino or a direct link to R^1;

R^2 is hydrogen, halogen, (1–4C)alkyl or (1–4C)alkoxy;

one of R^3 and R^4 is a radical of formula II:



II

wherein

Rb is hydrogen, (1–4C)alkyl or (1–4C)alkoxy;

Rc is hydrogen, (1–4C)alkyl, (1–4C)alkoxy, trifluoromethyl or halogeno; and

M is a hydrogen, cyano, (1–4C)alkoxycarbonyl, carbamoyl, N-phenylcarbamoyl in which the phenyl may bear a substituent selected from a group consisting of (1–4C)alkyl, halogeno and (1–4C)alkoxy, N-(1–4C)alkylcarbamoyl, N,N-di[(1–4C)alkyl]carbamoyl or (1–6C)alkanoyl;

and the other of R^3 and R^4 is hydrogen, halogeno (provided that R^3 may not be halogeno), (3–8C)cycloalkyl, (3–8C-)cycloalkyl-(1–4C)alkyl, or (1–10C)alkyl which may contain one or two double or triple bonds, said (1–10C)alkyl additionally may bear a substituent P selected from a group consisting of cyano, carboxy, 1H-tetrazol-5-yl, (1–4C)alkoxy, (1–4C)alkoxycarbonyl, carbamoyl of formula CONRdRe, ureido of formula NRfCONRdRe, carbamoyloxy of formula (OCONRdRe, a carbamate of formula NRfCOORg, acylamino of formula NRfCORg, acyloxy of formula OCORg, and a group of formula $S(O)_nRg$ in which for Rd, Re and Rf (1) Rd is selected from a group consisting of hydrogen, (1–6C)alkyl, and phenyl, the phenyl moiety of which may bear 1 or 2 substituents selected from a group consisting of halogeno, (1–4C)alkyl, (1–4C)alkoxy and trifluoromethyl; and Re and Rf are independently chosen from a group consisting

of hydrogen and (1-6C)alkyl; or (2) Rd and Re together with the adjacent nitrogen form a pyrrole, pyrrolidine, piperidine, morpholine, piperazine or N-(1-6C)alkylpiperazine ring; and Rf is hydrogen or (1-6C)alkyl;

Rg is selected from a group consisting of (1-4C)alkyl and phenyl, the phenyl moiety of which may bear 1 or 2 substituents selected from a group consisting of halogeno, (1-4C)alkyl, (1-4C)alkoxy and trifluoromethyl; and

n is the integer 0, 1 or 2;

or a pharmaceutically acceptable salt thereof.

16. A method of antagonizing at least one of the actions of at least one type of leukotriene in a mammal comprising administering to the mammal a leukotriene antagonizing amount of a compound of claim 1.

4,837,236

FUNGICIDAL MORPHOLINE COMPOUNDS, AND THEIR PRODUCTION AND USE

Naoto Meki, Toyonaka, and Hirotaka Takano, Nishinomiya, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

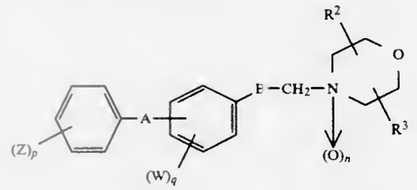
Filed Sep. 24, 1987, Ser. No. 100,461

Claims priority, application Japan, Sep. 24, 1986, 61-225529; Dec. 26, 1986, 61-314251; Feb. 12, 1987, 62-30260; Mar. 13, 1987, 62-59166

Int. Cl.[4] A01N *43/84;* **C07D** *295/06, 295/08*

U.S. Cl. 514—233.8 **9 Claims**

1. A compound of the formula:



wherein

A is oxygen or sulfur;

B is $—CH_2—CHR^1—$ or $—CH=CR^1—$ wherein R^1 is H or CH_3;

W is, the same or different, hydrogen, halogen, a lower alkyl group or a lower alkoxy group;

R^2 is hydrogen, a lower alkyl group, a lower alkoxy group, a lower alkoxy(lower)alkyl group, a hydroxyl group or a hydroxy(lower)alkyl group;

R^3 is hydrogen or a lower alkyl group;

n is an integer of 0 or 1;

Z is, the same or different, hydrogen, halogen, a lower alkyl group, a lower alkoxy group, a halo(lower)alkyl group, a halo(lower)alkoxy group, a nitro group, a methylenedioxy group or a cyano group;

p is an integer of 0 to 5; and

q is an integer of 0 or 1, or its salt.

4,837,237

THERAPY USING GLUCOSIDASE PROCESSING INHIBITORS

Larry R. Rohrschneider, Mercer Island, Wash., and Everett J. Nichols, 1501 - 1st Ave. N., #3A, Seattle, Wash. 98109, assignors to Fred Hutchinson Cancer Research Center and Everett J. Nichols, both of Seattle, Wash.

Filed Jul. 9, 1985, Ser. No. 753,686

Int. Cl.[4] A61K *31/70;* **C01N** *33/48*

U.S. Cl. 514—62 **13 Claims**

1. A method of regulating oncogene medicated cell transformation in a host, comprising the step of administering to a host comprising cells tranformed by an oncogene having a glycosylated expression product an amount of processing glucosidase inhibitor effective to revert the transformed cells to a normal phenotype.

4,837,238

PHARMACOLOGICALLY USEFUL PYRAZOLOPYRIDINES

Roger E. Markwell, Great Dunmow; Ian Hughes, Sawbridgeworth, and Robert W. Ward, Old Harlow, all of England, assignors to Beecham Group p.l.c., Brentford, England

Continuation of Ser. No. 831,166, Feb. 20, 1986, abandoned. This application Oct. 21, 1987, Ser. No. 112,050

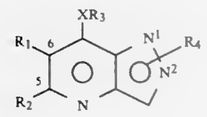
Claims priority, application United Kingdom, Feb. 22, 1985, 8504682; Oct. 1, 1985, 8524117

The portion of the term of this patent subsequent to Dec. 17, 2002, has been disclaimed.

Int. Cl.[4] C07D *471/04, 471/14;* **A61K** *31/44*

U.S. Cl. 514—212 **9 Claims**

1. A compound of the formula (I):



(I)

wherein:

X is NR wherein R is hydrogen or C_{1-6} alkyl; oxygen; sulphur; SO; or SO_2; or R and R_3 taken together are C_{4-6} polymethylene;

R_1 is hydrogen or C_{1-6} alkyl; and R_2 is CN, CR_5R_6Y where R_5 and R_6 are independently selected from hydrogen and C_{1-4} alkyl and Y is selected from hydrogen, OR_7, SR_7, where R_7, is hydrogen, C_{1-4} alkyl, or C_{2-4} alkanoyl, and NR_8R_9 where R_8 and R_9 are independently hydrogen, C_{1-4} alkyl, C_{2-4} alkenyl or C_{2-4} alkanoyl or R_8 and R_9 together are C_{4-6} polymethylene, or R_2 is COR_{10} where R_{10} is C_{1-4} alkyl, or

R_2 is hydrogen, C_{1-6} alkyl or phenyl optionally substituted by halogen, CF_3, C_{1-4} alkoxy or C_{1-4} alkyl; and R_1 is CN, CR_5R_6Y or COR_{10} as defined for R_2 above, provided that one of R_1 and R_2 is not hydrogen when the other is C_{1-6} alkyl, or R_1 and R_2 are not both C_{1-6} alkyl; or

R_1 and R_2 together form C_3–C_6 polymethylene optionally substituted by C_1–C_4 alkyl;

R_3 is C_{1-10} alkyl or C_{3-10} cycloalkyl, either optionally substituted by hydroxy, C_{1-4} alkoxy, thiol, C_{1-4} alkylthio or $NR_{11}R_{12}$ wherein R_{11} and R_{12} are independently hydrogen, C_{1-6} alkyl or C_{2-7} alkanoyl or together are C_{3-6} polymethylene; C_{2-10} alkenyl; or phenyl optionally substituted by one or two of halogen; CF_3, C_{1-4} alkoxy, C_{1-4} alkyl, hydroxy, nitro, cyano, C_{2-10}, acyloxy, $NR_{13}R_{14}$ wherein R_{13} and R_{14} are independently selected from hydrogen, C_{1-6} alkyl, C_{2-7} alkanoyl or C_{1-6} alkylsulphonyl or COR_{15} wherein R_{15} is hydroxy, C_{1-6} alkoxy or NR_6R_{17} wherein R_{16} and R_{17} are independently selected from hydrogen or C_{1-6} alkyl; or together with R is C_{4-6} polymethylene; and

R_4 is hydrogen; or C_{1-4} alkyl or benzyl optionally substituted in the phenyl ring by one or two of halogen, CF_3, C_{1-4} alkoxy or C_{1-4} alkyl and is attached at nitrogen atom 1 or 2.

4,837,239

CARDIOTONIC PHOSPHODIESTERASE INHIBITORS COMPLEXED WITH WATER SOLUBLE VITAMINS

Eric J. Benjamin, Dublin, Ohio, and Gary C. Visor, Half Moon Bay, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 768,549, Aug. 23, 1985, abandoned. This application Oct. 14, 1986, Ser. No. 918,449

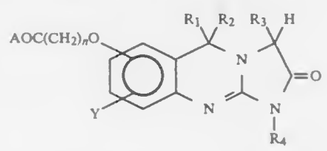
Int. Cl.[4] A61K *31/505, 31/51, 31/525;* **C07D** *487/04*

U.S. Cl. 514—267 **24 Claims**

1. A lyophilized complex of:

a water-soluble vitamin selected from the group consisting of ascorbic acid, pyridoxine, thiamine, nicotinamide, or a pharmaceutically acceptable salt thereof; and

a cardiotonic phosphodiesterase inhibitor of the formula



(I)

an optical isomer thereof, or a pharmaceutically acceptable salt thereof wherein:

n is an integer of 1 to 6;

R_1 is hydrogen or alkyl of 1 to 4 carbons;

R_2 is hydrogen or R_1 and R_2 are combined to form an oxo group;

R_3 is hydrogen, alkyl of 1 to 6 carbons, phenyl, benzyl, hydroxy lower alkyl or an aliphatic acylate thereof of 1 to 6 carbon atoms or an aryl acylate thereof of 7 to 12 carbon atoms, carbamoyl alkyl, carboxyalkyl, alkoxycarbonylalkyl or an α-amino acid side chain;

R_4 is hydrogen, alkyl of 1 to 6 carbons, benzyl, or hydroxy lower alkyl;

Y is hydrogen, alkyl of 1 to 4 carbon atoms, halo or lower alkoxy;

A is NR_5R_6 wherein R_5 and R_6 are independently selected from the group consisting of: hydrogen; alkyl of 1 to 6 carbon atoms; hydroxyalkyl of 1 to 6 carbon atoms or an aliphatic acylate thereof of 1 to 6 carbon atoms or an aryl acylate thereof of 7 to 12 carbon atoms; cycloalkyl of 3 to 8 carbon atoms or cycloalkyl lower alkyl of 4 to 12 carbon atoms wherein the cycloalkyl ring is unsubstituted or substituted with a lower alkyl, lower alkoxy, —OH, —O-COR_7, halo, $—NH_2$, $—N(R_7)_2$, $—NHCOR_7$, —COOH, or $—COO(R_7)$ group wherein R_7 is lower alkyl; phenyl or phenyl lower alkyl wherein phenyl is unsubstituted or substituted with at least one lower alkyl, halo or lower alkoxy group or an $—NH_2$, $—N(R_7)_2$, $—NHCOR_7$, —COOH, or $—COOR_7$ group wherein R_7 is lower alkyl; or wherein R_5 and R_6 are combined to form a compound selected from the group consisting of: morpholinyl; piperidinyl; perhexylenyl; N-loweralkylpiperazinyl; pyrolidinyl; tetrahydroquinolinyl; tetrahydroisoquinolinyl; (±)-decahydroquinolinyl and indolinyl.

9. An injectable formulation comprising the complex of claim 1.

4,837,240

AMINOALKYL SECOCANTHINE DERIVATIVES AND THEIR USE

Dietrich Thielke; Dagmar Höltje, both of Gronau, Fed. Rep. of Germany, and Guy Nadler, Saint Gregoire, France, assignors to Beecham-Wuelfing GmbH & Co. KG, France

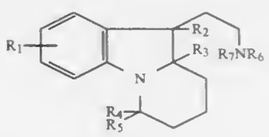
Filed Jun. 30, 1987, Ser. No. 68,625

Claims priority, application United Kingdom, Jul. 1, 1986, 8616031; United Kingdom, Dec. 22, 1986, 8630634

Int. Cl.[4] A61K *31/395;* **C07D** *471/02*

U.S. Cl. 514—294 **9 Claims**

1. A compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein:

R_1 is hydrogen, C_{1-6} alkyl, C_{1-6} alkoxy or halogen;

R_2 and R_3 are both hydrogen or together represent a bond;

R_4 is hydrogen and R_5 is hydrogen or R_4 and R_5 together represent an oxo group;

R_6 is phenyl, phenyl C_{1-7} alkyl or phenyl C_{1-7} alkanoyl, in which the phenyl moiety is substituted by NR_8R_9 wherein R_8 is C_{1-6} alkyl substituted by a group R_{10} selected from hydroxy, halo, CF_3 or COR_{11} where R_{11} is hydroxy, C_{1-4} alkoxy or amino optionally substituted by one or two C_{1-4} alkyl groups, and R_9 is hydrogen, C_{1-6} alkyl or R_8; and

R_7 is hydrogen or C_{1-4} alkyl.

9. A pharmaceutical composition comprising a compound according to claim 1 and a pharmaceutically acceptable carrier.

4,837,241

LIPOPHILLICALLY-SUBSTITUTED PIPERIDINE OXADIAZOLYL COMPOUNDS AND THEIR USE IN STIMULATING COGNITIVE FUNCTIONS

Leif H. Jensen, Copenhagen; Per Sauerberg, Valby; Frank Wätjen, Vaerlose, and Jens W. Kindtler, Kokkedal, all of Denmark, assignors to A/S Ferrosan, Soberg, Denmark

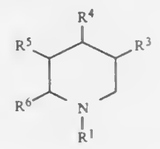
Filed Aug. 26, 1987, Ser. No. 89,747

Claims priority, application Denmark, Sep. 8, 1986, 4269/86; Dec. 12, 1986, 5971/86

Int. Cl.[4] C07D *413/04;* **A61K** *31/44*

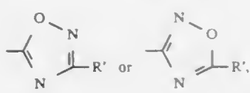
U.S. Cl. 514—340 **9 Claims**

1. Piperidine compound selected from those having the formula I

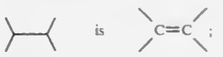


I

wherein one of R^3, R^4, and R^5 is



and the others independently are H or C_{1-6}-alkyl, and wherein R' is C_{3-8}-alkyl or cyclopropyl; and R^1 and R^6 independently are H or C_{1-6}-alkyl



and a salt thereof with a pharmaceutically-acceptable acid.

4,837,242

THIAZOLES AND PYRAZOLES AS FUNGICIDES

Tadashi Ohsumi; Kazunori Tsushima; Sumio Nishida; Kiyoto Maeda, all of Hyogo; Tadashi Ooishi, Saitama, and Noritada Matsuo, Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

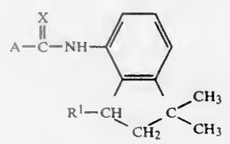
Filed Dec. 30, 1987, Ser. No. 139,607

Claims priority, application Japan, Jan. 20, 1987, 62-11666; Jan. 20, 1987, 62-11667; Feb. 10, 1987, 62-28574

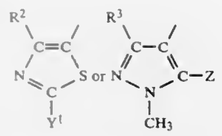
Int. Cl.[4] A01N *43/78*; C07D *277/04*, *231/10*, *277/18*

U.S. Cl. 514—365 4 Claims

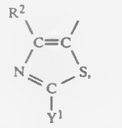
1. A heterocyclic derivative represented by the formula:



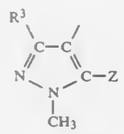
wherein R^1 represents a hydrogen atom or a methyl group, A represents



wherein R^2 represents a methyl group, an ethyl group or a trifluoromethyl group, Y^1 represents an amino group, a methyl group or a chlorine atom, R^3 represents a methyl group or a trifluoromethyl group and Z represents a hydrogen atom, a halogen atom or a methyl group and when A represents the formula:

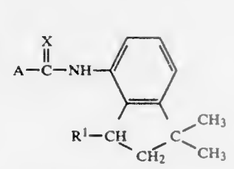


X represents an oxygen atom or a sulfur atom and when A represents the formula:

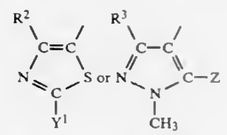


X represents a sulfur atom.

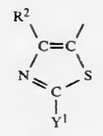
3. A method for controlling fungi which comprises applying to fungi a fungicidally effective amount of a heterocyclic compound of the formula:



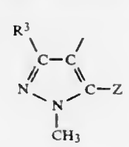
wherein R^1 represents a hydrogen atom or a methyl group, A represents



wherein R^2 represents a methyl group, an ethyl group or a trifluoromethyl group, Y^1 represents an amino group, a methyl group or a chlorine atom, R^3 represents a methyl group or a trifluoromethyl group and Z represents a hydrogen atom, a halogen atom or a methyl group and when A represents the formula:



X represents an oxygen atom or a sulfur atom and when A represents the formula:



X represents a sulfur atom.

4,837,243

FOAMABLE MOLDING COMPOSITIONS

Roger J. White, and Sivaram Krishnan, both of Pittsburgh, Pa., assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Nov. 15, 1988, Ser. No. 271,810

Int. Cl.[4] C08J *9/06*

U.S. Cl. 521—94 8 Claims

1. A thermoplastic molding composition comprising a thermoplastic polymeric resin selected from the group consisting of polycarbonate, polyalkylene terephthalate, aromatic polyester and polyester carbonate and a chemical blowing agent concentrate which includes a chemical blowing agent and a stabilizing amount of a modifying agent, said chemical blowing agent being characterized in that among its thermal decomposition products there is present a primary amine, said modifying agent being a mixture of (i) an anhydride polymer and (ii) a butadiene based rubber.

4,837,244

METHOD FOR THE PREPARATION OF POLYURETHANE FOAMS

Georg Burkhart, Essen; Volker Möring, Muelheim, and Dietmar Schaefer, Essen, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Jul. 11, 1988, Ser. No. 217,427

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724716

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—114 8 Claims

1. In a method for the preparation of rigid polyurethane and/or polyisocyanurate foams from a foaming mixture comprising (1) an at least difunctional polyisocyanates, (2) a compound with at least two hydrogen atoms capable of reacting with isocyanates, the equivalent weight of which per reactive hydrogen atom is about 50 to 900, (3) a catalyst, (4) a blowing agent and (5) a foam stabilizer, devoid of silicon atoms, the improvement which comprises that the foam stabilizer is a polyoxyalkylene ether of an alkylphenol-aldehyde condensation product,

the alkyl group(s) of the alkylphenol having 1 to 22 carbon atoms,

the aldehyde having 1 to 18 carbon atoms,

the condensation product comprising on the average 4 to 18 alkylphenol groups,

the oxyalkylene units having 2 to 4 carbon atoms and

the content of oxyalkylene groups being 15 to 85% by weight, based on the total weight.

4,837,245

PROCESS FOR THE PREPARATION OF NON-CELLULAR OR CELLULAR POLYURETHANE ELASTOMERS IN THE PRESENCE OF A POLYESTER POLYOL CONTAINING THEREIN TITANIUM AND/OR TIN COMPOUNDS AS CATALYSTS

Joachim Streu, Diepholz; Wolfgang Straehle, Heidelberg, and Gerhard Ramlow, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 4, 1987, Ser. No. 116,633

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1986, 3638488

Int. Cl.[4] C08G *18/08*, *18/22*; C08J *9/00*

U.S. Cl. 521—117 8 Claims

1. A process for the preparation of cellular or non-cellular polyurethane elastomer comprising reacting:

(a) an organic polyisocyanate with;

(b) a higher molecular weight compound having at least 2 reactive hydrogen atoms, in the presence of

(c) a polyester polyol containing a titanium compound, a tin compound or mixtures thereof as catalysts whereby the polyol is prepared through the polycondensation of an organic polycarboxylic acid with a multivalent alcohol in the presence of a titanium compound, a tin compound, or mixtures thereof as catalysts at temperatures from about 150° C. to 250° C.

4,837,246

HIGH MOLECULAR WEIGHT DISPERSANTS FOR POLYMER POLYOLS

Robert G. Gastinger, West Chester, Pa., and John E. Hayes, Wilmington, Del., assignors to ARCO Chemical Technology, Inc., Wilmington, Del.

Filed May 24, 1988, Ser. No. 197,938

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—137 45 Claims

1. A method for making stable, low viscosity polymer polyols comprising the steps of:

adding a charge to a reactor, where the charge comprises a high molecular weight polyol dispersant;

providing a feed stream to the reactor, where the feed stream comprises a relatively lower molecular weight polyol having a molecular weight equal to or less than 4000 relatively lower than that of the high molecular weight polyol dispersant, a monomer portion and an initiator suitable for polymerizing the monomer portion,

where the high molecular weight polyol dispersant is in the range of about 1 to 20% of the total.

4,837,247

STABLE POLYMER POLYOLS IN BASE POLYOLS WITH MOLECULAR WEIGHT GREATER THAN 4000 USING HIGH MOLECULAR WEIGHT DISPERSANTS

Robert G. Gastinger, West Chester, Pa., and John E. Hayes, Wilmington, Del., assignors to Arco Chemical Technology, Inc., Wilmington, Del.

Filed May 24, 1988, Ser. No. 197,933

Int. Cl.[4] C08G *18/14*

U.S. Cl. 521—137 48 Claims

1. A method for making stable, low viscosity polymer polyols comprising the steps of:

adding a charge to a reactor, where the charge comprises a high molecular weight polyol dispersant;

providing a feed stream to the reactor, where the feed stream comprises a base polyol having a molecular weight of greater than 4000, a monomer portion and an initiator suitable for polymerizing the monomer portion,

where the high molecular weight polyol dispersant is in the range of about 1 to 20% of the total of all polyols.

4,837,248

FLEXIBLE THERMOPLASTIC EPOXY RESIN AND COATINGS PREPARED THEREFROM

Michael B. Cavitt, Lake Jackson, and David J. Duncan, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 24,748, Mar. 11, 1987, Pat. No. 4,755,542. This application Apr. 18, 1988, Ser. No. 183,017

Int. Cl.[4] C08L *63/10*; C08F *283/10*

U.S. Cl. 523—172 27 Claims

1. A mixture comprising

(I) from about 70 to about 95 percent by weight based upon the combined weight of components (I) and (II) of a thermally stable, flexible thermoplastic epoxy resin resulting from

(A) reacting, in the presence of an effective quantity of a catalyst for effecting the reaction between a vicinal epoxide group and an aromatic hydroxyl group, a mixture comprising

(1) at least one aromatic based epoxy resin having an average of more than 1 but not more than about 2.1 vicinal epoxy groups per molecule;

(2) at least one aliphatic based epoxy resin having an average of more than 1 but not more than about 2.1 vicinal epoxy groups per molecule;

(3) at least one material having an average of more than 1 but not more than about 2 phenolic hydroxyl groups per molecule;

wherein components (1) and (2) are employed in quantities such that from about 90 to about 99.6 percent of the vicinal epoxy groups are contributed by the aromatic based epoxy resin and from about 10 to about 0.4 percent of the vicinal epoxy groups are contributed by the aliphatic based epoxy resin; and wherein component (3) is employed in quantities such that the resultant product has an epoxide equivalent weight of from about 1600 to about 2500, calculated on the basis that the aromatic groups contained therein are free of substituent groups even if they do in fact contain substituent groups;

(B) reacting, in the presence of an effective quantity of a catalyst for effecting the reaction between a vicinal epoxide group and a carboxyl group, the product resulting from (A) with

(4) at least one aromatic or aliphatic monocarboxylic

acid in a quantity which provides a ratio of moles of component (4) per epoxide group contained in component (1) of from about 0.033:1 to about 0.2:1;

(C) reacting, in the presence of an effective quantity of a catalyst for effecting the reaction between a vicinal epoxide group and a carboxyl group, the product resulting from (B) with

(5) a carboxyl terminated elastomer in an amount which provides a ratio of carboxyl groups per vicinal epoxy group contained in components (1) and (2) of from about 0.0028:1 to about 0.03:1;

with the proviso that the combined quantity of groups reactive with an epoxide group from components (3), (4), and (5) cannot exceed the combined quantity of epoxide groups contained in components (1) and (2); and

(II) from about 5 to about 30 percent by weight based upon the combined weight of components (1) and (II) of the product resulting from reacting, in the presence of an effective quantity of a catalyst for effecting the reaction between a vicinal epoxy group and a group selected from —OH, —SH, —COOH or —CO—O—CO— groups,

(6) at least one aromatic based epoxy resin having an average of more than 1 but not more than about 2.1 vicinal epoxy groups per molecule and an epoxide equivalent weight of not greater than about 225, calculated on the basis of the aromatic groups being free of substituent groups whether or not they do in fact contain substituent groups; and

(7) at least one material having only one group per molecule which is reactive with a vicinal epoxy group selected from —OH, —SH, —COOH or —CO—O—CO— groups; and wherein components (6) and (7) are employed in an amount which provides a ratio of groups reactive with a vicinal epoxy group to vicinal epoxy group of from about 0.9:1 to about 1.1:1.

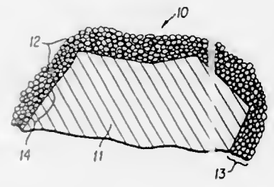
4,837,249

RAPID DISSOLVING POLYMER COMPOSITIONS AND USES THEREFOR

Dion P. O'Mara, Vienna, Va.; Albert F. Hasdermann, Ijamsville, Md., and Jerry C. Trippe, Fairfax Station, Va., assignors to General Technology Applicatinns, Inc., Manassas, Va.

Division of Ser. No. 807,947, Dec. 12, 1985, Pat. No. 4,720,397.
This application Nov. 16, 1987, Ser. No. 121,295
Int. Cl.[4] B05D *5/08*

U.S. Cl. 523—175 **10 Claims**



1. In a method wherein a high molecular weight polymer is mixed with and dissolved in liquid hydrocarbons to increase the rate of flow of the hydrocarbons moving through a conduit, the improvement comprising:

adding the polymer to said hydrocarbons as a particulate plymer composition, the particles of said polymer composition having a central core consisting of a high molecular weight thermoplastic polymer which imparts viscoelastic properties to a solution of said polymer in liquid hydrocarbons, said central core having clean surface and being surrounded by multi-layers of an adherent, particulate coating agent having a particle size much smaller than that of the central core and having the interstices between the coating agent particles and around the core filled with an inert gas, the amount of polymer dissolved in said hydrocarbons being sufficient to increase the flow rate of said hydrocarbons through said conduit.

4,837,250

TROWELABLE ABLATIVE COATING COMPOSITION AND METHOD OF USE

Stephen E. Headrick, Huntsville, and Roger L. Hill, Decatur, both of Ala., assignors to USBI Booster Production Company, Inc., Huntsville, Ala.

Division of Ser. No. 76,971, Jul. 23, 1987, Pat. No. 4,772,495.
This application Apr. 11, 1988, Ser. No. 183,268
Int. Cl.[4] C08K *7/26, 13/02*

U.S. Cl. 523—179 **2 Claims**

1. A trowelable ablative coating composition for protecting a substrate under high temperature, high velocity, erosive conditions, consisting essentially of:

about 67 weight percent to about 73 weight percent of a mixture of an epoxy resin consisting of an epichlorohydrin/bisphenol A reaction product and an amide curing agent, wherein the quantity by weight of the amide curing agent is equal to the quantity by weight of the epoxy resin multiplied by a factor between about 0.97 and about 1.03.

about 22 weight percent to about 28 weight percent hollow glass microspheres, and about 4.5 weight percent to about 5.5 weight

percent ground cork.

4,837,251

DIMENSIONALLY-STABLE LIGHTWEIGHT CORE FOR COMPOSITE STRUCTURES

David W. Okey, Rockford, Ill.; John S. Church, Wilmington, Del.; Hossein Saatchi, Rockford, and John F. Scanlon, Roscoe, both of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 8, 1988, Ser. No. 153,332
Int. Cl.[4] C08J *9/32*

U.S. Cl. 523—218 **5 Claims**

1. A composition for a pressure molded core of a composite structure, consisting essentially of:

a thermoplastic resin selected from the group consisting of polyetheretherketone, polyetherketone, poly arylene sulfide, poly arylene ketone, poly aryl sulfone, and poly aryl ether sulfone;

an inorganic fibrous material filler to reduce the coefficient of thermal expansion;

an inorganic hollow microsphere filler of high compressive strength; and

a blowing agent.

4,837,252

POLYMER-ASPHALT MIXING PROCESS

Frederick P. Seguin, Sarnia, Canada, and Michel Longuet, Strasbourg, France, assignors to Polysar Limited, Sarnia, Canada

Filed Dec. 14, 1987, Ser. No. 132,280
Int. Cl.[4] C08J *3/22, 23/04, 23/16, 95/00*

U.S. Cl. 523—351 **3 Claims**

1. A two stage process for preparing a polymer modified asphalt composition, said process consisting of:

(A) a first stage comprising forming a low asphalt masterbatch by (i) providing a composition comprising 100 parts by weight of ethylene-propylene elastomer, having from 45 to 75 mole per cent ethylene, 20 to 50 parts by weight of asphalt, 10 to 100 parts by weight of a thermoplastic polyolefin, 10 to 50 parts by weight napthenic oil and 8 to 20 parts by weight filler, (ii) mixing said composition in standard rubber mixing equipment at a temperature high enough to at least soften said thermoplastic polyolefin, and (iii) discharging said composition from said rubber mixer; and

(B) a second stage comprising adding said masterbatch to heated asphalt in an asphalt mixer, and mixing said masterbatch with said heated asphalt, wherein said polymer modified composition contains from 2 to 25 weight per cent of said masterbatch.

4,837,253

CORROSION INHIBITING PIGMENT

J. Douglas Mansell, Akron; Laurence E. Jones, Barberton; Harlan B. Johnson, Rittman; Thomas G. Krivak, Akron, all of Ohio, and Dennis W. Carson, Lower Burrell, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 15, 1987, Ser. No. 132,398
Int. Cl.[4] C08K *3/36*

U.S. Cl. 523—443 **24 Claims**

1. Amorphous precipitated silica having a surface area of from about 10 to about 50m^2/gram, an oil absorption of from about 40 to about 100 ml., a conductivity of less than 300 micromhos per centimeter, a pH of from about 7 to about 10.5, and a median agglomerate particle size of from about 3 to about 8 micrometers, said silica containing between about 6 and about 9 weight percent calcium (Ca0).

20. In a film-forming coating composition for a corrodible metal surface, which composition contains a volatile component including a resinous organic binder, a non-volatile component and a corrosion inhibiting amount of a corrosion inhibiting pigment, the improvement wherein the corrosion inhibiting pigment is calcium-containing amorphous precipitated silica, said silica having a surface area of from about 10 to about 50 m^2/gram, an oil absorption of from about 40 to about 100 ml, a conductivity of less than 300 microhmos per centimeter, a pH of from about 7 to about 10.5, and a median agglomerate particle size of from about 3 to about 8 micrometers, said silica containing between about 6 and about 9 weight percent calcium (as Ca0).

4,837,254

POLY(1,4-CYCLOHEXYLENE DIMETHYLENE TEREPHTHALATE) MOLDING COMPOSITIONS

Larry W. Branscome, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 2, 1988, Ser. No. 162,848
Int. Cl.[4] C08K *5/12, 5/05, 3/10, 3/08*

U.S. Cl. 523—455 **8 Claims**

1. A flame-retarded polyester molding composition having improved physical properties comprising

(a) a polyester having repeat units from terephthalic acid and 1,4-cyclohexane-dimethanol and having an I.V. of about 0.5–1.0, and

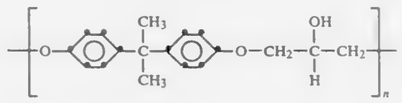
(b) an additive system comprising

(1) about 2–8%, based on the weight of the composition, of antimony oxide,

(2) about 0.5–5%, based on the weight of the composition, of powdered antimony metal having a particle size of less than 500 microns,

(3) about 5–20%, based on the weight of the composition, of an aromatic organic compound having at least one aromatic ring in which the compound has sufficient halogen bonded directly to the aromatic ring to provide flame retardant properties, and

(4) about 0.5–5% by weight of the composition of a phenoxy resin having the formula



wherein n is about 50 to 200.

4,837,255

PALATABLE HYPOCHOLESTEROLAEMIC GEL FORMULATION CONTAINING A PHARMACEUTICALLY ACCEPTABLE NON-DIGESTIBLE ANION EXCHANGE RESIN

Frederick J. Dechow, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 10, 1987, Ser. No. 24,224
Int. Cl.[4] A61K *37/02, 43/00*

U.S. Cl. 524—23 **9 Claims**

1. A hypocholesterolaemic gel formulation for oral administration comprising an effective hypocholesterolaemic amount of a uniform gelled dispersion of:

(a) between about 8 and about 20 percent by weight of a particulate, sparingly crosslinked non-digestible pharmaceutically acceptable quaternary ammonium substituted polystyrene anion exchange resin having an average particle size below about 100 microns;

(b) between about 4 and about 16 percent by weight of a water compatable pharmaceutically acceptable gelatin;

(c) between about 0.015 and about 10 percent by weight of a natural or synthetic pharmaceutically acceptable sweetener;

(d) between about 0.05 and about 2 percent by weight of a pharmaceutically acceptable organic acidulent;

(e) between about 0.05 and about 5% by weight of one or more pharmaceutically acceptable flavoring or coloring agents, or mixtures thereof; and

(f) the remainder water.

4,837,256

CROSSLINKABLE, CRYSTALLIZABLE POLYARYLETHERS AND COMPOSITES THEREFROM

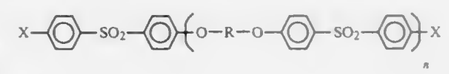
Hugh C. Gardner, Hillsborough; Ismael Colon, Piscataway, both of N.J., and Lloyd M. Robeson, Macungie, Pa., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 847,115, Apr. 3, 1986, abandoned, which is a continuation of Ser. No. 706,250, Feb. 28, 1985, abandoned, which is a continuation of Ser. No. 604,409, Apr. 30, 1984, abandoned, which is a continuation of Ser. No. 503,576, Jun. 16, 1983, abandoned. This application Sep. 15, 1987, Ser. No. 96,874
Int. Cl.[4] C08K *5/52, 5/41, 5/07;* **C08L** *81/06*

U.S. Cl. 524—141 **13 Claims**

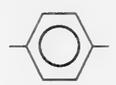
1. A crystallizable, crosslinkable resin mixture comprising:

(i) a polyarylether of the following formula:

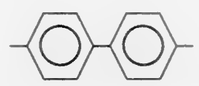


wherein

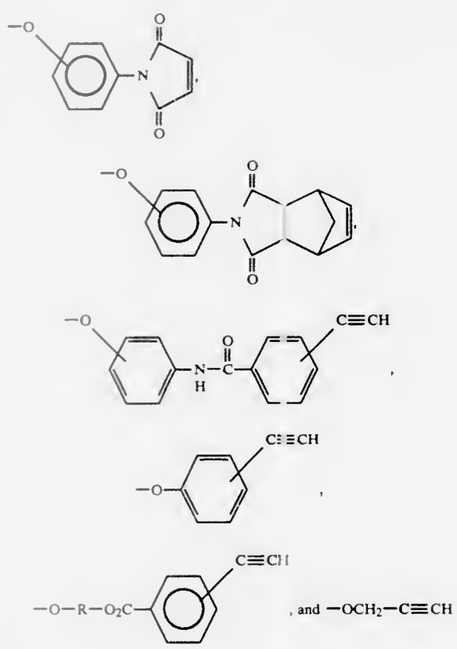
R is

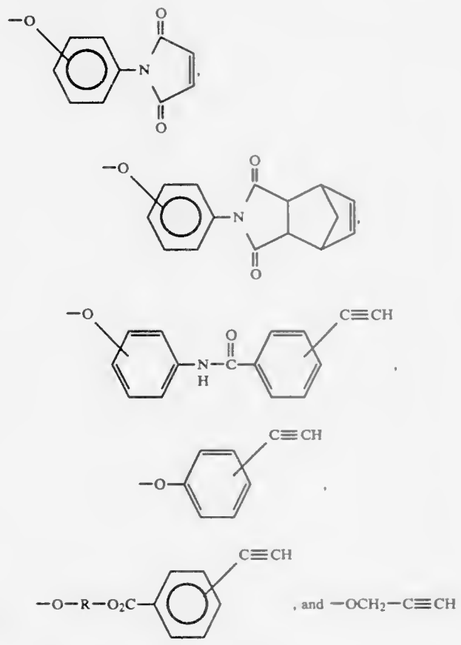


or



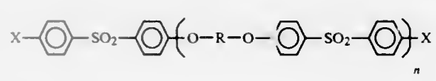
n is 4 to 100 and X is selected from



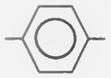


and, (ii) a crystallization promoting amount of a plasticizer having a boiling point of at least about 300° C. at about one atmosphere, a glass transition temperature of less than about 30° C., and solubility with the polyarylether selected from triarylphosphate esters, 4,4'-dichlorodiphenylsulfone, 4,4'-dichlorobenzophenone, or mixtures thereof in an amount of up to 50 percent by weight based upon the total weight of the mixture.

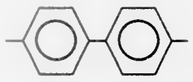
7. A crystallizable, crosslinkable resin mixture comprising: (i) a polyarylether of the following formula:



wherein
R is



or



n is 4 to 100 and X is selected from

and, (ii) a crystallization promoting amount of a plasticizer having a boiling point of at least about 300° C. at about one atmosphere, a glass transition temperature of less than about 30° C., and solubility with the polyarylether selected from triarylphosphate esters, or mixtures thereof in an amount of up to 50 percent by weight based upon the total weight of the mixture.

4,837,257

HOMOGENEOUS STORAGE-STABLE LIQUID BARIUM-CADMIUM-TRIPHOSPHITE STABILIZER SYSTEMS FOR POLYVINYL CHLORIDE RESINS

Alberto D. Aza, Flushing; Charles Keeley, Wantagh; Jay L. Rogers, Hicksville, and Stuart D. Brilliant, Levittown, all of N.Y., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Continuation of Ser. No. 128,246, Dec. 3, 1987, abandoned, which is a continuation of Ser. No. 25,894, Mar. 13, 1987, abandoned, which is a continuation of Ser. No. 918,173, Oct. 10, 1986, abandoned, which is a continuation of Ser. No. 804,554, Dec. 4, 1985, abandoned, which is a continuation of Ser. No. 748,523, Jun. 25, 1985, abandoned, which is a continuation of Ser. No. 660,818, Oct. 15, 1984, abandoned, which is a continuation of Ser. No. 481,112, Apr. 1, 1983, abandoned, which is a continuation of Ser. No. 396,529, Jul. 8, 1982, abandoned, which is a continuation of Ser. No. 184,452, Sep. 5, 1980, abandoned. This application Jul. 8, 1988, Ser. No. 216,912

Int. Cl.[4] C08K *5/52*

U.S. Cl. 524—151 **41 Claims**

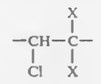
1. A homogeneous storage-stable liquid stabilizer system for polyvinyl chloride resins which is substantially solvent-free and has a low viscosity and a minimum flash point of 96° C., consisting essentially of:

(1) a liquid barium carbonate-alkyl phenate stabilizer;

(2) a cadmium salt of a carboxylic acid selected from the group consisting of branched chain aliphatic carboxylic acids having from about five to about thirteen carbon atoms, aromatic carboxylic acids having from about seven to about eleven carbon atoms, and unsaturated aliphatic carboxylic acids having from about twelve to about twenty-two carbon atoms; and

(3) a liquid organic triphosphite; the sum of the weight percent of barium and the weight percent of cadmium being at least 13%; and the ratio of the weight percent of cadmium to the weight percent of barium Cd:Ba being within the range from about 0.5:1 to about 1.5:1; the organic triphosphite being in an amount to form a homogeneous storage-stable liquid.

33. A polyvinyl chloride resin composition having improved resistance to deterioration when heated at 350° F., comprising a polyvinyl chloride resin formed at least in part of the recurring group:



and having a chlorine content in excess of 40%, where X is either hydrogen or chlorine; and an amount to enhance the resistance to deterioration of the resin of a stabilizer composition according to claim 1.

4,837,258

FIRE RETARDANT IMPACT MODIFIED CARBONATE POLYMER COMPOSITION

Michael K. Laughner, Lake Jackson, and Samuel A. Ogoe, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 46,364, May 6, 1987, Pat. No. 4,786,686. This application Aug. 4, 1988, Ser. No. 228,203

Int. Cl.[4] C08K *5/53, 5/42, 5/44*

U.S. Cl. 524—168 **10 Claims**

1. A flame retardant, impact resistant aromatic carbonate polymer composition comprising a mixture of: (a) one or more aromatic carbonate polymers, (b) an impact modifying quantity of a rubbery polymer selected from the group consisting of styrene/methyl methacrylate copolymer grafted onto homopolymers or interpolymers of butadiene, (c) from 0.01 to 10.0 percent by weight of the total composition of a fluorine containing polymer of the fibril forming type, (d) a metal salt of an aromatic sulfur containing compound; and (e) a monomeric, oligomeric or polymeric chlorine or bromine substituted organic compound, wherein (d) and (e) are present in an amount sufficient to enhance the flame retardant properties of the aromatic carbonate polymer.

4,837,259

POLYPROPYLENE STABILIZED AGAINST OXIDATIVE DEGRADATION WITH MIXTURES OF DIARYLAMINE DERIVATIVES AND STERICALLY HINDERED PHENOLS

Thomas M. Chucta, Naugatuck, Conn., assignor to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Continuation of Ser. No. 101,310, Sep. 25, 1987, abandoned. This application Sep. 16, 1988, Ser. No. 246,893

Int. Cl.[4] C08K *5/18*

U.S. Cl. 524—258 **4 Claims**

1. A polypropylene composition stabilized against oxidative degradation during mechanical processing comprising polypropylene as the sole high molecular weight polyolefin component, having incorporated therein a stabilizing amount of an antioxidant composition of:

(a) at least one aralkyl-substituted diarylamine selected from the group consisting of 4,4'-bis-(alpha,alpha-dimethylbenzyl)diphenylamine and 4,4'-bis-(alpha-methylbenzyl)diphenylamine;

(b) at least one 3,5 di-tertiarybutyl substituted phenol selected from the group consisting of tetrakis(methylene (3,5-di-tertiarybutyl-4-hydroxy-hydrocinnamate)methane, octadecyl-3,5-ditertiarybutyl-4-hydroxyhydrocinnamate, and 1,3,5-trimethyl-2,4,6-tris(3,5-ditertiarybutyl-4-hydroxybenzyl)benzene.

4,837,260

CYANOACRYLATE COMPOSITIONS

Mitsuyoshi Sato; Takumi Okamura, and Kaoru Kimura, all of Nagoya, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan

Filed May 12, 1987, Ser. No. 48,894

Claims priority, application Japan, May 23, 1986, 61-117189; Mar. 25, 1987, 62-69084

Int. Cl.[4] C08K *5/24*

U.S. Cl. 524—261 **16 Claims**

1. A cyanoacrylate composition which comprises a 2-cyanoacrylate as a main component and at least one of (A) crown ethers, polyalkylene oxides and polyalkylene oxide derivatives and at least one of (B) hydrophobic silicas.

4,837,261

SURFACE TREATMENT PRODUCT

Patrick Hampe, Le Giotto, Monaco, and Serge Kelbert, Cros De Cagnes, France, assignors to DYNA-5, Inc., Memphis, Tenn.

Continuation of Ser. No. 852,361, Apr. 15, 1986, abandoned. This application Dec. 7, 1988, Ser. No. 283,052

Claims priority, application France, Dec. 20, 1985, 85 18999

Int. Cl.[4] C08K *5/54*

U.S. Cl. 524—268 **17 Claims**

1. A product for treating a floor comprising at least one acid capable of cleaning the floor and imparting an enhanced shine thereto, a plurality of silicones capable of imparting water repellency, at least one solvent for said acid, at least one solvent for said plurality of silicones and at least one agent capable of emulsifying said acid, said plurality of silicones and said solvents.

4,837,262

NON-TOXIC WRAPPING FILM FOR THE PACKING OF FOODSTUFFS AND THE LIKE

Byung S. Jeon, 22, Azashokoji, Ohtakacho, Midori-Ku, Nagoya-City, and Takeo Namba, 4-1533 Kojimadanoguchi, Kurashiki-City, Okayama-Ken, both of Japan

Filed Jan. 9, 1987, Ser. No. 1,746

Claims priority, application Rep. of Korea, Feb. 22, 1986, 86-1286

Int. Cl.[4] C08K *5/09*

U.S. Cl. 524—322 **8 Claims**

1. Non-toxic film for wrapping foodstuffs comprising the extrusion product resulting from extruding a resin mixture consisting essentially of:

(a) a base resin mixture (A) of from 66 to 100 weight percent linear low density polyethylene (LLD-PE), from 10 to 30 weight percent low density polyethylene (LD-PE), and from 2 to 8 weight percent polyolefin-based resin modifier; and

(b) an additive mixture (B) of from 10 to 20 weight percent edible oil, from 8 to 12 weight percent calcium stearate, from 7 to 11 weight percent aluminum stearate, from 43 to 47 weight percent polybutene, from 7 to 10 weight percent surface active agent, and from 10 to 12 weight percent petroleum resin;

where said additive mixture (B) is mixed with said base resin mixture (A), based upon the weight of said mixture (A), in the ratio of 2 to 8 weight percent (B).

4,837,263

POLYMER POLYOL AND FLAME RETARDANT POLYURETHANE FOAMS

Robert G. Gastinger, West Chester, Pa., and John E. Hayes, Wilmington, Del., assignors to Arco Chemical Technology, Inc., Wilmington, Del.

Filed Jun. 8, 1987, Ser. No. 59,293
Int. Cl.[4] C08K 5/06; C08L 71/02; C08F 22/40
U.S. Cl. 524—377 10 Claims

1. A stable polymer polyol suitable for reaction with an isocyanate to form a polyurethane prepared by reacting at a temperature within the range of from about 70° C. to about 150° C. under free radical conditions a minor amount of a monomer mixture and a major amount of an organic polyol medium wherein:

(a) the monomer mixture comprises at least a first and a second monomer, wherein said first monomer is a maleimide monomer selected from the group consisting of N-arylmaleimides and N-alkylmaleimides and said second monomer is a styrenic monomer which is polymerizable with said first monomer; and

(b) the organic polyol medium consists essentially of a polyoxyalkylene polyether polyol having a molecular weight within the range of from about 4000 to about 6500 prepared from a polyhydric alcohol and at least one alkene oxide.

4,837,264

POLYAMIDE COMPOSITIONS CONTAINING ALKYL ORTHOTITANATE OR DIALKYLTIN DILAURATE

Franz Zahradnik, Ludwigshafen; Karlheinz Ulmerich, Lambsheim; Graham E. McKee, Weinheim; Horst Reimann, Worms; Richard Pfleger, Ludwigshafen, and Rainer Theysohn, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 5, 1988, Ser. No. 140,794
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1987, 3700330
Int. Cl.[4] C08L 77/00
U.S. Cl. 524—381 7 Claims

1. A high-impact polyamide molding composition containing as essential components:

(X) from 40 to 98% by weight based on (X)+(Y), of a thermoplastic polyamide,

(Y) from 2 to 60% by weight, based on (X)+(Y), of a polymer selected from the group consisting of:

1. ethylene copolymers of composition ABCD, where A, B, C and D are units of the following monomers:
   A=ethylene,
   B=ester of acrylic or methacrylic acid, in amounts from 0 to 50% by weight,
   C=acrylic or methacrylic acid, in amounts from 0.2 to 10% by weight, and
   D=maleic anhydride, in amounts from 0 to 2% by weight;
2. graft rubbers produced in emulsion of composition EF, where the graft base E is a polybutadiene or polyacrylate rubber present in amounts from 60 to 90% by weight, and the graft envelope F, in amounts from 40 to 10% by weight, is formed from the following monomers: 0–98% by weight of esters of acrylic or methacrylic acid, 0–80% by weight of styrene, acrylonitrile or vinyl methyl ether, 2–20% by weight of acrylic or methacrylic acid, or of a longer-chain carboxylic acid; and
3. graft rubbers of composition GH, where the graft base G is a thermoplastic copolymer selected from the group consisting of an ethylene-propylene copolymer and an ethylene-propylenediene copolymer present in amounts from 90 to 99.5% by weight, and the graft envelope H is formed from the following monomers:
   0.5–5% by weight of esters of acrylic or methacrylic acid,
   0–5% by weight of acrylic or methacrylic acid, and
   0–2% by weight of maleic anhydride, based on total graft rubber composition and

(Z) from 0.001 to 2% by weight, based on (X)+(Y), of a metal compound selected from the group consisting of alkyl orthotitanates and dialkyltin dilaurates.

4,837,265

PROCESS FOR THE PREPARATION OF STABILIZED POLYAMIDES

Erich Istel, Dormagen, and Franz Zimmermann, Neuss, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 8, 1987, Ser. No. 1,317
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1986, 3600890
Int. Cl.[4] C08K 3/10, 3/16, 5/34; C08L 77/00
U.S. Cl. 524—413 3 Claims

1. Process for the preparation of shaped articles from stabilized, synthetic, high-molecular polyamides with the use of a copper (I)-halide and a molar excess from about 100 to 1000%, relative to copper (I)-halide, of an alkali metal halide or alkaline earth metal halide, characterized in that copper I halide and alkali or alkaline earth metal halide are mixed with caprolactam to form a concentrate, the concentrate in at least 0.5% by weight is mixed with additional polyamide, and the mixture is polymerized for a time sufficient to ensure a good dispersion, the melt of the stabilizer concentrate is granulated and the granules are processed together with granulated polyamide which is to be stabilized, to give shaped articles containing about 10 to 100 mg of Cu(I)/kg of polyamide.

4,837,266

RUBBER VULCANIZATES HAVING REDUCED HEAT EVOLUTION WHEN SUBJECTED TO DYNAMIC DEFORMATION, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Richard Sattelmeyer, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst AG, Fed. Rep. of Germany

Filed Dec. 1, 1987, Ser. No. 127,483
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641344
Int. Cl.[4] C08L 21/00, 61/10; C08K 3/04; C08J 3/20
U.S. Cl. 524—511 8 Claims

1. A process for the preparation of a rubber vulcanizate from vulcanizable rubber mixtures containing at least one rubber and conventional compounding ingredients, which comprises preparing in each case at least two different rubber mixtures A and B of different compositions, the first mixture A containing 50 to 95 parts by weight of rubber and 30 to 150 parts by weight of filler, and a further mixture B containing 50 to 5 parts by weight of rubber and 80 to 5 parts by weight of filler, relative to 100 parts by weight of the total amount of rubber employed in the final mixture, and at least one of the base mixtures containing 2 to 30 parts by weight of a reinforcing novolak resin system and differing from one another in their content of at least one, of the components rubber, filler, oil, reinforcing resin system optionally thermoplastic copolymer, by mixing the constituents thereof, then mixing the resulting mixtures with one another and vulcanizing the resulting final mixture at an elevated temperature.

4,837,267

TETRAFLUOROETHYLENE COPOLYMERS

Satish C. Malhotra, Parkersburg, W. Va., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Mar. 21, 1988, Ser. No. 171,028
Int. Cl.[4] C08F 259/08
U.S. Cl. 524—535 4 Claims

1. Non-melt-processible tetrafluoroethylene copolymer particles wherein the total comonomer content in the particle is between 0.001 and 2 weight percent, said copolymer consisting of a core and a shell portion wherein the comonomer in the

core comprises recurring units of at least one comonomer selected from the class consisting of chlorotrifluoroethylene, dichlorodifluoroethylene, perfluoroalkenes of 3–7 carbon atoms, and mixtures thereof; and wherein the comonomer in the shell can comprise recurring units of at least one comonomer selected from the class described above and also contains recurring units of perfluoro(n-alkyl vinyl) ether of 3–7 carbon atoms; wherein the recurring units of perfluoro(n-alkyl vinyl) ether comprise between 0.0003 and 0.02 weight percent of the total copolymer particle; and provided that the total amount of comonomer units in the shell by weight is greater than the total amount in the core; and wherein the shell comprises between 5 and 50 weight percent of the particle.

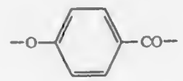
4,837,268

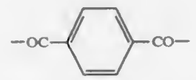
WHOLLY AROMATIC POLYESTER

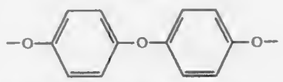
Mitsuo Matsumoto, Kurashiki, and Teruhisa Kaneda, Osaka, both of Japan, assignors to Kuraray Company, Ltd., Kurashiki, Japan

Filed Dec. 18, 1987, Ser. No. 134,754
Claims priority, application Japan, Dec. 29, 1986, 61-310917
Int. Cl.[4] C08L 67/02; C08F 20/00; C08G 63/18
U.S. Cl. 524—539 22 Claims

1. A thermotropic liquid crystal polyester consisting essentially of recurring units from I, Ii and III, said recurring units being unsubstituted or each recurring unit being substituted with at least one substituent selected from the group consisting of C_{1-4} alkyl groups, C_{1-4} alkoxy groups and halogens:

I. 

II. 

III. 

wherein the unit I is contained in the range from 45 to 68 mol %, the unit II is contained in the range from 16 to 27.5 mol %, the unit III is contained in the range from 16 to 27.5 mol %, and the unit II and the unit III exist in substantially the same amounts; said polyester having an inherent viscosity, when determined in pentafluorophenol solution with a concentration of 0.1 wt./vol % and at 60° C., of 0.5 dl/g or higher, and forming an optically anisotropic melt phase at a temperature below 350° C.

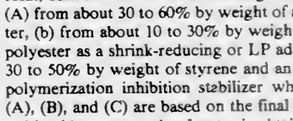
4,837,269

2-AMINOTHIOPHENE RADICAL SUBSTITUTED BY AN ELECTRON WITHDRAWING GROUP

Karl-Heinz Etzbach, Frankenthal; Guenter Hansen; Ernst Schefczik, both of Ludwigshafen, and Helmut Reichelt, Niederkirchen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 30, 1987, Ser. No. 68,168
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1986, 3622297
Int. Cl.[4] C09B 31/02, 33/02, 35/037
U.S. Cl. 534—761 24 Claims

1. A disazothiophene dye of the formula



wherein:

X which is an electron withdrawing group is fluorine, chlorine, bromine, hydroxyl, mercapto, C_1–C_4-alkoxy, C_1–C_4-alkoxy substituted by phenyl, C_5–C_7-cycloalkoxy, phenoxy, phenoxy substituted by methyl or chlorine, C_1–C_4-alkylthio, C_1–C_4-alkythio substituted by phenyl, C_5–C_7-cycloalkylthio, phenylthio, phenylthio substituted by methyl, or SO_2—E, where E is C_1–C_4-alkyl, phenylsubstituted C_1–C_8-alkyl, C_3–C_4-alkenyl, C_5–C_7-cycloalkyl, phenyl, phenyl substituted by chlorine or butyl, chlorine, hydroxyl, C_1–C_4-alkoxy, or C_1–C_4-alkoxy substituted by phenyl, or E is phenoxy, phenoxy substituted by chlorine or methyl, amino, C_1–C_4-monoalkylamino or C_1–C_4-dialkylamino or phenylamino, phenylamino substituted by chlorine or methyl,

Z is cyano, nitro, C_1–C_8-alkanoyl, benzoyl, benzoyl substituted by one or two methyl, one or two chlorine, or methoxy, C_1–C_4-alkylsulfonyl, phenylsulfonyl, phenylsulfonyl substituted by chlorine or methyl, carboxyl, C_1–C_8-alkoxycarbonyl, or C_1–C_8-alkoxycarbonyl whose alkyl chain is interrupted by one oxygen atom, or is phenoxycarbonyl, phenoxycarbonyl substituted by methyl, carbamoyl, C_1–C_8-monoalkylcarbamoyl or C_1–C_8-dialkylcarbamoyl, pyrrolidinocarbonyl, piperidinocarbonyl, morpholinocarbonyl, piperazinocarbonyl or (N-C_1–C_4-alkyl)piperazinocarbonyl,

D is the radical of a diazo component, and

K is the radical of a coupling component.

4,837,270

UNSATURATED POLYESTER RESIN AND MOLDING COMPOUNDS OBTAINED THEREFROM

Horst Kraemer; Hartmut Rohmer, and Johannes Stawowy, all of Marl, Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jun. 12, 1987, Ser. No. 60,786
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1986, 3620036
Int. Cl.[4] C08L 67/06
U.S. Cl. 525—27 18 Claims

1. A homogeneous, non-separating unsaturated polyester resin, suitable for use in a molding composition, comprising (A) from about 30 to 60% by weight of an unsaturated polyester, (b) from about 10 to 30% by weight of a saturated, liquid polyester as a shrink-reducing or LP additive, (C) from about 30 to 50% by weight of styrene and an effective amount of a polymerization inhibition stabilizer wherein the amounts of (A), (B), and (C) are based on the final resin; and wherein

(a) said unsaturated polyester is obtained by polycondensation of

(1) a mixture of an alpha, beta olefinically unsaturated C_4 dicarboxylic acid and a saturated, aliphatic C_4 to C_8 alpha, omega dicarboxylic acid and

(2) a mixture of 1,2-propylene glycol and ethylene glycol, and wherein said unsaturated polyester has an acid value of from about 5 to 40 mg KOH/g; the molar ratio of said unsaturated dicarboxylic acid to said saturated dicarboxylic acid is from about 4:1 to 8:1; and the molar ratio of said propylene glycol to said ethylene glycol is from about 1:1 to 5:1, respectively; and

(b) said saturated polyester is obtained by polycondensation of

(1) a saturated, aliphatic C_4 to C_8 alpha, omega dicarboxylic acid, and

(2) a mixture of ethylene glycol and a saturated, aliphatic diol having primary hydroxyl groups and having 5 or 6

C atoms in the chain between the hydroxyl groups and 3 methyl side groups,

and wherein said saturated polyester has an acid value of from about 15 to 40 and a weight average molecular weight of from about 5000 to 8000, determined by gel permeation chromatographic analysis and the molar ratio of said ethylene glycol to said diol is from about 1:1 to 3:1.

4,837,271

CURABLE MIXTURES AND THEIR USE

Gerhard Brindöpke, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst AG, Fed. Rep. of Germany

Filed Jun. 23, 1988, Ser. No. 210,632

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1987, 3720984

Int. Cl.⁴ C08G *16/14*

U.S. Cl. 525—330.3 **12 Claims**

1. A curable mixture based on

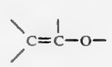
(A) compounds containing hydroxyl groups,

(B) curable compounds,

(C) catalysts and

(D) if appropriate a diluent and if appropriate further additives,

in which compounds which are used as the curing compound (B) are those which contain at least two enol ether groups of the formula (I)



(I)

4,837,272

CROSS-LINKING OF OLEFIN POLYMERS

Donald W. Kelley, 6205 Glenmoor, Garland, Tex. 75043

Filed Jul. 27, 1987, Ser. No. 77,881

Int. Cl.⁴ C08F *8/42*

U.S. Cl. 525—59 **12 Claims**

1. A composition useful for forming a cross-linked polymer said cross-linked polymer being characterized in that the cross-linking is stable after exposure to water, which comprises:

(a) a polymer selected from polyethylene, copolymer of ethylene with propylene, butylene hexene, vinyl acetate, methyl acrylate, ethyl acrylate, methyl methacrylate or ethyl methacrylate, polypropylene polybutylene, polybutadiene, polyvinyl chloride, polystyrene, polyvinyl ethyl ether, polyvinyl acetate, polyvinyl alcohol, polyvinyl formal, polyvinyl butyral, polyvinyl fluoride and polyvinylidene chloride;

(b) a free radical generator which is capable of and is present in an amount sufficient for generating free radicals on the polymer; and

(c) an organo zirconate which has at least one functional group that is reactive with the free radicals on the polymer selected from neoalkoxy triacryl zironate and neoalkoxy trimethacryl zirconate, wherein said organo zirconate is present in an amount sufficient to provide adequate functional groups that are reactive with the free radicals on the polymer to form said cross-linked polymer.

4,837,273

LACQUER BINDER CONTAINING GRAFT COPOLYMER AND POLYISOCYANATES

Christian Wamprecht, Krefeld; Manfred Schönfelder, Leverkusen; Peter Höhlein, Kempen, and Lothar Kahl, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 8, 1988, Ser. No. 153,236

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1987, 3705090

Int. Cl.⁴ C08L *51/00, 75/00*

U.S. Cl. 525—66 **10 Claims**

1. Binder combinations comprising

(A) 99–30 parts by weight of OH-functional graft copolymer resins prepared by the copolymerization of

(a) 1 to 60 parts by weight of at least one polybutadiene having a molecular weight of from 500 to 10,000 and containing more than 30% of a 1,2-vinyl structure,

(b) 5 to 60 parts by weight of at least one unsaturated aromatic monomer comprising styrene, vinyl toluene, or methacrylic acid ester containing aliphatic C_1–C_6 hydrocarbon groups,

(c) 5 to 80 parts by weight of at least one aliphatic acrylic acid ester containing 1 to 12 carbon atoms in the alcohol component,

(d) 10 to 60 parts by weight of at least one hydroxyalkyl ester of acrylic or methacrylic acid containing 2–8 carbon atoms in the hydroxyalkyl group,

(e) 0 to 50 parts by weight of at least one acrylic or methacrylic acid glycidyl ester or reaction products thereof with aliphatic or aromatic monocarboxylic acids and amino compounds,

(f) 0 to 30 parts by weight of acrylonitrile and,

(g) 0.05 to 10 parts by weight of at least one α,β-monoolefinically unsaturated mono or dicarboxylic acid containing 3 to 7 carbon atoms, at least one maleic acid or fumaric acid semi ester containing 2 to 14 carbon atoms in the alcohol group, or both and

(B) 1 to 70 parts by weight of a multi-functional crosslinking resin, the sum of parts by weight of components (A) and (B) and the sum of parts by weight of components (a) to (g) amounting in each case to 100.

4,837,274

CURABLE COMPOSITION

Fumio Kawakubo; Sadao Yukimoto, both of Kobe, and Michihide Homma, Takasago, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osakak, Japan

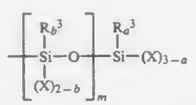
Filed Sep. 29, 1987, Ser. No. 102,687

Claims priority, application Japan, Sep. 30, 1986, 61-232229

Int. Cl.⁴ C08F *8/00*

U.S. Cl. 525—100 **9 Claims**

1. A curable composition comprising (A) at least one organic polymer selected from the group consisting of a polyether, a polyester, an ether-ester block copolymer, a polybutadiene, a styrene-butadiene copolymer, an acrylonitrile-butadiene copolymer, an acrylic acid ester-butadiene copolymer, an ethylene-butadiene copolymer, a vinylpyridine-butadiene copolymer, an ethylene-propylene copolymer, an ethylene-vinylacetate copolymer, an ethylene-acrylic acid ester copolymer, a polyisoprene, a styrene-isobutylene copolymer, a styrene-isoprene copolymer, an isobutylene-isoprene copolymer, a polychloroprene, a styrene-chloroprene copolymer, an acrylonitrile-chloroprene copolymer, a polyisobutylene, a polyacrylic acid ester and polymethacrylic acid ester, said organic polymer containing at least one reactive silicon functional group crosslinkable to produce an elastomer by the formation of a siloxane bond in its molecule wherein said reactive silicon functional group is a group represented by the formula (2):



(2)

wherein R^3 is a monovalent hydrocarbon group having 1 to 20 carbon atoms selected from the group consisting of an alkyl group, as aryl group and an aralkyl group or a triorganosiloxy group represented by the formula (3):

$$(R^4)_3SiO— \quad (3)$$

in which each R^4 is a nonvalent hydrocarbon group having 1 to 20 carbon atoms, and when more than one R^3 are present, the groups R^3 are the same or different; X is a hydroxyl group or a hydrolyzable group, and when more than one X are present, the group X are the same or different; a is O or an integer of 1 to 3 and b is 0, 1 or 2, provided that at least one X is present in the silicon functional group; and; m is 0 or an integer of 1 to 18; and (B) an organic silicon compound having a molecular weight of not less than 140 and represented by the formula (1):

$$[CH_3)_3SiO]_nR^1 \quad (1)$$

wherein R^1 has a valence of n and is a residue of a substituted or unsubstituted aliphatic alcohol having 2 to 30 carbon atoms, a residue of a substituted or substituted or aromatic hydroxyl compound having 6 to 30 carbon atoms, a residue of a substituted or unsubstituted aliphatic or aromatic carboxylic acid having 2 to 30 carbon atoms, a residue of a polymeric compound having hydroxyl or carboxyl groups or a residue of an inorganic acid, and n is 1, 2 or 3.

4,837,275

LINEAR POLYETHYLENE, FLUOROCARBON POLYMER AND POLYALKYLSILOXANE COMPOSITIONS, AND IMPROVED METHOD OF FILM EXTRUSION USING SAME

Shaw-Chang Chu, Belle Mead, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 901,699, Aug. 29, 1986, Pat. No. 4,740,341. This application Jan. 28, 1988, Ser. No. 149,332

Int. Cl.⁴ C08F *8/00*

U.S. Cl. 525—104 **9 Claims**

1. A composition suitable for extruding into a film comprising a linear polyethylene polymer, wherein said linear polyethylene polymer is a member selected from the group consisting of a homopolymer of ethylene and a copolymer of ethylene and a minor amount of a higher olefin containing 4 to 10 carbon atoms; 0.005 to 2 weight percent of a fluorocarbon polymer having a fluorine to carbon ratio of at least 1:2 which is fluid at a temperature of between 120° C. to 300° C.; and 0.01 to 0.5 weight percent of a polyalkylsiloxane consisting essentially of methyl-higher alkyl siloxane in which said higher alkyl contains 6 to 18 carbon atoms.

4,837,276

PHOSPHORUS-CONTAINING OLIGOMERS AND POLYMERS CONTAINING POLYPHENYLENE ETHER BLOCKS AND MIXTURES OF OTHER PLASTICS THEREWITH

Karl Fuhr, Krefeld; Friedemann Müller, Neuss, and Karl-Heinz Ott, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

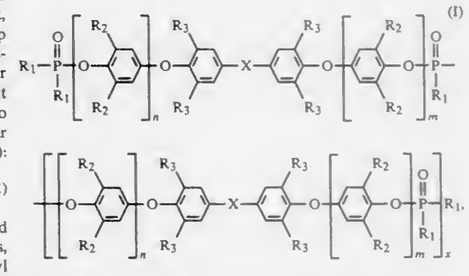
Filed Dec. 28, 1987, Ser. No. 138,215

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1987, 3700208

Int. Cl.⁴ C07F *9/40;* **C08G** *79/04;* **C08K** *5/53*

U.S. Cl. 524—125 **14 Claims**

1. Oligomeric and polymeric esters corresponding to the following formula



(I)

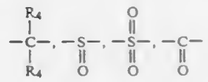
in which R_1, R_2 and R_3 independently of one another have the following meanings:

R_1 represents C_1–C_8 alkyl, C_6 aryl, C_7–C_{20} aralkyl, C_1–C_8 alkoxy, or C_6 aryloxy;

R_2 represents C_1–C_4 alkyl, C_6aryl, halogen, with one CH_3 having to be present per phenyl ring,

R_3 represents hydrogen, C_1–C_4 alkyl, C_6 aryl, or halogen, with one CH_3 having to be present per phenyl ring,

X represents a



group, —O—, or —S—and

R_4 independently of one another represent hydrogen and C_1–C_4 alkyl and, together with the carbon atom to which they are attached, form a C_3–C_6 ring,

n and m independently of one another have the values 0, 1, 2, 3, 4, 5, 6 and 7, with the proviso that n and m cannot both have the value 0 and the sum (n+m) is no greater than 8, and

x is an integer of from 1 to 50.

13. In an improved composition comprising a plastic and a flame-retarding agent, the improvement comprises said flame-retarding agent being an oligomeric or polymeric ester according to claim 1 in quantities of from 5 to 65% by weight.

4,837,277

POLY(4-METHYL-1-PENTANE) COMPOSITION AND ARTICLES MOLDED THEREFROM

Hiromi Shigemoto, Iwakuni, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Dec. 9, 1987, Ser. No. 130,500

Claims priority, application Japan, Dec. 16, 1986, 61-297497; Dec. 22, 1986, 61-303879

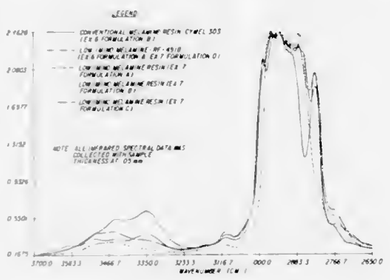
Int. Cl.⁴ C08L *23/20, 67/02, 69/00, 81/06*

U.S. Cl. 525—146 **13 Claims**

1. A resin composition which is resistant to food stains consisting essentially of

(A) 80 to 99.5% by weight of a polymer of 4-methyl-1-pentene and
(B) 0.5 to 20% by weight of a thermoplastic resin having a refractive index between 1.48 and 1.80.

4,837,278
CURABLE COATING COMPOSITION
James M. Cameron, Manmee; Timothy P. Stanton, Perrysburg; Anthony J. Tye, Toledo, all of Ohio, and Timothy S. December, Farmington Hills, Mich., assignors to BASF Corporation, Clifton, N.J.
Filed Nov. 13, 1987, Ser. No. 120,575
Int. Cl.[4] C08L *61/20*
U.S. Cl. 525—162 **8 Claims**



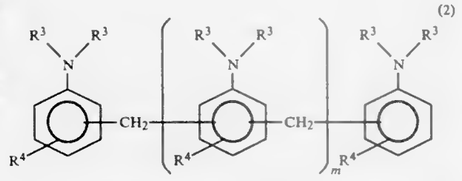
1. A coating composition comprising:
(a) A principle film forming resin containing pendant functional groups which are reactive with an aminoplast resin and,
(b) a fully alkylated, low imino amino plast resin, wherein the coating cures at ambient temperature.

4,837,279
BONE CEMENT
Nestor A. Arroyo, East Windsor, N.J., assignor to Pfizer Hospital Products Corp, Inc., New York, N.Y.
Filed Feb. 22, 1988, Ser. No. 158,472
Int. Cl.[4] A61L *25/00*; C08L *31/02*
U.S. Cl. 525—193 **8 Claims**

1. A bone cement composition comprising:
(a) a liquid component comprising a monomer of an acrylic ester, and
(b) a powdered component comprising, based on the weight of the powdered component,
(i) from 0 to about 20 percent of a methyl methacrylate homopolymer,
(ii) from about 30 to about 60 percent of a methyl methacrylate-styrene copolymer,
(iii) from about 30 to about 60 percent of a methyl methacrylate-butyl methacrylate copolymer.

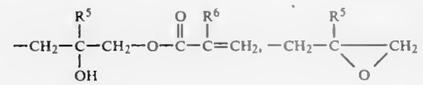
4,837,280
CURABLE RESIN COMPOSITION WITH A THIURAM AND A COPPER COMPOUND AS STORAGE STABILIZER
Toshio Awaji, Kawanishi; Kenichi Ueda, and Daisuke Atobe, both of Suita, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan
Filed Sep. 23, 1987, Ser. No. 100,210
Claims priority, application Japan, Sep. 26, 1986, 61-226198; Sep. 26, 1986, 61-226199
Int. Cl.[4] C08F *20/36*; C08G *12/44 59/17*; C08K *3/10*
U.S. Cl. 525—502 **4 Claims**

1. A thermosetting resin composition comprising:
(I) 100 parts by weight of a thermosetting resin composition comprising:
(A') (a') 30 to 95% by weight of an unsaturated ester compound represented by the formula (2):

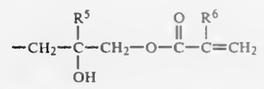


(2)

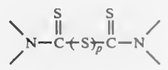
wherein R^3's are independently selected from the group consisting of



wherein R^5 and R^6 independently stand for hydrogen atom or methyl group, and hydrogen atom, at least one of R^3's stands for



wherein R^5 and R^6 have the same meanings as defined above, R^4's stand for at least one member selected from the group consisting of hydrogen atom, halogen atoms, methoxy group, and alkyl groups of 1 to 5 carbon atoms, and m stand for 0 or an integer in the range of 1 to 10,
(C') 70 to 5% by weight of polymerizable cross-linking agent
(II) 0.0001 to 2.0 parts by weight of a thiuram compound possessing at least one atomic group represented by the general formula (4):



(4)

wherein p stand for an integer in the range of 1 to 8, in the molecular unit thereof, and
(III) 0.00001 to 0.1 part by weight (as copper metal) of a copper-containing compound.

4,837,281
METHOD OF MAKING REINFORCED MATERIALS HAVING IMPROVED REINFORCING MATERIAL THEREIN
Billy B. Hibbard; Joe A. Mann, both of Williamsburg; Frans P. P. Koeleveld, Newport News, all of Va.; Agnes K. Potepan, Canandaigua, N.Y.; Richard E. White, Newark, N.Y.; Barry T. Knight, Fairport, N.Y., and Howard H. Bryant, Palmyra, N.Y., assignors to BASF Corporation, Williamsburg, Va.
Continuation of Ser. No. 669,200, Nov. 7, 1984, abandoned, which is a division of Ser. No. 479,586, Mar. 28, 1983, abandoned, which is a continuation of Ser. No. 214,838, Dec. 10, 1980, abandoned. This application Jun. 9, 1986, Ser. No. 871,961
Int. Cl.[4] C08L *9/02, 33/20*
U.S. Cl. 525—234 **3 Claims**

1. A process of making a reinforced gasketing material having an improved reinforcing fiber therein, the process comprising the steps of:
(a) applying, via fog box, approximately 4% (on weight of fiber) moisture to a tow of homopolymer acrylic fiber; and
(b) feeding the moistened tow of homopolymer acrylic fiber into an input chute of a Buss-Condux 300/400-4 cutting machine at a rate of 4.0 lbs/min., the tow having an average denier per filament of 21, the tow having 0.1% (on weight of fiber) of a water soluble finish thereon; and
(c) cutting the moistened tow of homopolymer acrylic fiber in the cutting machine in order to create a ministaple; and
(d) regulating length of the cut tow by installing a screen in the cutting machine, the screen having 3/16 inch diameter round-shaped holes therein, the screen having an open area of 32.5%; and
(e) combining the moistened, cut tow of homopolymer acrylic fiber with rubber in order to make a body layer mix, the acrylic fiber to rubber ratio having a value of substantially 2.0.

2. In a processe for manufacturing an improved reinforcing fiber for gasketing material, the process comprising the steps of:
(a) applying, via fogbox, approximately 4% (on weight of fiber) moisture to a tow of homopolymer acrylic fiber;
(b) feeding the moistened tow into an input chute of a Buss-Condux 300/400-4 cutting machine at a rate of 4.0 lbs./min., the tow having an average denier per filament of 21, the tow having 0.1% (on weight of fiber) of a water soluble finish thereon;
(c) cutting the moistened tow in the cutting machine to create a ministaple; and
(d) regulating the length of the cut tow by installing a screen in the cutting machine, the screen having 3/16 inch diameter round shaped holes therein, the screen having an open area of 32.5%.

4,837,282
POLYOLEFIN RUBBER COMPOSITION
Kiyoshi Yagi; Toshiaki Kanno; Masahiro Kanda, and Izumi Nomura, all of Gotenba, Japan, assignors to Yazaki Corporation, Japan
Continuation of Ser. No. 861,409, Jun. 9, 1986, abandoned. This application Sep. 4, 1987, Ser. No. 93,259
Claims priority, application Japan, May 13, 1985, 60-99490
Int. Cl.[4] C08L *23/16*; C08F *255/06*
U.S. Cl. 525—265 **5 Claims**

1. A polyolefin rubber composition for a polyolefin rubber which has superior electrical insulation and considerably-improved heat resistance, consisting essentially of:
(a) 100 part by weight (pbw) ethylenic copolymer;
said ethylenic copolymer being a copolymer consisting essentially of from 40 to 90 mol percent ethylene, from 10 to 60 mol percent alpha-olefin monomer other than ethylene, and from 3 to 20 mol percent conjugate or non-conjugate diolefine monomer;
(b) from 18–58 pbw monoethylenically unsaturated monomer to improve the heat-resistance of said polyolefin rubber;
said monoethylenically unsaturated monomer selected from the group consisting of styrene and methylmethacrylate;
(c) from 2–12 pbw polyethylenically unsaturated monomer for vulcanizing said ethylenic copolymer to improve the heat-resistance of said polyolefin rubber;
said polyethylenically unsaturated monomer selected from the group consisting of divinyl benzene and trimethylolpropane trimethacrylate;
wherein the ratio of the weight of said polyethylenically unsaturated monomer to that of said monoethylenically unsaturated monomer is about 0.03–0.25,
wherein said polyethylenically unsaturated monomer is divinyl benzene when styrene is used as the monoethylenically unsaturated monomer, and trimethylolpropane trimethacrylate when methylmethacrylate is used as the monethylenically unsaturated monomer; and
(d) from 0.1 to 15 pbw organic peroxide for initiation of the vulcanization.

4,837,283
MONOMERIC, OLIGOMERIC AND POLYMERIC SULFONATES
Donald G. Ries, Richmond, Tex., assignor to Nalco Chemical Company, Naperville, Ill.
Filed Aug. 31, 1987, Ser. No. 90,850
Int. Cl.[4] C08G *65/32*
U.S. Cl. 525—403 **23 Claims**

1. A polymeric sulfonate comprising the reaction product of a polyepihalohydrin and a compound selected from the group consisting of aminobenzene sulfonic acid salts and aminoalkyl sulfonic acid salts.

4,837,284
NOVEL POLY(ARYL ETHER KETONE)-POLYESTER BLOCK COPOLYMERS
Markus Matzner, Edison, N.J., and Donald M. Papuga, Danbury, Conn., assignors to Amoco Corporation, Chicago, Ill.
Division of Ser. No. 787,122, Oct. 15, 1985, Pat. No. 4,668,744. This application Mar. 31, 1987, Ser. No. 32,739
The portion of the term of this patent subsequent to Oct. 28, 2003, has been disclaimed.
Int. Cl.[4] C08G *81/00*
U.S. Cl. 525—437 **12 Claims**

1. A block copolymer having the general formula:

$(AB)_n$,

$(ABC)_n$, or

$(ABCD)_n$

wherein A and C are oligomers of a poly(aryl ether ketone) having an average molecular weight of approximately 500 to 2,000, B and D are oligomers of a liquid crystalline polyester, with the proviso that A and C are different and B and D are different, and n is 1 or greater.

4,837,285

COLLAGEN MATRIX BEADS FOR SOFT TISSUE REPAIR

Richard A. Berg, Lambertville, N.J.; Frederick H. Silver, Bangor, Pa., and James M. Pachence, Lawrenceville, N.J., assignors to MediMatrix, Princeton, N.J.

Continuation-in-part of Ser. No. 875,827, Jun. 18, 1986, which is a continuation-in-part of Ser. No. 843,328, Mar. 26, 1986, Pat. No. 4,703,108, which is a continuation of Ser. No. 593,733, Mar. 27, 1984, abandoned. This application Sep. 8, 1987, Ser. No. 93,826

Int. Cl.[4] C08H *1/06*; A23J *1/10*; A61K *37/02*

U.S. Cl. 530—356 **15 Claims**

1. A wound dressing or implant comprising resorbable, porous collagen matrix beads having particle sizes of from about 100 to 4000 microns, the beads having an average pore size of from about 50 to 350 microns, and the collagen comprising from 1 to 30% by volume of the beads, the porous collagen matrix forming a skeleton providing a volume sufficient for cells to attach and grow into the matrix and being stiff and non-compressible to a degree sufficient to fill and protect a wound, the dressing or implant having a degree of moisture and gas permeability sufficient to prevent liquid pooling on a wound and to permit sufficient oxygen diffusion for promoting wound healing.

4,837,286

METHOD FOR THE PRODUCTION OF POLYMETHACRYLATES

Yasuyuki Kato; Masahiro Yuyama; Masahiko Moritani, all of Niihama, and Yukio Yasunori, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 28, 1986, Ser. No. 901,363

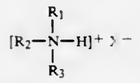
Claims priority, application Japan, Aug. 30, 1985, 60-192791

The portion of the term of this patent subsequent to Jan. 5, 2005, has been disclaimed.

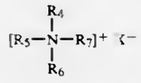
Int. Cl.[4] C08F *2/00*

U.S. Cl. 526—217 **5 Claims**

1. A method for the production of polymethacrylates by bulk polymerization in a mold, which comprises polymerizing 100 parts by weight of an unsaturated monomer selected from a methacrylate and a monomer mixture comprising predominantly a methacrylate which may partially contain a polymer of the monomer in the presence of 0.1 to 5 parts by weight of a radical polymerization initiator, 0.1 to 5 parts by weight of a reducing compound containing sulfur, 0.005 to 10 ppm of a copper-containing compound wherein the weight of the copper is based on the weight of said unsaturated monomer, and 0.005 to 1 part by weight of a tertiary amine hydrohalogenate of the formula:



wherein X is a halogen atom, R_1, R_2 and R_3 are the same or different and are each an alkyl having 1 to 16 carbon atoms, and the total carbon numbers of said R_1, R_2 and R_3 are represented by C_1, C_2 and C_3, respectively, and are in the range of the formula: $10 \leqq (C_1+C_2+C_3) \leqq 42$, or a quaternary ammonium halide of the formula:



wherein X is a halogen atom, R_4, R_5, R_6 and R_7 are the same or different and are each an alkyl having 1 to 16 carbon atoms, and the total carbon numbers of said R_4, R_5, R_6 and R_7 are represented by C_4, C_5, C_6 and C_7, respectively and are in the range of the formula: $11 \leqq (C_4+C_5+C_6+C_7) \leqq 43$.

4,837,287

T-ALKENYL PEROXY ESTERS AND THEIR USE AS INITIATORS AND CURING AGENTS

John Meijer, Deventer, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

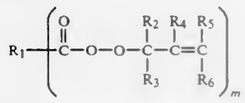
Division of Ser. No. 903,955, Sep. 4, 1986, Pat. No. 4,705,888. This application Jun. 24, 1987, Ser. No. 66,002

Claims priority, application Netherlands, Sep. 30, 1985, 8502661

Int. Cl.[4] C08F *4/32*

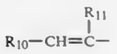
U.S. Cl. 526—231 **4 Claims**

1. A (co)polymerization process, comprising (co)polymerizing an ethylenically unsaturated compound selected from the group consisting of vinyl chloride, ethylene, styrene and methyl methacrylate in the presence of a peroxy ester of the formula:



wherein m=1 or 2, and when m=1, R_1 is selected from the group consisting of a cyclohexyl group,
a cyclohexenyl group,
an unsubstituted phenyl group,
a phenyl group which is substituted with at least one substituent selected from the group consisting of chlorine atoms, methyl groups and mixtures thereof
a group

wherein R_7 and R_8 are independently selected from the group consisting of a hydrogen atom and an alkyl group containing 1–10 carbon atoms, and R_9 is selected from the group consisting of a hydrogen atom, an alkyl group containing 1–10 carbon atoms, an alkoxy group containing 1–6 carbon atoms, a phenyl group, a phenoxy group and
a group



wherein R_{10} and R_{11} are independently selected from the group consisting of a hydrogen atom and an alkyl group containing 1–4 carbon atoms;
when m=2, R_1 is selected from the group consisting of
an alkylene group containing 1–11 carbon atoms,
a cyclohexylene group,
a phenylene group and
a group of the formula $—CH_2—O—CH_2—$;
R_2 and R_3 are either independently selected from the group consisting of an alkyl group containing 1–4 carbon atoms or together form a pentamethylene bridge; and
R_4, R_5 and R_6 are independently selected from the group consisting of a hydrogen atom and an alkyl group containing 1–4 carbon atoms.

4,837,288

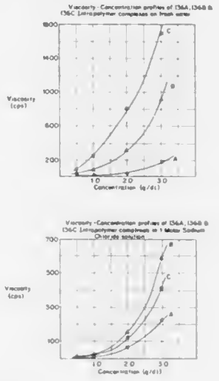
NOVEL POLYAMPHOLYTE COMPOSITIONS POSSESSING HIGH DEGREES OF ACID, BASE, OR SALT TOLERANCE IN SOLUTION

Dennis G. Peiffer, East Brunswick, and Robert D. Lundberg, Bridgewater, both of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

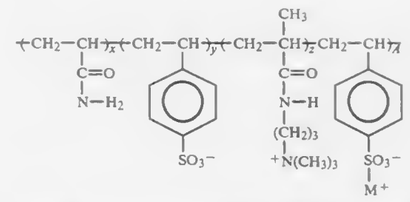
Division of Ser. No. 826,229, Feb. 5, 1986, Pat. No. 4,710,555, which is a continuation-in-part of Ser. No. 688,238, Jan. 2, 1985, abandoned, which is a continuation-in-part of Ser. No. 560,543, Dec. 12, 1983, abandoned. This application Aug. 5, 1987, Ser. No. 81,682

Int. Cl.[4] C08F *228/02*, *230/00*

U.S. Cl. 526—240 **2 Claims**



1. A terpolymer having the formula:



wherein x is about 1 to about 50 mole %, y is about 1 to about 50 mole %, z is about 1 to about 50 mole %, y is equal to z, A is about 1 to about 25 mole %, wherein A, y and z are less than 50 mole % and the ratio of A/y+z is about 0.01 to about 15, and M is selected from the group consisting of amines and a metallic cation being selected from the group consisting of lead, iron, aluminum, Groups IA, IIA, IB and IIB of the Periodic Table of Elements.

4,837,289

UV- AND HEAT CURABLE TERMINAL POLYVINYL FUNCTIONAL MACROMERS AND POLYMERS THEREOF

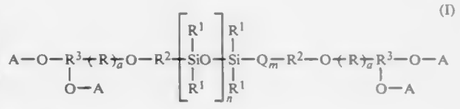
Karl F. Mueller, New York, and Paul Harisiades, Hastings-on-Hudson, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 45,020, Apr. 30, 1987, abandoned. This application Mar. 14, 1988, Ser. No. 167,806

Int. Cl.[4] C08F *30/08*, *120/08*, *230/08*

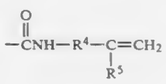
U.S. Cl. 526—279 **25 Claims**

1. A poly-unsaturated polysiloxane of the formula:



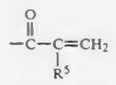
(I)

wherein
a is zero or 1;
n is 2 to about 500;
m is zero to 2;
where a and m are not both zero at the same time;
at least three of A either consists of a reactive vinyl containing group of the formula



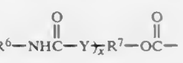
(Ia)

or

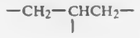


(Ib)

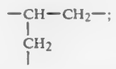
where R^4 is arylene of 6 to 12 carbon atoms, alkarylene of 7 to 14 carbon atoms, alkylene of up to 8 carbon atoms, alkyleneoxy of up to 8 carbon atoms or a group of the formula



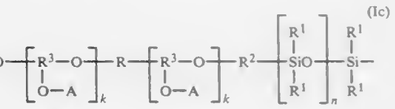
where R^7 is alkylene of 2 to 8 carbon atoms, x is zero or 1, Y is —O— or —NR^8— where R^8 is hydrogen or alkyl of up to 4 carbon atoms, and R^6 is the diradical residue of an aliphatic, cycloaliphatic, aromatic or araliphatic diisocyanate; and R^5 is hydrogen or methyl; and the remaining A are hydrogen or said reactive vinyl containing group;
R^1 is alkyl of up to 4 carbon atoms or phenyl;
R^2 is alkylene of 2 to 6 carbon atoms;
R^3 is



or



Q is a group of the formula



(Ic)

where R^1, R^2, R^3, A and n are as defined above; k is zero or 1; and
R is a group of the formula

where R^6 is as defined above, and where the

group is connected to R^3.

4,837,290

ACRYLAMIDOACYLATED OLIGOMERS

Jerald K. Rasmussen, Stillwater; Steven M. Heilmann, North St. Paul, and Frederick J. Palensky, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 316,234, Oct. 29, 1981, Pat. No. 4,777,276. This application Jul. 11, 1988, Ser. No. 217,560

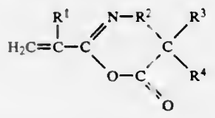
Int. Cl.[4] C08F *2/00; C07C 102/00, 103/133*

U.S. Cl. 526—304 **6 Claims**

1. A process for preparing an acrylamidoacyl or methacrylamidoacyl oligomer comprising the steps:

(a) admixing

(1) at least one alkenyl azlactone having the formula:



wherein

R^1 is hydrogen, chlorine, or a methyl group;

R^2 is a single bond or a methylene or ethylene group that can be substituted by an alkyl group having 1 to 6 carbon atoms or a phenyl group;

R^3 and R^4 are independently hydrogen, an alkyl or cycloalkyl group having 1 to 12 carbon atoms, a phenyl group or an alkyl-substituted phenyl group having 6 to 12 carbon atoms, or R^3 and R^4 taken together with the carbon atom to which they are attached form a 5- to 12-membered carbocyclic ring; and

(2) per mole of alkenylazlactone about 0.8 to 1.2 equivalent weights of at least one nucleophilic group-substituted oligomer having a molecular weight in the range of 200 to 20,000 selected from a group consisting of (1) polyether polyols, (2) polyester polyols, (3) polyoxyalkylene polyamines (4) hydroxy- and amino-functional derivatives of polymerized fatty acids, (5) hydroxy- or amino-functional olefin polymers and copolymers, (6) primary or secondary amino-functional polyamides, (7) polyethyleneimines; (8) polyvinyl alcohol and other hydrolyzed or partially hydrolyzed vinyl acetate homo- and interpolymers, and (9) polysiloxane polyols; and

(b) isolating said acrylamidoacyl or methacrylamidoacyl oligomer.

4,837,291

SELF-CROSSLINKING CATIONIC PAINT BINDERS FROM AMINE MODIFIED EPOXY RESINS REACTED WITH (1) PARTIALLY BLOCKED ISOCYANATE AND (2) FORMALDEHYDE

Willibald Paar, Graz, Austria, assignor to Vianova Kunstharz, A.G., Werndorf, Austria

Filed Jun. 19, 1987, Ser. No. 63,998

Claims priority, application Austria, Jun. 29, 1986, 1665/86

Int. Cl.[4] C08G *18/32, 18/58*

U.S. Cl. 528—45 **11 Claims**

6. Cationic paint binders which are water-dilutable upon protonation and which are self-crosslinking at elevated temperature comprising the reaction products of

(a) the epoxy groups of a polyepoxy compound with an equivalent amount of

(b) primary amine groups of an amino compound selected from the group consisting of primary alkylamines, primary hydroxyalkylamines, primary-secondary diamines, and primary-tertiary amines, and thereafter reacting the beta-hydroxyamine obtained at a temperature of from about 30° C. to about 50° C. with

(c) a partially blocked polyisocyanate having one free isocyanate group at a ratio selected in order that per secondary amine group one free isocyanate group is used, and thereafter reacting the urea groups of said reaction product at a temperature of from about 80° C. to about 130° C. with

(d) from about 0.5 to 1.0 mole of formaldehyde per urea group, the reactants being selected so that in the final product protonable amino groups are present corresponding to an amine value of at least 30 mg KOH/g which are derived from primary-tertiary alkylene diamines used in (b) and/or from tertiary amine group containing blocking agents used in (c).

4,837,292

ARTICLE OF SPANDEX HAVING POLYCARBONATE SOFT SEGMENT

Gary A. Lodoen, Fisherville, Va., assignor to E. I. DuPont De Nemours and Company, Wilmington, Del.

Filed Dec. 17, 1987, Ser. No. 134,022

Int. Cl.[4] C08G *18/10, 18/34*

U.S. Cl. 528—63 **4 Claims**

1. An improved fiber formed from a linear, segmented polyurethane-urea spandex polymer which is produced by reacting a hydroxyl-terminated polymer with an organic diisocyanate to form an isocyanate-terminated polymer, which is then chain extended with a diamine and the thusly produced spandex polymer is then formed into a fiber, wherein, to provide the fiber with increased resistance to chlorine and mildew, the improvement comprises, in combination,

the hydroxyl-terminated polymer being a polycarbonate selected from the group consisting of poly(pentane-1,5-carbonate)diol, poly(hexane-1,6-carbonate)diol, and copolymers or mixtures thereof,

the organic diisocyanate being selected from the group consisting of p,p'-methylene diphenyl diisocyanate, 4,4'-methylene-bis(cyclohexylisocyanate), α,α,α',α',-tetramethyl p-xylylene diisocyanate, α,α,α',α',-tetramethyl m-xylylene diisocyanate and mixtures thereof and

the chain-extending diamine being selected from the group consisting of hydrazine and diamines of the formula $H_2N—R—NH_2$, wherein R has 2 to 8 carbon atoms and is an alkylene group, an alicyclic group, a tetrachloro-substituted xylylene group and mixtures thereof.

4,837,293

LINEAR BISPHENOL EPOXY POLYMERS CONTAINING CYANO GROUPS

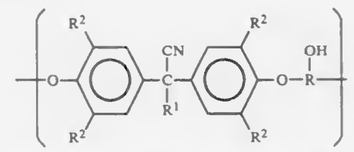
H. Craig Silvis; Steven P. Crain, and Bassam S. Nader, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 28, 1987, Ser. No. 90,643

Int. Cl.[4] C08G *59/28*

U.S. Cl. 528—99 **26 Claims**

1. A thermoplastic polymer comprising a plurality of cyanobisphenoxy units which conform to the formula:



wherein R^1 is either hydrogen or alkyl, each R^2 is independently hydrogen, alkyl, alkoxy or halogen, and R is an alkyl group of at least 3 carbons.

4,837,294

POLYARYLENE THIOETHER COMPOSITION CONTAINING POLYARYLENE ETHER NUCLEATING AGENT

Yukio Ichikawa; Takashi Kaneko; Yoshikatsu Satake, and Takayuki Katto, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 15, 1988, Ser. No. 182,172

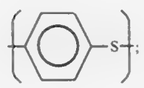
Claims priority, application Japan, Apr. 17, 1987, 62-94464

Int. Cl.[4] C08G *75/02*

U.S. Cl. 528—388 **10 Claims**

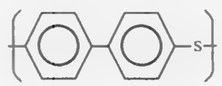
1. A polyarylene thioether composition comprising:

100 parts by weight of (A) which contains not less than 70 wt % of a repeating unit of



and

0.01 to 15 parts by weight of a polyarylene thioether (B), which is a nucleating agent and contains not less than 50 wt % of a repeating unit of



as the main constituent and has a melting point of not lower than 290° C. or a melt crystallization temperature of not lower than 220° C.; and

a 50% crystallization time, $\tau_{\frac{1}{2}}$, at 250° C. of said polyarylene thioether composition being not more than 1/1.5 of the 50% crystallization time of a polyarylene thioether which does not contain said polyarylene thioether (B).

4,837,295

EPOXY-AMINE COMPOSITIONS EMPLOYING UNSATURATED IMIDES

Kieran F. Drain, Rochester Hills, Mich., and Kris Kadziela, East Hartford, Conn., assignors to Loctite Corporation, Newington, Conn.

Filed Mar. 4, 1988, Ser. No. 164,075

Int. Cl.[4] C08G *59/60*

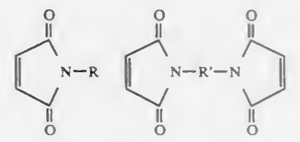
U.S. Cl. 528—111 **9 Claims**

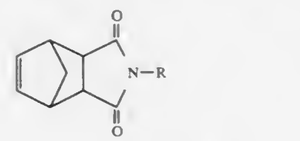
1. A composition comprising:

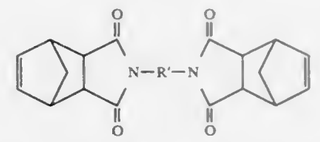
(1) a compound or mixture of compounds having a plurality of epoxy groups per molecule;

(2) a polyoxyalkylene amine curative for the epoxy; and

(3) an imide compound selected from those having the formulas:







wherein R and R' are, respectively, monovalent and divalent organic groups having 200 or fewer carbon atoms.

4,837,296

PREPARATION OF POLYARYL ETHER KETONES

Gerhard Heinz, Weisenheim; Joergen Koch, Neuhofen; Manfred Eggersdorfer, Frankenthal, and Jochem Henkelmann, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

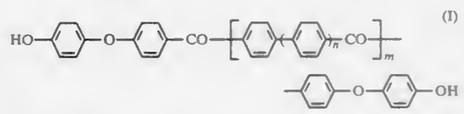
Filed Jan. 11, 1988, Ser. No. 141,726

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1987, 3700808

Int. Cl.[4] C08G *8/02, 14/00*

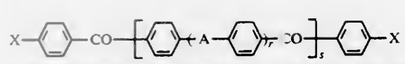
U.S. Cl. 528—125 **4 Claims**

1. A process for preparing a polyaryl ether ketone by reacting an aromatic dihydroxy compound with an aromatic dihalogen compound in a polar aprotic solvent in the presence of an alkali metal carbonate, which comprises reacting an aromatic dihydroxy compound of the formula I



(I)

or a ring-substituted C_1–C_8-alkyl, C_1–C_8-alkoxy, aryl, chlorine or fluorine derivative thereof, n and m each being 0 or 1, with an aromatic dihalogen compound of the formula II



(II)

or a ring-substituted C_1-C_8-alkyl, C_1-C_8-alkoxy, aryl, chlorine or fluorine derivative thereof, r and s each being 0 or 1, A being oxygen or a chemical bond and X being chlorine or fluorine.

4,837,297

PROCESS FOR THE HYDROLYTIC PREPARATION OF A PREPOLYMER AMIDE FROM A C_{12}-AMINOCARBOXYLIC ACID LACTAM

Klaus-Rudolf Meyer, Hattingen; Ingo Venn, Recklinghausen, and Ursula Mueller-Niescher, Marl, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jun. 5, 1987, Ser. No. 58,871

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1986, 3621804

Int. Cl.[4] C08G 69/14

U.S. Cl. 528—326 **9 Claims**

1. A process for the preparation of a prepolymer amide, comprising the steps of:

(1) hydrolytically polymerizing a lactam/water mixture of lauryl lactam at a steam pressure in the range of 45 to 100 bar, and at a temperature which is in the range from 260° C. to an upper limit which is defined by a boundary line defined by the following parameters:

340° C.—3.0 percent by weight of water,

325° C.—10.0 percent by weight of water,

310° C.—20.0 percent by weight of water,

300° C.—30.0 percent by weight of water; and

(ii) obtaining a prepolymer amide having a number average degree of polymerization of from 5 to 20.

4,837,298

CYCLIC IMIDES FROM SPIROBIINDANE DIAMINES AND METHODS OF PREPARATION

James A. Cella, Clifton Park, and Thomas L. Guggenheim, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 22, 1987, Ser. No. 64,650

Int. Cl.[4] C08G 63/02

U.S. Cl. 528—352 **14 Claims**

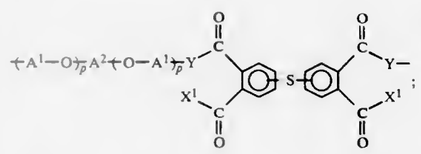
1. A method for preparing a composition comprising

(1) cyclic compounds of the formula

$$Z^1-(Z^2)_n, \qquad (I)$$

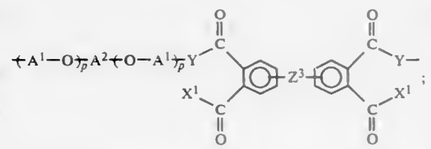
wherein:

Z^1 is



(II)

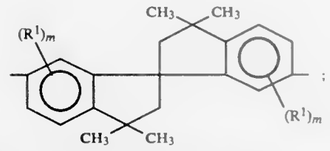
Z^2 is



(III)

A^1 is m- or p-phenylene;

A^2 is



(IV)

R^1 is C_{1-4} primary or secondary alkyl or halo;

Z^3 is a single bond, $-R^2-$, $-O-$, $-CO-$, $-SO_2-$, $-O-Q-O-$ or $-SO_2-Q-SO_2-$;

R^2 is a divalent aliphatic or alicyclic radical containing about 1-12 carbon atoms;

Q_1 is a divalent aliphatic or aromatic radical;

X^1 is OH and Y is NH, or X^1 and Y taken together are N;

m is from 0 to 3;

n is 0 or 1; and

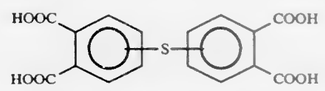
p is 0 or 1; and

(2) corresponding higher cyclic oligomers;

which comprises reacting a diamine of the formula

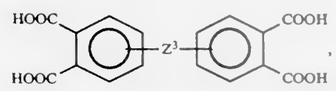
$$H_2N-A^1-O)_pA^2-O-A^1)_pNH_2 \qquad (VIII)$$

with a sulfur-containing tetracarboxylic acid of the formula



(IX)

or a mixture thereof with a second tetracarboxylic acid of the formula



(X)

or functional derivatives of said tetracarboxylic acids.

4,837,299

PROCESS FOR MAKING POLYIMIDES

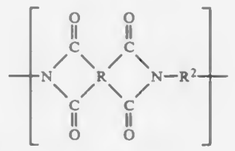
Edward N. Peters, Lenox, and Michael W. Schultz, Pittsfield, both of Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 31, 1986, Ser. No. 948,044

Int. Cl.[4] C08G 69/26

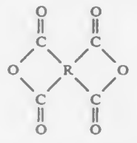
U.S. Cl. 528—353 **20 Claims**

1. A process for making a polyimide having repeating units of the formula



which comprises the steps of:

(a) reacting an aromatic dianhydride of the formula



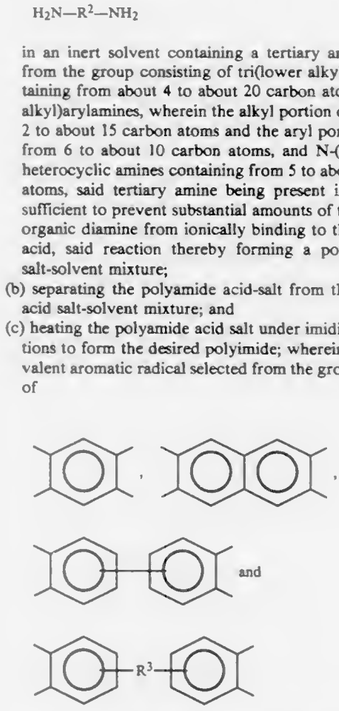
with a substantially equimolar amount of an organic diamine of the formula

$$H_2N-R^2-NH_2$$

in an inert solvent containing a tertiary amine selected from the group consisting of tri(lower alkyl)amines containing from about 4 to about 20 carbon atoms, di(lower alkyl)arylamines, wherein the alkyl portion contains from 2 to about 15 carbon atoms and the aryl portion contains from 6 to about 10 carbon atoms, and N-(lower alkyl)-heterocyclic amines containing from 5 to about 20 carbon atoms, said tertiary amine being present in an amount sufficient to prevent substantial amounts of the unreacted organic diamine from ionically binding to the polyamide acid, said reaction thereby forming a polyamide acid salt-solvent mixture;

(b) separating the polyamide acid-salt from the polyamide acid salt-solvent mixture; and

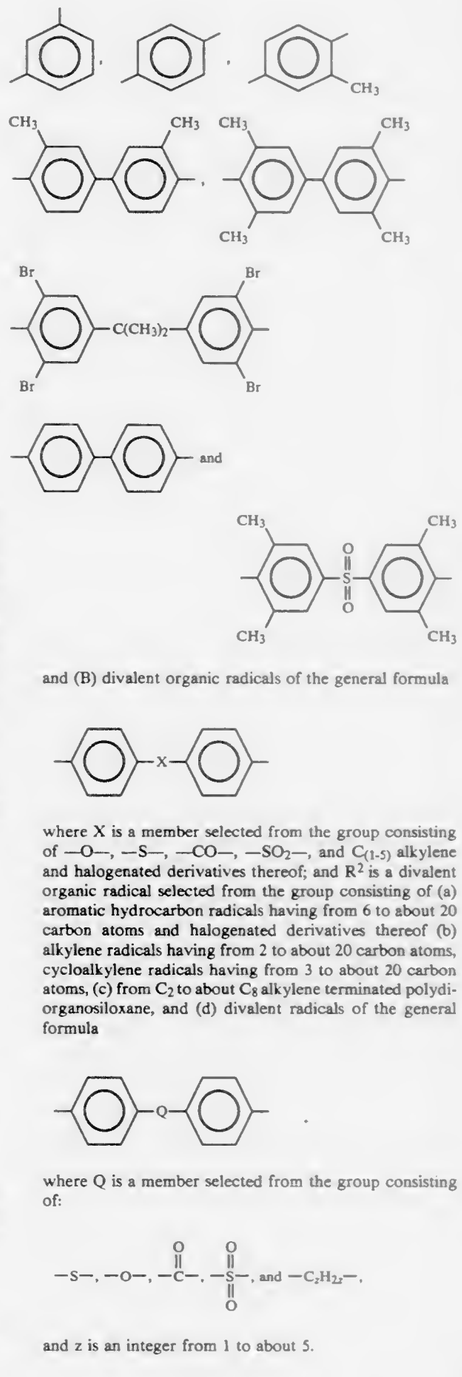
(c) heating the polyamide acid salt under imidization conditions to form the desired polyimide; wherein R is a tetravalent aromatic radical selected from the group consisting of



wherein R^3 is a member selected from the group consisting of —CO—, $-SO_2-$, $C_{(1-5)}$ alkylene and halogenated derivatives thereof, including perfluoroalkylene and divalent radicals of the formula

$$-O-Z-O-$$

wherein Z is a member selected from the group consisting of (A) divalent organic radicals of the formula:



and (B) divalent organic radicals of the general formula

where X is a member selected from the group consisting of —O—, —S—, —CO—, $-SO_2-$, and $C_{(1-5)}$ alkylene and halogenated derivatives thereof; and R^2 is a divalent organic radical selected from the group consisting of (a) aromatic hydrocarbon radicals having from 6 to about 20 carbon atoms and halogenated derivatives thereof (b) alkylene radicals having from 2 to about 20 carbon atoms, cycloalkylene radicals having from 3 to about 20 carbon atoms, (c) from C_2 to about C_8 alkylene terminated polydiorganosiloxane, and (d) divalent radicals of the general formula

where Q is a member selected from the group consisting of:

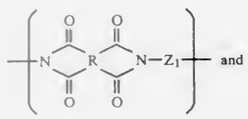
and z is an integer from 1 to about 5.

4,837,300
COPOLYIMIDE WITH A COMBINATION OF FLEXIBILIZING GROUPS

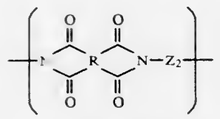
Terry L. St. Clair, Poquoson; Harold D. Burks, Newport News, and Donald J. Progar, Grafton, all of Va., assignors to The United States of America as represented by the Administration of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 740,901, Jun. 20, 1985, abandoned. This application Jul. 9, 1987, Ser. No. 71,686
Int. Cl.[4] C08G 73/10
U.S. Cl. 528—353 12 Claims

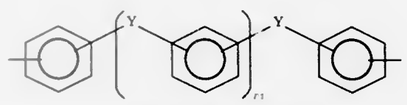
1. A copolyimide consisting essentially of chemically combined recurring units of the formula:



and

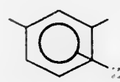


wherein R is the same or differs between said recurring units and is at least one aromatic tetravalent radical; and wherein Z_1 is of the formula:



where Y is selected from the group consisting of —O—, —S—, —CO—, $—SO_2—$, —NH—, —SO—,

$—C(CF_3)_2—$ and $—C(CH_3)_2—$, wherein R′ is alkyl or aryl and m is 0, 1, 2 or 3; and wherein Z_2 is of the formula



where Z is selected from the group consisting of alkyl, aryl, —Br, —Cl, —F, $—CF_3—$, and hydrogen.

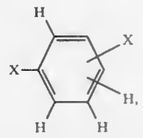
4,837,301
PROCESS FOR THE PREPARATION OF HIGH MOLECULAR WEIGHT OPTIONALLY BRANCHED POLYARYLENESULPHIDES

Volker Glock; Wolfgang Ebert, and Rolf-Volker Meyer, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 6, 1988, Ser. No. 142,186
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1987, 3701068
Int. Cl.[4] C08G 75/14
U.S. Cl. 528—388 6 Claims

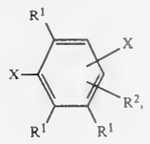
1. Process for the preparation of unbranched or branched polyarylene sulphide from

(a) 50–100 mol-% of aromatic dihalogen compounds corresponding to the following formula (I)



(I)

and 0–50 mol-% of aromatic dihalogen compounds corresponding to formula (II)



(II)

wherein

X denotes halogens in the m- or p-position to one another and

R^1 and R^2 are identical or different and denote hydrogen, C_1–C_4-alkyl, C_5–C_{10}-cycloalkyl, C_6–C_{10}-aryl, C_7–C_{10}-alkylaryl or C_7–C_{14}-arylalkyl or two groups R^1 in the ortho-position to one another are joined together to form an aromatic or heterocyclic ring containing up to three hetero atoms and one of the groups R^1 is in all cases different from hydrogen, and

(b) 0–5 mol-% based on the sum of aromatic dihalogen compounds of formulae I and II, of a trihalogen or tetrahalogen aromatic compound corresponding to formula (III)

$$ArX_n \quad \text{(III)},$$

wherein

Ar denotes an aromatic C_6–C_{14}-group or a heterocyclic group having 5 to 14 ring atoms and up to three ring carbon atoms replaced by hetero atoms

X denotes halogen and

n represents the number 3 or 4, and

(c) 50 to 100 mol-% of alkali metal sulphide, with or without small quantities of alkali metal hydroxides, and 0 to 50 mol-% of alkali metal bisulphide, in which the molar ratio of (a+b):c is in the range of from 0.75:1 to 1.25:1, with or without a reaction accelerator,

characterized in that at least one aromatic (thio)ether compound corresponding to the following formula (IV)

$$A—X—R \quad \text{(IV)}$$

wherein

X denotes O or S and

A denotes an aromatic or heterocyclic group having from 6 to 24 carbon atoms with up to 3 carbon atoms replaced by hetero atoms and

R denotes C_{1-18}alkyl or C_{7-19}-aralkyl, is added to the reaction mixture in quantites of 0.1 to 6 mol-%.

4,837,302
CROSS-LINKED RESIN FROM BIS(2-OXAZOLINE) AND AROMATIC COMPOUND CONTAINING TWO AMINO GROUPS

Yasuo Sano, Minoo, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 21, 1987, Ser. No. 111,513
Claims priority, application Japan, Nov. 4, 1986, 61-263390
Int. Cl.[4] C08G 73/00
U.S. Cl. 528—407 9 Claims

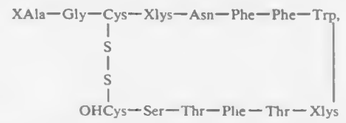
1. A cross-liniked resin which is prepared by the reaction of bis (2-oxazoline) compound with an aromatic compound having at least two amino groups, wherein the amount of said aromatic compound having at least two amino groups is about 1.25 mole or less relative to 1 mole of the bis (2-oxazoline) compound and the rection is carried out in the presence of an oxazoline ring opening catalyst.

4,837,303
NOVEL SOMATOSTATIN DERIVATIVES

Guenter Jung, Tuebingen, Fed. Rep. of Germany, assignor to Diamalt Aktiengesellschaft, Munich, Fed. Rep. of Germany

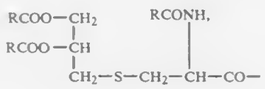
PCT No. PCT/DE86/00259, § 371 Date Feb. 25, 1987, § 102(e) Date Feb. 25, 1987, PCT Pub. No. WO87/00181, PCT Pub. Date Jan. 15, 1987
PCT Filed Jun. 20, 1986, Ser. No. 30,810
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1985, 3522638
Int. Cl.[4] C07K 7/26, 7/64; A61K 37/02
U.S. Cl. 530—311 6 Claims

1. A somatostatin derivative of the Formula I



(I)

wherein at least one X is a moiety, bound to the free amino group of alanine or lysine, of Formula II



(II)

wherein R is alkyl of 7–23 carbon atoms, and all X's are hydrogen or said moiety of Formula II.

4,837,304
INHIBITOR OF RIBONUCLEOTIDE REDUCTASE

Victor M. Garsky, Blue Bell, and Robert A. Stein, Rydal, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 22, 1987, Ser. No. 53,180
Int. Cl.[4] C07K 7/06; C12N 9/99; A61K 37/02
U.S. Cl. 530—328 5 Claims

1. A peptide having one of the following amino acid sequence:

A V V N dD L,

A V V dN D L,

A V dV N D L,

-continued

dA V V N D L,

Y A G A V V dN D L,

Y A G dA V V N D L,

Y A dA A V V N D L,

Y dA G A V V N D L or

dY A G A V V N D L

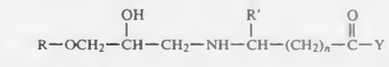
and the amides and physiologically acceptable salts thereof.

4,837,305
DERIVATIVES OF β-ADRENERGIC ANTAGONISTS

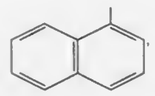
Murray Goodman; Debra Marr-Leisy, both of La Jolla; Roberto P. Rosenkranz, Menlo Park; Kenneth L. Melmon, Woodside, and Michael S. Verlander, Del Mar, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

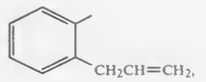
Continuation of Ser. No. 733,391, May 10, 1985, which is a continuation of Ser. No. 463,498, Feb. 3, 1983. This application Aug. 13, 1987, Ser. No. 85,517
Int. Cl.[4] C07K 5/00, 13/00; C07C 125/06
U.S. Cl. 530—345 12 Claims

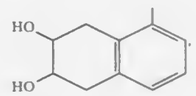
1. β-adrenergic antagonist compounds having the formula:

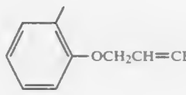


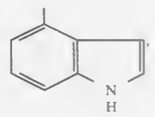
wherein R=an aryl or substituted aryl or heterocyclic or substituted heterocyclic moiety selected from the group consisting of:











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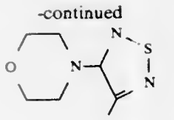
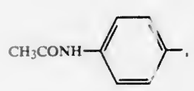
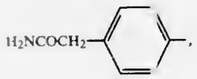
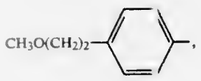
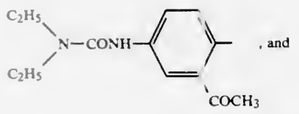


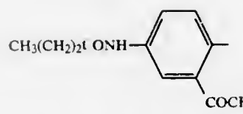








, and



R′=H, —CH_3, or short chain alkyl moiety; n is an integer between 1 and 15; and Y=—O—A—X, or —NH—A—X, where A—a linking functional group ng selected from alkyl, aryl or aralkyl, and X=carrier moiety selected from polypeptides, peptide hormones, proteins, or antibodies each having a molecular weight of between about 75 and 10,000 daltons wherein said carrier moiety in and of itself has essentially no biological activity.

4,837,306

METHOD FOR SELECTING HYBRIDOMAS PRODUCING ANTIBODIES SPECIFIC TO THE P-GLYCOPROTEIN CELL SURFACE ANTIGEN AND A CDNA CLONE ENCODING THE C-TERMINAL PORTION OF THE ANTIGEN

Victor Ling, Toronto, and Norbert Kartner, Ajax, both of Canada, assignors to The Ontario Cancer Institute, Toronto, Canada

Continuation-in-part of Ser. No. 705,361, Feb. 25, 1985, abandoned. This application Nov. 10, 1986, Ser. No. 930,390

Int. Cl.[4] **C07K** *15/14;* **G01N** *33/577*

U.S. Cl. 530—387 **6 Claims**

1. A monoclonal antibody specific for a conserved region located in the C-terminal portion of the P-glycoprotein cell surface antigen correlated with multidrug resistance in mammalian species, said C-terminal portion having about 239 amino acids; said antibody having cross-reactivity with P-glycoprotein cell surface antigens of different mammalian species; and said antibody being further defined by its ability to bind isolated plasma membranes of multidrug resistant cells and its inability to bind live cells; said monoclonal antibody being prepared by the process of (1) obtaining hybridomas derived by immortalizing antibody producing cells obtained from a mammal having been immunized with denatured plasma membranes obtained from mammalian cells derived from a tumor, tissue or cell line displaying multidrug resistance and (2) screening the hybridomas for production of antibody which binds isolated plasma membranes of multidrug resistant cells but does not bind live cells.

4,837,307

[1,1′-BIPHENYL]COMPOUNDS HAVING A 2,2′-(ALKYL)BRIDGE AND A 3-YL(SUBSTITUTED)METHYL SUBSTITUENT

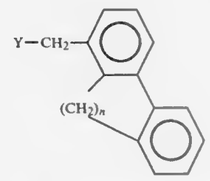
Ernest L. Plummer, Yardley, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 331,506, Dec. 17, 1981, Pat. No. 4,433,182, which is a division of Ser. No. 259,111, Apr. 30, 1981, abandoned. This application Jan. 16, 1984, Ser. No. 571,250

Int. Cl.[4] **C07C** *113/02, 143/72, 143/78, 87/30*

U.S. Cl. 534—563 **21 Claims**

1. A 2,2′-Bridged[1,1′-biphenyl]-3-ylmethyl compund of the formula



wherein n is 2–4, and Y is a leaving group readily displaced by carboxylate anions.

4,837,308

PROCESS FOR THE PREPARATION OF AZO COMPOUNDS

Rainer Gerlach, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

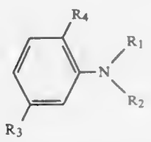
Continuation of Ser. No. 862,067, May 12, 1986, abandoned. This application Jan. 12, 1988, Ser. No. 143,428

Claims priority, application Fed. Rep. of Germany, May 14, 1985, 3517273

Int. Cl.[4] **C09B** *27/00*

U.S. Cl. 534—578 **7 Claims**

1. Process for the preparation of azo compounds by the oxidative coupling of aromatic or heteroaromatic hydrazines with aromatic amines of the formula



wherein

R_1 and R_2 denote H, unsubstituted alkyl or aralkyl or alkyl or aralkyl substituted by F, Cl, Br, OH, SO_3H, COOH, COO-alkyl or $CONH_2$and

R_3 denotes unsubstituted alkyl or aralkyl, or alkyl or aralkyl substituted by Cl, Br, F, alkyl, —CO—alkyl, OCO-alkyl, O—CO—O-alkyl, -(oxyalkylene)$_n$OH, —N^+(alkyl)$_n X^-$, —SO_3H, —COOH or CN; NH-acyl, —O—alkyl, —O—aryl, —$(OCH_2CH_2)_m$—OH, —OCO-alkyl, —OCO—O-alkyl, —NR′R″ (R′, R″=H or alkyl; m=1—100) or NH—SO_2-alkyl, and

R_4 denotes alkyl, F, Cl, Br, O-alkyl, or O-aryl, wherein the oxidation is carried out in the presence of redox mediators with a standard potential of 0.99–1.5 volts said redox mediators being elementary iodine or iodine-liberating compounds.

4,837,309

MONOHALO SUBSTITUTED TRIAZINYL MONOAZO DYESTUFFS FOR CELLULOSE-CONTAINING FIBERS

Toshio Niwa; Kiyoshi Himeno; Toshio Hihara, all of Yokohama; Yutaka Kurose, Kawasaki, and Yukiharu Shimizu, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

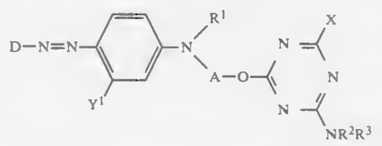
Filed Feb. 24, 1984, Ser. No. 583,233

Claims priority, application Japan, Mar. 16, 1983, 58-43793

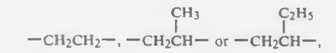
Int. Cl.[4] **C09B** *62/02, 62/03;* **D06P** *1/382*

U.S. Cl. 534—632 **9 Claims**

1. A monoazo dyestuff of the formula:



wherein D represents phenyl; phenyl substituted by fluorine, chlorine, bromine, methyl, ethyl, trifluoromethyl, methoxy, ethoxy, phenylazo, cyano, nitro, methylsulfonyl, ethylsulfonyl, arylsulfonyl, lower alkoxycarbonyl, lower alkoxyethoxycarbonyl, aryloxyethoxycarbonyl, mono-lower-alkylaminocarbonyl, di-lower-alkylaminocarbonyl, diallylaminocarbonyl, monoallylaminocarbonyl, dimethylaminosulfonyl, diethylaminosulfonyl, monomethylaminosulfonyl, monoethylaminosulfonyl, acetyl or phenyl; pyridyl; pyridyl substituted by chlorine, bromine, nitro, methyl, methylsulfonyl or cyano; thiazolyl; thiazolyl substituted by methyl, chlorine, bromine, nitro, lower alkoxycarbonyl, methoxyethoxycarbonyl, ethoxyethoxycarbonyl, trifluoromethyl or methylsulfonyl; 1,3,4-thiadiazolyl; 1,3,4-thiadiazolyl substituted by alkylthio, arylthio, alkenylthio, aralkylthio, bromine, chlorine, trifluoromethyl or alkylsulfonyl; 1,2,4-thiadiazolyl; 1,2,4-thiadiazolyl substituted by alkylthio, arylthio, alkenylthio, aralkylthio or alkoxycarbonyl; thienyl substituted by cyano, chlorine, bromine, acetyl, formyl, nitro, alkoxycarbonyl or sulfomethyl; benzoisothiazolyl; benzoisothiazolyl substituted by nitro, bromine, chlorine, acetyl or alkoxycarbonyl; pyridinoisothiazolyl substituted by cyano, methyl or nitro; thienoisothiazolyl; thienoisothiazolyl substituted by nitro, bromine, chlorine or cyano; thienothiazolyl; thienothiazolyl substituted by nitro, bromine, chlorine or cyano; thienothiazolyl; thienothiazolyl substituted by nitro bromine or chlorine; benzothiazolyl; or benzothiazolyl substituted by methyl, chlorine, bromine, nitro, lower alkoxycarbonyl, thiocyano, trifluoromethyl or methylsulfonyl; R^1 represents alkyl; substituted alkyl, cyclohexyl, alkenyl, aralkyl or substituted aralkyl; R^2 and R^3 each represent hydrogen, alkyl, alkyl substituted by a member selected from the group consisting of cyano, hydroxy, alkoxy and alkoxyalkoxy, alkenyl, cyclohexyl, aryl or aralkyl, or R^2 and R^3 together with the nitrogen atom represent a 5- or 6-membered nitrogen-containing heterocyclic ring selected from the group consisting of pyrrolidinyl, 3-methyl-1-pyrrolidinyl, 2-hydroxyethyl-1-pyrrolidinyl, 2,5-dimethyl-1-pyrrolidinyl, 3-thiazolidinyl, 1-pyrrolyl, 1-pyrazolyl, 1-imidazolyl, morpholino, piperidino, 2,6-dimethylpiperidino, 1-piperadinyl and 4-methyl-1-piperadinyl; A represents



X represents fluorine or chlorine; and Y^1 represents hydrogen, chlorine, methyl or acylamino selected from the group consisting of acetylamino, chloroacetylamino, benzoylamino, methylsulfonylamino, chloropropionylamino, ethoxycarbonylamino and ethylaminocarbonylamino.

4,837,310

RED OR BLUISH-RED FIBER-REACTIVE MONOAZO COMPOUND HAVING 7-SUBSTITUTED AMINO-1-NAPHTHOL-SULFONIC ACID AS COUPLING COMPONENT BETWEEN THE CHROMOPHORE AND FIBER REACTIVE PORTIONS OF THE COMPOUND

Toshihiko Morimitsu; Sadanobu Kikkawa, both of Minoo, and Takashi Omura, Ashiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

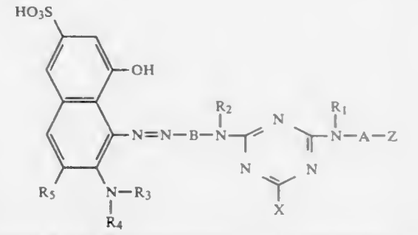
Filed Jan. 9, 1987, Ser. No. 1,852

Claims priority, application Japan, Jan. 16, 1986, 61-7696; Jan. 17, 1986, 61-8453

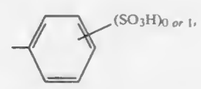
Int. Cl.[4] **C09B** *62/085, 62/51;* **D06P** *1/382, 1/384*

U.S. Cl. 534—638 **6 Claims**

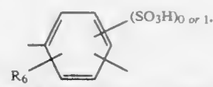
1. A monoazo compound of the following formula in a free acid form,



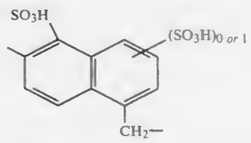
wherein R_1 and R_2 independently of one another denote hydrogen, lower alkyl unsubstituted or substituted with hydroxy, cyano, C_1–C_4 alkoxy, halogen, carboxy, carbamoyl, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, sulfo or sulfamoyl, R_3 denotes lower alkyl unsubstituted or substituted with hydroxy, cyano, C_1–C_4 alkoxy, halogen, carboxy, carbamoyl, C_1–C_4 alkoxy, halogen, carboxy, carbamoyl, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarnoyloxy, sulfo or sulfamoyl, acetyl, propionyl, butyl, valeryl, benzoyl, or a group of the formula



R denotes hydrogen, lower alkyl unsubstituted or substituted with hydroxy, cyano, C_1–C_4 alkoxy, halogen, carboxy, carbamoyl, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, sulfo or sulfamoyl, and R_5 denotes hydrogen or sulfo,



B denotes a group of the formula, in which R_6 is hydrogen, chlorine, sulfo, carboxyl, methyl, methoxy or ethoxy, or a group of the formula,



X denotes chlorine, fluorine, lower alkoxy, phenoxy, unsubstituted or substituted with C_1–C_4 alkyl, C_1–C_4 alkoxy, nitro, sulfo, carboxyl or chlorine, or a group of formula

in which R_7 and R_8 independently of one another are hydrogen, lower alkyl unsubstituted or substituted with C_1–C_4 alkoxy, sulfo, carboxyl, hydroxy, chlorine, phenyl, or sulfate; phenyl unsubstituted or substituted with C_1–C_4 alkyl, C_1–C_4 alkoxy, sulfo, carboxy or chlorine; naphthyl unsubstituted or substituted with hydroxy, carboxy, sulfo, C_1–C_4 alkyl, C_1–C_4 alkoxy or chlorine; or benzyl unsubstituted or substituted with C_1–C_4 alkyl, C_1–C_4 alkoxy, sulfo chlorine; A denotes phenylene unsubstituted or substituted with methyl, ethyl, methoxy, ethoxy, chlorine, bromine or sulfo or naphthylene unsubstituted or substituted with sulfo, and Z denotes a group of the formula, $-SO_2CH=CH_2$ or $-SO_2CH_2CH_2Y$, in which Y is a group splittable by the action of an alkali.--

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4,837,311

ANTI-RETROVIRAL COMPOUNDS

Steve Tam, West Caldwell; Manfred Weigele, North Caldwell, both of N.J.; Samuel Broger, Bethesda, and Hiroaki Mitsuya, Rockville, both of Md., assignors to Hoffman-La Roche Inc., Nutley, N.J. and United States of America, Washington, D.C.

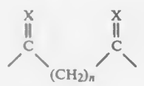
Filed Jun. 22, 1987, Ser. No. 64,631
Int. Cl.[4] A61K *31/70, 9/00, 9/22*
U.S. Cl. 536—22 41 Claims

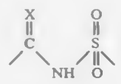
1. A compound of formula

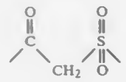
A— B— C

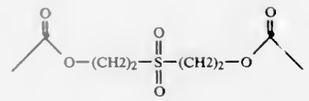
wherein A and C are each independently dideoxynucleoside radicals and B is a linking group represented by the formula

(a)









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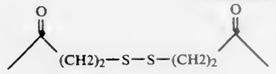
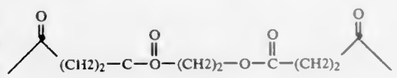
(h)



(i)



with X=O or S and n=2–6 and B is attached to A at the 4 amino or the 5′ hydroxy position of A; and C is attached to B at the 4 amino or 5′ hydroxy position of C.

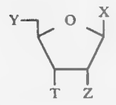
4,837,312

CHELATOR-FUNCTIONALIZED NUCLEOSIDES AND NUCLEOTIDES AND METHODS FOR MAKING SAME

Peter B. Dervan, South Pasadena, and Geoffrey B. Dreyer, Pasadena, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

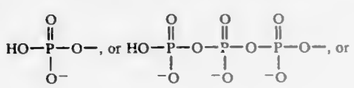
Filed Jan. 25, 1985, Ser. No. 695,214
The portion of the term of this patent subsequent to Jan. 3, 2006, has been disclaimed.
Int. Cl.[4] C07H *21/00, 19/00, 17/00, 15/12*
U.S. Cl. 536—27 8 Claims

1. A compound of structure:

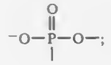


where Z is hydrogen or hydroxy; Y is NHR_1, W where w is a hydroxyl protecting group or

(b)



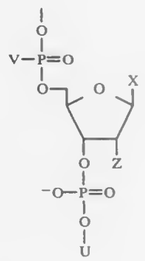
(c)



(d)

T is hydrogen or hydroxyl or

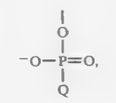
(e)



(f)

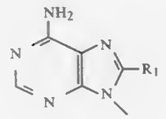
(g)

where
Q is OR_1, R_1 or NHR_1, or

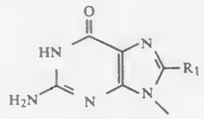


where V is OR_1, R_1 or NHR_1 and where U is a polyribonucleotide or polydeoxyribonucleotide sequence;
and where X is a nucleoside base selected from the group consisting of

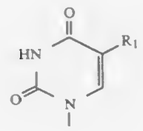
(a)



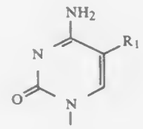
(b)

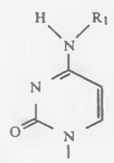


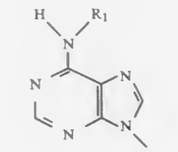
(c)

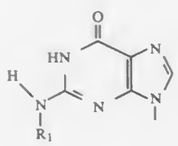


(d)



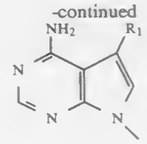






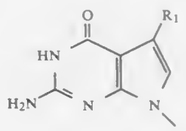
-continued

(h)

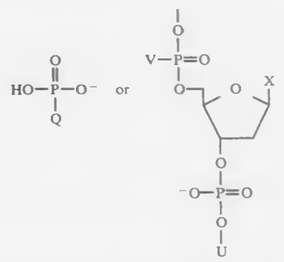


and

(i)



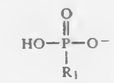
where R_1 is a thethered metal chelator said metal capable of reducing dioxygen; provided, however, that when Y is



or NHR_1, X is a nucleoside base selected from the group consisting of tethered metal chelator functionalized nucleoside bases guanine, adenine, cytosine, uracil and thymine, provided that when X is thymine, T is hydrogen; and provided that when T is

(d)

(e)



X is a nucleoside base selected from the group consisting of tethered metal chelator functionalized nucleoside bases guanine, adenine, cytosine, uracil and thymine.

4,837,313

(f) **POLYGALACTOSAMINE PF-192 AND SALTS THEREOF**

Jun-ichi Tamura, and Hiroaki Takagi, both of Chiba, Japan, assignors to Higeta Shoyu Co., Ltd., Tokyo, Japan

Filed Feb. 2, 1987, Ser. No. 10,305
Claims priority, application Japan, Jun. 12, 1986, 61-134799
Int. Cl.[4] C07H *5/04, 5/06;* C12R *1/79;* C08B *37/00*
U.S. Cl. 536—55.1 2 Claims

1. An essentially pure polygalactosamine having the following physicochemical properties:

(g) (1) a hydrochloride which can flocculate fine suspended matters when only a very small amount of said hydrochloride is added to said fine suspended matter;
(2) a hydrochloride having a stable flocculation activity within the range of pH 2 to 9;
(3) a hydrochloride having a flocculation activity within the range of 0° to 100° C.;
(4) a hydrochloride having a flocculation activity which is

inhibitied by carbonic acid and $Fe_2(SO_4)_3$, but is unaffected by other ions, neither NaCl nor K_2SO_4 inhibiting flocculation up to a concentration of 1 M;
(5) an elemental analysis as follows:
N: 8.64%
C: 42.80% and
H: 6.87%; and
a general formula: $(C_6H_{11}NO_4.xH_2O)_n$, where x indicates the degree of hydration and n indicates the degree of polymerization;
(6) a hydrochloride having an ultraviolet absorption spectrum as shown in FIG. 1;
(7) an infrared absorption spectrum as shown in FIG. 2;
(8) a hydrochloride which exhibits the following color reactions:
ninhydrin reaction: +,
xanthoprotein reaction: −,
Ehrlich reaction: −,
Molisch reaction: −,
phenol sulfate reaction: ± and
Le Rosen test: −;
(9) the production of only galactosamine as saccharide upon hydrolysis of said polygalactosamine without the generation of detectable neutral saccharides or amino acids, a measurement of specific rotatory power, periodate oxidation, and Smith's decomposition treatment producing results typical of an alpha 1-4 main linkage;
(10) an isoelectric point (pI) of 8.5 as confirmed by density-gradient isoelectric focusing;
(11) a pale yellow color;
(12) a pH value of 7.5 when suspended in water at a concentration of 0.5% w/v (pH value of deionized water being 5.8);
(13) solubility as follows:
hardly soluble in hot water;
hardly soluble in cold water;
highly soluble in a diluted acid;
hardly soluble in a diluted alkali;
insoluble in alcohols, acetone, chloroform, benzene and n-pentane:
(14) an average molecular weight of 100,000 to 300,000; and salt(s) thereof.

4,837,314

ETHERIFIED AND ESTERIFIED STARCH DERIVATIVES AND PROCESSES FOR PREPARING SAME

James E. Eastman, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Jun. 19, 1987, Ser. No. 65,036
Int. Cl.[4] C08B *31/08, 31/02*
U.S. Cl. 536—111 **20 Claims**

1. A cold water soluble etherified or esterified starch derivative having an average degree of ether or ester substitution of from about 0.05 to about 1 per anhydroglucose unit and which has a Brookfield Model RVF viscosity at 20 rpm of less than 15,000 cps when tested in the form of a 10 weight percent starch derivative solids aqueous solution at 25° and which forms a transparent film when dried from an aqueous solution thereof.

4,837,315

PROCESS FOR SEPARATING GLUCOSE AND MANNOSE WITH CA/NH4 - EXCHANGED ION EXCHANGE RESINS

Santi Kulprathipanja, Hoffman Estates, Ill., assignor to UOP, Des Plaines, Ill.

Filed Jun. 22, 1987, Ser. No. 64,642
Int. Cl.[4] C07H *1/06;* **C13K** *13/00*
U.S. Cl. 536—127 **5 Claims**

1. A process for separating mannose from a mixture of glucose and mannose which comprises contacting said mixture at a temperature of from 20° C. to 200° C and a pressure sufficient to maintain liquid phase, with an adsorbent comprising a partial calcium and partial ammonium salt of a sulfonated polystyrene polymer, crosslinked with divinylbenzene, selectively adsorbing said mannose, removing the nonadsorbed portion of said mixture from contact with said adsorbent, thereby recovering high purity glucose and desorbent and separating said mannose by desorption with a desorbent comprising water at a temperature of from 20° C. to 200° C. and a pressure sufficient to maintain liquid phase.

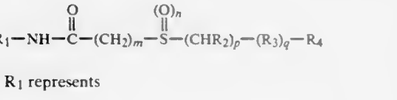
4,837,316

ALKYLAMIDE DERIVATIVES WITH H_2-RECEPTOR ANTAGONISTIC AND CYTOPROTECTIVE ACTION

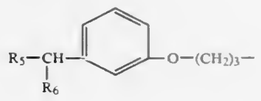
Yasuo Sekine, Yokohama; Nobubiro Hirakawa, Tokyo; Noriaki Kashiwaba, Kawasaki; Tetsuaki Yamaura, Niiza; Hisako Harada, Hino; Teruo Kutsuma, Inagi; Hajime Matsumoto; Akibiro Sekine, both of Hino, and Yoshikazu Isowa, Tokyo, all of Japan, assignors to Fujirebio Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1986, Ser. No. 900,752
Claims priority, application Japan, Aug. 29, 1985, 60-190469; Dec. 27, 1985, 60-292795; Dec. 27, 1985, 60-292797; Jan. 21, 1986, 61-008864; Jan. 25, 1986, 61-013025; Jan. 29, 1986, 61-015578; Apr. 28, 1986, 61-096999
Int. Cl.[4] C07D *405/12;* **A61K** *31/33*
U.S. Cl. 546—214 **11 Claims**

1. A compound of the formula



in which R_1 represents



wherein
R_5 represents piperidino, 2 methylpiperidino, 3-methylpiperidino, 4-methylpiperidino, dimethylamino, 1-pyrrolidinyl or 1-perhydro-azepinyl and R_6 represents hydrogen or methyl,
m represents an integer from 1 to 5 inclusive,
n represents zero or an integer from 1 to 2 inclusive,
R_2 represents hydrogen, alkyl having 1 to 3 carbon atoms or phenyl,
p represents zero or one,
R_3 represents a saturated or unsaturated chain hydrocarbon residue having 1 to 4 carbon atoms,
q represents zero or one,
R_4 represents a phenyl group or a phenyl group substituted with an alkyl group or alkoxy group having 1 to 3 carbon atoms, a methoxy carbonyl group, a carboxyl group, a cyano group, a halogen atom, a benzothiazolyl group, nitro, two of said alkoxy groups, acetoxy, hydroxyl, methylenedioxy, acetamide, or trifluoromethyl,
a pyridyl group or a pyridyl group substituted which may have 1 or 2 substituents which may be alkyl having 1 to 3 carbon atoms, halogen atoms, cyano groups, alkoxy groups having 1 to 3 carbon atoms, aminoalkyl in which the alkyl moiety has 1 or 2 carbon atoms and the amino moiety is a secondary amino group, nitro, carbomethoxy, carboxyl or acetoxy, a furyl group or a furyl group substituted by cyano, methoxycarbonyl, carboxyl, methyl, piperidino methyl or dimethylamino methyl,
a thienyl group or a substituted thienyl group which may have an alkyl group having 1 to 3 carbon atoms, a halogen atom, a methoxy carbonyl group, an ethoxy carbonyl group or an

amide group or a pharmaceutically acceptable acid addition salt of any of the above compounds.

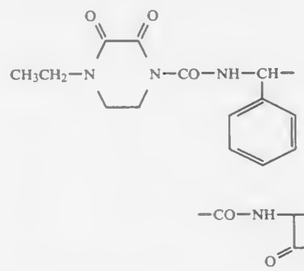
4,837,317

PROCESS FOR THE PREPARATION OF 6-[D(−)ALPHA-(4-ETHYL-2,3-DIOXOPIPERAZIN-1-YLCARBONYLAMINO)-ALPHA-PHENYLACETAMIDO]-PENICILLANIC ACID AND INTERMEDIATES USEFUL IN THIS PROCESS

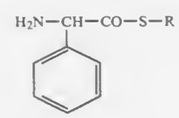
Luigi Ratti, Bergamo, Italy, assignor to Biochimica Opos S.p.A., Milan, Italy

Filed Oct. 5, 1987, Ser. No. 105,097
Claims priority, application Italy, Oct. 6, 1986, 21913 A/86
Int. Cl.[4] C07D *499/12, 417/10, 277/68*
U.S. Cl. 540—316 **8 Claims**

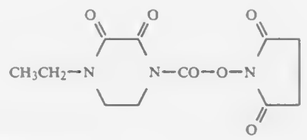
1. A process for the preparation of 6-8 D-(-)-alpha-4-(ethyl-2,3-dioxopiperazin-1-ylcarbonylamino)-alpha-phenylacetamido]penicillanic acid of formula:



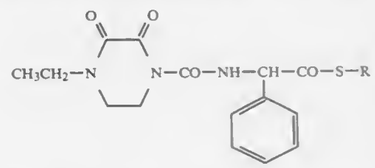
and of the pharmaceutically acceptable salts thereof, characterized in that:
(a) a functional derivative of D(-)-phenylglycine is reacted in an organic solvent with a mercaptoheterocycle of formula R—SH (II), wherein R—SH is a mercaptobenzothiazole;
(b) the thioester of D(-)-phenylglycine thus obtained having formula:



wherein R is a benzothiazolyl group, is reacted with N-(4-ethyl-2,3-dioxopiperazin-1-ylcarbonyloxy) succinimide having the formula:



in an organic solvent;
(c) the thioester of D(-)alpha-(4-ethyl-2,3-dioxopiperzin-1-ylcarbonylamino)-alpha-phenylacetic acid of formula:



wherein R is as defined above, is reacted with 6-aminopenicillanic acid or a salt thereof in an organic solvent at a temperature of between −40° C. and −5° C.; and if necessary the thus obtained product is converted into a pharmaceutically acceptable salt thereof.

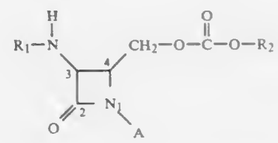
4,837,318

CARBONATE SUBSTITUTED MONOBACTAMS AS ANTIBIOTICS

Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 732,465, May 9, 1985, abandoned. This application Feb. 6, 1987, Ser. No. 29,507
Int. Cl.[4] C07D *205/08, 417, 12;* **A61K** *31/395, 31/425*
U.S. Cl. 540—355 **8 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein:
R_1 is an acyl group derived from a carboxylic acid;
A is sulfo;
R_2 is selected from the group consisting of:
a. $(C_1–C_8)$alkyl;
b. $(C_2–C_8)$alkenyl;
c. $(C_3–C_8)$alkynyl;
d. $(C_3–C_8)$cycloalkyl;
e. $(C_6–C_8)$aryl;
f. $(C_6–C_{12})$aralkyl;
g. heterocyclic radicals selected from the group consisting of 2- or 3-pyrrolyl, 2- or 3-furyl, 2- or 3-thienyl, 2- or 3-pyrrolidinyl, 2-, 3- or 4-pyridyl, N-oxido-2-, 3- or 4-pyridyl, 2-, 3-or 4-piperidinyl, 2-, 3- or 4-pyranyl, 2-, 3- or 4-thiopyranyl, pyrazinyl, 2-, 4- or 5-thiazolyl, 2-, 4- or 5-oxazolyl, 3-, 4- or 5-isothiazolyl, 3-, 4- or 5-isoxazolyl, 2-, 4- or 5-imidazolyl, 3-, 4- or 5-pyrazolyl, 3- or 4-pyridazinyl, 2-, 4- or 5-pyrimidinyl, piperazinyl, 4- or 5-(1,2,3-thiadiazolyl), 3- or 5-(1,2,4-thiadiazolyl), 1,3,4-thiadiazolyl, 1,2,5-thiadiazolyl, 4- or 5-(1,2,3-oxadiazolyl), 3- or 5-(1,2,4-oxadiazolyl), 1,3,4-oxadiazolyl, 1,2,5-oxadiazolyl, 1,2,3- or 1,2,4-triazolyl, 1H- or 2H-tetrazolyl, pyrido(2,3-d)pyrimidyl, benzopyranyl, 1,8-, 1,5-,

1,6-, 1,7-, 2,7- or 2,6-naphthyridyl, quinolyl, and thieno(2,3-b)pyridyl;

where each member of (a) through (g) may be substituted by 1 to 4 substituents selected from the group consisting of methoxy, hydroxy, halogen, nitro, and $N(R_{10})(R_{11})$ wherein R_{10} is hydrogen or alkyl (C_1–C_4) and R_{11} is hydrogen, alkyl (C_1–C_4) or alkoxy (C_1–C_4) provided that when R_{11} is alkoxy, R_{10} must be hydrogen; and

h. $(CH_2)_nCH_2X$ where n is 1 to 4 and X is $—OR_3$ where R_3 is selected from the group consisting of (C_2–C_4) alkyl, (C_2–C_3) alkoxyalkyl and (C_2–C_4) alkylcarbonyl or X is (C_2–C_4) alkylcarbonylamino.

4,837,319

1-SUBSTITUTED ALKYL-1,2-DIHYDRO-2-PYRAZINONE DERIVATIVES

Masao Yaso; Yukio Suzuki; Kensuke Shibata, and Eiichi Hayashi, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

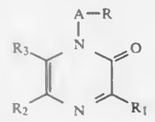
Filed Feb. 25, 1987, Ser. No. 20,012

Claims priority, application Japan, Feb. 25, 1986, 61-38210

Int. Cl.[4] **C07D** *403/06, 403/14, 401/06, 403/12*

U.S. Cl. 544—120 **10 Claims**

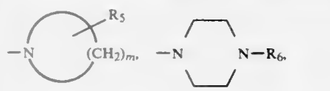
1. A compound of the formula

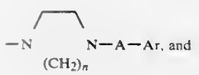


wherein

A is lower alkylene R_1 is selected from the group consisting of alkyl, phenyl-lower alkyl, and substituted phenyl-lower alkyl; R_2 and R_3 are each lower alkyl;

and R is selected from the group consisting of 1-methyltetrazole-5-yl-thio, 1-imidazolyl, morpholino,





in which R_5 is hydrogen, lower alkyl or aryl, R^6 is hydrogen, lower alkyl, hydroxy-lower alkyl, aryl aryl-lower alkanoyl, arylcarbonyl, arylsulfonyl or thienyl-lower alkanoyl, Ar is phenyl or phenyl substituted with C_{1-3} alkyl, halogen, nitro, or lower alkoxy, A, R_1, R_2 and R_3 are as defined above, m is an integer from 4–6, and n is 2 or 3;

and pharmaceutically acceptable salts thereof.

4,837,320

ONE-AMINE-2-SULPHO-4-[(4-HALO-6-AMINO TRIAZINYL-2)AMINOCYCLOHEXYLAMINO]ANTHRAQUINONE REACTIVE DYESTUFFS

Wolfgang Harms; Klaus Wunderlich, both of Leverkusen, and Klaus von Oertzen, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

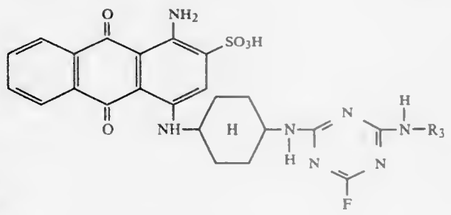
Continuation of Ser. No. 592,686, Mar. 23, 1984, abandoned, which is a continuation of Ser. No. 418,158, Sep. 15, 1982, abandoned, which is a continuation of Ser. No. 848,295, Nov. 3, 1977, abandoned. This application Jan. 16, 1985, Ser. No. 691,992

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1976, 2652119

Int. Cl.[4] **C09B** *62/004, 62/024, 62/06;* **D06P** *1/382*

U.S. Cl. 544—189 **3 Claims**

1. A dyestuff of the formula



wherein

R_3 = phenyl substituted with sulpho.

4,837,321

PROCESS FOR THE PREPARATION OF POLYISOCYANATES CONTAINING ISOCYANURATE GROUPS

Dimitrios Kcrimis, Cologne, and Hanns P. Müller, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Dec. 4, 1986, Ser. No. 937,952

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1985, 3543925

Int. Cl.[4] **C07D** *251/34*

U.S. Cl. 544—193 **9 Claims**

1. A process for the preparation of an isocyanurate group-containing polyisocyanate which comprises trimerizing a portion of the isocyanate groups of an organic polyisocyanate in the presence of a trimerization catalyst which comprises a quaternary phosphonium salt of a tertiary phosphine and an alkylating ester of an acid of phosphorous and subsequently terminating the trimerization reaction by the addition of the catalyst poison.

4,837,322

MIXTURES OF SULFUROUS TRIAZINE COMPOUNDS

Ulrich Deschler, Hanau; Georg Hellwig, Gründau; Rudolf Michel, Freigericht; Peter Kleinschmit, Hanau, and Siegfried Wolff, Bornheim, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

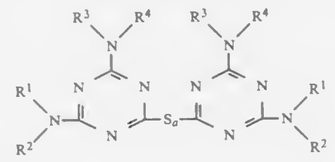
Filed Aug. 27, 1987, Ser. No. 89,895

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1986, 3630055

Int. Cl.[4] **C07D** *403/12, 403/14*

U.S. Cl. 544—209 **4 Claims**

1. A method of preparing mixtures of sulfurous triazine compounds of the formula



I

in which:

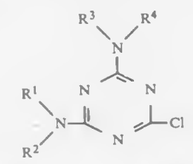
R^1 is hydrogen, R^2 is selected from the group consisting of hydrogen, benzyl, C_1–C_8-alkyl, allyl, C_3–C_8 cycloalkyl, the latter unsubstituted or substituted with 1–3 methyl groups, 2-hydroxethyl 2-hydroxypropyl and 3-hydroxypropyl,

R^3 and R^4 are C_1–C_8- alkyl, allyl, C_3–C_8 cycloalkyl, the latter unsubstituted or substituted with 1–3 methyl groups, 2-hydroxethyl, 3-hydroxypropyl or 2-hydroxypropyl or R^3 and R^4 (together) may be C_4–C_6-alkylene or $—(CH_2X)_2Y$ where

X is H or CH_3 and Y is O or S

S_a is a polysulfide chain with 2–10 S atoms (i.e. $2 \leqq a \leqq 10$), in which the individual polysulfides are present in such proportions that the statistical average value of "a" is a whole or fractional numerical value in the range from 2 to 5

which method comprises reacting a triazine compound of the formula



I

in which R^1, R^2, R^3, R^4 have the meanings indicated above, with a compound of the formula

Me_2S_a III

dissolved in a protic polar solvent in which Me signifies the ammonium cation or an alkali cation, and a corresponds to the statistical average with $2 \leqq a \leqq 5$ in a molar ratio of 2:1 to 2:1.1 at temperature of 80° to 140° C. and separating the product from the accumulating reaction mixture.

4,837,323

CORROSION INHIBITORS

Robert G. Martinez; Duane S. Treybig, both of Lake Jackson, and Terry W. Glass, Richwood, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 843,521, Mar. 24, 1986, abandoned, which is a continuation-in-part of Ser. No. 691,329, Jan. 14, 1985, abandoned. This application May 13, 1987, Ser. No. 49,629

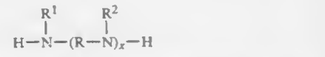
Int. Cl.[4] **C07D** *239/04, 233/02*

U.S. Cl. 544—242 **12 Claims**

1. A new composition of matter which comprises the product resulting from thermally treating, at a temperature of from about 190° C. to about 350° C. for from about 10 minutes to about 48 hours, the product resulting from reacting, in the presence or absence of a suitable solvent,

(A) acrolein, crotonaldehyde or a combination thereof; and

(B) at least one organic polyamine represented by the formula



wherein R is a divalent saturated C_2 to C_4 aliphatic hydrocarbon group; each R^1 and R^2 is independently hydrogen or a saturated alkyl amino or an alkyloxy group containing from 2 to about 4 carbon atoms or when two adjacent R^2 groups are taken together, they form a bridging alkylene radical containing 2 carbon atoms such that the R group containing 2 carbon atoms and two adjacent R^2 groups and two nitrogen atoms form a heterocyclic ring containing 4 carbon atoms and 2 nitrogen atoms; x has a value from 1 to about 8; and

wherein components (A) and (B) are employed in a mole ratio of (A) to (B) of from about 1:1 to about 1:6.

4,837,324

PROCESS FOR THE REACTION OF PIPERAZINE, AND DERIVATIVES THEREOF, WITH GLYOXAL, AND DERIVATIVES THEREOF

Duane S. Treybig, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

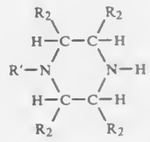
Division of Ser. No. 749,697, Jun. 28, 1985, Pat. No. 4,761,476. This application Jul. 8, 1987, Ser. No. 70,981

Int. Cl.[4] **C07D** *295/08, 295/10*

U.S. Cl. 544—357 **11 Claims**

1. A process for preparing 1,2-bis (piperazinyl) ethanediol and 2-hydroxy-1-(1-piperazinyl) ethanone or derivative products thereof wherein alkyl, non-heterocyclic aryl, or non-heterocyclic aralkyl groups are substituted for one of the hydrogen moieties on each carbon atom which comprises:

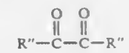
reacting from 0.5 to 10 moles of:



(A)

where R is hydrogen; C_1 of C_{10} alkyl; non-heterocyclic aryl or non-heterocyclic aralkyl; and

R' is hydrogen or C_1 to C_{20} alkyl; either with no solvent or in a solvent, but without sodium carbonate or bicarbonate, with 1.0 mole of:



(B)

where R" is hydrogen or C_1 of C_4 alkyl to produce 1,2-bis(piperazinyl) ethanediol or 2-hydroxy-1-(1-piperazinyl) ethanone or derivative products thereof where alkyl, nonheterocyclic aryl, or non-heterocyclic aralkyl groups are substituted for the hydrogen moieties.

4,837,325

BETA-CARBOLINE H_1-RECEPTOR ANTAGONISTS

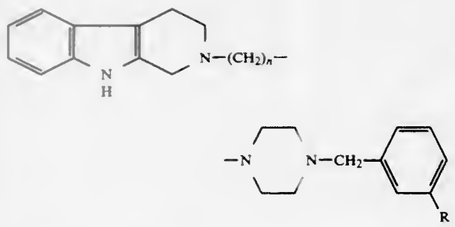
Magid A. Abou-Gharbia, Wilmington, Del., assignor to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 19,089, Feb. 26, 1987, Pat. No. 4,766,124. This application Apr. 8, 1988, Ser. No. 179,105

Int. Cl.[4] **C07D** *401/14*

U.S. Cl. 544—372 **3 Claims**

1. A compound of the formula:



in which
R is halo or trifluoromethyl;
n is one of the integers 2, 3 or 4;
or a pharmaceutically acceptable salt thereof.

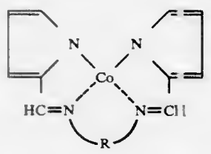
4,837,326
COBALT (II) COMPLEX CATALYST FOR POLYMERIZATION OF MONOMERS

Ju-Chui Lin, Strongsville, and Kirk J. Abbey, Seville, both of Ohio, assignors to The Glidden Company, Cleveland, Ohio

Division of Ser. No. 865,555, May 21, 1986, Pat. No. 4,680,354. This application May 1, 1987, Ser. No. 45,486
Int. Cl.[4] C07F *15/06*; C08F *4/80*
U.S. Cl. 546—12 **7 Claims**

1. A metal catalyst combination for free-radical copolymerization of ethylenically unsaturated monomers, the metal catalyst combination comprising:

a Cobalt (II) complex of a nitrilomethylidyne dipyrrole and a ligand selected from amine, pyridine, or triphenylphosphine, where the Cobalt (II) nitrilomethylidyne dipyrrole has the structure:



where R is a diradical selected from trimethylene bis-, o-phenylenebis-, or ethylenebis-.

4,837,327
PROCESS FOR NUCLEOPHILIC FLUOROALKYLATION OF ALDEHYDES

G. Patrick Stahly, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jul. 13, 1987, Ser. No. 72,629
Int. Cl.[4] C07D *215/36, 213/28, 209/36, 209/04*
U.S. Cl. 546—24 **10 Claims**

1. A process which comprises reacting under phase transfer condition an aryl difluoromethyl sulfone with an aldehyde co-reactive therewith so that there is produced a substituted alcohol of the formula

$$RCH(OH)CF_2SO_2Ar$$

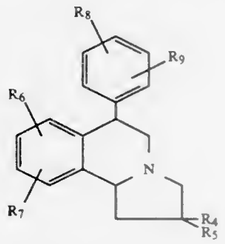
wherein R is an aryl, cycloaliphatic, secondary or tertiary aliphatic or heterocyclic group, and Ar is an aryl group.

4,837,328
STEREOSELECTIVE REACTION FOR HEXAHYDRO-6-ARYLPYRROLO(2,1-A) ISOQUINOLINES

Bruce E. Maryanoff; Cynthia A. Maryanoff, both of Solebury Township, Bucks County; David F. McComsey, Warminster, and Kirk L. Sorgi, Norristown, all of Pa., assignors to McNeilab, Inc., Spring House, Pa.

Filed Feb. 16, 1988, Ser. No. 156,063
Int. Cl.[4] C07D *455/00*
U.S. Cl. 546—94 **16 Claims**

1. A process for producing an amine of the following formula (I):

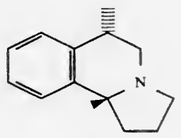


(I)

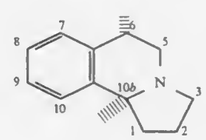
wherein

R_4 and R_5 are the same and both are hydrogen, or different and each is selected from the group of hydrogen or lower alkyl;

R_6 and R_7 are the same or different and each is selected from the group hydrogen, lower alkyl, lower alkoxy, hydroxy, or halogen, or else are taken together as methylenedioxy; and R_8 and R_9 are selected from the group hydrogen, lower alkyl perfluoro(lower)alkyl, lower alkoxy, carb-(lower)alkoxy, lower alkylthio, lower alkylsulfonyl, nitro, or halogen; with a ratio of the following general diastereomeric formulae (II):(III) of at least about 1:1:

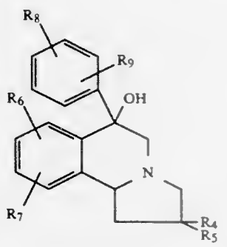


(II)



(III)

which comprises reducing an aminoalcohol or an acid-addition salt thereof of the following formula (VII):



(VII)

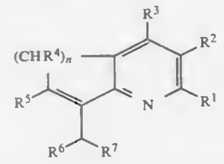
with a reducing agent in the presence of a strong acid to yield the amine (I).

4,837,329
QUINOLINE DERIVATIVES

Roger Crossley, Reading, and Kenneth Heatherington, Burnham, both of England, assignors to American Home Products Corporation, New York, N.Y.

Filed Jan. 18, 1984, Ser. No. 571,972
Claims priority, application United Kingdom, Jan. 19, 1983, 8301377
Int. Cl.[4] C07D *215/04*
U.S. Cl. 546—181 **4 Claims**

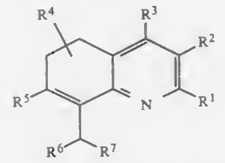
1. A dihydro compound of formula I



I

and acid addition salts thereof, wherein R^1, R^2, R^3, R^4, R^5, R^6 and R^7 are the same or different and represent hydrogen, or lower alkyl, cycloalkyl, loweraralkyl, or phenyl radicals any of which radicals may be substituted by lower alkyl, lower alkoxy or $-CF_3$, or R^1 and R^2 taken together or R^2 and R^3 taken together, form a 5, 6 or 7 membered saturated ring R^4 and R^5 may also represent loweralkoxy, or cycloalkoxy, n is 1, 2 or 3 and, if more than one R^4 radical is present the R^4 radicals may be the same or different and R^6 and R^7 represent loweralkyl, cycloalkyl, or loweraralkyl radicals with the proviso that R^6 and R^7 are not both hydrogen when R^1, R^2, R^3, R^4 and R^5 are all hydrogen.

4. A dihydro compound of formula I



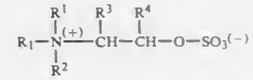
and pharmaceutically acceptable acid addition salts thereof, wherein R^1, R^2, R^3, R^4, R^5, R^6 and R^7 are the same or different and represent hydrogen, or lower alkyl, cycloalkyl, loweraralkyl, or phenyl radicals any of which radicals may be substituted by lower alkyl, lower alkoxy or trifluoromethyl, or R^1 and R^2 taken together or R^2 and R^3 taken together, form a 5, 6 or 7 membered saturated ring, R^4 and R^5 may also represent loweralkoxy, or cycloalkoxy, and, if more than one R^4 radical is present the R^4 radicals may be the same or different, with the provisos that (1) R^6 and R^7 are not both hydrogen when R, R^2, R^3, R^4 and R^5 are all hydrogen and (2) when R^2, R^3, R^4 and R^5 are all hydrogen and R^6 and R^7 are selected from hydrogen and loweralkyl, then R^1 is other than loweralkyl.

4,837,330
PREPARATION OF SULFATOBETAINES

Gerold Braun, Ludwigshafen; Chung-Ji Tschang, Bad Duerkheim; Christos Vamvakaris, Kallstadt, and Klaus Glaser, Mutterstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 15, 1988, Ser. No. 168,241
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709216
Int. Cl.[4] C07D *211/82, 213/18, 291/00, 233/54*
U.S. Cl. 546—339 **9 Claims**

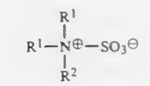
1. A process for the preparation of a sulfatobetaine of the formula:



(I)

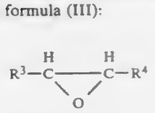
wherein radicals R^1 and R^2 are identical or different and each is a saturated straight-chain or branched alkyl radical 1–22 carbon atoms, a cycloalkyl radical of 5–7 carbon atoms, phenyl, naphthyl or C_{7-12} aralykyl, or the two R^1 radicals, together with the nitrogen atom, form a 5-membered or 6-membered heterocyclic ring which may contain at least one additional heteroatom and may contain a fused benzene ring, and R^2 is C_{1-4} alkyl, or the two R^1 radicals together with the N atom and the radical R^2 form a 5-membered or 6-membered unsaturated heterocyclic ring which may contain at least one additional heteroatom and may contain a fused benzene ring, R^3 and R^4 are identical or different and R^3 is hydrogen, C_{1-7} alkyl, $-CH_2Cl$ or $-CH_2-OR^5$, wherein R^5 is a straight-chain or branched C_{1-18} alkyl or phenyl, and R^4 is hydrogen, C_{1-20} alkyl or phenyl, and R^3 and R^4 are interchangeable, which comprises:

reacting an adduct of a base having a tertiary N atom and sulfur trioxide having the formula (II):



(II)

wherein R^1 and R^2 are as defined above, with an alkylene oxide of the formula (III):



(III)

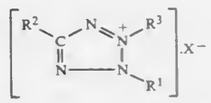
wherein R^3 and R^4 each have the meaning stated above at from 40°–150° C. in the presence of ethylene carbonate or 1,2-propylene carbonate, or a mixture thereof as an inert solvent.

4,837,331
STABILIZATION OF TETRAZOLIUM SALTS WITH CYCLODEXTRINS

Kazuhiko Yamanishi, Tokyo, and Toshiro Hanada, Kawagoe, both of Japan, assignors to Wako-Pure Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 13, 1986, Ser. No. 930,094
Claims priority, application Japan, May 30, 1983, 95185/83
Int. Cl.[4] C07D *257/04, 403/12, 417/04*
U.S. Cl. 548—146 **6 Claims**

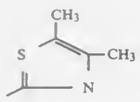
1. In a process for stabilizing a tetrazolium salt used as a color indicator in the determination of a substrate which is an oxidizable biochemical material by oxidizing said substrate with an oxidase, wherein said tetrazolium salt is selected from the group consisting of compounds of the formulas II, III, and IV:



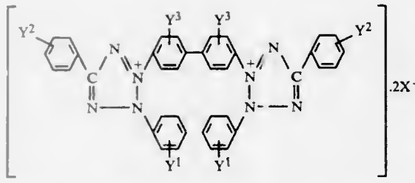
(II)

wherein X is halogen; and each of R^1, R^2 and R^3 is independently an organic residue selected from the group consisting of

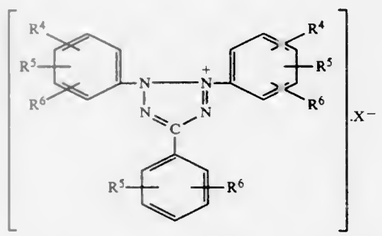
phenyl, phenyl substituted with at least one halogen, nitro and



(III)



wherein each of Y^1 and Y^2 is independently $-NO_2$ or $-H$; Y^3 is $-OCH_3$, $-I$ or $-H$; and X is a halogen;



(IV)

wherein each R4 is nitro or halogen, provided that at least one R^4 is nitro; R^5 is hydrogen; a lower alkyl group, a lower alkoxy group or a halogen; R^6 is hydrogen or $-OR^7$; R^7 is a straight- or branched-chain aliphatic hydrocarbon having 1 to 4 carbon atoms which has at least one functional group selected from the group consisting of sulfonic acid, sulfonic acid salt, carboxyl, and carboxyl salt, and can also have a hydroxyl group, provided that the sum of the number of sulfonic acid group, sulfonic acid salt group, carboxyl group, and carboxyl salt group contained in R^6 is 2 or more and one of said functional groups forms an intramolecular salt with a tetrazolium ring; and X is a halogen,

the improvement wherein said tetrazolium salt is stabilized against chemical decomposition by adding to an aqueous solution of said tetrazolium salt at least one member selected from the group consisting of:

(i) β-cyclodextrin;

(ii) a derivative of β-cyclodextrin represented by the formula:

$$\beta\text{-CD}(-OH)_{21-m}(-OZ^1)_m \quad (V)$$

wherein CD is a cyclodextrin residue, Z^1 is $-NO_2$, $-PO_3H$, $-SO_3H$ or a group of the formula $-(CH_2)_nZ^2$; Z^2 is $-SO_3H$ or $-CO_2H$; n is an integer of 1 to 4; and m is a positive number having a value of 1 to 5,

or represented by the formula:

$$\beta\text{-CD}(-OH)_{21-k}(-OCH_3)_k \quad (VI)$$

wherein k is a positive number having a value of 1 to 21; and

(iii) γ-cyclodextrin.

4,837,332

PROCESS FOR BLOCKING AMINO ACIDS WITH THE TERTIARY-ALKOXYCARBONYL GROUP

Chih-Yueh Chou, Elk Grove Village, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 7, 1986, Ser. No. 837,228

Int. Cl.⁴ C07D *233/84*

U.S. Cl. 548—321 **24 Claims**

1. In a process wherein precursory amino acid salt comprising an amino acid anion having at least one unblocked amino or imino group and further comprising at least one cation is reacted with 1-(tertiary-alkoxycarbonyl)imidazole to produce N-(tertiary-alkoxycarbonyl)-blocked amino acid salt in which the tertiary-alkoxycarbonyl group is tertiary-butoxycarbonyl or tertiary-amyloxycarbonyl, the improvement wherein said cation contains a nitrogen cationic atom and the reaction is conducted in the liquid phase and in the presence of essentially inert organic solvent having a dielectric constant at 25° C. of at least about 4.

4,837,333

SUBSTITUTED ALKYLIDENE IMIDAZOLES

Paul W. Manley, Monks Risborough; Roderick A. Porter, High Wycombe, both of United Kingdom, and Mun F. Lai, Singapore, Singapore, assignors to G. D. Searle & Co., Chicago, Ill.

Filed May 14, 1987, Ser. No. 49,491

Int. Cl.⁴ C07D *233/60*

U.S. Cl. 548—341 **2 Claims**

1. A compound of the formula

2. A compound of the formula:

as the E-isomer.

4,837,334

PRECURSORS TO QUINOLONE INOTROPIC AGENTS

Simon F. Campbell, Deal, and David A. Roberts, Sandwich, both of England, assignors to Pfizer Inc., New York, N.Y.

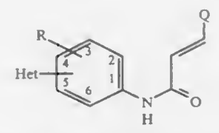
Division of Ser. No. 844,448, Mar. 26, 1986, Pat. No. 4,728,653, which is a continuation-in-part of Ser. No. 737,363, May 23, 1985, abandoned. This application Nov. 23, 1987, Ser. No. 125,037

Claims priority, application United Kingdom, May 29, 1984, 8413685; Oct. 26, 1984, 8427167

Int. Cl.⁴ C07D *233/61*

U.S. Cl. 548—346 **6 Claims**

1. An N-(ring-substituted phenyl)propenamide compound of the formula:



or an acid addition salt thereof, wherein (a) "Het" is an imidazolyl or triazolyl group attached by a nitrogen atoms of said group to the 3-, 4-, 5- or 6-positions of said phenyl ring, said heterocyclic groups being unsubstituted or substituted with up to three substituents each independently selected from C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, trifluoromethyl, halo, cyano, hydroxymethyl, (C_1–C_4 alkoxy)carbonyl, nitro, $-CONR^1R^2$ and $-NR^1R^2$ wherein R^1 and R^2 are each independently hydrogen or C_1–C_4 alkyl; and (b) R is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, trifluoromethyl, halo, cyano or hydroxymethyl, said R being attached to the 3-, 4-, 5-, or 6-positions of the aforesaid phenyl ring; and (c) Q is a C_1–C_4 alkoxy group.

4,837,335

PROCESS FOR THE PREPARATION OF PURE 1-PHENYL-3-CARBALKOXY-5-HYDROXYPYRAZOLES

Hubert Stückler, and Wilhelm Dobramysl, both of Linz, Austria, assignors to Chemie Linz G.m.b.H., Linz, Austria

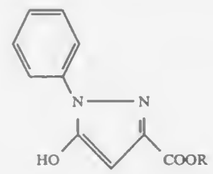
Filed Apr. 4, 1988, Ser. No. 177,345

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1987, 3711878

Int. Cl.⁴ C07D *231/22*

U.S. Cl. 548—367 **9 Claims**

1. A process for the preparation of a pure 1-phenyl-3-carbalkoxy-5-hydroxypyrazole of the general formula

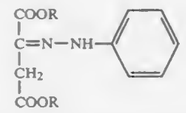


(I)

in which R denotes methyl or ethyl, which comprises converting an acetylsuccinic ester of the general formula

$$ROOC-CH_2-CH(COCH_3)-COOR \quad (II)$$

in which R has the abovementioned meaning, with simultaneous addition of phenyldiazonium chloride and an aqueous solution of a base with a pK_B value of +3.6 to −1.5 at a pH of 4 to 9, to the phenylhydrazone of the general formula



(III)

in which R has the abovementioned meaning, and subsequently cyclizing this compound, with warming and with the addition of ammonia at a pH of 7 to 9.5, to give the ammonium salt of the hydroxypyrazole of the general formula I, from which the hydroxypyrazole of the general formula I is liberated by addition of acid.

4,837,336

PROCESS FOR PREPARING HETEROCYCLIC COMPOUNDS

David F. Hayman, Bucks; Alastair C. Brodie, Uxbridge, and Panayiotis A. Procopiou, Harrow, all of England, assignors to Glaxo Group Limited, London, England

Filed Oct. 23, 1986, Ser. No. 922,255

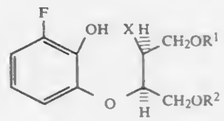
Claims priority, application United Kingdom, Oct. 23, 1985, 8526209

Int. Cl.⁴ C07D *498/04, 319/20*

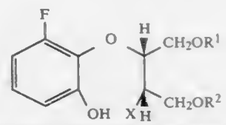
U.S. Cl. 548—430 **2 Claims**

1. A process for the preparation of (±) trans- 5l -fluoro-2,3,3a,9a-tetrahydro- 1l H-(1,4)-benzodioxino-(2,3-c)pyrrole by a multi-stage process comprising

(a) cyclising a compound of formula (IIa) or (IIb):



(IIa)



(IIb)

or a mixture thereof (in which X represents a hydroxyl group or

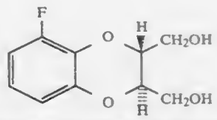
a halogen atom and R^1 and R^2, which may the same or different, represent hydroxy protecting groups), wherein

(i) when x represents a hydroxyl group the cyclisation is effected using a disubstituted formamide in the presence of a reagent selected from oxalyl chloride, thionyl chloride, phosgene and phosphorous oxychloride in the presence of a base, or a triarylphosphine, a trialkylphosphine or a trialylphosphite in the presence of diethylazodicarboxylate, or a triarylphosphine or trialkylphosphine in the presence of carbon tetrachloride, or

(ii) when X is a halogen atom the cyclisation is effected in the presence of a base, and

(b) removal of the protection groups R^1 and R^2;

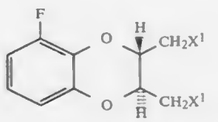
(c) reacting the resulting compound of formula (I):



(I)

with a reagent capable of replacing the hydroxyl groups with leaving groups;

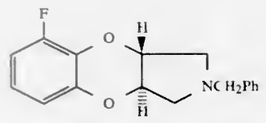
(d) aminating the resulting compound of general formula (IV):



(IV)

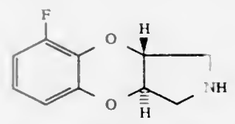
(where X^1 represents a leaving group) with benzylamine;

(e) subjecting the resulting compound of formula (V):



(V)

to hydrogenolysis to produce the desired compound (VI):



(VI)

and, if desired, reacting the resulting compound of formula (VI) with an acid to produce the acid addition salt thereof.

4,837,337

PROCESS FOR PRODUCING PYRROLIDONE DERIVATIVE

Yoshikazu Murao, Machida, and Masaru Miyake, Yokohama, both of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 804,757, Dec. 5, 1985, abandoned. This application Feb. 3, 1988, Ser. No. 151,589

Claims priority, application Japan, Dec. 15, 1984, 59-264845; Jan. 23, 1985, 60-10374; Jun. 17, 1985, 60-131505; Jun. 17, 1985, 60-131506

Int. Cl.[4] C07D *207/27*

U.S. Cl. 548—551 **15 Claims**

1. A process for producing a pyrrolidone derivative represented by the general formula (I):

(I)

wherein R is an organic residue obtained by removing hydroxy radical from a C_{1-10} primary alcohol, C_{1-10} secondary alcohol or derivative thereof, comprising:

(1) reacting 2-pyrrolidone with acetaldehyde in the presence of a catalyst which is at least one member selected from the group consisting of potassium carbonate, sodium carbonate, potassium phosphate, sodium phosphate, potassium pyrophosphate, sodium pyrophosphate, potassium silicate and sodium silicate in an amount of 0.0001 to 10 mol % of the catalyst per mole of 2-pyrrolidone, thereby obtaining N-(α-hydroxyethyl)pyrrolidone at a temperature in the range of −10° to 60° C.; and

(2) reacting the thus obtained N-(α-hydroxyethyl)pyrrolidone with a C_{1-10} primary alcohol, a C_{1-10} secondary alcohol or a derivative thereof in the presence of an acidic catalyst selected from the group consisting of an inorganic acid, sulfamic acid, methanesulfonic acid, ethanesulfonic acid, p-toluenesulfonic acid and an acidic ion-exchange resin used in an amount of 0.001 to 10 mol % of the acidic catalyst per mole of N-(α-hydroxyethyl)pyrrolidone at a temperature in the range of −10° to 100° C.

4,837,338

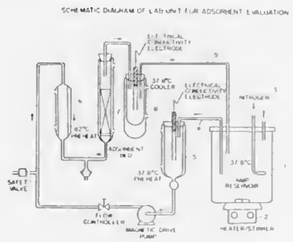
REMOVAL OF IMPURITIES FROM N-METHYL-PYRROLIDONE USING HIGHLY PURE WATER WASHED ACTIVATED ALUMINA

Bordan W. Krupay, and Lloyd E. Reid, both of Sarnia, Canada, assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jun. 16, 1986, Ser. No. 874,474

Int. Cl.[4] C07D *207/38*

U.S. Cl. 548—555 **9 Claims**



1. In the method for removing contaminants from N-methyl pyrrolidone (NMP) by the adsorption of said contaminants by use of an adsorbent, the improvement comprising using as the adsorbent activated alumina which is water washed until the electrical conductivity of the wash water is about 100 micro mho/cm or less prior to its use as the adsorbent.

4,837,339

4-SUBSTITUTED-1,2,3,6-TETRAHYDROPHTHALIC ACID ANHYDRIDE

Fumie Sato, Fujisawa, Japan, assignor to Nissan Chemical Industries, Ltd., Tokyo, Japan

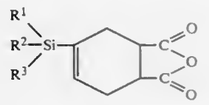
Continuation-in-part of Ser. No. 780,006, Sep. 25, 1985, abandoned. This application Apr. 20, 1987, Ser. No. 39,726

Claims priority, application Japan, Sep. 25, 1984, 59-199855

Int. Cl.[4] C07F *7/18*

U.S. Cl. 549—214 **8 Claims**

1. A 4-substituted-1,2,3,6-tetrahydrophthalic acid anhydride compound represented by the structural formula:



wherein R^1 and R_2 each represents a lower alkoxy group, and R^3 represents a lower alkoxy group or a lower alkyl group, said 4-substituted-1,2,3,6-tetrahydrophthalic acid anhydride being a liquid.

4,837,340

PHOSPHOLIPID-LIKE COMPOUNDS

Hansjörg Eibl, Bovenden, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft Zur Foederung Der Wissenschaften E. V., Goettingen, Fed. Rep. of Germany

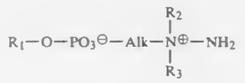
Division of Ser. No. 13,145, Feb. 11, 1987, Pat. No. 4,749,805, which is a continuation of Ser. No. 682,812, Dec. 18, 1984, abandoned. This application Feb. 19, 1988, Ser. No. 157,906

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1977, 2752553

Int. Cl.[4] C07F *9/09*

U.S. Cl. 549—221 **7 Claims**

1. Compound of the formula



wherein

Alk represents a straight-chain, branched or cyclic alkyl group having 2 to 12 carbon atoms,

R_1 represents the moiety of a univalent or polyvalent aliphatic primary or secondary alcohol whose additional OH groups, if any, are in the esterified or etherified state and the ester or ether groups contain 1 to 26 carbon atoms and, in some cases, one or more carbon multiple bonds, R_1 containing a total of at least 6 carbon atoms,

R_2 represents hydrogen or an alkyl group of 1 to 4 carbon atoms, and

R_3 represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms or a free electron pair.

2. 1,2-Dipentadecylkentone-glycerol-3-phosphoryl-(N-ethylamino)-ethanolamine.

4,837,341

NOVEL DERIVATIVES

Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil-Sois-Bois, both of France, assignors to Roussel Uclaf, Paris, France

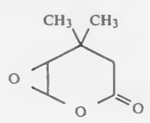
Filed Jan. 7, 1988, Ser. No. 142,534

Claims priority, application France, Jan. 9, 1987, 87-00150; Jul. 30, 1987, 87-10792

Int. Cl.[4] C07D *493/04*

U.S. Cl. 549—283 **2 Claims**

1. A compound of the formula



I

in its d, l or dl form and mixture thereof.

4,837,342

PROSTACYCLIN ANALOGUE, AND BLOOD CIRCULATION IMPROVING AGENT AND ANTI-ULCER COMPOSITION CONTAINING IT AS ACTIVE INGREDIENT

Masakatsu Shibasaki, Sapporo; Atsuo Takahashi; Tuyoshi Aoki, both of Sagamihara; Kentaro Kogi, Fukushima; Yozo Nishimiya, Fukushima; Takeshi Nara, Fukushima, and Takashi Yamaguchi, Fukushima, all of Japan, assignors to Sagami Chemical Research Center and Toa Eiyo Ltd., both of Tokyo, Japan

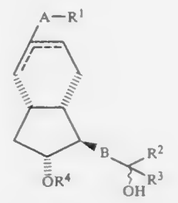
Filed Feb. 13, 1987, Ser. No. 14,591

Claims priority, application Japan, Feb. 28, 1986, 61-41691; Feb. 28, 1986, 61-41693; Dec. 4, 1986, 61-287740; Dec. 4, 1986, 61-287732; Dec. 4, 1986, 61-287734; Dec. 4, 1986, 61-287736; Dec. 4, 1986, 61-287737; Dec. 4, 1986, 61-287738; Dec. 4, 1986, 61-287739

Int. Cl.[4] C07C *177/00*

U.S. Cl. 549—422 **4 Claims**

1. A prostacyclin analogue having the formula:



(I)

wherein R^1 is $—CO_2R^5$ (wherein R^5 is a hydrogen atom, a straight chain or branched alkyl group having from 1 to 12 carbon atoms, an aralkyl group having from 7 to 12 carbon atoms, a cycloalkyl group having from 4 to 7 carbon atoms and unsubstituted or substituted by at least one alkyl group having form 1 to 4 carbon atoms, a substituted or unsubstituted phenyl group, or one equivalent of a cation), or $—CONR^6R^7$ (wherein each of R^6 and R^7 is a hydrogen atom or a alkyl group having from 1 to 10 carbon atoms, or R^6 and R^7 together with the adjacent nitrogen atom, form a 5- or 6-membered substituted or unsubstituted hetero ring which may contain a hetero atom other than said nitrogen atom); A is $—CH_2CH_2CH_2—$, $CH_2—O—CH_2CH_2—$, $—CH_2CH_2CH_2CH_2—$, $—CH_2CH_2—OH—CH_2—$ or $—CH=CHCH_2CH_2—$; B is trans $—CH=CH—$ or $—C\equiv C—$; R^2 is a straight chain or branched alkyl group having from 3 to 10 carbon atoms, a cycloalkyl group having from 4 to 7 carbon atoms and unsubstituted or substituted by at least one alkyl group having from 1 to 4 carbon atoms, a straight chain or branched alkenyl group having form 3 to 12 carbon atoms, a straight chain or branched alkynyl group having from 3 to 8 carbon atoms, or an alkyl group having from 1 to 3 carbon atoms substituted by a substituted or unsubstituted phenyl or phenyoxy group, by an alkoxy group having from 1 to 6 carbon atoms or by a cycloalkyl group having from 5 to 8 carbon atoms; R^3 is a hydrogen atom, a methyl group or a vinyl group; and R^4 is a hydrogen atom, an acyl group having from 1 to 7 carbon atoms, a tri-C_1–C_7 hydrocarbon-silyl group or a group capable of forming an acetal bond together with the oxygen atom of a hydroxyl group; provided that the double bond in a substituent for A is E or Z, or a mixture thereof; the asymmetric center in a substituent for R^2 assumes a R-conformation or a S-conformation, or a mixture thereof; and the bonds shown by dotted lines at the 2–3 and 3–4 positions mean that either one of them is a double bond.

4,837,343

OPTICALLY ACTIVE β-AMINO ACID DERIVATIVES AND THEIR SALTS, AND PROCESSES FOR PRODUCING THE SAME

Minoru Hatanaka, Takatsuki, Japan, assignor to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

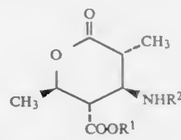
Filed Sep. 1, 1987, Ser. No. 91,832

Claims priority, application Japan, Sep. 8, 1986, 61-210889

Int. Cl.[4] C01D *309/06*

U.S. Cl. 549—291 **6 Claims**

1. Optically active β-amino acid derivatives of the following formula:



(I)

wherein R^1 and R^2 are selected from the group consisting of hydrogen, methyl, ethyl, propyl, isopropyl, butyl, sec-butyl,

tert-butyl, pentyl, heptyl, cyclohexyl, benzyl, phenethyl, phenyl, β-naphthyl, carboxyl, methoxycarbonyl, ethoxycarbonyl, methylamino, ethylamino, diethylamino, methoxy, ethoxy, trimethylsilyl, triethylsilyl, acetyloxy, propionyloxy, chlorine, bromine, iodine, carbamoyl, mercapto, nitrile and nitro, and salts of said derivatives wherein the salts are sodium or potassium when R^1 is hydrogen and the salts are hydrochlorides or sulfates when R^2 is hydrogen.

4,837,344

OPTICALLY ACTIVE BICYCLO CARBOXYLIC ACIDS AND THEIR DERIVATIVES

Katsuaki Miyaji; Kazutaka Arai; Yoshio Ohara, and Yasuhiro Takahashi, all of Funabashi, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Jun. 17, 1987, Ser. No. 63,076

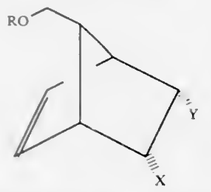
Claims priority, application Japan, Jun. 19, 1986, 61-143447; Aug. 8, 1986, 61-187050

Int. Cl.⁴ C07D *307/20*

U.S. Cl. 549—319 **5 Claims**

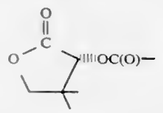
1. A compound having the formula:

(I)



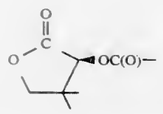
where R is a hydroxyl-protecting group and is a benzyl group which is unsubstituted or substituted on its benzene ring by one or two lower alkyl groups, bromine atoms or chlorine atoms, a lower alkoxy methyl group, or a lower alkylated silyl group, X is a hydrogen atom or a group of the formula:

(i)



and when X is a hydrogen atom, Y is a group of the formula:

(ii)



and when X is a group of the formula (i), Y is a hydrogen atom.

4,837,345

PROCESS FOR THE PRODUCTION OF TETRAHYDROPYRAN-3-ONE DERIVATIVES

Tatsuo Numata; Masataka Hatanaka, and Junichi Watanabe, all of Funabashi, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Dec. 31, 1987, Ser. No. 140,211

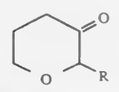
Claims priority, application Japan, Jan. 9, 1987, 62-3026

Int. Cl.⁴ C07D *309/30*

U.S. Cl. 549—416 **5 Claims**

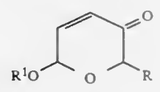
1. A process for producing a tetrahydropyran-3-one derivative of the formula I:

I



wherein R is a hydrogen atom; a straight-chained or branched C_1–C_{10} alkyl group which is unsubstituted or substituted by a halogen atom, a hydroxyl group, a C_1–C_6 alkoxy group, a C_1–C_6 alkylthio group, a C_1–C_6 alkylcarbonyloxy group, a C_1–C_6 alkoxycarbonyl group, a C_1–C_6 mono- or dialkylamino group, a C_3–C_6 cycloalkyl group, a C_1–C_6 alkylaminocarbonyl group, a C_1–C_6 alkylcarbonylamino group, a C_1–C_6 alkylcarbonyl group or a phenyl or benzyl group which is unsubstituted or substituted by a halogen atom, a C_1–C_6 alkyl group, a C_1–C_6 alkoxy group, a C_1–C_6 alkylthio group or a C_1-C_6 alkoxycarbonyl group; a C_3–C_6cycloalkyl group; or a phenyl or biphenyl group which is unsubstituted or substituted by a halogen atom, a C_1–C_6alkoxy group or C_1–C_6 alkylthio group, which consists essentially of reacting a 2H-pyran-3(6H)-one derivative of the formula II:

II



wherein R is as defined above, and R_1 is an acetyl group, with hydrogen in an aqueous organic medium comprising water and tetrahydrofuran or A-butyl alcohol in the presence of a palladium catalyst.

4,837,346

PREPARATION OF ESTERS OF TETRAHYDROPYRAN-4-CARBOXYLIC ACID

Rainer Becker, Bad Durkheim; Heinz Eckhardt, Ludwigshafen; Rolf Fischer, Heidelberg; Wolfgang Spiegler, Worms, and Uwe Vagt, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 21, 1988, Ser. No. 170,768

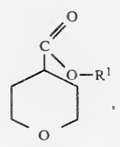
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710805

Int. Cl.⁴ C07D *309/06*

U.S. Cl. 549—425 **5 Claims**

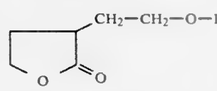
1. A process for the preparation of esters of tetrahydropyran-4-carboxylic acid of the general formula I

I



where R^1 is an alkyl group of from 1 to 6 carbon atoms, a cycloalkyl group of from 5 to 7 carbon atoms, or an aryl group of from 6 to 10 carbon atoms, by treating butyrolactones of the general formula II,

II



where R^2 is a hydrogen atom, an alkyl group of from 1 to 6 carbon atoms, or an acyl group —CO—R^3, R^3 being a hydrogen atom or an alkyl group of from 1 to 6 carbon atoms, with alcohols of the general formula III,

R^1—OH III,

where R^1 has the meaning given above, at temperatures of from 150° C. to 400° C. in the presence of acid catalysts.

4,837,347

PROCESS FOR OXIDATION OF ETHYLENE TO ETHYLENE OXIDE

Jay A. Rashkin, Monticello, N.Y., assignor to Scientific Design Company, Inc., Little Ferry, N.J.

Division of Ser. No. 388,865, Jun. 16, 1982, Pat. No. 4,774,222. This application Jul. 6, 1988, Ser. No. 215,618

Int. Cl.⁴ C07D *301/10*

U.S. Cl. 549—534 **20 Claims**

1. In a process for oxidation of ethylene with molecular oxygen to produce ethylene oxide at a temperature in the range of about 150° to 400° C. over a supported silver catalyst wherein the improvement comprises a catalyst in which a support is impregnated with a solution of a silver compound and activated by heating in air and includes at least one alkali metal selected from the group consisting of sodium, cesium rubidium and potassium in an amount sufficient to depress the activity and selectivity of said alkali-containing silver catalyst relative to an alkali-free catalyst after activation and thereafter heat treating said alkali metal-containing catalyst at a temperature of at least 400° C. for a period of time sufficient to reactivate said depressed catalyst.

4,837,348

BONDED PHASE CHROMATOGRAPHIC SUPPORTS

Mark L. Stolowitz, Long Beach, and Amy G. Taketomo, Gardena, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

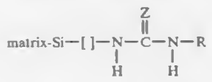
Filed Apr. 30, 1986, Ser. No. 859,148

Int. Cl.⁴ C07F *7/10*

U.S. Cl. 556—9 **6 Claims**

1. A compound having the general Formula II:

II



wherein R is selected from hydrogen, —$CH_2CH_2SO_3H$, carboxymethyl, diethylaminoethyl, tris(hydroxymethyl) methyl, and guanidino;

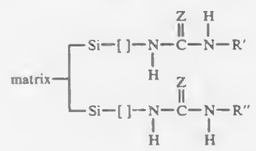
Z is oxygen or sulfur;

[] is a support selected from a straight chain alkyl having 2 to 8 carbons, aryl or alkyl aryl; and

matrix is patriculate bonded silica or controlled pore glass beads.

2. The compound having the general Formula III:

III



wherein R′ is selected from hydrogen and tris(hydroxymethyl) methyl;

R″ is selected from the group consisting of hydrogen, —$CH_2CH_2SO_3H$, carboxymethyl, diethylaminoethyl, guanidino, —$C_6H_4(BO_2H_2)$, —$C_6H_4HgOCOCH_3$, —C_6H_4AsO, tris(hydroxymethyl) methyl, n-butyl, n-octyl, —$CH_2(CH_2)_4COOH$, and ethylmercapto;

matrix is particulate bonded silica or controlled pore glass beads;

Z is oxygen or sulfur; and

[] is a support selected from a straight chain alkyl having 2 to 8 carbons, aryl or alkyl aryl.

4,837,349

TERTIARY-BUTYLDIMETHYLSILYL CARBAMATE DERIVATIVE AND PROCESS FOR PRODUCING THE SAME

Yasufumi Ohfune, and Masahiro Sakaitani, both of Osaka, Japan, assignors to Suntory Limited, Osaka, Japan

Filed Sep. 19, 1986, Ser. No. 909,397

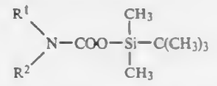
Claims priority, application Japan, Sep. 19, 1985, 60-207204; Jul. 11, 1986, 61-16343

Int. Cl.⁴ C07F *7/10*

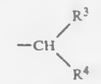
U.S. Cl. 556—420 **3 Claims**

1. A process for producing a t-butyldimethylsilyl carbamate derivative of the general formula (1):

(1)



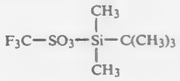
where R^1 is an alkyl group having 1–3 carbon atoms or a hydrogen atom; R^2 is



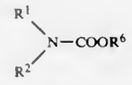
(where R^3 is a hydrogen atom, an alkyl, alkenyl or aralkyl group having 1–10 carbon atoms, each of which groups may be substituted by a hydroxyl group, a t-butyldimethylsilyloxy group, a methylthio group, a lower alkoxycarbonyl group, a lower alkoxy group, an indolyl group or an imidazolyl group; R^4 is a lower alkoxycarbonyl group, an N-alkylamido group having 2–6 carbon atoms, an O-tetrahydropyranylthreonine methyl ester amido residue, an O-t-butyldimethylsilylthreonine methyl ester amido residue, a threonine methyl ester amido residue or —$(CH_2)_n$—$COOR^5$ (where n is an integer of 1–3 and R^5 is a lower alkyl group), provided that R^3 combines with R^4 to form a cyclopentyl group, a cyclohexyl group, a tetrahydrofuranyl group or a dioxanyl group, these rings being optionally substituted by a lower alkyl group, a lower alkenyl group, a lower alkoxycarbonyl group or a lower alkoxycarbonylmethyl group); and R^1 and R^2, when taken together, form a 4- or 5-membered carbon ring, which may be substituted by a lower alkoxycarbonyl group or a t-butyldimethylsilyloxycarbonyl group, said process comprising treating a t-butyl carbamate derivative of the formula (2):

(2)

(where R^1 and R^2 are the same as defined above) with t-butyldimethylsilyl trifluoromethane sulfonate (TBDMSOTf) of the formula:

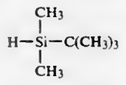


in the presence of a base, or reacting a carbamate derivative of the formula (3):



(3)

(where R^1 and R^2 are the same as defined above; R^6 is an allyl or benzyl group) with t-butyldimethylsilane of the formula:



in the presence of a palladium catalyst.

4,837,350

PROCESS FOR THE PREPARATION OF BENZOIN SULFONATES

Werner Rutsch, Fribourg, and Rinaldo Hüsler, Marly, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

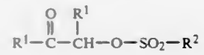
Filed Dec. 7, 1987, Ser. No. 129,574

Claims priority, application Switzerland, Dec. 15, 1986, 4988/86

Int. Cl.⁴ C07C *143/68*

U.S. Cl. 558—52 **9 Claims**

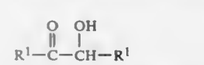
1. In the process for the preparation of a sulfonic acid ester of formula I



(I)

wherein

R^1 is phenyl or phenyl which is substituted by halogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4alkylthio, —NH—CO—(C_1–C_4alkyl), —NH—CO—phenyl, morpholino, piperidino or a radical —N(R^3)(R^4), or is naphthyl or tetrahydronaphthyl, each unsubstituted or substituted by halogen or C_1–C_6alkyl, or is a univalent 5- or 6-membered heteroaromatic radical which contains O, S or N and is unsubstituted or substituted by halogen or C_1–C_4alkyl, R^2 is phenyl or phenyl which is substituted by halogen, C_1–C_{20}alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy, C_1–C_4alkylthio, nitro, —NH—CO—(C_1–C_4-alkyl), —NH—CO—phenyl or benzoyl, or is naphthyl or naphthyl which is substituted by halogen or C_1–C_{20} alkyl, or is a univalent 5- or 6-membered heteroaromatic radical which contains O, S or N and is unsubstituted or substituted by halogen or C_1–C_6alkyl, and R^3 and R^4 are each independently of the other C_1–C_4alkyl, allyl, or cyclohexyl, by reaction of a benzoin compound of formula II



(II)

with a sulfonyl halide of formula III

(III)

wherein X is fluorine, chlorine, bromine, in an inert organic solvent, the improvement comprising conducting said reaction in the presence of an aqueous solution of NaOH or KOH with a NaOH/KOH to sulfonyl halide mole ratio of 1:1 to 1.5:1 and at a reaction temperature below 40° C.

4,837,351

2-CYANO-4-PHENYL PENTANE AND FRAGRANCE OR PERFUME COMPOSITIONS CONTAINING THE SAME

Masahiro Torihara, Niigata, and Yoshin Tamai, Shibata, both of Japan, assignors to Kuraray Company Ltd., Kurashiki, Japan

Filed Dec. 2, 1987, Ser. No. 127,381

Claims priority, application Japan, Dec. 29, 1986, 61-310913

Int. Cl.⁴ C07C *121/46*

U.S. Cl. 558—388 **10 Claims**

1. 2-cyano-4-phenyl pentane.

2. A fragrance or perfume composition, which comprises at least two components, one component of which is an olfactorily sensible amount of 2-cyano-4-phenyl pentane, and a carrier.

4,837,352

3-CHLORO-2-(2'-SUBSTITUTED BENZOYL)-CYCLOHEX-2-ENONE INTERMEDIATE COMPOUNDS

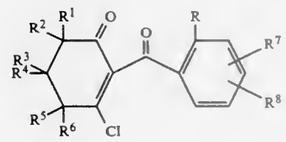
Christopher G. Knudsen, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 872,078, Jun. 9, 1986. This application Mar. 21, 1988, Ser. No. 171,358

Int. Cl.⁴ C07C *149/415*

U.S. Cl. 558—396 **1 Claim**

1. An intermediate compound having the structural formula



wherein

R is halogen, C_1–C_2 alkyl, C_1–C_2 alkoxy, nitro; cyano; C_1–C_2 haloalkyl, or R^aSO_n- wherein n is 0 or 2 and R^a is C_1–C_2 alkyl;

R^1 is hydrogen or C_1–C_4 alkyl;

R^2 is hydrogen or C_1–C_4 alkyl; or

R^1 and R^2 together are alkylene having 2 to 5 carbon atoms;

R^3 is hydrogen or C_1–C_4 alkyl;

R^4 is hydrogen or C_1–C_4 alkyl; or

R^3 and R^4 together can be oxo;

R^5 is hydrogen or C_1–C_4 alkyl;

R^6 is hydrogen or C_1–C_4 alkyl; or

R^5 and R^6 together are alkylene having 2 to 5 carbon atoms;

R^7 and R^8 independently are (1) hydrogen; (2) halogen; (3) C_1–C_4 alkyl; (4) C_1–C_4 alkoxy; (5) trifluoromethoxy; (6) cyano; (7) nitro; (8) C_1–C_4 haloalkyl; (9) R^bSO_n- wherein n is the integer 0, 1 or 2; and R^b is (a) C_1–C_4 alkyl; (b) C_1–C_4 alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10) —NR^cR^d wherein R^c and R^d independently are hydrogen or C_1–C_4 alkyl; (11) $R^eC(O)$- wherein R^e is C_1–C_4 alkyl or C_1–C_4 alkoxy; (12) $SO_2NR^cR^d$ wherein R^c and R^d are as defined; or (13) —$N(R^c)C(O)R^d$ wherein R^c and R^d are as defined.

4,837,353

DOPAMINE-β-HYDROXYLASE INHIBITORS

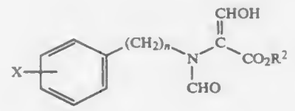
Joseph A. Finkelstein, Philadelphia, Pa.; Lawrence I. Kruse, Tewin, England, and Thomas B. Leonard, Haverford, Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Division of Ser. No. 29,512, Mar. 24, 1987. This application Jan. 21, 1988, Ser. No. 146,537

Int. Cl.⁴ C07C *101/30, 101/02*

U.S. Cl. 560—39 **2 Claims**

1. A compound represented by the formula:



in which:

X is H, F, Cl, Br, I, C_{1-4}alkyl, CN, NO_2, SO_2NH_2, COOH, OH<CHO, C_{1-4}alkoxy, CH_2OH, CF_3, SO_2CH_3, SO_2CF_3, or $CO_2C_nH_{2n+1}$ wherein a is 1 to 5, or any accessible combination thereof of up to 5 substituents;

R^2 is C_{1-4}alkyl; and

n is 1-5.

4,837,354

PROCESS FOR MAKING AND ISOLATING (R)-2-HYDROXY-4-PHENYLBUTYRIC ACID AND ESTERS

Gary A. Flynn, and Douglas W. Beight, both of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 19,102, Feb. 26, 1987, abandoned. This application Sep. 9, 1987, Ser. No. 96,312

Int. Cl.⁴ C07C *69/76*

U.S. Cl. 560—60 **9 Claims**

1. The compound (L)-menthyl 2-oxo-4-phenylbutyrate.

4,837,355

PROCESS FOR THE SYNTHESIS OF PHENOXYALKANE DERIVATIVES

Keith G. Watson, Victoria, Australia, assignor to ICI Australia Limited, Melbourne, Australia

PCT No. PCT/AU81/00101, § 371 Date Mar. 31, 1982, § 102(e) Date Mar. 31, 1982, PCT Pub. No. WO82/00639, PCT Pub. Date Mar. 4, 1982

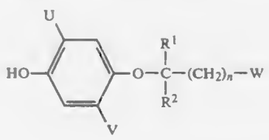
PCT Filed Jul. 31, 1981, Ser. No. 367,229

Claims priority, application Australia, Aug. 21, 1980, PE5159; Mar. 27, 1981, PE8174

Int. Cl.⁴ C07C *69/76*

U.S. Cl. 560—061 **10 Claims**

1. A process for the synthesis of a compound of formula I



(I)

wherein:

U and V are independently chosen from the group consisting of hydrogen, halogen, nitro, cyano, thiocyano, C_1 to C_6 alkyl, C_1 to C_6 haloalkyl, C_2 to C_6 alkenyl, C_2 to C_6 haloalkenyl, C_1 to C_6 alkoxy, C_1 to C_6 haloalkoxy, C_1 to C_6 alkylthio, carboxy, (C_1 to C_6 alkoxy)carbonyl, phenyl, phenoxy, phenylthio and the groups substituted phenyl, substituted phenoxy and substituted phenylthio wherein in each group the phenyl ring is substituted with from 1 to 3 substituents chosen from the group consisting of halogen, nitro, cyano, C_1 to C_6 alkyl, C_1 to C_6 haloalkyl and C_1 to C_6 alkoxy;

R^1 is chosen from the group consisting of hydrogen, C_1 to C_6 alkyl, C_2 to C_6 alkenyl, C_2 to C_6 alkoxyalkyl, C_1 to C_6 haloalkyl, acetyl, propionyl and C_2 to C_6 alkoxycarbonyl, R^2 is chosen from the group consisting of hydrogen, C_1 to C_6 alkyl, C_2 to C_6 alkenyl, C_2 to C_6, alkoxyalkyl and C_1 to C_6 haloalkyl, or R^1 and R^2 together may form a methylene, ethylidene, propylidene or isopropylidene group;

W is chosen from the group consisting of cyano, thiocarbamoyl,

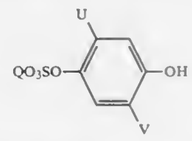
and CH_2Z wherein: G is chosen from the group consisting of hydroxy, mercapto, C_1 to C_{10} alkoxy, C_1 to C_{10} haloalkoxy, C_2 to C_{10} alkenyloxy, C_2 to C_{10} alkynyloxy, C_1 to C_{10} alkylthio, C_2 to C_{10} alkynylthio, C_2 to C_{10} alkynylthio, C_3 to C_7 cycloalkoxy, C_3 to C_7 cycloalkoxy substituted with 1 or 2 C_1 to C_4 alkyl groups, phenoxy, phenylthio, benzyloxy, benzylthio, the group C_1 to C_{10} alkoxy substituted with a substituent chosen from the group consisting of C_1 to C_6 alkoxy, amino, ammonio, cyano, N-(C_1 to C_6 alkyl)amino, N,N-di(C_1 to C_6 alkyl)amino and N,N,N-tri(C_1 to C_6 alkyl)ammonio, the groups phenoxy, phenylthio, benzyloxy and benzylthio wherein in each group the phenyl ring is substituted with from 1 to 3 substituents chosen from the group consisting of halogen, nitro, cyano, C_1 to C_6 alkyl, C_1 to C_6 haloalkyl and C_1 to C_6 alkoxy, the group OM wherein M is the cation of an inorganic or organic base, the group -$NHSO_2R^3$ wherein R^3 is chosen from C_1 to C_{10} alkyl and C_1 to C_6 haloalkyl, the group —NR^4R^5 wherein R^4 and R^5 are independently chosen from the group consisting of hydrogen, C_1 to C_6 alkyl, phenyl and benzyl or R^4 and R^5 together form a heterocyclic ring, and the group -O-N=R^6 wherein R^6 is a C_1 to C_{10} alkylidene group;

Z is chosen from the group consisting of halogen, hydroxy, mercapto, C_1 to C_{10} alkoxy, C_1 to C_{10} haloalkoxy, C_1 to C_{10} alkylthio and the group —NR^4R^5 wherein R^4 and R^5 are as hereinbefore defined; and

n is 0, 1 or 2;

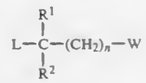
which process is characterized in that it comprises the following steps in sequence;

(a) reacting a sulfate ester of formula II,



II

wherein Q is a cation, with a compound of formula III,



III

wherein L is a leaving group; and

(b) hydrolysing the sulfate ester formed in step (a) to give a compound of formula I.

4,837,356

PROCESS FOR THE PREPARATION OF ALKYL 4-KETOALKANOATES

Kuo-Hua Chao, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 23, 1987, Ser. No. 111,952

Int. Cl.⁴ C07C *69/66*

U.S. Cl. 560—174 **6 Claims**

1. A process for the preparation of alkyl 4-ketohexanoate which comprises reacting alkyl acrylate, ethylene, carbon monoxide and a secondary alcohol in the presence of a catalyst comprising rhodium in complex combination with carbon monoxide and a triorgano phosphorus compound selected

from the group consisting of phosphanes, phosphinites, phosphonites and phosphites at a temperature ranging from about 100° C. to about 300° C. and at a pressure ranging from about atmospheric to about 10 atmospheres

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4,837,357

PREPARATION OF 2,2-DISUBSTITUTED 3-CHLOROPROPIONIC ESTERS

Franz Merger, Frankenthal, and Peter Hettinger, Edingen-Neckarhausen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

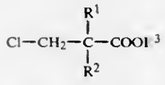
Filed Oct. 21, 1987, Ser. No. 111,624

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1986, 3638009

Int. Cl.⁴ C07C *69/63*

U.S. Cl. 560—226 **11 Claims**

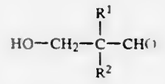
1. A process for preparing a 2,2-disubstituted 3-chloropropionic ester of the formula



I

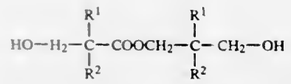
where R^1 and R^2 are each C_1–C_6-alkyl, C_2–C_6-oxaalkyl, C_2–C_6-alkenyl, C_2–C_6-oxaalkenyl, acyl, or C_7–C_{12}-aralkyl where R^1-C-R^2 together can also form a 5-, 6- or 7-membered ring, and where R^3 has the meanings of R^1 and R^2 other than aryl, which process comprises:

converting a 2,2-disubstituted 3-hydroxypropanal of the formula



II

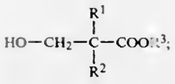
into the esterdiol



III

by disproportionation according to the Tischenko process;

reacting this esterdiol III in the presence of a transesterification catalyst with an alcohol R^3OH to give the 3-hydroxyester



IV

reacting the hydroxyester IV with a stoichiometric or greater than stoichiometric amount of thionyl chloride to form a chlorosulfinate intermediate; and

thermally decomposing said chlorosulfinate intermediate at 120° to 180° C. to give the chloropropionic ester I.

4,837,358

PREPARATION OF 9-ALKENYL ESTER COMPOUNDS

Jim D. Byers, and Charles A. Drake, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 26, 1986, Ser. No. 833,301

Int. Cl.⁴ C07C *67/317*

U.S. Cl. 560—261 **21 Claims**

1. A process for the synthesis of 9-alkenyl esters which comprises:

(a) disproportionating cyclooctene and an α-olefin having in the range of 3 up to 12 carbon atoms in the presence of a disproportionation catalyst at a temperature in the range of −20° to 650° C. to produce a 1,9-alkadiene;

(b) metallating the 1,9-alkadiene obtained in step (a) with a metallating agent under conditions suitable to form a 1-metallo-9-alkene;

(c) contacting the 1-metallo-9-alkene with oxygen under conditions suitable to form a 9-alkenyl-1-oxymetallo compound; and

(d) esterifying the 9-alkenyl-1-oxymetallo compound with an esterifying agent to produce the desired 9-alkenyl ester.

4,837,359

PROCESS FOR THE PRODUCTION OF POLYISOCYANATES WITH BIURET STRUCTURES

Helmut Woynar, Dormagen; Klaus König, Odenthal; Josef Pedain, Cologne, all of Fed. Rep. of Germany, and William E. Slack, Moundsville, W. Va., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany and Mobay Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1987, Ser. No. 139,495

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1987, 3700209

Int. Cl.⁴ C07C *119/042*

U.S. Cl. 560—335 **12 Claims**

1. A process for the production of a polyisocyanate containing a biuret structure comprising reacting

(a) an excess of an organic diisocyanate containing aliphatically and/or cycloaliphatically bound isocyanate groups with

(b) an organic diamine containing aliphatically and/or cycloaliphatically bound primary amino groups

in a reactor at a temperature above 270° C.

4,837,360

PROCESS FOR PRODUCING ACROLEIN AND ACRYLIC ACID

Koju Kadowaki; Kohei Sarumaru, both of Ami, and Takeshi Shibano, Yokkaichi, all of Japan, assignors to Mitsubishi Petrochemical Company Ltd., Tokyo, Japan

Continuation of Ser. No. 123,702, Feb. 22, 1980, abandoned. This application Sep. 23, 1982, Ser. No. 421,796

Claims priority, application Japan, Feb. 26, 1979, 54-20887

Int. Cl.⁴ C07C *51/25, 57/055, 47/22, 45/35*

U.S. Cl. 562—546 **10 Claims**

1. The process for producing acrolein and acrylic acid by vapor-phase catalytic oxidation of propylene with molecular oxygen by using a multi-tubular, fixed-bed reaction vessel, comprising:

(a) contacting propylene with a composite oxide catalyst represented by the formula

$$Mo_aBi_bFe_cA_dB_eC_fD_gSi_hO_x,$$

wherein: A is at least one element selected from the group consisting of Co, Ni, and Mg; B is at least one element selected from the group consisting of P, B, and As; C is at least one element selected from the group consisting of Li, Na, and Mn; D is at least one element selected from the group consisting of K, Rb, Cs, and Tl; a, b, c, h, and x are the numbers of atoms of their respective elements; and d, e, f, and g are the total numbers of atoms of their respective element groups, b being 0.4 to 7, c being 0.1 to 4, d being 2 to 10, e being 0 to 2, f being 0 to 2, g being 0 to 2, and h being 0 to 60, and x being a number satisfying the valences of the elements other than the oxygen when a is 12; and

(b) wherein in each reaction tube the catalyst is packed in the tube in a plurality of divided sections disposed successively in the tube axial direction to form the catalyst bed, said catalyst being comprised of a plurality of species of said composite oxide, respectively varying in the elemental composition of the component D, the proportion of component D as defined by g or a combination thereof, whereby the catalyst species each contain substantially the same proportion of total catalyst, but have varying activities, and wherein the catalyst species are packed respectively in said sections of the catalyst bed so that the activity of each catalyst species increases from the tube inlet toward the tube outlet.

4,837,361

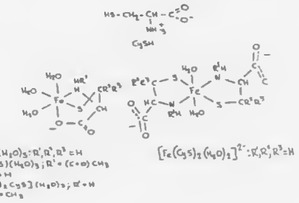
A PROCESS FOR THE PREPARATION OF CYSTEINE FROM CYSTINE

Shih-Ger Chang, El Cerrito; David K. Liu, Oakland, both of Calif.; Elizabeth A. Griffiths, Morristown, N.J., and David Littlejohn, Oakland, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 923,541, Oct. 27, 1986, Pat. No. 4,732,744. This application Nov. 18, 1987, Ser. No. 122,725

Int. Cl.⁴ C07C *147/02, 149/24, 149/243;* C12P *13/12*

U.S. Cl. 562—556 **8 Claims**



AA: $Fe_8(C_5S)(H_2O)_5$; $R^1,R^2,R^3=H$
AB: $Fe_8(Ac_6C_5S)(H_2O)_3$; $R^1=(C{=}O)CH_3$; $R^2=R^3=H$
AC: $Fe_8[(CH_3)_6C_5S](H_2O)_2$; $R^1=H$; $R^2=R^3=CH_3$

$[Fe_8(C_5S)_2(H_2O)_2]^{2-}$; $R^1,R^2,R^3=H$

1. An improved process for the preparation of cysteine from cystine, which process comprises:

(a) reacting an aqueous solution of cystine at a pH of between about 9 and 13 with an effective amount of a combination reducing agent A and B wherein A is selected from hydrogen sulfide, alkali metal sulfide or mixtures thereof, and B is selected from sulfur dioxide, alkali metal sulfite, alkali metal bisulfite or mixtures thereof for a time and at a temperature sufficient to reduce the cystine to cysteine, and

(b) recovering the cysteine formed.

4,837,362

PREPARATION OF PURE HYDROXYLAMMONIUM SALTS OF FATTY ACIDS OF 1 TO 4 CARBON ATOMS

Hugo Fuchs, Ludwigshafen, and Franz-Josef Weiss, Neuhofen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 15, 1987, Ser. No. 3,658

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1986, 3601216

Int. Cl.⁴ C07C *51/41*

U.S. Cl. 562—606 **3 Claims**

1. A process for preparing a pure hydroxylammonium salt of a fatty acid of 1 to 4 carbon atoms by

(a) reacting hydroxylammonium sulfate and an alkali metal salt of a fatty acid of 1 to 4 carbon atoms in solution in water or an alkanol of 1 to 3 carbon atoms or a mixture thereof at 20°–70° C.,

(b) evaporating the solvent out of the reaction mixture at 5°–60° C. and 5–500 mbar to obtain a dry residue,

(c) isolating from the dry residue thus obtained the hydroxylammonium salt of the fatty acid of 1 to 4 carbon atoms by sublimination at 10°–50° C. and under a reduced pressure of 0.1–200 mbar.

4,837,363

CYCLOPENTYL ETHERS AND THEIR PREPARATION AND PHARMACEUTICAL FORMULATION

Eric W. Collington, Welwyn, England, assignor to Glaxo Group Limited, London, England

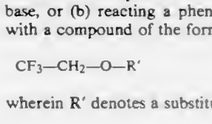
Filed Apr. 23, 1985, Ser. No. 726,332

Claims priority, application United Kingdom, Apr. 24, 1984, 8410396

Int. Cl.⁴ C07C *177/00*

U.S. Cl. 560—053 **10 Claims**

1. Compounds of the general formula (I)



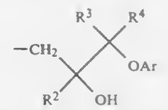
(I)

wherein

n is 1 or 2;

m is 2–5 and X is cis or trans —CH=CH— or CH_2—CH_2—; or m is 1–4 and X is —CH=C=CH—;

R^1 is a hydrogen atom, C_{1-6} alkyl or C_{7-10} phenalkyl; and Y is



where R^2, R^3 and R^4 are each a hydrogen atom or methyl and at least one is a hydrogen atom, and

Ar is a phenyl group (optionally substituted by one or two C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, C_{1-4} alkylsulphinyl, C_{1-4} alkylsulphonyl, halogen or trifluoromethyl groups); and the physiologically acceptable salts and solvates thereof.

4,837,364

PROCESSES FOR PREPARING PENTAFLUOROETHOXY- AND PENTAFLUOROETHYLTHIOBENZENE DRIVATIVES

Michel Desbois, Rillieux La Pape, and Bernard Langlois, Lyons, both of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Mar. 28, 1986, Ser. No. 845,192

Claims priority, application France, Mar. 29, 1985, 85 04755

Int. Cl.⁴ C07C *148/00, 41/22*

U.S. Cl. 568—43 **24 Claims**

1. A process for preparing a pentafluoroethoxy- or pentafluoroethylthio monocyclic or condensed polycyclic aromatic compound, wherein said compound either has no further, substituent or has further substituents, comprising the steps of:

(1) either (a) reacting a haloaromatic compound with trifluoroethanol in an aprotic solvent in the presence of a strong base, or (b) reacting a phenol or thiophenol compound with a compound of the formula (I)

$$CF_3—CH_2—O—R' \quad (I)$$

wherein R′ denotes a substituent selected from the group

consisting of trifluoroacetyl, methanesulfonyl, paratoluenesulfonyl, trichloromethane sulfonyl, chlorosulfonyl and trifluoromethane sulfonyl, in the presence of a strong alkaline base, and an aprotic solvent to obtain a 2,2,2-trifluoroethoxyaromatic compound or a 2,2,2-trifluoroethylthio aromatic compound

(2) chlorinating said aromatic compound obtained in step (1) using gaseous chlorine in the presence of one or more of radiation and phosphorus trichloride to obtain a 1,1-dichloro-2,2,2-trifluoroethoxy aromatic compound or a 1,1-dichloro-2,2,2-trifluoroethylthio aromatic compound; and

(3) fluorinating said aromatic compound obtained in step (2) in anhydrous liquid hydrofluoric acid in the presence of a Lewis acid to obtain said pentafluoroethoxy- or pentafluoroethylthio aromatic compound

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4,837,365

CHLORINATED β-KETOESTERS, THEIR PREPARATION AND THEIR USE

Didier Morel, Lyons, France, assignor to Rhone-Poulenc Sante, Courbevoie, France

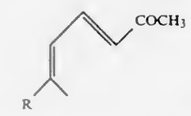
Division of Ser. No. 450,267, Dec. 16, 1982. This application Aug. 13, 1984, Ser. No. 640,112

Claims priority, application France, Dec. 18, 1981, 81 23684

Int. Cl.⁴ C07C *45/67*

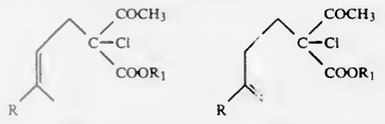
U.S. Cl. 568—394 **2 Claims**

1. Process for the preparation of an ethylenic ketone of the formula:



(VI)

wherein R represents alkyl of 1 through 6 carbon atoms or alkenyl of 2 through 6 carbon atoms, which comprises treating a chlorinated β-ketoester of the formula:



(Ia) (Ib)

wherein R is as defined above and R₁ represents alkyl of 1 through 4 carbon atoms, with the system lithium chloride/inorganic acid/tertiary amine in a basic polar aproptic solvent, at a temperature between 80° and 160° C., and isolating the said ethylenic ketone of formula (VI).

4,837,366

PREPARATION OF POLYFLUOROALDEHYDES AND POLYFLUOROACETALS

Katsuyoshi Murata, Kamifukuoka; Toru Nakazora, Iruma, and Takashi Isago, Kamifukuoka, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Sep. 3, 1987, Ser. No. 92,680

Claims priority, application Japan, Sep. 5, 1986, 61-208051; Jul. 17, 1987, 62-177218

Int. Cl.⁴ C07C *45/00, 47/14*

U.S. Cl. 568—490 **13 Claims**

1. A method of preparing a polyfluoroaldehyde represented by the formula (1),

$$RfCH_2CHO \quad (1)$$

wherein Rf represents a perfluoroalkyl group having not more than 12 carbon atoms,

the method comprising the step of reacting a polyfluoroalkene represented by the formula (2):

$$RfCH{=}CH_2 \quad (2)$$

wherein Rf is as defined above with respect to the formula (1), with water in the presence of a source of divalent palladium selected from the group consisting of palladium chloride, palladium sulfate, palladium nitrite, palladium acetate and metallic palladium, with the proviso that metallic palladium is used in combination with an oxidizer selected from the group consisting of copper salts, iron salts, heterophosphoric acid and p-benzoquinone.

4,837,367

LOW PRESSURE CATALYTIC HYDROGENATION OF CARBONYL-CONTAINING COMPOUNDS

Bruce L. Gustafson; Paul S. Wehner; Gregory O. Nelson, and Patricia N. Mercer, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 3, 1987, Ser. No. 81,252

Int. Cl.⁴ C07C *31/13, 31/18, 29/136, 29/14*

U.S. Cl. 568—831 **30 Claims**

1. A process for the low pressure hydrogenation of carbonyl-containing compounds to produce the corresponding alcohol, wherein said carbonyl-containing compounds have the structure:

wherein

R is a C_1–C_{20} alkyl or substituted alkyl radical; or a C_2–C_{20} alkenyl or alkynyl radical or a substituted derivative thereof;

wherein said substituted groups are selected from the group consisting of additional carbonyl groups, aryl groups, hydroxyl groups and alkoxy groups; and

Z is selected from the group consisting of: H and OR'- wherein R' is defined the same as R, and is selected independently of R,

with the proviso that R and Z can be joined as part of a polymethylene or hydrocarbyl-substituted polymethylene radical; and mixtures of any two or more thereof;

said process comprising contacting said carbonyl-containing compounds with a catalyst comprising 0.01 up to 20 wt % palladium on a zinc oxide-containing support in the presence of hydrogen under hydrogenation conditions.

4,837,368

LOW PRESSURE CATALYTIC HYDROGENATION OF CARBONYL-CONTAINING COMPOUNDS AND SUPPORTED CATALYSTS THEREFOR

Bruce L. Gustafson, and Paul S. Wehner, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 1, 1988, Ser. No. 150,791

Int. Cl.⁴ C07C *29/14*

U.S. Cl. 568—881 **33 Claims**

1. A process for the low pressure hydrogenation of carbonyl-containing compounds to produce the corresponding alcohol, wherein said carbonyl-containing compounds have the structure:

wherein R is a C_1–C_{20} alkyl or substituted alkyl radical; or a C_2–C_{20} alkenyl or alkynyl radical or a substituted derivative thereof;

wherein said substituted groups include ethers, amines, additional carbonyl groups, C_6–C_{20} aryl groups, hydroxy groups and alkoxy groups; and Z is selected from the group consisting of:

H,

R', wherein R' is selected from R, C_6–C_{20} aryl or substituted aryl, and is selected independently of R,

OR', wherein R' is as defined above,

X, wherein X is any one of the halogens, and

NR''_2, wherein each R'' is independently selected from H or R';

with the proviso that R and Z can be joined as part of a polymethylene or hydrocarbyl- or heteroatom-substituted polymethylene radical, and

mixtures thereof;

said process comprising contacting said carbonyl-containing compounds with a catalyst comprising palladium and zinc on a support, wherein the quantity of palladium employed falls within the range of 0.01 up to 20 weight %, calculated as the metal and based on the total weight of palladium, zinc and support; and wherein the atomic ratio of Pd to Zn falls within the range of about 0.01 up to 10; wherein said contacting is carried out in the presence of hydrogen under hydrogenation conditions; wherein said hydrogenation conditions comprise a temperature in the range of 25° up to 400° C., and a pressure in the range of 100 up to 10,000 psig.

4,837,369

PROCESS FOR THE PREPARATION OF 3-FLUORO-2-(FLUOROMETHYL)-PROPENE

Hermann Hagemann, and Bernd Baasner, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 25, 1987, Ser. No. 18,543

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1986, 3608380

Int. Cl.⁴ C07C *17/20, 21/18*

U.S. Cl. 570—160 **7 Claims**

1. A process for the preparation of 3-fluoro-2-(fluoromethyl)-propene comprising reacting 3-chloro-2-(chloromethyl)-propene with a fluorinating agent selected from the group consisting of potassium fluoride, sodium fluoride, sodium hydrogen fluoride, calcium fluoride, magnesium fluoride and mixtures thereof, wherein the process is conducted in the presence of a solvent selected from the group consisting of diethylene glycol, triethylene glycol, tetraethylene glycol and mixtures thereof and the process is conducted at a temperature of 80° to 300° C.

4,837,370

MANUFACTURE OF DIFLUOROCHLOROMETHANE

Charles G. Rudershausen, Kennett Square, Pa., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 85,304, Aug. 12, 1987, abandoned, which is a continuation of Ser. No. 889,467, Jul. 25, 1986, abandoned. This application Jun. 17, 1988, Ser. No. 211,104

Int. Cl.⁴ C07C *17/20, 17/24, 19/02, 19/00*

U.S. Cl. 570—163 **6 Claims**

1. A process comprising contacting, in the vapor phase, fluorodichloromethane with an effective amount of a catalyst comprising an activated mixture of iron oxide and rare earth metal oxides, said rare earth metal selected from the group consisting of scandium, yttrium, lanthanum, cerium, praseodymium, neodymium, illinium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium and lutecium, at a temperature of 50 to 300 degrees Celsius and a contact time of 0.1 to 10 seconds based on the volume of feed and the catalyst bed to produce a reaction product containing primarily difluorochloromethane and chloroform, said contacting step conducted without HF feed.

4,837,371

PROCESS FOR CONCENTRATION OF AN AQUEOUS SOLUTION OF AMINO ACID

Shinji Ogawa, Kanagawa; Seiya Iguchi, Tokyo; Hiroshi Kimura, and Yoh Ohmori, both of Kanagawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Sep. 3, 1987, Ser. No. 92,442

Claims priority, application Japan, Sep. 8, 1986, 61-209621

Int. Cl.⁴ C07D *209/20*; C07C *99/12*

U.S. Cl. 548—497 **1 Claim**

1. A process for concentrating an aqueous solution of an amino acid having a low solubility in water at the isoelectric point, wherein said amino acid is selected from the group consisting of tryptophan, 5-hydroxy-tryptophan, tyrosine, phenylalanine, cystine and metbionine, which comprises carrying out concentration of said aqueous solution in the presence of an aliphatic alcohol having 1 to 4 carbon membrane by means of a reverse osmosis membrane having an exclusion ratio for NaCl of 30% to 90%.

4,837,372

PROCESS FOR OLIGOMERIZATION OF OLEFINS

Heinz Zimmermann, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jul. 28, 1987, Ser. No. 78,508

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1986, 3625572; Jul. 29, 1986, 3625571

Int. Cl.⁴ C07C *2/08, 2/14*

U.S. Cl. 585—514 **12 Claims**

1. A process for the oligomerization of olefins comprising oligomerizing at least one olefin in the gas phase in contact with an oligomerizing quantity of a solid catalyst containing a catalytic quantity of at least one superacidic fluorine compound said compound being HBF_4, NH_4BF_4, H_2SiF_6, $(NH_4)_2SiF_6$ or HPF_6.

4,837,373

TEST STRIPS

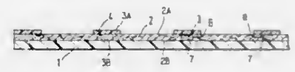
Werner Gunkel, Rossdorf, and Helmuth Krauss, Bensheim, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed May 12, 1987, Ser. No. 48,696

Claims priority, application Fed. Rep. of Germany, May 13, 1986, 3616105

Int. Cl.⁴ G01N *21/77, 33/52*

U.S. Cl. 422—56 **9 Claims**



1. A test strip for detecting a substance present in a liquid, wherein the test strip comprises:

a substrate having a top surface;

at least one single layer absorbent matrix pad which is impregnated with reagents for reacting with a selected substance in a liquid, each single layer absorbent matrix pad having an exposed front surface which defines an evaluation zone for facing a liquid and for displaying results of a

reaction between a selected substance and the reagents impregnated therein, a back surface which directly abuts with the top surface of the substrate, and edges extending between its front and back surfaces;

at least two adhesive strips adjacent each single layer absorbent matrix pad, each adhesive strip having a back surface which directly abuts with the top surface of the substrate, a front surface which is complanar with the front surface of single layer absorbent matrix pads adjacent thereto, and side edges, with at least one side edge of each adhesive strip being adhered substantially to a side edge of absorbent matrix pads adjacent thereto, and wherein each single layer absorbent matrix pad only contacts adhesive along its edges;

a layer of film material corresponding to each adhesive strip, with each layer of film material adhered to and completely covering its corresponding adhesive strip and having an edge portion overlapping edges of single layer absorbent matrix pads which are adhered substantially to an edge of its corresponding adhesive strip in such a manner that a substantial portion of the evaluation zone of each single layer absorbent matrix pad is visually unobstructed.

4,837,374

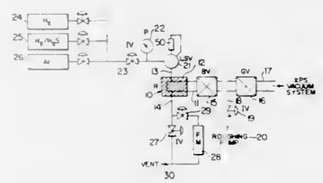
MICROREACTOR FOR ANALYZING THIN SOLID SAMPLES

James R. Brown, 22 Milne Crescent, Kanata, Ontario, Canada K2K 1H8; Leighton L. Coatsworth, 646 Platt's Lane, London, Ontario, Canada N6G 3B2, and Irold S. Schmidt, 857 Farnham Grove, London, Ontario, Canada N6K 1S5

Filed Jun. 1, 1987, Ser. No. 56,126

Int. Cl.[4] G01N *31/12*

U.S. Cl. 422—130 **5 Claims**



1. A reactor apparatus comprising:

(a) a horizontal tubular reactor vessel for receiving an article for testing, a first end of said vessel being closed and a second end being connected to a ball valve end flange,

(b) a pair of horizontal laterally spaced shelves within the reactor vessel, said shelves projecting horizontally inwardly from said first closed end and adapted to receive and support the article for testing

(c) gas inlet means for introducing gas into the vessel,

(d) gas outlet means for removing gas from the vessel,

(e) sensing means for sensing temperatures within the vessel,

(f) means disposed outwardly of said reactor vessel and in heat-conductive relation to an outer surface thereof for heating said vessel, and

(g) releasable gripper means for delivering said article for testing through a ball valve and into the reactor vessel and for releasing said article onto said shelves.

4,837,375

METHOD FOR PRODUCING GREEN SALT (UF_4) FROM URANIUM AND URANIUM ALLOY PIECES

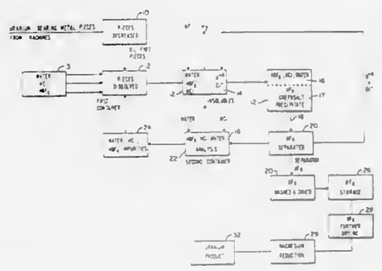
Eugene N. Pollock, Brookline, Mass., assignor to Nuclear Metals, Inc., Concord, Mass.

Continuation-in-part of Ser. No. 723,302, Apr. 15, 1985, Pat. No. 4,699,769. This application Jan. 20, 1987, Ser. No. 5,011

The portion of the term of this patent subsequent to Oct. 13, 2004, has been disclaimed.

Int. Cl.[4] C01O *43/06*

U.S. Cl. 423—20 **18 Claims**



1. A method of producing green salt (UF_4) from uranium-bearing metal pieces comprising:

dissolving the uranium-bearing metal pieces in a first aqueous solution containing hydrochloric acid and at least 0.5% but no more than 5.0% fluoboric acid to provide a second aqueous solution which includes uranium (U^{+4}), chloride ions and hydrochloric and fluoboric acids;

adding hydrofluoric acid to said second aqueous solution to precipitate green salt out of said second solution and provide a third aqueous solution containing hydrochloric acid; and

separating said green salt from said third aqueous solution.

4,837,376

PROCESS FOR REFINING SILICON AND SILICON PURIFIED THEREBY

Ingo Schwirtlich; Horst Lange, both of Krefeld, and Werner Kannchen, Duisburg, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 5, 1987, Ser. No. 104,657

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1986, 3635064

Int. Cl.[4] C01B *33/02*

U.S. Cl. 423—348 **6 Claims**

1. A process for refining silicon to remove impurities which comprises contacting a silicon melt with a reactive gas which comprises a gaseous halogen compound mixed with steam, hydrogen, or a steam/hydrogen mixture wherein the halogen compound is at least one halogen silane of the formula Si_nX_{2n+2}, wherein n is 1 to 4 and X represents halogen and/or hydrogen.

4,837,377

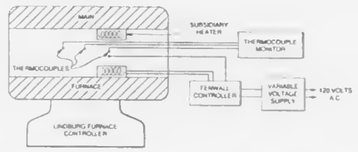
RUBBERY, ELECTRICALLY NON-CONDUCTIVE, AND INTRINSICALLY MAGNETIC GRAPHITE INTERCALATION COMPOUNDS AND METHODS FOR THEIR MAKING

George O. Zimmerman, South Hamilton, and Abdo K. Ibrahim, Dorchester, both of Mass., assignors to Trustees of Boston University, Boston, Mass.

Filed Dec. 28, 1987, Ser. No. 137,910

Int. Cl.[4] C01B *31/04*

U.S. Cl. 423—448 **13 Claims**



5. A method for making an intrinsically magnetic graphite intercalation compound comprising the steps of:

obtaining a graphite intercalation compound comprised of an ordered, repetitious sequence of a multi-staged graphite stratum followed by an intercalant stratum, each said multi-staged graphite stratum being composed of not less than four atomic structural layers of graphite, and each said intercalant stratum being composed of a single molecular structural layer of a halide salt having the formula MX_n

wherein

M is a ferromagnetic metal,

X is a halide moiety, and

n is a number not less than 2;

reacting said graphite intercalation compound at an elevated temperature with an alkali metal; and

combining said reacted graphite intercalation compound with at least one substance selected from the group consisting of molecular oxygen and water such that at least one ferromagnetic metal oxide composition is formed within said intercalant stratum.

4,837,378

TOPICAL METRONIDAZOLE FORMULATIONS AND THERAPEUTIC USES THEREOF

Rubert J. Borgman, Mundelein, Ill., assignor to Curatek Pharmaceuticals, Inc., Elk Grove Village, Ill.

Continuation-in-part of Ser. No. 819,066, Jan. 15, 1986, abandoned. This application Jan. 15, 1988, Ser. No. 144,252

Int. Cl.[4] A61K *31/78*

U.S. Cl. 424—81 **17 Claims**

1. A dermatological preparation for topical application in the form of an aqueous gel composition comprising:

a therapeutically effective amount of metronidazole as the sole active ingredient;

a gelled, hydrophillic and water-dispersible polymer having free carboxylic groups which is a polyacrylic acid polymer having a molecular weight in the range of about 1,250,000 to about 4,000,000 daltons; and

an aqueous solvent for said metronidazole.

4,837,379

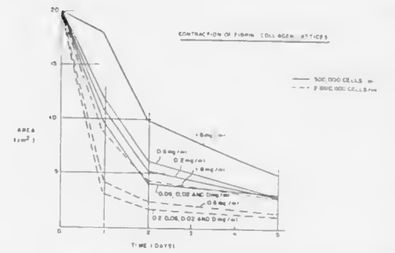
FIBRIN-COLLAGEN TISSUE EQUIVALENTS AND METHODS FOR PREPARATION THEREOF

Crispin B. Weinberg, Brookline, Mass., assignor to Organogenesis Inc., Cambridge, Mass.

Filed Jun. 2, 1988, Ser. No. 201,585

Int. Cl.[4] A61K *35/14, 37/12*

U.S. Cl. 424—101 **46 Claims**



1. A tissue equivalent comprising (i) a hydrated collagen lattice contracted by a contractile agent and (ii) fibrin.

4,837,380

LIPOSOME-CALCITONIN PREPARATION

Leonard J. Deftos, and Karl Y. Hostetler, both of Del Mar, Calif., assignors to Regents of University of California, Berkeley, Calif.

Continuation of Ser. No. 781,760, Sep. 30, 1985, abandoned, which is a continuation of Ser. No. 449,053, Dec. 13, 1982, abandoned. This application Mar. 17, 1987, Ser. No. 26,980

Int. Cl.[4] A61K *9/10*

U.S. Cl. 424—450 **10 Claims**

1. A liposome-entrapped preparation for parenteral administration into mammals to produce a rapid maximal decrease of serum calcium comprising an effective amount of calcitonin encapsulated in a vesicle consisting essentially of a cholesterol-free phospholipid, parenteral vehicle.

4,837,381

COMPOSITIONS FOR PARENTERAL ADMINISTRATION AND THEIR USE

William Steber, Ledgewood; Richard Fishbein, Skillman, both of N.J., and Susan M. Cady, Yardley, Pa., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 895,608, Aug. 11, 1986, abandoned. This application Jul. 31, 1987, Ser. No. 78,926

Int. Cl.[4] A61K *9/50*

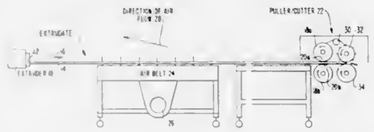
U.S. Cl. 424—502 **25 Claims**

1. A microsphere composition comprising on a weight basis about 30% to 95% of a fat or wax or mixture thereof and about 2% to 70% of a biologically active protein, peptide or polypeptide.

7. A method for increasing milk production in lactating animals comprising parenterally

administering to the animal a microsphere composition comprising on a weight basis about 30% to 95% fat or wax or mixtures thereof; and about 2% to 70% of a growth hormone, somatomedin, growth factor or biologically active fragment or derivative thereof; wherein the microsphere is dispersed in a pharmaceutically and pharmacologically acceptable liquid vehicle.

4,837,382
PROCESS AND APPARATUS FOR UNIFORMLY FORMING INDIVIDUAL FOOD PIECES FROM A MASS OF FLOWABLE MATERIAL
Richard J. Ruegg, Coppell; William R. Slovak, Arlington, and Moise Riboh, Plano, all of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.
Filed Nov. 10, 1987, Ser. No. 119,036
Int. Cl.[4] A21C *3/10*; A21D *6/00*
U.S. Cl. 426—503 27 Claims

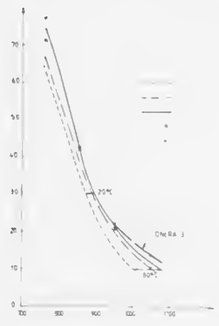


1. A process for forming individual food pieces from a mass flowable food material, comprising:
(a) continuously extruding a flowable food material through a die orifice at a first rate of speed, to form a moving, continuous, flexible, extrudate ribbon;
(b) curing the continuous flexible ribbon to form a continuous semi-rigid ribbon that can be cut with substantially planar cuts and without substantial pinching of the ribbon during cutting, wherein said curing includes the steps of:
(i) feeding the continuous ribbon between a pair of pull rollers having opposing roller surfaces that contact the ribbon; and
(ii) rotating the pull rollers in opposite directions so that the opposing roller surfaces pull the continuous ribbon at a rate of speed that is faster than the extrusion rate of the ribbon to thereby stretch the ribbon during formation of said semi-rigid ribbon, which semi-rigid ribbon is then pushed by the pull rollers into a cutter having a cutter roller and an opposing backup roller, the cutter roller having outwardly projecting transversly mounted blades with edges that bias against an outer support surface of the backup roller during cutting, the blades being positioned to form cuts in the ribbon that are substantially prependicular to the direction of ribbon travel;
(c) rotating the opposing cutter and backup rollers in opposite directions so that the cutter blade edges and the outer support surface of the backup roller rotate at substantially the same speed as the opposing roller surfaces of the pull rollers, to cut the semi-rigid ribbon with cuts that are substantially perpendicular to the direction of ribbon travel, and thereby form individual food pieces having substantially planar cut faces.

4,837,383
GLASS ENAMEL
Ray Andrews, 800 E. Beau St., Washington, Pa. 15301
Continuation-in-part of Ser. No. 111,927, Oct. 23, 1987, and Ser. No. 212,252, Jun. 27, 1988. This application Oct. 11, 1988, Ser. No. 255,383
Int. Cl.[4] B05D *5/12, 1/69*
U.S. Cl. 427—108 38 Claims

1. A method of decorating a glass substrate said method including the steps of:
applying to said glass substrate a glass enamel composition which includes a printing vehicle which forms reducing conditions when the glass enamel is fired to prevent rapid oxidation of aluminum, 5 to 25 percent by weight glass coloring agents, 1 to 25 percent by weight aluminum and the remainder being lead glass flux,
drying or curing the glass enamel composition,
applying a silver containing coating which includes finely divided electrically conductive silver and a glass binder,
firing the substrate bearing the glass enamel composition and the silver containing coating onto the substrate whereby said aluminum prevents migration of silver in said silver containing coating in the fired glass enamel.

4,837,384
NICKEL-BASED MONOCRYSTALLINE SUPERALLOY, IN PARTICULAR FOR THE BLADES OF A TURBOMACHINE
Tasadduq Khan, Jouy en Josas; Pierre Caron, and Jean-Louis Raffestin, both of Les Ulis, all of France, assignors to Office National d'Etudes et de Recherche Aerospatiales, Chatillon Cedex, France
Filed May 28, 1987, Ser. No. 55,465
Claims priority, application France, Jun. 4, 1986, 86 08068
Int. Cl.[4] C22F *1/10*
U.S. Cl. 148—3 4 Claims

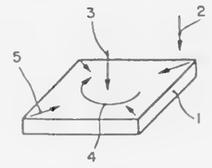


1. A method of manufacturing a turbomachine blade from a superalloy consisting essentially of:

Co: 5.0 to 6.0% by weight
W: 4.8 to 5.2%
Cr: 7.8 to 8.3%
Al: 5.8 to 6.1%
Ta: 3.3 to 3.7%
Mo: 2.1 to 2.4%
Ti: 1.8 to 2.2%
B: ≦10 ppm;
Zr: ≦50 ppm; and
Ni: balance to 100%;

which comprises the steps of:
(a) working said superalloy into a monocrystalline blade;
(b) heating the monocrystalline blade to a sufficiently high temperature for a sufficient length of time to put its gamma prime phase into solution;
(c) cooling the monocrystalline blade in the air; and
(d) increasing the temperature of the monocrystalline blade following step (c) to a temperature of more than 1000° C. in order to cause the gamma prime phase to precipitate.

4,837,385
PROCESS FOR SEPARATING THE INCLUSIONS CONTAINED IN A BATH OF MOLTEN METAL, BY FILTRATION
Calogero Conti, Bois D'Hayne, Belgium; Jean-Luc Meyer, Voiron, France; Pierre Netter, Pont St. Esprit, France, and Jean-Pierre Riquet, St. Hilaire de la Cote, France, assignors to Aluminium Pechiney, Paris, France
Filed Apr. 18, 1988, Ser. No. 182,502
Claims priority, application France, May 7, 1987, 87 06879
Int. Cl.[4] C22B *15/00*; C02F *1/48*
U.S. Cl. 210—695 24 Claims



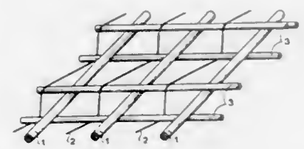
1. A process for separating inclusions contained in a molten metal bath comprising passing a molten metal bath containing inclusions having a higher electrical resistance than the molten metal through a filtering medium, and applying an electromagnetic force field of a strength at least $1\times10^3 N/m^3$ to said medium, causing said filtering medium to more effectively retain said inclusions.

4,837,386
METHOD OF TREATING MEMBRANES WITH ULTRAVIOLET RADIATION
Pushpinder S. Puri, Macungie, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.
Filed Jun. 24, 1987, Ser. No. 65,795
Int. Cl.[4] C08F *30/08*
U.S. Cl. 204—157.61 14 Claims

1. A process for enhancing the permselectivity without adversely affecting the mechanical properties of a polymeric membrane containing substituted acetylene monomer units, said process comprising: irradiating the surface of said membrane with ultraviolet rays having wavelengths between 230–280 nm while maintaining said membrane in an environment comprising a fluid which is capable of removing surface heat from the polymer without significantly absorbing or depleting the intensity of the ultraviolet rays having wavelengths between 230–280 nm while maintaining the surface temperature of said membrane at or below about 160° F.

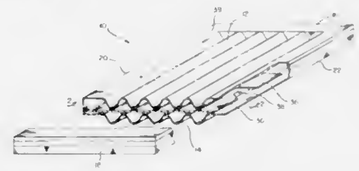
4,837,387
SUPPORTING FABRIC FOR BEARING BULK MATERIAL
Gustaaf M. W. van de Pol, Zevenaar, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands
Filed Feb. 19, 1987, Ser. No. 16,584
Claims priority, application Netherlands, Feb. 21, 1986, 8600436
Int. Cl.[4] D03D *3/00*
U.S. Cl. 428—229 16 Claims

1. A supporting woven fabric, having a warp axis and a orthogonal weft axis, for stationary geotextile uses, such as for bearing one or more layers of sand, gravel, stones, clay, loam, asphalt, mortar or the like bulk or other material, to a height of at least 5–10 mm, the fabric having a tensile strength along at least one of the warp axis or weft axis of at least 50 kN/m, comprises of synthetic yarns having a weight, the yarn being composed of polypropylene incorporating polyester, and the polypropylene is used in an amount of 75 to 85 percent by



weight, and the polyester is used in an amount of 25 to 15% by weight, based on the total weight of the synthetic yarn.

4,837,388
EVACUATED INSULATION AND A METHOD OF MANUFACTURING SAME
Franz J. Kugelmann, Juneau, Ak., assignor to Nudvuck Enterprises, Juneau, Ak.
Filed Dec. 23, 1987, Ser. No. 137,964
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—69 8 Claims



1. An insulation article, comprising:
upper and lower spaced-apart outer elements of deformable but substantially rigid material, joined together around the periphery thereof and sealed so as to define an airtight interior volume, wherein the interior volume has been substantially evacuated and wherein the upper and lower outer elements each have a surface configuration defining successive peaks and valleys, wherein the upper and lower outer elements each have successive high and low points;
at least one relatively thin, substantially flat, flexible, resilient interior element, wherein the interior element extends continuously and substantially completely across the article between the low points of the upper outer element and the high points of the lower outer element; and
means securing the interior element to successive portions of both the upper and lower outer elements which are closely adjacent to the interior element.

4,837,389
COMPOSITE ALLOY STRUCTURES
Srinivasan Shankar, Branford, and George W. Goward, New Haven, both of Conn., assignors to Turbine Components Corporation, Branford, Conn.
Filed Jun. 4, 1984, Ser. No. 617,112
Int. Cl.[4] B32B *15/00*
U.S. Cl. 428—668 7 Claims

1. A restored article of cobalt base alloy having a surface layer of alloy consisting essentially of an alloy whose composi-

tion is substantially the composition of the cobalt base alloy combined with about 1 to 4% aluminum, up to 1.5% hafnium

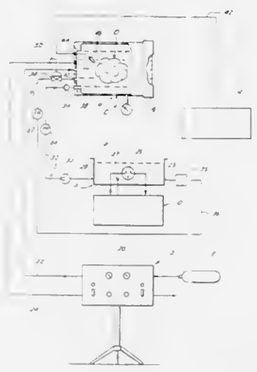
and up to 20% nickel by weight of the base composition of the cobalt alloy article.

4,837,390

HYPERBARIC ORGAN PRESERVATION APPARATUS AND METHOD FOR PRESERVING LIVING ORGANS

Raymond P. Reneau, Houston, Tex., assignor to Keyes Offshore, Inc., Sugarland, Tex.

Filed May 11, 1983, Ser. No. 493,600
Int. Cl.[4] A01N 1/02; C12M 1/00
U.S. Cl. 435—1 **7 Claims**



I. A method for preserving living organs extracorporeally utilizing a perfusate, including the steps of:

storing the organ in a chamber formed in a vessel having a hyperbaric atmosphere;

maintaining a supply of the perfusate in a reservoir under ambient pressure; and,

supplying the organ in the chamber with perfusate from the reservoir.

4,837,391

DRY ELECTROSTATOGRAPHIC DEVELOPER CONTAINING TONER PARTICLES COMPRISING A VINYL ADDITION POLYMER CONTAINING A COVALENTLY BOUND QUATERNARY PHOSPHONIUM SALT

James H. Anderson, and Douglas E. Bugner, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 5, 1988, Ser. No. 229,047
Int. Cl.[4] G03G 9/08, 9/10, 9/14
U.S. Cl. 430—110 **4 Claims**

1. In a dry electrostatographic developer comprising:

(a) carrier particles and

(b) toner particles comprising a vinyl addition binder polymer and a charge-control agent comprising a quaternary phosphonium salt,

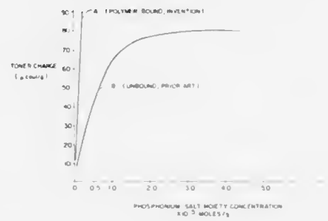
the improvement wherein the phosphonium salt has an anionic portion which is covalently bonded to the backbone of the binder polymer.

4,837,392

DRY ELECTROSTATOGRAPHIC DEVELOPER CONTAINING TONER PARTICLES COMPRISING A VINYL ADDITION POLYMER CONTAINING A COVALENTLY BOUND QUATERNARY PHOSPHONIUM SALT

James H. Anderson; Douglas E. Bugner; Lawrence P. DeMejo; Richard C. Sutton, and John C. Wilson, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 5, 1988, Ser. No. 229,046
Int. Cl.[4] G03G 9/08, 9/10, 9/14
U.S. Cl. 430—110 **5 Claims**



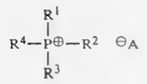
1. In a dry electrostatographic developer comprising:

(a) carrier particles and

(b) toner particles comprising a vinyl addition binder polymer and a charge-control agent comprising a quaternary phosphonium salt,

the improvement wherein the phosphonium salt has a cationic portion comprising a phosphorous atom covalently bonded to the backbone of the binder polymer.

2. The developer of claim 1, wherein the phosphonium salt has the structure



wherein:

R^1 is directly covalently bonded to the backbone of the binder polymer and comprises arylene, alkylene, or arylenealkylene;

R^2, R^3, and R^4 are each independently: alkyl which is unsubstituted or substituted with one or more aryl; or aryl which is unsubstituted or substituted with one or more alkyl;

$A^\ominus$ is an anion;

each alkyl or alkylene moiety recited above has from 1 to 20 carbon atoms; and

each aryl or arylene moiety recited above has from 6 to 14 carbon atoms.

4,837,393

ELECTROSTATOGRAPHIC TONER PARTICLE COMPRISING A POLYESTER CONTAINING A COVALENTLY BOUND QUATERNARY PHOSPHONIUM SALT

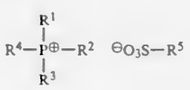
Peter S. Alexandrovich; Lawrence P. DeMejo, and John C. Wilson, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 5, 1988, Ser. No. 229,045
Int. Cl.[4] G03G 9/08, 9/10, 9/14
U.S. Cl. 430—110 **6 Claims**

1. In an electrostatographic toner particle having an average diameter in the range of 0.01 to 100 micrometers and comprising a binder polyester and a charge-control agent comprising a quaternary phosphonium salt,

the improvement wherein the phosphonium salt has an anionic portion comprising a sulfonate group covalently bonded to a moiety containing at least one ester linkage to the binder polyester.

2. The toner particle of claim 1, wherein the phosphonium salt has the structure



wherein:

R^1, R^2, R_3, and R^4 are each independently: alkyl which is unsubstituted or substituted with one or more aryl; or aryl which is unsubstituted or substituted with one or more alkyl;

R^5 is aryl substituted with one or more moiety containing an ester linkage to the binder polyester;

each alkyl moiety recited above has from 1 to 20 carbon atoms; and

each aryl moiety recited above has from 6 to 14 carbon atoms.

4,837,394

ELECTROSTATOGRAPHIC TONER PARTICLE COMPRISING A POLYESTER CONTAINING A COVALENTLY BOUND QUATERNARY PHOSPHONIUM SALT

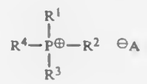
Peter S. Alexandrovich; Lawrence P. DeMejo; Thomas A. Jadwin, and John C. Wilson, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 5, 1988, Ser. No. 229,043
Int. Cl.[4] G03G 9/08, 9/10, 9/14
U.S. Cl. 430—110 **14 Claims**

1. In an electrostatographic toner particle having an average diameter in the range of 0.01 to 100 micrometers and comprising a binder polyester and a charge-control agent comprising a quaternary phosphonium salt,

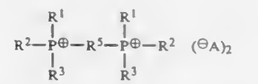
the improvement wherein the phosphonium salt has a cationic portion comprising a phosphorus atom covalently bonded to at least one moiety containing an ester linkage to the binder polyester.

2. The toner particle of claim 1, wherein the phosphonium salt has the structure



I

or the structure



II

wherein:

R^1, R^2, R^3, and R^4 are each independently: alkyl which is unsubstituted, substituted with one or more aryl, or substituted with one or more group containing an ester linkage to the binder polyester; or aryl which is unsubstituted, substituted with one or more alkyl, or substituted with one or more group containing an ester linkage to the binder polyester;

R^5 is alkylene, oxydialkylene, or arylenedialkylene; and

$A^\ominus$ is an anion; with the provisos that:

each alkyl or alkylene moiety recited above has from 1 to 20 carbon atoms;

each aryl or arylene moiety recited above has from 6 to 14 carbon atoms; and

at least one of R^1, R^2, R^3, and R^4 contains at least one ester linkage to the binder polyester.

4,837,395

SINGLE STEP HETEROGENEOUS ASSAY

Sydney Leeder, Union City, and Robert F. Zuk, Menlo Park, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed May 10, 1985, Ser. No. 733,013
Int. Cl.[4] G01N 33/53
U.S. Cl. 435—7 **37 Claims**

1. In an assay method involving in an aqueous medium the reaction of members of a specific binding pair ("sbp members") and the reaction of members of a signal producing system ("sps members") capable of producing a detectable signal in relation to the presence or amount of an analyte in a sample suspected of containing said analyte wherein at least one sbp member is bound to at least one sps member, the improvement which comprises temporarily delaying the production of said signal by employing an effective amount of a signal inhibitor present in said aqueous medium prior to the production of said signal, said signal inhibitor being a compound that chemically inhibits the reaction of an sps member.

4,837,396

ZEOLITE BETA CONTAINING HYDROCARBON CONVERSION CATALYST OF STABILITY

Joseph A. Herbst, Turnersvill, and Yun-Yang Huang, Voorhees, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 11, 1987, Ser. No. 131,595
Int. Cl.[4] B01J 29/28
U.S. Cl. 502—67 **13 Claims**

1. A method of improving the hydrothermal stability of a zeolite beta hydrocarbon conversion catalyst which method comprises compositing zeolite beta with a stabilizing compound which comprises a hydroxychloride of aluminum.

2. A method according to claim 1 in which the stabilizing compound comprises aluminum hydroxychloride.

3. A method according to claim 1 in which the stabilizing compound comprises aluminum zirconium hydroxychloride or glycine aluminum zirconium hydroxychloride.

8. A method according to claim 1 in which a second zeolite having cracking activity is composited with the zeolite beta and the stabilizing compound.

4,837,397

NOBILE METAL CONTAINING CATALYSTS OF IMPROVED STABILITY

Robert P. L. Absil, Mantua, and Yun-Yang Huang, Voorhees, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 11, 1987, Ser. No. 131,596
Int. Cl.[4] B01J *29/12, 29/32*
U.S. Cl. 502—66 20 Claims

16. A method of producing a noble metal containing zeolite catalyst of improved dispersability characteristics which compises:

(i) forming a catalyst composition of at least one zeolite, a catalyst matrix material, a noble metal component and a compound containing a complex cation of zirconium,

(ii) forming the catalyst composition into solid catalyst particles;

(iii) calcining the catalyst particles.

4,837,398

AMMONIUM ACTIVATION OF ZEOLITES IN THE PRESENCE OF GASEOUS AMMONIA

Clarence D. Chang, Princeton; Cynthia T. Chu, Princeton Junction, and Carol S. Lee, Princeton, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 81,955, Aug. 5, 1987, abandoned. This application Jan. 4, 1988, Ser. No. 140,359
Int. Cl.[4] B01J *29/28*
U.S. Cl. 502—86 20 Claims

1. A method for modifying a composition to increase its acid catalytic activity, said composition comprising a solid source of aluminum and a zeolite characterized by a silica to alumina mole ratio of at least about 100 and a constraint index of about 1 to 12, which method comprises contacting said composition with an aqueous ammonium solution under ammonia gas pressure such that a pH of at least about 8 is maintained in said solution and under a combination of conditions including a temperature of about 40° to 200° C. for about 2 to 72 hours, said combination of conditions being effective to induce said increase in catalytic activity.

4,837,399

NAPTHOQUINONE ANTIBIOTICS FROM FUSERIUM SOLANI

Robert A. Baker, Lake Wales, and James H. Tatum, Winter Haven, both of Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 10, 1988, Ser. No. 192,085
Int. Cl.[4] C12P *1/02, 7/26*
U.S. Cl. 514—468 4 Claims

1. A method for controlling bacteria comprising applying to the locus of said bacteria an antibiotically effective amount of a substantially pure or formulated naphthoquinone selected from the group consisting of: 2,3-dihydro-5,8-dihydroxy-6-methoxy-2-hydroxymethyl-3-(2-hydroxypropyl)-1,4-naphthalenedione; 2,3-dihydro-5-hydroxy-4-hydroxymethyl-8-methoxy-2-methyl-naphtho[1,2]furan-6,9-dione; and 5,8-dihydroxy-2-methoxy-6-hydroxymethyl-7-(2 hydroxypropyl)-1,4-naphthalenedione.

4,837,400

POLYOXYMETHYLENE MOLDING MATERIALS HAVING IMPROVED THERMAL STABILITY, THEIR PREPARATION AND THEIR USE

Manfred Walter; Wilhelm Schuette, both of Speyer, and Heiner Goerrissen, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 077,217, Jul. 24, 1987, abandoned. This application Feb. 4, 1988, Ser. No. 152,389
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1986, 3628560
Int. Cl.[4] C08K *5/52, 5/13*
U.S. Cl. 524—145 11 Claims

1. A polyoxymethylene molding material having improved heat stability comprising

(A) one or more polyoxymethylene homopolymers and/or copolymers,

(B) one or more antioxidants having a sterically hindered phenolic structure, and

(C) one or more alkaline earth metal glycerophosphates of the chemical formula $C_3H_7O_6PMe$ and/or alkaline earth metal silicates of the chemical formula

$$MeO.xSiO_2.nH_2O$$

where Me is an alkaline earth metal, x is from 1.4 to 10 and n is greater than or equal to 0, for improving the heat stability.

4,837,401

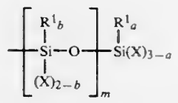
CURABLE POLYMER COMPOSITION COMPRISING ORGANIC POLYMER HAVING SILICON-CONTAIING REACTIVE GROUP

Toshifumi Hirose; Sadao Yukimoto, and Katsuhiko Isayama, all of Kobe, Japan, assignors to Kanegafuchi Chemical Industry, Co., Ltd., Japan

Filed Dec. 11, 1985, Ser. No. 807,842
Claims priority, application Japan, Dec. 12, 1984, 58-263293
Int. Cl.[4] C08F *8/42, 30/08*
U.S. Cl. 525—364 6 Claims

1. A curable polymer composition consisting essentially of

(A) 100 parts by weight of an organic polymer having a backbone selected from the group consisting of polymers of polyethers and polymers and copolymers of, vinyl compounds and diene compounds and 1.2 to 6 silicon-containing reactive groups on the average of the formula:



(I)

wherein R^1 is, the same or different, a C_1–C_{20} monovalent hydrocarbon group or a triorganosiloxy group of the formula:

$$(R')_3SiO— \quad (II)$$

in which R' is, the same or different, a C_1–C_{20} monovalent hydrocarbon group; X is a hydroxyl group or a hydrolyzable group provided that when the number of Xs in the group (I) is at least 2, Xs are the same or different; a is 0, 1, 2 or 3; b is 0, 1 or 2; and m is an integer of 1 to 18, and

(B) 0.01 to 10 parts by weight of a curing catalyst selected from the compounds of the formulas:

$$Q_2Sn(OZ)_2 \quad (IIIa)$$

and

-continued

(IIIb)

wherein Q is a C_1–C_{20} monovalent hydrocarbon group; and Z is, the same or different, a C_1–C_{20} monovalent hydrocarbon group or an organic group having a functional residue which can form a coordinate bond with Sn atom.

4,837,402

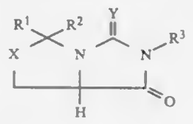
PROCESS FOR THE PREPARATION OF D-(+)-BIOTIN

Eike Poetsch, Mühltal, and Michael Casutt, Pfungstadt, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Division of Ser. No. 39,342, Apr. 17, 1987, Pat. No. 4,732,987. This application Jan. 6, 1988, Ser. No. 141,161
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1986, 3613245; Feb. 7, 1987, 3703872
Int. Cl.[4] C07D *495/04*
U.S. Cl. 548—303 11 Claims

1. A process for the preparation of D-(+)-biotin, comprising:

(i) Reducing a starting material compound of the formula



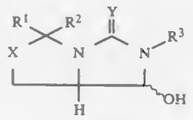
wherein

R^1 and R^2 are each in independently H, alkyl, substituted alkyl, cycloalkyl, aryl, aralkyl or heteroaryl, wherein the heteroatom is O, N, or S, or taken together are alkylene, substituted alkylene or heteroalkylene, wherein the heteroatom is O, N, or S;

R^3 is H or benzyl, benzyl substituted by one or more of C_{1-4}-alkyl, C_{1-4}-alkoxyl, C_{3-5}alkyl-2-enyl or C_{3-6}-trialkylsilyl;

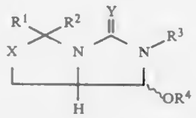
X and Y independently are each O or S;

to an alcohol of the formula



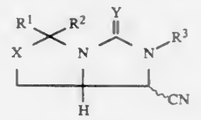
by reacting said starting material compound with a reducing agent or by catalytically hydrogenating said starting material compound;

(ii) converting said alcohol into an activated ester of the formula

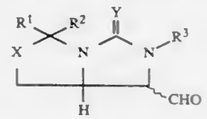


wherein R^4 is an activating ester group and is alkanoyl, aroyl, alkylsulfonyl or azole.M, wherein azole is a fused or non-fused, substituted or unsubstituted, nitrogen-containing 5-membered ring, and M is CO, CS, SO_2, SO or S;

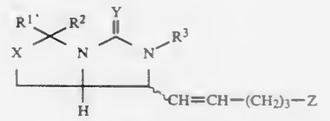
(iii) reacting said activated ester with an alkali metal cyanide, an alkaline earth metal cyanide or a cyanosilane, to give a nitrile of the formula



(iv) reacting the product of step (iii) with a reducing agent to give an aldehyde of the formula

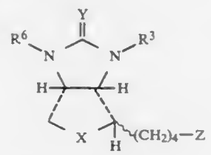


(v) condensing said aldehyde with an organophosphorus compound to give an unsaturated carboxylic acid of the formula



wherein Z is OR^5 or $COOR^5$, wherein R^5 is H, alkyl, cycloalkyl or aryl;

(vi) reacting said carboxylic acid with an acid, a reducing agent or a mixture thereof to produce a biotin derivative of the formula



wherein R^6 is H or R^1R^2CH;

(vii) converting said derivative into D-(+)-biotin by known processes.

4,837,403

NOVEL POLYALKYLPIPERIDINE DERIVATIVES HAVING ALKYLENE BRIDGES, USE THEREOF AS STABILIZERS, AND INTERMEDIATES

Alexander Aumueller, Deidesheim; Peter Neuman, Wiesloch, and Hubert Trauth, Dudenhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 14, 1987, Ser. No. 132,331
Int. Cl.[4] C07D *251/00*
U.S. Cl. 544—215 18 Claims

1. A compound of the formula 1

C—A—B—A— (I)

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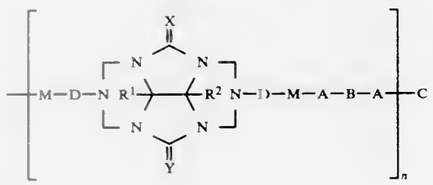
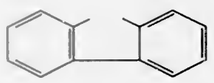


where

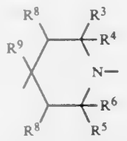
n is an integer from 1 to 70,

R^1 and R^2 are independently of each other hydrogen, C_1–C_6-alkyl, C_7–C_{12}-phenylalkyl, methylbenzyl, phenyl, tolyl or carbo-C_1–C_4-alkoxy, or together a tetra-, penta- or hexamethylene group, or a radical of the formula



X and Y are independently of each other oxygen or sulfur,

M is

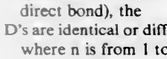


where R^3, R^4, R^5 and R^6 are identical or different and each is C_1–C_4-alkyl, or where R^3 and R^4 and also R^5 and R^6, together with the carbon atom to which they are bonded, form a 5- or 6-membered ring, and where R^8 is hydrogen, or together with the associated carbon atom forms a

group and where R^9 is hydrogen or a further bond to a spirolinked bridge member —B— (—A— is in this case a direct bond), the

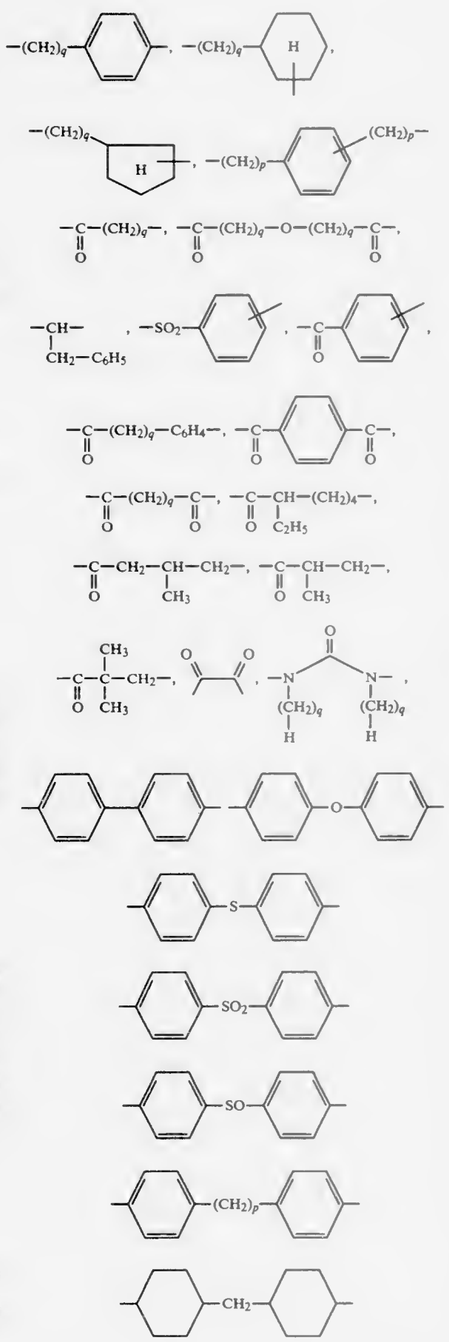
D's are identical or different and each is a $(—CH_2—)_n$ group, where n is from 1 to 20, or, if the radical M is bonded to —A— via the nitrogen atom, D can also be a direct bond, one or more —M—D— groups being present in the molecule where the radical —M— is bonded to —D— via its nitrogen atom, the

A's are identical or different and each is oxygen, —NH—,



—NH—CO—O— or —NH—CO—NH—, wherein m is 0–20, or a direct bond,

B is a direct bond, C_1–C_{20}-alkylene or a bridge member of the formula



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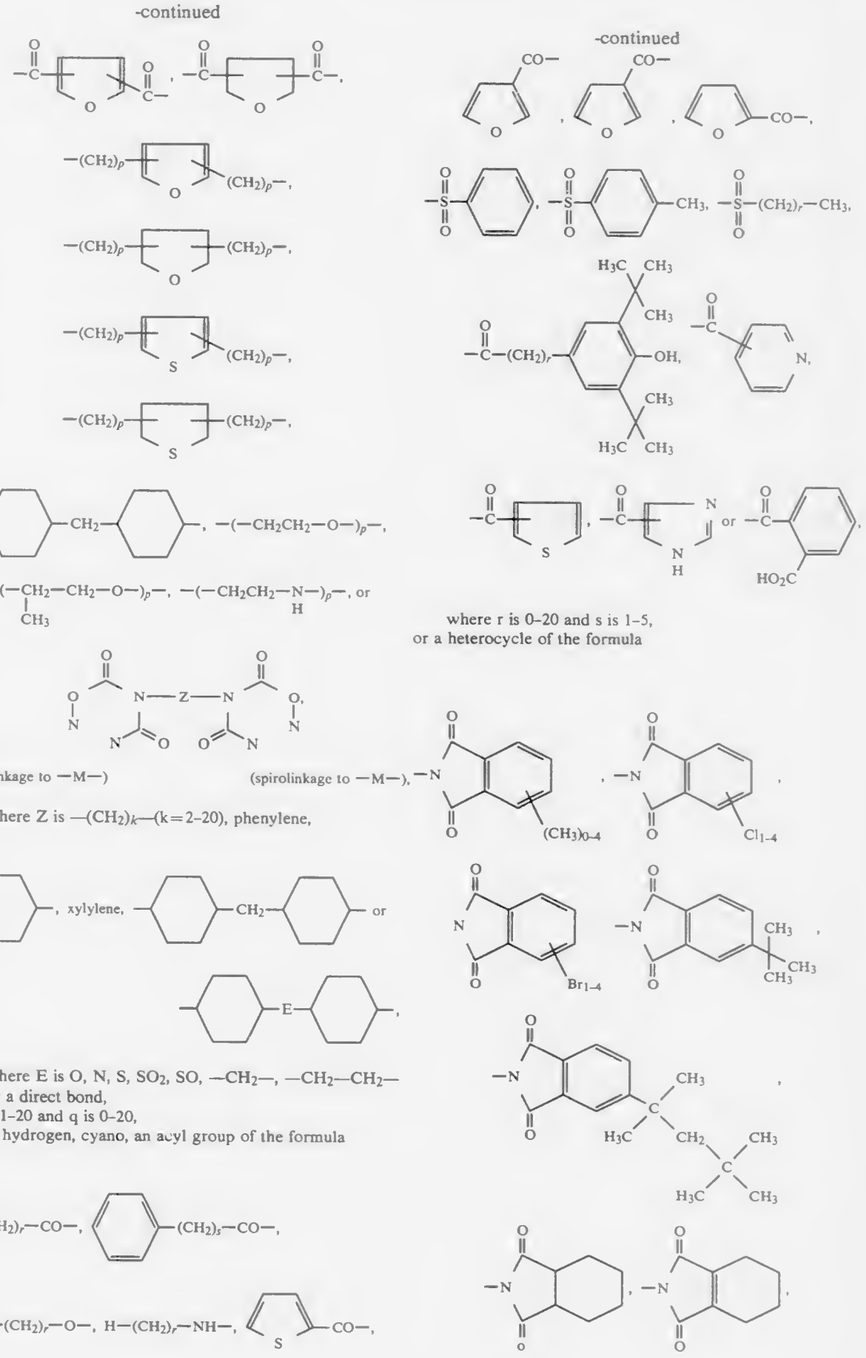
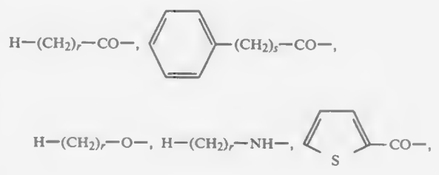


where E is O, N, S, SO_2, SO, $—CH_2—$, $—CH_2—CH_2—$ or a direct bond,

p is 1–20 and q is 0–20,

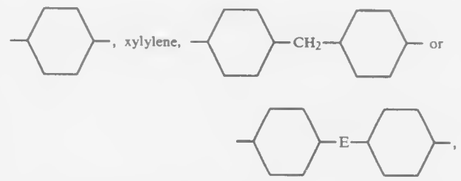
C is hydrogen, cyano, an acyl group of the formula



(spirolinkage to —M—)

(spirolinkage to —M—),

where Z is $—(CH_2)_k—$(k=2–20), phenylene,



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where r is 0–20 and s is 1–5,

or a heterocycle of the formula

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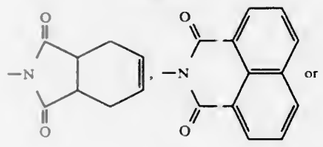
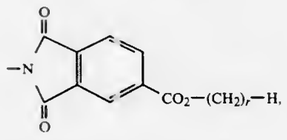
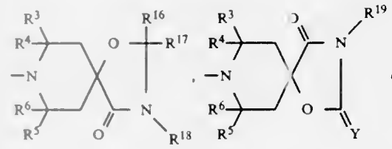
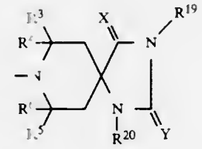




where r is 0–20 or in the formula (I) the group —M—A—B—A—C is a group of the formula



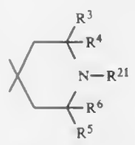


where

R^3 to R^6 and also X and Y are as defined above,

R^{16} and R^{17} are independently of each other hydrogen, C_1–C_{22}-alkyl, etheroxygen-, sulfur- or nitrogen-interrupted C_1–C_{22}-alkyl, or cyano-, carboxyl-, carbamoyl-, carbo-C_1–C_4-alkoxy or keto-substituted C_1–C_{22}-alkyl, C_3–C_{12}-cycloalkyl, phenyl, chlorine, C_1–C_{22}-alkyl or C_1–C_{22}-alkoxy-substituted phenyl, or C_7–C_{22}-phenylalkyl or where

R^{16} and R^{17} together with the carbon atom joining them form a C_5–C_{12}-cycloalkyl group which may be substituted by up to 4 C_1–C_4-alkyl groups, or a group of the formula



where R^{21} is hydrogen, C_1–C_{22}-alkyl, which may be interrupted by etheroxygen, sulfur or nitrogen or may be substituted by cyano, hydroxyl, thiol, carboxyl, carbamoyl or carbo-C_1–C_4-alkoxy, C_1–C_{22}-alkenyl or C_1–C_{22}-alkylcarbonyl, and R^3, R^4, R^5 and R^6 have the above-mentioned meaning,

R^{18} is hydrogen, C_1–C_{22}-alkyl, which may be interrupted by etheroxygen, sulfur or nitrogen or may be substituted by cyano, carboxyl, carbamoyl, carbo-C_1–C_4-alkoxy, hydroxyl, thiol or amino, or C_1–C_{22}-alkylcarbonyl,

R^{19} is hydrogen, C_1–C_{22}-alkyl, C_1–C_{22}-alkyl which is interrupted by etheroxygen, sulfur or nitrogen or substituted by cyano or carbo-C_1–C_4-alkoxy, phenyl, phenyl substituted by chlorine, C_1–C_{22}-alkyl or C_1–C_{22}-alkoxy, C_7–C_{22}-phenylalkyl or C_3–C_{12}-cycloalkyl and

R^{20} is hydrogen or linear or branched C_1–C_{22}-alkyl, and the acid addition salts and hydrates thereof.

4,837,404

PROCESS FOR THE PREPARATION OF OXY-DIPHTHALIC ANHYDRIDES

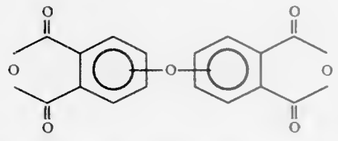
Willis T. Schwartz, Grand Island, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Aug. 24, 1987, Ser. No. 88,325

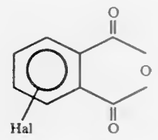
Int. Cl.[4] C07D *307/89*

U.S. Cl. 549—241 **19 Claims**

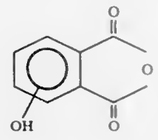
1. A process for the preparation of a diphthalic ether dianhydride of the formula



comprising reacting a halo-phthalic anhydride of the formula



where Hal is F, Cl, Br, or I with an hydroxyphthalic anhydride of the formula



in the presence of a polar, aprotic solvent and an alkali metal compound selected from the group consisting of KF, CsF and K_2CO_3.

4,837,405

SEGMENTED ELECTRIC CABLE ARRANGEMENT

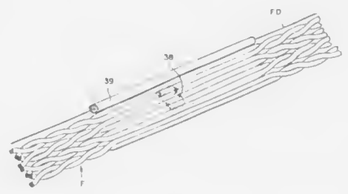
Jacques L. Bonjour, Epalinges, and Dan G. Baz, Ecublens, both of Switzerland, assignors to Maillefer S. A., Ecublens, Switzerland

Filed Dec. 9, 1987, Ser. No. 130,633

Claims priority, application Switzerland, Dec. 18, 1986, 5052/86

Int. Cl.[4] H01B *11/02, 7/08*

U.S. Cl. 174—36 **5 Claims**



1. An electric cable comprising an assembly of individual conductors and a jacket, said individual conductors being provided with individual insulating sheaths, said individual conductors being arranged in alternating successive first and second segments, said first segments being grouped segments of stranded individual conductors and said second segments being bonded segments of individual conductors arranged in parallel in a flat web, said sheaths of said individual conductors being joined to one another in a predetermined order over the entire length of each of said bonded segments;

said cable further comprising a metal shield, a ground conductor, and an additional sheath, said ground conductor being bare along said grouped segments and contained within said additional sheath along said bonded segments, said additional sheath being bonded to said sheaths of said individual conductors along one edge of said web in each of said bonded segments.

4,837,406

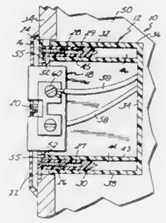
FACE PLATE AND ELECTRICAL COMPONENT ASSEMBLY

David J. Emmons, 6744 12th Ave. South, Richfield, Minn. 55423

Filed May 29, 1987, Ser. No. 56,547

Int. Cl.[4] H02G *3/12*

U.S. Cl. 174—57 **11 Claims**



1. A device comprising:

an assembly having an electrical component and first and second mounting screws extending from the component and means for adhesively mounting the assembly, said means comprising first and second plugs in threadable engagement with the first and second mounting screws, respectively;

an electrical box adapted for receiving the assembly and for being adhesively securable to said means for adhesively mounting the assembly including first and second bosses, each having a hole, the holes being positioned to receive the first and second plugs and having substantially smooth interior surfaces defining the holes; and

the first and second plugs having a smooth external surface and being of substantially constant cross sectional configuration.

4,837,407

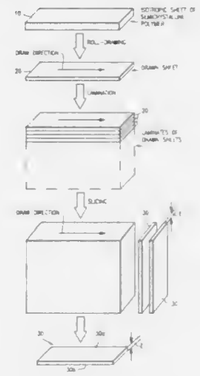
PLASTIC ELECTRICALLY INSULATING SUBSTRATES FOR WIRING CIRCUIT BOARDS AND A METHOD OF MANUFACTURING THEREOF

Shioji Nezu, Farmington Hills, Mich., assignor to Aisin Seiki Company, Ltd., Kariya, Japan

Filed Mar. 30, 1987, Ser. No. 31,555

Int. Cl.[4] H05K *01/03*

U.S. Cl. 174—68.5 **6 Claims**



1. A plastic electrically insulating substrate, having high thermal conductivity, for wiring circuit boards, comprising a substrate having a major planar front surface for mounting an electrical device thereon and an opposite major planar back surface, said substrate being made of a laminate of a plurality of oriented sheets of one or more semicrystalline polymers having an oriented direction of said sheets which is uniform, wherein said oriented direction of said sheets is arranged in the direction of the substrate thickness perpendicular to said major planar front and back surfaces, and wherein said substrate has a thermal conductivity in the thickness direction in the range of 13 $m\overline{W}cm^{-1}deg^{-1}$ to 110 $m\overline{W}cm^{-1}deg^{-1}$ at 298° K.

4,837,408

HIGH DENSITY MULTILAYER WIRING BOARD AND THE MANUFACTURING THEREOF

Kazuo Kondo; Asao Morikawa, and Hiroshi Iwata, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed May 20, 1988, Ser. No. 196,408

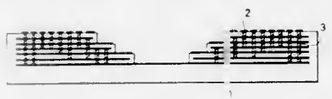
Claims priority, application Japan, May 21, 1987, 62-122486; May 26, 1987, 62-129441

Int. Cl.[4] H05K *1/09*

U.S. Cl. 174—68.5 **6 Claims**

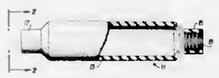
1. A multilayered wiring board comprising a plurality of green sheets containing a crystallizable glass and having printed on surfaces thereof respective patterns of conductive composition, said plurality of printed green sheets being laminated together and then sintered, wherein said conductive

composition contains by weight, 100 parts of a base composition containing 50 to 90% CuO and 10 to 50% Cu by weight,



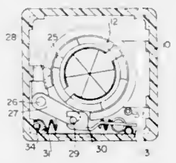
20 to 80 parts of Pd and/or Pt, 10 parts or less of MnO_2, and 5 parts or less of Ag_2O.

4,837,409
SUBMERISIBLE INSULATED SPLICE ASSEMBLIES
John J. Klosin, Ormond Beach, Fla., assignor to Homac Mfg. Company, Ormond Beach, Fla.
Filed Mar. 2, 1984, Ser. No. 858,564
Int. Cl.[4] H02G *15/117*
U.S. Cl. 174—88 R **15 Claims**



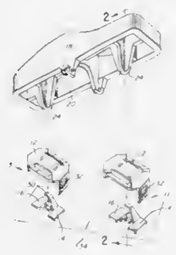
1. A kit for joining insulated electrical cables comprising
a deformable metal connector;
a resilient open ended splice cover having a tubular central section and cable sealing means at both ends, said central section having an internal cross-sectional area smaller than the cross-sectional area of said metal connector;
partially removable friction reducing material within said splice cover; and
absorbent material within said splice cover for retaining said friction reducing material.

4,837,410
SWITCH
Manuel F. Martin, Valls, Spain, assignor to Mecanismos Auxiliares Industriales, SA -M.A.I.S.A., Valls, Spain
Continuation of Ser. No. 1,861, Jan. 9, 1987, abandoned. This application Jun. 22, 1988, Ser. No. 214,843
Claims priority, application Spain, Mar. 24, 1986, 293339
Int. Cl.[4] H01H *9/00, 13/56*
U.S. Cl. 200—5 R **4 Claims**



1. A pushbutton switch comprising a casing having a base wall, a peripheral wall extending upwardly from the base wall and an open top, a depressable pushbutton received in the casing and extending from the open top, finger elements fixed in the casing defining means for guiding the pushbutton to perform up and down movements in the casing when the pushbutton is depressed and released, a rotatable follower roller rotatably supported in the casing for depression and rotation below the pushbutton, interengagable teeth on the pushbutton and roller respectively, the teeth and finger elements together defining means for translating repetitive up and down movements of the pushbutton into incremental equal-angle rotational movements of the roller, a pair of fixed switch contacts mounted on the base wall, a moveable contact mounted in the casing for back and forth movement between respective engagement positions contacting the respective fixed contacts selectively, an actuating lever mounted on the base wall and connected with the moveable contact for moving the moveable contact back and forth between said engagement positions by respective forward and reverse pivotal movements of the lever, the roller having a repetitively indented peripheral wall engaging said lever for providing the respective forward and reverse pivotal movements of the lever with respective alternate incremental movements of the roller whereby the moveable contact is moved between the respective engagement positions each time the pushbutton is depressed.

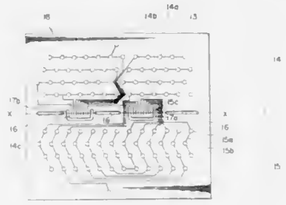
4,837,411
SPRING SWITCH
Gary R. Best, Hamilton, Ill., assignor to Methode Electronics, Inc., Chicago, Ill.
Filed Dec. 7, 1987, Ser. No. 129,299
Int. Cl.[4] H01H *3/12*
U.S. Cl. 200—5 A **4 Claims**



4. In an electrical switch assembly which comprises a first, outwardly domed contact member; a pair of second, flexible, finger-type contact members positioned under said first contact member in normally spaced relation thereto and actuator means for pressing said first, domed contact member into contact with said second, flexible contact members by collapsing said domed member, whereby an electrical circuit comprising said pair of second contact members may be closed by said contact with the first, domed contact member.

4,837,412
KEYBOARD OF A MEMBRANE CONTACT TYPE
Sadao Tachibana, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Jun. 20, 1988, Ser. No. 208,721
Claims priority, application Japan, Jun. 29, 1987, 62-98590[U]
Int. Cl.[4] H01H *9/00, 13/70*; H05K *1/00*
U.S. Cl. 200—5 A **3 Claims**

1. A keyboard of a membrane contact type comprising:
(a) a membrane contact unit comprising:
a flexible, insulating, membranous substrate having a movable contact section and a fixed contact section demarcated by a folding line, and folded along said folding line,
a plurality of movable contacts formed on one surface of said flexible, insulating, membranous substrate in said movable contact section and divided into a plurality of lateral lines,
a plurality of fixed contacts formed on the same surface as said movable contacts in said fixed contact section and divided into a plurality of longitudinal rows,
first wiring lines formed in said movable contact section and each connecting the movable contact on each lateral line in series,
second wiring lines formed in said fixed contact section and each connecting the fixed contact on each longitudinal row in series,
a first terminal section having a plurality of first terminals respectively connected to said first wiring lines, and formed in the vicinity of said folding line,

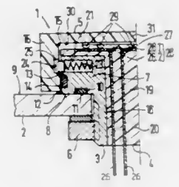


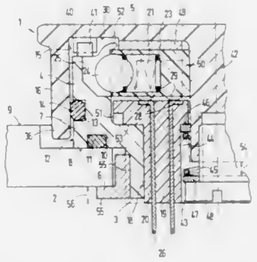
a second terminal section having a plurality of second terminals respectively connected to said second wiring lines, and formed in the vicinity of said folding line,
a spacer having openings and placed between said movable contact section and said fixed contact section so that said openings are aligned respectively with said movable contacts and the corresponding fixed contacts; and
(b) a printed wiring board having electronic circuit elements and provided with printed wiring pattern and terminals connected to said plurality of first and second terminals of said membrane contact unit.

2. A keyboard of a membrane contact type, according to claim 1, wherein a first U-shaped slit is formed in the vicinity of said folding line so as to embrace the extremity of said first terminal section, and a second U-shaped slit is formed in the vicinity of said folding line so as to embrace the extremity of said second terminal section.

4,837,413
ROTARY SWITCH
Günter Schwab, Pforzheim; Helmut Reiber, Neuiingen, and Rolf Stapelfeldt, Remchingen, all of Fed. Rep. of Germany, assignors to Standard Elektrik Lorenz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Filed Oct. 28, 1987, Ser. No. 113,314
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, 3636575
Int. Cl.[4] H01H *19/06, 9/04*; H02B *1/04*
U.S. Cl. 200—11 R **19 Claims**

1. A rotary switch adapted to be secured to a panel, comprising
(a) a stator having a bearing flange provided with a cylindrical side wall and an underside; a circumferential groove provided in said side wall and an annular groove provided in said underside;
(b) a rotor extending over said bearing flange and having a cylindrical side wall surrounding the cylindrical side wall of said bearing flange; said rotor being rotatably supported on and relative to said stator;
(c) stationary contacts mounted in said stator;
(d) a movable contact carried by said rotor for displacement relative to said stationary contacts upon turning of said rotor;
(e) a first sealing ring received in said circumferential groove and projecting radially outwardly from said cylindrical side wall of said bearing flange; said first sealing ring sealingly and slidably engaging said cylindrical side wall of said rotor; and
(f) a second sealing ring received in said annular groove and projecting outwardly from said underside of said bearing flange.





4,837,414
OVEN WITH ELECTRONIC REMOTE CONTROLLER
Kaoru Edamula, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 855,496, Apr. 23, 1986, abandoned. This application Dec. 10, 1987, Ser. No. 131,284
Int. Cl.[4] H05B *6/64*
U.S. Cl. 219—10.55 B **14 Claims**

1. An electronically controlled oven comprising
a main body and
a remote controller which is physically separable from said main body, said remote controller including
a start button means,
a scanner means for scanning a code and outputting a code signal indicative of said scanned code,
a transmitter means for transmitting electromagnetic wave signals, and
a processing means for receiving said code signal from said scanner for a predetermined period of time after said start button means is operated, judging whether said received code signal is in a transmittable form or not, and causing said transmitter means tp transmit said code signal a prede-

termined number of times repeatedly if said received code signal is judged to be in a transmittable form,

said main body including

a receiver means for receiving said code signal transmitted form said transmitter means and converting said received code signal into an electric code signal,

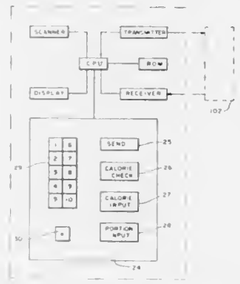
memory means for storing cooking programs,

control means for retrieving from said memory means a particular one of said stored cooking programs corresponding to said electric code signal indicative of said received code signal and outputting heater-controlling signals describing said particular one of said cooking programs,

a cooking chamber,

heater means for heating items inside said cooking chamber, and

heater-control means for receiving said heater-controlling signals and controlling the operation of said heater means according to said received heater-controlling signals.



4,837,415

WIRE ELECTRODE TYPE ELECTRIC DISCHARGE MACHINING APPARATUS

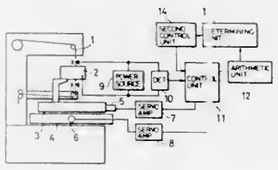
Takuji Magara, and Toshio Suzuki, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1987, Ser. No. 112,170

Claims priority, application Japan, Oct. 24, 1986, 61-252901; Oct. 24, 1986, 61-252902; Oct. 24, 1986, 61-252903; Oct. 24, 1986, 61-252904; Oct. 24, 1986, 61-252905; Oct. 24, 1986, 61-252906; Oct. 24, 1986, 61-252907; Oct. 24, 1986, 61-252908; Oct. 24, 1986, 61-252909; Oct. 24, 1986, 61-252910; Oct. 24, 1986, 61-252911; Oct. 24, 1986, 61-252912; Oct. 24, 1986, 61-252913; Oct. 24, 1986, 61-252914; Oct. 24, 1986, 61-252946

Int. Cl.[4] B23H *7/0*

U.S. Cl. 219—69 W **31 Claims**



1. A wire electrode type electric discharge machining apparatus in which a wire electrode and a workpiece to be machined are moved relative to each other with an interelectrode gap and a voltage is applied to said interelectrode gap between said wire electrode and workpiece to machine said workpiece into a desired configuration, comprising

a first arithmetic means for calculating a first distance between a start point of a curved portion of said workpiece and a position before the start point where the amount of machining removal starts changing;

a first determining means for determining whether or not a second distance between a present machining position and the start point coincides with the first distance; and

a control means for controlling the interelectrode gap to correct for the change thereof which is caused by a change in the amount of machining, in response to an output signal of said first determining means.

4,837,416

CUT WIRE FOR ELECTRICAL DISCHARGE MACHINING

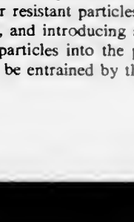
Susumu Yamamoto, and Yoshimitsu Aoki, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 9, 1986, Ser. No. 943,943

Claims priority, application Japan, Dec. 20, 1985, 60-288197

Int. Cl.[4] B23H *7/08*

U.S. Cl. 219—69.12 **2 Claims**



1. An electrical discharge machining wire electrode comprising a core of austanitic stainless steel and a covering layer of copper or copper alloy provided around said core, said cut wire having a diameter of 0.05 to 0.4 mm and a tensile strength of 40 to 200 kg/mm^2, the percentage of the sectional area of said core to that of the entire cut wire being 30 to 90 percent.

4,837,417

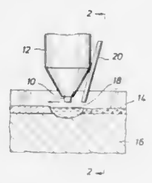
METHOD OF HARD-FACING A METAL SURFACE

Charles F. Funk, P.O. Box 6513, Gulfport, Miss. 39501

Continuation-in-part of Ser. No. 788,405, Oct. 17, 1985, Pat. No. 4,745,254, which is a continuation-in-part of Ser. No. 557,760, Dec. 5, 1983, abandoned, which is a continuation-in-part of Ser. No. 455,923, Jan. 6, 1983, abandoned. This application Mar. 7, 1988, Ser. No. 164,784

Int. Cl.[4] B23K *9/04*

U.S. Cl. 219—76.15 **23 Claims**



1. A method of hard-facing the surface of a metal base member with a matrix of metal having particles of wear resistant material, evenly distributed therein comprising the steps of positioning a member of the desired matrix metal on the surface to be hard-faced, moving a non-consumable electrode over the member to melt the matrix metal and a portion of the base metal to form a pool of liquid metal that swirls under the electrode, heating wear resistant particles to substantially reduce the contaminants, and introducing a stream of the preheated wear resistant particles into the pool of liquid metal under the electrode to be entrained by the swirling liquid so

that the particles are distributed throughout the matrix from the top to the bottom when the matrix metal solidifies.

4,837,418

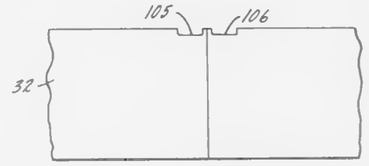
METHOD AND APPARATUS FOR FORMING WELDED RINGS

Donald D. Modglin, Nashville, Tenn., assignor to Merrick Engineering, Inc., Nashville, Teno.

Filed Feb. 13, 1987, Ser. No. 14,805

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—121.45 **14 Claims**



1. In a ring welding machine,

frame means for supporting the following operative means,

means for supporting strip stock having a free end portion preparatory to being formed into a ring,

means for clamping the free end portion of said strip stock preparatory to forming a blank therefrom,

means for forming a blank from said strip stock while the free end portion of said strip stock is clamped in said clamping means,

weld gripping means for gripping said formed blank,

said clamping means being actuable to unclamp following gripping of said blank by the weld gripping means,

means for bending a gripped blank into a substantially circular configuration having the blank ends in opposed relationship preparatory to welding,

said weld gripping means being carried by the bending means,

means for welding the opposed blank ends to form a ring, and

means for ejecting the welded ring.

4,837,419

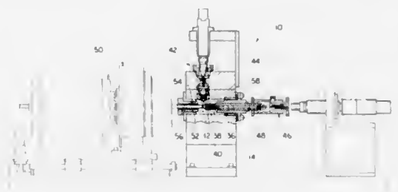
FUEL ROD END PLUG WELDING APPARATUS AND METHOD

David A. Boatwright, Columbia; Robert Duncan, Fork Township, Lexington County, and Kenneth K. Klapper, Columbia, all of S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 2, 1988, Ser. No. 201,145

Int. Cl.[4] B23K *9/225*

U.S. Cl. 219—125.11 **21 Claims**



1. In an apparatus for welding an axial bore-bearing end plug on an end of a cladding tube, an end plug stop assembly comprising:

(a) an end stop configured to receive an end seal welding electrode through a rear portion thereof and a flow of fill gas along the electrode through said rear portion; and

(b) an end plug-engaging insert adapted to be removably received in a forward portion of said end stop, said insert being configured to receive a leading end portion of the end plug at a front portion of said insert and a leading end portion of the end seal welding electrode through a rear portion of said insert into a position for forming an end seal weld in the axial bore of the end plug when the latter is received in said forward portion of said insert, said insert also being configured to receive the flow of fill gas from said end stop into said rear and forward portions of said insert along and past the electrode leading end portion for filling a welding chamber containing said stop assembly and filling the cladding tube through the axial bore of the end plug prior to formation of the end seal therein.

4,837,420

METHOD AND APPARATUS FOR CONDUCTING CURRENT TO AN ELECTRODE IN ARC WELDING, ARC CUTTING OR THE LIKE OPERATIONS

Ensi K. J. Niinivaara, Koria, Finland, assignor to Oy GSS General Sea Safety Ltd., Helsinki, Finland

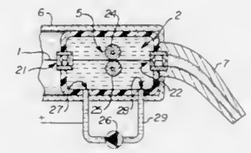
PCT No. PCT/FI86/00084, § 371 Date May 15, 1987, § 102(e) Date May 15, 1987, PCT Pub. No. WO87/00470, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 23, 1986, Ser. No. 44,848

Claims priority, application Finland, Jul. 24, 1985, 852875

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—137 R **10 Claims**



1. A method of conducting electric current in an arc welding device to an arc electrode (1) for welding, cutting, cleaning and electrolytical coating, or to a drive shaft (3) or a sleeve part (4) and like member supporting the arc electrode, characterized in that the electrode (1) or the member supporting it is brought into contact with flowing liquid, electrically conductive medium, which is connected to a power supply and moving the arc electrode or the member supporting the arc electrode by way of a force generated by said flowing medium.

4,837,421

FRAGRANCE DISPENSING APPARATUS

Chella Lothy, New York, N.Y., assignor to Creative Environments, Inc., New York, N.Y.

Filed Nov. 23, 1987, Ser. No. 123,669

Int. Cl.[4] H05B *3/48*

U.S. Cl. 219—272 **15 Claims**

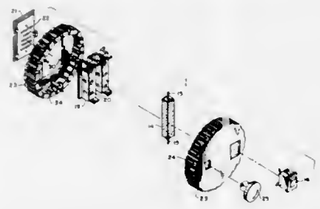
1. Fragrance dispensing apparatus comprising, in combination;

means adapted to be selectively connected to a source of voltage;

resistance heating means, electrically coupled to said connection means, for maintaining a substantially constant temperature in the range of 40°–120° C.;

means disposed in thermally coupled relationship to said heating means, for holding a composition for slow release of volatile ingredients at an elevated temperature, said composition comprising a solid, thermoplastic polyamide

resin body consisting essentially of from 35 percent up to 70 percent by weight of said body of a volative substance selected from the group consisting of perfume oils, insecticides, odorants, bactericides and animal repellants, said solid resin body being in the form of an elongate block, and said holding means comprising a thermally conductive heater plate formed of sheet metal, said heater plate being configured to at least partially surround and contact



said block along substantially its entire length on one side and being in thermally coupled relationship to said heating means; and

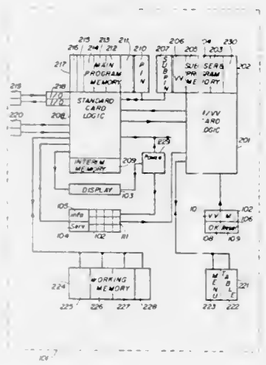
a housing for holding and surrounding said resistance heating means and said holding means and having at least one opening therein and disposed adjacent said composition for allowing fragrance to be transferred from said composition to the outside of said housing.

4,837,422

MULTI-USER CARD SYSTEM

Juergen Dethloff, and Christian Hinneberg, both of Hamburg, Fed. Rep. of Germany, assignors to Juergen Dethloff, Hamburg, Fed. Rep. of Germany

Filed Sep. 8, 1987, Ser. No. 94,379
Int. Cl.[4] G06F *15/30*
U.S. Cl. 235—380 **25 Claims**



1. A self-contained multi-user card combination, comprising:

cardholder memory means for storing a cardholder personal identification code;

programmable sub-user memory means for storing a sub-user personal identification code, and a sub-user use condition;

program means for programming said programmable sub-user memory means with at least one selected sub-user personal identification code and for programming said programmable sub-user memory means with a selected sub-user use condition;

authenticity checking means for authenticating a personal identification code as corresponding to the stored cardholder personal identification code for permitting access to said program means for programming said sub-user memory means, said authenticity checking means also authenticating a personal identification code as corresponding to a sub-user personal identification code stored in said sub-user memory means, said authenticity checking means upon authenticating a personal identification code as corresponding to the stored cardholder personal identification code, permitting a cardholder to conduct activities with the card combination, said authenticity checking means upon authenticating a personal identification code as corresponding to a sub-user personal identification code stored in said sub-user memory means permitting access to said sub-user memory means for conducting activities within the sub-user use conditions; and

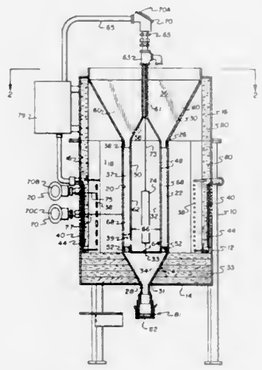
input means for receiving at least one of a cardholder and sub-user personal identification code.

4,837,423

LOW TEMPERATURE KILN

Joseph L. Peterson, and Robert A. Wilson, both of Salt Lake City, Utah, assignors to Custom Equipment Corporation, Salt Lake City, Utah

Continuation-in-part of Ser. No. 17,470, Feb. 20, 1987, which is a continuation of Ser. No. 794,952, Nov. 1, 1985, abandoned, which is a continuation of Ser. No. 611,147, May 17, 1984, abandoned, which is a division of Ser. No. 381,426, May 24, 1982, Pat. No. 4,462,870. This application Oct. 30, 1987, Ser. No. 115,444
Int. Cl.[4] F26B *17/16*
U.S. Cl. 219—390 **11 Claims**



1. A kiln comprising:

a metallic vessel having an inner wall which substantially surrounds an interior space and thereby defines a heating zone;

heating means for heating said inner wall to a selected temperature below the softening point of said inner wall;

a spacing member mounted within said interior space, said spacing member in association with said inner wall defining an approximately annular heating zone therebetween;

means for introducing particulate material to the top of said vessel and for discharging said material from the bottom of said vessel wherein the material introduced to the top migrates down through the heating zone during a selected residence time;

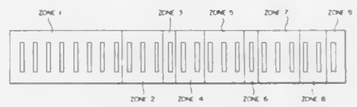
wherein said spacing member is mounted to permit its upward as well as downward movement within said interior space in response to thermal expansion or contraction.

4,837,424

PROCESS FOR CONDUCTING AND MONITORING THE TEMPERATURE RISE OF ELECTRICALLY HEATED COMPONENTS

Max Nussbaum, Ermont; Thierry Picart, Boulogne sur Seine, and Jean Sauron, Draveil, all of France, assignors to Gaz de France, Paris, France

Filed Dec. 15, 1987, Ser. No. 133,478
Claims priority, application France, Dec. 23, 1986, 86 18117
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—494 **3 Claims**



1. A process for conducting, monitoring and controlling the rise in temperature of electrically-heated plastic components to be welded together by an automatically-controlled welding machine, said process comprising:

(a) providing a heating control chart, said chart comprising a plurality of zones, each of said zones occupying a separate, distinct area on said chart;

(b) entering machine-readable data in at least some of said zones, said data comprising primary data relating to a reference physical state of said components, first additional data relating to the actual state of said components and process data;

(c) establishing a sequence for machine-reading data in said zones;

(d) machine-reading said data in said zones in said sequence;

(e) providing directly on said plastic components second additional machine-readable data relating to a further actual physical state of said plastic components, and machine-reading said second additional data;

(f) modifying data read in at least some of said zones on the basis of said first additional data contained and read in at least some of the other of said zones and of said second additional data read directly on said plastic components; and,

(g) heating said components in accordance with said modified data for welding together said components.

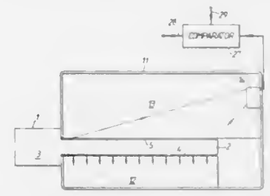
4,837,425

SECURITY ARRANGEMENT

Philip J. Edwards, Chelmsford, United Kingdom, assignor to The General Electric Company, p.l.c., London, England

Filed Jul. 31, 1987, Ser. No. 80,499
Claims priority, application United Kingdom, Aug. 7, 1986, 8619286
Int. Cl.[4] G06K *7/10*; G03H *1/26*
U.S. Cl. 235—457 **22 Claims**

1. A security arrangement including a token and a receptor, the token comprising a thin lamina carrying an optically readable pattern, and a thin holographic light deflector arranged to deflect light which is modified by said pattern; and the receptor comprising means for accepting the token and for detecting the deflected light

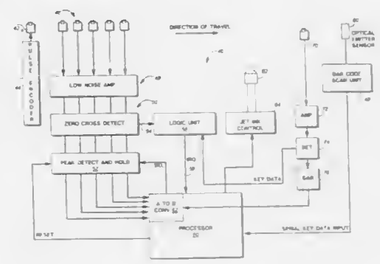


4,837,426

OBJECT VERIFICATION APPARATUS AND METHOD

Kevin J. Pease, Glenview; Robert A. Copella, Northbrook, and Ann M. Flannery, Chicago, all of Ill., assignors to Rand, McNally & Company, Skokie, Ill.

Filed Jan. 16, 1987, Ser. No. 3,954
Int. Cl.[4] G06K *7/00*
U.S. Cl. 235—440 **133 Claims**



1. A method of verifying the authenticity of an object which has a continuously extending, recordable, magnetic region thereon with the magnetic region including a randomly varying magnetic characteristic unique to the object with detectability of the characteristic enhanced by an electrical signal pre-recorded on and carried by the magnetic region, the method comprising:

detecting the enhanced randomly varying characteristic within the recordable magnetic region;

retrieving a prestored representation of that characteristic;

comparing the detected randomly varying characteristic of the recordable magnetic region to the retrieved prestored representation; and

indicating the results of the comparison.

4,837,427

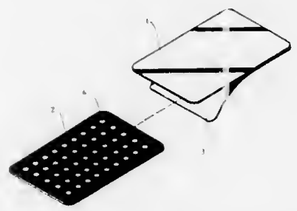
MANUALLY CODEABLE CARDS FOR CARD READERS

Jui-Chang Lin, Kaohsiung, Taiwan, assignor to Jeun-Keun Lee and In-Jyh Liou, both of Taipei, Taiwan

Filed Jul. 24, 1987, Ser. No. 77,300
Int. Cl.[4] G06K *21/00*
U.S. Cl. 235—488 **4 Claims**

1. An assembly for manually coding cards for card readers, said assembly comprising first and second sheets of transparent plastic, metal or paper; said first sheet having one side thereof coated with glue and being originally protected with an oiled paper adapted to be peeled off therefrom; said second sheet

having one side thereof printed all over with a opaque ink except for a plurality of transparent circles arranged in a regular pattern, and a paper containing a plurality of opaque elements adapted to be transposed onto selected ones of the transparent circles on the second sheet such that the transparent



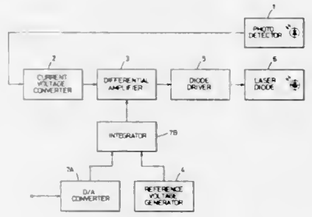
circles which remain after the opaque elements have been disposed over the selected transparent circles form a predetermined code; said first sheet with the called paper removed therefrom being adapted to be stuck together with the lower sheet with the opaque elements transposed thereon to form a finished card for card readers.

4,837,428

DRIVING CIRCUIT FOR LASER DIODE

Yasutomo Takagi, and Kazuyoshi Takashi, both of Tokyo, Japan, assignors to Ando Electric Co., Ltd., Tokyo, Japan

Filed Feb. 8, 1988, Ser. No. 153,108
Claims priority, application Japan, Feb. 6, 1987, 62-25719
Int. Cl.[4] G06F *11/00*
U.S. Cl. 250—205 **3 Claims**



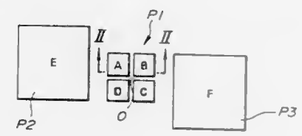
1. A driving circuit for a laser diode including;
(A) a detector for sampling light emitted from the laser diode,
(B) a current- voltage converter to which is inputted the output of said detector,
(C) a voltage supplier capable of generating a variable output,
(D) a differential amplifier to which is inputted the output of said current - voltage converter and from the output of said variable voltage supplier, to provide an output for driving said laser diode, whereby the output intensity of the laser diode in controlled by the variable output of the voltage supplier through feedback loop.

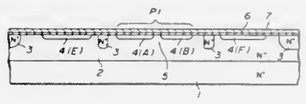
4,837,429

PHOTODETECTOR FOR USE WITH AN OPTICAL RECORDING MEDIUM

Isao Umezawa; Haruo Sone, both of Kanagawa, and Tadahiro Kusuda, Kagoshima, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 11, 1987, Ser. No. 95,237
Claims priority, application Japan, Oct. 1, 1986, 61-233999
Int. Cl.[4] H01L *27/14, 31/00*
U.S. Cl. 250—211 J **13 Claims**





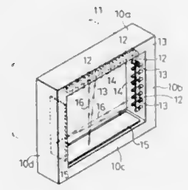
1. A photodetector including a center photosensitive section having a surface for receipt of light reflected from an optical recording medium in producing information recorded on the optical recording medium, the center photosensitive section including a plurality of photosensitive elements separated by a space from one another about a center, the center photosensitive section including a non-reflective transparent film provided on substantially the whole area of the surface of the center photosensitive section to cover the photosensitive elements and the space, said film causing said photodetector to exhibit improved sensitivity to low frequency components in said light to reduce jitter in that any of said photosensitive elements is able to receive light incident on the film above said space.

4,837,430

PHOTOELECTRIC TOUCH PANEL HAVING PARALLEL LIGHT EMITTING AND DETECTING ARRAYS SEPARATED BY A LIGHT SHIELD

Kazuo Hasegawa, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan

Continuation of Ser. No. 830,554, Feb. 18, 1986, abandoned.
This application Nov. 30, 1987, Ser. No. 125,736
Claims priority, application Japan, Feb. 15, 1985, 60-20130[U]
Int. Cl.[4] G01V *9/04*
U.S. Cl. 250—221 **1 Claim**



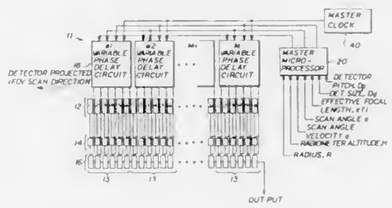
1. A photoelectric touch panel comprising:
a rectangular frame defining a planar area for a matrix of light beams which is disposed in front of an associated display screen;
two light detection assemblies perpendicular to each other, each assembly being disposed in parallel with the matrix plane on a respective one of two adjcent sides of said rectangular frame, each assembly consisting of a row of light emitting elements in parallel with a row of light detecting elements, both rows being aligned in parallel with said matrix plane with each of the light emitting elements being positioned spaced apart in a direction perpendicular to said matrix plane from a corresponding one of the light detecting elements, and a light shielding plate arranged upright and extending longitudinally between the two rows of light emitting and light detecting elements, wherein the row of light emitting elements is disposed between the light shielding plate and the display screen; and
two light reflecting members perpendicular to each other, each member being disposed in parallel with the matrix plane on a respective one of the other two adjacent sides of said rectangular frame facing opposite a respective one of the two light detection assemblies, each member consisting of a single planar reflecting plate for reflecting and returning light emitted by each of said light emitting elements of the light detection assembly across said matrix plane to the corresponding ones of said light detecting elements if the respective light beams therefore are not interrupted by an object interposed in said matrix plane, wherein said single planar reflecting plate is oriented perpendicular to said matrix plane and parallel with light to said rows of light emitting and detecting elements.

4,837,431

VARIABLE PHASE TIME DELAY AND SIGNAL AGGREGATION SYSTEM AND METHOD FOR ACHIEVING CONSTANT SPATIAL RESOLUTION IN SCANNING DETECTION INSTRUMENTS

Frank R. Malinowski, Santa Barbara, and Thomas S. Pagano, Goleta, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Aug. 7, 1987, Ser. No. 83,600
Int. Cl.[4] H01J *3/14;* H04N *7/18*
U.S. Cl. 250—235 **12 Claims**



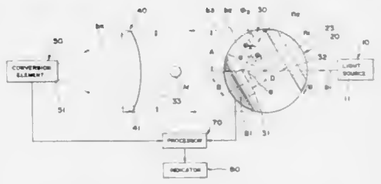
1. A variable phase time delay and signal aggregation system for use in a scanning detection system and effective to maintain a predetermined spatial resolution on a target surface independent of scan angle, said system comprising:
detector means for detecting electromagnetic signals from said surface area, said detector means including a plurality of detector elements, each detector element generating a corresponding first plurality of output signals representative of the response of the detector element to energy received from said surface area within the field of view of the detector element as said detection system scans through a predetermined range;
control means for selectively clocking the first plurality of output signals from the detector elements to phase the relative timing thereof as a function of the scan angle; and
means for aggregating said first plurality of output signals to provide a combined output signal corresponding to said predetermined spatial resolution.

4,837,432

OPTICAL MEASURING APPARATUS WHICH EMPLOYS TWO SYNCHRONOUSLY ROTATING MEANS TO MEASURE OBJECT

Ichiro Katayama, Tokyo, Japan, assignor to Union Tool Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1988, Ser. No. 236,448
Claims priority, application Japan, Sep. 30, 1987, 62-246822
Int. Cl.[4] H01J *3/14*
U.S. Cl. 250—235 **1 Claim**



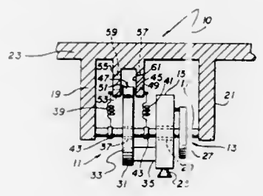
1. The optical measuring apparatus comprising:
a first light source for generating a light beam;
a driving section for rotation including a drive motor and a supporting member rotated by the drive motor;
a light scanning section for providing a parallel scanning light flux, including a first mirror fixed mounted on said supporting member of the driving section periodically receiving the light beam from said first light source and a second mirror fixedly arranged on said supporting member horizontally vertically displaced from the first mirror such that a reflecting surface of the second mirror being parallely opposed to a reflecting surface of the first mirror, the first mirror and the second mirror being synchronously rotated by said drive motor of the driving section;
a focussing section including a first focussing lens for focussing a parallel scanning light beam produced by said light scanning section, being arranged on a light path of the parallel scanning light beam;
an electric signal generating section including a first photoelectric conversion element for converting a focussed light beam focussed by said focussing lens of the focussing section to an electric signal;
a measuring reference signal generating section for generating a measuring reference signal in synchronism with the generation of the parallel scanning light, said measuring reference signal generating section including a transparent scale having a plurality of scaling marks and fixedly mounted on said supporting member of the driving section together with said first and second mirror of the light scanning section, a second light source fixedly arranged spaced apart from a rotation tracking plane, a second focussing lens fixedly positioned on a light path of a light beam between the second light source and the rotation tracking plane and a second photoelectric conversion element fixedly arranged opposed to the second focussing lens with respect to the rotation tracking plane spaced apart from the second focussing lens at a predetermined distance;
an electric signal generating section for processing said electric signal of the electric signal generating section and said measuring reference signal of the measuring reference signal generating section to produce a measuring signal of the object to be measured and;
an indicating section for indicating a dimension of the object based on said measuring signal of said electric signal generating section.

4,837,433

APPARATUS FOR PROVIDING A PREDETERMINED SURFACE SCAN VELOCITY OF THE PROJECTED FIELD OF VIEW OF A SCANNING INSTRUMENT

Frank R. Malinowski, 1242 Dover La., Santa Barbara, Calif. 93103

Filed Aug. 7, 1987, Ser. No. 83,599
Int. Cl.[4] H01J 5/16; G01B 26/08
U.S. Cl. 250—236 5 Claims



1. Apparatus for providing a predetermined surface scan velocity of the projected field of view of a scanning instrument, said scanning instrument including a frame and scan drive means attached thereto, said scan drive means including an inertial element and detector means coupled to said inertial element for detecting or projecting radiation during a scan, said apparatus comprising:

cam means mechanically coupled to said inertial element and supported by said frame, to pivot therewith, said cam means including a cam having a variable contour and

bearing means for displacing a spring means in response to the variable contour of said cam as said cam and said inertial element pivot during said scan,

said spring means coupling said bearing means to said frame for storing energy from and for restoring energy to said inertial element via said bearing means and said cam means;

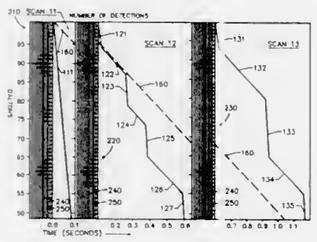
whereby said apparatus is effective to transfer the kinetic energy of said inertial element to potential energy as said inertial element scans in a first direction and to transfer said potential energy to kinetic energy as said inertial element scans in a second direction.

4,837,434

MASS SPECTROMETRY SYSTEM AND METHOD EMPLOYING MEASUREMENT/SURVEY SCAN STRATEGY

Craig A. James, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 9, 1987, Ser. No. 71,492
Int. Cl.[4] H01J 49/10
U.S. Cl. 250—281 8 Claims



1. A system comprising:

means for receiving a sample;

scanning means for repeatedly monotonically scanning said sample over a predetermined scanning range so as to obtain a series of spectra, said scanning means having alternate survey and measurement modes, said survey mode being characterized by a faster scanning rate than said measurement mode;

output means for indicating spectral data gathered during the measurement mode for each scan taken by said scanning means;

map means for generating a map during a scan by said scanning means so that said predetermined scanning range is divided into signal and blank regions according to a predetermined threshold criterion; and

mode means for switching between said survey mode and said measurement mode during a monotonic scan over said predetermined scanning range by said scanning means at least in part as a function of the map generated by said map means during a preceding scan over said predetermined scanning range;

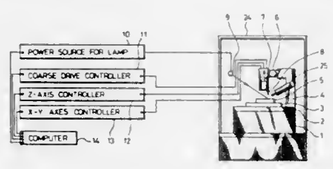
wherein a spectral chromatogram can be obtained using a series of monotonic scans, said series including at least some scans serving the dual functions of measuring in accordance with a map generated by a preceding scan and of surveying to generate a map to be used by a succeeding scan.

4,837,435

TUNNELING SCANNING MICROSCOPE HAVING LIGHT SOURCE

Toshihiko Sakuhara; Fumiki Sakai, and Tetsuo Uchiyama, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Tokyo, Japan

Filed Jun. 24, 1988, Ser. No. 210,810
Claims priority, application Japan, Jun. 25, 1987, 62-158571
Int. Cl.[4] H01J 37/26
U.S. Cl. 250—306 2 Claims



1. A tunneling scanning microscope comprising: a probe having a fine conductive tip; means for positioning the tip of said probe sufficiently close to a sample surface to be investigated so that tunneling current flows; means for scanning across said sample surface with the tip of said probe; means for automatically controlling a distance between the tip of said probe and said sample surface during scanning in response to measured tunnel current; means for graphically displaying the spatial coordinates of said sample surface and producing an image of the configuration of said sample surface; and a light source for irradiating said sample surface.

4,837,436

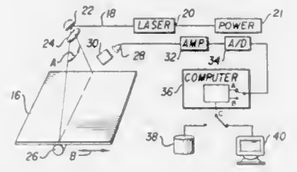
STORAGE PHOSPHOR READ-OUT METHOD

Bruce R. Whiting, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 18, 1987, Ser. No. 64,264
Int. Cl.[4] A61B 6/00; G01N 23/04; H01J 37/22
U.S. Cl. 250—327.2 2 Claims

1. A wide dynamic range radiation read-out method for a storage phosphor sheet which has been subjected to image-wise radiation to form a stored image therein, and the image being read-out by exposure to stimulating radiation to release stimulated radiation in the pattern of said stored image, said stimulated radiation being photo-electrically detected by a sensor having a dynamic range sensing capability less than the dynamic range of the image to produce an image signal, said wide dynamic range read-out method comprising the steps of:

a. conducting one read-out with low intensity stimulating radiation to produce a first image signal having information representing high exposure image detail;



b. conducting another read-out with high intensity stimulating radiation to produce a second image signal having information representing low exposure image detail and lacking some information representing the high exposure image detail; and

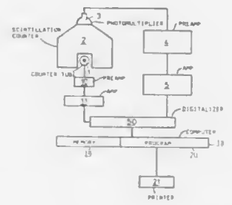
c. combining said image signals to form a wide dynamic range image signal having information representing low and high exposure image detail.

4,837,437

METHOD AND CIRCUIT ARRANGEMENT FOR REDUCING THE BACKGROUND COUNT IN RADIOACTIVITY MEASUREMENTS WITH A COINCIDENCE-ANTICOINCIDENCE EVALUATION

Markus Forster, Neufahrn; Peter Maier, Munich; Harald Gaudlitz, Unterschleissheim, and Richard Hefka, Eching, all of Fed. Rep. of Germany, assignors to Gesellschaft für Strahlen- und Umweltforschung GmbH, Neuherberg, Fed. Rep. of Germany

Filed Oct. 19, 1987, Ser. No. 114,237
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1986, 3635477
Int. Cl.[4] G01T 1/164
U.S. Cl. 250—336.1 12 Claims



1. A method for reducing the background count rate in a measurement with a coincidence-anticoincidence evaluation, in which pulses from a detector and pulses from a shield counter adjacent the detector are compared based upon a time relationship, comprising the steps of:

(a) amplifying the pulses from the detector and the shield counter;

(b) repeatedly converting the amplified pulses to digital values at a predetermined clock frequency to provide digitalized pulses;

(c) identifying a series of digital values corresponding to a digitalized pulse from the detector;

(d) transferring to a computer the digitalized pulse from the detector identified in step (c) along with any concurrent digitalized pulse from the shield counter; and

(e) in the computer, comparing a characteristic of the digitalized pulse from the detector which was transferred in step (d) with a corresponding characteristic of any digitalized pulse from the shield counter that was transferred in step (d),

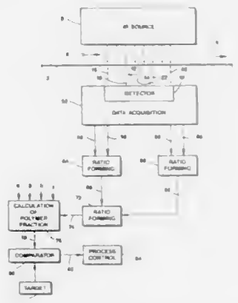
wherein pulses from the detector are conveyed to the computer via a detector channel having a digital portion, and wherein step (c) includes monitoring the digital portion of the detector channel to detect a digital voltage value which exceeds a trigger threshold.

4,837,438

DIRECT INFRARED MEASUREMENT OF HOMOGENOUS MIXTURES

Steven P. Sturm, Columbus, Ohio, assignor to Process Automation Business, Inc., Columbus, Ohio

Filed Jun. 17, 1987, Ser. No. 62,992
Int. Cl.[4] G01N 21/35
U.S. Cl. 250—339 11 Claims



1. An apparatus for directly measuring the polymer content of a homogeneous mixture having both polymer and cellulose components, comprising:

(a) source means for directing infrared radiation onto a portion of the mixture;

(b) detector means for detecting infrared radiation of two sets of wavelengths after the radiation has interacted with the mixture, the first set including wavelengths that have about the same absorption coefficient for the cellulose component but have substantially different absorption coefficients for the polymer component, the second set including wavelengths that have about the same absorption coefficient for the polymer component but have substantially different absorption coefficients for the cellulose component, the detector means produces detector responses to the radiation corresponding to the two sets, wherein the responses are processed to produce a measurement of the fraction of polymer and cellulose components which is accounted for by the polymer component.

4,837,439

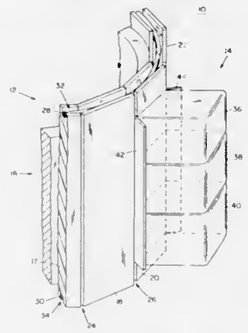
SCINTILLATION CAMERA WITH SEGMENTED LIGHT PIPE

Sebastian Genna, Belmont, and Andrew P. Smith, Medford, both of Mass., assignors to Digital Scintigraphics, Inc., Cambridge, Mass.

Filed Feb. 24, 1988, Ser. No. 159,657
Int. Cl.[4] G01T 1/164
U.S. Cl. 250—368 19 Claims

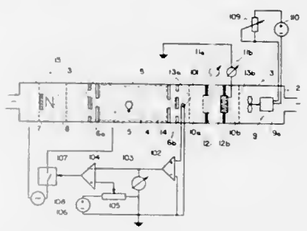
1. A scintillation camera, comprising:

optically continuous scintillation material for emitting light in response to absorbed radiation;
an array of photodetectors for detecting said emitted light;
a segmented light pipe for conducting said emitted light to said photodetectors, said light pipe including a plurality of segments disposed about said scintillation material, each said segment intersecting at an angle to form a junction with adjacent segments and each defining a generally planar face optically coupled to at least one of said photo-



detectors, and each said segment optically coupled to adjacent segments to allocate light among said photodetectors across said junctions; and
optically reflective surfaces extending into said light pipe at said junctions for increasing collection of light by the photodetector nearest each emission and improving resolution of said camera in a direction normal to said reflective surfaces without affecting resolution in a direction parallel to said reflective surfaces.

4,837,440
METHOD AND APPARATUS FOR CHARACTERIZATION OF AEROSOLS
Heinz Burtscher; Adnreas Schmidt-Ott, and Hans-Christoph Siegmann, all of Zurich, Switzerland, assignors to Matter & Siegmann AG, Wohlen, Switzerland
Continuation-in-part of Ser. No. 732,858, May 10, 1985, abandoned. This application Nov. 3, 1986, Ser. No. 926,903
Claims priority, application Fed. Rep. of Germany, May 11, 1984, 3417525
Int. Cl.[4] G01N *27/64*
U.S. Cl. 250—379 **15 Claims**

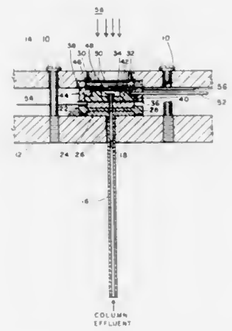


1. A method for the characterization of particles in aerosol, comprising:
using an aerosol, which has been brought to at least one predetermined temperature sufficient for evaporation or decomposition or preventing condensation of molecules on particles of said aerosol;
exposing said aerosol to an electromagnetic radiation for activating particles contained in the aerosol to cause said aerosol particles to emit electrons and attain an electric charge correspondingly; and
measuring the electric charge of said aerosol particles.

14. An apparatus for characterization of particles in an aerosol, said apparatus comprising:
an essentially closed chamber comprising a gas inlet, a gas outlet, and means for establishing an aerosol flow through said chamber;
means mounted in the interior of said essentially closed chamber in the region of said inlet for electrically neutralizing said aerosol;
means for heating said aerosol, said heating means comprising measuring and control means for establishing a predetermined aerosol temperature;
radiation means arranged within the interior of said essentially closed chamber and defining an irradiation zone for activating the heated aerosol flowing therethrough;
said irradiation zone comprising a wall surface held at a defined electric potential and having a conductivity which is high enough to conduct the charge of ions produced by irradiation and movable to said wall surface to said defined electric potential; and
at least one collector electrode mounted in the interior of said essentially closed chamber downstream of said irradiation zone for collecting electrically charged particles and electrically connected to a current or charge meter;
said at least one collector electrode comprising a size selective particle filter mounted downstream of said irradiation zone and arranged in the flow of said aerosol, said size selective particle filter comprising an electric capacitor having two electrodes in spaced relationship and an electric field between said two electrodes, said aerosol flowing through the space between said two electrodes and said electric field having a magnitude which is high enough to deposit at least a part of the charged particles of said aerosol on the negative electrode of said capacitor, and control means connected to said electrodes of said capacitor in order to periodically change the field strength of said electric field between a lower value and a higher value.

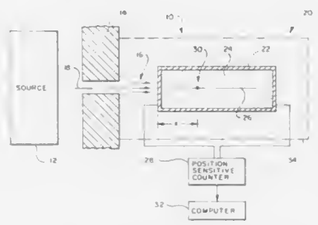
4,837,441
IONIZATION DETECTORS FOR GAS CHROMATOGRAPHY
Ronald A. Hurrell, Buckinghamshire, England, assignor to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed Oct. 24, 1986, Ser. No. 922,586
Claims priority, application United Kingdom, Oct. 30, 1985, 8526765
The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.
Int. Cl.[4] G01N *27/64*
U.S. Cl. 250—382 **10 Claims**

1. In an apparatus for analyzing an unknown substance in a gaseous or vapor phase, a sample of which is entrained in a rare gas carrier, a detector comprising:
a detection chamber with associated flow passages for influx and outlet of the gas and entrained sample;
photoemissive means for emitting electrons for raising atoms of the rare gas carrier to a metastable state such that collision of said metastable atoms with molecules of said sample effects ionization of said sample molecules, said photoemissive means comprising a solid photo-emitter element of gold, aluminum or copper, said photo-emitter being positioned adjacent said chamber;
means for irradiating said photo-emitter element with ultraviolet radiation to cause emission of electrons so as to raise atoms of the rare gas carrier to a metastable state such that collision of said metastable atoms with molecules of said sample effects ionization of said molecules; and



means for impressing an electrical potential across said chamber.

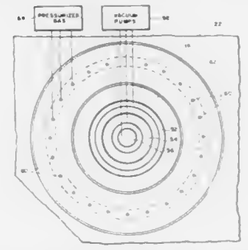
4,837,442
NEUTRON RANGE SPECTROMETER
Stephen H. Manglos, East Syracuse, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Mar. 10, 1988, Ser. No. 166,581
Int. Cl.[4] G01T *3/00*
U.S. Cl. 250—390.01 **8 Claims**



1. A neutron range spectrometer for determining a neutron energy spectrum of a neutron emitting source comprising:
a neutron collimator which produces a collimated neutron beam from the source along a collimation axis;
a position sensitive neutron counter means disposed in the path of the collimated neutron beam for determining position along the collimator axis of interactions between neutrons in the neutron beam and said counter means; and
an analyzing means for analyzing the interaction positions determined and for determining the neutron energy spectrum of the neutron beam.

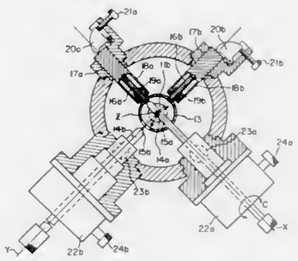
4,837,443
GUARD RING FOR A DIFFERENTIALLY PUMPED SEAL APPARATUS
Lydia J. Young, Palo Alto, and Glen E. Howard, Pleasanton, both of Calif., assignors to The Perkin-Elmer Corporation
Filed Oct. 15, 1987, Ser. No. 109,883
Int. Cl.[4] G01F *21/00*; **G21K** *5/08*
U.S. Cl. 250—441.1 **8 Claims**

1. A particle beam lithography system for treating a semiconductor wafer or mask workpiece surface comprising a beam column having means for generating and directing a particle beam toward the workpiece surface,
a seal apparatus for maintaining only a portion of said workpiece surface in a vacuum so that the beam can be directed to that portion in vacuum while the rest of the workpiece surface is at ambient pressure,
means for positioning said workpiece with respect to said seal apparatus so that a gap is formed between the seal apparatus and the workpiece during workpiece processing and so that the workpiece can move generally trans-



versely of the beam to enable different portions to be treated by the beam at different times yet maintain the vacuum beneath the seal apparatus, and
means surrounding said seal apparatus and cooperating with said workpiece surface for reducing the possibility of contaminants entering said seal apparatus and to moderate the localized temperature differential in the area of the workpiece in vacuum which comprises a ring of heated gas under pressure directed toward and impinging on said workpiece surface.

4,837,444
ELECTRON MICROSCOPE
Kimio Ohi, Tokyo, Japan, assignor to Jeol Ltd., Tokyo, Japan
Filed May 17, 1988, Ser. No. 194,983
Claims priority, application Japan, May 22, 1987, 62-125540
Int. Cl.[4] G21K *5/10*
U.S. Cl. 250—442.1 **3 Claims**



1. An electron microscope having an objective lens including upper and lower magnetic pole pieces and specimen-positioning devices each of which moves a specimen holder along a plane perpendicular to the optical axis of an electron beam and brings the specimen holder onto the optical axis between the pole pieces, said electron microscope comprising:
a small specimen holder for, high-resolution observation;
a large specimen holder for special observation;
a first drive mechanism for moving the small specimen holder along said plane onto the optical axis; and

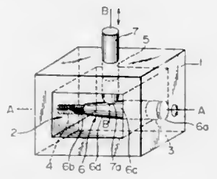
a second drive mechanism for moving the large specimen holder along said plane from a direction different from the direction in which the small specimen holder is moved by the first drive mechanism, to bring the large specimen holder onto the optical axis.

4,837,445

COARSE ADJUSTING DEVICE OF SCANNING TUNNELING MICROSCOPE

Tadashi Nishioka; Takao Yasue, and Hiroshi Koyama, all of Itami City, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 10, 1988, Ser. No. 230,347
Claims priority, application Japan, Apr. 4, 1988, 63-81224
Int. Cl.[4] G21K *5/10* *5/08*
U.S. Cl. 250—442.1 **21 Claims**



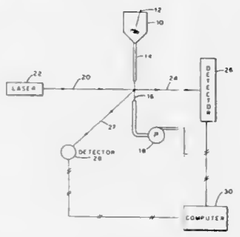
1. A coarse adjusting device for use in a scanning tunneling microscope comprising:
a main body having a hollow space,
transmission means extending through said hollow space, said means having one end thereof screwed into said main body, so that said means moves in one or the other direction as said means is rotated about its axis, said transmission means being provided along the portion within said hollow space with a tapered peripheral surface; and
a coarsely-movable member disposed for movement in a direction perpendicular to the axis of rotation of said transmission means, said coarsely movable member having one end thereof contacting said tapered surface of said transmission means within said hollow space and the other end thereof extending out of said main body, the outwardly extending other end comprising means for carrying an object to be scanned.

4,837,446

APPARATUS AND PROCESS FOR TESTING UNIFORMITY OF PULP

Jean J. Renard, Mobile, Ala., and David M. Hanson, Cornwall, N.Y., assignors to International Paper Company, Purchase, N.Y.

Filed Mar. 31, 1988, Ser. No. 175,516
Int. Cl.[4] G01N *21/64*
U.S. Cl. 250—461.1 **17 Claims**



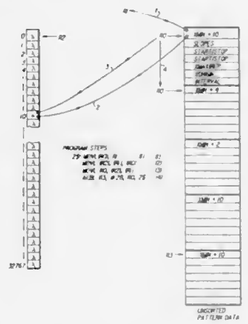
1. A process for determining the uniformity of papermaking pulp with respect to the lignin content associated with the fibers of said pulp comprising the steps of:
selecting a sample of said pulp,
adjusting the concentration of fibers within said sample to a value less than about 100 milligrams of dry fiber to 1000 grams of water,
agitating said sample to disperse said fibers within said sample,
forming said sample into a flowing stream which includes individual fibers of said pulp suspended therein,
directing a beam of substantially monochromatic light into said stream to cause individual ones of said fibers moving through said beam to cast a length shadow and to cause lignin associated with individual ones of said fibers to fluoresce,
detecting said length shadow for individual ones of said fibers,
detecting the intensity of fluorescence of individual ones of said fibers,
correlating the length shadow value of a particular fiber with the fluorescence of the same fiber.

4,837,447

RASTERIZATION SYSTEM FOR CONVERTING POLYGONAL PATTERN DATA INTO A BIT-MAP

John L. Pierce, Hillsborough, and Nick Kanopoulos, Durham, both of N.C., assignors to Research Triangle Institute, Inc., Research Triangle Park, N.C.

Filed May 6, 1986, Ser. No. 860,216
Int. Cl.[4] G21K *1/00*
U.S. Cl. 250—492.2 **56 Claims**



29. An exposure system in which an electron beam from an electron beam source selectively irradiates plural abutting stripe areas of a wafer, comprising:
a rasterization system for producing a two-dimensional bit-map of said wafer, wherein portions of the wafer to be irradiated are represented by bits in the bit-map having a first logic level and the remaining portions not to be irradiated are represented by the remaining bits in the bit-map having a second logic level, said rasterization system converting plural polygonal pattern data each defining the shape and location of a respective polygon in a two dimensional field into respective bits of said bit-map such that said respective bits and the locations thereof in said bit-map correspond to the shapes and locations of the polygons in said two dimensional field, wherein said bit-map is divided into plural data stripes and each data stripe includes plural scan lines, each scan line including plural bits, said rasterization system comprising,
means for converting said plural pattern data of a data stripe into plural respective linked data entries such that data entries which correspond to polygons intersecting the same scan line are sequentially linked from one data entry to a next data entry,
first memory means for storing said plural linked data entries,
processor means coupled to said first memory means for receiving said plural linked data entries from said memory means and processing the received data entries by determining for each scan line the bits thereof intersected by each polygon represented by the respective linked data entries, said processor means setting each bit so determined to a predetermined logic state and producing bit-map data corresponding to the set bits,
second memory means coupled to said processor means for storing said bit-map data for each scan line of said data stripe, wherein the two-dimensional bit-map of the plural polygonal pattern data corresponding to said data strip is formed and stored in said second memory means, and
means for reading out sequentially the bit-map data stored in said second memory means; and
means for selectively controlling irradiation of said wafer by said electron beam based on the bit-map data read out from said reading out means.

4,837,448

PROTECTIVE SHEATH FOR ELECTRICAL OR OPTICAL CONDUCTORS HARDENED WITH RESPECT TO X-RAYS

Jean Sainte Luce Banchelin, Le Haillan; Jean Bourcereau, Bordeaux, and Yves Valy, St. Medard en Jalles, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Apr. 8, 1987, Ser. No. 35,742
Claims priority, application France, Apr. 16, 1986, 86 05443
Int. Cl.[4] G21F *1/12*
U.S. Cl. 250—519.1 **14 Claims**

1. A flexible cable comprising at least one conductor from the group consisting of electrical and optical conductors and an external protection sheath hardened with respect to X-rays, said sheath comprising a flexible X-ray protection sheath externally surrounding said conductor and being formed from a resin matrix containing a regularly dispersed powder of at least one material which is either a metal or an inorganic compound of a metal, the metal having a high atomic number of at least 47, and an anti-SGEMP covering inserted between said conductor and said flexible X-ray protection sheath.

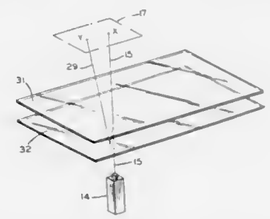
4,837,449

INSPECTING FOR MATCHING OF PAIRED SHEETS OF TRANSPARENT MATERIAL

Robert E. Maltby, Jr., 7869 McCutcheonville Rd., Wayne, Ohio 43466

Filed May 16, 1988, Ser. No. 193,574
Int. Cl.[4] G01N *21/86*
U.S. Cl. 250—571 **22 Claims**

1. A method of inspecting paired first and second sheets of transparent material whose surfaces are essentially parallel for determining the wedge angle between the sheets at a selected location, comprising supporting said first and second sheets with one of the major surfaces of each sheet facing one another whereby said one major surface of each said sheet comprises an inner surface, directing a light beam toward said first one of said paired sheets with a major portion of said light beam being transmitted through said first and second sheets and a minor portion of said beam being reflected from said inner surface of said second sheet to said inner surface of said first sheet and then back through said second sheet, intercepting said transmitted beam and said reflected beam after they emerge from said second sheet, and determining the slope and direction between the sheets at the point of inspection from the position



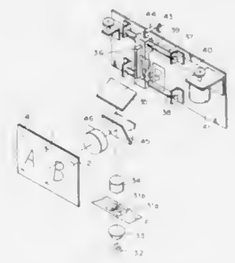
of the intercepted reflected beam relative to the position of the intercepted main beam.

4,837,450

APPARATUS FOR READING A FILM IMAGE WITH CONTROLLABLE ILLUMINATION AND THRESHOLD VALUE

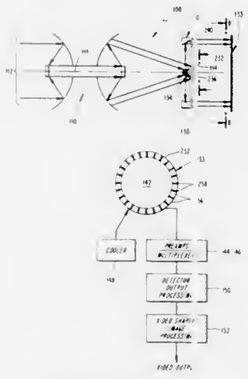
Seiichiro Satomura, Kawasaki, and Masahide Kotera, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 191,837, May 2, 1988, abandoned, which is a continuation of Ser. No. 878,790, Jun. 26, 1986, abandoned. This application Oct. 18, 1988, Ser. No. 259,414
Claims priority, application Japan, Jul. 1, 1985, 60-144219; Jul. 1, 1985, 60-144221; Jul. 1, 1985, 60-144223; Jul. 1, 1985, 60-144224; Jul. 1, 1985, 60-144225
Int. Cl.[4] G01N *21/86*
U.S. Cl. 250—571 **90 Claims**



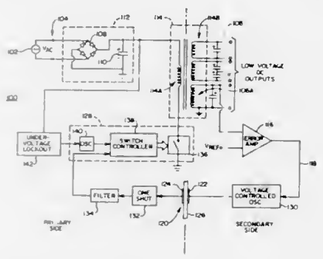
1. A film image reading apparatus comprising:
means for illuminating a film on which an image is recorded;
means for reading image recorded on the film illuminated by said illuminating means and for outputting image signals representing the image;
first detection means for detecting an image density of the image recorded on the film on the basis of the image signals from said reading means;
second detection means for detecting a base density of the film on the basis of the image signals from said reading means;
means for quantizing the image signals outputted from said reading means; and
means for determining a threshold value for quantizing the image signals on the basis of the thus detected image density and base density.

4,837,451
RING ARRAY IMAGING SYSTEM
George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.
Filed Aug. 26, 1987, Ser. No. 89,531
Int. Cl.[4] H01L *25/02, 31/00*
U.S. Cl. 250—578 30 Claims



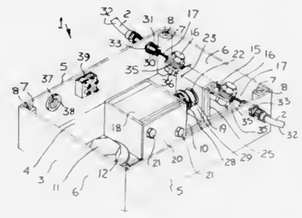
1. A ring array imaging system, comprising:
an annular array of image detecting elements, said annular array being substantially axisymmetric about a longitudinal axis; and
means for projecting onto the entire annualr array of image detecting elements simultaneously a complete image focused onto an imaginary focal plane positioned proximate said longitudinal axis.

4,837,452
OFF-LINE DC POWER SUPPLY
Donald S. Peterson, Philomath, Oreg., assignor to Spectra-Physics, Inc., San Jose, Calif.
Filed Oct. 19, 1988, Ser. No. 259,842
Int. Cl.[4] H02M *3/335*
U.S. Cl. 307—2 14 Claims



1. A method for controlling an off-line dc power supply circuit including a power transformer which separates said power supply circuit into a primary side and a secondary side, and a printed circuit board supporting components of said power supply circuit, said method comprising the steps of:
(a) generating a source of unregulated dc input power;
(b) selectively connecting said unregulated dc input power to a primary winding of the power transformer which also has at least one secondary winding;
(c) comparing an output dc voltage generated at a secondary winding of said power transformer to a reference voltage to generate an error signal representative of the difference error therebetween;
(d) coupling said error signal from the secondary side of said power supply circuit to the primary side of said power supply circuit through the printed circuit board via a capacitor formed from traces on opposite sides of said printed circuit board; and
(e) controlling step (b) in the primary side of said power supply circuit in response to said error signal.

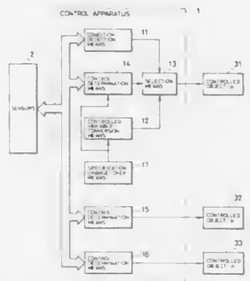
4,837,453
SECURITY DEVICE
Michael J. Wiley, Chapelizod; Stewart Irving, and John P. McKeon, both of Greystones, all of Ireland, assignors to Inventa Chemicals Limited, Dublin, Ireland
Filed Nov. 28, 1986, Ser. No. 936,532
Claims priority, application Ireland, May 31, 1985, 1353/85; Feb. 13, 1986, 397/86
Int. Cl.[4] B62D *45/00*; B60R *25/04*
U.S. Cl. 307—10.2 13 Claims



1. A security device for rendering a mechanical cable inoperative, the device comprising
a housing,
a pivotal member pivotally mounted in the housing,
a cable engaging member for engaging the cable, the cable engaging member being mounted on the pivotal member and constrained to move with the pivotal member, and
stop means mounted on the pivotal member and being movable from a locking position preventing movement of the cable engaging member to a release position permitting movement of the cable engaging member.

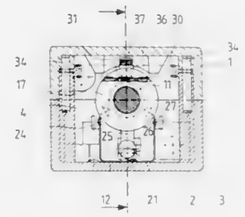
4,837,454
VEHICLE CONTROL APPARATUS
Mitsuaki Ishii, and Masaaki Miyazaki, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 25, 1987, Ser. No. 125,282
Claims priority, application Japan, Nov. 25, 1986, 61-281202
Int. Cl.[4] G01M *15/00*
U.S. Cl. 307—10.1 1 Claim

1. An apparatus for controlling a vehicle comprising:
a plurality of sensor means for detecting conditions at various parts of said vehicle;
at least one controlled object to be controlled; and
control means for appropriately controlling said controlled object according to an output of said plurality of sensor means, said control means comprising:
detection means for detecting an output information of at least one sensor of said plurality of sensors, said detecting means outputting a signal when said output information of said at least one sensor is of a predetermined condition which is improbable in practical use;
first controlled variable determining means for determining a first controlled variable for said controlled object according to said output of said plurality of sensor means;
specification change-over means for applying data information for selecting pre-stored one of control procedures and control data to said first controlled variable determining means;



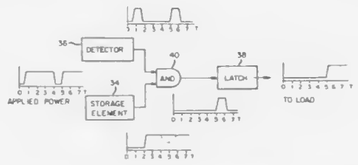
second controlled variable determining means for converting said data information applied from said specification change-over means into a second controlled variable for said controlled object; and
selecting means for selecting one of said first and second variables as an actual controlled value of said controlled object according to said output signal of said detecting means.

4,837,456
PULSE GENERATOR
Jochen Rose, Röthenbach, Fed. Rep. of Germany, assignor to Standard Elektrik Lorenz AG, Stuttgart, Fed. Rep. of Germany
Continuation-in-part of Ser. No. 122,436, Nov. 19, 1987, Pat. No. 4,782,243. This application Mar. 7, 1988, Ser. No. 165,090
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1987, 3707418
Int. Cl.[4] H01H *19/08*
U.S. Cl. 307—106 8 Claims



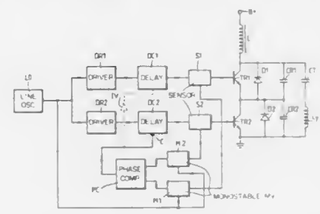
1. Pulse generator comprising a first plunger for actuating several contacts, said first plunger having a longitudinal axis, being guided in a housing and being slidable in the direction of and rotatable about said longitudinal axis against the action of a spring and being provided with at least one first actuating member capable of entering into non-positive engagement with at least one contact both in at least one of the longitudinally adjusted positions of said first plunger, said first plunger having a hole which runs parallel to the direction of sliding, the pulse generator further having a second plunger which is slidable and/or rotatable against the action of a spring associated therewith, and a second actuating member on said second plunger.

4,837,455
INTERRUPT CONTROLLED SWITCHING DEVICE
Michael G. Sleator, Star Rte. Box 73, Woodside, Calif. 94062
Filed May 20, 1987, Ser. No. 51,635
Int. Cl.[4] H01H *47/12*
U.S. Cl. 307—38 17 Claims



1. A switching device for controlling the delivery of power from a power source to a load, comprising:
input means for receiving the power applied from the power source;
output means for delivering the applied power to the load; and
switching means responsive to a momentary interruption of power for changing state from an initial state to a new state that persists until another interruption of power of duration greater than the momentary interruption and sufficient to cause a reset to the initial state, the switching means constructed to connect the input means to the output means in one of the states and to disconnect the input means from the output means in the other of the states.

4,837,457
HIGH VOLTAGE POWER TRANSISTOR CIRCUITS
Michael J. Bergstrom, Carshalton, and Derek J. Gent, Wallington, both of England, assignors to U.S. Philips Corp., New York, N.Y.
Filed Dec. 14, 1987, Ser. No. 132,536
Claims priority, application United Kingdom, Dec. 19, 1986, 8630406; Dec. 19, 1986, 8630407; Dec. 19, 1986, 8630408
Int. Cl.[4] H03K *17/60, 3/01, 5/153, 17/56*
U.S. Cl. 307—253 19 Claims



1. A circuit arrangement comprising: a first high voltage bipolar power transistor, first control means for repeatedly cutting-off said first transistor, means connecting said first control means to a signal source which produces a drive signal for said first transistor, said first control means comprising a first device having an electric characteristic which is used to control said drive signal, a comparison stage having an output coupled to said first device for controlling the electric characteristic of said first device, first sensor means coupled to said

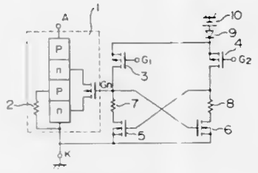
first transistor for sensing the rate of change of base current of said first transistor each time said first transistor is cut off, first means for applying the sensing signal so produced to a first input of said comparison stage, second means for applying a time-related signal to a second input of the comparison stage, said first device controlling the instant of cut-off of said first transistor in response to a resulting comparison between said sensing signal and said time-related signal.

4,837,458

FLIP-FLOP CIRCUIT

Sigeyuki Kawahata, and Yoshitaka Sugawara, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 19, 1987, Ser. No. 86,823
Claims priority, application Japan, Aug. 22, 1986, 61-195415; Oct. 31, 1986, 61-258274
Int. Cl.[4] H03K *3/26, 17/16, 19/094*
U.S. Cl. 307—279 **13 Claims**



1. A flip-flop circuit comprising:
- a first field effect transistor of a first conductivity type to the gate of which an input signal of a first polarity is applied;
- a second field effect transistor of a first conductivity type to the gate of which an input signal of a second polarity opposite to said first polarity is applied;
- a third and a fourth field effect transistor both of a second conductivity type having their sources electrically connected with each other,
- said first and said second field effect transistor having their sources commonly connected,
- said third and said fourth field effect transistor having their gates connected with a drain of said second and of said first field effect transistor, respectively,
- an output terminal provided on a connection between the gate of said fourth field effect transistor and a drain of said third field effect transistor,
- a first resistor along said connection between the gate of said fourth field effect transistor and the drain of said third field effect transistor; and
- a second resistor connected between the gate of said third field effect transistor and a drain of said fourth field effect transistor.

4,837,459

CMOS REFERENCE VOLTAGE GENERATION

Eugene R. Bukowski, Cary, and Charles R. Hoffman, Raleigh, both of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jul. 13, 1987, Ser. No. 72,362
Int. Cl.[4] H03K *3/023, 3/353, 3/013, 17/687*
U.S. Cl. 307—296.8 **11 Claims**

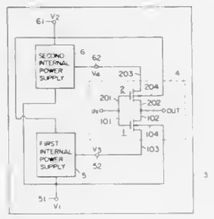
1. A circuit arrangement for generating a reference voltage comprising:
- first FET device and second FET device, with each device having a control terminal, a drain terminal, a source terminal and a substrate terminal and both devices having the same base threshold voltage;
- an operational amplifier having a positive input terminal connected to the source terminal of the first FET device, a negative input terminal connected to the source terminal of the second FET device and an output terminal;
- a first means interconnecting the output terminal to the control terminal of the second FET device;
- a second means interconnecting the substrate terminal to the source terminal of said second FET device;
- a first biasing network for generating a first reference voltage connected to the control terminal of the first FET device;
- a second biasing network for generating a second reference voltage connected to the source and substrate terminals of the first FET device; and
- third means for generating identical current flow connected to the source electrodes of the first FET device and the second FET device.

4,837,460

COMPLEMENTARY MOS CIRCUIT HAVING DECREASED PARASITIC CAPACITANCE

Yukimasa Uchida, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jan. 23, 1984, Ser. No. 573,202
Claims priority, application Japan, Feb. 21, 1983, 58-27470
The portion of the term of this patent subsequent to Apr. 29, 2003, has been disclaimed.
Int. Cl.[4] H03K *17/14*
U.S. Cl. 307—296.8 **3 Claims**



1. A complementary MOS circuit comprising:
- a complementary MOS circuit means comprising an n-channel MOS transistor on a semiconductor substrate of p-type and a p-channel MOS transistor on a semiconductor substrate n-type, the gate terminals of said n-channel MOS transistor and said p-channel MOS transistor being connected electrically in common to an input terminal, and the drain terminals of said n-channel MOS transistor and said p-channel MOS transistor being connected electrically in common to an output terminal;
- first power supply means for applying first and second externally supplied voltages to the substrate terminals, respectively, of said n-channel MOS transistor and said p-channel MOS transistor;

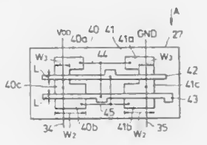
- second power supply means for applying first and second internally supplied voltages to the source terminals, respectively, of said n-channel MOS transistor and said p-channel MOS transistor; and
- a constant voltage circuit means comprising a means for receiving through one of a first and a second externally supplied power terminal, one of a first and a second externally supplied voltage and for converting said one externally supplied voltage into one of said first and second internally supplied voltages;
- said first and second externally supplied power supply terminals being electrically connected to the substrate terminals, respectively, of said n-channel MOS transistor and said p-channel MOS transistor;
- said first and second internally supplied voltages being connected electrically to the source terminals, respectively, of said n-channel MOS transistor and said p-channel MOS transistor; and
- wherein the absolute value of the difference between said first and second internally supplied voltages is maintained constant regardless of the variation in the absolute value of the difference between said first and second externally supplied voltages.

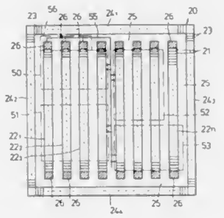
4,837,461

MASTER SLICE TYPE INTEGRATED CIRCUIT

Hajime Kubosawa, and Masato Ishiguro, both of Machida, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 12, 1988, Ser. No. 155,571
Claims priority, application Japan, Feb. 24, 1987, 62-40603
Int. Cl.[4] H03K *3/26, 19/173*
U.S. Cl. 307—303 **14 Claims**





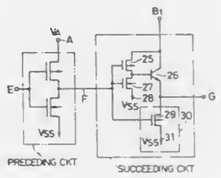
1. A master slice type integrated circuit in which various circuits may be formed by varying the routing of interconnections, comprising:
- a plurality of input/output cells being arranged in a peripheral region on a semiconductor chip;
- a plurality of basic cell columns each comprising a plurality of basic cells arranged in a predetermined direction, each basic cell constituting transistors;
- an interconnection region formed on the chip, for accommodating a data bus; and
- a plurality of latch cells arranged in the basic cell columns, for keeping a potential of a data bus laid on the interconnection region to prevent the data bus from being changed into a floating state, each latch cell comprising transistors, each of which has a driving capability smaller than that of each transistor of the basic cell.

4,837,462

SEMICONDUCTOR DECODER CIRCUIT HAVING SWITCHING MEANS FOR PREVENTING COUNTERFLOW

Takao Watanabe, Kokubunji; Goro Kitukawa; Ryoichi Hori, both of Tokyo; Kiyoo Itoh, Higashikurume; Yoshiki Kawajiri, Hachioji, and Takayuki Kawahara, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 886,816, Jul. 18, 1986. This application Dec. 9, 1987, Ser. No. 130,640
Claims priority, application Japan, Jul. 22, 1985, 60-161467; Jan. 31, 1986, 61-17929; Feb. 17, 1986, 61-30846
Int. Cl.[4] H03K *19/017*
U.S. Cl. 307—446 **6 Claims**



1. A semiconductor circuit comprising:
- a preceding circuit which delivers an output signal of first amplitude in response to an input signal;
- a power source which has a first potential to be fed to said preceding circuit;
- a succeeding circuit which includes at least one insulated-gate field effect transistor and to which the output signal of said preceding circuit is applied, said succeeding circuit delivering an output signal of a second amplitude larger than the first amplitude in response to the output signal of said preceding circuit and being supplied with a voltage of a second potential from a second power source higher than the first potential; and
- a switching means for preventing counterflow of current to the preceding circuit from the succeeding circuit, coupled between the preceding circuit and the succeeding circuit; and wherein
- said preceding circuit is a decoder circuit which decodes an address signal, and said succeeding circuit is a word line driver which drives a word line of a memory, and said memory is dynamic random access memory.

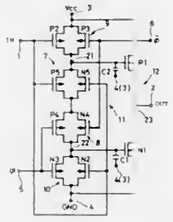
235-361 O.G.-89-19

4,837,463

THREE-STATE COMPLEMENTARY FIELD EFFECT INTEGRATED CIRCUIT

Takenori Okitaka, and Yukio Miyazaki, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 3, 1987, Ser. No. 129,940
Claims priority, application Japan, Dec. 4, 1986, 61-290195
Int. Cl.[4] H03K *3/295*
U.S. Cl. 307—473 **10 Claims**



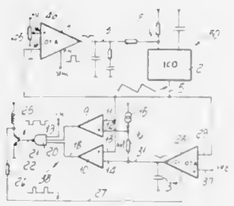
1. A three-state complementary field effect integrated circuit comprising:
an input (1);
an output (2);
a first control input (6) and a second control input (5) to which control signals opposite to each other are applied;
a first series connection connected to said input (1) and said first and second control input (6, 5), in which first switching means (9), second switching means (7, 8) having a delay resistance and third switching means (10) are connected in this order between a power supply (Vc) and a ground (GND);
an output circuit comprising a second series connection connected to said first series connection, in which a first field effect device (P1) of a certain conductivity type having a control electrode and a second field effect device (N1) of an opposite conductivity type having a control electrode are connected in series between said power supply (Vcc) and said ground (GND); wherein
a node connected to said first and the second field effect devices (P1, N1) constitutes said output (2),
one terminal and another terminal of said second switching means are connected respectively to said control electrodes of said first and second field effect devices (P1, N1),
said second switching means turns on in response to the control signals applied to said first and second control input (6, 5) and provides said delay resistance to said first series connection in series,
said first switching means (9) is coupled to said input (1) and said first control input (6), turns on in response to the input signal applied to said input (1) and applies the voltage from said power supply (Vcc) to said control electrode of said second field effect device (N1) through said second switching means (7, 8); said circuit further comprising
a first capacitance (C1) connected between said control electrode of said second field effect device (N1) and a predetermined reference voltage point; wherein
said first capacitance (C1) forms a first integrating circuit having a first time constant together with said delay resistance of said second switching means (7, 8),
said second field effect device (N1) turns on in response to the voltage applied from said power supply (Vcc) through said first integrating circuit and having a delay determined by said first time constant,
said third switching means (10) is coupled to said input (1) and said second control input (5), turns on in response to the input signal applied to said input (1) and applies the voltage from said ground (GND) to said control electrode of said first field effect device (P1) through said second switching means (7, 8); and
a second capacitance (C2) connected between said control electrode of said first field effect device (P1) and said reference voltage point, wherein
said second capacitance (C2) forms a second integrating circuit having a second time constant together with said delay resistance of said second switching means (7, 8), and
said first field effect device (P1) turns on in response to the voltage applied from said ground (GND) through said second integrating circuit and having a delay determined by said second time constant wherein
said second switching means comprises a third series connection of a resistance connection (7) and a fourth switching means (8) having a first on resistance,
said fourth switching means (8) turns on in response to the control signal applied to said first and second control inputs (6, 5) and interconnects said first on resistance with said third series connection, and
said first on resistance of said fourth switching means (8) and said resistance connection (7) forming said delay resistance.

4,837,464

PHASE REGULATION CIRCUIT, PARTICULARLY FOR HORIZONTAL PHASE REGULATION IN DATA DISPLAYS

Roberto Viscardi, Lissone; Silvano Gornati, Casorezzo, and Silvano Coccetti, Vittuone, all of Italy, assignors to SGS Microelettronica S.p.A., Catania, Italy

Filed Jun. 1, 1987, Ser. No. 55,954
Claims priority, application Italy, Jun. 18, 1986, 20837 A/86
Int. Cl.[4] H03L *7/00*
U.S. Cl. 307—511 5 Claims



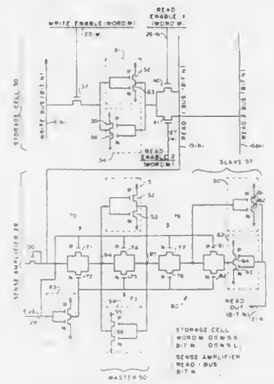
1. A phase regulation circuit, in particular for horizontal phase regulation in data displays, comprising a phase-lock stage receiving a first reference signal and a synchronism signal and generating a triangular signal phase-correlated with said synchronism signal, a rectangular waveform generator, receiving said triangular signal and supplying a rectangular waveform signal, a drive element receiving said rectangular waveform signal and generating a periodic control signal, and a phase comparator receving said triangular signal, said periodic control signal and a second reference signal and generating a compensation signal for compensating dynamic phase differences produced by said drive element, said compensation signal being fed to said rectangular waveform generator, wherein at least one of said reference signals is variable between presettable minimum and maximum values, thereby compensating static phase differences between said synchronism signal and said periodic control signal.

4,837,465

SINGLE RAIL CMOS REGISTER ARRAY AND SENSE AMPLIFIER CIRCUIT THEREFOR

Jorge Rubinstein, 215-4 Lake Shore Rd., Brighton, Mass. 02135

Division of Ser. No. 692,815, Jan. 16, 1985, Pat. No. 4,792,924.
This application Mar. 30, 1988, Ser. No. 175,058
Int. Cl.[4] H03K *3/26, 3/284, 19/094*
U.S. Cl. 307—530 5 Claims



1. A sense amplifier for receiving an input digital signal from an input terminal and for transmitting a signal representative of the digital value of the input digital signal to an output terminal in response to an evaluation enabling signal comprising:
A. master latch means connected to said input terminal for receiving the input digital signal, said master latch means including flip-flop means having two stable states and a meta-stable condition, said master latch means further comprising meta-stable means for maintaining said flip-flop means close to the meta-stable condition;
B. slave latch means connected to said output terminal and having two stable states, the slave latch means transmitting a signal to said output terminal representative of the state of said slave latch means; and
C. normally-disabled capture gate means connected to said master latch means and said slave latch means, said capture gate means coupling a signal representative of the state of said flip-flop means to said slave latch means when enabled,
each of said master latch means, said slave latch means and said capture gate means being connected to receive said evaluation enabling signal, said meta-stable means being disabled and said capture gate means being enabled in response to said evaluation enabling signal to thereby enable said flip-flop means to assume one of its stable states as determined by the input digital signal and to enable said capture gate means to couple a signal from the master latch means to said slave latch means, said slave latch means in response to said evaluation enabling signal being enabled to assume a state in response to the signal from said capture gate means, the state being representative of the state of said flip-flop means.

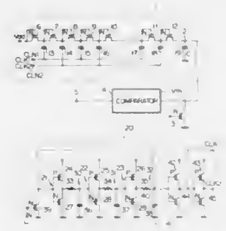
4,837,466

DELAY CIRCUIT

Shushi Kanauchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 19, 1987, Ser. No. 122,806
Claims priority, application Japan, Nov. 19, 1986, 61-277131
Int. Cl.[4] H03K *5/153*
U.S. Cl. 307—605 9 Claims

1. A delay circuit for counting a time period comprising:
(a) a charging circuit operative to boost-up a voltage level at an output node thereof;
(b) a resetting circuit operative to start said charging circuit boosting up said voltage level at said output node in response to an input signal supplied form the outside of said delay circuit; and
(c) a comparator circuit for detecting that the voltage level at the output node of said charging circuit exceeds a reference voltage level, thereby producing a delayed signal which is delivered after said time period measuring from the start of said boosting-up, in which said charging circuit comprises plural stages of charge pump circuits providing a conduction path coupled between a first source of voltage and the output node thereof and driven by two



clock signals different in phase from each other by 180 degrees, a load capacitor coupled to the output node and operative to accumulate electric charges transferred from the first source of voltage by said charge pump circuits and in which said delay circuit is accompanied by a clock signal generating circuit comprising a phase shift oscillator circuit, and a series combination of a first CMOS type inverter circuit, a first output node and a second CMOS type inverter circuit coupled between said phase shift oscillator and a second output node, said two clock signals appearing at said first output node and said second output node, respectively.

4,837,467

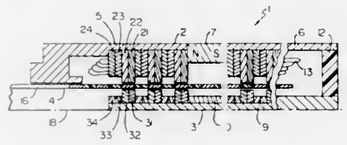
LINEAR MOTOR WITH ANGULARLY INDEXED MAGNETIC POLES

Wyatt S. Newman, New York, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 2, 1987, Ser. No. 127,832
Int. Cl.[4] H02K *41/00*
U.S. Cl. 310—12 16 Claims

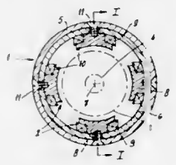
1. A linear motor comprising:
a displacer arranged for movement parallel to an axis, and carrying a plurality of axially spaced magnetizable elements having surfaces parallel to said axis, and
a stator extending parallel to said axis, comprising a plurality of magnetic-pole-defining members having pole-defining surfaces parallel to said displacer surfaces, successive magnetic-pole-defining surfaces being axially and angu-

larly spaced with respect to each other; and means for selectively increasing magnetic flux through angularly



selected surfaces of said stator to attract said displacer to selected axial positions with respect to said stator.

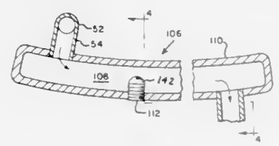
4,837,468
DOUBLE CASING FOR ELECTRIC ROTATING MACHINE STATOR
Francis Froment, Lyons, France, assignor to Equipements Electriques Moteur, Creteil Cedex, France
Filed Feb. 17, 1988, Ser. No. 156,662
Claims priority, application France, Feb. 17, 1987, 87 02520
Int. Cl.[4] H02K 5/26; F16L 55/12
U.S. Cl. 310—42 8 Claims



1. An electric rotating machine stator comprising a double casing, and polar grounds attached to the inside of said casing by screws, said casing including two pipes placed coaxially one inside the other, said pipes having therethrough, at locations provided for said screws used to attach said polar grounds, aligned holes, the improvement wherein each said hole in the outer pipe comprises:
- a countersink resulting from the punching deformation of an initially cylindrical hole and dimensioned to accommodate the head of a respective said screw; and
- a boss formed of the material from said outer pipe during the punching deformation operation and extending inwardly from said countersink into the corresponding said hole in the inner pipe.

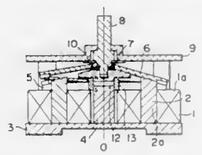
4,837,469
ELECTRICAL GENERATOR WITH IMPROVED LIQUID COOLING ARRANGEMENT
Robert T. Ward, Winter Park, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jan. 19, 1988, Ser. No. 144,907
Int. Cl.[4] H02K 9/00
U.S. Cl. 310—53 6 Claims

1. A cooling arrangement for an electrical generator which includes a stator, a cylindrical opening extending therethrough, an armature received in coaxially aligned relation with said stator and mounted for rotation within said stator, said stator including a plurality of individual electrical windings each having portions disposed in slots extending axially of said stator, a plurality of current-carrying rings arranged in parallel relation to one another so as to form a cylindrical array of said rings, said array being disposed at one end of said stator and aligned coaxially therewith such that said rings extend circumferentially of said stator opening, each of said rings being in electrically conductive relation with an associated electrical winding, each of said parallel rings being of tubular construction and having a continuous ring sidewall portion defining an interior liquid passage, each of said rings also having a liquid coolant inlet and a liquid coolant outlet, means for distributing coolant from a coolant source to each of said ring inlets, means for collecting coolant from each of said coolant outlets for return to said coolant source, and means for circulating said coolant from said coolant source to said ring inlets, through said rings, and from said ring outlets back to said coolant source, at least one of said rings having at least one



means for adjustably controlling the flow of said coolant within said passage, said flow control means including an end portion positionable within said interior liquid passage, cooperating means on said ring sidewall portion and said flow control means for positioning said end portion relative to said liquid passage, and means for securing said cooperating means on said ring sidewall and said flow contrrol means against coolant leakage and movement relative to said ring when said end portion of said flow control means has been placed in a desired position of use within said coolant passage.

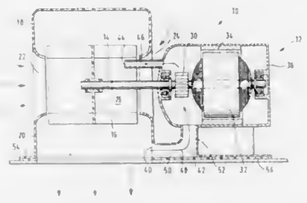
4,837,470
MAGNETICALLY DRIVEN NUTATING MOTOR
Shuichi Tamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 16, 1987, Ser. No. 121,113
Claims priority, application Japan, Nov. 19, 1986, 61-275750
Int. Cl.[4] H02K 7/06
U.S. Cl. 310—82 11 Claims



1. A magnetically driven motor comprising:
(a) an output shaft supported to be rotatable about a predetermined central line;
(b) a magnetic conical plate having a vertex on the predetermined central line and a predetermined peripheral length, said plate being rotatable together with said output shaft about the predetermined central line and swingably supported to be inclined with respect to the predetermined central line;
(c) a stationary guide having the predetermined central line as an axis, having a vertex angle slightly smaller than a vertex angle of said plate and having an annular guide surface corresponding to part of a conical surface of said plate, said guide being adapted such that a peripheral portion of said plate is swingable along said guide surface having a peripheral length larger than that of said plate;
(d) at least three electromagnets equiangularly disposed about the predetermined central line so as to oppose said conical plate and adapted to be sequentially energized;

(e) a fixed shaft of magnetic material provided on the inner side of said electromagnets disposed about said predetermined central line, said fixed shaft being formed as a bearing of said output shaft, and provided so as to be in contact with a part of said plate when at least one of said electromagnets is energized and so as to form a part of a magnetic circuit of each said electromagnet; and
(f) a supporting member of magnetic material adapted to be in contact with each of said electromagnets and said fixed shaft,
wherein said peripheral portion of said plate is swung along said guide surface by a magnetic attraction force acting on said plate upon sequential energization of said at least three electromagnets.

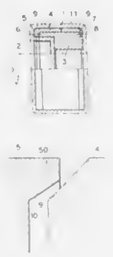
4,837,471
DYNAMOELECTRIC MACHINE STATOR USING CYLINDRICAL KEYBAR WITH IMPROVED DOVETAIL CONFIGURATION
Joseph M. Kostoss, Schenectady, and Frederick T. Rohrs, Johnstown, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Oct. 23, 1987, Ser. No. 113,103
Int. Cl.[4] H02K 1/12
U.S. Cl. 310—258 10 Claims



1. A keybar for a stator of a dynamoelectric machine comprising:
- a cylindroidal portion having opposed ends and exhibiting a lengthwise dimension extending between said ends;
- a substantially T-shaped dovetail portion attached to said cylindroidal portion and extending between said opposed end along the lengthwise dimension of said cylindroidal portion;
- a shaft having opposed ends included within the T-shaped portion, said shaft being attached to said cylindroidal portion and extending substantially from end to end of said cylindroidal portion along the lengthwise dimension of the cylindroidal portion;
- a cross member attached to said shaft along a lengthwise dimension, said cross member being substantially perpendicular to said shaft; and,
- opposed V-shaped side surfaces included within the cross member and extending substantially from end to end of said cross member.

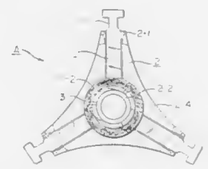
4,837,472
INNER MAGNET ROTOR FOR MAGNET PUMP
Masayuki Kotera, Mishima, Japan, assignor to Seikow Chemical Engineering & Machinery, Ltd., Hyogo, Japan
Filed Feb. 3, 1988, Ser. No. 151,801
Claims priority, application Japan, Mar. 3, 1987, 31754
Int. Cl.[4] H02K 21/14
U.S. Cl. 310—156 7 Claims

1. An inner magnet rotor for a magnet pump including a yoke to be drivingly connected to the impeller shaft of the magnet pump, magnets of different polarities arranged alternately on the yoke, a first, metal holder for tightly holding the magnets at the front side of the yoke, first fastening means for fixing the first holder to the yoke, a second, metal holder, independent of said first holder, for tightly holding the magnets at the rear side of the yoke, and second fastening means for fixing the second holder to the yoke, the inner magnet rotor being characterized in that the first and second holders are lower than the magnets in hardness, the magnets being chamfered at each of their front and rear ends to form a bevel face,



each of the first and second holders being formed with a slanting face opposed to the bevel face, the slanting face of each of the holders being at a smaller angle with the axis of the rotor than the bevel face of each of the magnets and the portion of each slanting face in contact with the corresponding bevel face being slightly compressed against that bevel face.

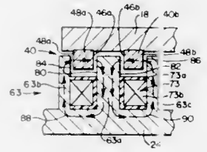
4,837,473
COMMUTATOR
Shinichi Matuda; Kenji Furuya, and Tetsuo Kubo, all of Matsudo, Japan, assignors to Mabuchi Motor Co., Ltd., Japan
Filed Jan. 26, 1988, Ser. No. 148,490
Claims priority, application Japan, Jan. 28, 1987, 62-11179
Int. Cl.[4] H02K 13/06
U.S. Cl. 310—237 4 Claims



1. A commutator comprising an insulating commutator core having a forwardly extending cylindrical portion and insert pieces extending in the opposite direction to said cylindrical portion for attaching the commutator to a rotor; metal commutator segments having arc-shaped segment pieces disposed in contact with the outer periphery of said cylindrical portion and commutator legs extending radially at equally spaced angular positions corresponding to the angular positions between adjacent windings of the rotor, the legs having winding wire connecting portions adjacent radially outer ends thereof; and a commutator washer engaged with the outer periphery of said arc-shaped segment pieces to fixedly fit said commutator segments to said commutator core; characterized in that the commutator core is formed with a flat portion of triangular shape having respective apices spaced radially outwardly of said cylindrical portion at angular positions corresponding to the angular positions of the legs, in the normal direction to the axis of said cylindrical portion so as to lie between respective rotor windings, and along and behind said commutator legs in supporting relation thereto so as to resist axially rearward movement of said commutator legs; and winding hooks for hooking rotor windings and having radially outwardly facing

winding supporting surfaces provided at locations of said commutator core flat portions adjacent the sides of said commutator legs.

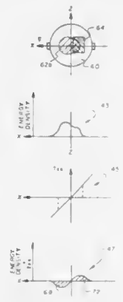
4,837,474
D.C. MOTOR
Christian C. Petersen, and Ken G. Wasson, both of Fremont, Calif., assignors to Camatec Corporation, Fremont, Calif.
Filed Aug. 12, 1988, Ser. No. 231,763
Int. Cl.[4] H02K *1/12*
U.S. Cl. 310—254 21 Claims



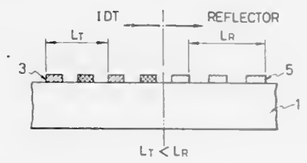
1. A d.c. motor comprising:
means for providing a stator base having a given central axis;
rotor means mounted upon said stator base for rotation about said central axis;
a predetermined number of permanent magnet components located upon said rotor for movement therewith about a circular rotor locus, each being magnetized having a select polarization aligned radially with respect to said central axis and emanating magnetic flux from oppositely disposed substantially parallel flux transfer surfaces thereof;
a plurality of pole assemblies located upon said stator base along a circular locus of pole positions, each pole assembly including first and second spaced, substantially parallel core components mutually associated in magnetic flux transfer communication, each extending from said base to include a flux interaction surface extending into adjacency with said permanent magnet rotor locus to derive oppositely disposed flux transfer gaps with said flux transfer surfaces upon movement of said flux transfer surfaces into adjacency therewith forming a complete, localized magnetic circuit including said first and second core components, and field winding means positioned intermediate said base and a said flux interaction surface and selectively excitable to effect driven rotation of said rotor means about said axis.

4,837,475
CRYSTAL RESONATOR WITH LOW ACCELERATION SENSITIVITY AND METHOD OF MANUFACTURE THEREOF
Errol P. EerNisse, Salt Lake City, and Roger W. Ward, Park City, both of Utah, assignors to Quartztronics, Inc., Salt Lake City, Utah
Filed Oct. 2, 1987, Ser. No. 103,670
Int. Cl.[4] H01L *41/04, 41/08, 41/22*
U.S. Cl. 310—312 22 Claims

1. A method of manufacturing crystal resonators to control acceleration sensitivity of said resonators comprising
producing a piezoelectric crystal,
providing support structure for the crystal,
providing excitation means for causing said crystal to resonate with an active region of vibration,
determining at least one component of the acceleration sensitivity for said crystal, and
modifying resonator mass to thereby move the location of the active region of vibration of the crystal and thus modify at least said one component of the acceleration sensitivity.

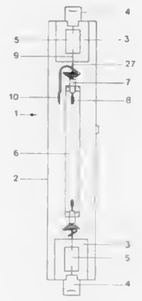


4,837,476
SURFACE ACOUSTIC WAVE RESONATOR HAVING TRANSDUCERS AND REFLECTORS OF DIFFERENT PERIODS
Masami Mochizuki, Yamanashi, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Apr. 28, 1986, Ser. No. 856,317
Claims priority, application Japan, Apr. 27, 1985, 60-91642
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—313 R 4 Claims



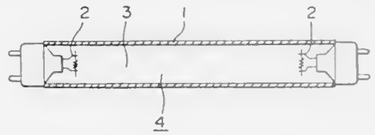
1. A surface acoustic wave resonator, comprising:
a substrate of a crystal;
a pair of surface wave reflectors formed on a crystal surface of said substrate and each comprising a plurality of reflection gratings;
a plurality of electro-acoustic interdigital transducers formed on said substrate surface between said pair of reflectors and each having a plurality of electrodes; and
a film covering only said pair of reflectors or only said plurality of transducers, thereby providing different propagation velocities,
wherein a spatial propagation period L_{T1} of said electrodes of said interdigital transducers and a spatial propagation period L_{R1} of said gratings of said reflectors have values having a ratio L_{T1}/L_{R1} less than one.

4,837,477
HIGH PRESSURE DISCHARGE LAMP WITH IMPROVED ARC TUBE RETENTION STRUCTURE
Joachim Dassler; Detlef Girod; Klaus Kramer, and Ingrid Liesch, all of Berlin, Fed. Rep. of Germany, assignors to Patent Treuhand Gesellschaft fur elektrische Gluhlampen mbH, Munich, Fed. Rep. of Germany
Filed Feb. 5, 1988, Ser. No. 152,914
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1987, 8702658[U]
Int. Cl.[4] H01J *61/34*
U.S. Cl. 313—25 22 Claims



1. A high-pressure discharge lamp,
said lamp defining a central axis, and having
an outer envelope (2, 12);
an arc tube or discharge vessel (6, 16) having two ends, gas tightly surrounded by said envelope, with an evacuated space between the outside of said arc tube and said envelope;
first electrical connection means (9, 19) extending inwardly of the outer envelope from respective ends in opposite direction
said first electrical connection means defining a predetermined position for the arc tube or discharged vessel with respect to the central axis in the envelope;
second electrical connection means located at opposite ends of the arc tube or discharge vessel (6, 16); and
at least one resilient combined connection and holding means (23) coupled to at least one of said first electrical connection means (9, 19) and to one of said second electrical connection means (7, 17) at a respective end of the arc tube or discharge vessel, and resiliently holding said arc tube or discharge vessel within the envelope,
said at least one of said combined connection and holding means including a spiral spring means (23) electrically and mechanically secured to at least one of the first electrical connection means (9, 19) of the arc tube and at least one of the second electrical connection means (7, 17) at an adjacent end portion of the envelope, and oriented to permit resilient axial excursion while elastically resiliently resisting radial excursion with respect to said axis; and
wherein said spring means is free from contact with the outer envelope (2, 12).

4,837,478
NEAR-INFRARED RAY RADIATION ILLUMINATOR AND NEAR-INFRARED RAY IMAGE PICK-UP DEVICE
Yoshioori Anzai, Zushi; Takao Saikatsu, Kamakura; Masato Saito, Kamakura, and Michihiro Tsuchihashi, Kamakura, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 10, 1987, Ser. No. 132,664
Claims priority, application Japan, May 9, 1984, 59-92098; May 9, 1984, 59-92099
Int. Cl.[4] H01J *61/16, 61/35*
U.S. Cl. 313—112 4 Claims



1. A near-infrared ray radiation illuminator comprising:
a low pressure rare gas electric discharge lamp which is provided with a discharge tube having a plurality of electrodes, and a filter which permits the near-infrared region to pass therethrough and removes the visible region out of the light rays radiated from said electric discharge lamp, wherein at least any one kind of said rare gases is filled in said discharge tube under the following pressure range:

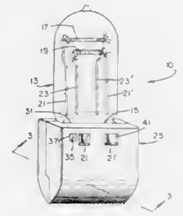
5.0 Torr>Ar>0.5 Torr

4.5 Torr>Kr>0.5 Torr

4.0 Torr>Xe>0.5 Torr

and wherein said rare gas is excitable so as to produce a light omission.

4,837,479
ELECTRIC LAMP WITH INSULATING BASE
Daniel D. Devir, Sutton; Richard J. Dolan, Bradford, and John A. Bergin, Hancock, all of N.H., assignors to GTE Products Company, Danvers, Mass.
Filed Feb. 16, 1984, Ser. No. 580,930
Int. Cl.[4] H01J *5/48*
U.S. Cl. 313—318 11 Claims



1. An electric lamp comprising:
a sealed light-transmitting envelope having a bulbous portion and a press sealed end portion, said sealed end portion substantially rectangular in cross section;
at least one filament located within the interior of said bulbous portion of said envelope;
a pair of lead-in conductors each connected to said filament, each or said conductors sealed within said press sealed end portion of said envelope and projecting exteriorly thereof; and

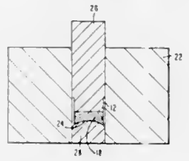
an electrically insulating base member of unitary construction for being positioned within a socket member having electrical contacts therein, said base member defining an elongated opening therein and secured to said press sealed end portion of said envelope and providing a cover therefor, said press sealed end portion being positioned within said elongated opening, said base member including a pair of apertures located within one side thereof and means for maintaining each of the exteriorly projecting portions of said lead-in conductors in predetermined alignment against an external surface of said press sealed end portion of said envelope relative to a respective one of said apertures so as to expose preselected portions of said exteriorly projecting portions through said apertures such that electrical contact can be accomplished between said preselected portions of said conductors and said electrical contacts within said socket member through said apertures within said base member when said base member is positioned within said socket member, said base member including a narrowed section to enable said base member to be folded therealong when said base member is positioned on said press sealed end portion of said envelope.

4,837,480

SIMPLIFIED PROCESS FOR FABRICATING DISPENSER CATHODES

Glenn S. Breeze, Carson, and Robert M. Baird, Redondo Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 28, 1988, Ser. No. 174,262
Int. Cl.[4] H01J 7/18 7/385
U.S. Cl. 313—346 DC **12 Claims**



1. A method for manufacturing a dispenser cathode comprising:
providing a mixture of electron emissive material powder and refractory metal power;
providing a metallic support member; and
pressing said mixture together and into said metallic support member forming therein a pellet of impregnated cathode material having an emissive surface.

4,837,481

CERIUM AND TERBIUM ACTIVATED LUMINESCENT MATERIAL AND MERCURY VAPOR DISCHARGE LAMP CONTAINING THE SAME

Judicus M. P. J. Verstegen; Johannus G. Verlijsdonk; Emiel P. J. de Meester; Willebrordus H. M. M. Van de Spijker, and Johannes G. Verrict, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 585,969, Mar. 5, 1984, abandoned, which is a division of Ser. No. 450,488, Dec. 16, 1982, which is a division of Ser. No. 144,731, Apr. 28, 1980, Pat. No. 4,382,207, which is a division of Ser. No. 876,826, Feb. 10, 1978, Pat. No. 4,216,408, which is a continuation of Ser. No. 699,344, Jun. 24, 1976, abandoned, which is a continuation of Ser. No. 410,104, Oct. 26, 1973, abandoned. This application Jun. 4, 1985, Ser. No. 741,201
Claims priority, application Netherlands, Nov. 3, 1972, 7214862
The portion of the term of this patent subsequent to May 10, 2000, has been disclaimed.
Int. Cl.[4] C09K 11/80
U.S. Cl. 313—486 **3 Claims**

1. A luminescent material having a hexagonal crystal structure corresponding to β-alumina, β''-alumina, or the hexagonal ferrites, said luminescent material being activated by cerium and terbium, and having a non-stoichiometric composition comprising a compound of the formula

$$Ce_xTb_yMgAl_{11}O_{19}$$

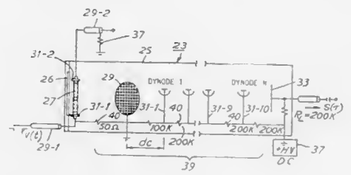
wherein
$0.60 \leqq x \leqq 0.80$
$0.20 \leqq y \leqq 0.40$
$x+y=1$
and wherein excess Al_2O_3 is in the luminescent material up to 10 mol.%.

4,837,482

COLOR PICTURE TUBE HAVING REDUCED LOCAL DOMING

Osamu Adachi, Osaka, and Osamu Konosu, Kyoto, both of Japan, assignors to Matsushita Electronics Corporation, Japan

Filed Mar. 24, 1988, Ser. No. 172,391
Claims priority, application Japan, Mar. 26, 1987, 62-72449
Int. Cl.[4] H01J 29/07
U.S. Cl. 313—402 **2 Claims**



1. A color picture tube comprising of a rectangular shadow mask having a longer axis and a shorter axis, the shadow mask having a curved surface, wherein a point of the curved surface of the shadow mask is represented by an orthogonal coordinate system having an X component, a Y component, and a Z component, the coordinate system having an origin coincident with a center of the curved surface, the X component being measured along the longer axis, the Y component being measured along the shorter axis, the Z component being measured in a direction perpendicular to directions of the longer the shorter axes, wherein a sagittal height of the curved surface represented by the Z component and measured from the origin is given by a polynomial including a term of sixth-degree

power of one of the X component and the Y component, the sagittal height represented by a value z which is given by the following equation:

$$z=a1\cdot x^2+a2\cdot x^4+a3\cdot y^2+a4\cdot x^2\cdot y^2+a5\cdot x^4\cdot y^2+a6\cdot y^4+a7\cdot x^2\cdot y^4+a8\cdot x^4\cdot y^4+a9\cdot x^6$$

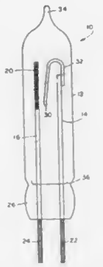
where $X/H=x$, $Y/H=y$, $Z/H=z$, a value of 2H equals the length of the longer axis of the shadow mask, and a1–a9 represent predetermined coefficients.

4,837,483

GLOW DISCHARGE STARTER CONTAINING BORON

Michael R. Kling, Williamsport, Pa., assignor to GTE Products Corporation, Danvers, Mass.

Filed Apr. 14, 1988, Ser. No. 181,345
Int. Cl.[4] H01J 17/24, 61/64
U.S. Cl. 313—619 **10 Claims**



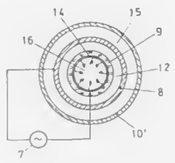
1. A glow discharge starter comprising:
an hermetically sealed envelope of vitreous material having a seal located at one end thereof and containing an ionizable medium; a pair of electrical conductors extending through said seal and terminating in a spaced relationship to form a pair of electrodes within said envelope, at least one of said electrodes having a bimetallic element secured thereto, said bimetallic element being deformable by heat into engagement with the other of said electrodes; and a coating comprising lanthanum, nickel and boron disposed on a surface within said envelope.

4,837,484

HIGH-POWER RADIATOR

Baldur Eliasson, Birmenstorf; Peter Erni, Baden; Michael Hirth, Unterentfelden, and Ulrich Kogelschatz, Hausen, all of Switzerland, assignors to BBC Brown, Boveri AG, Baden, Switzerland

Filed Jul. 22, 1987, Ser. No. 76,926
Claims priority, application Switzerland, Jul. 22, 1986, 2924/86
Int. Cl.[4] H01J 17/16, 61/06
U.S. Cl. 313—634 **6 Claims**



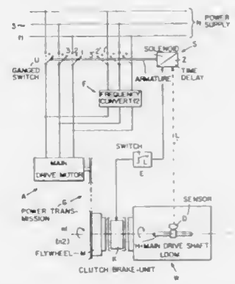
1. A high-power radiator for ultraviolet light, said high-power radiator comprising:
(a) a dielectric tube that is transparent to radiation;
(b) a first electrode that is transparent to radiation and that is of tubular construction disposed coaxially inside said dielectric tube;
(c) a second electrode that is of tubular construction and that is disposed coaxially outside and spaced from said dielectric tube, the space between said dielectric tube and said second electrode forming an annular discharge gap;
(d) a gas that forms excimers under discharge conditions disposed in said annular discharge gap; and
(e) a source of alternating current connected to said first and second electrodes.

4,837,485

METHOD AND SYSTEM FOR STARTING A POWER LOOM

Klaus Meroth, Lindau, and Dieter Wegendt-Kristyn, Lindau/-Bodolz, both of Fed. Rep. of Germany, assignors to Lindauer Dornier Gesellschaft mbH, Lindau/Bondensee, Fed. Rep. of Germany

Filed Dec. 22, 1987, Ser. No. 136,656
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1986, 3644565; Oct. 5, 1987, 3733590
Int. Cl.[4] H02K 7/02
U.S. Cl. 318—161 **13 Claims**



1. A method for starting a power loom having a main drive shaft with a rated operational r.p.m., an electric motor drive means, and a flywheel mass connected to said electric motor drive means and connectable to said main drive shaft, comprising the following steps:
(a) disconnecting said flywheel mass from said main drive shaft,
(b) connecting said electric motor drive means to a power supply network for accelerating said flywheel mass to an accelerated flywheel mass having an r.p.m. higher than said rated drive shaft r.p.m.,
(c) reconnecting said accelerated flywheel mass to said main drive shaft in response to a first switching control signal,
(d) using said first switching control signal for simultaneously and temporarily disconnecting said electric motor drive means from said power supply network so that during start-up of said main drive shaft said electric motor drive means is not energized,
(e) providing a delayed second switching control signal when said flywheel r.p.m. approximates said rated drive shaft r.p.m., and
(f) reconnecting said electric motor drive means to said power supply network in response to said second switching control signal, whereby said electric motor drive means are disconnected from said power supply network during a time duration when said flywheel mass accelerate said main drive shaft.

6. A system for starting a power loom, comprising a loom drive shaft, electric motor drive means for driving said loom

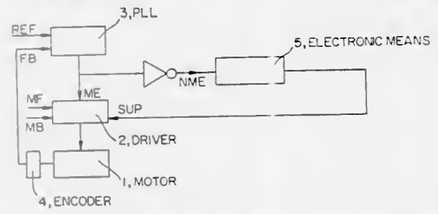
drive shaft, flywheel means for a run-up start of said loom drive shaft, brake and clutch means operatively interposed between said electric motor drive means and said loom drive shaft, an a.c. power supply network, a frequency converter, change-over switch means operatively arranged for providing a direct connection of said electric motor drive means to said a.c. power supply network or an indirect connection of said electric motor drive means through said frequency converter to said a.c. power supply network, said change-over switch means comprising three positions, a first end position providing said direct connection, an intermediate position disconnecting said electric motor drive means from said a.c. power supply network and a third end position providing said indirect connection, operator actuated switch means electrically connected to said change-over switch means for intentionally switching said change-over switch means from one of said end positions to said intermediate disconnecting position, and automatic operating means connected to said change-over switch means for automatically switching said change-over switch means from said intermediate disconnecting position to the other end position when a time delay has elapsed.

4,837,486

DC MOTOR SPEED STABILIZING METHOD AND APPARATUS

Maurits Geens, Boortmeerbeek, and Jean A. Van Daele, Bonheiden, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Continuation of Ser. No. 886,311, Jul. 17, 1986, abandoned. This application Jun. 29, 1988, Ser. No. 213,464
Int. Cl.[4] H02P *5/00*
U.S. Cl. 388—811 **3 Claims**



1. A method of controlling the speed of a DC motor comprising the steps of:

generating a reference signal in the form of a train of pulses having a frequency corresponding to a desired operating speed of said motor;

generating a measured signal in the form of a pulse train corresponding to an actual motor speed, said measured signal train having its pulses out of phase with the reference signal pulses at a predetermined interval when said actual motor speed corresponds with the desired speed, but deviating from said predetermined interval when the actual motor speed deviates from the desired speed;

detecting the actual interval between each reference pulse and the next succeeding measured motor speed pulse when the reference signal pulse leads the next succeeding measured signal pulse but not when the reference signal pulse lags the measured signal pulse;

activating a voltage source to said motor during the thus-detected actual interval between said successive pulses and then deactivating the same for a following interval to intermittently apply a voltage from said source to said motor, such applied voltage being initially adjusted to an equilibrium level selected in relation to said predetermined interval such as to drive the motor normally at the desired operating speed; and

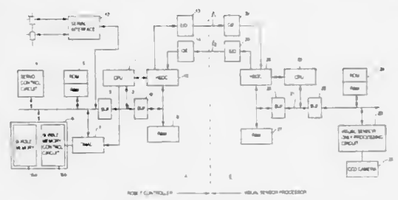
modulating the level of the applied voltage continuously up and down in proportion to successive actual activation and deactivation intervals respectively to restore the thus-modulated applied voltage level to said equilibrium level and thereby bring the detected actual interval into correspondence with said predetermined interval.

4,837,487

SYSTEM FOR COUPLING A VISUAL SENSOR PROCESSOR AND A ROBOT CONTROLLER

Mitsuo Kurakake; Hideo Miyashita, and Shoichi Otsuka, all of Hino, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Continuation of Ser. No. 795,938, Oct. 17, 1985. This application Oct. 26, 1987, Ser. No. 113,344
Claims priority, application Japan, Feb. 22, 1984, 59-32019
Int. Cl.[4] G05B *19/18*
U.S. Cl. 318—568.16 **2 Claims**



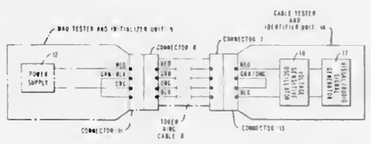
1. A system for coupling a visual sensor processor which converts an image signal of a camera to digital information, extracts therefrom image information of an object and recognizes its position and shape, and a robot controller which controls the movement of a robot in accordance with the results of recognition by the visual sensor processor, the robot controller including a non-volatile memory for storing visual sensor programs and visual sensor parameters, and a serial interface for connection to an external input/output device, said system comprising a bidirectional high-speed data transfer channel for coupling together the visual sensor processor and the robot controller for an exchange therebetween of the required information, said bidirectional high-speed data transfer channel including an optical data link, the non-volatile memory and the serial interface being shared between the robot controller and the visual sensor processor through utilization of said high-speed data transfer channel, so that the visual sensor programs and the visual sensor parameters are loaded from said non-volatile memory to said visual sensor processor.

4,837,488

PORTABLE IDENTIFIER AND TESTER UNITS FOR COMPUTER COMMUNICATION CABLES

Keith C. Donahue, Centerville, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed May 6, 1988, Ser. No. 190,906
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—66 **10 Claims**



1. A pair, first and second, of portable identifier and tester units for use with an electrical wiring cable composed of four or more lines having connectors at each end, comprising:

a first portable identifier and tester, unit with a connector mateable to the connector at one end of the cable, and

when mated providing a voltage between the first and the second lines of the cable and providing a direct, electrically common, connection between the third and the fourth lines of the cables; and

a second, portable identifier and tester, unit with a connector mateable to the connector at the other end of the cable, and when mated providing a signal responsive to voltage from the first unit appearing between the first and the fourth lines of the cable and providing a direct, electrically common, connection between the second and the third lines of the cable.

4,837,489

MAGNETOMETER-BASED LOCATOR AND IDENTIFIER FOR FERROUS OBJECTS HAVING UNKNOWN SHAPES

John E. McFee, Medicine Hat, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Sep. 29, 1987, Ser. No. 102,379
Claims priority, application Canada, Apr. 24, 1987, 535584
Int. Cl.[4] G01R *19/00, 33/12;* **G01V** *3/08*
U.S. Cl. 324—67 **7 Claims**

1. A ferrous object locator, comprising:

magnetic sensing means for measuring a magnetic field from a ferrous object, said magnetic sensing means comprising a magnetometer;

position sensing means for measuring the displacement from an initial position of said magnetic sensing means in one or more orthogonal directions in a plane of measurement behind or beneath which said ferrous object is located; and

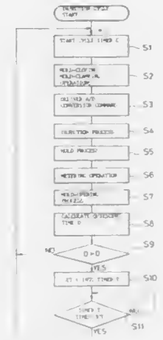
microprocessor means for receiving data from said magnetic sensing means and said position sensing means and deriving from said data, information about the location and identification of said ferrous object, wherein said microprocessor means compares said data from said magnetic sensing means and from said position sensing means with magnetic data or magnetic and positional data stored in a data storage means.

4,837,490

CONTROL METHOD FOR AN INJECTION MOTOR OF AN INJECTION MOLDING MACHINE

Noriaki Neko, Hachioji, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP88/00080, § 371 Date Jul. 11, 1988, § 102(e) Date Jul. 11, 1988, PCT Pub. No. WO88/05720, PCT Pub. Date Aug. 11, 1988
PCT Filed Jan. 29, 1988, Ser. No. 224,881
Claims priority, application Japan, Feb. 3, 1987, 62-21835
Int. Cl.[4] G05B *19/42*
U.S. Cl. 318—568.1 **9 Claims**



1. A control method for an injection motor, comprising the steps of:

(a) sampling and detecting, for intervals having a predetermined period, a value of current flowing through the injection motor;

(b) adding respective square products of the detected current values to obtain a sum and multiplying the sum by the predetermined period to obtain a first value;

(c) determining whether or not the injection motor is in an overheating state on the basis of a ratio of said first value to a first predetermined determination value; and

(d) setting a quiescent time to lengthen an injection molding cycle time, when said step (c) determines that the injection motor is in the overheating state.

4,837,491

MOTOR VELOCITY CONTROL APPARATUS

Yoshiki Fujioka, Higashiyamato, and Mitsuhiko Hirota, Tokyo, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP86/00078, § 371 Date Oct. 16, 1986, § 102(e) Date Oct. 16, 1986, PCT Pub. No. WO86/05044, PCT Pub. Date Aug. 28, 1986
PCT Filed Feb. 20, 1986, Ser. No. 928,208
Claims priority, application Japan, Feb. 22, 1985, 60-34112
Int. Cl.[4] G05B *11/32*
U.S. Cl. 318—625 **4 Claims**

3. A motor velocity control apparatus for feedback control of plural types of spindle motors having different operating characteristics based on a velocity command voltage, comprising:

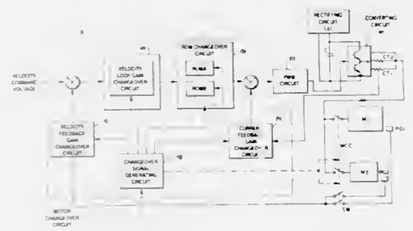
a servoamplifier capable of controlling the plural types of motors by changing over a gain of feedback signals from the motors to adjust and amplify said velocity command voltage, said servoamplifier including:

means for changing over the feedback gain of an input current to each of the motors;

means, coupled to the motors, for changing over the feedback gain of an rotational velocity signal of each of the motors;

means, coupled to said means for changing over the feedback gain of rotational velocity signal, for changing over a velocity loop gain of each of the motors; and

changeover circuit means, connected to said means for changing over the velocity loop gain, for determining the amplitude and phase of a current loop gain based upon values input from a phase table storage circuit; and



a changeover signal generating circuit, connected to said means for changing over the feedback gain of the input current, said means for changing over the feedback gain of the rotational velocity signal, and said changeover circuit means, for changing over and controlling said servoamplifier by a motor changeover signal.

4,837,492

APPARATUS FOR DETECTING REVOLUTION USING A SYNCHRO

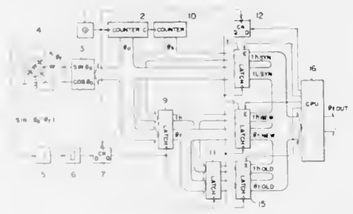
Ryoichi Kurosawa, Kokubunji, and Koizou Kawata, Hino, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 18, 1988, Ser. No. 169,977

Claims priority, application Japan, Mar. 18, 1987, 62-61217; Mar. 18, 1987, 62-61218

Int. Cl.[4] G05B *1/06*

U.S. Cl. 318—661 **8 Claims**



1. An apparatus comprising:

an excitation circuit for generating a polyphase a.c. excitation signal, and

a synchro coupled to a rotary body in which a polyphase primary winding is excited by said a.c. excitation signal to generate on a secondary winding thereof an induced voltage signal the phase of which varies by an angle proportional to a rotational position of said rotary body, thus detecting a physical quantity relating to revolution on the basis of a phase difference produced between said a.c. excitation signal and said induced voltage signal,

said apparatus further including:

a phase difference detecting circuit for detecting a phase difference between said a.c. excitation signal and said induced voltage signal and a detection time thereof, and

a predictive computation circuit for predicting a rotational position at an arbitrary time from at least two phase differences and their detection times thereof detected by said phase difference detecting circuit.

4,837,493

SYSTEM FOR DRIVING DRUM

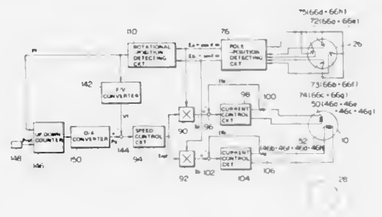
Satoru Maeno; Norio Fukuyama; Tetsuo Ohishi; Senzo Kyutoku, and Thutomu Nakamura, all of Ise, Japan, assignors to Shinko Electric Co., Ltd., Japan

Filed Dec. 11, 1986, Ser. No. 940,625

Claims priority, application Japan, Dec. 18, 1985, 60-285125; Dec. 18, 1985, 60-285126; Dec. 19, 1985, 60-286574

Int. Cl.[4] G05B *19/40*

U.S. Cl. 318—685 **6 Claims**



1. A system for driving a drum, the drum being rotatable about an axis thereof, said system comprising:

(a) a stepping motor comprising an annular rotor adapted to be fixedly mounted within the drum coaxially therewith for rotation with the drum and having a series of rotor teeth formed at equal intervals over an entire inner periphery thereof, and a stator disposed within said rotor coaxially therewith and having a plurality of magnetic poles having respective exciting coils and spaced equally circumferentially thereof, each of said magnetic poles having a series of stator teeth disposed at equal intervals in closely spaced opposed relation to said rotor teeth, the pitches of said rotor teeth and stator teeth being determined in such a manner that a magnetic flux linking each of said coils is changed in a sinusoidal fashion as a function of the angle of the rotation of said rotor;

(b) pole position-detecting means for producing a multiphase sinusoidal pole position-detecting signal representative of the position of said magnetic poles of said stator relative to said rotor;

(c) speed control means for producing a current amplitude command signal representative of a desired torque of rotation of said rotor;

(d) multiplier means for multiplying said pole-position detecting signal by said current amplitude command signal to produce a multiplication signal; and

(e) current control means responsive to said multiplication signal to output to said coils a drive current corresponding in amplitude to said current amplitude command signal and corresponding in phase to said pole-position detecting signal, thereby energizing said coils to rotate said rotor together with the drum relative to said stator.

4,837,494

GENERATOR AND RECHARGEABLE BATTERY SYSTEM FOR SKI

Gregory J. Maier, 8908 Wooden Bridge Rd., Potomac, Md. 20854

Filed Jun. 28, 1988, Ser. No. 212,614

Int. Cl.[4] A43B *7/02;* **A63C** *11/00;* **H02K** *5/00;* **H02J** *7/00*

U.S. Cl. 322—1 **30 Claims**

1. A ski generator network adapted to be used with conventional skis comprising:

water-tight housing means for housing a generator;

an electrical generator mounted within said housing for converting kinetic energy into electrical energy;

drive shaft means coupled to said generator for driving said generator, said drive shaft means protruding outwardly from said housing;

power roller means removably coupled to said drive shaft means for rotating said drive shaft means, said power roller means comprising a structure and material particularly suited to engage a surface that is stationary relative to said housing whereby said power roller is rotated by frictional engagement with said surface to rotate said drive shaft means; and

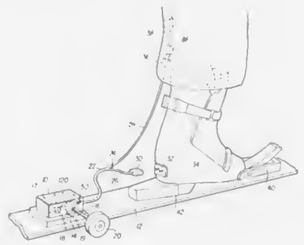
mounting means adapted to be secured to a ski for removably mounting said housing to a ski.

18. A ski generator network adapted to be used on a conventional ski for powering of two electricallyheated ski boots and for powering other electrically operable loads, comprising:

a mounting bracket with an interior groove,

affixing means for affixing said mounting bracket to said snow ski,

an electrical generator having a generator mechanism for generating an electrical current,



generator housing insulating said electrical generator,

a flange connected to and supporting said gear housing and which can be inserted in and removed from said interior groove of the mounting bracket,

a rechargeable and removable storage battery located in the interior of said generator housing electrically connected to said electrical generator,

a drive shaft horizontally extending away from said generator housing and located above and parallel to the surface of said ski, one end of said drive shaft being connected to a gear train located in said generator housing, said gear train connecting to the generator mechanism of said electrical generator,

a power roller connected to the other end of said drive shaft said power roller making contact with the skiing surface,

an output cord connecting said electrical generator to one of said electrically heated ski boots,

a bridge cord connected at one end to said electrical generator and connected at its other end to the second of said electrically heated ski boots.

4,837,495

CURRENT MODE CONVERTER WITH CONTROLLED SLOPE COMPENSATION

Zoltan Zansky, Menlo Park, Calif., assignor to Astec U.S.A. (HK) Limited, Santa Clara, Calif.

Filed Oct. 13, 1987, Ser. No. 108,170

Int. Cl.[4] G05F *1/46;* **H02M** *3/335*

U.S. Cl. 323—222 **18 Claims**

1. An improved current mode converter comprising: a power source; an inductor coupled to said power source; a switching means coupled to said inductor and responsive to a control signal for periodically switching said inductor between charging and discharging modes and for causing a current to flow in said inductor during said charging mode; means coupled to said inductor for coupling the current from said inductor to a load during said discharging mode; control means for generating said control signal including current sensing means coupled to said inductor for sensing the magnitude and slope of current flow in said inductor and for generating a sensed current signal; clock means for generating a clock signal; means for generating an error voltage related to the output voltage of said converter; continuously variable slope compensation means for generating a continuously variable slope compensation signal as a function of the loading of said converter;

combining means for combining said sensed current signal and said continuously variable slope compensation signal and for generating a compensated sensed current signal responsive thereto; and

means responsive to said control signal for causing said charging mode to be entered once every cycle of said clock signal and for causing said discharging mode to be entered whenever said compensated sensed current signal exceeds a predefined relationship with respect to said error voltage; and

wherein said continuously variable slope compensation means comprises:

amplifier means coupled to the output of said error amplifier of said current mode converter for producing an output voltage which is proportional to the output voltage of said error amplifier;

capacitor means coupled to the output of said amplifier means wherein a ramp signal is developed across said capacitor which is related to the output voltage of said amplifier means;

enabling means coupled to said capacitor means and the output of said means responsive to said control signal, said enabling means for discharging said capacitor during said discharging mode and enabling said capacitor to charge during said charging mode; and

buffer amplifier means having an output wherein said buffer means is coupled to said capacitor means and the output of said buffer means comprises said continuously variable slope compensation generator.

4,837,496

LOW VOLTAGE CURRENT SOURCE/START-UP CIRCUIT

George Erdi, Portola Valley, Calif., assignor to Linear Technology Corporation, Milpitas, Calif.

Filed Mar. 28, 1988, Ser. No. 173,758

Int. Cl.[4] G05F *3/20*

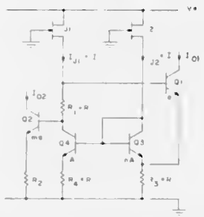
U.S. Cl. 323—315 **6 Claims**

1. A start-up/current source circuit providing current source outputs that are independent of power supply voltage and start-up currents comprising

first and second voltage potentials,

first and second current paths connected between said first and second voltage potentials for conducting equal currents, said first current path including a first bipolar transistor serially connected with a first resistor and said second current path including a second bipolar transistor

serially connected with a second resistor, said first and second resistors being equal, the base and collector of said second transistor being connected, the emitter of said second transistor being larger than the emitter of said first transistor and the bases of said first and second transistors being connected, said first and second current paths further including first and second field effect transistors



serially connected with said first and second bipolar transistors and said first and second resistors, respectively, the currents through said first and second field effect transistors being equal, and

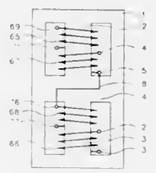
a first current source including a third bipolar transistor serially connected with said second resistor, the base of said third transistor being connected to said first current path.

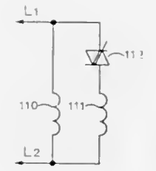
4,837,497

VARIABLE TRANSFORMER, REACTOR AND METHOD OF THEIR CONTROL

Gregory Leibovich, 2218 Ardemore Dr. Fullerton, Calif. 92633

Filed Dec. 29, 1987, Ser. No. 128,958
Int. Cl.[4] G05F *3/14*
U.S. Cl. 323—345 **37 Claims**





1. In a transformer, the combination comprising: core means combining at least two complete core elements with at least one core yoke common for both said core elements;

primary winding means including at least two phase sets of independently fed coils with each phase set having at least one coil wound in the direction opposite to the associated coil of other set, carried by symmetrical core legs of each said core elements and separated by said common yoke;

secondary winding means including at least one phase set having at least one coil with at least two coil portions wound in opposite direction, carried by said symmetrical core legs of each said core elements and separated by said common yoke;

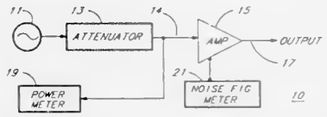
means for applying power to said primary winding phase sets including means for selectively controlling the application of power to at least one said phase set relatively to the other for enabling control of one of the currents therein and phase shift of the currents therein relative to the other said phase set to control operating parameters of said transformer.

4,837,498

METHOD AND APPARATUS FOR SETTING THE SIGNAL-TO-NOISE RATIO OF A CARRIER WAVE

Thomas R. Faulkner, Veradale, and Earl C. Herleikson, Otis Orchards, both of Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 29, 1987, Ser. No. 102,184
Int. Cl.[4] G01R *27/28*
U.S. Cl. 324—57 N **12 Claims**



1. A method for setting the signal-to-noise ratio of a carrier wave having sideband noise components, said method comprising the steps of:

attenuating said carrier wave and said sideband noise components to a level such that said sideband noise components are attenuated substantially below a thermal noise floor level of an attenuator, said thermal noise floor level being a function of the absolute temperature and the measurement bandwidth;

amplifying said carrier wave, said sideband noise components and said attenuator thermal noise in an amplifier coupled to said attenuator, said amplifier having a known noise figure; and

adjusting the power level of said carrier wave to provide said carrier wave with a desired signal-to-noise ratio at an output of said amplifier thereby setting said desired signal-to-noise ratio of said carrier wave at said amplifier output.

4,837,499

MOISTURE SENSING DEVICE

Robert P. Scherer, III, 619 N. Cataract Ave., San Dimas, Calif. 91773

Filed May 19, 1986, Ser. No. 864,421
Int. Cl.[4] G01R *27/02*
U.S. Cl. 324—61 P **9 Claims**

8. A moisture sensing device, comprising:

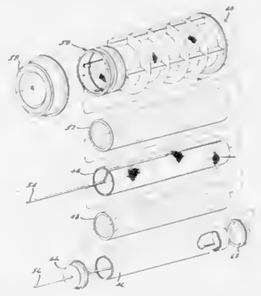
an enclosure which is generally cylindrical in shape and constructed of a nonconductive material, said enclosure including a unitary cage which secures screen means for permitting moisture to pass through said enclosure, and a pair of end caps secured to said cage;

a first conductor which is generally cylindrical in shape and constructed of an electrically conductive solid material;

a second conductor which is generally cylindrical in shape and constructed of an electrically conductive mesh material, said first conductor being coaxially disposed within said second conductor, and said second conductor being coaxially disposed within said cage of said enclosure;

a first porous layer of synthetic dielectric material interposed between said first and second conductors, and a second porous layer of said dielectric material interposed between said second conductor and said cage of said enclosure;

said first and second conductors and said first porous layer forming a capacitor whose resistance will vary in response to the level of moisture present in said dielectric material;



circuit means connected across said first and second conductors for measuring the variable resistance caused by the level of moisture present in said dielectric material.

4,837,500

CAPACITIVE DISPLACEMENT METER OR TRANSDUCER

Johannes F. Abbringh, Groningen, Netherlands, assignor to Schut's Im- & Exporthandel B.V., Groningen, Netherlands

Filed Apr. 13, 1988, Ser. No. 181,187
Int. Cl.[4] G01R *27/26*
U.S. Cl. 324—61 R **23 Claims**

1. In a capacitive displacement meter or transducer of coaxial set-up which includes at least one cylindrical, hollow, outer electrode element and at least one cylindrical inner electrode element disposed coaxially within said at least one outer electrode element, and in which said inner and outer electrode elements are coaxially movable relatively to each other;

the improvement comprising that:

(a) one of said inner and outer electrode elements comprises three axially spaced and aligned, cylindrical electrodes, of which the two end electrodes are of equal length and the intermediate middle electrode is shorter than each of said end electrodes;

(b) the other of said inner and outer electrode elements comprises at least one electrode extending coaxially relatively to said three electrodes of said one electrode element and, in an inoperative position, is symmetrically juxtaposed to said middle electrode; and

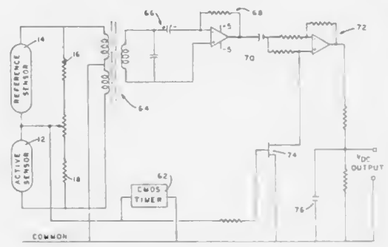
(c) said middle electrode and said two end electrodes of said one electrode element are provided with respective terminals.

4,837,501

APPARATUS FOR MEASURING DIFFERENTIAL IMPEDANCES

John J. Fry, Wickliffe, and Robert A. Smith, Mentor, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Sep. 4, 1987, Ser. No. 93,432
Int. Cl.[4] G01R *27/02*
U.S. Cl. 324—62 **10 Claims**



1. An apparatus for measuring differential impedances, comprising:

a four leg, AC differential impedance bridge having a reference sensor element, an active sensor element, and two reference resistors;

a toroidal signal transformer, having a primary and a secondary winding tightly twisted together, both windings wound around a core of said transformer, wherein one end of said primary winding is connected to one end of said reference sensor element and to one end of one of the reference resistors, the other end of said primary winding is connected to one end of said active sensor element and to one end of the other reference resistor, and having a center tap connected to common, for producing a differential bipolar AC current signal indication of the difference in impedance between the active sensor element and the reference sensor element;

a CMOS timer, connected to the AC differential impedance bridge at a common input point to all four legs of the bridge, for producing an unipolar square wave reference signal which is applied at said common input point;

first signal filter means, connected across the secondary winding, for reducing the amplitude of the differential bipolar AC current signal;

a single stage amplifier, connected to said first signal filter means for amplifying and converting the differential bipolar AC current signal to a differential bipolar AC voltage signal;

second filter means, connected to the output of the single stage amplifier and to an input of an AC to DC converter;

a field effect transistor, connected to the output of said CMOS timer, to common, and to the positive input of the AC and DC converter, for switching the AC to DC converter to produce a DC output signal; and

third filter means, connected to the output of the AC to DC converter, for minimizing the ripple in the DC output signal.

4,837,502

COMPUTER-AIDED, LOGIC PULSING PROBE FOR LOCATING FAULTY CIRCUITS ON A PRINTED CIRCUIT CARD

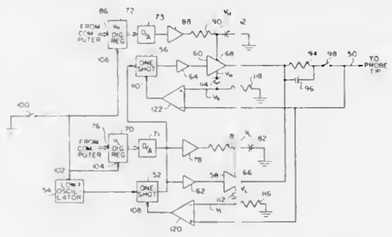
Michael Ugenti, Melville, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 4, 1983, Ser. No. 548,612
Int. Cl.[4] G01R *1/30, 31/08*
U.S. Cl. 324—73 PC **16 Claims**

13. A system for locating shorts on a printed circuit card, said system comprising

injection means for injecting an electric current into a node of the printed circuit card;

detection means for detecting flow of the electric current through designated branches of the printed circuit card, said detection means comprising a hand held inductive probe having a voltage amplifier responsive to a wound ferrite core, the voltage amplifier having an adjustable



gain, the ferrite core being sized to allow said probe to be positioned over a single pin of an integrated circuit chip; and

reference voltage means for controlling high and low logic levels at which the electric current is injected into the node, the injection means being responsive to said reference voltage means.

4,837,503

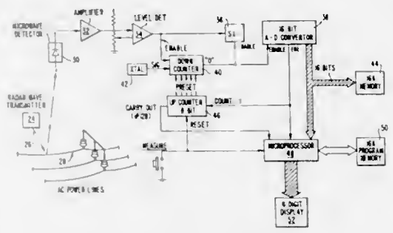
REMOTE MEASUREMENT OF HIGH VOLTAGE AC WITH RADAR

Ernest L. Hasenzahl, 6609 Lochinvar Dr., Baltimore, Md. 21228

Continuation of Ser. No. 765,460, Aug. 14, 1985, abandoned. This application Dec. 17, 1987, Ser. No. 134,086

Int. Cl.[4] G01R *19/00*

U.S. Cl. 324—95 **17 Claims**



1. A system for determining the voltage of the sine wave of an AC power line, including:

a transmitter means for generating electromagnetic waves beamed to said AC power line;

receiver means for detecting the reflected electromagnetic waves from said AC power line depending upon the instantaneous value of said AC sine wave, with a change in the shape of said AC sine wave, as the voltage varies, creating a varying time interval during which said electromagnetic waves are reflected from said powerline; and

a display means for indicating a voltage value as a function of said varying time interval.

4,837,504

ELECTRICITY METER AND METHOD OF CALIBRATING SAME

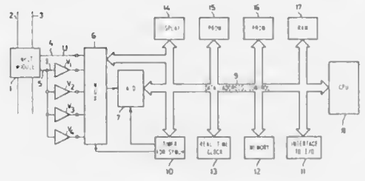
Hanspeter Baer, and Gion Durisch, both of Uster, Switzerland, assignors to Zellweger Uster Ltd., Uster, Switzerland

Filed Apr. 29, 1986, Ser. No. 857,061

Claims priority, application Switzerland, May 2, 1985, 01854/85

Int. Cl.[4] G01R *21/133*

U.S. Cl. 324—142 **18 Claims**



1. A meter for measuring consumption of electrical energy, comprising:

an electronic measuring unit including a plurality of amplifiers that are respectively associated with a plurality of measurement ranges, and an analog-to-digital converter which receives output signals from said amplifiers;

a memory unit which stores one meter-characteristic quantity for each of said measurement ranges, each meter-characteristic quantity representing a numerical value which corresponds to a defined quantity of electrical energy and which comprises a correction parameter and an energy measurement parameter; and

a microcomputer that processes signals from said measuring unit in accordance with said stored meter-characteristic quantities to thereby provide an indication of consumed energy that is compensated for said correction parameter.

2. A method for measuring consumed electrical energy and providing an indication of consumed energy that is corrected for characteristics of an energy measuring meter, comprising the steps of:

applying a predetermined voltage and current to said meter for a predetermined period of time;

measuring said voltage and current with said meter;

storing a meter-characterisitic quantity comprising a correction parameter and an energy measurement parameter corresponding to the amount of voltage and current that it measured over said period of time;

subsequently measuring electrical energy that is applied to said meter;

comparing the measured energy with said meter-characteristic quantity; and

indicating that a predetermined amount of energy has been consumed for each unit of measured energy that is equal to said meter-characteristic quantity.

4,837,505

TEST MODE ACTIVATION CIRCUIT

Takamasa Mitsunobu, Toyonaka, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 17, 1986, Ser. No. 931,676

Claims priority, application Japan, Nov. 20, 1985, 60-262235

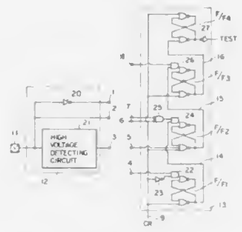
Int. Cl.[4] G01R *31/00;* **H03K** *17/56*

U.S. Cl. 324—158 R **11 Claims**

1. A test mode activation circuit comprising:

first means including a first input terminal and a first plurality of first output terminals, said first means determining a voltage level of each of said first plurality of first output terminals depending on a level of an input signal applied to said first input terminal, said first means including an inverter connected between said first input terminal and one of said first plurality of first output terminals, said inverter being operable at first high level voltage; and

second means including a second plurality of second input terminals and a second output terminal, at least one of said



second plurality of second input terminals being electrically connectable to at least one of said first plurality of first output terminals, whereby a test mode activation signal appears at said second output terminal when said input signal is applied to said first input terminal.

4,837,506

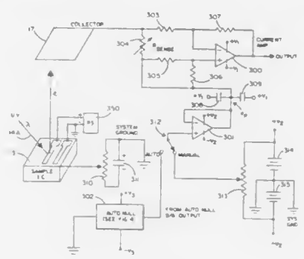
APPARATUS INCLUDING A FOCUSED UV LIGHT SOURCE FOR NON-CONTACT MEASUREMENHT AND ALTERATION OF ELECTRICAL PROPERTIES OF CONDUCTORS

Joseph M. Patterson, Mission Viejo, Calif., assignor to Ultraprobe, Inc., Irvine, Calif.

Continuation of Ser. No. 914,719, Oct. 2, 1986, abandoned. This application Mar. 11, 1988, Ser. No. 166,978

Int. Cl.[4] G01R *31/00, 31/01*

U.S. Cl. 324—158 R **18 Claims**



1. Apparatus for performing non-contact measurement of electrical properties of conductors comprising,

source means for providing a focused beam of ultraviolet light,

sample holder means for supporting a sample means including conductors to be operated upon by directing said focused beam of ultraviolet light thereon,

said source means and said sample holder means adapted for movement relative to each other,

chamber means wherein said sample holder means is disposed for supporting said sample means for receiving said focused beam,

pressure control means for selectively altering the pressure within said chamber means,

output detection means for detecting a characteristic of said sample means supported on said sample holder means as determined by said directing said focused beam of ultraviolet light therecn,

said output detection means includes a collector plate for collecting electrons which have been released by said sample means in response to directing said focused beam of ultraviolet light thereon,

attractor means disposed between said sample holder means and said collector plate for providing an electric field which accelerates said electrons which have been released by said sample means toward said collector plate,

potential supply means for controlling electric potentials at said sample means, said attractor means, and said collector plate, and

null adjusting means including at least one of an automatic null circuit means and a manual null circuit means for establishing a null condition at said collector plate relative to said sample means so that the energy of electrons collected at said collector plate can be detected, and

current amplifier means connected to said collector plate,

said current amplifier means includes an operational amplifier connected to said null adjusting means and said collector plate and is operative to produce an output signal representative of the energy of electrons collected at said collector plate.

4,837,507

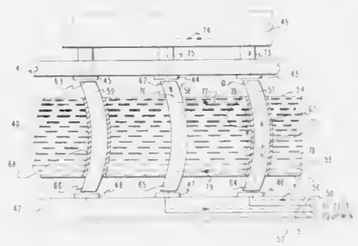
HIGH FREQUENCY IN-CIRCUIT TEST FIXTURE

Charles D. Hechtman, Plainsboro, N.J., assignor to American Telephone and Telegraph Company AT&T Technologies, Inc., Berkeley Heights, N.J.

Continuation of Ser. No. 749,138, Jun. 27, 1985, abandoned, Continuation-in-part of Ser. No. 618,804, Jun. 8, 1984, abandoned. This application Oct. 26, 1987, Ser. No. 112,337

Int. Cl.[4] G01R *1/06, 31/02*

U.S. Cl. 324—158 P **2 Claims**



1. A test fixture comprising:

electrically conductive, elastomeric support body means for carrying electrical signals therethough;

at least one first bendable Euler column held by said support body means so as to extend through and project in opposite directions beyond, said support body means, said first probe being electrically insulated from said support body means; and

at least one second bendable Euler probe held by, and extending though, said support body means so as to project in opposite directions therebeyond, said second Euler probe being positioned adjacent to said first probe and being in electrical contact with said support body means so that a signal launched into said second Euler probe can pass therefrom into said support body means and travel therethrough before re-entering said second Euler probe.

4,837,508

PROCESS AND DEVICE FOR CHECKING THE OPERATIONAL STATE OF A VARIABLE RELUCTANCE MAGNETIC SENSOR AND THEIR APPLICATION TO AUTOMOBILE ELECTRONICS

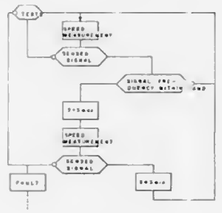
Joël Garnault, Sannois, France, assignor to Bendix France, Drancy, France

Filed Mar. 18, 1988, Ser. No. 170,212

Claims priority, application France, Mar. 20, 1987, 87 03877

Int. Cl.[4] G01P *3/488, 21/02;* **G01R** *33/06;* **B60T** *8/32*

U.S. Cl. 324—166 **10 Claims**



1. A process for checking the operational state of a variable reluctance magnetic sensor used for measuring the speed of a moving object, said sensor providing a quasi-sinusoidal electrical signal which feeds an adjustable threshold comparator which supplies electrical pulses whose frequency represents the detected speed of said moving object, the process comprising the steps of:

verifying that said frequency is included within a frequency band corresponding to a useful speed range; and, if said frequency is included within said frequency band;

switching an amplitude threshold value of said comparator from an operational value to a test value which is higher than said operational value; and

verifying the presence of said electrical pulses at an output of said comparator while the threshold value is adjusted to the test value.

4,837,509

METHOD AND APPARATUS FOR MEASURING DIAMETER OF A STEEL REINFORCEMENT ROD EMBEDDED IN CONCRETE AND THE THICKNESS OF THE CONCRETE OVERLAYER

Gerd Dodmann, Dudweiler; Otto Kroggel, Jochen Fey, both of Darmstadt; Harald Kopp, Saarbrucken, and Christoph Fritz, Darmstadt, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Filed Sep. 30, 1986, Ser. No. 913,769

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1985, 3535117

Int. Cl.[4] G01B *7/02;* **G01N** *27/72* **G01R** *33/12*

U.S. Cl. 324—207 **13 Claims**

1. A method for measuring ferromagnetic objects embedded in nonmagnetic material and the distance between the surface of said material and said objects by determining and evaluating the effect of the ferromagnetic objects on a magnetic field, the method comprising:

scanning a surface of a first layer of nonmagnetic material with a U-shaped electromagnet having two spaced apart poles, said nonmagnetic material having a ferromagnetic object embedded therein disposed between the poles of said U-shaped electromagnet, said scanning being conducted along a line interconnecting said spaced apart poles;

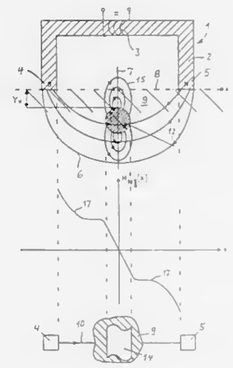
measuring and storing a first amplitude locus representing the normal components of the magnetic field oriented perpendicularly to said first surface between the pole of said magnet and along a line on said first surface which connects said poles;

scanning a second surface of material which is devoid of ferromagnetic objects;

measuring and storing amplitude locus representing the normal component of the magnetic field between the poles of the magnet along said second surface;

storing a calibration curve representing the exciting field strength between the poles as a function of the exciting current of said electromagnet;

determining a difference locus from said first and second amplitude loci;



calculating the distance between the center of the ferromagnetic object and the surface of the first layer of material from the distance between the maximum values of said difference locus;

calculating the diameter of said ferromagnetic object and the distance between the surface of said object and said first surface from the distance between said two maximum values, the amplitude of the magnetic field strength at one of said maximum values, and the exciting field strength derived from the calibration curve at the location of the object.

4,837,510

DEVICE FOR SUPPRESSION AND/OR SEPARATION OF SIGNALS DUE TO MAGNETIC OXIDE SCALES IN HOT CAST BILLETS

Bengt H. Törnblom, Västeras, Sweden, assignor to Tornbloms Kvalitetskontroll AB, Sweden

Filed Jan. 20, 1988, Ser. No. 146,175

Claims priority, application Sweden, Jan. 30, 1987, 8700359

Int. Cl.[4] G01N *27/72;* **G01R** *33/12*

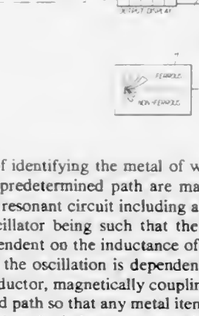
U.S. Cl. 324—225 **13 Claims**

1. A device for monitoring a test object for the presence of oxide scale and cracks, comprising:

a sensor adapted to be moved relative to the surface of the test object for generating sensor output signals representative of the detection of cracks and oxide scale;

a magnetic detector responsive to said sensor output signal for detecting the presence of at least said oxide scale and generating a first output signal in response thereto;

a crack detector responsive to said sensor output signal for detecting the presence of cracks and generating a second output signal in response thereto; and



means responsive to said first output signal for blocking said second output signal to prevent detection of false cracks.

4,837,511

METHOD AND APPARATUS FOR IDENTIFYING THE METAL INCLUDED IN A METALLIC ITEM

Herbert W. Whittington, Longniddry; James R. Jordan, Dunfermline, and Ian Flanagan, Edinburgh, all of United Kingdom, assignors to Ranco Europe Limited, Devon, England

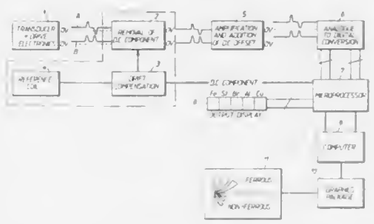
PCT No. PCT/GB86/00226, § 371 Date Dec. 16, 1986, § 102(e) Date Dec. 16, 1986, PCT Pub. No. WO86/06364, PCT Pub. Date Nov. 6, 1986

PCT Filed Apr. 25, 1986, Ser. No. 2,655

Claims priority, application United Kingdom, Apr. 26, 1985, 8510732

Int. Cl.[4] G01N *27/74;* **G01R** *33/12;* **G01V** *3/08*

U.S. Cl. 324—236 **23 Claims**



1. A method of identifying the metal of which metal items moving along a predetermined path are made, providing an oscillator having resonant circuit including a capacitor and an inductor, the oscillator being such that the frequency of its oscillation is dependent on the inductance of the inductor and the amplitude of the oscillation is dependent on the resistive loading on the inductor, magnetically coupling the inductor to the predetermined path so that any metal item moving along it would be coupled to the inductor, separately measuring both the change in the frequency and the change in the amplitude of the oscillation due to the passage of the item along the path, and deriving from the changes in frequency and the changes in amplitude as measured an output indication characteristic of the metal of which the item moving along the predetermined path is composed.

4,837,512

METHOD AND SYSTEM FOR ACQUIRING MOTIONAL INFORMATION OF OBJECT IN MAGNETIC RESONANCE

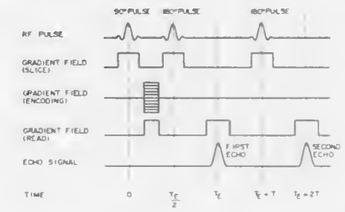
Hirokazu Suzuki, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 21, 1987, Ser. No. 135,272

Claims priority, application Japan, Dec. 22, 1986, 61-303998

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—306 **15 Claims**



1. A method for acquiring a velocity of liquid inside an object in magnetic resonance, the method comprising the steps of:

exciting a selected slice of the object by an application of a 90° pulse;

applying a first 180° pulse after a first period of time from the application of the 90° pulse;

detecting a first echo signal after a second period of time from the application of the 90° pulse;

applying a second 180° pulse after a third period of time from the application of the 90° pulse;

detecting a second echo signal after a fourth period of time from the application of the 90° pulse;

subtracting phases of the detected first and second echo signals from each other; and

calculating the velocity of the liquid inside the object from a result of the subtraction.

4,837,513

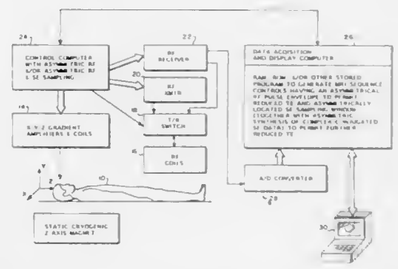
MRI USING ASYMMETRIC RF NUTATION PULSES AND ASYMMETRIC SYNTHESIS OF COMPLEX CONJUGATED SE DATA TO REDUCE TE AND T2 DECAY NMR SPIN ECHO RESPONSES

Ching Yao, Belmont, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 181,386, Apr. 14, 1988, abandoned. This application Dec. 5, 1988, Ser. No. 283,059

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—309 **14 Claims**



1. In a magnetic resonance imaging system of the type which elicits NMR RF responses from an imaged object volume by

using at least one slice-selective NMR RF pulse having a shaped envelope, the improvement comprising:

means for generating and transmitting at least one slice-selective NMR RF pulse with an asymmetric envelope;

means for receiving a spin echo NMR RF response, which results at least in part from said RF pulse, during a sampling window which is asymmetrically positioned in the time domain with respect to a maximum envelope peak in the spin echo; and

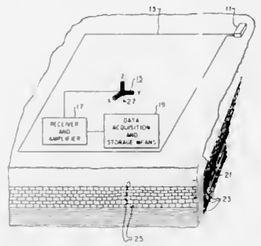
means for asymmetrically synthesizing spin echo response data not actually sampled by use of assumed complex conjugate symmetry so as to supply partly synthesized completed spin echo data representing a theoretical sampling window symmetrically positioned in the time domain about said envelope peak.

4,837,514

METHOD OF REDUCING NOISE IN ELECTROMAGNETIC GEOPHYSICAL EXPLORATION DATA

Brian R. Spies, McKinney, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 14, 1988, Ser. No. 219,337
Int. Cl.[4] G01V *3/08, 3/10*
U.S. Cl. 324—336 **5 Claims**



1. A method for reducing noise in electromagnetic response records obtained from electromagnetic prospecting activities over a portion of the earth having strata which is layered in a relatively parallel arrangement, comprising the steps of:

(a) simultaneously measuring three orthogonal components of the ambient noise for a period of time to produce noise records, said three components resolvable into first, second, and third orthogonal components, wherein the first and second components are parallel to said strata and the third component is perpendicular to said strata, said noise records measured at a position near an electromagnetic center of a transmitting antenna means, said electromagnetic center being that position relative to said transmitting antenna means wherein the electromagnetic field generated by said transmitting antenna means is perpendicular to said earth strata with negligible parallel components;

(b) determining from said noise records the impulse response of the earth;

(c) simultaneously measuring three orthogonal components of the decay of current induced into the earth so as to create transient electromagnetic response records, said response records having orthogonal components which have been resolved into said first, second, and third orthogonal components, said response record of the third component having an induced current decay portion and a noise portion;

(d) determining from the response records of the first and second components in said response record and said earth impulse response the noise portion of said third component response record;

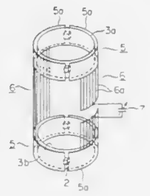
(e) removing said determined noise portion of said third component from said third component to obtain a response record with reduced noise.

4,837,515

RADIO FREQUENCY COIL FOR NUCLEAR MAGNETIC RESONANCE IMAGING

Susumu Nishihara, and Kiyoshi Yoda, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1987, Ser. No. 26,891
Claims priority, application Japan, Sep. 26, 1986, 61-228915
The portion of the term of this patent subsequent to Jan. 19, 2005, has been disclaimed.
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 **23 Claims**



1. A radio frequency coil for receiving input radio frequency magnetic signals for exciting nuclei in a sample and for delivering radio frequency signals which are emitted by said excited nuclei for nuclear magnetic resonance imaging, comprising:

two annular conductor means including two annular conductors which are made of an electrically conducting material and which are coaxially disposed with respect to a prescribed axis;

at least one pair of longitudinal conductor groups which are symmetrical disposed about said prescribed axis, each of said longitudinal conductor groups comprising a plurality of electrical conductors which extend longitudinally in parallel to said prescribed axis, which are separated from one another in the circumferential direction of said coil, and which have one end secured to and electrically connected to one of said annular conductors and the other end secured to and electrically connected to said other annular conductor and wherein at least one group of each of said one pair of conductor groups has said electrical conductors such that each of said conductors extend continuously from one of said annular conductors to the other of said annular conductors in order to form a direct electrical connection between said one annular conductor and said other annular conductor, input feeding means connected to at least one of said two annular conductors for receiving said radio magnetic frequency signals for exciting said nuclei and for delivering said radio frequency signal emitted by said excited nuclei.

4,837,516

TUNING DEVICE FOR NUCLEAR MAGNETIC RESONANCE IMAGING APPARATUS AND NUCLEAR MAGNETIC RESONANCE IMAGING APPARATUS INCLUDING THE TUNING DEVICE

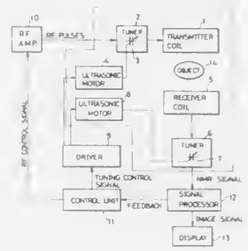
Ryoichi Takahashi, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 22, 1988, Ser. No. 222,904
Claims priority, application Japan, Jul. 27, 1987, 62-185526
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—322 **10 Claims**

1. A tuning device for an NMR imaging apparatus, comprising:

tuning means including variable capacitor means;

coil means for forming resonant LC circuit with the tuning means; and



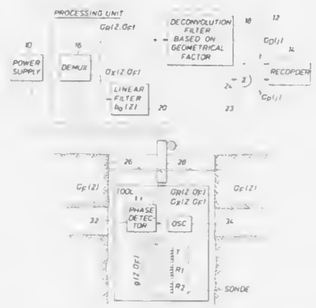
ultrasonic motor means for adjusting the capacitance of the variable capacitor means.

4,837,517

SPATIAL FREQUENCY METHOD AND APPARATUS FOR INVESTIGATING EARTH CONDUCTIVITY WITH HIGH VERTICAL RESOLUTION BY INDUCTION TECHNIQUES

Thomas D. Barber, Houston, Tex., assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Jul. 16, 1987, Ser. No. 73,933
Int. Cl.[4] G01V *3/28*
U.S. Cl. 324—339 **8 Claims**



1. An induction sonde for measuring a characteristic of an earth formation traversed by a borehole comprising:

a support member;

transmitter means secured to the support member for transmitting an electromagnetic induction signal into said formation about the sonde; and

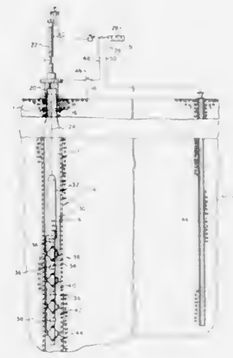
receiver means secured to the support member a preselected distance from the transmitter means for receiving induction signals from the formation thereby determining the vertical response as a function of depth, the preselected distance being selected to provide a sonde with no zeros in the spatial frequency response in the frequency range of interest, said spatial frequency response being the Fourier transform of said vertical response.

4,837,518

METHOD AND APPARATUS FOR MEASURING THE ELECTRICAL RESISTIVITY OF GEOLOGIC FORMATIONS THROUGH METAL DRILL PIPE OR CASING

Michael F. Gard, Plano; John E. E. Kingman, Dallas, and James D. Klein, McKinney, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 18, 1987, Ser. No. 86,999
Int. Cl.[4] G01V *3/18*
U.S. Cl. 324—368 **22 Claims**



12. A system for determining the resistivity of an earth formation by measuring voltage differentials along a metal conduit penetrating said formation, said system comprising:

an electrical potential source having a first electrode, means for electrically connecting said first electrode to said conduit and a second electrode connected to said formation at a distance from said conduit;

a first set of spaced apart contactors for detecting voltages between first and second points in said conduit;

a differential amplifier having input conductors coupled to said first set of contactors, respectively, and having an output conductor;

an inverter circuit having an input conductor to said differential amplifier output conductor and having an inverter output conductor;

switching means having a first input conductor connected to said differential amplifier output conductor, a second input conductor connected to said inverter output conductor, a control input conductor and a switching means output conductor, said switching means being operable to alternately couple said first and second input conductors to said switching means output conductor; and

signal averaging means having an input conductor connected to the said switching means output conductor and an averaging means output conductor for conducting a signal indicating the differential voltage along said conduit between said first set of contactors.

4,837,519

FAULT DETECTION

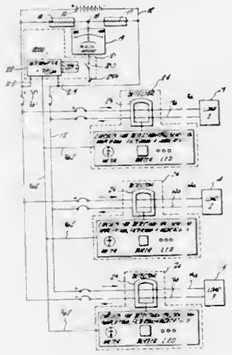
Juan P. Lopetrone, Rancho Palos Verdes; Oliver Valdes, West Covina, and James Clopton, Jr., Huntington Beach, all of Calif., assignors to Southern California Edison Company, Rosemead, Calif.

Continuation-in-part of Ser. No. 773,333, Sep. 6, 1985, and a continuation-in-part of Ser. No. 899,927, Aug. 25, 1986. This application Dec. 7, 1987, Ser. No. 129,160

The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.

Int. Cl.[4] G01R *31/08*

U.S. Cl. 324—529 **98 Claims**



1. Apparatus for the detection of a fault signal in a supply system including conductors from a supply for supplying power to a load connected in the system comprising an impedance element for connection across the power supply, a tapping point to the impedance element, a connector between the tapping point and a point to complete a circuit for a fault signal in the system, an interrupter for periodically pulsing a signal into the system effectively thereby to generate a pulse interrupted fault signal, a detector for location relative to the system for sensing the pulse interrupted fault signal and thereby providing for detecting the location of the fault, and means for operating the detector in synchronism with the interrupter whereby the detector senses a substantially steady state level of the pulse interrupted fault signal.

4,837,520

FUSE STATUS DETECTION CIRCUIT

Keith W. Golke, Minneapolis, and Robert L. Rabe, Maple Grove, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 717,935, Mar. 29, 1985. This application Nov. 12, 1987, Ser. No. 129,891

Int. Cl.[4] G08B *21/00*; G01R *31/02*

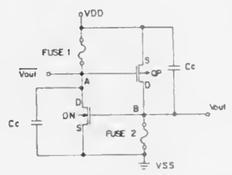
U.S. Cl. 324—550 **21 Claims**

1. A fuse state detection circuit for detecting the status of a fuse, the circuit comprising:

first and second terminal means adapted for electrical connection to first and second voltage sources, respectively;

a flip-flop circuit electrically connected between first and second terminal means comprising two fuses and further comprising two transistors each having a control region, each fuse being in a load circuit of one of the transistors with the control region of each transistor being electrically connected to the load circuit of the other transistor, each fuse providing a conductive path of a selected conductivity which is of a relatively high conductivity in the form in which the fuse is initially provided but of a relatively low conductivity if blown; and

an initializing element electrically connected between a selected one of said first and second terminal means and a selected one of said transistor control region, wherein said initializing element includes a capacitor comprising a thin film metal layer which overlies and is separated from a



doped semiconductor region by an insulating layer, and whereby, if the detection circuit is electrically energized, a first predetermined signal is provided if the fuses are conducting and a second predeterined signal is provided if the fuses are blown.

4,837,521

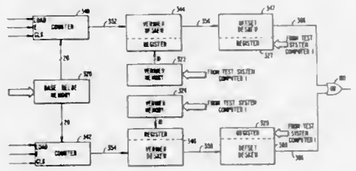
DELAY LINE CONTROL SYSTEM FOR AUTOMATIC TEST EQUIPMENT

Richard F. Herlein, San Jose, and Jeffrey A. Davis, Santa Clara, both of Calif., assignors to Schlumberger Systems & Services, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 70,130, Jul. 2, 1987, Pat. No. 4,789,835. This application Dec. 21, 1987, Ser. No. 135,782

Int. Cl.[4] H03K *17/00*; G06K *5/04*

U.S. Cl. 328—72 **6 Claims**



1. Apparatus for supplying a signal after a predetermined time delay comprising:

a base delay storage means for storing at least one first sequence of bits being a digital representation of higher order bits of the value of both a first and a second time delay;

a first vernier delay storage means for storing at least one second sequence of bits being a digital representation of lower order bits of the value of the first time delay;

a first offset storage means for storing at least one first offset sequence of bits being a digital representation of a correction to the value of the first time delay;

first and second generating means coupled to the base delay storage means, each connected to receive independent start signals, and each means for supplying respective first and second signals an amount of time after receiving the start signals as represented by the first sequence of bits;

first vernier delay means connected to receive the first signal from the first generating means and connected to the first vernier delay storage means, the first delay means for supplying a first delayed signal an amount of time after receiving the first signal as represented by the second sequence of bits; and

first offset means connected to receive the first delayed signal and connected to the first offset storage means, the first offset means for supplying a final first delayed signal

an amount of time after receiving the first delayed signal as represented by the first offset sequence of bits.

4,837,522

NOISE REDUCER FOR MICROWAVE AMPLIFIER

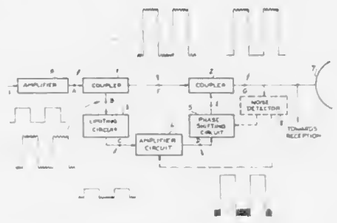
Georges Fleury, Gif Sur Yvette, and Bernard Epsztein, Sceaux, both of France, assignors to Thomson CSF, Paris, France

Filed May 23, 1988, Ser. No. 197,320

Claims priority, application France, May 26, 1987, 87 07417

Int. Cl.[4] H03F *1/26*

U.S. Cl. 330—149 **2 Claims**



1. A noise reducer for microwave amplifiers, working in pulses, said noise reducer comprising a first coupler having an input to be coupled to the amplifier, a main output and an ancillary output; a second coupler having a main input coupled to the main output of the first coupler, an ancillary input and an output constituting the output of the noise reducer; and, series-connected between the ancillary output of the first coupler and the ancillary input of the second coupler, a voltage limiting circuit, an amplifier circuit and a phase-shifting circuit, wherein the first coupler and second coupler having respective coupling coefficients C1 and C2, the amplifier circuit has a gain Ga which is at least substantially equal to the sum C1+C2, and wherein the phase-shifting circuit is adjusted so that, between the working pulses of the amplifier, the signals reaching the two inputs of the second coupler are combined in phase opposition in the second coupler.

4,837,523

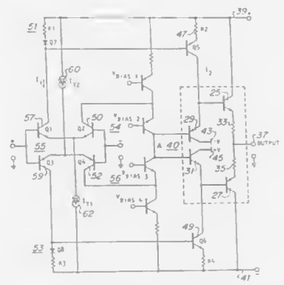
HIGH SLEW RATE LINEAR AMPLIFIER

John W. Wright, Los Altos, Calif., assignor to Elantec, Milpitas, Calif.

Filed Apr. 4, 1988, Ser. No. 177,495

Int. Cl.[4] H03F *3/45*, *3/26*

U.S. Cl. 330—255 **6 Claims**



1. An amplifier circuit for operation at reduced quiescent current levels having double-ended input and single-ended output, the circuit comprising:

an output stage having a pair of transistors with collectors and emitters serially connected to receive bias signal;

a driver transistor coupled to supply signal to one of the transistors of the output stage;

means coupling an input stage to supply signal at the output thereof to said driver transistor;

source means connected to supply current of controllable level to the driver transistor; and

circuit means coupled to the input stage for supplying control signal to the source means for controlling the level of current supplied thereby to the driver transistor in response to signal level in the input stage.

4,837,524

LOWER-NOISE MICROWAVE AMPLIFYING CIRCUIT

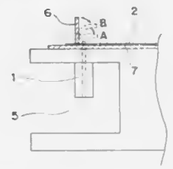
Makio Nakamura, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 11, 1988, Ser. No. 154,356

Claims priority, application Japan, Feb. 13, 1987, 62-32112

Int. Cl.[4] H03F *3/60*

U.S. Cl. 330—286 **18 Claims**



1. A lower-noise microwave amplifying circuit for amplifying microwave signals from coaxial waveguide converting means comprising:

an input coaxial rod projecting through a hole on a surface of said coaxial waveguide converting means into a hollow portion within said coaxial waveguide converting means;

a microstrip line connected to said amplifying circuit and disposed on said surface of said coaxial waveguide converting means; and

a bendable metallic conductor connected to said microstrip line and projected out from said surface away from said hollow portion of said coaxial waveguide converting means, said bendable metallic conductor being adjusted to an optimum angle for reducing noise of said microwave signals.

4,837,525

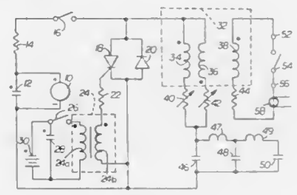
TRANSIENT WAVEFORM GENERATOR

Tapas Mukutmoni, Anaheim, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Mar. 15, 1988, Ser. No. 168,448

Int. Cl.[4] H03B *11/00*

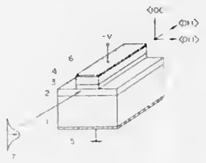
U.S. Cl. 331—165 **12 Claims**



1. A transient waveform generator comprising;

high impedance means for supplying high voltage, having a positive terminal and a negative terminal;
trigger means for initiating said generator transient waveform, shunted across said high impedance means;
inductive transfer means for transmitting and controlling said generated transient waveform; and
resonance inducing means, connected to said inductive transfer means, for inducing resonance with said inductive transfer means.

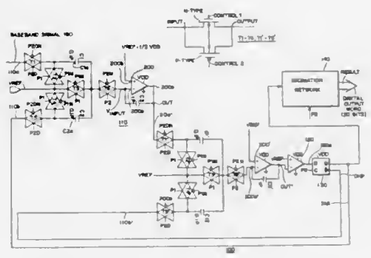
4,837,526
SEMICONDUCTOR EXTERNAL OPTICAL MODULATOR
Masatoshi Suzuki; Yukio Noda; Yuditoshi Kushiro, and Shigeyuki Akiba, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 24, 1987, Ser. No. 42,433
Claims priority, application Japan, May 7, 1986, 61-103055
Int. Cl.[4] G02B 06/10
U.S. Cl. 332—7.51 **7 Claims**



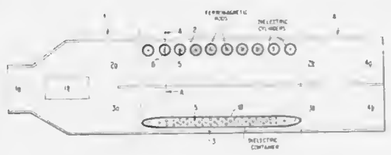
1. A semiconductor external optical modulator for modulating a light output of a light emitting source comprising, a substrate, an optical waveguide layer for propagation therethrough of incident light, a clad layer having a refractive index smaller than that of said optical waveguide layer, electrodes for applying an electric field, and an absorption coefficient of the optical waveguide layer being varied by application of said electric field across said electrodes, for changing the intensity of the incident light, characterized in that said substrate has a zinc blende type crystal structure, and the crystal direction of the substrate parallel to the direction of the applied electric field, the mode of polarization and the direction of travel of the incident light, and the energy gap of the optical waveguide layer being selected so that variations in the refractive index of the optical waveguide by electroabsorption effect and by electrooptic effect cancel each other, whereby variation in the real part of the refractive index of the optical waveguide layer is reduced to substantially zero.

4,837,527
SWITCHED CAPACITOR ARRANGEMENT
Donald J. Sauer, Allentown, N.J., assignor to RCA Licensing Corporation, Princeton, N.J.
Filed Dec. 23, 1987, Ser. No. 137,230
Int. Cl.[4] H03K 7/10
U.S. Cl. 332—11 D **19 Claims**

1. A signal integrator, comprising:
a source of an input signal;
a first capacitance;
a first transmission gate having a control terminal that is responsive to a bilevel, first control signal having a first signal terminal that is coupled to a first terminal of said first capacitance and having a second signal terminal that is coupled to said source of input signal;
an amplifier having a first input terminal and an output terminal;
a second transmission gate having a control terminal that is responsive to a bilevel, second control signal, having a first signal terminal that is coupled to said first input terminal of said amplifier and having a second signal terminal that is coupled to a second terminal of said first capacitance such that said input signal produces a current that is coupled from said source of said input signal to said first input terminal of said amplifier, when both said transmission gates are simultaneously conductive, via the series arrangement of said first transmission gate, said first capacitance and said second transmission gate, said first and second transmission gates being timed to operate in accordance with said first and second control signals, respectively;
an integrating, second capacitance coupled between said first input and output terminals of said amplifier for developing an output signal at said output terminal of said amplifier that is representative of a time integral of said input signal; and
means for generating said first and second control signals such that said first control signal is delayed relative to said second control signal for rendering, in a given period of said second control signal, said second transmission gate nonconductive prior to a time when said first transmission gate becomes nonconductive thereby to prevent signal associated with a transition of said first control signal turning off of said first transmission gate from being coupled to said first input terminal of said amplifier.



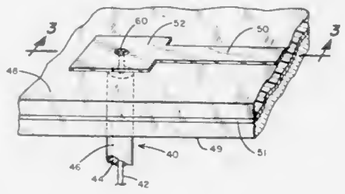
4,837,528
MICROWAVE PHASE SHIFTER
Günter Mörz, Ludwigsburg; Erich Pivit, Allmersbach, and Sigmund Lenz, Aspach, all of Fed. Rep. of Germany, assignors to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany
Filed Feb. 17, 1988, Ser. No. 156,798
Claims priority, application European Pat. Off., Feb. 21, 1987, 87102471.7
Int. Cl.[4] H01P 1/19
U.S. Cl. 333—24.1 **12 Claims**



1. A phase shifter, comprising:
a waveguide for conveying an electromagnetic wave along a path in a direction of wave propagation, the waveguide having a pair of opposing waveguide walls;
means for generating a static magnetic field inside the waveguide, the static magnetic field being oriented parallel to the high frequency electrical field of the electromagnetic wave; and
means for rotating the phase of an electromagnetic wave

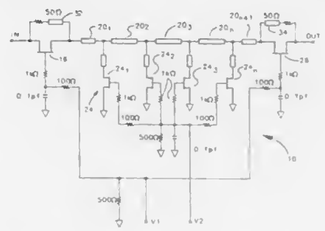
conveyed by the waveguide without unnecessarily attenuating the electromagnetic wave, the means for rotating including ferromagnetic material disposed along at least one plane extending in the direction of wave propagation and parallel to the high frequency electrical field of the electromagnetic wave, the ferromagnetic material being shaped to define a plurality of three-dimensional elongated regions which extend in the direction of the static magnetic field from one waveguide wall to the opposite waveguide wall, wherein the strength of the static magnetic field is selected so that the ferromagnetic material does not operate at gyromagnetic resonance.

4,837,529
MILLIMETER WAVE MICROSTRIP TO COAXIAL LINE SIDE-LAUNCH TRANSITION
Michael J. Gawronski, Minneapolis; Steven L. Palmquist; John R. Lamberg, both of Minnetonka, and Rebecca A. Hart, Plymouth, all of Minn., assignors to Honeywell, Inc., Minneapolis, Minn.
Filed Mar. 24, 1988, Ser. No. 172,446
Int. Cl.[4] H01P 5/08
U.S. Cl. 333—33 **9 Claims**



1. A method of coupling a coaxial transmission line or coaxial connector of the type having a center conductor and an outer conductive shield separated by a dielectric material to a microstrip transmission line of the type comprising a conductive microstrip disposed on one surface of a planar dielectric substrate and a conductive ground plane disposed on the opposed surface of said substrate for efficient signal transfer through the junction at millimeter wave frequencies, comprising the steps of:
(a) integrally forming a rectangular conductive pad area with said conductive microstrip on said one surface of said substrate, the length of said pad being approximately equal to the wavelength of the signals to be transmitted and the width of said pad area being greater than the width of said conductive microstrip;
(b) forming a circular aperture through said conductive ground plane, the center of said aperture being halfway along the length of said conductive pad area and the diameter of said aperture being slightly less than the outer diameter of said dielectric material of said coaxial transmission line or coaxial connector, said circular aperture configured to create a reactance for resonating with the parasitic reactance of the coaxial transmission line discontinuity at the operating millimeter wave frequency;
(c) forming a circular hole through the dielectric substrate and the microstrip conductor of said microstrip transmission line concentric with said circular aperture in said ground plane, the diameter of said circular hole being slightly greater than the diameter of said center conductor of said coaxial transmission line or coaxial connector;
(d) orienting said coaxial transmission line or coaxial connector normal to said microstrip transmission line and inserting an end portion of said center conductor through said circular hole; and
(e) conductively joining said center conductor of said coaxial transmission line or coaxial connector to said conductive pad area of said microstrip and said outer conductive shield of said coaxial transmission line or coaxial connector to said conductive ground plane of said microstrip transmission line.

4,837,530
WIDEBAND (DC-50 GHZ) MMIC FET VARIABLE MATCHED ATTENUATOR
Hiroshi Kondoh, Santa Rosa, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Dec. 11, 1987, Ser. No. 132,088
Int. Cl.[4] H01P 1/22
U.S. Cl. 333—81 A **21 Claims**

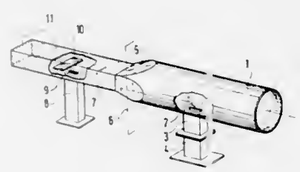


1. A FET variable absorptive attenuator having an input and output and including a plurality of FETs connected between the input and the output and utilized as variable resistors controlled by voltages applied to their gate terminals, comprising:
a first series FET, a shunt FET, and a second series FET connected in a T configuration;
a first voltage supply for providing a first control voltage to adjust the resistances of the first and second series FETs to bias the first and second series FETs well below their pinch-off voltages at relatively high attenuation settings;
a second voltage supply for providing a second control voltage to adjust the resistance of the shunt FET;
a first resistor connected in parallel with the first series FET, the first resistor having a predetermined resistance depending on the output impedance of an external circuit connected to the input of the attenuator; and
a second resistor connected in parallel with the second series FET, the second resistor having a predetermined resistance depending on the input impedance of an external circuit connected to the output of the attenuator;
whereby the first and second resistors allow the first and second series FETs to be biased well below their pinch-off voltages to minimize parasitic capacitances at relatively high attenuation settings, as well as improve the isolation for high attenuation settings at relatively high frequencies thereby increasing bandwidth and extending the dynamic range of attenuation.

4,837,531
THREE-ACCESS POLARIZATION AND FREQUENCY DUPLEXING DEVICE
Philippe Gourlain, Leguevin; Régis Lenormand, Toulouse, and Dominique Morin, Muret, all of France, assignors to Alcatel Espace, Courbivoie, France
Filed Jan. 28, 1987, Ser. No. 7,863
Claims priority, application France, Jan. 28, 1986, 86 01160
Int. Cl.[4] H03H 7/46; H01P 1/213
U.S. Cl. 333—135 **1 Claim**

1. A three-access polarization and frequency duplexing device comprising:
in series with respect to a coupling access to an antenna, a common circular waveguide, having an axis perpendicular to its circular cross-section, for passing two orthogonal polarizations of a wave within a low-frequency band and

one polarization of a wave within a high frequency band parallel to one of the two orthogonal polarizations of the low-frequency wave, a transition and a second waveguide having an axis, said device further comprising a first access waveguide for one of the two orthogonal polarizations of the low-frequency wave connected to said common waveguide and opening through a first resonant slot into the common waveguide and being at right angles to the axis of said common waveguide, and a second access waveguide providing access to the secondary waveguide at right angles to the axis of said secondary waveguide and coupled to said secondary waveguide by a second resonant slot, a short-circuit plate positioned within said secondary waveguide adjacent said second resonant slot and performing a short-circuit function for the high-frequency portion of the wave which is directed towards said second access waveguide, a third, series access guide formed by a



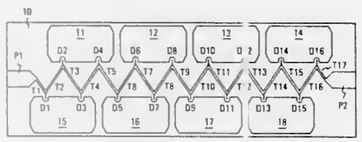
free end of the secondary waveguide opposite an end of said secondary waveguide proximate to said transition, wherein the secondary waveguide is a rectangular guide having narrow sides and broad sides, the narrow sides of the secondary waveguide being parallel to the second polarization of the low-frequency wave and the broad sides of the secondary waveguide being parallel to the polarization of the high-frequency wave, wherein the first access waveguide providing access to the common waveguide includes a filter for selecting the low-frequency wave by providing a short-circuit for the high-frequency wave at the level of the first resonant slot, wherein the second access wavelength is at right angles to the broad sides of the secondary waveguide and constitutes the access for said polarization of the high-frequency wave, and wherein said series access guide propagates the other of said two orthogonal polarizations of said low-frequency wave.

4,837,532

MMIC (MONOLITHIC MICROWAVE INTEGRATED CIRCUIT) VOLTAGE CONTROLLED ANALOG PHASE SHIFTER

Richard J. Lang, Liverpool, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Oct. 26, 1987, Ser. No. 112,611
Int. Cl.[4] H03H *11/20*
U.S. Cl. 333—164 **6 Claims**



1. A monolithic microwave integrated circuit (MMIC) voltage controlled, analog phase shifter having a specified characteristic impedance (Zo) and specified worst case VSWR and requiring minimum substrate area at millimeter and microwave wavelengths; comprising:

(A) a substrate of semi-insulating Gallium Arsenide having a ground plane on the under surface thereof,

(B) a first input-output port,

(C) a second input-output port,

(D) an artificial transmission line comprising

(1) an (n+1) fold succession of sections of microstrip transmission line, where n is an integer, consisting of said ground plane and a conductor formed on the upper surface of said substrate, the sections having a high impedance relative to said characteristic impedance Zo and being serially connected between said first and second input-output ports, the first and last sections having an inductance value of L/2 and the intermediate sections having an inductance value of L, all sections of transmission line having a length substantially shorter than one-quarter wavelength;

(2) an n fold plurality of semi-conductor elements having at least a first and second terminal, each semi-conductor element having a variable capacitance of the value C, the capacitance thereof being a function of an applied voltage, the first terminal of each semi-conductor element being connected to a respective connection between transmission line sections and the second terminal coupled to substrate ground through a plated through hole,

said semi-conductor elements being arranged along a first line in a sequence of odd numbered semi-conductor elements, and arranged along a second line in a sequence of even numbered semi-conductor elements, the second line being displaced from the first line and parallel thereto, the intermediate members of said (n+1) fold succession of transmission line sections extending between said succession of odd and even numbered semi-conductor elements in said first and second lines,

and said plated through holes being arranged in a second pair of parallel lines, outside of and close to said two lines of semi-conductor elements to permit direct paths without cross-overs for each transmission line section between consecutive first terminals of said semi-conductor element and short connections between the second terminal of each semi-conductor element and ground,

the semi-conductor elements in one line being staggered in relation to the semi-conductor elements in the other line to provide equal spacing and thereby equal length transmission sections between the first terminals of said semi-conductor elements,

the values of L and C being chosen to achieve the desired characteristic impedance in approximate satisfaction of the expression

$$Zo=(L/C-w^2L^2/4)^{\frac{1}{2}}$$

where w=the angular frequency 2 pi f neglecting transmission line and semi-conductor element parasitics, and

(E) means for applying a control voltage between the first and second terminals of each variable capacitance semi-conductor element to achieve the desired phase shift.

4,837,533

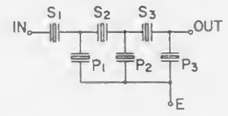
LADDER-TYPE CERAMIC FILTER

Michitaka Oshikawa, Tsurugashima, Japan, assignor to Toko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1988, Ser. No. 221,280
Claims priority, application Japan, Jul. 22, 1987, 62-112315[U]
Int. Cl.[4] H03H *9/58*
U.S. Cl. 333—189 **4 Claims**

1. A ladder-type ceramic filter comprising a first plurality of resonators connected in series between an input terminal and an output terminal, the connection points between two of said series resonators and the connection point between a series resonator and said output terminal each defining a junction,

and a second plurality of parallel resonators each having one end thereof grounded and another end connected to a respective one of said junctions, said first and second plurality of resonators forming a ladder arrangement between said input and output terminal, each of said resonators having a respective resonant and a respective antiresonant frequency, and a respective frequency difference between said resonant and antiresonant frequencies;



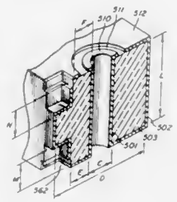
said resonators being arranged such that one or more of said resonators having a minimum frequency difference is positioned in the center of said ladder arrangement and that resonators having increasing frequency differences are placed closer to said input or output terminal in the order of increasing frequency difference.

4,837,534

CERAMIC BLOCK FILTER WITH BIDIRECTIONAL TUNING

Mark I. Van Horn, Bedford, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 29, 1988, Ser. No. 150,251
Int. Cl.[4] H01P *1/202, 7/04*
U.S. Cl. 333—207 **8 Claims**



4. A transmission line filter having at least one resonator having a length and a resonant frequency that may be tuned, said resonator comprising:

(a) an inner conductor;

(b) an outer conductor comprising conductive material and substantially surrounding said inner conductor thereby forming a spacing between said inner conductor and said outer conductor;

(c) a dielectric medium disposed between said inner conductor and said outer conductor;

(d) a low-impedance end at which said inner conductor is electrically connected to said outer conductor;

(e) a high-impedance end;

wherein said resonator has a first tuning region aligned with and extending along a first part of said length proximate to said low-impedance end of said resonator, wherein removal of said conductive material from said first tuning region will decrease said resonant frequency; and

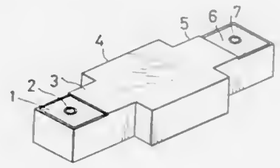
said resonator has a second tuning region extending along and aligned with a second part of said length proximate to said high-impedance end of said resonator, wherein removal of said conductive material from said second tuning region will increase said resonant frequency.

4,837,535

RESONANT WAVE FILTER

Yoshihiro Konishi, Sagamihara; Kenichi Konno, Machida, and Ikuo Awai, Ichikawa, all of Japan, assignors to Uniden Corporation, Ichikawa, Japan

Filed Jan. 5, 1989, Ser. No. 293,666
Int. Cl.[4] H01P *1/208, 1/205, 1/20*
U.S. Cl. 333—210 **8 Claims**



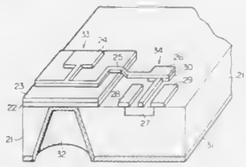
1. A resonant wave filter capable of selectively propagating an electromagnetic wave of a prescribed frequency comprising a TM mode resonator disposed perpendicularly to the direction of propagation of electromagnetic wave energy, a pair of TEM mode resonators disposed one on either side or said TM mode resonator in the direction of propagation of electromagnetic wave energy, and a pair of cutoff waveguides disposed one between said TEM mode resonator and each of said TM mode resonators to couple said TEM mode resonator with said TM mode resonators in evanescent mode.

4,837,536

MONOLITHIC MICROWAVE INTEGRATED CIRCUIT DEVICE USING HIGH TEMPERATURE SUPERCONDUCTIVE MATERIAL

Kazuhiko Honjo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 223,525
Claims priority, application Japan, Jul. 30, 1987, 62-191798
Int. Cl.[4] H01P *3/08*
U.S. Cl. 333—247 **12 Claims**



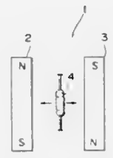
1. A microwave device fabricated on a semi-insulating substrate and comprising a passive component area where a plurality of passive component elements are formed and an active component area where at least one active element is formed, said passive component area having a film overlain by a dielectric film and a strip conductor extending on said dielectric film, wherein said film and said strip conductor are formed of a superconductive material.

4,837,537

REED SWITCH DEVICE

Tsutomu Nakada, and Yasuhiro Naka, both of Kanagawa, Japan, assignors to Nippon Aleph Corporation, Kanagawa, Japan

Filed Feb. 2, 1988, Ser. No. 151,595
Claims priority, application Japan, Feb. 6, 1987, 62026116
Int. Cl.[4] H01H 9/00
U.S. Cl. 335—153 7 Claims



1. A reed switch device comprising:
a pair of magnets arranged in inverted polar orientations and maintained in a predetermined positional relationship with each other, said pair of magnets providing a region where a strength of a composite magnetic field presented by said pair of magnets changes at a greater rate than a strength of a magnetic field presented by each of said magnets changes, and
a reed switch having a longitudinal axis maintained substantially in parallel to axes of magnetization of said magnets, said reed switch being movable relative to said pair of magnets for detection of relative position between said reed switch and said pair of magnets by on-off activation of said reed switch within said region.

4,837,538

ELECTROMAGNETIC RELAY

Michael Dittmann, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 167,083, Mar. 11, 1988, abandoned. This application Sep. 9, 1988, Ser. No. 244,609
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1987, 3708286
Int. Cl.[4] H01H 9/02, 13/04
U.S. Cl. 335—202 10 Claims

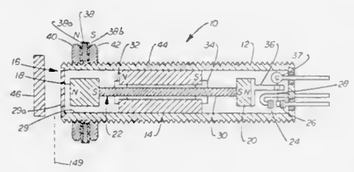
1. An electromagnetic relay, comprising:
a coil member carrying a winding and having an axis extending parallel to a terminal plane of said relay, said coil member including coil flanges:
winding supporting wires secured in said coil flanges;
a core extending into said coil member in a direction of said axis;
an angular yoke having a first leg coupled to an end of said core, said angular yoke having a second leg extending parallel to said axis and adjacent said winding;
a flat armature seated on a free end of said second leg of said angular yoke, said flat armature forming a working air gap with a free end of said core;
a leaf spring having a restoring leg biasing said flat armature relative to said angular yoke, said leaf spring having at least one contact spring leg;
at least one cooperating contact element cooperating with said at least one contact spring leg;
a separately manufactured pedestal having said coil member arranged thereon, said pedestal having a plurality of optionally equippable plug shafts for different types of cooperating contact elements;
terminal elements for said coil member and for said contact elements being fixed in said pedestal;
said winding supporting wires being at an underside of said coil member and being connected to appertaining ones of said terminal elements and;
a separately fabricated terminal angle connected to said leaf spring in electrically conductive fashion and being secured to said second leg of said angled yoke,
said terminal angle having a first section lying flat on said second leg of said angular yoke,
said terminal angle having a second section bent at a substantially right angle relative to said first section, said second section surrounding an end of said flat armature that is seated on said angular yoke,
said terminal element having a third section extending relative to an underside of said relay and forming a terminal element for said leaf spring.

4,837,539

MAGNETIC SENSING PROXIMITY DETECTOR

Gerald S. Baker, Houston, Tex., assignor to Cameron Iron Works USA, Inc., Houston, Tex.

Filed Dec. 8, 1987, Ser. No. 130,242
Int. Cl.[4] H01H 9/00
U.S. Cl. 335—207 8 Claims



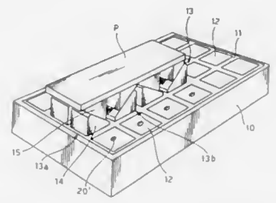
1. A magnetic proximity detector for ferrous metals comprising
a housing,
an assembly of magnets, at least one of which is movable, positioned within said housing,
a switch,
means connecting the movable magnet to the switch to change its position when the magnet moves,
said movable magnet being biased to one position by the other magnets of said assembly and moving to its other position responsive to the presence of a ferrous metal within its effective sensitivity range, and
means for focusing the flux of said magnets by changing the shape of their magnetic fields to change the effective sensitivity range which causes movement of said movable magnet responsive to the presence of a ferrous metal.

4,837,540

MAGNETIC WORK-HOLDER

Cardone Michele; Grandini Angelo, and Zaramella Bruno, all of Milano, Italy, assignors to Tecnomagnete S.p.A., Milan, Italy

Filed Oct. 3, 1988, Ser. No. 252,882
Claims priority, application Italy, Oct. 12, 1987, 22227 A/87
Int. Cl.[4] H01F 7/20
U.S. Cl. 335—286 9 Claims



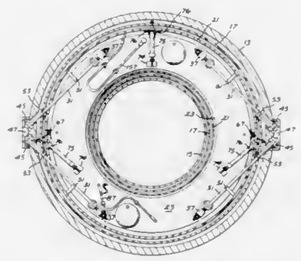
1. A magnetic work-holding device comprising a magnetically activable and deactivable holding surface having pole pieces of different polarities, and pole extension members for said pole pieces, said pole extension members comprising at least a first and second single-pole extension members set on respective pole pieces of opposite polarities, each of said first and second pole extension members comprising a base pole portion and at least a movable pole portion, said base and movable pole portions having abutting faces angularly disposed in respect to said holding surface, said movable pole portion of said pole extension members having an outwardly oriented work-holding face, and guiding means for guiding said movable pole portion on said base pole portion, said abutting faces of the base and movable pole portions of said first and second pole extension members being slanted in opposite angular directions.

4,837,541

SHIELD SUSPENSION SYSTEM FOR A MAGNETIC RESONANCE CRYOSTAT

Richard E. Pelc, Florence, S.C., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 33,329, Apr. 2, 1987. This application Sep. 16, 1987, Ser. No. 97,574
Int. Cl.[4] H01F 5/00
U.S. Cl. 335—300 2 Claims



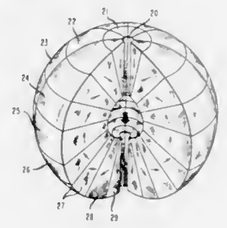
1. A cryostat for a magnetic resonance magnet comprising:
a cylindrical helium vessel concentrically situated in the cryostat;
a first cylindrical shield situated in the cryostat surrounding said helium vessel;
a second cylindrical shield situated in the cryostat surrounding said first shield;
a plurality of tubular struts affixed to both of said helium vessel circular and faces and said second shield, said tubular struts circumferentially spaced and extending radially, parallel to said end shields of the helium vessel, to said second shield, said struts supporting said second shield spaced away from said helium vessel; and
plate means circumferentially spaced about the outside of each of the circular end faces of said first shield and affixed thereto, said plate means extending radially, parallel to the end faces of said first shield and affixed to the inner circular end faces of said second shield, supporting said first shield spaced away from the second shield.

4,837,542

HOLLOW SUBSTANTIALLY HEMISPHERICAL PERMANENT MAGNET HIGH-FIELD FLUX SOURCE FOR PRODUCING A UNIFORM HIGH FIELD

Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 27, 1988, Ser. No. 199,500
Int. Cl.[4] H01F 7/02
U.S. Cl. 335—306 8 Claims



1. A permanent magnet structure comprising a hollow substantially spherical magnetic flux source for producing a uniform high-field in its central cavity, said spherical flux source being azimuthally symmetrical in magnetization, the magnetic orientation (α) in the substantially spherical magnetic shell being given by:

$$\alpha = 2\theta$$

where θ is the polar angle.

4,837,543

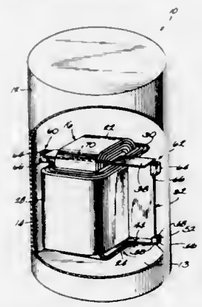
TRANSFORMER CORE AND COIL SUPPORT ASSEMBLY

Michael W. Humen, and Augusto Hernandez, both of Waukesha, Wis., assignors to Cooper Power Systems, Inc., Houston, Tex.

Filed Sep. 28, 1988, Ser. No. 251,103
Int. Cl.[4] H01F 27/02
U.S. Cl. 336—92 28 Claims

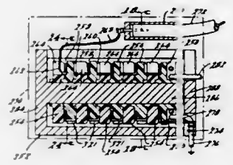
1. A transformer comprising

a tank having side walls,
a core defining a core window, and



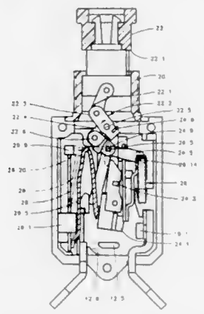
an I-beam which extends through said core window, which supports said core and which is supported by said side walls of said tank.

4,837,544
SPIRAL WINDINGS
John A. McDougal, 14388 Harbor Island, Detroit, Mich. 48215
Continuation of Ser. No. 61,027, Jun. 10, 1987, abandoned, which is a continuation of Ser. No. 698,913, Feb. 6, 1985, abandoned, which is a division of Ser. No. 135,188, Mar. 28, 1980, Pat. No. 4,517,540, which is a continuation of Ser. No. 796,553, May 13, 1977, abandoned. This application Apr. 26, 1988, Ser. No. 186,759
Int. Cl.[4] H01F 27/20
U.S. Cl. 336—185 **16 Claims**



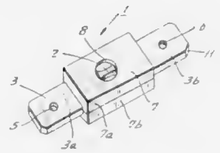
1. In an ignition coil assembly adapted for use with an ignition system in an internal combustion engine, said ignition coil assembly having an ignition coil including a secondary winding assembly and an electromagnetically-coupled primary winding assembly which receives periodic energy pulses at least in part in accordance with an operating position of said engine so as to thereby induce a relatively high voltage in said secondary winding which is adapted to cause a spark generating device partially disposed within a combustion chamber of said engine to ignite an air fuel mixture therein, the improvement wherein said secondary winding assembly comprises:
a core which provides a closed magnetic circuit;
an electrically non-conductive bobbin support assembly mounted on a portion of said core, said support assembly having individual and separate winding and transition discs of different shapes which are directly connected together in an alternating coaxial nested relationship to form a unitary structure, sad discs being formed to provide a plurality of axially separated annular winding recesses and transition recesses, with at least one of said discs being formed with an inwardly extending slot; and
a single continuous electrically-conductive wire being wound without severances or splices on said unitary structure so as to form a plurality of spaced apart spiral coils, each of said spiral coils having a plurality of layers, each of said spiral coils having only one turn per radial layer in each of said winding recesses, said wire passing through each of said transition recesses and through said slot to traverse from a major spiral coil diameter to a minor spiral coil diameter of the next adjacent spiral coil, said winding recesses having a width less than twice the diameter of said wire.

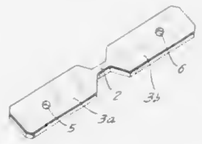
4,837,545
MINIATURE CIRCUIT BREAKER WITH IMPROVED LONGEVITY
Carleton M. Cobb, III, East Walpole; Hans G. Hirsbrunner, Attleboro; Edward M. Gonsalves, Swansea; Richard L. Jenne, Attleboro, all of Mass., and Sepideh H. Nott, Portsmouth, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.
Division of Ser. No. 34,174, Apr. 2, 1987. This application Feb. 26, 1988, Ser. No. 161,069
Int. Cl.[4] H01H 71/04, 73/12
U.S. Cl. 337—66 **8 Claims**



1. A switching device comprising a housing having walls defining a chamber therein, stationary contact means and movable contact means mounted in the chamber, the movable contact means adapted to move into and out of engagement with the stationary contact means, actuating means extending from outside the housing into the chamber coupled to the movable contact means adapted to move the movable contact means and latching means disposed in the chamber adapted to maintain the stationary and movable contact means in engagement during selected conditions, the actuating means comprising a push-button mounted on the housing adapted for movement between first and second limits, a push-button link member having first and second ends, the first end pivotably connected to the push-button, a toggle link having first and second ends and an intermediate fulcrum, the first end of the toggle link being pivotably connected to the second end of the push-button link, the fulcrum being pivotably mounted on a pin fixedly mounted in the housing, a bellcrank link having first and second ends, the first end of the bellcrank link pivotably connected to the second end of the toogle link, a bellcrank element having first and second ends and an intermediate fulcrum, the fulcrum of the bellcrank element pivotably connected to the second end of the bellcrank link through a pin, a pair of gnerally vertically extending grooves formed in the housing, the pin extending between and into the grooves to limit motion of the fulcrum of the bellcrank element to generally vertical motion, the first end of the bellcrank element formed with a latching surface adapted to move into and out of engagement with a reaction surface of the latching means, the second end of the bellcrank element being coupled to the movable contact means whereby downward movement of the push-button will cause the toggle to pivot and move the latching surface into engagement with the reaction surface and continued downward movement of the push-button will cause the fulcrum of the bellcrank element to move downwardly with the movable contact means engaging the stationary contact means and the first end of the bellcrank link moving laterally from a point relative to an imaginary line extending through the fulcrum of the toggle link and the fulcrum of the bellcrank element away from the latching surface to a point across the imaginary line which is toward the latching surface.

4,837,546
FUSE BLOCK
Elliot Bernstein, Glen Cove, N.Y., assignor to Bel Fuse Inc., Jersey City, N.J.
Filed Mar. 11, 1988, Ser. No. 166,705
Int. Cl.[4] H01H 85/04
U.S. Cl. 337—272 **16 Claims**

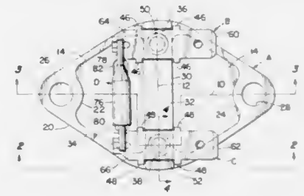




1. A fuse block for protecting an electrical system from an electrical overload, comprising:
a fusible metal element having a first terminal in the form of a first tongue and spaced from it a second terminal in the form of a second tongue each tongue being adapted for installation in a disconnect terminal of the electrical system, the fusible metal element having a mid-section between the first and second tongues of a cross-section less than the cross-sections of the tongues, whereby the mid-section is meltable and fusible in response to an electrical overload, the metal element and the tongues being integral, providing a one piece fusible metal element; and
a housing for the metal element for providing mechanical integrity between the first and second tongues when the mid-section melts, the housing covering portions of the first tongue and the second tongue near the mid-section, the housing having an aperture exposing the mid-section so that the housing avoids contacting the mid-section for preventing the housing from acting as a heat sink for the mid-section and from interfering with prompt heating of the mid-section due to an electrical overload, the aperture extending through the housing across the mid-section, exposing the mid-section, the fuse block being comprised solely of the fusible metal element and the housing.

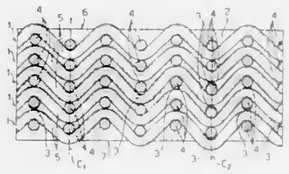
4,837,547
THERMAL CUTOFF ASSEMBLY
Ronald A. Nixon, and Charles Yagher, Jr., both of Lexington, Ohio, assignors to Therm-O-Disc, Incorporated, Mansfield, Ohio
Filed Nov. 2, 1987, Ser. No. 115,379
Int. Cl.[4] H01H 37/76
U.S. Cl. 337—414 **21 Claims**

1. A mounting base for a thermal cutoff, said base having front and rear surfaces, an air flow passage extending through said base between said front and rear surfaces, mounting means on said base for mounting a thermal cutoff to said base in alignment with said air flow passage and in spaced relationship to said front surface, securing means on said base for securing said base to a support with said rear surface facing the support and with said thermal cutoff on the opposite side of said base



from the support, and connector terminals mounted on said base for connecting said thermal cutoff in an electrical circuit, whereby hot air flowing through said air flow passage from said rear surface toward said front surface mixes with ambient air adjacent said front surface before contacting the thermal cutoff.

4,837,548
ELECTRIC RESISTOR DESIGNED FOR USE AS AN ELECTRIC CONDUCTING ELEMENT IN AN ELECTRIC CIRCUIT, AND RELATIVE MANUFACTURING PROCESS
Paolo Lodini, Turin, Italy, assignor to Leda Logarithmic Electrical Devices for Automation S.r.l, Turin, Italy
Filed Jan. 19, 1988, Ser. No. 145,611
Claims priority, application Italy, Feb. 5, 1987, 67073 A/87
Int. Cl.[4] H01L 10/10
U.S. Cl. 338—47 **13 Claims**



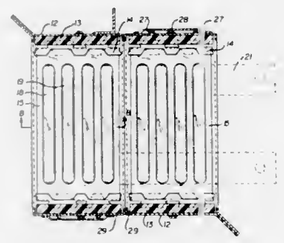
1. An electric resistor designed for use as an electric conducting element in an electric circuit, comprising a structure of:
a plurality of networks of electrical conductive wires each of which comprises weft wires separated from each other by warp wires,
a matirx formed by a flexible, electrically insulating material in which said weft and warp wires are sunk;
said networks being superimposed in the material of said matrix in such a way to obtain a regular configuration in which first sets of weft and warp wires are in contact with each other and second sets of weft and warp wires are separated from each other;
said matrix formed by said flexible insulating material defining small gaps each of which is positioned between a warp and a weft wire of one said second set.

4,837,549

TAPPED RESISTOR GRID ASSEMBLY

Victor V. Kirilloff, Lincoln, Nebr.; William A. Benson, Pittsburgh, Pa.; Robert Cummins, Pittsburgh, Pa., and Richard S. Dawson, Pittsburgh, Pa., assignors to Mosebach Manufacturing Company, Pittsburgh, Pa.

Filed Feb. 22, 1988, Ser. No. 158,858
Int. Cl.[4] H01C 3/00
U.S. Cl. 338—279 11 Claims



1. In a resistor asssembly comprising an flat fan-folded strip having a plurality of indentations of resistance material connected at each end to an end terminal and disposed in parallel flights in a frame and supported at the ends of its folds

the improvement comprising at least one terminal intermediate said end terminals, said intermediate terminal being dimensioned to be inserted into said assembly between adjoining flights, the depth of the indentations in said adjoining flights being dimensioned to make conducting contact with said intermediate terminal, and clip means adapted to be affixed to the edges of said adjoining flights and said intermediate terminal to hold said intermediate terminal in contact with said indentations in said adjoining flights, whereby the position of said intermediate terminal may be adjusted in an assembled resistor unit.

4,837,550

NICHROME RESISTIVE ELEMENT AND METHOD OF MAKING SAME

Charles T. Plough, Jr., Norfolk, Nebr., assignor to Dale Electronics, Inc., Columbus, Nebr.

Filed May 8, 1987, Ser. No. 47,112
Int. Cl.[4] H01C 1/012
U.S. Cl. 338—308 11 Claims

1. An electrical resistor including an insulating substrate or core having a supporting surface;

a resistance element on said supporting surface;

said resistance element containing nickel, chromium, and a small but corrosion inhibiting and impurity barrier providing effective amount of an additive selected from the group consisting of a transitional element, rare earth elements, mixtures thereof, and aluminum combined with said transitional element, rare earth element or mixture thereof;

said resistance element providing a barrier against impurities, inhibiting corrosion and providing electrical stability to said electrical resistor.

4,837,551

DISPLAY APPARATUS FOR AUTOMOTIVE VEHICLE

Tadashi Iino, Susono, Japan, assignor to Yazaki Corporation, Japan

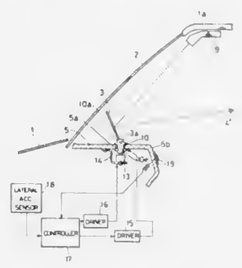
Filed Feb. 3, 1988, Ser. No. 151,632
Int. Cl.[4] B60Q 1/00
U.S. Cl. 340—705 8 Claims

6. A display apparatus for an automotive vehicle having a passenger compartment and a driver, comprising:

(a) projecting means disposed in the passenger compartment of the automotive vehicle, for projecting display images;

(b) half-mirror reflecting means having a reflection surface for reflecting the display images projected by said projecting means to a driver;

(c) actuator means coupled to said half-mirror reflective means, for turning said half-mirror reflecting means to adjust an angular position of a reflection surface of said half-mirror reflecting means from a lateral direction of the vehicle;



(d) sensor means for detecting vehicle lateral acceleration; and

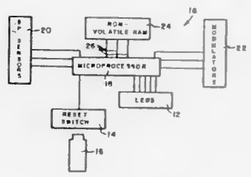
(e) control means coupled to said actuator means and said sensor means, for controlling the angular position of said half-mirror reflecting means in accordance with a look-up table of values on the basis of detected vehicle lateral acceleration detected by said sensor means to automatically form virtual display images ahead of said half-mirror reflecting means in a driver's eye direction variable according to vehicle lateral acceleration.

4,837,552

NON-VOLATILE FAULT DISPLAY WITH MAGNETIC RESET SWITCH FOR ADAPTIVE BRAKING SYSTEM

Patrick J. Vandemotter, Westlake; Merlyn L. Hutchins, Wellington; Jon S. Canale, Avon Lake, and Kenneth R. Koyan, Wellington, all of Ohio, assignors to Allied-Signal Inc., Morristown, N.J.

Filed Mar. 25, 1988, Ser. No. 172,930
Int. Cl.[4] B60Q 1/00
U.S. Cl. 340—461 7 Claims



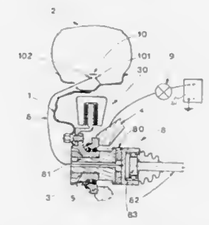
1. Fault indicating mechanism for an electronic system, said electronic system including a housing and electronic components within said housing, said housing protecting said components from environmental contaminants, an electronic display including a series of discrete indicators, each of said indicators being mounted within said housing but visible from the exterior thereof for indicating malfunctions of one or more components of said electronic system, each of said indicators indicating a corresponding predetermined type of malfunction, and a reset mechanism sealed within said housing and inaccessible from outside of said housing without disassembly of the housing for resetting said electronic display, said reset mechanism including a magnetically responsive component covered by the housing which responds to a magnet held adjacent that portion of the housing covering the magnetically responsive component to reset said display after the malfunctions indicated thereby are corrected, memory means for storing records of said malfunctions even if power to the system is turned off and for causing said electronic display to again display the malfunctions displayed before the power was turned off when the power is again turned on, and diagnostic means for sensing malfunctions of said components, said memory means including means for memorizing each malfunction sensed by said diagnostic means and causing said electronic display to indicate said malfunction even if the malfunction disappears.

4,837,553

DEVICE FOR TRANSMISSION OF AN ELECTRIC SIGNAL FROM A DEVICE FOR MONITORING A DRIVING WHEEL ON A VEHICLE

Jean-Pierre Pompier, Enval, France, assignor to Michelin & Cie, Clermont-Ferrand, France

Filed Oct. 22, 1987, Ser. No. 111,349
Claims priority, application France, Nov. 4, 1986, 86 15453
Int. Cl.[4] B60C 23/00
U.S. Cl. 340—442 13 Claims



1. In a vehicle having at least one rotatable driving wheel, a stationary portion including suspension means for suspending said wheel, at least one bearing rotatably connecting said wheel and said suspension means, transmission means for transmitting rotational torque to said wheel, electrical means rotatable with said wheel and and having an electrical potential different from a vehicle ground electrical potential, means for electrically connecting said electrical means rotatable with said wheel to said operating means, comprising:

one electrically conductive path connected between said operating means and said electrical means rotatable with said wheel, said one path comprising at least one unsuspended element of said suspension means and at least one of said bearings,

insulating means for electrically insulating said at least one of said bearings from a portion of said transmission means at the vehicle ground electrical potential; and

another electrically conductive path connected between said electrical means rotatable with said wheel and said grounded portion of said transmission means.

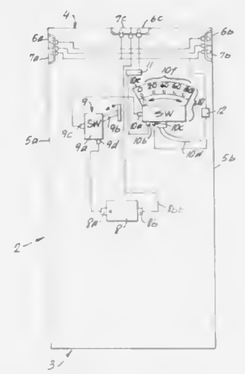
4,837,554

MOTOR VEHICLE BRAKE-STATE OF MOTION SIGNAL-LIGHTS INDICATOR

Anthony Gianforcaro, 122 Woodward La., Basking Ridge, N.J. 07920

Filed Aug. 12, 1988, Ser. No. 231,262
Int. Cl.[4] B60Q 01/26
U.S. Cl. 340—468 16 Claims

1. A motor vehicle signaling-light device comprising in combination: a power source means for providing direct current electricity, having a positive terminal outlet and having a ground negative terminal; a brake switch means for making and breaking electrical circuit, having a brake switch input terminal and having a brake switch output terminal; a brake switch power input circuit including a brake switch power lead connected between said positive terminal outlet and said brake switch input terminal; first forward signal light means including a first forward signal light, for mounting on at least a forwardly-directed face of a motor vehicle, such that any forward signal lights thereof are viewable from at least a forwardly direction and having a first forward light input terminal and forward light output terminal; a motion switch means including a motion switch power input terminal electrically connected to said brake switch output terminal, and at least a first motion switch power outlet terminal, for directing electrical current from the motion switch inlet terminal to said first



motion switch power outlet terminal when a vehicle on which the motion switch is mounted is motionless, and for breaking electrical circuit to said first motion switch power inlet terminal when the motor is in motion; and a motion switch first power lead connected between said first motion switch power outlet terminal and said first forward light input terminal; and said brake switch power input circuit additionally including a brake switch circuit ground lead connected between said first forward light output terminal and said main ground negative terminal, whereby said first forward signal light becomes activated by receiving electric power when simultaneously said brake switch means is in a closed circuit state resulting from a brake pedal being depressed when concurrently the motor vehicle is in a motionless state.

4,837,555

PRESSURE-RESPONSIVE SECURITY ALARM

Frederick W. Millar, 3 Fenton Crescent, Frankston, Australia VIC 3199

Continuation of Ser. No. 61,282, Jul. 15, 1987, abandoned. This application Jul. 12, 1988, Ser. No. 219,861
Claims priority, application Australia, Aug. 12, 1985, PH1895
Int. Cl.[4] G08B 13/08
U.S. Cl. 340—544 7 Claims

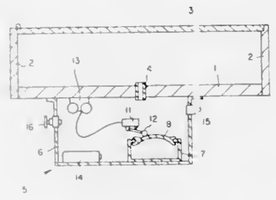
1. A display case comprising:

an openable and closeable hollow case having a transparent wall through which to view the interior thereof and means providing a substantially airtight interior to the case when it is closed;

an alarm housing mounted on said case and defining a substantially airtight interior chamber, said housing being in gas communication with the interior of the case;

evacuation means to enable said chamber and with it the

interior of the case to be evacuated to a sub-atmospheric pressure when the case is closed; and



alarm means located within the alarm housing and activatable by a change of pressure in said chamber to cause an alarm to signal.

4,837,556

SIGNAL TRANSMISSION DEVICE

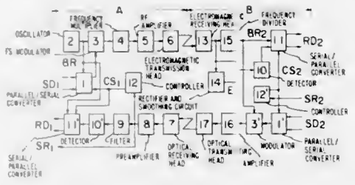
Akira Matsushita, and Shohkichi Nakano, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Nihon Denzai Kogyo Kenkyusho, Kawasaki, Japan

Continuation of Ser. No. 852,009, Apr. 14, 1986, abandoned. This application Aug. 30, 1988, Ser. No. 239,043

Claims priority, application Japan, Apr. 15, 1985, 60-79762; May 27, 1985, 60-113899; May 27, 1985, 60-113900; May 27, 1985, 60-113901; Jun. 11, 1985, 60-126701; Jun. 11, 1985, 60-126702; Aug. 9, 1985, 60-175342; Sep. 9, 1985, 60-199124; Dec. 5, 1985, 60-273645

Int. Cl.[4] H04M *11/04;* **G02F** *1/00*

U.S. Cl. 340—310 R **19 Claims**



1. A signal transmission device for controlling and providing power to a load, said device comprising an active module and a passive module, one of said modules having means for generating a repetitive electrical signal and one of said modules having means for frequency modulating the repetitive signal to provide modulated signals,

said active module including means for transmitting modulated electromagnetic signals based upon the modulated signals, the modulated electromagnetic signals including light signals, and means for receiving modulated electromagnetic signals, including light signals;

a passive module physically remote from and in electromagnetic transmissive communication with said active module, said passive module having electronic circuitry including means for transmitting modulated electromagnetic signals, based upon the modulated signals, to said active module, means for receiving the modulated electromagnetic signals transmitted from said active module, and means for deriving power from the modulated electromagnetic signals received from said active module for supplying power to said electronic circuitry and an electrical load connected to said passive module.

4,837,557

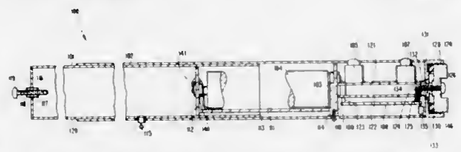
COMBINATION ALARM AND LOCK DEVICE WITH SENSITIVITY ADJUSTMENT

R. Michael Striebel, West Lafayette, Ind., assignor to Raywheel, Inc., Everett, Wash.

Continuation of Ser. No. 164,497, Mar. 4, 1988, abandoned. This application Aug. 30, 1988, Ser. No. 240,374

Int. Cl.[4] G08B *13/08;* **H01H** *3/16*

U.S. Cl. 340—546 **15 Claims**



1. A portable, self-contained security device for sliding doors or windows comprising:

elongate means adapted for positioning, in axial alignment with the plane of a sliding door or window and in the marginal path of its normally sliding opening to prevent opening;

electrical power source means mounted to said elongate means;

alarm means mounted to said elongate means and connectable to said electrical power source means;

depressible switch means mounted to an end of said elongate means and including first and second contacts mounted to said elongate means and movable means mounted to an end of said elongate means and associated with said contacts being operable to move said contacts together and connect said electrical power source means with said alarm means when said switch means is depressed by movement of said sliding door or window; and,

adjustable means operable to adjustingly control the spacing between said contacts and said movable means allowing presetting of sensitivity of said switch means to movement of said sliding door or window.

4,837,558

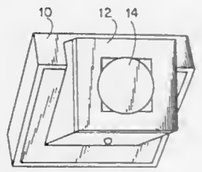
GLASS BREAK DETECTOR

William E. Abel, Portland, Oreg., and Douglas H. Marman, Ridgefield, Wash., assignors to Sentrol, Inc., Portland, Oreg.

Filed Oct. 13, 1987, Ser. No. 108,284

Int. Cl.[4] G08B *13/04*

U.S. Cl. 340—550 **15 Claims**



1. A glass break detector comprising:

(a) acoustic transducer means including:

(i) a rectangular enclosure having a rear wall and four shallow sidewalls, each of said sidewalls having an arcuate cut-out portion thereby providing mounting lips;

(ii) a flat circular metallic disk affixed to the respective lip portions of the sidewalls of said enclosure;

(iii) a piezoelectric element affixed to the rear of the metallic disk and

(b) signal processing means responsive to an electrical output of said piezoelectric element for providing an alarm when the sound of breaking glass occurs.

4,837,559

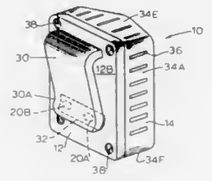
PERSONAL SECURITY DEVICE

James G. Green, Sr., 105 Knollwood Dr., Greensboro, N.C. 27403

Filed Dec. 10, 1987, Ser. No. 131,198

Int. Cl.[4] G08B *23/00*

U.S. Cl. 340—573 **7 Claims**



1. A portable personal security device, comprising:

a. a housing having a back surface mounting a flexible clip for receiving an article such as a belt for supporting the housing on the body of the user;

b. an electrically energized signalling device enclosed in said housing;

c. a battery enclosed in said housing;

d. a circuit connecting said signalling device and battery in series enclosed in said housing; and

e. circuit closure means associated with said clip and arranged to be opened by said article when received by said clip to maintain said circuit normally open and to close when said clip is removed from said article to complete said circuit and allow said battery to energize said signalling device.

4,837,560

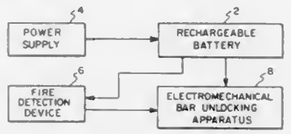
SMOKE ALARM CONTROLLED UNLOCKING APPARATUS FOR WINDOW BARS

Chenia L. Newberry, 428 E. 211 St., Carson, Calif. 90745

Filed Nov. 16, 1987, Ser. No. 121,788

Int. Cl.[4] G08B *17/12*

U.S. Cl. 340—578 **9 Claims**



1. A fire safety apparatus comprising:

a rechargeable battery;

a power supply for charging said rechargeable battery;

a fire detection device for producing an output control signal in response to the detection of fire; and

an electromechanical window bar unlocking mechanism powered by said reachargeable battery, electrically coupled to said fire detection device and responsive to said control signal to activate said mechanism to its unlocked mode, said mechanism having at least one locking fixture which comprises

an outer flanged member having a cylindrical flange part welded to said window bars and a pair of retaining brackets perpendicular to said cylindrical part and spaced apart, each having a hole therethrough along a line parallel to the plane of said cylindrical flange part;

a cylindrical insert threaded at one end and having a cylindrical flange at the other end and a coaxial hollow passage therethrough having a first diameter at one end tapering to a larger, second diameter at the other end;

a threaded linking rod pivotally attached at one end between said retaining brackets;

a pivoted locking member pivotally attached to said linking rod at one end and having a hole near another end;

a cylindrical retaining collar threaded at one end and having a flange of larger radius at the other end with a hole therethrough;

a cylindrical bushing having a threaded interior and four holes spaced 90° apart and perpendicular to the cylindrical axis of said bushing, threaded onto said cylindrical retaining collar;

a mounting bracket having a plurality of holes therethrough;

a slotted bracket through which said linking member passes, attached to said mounting bracket; and

a guiding sleeve mounted on said mounting bracket through which said unlocking rod passes.

4,837,561

METHOD AND APPARATUS FOR THE GENERATION OF MIXED REFRESH AND ROLL MODE DISPLAY IN A CRT

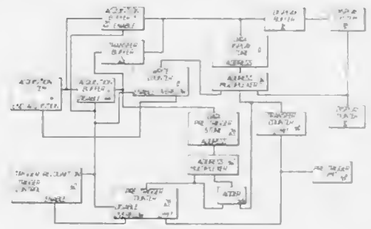
Brian D. Tucker, Ilford, England, assignor to Gould Electronics Limited, Hainault, England

Filed Jul. 7, 1987, Ser. No. 70,471

Claims priority, application United Kingdom, Jul. 8, 1986, 8616588

Int. Cl.[4] G09G *1/06*

U.S. Cl. 340—722 **6 Claims**



1. A method of displaying data on a display screen on either side of a trigger point upon occurrence of a trigger event, comprising the steps of:

displaying new data as the new data is acquired at the trigger point and rolling old data toward and off a first end of the display screen;

detecting the trigger event;

freezing the data being displayed on the display screen between the trigger point and the first end; and

displaying post-trigger event data continuously from the trigger point toward and to a second end of the display screen as the post-trigger event data is acquired.

4,837,562

SMOOTHING DEVICE

Masaaki Nishiura, and Isei Minamitani, both of Fukaya, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 760,409, Jul. 30, 1985, abandoned. This application Aug. 7, 1987, Ser. No. 83,003

Claims priority, application Japan, Aug. 9, 1984, 59-165676

Int. Cl.[4] G09G *1/14*

U.S. Cl. 340—728 **6 Claims**

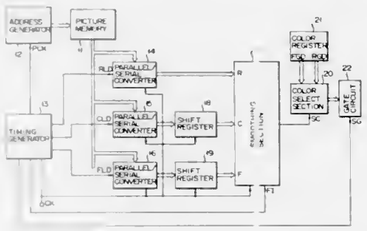
1. A smoothing device comprising:

a picture memory for storing pattern data representing a

pattern to be displayed on a display device, said pattern being formed of picture elements formed by line-scanning a first and second field;

data storage means coupled to said picture memory for storing pattern data consisting of nine picture elements Ct(n−1), Ct(n), Ct(n+1), Rt(n−1), Rt(n), Rt(n+1), Ft(n−1), Ft(n), and Ft(n+1), in which C represents pattern data of a current horizontal line, t(n) represents a timing of a currently scanning picture element, t(n−1) and t(n+1) are equivalent timings immediately preceding and following, respectively, said timing t(n), R represents pattern data of a horizontal line one line above the current horizontal line, and F represents pattern data of a horizontal line one line below the current horizontal line;

adding-decision means for deciding whether or not to add to



said pattern a half-pixel pattern having half the width of said picture element, at display timing t(n) of one field of current display picture element Ct(n), in accordance with any one of the following conditions expressed by said pattern data stored in said data storage means:

$$Rt(n-1)\cdot Rt(n)\cdot Ct(n-1)\cdot Ct(n)\cdot Ct(n+1)=1$$

$$Rt(n-1)\cdot Rt(n)\cdot Ct(n-1)\cdot Ct(n)\cdot Ft(n)=1$$

$$Rt(n-1)\cdot Rt(n)\cdot Rt(n+1)\cdot Ct(n-1)\cdot Ct(n)\cdot Ct(n+1)\cdot Ft(n-1)\cdot Ft(n)=1;$$

and

display means for displaying on said display device said pattern modified by said half-pixel pattern in accordance with the decision made by said adding-decision means, so that the displayed pattern has relatively smooth contours.

4,837,563

GRAPHICS DISPLAY SYSTEM FUNCTION CIRCUIT

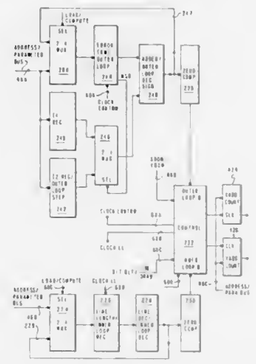
Robert L. Mansfield; Alexander K. Spencer, both of Austin, and Joe C. St. Clair, Round Rock, all of Tex., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed Feb. 12, 1987, Ser. No. 13,841
Int. Cl.[4] G09G 1/00
U.S. Cl. 340—732 **10 Claims**

1. In a graphics display system having a processor for performing either a line drawing algorithm or a bit block transfer algorithm, said processor including a counter circuit comprising:

a first counter means for counting from a first initial state to a first predetermined value, and

a second counter means operatively connected to said first counter for performing either a first operation for providing addresses to perform a bit block transfer including counting from a second initial value to a second predetermined value in response to said first counter means counting to said first predetermined value, or a second operation for providing addresses to perform drawing a line including computing a parameter value upon the occurrence of a first counter means count and conditionally counting if said parameter value is greater than a preselected value, from said second initial value to said second



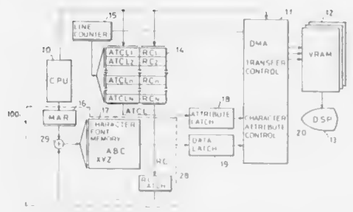
predetermined value, said first or second operation being specified by a signal from said processor.

4,837,564

DISPLAY CONTROL APPARATUS EMPLOYING BIT MAP METHOD

Shinji Ogawa, Sagamihara; Haruhiko Tsuchiya, Yokohama; Tsutomu Araki, Sagamihara; Hiroshi Aoki, Yokohama, and Hiroshi Yamamoto, Sagamihara, all of Japan, assignors to Panafacom Limited, Yamato, Japan

Continuation-in-part of Ser. No. 917,087, Sep. 17, 1986. This application Nov. 7, 1986, Ser. No. 928,005
Claims priority, application Japan, May 7, 1985, 60-96436
Int. Cl.[4] G09G 3/16
U.S. Cl. 340—750 **7 Claims**



1. A display control apparatus employing a bit map method, comprising:

display means for displaying data;

video data memory means, operatively connected to said display device, for storing display data to be displayed on said display device;

character font storage means for storing and outputting character font data corresponding to characters to be displayed on said display device;

character attribute storage means for storing and outputting character attribute data in units of transfer lines of the character font data;

direct memory access (DMA) transfer control means, operatively connected between said character attribute storage means and said video data memory means, for controlling a read operation of said character attribute storage means, so that the transfer lines of the character font data are transferred to and stored in said video data memory during a DMA transfer sequence;

character attribute control means, operatively connected to said character attribute storage means, said character font storage means and said DMA transfer control means, for processing and controlling the transfer lines of the character font data in response to said character attribute data output from said character attribute storage means; and

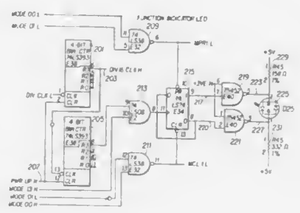
processing means, operatively connected to said character font storage means, said character attribute storage means, said DMA transfer control means and said character attribute control means, for controlling operations thereof.

4,837,565

TRI-STATE FUNCTION INDICATOR

Randall A. White, Plainville, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 13, 1987, Ser. No. 84,845
Int. Cl.[4] G05G 3/14
U.S. Cl. 340—762 **4 Claims**



1. A method of indicating a function status which can be one of three function states, comprising upon detecting a first state, lighting a bicolor LED with a first color; upon detecting a second state, lighting the LED with a second color; and upon detecting a third state, alternately lighting said LED with said first and said second colors at a sufficiently high rate to cause the color of said LED to appear as a third color, said function states being indicated by a 2 bit binary code and further include:

generating a first signal when both of said binary its are in a first binary state;

coupling said first signal to the preset input of a D type flip flop;

generating a second signal when a first of said binary signals is in a second state and a second of said binary signals is in said first state;

coupling said second signal to the clear input of the D type flip flop;

and generating a third signal when said second bit is in said second state;

providing a clock oscillator having a clock signal;

performing an And operation on said clock signal with said third signal;

providing said clock signal as the clock input to a flip flop;

coupling one of the outputs of said D type flip flop to its D input to alternate the outputs of the D type flip flop;

using said first signal to energize the first color of said LED;

using said second signal to energize the second color of said LED;

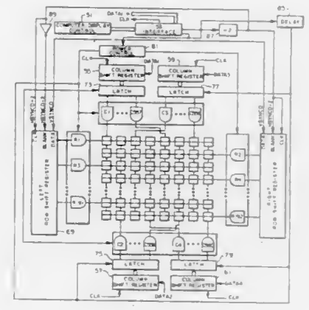
utilizing said third signal by triggering said D-type flip flop to generate an alternating signal to alternately energize said first and second colors in said LED.

4,837,566

DRIVE CIRCUIT FOR OPERATING ELECTROLUMINESCENT DISPLAY WITH ENHANCED CONTRAST

Dean A. Channing, St. Charles, and Lih W. Chiang, Waukegan, both of Ill., assignors to The Cherry Corporation, Waukegan, Ill.

Continuation of Ser. No. 755,200, Jul. 12, 1985, abandoned. This application Jan. 27, 1988, Ser. No. 148,107
Int. Cl.[4] G09G 3/30
U.S. Cl. 340—781 **18 Claims**



1. A D.C. electroluminescent display with enhanced contrast and brightness, comprising:

a plurality of conducting row and column electrodes disposed in an intersecting overlapping relation to form a matrix;

a plurality of phosphor pixel elements disposed between said row and column electrodes in conductive contact with said electrodes and adjacent to the points of intersection of said electrodes, each pixel having means for emitting light in response to a D.C, voltage which exceeds a defined threshold voltage;

means for sequentially scanning each one of said row electrodes with a first predefined energization row voltage and for applying a second predefined de-energization row voltage to the row electrodes which are not being scanned; and

means for applying a selected pattern of first column energization and second column de-energization voltages to said column electrodes for the scan of each row electrode, at least the first row or the first column energization voltages being greater than said threshold voltage, the pixels adjacent to intersecting scanned row electrodes and energized column electrodes lighting in response to a total energization voltage which exceeds said threshold voltage and which is defined by said first row energization and first column energization voltages;

all other pixels being unlighted in response to total voltages which are defined less than said threshold voltage by row and column voltages that include at least one of said de-energization voltages.

4,837,567

SECURITY SYSTEM FOR A MOTOR VEHICLE

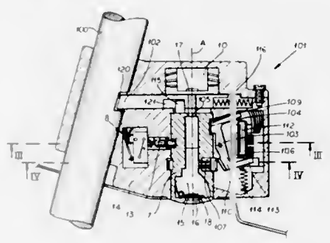
Frank Kleefeldt, Heiligenhaus; Horst Bruckmann, Velbert, and Peter Bartel, Hattingen, all of Fed. Rep. of Germany, assignors to Kiekert GmbH & Co. Kommandigesellschaft, Heiligenhaus, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 13,196, Feb. 9, 1987, abandoned, which is a continuation of Ser. No. 770,686, Aug. 29, 1985, abandoned. This application Sep. 15, 1987, Ser. No. 97,226

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1984, 3432064

Int. Cl.[4] G06F *7/04;* G08C *19/00*

U.S. Cl. 340—825.31 7 Claims



1. In a motor vehicle having a mechanical door latch and a rotatable steering column, a security system comprising:

a key formed with a laterally open recess and including transmitter means for emitting a coded signal;

means for receiving the signal and connected to the latch for unlocking a door secured thereby only when the coded signal is received;

a housing secured to the steering column;

a column bolt displaceable in the housing between a locking position preventing relative rotation between the column and the housing and a freeing position out of engagement with the column and with the column freely rotatable in the housing;

a barrel rotatable in the housing between end positions and formed with an axially open pocket generally complementary to the key and with a radially open latching recess;

means coupling the barrel to the bolt for displacement of the bolt between its locking and freeing positions on displacement of the barrel between its end positions;

means including a switch actuatable in one end position of the barrel for starting the vehicle;

a locking pin radially displaceable in the barrel and engageable into the pocket and into the recess of the key when same is fitted in the pocket;

a lever having one arm engageable in the recess of the barrel in the other of the barrel end positions and another arm engageable in this other barrel end position with the pin to push same into the pocket and into the recess of the key therein;

spring means for urging the lever into a normal position with the one arm engaged in the barrel recess and the other arm pulled away form the pin, whereby, in the normal position of the lever and the other barrel end position of the barrel, the barrel cannot rotate in the housing and the key can be moved axially out of the pocket;

solenoid means connected to the lever and energizable in the other barrel end position of the barrel for pulling the lever out of the normal position and thereby pulling the one arm out of the barrel recess and pushing the other arm against the pin to push same in turn into the key recess, whereby when the solenoid means is energized the barrel and key can turn in the housing but the key cannot be withdrawn axially from the barrel; and

means in the housing including a receiver and a decoder connected to the solenoid means for receiving the signal from the key in the pocket and for energizing the solenoid means only on receiving the signal.

4,837,568

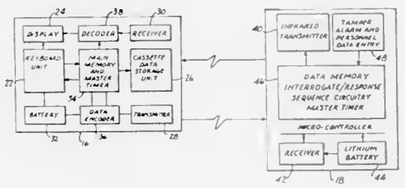
REMOTE ACCESS PERSONNEL IDENTIFICATION AND TRACKING SYSTEM

Alvin A. Snaper, 2800 Cameo Cir., La Vegas, Nev. 89107

Filed Jul. 8, 1987, Ser. No. 70,993

Int. Cl.[4] H04Q *7/00;* G08B *13/00*

U.S. Cl. 340—825.540 8 Claims



1. A personnel identification and security system comprising:

a remote personnel identification module to be worn by personnel, said programmable personnel identification module comprising:

means for storing identifying data in digital form;

means for entering or changing said identification data in said storing means;

means for transmitting said identifying data to a remote location for interrogation, processing and storage;

portable interrogating means for remotely interrogating said personnel identification module, said portable interrogating means comprising:

a portable hand-held infra-red transmitting and receiving means for transmitting data to or receiving data from said personnel identification module; said portable interrogating means being constructed to transmit data to said storing means in said personnel identification module to add to or update identification data stored in said personnel identification module;

processing means for processing identifying data received from said personnel identification module, said processing means including alarm means for alerting security personnel when any errors received in identifying data are detected; and

storage means for storing identifying data received;

whereby personnel identification and movements may be processed and stored anywhere within a secured area.

4,837,569

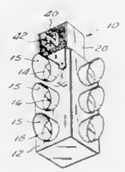
TRAFFIC SIGNAL DIRECTIONAL INDICATOR DEVICE

Fred C. Sproul, Sr., San Marcos, Calif., assignor to Fred C. Sproul, Sr., Patents, Inc., Irvine, Calif.

Filed Jun. 22, 1987, Ser. No. 64,386

Int. Cl.[4] G08G *1/095;* E01F *9/00*

U.S. Cl. 340—907 4 Claims



1. A traffic signal directional indicator device comprising:

a housing sized to be supported upon a traffic signal defining an enclosure;

a light source positioned within said enclosure;

a reflector positioned within said enclosure to direct said light source outwardly therefrom;

a planar element removably mounted to said housing and positioned outwardly from said light source;

indicia formed on said planar element representing a compass bearing direction; and

means formed on said housing for registering and mounting said housing to the traffic signal, said registering and mounting means comprising a planar extension from said housing sized to extend over a portion of the traffic signal; and

a recess on said planar extension formed in a complementary configuration to a lens shroud of the traffic signal.

4,837,570

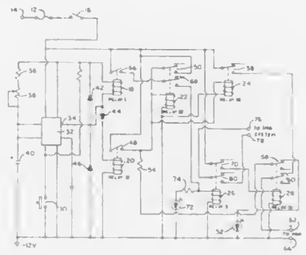
IGNITION DELAY VAPOR EXPULSION MODULE

Anthony J. Molfetta, 4 Prince Charming Rd., Nesconset, N.Y. 11767, and William H. Sawicki, 3258 Philip Ave., Bronx, N.Y. 10465

Filed Feb. 4, 1988, Ser. No. 152,162

Int. Cl.[4] G08B *23/00;* B63J *2/06*

U.S. Cl. 340—984 4 Claims



1. An ignition delay vapor expulsion module comprising a switching circuit for connection to an accessory power source, an accessory ventilating fan and an accessory ignition switch, such that when said switching circuit is activated, said ventilating fan is powered by said accessory power source for a predetermined time interval, after which said ventilating fan ceases to operate and said ignition switch is enabled, and indicating means for signalling the operation of said ventilating fan and the enabling of said ignition switch, wherein said switching circuit comprises an electronic timing device whose output is a zero when reset and whose output becomes a one at the end of some predetermined time interval; a first switching device that is activated only when said output is a one; a second switching device that is activated only when said output is a zero; a power switch that applies power to said module; a momentary contact activation switch that activates said electronic timer; a first latching/switching device energized by said second switching device; and a second latching/switching device energized by said first switching device; wherein after said power switch is turned on; and said activation switch is momentarily depressed, said second switch device causes said first latchings/switching device to energize said accessory ventilating fan and said fan signalling means; and wherein after said predetermined time interval said first switch device causes said second latching/switching device to enable said accessory ignition switch and means for signalling enabling of said ignition switch, while disabling said accessory ventilating fan and said fan signalling means.

4,837,571

CIRCUIT ARRANGEMENT FOR CONVERTING A DATA SIGNAL

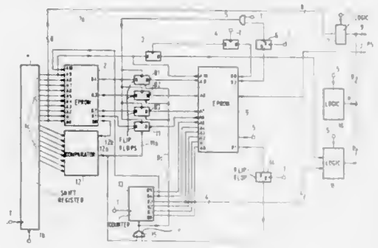
Georg Lutz, Heinersreuth, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 28, 1987, Ser. No. 101,914

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1986, 3632682

Int. Cl.[4] H03M *7/40*

U.S. Cl. 341—67 5 Claims



1. A circuit arrangement for converting a data signal having a constant bit rate and code words of varying length into an output signal having code words of constant length and a variable bit rate, the circuit arrangement comprising:

a. a first encoder, for recognizing the code words of the data signal and converting them into code words of equal length, comprising:

i. an output at which the code words of equal length are supplied;

ii. a shift register having

A. an input for receiving the data signal so that the data signal is shifted through the shift register; and

B. a plurality parallel outputs;

iii. a first memory having:

A. parallel inputs coupled with the parallel outputs of the shift register;

B. a first output, at which a signal is supplied when a uniform recognition of the code words of the data signal is not possible in the first memory;

C. a second output;

iv. a comparator having:

A. parallel inputs coupled with the parallel outputs of the shift register;

B. an enable input coupled with the output of the first memory, so that the comparator is enabled when the uniform recognition is not possible;

C. output means;

v. an intermediate memory, for receiving data from the first memory and from the comparator;

vi. a second memory having

A. a plurality of inputs for receiving data from data from the intermediate memory;

B. a clock output for supplying clock pulses for timing transferring data from the first memory and the comparator to the intermediate memory;

C. a second output for supplying reset pulses;

D. a plurality of further inputs;

E. a plurality of further outputs, for supplying control signals;

vii. a bit-clock controlled counter having a plurality of stages coupled with the further inputs of the second memory, the bit-clock controlled counter being reset by the reset pulses from the second output of the second memory;

viii. logic means for supplying code words of equal length to the output of the first encoder under control of the

control signals from the plurality of further outputs of the second memory;

b. a buffer memory coupled to receive the code words of equal length from the first encoder; and

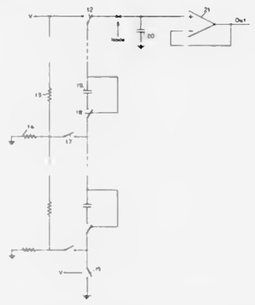
c. a second encoder for reading the buffer memory and having an output at which the output signal of the arrangement is provided.

4,837,572

DIGITAL-TO-ANALOG CONVERTER

Zdzislaw Gulczynski, P.O. Box 441, Winchester, Mass. 01890

Filed Jul. 20, 1987, Ser. No. 75,450
Int. Cl.[4] H03M 1/80
U.S. Cl. 341—150 **19 Claims**



1. Digital-to-analog converter for converting a input code consisting of bits each having first or second value, into an output signal, comprising:

a node with the output signal of the digital-to-analog converter appearing thereat;

a pair of reference signal sources;

a resistive means coupled to the reference signal sources for providing a plurality of reference voltages;

a terminating means having an output for coupling one of the reference signal source thereto; and

a plurality of capacitor/switch means coupled in series between the node and terminating means output, each being responsive to a respective bit, having a pair of terminals used for the serial coupling, including a capacitor, and being operative to apply a respective reference voltage to the capacitor, couple the capacitor across the terminals when the bit has the first value, and connect the terminals when the bit has the second value.

4,837,573

DIGITAL TO ANALOG CONVERTER

Douglas W. Brooks, Honeoye Falls, N.Y., assignor to Process Automation Business, Inc., Columbus, Ohio

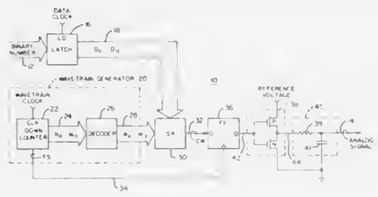
Filed Mar. 3, 1988, Ser. No. 164,657
Int. Cl.[4] H03M 1/82
U.S. Cl. 341—152 **21 Claims**

1. A circuit for converting a binary number having bits, D_0 to D_n, to an output signal having a proportionally equivalent characteristic, said circuit comprising

a parallel input for receiving each bit, D_0 to D_n, of the binary number;

means for generating wavetrains, W_0 to W_n, having frequencies decreasing by powers of two from the least significant wavetrain, W_0, to the most significant wavetrain, W_n, each of said wavetrains comprising pulses having a pulse width equal to the inverse of twice the frequency of the least significant wavetrain, W_0, so that the duty cycle of each of said wavetrains is proportional to the corresponding frequency thereof, and the pulses of each of said wavetrains are nonoverlapping with the pulses of others of said wavetrains;

logic means, connected to said input and said generating means, for logically multiplying each of said wavetrains taken in an order from the least significant to the most significant, W_0 to W_n, by a corresponding bit of the binary number taken in a reverse order from the most significant to the least significant, D_n to D_0, and logically summing



all the products of each, the sum thereof being a composite waveform; and,

output means, connected to said logic means, for receiving said composite waveform and for providing said output signal, in response thereto;

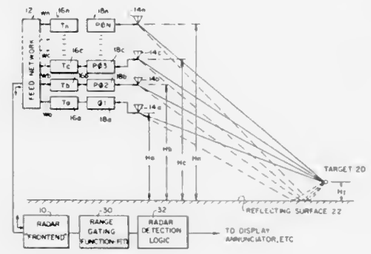
whereby, said composite waveform has an amplitude equal to that of the pulses of said wavetrains and a duty cycle proportionally equivalent to the binary number.

4,837,574

NEAR-FIELD MONOSTATIC INTRUSION DETECTION SYSTEM

Robert V. Hill, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 17, 1987, Ser. No. 39,232
Int. Cl.[4] G01S 13/04, 15/04
U.S. Cl. 342—27 **32 Claims**



1. A near-field object-detection system, comprising:

a plurality of monostatic transducers for radiating and receiving direct and reflected non-parallel signals in a near field, said monostatic transducers being disposed in a vertically-spaced relationship such that signals from each said monostatic transducer follow a direct path to an object to be detected and a reflected path to said object to be detected, said reflected path including a path to a surface below said object and a path from said surface to said object; and

means for receiving signals from each of said monostatic devices and identifying objects in said near field therefrom;

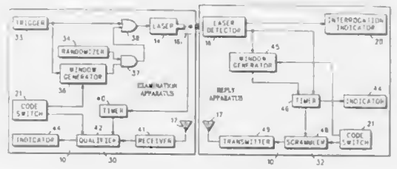
wherein the heights of said monostatic devices are such that constructive interference occurs between the direct path signal and the reflected path signal of each said device, said constructive interference occurring at a different distance for each of said monostatic devices.

4,837,575

IDENTIFICATION SYSTEM

Leo B. Conner, Jr., Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 820,398, Nov. 4, 1985, abandoned. This application Nov. 14, 1988, Ser. No. 271,402
Int. Cl.[4] G01S 13/80
U.S. Cl. 342—45 **20 Claims**



1. A battlefield identification system comprising:

an interrogator including laser transmission means for producing convergent coded interrogation pulses during a random time period to selectively interrogate one target of a plurality of targets and said interrogator receiver means for receiving a reply signal;

the interrogating pulses of said interrogator being aimed in a predetermined direction;

means, coupled to said laser transmission means, for randomizing a period of time between a first one of the interrogation pulses and a second one of the interrogation pulses;

a target including diode detector means for detecting said interrogation pulses, said diode detector means being located periodically about said target of detecting the interrogation pulses produced by the laser transmission means of said interrogator;

means, coupled to said diode detector means of said target, for measuring said random time period between successive interrogation pulses of said laser transmission means of said interrogator;

first memory means coupled to said means for measuring, said first memory means operating to produce predetermined random numbers, for controlling the frequency, pulse width and transmission delay parameters of said reply signal;

transmitter means coupled to said measuring means and to said first memory means, said transmitter means being for transmitting said reply signal so that the reply signal exhibits said frequency, pulse width and transmission delay parameters determined by said random time period between said successive interrogation pulses and by said random numbers;

said receiver means operating to receive said reply signal from said transmitter means;

second memory means operating to produce said predetermined random numbers for controlling said frequency, pulse width and transmission delay parameters of said reply signal;

qualifier means, coupled to said receiver means and to said second memory means, for generating an expected frequency, pulse width and transmission delay parameters of said reply signal; and

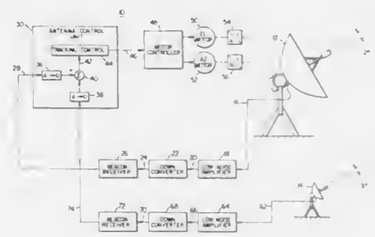
means, coupled to said qualified means, for indicating whether said reply signal conforms to said expected frequency, pulse width and transmission delay.

4,837,576

ANTENNA TRACKING SYSTEM

Helmut E. Schwarz, Satellite Beach, Fla., assignor to Electrospace Systems, Inc., Richardson, Tex.

Filed Nov. 16, 1984, Ser. No. 672,579
Int. Cl.[4] G01S 13/66
U.S. Cl. 342—77 **4 Claims**



1. An antenna system for tracking a moving signal source, comprising:

a primary tracking antenna having a narrow beam width for receiving a primary signal from said moving signal source, said primary signal including a tracking pattern component and a noise component resulting from atmospheric conditions and signal source variations;

a secondary antenna having a beam width wider than said narrow beam width for receiving a secondary signal comprising said noise component but substantially none of said tracking pattern component;

first means connected to said primary antenna for producing a first signal strength signal derived from said primary signal;

second means connected to said secondary antenna for producing a second signal strength signal derived from said secondary signal;

means for subtracting said second signal strength signal, which essentially comprises said noise component, from said first signal strength signal, which includes both said noise component and said tracking component, to produce a tracking signal which comprises said first signal strength signal having the noise component thereof substantially removed therefrom; and

means for directing said primary tracking antenna in azimuth and elevation in response to a predetermined tracking pattern and to said tracking signal.

4,837,577

METHOD FOR STABILIZING AN ELECTRONICALLY STEERED MONOPULSE ANTENNA

Theadore J. Peregrim, Bedford; Frank A. Okurowski, Concord, and Rosario Mangiapane, Chelmsford, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 16, 1988, Ser. No. 194,618
Int. Cl.[4] G01S 13/44, 13/89
U.S. Cl. 342—80 **4 Claims**

1. A method of forming a compensated sum signal, a compensated azimuthal difference signal, and and a compensated elevation difference signal to electronically stabilize a beam from a monopulse antenna carried in a moving body, such beam being electronically steerable in a first direction and a second direction in a first coordinate system relatively to the monopulse antenna to coincide with a line fixed in relation to a second coordinate system, such monopulse antenna producing a sum signal, an azimuthal difference signal, and an elevation difference signal, the method comprising the steps of:

(a) electronically steering the beam in the first direction and the second direction an amount sufficient to compensate for motion of the moving body in the first direction;

(b) using the sum signal as the compensated sum signal;
(c) computing a plurality of coefficients relating:
(i) deviations of the line relative to the second coordinate system expressed in terms of the second coordinate system; and
(ii) deviations of the line relative to the second coordinate

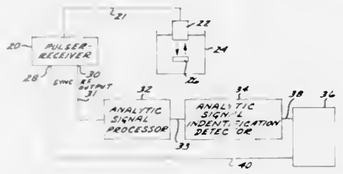
system expressed in terms of the first coordinate system; and
(d) forming a compensated azimuthal difference signal and a compensated elevation difference signal by adding the azimuthal difference signal and elevational difference signal each weighted by a combination of the plurality of coefficients.

4,837,578

APPARATUS AND METHOD FOR RANGE DETECTION USING THE ANALYTIC SIGNAL IDENTIFIED FROM THE RECEIVED SIGNAL

Paul M. Gammell, Altadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Oct. 29, 1981, Ser. No. 316,145
Int. Cl.[4] G01S *11/00, 13/10;* **G01N** *22/02, 29/04*
U.S. Cl. 342—194 **28 Claims**



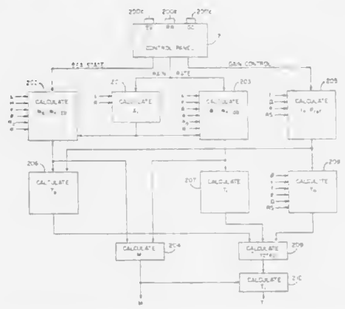
1. A pulse-echo or passive listening response system for indentifying one or more closely spaced interfaces of a target wherein an unprocessed signal is received by the system's receiver either after a pulsed signal from the system has struck the target and has been reflected by one or more of the target's interfaces, or by passive reception, wherein the response system is characterized by the received signal being a multi-frequency signal which occupies a given bandwidth, which received signal is then processed by said system to identify a particular portion of the processed signal which is useful for locating the target interface (s), the system comprising:
(1) a signal receiving means at the system's receiver for receiving said unprocessed signal, which received signal contains information proportional to the rate of arrival of energy at the receiver and is indicative of the location of said target's interface (s);
(2) a signal processing means, connected to said signal receiving means, for processing said received unprocessed signal by a constant phase-shift while leaving the relative amplitude of all phase-shifted frequency components of the multi-frequency signal unchanged and to produce therefrom a pair of signals which together represent the complete complex analytic signal from which the location of the target interface(s) can be identified; said signal processing means comprising:
(a) a signal separation means connected to receive said unprocessed signal for separating said received signal into two signals in two channels;
(b) phase shifting means connected to receive both of said separated signals in said channels for subjecting the signal in each channel to a constant phase shift (i.e., a phase shift which is the same for all frequency components in that channel), the constant phase shift differing between the two channels by 90 degrees and therefore resulting in the processed signals of the two channels being Hilbert transforms of each other; and
(3) means forming a representation of said analytic signal from said processed signal in order to identify said particular portion from the representation whereby the target interface(S) may be located.

4,837,579

PULSE RADAR THRESHOLD GENERATOR

William M. Pease, Weston, and William M. Hall, Lexington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jan. 27, 1986, Ser. No. 823,166
Int. Cl.[4] G01S *7/34, 13/95*
U.S. Cl. 342—197 **12 Claims**



1. A pulse radar threshold generator for a marine radar system, comprising:
means for providing a signal corresponding to observable environmental conditions;
means responsive to said signal and predetermined radar parameters for calculating digital threshold values for a plurality of successive ranges as a function of clutter probability at said ranges, said calculation being independent of measurements of radar return data for said ranges; and
means responsive to said calculated digital threshold values for generating a range dependent analog threshold voltage.

4,837,580

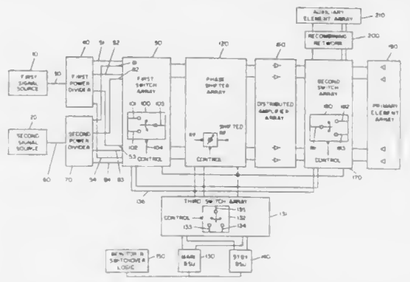
MICROWAVE LANDING SYSTEM WITH FAIL-SOFT SWITCHING OF DUAL TRANSMITTERS, BEAM STEERING AND SECTOR ANTENNAS

Richard F. Frazita, St. James, N.Y., assignor to Hazeltine Corporation, Greenlawn, N.Y.

Filed May 14, 1987, Ser. No. 49,741
Int. Cl.[4] H01Q *3/02, 3/12*
U.S. Cl. 342—374 **37 Claims**

1. An antenna system for radiating wave energy signals into a selected region of space and in a desired radiation pattern, said system comprising:

(a) an aperture comprising an array of antenna elements;
(b) first means for supplying a plurality of first wave energy signals;
(c) second means, independent of said first means, for supplying a like plurality of second wave energy signals substantially the same as said first wave energy signals;



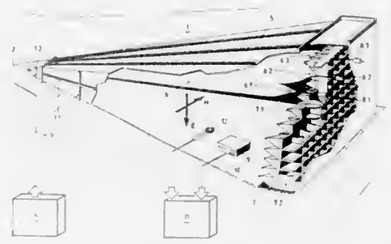
(d) third means for selectively coupling either said plurality of first wave energy signals or said plurality of second wave energy signals to the antenna elements; and
(e) fourth means for scanning a beam radiated by the array in accordance with a predetermined pattern, said beam resulting from the supplied wave energy signals coupled to the antenna elements.

4,837,581

DEVICE FOR THE EMI TESTING OF ELECTRONIC SYSTEMS

Diethard Hansen, Berikon, and Dietrich Königstein, Dättwil, both of Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland

Filed May 11, 1987, Ser. No. 48,647
Claims priority, application Switzerland, May 20, 1986, 2026/86
Int. Cl.[4] H01Q *17/00;* **G01R** *31/00*
U.S. Cl. 343—703 **9 Claims**



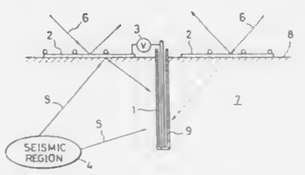
1. A device for the EMI testing of electronic systems having a TEM waveguide (1), which opens out in a pyramid shape and which is terminated by a wall (7) of high-frequency peak absorbers (7.1) and which exhibits an asymmetrically disposed, plate-shaped inner line (6), which is connected to a number of terminal resistors (8.1, 8.2, 8.3) through the absorber wall (7), wherein the TEM waveguide (1) exhibits a closed outer line (5), wherein the absorber wall (7) is curved in the manner of a spherical segment, and wherein the center of curvature is situated in the region of the tip (2) of the pyramid-shaped TEM waveguide (1).

4,837,582

METHOD AND APPARATUS FOR DETECTING ELECTROMAGNETIC WAVES GENERATED BY THE EARTH'S CRUST UNDER STRAIN

Kozo Takahashi; Yoshihisa Masuda, and Hisao Inuki, all of Tokyo, Japan, assignors to Communications Research Laboratory and Ministry of Posts and Telecommunications, both of Tokyo, Japan

Filed Dec. 29, 1987, Ser. No. 138,947
Claims priority, application Japan, Jan. 27, 1987, 62-15177
Int. Cl.[4] H01Q *1/04*
U.S. Cl. 343—719 **18 Claims**



1. A method for detecting pre-earthquake electromagnetic waves comprising the steps of:
using a monopole antenna comprising a linear element formed of a conductive material having a length equal to approximately one quarter of the wavelength of the electromagnetic waves to be received and a reflector composed of one or more conductive elements and having a reflection diameter larger than the length of said linear element,
placing said linear element to extend vertically within the earth,
placing said reflector on the surface of the earth so that a center thereof is at said linear element, thereby substantially preventing external electromagnetic waves above the earth from passing into the earth and reflecting internal electromagnetic waves from within the earth onto said linear element to increase an intensity ratio of the internal electromagnetic waves to the external electromagnetic waves received by said linear element, and
connecting a receiver for detecting the electromagnetic waves reaching said linear element between said linear element and said reflector.

4,837,583

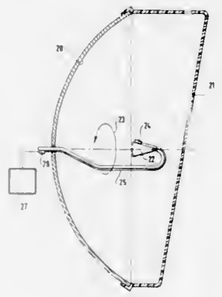
DEVICE FOR ADJUSTING THE POLARIZATION OF AN ANTENNA AND A METHOD FOR THE PRACTICAL APPLICATION OF SAID DEVICE

René Chevallier, Paris, and Jean Fouillet, Mesnil Le Roi, both of France, assignors to Alcatel Thomson Faisceaux Hertziens, France

Filed Feb. 18, 1987, Ser. No. 16,161
Claims priority, application France, Feb. 18, 1986, 86 02170
Int. Cl.[4] H01Q *3/12*
U.S. Cl. 343—760 **3 Claims**

1. An adjusting device for adjusting the polarization of a rotatable-feed antenna having a front and a rear with respect to a reference plane, said adjusting device including an angular position detecting means located near a feed horn aperture at the front of the antenna for indicating a desired angular position of said feed horn, wherein said angular position detecting means is a tilting mercury switch having a mass of mercury selectively bridging spaced contacts defining outputs, said tilting switch being rigidly fixed to the feed horn, and wherein said adjusting device further includes a connector located at the rear of the antenna in a zone which is accessible for adjustment and a multiple-conductor cable electrically connecting said contact outputs of said tilting mercury switch and the connector in order to electrically connect the angular position

detecting means to a visual display device to facilitate adjustment of the feed horn to said desired angular position, the



polarization of said antenna depending upon the angular position of the feed horn which is inaccessible materially and/or visually.

4,837,584

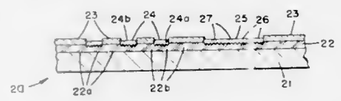
SECURITY TIME CLOCK SYSTEM

Richard B. Sharkey, New York, and Robert T. Emerson, Manhasset, both of N.Y., assignors to Leedal Products, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 51,510, May 8, 1987, abandoned. This application Jan. 4, 1988, Ser. No. 140,567

Int. Cl.[4] G01D *9/00*

U.S. Cl. 346—1.1 **23 Claims**



1. A method for applying multiple-color written indicia and automatically-printed indicia to a record sheet and for correlating the time period during which said different indicia must be applied to said record sheet, comprising the steps of (a) providing a predetermined area of the printing surface of the record sheet with a discontinuous dry coating comprising spaced first areas containing a reactive first color-forming receptor chemical and interposed spaced second areas which are free of said color-forming receptor chemical; (b) automatically wetting said predetermined area with a liquid color-permitting composition which remains liquid on said area for a limited time period; (c) automatically printing indicia on a predetermined area of said record sheet associated with said wetted area of said record sheet using a printing liquid, and (d) applying written indicia to said wetted area while said color-permitting material is still liquid, using a writing liquid containing (1) at least one reactive first color-forming donor chemical which is capable of developing written indicia portions of a first predetermined color upon reaction with the said color-forming first receptor chemical in said first areas in the presence of said liquid color-permitting composition and (2) a color-producing material which is capable of producing written indicia portions of a second predetermined color upon contact with the interposed spaced second areas of the discontinuous dry coating of the record sheet in the presence of said liquid color-permitting composition, whereby said writing liquid forms multiple-color written indicia on said discontinuous dry coating.

4,837,585

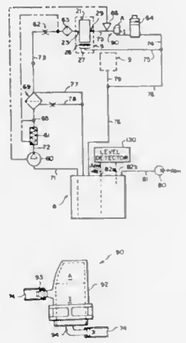
CONTINUOUS INK JET PRINTER HAVING IMPROVED SYSTEM FOR REDUCING PRESSURE VARIATIONS

Theodore F. Williams, Dayton; James A. Katerberg, Kettering, both of Ohio; Lawrence R. Young, West Lebanon, N.H., and James D. Isaacson, Denver, Colo., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 25, 1988, Ser. No. 185,738

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—75 **8 Claims**



1. In continuous ink jet printers of the kind having: (i) print head means, including an ink cavity, an ink inlet and outlet to said cavity and an orifice plate coupled to said cavity, and (ii) an ink circulation system having an ink supply conduit for supplying ink under pressure to said cavity inlet and an ink return conduit for receiving ink from said cavity outlet, a damping system construction for reducing ink pressure transients within said print head means, comprising:

(a) chamber means mounted in said printer for enclosing ink and a damping gas in a gas-over-ink disposition;

(b) means for coupling the enclosed interior of said chamber means to said ink return conduit at a location such that ink pressure transients occuring within said print head means are attenuated by gas in said chamber; and

(c) means for periodically introducing gas into said ink return conduit upstream of said chamber means.

4,837,586

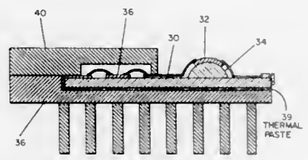
IMAGE CONTRAST BY THERMAL PRINTERS

Scott A. Brownstein, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 28, 1988, Ser. No. 149,253

Int. Cl.[4] B41S *3/20*

U.S. Cl. 346—76 PH **1 Claim**



1. A print head for a continuous tone thermal printer comprising:

(a) an aluminum heat sink;

(b) a ceramic substrate having first and second surfaces;

(c) heaters mounted on the substrate first surface;

(d) a thermal paste providing a thermal interface between the heat sink and the second surface of the ceramic substrate; and

(e) the thermal paste having a thermal resistance, of less than about 0.6° C./Watt which will cause the contrast of a thermal print produced by this head to be improved by reducing both average print head temperature and lateral heat transfer between adjacent heaters.

4,837,587

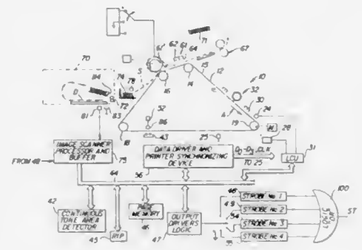
NON-IMPACT PRINTER WITH NONUNIFORMITY CORRECTION

Yee S. Ng, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 31, 1987, Ser. No. 140,193

Int. Cl.[4] G01D *9/42*

U.S. Cl. 346—108 **2 Claims**



1. Apparatus for printing information, comprising:

a printhead having a plurality of dot-like printing elements for recording on a recording member;

means for moving the recording member relative the printhead;

means for activating particular printing elements in accordance with recording data related to the information to be printed to reproduce the data;

means for compensating for the nonuniform output of some of the activated printing elements by further activating such some of the activated printing elements requiring compensation with additional activations that are provided at times both immediately before and after a respective data activation to provide for relatively symmetrical dot-like image elements wherein a compensation activation immediately before a data activation is of different duration than the one immediately after the data activation; and

wherein the means for activating particular printing elements further includes a plurality of strobe lines, means connecting each printing element with only one of the strobe lines and means for providing different compensation signals on the strobe lines so that printing elements connected to one strobe line are compensated differently from printing elements connected to other strobe lines.

4,837,588

SYNCHRONIZING SIGNAL GENERATING SYSTEM FOR LASER SCANNER

Susumu Imakawa, Yokohama, and Yoshinobu Takeyama, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 4, 1988, Ser. No. 190,069

Claims priority, application Japan, May 8, 1987, 62-112035; May 8, 1987, 62-112034; Oct. 9, 1987, 62-155325; Oct. 13, 1987, 62-257949; Dec. 4, 1987, 62-307117; Dec. 4, 1987, 62-307118

Int. Cl.[4] G01D *9/42;* **H01J** *3/14, 5/16*

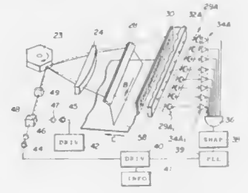
U.S. Cl. 346—108 **52 Claims**

1. A synchronizing signal generating system for a laser scanner, said synchronizing signal generating system comprising:

first means for emitting a first laser beam for scanning and a second laser beam for synchronization of scans by said first laser beam;

second means for scanning a medium by said first laser beam;

third means for scanning a grating by said second laser beam, said grating having bright portions and dark portions alternately arranged along a scanning direction of said second laser beam;



a converging optical system for converging said second laser beam transmitted through said grating;

a light receiving system for receiving said second laser beam converged by said converting optical system and for generating a synchronizing signal; and

fourth means for controlling said first means responsive to said synchronizing signal so as to synchronize a scan timing of said first laser beam,

said converging optical system comprising a plurality of lenses provided for a length corresponding to a scan length of said second laser beam on said grating.

4,837,589

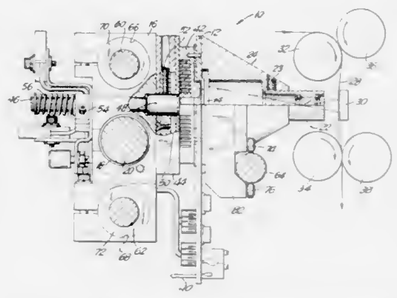
NON-CONTACT LED-ARRAY IMAGE PRINTER

Dennis W. Dodge, Amherst, N.H., assignor to Itek Graphix Corp., Waltham, Mass.

Filed Oct. 23, 1987, Ser. No. 112,913

Int. Cl.[4] G01D *9/42*

U.S. Cl. 346—108 **16 Claims**



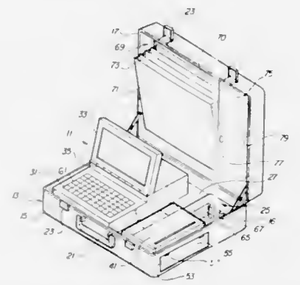
1. A non-contact LED-array printer for imaging on a photosensitive medium comprising:

an integrated circuit substrate bearing an LED-array and an interface circuit electrically connected to said array for controlling the activation of each light emitting diode in said array;

a drive carriage for transporting said integrated circuit substrate across the photosensitive medium perpendicular to the direction of travel of the photosensitive medium to allow said LED-array to scan the photosensitive medium, said carriage including,

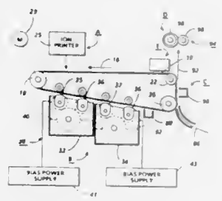
(i) a substrate support base for supporting said substrate, said base having a threaded aperture therethrough parallel to the direction scan, said substrate support base also having at least one guide rail aperture therethrough parallel to the direction of scan;
(ii) a motor driven threaded lead screw engaging said threaded aperture, such that said support base and said substrate scan across the photosensitive medium as said lead screw is driven;
(iii) at least one guide rail parallel to said threaded lead screw engaging said guide rail aperture;
an exposure platen defining an exposure image plane parallel to the direction of scan of said substrate;
photosensitive drive means for driving the photosensitive medium across said exposure platen with the unsensitized surface thereof biased against said platen and with the sensitized surface thereof in spaced facing relationship to said integrated circuit substrate.

4,837,590
PORTABLE COMPUTER AND CARRYING CASE FOR MOBILE OFFICE
Glenn R. Sprague, 33935 Nine Mile Rd., Farmington Hills, Mich. 48024
Filed May 3, 1988, Ser. No. 189,860
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—145 **11 Claims**



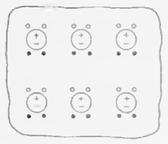
1. A mobile office comprising a carrying case having a hollow rectangular base and a hollow cover hingedly connected thereto;
a rectangular first platform positioned within a first portion of said base and anchored therein;
a lap-top computer mounted upon and anchored to said first platform adapted for connection to an electric power source;
said computer including a horizontal video display screen hinged thereto, normally enclosed within the profile of said cover when closed and pivotal to an upright use position when said cover is open;
a rectangular second platform arranged laterally of and elevated relative to said first platform, positioned within a second portion of said base and anchored therein;
said second platform being spaced from the bottom of said base defining a paper storage chamber below said second platform;
an electronic printer mounted upon and anchored to said second platform and connected to said computer; and
a stack of tractor feed manifold paper within said storage chamber with its lead edge threaded into said printer.

4,837,591
HIGHLIGHT COLOR IMAGING BY DEPOSITING POSITIVE AND NEGATIVE IONS ON A SUBSTRATE
Christopher Snelling, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed May 2, 1988, Ser. No. 189,498
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—159 **10 Claims**



1. Apparatus for depositing ions on a charge receptor, said apparatus comprising:
means for generating positive and negative ions;
means for selectively effecting extraction of positive or negative ions from said generating means and depositing them on a charge receptor, said means for selectively effecting extraction of positive or negative ions effecting extraction of positive and negative ions in image configuration to thereby form positive and negative images on said receptor; and
means for developing images formed by said positive ions with a first type of toner; and
means for developing images formed by said negative ions with a second type of toner.

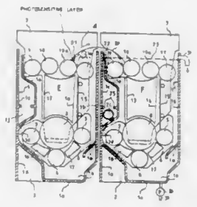
4,837,592
METHOD OF MAKING AN ELECTROCHROMIC LAYER AND NEW ELECTROCHROMIC DEVICE MADE THEREFROM
Hulya Demiryont, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Dec. 24, 1987, Ser. No. 137,630
Int. Cl.[4] G02F *1/01, 1/17*
U.S. Cl. 350—357 **22 Claims**



1. An electrochromic device which comprises:
a first electrode;
a second electrode;
an electrochromic layer between said first and said second electrodes comprising:
an inorganic based solid material supporting electrochromic particles and ion producing particles in fixed but generally distributed positions therewithin, said solid material permitting migration of ions produced by said ion producing particles to and from said electrochromic particles upon change in voltage between said first and second electrodes, said solid bulk material also prohibiting the passage of electrons therethrough when a voltage is applied between said first electrode and said second electrode,

whereby an electric field is built up between said first and second electrodes which causes migration of said ions.

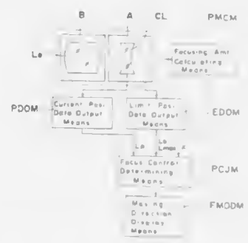
4,837,593
APPARATUS FOR WET TREATMENT OF PHOTOSENSITIVE MATERIAL
Wilfried Hehn, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Apr. 21, 1987, Ser. No. 40,852
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1986, 3614253
Int. Cl.[4] G03D *3/02, 3/13*
U.S. Cl. 354—322 **12 Claims**



1. Apparatus for wet treatment of photosensitive material, comprising a first vessel for a first body of liquid; a second vessel for a second body of liquid; means for conveying the photosensitive material in a predetermined direction along a predetermined path having a first portion in the first vessel and a second portion in the second vessel, comprising a plurality of parallel rollers in said second vessel, comprising a plurality of parallel rollers in said second vessel; a source of liquid medium whose composition matches or approximates that of the second body of liquid, including a tank provided in said second vessel and having an upper portion and an enlarged lower portion; and means for directing the liquid medium against the photosensitive material downstream of the first portion and not later than in the second portion of said path, including a plurality of orifices provided in said upper portion and arranged to spray the liquid medium against the photosensitive material, said source further comprising a pipe arranged to deliver liquid medium into said lower portion and extending in substantial parallelism with said rollers.

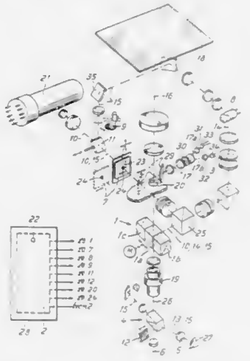
4,837,594
AUTOMATIC FOCUSING DEVICE AND AUTOMATIC EXPOSURE CONTROL DEVICE
Akiyoshi Nakamura; Makoto Ando, both of Sakai; Shuji Ogino, Kawachinagano, and Nobuyuki Taniguchi, Nishinomiya, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Division of Ser. No. 893,363, Aug. 4, 1986, Pat. No. 4,728,980.
This application Feb. 25, 1988, Ser. No. 160,407
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—402 **1 Claim**

1. An automatic focusing device which comprises:
a defocus amount detecting means for detecting a defocus amount attributable to a first optical system of an interchangeable lens assembly and a second optical system of an AF convertor;
a focal length data outputting means for outputting focal length data representative of the focal length of the second optical system;
a converting means for converting said defocus amount, taken into consideration with the focal length data, into data corresponding to a focusing amount of the second optical system which varies in non-linear relationship to said defocus amount; and



an optical drive means for moving the second optical system on the basis of the data representative of the focusing amount supplied from the converting means.

4,837,595
PROCESS AND DEVICE FOR PHOTOGRAPHING MICROSCOPIC OBJECTS
Herbert Leiter, Wetzlar; Herbert Koch, Biebertal; Andreas Hund, Wetzlar, and Guenter Reinheimer, Biebertal, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany
PCT No. PCT/DE87/00237, § 371 Date Mar. 9, 1988, § 102(e) Date Mar. 9, 1988, PCT Pub. No. WO88/00714, PCT Pub. Date Jan. 28, 1988
PCT Filed May 23, 1987, Ser. No. 163,823
Claims priority, application Fed. Rep. of Germany, Jul. 12, 1986, 3623615; Aug. 12, 1986, 3627354
Int. Cl.[4] G03B *7/08, 17/48*
U.S. Cl. 354—412 **16 Claims**



1. A process for photographing microscopic objects with consideration of exposure time values to be determined as well as for making visible a spatial variable measurement spot and an exposure format marking before and after the exposure, wherein a beam splitter system (**1**), which is disposed so as to be transversely displaceable in the photographic beam path (**16**) and which exhibits splitter surfaces of differeing transmission/reflection ratios (**1***b*;**1***c*) and, in addition, a full-mirror-coating surface (**1***a*), a rotary mirror (**11**) disposed in the measurement beam path (**10**) in front of the light receiver (**21**) as well as a dark flap (**9**) disposed in the illumination beam path (**15**) are driven and positioned, in order to produce microphotographic exposures with shortened and stored exposure times,

with execution of a spot measurement by means of the spatially variable measurement spot, according to the following process steps:

(a) the beam splitter system (1) is positioned in the optical microscope axis (26) in such a manner that the full-mirror-coating surface of the glass cube (1a) in the diagonal position deflects the illumination beam paths (14 and 15 respectively) via the photographic eyepiece (19) into the microscope eyepiece (5);

(b) after setting of the image sharpness, selection of the image section of the object (6) and positioning of the spatially variable detail measurement diaphragm (24) by the observer (27) in the working position, there takes place an

(c) actuation of a release key (22) on a control unit (28), whereby the following functions are initiated:

(c1) a lamp (8) is extinguished;

(c2) a dark flap (9) pivots into the illumination beam path (15);

(c3) the rotary mirror (11) pivots out of the measurement beam path (10);

(c4) a dark flap (12) in the observation beam path (13) swings into the working position;

(c5) the light receiver (21) measures the light falling through the detail measurement diaphragm (24), and the value measured by the light receiver (21) is then passed to an exposure control system (2) and stored;

(c6) the beam splitter system (1) is now positioned in such a manner that the beam splitter cube (1c) passes with that splitter surface in the diagonal position transversely to the optical microscope axis (26) which exhibits a transmission/reflection ratio of 9/1;

(c7) the exposure control system (2) opens the shutter (20), depending upon the respective y stored value, for an exposure of an image recording medium disposed in the plane (18), for example a film;

(c8) following completion of exposure and blocking of the shutter (20) for the further passage of the photographic beam path (16), the beam splitter system (1) is again guided back into the initial position—i.e. the glass cube (1a) in the working position—the lamp (8) being simultaneously switched on, the dark flaps (9 and 12, respectively) being switched out, the rotary mirror (11) being pivoted into the measurement beam path (10), and the image recording medium being further transported.

4,837,596

INFORMATION SET DEVICE FOR CAMERA

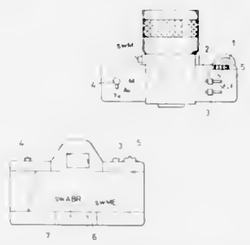
Masaharu Kawamura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1987, Ser. No. 79,134

Claims priority, application Japan, Aug. 1, 1986, 179855; Apr. 14, 1987, 62-4969

Int. Cl.[4] G03B *7/097, 17/00, 17/08*

U.S. Cl. 354—442 **9 Claims**



1. An information setting device for a camera, comprising:

(a) a mode setting operation member for setting a manual mode;

(b) a first operation member;

(c) an information setting operation

(d) an information setting circuit, said information setting circuit setting, when the manual mode is set by said mode setting operation member, one of time value and aperture value information in response to the operation of said information setting operation member while said first operation member is in an operative state, and wherein said information setting circuit sets the other of the time value and aperture value information, in response to the operation of said information setting operation member while said first operation member is in an inoperative state.

7. An information setting device for a camera, comprising:

(a) a housing portion comprising:

a cover; and

a built-in first operation member for setting a special-mode by generating a special mode signal when said first operation member is in an operational state, wherein the generation of the special mode signal is cancelled when the operational state of said first operation member is cancelled;

(b) a latch-circuit for latching the special mode signal;

(c) an information setting operation member provided outside of said housing portion, for generating photographing information;

(d) a first memory circuit for memorizing preset information relating to a shutter speed and an aperture value to control the exposure;

(e) a second memory circuit for memorizing information relating to the special mode;

(f) a selection circuit which selects said second memory circuit to receive the information generated by the operation of said information setting operation member when said latch circuit is in a latch state for latching the said special mode signal and which selects said first memory circuit to receive the information generated by the operation of said information setting operation member when said latch circuit is not in the latch state for latching said special mode signal; and

(g) an outside operation member provided outside of said housing portion, for canceling the special mode signal latched by said latch circuit.

4,837,597

METHOD AND APPARATUS APPLICABLE TO MULTICOLOR DEVELOPING DEVICE FOR DETECTING IMAGE DENSITY

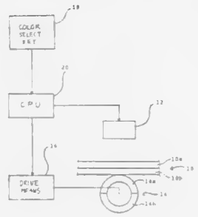
Takashi Bisaiji, Yokobama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 15, 1988, Ser. No. 168,235

Claims priority, application Japan, Mar. 19, 1987, 62-64595

Int. Cl.[4] G03G *21/00*

U.S. Cl. 355—203 **13 Claims**



6. An apparatus for detecting the density of an image which is developed in multiple colors, comprising:

an image carrier in a non-image region of which a latent image representative of an exclusive pattern for density detection is formed and developed by toner of any of said multiple colors to become a toner image for density detection;

a photosensor located above a face of said image carrier for emitting light toward said toner image and sensing light reflected by said toner image;

a light absorbing body located below and in contact with a back of said image carrier and constituted by a plurality of absorbing members each having a predetermined absorption characteristic;

drive means for driving said light absorbing body to selectively move said absorbing members to a position to which said light is to become incident; and

control means for controlling said drive means such that one of said absorbing members which is associated with a spectral reflectivity characteristic of the color of said toner image is moved to said position.

4,837,598

IMAGE ERASING APPARATUS

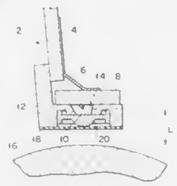
Hidetaka Nonami, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 29, 1988, Ser. No. 150,256

Claims priority, application Japan, Jan. 31, 1987, 62-21031

Int. Cl.[4] G03G *15/00, 15/048*

U.S. Cl. 355—218 **8 Claims**



1. An image erasing apparatus for erasing an image on an image carrier of a copying machine, comprising:

a base including a surface facing said image carrier;

a plurality of light-emitting elements formed, at a predetermined pitch, on the surface of said base;

casing means for independently covering said plurality of light-emitting elements, said casing including a plurality of windows for guiding light emitted from said plurality of light-emitting elements onto said image carrier, and gaps respectively formed between said light-emitting elements and said windows; and

dustproof means, arranged to cover said windows and to transmit therethrough light emitted from said light-emitting elements, for preventing dust from entering said casing means through said windows.

4,837,599

COPYING APPARATUS HAVING AN EDITING FUNCTION

Tadashi Ohira, Toyokawa; Masazumi Ito, Toyohashi, and Syuzi Maruta, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 1, 1987, Ser. No. 71,710

Claims priority, application Japan, Jul. 5, 1986, 61-158186

Int. Cl.[4] G03G *15/052*

U.S. Cl. 355—7 **6 Claims**

1. A copying apparatus capable of copying a desired region of a document, comprising:

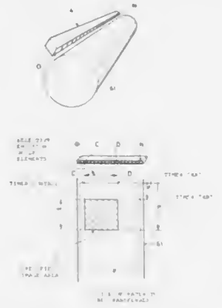
a rotating photoconductor,

means for charging said photoconductor in advance,

means for projecting an image of the document of said charged photoconductor to form an electrostatic latent image on said photoconductor,

means for developing said electrostatic latent image,

light emitting means for exposing to light, said photoconductor where said electrostatic latent image is to be formed, prior to the development of said electrostatic latent image, thereby to remove any unnecessary portion of said electrostatic latent image corresponding to a region other than said desired region of the document, said light emitting



means having a predetermined perimeter of light emission on said photoconductor,

means for inputting data for specifying said desired region of the document to be copied, and

control means for controlling a period of time for emission of light of said light emitting means based on data on said predetermined perimeter of emission of light of said light emitting means and the input data for specifying said desired region.

4,837,600

RECORDING APPARATUS

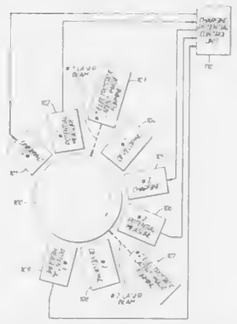
Toshihiro Kasai, and Naoaki Ide, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 8, 1987, Ser. No. 105,828

Claims priority, application Japan, Oct. 24, 1986, 61-252874

Int. Cl.[4] G03G *15/00;* **H04N** *1/00*

U.S. Cl. 355—208 **14 Claims**



1. A recording apparatus including a photosensitive body, means for charging the photosensitive body, means for forming a latent image on the photosensitive body charged by the charging means, and means for developing the latent image into a visible image on the photosensitive body, the photosensitive body having a surface which is movable to successively

pass the charging means, the latent image forming means and developing means, the apparatus comprising:

first measuring means for measuring the surface potential of the photosensitive body at a position before the developing means;

second measuring means for measuring the surface potential of the photosensitive body at a position after the developing means;

means for estimating an estimated surface potential at the position of the developing means based on the surface potentials measured by the first and second measuring means; and

means for controlling the charging means in response to the estimated surface potential, to charge the photosensitive body to a determined level when an image forming operation is performed.

4,837,601

AUTOMATIC PHOTOGRAPHIC PAPER PROCESSING APPARATUS

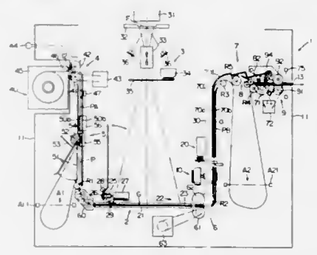
Nobu Nakane; Noriharu Maruyama, both of Tokyo, and Haruo Hakamada, Kanagawa, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 924,842, Sep. 19, 1986, abandoned. This application Sep. 15, 1988, Ser. No. 245,007

Claims priority, application Japan, Jan. 30, 1985, 60-14455; Mar. 6, 1985, 60-42816

Int. Cl.[4] G03B *27/32, 27/52*

U.S. Cl. 355—28 **10 Claims**



1. In a photographic photosensitive material processing apparatus comprising

an exposing portion for imagewise exposing an elongated photographic photosensitive material to form exposed photographic material,

a first accumulator for temporarily accumulating said exposed photographic material,

a developing processing portion for developing processing said exposed photographic material, and

cutter means for cutting away said exposed photographic material from an unexposed section of said photographic photosensitive material,

the improvement which comprises

a second accumulator provided between said first accumulator and said developing processing portion,

rotatable transfer means between said first accumulator and said second accumulator, and

control means for controlling said rotatable transfer means such that the transfer speed of said rotatable transfer means becomes higher than that of developing process portion after said photographic photosensitive material is cut after interruption of said imagewise exposing,

wherein, after said photographic photosensitive material is cut, photographic photosensitive material remaining in said first accumulator is exhausted continuously into said second accumulator, and said rotatable transfer means is thereafter ready to receive said photographic photosensitive material fed in accordance with the next imagewise exposing.

4,837,602

PHOTOGRAPHIC PRINTER MAKING DIFFERENTLY-SIZED PRINTS

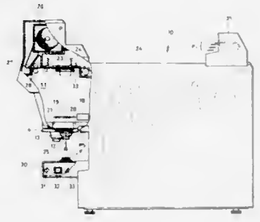
Syuji Tahara, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 4, 1988, Ser. No. 164,167

Claims priority, application Japan, Mar. 6, 1987, 62-51408

Int. Cl.[4] G03B *29/00, 27/44, 27/52*

U.S. Cl. 355—29 **9 Claims**



1. A photographic printer having an exposure station, and a cutter disposed adjacent thereto for cutting an exposed part of a photographic paper on which an image is projected, said photographic printer further comprising:

a plurality of printing lenses providing different degrees of magnification; and

means for selectively mounting each of said plurality of printing lenses on said photographic printer such that an exposure axis of each of said printing lenses is inclined at an angle in accordance with its magnification with respect to a plane on which said each of said printing lenses projects an image.

4,837,603

METHOD OF CORRECTING AZIMUTH ANGLE OF PHOTOMETRIC ELLIPSOMETERS

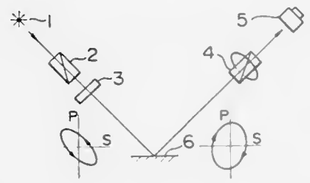
Yasuaki Hayashi, Kanagawa, Japan, assignor to Nihon Shinku Gijutsu Kabushiki Kaisha, Kanagawa, Japan

Filed Oct. 29, 1986, Ser. No. 925,102

Claims priority, application Japan, Apr. 11, 1986, 61-82327

Int. Cl.[4] G01J *4/00*

U.S. Cl. 356—369 **4 Claims**



1. A method of correcting the azimuth angle of a photometric ellipsometer having a light processing assembly including a polarizer subassembly forming a light source portion and an analyzer subassembly forming a light receiving portion, the polarizer subassembly included in light source, a polarizer and a quarter-wave plate and the analyzer subassembly including an analyzer and a photo-detector, the quarter-wave plate being disposed at an azimuth angle of 45° to the polarizer or analyzer subassembly, comprising the step of positioning the polarizer or analyzer subassembly with an azimuth angle by 45° each time, measuring ellipsometric parameters Ψ′ and Δ′, determining the errors δA and δP in the azimuth angle of the polarizer and the analyzer subassemblies respectively, and cancelling the determined error values δA and δP in the azimuth angles of the polarizer subassemblies and the analyzer subassemblies from the measured ellipsometric parameters Δ′ and Δ′ to obtain accurate ellipsometric parameters Ψ and Δ.

4,837,604

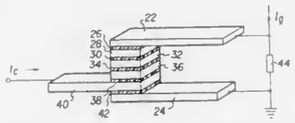
FEMTOSECOND THREE-TERMINAL SWITCH AND VERTICAL TUNNEL JUNCTION

Sadeg M. Faris, Yorktown Heights, N.Y., assignor to Hypres, Inc., Elmsford, N.Y.

Filed Apr. 18, 1986, Ser. No. 853,738

Int. Cl.[4] H03K *17/92;* **H01L** *39/22*

U.S. Cl. 357—5 **43 Claims**



1. A switch for a superconducting integrated circuit, comprising:

first and second Josephson tunnel junction;

means for injecting a current through the first junction which exceeds the critical current of the first junction to cause the first junction to switch to the voltage state; and

means for tightly coupling the second junction to the first junction such that switching of the first junction causes the second junction to switch.

4,837,605

INDIUM-PHOSPHIDE HETERO-MIS-GATE FIELD EFFECT TRANSISTOR

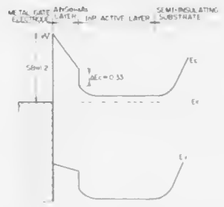
Kensuke Kasahara; Tomohiro Itoh, and Keiichi Ohata, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 9, 1987, Ser. No. 130,575

Claims priority, application Japan, Dec. 9, 1986, 61-293853

Int. Cl.[4] H01L *29/80, 29/205*

U.S. Cl. 357—22 **8 Claims**



1. A hetero-MIS gate type field effect transistor comprising:

(a) an indium-phosphide semi-insulating substrate;

(b) an indium-phosphide active layer formed on a surface of said semi-insulating substrate;

(c) an aluminum-gallium-arsenide layer on a surface of said indium-phosphide active layer said aluminum-gallium-arsenide layer having a lower surface portion contacting the surface of said indium-phosphide active layer, a potential discontinuity being produced between said indium-phosphide active layer and said aluminum-gallium-arsenide layer;

(d) a metal gate electrode formed on an upper surface portion of said aluminum-gallium-arsenide layer; and

(e) source and drain electrodes formed on said indium-phosphide active layer and located at the both sides of said metal gate electrode, wherein said aluminum-gallium-arsenide layer has the highest aluminum atom composition at the upper surface portion contacting said metal gate electrode and the lowest aluminum atom composition at the lower surface portion contacting said indium-phosphide active layer, wherein said upper surface portion is larger in aluminum content than said lower surface portion.

4,837,606

VERTICAL MOSFET WITH REDUCED BIPOLAR EFFECTS

Lawrence A. Goodman, Plainsboro, and Alvin M. Goodman, Prioeton, both of N.J., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 798,612, Nov. 15, 1985, abandoned, which is a division of Ser. No. 582,601, Feb. 22, 1984, Pat. No. 4,587,713. This application Feb. 12, 1987, Ser. No. 14,196

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.4 **5 Claims**

1. In a vertical MOSFET device comprising a semiconductor wafer having first and second opposing major surfaces, a first conductivity type drain region at the first surface, a second conductivity type drain region at the extending from the first surface so as to form a PN junction with the drain region, a first conductivity type source region extending a predetermined depth into the body region so as to form a source/body PN junction, the spacing between the source/body PN junction and body/drain PN junction defining a channel region in the body region at the first surface, a source electrode contacting the source and body regions at the first surface, an insulated gate electrode overlying the channel region on the first surface, and a drain electrode on the second surface, the improvement comprising:

a second conductivity type supplementary region contiguous with the body region and having a high areal dopant concentration compared to that of the body region, the supplementary region including a region of peak dopant concentration that is substantially parallel to the first surface at a predetermined depth therefrom and extends laterally beneath at least a portion of the channel region.

4,837,607

LARGE-AREA, LOW CAPACITANCE SEMICONDUCTOR ARRANGEMENT

Josef Kemmer, Hauptstr. 41 D, 8048 Haimhausen, and Gerhard Lutz, Therese-Giese-Allee 23, 8000 Munchen 83, both of Fed. Rep. of Germany

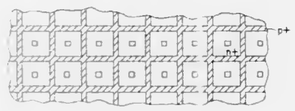
PCT No. PCT/DE85/00134, § 371 Date Feb. 24, 1986, § 102(e) Date Feb. 24, 1986, PCT Pub. No. WO85/04987, PCT Pub. Date Nov. 7, 1985

PCT Filed Apr. 25, 1985, Ser. No. 828,307

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1984, 3415439; Mar. 5, 1985, 3507763

Int. Cl.[4] H01L *27/14*

U.S. Cl. 357—30 12 Claims



1. A detector for detecting hole-electron pairs produced by radiation into a semiconductor material comprising,

a semiconductor body of a first conductivity type with opposed, parallel main surfaces,

semiconductor surface regions of a second conductivity type disposed on said opposed main surfaces capable of forming lateral depletion layers through the semiconductor body, the surface regions of the second conductivity type having a large area region on one main surface with a low surface resistance compared to surrounding regions and reversed biased p—n junction zones on the other main surface,

first and second electrode means connected to both of the main surfaces for reverse biasing the semiconductor body with respect to the surface regions of the second conductivity type to the extent that the body is substantially completely depleted of majority carriers, the reverse bias creating a potential minimum in the body, spaced away from the main surfaces,

third electrode means, coacting with the first and second electrode means, for forming a potential gradient throughout the semiconductor body for sweeping one of the majority and minority carriers, produced by radiation, out of the body, into one of said electrode means, the other of the majority and minority carriers moving away from the potential gradient toward another of said electrode means, and

means for measuring the amount of swept carriers in said electrode means.

4,837,608

DOUBLE GATE STATIC INDUCTION THYRISTOR AND METHOD FOR MANUFACTURING THE SAME

Jun-ichi Nishizawa, Miyagi, and Hisao Kondoh, Osaka, both of Japan, assignors to Mitsubishi Electric Corporation, Tokyo, Japan

Continuation of Ser. No. 834,583, Feb. 28, 1986, abandoned. This application Jul. 14, 1988, Ser. No. 219,902

Claims priority, application Japan, Feb. 28, 1985, 60-39378

Int. Cl.[4] H01L *29/74*

U.S. Cl. 357—38 10 Claims

1. A double gate static induction thyristor comprising a semiconductor substrate having a first conduction type and having first and second principal surfaces opposite to each other,

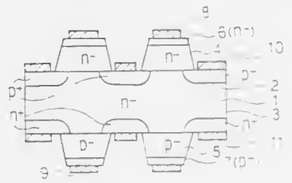
a first gate semiconductor region selectively formed in the first principal surface of the substrate and having a second conduction type opposite to the first conduction type,

a second gate semiconductor region selectively formed in the second principal surface of the substrate and having the first conduction type,

a first gate electrode formed on the first gate semiconductor region to trace a surface pattern formed by the first gate semiconductor region,

a second gate electrode formed on the second gate semiconductor region to trace a surface pattern formed by the second gate semiconductor region,

a first semiconductor layer of the first conduction type formed on the first principal surface of the substrate excluding the first gate electrode,



a second semiconductor layer of the second conduction type formed on the second principal surface of the substrate excluding the second gate electrode, said second gate semiconductor region being located at a p-n junction formed at a boundary between said semiconductor substrate and said second semiconductor layer,

a cathode electrode deposited on the surface of the first semiconductor layer, and

an anode electrode deposited on the surface of the second semiconductor layer.

4,837,609

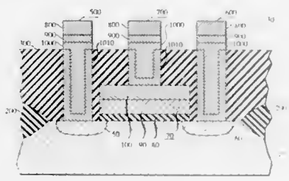
SEMICONDUCTOR DEVICES HAVING SUPERCONDUCTING INTERCONNECTS

Michael Gurvitch, Murray Hill, and Roland A. Levy, Berkeley Heights, both of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 9, 1987, Ser. No. 94,573

Int. Cl.[4] H01L *29/48*

U.S. Cl. 357—71 9 Claims



1. A device, comprising:

a substrate which includes silicon-containing material;

first and second device components formed in and/or on or supported by, said substrate; and

an interconnect, also supported by said substrate, which electrically contacts, and extends between, said device components, characterized in that

said interconnect includes a first region of superconducting material and at least a second region including Ag and/or Au, said second region being interposed between said first region and said substrate.

4,837,610

INSULATION FILM FOR A SEMICONDUCTOR DEVICE

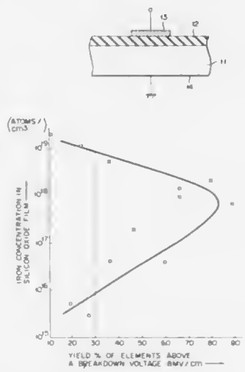
Hachiro Hirstsuka, Yokohama; Yoshiaki Matsushita, Kawasaki, and Shintaro Yoshii, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 910,852, Sep. 24, 1986, abandoned, Continuation of Ser. No. 677,162, Nov. 30, 1984, abandoned. This application Jan. 22, 1988, Ser. No. 147,605

Claims priority, application Japan, Mar. 1, 1984, 59-39509

Int. Cl.[4] H01L *29/78, 27/02, 29/34*

U.S. Cl. 357—52 2 Claims



1. A semiconductor device, comprising:

(a) a semiconductor substrate;

(b) a silicon oxide gate insulation film formed on the semiconductor substrate;

(c) a gate electrode formed on the gate insulation film;

(d) iron present in the gate insulation film in a concentration effective to improve the insulation breakdown resistance of the gate insulation film positioned between the semiconductor substrate and the gate electrode, the iron being contained in the gate insulation film in a concentration range of between 1×10^{16} atoms/cm^3 and 1×10^{19} atoms/cm^3; and

(e) a means for applying voltage between the gate electrode and the semiconductor substrate.

4,837,611

WIDEBAND NTSC-COMPATIBLE TRANSMISSION SYSTEM WITH NOISE REDUCTION PROCESSING

Yves C. Faroudja, 26595 Anacapa Dr., Los Altos Hills, Calif. 94022

Filed Feb. 3, 1988, Ser. No. 151,895

Int. Cl.[4] H04N *11/12, 11/14*

U.S. Cl. 358—12 7 Claims

1. A method for generating for transmission through a medium a wide band quadrature modulated color television signal spectrum with NTSC format compatibility, said method comprising the steps of:

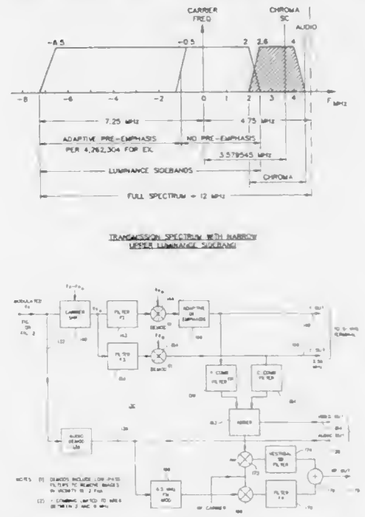
generating an amplitude modulated radio frequency carrier,

generating a first sideband of said carrier which includes limited bandwidth luminance information and which includes a quadrature modulated chroma subcarrier interleaved within said luminance information,

adaptively preemphasizing low level signal transitions occurring in extended bandwidth luminance information, and

generating a second sideband of said carrier comprising said adaptively preemphasized extended bandwidth luminance information without addition or presence of said chroma subcarrier.

5. A method for detecting a wide band quadrature modulated color television signal which is NTSC format compatible and which has been generated by the steps of generating an amplitude modulated radio frequency carrier; generating a first sideband of said carrier comprising limited bandwidth luminance information and quadrature modulated chroma subcarrier interleaved within said luminance information within said first sideband; adaptively preemphasizing low level signal transitions occurring in extended bandwidth luminance information, and generating a second sideband of said carrier comprising said adaptively preemphasized extended bandwidth luminance information without addition of said chroma subcarrier, said detection method comprising the steps of: separating said second sideband of said carrier from said first sideband of



said carrier and detecting said second sideband in order to recover said extended bandwidth luminance information;

demodulating said quadrature modulated chroma subcarrier within said separated first sideband in order to recover chrominance information,

deemphasizing said low level signal transitions in said detected extended bandwidth luminance information to put out restored extended bandwidth luminance information; and

putting out said chrominance information and said restored extended bandwidth luminance information for further processing and display with a television picture display device.

4,837,612

AUTOMATIC HUE CORRECTOR APPARATUS AND METHOD WITH A CAPABILITY TO CORRECT WIDE ANGLE DEMODULATOR HUE SIGNAL DISTORTION CREATED IN RESPONSE TO PREDOMINANTLY GREEN HUE ENVIRONMENTS

William G. Miller, Knoxville, Tenn., assignor to North American Philips Corporation, New York, N.Y.

Filed Mar. 3, 1988, Ser. No. 163,494

Int. Cl.[4] H04N *9/68*

U.S. Cl. 358—28 10 Claims

1. An apparatus for correcting chroma distortion created in a hue decoding matrix providing chroma signals with respective potentials modified to achieve flesh-tone corrections thereby providing modified signals comprising:

comparator means coupled to said decoding matrix to re-

ceive said modified signals for providing output signals representative of relative modified signal levels;

switching means coupled to said decoding matrix to receive a plurality of said modified signals and responsive to said output signals for switching said plurality of modified signals between first and second switch positions;

first combining means coupled to said switching means for combining at least selected ones of said plurality of modified signals in a predetermined manner to provide combined signals when said switching means is in said first position; and

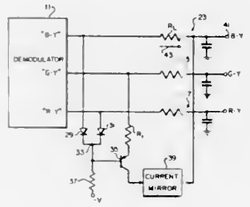
second combining means coupled to said first combining means to receive said combined signals and to said hue decoding matrix when said switching means is in said first position to receive at least one of said modified signals for providing hue corrected signals at an output terminal, said at least one modified signal being directly coupled to said output terminal and said first and second combining means being decoupled from said decoding matrix when said switching means is in said second position.

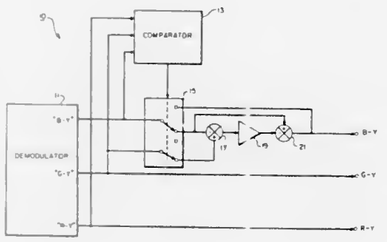
10. Apparatus for correcting color distortion in green subject matter resulting from modification of standard red, green, and blue chroma signals to create modified red, green, and blue chroma signals having improved flesh tones, comprising

comparator means for comparing said modified red, green, and blue signals to each other and generating a first signal indicative of a predominantly green hue;

means responsive to said modified red, green, and blue chroma signals for generating a correction signal corresponding to an amplitude difference between said modified green chroma signal and a selected one of said modified blue and red chroma signals; and

means for applying said correction signal to said modified blue chroma signal.



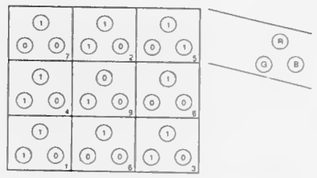


4,837,613

METHOD OF COLOR SELECTION FOR DISPLAY AND PRINTING

William H. Paxton, Los Altos Hills; Michael D. Schuster, Redwood City, and John E. Warnock, Los Altos, all of Calif., assignors to Adobe Systems, Inc., Mountain View, Calif.

Filed Sep. 1, 1988, Ser. No. 239,299
Int. Cl.[4] H04N *1/46, 1/40*
U.S. Cl. 358—75 **4 Claims**



1. A method for selecting the intensity level of each of the primary colors for displaying or printing a predetermined, desired color to be composed of a specified percent of each of the primary colors, wherein each primary color has available a predetermined number of discrete intensity levels ranging from minimum to maximum, and wherein each primary color is to be displayed on a matrix having a predetermined number of cells, comprising:

determining a desired intensity level for each primary color and selecting the number of cells of said matrix which are to display that color at said intensity level;

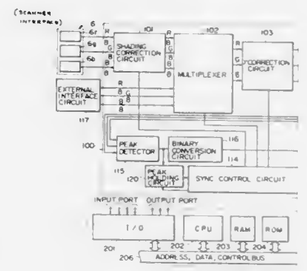
arranging the selected cells of each primary color in said matrix in a predetermined ordering to display the desired color, the sequence of the ordering being predetermined and the same for each primary color, the starting point of said sequence for one of said primary colors being fixed, but the starting point for the sequence for each successive primary color being dependent upon the ending cell location of the sequence of cells for the preceding color.

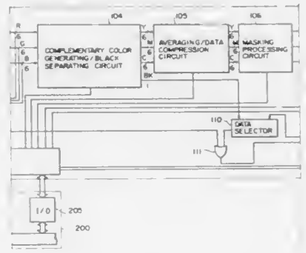
4,837,614

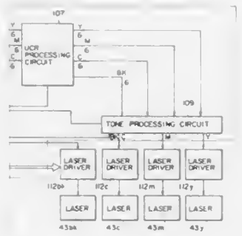
COLOR IMAGE PROCESSING METHOD

Kyoji Omi, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Aug. 18, 1987, Ser. No. 87,261
Claims priority, application Japan, Aug. 20, 1986, 61-194712; Aug. 20, 1986, 61-194713
Int. Cl.[4] H04N *1/46*
U.S. Cl. 358—75 **3 Claims**







1. A color image processing method using an image sensor including a plurality of photoelectric elements arranged in the form of an array and a plurality of filters, each of which is provided for the corresponding one of said plurality of photoelectric elements, said plurality of filters including at least two different kinds of first and second color-separating filters arranged in a predetermined pattern, said method comprising the steps of:

obtaining a first color output from a first photoelectric element having said first color-separating filter for a pixel of interest of an original; and

obtaining a second color output from each of a pair of second photoelectric elements, each having said second color-separating filter, located on opposite sides of said first photoelectric element with respect to a scanning direction; and

processing said color outputs in a predetermined manner with respect to a positional relationship between said first and second photoelectric elements, thereby providing a processed second color output for said pixel of interest, thereby providing first and second color outputs for said same pixel of interest, and

wherein coefficients to be multiplied to said second color output depending on the positional relationship between said first and second photoelectric elements are previously determined and these coefficients are stored in a memory.

4,837,615

GAP MEASURING APPARATUS

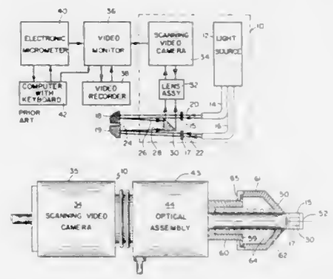
Geoffrey Boshier, Greenbrier, Tenn., assignor to Textron Inc., Providence, R.I.

Filed Sep. 29, 1987, Ser. No. 101,985
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—100 **2 Claims**

1. A hand held optical probe axially insertable into the fastener holes of a plurality of layers of panels for measuring the gap between adjacent panels, the combination comprising:

a rigid hand held housing, said housing containing a video camera, a source of light, and a fiber optic borescope, the tip of said borescope projecting through said housing, said borescope having optical fibers for directing the light from said source axially toward a fastener hole, the end of the optical fibers extending at a right angle to the axis of the fastener hole so that the edges of the adjacent panels surrounding the hole are illuminated when the probe is at the depth of the gap, and a right angle prism, the light energy reflected from said edges being redirected axially by said prism into said borescope, said video camera scanning said redirected light energy to provide an electronic video image of said gap; and

an axially adjustable guide for said probe, said guide comprising a first cylinder fixedly mounted on said housing, a second cylinder having a truncated conical end, said second cylinder being axially slideable on said first cylinder, the tip of said borescope projecting axially through the truncated end of said second cylinder, means biasing said cylinders into an initial position, said conical end of said probe being seatable within said hole, the movement of said probe into said hole driving said cylinders against said bias, and whereby said guide permits said probe to travel variable distances within said fastener hole, while automatically centering the probe within the hole.

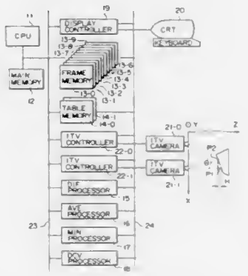


4,837,616

IMAGE PROCESSING APPARATUS SUITABLE FOR MEASURING DEPTH OF GIVEN POINT WITH RESPECT TO REFERENCE POINT USING TWO STEREOSCOPIC IMAGES

Akira Kasano, and Yoichi Inoue, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 17, 1988, Ser. No. 207,831
Claims priority, application Japan, Jun. 19, 1987, 62-151346
Int. Cl.[4] G01C *3/08;* **G06K** *9/52*
U.S. Cl. 358—107 **11 Claims**



1. An image processing apparatus comprising:

first frame memory means for storing a first image as a two-dimensional gray-level image obtained when a three-dimensional object to be measured is viewed from a predetermined direction, a position of each pixel of said first

image being expressed by coordinates defined by a first direction and a second direction perpendicular to the first direction;

second frame memory means for storing a second image as a two-dimensional gray-level image obtained when said three-dimensional object to be measured is viewed from a direction different from said predetermined direction, a position of each pixel of said second image being expressed by coordinates defined along said first and second directions, and a deviation between said first and second images being generated in one direction of said first and second directions;

shifted image generating means for shifting, by a value, said second image within a predetermined range in said one direction to obtain a shifted image;

third image generating means for calculating the absolute values representing differences between image data of pixels located at identical coordinate positions in said shifted and first images, thereby obtaining a third image, the absolute values being image data representing gray levels of pixels located in said third image at coordinate positions which correspond to the pixel positions of said first and shifted images;

average value filtering means for performing average value filtering for each pixel of said third image so as to obtain a fourth image;

holding means for holding a fifth image having the same size as said fourth image, each pixel of said fifth image having a maximum gray level in an initial state;

sixth image generating means for selecting image data representing a smaller gray level from image data of pixels at identical coordinate positions of said fourth and fifth images, thereby obtaining a sixth image, the selected image data being image data representing gray levels of pixels in said sixth image located at coordinate positions which correspond to the pixel position of said fourth and fifth images;

seventh image generating means for calculating absolute values of differences between image data of pixels at identical coordinate positions in said sixth and fifth images, and processing the absolute value, thereby obtaining a seventh image, the absolute values being image data representing gray levels of pixels in said seventh image located at coordinate positions which correspond the pixel positions in said fifth and sixth images;

means for holding an eighth image having the same size as that of said seventh image;

ninth image generating means for detecting a gray level of each pixel of said seventh image, and obtaining a ninth image, when the detected gray level is 0, from the image data of pixel located at the corresponding coordinate position in the eighth image, which is used as image data representing a gray level of pixel located at the corresponding coordinate position in the ninth image, and, when the detected gray level is other than 0, from image data representing a gray level corresponding to said value dx, which is used as image data representing a gray level of pixel located at the corresponding coordinate position in said ninth image; and

updating means for, after said ninth image has been obtained, setting said sixth image as said fifth image and said ninth image as said eighth image, updating the value dx, for repetitively obtaining said ninth image, and determining the finally obtained ninth image as a parallax image representing, by gray levels, a deviation of corresponding pixels in said first and second images by gray levels.

4,837,617

METHOD AND MEANS FOR CODING AND DECODING PICTURE INFORMATION

Harald Brusewitz, Farsta, Sweden, assignor to Televerket, Farsta, Sweden

Filed Feb. 17, 1988, Ser. No. 156,620
Claims priority, application Sweden, Feb. 20, 1987, 8700726
Int. Cl.[4] H04N *7/133, 7/137*
U.S. Cl. 358—133 **10 Claims**

1. A method of picture coding a block containing picture information in the form of data words, comprising the steps of:

transforming the data words, from time domain to frequency domain, into transform coefficients;

quantizing the transform coefficients;

transmitting the quantized transform coefficients over two channels;

predicting the transform coefficients in one of the channels, the transform coefficients in the other channel not being predicted;

connecting either channel to a variable coding means for coding the transform coefficients; and

controlling the connection of the channels by a cotnrol means.

4,837,618

MOVING IMAGE SIGNAL CODING SYSTEM

Yoshinori Hatori, Kawasaki; Yoichi Kato, Yokohama; Mutsumi Ohta, and Yasuhiro Kosugi, both of Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Shinjuku; Nippon Telegraph and Telephone Corporation, Chiyoda; NEC Corporation, Minato and Fujitsu Limited, Kawasaki, all of, Japan

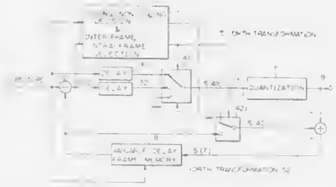
Filed Nov. 9, 1987, Ser. No. 118,467
Claims priority, application Japan, Nov. 10, 1986, 61-267367
Int. Cl.[4] H04N *7/12*
U.S. Cl. 358—135 **8 Claims**

1. A system for coding moving image signals using a predictive error signal produced by predictive coding base on interframe correlation, comprising:

orthogonal transformation means for transforming orthogonally the predictive error signal to generate a transformed error signal;

quantization means for quantizing the transformed error signal for each block of a picture frame constituted by N lines of M pixels; and

block coding/non-coding decision means for calculating a first evaluation value of the predictive error signal for each block of the picture frame, for deciding that block non-coding is applicable when the first evaluation value is less than a first threshold value, for deciding that block coding is applicable when the first evaluation value Sm is greater than the first threshold value, for preventing quantization of the transformed error signal when block non-coding is applicable, and for permitting quantization of the transformed error signal when block coding is applicable, said block coding/non-coding decision means dividing



each block into a plurality of sub-blocks having a size smaller than the block, calculating a sub-block evaluation value for each sub-block, comparing the sub-block evaluation value with a sub-block threshold value, and deciding that the block in question is to be coded when at least one coding sub-block exists and otherwise deciding that the block in question is not to be coded.

4,837,619

SCAN RATE CONVERSION APPARATUS AND METHOD

Mikhail Tsinberg, Riverdale, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Oct. 28, 1987, Ser. No. 114,465
Int. Cl.[4] H04N *7/01*
U.S. Cl. 358—140 **12 Claims**

1. An apparatus for providing a conversion from a first scan rate to a second rate comprising:

means for receiving data on horizontal scan lines of said first scan rate;

means coupled to said receiving means for storing said data of said horizontal scan lines of said first scan rate;

means for providing multiplicative factors, each corresponding to at least one of said horizontal scan lines of said first scan rate and associated with at least one horizontal scan line of said second scan rate;

means coupled to said storing means and said multiplicative factor providing means for multiplying data of a horizontal scan line of said first scan rate by a multiplicative factor corresponding to that horizontal scan line and its associated horizontal scan line of said second scan rate to obtain weighted data; and

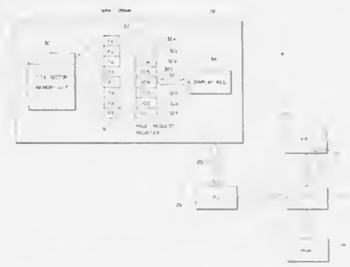
means coupled to said multiplying means for summing correspondingly positioned weighted data of said horizontal scan lines of said first scan rate to provide correspondingly positioned data on horizontal scan lines of said second scan rate.

4,837,620

TELETEXT RECEIVER WITH PAGE UP AND PAGE DOWN FUNCTIONS

Timothy J. Harvey, Northbrook, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed May 12, 1988, Ser. No. 193,463
Int. Cl.[4] H04N *7/08*
U.S. Cl. 358—142 **8 Claims**



1. A method of operating a teletext system comprising:

requesting a desired page of teletext data;

storing a predetermined sequence of contiguous pages of teletext data, extending on either side of and including the desired page;

displaying the desired stored page; and

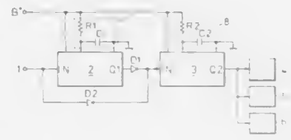
displaying an adjacent stored page of stored teletext data in response to a paging command.

4,837,621

MODE DISCRIMINATOR FOR MONITOR

Geun J. Yug, Kyungsangbook-do, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 30, 1987, Ser. No. 139,819
Claims priority, application Rep. of Korea, Dec. 30, 1986, 21755/1986
Int. Cl.[4] H04N *5/04*
U.S. Cl. 358—148 **4 Claims**



1. A mode discriminator for discriminating a horizontal synchronizing frequency mode applied to a display monitor, comprising:

a first monostable multivibrator having an input coupled to a vertical synchronizing signal of a polarity corresponding to a particular horizontal synchronizing frequency;

a second monostable multivibrator having an input coupled

to said vertical synchronizing signal and to an output of said first monostable multivibrator;

said first monostable multivibrator being responsive to a falling edge of said vertical synchronizing signal to output a signal of a first predetermined period;

said second monostable multivibrator being responsive to a rising edge of either of said vertical synchronizing signal or said signal output by said first monostable multivibrator to output a signal of a second predetermined period;

said vertical synchronizing signal and said signal output by said first monostable vibrator combining at the input of said second monostable multivibrator such that a rising edge is detected for a first horizontal synchronizing frequency mode, and no rising edge is detected for a second horizontal synchronizing frequency mode.

4,837,622

HIGH DENSITY PROBE CARD

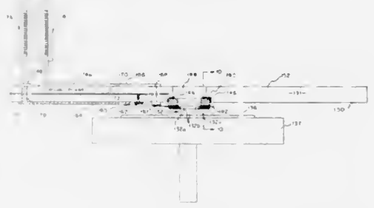
Welton B. Whann, San Diego, and Paul M. Elizondo, Escondido, both of Calif., assignors to Micro-Probe, Inc., San Diego, Calif.

Continuation of Ser. No. 45,605, May 1, 1987, Pat. No. 4,757,256, which is a continuation of Ser. No. 733,501, May 10, 1985, abandoned. This application June 22, 1988, Ser. No. 209,915

The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.

Int. Cl.[4] G01R 1/073

U.S. Cl. 324—158 P **2 Claims**



1. A method of forming a high density epoxy ring probe card for enabling testing apparatus to contact and test unsevered large scale integrated circuit dies replicatively formed on a planar semiconductor wafer, said method comprising the steps of:

forming a unitary printed circuit board with a central opening, a first set of conductive traces on a lower major surface thereof, and a second set of traces formed on an upper major surface thereof, there being in number at least as many traces as there are probes of said probe card to be formed;

forming a probe array by:

forming an annular frame,

forming said two sets of spaced apart discrete wire probes by:

spacing said first set of probes adjacently apart from the second set thereof so that said first set lies in a first cone and the said second set lies in a second cone substantially congruent with the first cone, and wherein the probes of said first set are interleaved in vertical cross section with respect to the probes of said second set,

adapting said first set of probes for electrical connection to said first set of traces located entirely within an outer region on said lower surface and adapting said second set of probes for electrical connection to said second set of traces on said upper surface, via an inner region formed entirely inside of and separated from the outer region by a separation zone on the lower surface, and

bonding said sets to said annular frame by curable resin material in alignment position relative to respective connection pads of each said die,

aligning and mounting said formed array in said central opening with curable resin material, and

electrically connecting said probes of said second set to said second set of traces via the lower surface and electrically connecting said probes of said first set to said first set of traces on the lower surface,

so that said probe card is formed with a capacity for providing a probe wire plan view density of not less than 0.7 probes per degree of rotation about a center axis of and normal to said central opening of said unitary printed circuit board.

4,837,623

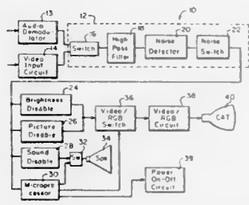
TELEVISION INTERRUPT CIRCUIT

Tsutomu Motoyama, Knoxville, Tenn., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 17, 1987, Ser. No. 134,340

Int. Cl.[4] H04N 5/222

U.S. Cl. 358—165 **23 Claims**



1. An apparatus for use in a television having an audio demodulator for producing at its output an electrical audio signal normally corresponding to a sound program in a television signal, a cathode ray tube for producing a video picture in response to a video signal and an audio speaker for producing television sound in response to the audio signal, comprising:

a detector for being connected to the output of the audio demodulator to receive the electrical audio signal and for producing a detect signal when the electrical audio signal does not correspond to a sound program; and

disable means for interrupting at least a portion of the television signal that produces the video picture in response to the detect signal.

4,837,624

RECOGNITION AND COMPENSATION OF ERRORS IN A DIGITAL VIDEO SIGNAL

Jurgen Heitmann, Alsbach-Hahnlein, Fed. Rep. of Germany, and Peter Wagner, Bedford Hills, N.Y., assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 928,542, Nov. 7, 1986, abandoned. This application Apr. 30, 1987, Ser. No. 45,693

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 3539415

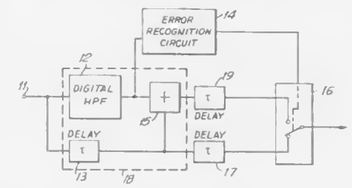
Int. Cl.[4] H04N 5/14

U.S. Cl. 358—166 **5 Claims**

1. Method of recognizing and compensating for errors in a digital video signal composed of pixel-value digital words by replacement of a pixel value word recognized as erroneous with a substitute word derived by interpolation from values of neighboring pixels, comprising the steps of:

high-pass filtering an original digital video signal, which has been produced by digitally sampling an analog video signal in a converter at a predetermined sampling rate, in a digital filter having half said sampling rate within its passband and having its cut-off at a frequency lower than said sampling rate and thereby producing a high-pass filtered signal;

detecting energy maxima of said high-pass filtered signal and providing an error recognition signal in response to each of said maxima;



at least whenever said error recognition signal is present, subtracting said high-pass filtered video signal from the original digital video signal to produce a low-pass filtered video signal providing an interpolation-derived substitute digital word corresponding to a word of said original digital signal, and in response to each said error recognition signal substituting said substitute digital word for said digital word of said original digital signal which is related to said error recognition signal.

4,837,625

AUTOMATIC GAIN CONTROL DEVICE FOR VIDEO SIGNALS

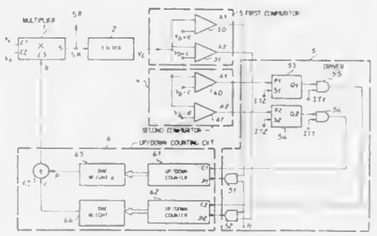
Patrick Donziech, and Philippe Berger, both of Villingen, Fed. Rep. of Germany, assignors to SGS-Thomson Microelectronics S.A., Paris, France

Filed Feb. 12, 1988, Ser. No. 155,540

Claims priority, application France, Feb. 20, 1987, 87 02206

Int. Cl.[4] H04N 5/52

U.S. Cl. 358—174 **7 Claims**



1. An automatic gain control device for video signals comprising:

a multiplier (1) comprising first and second differential inputs (E1, E2), said first differential input (E1) receiving an input video signal (V_i), said second differential input (E2) receiving a black level signal (V_n) corresponding to a video black level, said multiplier further comprising a third input (E3) for receiving a gain setting signal and an output for supplying a video signal;

first comparison means (3) receiving the video signal (V_c) from the output of said multiplier and first and second thresholds which are obtained from a signal providing a desired white level (V_b) increased respectively with first (d) and second (c) levels and outputting respective difference signals;

second comparison means (4) receiving the video signal (V_c) from the output of said multiplier and third and fourth thresholds which are obtained from the signal providing the desired white level (V_b) decreased respectively with said first (d) and second (c) levels and outputting respective difference signals;

driving means (5) receiving the output signals from the first (3) and second (4) comparison means, a frame return trace end signal (IT2) and a pulsed clock signal (H) having a pulse frequency higher than a frequency of the frame return trace end signal, said driving means providing pulse output signals responsive to said first and second comparison means output signals, said frame return trace return and said pulsed clock signal;

counting means (6) receiving the pulse output signals from said driving means, said counting means including a first counter for selectively counting a first quantity proportional to the first and second levels, respectively, responsive to the difference signals output from said first and second comparison means and responsive to a level of said video signal output from said multiplier lower than said third and fourth thresholds, and including a second counter for selectively decrementing a second quantity proportional to the third and fourth levels, respectively, responsive to the difference signals output from said first and second comparison means and responsive to said level of said video signal output from said multiplier higher than said first and second thresholds; an output signal of the counting means responsive to said first and second counters and supplied to said third input of said multiplier for controlling a gain thereof.

4,837,626

CONTROLLER FOR CRT DISPLAY APPARATUS

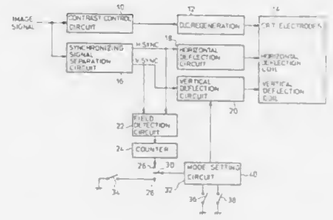
Mikio Nishiyama, and Taizo Akimoto, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 2, 1987, Ser. No. 103,636

Claims priority, application Japan, Oct. 2, 1986, 61-235377

Int. Cl.[4] H04N 5/262, 5/08

U.S. Cl. 358—183 **16 Claims**



1. A controller for a CRT display apparatus which is capable of displaying, in accordance with an input image signal, an image selectively either in an interlace mode in which a vertical scanning is conducted in such a manner as to skip over every other scanning line or in a noninterlace mode in which the vertical scanning is conducted without skipping over any scanning line, and which is capable of displaying said image in a raster erase mode in which rasters are shifted vertically to scan the gaps between adjacent scanning lines, said controller comprising:

separation means for separating vertical synchronizing pulses and horizontal synchronizing pulses from said input image signal;

judging means for judging, on the basis of the separated vertical and horizontal synchronizing pulses, whether the present mode is the interlace mode or the noninterlace mode; and

control means for allowing said CRT display apparatus to display the image of said input image signal in said raster

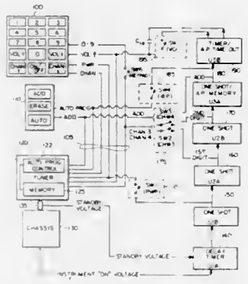
erase mode which is changed so as to match with the interlace display mode or the non interlace display mode switched over therebetween in accordance with the result of the judgment conducted by said judging means.

4,837,627

PROGRAMMABLE OPERATING-PARAMETER CONTROL APPATATUS FOR A TELEVISION RECEIVER

William H. Mengel, Marlton, N.J., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Aug. 19, 1987, Ser. No. 87,174
Int. Cl.[4] H04N *5/50, 5/44, 5/268, 5/60*
U.S. Cl. 358—191.1 **14 Claims**



1. Apparatus for enabling a television receiver, having a source of standby power and a source of operating power, to operate in accordance with preselected operating parameters, comprising:

means for detecting an initial application of said standby power to said receiver for generating a signal indicative of said initial application of said standby power;

first programmable switch means having a first position for selecting a first parameter, and having a second position;

second programmable switch means having a first position for selecting second parameter;

first control means, coupled to said means for detecting application of standby power and responsive to said first switch means being in said first position and to said indicative signal for generating a first control signal for causing said television receiver to operate in accordance with said selected first operating parameter; and

second control means, coupled to said first control means and responsive to said second switch means being in said first position and to said first control signal, for generating a second control signal for causing said television receiver to operate in accordance with said selected second operating parameters when said operating power for said receiver is developed.

4,837,628

ELECTRONIC STILL CAMERA FOR RECORDING STILL PICTURE ON MEMORY CARD WITH MODE SELECTING SHUTTER RELEASE

Minoru Sasaki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 14, 1987, Ser. No. 73,160
Claims priority, application Japan, Jul. 14, 1986, 61-163711
Int. Cl.[4] H04N *5/225*
U.S. Cl. 358—209 **9 Claims**

1. An electronic still camera comprising:

a camera housing;

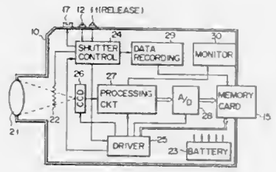
an optical system disposed in said camera housing;

a solid state imaging device, which is disposed at a predetermined location in said camera housing and on which an image of an object is focused through said optical system, said solid state imaging device including a number of pixels for storing signal charges corresponding to the amount of incident light thereto, and readout means for reading out a signal charge stored in each of said pixels as an analog picture signal;

shutter release means having a shutter release disposed on said camera housing and adapted to be actuated by an operator, said shutter release serving as a mode change-over switch which provides a first control signal by half depression of said shutter release and a second control signal by full depression of said shutter release;

shutter control circuit means, coupled to said shutter release means, for generating in response to the second control signal a shutter pulse having a pulse width corresponding to a shutter time set externally, and a solid state imaging device drive frequency switching control signal;

solid state imaging device driving means for driving said solid state imaging device on a real time basis in response to the first control signal to continuously derive analog picture signals representing a motion image of the object, controlling a charge storage time of said solid state imaging device according to the pulse width of the shutter



pulse in response to reception of the shutter pulse and deriving, from said solid state imaging device, an analog picture signal corresponding to the signal charge stored in each of said pixels within the charge storage time at a low speed in response to the solid state imaging device drive frequency switching control signal;

electronic view finder means, coupled to said solid state imaging device, for displaying the motion image of the object based on the analog picture signal continuously derived from said solid state imaging device when said solid state imaging device is driven on a real time basis;

analog-to-digital conversion means, coupled to said solid state imaging device and said solid state imaging device driving means, for converting the analog picture signal derived from said solid state imaging device for each of said pixels, into a digital picture signal at a low speed; and

a card type recording medium, adapted to be loaded into a predetermined location of said camera housing through an insert section provided thereon, said recording medium having a plurality of semiconductor memory chips for recording the digital picture signal from said analog-to-digital conversion means for each of said pixels in response to said solid state imaging device driving means.

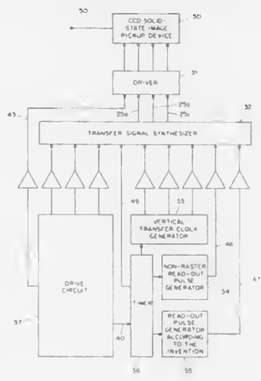
4,837,629

IMAGE PICKUP METHOD USING A CCD-TYPE SOLID STATE IMAGE PICKUP DEVICE WITH CHARGE DISSIPATION

Yasuyuki Shiromizu, and Kenji Urata, both of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 13, 1988, Ser. No. 180,881
Claims priority, application Japan, Apr. 14, 1987, 62-89764
Int. Cl.[4] H04N *3/15*
U.S. Cl. 358—213.19 **1 Claim**

1. An image pickup method using a CCD-type solid state image pickup device including a photoelectric conversion element having an overflow drain structure, a vertical CCD register for receiving electric charges from the photoelectric conversion element having a potential barrier which is lowered to permit transfer of charges from the photoelectric conversion element, and a horizontal CCD register for receiving electric charges from the vertical CCD register, comprising the steps of transferring the electric charges which the vertical CCD register has received from the photoelectric conversion element to the horizontal CCD register at a first time during a vertical blanking interval in accordance with a first transfer clock at a higher speed than the electric charges are normally read out, discharging the electric charges from the horizontal CCD register, transferring electric charges from the photoelectric conversion element to the vertical CCD register at a second time after a predetermined time within the vertical blanking interval, supplying as an output signal the electric



charges transferred from the vertical CCD register to the horizontal CCD register in accordance with a second transfer clock having a normal reading-out speed, using the time interval between the first and second times as an image-receiving interval, and lowering the potential barrier on the vertical CCD register in a particular clock phase which the first transfer clock assumes during the step of discharging the electric charges from the horizontal CCD register, thereby permitting any electric charges remaining on the horizontal CCD register to flow reversely to the photoelectric conversion element via the vertical CCD register and to be discharged from the overflow drain of the conversion element without being hindered by the barrier.

4,837,630

SOLID-STATE IMAGING APPARATUS WITH A PLURALITY OF CCD STORAGE SECTIONS

Kazuhiko Ueda, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Aug. 21, 1987, Ser. No. 88,728
Claims priority, application Japan, Aug. 22, 1986, 61-196933
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213.26 **4 Claims**

1. A solid-state imaging apparatus comprising:

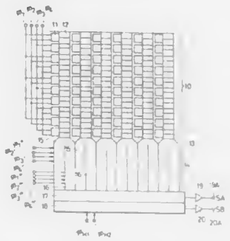
(a) an image pickup section including an interline transfer CCD and a color filter arrangement having a period of two picture elements in horizontal and vertical directions, the image pickup section generating charges in accordance with incident lights;

(b) a storage section including first and second CCDs;

(c) a switch arrangement selectively transferring the charges from the image pickup section to either of the first and second CCDs in the storage section; and

(d) a readout section including at least one CCD and reading out the charges from the storage section;

wherein during a vertical blanking period, picture element signals corresponding to odd lines are outputted from the image pickup section and are transferred to the first CCD in the storage section, and then picture element signals corresponding to even lines are outputted from the image pickup section and are transferred to the second CCD in the storage section; and



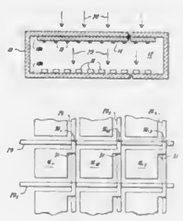
wherein during a horizontal blanking period after the vertical blanking period, the readout section independently reads out the picture element signals from the first and second CCDs in the storage section.

4,837,631

ELECTRONIC STILL CAMERA TUBE

John W. Hicks, Jr., Northboro, Mass., assignor to Peter D. Sahageo, New York, N.Y.

Continuation-in-part of Ser. No. 96,623, Sep. 14, 1987. This application May 9, 1988, Ser. No. 191,862
Int. Cl.[4] H04N *5/30*
U.S. Cl. 358—217 **29 Claims**



1. A camera tube comprising:

means for emitting electrons having a spatial variation representative of an incident light intensity pattern when exposed to light in a predetermined wavelength range;

an array of storage electrodes each capable of storing an electrical charge in response to said electrons from said electron emitting means;

means for accelerating electrons from said electron emitting means to said array of storage electrodes during exposure;

a sealed and evacuated envelope surrounding said electron emitting means and said array of storage electrodes; and

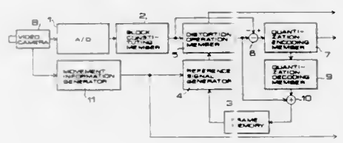
readout means for sensing the charge on each of the storage electrodes in said array during a readout phase after exposure, said readout means comprising a readout device associated with each storage electrode in said array of storage electrodes, each readout device including means for generating a readout current in an evacuated region adjacent to the storage electrode, and means for collecting said readout current to provide a readout signal, each readout current having a magnitude that is a function of the charge on the adjacent storage electrode so that the readout signals collectively represent said charge pattern.

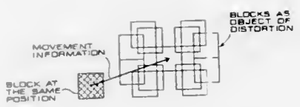
4,837,632

VIDEO ENCODING APPARATUS INCLUDING MOVEMENT COMPENSATION

Tsutomu Kubo; Kenichi Asano; Hiroaki Kikuchi, and Mitsuyoshi Suzuki, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 819,067, Jan. 15, 1986, Pat. No. 4,769,826.
This application Apr. 13, 1988, Ser. No. 181,164
Claims priority, application Japan, Jan. 16, 1985, 60-5453; Mar. 5, 1985, 60-42905; May 16, 1985, 60-104505; Jun. 13, 1985, 60-127258; Jul. 16, 1985, 60-156307; Jul. 16, 1985, 60-156308; Sep. 5, 1985, 60-196207; Nov. 15, 1985, 60-255990
Int. Cl.[4] H04N *5/228 7/12*
U.S. Cl. 358—222 7 Claims





1. Video encoding apparatus comprising:

a frame memory storing video information being one frame before video information constituted by the existing input signal series which is outputted from a video camera and converted into digital signal series; and

a reference signal generator for reading, from said frame memory, a block formed by a specific signal series among the video information constituted by the existing input signal series and a plurality of blocks formed by said specific signal series in video information being one frame before the video information including a block having the same position on the picture image,

wherein said video camera is provided with a moving direction detecting means which detects movement of the video camera in a preset moving direction and outputs a detecting signal, and also provided with a movement information generator which operates displacement amount of the video camera based on the detecting signal outputted from the moving direction detecting means and estimates the specific position in the frame memory corresponding to the operated displacement amount of the video camera and then provides an output indicating the estimated position to the reference signal generator, whereby the plural blocks stored to the specific position in the frame memory are read based on the output from the movement information generator

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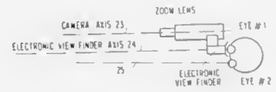
4,837,633

ELECTRONIC BOUNDARY FRAMING DEVICE AND METHOD

Jorge M. Parra, 1905 Blvd. St., New Port Richey, Fla. 33552

Continuation-in-part of Ser. No. 64,418, Jun. 22, 1987. This application Mar. 1, 1988, Ser. No. 162,937
Int. Cl.[4] H04N *5/30*; G03B *13/02*
U.S. Cl. 358—224 12 Claims

1. In an electronic view finder having an electronic display screen, means for producing an electronic image and means for causing said electronic image to cause a visual display on said display screen, the improvement wherein said electronic image is a boundary frame and a neutral background and means for electronically adjusting said boundary frame in a predetermined manner, whereby when a binocular visioned observer



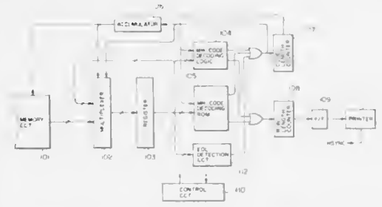
views the image of said electronic image with one eye and a scene with the other eye, an optically fused range of said scene and electronic image is presented to the brain of said observer.

4,837,634

APPARATUS FOR DECODING IMAGE CODES OBTAINED BY COMPRESSION PROCESS

Katsutoshi Hisada, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1985, Ser. No. 739,069
Claims priority, application Japan, Jun. 5, 1984, 59-114831; Jun. 5, 1984, 59-114832
Int. Cl.[4] H04M *1/419*
U.S. Cl. 358—261.1 36 Claims



1. A decoding apparatus for decoding image codes obtained by a compression process, comprising:

means for storing image codes entered together with a particular code indicating the end of each line;

means for decoding the image codes read out from said storing means;

means for shifting the image codes in said storing means, in order to discharge the image code already decoded by said decoding means from said storing means; and

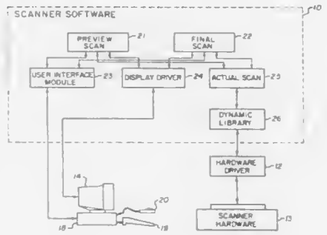
plural detecting means respectively adapted to detect the presence of said particular code in said storing means, said plural detecting means being arranged so as to detect the presence of said particular code in different positions of said storing means each corresponding to the associated one of said plural detecting means.

4,837,635

A SCANNING SYSTEM IN WHICH A PORTION OF A PREVIEW SCAN IMAGE OF A PICTURE DISPLACED ON A SCREEN IS SELECTED AND A CORRESPONDING PORTION OF THE PICTURE IS SCANNED IN A FINAL SCAN

Francisco E. Santos, Fremont, Calif., assignor to Hewlett-Packard Company, Palto Alto, Calif.

Filed Jan. 22, 1988, Ser. No. 146,897
Int. Cl.[4] H04N *1/393, 1/00, 1/04*
U.S. Cl. 358—287 8 Claims



1. In a computing system, a method for scanning a picture using a scanner and for presenting to a user a final scan image of the picture on a screen, the method comprising:

(a) performing a preview scan of the picture to produce a preview scan image of the picture;

(b) displaying the preview scan image of the picture on the screen;

(c) selecting portion of the preview scan image for final scan;

(d) performing a final scan of a portion of the picture which corresponds to the portion of the preview scan image to produce a final scan image; and

(e) displaying on the screen the final scan image produced by the final scan.

3. In a scanner system, a method which allows a user to determine the dimensions of a printed copy of a picture to be produced, the method comprising:

displaying the original dimensions of the picture;

allowing the user to specify an amount the picture will be enlarged or reduced in producing the printed copy of the picture; and

varying the displayed original dimensions in accordance with the specified amount of enlargement or reduction in order to reflect the dimensions of the printed image to be produced.

4. In a scanning system including a scanner for scanning a picture and means for displaying a scanned image of a portion of the picture on a screen and for reducing or enlarging the portion of the picture when producing a printed copy of the portion of the picture the improvement comprising:

calculating means for calculating the dimensions of the printed copy to be produced based on the original dimensions of the portion of the picture and the amount the portion of the picture will be reduced or enlarged in producing the printed copy; and

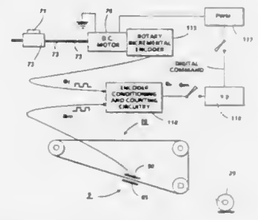
first display means, driven by the calculating means, for displaying the dimensions of the printed copy to be produced.

4,837,636

MOTION SENSOR FOR SENSING THE RELATIVE POSITION AND VELOCITY OF A RECORDING MEMBER

Joseph J. Daniele, Pittsford, and Robert M. Lofthus, Honeoye Falls, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 22, 1987, Ser. No. 111,400
Int. Cl.[4] G01D *9/42*; H04N *1/23*
U.S. Cl. 358—300 7 Claims



1. In a printing machine having a movable recording member, the combination of:

(a) a series of discrete fiducial marks arranged in at least one row about the circumference of said recording member, said row of marks extending in a direction parallel to the direction of movement of said recording member;

(b) a stationary array having at least one row of image sensors, the longitudinal axis of said array being parallel to the direction of movement of said recording member with said array positioned so that said row of sensors view a portion of said recording member including at least two of said marks;

(c) means for operating said array to repeatedly scan said recording member portion and the marks currently viewed by said row of sensors whereby to output on each scan a block of image signals representing the image presented by said recording member portion with said marks, said image changing as said recording member with said row of marks moves past said array; and

(d) means for converting said blocks of image signals into a clock signal representative of the velocity of said recording member.

4,837,637

SCANNING METHOD FOR DISK PLAYER

Toru Akiyama; Shigeru Yasuda; Kenichiro Yasukawa, and Yasumasa Fukatsu, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 19, 1987, Ser. No. 86,801
Claims priority, application Japan, Aug. 19, 1986, 61-194449; Aug. 28, 1986, 61-202307; Aug. 29, 1986, 61-203245
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—342 6 Claims

1. In a disc player for reproducing a video signal recorded on an information recording disc comprising a turntable for carrying and rotating said information recording disc to be played back, a pickup unit for irradiating an incident light beam onto said disc carried on said turntable for receiving a reflected light beam reflected from said disc so as to convert the reflected light beam into an information signal, said pickup unit including a tracking actuator for deflecting said light beam in a radial direction of said disc, pickup unit carriage means for positioning said pickup unit along the radial direction of said disc as said disc is rotated, tracking error signal generating means for generating a tracking signal having a magnitude representing a deviation of a pickup spot produced on said disc by said incident light beam from a target track, tracking servo means for driving said tracking actuator and said pickup unit

carriage means so as to reduce the magnitude of said tracking signal, demodulating means for demodulating said information signal into a video signal including vertical synchronization pulses, and time-base servo means for performing a time-base control of said video signal while comparing the synchronization signal separated from said video signal by said demodulating means with a reference signal, the improvement comprising:

means for selectively issuing a scan command signal;

carriage drive means for causing said pickup unit carriage means to move said pickup unit at a predetermined speed as long as a scan command signal exists;

tracking inhibition signal generating means for intermittently producing a tracking inhibition signal as long as said scan command exists, said tracking inhibition signal being at one of a high level or a low level;

tracking servo switch means for inhibiting said tracking servo means from driving said tracking actuator in response to said tracking inhibition signal;

memory means for storing a portion of said video signal occurring after one of said vertical synchronization pulses occurs upon the lapse of a first predetermined time period from a transition of said tracking inhibition signal from said high level to said low level; and

read-out means for producing a read-out signal for repeatedly reading out the stored portion of the video signal from said memory means.

4,837,638

VIDEO TAPE EDITING SYSTEM WITH VERTICAL INTERVAL TIME CODE

John W. Fullwood, 17 Chittenden Ave., New York, N.Y. 10033

Filed Aug. 6, 1987, Ser. No. 83,033

Int. Cl.[4] H04N *7/087, 5/91*; **G11B** *27/02*

U.S. Cl. 360—14.2 **18 Claims**

1. A video editing system for editing a first video signal having first vertical time code addresses recorded thereon, onto a storage means having a second video signal recorded thereon and capable of being erased therefrom with second vertical time code addresses in respective vertical blanking periods thereof; comprising:

means for supplying said first video signal;

recording means for recording selected segments of said first video signal on said storage means;

first reading means for reading said first vertical time code addresses from said first video signal;

second reading means for reading said second vertical time code addresses from said second video signal, and for operatively supplying selected second vertical time code addresses to an inserting means;

control means having inputs for reading said first and second time code addresses from said first and second reading means, respectively, wherein said control means includes means for selecting segments of said first video signal to be recorded on said storage means; for selecting edit points on said storage means, based on said second vertical time code addresses, for recording said selected segments; and for remotely controlling said first video signal supply means and said recording means; and

inserting means between said supply means and said recording means for inserting said second vertical time code addresses of said edit points respectively into vertical blanking periods of said selected segments of said first video signal before said segments are recorded at said edit points of said second video signal by said recording means.

4,837,639

CONTROL SIGNAL EXTRACTION IN A REPRODUCING APPARATUS

Yutaka Masumoto, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 7, 1987, Ser. No. 70,469

Claims priority, application Japan, Jul. 7, 1986, 61-160431

Int. Cl.[4] G11B *5/012, 5/024*

U.S. Cl. 360—27 **8 Claims**

1. A magnetic reproducing apparatus, comprising:

a magnetic head for reproducing a signal recorded on a magnetic medium to produce an output signal;

a read circuit for reading said output signal of said magnetic head;

a separation circuit for separating a signal of a predetermined frequency from said output signal of said magnetic head;

a detection circuit for detecting a level of an output signal of said separation circuit; and

a control circuit for allowing said read circuit to perform its reading operation only when said detected level is less than a first reference level and inhibiting said read circuit when said detected level is greater than said reference level.

4,837,640

METHOD AND APPARATUS FOR DETECTING A CONTROL SIGNAL

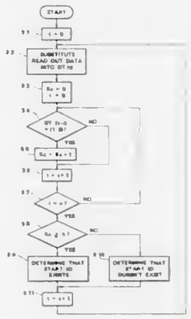
Shinya Ozaki; Tadashi Fukami, both of Kanagawa, and Kentaro Odaka, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 19, 1987, Ser. No. 64,829

Claims priority, application Japan, Jun. 28, 1986, 61-152205

Int. Cl.[4] G11B *5/02, 15/18*

U.S. Cl. 360—27 **10 Claims**



1. A method for detecting control signals, each of which is recorded among other signals on a recording medium, comprising the steps of electronically;

reproducing the signals recorded on the medium and detecting the control signals;

checking n of a series of the reproduced control signals for error, n being an integer equal to or more than 2; and

determining that a prescribed control signal has been recorded when not less than k of the prescribed control signals have been detected without error out of n of the control signals checked.

4,837,641

ROTARY HEAD TYPE DIGITAL SIGNAL RECORDING AND REPRODUCING APPARATUS

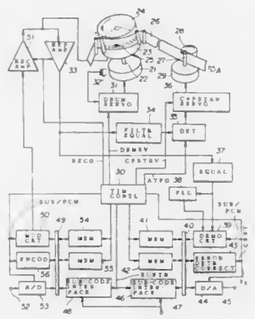
Takaro Mori, Sagamihara, and Yasuhiro Yamada, Yokosuka, both of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Sep. 29, 1987, Ser. No. 102,550

Claims priority, application Japan, Oct. 2, 1986, 61-234959

Int. Cl.[4] G11B *5/09*

U.S. Cl. 360—32 **7 Claims**



1. A rotary head type digital signal recording and reproducing apparatus for playing a magnetic tape pre-recorded with a time division multiplexed signal which comprises a pulse code modulated audio data which is obtained by subjecting an original audio signal to a pulse code modulation and a sub-channel signal which amounts to a predetermined time period and which is time division multiplexed immediately before and after said pulse code modulated audio data for each track formed on said magnetic tape, wherein said time division multiplexed signal is recorded on or reproduced from successive tracks formed obliquely to a longitudinal direction of the magnetic tape by two rotary heads which are diametrically mounted on a rotary drum in a first mode or a second mode, and wherein in the second mode, a data quantity per unit time and a bit rate of said sub-channel signal are 1/n (n is an arbitrary integer equal to 2 or over) times those in the first mode, and wherein a rotational speed of said rotary heads and a tape transport speed of said magnetic tape in the second mode are also 1/n times those in said first mode, said rotary head type digital signal recording and reproducing apparatus comprising:

means for controlling the rotational speed of said magnetic heads and the tape transport speed of said magnetic tape on which data is recorded in the second mode so as to become identical to those in the first mode;

recording means for over-writing a new sub-channel signal to be recorded on the magnetic tape, said new sub-channel signal having a bit rate which is n times that at the time of the second mode; and

demodulating means for receiving the pulse code modulated audio data which is read out from the magnetic tape and for producing a monitor audio signal which is obtained by discretely extracting PMC audio data from said received pulse code modulated audio data and which has a frequency identical to that at the time of the reproduction in the second mode.

4,837,642

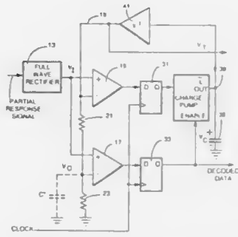
THRESHOLD TRACKING SYSTEM

Peter Smidth, Menlo Park, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Jan. 12, 1988, Ser. No. 143,911

Int. Cl.[4] G11B *5/09*

U.S. Cl. 360—46 **11 Claims**



1. A method for decoding partial-response signals wherein decision threshold levels are automatically adjusted in proportion to variations in the amplitude of the partial-response signal, whose level at a specified clock time represents one binary state if the level exceeds a positive threshold level and represents another digital binary state if the level is below the threshold level, comprising the steps of:

comparing the amplitude of a partial-response signal with the amplitude of a feedback signal;

comparing the amplitude of the partial-response signal with a predetermined fraction of the amplitude of the feedback signal and providing an enable signal only when this comparison indicates that the partial-response signal exceeds the predetermined fraction of the feedback signal;

only when an enable signal is present, increasing the charge

on a charge storage device when the amplitude of the partial-response signal exceeds the amplitude of the feedback signal and decreasing the charge on the charge storage device when the amplitude of the partial-response signal is less than the amplitude of the feedback signal.

4,837,643

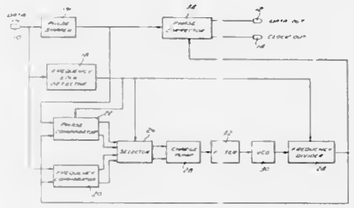
CIRCUIT FOR CONTROLLING FREQUENCY AND PHASE OF VOLTAGE CONTROLLED OSCILLATOR IN A DATA SMOOTHER FOR A STREAMING CARTRIDGE TAPE DRIVE

James V. Tierney, III, Costa Mesa, Calif., assignor to Archive Corporation, Costa Mesa, Calif.

Filed Nov. 7, 1986, Ser. No. 928,471

Int. Cl.[4] G11B 5/09

U.S. Cl. 360—51 38 Claims



27. A data smoother for a streaming cartridge tape drive, said data smoother comprising:

an oscillator for generating a clock signal;

a phase comparator for detecting the phase difference between said clock signal and a data signal which is input to said data smoother, said phase comparator detecting the phase of said clock signal and the phase of said input data signal by detecting the time occurrence of an edge of said clock signal and the time occurrence of a corresponding edge of said input data signal said phase comparator generating a frequency adjust signal which is directly proportional to the difference in time between said time occurrences, said frequency adjust signal being used to adjust the frequency of said oscillator;

a frequency comparator for detecting the phase difference between said clock signal and said input data signal;

a selector for alternatively selecting the outputs of said phase comparator and said frequency comparator, the selected output adjusting the frequency of said clock signal, the output of said frequency comparator being selected during the preamble portion of said input data signal and the output of said phase comparator being selected after the preamble portion of said input data signal, said frequency comparator causing frequency lock to be established between said input data signal and said clock signal during the preamble portion of said input data signal;

a circuit coupled to receive the selected output of said phase comparator and said frequency comparator for changing the frequency of oscillation of said oscillator based upon the phase difference detected by said phase comparator, the frequency of said oscillator being increased when said input data signal leads said clock signal by an amount directly proportional to the phase difference between said clock signal and said input data signal, the frequency of said oscillator being decreased when said input data signal lags said clock signal by an amount directly proportional to the phase difference between said clock signal and said input data signal;

means for initially adjusting the phase of said clock signal to correspond to the phase of said input data signal after frequency lock is established between said input data signal and said clock signal; and

a circuit for generating an output data signal from said input data signal, said output data signal being output from said data smoother at a rate controlled by said clock signal.

4,837,644

MAGNETIC RECORDING/REPRODUCTION APPARATUS

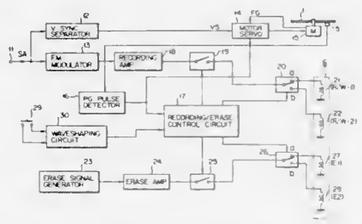
Yutaka Yunoki, Kunitachi, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 796,573, Oct. 28, 1985, Pat. No. 4742404. This application Mar. 11, 1988, Ser. No. 166,877

Claims priority, application Japan, Mar. 13, 1984, 59-47865; Mar. 13, 1984, 59-47866; Mar. 13, 1984, 59-47867; Mar. 13, 1984, 59-47868; Mar. 13, 1984, 59-47869; Mar. 13, 1984, 59-47870

Int. Cl.[4] G11B 5/03, 15/12

U.S. Cl. 360—66 11 Claims



1. A magnetic recording/reproduction apparatus adopting as a recording medium a magnetic disk having a rotational position detection index, comprising: pulse detecting means for detecting said index on said magnetic disk so as to extract a pulse corresponding to rotation of said disk, erase recording/reproduction means operative in accordance with the pulse extracted by said pulse detecting means so as to control an erase operation and a recording/reproduction operation, and magnetic head means controlled by said erase recording/reproduction means, wherein said erase recording/reproduction means include a control circuit means for maintaining the erase operation of said magnetic head means over a duration exceeding a time period for one revolution of the magnetic disk, and means for ending the erase operation in synchronism with the pulses issued from said pulse detecting means and for enabling recording operation of the magnetic head means immediately after the erase operation is ended.

4,837,645

DRIVE MECHANISM FOR CASSETTE-ENCLOSED MAGNETIC TAPE

Ritsu Miyamoto; Eiichi Tsuchiya, both of Yokohama; Kazuhiko Shishido, Tokyo; Toshiaki Shimizu, Kamakura, and Atsushi Hosoya, Sagamihara, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 2, 1987, Ser. No. 33,389

Claims priority, application Japan, Apr. 2, 1986, 61-76336

Int. Cl.[4] G11B 5/027

U.S. Cl. 360—85 2 Claims

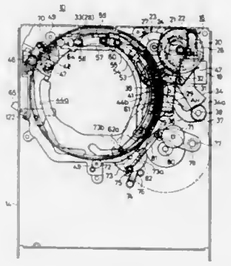
1. A recording/reproducing apparatus having a chassis base, comprising:

a guide drum having at least one recording or reproducing head; and

loading means having at least one vertical pole and at least one inclined pole for pulling out a tape from a tape cassette mounted on said recording/reproducing apparatus and for wrapping the tape around said guide drum, said loading means including annular pole driving means for driving the poles and a toggle mechanism for causing a pinch roller to come into contact with a capstan so that

the tape is interposed therebetween after the tape is wrapped around said guide drum, and toggle mechanism comprising:

(a) pinch roller cam mounted on said chassis base and rotationally driven by said annular pole driving means, said pinch roller cam having a plurality of grooves at its periphery, each of said plurality of grooves being engaged with a respective pin provided on said annular pole driving means so that said pinch roller cam is rotationally



moved in accordance with the movement of said annular pole driving means;

(b) a pinch roller arm having said pinch roller mounted thereon and rotatably supported at one end thereof on said chassis base;

(c) a link member coupled between said pinch roller cam and said pinch roller arm, said pinch roller being moved toward said capstan in response to the movement of said link member.

4,837,646

TAPE GUIDE APPARATUS FOR HELICALLY WOUND TAPE

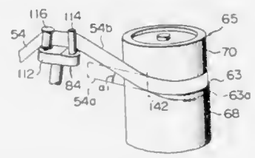
Kyuichiro Nagai, Katsuta; Nobuyuki Kaku, and Kenji Ogiro, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 925,908, Nov. 3, 1986, abandoned, which is a continuation of Ser. No. 456,297, Jan. 6, 1983, abandoned. This application Sep. 26, 1988, Ser. No. 249,246

Claims priority, application Japan, Jan. 13, 1982, 57-2691

Int. Cl.[4] G11B 5/027, 15/60

U.S. Cl. 360—85 11 Claims



1. A signal recording/reproducing apparatus for use with a tape cassette, comprising:

a cylinder assembly having an outer peripheral surface said cylindrical assembly having mounted thereon heads for recording a signal on a magnetic tape within the tape cassette and for reproducing a signal from said magnetic tape, and an actual lead formed on the outer peripheral surface of said cylinder assembly; and

a pair of tape guide means for guiding said tape such that said tape is helically wound around said outer peripheral surface of said cylinder assembly over a predetermined angular extent along said actual lead upon the recording and reproducing of the signal, one of said pair of tape guide means being disposed, upon recording of the signal on said tape and upon the reproducing of the signal from said tape, at an approaching side of said cylinder assembly in which said tape approaches said cylinder assembly, while the other of said pair of tape guide means is disposed, upon the recording of the signal on said tape and upon the reproducing of the signal from said tape, at a leaving side of said cylinder assembly in which the tape runs away from the cylinder assembly; and

upon the recording and reproducing of the signal, said pair of tape guide means each including guide element means located and oriented with respect to said cylinder assembly for contacting said tape along an entire extent of said tape extending in a direction transverse to the running direction of said tape to impart a force to said tape so as to press one edge of said tape against said actual lead to enable said one edge of said tape to run along said actual lead, said pair of tape guide means being located and oriented to urge said tape to travel along a geometric path corresponding to an imaginary lead inclined relative to said actual lead and having a portion shifted downwardly from a portion of said actual lead along which said tape actually runs thereby imparting the force to said tape so as to enable said one edge of said tape to continuously run along said actual lead and to prevent said tape from moving away from said actual lead;

wherein upon the recording and reproducing of the signal, said pair of tape guide means are located and oriented in predetermined positions such that a portion of said tape extending between said guide element means of said one tape guide means and a generating line on said cylinder assembly at which the contact of said tape with said cylinder assembly is initiated at said approaching side forms a first predetermined angle of incidence with respect to a tape running path based on a geometric arrangement of the actual lead and, a portion of said tape extending between said guide element means of said other tape guide means and a generating line on said cylinder assembly at which the contact of said tape with said cylinder assembly is terminated forms a second predetermined angle of incidence together with said lead at said leaving side, said first and second predetermined angles of incidence ranging between about 0.5° and about 2.0°.

4,837,647

VIDEO CASSETTE AUTO-CHANGER

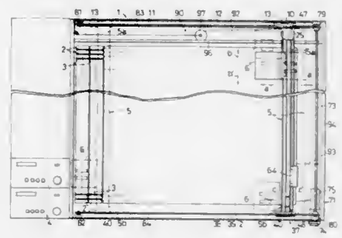
Wataru Nonaka, and Eiichi Hirata, both of Kanagawa, Japan, assignors to Sony Corp., Tokyo, Japan

Filed Apr. 2, 1987, Ser. No. 33,459

Claims priority, application Japan, Apr. 12, 1986, 61-84674

Int. Cl.[4] G11B 15/68

U.S. Cl. 360—92 20 Claims



1. In an apparatus for selectively supplying and reproducing cassettes and which includes a plurality of reproducing and/or recording means, a plurality of cassette storage bins arrayed in first and second orthogonally related directions and each

adapted to store a cassette therein, and cassette transporting means for selectively transporting cassettes between said storage bins and between said storage bins and said reproducing and/or recording means; said cassette transporting means comprises:

first fixed guide rail means extending longitudinally in said first direction;

slider means slidably mounted on said first guide rail means for movement along the latter in said first direction;

slider driving means for driving said slider means along said first fixed guide rail means;

movable guide rail means extending longitudinally in said second direction;

connecting means pivotally connecting one end of said movable guide rail means to said slider means for movement with the latter along said first fixed guide rail means and for pivoting in respect to said slider means about a pivot axis perpendicular to a plane containing said first and second orthogonally related directions;

second fixed guide rail means extending substantially parallel with, and spaced from said first fixed guide rail means with said movable guide rail means extending between said first and second fixed guide rail means;

cooperating means on said second fixed guide rail means and the other end of said movable guide rail means for limiting movements of the latter only in directions parallel to said pivot axis;

carriage means mounted on said movable guide rail means for movement along the latter in said second direction and being adapted to receive a cassette from, and to discharge a cassette into a selected one of said storage bins or said reproducing and/or recording means with which said carriage means is registered; and

carriage driving means for driving said carriage along said movable guide rail means so that, by the combined selective operations of said slider driving means and said carriage driving means, said carriage means can be registered with said selected one of the storage bins and the reproducing and/or recording means.

4,837,648

FLOATING MAGNETIC HEAD

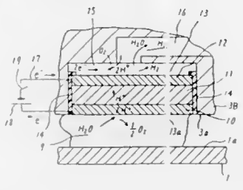
Shiro Yamauchi, Amagasaki, Japan assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 13, 1988, Ser. No. 181,071

Claims priority, application Japan, Apr. 16, 1987, 62-93767

Int. Cl.[4] G11B *5/60 21/21*

U.S. Cl. 360—103 **14 Claims**



1. A floating magnetic head comprising:

a magnetic head body;

a slider means provided on said magnetic head body and having a floating surface disposed generally in parallel with a plane on which a magnetic disk rotates, said floating surface capable of moving toward and away from a surface of said magnetic disk; and

a water removing member formed on at least a portion of said floating surface of said slider means for electrolytically removing any existing water between the floating surface of said slider means and the surface of said magnetic disk.

4,837,649

IMPROVEMENTS TO ROTATING HEAD ASSEMBLY IN A VIDEO TAPE RECORDING MACHINE

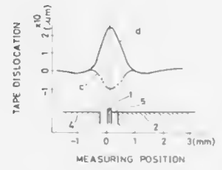
Toyofumi Tani, and Hiroshi Miwa, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 645,664, Aug. 30, 1984. This application Feb. 27, 1987, Ser. No. 20,224

Claims priority, application Japan, Sep. 21, 1983, 58-147203[U]

Int. Cl.[4] G11B *5/48, 5/027, 15/60*

U.S. Cl. 360—104 **3 Claims**



1. In a rotational magnetic head apparatus of a drum rotating system including a fixed drum having a guiding offset portion for guiding a magnetic tape along an outer periphery of the fixed drum; said fixed drum also including an annular end surface,

a rotational drum having an end surface facing said fixed drum and mounted for rotation about a central longitudinal axis of said fixed drum, said rotational drum having an opening formed on said end surface facing the annular end surface of said fixed drum, said opening having an uppermost surface extending generally parallel to the end surface of said rotational drum,

a magnetic head and means for mounting said magnetic head to the apparatus in said opening of said rotational drum, said tape being wound around the outer periphery of said fixed drum and said rotational drum at a predetermined angle for travel in sliding contact with said magnetic head, the improvement wherein

the position of said magnetic head is selected to be in the center between and in relation to said uppermost surface of said opening of said rotational drum facing said fixed drum and said annular end surface of said fixed drum opposing said uppermost surface, such center positioning of the magnetic head resulting in alignment in a travel direction of the head of a convex deformation in the tape with adjacent forward and rearward concave deformed tape portions, caused by said head, with a central longitudinal axis extending parallel to sides of said tape.

4,837,650

HEAD POSITIONING DEVICE

Junji Kawada, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 920,135, Oct. 17, 1986, abandoned. This application Jun. 6, 1988, Ser. No. 203,596

Claims priority, application Japan, Oct. 17, 1985, 60-231812

Int. Cl.[4] G11B *21/08, 5/55*

U.S. Cl. 360—106 **5 Claims**

1. A positioning device for a read/write head, comprising:

a rotatable capstan;

an idle roller;

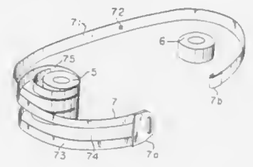
an elongate metallic band comprising:

(a) a middle portion,

(b) a first portion forming a first strip integral with said middle portion and extending from said middle portion in a longitudinal direction of said band,

(c) a second portion forming a second strip integral with said middle portion and extending from said middle portion in a direction opposite that of said first strip, said second strip having an opening, and

(d) a pair of tongue portions integral with said middle portion and extending therefrom in the same direction as said first portion, said tongue portions being positioned on opposite sides of said first portion and being separated therefrom by slits;



means for fixing said band to said capstan; and means for fixing a read/write head to said band, whereby said tongue portions provide smooth movement of said band around said capstan and prevent said band from breaking due to stress concentrations during movement of said band around said capstan.

4,837,651

DISC CARTRIDGE

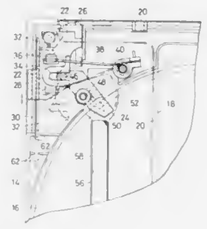
Kimio Tanaka; Toshihiko Ishida, and Haruo Shiba, all of Nagano, Japan, assignors to TDK Corporation, Japan

Filed Dec. 16, 1986, Ser. No. 942,492

Claims priority, application Japan, Dec. 18, 1985, 60-194554[U]

Int. Cl.[4] G11B *23/03*

U.S. Cl. 360—133 **16 Claims**



1. A disc cartridge comprising:

a casing comprising an upper cover plate and a lower cover plate joined together;

a disc rotatably housed in said casing;

a shutter for operating at least one window provided in said casing to insert a disc driving mechanism therethrough into said disc cartridge;

actuator means movably arranged in said casing and engaged with said shutter to releasably lock said shutter; and

a disc receiver movably arranged in said casing and operatively connected to said actuator means whereby movement of said actuator means in turn moves said disc receiver;

said disc receiver selectively receiving therein a part of a peripheral portion of said disc and being formed with a recess for receiving said peripheral portion of said disc;

said recess of said disc receiver having an end surface contacting an outer periphery of said disc which is formed into a substantially sideways V-shape having an apex positioned at substantially a center of said end surface;

said disc receiver being movably positioned within said casing to retain said disc substantially at a center of said casing between inner surfaces of said upper and lower cover plates in a top-to-bottom direction, when said cartridge is not in use; whereby

(i) said disc receiver receives the peripheral part of said disc and said is forced towards a rear end of said casing while being kept substantially at the center of said casing in a width direction of said casing by said disc receiver when said shutter is actuated to close said window and said actuator means are moved in a first direction, and

(ii) said disc receiver is separated from said disc when said shutter is actuated to open said window and said actualor means are moved in a second direction;

wherein said disc receiver is supported on a pivot pin so as to be rotatable about said pivot pin and axially movable along said pivot pin.

4,837,652

METHOD AND APPARATUS FOR INDEXING AND LABELING ELECTRONIC DISKS

Thomas D. Kerby, 68 E. Kensington Ave., Salt Lake City, Utah 84115

Filed Jun. 11, 1987, Ser. No. 60,411

Int. Cl.[4] G11B *23/03*

U.S. Cl. 360—133 **7 Claims**

1. A method for indexing and labeling one or more electronic disks for use in a disk drive of a data processing system having electronically activated storage media covered by an outer jacket surface with a segment on the non-electronic readable portions of said outer jacket surface sized to accommodate a removable label, and with a window opening in the face of the electronic disk jacket in communication with the segment to expose a label, said method comprising the steps of:

a. adapting a segment of the outer jacket of each electronic disk, which will not interfere with the electronic reading of the storage media, with window structure to accommodate a removable label;

b. reading names of files stored on each electronic disk;

c. storing the names of files into a data structure;

d. sorting the names of files from said data structure by desired criteria;

e. printing an index of names for each disk on a removable label insert which is sized to fit within said window; and

f. inserting the removable label insert into an appropriate window.

4,837,653

QUASI-POWER MEASUREMENT CIRCUIT

Douglas Yip, Bellevue, Wash., assignor to Data I/O Corporation, Redmond, Wash.

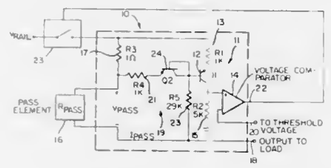
Filed Jun. 26, 1987, Ser. No. 67,360

Int. Cl.[4] H02M *3/26*

U.S. Cl. 361—86 **20 Claims**

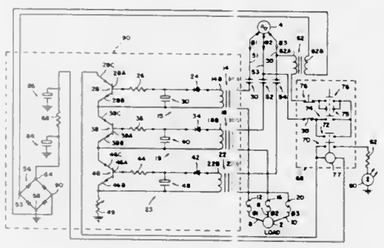
1. A signaling circuit adapted to be connected to an electrical component to signal when the electrical component is consuming excessive power, the maximum allowable current through and voltage across the component being I_{max} and V_{max}, respectively, the signaling circuit comprising:

means for measuring the current through the electrical component;
means for measuring the voltage across the electrical component;
means for producing a comparison voltage that represents the sum of the values of I and V, I and V respectively being the normalized current through and voltage across



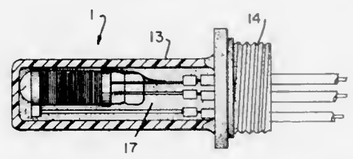
the electrical component, the normalization factors being I_{max} and V_{max}, respectively, the comparison voltage being an approximation to the power consumed by the electrical component; and
means for comparing the comparison voltage to a threshold voltage and producing an overpower signal when the comparison voltage exceeds the threshold voltage.

4,837,654
CONTROL APPARATUS FOR THREE PHASE ALTERNATING CURRENT LOAD PROTECTION
Wenbing Chen, and Da Q. Chen, both of 6203 10th Ave., #2R, Brooklyn, N.Y. 11219
Continuation-in-part of Ser. No. 46,455, May 5, 1987, abandoned. This application Jan. 14, 1988, Ser. No. 143,842
Int. Cl.[4] H02H *3/05*
U.S. Cl. 361—93 **14 Claims**



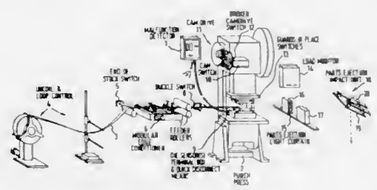
1. Control apparatus for three phase alternating current load protection, comprising:
a load circuit including a load and a power supply for the load said power supply having three phases, with each of said phases providing a full wave alternating output;
a detecting circuit connected to the load circuit for detecting when all three of the phases provide a half wave output in one sense of the full wave alternating output and for detecting when at least one of said half wave outputs is absent, and for providing a controlling output; and
means connected to the load circuit and to the detecting circuit and responsive to the controlling output from the detecting circuit when all three of the half wave outputs in the one sense are present to close the load circuit, and responsive to said controlling output when at least the one of said half wave outputs in the one sense is absent to open said load circuit.

4,837,655
OVERTEMPERATURE PROTECTOR FOR INCANDESCENT LAMP
Robert L. Ekowicki, Westbrook, Me., assignor to GTE Products Corporation, Stamford, Conn.
Continuation of Ser. No. 514,439, Jul. 18, 1983, abandoned. This application Dec. 7, 1987, Ser. No. 131,258
Int. Cl.[4] H02H *5/04;* **H01H** *71/16*
U.S. Cl. 361—103 **3 Claims**



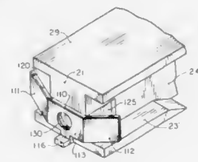
I. An overtemperature protector for a lamp socket housing comprising: a circuit breaker disposed within a glass envelope having a first and a second lead-in wire extending through one end of the glass envelope; an electrical heater consisting of insulated heater wire wrapped around the glass envelope; the first and second ends of the heater wire being secured by and connected to spring metal clips at opposite ends of the glass envelope; said first end of the heater wire being electrically connected to said first lead-in wire; said second lead-in wire being connectable to one side of line voltage; said second end of the heater wire being connectable to the other side of line voltage; the wire wrapped glass envelope being embedded in potting material in an enclosure closed at one end, there being a third, a fourth and a fifth lead-in wire extending out the end of the enclosure; said third and fourth lead-in wires being directly connected to said first and second lead-in wires, said fifth lead-in wire being connected to said second end of the heater wire; the heater being in series with the circuit breaker so that when the circuit breaker is open there can be no current flow through the heater.

4,837,656
MALFUNCTION DETECTOR
Austen B. Barnes, 2250 Midland Avenue, Unit 24, Scarborough, Ontario, Canada M1P 4R9
Filed Feb. 27, 1987, Ser. No. 19,692
Int. Cl.[4] H01H *47/28, 47/32, 9/00*
U.S. Cl. 361—185 **7 Claims**



1. A malfunction detector for detecting a malfunction in a machine having switch responsive to an operational parameter of said machine, said malfunction detector comprising:
supplying means for supplying an alternating current test signal to said switch means, said supplying means comprising generating means for generating said alternating current test signal with a frequency equal to the product of a mains frequency and a positive non-zero integer and with a phase which is shifted by a predetermined amount with respect to said mains phase; and
determining means for determining whether the resistance of said switch means to said alternating current test signal exceeds a threshold value, said determining means comprising phase detection means for responding only to a detection signal from said switch means having the same frequency and phase as said alternating current test signal.

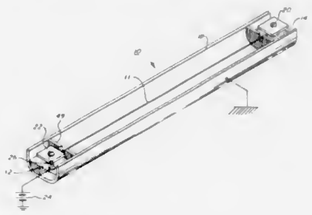
4,837,657
ELECTROSTATIC DISCHARGE DEVICE
Thomas D. Belanger, Jr., Clarendon Hills, and Roy L. Johnson, Arlington Heights, both of Ill., assignors to AG Communication Systems Corporation, Phoenix, Ariz.
Filed Dec. 17, 1987, Ser. No. 134,481
The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.
Int. Cl.[4] H05F *3/02*
U.S. Cl. 361—220 **6 Claims**



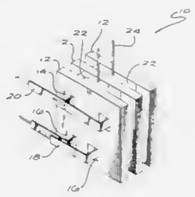
I. An electrostatic discharge device comprising.
a center section having an electrically conductive surface, said center section including means for mounting said center section to a substrate mounting device, and means for electrically connecting said center section to a protection ground;
a first resilient arm extending outward from said center section, said first arm including an electrically conductive surface electrically connected to said center section;
a second resilient arm extending outward from said center section directly opposite said first arm, said second arm including an electrically conductive surface electrically connected to said center section; and,
responsive to the installation of a circuit substrate to said substrate mounting device, said first arm contacts an edge of said circuit substrate allowing said first arms electrically conductive surface to electrically connect to said circuit substrate thereby, providing an electrical path for discharging electrostatic potentials from said circuit substrate to said protection ground and alternatively responsive to the installation of a circuit substrate to said substrate mounting device, said second arm contacts an edge of said circuit substrate allowing said second arms electrically conductive surface to electrically connect to said circuit substrate thereby, providing an electrical path for discharging electrostatic potentials from said circuit substrate to said protection ground.

4,837,658
LONG LIFE CORONA CHARGING DEVICE
Louis Reale, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 14, 1988, Ser. No. 284,224
Int. Cl.[4] H01T *23/00*
U.S. Cl. 361—230 **15 Claims**

1. A corona generating device for depositing a negative charge on an imaging surface carried on a conductive substrate held at a reference potential comprising at least one elongated conductive metal corona discharge electorde supported between insulating end blocks, means to connect said electrode to a corona generating potential source, said discharge electrode being coated with a substantially continuous thin conductive dry film of aluminum hydroxide containing conductive particles.



4,837,659
TRANSFORMER/INDUCTOR WITH INTEGRATED CAPACITOR USING SOFT FERRITES
Waseem A. Roshen; David E. Turcotte, and Dale F. Regelman, all of Tucson, Ariz., assignors to ITT Corporation, New York, N.Y.
Filed Mar. 21, 1988, Ser. No. 171,313
Int. Cl.[4] H01H *9/28;* **H01F** *27/28*
U.S. Cl. 361—270 **13 Claims**

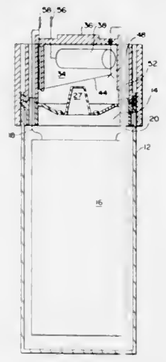


1. An integrated inductive and capacitive device comprising:
at least one planar, soft ferrite layer;
at least a first conductive element forming a loop in a plane generally perpendicular to said planar soft ferrite layer, said loop enclosing at least part of said soft ferrite layer within said loop formed by said first conductive element; and
at least a pair of second conductive elements, said pair of second conductive elements being planar, rectangular sheet-like plates disposed on opposing sides of said soft ferrite layer, said pair of second conductive elements forming a capacitor with said at least a portion of said soft ferrite layer disposed between said pair of second conductive elements,
whereby an integrated inductive and capacitive device is fabricated and is characterized by enhanced inductive and capacitive magnitudes.

4,837,660
SELF-PROTECTED LOW VOLTAGE CAPACITOR
Serge Theoleyre, Aix-les-Bains; Pascal Salsetti, Voiron, and Daniel Masset, Veyrier-du-Lac, all of France, assignors to Merlin Gerin, France
Filed May 17, 1988, Ser. No. 196,068
Int. Cl.[4] H01G *4/40*
U.S. Cl. 361—275 **8 Claims**

I. A low voltage capacitor cell comprising :
a self-healing wound coil
a rigid external housing surrounding said coil, said housing

having an open-ended casing and a deformable sealing membrane of said open end,
a first compartment of said housing, confined in a leaktight manner by the casing and the deformale membrane and in which said coil is housed,
a first and second connecting conductor of said wound coil, passing tightly through said membrane,
a short-circuiting contact having a pair of stationary and movable contacts capable of being actuated when a deformation of said membrane occurs due to an overpressure



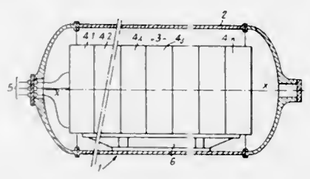
generated in the first compartment, to bring about a clean short-circuit of said wound coil on closing,
a cover covering said membrane a second compartment confined by said cover and the deformable membrane, in which is housed the short-circuiter and a protective fuse arranged in said second compartment and inserted in series with one of said connecting conductors and said coil and said short-circuiting contact to disconnect said capacitor cell when an overpressure occurs causing the short-circuiting contact to close and when an overcurrent occurs flowing through said coil.

4,837,661

DEVICE FOR STORING ELECTRICAL ENERGY AT VERY HIGH VOLTAGE, PARTICULARLY FOR HIGH ENERGY DENSITY MARX GENERATOR, AND ELECTRODE FOR SUCH A DEVICE

André Lherm, Haillan; Bernard Raveu, St-Medard-En-Jalles, and Alain Nicolas, Reyrieux, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Oct. 6, 1988, Ser. No. 254,228
Claims priority, application France Oct. 19, 1987, 8714374
Int. Cl.[4] H01G *4/38;* H02M *3/18*
U.S. Cl. 361—329 18 Claims



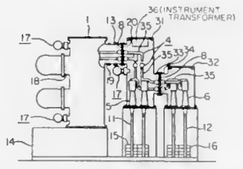
1. In a device for storing very high voltage electrical energy, of the type comprising a plurality of capacitor stages of which each is in the form of a ring and is provided, at each of the end faces of the corresponding capacitor, with at least one electrode, said rings being coaxial and distributed along their common axis, each electrode having at least one radial portion with respect to the corresponding ring and being constituted by a thin metal band of which the plane is of general direction perpendicular to said common axis and parallel to said end faces of said rings.
the longitudinal edges of said electrodes are rounded, at least concerning certain portions of said electrodes which lie opposite an end face of the corresponding capacitor, so as not to present any longitudinal end edge opposite said end face.

4,837,662

GAS INSULATED SWITCHGEAR

Hiroshi Takeuchi; Kiyokazu Torimi, and Keizo Takatsuka, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 29, 1987, Ser. No. 102,338
Claims priority, application Japan, Oct. 7, 1986, 61-153156[U]
Int. Cl.[4] H02B *1/04*
U.S. Cl. 361—335 6 Claims



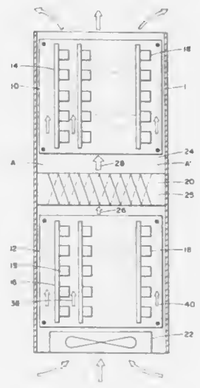
1. A gas insulated switchgear comprising:
an upstanding interrupter vessel having a base;
an interrupter in said interrupter vessel which is operable to interrupt current flowing therethrough, said interrupter having interrupter lead-in terminals;
a first cable head vessel including upstanding first cable heads located at a level above said base, said first cable heads having lead-in terminals at opposite first and second sides of said first cable head vessel;
a second cable head vessel including upstanding second cable heads located at a level above said base substantially the same as the level of said first cable heads, said second cable heads having lead-in terminals at one side of said second cable head vessel;
fastening portions fastening, respectively,
said interrupter vessel and said first cable head vessel, and said first and second cable head vessels;
said fastening portion fastening said first and second cable head vessels being at a level above said base lower than said fastening portion fastening said interrupter vessel and said first cable head vessel; and
conductors connecting said interrupter to said first cable heads through the interrupter lead-in terminals and the lead-in terminals at the first side of said first cable head vessel, and connecting said first cable heads to said second cable heads through the lead-in terminals at the second side of said first cable head vessel and the lead-in terminals at the one side of said second cable head vessel;
each of said vessels being filled with an electrically insulating gas.

4,837,663

ELECTRONIC APPARATUS COOLING SYSTEM

Shizuo Zushi; Mitsuo Miyamoto; Hiroshi Gou; Fumiyuki Kobayashi, all of Kanagawa, and Tetsuo Ogata, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 19, 1988, Ser. No. 145,473
Claims priority, application Japan, Jan. 21, 1987, 62-11889
Int. Cl.[4] H02B *1/00;* H05K *7/20*
U.S. Cl. 361—384 11 Claims



1. A cooling system for an electronic apparatus comprising:
a plurality of mother boards having circuit boards to be cooled;
a blower for causing an air flow from a one mother board to an other mother board; and,
a draft duct disposed intermediate the mother boards and having means for dividing the air flow into a plurality of partial flows, means for changing an air flow direction of the partial flows, and means for intermixing the partial flow wherein the intermixed partial flows have a substantially uniform temperature distribution for uniform cooling of the mother boards.

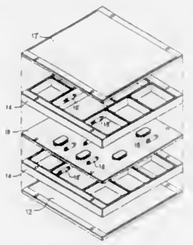
4,837,664

BUILDING BLOCK COMPOSITE DESIGN AND METHOD OF MAKING FOR RF LINE REPLACEABLE MODULES

Noe E. Rodriguez, II, Arnold; William T. Flaherty, Jr., Columbia, both of Md.; Sharon A. Duggan, Washington, D.C., and Timothy M. Fertig, Pasadena, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 12, 1988, Ser. No. 247,865
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—386 10 Claims

1. A line replaceable electronic module, comprising:
a planar thermal means, said planar thermal means having a first and a second face, said planar thermal means being operable to dissipate heat away from a multiplicity of electronic components mounted upon said first face of said planar thermal means to the edges of said planar thermal means during said module operation, said planar thermal means comprising a heat conducting composite material;
a planar grid partition top, said planar grid partition top being fixedly interconnected to said first face of said planar thermal means, said planar grid partition top being operable to provide structural support to said planar thermal means, said planar grid partition top comprising a molded composite material;
a planar grid partition bottom, said planar grid partition bottom being fixedly interconnected to said second face of said planar thermal means, and further said planar grid partition bottom being operable to provide structural support to said planar thermal means, said planar grid partition bottom comprising a molded composite material;
a planar top cover, said planar top cover being fixedly interconnected to said planar grid partition top, said planar top cover being operable to enclose and protect said electronic components mounted upon said first face of said



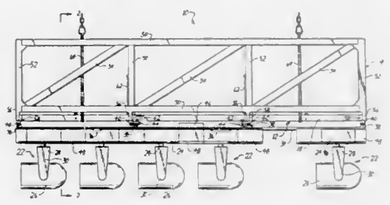
thermal plane, said planar top cover comprising a molded composite material; and,
a planar bottom cover, said planar bottom cover being fixedly interconnected to said planar grid partition bottom, said planar bottom cover comprising a molded composite material said planar bottom cover being operable to enclose and protect said second face of said thermal plane during line replaceable electronic module operation.

4,837,665

MODULAR STAGE LIGHT SYSTEM

Bryan Hoyer, San Jose, and John Richardson, Los Gatos, both of Calif., assignors to Morpheus Lights, Inc., San Jose, Calif.

Filed Dec. 2, 1987, Ser. No. 127,890
Int. Cl.[4] F21V *21/14*
U.S. Cl. 362—96 8 Claims



1. A stage lighting system comprising: truss means including an elongated rail supported by said truss means;
a power connection device supported by said truss means; a plurality of light means each having a control box with a modular housing having open ends and being supported by said rail in alignment with open ends of other modular housings, each said control box being electrically connected to said power connection device,
lamp means supported by said control box modular housing, and
motor means supported by said control box modular housing and responsive to control currents received via an output bus to adjust the operation of said light means; and
a fan having a modular housing with open ends and which is supported by said rail in alignment with an open end of another modular housing.

4,837,666

NIGHT LIGHT FOR WALKING ASSISTANCE DEVICES

Gary L. Conkle, Box 143, Harrod, Ohio 45850

Filed May 20, 1988, Ser. No. 196,565
Int. Cl.[4] A45B *3/02*
U.S. Cl. 362—102 5 Claims

1. A night light for attachment to a walking assistance and sports devices having a support member, said night light comprising a housing, means mounting the housing on said support member, a light bulb mounted externally on the housing with the periphery and one end being exposed, said bulb facing an area to be illuminated, battery means in the housing, switch means on the housing for selectively connecting the battery means to the light bulb with the switch means including an actuator oriented externally of the housing for access, said support member including handle means engaged by the user of the walking assistance and sports devices with the switch actuator being disposed adjacent the handle to enable a person using the walking assistance and sports devices by gripping engagement with the handle to reach and manipulate the switch actuator, a transparent shield of cylindrical configuration disposed in encircling relation to the periphery of the light bulb and beyond the end of the light bulb to protect the bulb and enable light rays to pass radially through the shield and out the end of the shield, said shield being provided with an open end to provide access to the light bulb, and means connecting the shield to the housing to enable removal of the bulb when the light bulb is to be replaced.

4,837,667

LIGHTING SYSTEM WITH LAMPS ARRANGED BETWEEN TWO LOW-VOLTAGE CONDUCTORS

Tobias Grau, Lippmannstrasse 72-74 DE-2000 Hamburg 50, Fed. Rep. of Germany

PCT No. PCT/EP87/00566, § 371 Date Jun. 1, 1988, § 102(e) Date Jun. 1, 1988, PCT Pub. No. WO88/02460, PCT Pub. Date Apr. 7, 1988
PCT Filed Oct. 2, 1987, Ser. No. 213,703
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1986, 3633792; Jan. 13, 1987, 8700563
Int. Cl.[4] F21S *1/02*
U.S. Cl. 362—147 25 Claims

1. Lighting system with lamps electrically connected between a pair of low-voltage conductors in the form of one of ropes, cables and wires, each lamp comprising

a lamp holder with a bulb holder and electrical contacts for a bulb;

current-carrying bars connected to said contacts and extending radially from said lamp holder relative to a longitudinal axis of the lamp holder, and

supports for connecting the current-carrying bars to the low-voltage conductors, each support being provided with a rotatable fixture and a pivotal holding element, and each support being rotatably connected to a respective one of the low-voltage conductors by said rotatable fixture for rotation about a rotational axis extending normal to said current-carrying bars and being pivotally connected to said current-carrying bars by said pivotal holding element for pivoting about a pivot axis that is parallel

to said current-carrying bars, thereby creating a universal mounting of each lamp; and

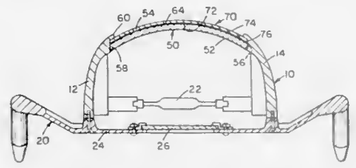
wherein a holding device having a deviating means for producing an angle of deviation in a mounted configuration of the low-voltage conductors is provided, said deviating means comprising a pair of deviation segments for supporting the low-voltage conductors, each of said deviating means being provided with a guide for a respective one of the low-voltage conductors, wherein said deviation segments are interconnected together, and wherein said holding device has mounting means for pivotally mounting said deviating means to a supporting wall.

4,837,668

REFLECTOR FOR DENTAL OR MEDICAL LIGHT

Joseph P. Koehler, 10523 Chillicothe, Kirtland, Ohio 44094

Filed Jan. 28, 1988, Ser. No. 149,410
Int. Cl.[4] F21Y *7/22*
U.S. Cl. 362—297 21 Claims



1. A reflector for use in a dental or medical lighting device, comprising:

a glass substrate of a predetermined paraboloidal shape for reflecting light in a predetermined pattern and having a front surface and a rear surface, wherein one of said front and rear surfaces is a reflecting surface;

a paraboloidal cover plate for covering said rear surface of said glass substrate, wherein said cover plate also has a reflecting surface; and,

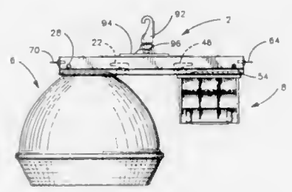
a securing means for fastening said cover plate to said glass substrate in a selectively removable manner.

4,837,669

LOW PROFILE INDUSTRIAL LUMINAIRE

Terry M. Tharp; David W. Roberts; John C. McCartney, and John W. Harvey, all of Newark, Ohio, assignors to Manville Corporation, Denver, Colo.

Filed Jan. 28, 1987, Ser. No. 7,889
Int. Cl.[4] F21S *1/02*
U.S. Cl. 362—418 9 Claims



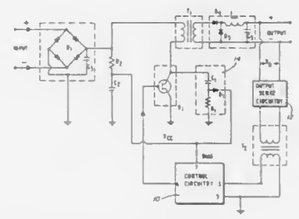
1. A low profile HID light fixture comprising; a housing, means for mounting said housing, an optical assembly having a lamp contained therein, an electrical assembly having a ballast contained therein and means for mounting said optical assembly and said electrical assembly in side by side relationship directly beneath said housing affording both independent and simultaneous access to each assembly for maintenance and replacement purposes, wherein said means for mounting said optical assembly in side by side relationship beneath said housing includes tracks formed in said housing and plates fixed to said optical assembly and said electrical assembly, said plates being adapted to ride in said tracks formed in said housing, and wherein each plate is mounted at ends of side housing opposite the other respective plate.

4,837,670

BIAS SOURCE FOR A SWITCHMODE CONVERTER

Bonifacio Diaz, El Paso, Tex., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Sep. 20, 1988, Ser. No. 247,030
Int. Cl.[4] H02M *3/335*
U.S. Cl. 363—21 20 Claims



1. A regulator/converter, comprising:

(a) a transformer;

(b) a switch in series with the primary of said transformer, said switch and transformer being adapted to be connected across a source of DC voltage;

(c) control means for opening and closing said switch to supply current through the primary winding of said transformer in response to the flow of current through the output of the transformer;

(d) snubber means for said switch; and

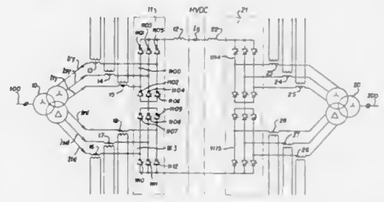
(e) bias means, using the flow of current through said snubber means, for supplying voltage to said control means.

4,837,671

STATE SIGNAL FORMATION FOR INDICATING THE TRANSITION INTO THE BYPASS MODE OF OPERATION IN AN APPARATUS FOR HIGH-VOLTAGE D-C TRANSMISSION

Georg Wild, Langensendelbach; Rembert Kohler, Nuremberg; Manfred Weibelzahl, Uttenreuth-Weiher; Martin Haushofer, Creglingen, and Johann Messner, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 12, 1988, Ser. No. 193,511
Claims priority, application Fed. Rep. of Germany, May 15, 1987, 3716351
Int. Cl.[4] H02J *3/36*; H02H *7/10*
U.S. Cl. 363—35 15 Claims



1. In a system including a high voltage DC transmission line and a converter which acts as a rectifier or inverter coupled to one of the ends of the transmission line, a method for forming a state signal, which, after interruption of a normal commutating sequence of the converter, indicates a successful commutation of the DC current to selected valves of the converter which make possible the flow of DC current, the successful commutation thereby circumventing the side of a converter transformer coupled to the converter, comprising the steps of:

(a) measuring currents on the side of the converter transformer connected to the converter;

(b) weighting the measured currents with weighting factors to form a summation current in such a manner that for a normal commutation sequence, the absolute value of the summation current has no null zones; and

(c) releasing the state signal if, at the end of a predetermined time after the interruption of the normal commutation sequence and the firing of the selected converter valves, the absolute value of the summation current has become zero, and wherein

(d) the predetermined time is set at least as large as is required for the successful commutation of the DC current to the selected converter valves.

4,837,672

SWITCHED MODE POWER SUPPLY

Jerry L. Donze, Arvada, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Aug. 30, 1988, Ser. No. 238,864
Int. Cl.[4] H02M *7/04*
U.S. Cl. 363—143 14 Claims

1. In a power supply:

an input side,

an output side,

an ac input,

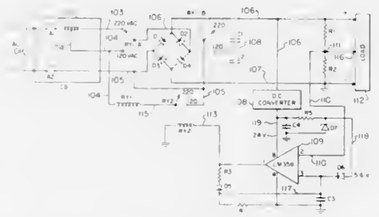
a rectifier,

a circuit breaker on said input side connected in series between said ac input and said rectifier,

means for operating said rectifier as a full wave rectifier to generate a relatively high dc potential on said output side in response to the application of a relatively high ac potential to said ac input,

means for subsequently operating said rectifier as a voltage doubler to generate said relatively high dc potential on

said output side in response to the application of a relatively low ac potential to said ac input, and



means for controlling said circuit breaker to trip at an input current corresponding to a fixed output current as said relatively high and relatively low ac potentials are applied at different times to said ac input

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4,837,673

PREPARATION AND DISPLAY OF SEWING DATA ON AN AUTOMATIC SEWING MACHINE

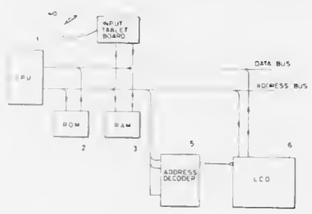
Iwao Yamane, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 925,055, Oct. 30, 1986, abandoned. This application Oct. 20, 1988, Ser. No. 262,265

Claims priority, application Japan, Oct. 31, 1985, 60-244655

Int. Cl.[4] D05B *3 '02*

U.S. Cl. 364—188 **7 Claims**



1. A data input device for a sewing machine, comprising

an input tablet board having a pattern input section for inputting an image of a sewing pattern and an operation key input section for inputting character data on a plurality of operation input keys representing said character data, said operation input keys including function keys and numerical keys, said numerical keys indicating a number;

a manually movable stylus for tracing said image of said sewing pattern on said pattern input section and for selecting respective ones of said plurality of operation input keys in said operation key input section;

means for preparing sewing data according to said inputted image of said sewing pattern and said inputted character data;

a liquid crystal display for sequentially displaying selective operations to be performed by said stylus, contents of said liquid crystal display changing in accordance with selection of ones of numerical keys by said stylus to select an input mode, a scale, a pitch, a sewing speed, and a method of inputting said sewing data; and

means, responsive to said selection of said ones of said numerical keys, for displaying sequential menus from which said input mode, said scale, said pitch, said sewing speed, and said method of inputting said sewing data are respectively selected, said contents of said liquid crystal display changing in accordance with the one of said menus being displayed.

4,837,674

CIRCUIT ARRANGEMENT CAPABLE OF QUICKLY PROCESSING AN INTERRUPT IN A VIRTUAL MACHINE OPERATED BY A PLURALITY OF OPERATING SYSTEMS

Hisao Takane, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 9, 1987, Ser. No. 12,162

Claims priority, application Japan, Feb. 10, 1986, 61-25979

Int. Cl.[4] G06F *9/46*

U.S. Cl. 364—200 **4 Claims**

1. A circuit arrangement for use in a virtual machine which comprises a main memory connected to an input/output device, and a plurality of execution processing units and which is operable in accordance with a plurality of operating systems, said circuit arrangement being responsive to an interrupt request which indicates an interrupt processing operation to be carried out in a preselected one of said execution processing units, wherein the circuit arrangement comprises:

first means included in said input/output device for supplying said interrupt request simultaneously to each of said execution processing units so that only a receivable one of said execution processing units responds to said interrupt request; and

second means included in each of said execution processing units and coupled to said main memory and interruption reception circuit of the other execution processing unit, said second means of said receivable processing unit cooperating with a control program in said main memory for generating an interrupt start signal for directly starting said interrupt processing operation in said preselected one of the execution processing units when said receivable one of the execution processing units is different from said preselected one of the execution processing units.

4,837,675

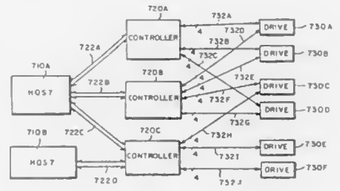
SECONDARY STORAGE FACILITY EMPOLYING SERIAL COMMUNICATIONS BETWEEN DRIVE AND CONTROLLER

Robert G. Bean; Michael E. Beckman; Barry L. Rubinson; Edward A. Gardner; O. Winston Sergeant, and Peter T. McLean, all of Colorado Springs, Colo., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 97,315, Sep. 14, 1987, abandoned, which is a continuation of Ser. No. 944,929, Mar. 23, 1987, abandoned, which is a divisioo of Ser. No. 823,121, Jan. 24, 1986, abandoned, which is a contiauation of Ser. No. 570,412, Jan. 12, 1984, abandoned, which is a continuation of Ser. No. 308,593, Oct. 5, 1981, abandoned. This application Feb. 1, 1988, Ser. No. 153,518

Int. Cl.[4] G06F *11/00*

U.S. Cl. 364—200 **7 Claims**



I. In a secondary storage system for a data processing system including a mass storage device and a controller for effectuating the operations of the mass storage device, a method of attempting to recover from data errors in reading data from the mass storage device comprising the steps of:

A. assigning a number to each error recovery technique available to the mass storage device;

B. the controller requesting information regarding the number of error recovery techniques in the mass storage device;

C. the mass storage device providing to the controller a signal representing the numer of error recovery techniques available to the device;

D. the controller monitoring read data from the mass storage device to detect a data error;

E. if the mass storage device has only one available error recovery technique, then upon the detection of a data error,

1. the controller producing a command signal including the number of the error recovery technique available to the mass storage device;

2. the controller sending to the mass storage device the command signal including the number of the error recovery technique available to the mass storage device; and

3. the mass storage device implementing the error recovery technique specified by the command signal;

F. if the mass storage device has more than one available error recovery technique step A further comprises the step of ordering the number assignment for each error recovery technique so as to prescribe an order of implementation and then upon detection of a data error,

1. the controller, using information from the signal provided by the mass storage device representing the number of error recovery techniques, producing a command signal including the number identifying one of the error recovery techniques available to the mass storage device;

2. the controller sending the command signal to the mass storage device;

3. the mass storage device implementing the error recovery technique identified by the command signal;

4. the controller monitoring the read data; after the mass storage device implements the error recovery technique, to detect a data error;

5. if a data error is detected, and if there is at least one error recovery technique which has not been implemented, the controller producing and sending another command signal including the number identifying another of the error recovery techniques available to the mass storage device;

6. if the controller sends another command signal to the mass storage device, the mass storage device responding to said another command signal by implementing the next error recovery technique of the prescribed order; and

7. repeating steps F.4., F.5., and F.6. until either the read operation succeeds or all of the error recovery techniques of the mass storage device have been implemented; and

G. if the mass storage device has no error recovery techniques available, the controller not sending a command signal to the mass storage device.

4,837,676

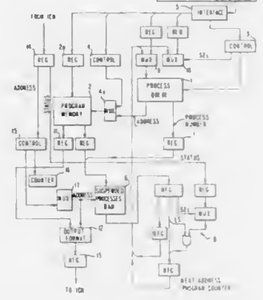
MIMD INSTRUCTION FLOW COMPUTER ARCHITECTURE

Andrew Rosman, Los Alamitos, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 668,590, Nov. 5, 1984, abandoned. This application Aug. 15, 1988, Ser. No. 233,867

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—200 **9 Claims**



1. An instruction flow computer, comprising:

process control units, each having a set of processes, each process having sequential instructions;

function units;

memory units;

an interconnection network interconnecting said process control units, said function units and said memory units in parallel paths for providing communication among the units on the interconnection network;

means forming part of at least one process control unit for initiating a first process of said set of processes having said sequential instructions, at said at least one of said process control units; and

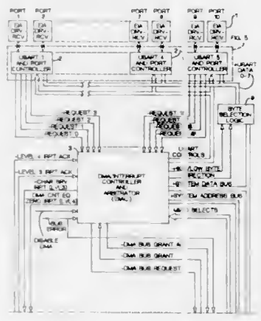
means forming part of said at least one process control unit responsive to initiation of said first process for routing the first instruction of said sequential instructions of said first process via said interconnection network to others of said units, wherein said means for routing routes the first instruction of said sequential instructions of said first process to proceed in sequence from said process control unit, to a memory unit for fetching data, to a function unit for processing and back to said process control unit.

4,837,677

MULTIPLE PORT SERVICE EXPANSION ADAPTER FOR A COMMUNICATIONS CONTROLLER

Gilbert S. Burrus, Jr., Apex; Ronald J. Cooper, Raleigh; Michael R. Marr, Chapel Hill; Mario A. Marsico, Cary; John C. Pescatore, Chapel Hill, and Paul D. Sullivan, Apex, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 14, 1985, Ser. No. 744,850
Int. Cl.[4] G06F *13/32*
U.S. Cl. 364—200 8 Claims



1. A multiport service expansion adapter means for expanding service at a single port of a communications controller, comprising:

a multiport communications adapter having multiports and first system address and data busses;

a communications controller having second system address and data busses and at least one access port for access thereto; and

interconnection control means connected to said multiport communications adapter and connected to said access port of said communications controller;

said interconnection control means requesting access to said access port for any of said multiports of said communications adapter which require service; and

said interconnection control means further including means responsive to a grant of access to said communications controller port for connecting signals from said first system address and data busses to said second system address and data busses.

4,837,678

INSTRUCTION SEQUENCER FOR PARALLEL OPERATION OF FUNCTIONAL UNITS

Glen J. Culler, 608 Litchfield, Santa Barbara, Calif. 93105; Robert B. Pearson, 6457 Camino Viviente, Goleta, Calif. 93117; Michael McCammon, 683 Catania Way, Santa Barbara, Calif. 93105; William L. Proctor, 6641 Del Playa, Goleta, Calif. 93117, and John L. Richardson, 5561 Huntington Dr., Santa Barbara, Calif. 93111

Filed Apr. 7, 1987, Ser. No. 35,349
Int. Cl.[4] G06F *9/22*
U.S. Cl. 364—200 20 Claims

1. An instruction sequencer for programming parallel operations of a plurality of functional units in response to an instruction stream comprising

memory means for storing in selected locations in said memory means a plurality of instruction segments for programming operations of at least two of said plurality of functional units;

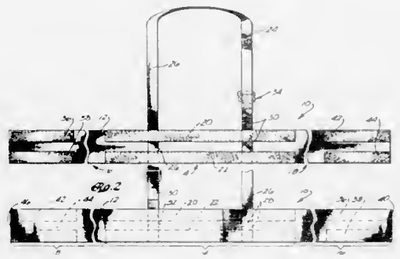
an instruction address register adapted to be loaded with instruction addresses for selected locations in said memory means;

memory addressing means operatively coupled to said memory means and said instruction address register and responsive to instruction addresses loaded in said address registers for reading out instruction segments from addressed selected locations in said memory means in an instruction stream comprising instruction segments which include a selected instruction segment for programming operation of at least a predetermined one of said plurality of functional units;

an instruction buffer register operatively coupled to said memory means for storing said instruction stream from said memory means;

a rotating network means operatively coupled to said instruction buffer register for rotating said instruction stream to position a selected instruction segment thereof at a predetermined location in said rotating network means, said rotating network means including output means for transfering as an output therefrom the rotated instruction stream;

control means including a staging register adapted to be loaded with an address designating the location of said selected instruction segment in the instruction stream and means for determining the width of said selected instruction segment, said control means being operatively coupled to said instruction buffer register and to said rotating



network means for enabling said rotating network means to be responsive to said staging register to rotate said instruction stream to position said selected instruction segment at said predetermined location in said rotating network means;

a first decoding means operatively coupled to said rotating network means output means for decoding said selected instruction segment to produce a first control signal which is capable of commencing operation of said predetermined one of said plurality of functional units;

a shifting means operatively coupled to said rotating network means output means and to said control means for enabling said shifting means to shift said rotated instruction stream at least the width of said selected instruction segment to position the beginning of a successive instruction segment for another of said plurality of functional units at a predetermined location within said shifting means; and

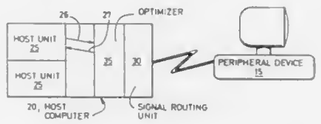
a second decoding means operatively coupled to said shifting means for decoding said shifted rotated instruction stream to produce a second control signal which is capable of commencing operation of said another of said plurality of functional units in parallel with the operation of said predetermined one of said plurality of functional units.

4,837,679

SYSTEM FOR SUPPORTING AN ERASE INPUT KEY WITH INPUT SUPPRESSION IN A SYSTEM FOR OPTIMIZING DATA TRANSMISSION ASSOCIATED WITH ADDRESSABLE-BUFFER DEVICES

Philip V. Wiles, Jr., Houston; Thomas A. Harper, and Carol R. Harper, both of Sugarland, all of Tex., assignors to BMC Software, Inc., Sugarland, Tex.

Filed Dec. 31, 1986, Ser. No. 948,150
Int. Cl.[4] G06K *15/00*; H04L *11/00*
U.S. Cl. 364—200 2 Claims



1. A method for optimizing a signal exchange,

said signal exchange including one or more outgoing transmissions of outgoing signals having information contents and generated by a host unit to be received for processing by a peripheral unit,

said signal exchange further including one or more incoming transmissions of incoming signals having information contents and generated by the peripheral unit to be received for processing by the host unit,

said peripheral device having an addressable peripheral unit buffer modifiable at the peripheral unit in response to the information contents of an outgoing signal,

the peripheral unit buffer having information contents that are logically dividable into one or more fields,

each said field having a field attribute byte for representation of field attributes,

one said field attribute being a modified data tag (MDT) signifying a premodified field and capable of selectively having a set state or an unset state,

another field attribute being a protected-field attribute representing a protected field,

said method comprising the steps, executed by a machine, of:

creating a buffer contents map in a storage device, said buffer contents map representing information available at the machine about the informational contents of said peripheral unit buffer;

for each outgoing signal that would cause a modification of the informational contents of the peripheral unit buffer,

blocking the outgoing signal from being processed by the peripheral unit,

updating said buffer contents map to reflect the informational content of said outgoing signal, and

generating and transmitting to the peripheral unit an input-suppressed signal,

any MDT for any protected field in the outgoing signal being in said unset state in said inputsuppressed signal;

for each incoming signal subsequent to a previous said outgoing signal,

blocking the incoming signal from being processed by the host unit,

updating said buffer contents map to reflect the informational content of said incoming signal,

if no fields in the outgoing signal were premodified fields, filling all unprotected fields in the buffer contents map with an in-doubt character,

if the incoming signal includes fields corresponding to all premodified fields in the outgoing signal, filling all unprotected fields in the buffer contents map with an in-doubt character,

otherwise, if the incoming signal includes fields corresponding to less than all premodified fields in the outgoing signal, filling all unprotected fields in the buffer contents map with nulls, and

generating and transmitting an augmented incoming signal to the host unit,

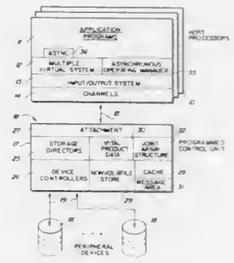
said augmented incoming signal including the informational content of the buffer contents map corresponding to the fields in the peripheral unit buffer, if any, associated with any premodified fields in the previous outgoing signal.

4,837,680

CONTROLLING ASYNCHRONOUSLY OPERATING PERIPHERALS

Robert N. Crockett; Robert F. Kern; Arnold G. Miller; Richard E. Norris; Michael W. Pousson, Jr., and Robert E. Wagner, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 28, 1987, Ser. No. 90,722
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—200 6 Claims



1. In a method of operating a multiple host processor data processor system wherein a plurality of host processors are commonly connected to a peripheral subsystem having a programmed control unit and a plurality of attached peripheral devices, path address means in the subsystem for accessing the devices from the programmed control unit, each of the peripheral devices having means for performing host related data processing functions which are commanded by any one of the host processors, a fast access cache in the programmed control unit for storing data during data transfer operations between any of the commonly connected host processors and addressed ones of the devices, the host processors accessing data areas in the cache and in the peripheral devices via addresses of the devices, said addresses of the devices including said addresses with paths not being individually and separately addressable by the host processors, each of the commonly connected host processors having a unit control block for and describing the peripheral devices and control tables describing current configuration and status of the peripheral subsystem;

the steps of:

grouping less than all of said peripheral devices into one or more logical groups of primary and secondary devices, making said primary devices directly addressable by any of said commonly connected host processors and making said secondary devices not directly addressable by said host processors;

in each of the commonly connected host processors establishing a device table for each of the devices, which tables are separate from the unit control blcoks, storing the addresses of the peripheral devices of the same logical group to which the peripheral device belongs and indicating in each device table whether each of the peripheral devices are primary or secondary devices;

in said peripheral subsystem retentively storing identifications of said logical groups of devices, the addresses of the devices in said logical groups and indicating which of the devices are primary or secondary devices, and status of said cache and programmed control unit;

changing the statut of a peripheral device, programmed control unit or cache of the peripheral sybsystem from within such peripheral subsystem, retentively storing in said subsystem the changed statu;

sending an untagged interruption signal from the control unit which identifies a one of the peripheral devices affected by such change in status and indicating in the interruption signal that a device-state transition has occurred;

in each of the commonly connected host processors receiving said untagged interruption signal, operating the host processors to respond to said interruption signal to command the peripheral subsystem to supply status about the device identified in the interruption signal and status of control unit or cache irrespective of what change in status occurred in the subsystem; and

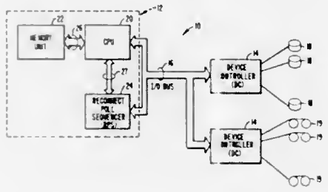
operating the peripheral subsystem to respond to the command to send the change in status to the commanding host processor, then operating the host processor to update its UBS's and control tables to reflect the change in subsystem status.

4,837,681

INSTRUCTION SEQUENCER BRANCH MECHANISM

William T. Fuller, San Jose, Calif., assignor to Tandem Computers Incorporated, Cupertino, Calif.

Filed Mar. 13, 1986, Ser. No. 839,742
Int. Cl.[4] G06F 9/32
U.S. Cl. 364—200 **16 Claims**



1. Digital apparatus, comprising:

memory means for containing a plurality of instructions;

address means coupled to the memory means for providing address signals causing pairs of the instructions, comprising a primary instruction and a target instruction, to issue simultaneously from the memory means;

register means for receiving and temporarily storing the pairs of instructions, the register means including a first and a second portion for respectively storing the primary and target instruction;

decoding means coupled to the first portion of the register means for interpreting the primary instruction to provide control signals therefrom, the decoder means including a first circuit means for receiving at least one condition signal; and

a second circuit means coupled to the register means and responsive to decoding of certain ones of the primary instructions by the decoder means and to presence of the condition signal for transferring the target instruction to the first portion of the register means.

4,837,682

BUS ARBITRATION SYSTEM AND METHOD

Glen J. Culler, Santa Barbara, Calif., assignor to Glen Culler & Associates, Goleta, Calif.

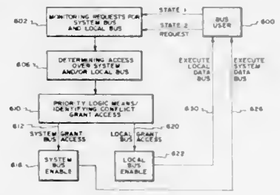
Filed Apr. 7, 1987, Ser. No. 35,307
Int. Cl.[4] G06F 1/00
U.S. Cl. 364—200 **8 Claims**

1. A data bus arbitration system in a data processing system having a plurality of processing units each of which are coupled through a local data bus to an associated local memory and a system data bus which interconnects said processing units and local memories parallel to the local data bus, said system data bus being responsive to an external system request to access any one of the associated local memories independently of the processing units requests, said processing units including two states for accessing its local memory, a first state wherein access to its local memory is provided over the system data bus, and a second state wherein access to its associated local memory is provided over a local bus, said data bus arbitration system comprising

means coupled to each of said processing units for monitoring when access to an associated local memory is requested by one or more processing units each being in its first state and coupled to the system data bus for monitoring when access is requested by an external system request over the system data bus to an associated local memory;

means responsive to said monitoring means for determining whether said access can be provided over each of said system data bus and a local data bus;

priorty logic means coupled to said monitoring means and to said determining means for identifying an existence of a conflict due to one or more of the processing units and an



extrenal system request requesting access over the system data bus to an associated local memory and for granting any external system priority to the system bus and to an associated local memory over a request from a selected one of the processing units to and enabling the processing units change from its first state to a second state to secure access to its associated local memory over a local bus and, in absence of a conflict requesting a local memory associated with a processing unit, to grant a processing unit its sequest in its second state to access its associated local memory over its local data bus; and

control means means coupled to said priority logic means for enabling said selected one of said processing units and said system data bus being granted priority to access an associated local memory over said system bus and for enabling a processing unit granted priority to access its associated local memory over its local bus;

said priority logic means being responsive to deny memory access to all other processing units and other system requests for a specific period of time whereupon the priority logic means determines a new prioity from requests from the processing units and external systems requests.

4,837,683

HIDDEN FAULT BIT APPARATUS FOR A SELF-ORGANIZING DIGITAL PROCESSOR SYSTEM

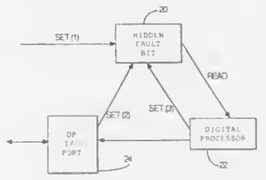
Malcolm Frazier, Medfield, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 21, 1985, Ser. No. 789,862
Int. Cl.[4] G06F 11/00, 15/16
U.S. Cl. 364—200 **2 Claims**

1. A hidden fault bit apparatus for a self-organizing digital processor system comprising in combination:

a plurality of digital processor units operatively connected to each other to pass messages therebetween and to participate in a self-organization procedure, each digital processor utilizes its own diagnostics to determine if it is itself operational, each digital processor that passes its own diagnostics, then, communicates with the other digital processors by means of messages, said self-organization procedure is completed when each digital processor that is operational has communicated with other digital processors in the system, and,

a plurality of means for providing a hidden fault bit, each of said plurality of said hidden fault bit means operatively connected respectively to each digital processor of said



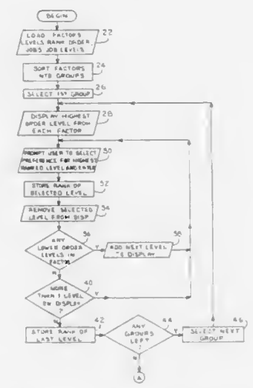
self-organizing digital processor system, said plurality of said hidden fault bit means are set during operation of the self-organizing digital processor system, each of said plurality of said hidden fault bit means is utilized to indicate that the digital processor which contains it, contains a hidden fault and therefore, should not normally participate in the self-organization procedure, each of said plurality of said hidden fault bit means being in the form of a single bit of non-volatile memory, said hidden fault bit means prevents its own digital processor from participating in the self-organization procedure.

4,837,684

DATA INPUT/OUTPUT SYSTEM FOR APPLICATION SYSTEM IN NUMERICAL CONTROL EQUIPMENT

Hideaki Kawamura, Hachioji, and Toshiaki Otsuki, Hino, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Continuation of Ser. No. 65,073, Jun. 17, 1987, abandoned, which is a continuation of Ser. No. 755,333, Jun. 27, 1985, abandoned. This application Feb. 3, 1988, Ser. No. 153,557
Claims priority, application Japan, Oct. 27, 1983, 58-201816
Int. Cl.[4] G06F 15/46
U.S. Cl. 364—474.11 **1 Claim**



1. A numerical control system comprising:

an application system including:

a processor for executing an application program and for delivering another program; and

memory means, coupled to said processor, for storing the application program;

numerical control equipment including:

a servomotor;

NC processor means for delivering the application program to said application system program, and for receiving the another program from said application system and executing the another program;

an input/output interface coupled to said NC processor;

at least one data buffer coupled to said processor and to said NC processor;

at least one flag, coupled to said processor and to said NC processor, for indicating that data has been stored in said at least one data buffer;

at least one pointer, coupled to said processor and to said NC processor, for indicating the address of the data in said at least one data buffer which is currently being referred to; and

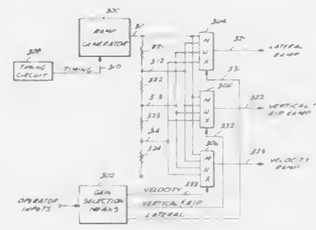
a control flag, coupled to said processor and to said NC processor, for indicating the purpose for which said at least one data buffer is being used.

4,837,685

ANALOG PREPROCESSOR FOR JAW TRACKING DEVICE

Richard E. Jokela, Puyallup, Wash., assignor to Myo-Tronics Research, Inc., Seattle, Wash.

Filed Feb. 18, 1987, Ser. No. 16,020
Int. Cl.[4] G06F 15/42
U.S. Cl. 364—413.02 **5 Claims**



1. In a jaw tracking device having a plurality of magnetic sensors, each adapted to produce a first analog signal corresponding to the position of the sensor with respect to a magnet that is fixed with respect to a patient's mandible, means for positioning the magnetic sensors on opposite sides of the patient's mandible, and controller means for receiving movement signals representing movement of the patient's mandible and for providing movement information to an operator of the jaw tracking device, an improved preprocessor for processing the first analog signals, the improved preprocessor comprising:

analog means for electrically combining the first analog signals to produce at least one analog position signal corresponding to the position of the magnet along a selected axis;

gain selection means responsive to inputs from an operator of the jaw tracking device for providing a gain select signal;

a variable slope ramp generator including means for generating a ramp signal having a slope corresponding to the gain select signal;

comparator means for comparing the position signal to the ramp signal and for generating an output pulse having a length corresponding to the magnitude of the position signal; and

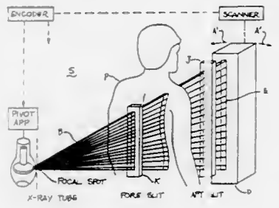
means for receiving the output pulse and for producing an analog movement signal having a magnitude corresponding to the pulse length.

4,837,686

SUBSTANCE QUANTIFICATION IN ANIMAL BODIES

Richard A. Sones, Cleveland Heights; Karen L. Lauro, South Euclid, both of Ohio; Gary T. Barnes, Birmingham, Ala., and Mike M. Tesic, Cleveland, Ohio, assignors to Picker International, Cleveland, Ohio

Filed Nov. 15, 1985, Ser. No. 798,458
Int. Cl.[4] G01D *18/00*
U.S. Cl. 364—413.19 36 Claims



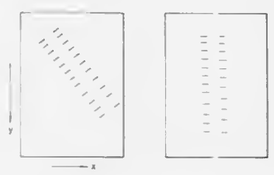
1. A method of evaluating the amount of a particular substance within an object of interest in a subject body, wherein the substance in said object of interest is at least partially obscured by an additional quantity of such substance, said method utilizing a digital imaging system having source and detector means for employing penetrative radiation and for generating and storing pixel values including signals corresponding to detected radiation emergent from the subject, said method comprising the steps of:
(a) actuating the source for causing penetrative radiation to pass through both the object of interest and the obscuring quantity of the substance to emerge in a pattern;
(b) detecting the emergent pattern;
(c) generating signals defining a set of pixel values related to the emergent pattern;
(d) identifying first and second portions of said pattern, whereby a first set of pixel values corresponding to said first pattern portion and a second set of pixel values corresponding to said second pattern portion are identified;
(e) combining said first set of pixel values;
(f) combining said second set of pixel values; and
(g) producing a scalar representation of the difference between the resultants produced by combining said first set of pixel values and said second set of pixel values.

4,837,687

METHOD FOR ANALYZING AN AUTORADIOGRAPH

Kazuyoshi Tanaka, Tokyo, and Masakazu Hashiue, Kaisei, both of Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

Filed Mar. 27, 1986, Ser. No. 844,967
Claims priority, application Japan, Mar. 27, 1985, 60-62298; Mar. 27, 1985, 60-62299
Int. Cl.[4] G01N *33/50, 33/58;* C12Q *1/68*
U.S. Cl. 364—413.01 35 Claims



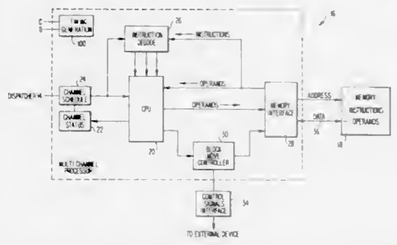
1. A method for analyzing an autoradiograph by subjecting digital signals corresponding to an autoradiograph having information on two-dimensional location of radioactively labeled substances resolved on a support medium to signal processing, to obtain the locational information on the radioactively labeled substances in the form of visual indicia, that includes the steps of:
(1) electrically displaying the autoradiograph in the form of an image on the basis of the digital signals;
(2) extracting signals in a given area along resolved rows of the radioactively labeled substances on the basis of input information on the rows determined from the display image; and
(3) subjecting the extracted signals to one-dimensional signal processing to detect resolved portions.

4,837,688

MULTI-CHANNEL SHARED RESOURCE PROCESSOR

Thomas D. Cronauer, Nokesville, and Galen P. Plunkett, Burke, both of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 25, 1986, Ser. No. 889,531
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 6 Claims



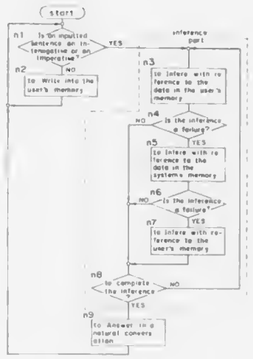
1. A multi-channel shared resource processor coupled to an external dispatcher system which distributes a plurality of prioritized, independent tasks to a plurality of processor channels in the processor, said multi-channel shared resource processor comprising:
a central processor unit;
means coupled to said central processor for selecting which of the plurality of processor channels will be serviced on a prioritized basis by the central processor unit;
means coupled to said central processor for monitoring the status of the processor channels selected to be serviced by the selecting means;
means coupled to the selecting means and to said central processor unit, for decoding instructions to be processed by the selected processor channels to enable the operation of the central processor unit;
an external memory means;
means coupled to said selecting means and coupled between said central processor and said external memory means and responsive to the selecting means, for transferring blocks of data to and from the external memory means;
wherein the plurality of processor channels share a multiphase instruction execution cycle having an odd and an even partition and wherein the selecting means includes:
means for assigning the selected channels to an even partition and to an odd partition of the multiphase instruction cycle;
a first means for generating a plurality of phase and gated-clock signals; and
a first means, responsive to the first generating means, for determining which of the processor channels will contend for the even partition and for the odd partition of a multiphase instruction cycle.

4,837,689

INPUTTING AND EDITING SYSTEM IN A KNOWLEDGE BASED INQUIRY AND ANSWER SYSTEM

Toshiyuki Tanaka, Yamatokoriyama; Shigeki Kuga, Nara; Taro Morishita; Nobuo Nakamura, both of Yamatokoriyama, and Mikio Ohsaki, Kashihara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 3, 1986, Ser. No. 915,021
Claims priority, application Japan, Oct. 7, 1985, 60-225188; Oct. 7, 1985, 60-225189
Int. Cl.[4] G06F *15/38*
U.S. Cl. 364—419 2 Claims



1. A method for introducing information into an inquiry-and-answer system comprising the steps of:
(a) presenting an interrogative to an operator to seek a response;
(b) inputting a desired sentence to be analyzed as a response to the presented interrogative;
(c) analyzing the desired sentence to determine different components of the desired sentence;
(d) extracting necessary components from the desired sentence;
(e) developing inferences from the necessary components;
(f) using said inferences of step (e) to obtain a case nominal corresponding to a pronoun used in the interrogative; and
(g) supplying said case nominal as an answer to said interrogative of step (a).

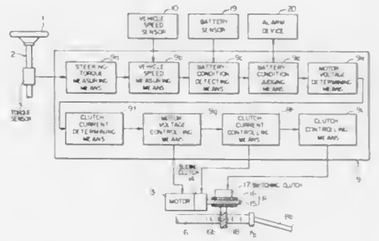
4,837,690

MOTOR-DRIVEN POWER STEERING SYSTEM FOR A VEHICLE

Mitsuharu Morishita, and Shinichi Konge, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Apr. 21, 1987, Ser. No. 40,813
Claims priority, application Japan, Apr. 22, 1986, 61-95128
Int. Cl.[4] B62D *5/04;* B60G *17/08*
U.S. Cl. 364—424.05 7 Claims

1. A motor-driven power steering system for a vehicle having a steering wheel operatively connected to steer steerable road wheels in response to force exerted thereon by an operator, said motor-driven power steering system comprising:
a battery connected to a charging means to provide power in the form of voltage and current;
a motor connected to be energized by the voltage of said battery and operable to transmit a force to said steerable road wheels for power-assisting steering motion caused by the operator through said steering wheel;
an electromagnetic sliding clutch connected to continuously change the power-assisting force transmitted from said motor to said steerable road wheels in accordance with the current supplied thereto from said battery;
a torque sensor connected to detect operator-induced steering torque resulting from steering force exerted on said steering wheel by the operator and generating an output signal representative thereof;
a vehicle-speed sensor connected to detect vehicle speed and generating an output signal representative thereof;
a battery sensor means for detecting the condition of charge of said battery and for generating an output signal representative of whether the charge of said battery is substantially zero or is not maintained at a predetermined level indicating that the battery is insufficiently charged; and
a control unit connected to receive output signals from said torque sensor, said vehicle-speed sensor, and said battery sensor and having means for controlling respective running and switching operations of said motor and said electromagnetic sliding clutch in such a manner that both the voltage imposed on said motor and the current supplied to said electromagnetic sliding clutch are made zero when the output signal of said battery sensor means indicates that the charge of said battery is substantially zero, while, on the other hand, at least one of the motor voltage and the clutch current is gradually reduced to decrease the power-assisting force transmitted from said motor toward said steerable road wheels in a gradual manner when the output signal of said battery sensor means indicates that said battery is insufficiently charged.

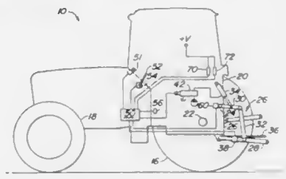


4,837,691

HITCH CONTROL SYSTEM WITH START-UP LOCK-OUT

Thomas E. Boe, Cedar Falls, and Richard L. Sweet, Waterloo, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 27, 1987, Ser. No. 54,658
Int. Cl.[4] A01B *63/112, 63/114*
U.S. Cl. 364—424.05 7 Claims



1. In a vehicle having connecting means for attaching a ground-penetrating implement thereto and actuating means for raising and lowering the hitch through a range of positions in response to control signals applied to an input thereof, a control system comprising:
an operator-controlled device for generating a command signal representing a desired characteristic;
a position sensor for sensing the actual hitch position;
an operator-controlled limit setter for generating an electrical limit signal distinct from the command signal and

representing a desired limit position to the positions occupied by the hitch; and

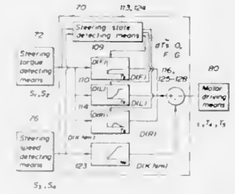
means for automatically generating said control signals as a function of the command signal and of a sensed parameter, and including means operable, upon start-up of the control system, to prevent automatic hitch movement until the hitch is manually moved to the limit position as a result of operator movement of the operator-controlled device if, upon start-up, the actual hitch position is beyond the limit position.

4,837,692

ELECTRIC POWER STEERING SYSTEM FOR VEHICLES

Yasuo Shimizu, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1987, Ser. No. 30,323
Int. Cl.[4] B62D 5/04
U.S. Cl. 364—424.05 **8 Claims**



8. An electric power steering system for a vehicle comprising:

a steering wheel;

a steered wheel;

a steering shaft transmitting a rotation of said steering wheel to said steered wheel;

a direct-current motor providing auxiliary torque to said steering shaft;

steering torque detecting means for detecting steering torque acting on said steering shaft;

steering speed detecting means for detecting a steering speed of said steering wheel; and

control means for controlling said motor depending upon a steering torque detection signal from said steering torque detecting means a steering speed detection signal from said steering speed detection means, said control means including control signal generating means, for generating a PWM signal which depends upon said steering torque detection signal and said steering speed detection signal, and motor drive circuit means for receiving said PWM signal and for applying an on-off voltage to said motor, said motor drive circuit means having a close circuit through which an electric current, due to an inductance of said motor, flows while said on-off signal is off;

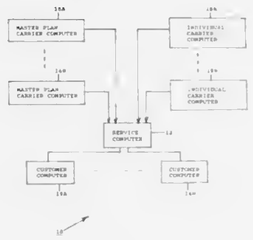
said control signal generating means, during a positive steering state in which a direction of rotation of the steering wheel is coincident with a direction that the steering torque is acting, generating said PWM signal having a duty proportional to the steering torque and steering speed, and said control signal generating means, during a steering wheel returning state in which the direction of rotation of the steering wheel is not coincident with the direction that the steering torque is acting, having a duty which is proportional to said steering torque and reversely proportional to said steering speed.

4,837,693

METHOD AND APPARATUS FOR FACILITATING OPERATION OF AN INSURANCE PLAN

Barry R. Schotz, 1212 Muirlands, La Jolla, Calif. 92037

Filed Feb. 27, 1987, Ser. No. 20,329
Int. Cl.[4] G06F 15/21, 15/30
U.S. Cl. 364—408 **36 Claims**



25. A system for facilitating the design, establishment and administration of a plurality of insurance plans on behalf of customer accounts, where base customer information is gathered and updated,

and insurance carrier accounts

where insurance plans are evaluated, said system comprising:

first data receiving and storing means for receiving and storing customer base information signals gathered by the customer account;

compiling means responsive to said customer base information signals for compiling said customer base information;

processor means responsive to said compiling means for generating tentative insurance illustration signals indicative of an insurance risk for a calculated premium;

report generating means responsive to said processor means for generating tentative insurance illustration reports and tentative information for proposal report for insurance carrier evaluation and acceptance, said reports delineating a tentative insurance plan;

sending means for sending the tentative insurance plan individually and selectively to an insurance carrier account for evaluation purposes and to a customer account for pre-plan approval;

second data receiving and storing means for receiving and storing insurance carrier information signals indicative of evaluated insurance illustration information and update information relating to said customer account; and

analyzing means responsive to said second data receiving and storing means for generating information signals for further evaluation by said customer account or alternately said insurance carrier account.

4,837,694

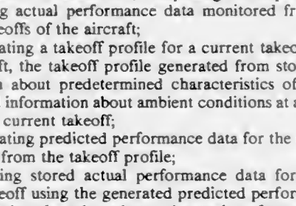
PITCHING CONTROL SYSTEM FOR A SKID STEER VEHICLE

Toshihide Narita, and Yoshio Kadokawa, both of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Mar. 27, 1987, Ser. No. 31,998
Claims priority, application Japan, Mar. 28, 1986, 61-72219
Int. Cl.[4] G06F 15/14; G06G 7/00
U.S. Cl. 364—426.01 **17 Claims**

1. A system for controlling a pitching of a skid steer vehicle including vehicle body, a set of right driving wheels having tires thereon and arranged on one side of the vehicle body, a set of left driving wheels having tires thereon and arranged on an opposite side of the vehicle, a first driving means for driving the set of right driving wheels, a second driving means for driving the set of left driving wheels, and a pair of first and second control levers provided in an operator's compartment of the vehicle body, comprising:

means for generating detection signals indicating detection of a pitching motion of said skid steer vehicle while said skid steer vehicle is in a mode of operation including straight running operation and skid steer turning operation, said pitching motion being based on deformation of said tires and a small wheel base of the vehicle; and



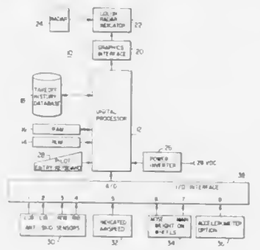
control means for generating control signals including pitching suppressing signals on the basis of said detection signals from said means for generating detection signals, said control means simultaneously and independently delivering said control signals to said right and left driving means until said pitching motion of said skid steer vehicle is suppressed.

4,837,695

METHOD AND APPARATUS FOR PREDICTING AND MONITORING AIRCRAFT TAKEOFF PERFORMANCE

Steven F. Baldwin, Lewisville, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Filed Mar. 12, 1986, Ser. No. 840,129
Int. Cl.[4] G01C 21/00; G06F 15/50
U.S. Cl. 364—427 **23 Claims**



1. A method for predincting and monitoring the takeoff performance of an aircraft, comprising the steps of:

storing actual performance data monitored from previous takeoffs of the aircraft;

generating a takeoff profile for a current takeoff of the aircraft, the takeoff profile generated from stored information about predetermined characteristics of the aircraft and information about ambient conditions at an airport for the current takeoff;

generating predicted performance data for the current takeoff from the takeoff profile;

selecting stored actual performance data for the current takeoff using the generated predicted performance data;

displaying the selected stored actual performance data for the current takeoff;

generating monitored performance data for the current takeoff; and

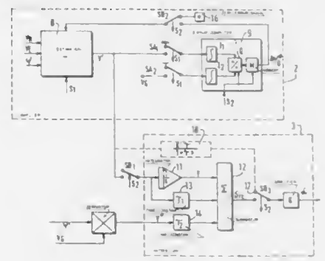
displaying the monitored performance data for the current takeoff in conjunction with the selected stored actual performance data to provide an indication of the progress of the current takeoff.

4,837,696

METHOD AND DEVICE FOR GUIDING AN AERODYNE ON A RUNWAY, PARTICULARLY DURING THE TAXIING PHASE PRECEDING TAKE OFF

Jean-Louis Lebrun, Antony, and Patrick Pont, Paris, both of France, assignors to Societe Francaise d'Equipements pour la Navigation Aerienne (S.F.E.N.A.), France

Filed Feb. 3, 1987, Ser. No. 10,515
Claims priority, application France, Feb. 6, 1986, 86 01929
Int. Cl.[4] G06F 15/50
U.S. Cl. 364—427 **15 Claims**



6. A device for guiding an aerodyne on a runway having a longitudinal axis, particularly during the taxiing phase preceding take off, said device comprising on board the aerodyne:

(a) at least one inertial unit delivering signals representative of at least the North speed (VN), the East speed (VE), the azimuth ψ of the aerodyne, and a signal representative of its ground speed VG,

(b) a computer having a memory and means for determining from signals delivered by the unit:

(i) at least one parameter defining the axis of the runway, during a first so called apprenticeship step, during which the aerodyne guided on site by a pilot along the said axis begins the taxiing phase preceding take off, the said parameter being stored in the said memory at the end of this first step;

(ii) a synthetic runway aberration signal which is representative of the distance between a theoretical axis of the runway calculated from the previously stored parameter and the position of the aerodyne determined from said signal delivered by said unit, and

(c) means for guiding the aerodyne during a second step based on the synthetic runway aberration signal.

4,837,697

OVERSPEED GOVERNOR FOR AN ELECTRONIC CONTROLLED FUEL SYSTEM

Soraya Eisa, South Bend; Joseph Peczkowski, Granger; Henry Tyler, and Glenn Richardson, both of South Bend, all of Ind., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Jul. 31, 1987, Ser. No. 80,728
Int. Cl.[4] F02C 9/38
U.S. Cl. 364—431.02 **14 Claims**

1. In a fuel management system having a supply of fuel with a substantially constant fluid pressure, P_1, a metering valve driven by an electronic computer for supplying fuel under pressure P_2 to a turbine, a bypass valve responsive to the fluid pressure P_2 for allowing a portion of the supply fuel to return to the source while a fluid differential pressure P_1-P_2 develops across the metering valve, said turbine responding to the fuel

under pressure P_2 by rotating to produce a desired thrust for an engine, the improvement comprising:

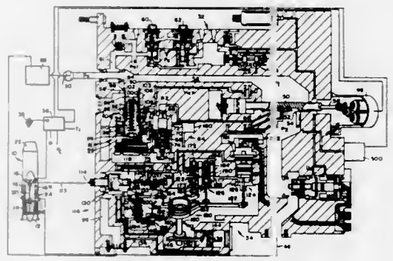
a mechanical governor responsive to a rotational speed of the turbine above a preselected rotation for lowering the pressure differential P_1-P_2 across the metering valve by modifying the fluid pressure P_2 presented to the bypass valve to P_2P whereby additional fuel is allowed to return to the source with a corresponding reduction in the fuel supplied to the turbine independently of the operation and position of the metering valve by the electronic computer to prevent an overspeed condition in the turbine, said mechanical governor having:

cam means with first, second, third and fourth contour thereon;

a speed sensor responsive to the rotation of the turbine for the development of an operational signal;

a valve responsive to said operational signal for supplying a motive force for moving he cam means to a position corresponding to the rotation of the turbine; and

feedback means responsive said first contour to provide said valve with an indication of the position of said cam means whereby said operational signal is nullified when the position of the cam means corresponds to the actual rotation of the turbine; p1 a sensor connected to said bypass valve, metering valve and mechanical governor, said sensor being responsive to the resulting pressure differential P_1–P_2P, said mechanical governor providing said sensor with an input when the turbine rotation



is above the predetermined rotation whereby the bypass valve is correspondingly moved to allow additional fuel to return to the sources;

integrator piston means located in the bypass valve and having a first surface exposed to an operational supply fluid pressure P_2P and a second surface exposed to a reference fluid pressure P_x;

sleeve means connected to said integrator piston means and extending into a bore, said bore having a first port connected to the supply fuel and a second port connected to the return reservoir, said sleeve means having a series of radial openings for connecting the first port to the second port through the sleeve means;

proportional piston means located in said sleeve means and having a first face exposed to fluid pressure P_1 and a second face exposed to fluid pressure P_2P;

first spring means for urging the integrator piston means toward a position to interrupt the flow of fuel through the radial openings in said sleeve means to the second port as a function of the force created by the pressure differential $P_2P—P_x$;

second spring means for urging said proportional piston means toward a stop as a function of the force created by the pressure differential P_1–P_2P to control the number of available radial openings through which fuel may flow to the second port; and

a proportional valve responsive to the rotational speed of the turbine and connected to said bypass valve through said speed sensor for allowing fluid under pressure P_2 to flow through an opening and thereby lower the fluid pressure to P_2P, said integrator piston means responding to the lower fluid pressure P_2P by moving to correspondingly position the radial openings in the sleeve means with respect to the second port such that additional fuel flows to the return conduit.

4,837,698

METHOD OF CONTROLLING AIR-FUEL RATIO

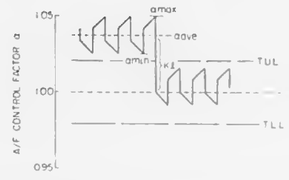
Matsuo Amano, Hitachi; Masami Shida, Mito; Masahide Sakamoto, Katsuta; Takeshi Hirayama, Mito, and Takao Sasayama, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 672,591, Nov. 19, 1984, Pat. No. 4,703,430. This application Oct. 26, 1987, Ser. No. 112,146

Claims priority, application Japan, Nov. 21, 1983, 58-217838; Mar. 10, 1984, 59-44835

Int. Cl.⁴ F02D *41/00*

U.S. Cl. 364—431.07 **19 Claims**



1. In a method of controlling fuel injection in an internal combustion engine wherein the fuel injection timing for operation of a fuel injector is based at least on a basic fuel injection time and a steady-state compensation factor which is stored in memory for each of a plurality of operating regions formed by a range of values of at least two predetermined engine conditions, a method of controlling fuel injection during acceleration of the engine, comprising the steps of:

(a) detecting whether said internal combustion engine is in a state of acceleration;

(b) if said internal combustion engine is in a state of acceleration, detecting whether the air/fuel ratio has exceeded a predetermined upper limit value;

(c) if the air/fuel ratio has exceeded a predetermined upper limit value while the internal combustion engine is in a state of acceleration, storing in an acceleration table a transient compensation factor having a value related to the amount by which the air/fuel ratio exceeds said predetermined upper limit value, said transient compensation factor being stored at a storage location in said acceleration table identified by at least two predetermined engine conditions; and

(d) determining the fuel injection timing during acceleration of said internal combustion engine on the basis of said basic fuel injection time, a steady-state compensation factor obtained from memory and a transient compensation factor read out of a storage location of said acceleration table according to said two predetermined engine conditions.

4,837,699

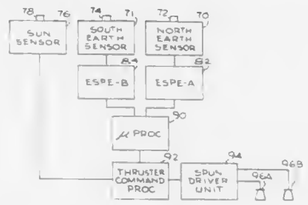
METHOD FOR CONTROLLING THE SPIN AXIS ATTITUDE OF A SPINNING SPACECRAFT

John W. Smay, Torrance; William F. Hummel, Jr., Los Angeles; Carl L. Chen, Rolling Hills Estate, and Loren I. Slafer, Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 756,880, Jul. 18, 1985, abandoned. This application Jul. 5, 1988, Ser. No. 214,789

Int. Cl.⁴ B64G *1/26*; G06F *15/50*

U.S. Cl. 364—434 **4 Claims**



1. A method for controlling the spin axis attitude and orbit inclination of a spinning spacecraft in a geosynchronous orbit comprising the steps of:

sensing the direction of the earth from the spacecraft to detect deviations of the spacecraft spin plane from coincidence with the spacecraft orbital plane and developing signals in accordance with the detected deviation;

generating signals for controlling the activation of spacecraft thrusters in response to said detected deviation signals; and

selectively applying the thruster control signals to activate a selected thruster when the spacecraft is in the vicinity of a descending orbit node and at a predetermined point on the rotation of the spacecraft to develop an element of orbit plane adjustment and a correction of the deviation of the spin axis.

4,837,700

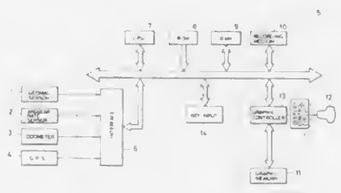
METHOD AND APPARATUS FOR PROCESSING DATA IN A GPS RECEIVING DEVICE IN A ROAD VEHICLE

Hitoshi Ando; Takashi Kashiwazaki; Masayuki Hosoi, and Atsuhiko Fukushima, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 27, 1987, Ser. No. 112,918

Int. Cl.⁴ G06F *15/50*; G01S *5/02*

U.S. Cl. 364—449 **4 Claims**



3. A device for determining a present location of a vehicle, comprising:

a receiving device mounted in a vehicle for receiving signals from a plurality of satellites as data;

means for determining if said vehicle is stopped;

means for calculating an average of a predetermined number of data received by said receiving device while said vehicle is stopped;

means for determining whether a standard deviation of said predetermined number of data is less then a predetermined value; and

means for controlling said receiving device to calculate a present position of said vehicle based on said average if said standard deviation is less than said predetermined value.

4,837,701

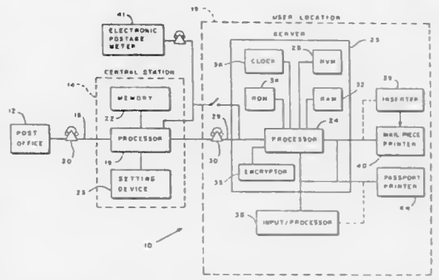
MAIL PROCESSING SYSTEM WITH MULTIPLE WORK STATIONS

Ronald P. Sansone, Weston; George G. Gelfer, W. Redding; Michael P. Taylor, Norwalk, and Barry H. Axelrod, Newtown, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 813,445, Dec. 26, 1985. This application Sep. 5, 1986, Ser. No. 904,577

Int. Cl.⁴ G06F *15/20*

U.S. Cl. 364—464.03 **20 Claims**



20. A system for transmitting postage value comprising:

a user location having a secure accounting means including a processor and a memory in communication with said processor, said memory having a descending register therein for receiving and storing postage value and for dispensing postagle value upon command, said user location having means for applying postage to mail pieces; and

a plurality of inserters in communication with said processor.

4,837,702

ELECTRONIC POSTAGE METER HAVING AN INFINITE LOOP LOCKOUT ARRANGEMENT

Liana Obrea, Greenwich, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Apr. 28, 1986, Ser. No. 856,549

Int. Cl.⁴ G06F *15/20*

U.S. Cl. 364—466 **4 Claims**

1. A method of recovering operation in a postage meter having a microcomputer operating under control of a computer program comprising the steps of:

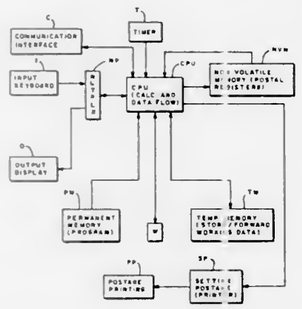
(a) providing a programmable external timer operative to generate a signal upon completion of a programmed timing-interval;

(b) programming said programmable external timer with a first watch-dog modulus corresponding to an expected duration of a first monitored program routine;

(c) starting the timer;

(d) sequentially programming said programmable external timer with a modulus corresponding to an expected duration of the next-in-sequence of a plurality of program routines as such one of said routines is to be executed by said postage meter microcomputer whereby the timer is

reset to the value corresponding to he expected duration of the to-be executed routine, said timer providing said



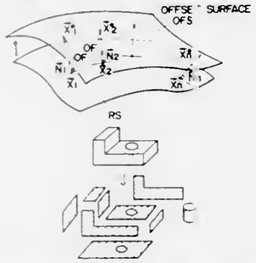
signal in the event that the timer t mes out prior to the reprogramming of the timer.

4,837,703

METHOD FOR GENERATING TOOL PATH

Yukinori Kakazu, Ebetsu; Noburo Mi tami, and Katsuhiko Nukui, both of Numazu, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1987, Ser. N . 63,644
Claims priority, application Japan, Jun. 26, 1986, 61-150529
Int. Cl.[4] G06F *15/0*
U.S. Cl. 364—474.18 **7 Claims**



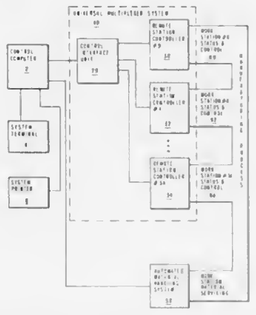
1. A method for generating a tool path in a CAD/CAM system which is characterized by the steps of replacing the relation between an environmental model including a workpiece and a tool by a relation between a 3D-solid model representing the workpiece and a line representing the tool, and checking said line for collision by offsetting (offset processing) the 3D-solid model in a direction normal to a surface of the 3D-solid model in correspondence to the radius of said tool by an offset value which includes a finish margin; and wherein said offset processing comprises the steps of roughly processing an inputted shape with a large offset value, simplifying the shape by deleting at least holes and grooves which exist in the shape and negatively offsetting the simplified shape by subtracting the offset value from the large offset value.

4,837,704

COMPUTER CONTROLLED MATERIAL HANDLING

Wendell L. Lengefeld, Round Rock, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 905,433, Sep. 10, 1986, abandoned. This application Jul. 29, 1988, Ser. No. 227,446
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—478 **4 Claims**



1. A control system for a high volume manufacturing installation including:
a control computer;
a plurality of workstations;
a material handling system in communication with said control computer and said workstations;
a plurality of station controllers, in communication with said workstations, for monitoring and storing status of I/O lines associated with said workstations;
a control interface unit in communication with said control computer and said plurality of station controllers for continuously polling said station controllers for obtaining and buffering status data about said workstations;
means in said control interface unit for transferring said status data to said control computer on demand therefrom, in a sequence predetermined as a function of relative position of each of said plurality of workstations,
means in said control computer responsive to said status data for instructing said material handling system in real time for defining a movement path among said plurality of workstations for servicing same.

4,837,705

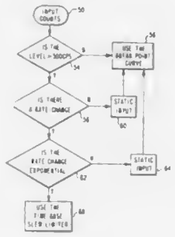
METHOD FOR CALCULATING THE RATE OF FREQUENCY OF RANDOM EVENTS

James M. Mussler, Bethel Park, and Jane P. Arnold, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 25, 1987, Ser. No. 18,899
Int. Cl.[4] G01R *23/10, 23/15*
U.S. Cl. 364—484 **6 Claims**

1. A method of monitoring the rate of change of frequency of neutron activity in a nuclear reactor, said method comprising the steps of:
generating a plurality of electric pulses in response to neutrons entering a neutron detector;
counting the number of said pulses which occur within a plurality of predetermined sampling intervals, to obtain a plurality of count values, each corresponding to one of said sampling intervals;
storing said count values in a memory table;
summing said count values which correspond to a most recent set of N of said sampling intervals, to obtain a first accumulated count, S_1,
summing said count values which correspond to a second set

of N of said sampling intervals, preceding said most recent set, to obtain a second accumulated count, S_2;



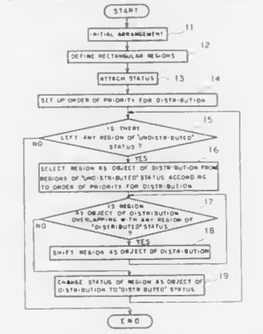
calculating the rate of change of event frequency by dividing the logarithm of (S_1/S_2), by N; and
displaying said rate of change of frequency.

4,837,706

DRAWING PROCESSING APPARATUS

Kenji Iijima, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP86/00098, § 371 Date Aug. 18, 1986, § 102(e) Date Aug. 18, 1986, PCT Pub. No. WO86/05297, PCT Pub. Date Sep. 12, 1986
PCT Filed Feb. 28, 1986, Ser. No. 918,823
Claims priority, application Japan, Feb. 28, 1985, 60-39817
Int. Cl.[4] G06F *15/626*
U.S. Cl. 364—518 **6 Claims**



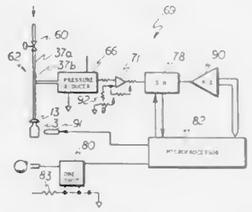
1. A drawing processing apparatus for making a drawing consisting of a plurality of symbols of a first kind whose positions in the drawing are fixedly determined, and a plurality of symbols of a second kind whose positions in the drawing are arbitrarily determined within respective predetermined ranges in correspondence with the symbols of the first kind for defining the respective symbols of the first kind, said drawing processing apparatus comprising:
assignment designation means for assigning respective rectangular regions of predetermined dimensions on the face of the drawing to all of said symbols of the first and second kinds;
temporary distribution designation means for designating positions of said rectangular regions of the symbols of the first kind at the corresponding fixed positions, and for temporarily designating positions of said rectangular regions of the symbols of the second kind at first selected positions in the predetermined ranges relative to the respective symbols of the first kind on the face of the drawing; and
adjustment means for determining an overlapped portion of each of said rectangular regions of the symbols of the second kind temporarily distributed over the face of the drawing on another rectangular region and for automatically changing the designated positions of said rectangular regions to second positions within respective predetermined ranges so as to eliminate the overlapping thereby to finally determine the distribution of the rectangular regions such that, after the distribution has been finished, the symbols corresponding to respective rectangular regions are suitable for employment in the drawing.

4,837,707

CONTAINER INSPECTION APPARATUS

Stephen M. Giometti, and Timothy W. Shay, both of Horseheads, N.Y., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Continuation of Ser. No. 946,411, Dec. 24, 1986, abandoned. This application Nov. 8, 1988, Ser. No. 270,414
Int. Cl.[4] G01M *3/26*
U.S. Cl. 364—552 **4 Claims**



1. A testing apparatus for pressure testing a container so that containers having imperfections at the sealing surface of the container opening which will result in leaks when a cap is secured thereto can be identified comprising
test head means having surface means for sealing the opening of a container,
means for displacing said test head means from a remote position to an operative position whereat said surface means can sealing engage the container opening,
means for delivering air under pressure through said test head means to the container when said test head means is at said operative position so that the pressure within the container will increase to a steady state pressure which will be higher for a container which has no imperfections at the sealing surface than for a container which has imperfections at the sealing surface,
means for sampling the pressure within the container at a selected time following the commencement of delivery of air under pressure thereto, said time being selected so that the sampling will take place below the steady state pressure of the container whether the container leaks or not,
means for comparing the sampled pressure to a standard, and
means for rejecting the container if the sampled pressure does not agree with said standard.

4,837,708

PROCESS AND APPARATUS FOR DETERMINING FLOW RATE OF A FLOW MEDIUM IN A FLOW LINE

Terence Wright, Caracas, Venezuela, assignor to Maraven, S.A., Caracas, Venezuela

Filed Jul. 1, 1987, Ser. No. 68,839
Int. Cl.[4] G06F *15/64, 15/66, 7/56*
U.S. Cl. 364—509 **24 Claims**

1. A process for continuously monitoring and calculating the flow rate of a fluid medium in a flow line having an orifice

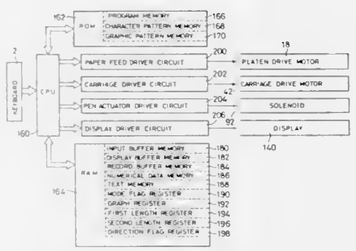
plate positioned therein which comprises transcribing a first trace line representing manometric pressure upstream of the orifice and a second line representing differential pressure across the orifice on a chart associated with a recording device, said first and second trace lines having different colors; optically scanning said trace lines and said chart and capturing a first image of said lines and said chart; digitizing said first image; and determining said flow rate of said fluid medium in said flow line by interpreting said digitized first image.

4,837,709

RECORDING APPARATUS WITH A FUNCTION OF DETERMINING RECORDING DIRECTION OF EXPLANATORY CHARACTERS FOR GRAPH

Ryoichi Sasaki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 10, 1986, Ser. No. 850,131
Claims priority, application Japan, Apr. 13, 1985, 60-78793
Int. Cl.[4] G01D *9/18*
U.S. Cl. 364—519 **7 Claims**



1. A recording apparatus capable of recording on a recording medium a graphical representation selected from a group which includes at least one of a bar graph, a broken-line graph and a circular graph, and a succession of explanatory characters accompanying the graphical representation, said succession of explanatory characters being recorded selectively in a first and a second direction, said recording apparatus comprising:

an input device through which explanatory-character data indicative of said explanatory characters and graph data indicative of said graphical representation are entered;

memory means connected to said input device for storing said explanatory-character data and said graph data;

a recording mechanism connected to said memory means for recording said graphical representation and said explanatory characters on said recording medium; and

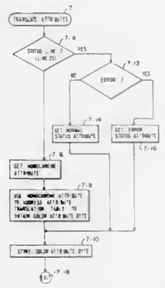
direction-determining means connected to said memory means for selecting said first direction if a length of said succession of explanatory characters is equal to or smaller than a reference limit value, and selecting said second direction if said length is larger than said reference limit value, the selection of said second direction assuring a sufficient recording space for said succession of characters.

4,837,710

EMULATION ATTRIBUTE MAPPING FOR A COLOR VIDEO DISPLAY

Jerold M. Zelinsky, Malden, Mass.; John P. Stafford, Nashua, N.H., and Gerald A. Lief, Newton, Mass., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Dec. 6, 1985, Ser. No. 806,988
Int. Cl.[4] G06F *15/40*
U.S. Cl. 364—521 **16 Claims**



1. A method of translating monochrome attributes to colors and color attributes for display on a color screen, said method comprising the steps of:

A. displaying a menu including a plurality of monochrome attributes, a plurality of colors for each of said plurality of monochrome attributes, and a plurality of color attributes for each of said plurality of monochrome attributes;

B. associating from said menu one of said plurality of colors and one of said plurality of color attributes in combination with each of said plurality of monochrome attributes;

C. generating a color attribute matrix in the memory having a plurality of color attribute bytes, one color attribute byte representative of each combination of color and color attribute;

D. initializing a pointer stored in said memory, said pointer pointing to the first location of a translation table stored in said memory;

E. getting a certain color attribute byte selected by indexing said color attribute matrix using a first color and first color attribute selected by said menu for the first of said plurality of monochrome attributes;

F. testing if a first bit of said pointer equals binary ONE, said first bit corresponding to a first bit of a certain monochrome attribute byte;

G. storing said certain color attribute byte in said translation table at a location specified by contents of said pointer if said first bit is binary ONE and incrementing said pointer, or incrementing said pointer if said first bit is not binary ONE;

H. testing if the contents of said pointer equal decimal 32; and

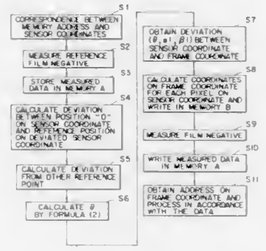
I. repeating steps F through I if the contents of said pointer do not equal 32 and repeating steps D through I when the contents of said pointer equals decimal 32 for each subsequent monochrome attribute.

4,837,711

METHOD FOR DETECTING/PROCESSING IMAGE INFORMATION

Kenji Suzuki, Kaisei, Japan, assignor to Fuji Photo Film Co., Ltd., Ara, Japan

Filed Apr. 21, 1986, Ser. No. 854,560
Claims priority, application Japan, Apr. 20, 1985, 60-85062; Apr. 20, 1985, 60-85063; Jul. 9, 1985, 60-151094
Int. Cl.[4] G03B *27/52*
U.S. Cl. 364—523 **11 Claims**



1. A method for detecting/processing image information comprising the steps of:

receiving light from images with an image sensor;

digitally detecting, on a pixel by pixel basis, image information data of an entire area through which said image sensor receives light;

storing said information data in a memory;

processing said stored information data, wherein memory addresses of tables containing said information data are made to correspond with sensor coordinates of said image sensor;

photometrically measuring a reference film negative having a mark at a frame reference position;

calculating the amount of deviation between (a) a sensor coordinate which corresponds to said frame reference position, and (b) a reference coordinate of said sensor;

calculating values of frame coordinates corresponding to each pixel point of said sensor coordinates;

writing said values in said data information tables;

photometrically measuring said images and storing information corresponding thereto in said memory; and simultaneously,

processing said image information in accordance with said memory addresses of said frame coordinates obtained by referring to said data information tables;

wherein said images and said image sensor are fixed, and reading out area of said memory is operatively variable.

4,837,712

DATA PROCESSING APPARATUS

Yoshikazu Shibamiya, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 707,825, Mar. 4, 1985, abandoned. This application Dec. 7, 1987, Ser. No. 131,243
Claims priority, application Japan, Mar. 15, 1984, 59-48168; Mar. 15, 1984, 59-48169
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—523 **7 Claims**

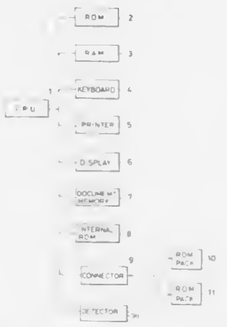
1. Information processing apparatus comprising;

first memory means for storing data of a predetermined font style;

second memory means detachable from the apparatus for storing data of a font style different from said predetermined font style stored in said first memory means;

font style indication means for indicating the font style to be read out from said first memory means or second memory means;

compulsory read-out means for selectively instructing a compulsory read-out of data of the predetermined font style from said first memory means; and



control means in response to the compulsory read-out instruction for reading out the data from said first memory means when said second memory means is detached from the apparatus.

4,837,713

APPARATUS FOR WARMING UP AUTOMATIC DEVELOPING SYSTEM

Toshiro Tahara, and Hideo Iwasaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 9, 1987, Ser. No. 36,527
Claims priority, application Japan, Apr. 9, 1986, 61-081915
Int. Cl.[4] H05B *3/02;* **G02B** *0/00*
U.S. Cl. 364—525 **12 Claims**

1. An apparatus for warming up an automatic developing system comprising:

temperature sensing means for obtaining temperature data relating to the rise of the temperature of a treating liquid used for treating a photosensitive material in said developing system;

setting means for setting the time at which the operation of said developing system is to be started;

computing means for computing the time at which the warming up of said developing system is to be commenced, on the basis of said temperature data relating to the rise of the temperature of said treating liquid and said

time at which the operation of said developing system is to be started set by said setting means, and

control means for commencing the warming up at the time computed by said computing means.

4,837,714

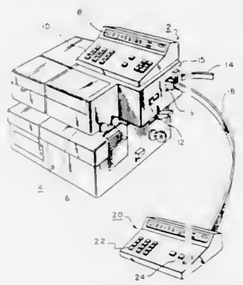
METHODS AND APPARATUS FOR CUSTOMIZING AND TESTING FULLY ASSEMBLED POSTAGE METERS

George M. Brookner, Norwalk, and Sun S. Change, Stamford, both of Conn., assignors to Pitney Bowes, Inc., Stamford, Conn.

Continuation of Ser. No. 856,530, Apr. 18, 1986, abandoned. This application Dec. 28, 1987, Ser. No. 140,862

Int. Cl.[4] G06F *15/20, 15/22*

U.S. Cl. 364—550 23 Claims



1. Apparatus for customizing firmware stored in the memory of an assembled electronic postage meter, said apparatus being located external to said meter, comprising:

(a) means for storing at least one data set;

(b) means for inputting a user command to produce a blank meter; and

(c) means, responsive to said command to produce a blank meter, for clearing a predetermined portion of meter memory,

(d) means for inputting at least one user command to select a data set for transmission to said meter; and

(e) means, responsive to said commands, for transmitting a selected data set from said means for storing, to said meter, for storing in a predetermined portion of meter memory.

4,837,715

METHOD AND APPARATUS FOR DETECTING THE PLACEMENT OF COMPONENTS ON ABSORBENT ARTICLES

Tanakon Ungpiyakul; Arch D. Morgan; Thomas Douglas C., all of Neenah; Timothy J. Ketenhofen, Appleton; Douglas J. Marver, Mosinee; Laurie Couture-Dorschner, Hortonville, and William S. Pomplun, Neenah, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jan. 27, 1987, Ser. No. 7,862

Int. Cl.[4] G06F *15/20, 15/46;* G01N *21/84;* B23Q *15/00*

U.S. Cl. 364—552 37 Claims

1. An apparatus for examining a web, which includes an interconnected plurality of articles, to determine a location of a selected component thereof, comprising:

indicating means for providing marker data corresponding to the presence of a selected article;

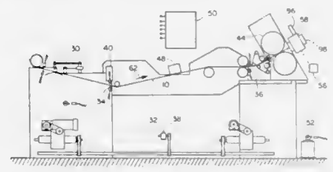
metering means for generating gauge data corresponding to selected incremental lengths of said article along a movement direction of said web;

first designating means for providing first reference data corresponding to a selected reference point on said article;

locating means for detecting location data corresponding to a position of a selected component of said article;

first evaluating means for processing said first reference data, said location data and said gauge data to determine first spacing data corresponding to a spaced distance between said component and said reference point;

second designating means, which is spaced from said first designating means, for providing additional, updated reference data corresponding to said selected reference point on said article;



second evaluating means for processing said first spacing data and said updated reference data to determine updated spacing data corresponding to said component and said reference point;

comparator means for determining a difference between said updated spacing data and a predetermined acceptance spacing range; and

culling means for identifying selected articles for which said updated spacing data is outside of said acceptance spacing range.

4,837,716

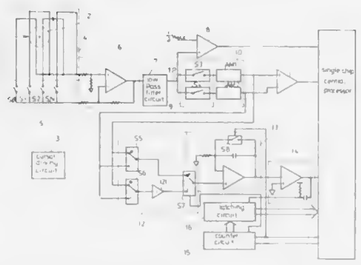
TWIN-RATE CHARGING AND DISCHARGING PROPORTIONAL TYPE CURSOR POSITION DETERMINING DEVICE

Lin Chia-Hui, Rm. 804, No. 149, Sec. 1, Keelung Rd, Taipei, Taiwan

Filed Jul. 24, 1987, Ser. No. 79,167

Int. Cl.[4] G08C *21/00;* G06F *3/033*

U.S. Cl. 364—559 5 Claims



1. A twin-rate charging and discharging proportional type cursor position determining device comprising

a central processor unit;

a cursor;

a cursor driving circuit;

a sense ring ciruit composed of a multiple spaced sense rings;

a sense ring switching circuit composed of multiple electronic switches, controlled by the central processor unit to switch the sense rings in the sense ring circuit;

an amplifier circuit connected to the sense ring circuit to amplify voltages detected by the sense rings;

a low pass filter circuit to filter output from the amplifer circuit;

a first comparator circuit which compares output of the low pass filter circuit with a standard voltage and then sends the result of its comparison to the central processor unit;

an analog memory switching circuit controlled by the central processor unit;

an analog memory circuit operable to store output signals from the low pass filter circuit;

a second comparator circuit which compares output signals from the analog memory circuit and then sends the result of the comparison to the central processor unit;

an integrating switch circuit controlled by the central processor unit;

a counter circuit receiving pulse signals and control signals from the single chip central processor unit;

an integrator circuit controlled by the counter circuit to integrate the output signal from the integrating switch circuit;

anintegrating test circuit operable to send a trigger signal to the central procesor unit when the integrator circuit completes integration; and

a latching circuit controlled by the integrating test circuit trigger signal to send the output of the counter circuit to the central processor unit;

wherein the central processor unit drives the sense ring switching circuit to causes voltages detected by the sense ring circuit to proceed via the amplifier circuit and the low pass filter circuit to the first comparator circuit for comparison with a standard voltage; and wherein if the voltage detected by the sense ring circuit is greater than the standard voltage, the central processor unit drives the analog memory switching circuit to save the largest voltage and second largest voltage in the analog memory circuit for comparison in the second comparator circuit; and wherein the central processor unit sequentially drives the integrating switch circuit to send the second largest voltage in the analog memory circuit to the integrator circuit for positive integration until the counter circuit counts to a preset value after which the largest voltage in the analog memory circuit is sent to the integrator circuit for negative integration, beginning at the initial value of voltage integrated and continuing until the integrator circuit reaches zero potential.

4,837,717

DEVICE FOR MEASURING SUBSTANTIALLY VERTICAL, CIRCULAR-CYLINDRICAL OBJECTS

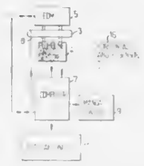
Rudolf Wiklund, and Lars Ericsson, both of Täby, Sweden, assignors to Geotronics AB, Danderyd, Sweden

Filed Feb. 4, 1987, Ser. No. 10,678

Claims priority, application Sweden, Feb. 4, 1986, 8600488; May 23, 1986, 8602358

Int. Cl.[4] G01B *7/14*

U.S. Cl. 364—563 7 Claims



1. A device for measuring a dimension of a substantially vertical cylindrical object at a distance from said object, comprising:

an aiming instrument for sighting various points along said object, said aiming instrument including a plumb line angle sensor, an electronic distance meter and a horizontal angle device for measuring a horizontal angular distance between opposite edges of said object at a predetermined height along said object; and,

a computing unit coupled to receive a distance signal from said distance meter, a signal from said angle sensor, and a signal from said horizontal angle device, said computing unit computing a diameter of said object at said predetermined height from information supplied by said signals.

4,837,718

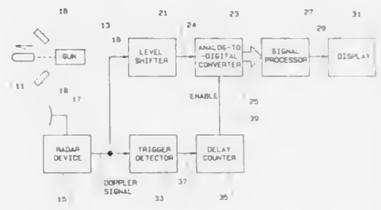
DOPPLER RADAR METHOD AND APPARATUS FOR MEASURING A PROJECTILE'S MUZZLE VELOCITY

Yair Alon, Agoura, Calif., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Feb. 5, 1987, Ser. No. 11,251

Int. Cl.[4] G06F *15/14;* G01L *5/14;* G01S *13/58*

U.S. Cl. 364—565 29 Claims



1. Doppler radar apparatus for determining the initial velocity of a projectile ejected from a muzzle, comprising:

radar means for producing a Doppler signal indicative of movement of the projectile relative to the muzzle;

Fourier transform means for operating on a predetermined plurality of segments of the Doppler signal, each segment representing a separate time period, to produce a corresponding plurality of frequency spectrum signals;

detection means, responsive to the plurality of frequency spectrum signals, for measuring the velocity of the projectile during the time period associated with each successive segment of the Doppler signal, wherein the detection means includes comparator means for comparing each of the plurality of frequency spectrum signals with a prescribed threshold that varies with frequency and with the amount of superimposed noise, the comparator means also determining that portions of the signals exceeding the threshold result from one or more moving objects, including the projectile whose initial, muzzle velocity is being estimated; and

regression means, responsive to the projectile velocities measured by the detection means for the plurality of successive time periods, for estimating the projectile's initial, muzzle velocity.

4,837,719

MEDICATION CLOCK

Kenneth B. McIntosh, Rte. 4, Box 119, Greensburg, Ind. 47240; James O. Pratt, Murfreesboro, Tenn., and Donald E. Stout, Annandale, Va., assignors to Kenneth B. McIntosh, Greensburg, Ind.

Continuation-in-part of Ser. No. 702,746, Feb. 19, 1985, Pat. No. 4,682,299. This application Jul. 6, 1987, Ser. No. 70,221

Int. Cl.[4] G08B *1/00;* G06G *15/20*

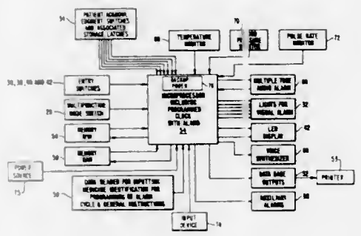
U.S. Cl. 364—569 36 Claims

1. A medication clock comprising:

(a) a plurality of compartments with each compartment being separately usable for holding one or more medications to be taken by a person, the medications being chosen from medications which have individual dosages to be taken at specific times, and medications to be taken on an as needed basis;

(b) a programmable timing means which produces a medica-

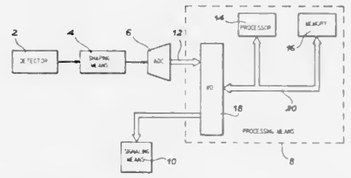
tion dispensing signal indicating the time that one or more medications is to be taken at specific times;
(c) means, responsive to the medication dispensing signal produced by the programmable timing means, for producing an alarm for alerting the person that it is time to take a medication located within one of the compartments;
(d) means which are separately activable by the person for producing an acknowledgment signal that any one of the medications stored in one of the compartments has been taken by the person in response to an alarm and that any one of the medications has been taken on an as needed basis;
(e) a memory, coupled to the programmable timing means and to the means for producing an acknowledgment signal, for storing the time of occurrence of each acknowledgment signal produced by one of the means for producing an acknowledgment signal and an identification of the medication taken from one of the compartments;



(f) record producing means, coupled to the memory, for providing a dosage record of the stored identification of the medication and time of each dosage of medication taken by the person for each of the medications being taken by the person under the control of the programmable timing means in response to an alarm and an identification and time of each dosage of medications taken by the person on an as needed basis; and
(g) control means, including mode selection means having at least two selectable modes of operation, the first mode being used for recording an identification and the time of taking of dosages of medications taken on an as needed basis and the second mode being used for recording an identification and the time of taking dosages of medications taken in response to the programmable timing means.

4,837,720
SYSTEM FOR THE SUPPRESSION OF NOISE AND ITS VARIATIONS FOR THE DETECTION OF A PURE SIGNAL IN A MEASURED NOISY DISCRETE SIGNAL
Michel Rambaut, Bures-sur-Yvette, France, assignor to Commissariat a l'Energie Atomique, Paris, France
Filed Mar. 31, 1986, Ser. No. 845,958
Claims priority, application France, Apr. 2, 1985, 85 04977
Int. Cl.[4] G01T *1/15*
U.S. Cl. 364—574 **7 Claims**

1. A system for the suppression of noise and its variations for the detection of a pure signal in a measured discrete noisy signal, comprising:
a detector for converting radiation received into electrical pulses;
a shaping means coupled to the detector for shaping signals produced at an output of the detector;
an analog-digital converter coupled to said shaping means for converting analog output signals from said shaping means to digital signals;
a processor means coupled to the analog-digital converter for processing said digital signals; and
a signaling means for signaling results of processing performed by said processing means;
said processing means comprising a processor, at least one memory and an input-output circuit;
wherein the processor sequences the selection of two identical time durations Δt in a selected range of frequential and spatial spectrums of corpuscular radiation, one range where radiating signal is present constituting a signal channel, the other range where there is only noise constituting a reference channel;
wherein the detector receives the radiation signal from the signal channel having a mean noise level M_2 and delivers a first pulse at each detection of radiation signal, each said pulse being transformed and converted by the analog-digital converter and counted by the processor, to produce a



sum which constitutes a counting rate N_2, wherein N_2 gives an estimation of the mean noise level M_2, N_2 being stored in the memory;
wherein the detector receives radiation in the reference channel having a mean noise level M_3 and delivers a second pulse at each such detection, each said second pulse being transformed and converted by the analog-digital converter and counted by the processor to produce a sum which constitutes a counting rate N_3, wherein N_3 gives an estimation of the mean noise level M_3, N_3 being stored in the memory;
wherein the processor performs the following steps:
computation of the ratio $\lambda_E = N_3/N_2$ which represents an estimation of λ defined as the ratio of M_3/M_2,
computation of the false detection rate TF, according to the following relationships,

$$TF = \sum_{j=(\{M_1\}+\{M_2\}+1)}^{\infty} \left(\frac{\lambda_E^{\{M3\}+1}}{(1+\lambda_E)^{j+\{M3\}+1}} \cdot \frac{(j+\{M_3\})!}{j!/\{M_3\}!} \cdot Y_1 \right)$$

where $Y_1 =$

$$e^{-(1+\lambda E)\cdot(\{M1\}+\{M2\})} \cdot \sum_{k=0}^{k=j+\{M_3\}} \frac{((1+\lambda_E)\cdot(\{M_1\}+\{M_2\}))^k}{k!},$$

$\{M_1\}$ = the integer part of $(N_2 - N_3)/\lambda_E$,and
$\{M_2\}$ = the integer part of N_2;

computation of a threshold $I_m$where

$$I_m = -\log (TF/(1-TF));$$

computation of the probability of false detection PF according to the following relationships,

$$PF = \sum_{j=N_2+1}^{\infty} \left(\frac{\lambda_E^{N3+1}}{(1+\lambda)^{j+N3+1}} \cdot \frac{(j+N_3)!}{j!/N_3!} \cdot Y \right)$$

-continued

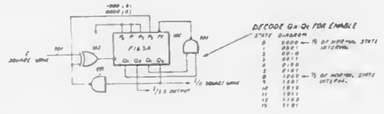
where $Y = e^{-(1+\lambda E)\cdot N2} \cdot \sum_{k=0}^{k=j+N_3} \frac{((1+\lambda_E)\cdot N_2)^k}{k!}$;

computation of a threshold I, where

$I = -\log (PF/(1-PF))$, and

comparison of I and Im,
control of the signaling means as a function of the result of said comparison of I and I_m.

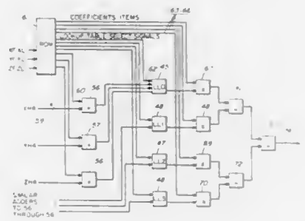
4,837,721
DIGITAL DIVIDER WITH INTEGER AND FRACTIONAL DIVISION CAPABILITY
Philip D. Carmichael, Closter, and Thomas E. Finley, Pompton Lakes, both of N.J., assignors to ITT Defense Communications, A Division of ITT Corporation, Nutley, N.J.
Filed Jun. 30, 1986, Ser. No. 880,405
Int. Cl.[4] G06F *7/52*; H03K *21/00*
U.S. Cl. 364—703 **17 Claims**



1. A fractional digital divider circuit comprising:
a counter having an input for receiving an input clock signal at a frequency f, a data input for presetting the counter to a desired state and a plurality of outputs including one output for providing a divided down counter output signal at a frequency f/n, where n is an integer;
first logic means connected to said counter for presetting selected states;
second logic means connected to said counter for receiving at one input of said second logic means an input digital signal and for receiving at another input of said second logic means a control signal, and for providing said input clock signal consisting either of said input digital signal or of said input digital signal with a phase reversal at said preset selected states, such that a period at each of said selected states of said counter is terminated in a shorter time duration than periods at states without said phase reversal, whereby said counter output signal frequency is fractionally divided at a frequency f/(n+m) where m is less than 1.

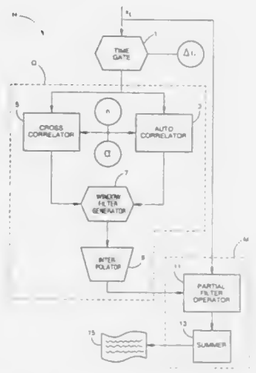
4,837,722
DIGITAL HIGH SPEED 3-DIMENSIONAL INTERPOLATION MACHINE
Jason Sara, Delray Beach, Fla., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Filed May 14, 1986, Ser. No. 863,012
Int. Cl.[4] G06F *7/38*
U.S. Cl. 364—723 **7 Claims**

1. An interpolation apparatus comprising: a total interpolation table comprising a plurality of interpolation subtables, each subtable storing a fraction of the total interpolation table;
a plurality of address generation circuits for the interpolation subtables;
a plurality of coefficient generation circuits;



and circuitry to combine the coefficients and interpolation table values in parallel into a 3-dimensional interpolating function.

4,837,723
METHOD AND APPARATUS FOR CONTINUOUS TIME-VARIANT DIGITAL FILTERING
Kenneth L. Peacock, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.
Filed Jan. 30, 1987, Ser. No. 8,995
Int. Cl.[4] G06F *15/31, 15/58*; G01V *1/38*
U.S. Cl. 364—724.01 **17 Claims**



11. A time-variant digital filter for continuous time-variant filtering of input digitized electric signals, comprising:
(a) time gate means for gating the input digitized electric signal into discrete time windows;
(b) a filter generator, wherein the filter generator includes means for generating a set of continuous filter operators from corresponding elements of prediction error functions of each time window of the input digital electric signal, means for developing a plurality of continuous filter functions, and means for controlling the resolution of the digital filter; and
(c) a continuous filter operator, wherein the continuous filter operator includes means for forming partially filtered signals by separately applying each continuous filter function to the input digitized electric signal, to form partially filtered signals and means for summing the partially filtered signals to form a finally filtered electric signal.

4,837,724

DISCRETE COSINE TRANSFORM ARRANGEMENT

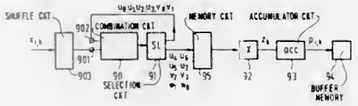
Stephanus M. C. Borgers, and Cornelis P. Visser, both of Eindoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 6, 1987, Ser. No. 47,795

Claims priority, application Netherlands, May 12, 1986, 8601183

Int. Cl.[4] G06F 7/38; H04N 7/12

U.S. Cl. 364—725 **7 Claims**



1. An arrangement for real-time calculation of discrete cosine transformation coefficients of a group of N signal samples of a time-discrete input signal, comprising:

combination means receiving the signal samples as well as a number of auxiliary samples for adding and subtracting predetermined combinations of said signal samples and said auxiliary samples for generating sum and difference samples;

selection means receiving the sum and difference samples and supplying said auxiliary samples as well as transfer samples, the auxiliary samples being constituted by selected ones of the sum and difference samples and the transfer samples being comprised by the remaining sum and difference samples;

multiplication means receiving the transfer samples and multiplying each by only one weighting factor selected from a plurality of predetermined weighting factors for generating product samples; and

accumulator means receiving the product samples for accumulating given samples of said product samples for generating the coefficients.

4,837,725

FUZZY MEMBERSHIP FUNCTION CIRCUIT

Takeshi Yamakawa, Kikuchi, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Oct. 14, 1986, Ser. No. 917,952

Claims priority, application Japan, Oct. 22, 1985, 60-234644

Int. Cl.[4] G06G 7/12; H03K 19/20

U.S. Cl. 364—807 **18 Claims**

1. A fuzzy logic circuit for use in composing a desired fuzzy membership function, comprising:

a plurality of fuzzy membership function basic circuits comprising means for outputting signals representing respective basic fuzzy membership functions, and

a circuit including a MIN circuit and a MAX circuit, to which the output signals of said basic circuits are fed, comprising means for producing a signal representing said desired fuzzy membership function based on a MIN/MAX operation of said output signals of said basic circuits.

4,837,726

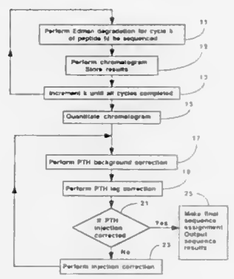
QUANTITATION OF CHROMATOGRAPHIC INFORMATION

Michael W. Hunkapiller, San Carlos, Calif., assignor to Applied Biosystems, Inc., Foster City, Calif.

Filed Jun. 19, 1987, Ser. No. 65,012

Int. Cl.[4] G06F 15/46; G01N 30/02

U.S. Cl. 364—498 **7 Claims**



1. A method of obtaining a baseline corrected chromatogram, said method using a discrete, linear, translation invariant filter function $a_N\alpha$, where N is a measure of the filter function width and α is a parameter whose value determines signal to noise characteristics of the filter function, comprising the steps of:

performing a chromatographic analysis of a sample to obtain a first chromatogram;

filtering said first chromatogram with the filter function, with N set to approximate the width of peaks obtained in said first chromatogram, and 60 set to filter out high frequency noise from said first chromatogram to obtain a second chromatogram having a first filtered baseline:

filtering said second chromatogram with the filter function, with N set to approximate the width of peaks obtained in said first chromatogram and α set to resolution enhance peaks in said second chromatogram to obtain a third chromatogram having a baseline which is substantially the same as said first filtered baseline; and

subtracting said second chromatogram from said third chromatogram to obtain a fourth chromatogram which is baseline corrected.

4,837,727

ROAD SURFACE DETECTING DEVICE FOR VEHICLE

Syuzaburou Tashiro, Okazaki; Toshikazu Ina, Nagoya, and Hisasi Kawai, Toyohashi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 3, 1986, Ser. No. 835,883

Claims priority, application Japan, Mar. 4, 1985, 60-42512; May 28, 1985, 60-115114

Int. Cl.[4] G01B 5/28

U.S. Cl. 364—551.01 **18 Claims**

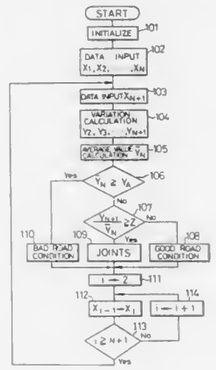
1. A road surface detecting device for detecting a condition of a road surface on which a vehicle runs, comprising:

(1) speed detecting means for detecting a speed of the vehicle at regular intervals of time;

(2) speed variation calculating means, coupled to said speed detecting means, for repeatedly calculating a speed variation between successively detected speeds of the vehicle;

(3) deviation calculating means for calculating a deviation between a predetermined number of said speed variations; and

(4) determining means for: (a) determining the road surface as a bad condition when said deviation is not less than a predetermined value, and determining the road surface as a good condition when said deviation is less than said predetermined value and (b) determining the road surface as a rough area on a good road when said deviation is less than said predetermined value and a newest speed variation which has been most recently calculated is not less than a predetermined speed variation.



4,837,728

MULTIPLE PROGRESSIVE GAMING SYSTEM THAT FREEZES PAYOUTS AT START OF GAME

Robert P. Barrie, and Jon Bengtson, both of Reno, Nev., assignors to IGT, Reno, Nev.

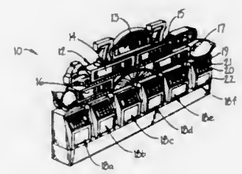
Filed Jan. 25, 1984, Ser. No. 573,771

Int. Cl.[4] A63F 5/04; G07F 17/34; G06F 15/44

U.S. Cl. 364—412 **1 Claim**

MICROFICHE APPENDIX INCLUDED

(58 Microfiche, 2 Pages)



1. A multiple progressive gaming system comprising:

a plurality of gaming means, each for accepting a pay-in, for generating a random output with a selected set of said random outputs being winning outputs, and for delivering a payout when a winning output is generated;

a plurality of display means for displaying a progressive numerical value, with the progressive numerical value displayed by each of said display means indicating the payout for a given one of said winning outputs;

means for incrementing the progressive numerical value displayed by each of said display means by a preselected percentage of the pay-in to any of said gaming machines when a non-winning output is generated, where said progressive numerical values are displayed at each gaming machine; and

means for freezing for progressive numerical values displayed at a given gaming machine between the pay-in and game output for the given gaming machine.

4,837,729

DISPLAY APPARATUS FOR SIMULTANEOUS DISPLAY OF LINES OF CHARACTERS HAVING DIFFERENT LINE PITCHES

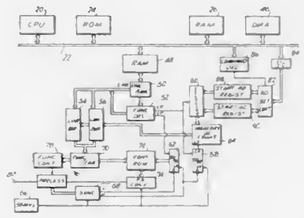
Takeshi Funahashi, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 16, 1981, Ser. No. 331,545

Claims priority, application Japan, Dec. 16, 1980, 55-177735

Int. Cl.[4] G06F 3/12

U.S. Cl. 364—900 **5 Claims**



1. A method of operating an information processing apparatus having a single memory with a plurality of memory locations and display means which produces a display of lines of characters on a display screen by repetitive scanning operations each including a vertical blanking period after the occurrence of a start signal, said display screen having a predetermined portion with a predetermined total vertical space, and each of said lines of characters having a selected one of a plurality of line pitches defining a total vertical height of the respective line and occupying said vertical height on said display screen determined by the respective line pitch, each of said lines of characters corresponding to a respective block of character information stored in one of said memory locations and a respective line pitch information also stored within said single memory which determines said respective line pitch, said display means being adapted to display on said portion thereof those lines of characters corresponding to ordered blocks of character information stored in selected ordered ones of said memory locations with line pitches corresponding to the respective line pitch information associated with the ordered memory locations so that vertically adjacent displayed lines have an inter-line spacing determined by the respective line pitch information, said method being provided for producing a vertical scroll of said lines of characters, and comprising the steps of:

storing a first plurality of said blocks and first line pitch information respectively associated with each of said blocks in said ordered memory locations within said single memory;

displaying a corresponding first plurality of lines on said portion of the display means, the line pitch of each of said lines being determined by said respective first line pitch information;

said first line pitch information being predetermined such that the sum of the vertical heights of said first plurality of lines equals the total vertical space of said portion of the display means;

computing second line pitch information for a second plurality of said blocks such that the sum of the vertical heights of a second plurality of lines corresponding to said second plurality of blocks, which would be displayed on said portion of said display means when said second plurality of blocks are stored in said ordered memory locations,

equals the total vertical space of said portion of the display means;

storing said second plurality of blocks in said ordered memory locations while keeping said first line pitch information in said memory locations unchanged; and

subsequently replacing said first line pitch information with said second line pitch information in said ordered memory locations within said single memory during said vertical blanking period after the detection of said start signal.

4,837,730

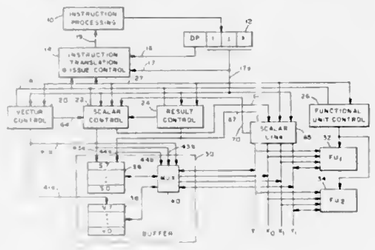
LINKING SCALAR RESULTS DIRECTLY TO SCALAR OPERATION INPUTS ON A BIDIRECTIONAL DATABUS IN A COMPUTER WHICH SUPERPOSITIONS VECTOR AND SCALAR OPERATIONS

Erick M. Cook; Andrew E. Phelps, both of San Diego, and Hanan Potash, La Jolla, all of Calif., assignors to Scientific Computer Systems Corporation, San Diego, Calif.

Filed Feb. 6, 1987, Ser. No. 11,759

Int. Cl.⁴ G06F *13/00, 13/14, 13/38, 13/40*

U.S. Cl. 364—200 **7 Claims**



1. A computer which performs scalar and vector operations in response to a program instruction sequence and which includes a plurality of functional units, each for producing a result data object in response to two or more operand data objects, and which also includes a buffer unit having scalar registers and vector registers which receive result data objects from said functional units, store said received data objects, and provide stored data objects as operand data objects to said functional units, in which the improvement comprises:

an apparatus for conditionally bypassing storage of a scalar data object in said buffer unit scalar registers prior to providing the data object as a result by directly linking a result data object to a functional unit, said apparatus including:

a bidirectional function bus connected to said buffer unit and to said functional units for transferring scalar and vector data objects between said buffer unit and said functional units during each cycle of a succession of multiphase bus transfer cycles, in which scalar operands are transferred form said buffer unit scalar registers to said functional units during an operand transfer phase of each bus transfer cycle and in which scalar results are transferred from said functional units to said buffer unit scalar registers during a result transfer phase of each bus transfer cycle;

link control means responsive to said program instruction sequence for identifying a buffer unit scalar register which is to receive a scalar result from said functional units during a first bus transfer cycle and which is to provide said scalar result as a scalar operand to said functional units during a second bus transfer cycle following said first bus transfer cycle, said second bus transfer cycle being displaced from said first bus transfer cycle by one or more bus transfer cycles; and

link transfer means connected to said bidirectional function bus and responsive to said link control means for receiving said scalar result form said bidirectional function bus during the result transfer phase of said first bus transfer cycle, while said scalar result is being transferred on said bidirectional function bus to said buffer unit scalar register, and for providing said scalar result to said bidirectional function bus during the operand transfer phase of the bus transfer cycle immediately following said first bus transfer cycle.

4,837,731

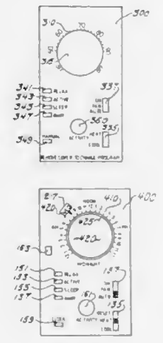
SYSTEM FOR TIME PROGRAMMING OF STATES BY COMMUNICATING TIME DATA VIA A CONTINUOUSLY ROTATABLE POTENTIOMETER

Matthew Levine; Anthony Cairo; James Russo; Victor Rigotti, and Roger Clark, all of Ann Arbor, Mich., assignors to Honeywell Incorporated, Minneapolis, Minn.

Filed Jul. 7, 1987, Ser. No. 70,799

Int. Cl.⁴ F23N *5/20;* **G05D** *23/19;* **G04C** *9/00;* **C04B** *27/00*

U.S. Cl. 364—145 **21 Claims**



1. A programmable control device comprising:

an operator adjustable rotary potentiometer having an adjustment knob with a mark thereon and an associated printed time indicia corresponding to twenty four hours of time disposed concentric with said adjustment knob, said rotary potentiometer being rotatable through 360° via said adjustment knob, said mark on said adjustment knob indicating a corresponding time on said time indicia, said rotary potentiometer having a pair of fixed terminals and a single rotary terminal, the resistance between said rotary terminal and one of said fixed terminals corresponding to the rotary position of said adjustment knob and thereby further corresponding to said time in said time indicia indicated by said mark;

a time signal means connected to said rotary potentiometer for generating a time signal indicative of a time corresponding to the resistance between said rotary terminal of said rotary potentiometer and one of said fixed terminals of said rotary potentiometer and thereby further corresponding to said time in said time indicia indicated by said mark;

a manual control state input means for selection of one of a plurality of control states;

a program memory means for storing therein a program of control states for particular times of a single 24 hours day;

a programming means connected to said time signal means, said manual control state input means and said program memory means for writing an indication of said selected control state in said program memory means at a location corresponding to said time signal;

a clock means for generating a clock signal indicative of the current time; and

a control means connected to said program memory means and said clock means for recalling from said program memory means the control state corresponding to the current time indicated by said clock signal and for performing said recalled control function.

12. A programmable thermostat for control of a temperature modifying apparatus comprising:

a mode selection means for selection of one of a program mode and a control mode;

an operator adjustable rotary potentiometer having an adjustment knob with a mark thereon, an associated printed time indicia corresponding to twenty four hours of time disposed concentric with said adjustment knob and a printed temperature indicia corresponding to temperature disposed concentric with said adjustment knob, said rotary potentiometer being rotatable through 360° via said adjustment knob, said mark on said adjustment knob indicating a corresponding time on said time indicia and a corresponding temperature on said temperature indicia, said rotary potentiometer having a pair of fixed terminals and a single rotary terminal, the resistance between said rotary terminal and one of said fixed terminals corresponding to the rotary position of said adjustment knob and thereby further corresponding to both said time in said time indicia indicated by said mark and said temperature in said temperature indicia indicated by said mark;

a time signal means connected to said rotary potentiometer for generating a time signal indicative of a time corresponding to the resistance between said rotary terminal of said rotary potentiometer and one of said fixed terminals of said rotary potentiometer and thereby further corresponding to said time in said time indicia indicated by said mark;

a manual control state input means for selection of a temperature offset;

a program memory means for storing therein a program of temperature offsets for particular times of a single 24 hour day;

a programming means connected to said mode selection means, said time signal means, said manual temperature offset input means and said program memory means for writing an indication of said selected temperature offset in said program memory means at a location corresponding to said time signal when in program mode;

a clock means for generating a clock signal indicative of the current time;

a set point temperature signal means connected to said rotary potentiometer for generating a set point temperature indicative of a temperature corresponding to the resistance between said rotary terminal of said rotary potentiometer and said one of said fixed terminals of said rotary potentiometer and thereby further corresponding to said temperature in said temperature indicia indicated by said mark; and

a control means connected to said mode selection means said program memory means, said clock means and said set point temperature signal means for recalling from said program memory means the temperature offset corresponding to the current time indicated by said clock signal and for thermostatic control of the temperature modifying apparatus for maintaining a temperature equal to the sum of the set point temperature indicated by said set point temperature signal and said recalled temperature offset when in control mode.

4,837,732

METHOD AND APPARATUS FOR THE THREE-DIMENSIONAL REGISTRATION AND DISPLAY OF PREPARED TEETH

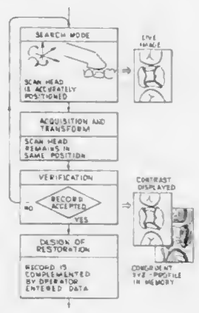
Marco Brandestini, Gartenstrasse 10, 8702 Zollikon, and Werner H. Moermann, Zweiackerstrasse 57, 8053 Zurich, both of Switzerland

Filed Jun. 5, 1987, Ser. No. 58,462

Claims priority, application Switzerland, Jun. 24, 1986, 02512/86

Int. Cl.⁴ G01B *11/24;* **A61C** *19/04, 5/10*

U.S. Cl. 364—413.28 **28 Claims**



1. A method of facilitating acquisition of data defining the three-dimensional shaped of prepared teeth and their immediate vicinity, comprising the steps of: displaying on a video display a live image from a scan head, manually orienting the scan head relative to the prepared teeth while observing the image of the teeth on said video display, thereafter generating from data produced by said scan head in a selected orientation corresponding depth and contrast images, and thereafter processing said depth image based on said contrast image.

5. An apparatus, comprising manually positionable scan head means for utilizing active triangulation to generate data representing a running sequence of images of a prepared tooth and its immediate neighborhood, means operable during a search mode when said scan head means is being manually positioned for cancelling from said data artifacts generated by said triangulation so each of said images in said sequence is an uncluttered high resolution image, and means operable during an acquisition mode immediately following said search mode for acquiring and storing a subset of said data corresponding to a selected said image of said sequence occurring at a given point in time.

13. In a method for noncontact topographic scanning of a three-dimensional contour on an object, including the steps of: directing a predetermined intensity pattern of light onto the contour so that a corresponding intensity pattern of light will be backscattered therefrom, the varying intensity pattern of said backscattered light being a measure of the three-dimensional contour on the object; directing said pattern of said backscattered light onto electro-optical light sensing means; periodically reading from said light sensor means electrical data representative of the image directed onto said sensor and displaying said electrical data on a video display; thereafter successively moving said intensity pattern relative to the object to at least two different positions and reading from said light sensor means for each said position of said pattern a respective set of electrical data, and storing each said set of electrical data; and calculating from said stored sets of electrical data a digital three-dimensional image of the contour; the improvement comprising the step of calculating from said stored sets of electrical data a digital two-dimensional contrast image of the contour and the step of continuously displaying on said video display said two-dimensional contrast image, said

contrast image being for each point on the contour the difference between the respective backscattered light intensities detected by said light sensing means for illumination of said point with maximum and minimum light intensities of said pattern.

22. In an apparatus for noncontact topographic scanning of a three-dimensional contour on an object, including: light source means for generating light and means for directing light from said light source means onto the contour; pattern generating means disposed in the path of the light from said light source for imparting to said light a predefined pattern of intensity; light sensor mans at a predetermined location; and means for directing light backscattered from said contour onto said light sensing means; the improvement comprising wherein said pattern generating means includes a liquid crystal cell having therein a liquid crystal material through which light traveling from said light source means to said object passes, said liquid crystal cell having electrode means responsive to electric stimulation for generating transparent regions and opaque regions in said liquid crystal material in the form of said predefined pattern.

27. In an apparatus for noncontact topographic scanning of a three-dimensional contour on an object, including: light source means for generating light and means for directing light from said light source means onto the contour; pattern generating means disposed in the path of light from said light source means for imparting to said light a predefined intensity pattern; electro-optical light sensor means at a predetermined location and means for periodically reading from said sensor means at a frame rate respective sets of electrical data which each represent a respective image of light intensity impinging on said sensor means; and means for directing light reflected from the contour onto said light sensing means; the improvement comprising wherein said pattern generating means includes means for selectively effecting oscillatory movement of said intensity pattern in a direction substantially perpendicular to a path of travel of light through said pattern generating means, said oscillatory movement being effected at a frequency which is an integer multiple of said frame rate of said sensor means.

4,837,733

SIGNAL PROCESSING METHOD IN AUTORADIOGRAPHY

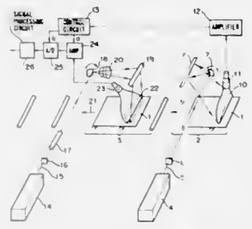
Hisashi Shiraishi, Minami-ashigara; Tsutomu Kimura, and Kazuhiro Hishinuma, both of Kaisei, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 568,906, Jan. 6, 1984, abandoned. This application Jul. 10, 1986, Ser. No. 883,922

Claims priority, application Japan, Jan. 8, 1983, 58-1328; Jan. 8, 1983, 58-1329; Jan. 8, 1983, 58-1334; Mar. 31, 1983, 58-57415

Int. Cl.[4] G01N *33/58;* **C12Q** *1/68*

U.S. Cl. 364—413.13 55 Claims



1. A signal processing method for processing an autoradiograph recorded on a support medium and containing locational information on the one dimensional location of radioactively labeled substances in a sample where the substances are distributed in at least one one dimensional direction on said support medium to form at least one row of the distributed substances, which comprises the steps of:

(1) generating digital image data where the data comprises sets of digital signals corresponding to the autoradiograph including the row of distributed substances;

(2) scanning said digital image data in at least two different positions in such a manner that each scanning selects certain ones of said digital signals corresponding to the row of distributed substances to obtain relationships between positions of said certain ones of the digital signals in the direction of the scanning and the signal levels at said positions;

(3) generating at least two distributed point signals based on said relationships where the two distributed point signals are generated for said row of distributed substances, the two distributed point signals respectively corresponding to the two different scanning positions and where said two distributed points are disposed on said row;

(4) generating a signal corresponding to a continuous line selected from the group consisting of a straight line, a curved line and a polygonal line connecting said points on the row where said continuous line corresponds to a scanning line for detection of sampling points respectively corresponding to the locations of said substances;

(5) scanning said digital image data along said scanning line to obtain locational information signals representative of said locational information for each of said substances in said sample;

(6) said digital image data being generated by (a) causing a stimulable phosphor sheet to absorb radiation energy emitted by the radioactively labeled substances on the support medium to record the autoradiograph of the radioactively labeled substances on the stimulable phosphor sheet, (b) scanning said stimulable phosphor sheet with an electromagnetic wave to release as stimulated emission at least a portion of the radiation energy absorbed by said phosphor sheet in the form of the autoradiograph, (c) detecting said stimulated emission photoelectrically, and (d) converting the detected stimulated emission into said digital image data; and

whereby said locational information signals can be obtained in spite of one or more deviations of said row of said distributed substances from a straight line due to the compensation effected by said scanning line for said deviations where said deviations may be present in the support medium and/or the stimulable phosphor sheet.

4,837,734

METHOD AND APPARATUS FOR MASTER-SLAVE MANIPULATION SUPPLEMENTED BY AUTOMATIC CONTROL BASED ON LEVEL OF OPERATOR SKILL

Yoshiaki Ichikawa, Hitachi; Makoto Senoh, Ibaraki; Masanori Suzuki, Hitachi; Hiroshi Kamimura, Hitachi; Fumio Tomizawa, Hitachi; Sakae Sugiyama, Ibaraki, and Masayoshi Sasaki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 26, 1987, Ser. No. 19,601

Claims priority, application Japan, Feb. 26, 1986, 61-39232

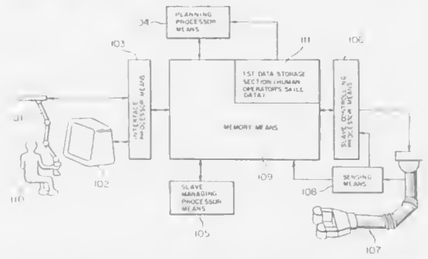
Int. Cl.[4] G06F *15/46;* **B25J** *9/00*

U.S. Cl. 364—513 13 Claims

1. A remote manipulation method for performing work including a sequence of operational steps using a manually operable master device and a slave device operable in response to said master device and a programmable control means coupled between said master device and said slave device, comprising the steps of:

producing an operation procedure plan on the basis of data indicating a level of skill of a human operator and data indicating a goal for work to be performed, said plan including a combination of manual operations and automatic operations allocated according to said level of skill of the human operator;

programming said control means in accordance with said plan so that each of said operational steps is defined as being carried out by manual operation of said master by said human operator and/or by automatic operations defined by commanding data produced by said control means; and



actuating said slave by carrying out said manual operations in response to actuation of said master device by said human operator and by carrying out said automatic operations under control of said control means in accordance with said plan.

4,837,735

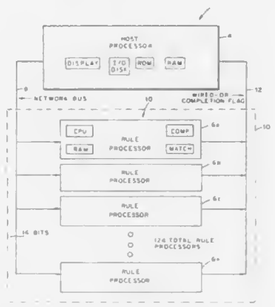
PARALLEL MACHINE ARCHITECTURE FOR PRODUCTION RULE SYSTEMS

John D. Allen, Jr., and Philip L. Butler, both of Knoxville, Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Jun. 9, 1987, Ser. No. 59,976

Int. Cl.[4] G06F *15/16*

U.S. Cl. 364—513 55 Claims



1. A parallel processing system for processing production rule programs having a plurality of rules wherein each rule includes at least one non-negated "if" condition left hand side and at least one "then" action right hand side comprising:

(a) a data bus;

(b) an address bus;

(c) a host processor connected to said data and address buses, said host processor including means for executing the right hand sides of said rules;

(d) a plurality of rule processors, each connected to said data and address busses and each including a memory storage device having a data memory section storing data and a program memory section for storing said at least one left hand side of at least one of said rules, said memory storage device having storage locations designated by addresses, each rule processor comprising means for evaluating said at least one stored left hand side of said at least one rule and for generating an associated match flag if all conditions specified in the stored at least one left hand side are satisfied by at least a combination of said stored data;

(e) said host processor comprising means responsive to said match flags from each of said rule processors, for selecting one of said rules and executing the actions of said at least one right hand side of said selected rule for generating commands and associated data;

(f) said host processor comprising means for transmitting said commands and associated data to all of said rule processors; and

(g) each of said rule processors comprising means for receiving said commands and associated data and selecting ones of said commands and associated data for which said associated data is identified in said at least one stored left hand side of said rule and for changing said stored data in accordance with said selected ones of said commands and associated data.

4,837,736

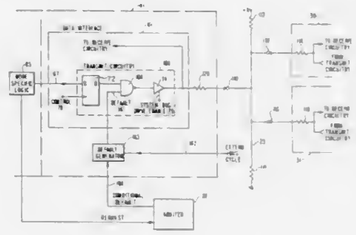
BACKPLANE BUS WITH DEFAULT CONTROL

Darrel D. Donaldson, Lancaster, and Richard B. Gillett, Jr., Westford, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed May 1, 1987, Ser. No. 44,953

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—900 7 Claims



1. A system for transmitting and receiving data between a plurality of nodes containing logic circuit means for selectively transmitting data at first and second logic levels, comprising:

a bus coupled to the nodes for carrying the data between the nodes;

means for biasing the bus to place the bus at a voltage level intermediate said first and second logic levels if none of said nodes is driving the bus;

arbiter means coupled to said nodes for detecting a lack of request activity from the logic circuit means coupled to the bus and activating a conditional default line when no request activity is detected;

an extend bus cycle line coupled to said nodes for notifying said nodes that a multi-cycle transfer is being performed by one of the nodes;

default generator means, within at least one of said nodes coupled to said extend bus cycle line and connected to said conditional default line from said arbiter means, for activating a default bus signal during cycles when there is no activity on the bus, as determined by said conditional default line being activated and said extend bus cycle line being deactivated in a previous cycle; and

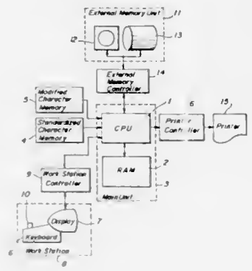
means, within each node containing said default generator means and responsive to said default bus signal, for driving the bus to one of said first and second logic levels, instead of allowing the bus to assume the intermediate voltage level, upon detection by said default generator means of said lack of activity on the bus.

4,837,737

SYSTEM FOR DETECTING ORIGIN OF PROPRIETARY DOCUMENTS GENERATED BY AN APPARATUS FOR PROCESSING INFORMATION SUCH AS WORDS, FIGURES AND PICTURES

Toshiaki Watanabe, 19-11, Kichijojminami-Cho 3-Chome, Musashino City, Japan

Filed Aug. 4, 1986, Ser. No. 892,281
Claims priority, application Japan, Aug. 20, 1985, 60-180906
Int. Cl.[4] G06F *5/00, 15/62, 3/023;* B41J *1/31*
U.S. Cl. 364—900 19 Claims



1. An apparatus for processing information such as words, figures and pictures to facilitate tracing the source of origin of a copy of a document, comprising:

first memory means for storing character information comprising characters including letters, numbers, punctuation marks, symbols, figures and pictures, each character having an inherent meaning;

input means, connected to said first memory means, for entering selection commands for formatting the character information if accordance with a form of a desired document;

display means, connected to said first memory means, for reading characters denoted by said selection commands out of said first memory means and for displaying the read out characters;

second memory means, connected to said display means for storing text information including characters read out and displayed by said display means;

first output means, connected to said second memory means, for outputting the text information stored in said second memory means;

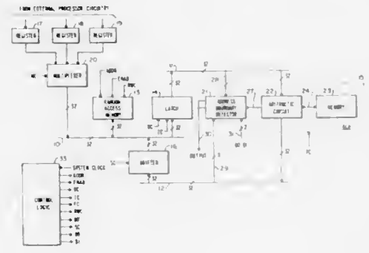
conversion means, connected to said second memory means, for modifying selectively a configuration of at least one character in said text information in such a way that said inherent meaning of said at least one character and a textual content of said text information are not altered, but the source of origin of versions of said text is encoded in said modified character configuration: and, second output means connecting said conversion means to said second memory means for inserting said at least one modified character configuration in said text information stored in the second memory means, so that said first output means presents a modified copy of a document including such encoded origin information, wherein the character configuration modification is detecable only upon close visual inspection; thereby allowing an investigator to trace and find the source of said copy of said document including the modification when said document was improperly disclosed.

4,837,738

ADDRESS BOUNDARY DETECTOR

Richard A. Lemay, Carlisle; William E. Woods, Natick, and Steven A. Tague, Billerica, all of Mass., assignors to Honeywell Information Systems Inc. and Hutton/PRC Technology Partners 1, both of Minneapolis, Minn.

Filed Nov. 5, 1986, Ser. No. 927,631
Int. Cl.[4] G06F *12/00, 12/06*
U.S. Cl. 364—900 2 Claims



1. A data processing system including means for detecting memory address page crossing, said system comprising,

a memory for storing data in storage space divided into pages of 2^n storage locations per page, each of said locations being specified by a multi-bit binary address such that the least significant n bits of said address identify one of said locations within a particular page and the remaining bits of said address identify the particular page containing said one location,

an integrated circuit arithmetic unit for performing the addition of a base addend address to an offset addend address to form a result address, said arithmetic unit including means for adding

the nth bit of the base addend address,

the nth bit of the offset addend address, and

the low-order carry bit resulting from the addition of the —-1 lower order bits of the two addend addresses to generate a result bit and a boundary crossing carry bit, said boundary crossing carry bit being inaccessible to circuitry exterior to said integrated circuit arithmetic unit, and

a sensing mechanism external to said integrated circuit for generating a replica of said boundary crossing carry bit to identify result addresses which specify a memory location in a page different than the page occupied by the location specified by said base addend address, said sensing mechanism comprising, in combination,

a first input connected to receive said low-order carry bit,

a second input connected to receive the nth bit of one of said addend addresses,

a third input connected to receive said result bit, and

first logic means responsive to the bit values received on said first, second and third inputs for generating said replica of said boundary crossing carry bit, said replica being a binary 1 whenever

a binary 0 is received at said third input and a binary 1 is received at either said first or said second input, or

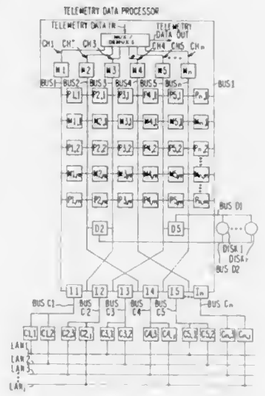
a binary 1 is received at both said first and second inputs.

4,837,739

TELEMETRY DATA PROCESSOR

David C. McGill, Houston; Gary J. McIntire, Friendswood, and Mitchell T. Stowe, League City, all of Tex., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Jul. 25, 1986, Ser. No. 890,668
Int. Cl.[4] G06F *15/16, 15/20*
U.S. Cl. 364—900 1 Claim



1. A data processor for high bandwidth data, said data processor having a cylindrical architecture and comprising:

means for distributing the data onto n generally parallel buses where n is any preselected positive integer greater than 3;

several processor modules directly coupled to each bus, with each processor module directly coupled to two adjacent buses, where bus(r) is defined as being "adjacent" to bus(r+1) and to bus(r−1), r being any positive integer from 2 through n−1, and, in addition, bus(n) is defined as being "adjacent" to bus(1); and

several memory modules directly coupled to each bus, with each memory module directly coupled to two adjacent buses; wherein

each individual module has a first, relatively direct, communications relationship with each other module that is directly coupled to a bus to which said individual module is directly coupled in view of the fact that communications between such modules occur over but a single intervening bus, and a second, relatively indirect, communications relationship with each other module that is directly coupled to a bus to which said individual module is not directly coupled in view of the fact that communications between any two such modules is routed via at least one additional intermediate module and two buses; and

distinct buses can simultaneously be activated to communicate distinct packets of information between different modules wherein each bus comprises data lines and address lines, and each processor module comprises:

first and second ports for coupling to the two adjacent buses, respectively;

an address translation/access protection unit coupled to the address lines at each of said ports;

a microprocessor coupled to the address translation/access protection unit and to the data lines at each of said ports via a set of transceivers;

a first local memory coupled to the address translation/access protection unit and to the data lines at each of said ports;

a second local memory coupled directly to the microprocessor and coupled to the address translation/access protection unit via the set of transceivers; and

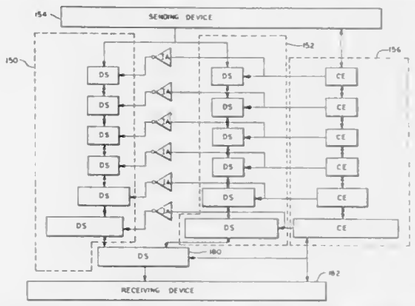
a cache memory coupled directly to the microprocessor, coupled directly to the second local memory, and coupled to the address translation/access protection unit via the set of transceivers.

4,837,740

ASYNCHRONOUS FIRST-IN-FIRST-OUT REGISTER STRUCTURE

Ivan F. Sutherland, 1035 Devon Rd., Pittsburgh, Pa. 15213

Continuation of Ser. No. 688,848, Jan. 4, 1985, abandoned. This application Nov. 10, 1987, Ser. No. 118,997
Int. Cl.[4] G06F *13/00;* G21K *5/08*
U.S. Cl. 364—900 24 Claims



1. An apparatus for use with data signals as one of a plurality of like units in a sequence, as in a first-in-first-out register, said one of a plurality of like units for connection with a predecessor unit and a successor unit, said apparatus comprising:

means for registering a state to provide a control signal for said one unit;

means controlled by said predecessor and successor units for altering said registered state of said one unit to that of said predecessor unit upon detecting the state of said predecessor unit and said successor unit to be different;

data means for said one unit for providing a data signal to said predecessor and successor units; and

switch means for said data means for said one unit activated in accordance with said control signal of said one unit, selectively provide forward and retrograde data paths to said successor and predecessor units whereby to pass a said data signal and enable virtual storage between said one unit and said other of said plurality of like units.

4,837,741

MAGNETIC BUBBLE MEMORY DEVICE

Toshihiro Sato, Kokubunji; Takashi Toyooka, Sayama; Naoki Kodama, Tachikawa; Teruaki Takeuchi, Koganei; Masatoshi Takeshita, Hachioji, and Ryo Suzuki, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 5, 1987, Ser. No. 46,170
Claims priority, application Japan, May 9, 1986, 61-104644
Int. Cl.[4] G11C *19/08*
U.S. Cl. 365—12 16 Claims

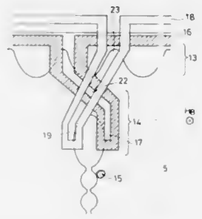
5. A magnetic bubble memory device comprising:

at least one major line having ion-implanted tracks;

a plurality of minor loops having ion-implanted tracks; and

gate means having ion-implanted tracks and first and second hair-pin conductor patterns electrically isolated from one another by an insulating material, each of the first and

second hair-pin conductor patterns extending from the at least one major line to at least one of the minor loops and



crossing one another during at least a portion of the extension thereof.

4,837,742

ELECTRICALLY PROGRAMMABLE ROM

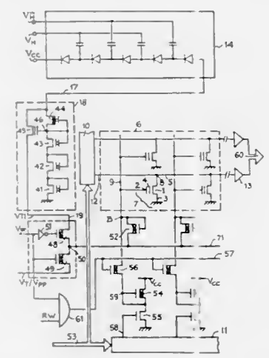
Gérard Silvestre de Ferron, Greasque, France, assignor to Eurotechnique, Rousset, France

Continuation of Ser. No. 1,637, Dec. 5, 1986, abandoned. This application Nov. 9, 1988, Ser. No. 274,661

Claims priority, application France, Apr. 12, 1985, 85 05563

Int. Cl.[4] G11C *11/34, 29/00* **G01R** *15/12*

U.S. Cl. 365—185 **8 Claims**



1. An EEPROM having a plurality of memory cells with each employing at least one floating gate transistor and wherein each memory cell is accessible through a matrix of bit lines and word lines, comprising:

integrated circuit means internal to said EEPROM for applying to these bit lines and word lines potentials representative of information to be recorded in the cells or representative of control signals for reading the recorded information:

further comprising as part of said integrated circuit means

verification means for applying to those bit lines and word lines connected to each cell a verification potential whose level is fixed intrinsically to said EEPROM, wherein said integrated circuit means further includes means for producing a calibrated potential, said means for producing a calibrated potential comprising means for amplifying a supply potential and means for reducing an amplified potential, wherein the output of said amplifying means is coupled to the input of said reducing means for reducing said supply potential being amplified.

4,837,743

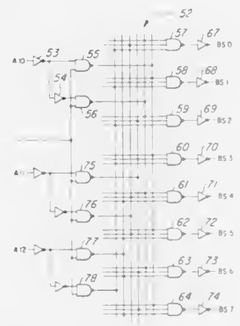
ARCHITECTURE FOR MEMORY MULTIPLEXING

Edison H. Chiu, Richardson; Jy-Der Tai, Plano, and Te-Chuan Hsu, Arlington, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 17, 1987, Ser. No. 86,329

Int. Cl.[4] G11C *11/40, 13/00*

U.S. Cl. 371—51 **10 Claims**



7. A solid state memory system including circuitry for providing addresses to a plurality of memory cells, comprising:

(a) a plurality of blocks of memory cells, the memory cells in each block arranged in columns and rows;

(b) block selection means responsive to the addresses, for selecting any one of the blocks, as determined by a selected address, for a memory reference thereto at the selected address;

(c) output means connected to receive the output from each of the blocks;

(d) output isolation means connected to the output means, for isolating the output means connected to the non-selected blocks from the output means connected to the selected block, to minimize loading of the output means connected to the selected block;

(e) data buffer means for receiving input data to be written into the memory system, having outputs for inputting the memory cells;

(f) comparator means, connected to receive the outputs from the data buffer means and from the output means for comparing the input data with the information from the output means; and

(g) comparator isolation means connected to the comparator means for isolating the comparator means connected to the non-selected blocks from the comparator means connected to the selected block, to minimize loading of the comparator means connected to the selected block.

4,837,744

INTEGRATED CIRCUIT OF THE LOGIC CIRCUIT TYPE COMPRISING AN ELECTRICALLY PROGRAMMABLE NON-VOLATILE MEMORY

Alexis Marquot, Saint Maximin, France, assignor to Thomson Semiconducteurs, Paris, France

Filed Nov. 4, 1987, Ser. No. 116,692

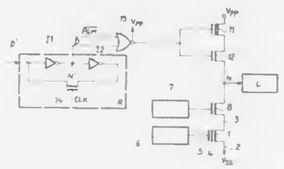
Claims priority, application France, Nov. 4, 1986, 86 15325

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—195 **8 Claims**

1. An integrated circuit comprising an electrically programmable non-volatile memory, said circuit comprising means for periodically refreshing data to be written in the memory, means for supplying a periodical clock signal to the refreshing means, and means for applying a write control signal to the memory for enabling writing said data in the memory, wherein said integrated circuit further comprises a circuit for detecting

an absence of said periodical clock signal, and means coupled to said detect circuit for inhibiting transmission of said write



control signal to the memory when an absence of periodical clock signal is detected by said detect circuit.

4,837,745

PROCESS FOR THE REVERSIBLE OPTICAL STORAGE OF DATA

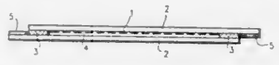
Manfred Eich, Frankfurt; Joachim Wendorff, Nauheim, and Bernd Reck, Mannheim, all of Fed. Rep. of Germany, assignors to Röhm GmbH Chemische Fabrik, Darmstadt, Fed. Rep. of Germany

Filed Feb. 3, 1987, Ser. No. 10,778

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1986, 3603268

Int. Cl.[4] G11C *13/04*

U.S. Cl. 365—108 **31 Claims**



1. A process for reversible optical information storage which utilizes a device comprising (1) a substrate, and (2) a film comprising a liquid crystal side chain polymer in contact with said substrate, comprising the steps of:

(a) storing information below the glass temperature of said liquid crystal side chain polymer and within the stable shape retention state of said polymer on said device by locally reorienting said film; and

(b) reading stored information from said device by illuminating said film with coherent monochromatic light.

4,837,746

METHOD AND APPARATUS FOR RESETTING A VIDEO SRAM

Pradip Banerjee, Sunnyvale, and Paul D. Keswick, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 4, 1985, Ser. No. 805,158

Int. Cl.[4] G11C *7/00, 11/40*

U.S. Cl. 365—189.05 **19 Claims**

1. A method of resetting a first memory during a data transfer cycle between a second memory and said first memory in a graphics system having a second memory with a plurality of bit lines, a first memory with a plurality of bit lines, a first memory address decoder, a RESET data register and data lines, comprising in sequence the steps of:

isolating said first memory bit lines from said data lines;

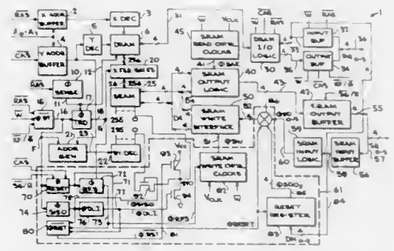
isolating said first memory from said decoder;

transferring RESET data into said RESET data register;

transferring data in parallel between said second memory bit lines and said first memory bit lines;

isolating said first memory bit lines from said second memory bit lines upon the completion of said data transfer between said second memory and said first memory;

coupling said first memory bit lines in parallel to said data lines; and



transferring said RESET data from said RESET data register to said first memory bit lines via said data lines.

4,837,747

REDUNDARY CIRCUIT WITH A SPARE MAIN DECODER RESPONSIVE TO AN ADDRESS OF A DEFECTIVE CELL IN A SELECTED CELL BLOCK

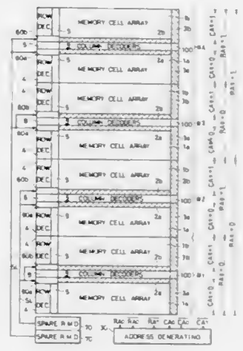
Katsumi Dosaka; Masaki Kumanoya; Hideshi Miyatake; Hideto Hidaka; Yasuhiro Konishi; Hiroyuki Yamasaki; Yuto Ikeda; Kazuhiro Tsukamoto, and Masaki Shimoda, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1987, Ser. No. 126,349

Claims priority, application Japan, Nov. 29, 1986, 61-284848; Dec. 22, 1986, 61-307139

Int. Cl.[4] G11C *7/00, 29/00, 8/00*

U.S. Cl. 371—10 **18 Claims**



1. A semiconductor memory device including a programmable redundancy circuit, comprising:

a plurality of memory cells and at least one spare memory cell,

block selecting means for generating a block selecting signal and a block non-selecting signal,

each of said memory cell array blocks being selected by said block selecting signal and not selected by said block non-selecting signal,

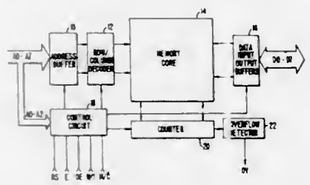
a plurality of decoders each provided in each of said memory cell array blocks and responsive to address signals for selecting any of said memory cells,

a plurality of spare sub-decoders each provided in each of said memory cell array blocks for selecting spare memory

cell in place of a defective memory cell when said defective memory cell exists in said memory cells,
a spare main decoder arranged outside said memory cell array blocks,
said spare main decoder being responsive to an address signal corresponding to a defective memory cell in a selected memory cell array block and the block selecting signal for generating a spare decoder selection signal, and
a spare decoder selecting line connected between said spare main decoder and said memory cell array block selected by said block selecting signal and said memory cell array block non-selected by said block non-selecting signal for transmitting said spare decoder selecting signal generated by said spare main decoder to said selected and non-selected memory cell array blocks,
said spare sub-decoders being activated by said spare decoder selecting signal.

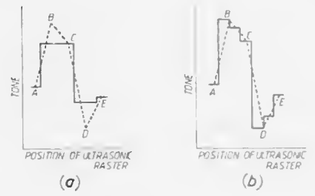
7. A semiconductor memory device including a programmable redundancy circuit, comprising:
a memory cell array comprising a plurality of memory cells arranged in selectable blocks and at least one spare memory cell,
a decoder responsive to an address signal for selecting any of said memory cells, and
a spare decoder responsive to an address signal corresponding to a defective memory cell for selecting said spare memory cell when said defective memory cell exists in said memory cells,
said spare decoder comprising a plurality of address selecting means and decoder means responsive to a predetermined combination of outputs of said plurality of address selecting means and block selection and non-selection signals for generating a selecting signal for selecting said spare memory cell,
each of said address selecting means comprising
a plurality of buffer circuits receiving different address signals,
an output terminal, and
a plurality of link element means each connected between each of said buffer circuits and said output terminal for selectively disconnecting ones of said buffer circuits from said output terminal.

4,837,748
COUNTING RAM
Shine C. Chung; Siu K. Tsang, both of San Jose; James T. Koo, Los Altos Hills; Sho Long S. Chen, Palo Alto, and John Y. Chan, San Carlos, all of Calif., assignors to Vitelic Corporation, San Jose, Calif.
Continuation-in-part of Ser. No. 930,792, Nov. 13, 1986, abandoned. This application Apr. 14, 1987, Ser. No. 38,107
Int. Cl.[4] G11C 8/00
U.S. Cl. 365—236 9 Claims



1. An integrated electronic circuit comprising:
a memory having a plurality of addressable locations;
a counter;
control means for first providing the contents of an addressed one of said memory locations to said counter as the count of said counter, second, directing said counter to change said count, and third, returning said changed count to said memory location.

4,837,749
ULTRASONIC IMAGING SYSTEM FOR OBTAINING ZOOM VIDEO IMAGES OF AN OBJECT
Hirotaka Nakajima, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Continuation of Ser. No. 753,994, Jul. 11, 1985, abandoned. This application Nov. 16, 1987, Ser. No. 120,777
Claims priority, application Japan, Jul. 13, 1984, 59-145349
Int. Cl.[4] G03B 42/06
U.S. Cl. 367—7 19 Claims

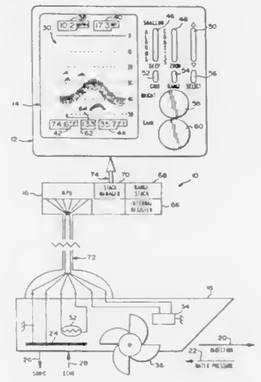


1. A method of magnifying ultrasonic image pixel data by a non-integer magnification rate so as to obtain a zoom video image from an ultrasonic image of an object, comprising the steps of:
emitting ultrasonic beams from a probe toward said object at a predetermined ultrasonic rate;
detecting ultrasonic echo signals produced when said ultrasonic beams are reflected from said object;
converting said ultrasonic echo signals into digital ultrasonic image pixel data representing said object;
storing said ultrasonic image pixel data in a plurality of line memories at the ultrasonic rate;
reading said ultrasonic image pixel data from said line memories;
first interpolating data of said read ultrasonic image pixel data positionally corresponding to display pixels of a display matrix of a display monitor, in accordance with said magnification rate, with ultrasonic image pixel data which do not positionally correspond to said display pixels, due to said magnification rate, using first and second weighting factors, respectively, said second weighting factor being non-zero, to thereby define first interpolated pixel data positionally corresponding to said display pixels in accordance with said magnification rate;
storing said ultrasonic image pixel data positionally corresponding to said display pixels as well as said first interpolated pixel data in a frame memory;
reading said ultrasonic image pixel data positionally corresponding to said display pixels and said first interpolated pixel data from said frame memory;
second interpolating said first interpolated pixel data and said ultrasonic image pixel data positionally corresponding to said display pixels read from said frame memory utilizing third and fourth non-zero weighting factors, respectively, to thereby define second interpolated pixel data positionally corresponding to said display pixels in accordance with said magnification rate;
converting said ultrasonic image pixel data positionally corresponding to said display pixels and said first and second interpolated pixel data into video signals; and
displaying said video signals.

4,837,750
APPARATUS FOR DISPLAYING DEPTH SOUNDING DATA WITH NAUTICAL RANGE
Ted G. Saunders, 97 Indian Hill Pl., Fremont, Calif. 94539
Filed Dec. 21, 1987, Ser. No. 135,460
Int. Cl.[4] G01S 15/06
U.S. Cl. 367—111 15 Claims

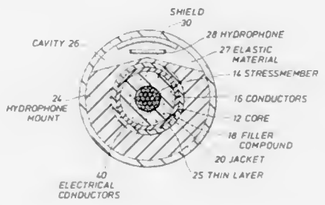
1. In an improved depth sounding device for use on a vessel

on water and having transceiver means for transmitting an acoustic signal downwardly through the water and for receiving echo signals from the water, means for sensing motion of the vessel, a microprocessor device for storing and conditioning the echo signals and signals from the motion sensor, and a display device for receiving data from the microprocessor device and providing an XY display of underwater conditions represented by the echo signals where Y represents depth and X represents travel of the vessel over the water, the improvement comprising



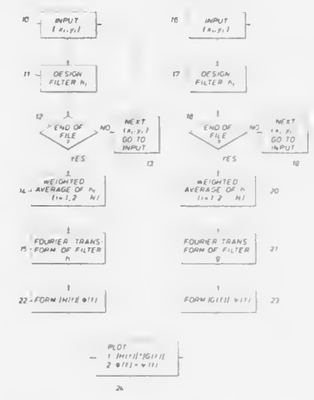
microprocessor range means for simultaneously receiving and processing the echo signals and the motion sensor signals, and
range display means associated with the XY display of the display device and operated by the microprocessor range means for displaying nautical range of a selected point on the X axis of the XY display relative to a predetermined base point.

4,837,751
SHIELDED HYDROPHONE ASSEMBLY
Vitold R. Kruka; Robert M. Klpp, and Edward R. Cadena, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.
Filed Dec. 22, 1981, Ser. No. 333,525
Int. Cl.[4] G01V 1/38
U.S. Cl. 367—154 7 Claims



1. A hydrophone assembly for use in a marine cable, said hydrophone assembly comprising:
a housing adapted to be mounted in said cable, said housing having a cavity containing a moldable material;
an acoustic energy transducer positioned in said moldable material; and
a rigid body positioned adjacent to said housing such that said rigid body covers a sufficient portion of said cavity to radially screen said transfer from the exterior of said cable and to physically block flow noise pressures from reaching said transducer.

4,837,752
METHOD FOR ESTABLISHING A COMMON BANDWIDTH FOR PROCESSING SEISMIC DATA OBTAINED FROM DIFFERENT SOURCES, RECORDING EQUIPMENT AND SURVEYS
Michael P. Pepchinski, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.
Filed Sep. 12, 1988, Ser. No. 243,454
Int. Cl.[4] G01V 1/30
U.S. Cl. 367—38 7 Claims



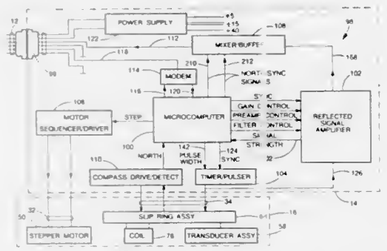
1. Method of establishing a common bandwidth for processing first and second seismic datasets obtained having different amplitude and phase characteristics, which comprises
for each corresponding pair of the respective datasets, determining a first least-squares filter by assuming the data from the first dataset is the input and the data from the second dataset is the desired output,
determining a first transfer function from a weighted average of all of said first filters,
for each corresponding pair of the respective datasets, determining a second least-squares filter by assuming the data from the second dataset is the input and the data from the first dataset is the desired output,
determining a second transfer function from a weighted average of all of said second filters,
creating respective first and second amplitude spectra from said first and second transfer functions,
creating respective first and second phase spectra from said first and second transfer functions,
plotting the product of said first and second amplitude spectra versus frequency,
plotting the sum of said first and second phase spectra versus frequency, and
graphically determining the common bandwidth that most nearly satisfies both the amplitude product plot and the phase sum plot.

4,837,753

METHOD AND APPARATUS FOR LOGGING A BOREHOLE

Steven A. Morris, Sand Springs; Houston B. Mount, II, Tulsa, and John T. Penn, Wagoner County, all of Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Apr. 10, 1987, Ser. No. 37,280
Int. Cl.[4] G01V 1/40
U.S. Cl. 367—69 47 Claims



1. A method for generating a signal containing information relating to the state of a borehole, said method being of the type in which acoustic energy pulses are transmitted from the central portion of the borehole toward the borehole wall in a plurality of radial directions and at a plurality of different depths thereby generating reflected acoustic pulses from a reflecting boundary adjacent the borehole which are indicative of the condition of the reflecting boundary, said method comprising the steps of:

providing means in a downhole housing for substantially continuously rotating at a rate dependent upon a speed control signal supplied to said rotating means;

providing a transducer assembly on said rotating means, said transducer assembly including means for generating such acoustic energy pulses and means for receiving such reflected acoustic pulses:

generating in the housing a speed control signal for a selected controlled rate of substantially continuous rotation of the rotating means;

providing the speed control signal to the rotating means;

varying the rate of substantially continuous rotation of the rotating means while in the borehole; and

generating and without interrupting scanning, varying the rate of generating periodic pulses firing signals for producing such acoustic energy pulses while in the borehole.

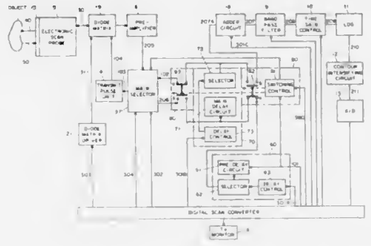
4,837,754

ULTRASONIC WAVE PHASE MATCHING APPARATUS

Yukio Nakagawa, Sagamihara, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 11, 1987, Ser. No. 131,983
Claims priority, application Japan, Dec. 16, 1986, 61-299219
Int. Cl.[4] G01S 9/68
U.S. Cl. 367—105 1 Claim

1. An ultrasonic wave phase matching apparatus for visualizing a sectional plane of an object to be examined by selecting a plurality of excited ultrasonic transducers and controlling each amplitude and phase of transmitted and received ultrasonic waves to converge ultrasonic beams within the object and reconfigure reflected waves coming from a given area including a focal point comprising main delay means for providing predetermined delay times corresponding to distance differences between the focal point and the plurality of excited ultrasonic transducers at least partially on the basis of delay times of received ultrasonic wave signals, pre-delay means for fine-controlling the delay times provided by said main delay means according to differences between transmitted ultrasonic wave delay times and received ultrasonic wave delay times, and transmit-receive switching control circuit means for connecting said main delay means to a receive circuit side during



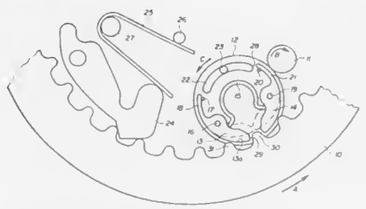
a receive period and for connecting a series combination of said main delay means and said pre-delay means to a transmit circuit side during a transmit period.

4,837,755

DEVICE FOR CONTROLLING OR CORRECTING THE READOUT OF THE DAY OF THE WEEK OR DATE FOR A WRIST WATCH

René Besson, Geneve, Switzerland, assignor to Montres Rolex S.A., Geneve, Switzerland

Filed May 23, 1988, Ser. No. 197,751
Claims priority, application Switzerland, May 25, 1987, 02014/87
Int. Cl.[4] G04B 19/24
U.S. Cl. 368—35 13 Claims



1. Device for controlling or correcting the readout of the day or date for a watch, comprising at least one bi-directional electric motor, at least one mechanism coupled to said motor for driving one of a day disk and a date disk, and at least one electronic circuit designed to transmit control impulses to said motor, said mechanism comprising means coupled to said motor and pivoting around a fixed axis, symmetrically in one direction or another with respect to a central position, toward two extreme positions, said means comprising an element adapted to be coupled to one of said day disk and said date disk so as to drive it by one step in one direction or another, whereby to modify the readout of one of a day or of a date by increasing or decreasing it.

4,837,756

PERIMETRICAL WATCH PROTECTOR

James Hartman, 904 Elmwood Trail, and Blake Schwartzman, 913 Elmwood Trail, both of Cedar Park, Tex. 78613

Continuation-in-part of Ser. No. 19,752, Feb. 27, 1987, abandoned. This application Mar. 31, 1988, Ser. No. 176,239
Int. Cl.[4] G04B 37/00
U.S. Cl. 368—286 5 Claims

1. A perimetrical watch protector for a watch; said watch having a watch case, a face and a crystal overlying said face, said case having an edge and a back; comprising a perimetrical guard for encompassing said crystal, the surface of said perimetrical guard, arranged to confront said crystal when said guard is in place on said watch, lying in a predetermined plane; a plurality of retainer lugs integral with said perimetrical guard, said lugs projecting transversely to said plane of said surface of said perimetrical guard and being resilient to snap over said edge of said watch; and a plurality of retainer bands, each joining the ends of at least two of said lugs opposite said

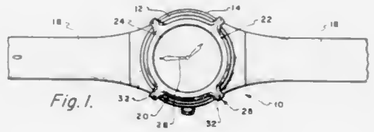


Fig. 1.

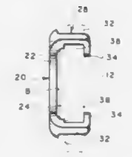


Fig 5

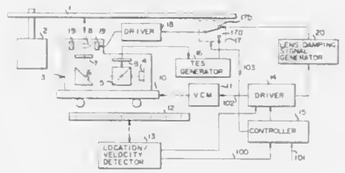
perimetrical guard, for engaging the back of said watch, said lugs each having a land, facing away from said perimetrical guard and spaced from said predetermined plane of said surface of said perimetrical guard, for engaging said watch case to maintain said surface of said perimetrical guard confronting said crystal in spaced relationship with said crystal and watch case to isolate said watch case and crystal from deleterious abrasion and impact.

4,837,757

OPTICAL RECORDING/REPRODUCING DEVICE

Hiroo Okada, Ina; Yoshiaki Ikeda, and Ken Ohsima, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1986, Ser. No. 891,257
Claims priority, application Japan, Aug. 3, 1985, 60-171424
Int. Cl.[4] G11B 7/00
U.S. Cl. 369—44 10 Claims



1. An optical recording/reproducing device, for use with an optical disk having a plurality of tracks thereon, comprising:

pickup means including a laser light source; a shiftable lens means arranged for irradiating an optical disk with a laser light beam from said laser light source; and lens actuator means for moving an optical axis of said lens means and for tracking said optical disk with said laser light beam;

access means including means for shifting said pickup means in a radial direction of said optical disk in response to an access command; and means for locating said pickup means on a predetermined track on said optical disk; and

lens damping means for supplying to said lens actuator means, a lens damping signal which attenuates vibration of said lens means caused by a force acting thereon in accordance with acceleration of said pickup means, said lens damping signal being supplied during shifting of said pickup means and during a predetermined period of time after shifting of said pickup means;

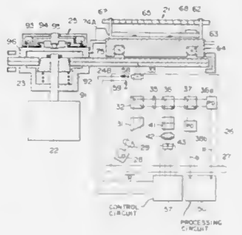
said lens damping means comprising gate means for supplying selectively said lens damping signal and a trucking error signal to said lens actuator means.

4,837,758

MAGNETO-OPTICAL RECORDING REPRODUCING DEVICE HAVING FIELD APPLYING MEANS

Kazuyasu Motoyama, Hachioji; Tsuneo Yanagida, Hino; Mitsugu Sakai, Hachioji; Hitoshi Ichikawa, Machida, and Akihiko Yoshizawa, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 19, 1986, Ser. No. 909,355
Claims priority, application Japan, Sep. 20, 1985, 60-207954
Int. Cl.[4] G11B 13/04
U.S. Cl. 369—13 7 Claims



1. An optical recording/reproducing device, comprising:

an optical pickup means for recording/reproducing/erasing information on a recording medium through focused irradiation of a light beam on said recording medium;

a field applying means for applying a magnetic field to said recording medium when recording or erasing on a magneto-optical recording medium;

a magneto-optical cartridge containing a magneto-optical recording medium;

a moving means for movably supporting said field applying means at an operational position near said recording medium and at a non-operational position spaced apart from said recording medium;

a discriminating part formed on at least on one side of said magneto-optical cartridge and intended to judge; and

a coupling means and recording medium judging means to set up the location of said field applying means intended to make variable the interval between said field applying means and recording medium in the case when said field applying means is brought close to said recording medium by said moving means based on the discriminating results obtained from the discriminating part.

4,837,759

OPTICAL INFORMATION RECORDER

Hidehiro Miyazaki; Kazuto Shingai, and Susumu Ohsawa, all of Yamanashi, Japan, assignors to Pioneer Electronic Corporation and Pioneer Video Corporation, both of, Japan

Filed Sep. 16, 1987, Ser. No. 97,559
Claims priority, application Japan, Sep. 16, 1986, 61-218698
Int. Cl.[4] G11B 7/00, 21/08
U.S. Cl. 369—32 7 Claims

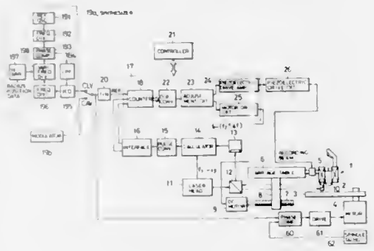
1. An optical information recorder/reproducer, comprising:

a focusing unit for converging an information beam onto a surface of a recording matrix;

a carriage supporting said focusing unit and movable in a radial direction of said recording matrix;

means for roughly adjusting the moved position of said focusing unit in the radial direction of said recording matrix by driving said carriage;

means for finely adjusting the moved position of said focusing unit in the radial direction of said matrix; and



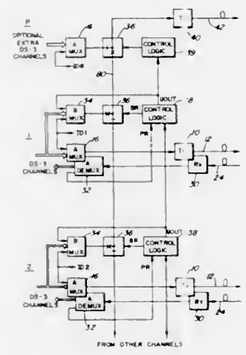
a position measuring means for measuring a moved position of said focusing unit in the radial direction of said recording matrix and sending out information on said moved position so as to selectively drive and control said rough adjustment means and said fine adjustment means depending on said information on said moved position.

4,837,760

COMMUNICATIONS SYSTEM WITH PROTECTION SWITCHING USING INDIVIDUAL SELECTORS

David I. Reid, Edmonton; John C. Ellson, and Malcolm C. Betts, both of Sherwood Park, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Aug. 2, 1985, Ser. No. 761,926
Int. Cl.[4] H04J 1/16
U.S. Cl. 370—16 8 Claims



1. In a communications system comprising communications channels extending from a first location to a second location, the channels comprising a plurality of normal channels, for carrying traffic in normal operation from the first location to the second location, and a protection channel for carrying the traffic of a normal channel in the event of a fault on the normal channel, a method of selectively supplying the traffic of a normal channel to the protection channel comprising the steps of:

providing an individually controlled selector for each normal channel for selectively supplying the traffic of the channel to the protection channel;

controlling the selector of a normal channel having a fault to supply the traffic of the channel to the protection channel; and

inhibiting the selector of each other channel from supplying traffic to the protection channel;

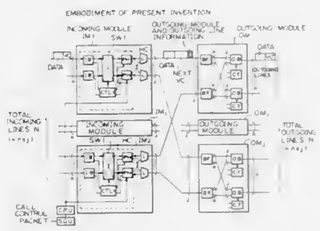
wherein the normal channels have respective protection priorities, the method including the step of enabling, following the inhibition of the selector of each other channel, the selector of each normal channel having a higher priority than that of the channel having the fault, to supply traffic to the protection channel in response to a fault on the higher priority channel.

4,837,761

HEADER DRIVEN TYPE PACKET SWITCHING SYSTEM

Osamu Isono; Toshimasa Fukui; Tetsuo Nishino; Tetsuo Tachibana, all of Kawasaki, and Eisuke Iwabuchi, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 24, 1988, Ser. No. 198,089
Claims priority, application Japan, May 26, 1987, 62-129471
Int. Cl.[4] H04J 3/24
U.S. Cl. 370—60 4 Claims



1. A header driven type packet switching system for switching from N incoming lines to N outgoing lines, comprising:

j incoming modules (IMl to IMj) each accommodating a group of n incoming lines which are derived from said N incoming lines by dividing said N incoming lines into j groups;

j outgoing modules (OMl to OMj) each being connected to said j incoming modules through transfer lines, each of said j outgoing modules being connected to n outgoing lines which are derived from said N outgoing lines by dividing said N outgoing lines into j groups;

each of said j incoming modules (IMl to IMj) comprising:

a plurality of packet header processing circuits (PHl to PHk) disposed independently of said n incoming lines, for rewriting outgoing line information, outgoing module information and header information in the header of the incoming packet;

a hunt control portion (HC) for hunting a free circuit from among said packet header processing circuits; and

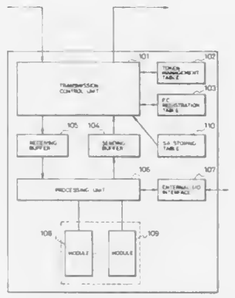
linking portion (Ll to Lj) disposed to be corresponding to all of said outgoing modules (OMl to OMj), for transferring packets from said hunt controlling portion (HC) to the corresponding outgoing modules in the sequence of transfer requests.

4,837,762

DATA TRANSMISSION CONTROL METHOD AND APPARATUS

Isao Wachi, Hitachi; Kinji Mori, Yokohama; Yasuo Suzuki, Ebina; Masayuki Orimo, Kawasaki; Katsumi Kawano, Fuchu; Minoru Koizumi, Yokohama; Kozo Nakai, Katsuta, and Hirokazu Kasashima, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 15, 1987, Ser. No. 133,083
Claims priority, application Japan, Dec. 24, 1986, 61-306413
Int. Cl.[4] H04J 3/16
U.S. Cl. 370—89 4 Claims



1. A method of controlling the transmission of data in a data transmission system having a plurality of sending/receiving stations coupled together by a transmission medium, said method comprising the steps of:

within a first sending/receiving station having data to be transmitted, receiving a transmission token authorizing transmission of data on the transmission medium; appending to the transmission token a code indicative of the function of the data which said first sending/receiving station has for transmission; and applying the transmission token, with the code appended thereto, and the data to the transmission medium for transmission to the sending-/receiving stations of the system; and

within each of the receiving sending/receiving stations, detecting the appended code transmitted on the transmission medium; determining whether the detected code is indicative of a data function required by the detecting sending/receiving station; and receiving into the detecting sending/receiving station data transmitted with those transmission tokens having appended thereto a code indicative of a data function required by such sending/receiving station.

4,837,763

MULTIPLEXER FOR MULTIPLEXING INSERTION CODES AND A DIGITAL DATA SIGNAL TRAIN

Katsuhiro Sasaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

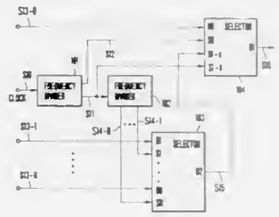
Filed Jul. 20, 1987, Ser. No. 75,903
Claims priority, application Japan, Jul. 23, 1986, 61-173209
Int. Cl.[4] H04J 3/04
U.S. Cl. 370—112 4 Claims

1. A multiplexer for multiplexing N insertion codes and a digital data signal train having an alternate repetition of a digital data signal using (M−1) continuous time slots and a gap of one time slot, each of N and M being an integer and equal to or greater than 2, said multiplexer comprising:

a first frequency divider for receiving a clock signal which determines a multiplexing time slot and for frequency dividing said clock signal to produce a first signal having a period of M time slots;

a second frequency divider for receiving and frequency dividing said first signal to produce N second signals whose phases are different from each other;

first selector means for converting said N insertion codes into one code signal train on the basis of said second signals; and



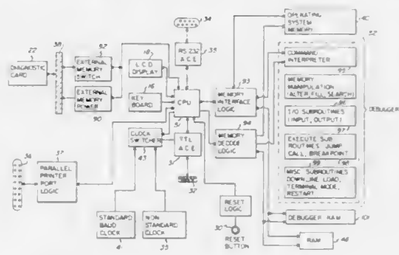
second selector means for receiving said one code signal train of N insertion codes and said digital data signal train and for inserting said N insertion codes of said one code signal train into said gap of one time slot one the basis of said first signal.

4,837,764

PROGRAMMABLE APPARATUS AND METHOD FOR TESTING COMPUTER PERIPHERALS

Vincent J. Russello, West Haven, Conn., assignor to Bunker Ramo Corporation, Shelton, Conn.

Filed Mar. 26, 1987, Ser. No. 31,534
Int. Cl.[4] G06F 11/22
U.S. Cl. 371—20 15 Claims



1. Apparatus for conducting testing of the condition of computer peripherals, said apparatus being portable and enclosed in a housing and comprising:

(a) a microprocessor for controlling the testing of said peripherals by sending excitation signals to said peripherals in accordance with a test protocol and receiving response signals therefrom;

(b) nonvolatile memory means having stored therein an operating system routine for said microprocessor;

(c) at least one working memory means for said microprocessor, said working memory means for storing an instruction set defining said test protocol for said microprocessor;

(d) at least one peripheral connector means for operatively connecting said apparatus with a peripheral to be tested in accordance with said protocol, said peripheral connector means connecting said microprocessor to said peripheral to enable said microprocessor to send said excitation signals in accordance with said protocol and receive said response signals;

(e) at least one data source connector means for operatively

connecting an external data source to said apparatus, said external data source being distinct from said apparatus;

(f) a keyboard, mounted in said housing and accessible to a user, being operatively connected to said microprocessor for receiving user commands for controlling the operation of said microprocessor and sending said user commands to said microprocessor;

(g) a display mounted in said housing for providing an indication to the user of the status of the protocol and the condition of the peripheral; and

(h) a debugger routine stored in said nonvolatile memory means and accessible by the user through the keyboard, said debugger routine for responding to user commands input through the keyboard to instruct the mircoprocessor to modify said instruction set in working memory as defined by data input from said external data source and test said peripheral in accordance with a modified protocol set forth in a modified instruction set

whereby said external data source can provide a modified protocol for testing said peripheral.

4,837,765

TEST CONTROL CIRCUIT FOR INTEGRATED CIRCUIT

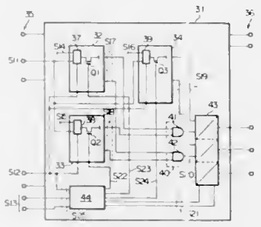
Takamasa Suzuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 8, 1987, Ser. No. 71,068

Claims priority, application Japan, Jul. 11, 1986, 61-163040

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—25 **6 Claims**



1. A test control circuit for an integrated circuit having a plurality of component blocks including at least two component blocks responsive to respective data signals or a common test signal and achieving predetermined functions, respectively, to produce respective output signals based on the respective data signals or the common test signal, said predetermined functions being identical with one another, comprising:

(a) a control signal generating circuit responsive to a command signal and capable of producing at least two prohibiting signals applied to said at least two component blocks, respectively;

(b) mode selecting means responsive to a test mode signal and causing said at least two component blocks to concurrently respond to said common test signal in the absence of said prohibiting signals; and

(c) a logic circuit carrying out a logical operation for the output signals supplied from said at least two component blocks and producing an output signal,

wherein each of said at least two component blocks suspends the production of said output signal based on said common test signal in the presence of said prohibiting signal.

4,837,766

FRAME STEP-OUT DETECTING SYSTEM

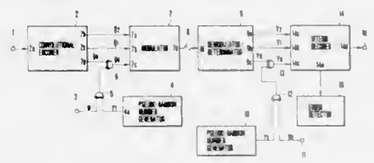
Atsushi Yoshida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 24, 1987, Ser. No. 29,556

Claims priority, application Japan, Mar. 24, 1986, 61-63901; Mar. 24, 1986, 61-63902

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—46 **6 Claims**



1. A frame step-out detecting means comprising:

on a transmission side, a convolutional encoder for encoding data to be transmitted into a N-bit convolutional code and outputting N−1 bits of the convolutional code to a modulating means, a first pseudo-random number generator for generating a first pseudo-random number, a first exclusive OR circuit for obtaining an exclusive logical sum of the first pseudo-random number of a transmission frame sync signal, a second exclusive OR circuit for obtaining an exclusive logical sum of an output from said first exclusive OR circuit and the remaining 1 bit of the N-bit output from said convolutional encoder, said modulating means for receiving the N−1 bits of the N-bit output from said convolutional encoder and an output bit from said second exclusive OR circuit and modulating a carrier thereby;

a transmission path for transmitting an output from said modulating means to a reception side; and

on the reception side, demodulating means for demodulating a transmission signal from said transmission path and outputting N parallel bits, N−1 of those bits being applied directly to a Viterbi decoder, a second pseudo-random number generator for generating a second pseudo-random number, a third exclusive OR circuit for obtaining an exclusive logical sum of a reception frame sync signal and the second pseudo-random number, a fourth exclusive OR circuit for obtaining an exclusive logical sum of the remaining 1 bit of the N-bit output from said demodulating means and an output from said third exclusive OR circuit, said Viterbi decoder for receiving the N−1 bits of the N-bit output from said demodulating means and an output bit from said fourth exclusive OR circuit, decoding them, and outputting reception data, and means for monitoring an internal state of said Viterbi decoder and detecting a frame step-out.

4,837,767

BUS ADAPTER MODULE WITH IMPROVED ERROR RECOVERY IN A MULTIBUS COMPUTER SYSTEM

David W. Hartwell, Boxboro; Elbert Bloom, Southboro, and Victoria M. Triolo, Boylston, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Sep. 4, 1987, Ser. No. 93,480

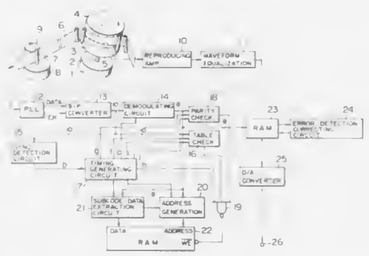
Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—49 **7 Claims**

1. A control adapter module providing error recovery in a computer system including a first bus, connected to an interconnect bus through a response adapter module, and a second bus, the second bus having a plurality of data lines and a plurality of command lines carrying command signals to initiate execution of a plurality of types of transactions on the second bus, the response module including a logic circuit asserting a RECOVERABLE ERROR signal when a parity error occurs during a READ transaction and asserting a NON-RECOVERABLE ERROR signal when a parity error occurs during a WRITE transaction to initiate a system shut-down, the control adapter module comprising:

an interconnect interface circuit adapted for connection to the interconnect bus;

a bus interface circuit connected to the interconnect interface circuit and adapted for connection to the second bus;



decoder means connected to the bus interface circuit and responsive to command signals on the command lines for asserting a command type signal and for supplying the command type signal to the interconnect interface circuit; and

control means responsive to the RECOVERABLE ERROR signal for asserting a signal on the second bus indicating unsuccessful execution of the current transaction on the second bus.

4,837,768

LASER MODULE AND METHOD OF COUPLING AN OPTICAL FIBER THERETO

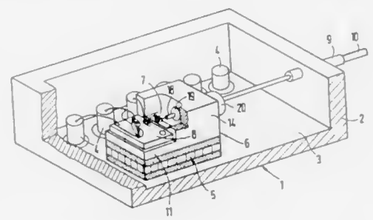
Peter Schmid, Tamm, Fed. Rep. of Germany, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed Sep. 23, 1988, Ser. No. 248,560

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1987, 3732433

Int. Cl.[4] H01S *3/04*

U.S. Cl. 372—36 **10 Claims**



1. A laser module comprising

a housing;

a heat sink having a base plate portion for securing the heat sink inside the housing, said heat sink defining a mounting surface, a supporting surface, and a mounting block portion having a vertical front surface which is adjacent the supporting surface and which extends above and below a horizontal plane including at least a portion of said supporting surface, said mounting block portion defining an opening extending horizontally from said front surface to a rear surface of the mounting block portion remote from said supporting surface;

a laser supported by said supporting surface in front of said opening;

a drive and control circuit mounted on said mounting surface and electrically coupled to said laser;

an end sleeve disposed in the horizontally extending opening, said end sleeve having an outer dimension substantially less than the corresponding inner dimension of said opening;

a front holder fixed both to a front end of the end sleeve and to the mounting block portion for radially locating the front end of the sleeve relative to the front surface of the mounting block portion;

a rear holder fixed both to a rear end of the end sleeve and to the mounting block portion for radially locating the rear end of the sleeve relative to the rear surface of the mounting block portion, and

an optical waveguide embedded in said end sleeve and having an end optically aligned with said laser,

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4,837,769

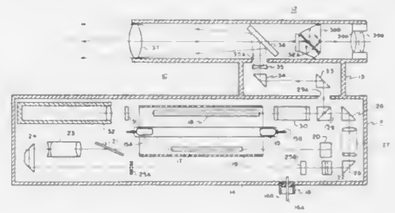
PHASE CONJUGATED SLAB LASER DESIGNATOR

Suresh Chandra, Falls Church, Va., and Jeffrey L. Paul, Thousand Oaks, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 1, 1989, Ser. No. 304,622

Int. Cl.[4] H01S *3/16*

U.S. Cl. 372—41 **3 Claims**



1. A laser designator; comprising

a laser pump means;

a high power phase conjugated slab laser amplifier formed of GSGG:Cr:Nd as a lasing material on one side of said pump means;

a low power rod shaped laser oscillator on the opposite side of said pump means;

and a first plurality of optical reflecting and refracting means for directing and shaping a laser beam which surrounds said pump means and passes through said rod and slab; and

a telescope means coupled to said beam to direct it to a distant target.

4,837,770

FLOWING GAS CO_2 LASER

Dale Koop, Sunnyvale, Calif., assignor to Rofin Sinar, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 811,593, Dec. 19, 1985, Pat. No. 4,709,372. This application Jul. 6, 1987, Ser. No. 69,726

Int. Cl.[4] H01S *3/22*

U.S. Cl. 372—59 **14 Claims**

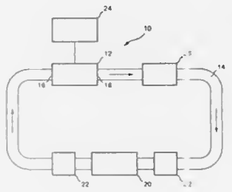
1. A flowing gas CO_2 laser assembly, comprising:

an optical resonator defining a lasing region where an electrical discharge causes CO_2 gas to lase, the optical resonator including a gas inlet and a gas outlet;

means defining a substantially closed gas feedback flow system operatively associated with the gas inlet and outlet;

means for pumping the flowing gas through the optical resonator and the feedback system, the pumping means

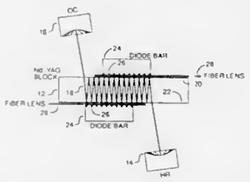
being operatively associated with the optical resonator and the feedback flow system;
power supply means operatively associated with the optical resonator; and
a catalyst member disposed on a honeycomb structure being positioned in the feedback flow system with the catalyst member acting to increase reassociation of CO and O_2 to form CO_2 and constructed so that the flow (Q) of gas through the honeycomb structure is defined as follows:



$$Q = N\,AL(0.002)$$

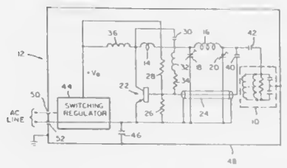
where
N = the number of cells per square inch
A = the cross section area measured in inches.
L = length of the cell measured in inches.

4,837,771
HIGH-EFFICIENCY MODE-MATCHED SOLID-STATE LASER WITH TRANSVERSE PUMPING AND CASCADED AMPLIFIER STAGES
Thomas M. Baer, Mountain View, Calif., assignor to Spectra-Physics, Inc., San Jose, Calif.
Continnation-in-part of Ser. No. 103,557, Sep. 30, 1987, which is a continuation-in-part of Ser. No. 35,530, Apr. 7, 1987, which is a continuation-in-part of Ser. No. 811,546, Dec. 19, 1985, Pat. No. 4,656,635, which is a continuation-in-part of Ser. No. 730,002, May 1, 1985, Pat. No. 4,653,056. This application May 18, 1988, Ser. No. 195,713
The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.
Int. Cl.[4] H01S *3/091*
U.S. Cl. 372—75 **22 Claims**



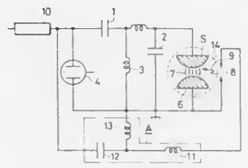
1. A mode-matched diode pumped solid-state laser amplifier system including a plurality of amplifier stages, each of said stages including:
a block of laser amplifier material having a pair of opposed sides,
a tightly folded zig-zag optical path within said block between said opposed sides having vertices at a preselected fold angle, said fold angle being selected to substantially match the mode volume with pump radiation from the pump sources,
a plurality of laser diode pumping sources positioned adjacent to at least one of said opposed sides and substantially aligned with the vertices of said zig-zag optical path,
said amplifier stages being optically coupled to one another in a cascade arrangement.

4,837,772
ELECTRICALLY SELF-OSCILLATING, RF-EXCITED GAS LASER
Peter Laakmann, Seattle, Wash., assignor to Synrad, Inc., Bothell, Wash.
Filed Aug. 14, 1987, Ser. No. 85,889
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—82 **24 Claims**



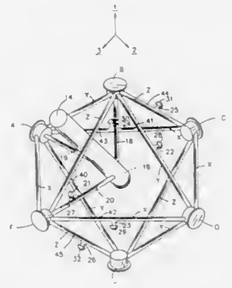
1. A radio frequency-excited gas laser, comprising:
a plasma tube for producing laser energy, said plasma tube including a discharge section, an optical resonator, and means for outcoupling laser energy from the laser, said discharge section having electrodes made from electrically conductive material, said electrodes having electrical capacities;
a laser gas medium within said discharge section;
an amplifier having an input and an output, the output being connected to the plasma tube and the input being connected to the plasma tube, for amplifying energy from the plasma tube, and thereby forming a feedback path; and
an inductive element connected to said electrodes, said inductive element forming a resonant circuit with said electrical capacity, said resonant circuit being resonant at a predetermined operating radio frequency.

4,837,773
DISCHARGE EXCITATION TYPE SHORT PULSE LASER
Hitoshi Wakata; Mitsuo Inoue; Yukio Sato; Kenyu Haruta, and Haruhiko Nagai, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 16,037, Feb. 18, 1987, abandoned. This application Oct. 31, 1988, Ser. No. 267,629
Claims priority, application Japan, Feb. 18, 1986, 61-31893; Feb. 18, 1986, 61-31894
Int. Cl.[4] H01S *3/097*
U.S. Cl. 372—86 **10 Claims**



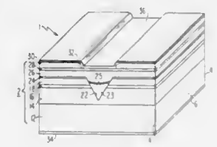
1. A discharge excitation type short pulse laser device comprising:
a main discharge circuit including first and second confronting main electrodes in a laser medium, a discharge starting high voltage switch, main discharge capacitor means coupled to said switch for storing energy from a voltage supply and for producing a voltage pulse upon closure of said switch, and peaking capacitor means responsive to said voltage pulse and connected in parallel with said confronting main electrodes for causing breakdown of said laser medium in response to the charging of the peaking capacitor means by said voltage pulse; and
a preliminary ionization circuit independent of the main discharge capacitor means and the peaking capacitor means and connected to and receiving signals from said high voltage switch and said voltage supply, said preliminary ionization circuit including a discharging gap for preliminary ionization of said laser medium, and a signal generating circuit coupled to said voltage supply for producing a signal to break down said discharging gap, the current produced by said signal generating circuit being independent of the current produced by said discharge capacitor means.

4,837,774
COMMON MIRROR TRIAXIAL RING LASER GYROSCOPE HAVING A SINGLE INTERNAL CATHODE
Salim N. Jabr, Woodland Hills; Thomas J. Hutchings, West Hills, and Nicholas Koumvakalis, Thousand Oaks, all of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.
Continuation-in-part of Ser. No. 102,216, Sep. 29, 1987. This application Apr. 19, 1988, Ser. No. 183,580
Int. Cl.[4] H01S *3/083*
U.S. Cl. 372—94 **20 Claims**



1. A ring laser gyroscope including a laser block having twelve conduits therein and six corner mirrors for defining three orthogonal closed laser beam-paths for guiding counter-propagating laser beams, each laser beam-path having a gain medium therein and being configured and positioned to define a sensing axis for detection of rotations of the laser block, a cathode, six anodes mounted to the laser block, two in conduit communication with each of said beam-paths, and spaced apart from said cathode, comprising:
said single cathode positioned substantially in the center of said laser block;
at least three conduits of substantially equal length between said cathode and said beam-paths, two to each beam-path, to form substantially equal length ion flow paths between each anode and said cathode such that application of substantially electrical positive potential, relative to said cathode, to said anodes produces substantially equal ion flows in opposite directions in each of said beam-paths to produce coherent counterpropagating laser beams in each said laser beam-path whereby said cathode position restrains said conduit and ion flow lengths to be substantially equal.

4,837,775
ELECTRO-OPTIC DEVICE HAVING A LATERALLY VARYING REGION
James T. Andrews, Hopewell Township, Mercer County, N.J., and Ivan Ladany, Accomack County, Va., assignors to General Electric Company, Schenectady, N.Y.
Continuation-in-part of Ser. No. 789,461, Oct. 21, 1985, abandoned. This application Nov. 2, 1987, Ser. No. 115,672
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—96 **13 Claims**

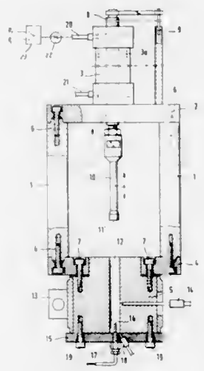


1. A distributed feedback laser comprising a semiconductor body having a pair of opposed end faces, at least one of which is partially transparent at the laser wavelength, said body having an active region positioned between first and second cladding regions of opposite conductivity type, wherein the improvement comprises:
a channel defined by a pair of spaced sidewalls, said channel extending in a longitudinal direction between the end faces and periodically varying in width in the lateral direction with each period in the longitudinal direction being about an integral multiple of one half of said wavelength in the semiconductor body, said first cladding region and said active region lying within said channel and abutting said sidewalls whereby said active region periodically varies in said width in said lateral direction in periods which are in said integral multiple; and electrical contact means coupled to said first and second cladding regions.

4,837,776
PROCESS FOR MEASURING THE VARIATIONS IN VOLUME OF FLUIDS, ESPECIALLY SHRINKAGE MEASUREMENTS IN SYNTHETIC RESINS DURING HARDENING AND A DEVICE FOR CARRYING OUT THE PROCESS
Dietmar Poll, Ste. Silvester, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
Filed Dec. 7, 1987, Ser. No. 129,517
Claims priority, application Switzerland, Dec. 16, 1986, 4994/86
Int. Cl.[4] G01N *3/18, 25/02*
U.S. Cl. 374—56 **13 Claims**

1. A process for measuring variations in volume of a material comprising exerting a pressure upon the material to be measured such that a fully homogeneous test piece is obtained without any fractures or blisters and that simultaneously and

independently from one another, the impinging pressure, the pressure exerted through the test piece the temperature in the



test piece and in its environs and the volume of the test piece are measured under non-isothermal conditions.

4,837,777

PRESSURE OR TEMPERATURE TRANSDUCER

Norman B. Jones, and George Papageorgiou, both of The University, Leicester, Department of Engineering, The University of Leicester, United Kingdom (LE1 7RH)

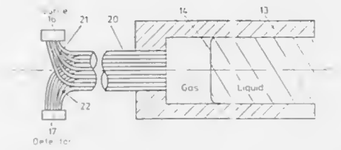
PCT No. PCT/GB85/00216, § 371 Date Jan. 27, 1986, § 102(e) Date Jan. 27, 1986, PCT Pub. No. WO85/05678, PCT Pub. Date Dec. 19, 1985

PCT Filed May 22, 1985, Ser. No. 827,260

Claims priority, application United Kingdom, May 29, 1984, 8413650

Int. Cl.⁴ G01J *05/00;* **G01N** *07/00, 25/00*

U.S. Cl. 374—142 **26 Claims**



1. A transducer for monitoring pressure or temperature changes, said transducer comprising: a compressible first body means; liquid means trapping said compressible first body means so as to define an interface with said first body means whereby the position of said interface is responsive to said temperature or the pressure change of said first body means transmitted to said compressible first body means by said said liquid means; means for transmitting radiation to said interface; and means for detecting said transmitted radiation from said interface whereby the proportion of radiation transferred from said transmitting means to said detector means is a function of the position of said interface in response to said pressure or temperature changes.

4,837,778

CIRCUIT ARRANGEMENT FOR TIME-REGENERATION OF BROADBAND DIGITAL SIGNALS

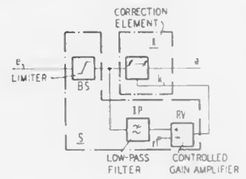
Gerhard Trumpp, Puchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 13, 1987, Ser. No. 25,407

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1986, 3608601

Int. Cl.⁴ H03K *11/00, 5/153*

U.S. Cl. 375—4 **23 Claims**



1. A circuit arrangement for time regeneration of digital signals, comprising:

a correction element for time regeneration of broadband signals coded in a DC-free code, comprising a digital signal input and a control input in a signal path;

the digital signal experiencing an increased running time at its signal edges of one operational sign in said correction element and simultaneously experiencing a reduced running time at its signal edges of the respectively other operational sign based on a measure of each DC component occurring in the digital signal;

a control circuit including a limiter for receiving the digital signal and a low-pass filter connected to said correction element and limiter, said correction element and said control circuit identifying said DC components, and means for connecting an output of said low-pass filter to said control input.

4,837,779

COMMUNICATOR AND COMMUNICATION METHOD AND SYSTEM

Paul R. Lundgren, Newtown, Conn., assignor to Dual-Lite Manufacturing, Inc., Naguabo, P.R.

Filed Apr. 12, 1988, Ser. No. 180,942

Int. Cl.⁴ H04Q *5/14*

U.S. Cl. 375—10 **38 Claims**

1. A method of communicating on a communication bus with at least one remote unit, including the step of determining the transmission speed of the remote unit by the remote unit transmitting a start of message header onto the communication bus, wherein the state of the bus is in either a logic "one" or a logic "zero" state, comprising the sub-steps of:

(1) determining when the communication bus makes a transition from a logic zero state to a logic one state;

(2) sampling the state of the bus at least one additional time during a first predetermined length of time to determine if the bus remains in a logic one state;

(3) continually determining the state of the bus after the first predetermined length of time until a logic one to logic zero transition is detected;

(4) determining the length of time after the first predetermined length of time in which the bus was in a logic one state prior to its transition to a logic zero state;

(5) determining the actual transmission period by adding the first predetermined length of time with the period of time determined in step 4 so as to yield the length of time for the logic one state associated with a start of message header; and

(6) adjusting subsequent sampling of the bus so as to be a fraction of the determined actual transmission period.

4,837,780

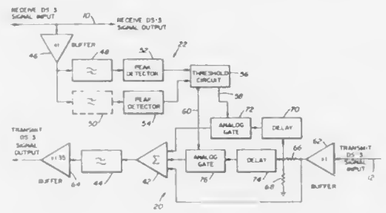
TRANSMIT LINE BUILDOUT CIRCUITS

Wayne D. Grover, Edmonton, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 27, 1987, Ser. No. 77,914

Int. Cl.⁴ H03H *7/30;* **H03K** *5/59*

U.S. Cl. 375—11 **17 Claims**



1. A transmit line buildout circuit comprising:

control means for producing a control signal in dependence upon a level of a signal on a receive path, said level being dependent upon the length of a receive line via which the signal on the receive path is received; and

signal modifying means responsive to the control signal for modifying in a predetermined manner a transmit path signal to be transmitted via a transmit line, thereby to compensate for a corresponding length of the transmit line;

wherein the control means comprises spectral filtering means for filtering the signal on the receive path to produce at least two receive path signals with different frequency bands, and means for producing the control signal in dependence upon level differences between said at least two receive path signals.

4,837,781

PHASE LOCKED LOOP CLOCK SYNCHRONIZER AND SIGNAL DETECTOR

Ronald M. Hickling, Simi Valley, Calif., assignor to Gigabit Logic, Inc., Newbury Park, Calif.

Filed Apr. 7, 1987, Ser. No. 35,567

Int. Cl.⁴ H03D *3/18, 3/24*

U.S. Cl. 375—81 **4 Claims**

1. A phase-locked loop signal detector and synchronizer comprising

time delay means for receiving and delaying input data,

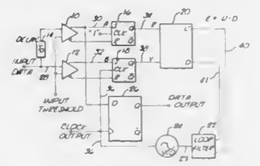
first comparator means connected to said time delay means for receiving delayed input data and a reference voltage,

second comparator means for receiving input data and a reference voltage,

first and second latch means wherein said first latch means is connected to said first comparator means for receiving delayed input data and said second latch means is connected to said second comparator means for receiving input data,

phase/frequency comparator means connected to said first and second latch means for receiving output signals of said first and second latch means and detecting phase or frequency differences between said output signals and producing an error signal corresponding to said phase or frequency difference,

loop filter means connected to said phase/frequency comparator means for receiving said error signal and producing a drive signal corresponding to said error signal, and



oscillator means connected to said loop filter means for receiving said drive signal and producing a clock frequency signal that changes in response to said drive signal, said clock frequency signal connected to said second latch means for clocking said second latch means.

4,837,782

CMI DECODER

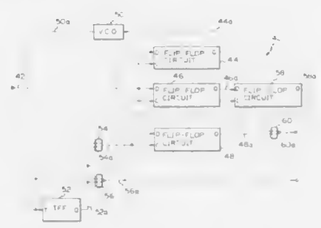
Eisaku Sasaki, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Apr. 14, 1988, Ser. No. 181,446

Claims priority, application Japan, Apr. 21, 1987, 62-96318

Int. Cl.⁴ H03M *7/14*

U.S. Cl. 375—95 **5 Claims**



1. A decoder for decoding a digitized signal into a CMI (Coded Mark Inversion) coded signal, comprising:

a voltage controlled oscillator (VCO);

½ frequency dividing means for dividing an output of said VCO;

first logic means supplied with an output of said VCO and an output of said ½ frequency dividing means for producing three clock signals, two of said three clock signals being individually deviated in phase by $+\frac{1}{4}$ and $-\frac{1}{4}$ of a period relative to a reference clock signal which is a remaining one of the three clock signals;

first discriminating means for sampling a CMI coded input signal by the clock signal which is deviated by $+\frac{1}{4}$ of a period and outputted by said first logic means;

second discriminating means for sampling the input signal by the reference clock signal, said VCO being controlled by an output of said second discriminating means; and

third discriminating means for sampling the input signal by the clock signal which is deviated by $-\frac{1}{4}$ of a period; and

second logic means supplied with an output of said first discriminating means and an output of said third discriminating means for producing a NRZ (Non-Return to Zero) format signal.

4,837,783

DEVICE FOR DERIVING A SYNCHRONIZING SIGNAL

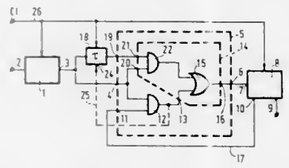
Joseph H. Peters, and Johannes T. Kanters, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed Sep. 4, 1986, Ser. No. 904,088

Claims priority, application Netherlands, Sep. 23, 1985, 8502600

Int. Cl.[4] H04L 7/00

U.S. Cl. 375—110 8 Claims



1. A device for deriving a synchronizing signal from an electric signal including alternate blocks of information and the synchronizing signal, comprising:

a synchronizing signal detector having an input for receiving the electric signal and an output for supplying a detection signal,

a flywheel counter having an input, a first output for supplying the synchronizing signal and a second output for supplying a control signal, and

a signal combination unit having a first and a second input coupled to the output of the synchronizing signal detector and to the second output of the flywheel counter, respectively, and an output coupled to the input of the flywheel counter for restarting the flywheel counter under the influence of the signals presented to the inputs of the signal combination unit, characterized in that the signal combination unit has a third input coupled to the output of the synchronizing signal detecor via a delay unit having a delay time which at least substantially corresponds to n times the temporal length of the information block and the synchronizing signal, where n is an integer which is larger than or equal to 1.

4,837,784

APPARATUS FOR ADAPTING THE DIAMETER OF A DISK-LIKE RECORDING MEDIUM

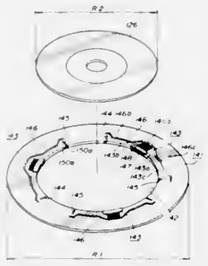
Eiji Yamamori, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 29, 1988, Ser. No. 162,203

Claims priority, application Japan, Mar. 14, 1987, 62-59668; Mar. 14, 1987, 62-59669; Mar. 14, 1987, 62-59670; Nov. 30, 1987, 62-302060

Int. Cl.[4] G11B 23/00, 25/04

U.S. Cl. 369—289 75 Claims



1. An apparatus for adapting the diameter of a disk-like recording medium, comprising a holder having a diameter larger than that of the disk-like recording medium, said holder being formed as a solid ring concentric with a center of rotation of the disk-like recording medium when the disk-like recording medium is held therein and so as to hold a non-signal record area on the outer periphery of the disk-like recording medium integrally therewith and so as to allow signals recorded on the disk-like recording medium to be read out when the disk-like recording medium is held by said holder and said solid-ring including means for forming an expandable central opening so that said holder is mountable to and dismountable from the disk-like recording medium.

4,837,785

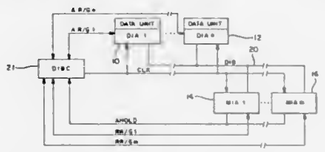
DATA TRANSFER SYSTEM AND METHOD OF OPERATION THEREOF

Gary McAlpine, Portland, Oreg., assignor to Aptec Computer Systems, Inc., Portland, Oreg.

Filed Jun. 14, 1983, Ser. No. 504,150

Int. Cl.[4] H04J 3/02

U.S. Cl. 370—85 4 Claims



1. A system for transferring multiple-bit data words among at least three data units, the bits of any given data word being transferred in parallel, each said data unit having a respective maximum data transfer bandwidth, comprising:

(a) parallel-bit data bus means for conducting said data words to be transferred among said data units, said parallel-bit data bus means having a predetermined set of data-conducting paths and a data transfer bandwidth at least as great as the sum of the respective bandwidths of the two of said data units having the lowest bandwidths; and

(b) control means adapted to be coupled to said data units for synchronously controlling access by said data units to said parallel-bit data bus means so as to interleave on the same said set of data-conducting paths said data words transmitted by at least one of said data units with data words transmitted by another of said data units and thereby transmit both said data words at a data transfer rate at least as great as said sum of the respective bandwidths of said two of said data units having the lowest bandwidths.

4,837,786

TECHNIQUE FOR MITIGATING RAIN FADING IN A SATELLITE COMMUNICATIONS SYSTEM USING QUADRATURE PHASE SHIFT KEYING

Itzhak Gurantz, San Diego, and David A. Wright, Solana Beach, both of Calif., assignors to Comstream Corporation, San Diego, Calif.

Filed Aug. 7, 1986, Ser. No. 894,316

Int. Cl.[4] H04J 11/0; H04B 15/00

U.S. Cl. 370—20 13 Claims

1. A communications system for transmitting digital data from a first location to a second location, comprising:

means at said first location for providing to digital data in first and second input data streams at first and second data rates, respectively, wherein the second data rate is faster than the first data rate, and for synchronizing the first and second input data streams in a fixed timing relationship, with at least said first input data stream providing timing for the first and second input data streams;

means electrically connected to the means for providing digital data, for generating a first phase modulated output signal having a phase relative to a reference phase that is responsive to the data of the first and second input data streams, said phase relative to said reference phase having a first component responsive to the data of said first input data systems and having a second component responsive to the data of said second input data stream, said second component variable independent of said first component, said first component and said second component of said first phase modulated output signal providing two distinct, noninterfering data communications channels at the same time;

means responsive to the first phase modulated output signal for transmitting a radio frequency signal modulated by said first phase modulated output signal;

means at said second location for receiving a radio frequency signal corresponding to said transmitted radio frequency signal and for generating a second phase modulated output signal corresponding to the first phase modulated output signal; and

means for demodulating the second phase modulated output signal to provide first and second output data streams at said first and second data rates, respectively, wherein said first and second output data streams correspond, respectively, to said first and second input data streams, and wherein the means for demodulating provides the first output data stream independently of the second output data stream so that timing information encoded on said first output data stream can be decoded independent of the second output data stream, said first data rate selected to be sufficiently slower than said second data rate so that said means for demodulating continues to provide said first output data stream in the presence of signal attenuation between said first and second locations that prevents said means for demodulating from providing said second output data stream, said first output data stream providing timing for said second output data stream.

4,837,787

SEMICONDUCTOR LASER DEVICE WITH LIGHT EMISSION INHIBITING MEANS

Toshihiro Takesue; Takashi Murahashi, and Toshihiko Nakazawa, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 26, 1987, Ser. No. 54,418

Claims priority, application Japan, Jun. 4, 1986, 61-129381; Jun. 4, 1986, 61-129382; Jun. 4, 1986, 61-129383; Jun. 4, 1986, 61-129384; Jul. 9, 1986, 61-161461

Int. Cl.[4] H01S 3/10

U.S. Cl. 372—29 17 Claims

1. A semiconductor laser device comprising:

a semiconductor laser;

a light quantity monitor circuit for monitoring the quantity of light emitted from said semiconductor laser, and for outputting a signal corresponding to the quantity of light emitted from said laser;

A/D converting means for converting said signal output from said light quantity monitor circuit into a digital quantity and for providing a digital output;

control means for controlling said digital quantity so that said digital output of said A/D converting means is within a predetermined range;

D/A converting means for converting the output of said control means into an analog signal;

current generating means for supplying said semiconductor laser with a predetermined driving current in accordance with said analog signal; and

means for comparing the quantity of light emitted from said laser with a predetermined value;

said control means comprising means for selecting either an increment or a decrement of the quantity of light, wherein the increment or the decrement of said digital quantity is selected in such a manner that, when the output of said light quantity monitor circuit is below a predetermined light quantity, A is selected, whereas, when said output is above said predetermined light quantity, B is selected said A and B being set so as to satisfy the following condition:

$$A > B$$

wherein each of A and B is an increment or decrement of said digital quantity.

4,837,788

REPEATER FOR EXTENDING LOCAL AREA NETWORKS

Wiley M. Bird, El Toro, Calif., assignor to Ford Aerospace & Communications Corporation, Newport Beach, Calif.

Filed Nov. 8, 1985, Ser. No. 796,388

Int. Cl.[4] H04L 25/20

U.S. Cl. 375—3 6 Claims

1. In a data communication system including a local area network having a pair of local buses, only one of which is active at any given time, a remote terminal having a single remote bus, and a repeater for interconnecting, at any given time, said remote bus with the currently active one of said local buses, the system being so structured that data transfer messages contain a fixed number of data words, a system controller of the local area network initiates a data transfer by issuing an address-containing command word, the remote terminal acknowledges by issuing an address-containing status word, and data words have a different synchronization than said command and status words, the improvement comprising said repeater including:

(a) a switchable transceiver circuit arranged to identify said active bus and to selectably convey traffic between said

remote bus and said currently active local bus in a transmit or a receive direction:

(b) converter means connected to said transceiver means for decoding words of said traffic regardless of the direction of said traffic;

(c) detecting means associated with said convertor for detecting whether a command word is a receive command or a transmit command;

(d) direction switching means for switching said transceiver means from the receive direction to the transmit direction following a transmit command or the last data word after a receive command; and

(e) reset means for switching said transceiver means from the transmit direction to the receive direction following a status word after a receive command or the last data word after a transmit command.

4,837,789

HIGH FREQUENCY DISCHARGE EXCITATION LASER APPARATUS

Akira Egawa, Yamanashi, Japan, assignor to Fanuc Ltd., Yamanashi, Japan

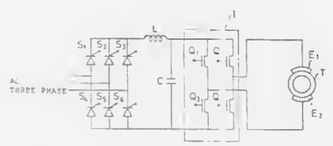
PCT No. PCT/JP87/00783, § 371 Date May 31, 1988, § 102(e) Date May 31, 1988, PCT Pub. No. WO88/02938, PCT Pub. Date Apr. 21, 1988

PCT Filed Oct. 15, 1987, Ser. No. 207,094

Claims priority, application Japan, Oct. 15, 1986, 61-243212

Int. Cl.⁴ H01S 3/097

U.S. Cl. 372—82 **3 Claims**



1. A high frequency discharge excitation laser apparatus, comprising a drive power source of a laser tube having a high frequency range of at least 1 Megahertz but less than 10 Megahertz.

4,837,790

MAXIMUM LENGTH LINEARLY OCCURRING CODE SEQUENCE GENERATOR

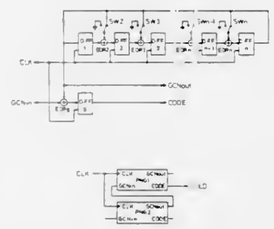
Masaaki Harada, Tokyo, Japan, assignor to Clarion, Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1987, Ser. No. 109,432

Claims priority, application Japan, Oct. 24, 1986, 60-253993

Int. Cl.⁴ G06M 3/02; H03K 19/21

U.S. Cl. 377—33 **9 Claims**



1. An m sequence generator for producing a GOLD code, comprising:

first m sequence generator means for generating a first m sequence, including a plurality of first flip-flops each having a clock input driven by a clock signal and having a data input and a data output, and a gating circuit which is connected to said data input and said data output of each said first flip-flop, said first m sequence being present at said data input of one of said first flip-flops;

second m sequence generator means for generating a second m sequence, including a plurality of second flip-flops each having a clock input driven by said clock signal and having a data input and a data output, and a gating circuit which is connected to said data input and said data output of each said second flip-flop, said second m sequence being present at said data input of one of said second flip-flops;

an exclusive logic sum gate which has two inputs respectively coupled to said data input of said one first flip-flop and said data input of said one second flip-flop and which produces at an output thereof an exclusive logic sum of said first m sequence and said second m sequence; and

a further flip-flop which has a data input connected to said output of said exclusive logic sum gate and a clock input driven by said clock signal, and which produces at a data output thereof a GOLD code.

4,837,791

COUNTER

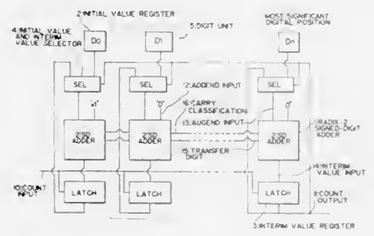
Tadashi Nakanishi, Zama, and Hironori Yamauchi, Machida, both of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Feb. 29, 1988, Ser. No. 162,096

Claims priority, application Japan, Mar. 4, 1987, 62-49616

Int. Cl.⁴ G06F 7/50

U.S. Cl. 377—49 **5 Claims**



1. A counter comprising:

an initial value generator means for calculating and providing, as an output, an initial value;

preset circuit means for presetting the initial value calculated by the initial value generator means;

an adder circuit including

plural digits of radix-2 Signed-Digit adders, each including an adder, transfer digit generator means for generating a transfer digit and interim sum digit generator means for generating an interim sum digit; and

detecting circuit means for detecting an overflow at a specified one of said digits of radix-2 Signed-Digit adders.

4,837,792

COMPUTER TOMOGRAPHY APPARATUS

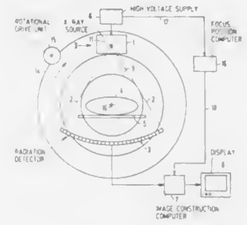
Dieter Goethert, Leutenbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 11, 1988, Ser. No. 167,084

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 8704182[U]

Int. Cl.⁴ G03B 41/16

U.S. Cl. 378—4 **2 Claims**



1. A computer tomography apparatus for obtaining a tomograph of an examination subject, said apparatus comprising:

means for generating an x-ray beam emanating from a focus, said focus changing position over time due to heating of said means for generating an x-ray beam during operation;

a radiation receiver disposed for receiving radiation from said x-ray beam attenuated by said examination subject and for generating a plurality of electrical signals corresponding to the received radiation intensity;

means for rotating said means for generating an x-ray beam and said radiation receiver around said examination subject to irradiate said examination subject from different directions thereby generating a plurality of data sets from said electrical signals of said radiation receiver;

image construction means for calculating an image of a slice of said examination subject from said data sets using the position of said focus in said means for generating an x-ray beam;

means for feeding said means for generating an x-ray beam with operating values, and for generating electrical signals corresponding to said operating values; and

means to which said electrical signals corresponding to said operating values are supplied for calculating the temperature of said means for generating an x-ray beam therefrom and for calculating the position of said focus in said means for generating an x-ray beam based on the calculated temperature and for supplying a signal corresponding to the position of said focus to said means for constructiong an image for use by said image construction means in calculating said image.

4,837,793

MASS LIMITED TARGET

Robert D. Frankel, Rochester, and Jerry Drumheller, Webster, both of N.Y., assignors to Hampshire Instruments, Inc., Rochester, N.Y.

Filed Aug. 25, 1987, Ser. No. 89,496

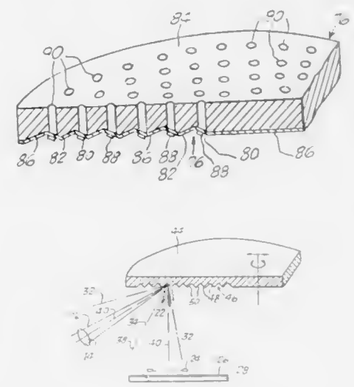
Int. Cl.⁴ G21K 5/10

U.S. Cl. 378—34 **51 Claims**

1. In an X-ray lithography system in which X-rays, generated by focusing a laser beam on a target with sufficient power to create an X-ray emitting plasma, are directed towards a mask-substrate combination for causing a pattern of X-rays to expose a resist layer on said substrate, the improvement in said target comprising:

support means; and

a sheet of target material held by said support means, said target material sheet having a thickness sufficient to permit the ablation of the entire target material sheet, said ablation being substantially completed during the time said laser pulse is provided.



4,837,794

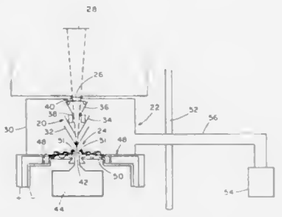
FILTER APPARATUS FOR USE WITH AN X-RAY SOURCE

John C. Riordan, Carlsbad, and Jay S. Pearlman, San Diego, both of Calif., assignors to Maxwell Laboratories Inc., San Diego, Calif.

Filed Oct. 12, 1984, Ser. No. 660,447

Int. Cl.⁴ G01N 23/20

U.S. Cl. 378—119 **14 Claims**



13. A method of filtering undesirable by-products of x-ray generation by an x-ray source aligned with a window for transmiting x-rays, said source being disposed in a vacuum chamber partially defined by said window, said method comprising:

(1) diffusing hot gases caused by operation of said x-ray source and directing them away from said window and further diffusing any hot gases still traveling towards said window through the use of a plurality of baffles disposed in series between said source and said window;

(2) deflecting charged particles away from said window; and

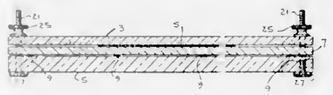
(3) protecting said window from ultraviolet radiation.

4,837,795

TISSUE SPECIMEN HOLDING DEVICE AND BIOPSY PROCEDURE

George W. Garrigus, Dorsey, Ill., assignor to Double D Double G Enterprises, Incorporated, St. Louis, Mo.

Filed Jul. 27, 1987, Ser. No. 78,091
Int. Cl.[4] G03B 42/02
U.S. Cl. 378—180 12 Claims



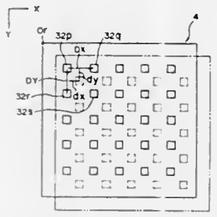
1. A portable device for use in conjunction with an X-ray machine but structurally independent of said X-ray machine, said portable device having means for holding a surgically removed tissue specimen during radiographic exposure of the specimen by said X-ray machine and for assisting in the subsequent isolation of an abnormality in the specimen as detected by said radiographic exposure, said portable device comprising first and second platen members of radiolucent material, radiopaque grid means dividing one platen member into a plurality of regions, means for drawing the two platen members toward one another for compressing a tissue specimen between the platen members and flattening the specimen to a substantially uniform thickness prior to radiographic exposure by said X-ray machine, said means for drawing the two platen members toward one another comprising a plurality of screws extending through holes spaced around the periphery of the platen members, and nuts threadable on the screws, and radiopaque orientation means associated with said grid means for orienting a radiograph having an image of said grid means and an image of said tissue specimen thereon to enable identification of a region or regions of said one platen member in which an abnormality is located, said device being sufficiently small to enable it to be hand carried by a single person from one location where a tissue specimen held by said portable device is subjected to radiographic exposure by said X-ray machine to another location remote from said X-ray machine where any abnormality in said specimen may be isolated and analyzed.

4,837,796

X-RAY IMAGING SYSTEM

Takehiro Ema, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 77,519, Jul. 24, 1987, abandoned, which is a continuation of Ser. No. 857,050, Apr. 29, 1986, Pat. No. 4,688,242. This application May 25, 1988, Ser. No. 196,841
Claims priority, application Japan, Apr. 30, 1985, 60-90929
The portion of the term of this patent subsequent to Aug. 18, 2004, has been disclaimed.
Int. Cl.[4] G21K 1/00
U.S. Cl. 378—154 9 Claims



1. An X-ray imaging system comprising:

an X-ray source for emitting X-rays to be radiated on an object;

X-ray image detection means for detecting an X-ray image emitted from said X-ray source and transmitted through said object;

X-ray mask means, having a plurality of X-ray shielding regions distributed in a predetermined pattern, for locally shielding X-rays with said plurality of X-ray shielding regions;

drive means for moving said X-ray mask means so that said X-ray mask means is inserted or removed with respect to an X-ray radiation field between said X-ray image detection means and said X-ray source and is positionable at a plurality of predetermined positions in said X-ray radiation field;

storage means for storing X-ray image data;

first calculating means, associated with said storage means, for calculating scattered X-ray intensity distribution data associated with said object based on a plurality of transmission X-ray data obtained by irradiating said object with X-rays when said X-ray mask means is located at different positions in said X-ray radiation field, and on transmission X-ray data obtained by irradiating said object with X-rays when said X-ray mask means is located outside said X-ray radiation field;

second calculating means, associated with said storage means, for calculating X-ray image data, from which the influence of scattered X-rays is eliminated, in accordance with the scattered X-ray intensity distribution data obtained by said first calculating means and transmission X-ray data obtained by irradiating said object with X-rays when said X-ray mask means is located outside said X-ray radiation field; and

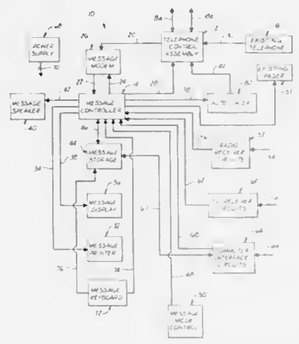
image output means for outputting the X-ray image data calculated by said second calculating means as a visible image.

4,837,797

ELECTRONIC MESSAGE UNIT AND METHODS USING SAME

Charles C. Freeny, Jr., Fort Worth, Tex., assignor to Advanced Service Development Corporation, Oklahoma City, Okla.

Continuation of Ser. No. 802,666, Nov. 27, 1985, abandoned. This application Jan. 27, 1988, Ser. No. 148,100
Int. Cl.[4] H04M 1/64, 11/00
U.S. Cl. 379—96 7 Claims



1. An electronic message unit adapted for use with an existing telephone and an existing telephone link for receiving incoming messages (machine interpretable messages and voice messages) over the telephone link and for receiving call incoming signals indicating an incoming message (machine interpretable message or voice message) is receivable over the telephone link, comprising:

a telephone control assembly connectable to the telephone link and to the telephone for receiving call incoming signals and for connecting to the telephone link in response to receiving a call incoming signal, the telephone control assembly receiving the incoming messages over the telephone link when connected to the telephone link and outputting the received incoming message; and

a message controller receiving the incoming messages outputted via the telephone control assembly, and for each incoming message determining if the incoming message is a machine interpretable message,

the message controller providing an output ring signal in response to the incoming signal being a voice message for causing an audibly perceivable ring output indication indicating a voice message being received over the telephone link, and the message controller outputting the incoming message in response to determining a machine interpretable message being received over the telephone link for reproduction in a retrievable form without causing the audibly perceivable ring output indication to be provided;

wherein the electronic message unit is uniquely identified by a message unit code, and wherein at least some of the machine interpretable messages are defined further to include the message unit code, and wherein the message controller is defined further as being conditionable in one of a private mode and a public mode, the message controller outputting all received machine interpretable messages (machine interpretable messages including the message unit code and machine interpretable messages not including message unit code) in the public mode, and the message controller determining the presence of the message unit code in each of the received machine interpretable messages, and the message controller outputting the received machine interpretable message in response to determining the presence of the message unit code in the received machine interpretable message and the message controller outputting a disconnect signal in response to determining a received machine interpretable message not including a message unit code, and wherein the telephone control assembly is defined further as receiving the disconnect signal outputted via the message controller and disconnecting the telephone link in response to receiving the disconnect signal, and wherein the electronic message unit is defined further to include:

a mode control connected to the message controller being conditionable in one mode for providing a private mode signal and being conditionable in one other mode for providing a public mode signal; and

wherein the message controller is defined further as receiving the private mode signal and the public mode signal from the mode control and the message controller being conditioned in the public mode in response to receiving the public mode signal and being conditioned in the private mode in response to receiving the private mode signal.

terminal or a data terminal as a prime message receptor for said recipient,

sending to said prime message receptor notifications of the arrival of either voice or data messages, and

alerting, under control of said prime message receptor, said recipient of said notifications.

4,837,799

TELEPHONE LINE COMMUNICATIONS CONTROL SYSTEM

John R. Prohs, Pasadena, Calif.; Charles G. Akins; Nicholas Efthyvoulos, both of Big Sandy, Tex.; Phillip E. Sandilands, and Michael R. Scheid, both of Pasadena, Calif., assignors to Ambassador College, Pasadena, Calif.

Continuation of Ser. No. 106,726, Oct. 5, 1987, abandoned. This application Sep. 19, 1988, Ser. No. 249,220
Int. Cl.[4] H04M 3/00
U.S. Cl. 379—224 81 Claims

29. A telecommunications control system for networking a plurality of multi-purpose telephone stations for use as attendant stations in an attendant service complex to service calls directed to the system from originating stations, the system comprising:

a first plurality of station connection controllers, each station connection controller in the first plurality for cooperating with a respective one of a plurality of multi-purpose stations in defining opposite ends of a call connection path;

a second plurality of station connection controllers, each station connection controller in the second plurality for cooperating with a respective one of a plurality of originating stations in defining opposite ends of a call connection path;

controllable inter-connection means arranged between the first and second plurality of station connection controllers; and

means for controlling the inter-connection means such that incoming calls from originating stations are extended to multi-purpose stations that have been networked for use as attendant stations, and wherein the means for controlling the inter-connection means includes means for causing a plurality of incoming calls to be extended to the same

4,837,798

COMMUNICATION SYSTEM HAVING UNIFIED MESSAGING

Roberta S. Cohen; Kenneth M. Huber, both of Middletown, and Deborah J. Mills, Eatontown, all of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed Jun. 2, 1986, Ser. No. 869,277
Int. Cl.[4] H04M 1/00, 3/50, 11/00
U.S. Cl. 379—88 34 Claims

22. A message delivery method for use in situations where a plurality of users send voice or data messages, said messages having recipients, said method comprising the steps of

designating, under control of a recipient, either a voice

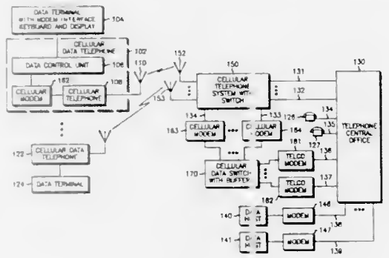
multi-purpose station during an interval throughout which the multi-purpose station remains networked as an attendant station.

4,837,800

CELLULAR DATA TELEPHONE SYSTEM AND CELLULAR DATA TELEPHONE THEREFOR

Thomas A. Freeburg, Arlington Heights, and Donald F. Dautel, Glendale Heights, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 18, 1988, Ser. No. 170,224
Int. Cl.[4] H01Q 7/04
U.S. Cl. 379—59 **13 Claims**



4. A Cellular data telephone system for communicating data with a data host, comprising:

a cellular telephone system having a plurality of radio channels for cellular telephone calls;

a landline telephone system having a plurality of telephone lines for switching a landline telephone call to a data host;

a cellular data switch having a plurality of telephone lines coupled to the cellular telephone system and landline telephone system for switching a cellular telephone call to the landline telephone system, said cellular data switch maintaining and reswitching a cellular telephone to a switched telephone line to the landline telephone system until disconnected by the cellular telephone;

a cellular telephone having a predetermined telephone number for originating and receiving cellular telephone calls on the cellular telephone system;

a cellular modem coupled to the cellular telephone for communicating data therebetween;

a data terminal for transceiving data, said data terminal producing a call origination signal having a first state when a landline telephone call to the data host is originated and a second state when the landline telephone call is disconnected; and

data control means coupled between said data terminal and said cellular modem for coupling data therebetween, said data control means including:

buffer means for storing data from the data terminal and producing an output signal when said buffer means is full; and

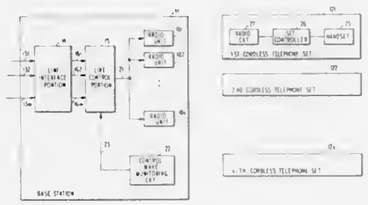
processing means for placing a cellular telephone call to the cellular data switch in response to the first state of the call origination signal, for disconnecting the cellular telephone call when data has not been received from the data terminal for a predetermined time interval, for placing another cellular telephone call to the cellular data switch in response to the buffer means output signal, and for disconnecting the cellular telephone call and the landline telephone call in response to the second state of the call origination signal.

4,837,801

BASE STATION CAPABLE OF MONITORING OCCURRENCE OF INTERFERENCE ON EVERY TRANSMISSION

Yukihiro Shimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 8, 1987, Ser. No. 47,792
Claims priority, application Japan, May 9, 1986, 61-104969
Int. Cl.[4] H04M 11/00
U.S. Cl. 379—61 **8 Claims**



1. In a base station for use in a radio communication network between a plurality of telephone lines connected to substations and a plurality of wireless telephone sets for communication by the use of a plurality of radio waves having different frequencies, said base station comprising line interface means for connection to said plurality of the telephone lines, a plurality of radio communication units for communication with the respective wireless telephone sets through said radio waves, and connection control means intermediate between said line interface means and said radio communication units for selectively connecting said line interface means to said radio communication units, said radio waves including a plurality of speech radio waves for speech between said wireless telephone sets and said substations and a control radio wave predetermined for allocation control of said speech radio waves, each of said radio communication units being communicable with each of said wireless telephone sets by selecting one of said speech radio waves that is unused and by transmitting said one of the speech radio waves towards said wireless telephone sets, the improvement wherein:

said base station comprises monitoring means operation on transmission of said one of the speech radio waves for monitoring said control radio wave after selection of said one of the unused speech radio waves to determine whether or not interference takes place in said control radio wave due to transmission of said one of the speech radio waves, said monitoring means supplying said connection control means with a switching request signal indicative of a request for switching said one of the speech radio waves when said interference is monitored;

said connection control means comprising means responsive to said switching request signal for changing said one of the speech radio waves to another unused one of said speech radio waves.

4,837,802

RADIO COMMUNICATION METHOD AND SYSTEM

Mitsuo Higashiyama, Kanagawa; Naoto Iwahashi, Tokyo; Takushi Kunihiro, Kanagawa, all of Japan, and Jun Nakai, Dallas, Tex., assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 17, 1987, Ser. No. 98,044
Claims priority, application Japan, Sep. 18, 1986, 61-220295
Int. Cl.[4] H01Q 7/04
U.S. Cl. 379—62 **6 Claims**

1. A method for radio communication between at least one parent communication unit and a plurality of slave communication units, comprising the steps of:

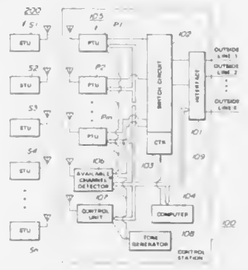
designating one of the slave communication units as a representative slave communication unit;

transmitting a call signal from the parent communication unit;

transmitting an automatic answer signal from the representative slave communication unit automatically in response to receipt of the call signal from the parent communication unit;

transmitting a called-person's answer signal from one of the slave communication units in response to receipt of the call signal;

detecting the presence of inteference between the automatic answer signal from the representative slave communication unit and the called-person's answer signal from the one of the slave communication units;



terminating the transmission of the called-person's signal from the one slave communication unit when the presence of interference is detected;

transmitting an identification signal from the one slave communication unit to identify that the called-person's answer signal was transmitted from the one slave communication unit; and

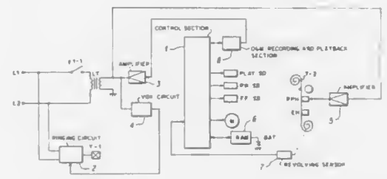
transmitting a specification signal from the parent communication unit in response to receipt of the identification signal to specify the one slave communication unit as a slave communication unit communicable with the parent communication unit.

4,837,803

TELEPHONE ANSWERING DEVICE HAVING FUNCTION OF PLAYBACK WITHOUT REWINDING TAPE

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Jun. 1, 1988, Ser. No. 200,777
Claims priority, application Japan, Jun. 2, 1987, 62-138623
Int. Cl.[4] H04M 1/65
U.S. Cl. 379—79 **1 Claim**



1. A telephone answering device having immediate playback function, comprising;

means for sending a prerecorded outgoing message to a calling party in response to an incoming call;

means for setting an incoming message tape to a most suitable recording position during said sending of the outgoing message;

means for recording an incoming message from the calling party on the incoming message tape from said most suitable recording position according to a beep tone generated after said sending of the outgoing message;

means for rewinding the incoming message tape to a beginning position after the recording of said incoming message is completed;

means for fast forwarding said incoming message tape to next recording position following said recording position while the outgoing message is sent out to the calling part in response to next incoming call;

means for recording the incoming message from said next recording position on the incoming message tape according to the beep tone generated after the sending of the outgoing message; and

means for rewinding again the incoming message tape to the beginning position after said recording,

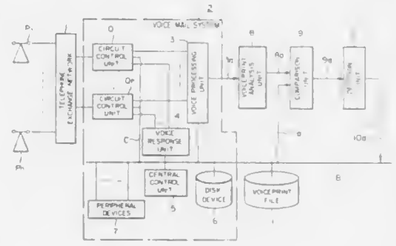
wherein when a user returns to his home or he remotely operates the device from a remote location after the incoming messages from the calling parties are successively recorded, said recorded incoming messages can be played back immediately from the beginning position of the incoming message tape.

4,837,804

TELEPHONE ANSWERING VOICEPRINT DISCRIMINATING AND SWITCHING APPARATUS

Koichiro Akita, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 13, 1987, Ser. No. 3,034
Claims priority, application Japan, Jan. 14, 1986, 61-4243
Int. Cl.[4] H04M 3/38, 3/50
U.S. Cl. 379—88 **3 Claims**



1. A telephone switching apparatus which operates in a first mode and a second mode, said apparatus comprising:

a first telephone circuit connectable with a public telephone network;

sending means for sending predetermined messages to calling parties calling the first telephone circuit from second telephone circuits through the public telephone network;

voiceprint discrimination means, operable in the first mode, for discriminating whether a voiceprint of a voice signal of a calling party calling from a second telephone circuit coincides with one of a plurality of predetermined voiceprints;

switching means, operable in the first mode, for switching and connecting the second telephone circuit to a predetermined third telephone circuit when said voiceprint discrimination means has determined that the voiceprint of the calling party coincides with one of the plurality of predetermined voiceprints; and

accumulating means operable in the second mode for accumulating voice signals of all calling parties as voice mail and operable in the first mode for accumulating voice signals of those calling parties whose voiceprints do not

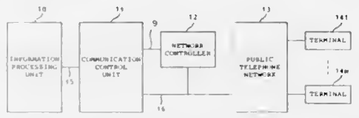
coincide with one of the plurality of predetermined voice-prints as voice mail.

4,837,805

OPENING COMMAND TRANSMISSION SYSTEM AND METHOD CAPABLE OF REDUCING OVERHEAD IN AN INFORMATION PROCESSING UNIT

Teiji Okumura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 22, 1987, Ser. No. 64,616
Claims priority, application Japan, Jun. 24, 1986, 61-147498
Int. Cl.[4] H04M *1/00*
U.S. Cl. 379—90 **4 Claims**



1. A method of opening a destination terminal from an information processing unit through a communication control unit and a public telephone network, connected to said communication control unit, before communication is carried out between hardware associated with a preselected application program kept in said information processing unit and said destination terminal, said destination terminal being connected to a switched line of said public telephone network and being identified by a dial number and a terminal identifier which are assigned to said switched line and said destination terminal, respectively, said method comprising the steps of:

receiving in said information processing unit an opening request, for opening said destination terminal, from said preselected application program;

producing in said information processing unit, in response to reception of said opening request, a primary opening command carrying said dial number in addition to said terminal identifier;

transmitting said primary opening command from said information processing unit to said communication control unit;

storing said primary opening command in said communication control unit;

connecting said destination terminal to said communication control unit through said public telephone network by the use of said dial number, carried by said primary opening command stored in said communication control unit;

removing said dial number from said primary opening command to form a remaining part of said primary opening command, after completion of the connection between said destination terminal and said communication control unit, to produce the remaining part as a secondary opening command;

delivering said secondary opening command from said communication control unit to said destination terminal; and

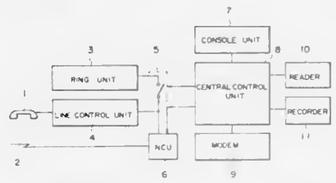
connecting said communication control unit to said information processing unit so as to enable communication between hardware associated with said preselected application program and said destination terminal through said communication control unit and said public telephone network.

4,837,806

DATA COMMUNICATION PROCESS SUITABLE FOR USE IN A QUIET ENVIRONMENT

Tsunehiro Watanabe, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1987, Ser. No. 17,600
Claims priority, application Japan, Feb. 27, 1986, 61-042153
Int. Cl.[4] H04M *11/00*
U.S. Cl. 379—93 **6 Claims**



1. A data communication apparatus comprising:

data communication means for performing data communication;

setting means for setting said apparatus in an automatic communication mode;

information means responsive to a calling signal coming from a line for informing an operator of an incoming call, using a sound;

detection means for detecting malfunction of said data communication means; and

control means for disabling said information means from performing its informing function in response to the calling signal from the line while said apparatus is in the automatic communication mode and for automatically performing data communication using said data communication means,

wherein said control means controls said information means to be activated when said detection means detects malfunction while said apparatus is in the automatic communication mode.

4,837,807

STATION TO STATION MESSAGE ARRANGEMENT

Rickens T. Szeto, Tinton Falls, and Harold K. Woodland, Lakewood, both of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Services Inc., Morristown, N.J.

Filed Dec. 30, 1987, Ser. No. 139,874
Int. Cl.[4] H04M *1/02, 11/00*
U.S. Cl. 379—96 **12 Claims**

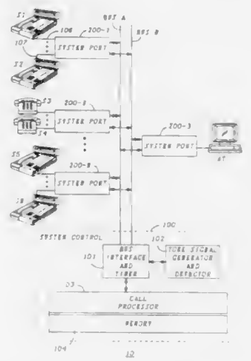
6. An arrangement for sending a textual message from one of a plurality telephone station sets to any other one of said station sets, each of said telephone station sets having a display and being identified by respective telephone numbers, said arrangement comprising

a memory,

a plurality of predefined messages stored in said memory, said predefined messages being represented by respective codes,

means responsive to a predetermined request from a user at said one of said station sets for returning thereto a series of signals prompting said user to enter the code of the predefined message that said user desires to send and the identity of said other one of said station sets, respectively, and

means for forming into a display message the message represented by the code entered by said user and the identity of said one of said station sets and for sending said display



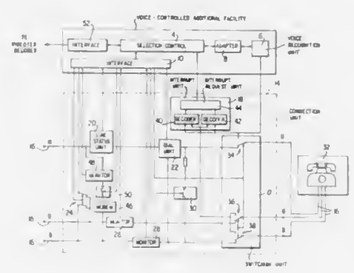
message to said other one of said station sets for display thereat.

4,837,808

CIRCUIT CONNECTING A VOICE-CONTROLLED DEVICE TO A TELEPHONE STATION AND LINE

Manfred Immendorfer, Ditzingen; Dieter Kopp, Hemmingen, and Thomas Hormann, Grossbottwar, all of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Continuation of Ser. No. 753,841, Jul. 11, 1985, abandoned. This application Oct. 13, 1987, Ser. No. 106,951
Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 3425789
Int. Cl.[4] H04M *11/00, 1/26*
U.S. Cl. 379—96 **7 Claims**



1. A circuit arrangement for connecting a voice controlled additional facility associated with a telephone station and said telephone station to a telephone line containing at least first and second conductors, said telephone station including a telephone set having a microphone for receiving voice messages and said voice controlled additional facility including a voice recognition circuit, selection control means for controlling the mode of operation of said voice controlled additional facility and interface means for connection of said voice controlled additional facility, said circuit arrangement comprising:

interrupt means connected to said selection control means of said voice controlled additional facility, said interrupt means acting to signal the presence of telephone set dialing information to said voice controlled additional facility to inhibit the operation thereof;

a switching unit connected into said first and second conductors of said telephone line and to said voice recognition circuit and, through said interrupt means, to said selection control means, thereby selectively connecting said telephone station via said telephone line either to an exchange or to said voice controlled additional facility;

loop monitoring means for determining the On-Hook and Off-Hook condition of said telephone set and signalling the condition determined to said selection control means through said interface means;

line status identification means for detecting the presence of an outgoing or incoming telephone call and signalling the presence detected to said selection control means through said interface means, said line status identification means being connected to said switching unit;

means for selectively connecting said first and second conductors of said telephone line, said means for connecting being coupled to said loop monitoring means and said line status identification means; and

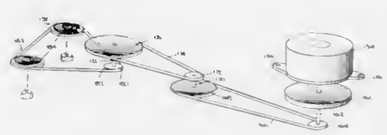
dialing means responsive to signals generated by said voice recognition circuit for applying dialing signals to said telephone line, said dialing means being connected to said switching unit and said means for connecting and acting when said telephone set is in an Off-Hook condition and the presence of an outgoing telephone call is ascertained to apply dialing signals to said telephone line when outgoing telephone call dialing statements are spoken into said microphone.

4,837,809

TELEPHONE ANSWERING DEVICE HAVING IMMEDIATE PLAYBACK FUNCTION

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Jul. 14, 1988, Ser. No. 219,001
Claims priority, application Japan, Jul. 14, 1987, 62-175449
Int. Cl.[4] H04M *1/65*
U.S. Cl. 379—79 **5 Claims**



1. A telephone answering device adapted to be connected to a telephone line and having an immediate playback function, comprising:

means for sending a prerecorded outgoing message to a calling party followed by a beep tone in response to an incoming call;

means for starting to drive an incoming message tape to a first suitable recording position after a predetermined period of time, for instance, a couple of seconds, during said sending of the outgoing message;

means for recording an incoming message from the calling party on the incoming message tape from said first suitable recording position according to the beep tone generated after said sending of the outgoing message;

means for rewinding the incoming message tape to a beginning position thereof after the recording of said incoming message is completed;

means for fast forwarding said incoming message tape to a second suitable recording position following said first suitable recording position after the predetermined period of time in response to next incoming call;

means for recording the incoming message from said second suitable recording position on the incoming message tape according to the beep tone generated after the sending of the outgoing message; and

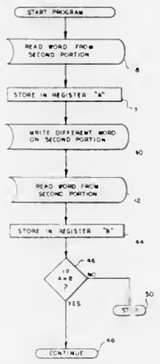
means for rewinding again the incoming message tape to said beginning position thereof after said recording,

whereby when a user returns to his home or he remotely operates the device from a remote location after the incoming messages from the calling parties are successively recorded, said recorded incoming messages can be played back immediately from the beginning position of the incoming message tape.

4,837,810
TELEPHONE SWITCH CENTER WITH CONTROL OF INDIVIDUAL DEVICES

Gerhard Prey, Eichenau, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 9, 1988, Ser. No. 165,857
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1987, 3708833
Int. Cl.[4] H04M *3/00*
U.S. Cl. 379—242 **1 Claim**

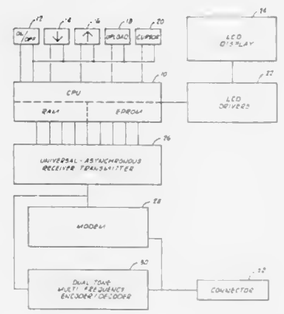


1. Circuit arrangement for telecommunication systems, including telephone exchange installations, wherein individual devices are activated by a central switching device with device-specific connect commands transmittable by the latter to the devices, and wherein, after each activation and connection of the particular device to the switching device, information is exchanged between these two for surveillance of correctness of the connect command output to the device as well as the connection of the correct device established thereupon, and in which different commands transmitted from the switching device to a connected device are command-specifically monitored through acknowledgement signals transmitted back, and in which a start command is transmitted from the switching device to the particular device after established connection and a stop command is transmitted before or for the purpose of disconnection, characterized in that after completed connection of a device to the switching device with connect command and transmision of the start command as well as transmission back of a start command acknowledgement signal, the connect command is changed one or several times partially or slightly and each time transmitted again, that after each output of the changed connect command the stop command is transmitted from the switching device to the particular device, which has reacted to the changed connect command, that each device having reacted in this manner, responds to the stop command with a stop command acknowledgement signal transmitted back only, if, after connection has taken place, it has received a start command before a stop command, and that the switching device recognized an activation error in that, after output of the changed connect command and the stop command transmitted thereupon, it receives a stop command acknowledgement signal.

4,837,811
TELEPHONE TECHNICIAN'S TERMINALS

Myron C. Butler, Edmond, Okla., and Christopher Madore, Cypress, Calif., assignors to Communication Manufacturing Co., Los Angeles, Calif.

Filed Jan. 25, 1988, Ser. No. 148,427
Int. Cl.[4] H04M *1/21, 11/00*
U.S. Cl. 379—96 **11 Claims**



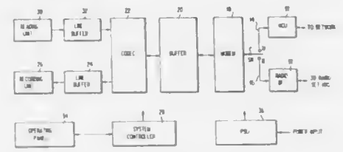
1. A portable craftman's terminal for communicating with a central access network of a telephone operating system, comprising:
means for connecting the terminal in communication with the central access network;
means actuatable to transmit a code signal to the central access network to initiate downloading of ASCII coded data from the central access network;
a central processing unit including a random access memory and erasable programmable read only memory;
means for receiving downloaded ASCII coded data as transmitted from said central access network;
a modem receiving said ASCII coded data and reformatting for input conversion to a serial tone signal;
a parallel-to-serial converter receiving said serial tone signal and providing output of a parallel multi-digital signal for input to said central processing unit;
display means receiving output from said central processing unit for displaying said downloaded data;
dual tone multi-frequency keypad means operative thru said central processing unit for composing an alpha-numeric data message as an encoded serial tone signal for processing through said converter, and for storage in said central processing unit random access memory, and for read out on said display means; and
means for transmitting a dual tone multi-frequency coded data message of upload to said central access network.

4,837,812
DUAL CONNECTION MODE EQUIPPED COMMUNICATION CONTROL APPARATUS

Shuichi Takahashi, Sagamihara, and Takaho Koshiishi, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 943,787, Dec. 19, 1986, abandoned. This application Mar. 23, 1988, Ser. No. 172,084
Claims priority, application Japan, Dec. 21, 1985, 60-286911; Mar. 23, 1987, 62-65785
Int. Cl.[4] H04N *1/32;* **H04M** *11/00;* **G06F** *13/00*
U.S. Cl. 379—98 **10 Claims**

1. A communication control apparatus comprising:
first interface means connectable to a telephone wire communication network;
second interface means connectable to a radiotelephone wireless communication network which is different from said first communication network in mode of communication;
processing means for processing data to be transmitted or data received in accordance with a predetermined procedure through said first and second interface means;
selecting means for selecting one of said first and second interface means to be operatively connected to said processing means; and

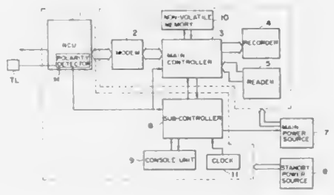


controlling means for controlling the overall operation of said apparatus, said controlling means supplying a selection signal to said selecting means thereby causing said selecting means to select one of said first and second interface means to be connected to said processing means;
wherein said processing means comprises,
a MODEM for modulating data to be transmitted through a selected one of said first and second interface means and demodulating data received through a selected one of said first and second interface means.

4,837,813
FACSIMILE APPARATUS WITH DEVICE TO DETERMINE LINE CHANGES, AND HAVING A POWER CONSERVATION FEATURED

Hisao Terajima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1987, Ser. No. 125,004
Claims priority, application Japan, Dec. 1, 1986, 61-287177; Dec. 1, 1986, 61-287185
Int. Cl.[4] H04M *15/18*
U.S. Cl. 379—113 **12 Claims**

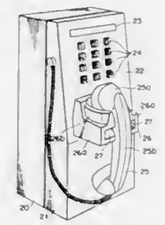


1. A communication apparatus comprising:
monitor means for monitoring if a line is released, after the line has been captured;
memory means for storing time information on a line release time, when line release is detected by said monitor means;
control means for controlling the apparatus, said control means receiving the time information from said memory means at an end of a predetermined operation;
a first power supply for supplying power to at least said control means; and
a second power supply for supplying power to said monitor means,
wherein said monitor means controls said first power supply.

4,837,814
TELEPHONE SET

Yutaka Yoshino, Isehara; Makoto Gotoh, Atsugi; Osamu Fujimoto, Tokyo, and Masahiro Shizawa, Atsugi, all of Japan, assignors to Anritsu Corporation, Tokyo, Japan

Filed Sep. 23, 1987, Ser. No. 100,283
Claims priority, application Japan, Sep. 29, 1986, 61-230299; Sep. 29, 1986, 61-230300
Int. Cl.[4] H04M *17/02*
U.S. Cl. 379—144 **10 Claims**

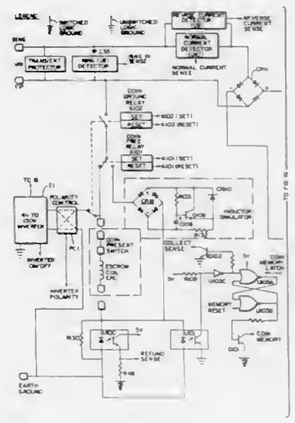


1. A telephone set comprising a housing, hanger means provided on said housing, a handset adapted to be hung up on said hanger means, a slit-like card insertion port on a surface of said housing and in which a card is insertable, wherein:
said slit-like card insertion port is formed on a portion of the surface of said housing located behind said handset when said handset is hung up on said hanger means; and
said card reader is arranged behind said card insertion port.

4,837,815
ARMORED CORD HANDSET

Rudolf P. Brancati, Richmond Hill, N.Y., assignor to Nynex Corporation, New York, N.Y.

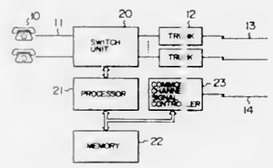
Filed Jun. 26, 1986, Ser. No. 879,085
Int. Cl.[4] H04M *1/15, 1/03;* **H04R** *1/06*
U.S. Cl. 379—438 **27 Claims**



1. In combination:
an armored cord for use in connecting a telephone handset to a telephone housing, the telephone handset having a receiver section, a transmitter section, a yoke section connecting the transmitter and receiver sections and means for securing the sheath member of an armored cord to the telephone handset, the armored cord comprising: a

flexible, armored outer sheath member for extending between the telephone handset and the telephone housing; a strength member extending in the interior and over the length of the sheath member; and a number of conductors disposed within said sheath member for extending between the telephone handset and the telephone housing; and strength member securing means for securing the strength member to the telephone handset, said strength member securing means including resilient means for providing resilient engagement of the strength member with the strength member securing means.

4,837,816
COMMUNICATION SYSTEM USING SWITCHING APPARATUS
Noboru Mizuhara, Kawasaki; Tohru Hoshi, Yokohama; Jiro Kashio, Kawasaki, and Takashi Morita, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 22, 1987, Ser. No. 136,611
Claims priority, application Japan, Dec. 24, 1986, 61-306415
Int. Cl.[4] H04M *3/22, 7/06*
U.S. Cl. 379—221 **3 Claims**



3. A communication system in which a plurality of switching apparatuses to each of which a plurality of terminal apparatuses are connected are mutually connected through a plurality of circuits having different priorities and through one control signal line,

each of said switching apparatuses comprising:

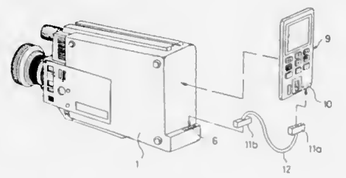
means which, in response to a telephone number input from the terminal apparatus which generated a call that is connected to said switching apparatus, selects one route directing to a destination switching apparatus enclosing a destination terminal apparatus to which said telephone number is assigned;

means for hunting an idle circuit having the highest priority from a plurality of circuits included in said selected one route;

means which, upon completion of a call, in the route to which a first circuit to be released by said call belongs, determines whether a call using a second circuit having a lower priority than that of said first circuit exists or not; and

means which, when the call using the second circuit of the lower priority has been found out by said determining means, communication with the partner switching apparatus of said call through said control signal line and, thereafter, switches the busy circuit of said call from the second circuit to the first circuit.

4,837,817
VIDEO CAMERA WITH REMOVABLE VIEWER AND CONTROLS
Takashi Maemori, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 20, 1987, Ser. No. 39,848
Claims priority, application Japan, Apr. 18, 1986, 61-57589[U]
Int. Cl.[4] G03B *13/10*
U.S. Cl. 358—224 **3 Claims**



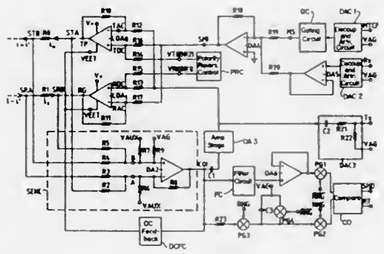
1. A video camera, comprising:

a camera body with an electronic video camera section; and

an auxiliary body detachably mounted on said camera body and including a control section for said video camera, said section including a view finder display unit for said electronic video camera section and switches for controlling start/stop operation of said video camera when said auxiliary body is connected to said camera body directly through a cable,

the improvement wherein said control section further comprises means for zooming operation and means for photographing exposure adjustment.

4,837,818
TELECOMMUNICATION LINE CIRCUIT
Jozef F. P. Pieters, LebbekeWieze, and Pierre-Paul F. M. Marie Guebels, Edegem, both of Belgium, assignors to Alcatel N.V., Amsterdam, Netherlands
Filed Apr. 16, 1986, Ser. No. 852,609
Claims priority, application European Pat. Off., May 17, 1985, 85200774.9
Int. Cl.[4] H04M *3/27, 19/02*
U.S. Cl. 379—252 **11 Claims**



1. Telecommunication line circuit for interfacing a bidirectional 2-wire subscriber line to an exchange circuit having a receive leg and a transmit leg, said line circuit comprising:

a ringing generator;

a first operational amplifier having a non-inverting input, an inverting input and an output;

a feedback resistance coupling the first operational amplifier's output to its inverting input;

a first bias source;

first and second bias resistances of equal value;

a Herter bridge having

a first pair of terminals coupled to the bidirectional 2-wire line,

a second pair of terminals coupled to the receive leg of the exchange circuit and via first switching means to said ringing generator,

two equal-valued first Herter bridge resistances each connecting a terminal of said first pair of terminals to a respective terminal of said second pair of terminals,

a third pair of terminals coupled to the transmit leg of the exchange circuit via said first operational amplifier as well as to said first bias source through said first and second bias resistances, respectively, and

four equal-valued second Herter bridge resistances each connecting a terminal of said third pair of terminals to a respective terminal of each of said first and second pairs of terminals;

a second bias source, and

a third bias resistance connecting the first operational amplifier's non-inverting input to said second bias source,

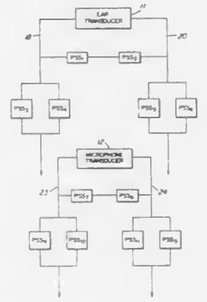
wherein;

said first and second bias resistances are of equal value;

said third bias resistance and said feedback resistance are of equal value; and

the resistance of said feedback resistance is sufficiently low relative to that of said first Herter bridge resistances to prevent saturation of an output stage of the first operational amplifier and the resistance of the first bias resistance is sufficiently low relative to that of said feedback resistance to prevent saturation of an input stage of the first operational amplifier upon a ringing signal being applied across said second pair of terminals by said ringing generator.

4,837,819
SECURITY HANDSET
Donald T. McClain, Richardson, Tex., assignor to Northern Telecom Limited, Montreal, Canada
Filed Dec. 8, 1987, Ser. No. 130,190
Int. Cl.[4] H04M *1/19*
U.S. Cl. 379—424 **22 Claims**



1. A security device for use with a telephone handset having a microphone transducer and an ear transducer, adapted to prevent eavesdropping while the handset is in an on-hook position, comprising:

switching means disposed in said handset adapted to disable said transducers;

said switching means comprising a first switching means connected across said ear and microphone transducers and a second switching means connected in series with said ear and microphone transducers;

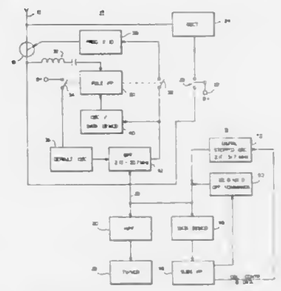
said switching means being switched to a first state when said headset is placed within a first predetermined orientation corresponding to a secure mode;

said first state having the first switching means closed, thereby shorting said ear and microphone transducers, and the second switching means open;

said switching means being switched to a second state when said handset is placed within a second predetermined orientation corresponding to an operative mode;

said second state having the first switching means open, thereby enabling said ear and microphone transducers, and the second switching means closed.

4,837,820
HYBRID CATV SCRAMBLING SYSTEM
Andrew S. Bellavia, Jr., Elk Grove Village, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.
Filed Oct. 17, 1986, Ser. No. 920,488
Int. Cl.[4] H04N *7/167, 7/10;* **H04K** *3/00*
U.S. Cl. 380—7 **7 Claims**



1. A cable communication system comprising:

a head end source of television channel signals and subscriber authorization signals;

cable means connecting said head end source to a plurality of subscriber locations and conveying all of said television channel signals and authorization signals thereto, each of said plurality of subscriber locations including tuner means for permitting selective reception of all said television channel signals;

a scrambling station located near each subscriber location, including broadband interference generating means, for rendering at least some of said television channels unviewable at its associated subscriber location;

means, at an authorized subscriber location, for generating specific interfering signals for overriding said broadband interference means; and

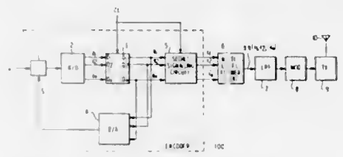
control means at said authorized subscriber location for autmatically supplying said specific interfering signals to its associated one of said scrambling stations responsive to an authorization signal from said head end to permit viewing of an authorized one of said unviewable television channels.

4,837,821
SIGNAL TRANSMISSION SYSTEM HAVING ENCODER/DECODER WITHOUT FRAME SYNCHRONIZATION SIGNAL
Konzou Kage, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Jan. 4, 1984, Ser. No. 568,312
Claims priority, application Japan, Jan. 10, 1983, 58-1040
Int. Cl.[4] H04K *1/00*
U.S. Cl. 380—9 **12 Claims**

9. A signal transmission system including a transmitting terminal and a receiving terminal, wherein:

said transmitting terminal comprises first converter means for converting an incoming analog audio signal into a first parallel digital signal, second converter means responsive to a first clock signal for scrambling said first parallel digital signal to provide a second parallel digital signal, multi-level former means for converting said second parallel digital signal into a multi-level analog signal, and means for transmitting said multi level analog signal and wherein:

said receiving terminal comprises means for receiving the



transmitted multi-level analog signal means for recovering from the received multi-level analog signal a second clock signal which corresponds to said first clock signal, level-discriminator means responsive to said second clock signal for converting said received multi-level analog signal into a third parallel digital signal, third converter means for responsive to said second clock signal for scrambling said third parallel digital signal to provide a fourth parallel digital signal, and fourth converter means for converting said fourth parallel digital signal into an outgoing analog audio signal.

4,837,822

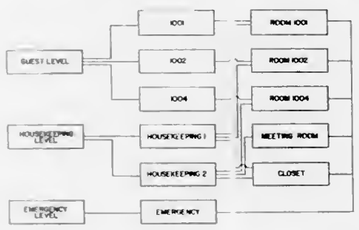
CRYPTOGRAPHIC BASED ELECTRONIC LOCK SYSTEM AND METHOD OF OPERATION

Thomas W. Crosley, Saratoga, Calif.; Wayne Davison, Portland, Oreg.; James R. Goldberg, Novato, Calif.; Leonard L. Hofheins, Concord, Calif.; Ronald D. Lichty, San Francisco, Calif.; Charles A. Vollum; Stephen H. Vollum, both of Sherwood, Oreg., and Victor H. Yee, Oakland, Calif., assignors to Schlage Lock Company, San Francisco, Calif.

Filed Apr. 8, 1986, Ser. No. 849,472

Int. Cl.⁴ H04L 9/04

U.S. Cl. 380—23 **10 Claims**



1. In the process of activating an electronic lock to perform selected functions controlled by the input of a data message from a magnetic card, the steps of encoding and decoding the data comprising:

providing a card having facilities thereon for writing in an encoded message and providing an electronic lock, the lock being a discrete, stand-alone unit without connection or communication to external processor or memory;

determining a pair of prime factors pq such that pq=n;

selecting a data message, m, for causing the lock to perform the selected functions;

providing n to the lock;

determining a value x such that x^2 mod n=m;

magnetically writing the encoded value x on the card;

reading the value x into the electronic lock;

calculating x^2 mod n at the lock to decode the message, m; and based upon the decoded message operating the electronic lock.

4,837,823

COMMUNICATION SYSTEM

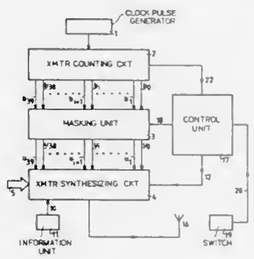
Wilhelmus J. Ham, and Jacob T. Nagelhout, both of Huizen, Netherlands, assignors to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Mar. 4, 1987, Ser. No. 21,872

Claims priority, application Netherlands, Mar. 6, 1986, 8600576

Int. Cl.⁴ H01I 7/00

U.S. Cl. 380—34 **17 Claims**



1. Communication system, comprising: at least one transmitter provided with a clock-pulse generator, a transmitter counting circuit connected to the clock-pulse generator for producing timing signals, a transmitter synthesising circuit driven by said timing signals for time-dependently selecting a carrier frequency from a predetermined periodic frequency series of the first type and for generating and modulating said carrier frequency; the communication system further comprising at least one receiver provided with a of clock-pulse generator, a receiver counting circuit connected to said clock-pulse generator for generating timing signals, a receiver synthesising circuit driven by said timing signals for time-dependently selecting the carrier frequency from the predetermined periodic frequency series of the first type also available in the receiver and for demodulating said carrier frequency; the communication system still further comprising synchronisation means for synchronising the receiver synthesising circuit with the transmitter synthesising circuit by means of a message of the transmitter containing the count information of the transmitter counting circuit at the time of commencement, characterised in that the synchronisation means is arranged to successively transmit count information spread over different frequencies, where each frequency, being retained for a certain time interval, is an element of a predetermined frequency series of the second type, which frequency series is an element of a predetermined set of frequency series, where the selection of the frequency series of the second type has a functional relationship with the count of the transmitter and receiver counting circuits.

4,837,824

STEREOPHONIC IMAGE WIDENING CIRCUIT

Robert A. Orban, Belmont, Calif., assignor to Orban Associates, Inc., San Francisco, Calif.

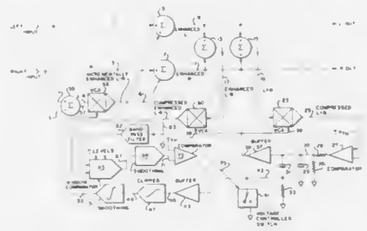
Filed Mar. 2, 1988, Ser. No. 162,978

Int. Cl.⁴ H04S 1/00

U.S. Cl. 381—1 **16 Claims**

1. A circuit enhancing stereophonic sound by processing an L−R signal, comprising:

first means for developing a control signal which varies as a function of the attack transients in an L+R signal;



second means for controlling the gain of said L−R signal as a function of said control signal, said second means being coupled to receive said control signal.

4,837,825

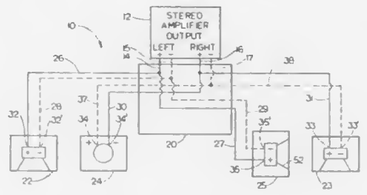
PASSIVE AMBIENCE RECOVERY SYSTEM FOR THE REPRODUCTION OF SOUND

Clarence L. Shivers, 3055 Purgatory Dr., Colorado Springs, Colo. 80218

Continuation-in-part of Ser. No. 18,357, Feb. 28, 1987, abandoned. This application Jan. 19, 1988, Ser. No. 145,284

Int. Cl.⁴ H04R 5/02

U.S. Cl. 381—24 **9 Claims**



1. A multi-channel audio system for producing L and R stereo signals from an audio source for reception by a listening site proximate the audio source, the system comprising:

first and second speakers arranged in horizontally spaced relation to one another and facing in substantially the same direction, each speaker producing and directing one of said L and R signals in substantially the same direction;

third and fourth speakers positioned in front of said first and second speakers, first means for transmitting one of said L and R signals to one of said third and fourth speakers, and second means for transmitting the other of said L and R signals to the other of said third and fourth speakers, one of said L and R signals being transmitted in-phase and the other of said L and R signals being transmitted in out-of-phase relation to said third and fourth speakers;

one of said third and fourth speakers directing the sound produced by said in-phase signal at right angles to the sound produced by said out-of-phase signal and directed by the other of said third and fourth speakers; and

means including a first sound-reflective surface for reflecting the sound produced from said in-phase signal and means including a second sound-reflective surface at right angles to said first sound reflective surface for reflecting the sound produced by said out-of-phase signal whereby four different signals are produced and directed by said first, second, third and fourth speakers from different locations and arrive at the listening site at spaced time intervals with respect to one another.

4,837,826

STEREOPHONIC BAFFLE

Walter Schupbach, Prangins, Switzerland, assignor to SES Sound Electronic Systems S.A., Geneva, Switzerland

Filed Apr. 14, 1987, Ser. No. 38,534

Claims priority, application Switzerland, Jun. 5, 1986, 02282/86

Int. Cl.⁴ H04R 5/02

U.S. Cl. 381—24 **8 Claims**

1. A monolithic stereophonic baffle, comprising

(a) a first group of loud-speakers arranged along a first line and receiving a right signal from an amplifier;

(b) a second group of loud-speakers arranged along a second line at an angle to said first line and receiving a left signal from the amplifier, each loud-speaker of said second group of loud-speakers being associated with one loud-speaker of said first group of loud-speakers;

(c) the right and left signals from the amplifier being in phase;

(d) the path separating the active zones of associated loud-speakers being generally equal to an odd multiple of half of the wavelength of a frequency between 300 and 1000 Hz, thereby creating acoustical coupling for said frequency between said associated loud-speakers;

(e) the coupling frequencies for different associated loud-speakers being different;

(f) the baffle comprising a planar baffle carrying loud-speakers disposed along two lines forming an angle between them, each couple of loud-speakers being connected by a resonance chamber tuned on the coupling frequency of said couple.

4,837,827

METHOD FOR TRANSMITTING TWO INDEPENDENT TYPES OF INFORMATION AND DEVICE FOR IMPLEMENTING THE METHOD

Artur Bardl, Munich, and Manfred Lindner, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 20, 1985, Ser. No. 747,113

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1984, 3424037

Int. Cl.⁴ G06F 11/00; G10L 1/00

U.S. Cl. 381—34 **2 Claims**

2. Apparatus for transmitting two mutually independent types of information on a transmission path having a transmit and a receive side, comprising: a transmit buffer store; a first clock source for writing-in the first type of information into the transmit buffer store; a second clock source faster than the first clock source connected to the transmit buffer store for reading out the first type of information from the transmit buffer store for time-compressing the first type information and leaving time gaps therein; transmitting the time-compressed first type of information on the transmission path, transmitting the second type information on the transmission path in the time gaps; the transmit buffer store including at least four independently operating, parallel charge-coupled memories, said first clock frequency source being controlled by a first synchronizing signal; a multiplexer driven by said first clock frequency source, cyclically addressing each of said charge-coupled memories within a transmission cycle first with a respective

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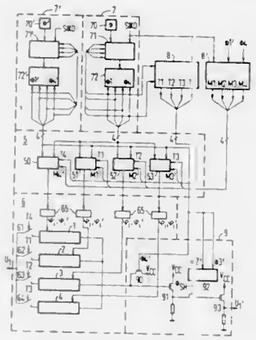
first shift frequency and subsequently with a second shift frequency faster than said first shift frequency; a receive buffer store having at least four further independently operating parallel charge-coupled memories, another clock frequency source controlled by a second synchronizing signal; and another multiplexer driven by said other clock frequency source,



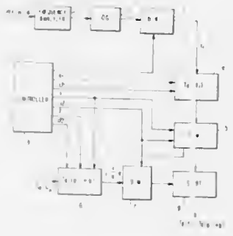
cyclically addressing each of said further charge-coupled memories within a transmission cycle, first with said second shift frequency, and subsequently with said first shift frequency; said first shift frequency being derived from said first clock frequency source and said second faster shift frequency being derived from said other clock frequency source.

4,837,828

PATTERN FEATURE EXTRACTING SYSTEM

Masao Watari, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 493,200, May 10, 1983, abandoned. This application Jun. 11, 1987, Ser. No. 61,009
Claims priority, application Japan, May 12, 1982, 57-79379
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—36 **10 Claims**



1. A system for extracting pattern features from pattern data, which is composed of n pieces of pattern information, comprising:

orthogonal transformation means for orthogonally transforming the pattern data to develop a first set of m (where $m<n$) orthogonal parameters;

least squares straight line transformation means for determining a second set of m orthogonal parameters of a least-squares straight line fit for said n pieces of pattern information by using the l parameters ($1<m$) of the first set of m orthogonal parameters; and

a subtraction means for subtracting respective ones of said second set of orthogonal parameters from the corresponding ones of said first set of orthogonal parameters, said subtraction means producing at its output and subtracted results as pattern features.

4,837,829

ACOUSTIC SOUND SYSTEM FOR A ROOM

William E. Lobb, Wallingford, Conn., assignor to Jaffe Acoustics, Inc., Norwalk, Conn.

Continuation of Ser. No. 818,903, Jan. 15, 1986, abandoned, which is a continuation of Ser. No. 681,691, Dec. 14, 1984, abandoned, which is a continuation of Ser. No. 407,845, Aug. 13, 1982, abandoned. This application Oct. 8, 1987, Ser. No. 106,936
Int. Cl.[4] H04R *3/00, 27/00*
U.S. Cl. 381—83 **12 Claims**

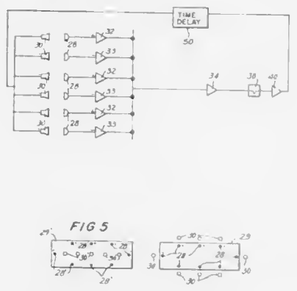


FIG 5

1. An acoustic sound system for a room, comprising:

pairs of modules in the room, each pair including a first module with a first microphone and an associated first loudspeaker and a second module with a second microphone and an associated second loudspeaker, each first microphone and first loudspeaker, and each second microphone and second loudspeaker, having a substantially similar acoustic relationship, microphone relative to loudspeaker, substantially equal level sound signals incident on each microphone causing outputs of a substantially equal level signal from each loudspeaker;

phase shifting means for shifting by about 180° the phase of either the output of each second microphone or the input of each second loudspeaker; and

central summing means for receiving the outputs of the first and second microphones from each of the pairs of modules and summing the outputs to produce a single summed output signal, the single summed output signal being coupled to the input of each first and second loudspeaker;

whereby sound input to a microphone from external the system is output from each of the loudspeakers and sound input to a microphone from one of the loudspeakers is substantially cancelled.

4,837,830

MULTIPLE PARAMETER SPEAKER RECOGNITION SYSTEM AND METHODS

Edwin H. Wrench, Jr., San Diego, Calif.; Robert Wohlford, Germantown, Md., and Joe Naylor, San Diego, Calif., assignors to ITT Defense Communications, A Division of ITT Corporation, Nutley, N.J.

Filed Jan. 16, 1987, Ser. No. 3,971
Int. Cl.[4] G10L *5/06*
U.S. Cl. 381—42 **18 Claims**

1. Speaker recognition apparatus for identifying a speaker by identifying the speech signal of an unknown speaker as one of a finite number of speakers comprising:

front end processing means responsive to said speech signal to provide digitized samples of said speech at an output, said front end processing means including lowpass filter means responsive to said speech signal to limit the band

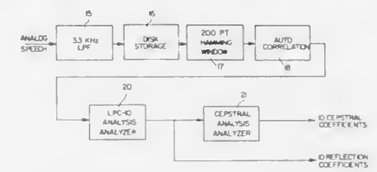
width thereof to about 3 KHz at an output of said filter means,

storage means coupled to said processing means and having a first plurality of storage locations for storing said digitized samples,

means included in said front end processing means and coupled to said storage means and responsive to said stored digitized samples for dividing said samples into frames, each frame containing a given number of samples,

signal processing means included in said front end processing means and coupled to said logic means and responsive to said samples in said frame to provide at an output a series of speech parameters indicative of the nature of said speech content in each of said frames and including means for determining which of said frames contain speech by providing a smoothed histogram of the input energy in each of said frame to determine which of said frames contain speech according to said input energy,

speaker modeling means coupled to said output of said signal processing means in a first selectable mode and operative



to provide a model of speech characteristics for said speaker in said first mode, said signal modeling means including processor means responsive to said speech parameters within each speech frame to provide a covariance matrix indicative of said speech parameters and coupled to said storage means to store at a second plurality of locations said matrix to employ said matrix as a model during a second selectable mode of operation,

speaker recognition means coupled to the output of said signal processing means in a second selectable mode operative to identify the speaker from the model which has been stored in said first mode and responsive to said parameters including comparison means for comparing the average current parameter with said stored speaker models during said speech frames as provided by said front end processing means, over a predetermined number of frames whereby a favorable comparison is indicative of a known speaker for which a model is stored, and

means coupled to said output of said signal processing means for selecting either said first or second modes.

4,837,831

METHOD FOR CREATING AND USING MULTIPLE-WORD SOUND MODELS IN SPEECH RECOGNITION

Laurence Gillick, Brookline; Paul G. Bamberg, Framingham; James K. Baker, West Newton, and Robert S. Roth, Newtonville, all of Mass., assignors to Dragon Systems, Inc., Newton, Mass.

Filed Oct. 15, 1986, Ser. No. 919,885
Int. Cl.[4] G10L *5/00*
U.S. Cl. 381—43 **24 Claims**

1. A prefiltering method for use in a speech recognition system, said method comprising:

receiving an acoustic description of an utterance to be recognized;

storing a vocabulary of words;

storing a plurality of probabilistic acoustic cluster models and using individual ones of said acoustic cluster models to represent at least a part of more than one vocabulary word;

comparing at least a portion of said acoustic description from said utterance against each of said cluster models, and producing a cluster likelihood score for each cluster model against which such a comparison is made;

using the cluster likelihood score produced for each cluster model to calculate a prefilter score for words represented by that cluster model; and

selecting a subset of said vocabulary words to undergo a more lengthy comparison against said utterance to be recognized based on the prefilter scores associated with said vocabulary words;

wherein:

said acoustic description of said utterance to be recognized includes a succession of acoustic descriptions representing a sequence of sounds associated with said utterance;

said cluster models each comprises a succession of probabilistic acoustic models, for modeling a sequence of sounds associated with each word represented by said cluster model;

said comparing includes comparing a succession of said acoustic descriptions from the utterance to be recognized against the succession of acoustic models from each of a plurality of cluster models and producing a cluster likelihood score for each such cluster model as a result of that comparison; and

said cluster models are wordstart cluster models, that is, models which only represent the initial portion of many words in said vocabulary.

4,837,832

ELECTRONIC HEARING AID WITH GAIN CONTROL MEANS FOR ELIMINATING LOW FREQUENCY NOISE

Sol Fansbel, 6 Tatra Ridge Rd., Woodstock, N.Y. 12498

Filed Oct. 20, 1987, Ser. No. 111,438
Int. Cl.[4] H04R *25/00, 25/04;* **H03G** *3/20, 7/00*
U.S. Cl. 381—68.4 **7 Claims**

1. A hearing aid device for the compensation of hearing deficiencies and for enhancing the intelligibility of audio-frequency speech signals corrupted by low frequency noise, said device comprising:

a signal input transducer for converting input audio speech signals to electric speech signals,

an output terminal adapted for connection to an output transducer for supplying acoustic output signals compensated for a hearing deficiency of a hearing-impaired person, and

a control circuit having an input terminal connected between the output side of said input transducer and said output terminal, said control circuit comprising:

summing means for summing signals applied thereto and producing a sum signal;

a low-frequency channel, including a first band-pass filter,

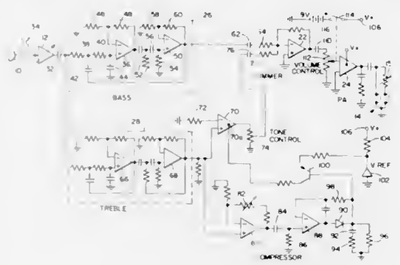
connected between said input terminal and said summing means for coupling to said summing means a low-frequency signal which is substantially free of frequency components above a selected frequency;

a high-frequency channel connected in parallel with said low-frequency channel between said input terminal and said summing means and comprising:

a second band-pass filter connected to said input terminal for producing from said electric speech signal a high-frequency signal which is substantially free of frequency components below said selected frequency,

a variable gain amplifier connected to the output of said high-pass filter and having a gain control terminal and an output terminal, for compressing said high-frequency signal and producing a compressed high-frequency signal at its output terminal,

means for generating a control signal for controlling the gain of said amplifier including means connected to the output



of said high-frequency filter for controllably amplifying said high-frequency signal, means for rectifying said amplified high-frequency signal, and means for comparing the level of such rectified high-pass signal against a reference level and applying to said gain control terminal a signal proportional to the difference, for varying the gain of said amplifier inversely with the amplitude of said rectified high-frequency signal, and

a potentiometer connected between the output terminal of said amplifier and said summing means for coupling a controllable portion of said compressed high-frequency signal to said summing means;

a power amplifier having an input terminal and an output terminal connected to said device output terminal; and

a potentiometer connected between the output of said summing means and the input terminal of said power amplifier for coupling a controllable portion of said sum signal to said power amplifier.

4,837,833

MICROPHONE WITH FREQUENCY PRE-EMPHASIS CHANNEL PLATE

Peter L. Madaffari, Elgin, Ill., assignor to Industrial Research Products, Inc., Elk Grove Villiage, Ill.

Filed Jan. 21, 1988, Ser. No. 146,483
Int. Cl.[4] H04R *25/00 1/20*
U.S. Cl. 381—69 **8 Claims**

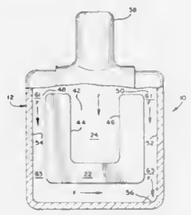
1. A frequency-compensated hearing aid microphone assembly for providing from incoming ambient sound a frequency-varying differential actuating pressure to a transducer-operating diaphragm comprising:

a hollow housing having housing walls defining a main chamber therein;

a compliant diaphragm disposed to divide the interior of said main chamber into a first chamber on a first side of said diaphragm and a second chamber on the second side of said diaphragm;

transducing means responsive to the movement of said diaphragm for producing an electrical signal responsively to said movement;

acoustically isolating chamber partition means disposed in said first chamber between the central region of said diaphragm and one or more confronting inner walls of said first chamber to acoustically divide said first chamber into an excitation chamber confronting said central region of said diaphragm and one or more elongated inertance-forming transfer chambers peripheral thereto and having first and second ends;



input port means configured to deliver incoming ambient sound to said excitation chamber;

transfer chamber inlet port means acoustically communicating between said excitation chamber and said first ends of each said transfer chamber; and

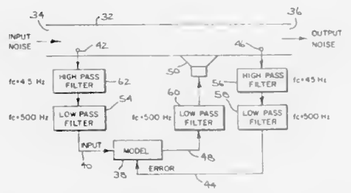
transfer chamber outlet port means acoustically communicating between said second chamber and and a portion of each said transfer chamber remote from said first end thereof.

4,837,834

ACTIVE ACOUSTIC ATTENUATION SYSTEM WITH DIFFERENTIAL FILTERING

Mark C. Allie, Oregon, Wis., assignor to Nelson Industries, Inc., Stoughton, Wis.

Filed May 4, 1988, Ser. No. 189,994
Int. Cl.[4] G10K *11/16*
U.S. Cl. 381—71 **36 Claims**



1. In an acoustic system having an input for receiving an input acoustic wave and an output for radiating an output acoustic wave, an active attenuation method for attenuating undesirable said output acoustic wave by introducing a cancelling acoustic wave from an output transducer, comprising:

sensing said input acoustic wave with an input transducer and providing an input signal;

sensing the combined said output acoustic wave and said cancelling acoustic wave from said output transducer with an error transducer and providing an error signal;

modeling said acoustic system with an adaptive filter model having a model input from said input transducer and an error input from said error transducer and outputting a correction signal to said output transducer to introduce the cancelling acoustic wave such that said error signal approaches a given value;

bandpass filtering said input signal;

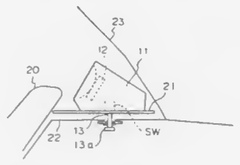
bandpass filtering said error signal to a narrower range than said bandpass filtered input signal.

4,837,835

SPEAKER SYSTEM FOR MOTOR VEHICLES WITH AN ALARM DEVICE

Fumio Murayama, Tendo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 31, 1988, Ser. No. 175,788
Claims priority, application Japan, Apr. 1, 1987, 62-049196[U]
Int. Cl.[4] H04B *1/00; G08B 13/14*
U.S. Cl. 381—86 **3 Claims**



1. A speaker system for fixing a speaker to the vehicle body of a motor vehicle comprising:

a speaker unit;

a cabinet holding said speaker unit;

a fixing means for fixing said cabinet on a part of said vehicle body of said motor vehicle;

a detection switch having a contact element in connection with said fixing means, and a switch contact, said contact element being separated from said switch contact when said switch contact is shifted by a change in a state of fixing by said fixing means; and

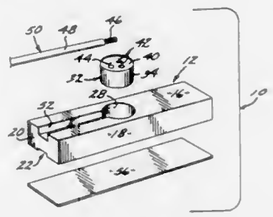
an alarming means electrically connected to said detecting switch, for generating an alarm when said contact element and said switch contact are separated.

4,837,836

MICROPHONE PICKUP SYSTEM

Lester M. Barcus, 16226 Wayfarer La., Huntington Beach, Calif. 92649

Filed Sep. 30, 1982, Ser. No. 430,749
Int. Cl.[4] G10D *5/00*
U.S. Cl. 381—118 **7 Claims**



1. A microphone pickup module having a generally elongated pattern of response, which comprises:

a body having an elongated channel extending therethrough between generally oppositely facing open ends; and

a microphone mounted in said body and having a sound-sensitive surface area in communication with said channel intermediate said ends of said channel;

said elongated channel being generally flat, whereby said elongated pattern of response is also generally flat;

said sound-sensitive surface area being substantially centered along the length of said channel; and

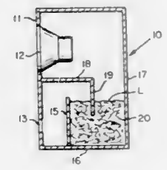
said channel being substantially straight.

4,837,837

LOUDSPEAKER

Anthony R. Taddeo, 800 Corwin Rd., Rochester, N.Y. 14610

Filed Nov. 5, 1987, Ser. No. 117,040
Int. Cl.[4] H04R *1/28;* **G10K** *13/00*
U.S. Cl. 381—158 **1 Claim**



1. In combination with a loudspeaker housing having therein a pair of openings, a loudspeaker mounted in and closing one of said openings, and a plurality of baffles mounted in said housing and forming therein a labyrinth communicating at one end with said loudspeaker and at its opposite end with the other of said openings in said housing, an improved high frequency sound damping material comprising

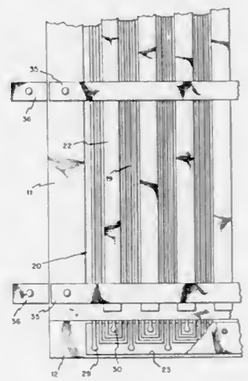
a quantity of mohair fibers positioned in said housing and operatively filling a portion of said labyrinth to a level such that all sound waves emanating from said loudspeaker must pass through said mohair fibers before reaching said other opening, said mohair fibers having a scaliness less than that of wool fibers.

4,837,838

ELECTROMAGNETIC TRANSDUCER OF IMPROVED EFFICIENCY

F. Bruce Thigpen, and David E. Collie, both of Tallahassee, Fla., assignors to Eminent Technology, Inc., Tallahassee, Fla.

Filed Mar. 30, 1987, Ser. No. 31,594
Int. Cl.[4] H04R *7/02, 7/04*
U.S. Cl. 381—158 **23 Claims**



1. An electromagnetic transducer, comprising support

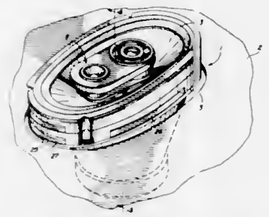
means, a flexible diaphragm having its perimeter mounted on said support means, elongated electrical conductor means mounted on said diaphragm, said conductor means having electrical connection means, a plurality of spaced first and a plurality of spaced second elongated permanent magnet means mounted on said support means parallel to but offset from each other and on opposite sides of said diaphragm, each first and second permanent magnet means having one pole on a side thereof which is contiguous to said diaphragm and an opposite pole on its remote side, each first and second permanent magnet means having poles of opposite polarity contiguous to said diaphragm, and said conductor means extending parallel to each first and second permanent magnet means and in the magnet flux field therebetween, in which each first and second permanent magnet means comprises a magnetic strip arranged in an elongated U-shaped channel of ferrous material, said channel having a web, the web of the channel being mounted on said support means, thereby causing an increase in flux field denstity at the pole which is contiguous to the diaphragm.

4,837,839

COMPACT SPEAKER ASSEMBLY WITH IMPROVED LOW FREQUENCY RESPONSE

Jay E. S. Andrews, Glendale, Ariz., assignor to AVM Hess, Inc., Phoenix, Ariz.

Filed Aug. 11, 1987, Ser. No. 84,675
Int. Cl.[4] H04R *1/24, 7/12*
U.S. Cl. 381—199 **10 Claims**



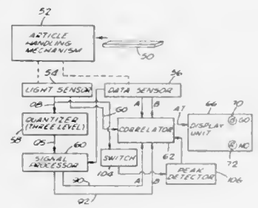
1. A speaker transducer assembly comprising:
(A) a magnet system having a circular air gap;
(B) a cylindrical voice coil form having a first section hereof extending into said air gap and a second section disposed outside said air gap;
(C) a voice coil wound circumferentially onto said first section of said voice coil form;
(D) first and second speaker diaphragms;
(E) frame means supporting said first and second speaker diaphragms in over and under juxtaposition and coaxially aligned with one another and with said cylindrical form;
(F) said first speaker diaphragm having an outer periphery and a central opening defining an inner periphery, said inner periphery of said first speaker diaphragm being attached to said second section of said cylindrical voice coil form for coaxial movement therewith;
(G) said second speaker diaphragm having an outer periphery and a central opening defining an inner periphery, said inner periphery of said second speaker diaphragm being attached to said second section of said cylindrical voice coil form for coaxial movement therewith and in unison with said inner periphery of said first speaker diaphragm; and
(H) an intermediate baffle coaxially positioned between said first and second speaker diaphragms, said intermediate baffle having an outer periphery rigidly supported by said frame and a central opening defining an inner periphery terminating in such a manner that the inner periphery of said baffle is slightly spaced from said second section of said cylindrical voice coil form.

4,837,840

SYSTEM FOR VERIFYING AUTHENTICITY OF VARIOUS ARTICLES

Robert N. Goldman, Honolulu, Hi., assignor to Light Signatures, Inc., Los Angeles, Calif.

Filed Feb. 26, 1987, Ser. No. 19,463
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—7 **4 Claims**



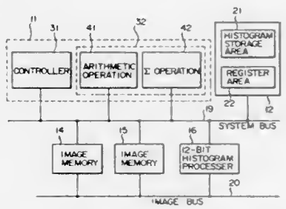
1. A system for developing test values of a substantially binary characteristic of an article that is to be authenticated on the basis of such values representing said characteristic, said system comprising:
means to provide scale signals representative of said substantially binary characteristic at a specific location of said article;
means for converting said scale signals to one of three representative values of quantized signals, each being indicative of one of three distinct signal ranges encompassing a range approximating substantially average values and one range above and one range below said substantially average values;
means for providing said quantized signals in a binary format; and
means for rejecting quantized signals for a location of said article representing said range approximating substantially average values.

4,837,841

METHOD FOR REALIZING HIGH-SPEED STATISTIC OPERATION PROCESSING AND IMAGE DATA PROCESSING APPARATUS FOR EMBODYING THE METHOD

Akira Kasano, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 12, 1987, Ser. No. 61,285
Claims priority, application Japan, Jun. 16, 1986, 61-139815
Int. Cl.[4] G06K *9/46*
U.S. Cl. 382—18 **19 Claims**



1. A method for executing a statistic operation between image data A and B at high speed, where the image data A is constituted by pixel group ΣA_{ij} consisting of N pixels A_{ij} where N is a positive integer more than 2; i and j respectively indicate a row position and a column position, and density data A_{dij} of each pixel A_{ij} is expressed by n(2m)-bit data where n and

m are positive integers, and the image data B is constituted by pixel group ΣB_{ij} consisting of N pixels B_{ij}, and density data B_{dij} of each pixel B_{ij} is expressed by n(2m)-bit data, comprising:
carrying out, in accordance with an input ΣAB processing command generated by a control unit and input to a calculation unit, a 3m-bit histogram operation for obtaining histogram $h_U(2^{2m}k_U+k_B)$ representing a number of sets of pixels A_{ij} and B_{ij}, in which a value of upper m-bit portion a_{Uij} of designated 2m-bit portion a_{ij} is k_U and a value of designated 2m-bit portion b_{ij} of the pixel B_{ij} at a same position as the pixel A_{ij} is k_B, from a designated 2m-bit portion a_{ij} of the pixel group ΣA_{ij} and a designated 2m-bit portion b_{ij} of the pixel group ΣB_{ij}, and calculating an upper correlation weight T_U from equation (1) using the histogram $h_U(2^{2m}k_U+k_B)$:

$$T_U = \sum_{k_U=0}^{2^m-1} \sum_{k_B=0}^{2^{2m}-1} h_U(2^{2m}k_U + k_B) \cdot k_U \cdot k_B \quad (1)$$

carrying out, in accordance with the input ΣAB processing command, the 3m-bit histogram operation for obtaining histogram $h_L(2^{2m}k_L+k_B)$ representing the number of sets of pixels A_{ij} and B_{ij}, in which a value of lower m-bit portion a_{Lij} of the designated 2m-bit portion a_{ij} is k_L and the value of the designated 2m-bit portion b_{ij} of pixel B_{ij} at the same position as the pixel A_{ij} is k_B, from the designated 2m-bit portion a_{ij} of the pixel group ΣA_{ij} and the designated 2m-bit portion b_{ij} of the pixel group ΣB_{ij}, and calculating a lower correlation weight T_L from equation (2) using the histogram $h_L(2^{2m}k_L+k_B)$:

$$T_L = \sum_{k_U=0}^{2^m-1} \sum_{k_B=0}^{2^{2m}-1} h_L(2^{2m}k_L + k_B) \cdot k_L \cdot k_B \quad (1)$$

and,
calculating, in accordance with the input ΣAB processing command input to said calculation unit and generated by said control unit, correlation weight T_{ab} from the calculated upper and lower correlation weights T_U and T_L using equation (3):

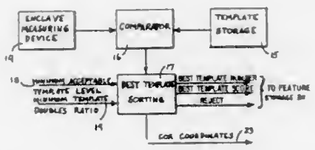
$$T_{ab}=2^m T_U+T_L \quad (3).$$

4,837,842

CHARACTER AND PATTERN RECOGNITION MACHINE AND METHOD

Arthur W. Holt, 100 Caroline St., Oxford, Md. 21654

Filed Sep. 19, 1986, Ser. No. 909,388
Int. Cl.[4] G06K *9/46, 9/00*
U.S. Cl. 382—26 **68 Claims**



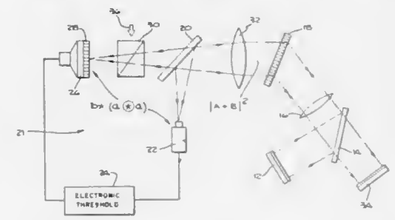
1. In a hand print character recognition system comprising,
(a) means for creating an electrical binary black/white "image" of one or more hand printed characters,
(b) means for selecting a plurality of centers of recognition (CORs) within said binary black/white image as reference points and measuring the characteristic enclave of the black/white image immediately surrounding the CORs,
(c) means for storing a library of templates of said measurements around the CORs for a plurality of known exemplary character images,
(d) means for comparing said library of templates to corresponding measurements made around the CORs of images whose class is unknown to produce "template scores" proportional to the similarity of the enclaves of the known image to the enclaves measured by templates,
(e) means for expressing the generic shape of a character as being a "character equation" involving template scores developed on an unknown image, and
(f) means for evaluating each character equation, including comparing the values of such equations, and selecting the best value to determine the generic name of the unknown character.

4,837,843

HYBRID OPTICAL AND ELECTRONIC ASSOCIATIVE MEMORY

Yuri Owechko, Newbury Park, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 19, 1987, Ser. No. 64,901
Int. Cl.[4] G06K *9/76*
U.S. Cl. 382—31 **13 Claims**



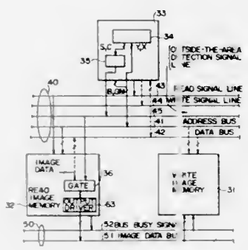
1. A hybrid optical and electronic associative memory system capable of recalling a stored image when the memory system is provided with a distorted input image which is a partial or distorted version of the stored image, comprising:
a hologram including at least one stored image, said stored image comprising a first stored image of a first object, said first stored image being recorded with a first reference beam, said first stored image being a transform of a first real image of said first object;
image transforming means for providing a transform of the distorted input image to said hologram, so as to generate a distorted reference beam;
means for transforming said distorted reference beam into a correlation image related to said first stored image and distorted input image; and
means for enhancing said correlation image, including:
an electro-optical thresholding means for thresholding said correlation image and eliminating low level spurious light therein while preserving shift-invariance, said electro-optical thresholding means including an electronic threshold processor for thresholding said correlation image, and
optical means for amplifying and conjugating the thresholded correlation image to generate an amplified correlation image signal, wherein said optical means includes a spatial light modulator.

4,837,844

IMAGE PROCESSING APPARATUS

Yukio Urushibata, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 27, 1987, Ser. No. 43,251
Int. Cl.[4] G06K 9/16
U.S. Cl. 382—44 9 Claims



1. An image processing apparatus for reading out image data stored in a first image memory, performing affine conversion of the readout image data, and writing the converted image data in a second image memory, comprising:

an affine conversion address generator for outputting an affine conversion address, used for reading out the image data, and a read control signal based on a raster address;

an outside-the-image memory area detector, connected to the affine conversion address generator, for detecting whether the outputted affine conversion address from the affine conversion address generator falls outside an image memory area;

a control bus, connected to the affine conversion address generator, the outside-the-image memory area detector, and the first and second image memories, having a read signal line for transferring a read signal, an outside-the-area detection signal line for transferring a detection signal from the outside-the-image memory area detector, an address bus for transferring the affine conversion address, and a data bus for transferring data of various types;

an image bus, connected to the first and second image memories, having an image data bus for transferring the image data read from the first image memory and a bus busy signal line for transferring a busy signal indicative of the image data transfer to the image bus for operating independently of said control bus in order to transfer the image data and the busy signal;

first image memory control means for reading out, in response to the read signal on the control bus, image data from a location of the first image memory defined by the affine conversion address and outputting the busy signal to the bus busy signal line;

a gate circuit, connected between the first and second image memories, for outputting, in response to the detection signal on the outside-the-area detection signal line, the image data read out from said first image memory directly or after converting it to predetermined image data; and

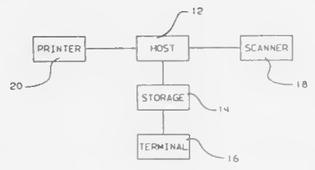
second image memory control means for storing, in response to the busy signal on the bus busy signal line, the image data on the image data bus in the second image memory in accordance with the raster address.

4,837,845

METHOD FOR ROTATING A BINARY IMAGE

David R. Pruett, Sangerties; Gerald Goertzel, White Plains, and Gerhard R. Tompson, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 793,611, Oct. 31, 1985, abandoned.
This application Feb. 2, 1988, Ser. No. 150,466
Int. Cl.[4] G06K 9/32
U.S. Cl. 382—46 4 Claims



1. A method for rotating binary data by 90 degrees, comprising the steps of: storage said data in a matrix arranged in r rows by c columns, where r may be equal to c, information in each row being stored in a number of bytes, each byte having b bits, there being c/b bytes in each said row;

separating said matrix into groups of bits of rotatable size;

arranging the groups of bits into registers so that those bits to be exchanged line up in corresponding bit positions of different registers and all the bits to be exchanged can be exchanged in parallel;

simultaneously exchanging selected group positions between registers to thereby simultaneously transpose first selected bit positions with second selected bit positions in said each group under the control of a mask instruction;

storing said simultaneously transposed groups of bits into predetermined registers; and

repeating said steps of arranging, exchanging and storing until said matrix has been rotated by 90 degrees.

4,837,846

METHOD OF THE IMAGE PROCESSING

Masaaki Oyabu, Aichi; Masamichi Sugiura, Toyokawa; Hirofumi Hasegawa, Toyokawa, and Munehiro Nakatani, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 18, 1985, Ser. No. 777,214
Claims priority, application Japan, Sep. 19, 1984, 59-197448
Int. Cl.[4] G06K 9/00
U.S. Cl. 382—50 2 Claims

1. A method of image processing for sampling the concentration of each portion of an image divided into a unit of picture elements and for binarizing the concentrations of the picture elements in the unit into submatrices of predetermined size to obtain a bi-level image, being characterized in that the bi-level image is obtained from concentrations that have been sampled according to the steps as follows:

(a) calculating the average of the concentrations of the picture elements at every submatrix to which the picture elements belong;

(b) determining the number of picture elements in the submatrix to be treated as either one of black or white according to the calculated average;

(c) assigning the picture elements in the submatrix to be treated as either one of black or white up to the number determined in the step (b) in order of concentration of each picture element in the submatrix;

(d) deciding, during the prosecution of the step (c), whether the total number of elements that still remain to be assigned is smaller than the number of the elements having a similar concentration to be assigned next, and

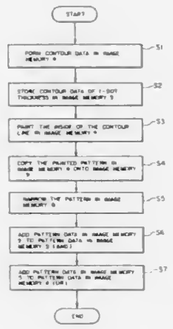
(e) assigning the elements to be assigned next in accordance with a predetermined concentration, which is calculated as either a sum or an average of concentrations of the elements surrounding each element having the same concentration when the number of elements that remain to be assigned is smaller than the elements that would be assigned next.

4,837,847

IMAGE PROCESSING APPARATUS

Akifumi Shirasaka; Kensaku Tanaka, both of Yokohama, and Masaki Hamada, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1988, Ser. No. 148,712
Claims priority, application Japan, Feb. 3, 1987, 62-23856; Feb. 10, 1987, 62-29043; Jun. 30, 1987, 62-160999; Jun. 30, 1987, 62-161000
Int. Cl.[4] G06K 9/44
U.S. Cl. 382—55 5 Claims



1. An image processing apparatus comprising:

input means for inputting contour line data of image information;

means for making a contour line pattern of said image information on the basis of said contour line data;

means for making a painted pattern in which the inside of the contour line pattern was painted;

means for narrowing said painted pattern, thereby making a narrow painted pattern;

means for obtaining an AND of said contour line pattern and said narrow painted pattern, thereby obtaining a pattern for correction; and

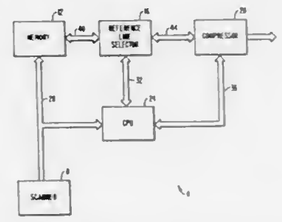
contour line correcting means for obtaining an exclusive-OR of said painted pattern and said pattern for correction.

4,837,848

APPARATUS FOR SELECTING A REFERENCE LINE FOR IMAGE DATA COMPRESSION

Alex E. Henderson, El Granada; Frederick L. Drain, So. San Francisco, and Lawrence G. Roberts, Woodside, all of Calif., assignors to NetExpress Systems, Inc., San Mateo, Calif.

Filed Mar. 27, 1987, Ser. No. 32,102
Int. Cl.[4] G06K 9/36
U.S. Cl. 382—56 24 Claims



1. In an image processing system wherein an image is represented by a series of image scan lines, each image scan line in turn being represented by a series of bits, and wherein an image scan line is communicated from one image processing element to another image processing element by encoding the image scan line in a compressor using a reference image scan line, an apparatus for selecting a reference image scan line from a plurality of candidate reference image scan lines comprising:

means for receiving a plurality of candidate reference image scan lines;

means for receiving an image scan line to be encoded;

means for simultaneously comparing the bits from the image scan line to be encoded with corresponding bits from a plurality of candidate reference image scan lines;

means, connected to the comparing means, for counting the number of bits in each candidate image scan line unequal to the corresponding bits in the image scan line to be encoded;

means, connected to the counting means, for determining which candidate reference image scan line has a least number of bits unequal to the corresponding bits in the image scan line to be encoded; and

means, connected to the determining means, for indicating which candidate reference image scan line has a least number of bits unequal to the corresponding bits in the image scan line to be encoded.

4,837,849

STAND-UP PLASTIC BAG AND METHOD OF MAKING SAME

Laurence R. Erickson; R. Douglas Behr, and Roger D. Vrooman, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 21, 1988, Ser. No. 171,053
Int. Cl.[4] B65D 30/16
U.S. Cl. 383—104 12 Claims

1. A stand-up plastic bag, comprising:

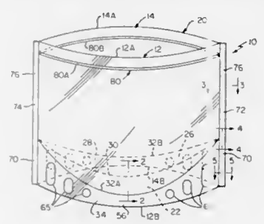
(a) a pair of front and rear side walls defining an open bag mouth at upper edges thereof; and

(b) a pair of front and rear bottom gusset walls being disposed between said side walls;

(c) said front and rear side walls and said front and rear bottom gusset walls being composed of a multi-layered film of first and second thermoplastic materials, said first material being on interior surfaces of said walls and heat-sealable at a temperature within a first temperature range, said second material being on exterior surfaces of said walls and heat-sealable at a temperature within a second

temperature range greater than said first temperature range;

(d) said bottom gusset walls having upper portions interconnected together to form a bottom wall extending between said front and rear side walls, said bottom gusset walls having lower portions joined by heat seals made within said first temperature range to lower portions of said front and rear side walls at contiguous portions of said first material on said interior surfaces to form a support band



connected to and extending below the periphery of said bottom wall;

(e) said front and rear bottom gusset walls also having opposite longitudinal edges joined together by heat seals made within said second temperature range at contigous portions of said second material on said exterior surfaces thereof which complete formation of said support band as a continuous self-standing structure and define with said bottom wall a stand-up base on said bag.

4,837,850

HIERARCHIC SYNCHRONIZATION METHOD AND CIRCUIT ARRANGEMENT FOR EXCHANGES OF A MESH TELECOMMUNICATION NETWORK

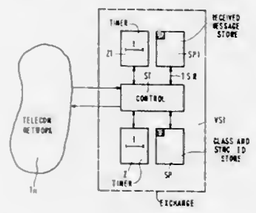
Manfred Maisel, Igensdorf; Erich Kölle, and Gerhard Hauenstein, both of Nürnberg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Aug. 31, 1987, Ser. No. 91,672

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1986, 3629931

Int. Cl.[4] H04L *7/00, 7/10*

U.S. Cl. 455—58 **6 Claims**



1. A hierarchical synchronization method for a mesh network of telecommunications exchanges wherein the synchronizing clock pulses of each exchange are assigned a class identification corresponding to a hierarchical synchronization order of the exchanges in the network, such method comprising:

assigning to each exchange a synchronization identification signifying the relative priority of the clock pulses of such exchange in relation to clock pulses of other exchanges in said network;

transmission by each exchange of its class and synchronization identifications to all exchanges connected thereto;

determination in each exchange, from the class and synchronization identifications received thereby, of the exchange connected thereto having the highest class identification and the highest synchronization identification in such class, the synchronizing clock pulses of such highest order exchange being master clock pulses for exchanges connected thereto; and

reception in each exchange of master clock pulses from the highest order exchange connected thereto and use of such master clock pulses by the receiving exchange for synchronizing the receiving exchange.

4,837,851

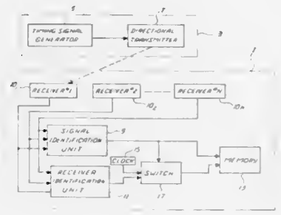
MONITORING TECHNIQUE FOR DETERMINING WHAT LOCATION WITHIN A PREDETERMINED AREA IS BEING VIEWED BY A PERSON

Lee S. Weinblatt, 797 Winthrop Rd., Teaneck, N.J. 07666

Filed Aug. 28, 1987, Ser. No. 90,458

Int. Cl.[4] H04B *17/00, 1/34;* **G08B** *5/22*

U.S. Cl. 455—67 **27 Claims**



1. An apparatus for determining what portion of a predetermined area is being looked at by an individual person, comprising:

a portable unit including means for securing such unit so as to be worn by a person, and a transmitter means for emitting a viewer signal in substantially the direction in which said person is looking;

a stationary unit located in a selected portion of said predetermined area and including a receiver means for detecting said viewer signal to generate a receiver output signal;

wherein said transmitter means includes directional means for narrowing the spread of said viewer signal to direct said viewer signal in substantially only the direction in which said person is looking.

4,837,852

ELECTRONIC TUNING CIRCUIT FOR AM RECEIVER WHICH IS EASY TO EFFECT TRACKING ADJUSTMENT

Noboru Takada, and Hajime Yokoyama, both of Saitama, Japan, assignors to Toko, Inc., Tokyo and Matsushita Electric Industrial Co., Ltd., Osaka, both of, Japan

Filed Jun. 13, 1986, Ser. No. 874,067

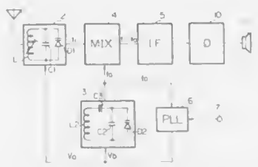
Claims priority, application Japan, Jun. 17, 1985, 60-131540; Jun. 28, 1985, 60-143508; Jan. 9, 1986, 61-2733

Int. Cl.[4] H04B *1/26*

U.S. Cl. 455—197 **5 Claims**

1. An electronic tuning circuit for an AM receiver wherein an oscillation frequency control voltage for setting an oscillation frequency of a local oscillator circuit to be higher or lower than a tuned frequency by an amount corresponding to an intermediate frequency is supplied thrugh a preset system, comprising: an antenna tuning circuit including a first tuning coil for effecting tracking adjustment, a fixed capacitor, and a first variable capacitance diode; and a local oscillator circuit including a second tuning coil, fixed capacitors, and a second variable capacitance diode which are connected so that in an oscillation output that is automatically adjusted to a desired

frequency is provided by said local oscillator circuit, said electronic tuning circuit being designed such that dispersion in inductance values of said first and second tuning coils and



dispersion in capacitances in said antenna tuning circuit and local oscillator circuit, are set within the range of ±5%, and wherein tracking errors are decreased by adjusting the inductance of said first tuning coil alone.

4,837,853

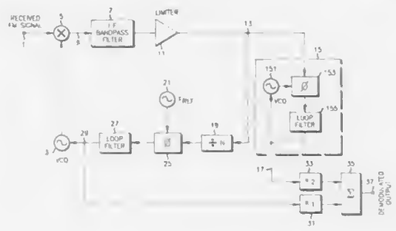
DUAL PORT FM DEMODULATION IN PHASE LOCKED RECEIVERS

Joseph P. Heck, Ft. Worth, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 5, 1987, Ser. No. 58,411

Int. Cl.[4] H04B *1/16, 1/12*

U.S. Cl. 455—208 **8 Claims**



1. A receiver for recovering modulation signals frequency modulated on a received carrier signal, comprising:

frequency conversion means for converting the carrier frequency of the received signal to an intermediate frequency and producing an intermediate frequency signal, the frequency conversion means including carrier tracking means for

producing a low frequency recovered modulation signal substantially proportional to static errors and slow variations in the carrier signal;

frequency demodulation means for recovering the frequency modulation information carried by the intermediate frequency signal and producing a high frequency recovered modulation signal; and

combining means for weighting and combining the low frequency and high frequency recovered modulation signals and producing a recovered modulation signal with substantially flat frequency response.

4,837,854

PAGING RECEIVER HAVING A NOISE-IMMUNE VERIFICATION CIRCUIT FOR DISABLING BATTERY SAVING OPERATION

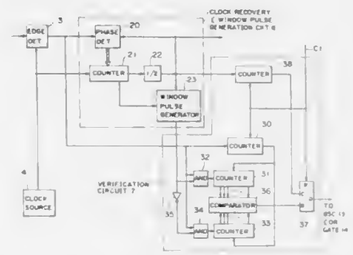
Takashi Oyagi, and Toshifumi Sato, both of Tokyo, Japan, assignors to Nec Corporation, Tokyo, Japan

Filed Jun. 17, 1987, Ser. No. 63,055

Claims priority, application Japan, Jun. 18, 1986, 61-140305

Int. Cl.[4] H04B *1/16;* **H04Q** *9/14*

U.S. Cl. 455—343 **9 Claims**



1. A selective calling radio paging receiver adapted to receive a digital bit stream, comprising:

battery saving means for interrupting power supply to a high power drain unit of the receiver at periodic intervals;

clock recovery means for recovering clock pulses from the received bit stream;

window pulse generator means for generating window pulses in synchronism with said clock pulses;

edge detector means for detecting the leading and trailing edges of each pulse in said bit stream and generating a transition pulse in response to the detection of each of the leading and trailing edges;

first counter means for counting said transition pulse which occurs within the period of each of said window pulses;

second counter means for counting said transition pulse which occurs during the interval between said window pulses; and

verification means for detecting when the count in said first counter means is greater than the count in said second counter means and causing said battery saving means to cease the interruption of power supply.

4,837,855

NON-BLOCKING OPTICAL SPACE SWITCH

Kazuo Hajikano, Machida; Tosbio Shimoe; Jyoei Kamoi, both of Kawasaki; Ippei Sawaki, Sagamihara, and Koso Murakami, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP87/00027, § 371 Date Aug. 18, 1987, § 102(e) Date Aug. 18, 1987, PCT Pub. No. WO87/04886, PCT Pub. Date Aug. 13, 1987

PCT Filed Jan. 19, 1987, Ser. No. 117,148

Claims priority, application Japan, Jan. 31, 1986, 61-18084; Feb. 28, 1986, 61-43319

Int. Cl.[4] H04B *9/00*

U.S. Cl. 455—600 **8 Claims**

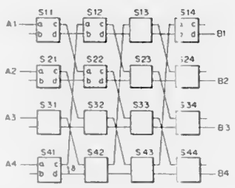
1. An optical space switch comprising:

switch elements, each having a non-switched state and a switched state, and each having two input terminals and two output terminals, said switch elements arranged in an n×n matrix form of n columns and n rows, where n is an integer;

one input terminal of each of said switch elements arranged in the first column of each row of the matrix being used as

one of n input highways, and the other input terminal thereof being used as a dead terminal,

one output terminal of each of said switch elements arranged in an n'th column of each row of the matrix being used as one of n output highways, and the other output terminal thereof being used as a dead terminal,



the output terminals of each of said switch elements except for said switch elements arranged in the n'th column of each row of the matrix being respectively connected to the input terminals of the switch elements of a next column,

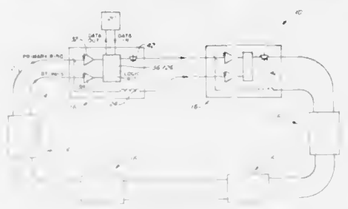
any one of said n input highways being connectable to any one of said n output highways by switching no more than one of said switch elements to the switched state.

4,837,856

FAULT-TOLERANT FIBER OPTIC COUPLER/REPEATER FOR USE IN HIGH SPEED DATA TRANSMISSION AND THE LIKE

Andrew S. Glista, Jr., 4126 Whispering Lane, Annandale, Va. 22003

Filed May 4, 1987, Ser. No. 45,469
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—601 **40 Claims**



1. A fault-tolerant fiber optic coupler/repeater for use in high speed data transmission, data bus and high speed parallel processors and computers, comprising:

a terminal;

a primary input optical fiber connected to said terminal for conducting a primary optical signal to said terminal;

a bypass optical fiber connected to said terminal for conducting a bypass optical signal to said terminal;

a data input/output device connected to said terminal;

coupling means for coupling said primary input optical fiber, said bypass optical fiber and said data input/output device together, said coupling means including a power splitting device connected to said primary input and to said bypass optical fibers whereby the primary optical signal can be divided to a predetermined ratio;

a primary input photodiode in said primary input optical fiber;

a bypass photodiode in said bypass optical fiber; and

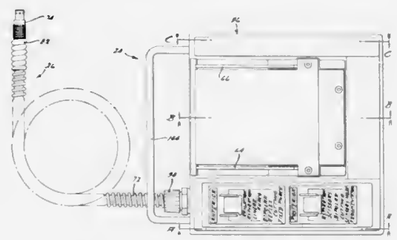
logic means connecting said primary input and bypass photodiodes to said data input/output device for determining which of said primary or said bypass optical signals to send to said data input/output device for use thereby and which of said optical signals to reject, said logic means including a first power amplitude detector connected to said primary input photodiode to receive optical signals therefrom, a second power amplitude detector connected to said bypass photodiode to receive optical signals therefrom, a ratio detector connector to both of said power amplitude detectors for receving signals therefrom and for comparing the power in each of the primary have bypass optical signals to a preselected power range and for selecting the optical signal which is closest to the preselected power range and for rejecting the other optical signal, a select switch connected to said ratio detector to receive a signal therefrom based on the preselected power range and for generating a switching signal corresponding to the selected optical signal, and switch device connected to said select switch to receive said switching signal from said select switch, said switch device including a first switch connected to said primary input photodiode and a second switch connected to said bypass photodiode, said switch device being connected to said data input/output device or to a filter and a signal shaping circuit to boost a signal from a terminal ahead of said terminal.

4,837,857

FOOT PEDAL ASSEMBLY FOR OPHTHALMIC SURGICAL INSTRUMENT

Gregg D. Scheller; Jerry S. Gahn, both of Ballwin; Daniel E. Higgins, St. Louis; Richard Wendt, Des Peres; James Gibeltirra, Florissant, and J. Alan Ritter, Des Peres, all of Mo., assignors to Storz Instrument Company, St. Louis, Mo.

Filed Nov. 6, 1986, Ser. No. 927,807
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—617 **25 Claims**



1. A foot pedal assembly for remotely controlling an instrument, comprising:

a base;

a foot pedal movably mounted to said base; and

means for providing an optically transmitted signal for controlling said instrument in response to the movement of said foot pedal with respect to said base;

wherein said foot pedal is mounted for movement in a generally vertical direction, and said foot pedal assembly also includes two side actuators which are mounted to said base and associated with said signal providing means for providing a further optically transmitted signal for controlling said instrument, said side actuators being arranged so that said foot pedal is interposed between them.

4,837,858

SUBSCRIBER UNIT FOR A TRUNKED VOICE/DATA COMMUNICATION SYSTEM

Sewim F. Ablay, Hoffman Estates; Stuart W. Thro, Cary, and Kenneth J. Zdunek, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 30, 1987, Ser. No. 44,392
Int. Cl.[4] H04M *11/00;* **H04Q** *7/00;* **H04B** *7/14;* **H04J** *3/16*
U.S. Cl. 455—34 **17 Claims**

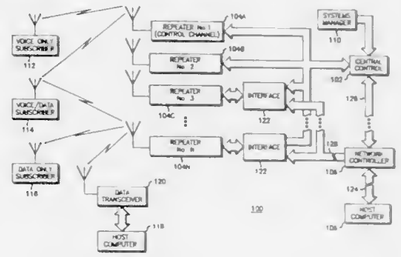
1. In a trunked voice/data communication system having a plurality of voice/data subscriber units for communicating over a plurality of communication channels some of which may be allocated for data traffic, and a particular one of which is reserved as a control channel, a method for operating within said system comprising the steps of:

in at least one of said plurality of voice/data subscriber units;

(a) determining whether at least one of the communication channels has been allocated for data traffic;

(b) transmitting over the control channel, a data channel request if no data channels are currently allocated;

(c) receiving over the control channel, a data channel grant which identifies a particular communication channel as a data channel;



(d) operating, thereafter, on said data channel until receiving a command over said data channel to monitor said control channel.

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DESIGN PATENTS

GRANTED JUN. 6, 1989

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For CLASS	See PATENT NO.
D08-068	301,496
D22-143	301,501

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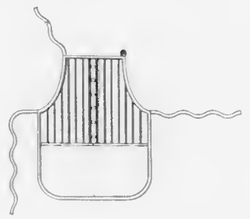
JUNE 6, 1989

301,380
PASTRY FOOD PRODUCT
Florence Bogin, Leawood, Kans., assignor to Ruggels, Inc., Leawood, Kans.
Filed Feb. 28, 1986, Ser. No. 840,720
Term of patent 14 years
U.S. Cl. D1—129

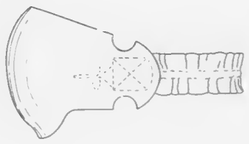
301,381
BIB
Marilyn A. Meade, Pittsburgh, Pa., assignor to Kitchen Quarterback Enterprises, Pittsburgh, Pa.
Filed Nov. 6, 1986, Ser. No. 927,666
Term of patent 14 years
U.S. Cl. D2—226

301,382
APRON
Marilyn A. Meade, Pittsburgh, Pa., assignor to Kitchen Quarterback Enterprises, Pittsburgh, Pa.
Filed Nov. 6, 1986, Ser. No. 927,688
Term of patent 14 years
U.S. Cl. D2—226

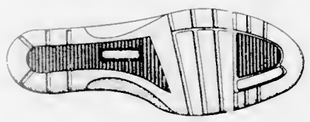


301,383
BASEBALL HAT
Richard K. Pesta, 1420 Hobson Dr., Apt. F, Rantoul, Ill. 61866
Filed Jun. 9, 1986, Ser. No. 872,412
Term of patent 14 years
U.S. Cl. D2—251

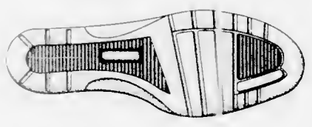
301,384
SHOE GUARD
Sophie Ball, 1238 Waukegan Rd., Glenview, Ill. 60025
Filed Jul. 24, 1986, Ser. No. 888,838
Term of patent 14 years
U.S. Cl. D2—277



301,385
WALKING SHOE
Stanley Weiner, Cincinnati, Ohio, assignor to The United States Shoe Corporation, Cincinnati, Ohio
Filed Dec. 1, 1987, Ser. No. 126,668
Term of patent 14 years
U.S. Cl. D2—308



301,386
WALKING SHOE
Stanley Weiner, Cincinnati, Ohio, assignor to The United States Shoe Corporation, Cincinnati, Ohio
Filed Dec. 1, 1987, Ser. No. 126,666
Term of patent 14 years
U.S. Cl. D2—309

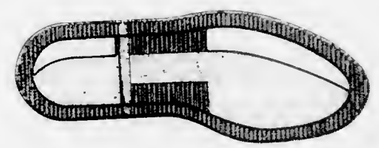


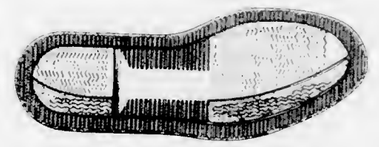
301,387
SHOE UPPER
Juan A. Diaz, Waymouth; Paul D. Brown, Hingham, and Christopher J. Kittle, Cohasset, all of Mass., assignors to Reebok International Ltd., Canton, Mass.
Filed Jul. 20, 1988, Ser. No. 221,625
Term of patent 14 years
U.S. Cl. D2—314

301,388
SHOE UPPER
David E. Miller, Carver, Mass., and Hugh J. Hamill, State College, Pa., assignors to Reebok International Ltd., Canton, Mass.
Filed Nov. 21, 1988, Ser. No. 273,507
Term of patent 14 years
U.S. Cl. D2—314

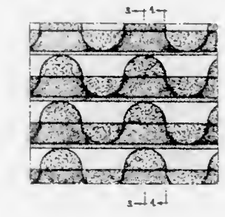
301,389
SHOE UPPER
David E. Miller, Carver, Mass., assignor to Reebok International Ltd., Canton, Mass.
Filed Nov. 23, 1988, Ser. No. 275,737
Term of patent 14 years
U.S. Cl. D2—314

301,391
SHOE SOLE
Gary Duclos, Newburyport, and Stanley Kravetz, Andover, both of Mass., assignors to Highland Import Corporation, Marlboro, Mass.
Filed Jun. 24, 1988, Ser. No. 210,775
Term of patent 14 years
U.S. Cl. D2—320

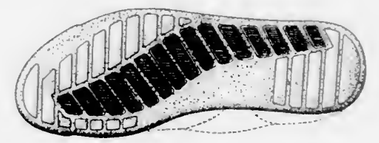




301,390
SHOE SOLE MATERIAL
Paul D. Brown, Hingham, and Juan A. Diaz, Weymouth, both of Mass., assignors to Reebok International Ltd., Canton, Mass.
Filed Jul. 16, 1987, Ser. No. 74,168
Term of patent 14 years
U.S. Cl. D2—320



301,392
SHOE SOLE
Tuan N. Le, New York, N.Y., assignor to Reebok International Ltd., Canton, Mass.
Filed Nov. 9, 1988, Ser. No. 269,002
Term of patent 14 years
U.S. Cl. D2—320



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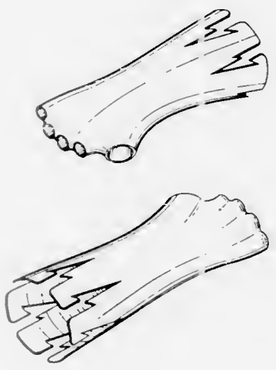
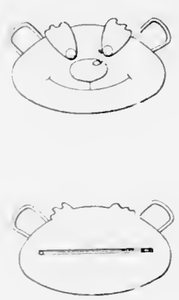
301,393
GLOVE FOR SPORTING EVENTS AND THE LIKE
Eliseo Gonzalez, 10622 Oak Gate La., Dallas, Tex. 75217
Filed Apr. 28, 1986, Ser. No. 857,826
Term of patent 14 years
U.S. Cl. D2—610



301,394
CLOTHING STORAGE BAG
Susan E. Schrader, 205 Washington, #18, Santa Monica, Calif. 90403
Filed Nov. 12, 1985, Ser. No. 805,131
Term of patent 14 years
U.S. Cl. D3—44



301,395
MOUNTING BOARD FOR CAMERA ARMBAND ATTACHMENT
Kent J. Meldrum, 4820 Clearwater Pkwy., Paradise Valley, Ariz. 85253
Filed Jun. 6, 1986, Ser. No. 871,584
Term of patent 14 years
U.S. Cl. D3—100

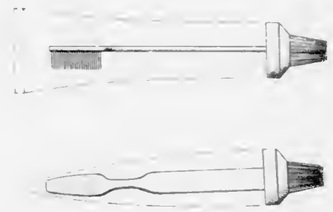
301,396
KNIFE SHEATH
Charles A. Finn, 2955 Cottingham St., Oceanside, Calif. 92054
Filed Aug. 15, 1985, Ser. No. 766,101
Term of patent 14 years
U.S. Cl. D3—102

301,397
TOOTHBRUSH
Sheldon Lacher, 1107 N. Bush St., Apt. 1, Santa Ana, Calif. 92701
Filed Oct. 23, 1987, Ser. No. 111,573
Term of patent 14 years
U.S. Cl. D4—104

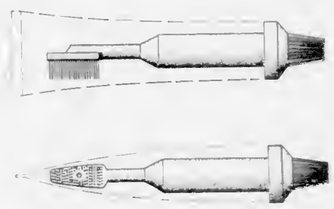
301,398
SHOE POLISHING SET
Henry C. H. Cheung, Room 604, Mary Building, 71 Peking Road, Kowloon, Hong Kong
Filed Mar. 27, 1986, Ser. No. 847,025
Claims priority, application United Kingdom, Sep. 30, 1985, 1029561
Term of patent 14 years
U.S. Cl. D4—102

301,399
DENTAL BRUSH
Robert E. Kreyer, Jr., 623 Redwood Ave., Corte Madera, Calif. 94925
Filed Sep. 16, 1987, Ser. No. 97,442
Term of patent 14 years
U.S. Cl. D4—105

301,400
COMBINED TOOTHBRUSH AND PACKAGING CLOSURE
Robert W. Berendsen, 2233 Kemper La., Cincinnati, Ohio 45206, and David Skrewlowski, Villa Hills, Ky., assignors to Robert W. Berendsen, Cincinnati, Ohio
Filed Mar. 12, 1987, Ser. No. 24,807
Term of patent 14 years
U.S. Cl. D4—108

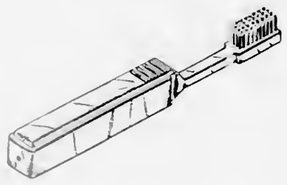


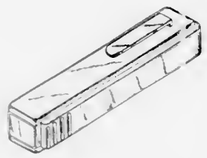
301,401
COMBINED TOOTHBRUSH AND TOOTHPASTE DISPENSING UNIT AND PACKAGING CLOSURE
Robert W. Berendsen, 2233 Kemper La., Cincinnati, Ohio 45206, and David Skrewlowski, Villa Hills, Ky., assignors to Robert W. Berendsen, Cincinnati, Ohio
Filed Mar. 12, 1987, Ser. No. 25,085
Term of patent 14 years
U.S. Cl. D4—108



301,402
TOOTHBRUSH
Alan R. Hirsch, 180 E. Pearson, Chicago, Ill. 60611
Filed May 5, 1987, Ser. No. 47,057
Term of patent 14 years
U.S. Cl. D4—108

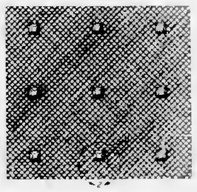
301,403
COMBINED TOOTHBRUSH AND CONTAINER THEREFOR
Emilio Ambasz, 295, Central Park West, New York, N.Y. 10024
Filed Dec. 30, 1987, Ser. No. 139,431
Term of patent 14 years
U.S. Cl. D4—108





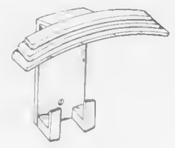
301,404
HAIRBRUSH
Franz Fischer, Triengen, Switzerland, assignor to Trisa Bürstenfabrik AG, Triengen, Switzerland
Filed May 13, 1986, Ser. No. 863,384
Claims priority, application Switzerland, Dec. 6, 1985, 114874
Term of patent 14 years
U.S. Cl. D4—128

301,405
SYNTHETIC RESIN CLOTH
Ryuzo Kawaguchi, Tokyo, Japan, assignor to Patty Madden, Inc., New York, N.Y. and Lonseal Corp., Tokyo, Japan
Filed Nov. 17, 1986, Ser. No. 931,045
Claims priority, application Japan, May 27, 1986, 61-20484
Term of patent 14 years
U.S. Cl. D5—58



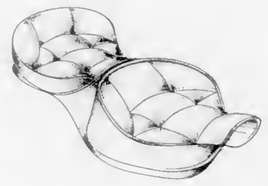
301,406
WALL COAT HOOK
Raul Barbieri, and Giorgio Marianelli, both of Via Faruffini 13, 20149 Milan, Italy
Filed Mar. 9, 1987, Ser. No. 23,301
Claims priority, application Italy, Sep. 16, 1986, 230538/86
Term of patent 14 years
U.S. Cl. D6—323

301,407
COAT HOOK
Cini Boeri, Via S. Ambrogio, 14-20123 Milan, Italy
Filed Feb. 24, 1988, Ser. No. 160,075
Claims priority, application Italy, Sep. 2, 1987, 22250/87[U]
Term of patent 14 years
U.S. Cl. D6—323

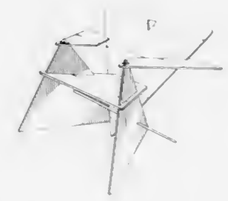


301,408
CHAIR
Sandro Tonon, Manzano, Italy, assignor to Tonon & C. S.p.A., Manzano, Italy
Filed Nov. 6, 1985, Ser. No. 804,366
Claims priority, application Italy, May 9, 1985, 60375/85[U]
Term of patent 14 years
U.S. Cl. D6—334

301,409
MOTORCYCLE SEAT
Robert F. Beckett, 2702 S. Cleve-Mass. Rd., Norton, Ohio 44203
Filed Feb. 10, 1986, Ser. No. 827,523
Term of patent 14 years
U.S. Cl. D6—354



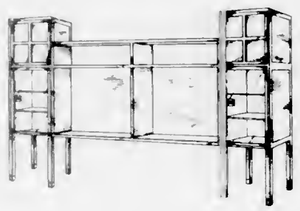
301,410
CHAIR
Dennis N. Swilley, #12 W. Oak Bluff, Aubrey, Tex. 76227
Filed Oct. 9, 1986, Ser. No. 917,378
Term of patent 14 years
U.S. Cl. D6—374



301,411
FRAME FOR A BED
Friedrich Schlapp, Schulstrasse 2A, Neu Anspach/Ts, Fed. Rep. of Germany, assignor to Friedrich Schlapp, Moebelbau Usingen, Fed. Rep. of Germany
Filed Nov. 4, 1985, Ser. No. 803,861
Claims priority, application Fed. Rep. of Germany, May 4, 1985, MR77
Term of patent 14 years
U.S. Cl. D6—393

301,412
ADJUSTABLE BED FRAME
Jean-Marie Duvivier, Usson du Poitou, France, assignor to Duvivier - Durev, Usson du Poitou, France
Filed Sep. 26, 1986, Ser. No. 911,800
Term of patent 14 years
U.S. Cl. D6—395

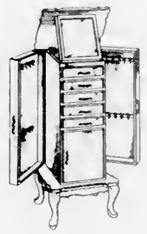
301,413
COMBINED STORAGE CABINET AND DISPLAY UNIT
James Rosen, Los Angeles, Calif., assignor to The Pace Collection, Inc., Long Island City, N.Y.
Filed Dec. 8, 1986, Ser. No. 939,459
Term of patent 14 years
U.S. Cl. D6—397



301,414
COMPUTER STAND
Paul A. Maltese, 819 W. 4th St. #7, San Pedro, Calif. 90731
Filed May 13, 1986, Ser. No. 863,383
Term of patent 14 years
U.S. Cl. D6—420

301,415
CABINET FOR INTERACTIVE VIDEO SYSTEM
David F. Fry, Birmingham, Mich.; Louis J. Crosslen, Saukville, and John L. Kraus, Shorewood, both of Wis., assignors to Chrysler Motors Corporation, Highland Park, Mich.
Filed May 7, 1986, Ser. No. 859,895
Term of patent 14 years
U.S. Cl. D6—432

301,416
CHEST
Larry Powell, Los Angeles, Calif., assignor to L. Powell Co., Culver City, Calif.
Filed Jun. 1, 1988, Ser. No. 202,182
Term of patent 14 years
U.S. Cl. D6—440

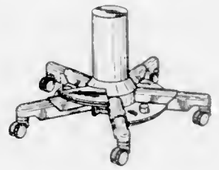


301,417
CHEST
Daniel D. Wistehuff, Hickory, N.C., assignor to LADD Furniture, Inc., High Point, N.C.
Filed Apr. 10, 1986, Ser. No. 851,377
Term of patent 14 years
U.S. Cl. D6—446

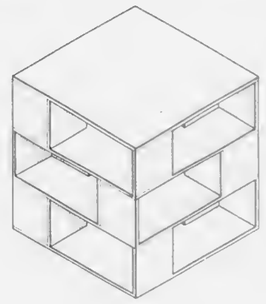
301,418
MUSICAL INSTRUMENT STAND OR THE LIKE
William M. Wernick, 190 St. Saviours Road, Leicester, LE5 3SG, England
Filed Jun. 30, 1986, Ser. No. 880,494
Term of patent 14 years
U.S. Cl. D6—462

301,419
CABINET
James Rosen, Los Angeles, Calif., assignor to The Pace Collection, Inc., Long Island City, N.Y.
Filed Dec. 8, 1986, Ser. No. 939,458
Term of patent 14 years
U.S. Cl. D6—436

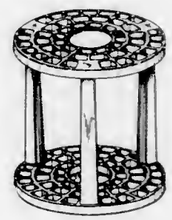
301,420
MOBILE CHAIR BASE
Rolf Garnich, Esslingen/Zell, Fed. Rep. of Germany, assignor to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany
Filed Sep. 4, 1986, Ser. No. 904,266
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1986, 8 MR 937
Term of patent 14 years
U.S. Cl. D6—498



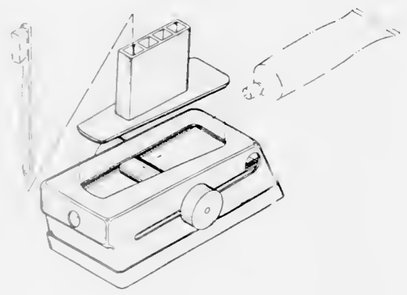
301,421
FOUR-SIDED BOOKSHELF
Bill B. Turley, 1522 S. Carson, Tulsa, Okla. 74119
Filed May 12, 1986, Ser. No. 862,547
Term of patent 14 years
U.S. Cl. D6—478



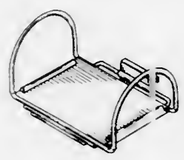
301,422
BRUSH HOLDER
Sheldon Schmidt, Paramus, N.J., assignor to Loew-Cornell, Inc., Teaneck, N.J.
Filed Dec. 9, 1987, Ser. No. 130,675
Term of patent 14 years
U.S. Cl. D6—512



301,423
COMBINED TOOTHPASTE TUBE SQUEEZER AND TOOTHBRUSH HOLDER
Joseph Waltel, Jr., Ten Ruland Rd., Melville, N.Y. 11747
Filed Jan. 30, 1987, Ser. No. 8,929
Term of patent 14 years
U.S. Cl. D6—530

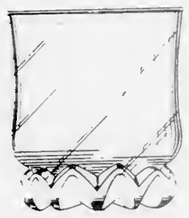


301,424
SHELF OR THE LIKE
Jean Beirise, and John Coons, both of Cincinnati, Ohio, assignors to Herman Miller, Inc., Zeeland, Mich.
Filed Apr. 22, 1987, Ser. No. 41,585
Term of patent 14 years
U.S. Cl. D6—574

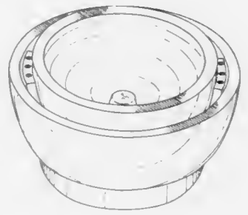


301,425
VACUUM TANKARD
Björn O. H. Persson, Angantyrvägen 27, S-182 64 Djursholm, Sweden
Filed Sep. 24, 1986, Ser. No. 910,841
Term of patent 14 years
U.S. Cl. D7—9

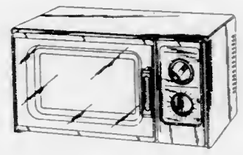
301,426
TUMBLER OR SIMILAR ARTICLE
Jean-Jacques Durand, LaBute, 62510, Arques, France
Filed Apr. 9, 1986, Ser. No. 850,923
Term of patent 14 years
U.S. Cl. D7—13

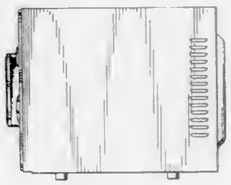


301,427
NUT BOWL
Scott Klingelhofer, 524 N. 8th St., Wahpeton, N. Dak. 58075
Filed Aug. 20, 1986, Ser. No. 898,086
Term of patent 14 years
U.S. Cl. D7—98

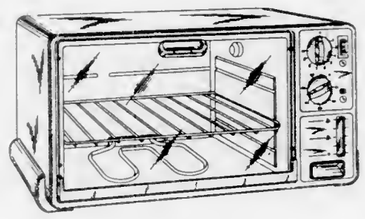


301,429
MICROWAVE OVEN
Hideo Nishikawa; Kenzo Okamoto, and Fumihiko Kitada, all of Osaka, Japan, assignors to Imanishi Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Jun. 10, 1986, Ser. No. 873,205
Claims priority, application Japan, Feb. 27, 1986, 61-6614
The portion of the term of this patent subsequent to Jun. 6, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—351

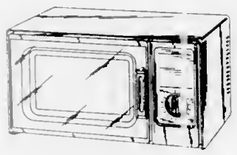


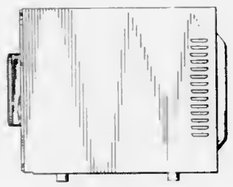


301,428
STEAM OVEN
Claude Viancin, Rumilly, France, assignor to S.N. Vivalp, Rumilly, France
Filed Jan. 29, 1986, Ser. No. 823,947
Claims priority, application France, Sep. 17, 1985, 85 5113
Term of patent 14 years
U.S. Cl. D7—350

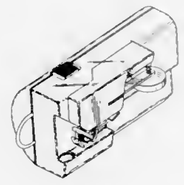


301,430
MICROWAVE OVEN
Hideo Nishikawa; Kenzo Okamoto, and Fumihiko Kitada, all of Osaka, Japan, assignors to Imanishi Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Jun. 10, 1986, Ser. No. 873,209
Claims priority, application Japan, Feb. 27, 1986, 61-6613
The portion of the term of this patent subsequent to Jun. 6, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—351

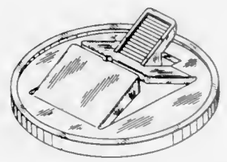




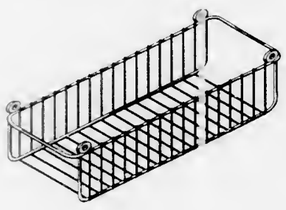
301,432
HAND HELD CAN OPENER
Paul Gildersleeve, Ridgefield, Conn., assignor to Kidde Consumer Durables Corp., Bala Cynwyd, Pa.
Filed Oct. 23, 1986, Ser. No. 922,507
Term of patent 14 years
U.S. Cl. D8—35

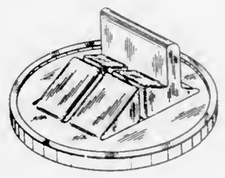


301,433
CORD CLENCHING DEVICE
Mark J. Krauss, New York City, N.Y., assignor to American Cord and Webbing Co., Inc., New York, N.Y.
Filed Jan. 8, 1986, Ser. No. 817,005
Term of patent 14 years
U.S. Cl. D8—356



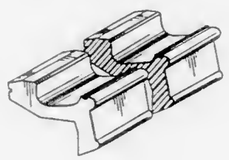
301,431
BASKET FOR A BARBECUE GRILL
David Landis, 3137 SE. Tibbetts, Portland, Oreg. 97202
Filed Oct. 8, 1987, Ser. No. 106,316
Term of patent 14 years
U.S. Cl. D7—402



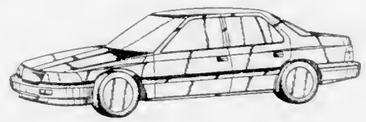


301,434
SWIRL PIN
Mary J. Kazmierski, 608 Millwright Ct. #22, Millersville, Md. 21108
Filed Dec. 23, 1986, Ser. No. 931,134
Term of patent 14 years
U.S. Cl. D11—206

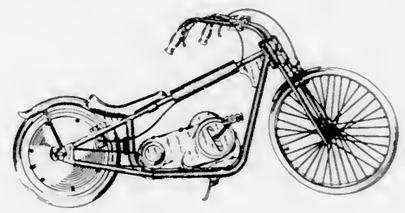
301,435
RAILWAY CROSSING INSERT
John K. Martin, 419 Oakside Circle S.W., Calgary, Alberta, Canada T2B 4V3
Filed Mar. 25, 1987, Ser. No. 40,390
Term of patent 14 years
U.S. Cl. D12—49



301,436
AUTOMOBILE
Tetsuya Mizuno, Hoya; Yoshio Ui, Niiza, and Yukio Kurosu, Urawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan
Filed Mar. 14, 1986, Ser. No. 845,026
Term of patent 14 years
U.S. Cl. D12—92

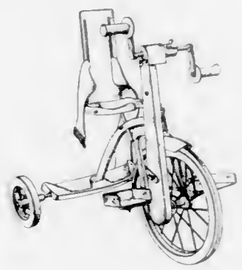


301,437
BICYCLE OR SIMILAR ARTICLE
Jeffrey L. Bleustein, Bayside, and Daniel A. Matre, Milwaukee, both of Wis., assignors to Harley-Davidson, Inc., Milwaukee, Wis.
Filed Jun. 25, 1987, Ser. No. 67,082
Term of patent 14 years
U.S. Cl. D12—111



301,438
BICYCLE
Junichi Hanamura, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed Dec. 8, 1987, Ser. No. 130,155
Term of patent 14 years
U.S. Cl. D12—111

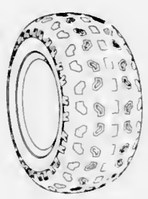
301,439
TRICYCLE FOR HANDICAPPED
David Glasgow, and Judith Glasgow, both of 163 E. Cottage Pl., York, Pa. 17403
Filed Oct. 27, 1986, Ser. No. 923,703
Term of patent 14 years
U.S. Cl. D12—113



301,440
BABY WALKER
Robert M. Conley, 1408 Lamar Ct. Kingsport, Tenn. 37664
Filed Nov. 20, 1986, Ser. No. 933,062
Term of patent 14 years
U.S. Cl. D12—130

301,441
MOTORCYCLE TIRE
Sadahiko Matsumura, Hyogo, Japan, assignor to Sumitomo Rubber Iadustries, Ltd., Hyogo, Japan
Filed Aug. 18, 1986, Ser. No. 897,200
Claims priority, application Japan, Jun. 20, 1986, 61-24018
Term of patent 14 years
U.S. Cl. D12—145

301,442
AUTOMOBILE TIRE
Tetsushi Fujiki, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Sep. 12, 1986, Ser. No. 906,765
Claims priority, application Japan, Jun. 6, 1986, 61-22029
Term of patent 14 years
U.S. Cl. D12—146



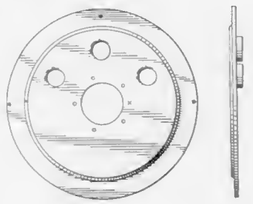
301,443
AUTOMOBILE TIRE
Tetsushi Fujiki, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Jul. 1, 1986, Ser. No. 880,905
Claims priority, application Japan, Mar. 12, 1986, 61-9155
Term of patent 14 years
U.S. Cl. D12—147

301,444
MOTORCYCLE TIRE
Shizuya Aoki, and Mikio Takeuchi, both of Hyogo, Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Jul. 3, 1986, Ser. No. 881,781
Term of patent 14 years
U.S. Cl. D12—147

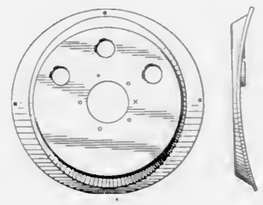
301,445
AUTOMOBILE TIRE
Minoru Terada, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Aug. 15, 1986, Ser. No. 897,119
Claims priority, application Japan, May 28, 1986, 61-20748
Term of patent 14 years
U.S. Cl. D12—147

301,446
MOTORCYCLE TIRE
Toshiaki Kobayashi, and Atsushi Tomura, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed Nov. 19, 1986, Ser. No. 932,996
Claims priority, application Japan, Jun. 12, 1986, 61-22422
Term of patent 14 years
U.S. Cl. D12—147

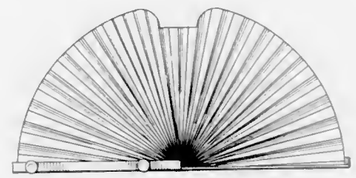
301,447
UNIVERSAL CLUSTER FITTING FOR A TRUCK FUEL TANK
Gerald J. Snyder, Hamburg, N.Y., assignor to Snyder Tank Corporation, Buffalo, N.Y.
Filed May 12, 1986, Ser. No. 862,539
The portion of the term of this patent subsequent to Jun. 6, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—155



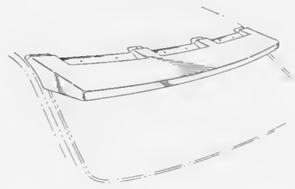
301,448
UNIVERSAL CLUSTER FITTING FOR A TRUCK FUEL TANK
Gerald J. Snyder, Hamburg, N.Y., assignor to Snyder Tank Corporation, Buffalo, N.Y.
Filed May 12, 1986, Ser. No. 862,540
The portion of the term of this patent subsequent to Jun. 6, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—144



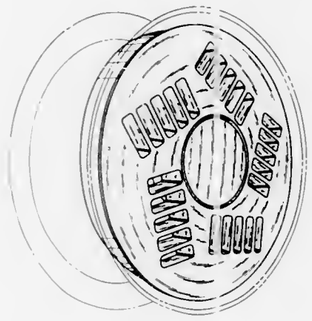
301,449
AUTOMOBILE SUN SCREEN
Braulio Silva, 6425 Westheimer #121, Houston, Tex. 77057
Filed Nov. 30, 1987, Ser. No. 126,943
Term of patent 14 years
U.S. Cl. D12—191



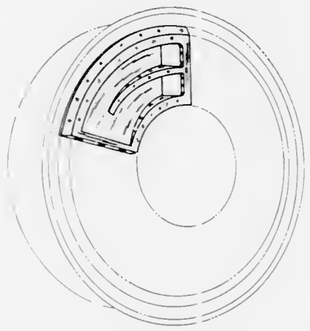
301,450
VEHICLE EXTERIOR SUN VISOR
Richard J. Kingsley, N. Bonneville, Wash., assignor to Saturn Corporation, Tacoma, Wash.
Filed Oct. 3, 1986, Ser. No. 915,321
Term of patent 14 years
U.S. Cl. D12—191



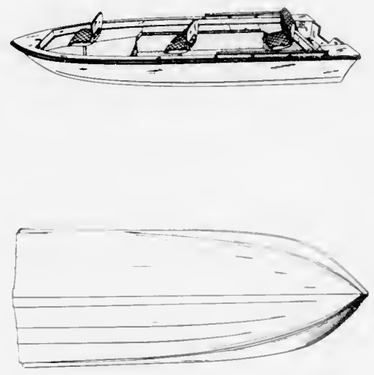
301,451
VEHICLE WHEEL CENTER
Donald J. Reid, Plymouth, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Jan. 7, 1987, Ser. No. 1,269
Term of patent 14 years
U.S. Cl. D12—211



301,452
VEHICLE WHEEL CENTER COMPONENT
Donald J. Reid, Plymouth, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Jan. 7, 1987, Ser. No. 661,268
Term of patent 14 years
U.S. Cl. D12—213

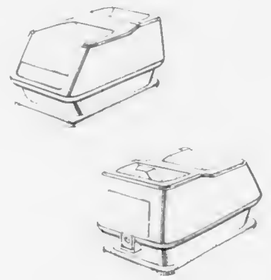


301,453
BOAT
Forrest L. Wood, Flippin; Dale H. Jensen, Everton; Kenneth P. Poley, Yellville; Randy W. Hopper, Flippin, and Charles C. Hoover, Bull Shoals, all of Ark., assignors to Wood Manufacturing Company, Inc., Flippin, Ark.
Filed Feb. 27, 1987, Ser. No. 19,772
Term of patent 14 years
U.S. Cl. D12—314

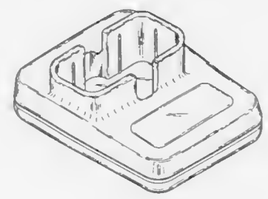


301,454
MINIATURE ELECTRIC MOTOR
Naoyuki Hara, and Ippei Hagiwara, both of Gifu, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 4, 1986, Ser. No. 850,366
Claims priority, application Japan, Oct. 16, 1985, 60-43439
Term of patent 14 years
U.S. Cl. D13—1

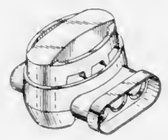
301,455
BATTERY CHARGER FOR A PORTABLE RADIO TELEPHONE SET
Minoru Hotsumi, and Yasuhito Nagaki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Oct. 27, 1987, Ser. No. 114,258
Claims priority, application Japan, Apr. 28, 1987, 62-17173
Term of patent 14 years
U.S. Cl. D13—5



301,456
BATTERY CHARGER
Craig F. Siddoway, Fort Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 31, 1987, Ser. No. 140,173
Term of patent 14 years
U.S. Cl. D13—5

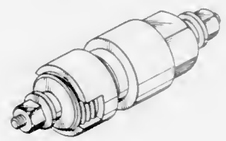


301,457
ELECTRICAL WIRE CONNECTOR
Daniel M. Friederichs, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Dec. 31, 1986, Ser. No. 948,298
Term of patent 14 years
U.S. Cl. D13—24

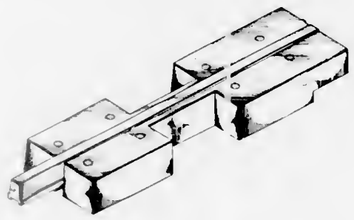


301,458
X-RAY CABLE CONNECTOR
Robert Tierie, Kleiberglaan 4, 6891 DK Rozendaal, Netherlands
Filed Nov. 7, 1985, Ser. No. 782,215
Claims priority, application Int'l Pat. Institute, Jul. 24, 1985, DM/005,610
Term of patent 14 years
U.S. Cl. D13—24

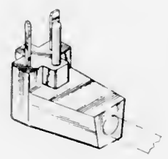
301,459
ELECTRICAL CONNECTOR
Jeffrey Chambers, Ulverston, England, assignor to Oxley Developments Company Limited, London, England
Filed Jan. 14, 1986, Ser. No. 819,233
Claims priority, application United Kingdom, Jul. 18, 1985, 1 028 160
Term of patent 14 years
U.S. Cl. D13—24



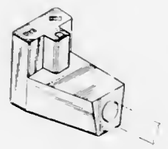
301,460
HOUSING FOR ELECTRICAL CONNECTOR
Floyd J. Pushelberg, Ottawa, Canada, James A. Rintala, Livonia, and Leo B. Koziol, Canton, both of Mich., assignors to Northern Telecom Limited, Montreal, Canada
Filed Mar. 5, 1986, Ser. No. 841,722
Term of patent 14 years
U.S. Cl. D13—24



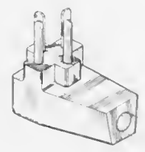
301,461
ELECTRICAL CONNECTING PLUG
Douglas Drew, Toronto, Canada, assignor to Noma Inc., Scarborough, Canada
Filed Dec. 24, 1986, Ser. No. 947,464
Term of patent 14 years
U.S. Cl. D13—28



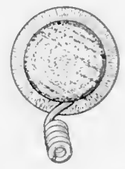
301,462
ELECTRICAL RECEPTACLE PLUG
Douglas Drew, Toronto, Canada, assignor to Noma Inc., Scarborough, Canada
Filed Dec. 24, 1986, Ser. No. 947,465
Term of patent 14 years
U.S. Cl. D13—28



301,463
ELECTRICAL CONNECTING PLUG
Douglas Drew, Toronto, Canada, assignor to Noma Inc., Scarborough, Canada
Filed Dec. 24, 1986, Ser. No. 947,468
Term of patent 14 years
U.S. Cl. D13—28

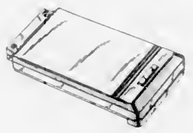


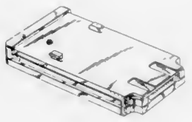
301,464
TELEPHONE HANDSET
Takei Yoshiharu, Shatin, Hong Kong, assignor to Tasca International Ltd., Kowloon, Hong Kong
Filed Oct. 16, 1987, Ser. No. 109,430
Claims priority, application United Kingdom, Jun. 19, 1987, 1042960
Term of patent 14 years
U.S. Cl. D14—248



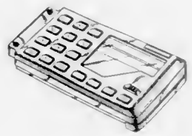
301,465
RADIO
Melvyn H. Dawson, Jr., 1130 Rollingwood Trail, Maitland, Fla. 32751
Filed Sep. 8, 1986, Ser. No. 904,251
Term of patent 14 years
U.S. Cl. D14—194

301,466
DUMMY CONTROL UNIT FOR THE HANDSET AND FIXED VERTICAL HOLDER OF A MOBILE TELEPHONE SET
Jorma Pitkonen, Turku, Finland, assignor to Mobira Oy, Salo, Finland
Division of Ser. No. 850,346, Apr. 4, 1986. This application May 31, 1988, Ser. No. 200,304
Claims priority, application Finland, Oct. 11, 1985, 771/85
Term of patent 14 years
U.S. Cl. D14—138





301,467
CONTROL UNIT FOR THE HANDSET HOUSING OF A MOBILE RADIOTELEPHONE SET
Jorma Pitkonen, Turku, Finland, assignor to Mobira Oy, Salo, Finland
Division of Ser. No. 850,346, Apr. 4, 1986. This application May 31, 1988, Ser. No. 200,305
Claims priority, application Finland, Oct. 11, 1985, 771/85
Term of patent 14 years
U.S. Cl. D14—138



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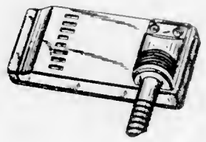
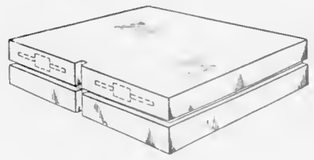
301,468
COMBINED CONTROL UNIT HOLDER WITH UPRIGHT SUPPORT AND BASE FOR A MOBILE RADIOTELEPHONE SET
Jorma Pitkonen, Turku, Finland, assignor to Mobira Oy, Salo, Finland
Division of Ser. No. 850,346, Apr. 4, 1986. This application May 31, 1988, Ser. No. 200,311
Claims priority, application Finland, Oct. 11, 1985, 77/85
Term of patent 14 years
U.S. Cl. D14—138

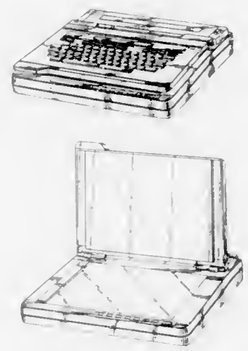
301,469
COMBINED DUMMY CONTROL UNIT AND HOLDER THEREFOR WITH UPRIGHT SUPPORT AND BASE FOR A MOBILE RADIOTELEPHONE SET
Jorma Pitkonen, Turku, Finland, assignor to Mobira Oy, Salo, Finland
Division of Ser. No. 850,346, Apr. 4, 1986. This application May 31, 1988, Ser. No. 200,316
Claims priority, application Finland, Oct. 11, 1985, 771/85
Term of patent 14 years
U.S. Cl. D14—138



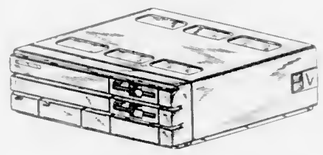
301,470
COMPUTER HOUSING
Andreas Preussner, Highlands, N.J., assignor to Siemens Aktiengeselischaft, Berlin and Munich, Fed. Rep. of Germany
Filed Mar. 8, 1984, Ser. No. 587,857
Term of patent 14 years
U.S. Cl. D14—100



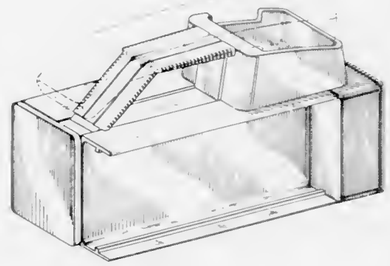
301,471
COMBINED COPYING MACHINE AND ELECTRONIC COMPUTER
Kunio Hara, Chiba, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 4, 1986, Ser. No. 903,436
Claims priority, application Japan, Mar. 13, 1986, 61-8789
Term of patent 14 years
U.S. Cl. D14—100



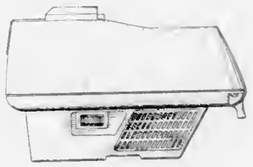
301,472
COMPUTER
Masaki Kurihara, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Dec. 3, 1986, Ser. No. 937,651
Claims priority, application Japan, Jun. 4, 1986, 61-21572
Term of patent 14 years
U.S. Cl. D14—100

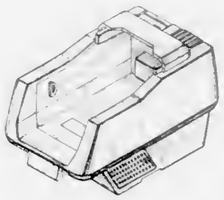


301,473
PORTABLE HOUSING FOR RADIO HANDSET, TRANSCEIVER AND BATTERY
John F. Rojc, Glen Ellyn, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 5, 1986, Ser. No. 893,509
Term of patent 14 years
U.S. Cl. D14—137

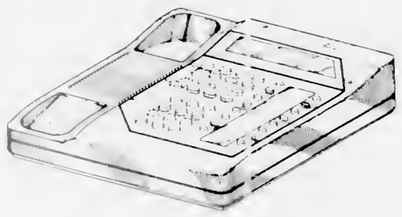


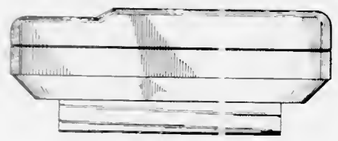
301,474
CRADLE FOR A PORTABLE RADIO TELEPHONE SET
Minoru Hotsumi, and Yasuhito Nagaki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Nov. 30, 1987, Ser. No. 127,012
Claims priority, application Japan, May 29, 1987, 62-21920
Term of patent 14 years
U.S. Cl. D14—142



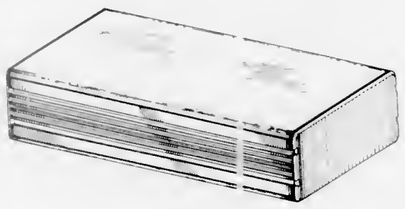


301,475
SECURITY TELEPHONE OR SIMILAR ARTICLE
Albert L. Nagele, Wilmette, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 28, 1987, Ser. No. 138,526
Term of patent 14 years
U.S. Cl. D14—142



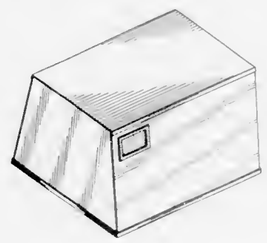


301,476
VEHICULAR RADIO HOUSING OR SIMILAR ARTICLE
Anthony Scianna, Sr., Morton Grove; Nicholas Mischenko, Mount Prospect; Kenneth J. Robacik, Arlington Heights, and Terrance N. Taylor, Cary, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jan. 31, 1986, Ser. No. 824,699
Term of patent 14 years
U.S. Cl. D14—188

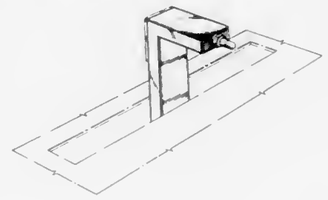


301,477
FUR HEAD PHONES
Sharon N. Storyk, c/o William Kraus 160 Cabrini Blvd., #81, New York, N.Y. 10033
Filed Dec. 8, 1986, Ser. No. 939,461
Term of patent 14 years
U.S. Cl. D14—205

301,478
HOUSING FOR A PUMPING AND FILTERING UNIT
Gerald K. Yankoff, Cincinnati, Ohio 45069, assignor to Ulticon Systems, Inc., Blue Ash, Ohio
Filed Aug. 29, 1986, Ser. No. 902,397
Term of patent 14 years
U.S. Cl. D15—7



301,479
SPEED CONTROL HANDLE FOR A PAVEMENT SAW
James R. Wright, Grandview, Mo., assignor to Magnum Diamond & Machinery, Inc., Grandview, Mo.
Filed Feb. 12, 1986, Ser. No. 833,487
Term of patent 14 years
U.S. Cl. D15—142

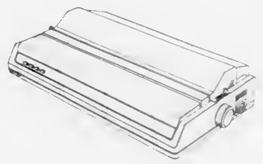


301,480
SUN GLASSES
Robert Sonthonnax, Marchon, Oyonnax, France 01100
Filed Feb. 13, 1987, Ser. No. 14,342
Claims priority, application France, Sep. 10, 1986, 864740
Term of patent 14 years
U.S. Cl. D16—102

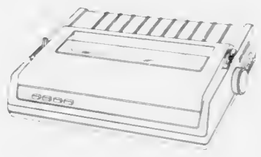
301,481
SUN GLASSES
Robert Sonthonnax, Marchon, Oyonnax, France 01100
Filed Feb. 13, 1987, Ser. No. 14,343
Claims priority, application France, Sep. 10, 1986, 864740
Term of patent 14 years
U.S. Cl. D16—102

301,482
SPECTACLE FRAME
Jean-Pierre Chodat, Auvernier, Switzerland, assignor to Fabrique Ebel, Societe Anonyme, Switzerland
Filed Nov. 7, 1986, Ser. No. 928,465
Term of patent 14 years
U.S. Cl. D16—102

301,483
PRINTER
Kazuo Yoshida, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Apr. 10, 1986, Ser. No. 851,369
Claims priority, application Japan, Oct. 14, 1985, 60-42654
Term of patent 14 years
U.S. Cl. D18—13



301,484
PRINTER
Kazuo Yoshida, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Apr. 10, 1986, Ser. No. 851,370
Claims priority, application Japan, Oct. 14, 1985, 60-42653
Term of patent 14 years
U.S. Cl. D18—13



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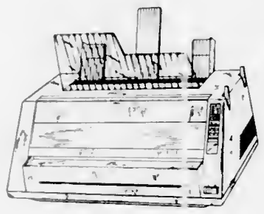
301,485
PRINTER
Shigemasa Kato, and Sanae Takada, both of Chofu, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan
Filed May 1, 1986, Ser. No. 858,501
Term of patent 14 years
U.S. Cl. D18—13



301,486
PEN WITH AUTOMATIC LIGHT SYSTEM
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Oct. 22, 1985, Ser. No. 790,150
Claims priority, application United Kingdom, May 7, 1985, 1026632
Term of patent 14 years
U.S. Cl. D19—36

301,487
COMBINED WRITING INSTRUMENT AND RANDOM NUMBER SELECTOR
David M. Audet, 3828 Lindsay St., Abbotsford, B.C., Canada V2S 4N3
Filed Aug. 9, 1985, Ser. No. 764,182
Term of patent 14 years
U.S. Cl. D19—41

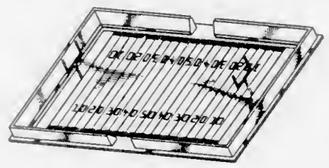
301,488
MARKING PEN
Keiichi Mizutani, and Akira Ohashi, both of Nagoya, Japan, assignors to Shachihata Industrial Co., Ltd., Nagoya, Japan
Filed Jun. 24, 1986, Ser. No. 877,995
Claims priority, application Japan, Dec. 26, 1985, 60-54604
Term of patent 14 years
U.S. Cl. D19—43

301,489
CLIPBOARD FOR SHOPPING CART PUSH BAR
Christopher A. Aquila, 21377 Cabot Blvd., Hayward, Calif. 94545, and Richard J. Wilson, 3940 Pacific Hts. Blvd., San Bruno, Calif. 94080
Filed Nov. 15, 1985, Ser. No. 805,224
Term of patent 14 years
U.S. Cl. D19—88

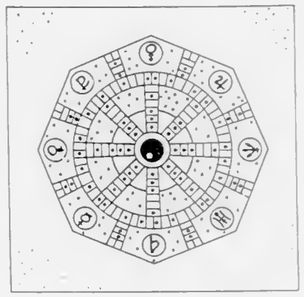
301,490
MESSAGE ORGANIZER
Jonathan B. Horowitz, 1106 S. El Camino Real, San Mateo, Calif. 94402
Filed Oct. 25, 1985, Ser. No. 791,620
Term of patent 14 years
U.S. Cl. D19—90

301,491
BRACKET FOR A POSTER
Herbert Walter, Im Zehntgarten 13, D-7840 Müllheim 13, Fed. Rep. of Germany
Filed Aug. 3, 1987, Ser. No. 81,101
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1987, DM/008 241
Term of patent 14 years
U.S. Cl. D20—43

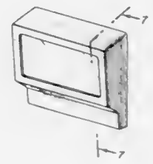
301,492
FOOTBALL GAMEBOARD
Bradley S. Ferguson, 108 Palmer St., Fostoria, Ohio 44830
Filed Jul. 24, 1986, Ser. No. 888,989
Term of patent 14 years
U.S. Cl. D21—15



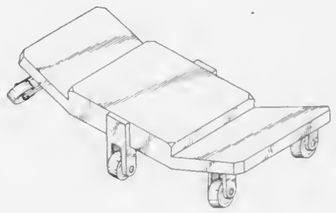
301,493
GAMEBOARD
Rick Livernoise, 5308 Chenault Ave., Orlando, Fla. 32809, and John S. Thompson, 4206 Crossen Dr., Orlando, Fla. 32822
Filed Jul. 6, 1984, Ser. No. 628,646
Term of patent 14 years
U.S. Cl. D21—35



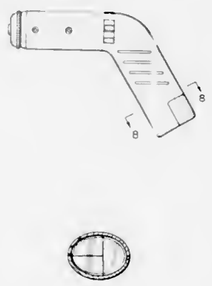
301,494
COVER FOR SLOT MACHINE
Leroy H. Gutknecht, 3111 S. Valley View, Suite E-133, Las Vegas, Nev. 89102
Filed Apr. 17, 1986, Ser. No. 855,767
Term of patent 14 years
U.S. Cl. D21—48



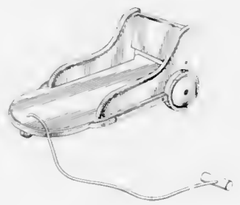
301,495
BALANCE TOY WALKER
Oliver Riggs, Rte. 1, Box 398, Forrest City, Ark. 72335
Filed May 8, 1986, Ser. No. 862,439
Term of patent 14 years
U.S. Cl. D21—66



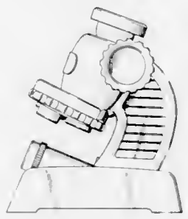
301,496
MOTOR-DRIVEN SCREW DRIVER
Kazuyoshi Yonesawa, and Yonosuke Iwai, both of Kadoma, Japan, assignors to Matsushita Electric Works, Japan
Filed May 19, 1986, Ser. No. 885,871
Claims priority, application Japan, Dec. 12, 1985, 60-51807
Term of patent 14 years
U.S. Cl. D8—68



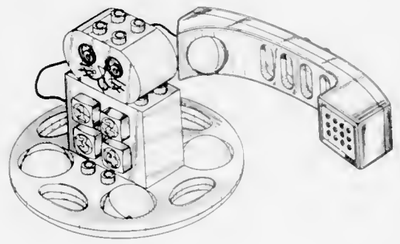
301,497
RIDING PULL TOY
Lester R. Gassaway, 835 Keith Ln., Athens, Tenn. 37303
Filed Sep. 8, 1986, Ser. No. 905,042
Term of patent 14 years
U.S. Cl. D21—71



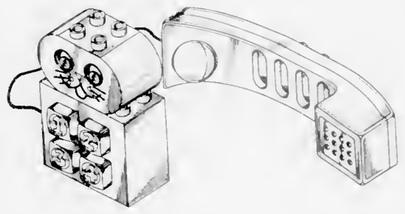
301,498
TOY MICROSCOPE
Michael W. Nuttal, Carson, Calif., and Toshinori Tabata, Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Apr. 25, 1986, Ser. No. 857,787
Claims priority, application Japan, Oct. 25, 1985, 60-44877
Term of patent 14 years
U.S. Cl. D21—109



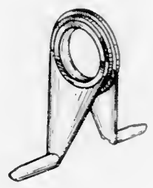
301,499
TOY TELEPHONE
Erik P. Tapdrup, Virum, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 26, 1986, Ser. No. 935,698
Term of patent 14 years
U.S. Cl. D21—111



301,500
TOY TELEPHONE
Erik P. Tapdrup, Virum, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Nov. 26, 1986, Ser. No. 935,700
Term of patent 14 years
U.S. Cl. D21—111



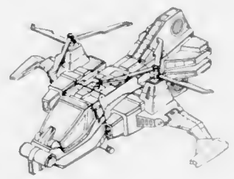
301,501
GUIDE FOR A FISHING ROD
Young J. Kim, 118-8, Wonmi-Dong, Buchon-City, Kyongki-Do, D.P.R. of Korea
Filed Jan. 8, 1987, Ser. No. 1,297
Term of patent 14 years
U.S. Cl. D22—143

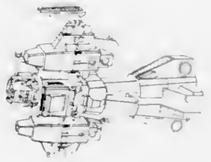


301,502
TOY FOX ANIMAL FIGURE
Ken Havelock, 1401 W. 14th St., Sault Ste. Marie, Mich. 49783
Filed Jun. 2, 1986, Ser. No. 869,956
Term of patent 14 years
U.S. Cl. D21—148

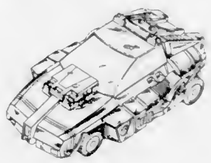
301,503
TOY SKUNK ANIMAL FIGURE OR SIMILAR ARTICLE
Ken Havelock, 1401 West 14th St., Sault St. Marie, Mich. 49783
Filed Sep. 15, 1986, Ser. No. 907,089
Term of patent 14 years
U.S. Cl. D21—148

301,504
RECONFIGURABLE TOY HELICOPTER
Takashi Kunihiro, Abiko, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Jan. 7, 1987, Ser. No. 1,089
Claims priority, application Japan, Nov. 4, 1986, 61-43571
Term of patent 14 years
U.S. Cl. D21—150





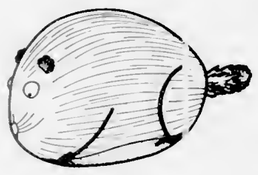
301,505
RECONFIGURABLE TOY VEHICLE
Takashi Kunihiro, Abiko, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Jan. 7, 1987, Ser. No. 1,090
Claims priority, application Japan, Nov. 4, 1986, 61-43568
Term of patent 14 years
U.S. Cl. D21—150



301,506
DOLL
Bruce W. Harrell, 2408 Druid Hill Ave., Baltimore, Md. 21217
Filed Dec. 5, 1985, Ser. No. 804,840
Term of patent 14 years
U.S. Cl. D21—168

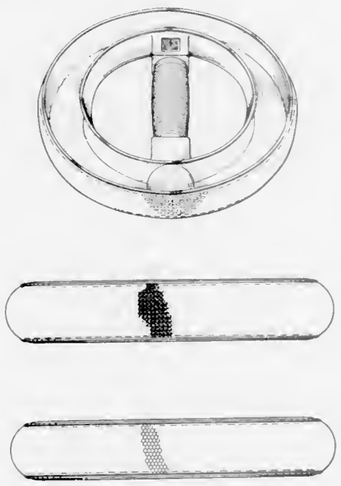
301,507
DOLL
Rhondaiya S. Darville, P.O. Box 905, Galliano, La. 70354
Filed Nov. 27, 1985, Ser. No. 806,931
Term of patent 14 years
U.S. Cl. D21—184

301,508
TOY PRAIRIE DOG ANIMAL FIGURE
Ken Havelock, 1404 W. 14th St., Sault Ste. Marie, Mich. 49783
Filed Jun. 2, 1986, Ser. No. 869,955
Term of patent 14 years
U.S. Cl. D21—188

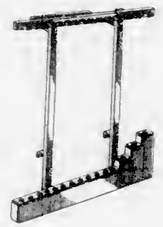


301,509
TOY CHIPMUNK ANIMAL FIGURE
Ken Havelock, 1401 W. 14th St., Sault Ste. Marie, Mich. 49783
Filed Jun. 27, 1986, Ser. No. 879,560
Term of patent 14 years
U.S. Cl. D21—188

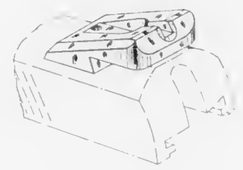
301,510
RHYTHMIC EXERCISER
Zeki Orak, 68 Cumberland, San Francisco, Calif. 94110
Filed Nov. 17, 1986, Ser. No. 928,241
Term of patent 14 years
U.S. Cl. D21—191



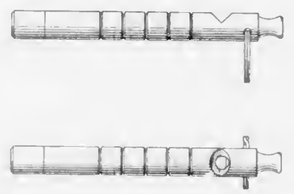
301,511
GOLF CLUB RACK
Robert L. Rainsberger, 117 Don Quixote Dr., Rancho Mirage, Calif. 92270, and Fred F. Fredensburg, 39-825 Sweetwater Dr., Palm Desert, Calif. 92260
Filed Sep. 19, 1986, Ser. No. 909,416
Term of patent 14 years
U.S. Cl. D21—223



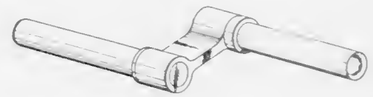
301,512
REAR SIGHT FOR A PISTOL
Wayne F. Novak, 1206-½ 30th St., P.O. Box 4045, Parkersburg, W. Va. 26102
Filed Aug. 15, 1986, Ser. No. 896,969
Term of patent 14 years
U.S. Cl. D22—109



301,513
COMBINED WHISTLE, KEY HOLDER, AND STRIKING WEAPON
Willard D. Wright, 461 Rose Hill Rd., Asheville, N.C. 28803
Filed Feb. 13, 1987, Ser. No. 14,528
Term of patent 14 years
U.S. Cl. D22—117

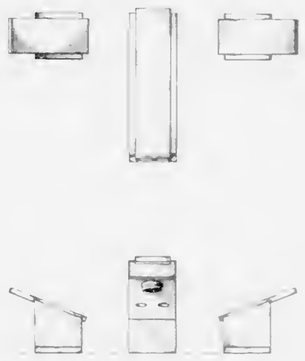


301,514
FERRULE FOR A STEPPED FISHING ROD
Thomas Eccles, 1 St. Anne's Terrace, Newtown, Santon, Isle of Man
Filed Apr. 27, 1987, Ser. No. 42,644
Term of patent 14 years
U.S. Cl. D22—142



301,515
HANDLE FOR A FISHING ROD
James E. Andreasen, Magnolia Springs, Ala., assignor to Lew Childre & Sons, Inc., Foley, Ala.
Filed Feb. 20, 1986, Ser. No. 834,479
Term of patent 14 years
U.S. Cl. D22—142

301,516
COMBINED SPOUT AND WATER CONTROL HANDLES
Harvey B. Rodstein, Los Angeles, Calif., assignor to Harden Industries, Inc., Los Angeles, Calif.
Filed Apr. 6, 1987, Ser. No. 35,145
Term of patent 14 years
U.S. Cl. D23—242



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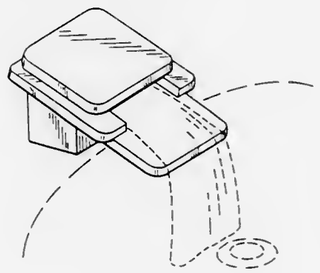
301,517
SPOUT
Donald Anawalt, 8405 Gaylor St., Carmichael, Calif.
Filed Jan. 12, 1987, Ser. No. 2,188
Term of patent 14 years
U.S. Cl. D23—255



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF JUNE, 1989

NOTE —Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See—*
Frejborg, Frey, 4,836,915, Cl. 209-273.000.

A. E. Staley Manufacturing Company: *See—*
Eastman, James E., 4,837,314, Cl. 536-111.000.

A. L. Hansen Manufacturing Company: *See—*
Akright, Michael V., 4,835,997, Cl. 70-141.000.

A/S Ferrosan: *See—*
Jensen, Leif H.; Sauerberg, Per; Watjen, Frank; and Kindtler, Jens W., 4,837,241, Cl. 514-340.000.

A V L Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik M.B.H., Prof. Dr. Dr. h.c. Hans List: *See—*
Melde-Tuczai, Helmut; Skatsche, Othmar; and Rachholz, Josef, 4,836,171, Cl. 123-508.000.

A. W. Showell (Surgicraft) Limited: *See—*
Ransford, Andrew O., 4,836,193, Cl. 128-69.000.

AB Fas Lasfabrik: *See—*
Hirvi, Jorma, 4,836,000, Cl. 70-352.000.

AB Volvo: *See—*
Janiszewski, Grzegorz, 4,836,351, Cl. 192-48.910.

Abbate, Mariarosa, to Abbate, Mariarosa; and Corti, Ciulio. Vacuum generator for stimulating the scalp. 4,836,192, Cl. 128-38.000.

Abbey, Kirk J.: *See—*
Lin, Ju-Chui; and Abbey, Kirk J., 4,837,326, Cl. 546-12.000.

Abbott Ball Company, The: *See—*
Bond, Roger A. L.; and Nigro, Stephen J., 4,835,911, Cl. 51-313.000.

Abbott Laboratories: *See—*
Ford, Jayme R., 4,836,908, Cl. 204-435.000.
Rosenberg, Saul H.; Luly, Jay R.; and Plattner, Jacob J., 4,837,204, Cl. 514-18.000.

Abbringh, Johannes F., to Schut's Im- & Exporthandel B.V. Capacitive displacement meter or transducer. 4,837,500, Cl. 324-61.00R.

ABC Auto Alarms, Inc.: *See—*
Faust, James H., 4,836,591, Cl. 292-336.300.

ABC Bio-Industries: *See—*
Caillau, Pierre; Morgan, Paul; and De Veauce, Charles D. C., 4,836,855, Cl. 106-91.000.

Abe, Masanori: *See—*
Oishi, Masao; Saito, Takao; Ishikawa, Katsukiyo; Abe, Masanori; and Tamaura, Yutaka, 4,837,046, Cl. 427-38.000.

Abe, Masaru; Kobata, Takashi; and Kawamoto, Yoshimichi, to Honda Giken Kogyo Kabushiki Kaisha. Automobile suspension. 4,836,577, Cl. 280-773.000.

Abe, Yukio: *See—*
Kawamma, Kouichi; Abe, Yukio; Higashi, Tatsuji; and Aotani, Yoshimasa, 4,837,128, Cl. 430-281.000.

Abel, William E.; and Marman, Douglas H., to Sentrol, Inc. Glass break detector. 4,837,558, Cl. 340-550.000.

Abernathy, Joseph V.: *See—*
Davis, Cecil J.; Abernathy, Joseph V.; Matthews, Robert T.; Hildenbrand, Randall C.; Simpson, Bruce; Bohlman, James G.; Loewenstein, Lee M.; and Jones, John I., 4,836,905, Cl. 204-298.000.

ABG Werke GmbH: *See—*
Heims, Dirk, 4,836,564, Cl. 280-6.120.

Ablay, Sewim F.; Thro, Stuart W.; and Zdunek, Kenneth J., to Motorola, Inc. Subscriber unit for a trunked voice/data communication system. 4,837,858, Cl. 455-34.000.

Abou-Gharbia, Magid A., to American Home Products Corporation. Beta-carboline H_1-receptor antagonists. 4,837,325, Cl. 544-372.000.

Abrahamson, Daniel P., to Builders Equipment Company. Method and apparatus for cubing stones of diverse geometries. 4,836,731, Cl. 414-789.100.

Absil, Robert P. L.; and Huang, Yun-Yang, to Mobil Oil Corporation. Nobile metal containing catalysts of improved stability. 4,837,397, Cl. 502-66.000.

Abthoff, Jorg; Fortnagel, Manfred; Fricker, Ludwig; Kutschera, Immanuel; Kramer, Michael; and Kuhn, Michael, to Daimler-Benz Aktiengesellschaft. Direct fuel injection method for a diesel engine. 4,836,161, Cl. 123-299.000.

Abujudom, David N.; and Miller, Dennis E., to Johnson Service Company. SMF actuator. 4,836,496, Cl. 251-11.000.

Acker, Jesse: *See—*
Meserol, Peter M.; and Acker, Jesse, 4,837,160, Cl. 436-45.000.

Acme Marls Limited: *See—*
Elliott, John, 4,836,777, Cl. 432-241.000.

AcroMed Corporation: *See—*
Park, Joon B.; Weinstein, James N.; and Goel, Vijay K., 4,836,196, Cl. 128-92.0YM.

Adachi, Osamu; and Konosu, Osamu, to Matsushita Electronics Corporation. Color picture tube having reduced local doming. 4,837,482, Cl. 313-402.000.

Adam, Roger F. J. Cutterhead for water jet assisted cutting. 4,836,613, Cl. 299-81.000.

Adams, John H. Hose storing and dispensing rack. 4,836,479, Cl. 248-89.000.

Adcock, John J.; Allan, Geoffrey; and Smith, Terence W., to Burroughs Wellcome Co. Pharmacologically active compounds and use. 4,837,203, Cl. 514-17.000.

Adlon, Daniel T.; and Arbogast, William C., Jr., to AMP Incorporated. Method and apparatus for assembling electrical harnesses. 4,835,858, Cl. 29-868.000.

Adobe Systems, Inc.: *See—*
Paxton, William H.; Schuster, Michael D.; and Warnock, John E., 4,837,613, Cl. 358-75.000.

Adrian, Willy; and Mehlert, Martin, to Otis Elevator Company. Guide for moving handrail. 4,836,353, Cl. 198-335.000.

Advanced Composite Components Ltd.: *See—*
Sloman, Roger M.; and Ridgard, Christopher, 4,836,876, Cl. 156-242.000.

Advanced Engineering Systems, Operations & Products, Inc.: *See—*
Slocum, Alexander H., 4,836,042, Cl. 74-424.80R.

Advanced Micro Devices, Inc.: *See—*
Banerjee, Pradip; and Keswick, Paul D., 4,837,746, Cl. 365-189.050.
Hatcher, Owen W., Jr., 4,836,883, Cl. 156-627.000.

Advanced Service Development Corporation: *See—*
Freeny, Charles C., Jr., 4,837,797, Cl. 379-96.000.

Aerospace Corporation, The: *See—*
Kao, Wei H.; Katzman, Howard A.; and Slater, Eric M., 4,837,053, Cl. 427-214.000.

Aerospatiale Societe Nationale Industrielle: *See—*
Lherm, Andre ; Raveu, Bernard; and Nicolas, Alain, 4,837,661, Cl. 361-329.000.
Sainte Luce Banchelin, Jean; Bourcereau, Jean; and Valy, Yves, 4,837,448, Cl. 250-519.100.

Afshar, Mohammad M. Container closure and dispenser for granular materials. 4,836,424, Cl. 222-279.000.

Afzali-Ardakani, Ali; and Pennington, Keith S., to International Business Machines Corporation. Direct offset master by resistive thermal printing. 4,836,106, Cl. 101-467.000.

AG Communication Systems Corporation: *See—*
Belanger, Thomas D., Jr.; and Johnson, Roy L., 4,837,657, Cl. 361-220.000.

Agency of Industrial Science and Technology: *See—*
Uchiyama, Futoshi; Tsukamoto, Koichi; Kurashige, Tomoyoshi; Furusawa, Kaoru; and Koike, Mitsumaro, 4,836,417, Cl. 222-63.000.

Agency of Industrial Science & Technology, Ministry of International Trade & Industry: *See—*
Okaji, Masahiro, 4,836,678, Cl. 356-351.000.

Agfa-Gevaert Aktiengesellschaft: *See—*
Hehn, Wilfried, 4,837,593, Cl. 354-322.000.

Agfa-Gevaert N.V.: *See—*
Geens, Maurits; and Van Daele, Jean A., 4,837,486, Cl. 388-811.000.

Agintec AG: *See—*
Maier, Hans P.; and Vlaykowski, Nikolay, 4,836,583, Cl. 285-336.000.

Aglas, Johann: *See—*
Weber, Alfred; Aglas, Johann; and Hochgatterer, Franz, 4,836,510, Cl. 266-142.000.

Agricultural & Food Research Council: *See—*
Kirsop, Brian H.; and Brocklehurst, Timothy F., 4,837,037, Cl. 426-303.000.

Agro-Industria Innovacios Vallalat: *See—*
Vajda, Gabor; Ravasz, Laszlo; Vajda, Gaborne; and Karacsonyi, Bela, 4,837,042, Cl. 426-615.000.

Ahn, Yeon S.: *See—*
Harrington, William J.; Ahn, Yeon S.; and Mylvaganam, Ravindra, 4,837,212, Cl. 514-176.000.

Aho, Jack R.: *See—*
Londeck, Paul B.; Sarti, Robert F.; and Aho, Jack R., 4,835,908, Cl. 49-377.000.

Aida, Hiroshi: *See—*
Matsuo, Itaru; Takahashi, Yuzo; Hashimoto, Hideo; Takatsuka, Toru; Iimori, Takeru; Maekawa, Hitoshi; Ito, Tamotsu; Shohji, Yoshihiko; Watari, Ryuzo; and Aida, Hiroshi, 4,836,909, Cl. 208-72.000.

Aigner, Johann: *See—*
Melde-Tuczai, Helmut; Aigner, Johann; and Skatsche, Othmar, 4,836,162, Cl. 123-321.000.

Aim Instruments Ltd.: *See—*
Baldwyn, Einar D. N., 4,836,038, Cl. 73-864.210.

Air Products and Chemicals, Inc.: *See—*
Bennett, Douglas L.; Ludwig, Keith A.; Witmer, George S.; and Woods, Charles M., 4,836,836, Cl. 62-22.000.
Nicholas, David M.; Goff, Stephen P.; Foden, Thomas M.; and Bushinsky, Joseph P., 4,836,833, Cl. 55-6.000.
Puri, Pushpinder S., 4,837,386, Cl. 204-157.610.

Airmar Technology Corporation: *See—*
Boucher, Stephen G., 4,836,020, Cl. 73-18.000.

Aisan Kogyo Kabushiki Kaisha: *See—*
Haruta, Kazumi; and Yamada, Yutaka, 4,836,172, Cl. 123-520.000.

Aisin Seiki Company, Ltd.: *See—*
Nezu, Shinji, 4,837,407, Cl. 174-68.500.

Aisin Seiki Kabushiki Kaisha: *See—*
Teranishi, Shunichi, 4,836,621, Cl. 360-98.050.
Yamauchi, Nobuhiro, 4,836,502, Cl. 254-1.6.000.

Aizawa, Koichi; Kazama, Toyoki; Takano, Yukio; and Tamura, Yukihisa, to Fuji Electric Co., Ltd. Electrophotographic photoreceptor. 4,837,137, Cl. 430-65.000.

Aizawa, Masanobu; Yamauchi, Shigekazu; and Hisatake, Yuzo, to Stanley Electric Co., Ltd. Liquid crystal cell. 4,837,058, Cl. 428-1.000.

Akaike, Toshihiro: *See—*
Aoyagi, Juuro; Yamamoto, Yuichi; Akaike, Toshihiro; and Nozaki, Yasuhiro, 4,836,928, Cl. 210-635.000.

Akasaka, Michiyo: *See—*
Hotta, Hajime; and Akasaka, Michiyo, 4,837,010, Cl. 424-59.000.

Akazawa, Toyo, to Japan M&C Trading Co., Ltd. Screw mill. 4,836,460, Cl. 241-247.000.

Aketa, Tomoyuki: *See—*
Suzuki, Yoshiharu; and Aketa, Tomoyuki, 4,836,889, Cl. 156-667.000.

Akiba, Shigeyuki: *See—*
Suzuki, Masatoshi; Noda, Yukio; Kushiro, Yukitoshi; and Akiba, Shigeyuki, 4,837,526, Cl. 332-7.510.

Akimoto, Kazuhiko: *See—*
Oishi, Hisao; Yanagihara, Kazuhiko; Miyakawa, Tadashi; Nakamura, Takeshi; Akimoto, Kazuhiko; and Shioji, Mitsuaki, 4,836,652, Cl. 350-334.000.

Akimoto, Taizo: *See—*
Nishiyama, Mikio; and Akimoto, Taizo, 4,837,626, Cl. 358-183.000.

Akins, Charles G.: *See—*
Prohs, John R.; Akins, Charles G.; Efthyvoulos, Nicholas; Sandilands, Phillip E.; and Scheid, Michael R., 4,837,799, Cl. 379-224.000.

Akita, Koichiro, to Mitsubishi Denki Kabushiki Kaisha. Telephone answering voiceprint discriminating and switching apparatus. 4,837,804, Cl. 379-88.000.

Akiyama, Toru; Yasuda, Shigeru; Yasukawa, Kenichiro; and Fukatsu, Yasumasa, to Pioneer Electronic Corporation. Scanning method for disk player. 4,837,637, Cl. 358-342.000.

Akiyoshi, Hideki; Tamura, Hiroshi; Kutami, Atsushi; and Takada, Yoshihiro, to Ricoh Company, Ltd. Electrophotographic photoconductor having cylindrical base support of specific phenol resin. 4,837,120, Cl. 430-56.000.

Akizuki, Ikuo; Kaya, Hiroshi; Okano, Shohei; Otake, Nobuo; Kumagai, Keiji; and Kaneko, Yoshihito, to Toa Nenryo Kogyo Kabushiki Kaisha. Hydrotreating catalyst and process of manufacture. 4,837,193, Cl. 502-242.000.

Akright, Michael V., to A. L. Hansen Manufacturing Company. Two-way rotary lock. 4,835,997, Cl. 70-141.000.

Aktiebolaget IRO: *See—*
Jacobsson, Kurt A. G., 4,835,988, Cl. 66-32.00T.

Aktiengesellschaft Kuehnle, Kopp & Kausch: *See—*
Hotz, Stephan, 4,836,747, Cl. 415-163.000

Akzo America Inc.: *See—*
Summers, William, III; and Burkhardt, Eric W., 4,837,190, Cl. 502-171.000.

Akzo N.V.: *See—*
Meijer, John, 4,837,287, Cl. 526-231.000.
van de Pol, Gustaaf M. W., 4,837,387, Cl. 428-229.000.
Vogelesang, Laurens B.; Verbruggen, Marcel L. C. E.; and Paalvast, Cornelis G., 4,836,084, Cl. 89-36.020.

Al Exfiltra Company (Proprietary) Limited: *See—*
Schewitz, Alexander, 4,836,936, Cl. 210-791.000.

Albert Schulte Sohne GmbH & Co.: *See—*
Mellwig, Dieter; and Lange, Hans-Willi, 4,835,815, Cl. 16-35.00R.

Alcamo, John M. Bicycle pedal system. 4,836,047, Cl. 74-594.600.

Alcan International Limited: *See—*
Smits, Paul; Rosenfeld, Aron M.; and DeFerrari, Howard F., 4,837,061, Cl. 428-40.000.

Alcantara, Bernardo P.; Diaz-Zorita, Fernando; and Becerra, Rodrigo C., to Investronica, S.A. Automatic apparatus for drawing on and scoring of sheet material. 4,835,872, Cl. 33-18.100.

Alcate Cit: *See—*
De Amorim, Lionel, 4,836,635, Cl. 350-9[illegible].200.

Alcatel Espace: *See—*
Gourlain, Philippe; Lenormand, Regis; and Morin, Dominique, 4,837,531, Cl. 333-135.000.

Alcatel N.V.: *See—*
Immendorfer, Manfred; Kopp, Dieter; and Hormann, Thomas, 4,837,808, Cl. 379-96.000.
Pieters, Jozef F. P.; and Marie Guelels, Pierre-Paul F. M., 4,837,818, Cl. 379-252.000.
Schmid, Peter, 4,837,768, Cl. 372-36.000.

Alcatel Thomson Faisceaux Hertizens: *See—*
Chevallier, Rene; and Fouillet, Jean, 4,837,583, Cl. 343-760.000.

Alexander, William, to American Colloid Company. Composition and method of controlling lost circulation from wellbores. 4,836,940, Cl. 252-8.512.

Alexandrovich, Peter S.; DeMejo, Lawrence P.; and Wilson, John C., to Eastman Kodak Company. Electrostatographic toner particle comprising a polyester containing a covalently bound quaternary phosphonium salt. 4,837,393, Cl. 430-110.000.

Alexandrovich, Peter S.; DeMejo, Lawrence P.; Jadwin, Thomas A.; and Wilson, John C., to Eastman Kodak Company. electrostatographic toner particle comprising a polyester containing a covalently bound quaternary phosphonium salt. 4,837,394, Cl. 430-110.000.

Alf, Steven W.: *See—*
Metz, Kenneth D.; Haggerty, John W.; and Alf, Steven W., 4,836,419, Cl. 222-110.000.

Alfred E. Mann Foundation for Scientific Research: *See—*
Byers, Charles L.; Schulman, Joseph H.; and Whitmoyer, David I., 4,837,049, Cl. 427-96.000.

Alkem GmbH: *See—*
Guldner, Ralf; Lasberg, Ingo; Wittmann, Kurt; and Kindleben, Gerd, 4,836,975, Cl. 376-272.000.

Allan, Geoffrey: *See—*
Adcock, John J.; Allan, Geoffrey; and Smith, Terence W., 4,837,203, Cl. 514-17.000.

Allen, Donavan J., to Torus Corporation. Cleaning device for paint brushes and rollers. 4,836,702, Cl. 401-10.000.

Allen, John D., Jr.; and Butler, Philip L., to Martin Marietta Energy Systems, Inc. Parallel machine architecture for production rule systems. 4,837,735, Cl. 364-513.000.

Allen, Theresa M., to Liposome Technology, Inc. Liposomes with enhanced circulation time. 4,837,028, Cl. 424-450.000.

Alliance Research Corporation: *See—*
Cooper, Gershon, 4,836,485, Cl. 248-278.000.

Allie, Mark C., to Nelson Industries, Inc. Active acoustic attenuation system with differential filtering. 4,837,834, Cl. 381-71.000.

Allied Corporation: *See—*
Romey, Russell P.; and Greer, Lonny R., 4,835,971, Cl. 60-740.000.

Allied-Signal Inc.: *See—*
Doran, Robert A.; and Ficalora, Joseph P., 4,836,677, Cl. 356-350.000.
Eisa, Soraya; Peczkowski, Joseph; Tyler, Henry; and Richardson, Glenn, 4,837,697, Cl. 364-431.020.
Hardy, James A., 4,835,963, Cl. 60-274.000.
Lund, Earl A. E.; Richard, Robert G.; Shankland, Ian R.; and Wilson, David P., 4,836,947, Cl. 252-171.000.
McAllister, Lawrence E.; and Jannasch, Norman E., 4,837,073, Cl. 428-212.000.
Moore, Robert G., Jr., 4,836,089, Cl. 91-446.000.
Murry, Roger P.; Silver, Alexander; and Fischer, Richard L., 4,835,979, Cl. 62-172.000.
Taig, Alistair G., 4,836,338, Cl. 188-72.100.
Tallman, Jack A., 4,835,969, Cl. 60-39.281.
Vandemotter, Patrick J.; Hutchins, Merlyn L.; Canale, Jon S.; and Koyan, Kenneth R., 4,837,552, Cl. 340-461.000.

Allred, Jimmie B., III; Kokosa, Richard A.; Krauter, Allan I.; and Newman, Richard W., to Welch Allyn, Inc. Video hysteroscope. 4,836,189, Cl. 128-6.000.

Alon, Yair, to Lear Siegler, Inc. Doppler radar method and apparatus for measuring a projectile's muzzle velocity. 4,837,718, Cl. 364-565.000.

Alpegiani, Marco: *See—*
Perrone, Ettore; Alpegiani, Marco; Bedeschi, Angelo; Zarini, Franco; Franceschi, Giovanni; and Bruna, Costantino D., 4,837,215, Cl. 514-192.000.

Alpine Aktiengesellschaft: *See—*
Karl, Veit-Holger; Mahler, Franz; and Greisel, Josef, 4,836,744, Cl. 425-72.100.

Alps Electric Co., Ltd.: *See—*
Hasegawa, Kazuo, 4,837,430, Cl. 250-221.000.

Alten, Kurt. Transfer bridge for a dock. 4,835,806, Cl. 14-71.100.

Aluminium Pechiney: *See—*
Conti, Calogero; Meyer, Jean-Luc; Netter, Pierre; and Riquet, Jean-Pierre, 4,837,385, Cl. 210-695.000.

Aluminum Company of America: *See—*
La Barge, Robert L.; and Ewing, Ronald J., 4,836,705, Cl. 403-282.000.
Leftault, Charles J., Jr.; and Willis, W. Coy, 4,836,398, Cl. 220-66.000.
Loutfy, Raouf O.; and Weisbrod, Kirk R., 4,836,998, Cl. 423-460.000.

Alvis, John R.; Pfiester, James R.; and Holland, Orin W., to Motorola, Inc. N-channel MOS transistors having source/drain regions with germanium. 4,837,173, Cl. 437-024.000.

Aly, Fouad A.; Graven, Richard G.; and Lewis, David W., to Mobil Oil Corporation. Distribution system for downflow reactors. 4,836,989, Cl. 422-195.000.

ALZA Corporation: *See—*
Deters, Joseph C.; Wong, Patrick S. L.; Barclay, Brian L.; Theeuwes, Felix; and Swanson, David R., 4,837,111, Cl. 424-473.000.
Lee, Eun S.; and Yum, Su I., 4,837,027, Cl. 424-449.000.

Amana Refrigeration, Inc.: *See—*
Rinholen, Robert K., 4,835,981, Cl. 62-229.000.

Amano, Matsuo; Shida, Masami; Sakamoto, Masahide; Hirayama, Takeshi; and Sasayama, Takao, to Hitachi, Ltd. Method of controlling air-fuel ratio. 4,837,698, Cl. 364-431.070.

Ambassador College: *See—*
Prohs, John R.; Akins, Charles G.; Efthyvoulos, Nicholas; Sandilands, Phillip E.; and Scheid, Michael R., 4,837,799, Cl. 379-224.000.

Amberg, Guenther: *See—*
Schulz, Paul; and Amberg, Guenther, 4,836,405, Cl. 220-93.000.

Amco Partnership: *See—*
Fingerson, Conrad F.; and Eickhoff, Robert D., 4,836,504, Cl. 256-10.000.

Amdall, John K.: *See—*
Morris, Leslie C.; and Amdall, John K., 4,836,043, Cl. 74-579.00E.

Amelot, Bernard: *See—*
Savall, Jose; Parmentier, Claude; and Amelot, Bernard, 4,835,822, Cl. 24-122.600.

Ament, Eduard, to Baumeister & Gatler. Window shade or screen apparatus, particularly for vehicle windows. 4,836,263, Cl. 160-68.000.

American Bottlers Equipment Co., Inc.: *See—*
Fauth, Frederick E., Sr.; and Barkley, Paul E., 4,836,358, Cl. 198-789.000.

American Colloid Company: *See—*
Alexander, William, 4,836,940, Cl. 252-8.512.

American Cyanamid Company: *See—*
Schwindeman, James A., 4,836,845, Cl. 71-92.000.
Steber, William; Fishbein, Richard; and Cady, Susan M., 4,837,381, Cl. 424-502.000.
Valorose, Joseph J., Jr.; Biehl, Raymond J.; Sheth, Nitin V.; Strathy, Walter A.; and Doelling, Michael K., 4,837,030, Cl. 424-456.000.

American General Products, Inc.: *See—*
Walters, Jon S.; and Boatwright, Neil, 4,836,180, Cl. 126-41.00R.

American Home Products Corporation: *See—*
Abou-Gharbia, Magid A., 4,837,325, Cl. 544-372.000.
Crossley, Roger; and Heatherington, Kenneth, 4,837,329, Cl. 546-181.000.

American Home Products Corporation (Del.): *See—*
Ulbrich, Paul, 4,836,208, Cl. 128-642.000.

American Standard Inc.: *See—*
Wagner, Daniel G., 4,836,093, Cl. 92-160.000.
York, John D.; Peppard, Edward M.; and Haugen, Bruce A., 4,835,828, Cl. 29-157.30C.

American Telephone and Telegraph Company: *See—*
Cohen, Roberta S.; Huber, Kenneth M.; and Mills, Deborah J., 4,837,798, Cl. 379-88.000.
Szeto, Rickens T.; and Woodland, Harold K., 4,837,807, Cl. 379-96.000.

American Telephone and Telegraph Company, AT&T Bell Laboratories: *See—*
Gartside, Charles H., III; Glodis, Paul F.; and Patel, Parbhubhai D., 4,836,640, Cl. 350-96.230.
Gurvitch, Michael; and Levy, Roland A., 4,837,609, Cl. 357-71.000

American Telephone and Telegraph Company AT&T Technologies, Inc.: *See—*
Hechtman, Charles D., 4,837,507, Cl. 324-158.00P.

Ametek, Inc.: *See—*
Doty, Mitchell E.; and Schmidt, Ferenc J., 4,836,012, Cl. 73-23.000.

Ammon, Robert L.: *See—*
Svedberg, Robert C.; and Ammon, Robert L., 4,836,849, Cl. 75-245.000.

Amoco Corporation: *See—*
Bertolacini, Ralph J.; Hirschberg, Eugene H.; and Modica, Frank S., 4,836,993, Cl. 423-244.000.
Gardner, Hugh C.; Colon, Ismael; and Robeson, Lloyd M., 4,837,256, Cl. 524-141.000.
Matzner, Markus; and Papuga, Donald M., 4,837,284, Cl. 525-437.000.
Morris, Steven A.; Mount, Houston B., II; and Penn, John T., 4,837,753, Cl. 367-69.000.
Owens, David W.; and Propp, Jack E., 4,836,291, Cl. 169-46.000.
Peacock, Kenneth L., 4,837,723, Cl. 364-724.010.
Reed, Robert L.; and Holdeman, David A., 4,836,999, Cl. 423-574.00R.

AMP Incorporated: *See—*
Adlon, Daniel T.; and Arbogast, William C., Jr., 4,835,858, Cl. 29-868.000.
Gerst, Michael; Knapp, Horst J. T.; and Maack, Werner, 4,835,844, Cl. 29-747.000.
Grabbe, Dimitry G.; Granitz, Richard F.; Bakker, Roel J.; Milbrand, Donald W., Jr.; and Masterson, Earl E., 4,836,791, Cl. 439-79.000.
Rudy, William J., Jr.; and Shaffer, Howard R., 4,836,789, Cl. 439-64.000.

Ampex Corporation: *See—*
Smidth, Peter, 4,837,642, Cl. 360-46.000.

Amtrol Inc.: *See—*
Lane, Joseph A., 4,836,409, Cl. 220-403.000.

Anchor Hocking Corporation: *See—*
Hayes, Thomas H.; and Lo Maglio, Lewis C., 4,836,423, Cl. 222-257.000.

Ancona, Bruce: *See—*
Ancona, Jane; and Ancona, Bruce, 4,836,396, Cl. 220-212.000.

Ancona, Jane; and Ancona, Bruce, to M. Kamenstein, Inc. Combination canister cover and cookie cutter. 4,836,396, Cl. 220-212.000.

Andermann, Guy; de Burlet, Georges; Dietz, Michel; and Spittler, Joseph, to Laboratoires P.O.S. Two part tissue irrigating solution. 4,837,021, Cl. 424-602.000.

Anderson, James H.; and Bugner, Douglas E., to Eastman Kodak Company. Dry electrostatographic developer containing toner particles comprising a vinyl addition polymer containing a covalently bound quaternary phosphonium salt. 4,837,391, Cl. 430-110.000.

Anderson, James H.; Bugner, Douglas E.; DeMejo, Lawrence P.; Sutton, Richard C.; and Wilson, John C., to Eastman Kodak Company. Dry electrostatographic developer containing toner particles comprising a vinyl addition polymer containing a covalently bound quaternary phosphonium salt. 4,837,392, Cl. 430-110.000.

Anderson, Milo D.; Holt, Neil L.; Larsson, Peter L.; and Richardson, Anthony R. W., to Raychem Corporation. Bulkhead seal. 4,836,558, Cl. 277-1.000.

Anderson, Richard A. Flexible circuit interconnection for a matrix addressed liquid crystal panel. 4,836,651, Cl. 350-334.000.

Anderson, Richard A.: *See—*
Martin, John R.; and Anderson, Richard A., 4,837,068, Cl. 428-133.000.

Anderson, Richard N., to Hunter Douglas Inc. Clutch system for gear drive. 4,836,345, Cl. 192-20.000.

Anderson, Vernon B.: *See—*
Ong, Helen H.; Anderson, Vernon B.; and Profitt, James A., 4,837,227, Cl. 514-450.000.

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Etzbach, Karl-Heinz; Hansen, Guenter; Schefczik, Ernst; and Reichelt, Helmut, 4,837,269, Cl. 534-761.000.
Fuchs, Hugo; and Weiss, Franz-Josef, 4,837,362, Cl. 562-606.000.
Gramlich, Walter; Goetz, Norbert; Siegel, Hardo; and Schindler, Gerhard, 4,837,201, Cl. 512-26.000.
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Merger, Franz; and Hettinger, Peter, 4,837,357, Cl. 560-226.000.

Richter, Juergen; Grau, Werner; Maurer, Gerd; Domas, Friedrich; Loeser, Werner; Bender, Rainer; Schulze, Axel-Ruediger; and Doerr, Kurt, 4,835,909, Cl. 51-281.0SF.
Schlaefer, Dieter; Kochanek, Wolfgang; and Leutner, Bernd, 4,837,002, Cl. 423-641.000.
Simon, Helmut; and Thanos, Jordanes, 4,837,189, Cl. 502-150.000.
Streu, Joachim; Straehle, Wolfgang; and Ramlow, Gerhard, 4,837,245, Cl. 521-117.000.
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BASF Corporation: *See—*
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Hibbard, Billy B.; Mann, Joe A.; Koeleveld, Frans P. P.; Potepan, Agnes K.; White, Richard E.; Knight, Barry T.; and Bryant, Howard H., 4,837,281, Cl. 525-234.000.

Basic Packaging Systems, Inc.: *See—*
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Baumann, Hans; and Stucki, Samuel, to BBC Brown Boveri AG. Process for breaking down organic substances and/or microbes in pretreated feed water for high-purity water recirculation systems. 4,836,929, Cl. 210-638.000.

Baumann, Karl-Heinz, to Daimler-Benz Aktiengesellschaft. Bracing of vehicle body structures on a resiliently mounted front engine motor vehicle. 4,836,321, Cl. 180-232.000.

Baumeister & Gatler: *See—*
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Baumhardt, Robert J.: *See—*
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Baumrind, Sheldon; and Curry, Sean, to Vexcel Corporation. Mandibular motion monitoring system. 4,836,778, Cl. 433-69.000.

Baureis, Hans-Paul; Bickle, Wolfgang; and Lankreijer, Wilhelm, to Kolbenschmidt Aktiengesellschaft. Composite sliding surface bearing. 4,836,695, Cl. 384-276.000.

Bausch & Lomb Incorporated: *See—*
Ogunbiyi, Lai; Smith, Francis X.; and Riechhammer, Thomas M., 4,836,986, Cl. 422-28.000.

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Baxter International Inc.: *See—*
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Bayer Aktiengesellschaft: *See—*
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Bayer Aktiengesellschaft: *See—*
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Bayes Turull, Ramon: *See—*
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Bayly, Peter K., to Kingsley Nominees Pty. Ltd. Whisk. 4,836,688, Cl. 366-342.000.

Baz, Dan G.: *See—*
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BBC Brown Boveri AG: *See—*
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Beach, Daryl R.; and Hayashi, Kazuo, to Kabushiki Kaisha Morita Seisakusho. Treatment chair assembly. 4,836,603, Cl. 297-193.000.

Bean, Jeffrey W. Rotating ring game. 4,836,540, Cl. 273-1.00G.

Bean, Robert G.; Beckman, Michael E.; Rubinson, Barry L.; Gardner, Edward A.; Sergeant, O. Winston; and McLean, Peter T., to Digital Equipment Corporation. Secondary storage facility empolying serial communications between drive and controller. 4,837,675, Cl. 364-200.000.

Beard, Terry D. Low differential 3-D viewer glasses and method with spectral transmission characteristics to control relative intensities. 4,836,647, Cl. 350-132.000.

Becerra, Rodrigo C.: *See—*
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Bechtel, Richard L.: *See—*
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Becker, Rainer; Eckhardt, Heinz; Fischer, Rolf; Spiegler, Wolfgang; and Vagt, Uwe, to BASF Aktiengesellschaft. Preparation of esters of tetrahydropyran-4-carboxylic acid. 4,837,346, Cl. 549-425.000.

Becker, William J.: *See—*
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Beckett, Frederick J., to Tektronix, Inc. Method of forming a contact bump. 4,835,859, Cl. 29-846.000.

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Beckman, Michael E.: *See—*
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Beckman Research Institute, City of Hope: *See—*
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Beecham-Wuelfing GmbH & Co. KG: *See—*
Thielke, Dietrich; Holtje, Dagmar; and Nadler, Guy, 4,837,240, Cl. 514-294.000.

Beelart, Joseph H., Jr. Apparatus for manipulating a hinged member. 4,835,799, Cl. 4-661.000.

Beer, Manfred: *See—*
Frantl, Erich; and Hofstatter, Peter, 4,836,967, Cl. 264-69.000.

Beeson, Charles F., to Johnson Controls, Inc. Adjustable valve linkage. 4,836,497, Cl. 251-80.000.

Behncke, Hans: *See—*
Burghart, Heiner; and Behncke, Hans, 4,836,223, Cl. 131-329.000.

Behr, R. Douglas: *See—*
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Behre, Horst: *See—*
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Behrens, Christine L.: *See—*
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Behringer, Cecil R. Method for cooling a nuclear reactor and a product therefor. 4,836,292, Cl. 169-47.000.

Beier, Rudolf: *See—*
Welschof, Hans-Heinrich; Beier, Rudolf; and Hofmann, Norbert, 4,835,829, Cl. 29-159.300.

Beight, Douglas W.: *See—*
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Bel Fuse Inc.: *See—*
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Belanger, Thomas D., Jr.; and Johnson, Roy L., to AG Communication Systems Corporation. Electrostatic discharge device. 4,837,657, Cl. 361-220.000.

Bell, Cecil R., Jr.: *See—*
Thomas, Richard D.; and Bell, Cecil R., Jr., 4,835,939, Cl. 53-248.000.

Bell, James A. E.; Eerkes, Thijs; Diaz, Carlos M.; and Mankins, William L., to Inco Limited. Manufacture of composite structures. 4,836,979, Cl. 419-23.000.

Bell, Jan E. Piano roll cabinet. 4,836,391, Cl. 211-60.100.

Bell, Jonathan D.: *See—*
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Bell Telephone Laboratories, Incorporated: *See—*
Frisch, David C.; Manzione, Louis T.; Poelzing, Gerhard W.; and Weber, Wilhelm, 4,837,129, Cl. 430-319.000.

Bellanger, Gilbert, to Commissariat a l'Energie Atomique. Process for the decontamination of the surface of a metal port contaminated by tritium and apparatus usable for this process. 4,836,900, Cl. 204-140.000.

Bellavia, Andrew S., Jr., to Zenith Electronics Corporation. Hybrid CATV scrambling system. 4,837,820, Cl. 380-7.000.

Bellis, Kenneth E.; Brown, Jackson E.; Nagarwalla, Pheroze J.; and Rea, James, to Roberts Corporation. Forming apparatus having catalyst introduction simultaneous with sand injection. 4,836,269, Cl. 164-200.000.

Beloit Corporation: *See—*
Bielagus, Joseph, 4,836,388, Cl. 209-672.000.
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Welsby, John, 4,835,881, Cl. 34-117.000.

Ben Lee Calls: *See—*
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Bencriscutto, Michael. Machine for digging a putting cup hole. 4,836,294, Cl. 172-22.000.

Bender, Rainer: *See—*
Richter, Juergen; Grau, Werner; Maurer, Gerd; Domas, Friedrich; Loeser, Werner; Bender, Rainer; Schulze, Axel-Ruediger; and Doerr, Kurt, 4,835,909, Cl. 51-281.0SF.

Bendix France: *See—*
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Bengtson, Jon: *See—*
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Benjamin, Eric J.; and Visor, Gary C., to Syntex (U.S.A.) Inc. Cardiotonic phosphodiesterase inhibitors complexed with water soluble vitamins. 4,837,239, Cl. 514-267.000.

Bennett, Douglas L.; Ludwig, Keith A.; Witmer, George S.; and Woods, Charles M., to Air Products and Chemicals, Inc. Separating argon/oxygen mixtures using a structured packing. 4,836,836, Cl. 62-22.000.

Benning, Friedrich, to Deere & Company. Closure for a pressurized fluid-filled container. 4,836,406, Cl. 220-203.000.

Benson, William A.: *See—*
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Bentley-Harris Manufacturing Company, The: *See—*
Kite, Joseph S., III; and Tresslar, Marie C., 4,836,080, Cl. 87-9.000.

Berenbaum, Morris C.: *See—*
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Berfield, Robert C.; Meland, Ronald F.; and Seasholtz, Craig A., to Shop-Vac Corporation. Portable electric blower. 4,836,753, Cl. 417-236.000.

Berg, Lloyd, to Berg, Lloyd. Separation of m-diisopropylbenzene from p-diisoproylbenzene by azeotropic distillation with acetophenone. 4,836,896, Cl. 203-46.000.

Berg, Richard A.; Silver, Frederick H.; and Pachence, James M., to MediMatrix. Collagen matrix beads for soft tissue repair. 4,837,285, Cl. 530-356.000.

Berg, Roger M.; and Scott, Francis H., to Uni-BMX, Inc. Demountable disc covers for spoked wheels and the like. 4,836,615, Cl. 301-37.0SA.

Bergaentzle, Denis: *See—*
Anton, Patrice; and Bergaentzle, Denis, 4,837,077, Cl. 428-240.000.

Berger, Moshe, to Ariel and Berger Industries Ltd. Quickly-releasable clutch. 4,836,346, Cl. 192-27.000.

Berger, Philippe: *See—*
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Bergeron, Charles W. Poppet valve assembly with apertures. 4,836,154, Cl. 123-79.00C.

Bergin, John A.: *See—*
Devir, Daniel D.; Dolan, Richard J.; and Bergin, John A., 4,837,479, Cl. 313-318.000.

Bergstrom, Michael J.; and Gent, Derek J., to U.S. Philips Corp. High voltage power transistor circuits. 4,837,457, Cl. 307-253.000.

Bernier, Michel M. Molded sound box for violin and the like. 4,836,076, Cl. 84-275.000.

Bernstein, Elliot, to Bel Fuse Inc. Fuse block. 4,837,546, Cl. 337-272.000.

Berstein, Linda A.: *See—*
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Bernstein, Peter R.; Brown, Frederick J.; Matassa, Victor G.; and Yee, Ying K., to ICI Americas Inc. Indole and indazole keto sulphones as leukotriene antagonists. 4,837,235, Cl. 514-234.500.

Berrehail, Mohamed. Device for abduction of upper limbs. 4,836,195, Cl. 128-83.000.

Berry, Yale J. Instrument for illuminated steresopic viewing of body cavities. 4,836,188, Cl. 128-6.000.

Bersani, Pierre, to PARTEUROSA, Societe Anonyme. Container. 4,835,922, Cl. 52-228.000.

Bertin & Cie: *See—*
Lequime, Michel; and Millet, Jocelyn, 4,836,674, Cl. 356-319.000.

Bertolacini, Ralph J.; Hirschberg, Eugene H.; and Modica, Frank S., to Amoco Corporation. Process for removing sulfur oxides from a gas. 4,836,993, Cl. 423-244.000.

Bertolami, Charles N.: *See—*
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Bescup, Terrance L.; Fellows, Benjamin T.; and Leedecke, Charles J., to Minnesota Mining and Manufacturing Company. Transparent alumina microspheres. 4,837,069, Cl. 428-148.000.

Besner, Guy. Multi-purpose support frame for cooking grill. 4,836,480, Cl. 248-125.000.

Besson, Rene, to Montres Rolex S.A. Device for controlling or correcting the readout of the day of the week or date for a wrist watch. 4,837,755, Cl. 368-35.000.

Best, Gary R., to Methode Electronics, Inc. Spring switch. 4,837,411, Cl. 200-5.00A.

Best Lock Corporation: *See—*
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Beth Israel Hospital Association, The: *See—*
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Betts, Malcolm C.: *See—*
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Betz, Howard T.: *See—*
Murarka, Narayan P.; Kogler, Kent J.; Bartholomew, Craig S.; Betz, Howard T.; and Harris, Richard J., 4,837,044, Cl. 427-10.000.

Beu, Richard A., to Teledyne Hanau. Dental face bow. 4,836,779, Cl. 433-73.000.

Bevan, Bruno: *See—*
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Beyerle, Rudi: *See—*
Zoller, Gerhard; Beyerle, Rudi; Schindler, Ursula; Nitz, Rolf-Eberhard; and Martorana, Piero, 4,837,225, Cl. 514-427.000.

Bhargava, Akhil: *See—*
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Bianchi, Maurice P., to TRW Inc. Method for cleaning spacecraft critical surfaces. 4,836,860, Cl. 134-21.000.

Bianchini, William L.; Infantino, Robert, and Musarra, Vicent, to Rockport Company, The. Shoe structure. 4,835,884, Cl. 36-24.500.

Bickle, Wolfgang: *See—*
Baureis, Hans-Paul; Bickle, Wolfgang; and Lankreijer, Wilhelm, 4,836,695, Cl. 384-276.000.

Biehl, Raymond J.: *See—*
Valorose, Joseph J., Jr.; Biehl, Raymond J.; Sheth, Nitin V.; Strathy, Walter A.; and Doelling, Michael K., 4,837,030, Cl. 424-456.000.

Biek, Paul A., to Dresser Industries, Inc. Fluid pressure impulse nut runner. 4,836,296, Cl. 173-93.500.

Bielagus, Joseph, to Beloit Corporation. Apparatus for separating material by length. 4,836,388, Cl. 209-672.000.

Bierman, Laurence W.; and Polinsky, Samuel M., to J. R. Simplot Co. Stabilization of setting times of phosphate-bonded magnesia cements. 4,836,854, Cl. 106-85.000.

Bigler, Charles G.: *See—*
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Bihlmaier, John A., to Sundstrand Corporation. Seal assembly with meltable metal binder layer. 4,836,559, Cl. 277-26.000.

Billings, Scott C.: *See—*
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Bio-Technology General Corp.: *See—*
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Biochimica Opos S.p.A.: *See—*
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Bionix Corporation: *See—*
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Biotechnology Australia Pty. Ltd.: *See—*
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Bird, Wiley M., to Ford Aerospace & Communications Corporation. Repeater for extending local area networks. 4,837,788, Cl. 375-3.000.

Birsching, Joel E., to General Motors Corporation. Four-wheel steering system. 4,836,566, Cl. 280-91.000.

Bisaiji, Takashi, to Ricoh Company, Ltd. Method and apparatus applicable to multicolor developing device for detecting image density. 4,837,597, Cl. 355-203.000.

Bishop, Norman G.; Bottinelli, N. Edward; and Kotraba, Norman L., to Zia Technology, Inc. Method for reclaiming metal values from electric arc furnace flue dust and sludge and rendering residual solids recyclable or non-hazardous. 4,836,847, Cl. 75-25.000.

Bisping, Heinz; Gahler, Alfred; Hoffmann, Armin; and Popp, Franz, to Hilti Aktiengesellschaft. Anchoring unit for use in structures with internal open spaces. 4,836,729, Cl. 411-82.000.

Bitter, Johan G. A., to Shell Oil Company. Supported membrane and process for its preparation. 4,837,055, Cl. 427-244.000.

Bivens Winchester Corporation: *See—*
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Bizerba-Werke Wilhelm Kraut GmbH & Co. KG: *See—*
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Blacklin, Peter A.; and Bell, Jonathan D., to Tate Acess Floors. Self-gridding flooring system. 4,835,924, Cl. 52-263.000

Blackmon, Laura M. Multi-use tray with accessories. 4,836,403, Cl. 220-85.00H.

Blake, Jeffrey T., to Emhart Industries, Inc. System for providing a liquid to a blind rivet setting mechanism. 4,836,003, Cl. 72-44.000.

Blakeney, Andrew J.; Jeffries, Alfred T., III; and Sarubbi, Thomas R., to Olin Hunt Specialty Products Inc. Thermally stable light-sensitive compositions with o-quinone diazide and phenolic resin. 4,837,121, Cl. 430-192.000.

Blanc, Philippe, to Societe Montalbanaise de Constructions/-Mecaniques. Device for transfer of fragile objects from a conveyor to a transporter. 4,836,355, Cl. 198-418.600.

Blank, Heinz U.: *See—*
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Blanton, Albert G., to Avco Corporation. Deburring apparatus. 4,835,913, Cl. 51-336.000.

Blazek, Vladimir: *See—*
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Block, Aleck. Abrasive wheel. 4,835,912, Cl. 51-332.000.

Bloom, Elbert: *See—*
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Bluepoint Industries, Inc.: *See—*
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BMC Software, Inc.: *See—*
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Boatwright, David A.; Duncan, Robert; and Klapper, Kenneth K., to Westinghouse Electric Corp. Fuel rod end plug welding apparatus and method. 4,837,419, Cl. 219-125.110.

Boatwright, Neil: *See—*
Walters, Jon S.; and Boatwright, Neil, 4,836,180, Cl. 126-41.00R

Boca Foods Inc.: *See*—
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Bodine, Albert G. Sonic method and apparatus for installing monitor wells for the surveillance and control of earth contamination. 4,836,299, Cl. 175-22.000.

Bodolus, Christopher: *See*—
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Bodson, Guy: *See*—
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Boe, Thomas E.; and Sweet, Richard L., to Deere & Company. Hitch control system with start-up lock-out. 4,837,691, Cl. 364-424.050.

Boehringer Werkzeugmaschinen GmbH: *See*—
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Boeing Company, The: *See*—
Buttermore, Alun L.; and Harder, Mark T., 4,836,875, Cl. 156-231.000.
d'Almada Remedios, Miguel A.; and Riedinger, Thomas R., 4,836,602, Cl. 297-191.000.
Hill, Robert V., 4,837,574, Cl. 342-27.000
Pinson, George T., 4,837,451, Cl. 250-578.000.

Bohlman, James G.: *See*—
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Bohm, Peter D.: *See*—
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Bolger, John G., to Inductran Corporation. Roadway power and control system for inductively coupled transportation system. 4,836,344, Cl. 191-10.000.

Bomed Medical Manufacturing, Ltd.: *See*—
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Bond, Anthony J.: *See*—
Doyle, James; Bond, Anthony J.; and Davidson, Fiona E., 4,836,628, Cl. 350-3.610.

Bond, Roger A. L.; and Nigro, Stephen J., to Abbott Ball Company, The. Methods of making steel abrading elements for mass finishing of workpieces and for using same. 4,835,911, Cl. 51-313.000.

Bondoc, Alfredo A.; Carroll, William R.; and Lloyd, Bobbie J., to GAF Corporation. Laminated roofing hip. 4,835,929, Cl. 52-518.000.

Bonestroo, David A.: *See*—
Kardoes, Oliver A.; Kardoes, Richard T.; and Bonestroo, David A., 4,836,687, Cl. 366-286.000.

Bonjour, Jacques L.; and Baz, Dan G., to Maillefer S. A. Segmented electric cable arrangement. 4,837,405, Cl. 174-36.000.

Bonnet, Jacques, to Rowenta-Werke GmbH. Vacuum cleaner. 4,835,814, Cl. 15-339.000.

Bonnett, Raymond; and Berenbaum, Morris C., to Efamol Ltd. Methods of treating tumors susceptible to necrosis. 4,837,221, Cl. 514-410.000.

Boo, William O. J. Construction kit educational aid and toy. 4,836,787, Cl. 434-403.000.

Borden Company Limited: *See*—
Navratil, Martin; Mitchell, Mark S.; and Novak, Mojmir, 4,836,285, Cl. 166-295.000.

Borg, Bertil: *See*—
Landaeus, Kjell; and Borg, Bertil, 4,836,717, Cl. 405-252.000.

Borgers, Stephanus M. C.; and Visser, Cornelis P., to U.S. Philips Corporation. Discrete cosine transform arrangement. 4,837,724, Cl. 364-725.000.

Borgman, Robert J., to Curatek Pharmaceuticals, Inc. Topical metronidazole formulations and therapeutic uses thereof. 4,837,378, Cl. 424-81.000.

Borrelli, Robert E. Vehicle chocking device for flatbed carrier. 4,836,337, Cl. 188-32.000.

Boshier, Geoffrey, to Textron Inc. Gap measuring apparatus. 4,837,615, Cl. 358-100.000.

Bosshard, Alexander, to Steigmuhle Toss AG. Dual chamber container and method for forming an opening between the chambers of the container. 4,836,370, Cl. 206-222.000.

Boston Beer Limited Partnership: *See*—
Owades, Joseph L.; and Koch, Charles J. 4,837,034, Cl. 426-16.000.

Boston University, Trustees of: *See*—
Zimmerman, George O.; and Ibrahim, Abdo K., 4,837,377, Cl. 423-448.000.

Bottinelli, N. Edward: *See*—
Bishop, Norman G.; Bottinelli, N. Edward; and Kotraba, Norman L., 4,836,847, Cl. 75-25.000.

Bouchard, Andre C.; and Thibault, Paul A., to GTE Products Corporation. Method of treating tungsten cathodes. 4,836,816, Cl. 445-51.000.

Boucher, Stephen G., to Airmar Technology Corporation. Marine instrument. 4,836,020, Cl. 73-187.000.

Bouldin, Eric W.; and Drexler, Jerome, to Drexler Technology Corporation. Optical memory card with versatile storage medium. 4,837,134, Cl. 430-445.000.

Boulet, Jean; and Morin, Pierre, to SMF International; and Institut Francais du Petrole. Device for the remote adjustment of the relative orientation of two sections of a column. 4,836,303, Cl. 175-74.000.

Bourcereau, Jean: *See*—
Sainte Luce Banchelin, Jean; Bourcereau, Jean; and Valy, Yves, 4,837,448, Cl. 250-519.100.

Bourque, Rene: *See*—
Hoshizaki, Thomas B.; Hall, Kenneth; and Bourque, Rene, 4,835,885, Cl. 36-115.000.

Bowen, Hamilton S. Hand operable telescopic sight mounting system. 4,835,895, Cl. 42-101.000.

Bowen, Paul D. Lawn chair fish fighter. 4,835,896, Cl. 43-21.200.

Bower, Lewis R. B., to Fletcher Sutcliffe Wild Limited. Endless drive transmission. 4,836,362, Cl. 198-854.000.

Bozek, Daryn S., to Universal Industries Ltd. Method and apparatus for determining oil content of oil well production. 4,836,017, Cl. 73-155.000.

Bozler, Carl O.; Fan, John C. C.; and McClelland, Robert W., to Massachusetts Institute of Technology. Method of producing sheets of crystalline material. 4,837,182, Cl. 437-82.000.

Brackmann, Horst: *See*—
Kleefeldt, Frank; Brackmann, Horst; and Bartel, Peter, 4,837,567, Cl. 340-825.310.

Braithwaite, Melvyn: *See*—
Sutter, R. Frank; and Braithwaite, Melvyn, 4,836,472, Cl. 244-114.00R.

Brancati, Rudolf P., to Nynex Corporation. Armored cord handset. 4,837,815, Cl. 379-438.000.

Brandestini, Marco; and Moermann, Werner H. Method and apparatus for the three-dimensional registration and display of prepared teeth. 4,837,732, Cl. 364-413.280.

Branscome, Larry W., to Eastman Kodak Company. Poly(1,4-cyclohexylene dimethylene terephthalate) molding compositions. 4,837,254, Cl. 523-455.000.

Branson, Terry L.: *See*—
Hirth, Gregory; and Branson, Terry L., 4,836,431, Cl. 226-74.000.

Bras, Johan C. M., to SKF Industrial Trading and Development Co., B.V. Lubricating device. 4,836,334, Cl. 184-45.100.

Bratic, Peter: *See*—
Lewin, Henry B.; and Bratic, Peter, 4,836,259, Cl. 152-222.000.

Braun, Gerold; Tschang, Chung-Ji; Vamvakaris, Christos; and Glaser, Klaus, to BASF Aktiengesellschaft. Preparation of sulfatobetaines. 4,837,330, Cl. 546-339.000.

Brazdil, James F., Jr.: *See*—
Glaeser, Linda C.; Brazdil, James F., Jr.; and Toft, Mark A., 4,837,191, Cl. 502-202.000.
Glaeser, Linda C.; Brazdil, James F., Jr.; and Toft, Mark A., 4,837,233, Cl. 502-204.000.

Brazell, Charles R.: *See*—
Davis, Dick E.; Brazell, Charles R.; and Johnston, Jerome E., 4,836,308, Cl. 177-25.140

Breck, Donald W., deceased: *See*—
Skeels, Gary W.; Breck, Donald W., deceased; Breck, Stephen R., heir; and Breck, George D., heir, 4,836,911, Cl. 208-111.000.

Breck, George D., heir: *See*—
Skeels, Gary W.; Breck, Donald W., deceased; Breck, Stephen R., heir; and Breck, George D., heir, 4,836,911, Cl. 208-111.000.

Breck, Stephen R., heir: *See*—
Skeels, Gary W.; Breck, Donald W., deceased; Breck, Stephen R., heir; and Breck, George D., heir, 4,836,911, Cl. 208-111.000.

Breeze, Glenn S.; and Baird, Robert M., to Hughes Aircraft Company. Simplified process for fabricating dispenser cathodes. 4,837,480, Cl. 313-346.0DC.

Breiten, Charles P.; Stanasolovich, David; and Theisen, Jacob F., to International Business Machines Corporation. Planarization process for wide trench isolation. 4,836,885, Cl. 156-643.000.

Brejcha, Robert J.: *See*—
DeVale, Donald P.; Brejcha, Robert J.; and Lantz, Gregory W., 4,836,556, Cl. 273-376.000.

Brems, John H. Differential rotary-to-rotary cam system to achieve long dwell periods with continuous rotary input. 4,836,040, Cl. 74-63.000.

Brestle, Gary C.: *See*—
De Rosa, R. James; and Brestle, Gary C., 4,836,232, Cl. 135-99.000.

Bridge Products, Inc.,: *See*—
Pagani, Ezio, 4,836,235, Cl. 137-223.000.

Bridgestone Corporation: *See*—
Mamada, Mamoru; Yahagi, Mitsuhisa; and Nakamura, Masao, 4,836,257, Cl. 152-209.00R.
Muramatsu, Tateo; Saito, Hideaki; Takasaki, Mamoru; and Enami, Yasushi, 4,836,713, Cl. 405-115.000.
Nishizawa, Kuninori; Miura, Teruo; Watanabe, Yoichi; and Takagi, Hirohiko, 4,836,262, Cl. 152-451.000.

Brilliant, Stuart D.: *See*—
Aza, Alberto D.; Keeley, Charles; Rogers, Jay L.; and Brilliant, Stuart D., 4,837,257, Cl. 524-151.000.

Brindopke, Gerhard, to Hoechst AG. Curable mixtures and their use. 4,837,271, Cl. 525-330.300.

Brinly-Hardy Co., Inc.: *See*—
Doering, Charles W.; Caudill, Garland E.; Johnson, Henry L.; and Thomas, Bruce A., 4,836,610, Cl. 298-6.000.

Briscoe, James A.; Putt, James C.; Phillips, Ronald W., II; and Leffel, Kevin L., to B. F. Goodrich Company, The. De-icer. 4,836,474, Cl. 244-134.00A.

Bristol-Myers Company: *See*—
Golik, Jerzy, 4,837,206, Cl. 514-25.000.

Britax Rainsfords, Pty. Ltd.: *See*—
Fimeri, Garry G. L., 4,836,491, Cl. 248-549.000.

Britcliffe, Michael J.: *See*—
Jones, Jack A.; Petrick, S. Walter; and Britcliffe, Michael J., 4,835,973, Cl. 62-6.000.

British Telecommunications public limited company: *See*—
France, Paul W.; and Williams, John R., 4,836,643, Cl. 350-96.340.

British United Shoe Machinery Ltd: *See*—
Davies, John, 4,836,139, Cl. 118-696.000.

Broaddus, Clarke R., to Du Pont de Nemours, E. I., and Company. Seven hole spinneret. 4,836,763, Cl. 425-131.500.

Brocklehurst, Timothy F.: *See*—
Kirsop, Brian H.; and Brocklehurst, Timothy F., 4,837,037, Cl. 426-303.000.

Brode, George L., II; and Merritt, Frederick M., II, to Union Carbide Corporation. Partially hydrolyzed, poly(N-acyl)alkylenimines in personal care. 4,837,005, Cl. 424-47.000.

Brodie, Alastair C.: *See*—
Hayman, David F.; Brodie, Alastair C.; and Procopiou, Panayiotis A., 4,837,336, Cl. 548-430.000.

Broger, Samuel: *See*—
Tam, Steve; Weigele, Manfred; Broger, Samuel; and Mitsuya, Hiroaki, 4,837,311, Cl. 536-22.000.

Broken Hill Proprietary Company Ltd., The: *See*—
Swinkels, Dominicus A.; and Chouzadjian, Kevork, 4,836,990, Cl. 423-130.000.

Brom, Lawrence V.: *See*—
Hanko, Jimmy J.; and Brom, Lawrence V., 4,836,364, Cl. 206-45.140.

Brookman, Pauline J.: *See*—
Wilson, Alan D.; Prosser, Havard J.; Dunsdon, Anthony J.; Skinner, John C.; and Brookman, Pauline J., 4,836,768, Cl. 428-323.000.

Brookner, George M.; and Change, Sung S., to Pitney Bowes, Inc. Methods and apparatus for customizing and testing fully assembled postage meters. 4,837,714, Cl. 364-550.000.

Brooks, Douglas W., to Process Automation Business, Inc. Digital to analog converter. 4,837,573, Cl. 341-152.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Hirose, Noboru, 4,835,838, Cl. 29-568.000.
Okumura, Takashi; Yamaguchi, Koshiro; and Yuki, Yoshiaki, 4,836,696, Cl. 400-58.000.
Sasaki, Ryoichi, 4,837,709, Cl. 364-519.000.
Takagi, Kazuhiko; and Nonomura, Yoshihito, 4,836,698, Cl. 400-208.000.

Brown, Christopher W.: *See*—
Graves, Thomas J.; Yang, Robert A.; and Brown, Christopher W., 4,836,081, Cl. 89-1.140.

Brown, Frederick J.: *See*—
Bernstein, Peter R.; Brown, Frederick J.; Matassa, Victor G.; and Yee, Ying K., 4,837,235, Cl. 514-234.500.

Brown, Ivonne: *See*—
Macchio, Ralph A.; Brown, Ivonne; and Tietjen, Marlene, 4,837,011, Cl. 424-69.000.

Brown, Jackson E.: *See*—
Bellis, Kenneth E.; Brown, Jackson E.; Nagarwalla, Pheroze J.; and Rea, James, 4,836,269, Cl. 164-200.000.

Brown, James R.; Coatsworth, Leighton L.; and Schmidt, Irold S. Microreactor for analyzing thin solid samples. 4,837,374, Cl. 422-130.000.

Brown, Maurice H. Terminal forming apparatus. 4,836,006, Cl. 721-338.000.

Brown & Sharpe Manufacturing Co.: *See*—
Pesikov, Vitaly I., 4,835,871, Cl. 33-1.00M.

Browning, James A. Duct-stabilized flame-spray method and apparatus. 4,836,447, Cl. 239-8.000.

Brownstein, Scott A., to Eastman Kodak Company. Image contrast by thermal printers. 4,837,586, Cl. 346-76.0PH.

Bruce, Robert; and Whitney, Robert W., to CPC-Rexcel, Inc. Tamper-evident, differential pressure-thermoformed lidded plastic container. 4,836,407, Cl. 220-276.000.

Bruckner Apparatebau GmbH: *See*—
Koch, Werner, 4,835,992, Cl. 68-13.00R.

Bruna, Costantino D.: *See*—
Perrone, Ettore; Alpegiani, Marco; Bedeschi, Angelo; Zarini, Franco; Franceschi, Giovanni; and Bruna, Costantino D., 4,837,215, Cl. 514-192.000.

Bruno, Zaramella: *See*—
Michele, Cardone; Angelo, Grandini; and Bruno, Zaramella, 4,837,540, Cl. 335-286.000.

Brunswick Corporation: *See*—
Entringer, David C., 4,836,810, Cl. 440-61.000.
Griffiths, John M.; Litjens, John J.; and Newman, Neil A., 4,836,811, Cl. 440-61.000.
Griffiths, John M., 4,836,812, Cl. 440-61.000.
Haasl, William D., 4,836,124, Cl. 114-285.000.
Hundertmark, James M., 4,836,506, Cl. 261-23.200.
Litjens, John J.; Griffiths, John M.; and Baumhardt, Robert J., 4,836,151, Cl. 123-65.00V.
Phillips, George E., 4,836,802, Cl. 439-622.000.
Riese, Stephen B., 4,836,152, Cl. 123-65.0EM.

Brupbacher, John M.; Christodoulou, Leontios; and Nagle, Dennis C., to Martin Marietta Corporation. Rapid solidification of metal-second phase composites. 4,836,982, Cl. 420-129.000.

Brusewitz, Harald, to Televerket. Method and means for coding and decoding picture information. 4,837,617, Cl. 358-133.000.

Bruss, Elroy A. Toilet tissue dispenser. 4,836,462, Cl. 242-55.300.

Bryant, Howard H.: *See*—
Hibbard, Billy B.; Mann, Joe A.; Koeleveld, Frans P. P.; Potepan, Agnes K.; White, Richard E.; Knight, Barry T.; and Bryant, Howard H., 4,837,281, Cl. 525-234.000.

Bucar, Matjaz: *See*—
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Buchanan, L. Stephen. Anti-curvature dental root canal shaping file. 4,836,780, Cl. 433-102.000.

Bugner, Douglas E.: *See*—
Anderson, James H.; and Bugner, Douglas E., 4,837,391, Cl. 430-110.000.
Anderson, James H.; Bugner, Douglas E.; DeMejo, Lawrence P.; Sutton, Richard C.; and Wilson, John C., 4,837,392, Cl. 430-110.000.

Buhmann, Ulrich: *See*—
Neh, Harribert, Buhmann, Ulrich; Joppien, Hartmut, and Giles, David, 4,837,220, Cl. 514-403.000.

Builders Equipment Company: *See*—
Abrahamson, Daniel P., 4,836,731, Cl. 414-789.100.

Bukowski, Eugene R.; and Hoffman, Charles R., to International Business Machines Corp. CMOS reference voltage generation 4,837,459, Cl. 307-296.800.

Bull HN Information Systems Inc.: *See*—
Zelinsky, Jerold M.; Stafford, John P.; and Lief, Gerald A., 4,837,710, Cl. 364-521.000.

Bullings, Bruce R.: *See*—
Lawson, Jerry W.; Bullings, Bruce R., and Perfetti, Thomas A., 4,836,224, Cl. 131-336.000.

Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Kamimae, Hajime, to Toyota Jidosha Kabushiki Kaisha. Vehicle air suspension circuit with a changeover means and a low pressure reservoir that surrounds a high pressure reservoir. 4,836,511, Cl. 267-64.160.

Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Kamimae, Hajime, to Toyota Jidosha Kabushiki Kaisha. Vehicle fluid suspension circuit. 4,836,575, Cl. 280-702.000.

Bunker Ramo Corporation: *See*—
Russello, Vincent J., 4,837,764, Cl. 371-20.000.

Burczynski, Thomas J. Bullet having sections separable upon impact and method of fabrication. 4,836,110, Cl. 102-508.000.

Burghart, Heiner; and Behncke, Hans, to Heinrich Burghart Elektro- und Feinmechanik GmbH. Cigarette smoking device. 4,836,223, Cl. 131-329.000.

Burkett, David, to Fisher Scientific Company. Partial restriction detector. 4,836,752, Cl. 417-12.000.

Burkhardt, Eric W.: *See*—
Summers, William, III; and Burkhardt, Eric W., 4,837,190, Cl. 502-171.000.

Burkhart, Georg; Moring, Volker; and Schaefer, Dietmar, to Th. Goldschmidt AG. Method for the preparation of polyurethane foams. 4,837,244, Cl. 521-114.000.

Burks, Harold D.: *See*—
St. Clair, Terry L.; Burks, Harold D.; and Progar, Donald J., 4,837,300, Cl. 528-353.000.

Burlington Industries, Inc.: *See*—
Hussamy, Samir, 4,836,828, Cl. 8-594.000.

Burroughs Wellcome Co.: *See*—
Adcock, John J.; Allan, Geoffrey; and Smith, Terence W., 4,837,203, Cl. 514-17.000.
Holder, Anthony A.; and Freeman, Robert R., 4,837,016, Cl. 424-88.000.
Rideout, Janet L.; Barry, David W.; Lehrman, Sandra N.; St Clair, Martha H.; and Furman, Phillip A., 4,837,208, Cl. 514-50.000.

Burrus, Gilbert S., Jr.; Cooper, Ronald J.; Marr, Michael R.; Marsico, Mario A.; Pescatore, John C.; and Sullivan, Paul D., to International Business Machines Corporation. Multiple port service expansion adapter for a communications controller. 4,837,677, Cl. 364-200.000.

Bursell, Sven-Erik; and Serur, Juan R., to Beth Israel Hospital Association, The. Method and apparatus to monitor cholesterol levels with photon correlation spectroscopy. 4,836,207, Cl. 128-633.000.

Burtscher, Heinz; Schmidt-Ott, Adnreas; and Siegmann, Hans-Christoph, to Matter & Siegmann AG. Method and apparatus for characterization of aerosols. 4,837,440, Cl. 250-379.000.

Burvee, Richard W., to Minnesota Mining and Manufacturing Company. Replaceable tube of conductive gel. 4,836,796, Cl. 439-178.000.

Bushinsky, Joseph P.: *See*—
Nicholas, David M.; Goff, Stephen P.; Roden, Thomas M.; and Bushinsky, Joseph P., 4,836,833, Cl. 55-16.000.

Bussard, Robert W.; and Coppi, Bruno, to FDX Patents Holding Company, N.V. Controlled thermonuclear fusion device and method. 4,836,972, Cl. 376-131.000.

Bussert, Althea J. Temporary window shades. 4,836,265, Cl. 160-354.000.

Bussjager, Rudy C.: *See*—
Vyavaharkar, Dilip Y.; and Bussjager, Rudy C., 4,835,984, Cl. 62-285.000.

Butler, Myron C.; and Madore, Christopher, to Communication Manufacturing Co. Telephone technician's terminals. 4,837,811, Cl. 379-96.000.

Butler, Philip L.: *See*—
Allen, John D., Jr.; and Butler, Philip L., 4,837,735, Cl. 364-513.000.

Butler, Richard J.: *See*—
Bartoszek-Loza, Rosemary; and Butler, Richard J., 4,837,057, Cl. 427-388.400.

Buttermore, Alun L.; and Harder, Mark T., to Boeing Company, The. Method of making an electrically resistive sheet. 4,836,875, Cl. 156-231.000.

Byers, Charles L.; Schulman, Joseph H.; and Whitmoyer, David L., to Alfred E. Mann Foundation for Scientific Research. Method of making an electrode array. 4,837,049, Cl. 427-96.000.

Byers, Jim D.; and Drake, Charles A., to Phillips Petroleum Company. Preparation of 9-alkenyl ester compounds. 4,837,358, Cl. 560-261.000.
Bylander, Lolo: *See—*
Axelsson, Anders R.; Bylander, Lolo; Porrvik, Sten; and Tanner, Olof, 4,837,107, Cl. 430-138.000.
Cabiran, Michel L.: *See—*
Petermann, Steven G.; Cabiran, Michel L.; and Cooper, John D., 4,835,876, Cl. 33-313.000.
Cadena, Edward R.: *See—*
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Cadorniga, Lauro C.: *See—*
Puckett, Troy L.; and Cadorniga, Lauro C., 4,836,552, Cl. 273-218.000.
Cady, Susan M.: *See—*
Steber, William; Fishbein, Richard; and Cady, Susan M., 4,837,381, Cl. 424-502.000.
Caillau, Pierre; Morgan, Paul; and De Veauce, Charles D. C., to ABC Bio-Industries. Additive of protein nature for hydraulic cements, mortars & concretes, and use thereof in the field construction. 4,836,855, Cl. 106-91.000.
Cairo, Anthony: *See—*
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Cakmakci, Mehmet Y., to Sterling Engineered Products Inc. Method of making fiber optic duct insert. 4,836,968, Cl. 264-177.190.
Cal R&D, Inc.: *See—*
May, Richard L.; and Curran, Kenneth J., 4,836,465, Cl. 242-192.000.
Calandro, Thomas; Straka, Robert; and Verrico, Marsha K., to Nabisco Brands, Inc. Process for extrusion of bran products. 4,837,112, Cl. 426-463.000.
California Institute of Technology: *See—*
Dervan, Peter B.; and Dreyer, Geoffrey B., 4,837,312, Cl. 536-27.000.
Gammell, Paul M., 4,837,578, Cl. 342-194.000.
Calviello, Joseph A., to Eaton Corporation. Making a buried channel FET with lateral growth over amorphous region. 4,837,175, Cl. 437-24.000.
Camatec Corporation: *See—*
Petersen, Christian C.; and Wasson, Kim G., 4,837,474, Cl. 310-254.000.
Camden, Thomas M., Jr.: *See—*
Cooney, Barry F.; and Camden, Thomas M., Jr., 4,836,977, Cl. 376-333.000.
Cameron Iron Works USA, Inc.: *See—*
Baker, Gerald S., 4,837,539, Cl. 335-207.000.
Cameron, James M.; Stanton, Timothy P.; Tyc, Anthony J.; and December, Timothy S., to BASF Corporation. Curable coating composition. 4,837,278, Cl. 525-162.000.
Campagnolo S.p.A.: *See—*
Romano, Antonio, 4,836,604, Cl. 297-195.000.
Campbell, Gloria H.: *See—*
Hannah, William J., 4,836,436, Cl. 228-182.000.
Campbell, Simon F.; and Roberts, David A., to Pfizer Inc. Precursors to quinolone inotropic agents. 4,837,334, Cl. 546-346.000.
Campling, Brian, to Engraving Developments Ltd. Engraving machine. 4,836,721, Cl. 409-125.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
McFee, John E., 4,837,489, Cl. 324-67.000.
Canadian Patents & Development Limited: *See—*
de Silva, K. Nimalasiri; and Guevremont, Roger, 4,836,039, Cl. 73-864.810.
Morrall, Robin A. A.; Turkington, T. K.; Hugel, Richard K.; and Rude, Sheldon V., 4,837,146, Cl. 435-34.000.
Ploeg, Jozinus; and Jamieson, Wayne W., 4,836,709, Cl. 405-31.000.
Canale, Jon S.: *See—*
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Canfield, Kenneth A.: *See—*
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Canon Kabushik Kaisha: *See—*
Hisada, Katsutoshi, 4,837,634, Cl. 358-261.00.
Canon Kabushiki Kaisha: *See—*
Ikemori, Keiji, 4,836,661, Cl. 350-423.000.
Ishihara, Shunichi; Hanna, Jun-ichi; and Shimizu, Isamu, 4,837,048, Cl. 427-69.000.
Kato, Hideo; Matsushima, Masaaki; Matsuda, Keiko; and Shibata, Hirofumi, 4,837,123, Cl. 430-269.000.
Kawamura, Masaharu, 4,837,596, Cl. 354-42.000.
Mouri, Akihiro; Toyono, Tsutomu; Kaneko, Shuzo; Inaba, Yutaka; and Kanbe, Junichiro, 4,836,656, Cl. 350-350.00S.
Satomura, Seiichiro; and Kotera, Masahide, 4,837,450, Cl. 250-571.000.
Shibamiya, Yoshikazu, 4,837,712, Cl. 364-523.000.
Shirasaka, Akifumi; Tanaka, Kensaku; and Hamada, Masaki, 4,837,847, Cl. 382-55.000.
Tamura, Shuichi, 4,837,470, Cl. 310-82.000.
Terajima, Hisao, 4,837,813, Cl. 379-113.00.
Watanabe, Tsunehiro, 4,837,806, Cl. 379-9.000.
Canton, Geoffrey A.: *See—*
Zimmerman, Abraham A.; Canton, Geoffrey A.; Siegel, Joel R.; and Vardi, Joseph, 4,836,829, Cl. 44-53.00.
Cappelletto, George C.; and O'Genski, Richard K. Device for supporting and tilting vehicle bodies. 4,836,739, Cl. 414-678.000.
Card, Joseph L.: *See—*
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Card-Monroe Corporation: *See—*
Card, Roy T.; and Card, Joseph L., 4,836,118, Cl. 112-80.410.
Card, Roy T.; and Card, Joseph L., to Card-Monroe Corporation. Apparatus and method for producing a cut loop overlay of a loop pile base fabric in a single pass of the base fabric through the tufting machine. 4,836,118, Cl. 112-80.410.
Carey, Patrick H., Jr.; and Kronzer, Joseph P., to Minnesota Mining and Manufacturing Company. Nonwoven thermal insulating batts. 4,837,067, Cl. 428-108.000.
Caribbean Stud Enterprises, Inc.: *See—*
Suttle, James P.; and Jones, Daniel A., 4,836,553, Cl. 273-292.000.
Carl Freudenberg, Firma: *See—*
Franz, Rainer; Idigkeit, Werner; Loschmann, Hartmut; Rohner, Gerhard; and Kurr, Klaus, 4,836,515, Cl. 267-219.000.
Carl Schenck AG: *See—*
Jatho, Ralf; Hintz, Gerhart; and Keller, Guenter, 4,836,031, Cl. 73-800.000.
Carl-Zeiss-Stiftung: *See—*
Muller, Gerhard; and Greve, Peter, 4,836,203, Cl. 128-203.100.
Carlisi, Joseph: *See—*
DiRe, Felix M.; and Carlisi, Joseph, 4,836,546, Cl. 273-138.00A.
Carlisle, Billy M., Jr. Universal accumulator. 4,835,986, Cl. 62-503.000.
Carmichael, Philip D.; and Finley, Thomas E., to ITT Defense Communications, A Division of ITT Corporation. Digital divider with integer and fractional division capability. 4,837,721, Cl. 364-703.000.
Carnevale, Francesco L.; and Morrow, Kirk D., to Sunbeam Corporation. Bath scale. 4,836,316, Cl. 177-256.000.
Carnley, Franklin D.: *See—*
Peele, Camille; and Carnley, Franklin D., 4,835,851, Cl. 29-272.000.
Carolina Medical Products Company, Inc.: *See—*
Olsen, James L., 4,837,015, Cl. 424-79.000.
Carolina Medical Products, Inc.: *See—*
Olsen, James L., 4,837,029, Cl. 424-451.000.
Olsen, James L., 4,837,211, Cl. 514-175.000.
Caron, Daniele; and Shroot, Braham, to Centre Internatinal de Recherches Dermatologiques C.I.R.D. Pharmaceutical vehicle for active substances in the form of an anhydrous gel. 4,837,213, Cl. 514-179.000.
Caron, Pierre: *See—*
Khan, Tasadduq; Caron, Pierre; and Raffestin, Jean-Louis, 4,837,384, Cl. 148-3.000.
Carondelet Foundry Company: *See—*
Culling, John H., 4,836,985, Cl. 420-582.000.
Carrier Corporation: *See—*
Vyavaharkar, Dilip Y.; and Bussjager, Rudy C., 4,835,984, Cl. 62-285.000.
Wright, Edward F., Jr., 4,836,095, Cl. 98-31.600.
Carroll, William R.: *See—*
Bondoc, Alfredo A.; Carroll, William R.; and Lloyd, Bobbie J., 4,835,929, Cl. 52-518.000.
Carson, Dennis W.: *See—*
Mansell, J. Douglas; Jones, Laurence E.; Johnson, Harlan B.; Krivak, Thomas G.; and Carson, Dennis W., 4,837,253, Cl. 523-443.000.
Carter, Andrew C.: *See—*
Morgan, Peter J.; Carter, Andrew C.; Davis, Richard; and Randle, Frederick A., 4,836,633, Cl. 350-96.180.
Carter, Clyde T., to Wells Electronics, Inc. Zero insertion socket with normally closed contacts. 4,836,798, Cl. 439-268.000.
Carter, Edward L., to United States of America, National Aeronautics and Space Administration. Magnetic drive coupling. 4,836,826, Cl. 464-29.000.
Casci, John L.; Lowe, Barrie M.; and Lowe, Thomas V., to Imperial Chemical Industries PLC. Method of making zeolite Eu-2. 4,836,996, Cl. 423-328.000.
Casco Nobel AB: *See—*
Axelsson, Anders R.; Bylander, Lolo; Porrvik, Sten; and Tanner, Olof, 4,837,107, Cl. 430-138.000.
Casio Computer Co., Ltd.: *See—*
Atsumi, Hiroki, 4,836,712, Cl. 400-22.000.
Fujimura, Koh; Higa, Masakatsu; and Aoki, Hisashi, 4,836,654, Cl. 350-346.000.
Kudo, Toshio, 4,837,094, Cl. 428-694.000.
Cassell Aktiengesellschaft: *See—*
Zoller, Gerhard; Beyerle, Rudi; Schindler, Ursula; Nitz, Rolf-Eberhard; and Martorana, Piero, 4,837,225, Cl. 514-427.000.
Castelli, Cesare. Low profile siphonic flush closet. 4,835,797, Cl. 4-332.000.
Castiglioni, Giovanni P., to F.I.C.I. Finanziaria Industriale Commerciale Immobiliare SpA. Machine for slitting continuous tapes into stripes, in particular with cutting cylinders having variable size. 4,836,073, Cl. 83-344.000.
Castonguay, Roger N.; and Meiners, David J., to General Electric Company. Method of assembling a molded case circuit breaker operating mechanism. 4,835,842, Cl. 29-622.000.
Casutt, Michael: *See—*
Poetsch, Eike; and Casutt, Michael, 4,837,402, Cl. 548-303.000.
Catalo, Irenee. Suitcase for arranging golf equipment, convertible to a golf cart. 4,836,565, Cl. 280-37.000.
Caterpillar Inc.: *See—*
Morris, Leslie C.; and Amdall, John K., 4,836,043, Cl. 74-579.00E.

Tonsor, Andrew J.; Nelson, David E.; Gee, James E.; and Stevens, Samuel B., 4,836,318, Cl. 180-9.500.
Catta, David, to 221241 Alberta Ltd. Console structure. 4,836,625, Cl. 312-257.0SK.
Cattini, Flavio, to FK Arna S.R.l. Carriage with turret support for bolts of fabric for spreading on the bedplate of automatic spreaders. 4,836,524, Cl. 270-31.000.
Caudill, Garland E.: *See—*
Doering, Charles W.; Caudill, Garland E.; Johnson, Henry L.; and Thomas, Bruce A., 4,836,610, Cl. 298-6.000.
Cavada, David R.: *See—*
Ezekoye, L. Ike; and Cavada, David R., 4,836,974, Cl. 376-258.000.
Cavagna, Elio. Device for the selective or simultaneous traverse of the cutting members in a machine for the chopping and/or cutting of material in sheet. 4,836,458, Cl. 241-101.200.
Cavitt, Michael B.; and Duncan, David J., to Dow Chemical Company, The. Flexible thermoplastic epoxy resin and coatings prepared therefrom. 4,837,248, Cl. 523-172.000.
Cawlfield, David W., to Olin Corporation. Sodium hydrosulfite electrolytic cell process control system. 4,836,903, Cl. 204-228.000.
Ceccarelli, Pietro, to Olivetti Synthesis, S.p.A. Support for writing desks. 4,836,481, Cl. 248-188.100.
Cecconi, Angelo. Apparatus and method for the mixing and diffusion of warm and cold air for dissolving fog. 4,836,086, Cl. 98-1.000.
Cella, James A.; and Guggenheim, Thomas L., to General Electric Company. Cyclic imides from spirobiindane diamines and methods of preparation. 4,837,298, Cl. 528-352.000.
Cemtech Laboratories Inc.: *See—*
Colin, Laurence; and Pardiso, Vincent A., 4,836,969, Cl. 264-311.000.
Center for Innovative Technology: *See—*
Hutchinson, Thomas E., 4,836,670, Cl. 351-210.000.
Centocor, Inc.: *See—*
Schoemaker, Hubert J. P.; Wands, Jack R.; Westrick, Barbara L.; and Zurawski, Vincent R., Jr., 4,837,167, Cl. 436-513.000.
Schoemaker, Hubert J. P.; Wands, Jack R.; Westrick, Barbara L.; and Zurawski, Vincent R., Jr., 4,837,167, Cl. 436-513.000.
Central Glass Company, Limited: *See—*
Murata, Katsuyoshi; Nakazora, Toru; and Isago, Takashi, 4,837,366, Cl. 568-490.000.
Centre Internatinal de Recherches Dermatologiques C.I.R.D.: *See—*
Caron, Daniele; and Shroot, Braham, 4,837,213, Cl. 514-179.000.
Century Wrecker Corporation: *See—*
Holmes, Gerald E.; and Pace, Jerry E., 4,836,737, Cl. 414-563.000.
Cerreta, Jonathan D. Filament trimmer including a blower. 4,835,950, Cl. 56-12.800.
Chaffey, Wayne P.; Vaxmonsky, Joseph J.; Wagner, David L.; and Wiedmeyer, Warren G. Caulking method for forming a leak free cup. 4,836,400, Cl. 220-81.00R.
Challenge Cook Bros., Inc.: *See—*
Dongelmans, Anthony A., 4,835,882, Cl. 34-131.000.
Chambers, Randall P.; Dzung, John C.; and Gatto, Donald F., to Motorola, Inc. Self-locking, anti-rotational retaining washer for a "D" shaped shaft. 4,836,708, Cl. 403-358.000.
Chan, John Y.: *See—*
Chung, Shine C.; Tsang, Siu K.; Koo, James T.; Chen, Sho Long S.; and Chan, John Y., 4,837,748, Cl. 365-236.000.
Chance, James L.; and Wicks, Laurie D., to Beloit Corporation. Profiling air/steam system for paper-making machines. 4,836,894, Cl. 162-253.000.
Chandler, Rupert P., Jr.; McDavid, Fred R.; Lough, Jimmie D.; and Dove, Gary E., to Hopeman Brothers, Inc. Kiosk with air conditioning. 4,835,983, Cl. 62-259.100.
Chandra, Suresh; and Paul, Jeffrey L., to United States of America, Army. Phase conjugated slab laser designator. 4,837,769, Cl. 372-41.000.
Chanel, Pierre. Device and method for producing artificial snow. 4,836,446, Cl. 239-2.200.
Chang, Clarence D.; Chu, Cynthia T.; and Lee, Carol S., to Mobil Oil Corporation. Ammonium activation of zeolites in the presence of gaseous ammonia. 4,837,398, Cl. 502-86.000.
Chang, Shih-Ger; Liu, David K.; Griffiths, Elizabeth A.; and Littlejohn, David, to United States of America, Energy. A process for the preparation of cysteine from cystine. 4,837,361, Cl. 562-556.000.
Chang, Yeong-Ho: *See—*
Wu, Stephen H. W.; Kirk, Shane K.; Perry, Kenneth P.; Smith, E. Phillip; Chang, Yeong-Ho; and Jenkins, Waylon L., 4,837,004, Cl. 424-438.000.
Change, Sung S.: *See—*
Brookner, George M.; and Change, Sung S., 4,837,714, Cl. 364-550.000.
Channing, Dean A.; and Chiang, Lih W., to Cherry Corporation, The. Drive circuit for operating electroluminescent display with enhanced contrast. 4,837,566, Cl. 340-781.000.
Chant, Philip, to Bluepoint Industries, Inc. Anti-theft device for automobiles. 4,835,999, Cl. 70-238.000.
Chao, Fung-Ching, to Industrial Technology Research Institute. Ladder gate LDDFET. 4,837,180, Cl. 437-44.000.
Chao, Kuo-Hua, to Shell Oil Company. Process for the preparation of alkyl 4-ketoalkanoates. 4,837,356, Cl. 560-174.000.
Chappel, Gilmore H. Automatic bicycle transmission. 4,836,046, Cl. 74-594.200.
Charatan, Norman. Oral hygiene device. 4,836,227, Cl. 132-324.000.
Charles of the Ritz Group Ltd.: *See—*
Georgalas, Arthur C. W.; and Deckner, George E., 4,837,019, Cl. 424-101.000.
Charles Stark Draper Laboratory, Inc., The: *See—*
Siraco, Frank J.; and Barrett, David S., 4,836,119, Cl. 112-306.000.
Chaudhuri, Ratan K.: *See—*
Login, Robert B.; Chaudhuri, Ratan K.; Tracy, David J.; and Helioff, Michael W., 4,837,013, Cl. 424-70.000.
Chavdarian, Charles G., to Stauffer Chemical Company. S-cycloalkylmethyl trithiophosphonate insecticides. 4,837,209, Cl. 514-141.000.
Chemello, Jean-Pierre; and Mabboux, Michel, to Salomon S.A. Apparatus for wedging the heel of the foot of a skier in a ski boot. 4,835,886, Cl. 36-119.000.
Chemicoal, Inc.: *See—*
Kestner, Mark O., 4,836,945, Cl. 252-88.000.
Chemie Linz G.m.b.H.: *See—*
Stuckler, Hubert; and Dobramysl, Wilhelm, 4,837,335, Cl. 548-367.000.
Chen, Carl L.: *See—*
Smay, John W.; Hummel, William F., Jr.; Chen, Carl L.; and Slafer, Loren I., 4,837,699, Cl. 364-434.000.
Chen, Ching-Hwa: *See—*
Chen, Jiann-Jong; and Chen, Ching-Hwa, 4,835,794, Cl. 2-150.000.
Chen, Da Q.: *See—*
Chen, Wenbing; and Chen, Da Q., 4,837,654, Cl. 361-93.000.
Chen, Jiann-Jong; and Chen, Ching-Hwa. Preset necktie. 4,835,794, Cl. 2-150.000.
Chen, Shih-Huei; and Davis, H. O., to Kaiser Aerotech. Structural ceramic materials having refractory interface layers. 4,837,230, Cl. 501-88.000.
Chen, Sho Long S.: *See—*
Chung, Shine C.; Tsang, Siu K.; Koo, James T.; Chen, Sho Long S., and Chan, John Y., 4,837,748, Cl. 365-236.000.
Chen, Wenbing; and Chen, Da Q. Control apparatus for three phase alternating current load protection. 4,837,654, Cl. 361-93.000.
Cheng, Peter S. C. Carrier container with improved closure. 4,836,690, Cl. 383-6.000.
Cherry Corporation, The: *See—*
Channing, Dean A.; and Chiang, Lih W., 4,837,566, Cl. 340-781.000.
Chevallier, Rene; and Fouillet, Jean, to Alcatel Thomson Faisceaux Hertizens. Device for adjusting the polarization of an antenna and a method for the practical application of said device. 4,837,583, Cl. 343-760.000.
Chevron Research Company: *See—*
Spalding, August V.; Sabet, Mahmoud H.; Hamburger, Ronald O.; and Luk, Martin H., 4,836,716, Cl. 405-224.000.
Chia-Hui, Lin. Twin-rate charging and discharging proportional type cursor position determining device. 4,837,716, Cl. 364-559.000.
Chiang, Lih W.: *See—*
Channing, Dean A.; and Chiang, Lih W., 4,837,566, Cl. 340-781.000.
Chiba, Kazuo: *See—*
Obara, Yuichi; Fuse, Kenichi; Onuma, Yoshihiro; Toya, Takao; and Chiba, Kazuo, 4,836,636, Cl. 350-96.200.
Chiba, Tohru: *See—*
Kokubo, Hiroyasu; Chiba, Tohru; and Sekigawa, Fujio, 4,837,033, Cl. 424-494.000.
Chicago Lock Company: *See—*
Steinbach, Robert, 4,835,998, Cl. 70-208.000.
Chien, Sze-Foo: *See—*
Redus, Clifford L.; Chien, Sze-Foo; and Sigwardt, Peter L., 4,836,032, Cl. 73-861.040.
Children On the Go, Inc.: *See—*
Greenwood, Mark H.; and Sherman, Alan P., 4,836,605, Cl. 297-250.000.
Childs, Lee R.: *See—*
Kennedy, Kurtis R.; and Childs, Lee R., 4,836,492, Cl. 248-676.000.
Chin, Maw R.: *See—*
Farb, Joseph E.; and Chin, Maw R., 4,837,051, Cl. 427-97.000.
Chittenden, Duane R. Escape mechanism for sliding block puzzles. 4,836,548, Cl. 273-153.00S.
Chiu, Edison H.; Tai, Jy-Der; and Hsu, Te-Chuan, to Texas Instruments Incorporated. Architecture for memory multiplexing. 4,837,743, Cl. 371-51.000.
Chou, Chih-Yueh, to PPG Industries, Inc. Process for blocking amino acids with the tertiary-alkoxycarbonyl group. 4,837,332, Cl. 548-321.000.
Chouzadjian, Kevork: *See—*
Swinkels, Dominicus A.; and Chouzadjian, Kevork, 4,836,990, Cl. 423-130.000.
Christ, Hubertus; Niemann, Klaus; and Mehren, Herbert, to Daimler-Benz Aktiengsellschaft. Safety system on track guidance lines. 4,836,475, Cl. 246-169.00R.
Christianson, Thomas R., to Shower Tek, Inc. Self-supported, adjustable, condensation-free shower mirror. 4,836,668, Cl. 350-588.000.
Christie, Dean E.: *See—*
Plan, Charles T.; Christie, Dean E.; and Grills, Robert H., 4,836,026, Cl. 73-620.000.
Christie Electric Corporation: *See—*
Eddy, Richard P., 4,836,463, Cl. 242-55.19R.
Christodoulou, Leontios: *See—*
Brupbacher, John M.; Christodoulou, Leontios; and Nagle, Dennis C., 4,836,982, Cl. 420-129.000.
Chrysler Motors Corporation: *See—*
Eastman, Richard E.; and Jagani, Anand M., 4,836,053, Cl. 74-789.000.
Glover, Alfred H., 4,836,792, Cl. 439-81.000.

Chu, Cornel, to Hi Tech Industries, Ltd. Paper holder. 4,836,489, Cl. 248-442.200.
Chu, Cynthia T.: *See—*
Chang, Clarence D.; Chu, Cynthia T.; and Lee, Carol S., 4,837,398, Cl. 502-86.000.
Chu, Shaw-Chang, to Mobil Oil Corporation. Linear polyethylene, fluorocarbon polymer and polyalkylsiloxane compositions, and improved method of film extrusion using same. 4,837,275, Cl. 525-104.000.
Chuang, Rong-Chao. Regulator means for automatically shutting the gas pipeline passage off during pressure reducing failure. 4,836,247, Cl. 137-624.120.
Chucta, Thomas M., to Uniroyal Chemical Company, Inc. Polypropylene stabilized against oxidative degradation with mixtures of diarylamine derivatives and sterically hindered phenols. 4,837,259, Cl. 524-258.000.
Chugai Ro Co., Ltd.: *See—*
Kashiwadani, Nobuo; and Ohta, Hitoshi, 4,836,980, Cl. 419-36.000.
Murakami, Koji; Shima, Tsunao; Shinosato, Yoshikazu; and Yokoyama, Akira, 4,836,864, Cl. 148-1[illegible]500.
Chugai Seiyaku Kabushiki Kaisha: *See—*
Nemoto, Kaoru; Igusa, Kazuo; and Ogasawara, Toshichika, 4,836,957, Cl. 260-397.200.
Chujo, Yoshiki; Inoue, Tokuta; Konomi, Toshiaki; and Hyodo, Yoshihiko, to Toyota Jidosha Kabushiki Kaisha. Engine control system. 4,836,174, Cl. 123-571.000.
Chung, Shine C.; Tsang, Siu K.; Koo, James T. Chen, Sho Long S.; and Chan, John Y., to Vitelic Corporation. Counting RAM. 4,837,748, Cl. 365-236.000.
Church Holdings: *See—*
Church, Leslie G., 4,836,748, Cl. 416-181.000.
Church, John F.: *See—*
Popoff, Peter; Stone, Walter H.; and Church, John F., 4,836,923, Cl. 210-232.000.
Church, John S.: *See—*
Okey, David W.; Church, John S.; Saatchi, Hossein; and Scanlon, John F., 4,837,251, Cl. 523-218.000.
Church, Leslie G., to Church Holdings. Ring propeller. 4,836,748, Cl. 416-181.000.
Ciba-Geigy AG: *See—*
Doyle, James; Bond, Anthony J.; and Davidson, Fiona E., 4,836,628, Cl. 350-3.610.
Kuhn, Jakob, 4,837,133, Cl. 430-358.000.
Ciba-Geigy Corporation: *See—*
Dechow, Frederick J., 4,837,255, Cl. 524-23.000.
Irving, Edward; and Smith, Terence J., 4,836,878, Cl. 156-307.300.
Karydas, Athanasios, 4,836,958, Cl. 260-501.150.
Mueller, Karl F.; and Harisiades, Paul, 4,837,289, Cl. 526-279.000.
Nohl, Andre J.; Nau, Vance J.; and Metzger, Andre, 4,836,037, Cl. 73-864.160.
Poll, Dietmar, 4,837,776, Cl. 374-56.000.
Puntener, Alois, 4,836,827, Cl. 8-437.000.
Rutsch, Werner; and Husler, Rinaldo, 4,837,350, Cl. 558-52.000.
Cicci, Thomas, to Fusion Systems Corporation. Ink transfer with partial curing. 4,836,102, Cl. 101-41.000.
Cignetti, Nicolas P.; Mortimer, John H.; and Swaney, Richard U., to Inductotherm Corp. Micro mill continuous steel process. 4,836,273, Cl. 164-471.000.
Clairol Incorporated. *See—*
Hilliard, Peter, 4,836,014, Cl. 73-76.000.
Clarion, Co., Ltd.: *See—*
Harada, Masaaki, 4,837,790, Cl. 377-33.000.
Clark Equipment Company: *See—*
Wagner, Oryn B., 4,836,740, Cl. 414-686.000.
Clark, Lowell E.: *See—*
Lesk, Israel A.; and Clark, Lowell E., 4,837,177, Cl. 437-31.000.
Clark, Rodney D., to Lacey, Edward H., a part interest. Oxygen tube support strap. 4,836,200, Cl. 128-207.180.
Clark, Roger: *See—*
Levine, Matthew; Cairo, Anthony; Russo, James; Rigotti, Victor; and Clark, Roger, 4,837,731, Cl. 364-[illegible]5.000.
Clemens, Peter, to Siemens Aktiengesellschaft. Method for field-assisted ion exchange with anodic and cathodic contacting. 4,836,899, Cl. 204-130.000.
Clopton, James, Jr.: *See—*
Lopetrone, Juan P.; Valdes, Oliver; and Clopton, James, Jr., 4,837,519, Cl. 324-529.000.
CMI International, Inc.: *See—*
Wuepper, Thomas E.; and Franklyn, Terry L., 4,836,266, Cl. 164-29.000.
Coatsworth, Leighton L.: *See—*
Brown, James R.; Coatsworth, Leighton L.; and Schmidt, Irold S., 4,837,374, Cl. 422-130.000.
Cobb, Carleton M., III; Hirsbrunner, Hans C.; Gonsalves, Edward M.; Jenne, Richard L.; and Nott, Sepideh H., to Texas Instruments Incorporated. Miniature circuit breaker with improved longevity. 4,837,545, Cl. 337-66.000.
Coca-Cola Company, The: *See—*
Credle, William S., Jr.; and Kirschner, Jonathan, 4,836,414, Cl. 222-1.000.
Coccetti, Silvano: *See—*
Viscardi, Roberto; Gornati, Silvano; and Coccetti, Silvano, 4,837,464, Cl. 307-511.000.
Codatto, Antonio. Folding press for plates. 4,836,004, Cl. 72-323.000.
Codington, John F., to General Hospital Corporation, The. Anti-epiglycanin monoclonal antibodies. 4,837,171, Cl. 436-548.000.
Coffey, Gerald P.: *See—*
Loza, Roman; Cooper, Arthur J.; and Coffey, Gerald P., 4,836,283, Cl. 166-225.000.
Coffinberry, George A., to General Electric Company. Multiple-propellant air vehicle and propulsion system. 4,835,959, Cl. 60-212.000.
Coffre, Eric; Gary, Daniel; di Giulio, Christophe; Loiseau, Gerard; and Torelli, Gerard, to L'Air Liquide. Pressure reducer for pure gases. 4,836,242, Cl. 137-505.420.
Cohen, Marc M.; Kaplicky, Jan; and Nixon, David A., to United States of America, National Aeronautics and Space Administration. Space station wardroom table. 4,836,114, Cl. 108-77.000.
Cohen, Morris: *See—*
Olson, Gregory B.; Watton, John F.; and Cohen, Morris, 4,836,869, Cl. 148-331.000.
Cohen, Roberta S.; Huber, Kenneth M.; and Mills, Deborah J., to American Telephone and Telegraph Company; and AT&T Information Systems Inc. Communication system having unified messaging. 4,837,798, Cl. 379-88.000.
Colby, John: *See—*
Dalton, Howard; Colby, John; and Stirling, David I., 4,837,150, Cl. 435-123.000.
Cole, John B. Method and apparatus for washing and treating animals with a recirculating fluid system. 4,836,144, Cl. 119-158.000.
Cole, Ronald E., to Emhart Industries, Inc. Icemaker with improved bail mechanism. 4,835,978, Cl. 62-137.000.
Colgate-Palmolive Company: *See—*
Dixit, Nagaraj S., 4,836,946, Cl. 252-97.000.
Colin, Laurence; and Pardiso, Vincent A., to Cemtech Laboratories Inc. Method of casting a structure from cementitious. 4,836,969, Cl. 264-311.000.
Collie, David E.: *See—*
Thigpen, F. Bruce; and Collie, David E., 4,837,838, Cl. 381-158.000.
Collin, Pierre. Security grill for window opening. 4,835,906, Cl. 49-57.000.
Collington, Eric W., to Glaxo Group Limited. Cyclopentyl ethers and their preparation and pharmaceutical formulation. 4,837,363, Cl. 560-053.000.
Collins, G. Robert: *See—*
Parker, Theodore L.; and Collins, G. Robert, 4,836,646, Cl. 350-96.340.
Collins, Imack L.; Stuart, Jerry E.; and Foster, Gary H., to White Consolidated Industries, Inc. Apparatus for cutting vegetation. 4,835,867, Cl. 30-276.000.
Colon, Ismael: *See—*
Gardner, Hugh C.; Colon, Ismael; and Robeson, Lloyd M., 4,837,256, Cl. 524-141.000.
Colt Industries Inc.: *See—*
Lemp, Mark D., 4,836,246, Cl. 137-561.00A.
Columbus, Eugene P., to United States of America, Agriculture, Differential ginning process and apparatus. 4,835,818, Cl. 19-55.00R.
Combined Optical Industries Limited: *See—*
Roote, Robert J.; Pasco, Ian K.; Smithers, Ian J.; and Fisher, Paul J., 4,836,659, Cl. 350-409.000.
COMEZ, S.p.A.: *See—*
Zorini, Luigi O., 4,835,990, Cl. 66-209.000.
Comi, Alessandro: *See—*
Galbiati, Sergio; and Comi, Alessandro, 4,837,181, Cl. 437-45.000.
Commissariat a l'Energie Atomique: *See—*
Bellanger, Gilbert, 4,836,900, Cl. 204-140.000.
Rambaut, Michel, 4,837,720, Cl. 364-574.000.
Voituriez, Bernard, 4,836,028, Cl. 73-726.000.
Communication Manufacturing Co.: *See—*
Butler, Myron C.; and Madore, Christopher, 4,837,811, Cl. 379-96.000.
Communications Research Laboratory: *See—*
Takahashi, Kozo; Masuda, Yoshihisa; and Inuki, Hisao, 4,837,582, Cl. 343-719.000.
Compagnie Generale D'Automatisme CGA-HBS: *See—*
Smeets, Jacques; Dupuy, Marcel; and Rossi, Paul, 4,836,825, Cl. 453-49.000.
Comstream Corporation: *See—*
Gurantz, Itzhak; and Wright, David A., 4,837,786, Cl. 370-20.000.
Cone, Richard E., to U.S. Brands. Folding chair. 4,836,601, Cl. 297-16.000.
Conforex AB: *See—*
Eckerud, Ove, 4,835,931, Cl. 52-586.000.
Conkle, Gary L. Night light for walking assistance devices. 4,837,666, Cl. 362-102.000.
Conner, Leo B., Jr., to Motorola, Inc. Identification system. 4,837,575, Cl. 342-45.000.
Connolly, Douglas P., to Xerox Corporation. Scavenging field for electrostatographic printing machine. 4,837,104, Cl. 430-125.000.
Conoco Inc.: *See—*
Lilienthal, Walter B., 4,836,935, Cl. 210-788.000.
Consolidated Technologies, Corp.: *See—*
St. Louis, Paul T.; and Welch, Charles L., 4,836,741, Cl. 414-723.000.
Consolidation Coal Company: *See—*
El-Saie, Ahmed A., 4,836,611, Cl. 299-7.000.
Constantin, Daniel, to L'Oreal. Device intended for testing the mechanical strength of pressurized containers in a hot condition. 4,836,013, Cl. 73-41.000.
Constantino, Cynthia L. Upright baby-nipple sanitizer. 4,836,392, Cl. 211-181.000.

Container Corporation of America: *See—*
Hart, Joseph J., 4,836,439, Cl. 229-104.000.
Contat, Bernard, to Etablissements Contat Freres (S.A.). Snap-hook, primarily for rock-climbing, and its process of manufacture. 4,835,823, Cl. 24-234.000.
Conti, Calogero; Meyer, Jean-Luc; Netter, Pierre; and Riquet, Jean-Pierre, to Aluminium Pechiney. Process for separating the inclusions contained in a bath of molten metal, by filtration. 4,837,385, Cl. 210-695.000.
Continental Can Company, Inc.: *See—*
Walter, John, 4,836,359, Cl. 198-803.010.
Cook, Erick M.; Phelps, Andrew E.; and Potash, Hanan, to Scientific Computer Systems Corporation. Linking scalar results directly to scalar operation inputs on a bidirectional databus in a computer which superpositions vector and scalar operations. 4,837,730, Cl. 364-200.000.
Cooley, John. Pizza utensil. 4,836,593, Cl. 294-1.100.
Cooney, Barry F.; and Camden, Thomas M., Jr., to Westinghouse Electric Corp. Standardized reduced length burnable absorber rods for a nuclear reactor. 4,836,977, Cl. 376-333.000.
Cooper, Arthur J.: *See—*
Loza, Roman; Cooper, Arthur J.; and Coffey, Gerald P., 4,836,283, Cl. 166-225.000.
Cooper, Gershon, to Alliance Research Corporation. Universally adjustable mounting device. 4,836,485, Cl. 248-278.000.
Cooper, John D.: *See—*
Petermann, Steven G.; Cabiran, Michel L.; and Cooper, John D., 4,835,876, Cl. 33-313.000.
Cooper, John D. H.: *See—*
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Cooper Power Systems, Inc.: *See—*
Humen, Michael W.; and Hernandez, Augusto, 4,837,543, Cl. 336-92.000.
Cooper, Randall K.: *See—*
Hutchins, Walter J.; and Cooper, Randall K., 4,836,374, Cl. 206-373.000.
Cooper, Ronald J.: *See—*
Burrus, Gilbert S., Jr.; Cooper, Ronald J.; Marr, Michael R.; Marsico, Mario A.; Pescatore, John C.; and Sullivan, Paul D., 4,837,677, Cl. 364-200.000.
CooperVision, Inc.: *See—*
Krasner, Gary N., 4,836,202, Cl. 128-303.00R.
Copeland Corporation: *See—*
Elson, John P.; and Kramp, Stephen F., 4,836,758, Cl. 418-55.000.
Copella, Robert A.: *See—*
Pease, Kevin J.; Copella, Robert A.; and Flannery, Ann M., 4,837,426, Cl. 235-440.000.
Coppi, Bruno: *See—*
Bussard, Robert W.; and Coppi, Bruno, 4,836,972, Cl. 376-131.000.
Corbin, Steven K. Folding wing toy glider. 4,836,817, Cl. 446-62.000.
Corbisiero, Salvatore. Length-adjustable toy ski. 4,836,571, Cl. 280-600.000.
Corner, Michael R.; Griffiths, Phillip N.; Holmes, Tom; and Kemp, Ian, to SP Tyres UK Ltd. Wheel rim for a pneumatic tire. 4,836,260, Cl. 152-375.000.
Cornette, Henri: *See—*
Arnau-Munoz, Jose L.; and Cornette, Henri, 4,835,804, Cl. 8-158.000.
Corning Glass Works: *See—*
Rittler, Hermann L., 4,836,954, Cl. 252-378.00R.
Corring, Robert, to Lever Brothers Company. Viscoelastic gel detergent compositions. 4,836,948, Cl. 252-99.000.
Corsentino, John A.: *See—*
Korbach, William; Corsentino, John A.; Jones, Allen R.; and McCaskie, John E., 4,836,897, Cl. 204-51.000.
Corti, Ciulio: *See—*
Abbate, Mariarosa, 4,836,192, Cl. 128-38.000.
Cotton, James D., to Kimberly-Clark Corporation. Preparation and dispensing container for hot, moist towels. 4,836,368, Cl. 206-205.000.
Cottrell, Ronald A., to De La Rue Systems, Limited. Deflection gate driven by stepper motor. 4,836,387, Cl. 209-657.000.
Coughenour, Linda L.; and Johnson, Graham, to Warner-Lambert Company. Polycyclic amine derivatives useful as cerebrovascular agents. 4,837,226, Cl. 514-443.000.
Coulon, Jean-Claude; and Douche, Jean-Pierre, to Saint-Gobain Vitrage. Uniformly coated glass substrates. 4,837,093, Cl. 428-432.000.
Couture-Dorschner, Laurie: *See—*
Ungpiyakul, Tanakon; Morgan, Arch D.; Thomas Douglas C.; Ketenhofen, Timothy J.; Marver, Douglas J.; Couture-Dorschner, Laurie; and Pomplun, William S., 4,837,715, Cl. 364-552.000.
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Cox, Geoffrey B.; and Stout, Richard W., to Du Pont de Nemours, E. I., and Company. Process for porosity control and rehydroxylations of silica bodies. 4,837,195, Cl. 502-408.000.
Coy, Peter. Valved container closure. 4,836,404, Cl. 220-90.400.
CPC-Rexcel, Inc.: *See—*
Bruce, Robert; and Whitney, Robert W., 4,836,407, Cl. 220-276.000.
CPS KEMI ApS: *See—*
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Crain, Steven P.: *See—*
Silvis, H. Craig; Crain, Steven P.; and Nader, Bassam S., 4,837,293, Cl. 528-99.000.
Crawley, Matthew J. Football kicking practice device. 4,836,542, Cl. 273-55.00B.
Creative Environments, Inc.: *See—*
Luthy, Chella, 4,837,421, Cl. 219-272.000.
Credle, William S., Jr.; and Kirschner, Jonathan, to Coca-Cola Company, The. Premix dispensing system. 4,836,414, Cl. 222-1.000.
Cregg, James M., to Phillips Petroleum Company. Autonomous replication sequences for yeast strains of the genus pichia. 4,837,148, Cl. 435-172.300.
Crider, Curtis W. Mailbox delivery indicator. 4,836,441, Cl. 232-35.000.
Criswell, David R. Aerospace vehicle having multiple propulsion systems on a relatively rotatable flying wing. 4,836,470, Cl. 244-2.000.
Crockett, Robert N.; Kern, Robert F.; Miller, Arnold G.; Norris, Richard E.; Pousson, Michael W., Jr.; and Wagner, Robert E., to International Business Machines Corporation. Controlling asynchronously operating peripherals. 4,837,680, Cl. 364-200.000.
Cronauer, Thomas D.; and Plunkett, Galen P., to International Business Machines Corporation. Multi-channel shared resource processor. 4,837,688, Cl. 364-200.000.
Crosley, Thomas W.; Davison, Wayne; Goldberg, James R.; Hofheins, Leonard L.; Lichty, Ronald D.; Vollum, Charles A.; Vollum, Stephen H.; and Yee, Victor H., to Schlage Lock Company. Cryptographic based electronic lock system and method of operation. 4,837,822, Cl. 380-23.000.
Crossley, Roger; and Heatherington, Kenneth, to American Home Products Corporation. Quinoline derivatives. 4,837,329, Cl. 546-181.000.
Crowhurst, Arthur G. Brushing and washing machine. 4,835,811, Cl. 15-21.00E.
CTI Industries: *See—*
Milne, James A., 4,837,059, Cl. 428-12.000.
Cube Overseas Trading Ltd: *See—*
Barrett, Garth J. M., 4,836,079, Cl. 86-50.000.
Culler, Glen J.; Pearson, Robert B.; McCammon, Michael; Proctor, William L.; and Richardson, John L. Instruction sequencer for parallel operation of functional units. 4,837,678, Cl. 364-200.000.
Culler, Glen J., to Glen Culler & Associates. Bus arbitration system and method. 4,837,682, Cl. 364-200.000.
Culling, John H., to Carondelet Foundry Company. Ni-Cr-Fe corrosion resistant alloy. 4,836,985, Cl. 420-582.000.
Cummins, Robert: *See—*
Kirilloff, Victor V.; Benson, William A.; Cummins, Robert; and Dawson, Richard S., 4,837,549, Cl. 338-279.000.
Cunningham, Glenn R.; and Senules, Alex, to Mitchell Chemical Co. Emulsion-type explosive compositions. 4,836,870, Cl. 149-2.000.
Curatek Pharmaceuticals, Inc.: *See—*
Borgman, Robert J., 4,837,378, Cl. 424-81.000.
Curlett, Harry B., to Pangaea Enterprises, Inc. Drill pipes and casings utilizing multi-conduit tubulars. 4,836,305, Cl. 175-215.000.
Curran, Kenneth J.: *See—*
May, Richard L.; and Curran, Kenneth J., 4,836,465, Cl. 242-192.000.
Curry, Sean: *See—*
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Curwen, Peter W.; and Hurst, Ralph, to Mechanical Technology Incorporated. Pressure actuated movable head for a resonant reciprocating compressor balance chamber. 4,836,757, Cl. 417-416.000.
Custom Chrome, Inc.: *See—*
Panzica, Ignatius J., 4,836,158, Cl. 123-193.0CH.
Custom Equipment Corporation: *See—*
Peterson, Joseph L.; and Wilson, Robert A., 4,837,423, Cl. 219-390.000.
Dahlgren, Harvey W., to Epic Products International Corp. Apparatus for coating a web with wet ink thereon. 4,836,129, Cl. 118-46.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Kondo, Hiromasa; Okumura, Yoshitaka; Fukui, Terunobu; Egashira, Noritaka; Iwata, Tamami; and Satake, Naoto, 4,837,200, Cl. 503-227.000.
Daido Tokushuko Kabushiki Kaisha: *See—*
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Daikin Industries Ltd.: *See—*
Tohzuka, Takashi; Ishikawa, Sueyoshi; Kubo, Katsuyoshi; Honda, Yoshitaka; Ohmure, Yukio; and Kataoka, Norio, 4,836,944, Cl. 252-54.000.
Daimler-Benz Aktiengesellschaft: *See—*
Abthoff, Jorg; Fortnagel, Manfred; Fricker, Ludwig; Kutschera, Immanuel; Kramer, Micbael; and Kuhn, Michael, 4,836,161, Cl. 123-299.000.
Baumann, Karl-Heinz, 4,836,321, Cl. 180-232.000.
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Daimler-Benz Aktiengsellschaft: *See—*
Christ, Hubertus; Niemann, Klaus; and Mehren, Herbert, 4,836,475, Cl. 246-169.00R.
Dainichiseika Color & Chemicals Mfg. Co., Ltd.: *See—*
Kuriyama, Katsumi; Hanada, Kazuyuki; Nakamura, Susumu; Misaizu, Iwao; Kashimura, Masashi; and Goto, Tomoko, 4,837,198, Cl. 503-227.000.
Dale Electronics, Inc.: *See—*
Plough, Charles T., Jr., 4,837,550, Cl. 338-308.000.
Dale, William, Jr. Support mechanism for insect repellant holder. 4,836,483, Cl. 248-231.600.

d'Almada Remedios, Miguel A.; and Riedinger, Thomas R., to Boeing Company, The. Apparatus for storing food and beverages in a passenger seatback. 4,836,602, Cl. 297-191.000.
Dalton, Howard; Colby, John; and Stirling, David I., to National Research Development Corporation. Oxidation processes. 4,837,150, Cl. 435-123.000.
Dan, Shigeyuki; Kato, Eiichi; Ishii, Kazuo; Ishibashi, Hiroshi; and Sera, Hidefumi, to Fuji Photo Film Co., Ltd. Liquid developer for electrostatic photography. 4,837,102, Cl. 430-114.000.
Daniele, Joseph J.; and Lofthus, Robert M., to Xerox Corporation. Motion sensor for sensing the relative position and velocity of a recording member. 4,837,636, Cl. 358-300.000.
Daniels, Ralph S. Fertilizer process. 4,836,843, Cl. 71-25.000.
Dannoura, Sadayuki: *See—*
Ueno, Toyoaki; and Dannoura, Sadayuki, 4,836,267, Cl. 164-113.000.
Dardick, David. Cloud gun. 4,836,082, Cl. 89-1.410.
Dassler, Joachim; Girod, Detlef; Kramer, Klaus; and Liesch, Ingrid, to Patent Treuhand Gesellschaft fur elektrische Gluhlampen mbH. High pressure discharge lamp with improved arc tube retention structure. 4,837,477, Cl. 313-25.000.
Data I/O Corporation: *See—*
Yip, Douglas, 4,837,653, Cl. 361-86.000.
Dataproducts Corporation: *See—*
Hirth, Gregory; and Branson, Terry L., 4,836,431, Cl. 226-74.000.
Daubenspeck, Timothy H., to International Business Machines Corporation. Binary chlorofluorocarbon chemistry for plasma etching. 4,836,886, Cl. 156-643.000.
Daubenspeck, Timothy H.; and Ichishita, Fatih S., to International Business Machines Corporation. Chlorofluorocarbon additives for enhancing etch rates in fluorinated haloc rbon/oxidant plasmas. 4,836,887, Cl. 156-643.000.
Dautel, Donald F.: *See—*
Freeburg, Thomas A.; and Dautel, Donald F., 4,837,800, Cl. 379-59.000.
Daverio, Jean-Claude; and Rocchi, Dominique, to Institut de Recherches de la Siderurgie Francaise. Support and introduction bench for an elongated rectilinear probe, and probe adapted to same. 4,836,509, Cl. 266-99.000.
David A. Clayton: *See—*
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Davidson, Fiona E.: *See—*
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Davidson Textron Inc.: *See—*
McCormack, Joseph A., 4,836,495, Cl. 24[illegible]-83.000.
Davies, John, to British United Shoe Machinery Ltd. Adhesive-applying apparatus. 4,836,139, Cl. 118-696.000.
Davis, Cecil J.; Abernathy, Joseph V.; Matthews, Robert T.; Hildenbrand, Randall C.; Simpson, Bruce; Bohlman, James G.; Loewenstein, Lee M.; and Jones, John I., to Texas Instruments Incorporated. Processing apparatus. 4,836,905, Cl. 204-298.000.
Davis, Cecil J.: *See—*
Luttmer, Joseph D.; York, Rudy L.; Smith, Patricia B.; and Davis, Cecil J., 4,837,113, Cl. 427-38.000.
Davis, Dick E.; Brazell, Charles R.; and Johnson, Jerome E., to General Electrodynamics Corporation. Highly accurate platform weighing system. 4,836,308, Cl. 177-25.140.
Davis, H. O.: *See—*
Chen, Shih-Huei; and Davis, H. O., 4,837,230, Cl. 501-88.000.
Davis, Jeffrey A.: *See—*
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Davis, Lindsey B., Jr. Apparatus for molding concrete blocks or bricks. 4,836,762, Cl. 425-89.000.
Davis, Richard: *See—*
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Davison, John F.: *See—*
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Dawson, Richard S.: *See—*
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De La Rue Systems, Limited: *See—*
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Taylor, Warren G., 4,836,091, Cl. 92-26.000.
De Amorim, Lionel, to Alcate Cit. Active base for an optical connector. 4,836,635, Cl. 350-96.200.
Deaton, Hubert, to Schnabel Foundation Company. Earth retaining method and structure with improved corrosion protection and drainage. 4,836,718, Cl. 405-262.000.
de Burlet, Georges: *See—*
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December, Timothy S.: *See—*
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Dechow, Frederick J., to Ciba-Geigy Corporation. Palatable hypocholesterolaemic gel formulation containing a pharmaceutically acceptable non-digestible anion exchange resin. 4,837,255, Cl. 524-23.000.
Deckner, George E.: *See—*
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Deere & Company: *See—*
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Deftos, Leonard J.; and Hostetler, Karl Y., to University of California, Regents of. Liposome-calcitonin preparation. 4,837,380, Cl. 424-450.000.
Degen, Peter J.: *See—*
Rothman, Isaac; and Degen, Peter J., 4,837,162, Cl. 436-531.000.
Degussa Aktiengesellschaft: *See—*
Deschler, Ulrich; Hellwig, Georg; Michel, Rudolf; Kleinschmit, Peter; and Wolff, Siegfried, 4,837,322, Cl. 544-209.000.
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de Jaeger, Nikolaas C. J.; Monbaliu, Marcel J.; Noppe, Marcus J. M.; and Konings, Frank J., to Janssen Pharmaceutica N.V. Immunoassay using colorable latex particles. 4,837,168, Cl. 436-533.000.
Delaware Capital Formation, Inc.: *See—*
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Delco Electronics Corporation: *See—*
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Alexandrovich, Peter S.; DeMejo, Lawrence P.; Jadwin, Thomas A.; and Wilson, John C., 4,837,394, Cl. 430-110.000.
Anderson, James H.; Bugner, Douglas E.; DeMejo, Lawrence P.; Sutton, Richard C.; and Wilson, John C., 4,837,392, Cl. 430-110.000.
Demiryont, Hulya, to Ford Motor Company. Method of making an electrochromic layer and new electrochromic device made therefrom. 4,837,592, Cl. 350-357.000.
de Montigny, Pierre M. R.; Sternson, Larry A.; Repta, Arnold J.; Stobaugh, John F.; Higuchi, Takeru, deceased (Dickinson, Martin B., Jr., co-executor); and Higuchi, Kenji W., co-executor, to Oread Laboratories, Inc. Assaying method for primary amines using aromatic dialdehydes. 4,837,166, Cl. 436-111.000.
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Denholtz, Melvin: *See—*
Rudy, Jerome B.; Denholtz, Melvin; Denholtz, Jeffrey R.; and Bohm, Peter D., 4,837,008, Cl. 424-53.000.
Denis, Gerard; and Rius, Jean-Michel, to Sidel. Method for manufacturing heat resistant PET containers. 4,836,971, Cl. 264-521.000.
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Denton, Larry E., to Mallinckrodt, Inc. Compositions containing ibuprofen. 4,837,031, Cl. 424-464.000.
Dentsply GmbH: *See—*
Gribi, Hans-Peter K., 4,836,853, Cl. 106-35.000.
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Dervan, Peter B.; and Dreyer, Geoffrey B., to California Institute of Technology. Chelator-functionalized nucleosides and nucleotides and methods for making same. 4,837,312, Cl. 536-27.000.
Desbois, Michel; and Langlois, Bernard, to Rhone-Poulenc Specialites Chimiques. Processes for preparing pentafluoroethoxy- and pentafluoroethylthiobenzene drivatives. 4,837,364, Cl. 568-43.000.

Deschler, Ulrich; Hellwig, Georg; Michel, Rudolf; Kleinschmit, Peter; and Wolff, Siegfried, to Degussa Aktiengesellschaft. Mixtures of sulfurous triazine compounds. 4,837,322, Cl. 544-209.000.
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de Silva, K. Nimalasiri; and Guevremont, Roger, to Canadian Patents & Development Limited. Method and apparatus for introduction of a particulate sample for analysis. 4,836,039, Cl. 73-864.810.
Deters, Joseph C.; Wong, Patrick S. L.; Barclay, Brian L.; Theeuwes, Felix; and Swanson, David R., to ALZA Corporation. Dosage form for dispensing drug for human therapy. 4,837,111, Cl. 424-473.000.
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Detroit Bracket Company, Inc.: *See—*
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Magnien, Emile G.; and Plantureux, Alain M., 4,835,987, Cl. 63-28.000.
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Diaz-Zorita, Fernando: *See—*
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DiCarlo, Frank. Pipe handling apparatus. 4,836,595, Cl. 294-15.000.
Dickinson, Martin B., Jr., co-executor: *See—*
de Montigny, Pierre M. R.; Sternson, Larry A.; Repta, Arnold J.; Stobaugh, John F.; Higuchi, Takeru, deceased; and Higuchi, Kenji W., co-executor, 4,837,166, Cl. 436-111.000.
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Hartwell, David W.; Bloom, Elbert; and Triolo, Victoria M., 4,837,767, Cl. 371-49.000.
White, Randall A., 4,837,565, Cl. 340-762.000.
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Coffre, Eric; Gary, Daniel; di Giulio, Christophe; Loiseau, Gerard; and Torelli, Gerard, 4,836,242, Cl. 137-505.420.
Dinslage, Wilfried. Bulk container and method of manufacturing and preparing same. 4,836,418, Cl. 222-82.000.
Dippel, Hans-Jurgen, to MWB Messwandler-Bau AG. Device for shading spaces. 4,835,918, Cl. 52-63.000.
DiRe, Felix M.; and Carlisi, Joseph. Game with multiple winning ways. 4,836,546, Cl. 273-138.00A.
Dispenza, Charles. Rain gauge with improved syphon discharge. 4,836,018, Cl. 73-171.000.
Dittmann, Michael, to Siemens Aktiengesellschaft. Electromagnetic relay. 4,837,538, Cl. 335-202.000.
Dittmann, Norbert: *See—*
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Dodmann, Gerd; Kroggel, Otto; Fey, Jochen; Kopp, Harald; and Fritz, Christoph, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Method and apparatus for measuring diameter of a steel reinforcement rod embedded in concrete and the thickness of the concrete overlayer. 4,837,509, Cl. 324-207.000.
Dodson, Guy: *See—*
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Domas, Friedrich: *See—*
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Dombrowski, Ferdinand; and Forster, Dieter, to Fisher Controls International, Inc. Zero and span adjustment circuit for current/pressure transducer. 4,836,011, Cl. 73-4.00R.
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Dong, Jimmy. Variable tension loaded striking apparatus. 4,836,533, Cl. 272-76.000.
Dongelmans, Anthony A., to Challenge Cook Bros., Inc. Dryer flow separator. 4,835,882, Cl. 34-131.000.
Donze, Jerry L., to Storage Technology Corporation. Switched mode power supply. 4,837,672, Cl. 363-143.000.
Doran, Robert A.; and Ficalora, Joseph P., to Allied-Signal Inc. Ring laser cavity length control mirror assembly. 4,836,677, Cl. 356-350.000.
Dorner, Wolfgang; Lux, Helmut; and Fink, Reinhold, to Stihl, Andreas. Handheld portable tool having an internal combustion engine. 4,836,297, Cl. 173-162.100.
Dosaka, Katsumi; Kumanoya, Masaki; Miyatake, Hideshi; Hidaka, Hideto; Konishi, Yasuhiro; Yamasaki, Hiroyuki; Ikeda, Yuto; Tsukamoto, Kazuhiro; and Shimoda, Masaki, to Mitsubishi Denki Kabushiki Kaisha. Redundary circuit with a spare main decoder responsive to an address of a defective cell in a selected cell block. 4,837,747, Cl. 371-10.000.
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Anderson, James H.; Bugner, Douglas E.; DeMejo, Lawrence P.; Sutton, Richard C.; and Wilson, John C., 4,837,392, Cl. 430-110.000.
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Edwards, James J.; and Singerman, Richard C., Jr. Patterned art apparatus and method. 4,836,381, Cl. 206-575.000.
Edwards, Lloyd, to E.F.L. Electro-Flood Ltd. Method for removal of flow-restricting matter from hydrocarbon producing wells. 4,836,286, Cl. 166-304.000.
Edwards, Philip J., to General Electric Company, p.l.c., The. Security arrangement. 4,837,425, Cl. 235-457.000.
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Egawa, Akira, to Fanuc Ltd. High frequency discharge excitation laser apparatus. 4,837,789, Cl. 372-82.000.
Egelhof, Dieter, to J. M. Voith GmbH. Headbox for paper machines or the like. 4,836,895, Cl. 162-259.000.
Egelstad, Randi K. Scented pad for hand-held hair dryers. 4,835,879, Cl. 34-97.000.
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Eibl, Hansjorg, to Max-Planck-Gesellschaft Zur Foederung Der Wissenschaften E. V. Phospholipid-like compounds. 4,837,340, Cl. 549-221.000.
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Eisenmann, Michael; and Weidel, Edgar, to Licentia Patent-Verwaltungs-GmbH. Fiber optic star coupler. 4,836,644, Cl. 350-96.160.
Ekowicki, Robert L., to GTE Products Corporation. Overtemperature protector for incandescent lamp. 4,837,655, Cl. 361-103.000.
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Ellman, Steven; Ellman, Fred; Ellman, Julius; and Lerner, George. Driven marking system for creating a plurality of varied line designs. 4,835,874, Cl. 33-27.110.
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Stevens, Timothy S.; Frawley, Nile N.; Swart, Daniel J.; Harris, William C.; Diedering, Deborah E.; Nicholson, Lawrence W.; and Rothman, L. David, 4,837,161, Cl. 436-52.000.
Frazier, Malcolm, to United States of America, Air Force. Hidden fault bit apparatus for a self-organizing digital processor system. 4,837,683, Cl. 364-200.000.
Frazita, Richard F., to Hazeltine Corporation. Microwave landing system with fail-soft switching of dual transmitters, beam steering and sector antennas. 4,837,580, Cl. 342-374.000.
Fred C. Sproul, Sr., Patents, Inc.: *See—*
Sproul, Fred C., Sr., 4,837,569, Cl. 340-907.000.
Fred Hutchinson Cancer Research Center: *See—*
Rohrschneider, Larry R.; and Nichols, Everett J., 4,837,237, Cl. 514-62.000.
Freeburg, Thomas A.; and Dautel, Donald F., to Motorola, Inc. Cellular data telephone system and cellular data telephone therefor. 4,837,800, Cl. 379-59.000.
Freedman, Melvin S., to Avery International Corporation. Coextruded core laminates. 4,837,088, Cl. 156-243.000.
Freeman, Robert R.: *See—*
Holder, Anthony A.; and Freeman, Robert R., 4,837,016, Cl. 424-88.000.
Freeman, T. Austin, to Halliburton Company. Non-rotating plug. 4,836,279, Cl. 166-153.000.

Freeny, Charles C., Jr., to Advanced Service Development Corporation. Electronic message unit and methods using same. 4,837,797, Cl. 379-96.000.
Frejborg, Frey, to A. Ahlstrom Corporation. High flow capacity barrier type screening apparatus. 4,836,915, Cl. 209-273.000.
French, Gordon K., to Nordson Corporation. Sift-proof carton and method of manufacture. 4,836,440, Cl. 229-132.000.
Freyssinet International (Stup): *See*—
Savall, Jose; Parmentier, Claude; and Amelot, Bernard, 4,835,822, Cl. 24-122.600.
Fricker, Ludwig: *See*—
Abthoff, Jorg; Fortnagel, Manfred; Fricker, Ludwig; Kutschera, Immanuel; Kramer, Michael; and Kohn, Michael, 4,836,161, Cl. 123-299.000.
Friedman, Nitza: *See*—
Manor, Shalom; Pipko, Grigori; Langham, Adrian; Friedman, Nitza; and Steiner, Amalia, 4,836,997, Cl. 423-309.000.
Frisch, David C.; Manzione, Louis T.; Poelzing, Gerhard W.; and Weber, Wilhelm, to Kollmorgen Technologies Corp.; and Bell Telephone Laboratories, Incorporated. Process for producing conductor patterns on three dimensional articles. 4,837,129, Cl. 430-319.000.
Frito-Lay, Inc.: *See*—
Ruegg, Richard J.; Slovak, William R.; and Riboh, Moise, 4,837,382, Cl. 426-503.000.
Fritz, Christoph: *See*—
Dodmann, Gerd; Kroggel, Otto; Fey, Jochen; Kopp, Harald; and Fritz, Christoph, 4,837,509, Cl. 324-107.000.
Frohlich, Alfons, to Opti- Patent, Forschungs-Und Fabrikations-AG. Method of producing a slide-fastener stringer on a needle loom. 4,836,251, Cl. 139-116.000.
Froment, Francis, to Equipements Electriques Moteur. Double casing for electric rotating machine stator. 4,837,468, Cl. 310-42.000.
Fromme, Lorenz: *See*—
Babsch, Alfred; and Fromme, Lorenz. 4,836,699, Cl. 400-479.000.
Fry, John J.; and Smith, Robert A., to Babcock & Wilcox Company, The. Apparatus for measuring differential impedances. 4,837,501, Cl. 324-62.000.
Fuchs, Hugo; and Weiss, Franz-Josef, to BASF Aktiengesellschaft. Preparation of pure hydroxylammonium salts of fatty acids of 1 to 4 carbon atoms. 4,837,362, Cl. 562-606.000.
Fuhr, Karl; Muller, Friedemann; and Ott, Karl-Heinz, to Bayer Aktiengesellschaft. Phosphorus-containing oligomers and polymers containing polyphenylene ether blocks and mixtures of other plastics therewith. 4,837,276, Cl. 524-125.000.
Fuji Electric Co., Ltd.: *See*—
Aizawa, Koichi; Kazama, Toyoki; Takano, Yukio; and Tamura, Yukihisa, 4,837,137, Cl. 430-65.000.
Kasahara, Masahiko; and Narita, Mitsuru, 4,837,099, Cl. 430-58.000.
Nakagawa, Yukio, 4,837,754, Cl. 367-105.000.
Shiromizu, Yasuyuki; and Urata, Kenji, 4,837,629, Cl. 358-213.190.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Morozumi, Takuro; and Sakamoto Masanori, 4,836,164, Cl. 123-339.000.
Sakakiyama, Ryuzo, 4,836,322, Cl. 180-247.000.
Suzuki, Hosei, 4,836,055, Cl. 74-866.000.
Fuji Koki Mfg. Co. Ltd.: *See*—
Oyanagi, Reinosuke; and Tanaka Hazime, 4,835,980, Cl. 62-212.000.
Fuji Oili Company, Limited: *See*—
Yokoyama, Hitoshi; and Mukai, Noriko, 4,837,040, Cl. 426-582.000.
Fuji Photo Film Co., Ltd.: *See*—
Dan, Shigeyuki; Kato, Eiichi; Ishii, Kazuo; Ishibashi, Hiroshi; and Sera, Hidefumi, 4,837,102, Cl. 430-114.000.
Fujimoto, Hiroshi; and Ishikawa, Takatoshi, 4,837,132, Cl. 430-380.000.
Ichijima, Seiji; Shimada, Yasuhiro; and Arakawa, Jun, 4,837,136, Cl. 430-543.000.
Ikeda, Tadashi; and Ogawa, Tadashi, 4,837,140, Cl. 430-550.000.
Ishikawa, Shun-ichi; Imagawa, Taeao; Maeda, Minoru; and Shinozaki, Fumiaki, 4,837,106, Cl. 430-138.000.
Kawamma, Kouichi; Abe, Yukio; Higashi, Tatsuji; and Aotani, Yoshimasa, 4,837,128, Cl. 430-281.000.
Kobayashi, Kesanao; Ohba, Hisao; and Toyama, Tadao, 4,837,131, Cl. 430-302.000.
Maemori, Takashi, 4,837,817, Cl. 358-224.000.
Nakajima, Kenji, 4,837,045, Cl. 427-13.000.
Nakashima, Hiroshi; Kawarada, Masayuki; and Fukuhara, Sanshirou, 4,836,429, Cl. 226-7.000.
Nishiyama, Mikio; and Akimoto, Taizo, 4,837,626, Cl. 358-183.000.
Ogata, Yasuhiro, 4,837,196, Cl. 503-200.000.
Ohara, Shinichiro; and Naruo, Kyoichi, 4,837,127, Cl. 430-270.000.
Oishi, Hisao; Yanagihara, Kazuhiko; Miyakawa, Tadashi; Nakamura, Takeshi; Akimoto, Kazuhiko; and Shioji, Mitsuaki, 4,836,652, Cl. 350-334.000.
Sato, Kozo; Takeuchi, Masashi; and Shibata, Takeshi, 4,837,142, Cl. 430-562.000.
Shiraishi, Hisashi; Kimura, Tsutomu; and Hishinuma, Kazuhiro, 4,837,733, Cl. 364-413.130.
Suzuki, Kenji, 4,837,711, Cl. 364-523.000.
Tahara, Syuji, 4,837,602, Cl. 355-29.000.
Tahara, Toshiro; and Iwasaki, Hideo, 4,837,713, Cl. 364-525.000.
Tanaka, Kazuyoshi; and Hashiue Masakazu, 4,837,687, Cl. 364-413.010.
Torii, Shumpeita; and Isozaki, Yutaka, 4,835,941, Cl. 53-382.000.
Yamada, Yasuyuki; Miyatsuka, Hajime; Okita, Tsutomu; and Tsuji, Nobuo, 4,837,081, Cl. 428-329.000
Yamamoto, Ryoichi; Nomura, Masaaki; Yamada, Takashi; and Nahara, Akira, 4,837,118, Cl. 428-645.000.
Fuji Seiki Machine Works, Ltd : *See*—
Kataoka, Shigeaki, 4,836,131, Cl. 118-220.000.
Fuji Xerox Co., Ltd.: *See*—
Murofushi, Toshiaki; Ohya, Yasuhiro; Nakazawa, Hiroshi; and Oyamada, Koichi, 4,837,100, Cl. 430-106.600.
Fujiki, Norio: *See*—
Shimamura, Morihiko; Kubo, Jun; Kubota, Hitoshi; Fujiki, Norio; Tobisawa, Yoshio; Ishikawa, Yasuki; and Fukawa, Kazuyoshi, 4,835,970, Cl. 60-545.000.
Fujikura Ltd.: *See*—
Sakaya, Masuji; Motai, Tsuneaki; Mochizuki, Masataka; and Mashiko, Kouichi, 4,836,275, Cl. 165-46.000.
Shamoto, Naoki; Suzuki, Hideo; Sugawara, Yasuyuki; Kawase, Masaaki; and Shinohara, Hiromichi, 4,836,639, Cl. 350-96.230.
Fujimoto, Hiroshi; and Ishikawa, Takatoshi, to Fuji Photo Film Co., Ltd. Method for processing silver halide color photographic material using a chelating agent and developer with substantially no benzyl alcohol. 4,837,132, Cl. 430-380.000.
Fujimoto, Osamu: *See*—
Yoshino, Yutaka; Gotoh, Makoto; Fujimoto, Osamu; and Shizawa, Masahiro, 4,837,814, Cl. 379-144.000.
Fujimoto, Tadayuki: *See*—
Hirota, Shinichiro; Sugawara, Kishio; and Fujimoto, Tadayuki, 4,836,838, Cl. 65-308.000.
Fujimura, Koh; Higa, Masakatsu; and Aoki, Hisashi, to Casio Computer Co., Ltd. Drive method for a dual-frequency, dielectric anisotropy liquid crystal optical device. 4,836,654, Cl. 350-346.000.
Fujino, Yasunori; Sugiura, Noboru; and Kobayashi, Ryoichi, to Hitachi, Ltd. Ignition apparatus of electronic distribution type for multi-cylinder internal combustion engine. 4,836,176, Cl. 123-640.000.
Fujioka, Yoshiki; and Hirota, Mitsuhiko, to Fanuc Ltd. Motor velocity control apparatus. 4,837,491, Cl. 318-625.000.
Fujirebio Kabushiki Kaisha: *See*—
Sekine, Yasuo; Hirakawa, Nobuhiro; Kashiwaba, Noriaki; Yamaura, Tetsuaki; Harada, Hisako; Kutsuma, Teruo; Matsumoto, Hajime; Sekine, Akihiro; and Isowa, Yoshikazu, 4,837,316, Cl. 546-214.000.
Fujirebio Kabushiki Kaisha, also trading as Fujirebio Inc.: *See*—
Sugiyama, Masami, 4,837,144, Cl. 435-4.000.
Fujitsu Limited: *See*—
Hajikano, Kazuo; Shimoe, Toshio; Kamoi, Jyoei; Sawaki, Ippei; and Murakami, Koso, 4,837,855, Cl. 455-600.000.
Hatori, Yoshinori; Kato, Yoichi; Ohta, Mutsumi; and Kosugi, Yasuhiro, 4,837,618, Cl. 358-135.000.
Isono, Osamu; Fukui, Toshimasa; Nishino, Tetsuo; Tachibana, Tetsuo; and Iwabuchi, Eisuke, 4,837,761, Cl. 370-60.000.
Kubosawa, Hajime; and Ishiguro, Masato, 4,837,461, Cl. 307-303.000.
Ohshima, Toshio; and Yokoyama, Naoki, 4,837,178, Cl. 437-33.000.
Shiba, Akira; Yamada, Isamu; and Murakami, Keiichi, 4,836,210, Cl. 128-660.060.
Fukami, Tadashi: *See*—
Ozaki, Shinya; Fukami, Tadashi; and Odaka, Kentaro, 4,837,640, Cl. 360-27.000.
Fukatsu, Yasumasa: *See*—
Akiyama, Toru; Yasuda, Shigeru; Yasukawa, Kenichiro; and Fukatsu, Yasumasa, 4,837,637, Cl. 358-342.000.
Fukawa, Kazuyoshi: *See*—
Shimamura, Morihiko; Kubo, Jun; Kubota, Hitoshi; Fujiki, Norio; Tobisawa, Yoshio; Ishikawa, Yasuki; and Fukawa, Kazuyoshi, 4,835,970, Cl. 60-545.000.
Fukuhara, Sanshirou: *See*—
Nakashima, Hiroshi; Kawarada, Masayuki; and Fukuhara, Sanshirou, 4,836,429, Cl. 226-7.000.
Fukui, Terunobu: *See*—
Kondo, Hiromasa; Okumura, Yoshitaka; Fukui, Terunobu; Egashira, Noritaka; Iwata, Tamami; and Satake, Naoto, 4,837,200, Cl. 503-227.000.
Fukui, Toshimasa: *See*—
Isono, Osamu; Fukui, Toshimasa; Nishino, Tetsuo; Tachibana, Tetsuo; and Iwabuchi, Eisuke, 4,837,761, Cl. 370-60.000.
Fukumoto, Toshiyuki, to Nippon Pillar Packing Co., Ltd. Pneumatic pumping device. 4,836,756, Cl. 417-394.000.
Fukuoka, Satoru: *See*—
Ohta, Minemasa; Suzuki, Kenji; Fukuoka, Satoru; Takishita, Toshihiko; and Hayashi, Tuyoshi, 4,837,130, Cl. 430-321.000.
Fukushima, Atsuhiko: *See*—
Ando, Hitoshi; Kashiwazaki, Takashi; Hosoi, Masayuki; and Fukushima, Atsuhiko, 4,837,700, Cl. 364-449.000.
Fukushima, Takeo: *See*—
Harada, Masahiro; Yanagi, Kenichi; Fukushima, Takeo; Furukawa, Kusuo; Soeda, Naohiko; Ohta, Norio; Sato, Kuniaki; and Nakajima, Yasuhisa, 4,836,774, Cl. 432-8.000.
Fukuyama, Norio: *See*—
Maeno, Satoru; Fukuyama, Norio; Ohishi, Tetsuo; Kyutoku, Senzo; and Nakamura, Thutomu, 4,837,493, Cl. 318-685.000.
Fuller, George L. Cylindrical sundial with installation indicia. 4,835,875, Cl. 33-270.000.
Fuller, William T., to Tandem Computers Incorporated. Instruction sequencer branch mechanism. 4,837,681, Cl. 364-200.000.
Fullwood, John W. Video tape editing system with vertical interval time code. 4,837,638, Cl. 360-14.200.

Funahashi, Takeshi, to Sony Corporation. Display apparatus for simultaneous display of lines of characters having different line pitches. 4,837,729, Cl. 364-900.000.
Funk, Charles F. Method of hard-facing a metal surface. 4,837,417, Cl. 219-76.150.
Furman, Phillip A.: *See*—
Rideout, Janet L.; Barry, David W.; Lehrman, Sandra N.; St. Clair, Martha H.; and Furman, Phillip A., 4,837,208, Cl. 514-50.000.
Furukawa, Akira: *See*—
Yamamoto, Hirokazu; and Furukawa, Akira, 4,837,103, Cl. 430-115.000.
Furukawa Electric Co., Ltd., The: *See*—
Obara, Yuichi; Fuse, Kenichi; Onuma, Yoshihiro; Toya, Takao; and Chiba, Kazuo, 4,836,636, Cl. 350-96.200.
Furukawa, Kusuo: *See*—
Harada, Masahiro; Yanagi, Kenichi; Fukushima, Takeo; Furukawa, Kusuo; Soeda, Naohiko; Ohta, Norio; Sato, Kuniaki; and Nakajima, Yasuhisa, 4,836,774, Cl. 432-8.000.
Furukawa, Tadahiro: *See*—
Shimamura, Masayoshi; Furukawa, Tadahiro; Murakami, Akiyoshi; and Haga, Toshio, 4,837,098, Cl. 430-7.000.
Furusawa, Kaoru: *See*—
Uchiyama, Futoshi; Tsukamoto, Koichi; Kurashige, Tomoyoshi; Furusawa, Kaoru; and Koike, Mitsumaro, 4,836,417, Cl. 222-63.000.
Furuya, Kenji: *See*—
Matuda, Shinichi; Furuya, Kenji; and Kubo, Tetsuo, 4,837,473, Cl. 310-237.000.
Furuya, Masami: *See*—
Matsuo, Mamoru; and Furuya, Masami, 4,836,863, Cl. 148-2.000.
Fuse, Kenichi: *See*—
Obara, Yuichi; Fuse, Kenichi; Onuma, Yoshihiro; Toya, Takao; and Chiba, Kazuo, 4,836,636, Cl. 350-96.200.
Fushiya, Fusao, to Makita Electric Works, Ltd. Bolt tightening tool. 4,836,063, Cl. 81-55.000.
Fusion Systems Corporation: *See*—
Cicci, Thomas, 4,836,102, Cl. 101-41.000.
Future Power Inc.: *See*—
Newbold, Vernon D., 4,836,149, Cl. 123-44.00R
G. D. Searle & Co.: *See*—
Manley, Paul W.; Porter, Roderick A.; and Lai, Mun F., 4,837,333, Cl. 548-341.000.
GAF Corporation: *See*—
Bondoc, Alfredo A.; Carroll, William R.; and Lloyd, Bobbie J., 4,835,929, Cl. 52-518.000.
Login, Robert B.; Chaudhuri, Ratan K.; Tracy, David J.; and Helioff, Michael W., 4,837,013, Cl. 424-70.000.
Gahler, Alfred: *See*—
Bisping, Heinz; Gahler, Alfred; Hoffmann, Armin; and Popp, Franz, 4,836,729, Cl. 411-82.000.
Gahn, Jerry S.: *See*—
Scheller, Gregg D.; Gahn, Jerry S.; Higgins, Daniel E.; Wendt, Richard; Gibeltirra, James; and Ritter, J. Alan, 4,837,857, Cl. 455-617.000.
Galbiati, Sergio; and Conti, Alessandro, to SGS-Thomson Microelectronics s.r.l. ROM memory programming procedure using MOS technology with thin gate oxide and junctions. 4,837,181, Cl. 437-45.000.
Gallens, Richard F.: *See*—
Webber, Jerry D.; Olson, Jay H.; and Gallens, Richard F., 4,836,412, Cl. 221-211.000.
Gamma Biologicals, Inc.: *See*—
Meserol, Peter M.; and Acker, Jesse, 4,837,160, Cl. 436-45.000.
Gammell, Paul M., to California Institute of Technology. Apparatus and method for range detection using the analytic signal identified from the received signal. 4,837,578, Cl. 342-194.000.
Gard, Michael F.; Kingman, John E. E.; and Klein, James D., to Atlantic Richfield Company. Method and apparatus for measuring the electrical resistivity of geologic formations through metal drill pipe or casing. 4,837,518, Cl. 324-368.000.
Gardner, Edward A.: *See*—
Bean, Robert G.; Beckman, Michael E.; Rubinson, Barry L.; Gardner, Edward A.; Sergeant, O. Winston; and McLean, Peter T., 4,837,675, Cl. 364-200.000.
Gardner, Hugh C.; Colon, Ismael; and Robeson, Lloyd M., to Amoco Corporation. Crosslinkable, crystallizable polyarylethers and composites therefrom. 4,837,256, Cl. 524-141.000.
Garnault, Joel, to Bendix France Process and device for checking the operational state of a variable reluctance magnetic sensor and their application to automobile electronics. 4,837,508, Cl. 324-166.000.
Garrigus, George W., to Double D Double G Enterprises, Incorporated. Tissue specimen holding device and biopsy procedure. 4,837,795, Cl. 378-180.000.
Garsky, Victor M.; and Stein, Robert A., to Merck & Co., Inc. Inhibitor of ribonucleotide reductase. 4,837,304, Cl. 530-328.000.
Gartside, Charles H., III; Glodis, Paul F.; and Patel, Parbhubhai D., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Depressed cladding optical fiber cable. 4,836,640, Cl. 350-96.230.
Gary, Daniel: *See*—
Coffre, Eric; Gary, Daniel; di Giulio, Christophe; Loiseau, Gerard; and Torelli, Gerard, 4,836,242, Cl. 137-505.420.
Gaskell, David J., to Lucas Industries Public Limited Company. Fuel injection nozzles. 4,836,454, Cl. 239-533.900.
Gasparri, Angelo S.: *See*—
Posner, Carole; and Gasparri, Angelo S., 4,835,920, Cl. 52-207.000.
Gasseev, Amiran F.: *See*—
Slesarenko, Vladimir F.; Vaisberg, Leonid A.; Balabatko, Leonid K.; Sozykin, Veniamin I.; and Gasseev, Amiran F., 4,836,385, Cl. 209-315.000.
Gastinger, Robert G.; and Hayes, John E., to ARCO Chemical Technology, Inc. High molecular weight dispersants for polymer polyols. 4,837,246, Cl. 521-137.000.
Gastinger, Robert G.; and Hayes, John E., to Arco Chemical Technology, Inc. Stable polymer polyols in base polyols with molecular weight greater than 4000 using high molecular weight dispersants. 4,837,247, Cl. 521-137.000.
Gastinger, Robert G.; and Hayes, John E., to Arco Chemical Technology, Inc. Polymer polyol and flame retardant polyurethane foams. 4,837,263, Cl. 524-377.000.
Gates Formed-Fibre Products, Inc.: *See*—
Quinn, Pat A.; and Billings, Scott C., 4,837,066, Cl. 428-95.000
Gates, Jeffrey L. Paper transport device for printing-installations. 4,836,701, Cl. 400-617.000.
Gates, William M., to Stein-Gates Medical Equipment, Inc. Portable ventilating device. 4,836,198, Cl. 128-205.180.
Gatto, Donald F.: *See*—
Chambers, Randall P.; Dzung, John C.; and Gatto, Donald F., 4,836,708, Cl. 403-358.000.
Gaubis, Alfred E. Hand-operated fruit picker. 4,835,955, Cl 56-333.000.
Gaudet, Peter W.: *See*—
Tugal, Halil; and Gaudet, Peter W., 4,835,972, Cl. 62-50.100.
Gaudlitz, Harald: *See*—
Forster, Markus; Maier, Peter; Gaudlitz, Harald; and Hefka, Richard, 4,837,437, Cl. 250-336.100.
Gavilan, William A., to Westinghouse Electric Corp. Pre-load device for a turbomachine rotor. 4,836,749, Cl. 416-221.000.
Gawronski, Michael J.; Palmquist, Steven L.; Lamberg, John R.; and Hart, Rebecca A., to Honeywell, Inc. Millimeter wave microstrip to coaxial line side-launch transition. 4,837,529, Cl. 333-33.000.
Gay, Thomas; Bertolami, Charles N.; and Solonche, David J., to Arthrotek, Inc. Method and apparatus for the acoustic detection and analysis of joint disorders. 4,836,218, Cl. 128-773.000.
Gaz de France: *See*—
Nussbaum, Max; Picart, Thierry; and Sauron, Jean, 4,837,424, Cl. 219-494.000.
Geary, Frederick J., to Robertshaw Controls Company. Primary gas furnace control. 4,836,770, Cl. 431-46.000.
Gebhard, Albert W., to Gerico, Inc. Combination infant stroller and baby bassinet. 4,836,573, Cl. 280-644.000.
Gebo, Charles H.; and Roth, Bradley C., to Eastman Kodak Company. Shielding method for use with electromagnetic balance. 4,836,293, Cl. 177-1.000.
Gebruder Bauermeister & Co.: *See*—
Holl, Wolfgang; Weilandt, Gerhard; and Thiem, Heinz, 4,836,459, Cl. 241-225.000.
Gee, James E.: *See*—
Tonsor, Andrew J.; Nelson, David E.; Gee, James E.; and Stevens, Samuel B., 4,836,318, Cl. 180-9.500.
Geens, Maurits; and Van Daele, Jean A., to Agfa-Gevaert N.V. DC motor speed stabilizing method and apparatus. 4,837,486, Cl. 388-811.000.
Geerts, Jean-Pierre: *See*—
Gobert, Jean; Geerts, Jean-Pierre; and Dodson, Guy, 4,837,223, Cl. 514-424.000.
Gobert, Jean; Giurgea, Cornelu; Geerts, Jean-Pierre; and Bodson, Guy, 4,837,224, Cl. 514-424.000.
Gefitec S.A.: *See*—
Posso, Patrick P., 4,836,376, Cl. 206-45.230.
Geiser, Peter, to Grapha-Holding AG. Apparatus for manipulating sheet-like commodities in gathering machines. 4,836,528, Cl. 271-263.000.
Gelfer, George G.: *See*—
Sansone, Ronald P.; Gelfer, George G.; Taylor, Michael P.; and Axelrod, Barry H., 4,837,701, Cl. 364-464.030.
Gellert, Jobst U. Injection molding valve gating one of two nozzles in tandem. 4,836,766, Cl. 425-549.000.
General Dynamics Corporation: *See*—
Bartholomew, Bruce J., 4,836,679, Cl 356-364.000.
General Electric Company: *See*—
Andrews, James T.; and Ladany, Ivan, 4,837,775, Cl. 372-96.000.
Castonguay, Roger N.; and Meiners, David J., 4,835,842, Cl 29-622.000.
Cella, James A.; and Guggenheim, Thomas L., 4,837,298, Cl 528-352.000.
Coffinberry, George A., 4,835,959, Cl. 60-212.000.
Forbes, Franklin L.; and Harms, Harold B., 4,835,839, Cl. 29-596.000.
Goodman, Lawrence A.; and Goodman, Alvin M., 4,837,606, Cl 357-23.400.
Gunnels, William F.; Willis, Candler A.; and Osteen, Mitchell M., 4,835,841, Cl. 29-605.000.
Huang, Shyh-Chin; and Gigliotti, Michael F. X., Jr., 4,836,983, Cl. 420-418.000.
Jacobs, Alvin J., 4,836,976, Cl. 376-305.000.
Kostoss, Joseph M.; and Rohrs, Frederick T., 4,837,471, Cl. 310-258.000.
Lang, Richard J., 4,837,532, Cl. 333-164.000.
Pele, Richard E., 4,837,541, Cl. 335-300.000.
Peters, Edward N.; and Schultz, Michael W., 4,837,299, Cl. 528-353.000.
Stokes, Vijay K., 4,835,840, Cl. 29-598.000.

General Electric Company, p.l.c., The: *See*--
Edwards, Philip J., 4,837,425, Cl. 235-457.000.
Laycock, Leslie C., 4,836,658, Cl. 350-334.000.
General Electrodynamics Corporation: *See*--
Davis, Dick E.; Brazell, Charles R.; and Johnston, Jerome E., 4,836,308, Cl. 177-25.140.
General Hospital Corporation, The: *See*—
Codington, John F., 4,837,171, Cl. 436-548.000.
Schoemaker, Hubert J. P.; Wands, Jack R.; Westrick, Barbara L.; and Zurawski, Vincent R., Jr., 4,837, 67, Cl. 436-513.000.
General Motors Corporation: *See*—
Arnold, Philip D.; and Kaywood, Roy G., 4,835,832, Cl. 29-523.000.
Baker, James A., 4,836,584, Cl. 285-351 000.
Birsching, Joel E., 4,836,566, Cl. 280-91 000.
Hall, Arthur, III, 4,836,341, Cl. 188-290 000.
Johnston, Albert D.; and Lederman, Frederick E., 4,836,347, Cl. 192-45.000.
Krage, Mark K., 4,836,015, Cl. 73-117.2 00.
Lobig, Arnold, 4,836,044, Cl. 74-579.00E.
Lobig, Arnold, 4,836,045, Cl. 74-579.00E.
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Londeck, Paul B.; Sarti, Robert F.; and Aho, Jack R., 4,835,908, Cl. 49-377.000.
Lun, Saiman, 4,836,512, Cl. 267-140.10
Polster, Michael; and Schamber, Ortwin, 4,836,168, Cl. 123-41.500.
Priem, Barry L., 4,836,272, Cl. 164-457 000.
Savage, John R.; and Mellin, Robert C 4,836,148, Cl. 123-41.490.
Smith, Richard H., 4,836,090, Cl. 92-12 200.
General Signal Corporation: *See*—
Homer, John C., 4,836,934, Cl. 210-771 000.
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General Technology Applications, Inc.: *See*—
O'Mara, Dion P.; Hadermann, Albert F.; and Trippe, Jerry C., 4,837,249, Cl. 523-175.000.
Genna, Sebastian, and Smith, Andrew P., to Digital Scintigraphics, Inc. Scintillation camera with segmented light pipe. 4,837,439, Cl. 250-368.000.
Genova, Alessandro: *See*—
Knirsch, Franco; Soudaz, Anna M.; and Genova, Alessandro, 4,836,852, Cl. 106-22.000.
Genssler, Hans-Peter: *See*—
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Gent, Derek J.: *See*—
Bergstrom, Michael J.; and Gent, Derek J., 4,837,457, Cl. 307-253.000.
Georgalas, Arthur C. W.; and Deckner, George E., to Charles of the Ritz Group Ltd. Skin treatment composition and method for treating burned skin. 4,837,019, Cl. 424-101.000.
George, Kevin R.: *See*—
Wesson, David S.; and George, Kevin R., 4,836,109, Cl. 102-312.000.
Geotronics AB: *See*—
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GEP Groupe Pasquier: *See*—
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Gerber Garment Technology, Inc.: *See*—
Gerber, Heinz J., 4,836,072, Cl. 83-152.000.
Gerber, Heinz J., to Gerber Garment Technology, Inc. Vacuum supply system for movable cutter. 4,836,072, Cl. 83-152.000.
Gerico, Inc.: *See*—
Gebhard, Albert W., 4,836,573, Cl. 285-644.000.
Gerin, Merlin: *See*—
Theoleyre, Serge; Salsetti, Pascal; and Masset, Daniel, 4,837,660, Cl. 361-275.000.
Gerlach, Rainer, to Bayer Aktiengesellschaft. Process for the preparation of azo compounds. 4,837,308, Cl. 534-578.000.
Gerst, Michael; Knapp, Horst J. T.; and Maack, Werner, to AMP Incorporated. Block loading apparatus. 4,835,844, Cl. 29-747.000.
Gesellschaft fur Strahlen-und Umweltforschung GmbH: *See*—
Forster, Markus; Maier, Peter; Gaudlitz, Harald; and Hefka, Richard, 4,837,437, Cl. 250-336.100.
Getrag Getriebe und Zahnradfabrik GmbH: *See*—
Knodel, Gunter; and Henzler, Helga, 4,836,348, Cl. 192-53.00F.
Gianforcaro, Anthony. Motor vehicle brake-state of motion signal-lights indicator. 4,837,554, Cl. 340-468.000.
Gibeltirra, James: *See*—
Scheller, Gregg D.; Gahn, Jerry S.; Higgins, Daniel E.; Wendt, Richard, Gibeltirra, James; and Reiter, J. Alan, 4,837,857, Cl. 455-617.000.
Gigabit Logic, Inc.: *See*—
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Gigliotti, Michael F. X., Jr.: *See*—
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Giles, David: *See*—
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Gillett, Richard B., Jr.: *See*—
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Gillick, Laurence; Bamberg, Paul G.; Baker, James K.; and Roth, Robert S., to Dragon Systems, Inc. Method for creating and using multiple-word sound models in speech recognition. 4,837,831, Cl. 381-43.000.
Gilman, Llewellyn A., Jr., to Old Town Canoe Company. Rotational molding method. 4,836,963, Cl. 264-45.700.
Giometti, Stephen M.; and Shay, Timothy W., to Emhart Industries, Inc. Container inspection apparatus. 4,837,707, Cl. 364-552.000.
Girod, Detlef: *See*—
Dassler, Joachim; Girod, Detlef; Kramer, Klaus; and Liesch, Ingrid, 4,837,477, Cl. 313-25.000.
Giroux, D. William. Method for pulling fiber optic cable through a conduit. 4,836,503, Cl. 254-134.3FT.
Gisske, Ed: *See*—
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Giurgea, Corneliu: *See*—
Gobert, Jean; Giurgea, Corneliu; Geerts, Jean-Pierre; and Bodson, Guy, 4,837,224, Cl. 514-424.000.
Giuseppe, Cassan. Cutting diamond machine for ornamentally machining chainlets and provided with a device permitting a vice shaft to be rotated and/or shifted axially, and an engraving device effecting various machining movements. 4,836,724, Cl. 409-144.000.
Glaenzer-Spicer: *See*—
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Glaeser, Linda C.; Brazdil, James F., Jr.; and Toft, Mark A., to Standard Oil Company, The. Catalytic mixture for the ammoxidation of paraffins. 4,837,191, Cl. 502-202.000.
Glaeser, Linda C.; Brazdil, James F., Jr.; and Toft, Mark A., to Standard Oil Company, The. Catalyst system for ammoxidation of paraffins. 4,837,233, Cl. 502-204.000.
Glanz, Kenneth D.: *See*—
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Glaser, Klaus: *See*—
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Glass, Terry W.: *See*—
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Glaxo Group Limited: *See*—
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Hayman, David F.; Brodie, Alastair C.; and Procopiou, Panayiotis A., 4,837,336, Cl. 548-430.000.
Glen Culler & Associates: *See*—
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GLI Industries, Inc.: *See*—
Graham, Charles H.; and Matthews, George A., 4,836,066, Cl. 81-177.400.
Glick, J. Leslie, to Bionix Corporation. Methods for diagonosing, monitoring and controlling the onset and progression of certain dementias and impeding memory loss or improving impairment of memory. 4,837,164, Cl. 436-88.000.
Glidden Company, The: *See*—
Lin, Ju-Chui; and Abbey, Kirk J., 4,837,326, Cl. 546-12.000.
Glista, Andrew S., Jr. Fault-tolerant fiber optic coupler/repeater for use in high speed data transmission and the like. 4,837,856, Cl. 455-601.000.
Glock, Volker; Ebert, Wolfgang; and Meyer, Rolf-Volker, to Bayer Aktiengesellschaft. Process for the preparation of high molecular weight optionally branched polyarylenesulphides. 4,837,301, Cl. 528-388.000.
Glodis, Paul F.: *See*—
Gartside, Charles II., III; Glodis, Paul F.; and Patel, Parbhubhai D., 4,836,640, Cl. 350-96.230.
Gloersen, Stig T. Apparatus for treatment of fiber material. 4,836,893, Cl. 162-237.000.
Glomski, Norman J., to Heil Co., The. Refuse container with two-position lid. 4,836,394, Cl. 220-1.00T.
Glover, Alfred H., to Chrysler Motors Corporation. Connector. 4,836,792, Cl. 439-81.000.
Gobert, Jean; Geerts, Jean-Pierre; and Dodson, Guy, to UCB Societe Anonyme. (S)-alpha-ethyl-2-oxo-1-pyrrolidineacetamide compositions. 4,837,223, Cl. 514-424.000.
Gobert, Jean; Giurgea, Corneliu; Geerts, Jean-Pierre; and Bodson, Guy, to UCB Societe Anonyme. (R)-alpha-ethyl-2-oxo-1-pyrrolidineacetamide compositions. 4,837,224, Cl. 514-424.000.
Godbersen, Byron L. Load guide for a boat trailer. 4,836,569, Cl. 280-414.100.
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Goel, Vijay K.: *See*—
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Goerrissen, Heiner: *See*—
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Goetz, Norbert: *See*—
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Goldberg, James R.: *See*—
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Goldblatt, Jeffrey S.: *See*—
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Goldman, Boris. Hypodermic syringe and cover handling device. 4,836,373, Cl. 206-366.000.
Goldman, Robert N., to Light Signatures, Inc. System for verifying authenticity of various articles. 4,837,840, Cl. 382-7.000.
Goldstar Co., Ltd.: *See*—
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Golik, Jerzy, to Bristol-Myers Company. Esperamicin derivatives. 4,837,206, Cl. 514-25.000.
Golkar, Homayun. Compartmented food container with handled partition. 4,836,367, Cl. 206-200.000.
Golke, Keith W.; and Rabe, Robert L., to Honeywell Inc. Fuse status detection circuit. 4,837,520, Cl. 324-550.000.
Gonsalves, Edward M.: *See*—
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Gonser, Donald I., to Dentsply Research & Development Corp. Method for providing direct cool beam incident light on dental target. 4,836,782, Cl. 433-229.000.
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Goodman, Lawrence A.; and Goodman, Alvin M., to General Electric Company. Vertical MOSFET with reduced bipolar effects. 4,837,606, Cl. 357-23.400.
Goodman, Murray; Marr-Leisy, Debra; Rosenkranz, Roberto P.; Melmon, Kenneth L.; and Verlander, Michael S., to University of California, The Regents of the. Derivatives of β-adrenergic antagonists. 4,837,305, Cl. 530-345.000.
Goodyear Tire & Rubber Company, The: *See*—
Kramer, Robert H.; and Koons. Roger R., 4,836,513, Cl. 267-140.100.
Gordon, Robert L.; and Bernstein, Linda A., to International Paper Company. Microwave food carton with divider panel. 4,836,383, Cl. 206-611.000.
Gornati, Silvano: *See*—
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Gould Electronics Limited: *See*—
Tucker, Brian D., 4,837,561, Cl. 340-722.000.
Gould, Russell J., to Minigrip, Inc. Method and apparatus for making extruded separable fastener with reactivatable adhesive. 4,835,835, Cl. 29-527.200.
Gourlain, Philippe; Lenormand, Regis; and Morin, Dominique, to Alcatel Espace. Three-access polarization and frequency duplexing device. 4,837,531, Cl. 333-135.000.
Goutille, Maurice, to Weidmann & Pittet S.A. Large disposable convertible packing case. 4,836,395, Cl. 220-1.500.
Goward, George W.: *See*—
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Grabbe, Dimitry G.; Granitz, Richard F.; Bakker, Roel J.; Milbrand, Donald W., Jr.; and Masterson, Earl E., to AMP Incorporated. High density coax connector. 4,836,791, Cl. 439-79.000.
Gradeff, Peter S.; and Davison, John F., to Rhone-Poulenc Inc. Rare earth compositions for diesel fuel stabilization. 4,836,830, Cl. 44-57.000.
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Graef, John T., to Lutron Electronics Co., Inc. Twist-off knob. 4,835,816, Cl. 16-114.00R.
Graham, Charles H.; and Matthews, George A., to GLI Industries, Inc. Self-storing tool set. 4,836,066, Cl. 81-177.400.
Gramlich, Walter; Goetz, Norbert; Siegel, Hardo; and Schindler, Gerhard, to BASF Aktiengesellschaft. 4-Methyl-4-phenyl-1-pentanals, their preparation and their use as scents. 4,837,201, Cl. 512-26.000.
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Graven, Richard G.: *See*—
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Graves, Thomas J.; Yang, Robert A.; and Brown, Christopher W., to United States of America, National Aeronautics and Space Administration. Toggle release. 4,836,081, Cl. 89-1.140.
Gray, John C. Production of threaded metal rods for making U-bolts. 4,835,805, Cl. 10-27.0UB.
Green, James G., Sr. Personal security device. 4,837,559, Cl. 340-573.000.
Greenbaum, Michael: *See*—
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Gregson, Richard P.; and McInerney, Bernard V., to Biotechnology Australia Pty. Ltd. Xenocoumacins. 4,837,222, Cl. 514-422.000.
Greiner, Gabriele, to Lindemann Maschinenfabrik G.m.b.H. Screen for comminuting machines. 4,836,457, Cl. 241-73.000.
Greisel, Josef: *See*—
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Gribi, Hans-Peter K., to Dentsply GmbH. Algin based dental impression material containing biocidal component. 4,836,853, Cl. 106-35.000.
Griffiths, Elizabeth A.: *See*—
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Griffiths, John M.; Litjens, John J.; and Newman, Neil A., to Brunswick Corporation. Transom extension mounting assembly for outboard motors. 4,836,811, Cl. 440-61.000.
Griffiths, John M., to Brunswick Corporation. Steering system for auxiliary marine engine. 4,836,812, Cl. 440-61.000.
Griffiths, John M.: *See*—
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Griffiths, Phillip N.: *See*—
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Grills, Robert H.: *See*—
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Grina, Larry D.: *See*—
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Grinde, James E.; and Kuroda, Kazuo, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Compact motor/generator set for providing alternating current power to a marine craft. 4,836,123, Cl. 114-270.000.
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Groetzinger, John K.: *See*—
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Grover, Wayne D., to Northern Telecom Limited. Transmit line build-out circuits. 4,837,780, Cl. 375-11.000.
Gruber, Robert J.; Knapp, John F.; Koch, Ronald J.; and Floyd, Lawrence, Jr., to Xerox Corporation. Negatively charged colored toner compositions. 4,837,101, Cl. 430-109.000.
Grumman Aerospace Corporation: *See*—
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Grussmark, Stephen M. Dental timer. 4,836,415, Cl. 222-39.000.

GTE Products Company: *See—*
Devir, Daniel D.; Dolan, Richard J.; and Bergin, John A., 4,837,479, Cl. 313-318.000.
GTE Products Corporation: *See—*
Bouchard, Andre C.; and Thibault, Paul A., 4,836,816, Cl. 445-51.000.
Ekowicki, Robert L., 4,837,655, Cl. 361-103.000.
Kegel, Andrew J.; Spencer, James R.; Smith, James S.; Rhodes, Russell H.; and Mullendore, James A., 4,836,108, Cl. 102-306.000.
Kemp, Preston B., Jr.; and Johnson, Walter A., 4,836,850, Cl. 75-251.000.
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Ojanen, Randall W., 4,836,614, Cl. 299-86.000.
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Guezou, Jean-Pierre; Heid, Gilles; Bailleux, Pierre; and Pruvost, Marc, to Etat Francais; and Office National d'Etudes et de Recherches Aerospatiales. Cross flow fan. 4,836,743, Cl. 417-5.100.
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Guillemet, Alain; Teillaud, Eric; Reginault, Philippe; and Bevan, Bruno, to Laboratoires D'Hygiene et de Dietetique. Self-adhesive device for the percutaneous administration of an active ingredient. 4,837,025, Cl. 424-448.000.
Guilloteau, Rene, to Societe Generale Pour les Techniques. Device for making a sealed connection. 4,836,581, Cl. 285-31.000.
Guimbretiere, Pierre L., to Glaenzer-Spicer. Differential transmission device in particular for a motor vehicle. 4,836,051, Cl. 74-711.000.
Gulczynski, Zdzislaw. Digital-to-analog converter. 4,837,572, Cl. 341-150.000.
Guldner, Ralf; Lasberg, Ingo; Wittmann, Kurt; and Kindleben, Gerd, to Alkem GmbH. Container, in particular for a radioactive substance. 4,836,975, Cl. 376-272.000.
Gulf States Paper Corporation: *See—*
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Gunji, Yasuhiro; Okada, Sadayuki; Isogai, Masato; Kondo, Katsumi; Ibamoto, Masahiko; Kuwabara, Kazuhiro; and Kanke, Atsushi, to Hitachi, Ltd. Optical change-over switch utilizing ferroelectric liquid crystal material. 4,836,657, Cl. 350-350.00S.
Gunkel, Werner; and Krauss, Helmuth, to Merck Patent Gesellschaft mit Beschrankter Haftung. Test strips. 4,837,373, Cl. 422-56.000.
Gunnels, William F.; Willis, Candler A.; and Osteen, Mitchell M., to General Electric Company. Method of making a coil assembly. 4,835,841, Cl. 29-605.000.
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Gurantz, Itzhak; and Wright, David A., to Comstream Corporation. Technique for mitigating rain fading in a satellite communications system using quadrature phase shift keying. 4,837,786, Cl. 370-20.000.
Gurvitch, Michael; and Levy, Roland A., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Semiconductor devices having superconducting interconnects. 4,837,609, Cl. 357-71.000.
Gustafson, Bruce L.; Wehner, Paul S.; Nelson, Gregory O.; and Mercer, Patricia N., to Eastman Kodak Company. Low pressure catalytic hydrogenation of carbonyl-containing compounds. 4,837,367, Cl. 568-831.000.
Gustafson, Bruce L.; and Wehner, Paul S., to Eastman Kodak Company. Low pressure catalytic hydrogenation of carbonyl-containing compounds and supported catalysts therefor. 4,837,368, Cl. 568-881.000.
Guttinger, Peter: *See—*
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H. J. Langen & Sons Limited: *See—*
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Haas, Herbert G. Tire assembly machine. 4,836,880, Cl. 156-400.000.
Haasl, William D., to Brunswick Corporation. Mounting assembly with trim plate for outboard motors. 4,836,124, Cl. 114-285.000.
Haberberger, Vitus, to Siemens Aktiengesellschaft. Seal. 4,836,560, Cl. 277-88.000.
Hadden, Terrence B. Drill guide. 4,836,720, Cl. 408-112.000.
Hadermann, Albert F.: *See—*
O'Mara, Dion P.; Hadermann, Albert F.; and Trippe, Jerry C., 4,837,249, Cl. 523-175.000.
Hafele, Walter, to Robert Bosch GmbH. Fuel injection pump for an internal combustion engine. 4,836,170, Cl. 123-503.000.
Haga, Toshio: *See—*
Shimamura, Masayoshi; Furukawa, Tadahiro; Murakami, Akiyoshi; and Haga, Toshio, 4,837,098, Cl. 430-7.000.
Hageman, John P. In situ roofing composite and method utilizing wider polyester. 4,837,095, Cl. 428-287.000.
Hagemann, Hermann; and Baasner, Bernd, to Bayer Aktiengesellschaft. Process for the preparation of 3-fluoro-2-(fluoromethyl)-propene. 4,837,369, Cl. 570-160.000.
Hagen, Floyd W.; and DeLeo, Richard V., to Rosemount Inc. Compact air data sensor. 4,836,019, Cl. 73-180.000.
Hagen, Johannes L. M., to U.S. Philips Corporation. Shaft support comprising static fluid bearings. 4,836,692, Cl. 384-107.000.
Haggerty, John W.: *See—*
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Hagiwara, Taro: *See—*
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Haglund, Richard A.; and Tupack, Robert E., to Teledyne Industries, Inc. Apparatus and method of air-conditioning parked aircraft. 4,835,977, Cl. 62-89.000.
Hahn, Joseph A.; and House, John E., to Magnaflux Corporation. Waste water treatment apparatus. 4,836,921, Cl. 210-202.000.
Hahne, Ernst-August; and Kunzig, Hermann, to Eltex-Elektrostatik Gesellschaft mbH. Probe for removing dust from moving webs. 4,835,808, Cl. 15-1.50R.
Haifa Chemicals Ltd.: *See—*
Manor, Shalom; Pipko, Grigori; Langham, Adrian; Friedman, Nitza; and Steiner, Amalia, 4,836,995, Cl. 423-309.000.
Hajikano, Kazuo; Shimoe, Toshio; Kamoi, Jyoei; Sawaki, Ippei; and Murakami, Koso, to Fujitsu Limited. Non-blocking optical space switch. 4,837,855, Cl. 455-600.000.
Hakamada, Haruo: *See—*
Nakane, Nobu; Maruyama, Noriharu; and Hakamada, Haruo, 4,837,601, Cl. 355-28.000.
Halczenko, Wasyl; Hartman, George; and Pitzenberger, Steven M., to Merck & Co., Inc. Prodrugs of antihypercholesterolemic compounds. 4,837,205, Cl. 514-25.000.
Hall, Arthur, III, to General Motors Corporation. Control system for a hydraulic retarder. 4,836,341, Cl. 188-290.000.
Hall, David M.: *See—*
McCullough, Francis P., Jr.; and Hall, David M., 4,837,076, Cl. 428-224.000.
Hall, John H.; and Watson, Robert N. Machine knitted fabrics. 4,835,989, Cl. 66-203.000.
Hall, Kenneth: *See—*
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Hall, Morley, to Minverose Limited. Portable coin holder and dispenser. 4,836,365, Cl. 206-0.830.
Hall, William M.: *See—*
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Wesson, David S.; and George, Kevin R., 4,836,109, Cl. 102-312.000.
Ham, Wilhelmus J.; and Nagelhout, Jacob T., to Hollandse Signaalapparaten B.V. Communication system. 4,837,823, Cl. 380-34.000.
Hamada, Masaki: *See—*
Shirasaka, Akifumi; Tanaka, Kensaku; and Hamada, Masaki, 4,837,847, Cl. 382-55.000.
Hamada, Takaki; Hayakawa, Tetsuji; and Matsuura, Yutaka, to Sumitomo Special Metals Co., Ltd. Process for producing magnets having improved corrosion resistance. 4,837,114, Cl. 427-127.000.
Hamasaki, Masaharu: *See—*
Kato, Yasaburo; Suzuki, Toshihiko; Isawa, Nobuyuki; Kanbe, Hideo; and Hamasaki, Masaharu, 4,836,788, Cl. 437-017.000.
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Hampshire Instruments, Inc.: *See—*
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Hanada, Kazuyuki: *See—*
Kuriyama, Katsumi; Hanada, Kazuyuki; Nakamura, Susumu; Misaizu, Iwao; Kashimura, Masashi; and Goto, Tomoko, 4,837,198, Cl. 503-227.000.
Hanada, Toshiro: *See—*
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Handa, Akio: *See—*
Enokimoto, Akito; Hosoya, Eiji; Kasa, Keiji; Handa, Akio; Ishiwatari, Makoto; and Mizumoto, Kousei, 4,836,325, Cl. 180-333.000.
Hanko, Jimmy J.; and Brom, Lawrence V., to Gulf States Paper Corporation. Shadow box carton with strut improvement. 4,836,364, Cl. 206-45.140.
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Hannah, William J., to McDonald, Gerald; and Campbell, Gloria H. Method of manufacturing a fabricated open web steel joist. 4,836,436, Cl. 228-182.000.
Hannappel, Joachim; and Pfeifer, Thomas, to VDO Adolf Schindling AG. Circuit for a sensor. 4,836,027, Cl. 73-708.000.
Hansen, Charles M.: *See—*
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Hansen, Diethard; and Konigstein, Dietrich, to BBC Brown Boveri AG. Device for the EMI testing of electronic systems. 4,837,581, Cl. 343-703.000.
Hansen, Guenter: *See—*
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Harada, Masaaki, to Clarion, Co., Ltd. Maximum length linearly occurring code sequence generator. 4,837,790, Cl. 377-33.000.
Harada, Masahiro; Yanagi, Kenichi; Fukushima, Takeo; Furukawa, Kusuo; Soeda, Naohiko; Ohta, Norio; Sato, Kuniaki; and Nakajima, Yasuhisa, to Mitsubishi Jukogyo Kabushiki Kaisha; and Kawasaki Steel Corporation. Method and apparatus for heating a strip of metallic material in a continuous annealing furnace. 4,836,774, Cl. 432-8.000.
Harder, Mark T.: *See—*
Buttermore, Alun L.; and Harder, Mark T., 4,836,875, Cl. 156-231.000.
Hardy, James A., to Allied-Signal Inc. Diesel engine particulate trap regeneration system. 4,835,963, Cl. 60-274.000.
Harenslak, Gerd: *See—*
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Harms, Harold B.: *See—*
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Harms, Wolfgang; Wunderlich, Klaus; and von Oertzen, Klaus, to Bayer Aktiengesellschaft. One-amine-2-sulpho-4-[(4-halo-6-amino triazinyl-2)aminocyclohexylamino]anthraquinone reactive dyestuffs. 4,837,320, Cl. 544-189.000.
Harold Simpson, Inc.: *See—*
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Harper, Carol R.: *See—*
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Harper, Cliff. Activity kit. 4,836,783, Cl. 434-87.000.
Harper, Thomas A.: *See—*
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Harrel, Donald M.: *See—*
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Harrell, Edward R.; Rustad, Norman E.; and Mosbey, Deral T., to Minnesota Mining and Manufacturing Company. Flexible magnetic recording media and a method using a stable fluid reactive dispersion to prepare magnetic recording media. 4,837,082, Cl. 428-329.000.
Harrington, James H., to Hercules Incorporated. Wet/dry wipes. 4,837,078, Cl. 428-284.000.
Harrington, William J.; Ahn, Yeon S.; and Mylvaganam, Ravindra, to University of Miami. Treatment of hemolytic anemia with danazol. 4,837,212, Cl. 514-176.000.
Harris, Richard J.: *See—*
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Harris, Robert S.; Szlaga, Emil; and Thompson, Robert H., to Stant Inc. Vacuum-actuated vapor recovery system. 4,836,835, Cl. 55-168.000.
Harris, William C.: *See—*
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Hart, Rebecca A.: *See—*
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Hartman, George: *See—*
Halczenko, Wasyl; Hartman, George; and Pitzenberger, Steven M., 4,837,205, Cl. 514-25.000.
Hartman, James; and Schwartzman, Blake. Perimetrical watch protector. 4,837,756, Cl. 368-286.000.
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Hartness, Robert G.: *See—*
Hartness, Thomas S.; and Hartness, Robert G., 4,835,946, Cl. 53-539.000.
Hartness, Thomas S.; and Hartness, Robert G., to Hartness International. Article transport apparatus. 4,835,946, Cl. 53-539.000.
Hartwell, David W.; Bloom, Elbert; and Triolo, Victoria M., to Digital Equipment Corporation. Bus adapter module with improved error recovery in a multibus computer system. 4,837,767, Cl. 371-49.000.
Haruta, Kazumi; and Yamada, Yutaka, to Aisan Kogyo Kabushiki Kaisha. Canister device for use in gasoline tank. 4,836,172, Cl. 123-520.000.
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Harvey, John W.: *See—*
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Harvey, Timothy J., to Zenith Electronics Corporation. Teletext receiver with page up and page down functions. 4,837,620, Cl. 358-142.000.
Harwood, Jon W.; and Kimmet, Mark S., to AP Industries, Inc. Plural chamber stamp formed muffler with single intermediate tube. 4,836,330, Cl. 181-282.000.
Haseda, Satoshi; Tsuzuki, Yoshihiko; Konishi, Yoshimune; and Suzuki, Motoshi, to Nippondenso Co., Ltd. Steering control apparatus for motor vehicles. 4,836,319, Cl. 180-142.000.
Hasegawa, Hirofumi: *See—*
Oyabu, Masaaki; Sugiura, Masamichi; Hasegawa, Hirofumi; and Nakatani, Munehiro, 4,837,846, Cl. 382-50.000.
Hasegawa, Kazuo, to Alps Electric Co., Ltd. Photoelectric touch panel having parallel light emitting and detecting arrays separated by a light shield. 4,837,430, Cl. 250-221.000.
Hasegawa, Taiji: *See—*
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Hasenzahl, Ernest L. Remote measurement of high voltage AC with radar. 4,837,503, Cl. 324-95.000.
Hashimoto Corporation: *See—*
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Hashimoto, Kazuo, 4,837,809, Cl. 379-79.000.
Hashimoto, Hideo: *See—*
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Hashimoto, Kazuo, to Hashimoto Corporation. Telephone answering device having function of playback without rewinding tape. 4,837,803, Cl. 379-79.000.
Hashimoto, Kazuo, to Hashimoto Corporation. Telephone answering device having immediate playback function. 4,837,809, Cl. 379-79.000.
Hashiue, Masakazu: *See—*
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Hassia Verpackungsmaschinen GmbH: *See—*
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Hatanaka, Masataka: *See—*
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Hatanaka, Minoru, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Optically active β-amino acid derivatives and their salts, and processes for producing the same. 4,837,343, Cl. 549-291.000.
Hatcher, Owen W., Jr., to Advanced Micro Devices, Inc. Method of performing electrical reject selection. 4,836,883, Cl. 156-627.000.
Hatori, Yoshinori; Kato, Yoichi; Ohta, Mutsumi; and Kosugi, Yasuhiro, to Kokusai Denshin Denwa Co., Ltd.; Nippon Telegraph and Telephone Corporation; NEC Corporation; and Fujitsu Limited. Moving image signal coding system. 4,837,618, Cl. 358-135.000.
Hattori, Yoshiyuki: *See—*
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Hawke, David H., to Beckman Research Institute, City of Hope. Method for sequencing of peptides by carboxyl terminus degradation. 4,837,165, Cl. 436-89.000.
Hayakawa, Hidenori: *See—*
Kume, Toyohiko; Goto, Toshio; Kamochi, Atsumi; Yanagi, Akihiko; Hayakawa, Hidenori; and Yagi, Shigeki, 4,836,844, Cl. 71-90.000.
Hayakawa, Nobuhiro: *See—*
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Hayakawa, Tetsuji: *See—*
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Hayashi, Eiichi: *See—*
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Hayashi, Kazuo: *See—*
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Hayashi, Kenro; and Tanaka, Takashi, to Toshiba Ceramics Co., Ltd. Method of producing heat treating furnace member. 4,836,965, Cl. 264-60.000.

Hayashi, Takashi: *See*—
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Hayashi, Tuyoshi: *See*—
Ohta, Minemasa; Suzuki, Kenji; Fukuoka, Satoru; Takishita, Toshihiko; and Hayashi, Tuyoshi, 4,837,130, Cl. 430-321.000.

Hayashi, Yasuaki, to Nihon Shiaku Gijutsu Kabushiki Kaisha. Method of correcting azimuth angle of photometric ellipsometers. 4,837,603, Cl. 356-369.000.

Hayden, Owen: *See*—
Firth, George F.; and Hayden, Owen, 4,836,274, Cl. 165-11.100.

Hayden, Percy, to Imperial Chemical Industries PLC. Process for improving the performance of a catalyst for the production of alkylene oxides. 4,837,194, Cl. 502-348.000.

Hayes, John E.: *See*—
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Gastinger, Robert G.; and Hayes, John E., 4,837,247, Cl. 521-137.000.
Gastinger, Robert G.; and Hayes, John E., 4,837,263, Cl. 524-377.000.

Hayes, Thomas H.; and Lo Maglio, Lewis C., to Anchor Hocking Corporation. Pump dispenser package. 4,836,423, Cl. 222-257.000.

Hayman, David F.; Brodie, Alastair C.; and Procopiou, Panayiotis A., to Glaxo Group Limited. Process for preparing heterocyclic compounds. 4,837,336, Cl. 548-430.000.

Hazeltine Corporation: *See*—
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Headrick, Stephen E.; and Hill, Roger L., to USBI Booster Production Company, Inc. Trowelable ablative coating composition and method of use. 4,837,250, Cl. 523-179.000.

Heatherington, Kenneth: *See*—
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Hechtman, Charles D., to American Telephone and Telegraph Company AT&T Technologies, Inc. High frequency in-circuit test fixture. 4,837,507, Cl. 324-158.00P.

Heck, Joseph P., to Motorola, Inc. Dual port FM demodulation in phase locked receivers. 4,837,853, Cl. 455/208.000.

Hefka, Richard: *See*—
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Hehn, Wilfried, to Agfa-Gevaert Aktiengesellschaft. Apparatus for wet treatment of photosensitive material. 4,837,593, Cl. 354-322.000.

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Heil Co., The: *See*—
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Heilhecker, Joe K.; Williams, Robert E.; and Marshall, William H. Apparatus and method for removing and recovering oil and/or other oil-based drilling mud additives from drill cuttings. 4,836,302, Cl. 175-66.000.

Heilmann, Steven M.: *See*—
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Heims, Dirk, to ABG Werke GmbH. Road-finishing machine. 4,836,564, Cl. 280-6.120.

Heine, Werner; and Kurz, Helmut, to Koppenschmidt-Mueller GmbH & Co. KG. Apparatus for electrostatically spray coating workpieces with air ionizing neutralizing device. 4,835,137, Cl. 118-663.000.

Heinrich Burghart Elektro- und Feinmechanik GmbH: *See*—
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Heinz, Gerhard; Koch, Juergen; Eggersdorfer, Manfred; and Henkelmann, Jochem, to BASF Aktiengesellschaft. Preparation of polyaryl ether ketones. 4,837,296, Cl. 528-125.000.

Heithoff, Robert B.; and Groetzinger, John K., to PPG Industries, Inc. Air cooled rotary kiln collar. 4,836,775, Cl. 432-112.000.

Heitmann, Jurgen; and Wagner, Peter, to Robert Bosch GmbH. Recognition and compensation of errors in a digital video signal. 4,837,624, Cl. 358-166.000.

Hektner, Andrew P.: *See*—
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Helfand, Rita: *See*—
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Helton, Doyle D. Fishing lure with temperature responsive color change. 4,835,899, Cl. 43-42.330.

Hemphill, Charles W. Excavating tooth and holder therefor. 4,835,888, Cl. 37-141.00T.

Hemphill, John K.; and Warshaw, Claire A., to Sungene Technologies Corporation. Process for regenerating soybeans. 4,837,152, Cl. 435-240.490.

Henderson, Alex E.; Drain, Frederick L.; and Roberts, Lawrence G., to NetExpress Systems, Inc. Apparatus for selecting a reference line for image data compression. 4,837,848, Cl. 382-56.000.

Henderson, James F.; and Wingham, Philip J., to University of Bath. Fairing sections. 4,836,122, Cl. 114-243.000.

Hendow, Sami T.; and Martin, Graham J., to Litton Systems, Inc. Apparatus and method for detecting rotation rate and direction of rotation and providing cavity length control in multioscillator ring laser gyroscopes. 4,836,675, Cl. 356-350.000.

Hendrickson, Constance, to Rockwood Systems Corporation. Stable expandable foam & concentrate & method. 4,836,939, Cl. 252-3.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
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Henley, Douglas R. Lead arm development bat. 4,836,541, Cl. 273-26.00B.

Henning Berlin GmbH Chemie- und Pharmawerk: *See*—
Rokos, Hartmut; Konczak, Heinz; and Forth, Wolfgang, 4,837,229, Cl. 514-517.000.

Henson, Robert M. Foldable sawhorse. 4,836,332, Cl. 182-155.000.

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Herbst, Joseph A.; and Huang, Yun-Yang, to Mobil Oil Corporation. Zeolite beta containing hydrocarbon conversion catalyst of stability. 4,837,396, Cl. 502-67.000.

Hercules Incorporated: *See*—
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Herleikson, Earl C.: *See*—
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Herlein, Richard F.; and Davis, Jeffrey A., to Schlumberger Systems & Services, Inc. Delay line control system for automatic test equipment. 4,837,521, Cl. 328-72.000.

Hernandez, Augusto: *See*—
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Hernandez, Benito B. Basket sink strainer centering tool. 4,835,798, Cl. 4-661.000.

Heron, Harold G. Cover clip for photographic slides. 4,836,377, Cl. 206-456.000.

Heron, Roger A.; Hughes, Martin L.; and Hansford, Ian. Liquid flow control assembly. 4,836,498, Cl. 251-126.000.

Herren, Harold L. Replaceable device for outer spoke edge of pulley wheel. 4,836,361, Cl. 198-843.000.

Herrick, Paul W.; Thayer, Edward B.; and Stewart, Jim D., to United Technologies Corporation. Yaw and pitch convergent-divergent thrust vectoring nozzle. 4,836,451, Cl. 239-265.270.

Herrin, Robert M. Carton nesting apparatus and method. 4,835,944, Cl. 53-485.000.

Hertel, Richard J.; Delforge, Adrian C.; Mears, Eric L.; MacIntosh, Edward D.; Jennings, Robert E.; and Bhargava, Akhil, to Varian Associates, Inc. Wafer transfer system. 4,836,733, Cl. 414-225.000.

Hettinger, Peter: *See*—
Merger, Franz; and Hettinger, Peter, 4,837,357, Cl. 560-226.000.

Heubner, Wilhelm; and Reeb, Wolfgang, to FAG Kugelfischer Georg Schafer (KGaA). Pneumatic-hydraulic pressure transducer. 4,836,092, Cl. 92-48.000.

Heuchert, Karl H., to Metalurgica Carto Ltda. Automotive vehicle window drive mechanism. 4,835,907, Cl. 49-352.000.

Hewlett-Packard Company: *See*—
Faulkner, Thomas R.; and Herleikson, Earl C., 4,837,498, Cl. 324-57.00N.
James, Craig A., 4,837,434, Cl. 250-281.000.
Kondoh, Hiroshi, 4,837,530, Cl. 333-81.00A.
Pawlowski, Norman E.; Bares, Steven J.; Johnson, Loren E.; and Hindagolla, Suraj L., 4,836,851, Cl. 106-22.000.
Santos, Francisco E., 4,837,635, Cl. 358-287.000.

Hi Tech Industries, Ltd.: *See*—
Chu, Cornel, 4,836,489, Cl. 248-442.200.

Hibbard, Billy B.; Mann, Joe A.; Koeleveld, Frans P. P., Potepan, Agnes K.; White, Richard E.; Knight, Barry T.; and Bryant, Howard H., to BASF Corporation. Method of making reinforced materials having improved reinforcing material therein. 4,837,281, Cl. 525-234.000.

Hickling, Ronald M., to Gigabit Logic, Inc. Phase locked loop clock synchronizer and signal detector. 4,837,781, Cl. 375-81.000.

Hicks, John W., Jr., to Sahagen, Peter D. Electronic still camera tube. 4,837,631, Cl. 358-217.000.

Hicks, Weldon R. Electrically operated fluid control valve. 4,836,234, Cl. 137-596.170.

Hidaka, Hideto: *See*—
Dosaka, Katsumi; Kumanoya, Masaki; Miyatake, Hideshi; Hidaka, Hideto; Konishi, Yasuhiro; Yamasaki, Hiroyuki; Ikeda, Yuto; Tsukamoto, Kazuhiro; and Shimoda, Masaki, 4,837,747, Cl. 371-10.000.

Higa, Masakatsu: *See*—
Fujimura, Koh; Higa, Masakatsu; and Aoki, Hisashi, 4,836,654, Cl. 350-346.000.

Higashi, Tatsuji: *See*—
Kawamma, Kouichi; Abe, Yukio; Higashi, Tatsuji; and Aotani, Yoshimasa, 4,837,128, Cl. 430-281.000.

Higashiyama, Mitsuo; Iwahashi, Naoto; Kunihiro, Takushi; and Nakai, Jun, to Sony Corporation. Radio communication method and system. 4,837,802, Cl. 379-62.000.

Higbee, Robert W.: *See*—
Wendt, David W.; Higbee, Robert W.; Kemp, Alan E.; and Gisske, Ed, 4,835,843, Cl. 29-708.000.

Higeta Shoyu Co., Ltd.: *See*—
Tamura, Jun-ichi; and Takagi, Hiroaki, 4,837,313, Cl. 536-55.100.

Higgins, Daniel E.: *See*—
Scheller, Gregg D.; Gahn, Jerry S.; Higgins, Daniel E.; Wendt, Richard; Gibeltirra, James; and Ritter, J. Alan, 4,837,857, Cl. 455-617.000.

Highland Supply Corporation: *See*—
Weder, Donald E., 4,835,834, Cl. 29-525.000.

Higuchi, Kenji W., co-executor: *See*—
de Montigny, Pierre M. R.; Sternson, Larry A.; Repta, Arnold J.; Stobaugh, John F.; Higuchi, Takeru, deceased; and Higuchi, Kenji W., co-executor, 4,837,166, Cl. 436-111.000.

Higuchi, Masahiro: *See*—
Ikeda, Haruhiko; Higuchi, Masahiro; and Ohkura, Hirokazu, 4,837,197, Cl. 503-209.000.

Higuchi, Takeru, deceased: *See*—
de Montigny, Pierre M. R.; Sternson, Larry A.; Repta, Arnold J.; Stobaugh, John F.; Higuchi, Takeru, deceased; and Higuchi, Kenji W., co-executor, 4,837,166, Cl. 436-111.000.

Hihara, Toshio: *See*—
Niwa, Toshio; Himeno, Kiyoshi; Hihara, Toshio; Kurose, Yutaka; and Shimizu, Yukiharu, 4,837,309, Cl. 534-632.000.

Hildenbrand, Karlheinz: *See*—
Engelmann, Helmut; Hildenbrand, Karlheinz; and Junkers, Gunter, 4,837,043, Cl. 427-2.000.

Hildenbrand, Randall C.: *See*—
Davis, Cecil J.; Abernathy, Joseph V.; Matthews, Robert T.; Hildenbrand, Randall C.; Simpson, Bruce; Bohlman, James G.; Loewenstein, Lee M.; and Jones, John I., 4,836,905, Cl. 204-298.000.

Hill, Hugh A. O.: *See*—
Armstrong, Frazer A.; Oliver, Brian N.; and Hill, Hugh A. O., 4,836,904, Cl. 204-294.000.

Hill, Kevin E., to Milsco Manufacturing Company. Vehicle seat. 4,836,609, Cl. 297-452.000.

Hill, Robert V., to Boeing Company, The. Near-field monostatic intrusion detection system. 4,837,574, Cl. 342-27.000.

Hill, Roger L.: *See*—
Headrick, Stephen E.; and Hill, Roger L., 4,837,250, Cl. 523-179.000.

Hill, William R. Method of repairing vehicular tires. 4,836,930, Cl. 156-97.000.

Hilliard, Peter, to Clairol Incorporated. Simulated in vivo measurement of skin characteristics. 4,836,014, Cl. 73-76.000.

Hilti Aktiengesellschaft: *See*—
Bisping, Heinz; Gahler, Alfred; Hoffmann, Armin; and Popp, Franz, 4,836,729, Cl. 411-82.000.

Himeno, Kiyoshi: *See*—
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Hindagolla, Suraj L.: *See*—
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Hinneberg, Christian: *See*—
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Hintz, Gerhart: *See*—
Jatho, Ralf; Hintz, Gerhart; and Keller, Guenter, 4,836,031, Cl. 73-800.000.

Hinzmann, Alfred, to Hauni Richmond, Inc. Apparatus for making knots in drawstrings of catamenial tampons. 4,836,587, Cl. 289-2.000.

Hirakawa, Jun, to Asahi Kogaku Kogyo Kabushiki Kaisha. Telephoto zoom lens system. 4,836,663, Cl. 350-427.000.

Hirakawa, Nobuhiro: *See*—
Sekine, Yasuo; Hirakawa, Nobuhiro; Kashiwaba, Noriaki; Yamaura, Tetsuaki; Harada, Hisako; Kutsuma, Teruo; Matsumoto, Hajime; Sekine, Akihiro; and Isowa, Yoshikazu, 4,837,316, Cl. 546-214.000.

Hiraki, Akitoshi: *See*—
Tokunaga, Masaaki; Uchida, Kimio; and Hiraki, Akitoshi, 4,837,109, Cl. 420-83.000.

Hirata, Eiichi: *See*—
Nonaka, Wataru; and Hirata, Eiichi, 4,837,647, Cl. 360-92.000.

Hirata, Kiminori: *See*—
Ogura, Tomoyuki; Kawamura, Yasuo; Baba, Masatoshi; Ishii, Shigeru; Hirata, Kiminori; Kudo, Masaki; Ochiai, Yoshinori; and Hirose, Masayoshi, 4,837,217, Cl. 514-252.000.

Hirata, Sadao: *See*—
Igarashi, Reiko; Watanabe, Yoshihiko; and Hirata, Sadao, 4,837,115, Cl. 428-36.920.

Hiratsuka, Hachiro; Matsushita, Yoshiaki; and Yoshii, Shintaro, to Kabushiki Kaisha Toshiba. Insulation film for a semiconductor device. 4,837,610, Cl. 357-52.000.

Hirayama, Ryuta: *See*—
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Hirayama, Takeshi: *See*—
Amano, Matsuo; Shida, Masami; Sakamoto, Masahide; Hirayama, Takeshi; and Sasayama, Takao, 4,837,698, Cl. 364-431.070.

Hirose, Masayoshi: *See*—
Ogura, Tomoyuki; Kawamura, Yasuo; Baba, Masatoshi; Ishii, Shigeru; Hirata, Kiminori; Kudo, Masaki; Ochiai, Yoshinori; and Hirose, Masayoshi, 4,837,217, Cl. 514-252.000.

Hirose, Noboru, to Brother Kogyo Kabushiki Kaisha. Automatic tool changer in machine tool. 4,835,838, Cl. 29-568.000.

Hirose, Toshifumi; Yukimoto, Sadao; and Isayama, Katsuhiko, to Kanegafuchi Chemical Industry Co., Ltd. Curable polymer composition comprising organic polymer having silicon-containg reactive group. 4,837,401, Cl. 525-364.000.

Hirota, Mitsuhiko: *See*—
Fujioka, Yoshiki; and Hirota, Mitsuhiko, 4,837,491, Cl. 318-625.000.

Hirota, Shinichiro; Sugawara, Kishio; and Fujimoto, Tadayuki, to Hoya Corporation. Apparatus for molding glass articles. 4,836,838, Cl. 65-308.000.

Hirota, Shinichiro; and Sugawara, Kishio, to Hoya Corporation. Press-molding device for lenses. 4,836,840, Cl. 65-323.000.

Hirsbrunner, Hans G.: *See*—
Cobb, Carleton M., III; Hirsbrunner, Hans G.; Gonsalves, Edward M.; Jenne, Richard L.; and Nott, Sepideh H., 4,837,545, Cl. 337-66.000.

Hirschberg, Eugene H.: *See*—
Bertolacini, Ralph J.; Hirschberg, Eugene H.; and Modica, Frank S., 4,836,993, Cl. 423-244.000.

Hirschberg, Jakub, to Siemens Aktiengesellschaft. Method for electrically connecting conductors & electrodes in an implantable electrode lead. 4,835,853, Cl. 29-854.000.

Hirth, Gregory; and Branson, Terry L., to Dataproducts Corporation. Semi-automatic loading paper feed tractor. 4,836,431, Cl. 226-74.000.

Hirth, Michael: *See*—
Eliasson, Baldur; Erni, Peter; Hirth, Michael; and Kogelschatz, Ulrich, 4,837,484, Cl. 313-634.000.

Hirvi, Jorma, to AB Fas Lasfabrik. Lever tumbler lock. 4,836,000, Cl. 70-352.000.

Hisada, Katsutoshi, to Canon Kabushik Kaisha. Apparatus for decoding image codes obtained by compression process. 4,837,634, Cl. 358-261.100.

Hisatake, Yuzo: *See*—
Aizawa, Masanobu; Yamauchi, Shigekazu; and Hisatake, Yuzo, 4,837,058, Cl. 428-1.000.

Hishinuma, Kazuhiro: *See*—
Shiraishi, Hisashi; Kimura, Tsutomu; and Hishinuma, Kazuhiro, 4,837,733, Cl. 364-413.130.

Hiss, Herbert: *See*—
Tuns, Heinz J.; and Hiss, Herbert, 4,836,384, Cl. 206-621.300.

Hitachi Chemical Co., Ltd.: *See*—
Takahashi, Hiroshi; Morozumi, Naohiro; Takanezawa, Shin; and Nakao, Kiyoshi, 4,837,086, Cl. 428-506.000.

Hitachi Koki Company, Ltd.: *See*—
Sakamoto, Junshin; Suzuki, Shun; and Tsushima, Akinori, 4,836,349, Cl. 192-56.00R.

Hitachi, Ltd.: *See*—
Amano, Matsuo; Shida, Masami; Sakamoto, Masahide; Hirayama, Takeshi; and Sasayama, Takao, 4,837,698, Cl. 364-431.070.
Fujino, Yasunori; Sugiura, Noboru; and Kobayashi, Ryoichi, 4,836,176, Cl. 123-640.000.
Gunji, Yasuhiro; Okada, Sadayuki; Isogai, Masato; Kondo, Katsumi; Ibamoto, Masahiko; Kuwabara, Kazuhiro; and Kanke, Atsushi, 4,836,657, Cl. 350-350.00S.
Ichikawa, Yoshiaki; Senoh, Makoto; Suzuki, Masanori; Kamimura, Hiroshi; Tomizawa, Fumio; Sugiyama, Sakae; and Sasaki, Masayoshi, 4,837,734, Cl. 364-513.000.
Ishikawa, Hideaki; and Hasegawa, Taiji, 4,836,169, Cl. 123-480.000.
Kawahata, Sigeyuki; and Sugawara, Yoshitaka, 4,837,458, Cl. 307-279.000.
Mizuhara, Noboru; Hoshi, Tohru; Kashio, Jiro; and Morita, Takashi, 4,837,816, Cl. 379-221.000.
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Sato, Toshihiro; Toyooka, Takashi; Kodama, Naoki; Takeuchi, Teruaki; Takeshita, Masatoshi; and Suzuki, Ryo, 4,837,741, Cl. 365-12.000.
Takenaka, Takaji; Watanabe, Hideki; and Kobayashi, Fumiyuki, 4,836,434, Cl. 228-179.000.
Wachi, Isao; Mori, Kinji; Suzuki, Yasuo; Orimo, Masayuki; Kawano, Katsumi; Koizumi, Minoru; Nakai, Kozo; and Kasashima, Hirokazu, 4,837,762, Cl. 370-89.000.
Watanabe, Ryuji; Andoh, Hisashi; Iwashita, Kiyoji; and Shimizu, Kinko, 4,836,978, Cl. 419-10.000.
Watanabe, Takao; Kitukawa, Goro; Hori, Ryoichi; Itoh, Kiyoo; Kawajiri, Yoshiki; and Kawahara, Takayuki, 4,837,462, Cl. 307-446.000.
Zushi, Shizuo; Miyamoto, Mitsuo; Gou, Hiroshi; Kobayashi, Fumiyuki; and Ogata, Tetsuo, 4,837,663, Cl. 361-384.000.

Hitachi Metals, Ltd.: *See*—
Tokunaga, Masaaki; Uchida, Kimio; and Hiraki, Akitoshi, 4,837,109, Cl. 420-83.000.

Hobson, J. Allan; Mamelak, Adam; Helfand, Rita; and Lavie, Peretz, to President & Fellows of Harvard College. Electronic sleep monitor headgear. 4,836,219, Cl. 128-782.000.

Hochgatterer, Franz: *See*—
Weber, Alfred; Aglas, Johann; and Hochgatterer, Franz, 4,836,510, Cl. 266-142.000.

Hoechst AG: *See*—
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Sattelmeyer, Richard, 4,837,266, Cl. 524-511.000

Hoechst Aktiengesellschaft: *See*—
Kuhlmann, Ludwig; and Putter, Dietrich, 4,837,110, Cl. 423-2.000.
Hoechst Celanese Corporation: *See*—
Wu, Chengjiu; Mooring, Anne M.; McFarland, Michael J.; Osuch, Christopher E.; and Yardley, James T., 4,837,124, Cl. 430-270.000.
Hoechst-Roussel Pharmaceuticals, Inc.: *See*—
Ong, Helen H.; Anderson, Vernon E.; and Profitt, James A., 4,837,227, Cl. 514-450.000.
Hoek, Arend: *See*—
van de Griend, Jacob A.; Hoek, Arend; and Huizinga, Tom, 4,836,910, Cl. 208-120.000.
Hoekstra, Jan-Pieter: *See*—
Factor, Bradford J.; Hoekstra, Jan-Pieter; and Pennington, Keith S., 4,836,105, Cl. 101-453.000.
Hoffend, Thomas R.: *See*—
Manca, Richard D.; Hoffend, Thomas R.; and Jugle, Don B., 4,837,105, Cl. 430-126.000.
Hoffman, Charles R.: *See*—
Bukowski, Eugene R.; and Hoffman, Charles R., 4,837,459, Cl. 307-296.800.
Hoffman-La Roche Inc.: *See*—
Tam, Steve; Weigele, Manfred; Broger, Samuel; and Mitsuya, Hiroaki, 4,837,311, Cl. 536-22.000.
Hoffmann, Armin: *See*—
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Hoffmann, Dennis, Sr., to PRO Patch Systems, Inc. Flexible corner bead strip. 4,835,925, Cl. 52-288.000.
Hofheins, Leonard L.: *See*—
Crosley, Thomas W.; Davison, Wayne Goldberg, James R.; Hofheins, Leonard L.; Lichty, Ronald D.; Vollum, Charles A.; Vollum, Stephen H.; and Yee, Victor H., 4,837,822, Cl. 380-23.000.
Hofmann, Norbert: *See*—
Welschof, Hans-Heinrich; Beier, Rudolf; and Hofmann, Norbert, 4,835,829, Cl. 29-159.300.
Hofstatter, Peter: *See*—
Frantl, Erich; and Hofstatter, Peter, 4,836,967, Cl. 264-69.000.
Hogue, John H. Method for reinforcing the neck of a violin. 4,836,077, Cl. 84-293.000.
Hohlein, Peter: *See*—
Wamprecht, Christian; Schonfelder, Manfred; Hohlein, Peter; and Kahl, Lothar, 4,837,273, Cl. 525-66.000.
Holdeman, David A.: *See*—
Reed, Robert L.; and Holdeman, David A., 4,836,999, Cl. 423-574.00R.
Holder, Anthony A.; and Freeman, Robert R., to Burroughs Wellcome Co. Protozoal antigen. 4,837,016, Cl. 424-88.000.
Holl, Wolfgang; Weilandt, Gerhard; and Thiem, Heinz, to Gebruder Bauermeister & Co.; and Verfahrenstechnik GmbH & Co. Apparatus for feeding rolling mills, particularly for oil seed. 4,836,459, Cl. 241-225.000.
Holland, Orin W.: *See*—
Alvis, John R.; Pfiester, James R.; and Holland, Orin W., 4,837,173, Cl. 437-024.000.
Holland, Robert C. Executive desk convertible into a computer center. 4,836,623, Cl. 312-195.000.
Hollandse Signaalapparaten B.V.: *See*—
Ham, Wilhelmus J.; and Nagelhout, Jacob T., 4,837,823, Cl. 380-34.000.
Holmes, Gerald E.; and Pace, Jerry E., to Century Wrecker Corporation. Wheel lift tow assembly. 4,836,737, Cl. 414-563.000.
Holmes, Tom: *See*—
Corner, Michael R.; Griffiths, Phillip N.; Holmes, Tom; and Kemp, Ian, 4,836,260, Cl. 152-375.000.
Holstein und Kappert Aktiengesellschaft: *See*—
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Holt, Arthur W. Character and pattern recognition machine and method. 4,837,842, Cl. 382-26.000.
Holt, Neil L.: *See*—
Anderson, Milo D.; Holt, Neil L.; Larrson, Peter L.; and Richardson, Anthony R. W., 4,836,558, Cl. 77-1.000.
Holtje, Dagmar: *See*—
Thielke, Dietrich; Holtje, Dagmar; and Nadler, Guy, 4,837,240, Cl. 514-294.000.
Holzaepfel, Guenter: *See*—
Rickert, Hans; Mueller, Peter; and Holzaepfel, Guenter, 4,836,992, Cl. 423-242.000.
Holzer, Walter. Tennis racquet frame. 4,836,543, Cl. 273-73.00C.
Homac Mfg. Company: *See*—
Klosin, John J., 4,837,409, Cl. 174-88.00R.
Homer, John C., to General Signal Corporation. System for removing liquid from slurries of liquid and particulate material. 4,836,934, Cl. 210-771.000.
Homer, John C., to General Signal Corporation. System for removing liquid from a slurry of liquid and powdered material. 4,836,937, Cl. 210-808.000.
Homma, Michihide: *See*—
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Enokimoto, Akito; Hosoya, Eiji; Kasa, Keiji; Handa, Akio; Ishiwatari, Makoto; and Mizumoto, Kousei, 4,836,325, Cl. 180-333.000.
Inagaki, Takashi; Okazaki, Kouji; and Ikeda, Tsugio, 4,836,156, Cl. 123-90.310.
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Honda, Yoshitaka: *See*—
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Honeyager, Kevin S.: *See*—
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Honeywell Inc.: *See*—
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Gawronski, Michael J.; Palmquist, Steven L.; Lamberg, John R.; and Hart, Rebecca A., 4,837,529, Cl. 333-33.000.
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Levine, Matthew; Cairo, Anthony; Russo, James; Rigotti, Victor; and Clark, Roger, 4,837,731, Cl. 364-145.000.
Honeywell Information Systems Inc.: *See*—
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Honjo, Kazuhiko, to NEC Corporation. Monolithic microwave integrated circuit device using high temperature superconductive material. 4,837,536, Cl. 333-247.000.
Hopeman Brothers, Inc.: *See*—
Chandler, Rupert P., Jr.; McDavid, Fred R.; Lough, Jimmie D.; and Dove, Gary E., 4,835,983, Cl. 62-259.100.
Hopkins, Bob C.: *See*—
Wester, Randy J.; Hopkins, Bob C.; and Underwood, Don C., 4,836,579, Cl. 285-3.000.
Hopkins, David L., to Lubrizol Corporation, The. Asphalt additive compositions. 4,836,857, Cl. 106-284.400.
Hora, Peter: *See*—
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Watanabe, Takao; Kitukawa, Goro; Hori, Ryoichi; Itoh, Kiyoo; Kawajiri, Yoshiki; and Kawahara, Takayuki, 4,837,462, Cl. 307-446.000.
Horie, Shinji, to Mitsubishi Petrochemical Company Limited. Colored resin composition. 4,837,138, Cl. 430-106.000.
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Immendorfer, Manfred; Kopp, Dieter; and Hormann, Thomas, 4,837,808, Cl. 379-96.000.
Horsky, Anton; Kuhn, Siegfried; and Voss, Wolf-Dietrich, to Boehringer Werkzeugmaschinen GmbH. Adjustable tool-holder in machine-tools for slot milling. 4,836,725, Cl. 409-201.000.
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Hoshin Kagaku Sangyosho Co., Ltd.: *See*—
Koji, Masashi, 4,836,140, Cl. 118-722.000.
Hoshizaki, Thomas B.; Hall, Kenneth; and Bourque, Rene, to Warrington, Inc. Skate boot. 4,835,885, Cl. 36-115.000.
Hosiden Electronics Co., Ltd.: *See*—
Yoshino, Katsumi; and Shigeno, Yasuhiro, 4,836,653, Cl. 350-341.000.
Hosoi, Masayuki: *See*—
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Enokimoto, Akito; Hosoya, Eiji; Kasa, Keiji; Handa, Akio; Ishiwatari, Makoto; and Mizumoto, Kousei, 4,836,325, Cl. 180-333.000.
Hostetler, Karl Y.: *See*—
Deftos, Leonard J.; and Hostetler, Karl Y., 4,837,380, Cl. 424-450.000.
Hotta, Hajime; and Akasaka, Michiyo, to Kao Corporation. Long wave UV ray absorber. 4,837,010, Cl. 424-59.000.
Hotz, Stephan, to Aktiengesellschaft Kuehnle, Kopp & Kausch. Adjusting device for a compressor. 4,836,747, Cl. 415-163.000.
Hourmouziadis, Jean, to MTU Muenchen. Turbo-engine with transonically traversed stages. 4,836,745, Cl. 415-119.000.
House, John E.: *See*—
Hahn, Joseph A.; and House, John E., 4,836,921, Cl. 210-202.000.
Howard, Glen E.: *See*—
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Howmet Corporation: *See*—
Frank, Gregory R.; Canfield, Kenneth A.; and Wright, Thomas R., 4,837,187, Cl. 501-127.000.
Hoya Corporation: *See*—
Hirota, Shinichiro; Sugawara, Kishio; and Fujimoto, Tadayuki, 4,836,838, Cl. 65-308.000.
Hirota, Shinichiro; and Sugawara, Kishio, 4,836,840, Cl. 65-323.000.
Hoyer, Bryan; and Richardson, John, to Morpheus Lights, Inc. Modular stage light system. 4,837,665, Cl. 362-96.000.
Hsieh, Wen-Ching, to Union Oil Company of California. Enhanced oil recovery method employing an aqueous polymer. 4,836,282, Cl. 166-273.000.

Hsu, Te-Chuan: *See*—
Chiu, Edison H.; Tai, Jy-Der; and Hsu, Te-Chuan, 4,837,743, Cl. 371-51.000.
Huang, Shyh-Chin; and Gigliotti, Michael F. X., Jr., to General Electric Company. Silicon-modified titanium aluminum alloys and method of preparation. 4,836,983, Cl. 420-418.000.
Huang, Yun-Yang: *See*—
Absil, Robert P. L.; and Huang, Yun-Yang, 4,837,397, Cl. 502-66.000.
Herbst, Joseph A.; and Huang, Yun-Yang, 4,837,396, Cl. 502-67.000.
Hubbard, David W., to Pitney Bowes Inc. Oscillating and locking apparatus and method for vibrating tray weighing scale. 4,836,311, Cl. 177-145.000.
Hubbard, David W., to Pitney Bowes Inc. Oscillating and locking apparatus and method for vibrating tray weighing scale. 4,836,312, Cl. 177-210.0FP.
Hubbard, David W., to Pitney Bowes Inc. Oscillating and locking apparatus and method for vibrating tray weighing scale. 4,836,313, Cl. 177-210.0FP.
Huber, Hans-Georg. Device for removing waste material screened or filtered out of liquid flowing throgh a channel. 4,836,919, Cl. 210-158.000.
Huber, Kenneth M.: *See*—
Cohen, Roberta S.; Huber, Kenneth M.; and Mills, Deborah J., 4,837,798, Cl. 379-88.000.
Huels Aktiengesellschaft: *See*—
Kraemer, Horst; Rohmer, Hartmut; and Stawowy, Johannes, 4,837,270, Cl. 525-27.000.
Meyer, Klaus-Rudolf; Venn, Ingo; and Mueller-Niescher, Ursula, 4,837,297, Cl. 528-326.000.
Huffman, Paul F.; and Bardell, Ron L., to Onan Corporation. Engine governor friction damper and method. 4,836,167, Cl. 123-376.000.
Hughes Aircraft Company: *See*—
Breeze, Glenn S.; and Baird, Robert M., 4,837,480, Cl. 313-346.0DC.
Farb, Joseph E.; and Chin, Maw R., 4,837,051, Cl. 427-97.000.
Klayman, Arnold I., 4,836,329, Cl. 181-155.000.
Ledebuhr, Arno G.; and Sprothbery, Donald E., 4,836,649, Cl. 350-331.00R.
Owechko, Yuri, 4,837,843, Cl. 382-31.000.
Rosman, Andrew, 4,837,676, Cl. 364-200.000.
Smay, John W.; Hummel, William F., Jr.; Chen, Carl L.; and Slafer, Loren I., 4,837,699, Cl. 364-434.000.
Hughes, Ian: *See*—
Markwell, Roger E.; Hughes, Ian; and Ward, Robert W., 4,837,238, Cl. 514-212.000.
Hughes, Martin L.: *See*—
Heron, Roger A.; Hughes, Martin L.; and Hansford, Ian, 4,836,498, Cl. 251-126.000.
Hugo, Donald G., to Rainbow Lifegard Products, Inc. Wheeled pool vacuum head with vacuum enhancing seal. 4,835,810, Cl. 15-1.700.
Hui, Sai H.: *See*—
Floyd, William C.; and Hui, Sai H., 4,837,087, Cl. 428-511.000.
Huignard, Jean Pierre; and Meyzonnette, Jean Louis, to Thomson-CSF. Device to control a light beam in a wide angle field and application to a sensing device. 4,836,629, Cl. 350-3.730.
Huizinga, Tom: *See*—
van de Griend, Jacob A.; Hoek, Arend; and Huizinga, Tom, 4,836,910, Cl. 208-120.000.
Hulett, Vanessa: *See*—
Baker, Donald B.; and Hulett, Vanessa, 4,837,035, Cl. 426-43.000.
Baker, Donald B.; and Hulett, Vanessa, 4,837,036, Cl. 426-43.000.
Humen, Michael W.; and Hernandez, Augusto, to Cooper Power Systems, Inc. Transformer core and coil support assembly. 4,837,543, Cl. 336-92.000.
Hummel, William F., Jr.: *See*—
Smay, John W.; Hummel, William F., Jr.; Chen, Carl L.; and Slafer, Loren I., 4,837,699, Cl. 364-434.000.
Humphrey, Brian, to Basic Packaging Systems, Inc. Bag filling machine. 4,835,948, Cl. 53-567.000.
Hund, Andreas: *See*—
Leiter, Herbert; Koch, Herbert; Hund, Andreas; and Reinheimer, Guenter, 4,837,595, Cl. 354-412.000.
Hundertmark, James M., to Brunswick Corporation. Valve control for back draft carburetor. 4,836,506, Cl. 261-23.200.
Hunkapiller, Michael W., to Applied Biosystems, Inc. Quantitation of chromatographic information. 4,837,726, Cl. 364-498.000.
Hunt, Toby C.: *See*—
Andrews, Anthony J.; Hunt, Toby C.; and Newsham, John, 4,836,327, Cl. 181-152.000.
Hunter Douglas Inc.: *See*—
Anderson, Richard N., 4,836,345, Cl. 192-20.000.
Hunter Douglas International N.V.: *See*—
Schimmel, Petrus J. C.; and Spikker, Gerhardus J., 4,835,848, Cl. 29-24.500.
Hunter, Edwin J. Sprinkler unit with stream deflector. 4,836,449, Cl. 239-232.000.
Hunter, Edwin J. Sprinkler unit with alternating stream interruptor. 4,836,450, Cl. 239-232.000.
Hunter, Robert L.; and Duncan, Alexander, to Emory University. An improved method of treating sickle cell anemia. 4,837,014, Cl. 424-78.000.
Hurrell, Ronald A., to Perkin-Elmer Corporation, The. Ionization detectors for gas chromatography. 4,837,441, Cl. 250-382.000.
Hurst, Ralph: *See*—
Curwen, Peter W.; and Hurst, Ralph, 4,836,757, Cl. 417-416.000.
Husky Injection Molding System, Ltd.: *See*—
Schad, Robert D.; and Pocock, John, 4,836,767, Cl. 425-552.000.
Husler, Rinaldo: *See*—
Rutsch, Werner; and Husler, Rinaldo, 4,837,350, Cl. 558-52.000.
Hussamy, Samir, to Burlington Industries, Inc. Continuous thermosol dyeing of high-modulus, high-tenacity, low-shrinkage polyamide fabrics with acid dyes. 4,836,828, Cl. 8-594.000.
Hutchings, Thomas J.: *See*—
Jabr, Salim N.; Hutchings, Thomas J.; and Koumvakalis, Nicholas, 4,837,774, Cl. 372-94.000.
Hutchins, Merlyn L.: *See*—
Vandemotter, Patrick J.; Hutchins, Merlyn L.; Canale, Jon S.; and Koyan, Kenneth R., 4,837,552, Cl. 340-461.000.
Hutchins, Walter J.; and Cooper, Randall K., to Stanley Works, The Fitted tool case. 4,836,374, Cl. 206-373.000.
Hutchinson, Thomas E., to Center for Innovative Technology. Eye movement detector. 4,836,670, Cl. 351-210.000.
Huttierer, Jeffrey. Medication for Alzheimer's disease. 4,837,219, Cl. 514-400.000.
Hutton/PRC Technology Partners I: *See*—
Lemay, Richard A.; Woods, William E.; and Tague, Steven A., 4,837,738, Cl. 364-900.000.
Hwang, Bor-Yuan: *See*—
Zdebel, Peter J.; Balda, Raymond J.; Hwang, Bor-Yuan; and Wagner, Allen J., 4,837,176, Cl. 437-31.000.
Hyner, Jacob; and Gradowski, Steven, to Whyco Chromium Company, Inc. Corrosion resistant coating for fasteners. 4,837,090, Cl. 428-626.000.
Hyodo, Yoshihiko: *See*—
Chujo, Yoshiki; Inoue, Tokuta; Konomi, Toshiaki; and Hyodo, Yoshihiko, 4,836,174, Cl. 123-571.000.
Hypres, Inc.: *See*—
Faris, Sadeg M., 4,837,604, Cl. 357-5.000.
Ibamoto, Masahiko: *See*—
Gunji, Yasuhiro; Okada, Sadayuki; Isogai, Masato; Kondo, Katsumi; Ibamoto, Masahiko; Kuwabara, Kazuhiro; and Kanke, Atsushi, 4,836,657, Cl. 350-350.00S.
Ibrahim, Abdo K.: *See*—
Zimmerman, George O.; and Ibrahim, Abdo K., 4,837,377, Cl. 423-448.000.
Ichijima, Seiji; Shimada, Yasuhiro; and Arakawa, Jun, to Fuji Photo Film Co., Ltd. Silver halide photographic materials comprising non-diffusible photographically useful compounds. 4,837,136, Cl. 430-543.000.
Ichikawa, Hitoshi: *See*—
Motoyama, Kazuyasu; Yanagida, Tsuneo; Sakai, Mitsugu, Ichikawa, Hitoshi; and Yoshizawa, Akihiko, 4,837,758, Cl. 369-13.000.
Ichikawa, Yoshiaki; Senoh, Makoto; Suzuki, Masanori; Kamimura, Hiroshi; Tomizawa, Fumio; Sugiyama, Sakae; and Sasaki, Masayoshi, to Hitachi, Ltd. Method and apparatus for master-slave manipulation supplemented by automatic control based on level of operator skill. 4,837,734, Cl. 364-513.000.
Ichikawa, Yukio; Kaneko, Takashi; Satake, Yoshikatsu; and Katto, Takayuki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Polyarylene thioether composition containing polyarylene ether nucleating agent 4,837,294, Cl. 528-388.000.
Ichishita, Faith S.: *See*—
Daubenspeck, Timothy H.; and Ichishita, Faith S., 4,836,887, Cl 156-643.000.
ICI Americas Inc.: *See*—
Bernstein, Peter R.; Brown, Frederick J.; Matassa, Victor G.; and Yee, Ying K., 4,837,235, Cl. 514-234.500.
ICI Australia Limited: *See*—
Watson, Keith G., 4,837,355, Cl. 560-061.000.
Ide, Naoaki: *See*—
Kasai, Toshihiro; and Ide, Naoaki, 4,837,600, Cl. 355-208.000.
Idigkeit, Werner: *See*—
Franz, Rainer; Idigkeit, Werner; Loschmann, Hartmut; Rohner, Gerhard; and Kurr, Klaus, 4,836,515, Cl. 267-219.000.
Ido, Tadashi: *See*—
Yokoyama, Hirotaka; Ido, Tadashi; Maeda, Tatsumi; and Kurisu, Shunji, 4,837,092, Cl. 428-694.000.
Igarashi, Reiko; Watanabe, Yoshihiko; and Hirata, Sadao, to Toyo Seikan Kaisha, Ltd. Thermoplastic polyester composition having improved flavor-retaining property and vessel formed therefrom. 4,837,115, Cl. 428-36.920.
IGT: *See*—
Barrie, Robert P.; and Bengtson, Jon, 4,837,728, Cl. 364-412.000.
Iguchi, Seiya: *See*—
Ogawa, Shinji; Iguchi, Seiya; Kimura, Hiroshi; and Ohmori, Yoh, 4,837,371, Cl. 548-497.000.
Igusa, Kazuo: *See*—
Nemoto, Kaoru; Igusa, Kazuo; and Ogasawara, Toshichika, 4,836,957, Cl. 260-397.200.
Iijima, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Drawing processing apparatus. 4,837,706, Cl. 364-518.000.
Iimori, Takeru: *See*—
Matsuo, Itaru; Takahashi, Yuzo; Hashimoto, Hideo; Takatsuka, Toru; Iimori, Takeru; Maekawa, Hitoshi; Ito, Tamotsu; Shohji, Yoshihiko; Watari, Ryuzo; and Aida, Hiroshi, 4,836,909, Cl. 208-72.000.
Iino, Tadashi, to Yazaki Corporation. Display apparatus for automotive vehicle. 4,837,551, Cl. 340-705.000.

Iizima, Yoichi: *See—*
Kataoka, Sachiro; Iizima, Yoichi; Kuwahara, Masaji; Takeoka, Seiei; and Katsutani, Kazuzi, 4,836,323 Cl. 180-270.000.

Ikeda Bussan Co., Ltd.: *See—*
Izumida, Satoshi, 4,836,597, Cl. 296-63.000.
Sugiyama, Hiroshi, 4,836,608, Cl. 297-36[illegible].000.

Ikeda, Haruhiko; Higuchi, Masahiro; and Onikura, Hirokazu, to Mitsubishi Paper Mills, Ltd. Heat-sensitive recording material. 4,837,197, Cl. 503-209.000.

Ikeda, Hayato; Kitahama, Satoshi; and Onomura, Hiroshi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Turbulence generating device adjacent the inlet end of each discharge port of a multi-cylinder piston-type compressor for providing internal pulsation and noise suppression. 4,836,754, Cl. 417-269.000.

Ikeda, Tadashi; and Ogawa, Tadashi, to Fuji Photo Film Co., Ltd. Color image-forming high silver chloride color photographic material having improved spectral sensitivity and silver removability for use therewith. 4,837,140, Cl. 430-550.000.

Ikeda, Tsugio: *See—*
Inagaki, Takashi; Okazaki, Kouji; and Ikeda, Tsugio, 4,836,156, Cl. 123-90.310.

Ikeda, Yoshiaki: *See—*
Okada, Hiroo; Ikeda, Yoshiaki; and Ohshima, Ken, 4,837,757, Cl. 369-44.000.

Ikeda, Yuto: *See—*
Dosaka, Katsumi; Kumanoya, Masaki; Miyatake, Hideshi; Hidaka, Hideto; Konishi, Yasuhiro; Yamasaki, Hiroyuki; Ikeda, Yuto; Tsukamoto, Kazuhiro; and Shimoda, Masaki, 4,837,747, Cl. 371-10.000.

Ikegami Tsushinki Co., Ltd.: *See—*
Kosaka, Kenji; and Yasu, Yoshikazu, 4,836,529, Cl. 271-296.000.

Ikemori, Keiji, to Canon Kabushiki Kaisha. Optical system of variable magnification power. 4,836,661, Cl. 350-423.000.

Ikoma, Munehisa; Kawano, Hiroshi; Matsumoto, Isao; and Yanagihara, Nobuyuki, to Matsushita Electric Industrial Co., Ltd. Sealed storage battery and method for making its electrode. 4,837,119, Cl. 429-206.000.

Ilvento, Robert. Ice accommodating sleeve apparatus for cooling kegs. 4,835,985, Cl. 62-372.000.

Imagawa, Tadao: *See—*
Ishikawa, Shun-ichi; Imagawa, Tadao; Maeda, Minoru; and Shinozaki, Fumiaki, 4,837,106, Cl. 430-138.000.

Imakawa, Susumu; and Takeyama, Yoshinobu, to Ricoh Company, Ltd. Synchronizing signal generating system for laser scanner. 4,837,588, Cl. 346-108.000.

Immendorfer, Manfred; Kopp, Dieter; and Hormann, Thomas, to Alcatel N.V. Circuit connecting a voice-controlled device to a telephone station and line. 4,837,808, Cl. 379-96.000.

Imoto, Yuzo: *See—*
Wakata, Hideo; Takei, Toshihiro; Hattori, Yoshiyuki; Uno, Haruhiko; and Imoto, Yuzo, 4,836,61[illegible], Cl. 303-103.000.

Imperial Chemical Industries PLC: *See—*
Casci, John L.; Lowe, Barrie M.; and Lowe, Thomas V., 4,836,996, Cl. 423-328.000.
Hayden, Percy, 4,837,194, Cl. 502-348.000.

Ina, Hiroji: *See—*
Shibata, Toshiko; Ina, Hiroji; and Ina, Kazuo, 4,836,987, Cl. 422-101.000.

Ina, Kazuo: *See—*
Shibata, Toshiko; Ina, Hiroji; and Ina, Kazuo, 4,836,987, Cl. 422-101.000.

Ina, Toshikazu: *See—*
Tashiro, Syuzaburou; Ina, Toshikazu; and Kawai, Hisasi, 4,837,727, Cl. 364-551.010.

Inaba, Yutaka: *See—*
Mouri, Akihiro; Toyono, Tsutomu; Kaneko, Shuzo; Inaba, Yutaka; and Kanbe, Junichiro, 4,836,656, Cl. 350-350.00S

Inagaki, Takashi; Okazaki, Kouji; and Ikeda, Tsugio, to Honda Giken Kogyo Kabushiki Kaisha. Timing transmission device for an internal combustion engine. 4,836,156, Cl. 123-90.310.

Inco Limited: *See—*
Bell, James A. E.; Eerkes, Thijs; Diaz Carlos M.; and Mankins, William L., 4,836,979, Cl. 419-23.000

Inductotherm Corp.: *See—*
Cignetti, Nicolas P.; Mortimer, John H and Swaney, Richard U., 4,836,273, Cl. 164-471.000.

Inductran Corporation: *See—*
Bolger, John G., 4,836,344, Cl. 191-10[illegible].00.

Industrial Research Products, Inc.: *See—*
Madaffari, Peter L., 4,837,833, Cl. 381-[illegible]9.000.

Industrial Technology Research Institute: *See—*
Chao, Fung-Ching, 4,837,180, Cl. 437-[illegible]4.000.

Industrie Secco S.p.A.: *See—*
Secco, Renzo, 4,835,904, Cl. 49-7.000.

Infantino, Robert: *See—*
Bianchini, William L.; Infantino, Robert; and Musarra, Vicent, 4,835,884, Cl. 36-24.500.

Infeld, Andrew L. Carton-opening tool. 4,835,860, Cl. 30-2.000.

Ing. C. Olivetti & Co., S.p.A.: *See—*
Knirsch, Franco; Soudaz, Anna M.; and Genova, Alessandro, 4,836,852, Cl. 106-22.000.

Ingalls, William E., to O'Rourke, Thomas W., a part interest. Asssembly for adjusting wheel alignment, and method. 4,836,574, Cl. 280-661.000.

Ingemann, Ole, to PLM AB. Container for liquids and method for filling and sealing the container. 4,836,401, Cl. 220-83.000.

Ingersoll-Rand Company: *See—*
Barrows, Robert E., 4,836,306, Cl. 175-321.000.
Munoz, Jose P., 4,836,455, Cl. 239-590.300.

Ingram, Gary D.: *See—*
Stone, Patrick C.; Luke, Mike A.; and Ingram, Gary D., 4,836,278, Cl. 166-115.000.

Inland Steel Company: *See—*
Nickola, Richard A., 4,837,091, Cl. 428-653.000.

Inomata, Yoshihisa: *See—*
Shimuzu, Isoo; Matsumura, Yasuo; and Inomata, Yoshihisa, 4,836,966, Cl. 264-63.000.

Inoue, Akira; Ushio, Masaru; Morita, Toru; Oishi, Yasuyuki; and Sakoda, Hisao, to Nippon Oil Co., Ltd. Method for removing iron content in petroleum series mineral oil therefrom. 4,836,914, Cl. 208-251.00H.

Inoue, Keizo: *See—*
Miyazaki, Kenichi; Nakamura, Katsumi; Hagiwara, Taro; and Inoue, Keizo, 4,836,600, Cl. 296-197.000.

Inoue, Mitsuo: *See—*
Wakata, Hitoshi; Inoue, Mitsuo; Sato, Yukio; Haruta, Kenyu; and Nagai, Haruhiko, 4,837,773, Cl. 372-86.000.

Inoue, Senya; and Ono, Akira, to Kanto Kagaku Kabushiki Kaisha. Calcium-phosphorus-apatite having novel properties and process for preparing the same. 4,836,994, Cl. 423-308.000.

Inoue, Tokuta: *See—*
Chujo, Yoshiki; Inoue, Tokuta; Konomi, Toshiaki; and Hyodo, Yoshihiko, 4,836,174, Cl. 123-571.000.

Inoue, Yoichi: *See—*
Kasano, Akira; and Inoue, Yoichi, 4,837,616, Cl. 358-107.000.

Insituform International N.V.: *See—*
Wood, Eric, 4,836,715, Cl. 405-150.000.

Institut de Recherches de la Siderurgie Francaise: *See—*
Daverio, Jean-Claude; and Rocchi, Dominique, 4,836,509, Cl. 266-99.000.

Institut Francais du Petrole: *See—*
Boulet, Jean; and Morin, Pierre, 4,836,303, Cl. 175-74.000.
Robin, Michel; and Demay, Claude, 4,836,281, Cl. 166-272.000.
Toulhoat, Herve; and Favre, Anne, 4,837,158, Cl. 436-37.000.

Instruments SA: *See—*
Laude, Jean-Pierre, 4,836,634, Cl. 350-96.190.

Insul Company, Inc.: *See—*
Perri, Joseph A., 4,836,433, Cl. 266-266.000.

Intel Corporation: *See—*
Yau, Leopoldo D.; and Kawamoto, Galen H., 4,837,185, Cl. 437-228.000.

Intellistor, Inc.: *See—*
Schwickrath, Bruce R., 4,836,624, Cl. 312-216.000.

International Business Machine Corporation: *See—*
Mansfield, Robert L.; Spencer, Alexander K.; and St. Clair, Joe C., 4,837,563, Cl. 340-732.000.

International Business Machines Corporation: *See—*
Afzali-Ardakani, Ali; and Pennington, Keith S., 4,836,106, Cl. 101-467.000.
Breiten, Charles P.; Stanasolovich, David; and Theisen, Jacob F., 4,836,885, Cl. 156-643.000.
Bukowski, Eugene R.; and Hoffman, Charles R., 4,837,459, Cl. 307-296.800.
Burrus, Gilbert S., Jr.; Cooper, Ronald J.; Marr, Michael R.; Marsico, Mario A.; Pescatore, John C.; and Sullivan, Paul D., 4,837,677, Cl. 364-200.000.
Crockett, Robert N.; Kern, Robert F.; Miller, Arnold G.; Norris, Richard E.; Pousson, Michael W., Jr.; and Wagner, Robert E., 4,837,680, Cl. 364-200.000.
Cronauer, Thomas D.; and Plunkett, Galen P., 4,837,688, Cl. 364-200.000.
Daubenspeck, Timothy H., 4,836,886, Cl. 156-643.000.
Daubenspeck, Timothy H.; and Ichishita, Faith S., 4,836,887, Cl. 156-643.000.
Factor, Bradford J.; Hoekstra, Jan-Pieter; and Pennington, Keith S., 4,836,105, Cl. 101-453.000.
Kamperman, James S., 4,835,847, Cl. 29-840.000.
Lengefeld, Wendell L., 4,837,704, Cl. 364-478.000.
Napp, Duane T.; and Roche, Kevin J., 4,836,435, Cl. 228-180.200.
Pruett, David R.; Goertzel, Gerald; and Tompson, Gerhard R., 4,837,845, Cl. 382-46.000.

International Paper Company: *See—*
Gordon, Robert L.; and Bernstein, Linda A., 4,836,383, Cl. 206-611.000.
Renard, Jean J.; and Hanson, David M., 4,837,446, Cl. 250-461.100.

Intersteel Technology, Inc.: *See—*
Vallomy, John A., 4,836,732, Cl. 414-188.000.

Intissel: *See—*
Anton, Patrice; and Bergaentzle, Denis, 4,837,077, Cl. 428-240.000.

Inuki, Hisao: *See—*
Takahashi, Kozo; Masuda, Yoshihisa; and Inuki, Hisao, 4,837,582, Cl. 343-719.000.

Inventa Chemicals Limited: *See—*
Wiley, Michael J.; Irving, Stewart; and McKeon, John P., 4,837,453, Cl. 307-10.200.

Inventio AG: *See—*
Schroder, Joris, 4,836,336, Cl. 187-121.000.

Investronica, S.A.: *See—*
Alcantara, Bernardo P.; Diaz-Zorita, Fernando; and Becerra, Rodrigo C., 4,835,872, Cl. 33-18.100.

Irbit Research & Consulting AG: *See—*
Tschudin-Mahrer, Rolf, 4,837,064, Cl. 428-71.000.

Irie, Masahiro, to Mitsubishi Chemical Industries Limited. Optical recording material. 4,837,063, Cl. 428-64.000.

Irving, Edward; and Smith, Terence J., to Ciba-Geigy Corporation. Method of adhering two surfaces with an anaerobically polymerizable acrylic ester composition. 4,836,87[illegible] Cl. 156-307.300.

Irving, Stewart: *See—*
Wiley, Michael J.; Irving, Stewart; and McKeon, John P., 4,837,453, Cl. 307-10.200.

Isaacson, James D.: *See—*
Williams, Theodore F.; Katerberg, James A.; Young, Lawrence R.; and Isaacson, James D., 4,837,585, Cl. 346-75.000.

Isago, Takashi: *See—*
Murata, Katsuyoshi; Nakazora, Toru; and Isago, Takashi, 4,837,366, Cl. 568-490.000.

Isawa, Nobuyuki: *See—*
Kato, Yasaburo; Suzuki, Toshihiko; Isawa, Nobuyuki; Kanbe, Hideo; and Hamasaki, Masaharu, 4,836,788, Cl. 437-017.000.

Isayama, Katsuhiko: *See—*
Hirose, Toshifumi; Yukimoto, Sadao; and Isayama, Katsuhiko, 4,837,401, Cl. 525-364.000.

Isayama, Muneo: *See—*
Miyoshi, Masazumi; Isayama, Muneo; Midorikawa, Shoichi; and Ota, Akitada, 4,836,421, Cl. 222-166.000.

ISE Kaguku Kogyo Kabushiki Gaisha: *See—*
Miyoshi, Masazumi; Isayama, Muneo; Midorikawa, Shoichi; and Ota, Akitada, 4,836,421, Cl. 222-166.000.

Ishibashi, Hiroshi: *See—*
Dan, Shigeyuki; Kato, Eiichi; Ishii, Kazuo; Ishibashi, Hiroshi; and Sera, Hidefumi, 4,837,102, Cl. 430-114.000.

Ishibashi, Toshihiro: *See—*
Okuno, Masaharu; Ishibashi, Toshihiro; Naitou, Satoshi; and Sasaki, Tatsuyoshi, 4,836,183, Cl. 126-110.00R.

Ishibashi, Yasuo: *See—*
Kakimoto, Fumio; Asakawa, Naoki; Ishibashi, Yasuo; and Miyake, Yasuo, 4,837,022, Cl. 424-94.300.

Ishida, Katsuyuki; Torita, Fumio; and Kohsaka, Yoshio, to Kabushiki Kaisha Toshiba. Washing machine. 4,835,994, Cl. 68-174.000.

Ishida, Kimikazu; and Ishida, Tsuneo, to Saboten Co., Ltd. Arrangement for holding oil supply in sharp-edged tools. 4,836,335, Cl. 184-102.000.

Ishida, Toshihiko: *See—*
Tanaka, Kimio; Ishida, Toshihiko; and Shiba, Haruo, 4,837,651, Cl. 360-133.000.

Ishida, Tsuneo: *See—*
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Uchida, Yukimasa, 4,837,460, Cl. 307-296.800.
Urushibata, Yukio, 4,837,844, Cl. 382-44.000.
Yokoyama, Hirotaka; Ido, Tadashi; Maeda, Tatsumi; and Kurisu, Shunji, 4,837,092, Cl. 428-694.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Ikeda, Hayato; Kitahama, Satoshi; and Onomura, Hiroshi, 4,836,754, Cl. 417-269.000.
Narita, Toshihide; and Kadokawa, Yoshio, 4,837,694, Cl. 364-426.010.
Yamaguchi, Yutaka, 4,835,968, Cl. 60-422.000.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Ishiguro, Yasuo; Itou, Yoshizumi; Shiroshita, Osamu; and Nakano, Masaru, 4,836,742. Cl. 414-742.000.
Kadokawa, Yoshio: *See—*
Narita, Toshihide; and Kadokawa, Yoshio, 4,837,694, Cl. 364-426.010.
Kadowaki, Koju; Sarumaru, Kohei; and Shibano, Takeshi, to Mitsubishi Petrochemical Company Ltd. Process for producing acrolein and acrylic acid. 4,837,360, Cl. 562-546.000.
Kadziela, Kris: *See—*
Drain, Kieran F.; and Kadziela, Kris, 4,837,295, Cl. 528-111.000.
Kage, Kouzou, to NEC Corporation. Signal transmission system having encoder/decoder without frame synchronization signal. 4,837,821, Cl. 380-9.000.
Kageyama, Hidehei; Mitsuya, Yoshihide; and Kobayashi, Saburo, to Kotobuki & Co., Ltd. Lead cartridge opening and closing unit. 4,836,703, Cl. 401-65.000.
Kahl, Lothar: *See—*
Wamprecht, Christian; Schonfelder, Manfred; Hohlein, Peter; and Kahl, Lothar, 4,837,273, Cl. 525-66.000.
Kaiser Aerotech: *See—*
Chen, Shih-Huei; and Davis, H. O., 4,837,230, Cl. 501-88.000.
Kakazu, Yukinori; Minami, Noburo; and Nukui, Katsuhiko, to Toshiba Kikai Kabushiki Kaisha. Method for generating tool path. 4,837,703, Cl. 364-474.180.
Kakimoto, Fumio; Asakawa, Naoki; Ishibashi, Yasuo; and Miyake, Yasuo, to Eisai Co., Ltd. Composition containing tissue plasminogen activator. 4,837,022, Cl. 424-94.300.
Kaku, Nobuyuki: *See—*
Nagai, Kyuichiro; Kaku, Nobuyuki, and Ogiro, Kenji, 4,837,646, Cl. 360-85.000.
Kally, Inc.: *See—*
Evans, Richard C.; and Schell, William S., 4,836,428, Cl. 224-253.000.
Kalnitsky, Alexander; Ellul, Joseph P.; and Tay, Sing P., to Northern Telecom Limited. Method and apparatus for removing coating from substrate. 4,836,902, Cl. 204-192.320.
Kambara, Goro: *See—*
Eaton, Homer L.; Selesky, Kenneth G.; and Kambara, Goro, 4,835,855, Cl. 29-863.000.
Kamei Machine Project Co., Ltd.: *See—*
Koizumi, Tetsuro; and Kamei, Masato, 4,836,461, Cl. 242-1.10R.
Kamei, Masato: *See—*
Koizumi, Tetsuro; and Kamei, Masato, 4,836,461, Cl. 242-1.10R.
Kamimae, Hajime: *See—*
Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Kamimae, Hajime, 4,836,511, Cl. 267-64.160.
Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Kamimae, Hajime, 4,836,575, Cl. 280-702.000.
Kamimura, Hiroshi: *See—*
Ichikawa, Yoshiaki; Senoh, Makoto; Suzuki, Masanori; Kamimura, Hiroshi; Tomizawa, Fumio; Sugiyama, Sakae; and Sasaki, Masayoshi, 4,837,734, Cl. 364-513.000.
Kamochi, Atsumi: *See—*
Kume, Toyohiko; Goto, Toshio; Kamochi, Atsumi; Yanagi, Akihiko; Hayakawa, Hidenori; and Yagi, Shigeki, 4,836,844, Cl. 71-90.000.
Kamogawa, Hiromi: *See—*
Ishiguro, Okikazu; Nishimura, Masakatsu; Nozawa, Shigeru; Kamogawa, Hiromi; and Kawano, Shigeyoshi, 4,836,991, Cl. 423-242.000.
Kamoi, Jyoei: *See—*
Hajikano, Kazuo; Shimoe, Toshio; Kamoi, Jyoei; Sawaki, Ippei; and Murakami, Koso, 4,837,855, Cl. 455-600.000.
Kamperman, James S., to International Business Machines Corp. Method and apparatus for mounting a flexible film electronic device carrier on a substrate. 4,835,847, Cl. 29-840.000.
Kanada, Eiji: *See—*
Kondo, Toshiro; Kanada, Eiji; and Nishinoiri, Hiroshi, 4,837,122, Cl. 430-204.000.
Kanauchi, Shushi, to NEC Corporation. Delay circuit. 4,837,466, Cl. 307-605.000.
Kanbe, Hideo: *See—*
Kato, Yasaburo; Suzuki, Toshihiko; Isawa, Nobuyuki; Kanbe, Hideo; and Hamasaki, Masaharu, 4,836.788, Cl. 437-017.000.
Kanbe, Junichiro: *See—*
Mouri, Akihiro; Toyono, Tsutomu; Kaneko, Shuzo; Inaba, Yutaka; and Kanbe, Junichiro, 4,836,656, Cl 350-350.00S.
Kanda, Masahiro: *See—*
Yagi, Kiyoshi; Kanno, Toshiaki; Kanda, Masahiro; and Nomura, Izumi, 4,837,282, Cl. 525-265.000.
Kanebo, Ltd.: *See—*
Tomita, Yoji; Oishi, Eiichi; Miyaji, Hiroshi, Morimoto, Hiroya; Sekigawa, Tetsuo; and Mitsuhashi, Kenichi, 4,836,917, Cl. 210-104.000.
Kaneda, Teruhisa: *See—*
Matsumoto, Mitsuo; and Kaneda, Teruhisa, 4,837,268, Cl. 524-539.000.

Kanegafuchi Chemical Industry, Co., Ltd.: *See—*
Hirose, Toshifumi; Yukimoto, Sadao; and Isayama, Katsuhiko, 4,837,401, Cl. 525-364.000.
Shimazu, Kikuo; Suzuki, Kazuo; Shiraki, Manabu; and Miyao, Osami, 4,836,631, Cl. 350-6.800.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Hatanaka, Minoru, 4,837,343, Cl. 549-291.000.
Kawakubo, Fumio; Yukimoto, Sadao; and Homma, Michihide, 4,837,274, Cl. 525-100.000.
Kaneko, Shuzo: *See—*
Mouri, Akihiro; Toyono, Tsutomu; Kaneko, Shuzo; Inaba, Yutaka; and Kanbe, Junichiro, 4,836,656, Cl. 350-350.00S.
Kaneko, Takashi: *See—*
Ichikawa, Yukio; Kaneko, Takashi; Satake, Yoshikatsu; and Katto, Takayuki, 4,837,294, Cl. 528-388.000.
Kaneko, Yoshihito: *See—*
Akizuki, Ikuo; Kaya, Hiroshi; Okano, Shohei; Otake, Nobuo; Kumagai, Keiji; and Kaneko, Yoshihito, 4,837,193, Cl. 502-242.000.
Kaneko, Yoshinobu: *See—*
Oshima, Yasuji; Araki, Hiroyuki; and Kaneko, Yoshinobu, 4,837,147, Cl. 435-68.000.
Kanke, Atsushi: *See—*
Gunji, Yasuhiro; Okada, Sadayuki; Isogai, Masato; Kondo, Katsumi; Ibamoto, Masahiko; Kuwabara Kazuhiro; and Kanke, Atsushi, 4,836,657, Cl. 350-350.00S.
Kannchen, Werner: *See—*
Schwirtlich, Ingo; Lange, Horst; and Kannchen, Werner, 4,837,376, Cl. 423-348.000.
Kanno, Toshiaki: *See—*
Yagi, Kiyoshi; Kanno, Toshiaki; Kanda, Masahiro; and Nomura, Izumi, 4,837,282, Cl. 525-265.000.
Kanopoulos, Nick: *See—*
Pierce, John L.; and Kanopoulos, Nick, 4,837,447, Cl. 250-492.200.
Kanters, Johannes T.: *See—*
Peters, Joseph H.; and Kanters, Johannes T., 4,837,783, Cl. 375-110.000.
Kanto Kagaku Kabushiki Kaisha: *See—*
Inoue, Senya; and Ono, Akira, 4,836,994, Cl. 423-308.000.
Kanzaki Paper Manufacturing Co., Ltd.: *See—*
Kondo, Hiromasa; Okumura, Yoshitaka; Fukui, Terunobu; Egashira, Noritaka; Iwata, Tamami; and Satake, Naoto, 4,837,200, Cl. 503-227.000.
Kao Corporation: *See—*
Hotta, Hajime; and Akasaka, Michiyo, 4,837,010, Cl. 424-59.000.
Tanaka, Yukitaka; Nakamura, Minoru; Okada, Johshin; and Mansho, Kenji, 4,837,214, Cl. 514-179.000.
Kao, Wei H.; Katzman, Howard A.; and Slater, Eric M., to Aerospace Corporation, The. Diffusion barrier for high temperature composites. 4,837,053, Cl. 427-214.000.
Kaplicky, Jan: *See—*
Cohen, Marc M.; Kaplicky, Jan; and Nelson, David A., 4,836,114, Cl. 108-77.000.
Kapuscinski, Maria M.; Liu, Christopher S.; Jones, Ronald E.; and Grina, Larry D., to Texaco Inc. Anti-oxidant system. 4,836,943, Cl. 252-50.000.
Kar, Naresh J.: *See—*
Keshavan, Madapusi K.; Underwood, Lance D.; Kar, Naresh J.; Oldham, Thomas W.; Roth, Cary A.; and Armstrong, Brian J., 4,836,307, Cl. 175-374.000.
Karacsonyi, Bela: *See—*
Vajda, Gabor; Ravasz, Laszlo; Vajda, Caborne; and Karacsonyi, Bela, 4,837,042, Cl. 426-615.000.
Kardoes, Oliver A.; Kardoes, Richard T.; and Bonestroo, David A., to Kardoes, Oliver A. Waste pit stirrer. 4,836,687, Cl. 366-286.000.
Kardoes, Richard T.: *See—*
Kardoes, Oliver A.; Kardoes, Richard T.; and Bonestroo, David A., 4,836,687, Cl. 366-286.000.
Karl, Veit-Holger; Mahler, Franz; and Greiser, Josef, to Alpine Aktiengesellschaft. Take-away device for tubing foils. 4,836,744, Cl. 425-72.100.
Kartner, Norbert: *See—*
Ling, Victor; and Kartner, Norbert, 4,837,306, Cl. 530-387.000.
Karydas, Athanasios, to Ciba-Geigy Corporation. Fluorinated cationic compounds. 4,836,958, Cl. 260-501.150.
Kasa, Keiji: *See—*
Enokimoto, Akito; Hosoya, Eiji; Kasa, Keiji; Handa, Akio; Ishiwatari, Makoto; and Mizumoto, Kousei, 4,836,325, Cl. 180-333.000.
Kasahara, Kensuke; Itoh, Tomohiro; and Ohata, Keiichi, to NEC Corporation. Indium-phosphide hetero-MIS-gate field effect transistor. 4,837,605, Cl. 357-22.000.
Kasahara, Masahiko; and Narita, Mitsuru, to Fuji Electric Co., Ltd. Multilayer photoconductor for electrophotography. 4,837,099, Cl. 430-58.000.
Kasai, Toshihiro; and Ide, Naoaki, to Kabushiki Kaisha Toshiba. Recording apparatus. 4,837,600, Cl. 355-208.000.
Kasano, Akira; and Inoue, Yoichi, to Kabushiki Kaisha Toshiba. Image processing apparatus suitable for measuring depth of given point with respect to reference point using two stereoscopic images. 4,837,616, Cl. 358-107.000.
Kasano, Akira, to Kabushiki Kaisha Toshiba. Method for realizing high-speed statistic operation processing and image data processing apparatus for embodying the method. 4,837,841, Cl. 382-18.000.
Kasaoka, Katsuyuki: *See—*
Sasaki, Yoshiyuki; and Kasaoka, Katsuyuki, 4,835,956, Cl. 57-245.000.
Kasashima, Hirokazu: *See—*
Wachi, Isao; Mori, Kinji; Suzuki, Yasuo; Orimo, Masayuki; Kawano, Katsumi; Koizumi, Minoru; Nakai, Kozo; and Kasashima, Hirokazu, 4,837,762, Cl. 370-89.000.
Kashimura, Masashi: *See—*
Kuriyama, Katsumi; Hanada, Kazuyuki; Nakamura, Susumu; Misaizu, Iwao; Kashimura, Masashi; and Goto, Tomoko, 4,837,198, Cl. 503-227.000.
Kashio, Jiro: *See—*
Mizuhara, Noboru; Hoshi, Tohru; Kashio, Jiro; and Morita, Takashi, 4,837,816, Cl. 379-221.000.
Kashiwaba, Noriaki: *See—*
Sekine, Yasuo; Hirakawa, Nobuhiro; Kashiwaba, Noriaki; Yamaura, Tetsuaki; Harada, Hisako; Kutsuma, Teruo; Matsumoto, Hajime; Sekine, Akihiro; and Isowa, Yoshikazu, 4,837,316, Cl. 546-214.000.
Kashiwadani, Nobuo; and Ohta, Hitoshi, to Chugai Ro Co., Ltd. Method of sintering an injection-molded article. 4,836,980, Cl. 419-36.000.
Kashiwazaki, Takashi: *See—*
Ando, Hitoshi; Kashiwazaki, Takashi; Hosoi, Masayuki; and Fukushima, Atsuhiko, 4,837,700, Cl. 364-449.000.
Kasik, John P., to Stewart Systems, Inc. Continuous proofing and baking apparatus having magnetic conveyor system. 4,836,360, Cl. 198-803.600.
Kataoka, Norio: *See—*
Tohzuka, Takashi; Ishikawa, Sueyoshi; Kubo, Katsuyoshi; Honda, Yoshitaka; Ohmure, Yukio; and Kataoka, Norio, 4,836,944, Cl. 252-54.000.
Kataoka, Sachiro; Iizima, Yoichi; Kuwahara, Masaji; Takeoka, Seiei; and Katsutani, Kazuzi, to Nissan Motor Co., Ltd.; and Niles Parts Co., Ltd. Vehicular voltage regulating system. 4,836,323, Cl. 180-270.000.
Kataoka, Shigeaki, to Fuji Seiki Machine Works, Ltd. Solder coating apparatus. 4,836,131, Cl. 118-220.000.
Katayama, Ichiro, to Union Tool Co., Ltd. Optical measuring apparatus which employs two synchronously rotating means to measure object. 4,837,432, Cl. 250-235.000.
Katerberg, James A.: *See—*
Williams, Theodore F.; Katerberg, James A.; Young, Lawrence R.; and Isaacson, James D., 4,837,585, Cl. 346-75.000.
Kato, Eiichi: *See—*
Dan, Shigeyuki; Kato, Eiichi; Ishii, Kazuo; Ishibashi, Hiroshi; and Sera, Hidefumi, 4,837,102, Cl. 430-114.000.
Kato, Heizaburo, to Sankyo Manufacturing Co. Pressing machine. 4,836,101, Cl. 100-215.000.
Kato, Hideo; Matsushima, Masaaki; Matsuda, Keiko; and Shibata, Hirofumi, to Canon Kabushiki Kaisha. Mask structure for lithography, method of preparation thereof and lithographic method. 4,837,123, Cl. 430-269.000.
Kato, Kazuyoshi: *See—*
Konishi, Takao; Sugimori, Giichi; Kato, Kazuyoshi; Kimura, Nobutake; and Shibata, Kenji, 4,837,018, Cl. 424-92.000.
Kato, Naoyuki, to Mitsubishi Yuka Badische Co., Ltd. Manufacturing method for an expanded laminated sheet. 4,836,871, Cl. 156-79.000.
Kato, Yasaburo; Suzuki, Toshihiko; Isawa, Nobuyuki; Kanbe, Hideo; and Hamasaki, Masaharu, to Sony Corporation. Production of solid-state image pick-up device with uniform distribution of dopants. 4,836,788, Cl. 437-017.000.
Kato, Yasuyuki; Yuyama, Masahiro; Moritani, Masahiko; and Yasunori, Yukio, to Sumitomo Chemical Company, Limited. Method for the production of polymethacrylates. 4,837,286, Cl. 526-217.000.
Kato, Yoichi: *See—*
Hatori, Yoshinori; Kato, Yoichi; Ohta, Mutsumi; and Kosugi, Yasuhiro, 4,837,618, Cl. 358-135.000.
Katsutani, Kazuzi: *See—*
Kataoka, Sachiro; Iizima, Yoichi; Kuwahara, Masaji; Takeoka, Seiei; and Katsutani, Kazuzi, 4,836,323, Cl. 180-270.000.
Katto, Takayuki: *See—*
Ichikawa, Yukio; Kaneko, Takashi; Satake, Yoshikatsu; and Katto, Takayuki, 4,837,294, Cl. 528-388.000.
Katz, Peter: *See—*
Taylor, Homer L.; and Katz, Peter, 4,836,626, Cl. 312-257.0SM.
Katzman, Howard A.: *See—*
Kao, Wei H.; Katzman, Howard A.; and Slater, Eric M., 4,837,053, Cl. 427-214.000.
Kaufmann, Karl-Ernst, to Mannesmann AG. Three dimensional movement of a robot manipulator. 4,836,111, Cl. 104-89.000.
Kauss, Wolfgang; and Schulte, Heinz, to Mannesmann Rexroth GmbH. Control switching arrangement for a hydraulic power lift. 4,835,966, Cl. 60-376.000.
Kawada, Junji, to Mitsubishi Denki Kabushiki Kaisha. Head positioning device. 4,837,650, Cl. 360-106.000.
Kawagoe, Mitsuhiro: *See—*
Kume, Satoru; Yoshida, Michiyasu; Kume, Tateo; Oshima, Hiroki; Kawagoe, Mitsuhiro; and Koga, Kazuo, 4,835,964, Cl. 60-285.000.
Kawahara, Takayuki: *See—*
Watanabe, Takao; Kitukawa, Goro; Hori, Ryoichi; Itoh, Kiyoo; Kawajiri, Yoshiki; and Kawahara, Takayuki, 4,837,462, Cl. 307-446.000.

Kawahara, Yosihiro: *See—*
Nozaka, Kenkichi; Kawahara, Yosihiro; Kitamura, Yuji; Morita, Shigeru; and Takahashi, Sadayuki, 4,836,738, Cl. 414-607.000.
Kawahata, Sigeyuki; and Sugawara, Yoshitaka, to Hitachi, Ltd. Flip-flop circuit. 4,837,458, Cl. 307-279.000.
Kawai, Hisasi: *See—*
Tashiro, Syuzaburou; Ina, Toshikazu; and Kawai, Hisasi, 4,837,727, Cl. 364-551.010.
Kawajiri, Yoshiki: *See—*
Watanabe, Takao; Kitukawa, Goro; Hori, Ryoichi; Itoh, Kiyoo; Kawajiri, Yoshiki; and Kawahara, Takayuki, 4,837,462, Cl. 307-446.000.
Kawakami, Takeshi: *See—*
Iwabuchi, Tadashi; and Kawakami, Takeshi, 4,836,769, Cl. 428-377.000.
Kawakubo, Fumio; Yukimoto, Sadao; and Homma, Michihide, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Curable composition. 4,837,274, Cl. 525-100.000.
Kawamma, Kouichi; Abe, Yukio; Higashi, Tatsuji; and Aotani, Yoshimasa, to Fuji Photo Film Co., Ltd. Light-sensitive composition. 4,837,128, Cl. 430-281.000.
Kawamoto, Galen H.: *See—*
Yau, Leopoldo D.; and Kawamoto, Galen H., 4,837,185, Cl. 437-228.000.
Kawamoto, Yoshimichi: *See—*
Abe, Masaru; Kohata, Takashi; and Kawamoto, Yoshimichi, 4,836,577, Cl. 280-773.000.
Kawamura, Hideaki; and Otsuki, Toshiaki, to Fanuc Ltd. Data input-/output system for application system in numerical control equipment. 4,837,684, Cl. 364-474.110.
Kawamura, Hideo, to Isuzu Motors Limited. Device for controlling heater for motor vehicle. 4,836,444, Cl. 237-2.00A.
Kawamura, Masaharu, to Canon Kabushiki Kaisha. Information set device for camera. 4,837,596, Cl. 354-442.000.
Kawamura, Yasuo: *See—*
Ogura, Tomoyuki; Kawamura, Yasuo; Baba, Masatoshi; Ishii, Shigeru; Hirata, Kiminori; Kudo, Masaki; Ochiai, Yoshinori; and Hirose, Masayoshi, 4,837,217, Cl. 514-252.000.
Kawano, Hiroshi: *See—*
Ikoma, Munehisa; Kawano, Hiroshi; Matsumoto, Isao; and Yanagihara, Nobuyuki, 4,837,119, Cl. 429-206.000.
Kawano, Katsumi: *See—*
Wachi, Isao; Mori, Kinji; Suzuki, Yasuo; Orimo, Masayuki; Kawano, Katsumi; Koizumi, Minoru; Nakai, Kozo; and Kasashima, Hirokazu, 4,837,762, Cl. 370-89.000.
Kawano, Shigeyoshi: *See—*
Ishiguro, Okikazu; Nishimura, Masakatsu; Nozawa, Shigeru; Kamogawa, Hiromi; and Kawano, Shigeyoshi, 4,836,991, Cl. 423-242.000.
Kawarada, Masayuki: *See—*
Nakashima, Hiroshi; Kawarada, Masayuki; and Fukuhara, Sanshirou, 4,836,429, Cl. 226-7.000.
Kawasaki Steel Corporation: *See—*
Harada, Masahiro; Yanagi, Kenichi; Fukushima, Takeo; Furukawa, Kusuo; Soeda, Naohiko; Ohta, Norio; Sato, Kuniaki; and Nakajima, Yasuhisa, 4,836,774, Cl. 432-8.000.
Kawase, Masaaki: *See—*
Shamoto, Naoki; Suzuki, Hideo; Sugawara, Yasuyuki; Kawase, Masaaki; and Shinohara, Hiromichi, 4,836,639, Cl. 350-96.230.
Kawata, Kouzou: *See—*
Kurosawa, Ryoichi; and Kawata, Kouzou, 4,837,492, Cl. 318-661.000.
Kawata, Noboru: *See—*
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Kaya, Hiroshi: *See—*
Akizuki, Ikuo, Kaya, Hiroshi; Okano, Shohei; Otake, Nobuo; Kumagai, Keiji; and Kaneko, Yoshihito, 4,837,193, Cl. 502-242.000.
Kayaba Industry Co., Ltd.: *See—*
Nakagomi, Yukinao, 4,836,087, Cl. 91-29.000.
Takahashi, Yoneaki; and Sekikawa, Keiji, 4,836,245, Cl. 137-599.000.
Kaywood, Roy G.: *See—*
Arnold, Philip D.; and Kaywood, Roy G., 4,835,832, Cl. 29-523.000.
Kazama, Toyoki: *See—*
Aizawa, Koichi; Kazama, Toyoki; Takano, Yukio; and Tamura, Yukihisa, 4,837,137, Cl. 430-65.000.
Keeley, Charles: *See—*
Aza, Alberto D.; Keeley, Charles; Rogers, Jay L.; and Brilliant, Stuart D., 4,837,257, Cl. 524-151.000.
Keenan, Paul C., III, to Du Pont de Nemours, E. I., and Company. Method and apparatus for calibrating optical sensors. 4,836,682, Cl. 356-445.000.
Kegel, Andrew J.; Spencer, James R.; Smith, James S.; Rhodes, Russell H.; and Mullendore, James A., to GTE Products Corporation. Material for multiple component penetrators and penetrators employing same. 4,836,108, Cl. 102-306.000.
Keiper Recaro GmbH & Co.: *See—*
Kluting, Bernd, 4,836,607, Cl. 297-355.000.
Werner, Heinz, 4,836,606, Cl. 297-362.000.
Keisei Medical Industrial Co., Ltd.: *See—*
Purcey, Larry J.; VanderHoff, Douglas A.; Vreeland, Robert H.; Nielsen, James P.; and Ueno, Iowa, 4,835,802, Cl. 5-453.000.
Kelbert, Serge: *See—*
Hampe, Patrick; and Kelbert, Serge, 4,837,261, Cl. 524-268.000.
Keller, Guenter: *See—*
Jatho, Ralf; Hintz, Gerhart; and Keller, Guenter, 4,836,031, Cl. 73-800.000.
Kelley, Donald W. Cross-linking of olefin polymers. 4,837,272, Cl. 525-59.000.
Kelso, John H. Firearm with removable trigger. 4,835,893, Cl. 42-69.010.
Kem, Kenneth M., to Occidental Chemical Corporation. Extraction of polyvalent metals with organodiphosphonic acids. 4,836,956, Cl. 252-631.000.
Kemmer, Josef; and Lutz, Gerhard. Large-area, low capacitance semiconductor arrangement. 4,837,607, Cl. 357-30.000.
Kemp, Alan E.: *See—*
Wendt, David W.; Higbee, Robert W.; Kemp, Alan E.; and Gisske, Ed, 4,835,843, Cl. 29-708.000.
Kemp, Ian: *See—*
Corner, Michael R.; Griffiths, Phillip N.; Holmes, Tom; and Kemp, Ian, 4,836,260, Cl. 152-375.000.
Kemp, Preston B., Jr.; and Johnson, Walter A., to GTE Products Corporation. Iron group based and chromium based fine spherical particles. 4,836,850, Cl. 75-251.000.
Kennametal Inc.: *See—*
Bartley, Donald L., 4,835,878, Cl. 33-637.000.
Erickson, Robert A., 4,836,068, Cl. 82-160.000.
Kennedy, Kurtis R.; and Childs, Lee R. Knitting machine stand. 4,836,492, Cl. 248-676.000.
Kerby, Thomas D. Method and apparatus for indexing and labeling electronic disks. 4,837,652, Cl. 360-133.000.
Kerimis, Dimitrios; and Muller, Hanns P., to Bayer Aktiengesellschaft. Process for the preparation of polyisocyanates containing isocyanurate groups. 4,837,321, Cl. 544-193.000.
Kern Engineering & Mfg. Corp.: *See—*
Barr, John E., 4,836,794, Cl. 439-135.000.
Kern, Robert F.: *See—*
Crockett, Robert N.; Kern, Robert F.; Miller, Arnold G.; Norris, Richard E.; Pousson, Michael W., Jr.; and Wagner, Robert E., 4,837,680, Cl. 364-200.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Wolters, Johannes-Peter; and Escherich, Karl-Heinz, 4,836,443, Cl. 236-92.00C.
Keshavan, Madapusi K.; Underwood, Lance D.; Kar, Naresh J.; Oldham, Thomas W.; Roth, Cary A.; and Armstrong, Brian J., to Smith International, Inc. Hard facing for milled tooth rock bits. 4,836,307, Cl. 175-374.000.
Kestner, Mark O., to Chemicoal, Inc. Method for suppressing dust from bulk materials. 4,836,945, Cl. 252-88.000.
Keswick, Paul D.: *See—*
Banerjee, Pradip; and Keswick, Paul D., 4,837,746, Cl. 365-189.050.
Ketenhofen, Timothy J.: *See—*
Ungpiyakul, Tanakon; Morgan, Arch D.; Thomas Douglas C.; Ketenhofen, Timothy J.; Marver, Douglas J.; Couture-Dorschner, Laurie; and Pomplun, William S., 4,837,715, Cl. 364-552.000.
Keyes Offshore, Inc.: *See—*
Reneau, Raymond P., 4,837,390, Cl. 435-1.000.
Khan, Tasadduq; Caron, Pierre; and Raffestin, Jean-Louis, to Office National d'Etudes et de Recherche Aerospatiales. Nickel-based monocrystalline superalloy, in particular for the blades of a turbomachine. 4,837,384, Cl. 148-3.000.
Kidde Recreational Products Inc.: *See—*
DeVale, Donald P.; Brejcha, Robert J.; and Lantz, Gregory W., 4,836,556, Cl. 273-376.000.
Kiekert GmbH & Co. Kommanditgesellschaft: *See—*
Kleefeldt, Frank; Brackmann, Horst; and Bartel, Peter, 4,837,567, Cl. 340-825.310.
Kiffel, William G.; and Tyson, Therese M., to S. C. Johnson & Son, Inc. Hair reviver composition containing film-forming amino acids. 4,837,012, Cl. 424-70.000.
Kikkawa, Sadanobu: *See—*
Morimitsu, Toshihiko; Kikkawa, Sadanobu; and Omura, Takashi, 4,837,310, Cl. 534-638.000.
Kikuchi, Hiroaki: *See—*
Kubo, Tsutomu; Asano, Kenichi; Kikuchi, Hiroaki; and Suzuki, Mitsuyoshi, 4,837,632, Cl. 358-222.000.
Kim, Byoung Y.; and Shaw, Herbert J., to Leland Stanford Junior University, The Board of Trustees of the. Phase reading fiber optic interferometer. 4,836,676, Cl. 356-350.000.
Kimberly-Clark Corporation: *See—*
Cotton, James D., 4,836,368, Cl. 206-205.000.
Ungpiyakul, Tanakon; Morgan, Arch D.; Thomas Douglas C.; Ketenhofen, Timothy J.; Marver, Douglas J.; Couture-Dorschner, Laurie; and Pomplun, William S., 4,837,715, Cl. 364-552.000.
Weber, Robert E.; and Stokes, Bruce G., 4,837,070, Cl. 428-172.000.
Kimmet, Mark S.: *See—*
Harwood, Jon W.; and Kimmet, Mark S., 4,836,330, Cl. 181-282.000.
Kimura, Atsuyoshi; and Shibata, Noriyoshi, to Daido Tokushuko Kabushiki Kaisha. Austenitic free cutting stainless steels. 4,837,108, Cl. 420-41.000.
Kimura, Hiroshi: *See—*
Ogawa, Shinji; Iguchi, Seiya; Kimura, Hiroshi; and Ohmori, Yoh, 4,837,371, Cl. 548-497.000.

Kimura, Kaoru. *See*—
Sato, Mitsuyoshi; Okamura, Takumi and Kimura, Kaoru, 4,837,260, Cl. 524-261.000.

Kimura, Nobutake: *See*—
Konishi, Takao; Sugimori, Giichi; Kato, Kazuyoshi; Kimura, Nobutake; and Shibata, Kenji, 4,837,008, Cl. 424-92.000.

Kimura, Okitoshi; Ohsawa, Toshiyuki; Kabota, Toshiyuki; Nishihara, Hiroshi; and Aramaki, Kunitsugu, to Ricoh Company, Ltd.; and Aramaki, Kunitsugu. Semiconductive or conductive polymers, method of producing the same and batteries using the polymers as active materials. 4,837,096, Cl. 429-213.000.

Kimura, Tsutomu: *See*—
Shiraishi, Hisashi; Kimura, Tsutomu; and Hishinuma, Kazuhiro, 4,837,733, Cl. 364-413.130.

Kimura, Yuhji: *See*—
Izumi, Kohji; Eguti, Hirotoshi; Ohta, Eiichi; Kimura, Yuhji; and Ebi, Yutaka, 4,836,034, Cl. 73-862.040

Kindleben, Gerd: *See*—
Guldner, Ralf; Lasberg, Ingo; Wittmann, Kurt; and Kindleben, Gerd, 4,836,975, Cl. 376-272.000.

Kindtler, Jens W.: *See*—
Jensen, Leif H.; Sauerberg, Per; Watjen, Frank; and Kindtler, Jens W., 4,837,241, Cl. 514-340.000.

King, Marvin: *See*—
Naiman, Charles S.; King, Marvin; and Greenbaum, Michael, 4,836,672, Cl. 356-5.000.

King, Richard T. Spacer element for multiglazed windows and windows using the element. 4,835,926, Cl. 052 171.000.

Kingman, John E. E.: *See*—
Gard, Michael F.; Kingman, John E. E.; and Klein, James D., 4,837,518, Cl. 324-368.000.

Kingsbury, Jeffrey M.: *See*—
Spector, David P.; and Kingsbury, Jeffrey M., 4,836,960, Cl. 264-2.200.

Kingsley Nominees Pty. Ltd.: *See*—
Bayly, Peter K., 4,836,688, Cl. 366-342.000.

Kinkead, Clifford W. Water cooling tower and water level control system therefor. 4,836,239, Cl. 137-413.000

Kioritz Corporation: *See*—
Nagashima, Akira, 4,835,866, Cl. 30-381.000.
Nagashima, Akira, 4,835,868, Cl. 30-386.000.

Kipp, Robert M.: *See*—
Kruka, Vitold R.; Kipp, Robert M.; and Cadena, Edward R., 4,837,751, Cl. 367-154.000.

Kirilloff, Victor V.; Benson, William A.; Cummins, Robert; and Dawson, Richard S., to Mosebach Manufacturing Company. Tapped resistor grid assembly. 4,837,549, Cl. 338-279.000.

Kirk, Shane K.: *See*—
Wu, Stephen H. W.; Kirk, Shane K.; Perry, Kenneth P.; Smith, E. Phillip; Chang, Yeong-Ho; and Jenkins, Waylon L., 4,837,004, Cl. 424-438.000.

Kirschner, Ann S., to Surprises, Inc. Toy packaging. 4,836,437, Cl. 229-8.000.

Kirschner, Jonathan: *See*—
Credle, William S., Jr.; and Kirschner, Jonathan, 4,836,414, Cl. 222-1.000.

Kirsop, Brian H.; and Brocklehurst, Timothy F., to Agricultural & Food Research Council. Method for improving the shelf life of a foodstuff. 4,837,037, Cl. 426-303.000.

Kitahama, Satoshi: *See*—
Ikeda, Hayato; Kitahama, Satoshi; and Onomura, Hiroshi, 4,836,754, Cl. 417-269.000.

Kitamura, Yuji: *See*—
Nozaka, Kenkichi; Kawahara, Yosihiro; Kitamura, Yuji; Morita, Shigeru; and Takahashi, Sadayuki, 4,836,738, Cl. 414-607.000.

Kitate Sangyo Co., Inc.: *See*—
Yamaguchi, Isaburo, 4,836,773, Cl. 431-125.000.

Kite, Joseph S., III; and Tresslar, Marie C., to Bentley-Harris Manufacturing Company, The. Vibration abrasive resistant fabric covering. 4,836,080, Cl. 87-9.000.

Kitukawa, Goro: *See*—
Watanabe, Takao; Kitukawa, Goro; Hori, Ryoichi; Itoh, Kiyoo; Kawajiri, Yoshiki; and Kawahara, Takayuki, 4,837,462, Cl. 307-446.000.

Klajnscek, Leslie J., to Johnson & Johnson Consumer Products, Inc. Liquid detergent compositions with phosphate ester solubilizers. 4,836,949, Cl. 252-135.000.

Klapper, Kenneth K.: *See*—
Boatwright, David A.; Duncan, Robert; and Klapper, Kenneth K., 4,837,419, Cl. 219-125.110.

Klayman, Arnold I., to Hughes Aircraft Company. Loudspeaker system with wide dispersion baffle. 4,836,329, Cl. 181-155.000.

Klco, Kenneth S., to Domtar, Inc. Stabilizing road base composition and method for preparing same. 4,836,850, Cl. 404-76.000.

Kleefeldt, Frank; Brackmann, Horst; and Bartel, Peter, to Kiekert GmbH & Co. Kommanditgesellschaft. Security system for a motor vehicle. 4,837,567, Cl. 340-825.310.

Klefbeck, Robert J. Energy efficient cork extractor. 4,836,060, Cl. 81-3.290.

Klein, James D.: *See*—
Gard, Michael F.; Kingman, John E. E.; and Klein, James D., 4,837,518, Cl. 324-368.000.

Kleinschmit, Peter: *See*—
Deschler, Ulrich; Hellwig, Georg; Michel, Rudolf; Kleinschmit, Peter; and Wolff, Siegfried, 4,837,322 Cl. 544-209.000.

Kling, Michael R., to GTE Products Corporation. Glow discharge starter containing boron. 4,837,483, Cl. 313-619.000.

Klosin, John J., to Homac Mfg. Company. Submersible insulated splice assemblies. 4,837,409, Cl. 174-88.00R.

Kloss, John W.: *See*—
Skala, Dennis P.; and Kloss, John W., 4,836,029, Cl. 73-799.000.

Kluting, Bernd, to Keiper Recaro GmbH & Co. Hinge joint for the seats of motor vehicles and the like. 4,836,607, Cl. 297-355.000.

KMW Group, Inc., The: *See*—
Purcey, Larry J.; VanderHoff, Douglas A.; Vreeland, Robert H.; Nielsen, James P.; and Ueno, Iowa, 4,835,802, Cl. 5-453.000.

Knapek, Erwin; and Formanek, Helmut, to Siemens Aktiengesellschaft. Electron-beam-sensitive resist material for microstructures in electronics. 4,837,125, Cl. 430-270.000.

Knapp, Daniel K. Aiming apparatus for use in the game of basketball. 4,836,539, Cl. 273-1.50A.

Knapp, Horst J. T.: *See*—
Gerst, Michael; Knapp, Horst J. T.; and Maack, Werner, 4,835,844, Cl. 29-747.000.

Knapp, John F.: *See*—
Gruber, Robert J.; Knapp, John F.; Koch, Ronald J.; and Floyd, Lawrence, Jr., 4,837,101, Cl. 430-109.000.

Knaus, Dennis A.: *See*—
Bambara, John D.; Flathers, Charles E., Jr.; Knaus, Dennis A.; and Palmieri, Gregory G., 4,836,814, Cl. 441-65.000.

Knight, Barry T.: *See*—
Hibbard, Billy B.; Mann, Joe A.; Koeleveld, Frans P. P.; Potepan, Agnes K.; White, Richard E.; Knight, Barry T.; and Bryant, Howard H., 4,837,281, Cl. 525-234.000.

Knirsch, Franco; Soudaz, Anna M.; and Genova, Alessandro, to Ing. C. Olivetti & Co., S.p.A. Ink for an ink jet printer. 4,836,852, Cl. 106-22.000.

Knodel, Gunter; and Henzler, Helga, to Getrag Getriebe und Zahnradfabrik GmbH. Synchronizing mechanism for shifting clutches. 4,836,348, Cl. 192-53.00F.

Knoop, Donald E.; and Paustian, John K., to Whirlpool Corporation. Automatic water level control system for an automatic washer. 4,835,991, Cl. 68-12.00R.

Knoop, Heinz-Peter, to Martor-Argentax E.H. Beermann KG. Hollow-handle utility knife replaceable blade. 4,835,865, Cl. 30-162.000.

Knop, Reinhard, to Jagenberg Altiengesellschaft. Device for coating a web of material. 4,836,134, Cl. 118-413.000.

Knudsen, Christopher G., to Stauffer Chemical Company. 3-chloro-2-(2'-substituted benzoyl)-cyclohex-2-enone intermediate compounds. 4,837,352, Cl. 558-396.000.

Ko, Wen C.: *See*—
Peltzer, Douglas L.; Bechtel, Richard L.; Ko, Wen C.; and Liggett, William T., 4,836,861, Cl. 136-246.000.

Kobasic, Timothy J. Multipurpose chair structure. 4,836,938, Cl. 224-155.000.

Kobayashi, Fumiyuki: *See*—
Takenaka, Takaji; Watanabe, Hideki; and Kobayashi, Fumiyuki, 4,836,434, Cl. 228-179.000.
Zushi, Shizuo; Miyamoto, Mitsuo; Gou, Hiroshi; Kobayashi, Fumiyuki; and Ogata, Tetsuo, 4,837,663, Cl. 361-384.000.

Kobayashi, Kazuhiro; Koboshi, Shigeharu; Kuse, Satoru; and Ishikawa, Masao, to Konishiroku Photo Industry Co., Ltd. Method for processing a light-sensitive silver halide color photographic material using at least one silver halide emulsion layer and at least one of a cyan coupler and magneta coupler. 4,837,139, Cl. 430-542.000.

Kobayashi, Kesanao; Ohba, Hisao; and Toyama, Tadao, to Fuji Photo Film Co., Ltd. Developing method for photosensitive material. 4,837,131, Cl. 430-302.000.

Kobayashi, Kinzo; and Nakayama, Shinichi, to Tokico Ltd. Disc brake having shield portions for shielding a boot. 4,836,339, Cl. 188-73.100.

Kobayashi, Masashi, to Maruman Golf Co., Ltd. Club head for an iron-type golf club. 4,836,550, Cl. 273-167.00H.

Kobayashi, Ryoichi: *See*—
Fujino, Yasunori; Sugiura, Noboru; and Kobayashi, Ryoichi, 4,836,176, Cl. 123-640.000.

Kobayashi, Saburo: *See*—
Kageyama, Hidehei; Mitsuya, Yoshihide; and Kobayashi, Saburo, 4,836,703, Cl. 401-65.000.

Kobayashi, Satoru. Anchor retrieving device. 4,836,126, Cl. 114-297.000.

Koboshi, Shigeharu: *See*—
Kobayashi, Kazuhiro; Koboshi, Shigeharu; Kuse, Satoru; and Ishikawa, Masao, 4,837,139, Cl. 430-542.000.

Koch, Charles J.: *See*—
Owades, Joseph L.; and Koch, Charles J., 4,837,034, Cl. 426-16.000.

Koch, Herbert: *See*—
Leiter, Herbert; Koch, Herbert; Hund, Andreas; and Reinheimer, Guenter, 4,837,595, Cl. 354-412.000.

Koch, Juergen: *See*—
Heinz, Gerhard; Koch, Juergen; Eggersdorfer, Manfred; and Henkelmann, Jochem, 4,837,296, Cl. 528-125.000.

Koch, Ronald J.: *See*—
Gruber, Robert J.; Knapp, John F.; Koch, Ronald J.; and Floyd, Lawrence, Jr., 4,837,101, Cl. 430-109.000.

Koch, Werner, to Bruckner Apparatebau GmbH. Method and apparatus for the treatment of continuously moving tubular fabric in the wet state. 4,835,992, Cl. 68-13.00R.

Kochanek, Wolfgang: *See*—
Schlaefer, Dieter; Kochanek, Wolfgang; and Leutner, Bernd, 4,837,002, Cl. 423-641.000.

Kodama, Naoki: *See*—
Sato, Toshihiro; Toyooka, Takashi; Kodama, Naoki; Takeuchi, Teruaki; Takeshita, Masatoshi; and Suzuki, Ryo, 4,837,741, Cl. 365-12.000.

Koehler, Joseph P. Reflector for dental or medical light. 4,837,668, Cl. 362-297.000.

Koehler, Juergen, to Konvekta, GmbH. Heat exchanger apparatus having heat exchanger pipes and sheetmetal plates. 4,836,277, Cl. 165-151.000.

Koeleveld, Frans P. P.: *See*—
Hibbard, Billy B.; Mann, Joe A.; Koeleveld, Frans P. P.; Potepan, Agnes K.; White, Richard E.; Knight, Barry T.; and Bryant, Howard H., 4,837,281, Cl. 525-234.000.

Koga, Kazuo: *See*—
Kume, Satoru; Yoshida, Michiyasu; Kume, Tateo; Oshima, Hiroki; Kawagoe, Mitsuhiro; and Koga, Kazuo, 4,835,964, Cl. 60-285.000.

Kogelschatz, Ulrich: *See*—
Eliasson, Baldur; Erni, Peter; Hirth, Michael; and Kogelschatz, Ulrich, 4,837,484, Cl. 313-634.000.

Kogi, Kentaro: *See*—
Shibasaki, Masakatsu; Takahashi, Atsuo; Aoki, Tuyoshi; Kogi, Kentaro; Nishimiya, Yozo; Nara, Takeshi; and Yamaguchi, Takashi, 4,837,342, Cl. 549-422.000.

Kogler, Kent J.: *See*—
Murarka, Narayan P.; Kogler, Kent J.; Bartholomew, Craig S.; Betz, Howard T.; and Harris, Richard J., 4,837,044, Cl. 427-10.000.

Kohata, Takashi: *See*—
Abe, Masaru; Kohata, Takashi; and Kawamoto, Yoshimichi, 4,836,577, Cl. 280-773.000.

Kohge, Shinichi: *See*—
Morishita, Mitsuharu; and Kohge, Shinichi, 4,837,690, Cl. 364-424.050.

Kohler, Rembert: *See*—
Wild, Georg; Kohler, Rembert; Weibelzahl, Manfred; Haushofer, Martin; and Messner, Johann, 4,837,671, Cl. 363-35.000.

Kohmoto, Osamu: *See*—
Yajima, Kohichi; Kohmoto, Osamu; and Yoneyama, Tetsuhito, 4,836,868, Cl. 148-302.000.

Kohno, Junichi; Okauchi, Ken; Goto, Sohei; Iwagaki, Masaru; and Komamura, Tawara, to Konishiroku Photo Industry Co., Ltd. Thermally developable light-sensitive material containing a development restrainer compound. 4,837,141, Cl. 430-559.000.

Kohsaka, Yoshio: *See*—
Ishida, Katsuyuki; Torita, Fumio; and Kohsaka, Yoshio, 4,835,994, Cl. 66-174.000.

Kohyama, Mitsuaki; Yoshida, Naruhito; and Takagi, Osamu, to Kabushiki Kaisha Toshiba. Developing apparatus having one-component developing agent. 4,836,135, Cl. 118-653.000.

Koike, Mitsumaro: *See*—
Uchiyama, Futoshi; Tsukamoto, Koichi; Kurashige, Tomoyoshi; Furusawa, Kaoru; and Koike, Mitsumaro, 4,836,417, Cl. 222-63.000.

Koizumi, Minoru: *See*—
Wachi, Isao; Mori, Kinji; Suzuki, Yasuo; Orimo, Masayuki; Kawano, Katsumi; Koizumi, Minoru; Nakai, Kozo; and Kasashima, Hirokazu, 4,837,762, Cl. 370-89.000.

Koizumi, Tetsuro; and Kamei, Masato, to Kamei Machine Project Co., Ltd. Wire winding machine for stator cores. 4,836,461, Cl. 242-1.10R.

Koji, Masashi, to Hoshin Kagaku Sangyosho Co., Ltd. Photo-CVD apparatus. 4,836,140, Cl. 118-722.000.

Kokosa, Richard A.: *See*—
Allred, Jimmie B., III; Kokosa, Richard A.; Krauter, Allan I.; and Newman, Richard W., 4,836,189, Cl. 128-6.000.

Kokta, Milan R., to Union Carbide Corporation. Processes for enhancing fluorescence of Tl:Al203 tunable laser crystals. 4,836,953, Cl. 252-301.40F.

Kokubo, Hiroyasu; Chiba, Tohru; and Sekigawa, Fujio, to Shin-Etsu Chemical Co., Ltd. Method for the preparation of a coated solid medicament. 4,837,033, Cl. 424-494.000.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Hatori, Yoshinori; Kato, Yoichi; Ohta, Mutsumi; and Kosugi, Yasuhiro, 4,837,618, Cl. 358-135.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Suzuki, Masatoshi; Noda, Yukio; Kushiro, Yukitoshi; and Akiba, Shigeyuki, 4,837,526, Cl. 332-7.510.

Kolbenschmidt Aktiengesellschaft: *See*—
Baureis, Hans-Paul; Bickle, Wolfgang; and Lankreijer, Wilhelm, 4,836,695, Cl. 384-276.000.
Werner, Heribert; Grothe, Klaus; and Kreuzer, Martin, 4,836,576, Cl. 280-731.000.

Kolle, Erich: *See*—
Maisel, Manfred; Kolle, Erich; and Hauenstein, Gerhard, 4,837,850, Cl. 455-58.000.

Kollmorgen Technologies Corp.: *See*—
Frisch, David C.; Manzione, Louis T.; Poelzing, Gerhard W.; and Weber, Wilhelm, 4,837,129, Cl. 430-319.000.

Komamura, Tawara: *See*—
Kohno, Junichi; Okauchi, Ken; Goto, Sohei; Iwagaki, Masaru; and Komamura, Tawara, 4,837,141, Cl. 430-559.000.

Komori Printing Machinery Co., Ltd.: *See*—
Komori, Tatsuo; and Sugiyama, Hiroyuki, 4,836,103, Cl. 101-231.000.

Komori, Tatsuo; and Sugiyama, Hiroyuki, to Komori Printing Machinery Co., Ltd. Cylinder apparatus of sheet-fed rotary press. 4,836,103, Cl. 101-231.000.

Komorita, Kazuo; and Onodera, Kaoru, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic light-sensitive material. 4,837,143, Cl. 430-621.000.

Konczak, Heinz: *See*—
Rokos, Hartmut; Konczak, Heinz; and Forth, Wolfgang, 4,837,229, Cl. 514-517.000.

Kondo, Hiromasa; Okumura, Yoshitaka; Fukui, Terunobu; Egashira, Noritaka; Iwata, Tamami; and Satake, Naoto, to Kanzaki Paper Manufacturing Co., Ltd.; and Dai Nippon Insatsu Kabushiki Kaisha. Image-receiving sheet for thermal transfer printing. 4,837,200, Cl. 503-227.000.

Kondo, Katsumi: *See*—
Gunji, Yasuhiro; Okada, Sadayuki; Isogai, Masato; Kondo, Katsumi; Ibamoto, Masahiko; Kuwabara, Kazuhiro; and Kanke, Atsushi, 4,836,657, Cl. 350-350.00S.

Kondo, Kazuo; Morikawa, Asao; and Iwata, Hiroshi, to NGK Spark Plug Co., Ltd. High density multilayer wiring board and the manufacturing thereof. 4,837,408, Cl. 174-68.500.

Kondo, Thomas J.; Kusbel, James F.; and Philp, John D., to Three Phoenix Company. Handling apparatus for magnetic recording disks. 4,836,916, Cl. 209-538.000.

Kondo, Toshiro; Kanada, Eiji; and Nishinoiri, Hiroshi, to Mitsubishi Paper Mills. Ltd. Deleting fluid for printing plates and method for deletion. 4,837,122, Cl. 430-204.000.

Kondoh, Hiroshi, to Hewlett-Packard Company. Wideband (DC-50 GHz) MMIC FET variable matched attenuator. 4,837,530, Cl 333-81.00A.

Kondoh, Hisao: *See*—
Nishizawa, Jun-ichi; and Kondoh, Hisao, 4,837,608, Cl. 357-38.000.

Konig, Klaus: *See*—
Woynar, Helmut; Konig, Klaus; Pedain, Josef; and Slack, William E., 4,837,359, Cl. 560-335.000.

Konigstein, Dietrich: *See*—
Hansen, Diethard; and Konigstein, Dietrich, 4,837,581, Cl. 343-703.000.

Konings, Frank J.: *See*—
de Jaeger, Nikolaas C. J.; Monbaliu, Marcel J.; Noppe, Marcus J. M.; and Konings, Frank J., 4,837,168, Cl. 436-533.000.

Konishi, Akihiko; Mizukami, Masamichi; and Shimuta, Masanori, to Mitsubishi Gas Chemical Co., Ltd. Method for treating contact lenses. 4,836,859, Cl. 134-1.000.

Konishi, Takao; Sugimori, Giichi; Kato, Kazuyoshi; Kimura, Nobutake; and Shibata, Kenji, to Shionogi & Co., Ltd.; and Nisshin Flour Milling Co., Ltd. Vaccines for fowl colibacillosis. 4,837,018, Cl. 424-92.000.

Konishi, Yasuhiro: *See*—
Dosaka, Katsumi; Kumanoya, Masaki; Miyatake, Hideshi; Hidaka, Hideto; Konishi, Yasuhiro; Yamasaki, Hiroyuki; Ikeda, Yuto; Tsukamoto, Kazuhiro; and Shimoda, Masaki, 4,837,747, Cl. 371-10.000.

Konishi, Yoshihiro; Konno, Kenichi; and Awai, Ikuo, to Uniden Corporation. Resonant wave filter. 4,837,535, Cl. 333-210.000.

Konishi, Yoshimune: *See*—
Haseda, Satoshi; Tsuzuki, Yoshihiko; Konishi, Yoshimune; and Suzuki, Motoshi, 4,836,319, Cl. 180-142.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Kobayashi, Kazuhiro; Koboshi, Shigeharu; Kuse, Satoru; and Ishikawa, Masao, 4,837,139, Cl. 430-542.000.
Kohno, Junichi; Okauchi, Ken; Goto, Sohei; Iwagaki, Masaru; and Komamura, Tawara, 4,837,141, Cl. 430-559.000.
Komorita, Kazuo; and Onodera, Kaoru, 4,837,143, Cl. 430-621.000.
Nakane, Nobu; Maruyama, Noriharu; and Hakamada, Haruo, 4,837,601, Cl. 355-28.000.
Takesue, Toshihiro; Murahashi, Takashi; and Nakazawa, Toshihiko, 4,837,787, Cl. 372-29.000.

Konno, Kenichi: *See*—
Konishi, Yoshihiro; Konno, Kenichi; and Awai, Ikuo, 4,837,535, Cl. 333-210.000.

Konomi, Toshiaki: *See*—
Chujo, Yoshiki; Inoue, Tokuta; Konomi, Toshiaki; and Hyodo, Yoshihiko, 4,836,174, Cl. 123-571.000.

Konosu, Osamu: *See*—
Adachi, Osamu; and Konosu, Osamu, 4,837,482, Cl. 313-402.000.

Konvekta, GmbH: *See*—
Koehler, Juergen, 4,836,277, Cl. 165-151.000.

Koo, James T.: *See*—
Chung, Shine C.; Tsang, Siu K.; Koo, James T.; Chen, Sho Long S.; and Chan, John Y., 4,837,748, Cl. 365-236.000.

Koons, Roger R.: *See*—
Kramer, Robert H.; and Koons, Roger R., 4,836,513, Cl. 267-140.100.

Koop, Dale, to Rofin Sinar, Inc. Flowing gas CO_2 laser. 4,837,770, Cl. 372-59.000.

Kopp, Dieter: *See*—
Immendorfer, Manfred; Kopp, Dieter; and Hormann, Thomas, 4,837,808, Cl. 379-96.000.

Kopp, Harald: *See*—
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Kopperschmidt-Mueller GmbH & Co. KG: *See*—
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Korbach, William; Corsentino, John A.; Jones, Allen R.; and McCaskie, John E., to M&T ChemicalsInc. Baths and process for electroplating

hard,adherent,smooth, wear resistant and corrosion resistant chromium deposits. 4,836,897, Cl. 204-51.000.

Korber AG: *See*—
Janutta, Reinhard, 4,836,518, Cl. 269-4 .000.

Kordon, Moon J. Surface effect ship. 4,836 121, Cl. 114-67.00A.

Kornitzky, Michael A.; and Dublinski, Alexander C., to United Technologies Corporation. Molding apparatus for composite materials. 4,836,765, Cl. 425-388.000.

Kosaka, Kenji; and Yasu, Yoshikazu, to Ikegami Tsushinki Co., Ltd. Sorting machine. 4,836,529, Cl. 271-296.000.

Koshiishi, Takaho: *See*—
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Kosiak, Walter K.: *See*—
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Kostoss, Joseph M.; and Rohrs, Frederick T., to General Electric Company. Dynamoelectric machine stator using cylindrical keybar with improved dovetail configuration. 4,837,471, Cl. 310-258.000.

Kosugi, Yasuhiro. *See*—
Hatori, Yoshinori; Kato, Yoichi; Ohta, Mutsumi; and Kosugi, Yasuhiro, 4,837,618, Cl. 358-135.000

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Kotera, Masayuki, to Seikow Chemical Engineering & Machinery, Ltd. Inner magnet rotor for magnet pump. 4,837,472, Cl. 310-156.000.

Koto Electronics Co. Ltd.: *See*—
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Kotobuki & Co., Ltd.: *See*—
Kageyama, Hidehei; Mitsuya, Yoshihide; and Kobayashi, Saburo, 4,836,703, Cl. 401-65.000.

Kotraba, Norman L.: *See*—
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Koumvakalis, Nicholas: *See*—
Jabr, Salim N.; Hutchings, Thomas J.; and Koumvakalis, Nicholas, 4,837,774, Cl. 372-94.000.

Kowa Display Co., Inc.: *See*—
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Koyama, Hiroshi: *See*—
Nishioka, Tadashi; Yasue, Takao; and Koyama, Hiroshi, 4,837,445, Cl. 250-442.100.

Koyan, Kenneth R.: *See*—
Vandemotter, Patrick J.; Hutchins, Melvyn L.; Canale, Jon S.; and Koyan, Kenneth R., 4,837,552, Cl. 340-461.000.

Kraemer, Horst; Rohmer, Hartmut; and Stowowy, Johannes, to Huels Aktiengesellschaft. Unsaturated polyester resin and molding compounds obtained therefrom. 4,837,270, Cl. 525-27.000.

Kraetschmer, Horst, to Leonard Kurz GmbH & Co. Embossing foil. 4,837,072, Cl. 428-201.000.

Krage, Mark K., to General Motors Corporation. Method and apparatus for determining the compression ratio of an engine cylinder. 4,836,015, Cl. 73-117.200.

Krambrock, Wolfgang, to AVT Anlagen- und Verfahrenstechnik GmbH. Device for closing a pipe branch 4,836,250, Cl. 137-625.470.

Kramer, Dennis A.: *See*—
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Kramer, Klaus: *See*—
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Kramer, Michael: *See*—
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Kramer, Robert H.; and Koons, Roger R., to Goodyear Tire & Rubber Company, The. Hydraulically damped anti-vibration mount with a flexible flap as a dynamic rate inhibitor. 4,836,513, Cl. 267-140.100.

Kramp, Stephen F.: *See*—
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Krasner, Gary N., to CooperVision, Inc. Instrument for manipulating compressible intraocular lenses. 4,836,202, Cl. 128-303.00R.

Krause, Barbara A.: *See*—
Krause, Thomas S., deceased, 4,836,582, Cl. 285-158.000.

Krause, Barbara A., executor: *See*—
Krause, Thomas S., deceased, 4,836,582, Cl. 285-158.000.

Krause, Thomas S., deceased (by Krause, Barbara A., executor), to Krause, Barbara A. Fluid coupling for engine. 4,836,582, Cl. 285-158.000.

Krauss, Helmuth: *See*—
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Krikheli, Zurab. Game article. 4,836,547, Cl. 273-153.00S.

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Kristof, Wolfgang; Schlebener, Claus; and Linde, Gerhard, to Linde Aktiengesellschaft. Apparatus for removal of nitrogen oxides from flue gas. 4,836,988, Cl. 422-171.000.

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Krupay, Bordan W.; and Reid, Lloyd E., to Exxon Research and Engineering Company. Removal of impurities from n-methyl-pyrrolidone using highly pure water washed activated alumina. 4,837,338, Cl. 548-555.000.

Krupp Widia GmbH: *See*—
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Lasier, Thomas R.; and Downey, William L., to Schlage Lock Company. Door position indicator for a door closer. 4,835,905, Cl. 49-14.000.

LaTorre, Joseph S., to Lok-Fast, Inc. Universal tool adaptes for blind fastener installation tools and a universal method for installation of blind fasteners. 4,836,062, Cl. 81-55.000.

Laude, Jean-Pierre, to Instruments SA. Wavelength multiplexer/-demultiplexer using optical fibers. 4,836,63[illegible], Cl. 350-96.190.

Laughner, Michael K.; and Ogoe, Samuel A. to Dow Chemical Company, The. Fire retardant impact modified carbonate polymer composition. 4,837,258, Cl. 524-168.000.

Laurel Bank Machines Co., Ltd.: *See*—
Sakurai, Tomonari, 4,835,938, Cl. 53-212.000.

Laurenson, John G., Jr. Compost air injection and evacuation system with improved air control. 4,837,153, Cl. 415-243.000.

Lauro, Karen L.: *See*—
Sones, Richard A.; Lauro, Karen L.; Barnes, Gary T.; and Tesic, Mike M., 4,837,686, Cl. 364-413.190.

Lauterbach, Herbert G.: *See*—
Armiger, Thomas E.; Edison, David H.; Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., 4,837,117, Cl. 428-392.000.

Laval, Jean-Paul; Leconte, Michel; Ollivier, Jean; Perez, Emile; Quignard, Francoise; and Rico, Isabelle, to Societe Nationale Elf Aquitaine. Catalytic systems having extended duration and conservation for the metathesis of olefins. 4,837,188, Cl. 502-107.000.

Laven, Douglas J. Heart shaped novelty item. 4,836,823, Cl. 446-485.000.

Lavie, Peretz: *See*—
Hobson, J. Allan; Mamelak, Adam; Helfand, Rita; and Lavie, Peretz, 4,836,219, Cl. 128-782.000.

Lawson, Jerry W.; Bullings, Bruce R.; and Perfetti, Thomas A., to R. J. Reynolds Tobacco Company. Cigarette. 4,836,224, Cl. 131-336.000.

Laycock, Leslie C., to General Electric Company, p.l.c., The. Optical devices for forming image and reference beams with a polarizing beamsplitter and a spatial light modulator. 4,836,658, Cl. 350-384.000.

Layton, James R.: *See*—
Armiger, Thomas E.; Edison, David H. Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., 4,837,117, Cl. 428-392.000.

Le Groupe Laperriere & Verreault, Inc.: *See*—
Verreault, Laurent, 4,836,685, Cl. 366-141.000.

Lear Siegler, Inc.: *See*—
Alon, Yair, 4,837,718, Cl. 364-565.000.

Lebeck, Alan O.; and Young, Lionel A., to University of New Mexico. Wavy-tilt-dam seal ring. 4,836,561, Cl. 277-93.0SD.

Lebrun, Jean-Louis; and Pont, Patrick, to Societe Francaise d'Equipements pour la Navigation Aerienne (S.F.E.N.A.). Method and device for guiding an aerodyne on a runway, particularly during the taxiing phase preceding take off. 4,837,696, Cl. 364-427.000.

Leconte, Michel: *See*—
Laval, Jean-Paul; Leconte, Michel; Ollivier, Jean; Perez, Emile; Quignard, Francoise; and Rico, Isabelle, 4,837,188, Cl. 502-107.000.

Le Contellec, Michel: *See*—
Morin, Francois; and Le Contellec, Michel, 4,836,650, Cl. 350-334.000.

Leda Logarithmic Electrical Devices for Automation S.r.l: *See*—
Lodini, Paolo, 4,837,548, Cl. 338-47.000.

Ledebuhr, Arno G.; and Sprothbery, Donald E., to Hughes Aircraft Company. Optical layout for a three light valve full-color projector employing a dual relay lens system and a single projection lens. 4,836,649, Cl. 350-331.00R.

Lederman, Frederick E.: *See*—
Johnston, Albert D.; and Lederman, Frederick E., 4,836,347, Cl. 192-45.000.

Lee, Arnold St. J. Method for preparing a ballistocardiogram. 4,836,215, Cl. 128-714.000.

Lee, Ben R.: *See*—
Finley, Randy; and Lee, Ben R., 4,836,822, Cl. 446-397.000.

Lee, Carol S.: *See*—
Chang, Clarence D.; Chu, Cynthia T.; and Lee, Carol S., 4,837,398, Cl. 502-86.000.

Lee, Eun S.; and Yum, Su J., to ALZA Corporation. Transdermal drug delivery device. 4,837,027, Cl. 424-449.000.

Lee, Jeun-Keun: *See*—
Lin, Jui-Chang, 4,837,427, Cl. 235-488.000.

Lee, Richard J. Multifunctional ammunition case reloading die. 4,836,078, Cl. 86-24.000.

Lee, Richard J. Weighing scale. 4,836,315, Cl. 177-247.000.

Leedall Products, Inc.: *See*—
Sharkey, Richard B.; and Emerson, Robert T., 4,837,584, Cl. 346-1.100.

Leedecke, Charles J.: *See*—
Bescup, Terrance L.; Fellows, Benjamin T.; and Leedecke, Charles J., 4,837,069, Cl. 428-148.000.

Leeder, Sydney; and Zuk, Robert F., to Syntex (U.S.A.) Inc. Single step heterogeneous assay. 4,837,395, Cl. 435-7.000.

Leete, John H., II; and Skinner, William J., to TRW Inc. D-section structural tubes. 4,835,932, Cl. 52-648.000.

Lefevre, Herve ; and Bann, Sambath, to Thomson-CSF. Device for the connection of optic fibers to an integrated optic circuit and method for making the said device. 4,836,645, Cl. 350-96.170.

Leffel, Kevin L.: *See*—
Briscoe, James A.; Putt, James C.; Phillips, Ronald W., II, and Leffel, Kevin L., 4,836,474, Cl. 244-134.00A.

Leftault, Charles J., Jr.; and Willis, W. Coy, to Aluminum Company of America. Inwardly reformable endwall for a container. 4,836,398, Cl. 220-66.000.

Lehrman, Sandra N.: *See*—
Rideout, Janet L.; Barry, David W.; Lehrman, Sandra N.; St. Clair, Martha H.; and Furman, Phillip A., 4,837,208, Cl. 514-50.000.

Leibovich, Gregory. Variable transformer, reactor and method of their control. 4,837,497, Cl. 323-345.000.

Leiter, Herbert; Koch, Herbert; Hund, Andreas; and Reinheimer, Guenter, to Ernst Leitz Wetzlar GmbH. Process and device for photographing microscopic objects. 4,837,595, Cl. 354-412.000.

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Kim, Byoung Y.; and Shaw, Herbert J., 4,836,676, Cl. 356-350.000.

Leland Stanford Junior University, Stanford University, The Board of Trustees of the: *See*—
Stocker, Bruce A. D., 4,837,151, Cl. 435-172.300.

Le Lande, Walter C., Jr. Fire suppression system. 4,836,290, Cl. 169-46.000.

Lemay, Richard A.; Woods, William E.; and Tague, Steven A., to Honeywell Information Systems Inc.; and Hutton/PRC Technology Partners I. Address boundary detector. 4,837,738, Cl. 364-900.000.

Lemp, Mark D., to Colt Industries Inc. Manifold for distributing a fluid and method for making same. 4,836,246, Cl. 137-561.00A.

Lengefeld, Wendell L., to International Business Machines Corporation. Computer controlled material handling. 4,837,704, Cl. 364-478.000.

Lenormand, Regis: *See*—
Gourlain, Philippe; Lenormand, Regis; and Morin, Dominique, 4,837,531, Cl. 333-135.000.

Lenz, Sigmund: *See*—
Morz, Gunter; Pivit, Erich; and Lenz, Sigmund, 4,837,528, Cl. 333-24.100.

Leonard Kurz GmbH & Co.: *See*—
Kraetschmer, Horst, 4,837,072, Cl. 428-201.000.

Leonard, Thomas B.: *See*—
Finkelstein, Joseph A.; Kruse, Lawrence I.; and Leonard, Thomas B., 4,837,353, Cl. 560-39.000.

Lepage, Jean-Luc; and Simon, Gerard, to Rhone-Poulenc Specialites Chimiques. Plasma production of trichorosilane, $SiHCl_3$. 4,836,997, Cl. 423-342.000.

Lephardt, John O., to Philip Morris, Incorporated. Package having magnetically coded tear tape or sealing strip. 4,836,378, Cl. 206-459.000.

Lequime, Michel; and Millet, Jocelyn, to Bertin & Cie. Method and apparatus for determining color, in particular of a dental prosthesis. 4,836,674, Cl. 356-319.000.

Lerner, George. *See*—
Ellman, Steven; Ellman, Fred; Ellman, Julius; and Lerner, George, 4,835,874, Cl. 33-27.110.

Lescrenier, Charles: *See*—
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Lesk, Israel A.; and Clark, Lowell E., to Motorola Inc. Method of making bipolar semiconductor device having a conductive recombination layer. 4,837,177, Cl. 437-31.000.

Leupold, Herbert A., to United States of America, Army. Hollow substantially hemispherical permanent magnet high-field flux source for producing a uniform high field. 4,837,542, Cl. 335-306.000.

Leutner, Bernd: *See*—
Schlaefer, Dieter; Kochanek, Wolfgang; and Leutner, Bernd, 4,837,002, Cl. 423-641.000.

LeVeen, Eric G.: *See*—
LeVeen, Harry H.; LeVeen, Robert F.; and LeVeen, Eric G., 4,837,017, Cl. 424-88.000.

LeVeen, Harry H.; LeVeen, Robert F.; and LeVeen, Eric G. Urease antigen product and process. 4,837,017, Cl. 424-88.000.

LeVeen, Robert F.: *See*—
LeVeen, Harry H.; LeVeen, Robert F.; and LeVeen, Eric G., 4,837,017, Cl. 424-88.000.

Lever Brothers Company: *See*—
Corring, Robert, 4,836,948, Cl. 252-99.000.
Duckworth, Ralph M.; and Murray, Andrew M., 4,837,007, Cl. 424-52.000.

Levine, Matthew; Cairo, Anthony; Russo, James; Rigotti, Victor; and Clark, Roger, to Honeywell Incorporated. System for time programming of states by communicating time data via a continuously rotatable potentiometer. 4,837,731, Cl. 364-145.000.

Leviton Manufacturing Company, Inc.: *See*—
Poliak, John M.; Lopez, Juan M.; and Gritz, Robert W., 4,836,805, Cl. 439-657.000.

Levy, Roland A.: *See*—
Gurvitch, Michael; and Levy, Roland A., 4,837,609, Cl. 357-71.000.

Lewin, Henry B.; and Bratic, Peter. Snow and ice traction device for automotive vehicles. 4,836,259, Cl. 152-222.000.

Lewis, David W.: *See*—
Aly, Fouad A.; Graven, Richard G.; and Lewis, David W., 4,836,989, Cl. 422-195.000.

Lewis, Trevor A. Back support apparatus. 4,836,534, Cl. 272-85.000.

Lherm, Andre ; Raveu, Bernard; and Nicolas, Alain, to Aerospatiale Societe Nationale Industrielle. Device for storing electrical energy at very high voltage, particularly for high energy density marx generator, and electrode for such a device. 4,837,661, Cl. 361-329.000.

Libassi, Jack. Safety device for automatic firearms. 4,835,894, Cl. 42-70.110.

Licentia Patent-Verwaltungs-GmbH: *See*—
Eisenmann, Michael; and Weidel, Edgar, 4,836,644, Cl. 350-96.160.

Lichty, Ronald D.: *See*—
Crosley, Thomas W.; Davison, Wayne; Goldberg, James R.; Hofheins, Leonard L.; Lichty, Ronald D.; Vollum, Charles A.; Vollum, Stephen H.; and Yee, Victor H., 4,837,822, Cl. 380-23.000.

Lief, Gerald A.: *See*—
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Liesch, Ingrid: *See*—
Dassler, Joachim; Girod, Detlef; Kramer, Klaus; and Liesch, Ingrid, 4,837,477, Cl. 313-25.000.

Liggett, William T.: *See*—
Peltzer, Douglas L.; Bechtel, Richard L.; Ko, Wen C.; and Liggett, William T., 4,836,861, Cl. 136-246.000.

Light Signatures, Inc.: *See*—
Goldman, Robert N., 4,837,840, Cl. 382-7.000.

Lilienthal, Walter B., to Conoco Inc. Oil removal from waterflooding injection water. 4,836,935, Cl. 210-788.000.

Limon, Juval: *See*—
Shalgi, Asaf; and Limon, Juval, 4,836,416, Cl. 222-48.000.

Lin, Ju-Chui; and Abbey, Kirk J., to Glidden Company, The. Cobalt (II) complex catalyst for polymerization of monomers. 4,837,326, Cl. 546-12.000.

Lin, Jui-Chang, to Lee, Jeun-Keun; and Liou, In-Jyh. Manually codeable cards for card readers. 4,837,427, Cl. 235-488.000.

Lin, Paul T.; McShane, Michael B.; Bigler, Charles G.; and Goertz, John A., to Motorola Inc. Process of making an electronic device package with peripheral carrier structure of low-cost plastic. 4,837,184, Cl. 437-217.000.

Lin, Wei Y., to W. R. Grace & Co. Polymer composition for photoresist application. 4,837,126, Cl. 430-284.000.

Lindauer Dornier Gesellschaft mbH: *See*—
Meroth, Klaus; and Wegendt-Kristyn, Dieter, 4,837,485, Cl. 318-161.000.

Linde Aktiengesellschaft: *See*—
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Zimmermann, Heinz, 4,837,372, Cl. 585-514.000.

Linde, Gerhard: *See*—
Kristof, Wolfgang; Schlebener, Claus; and Linde, Gerhard, 4,836,988, Cl. 422-171.000.

Lindemann Maschinenfabrik G.m.b.H.: *See*—
Greiner, Gabriele, 4,836,457, Cl. 241-73.000.

Linder, Klaus. Device for locating a detail. 4,836,785, Cl. 434-153.000.

Lindner, Manfred: *See*—
Bardl, Artur; and Lindner, Manfred, 4,837,827, Cl. 381-34.000.

Linear Technology Corporation: *See*—
Erdi, George, 4,837,496, Cl. 323-315.000.

Ling, Victor; and Kartner, Norbert, to Ontario Cancer Institute, The. Method for selecting hybridomas producing antibodies specific to the P-glycoprotein cell suface antigen and a cDNA clone encoding the C-terminal portion of the antigen. 4,837,306, Cl. 530-387.000.

Liotta, Lance A. Layered immunoassay using antibodies bound to transport particles to determine the presence of an antigen. 4,837,145, Cl. 435-7.000.

Liou, In-Jyh: *See*—
Lin, Jui-Chang. 4,837,427, Cl. 235-488.000.

Liposome Technology, Inc.: *See*—
Allen, Theresa M., 4,837,028, Cl. 424-450.000.

Lisec, Peter. Apparatus for the production of spacer frames. 4,836,005, Cl. 72-306.000.

Litjens, John J.; Griffiths, John M., and Baumhardt, Robert J., to Brunswick Corporation. Two cycle engine with turbulence generator at reed valves. 4,836,151, Cl. 123-65.00V

Litjens, John J.: *See*—
Griffiths, John M.; Litjens, John J.; and Newman, Neil A., 4,836,811, Cl. 440-61.000.

Littlejohn, David: *See*—
Chang, Shih-Ger; Liu, David K.; Griffiths, Elizabeth A., and Littlejohn, David, 4,837,361, Cl. 562-556.000.

Litton Systems, Inc.: *See*—
Hendow, Sami T.; and Martin, Graham J., 4,836,675, Cl. 356-350.000.
Jabr, Salim N.; Hutchings, Thomas J.; and Koumvakalis, Nicholas, 4,837,774, Cl. 372-94.000.

Liu, Christopher S.: *See*—
Kapuscinski, Maria M.; Liu, Christopher S.; Jones, Ronald E.; and Grina, Larry D., 4,836,943, Cl. 252-50.000.

Liu, David K.: *See*—
Chang, Shih-Ger; Liu, David K.; Griffiths, Elizabeth A.; and Littlejohn, David, 4,837,361, Cl. 562-556.000.

Liu, Ssu-Liu. Detachable electric fan. 4,836,751, Cl. 416-247.00R

Livingston, Larry J. Process for treating tobacco. 4,836,222, Cl. 131-310.000.

Lloyd, Bobbie J.: *See*—
Bondoc, Alfredo A.; Carroll, William R.; and Lloyd, Bobbie J., 4,835,929, Cl. 52-518.000.

Lloyd, Ian, to Nautical Services Pty. Ltd. Rotary pump with orbiting rotor of harder material than stator. 4,836,759, Cl. 418-56.000.

Lobb, William E., to Jaffe Acoustics, Inc. Acoustic sound system for a room. 4,837,829, Cl. 381-83.000.

Lobig, Arnold, to General Motors Corporation. Connecting rod. 4,836,044, Cl. 74-579.00E.

Lobig, Arnold, to General Motors Corporation. Connecting rod. 4,836,045, Cl. 74-579.00E.

Lobig, Arnold, to General Motors Corporation. Engine crankshaft supports. 4,836,159, Cl. 123-195.00H.

Lockheed Corporation: *See*—
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Lockheed Electronics Co., Inc.: *See*—
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Loctite Corporation: *See*—
Drain, Kieran F.; and Kadziela, Kris, 4,837,295, Cl. 528-111.000.

Lodini, Paolo, to Leda Logarithmic Electrical Devices for Automation S.r.l. Electric resistor designed for use as an electric conducting element in an electric circuit, and relative manufacturing process. 4,837,548, Cl. 338-47.000.

Lodoen, Gary A., to Du Pont de Nemours, E. I., and Company. Article of spandex having polycarbonate soft segment. 4,837,292, Cl. 528-63.000.

Loeser, Werner: *See*—
Richter, Juergen; Grau, Werner; Maurer, Gerd; Domas, Friedrich; Loeser, Werner; Bender, Rainer; Schulze, Axel-Ruediger; and Doerr, Kurt, 4,835,909, Cl. 51-281.0SF

Loewenstein, Lee M.: *See*—
Davis, Cecil J.; Abernathy, Joseph V.; Matthews, Robert T.; Hildenbrand, Randall C.; Simpson, Bruce; Bohlman, James G.; Loewenstein, Lee M.; and Jones, John I., 4,836,905, Cl. 204-298.000.

Lofthus, Robert M.: *See*—
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Login, Robert B.; Chaudhuri, Ratan K.; Tracy, David J., and Helioff, Michael W., to GAF Corporation. Quaternized nitrogen containing compounds. 4,837,013, Cl. 424-70.000.

Lohr & Bromkamp GmbH: *See*—
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Loiseau, Gerard: *See*—
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Lok-Fast, Inc.: *See*—
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Lo Maglio, Lewis C.: *See*—
Hayes, Thomas H.; and Lo Maglio, Lewis C., 4,836,423, Cl. 222-257.000.

Londeck, Paul B.; Sarti, Robert F.; and Aho, Jack R., to General Motors Corporation. Frameless glass system for vehicle door. 4,835,908, Cl. 49-377.000.

London Harness & Cable Corp.: *See*—
London, Norman H.; Greene, Leonard S.; and Falgoust, Lee J., 4,836,804, Cl. 439-598.000.

London, Norman H.; Greene, Leonard S.; and Falgoust, Lee J., to London Harness & Cable Corp. Electrical connector 4,836,804, Cl. 439-598.000.

Long, Kenneth J.; and Formby, Bobby W., to Motorola, Inc. Filler strips. 4,836,371, Cl. 206-334.000.

Longuet, Michel: *See*—
Seguin, Frederick P.; and Longuet, Michel, 4,837,252, Cl. 523-351.000.

Lonon, Edward M. Body suit and underpants with self-gripping fasteners. 4,835,795, Cl. 2-408.000.

Lopetrone, Juan P.; Valdes, Oliver; and Clo ston, James, Jr., to Southern California Edison Company. Fault detection. 4,837,519, Cl. 324-529.000.

Lopez, Alfred G.; and Lopez, Arthur F. Trailer hitch. 4,836,570, Cl. 280-507.000.

Lopez, Arthur F.: *See*—
Lopez, Alfred G.; and Lopez, Arthur F., 4,836,570, Cl. 280-507.000.

Lopez, Josephine: *See*—
Poorman, Thomas J.; Lopez, Josephine; and Behrens, Christine L., 4,836,637, Cl. 350-96.210.

Lopez, Juan M.: *See*—
Poliak, John M.; Lopez, Juan M.; and G itz, Robert W., 4,836,805, Cl. 439-657.000.

Lord Corporation: *See*—
Skala, Dennis P.; and Kloss, John W., 4 836,029, Cl. 73-799.000.
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L'Oreal: *See*—
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Rosenbaum, Georges; and Grollier, Jean F., 4,837,006, Cl. 424-47.000.

Lorenzana, Moises B.; and Lorenzana, Vance A. Protective cover for toothbrush. 4,835,813, Cl. 15-184.000.

Lorenzana, Vance A.: *See*—
Lorenzana, Moises B.; and Lorenzana, Vance A., 4,835,813, Cl. 15-184.000.

Lorimer, D'Arcy H., to Applied Materials, Inc. Process for forming reflective gold coatings. 4,837,052, Cl. 427 160.000.

Loschmann, Hartmut: *See*—
Franz, Rainer; Idigkeit, Werner; Loschmann, Hartmut; Rohner, Gerhard; and Kurr, Klaus, 4,836,515, Cl. 267-219.000.

Lough, Jimmie D.: *See*—
Chandler, Rupert P., Jr.; McDavid, Fred R.; Lough, Jimmie D.; and Dove, Gary E., 4,835,983, Cl. 62-259.100.

Loughlin, Robert W.; and Loughlin, Thomas G. Tapered shackle padlock. 4,835,996, Cl. 70-53.000.

Loughlin, Thomas G.: *See*—
Loughlin, Robert W.; and Loughlin, Thomas G., 4,835,996, Cl. 70-53.000.

Loutfy, Raouf O.; and Weisbrod, Kirk R., to Aluminum Company of America. Production of partially calcined carbonaceous reductant using steam. 4,836,998, Cl. 423-460.000.

Lowe, Barrie M.: *See*—
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Lowe, Thomas V.: *See*—
Casci, John L.; Lowe, Barrie M.; and Lowe, Thomas V., 4,836,996, Cl. 423-328.000.

Loza, Roman; Cooper, Arthur J.; and Coffey, Gerald P., to Standard Oil Company, The. Divalent ion tolerant aromatic sulfonates. 4,836,283, Cl. 166-225.000.

Lubrizol Corporation, The: *See*—
Hopkins, David L., 4,836,857, Cl. 106-2[illegible]4.400.

Lucas Industries Public Limited Company: *See*—
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Lucas Weinschel, Inc.: *See*—
Ramirez, Ronald A., 4,836,801, Cl. 439-[illegible]22.000.

Ludwig, Keith A.: *See*—
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Luk Lamellen und Kupplungsbau GmbH: *See*—
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Luk, Martin H.: *See*—
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Luke, Mike A.: *See*—
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Luly, Jay R.: *See*—
Rosenberg, Saul H.; Luly, Jay R.; and Plattner, Jacob J., 4,837,204, Cl. 514-18.000.

Lun, Salman, to General Motors Corporation. Hydraulic mount with reciprocal partition and orifice. 4,836,512, Cl. 267-140.100.

Lund, Earl A. E.; Richard, Robert G.; Shankland, Ian R.; and Wilson, David P., to Allied-Signal Inc. Azeotrope-like compositions of 1,1-dichloro-1-fluoroethane and ethanol. 4,836,947, Cl. 252-171.000.

Lundbeeg, Robert D.: *See*—
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Lundgren, Paul R., to Dual-Lite Manufacturing, Inc. Communicator and communication method and system. 4,837,779, Cl. 375-10.000.

Lussier, Roger J.; and Surland, George J., to W. R. Grace & Co.-Conn. Catalytic cracking process exploying a zeolite as catalysts and catalyst supports. 4,836,913, Cl. 208-120.000.

Luszcz, Stanley J.; and Zwicker, Harry R. to Lanxide Technology Company, LP. Dense skin ceramic structure and method of making the same. 4,837,232, Cl. 501-127.000.

Luthy, Chella, to Creative Environments, Inc. Fragrance dispensing apparatus. 4,837,421, Cl. 219-272.000.

Lutron Electronics Co., Inc.: *See*—
Graef, John T., 4,835,816, Cl. 16-114.000 R.

Luttmer, Joseph D.; York, Rudy L.; Smith, Patricia B.; and Davis, Cecil J., to Texas Instruments Incorporated. Method for depositing compound from group II-VI. 4,837,113, Cl. 427-38.000.

Lutz, Georg, to U.S. Philips Corporation. Circuit arrangement for converting a data signal. 4,837,571, Cl. 341-67.000.

Lutz, Gerhard: *See*—
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Lux, Helmut: *See*—
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M. Kamenstein, Inc.: *See*—
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M&T Chemicals Inc.: *See*—
Korbach, William; Corsentino, John A.; Jones, Allen R.; and McCaskie, John E., 4,836,897, Cl. 204-51.000.

Maack, Werner: *See*—
Gerst, Michael; Knapp, Horst J. T.; and Maack, Werner, 4,835,844, Cl. 29-747.000.

Maass, Hans: *See*—
Eckold, Gerd-Juergen; and Maass, Hans, 4,835,850, Cl. 29-243.520.

Mabboux, Michel: *See*—
Chemello, Jean-Pierre; and Mabboux, Michel, 4,835,886, Cl. 36-119.000.

Mabuchi Motor Co., Ltd.: *See*—
Matuda, Shinichi; Furuya, Kenji; and Kubo, Tetsuo, 4,837,473, Cl. 310-237.000.

MacArthur, Charles E. Vertical furnace. 4,836,115, Cl. 110-234.000.

Macchio, Ralph A.; Brown, Ivonne; and Tietjen, Marlene, to Revlon, Inc. Cosmetic powder employing spherical silica particles. 4,837,011, Cl. 424-69.000.

MacGregor Golf Company: *See*—
Puckett, Troy L.; and Cadorniga, Lauro C., 4,836,552, Cl. 273-218.000.

Machin Designs Limited: *See*—
Machin, Francis, 4,836,264, Cl. 160-120.000.

Machin, Francis, to Machin Designs Limited. Roller blind assembly. 4,836,264, Cl. 160-120.000.

MacIntosh, Edward D.: *See*—
Hertel, Richard J.; Delforge, Adrian C.; Mears, Eric L.; MacIntosh, Edward D.; Jennings, Robert E.; and Bhargava, Akhil, 4,836,733, Cl. 414-225.000.

MacKay, G. David M.; and Trivett, Gordon S., to Technical University of Nova Scotia, The. Fluidized bed combustion system. 4,836,116, Cl. 110-245.000.

MacLeod, Edward N., to Parker Hannifin Corporation. Inlet for a positive displacement pump. 4,836,760, Cl. 418-166.000.

Madaffari, Peter L., to Industrial Research Products, Inc. Microphone with frequency pre-emphasis channel plate. 4,837,833, Cl. 381-69.000.

Madore, Christopher: *See*—
Butler, Myron C.; and Madore, Christopher, 4,837,811, Cl. 379-96.000.

Madsen, Claus H.; and Hansen, Charles M., to CPS KEMI ApS. Liquid for removing printing and screen printing inks: butyrolactone and/or N-methyl-2-pyrrolidone and propylene glycol derivative. 4,836,950, Cl. 252-153.000.

Maeda, Kiyoto: *See*—
Ohsumi, Tadashi; Tsushima, Kazunori; Nishida, Sumio; Maeda, Kiyoto; Ooishi, Tadashi; and Matsuo, Noritada, 4,837,242, Cl. 514-365.000.

Maeda, Minoru: *See*—
Ishikawa, Shun-ichi; Imagawa, Tadao; Maeda, Minoru; and Shinozaki, Fumiaki, 4,837,106, Cl. 430-138.000.

Maeda, Tatsumi: *See*—
Yokoyama, Hirotaka; Ido, Tadashi; Maeda, Tatsumi, and Kurisu, Shunji, 4,837,092, Cl. 428-694.000.

Maekawa, Hitoshi: *See*—
Matsuo, Itaru; Takahashi, Yuzo; Hashimoto, Hideo; Takatsuka, Toru; Iimori, Takeru; Maekawa, Hitoshi; Ito, Tamotsu; Shohji, Yoshihiko; Watari, Ryuzo; and Aida, Hiroshi, 4,836,909, Cl. 208-72.000.

Maemori, Takashi, to Fuji Photo Film Co., Ltd. Video camera with removable viewer and controls. 4,837,817, Cl. 358-224.000.

Maeno, Satoru; Fukuyama, Norio; Ohishi, Tetsuo; Kyutoku, Senzo; and Nakamura, Thutomu, to Shinko Electric Co., Ltd. System for driving drum. 4,837,493, Cl. 318-685.000.

Magara, Takuji; and Suzuki, Toshio, to Mitsubishi Denki Kabushiki Kaisha. Wire electrode type electric discharge machining apparatus. 4,837,415, Cl. 219-69.00W.

Magerlein, Barney J., to Upjohn Company, The. Carbonate substituted monobactams as antibiotics. 4,837,318, Cl. 540-355.000.

Magnaflux Corporation. *See*—
Hahn, Joseph A.; and House, John E., 4,836,921, Cl. 210-202.000.

Magnien, Emile G.; and Plantureux, Alain M., to Diamant Applications. Processes for the mechanized manufacture of jewellery comprising a plurality of small contiguous stones set in a support made of precious metal, and jewellery obtained by these processes. 4,835,987, Cl. 63-28.000.

Mahler, Franz: *See*—
Karl, Veit-Holger; Mahler, Franz; and Greisel, Josef, 4,836,744, Cl. 425-72.100.

Mahlich, Gotthard, to Robert Krups Stiftung & Co. KG. Electric shaver. 4,835,861, Cl. 30-43.920.

MAHO Aktiengesellschaft: *See*—
Babel, Werner, 4,835,837, Cl. 29-568.000.

Maier, Gregory J. Generator and rechargeable battery system for ski. 4,837,494, Cl. 322-1.000.

Maier, Hans P.; and Vlaykowski, Nikolay, to Agintec AG. Pipe connection for instruments or machines. 4,836,583, Cl. 285-336.000.

Maier, Peter: *See*—
Forster, Markus; Maier, Peter; Gaudlitz, Harald; and Hefka, Richard, 4,837,437, Cl. 250-336.100.

Maillefer S. A.: *See*—
Bonjour, Jacques L.; and Baz, Dan G., 4,837,405, Cl. 174-36.000.

Maisch, Gerhard: *See*—
Kubel, Manfred; and Maisch, Gerhard, 4,836,350, Cl. 192-106.100.

Maisel, Manfred; Kolle, Erich; and Hauenstein, Gerhard, to U.S. Philips Corp. Hierarchic synchronization method and circuit arrangement for exchanges of a mesh telecommunication network. 4,837,850, Cl. 455-58.000.

Makita Electric Works, Ltd.: *See*—
Fushiya, Fusao, 4,836,063, Cl. 81-55.000.

Malhotra, Satish C., to Du Pont de Nemours, E. I., and Company. Tetrafluoroethylene copolymers. 4,837,267, Cl. 524-535.000.

Malinowski, Frank R.; and Pagano, Thomas S., to Santa Barbara Research Center. Variable phase time delay and signal aggregation system and method for achieving constant spatial resolution in scanning detection instruments. 4,837,431, Cl. 250-235.000.

Malinowski, Frank R. Apparatus for providing a predetermined surface scan velocity of the projected field of view of a scanning instrument. 4,837,433, Cl. 250-236.000.

Malinowski, Mark E.: *See*—
Roper, Daniel W.; Kramer, Dennis A.; Malinowski, Mark E.; and Dombrowski, John, 4,836,616, Cl. 303-92.000.

Mallet, Jean-Louis; and Landais, Jean-Louis, to Power Compact, Societe Anonyme. Captive nut terminal for electronic module power connectors. 4,836,808, Cl. 439-813.000.

Mallinckrodt, Inc.: *See*—
Denton, Larry E., 4,837,031, Cl. 424-464.000.
Nicolotti, Robert A., 4,837,003, Cl. 424-1.100.

Maltby, Robert E., Jr. Inspecting for matching of paired sheets of transparent material. 4,837,449, Cl. 250-571.000.

Mamada, Mamoru; Yahagi, Mitsuhisa; and Nakamura, Masao, to Bridgestone Corporation. Pneumatic radial tire tread for reducing wandering. 4,836,257, Cl. 152-209.00R.

Mamelak, Adam: *See*—
Hobson, J. Allan; Mamelak, Adam; Helfand, Rita; and Lavie, Peretz, 4,836,219, Cl. 128-782.000.

Man Gutehoffnungshuette GmbH: *See*—
Owsianny, Emund; Wengorz, Wilfried; and Aschenbruck, Emil, 4,836,746, Cl. 415-160.000.

Manabe, Katsuhide; Ogisu, Yasuhiko; Goto, Kazuaki; and Toya, Hisao, to Toyoda Gosei Co., Ltd. Corona discharge treating method and apparatus for resin moldings. 4,836,901, Cl. 204-164.000.

Manca, Richard D.; Hoffend, Thomas R.; and Jugle, Don B., to Xerox Corporation. Imaging process with prevention of toner spots. 4,837,105, Cl. 430-126.000.

Mangiapane, Rosario: *See*—
Peregrim, Theadore J.; Okurowski, Frank A.; and Mangiapane, Rosario, 4,837,577, Cl. 342-80.000.

Menglos, Stephen H., to United States of America, Energy Neutron range spectrometer. 4,837,442, Cl. 250-390.010.

Mankins, William L.: *See*—
Bell, James A. E.; Eerkes, Thijs; Diaz, Carlos M.; and Mankins, William L., 4,836,979, Cl. 419-23.000.

Manley, Paul W.; Porter, Roderick A.; and Lai, Mun F., to G. D. Searle & Co. Substituted alkylidene imidazoles. 4,837,333, Cl. 548-341.000.

Mann, Joe A.: *See*—
Hibbard, Billy B.; Mann, Joe A.; Koeleveld, Frans P. P.; Potepan, Agnes K.; White, Richard E.; Knight, Barry T.; and Bryant, Howard H., 4,837,281, Cl. 525-234.000.

Mannesmann AG: *See*—
Babsch, Alfred; and Fromme, Lorenz, 4,836,699, Cl. 400-479.000.
Kaufmann, Karl-Ernst, 4,836,111, Cl. 104-89.000.

Mannesmann Aktiengesellschaft: *See*—
Reichelt, Wolfgang; Scheulen, Matthias; Schwerdtfeger, Klaus; Voss-Spilker, Peter; and Feuerstacke, Ewald, 4,836,271, Cl. 164-417.000.

Mannesmann Rexroth GmbH: *See*—
Kauss, Wolfgang; and Schulte, Heinz, 4,835,966, Cl. 60-376.000.

Manor, Shalom; Pipko, Grigori; Langham, Adrian; Friedman, Nitza; and Steiner, Amalia, to Haifa Chemicals Ltd. Process for the manufacture of monopotassium phosphate. 4,836,995, Cl. 423-309.000.

Mansell, J. Douglas; Jones, Laurence E.; Johnson, Harlan B.; Krivak, Thomas G.; and Carson, Dennis W., to PPG Industries, Inc. Corrosion inhibiting pigment. 4,837,253, Cl. 523-443.000.

Mansfield, Robert L.; Spencer, Alexander K.; and St. Clair, Joe C., to International Business Machine Corporation. Graphics display system function circuit. 4,837,563, Cl. 340-732.000.

Mansho, Kenji: *See*—
Tanaka, Yukitaka; Nakamura, Minoru; Okada, Johshin; and Mansho, Kenji, 4,837,214, Cl. 514-179.000.

Manville Corporation: *See*—
Schuster, Richard L., 4,836,375, Cl. 206-427.000.
Tharp, Terry M.; Roberts, David W.; McCartney, John C.; and Harvey, John W., 4,837,669, Cl. 362-418.000.

Manzawa, Katsuyuki: *See*—
Miyake, Yasuhiko; and Manzawa, Katsuyuki, 4,836,220, Cl. 460-130.000.

Manzione, Louis T.: *See*—
Frisch, David C.; Manzione, Louis T.; Poelzing, Gerhard W.; and Weber, Wilhelm, 4,837,129, Cl. 430-319.000.

Maraven, S.A.: *See*—
Wright, Terence, 4,837,708, Cl. 364-509.000.

Marble, Allan E.: *See*—
Landymore, Roderick W.; and Marble, Allan E., 4,836,204, Cl. 128-334.00R.

Marie Guebels, Pierre-Paul F. M.: *See*—
Pieters, Jozef F. P.; and Marie Guebels, Pierre-Paul F. M., 4,837,818, Cl. 379-252.000.

Markwardt, Terrance L., to Minnesota Mining and Manufacturing Company. Cable splicing method. 4,835,854, Cl. 29-857.000.

Markwardt, Terrance L., to Minnesota Mining and Manufacturing Company. Electrical connector (with telescoping fer sealing). 4,836,800, Cl. 439-291.000.

Markwell, Roger E.; Hughes, Ian; and Ward, Robert W., to Beecham Group p.l.c. Pharmacologically useful pyrazolopyridines. 4,837,238, Cl. 514-212.000.

Marman, Douglas H.: *See*—
Abel, William E.; and Marman, Douglas H., 4,837,558, Cl. 340-550.000.

Marqardt, Wolfgang: *See*—
Rohling, Holmer; Schulz, Frank; and Marqardt, Wolfgang, 4,836,197, Cl. 128-201.230.

Marquot, Alexis, to Thomson Semiconducteurs. Integrated circuit of the logic circuit type comprising an electrically programmable non-volatile memory. 4,837,744, Cl. 365-195.000.

Marr-Leisy, Debra: *See*—
Goodman, Murray; Marr-Leisy, Debra; Rosenkranz, Roberto P.; Melmon, Kenneth L.; and Verlander, Michael S., 4,837,305, Cl 530-345.000.

Marr, Michael R.: *See*—
Burrus, Gilbert S., Jr.; Cooper, Ronald J.; Marr, Michael R.; Marsico, Mario A.; Pescatore, John C.; and Sullivan, Paul D., 4,837,677, Cl. 364-200.000.

Marra, John J., to United Technologies Corporation. Method of balancing a rotor. 4,835,827, Cl. 29-156.80R.

Marshall, William H.: *See*—
Heilhecker, Joe K.; Williams, Robert E.; and Marshall, William H., 4,836,302, Cl. 175-66.000.

Marsico, Mario A.: *See*—
Burrus, Gilbert S., Jr.; Cooper, Ronald J.; Marr, Michael R.; Marsico, Mario A.; Pescatore, John C.; and Sullivan, Paul D., 4,837,677, Cl. 364-200.000.

Martens, Franciscus J. A., to Shell Oil Company. Process for partial oxidation of a hydrocarbon-containing fuel. 4,836,831, Cl. 48-197.00R.

Martin, Charles L., to Raychem Corporation. Composite coupling. 4,836,586, Cl. 285-381.000.

Martin, David A., to Lockheed Corporation. Method of testing composite materials for structural damage. 4,836,030, Cl 73-800.000.

Martin, Graham J.: *See*—
Hendow, Sami T.; and Martin, Graham J., 4,836,675, Cl. 356-350.000.

Martin, John R.; and Anderson, Richard A., to Foxboro Company, The. Compliant diaphragm material. 4,837,068, Cl. 428-133.000.

Martin, Manuel F., to Mecanismos Auxiliares Industriales, SA -M.A.-I.S.A. Switch. 4,837,410, Cl. 200-5.00R.

Martin Marietta Corporation: *See*—
Brupbacher, John M.; Christodoulou, Leontios; and Nagle, Dennis C., 4,836,982, Cl. 420-129.000.

Martin Marietta Energy Systems, Inc.: *See*—
Allen, John D., Jr.; and Butler, Philip L., 4,837,735, Cl 364-513.000.

Martinez, Robert G.; Treybig, Duane S.; and Glass, Terry W., to Dow Chemical Company, The. Corrosion inhibitors. 4,837,323, Cl. 544-242.000.

Marton, Joseph S. Apparatus for holding and retaining a ladder. 4,836,493, Cl. 248-558.000.

Martor-Argentax E.H. Beermann KG: *See*—
Knoop, Heinz-Peter, 4,835,865, Cl. 30-162.000.

Martorana, Piero: *See*—
Zoller, Gerhard; Beyerle, Rudi; Schindler, Ursula; Nitz, Rolf-Eberhard; and Martorana, Piero, 4,837,225, Cl. 514-427.000.

Maruman Golf Co., Ltd.: *See*—
Kobayashi, Masashi, 4,836,550, Cl. 273-167.00H.

Maruta, Syuzi: *See*—
Ohira, Tadashi; Ito, Masazumi; and Maruta, Syuzi, 4,837,599, Cl 355-7.000.

Maruyama, Noriharu: *See*—
Nakane, Nobu; Maruyama, Noriharu, and Hakamada, Haruo, 4,837,601, Cl. 355-28.000.

Maruzeni, Shouji; and Yanagihara, Toshimichi, deceased (by Yanagihara, Hiromi, legal representative), to Asahi Denka Kogyo Kabushiki Kaisha. Blooming resistance improver. 4,837,041, Cl. 426-611.000.

Marver, Douglas J.: *See*—
Ungpiyakul, Tanskon; Morgan, Arch D.; Thomas Douglas C.; Ketenhofen, Timothy J.; Marver, Douglas J.; Couture-Dorschner, Laurie; and Pomplun, William S., 4,837,715, Cl. 364-552.000.

Maryanoff, Bruce E.; Maryanoff, Cynthia A.; McComsey, David F.; and Sorgi, Kirk L., to McNeilab, Inc. Stereoselective reaction for hexahydro-6-arylpyrrolo(2,1-A) isoquinolines. 4,837,328, Cl 546-94.000.

Maryanoff, Cynthia A.: *See*—
Maryanoff, Bruce E.; Maryanoff, Cynthia A., McComsey, David F.; and Sorgi, Kirk L., 4,837,328, Cl. 546-94.000.

Marzolph, Gerhard: *See*—
Streicher, Willi; Marzolph, Gerhard; Behre, Horst; and Blank, Heinz U., 4,836,959, Cl. 260-508.000.

Marzullo, Joseph H., to Pitney Bowes Inc. Wick cartridge assembly. 4,836,132, Cl. 118-264.000.

Mashiko, Harumitsu: *See—*
Tagoku, Izumi; and Mashiko, Harumitsu, 4,837,071, Cl. 428-195.000.

Mashiko, Kouichi: *See—*
Sakaya, Masuji; Motai, Tsuneaki; Mochizuki, Masataka; and Mashiko, Kouichi, 4,836,275, Cl. 165-46.000.

Massachusetts Institute of Technology: *See—*
Bozler, Carl O.; Fan, John C. C.; and McClelland, Robert W., 4,837,182, Cl. 437-82.000.
Olson, Gregory B.; Watton, John F.; and Cohen, Morris, 4,836,869, Cl. 148-331.000.
Sara, Jason, 4,837,722, Cl. 364-723.000.

Masset, Daniel: *See—*
Theoleyre, Serge; Salsetti, Pascal; and Masset, Daniel, 4,837,660, Cl. 361-275.000.

Mastel, James M.: *See—*
Johnson, Harold W.; Mastel, James M.; and Scott, Alan L., 4,836,100, Cl. 100-118.000.

Masterson, Earl E.: *See—*
Grabbe, Dimitry G.; Granitz, Richard F.; Bakker, Roel J.; Milbrand, Donald W., Jr.; and Masterson, Earl E., 4,836,791, Cl. 439-79.000.

Mastin, Ronald D., to DFM Corporation. Insect screen attachment apparatus for vehicles. 4,836,598, Cl. 296-91.000.

Mastrobuoni, Alma. Dispensable towels and their relating container. 4,836,410, Cl. 221-47.000.

Masuda, Yoshihisa: *See—*
Takahashi, Kozo; Masuda, Yoshihisa; and Inuki, Hisao, 4,837,582, Cl. 343-719.000.

Masumoto, Tsuyoshi: *See—*
Sugawara, Eishu; Nakayama, Taketoshi; and Masumoto, Tsuyoshi, 4,836,867, Cl. 148-301.000.

Masumoto, Yutaka, to Pioneer Electronic Corporation. Control signal extraction in a reproducing apparatus. 4,837,639, Cl. 360-27.000.

Matassa, Victor G.: *See—*
Bernstein, Peter R.; Brown, Frederick J.; Matassa, Victor G.; and Yee, Ying K., 4,837,235, Cl. 514-234.200.

Material Engineering Technology Laboratory Inc.: *See—*
Suzuki, Tatsuo; and Isono, Keinosuke, 4,836,691, Cl. 383-80.000.

Materials Sciences Corporation: *See—*
Dow, Norris F., 4,837,065, Cl. 428-86.000.

Matiere, Marcel. Process for obtaining hollow structures such as conduits, silos or shelters. 4,835,936, Cl. 52-741.000.

Matiere, Marcel. Enclosed structures of very large cross-section, such as conduits, silos or shelters. 4,836,714, Cl. 405-134.000.

Matsuda, Atsuya: *See—*
Sato, Toru; Matsuda, Atsuya; Shibata, Masaru; and Onohara, Masayuki, 4,837,047, Cl. 422-41.000.

Matsuda, Keiko: *See—*
Kato, Hideo; Matsushima, Masaaki; Matsuda, Keiko; and Shibata, Hirofumi, 4,837,123, Cl. 430-269.000.

Matsui, Fumio: *See—*
Murata, Yasushi; Ogoshi, Kunizho; and Matsui, Fumio, 4,836,890, Cl. 156-73.100.

Matsumoto, Hajime: *See—*
Sekine, Yasuo; Hirakawa, Nobuhiro; Kashiwaba, Noriaki; Yamaura, Tetsuaki; Harada, Hisako; Kutsuma, Teruo; Matsumoto, Hajime; Sekine, Akihiro; and Ishiwa, Yoshikazu, 4,837,316, Cl. 546-214.000.

Matsumoto, Isao: *See—*
Ikoma, Munehisa; Kawano, Hiroshi Matsumoto, Isao; and Yanagihara, Nobuyuki, 4,837,119, Cl. 429-206.000.

Matsumoto, Mitsuo; and Kaneda, Teruhisa, to Kuraray Company, Ltd. Wholly aromatic polyester. 4,837,268, Cl. 524-539.000.

Matsumoto, Tsuruyoshi; Shimada, Katsuhiko; and Uozu, Yoshihiro, to Mitsubishi Rayon Company, Ltd. Cladding material for optical fiber. 4,836,642, Cl. 350-96.340.

Matsumura, Koichi: *See—*
Mise, Noritoshi; and Matsumura, Koichi, 4,837,020, Cl. 424-68.000.

Matsumura, Yasuo: *See—*
Shimuzu, Isoo; Matsumura, Yasuo; and Inomata, Yoshihisa, 4,836,966, Cl. 264-63.000.

Matsuo, Itaru; Takahashi, Yuzo; Hashimoto, Hideo; Takatsuka, Toru; Iimori, Takeru; Maekawa, Hitoshi; Ito, Tomotsu; Shohji, Yoshihiko; Watari, Ryuzo; and Aida, Hiroshi, to Research Association for Residual Oil Processing. Process of thermally cracking heavy petroleum oil. 4,836,909, Cl. 208-72.000.

Matsuo, Mamoru; and Furuya, Masami, to Sky Aluminum Co., Ltd. Wrought material of aluminum alloy to be anodized gray and process for making the same. 4,836,863, Cl. 148-2 .000.

Matsuo, Noritada: *See—*
Ohsumi, Tadashi; Tsushima, Kazunori; Nishida, Sumio; Maeda, Kiyoto; Ooishi, Tadashi; and Matsuo, Noritada, 4,837,242, Cl. 514-365.000.

Matsushima, Masaaki: *See—*
Kato, Hideo; Matsushima, Masaaki; Matsuda, Keiko; and Shibata, Hirofumi, 4,837,123, Cl. 430-269.000.

Matsushita, Akira; and Nakano, Shohkichi, to Kabushiki Kaisha Nihon Denzai Kogyo Kenkyusho. Signal transmission device. 4,837,556, Cl. 340-310.00R.

Matsushita Electric Industrial Co., Ltd.: *See—*
Ikoma, Munehisa; Kawano, Hiroshi; Matsumoto, Isao; and Yanagihara, Nobuyuki, 4,837,119, Cl. 429-206.000.
Kuroe, Akio, 4,837,080, Cl. 428-323.00 .
Mizuno, Bunji; and Kubota, Masafumi, 4,837,172, Cl. 437-011.000.
Sakakima, Hiroshi; Osano, Koichi; Omata, Yuji; Satomi, Mitsuo; and Kugimiya, Koichi, 4,836,865, Cl. 148-306.000.
Takada, Noboru; and Yokoyama, Hajime, 4,837,852, Cl. 455-197.000.

Matsushita Electronics Corporation: *See—*
Adachi, Osamu; and Konosu, Osamu, 4,837,482, Cl. 313-402.000.

Matsushita, Toshihiko: *See—*
Morishita, Sadao; Matsushita, Toshihiko; and Sekine, Mikiya, 4,837,199, Cl. 503-227.000.

Matsushita, Yoshiaki: *See—*
Hiratsuka, Hachiro; Matsushita, Yoshiaki; and Yoshii, Shintaro, 4,837,610, Cl. 357-52.000.

Matsuura, Makiko: *See—*
Ohe, Yasuo; Matsuura, Makiko; Shimizu, Fumio; Nakajima, Yoshito; Shin Sadahito; and Shima, Kenji, 4,837,170, Cl. 436-548.000.

Matsuura, Yutaka: *See—*
Hamada, Takaki; Hayakawa, Tetsuji; and Matsuura, Yutaka, 4,837,114, Cl. 427-127.000.

Matter & Siegmann AG: *See—*
Burtscher, Heinz; Schmidt-Otl, Adnreas; and Siegmann, Hans-Christoph, 4,837,440, Cl. 250-379.000.

Matthews, George A.: *See—*
Graham, Charles H.; and Matthews, George A., 4,836,066, Cl. 81-177.400.

Matthews, Robert T.: *See—*
Davis, Cecil J.; Abernathy, Joseph V.; Matthews, Robert T.; Hildenbrand, Randall C.; Simpson, Bruce; Bohlman, James G.; Loewenstein, Lee M.; and Jones, John I., 4,836,905, Cl. 204-298.000.

Matuda, Shinichi; Furuya, Kenji; and Kubo, Tetsuo, to Mabuchi Motor Co., Ltd. Commutator. 4,837,473, Cl. 310-237.000.

Matzner, Markus; and Papuga, Donald M., to Amoco Corporation. Novel poly(aryl ether ketone)-polyester block copolymers. 4,837,284, Cl. 525-437.000.

Mauer, Dieter; and Renner, Wolf, to Emhart Industries, Inc. Blind-riveting assembly. 4,836,728, Cl. 411-43.000.

Maurer, Gerd: *See—*
Richter, Juergen; Grau, Werner; Maurer, Gerd; Domas, Friedrich; Loeser, Werner; Bender, Rainer; Schulze, Axel-Ruediger; and Doerr, Kurt, 4,835,909, Cl. 51-281.0SF.

Max-Planck-Gesellschaft Zur Foederung der Wissenschaften: *See—*
Eibl, Hansjorg, 4,837,023, Cl. 424-439.000.

Max-Planck-Gesellschaft Zur Foederung Der Wissenschaften E. V.: *See—*
Eibl, Hansjorg, 4,837,340, Cl. 549-221.000.

Max Rice Corporation, The: *See—*
Rice, Max, 4,836,538, Cl. 272-146.000.

Maxon Industries, Inc.: *See—*
Neagu, Alexandru, 4,836,736, Cl. 414-557.000.

Maxwell, G. Maret; and Webber, Richard L., to United States of America, Health and Human Services. Method and device for determining viability of intact teeth. 4,836,206, Cl. 128-633.000.

Maxwell Laboratories Inc.: *See—*
Riordan, John C.; and Pearlman, Jay S., 4,837,794, Cl. 378-119.000.

May, Richard L.; and Curran, Kenneth J., to Cal R&D, Inc. Magnetic tape transport system. 4,836,465, Cl. 242-192.000.

Mayama, Osamu; and Ishikawa, Yoshimi, to Mitsubishi Kinzoku Kabushiki Kaisha. Fe-based sintered alloy for valve seats for use in internal combustion engines. 4,836,848, Cl. 75-231.000.

Maye, Robert. Modular display stand. 4,836,393, Cl. 211-188.000.

McAllister, Lawrence E.; and Jannasch, Norman E., to Allied-Signal Inc. Barrier coating and penetrant providing oxidation protection for carbon-carbon materials. 4,837,073, Cl. 428-212.000.

McAlpine, Gary, to Aptec Computer Systems, Inc. Data transfer system and method of operation thereof. 4,837,785, Cl. 370-85.000.

McAuslan, Brian R., to Telectronics N.V. Implantable materials. 4,836,884, Cl. 156-629.000.

McCammon, Michael: *See—*
Culler, Glen J.; Pearson, Robert B.; McCammon, Michael; Proctor, William L.; and Richardson, John L., 4,837,678, Cl. 364-200.000.

McCartney, John C.: *See—*
Tharp, Terry M.; Roberts, David W.; McCartney, John C.; and Harvey, John W., 4,837,669, Cl. 362-418.000.

McCaskie, John E.: *See—*
Korbach, William; Corsentino, John A.; Jones, Allen R.; and McCaskie, John E., 4,836,897, Cl. 204-51.000.

McClain, Donald T., to Northern Telecom Limited. Security handset. 4,837,819, Cl. 379-424.000.

McClellan, Gary C. Handgun holder. 4,836,425, Cl. 224-163.000.

McClelland, Robert W.: *See—*
Bozler, Carl O.; Fan, John C. C.; and McClelland, Robert W., 4,837,182, Cl. 437-82.000.

McClymonds, Bruce J. Sign holder. 4,835,889, Cl. 40-611.000.

McComsey, David F.: *See—*
Maryanoff, Bruce E.; Maryanoff, Cynthia A.; McComsey, David F.; and Sorgi, Kirk L., 4,837,328, Cl. 546-94.000.

McCormack, Joseph A., to Davidson Textron Inc. Retainer mold for forming foamed automotive articles. 4,836,495, Cl. 249-83.000.

McCullough, Francis P., Jr.; and Hall, David M., to Dow Chemical Company, The. Carbonaceous fibers with spring-like reversible deflection and method of manufacture. 4,837,076, Cl. 428-224.000.

McCullough, Frederick L. Combination sillcock and leakage relief system. 4,836,237, Cl. 137-312.000.

McDavid, Fred R.: *See—*
Chandler, Rupert P., Jr.; McDavid, Fred R.; Lough, Jimmie D.; and Dove, Gary E., 4,835,983, Cl. 62-259.100.

McDonald, Gerald: *See—*
Hannah, William J., 4,836,436, Cl. 228-182.000.

McDonald, Gerald H., to Resistance Technology, Inc. Method of mounting a potentiometer. 4,835,833, Cl. 29-525.000.

McDonnell Douglas Corporation: *See—*
Mukutmoni, Tapas, 4,837,525, Cl. 331-165.000.

McDougal, John A. Spiral windings. 4,837,544, Cl. 336-185.000.

McFarland, Michael J.: *See—*
Wu, Chengjiu; Mooring, Anne M.; McFarland, Michael J.; Osuch, Christopher E.; and Yardley, James T., 4,837,124, Cl. 430-270.000.

McFee, John E., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Magnetometer-based locator and identifier for ferrous objects having unknown shapes. 4,837,489, Cl. 324-67.000.

McGill, David C.; McIntire, Gary J.; and Stowe, Mitchell T., to Ford Aerospace & Communications Corporation. Telemetry data processor. 4,837,739, Cl. 364-900.000.

McGroarty, Bryan M. Joint leak stop membrane. 4,837,085, Cl. 421-451.000.

McInerney, Bernard V.: *See—*
Gregson, Richard P.; and McInerney, Bernard V., 4,837,222, Cl. 514-422.000.

McIntire, Gary J.: *See—*
McGill, David C.; McIntire, Gary J.; and Stowe, Mitchell T., 4,837,739, Cl. 364-900.000.

McIntosh, Kenneth B.; Pratt, James O.; and Stout, Donald E., to McIntosh, Kenneth B. Medication clock. 4,837,719, Cl. 364-569.000.

McKee, Graham E.: *See—*
Zahradnik, Franz; Ulmerich, Karlheinz; McKee, Graham E.; Reimann, Horst; Pflueger, Richard; and Theysohn, Rainer, 4,837,264, Cl. 524-381.000.

McKeon, John P.: *See—*
Wiley, Michael J.; Irving, Stewart; and McKeon, John P., 4,837,453, Cl. 307-10.200.

McLane, Frank E. Lawn mower height adjustment linkages. 4,835,952, Cl. 56-17.200.

McLean, Peter T.: *See—*
Bean, Robert G.; Beckman, Michael E.; Rubinson, Barry L.; Gardner, Edward A.; Sergeant, O. Winston; and McLean, Peter T., 4,837,675, Cl. 364-200.000.

McManus, Phillip W. Tennis utility belt. 4,836,427, Cl. 224-224.000.

McNeilab, Inc.: *See—*
Maryanoff, Bruce E.; Maryanoff, Cynthia A.; McComsey, David F.; and Sorgi, Kirk L., 4,837,328, Cl. 546-94.000.

McShane, Michael B.: *See—*
Lin, Paul T.; McShane, Michael B.; Bigler, Charles G.; and Goertz, John A., 4,837,184, Cl. 437-217.000.

Mears, Eric L.: *See—*
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Mechanical Technology Incorporated: *See—*
Curwen, Peter W.; and Hurst, Ralph, 4,836,757, Cl. 417-416.000.

MediMatrix: *See—*
Berg, Richard A.; Silver, Frederick H.; and Pachence, James M., 4,837,285, Cl. 530-356.000.

Medisense, Inc.: *See—*
Armstrong, Frazer A.; Oliver, Brian N.; and Hill, Hugh A. O., 4,836,904, Cl. 204-294.000.

Meglino, Don A. Slat retaining means for chain link fences. 4,836,505, Cl. 256-34.000.

Mehlert, Martin: *See—*
Adrian, Willy; and Mehlert, Martin, 4,836,353, Cl. 198-335.000.

Mehlhorn, Heinz; and Schmahl, Gunter, to Bayer Aktiengesellschaft. Agents against protozoa in insects. 4,837,216, Cl. 514-241.000.

Mehren, Herbert: *See—*
Christ, Hubertus; Niemann, Klaus; and Mehren, Herbert, 4,836,475, Cl. 246-169.00R.

Meijer, John, to Akzo N.V. t-Alkenyl peroxy esters and their use as initiators and curing agents. 4,837,287, Cl. 526-231.000.

Meijer, Roelf J.; and Ziph, Benjamin, to Stirling Thermal Motors, Inc. Yieldably mounted lubricant control assemblies for piston rods. 4,836,094, Cl. 92-167.000.

Meinel, Aden B.; Meinel, Marjorie P.; and Stacy, John E., to United States of America, National Aeronautics and Space Administration. Compensation for primary reflector wavefront error. 4,836,666, Cl. 350-504.000.

Meinel, Marjorie P.: *See—*
Meinel, Aden B.; Meinel, Marjorie P.; and Stacy, John E., 4,836,666, Cl. 350-504.000.

Meiners, David J.: *See—*
Castonguay, Roger N.; and Meiners, David J., 4,835,842, Cl. 29-622.000.

Meinershagen, Charles I., to NewTech Products, Inc. Dental tool with dual restoration material retainers. 4,836,781, Cl. 433-141.000.

Meki, Naoto; and Takano, Hirotaka, to Sumitomo Chemical Company, Limited. Fungicidal morpholine compounds, and their production and use. 4,837,236, Cl. 514-233.800.

Meland, Ronald F.: *See—*
Berfield, Robert C.; Meland, Ronald F.; and Seasholtz, Craig A., 4,836,753, Cl. 417-236.000.

Melde-Tuczai, Helmut; Aigner, Johann; and Skatsche, Othmar, to AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik M.B.H. Prof.Dr.Dr.h.c. Hans List. Engine brake of an internal combustion engine. 4,836,162, Cl. 123-321.000.

Melde-Tuczai, Helmut; Skatsche, Othmar; and Rachholz, Josef, to AVL Gesellschaft fur Verbrennungskraftmaschinen und Messtechnik M.B.H., Prof. Dr. Dr. h.c. Hans List. Injection-type internal combustion engine. 4,836,171, Cl. 123-508.000.

Meliconi, Loris, to Meliconi s.r.l. Shockproof protective sheath for remote controls, in particular those of television receivers. 4,836,256, Cl. 206-523.000.

Meliconi s.r.l.: *See—*
Meliconi, Loris, 4,836,256, Cl. 206-523.000.

Melink, Peter, to Xerox Corporation. Sheet sorters. 4,836,526, Cl. 271-209.000.

Mellin, Robert C.: *See—*
Savage, John R.; and Mellin, Robert C., 4,836,148, Cl. 123-41.490.

Mellwig, Dieter; and Lange, Hans-Willi, to Albert Schulte Sohne GmbH & Co. Caster with blocking device and depressible releasing member for the blocking device. 4,835,815, Cl. 16-35.00R.

Melmon, Kenneth L.: *See—*
Goodman, Murray; Marr-Leisy, Debra; Rosenkranz, Roberto P.; Melmon, Kenneth L.; and Verlander, Michael S., 4,837,305, Cl. 530-345.000.

Melton, Sidney H. Method of providing a refractory covering to a furnace wall. 4,835,831, Cl. 29-460.000.

Menard, Michael J.: *See—*
Spano, John D.; and Menard, Michael J., 4,836,070, Cl. 83-27.000.

Mendoza, Benjamin D.: *See—*
Wright, William L.; and Mendoza, Benjamin D., 4,836,238, Cl. 137-315.000.

Mengel, William H., to RCA Licensing Corporation. Programmable operating-parameter control appatatus for a television receiver. 4,837,627, Cl. 358-191.100.

Mercer, Patricia N.: *See—*
Gustafson, Bruce L.; Wehner, Paul S.; Nelson, Gregory O.; and Mercer, Patricia N., 4,837,367, Cl. 568-831.000.

Merck & Co., Inc.: *See—*
Garsky, Victor M.; and Stein, Robert A., 4,837,304, Cl 530-328.000.
Halczenko, Wasyl; Hartman, George; and Pitzenberger, Steven M., 4,837,205, Cl. 514-25.000.

Merck Patent Gesellschaft mit Beschrankter Haftung: *See—*
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Poetsch, Eike; and Casutt, Michael, 4,837,402, Cl. 548-303.000.

Merger, Franz; and Hettinger, Peter, to BASF Aktiengesellschaft. Preparation of 2,2-disubstituted 3-chloropropionic esters. 4,837,357, Cl. 560-226.000.

Merip Oil Tools International (MOTI) S.A.: *See—*
Eric, Couste; and Jean-Luc, Jacob, 4,836,287, Cl. 166-321.000.

Meroth, Klaus; and Wegendt-Kristyn, Dieter, to Lindauer Dornier Gesellschaft mbH. Method and system for starting a power loom. 4,837,485, Cl. 318-161.000.

Merrell Dow Pharmaceuticals Inc.: *See—*
Flynn, Gary A.; and Beight, Douglas W., 4,837,354, Cl. 560-60.000.

Merrick Engineering, Inc.: *See—*
Modglin, Donald D., 4,837,418, Cl. 219-121.450.

Merritt, Frederick M., II: *See—*
Brode, George L., II; and Merritt, Frederick M., II, 4,837,005, Cl. 424-47.000.

Meserol, Peter M.; and Acker, Jesse, to Gamma Biologicals, Inc. Biological fluid assay system and method. 4,837,160, Cl. 436-45.000.

Messer, Griesheim GMBH: *See—*
Spahn, Walter, 4,835,974, Cl. 62-12.000.

Messerschmitt-Boelkow-Blohm GmbH: *See—*
Aulehla, Felix; and Genssler, Hans-Peter, 4,836,473, Cl. 244-130.000.
Woehrl, Alfons; and Hora, Peter, 4,836,024, Cl. 73-514.000.

Messner, Johann: *See—*
Wild, Georg; Kohler, Rembert; Weibelzahl, Manfred; Haushofer, Martin; and Messner, Johann, 4,837,671, Cl. 363-35.000.

Metalurgica Carto Ltda.: *See—*
Heuchert, Karl H., 4,835,907, Cl. 49-352.000.

Methode Electronics, Inc.: *See—*
Best, Gary R., 4,837,411, Cl. 200-5.00A.

Metz, Kenneth D.; Haggerty, John W.; and Alf, Steven W., to Jennico, Inc. Closure mechanism for liquid containers. 4,836,419, Cl. 222-110.000.

Metzger, Andre: *See—*
Nohl, Andre J.; Nau, Vance J.; and Metzger, Andre, 4,836,037, Cl. 73-864.160.

Meyer, Jean-Luc: *See—*
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Meyer, Jean-Marc; and Mizandjian, Jean-Luc, to L'Air Liquide. Apparatus for providing inert atmosphere in airtight packages for food products. 4,835,937, Cl. 53-88.000.

Meyer, Klaus-Rudolf; Venn, Ingo; and Mueller-Niescher, Ursula, to Huels Aktiengesellschaft. Process for the hydrolytic preparation of a prepolymer amide from a C_{12}-aminocarboxylic acid lactam. 4,837,297, Cl. 528-326.000.

Meyer, Rolf-Volker: *See*—
Glock, Volker; Ebert, Wolfgang; and Meyer, Rolf-Volker, 4,837,301, Cl. 528-388.000.
Meyzonnette, Jean Louis: *See*—
Huignard, Jean Pierre; and Meyzonnette, Jean Louis, 4,836,629, Cl. 350-3.730.
Michaeli, Dov, to University of California, The Regents of the. Compositions, articles and mehtod for improving wound healing. 4,837,024, Cl. 424-446.000.
Michel, Rudolf: *See*—
Deschler, Ulrich; Hellwig, Georg; Michel, Rudolf; Kleinschmit, Peter; and Wolff, Siegfried, 4,837,32[illegible], Cl. 544-209.000.
Michele, Cardone; Angelo, Grandini; and Bruno, Zaramella, to Tecnomagnete S.p.A. Magnetic work-holder 4,837,540, Cl. 335-286.000.
Michelin & Cie: *See*—
Pompier, Jean-Pierre, 4,837,553, Cl. 34[illegible]-442.000.
Michelotti, Guido, to Micromag S.P.A. Bicycle disk wheel and process for the construction thereof. 4,835,857, Cl. 29-159.00R.
Michlovic, John J., to Standard Products Company, The. Prefabricated glazing gasket. 4,835,927, Cl. 52-400.000
Micro Magnetics, Inc.: *See*—
Walsh, John V., 4,836,932, Cl. 210-695.000.
Micro-Probe, Inc.: *See*—
Whann, Welton B.; and Elizondo, Paul M., 4,837,622, Cl. 324-158.00P.
Microdot Inc.: *See*—
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Micromag S.P.A.: *See*—
Michelotti, Guido, 4,835,857, Cl. 29-159.00R.
Midorikawa, Shoichi: *See*—
Miyoshi, Masazumi; Isayama, Muneo; Midorikawa, Shoichi; and Ota, Akitada, 4,836,421, Cl. 222-166.000.
Mihara, Teruyoshi, to Nissan Motor Co., Ltd. Accelerometer. 4,836,025, Cl. 73-517.00R.
Mikami, Yuzuru: *See*—
Arai, Tadashi; and Mikami, Yuzuru, 4,837,149, Cl. 435-119.000.
Mikhail, Ameer G. Cigarette packs and boxes with attached matches. 4,836,366, Cl. 206-94.000.
Milbrand, Donald W., Jr.: *See*—
Grabbe, Dimitry G.; Granitz, Richard F.; Bakker, Roel J.; Milbrand, Donald W., Jr.; and Masterson, Earl E., 4,836,791, Cl. 439-79.000.
Miles Inc.: *See*—
Engelmann, Helmut; Hildenbrand, Karlheinz; and Junkers, Gunter, 4,837,043, Cl. 427-2.000.
Milgate, Robert W., III, to Eclipse Ion Technology, Inc. Method and apparatus for venting vacuum processing equipment. 4,836,233, Cl. 137-14.000.
Milks, Robert R.: *See*—
Rosinski, Richard J.; and Milks, Robert R., 4,837,074, Cl. 428-220.000.
Millar, Frederick W. Pressure-responsive security alarm. 4,837,555, Cl. 340-544.000.
Miller, Arnold G.: *See*—
Crockett, Robert N.; Kern, Robert F.; Miller, Arnold G.; Norris, Richard E.; Pousson, Michael W., Jr.; and Wagner, Robert E., 4,837,680, Cl. 364-200.000.
Miller, Dennis E.: *See*—
Abujudom, David N.; and Miller, Dennis E., 4,836,496, Cl. 251-11.000.
Miller, James K., to Walbro Corporation. Cold-start engine priming and air purging system. 4,836,157, Cl. 123-187.50R.
Miller, Joseph E., Jr. Recoil web pool skimmer. 4,836,920, Cl. 210-169.000.
Miller, Ralph, to T-Thermal, Inc. Production of sulfur from sulfur dioxide obtained from flue gas. 4,837,00[illegible], Cl. 423-574.00R.
Miller, Robert E.: *See*—
Dwyer-Hallquist, Patricia; Becker, William J.; Miller, Robert E.; and Glanz, Kenneth D., 4,837,210, Cl. 544-150.000.
Miller, Walter, to Johannes Heidenhain GmbH. Method of manufacturing an embodiment of measure. 4,835,82[illegible], Cl. 29-447.000.
Miller, William G., to North American Philips Corporation. Automatic hue corrector apparatus and method with a capability to correct wide angle demodulator hue signal distortion created in response to predominantly green hue environments. 4,837,612, Cl. 358-28.000.
Millet, Jocelyn: *See*—
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Mills, Deborah J.: *See*—
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Milne, James A., to CTI Industries. Support structure for an ornament. 4,837,059, Cl. 428-12.000.
Milner, Clifford E., to Du Pont de Nemours, E. I., and Company. Electron beam recording film. 4,837,13[illegible], Cl. 430-524.000.
Milsco Manufacturing Company: *See*—
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Minamitani, Isei: *See*—
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Mineral Deposits Limited: *See*—
Grobler, Hans J., 4,836,926, Cl. 210-512.100.
Minigrip, Inc.: *See*—
Gould, Russell J., 4,835,835, Cl. 29-527.200.
Ministry of International Trade and Industry: *See*—
Uchiyama, Futoshi; Tsukamoto, Koichi; Kurashige, Tomoyoshi; Furusawa, Kaoru; and Koike, Mitsumaro, 4,836,417, Cl. 222-63.000.
Ministry of Posts and Telecommunications: *See*—
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Minnesota Mining and Manufacturing Company: *See*—
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Carey, Patrick H., Jr.; and Kronzer, Joseph P., 4,837,067, Cl. 428-108.000.
Dunshee, Wayne K.; and Hames, Sydney B., 4,837,062, Cl. 428-41.000.
Harrell, Edward R.; Rustad, Norman E.; and Mosbey, Deral T., 4,837,082, Cl. 428-329.000.
Markwardt, Terrance L., 4,835,854, Cl. 29-857.000.
Markwardt, Terrance L., 4,836,800, Cl. 439-291.000.
Rasmussen, Jerald K.; Heilmann, Steven M.; and Palensky, Frederick J., 4,837,290, Cl. 526-304.000.
Seidel, Udo, 4,836,803, Cl. 439-447.000.
Tumey, Michael L.; Bange, Donna W.; and Robbins, Aida F., 4,836,832, Cl. 51-293.000.
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Natsuhara, Toshiya, 4,836,136, Cl. 118-657.000.
Ohira, Tadashi; Ito, Masazumi; and Maruta, Syuzi, 4,837,599, Cl. 355-7.000.
Oyabu, Masaaki; Sugiura, Masamichi; Hasegawa, Hirofumi; and Nakatani, Munehiro, 4,837,846, Cl. 382-50.000.
Minor, Valerie L.: *See*—
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Kuriyama, Katsumi; Hanada, Kazuyuki; Nakamura, Susumu; Misaizu, Iwao; Kashimura, Masashi; and Goto, Tomoko, 4,837,198, Cl. 503-227.000.
Mise, Noritoshi; and Matsumura, Koichi, to Takeda Chemical Industries, Ltd. Deodorant composition. 4,837,020, Cl. 424-68.000.
Mita Industrial Co., Ltd.: *See*—
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Mitanihara, Makoto; and Sekine, Tatsuo, to Kabushiki Kaisha Sato. Automatic packaging method and apparatus. 4,836,873, Cl. 156-157.000.
Mitchell Chemical Co.: *See*—
Cunningham, Glenn R.; and Senules, Alex, 4,836,870, Cl. 149-2.000.
Mitchell, James L., to Rogers Tool Works, Inc. Quick change tool holder. 4,836,706, Cl. 403-24.000.
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Mitsubishi Chemical Industries Limited: *See*—
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Mitsubishi Denki Kabushiki Kaisha: *See*—
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Anzai, Yoshinori; Saikatsu, Takao; Saito, Masato; and Tsuchihashi, Michihiro, 4,837,478, Cl. 313-112.000.
Dosaka, Katsumi; Kumanoya, Masaki; Miyatake, Hideshi; Hidaka, Hideto; Konishi, Yasuhiro; Yamasaki, Hiroyuki; Ikeda, Yuto; Tsukamoto, Kazuhiro; and Shimoda, Masaki, 4,837,747, Cl. 371-10.000.
Iijima, Kenji, 4,837,706, Cl. 364-518.000.
Ishii, Mitsuaki; and Miyazaki, Masaaki, 4,837,454, Cl. 307-10.100.
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Kubo, Tsutomu; Asano, Kenichi; Kikuchi, Hiroaki; and Suzuki, Mitsuyoshi, 4,837,632, Cl. 358-222.000.
Magara, Takuji; and Suzuki, Toshio, 4,837,415, Cl. 219-69.00W.
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Nishioka, Tadashi; Yasue, Takao; and Koyama, Hiroshi, 4,837,445, Cl. 250-442.100.
Okitaka, Takenori; and Miyazaki, Yukio, 4,837,463, Cl. 307-473.000.
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Wakata, Hitoshi; Inoue, Mitsuo; Sato, Yukio; Haruta, Kenyu; and Nagai, Haruhiko, 4,837,773, Cl. 372-86.000.
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Mitsubishi Electric Corporation: *See*—
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Mitsubishi Gas Chemical Co., Ltd.: *See*—
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Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
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Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Harada, Masahiro; Yanagi, Kenichi; Fukushima, Takeo; Furukawa, Kusuo; Soeda, Naohiko; Ohta, Norio; Sato, Kuniaki; and Nakajima, Yasuhisa, 4,836,774, Cl. 432-8.000.
Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
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Mitsubishi Paper Mills, Ltd.: *See*—
Ikeda, Haruhiko; Higuchi, Masahiro; and Ohkura, Hirokazu, 4,837,197, Cl. 503-209.000.
Kondo, Toshiro; Kanada, Eiji; and Nishinoiri, Hiroshi, 4,837,122, Cl. 430-204.000.
Morishita, Sadao; Matsushita, Toshihiko; and Sekine, Mikiya, 4,837,199, Cl. 503-227.000.
Yamamoto, Hirokazu; and Furukawa, Akira, 4,837,103, Cl. 430-115.000.
Mitsubishi Petrochemical Company Limited: *See*—
Horie, Shinji, 4,837,138, Cl. 430-106.000.
Kadowaki, Koju; Sarumaru, Kohei; and Shibano, Takeshi, 4,837,360, Cl. 562-546.000.
Mitsubishi Rayon Company, Ltd.: *See*—
Matsumoto, Tsuruyoshi; Shimada, Katsuhiko; and Uozu, Yoshihiro, 4,836,642, Cl. 350-96.340.
Mitsubishi Yuka Badische Co., Ltd.: *See*—
Kato, Naoyuki, 4,836,871, Cl. 156-79.000.
Mitsuhashi, Kenichi: *See*—
Tomita, Yoji; Oishi, Eiichi; Miyaji, Hiroshi; Morimoto, Hiroya; Sekigawa, Tetsuo; and Mitsuhashi, Kenichi, 4,836,917, Cl. 210-104.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Shigemoto, Hiromi, 4,837,277, Cl. 525-146.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Ogawa, Shinji; Iguchi, Seiya; Kimura, Hiroshi; and Ohmori, Yoh, 4,837,371, Cl. 548-497.000.
Mitsunobu, Takamasa, to Ricoh Company, Ltd. Test mode activation circuit. 4,837,505, Cl. 324-158.00R.
Mitsuya, Hiroaki: *See*—
Tam, Steve; Weigele, Manfred; Broger, Samuel; and Mitsuya, Hiroaki, 4,837,311, Cl. 536-22.000.
Mitsuya, Yoshihide: *See*—
Kageyama, Hidehei; Mitsuya, Yoshihide; and Kobayashi, Saburo, 4,836,703, Cl. 401-65.000.
Mittelhauser, Bernhard; and Winkler, Bernd, to Mittelhauser, Bernhard. Exterior mirror for a vehicle. 4,836,490, Cl. 248-549.000.
Miura, Teruo: *See*—
Nishizawa, Kuninori; Miura, Teruo; Watanabe, Yoichi; and Takagi, Hirohiko, 4,836,262, Cl. 152-451.000.
Miwa, Hiroshi: *See*—
Tani, Toyofumi; and Miwa, Hiroshi, 4,837,649, Cl. 360-104.000.
Miyaji, Hiroshi: *See*—
Tomita, Yoji; Oishi, Eiichi; Miyaji, Hiroshi; Morimoto, Hiroya; Sekigawa, Tetsuo; and Mitsuhashi, Kenichi, 4,836,917, Cl. 210-104.000.
Miyaji, Katsuaki; Arai, Kazutaka; Ohara, Yoshio; and Takahashi, Yasuhiro, to Nissan Chemical Industries Ltd. Optically active bicyclo carboxylic acids and their derivatives. 4,837,344, Cl. 549-319.000.
Miyakawa, Tadashi: *See*—
Oishi, Hisao; Yanagihara, Kazuhiko; Miyakawa, Tadashi; Nakamura, Takeshi; Akimoto, Kazuhiko; and Shioji, Mitsuaki, 4,836,652, Cl. 350-334.000.
Miyake, Masao: *See*—
Murao, Yoshikazu; and Miyake, Masao, 4,837,337, Cl. 548-551.000.
Miyake, Yasuhiko; and Manzawa, Katsuyuki, to Japan Tobacco, Inc. Tobacco leaf-stripping machine. 4,836,220, Cl. 460-130.000.
Miyake, Yasuo: *See*—
Kakimoto, Fumio; Asakawa, Naoki; Ishibashi, Yasuo; and Miyake, Yasuo, 4,837,022, Cl. 424-94.300.
Miyamoto, Mitsuo: *See*—
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Miyamoto, Ritsu; Tsuchiya, Eiichi; Shishido, Kazuhiko; Shimizu, Toshiaki; and Hosoya, Atsushi, to Victor Company of Japan, Ltd. Drive mechanism for cassette-enclosed magnetic tape. 4,837,645, Cl. 360-85.000.
Miyao, Osami: *See*—
Shimazu, Kikuo; Suzuki, Kazuo; Shiraki, Manabu; and Miyao, Osami, 4,836,631, Cl. 350-6.800.
Miyashita, Hideo: *See*—
Kurakake, Mitsuo; Miyashita, Hideo; and Otsuka, Shoichi, 4,837,487, Cl. 318-568.160.
Miyatake, Hideshi: *See*—
Dosaka, Katsumi; Kumanoya, Masaki; Miyatake, Hideshi; Hidaka, Hideto; Konishi, Yasuhiro; Yamasaki, Hiroyuki; Ikeda, Yuto; Tsukamoto, Kazuhiro; and Shimoda, Masaki, 4,837,747, Cl. 371-10.000.
Miyatsuka, Hajime: *See*—
Yamada, Yasuyuki; Miyatsuka, Hajime; Okita, Tsutomu; and Tsuji, Nobuo, 4,837,081, Cl. 428-329.000.
Miyazaki, Hidehiro; Shingai, Kazuto; and Ohsawa, Susumu, to Pioneer Electronic Corporation; and Pioneer Video Corporation. Optical information recorder. 4,837,759, Cl. 369-32.000.
Miyazaki, Kenichi; Nakamura, Katsumi; Hagiwara, Taro; and Inoue, Keizo, to Nissan Motor Co., Ltd. Floor structure for modular vehicle body. 4,836,600, Cl. 296-197.000.
Miyazaki, Masaaki: *See*—
Ishii, Mitsuaki; and Miyazaki, Masaaki, 4,837,454, Cl. 307-10.100.
Miyazaki, Yukio: *See*—
Okitaka, Takenori; and Miyazaki, Yukio, 4,837,463, Cl. 307-473.000.
Miyoshi, Masazumi; Isayama, Muneo; Midorikawa, Shoichi; and Ota, Akitada, to ISE Kaguku Kogyo Kabushiki Gaisha. Transportable hopper and tank assembly. 4,836,421, Cl. 222-166.000.
Mizandjian, Jean-Luc: *See*—
Meyer, Jean-Marc; and Mizandjian, Jean-Luc, 4,835,937, Cl. 53-88.000.
Mizuhara, Noboru; Hoshi, Tohru; Kashio, Jiro; and Morita, Takashi, to Hitachi, Ltd. Communication system using switching apparatus. 4,837,816, Cl. 379-221.000.
Mizukami, Masamichi: *See*—
Konishi, Akihiko; Mizukami, Masamichi; and Shimuta, Masanori, 4,836,859, Cl. 134-1.000.
Mizumoto, Kousei: *See*—
Enokimoto, Akito; Hosoya, Eiji; Kasa, Keiji; Handa, Akio; Ishiwatari, Makoto; and Mizumoto, Kousei, 4,836,325, Cl. 180-333.000.
Mizuno, Bunji; and Kubota, Masafumi, to Matsushita Electric Industrial Co., Ltd. Method for removing impurities existing in semiconductor substrate. 4,837,172, Cl. 437-011.000.
Mizuno, Masayuki, to Mita Industrial Co., Ltd. Automatic original feeding and discharging unit. 4,836,525, Cl. 271-3.000.
Mizushima, Shigesaburo. Process for producing a shape-memorizing wool and animal hair. 4,835,803, Cl. 8-128.100.
Moan, Richard D., to Ford Motor Company. Continually variable transmission having fixed ratio and variable ratio mechanisms. 4,836,049, Cl. 74-689.000.
Mobay Corporation: *See*—
White, Roger J.; and Krishnan, Sivaram, 4,837,243, Cl. 521-94.000.
Woynar, Helmut; Konig, Klaus; Pedain, Josef; and Slack, William E., 4,837,359, Cl. 560-335.000.
Mobil Oil Corporation: *See*—
Absil, Robert P. L.; and Huang, Yun-Yang, 4,837,397, Cl. 502-66.000.
Aly, Fouad A.; Graven, Richard G.; and Lewis, David W., 4,836,989, Cl. 422-195.000.
Chang, Clarence D.; Chu, Cynthia T.; and Lee, Carol S., 4,837,398, Cl. 502-86.000.
Chu, Shaw-Chang, 4,837,275, Cl. 525-104.000.
Herbst, Joseph A.; and Huang, Yun-Yang, 4,837,396, Cl. 502-67.000.
Mochizuki, Masami, to Pioneer Electronic Corporation. Surface acoustic wave resonator having transducers and reflectors of different periods. 4,837,476, Cl. 310-313.00R.
Mochizuki, Masataka: *See*—
Sakaya, Masuji; Motai, Tsuneaki; Mochizuki, Masataka; and Mashiko, Kouichi, 4,836,275, Cl. 165-46.000.
Modafferi, Mario; and Juneau, Paul A., to Pratt & Whitney Canada Inc. Rotor assembly. 4,836,750, Cl. 416-244.00A.
Modglin, Donald D., to Merrick Engineering, Inc. Method and apparatus for forming welded rings. 4,837,418, Cl. 219-121.450.
Modica, Frank S.: *See*—
Bertolacini, Ralph J.; Hirschberg, Eugene H.; and Modica, Frank S., 4,836,993, Cl. 423-244.000.
Moelzer, Peter: *See*—
Pollner, Juergen; Trummer, Gregor; and Moelzer, Peter, 4,836,734, Cl. 414-430.000.
Moermann, Werner H.: *See*—
Brandestini, Marco; and Moermann, Werner H., 4,837,732, Cl. 364-413.280.
Mohr, Russel R. Door lock. 4,836,589, Cl. 292-113.000.
Mohr, Wolfgang. Machine for cutting stacks of paper sheets and the like. 4,836,074, Cl. 83-379.000.
Molex Incorporated: *See*—
Baggett, George E., Jr.; and DeRoss, Robert W., 4,835,921, Cl. 52-220.000.
Molfetta, Anthony J.; and Sawicki, William H. Ignition delay vapor expulsion module 4,837,570, Cl. 340-984.000.
Monahan, Brian J. Programmable lock apparatus and method. 4,836,002, Cl. 70-382.000.
Monbaliu, Marcel J.: *See*—
de Jaeger, Nikolaas C. J.; Monbaliu, Marcel J.; Noppe, Marcus J. M.; and Konings, Frank J., 4,837,168, Cl. 436-533.000.
Monfedi, Jim M.: *See*—
Monfredi, Jim M., 4,836,413, Cl. 221-270.000.
Monfredi, Jim M., to PWS Company; and Monfedi, Jim M. Method and apparatus for dispensing boxed goods. 4,836,413, Cl. 221-270.000.
Montague, John M.: *See*—
Files, James H.; Harrel, Donald M.; Montague, John M.; Stansbury Sr., Thomas L.; and Sikes, Carlton T., 4,836,891, Cl. 159-28.100.
Montague, Peter G.; and Bainbridge, Peter, to National Starch and Chemical Corporation. Water treatment polymer. 4,836,933, Cl. 210-701.000.
Montanari, Paolo: *See*—
Sala, Oneglio; and Montanari, Paolo, 4,836,711, Cl. 405-92.000.
Montres Rolex S.A.: *See*—
Besson, Rene, 4,837,755, Cl. 368-35.000.
Moore, Andrew L., to Rockwell International Corporation. Hydraulic inching drive system. 4,836,112, Cl. 101-486.000.

Moore, Robert G., Jr., to Allied-Signal Inc. Series spool pressure regulator arrangement for a double-acting hydraulic actuator. 4,836,089, Cl. 91-446.000.

Mooring, Anne M.: *See*—
Wu, Chengjiu; Mooring, Anne M.; McFarland, Michael J.; Osuch, Christopher E.; and Yardley, James T., 4,837,124, Cl. 430-270.000.

Morel, Didier, to Rhone-Poulenc Sante. Chlorinated β-ketoesters, their preparation and their use. 4,837,365, Cl. 568-394.000.

Moreno, Gilbert. Handle for an exercise device. 4,836,537, Cl. 272-143.000.

Morgan, Arch D.: *See*—
Ungpiyakul, Tanakon; Morgan, Arch D.; Thomas Douglas C.; Ketenhofen, Timothy J.; Marver, Douglas J.; Couture-Dorschner, Laurie; and Pomplun, William S., 4,837,715, Cl. 364-552.000.

Morgan, Paul: *See*—
Caillau, Pierre; Morgan, Paul; and De Veauce, Charles D. C., 4,836,855, Cl. 106-91.000.

Morgan, Peter J.; Carter, Andrew C.; Davis, Richard; and Randle, Frederick A., to Plessey Overseas Limited. Optical connecting arrangements. 4,836,633, Cl. 350-96.180.

Morgan, Richard E.; and Dye, Charles B., to Morton Thiokol, Inc. Method of and apparatus for casting solid propellant rocket motors. 4,836,961, Cl. 264-3.100.

Mori, Kinji: *See*—
Wachi, Isao; Mori, Kinji; Suzuki, Yasuo; Orimo, Masayuki; Kawano, Katsumi; Koizumi, Minoru; Nakai, Kozo; and Kasashima, Hirokazu, 4,837,762, Cl. 370-89.000.

Mori, Takaro; and Yamada, Yasuhiro, to Victor Company of Japan, Ltd. Rotary head type digital signal recording and reproducing apparatus. 4,837,641, Cl. 360-32.000.

Morikawa, Asao: *See*—
Kondo, Kazuo; Morikawa, Asao; and Iwata, Hiroshi, 4,837,408, Cl. 174-68.500.

Morimitsu, Toshihiko; Kikkawa, Sadanobu; and Omura, Takashi, to Sumitomo Chemical Company, Limited. Red or bluish-red fiber-reactive monoazo compound having 7-sulfo-substituted amino-1-naphthol-sulfonic acid as coupling component between the chromophore and fiber reactive portions of the compound. 4,837,310, Cl. 534-638.000.

Morimoto, Hiroya: *See*—
Tomita, Yoji; Oishi, Eiichi; Miyaji, Hiroshi; Morimoto, Hiroya; Sekigawa, Tetsuo; and Mitsuhashi, Kenichi, 4,836,917, Cl. 210-104.000.

Morin, Dominique: *See*—
Gourlain, Philippe; Lenormand, Regis; and Morin, Dominique, 4,837,531, Cl. 333-135.000.

Morin, Francois; and Le Contellec, Michel. Process for the production of a diode array and liquid crystal display screen. 4,836,650, Cl. 350-334.000.

Morin, Pierre: *See*—
Boulet, Jean; and Morin, Pierre, 4,836,703, Cl. 175-74.000.

Moring, Volker: *See*—
Burkhart, Georg; Moring, Volker; and Schaefer, Dietmar, 4,837,244, Cl. 521-114.000.

Morishita, Mitsuharu; and Kohge, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Motor-driven power steering system for a vehicle. 4,837,690, Cl. 364-424.050.

Morishita, Sadao; Matsushita, Toshihiko; and Sekine, Mikiya, to Mitsubishi Paper Mills, Ltd. Thermal transfer recording material. 4,837,199, Cl. 503-227.000.

Morishita, Taro: *See*—
Tanaka, Toshiyuki; Kuga, Shigeki; Morishita, Taro; Nakamura, Nobuo; and Ohsaki, Mikio, 4,837,68[illegible], Cl. 364-419.000.

Morita, Masataka; Ishihara, Masao; and Takahikawa, Mitsuru, to Suzuki Motor Co., Ltd. Saddle type vehicle running on uneven ground. 4,836,324, Cl. 180-291.000.

Morita, Shigeru: *See*—
Nozaka, Kenkichi; Kawahara, Yoshihiro; Kitamura, Yuji; Morita, Shigeru; and Takahashi, Sadayuki, 4,836,738, Cl. 414-607.000.

Morita, Takashi: *See*—
Mizuhara, Noboru; Hoshi, Tohru; Kanno, Jiro; and Morita, Takashi, 4,837,816, Cl. 379-221.000.

Morita, Toru: *See*—
Inoue, Akira; Ushio, Masaru; Morita, Toru; Oishi, Yasuyuki; and Sakoda, Hisao, 4,836,914, Cl. 208-251.00H.

Moritani, Masahiko: *See*—
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Morooka, Isao: *See*—
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Morozumi, Naohiro: *See*—
Takahashi, Hiroshi; Morozumi, Naohiro; Takanezawa, Shin; and Nakao, Kiyoshi, 4,837,086, Cl. 428-306.000.

Morozumi, Takuro; and Sakamoto, Masanori, to Fuji Jukogyo Kabushiki Kaisha. Engine speed control system for an automotive engine. 4,836,164, Cl. 123-339.000.

Morpheus Lights, Inc.: *See*—
Hoyer, Bryan; and Richardson, John, 4,837,665, Cl. 362-96.000.

Morrall, Robin A. A.; Turkington, T. K.; Gugel, Richard K.; and Rude, Sheldon V., to Canadian Patents & Development Ltd. Forecasting the risk of sclerotinia stem rot in crops. 4,837,146, Cl. 435-34.000.

Morris, Leslie C.; and Arndall, John K., to Caterpillar Inc. Connecting rod assembly. 4,836,043, Cl. 74-579.00E

Morris, Peter T., to Ford Motor Company. Cooling system for an internal combustion engine. 4,836,147, Cl. 123-41.440.

Morris, Steven A.; Mount, Houston B., II; and Penn, John T., to Amoco Corporation. Method and apparatus for logging a borehole. 4,837,753, Cl. 367-69.000.

Morrow, Kirk D.: *See*—
Carnevale, Francesco L.; and Morrow, Kirk D., 4,836,316, Cl. 177-256.000.

Morse, Robert L., to Tecumseh Products Company. Method of making an integral internal pressure relief valve. 4,835,849, Cl. 29-156.70R.

Mortimer, John H.: *See*—
Cignetti, Nicolas P.; Mortimer, John H.; and Swaney, Richard U., 4,836,273, Cl. 164-471.000.

Morton Thiokol, Inc.: *See*—
Morgan, Richard E.; and Dye, Charles B., 4,836,961, Cl. 264-3.100.
Schneiter, Fred E.; and Taylor, Robert D., 4,836,255, Cl. 149-35.000.

Morz, Gunter; Pivit, Erich; and Lenz, Sigmund, to ANT Nachrichtentechnik GmbH. Microwave phase shifter. 4,837,528, Cl. 333-24.100.

Mosbey, Deral T.: *See*—
Harrell, Edward R.; Rustad, Norman E.; and Mosbey, Deral T., 4,837,082, Cl. 428-329.000.

Mosebach Manufacturing Company: *See*—
Kirilloff, Victor V.; Benson, William A.; Cummins, Robert; and Dawson, Richard S., 4,837,549, Cl. 338-279.000.

Motai, Tsuneaki: *See*—
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Motoda Electronics Co., Ltd.: *See*—
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Motoda, Kenro, to Motoda Electronics Co., Ltd. Tray positioning arrangement for delivery system. 4,836,354, Cl. 198-345.000.

Motor Wheel Corporation: *See*—
Weeks, James B.; Payne, Roger E.; and Swartz, Roger E., 4,836,261, Cl. 152-405.000.

Motorola, Inc.: *See*—
Ablay, Sewim F.; Thro, Stuart W.; and Zdunek, Kenneth J., 4,837,858, Cl. 455-34.000.
Alvis, John R.; Pfiester, James R.; and Holland, Orin W., 4,837,173, Cl. 437-024.000.
Chambers, Randall P.; Dzung, John C.; and Gatto, Donald F., 4,836,708, Cl. 403-358.000.
Conner, Leo B., Jr., 4,837,575, Cl. 342-45.000.
Freeburg, Thomas A.; and Dautel, Donald F., 4,837,800, Cl. 379-59.000.
Heck, Joseph P., 4,837,853, Cl. 455-208.000.
Lesk, Israel A.; and Clark, Lowell E., 4,837,177, Cl. 437-31.000.
Lin, Paul T.; McShane, Michael B.; Bigler, Charles G.; and Goertz, John A., 4,837,184, Cl. 437-217.000.
Long, Kenneth J.; and Formby, Bobby W., 4,836,371, Cl. 206-334.000.
Polito, Anthony; and Pages, Irenee M., 4,837,183, Cl. 437-198.000.
Van Horn, Mark I., 4,837,534, Cl. 333-207.000.
Zdebel, Peter J.; Balda, Raymond J.; Hwang, Bor-Yuan; and Wagner, Allen J., 4,837,176, Cl. 437-31.000.

Motoyama, Kazuyasu; Yanagida, Tsuneo; Sakai, Mitsugu; Ichikawa, Hitoshi; and Yoshizawa, Akihiko, to Olympus Optical Co., Ltd. Magneto-optical recording reproducing device having field applying means. 4,837,758, Cl. 369-13.000.

Motoyama, Tsutomu, to North American Philips Corporation. Television interrupt circuit. 4,837,623, Cl. 358-165.000.

Mount, Houston B., II: *See*—
Morris, Steven A.; Mount, Houston B., II; and Penn, John T., 4,837,753, Cl. 367-69.000.

Mouri, Akihiro; Toyono, Tsutomu; Kaneko, Shuzo; Inaba, Yutaka; and Kanbe, Junichiro, to Canon Kabushiki Kaisha. Driving method for optical modulation device. 4,836,656, Cl. 350-350.00S.

MTS Systems Corporation: *See*—
Eaton, Homer L.; Selesky, Kenneth G.; and Kambara, Goro, 4,835,855, Cl. 29-863.000.

MTU Muenchen: *See*—
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Mueller, Karl F.; and Harisiades, Paul, to Ciba-Geigy Corporation. UV- and heat curable terminal polyvinyl functional macromers and polymers thereof. 4,837,289, Cl. 526-279.000.

Mueller, Martin J. Apparatus for applying container lids. 4,835,943, Cl. 53-485.000.

Mueller-Niescher, Ursula: *See*—
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Mueller, Peter: *See*—
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Mukai, Hideki; and Atari, Yasuhiro, to Nippon Tsusho Kabushiki Kaisha. Cleaner for conveyor belt. 4,836,356, Cl. 198-499.000.

Mukai, Noriko: *See*—
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Mukutmoni, Tapas, to McDonnell Douglas Corporation. Transient waveform generator. 4,837,525, Cl. 331-165.000.

Mullendore, James A.: *See*—
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Muller, Friedemann: *See*—
Fuhr, Karl; Muller, Friedemann; and Ott, Karl-Heinz, 4,837,276, Cl. 524-125.000.

Muller, Gerhard; and Greve, Peter, to Carl-Zeiss-Stiftung. Device for therapeutical irradiation of organic tissue by laser radiation. 4,836,203, Cl. 128-203.100.

Muller, Hanns P.: *See*—
Kerimis, Dimitrios; and Muller, Hanns P., 4,837,321, Cl. 544-193.000.

Munn, Robert A.; and Minor, Valerie L. Carrying case for protective clothing. 4,836,426, Cl. 224-206.000.

Munoz, Jose P., to Ingersoll-Rand Company. Fluid-jet-cutting nozzle assembly. 4,836,455, Cl. 239-590.300.

Munroe, Ronald G., to Eagle Electric Mfg. Co. Inc. Duplex electrical receptacle with one-piece multi-function grounding strip. 4,836,793, Cl. 439-107.000.

Murahashi, Takashi: *See*—
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Murakami, Akiyoshi: *See*—
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Murakami, Keiichi: *See*—
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Murakami, Koji; Shima, Tsunao; Shimosato, Yoshikazu; and Yokoyama, Akira, to Chugai Ro Co., Ltd. Method of gas carburizing and hardening. 4,836,864, Cl. 148-16.500.

Murakami, Koso: *See*—
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Muramatsu, Tateo; Saito, Hideaki; Takasaki, Mamoru; and Enami, Yasushi, to Bridgestone Corporation. Flexible sheet dams. 4,836,713, Cl. 405-115.000.

Murao, Yoshikazu; and Miyake, Masao, to Mitsubishi Chemical Industries Limited. Process for producing pyrrolidone derivative. 4,837,337, Cl. 548-551.000.

Murarka, Narayan P.; Kogler, Kent J.; Bartholomew, Craig S.; Betz, Howard T.; and Harris, Richard J., to ITT Research Institute. Rugate optical filter systems. 4,837,044, Cl. 427-10.000.

Murata, Katsuyoshi; Nakazora, Toru; and Isago, Takashi, to Central Glass Company, Limited. Preparation of polyfluoroaldehydes and polyfluoroacetals. 4,837,366, Cl. 568-490.000.

Murata, Yasushi; Ogoshi, Kunizho; and Matsui, Fumio, to Pioneer Electronic Corporation. Method for producing optical information recording disk. 4,836,890, Cl. 156-73.100.

Murayama, Fumio, to Pioneer Electronic Corporation. Speaker system for motor vehicles with an alarm device. 4,837,835, Cl. 381-86.000.

Murofushi, Toshiaki; Ohya, Yasuhiro; Nakazawa, Hiroshi; and Oyamada, Koichi, to Fuji Xerox Co., Ltd. Electrophotographic developer containing positively chargeable toner. 4,837,100, Cl. 430-106.600.

Murphy, James C.: *See*—
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Murphy, Wesley T. Support structure including right angle stud bracket. 4,835,935, Cl. 52-721.000.

Murphy, William. Self-righting waterborne craft. 4,836,120, Cl. 114-61.000.

Murray, Andrew M.: *See*—
Duckworth, Ralph M.; and Murray, Andrew M., 4,837,007, Cl. 424-52.000.

Murray, Martin: *See*—
Ballantyne, Ronald; and Murray, Martin, 4,836,125, Cl. 114-294.000.

Murry, Roger P.; Silver, Alexander; and Fischer, Richard L., to Allied-Signal Inc. Surge control system for a closed cycle cryocooler. 4,835,979, Cl. 62-172.000.

Musarra, Vicent: *See*—
Bianchini, William L.; Infantino, Robert; and Musarra, Vicent, 4,835,884, Cl. 36-24.500.

Muschalik, Gerald, to VDO Adolf Schindling AG. Throttle-butterfly connector piece for an internal combustion engine. 4,836,163, Cl. 123-337.000.

Mussler, James M.; and Arnold, Jane P., to Westinghouse Electric Corp. Method for calculating the rate of frequency of random events. 4,837,705, Cl. 364-484.000.

Muto, Tetsuji, to Honda Giken Kogyo Kabushiki Kaisha. Anti-lock control method for vehicle. 4,836,619, Cl. 303-109.000.

MWB Messwandler-Bau AG: *See*—
Dippel, Hans-Jurgen, 4,835,918, Cl. 52-63.000.

Myers, W. Neill, to United States of America, National Aeronautics and Space Administration. Releasable clamping apparatus. 4,836,707, Cl. 403-322.000.

Myhre, Douglas C.: *See*—
O'Brien, Richard J.; and Myhre, Douglas C., 4,836,689, Cl. 374-125.000.

Mylvaganam, Ravindra: *See*—
Harrington, William J.; Ahn, Yeon S.; and Mylvaganam, Ravindra, 4,837,212, Cl. 514-176.000.

Myo-Tronics Research, Inc.: *See*—
Jokela, Richard E., 4,837,685, Cl. 364-413.020.

Naaktgeboren, Adrianus; Van Steelant, Jan R.; and Decoene, Frans J. G. C., to Ford New Holland, Inc. Drive neutralizing means for header reel for agricultural machine. 4,835,953, Cl. 56-226.000.

Nabisco Brands, Inc.: *See*—
Calandro, Thomas; Straka, Robert; and Verrico, Marsha K., 4,837,112, Cl. 426-463.000.

Nader, Bassam S.: *See*—
Silvis, H. Craig; Crain, Steven P.; and Nader, Bassam S., 4,837,293, Cl. 528-99.000.

Nadler, Guy: *See*—
Thielke, Dietrich; Holtje, Dagmar; and Nadler, Guy, 4,837,240, Cl. 514-294.000.

Nagai, Haruhiko: *See*—
Wakata, Hitoshi; Inoue, Mitsuo; Sato, Yukio; Haruta, Kenyu; and Nagai, Haruhiko, 4,837,773, Cl. 372-86.000.

Nagai, Kyuichiro; Kaku, Nobuyuki; and Ogiro, Kenji, to Hitachi, Ltd. Tape guide apparatus for helically wound tape. 4,837,646, Cl. 360-85.000.

Nagamatsu, Hidetoshi: *See*—
Kurita, Toshinori; Enomoto, Masaaki; and Nagamatsu, Hidetoshi, 4,836,722, Cl. 409-132.000.

Nagarwalla, Pheroze J.: *See*—
Bellis, Kenneth E.; Brown, Jackson E.; Nagarwalla, Pheroze J.; and Rea, James, 4,836,269, Cl. 164-200.000.

Nagashima, Akira, to Kioritz Corporation. Device for mounting carburetor on internal combustion engine. 4,835,866, Cl. 30-381.000.

Nagashima, Akira, to Kioritz Corporation. Saw chain tensioner of chain saw. 4,835,868, Cl. 30-386.000.

Nagelhout, Jacob T.: *See*—
Ham, Wilhelmus J.; and Nagelhout, Jacob T., 4,837,823, Cl. 380-34.000.

Nagle, Dennis C.: *See*—
Brupbacher, John M.; Christodoulou, Leontios; and Nagle, Dennis C., 4,836,982, Cl. 420-129.000.

Nahara, Akira: *See*—
Yamamoto, Ryoichi; Nomura, Masaaki; Yamada, Takashi; and Nahara, Akira, 4,837,118, Cl. 428-645.000.

Naiman, Charles S.; King, Marvin; and Greenbaum, Michael, to Riverside Research Institute. Covert optical system for probing and inhibiting remote targets. 4,836,672, Cl. 356-5.000.

Naitou, Satoshi: *See*—
Okuno, Masaharu; Ishibashi, Toshihiro; Naitou, Satoshi; and Sasaki, Tatsuyoshi, 4,836,183, Cl. 126-110.00R.

Naka, Yasuhiro: *See*—
Nakada, Tsutomu; and Naka, Yasuhiro, 4,837,537, Cl. 335-153.000.

Nakada, Tsutomu; and Naka, Yasuhiro, to Nippon Aleph Corporation. Reed switch device. 4,837,537, Cl. 335-153.000.

Nakagawa, Yukio, to Fuji Electric Co., Ltd. Ultrasonic wave phase matching apparatus. 4,837,754, Cl. 367-105.000.

Nakagomi, Yukinao, to Kayaba Industry Co., Ltd. Hydraulic control apparatus for vehicle. 4,836,087, Cl. 91-29.000.

Nakai, Jun: *See*—
Higashiyama, Mitsuo; Iwahashi, Naoto; Kunihiro, Takushi; and Nakai, Jun, 4,837,802, Cl. 379-62.000.

Nakai, Kozo: *See*—
Wachi, Isao; Mori, Kinji; Suzuki, Yasuo; Orimo, Masayuki; Kawano, Katsumi; Koizumi, Minoru; Nakai, Kozo; and Kasashima, Hirokazu, 4,837,762, Cl. 370-89.000.

Nakajima, Hirotaka, to Kabushiki Kaisha Toshiba. Ultrasonic imaging system for obtaining zoom video images of an object. 4,837,749, Cl. 367-7.000.

Nakajima, Kenji, to Fuji Photo Film Co., Ltd. Coating method. 4,837,045, Cl. 427-13.000.

Nakajima, Yasuhisa: *See*—
Harada, Masahiro; Yanagi, Kenichi; Fukushima, Takeo; Furukawa, Kusuo; Soeda, Naohiko; Ohta, Norio; Sato, Kuniaki; and Nakajima, Yasuhisa, 4,836,774, Cl. 432-8.000.

Nakajima, Yoshito: *See*—
Ohe, Yasuo; Matsuura, Makiko; Shimizu, Fumio; Nakajima, Yoshito; Shin Sadahito; and Shima, Kenji, 4,837,170, Cl. 436-548.000.

Nakamura, Akiyoshi; Ando, Makoto; Ogino, Shuji; and Taniguchi, Nobuyuki, to Minolta Camera Kabushiki Kaisha. Automatic focusing device and automatic exposure control device. 4,837,594, Cl. 354-402.000.

Nakamura, Katsumi: *See*—
Miyazaki, Kenichi; Nakamura, Katsumi; Hagiwara, Taro; and Inoue, Keizo, 4,836,600, Cl. 296-197.000.

Nakamura, Makio, to Sharp Kabushiki Kaisha. Lower-noise microwave amplifying circuit. 4,837,524, Cl. 330-286.000.

Nakamura, Masao: *See*—
Mamada, Mamoru; Yahagi, Mitsuhisa; and Nakamura, Masao, 4,836,257, Cl. 152-209.00R.

Nakamura, Minoru: *See*—
Tanaka, Yukitaka; Nakamura, Minoru; Okada, Johshin; and Mansho, Kenji, 4,837,214, Cl. 514-179.000.

Nakamura, Nobuo: *See*—
Tanaka, Toshiyuki; Kuga, Shigeki; Morishita, Taro; Nakamura, Nobuo; and Ohsaki, Mikio, 4,837,689, Cl. 364-419.000.

Nakamura, Susumu: *See*—
Kuriyama, Katsumi; Hanada, Kazuyuki; Nakamura, Susumu; Misaizu, Iwao; Kashimura, Masashi; and Goto, Tomoko, 4,837,198, Cl. 503-227.000.

Nakamura, Takeshi: *See*—
Oishi, Hisao; Yanagihara, Kazuhiko; Miyakawa, Tadashi; Nakamura, Takeshi; Akimoto, Kazuhiko; and Shioji, Mitsuaki, 4,836,652, Cl. 350-334.000.

Nakamura, Thutomu: *See*—
Maeno, Satoru; Fukuyama, Norio; Ohishi, Tetsuo; Kyutoku, Senzo; and Nakamura, Thutomu, 4,837,493, Cl. 318-685.000.

Nakane, Nobu; Maruyama, Noriharu; and Takamada, Haruo, to Konishiroku Photo Industry Co., Ltd. Automatic photographic paper processing apparatus. 4,837,601, Cl. 355-28.000.

Nakanishi, Tadashi; and Yamauchi, Hironori, to Nippon Telegraph and Telephone Corporation. Counter. 4,837,791, Cl. 377-49.000.

Nakano, Jiro; and Ito, Yoshizo, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for detecting abnormal state in pulse train generating sensor. 4,836,016, Cl. 73-118.00.

Nakano, Masaru: *See*—
Ishiguro, Yasuo; Itou, Yoshizumi; Shinoshita, Osamu; and Nakano, Masaru, 4,836,742, Cl. 414-742.000.

Nakano, Shohkichi: *See*—
Matsushita, Akira; and Nakano, Shohkichi, 4,837,556, Cl. 340-310.00R.

Nakao, Kiyoshi: *See*—
Takahashi, Hiroshi; Morozumi, Naohiro; Takanezawa, Shin; and Nakao, Kiyoshi, 4,837,086, Cl. 428-406.000.

Nakashima, Hiroshi; Kawarada, Masayuki; and Fukuhara, Sanshirou, to Fuji Photo Film Co., Ltd. Method and apparatus of non-contact conveyance of a web. 4,836,429, Cl. 226-7.000.

Nakatani, Munehiro: *See*—
Oyabu, Masaaki; Sugiura, Masamichi; Hasegawa, Hirofumi; and Nakatani, Munehiro, 4,837,846, Cl. 382-50.000.

Nakawaki, Yasunori; Numazawa, Akio; and Hayashi, Takashi, to Toyota Jidosha Kabushiki Kaisha. Control apparatus for vehicle power transmitting system including continuously variable transmission. 4,836,056, Cl. 74-866.000.

Nakayama, Shinichi: *See*—
Kobayashi, Kinzo; and Nakayama, Shinichi, 4,836,339, Cl. 188-73.100.

Nakayama, Taketoshi: *See*—
Sugawara, Eishu; Nakayama, Taketoshi; and Masumoto, Tsuyoshi, 4,836,867, Cl. 148-301.000.

Nakazawa, Hiroshi: *See*—
Murofushi, Toshiaki; Ohya, Yasuhiro; Nakazawa, Hiroshi; and Oyamada, Koichi, 4,837,100, Cl. 430-106.600.

Nakazawa, Toshihiko: *See*—
Takesue, Toshihiro; Murahashi, Takashi; and Nakazawa, Toshihiko, 4,837,787, Cl. 372-29.000.

Nakazora, Toru: *See*—
Murata, Katsuyoshi; Nakazora, Toru; and Isago, Takashi, 4,837,366, Cl. 568-490.000.

Nalco Chemical Company: *See*—
Ries, Donald G., 4,837,283, Cl. 525-403.000.

Namba, Takeo: *See*—
Jeon, Byung S.; and Namba, Takeo, 4,837,262, Cl. 524-322.000.

Napp, Duane T.; and Roche, Kevin J., to International Business Machines Corporation. Component self alignment. 4,836,435, Cl. 228-180.200.

Nara, Takeshi: *See*—
Shibasaki, Masakatsu; Takahashi, Atsuo; Aoki, Tuyoshi; Kogi, Kentaro; Nishimiya, Yozo; Nara, Takeshi; and Yamaguchi, Takashi, 4,837,342, Cl. 549-422.000

Narang, Ram S.; Perregaux, Alain E.; and Faucz, Eugene C., to Xerox Corporation. Optical Shield for liquid crystal devices and method of fabrication. 4,837,097, Cl. 430-5.000.

Narita, Hiroshi, to Du Pont de Nemours, E. I., and Company. Header device. 4,836,790, Cl. 439-68.000.

Narita, Mitsuru: *See*—
Kasahara, Masahiko; and Narita, Mitsuru, 4,837,099, Cl. 430-58.000.

Narita, Toshihide; and Kadokawa, Yoshio, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Pitching control system for a skid steer vehicle. 4,837,694, Cl. 364-426.016.

Naruo, Kyoichi: *See*—
Ohara, Shinichiro; and Naruo, Kyoichi, 4,837,127, Cl. 430-270.000.

Nasu, Yasunobu; and Uchida, Haruhiko, to Nippon Kayaku Kabushiki Kaisha. Deoxygenating composition. 4,836,952, Cl. 252-188.280.

National Magnetic Sensors Inc.: *See*—
Bardoorian, Robert J., 4,836,632, Cl. 350-96.200.

National Nuclear Corporation Limited: *See*—
Firth, George F.; and Hayden, Owen, 4,836,274, Cl. 165-11.100.

National Research Development Corporation. *See*—
Dalton, Howard; Colby, John; and Stirling, David I., 4,837,150, Cl. 435-123.000.
Jones, Robert L.; and Wilson, Norman H., 4,837,234, Cl. 514-469.000.
Wilson, Alan D.; Prosser, Havard J.; Dunsdon, Anthony J.; Skinner, John C.; and Brookman, Pauline J., 4,836,768, Cl. 428-323.000.

National Starch and Chemical Corporation: *See*—
Montague, Peter G.; and Bainbridge, Peter, 4,836,933, Cl. 210-701.000.

Natsuhara, Toshiya, to Minolta Camera Kabushiki Kaisha. Developer supplying member. 4,836,136, Cl. 118-657.000.

Nau, Vance J.: *See*—
Nohl, Andre J.; Nau, Vance J.; and Metzger, Andre, 4,836,037, Cl. 73-864.160.

Nautical Services Pty. Ltd.: *See*—
Lloyd, Ian, 4,836,759, Cl. 418-56.000

Navratil, Martin; Mitchell, Mark S.; and Sovak, Mojmir, to Borden Company Limited. Composition and methods for reducing the permeability of underground strata. 4,836,285, Cl. 166-295.000.

Naylor, Joe: *See*—
Wrench, Edwin H., Jr.; Wohlford, Robert; and Naylor, Joe, 4,837,830, Cl. 381-42.000.

NCR Corporation: *See*—
Donahue, Keith C., 4,837,488, Cl. 324-66.000.

Neagu, Alexandru, to Maxon Industries, Inc. Level ride liftgate with ramping action platform. 4,836,736, Cl. 414-557.000.

NEC Corporation: *See*—
Hatori, Yoshinori; Kato, Yoichi; Ohta, Mutsumi; and Kosugi, Yasuhiro, 4,837,618, Cl. 358-135.000.
Honjo, Kazuhiko, 4,837,536, Cl. 333-247.000.
Kage, Kouzou, 4,837,821, Cl. 380-9.000.
Kanauchi, Shushi, 4,837,466, Cl. 307-605.000.
Kasahara, Kensuke; Itoh, Tomohiro; and Ohata, Keiichi, 4,837,605, Cl. 357-22.000.
Okumura, Teiji, 4,837,805, Cl. 379-90.060.
Oyagi, Takashi; and Sato, Toshifumi, 4,837,854, Cl. 455-343.000.
Sasaki, Eisaku, 4,837,782, Cl. 375-95.000.
Sasaki, Katsuhiro, 4,837,763, Cl. 370-112.000.
Shimura, Yukihiro, 4,837,801, Cl. 379-61.000.
Suzuki, Takamasa, 4,837,765, Cl. 371-25.000.
Takane, Hisao, 4,837,674, Cl. 364-200.000.
Watari, Masao, 4,837,828, Cl. 381-36.000.
Yoshida, Atsushi, 4,837,766, Cl. 371-46.000.

Neh, Harribert; Buhmann, Ulrich; Joppien, Hartmut; and Giles, David, to Schering Akt. Insecticidal 3-substituted 4-fluorophenyl-1-(fluoroalkoxyphenylcarbamoyl)-pyrazolines. 4,837,220, Cl. 514-403.000.

Neko, Noriaki, to Fanuc Ltd. Control method for an injection motor of an injection molding machine. 4,837,490, Cl. 318-568.100.

Nelson, David E.: *See*—
Tonsor, Andrew J.; Nelson, David E.; Gee, James E.; and Stevens, Samuel B., 4,836,318, Cl. 180-9.500.

Nelson, Gregory O.: *See*—
Gustafson, Bruce L.; Wehner, Paul S.; Nelson, Gregory O.; and Mercer, Patricia N., 4,837,367, Cl. 568-831.000.

Nelson Industries, Inc.: *See*—
Allie, Mark C., 4,837,834, Cl. 381-71.000.

Nelson, Kenneth W.; and Roggenburg, Stanley L., Jr., to Nelson, Kenneth W. Interblocking plastic display. 4,835,890, Cl. 40-616.000.

Nemoto, Kaoru; Igusa, Kazuo; and Ogasawara, Toshichika, to Chugai Seiyaku Kabushiki Kaisha. Stabilized active forms of vitamin D_3. 4,836,957, Cl. 260-397.200.

Nestec SA: *See*—
Proudley, John C.; and Symbolik, William S., 4,837,038, Cl. 426-428.000.

NetExpress Systems, Inc.: *See*—
Henderson, Alex E.; Drain, Frederick L.; and Roberts, Lawrence G., 4,837,848, Cl. 382-56.000.

Netter, Pierre: *See*—
Conti, Calogero; Meyer, Jean-Luc; Netter, Pierre; and Riquet, Jean-Pierre, 4,837,385, Cl. 210-695.000.

Neubert, Eberhard; Wardenga, Hans-Michael; Polzer, Gottlieb; Lange, Juergen; Schrader, Klaus; Junker, Frank; Dittmann, Norbert; Spevacek, Ullrich; and Tappert, Hans-Juergen. Device for coating metallic internal surfaces. 4,836,130, Cl. 118-76.000.

Neuman, Peter: *See*—
Aumueller, Alexander; Neuman, Peter; and Trauth, Hubert, 4,837,403, Cl. 544-215.000.

Newberry, Chenia L. Smoke alarm controlled unlocking apparatus for window bars. 4,837,560, Cl. 340-578.000.

Newbold, Vernon D., to Future Power Inc. Rotating cylinder block piston-cylinder engine. 4,836,149, Cl. 123-44.00R.

Newman, Neil A.: *See*—
Griffiths, John M.; Litjens, John J.; and Newman, Neil A., 4,836,811, Cl. 440-61.000.

Newman, Richard W.: *See*—
Allred, Jimmie B., III; Kokosa, Richard A.; Krauter, Allan I.; and Newman, Richard W., 4,836,189, Cl. 128-6.000.

Newman, Wyatt S., to North American Philips Corporation. Linear motor with angularly indexed magnetic poles. 4,837,467, Cl. 310-12.000.

Newsham, John: *See*—
Andrews, Anthony J.; Hunt, Toby C.; and Newsham, John, 4,836,327, Cl. 181-152.000.

NewTech Products, Inc.: *See*—
Meinershagen, Charles I., 4,836,781, Cl. 433-141.000.

Nezu, Shinji, to Aisin Seiki Company, Ltd. Plastic electrically insulating substrates for wiring circuit boards and a method of manufacturing thereof. 4,837,407, Cl. 174-68.500.

Ng, Yee S., to Eastman Kodak Company. Non-impact printer with nonuniformity correction. 4,837,587, Cl. 346-108.000.

NGK Spark Plug Co., Ltd.: *See*—
Kondo, Kazuo; Morikawa, Asao; and Iwata, Hiroshi, 4,837,408, Cl. 174-68.500.
Yamada, Tetsusyo; Hayakawa, Nobuhiro; and Yokota, Kazunori, 4,836,906, Cl. 204-410.000.

Nicholas, David M.; Goff, Stephen P.; Roden, Thomas M.; and Bushinsky, Joseph P., to Air Products and Chemicals, Inc. Production and recovery of hydrogen and carbon monoxide. 4,836,833, Cl. 55-16.000.

Nichols, Everett J.: *See*—
Rohrschneider, Larry R.; and Nichols, Everett J., 4,837,237, Cl. 514-62.000.

Nicholson, Lawrence W.: *See*—
Stevens, Timothy S.; Frawley, Nile N.; Swart, Daniel J.; Harris, William C.; Diedering, Deborah E.; Nicholson, Lawrence W.; and Rothman, L. David, 4,837,161, Cl. 436-52.000.

Nickola, Richard A., to Inland Steel Company. Diffusion alloy steel foil. 4,837,091, Cl. 428-653.000.

Nicolas, Alain: *See*—
Lherm, Andre; Raveu, Bernard; and Nicolas, Alain, 4,837,661, Cl. 361-329.000.

Nicolotti, Robert A., to Mallinckrodt, Inc. Radiolabeled antibody fragments. 4,837,003, Cl. 424-1.100.

Nielsen, James P.: *See*—
Purcey, Larry J.; VanderHoff, Douglas A.; Vreeland, Robert H.; Nielsen, James P.; and Ueno, Iowa, 4,835,802, Cl. 5-453.000.

Niemann, Klaus: *See*—
Christ, Hubertus; Niemann, Klaus; and Mehren, Herbert, 4,836,475, Cl. 246-169.00R.

Nigro, Stephen J.: *See*—
Bond, Roger A. L.; and Nigro, Stephen J., 4,835,911, Cl. 51-313.000.

Nihon Metal Gasket Kabushiki Kaisha: *See*—
Yoshino, Nobuo, 4,836,562, Cl. 277-235.00B.

Nihon Shinku Gijutsu Kabushiki Kaisha: *See*—
Hayashi, Yasuaki, 4,837,603, Cl. 356-369.000.

Nihon Tokushu Noyaku Seizo K.K.: *See*—
Kume, Toyohiko; Goto, Toshio; Kamochi, Atsumi; Yanagi, Akihiko; Hayakawa, Hidenori; and Yagi, Shigeki, 4,836,844, Cl. 71-90.000.

Niinivaara, Ensi K. J., to Oy GSS General Sea Safety Ltd. Method and apparatus for conducting current to an electrode in arc welding, arc cutting or the like operations. 4,837,420, Cl. 219-137.00R.

Nikon Corporation: *See*—
Wakamiya, Koichi, 4,836,665, Cl. 350-476.000.

Niks, Mikhail. Hand and wrist exercising means. 4,836,531, Cl. 272-67.000.

Niles Parts Co., Ltd.: *See*—
Kataoka, Sachiro; Iizima, Yoichi; Kuwahara, Masaji; Takeoka, Seiei; and Katsutani, Kazuzi, 4,836,323, Cl. 180-270.000.

Nilssen, Ole K. Indirect office lighting system. 4,835,915, Cl. 52-28.000.

Nippon A B S, Ltd.: *See*—
Arikawa, Tetsuro, 4,836,620, Cl. 303-111.000.

Nippon Aleph Corporation: *See*—
Nakada, Tsutomu; and Naka, Yasuhiro, 4,837,537, Cl. 335-153.000.

Nippon Colin Co., Ltd.: *See*—
Wenzel, Dennis J.; Winter, Dean C.; and Honeyager, Kevin S., 4,836,213, Cl. 128-672.000.

Nippon Engineer Service Kabushiki Kaisha: *See*—
Sawada, Koji, 4,836,710, Cl. 405-54.000.

Nippon Kayaku Kabushiki Kaisha: *See*—
Nasu, Yasunobu; and Uchida, Haruhiko, 4,836,952, Cl. 252-188.280.

Nippon Oil Co., Ltd.: *See*—
Inoue, Akira; Ushio, Masaru; Morita, Toru; Oishi, Yasuyuki; and Sakoda, Hisao, 4,836,914, Cl. 208-251.00H.

Nippon Oil and Fats Company, Limited: *See*—
Araki, Masatada; and Kuroyama, Yutaka, 4,837,089, Cl. 428-552.000.

Nippon Paint Co., Ltd.: *See*—
Oishi, Masao; Saito, Takao; Ishikawa, Katsukiyo; Abe, Masanori; and Tamaura, Yutaka, 4,837,046, Cl. 427-38.000.
Shibata, Toshiko; Ina, Hiroji; and Ina, Kazuo, 4,836,987, Cl. 422-101.000.

Nippon Pillar Packing Co., Ltd.: *See*—
Fukumoto, Toshiyuki, 4,836,756, Cl. 417-394.000.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Awaji, Toshio; Ueda, Kenichi; and Atobe, Daisuke, 4,837,280, Cl. 525-502.000.

Nippon Soken, Inc.: *See*—
Tashiro, Syuzaburou; Ina, Toshikazu; and Kawai, Hisasi, 4,837,727, Cl. 364-551.010.

Nippon Steel Corporation: *See*—
Endo, Hidehiro; Tanemoto, Kei; and Kubo, Hiroshi, 4,837,231, Cl. 501-91.000.
Shimada, Haruo; and Sakakibara, Yoshiaki, 4,836,981, Cl. 420-79.000.

Nippon Telegraph and Telephone Corporation: *See*—
Hatori, Yoshinori; Kato, Yoichi; Ohta, Mutsumi; and Kosugi, Yasuhiro, 4,837,618, Cl. 358-135.000.
Nakanishi, Tadashi; and Yamauchi, Hironori, 4,837,791, Cl. 377-49.000.
Shamoto, Naoki; Suzuki, Hideo; Sugawara, Yasuyuki; Kawase, Masaaki; and Shinohara, Hiromichi, 4,836,639, Cl. 350-96.230.

Nippon Tsusho Kabushiki Kaisha: *See*—
Mukai, Hideki; and Atari, Yasuhiro, 4,836,356, Cl. 198-499.000.

Nippondenso Co., Ltd.: *See*—
Haseda, Satoshi; Tsuzuki, Yoshihiko; Konishi, Yoshimune; and Suzuki, Motoshi, 4,836,319, Cl. 180-142.000.
Wakata, Hideo; Takei, Toshihiro; Hattori, Yoshiyuki; Uno, Haruhiko; and Imoto, Yuzo, 4,836,618, Cl. 303-103.000.
Yamanaka, Yasutoshi; Izumida, Teruo; and Nomura, Kazuya, 4,836,276, Cl. 165-51.000.

Nishida, Sumio: *See*—
Ohsumi, Tadashi; Tsushima, Kazunori; Nishida, Sumio; Maeda, Kiyoto; Ooishi, Tadashi; and Matsuo, Noritada, 4,837,242, Cl. 514-365.000.

Nishihara, Hiroshi: *See*—
Kimura, Okitoshi; Ohsawa, Toshiyuki; Kabata, Toshiyuki; Nishihara, Hiroshi; and Aramaki, Kunitsugu, 4,837,096, Cl. 429-213.000.

Nishihara, Susumu; and Yoda, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Radio frequency coil for nuclear magnetic resonance imaging. 4,837,515, Cl. 324-318.000.

Nishimatsu, Masaharu: *See*—
Arioka, Hiroyuki; Nishimatsu, Masaharu; and Takayama, Suguru, 4,837,116, Cl. 428-141.000.

Nishimiya, Yozo: *See*—
Shibasaki, Masakatsu; Takahashi, Atsuo; Aoki, Tuyoshi; Kogi, Kentaro; Nishimiya, Yozo; Nara, Takeshi; and Yamaguchi, Takashi, 4,837,342, Cl. 549-422.000.

Nishimura, Dwight G., to Stanford University. NMR imaging of moving material using variable spatially selected excitation. 4,836,209, Cl. 128-653.000.

Nishimura, Masakatsu: *See*—
Ishiguro, Okikazu; Nishimura, Masakatsu; Nozawa, Shigeru; Kamogawa, Hiromi; and Kawano, Shigeyoshi, 4,836,991, Cl. 423-242.000.

Nishina, Kiichiro, to Ricoh Company, Ltd. Lens system for a copier. 4,836,664, Cl. 350-464.000.

Nishino, Tetsuo: *See*—
Isono, Osamu; Fukui, Toshimasa; Nishino, Tetsuo; Tachibana, Tetsuo; and Iwabuchi, Eisuke, 4,837,761, Cl. 370-60.000.

Nishinoiri, Hiroshi: *See*—
Kondo, Toshiro; Kanada, Eiji; and Nishinoiri, Hiroshi, 4,837,122, Cl. 430-204.000.

Nishioka, Tadashi; Yasue, Takao; and Koyama, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Coarse adjusting device of scanning tunneling microscope. 4,837,445, Cl. 250-442.100.

Nishiura, Masaaki; and Minamitani, Isei, to Kabushiki Kaisha Toshiba. Smoothing device. 4,837,562, Cl. 340-728.000.

Nishiyama, Mikio; and Akimoto, Taizo, to Fuji Photo Film Co., Ltd. Controller for CRT display apparatus. 4,837,626, Cl. 358-183.000.

Nishizawa, Jun-ichi; and Kondoh, Hisao, to Mitsubishi Electric Corporation. Double gate static induction thyristor and method for manufacturing the same. 4,837,608, Cl. 357-38.000.

Nishizawa, Kuninori; Miura, Teruo; Watanabe, Yoichi; and Takagi, Hirohiko, to Bridgestone Corporation. Metal cords and pneumatic tires using the same. 4,836,262, Cl. 152-451.000.

Nishizawa, Shohta: *See*—
Oishi, Shingo; and Nishizawa, Shohta, 4,836,819, Cl. 446-288.000.

Nishizawa, Toshinori: *See*—
Iwakoshi, Keiichi; Sato, Mitsuru; Umeda, Hiroyuki; and Nishizawa, Toshinori, 4,836,187, Cl. 128-4.000.

Nissan Chemical Industries Ltd.: *See*—
Miyaji, Katsuaki; Arai, Kazutaka; Ohara, Yoshio; and Takahashi, Yasuhiro, 4,837,344, Cl. 549-319.000.
Numata, Tatsuo; Hatanaka, Masataka; and Watanabe, Junichi, 4,837,345, Cl. 549-416.000.
Ogura, Tomoyuki; Kawamura, Yasuo; Baba, Masatoshi; Ishii, Shigeru; Hirata, Kiminori; Kudo, Masaki; Ochiai, Yoshinori; and Hirose, Masayoshi, 4,837,217, Cl. 514-252.000.
Sato, Fumie, 4,837,339, Cl. 549-214.000.

Nissan Motor Co., Ltd.: *See*—
Iwanaga, Kazuyoshi; and Yamaguchi, Toshio, 4,836,052, Cl. 74-759.000.
Kataoka, Sachiro; Iizima, Yoichi; Kuwahara, Masaji; Takeoka, Seiei; and Katsutani, Kazuzi, 4,836,323, Cl. 180-270.000.
Kumura, Haruyoshi, 4,836,054, Cl. 74-866.000.
Mihara, Teruyoshi, 4,836,025, Cl. 73-517.00R.
Miyazaki, Kenichi; Nakamura, Katsumi; Hagiwara, Taro; and Inoue, Keizo, 4,836,600, Cl. 296-197.000.
Nojiri, Hidetoshi; and Hirayama, Ryuta, 4,836,888, Cl. 156-647.000.
Sasaki, Michiaki, 4,836,402, Cl. 220-85.0VS.
Shimamura, Morihiko; Kubo, Jun; Kubota, Hitoshi; Fujiki, Norio; Tobisawa, Yoshio; Ishikawa, Yasuki; and Fukawa, Kazuyoshi, 4,835,970, Cl. 60-545.000.

Nisshin Flour Milling Co., Ltd.: *See*—
Konishi, Takao; Sugimori, Giichi; Kato, Kazuyoshi; Kimura, Nobutake; and Shibata, Kenji, 4,837,018, Cl. 424-92.000.

Nitsche, Klaus D.; and Zsiga, Johann P., to Durr Dental GmbH & Co KG. Compressor with balanced flywheel. 4,836,755, Cl. 417-368.000.

Nitz, Rolf-Eberhard: *See*—
Zoller, Gerhard; Beyerle, Rudi; Schindler, Ursula; Nitz, Rolf-Eberhard; and Martorana, Piero, 4,837,225, Cl. 514-427.000.

Niwa, Toshio; Himeno, Kiyoshi; Hihara, Toshio; Kurose, Yutaka; and Shimizu, Yukiharu, to Mitsubishi Chemical Industries Limited. Monohalo substituted triazinyl monoazo dyestuffs for cellulose-containing fibers. 4,837,309, Cl. 534-632.000.

Niwayama, Toshikazu, to Kabushiki Kaisha Matsuyama Seisakusho. Anti-glare rearview assembly for motor vehicles. 4,836,648, Cl. 350-281.000.

Nixdorf Computer AG: *See*—
Joachim, Burchart, 4,836,784, Cl. 434-113.000.

Nixon, David A.: *See*—
Cohen, Marc M.; Kaplicky, Jan; and Nixon, David A., 4,836,114, Cl. 108-77.000.

Nixon, Ronald A.; and Yagher, Charles, Jr., to Therm-O-Disc, Incorporated. Thermal cutoff assembly. 4,837,547, Cl. 337-414.000.

Noda, Yukio: *See*—
Suzuki, Masatoshi; Noda, Yukio; Kushiro, Yukitoshi; and Akiba, Shigeyuki, 4,837,526, Cl. 332-7.510.

Nohl, Andre J.; Nau, Vance J.; and Metzger, Andre, to Ciba-Geigy Corporation. Sample metering valve for a sample preparation system. 4,836,037, Cl. 73-864.160.

Nojiri, Hidetoshi; and Hirayama, Ryuta, to Nissan Motor Co., Ltd. Method of chemically etching semiconductor substrate. 4,836,888, Cl. 156-647.000.

Nomura, Izumi: *See*—
Yagi, Kiyoshi; Kanno, Toshiaki; Kanda, Masahiro; and Nomura, Izumi, 4,837,282, Cl. 525-265.000.

Nomura, Kazuya: *See*—
Yamanaka, Yasutoshi; Izumida, Teruo; and Nomura, Kazuya, 4,836,276, Cl. 165-51.000.

Nomura, Masaaki: *See*—
Yamamoto, Ryoichi; Nomura, Masaaki; Yamada, Takashi; and Nahara, Akira, 4,837,118, Cl. 428-64[illegible].000.

Nomura, Yoshihisa, to Toyota Jidosha Kabushiki Kaisha. Hydraulic booster equipped with emergency accumulator. 4,835,967, Cl. 60-404.000.

Nonaka, Wataru; and Hirata, Eiichi, to Sony Corp. Video cassette auto-changer. 4,837,647, Cl. 360-92.000.

Nonami, Hidetaka, to Kabushiki Kaisha Toshiba. Image erasing apparatus. 4,837,598, Cl. 355-218.000.

Nonomura, Yoshihito: *See*—
Takagi, Kazuhiko; and Nonomura, Yoshihito, 4,836,698, Cl. 400-208.000.

Noppe, Marcus J. M.: *See*—
de Jaeger, Nikolaas C. J.; Monbaliu, Marcel J.; Noppe, Marcus J. M.; and Konings, Frank J., 4,837,163, Cl. 436-533.000.

Nordica S.p.A.: *See*—
Pozzobon, Alessandro, 4,836,572, Cl. 280-613.000.

Nordischer Maschinenbau Rud. Baader GmbH + CO KG: *See*—
Jurs, Michael, 4,835,817, Cl. 17-62.000

Nordmann, Adolf: *See*—
Winkler, Gert; and Nordmann, Adolf, 4,836,085, Cl. 89-45.000.

Nordson Corporation: *See*—
French, Gordon K., 4,836,440, Cl. 22[illegible]-132.000.

Norris, Richard E.: *See*—
Crockett, Robert N.; Kern, Robert F.; Miller, Arnold G.; Norris, Richard E.; Pousson, Michael W., Jr.; and Wagner, Robert E., 4,837,680, Cl. 364-200.000.

North American Philips Consumer Electronics Co.: *See*—
Zoladz, Frank J., 4,836,399, Cl. 220-7[illegible].000.

North American Philips Corporation: *See*—
Miller, William G., 4,837,612, Cl. 358-28.000.
Motoyama, Tsutomu, 4,837,623, Cl. 358-165.000.
Newman, Wyatt S., 4,837,467, Cl. 310-12.000.
Tsinberg, Mikhail, 4,837,619, Cl. 358-140.000.

Northern Telecom Limited: *See*—
Grover, Wayne D., 4,837,780, Cl. 375-11.000.
Kalnitsky, Alexander; Ellul, Joseph P.; and Tay, Sing P., 4,836,902, Cl. 204-192.320.
McClain, Donald T., 4,837,819, Cl. 379-424.000.
Reid, David I.; Ellson, John C.; and Betts, Malcolm C., 4,837,760, Cl. 370-16.000.

Noske, Erich; Pfeiler, Manfred; and Reichenberger, Helmut, to Siemens Aktiengesellschaft. Lithotripsy work station. 4,836,191, Cl. 128-24.00A.

Nott, Sepideh H.: *See*—
Cobb, Carleton M., III; Hirsbrunner, Hans G.; Gonsalves, Edward M.; Jenne, Richard L.; and Nott, Sepideh H., 4,837,545, Cl. 337-66.000.

Novacel: *See*—
Anton, Patrice; and Bergaentzle, Denis, 4,837,077, Cl. 428-240.000.

Noyes, Gary P., to United Technologies Corporation. Methane conversion reactor. 4,836,898, Cl. 204-129.000.

Nozaka, Kenkichi; Kawahara, Yoshiro; Kitamura, Yuji; Morita, Shigeru; and Takahashi, Sadayuki, to Kubota Ltd. Load handling vehicle. 4,836,738, Cl. 414-607.000.

Nozaki, Yasuhiro: *See*—
Aoyagi, Juuro; Yamamoto, Yuichi; Asaike, Toshihiro; and Nozaki, Yasuhiro, 4,836,928, Cl. 210-635.000.

Nozawa, Shigeru: *See*—
Ishiguro, Okikazu; Nishimura, Masakatsu; Nozawa, Shigeru; Kamogawa, Hiromi; and Kawano, Shigeyoshi, 4,836,991, Cl. 423-242.000.

Nuclear Metals, Inc.: *See*—
Pollock, Eugene N., 4,837,375, Cl. 423-20.000.

Nudvuck Enterprises: *See*—
Kugelmann, Franz J., 4,837,388, Cl. 428-69.000.

Nukui, Katsuhiko: *See*—
Kakazu, Yukinori; Minami, Noburo; and Nukui, Katsuhiko, 4,837,703, Cl. 364-474.180.

Numata, Tatsuo; Hatanaka, Masataka; and Watanabe, Junichi, to Nissan Chemical Industries Ltd. Process for the production of tetrahydropyran-3-one derivatives. 4,837,345, Cl. 549-416.000.

Numazawa, Akio; Kubo, Seitoku; and Kuramochi, Koujiro, to Toyota Jidosha Kabushiki Kaisha. Transverse type automatic transmission with two separate lay shaft elements. 4,836,050, Cl. 74-695.000.

Numazawa, Akio: *See*—
Nakawaki, Yasunori; Numazawa, Akio; and Hayashi, Takashi, 4,836,056, Cl. 74-866.000.

Nunez, Fabian: *See*—
Landry, Louis G.; and Nunez, Fabian, 4,836,872, Cl. 156-85.000.

Nussbaum, Max; Picart, Thierry; and Sarron, Jean, to Gaz de France. Process for conducting and monitoring the temperature rise of electrically heated components. 4,837,424, Cl. 219-494.000.

Nye, Norman H. Container valve and filling means. 4,836,253, Cl. 141-18.000.

Nylok Fastener Corporation: *See*—
Duffy, Richard, 4,835,819, Cl. 427-195.000.

Nynex Corporation: *See*—
Brancati, Rudolf P., 4,837,815, Cl. 379-438.000.

Oba, Yoichi: *See*—
Iwasa, Yamahiro; Oba, Yoichi; and Morooka, Isao, 4,837,050, Cl. 427-96.000.

Obara, Yuichi; Fuse, Kenichi; Onuma, Yoshihiro; Teya, Takao; and Chiba, Kazuo, to Furukawa Electric Co., Ltd., The. Optical switch and optical keyboard utilizing the same. 4,836,636, Cl. 350-96.200.

Obrea, Liana, to Pitney Bowes Inc. Electronic postage meter having an infinite loop lockout arrangement. 4,837,702, Cl. 364-466.000.

O'Brien, Richard J.; and Myhre, Douglas C., to Rosemount Inc. Asymmetric purge air system for cleaning a lens. 4,836,689, Cl. 374-125.000.

Occidental Chemical Corporation: *See*—
Kem, Kenneth M., 4,836,956, Cl. 252-631.000.
Schwartz, Willis T., 4,837,404, Cl. 549-241.000.

Ochiai, Yoshinori: *See*—
Ogura, Tomoyuki; Kawamura, Yasuo; Baba, Masatoshi; Ishii, Shigeru; Hirata, Kiminori; Kudo, Masaki; Ochiai, Yoshinori; and Hirose, Masayoshi, 4,837,217, Cl. 514-252.000.

Odaka, Kentaro: *See*—
Ozaki, Shinya; Fukami, Tadashi, and Odaka, Kentaro, 4,837,640, Cl. 360-27.000.

Office National d'Etudes et de Recherche Aerospatiales: *See*—
Khan, Tasadduq; Caron, Pierre; and Raffestin, Jean-Louis, 4,837,384, Cl. 148-3.000.

Office National d'Etudes et de Recherches Aerospatiales: *See*—
Guezou, Jean-Pierre; Heid, Gilles; Bailleux, Pierre; and Pruvost, Marc, 4,836,743, Cl. 415-53.100.

Ogasawara, Toshichika: *See*—
Nemoto, Kaoru; Igusa, Kazuo; and Ogasawara, Toshichika, 4,836,957, Cl. 260-397.200.

Ogata, Tetsuo: *See*—
Zushi, Shizuo; Miyamoto, Mitsuo; Gou, Hiroshi; Kobayashi, Fumiyuki; and Ogata, Tetsuo, 4,837,663, Cl. 361-384.000.

Ogata, Yasuhiro, to Fuji Photo Film Co., Ltd. Heat-sensitive recording paper. 4,837,196, Cl. 503-200.000.

Ogata, Yasuji; and Yamanashi, Takanori, to Olympus Optical Co., Ltd. Telephoto zoom lens system. 4,836,662, Cl. 350-427.000.

Ogawa, Shinji; Iguchi, Seiya; Kimura, Hiroshi; and Ohmori, Yoh, to Mitsui Toatsu Chemicals, Inc. Process for concentration of an aqueous solution of amino acid. 4,837,371, Cl. 548-497.000.

Ogawa, Shinji; Tsuchiya, Haruhiko; Araki, Tsutomu; Aoki, Hiroshi; and Yamamoto, Hiroshi, to Panafacom Limited. Display control apparatus employing bit map method. 4,837,564, Cl. 340-750.000.

Ogawa, Tadashi: *See*—
Ikeda, Tadashi; and Ogawa, Tadashi, 4,837,140, Cl. 430-550.000.

O'Genski, Richard K.: *See*—
Cappelletto, George C.; and O'Genski, Richard K., 4,836,739, Cl. 414-678.000.

Ogino, Shuji: *See*—
Nakamura, Akiyoshi; Ando, Makoto; Ogino, Shuji; and Taniguchi, Nobuyuki, 4,837,594, Cl. 354-402.000.

Ogiro, Kenji: *See*—
Nagai, Kyuichiro; Kaku, Nobuyuki; and Ogiro, Kenji, 4,837,646, Cl. 360-85.000.

Ogisu, Yasuhiko: *See*—
Manabe, Katsuhide; Ogisu, Yasuhiko; Goto, Kazuaki; and Toya, Hisao, 4,836,901, Cl. 204-164.000.

Ogoe, Samuel A.: *See*—
Laughner, Michael K.; and Ogoe, Samuel A., 4,837,258, Cl. 524-168.000.

Ogoshi, Kunizho: *See*—
Murata, Yasushi; Ogoshi, Kunizho; and Matsui, Fumio, 4,836,890, Cl. 156-73.100.

Ogunbiyi, Lai; Smith, Francis X.; and Riedhammer, Thomas M., to Bausch & Lomb Incorporated. Disinfecting and preserving systems and methods of use. 4,836,986, Cl. 422-28.000.

Ogura, Tomoyuki; Kawamura, Yasuo; Baba, Masatoshi; Ishii, Shigeru; Hirata, Kiminori; Kudo, Masaki; Ochiai, Yoshinori; and Hirose, Masayoshi, to Nissan Chemical Industries, Ltd. Pyridazinone derivatives, preparation thereof, and insecticidal, acaricidal, nematicidal, fungicidal compositions. 4,837,217, Cl. 514-252.000.

Ohara, Shinichiro; and Naruo, Kyoichi, to Fuji Photo Film Co., Ltd. Recording medium. 4,837,127, Cl. 430-270.000.

Ohara, Yoshio: *See*—
Miyaji, Katsuaki; Arai, Kazutaka; Ohara, Yoshio; and Takahashi, Yasuhiro, 4,837,344, Cl. 549-319.000.

Ohata, Keiichi: *See*—
Kasahara, Kensuke; Itoh, Tomohiro; and Ohata, Keiichi, 4,837,605, Cl. 357-22.000.

Ohata, Yu; Kuramoto, Tsuyoshi; and Shimbo, Masaru, to Kabushiki Kaisha Toshiba. Silicon semiconductor substrate with an insulating layer embedded therein and method for forming the same. 4,837,186, Cl. 437-228.000.

Ohba, Hisao: *See*—
Kobayashi, Kesanao; Ohba, Hisao; and Toyama, Tadao, 4,837,131, Cl. 430-302.000.

Ohe, Yasuo; Matsuura, Makiko; Shimizu, Fumio; Nakajima, Yoshito; Shin Sadahito; and Shima, Kenji, to Otsuka Pharmaceutical Co., Ltd. Monoclonal antibody, measuring method of glucosylated protein by utilizing the monoclonal antibody, and kit therefor. 4,837,170, Cl. 436-548.000.

Ohfune, Yasufumi; and Sakaitani, Masahiro, to Suntory Limited. Tertiary-butyldimethylsilyl carbamate derivative and process for producing the same. 4,837,349, Cl. 556-420.000.

Ohi, Kimio, to Jeol Ltd. Electron microscope. 4,837,444, Cl. 250-442.100.

Ohira, Tadashi; Ito, Masazumi; and Maruta, Syuzi, to Minolta Camera Kabushiki Kaisha. Copying apparatus having an editing function. 4,837,599, Cl. 355-7.000.

Ohishi, Tetsuo: *See*—
Maeno, Satoru; Fukuyama, Norio; Ohishi, Tetsuo; Kyutoku, Senzo; and Nakamura, Thutomu, 4,837,493, Cl. 318-685.000.

Ohkura, Hirokazu: *See*—
Ikeda, Haruhiko; Higuchi, Masahiro; and Ohkura, Hirokazu, 4,837,197, Cl. 503-209.000.

Ohmori, Yoh: *See*—
Ogawa, Shinji; Iguchi, Seiya; Kimura, Hiroshi; and Ohmori, Yoh, 4,837,371, Cl. 548-497.000.

Ohmure, Yukio: *See*—
Tohzuka, Takashi; Ishikawa, Sueyoshi; Kubo, Katsuyoshi; Honda, Yoshitaka; Ohmure, Yukio; and Kataoka, Norio, 4,836,944, Cl. 252-54.000.

Ohnishi, Tsuyoshi. Simple blood test for diagnosing malignant hyperthermia. 4,837,163, Cl. 436-63.000.

Ohsaki, Mikio: *See*—
Tanaka, Toshiyuki; Kuga, Shigeki; Morishita, Taro; Nakamura, Nobuo; and Ohsaki, Mikio, 4,837,689, Cl. 364-419.000.

Ohsawa, Susumu: *See*—
Miyazaki, Hidehiro; Shingai, Kazuto; and Ohsawa, Susumu, 4,837,759, Cl. 369-32.000.

Ohsawa, Toshiyuki: *See*—
Kimura, Okitoshi; Ohsawa, Toshiyuki; Kabata, Toshiyuki; Nishihara, Hiroshi; and Aramaki, Kunitsugu, 4,837,096, Cl. 429-213.000.

Ohshima, Toshio; and Yokoyama, Naoki, to Fujitsu Limited. Method for producing a semiconductor integrated circuit having an improved isolation structure. 4,837,178, Cl. 437-33.000.

Ohsima, Ken: *See*—
Okada, Hiroo; Ikeda, Yoshiaki; and Ohsima, Ken, 4,837,757, Cl. 369-44.000.

Ohsumi, Tadashi; Tsushima, Kazunori; Nishida, Sumio; Maeda, Kiyoto; Ooishi, Tadashi; and Matsuo, Noritada, to Sumitomo Chemical Company, Limited. Thiazoles and pyrazoles as fungicides. 4,837,242, Cl. 514-365.000.

Ohta, Eiichi: *See*—
Izumi, Kohji; Eguti, Hirotoshi; Ohta, Eiichi; Kimura, Yuhji; and Ebi, Yutaka, 4,836,034, Cl. 73-862.040.

Ohta, Hitoshi: *See*—
Kashiwadani, Nobuo; and Ohta, Hitoshi, 4,836,980, Cl. 419-36.000.

Ohta, Minemasa; Suzuki, Kenji; Fukuoka, Satoru; Takishita, Toshihiko; and Hayashi, Tuyoshi, to Pioneer Electronic Corp.; and Pioneer Video Corporation. Optical disk manufacturing method. 4,837,130, Cl. 430-321.000.

Ohta, Mutsumi: *See*—
Hatori, Yoshinori; Kato, Yoichi; Ohta, Mutsumi; and Kosugi, Yasuhiro, 4,837,618, Cl. 358-135.000.

Ohta, Norio: *See*—
Harada, Masahiro; Yanagi, Kenichi; Fukushima, Takeo; Furukawa, Kusuo; Soeda, Naohiko; Ohta, Norio; Sato, Kuniaki; and Nakajima, Yasuhisa, 4,836,774, Cl. 432-8.000.

Ohwa, Nobutaka: *See*—
Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Kamimae, Hajime, 4,836,511, Cl. 267-64.160.
Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Kamimae, Hajime, 4,836,575, Cl. 280-702.000.

Ohya, Yasuhiro: *See*—
Murofushi, Toshiaki; Ohya, Yasuhiro; Nakazawa, Hiroshi; and Oyamada, Koichi, 4,837,100, Cl. 430-106.600.

Oikawa, Takahiro, to Yazaki Corporation. Vibrational angular rate sensor. 4,836,023, Cl. 73-505.000.

Oishi, Eiichi: *See*—
Tomita, Yoji; Oishi, Eiichi; Miyaji, Hiroshi; Morimoto, Hiroya; Sekigawa, Tetsuo; and Mitsuhashi, Kenichi, 4,836,917, Cl. 210-104.000.

Oishi, Hisao; Yanagihara, Kazuhiko; Miyakawa, Tadashi; Nakamura, Takeshi; Akimoto, Kazuhiko; and Shioji, Mitsuaki, to Fuji Photo Film Co., Ltd.; and Sharp Kabushiki Kaisha. Liquid crystal shutter array having microlenses corresponding to the pixel electrodes. 4,836,652, Cl. 350-334.000.

Oishi, Masao; Saito, Takao; Ishikawa, Katsukiyo; Abe, Masanori; and Tamaura, Yutaka, to Nippon Paint Co., Ltd. Method for forming ferrite film. 4,837,046, Cl. 427-38.000.

Oishi, Shingo; and Nishizawa, Shohta, to Iwaya Corporation. Skateboarding toy. 4,836,819, Cl. 446-288.000.

Oishi, Yasuyuki: *See*—
Inoue, Akira; Ushio, Masaru; Morita, Toru; Oishi, Yasuyuki; and Sakoda, Hisao, 4,836,914, Cl. 208-251.00H.

Ojanen, Randall W., to GTE Products Corporation. Retainer scheme for machine bit. 4,836,614, Cl. 299-86.000.

Okada, Hiroo; Ikeda, Yoshiaki; and Ohsima, Ken, to Olympus Optical Co., Ltd. Optical recording/reproducing device. 4,837,757, Cl. 369-44.000.

Okada, Johshin: *See*—
Tanaka, Yukitaka; Nakamura, Minoru; Okada, Johshin; and Mansho, Kenji, 4,837,214, Cl. 514-179.000.

Okada, Masaki, to Isuzu Motors Limited. Vehicle heating system. 4,836,445, Cl. 237-2.00A.

Okada, Sadayuki: *See*—
Gunji, Yasuhiro; Okada, Sadayuki; Isogai, Masato; Kondo, Katsumi; Ibamoto, Masahiko; Kuwabara, Kazuhiro; and Kanke, Atsushi, 4,836,657, Cl. 350-350.00S.

Okaji, Masahiro, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Double-path interferometer. 4,836,678, Cl. 356-351.000.

Okamura, Takumi: *See*—
Sato, Mitsuyoshi; Okamura, Takumi; and Kimura, Kaoru, 4,837,260, Cl. 524-261.000.

Okano, Shohei: *See*—
Akizuki, Ikuo; Kaya, Hiroshi; Okano, Shohei; Otake, Nobuo; Kumagai, Keiji; and Kaneko, Yoshihito, 4,837,193, Cl. 502-242.000.

Okauchi, Ken: *See*—
Kohno, Junichi; Okauchi, Ken; Goto, Sohei, Iwagaki, Masaru; and Komamura, Tawara, 4,837,141, Cl. 430-559.000.

Okazaki, Kouji: *See*—
Inagaki, Takashi; Okazaki, Kouji; and Ikeda, Tsugio, 4,836,156, Cl. 123-90.310.

Okey, David W.; Church, John S.; Saatchi, Hossein; and Scanlon, John F., to Sundstrand Corporation. Dimensionally-stable lightweight core for composite structures. 4,837,251, Cl. 523-218.000.

Oki Electric Industry Co., Ltd.: *See*—
Tachibana, Sadao, 4,837,412, Cl. 200-5.00A.

Okine, Richard K.: *See*—
Armiger, Thomas E.; Edison, David H.; Lauterbach, Herbert G.; Layton, James R.; and Okine, Richard K., 4,837,117, Cl. 428-392.000.

Okita, Tsutomu: *See*—
Yamada, Yasuyuki; Miyatsuka, Hajime; Okita, Tsutomu; and Tsuji, Nobuo, 4,837,081, Cl. 428-329.000.

Okitaka, Takenori; and Miyazaki, Yukio, to Mitsubishi Denki Kabushiki Kaisha. Three-state complementary field effect integrated circuit. 4,837,463, Cl. 307-473.000.

Okumoto, Yutaka, to Japan Tobacco Inc. Device for controlling contents of tobacco on cigarette manufacturing machine. 4,836,221, Cl. 131-84.100.

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Pease, William M.; and Hall, William M., 4,837,579, Cl. 342-197.000.
Peregrim, Theadore J.; Okurowski, Frank A.; and Mangiapane, Rosario, 4,837,577, Cl. 342-80.000.
Raywheel, Inc.: *See*—
Striebel, R. Michael, 4,837,557, Cl. 340-5?6.000.
RCA Licensing Corporation: *See*—
Mengel, William H., 4,837,627, Cl. 358-1?1.100.
Sauer, Donald J., 4,837,527, Cl. 332-11.0?D.
Rea, James: *See*—
Bellis, Kenneth E.; Brown, Jackson E.; Nagarwalla, Pheroze J.; and Rea, James, 4,836,269, Cl. 164-200.000
Reale, Louis, to Xerox Corporation. Long life corona charging device. 4,837,658, Cl. 361-230.000.
Reck, Bernd: *See*—
Eich, Manfred; Wendorff, Joachim; and Reck, Bernd, 4,837,745, Cl. 365-108.000.
Redus, Clifford L.; Chien, Sze-Foo; and Sigwardt, Peter L., to Texaco, Inc. Method of determining the quality of steam for stimulating hydrocarbon production. 4,836,032, Cl. 73?861.040.
Reeb, Wolfgang: *See*—
Heubner, Wilhelm; and Reeb, Wolfgang 4,836,092, Cl. 92-48.000.
Reed, Lowell M., to Parco Mast and Substructures, Inc. Method of performing drilling operations from a derrick. 4,836,300, Cl. 175-57.000.
Reed, Robert H. Wall bracket assembly. 4,8?6,484, Cl. 248-243.000.
Reed, Robert L.; and Holdeman, David A., to Amoco Corporation. Method for controlling claus furnace with variable hydrocarbon feed composition. 4,836,999, Cl. 423-574.00R.
Regas, Jennine: *See*—
Fernando, Ranjit S.; and Regas, Jennine, ?,836,216, Cl. 128-734.000.
Regelman, Dale F.: *See*—
Roshen, Waseem A.; Turcotte, David E.; and Regelman, Dale F., 4,837,659, Cl. 361-270.000.
Reginault, Philippe: *See*—
Guillemet, Alain; Teillaud, Eric; Reginault, Philippe; and Bevan, Bruno, 4,837,025, Cl. 424-448.000.
Reiber, Helmut: *See*—
Schwab, Gunter; Reiber, Helmut; and Stapelfeldt, Rolf, 4,837,413, Cl. 200-11.00R.
Reichelt, Helmut: *See*—
Etzbach, Karl-Heinz; Hansen, Guenter; Schefczik, Ernst; and Reichelt, Helmut, 4,837,269, Cl. 534-761.000.
Reichelt, Wolfgang; Scheulen, Matthias; Schwerdtfeger, Klaus; Voss-Spilker, Peter; and Feuerstacke, Ewald, to Mannesmann Aktiengesellschaft. Casting apparatus for casting metal strip, in particular, steel strip. 4,836,271, Cl. 164-417.000.
Reichenbach, Michael C.: *See*—
Van Saders, John G.; Tarasevich, Andrew; and Reichenbach, Michael C., 4,836,681, Cl. 356-374.000.
Reichenberger, Helmut: *See*—
Noske, Erich; Pfeiler, Manfred; and Reichenberger, Helmut, 4,836,191, Cl. 128-24.00A.
Reid, David I.; Ellson, John C.; and Betts, Malcolm C., to Northern Telecom Limited. Communications system with protection switching using individual selectors. 4,837,760, Cl. 370-16.000.
Reid, Lloyd E.: *See*—
Krupay, Bordan W.; and Reid, Lloyd E., 4,837,338, Cl. 548-555.000.
Reimann, Horst: *See*—
Zahradnik, Franz; Ulmerich, Karlheinz; McKee, Graham E.; Reimann, Horst; Pflueger, Richard; and Theysohn, Rainer, 4,837,264, Cl. 524-381.000.
Reinhart, Theodore J., to United States of America, Air Force. Ultrasonic assisted paint removal method. 4,836,858, Cl. 134-1.000.
Reinheimer, Guenter: *See*—
Leiter, Herbert; Koch, Herbert; Hund, Andreas; and Reinheimer, Guenter, 4,837,595, Cl. 354-412.000.
Reisman, Howard, to Boca Foods Inc. Packing platter for foods, with decorative tab-engaged strip. 4,836,363, Cl. 206-44.00R.
Renard, Jean J.; and Hanson, David M., to International Paper Company. Apparatus and process for testing uniformity of pulp. 4,837,446, Cl. 250-461.100.
Reneau, Raymond P., to Keyes Offshore, Inc. Hyperbaric organ preservation apparatus and method for preserving living organs. 4,837,390, Cl. 435-1.000.
Renner, Wolf: *See*—
Mauer, Dieter; and Renner, Wolf, 4,836,728, Cl. 411-43.000.
Repta, Arnold J.: *See*—
de Montigny, Pierre M. R.; Sternson, Larry A.; Repta, Arnold J.; Stobaugh, John F.; Higuchi, Takeru, deceased; and Higuchi, Kenji W., co-executor, 4,837,166, Cl. 436-111.000.
Resch, Reinhard, to Daimler-Benz Aktiengesellschaft. Antilocking system (ABS) and propulsion control system (ASR) for a road vehicle. 4,836,617, Cl. 303-100.000.
Research Association for Petroleum Alternatives Development: *See*—
Takatsu, Kozo; and Kawata, Noboru, 4,837,000, Cl. 423-328.000.
Research Association for Residual Oil Processing: *See*—
Matsuo, Itaru; Takahashi, Yuzo; Hashimoto, Hideo; Takatsuka, Toru; Iimori, Takeru; Maekawa, Hitoshi; Ito, Tamotsu; Shohji, Yoshihiko; Watari, Ryuzo; and Aida, Hiroshi, 4,836,909, Cl. 208-72.000.
Research Development Corporation: *See*—
Sugawara, Eishu; Nakayama, Taketoshi; and Masumoto, Tsuyoshi, 4,836,867, Cl. 148-301.000.
Research Development Corporation of Japan: *See*—
Kudo, Toshio, 4,837,094, Cl. 428-694.000.
Research Triangle Institute, Inc.: *See*—
Pierce, John L.; and Kanopoulos, Nick, 4,837,447, Cl. 250-492.200.
Resistance Technology, Inc.: *See*—
McDonald, Gerald H., 4,835,833, Cl. 29-525.000.
Revlon, Inc.: *See*—
Macchio, Ralph A.; Brown, Ivonne; and Tietjen, Marlene, 4,837,011, Cl. 424-69.000.
Rheinmetall GmbH: *See*—
Winkler, Gert; and Nordmann, Adolf, 4,836,085, Cl. 89-45.000.
Rhodes, Russell H.: *See*—
Kegel, Andrew J.; Spencer, James R.; Smith, James S.; Rhodes, Russell H.; and Mullendore, James A., 4,836,108, Cl. 102-306.000.
Rhone-Poulenc Inc.: *See*—
Gradeff, Peter S.; and Davison, John F., 4,836,830, Cl. 44-57.000.
Rhone-Poulenc Sante: *See*—
Morel, Didier, 4,837,365, Cl. 568-394.000.
Rhone-Poulenc Specialites Chimiques: *See*—
Desbois, Michel; and Langlois, Bernard, 4,837,364, Cl. 568-43.000.
Lepage, Jean-Luc; and Simon, Gerard, 4,836,997, Cl. 423-342.000.
Rials, Robert A.: *See*—
Dennehy, Michael J., Jr.; and Rials, Robert A., 4,836,735, Cl. 414-475.000.
Riboh, Moise: *See*—
Ruegg, Richard J.; Slovak, William R.; and Riboh, Moise, 4,837,382, Cl. 426-503.000.
Rice, Ivan G. Process for directing a combustion gas stream onto rotatable blades of a gas turbine. 4,835,958, Cl. 60-39.050.
Rice, Max, to Max Rice Corporation, The. Exercise machine with non-linear hydraulic resistance. 4,836,538, Cl. 272-146.000.

Richard, Robert G.: *See*—
Lund, Earl A. E.; Richard, Robert G.; Shankland, Ian R.; and Wilson, David P., 4,836,947, Cl. 252-171.000.
Richardson, Anthony R. W.: *See*—
Anderson, Milo D.; Holt, Neil L.; Larsson, Peter L.; and Richardson, Anthony R. W., 4,836,558, Cl. 277-1.000.
Richardson, Glenn: *See*—
Eisa, Soraya; Peczkowski, Joseph; Tyler, Henry; and Richardson, Glenn, 4,837,697, Cl. 364-431.020.
Richardson, John: *See*—
Hoyer, Bryan; and Richardson, John, 4,837,665, Cl. 362-96.000.
Richardson, John L.: *See*—
Culler, Glen J.; Pearson, Robert B.; McCammon, Michael; Proctor, William L.; and Richardson, John L., 4,837,678, Cl. 364-200.000.
Richter, Juergen; Grau, Werner; Maurer, Gerd; Domas, Friedrich; Loeser, Werner; Bender, Rainer; Schulze, Axel-Ruediger; and Doerr, Kurt, to BASF Aktiengesellschaft. Surface treatment of disk-shaped nickel-plated aluminum substrates. 4,835,909, Cl. 51-281.0SF.
Rickert, Hans; Mueller, Peter; and Holzaepfel, Guenter, to Vereinigte Elektrizitatswerke Westfalen AG. Process for desulfurizing waste gases. 4,836,992, Cl. 423-242.000.
Rico, Isabelle: *See*—
Laval, Jean-Paul; Leconte, Michel; Ollivier, Jean; Perez, Emile; Quignard, Francoise; and Rico, Isabelle, 4,837,188, Cl. 502-107.000.
Ricoh Company, Ltd.: *See*—
Akiyoshi, Hideki; Tamura, Hiroshi; Kutami, Atsushi; and Takada, Yoshihiro, 4,837,120, Cl. 430-56.000.
Bisaiji, Takashi, 4,837,597, Cl. 355-203.000.
Imakawa, Susumu; and Takeyama, Yoshinobu, 4,837,588, Cl. 346-108.000.
Izumi, Kohji; Eguti, Hirotoshi; Ohta, Eiichi; Kimura, Yuhji; and Ebi, Yutaka, 4,836,034, Cl. 73-862.040.
Kimura, Okitoshi; Ohsawa, Toshiyuki; Kabata, Toshiyuki; Nishihara, Hiroshi; and Aramaki, Kunitsugu, 4,837,096, Cl. 429-213.000.
Mitsunobu, Takamasa, 4,837,505, Cl. 324-158.00R.
Nishina, Kiichiro, 4,836,664, Cl. 350-464.000.
Omi, Kyoji, 4,837,614, Cl. 358-75.000.
Tagoku, Izumi; and Mashiko, Harumitsu, 4,837,071, Cl. 428-195.000.
Takahashi, Shuichi; and Koshiishi, Takaho, 4,837,812, Cl. 379-98.000.
Takanashi, Kenichi, 4,836,630, Cl. 350-6.100.
Rideout, Janet L.; Barry, David W.; Lehrman, Sandra N.; St. Clair, Martha H.; and Furman, Phillip A., to Burroughs Wellcome Co. Treatment of human viral infections. 4,837,208, Cl. 514-50.000.
Ridgard, Christopher: *See*—
Sloman, Roger M.; and Ridgard, Christopher, 4,836,876, Cl. 156-242.000.
Riechelmann, Bernd, to Sym-Tek Systems, Inc. Electrical device contactor. 4,836,797, Cl. 439-264.000.
Riedhammer, Thomas M.: *See*—
Ogunbiyi, Lai; Smith, Francis X.; and Riedhammer, Thomas M., 4,836,986, Cl. 422-28.000.
Riedinger, Thomas R.: *See*—
d'Almada Remedios, Miguel A.; and Riedinger, Thomas R., 4,836,602, Cl. 297-191.000.
Ries, Donald G., to Nalco Chemical Company. Monomeric, oligomeric and polymeric sulfonates. 4,837,283, Cl. 525-403.000.
Riese, Stephen B., to Brunswick Corporation. Exhaust heated crankcase for 2-cycle marine engine. 4,836,152, Cl. 123-65.0EM.
Rigby, William R., to Westvaco Corporation. Ovenable carton with handles. 4,836,438, Cl. 229-52.00B.
Rigotti, Victor: *See*—
Levine, Matthew; Cairo, Anthony; Russo, James; Rigotti, Victor; and Clark, Roger, 4,837,731, Cl. 364-145.000.
Ringler, Michael. Concrete curb form hanger. 4,836,487, Cl. 248-303.000.
Rinholen, Robert K., to Amana Refrigeration, Inc. Air conditioner with improved thermostating operation. 4,835,981, Cl. 62-229.000.
Riordan, John C.; and Pearlman, Jay S., to Maxwell Laboratories Inc. Filter apparatus for use with an x-ray source. 4,837,794, Cl. 378-119.000.
Riquet, Jean-Pierre: *See*—
Conti, Calogero; Meyer, Jean-Luc; Netter, Pierre; and Riquet, Jean-Pierre, 4,837,385, Cl. 210-695.000.
Rishel, John W.; and Schrink, George H., to Delaware Capital Formation, Inc. Vibrating filter apparatus. 4,836,922, Cl. 210-232.000.
Ritter, J. Alan: *See*—
Scheller, Gregg D.; Gahn, Jerry S.; Higgins, Daniel E.; Wendt, Richard; Gibeltirra, James; and Ritter, J. Alan, 4,837,857, Cl. 455-617.000.
Rittler, Hermann L., to Corning Glass Works. Fluorinated phyllosilicate and method. 4,836,954, Cl. 252-378.00R.
Rius, Jean-Michel: *See*—
Denis, Gerard; and Rius, Jean-Michel, 4,836,971, Cl. 264-521.000.
Riva Calzoni S.p.A.: *See*—
Sala, Oneglio; and Montanari, Paolo, 4,836,711, Cl. 405-92.000.
Riverside Research Institute: *See*—
Naiman, Charles S.; King, Marvin; and Greenbaum, Michael, 4,836,672, Cl. 356-5.060.
Roach, Daniel; and Spector, George. Try square protractor. 4,835,877, Cl. 33-426.000.
Robbins, Aida F.: *See*—
Tumey, Michael L.; Bange, Donna W.; and Robbins, Aida F., 4,836,832, Cl. 51-293.000.
Robbins, Edward S., III. Bag closure device. 4,835,820, Cl. 24-30.50R.
Robbins, Edward S., III. Method of extrusion blow-molding container having upper and lower sections of different thickness. 4,836,970, Cl. 264-515.000.
Robbins Tire and Rubber Company, Inc.: *See*—
Perdue, Thad A., 4,836,877, Cl. 156-244.130.
Robbins, William D., to Sports & Toys Concepts, Inc. Glove-and-ball sports toy. 4,836,554, Cl. 273-321.000.
Robert Bosch GmbH: *See*—
Hafele, Walter, 4,836,170, Cl. 123-503.000.
Heitmann, Jurgen; and Wagner, Peter, 4,837,624, Cl. 358-166.000.
Rauch, Hans; Osterkamp, Eva; and Stepper, Norbert, 4,835,870, Cl. 33-1.00C.
Stegmeier, Alwin, 4,836,248, Cl. 137-625.650.
Wietelmann, Jurgen, 4,836,166, Cl. 123-358.000.
Robert Krups Stiftung & Co. KG: *See*—
Mahlich, Gotthard, 4,835,861, Cl. 30-43.920.
Robert Manufacturing Co.: *See*—
Wright, William L.; and Mendoza, Benjamin D., 4,836,238, Cl. 137-315.000.
Roberts Corporation: *See*—
Bellis, Kenneth E.; Brown, Jackson E.; Nagarwalla, Pheroze J.; and Rea, James, 4,836,269, Cl. 164-200.000.
Roberts, David A.: *See*—
Campbell, Simon F.; and Roberts, David A., 4,837,334, Cl 548-346.000.
Roberts, David W.: *See*—
Tharp, Terry M.; Roberts, David W.; McCartney, John C.; and Harvey, John W., 4,837,669, Cl. 362-418.000.
Roberts, John S., to Phillips Petroleum Company. Catalyst composition. 4,837,192, Cl. 502-211.000.
Roberts, Lawrence G.: *See*—
Henderson, Alex E.; Drain, Frederick L.; and Roberts, Lawrence G., 4,837,848, Cl. 382-56.000.
Roberts, Robert E. Coffee filter selector. 4,836,592, Cl. 294-1.100.
Roberts, Timothy A., to TruAngle Broadhead Hones, Inc. Honing device. 4,835,910, Cl. 51-285.000.
Robertshaw Controls Company: *See*—
Geary, Frederick J., 4,836,770, Cl. 431-46.000.
Robertson, James C.; and Baker, William R., to Thrall Car Manufacturing Company. Vehicle wheel chock for securing vehicles during transport. 4,836,726, Cl. 410-9.000.
Robeson, Lloyd M.: *See*—
Gardner, Hugh C.; Colon, Ismael; and Robeson, Lloyd M., 4,837,256, Cl. 524-141.000.
Robin, Michel; and Demay, Claude, to Institut Francais du Petrole; and Atochem. Process for improving the gas sweeping of an oil formation, using foams mainly containing surfactants with perfluoric groups. 4,836,281, Cl. 166-272.000.
Robinson, McDonald; and Ozias, Albert E., to Epsilon Technology, Inc. Heating system for reaction chamber of chemical vapor deposition equipment. 4,836,138, Cl. 118-666.000.
Rocchi, Dominique: *See*—
Daverio, Jean-Claude; and Rocchi, Dominique, 4,836,509, Cl 266-99.000.
Roche, Kevin J.: *See*—
Napp, Duane T.; and Roche, Kevin J., 4,836,435, Cl. 228-180.200.
Rockport Company, The: *See*—
Bianchini, William L.; Infantino, Robert; and Musarra, Vicent, 4,835,884, Cl. 36-24.500.
Rockwell International Corporation: *See*—
Moore, Andrew L., 4,836,112, Cl. 101-486.000.
Roper, Daniel W.; Kramer, Dennis A.; Malinowski, Mark E.; and Dombrowski, John, 4,836,616, Cl. 303-92.000.
Rockwood Systems Corporation: *See*—
Hendrickson, Constance, 4,836,939, Cl. 252-3.000.
Roden, Thomas M.: *See*—
Nicholas, David M.; Goff, Stephen P.; Roden, Thomas M., and Bushinsky, Joseph P., 4,836,833, Cl. 55-16.000.
Rodgers, Lane, to Bivens Winchester Corporation. Carwash dryer control system. 4,836,467, Cl. 15-316.00R.
Rodriguez, Noe E., II; Flaherty, William T., Jr.; Duggan, Sharon A.; and Fertig, Timothy M., to Westinghouse Electric Corp. Building block composite design and method of making for RF line replaceable modules. 4,837,664, Cl. 361-386.000.
Roeder, Georg, to Schwan-Stabilo Schwanhaeusser GmbH & Co. Applicator device. 4,836,704, Cl. 401-146.000.
Rofin Sinar, Inc.: *See*—
Koop, Dale, 4,837,770, Cl. 372-59.000.
Rogers, Dale R.; Rogers, Delton F.; and Rogers, Larry L. Protective socket insert. 4,836,067, Cl. 81-185.000
Rogers, Delton F.: *See*—
Rogers, Dale R.; Rogers, Delton F.; and Rogers, Larry L., 4,836,067, Cl. 81-185.000.
Rogers, Jay L.: *See*—
Aza, Alberto D.; Keeley, Charles; Rogers, Jay L.; and Brilliant, Stuart D., 4,837,257, Cl. 524-151.000.
Rogers, Larry L.: *See*—
Rogers, Dale R.; Rogers, Delton F.; and Rogers, Larry L., 4,836,067, Cl. 81-185.000.
Rogers Tool Works, Inc.: *See*—
Mitchell, James L., 4,836,706, Cl. 403-24.000

Roggenburg, Stanley L., Jr.: *See*—
Nelson, Kenneth W.; and Roggenburg, Stanley L., Jr., 4,835,890, Cl. 40-616.000.

Rohling, Holmer; Schulz, Frank; and Marquardt, Wolfgang, to Dragerwerk Aktiengesellschaft. Folded protective hood having an oxygen mask. 4,836,197, Cl. 128-201.230.

Rohm GmbH Chemische Fabrik: *See*—
Eich, Manfred; Wendorff, Joachim; and Reck, Bernd, 4,837,745, Cl. 365-108.000.

Rohm, Gunter H. Selftightening drill chuck. 4,836,563, Cl. 279-63.000.

Rohmer, Hartmut: *See*—
Kraemer, Horst; Rohmer, Hartmut; and Stawowy, Johannes, 4,837,270, Cl. 525-27.000.

Rohner, Gerhard: *See*—
Franz, Rainer; Idigkeit, Werner; Loscmann, Hartmut; Rohner, Gerhard; and Kurr, Klaus, 4,836,515. Cl. 267-219.000.

Rohrs, Frederick T.: *See*—
Kostoss, Joseph M.; and Rohrs, Frederick T., 4,837,471, Cl. 310-258.000.

Rohrschneider, Larry R.; and Nichols, Everett J., to Fred Hutchinson Cancer Research Center; and Nichols, Everett J. Therapy using glucosidase processing inhibitors. 4,837,277, Cl. 514-62.000.

Rokos, Hartmut; Konczak, Heinz; and Forth, Wolfgang, to Henning Berlin GmbH Chemie- und Pharmawerk. 5-aminosalicylic acid-O-sulfates of physiologically acceptable bases, process for the preparation thereof and drugs containing same. 4,837,229, Cl. 514-517.000.

Rolls-Royce plc: *See*—
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Roloke Co.: *See*—
Walpin, Arline; and Walpin, Lionel A., 4,835,801, Cl. 5-432.000.

Romano, Antonio, to Campagnolo S.p.A. Saddle pillar for bicycles and the like, provided with means for adjusting the attitude of the saddle. 4,836,604, Cl. 297-195.000.

Rome Industries, Inc.: *See*—
Seabaugh, David T., 4,836,088, Cl. 91-436.000.

Romey, Russell P.; and Greer, Lonny R., to Allied Corporation. Adjustable non-piloted air blast fuel nozzle. 4,835,971, Cl. 60-740.000.

Ronchi nee Marchesin, Elena. Instant steam generator for domestic and professional use. 4,836,145, Cl. 122-4.00A

Roote, Robert J.; Pasco, Ian K.; Smithers, Ian J.; and Fisher, Paul J., to Combined Optical Industries Limited. Lens. 4,836,659, Cl. 350-409.000.

Roper, Daniel W.; Kramer, Dennis A.; Malinowski, Mark E.; and Dombrowski, John, to Rockwell International Corporation. Antilock brake system. 4,836,616, Cl. 303-92.000.

Rosaen, Lars O., to Universal Flow Monitors Inc. Fluid flow meter. 4,836,021, Cl. 73-259.000.

Rose, Jochen, to Standard Elektrik Lorenz AG. Pulse generator. 4,837,456, Cl. 307-106.000.

Rosemount Inc.: *See*—
Hagen, Floyd W.; and DeLeo, Richard V., 4,836,019, Cl. 73-180.000.
O'Brien, Richard J.; and Myhre, Douglas C., 4,836,689, Cl. 374-125.000.

Rosen, Allen. *See*—
Edwards, Anne M.; and Rosen, Allen, 4,836,892, Cl. 162-141.000.

Rosenbaum, Georges; and Grollier, Jean F., to L'Oreal. Photostable cosmetic composition containing trihydroxyethylrutin in combination with water-soluble sunscreens derived from benzylidenecamphor and its use in the protection of the skin and the hair. 4,837,006, Cl. 424-47.000.

Rosenberg, Saul H.; Luly, Jay R.; and Plattner, Jacob J., to Abbott Laboratories. Functionalized peptidyl aminodiols and -triols. 4,837,204, Cl. 514-18.000.

Rosenberg, Werner, to Henkel Kommanditgesellschaft auf Aktien. Propellantless foam dispenser. 4,836,422, Cl. 222-190.000.

Rosenfeld, Aron M.: *See*—
Smits, Paul; Rosenfeld, Aron M.; and DeFerrari, Howard F., 4,837,061, Cl. 428-40.000.

Rosenkranz, Roberto P.: *See*—
Goodman, Murray; Marr-Leisy, Debra; Rosenkranz, Roberto P.; Melmon, Kenneth L.; and Verlander, Michael S., 4,837,305, Cl. 530-345.000.

Roshen, Waseem A.; Turcotte, David E.; and Regelman, Dale F., to ITT Corporation. Transformer/inductor with integrated capacitor using soft ferrites. 4,837,659, Cl. 361-270.000.

Rosinski, Richard J.; and Milks, Robert R., to Dow Chemical Company, The. Thermoformed polyolefin articles having improved gloss. 4,837,074, Cl. 428-220.000.

Rosman, Andrew, to Hughes Aircraft Company. MIMD instruction flow computer architecture. 4,837,676, Cl. 364-200.000.

Ross, Gary. Coaster with adjustable means for retaining a beverage container. 4,836,488, Cl. 248-346.100.

Rossi, Paul: *See*—
Smeets, Jacques; Dupuy, Marcel; and Rossi, Paul, 4,836,825, Cl. 453-49.000.

Roth, Bradley C.: *See*—
Gebo, Charles H.; and Roth, Bradley C., 4,836,293, Cl. 177-1.000.

Roth, Cary A.: *See*—
Keshavan, Madapusi K.; Underwood, Lance D.; Kar, Naresh J.; Oldham, Thomas W.; Roth, Cary A.; and Armstrong, Brian J., 4,836,307, Cl. 175-374.000.

Roth, Robert S.: *See*—
Gillick, Laurence; Bamberg, Paul G.; Baker, James K.; and Roth, Robert S., 4,837,831, Cl. 381-43.000.

Rothman, Isaac; and Degen, Peter J., to Pall Corporation. Non-fluorescing, non-reflective polyamide for use in diagnostic testing. 4,837,162, Cl. 436-531.000.

Rothman, L. David: *See*—
Stevens, Timothy S.; Frawley, Nile N.; Swart, Daniel J.; Harris, William C.; Diedering, Deborah E.; Nicholson, Lawrence W.; and Rothman, L. David, 4,837,161, Cl. 436-52.000.

Roumagnac, Max. Apparatus for automatic cleaning particularly of the bottom of a swimming pool. 4,835,809, Cl. 15-1.700.

Roussel Uclaf: *See*—
Tessier, Jean; and Demoute, Jean-Pierre, 4,837,341, Cl. 549-283.000.

Rowenta-Werke GmbH: *See*—
Bonnet, Jacques, 4,835,814, Cl. 15-339.000.

Roy, Dhirendra C., to United Technologies Automotive, Inc. Integral latching arm. 4,836,408, Cl. 220-306.000.

Rubinson, Barry L.: *See*—
Bean, Robert G.; Beckman, Michael E.; Rubinson, Barry L.; Gardner, Edward A.; Sergeant, O. Winston; and McLean, Peter T., 4,837,675. Cl. 364-200.000.

Rubinstein, Jorge. Single rail CMOS register array and sense amplifier circuit therefor. 4,837,465, Cl. 307-530.000.

Ruddick, John N. R., to Forintek Canada Corporation. Multihead incisor for lumber, timber and the like. 4,836,254, Cl. 144-362.000.

Rude, Sheldon V.: *See*—
Morrall, Robin A. A.; Turkington, T. K.; Gugel, Richard K.; and Rude, Sheldon V., 4,837,146, Cl. 435-34.000.

Rudershausen, Charles G., to Du Pont de Nemours, E. I., and Company. Manufacture of difluorochloromethane. 4,837,370, Cl. 570-163.000.

Rudolph, John H. Fishing lure. 4,835,897, Cl. 43-42.060.

Rudy, Jerome B.; Denholtz, Melvin; Denholtz, Jeffrey R.; and Bohm, Peter D., to Peroxydent Group. Periodontal composition and method. 4,837,008, Cl. 424-53.000.

Rudy, William J., Jr.; and Shaffer, Howard R., to AMP Incorporated. Alignment system for line replaceable modules. 4,836,789, Cl. 439-64.000.

Ruegg, Richard J.; Slovak, William R.; and Riboh, Moise, to Frito-Lay, Inc. Process and apparatus for uniformly forming individual food pieces from a mass of flowable material. 4,837,382, Cl. 426-503.000.

Ruger, William B.; and Larson, Lawrence L., to Sturm, Ruger & Company, Inc. Magazine latch for pistol. 4,835,892, Cl. 42-7.000.

Rupprecht, Georg; and Patashnick, Harvey, to Rupprecht & Patashnick Co., Inc. Novel glass elements for use in balances. 4,836,314, Cl. 177-210.0FP.

Rupprecht & Patashnick Co., Inc.: *See*—
Rupprecht, Georg; and Patashnick, Harvey, 4,836,314, Cl. 177-210.0FP.

Russell, Paul F.; Doering, Egon L.; Segerstrom, Clifford C.; Stil, Jacob H.; Harenslak, Gerd; and van Kessel, Matheus M., to Shell Oil Company. Controlling rapping cycle. 4,836,146, Cl. 122-379.000.

Russello, Vincent J., to Bunker Ramo Corporation. Programmable apparatus and method for testing computer peripherals. 4,837,764, Cl. 371-20.000.

Russo, James: *See*—
Levine, Matthew; Cairo, Anthony; Russo, James; Rigotti, Victor; and Clark, Roger, 4,837,731, Cl. 364-145.000.

Rustad, Norman E.: *See*—
Harrell, Edward R.; Rustad, Norman E.; and Mosbey, Deral T., 4,837,082, Cl. 428-329.000.

Rutsch, Werner; and Husler, Rinaldo, to Ciba-Geigy Corporation. Process for the preparation of benzoin sulfonates. 4,837,350, Cl. 558-52.000.

Rutter, Stephen D., to Avco Corporation. Fuel atomization apparatus for gas turbine engine. 4,835,962, Cl. 60-737.000.

Rychlak, Andrew P.: *See*—
Skoczkowski, Andzej M.; and Rychlak, Andrew P., 4,835,960, Cl. 60-39.340.

S. C. Johnson & Son, Inc.: *See*—
Kiffel, William G.; and Tyson, Therese M., 4,837,012, Cl. 424-70.000.

S. J. Industries, Inc.: *See*—
Julius, Richard F., 4,836,228, Cl. 134-72.000.

Saatchi, Hossein: *See*—
Okey, David W.; Church, John S.; Saatchi, Hossein; and Scanlon, John F., 4,837,251, Cl. 523-218.000.

Sabet, Mahmoud H.: *See*—
Spalding, August V.; Sabet, Mahmoud H.; Hamburger, Ronald O.; and Luk, Martin H., 4,836,716, Cl. 405-224.000.

Saboten Co., Ltd.: *See*—
Ishida, Kimikazu; and Ishida, Tsuneo, 4,836,335, Cl. 184-102.000.

Saccoccio, August J. Method of forming a nut-like member. 4,836,007, Cl. 72-379.000.

Safeguard Industrial Corporation: *See*—
Sebastian, Peter R.; Stump, John L.; and Sebastian, Thomas V., 4,836,194, Cl. 128-78.000.

Saga, Halvor. Safety-device for stoves. 4,836,181, Cl. 126-42.000.

Sagami Chemical Research Center: *See*—
Shibasaki, Masakatsu; Takahashi, Atsuo; Aoki, Tuyoshi; Kogi, Kentaro; Nishimiya, Yozo; Nara, Takeshi; and Yamaguchi, Takashi, 4,837,342, Cl. 549-422.000.

Sahagen, Peter D.: *See*—
Hicks, John W., Jr., 4,837,631, Cl. 358-217.000.

Saikatsu, Takao: *See*—
Anzai, Yoshinori; Saikatsu, Takao; Saito, Masato; and Tsuchihashi, Michihiro, 4,837,478, Cl. 313-112.000.

St. Clair, Joe C.: *See*—
Mansfield, Robert L.; Spencer, Alexander K.; and St. Clair, Joe C., 4,837,563, Cl. 340-732.000.

St. Clair, Martha H.: *See*—
Rideout, Janet L.; Barry, David W.; Lehrman, Sandra N.; St. Clair, Martha H.; and Furman, Phillip A., 4,837,208, Cl. 514-50.000.

St. Clair, Terry L.; Burks, Harold D.; and Progar, Donald J., to United States of America, National Aeronautics and Space Administration. Copolyimide with a combination of flexibilizing groups. 4,837,300, Cl. 528-353.000.

Saint-Gobain Vitrage: *See*—
Coulon, Jean-Claude; and Douche, Jean-Pierre, 4,837,093, Cl. 428-432.000.

St. Louis, Paul T.; and Welch, Charles L., to Consolidated Technologies, Corp. Backhoe hitch apparatus. 4,836,741, Cl. 414-723.000.

Sainte Luce Banchelin, Jean; Bourcereau, Jean; and Valy, Yves, to Aerospatiale Societe Nationale Industrielle. Protective sheath for electrical or optical conductors hardened with respect to X-rays. 4,837,448, Cl. 250-519.100.

Saito, Hideaki: *See*—
Muramatsu, Tateo; Saito, Hideaki; Takasaki, Mamoru; and Enami, Yasushi, 4,836,713, Cl. 405-115.000.

Saito, Masato: *See*—
Anzai, Yoshinori; Saikatsu, Takao; Saito, Masato; and Tsuchihashi, Michihiro, 4,837,478, Cl. 313-112.000.

Saito, Takao: *See*—
Oishi, Masao; Saito, Takao; Ishikawa, Katsukiyo; Abe, Masanori; and Tamaura, Yutaka, 4,837,046, Cl. 427-38.000.

Sakai, Fumiki: *See*—
Sakuhara, Toshihiko; Sakai, Fumiki; and Uchiyama, Tetsuo, 4,837,435, Cl. 250-306.000.

Sakai, Mitsugu: *See*—
Motoyama, Kazuyasu; Yanagida, Tsuneo; Sakai, Mitsugu; Ichikawa, Hitoshi; and Yoshizawa, Akihiko, 4,837,758, Cl. 369-13.000.

Sakaitani, Masahiro: *See*—
Ohfune, Yasufumi; and Sakaitani, Masahiro, 4,837,349, Cl. 556-420.000.

Sakakibara, Yoshiaki: *See*—
Shimada, Haruo; and Sakakibara, Yoshiaki, 4,836,981, Cl. 420-79.000.

Sakakima, Hiroshi; Osano, Koichi; Omata, Yuji; Satomi, Mitsuo; and Kugimiya, Koichi, to Matsushita Electric Industrial Co., Ltd. Magnetic nitride film. 4,836,865, Cl. 148-306.000.

Sakakiyama, Ryuzo, to Fuji Jukogyo Kabushiki Kaisha. Power transmission system for a four-wheel drive vehicle. 4,836,322, Cl. 180-247.000.

Sakamoto, Junshin; Suzuki, Shun; and Tsushima, Akinori, to Hitachi Koki Company, Ltd. Clutch type tightening apparatus for allowing free adjustment of tightening force. 4,836,349, Cl. 192-56.00R.

Sakamoto, Masahide: *See*—
Amano, Matsuo; Shida, Masami; Sakamoto, Masahide; Hirayama, Takeshi; and Sasayama, Takao, 4,837,698, Cl. 364-431.070.

Sakamoto, Masanori: *See*—
Morozumi, Takuro; and Sakamoto, Masanori, 4,836,164, Cl. 123-339.000.

Sakaya, Masuji; Motai, Tsuneaki; Mochizuki, Masataka; and Mashiko, Kouichi, to Fujikura Ltd. Corrugated heat pipe. 4,836,275, Cl. 165-46.000.

Sakoda, Hisao: *See*—
Inoue, Akira; Ushio, Masaru; Morita, Toru; Oishi, Yasuyuki; and Sakoda, Hisao, 4,836,914, Cl. 208-251.00H.

Sakuhara, Toshihiko; Sakai, Fumiki; and Uchiyama, Tetsuo, to Seiko Instruments Inc. Tunneling scanning microscope having light source. 4,837,435, Cl. 250-306.000.

Sakurai, Tomonari, to Laurel Bank Machines Co., Ltd. Method and apparatus for delivering and winding packing paper. 4,835,938, Cl. 53-212.000.

Sala, Oneglio; and Montanari, Paolo, to Riva Calzoni S.p.A. Hinge-assembly, particularly for underwater mounting. 4,836,711, Cl. 405-92.000.

Salandre, Stephen M. Single catch knife sheath construction. 4,835,863, Cl. 30-143.000.

Salomon S.A.: *See*—
Chemello, Jean-Pierre; and Mabboux, Michel, 4,835,886, Cl. 36-119.000.

Salsetti, Pascal: *See*—
Theoleyre, Serge; Salsetti, Pascal; and Masset, Daniel, 4,837,660, Cl. 361-275.000.

Sanden Corporation: *See*—
Azami, Katsumasa, 4,835,856, Cl. 29-156.600.

Sander, Edmund: *See*—
Schmehr, Peter R.; and Sander, Edmund, 4,836,694, Cl. 384-145.000.

Sandilands, Phillip E.: *See*—
Prohs, John R.; Akins, Charles G.; Efthyvoulos, Nicholas; Sandilands, Phillip E.; and Scheid, Michael R., 4,837,799, Cl. 379-224.000.

Sankyo Manufacturing Co.: *See*—
Kato, Heizaburo, 4,836,101, Cl. 100-215.000.

Sano, Yasuo, to Takeda Chemical Industries, Ltd. Cross-linked resin from bis(2-oxazoline) and aromatic compound containing two amino groups. 4,837,302, Cl. 528-407.000.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Grinde, James E.; and Kuroda, Kazuo, 4,836,123, Cl. 114-270.000.

Sansone, Ronald P.; Gelfer, George G.; Taylor, Michael P.; and Axelrod, Barry H., to Pitney Bowes Inc. Mail processing system with multiple work stations. 4,837,701, Cl. 364-464.030.

Santa Barbara Research Center: *See*—
Malinowski, Frank R.; and Pagano, Thomas S., 4,837,431, Cl. 250-235.000.

Santos, Francisco E., to Hewlett-Packard Company. A scanning system in which a portion of a preview scan image of a picture displaced on a screen is selected and a corresponding portion of the picture is scanned in a final scan. 4,837,635, Cl. 358-287.000.

Sara, Jason, to Massachusetts Institute of Technology. Digital high speed 3-dimensional interpolation machine. 4,837,722, Cl. 364-723.000.

Sara Lee Corporation: *See*—
Thomas, Richard D.; and Bell, Cecil R., Jr., 4,835,939, Cl. 53-248.000.

Sarti, Robert F.: *See*—
Londeck, Paul B.; Sarti, Robert F.; and Aho, Jack R., 4,835,908, Cl. 49-377.000.

Sarubbi, Thomas R.: *See*—
Blakeney, Andrew J.; Jeffries, Alfred T., III; and Sarubbi, Thomas R., 4,837,121, Cl. 430-192.000.

Sarumaru, Kohei: *See*—
Kadowaki, Koju; Sarumaru, Kohei; and Shibano, Takeshi, 4,837,360, Cl. 562-546.000.

Sasaki, Eisaku, to NEC Corporation. CMI decoder. 4,837,782, Cl. 375-95.000.

Sasaki, Katsuhiro, to NEC Corporation. Multiplexer for multiplexing insertion codes and a digital data signal train. 4,837,763, Cl. 370-112.000.

Sasaki, Masayoshi: *See*—
Ichikawa, Yoshiaki; Senoh, Makoto; Suzuki, Masanori; Kamimura, Hiroshi; Tomizawa, Fumio; Sugiyama, Sakae; and Sasaki, Masayoshi, 4,837,734, Cl. 364-513.000.

Sasaki, Michiaki, to Nissan Motor Company, Limited. Fuel tank vent system for automotive vehicles. 4,836,402, Cl. 220-85.0VS.

Sasaki, Minoru, to Kabushiki Kaisha Toshiba. Electronic still camera for recording still picture on memory card with mode selecting shutter release. 4,837,628, Cl. 358-209.000.

Sasaki, Ryoichi, to Brother Kogyo Kabushiki Kaisha. Recording apparatus with a function of determining recording direction of explanatory characters for graph. 4,837,709, Cl. 364-519.000.

Sasaki, Tatsuyoshi: *See*—
Okuno, Masaharu; Ishibashi, Toshihiro, Naitou, Satoshi; and Sasaki, Tatsuyoshi, 4,836,183, Cl. 126-110.00R.

Sasaki, Yoshiyuki; and Kasaoka, Katsuyuki, to Teijin Limited. Bulky flat yarn of silky touch and a process for manufacturing the same. 4,835,956, Cl. 57-245.000.

Sasamura, Ross: *See*—
Preslik, Theresa D.; and Sasamura, Ross, 4,836,568, Cl. 280-164.100.

Sasayama, Takao: *See*—
Amano, Matsuo; Shida, Masami; Sakamoto, Masahide; Hirayama, Takeshi; and Sasayama, Takao, 4,837,698, Cl. 364-431.070.

Sassa, Yusei, to Yoshida Kogyo K. K. Parts applicator for slide fasteners. 4,835,845, Cl. 29-767.000.

Satake, Naoto: *See*—
Kondo, Hiromasa; Okumura, Yoshitaka; Fukui, Terunobu; Egashira, Noritaka; Iwata, Tamami; and Satake, Naoto, 4,837,200, Cl. 503-227.000.

Satake, Yoshikatsu: *See*—
Ichikawa, Yukio; Kaneko, Takashi; Satake, Yoshikatsu; and Katto, Takayuki, 4,837,294, Cl. 528-388.000.

Sato, Fumie, to Nissan Chemical Industries, Ltd. 4-Substituted-1,2,3,6-tetrahydrophthalic acid anhydride. 4,837,339, Cl. 549-214.000.

Sato, Kozo; Takeuchi, Masashi; and Shibata, Takeshi, to Fuji Photo Film Co., Ltd. Color light-sensitive material. 4,837,142, Cl. 430-562.000.

Sato, Kuniaki: *See*—
Harada, Masahiro; Yanagi, Kenichi; Fukushima, Takeo; Furukawa, Kusuo; Soeda, Naohiko; Ohta, Norio; Sato, Kuniaki; and Nakajima, Yasuhisa, 4,836,774, Cl. 432-8.000.

Sato, Mitsuru: *See*—
Iwakoshi, Keiichi; Sato, Mitsuru; Umeda, Hiroyuki; and Nishizawa, Toshinori, 4,836,187, Cl. 128-4.000.

Sato, Mitsuyoshi; Okamura, Takumi; and Kimura, Kaoru, to Toagosei Chemical Industry Co., Ltd. Cyanoacrylate compositions. 4,837,260, Cl. 524-261.000.

Sato, Toru; Matsuda, Atsuya; Shibata, Masaru; and Onohara, Masayuki, to Sumitomo Bakelite Co., Ltd. Container and method for storing blood. 4,837,047, Cl. 422-41.000.

Sato, Toshifumi: *See*—
Oyagi, Takashi; and Sato, Toshifumi, 4,837,854, Cl. 455-343.000.

Sato, Toshihiro; Toyooka, Takashi; Kodama, Naoki; Takeuchi, Teruaki; Takeshita, Masatoshi; and Suzuki, Ryo, to Hitachi, Ltd. Magnetic bubble memory device. 4,837,741, Cl. 365-12.000.

Sato, Yukio: *See*—
Wakata, Hitoshi; Inoue, Mitsuo; Sato, Yukio; Haruta, Kenyu; and Nagai, Haruhiko, 4,837,773, Cl. 372-86.000.

Satoh, Shuichi; and Tsuji, Kazuwo, to Sumitomo Electric Industries, Ltd. Process for synthesizing large diamond. 4,836,881, Cl. 156-621.000.

Satomi, Mitsuo: *See*—
Sakakima, Hiroshi; Osano, Koichi; Omata, Yuji; Satomi, Mitsuo; and Kugimiya, Koichi, 4,836,865, Cl. 148-306.000.

Satomura, Seiichiro; and Kotera, Masahide, to Canon Kabushiki Kaisha. Apparatus for reading a film image with controllable illumination and threshold value. 4,837,450, Cl. 250-571.000.
Sattelmeyer, Richard, to Hoechst AG. Rubber vulcanizates having reduced heat evolution when subjected to dynamic deformation, a process for their preparation and their use. 4,837,266, Cl. 524-511.000.
Sauer, Donald J., to RCA Licensing Corporation. Switched capacitor arrangement. 4,837,527, Cl. 332-11.00D.
Sauerberg, Per: *See*—
Jensen, Leif H.; Sauerberg, Per; Watjen, Frank; and Kindtler, Jens W., 4,837,241, Cl. 514-340.000.
Saunders, Ted G. Apparatus for displaying depth sounding data with nautical range. 4,837,750, Cl. 367-111.000.
Sauron, Jean: *See*—
Nussbaum, Max; Picart, Thierry; and Sauron, Jean, 4,837,424, Cl. 219-494.000.
Savage, John R.; and Mellin, Robert C., to General Motors Corporation. Shrouding for engine cooling fans. 4,836,148, Cl. 123-41.490.
Savall, Jose; Parmentier, Claude; and Amblot, Bernard, to Freyssinet International (Stup). Frustoconic anchoring jaws for cables and their methods of manufacture. 4,835,822, Cl. 24-122.600.
Sawada, Koji, to Nippon Engineer Service Kabushiki Kaisha. Underground tank with leak detection mechanism. 4,836,710, Cl. 405-54.000.
Sawaki, Ippei: *See*—
Hajikano, Kazuo; Shimoe, Toshio; Kamoi, Jyoei; Sawaki, Ippei; and Murakami, Koso, 4,837,855, Cl. 455-600.000.
Sawicki, William H.: *See*—
Molfetta, Anthony J.; and Sawicki, William H., 4,837,570, Cl. 340-984.000.
Scanlon, John F.: *See*—
Okey, David W.; Church, John S.; Sartchi, Hossein; and Scanlon, John F., 4,837,251, Cl. 523-218.000.
Scepter Manufacturing Company Limited: *See*—
Farrell, Grant D., 4,836,580, Cl. 285-2[illegible].000.
Schad, Robert D.; and Pocock, John, to Husky Injection Molding System, Ltd. Swing plate molding machine. 4,836,767, Cl. 425-552.000.
Schaefer, Dietmar: *See*—
Burkhart, Georg; Moring, Volker; and Schaefer, Dietmar, 4,837,244, Cl. 521-114.000.
Schamber, Ortwin: *See*—
Polster, Michael; and Schamber, Ortwin, 4,836,168, Cl. 123-41.500.
Schauer, Friedrich, to Kabelmetal Electro GmbH. Apparatus for providing an electrical conduction path between two contact locations. 4,836,795, Cl. 439-164.000.
Schauer, Markfield. Shaped flange for connecting air duct segments. 4,836,585, Cl. 285-363.000.
Schefczik, Ernst: *See*—
Etzbach, Karl-Heinz; Hansen, Guenther; Schefczik, Ernst; and Reichelt, Helmut, 4,837,269, Cl. 534 761.000.
Scheid, Michael R.: *See*—
Prohs, John R.; Akins, Charles G.; Efthyvoulos, Nicholas; Sandilands, Phillip E.; and Scheid, Michael R., 4,837,799, Cl. 379-224.000.
Schell, William S.: *See*—
Evans, Richard C.; and Schell, William S., 4,836,428, Cl. 224-253.000.
Scheller, Gregg D.; Gahn, Jerry S.; Higgins, Daniel E.; Wendt, Richard; Gibeltirra, James; and Ritter, J. Alan, to Storz Instrument Company. Foot pedal assembly for ophthalmic surgical instrument. 4,837,857, Cl. 455-617.000.
Scherer, Robert P., III. Moisture sensing device. 4,837,499, Cl. 324-61.00P.
Scherfenberg, Jerry W.: *See*—
Steele, James R.; and Scherfenberg, Jerry W., 4,836,499, Cl. 251-173.000.
Schering Akt.: *See*—
Neh, Harribert; Buhmann, Ulrich; Joppien, Hartmut; and Giles, David, 4,837,220, Cl. 514-403.000.
Scherrer, Fernand. False ceiling constituted by a stretched sheet fixed along its edges to a support frame. 4,835,914, Cl. 52-28.000.
Scheulen, Matthias: *See*—
Reichelt, Wolfgang; Scheulen, Matthias; Schwerdtfeger, Klaus; Voss-Spilker, Peter; and Feuerstacke, Ewald, 4,836,271, Cl. 164-417.000.
Schewitz, Alexander, to Al Exfiltra Company (Proprietary) Limited. Batch filtering method. 4,836,936, Cl. 210-791.000.
Schimmel, Petrus J. C.; and Spikker, Gerhardus J., to Hunter Douglas International N.V. Apparatus for feeding rigid spacers into travellers for a vertical blind. 4,835,848, Cl. 29-24.500.
Schindler, Gerhard: *See*—
Gramlich, Walter; Goetz, Norbert; Siegel, Hardo; and Schindler, Gerhard, 4,837,201, Cl. 512-26.000.
Schindler, Ursula: *See*—
Zoller, Gerhard; Beyerle, Rudi; Schindler, Ursula; Nitz, Rolf-Eberhard; and Martorana, Piero, 4,837,225, Cl. 514-427.000.
Schiwiora, Harry: *See*—
Wagner, Rudolf; Schiwiora, Harry; Stumke, Manfred; and Groll, Werner, 4,836,984, Cl. 420-464.000.
Schlaefer, Dieter; Kochanek, Wolfgang; and Leutner, Bernd, to BASF Aktiengesellschaft. Removal of chlorate from caustic soda. 4,837,002, Cl. 423-641.000.
Schlage Lock Company: *See*—
Crosley, Thomas W.; Davison, Wayne; Goldberg, James R.; Hofheins, Leonard L.; Lichty, Ronald D.; Vollum, Charles A.; Vollum, Stephen H.; and Yee, Victor H., 4,837,822, Cl. 380-23.000.
Lasier, Thomas R.; and Downey, William L., 4,835,905, Cl. 49-14.000.
Schlebener, Claus: *See*—
Kristof, Wolfgang; Schlebener, Claus; and Linde, Gerhard, 4,836,988, Cl. 422-171.000.
Schlosberg, Richard H.; and Olmstead, William N., to Exxon Research and Engineering Company. Hydroconversion process using aromatic metal chelate compositions. 4,836,912, Cl. 208-112.000.
Schlosser, Erich J.; and Stephen, James C., to Weber-Stephen Products Co. Portable barbecue grill with cover support. 4,836,179, Cl. 126-25.00R.
Schlumberger Systems & Services, Inc.: *See*—
Herlein, Richard F.; and Davis, Jeffrey A., 4,837,521, Cl. 328-72.000.
Schlumberger Technology Corporation: *See*—
Barber, Thomas D., 4,837,517, Cl. 324-339.000.
Schmahl, Gunter: *See*—
Mehlhorn, Heinz; and Schmahl, Gunter, 4,837,216, Cl. 514-241.000.
Schmehr, Peter R.; and Sander, Edmund, to SKF Gleitlager GmbH. Bearing seal. 4,836,694, Cl. 384-145.000.
Schmid, Engelbert. Roller skis. 4,836,567, Cl. 280-842.000.
Schmid, Peter, to Alcatel N.V. Laser module and method of coupling an optical fiber thereto. 4,837,768, Cl. 372-36.000.
Schmidt, Ferenc J.: *See*—
Doty, Mitchell E.; and Schmidt, Ferenc J., 4,836,012, Cl. 73-23.000.
Schmidt, Irold S.: *See*—
Brown, James R.; Coatsworth, Leighton L.; and Schmidt, Irold S., 4,837,374, Cl. 422-130.000.
Schmidt-Otl, Adnreas: *See*—
Burtscher, Heinz; Schmidt-Otl, Adnreas; and Siegmann, Hans-Christoph, 4,837,440, Cl. 250-379.000.
Schmitt, Hans J.; and Blazek, Vladimir, to Fa Nattermann Arneimittel GmbH. Apparatus for the noninvasive determination and acoustical representation of the dynamic behavior of peripheral venous hemodynamic. 4,836,212, Cl. 128-667.000.
Schnabel Foundation Company: *See*—
Deaton, Hubert, 4,836,718, Cl. 405-262.000.
Schneiter, Fred E.; and Taylor, Robert D., to Morton Thiokol, Inc. Azide gas generant formulations. 4,836,255, Cl. 149-35.000.
Schoemaker, Hubert J. P.; Wands, Jack R.; Westrick, Barbara L.; and Zurawski, Vincent R., Jr., to Centocor, Inc.; General Hospital Corporation, The; and Centocor, Inc. Immunoassay for multi-determinant antigens using high-affinity. 4,837,167, Cl. 436-513.000.
Schoenwald, Siegfried, to Siemens Aktiengesellschaft. Valve for the controlling of a pressure differential. 4,836,241, Cl. 137-494.000.
Scholz, Francis J. Body compression device for patients under fluoroscopic examination. 4,836,186, Cl. 128-897.000.
Schonfelder, Manfred: *See*—
Wamprecht, Christian; Schonfelder, Manfred; Hohlein, Peter; and Kahl, Lothar, 4,837,273, Cl. 525-66.000.
Schotz, Barry R. Method and apparatus for facilitating operation of an insurance plan. 4,837,693, Cl. 364-408.000.
Schrader, Klaus: *See*—
Neubert, Eberhard; Wardenga, Hans-Michael; Polzer, Gottlieb; Lange, Juergen; Schrader, Klaus; Junker, Frank; Dittmann, Norbert; Spevacek, Ulrich; and Tappert, Hans-Juergen, 4,836,130, Cl. 118-76.000.
Schreiber, Michael A., to Photo Industry Coupon Systems. Photo print envelope containing coupon pouch. 4,836,382, Cl. 206-610.000.
Schrink, George H.: *See*—
Rishel, John W.; and Schrink, George H., 4,836,922, Cl. 210-232.000.
Schroder, Joris, to Inventio AG. Elevator system floor call registering circuit. 4,836,336, Cl. 187-121.000.
Schucker, Robert C., to Exxon Research and Engineering Company. Thin film composite membrane prepared by deposition from a solution. 4,837,054, Cl. 427-244.000.
Schuette, Wilhelm: *See*—
Walter, Manfred; Schuette, Wilhelm; and Goerrissen, Heiner, 4,837,400, Cl. 524-145.000.
Schulman, Joseph H.: *See*—
Byers, Charles L.; Schulman, Joseph H.; and Whitmoyer, David L., 4,837,049, Cl. 427-96.000.
Schulte, Heinz: *See*—
Kauss, Wolfgang; and Schulte, Heinz, 4,835,966, Cl. 60-376.000.
Schulte, Karl-Heinz, to Muhr und Bender. Upper tool support for a stamping machine or the like. 4,836,009, Cl. 72-446.000.
Schultz, Michael W.: *See*—
Peters, Edward N.; and Schultz, Michael W., 4,837,299, Cl. 528-353.000.
Schulz, Frank: *See*—
Rohling, Holmer; Schulz, Frank; and Marqardt, Wolfgang, 4,836,197, Cl. 128-201.230.
Schulz, Paul; and Amberg, Guenther, to Henkel Kommanditgesellschaft auf Aktien. Container for the reception of a pumpable product. 4,836,405, Cl. 220-93.000.
Schulze, Axel-Ruediger: *See*—
Richter, Juergen; Grau, Werner; Maurer, Gerd; Domas, Friedrich; Loeser, Werner; Bender, Rainer; Schulze, Axel-Ruediger; and Doerr, Kurt, 4,835,909, Cl. 51-281.0SF.
Schupbach, Walter, to SES Sound Electronic Systems S.A. Stereophonic baffle. 4,837,826, Cl. 381-24.000.

Schuster, Michael D.: *See*—
Paxton, William H.; Schuster, Michael D.; and Warnock, John E., 4,837,613, Cl. 358-75.000.
Schuster, Richard L., to Manville Corporation. Wrap-around carrier. 4,836,375, Cl. 206-427.000.
Schut's Im- & Exporthandel B.V.: *See*—
Abbringh, Johannes F., 4,837,500, Cl. 324-61.00R.
Schwab, Gunter; Reiber, Helmut; and Stapelfeldt, Rolf, to Standard Elektrik Lorenz Aktiengesellschaft. Rotary switch. 4,837,413, Cl. 200-11.00R.
Schwan-Stabilo Schwanhaeusser GmbH & Co.: *See*—
Roeder, Georg, 4,836,704, Cl. 401-146.000.
Schwartz, Willis T., to Occidental Chemical Corporation. Process for the preparation of oxy-diphthalic anhydrides. 4,837,404, Cl. 549-241.000.
Schwartzman, Blake: *See*—
Hartman, James; and Schwartzman, Blake, 4,837,756, Cl. 368-286.000.
Schwarz, Helmut E., to Electrospace Systems, Inc. Antenna tracking system. 4,837,576, Cl. 342-77.000.
Schwerdtfeger, Klaus: *See*—
Reichelt, Wolfgang; Scheulen, Matthias; Schwerdtfeger, Klaus; Voss-Spilker, Peter; and Feuerstacke, Ewald, 4,836,271, Cl. 164-417.000.
Schwickrath, Bruce R., to Intellistor, Inc. Anti-tip device. 4,836,624, Cl. 312-216.000.
Schwindeman, James A., to American Cyanamid Company. Herbicidally active isoxazolyl-imadazolidinone derivatives. 4,836,845, Cl. 71-92.000.
Schwirtlich, Ingo; Lange, Horst; and Kannchen, Werner, to Bayer Aktiengesellschaft. Process for refining silicon and silicon purified thereby. 4,837,376, Cl. 423-348.000.
Science Applications International Corporation: *See*—
P'an, Charles T.; Christie, Dean E.; and Grills, Robert H., 4,836,026, Cl. 73-620.000.
Scientific Computer Systems Corporation: *See*—
Cook, Erick M.; Phelps, Andrew E.; and Potash, Hanan, 4,837,730, Cl. 364-200.000.
Scientific Design Company, Inc.: *See*—
Rashkin, Jay A., 4,837,347, Cl. 549-534.000.
Scott, Alan L.: *See*—
Johnson, Harold W.; Mastel, James M.; and Scott, Alan L., 4,836,100, Cl. 100-118.000.
Scott, Francis H.: *See*—
Berg, Roger M.; and Scott, Francis H., 4,836,615, Cl. 301-37.0SA.
Scott, Samuel C. Composite wall construction. 4,835,928, Cl. 52-426.000.
Seabaugh, David T., to Rome Industries, Inc. Directional control valve and regeneration valve. 4,836,088, Cl. 91-436.000.
Seasholtz, Craig A.: *See*—
Berfield, Robert C.; Meland, Ronald F.; and Seasholtz, Craig A., 4,836,753, Cl. 417-236.000.
Sebastian, Peter R.; Stump, John L.; and Sebastian, Thomas V., to Safeguard Industrial Corporation. Therapeutic lumbosacral appliance. 4,836,194, Cl. 128-78.000.
Sebastian, Thomas V.: *See*—
Sebastian, Peter R.; Stump, John L.; and Sebastian, Thomas V., 4,836,194, Cl. 128-78.000.
Secco, Renzo, to Industrie Secco S.p.A. Device for automatically closing windows. 4,835,904, Cl. 49-7.000.
Seering, Christine L.; and Seering, Mona E. Prenatal cradle. 4,836,824, Cl. 450-155.000.
Seering, Mona E.: *See*—
Seering, Christine L.; and Seering, Mona E., 4,836,824, Cl. 450-155.000.
Segerstrom, Clifford C.: *See*—
Russell, Paul F.; Doering, Egon L.; Segerstrom, Clifford C.; Stil, Jacob H.; Harenslak, Gerd; and van Kessel, Matheus M., 4,836,146, Cl. 122-379.000.
Seguin, Frederick P.; and Longuet, Michel, to Polysar Limited. Polymer-asphalt mixing process. 4,837,252, Cl. 523-351.000.
Seidel, Udo, to Minnesota Mining and Manufacturing Company. Wire holding device in an electrical connector. 4,836,803, Cl. 439-447.000.
Seiko Instruments Inc.: *See*—
Sakuhara, Toshihiko; Sakai, Fumiki; and Uchiyama, Tetsuo, 4,837,435, Cl. 250-306.000.
Seikow Chemical Engineering & Machinery, Ltd.: *See*—
Kotera, Masayuki, 4,837,472, Cl. 310-156.000.
Seitz, Peter. Capacitive measuring assembly for determining forces and pressures. 4,836,033, Cl. 73-862.040.
Sekigawa, Fujio: *See*—
Kokubo, Hiroyasu; Chiba, Tohru; and Sekigawa, Fujio, 4,837,033, Cl. 424-494.000.
Sekigawa, Tetsuo: *See*—
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Sekine, Akihiro: *See*—
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Sekine, Mikiya: *See*—
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Sekine, Yasuo; Hirakawa, Nobuhiro; Kashiwaba, Noriaki; Yamaura, Tetsuaki; Harada, Hisako; Kutsuma, Teruo; Matsumoto, Hajime; Sekine, Akihiro; and Isowa, Yoshikazu, to Fujirebio Kabushiki Kaisha. Alkylamide derivatives with H_2-receptor antagonistic and cytoprotective action. 4,837,316, Cl. 546-214.000.
Sekino, Naomi; and Tashiro, Yoshio. Ultrasonic treatment apparatus for performing medical treatment by use of ultrasonic vibrations. 4,836,211, Cl. 128-662.050.
Sekioka, Kunikazu, to Tokyo Electric Co., Ltd. Electronic weighing instrument. 4,836,309, Cl. 177-25.150.
Selders, Matthias: *See*—
Lang, Bernhard; and Selders, Matthias, 4,836,107, Cl. 102-293.000.
Selesky, Kenneth G.: *See*—
Eaton, Homer L.; Selesky, Kenneth G.; and Kambara, Goro, 4,835,855, Cl. 29-863.000.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei, 4,836,655, Cl. 350-350.00S.
Senne, Dennis R. Method for fuel economy. 4,836,184, Cl. 126-292.000.
Senoh, Makoto: *See*—
Ichikawa, Yoshiaki; Senoh, Makoto; Suzuki, Masanori; Kamimura, Hiroshi; Tomizawa, Fumio; Sugiyama, Sakae; and Sasaki, Masayoshi, 4,837,734, Cl. 364-513.000.
Sentrol, Inc.: *See*—
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Senules, Alex: *See*—
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Sequa Chemicals Inc.: *See*—
Floyd, William C.; and Hui, Sai H., 4,837,087, Cl. 428-511.000.
Sera, Hidefumi: *See*—
Dan, Shigeyuki; Kato, Eiichi; Ishii, Kazuo; Ishibashi, Hiroshi; and Sera, Hidefumi, 4,837,102, Cl. 430-114.000.
Serata Geomechanics, Inc.: *See*—
Serata, Shosei, 4,836,612, Cl. 299-11.000.
Serata, Shosei, to Serata Geomechanics, Inc. Stress control mining method and apparatus. 4,836,612, Cl. 299-11.000.
Sergeant, O. Winston: *See*—
Bean, Robert G.; Beckman, Michael E.; Rubinson, Barry L.; Gardner, Edward A.; Sergeant, O. Winston; and McLean, Peter T., 4,837,675, Cl. 364-200.000.
Serur, Juan R.: *See*—
Bursell, Sven-Erik; and Serur, Juan R., 4,836,207, Cl. 128-633.000.
SES Sound Electronic Systems S.A.: *See*—
Schupbach, Walter, 4,837,826, Cl. 381-24.000.
Setliff, Tyrus W. Radiator cap removal tool. 4,836,065, Cl. 81-124.200.
Seyerle, Carl E., to Outboard Marine Corporation. Operator presence control for self-propelled implements. 4,835,949, Cl. 56-10.800.
Sft X. Settele Stanz- und Formtechnik GmbH & Co. KG: *See*—
Singer, Thomas, 4,836,807, Cl. 439-787.000.
SGS Microelettronica S.p.A.: *See*—
Viscardi, Roberto; Gornati, Silvano; and Coccetti, Silvano, 4,837,464, Cl. 307-511.000.
SGS-Thomson Microelectronics s.r.l.: *See*—
Galbiati, Sergio; and Comi, Alessandro, 4,837,181, Cl. 437-45.000.
SGS-Thomson Microelectronics S.A.: *See*—
Douziech, Patrick; and Berger, Philippe, 4,837,625, Cl. 358-174.000.
Shadbolt, George W., Jr. Portable livestock handling panel. 4,836,143, Cl. 119-20.000.
Shaffer, Howard R.: *See*—
Rudy, William J., Jr.; and Shaffer, Howard R., 4,836,789, Cl. 439-64.000.
Shah, Jagdish C. Method and apparatus for cooking and packing food in glass containers. 4,836,098, Cl. 99-360.000.
Shalgi, Asaf; and Limon, Juval, to Aran Arizot Nachshon. Flexible container with stopper valve. 4,836,416, Cl. 222-48.000.
Shamoto, Naoki; Suzuki, Hideo; Sugawara, Yasuyuki; Kawase, Masaaki; and Shinohara, Hiromichi, to Fujikura Ltd.; and Nippon Telegraph and Telephone Corporation. Optical fiber cable having a neutral axis defining a zero stress. 4,836,639, Cl. 350-96.230.
Shankar, Srinivasan; and Goward, George W., to Turbine Components Corporation. Composite alloy structures. 4,837,389, Cl. 428-668.000.
Shankland, Ian R.: *See*—
Lund, Earl A. E.; Richard, Robert G.; Shankland, Ian R.; and Wilson, David P., 4,836,947, Cl. 252-171.000.
Shapiro, Paul J.: *See*—
Plotnick, Michael A.; Shapiro, Paul J.; and Stolfi, Fred R., 4,836,697, Cl. 400-120.000.
Sharkey, Richard B.; and Emerson, Robert T., to Leedall Products, Inc. Security time clock system. 4,837,584, Cl. 346-1.100.
Sharp Kabushiki Kaisha: *See*—
Edamula, Kaoru, 4,837,414, Cl. 219-10.55B.
Nakamura, Makio, 4,837,524, Cl. 330-286.000.
Oishi, Hisao; Yanagihara, Kazuhiko; Miyakawa, Tadashi; Nakamura, Takeshi; Akimoto, Kazuhiko; and Shioji, Mitsuaki, 4,836,652, Cl. 350-334.000.
Tanaka, Toshiyuki; Kuga, Shigeki; Morishita, Taro; Nakamura, Nobuo; and Ohsaki, Mikio, 4,837,689, Cl. 364-419.000.
Shaw, Herbert J.: *See*—
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Shaw, William H. Modular shock-absorbing shipping pack. 4,836,379, Cl. 206-523.000.
Shay, Timothy W.: *See*—
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Shell Oil Company: *See*—
Bitter, Johan G. A., 4,837,055, Cl. 427-244.000.
Chao, Kuo-Hua, 4,837,356, Cl. 560-174.000.
Kruka, Vitold R.; Kipp, Robert M.; and Cadena, Edward R., 4,837,751, Cl. 367-154.000.
Martens, Franciscus J. A., 4,836,831, Cl. 48-197.00R.
Russell, Paul F.; Doering, Egon L.; Segerstrom, Clifford C.; Stil, Jacob H.; Harenslak, Gerd; and van Kessel, Matheus M., 4,836,146, Cl. 122-379.000.
van de Griend, Jacob A.; Hoek, Arend; and Huizinga, Tom, 4,836,910, Cl. 208-120.000.
Van Dongen, Johannes C. M.; and Worrall, Robert N., 4,836,301, Cl. 175-61.000.
Shell Western E&P Inc.: *See*—
Tinker, Steven J., 4,836,284, Cl. 166-279.000.
Shelton, Lawrence S., to Paslode Corporation. Non-flagging collated nail strip. 4,836,372, Cl. 206-344.000.
Shepherd, James E. Saw chain grinding machine. 4,836,058, Cl. 76-25.00A.
Sherman, Alan P.: *See*—
Greenwood, Mark H.; and Sherman, Alan P., 4,836,605, Cl. 297-250.000.
Sherman, Daniel. Deflective tamper resistant rodent bait station. 4,835,902, Cl. 43-131.000.
Sheth, Nitin V.: *See*—
Valorose, Joseph J., Jr.; Biehl, Raymond J.; Sheth, Nitin V.; Strathy, Walter A.; and Doelling, Michael K., 4,837,030, Cl. 424-456.000.
Shiba, Akira; Yamada, Isamu; and Murakami, Keiichi, to Fujitsu Limited. Ultrasonic analyzer. 4,836,210, Cl. 128-660.060.
Shiba, Haruo: *See*—
Tanaka, Kimio; Ishida, Toshihiko; and Shiba, Haruo, 4,837,651, Cl. 360-133.000.
Shibamiya, Yoshikazu, to Canon Kabushiki Kaisha. Data processing apparatus. 4,837,712, Cl. 364-523.000.
Shibano, Takeshi: *See*—
Kadowaki, Koju; Sarumaru, Kohei; and Shibano, Takeshi, 4,837,360, Cl. 562-546.000.
Shibasaki, Masakatsu; Takahashi, Atsuo; Aoki, Tuyoshi; Kogi, Kentaro; Nishimiya, Yozo; Nara, Takeshi; and Yamaguchi, Takashi, to Sagami Chemical Research Center; and Toa Eiyo Ltd. Prostacyclin analogue, and blood circulation improving agent and anti-ulcer composition containing it as active ingredient. 4,837,342, Cl. 549-422.000.
Shibata, Hirofumi: *See*—
Kato, Hideo; Matsushima, Masaaki; Matsuda, Keiko; and Shibata, Hirofumi, 4,837,123, Cl. 430-269.000.
Shibata, Kenji: *See*—
Konishi, Takao; Sugimori, Giichi; Kato, Kazuyoshi; Kimura, Nobutake; and Shibata, Kenji, 4,837,048, Cl. 424-92.000.
Shibata, Kensuke: *See*—
Yaso, Masao; Suzuki, Yukio; Shibata, Kensuke; and Hayashi, Eiichi, 4,837,319, Cl. 544-120.000.
Shibata, Masaru: *See*—
Sato, Toru; Matsuda, Atsuya; Shibata, Masaru, and Onohara, Masayuki, 4,837,047, Cl. 422-41.000.
Shibata, Noriyoshi: *See*—
Kimura, Atsuyoshi; and Shibata, Noriyoshi, 4,837,108, Cl. 420-41.000.
Shibata, Takeshi: *See*—
Sato, Kozo; Takeuchi, Masashi; and Shibata, Takeshi, 4,837,142, Cl. 430-562.000.
Shibata, Toshiko; Ina, Hiroji; and Ina, Kazuo, to Nippon Paint Co., Ltd. Test tube assembly for serum separation. 4,836,987, Cl. 422-101.000.
Shicoh Engineering Co., Ltd.: *See*—
Shimazu, Kikuo; Suzuki, Kazuo; Shiraki, Manabu; and Miyao, Osami, 4,836,631, Cl. 350-6.800.
Shida, Hiroshi, to Sky Aluminium Co., Ltd. Metal roofing and siding panel. 4,835,930, Cl. 52-539.000.
Shida, Masami: *See*—
Amano, Matsuo; Shida, Masami; Sakamoto, Masahide; Hirayama, Takeshi; and Sasayama, Takao, 4,837,698, Cl. 364-431.070.
Shifflett, Shirley W. Multi-purpose pest trap. 4,835,900, Cl. 43-58.000.
Shigemoto, Hiromi, to Mitsui Petrochemical Industries, Ltd. Poly(4-methyl-1-pentane) composition and articles molded therefrom. 4,837,277, Cl. 525-146.000.
Shigeno, Yasuhiro: *See*—
Yoshino, Katsumi; and Shigeno, Yasuhiro, 4,836,653, Cl. 350-341.000.
Shima, Kenji: *See*—
Ohe, Yasuo; Matsuura, Makiko; Shimizu, Fumio; Nakajima, Yoshito; Shin Sadahito; and Shima, Kenji, 4,837,170, Cl. 436-548.000.
Shima, Tsunao: *See*—
Murakami, Koji; Shima, Tsunao; Shimosato, Yoshikazu; and Yokoyama, Akira, 4,836,864, Cl. 148-16.500.
Shimada, Haruo; and Sakakibara, Yoshiaki, to Nippon Steel Corporation. Concrete reinforcing steel bar or wire. 4,836,981, Cl. 420-79.000.
Shimada, Katsuhiko: *See*—
Matsumoto, Tsuruyoshi; Shimada, Katsuhiko; and Uozu, Yoshihiro, 4,836,642, Cl. 350-96.340.
Shimada, Yasuhiro: *See*—
Ichijima, Seiji; Shimada, Yasuhiro; and Arakawa, Jun, 4,837,136, Cl. 430-543.000.
Shimamura, Masayoshi; Furukawa, Tadahiro; Murakami, Akiyoshi; and Haga, Toshio, to Kyodo Printing Co., Ltd. Color filter and method of producing the same. 4,837,098, Cl. 430-7.000.
Shimamura, Morihiko; Kubo, Jun; Kubota, Hitoshi; Fujiki, Norio; Tobisawa, Yoshio; Ishikawa, Yasuki; and Fukawa, Kazuyoshi, to Nissan Motor Co. Ltd. Pneumatic power brake system. 4,835,970, Cl. 60-545.000.
Shimazu, Kikuo; Suzuki, Kazuo; Shiraki, Manabu; and Miyao, Osami, to Kanegafuchi Chemical Industry Co., Ltd.; and Shicoh Engineering Co., Ltd. Laser scanning motor having a rotating polygonal mirror and method of manufacturing the same. 4,836,631, Cl. 350-6.800.
Shimbo, Masaru: *See*—
Ohata, Yu; Kuramoto, Tsuyoshi; and Shimbo, Masaru, 4,837,186, Cl. 437-228.000.
Shimizu, Fumio: *See*—
Ohe, Yasuo; Matsuura, Makiko; Shimizu, Fumio; Nakajima, Yoshito; Shin Sadahito; and Shima, Kenji, 4,837,170, Cl. 436-548.000.
Shimizu, Isamu: *See*—
Ishihara, Shunichi; Hanna, Jun-ichi; and Shimizu, Isamu, 4,837,048, Cl. 427-69.000.
Shimizu, Kinko: *See*—
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Shimizu, Toshiaki: *See*—
Miyamoto, Ritsu; Tsuchiya, Eiichi; Shishido, Kazuhiko; Shimizu, Toshiaki; and Hosoya, Atsushi, 4,837,645, Cl. 360-85.000.
Shimizu, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Electric power steering system for vehicles. 4,837,692, Cl. 364-424.050.
Shimizu, Yukiharu: *See*—
Niwa, Toshio; Himeno, Kiyoshi; Hihara, Toshio; Kurose, Yutaka; and Shimizu, Yukiharu, 4,837,309, Cl. 534-632.000.
Shimoda, Masaki: *See*—
Dosaka, Katsumi; Kumanoya, Masaki; Miyatake, Hideshi; Hidaka, Hideto; Konishi, Yasuhiro; Yamasaki, Hiroyuki; Ikeda, Yuto; Tsukamoto, Kazuhiro; and Shimoda, Masaki, 4,837,747, Cl. 371-10.000.
Shimoe, Toshio: *See*—
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Shimosato, Yoshikazu: *See*—
Murakami, Koji; Shima, Tsunao; Shimosato, Yoshikazu; and Yokoyama, Akira, 4,836,864, Cl. 148-16.500.
Shimotori, Yoshio: *See*—
Tateno, Kunio; and Shimotori, Yoshio, 4,836,352, Cl. 194-215.000.
Shimura, Yukihiro, to NEC Corporation. Base station capable of monitoring occurrence of interference on every transmission. 4,837,801, Cl. 379-61.000.
Shimuta, Masanori: *See*—
Konishi, Akihiko; Mizukami, Masamichi; and Shimuta, Masanori, 4,836,859, Cl. 134-1.000.
Shimuzu, Isoo; Matsumura, Yasuo; and Inomata, Yoshihisa. Binder for ceramics. 4,836,966, Cl. 264-63.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Kokubo, Hiroyasu; Chiba, Tohru; and Sekigawa, Fujio, 4,837,033, Cl. 424-494.000.
Shin Sadahito: *See*—
Ohe, Yasuo; Matsuura, Makiko; Shimizu, Fumio; Nakajima, Yoshito; Shin Sadahito; and Shima, Kenji, 4,837,170, Cl. 436-548.000.
Shingai, Kazuto: *See*—
Miyazaki, Hidehiro; Shingai, Kazuto; and Ohsawa, Susumu, 4,837,759, Cl. 369-32.000.
Shinko Electric Co., Ltd.: *See*—
Maeno, Satoru; Fukuyama, Norio; Ohishi, Tetsuo; Kyutoku, Senzo; and Nakamura, Thutomu, 4,837,493, Cl. 318-685.000.
Shinohara, Hiromichi: *See*—
Shamoto, Naoki; Suzuki, Hideo; Sugawara, Yasuyuki; Kawase, Masaaki; and Shinohara, Hiromichi, 4,836,639, Cl. 350-96.230.
Shinozaki, Fumiaki: *See*—
Ishikawa, Shun-ichi; Imagawa, Tadao; Maeda, Minoru; and Shinozaki, Fumiaki, 4,837,106, Cl. 430-138.000.
Shioji, Mitsuaki: *See*—
Oishi, Hisao; Yanagihara, Kazuhiko; Miyakawa, Tadashi; Nakamura, Takeshi; Akimoto, Kazuhiko; and Shioji, Mitsuaki, 4,836,652, Cl. 350-334.000.
Shionogi & Co., Ltd.: *See*—
Konishi, Takao; Sugimori, Giichi; Kato, Kazuyoshi; Kimura, Nobutake; and Shibata, Kenji, 4,837,018, Cl. 424-92.000.
Shiraishi, Hisashi; Kimura, Tsutomu; and Hishinuma, Kazuhiro, to Fuji Photo Film Co., Ltd. Signal processing method in autoradiography. 4,837,733, Cl. 364-413.130.
Shiraki, Manabu: *See*—
Shimazu, Kikuo; Suzuki, Kazuo; Shiraki, Manabu; and Miyao, Osami, 4,836,631, Cl. 350-6.800.
Shirasaka, Akifumi; Tanaka, Kensaku; and Hamada, Masaki, to Canon Kabushiki Kaisha. Image processing apparatus. 4,837,847, Cl. 382-55.000.
Shiromizu, Yasuyuki; and Urata, Kenji, to Fuji Electric Co., Ltd. Image pickup method using a CCD-type solid state image pickup device with charge dissipation. 4,837,629, Cl. 358-213.190.

Shiroshita, Osamu: *See*—
Ishiguro, Yasuo; Itou, Yoshizumi; Shiroshita, Osamu; and Nakano, Masaru, 4,836,742, Cl. 414-742.000.
Shishido, Kazuhiko: *See*—
Miyamoto, Ritsu; Tsuchiya, Eiichi; Shishido, Kazuhiko; Shimizu, Toshiaki; and Hosoya, Atsushi, 4,837,645, Cl. 360-85.000.
Shivers, Clarence L. Passive ambience recovery system for the reproduction of sound. 4,837,825, Cl. 381-24.000.
Shizawa, Masahiro: *See*—
Yoshino, Yutaka; Gotoh, Makoto; Fujimoto, Osamu; and Shizawa, Masahiro, 4,837,814, Cl. 379-144.000.
Shohji, Yoshihiko: *See*—
Matsuo, Itaru; Takahashi, Yuzo; Hashimoto, Hideo; Takatsuka, Toru; Iimori, Takeru; Maekawa, Hitoshi; Ito, Tamotsu; Shohji, Yoshihiko; Watari, Ryuzo; and Aida, Hiroshi, 4,836,909, Cl. 208-72.000.
Shop-Vac Corporation: *See*—
Berfield, Robert C.; Meland, Ronald F.; and Seasholtz, Craig A., 4,836,753, Cl. 417-236.000.
Shower Tek, Inc.: *See*—
Christianson, Thomas R., 4,836,668, Cl. 350-588.000.
Shroot, Braham: *See*—
Caron, Daniele; and Shroot, Braham, 4,837,213, Cl. 514-179.000.
Side, Solly, to Societe Gerac. Impervious shelter made of modules. 4,835,919, Cl. 52-79.900.
Sidel: *See*—
Denis, Gerard; and Rius, Jean-Michel, 4,836,971, Cl. 264-521.000.
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Gramlich, Walter; Goetz, Norbert; Siegel, Hardo; and Schindler, Gerhard, 4,837,201, Cl. 512-26.000.
Siegel, Joel R.: *See*—
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Siemens Aktiengesellschaft: *See*—
Bardl, Artur; and Lindner, Manfred, 4,837,827, Cl. 381-34.000.
Clemens, Peter, 4,836,899, Cl. 204-130.000.
Dittmann, Michael, 4,837,538, Cl. 335-202.000.
Finzel, Lothar, 4,836,638, Cl. 350-96.210.
Goethert, Dieter, 4,837,792, Cl. 378-4.000.
Haberberger, Vitus, 4,836,560, Cl. 277-88.000.
Hirschberg, Jakub, 4,835,853, Cl. 29-854.000.
Knapek, Erwin; and Formanek, Helmut, 4,837,125, Cl. 430-270.000.
Noske, Erich; Pfeiler, Manfred; and Reichenberger, Helmut, 4,836,191, Cl. 128-24.00A.
Prey, Gerhard, 4,837,810, Cl. 379-242.000.
Schoenwald, Siegfried, 4,836,241, Cl. 137-494.000.
Straussmann, Juergen, 4,836,317, Cl. 178-2.00R.
Trumpp, Gerhard, 4,837,778, Cl. 375-4.000.
Wild, Georg; Kohler, Rembert; Weibelzahl, Manfred; Haushofer, Martin; and Messner, Johann, 4,837,671, Cl. 363-35.000.
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Sikes, Carlton T.: *See*—
Files, James H.; Harrel, Donald M.; Montague, John M.; Stansbury Sr., Thomas L.; and Sikes, Carlton T., 4,836,891, Cl. 159-28.100.
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Silver, Frederick H.: *See*—
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Silvestre de Ferron, Gerard, to Eurotechnique. Electrically programmable ROM. 4,837,742, Cl. 365-185.000.
Silvis, H. Craig; Crain, Steven P.; and Nader, Bassam S., to Dow Chemical Company, The. Linear bisphenol epoxy polymers containing cyano groups. 4,837,293, Cl. 528-99.000.
Simon, Gerard: *See*—
Lepage, Jean-Luc; and Simon, Gerard, 4,836,997, Cl. 423-342.000.
Simon, Helmut; and Thanos, Jordanes, to BASF Aktiengesellschaft. Surfactant modified metal catalysts. 4,837,189, Cl. 502-150.000.
Simoncelli, Philippe; and Prevot, Gerard, to Ferco International Usine de Ferrures de Batiment. Automatic double-action casement bolt. 4,836,588, Cl. 292-34.000.
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Davis, Cecil J.; Abernathy, Joseph V.; Matthews, Robert T.; Hildenbrand, Randall C.; Simpson, Bruce; Bohlman, James G.; Loewenstein, Lee M.; and Jones, John I., 4,836,905, Cl. 204-298.000.
Simpson, Harold G., to Harold Simpson, Inc. Membrane supported reroofing system. 4,835,917, Cl. 52-63.000.
Singer, Hans S. Yarn package creel for machine processing yarn. 4,836,468, Cl. 242-131.000.
Singer, Thomas, to Sft X. Settele Stanz- und Formtechnik GmbH & Co. KG. Screw-plug-terminal. 4,836,807, Cl. 439-787.000.
Singerman, Richard C., Jr.: *See*—
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Siraco, Frank J.; and Barrett, David S., to Charles Stark Draper Laboratory, Inc., The. Sperical ball positioning apparatus for seamed limp material article assembly system. 4,836,119, Cl. 112-306.000.
Skala, Dennis P.; and Kloss, John W., to Lord Corporation. Method and apparatus for measuring crack growth. 4,836,029, Cl. 73-799.000.
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Skeels, Gary W.; Breck, Donald W., deceased; by Breck, Stephen R., heir; and by Breck, George D., heir, to UOP. Hydrocarbon conversion using silicon-substituted zeolite compositions. 4,836,911, Cl. 208-111.000.
SKF Gleitlager GmbH: *See*—
Schmehr, Peter R.; and Sander, Edmund, 4,836,694, Cl. 384-145.000.
SKF Industrial Trading and Development Co., B.V.: *See*—
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Leete, John H., II; and Skinner, William J., 4,835,932, Cl. 52-648.000.
Skoczkowski, Andzej M.; and Rychlak, Andrew P. High compression gas turbine engine. 4,835,960, Cl. 60-39.340.
Skrmetta, Raphael Q. Seafood vacuum-pack system. 4,835,942, Cl. 53-453.000.
Sky Aluminium Co., Ltd.: *See*—
Shida, Hiroshi, 4,835,930, Cl. 52-539.000.
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Matsuo, Mamoru; and Furuya, Masami, 4,836,863, Cl. 148-2.000.
Slack, William E.: *See*—
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Slagley, Michael W.; and Slagley, M. Kathy W. Variable duration valve opening mechanism. 4,836,155, Cl. 123-90.160.
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Slator, Damon T. Jaws for power tongs and back-up units. 4,836,064, Cl. 81-57.180.
Sleator, Michael G. Interrupt controlled switching device. 4,837,455, Cl. 307-38.000.
Slesarenko, Vladimir F.; Vaisberg, Leonid A.; Balabatko, Leonid K.; Sozykin, Veniamin I.; and Gasseev, Amiran F. Vibratory screening machine. 4,836,385, Cl. 209-315.000.
Slidex Corporation: *See*—
Ozeki, Jiro, 4,836,667, Cl. 350-531.000.
Slocum, Alexander H., to Advanced Engineering Systems, Operations & Products, Inc. System to convert rotary motion to linear motion. 4,836,042, Cl. 74-424.80R.
Sloman, Roger M.; and Ridgard, Christopher, to Advanced Composite Components Ltd. Method for molding fibre reinforced laminates. 4,836,876, Cl. 156-242.000.
Slovak, William R.: *See*—
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Smay, John W.; Hummel, William F., Jr.; Chen, Carl L.; and Slafer, Loren I., to Hughes Aircraft Company. Method for controlling the spin axis attitude of a spinning spacecraft. 4,837,699, Cl. 364-434.000.
Smeets, Jacques; Dupuy, Marcel; and Rossi, Paul, to Compagnie Generale D'Automatisme CGA-HBS. Automatic dispenser and coin changer. 4,836,825, Cl. 453-49.000.
SMF International: *See*—
Boulet, Jean; and Morin, Pierre, 4,836,303, Cl. 175-74.000.
Smidth, Peter, to Ampex Corporation. Threshold tracking system. 4,837,642, Cl. 360-46.000.
Smith, Andrew P.: *See*—
Genna, Sebastian; and Smith, Andrew P., 4,837,439, Cl. 250-368.000.
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Smith, E. Phillip: *See*—
Wu, Stephen H. W.; Kirk, Shane K.; Perry, Kenneth P.; Smith, E. Phillip; Chang, Yeong-Ho; and Jenkins, Waylon L., 4,837,004, Cl. 424-438.000.
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Smith International, Inc.: *See*—
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Smith, Thomas J. Single knob adjustment apparatus. 4,836,522, Cl. 269-72.000.
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SmithKline Beckman Corporation: *See*—
Finkelstein, Joseph A.; Kruse, Lawrence I.; and Leonard, Thomas B., 4,837,353, Cl. 560-39.000.
Smits, Paul; Rosenfeld, Aron M.; and DeFerrari, Howard F., to Alcan International Limited. Tamper-evident structures. 4,837,061, Cl. 428-40.000.
Snaper, Alvin A. Remote access personnel identification and tracking system. 4,837,568, Cl. 340-825.540.
Snelling, Christopher, to Xerox Corporation. Highlight color imaging by depositing positive and negative ions on a substrate. 4,837,591, Cl. 346-159.000.
Societa' Cavi Pirelli S.p.A.: *See*—
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Societe Francaise d'Equipements pour la Navigation Aerienne (S.F.E.N.A.): *See*—
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Societe Montalbanaise de Constructions/Mecaniques: *See*—
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Sokol, Steven, to Detroit Bracket Company, Inc. Hinged support bracket for a radar detector or like device. 4,836,482, Cl. 248-206.300.
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Soliman, Mohamed Y., to Halliburton Company. Method of evaluating subsurface fracturing operations. 4,836,280, Cl. 166-250.000.
Solomon, Donald F. Reverse osmosis system and automatic cycling booster pump therefor. 4,836,924, Cl. 210-321.870.
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Sones, Richard A.; Lauro, Karen L.; Barnes, Gary T.; and Tesic, Mike M., to Picker International. Substance quantification in animal bodies. 4,837,686, Cl. 364-413.190.
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Sorg, Helmut; and Bucar, Matjaz, to Sorg GmbH & Co. KG. Roof for the working area, melting area or gob feeder of a glass melting furnace. 4,836,841, Cl. 65-347.000.
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Spahn, Walter, to Messer, Griesheim GMBH. Process for the removal of impurities from exhaust gases. 4,835,974, Cl. 62-12.000.
Spalding, August V.; Sabet, Mahmoud H.; Hamburger, Ronald O.; and Luk, Martin H., to Chevron Research Company. Method and apparatus for piled foundation improvement through freezing using surface mounted refrigeration units. 4,836,716, Cl. 405-224.000.
Span, Francis J., to U.S. Philips Corporation. Radiology patient support. 4,836,520, Cl. 269-322.000.
Spano, John D.; and Menard, Michael J., to Personal Products Company. Method and apparatus for producing fibrous web pieces. 4,836,070, Cl. 83-27.000.
Spaulding, Mark F.; and Goehring, Richard A., to Perkin-Elmer Corporation, The. Thermal spray gun with fan spray. 4,836,448, Cl. 239-79.000.
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Spearman, Patrick R.: *See*—
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Spector, David P.; and Kingsbury, Jeffrey M., to Sola USA, Inc. Fabrication of thermoplastic optical components by injection/compression molding. 4,836,960, Cl. 264-2.200.
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Spencer, Alexander K.: *See*—
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Spies, Brian R., to Atlantic Richfield Company. Method of reducing noise in electromagnetic geophysical exploration data. 4,837,514, Cl. 324-336.000.
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Sports & Toys Concepts, Inc.: *See*—
Robbins, William D., 4,836,554, Cl. 273-321.000.
Sprague, Glenn R. Portable computer and carrying case for mobile office. 4,837,590, Cl. 346-145.000.
Spreiter, Franz. Apparatus for hygienically collecting feces and method of manufacturing same. 4,836,594, Cl. 294-1.300.
Sprothbery, Donald E.: *See*—
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Sproul, Fred C., Sr., to Fred C. Sproul, Sr., Patents, Inc. Traffic signal directional indicator device. 4,837,569, Cl. 340-907.000.
Spurgeon, Robert L. Emergency illuminated lifeline. 4,836,815, Cl. 441-84.000.
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Standard Elektrik Lorenz AG: *See*—
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Glaeser, Linda C.; Brazdil, James F., Jr.; and Toft, Mark A., 4,837,233, Cl. 502-204.000.
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Stant Inc.: *See*—
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Steadman, Earl J. Frame for lighted ceilings. 4,835,916, Cl. 52-28.000.
Steber, William; Fishbein, Richard; and Cady, Susan M., to American Cyanamid Company. Compositions for parenteral administration and their use. 4,837,381, Cl. 424-502.000.
Steele, Gregory J., to Dynamic Air Inc. Air filter with back flow cleaning. 4,836,834, Cl. 55-96.000.
Steele, James R.; and Scherfenberg, Jerry W., to Dynamic Air Inc. Butterfly valves. 4,836,499, Cl. 251-173.000.
Stegmeier, Alwin, to Robert Bosch GmbH. Hydraulic electromagnetically actuated slide valve. 4,836,248, Cl. 137-625.650.
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Sterling Engineered Products Inc.: *See*—
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Sternson, Larry A.: *See*—
de Montigny, Pierre M. R.; Sternson, Larry A.; Repta, Arnold J.; Stobaugh, John F.; Higuchi, Takeru, deceased; and Higuchi, Kenji W., co-executor, 4,837,166, Cl. 436-111.000.
Stevens, Samuel B.: *See*—
Tonsor, Andrew J.; Nelson, David E.; Gee, James E.; and Stevens, Samuel B., 4,836,318, Cl. 180-9.500.
Stevens, Timothy S.; Frawley, Nile N.; Swart, Daniel J.; Harris, William C.; Diedering, Deborah E.; Nicholson, Lawrence W.; and Rothman, L. David, to Dow Chemical Company, The Method for reagent addition to a flowing liquid carrier stream. 4,837,161, Cl. 436-52.000.
Stewart, Jim D.: *See*—
Herrick, Paul W.; Thayer, Edward B.; and Stewart, Jim D., 4,836,451, Cl. 239-265.270.
Stewart Systems, Inc.: *See*—
Kasik, John P., 4,836,360, Cl. 198-803.600.
Steyr-Daimler-Puch Aktiengesellschaft: *See*—
Valev, Assen, 4,836,160, Cl. 123-198.00E.
Stiftelsen Institutet for Microvagsteknik VID: *See*—
Peterson, Sture, 4,837,174, Cl. 437-24.000.
Stihl, Andreas: *See*—
Dorner, Wolfgang; Lux, Helmut; and Fink, Reinhold, 4,836,297, Cl. 173-162.100.
Stil, Jacob H.: *See*—
Russell, Paul F.; Doering, Egon L.; Segerstrom, Clifford C., Stil, Jacob H.; Harenslak, Gerd; and van Kessel, Matheus M., 4,836,146, Cl. 122-379.000.
Stires, Sylvester, Jr. Fuel vaporization device for an internal combustion engine. 4,836,173, Cl. 123-522.000.
Stirling, David I.: *See*—
Dalton, Howard; Colby, John; and Stirling, David I., 4,837,150, Cl. 435-123.000.
Stirling Thermal Motors, Inc.: *See*—
Meijer, Roelf J.; and Ziph, Benjamin, 4,836,094, Cl. 92-167.000.
Stobaugh, John F.: *See*—
de Montigny, Pierre M. R.; Sternson, Larry A.; Repta, Arnold J.; Stobaugh, John F.; Higuchi, Takeru, deceased; and Higuchi, Kenji W., co-executor, 4,837,166, Cl. 436-111.000.
Stocker, Bruce A. D., to Leland Stanford Junior University, Stanford University, The Board of Trustees of the. Live vaccines comprising two mutations and foreign antigen. 4,837,151, Cl. 435-172.300.
Stokes, Bruce G.: *See*—
Weber, Robert E.; and Stokes, Bruce G., 4,837,070, Cl. 428-172.000.
Stokes, Vijay K., to General Electric Company. Method of making an improved disc rotor assembly. 4,835,840, Cl. 29-598.000.
Stolfi, Fred R.: *See*—
Plotnick, Michael A.; Shapiro, Paul J.; and Stolfi, Fred R., 4,836,697, Cl. 400-120.000.
Stolowitz, Mark L.; and Taketomo, Amy G., to Varian Associates, Inc. Bonded phase chromatographic supports. 4,837,348, Cl. 556-9.000.
Stone, Patrick C.; Luke, Mike A.; and Ingram, Gary D., to Baker Oil Tools, Inc. Apparatus for isolating a plurality of vertically spaced perforations in a well conduit. 4,836,278, Cl. 166-115.000.
Stone Rose Limited: *See*—
Armstrong, Tchaun, 4,836,075, Cl. 84-1.010.
Stone, Walter H.: *See*—
Popoff, Peter; Stone, Walter H.; and Church, John F., 4,836,923, Cl. 210-232.000.
Storage Technology Corporation: *See*—
Donze, Jerry L., 4,837,672, Cl. 363-143.000.
Storz Instrument Company: *See*—
Scheller, Gregg D.; Gahn, Jerry S.; Higgins, Daniel E.; Wendt, Richard; Gibeltirra, James; and Ritter, J. Alan, 4,837,857, Cl. 455-617.000.
Stout, Donald E.: *See*—
McIntosh, Kenneth B.; Pratt, James O.; and Stout, Donald E., 4,837,719, Cl. 364-569.000.
Stout, Richard W.: *See*—
Cox, Geoffrey B.; and Stout, Richard W., 4,837,195, Cl. 502-408.000.
Stowe, Mitchell T.: *See*—
McGill, David C.; McIntire, Gary J.; and Stowe, Mitchell T., 4,837,739, Cl. 364-900.000.
Straehle, Wolfgang: *See*—
Streu, Joachim; Straehle, Wolfgang; and Ramlow, Gerhard, 4,837,245, Cl. 521-117.000.
Straka, Robert: *See*—
Calandro, Thomas; Straka, Robert; and Verrico, Marsha K., 4,837,112, Cl. 426-463.000.
Strathy, Walter A.: *See*—
Valorose, Joseph J., Jr.; Biehl, Raymond J.; Sheth, Nitin V.; Strathy, Walter A.; and Doelling, Michael K., 4,837,030, Cl. 424-456.000.
Straussmann, Juergen, to Siemens Aktiengesellschaft. Method for distributing current address tables in "n" ring-shaped networks. 4,836,317, Cl. 178-2.00R.
Streicher, Willi; Marzolph, Gerhard; Behre, Horst; and Blank, Heinz U., to Bayer Aktiengesellschaft. Process for the preparation of 1-aminonaphthalene-2,4,7-trisulphonic acid and 1-aminonaphthalene-7-sulphonic acid. 4,836,959, Cl. 260-508.000.
Streu, Joachim; Straehle, Wolfgang; and Ramlow, Gerhard, to BASF Aktiengesellschaft. Process for the preparation of non-cellular or cellular polyurethane elastomers in the presence of a polyester polyol containing therein titanium and/or tin compounds as catalysts. 4,837,245, Cl. 521-117.000.
Striebel, R. Michael, to Raywheel, Inc. Combination alarm and lock device with sensitivity adjustment. 4,837,557, Cl. 340-546.000.
Stroze, Mark S., to Sundstrand Corp. Intermittently assisted hydrostatic bearing. 4,836,693, Cl. 384-121.000.
Stuart, Jerry E.: *See*—
Collins, Imack L.; Stuart, Jerry E.; and Foster, Gary H., 4,835,867, Cl. 30-276.000.
Stucki, Samuel: *See*—
Baumann, Hans; and Stucki, Samuel, 4,836,929, Cl. 210-638.000.

Stuckler, Hubert; and Dobramysl, Wilhelm, to Chemie Linz G.m.b.H. Process for the preparation of pure 1-phenyl-3-carbalkoxy-5-hydroxypyrazoles. 4,837,335, Cl. 548-367.000.

Stumke, Manfred: *See*—
Wagner, Rudolf; Schiwiora, Harry; Stumke, Manfred; and Groll, Werner, 4,836,984, Cl. 420-464.000.

Stump, John L.: *See*—
Sebastian, Peter R.; Stump, John L.; and Sebastian, Thomas V., 4,836,194, Cl. 128-78.000.

Sturm, Ruger & Company, Inc.: *See*—
Ruger, William B.; and Larson, Lawrence L., 4,835,892, Cl. 42-7.000.

Sturm, Steven P., to Process Automation Business, Inc. Direct infrared measurement of homogenous mixtures. 4,837,438, Cl. 250-339.000.

Su, Kou-Hwa. Paint roller. 4,835,812, Cl. 15-105.000.

Sudoh, Kunio, to Kowa Display Co., Inc. Shredded tobacco leaf pellet and production process thereof. 4,836,225. Cl. 131-352.000.

Suetrak Air Conditioning Sales Corporation *See*—
Ferdows, Houshang, 4,835,982, Cl. 62-259.000.

Sugawara, Eishu; Nakayama, Taketoshi; and Masumoto, Tsuyoshi, to Research Development Corporation; and Tokin Corporation. Anisotropic rare earth magnet material. 4,836,807, Cl. 148-301.000.

Sugawara, Kishio: *See*—
Hirota, Shinichiro; Sugawara, Kishio; and Fujimoto, Tadayuki, 4,836,838, Cl. 65-308.000.
Hirota, Shinichiro; and Sugawara, Kishio, 4,836,840, Cl. 65-323.000.

Sugawara, Yasuyuki: *See*—
Shamoto, Naoki; Suzuki, Hideo; Sugawara, Yasuyuki; Kawase, Masaaki; and Shinohara, Hiromichi, 4,836,639, Cl. 350-96.230.

Sugawara, Yoshitaka: *See*—
Kawahata, Sigeyuki; and Sugawara, Yoshitaka, 4,837,458, Cl. 307-279.000.

Sugimori, Giichi: *See*—
Konishi, Takao; Sugimori, Giichi; Kato, Kazuyoshi; Kimura, Nobutake; and Shibata, Kenji, 4,837,078, Cl. 424-92.000.

Sugita, Katsuhiko: *See*—
Tamura, Zenji; and Sugita, Katsuhiko, 4,836,252, Cl. 139-353.000.

Sugiura, Masamichi: *See*—
Oyabu, Masaaki; Sugiura, Masamichi; Hasegawa, Hirofumi; and Nakatani, Munehiro, 4,837,846, Cl. 381-50.000.

Sugiura, Noboru: *See*—
Fujino, Yasunori; Sugiura, Noboru; and Kobayashi, Ryoichi, 4,836,176, Cl. 123-640.000.

Sugiyama, Hiroshi, to Ikeda Bussan Co., Ltd. Reclining device of seat. 4,836,608, Cl. 297-367.000.

Sugiyama, Hiroyuki: *See*—
Komori, Tatsuo; and Sugiyama, Hiroyuki, 4,836,103, Cl. 101-231.000.

Sugiyama, Masami, to Fujirebio Kabushiki Kaisha, also trading as Fujirebio Inc. Method of measuring lipid-bound sialic acid. 4,837,144, Cl. 435-4.000.

Sugiyama, Sakae: *See*—
Ichikawa, Yoshiaki; Senoh, Makoto; Suzuki, Masanori; Kamimura, Hiroshi; Tomizawa, Fumio; Sugiyama, Sakae; and Sasaki, Masayoshi, 4,837,734, Cl. 364-513.000.

Sukup, Eugene G. Apparatus for stirring grain in rectangular bin regions. 4,836,686, Cl. 366-261.000.

Sullivan, Paul D.: *See*—
Burrus, Gilbert S., Jr.; Cooper, Ronald J.; Marr, Michael R.; Marsico, Mario A.; Pescatore, John C.; and Sullivan, Paul D., 4,837,677, Cl. 364-200.000.

Sumitomo Bakelite Co., Ltd.: *See*—
Sato, Toru; Matsuda, Atsuya; Shibata, Masaru; and Onohara, Masayuki, 4,837,047, Cl. 422-41.000.

Sumitomo Chemical Company, Limited: *See*—
Kato, Yasuyuki; Yuyama, Masahiro; Moritani, Masahiko; and Yasunori, Yukio, 4,837,286, Cl. 526-217.000.
Meki, Naoto; and Takano, Hirotaka, 4,837,236, Cl. 514-233.800.
Morimitsu, Toshihiko; Kikkawa, Sadanobu; and Omura, Takashi, 4,837,310, Cl. 534-638.000.
Ohsumi, Tadashi; Tsushima, Kazunori; Nishida, Sumio; Maeda, Kiyoto; Ooishi, Tadashi; and Matsuo, Noritada, 4,837,242, Cl. 514-365.000.

Sumitomo Electric Industries, Ltd.: *See*—
Satoh, Shuichi; and Tsuji, Kazuwo, 4,836,881, Cl. 156-621.000.
Yamamoto, Susumu; and Aoki, Yoshimitsu, 4,837,416, Cl. 219-69.120.

Sumitomo Special Metals Co., Ltd.: *See*—
Hamada, Takaki; Hayakawa, Tetsuji; and Matsuura, Yutaka, 4,837,114, Cl. 427-127.000.

Summers, William, III; and Burkhardt, Eric W., to Akzo America Inc. Organic solvent soluble polyvalent metal alkoxy alkoxides. 4,837,190, Cl. 502-171.000.

Sunbeam Corporation: *See*—
Carnevale, Francesco L.; and Morrow, Kirk D., 4,836,316, Cl. 177-256.000.

Sundin, George H. Turning apparatus for handle-operated equipment. 4,836,320, Cl. 180-19.100.

Sundstrand Corporation: *See*—
Bihlmaier, John A., 4,836,559, Cl. 277-2[illegible]000.
Okey, David W.; Church, John S.; Saatchi, Hossein; and Scanlon, John F., 4,837,251, Cl. 523-218.000.
Stroze, Mark S., 4,836,693, Cl. 384-121.000.

Sungene Technologies Corporation: *See*—
Hemphill, John K.; and Warshaw, Claire A., 4,837,152, Cl. 435-240.490.

Suntory Limited: *See*—
Ohfune, Yasufumi; and Sakaitani, Masahiro, 4,837,349, Cl. 556-420.000.

Supplee, Frank H., Jr.: *See*—
Teheng, Ping; and Supplee, Frank H., Jr., 4,836,035, Cl. 73-862.610.

Surland, George J.: *See*—
Lussier, Roger J.; and Surland, George J., 4,836,913, Cl. 208-120.000.

Surprises, Inc.: *See*—
Kirschner, Ann S., 4,836,437, Cl. 229-8.000.

Sutherland, Ivan F. Asynchronous first-in-first-out register structure. 4,837,740, Cl. 364-900.000.

Sutter, R. Frank; and Braithwaite, Melvyn, to Sutter, R. Frank. Fire retardant helicopter deck. 4,836,472, Cl. 244-114.00R.

Suttle, James P.; and Jones, Daniel A., to Caribbean Stud Enterprises, Inc. Poker game. 4,836,553, Cl. 273-292.000.

Sutton, Richard C.: *See*—
Anderson, James H., Bugner, Douglas E.; DeMejo, Lawrence P.; Sutton, Richard C.; and Wilson, John C., 4,837,392, Cl. 430-110.000.

Suzuki, Hideo: *See*—
Shamoto, Naoki; Suzuki, Hideo; Sugawara, Yasuyuki; Kawase, Masaaki; and Shinohara, Hiromichi, 4,836,639, Cl. 350-96.230.

Suzuki, Hirokazu, to Kabushiki Kaisha Toshiba. Method and system for acquiring motional information of object in magnetic resonance. 4,837,512, Cl. 324-306.000.

Suzuki, Hosei, to Fuji Jukogyo Kabushiki Kaisha. System for controlling a line pressure in an automatic transmission for motor vehicles. 4,836,055, Cl. 74-866.000.

Suzuki, Kazuo: *See*—
Shimazu, Kikuo; Suzuki, Kazuo; Shiraki, Manabu; and Miyao, Osami, 4,836,631, Cl. 350-6.800.

Suzuki, Kenji, to Fuji Photo Film Co., Ltd. Method for detecting/processing image information. 4,837,711, Cl. 364-523.000.

Suzuki, Kenji: *See*—
Ohta, Minemasa; Suzuki, Kenji; Fukuoka, Satoru; Takishita, Toshihiko; and Hayashi, Tuyoshi, 4,837,130, Cl. 430-321.000.

Suzuki, Masanori: *See*—
Ichikawa, Yoshiaki; Senoh, Makoto; Suzuki, Masanori; Kamimura, Hiroshi; Tomizawa, Fumio; Sugiyama, Sakae; and Sasaki, Masayoshi, 4,837,734, Cl. 364-513.000.

Suzuki, Masatoshi; Noda, Yukio; Kushiro, Yukitoshi; and Akiba, Shigeyuki, to Kokusai Denshin Denwa Kabushiki Kaisha. Semiconductor external optical modulator. 4,837,526, Cl. 332-7.510.

Suzuki, Mitsuyoshi: *See*—
Kubo, Tsutomu; Asano, Kenichi; Kikuchi, Hiroaki; and Suzuki, Mitsuyoshi, 4,837,632, Cl. 358-222.000.

Suzuki Motor Co., Ltd.: *See*—
Morita, Masataka; Ishihara, Masao; and Tachikawa, Mitsuru, 4,836,324, Cl. 180-291.000.

Suzuki, Motoshi: *See*—
Haseda, Satoshi; Tsuzuki, Yoshihiko; Konishi, Yoshimune; and Suzuki, Motoshi, 4,836,319, Cl. 180-142.000.

Suzuki, Ryo: *See*—
Sato, Toshihiro; Toyooka, Takashi; Kodama, Naoki; Takeuchi, Teruaki; Takeshita, Masatoshi; and Suzuki, Ryo, 4,837,741, Cl. 365-12.000.

Suzuki, Shun: *See*—
Sakamoto, Junshin; Suzuki, Shun; and Tsushima, Akinori, 4,836,349, Cl. 192-56.00R.

Suzuki, Takamasa, to NEC Corporation. Test control circuit for integrated circuit. 4,837,765, Cl. 371-25.000.

Suzuki, Tatsuo; and Isono, Keinosuke, to Material Engineering Technology Laboratory Inc. Medical bag and method for preparing the same. 4,836,691, Cl. 383-80.000.

Suzuki, Toshihiko: *See*—
Kato, Yasaburo; Suzuki, Toshihiko; Isawa, Nobuyuki; Kanbe, Hideo; and Hamasaki, Masaharu, 4,836,788, Cl. 437-017.000.

Suzuki, Toshio: *See*—
Magara, Takuji; and Suzuki, Toshio, 4,837,415, Cl. 219-69.00W.

Suzuki, Yasuo: *See*—
Wachi, Isao; Mori, Kinji; Suzuki, Yasuo; Orimo, Masayuki; Kawano, Katsumi; Koizumi, Minoru; Nakai, Kozo; and Kasashima, Hirokazu, 4,837,762, Cl. 370-89.000.

Suzuki, Yoshiharu; and Aketa, Tomoyuki, to Polyplastics Co., Ltd. Surface treating method for polyacetal resin molded articles. 4,836,889, Cl. 156-667.000.

Suzuki, Yukio: *See*—
Yaso, Masao; Suzuki, Yukio; Shibata, Kensuke; and Hayashi, Eiichi, 4,837,319, Cl. 544-120.000.

Svedberg, Robert C.; and Ammon, Robert L., to Westinghouse Electric Corp. Oxidation resistant niobium alloy. 4,836,849, Cl. 75-245.000.

Svensson, E. Gunnar, to Autopart Sweden AB. Vehicle visor installation. 4,836,599, Cl. 296-97.500.

Swaney, Richard U.: *See*—
Cignetti, Nicolas P.; Mortimer, John H.; and Swaney, Richard U., 4,836,273, Cl. 164-471.000.

Swanson, David R.: *See*—
Deters, Joseph C.; Wong, Patrick S. L.; Barclay, Brian L.; Theeuwes, Felix; and Swanson, David R., 4,837,111, Cl. 424-473.000.

Swart, Daniel J.: *See*—
Stevens, Timothy S.; Frawley, Nile N.; Swart, Daniel J.; Harris, William C.; Diedering, Deborah E.; Nicholson, Lawrence W.; and Rothman, L. David, 4,837,161, Cl. 436-52.000.

Swartz, Roger E.: *See*—
Weeks, James B.; Payne, Roger E.; and Swartz, Roger E., 4,836,261, Cl. 152-405.000.

Sweere, Harry C., to Ergotron, Inc. Suspension system for personal computers and monitors. 4,836,478, Cl. 248-1.00E.

Sweet, Richard L.: *See*—
Boe, Thomas E.; and Sweet, Richard L., 4,837,691, Cl. 364-424.050.

Swenson, Richard A. Heavy-duty spacer for reinforcing mesh. 4,835,934, Cl. 52-687.000.

Swift, Allan W., to E. J. Brooks Company. Security seal with tampering indicator. 4,836,590, Cl. 292-320.000.

Swift, Joseph A., to Xerox Corporation. Cleaning brush. 4,835,807, Cl. 15-1.50R.

Swinkels, Dominicus A.; and Chouzadjian, Kevork, to Broken Hill Proprietary Company Ltd., The. Removal of organics from Bayer process streams. 4,836,990, Cl. 423-130.000.

Switala, Lawrence W.: *See*—
Lakhan, Haresh C.; and Switala, Lawrence W., 4,836,229, Cl. 134-93.000.

Sym-Tek Systems, Inc.: *See*—
Riechelmann, Bernd, 4,836,797, Cl. 439-264.000.

Symbolik, William S.: *See*—
Proudley, John C.; and Symbolik, William S., 4,837,038, Cl. 426-428.000.

Synrad, Inc.: *See*—
Laakmann, Peter, 4,837,772, Cl. 372-82.000.

Syntex (U.S.A.) Inc.: *See*—
Benjamin, Eric J.; and Visor, Gary C., 4,837,239, Cl. 514-267.000.
Leeder, Sydney; and Zuk, Robert F., 4,837,395, Cl. 435-7.000.

Szeto, Rickens T.; and Woodland, Harold K., to American Telephone and Telegraph Company; and AT&T Information Services Inc. Station to station message arrangement. 4,837,807, Cl. 379-96.000.

Szikriszt, Georg. Apparatus for gas-producing treatment of organic material. 4,836,918, Cl. 210-151.000.

Szlaga, Emil: *See*—
Harris, Robert S.; Szlaga, Emil; and Thompson, Robert H., 4,836,835, Cl. 55-168.000.

T-Thermal, Inc.: *See*—
Miller, Ralph, 4,837,001, Cl. 423-574.00R.

Tabachnik, Mordechai, to Bio-Technology General Corp. Method of growing trichoderma. 4,837,155, Cl. 435-254.000.

Tachibana, Sadao, to Oki Electric Industry Co., Ltd. Keyboard of a membrane contact type. 4,837,412, Cl. 200-5.00A.

Tachibana, Tetsuo: *See*—
Isono, Osamu; Fukui, Toshimasa; Nishino, Tetsuo; Tachibana, Tetsuo; and Iwabuchi, Eisuke, 4,837,761, Cl. 370-60.000.

Tachikawa, Mitsuru: *See*—
Morita, Masataka; Ishihara, Masao; and Tachikawa, Mitsuru, 4,836,324, Cl. 180-291.000.

Tactical Fabs, Inc.: *See*—
Peltzer, Douglas L.; Bechtel, Richard L.; Ko, Wen C.; and Liggett, William T., 4,836,861, Cl. 136-246.000.

Taddeo, Anthony R. Loudspeaker. 4,837,837, Cl. 381-158.000.

Tagoku, Izumi; and Mashiko, Harumitsu, to Ricoh Company, Ltd. Information display medium. 4,837,071, Cl. 428-195.000.

Tague, Steven A.: *See*—
Lemay, Richard A.; Woods, William E.; and Tague, Steven A., 4,837,738, Cl. 364-900.000.

Tahara, Syuji, to Fuji Photo Film Co., Ltd. Photographic printer making differently-sized prints. 4,837,602, Cl. 355-29.000.

Tahara, Toshiro; and Iwasaki, Hideo, to Fuji Photo Film Co., Ltd. Apparatus for warming up automatic developing system. 4,837,713, Cl. 364-525.000.

Tai, Jy-Der: *See*—
Chiu, Edison H.; Tai, Jy-Der; and Hsu, Te-Chuan, 4,837,743, Cl. 371-51.000.

Taig, Alistair G., to Allied-Signal Inc. Electrically operated disc brakes. 4,836,338, Cl. 188-72.100.

Takada, Noboru; and Yokoyama, Hajime, to Toko, Inc.; and Matsushita Electric Industrial Co., Ltd. Electronic tuning circuit for AM receiver which is easy to effect tracking adjustment. 4,837,852, Cl. 455-197.000.

Takada, Yoshihiro: *See*—
Akiyoshi, Hideki; Tamura, Hiroshi; Kutami, Atsushi; and Takada, Yoshihiro, 4,837,120, Cl. 430-56.000.

Takagi, Hiroaki: *See*—
Tamura, Jun-ichi; and Takagi, Hiroaki, 4,837,313, Cl. 536-55.100.

Takagi, Hirohiko: *See*—
Nishizawa, Kuninori; Miura, Teruo; Watanabe, Yoichi; and Takagi, Hirohiko, 4,836,262, Cl. 152-451.000.

Takagi, Kazuhiko; and Nonomura, Yoshihito, to Brother Kogyo Kabushiki Kaisha. Invertible ribbon cartridge. 4,836,698, Cl. 400-208.000.

Takagi, Osamu: *See*—
Kohyama, Mitsuaki; Yoshida, Naruhito; and Takagi, Osamu, 4,836,135, Cl. 118-653.000.

Takagi, Yasutomo; and Takaishi, Kazuyoshi, to Ando Electric Co., Ltd. Driving circuit for laser diode. 4,837,428, Cl. 250-205.000.

Takahashi, Atsuo: *See*—
Shibasaki, Masakatsu; Takahashi, Atsuo; Aoki, Tuyoshi; Kogi, Kentaro; Nishimiya, Yozo; Nara, Takeshi; and Yamaguchi, Takashi, 4,837,342, Cl. 549-422.000.

Takahashi, Hiroshi; Morozumi, Naohiro; Takanezawa, Shin; and Nakao, Kiyoshi, to Hitachi Chemical Co., Ltd. Adhesive clad insulating substrate used for producing printed circuit boards. 4,837,086, Cl. 428-506.000.

Takahashi, Kozo; Masuda, Yoshihisa; and Inuki, Hisao, to Communications Research Laboratory; and Ministry of Posts and Telecommunications. Method and apparatus for detecting electromagnetic waves generated by the earth's crust under strain. 4,837,582, Cl. 343-719.000.

Takahashi, Ryoichi, to Kabushiki Kaisha Toshiba. Tuning device for nuclear magnetic resonance imaging apparatus and nuclear magnetic resonance imaging apparatus including the tuning device. 4,837,516, Cl. 324-322.000.

Takahashi, Sadayuki: *See*—
Nozaka, Kenkichi; Kawahara, Yosihiro; Kitamura, Yuji; Morita, Shigeru; and Takahashi, Sadayuki, 4,836,738, Cl. 414-607.000.

Takahashi, Shuichi; and Koshiishi, Takaho, to Ricoh Company, Ltd. Dual connection mode equipped communication control apparatus. 4,837,812, Cl. 379-98.000.

Takahashi, Yasuhiro: *See*—
Miyaji, Katsuaki; Arai, Kazutaka; Ohara, Yoshio; and Takahashi, Yasuhiro, 4,837,344, Cl. 549-319.000.

Takahashi, Yoneaki; and Sekikawa, Keiji, to Kayaba Industry Co., Ltd. Control valve. 4,836,245, Cl. 137-599.000.

Takahashi, Yuzo: *See*—
Matsuo, Itaru; Takahashi, Yuzo; Hashimoto, Hideo; Takatsuka, Toru; Iimori, Takeru; Maekawa, Hitoshi; Ito, Tamotsu; Shohji, Yoshihiko; Watari, Ryuzo; and Aida, Hiroshi, 4,836,909, Cl. 208-72.000.

Takaishi, Kazuyoshi: *See*—
Takagi, Yasutomo; and Takaishi, Kazuyoshi, 4,837,428, Cl. 250-205.000.

Takanashi, Kenichi, to Ricoh Company, Ltd. Optical scanning system having a surface inclination correction function. 4,836,630, Cl. 350-6.100.

Takane, Hisao, to NEC Corporation. Circuit arrangement capable of quickly processing an interrupt in a virtual machine operated by a plurality of operating systems. 4,837,674, Cl. 364-200.000.

Takanezawa, Shin: *See*—
Takahashi, Hiroshi; Morozumi, Naohiro; Takanezawa, Shin; and Nakao, Kiyoshi, 4,837,086, Cl. 428-506.000.

Takano, Hirotaka: *See*—
Meki, Naoto; and Takano, Hirotaka, 4,837,236, Cl. 514-233.800.

Takano, Yukio: *See*—
Aizawa, Koichi; Kazama, Toyoki; Takano, Yukio; and Tamura, Yukihisa, 4,837,137, Cl. 430-65.000.

Takasaki, Mamoru: *See*—
Muramatsu, Tateo; Saito, Hideaki; Takasaki, Mamoru; and Enami, Yasushi, 4,836,713, Cl. 405-115.000.

Takatsu, Kozo; and Kawata, Noboru, to Research Association for Petroleum Alternatives Development. Crystalline silicates and process for the production thereof. 4,837,000, Cl. 423-328.000.

Takatsuka, Keizo: *See*—
Takeuchi, Hiroshi; Torimi, Kiyokazu; and Takatsuka, Keizo, 4,837,662, Cl. 361-335.000.

Takatsuka, Toru: *See*—
Matsuo, Itaru; Takahashi, Yuzo; Hashimoto, Hideo; Takatsuka, Toru; Iimori, Takeru; Maekawa, Hitoshi; Ito, Tamotsu; Shohji, Yoshihiko; Watari, Ryuzo; and Aida, Hiroshi, 4,836,909, Cl. 208-72.000.

Takayama, Suguru: *See*—
Arioka, Hiroyuki; Nishimatsu, Masaharu; and Takayama, Suguru, 4,837,116, Cl. 428-141.000.

Takeda Chemical Industries, Ltd.: *See*—
Mise, Noritoshi; and Matsumura, Koichi, 4,837,020, Cl. 424-68.000.
Oshima, Yasuji; Araki, Hiroyuki; and Kaneko, Yoshinobu, 4,837,147, Cl. 435-68.000.
Sano, Yasuo, 4,837,302, Cl. 528-407.000.

Takeda, Osamu: *See*—
Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Kamimae, Hajime, 4,836,511, Cl. 267-64.160.
Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Kamimae, Hajime, 4,836,575, Cl. 280-702.000.

Takei, Toshihiro: *See*—
Wakata, Hideo; Takei, Toshihiro; Hattori, Yoshiyuki, Uno, Haruhiko; and Imoto, Yuzo, 4,836,618, Cl. 303-103.000.

Takenaka, Takaji; Watanabe, Hideki; and Kobayashi, Fumiyuki, to Hitachi, Ltd. Method and apparatus for airtightly packaging semiconductor package. 4,836,434, Cl. 228-179.000.

Takeoka, Seiei: *See*—
Kataoka, Sachiro; Iizima, Yoichi; Kuwahara, Masaji; Takeoka, Seiei; and Katsutani, Kazuzi, 4,836,323, Cl. 180-270.000.

Takeshita, Masatoshi: *See*—
Sato, Toshihiro; Toyooka, Takashi; Kodama, Naoki; Takeuchi, Teruaki; Takeshita, Masatoshi; and Suzuki, Ryo, 4,837,741, Cl. 365-12.000.

Takesue, Toshihiro; Murahashi, Takashi; and Nakazawa, Toshihiko, to Konishiroku Photo Industry Co., Ltd. Semiconductor laser device with light emission inhibiting means. 4,837,787, Cl. 372-29.000.

Taketomo, Amy G.: *See*—
Stolowitz, Mark L.; and Taketomo, Amy G., 4,837,348, Cl. 556-9.000.

Takeuchi, Hiroshi; Torimi, Kiyokazu; and Takatsuka, Keizo, to Mitsubishi Denki Kabushiki Kaisha. Gas insulated switchgear 4,837,662, Cl. 361-335.000.

Takeuchi, Masashi: *See*—
Sato, Kozo; Takeuchi, Masashi; and Shibata, Takeshi, 4,837,142, Cl. 430-562.000.

Takeuchi, Teruaki: *See*—
Sato, Toshihiro; Toyooka, Takashi; Kodama, Naoki; Takeuchi, Teruaki; Takeshita, Masatoshi; and Suzuki, Ryo, 4,837,741, Cl. 365-12.000.

Takeyama, Yoshinobu: *See*—
Imakawa, Susumu; and Takeyama, Yoshinobu, 4,837,588, Cl. 346-108.000.

Takishita, Toshihiko: *See*—
Ohta, Minemasa; Suzuki, Kenji; Fukuoka, Satoru; Takishita, Toshihiko; and Hayashi, Tuyoshi, 4,837,130, Cl. 430-321.000.

Takitani, Yukitaka: *See*—
Asayama, Yoshio; Tsubota, Makio; Takitani, Yukitaka; and Okura, Yasunori, 4,836,057, Cl. 74-867.000.

Tallman, Jack A., to Allied-Signal Inc. Error detection means for an overspeed governor. 4,835,969, Cl. 60-39.281.

Tam, Steve; Weigele, Manfred; Broger, Samuel; and Mitsuya, Hiroaki, to Hoffman-La Roche Inc.; and United States of America, America. Anti-retroviral compounds. 4,837,311, Cl. 536-22.000.

Tamai, Yoshin: *See*—
Torihara, Masahiro; and Tamai, Yoshin, 4,837,351, Cl. 558-388.000.

Tamaura, Yutaka: *See*—
Oishi, Masao; Saito, Takao; Ishikawa, Katsukiyo; Abe, Masanori; and Tamaura, Yutaka, 4,837,046, Cl. 427-38.000.

Tamura, Hiroshi: *See*—
Akiyoshi, Hideki; Tamura, Hiroshi; Kutami, Atsushi; and Takada, Yoshihiro, 4,837,120, Cl. 430-56.000.

Tamura, Jun-ichi; and Takagi, Hiroaki, to Higeta Shoyu Co., Ltd. Polygalactosamine PF-192 and salts thereof. 4,837,313, Cl. 536-55.100.

Tamura, Shuichi, to Canon Kabushiki Kaisha. Magnetically driven nutating motor. 4,837,470, Cl. 310-82.000.

Tamura, Yukihisa: *See*—
Aizawa, Koichi; Kazama, Toyoki; Takano, Yukio; and Tamura, Yukihisa, 4,837,137, Cl. 430-65.000.

Tamura, Zenji; and Sugita, Katsuhiko, to Tsudakoma Kogyo Kabushiki Kaisha. Warp yarn breakage detecting and indicating apparatus. 4,836,252, Cl. 139-353.000.

Tanaka, Hazime: *See*—
Oyanagi, Reinosuke; and Tanaka, Hazime, 4,835,980, Cl. 62-212.000.

Tanaka, Kazushi: *See*—
Kuroda, Kazuhiro; Tanaka, Kazushi; and Azegami, Hitoshi, 4,837,083, Cl. 428-329.000.

Tanaka, Kazuyoshi; and Hashiue, Masakazu, to Fuji Photo Film Co. Ltd. Method for analyzing an autoradiograph. 4,837,687, Cl. 364-413.010.

Tanaka, Kensaku: *See*—
Shirasaka, Akifumi; Tanaka, Kensaku; and Hamada, Masaki, 4,837,847, Cl. 382-55.000.

Tanaka, Kimio; Ishida, Toshihiko; and Shiba, Haruo, to TDK Corporation. Disc cartridge. 4,837,651, Cl. 360-133.000.

Tanaka, Takashi: *See*—
Hayashi, Kenro; and Tanaka, Takashi, 4,836,965, Cl. 264-60.000.

Tanaka, Toshiyuki; Kuga, Shigeki; Morishita, Taro; Nakamura, Nobuo; and Ohsaki, Mikio, to Sharp Kabushiki Kaisha. Inputting and editing system in a knowledge based inquiry and answer system. 4,837,689, Cl. 364-419.000.

Tanaka, Yukitaka; Nakamura, Minoru; Okada, Johshin; and Mansho, Kenji, to Kao Corporation. Suppository and base thereof. 4,837,214, Cl. 514-179.000.

Tandem Computers Incorporated: *See*—
Fuller, William T., 4,837,681, Cl. 364-200.000.

Tanemoto, Kei: *See*—
Endo, Hidehiro; Tanemoto, Kei; and Kubo, Hiroshi, 4,837,231, Cl. 501-91.000.

Tang, Hua H. Combination fork/spoon utensil. 4,835,864, Cl. 30-150.000.

Tani, Toyofumi; and Miwa, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Improvements to rotating head assembly in a video tape recording machine. 4,837,649, Cl. 360-104.000.

Taniguchi, Nobuyuki: *See*—
Nakamura, Akiyoshi; Ando, Makoto; Ogino, Shuji; and Taniguchi, Nobuyuki, 4,837,594, Cl. 354-402.000.

Tanner, Olof: *See*—
Axelsson, Anders R.; Bylander, Lolo; Perrvik, Sten; and Tanner, Olof, 4,837,107, Cl. 430-138.000.

Tappert, Hans-Juergen: *See*—
Neubert, Eberhard; Wardenga, Hans-Michael; Polzer, Gottlieb; Lange, Juergen; Schrader, Klaus; Junker, Frank; Dittmann, Norbert; Spevacek, Ullrich; and Tappert, Hans-Juergen, 4,836,130, Cl. 118-76.000.

Tarasevich, Andrew: *See*—
Van Saders, John G.; Tarasevich, Andrew; and Reichenbach, Michael C., 4,836,681, Cl. 356-374.000.

Tashiro, Syuzaburou; Ina, Toshikazu; and Kawai, Hisasi, to Nippon Soken, Inc. Road surface detecting device for vehicle. 4,837,727, Cl. 364-551.010.

Tashiro, Yoshio: *See*—
Sekino, Naomi; and Tashiro, Yoshio, 4,836,211, Cl. 128-662.050.

Tate Acess Floors: *See*—
Blacklin, Peter A.; and Bell, Jonathan D., 4,835,924, Cl. 52-263.000.

Tate, Shigeyuki: *See*—
Kubota, Yasuhiko; and Tate, Shigeyuki, 4,836,165, Cl. 123-357.000.

Tateno, Kunio; and Shimotori, Yoshio, to UPL Co. Ltd; and Koto Electronics Co. Ltd. Express package collection locker. 4,836,352, Cl. 194-215.000.

Tatum, James H.: *See*—
Baker, Robert A.; and Tatum, James H., 4,837,399, Cl. 514-468.000.

Tay, Sing P.: *See*—
Kalnitsky, Alexander; Ellul, Joseph P.; and Tay, Sing P., 4,836,902, Cl. 204-192.320.

Taylor, Homer L.; and Katz, Peter, to Tennsco Corporation. Knockdown cabinet. 4,836,626, Cl. 312-257.0SM.

Taylor, Michael P.: *See*—
Sansone, Ronald P.; Gelfer, George G.; Taylor, Michael P.; and Axelrod, Barry H., 4,837,701, Cl. 364-464.030.

Taylor, Robert D.: *See*—
Schneiter, Fred E.; and Taylor, Robert D., 4,836,255, Cl. 149-35.000.

Taylor, Warren G., to De-Sta-Co Division, Dover Resources, Inc. Hydraulic work support. 4,836,091, Cl. 92-26.000.

Teheng, Ping; and Supplee, Frank H., Jr., to United States of America, National Aeronautics and Space Administration. Skin friction balance. 4,836,035, Cl. 73-862.610.

TDK Corporation: *See*—
Arieka, Hiroyuki; Nishimatsu, Masaharu; and Takayama, Suguru, 4,837,116, Cl. 428-141.000.
Kuroda, Kazuhiro; Tanaka, Kazushi; and Azegami, Hitoshi, 4,837,083, Cl. 428-329.000.
Tanaka, Kimio; Ishida, Toshihiko; and Shiba, Haruo, 4,837,651, Cl. 360-133.000.
Yajima, Kohichi; Kohmoto, Osamu; and Yoneyama, Tetsuhito, 4,836,868, Cl. 148-302.000.

Teach, Ted L., to Spectra-Physics, Inc. Apparatus and method for projection of reference planes of light. 4,836,669, Cl. 350-618.000.

Technica Entwicklungsgesellschaft mbH & Co. KG: *See*—
Kuckens, Alexander, 4,835,903, Cl. 47-58.000.

Technical University of Nova Scotia, The: *See*—
MacKay, G. David M.; and Trivett, Gordon S., 4,836,116, Cl. 110-245.000.

Tecnomagnete S.p.A.: *See*—
Michele, Cardone; Angelo, Grandini; and Bruno, Zaramella, 4,837,540, Cl. 335-286.000.

Tecumseh Products Company: *See*—
Morse, Robert L., 4,835,849, Cl. 29-156.70R.

Teijin Limited: *See*—
Sasaki, Yoshiyuki; and Kasaoka, Katsuyuki, 4,835,956, Cl. 57-245.000.

Teillaud, Eric: *See*—
Guillemet, Alain; Teillaud, Eric; Reginault, Philippe; and Bevan, Bruno, 4,837,025, Cl. 424-448.000.

Tektronix, Inc.: *See*—
Beckett, Frederick J., 4,835,859, Cl. 29-846.000.

Telectronics N.V.: *See*—
McAuslan, Brian R., 4,836,884, Cl. 156-629.000.

Teledyne Hanau: *See*—
Beu, Richard A., 4,836,779, Cl. 433-73.000.

Teledyne Industries, Inc.: *See*—
Haglund, Richard A.; and Tupack, Robert E., 4,835,977, Cl. 62-89.000.

Televerket: *See*—
Brusewitz, Harald, 4,837,617, Cl. 358-133.000.

Teller, Raymond G.; Ebner, Ann M.; Bodolus, Christopher; and Gupta, Victor R., to Standard Oil Company, The. Oxidation catalyst and processes using same. 4,836,117, Cl. 110-342.000.

Tennsco Corporation: *See*—
Taylor, Homer L.; and Katz, Peter, 4,836,626, Cl. 312-257.0SM.

Terajima, Hisao, to Canon Kabushiki Kaisha. Facsimile apparatus with device to determine line changes, and having a power conservation featured. 4,837,813, Cl. 379-113.000.

Teranishi, Shunichi, to Aisin Seiki Kabushiki Kaisha. Disk file apparatus. 4,836,621, Cl. 360-98.050.

Terumo Kabushiki Kaisha: *See*—
Aoyagi, Juuro; Yamamoto, Yuichi; Akaike, Toshihiro; and Nozaki, Yasuhiro, 4,836,928, Cl. 210-635.000.

Tesic, Mike M.: *See*—
Sones, Richard A.; Lauro, Karen L.; Barnes, Gary T.; and Tesic, Mike M., 4,837,686, Cl. 364-413.190.

Tessier, Jean; and Demoute, Jean-Pierre, to Roussel Uclaf. Novel derivatives. 4,837,341, Cl. 549-283.000.

Tetrault, Edward J.; and Land, Larry D. Ventilated sole shoe construction. 4,835,883, Cl. 36-3.00R.

Texaco Inc.: *See*—
Kapuscinski, Maria M.; Liu, Christopher S.; Jones, Ronald E.; and Grina, Larry D., 4,836,943, Cl. 252-50.000.
Redus, Clifford L.; Chien, Sze-Foo; and Sigwardt, Peter L., 4,836,032, Cl. 73-861.040.

Texas Instruments Incorporated: *See*—
Chiu, Edison H.; Tai, Jy-Der; and Hsu, Te-Chuan, 4,837,743, Cl. 371-51.000.
Cobb, Carleton M., III; Hirsbrunner, Hans G.; Gonsalves, Edward M.; Jenne, Richard L.; and Nott, Sepideh H., 4,837,545, Cl. 337-66.000.
Davis, Cecil J.; Abernathy, Joseph V.; Matthews, Robert T.; Hildenbrand, Randall C.; Simpson, Bruce; Bohlman, James G.; Loewenstein, Lee M.; and Jones, John I., 4,836,905, Cl. 204-298.000.
Luttmer, Joseph D.; York, Rudy L.; Smith, Patricia B.; and Davis, Cecil J., 4,837,113, Cl. 427-38.000.

Textron Inc.: *See*—
Boshier, Geoffrey, 4,837,615, Cl. 358-100.000.

Th. Goldschmidt AG: *See*—
Burkhart, Georg; Moring, Volker; and Schaefer, Dietmar, 4,837,244, Cl. 521-114.000.

Thanos, Jordanes: *See*—
Simon, Helmut; and Thanos, Jordanes, 4,837,189, Cl. 502-150.000.

Tharp, Terry M.; Roberts, David W.; McCartney, John C.; and Harvey, John W., to Manville Corporation. Low profile industrial luminaire. 4,837,669, Cl. 362-418.000.

Thayer, Edward B.: *See*—
Herrick, Paul W.; Thayer, Edward B.; and Stewart, Jim D., 4,836,451, Cl. 239-265.270.

Theeuwes, Felix: *See*—
Deters, Joseph C.; Wong, Patrick S. L.; Barclay, Brian L.; Theeuwes, Felix; and Swanson, David R., 4,837,111, Cl. 424-473.000.

Theisen, Jacob F.: *See*—
Breiten, Charles P.; Stanasolovich, David; and Theisen, Jacob F., 4,836,885, Cl. 156-643.000.

Theoleyre, Serge; Salsetti, Pascal; and Masset, Daniel, to Gerin, Merlin. Self-protected low voltage capacitor. 4,837,660, Cl. 361-275.000.

Therm-O-Disc, Incorporated: *See*—
Nixon, Ronald A.; and Yagher, Charles, Jr., 4,837,547, Cl. 337-414.000.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile machine for distributing and shaping the ballast bed of a railroad track. 4,835,887, Cl. 37-104.000.

Theysohn, Rainer: *See*—
Zahradnik, Franz; Ulmerich, Karlheinz; McKee, Graham E.; Reimann, Horst; Pflueger, Richard; and Theysohn, Rainer, 4,837,264, Cl. 524-381.000.

Thibault, Paul A.: *See*—
Bouchard, Andre C.; and Thibault, Paul A., 4,836,816, Cl. 445-51.000.

Thielke, Dietrich; Holtje, Dagmar; and Nadler, Guy, to Beecham-Wuelfing GmbH & Co. KG. Aminoalkyl secocanthine derivatives and their use. 4,837,240, Cl. 514-294.000.

Thiem, Heinz: *See*—
Holl, Wolfgang; Weilandt, Gerhard; and Thiem, Heinz, 4,836,459, Cl. 241-225.000.

Thigpen, F. Bruce; and Collie, David E., to Eminent Technology, Inc. Electromagnetic transducer of improved efficiency. 4,837,838, Cl. 381-158.000.

Thirode, Pierre. Device for pickling meat by mixing under vacuum. 4,836,099, Cl. 99-472.000.

Thomas, Bruce A.: *See*—
Doering, Charles W.; Caudill, Garland E.; Johnson, Henry L.; and Thomas, Bruce A., 4,836,610, Cl. 298-6.000.

Thomas Douglas C.: *See*—
Ungpiyakul, Tanakon; Morgan, Arch D.; Thomas Douglas C.; Ketenhofen, Timothy J.; Marver, Douglas J.; Couture-Dorschner, Laurie; and Pomplun, William S., 4,837,715, Cl. 364-552.000.

Thomas, Richard D.; and Bell, Cecil R., Jr., to Sara Lee Corporation. Packaging system. 4,835,939, Cl. 53-248.000.

Thomas, Robert C., to Dow Chemical Company, The. Clear brine fluids. 4,836,941, Cl. 252-8.555.

Thompson, Robert H.: *See*—
Harris, Robert S.; Szlaga, Emil; and Thompson, Robert H., 4,836,835, Cl. 55-168.000.

Thomson CSF: *See*—
Fleury, Georges; and Epsztein, Bernard, 4,837,522, Cl. 330-149.000.
Huignard, Jean Pierre; and Meyzonnette, Jean Louis, 4,836,629, Cl. 350-3.730.
Lefevre, Herve ; and Bann, Sambath, 4,836,645, Cl. 350-96.170.

Thomson Semiconducteurs: *See*—
Marquot, Alexis, 4,837,744, Cl. 365-195.000.

Thrall Car Manufacturing Company: *See*—
Robertson, James C.; and Baker, William R., 4,836,726, Cl. 410-9.000.

Three Phoenix Company: *See*—
Kondo, Thomas J.; Kusbel, James F.; and Philp, John D., 4,836,916, Cl. 209-538.000.

Thro, Stuart W.: *See*—
Ablay, Sewim F.; Thro, Stuart W.; and Zdunek, Kenneth J., 4,837,858, Cl. 455-34.000.

Thuse, Erik, to FMC Corporation. Method of improving fatigue life of an elongated component. 4,836,866, Cl. 148-131.000.

Tierney, James V., III, to Archive Corporation. Circuit for controlling frequency and phase of voltage controlled oscillator in a data smoother for a streaming cartridge tape drive. 4,837,643, Cl. 360-51.000.

Tietjen, Marlene: *See*—
Macchio, Ralph A.; Brown, Ivonne; and Tietjen, Marlene, 4,837,011, Cl. 424-69.000.

Tinker, Steven J., to Shell Western E&P Inc. Equilibrium fracture acidizing. 4,836,284, Cl. 166-279.000.

Toa Eiyo Ltd.: *See*—
Shibasaki, Masakatsu; Takahashi, Atsuo; Aoki, Tuyoshi; Kogi, Kentaro; Nishimiya, Yozo; Nara, Takeshi; and Yamaguchi, Takashi, 4,837,342, Cl. 549-422.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Akizuki, Ikuo; Kaya, Hiroshi; Okano, Shohei; Otake, Nobuo; Kumagai, Keiji; and Kaneko, Yoshihito, 4,837,193, Cl. 502-242.000.

Toagosei Chemical Industry Co., Ltd.: *See*—
Sato, Mitsuyoshi; Okamura, Takumi; and Kimura, Kaoru, 4,837,260, Cl. 524-261.000.

Tobisawa, Yoshio: *See*—
Shimamura, Morihiko; Kubo, Jun; Kubota, Hitoshi; Fujiki, Norio; Tobisawa, Yoshio; Ishikawa, Yasuki; and Fukawa, Kazuyoshi, 4,835,970, Cl. 60-545.000.

Toft, Mark A.: *See*—
Glaeser, Linda C.; Brazdil, James F., Jr.; and Toft, Mark A., 4,837,191, Cl. 502-202.000.
Glaeser, Linda C.; Brazdil, James F., Jr.; and Toft, Mark A., 4,837,233, Cl. 502-204.000.

Tohzuka, Takashi; Ishikawa, Sueyoshi; Kubo, Katsuyoshi; Honda, Yoshitaka; Ohmure, Yukio; and Kataoka, Norio, to Daikin Industries Ltd. Halogen-containing polyether and its use. 4,836,944, Cl. 252-54.000.

Tokai Kogyo Kabushiki Kaisha: *See*—
Unuma, Sadao; and Yamashita, Masashi, 4,836,430, Cl. 226-74.000.

Tokico Ltd.: *See*—
Kobayashi, Kinzo; and Nakayama, Shinichi, 4,836,339, Cl. 188-73.100.

Tokin Corporation: *See*—
Sugawara, Eishu; Nakayama, Taketoshi; and Masumoto, Tsuyoshi, 4,836,867, Cl. 148-301.000.

Toko, Inc.: *See*—
Takada, Noboru; and Yokoyama, Hajime, 4,837,852, Cl. 455-197.000.

Toko Kabushiki Kaisha: *See*—
Oshikawa, Michitaka, 4,837,533, Cl. 333-189.000.

Tokunaga, Masaaki; Uchida, Kimio; and Hiraki, Akitoshi, to Hitachi Metals, Ltd. Method of producing neodymium-iron-boron permanent magnet. 4,837,109, Cl. 420-83.000.

Tokyo Electric Co., Ltd.: *See*—
Sekioka, Kunikazu, 4,836,309, Cl. 177-25.150.

Tomer, Jitendra P. Electrical cable connector. 4,836,799, Cl. 439-284.000.

Tomita, Yoji; Oishi, Eiichi; Miyaji, Hiroshi; Morimoto, Hiroya; Sekigawa, Tetsuo; and Mitsuhashi, Kenichi, to Kanebo, Ltd. Apparatus for performing separation of a solid-liquid mixture. 4,836,917, Cl. 210-104.000.

Tomizawa, Fumio: *See*—
Ichikawa, Yoshiaki; Senoh, Makoto; Suzuki, Masanori; Kamimura, Hiroshi; Tomizawa, Fumio; Sugiyama, Sakae; and Sasaki, Masayoshi, 4,837,734, Cl. 364-513.000.

Tomlinson, Peter N. Inset for a tool. 4,836,178, Cl. 125-39.000.

Tompson, Gerhard R.: *See*—
Prueti, David R.; Goertzel, Gerald; and Tompson, Gerhard R., 4,837,845, Cl. 382-46.000.

Toner, John L., to Eastman Kodak Company. Polypyridine Fluorescent labels for immunoassay. 4,837,169, Cl. 436-546.000.

Tonsor, Andrew J.; Nelson, David E.; Gee, James E.; and Stevens, Samuel B., to Caterpillar Inc. Track roller frame assembly. 4,836,318, Cl. 180-9.500.

Torelli, Gerard: *See*—
Coffre, Eric; Gary, Daniel; di Giulio, Christophe; Loiseau, Gerard; and Torelli, Gerard, 4,836,242, Cl. 137-505.420.

Torihara, Masahiro; and Tamai, Yoshin, to Kuraray Company Ltd. 2-cyano-4-phenyl pentane and fragrance or perfume compositions containing the same. 4,837,351, Cl. 558-388.000.

Torii, Nobutoshi; Ito, Susumu; Wakio, Hiroshi; and Iwasaki, Kyoji, to Fanuc Ltd. Industrial robot having dust-proof structure. 4,836,048, Cl. 74-608.000.

Torii, Shunpeita; and Isozaki, Yutaka, to Fuji Photo Film Co., Ltd. Mechanism for opening the cover of an image recording medium cassette. 4,835,941, Cl. 53-382.000.

Torimi, Kiyokazu: *See*—
Takeuchi, Hiroshi; Torimi, Kiyokazu; and Takatsuka, Keizo, 4,837,662, Cl. 361-335.000.

Torita, Fumio: *See*—
Ishida, Katsuyuki; Torita, Fumio; and Kohsaka, Yoshio, 4,835,994, Cl. 68-174.000.

Tornblom, Bengt H., to Tornbloms Kvalitetskontroll AB. Device for suppression and/or separation of signals due to magnetic oxide scales in hot cast billets. 4,837,510, Cl. 324-225.000.

Tornbloms Kvalitetskontroll AB: *See*—
Tornblom, Bengt H., 4,837,510, Cl. 324-225.000.

Torrence, Robert J., to Eaton Corporation. Controlling superheat in a refrigeration system. 4,835,976, Cl. 62-115.000.

Torus Corporation: *See*—
Allen, Donavan J., 4,836,702, Cl. 401-10.000.

Toshiba Ceramics Co., Ltd.: *See*—
Hayashi, Kenro; and Tanaka, Takashi, 4,836,965, Cl. 264-60.000.

Toshiba Kikai Kabushiki Kaisha: *See*—
Kakazu, Yukinori; Minami, Noburo; and Nukui, Katsuhiko, 4,837,703, Cl. 364-474.180.

Totten, George E.; and Johnson, Gordon C., to Union Carbide Corporation. Random polyether foam control agents. 4,836,951, Cl 252-174.210.

Toulhoat, Herve ; and Favre, Anne, to Institut Francais du Petrole. Process for characterizing a catalyst by determination of its conversion and coking activities. 4,837,158, Cl. 436-37.000.

Toya, Hisao: *See*—
Manabe, Katsuhide; Ogisu, Yasuhiko; Goto, Kazuaki; and Toya, Hisao, 4,836,901, Cl. 204-164.000.

Toya, Takao: *See—*
Obara, Yuichi; Fuse, Kenichi; Onuma, Yoshihiro; Toya, Takao; and Chiba, Kazuo, 4,836,636, Cl. 350-96.200

Toyama, Tadao: *See—*
Kobayashi, Kesanao; Ohba, Hisao; and Toyama, Tadao, 4,837,131, Cl. 430-302.000.

Toyo Jozo Kabushiki Kaisha: *See—*
Yaso, Masao; Suzuki, Yukio; Shibata, Kensuke; and Hayashi, Eiichi, 4,837,319, Cl. 544-120.000.

Toyo Seikan Kaisha, Ltd.: *See—*
Igarashi, Reiko; Watanabe, Yoshihiko and Hirata, Sadao, 4,837,115, Cl. 428-36.920.

Toyoda Gosei Co., Ltd.: *See—*
Kurita, Toshinori; Enomoto, Masaaki; and Nagamatsu, Hidetoshi, 4,836,722, Cl. 409-132.000.
Manabe, Katsuhide; Ogisu, Yasuhiko; Goto, Kazuaki; and Toya, Hisao, 4,836,901, Cl. 204-164.000.

Toyono, Tsutomu: *See—*
Mouri, Akihiro; Toyono, Tsutomu; Kaneko, Shuzo; Inaba, Yutaka; and Kanbe, Junichiro, 4,836,656, Cl. 350-350.00S.

Toyooka, Takashi: *See—*
Sato, Toshihiro; Toyooka, Takashi; Kodama, Naoki; Takeuchi, Teruaki; Takeshita, Masatoshi; and Suzuki, Ryo, 4,837,741, Cl. 365-12.000.

Toyota Jidosha Kabushiki Kaisha: *See—*
Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Kamimae, Hajime, 4,836,511, Cl. 267-64.160.
Buma, Shuuichi; Ohwa, Nobutaka; Takeda, Osamu; and Kamimae, Hajime, 4,836,575, Cl. 280-702.000.
Chujo, Yoshiki; Inoue, Tokuta; Konomi, Toshiaki; and Hyodo, Yoshihiko, 4,836,174, Cl. 123-571.000.
Ishiguro, Yasuo; Itou, Yoshizumi; Shiroshita, Osamu; and Nakano, Masaru, 4,836,742, Cl. 414-742.000.
Nakano, Jiro; and Ito, Yoshizo, 4,836,016, Cl. 73-118.100.
Nakawaki, Yasunori; Numazawa, Akio; and Hayashi, Takashi, 4,836,056, Cl. 74-866.000.
Nomura, Yoshihisa, 4,835,967, Cl. 60-404.000.
Numazawa, Akio; Kubo, Seitoku; and Kuramochi, Koujiro, 4,836,050, Cl. 74-695.000.

Tracy, David J.: *See—*
Login, Robert B.; Chaudhuri, Ratan K.; Tracy, David J.; and Helioff, Michael W., 4,837,013, Cl. 424-70.000.

Trahan, Albert J.; and Douglas, Robert J., to Emhart Industries, Inc. Plunger assembly for a glassware forming machine. 4,836,839, Cl. 65-323.000.

Trahan, Albert J., to Emhart Industries, Inc. Plunger assembly for a glassware forming machine. 4,836,842, Cl. 65-362.000.

Tran Dinh, Can. Process and means for cutting hard objects or materials without cutting softer objects or materials. 4,836,069, Cl. 83-13.000.

Trauth, Hubert: *See—*
Aumueller, Alexander; Neuman, Peter; and Trauth, Hubert, 4,837,403, Cl. 544-215.000.

Tresslar, Marie C.: *See—*
Kite, Joseph S., III; and Tresslar, Marie C., 4,836,080, Cl. 87-9.000.

Tretter, Hans, to Anton Steinecker Maschinenfabrik GmbH. Whirlpool for coarse sludge separation in brewing of beer. 4,836,097, Cl. 99-277.100.

Treybig, Duane S., to Dow Chemical Company, The. Process for the reaction of piperazine, and derivatives thereof, with glyoxal, and derivatives thereof. 4,837,324, Cl. 544-357.000.

Treybig, Duane S.: *See—*
Martinez, Robert G.; Treybig, Duane S. and Glass, Terry W., 4,837,323, Cl. 544-242.000.

Triezenberg, David M., to Westinghouse Electric Corp. Alternator for rapid repetitive pulsing of an electromagnetic launcher. 4,836,083, Cl. 89-8.000.

Triolo, Victoria M.: *See—*
Hartwell, David W.; Bloom, Elbert; and Triolo, Victoria M., 4,837,767, Cl. 371-49.000.

Trippe, Jerry C.: *See—*
O'Mara, Dion P.; Hadermann, Albert F., and Trippe, Jerry C., 4,837,249, Cl. 523-175.000.

Trivedi, Bharat K., to Warner-Lambert Company. Diastereoisomers of N^6-endo-bicyclo[2.2.1]heptyladenosine as antihypertensives with selective action. 4,837,207, Cl. 514-46.000.

Trivett, Gordon S.: *See—*
MacKay, G. David M.; and Trivett, Gordon S., 4,836,116, Cl. 110-245.000.

Troster, Josef; and Barten, Axel. Flatness measuring device for strip-shaped rolled material. 4,836,680, Cl. 356-37.000.

Trowbridge, Daniel W. Gas burning heating device. 4,836,182, Cl. 126-109.000.

TruAngle Broadhead Hones, Inc.: *See—*
Roberts, Timothy A., 4,835,910, Cl. 51-281.000.

Trummer, Gregor: *See—*
Pollner, Juergen; Trummer, Gregor; and Moelzer, Peter, 4,836,734, Cl. 414-430.000.

Trumpp, Gerhard, to Siemens Aktiengesellschaft. Circuit arrangement for time-regeneration of broadband digital signals. 4,837,778, Cl. 375-4.000.

TRW Inc.: *See—*
Bianchi, Maurice P., 4,836,860, Cl. 134-21.000.
Leete, John H., II; and Skinner, William J., 4,835,932, Cl. 52-648.000.

Tsai, Son-Kung. Method of producing a bow holding handle. 4,836,964, Cl. 264-46.700.

Tsang, Siu K.: *See—*
Chung, Shine C.; Tsang, Siu K.; Koo, James T.; Chen, Sho Long S.; and Chan, John Y., 4,837,748, Cl. 365-236.000.

Tschang, Chung-Ji: *See—*
Braun, Gerold; Tschang, Chung-Ji; Vamvakaris, Christos; and Glaser, Klaus, 4,837,330, Cl. 546-339.000.

Tschudin-Mahrer, Rolf, to Irbit Research & Consulting AG. Transport roller. 4,837,064, Cl. 428-71.000.

Tsinberg, Mikhail, to North American Philips Corporation. Scan rate conversion apparatus and method. 4,837,619, Cl. 358-140.000.

Tsubota, Makio: *See—*
Asayama, Yoshio; Tsubota, Makio; Takitani, Yukitaka; and Okura, Yasunori, 4,836,057, Cl. 74-867.000.

Tsuchihashi, Michihiro: *See—*
Anzai, Yoshinori; Saikatsu, Takao; Saito, Masato; and Tsuchihashi, Michihiro, 4,837,478, Cl. 313-112.000.

Tsuchiya, Eiichi: *See—*
Miyamoto, Ritsu; Tsuchiya, Eiichi; Shishido, Kazuhiko; Shimizu, Toshiaki; and Hosoya, Atsushi, 4,837,645, Cl. 360-85.000.

Tsuchiya, Haruhiko: *See—*
Ogawa, Shinji; Tsuchiya, Haruhiko; Araki, Tsutomu; Aoki, Hiroshi; and Yamamoto, Hiroshi, 4,837,564, Cl. 340-750.000.

Tsudakoma Kogyo Kabushiki Kaisha: *See—*
Tamura, Zenji; and Sugita, Katsuhiko, 4,836,252, Cl. 139-353.000.

Tsuji, Kazuwo: *See—*
Satoh, Shuichi; and Tsuji, Kazuwo, 4,836,881, Cl. 156-621.000.

Tsuji, Nobuo: *See—*
Yamada, Yasuyuki; Miyatsuka, Hajime; Okita, Tsutomu; and Tsuji, Nobuo, 4,837,081, Cl. 428-329.000.

Tsukamoto, Kazuhiro: *See—*
Dosaka, Katsumi; Kumanoya, Masaki; Miyatake, Hideshi; Hidaka, Hideto; Konishi, Yasuhiro; Yamasaki, Hiroyuki; Ikeda, Yuto; Tsukamoto, Kazuhiro; and Shimoda, Masaki, 4,837,747, Cl. 371-10.000.

Tsukamoto, Koichi: *See—*
Uchiyama, Futoshi; Tsukamoto, Koichi; Kurashige, Tomoyoshi; Furusawa, Kaoru; and Koike, Mitsumaro, 4,836,417, Cl. 222-63.000.

Tsushima, Akinori: *See—*
Sakamoto, Junshin; Suzuki, Shun; and Tsushima, Akinori, 4,836,349, Cl. 192-56.00R.

Tsushima, Kazunori: *See—*
Ohsumi, Tadashi; Tsushima, Kazunori; Nishida, Sumio; Maeda, Kiyoto; Ooishi, Tadashi; and Matsuo, Noritada, 4,837,242, Cl. 514-365.000.

Tsuzuki, Yoshihiko: *See—*
Haseda, Satoshi; Tsuzuki, Yoshihiko; Konishi, Yoshimune; and Suzuki, Motoshi, 4,836,319, Cl. 180-142.000.

Tuboscope, Inc.: *See—*
Weems, Craig C., 4,835,873, Cl. 33-21.300.

Tucker, Brian D., to Gould Electronics Limited. Method and apparatus for the generation of mixed REFRESH and ROLL mode display in a CRT. 4,837,561, Cl. 340-722.000.

Tugal, Halil; and Gaudet, Peter W., to Helix Technology Corporation. Flex-line vibration isolator and cryopump with vibration isolation. 4,835,972, Cl. 62-50.100.

Tumey, Michael L.; Bange, Donna W.; and Robbins, Aida F., to Minnesota Mining and Manufacturing Company. Method of preparing coated abrasive having radiation curable binder. 4,836,832, Cl. 51-293.000.

Tuns, Heinz J.; and Hiss, Herbert, to Sig Schweizerische Industrie-Gesellschaft. Carton, particularly for liquids and blank therefor. 4,836,384, Cl. 206-621.300.

Tupack, Robert E.: *See—*
Haglund, Richard A.; and Tupack, Robert E., 4,835,977, Cl. 62-89.000.

Turbine Components Corporation: *See—*
Shankar, Srinivasan; and Goward, George W., 4,837,389, Cl. 428-668.000.

Turbosound Limited: *See—*
Andrews, Anthony J.; Hunt, Toby C.; and Newsham, John, 4,836,327, Cl. 181-152.000.

Turcotte, David E.: *See—*
Roshen, Waseem A.; Turcotte, David E.; and Regelman, Dale F., 4,837,659, Cl. 361-270.000.

Turkington, T. K.: *See—*
Morrall, Robin A. A.; Turkington, T. K.; Gugel, Richard K.; and Rude, Sheldon V., 4,837,146, Cl. 435-34.000.

Turnell, David C.; and Cooper, John D. H., to Coventry Health Authority. Sample preparation method for liquid chromatography. 4,837,157, Cl. 436-20.000.

Turner, Carlton E.: *See—*
Elsohly, Mahmoud; Turner, Carlton E.; Murphy, James C.; and Wirth, Phillip W., 4,837,228, Cl. 514-456.000.

Twigger, Ronald T. Supporting element. 4,836,333, Cl. 182-186.000.

Twin Disc, Incorporated: *See—*
Pelligrino, Paul A., 4,836,809, Cl. 440-2.000.

Tye, Anthony J.: *See—*
Cameron, James M.; Stanton, Timothy P.; Tye, Anthony J.; and December, Timothy S., 4,837,278, Cl. 525-162.000.

Tyler, Henry: *See—*
Eisa, Soraya; Peczkowski, Joseph; Tyler, Henry; and Richardson, Glenn, 4,837,697, Cl. 364-431.020.

Tyson, Therese M.: *See—*
Kiffel, William G.; and Tyson, Therese M., 4,837,012, Cl. 424-70.000.

Ube Industries, Ltd.: *See—*
Ueno, Toyoaki; and Dannoura, Sadayuki, 4,836,267, Cl. 164-113.000.

UCB Societe Anonyme: *See—*
Gobert, Jean; Geerts, Jean-Pierre; and Dodson, Guy, 4,837,223, Cl. 514-424.000.
Gobert, Jean; Giurgea, Corneliu; Geerts, Jean-Pierre; and Bodson, Guy, 4,837,224, Cl. 514-424.000.

Uchida, Haruhiko: *See—*
Nasu, Yasunobu; and Uchida, Haruhiko, 4,836,952, Cl. 252-188.280.

Uchida, Kimio: *See—*
Tokunaga, Masaaki; Uchida, Kimio; and Hiraki, Akitoshi, 4,837,109, Cl. 420-83.000.

Uchida, Yukimasa, to Kabushiki Kaisha Toshiba. Complementary MOS circuit having decreased parasitic capacitance. 4,837,460, Cl. 307-296.800.

Uchiyama, Futoshi; Tsukamoto, Koichi; Kurashige, Tomoyoshi; Furusawa, Kaoru; and Koike, Mitsumaro, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Apparatus for continuous supply of fine powder, viscous fluid or the like at a constant rate. 4,836,417, Cl. 222-63.000.

Uchiyama, Tetsuo: *See—*
Sakuhara, Toshihiko; Sakai, Fumiki; and Uchiyama, Tetsuo, 4,837,435, Cl. 250-306.000.

Ueda, Kazuhiko, to Victor Company of Japan, Ltd. Solid-state imaging apparatus with a plurality of CCD storage sections. 4,837,630, Cl. 358-213.260.

Ueda, Kenichi: *See—*
Awaji, Toshio; Ueda, Kenichi; and Atobe, Daisuke, 4,837,280, Cl. 525-502.000.

Ueno, Iowa: *See—*
Purcey, Larry J.; VanderHoff, Douglas A., Vreeland, Robert H.; Nielsen, James P.; and Ueno, Iowa, 4,835,802, Cl. 5-453.000.

Ueno, Toyoaki; and Dannoura, Sadayuki, to Ube Industries, Ltd. Vertical die casting method and apparatus. 4,836,267, Cl. 164-113.000.

Ugenti, Michael, to Grumman Aerospace Corporation. Computer-aided, logic pulsing probe for locating faulty circuits on a printed circuit card. 4,837,502, Cl. 324-73.0PC.

Ukima Colour & Chemiclas Mfg. Co., Ltd.: *See—*
Kuriyama, Katsumi; Hanada, Kazuyuki; Nakamura, Susumu; Misaizu, Iwao; Kashimura, Masashi; and Goto, Tomoko, 4,837,198, Cl. 503-227.000.

Ulbing, Otmar M., to Windwinder Corporation. Preloaded spring, method and apparatus for forming same. 4,836,514, Cl. 267-166.000.

Ulbrich, Paul, to American Home Products Corporation (Del.). Electrode assembly for sensing heart activity. 4,836,208, Cl. 128-642.000.

Ulmerich, Karlheinz: *See—*
Zahradnik, Franz; Ulmerich, Karlheinz; McKee, Graham E.; Reimann, Horst; Pflueger, Richard; and Theysohn, Rainer, 4,837,264, Cl. 524-381.000.

Ultraprobe, Inc.: *See—*
Patterson, Joseph M., 4,837,506, Cl. 324-158.00R.

Ultrasonic Power Corporation: *See—*
Javorik, Laszlo J.; and Puskas, Peter J., 4,836,684, Cl. 366-114.000.

Umeda, Hiroyuki: *See—*
Iwakoshi, Keiichi; Sato, Mitsuru; Umeda, Hiroyuki; and Nishizawa, Toshinori, 4,836,187, Cl. 128-4.000.

Umezawa, Isao; Sone, Haruo; and Kusuda, Tadahiro, to Sony Corporation. Photodetector for use with an optical recording medium. 4,837,429, Cl. 250-211.00J.

Underwood, Don C.: *See—*
Wester, Randy J.; Hopkins, Bob C.; and Underwood, Don C., 4,836,579, Cl. 285-3.000.

Underwood, Lance D.: *See—*
Keshavan, Madapusi K.; Underwood, Lance D.; Kar, Naresh J.; Oldham, Thomas W.; Roth, Cary A.; and Armstrong, Brian J., 4,836,307, Cl. 175-374.000.

Unger, Dieter, to Holstein und Kappert Aktiengesellschaft. Apparatus for closing bottles. 4,835,940, Cl. 53-342.000.

Ungpiyakul, Tanakon; Morgan, Arch D.; Thomas Douglas C.; Ketenhofen, Timothy J.; Marver, Douglas J.; Couture-Dorschner, Laurie; and Pomplun, William S., to Kimberly-Clark Corporation. Method and apparatus for detecting the placement of components on absorbent articles. 4,837,715, Cl. 364-552.000.

Uni-BMX, Inc.: *See—*
Berg, Roger M.; and Scott, Francis H., 4,836,615, Cl. 301-37.0SA.

Uniden Corporation: *See—*
Konishi, Yoshihiro; Konno, Kenichi; and Awai, Ikuo, 4,837,535, Cl. 333-210.000.

Union Camp Corporation: *See—*
Edwards, Anne M.; and Rosen, Allen, 4,836,892, Cl. 162-141.000.

Union Carbide Corporation: *See—*
Brode, George L., II; and Merritt, Frederick M., II, 4,837,005, Cl. 424-47.000.
Kokta, Milan R., 4,836,953, Cl. 252-301.40F.
Totten, George E.; and Johnson, Gordon C., 4,836,951, Cl. 252-174.210.

Union Oil Company of California: *See—*
Hsieh, Wen-Ching, 4,836,282, Cl. 166-273.000.

Union Tool Co., Ltd.: *See—*
Katayama, Ichiro, 4,837,432, Cl. 250-235.000.

Uniroyal Chemical Company, Inc.: *See—*
Chucta, Thomas M., 4,837,259, Cl. 524-258.000.

U.S. Brands: *See—*
Cone, Richard E., 4,836,601, Cl. 297-16.000.

United States of America
Agriculture: *See—*
Baker, Robert A.; and Tatum, James H., 4,837,399, Cl 514-468.000.
Columbus, Eugene P., 4,835,818, Cl. 19-55.00R.

Air Force: *See—*
Frazier, Malcolm, 4,837,683, Cl. 364-200.000.
Reinhart, Theodore J., 4,836,858, Cl. 134-1.000.

America: *See—*
Tam, Steve; Weigele, Manfred; Broger, Samuel; and Mitsuya, Hiroaki, 4,837,311, Cl. 536-22.000.

Army: *See—*
Ballato, Arthur, 4,836,882, Cl. 156-626.000.
Chandra, Suresh; and Paul, Jeffrey L., 4,837,769, Cl. 372-41.000.
Leupold, Herbert A., 4,837,542, Cl. 335-306.000.

Energy: *See—*
Chang, Shih-Ger; Liu, David K.; Griffiths, Elizabeth A.; and Littlejohn, David, 4,837,361, Cl. 562-556.000.
Manglos, Stephen H., 4,837,442, Cl. 250-390.010.

Health and Human Services: *See—*
Maxwell, G. Maret; and Webber, Richard L., 4,836,206, Cl. 128-633.000.

National Aeronautics and Space Administration: *See—*
Carter, Edward L., 4,836,826, Cl. 464-29.000.
Cohen, Marc M.; Kaplicky, Jan; and Nixon, David A., 4,836,114, Cl. 108-77.000.
Graves, Thomas J.; Yang, Robert A.; and Brown, Christopher W., 4,836,081, Cl. 89-1.140.
Jones, Jack A.; Petrick, S. Walter; and Britcliffe, Michael J., 4,835,973, Cl. 62-6.000.
Meinel, Aden B.; Meinel, Marjorie P.; and Stacy, John E., 4,836,666, Cl. 350-504.000.
Myers, W. Neill, 4,836,707, Cl. 403-322.000.
St. Clair, Terry L.; Burks, Harold D.; and Progar, Donald J., 4,837,300, Cl. 528-353.000.
Tcheng, Ping; and Supplee, Frank H., Jr., 4,836,035, Cl. 73-862.610.

U.S. Philips Corp.: *See—*
Bergstrom, Michael J.; and Gent, Derek J., 4,837,457, Cl. 307-253.000.
Borgers, Stephanus M. C.; and Visser, Cornelis P., 4,837,724, Cl 364-725.000.
Hagen, Johannes L. M., 4,836,692, Cl. 384-107.000.
Lutz, Georg, 4,837,571, Cl. 341-67.000.
Maisel, Manfred; Kolle, Erich; and Hauenstein, Gerhard, 4,837,850, Cl. 455-58.000.
Peters, Joseph H.; and Kanters, Johannes T., 4,837,783, Cl. 375-110.000.
Span, Francis J., 4,836,520, Cl. 269-322.000.
Verstegen, Judicus M. P. J.; Verlijsdonk, Johannus G.; de Meester, Emiel P. J.; Van de Spijker, Willebrordus H. M. M.; and Verriet, Johannes G., 4,837,481, Cl. 313-486.000.

United Technologies Automotive, Inc.: *See—*
Roy, Dhirendra C., 4,836,408, Cl. 220-306.000.

United Technologies Corporation: *See—*
Herrick, Paul W.; Thayer, Edward B.; and Stewart, Jim D., 4,836,451, Cl. 239-265.270.
Kornitzky, Michael A.; and Dublinski, Alexander C., 4,836,765, Cl. 425-388.000.
Marra, John J., 4,835,827, Cl. 29-156.80R.
Noyes, Gary P., 4,836,898, Cl. 204-129.000.
Presz, Walter M., Jr.; Paterson, Robert W.; and Werle, Michael J., 4,835,961, Cl. 60-264.000.

Universal Flow Monitors Inc.: *See—*
Rosaen, Lars O., 4,836,021, Cl. 73-259.000.

Universal Industries Ltd.: *See—*
Bozek, Daryn S., 4,836,017, Cl. 73-155.000.

University of Bath: *See—*
Henderson, James F.; and Wingham, Philip J., 4,836,122, Cl. 114-243.000.

University of California, Regents of: *See—*
Deftos, Leonard J.; and Hostetler, Karl Y., 4,837,380, Cl. 424-450.000.
Goodman, Murray; Marr-Leisy, Debra; Rosenkranz, Roberto P.; Melmon, Kenneth L.; and Verlander, Michael S., 4,837,305, Cl. 530-345.000.
Michaeli, Dov, 4,837,024, Cl. 424-446.000.
Yao, Ching, 4,837,513, Cl. 324-309.000.

University of Miami: *See—*
Harrington, William J.; Ahn, Yeon S.; and Mylvaganam, Ravindra, 4,837,212, Cl. 514-176.000.

University of Mississippi, The: *See—*
Elsohly, Mahmoud; Turner, Carlton E.; Murphy, James C.; and Wirth, Phillip W., 4,837,228, Cl. 514-456.000.

University of New Mexico: *See—*
Lebeck, Alan O.; and Young, Lionel A., 4,836,561, Cl. 277-93.0SD

Uno, Haruhiko: *See—*
Wakata, Hideo; Takei, Toshihiro; Hattori, Yoshiyuki; Uno, Haruhiko; and Imoto, Yuzo, 4,836,618, Cl. 303-103.000.

Unuma, Sadao; and Yamashita, Masashi, to Tokai Kogyo Kabushiki Kaisha. Paper feed apparatus. 4,836,430, Cl. 226-74.000.

UOP: *See—*
Kulprathipanja, Santi, 4,837,315, Cl. 536-127.000.

Skeels, Gary W.; Breck, Donald W., deceased; Breck, Stephen R., heir; and Breck, George D., heir, 4,835,911, Cl. 208-111.000.

Uozu, Yoshihiro: *See*—
Matsumoto, Tsuruyoshi; Shimada, Kazuhiko; and Uozu, Yoshihiro, 4,836,642, Cl. 350-96.340.

Upjohn Company, The: *See*—
Magerlein, Barney J., 4,837,318, Cl. 540-355.000.

UPL Co. Ltd: *See*—
Tateno, Kunio; and Shimotori, Yoshio, 4,836,352, Cl. 194-215.000.

Urata, Kenji: *See*—
Shiromizu, Yasuyuki; and Urata, Kenji, 4,837,629, Cl. 358-213.190.

Urushibata, Yukio, to Kabushiki Kaisha Toshiba. Image processing apparatus. 4,837,844, Cl. 382-44.000.

USBI Booster Production Company, Inc.: *See*—
Headrick, Stephen E.; and Hill, Roger L., 4,837,250, Cl. 523-179.000.

Ushio, Masaru: *See*—
Inoue, Akira; Ushio, Masaru; Morita, Toru; Oishi, Yasuyuki; and Sakoda, Hisao, 4,836,914, Cl. 208-251.0H.

UVEX Winter Optik GmbH: *See*—
Wiedner, Klaus, 4,835,796, Cl. 2-431.000

Vacant, Andre, to GEP Groupe Pasquier. Machining device, especially for a robot used for the carding of leather. 4,835,995, Cl. 69-6.500.

Vagt, Uwe: *See*—
Becker, Rainer; Eckhardt, Heinz; Fischer, Rolf; Spiegler, Wolfgang; and Vagt, Uwe, 4,837,346, Cl. 549-425.000.

Vaisberg, Leonid A.: *See*—
Slesarenko, Vladimir F.; Vaisberg, Leonid A.; Balabatko, Leonid K.; Sozykin, Veniamin I.; and Gasseev, Amiran F., 4,836,385, Cl. 209-315.000.

Vajda, Gabor; Ravasz, Laszlo; Vajda, Gaborne; and Karacsonyi, Bela, to Agro-Industria Innovacios Vallalat. Fruit-containing chocolate products and process of their preparation. 4,837,042, Cl. 426-615.000.

Vajda, Gaborne: *See*—
Vajda, Gabor; Ravasz, Laszlo; Vajda, Gaborne; and Karacsonyi, Bela, 4,837,042, Cl. 426-615.000.

Valdes, Oliver: *See*—
Lopetrone, Juan P.; Valdes, Oliver; and Clopton, James, Jr., 4,837,519, Cl. 324-529.000.

Valentian, Dominique, to Societe Europeene de Propulsion. Gradient oven for oriented solidification, in particular by the Bridgman method. 4,836,771, Cl. 432-210.000.

Valev, Assen, to Steyr-Daimler-Puch Aktiengesellschaft. Internal combustion engine provided with a sound-insulating enclosure. 4,836,160, Cl. 123-198.00E.

Vallomy, John A., to Intersteel Technology, Inc. Method and apparatus for continuously charging a steelmaking furnace. 4,836,732, Cl. 414-188.000.

Valorose, Joseph J., Jr.; Biehl, Raymond J.; Sheth, Nitin V.; Strathy, Walter A.; and Doelling, Michael K., to American Cyanamid Company. Novel controlled release formulations of tetracycline compounds. 4,837,030, Cl. 424-456.000.

Valsan Partners Limited Partnership: *See*—
Wagenfeld, Robert E., 4,836,469, Cl. 244-1.00N.

Valy, Yves: *See*—
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Wenzel, Dennis J.; Winter, Dean C.; and Honeyager, Kevin S., to Nippon Colin Co., Ltd. Pressure control system for continuous blood pressure monitor transducer. 4,836,213, Cl. 128-672.000.
Werle, Michael J.: *See*—
Presz, Walter M., Jr.; Paterson, Robert W.; and Werle, Michael J., 4,835,961, Cl. 60-264.000.
Werner, Heinz, to Keiper Recaro GmbH & Co. Seat with adjustable back rest. 4,836,606, Cl. 297-362.000.
Werner, Heribert; Grothe, Klaus; and Kreuzer, Martin, to Kolbenschmidt Aktiengesellschaft. Safety steering wheel. 4,836,576, Cl. 280-731.000.
Wesson, David S.; and George, Kevin R., to Halliburton Company. Control line differential firing head. 4,836,109, Cl. 102-312.000.
Wester, Randy J., to FMC Corporation. Casing hanger and packoff running tool. 4,836,288, Cl. 166-348.000.
Wester, Randy J.; Hopkins, Bob C.; and Underwood, Don C., to FMC Corporation. Subsea casing hanger suspension system. 4,836,579, Cl. 285-3.000.
Westinghouse Electric Corp.: *See*—
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Cooney, Barry F.; and Camden, Thomas M., Jr., 4,836,977, Cl. 376-333.000.
Ezekoye, L. Ike; and Cavada, David R., 4,836,974, Cl. 376-258.000.
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Rodriguez, Noe E., II; Flaherty, William T., Jr.; Duggan, Sharon A.; and Fertig, Timothy M., 4,837,664, Cl. 361-386.000.
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Westrick, Barbara L.: *See*—
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Westvaco Corporation: *See*—
Rigby, William R., 4,836,438, Cl. 229-52.00B.
Wexler, Howard. Combination glove and slap ball. 4,836,555, Cl. 273-330.000.
Whann, Welton B.; and Elizondo, Paul M., to Micro-Probe, Inc. High density probe card. 4,837,622, Cl. 324-158.00P.
Whirlpool Corporation: *See*—
Knoop, Donald E.; and Paustian, John K., 4,835,991, Cl. 68-12.00R.
White Consolidated Industries, Inc.: *See*—
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White, Randall A., to Digital Equipment Corporation. Tri-state function indicator. 4,837,565, Cl. 340-762.000.
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White, Roger J.; and Krishnan, Sivaram, to Mobay Corporation. Foamable molding compositions. 4,837,243, Cl. 521-94.000.
Whitfield, Roxana R. Odor control pet excrement pan. 4,836,141, Cl. 119-1.000.
Whiting, Bruce R., to Eastman Kodak Company. Storage phosphor read-out method. 4,837,436, Cl. 250-327.200.
Whitmoyer, David L.: *See*—
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Whitney, Robert W.: *See*—
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Whittington, Herbert W.; Jordan, James R.; and Flanagan, Ian, to Ranco Europe Limited. Method and apparatus for identifying the metal included in a metallic item. 4,837,511, Cl. 324-236.000.
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Wiedner, Klaus, to UVEX Winter Optik GmbH. Goggles for protection against laser radiation. 4,835,796, Cl. 2-431.000.

Wietelmann, Jurgen, to Robert Bosch GmbH. Arrangement for controlling the metering of fuel to an internal combustion engine. 4,836,166, Cl. 123-358.000.
Wiklund, Rudolf; and Ericsson, Lars, to Geotronics AB. Device for measuring substantially vertical, circular-cylindrical objects. 4,837,717, Cl. 364-563.000.
Wild, Georg; Kohler, Rembert; Weibelzahl, Manfred; Haushofer, Martin; and Messner, Johann, to Siemens Aktiengesellschaft. State signal formation for indicating the transition into the bypass mode of operation in an apparatus for high-voltage D-C transmission. 4,837,671, Cl. 363-35.000.
Wiles, Philip V., Jr.; Harper, Thomas A.; and Harper, Carol R., to BMC Software, Inc. System for supporting an ERASE INPUT key with input suppression in a system for optimizing data transmission associated with addressable-buffer devices. 4,837,679, Cl. 364-200.000.
Wiley, Michael J.; Irving, Stewart; and McKeon, John P., to Inventa Chemicals Limited. Security device. 4,837,453, Cl. 307-10.200.
Wille, Mark E. Rod holder adaptor for boat. 4,836,127, Cl. 114-343.000.
Williams, Bill R., to Wills, Larry B., a part interest. Archery bow wrist brace apparatus. 4,836,177, Cl. 124-89.000.
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Williams, Theodore F.; Katerberg, James A.; Young, Lawrence R.; and Isaacson, James D., to Eastman Kodak Company. Continuous ink jet printer having improved system for reducing pressure variations. 4,837,585, Cl. 346-75.000.
Willis, Candler A.: *See*—
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Wilson, Alan D.; Prosser, Havard J.; Dunsdon, Anthony J.; Skinner, John C.; and Brookman, Pauline J., to National Research Development Corporation. Coated substrates. 4,836,768, Cl. 428-323.000.
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Alexandrovich, Peter S.; DeMejo, Lawrence P.; Jadwin, Thomas A.; and Wilson, John C., 4,837,394, Cl. 430-110.000.
Anderson, James H.; Bugner, Douglas E.; DeMejo, Lawrence P.; Sutton, Richard C.; and Wilson, John C., 4,837,392, Cl. 430-110.000.
Wilson, Martin E., to B.F. Goodrich Company, The. Method of burnishing. 4,835,826, Cl. 29-90.010.
Wilson, Norman H.: *See*—
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Wilson, Robert A.: *See*—
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Woehrl, Alfons; and Hora, Peter, to Messerschmitt-Boelkow Blohm GmbH. Impact sensor for motor vehicles or the like. 4,836,024, Cl. 73-514.000.
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Wohrle, Albert, deceased (by Wohrle, Ingrid, executor), to J. M. Voith GmbH. Coating device. 4,836,133, Cl. 118-410.000.
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Wolfe, Paul T., to Lord Corporation. Controllable fluid damper assembly. 4,836,342, Cl. 188-319.000.
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Wolters, Johannes-Peter; and Escherich, Karl-Heinz, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Temperature-dependent pressure release device for pressure vessels. 4,836,443, Cl. 226-92.00C.
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Wong, Patrick S. L.: *See*—
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Wrench, Edwin H., Jr.; Wohlford, Robert; and Naylor, Joe, to ITT Defense Communications, A Division of ITT Corporation Multiple parameter speaker recognition system and methods. 4,837,830, Cl. 381-42.000.
Wright, David A.: *See*—
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Wright, John W., to Elantec. High slew rate linear amplifier. 4,837,523, Cl. 330-255.000.
Wright, Terence, to Maraven, S.A. Process and apparatus for determining flow rate of a flow medium in a flow line. 4,837,708, Cl. 364-509.000.
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Wu, Chengjiu; Mooring, Anne M.; McFarland, Michael J.; Osuch, Christopher E.; and Yardley, James T., to Hoechst Celanese Corporation. High resolution photoresist of imide containing polymers. 4,837,124, Cl. 430-270.000.
Wu, Stephen H. W.; Kirk, Shane K.; Perry, Kenneth P.; Smith, E. Phillip; Chang, Yeong-Ho; and Jenkins, Waylon L., to Eastman Kodak Company. Rumen-stable pellets. 4,837,004, Cl. 424-438.000.
Wuepper, Thomas E.; and Franklyn, Terry L., to CMI International, Inc. Method and apparatus for registering flaskless sand cope and drag molds. 4,836,266, Cl. 164-29.000.
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Yagi, Kiyoshi; Kanno, Toshiaki; Kanda, Masahiro; and Nomura, Izumi, to Yazaki Corporation. Polyolefin rubber composition. 4,837,282, Cl. 525-265.000.

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Yajima, Kohichi; Kohmoto, Osamu; and Yoneyama, Tetsuhito, to TDK Corporation. Permanent magnet and method of producing same. 4,836,868, Cl. 148-302.000.

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Yamaguchi, Yutaka, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Hydraulic circuit in an industrial vehicle. 4,835,968, Cl. 60-422.000.

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Yamamoto, Hirokazu; and Furukawa, Akira, to Mitsubishi Paper Mills, Ltd. Negative charging liquid developer for electrophotography. 4,837,103, Cl. 430-115.000.

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Yamamoto, Ryoichi; Nomura, Masaaki; Yamada, Takashi; and Nahara, Akira, to Fuji Photo Film Co., Ltd. Magneto-optical recording medium. 4,837,118, Cl. 428-645.000.

Yamamoto, Susumu; and Aoki, Yoshimitsu, to Sumitomo Electric Industries, Ltd. Cut wire for electrical discharge machining. 4,837,416, Cl. 219-69.120.

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Yamanaka, Yasutoshi; Izumida, Teruo; and Nomura, Kazuya, to Nippondenso Co., Ltd. Heat exchanger for engine oil. 4,836,276, Cl. 165-51.000.

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Yamanishi, Kazuhiko; and Hanada, Toshiro, to Wako-Pure Chemical Industries, Ltd. Stabilization of tetrazolium salts with cyclodextrins. 4,837,331, Cl. 548-146.000.

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Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Ferroelectric liquid crystal device with a charge storage structure. 4,836,655, Cl. 350-350.00S.

Yanagi, Akihiko: *See—*
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Yang, Tai-Her. Combined fluid pump and two-cycle, internal combustion engine. 4,836,150, Cl. 123-59.0BS.

Yao, Ching, to University of California, The Regents of the. MRI using asymmetric RF nutation pulses and asymmetric synthesis of complex conjugated SE data to reduce TE and T2 decay NMR spin echo responses. 4,837,513, Cl. 324-309.000.

Yardley, James T.: *See—*
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Yaso, Masao; Suzuki, Yukio; Shibata, Kensuke; and Hayashi, Eiichi, to Toyo Jozo Kabushiki Kaisha. 1-substituted alkyl-1,2-dihydro-2-pyrazinone derivatives. 4,837,319, Cl. 544-120.000.

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Yau, Leopoldo D.; and Kawamoto, Galen H., to Intel Corporation. Pulsed dual radio frequency CVD process. 4,837,185, Cl. 437-228.000.

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Iino, Tadashi, 4,837,551, Cl. 340-705.000.
Oikawa, Takahiro, 4,836,023, Cl. 73-505.000.
Yagi, Kiyoshi; Kanno, Toshiaki; Kanda, Masahiro; and Nomura, Izumi, 4,837,282, Cl. 525-265.000.

Ybarra, Robert. Movable wall assembly. 4,835,923, Cl. 52-238.100.

Yee, Victor H.: *See—*
Crosley, Thomas W.; Davison, Wayne; Goldberg, James R.; Hofheins, Leonard L.; Lichty, Ronald D.; Vollum, Charles A.; Vollum, Stephen H.; and Yee, Victor H., 4,837,822, Cl. 380-23.000.

Yee, Ying K.: *See—*
Bernstein, Peter R.; Brown, Frederick J.; Matassa, Victor G.; and Yee, Ying K., 4,837,235, Cl. 514-234.500.

Yip, Douglas, to Data I/O Corporation. Quasi-power measurement circuit. 4,837,653, Cl. 361-86.000.

Yoda, Kiyoshi: *See—*
Nishihara, Susumu; and Yoda, Kiyoshi, 4,837,515, Cl. 324-318.000.

Yokota, Kazunori: *See—*
Yamada, Tetsusyo; Hayakawa, Nobuhiro; and Yokota, Kazunori, 4,836,906, Cl. 204-410.000.

Yokoyama, Akira: *See—*
Murakami, Koji; Shima, Tsunao; Shimosato, Yoshikazu; and Yokoyama, Akira, 4,836,864, Cl. 148-16.500.

Yokoyama, Hajime: *See—*
Takada, Noboru; and Yokoyama, Hajime, 4,837,852, Cl. 455-197.000.

Yokoyama, Hirotaka; Ido, Tadashi; Maeda, Tatsumi; and Kurisu, Shunji, to Kabushiki Kaisha Toshiba. Magnetic recording powder, method of manufacturing thereof and application thereof. 4,837,092, Cl. 428-694.000.

Yokoyama, Hitoshi; and Mukai, Noriko, to Fuji Oili Company, Limited. Cheese and yam product. 4,837,040, Cl. 426-582.000.

Yokoyama, Naoki: *See—*
Ohshima, Toshio; and Yokoyama, Naoki, 4,837,178, Cl. 437-33.000.

Yoneyama, Tetsuhito: *See—*
Yajima, Kohichi; Kohmoto, Osamu; and Yoneyama, Tetsuhito, 4,836,868, Cl. 148-302.000.

York, John D.; Peppard, Edward M.; and Haugen, Bruce A., to American Standard Inc. Automatic tube expander for a heat exchanger. 4,835,828, Cl. 29-157.30C.

York, Rudy L.: *See—*
Luttmer, Joseph D.; York, Rudy L.; Smith, Patricia B.; and Davis, Cecil J., 4,837,113, Cl. 427-38.000.

Yoshida, Atsushi, to NEC Corporation. Frame step-out detecting system. 4,837,766, Cl. 371-46.000.

Yoshida Kogyo K. K.: *See—*
Sassa, Yusei, 4,835,845, Cl. 29-767.000.

Yoshida, Michiyasu: *See—*
Kume, Satoru; Yoshida, Michiyasu; Kume, Tateo; Oshima, Hiroki; Kawagoe, Mitsuhiro; and Koga, Kazuo, 4,835,964, Cl. 60-285.000.

Yoshida, Naruhito: *See—*
Kohyama, Mitsuaki; Yoshida, Naruhito; and Takagi, Osamu, 4,836,135, Cl. 118-653.000.

Yoshii, Shintaro: *See—*
Hiratsuka, Hachiro; Matsushita, Yoshiaki; and Yoshii, Shintaro, 4,837,610, Cl. 357-52.000.

Yoshino, Katsumi; and Shigeno, Yasuhiro, to Hosiden Electronics Co., Ltd. Ferroelectric liquid crystal cell and its manufacturing method. 4,836,653, Cl. 350-341.000.

Yoshino, Nobuo, to Nihon Metal Gasket Kabushiki Kaisha. Laminated metallic gasket. 4,836,562, Cl. 277-235.00B.

Yoshino, Yutaka; Gotoh, Makoto; Fujimoto, Osamu; and Shizawa, Masahiro, to Anritsu Corporation. Telephone set. 4,837,814, Cl. 379-144.000.

Yoshizawa, Akihiko: *See—*
Motoyama, Kazuyasu; Yanagida, Tsuneo; Sakai, Mitsugu; Ichikawa, Hitoshi; and Yoshizawa, Akihiko, 4,837,758, Cl. 369-13.000.

Young, Joe A., to Southland Rentals, Inc. Method and apparatus for performing wireline operations in a well. 4,836,289, Cl. 166-379.000.

Young, Lawrence R.: *See—*
Williams, Theodore F.; Katerberg, James A.; Young, Lawrence R.; and Isaacson, James D., 4,837,585, Cl. 346-75.000.

Young, Lionel A.: *See—*
Lebeck, Alan O.; and Young, Lionel A., 4,836,561, Cl. 277-93.0SD.

Young, Lydia J.; and Howard, Glen E., to Perkin-Elmer Corporation, The. Guard ring for a differentially pumped seal apparatus. 4,837,443, Cl. 250-441.100.

Yug, Geun J., to Goldstar Co., Ltd. Mode discriminator for monitor. 4,837,621, Cl. 358-148.000.

Yuki, Yoshiaki: *See—*
Okumura, Takashi; Yamaguchi, Koshiro; and Yuki, Yoshiaki, 4,836,696, Cl. 400-58.000.

Yukimoto, Sadao: *See—*
Hirose, Toshifumi; Yukimoto, Sadao; and Isayama, Katsuhiko, 4,837,401, Cl. 525-364.000.
Kawakubo, Fumio; Yukimoto, Sadao; and Homma, Michihide, 4,837,274, Cl. 525-100.000.

Yum, Su I.: *See—*
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Yung, Fernand P. Rebar spacer assembly. 4,835,933, Cl. 52-685.000.

Yunger, Libby M.: *See—*
Edwards, Carl K., III; and Yunger, Libby M., 4,837,202, Cl. 514-12.000.

Yunoki, Yutaka, to Olympus Optical Co., Ltd. Magnetic recording/reproduction apparatus. 4,837,644, Cl. 360-66.000.

Yuyama, Masahiro: *See—*
Kato, Yasuyuki; Yuyama, Masahiro; Moritani, Masahiko; and Yasunori, Yukio, 4,837,286, Cl. 526-217.000.

Zahradnik, Franz; Ulmerich, Karlheinz; McKee, Graham E.; Reimann, Horst; Pflueger, Richard; and Theysohn, Rainer, to BASF Aktiengesellschaft. Polyamide compositions containing alkyl orthotitanate or dialkyltin dilaurate. 4,837,264, Cl. 524-381.000.

Zansky, Zoltan, to Astec U.S.A. (HK) Limited. Current mode converter with controlled slope compensation. 4,837,495, Cl. 323-222.000.

Zarini, Franco: *See—*
Perrone, Ettore; Alpegiani, Marco; Bedeschi, Angelo; Zarini, Franco; Franceschi, Giovanni; and Bruna, Costantino D., 4,837,215, Cl. 514-192.000.

Zdebel, Peter J.; Balda, Raymond J.; Hwang, Bor-Yuan; and Wagner, Allen J., to Motorola Inc. Integrated circuit structures having polycrystalline electrode contacts and process. 4,837,176, Cl. 437-31.000.

Zdunek, Kenneth J.: *See—*
Ablay, Sewim F.; Thro, Stuart W.; and Zdunek, Kenneth J., 4,837,858, Cl. 455-34.000.

Zelinsky, Jerold M.; Stafford, John P., and Lief, Gerald A., to Bull HN Information Systems Inc. Emulation attribute mapping for a color video display. 4,837,710, Cl. 364-521.000.

Zellweger Uster Ltd.: *See—*
Baer, Hanspeter; and Durisch, Gion, 4,837,504, Cl. 324-142.000.

Zenith Electronics Corporation: *See—*
Bellavia, Andrew S., Jr., 4,837,820, Cl. 380-7.000.
Diaz, Bonifacio, 4,837,670, Cl. 363-21.000.
Harvey, Timothy J., 4,837,620, Cl. 358-142.000.

Zetek, Inc.: *See—*
Fernando, Ranjit S.; and Regas, Jennine, 4,836,216, Cl. 128-734.000.

Zhang, Long N. Bi-color fluviograph of transmission and reflection type. 4,836,022, Cl. 73-293.000.

Zia Technology, Inc.: *See—*
Bishop, Norman G.; Bottinelli, N. Edward; and Kotraba, Norman L., 4,836,847, Cl. 75-25.000.

Zimmerman, Abraham A.; Canton, Geoffrey A.; Siegel, Joel R.; and Vardi, Joseph, to Exxon Research and Engineering Company. Fuel composition and process for multi-port fuel injection systems (PNE-509). 4,836,829, Cl. 44-53.000.

Zimmerman, Donna F., to Du Pont de Nemours, E. I., and Company. Herbicidal indole sulfonamides. 4,836,846, Cl. 71-93.000.

Zimmerman, George O.; and Ibrahim, Abdo K., to Boston University, Trustees of. Rubbery, electrically non-conductive, and intrinsically magnetic graphite intercalation compounds and methods for their making. 4,837,377, Cl. 423-448.000.

Zimmermann, Franz: *See—*
Istel, Erich; and Zimmermann, Franz, 4,837,265, Cl. 524-413.000.

Zimmermann, Heinz, to Linde Aktiengesellschaft. Process for oligomerization of olefins. 4,837,372, Cl. 585-514.000.

Ziph, Benjamin: *See—*
Meijer, Roelf J.; and Ziph, Benjamin, 4,836,094, Cl. 92-167.000.

Zoladz, Frank J., to North American Philips Consumer Electronics Co. Improved liquid tight transformer casing. 4,836,399, Cl. 220-76.000.

Zoller, Gerhard; Beyerle, Rudi; Schindler, Ursula; Nitz, Rolf-Eberhard; and Martorana, Piero, to Cassell Aktiengesellschaft. 2,5-dimethylpyrrole derivatives, their preparation and their use. 4,837,225, Cl. 514-427.000.

Zorini, Luigi O., to COMEZ, S.p.A. Pulling device for warp yarns in crochet galloon looms. 4,835,990, Cl. 66-209.000.

Zsiga, Johann P.: *See—*
Nitsche, Klaus D.; and Zsiga, Johann P., 4,836,755, Cl. 417-368.000.

Zuk, Robert F.: *See—*
Leeder, Sydney; and Zuk, Robert F., 4,837,395, Cl. 435-7.000.

Zurawski, Vincent R., Jr.: *See—*
Schoemaker, Hubert J. P.; Wands, Jack R.; Westrick, Barbara L.; and Zurawski, Vincent R., Jr., 4,837,167, Cl. 436-513.000.

Zushi, Shizuo; Miyamoto, Mitsuo; Gou, Hiroshi; Kobayashi, Fumiyuki; and Ogata, Tetsuo, to Hitachi, Ltd. Electronic apparatus cooling system. 4,837,663, Cl. 361-384.000.

Zwick, Christian R. Visceral retractor. 4,836,190, Cl. 128-20.000.

Zwicker, Harry R.: *See—*
Luszcz, Stanley J.; and Zwicker, Harry R., 4,837,232, Cl. 501-127.000.

221241 Alberta Ltd.: *See—*
Catta, David, 4,836,625, Cl. 312-257.0SK.

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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 6TH DAY OF JUNE, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ajisawa, Yukiyoshi: *See*—
Harita, Kozaburo; Ajisawa, Yukiyoshi; Iizuka, Kinji; Kinoshita, Yukihiko; Kamijo, Tetsuhide; and Kobayashi, Michihiro, Re. 32,944, Cl. 562-455.000.

Butt, Sheldon H., to Olin Corporation. Low thermal expansivity and high thermal conductivity substrate. Re. 32,942, Cl. 75-235.000.

Electro-Biology, Inc.: *See*—
Gardner, Arthur M. N.; and Fox, Roger H., Re. 32,939, Cl. 128-64.000.
Gardner, Arthur M. N.; and Fox, Roger H., Re. 32,940, Cl. 128-64.000.

Fox, Roger H.: *See*—
Gardner, Arthur M. N.; and Fox, Roger H., Re. 32,939, Cl. 128-64.000.
Gardner, Arthur M. N.; and Fox, Roger H., Re. 32,940, Cl. 128-64.000.

Gardner, Arthur M. N.; and Fox, Roger H., to Electro-Biology, Inc. Medical appliance. Re. 32,939, Cl. 128-64.000.

Gardner, Arthur M. N.; and Fox, Roger H., to Electro-Biology, Inc. Medical appliance. Re. 32,940, Cl. 128-64.000.

Haman, David F.; and Needham, Dale M., to Outboard Marine Corporation. Dual fuel system for internal combustion engine. Re. 32,938, Cl. 123-73.00B.

Harita, Kozaburo; Ajisawa, Yukiyoshi; Iizuka, Kinji; Kinoshita, Yukihiko; Kamijo, Tetsuhide; and Kobayashi, Michihiro, to Kissei Yakuhin Kogyo Kabushiki. Aromatic carboxylic amide derivatives. Re. 32,944, Cl. 562-455.000.

Honshu Seishi Kabushiki Kaisha: *See*—
Nakamura, Masato; Nomura, Yoshika; and Uchimoto, Iwahiro, Re. 32,943, Cl. 162-76.000.

Iizuka, Kinji: *See*—
Harita, Kozaburo; Ajisawa, Yukiyoshi; Iizuka, Kinji; Kinoshita, Yukihiko; Kamijo, Tetsuhide; and Kobayashi, Michihiro, Re. 32,944, Cl. 562-455.000.

Kamijo, Tetsuhide: *See*—
Harita, Kozaburo; Ajisawa, Yukiyoshi; Iizuka, Kinji; Kinoshita, Yukihiko; Kamijo, Tetsuhide; and Kobayashi, Michihiro, Re. 32,944, Cl. 562-455.000.

Kinoshita, Yukihiko: *See*—
Harita, Kozaburo; Ajisawa, Yukiyoshi; Iizuka, Kinji; Kinoshita, Yukihiko; Kamijo, Tetsuhide; and Kobayashi, Michihiro, Re. 32,944, Cl. 562-455.000.

Kissei Yakuhin Kogyo Kabushiki: *See*—
Harita, Kozaburo; Ajisawa, Yukiyoshi; Iizuka, Kinji; Kinoshita, Yukihiko; Kamijo, Tetsuhide; and Kobayashi, Michihiro, Re. 32,944, Cl. 562-455.000.

Kobayashi, Michihiro: *See*—
Harita, Kozaburo; Ajisawa, Yukiyoshi; Iizuka, Kinji; Kinoshita, Yukihiko; Kamijo, Tetsuhide; and Kobayashi, Michihiro, Re. 32,944, Cl. 562-455.000.

Nakamura, Masato; Nomura, Yoshika; and Uchimoto, Iwahiro, to Honshu Seishi Kabushiki Kaisha. Process for cooking lignocellulosic material in the presence of hydroxyanthracenes and derivatives thereof. Re. 32,943, Cl. 162-76.000.

Needham, Dale M.: *See*—
Haman, David F.; and Needham, Dale M., Re. 32,938, Cl. 123-73.00B.

Newton, Alan R. Drive chain. Re. 32,941, Cl. 474-210.000.

Nomura, Yoshika: *See*—
Nakamura, Masato; Nomura, Yoshika; and Uchimoto, Iwahiro, Re. 32,943, Cl. 162-76.000.

Olin Corporation: *See*—
Butt, Sheldon H., Re. 32,942, Cl. 75-235.000.

Outboard Marine Corporation: *See*—
Haman, David F.; and Needham, Dale M., Re. 32,938, Cl. 123-73.00B.

Rockwell International Corporation: *See*—
Smithson, Richard A., Re. 32,945, Cl. 375-106.000.

Smithson, Richard A., to Rockwell International Corporation. Synchronization system for digital data. Re. 32,945, Cl. 375-106.000.

Uchimoto, Iwahiro: *See*—
Nakamura, Masato; Nomura, Yoshika; and Uchimoto, Iwahiro, Re. 32,943, Cl. 162-76.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

American Home Products Corporation: *See*—
Buzby, George C., Jr.; and Colatsky, Thomas J., B1 4,721,809, Cl. 564-82.000.

Barker, Clark R., to University of Missouri, The Curators of the. High pressure fluid jet cutting and drilling apparatus. B1 4,369,850, 6-6-89, Cl. 175-393.000.

Bleck, Norris E.: *See*—
Meeker, Gregory W.; and Bleck, Norris E., B1 4,557,683, Cl. 425-147.000.

Boudreau, James C.; and White, Thomas D. to University of Texas. Dog food flavors. B1 4,267,195, 6-6-89, Cl. 426-2.000.

Buzby, George C., Jr.; and Colatsky, Thomas J., to American Home Products Corporation. Alkylsulfonamido or perfluoroalkylsulfonamido benzenesulfonamides. B1 4,721,809, 6-6-89, Cl. 564-82.000.

Colatsky, Thomas J.: *See*—
Buzby, George C., Jr.; and Colatsky, Thomas J., B1 4,721,809, Cl. 564-82.000.

Farrel Corporation: *See*—
Meeker, Gregory W.; and Bleck, Norris E., B1 4,557,683, Cl. 425-147.000.

Grove, William S., to PPG Industries, Inc. Substituted diphenyl ethers having herbicidal activity. B1 4,311,515, 6-6-89, Cl. 71-108.000.

Industrias Vassallo, Inc.: *See*—
Vassallo, Efrain D., B1 4,343,480, Cl. 277-207.00A.

Krakauer, Merrill. All-purpose merchandiser. B1 4,317,604, 6-6-89, Cl. 312-97.100.

Meeker, Gregory W.; and Bleck, Norris E., to Farrel Corporation. Rotary plasticator ram injection machine. B1 4,557,683, 6-6-89, Cl. 425-147.000.

Natale, Anthony. Particulate contamination control method and filtration device. B1 4,604,111, 6-6-89, Cl. 55-97.000.

PPG Industries, Inc.: *See*—
Grove, William S., B1 4,311,515, Cl. 71-108.000.

Rhone-Poulenc Agrochimie: *See*—
Theissen, Robert J., B1 4,339,268, Cl. 71-108.000.

Theissen, Robert J., to Rhone-Poulenc Agrochimie. Herbicidal nitroalkyl 5-[2-chloro-4-(trifluoromethyl)phenoxy]-2-nitrobenzoates. B1 4,339,268, 6-6-89, Cl. 71-108.000.

University of Missouri, The Curators of the: *See*—
Barker, Clark R., B1 4,369,850, Cl. 175-393.000.

University of Texas: *See*—
Boudreau, James C.; and White, Thomas D., B1 4,267,195, Cl. 426-2.000.

Vassallo, Efrain D., to Industrias Vassallo, Inc. Pipe bell and gasket. B1 4,343,480, 6-6-89, Cl. 277-207.00A.

White, Thomas D.: *See*—
Boudreau, James C.; and White, Thomas D., B1 4,267,195, Cl. 426-2.000.

LIST OF DESIGN PATENTEES

Ambasz, Emilio. Combined toothbrush and container therefor. 301,403, 6-6-89, Cl. D4-108.000.

American Cord and Webbing Co., Inc.: *See*—
Krauss, Mark J., 301,433, Cl. D8-356.000.

Anawalt, Donald. Spout. 301,517, 6-6-89, Cl. D23-255.000.

Andreasen, James E., to Lew Childre & Sons, Inc. Handle for a fishing rod. 301,515, 6-6-89, Cl. D22-142.000.

Aoki, Shizuya; and Takeuchi, Mikio, to Sumitomo Rubber Industries, Ltd. Motorcycle tire. 301,444, 6-6-89, Cl. D12-147.000.

Aquila, Christopher A.; and Wilson, Richard J. Clipboard for shopping cart push bar. 301,489, 6-6-89, Cl. D19-88.000.

Audet, David M. Combined writing instrument and random number selector. 301,487, 6-6-89, Cl. D19-41.000.

Ball, Sophie. Shoe guard. 301,384, 6-6-89, Cl. D2-277.000.

Barbieri, Raul; and Marianelli, Giorgio. Wall coat hook. 301,406, 6-6-89, Cl. D6-323.000.

Beckett, Robert F. Motorcycle seat. 301,409, 6-6-89, Cl. D6-354.000.

Beirise, Jean; and Coons, John, to Herman Miller, Inc. Shelf or the like. 301,424, 6-6-89, Cl. D6-574.000.

Berendsen, Robert W.; and Skrewlowski, David, to Berendsen, Robert W. Combined toothbrush and packaging closure. 301,400, 6-6-89, Cl. D4-108.000.

Berendsen, Robert W.; and Skrewlowski, David, to Berendsen, Robert W. Combined toothbrush and toothpaste dispensing unit and packaging closure. 301,401, 6-6-89, Cl. D4-108.000.

Bleustein, Jeffrey L.; and Matre, Daniel A., to Harley-Davidson, Inc. Bicycle or similar article. 301,437, 6-6-89, Cl. D12-111.000.

Boeri, Cini. Coat hook. 301,407, 6-6-89, Cl. D6-323.000.

Bogin, Florence, to Ruggels, Inc. Pastry food product. 301,380, 6-6-89, Cl. D1-129.000.

Bridgestone Corporation: *See*—
Kobayashi, Toshiaki; and Tomura, Atsushi, 301,446, Cl. D12-147.000.

Brown, Paul D.; and Diaz, Juan A., to Reebok International Ltd. Shoe sole material. 301,390, 6-6-89, Cl. D2-320.000.

Brown, Paul D.: *See*—
Diaz, Juan A.; Brown, Paul D.; and Kittle, Christopher J., 301,387, Cl. D2-314.000.

Chambers, Jeffrey, to Oxley Developments Company Limited. Electrical connector. 301,459, 6-6-89, Cl. D13-24.000.

Cheung, Henry C. H. Shoe polishing set. 301,398, 6-6-89, Cl. D4-102.000.

Chodat, Jean-Pierre, to Fabrique Ebel, Societe Anonyme. Spectacle frame. 301,482, 6-6-89, Cl. D16-102.000.

Chrysler Motors Corporation: *See*—
Fry, David F.; Crosslen, Louis J.; and Kraus, John L., 301,415, Cl. D6-432.000.

Conley, Robert M. Baby walker. 301,440, 6-6-89, Cl. D12-130.000.

Coons, John: *See*—
Beirise, Jean; and Coons, John, 301,424, Cl. D6-574.000.

Crosslen, Louis J.: *See*—
Fry, David F.; Crosslen, Louis J.; and Kraus, John L., 301,415, Cl. D6-432.000.

Darville, Rhondalyn S. Doll. 301,507, 6-6-89, Cl. D21-184.000.

Dawson, Melvyn H., Jr. Radio. 301,465, 6-6-89, Cl. D14-194.000.

Diaz, Juan A.; Brown, Paul D.; and Kittle, Christopher J., to Reebok International Ltd. Shoe upper. 301,387, 6-6-89, Cl. D2-314.000.

Diaz, Juan A.: *See*—
Brown, Paul D.; and Diaz, Juan A., 301,390, Cl. D2-320.000.

Drew, Douglas, to Noma Inc. Electrical connecting plug. 301,461, 6-6-89, Cl. D13-28.000.

Drew, Douglas, to Noma Inc. Electrical receptacle plug. 301,462, 6-6-89, Cl. D13-28.000.

Drew, Douglas, to Noma Inc. Electrical connecting plug. 301,463, 6-6-89, Cl. D13-28.000.

Duclos, Gary; and Kravetz, Stanley, to Highland Import Corporation. Shoe sole. 301,391, 6-6-89, Cl. D2-320.000.

Durand, Jean-Jacques. Tumbler or similar article. 301,426, 6-6-89, Cl. D7-13.000.

Duvivier - Durev: *See*—
Duvivier, Jean-Marie, 301,412, Cl. D6-395.000.

Duvivier, Jean-Marie, to Duvivier - Durev. Adjustable bed frame. 301,412, 6-6-89, Cl. D6-395.000.

Eccles, Thomas. Ferrule for a stepped fishing rod. 301,514, 6-6-89, Cl. D22-142.000.

Fabrique Ebel, Societe Anonyme: *See*—
Chodat, Jean-Pierre, 301,482, Cl. D16-102.000.

Ferguson, Bradley S. Football gameboard. 301,492, 6-6-89, Cl. D21-15.000.

Finn, Charles A. Knife sheath. 301,396, 6-6-89, Cl. D3-102.000.

Fischer, Franz, to Trisa Burstenfabrik AG. Hairbrush. 301,404, 6-6-89, Cl. D4-128.000.

Fredensburg, Fred F.: *See*—
Rainsberger, Robert L.; and Fredensburg, Fred F., 301,511, Cl. D21-223.000.

Friederichs, Daniel M., to Minnesota Mining and Manufacturing Company. Electrical wire connector. 301,457, 6-6-89, Cl. D13-24.000.

Fry, David F.; Crosslen, Louis J.; and Kraus, John L., to Chrysler Motors Corporation. Cabinet for interactive video system. 301,415, 6-6-89, Cl. D6-432.000.

Fujiki, Tetsushi, to Sumitomo Rubber Industries, Ltd. Automobile tire. 301,442, 6-6-89, Cl. D12-146.000.

Fujiki, Tetsushi, to Sumitomo Rubber Industries, Ltd. Automobile tire. 301,443, 6-6-89, Cl. D12-147.000.

Garnich, Rolf, to Wella Aktiengesellschaft. Mobile chair base. 301,420, 6-6-89, Cl. D6-498.000.

Gassaway, Lester R. Riding pull toy. 301,497, 6-6-89, Cl. D21-71.000.

Gildersleeve, Paul, to Kidde Consumer Durables Corp. Hand held can opener. 301,432, 6-6-89, Cl. D8-36.000.

Glasgow, David; and Glasgow, Judith. Tricycle for handicapped. 301,439, 6-6-89, Cl. D12-113.000.

Glasgow, Judith: *See*—
Glasgow, David; and Glasgow, Judith, 301,439, Cl. D12-113.000.

Gonzalez, Eliseo. Glove for sporting events and the like. 301,393, 6-6-89, Cl. D2-610.000.

Gutknecht, Leroy H. Cover for slot machine. 301,494, 6-6-89, Cl. D21-48.000.

Hagiwara, Ippei: *See*—
Hara, Naoyuki; and Hagiwara, Ippei, 301,454, Cl. D13-1.000.

Hamill, Hugh J.: *See*—
Miller, David E.; and Hamill, Hugh J., 301,388, Cl. D2-314.000.

Hanamura, Junichi, to Shimano Industrial Company Limited. Bicycle 301,438, 6-6-89, Cl. D12-111.000.

Hara, Kunio, to Kabushiki Kaisha Toshiba. Combined copying machine and electronic computer. 301,471, 6-6-89, Cl. D14-100.000.

Hara, Naoyuki; and Hagiwara, Ippei, to Mitsubishi Denki Kabushiki Kaisha. Miniature electric motor. 301,454, 6-6-89, Cl. D13-1.000.

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Ecke, Paul, Jr.: *See*—
Kientzler, Ludwig, 6,831, Cl. 68.000.
Harman, James M., to Adams County Nursery, Inc. Peach tree. 6,828, 6-6-89, Cl. 43.000.
Hesse, Peter S., to Ball Seed Company. Chrysanthemum plant named White Delight. 6,834, 6-6-89, Cl. 74.000.
Hesse, Peter S., to Ball Seed Company. Chrysanthemum plant named Carnival. 6,835, 6-6-89, Cl. 74.000.
Hesse, Peter S., to Ball Seed Company. Chrysanthemum plant named Samba. 6,836, 6-6-89, Cl. 74.000.
Hesse, Peter S., to Ball Seed Company. Chrysanthemum plant named Cindy. 6,838, 6-6-89, Cl. 76.000.
Hesse, Peter S., to Ball Seed Company. Chrysanthemum plant named Venoy. 6,840, 6-6-89, Cl. 77.000.
Hesse, Peter S.: *See*—
Shoesmith, Leonard H., deceased; and Hesse, Peter S., 6,837, Cl. 74.000.
Shoesmith, Leonard H., deceased; and Hesse, Peter S., 6,839, Cl. 77.000.
Hetherington, Ernest E., to Stewart Orchids. Orchid Laeliocattleya ballet folklorico 'Eloquence'. 6,830, 6-6-89, Cl. 68.000.
Kientzler, Ludwig, to Ecke, Paul, Jr. Impatiens plant named Lucine. 6,831, 6-6-89, Cl. 68.000.
Paboojian, John, Jr. Grapevine, "American Rose". 6,829, 6-6-89, Cl. 47.000.
Shoesmith, Leonard H., deceased (by Shoesmith, May Victoria, executrix); and Hesse, Peter S., to Ball Seed Company. Chrysanthemum plant named Pekoe. 6,837, 6-6-89, Cl. 74.000.
Shoesmith, Leonard H., deceased (by Shoesmith, May V., executor); and Hesse, Peter S., to Ball Seed Company. Chrysanthemum plant named Venetian. 6,839, 6-6-89, Cl. 77.000.
Shoesmith, May V., executor: *See*—
Shoesmith, Leonard H., deceased; and Hesse, Peter S., 6,839, Cl. 77.000.
Shoesmith, May Victoria, executrix: *See*—
Shoesmith, Leonard H., deceased; and Hesse, Peter S., 6,837, Cl. 74.000.
Stewart Orchids: *See*—
Hetherington, Ernest E., 6,830, Cl. 68.000.
Weyerhaeuser Company: *See*—
Brown, B. Frank, 6,842, Cl. 88.000.
Whiting, Hubert F. Cynodon dactylon grass plant CT-2. 6,841, 6-6-89, Cl. 88.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 6TH DAY OF JUNE, 1989

A. E. Staley Manufacturing Company: *See*—
Drury, Raymond L., Jr., H643, Cl. 536-119.000.
Adolph, Horst G.: *See*—
Sitzmann, Michael E.; and Adolph, Horst G., H644, Cl. 558-483.000.
Babbitt, Richard W.: *See*—
Stern, Richard A.; and Babbitt, Richard W., H639, Cl. 264-80.000.
Baciak, Mark G., to United States of America, Air Force. Method and apparatus for rapid optical phasing. H637, 6-6-89, Cl. 356-363.000.
Drury, Raymond L., Jr., to A. E. Staley Manufacturing Company. Process for the preparation of glycoside-containing polyester resin materials. H643, 6-6-89, Cl. 536-119.000.
Dryden, Hugh L., Jr., to NutraSweet Company, The. Process for the conversion of maleic acid derivatives to their corresponding fumaric isomers. H645, 6-6-89, Cl. 560-41.000.
E. R. Squibb & Sons, Inc.: *See*—
Floyd, David; and Loots, Melanie J., H642, Cl. 514-423.000.
Elliott, Philip G.; and Underwood, Daniel E., to United States of America, Energy. Torque limited drive for manual valves. H636, 6-6-89, Cl. 251-81.000.
Emerson Electric Company: *See*—
Nieri, Dario; and Zanon, Cesare, H634, Cl. 73-272.00R.
Floyd, David; and Loots, Melanie J., to E. R. Squibb & Sons, Inc. Substituted urido amino and imino acids and esters. H642, 6-6-89, Cl. 514-423.000.
Gavenonis, Thomas L.; and Hewitt, William H. Rapid flash lamp. H638, 6-6-89, Cl. 431-358.000.
Gillette Company, The: *See*—
Nizel, Jonathan, H640, Cl. 427-45.100.
Gordon, John R.: *See*—
Johnson, Dale V.; and Gordon, John R., H635, Cl. 166-310.000.
Hewitt, William H.: *See*—
Gavenonis, Thomas L.; and Hewitt, William H., H638, Cl. 431-358.000.
Johnson, Dale V.; and Gordon, John R. Injection mandrel. H635, 6-6-89, Cl. 166-310.000.
Loots, Melanie J.: *See*—
Floyd, David; and Loots, Melanie J., H642, Cl. 514-423.000.
McLellan, Dale L., to United States of America, Air Force. Method of predicting ductility of a metallic cast eutectic alloy and equation therefor. H633, 6-6-89, Cl. 73-87.000.
McQuillan, Barry W.; and Reynolds, George H., to United States of America, Air Force. Process for making coatings on graphite using intercalated species. H641, 6-6-89, Cl. 427-299.000.
Nieri, Dario; and Zanon, Cesare, to Emerson Electric Company. Flowmeter pressure relieving device. H634, 6-6-89, Cl. 73-272.00R.
Nizel, Jonathan, to Gillette Company, The. Inductive sintering of polymers to blades. H640, 6-6-89, Cl. 427-45.100.
NutraSweet Company, The: *See*—
Dryden, Hugh L., Jr., H645, Cl. 560-41.000.
Reynolds, George H.: *See*—
McQuillan, Barry W.; and Reynolds, George H., H641, Cl. 427-299.000.
Sitzmann, Michael E.; and Adolph, Horst G., to United States of America, Navy. Method for preparing 2,2,2-trinitroethyl 2-nitroxyethyl ether. H644, 6-6-89, Cl. 558-483.000.
Stern, Richard A.; and Babbitt, Richard W., to United States of America, Army. Method of making a ferrite element. H639, 6-6-89, Cl. 264-80.000.
Tsui, James B. Y., to United States of America, Air Force. Wideband self mixing millimeter wave receiver. H646, 6-6-89, Cl. 343-895.000.
Underwood, Daniel E.: *See*—
Elliott, Philip G.; and Underwood, Daniel E., H636, Cl. 251-81.000.
United States of America
Air Force: *See*—
Baciak, Mark G., H637, Cl. 356-363.000.
McLellan, Dale L., H633, Cl. 73-87.000.
McQuillan, Barry W.; and Reynolds, George H., H641, Cl. 427-299.000.
Tsui, James B. Y., H646, Cl. 343-895.000.
Army: *See*—
Stern, Richard A.; and Babbitt, Richard W., H639, Cl. 264-80.000.
Energy: *See*—
Elliott, Philip G.; and Underwood, Daniel E., H636, Cl. 251-81.000.
Navy: *See*—
Sitzmann, Michael E.; and Adolph, Horst G., H644, Cl. 558-483.000.
Zanon, Cesare: *See*—
Nieri, Dario; and Zanon, Cesare, H634, Cl. 73-272.00R.

CLASSIFICATION OF PATENTS

ISSUED JUNE 6, 1989

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2
150 4,835,794
408 4,835,795
431 4,835,796

CLASS 4
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661 4,835,798
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CLASS 5
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304 4,836,286
321 4,836,287
348 4,836,288
379 4,836,289

CLASS 169

46 4,836,290
4,836,291
47 4,836,292

CLASS 172

22 4,836,294
146 4,836,295

CLASS 173

93.5 4,836,296
162.1 4,836,297

CLASS 174

36 4,837,405
57 4,837,406
68.5 4,837,407
4,837,408
88 R 4,837,409

CLASS 175

22 4,836,299
57 4,836,300
61 4,836,301
66 4,836,302
74 4,836,303
215 4,836,305
321 4,836,306
374 4,836,307
393 B1 4,369,850

CLASS 177

1 4,836,293
25.14 4,836,308
25.15 4,836,309
25.18 4,836,310
145 4,836,311
185 4,836,304
210 FP 4,836,312
4,836,313
4,836,314
247 4,836,315
256 4,836,316

CLASS 178

2 R 4,836,317

CLASS 180

9.5 4,836,318
19.1 4,836,320
142 4,836,319
232 4,836,321
247 4,836,322
270 4,836,323
291 4,836,324
333 4,836,325

CLASS 181

144 4,836,326
152 4,836,327
155 4,836,328
4,836,329
282 4,836,330

CLASS 182

107 4,836,331
155 4,836,332
186 4,836,333

CLASS 184

45.1 4,836,334
102 4,836,335

CLASS 187

121 4,836,336

CLASS 188

32 4,836,337
72.1 4,836,338
73.1 4,836,339
82.34 4,836,340
290 4,836,341
319 4,836,342

CLASS 190

108 4,836,343

CLASS 191

10 4,836,344

CLASS 192

20 4,836,345
27 4,836,346
45 4,836,347
48.91 4,836,351
53 F 4,836,348
56 R 4,836,349
106.1 4,836,350

CLASS 194

215 4,836,352

CLASS 198

335 4,836,353
345 4,836,354
418.6 4,836,355
499 4,836,356
779 4,836,357
789 4,836,358
803.01 4,836,359
803.6 4,836,360
843 4,836,361
854 4,836,362

CLASS 200

5 A 4,837,411
4,837,412
5 R 4,837,410
11 R 4,837,413

CLASS 203

46 4,836,896

CLASS 204

51 4,836,897
129 4,836,898
130 4,836,899
140 4,836,900
157.61 4,837,386
164 4,836,901
192.32 4,836,902
228 4,836,903
294 4,836,904
298 4,836,905
410 4,836,906
412 4,836,907
435 4,836,908

CLASS 206

0.83 4,836,365
44 R 4,836,363
45.14 4,836,364
45.23 4,836,376
94 4,836,366
200 4,836,367
205 4,836,368
216 4,836,369
222 4,836,370
334 4,836,371
344 4,836,372
366 4,836,373
373 4,836,374
427 4,836,375
456 4,836,377
459 4,836,378
523 4,836,256
4,836,379
561 4,836,380
575 4,836,381
610 4,836,382
611 4,836,383
621.3 4,836,384

CLASS 208

72 4,836,909
111 4,836,911
112 4,836,912
120 4,836,910
4,836,913
251 H 4,836,914

CLASS 209

273 4,836,915
315 4,836,385
538 4,836,916
564 4,836,386
657 4,836,387
672 4,836,388

CLASS 210

104 4,836,917
151 4,836,918
158 4,836,919
169 4,836,920
202 4,836,921
232 4,836,922
4,836,923
321.87 4,836,924
323.2 4,836,925
484 4,836,931
512.1 4,836,926
635 4,836,928
638 4,836,929
651 4,836,927
695 4,836,932
4,837,385
701 4,836,933
771 4,836,934
788 4,836,935
791 4,836,936
808 4,836,937

CLASS 211

45 4,836,389
59.3 4,836,390
60.1 4,836,391
181 4,836,392
188 4,836,393

CLASS 219

10.55 B 4,837,414
69 W 4,837,415
69.12 4,837,416
76.15 4,837,417
121.45 4,837,418
125.11 4,837,419
137 R 4,837,420
272 4,837,421
390 4,837,423
494 4,837,424

CLASS 220

1 T 4,836,394
1.5 4,836,395
4,836,411
66 4,836,398
76 4,836,399
81 R 4,836,400
83 4,836,401
85 H 4,836,403
85 VS 4,836,402
90.4 4,836,404
93 4,836,405
203 4,836,406
212 4,836,396
214 4,836,397
276 4,836,407
306 4,836,408
403 4,836,409

CLASS 221

47 4,836,410
211 4,836,412
270 4,836,413

CLASS 222

1 4,836,414
39 4,836,415
48 4,836,416
63 4,836,417
82 4,836,418
110 4,836,419
148 4,836,420
166 4,836,421
190 4,836,422
257 4,836,423
279 4,836,424

CLASS 224

155 4,836,938
163 4,836,425
206 4,836,426
224 4,836,427
253 4,836,428

CLASS 226

7 4,836,429
74 4,836,430
4,836,431
196 4,836,432

CLASS 228

179 4,836,434
180.2 4,836,435
182 4,836,436

CLASS 229

8 4,836,437
52 B 4,836,438
104 4,836,439
132 4,836,440

CLASS 232

35 4,836,441

CLASS 235

380 4,837,422
440 4,837,426
457 4,837,425
488 4,837,427

CLASS 236

46 R 4,836,442
92 C 4,836,443

CLASS 237

2 A 4,836,444
4,836,445

CLASS 239

2.2 4,836,446
8 4,836,447
79 4,836,448
232 4,836,449
4,836,450
265.27 4,836,451
338 4,836,452
408 4,836,453
533.9 4,836,454
590.3 4,836,455
682 4,836,456

CLASS 241

73 4,836,457
101.2 4,836,458
225 4,836,459
247 4,836,460

CLASS 242

1.1 R 4,836,461
55.19 R 4,836,463
55.3 4,836,462
56 R 4,836,464
95 4,836,466
131 4,836,468
192 4,836,465

CLASS 244

1 N 4,836,469
2 4,836,470
99 4,836,471
114 R 4,836,472
130 4,836,473
134 A 4,836,474
147 4,836,477

CLASS 246

169 R 4,836,475

CLASS 248

1 E 4,836,478
89 4,836,479
125 4,836,480
146 4,836,476
188.1 4,836,481
206.3 4,836,482
231 6 4,836,483
243 4,836,484
278 4,836,485
281.1 4,836,486
303 4,836,487
346.1 4,836,488
442.2 4,836,489
549 4,836,490
4,836,491
558 4,836,493
669 4,836,494
676 4,836,492

CLASS 249

83 4,836,495

CLASS 250

205 4,837,428
211 J 4,837,429
221 4,837,430
235 4,837,431
4,837,432
236 4,837,433
281 4,837,434
306 4,837,435
327.2 4,837,436
336.1 4,837,437
339 4,837,438
368 4,837,439
379 4,837,440
382 4,837,441
390.01 4,837,442
441.1 4,837,443
442.1 4,837,444
4,837,445
461.1 4,837,446
492.2 4,837,447
519.1 4,837,448
571 4,837,449
4,837,450
578 4,837,451

CLASS 251

11 4,836,496
80 4,836,497
126 4,836,498
173 4,836,499
306 4,836,500

CLASS 252

3 4,836,939
8.512 4,836,940
8.555 4,836,941
47 4,836,942
50 4,836,943
54 4,836,944
88 4,836,945
97 4,836,946
99 4,836,948
135 4,836,949
153 4,836,950
171 4,836,947
174.21 4,836,951
188.28 4,836,952
301.4 F 4,836,953
378 R 4,836,954
512 4,836,955
631 4,836,956

CLASS 254

88 4,836,501
126 4,836,502
134.3 FT 4,836,503

CLASS 256

10 4,836,504
34 4,836,505

CLASS 260

397.2 4,836,957
501.15 4,836,958
508 4,836,959

CLASS 261

23.2 4,836,506

CLASS 264

2.2 4,836,960
3.1 4,836,961
40.5 4,836,962
45.7 4,836,963
46.7 4,836,964
60 4,836,965
63 4,836,966
69 4,836,967
143 4,836,507
177.19 4,836,968
311 4,836,969
515 4,836,970
521 4,836,971

CLASS 266

99 4,836,509
142 4,836,510
220 4,836,508
266 4,836,433

CLASS 267

64.16 4,836,511
140.1 4,836,512
4,836,513

166 4,836,514
219 4,836,515
279 4,836,516

CLASS 269

41 4,836,517
43 4,836,518
72 4,836,522
91 4,836,519
322 4,836,520
328 4,836,523

CLASS 270

31 4,836,524

CLASS 271

3 4,836,525
209 4,836,526
251 4,836,527
263 4,836,528
296 4,836,529

CLASS 272

32 4,836,521
65 4,836,530
67 4,836,531
72 4,836,532
76 4,836,533
85 4,836,534
118 4,836,535
134 4,836,536
143 4,836,537
146 4,836,538

CLASS 273

1 G 4,836,540
1.5 A 4,836,539
26 B 4,836,541
55 B 4,836,542
73 C 4,836,543
73 J 4,836,544
80 B 4,836,545
138 A 4,836,546
153 S 4,836,547
4,836,548
4,836,549
167 H 4,836,550
185 B 4,836,551
218 4,836,552
292 4,836,553
321 4,836,554
330 4,836,555
376 4,836,556
416 4,836,557

CLASS 277

1 4,836,558
26 4,836,559
88 4,836,560
93 SD 4,836,561
207 A B1 4,343,480
235 B 4,836,562

CLASS 279

63 4,836,563

CLASS 280

6.12 4,836,564
37 4,836,565
91 4,836,566
164.1 4,836,568
414.1 4,836,569
507 4,836,570
600 4,836,571
613 4,836,572
644 4,836,573
661 4,836,574
702 4,836,575
731 4,836,576
773 4,836,577
840 4,836,578
842 4,836,567

CLASS 285

3 4,836,579
24 4,836,580
31 4,836,581
158 4,836,582
336 4,836,583
351 4,836,584
363 4,836,585
381 4,836,586

CLASS 289

2 4,836,587

CLASS 292

34 4,836,588
113 4,836,589
320 4,836,590
336.3 4,836,591

CLASS 294

1.1 4,836,592
4,836,593
1.3 4,836,594
15 4,836,595
99.2 4,836,596

CLASS 296

63 4,836,597
91 4,836,598
97.5 4,836,599
197 4,836,600

CLASS 297

16 4,836,601
191 4,836,602
193 4,836,603
195 4,836,604
250 4,836,605
355 4,836,607
362 4,836,606
367 4,836,608
452 4,836,609

CLASS 298

6 4,836,610

CLASS 299

7 4,836,611
11 4,836,612
81 4,836,613
86 4,836,614

CLASS 301

37 SA 4,836,615

CLASS 303

92 4,836,616
100 4,836,617
103 4,836,618
109 4,836,619
111 4,836,620

CLASS 307

2 4,837,452
10.1 4,837,454
10.2 4,837,453
38 4,837,455
106 4,837,456
253 4,837,457
279 4,837,458
296.8 4,837,459
4,837,460
303 4,837,461
446 4,837,462
473 4,837,463
511 4,837,464
530 4,837,465
605 4,837,466

CLASS 310

12 4,837,467
42 4,837,468
53 4,837,469
82 4,837,470
156 4,837,472
237 4,837,473
254 4,837,474
258 4,837,471
312 4,837,475
313 R 4,837,476

CLASS 312

97.1 B1 4,317,604
114 4,836,622
195 4,836,623
216 4,836,624
257 SK 4,836,625
257 SM 4,836,626

CLASS 313

25 4,837,477
112 4,837,478
318 4,837,479
346 DC 4,837,480
402 4,837,482
486 4,837,481
619 4,837,483
634 4,837,484

CLASS 318

161 4,837,485
568.1 4,837,490
568.16 4,837,487
625 4,837,491
661 4,837,492
685 4,837,493

CLASS 322

1 4,837,494

CLASS 323

222 4,837,495
315 4,837,496
345 4,837,497

CLASS 324

57 N 4,837,498
61 P 4,837,499
61 R 4,837,500
62 4,837,501
66 4,837,488
67 4,837,489
73 PC 4,837,502
95 4,837,503
142 4,837,504
158 P 4,837,507
4,837,622
158 R 4,837,505
4,837,506
166 4,837,508
207 4,837,509
225 4,837,510
236 4,837,511
306 4,837,512
309 4,837,513
318 4,837,515
322 4,837,516
336 4,837,514
339 4,837,517
368 4,837,518
529 4,837,519
550 4,837,520

CLASS 328

72 4,837,521

CLASS 330

149 4,837,522
255 4,837,523
286 4,837,524

CLASS 331

165 4,837,525

CLASS 332

7.51 4,837,526
11 D 4,837,527

CLASS 333

24.1 4,837,528
33 4,837,529
81 A 4,837,530
135 4,837,531
164 4,837,532
189 4,837,533
207 4,837,534
210 4,837,535
247 4,837,536

CLASS 335

153 4,837,537
202 4,837,538
207 4,837,539
286 4,837,540
300 4,837,541
306 4,837,542

CLASS 336

92 4,837,543
185 4,837,544

CLASS 337

66 4,837,545
272 4,837,546
414 4,837,547

CLASS 338

47 4,837,548
279 4,837,549
308 4,837,550

CLASS 340

310 R 4,837,556
442 4,837,553
461 4,837,552
468 4,837,554
544 4,837,555
546 4,837,557
550 4,837,558
573 4,837,559
578 4,837,560
705 4,837,551
722 4,837,561
728 4,837,562
732 4,837,563
750 4,837,564
762 4,837,565
781 4,837,566
825.31 4,837,567
825.540 4,837,568
907 4,837,569
984 4,837,570

CLASS 341

67 4,837,571
150 4,837,572
152 4,837,573

CLASS 342

27 4,837,574
45 4,837,575
77 4,837,576
80 4,837,577
194 4,837,578
197 4,837,579
374 4,837,580

CLASS 343

703 4,837,581
719 4,837,582
760 4,837,583

CLASS 346

1.1 4,837,584
75 4,837,585
76 PH 4,837,586
108 4,837,587
4,837,588
4,837,589
145 4,837,590
159 4,837,591

CLASS 350

3.61 4,836,628
3.73 4,836,629
6.1 4,836,630
6 8 4,836,631
96.16 4,836,644
96.17 4,836,645
96.18 4,836,633
96.19 4,836,634
96.20 4,836,632
4,836,635
96.21 4,836,636
4,836,637
4,836,638
96.23 4,836,639
4,836,640
96.34 4,836,641
4,836,642
4,836,643
4,836,646
132 4,836,647
281 4,836,648
331 R 4,836,649
334 4,836,650
4,836,651
4,836,652
341 4,836,653
346 4,836,654
350 S 4,836,655
4,836,656
4,836,657
357 4,837,592
384 4,836,658
409 4,836,659
423 4,836,660
4,836,661
427 4,836,662
4,836,663
4,836,664
464 4,836,665
476 4,836,666
504 4,836,667
531 4,836,668
588 4,836,669

CLASS 351

210 4,836,670

CLASS 354

322 4,837,593
402 4,837,594
412 4,837,595
442 4,837,596

CLASS 355

7 4,837,599
28 4,837,601
29 4,837,602
203 4,837,597
208 4,837,600
218 4,837,598

CLASS 356

1 4,836,671
5 4,836,672
300 4,836,673
319 4,836,674
350 4,836,675
4,836,676
4,836,677
351 4,836,678
364 4,836,679
369 4,837,603
371 4,836,680
374 4,836,681
445 4,836,682

CLASS 357

5 4,837,604
22 4,837,605
23.4 4,837,606
30 4,837,607
38 4,837,608
52 4,837,610
71 4,837,609

CLASS 358

12 4,837,611
28 4,837,612
75 4,837,613
4,837,614
100 4,837,615
107 4,837,616
133 4,837,617
135 4,837,618
140 4,837,619
142 4,837,620
148 4,837,621
165 4,837,623
166 4,837,624
174 4,837,625
183 4,837,626
191.1 4,837,627
209 4,837,628
213.19 4,837,629
213.26 4,837,630
217 4,837,631
222 4,837,632
224 4,837,633
4,837,817
261.1 4,837,634
287 4,837,635
300 4,837,636
342 4,837,637

CLASS 360

14.2 4,837,638
27 4,837,639
4,837,640
32 4,837,641
46 4,837,642
51 4,837,643
66 4,837,644
85 4,837,645
4,837,646
92 4,837,647
98.05 4,836,621
103 4,837,648
104 4,837,649
106 4,837,650
133 4,837,651
4,837,652

CLASS 361

86 4,837,653
93 4,837,654
103 4,837,655
185 4,837,656
220 4,837,657
230 4,837,658
270 4,837,659
275 4,837,660
329 4,837,661
335 4,837,662
384 4,837,663
386 4,837,664

CLASS 362

96 4,837,665
102 4,837,666
147 4,837,667
297 4,837,668
418 4,837,669

CLASS 363

21 4,837,670
35 4,837,671
143 4,837,672

CLASS 364

145 4,837,731
188 4,837,673
200 4,837,674
4,837,675
4,837,676
4,837,677
408 4,837,693
412 4,837,728
413.01 4,837,687
413.02 4,837,685
413.13 4,837,733
413.19 4,837,686
413.28 4,837,732
419 4,837,689
424.05 4,837,690
4,837,691
4,837,692
426.01 4,837,694
427 4,837,695
4,837,696
431.02 4,837,697
431.07 4,837,698
434 4,837,699
449 4,837,700
464.03 4,837,701
466 4,837,702
474.11 4,837,684
474.18 4,837,703
478 4,837,704
484 4,837,705
498 4,837,726
509 4,837,708
513 4,837,734
4,837,735
518 4,837,706
519 4,837,709
521 4,837,710
523 4,837,711
4,837,712
525 4,837,713
550 4,837,714
551.01 4,837,727
552 4,837,707
4,837,715
559 4,837,716
563 4,837,717
565 4,837,718
569 4,837,719
574 4,837,720
703 4,837,721
723 4,837,722
724.01 4,837,723
725 4,837,724
807 4,837,725
900 4,837,729
4,837,736
4,837,737
4,837,738
4,837,739
4,837,740

CLASS 365

12 4,837,741
108 4,837,745
185 4,837,742
189.05 4,837,746
195 4,837,744
236 4,837,748

CLASS 366

98 4,836,683
114 4,836,684
141 4,836,685
261 4,836,686
286 4,836,687
342 4,836,688

CLASS 367

7 4,837,749
38 4,837,752
69 4,837,753
105 4,837,754
111 4,837,750
154 4,837,751

CLASS 368

35 4,837,755
286 4,837,756

CLASS 369

13 4,837,758
32 4,837,759
44 4,837,757
289 4,837,784

CLASS 370

16 4,837,760
20 4,837,786
60 4,837,761
85 4,837,785
89 4,837,762
112 4,837,763

CLASS 371

10 4,837,747
20 4,837,764
25 4,837,765
46 4,837,766
49 4,837,767
51 4,837,743

CLASS 372

29 4,837,787
36 4,837,768
41 4,837,769
59 4,837,770
75 4,837,771
82 4,837,772
4,837,789
4,837,773
94 4,837,774
96 4,837,775

CLASS 374

56 4,837,776
125 4,836,689
142 4,837,777

CLASS 375

3 4,837,788
4 4,837,778
10 4,837,779
11 4,837,780
81 4,837,781
95 4,837,782
106 Re.32,945
110 4,837,783

CLASS 376

131 4,836,972
216 4,836,973
258 4,836,974
272 4,836,975

305 4,836,976
333 4,836,977

CLASS 377

33 4,837,790
49 4,837,791

CLASS 378

4 4,837,792
34 4,837,793
119 4,837,794
154 4,837,796
180 4,837,795

CLASS 379

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61 4,837,801
62 4,837,802
79 4,837,803
4,837,809
88 4,837,798
4,837,804
90 4,837,805
93 4,837,806
96 4,837,797
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113 4,837,813
144 4,837,814
221 4,837,816
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438 4,837,815

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7 4,837,820
9 4,837,821
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1 4,837,824
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34 4,837,827
36 4,837,828
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43 4,837,831
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118 4,837,836
158 4,837,837
4,837,838
199 4,837,839

CLASS 382

7 4,837,840
18 4,837,841
26 4,837,842
31 4,837,843
44 4,837,844
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50 4,837,846
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CLASS 383

6 4,836,690
80 4,836,691
104 4,837,849

CLASS 384

107 4,836,692
121 4,836,693
145 4,836,694
276 4,836,695

CLASS 388

811 4,837,486

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58 4,836,696
120 4,836,697
208 4,836,698
479 4,836,699
489 4,836,700
617 4,836,701

CLASS 401

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65 4,836,703
146 4,836,704

CLASS 403

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282 4,836,705
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CLASS 405

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134 4,836,714
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224 4,836,716
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262 4,836,718

CLASS 408

1 R 4,836,719
112 4,836,720

CLASS 409

125 4,836,721
132 4,836,722
141 4,836,723
144 4,836,724
201 4,836,725

CLASS 410

9 4,836,726

CLASS 411

4 4,836,727
43 4,836,728
82 4,836,729
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188 4,836,732
225 4,836,733
430 4,836,734
475 4,836,735
557 4,836,736
563 4,836,737
607 4,836,738
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247 R 4,836,751

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36 4,836,980

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83 4,837,109
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582 4,836,985

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CLASS 422

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195 4,836,989

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244 4,836,993
308 4,836,994
309 4,836,995
328 4,836,996
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342 4,836,997
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574 R 4,836,999
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552 4,836,767

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503 4,837,382
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582 4,837,040
611 4,837,041
615 4,837,042

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388.4 4,837,057

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CLASS 432

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241 4,836,777

CLASS 433

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102 4,836,780
141 4,836,781
229 4,836,782

CLASS 434

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113 4,836,784
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403 4,836,787

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123 4,837,148
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20 4,837,157
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79 4,836,791
81 4,836,792
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164 4,836,795
178 4,836,796
264 4,836,797
268 4,836,798
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291 4,836,800
322 4,836,801
447 4,836,803
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622 4,836,802
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813 4,836,808

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61 4,836,810
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CLASS 446

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01	4,835,820	4,836,061	4,836,666	4,837,431	08 : 4,835,928		4,837,117
	4,836,707	4,836,062	4,836,668	4,837,433	4,835,951		4,837,195
	4,836,792	4,836,105	4,836,675	4,837,434	4,835,982		4,837,232
	4,836,877	4,836,114	4,836,676	4,837,443	4,836,002		4,837,325
	4,836,961	4,836,141	4,836,679	4,837,474	4,836,075	12 :	4,835,798
	4,836,970	4,836,155	4,836,700	4,837,480	4,836,149		4,835,827
	4,837,250	4,836,158	4,836,701	4,837,495	4,836,216		4,835,860
	4,837,446	4,836,173	4,836,716	4,837,496	4,836,361		4,835,893
	4,837,451	4,836,182	4,836,723	4,837,497	4,836,484		4,835,920
02	4,837,388	4,836,185	4,836,727	4,837,499	4,836,573		4,835,943
04	4,835,950	4,836,201	4,836,736	4,837,506	4,836,574		4,835,944
	4,836,065	4,836,202	4,836,752	4,837,513	4,836,624		4,835,955
	4,836,138	4,836,208	4,836,761	4,837,519	4,836,741		4,835,971
	4,836,239	4,836,209	4,836,778	4,837,521	4,836,856		4,835,975
	4,836,265	4,836,214	4,836,780	4,837,523	4,837,672		4,836,030
	4,836,530	4,836,215	4,836,781	4,837,525	4,837,675		4,836,040
	4,836,592	4,836,230	4,836,794	4,837,530	4,837,825		4,836,154
	4,836,731	4,836,238	4,836,797	4,837,560	09 : 4,835,824		4,836,232
	4,836,916	4,836,282	4,836,860	4,837,569	4,835,842		4,836,415
	4,836,998	4,836,290	4,836,861	4,837,578	4,835,911		4,836,432
	4,837,009	4,836,298	4,836,862	4,837,611	4,835,962		4,836,441
	4,837,176	4,836,307	4,836,866	4,837,613	4,836,003		4,836,451
	4,837,177	4,836,325	4,836,874	4,837,622	4,836,008		4,836,536
	4,837,183	4,836,344	4,836,875	4,837,635	4,836,014		4,836,545
	4,837,575	4,836,367	4,836,883	4,837,642	4,836,026		4,836,593
	4,837,659	4,836,392	4,836,923	4,837,643	4,836,072		4,836,623
	4,837,680	4,836,411	4,836,924	4,837,665	4,836,098		4,836,708
	4,837,839	4,836,413	4,836,932	4,837,676	4,836,132		4,837,153
05	4,836,400	4,836,431	4,836,960	4,837,678	4,836,218		4,837,212
	4,836,535	4,836,449	4,836,976	4,837,681	4,836,311		4,837,399
	4,836,706	4,836,450	4,837,024	4,837,682	4,836,312		4,837,409
06	Re.32,945	4,836,452	4,837,026	4,837,693	4,836,313		4,837,469
	4,835,799	4,836,462	4,837,027	4,837,699	4,836,337		4,837,576
	4,835,801	4,836,465	4,837,034	4,837,718	4,836,373		4,837,633
	4,835,810	4,836,470	4,837,049	4,837,726	4,836,374		4,837,722
	4,835,855	4,836,472	4,837,051	4,837,730	4,836,382		4,837,838
	4,835,862	4,836,479	4,837,052	4,837,746	4,836,632	13 :	4,836,414
	4,835,864	4,836,485	4,837,053	4,837,748	4,836,765		4,836,440
	4,835,882	4,836,487	4,837,111	4,837,750	4,836,839		4,836,552
	4,835,889	4,836,488	4,837,134	4,837,770	4,836,842		4,836,640
	4,835,897	4,836,490	4,837,148	4,837,771	4,836,898		4,836,726
	4,835,902	4,836,501	4,837,151	4,837,774	4,837,090		4,837,014
	4,835,912	4,836,523	4,837,152	4,837,781	4,837,206		4,837,070
	4,835,923	4,836,531	4,837,165	4,837,786	4,837,259		4,837,078
	4,835,932	4,836,533	4,837,209	4,837,788	4,837,389		4,837,126
	4,835,933	4,836,539	4,837,230	4,837,794	4,837,701	15 :	4,837,840
	4,835,952	4,836,558	4,837,305	4,837,799	4,837,702	16 :	4,835,896
	4,835,963	4,836,568	4,837,312	4,837,822	4,837,714		4,836,066
	4,835,973	4,836,580	4,837,348	4,837,824	4,837,764		4,836,854
	4,835,977	4,836,612	4,837,352	4,837,830	4,837,779	17 :	Re.32,938
	4,835,979	4,836,644	4,837,361	4,837,836	4,837,829		Re.32,942
	4,836,037	4,836,647	4,837,380	4,837,843	10 : 4,836,519		4,835,813
	4,836,047	4,836,649	4,837,395	4,837,848	4,836,682		4,835,834

4,835,835	4,836,194	4,837,590	4,837,160	4,837,471	4,836,237
4,835,869	4,836,206	4,837,592	4,837,166	4,837,502	4,836,279
4,835,905	4,836,228	4,837,731	4,837,227	4,837,532	4,836,280
4,835,915	4,836,358	4,837,849	4,837,255	4,837,546	4,836,300
4,835,921	4,836,438	27 : 4,835,833	4,837,256	4,837,570	4,836,304
4,835,925	4,836,775	4,835,852	4,837,275	4,837,573	4,837,035
4,835,960	4,836,801	4,835,883	4,837,279	4,837,580	4,837,036
4,835,976	4,836,913	4,835,901	4,837,284	4,837,584	4,837,192
4,835,997	4,836,982	4,836,019	4,837,285	4,837,586	4,837,358
4,835,998	4,837,145	4,836,123	4,837,288	4,837,587	4,837,723
4,836,006	4,837,164	4,836,167	4,837,311	4,837,591	4,837,753
4,836,010	4,837,494	4,836,229	4,837,347	4,837,604	4,837,811
4,836,043	4,837,503	4,836,292	4,837,381	4,837,619	41 : 4,835,859
4,836,112	4,837,664	4,836,320	4,837,396	4,837,636	4,836,058
4,836,120	4,837,842	4,836,442	4,837,397	4,837,638	4,836,108
4,836,179	25 : Re.32,941	4,836,471	4,837,398	4,837,654	4,836,388
4,836,184	4,835,884	4,836,478	4,837,507	4,837,658	4,836,425
4,836,190	4,835,898	4,836,499	4,837,527	4,837,707	4,836,486
4,836,318	4,835,961	4,836,504	4,837,542	4,837,793	4,836,595
4,836,359	4,836,119	4,836,589	4,837,554	4,837,815	4,836,615
4,836,372	4,836,186	4,836,689	4,837,606	4,837,832	4,836,851
4,836,397	4,836,188	4,836,823	4,837,609	4,837,837	4,837,185
4,836,407	4,836,207	4,836,832	4,837,627	4,837,845	4,837,452
4,836,412	4,836,219	4,836,834	4,837,721	4,557,683	4,837,455
4,836,556	4,836,233	4,836,931	4,837,775	37 : 4,835,841	4,837,558
4,836,559	4,836,343	4,837,062	4,837,798	4,835,851	4,837,785
4,836,591	4,836,366	4,837,067	4,837,807	4,835,939	42 : 4,835,816
4,836,596	4,836,379	4,837,069	4,837,851	4,836,068	4,835,858
4,836,605	4,836,409	4,837,082	4,317,604	4,836,224	4,835,999
4,836,671	4,836,651	4,837,085	4,339,268	4,836,342	4,836,012
4,836,684	4,836,672	4,837,290	4,604,111	4,836,732	4,836,029
4,836,693	4,836,733	4,837,406	35 : 4,835,863	4,836,749	4,836,046
4,836,809	4,836,760	4,837,520	4,835,894	4,836,763	4,836,059
4,836,815	4,836,814	4,837,529	4,836,561	4,836,879	4,836,080
4,836,894	4,836,816	28 : 4,835,818	4,836,847	4,837,015	4,836,083
4,836,908	4,836,843	4,836,205	36 : 4,835,807	4,837,029	4,836,093
4,836,921	4,836,869	4,836,316	4,835,840	4,837,208	4,836,236
4,836,940	4,836,955	4,836,541	4,835,847	4,837,211	4,836,328
4,836,993	4,837,060	4,836,787	4,835,874	4,837,447	4,836,398
4,837,031	4,837,068	4,837,228	4,835,877	4,837,459	4,836,404
4,837,044	4,837,121	4,837,417	4,835,890	4,837,559	4,836,433
4,837,059	4,837,171	29 : 4,835,954	4,835,935	4,837,677	4,836,439
4,837,204	4,837,182	4,836,180	4,835,945	38 : 4,836,740	4,836,483
4,837,251	4,837,299	4,836,295	4,835,984	39 : 4,835,805	4,836,611
4,837,314	4,837,375	4,836,437	4,836,053	4,835,826	4,836,613
4,837,315	4,837,377	4,836,455	4,836,060	4,835,878	4,836,697
4,837,332	4,837,379	4,836,817	4,836,082	4,835,899	4,836,705
4,837,378	4,837,439	4,836,942	4,836,095	4,835,916	4,836,735
4,837,411	4,837,465	4,836,985	4,836,106	4,835,927	4,836,753
4,837,426	4,837,545	4,837,003	4,836,110	4,835,948	4,836,782
4,837,566	4,837,565	4,837,056	4,836,121	4,835,959	4,836,789
4,837,620	4,837,572	4,837,218	4,836,293	4,836,117	4,836,791
4,837,657	4,837,577	4,837,857	4,836,314	4,836,148	4,836,798
4,837,795	4,837,579	4,369,850	4,836,383	4,836,253	4,836,804
4,837,800	4,837,631	30 : 4,836,896	4,836,393	4,836,269	4,836,806
4,837,820	4,837,683	31 : 4,836,143	4,836,396	4,836,273	4,836,833
4,837,833	4,837,710	4,837,549	4,836,448	4,836,283	4,836,836
4,837,858	4,837,736	4,837,550	4,836,469	4,836,330	4,836,846
18 : 4,835,839	4,837,738	32 : 4,836,517	4,836,505	4,836,331	4,836,849
4,835,910	4,837,767	4,836,553	4,836,514	4,836,347	4,836,850
4,835,978	4,837,831	4,837,568	4,836,522	4,836,381	4,836,870
4,836,001	26 : 4,835,802	4,837,728	4,836,527	4,836,386	4,836,920
4,836,089	4,835,819	33 : 4,835,892	4,836,546	4,836,423	4,836,956
4,836,175	4,835,832	4,835,972	4,836,547	4,836,426	4,836,974
4,836,270	4,835,849	4,836,020	4,836,548	4,836,474	4,836,977
4,836,272	4,835,908	4,836,447	4,836,555	4,836,512	4,836,986
4,836,341	4,835,969	4,836,495	4,836,584	4,836,513	4,836,989
4,836,497	4,836,015	4,836,872	4,836,757	4,836,601	4,837,065
4,836,835	4,836,021	4,837,479	4,836,779	4,836,669	4,837,163
4,837,073	4,836,049	4,837,589	4,836,793	4,836,758	4,837,167
4,837,091	4,836,077	34 : 4,835,795	4,836,805	4,836,772	4,837,205
4,837,202	4,836,090	4,835,821	4,836,911	4,836,818	4,837,235
4,837,557	4,836,091	4,835,891	4,836,915	4,836,822	4,837,243
4,837,697	4,836,094	4,835,929	4,836,943	4,836,837	4,837,246
4,837,719	4,836,147	4,835,934	4,836,947	4,836,845	4,837,247
19 : 4,835,981	4,836,157	4,835,985	4,836,951	4,836,857	4,837,263
4,836,011	4,836,226	4,835,996	4,836,954	4,836,858	4,837,304
4,836,196	4,836,246	4,836,018	4,836,958	4,836,880	4,837,307
4,836,503	4,836,261	4,836,070	4,836,969	4,836,934	4,837,328
4,836,569	4,836,266	4,836,153	4,836,983	4,836,937	4,837,353
4,836,598	4,836,338	4,836,189	4,837,001	4,837,038	4,837,370
4,836,686	4,836,408	4,836,227	4,837,011	4,837,057	4,837,383
4,836,687	4,836,482	4,836,231	4,837,030	4,837,075	4,837,386
4,837,691	4,836,516	4,836,363	4,837,097	4,837,088	4,837,483
20 : 4,836,198	4,836,557	4,836,390	4,837,101	4,837,191	4,837,705
21 : 4,835,900	4,836,566	4,836,542	4,837,104	4,837,233	4,837,740
4,836,345	4,836,578	4,836,554	4,837,105	4,837,239	4,721,809
4,836,364	4,836,582	4,836,590	4,837,129	4,837,253	43 : 4,343,480
4,836,428	4,836,616	4,836,677	4,837,135	4,837,278	44 : 4,835,871
4,836,610	4,836,673	4,836,681	4,837,162	4,837,326	4,836,007
4,836,730	4,836,719	4,836,829	4,837,169	4,837,354	4,836,500
22 : 4,835,867	4,836,770	4,836,830	4,837,175	4,837,438	45 : 4,835,875
4,835,942	4,836,824	4,836,882	4,837,190	4,837,449	4,835,946
4,836,289	4,836,922	4,836,892	4,837,219	4,837,488	4,836,088
4,836,375	4,836,938	4,836,897	4,837,257	4,837,501	4,836,249
4,837,054	4,836,941	4,836,912	4,837,289	4,837,547	4,836,468
4,837,327	4,836,968	4,836,945	4,837,298	4,837,552	4,836,521
23 : 4,836,115	4,837,161	4,836,946	4,837,391	4,837,585	4,836,702
4,836,540	4,837,187	4,836,948	4,837,392	4,837,666	4,837,017
4,836,762	4,837,207	4,837,005	4,837,393	4,837,668	4,837,084
4,836,821	4,837,226	4,837,008	4,837,394	4,837,669	4,837,087
4,836,963	4,837,293	4,837,013	4,837,404	4,837,686	4,837,419
4,837,066	4,837,295	4,837,019	4,837,421	4,311,515	4,837,541
4,837,655	4,837,318	4,837,095	4,837,436	40 : 4,835,831	46 : 4,836,200
24 : 4,835,924	4,837,407	4,837,112	4,837,442	4,835,917	47 : 4,835,828
4,836,102	4,837,544	4,837,124	4,837,467	4,836,177	4,835,895

	4,835,913		4,836,100		4,836,800		4,837,704		4,836,764		4,836,078
	4,835,949		4,836,104		4,836,826		4,837,739		4,836,828		4,836,124
	4,836,096		4,836,109		4,836,891		4,837,743		4,836,885		4,836,127
	4,836,118		4,836,113		4,836,905		4,837,751		4,836,972		4,836,151
	4,836,394		4,836,119		4,836,935		4,837,752		4,837,079		4,836,152
	4,836,399		4,836,124		4,836,939		4,837,756		4,837,249		4,836,240
	4,836,614		4,836,126		4,836,999		4,837,797		4,837,281		4,836,294
	4,836,626		4,836,203		4,837,074		4,837,819		4,837,292		4,836,315
	4,836,737		4,836,204		4,837,076		4,837,853		4,837,300		4,836,368
	4,836,903		4,836,243		4,837,113		4,267,195		4,837,688		4,836,391
	4,836,930		4,836,248		4,837,173	49	4,836,067		4,837,769		4,836,419
	4,837,004		4,836,254		4,837,184		4,836,199		4,837,856		4,836,420
	4,837,254		4,836,256		4,837,248		4,836,255	53 :	4,835,800		4,836,453
	4,837,367		4,836,258		4,837,258		4,836,492		4,835,825		4,836,462
	4,837,368		4,836,266		4,837,272		4,837,423		4,835,879		4,836,496
	4,837,418		4,836,302		4,837,283		4,837,475		4,835,926		4,836,506
	4,837,612		4,836,305		4,837,323		4,837,652		4,836,142		4,836,609
	4,837,615		4,836,318		4,837,324	50 :	4,836,886		4,836,389		4,836,802
	4,837,623		4,836,320		4,837,356		4,836,887		4,836,538		4,836,810
	4,837,735		4,836,330		4,837,382	51 :	4,835,983		4,836,602		4,836,811
48	4,835,854		4,836,371		4,837,390		4,836,035		4,836,953		4,836,812
	4,835,873		4,836,433		4,837,514		4,836,042		4,837,237		4,837,012
	4,835,876		4,836,447		4,837,517		4,836,222		4,837,498		4,837,154
	4,835,888		4,836,455		4,837,518		4,836,259		4,837,574		4,837,210
	4,835,958		4,836,511		4,837,534		4,836,306		4,837,653		4,837,543
	4,835,986		4,836,510		4,837,539		4,836,378		4,837,685		4,837,715
	4,835,991		4,836,599		4,837,563		4,836,467		4,837,772		4,837,834
	4,835,993		4,836,603		4,837,670		4,836,507	54 :	4,837,267	56 :	4,836,291
	4,836,032		4,836,677		4,837,679		4,836,587	55 :	4,835,843		4,836,466
	4,836,064		4,836,718		4,837,695		4,836,670		4,835,965		4,836,549
	4,836,081		4,836,766								

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04	301,395		301,408		301,476		301,503		301,448	41 :	301,431
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	301,495		301,516	24 :	301,434	27 :	301,457		301,513		301,439
06	301,394		301,517		301,506	29 :	301,479	38 :	301,427	47 :	301,440
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	6,830	12 :	6,834		6,836		6,840	34 :	6,827	51 :	6,828

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Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1101 O.G. 56 on Apr. 25, 1989.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 80 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	550.00
—Corresponding prior U.S. national application filed:	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority.	400.00
—Additional examination fee, per additional invention	130.00
—Searching Authority not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee:	436.00
Basic Supplemental fee (for each page over 30):	9.00
Designation fee per country or region for the first 10 national or regional offices:	106.00
Designation fee for 11th and subsequent designations:	No Charge
Handling fee:	134.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	165.00	330.00
USPTO was ISA but no IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	30.00	30.00

May 3, 1989. DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on June 10, 1986, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,593,415 through 4,594,733
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on June 8, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,333,179 through 4,334,324
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$ 245.00
By other than a small entity.....$ 490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small entity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity (§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED MARCH 26, 1989
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,506,393	06/480007	03/26/85
4,506,402	06/563374	03/26/85
4,506,403	06/616857	03/26/85
4,506,412	06/556282	03/26/85
4,506,414	06/465991	03/26/85
4,506,420	06/448766	03/26/85
4,506,423	06/512948	03/26/85
4,506,424	06/426835	03/26/85
4,506,426	06/527772	03/26/85
4,506,438	06/504335	03/26/85
4,506,447	06/534997	03/26/85
4,506,448	06/436824	03/26/85
4,506,450	06/593960	03/26/85
4,506,454	06/438865	03/26/85
4,506,457	06/475839	03/26/85
4,506,462	06/387667	03/26/85
4,506,465	06/452117	03/26/85
4,506,468	06/550845	03/26/85
4,506,470	06/483141	03/26/85
4,506,472	06/481801	03/26/85
4,506,473	06/551212	03/26/85
4,506,495	06/341332	03/26/85
4,506,499	06/567804	03/26/85
4,506,517	06/406127	03/26/85
4,506,521	06/448659	03/26/85
4,506,527	06/481803	03/26/85
4,506,529	06/429527	03/26/85
4,506,539	06/458002	03/26/85
4,506,549	06/327033	03/26/85
4,506,555	06/540152	03/26/85
4,506,562	06/594411	03/26/85
4,506,566	06/555640	03/26/85
4,506,567	06/472601	03/26/85
4,506,570	06/361406	03/26/85
4,506,571	06/349784	03/26/85
4,506,578	06/451531	03/26/85
4,506,585	06/477988	03/26/85
4,506,591	06/424048	03/26/85
4,506,597	06/547651	03/26/85
4,506,601	06/493889	03/26/85
4,506,603	06/467838	03/26/85
4,506,605	06/529007	03/26/85
4,506,613	06/495530	03/26/85
4,506,614	06/512833	03/26/85
4,506,615	06/420245	03/26/85
4,506,619	06/416050	03/26/85
4,506,623	06/469981	03/26/85
4,506,624	06/301431	03/26/85
4,506,628	06/513178	03/26/85
4,506,629	06/524986	03/26/85
4,506,643	06/369020	03/26/85
4,506,652	06/568784	03/26/85
4,506,653	06/463642	03/26/85
4,506,657	06/505034	03/26/85
4,506,658	06/456343	03/26/85
4,506,659	06/598060	03/26/85
4,506,661	06/487269	03/26/85
4,506,665	06/457125	03/26/85
4,506,676	06/416489	03/26/85
4,506,681	06/436705	03/26/85
4,506,689	06/412440	03/26/85
4,506,697	06/456210	03/26/85
4,506,701	06/493593	03/26/85
4,506,714	06/487512	03/26/85
4,506,720	06/579802	03/26/85
4,506,730	06/585677	03/26/85
4,506,736	06/479050	03/26/85
4,506,737	06/497903	03/26/85
4,506,747	06/419666	03/26/85
4,506,749	06/335595	03/26/85
4,506,751	06/452990	03/26/85
4,506,761	06/479753	03/26/85
4,506,763	06/389955	03/26/85
4,506,773	06/462398	03/26/85
4,506,775	06/389014	03/26/85
4,506,786	06/530909	03/26/85
4,506,788	06/521689	03/26/85
4,506,792	06/354958	03/26/85
4,506,811	06/386669	03/26/85
4,506,813	06/293233	03/26/85
4,506,825	06/461277	03/26/85

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4,506,832	06/453316	03/26/85
4,506,843	06/434746	03/26/85
4,506,845	06/578558	03/26/85
4,506,847	06/499148	03/26/85
4,506,854	06/458157	03/26/85
4,506,858	06/499341	03/26/85
4,506,861	06/456718	03/26/85
4,506,864	06/621025	03/26/85
4,506,866	06/446077	03/26/85
4,506,870	06/535817	03/26/85
4,506,880	06/509463	03/26/85
4,506,883	06/464644	03/26/85
4,506,884	06/471886	03/26/85
4,506,890	06/458549	03/26/85
4,506,891	06/362763	03/26/85
4,506,894	06/519918	03/26/85
4,506,901	06/424428	03/26/85
4,506,906	06/485377	03/26/85
4,506,908	06/49808	03/26/85
4,506,913	06/618915	03/26/85
4,506,915	06/444961	03/26/85
4,506,920	06/509180	03/26/85
4,506,924	06/429105	03/26/85
4,506,927	06/453690	03/26/85
4,506,931	06/270420	03/26/85
4,506,932	06/382651	03/26/85
4,506,942	06/446820	03/26/85
4,506,948	06/388380	03/26/85
4,506,950	06/446570	03/26/85
4,506,964	06/361000	03/26/85
4,506,968	06/532904	03/26/85
4,506,982	06/523700	03/26/85
4,506,988	06/546971	03/26/85
4,506,992	06/510973	03/26/85
4,506,995	06/447463	03/26/85
4,506,998	06/502577	03/26/85
4,507,003	06/498400	03/26/85
4,507,009	06/571665	03/26/85
4,507,016	06/402089	03/26/85
4,507,018	06/392452	03/26/85
4,507,020	06/493373	03/26/85
4,507,029	06/418871	03/26/85
4,507,030	06/402157	03/26/85
4,507,032	06/503523	03/26/85
4,507,034	06/432265	03/26/85
4,507,041	06/418220	03/26/85
4,507,042	06/432833	03/26/85
4,507,043	06/417251	03/26/85
4,507,049	06/390029	03/26/85
4,507,053	06/388651	03/26/85
4,507,056	06/538219	03/26/85
4,507,070	06/571046	03/26/85
4,507,079	06/493204	03/26/85
4,507,086	06/611572	03/26/85
4,507,089	06/592931	03/26/85
4,507,091	06/481774	03/26/85
4,507,120	06/370502	03/26/85
4,507,128	06/395704	03/26/85
4,507,129	06/452045	03/26/85
4,507,141	06/354122	03/26/85
4,507,142	06/454797	03/26/85
4,507,143	06/465905	03/26/85
4,507,152	06/557770	03/26/85
4,507,153	06/532856	03/26/85
4,507,157	06/578302	03/26/85
4,507,166	06/444808	03/26/85
4,507,170	06/419352	03/26/85
4,507,174	06/493258	03/26/85
4,507,175	06/490042	03/26/85
4,507,176	06/608071	03/26/85
4,507,193	06/637845	03/26/85
4,507,198	06/451001	03/26/85
4,507,207	06/623226	03/26/85
4,507,231	06/522105	03/26/85
4,507,249	06/472261	03/26/85
4,507,262	06/596978	03/26/85
4,507,283	06/482136	03/26/85
4,507,284	06/413141	03/26/85
4,507,296	06/569152	03/26/85
4,507,308	06/426229	03/26/85
4,507,309	06/367354	03/26/85
4,507,315	06/525503	03/26/85
4,507,336	06/344504	03/26/85
4,507,347	06/476500	03/26/85
4,507,355	06/585909	03/26/85
4,507,363	06/606885	03/26/85
4,507,382	06/471808	03/26/85
4,507,397	06/517913	03/26/85
4,507,403	06/529653	03/26/85
4,507,408	06/538975	03/26/85
4,507,424	06/614489	03/26/85
4,507,434	06/541230	03/26/85
4,507,446	06/474904	03/26/85
4,507,463	06/606077	03/26/85
4,507,464	06/578911	03/26/85
4,507,477	06/416272	03/26/85
4,507,483	06/473760	03/26/85
4,507,527	06/485925	03/26/85
4,507,541	06/570713	03/26/85
4,507,548	06/496081	03/26/85
4,507,566	06/498405	03/26/85
4,507,567	06/394111	03/26/85
4,507,578	06/389354	03/26/85
4,507,579	06/537080	03/26/85
4,507,595	06/504051	03/26/85
4,507,602	06/407985	03/26/85
4,507,606	06/365158	03/26/85
4,507,610	06/399301	03/26/85
4,507,612	06/325040	03/26/85
4,507,620	06/268739	03/26/85
4,507,623	06/441073	03/26/85
4,507,633	06/587109	03/26/85
4,507,638	06/329284	03/26/85
4,507,644	06/474816	03/26/85
4,507,645	06/520145	03/26/85
4,507,646	06/522377	03/26/85
4,507,655	06/377011	03/26/85
4,507,657	06/549159	03/26/85
4,507,699	06/450750	03/26/85
4,507,704	06/560967	03/26/85
4,507,661	06/371706	03/26/85
4,507,676	06/437263	03/26/85
4,507,709	06/579336	03/26/85
4,507,714	06/585219	03/26/85
4,507,722	06/588281	03/26/85
4,507,742	06/403438	03/26/85
4,507,758	06/384818	03/26/85
4,507,769	06/401712	03/26/85
4,507,770	06/416068	03/26/85
4,507,785	06/445380	03/26/85
4,507,794	06/491605	03/26/85
4,507,799	06/429226	03/26/85
4,507,800	06/337368	03/26/85

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b))

3,900,645, Re. S. N. 331,001, Filed Mar. 29, 1989, Cl. 428, SCORED ADHESIVE LAMINATED, Burton D. Morgan, Owner of Record: *Morgan Adhesive Co., Stow Ohio*, Attorney or Agent: Edwin W. Oldham, Ex. Gp.: 154

4,005,195, Re. S. N. 346,662, Filed May 3, 1989, Cl. 514/23, COMPOSITIONS FOR TREATING HYPERCHOLESTEROLMIA, Ronald J. Jandacek, Owner of Record: *The Procter and Gamble Co., Cincinnati, Ohio*, Attorney or Agent: Eric W. Guttag, Ex. Gp.: 183

4,018,562, Re. S. N. 340,540, Filed Apr. 18, 1989, Cl. 436/114, CHEMILUMINESCENT NITROGEN DETECTION APPARATUS AND METHOD, Robert E. Parks, et al., Owner of Record: *Antek Instruments, Inc., Houston, Tex.*, Attorney or Agent: Charles L. Gholz, Ex. Gp.: 181

4,116,785, Re. S. N. 338,906, Filed Apr. 14, 1989, Cl. 522/162, PHOSPHONITRILLIC POLYMERS WITH CURABILITY BY SULFUR ACCELERATED CURES OR RADIATION CURES, Tai C. Cheng, Owner of Record: *The Firestone Tire and Rubber Co., Akron, Ohio*, Attorney or Agent: D. A. Thomas, Ex. Gp.: 151

4,331,739, Re. S. N. 341,264, Filed Apr. 21, 1989, Cl. 623, AMORPHOURS METALLIC STRIPS, Mandayam C. Narasimhan, Owner of Record: *Allied Signal Inc., Morristown, N. J.*, Attorney or Agent: Norman H. Stepno, Ex. Gp.: 322

4,518,508, Re. S. N. 052,427, Filed May 21, 1987, Cl. 210/751, METHOD FOR TREATING WASTES BY SOLIDIFICATION, Jesse R. Conner, Owner of Record: *Inventor*, Attorney or Agent: William H. Holt, Ex. Gp.: 136

4,589,053, Re. S. N. 342,693, Filed Apr. 24, 1989, Cl. 361, METHOD AND DEVICE FOR CHARGING OR DISCHARGING A MEMBER, Nagao Hosono, et al., Owner of Record: *Canon Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: William H. Wannisky, Ex. Gp.: 211

4,647,068, Re. S. N. 317,826, Filed Mar. 1, 1989, Cl. 280/107, REAR SUSPENSION CONTROLLER, Ken Asami, et al., Owner of Record: *Toyota Jidosha Kabushiki Kaisha, Toyota, Japan*, Attorney or Agent: James A. Oliff, Ex. Gp.: 316

4,659,107, Re. S. N. 341,745, Filed Apr. 21, 1989, Cl. 280/804, AUTOMATIC SEAT BELT SYSTEM, Yoshihiro Yokote, Owner of Record: *Nippon Seiko Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: Herbert I. Cantor, Ex. Gp.: 316

4,660,529, Re. S. N. 342,945, Filed Apr. 25, 1989. Cl. 123/432, FOUR-CYCLE ENGINE, Masaaki Yoshikawa, Owner of Record: *Yamaha Hatsukoki Kabushiki Kaisha D/B/A, Yamaha Motor Co., Iwata, Japan*, Attorney or Agent: Ernest A. Beutler, Ex. Gp.: 342

4,660,674, Re. S. N. 345,374, Filed Apr. 28, 1989, Cl. 181/113, MOUNTING AND CONTROL MEANS FOR FULL WAVEFORM SEISMIC SOURCE, Tom P. Airhart, Owner of Record: *Atlantic Richfield Co., Los Angeles, Calif.*, Attorney or Agent: Albert C. Metrailer, Ex. Gp.: 221

4,662,229, Re. S. N. 347,517, Filed May 3, 1989, Cl. 73/859, GRIP ASSEMBLY, John M. Curtis, Owner of Record: *Inventor*, Attorney or Agent: Lawence G. Zurawsky, Ex. Gp.: 265

4,662,725,RE. S. N. 346,909, Filed: May 3, 1989, Cl. 350/432, OBJECTIVE LENS SYSTEM FOR ENDOSCOPES, Kimihiko Nisioka, Owner of Record: *Olympus Optical Co., Tokyo , Japan*, Attorney or Agent: G. Loyd Knight, Ex. Gp.: 257

4,663,089, Re. S. N. 344,231, Filed Apr. 27, 1989, Cl. 261/23.1, DIFFUSED BUBBLE AERATION SYSTEM, Jerry D. Lowry, et al., Owner of Record: *Inventor(s)*, Attorney or Agent: Daniel H. Kane Jr., Ex. Gp.: 135

4,720,755, Re. S. N. 345,463, Filed Apr. 28, 1989, Cl. 360/96.3, TAPE RECORDER, Masao Kamijo, Owner of Record: *Kabushiki Kaisha Sankyo Seiki Seisakusho, Tokyo, Japan*, Attorney or Agent: T. Murray Smith, Ex. Gp.: 233

4,473,546, Re. S. N. 346,632, Filed May 3, 1989, Cl. 424, BROMINATED SUCROSE DERAVITIVES COMPOSITIONS AND METHOD OF USE, Graham Jackson, et al., Owner of Record: *Tate and Lyle Public Ltd., Co., London, England*, Attorney or Agent: Edward A. Meilman, Ex. Gp.: 125

4,783,332, Re. S. N. 344,203, Filed Apr. 27, 1989, Cl. 424/59, NOVEL SKIN TANNING COMPOSITION, Johannes C. P. Schruder, Owner of Record: *Chemisch Adviesbureau, Baarn, Holland*, Attorney or Agent: Jacob M. Levine, Ex. Gp.: 125

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

4,183,989, Reexam. No. 90/001,769, Requested May 4, 1989, Cl. 428/195, SECURITY PAPERS, Alan J. Tooth, Owner of Record: *Portals Ltd., Hampshire, England*, Attorney or Agent: F. B. Ziesenheim, Ex. Gp.: 150, Requester: Owner

4,764,998, Reexam. No. 90/001,765, Requested May 1, 1989, Cl. 4/502, RETRACTABLE COVER, Neville L. Cousins, et al., Owner of Record: *Santolina Securities, Ltd., London, England*, Attorney or Agent: Ladas & Parry, Ex. Gp.: 240, Requester: Banner, Birch, McKie & Beckett, Washington, D. C.

4,781,676, Reexam. No. 90/001,768, Requested May 3, 1989 Cl. 604/021, INTERSTITIAL ADMINISTRATION OF PERFLUOROCHEMICAL EMULSIONS FOR REOXYGENATION OF HYPOXIC TUMOR CELLS, Frank K. Schweighart, et al., Owner of Record: *Air Products & Chemicals Inc., Allentown, Pa.*, Attorney or Agent: Unknown, Ex. Gp.: 330, Requester: Adamantech, Inc., Linwood, Pa.

4,800,407, Reexam. No. 90/001,767, Requested May 2, 1989, Cl. 354/114, TOTAL FOCUS 3-D CAMERA AND 3-D IMAGE STRUCTURE, Allen K. Wah Lo, Owner of Record: *Inventor, Dunwoody, Ga.*, Attorney or Agent: H. I. Marquis, Ex. Gp.: 210, Requester: Nimslo Corp., Doraville, Ga.

4,812,357, Reexam. No. 90/001,766, Requested May 1, 1989, Cl. 428/246, PRINTING BLANKET, Dennis O'Rell, et al., Owner of Record: *W. R. Grace Co.-Conn, Lexington, Mass.*., Attorney or Agent: J. D. Hubbard, Ex. Gp.: 150, Requester: Owner

Errata

"All reference to Patent No. 4,820,434 to Hitoshi Hati,et al. of Japan for `LUBRICATING OIL COMPOSITION FOR TRACTION DRIVE' appearing in the *Official Gazette* of April 11, 1989 should be deleted since no patent was granted."

"All reference to Patent No. 4,820,027 to Lenny Lipton, et al. of Calif. for `ACROMATIC LIQUID CRYSTAL SHUTTER FOR STEROSCOPIC AND OTHER APPLICATIONS' appearing in the *Official Gazette* of Apr. 11, 1989 should be deleted since no patent was granted."

"All reference to Patent No. 4,827,174 to James W. Bush, et al. of Ohio for `ROTOR BALANCING' appearing in the *Official Gazette* of May 2, 1989 should be deleted since no patent was granted."

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. These persons have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office. Final approval for registration is subject to establishing to the satisfaction of the Director of

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Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished the Director, Office of Enrollment and Discipline on or before July 14, 1989:

Abercrombie, Willie G., Route 1 Box 18-b, Broad Run, Va. 22014
Birmiel, Howard A., 7132 Freshaire Drive, Springfield, Va. 22153
Faggetter, Ronald D., 126 Bellefair Ave. Toronto, Canada M4L 3T9
Marbert, James B., 10110 Farmington Drive, Fairfax, Va. 22030
Ross, Taylor J., 2022 Baltimore Rd, #L-24, Rockville, Md. 20851
Schimdt, Ingrid E., 1416 Rebecca St., Oakville, Ont., Canada L6L 1Z5
Wieder, Stephen C., 12432 Quail Woods Drive, Germantown, Md. 20874

May 17, 1989

CAMERON WEIFFENBACH,
Director of
Enrollment and Discipline

Patents Available for Licensing or Sale

Inquiries about the patents listed below should be directed to Shirk, Reist, Wyagenseller and Shirk, K. S. Shirk , Jr., Esquire at P. O. Box 1552, Lancaster, Pa. 17603.

3,758,097 AUTOMATIC VISE JAW
3,792,851 AUTOMATIC VISE JAW
3,845,565 ANGLE MEASURING DEVICE
3,860,110 PIN ORIENTING, ALIGNING AND TAPING MACHINE
4,183,347 AIR HEATING AND CIRCULATING FIRE PLACE GRATE

Inquiries about the patents listed below should be directed to LADAS & PERRY 3600 Wilshire Blvd. #1520, Los Angeles, Calif. 90010

4,761,442 RUST-INHIBITING PRIMER COMPOSITION
4,540,427 METHOD FOR IMPROVING WATER RETENTION QUALITIES OF SOIL AND AN AGENT FOR PERFORMING THIS METHOD

General Electric Co. is prepared to grant non-exclusive licenses under the following patentS upon reasonable terms to domestic manufacturers. Applications for license may be addressed to Counsel Patent and Legal Operation, Corporate Research and Development, General Electric Co., P. O. Box 8, Bldg. K-1, Rm. 4A70, Schenectady, N. Y. 12301.

4,653,428 SELECTIVE CHEMICAL VAPOR DEPOSITION APPARATUS

Inquiries about the patents listed below should be directed to Jay Derman, Z-LOCK MFG. CO., 1201 North Catalina Ave., P. O. Box 949, Redondo Beach, Calif. 90277

4,655,057 SECURITY DEVICE FOR A VIDEO CASSETTE RECORDER OR THE LIKE
4,768,361 SPARE TIRE LOCKING DEVICE
4,779,434 TAILGATE LOCKING DEVICE

General Electric Co. is prepared to grant non-exclisive licenses under the following patent upon reasonable terms to the manufacturers. Applications for license may be addressed to Patent Counsel, GE Appliances, General Electric Co., Appliance Park 2-226, Louisville, Ky. 40225

4,737,617 POWER CONTROL FOR COOKING APPLIANCE WITH TRANSIENT OPERATING MODES

4,135,59 HOSE TRAY FOR LIQUID TRANSPORTER, *Glen Silba*, R. R. 7, Box 357A, Springfield, Mo. 65802

4,185,407 DISPLAY DEVICE ELECTRIC OR BATTERY RUN, *Jack Lamb*, 10822 Magnolia Blvd., #142, North Hollywood, Calif. 91601

4,266,112 WEB-CUTTING PROCESS, *William Niedermeyer*, 1024 Mount Mary Drive, Green Bay, Wis. 54301

4,576,178 AUDIO SIGNAL GENERATOR, *Wyatt, Gerber, Shoup and Badie*, Guy Shoup, One Rockefeller Plaza, New York, N. Y. 10020

4,742,839 SHAKE OR VIBRATION ACTIVATED VALVE OPERATING MECHANISM *Robert Stock*, 886 S. Ponderosa St., Orange, Calif. 92666

4,757,485 COMPOSITE WRIST WATCH, *Alan Young*, G. P. O. Box 6746, Hong Kong

4,762,198 IMPROVED VEHICLE ANTI-THEFT SYSTEM, *Richard Raheb*, 1900 Horatio Ave. Merrick N. Y. 11566

07/214,485 HOLDED SOUND BOX FOR VIOLIN AND THE LIKE *Ronald Morneau*, 4101 Jarry Est, Suite 305, Montreal, Que., Canada H1Z 2H4

07/278,765 BLOW DRYER HELPER DEVICE, *Roger Rico*, 90-54 186th St. Hollis, N. Y. 11426

07/209,313 K. G. MEDICAL T-SHIRT, *Raymond Rodriguez* 345 Sacremento Ave., Spring Valley, Calif. 92077

07/293,487 BAR OF SOAP, *Walter Swamson*, 11147 Fogelson Court, Indianapolis, Ind. 46229

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, their assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

The E. B. Millar Coffee Company, Denver, Colo., Reg. No. 878,794, for the mark "MILLAR'S", Canc. No. 17,533.

Verne Byers dba The Music Management Co. and dba The Music Management Corp., Las Vegas, Nev., Reg. No. 1,496,351, for the mark "THE FABULOUS DORSEYS ORCHESTRA", Canc. No. 17,691.

Stanley Kaufman, New York, N. Y., Reg. No. 1,299,621, for the mark "QUI NATURAL", Canc. No. 17, 790.

ERMA S. BROWN
Administrator
of the Trademark Trial
and Appeal Board
For JEFFERY M. SAMUELS
Assistant Commissioner for Trademarks,

DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

[Docket No. 90525-9125]

Interim Protection for Mask Works of Nationals, Domiciliaries, and Sovereign Authorities of Austria

Agency: Patent and Trademark Office, Commerce
Action: Issuance of Interim Order
Summary: The Secretary of Commerce has delegated to the Assistant Secretary and Commissioner of Patents and Trademarks, by Amendment 2 to Department Organization Order 10-14, the authority under Section 914 of title 17 of the United States Code, the Semiconductor Chip Protection Act of 1984 (SCPA), to make findings and to issue orders for the interim protection of mask works.

On March 7, 1989, the Patent and Trademark Office received a petition for the issuance of an interim order from the Austrian Patent Office. On April 4, 1989, a Notice of Initiation of Proceedings was published at 54 FR 13549, whereby the Commissioner requested comments on the Austrian Federal Law of June 23, 1988, on the Protection of Microelectric Semiconductor Products. Comments supporting the grant of an interim order were received from the U.S. Semiconductor Industry Association. The Commissioner has determined that the Austrian legislation meets the statutory requirements of section 914 of the SCPA, and has determined that an interim protection order shall issue for the protection of mask works of nationals, domiciliaries, and sovereign authorities of Austria. The order will remain in effect until October 31, 1989, the date on which all other orders issued under section 914 will expire.

Dates: The effective date of this order shall be March 7, 1989, the date of receipt of the petition. This order shall terminate on October 31, 1989.

For Further Information Contact: Michael K. Kirk, Assistant Commissioner for External Affairs, by telephone at (703) 557-3065, or by mail marked to his attention and addressed to Commissioner of Patents and Tradermarks, Box 4, Washington, D.C. 20231.

Supplementary Information: Chapter 9 of title 17 of the United States Code establishes an entirely new form of intellectual property protection for mask works that are fixed in semiconductor chip products. Mask works are defined in 17 U.S.C. 901(a)(2) as:

> "a series of related images, however, fixed or encoded
> (A) having or representing the predetermined, three-dimensional pattern of metallic, insulating or semiconductor material present or removed from the layers of a semiconductor chip product; and
> (B) in which series the relation of the images to one another is that each image has the pattern of the surface of one form of the semiconductor chip product."

Chapter 9 further provides for a 10-year term of protection for original mask works measured from their date of registration in the U.S. Copyright Office, or their first commercial exploitation anywhere in the world. Mask works must be registered within 2 years of their first commercial exploitation to maintain this protection.

Foreign mask works are eligible for protection under this chapter under basic criteria set out in section 902; first, that the owner of the mask works is a national, domiciliary, or sovereign authority of a foreign nation that is a party to a treaty providing for the protection of the mask works to which the United Sates is also a party, or a stateless person wherever domiciled; second, that the mask work is first commericially exploited in the United States; or that the mask work comes within the scope of a Presidential proclamation. Section 902(a)(2) provides that the President may issue such a proclamation upon a finding that:

> "a foreign nation extends to mask works of owners who are nationals or domiciliaries of the United States protection (A) on substantially the same basis as that on which the foreign nation extends protection to mask works of its own nationals and domiciliaries and mask works first commercially exploited in that nation, or (B) on substantially the same basis as provided under this chapter to mask works (i) of owners who are, on the date on which the mask works are registered under section 908, or the date on which mask works are first commercially exploited anywhere in the world, whichever occurs first, nationals, domiciliaries, or sovereign authorities of that nation, or (ii) which are first commercially exploited in that nation."

Although this chapter generally does not provide protection to foreign owners of mask works unless the works are first commercially exploited in the United States, it is contemplated that foreign nationals, domiciliaries, and sovereign authorities may obtain full protection if their nation enters into an appropriate treaty or enacts mask works protection legislation. To encourage steps toward a regime of international comity in mask works protection, section 914(a) provides that the Secretary of Commerce may extend the privilege of obtaining interim protection under chapter 9 to nationals, domiciliaries and sovereign authorities of foreign nations if the Secretary finds:

> "(1) that the foreign nation is making good faith efforts and reasonable progress toward---
> (A) entering into a treaty described in section 902(a(1)(A), or
> (B) enacting legislation that would be in compliance with subparagraphs (A) or (B) of section 902(a)(2); and
> (2) that the nationals, domiciliaries and sovereign authorities of the foreign nation, and persons controlled by them, are not engaged in the misappropriation, or unauthorized distribution or commercial exploitation of mask works; and
> (3) that issuing the order would promote the purposes of this chapter and international comity with respect to the protection of mask works.

On March 7, 1989, a petition for the issuance of an interim order under 17 U.S.C. section 914 was submitted to the Commissioner by the Austrian Patent Office on behalf of the Austrian Government. The petition was in the form of a letter from Dr. Josef Fichte, President of the Austrian Patent Office, and a copy of the Austrian Federal Law of June 23, 1988 on the Protection of the Topographies of Microelectronic Semiconductor Products (Austrian Law).

In its comments, the U.S. Semiconductor Industry Association (SIA) states that the Austrian Law appears to afford protection to U.S. mask works on substantially the same basis as provided under the SCPA. SIA recommends issuance of an order extending interim protection to Austrian mask works until October 31, 1989, the date until which existing interim orders have been extended. Thorough review of the Austrian statute is appropriate then, in SIA's view, when the legal regimes for mask work protection in all countries subject to section 914 orders are under consideration.

The record of this proceeding supports a finding that Austria has met the statutory requirements of section 914 (a)(2) by establishing a system for the protection of mask works in Austria on substantially the same basis as the SCPA. The Austrian Law provides an exclusive right to the creator of a topography, defined as a three-dimensional structure of microelectronic semiconductor products. The Law provides protection on the basis of non-commonplace originality resulting from an intellectual effort of the creator. Compulsory licenses are not permitted. An exemption for reverse engineering is included, and innocent infringers are protected.

The Austrian Law establishes a registration system, and the term of protection for eligible topographies is ten years from the date of first commercial exploitation or the date of filing with the Austrian Patent Office, whichever occurs first.

Protection under the law is available to both nationals and residents of Austria and, on a reciprocal basis, to nationals and residents of (1) States party to an international agreement to which Austria is a party, or (2) States identified in ordinances of the Federal Minister for Economic Affairs. Unlike the SCPA, the Austrian Law does not provide for interim protection. The Austrian Government has declared its intention to extend protection under the Law to mask works of the U.S. nationals and domiciliaries, and to mask works first commercialized in the United States.

The record contains no evidence that nationals, domiciliaries or sovereign authorities of Austria are engaged in the misappropriation, unauthorized distribution, or unauthorized commercial exploitation of mask works. Accordingly, the Commissioner finds that issuance of an interim order will promote the purposes of the SCPA and international comity with respect to the protec-

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tion of mask works. The order shall be effective as of March 7, 1989, the date on which the petition was received. The order shall terminate on October 31, 1989, the expiration date of all other existing interim orders issued under section 914. *See* 54. Fed. Reg. 13931 (April 6, 1989).

ORDER EXTENDING INTERIM PROTECTION UNDER CHAPTER 9, TITLE 17, UNITED STATES CODE, TO NATIONALS, DOMICILIARIES AND SOVEREIGN AUTHORITIES OF AUSTRIA

In accordance with the authority vested in me by Amendment 2 to Department Organization Order 10-14 regarding 17 U.S.C. 914, and based upon the record of this proceeding commenced on March 7, 1989, I find that: Austria is making and has been making, since March 7, 1989, good faith efforts toward providing effective protection for mask works in compliance with 17 U.S.C. 902(a)(2); that nationals, domiciliaries, and sovereign authorities of Austria and persons controlled by them are not engaged in the misappropriation or unauthorized distribution or commercial exploitation of mask works; and that the issuance of this order will promote international comity with respect to the protection of mask works.

Accordingly, nationals, domiciliaries, and sovereign authorities of Austria are entitled to protection under Chapter 9 of title 17, United States Code, subject to compliance with all formalities specified therein. The effective date of this order is March 7, 1989, and this order shall terminate on October 31, 1989.

May 10, 1989

DONALD J. QUIGG
Assistant Secretary and Commissioner of Patents and Trademarks

PATENT NOTICES

Certificates of Correction for Week of June 13, 1989

B14,678,498	4,754,228	4,776,218	4,793,352
PP06,542	4,756,605	4,776,566	4,793,697
RE32,845	4,756,640	4,776,612	4,794,107
D298,271	4,757,037	4,777,153	4,794,144
D299,369	4,757,053	4,777,509	4,794,238
4,664,833	4,760,382	4,777,640	4,794,458
4,670,201	4,761,552	4,778,849	4,794,628
4,677,193	4,763,148	4,778,944	4,795,014
4,679,098	4,765,448	4,779,078	4,795,170
4,687,138	4,765,488	4,779,091	4,795,400
4,689,565	4,766,290	4,780,758	4,795,541
4,693,060	4,766,447	4,781,557	4,795,583
4,696,928	4,767,610	4,783,555	4,797,088
4,699,663	4,767,977	4,784,191	4,797,303
4,707,567	4,768,543	4,784,719	4,797,493
4,709,783	4,768,858	4,785,006	4,797,985
4,711,977	4,769,129	4,785,516	4,798,570
4,712,727	4,769,727	4,786,478	4,798,600
4,715,801	4,770,334	4,786,976	4,798,605
4,716,386	4,771,187	4,787,275	4,798,642
4,719,608	4,771,645	4,787,520	4,798,732
4,720,455	4,772,304	4,787,799	4,798,760
4,721,960	4,772,329	4,788,167	4,799,060
4,723,237	4,772,502	4,788,581	4,799,589
4,726,115	4,772,597	4,789,540	4,799,700
4,727,170	4,772,629	4,790,362	4,799,846
4,727,558	4,772,661	4,790,669	4,799,908
4,729,242	4,772,858	4,790,857	4,800,054
4,731,109	4,773,013	4,791,471	4,800,092
4,733,719	4,773,443	4,791,634	4,800,538
4,734,413	4,774,114	4,792,052	4,802,055
4,735,677	4,774,233	4,792,144	4,802,390
4,739,392	4,774,416	4,792,222	4,802,594
4,746,732	4,775,030	4,792,252	4,802,868
4,750,583	4,775,360	4,792,391	4,804,501
4,751,087	4,775,950	4,792,591	4,804,872
4,752,332	4,776,086	4,792,769	4,811,288

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PATENT APPLICATION	New patent application and associated papers and fees.
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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF May 6, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director.	8-21-86
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	3-31-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	5-4-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-31-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. SHAW, Acting Director	11-24-86
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	3-2-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	8-11-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	2-19-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
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MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	1-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	7-22-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-4-88

Expiration of patents: The patents within the range of numbers indicated below expire during May 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 3,659,294 to 3,667,068, inclusive
Plant Patents	3,143 to 3,204 inclusive

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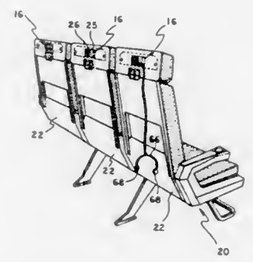
REEXAMINATIONS

JUNE 13, 1989

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,647,980 (1078th)
AIRCRAFT PASSENGER TELEVISION SYSTEM
Arnold R. Steventon, Valencia, and Robert F. Butler, Encino, both of Calif., assignors to Aviation Entertainment Corporation, Valencia, Calif.
Reexamination Request No. 90/001,437, Feb. 17, 1988.
Reexamination Certificate for Patent No. 4,647,980, issued Mar. 3, 1987, Ser. No. 819,737, Jan. 21, 1986.
Int. Cl.[4] H04N *5/64*
U.S. Cl. 358—254



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **21–30** is confirmed.

Claims **5**, **6**, **16** and **20** are cancelled.

Claims **1**, **7**, **12**, **14**, **17** and **31** are determined to be patentable as amended.

Claims **2–4**, **8–11**, **13**, **15**, **18** and **19**, dependent on an amended claim, are determined to be patentable.

New claims **32–35** are added and determined to be patentable.

1. An aircraft passenger television system for use in combination with an aircraft having a [pluarlity] *plurality* of passenger seats, comprising:

a plurality of television modules each having a viewing screen;

means for mounting said plurality of television modules each upon a respective one of said seats with said viewing screen visible from behind said seat, *each of said television modules being mounted within the upper rear side of a headrest portion of said respective seat*; and

means on the aircraft for coupling a plurality of television signals corresponding with a respective plurality of [differnet] *different* video programs on respective different channels to each of said television modules;

each of said television modules being removably mounted with said respective seat, said coupling means and said television module including mating fittings for releasable interconnection prior to mounting of said module with said seat;

each of said television modules including channel selection means for permitting individual passenger selection and viewing of one of said plurality of video programs.

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REISSUES

JUNE 13, 1989

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,946

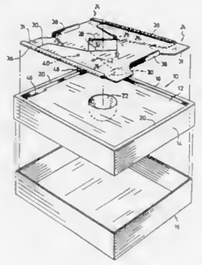
FISH BAIT TIER

Nori Nakata, 6 Van Allan Rd., Scarborough, Ontario, Canada M1G 1C2 , and Joseph Melanson, 1 Haddon Street, Scarborough, Ontario, Canada M1N 2K7

Original No. 4,555,893, dated Dec. 3, 1985, Ser. No. 586,421, Mar. 5, 1984. Application for reissue Jun. 13, 1989, Ser. No. 105,137

Int. Cl.[4] B65B *11/02, 47/04, 51/10*

U.S. Cl. 53—452 19 Claims



16. A method of heat sealing bait in a thermoplastic mesh bag, comprising

partially filling a thermoplastic mesh bag with fish bait,

placing the closed end of the bag containing the bait in a large recess in a housing,

temporarily gripping the bag adjacent its open end, and outwardly of said recess, between the converging edges of two metal plates which are mounted on the housing to slide into and out of closed positions in which they overlie and substantially close off the open end of said recess, and in which positions said converging edges of the plates surround and releasably hold said bag closed adjacent to but inwardly of its open end, and

temporarily applying sufficient heat to said bag at the side of said plates remote from said recess to cause the open end of said bag to be heat sealed closed.

Re. 32,947

MAGNETIC TRANSCUTANEOUS MOUNT FOR EXTERNAL DEVICE OF AN ASSOCIATED IMPLANT

Kenneth J. Dormer, Edmond, and Gordon L. Richard, Minco, both of Okla., assignors to Baptist Medical Center of Oklahoma, Inc., Oklahoma City, Okla.

Original No. 4,352,960, dated Oct. 5, 1982, Ser. No. 192,480, Sep. 30, 1980. Application for reissue Jan. 14, 1988, Ser. No. 144,011

Int. Cl.[4] A61F *11/00*

U.S. Cl. 128—420.6 19 Claims

3. [An apparatus as defined in claim 1, wherein:

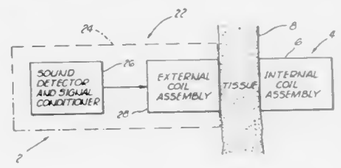
said first member includes electronic means for receiving an electrical signal; and] *A transcutaneous coupling apparatus, comprising:*

a first member positioned subcutaneously;

a second member positioned supercutaneously; and

magnet means, cooperating with said first and second members, for magnetically securing said second member to said first member; and wherein

said second member includes electronic means for [transmitting the electrical signal] *generating an electromagnetic transmission to activate electrical conduction in said first member; and*



said first member includes electronic means, responsive to said electromagnetic transmission, for electrically stimulating subcutaneous tissue.

Re. 32,948

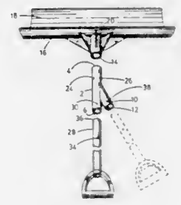
PIVOTABLE MULTIPLE SOCKET

John F. Lapshansky, 401 Terry Dr., Joliet, Ill. 60435

Original No. 4,538,847, dated Sep. 3, 1985, Ser. No. 629,375, Jul. 10, 1984. Application for reissue Aug. 25, 1987, Ser. No. 89,330

Int. Cl.[4] A01B *1/22;* B25G *3/12;* E01H *5/02*

U.S. Cl. 294—51 16 Claims



11. A shovel including a shovel blade having a shovel handle adapted to be connected thereto, comprising:

a socket permanently mounted to a rear wall of said shovel blade;

means for connecting said shovel handle to said shovel blade, said connecting means being insertable into said permanently mounted socket, said connecting means being rotatable relative to said permanently mounted socket;

said permanently mounted socket having a longitudinal axis extending from said shovel blade at substantially a right angle to a lateral direction across said shovel blade, said connecting means being associated with said shovel handle to rotate therewith relative to said permanently mounted socket, said shovel handle having a longitudinal axis adjacent said connecting means extending at an oblique angle to the longitudinal axis of said permanently mounted socket adjacent said connecting means; and

means for releasably securing said connecting means in a discrete plurality of fixed positions in said permanently mounted socket;

whereby said shovel handle can be retained in any of said discrete plurality of fixed positions for angular adjustment of said shovel handle relative to said shovel blade.

Re. 32,949

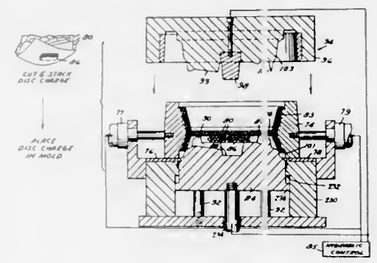
MOLD FOR FORMING A FIBER REINFORCED COMPOSITE WHEEL CONSTRUCTION

James A. Woelfel, and Richard W. Smith, both of Lansing, Mich., assignors to Motor Wheel Corporation, Lansing, Mich.

Original No. 4,583,933, dated Apr. 22, 1986, Ser. No. 685,448, Dec. 24, 1984. Division of Ser. No. 559,623, Dec. 12, 1983, Pat. No. 4,514,013, which is a continuation of Ser. No. 277,657, Jun. 26, 1981, abandoned, which is a division of Ser. No. 119,128, Feb. 6, 1980, Pat. No. 4,294,639, which is a continuation-in-part of Ser. No. 14,265 Feb. 11, 1979, abandoned. Application for reissue Nov. 16, 1987, Ser. No. 121,154

Int. Cl.[4] B29C *43/04*

U.S. Cl. 425—330 9 Claims



2. A compression mold for forming a resin wheel including integral rim and disc and having bead retaining flanges at axial ends of said rim comprising first radially reciprocable mold sections having mold surfaces defining radially outward rim forming surfaces of a mold cavity, second axially reciprocal mold sections having mold surfaces defining disc forming portions of said mold cavity and cooperable with opposing surfaces of said first mold sections for forming portions of said rim including said flanges, first means supporting said first mold sections for reciprocation relative to [said] *a central mold* axis, second means mounting said second mold section for unitary reciprocation axially with respect to each other and means coupled to said first and second mold sections for reciprocating all of said mold sections between open and closed positions, said second mold sections being spaced apart throughout their extent in fully closed positions such as to form a wheel with an imperforate disc.

Re. 32,950

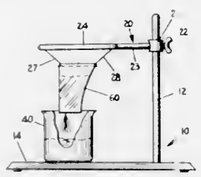
FUNNEL TEACHING METHOD AND APPARATUS

Peteris E. Graube, 1145 Collingdale Ave., N.W., Grand Rapids, Mich. 49504

Original No. 4,571,191, dated Feb. 18, 1986, Ser. No. 632,617, Jul. 19, 1984. Continuation-in-part of Ser. No. 517,973, Jul. 28, 1983, abandoned. Application for reissue Feb. 10, 1988, Ser. No. 154,791

Int. Cl.[4] G09B *23/02, 23/12*

U.S. Cl. 434—126 46 Claims



1. A method for teaching physical principles of fluid flow and mathematical principles [of integration] by concrete, measurable examples comprising the steps of: supporting a funnel of predetermined interior configuration in position to receive liquid in an open upper end and discharge the liquid through an outlet orifice in a lower end, the funnel having sidewalls with interior surfaces that conform with mathematical formulas as a function of the distance along the funnel axis that, when inserted in the formula for calculating the time it takes for the funnel to empty, provides a function capable of being integrated *either analytically or numerically;*

filling the funnel with a liquid to a preselected level in the funnel; and

measuring [the time it takes for all] *a characteristic* of the liquid [to flow] *as said liquid flows* out of the funnel outlet orifice, the measured [time] *characteristic* value being comparable with a [time] *theoretical characteristic* value obtainable theoretically [by integrating the equation for the theoretical time it takes the funnel to empty] *by mathematical formulation*, a comparison of the measured and theoretical values using mathematical [integration] *calculation* providing a concrete experience that facilitates learning the principles of fluid flow, *science* and [integration] *mathematical operations* in terms of abstract symbols.

Re. 32,951

PROCESS FOR PREPARING EPOXY RESINS HAVING IMPROVED PHYSICAL PROPERTIES WHEN CURED USING QUATERNARY PHOSPHONIUM CATALYSTS

Ross C. Whiteside, Jr., Angleton; Adolphus V. Gist, Lake Jackson, both of Tex., and George A. Doorakian, Bedford, Mass., assignors to The Dow Chemical Company, Midland, Mich.

Original No. 4,352,918, dated Oct. 5, 1982, Ser. No. 212,959, Dec. 4, 1980. Application for reissue Jun. 30, 1983, Ser. No. 509,479

Int. Cl.[4] C08G *59/62*

U.S. Cl. 528—89 12 Claims

1. In a process for advancing epoxy resins in molecular weight by reacting (A) an epoxy resin which is a glycidyl ether of a dihydric phenol having an average of more than one glycidyl ether group per molecule with (B) a dihydric phenolic compound in the presence of (C) a phosphonium catalyst employing components (A) and (B) in quantities such that the phenolic hydroxyl to epoxide equivalent ratio is that which will provide a theoretical percent epoxide of the resultant reaction product of from about 2.7 to about 14; the improvement which comprises employing the catalyst, component (C), in a quantity such that the epoxy resin which would result when subjecting a mixture of components (A), (B) and (C) to suitable reaction conditions produces an advanced epoxy resin wherein the difference obtained by subtracting the percent epoxide obtained by analysis from the theoretical percent epoxide is from about [0.5] *0.74* to about 4; thereby providing an epoxy resin which when cured with a curing quantity of a curing agent provides a composition which has an improvement in one or more of the properties selected from the group consisting of glass transition temperature and increased reactivity.

Re. 32,952

METHOD OF PREPARING N-ACRYLOYL-α-AMINO ACIDS

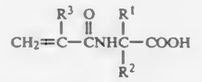
Larry R. Krepski, White Bear Lake; Howell K. Smith, II, Lauderdale; Jerald K. Rasmussen, Stillwater, and Steven M. Heilmann, Afton, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Original No. 4,694,103, dated Sep. 15, 1987, Ser. No. 865,190, May 19, 1986. Application for reissue Dec. 30, 1987, Ser. No. 139,788

Int. Cl.[4] C07C *99/10*

U.S. Cl. 562—450 17 Claims

17. A process for providing an N-acryloyl-α-amino acid having the formula

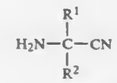


wherein:

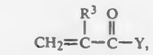
R^1 and R^2 are independently an alkyl group of 1 to 14 carbon atoms, a cycloalkyl group of 3 to 14 carbon atoms, an aryl group of 5 to 12 ring atoms, an arenyl group of 6 to 26 carbon and heteroatoms, or R^1 and R^2 taken together with the carbon to which they are joined form a carbocyclic ring containing 4 to 12 ring atoms, with the proviso that only one of R^1 and R^2 can be aryl, and

R^3 is hydrogen or methyl, said process comprising the steps:

(a) acryloylating an aminonitrile having the formula



wherein R^1 and R^2 are as previously defined with an acryloylating agent having the formula.



wherein R^3 is as previously defined and Y is chloride, methacrylyloxy, or acryloyloxy, to provide an acrylamidonitrile, and

(b) hydrolyzing the resulting acrylamidonitrile in aqueous acid to provide said N-acryloyl-α-amino acid.

Re. 32,953

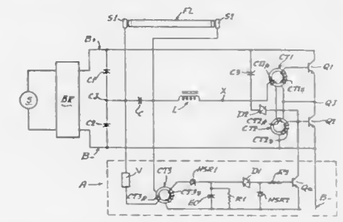
ELECTRONIC FLUORESCENT LAMP BALLAST WITH OVERLOAD PROTECTION

Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Original No. 4,554,487, dated Nov. 19, 1985, Ser. No. 495,540, May 17, 1983. Application for reissue Aug. 3, 1987, Ser. No. 87,330

Int. Cl.[4] H05B *41/24*

U.S. Cl. 315—224 21 Claims



16. An arrangement comprising:

a power source providing a DC voltage at a pair of DC terminals;

inverter means connected with the DC terminals and operative to provide an AC voltage at a pair of AC terminals, the inverter means having disable means operative on receipt of a disable signal to substantially reduce the magnitude of the AC voltage;

L-C series-circuit connected with the AC terminals, the L-C series-circuit: (i) being resonant at or near the frequency of the AC voltage, and (ii) having a tank-capacitor across which an output voltage is provided at a pair of output terminals;

load means connected with the output terminals and operative, when indeed connected and functioning properly, to limit the magnitude of the output voltage of a first magnitude level;

dissipative voltage-clamping means connected in circuit with the output terminals and operative to limit the magnitude of the output voltage to a second magnitude level in case the load means were to fail to function properly, the second magnitude level being higher than the first magnitude level; and

control means connected in circuit with the output terminals and operative, in case the load means were indeed to fail to function properly, to provide said disable signal after a brief delay, thereby manifestly limiting the amount of energy having to be absorbed by the dissipative voltage-clamping means.

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PLANT PATENTS

GRANTED JUNE 13, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,843

ROSE PLANT NAMED WINTONBURY PARISH

David H. Berg, Bloomfield, Conn., assignor to The First Congregational Church of Bloomfield, Bloomfield, Conn.

Filed Feb. 8, 1988, Ser. No. 153,668
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by its uniquely colored semi-double flowers wherein the bottom two-thirds of the petal is white and the top one-third is light red and wherein the petals are symmetrically arranged, pointed, and reflexed.

6,844

MINIATURE ROSE PLANT 'HONEY BEAR'

Lauren M. Chaffin, 4121 Prospect Ave., Yorba Linda, Calif. 92686

Filed Apr. 4, 1988, Ser. No. 177,582
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, rounded, much branched habit substantially as illustrated and described, characterized by buds and flowers which are in a color hue similar to Colibri (Miniature rose—non patented) giving a coloring effect of light apricot blend and resembling Rise 'N Shine (Miniature rose—U.S. Plant Pat. No. 4,231) in form and size; having buds and flowers of a distinctive and unusual appearance as compared to other miniature rose plants; said flowers being fully double, uniquely formed and further characterized by a compact growth habit with abundant foliage, ease of propagation from soft-wood cuttings or by budding, and being a prolific producer of flowers.

6,845

AFRICAN VIOLET PLANT NAMED IMPROVED FLORIDA

Reinhold Holtkamp, Sr., Wertherstrasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 5, 1988, Ser. No. 152,814
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Improved Florida, as described and illustrated, and particularly characterized by its single, violet-shaped, purplish pink flowers with slightly frilled edges and darker center; strong, upright flower stems that curve slightly toward the center to form a compact bouquet above the leaves; medium green spear-shaped, slightly serrated leaves; profuse flowering, vigorous and compact growth habit, flowering 10–11 weeks after potting, and its long lasting and non-dropping flowers.

6,846

AFRICAN VIOLET PLANT NAMED ANGELICA

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 5, 1988, Ser. No. 152,816
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Angelica, as described and illustrated, and particularly characterized by its single, shiny, light salmon pink flowers with darker pink center radiating into the 2 small petals; strong, upright flower stems that curve slightly toward the center to form a bouquet above the leaves; bright green oval to heart-shaped leaves; profuse flowering, vigorous growth habit, flowering 10–11 weeks after potting, and its long-lasting and non-dropping flowers.

6,847

AFRICAN VIOLET PLANT NAMED HARLEQUIN

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 5, 1988, Ser. No. 152,844
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Harlequin, as described and illustrated, and particularly characterized by its single, variegated flowers with white background and clear-cut purplish red frilled edges that are larger on the 2 small petals than on the 3 big petals; strong, upright flower stems that curve slightly toward the center to form a compact bouquet above the leaves; large, medium green, occasionally slightly serrated leaves; profuse flowering vigorous and compact growth habit, flowering 10–11 weeks after potting, and its long lasting and non-dropping flowers.

6,848

AFRICAN VIOLET PLANT NAMED DALLAS

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 5, 1988, Ser. No. 152,845
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Dallas, as described and illustrated, and particularly characterized by its single, purplish pink flowers with wavy edges and darker pink center; strong, upright flower stems that curve toward the center to form a bouquet above the leaves; bright green, serrated girl-type leaves; profuse flowering, vigorous and compact growth habit, flowering 10–11 weeks after potting, and its long-lasting and non-dropping flowers.

6,849

AFRICAN VIOLET PLANT NAMED IMPROVED GEORGIA

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 5, 1986, Ser. No. 152,846
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Improved Georgia, as described and illustrated, and particularly characterized by its single, violet-shaped, pink flowers with slightly frilled edges and darker center; strong, upright flower stems that curve slightly toward the center to form a compact bouquet above the leaves; medium green oval to heart-shaped, slightly serrated leaves; profuse flowering, vigorous and compact growth habit, flowering 10–11 weeks after potting, and its long lasting and non-dropping flowers.

6,850

AFRICAN VIOLET PLANT NAMED ALICE

Reinhold Holtkamp, Sr., Werther Strasse 112, D4294 Isselburg, Fed. Rep. of Germany

Filed Feb. 5, 1988, Ser. No. 152,847
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—69 **1 Claim**

1. A new and distinct cultivar of African violet named Alice, as described and illustrated, and particularly characterized by its single, variegated flowers mainly white with a lilac center and a fine purple line around the frilled edges; wide lilac edges

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on the two small petals; strong, upright flower stems that curve slightly toward the center to form a compact bouquet above the leaves; medium green, wavy and serrated leaves; profuse flowering, vigorous growth habit, flowering 10–11 weeks after potting, and its long lasting and non-dropping flowers.

6,851
CHRYSANTHEMUM NAMED CALIFORNIA MONEYMAKER
Rene Van Wingerden, Carpinteria, Calif., assignor to California Plant Company, Carpinteria, Calif.
Filed Dec. 11, 1987, Ser. No. 131,851
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—74 1 Claim

1. The new and distinct variety of Chrysanthemum plant and the parts thereof, substantially as herein shown and described, characterized by its profuse recurrent production of medium sized flowers with controlled photoperiod, being borne singly on straight stems growing from a main stem in a spray manner, the plant branching prolifically, if pinched, with vigorous, upright stems of good strength.

6,852
DISTINCT VARIETY OF POINSETTIA NAMED H516A
Alexander Hrebeniuk, R.D. #1, Box 118, Sugar Run, Pa. 18846
Filed Apr. 6, 1988, Ser. No. 178,332
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—86 1 Claim

1. A new and distinct variety of Poinsettia plant as herein shown and described and particularly characterized by its dark red and fade resistance bracts, dark green foliage, triple form and compact habit, large bracts, tight and long lasting Cyathia and long lasting keeping qualities, and parts therefor.

6,853
DISTINCT VARIETY OF POINSETTIA NAMED H420C
Alexander Hrebeniuk, R.D. #1, Box 118, Sugar Run, Pa. 18846
Filed Apr. 6, 1988, Ser. No. 178,335
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—86 1 Claim

1. A new and distinct variety of Poinsettia plant as herein shown and described and particularly characterized by its bright red and fade resistant bracts, very dark green leaves, triple rows of flat and smooth bracts, medium compact growth habit, and long lasting keeping qualities in the home, and parts therefor.

6,854
DIEFFENBACHIA HYBRIDA PARADISE
Edwin J. Frazer, Brisbane, Australia, assignor to Hartman Plant Laboratories, Inc., Santa Paula, Calif.
Filed Mar. 9, 1987, Ser. No. 23,603
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—88 1 Claim

1. A new and distinct cultivar of Dieffenbachia as described and illustrated.

6,855
DIEFFENBACHIA HYBRIDA TAHITI
Edwin J. Frazer, Brisbane, Australia, assignor to Hartman Plant Laboratories, Inc., Santa Paula, Calif.
Filed Mar. 9, 1987, Ser. No. 23,604
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—88 1 Claim

1. A new and distinct cultivar of Dieffenbachia as described and illustrated.

6,856
DIEFFENBACHIA HYBRIDA TORCH
Edwin J. Frazer, Brisbane, Australia, assignor to Hartman Plant Laboratories, Inc., Santa Paula, Calif.
Filed Mar. 9, 1987, Ser. No. 23,605
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—88 1 Claim

1. A new and distinct cultivar of Dieffenbachia as described and illustrated.

6,857
AGLAONEMA 'B.J. FREEMAN'
B. Frank Brown, Palm Bay, Fla., assignor to Weyerhaeuser Company, Tacoma, Wash.
Filed Feb. 8, 1988, Ser. No. 153,733
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—88 1 Claim

1. A new and distinct variety of Aglaonema substantially as shown and described, characterized by:

a full and compact appearance, a vigorous growth rate and an upright and spreading habit, and a large stature that resembles Dieffenbachia species;

the variety further having large elliptic leaves variegated with two distinct colors on the upper leaf surface, the basic color being a silvery-green with a glaucous appearance, with dark green leaf margins around the entire circumference, the area next to the margins and the midrib having blotches and spots of the same color as the margins.

6,858
DIEFFENBACHIA HYBRIDA HILO
Edwin J. Frazer, Brisbane, Australia, assignor to Hartman Plant Laboratories, Inc., Santa Paula, Calif.
Filed Mar. 9, 1987, Ser. No. 23,607
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—88 1 Claim

1. A new and distinct cultivar of Dieffenbachia as described and illustrated.

PATENTS

GRANTED JUN. 13, 1989

ERRATA

For CLASS	See PATENT NO.
062-137	4,838,026
073-861	4,838,127
248-188	4,838,440
418-170	4,838,764
123-352	4,838,780
137-007	4,838,945
335-210	4,839,059
135-068	4,839,283
210-210	4,839,352
252-350	4,839,434
528-328	4,839,441
528-422	4,839,442
525-474	4,839,443
525-481	4,839,444
525-503	4,839,445
525-504	4,839,446
388-815	4,839,570
340-606	4,839,571
307-146	4,839,605
371-038	4,839,755
369-025	4,839,857

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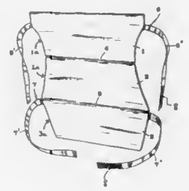
PATENTS

GRANTED JUNE 13, 1989

GENERAL AND MECHANICAL

4,837,859
SUPPLEMENTARY CLOTHING
Bjorn Hamberg, P.O. Box 94, S-822 00, Alfta, Sweden
Filed Dec. 10, 1986, Ser. No. 940,056
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—2 12 Claims



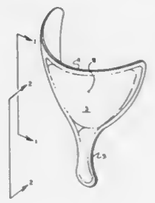
1. A supplementary clothing article adapted to be carried in a folded condition about a user's torso and for use, to be unfolded to provide an insulated area between a substrate and the user's body, comprising: (a) a one-piece member of heat insulating material having continuous upper and lower ends; said member comprising at least one upper pad member having a free edge forming said continuous upper end, at least one intermediate pad member, and at least one lower pad member, with the lower pad member forming said continuous lower end, said pad members each being comprised of a discrete mat of heat insulating material provided with an outer covering of a textile material the pad members being substantially the same length ; (b) a flexible connection forming a fold area between said intermediate pad member and each of the adjacent upper and lower pad members to permit adjacent ones of said pad members to be placed in juxtaposition with each other to form a layered or folded article and, when unfolded about said fold area, to provide a lay-flat article; and (c) a pair of flexible strap means spaced-apart along the length of said article, said strap means comprising a first set of belts connected to the upper portion of said upper pad member, and a second set of belts connected to the upper portion of said lower pad member, said first set of belts being adapted to encircle a user's torso at the waist thereof and to engage each other, said second set of belts being adapted to engage each other either to encircle a user's torso at the waist thereof there when said article is in its folded form or to encircle the user's lower torso in the region of the user's legs when said article is in its unfolded form.

4,837,860
PROTECTIVE GARMENT
Thomas J. Roberts, 1233 Sommerset, Elk Grove, Ill. 60007, and Timothy J. Roberts, 820 Yosemite, Rosselle, Ill. 60172
Filed Apr. 4, 1988, Ser. No. 177,320
Int. Cl.[4] A41D *13/12*
U.S. Cl. 2—51 4 Claims

1. A disposable protctive garment comprising an upper portion having a neck opening, a front portion, a back portion;
sleeve members attached to the upper portion for providing complete coverage of the whole arm;
said sleeve members having weakened lines at several places therealong to provide for easy tearing of the sleeves to a convenient length;
means secured to the sleeve members adjacent the weakened lines to provide for tightening the sleeve members around the arms of the wearer,
the front having a lower portion providing coverage of the front lower body of the wearer;

a tie means for securing the garment at the waist of the wearer.

4,837,861
FACIAL SPRAY GUARD
Evelyn Cole, Rt. 1, Box 340, Beckville, Tex. 75631, assignor to Evelyn Cole, Beckville, Tex.
Filed Jul. 21, 1988, Ser. No. 202,406
Int. Cl.[4] A61F *9/00*
U.S. Cl. 2—9 3 Claims

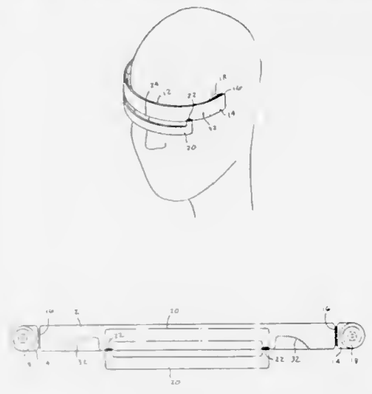


1. A face and ear guard used to protect the user's face, ears or eyes during the application of hair spray or the like, said guard comprising:
a paddle like main piece having concave and convex sides and having two side edges and one top edge,
a handle extending from said main piece, and
a reflector type mirror affixed to said concave side of said main piece.

4,837,862
SUN, RAIN AND WIND DEFLECTOR
Dean Heil, 16441 Creeksouth, Houston, Tex. 77068
Filed May 12, 1987, Ser. No. 49,857
Int. Cl.[4] A61F *9/04;* A42B *1/18*
U.S. Cl. 2—12 10 Claims

1. A personal sun shield comprising:
(a) a flexible primary shield member extending about the face of the wearer;
(b) a lower shield member extending downward from said primary shield member such that a slot is provided between said primary shield member and said lower shield member at the wearer's line of vision;

(c) hinge means connecting said primary shield member to said lower shield member, said hinge means allowing said



lower shield member to be folded upward to reside behind and become contiguous with said primary shield member.

4,837,863
HOSPITAL GOWN
Cheryle Van Scoy-Mosher, 256 Rafael Walk, Long Beach, Calif. 90803
Filed Mar. 31, 1988, Ser. No. 175,867
Int. Cl.[4] A41D *10/00*
U.S. Cl. 2—114 14 Claims

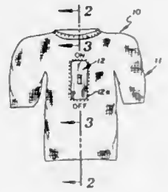
1. A patient's gown comprising a body portion having a yoke region and an aperture in said yoke region, said body portion, when laid out flat, being substantially rectangular and being foldable at said yoke region thereby defining a front panel and inner and outer back panels;

said front panel having first and second side edges, said inner back panel having a third side edge abutting said first side edge of said front panel when said body portion is folded at said yoke region, and said outer back panel having a fourth side edge abutting said second side edge of said front panel when said body portion is folded at said yoke region;

said inner and outer back panels each having respective center portions thereof, said center portion of said outer back panel overlapping substantially all of said center portion of said inner back panel;

whereby said patient's gown is placeable on a patient's torso with the patient's head extending through said aperture so that said front panel and inner and outer back panels substantially cover the patient's torso.

4,837,864
ARTICLE OF CLOTHING WITH THREE DIMENSIONAL APPLIQUE
Gerald D. Thill, Eden Prairie, Minn., assignor to Spearhead Industries, Inc., Eden Prairie, Minn.
Filed Jan. 25, 1988, Ser. No. 147,979
Int. Cl.[4] A41D *27/08;* A41B *1/00*
U.S. Cl. 2—244 6 Claims



1. An article of clothing having a three dimensional applique, said article including:

a. a continuous front and rear panel and arms to provide a shirt;

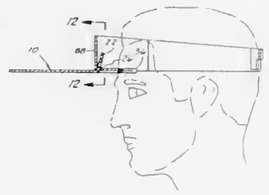
b. an aperture formed in said front panel;

c. a formed, three dimensional article having a peripheral attachment flange;

d. said three dimensional article being received over said aperture; and,

e. said peripheral flange of said three dimensional article being attached to the edges of said aperture, whereby said three dimensional article will extend forwardly through said front panel of the shirt.

4,837,865
SUN VISOR FORMED FROM A FOOD AND BEVERAGE CARRIER
Arlen L. Roth, 8150-1 Canby Ave., Reseda, Calif. 91335
Filed Jun. 20, 1988, Ser. No. 209,203
Int. Cl.[4] A42B *1/00*
U.S. Cl. 2—196 3 Claims



1. A sun visor formed from a disposable food and beverage carrier of conventional size consisting essentially of:

a food and beverage carrier having a rectangular flat bottom with two sides and a front end and a rear end and with a perforated half circle line in the middle section of said bottom and which extends to each side of said bottom to define a sun visor in conjunction with said front end of said bottom, the area thus formed extending from said half circle line to the rear end of said bottom and between said sides removable by tearing;

a perforated oval shaped member formed in said bottom and located between said front end of said bottom and said perforated half circle line and adapted to be punched out to define the rear portion of said sun visor;

a side flap member formed along each said side of said bottom and having a longitudinal fold line along its length, and having a perforated slanted straight line extending from one end of said side flap to the other end of said side flap, and having a portion of said fold line perforated between said rear end of said bottom and the intersection of said half circle line with said fold line, each side flap member forming a side of said carrier when in an assembled condition and forming a head band for said sun visor when the portion of each flap member is torn off from above said perforated slanted straight line;

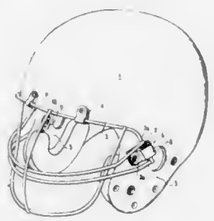
an end flap member formed at said front end of said carrier and an end flap member formed at said rear end of said carrier, said front end flap member having a generally square tab member formed at each end of said front end flap member and having a fold line along said front end of said bottom, said rear end flap member having a generally square tab member formed at each end of said rear end flap member and having a fold line along said rear end, said front end flap member forming the front end of said carrier and said rear end flap member forming the rear end of said carrier, when said carrier is in an assembled condition with each tab member secured to a side flap member in said assembled condition of said carrier;

a strip member formed form the top portions of said end flap member forming the rear end of said carrier and from each tab member of said rear end flap member, said strip member having a die cut lower edge extending form near each end of each tab member to the uncut middle secoin of said rear end flap member;

a strip member formed from the top portions of said front end flap member forming the front end of said carrier and from each tab member of said front end flap member, said strip member having a lower edge perforated at each end of each tab member and at the middle section of said front end flap member and with its remaining length die cut from the lower portions of said front end flap member and of each said tab member; and

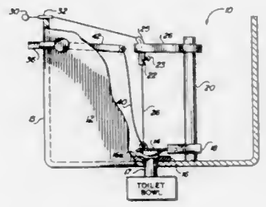
means for securing said head band of said sun visor around a person's head formed in each said side flap member.

4,837,866
SHOCK ATTENUATION TENSION MOUNTING FOR FACE GUARD
James L. Rector, Vienna, and Robert M. Zide, Williamstown, both of W. Va., assignors to Pro-Line, Inc., Marietta, Ohio
Filed Jul. 18, 1988, Ser. No. 219,777
Int. Cl.[4] A41D *13/00*
U.S. Cl. 2—424 18 Claims



1. A shock attenuation tension mounting for connecting a face guard to a helmet comprising, a pair of looped straps positioned on each side of the helmet, each pair of looped straps including an inner relatively stretchable looped strap enclosing a wire segment of the face guard, an outer, relatively stiff, looped strap enclosing said inner looped strap, and fastener means extending through said straps and the sides of said helmet, whereby the inner strap allows controlled movement of the face guard toward the helment with increasing resistance force for shock attenuation, and the outer strap limits the movement of the face guard toward the helmet and resists breakage at maximum impact force from a frontal blow.

4,837,867
DUAL FLUSH SYSTEM FOR TOILETS
John B. Miller, 110 W. Los Robles, Green Valley, Ariz. 85614
Filed Mar. 25, 1988, Ser. No. 173,055
Int. Cl.[4] E03D *1/14*
U.S. Cl. 4—324 6 Claims



1. An improved dual flush system providing a partial flush in addition to the usual complete flush for toilets of the type having an upper water holding tank and a lower waste receiving bowl, the water holding tank having a valve seat situated in the lower portion thereof connective to a water discharge port operably connecting to the bowl, a main valve operably situated on said valve seat adapted to be lifted off a sufficient distance to become buoyant and thereby become fully open and pass all water held in the tank into the water discharge port and into the bowl for the complete flush, an overflow pipe situated proximate the valve seat, and a main flush handle and lever pivotally attached to the tank and operably connected to the main valve, the improvement to effect a partial flush comprising:

means to open the main valve to permit water to flow into the discharge port and into the bowl; and

means to limit the opening of the main valve to prevent the main valve from becoming buoyant and fully open, said means including

(1) means to lift the main valve off the valve seat a predetermined distance including a cord having a length with first and second ends and capable of lengthwise travel, said cord first end attached to the main valve, the main valve lifted off the valve seat by lengthwise travel of said cord; and

(2) means to limit the lengthwise travel of said cord to said predetermined distance including an arm operably attached to the overflow pipe, said arm having an opening therethrough receiving and passing said cord through said arm, and a stop positionally attached to said cord between said cord first end and said arm, said stop so positionally attached to said cord as to strike said arm after said predetermined lengthwise travel of

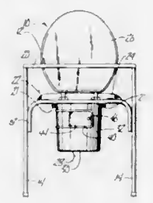
said cord to terminate further lengthwise travel whereby the main valve is lifted off the valve seat said predetermined distance by said cord lengthwise travel in order that the main valve does not become buoyant and will return to the valve seat when the main valve is no longer being held up by said cord thereby only a partial flush of the bowl is effected and not a complete flush by retaining control over the opening of the main valve in order that the main valve may be closed prior to a complete flush.

4,837,868

COMMODE DEVICE FOR INVALID PATIENTS

Joan A. Allen, 613 West State St., Marshalltown, Iowa 50158

Continuation of Ser. No. 017,834, Feb. 24, 1987, abandoned.
This application Jun. 17, 1988, Ser. No. 208,152
Int. Cl.[4] A47K *11/16*
U.S. Cl. 4—480 4 Claims



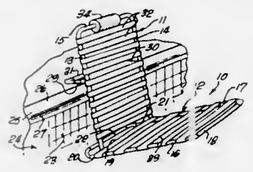
1. A commode device for invalid patients, comprising,
a chair frame having a plurality of supporting legs, and a horizontally disposed toilet seat portion,
a commode receptacle mounted on said frame below said toilet seat portion,
said commode receptacle being generally cylindrically shaped and having a bottom portion, a substantially vertically straight continuous sidewall portion extending upwardly from said bottom portion and terminating at an open top, with said open top having a diameter substantially equal to the diameter of said commode receptacle as defined by said sidewall portion,
an access port in said sidewall portion and elevated above said bottom portion to permit manual access to the interior of said commode receptacle to permit cleaning of an invalid patient seated over said open top,
a closure means secured to said commode receptacle to permit said port to be selectively opened and closed,
said closure means being substantially coextensive with the plane of said sidewall portion in both of its open and closed positions to permit easy access to the interior of said commode receptacle in confined spaces.

4,837,869

CHAIR FOR USE IN SWIMMING POOLS

Todd R. Simmon, 11777 Gayview Dr., La Mirada, Calif. 90638

Filed Feb. 29, 1988, Ser. No. 161,485
Int. Cl.[4] E04N *3/19*
U.S. Cl. 4—496 16 Claims



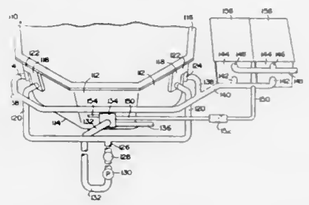
15. A chair for use in a swimming pool, spa or other aquatic body of the type which is surrounded by coping and which has a pool side below the coping, said chair being supported on said coping and side of said swimming pool, spa or other aquatic body, said chair and pool side comprising:
pool coping means at the edge of a swiming pool; said pool coping having a generally horizontal upper surface and said coping means having an edge at the edge of the pool, said edge being above a generally vertical pool side and said swimming pool including a wear line below the pool coping means and pool sides below said wear line; and
a pool chair including a generally horizontal seat having a front bar and two side bars and a generally vertical back attached to said seat, said generally vertical back having a base and two sides affixed to the two side bars of the seat and having a coping supported bar affixed to the generally vertical back and positioned atop the pool coping means and extending away from the vertical back and over the edge of the pool coping and said pool chair having pool side contact meams located below the water line of the pool affixed to the two side bars of the seat as an extension thereof and said side contact means contacting the side of the swimming pool to hold the seat of the pool chair away from the side of the pool.

4,837,870

SPA OVERFLOW SYSTEM

Robert B. Wiley, 4655 118th Ave., Clearwater, Fla. 33520

Continuation of Ser. No. 712,531, Mar. 18, 1985, abandoned.
This application Jun. 8, 1987, Ser. No. 59,574
Int. Cl.[4] E04H *3/18*
U.S. Cl. 4—508 5 Claims



5. A spa having (a) a water overflow control system and (b) a water flow circulating system connected thereto, with the overflow control system comprising an overlfow chamber and a water overflow tank communicating with the chamber, with the chamber communicating at its upper portion with the spa at its normal desired upper water level (c) a manifold communicating with the spa at a point in the lower portion of the spa, and (d) first conduit communicating at one end with the bottom of the overlflow tank and at its other end with the manifold, and with the circulation system including a second conduit communicating at one end in the upper portion of the spa and with the manifold at its other end, and having a pump arranged intermediate the ends of the second conduit for pumping water from the upper portion of the spa to the manifold said pump via venturi action in said manifold being effective to draw water through the first conduit for flow from the overflow tank to the bottom of the spa by way of the manifold.

4,837,871

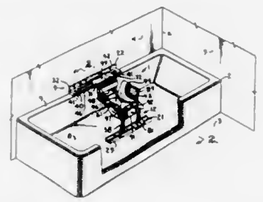
INFANT BATH SEAT

Johnny J. Wheeler, 814 E. Hayward, Independence, Mo. 64050

Filed Dec. 14, 1987, Ser. No. 132,598
Int. Cl.[4] A47K *3/024*
U.S. Cl. 4—546 10 Claims

1. A bath seat for mounting in a bathtub including a bottom and a rim, which comprises:
(a) a mounting assembly including:
(1) a bottom track subassembly adapted for mounting on said bathtub bottom; and
(2) an upper track subassembly adapted for mounting on said bathtub rim;
(b) a frame assembly including:
(1) an upright support standard with upper and lower ends;
(2) a horizontal cross beam including an inner end attached to said support standard upper end and an outer end;

(3) an upright suspension standard including a lower end attached to said cross beam outer end and an upper end;
(4) an extension including an inner end attached to said suspension standard upper end and an outer end;
(5) a lower wheel subassembly mounted on said support standard lower end and adapted for rollingly engaging said bottom track subassembly; and



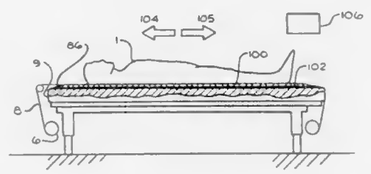
(6) an upper wheel subassembly mounted on said extension outer end and adapted for rollingly engaging said upper track subassembly;
(c) a sling assembly mounted on said cross beam and adapted for supporting an occupant of said bath seat; and
(d) said bottom track subassembly including a channel member and a suction cup mounted on said channel member for releasable attachment to said bathtub bottom.

4,837,872

PATIENT TRANSFER ARRANGEMENT

Paul DiMatteo, Dix Hills, and Robert Segnini, Stony Brook, both of N.Y., assignors to Nova Technologies, Inc., Hauppauge, N.Y.

Continuation-in-part of Ser. No. 731,533, May 7, 1985, Pat. No. 4,776,047. This application Aug. 28, 1987, Ser. No. 90,376
Int. Cl.[4] A61G *7/00*
U.S. Cl. 5—60 11 Claims



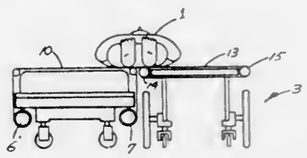
1. A bedsore protection arrangement comprising: a bed having a mattress, a cover on said mattress, and legs; transport means having rollers at opposite ends of the bed; a transport sheet on which a patient may lie and extending over said mattress between said rollers; roller drive means for winding said transport sheet onto a roller at one end of the bed and unwinding said transport sheet from a roller on the opposite end to pull said transport sheet and move said person across the mattress surface; motion control means connected to said roller drive means for slowly moving said transport sheet cyclically a distance toward one end and toward the other end; an adjustable surface member under said cover and having inflatable cavities forming raised ridges when inflated and having a substantialy flat surface when deflated; an air pump and control means for inflating and deflating said cavities; said ridges having an alternating pattern of connected segments, at plus and minus a pattern angle with respect to a direction of motion of said sheet; and said distance being such that points on said transport sheet moving said distance pass over two said connected segments.

4,837,873

RECLINABLE WHEELCHAIR APPARATUS

Paul DiMatteo, Huntington, and Charles F. Chubb, Brookville, both of N.Y., assignors to Med Bed Technologies, Inc., Hauppauge, N.Y.

Continuation of Ser. No. 764,941, Aug. 12, 1985, Pat. No. 4,700,415, which is a continuation-in-part of Ser. No. 731,533, May 7, 1985, Pat. No. 4,776,047. This application Oct. 16, 1987, Ser. No. 109,299
The portion of the term of this patent subsequent to Oct. 20, 2004, has been disclaimed.
Int. Cl.[4] A61G *7/10*
U.S. Cl. 5—81 R 6 Claims



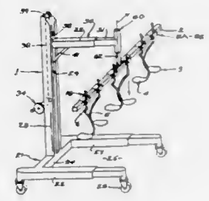
1. A method of moving a person from a reclining position on a first surface on a bed to a sitting position on a seat adjacent an edge of the bed comprising the steps of: rotating and lowering a back support on said seat and rotating and raising a leg support section on said seat to form a horizontal platform with a second surface on which a person may lie; moving said bed vertically so that said second surface and said first surface are at the same height level; moving said person toward and onto said second surface by moving said first surface at a velocity toward said second surface and vertically down in vicinity of said second surface, so that said person moves off said first surface and onto said second surface; moving said second surface up in vicinity of said first surface and horizontally across said platform at a velocity substantially equal to said velocity of said first surface for moving said person onto said second surface; raising said person to a sitting position on said seat by rotating and raising said back support to raise said person's back to substantially 80 degrees elevation and rotating and lowering said leg section to extend downward from said seat surface for supporting said person's legs and feet.

4,837,874

PERSON LIFTING DEVICE

Mieczysiaw Giercarz, 11 Rue de Barly, 62810 A-le-Comte, France, and Jaroslaw G. Alfer, 1331 Lilac Ter., Los Angeles, Calif. 90026

Continuation-in-part of Ser. No. 933,172, Nov. 21, 1986, abandoned. This application Aug. 17, 1987, Ser. No. 85,736
Int. Cl.[4] A61G *7/10*
U.S. Cl. 5—83 9 Claims



1. A person lifting device including;
a beam restrained in a horizontal plane in relation to a given level and to be placed above and parallel to a person lying in a plane substantially parallel to the horizontal plane,
a plurality of removable vertical height position regulating

means carried from the beam, and each comprised of a vertically disposed flexible member with opposite depressible sides engageable between a jam-cleat carried from the beam,

a lifting means attached to the beam by each vertical height position regulating means and comprised of a body handling tong swinging from the beam and adapted to go at least partially under the said person, the body handling tong being connected to a lower end of the member to swing and twist therefrom when the member is deflected,

a locking means releasably securing each removable vertical height position regulating means to the beam,

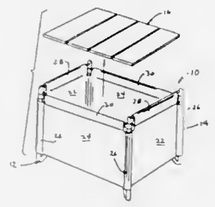
and a hoisting means incorporated with a frame and adapted to move the lifting means along a vertical axis perpendicular to the horizontal plane.

4,837,875

FOLDING PLAYPEN WITH ATTACHED FABRIC ENCLOSURE

Sam Shamie, and Louis Shamie, both of 175 Liberty Ave., Brooklyn, N.Y. 11212

Filed Jun. 13, 1988, Ser. No. 206,474
Int. Cl.[4] A47D 7/0
U.S. Cl. 5—99 C **11 Claims**



1. A foldable playpen, comprising:

a frame;

a fabric enclosure connected to said frame and defining a space;

a stiffened mattress in said space for defining a ridged floor in said enclosures;

said frame comprising a plurality of floor supports for supporting said mattress, hub means interconnecting said floor supports at inner ends thereof for movement in a horizontal plane between a use position and a folded position, an upright for each floor support, lower corner hinge means connected between the lower end of each upright and an outer end of one of said floor supports for locking each upright in a use position extending upwardly from said floor support and in a folded position extending substantially parallel to said floor support, a plurality of cross-members connected between adjacent pairs of said uprights, and bending means in at least some of said cross-members for permitting bending of said at least some of said cross-members to accommodate movement together of said uprights as said floor supports are moved toward their folded position.

4,837,876

ROCK 'N WALKER

Reuven Levy, U.S. Rt. 11, Box 25, Brushton, N.Y. 12916

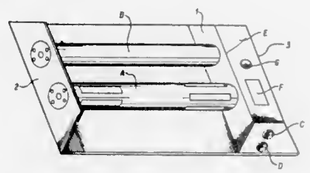
Filed Jun. 6, 1988, Ser. No 202,706
Int. Cl.[4] A47D 9/0
U.S. Cl. 5—107 **5 Claims**

1. A motion producing device for imparting motion to a wheeled baby carriage or hospital baby bed, the device comprising:

a rectangular holder having rotatable roller means mounted thereon to rotate the wheels of the baby carriage or hospital bed;

a rotatable guide cylinder mounted on the holder substantially parallel to the rotatable roller means biasing the wheels into the means for rotating;

means for rocking and oscillating the bed or carriage; said rocking and oscillating means forming part of the roller means, the rocking and oscillating means being in the form



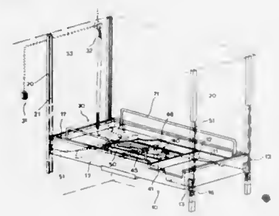
of plural slits located at opposite ends of the roller, the slits at one end of the roller being staggered relative to the slits at the opposite end; means for imparting rotary motion to the rotatable roller means, control means for controlling the rotation of the rotary motion means; whereby the device can be used to produce a simulated rocking and walking motion to help cranky, crying babies rest contently or get to sleep.

4,837,877

ELEVATION BED

Takeaki Hamada; Akio Okada; Kiyoshi Abe; Katsuhiro Udagawa; Fumitoshi Okazaki, and Kouji Fujino, all of Tokyo, Japan, assignors to Sanwa Shutter Corporation, Tokyo, Japan

Filed Oct. 28, 1987, Ser. No. 114,404
Claims priority, application Japan, Jan. 20, 1987, 62-6639; Jan. 20, 1987, 62-6640; Jan. 30, 1987, 62-11353; Jan. 30, 1987, 62-11354
Int. Cl.[4] A47C 19/06
U.S. Cl. 5—10 B **44 Claims**



1. An elevation bed comprising:

a main body having a frame assembly;

support rods disposed vertically between the floor and the ceiling, supporting elevatably said bed main body, and having a grooved cross-section, wherein the bed main body has anchor mean for corresponding support rods at both ends of frame beams on both sides thereof, and each of said anchor means is capable of retraction and rocking with respect to said frame beam and is equipped at the tip thereof with a main sheave for a driving system part of which is positioned inside a guide rail groove of said support rod and with a guide roller which comes into sliding contact with the inner edge of said guide rail, at the tip therof;

an elevation device for elevating said bed main body;

a safety device; and

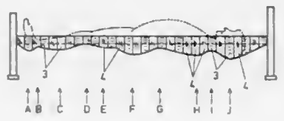
said elevation device including a winding mechanism assembled in said bed main body and a wire driving system having both ends thereof fixed to said winding mechanism and to said support rods.

4,837,878

RECLINING OR SEATING MEMBER

Hermann Huemer, Schützenstrasse 21, A-6800 Feldkirch-Altenstadt, Austria

PCT No. PCT/EP87/00260, § 371 Date Jan. 20, 1988, § 102(e) Date Jan. 20, 1988, PCT Pub. No. WO87/07125, PCT Pub. Date Dec. 3, 1987
PCT Filed May 16, 1987, Ser. No. 163,828
Claims priority, application Austria, May 22, 1986, 1372/86
Int. Cl.[4] A47C 19/00, 23/18
U.S. Cl. 5—191 **6 Claims**



1. Reclining or seating member, comprising a support frame and at least one partially flexibly or elastically yielding reclining or seating surface, wherein at least one of bands, straps, cables and the like having a longitudinal direction are consecutively fastened at longitudinal side support parts of the support frame and extend transversely to the longitudinal direction of said support parts, characterized in that at least a portion of the bands, straps (3, 4), cables and the like are fabricated of a material at least not extensible in the longitudinal direction thereof, wherein the non-extensible bands, straps (3), cables and the like are formed at least one of different lengths, and fixed at different levels at the longitudinal support parts (1, 2) of the support frame for adapting the reclining or seating member to the body portion of a reclining or sitting person.

4,837,879

THERAPEUTIC MATTRESS HAVING LUMBAR SUPPORT MEMBER

Leon Parnham, Box 91, Middle Brighton, Australia 3186

Filed Aug. 21, 1987, Ser. No. 88,097
Int. Cl.[4] A47C 27/14
U.S. Cl. 5—446 **8 Claims**

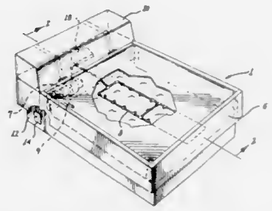
1. A mattress of a size sufficient to support the body of a user in a lying down position, comprising a substantially planar cushion of a relatively flexible, resilient material, having top and underside surfaces having a length and width; and at least one strip of foam comprising a lumbar support fixedly and permanently adhered to the underside of the cushion across its width, perpendicular to its length, said strip having a dimension parallel to the length of the cushion that is substantially smaller than the length of the cushion, and being positioned at the location of the lumbar region of the spine of a user to thereby provide support for a user's spine.

4,837,880

THERAPEUTIC WATERBED APPARATUS AND METHOD

Jeff Coffman, 5346 E. Royal Palm Rd., Paradise Valley, Ariz. 85253

Continuation-in-part of Ser. No. 855,839, Apr. 24, 1986, abandoned. This application Nov. 23, 1987, Ser. No. 124,374
Int. Cl.[4] A47C 27/08; A61H 7/00
U.S. Cl. 5—451 **12 Claims**



1. An improved therapeutic waterbed, comprising:

a mattress means for containing water therein;

a base means for accommodating said mattress means thereabove;

a control panel means for controlling environmental features of said waterbed, said control panel means being of touch-tone type;

a head board means for accommodating therein said control panel means;

a structural member means for circulating said water contained in said mattress;

a plurality of jet means operably coupled to said structural member means for ejecting water therefrom, wherein said jet means are angularly positioned and preset relative to the structural member means, and wherein at least some of said jet means are preset at different angular positions relative to other of said jet means, wherein each of said jet means comprises a spout portion, an extending portion and an attaching portion, wherein said spout and extending portions have a common continuous aperture passing therethrough for passing and ejecting said water, and wherein said attaching means is movable and suitable for being preset relative to said structural member means;

a pump means operably coupled to said structural member means for recirculating water throughout said structural member;

a motor means operably coupled to said pump means for operating said pump means; and

a suction member means operably connected to said structural member means for allowing water to enter into said structural member.

4,837,881

SEAT CUSHION WITH PORTIONS WITH DIFFERENT COMPRESSION CHARACTERISTICS

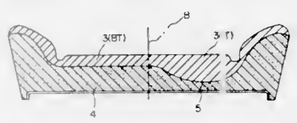
Nobuaki Kondo, Yokohama, and Shinichi Yamazaki, Kanagawa, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Toyo Tire & Rubber Co., Ltd., Osaka, both of, Japan

Filed Dec. 1, 1987, Ser. No. 127,236
Claims priority, application Japan, Dec. 2, 1986, 61-185707
Int. Cl.[4] A47C 7/18
U.S. Cl. 5—464 **3 Claims**

1. A seat cushion with compression characteristics which differ by portions, that is comprised of an upper layer portion made of a low hardness foamed body and a lower layer portion made of a high hardness foamed body which supports said upper layer portion, and in which:

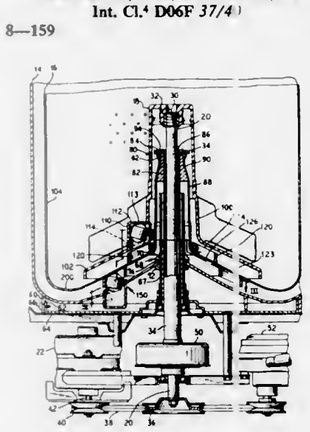
the upper layer portion forming an entire surface of a seat

portion has a basic profile formed to have a sloped plane with its height increased toward a front edge in a longitudinal direction;
the lower layer portion has a basic profile that conforms to a sitting posture of a human body;
the upper layer portion and the lower layer portion are combined to form a single unit, with a strong boundary portion formed along their interface
in a hind seat portion, a thickened portion of the low hardness foamed body having a concave cross section in a



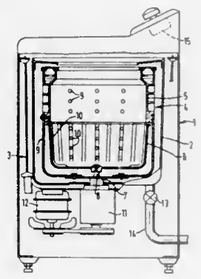
longitudinal direction, that is an approximation of a shape of a buttocks in a sitting position, is formed along an entire surface in a transverse direction; and
in a front seat portion, on either a right or a left side of a center line in the transverse direction, a thickened portion is formed by making a thickness of the upper layer thicker than that of the basic profile of the upper layer portion, by gradually increasing the thickness toward a front area in the longitudinal direction, and by also shaping the thickened portion into circular arc form in the transverse direction.

4,837,882
FLOTATION CONTROLLED DRIVE FOR AN AUTOMATIC WASHER
Robert A. Brenner, St. Joseph Township, Berrien County, and Anthony Mason, Lincoln Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Dec. 15, 1987, Ser. No. 133,630
Int. Cl.[4] D06F *37/40*
U.S. Cl. 8—159 **16 Claims**



1. An automatic laundry washer comprising:
a wash tub for containing wash liquid;
a spin basket rotatably mounted within said wash tub;
a vertical axis agitator mounted within said spin basket on a drive shaft extending through said spin basket and said wash tub; and
means responsive to the level of wash liquid in said spin basket for locking and not locking said spin basket to at least one of said agitator or wash tub, said means comprising a flotation device that mechanically engages and disengages between said spin basket and said one of said agitator or wash tub.

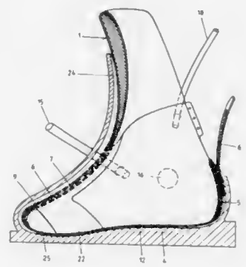
4,837,883
METHOD OF WASHING CLOTHES USING A WASHING MACHINE
Katsuyuki Ishida; Fumio Torita, both of Nagoya, and Yoshio Kohsaka, Aichi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed May 2, 1984, Ser. No. 606,149
Claims priority, application Japan, Jun. 7, 1983, 58-101283
Int. Cl.[4] D06F *21/08, 37/34*
U.S. Cl. 8—159 **2 Claims**



1. A method of washing clothes comprising the steps of:
(a) disposing said clothes and a washing liquid in a washing tub having an upper and lower drum,
(b) rotating said lower drum containing said clothes in alternating directions to thereby cause water flow agitation of said clothes, said rotating steps including rotating said lower drum about 120–180 revolutions per minute and periodically changing the direction of rotation of said lower drum about every two to three rotations,
(c) simultaneously with said rotating step, retaining said upper drum stationary, and
(d) simultaneously with said rotating step, agitating said clothes to thereby cause frictional contact of clothes contacting said upper and lower drums.

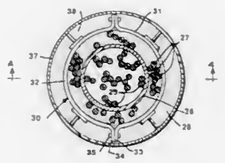
4,837,884
PROCESS FOR FILLING WITH FOAM THE INNER BOOT OF SKIBOOTS AND SKIBOOT PRODUCED ACCORDING TO THE PROCESS
Kurt Hilgarth, Graz, Austria, assignor to Skischuhfabrik Dynafit Gesellschaft GmbH, Graz, Austria
Filed Sep. 8, 1987, Ser. No. 93,792
Claims priority, application Austria, Oct. 9, 1986, 2692/86
Int. Cl.[4] A43B *5/04, 7/14*
U.S. Cl. 12—142 P **10 Claims**

1. A process for filling an inner boot of a ski boot with a foam material, comprising the steps of:
establishing two cavities on opposite lateral sides of an inner boot of a ski boot such that one of said cavities is located on an inner side of the inner boot and the other of said cavities is located on an outer side of the inner boot, said two cavities being asymmetrical with respect to a vertical longitudinal central plane of the inner boot in that one of the cavities extends further toward the tip of the inner boot than the other cavity, and an opening into the front portion of each of said cavities and at least one opening from the heel portions of the cavities;
introducing an expandable foam material into each of said cavities by injecting said expandable foam material through the openings in the front portons of the cavities, said foam material being directed toward the heel portions of the cavities, until the expandable foam emerges from the opening in the heel portions, thereby filling said cavities with expandable foam material; and
expanding said expandable foam material to produce expanded foam material completely filling said cavities.
3. An inner boot of a ski boot, comprising an inner boot body



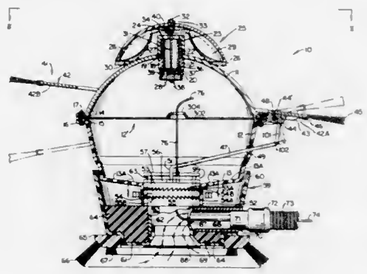
having a tip portion and a heel end and defining two cavities disposed on opposite lateral sides thereof with one of said cavities located on an inner side of the inner boot and the other of said cavities located on an outer side of the inner boot, said two cavities being asymmetrical with respect to a vertical longitudinal central plane of the inner boot in that one of said cavities extends further toward the tip portion of the inner boot body than the other cavity, said cavities being filled with an expanded foam material.

4,837,885
PRESTRESSED STAY CABLE FOR USE IN CABLE-STAYED BRIDGES
Y. C. Yang, San Francisco, Calif., assignor to T.Y. Lin International, San Francisco, Calif.
Filed Aug. 1, 1988, Ser. No. 226,837
Int. Cl.[4] E01D *11/00*
U.S. Cl. 14—21 **4 Claims**



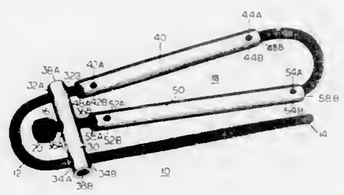
1. A prestressed stay cable for use in cable stayed bridges, comprising:
an inner cable group of greased strands enclosed in an inner pipe,
an outer cable group of cemented grouted strands outside of said inner pipe and retained by an encircling strap, and
an outer rigid structural pipe surrounding said encircling strap and its said outer cable group and separated therefrom by cement grout,
each said cable group having extreme ends, and
anchors for each said extreme end of each said cable group, one extreme end of said inner cable group being prestressed to a desired tension of about 270 kips for live loads, and one extreme end of said outer cable group being prestressed to a desired tension of about 670 kips for dead loads.

4,837,886
POOL CLEANING DEVICE
David Rawlins, 4511 San Marino Dr., Davis, Calif. 95616
Continuation-in-part of Ser. No. 916,188, Oct. 7, 1986, abandoned, which is a continuation-in-part of Ser. No. 707,245, Mar. 1, 1985, Pat. No. 4,686,728. This application Oct. 2, 1987, Ser. No. 102,107
Int. Cl.[4] E04H *3/20*
U.S. Cl. 15—1.7 **19 Claims**



1. A pool cleaning device comprising:
a housing adapted to be submerged in a pool of water, said housing defining therein a chamber for holding gas;
means for supplying a gas to the chamber to apply a lifting force to the housing, causing the housing to rise towards the surface of the water in a rise cycle;
means for releasing the gas in the chamber and to allow the entry of water into the chamber to replace the gas released, thereby causing the housing to fall towards the bottom of the pool in a fall cycle; and
means attached to the housing for cleaning the pool when the housing rises and falls in the water.

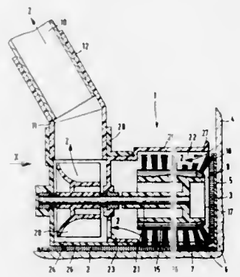
4,837,887
POWER CLEANING APPARATUS
Thomas L. McLaughlin, 516 Sidney St., Greensburg, Pa. 15601
Filed Feb. 2, 1988, Ser. No. 151,542
Int. Cl.[4] B08B *9/02*
U.S. Cl. 15—104.33 **5 Claims**



1. A power conduit cleaning apparatus for use in cleaning, removing and dislodging obstructions in pipes, drains, thermos bottles and other like conduits comprising:
a flexible drive means being a flexible coil having drive and driven ends; p1 a cleaning means being a brush crimped to said driven end of said flexible drive means;
a rotational power means engaged to said drive end for said axial rotation of said flexible drive means and said cleaning means;
a guide means used to direct said flexible drive means consisting of a first coil means constructed of tubular material

for receiving therethrough said flexible drive means during operation of said power conduit cleaning apparatus;
a second coil guide means approximately twice in length over said first coil guide means constructed from said tubular material for receiving therethrough said flexible drive means during operation of said power conduit cleaning apparatus;
a third coil guide means for approximately 10 percent more length over said second coil guide means constructed from said tubular material for receiving therethrough said flexible drive means during operation of said power conduit cleaning apparatus; wherein said first coil guide means, said second coil guide means and said third coil guide means are used alternatively depending on depth of penetration desired of said flexible drive means.

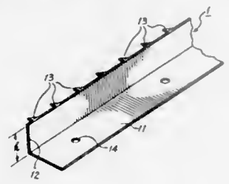
4,837,888
SUCTION NOZZLE FOR A VACUUM CLEANING DEVICE
Siegfried Maier, Grundstrasse 7, D-7012 Leinfelden-Echterdingen 3, Fed. Rep. of Germany
Filed Jun. 24, 1987, Ser. No. 65,784
Claims priority, application Fed. Rep. of Germany, Jun. 26, 1986, 8617077[U]
Int. Cl.⁴ A47L *5/10*
U.S. Cl. 15—387 **9 Claims**



1. A nozzle for use with a vacuum cleaning device, said nozzle being adapted to be detachably connected to a vacuum cleaning device through a suction line, characterized in that said nozzle comprises a housing having a bottom wall and a side wall, said bottom wall having a bottom opening and said side wall having a side opening through which dirt enters the housing when the vacuum cleaning device is operable; brush means in said housing, said brush means comprising a single brush support having a first set of radially extending bristles extending along the length thereof and projecting through said bottom opening for engaging the floor, and a second set of bristles connected to an end of said brush support and at an angle thereto extending through said side opening for engaging a sidewall to be cleaned; said brush means including a shaft for rotating said brush support; and drive means connected with said shaft along the said axis of rotation for rotating said brush support.

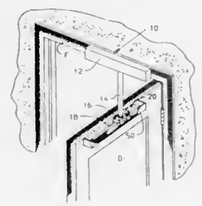
4,837,889
CARPET RETAINING DEVICE
Kunio Saotome, 1-1-4 Nakamurakita Nerima-ku, Tokyo, Japan
Filed Apr. 17, 1987, Ser. No. 40,008
Int. Cl.⁴ A47G *27/04*
U.S. Cl. 16—4 **4 Claims**

1. A carpet retaining device for anchoring the edge of a carpet overlying a floor adjacent a wall, comprising:
a base flange anchorable to the floor;
an upright first web extending upwardly from a first edge of said base flange;
tack means extending generally transversely to the upright first web and lying directly above said base flange for engaging the edge of the carpet;



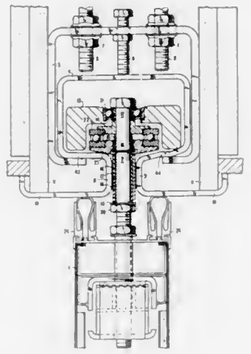
an upright second web extending upwardly from a second edge of said base flange and spaced away from the first web, the second web and the base flange having portions defining at least one notch to enable the first web to be bent at the location of such notch; and
a means for attaching said second web to the wall.

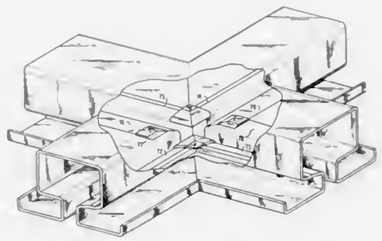
4,837,890
DOOR CLOSER HAVING ARM/SLIDE TRACK CONNECTION
Clay E. Tully, Charlotte, and Seth D. Perry, Monroe, both of N.C., assignors to Yale Security Inc., Monroe, N.C.
Filed May 13, 1988, Ser. No. 193,657
Int. Cl.⁴ E05F *1/00*
U.S. Cl. 16—71 **6 Claims**



1. A door closer of the type that is mounted above a door on a door frame associated with the door and having a single-piece arm extending out from a drive shaft associated with the closer, the arm having a downward pin remote from the drive shaft, a carriage/track assembly secured to the pin comprising:
(a) a straight extruded track adapted to be mounted along the top of the door, the track being formed with a base flange and an upward flange, the upward flange being concave on both of its sides and formed with an enlarged head running along its top;
(b) a traveler comprising a platform slidingly supported on the top of the track and having a central opening receiving the pin on the arm, the platform having at least two downward spindles, each spindle having rotatably secured thereon a hard plastic spherical roller shaped in its outer contour to complement the shape of the adjacent concave portion of the upward flange, the spindles positioned so that the rollers snugly engage the upward flange, one on each side of the track, the lower end of the spherical rollers being spaced above the base flange to permit the passage therebetween of any foreign materials.

4,837,891
TRACK AND TROLLEY WITH DUAL DRIVE WHEELS HAVING ANNULAR TRACK ENGAGING SURFACES OF DIFFERENT DIAMETERS
John W. Toma, Louisville, Ky., and N. Douglas Owens, Lynn, Ind., assignors to Modernfold, Inc., New Castle, Ind.
Filed Jun. 11, 1987, Ser. No. 60,477
Int. Cl.⁴ E05D *15/06*
U.S. Cl. 16—87.4 R **49 Claims**

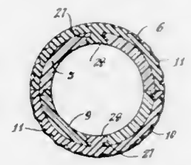




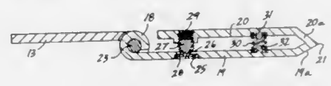
1. A track capable of receiving both dolleys and disc trolleys, comprising:
first and second longitudinally parallel rails;
said rails being unsymmetrical;
said second rail having first and second longitudinal planar surfaces disposed in a horizontally adjacent relationship;
said first longitudinal planar surface being coplanar with an upper surface of said first rail;
said second longitudinal planar surface being higher than said first longitudinal planar surface.

4,837,892
CUSHIONED HANDLE STRUCTURE FOR PERSONAL CARE APPLIANCES
Hou-On Lo, Kowloon, Hong Kong, assignor to Conair Corporation, Stamford, Conn.
Filed Mar. 4, 1988, Ser. No. 164,193
Int. Cl.⁴ B25G *3/00*
U.S. Cl. 16—116 R **4 Claims**

1. A handle structure for use in personal care appliances, said handle structure including
a plastic understructure having outer and inner surfaces, said understructure having a plurality of holes running between said two surfaces,
an elastomeric material integrally molded as an overlay in contact with said outer surface and as plugs molded in said holes, and
at least one channel molded in said inner surfaces, said channel connecting directly to at least one said hole, said channel having elastomeric material therein and integral with said plug in said hole.
whereby said overlay is held in position in contact with said outer surface by said plugs.



4,837,893
HAVING AN OVERFOLDED SPRING BIASED ADJUSTABLY POSITIONED LEAF
Scott O. Wilson, 234 N. 75th St. #3, Milwaukee, Wis. 53213
Filed Jun. 8, 1988, Ser. No. 203,770
Int. Cl.⁴ E05D *7/04*
U.S. Cl. 16—240 **1 Claim**



1. A hinge for adjustment of surfaces secured to relative portions of said hinge, said hinge comprising,
a first planar portion pivotally secured to a second overfolded portion;
said second overfolded portion including a lower planar member adjustably secured to an overlying upper planar member, and
rotative adjustment means secured to said lower planar member for relative adjustment of said upper planar member relative to said lower planar member, and wherein said first planar portion is pivotally secured to second overfolded portion by an axle captured within a plurality of spaced sleeves, said spaced sleeves secured to opposite ends of said first planar portion providing a recess therebetween for accommodation of a third sleeve integrally secured to said lower planar portion, and
wherein said rotative adjustment means includes a threaded screw with a shank threadedly accepted within a threaded bore of said upper planar portion, and
wherein said rotative adjustment means further includes a reduced shank between an enlarged head and the shank wherein said reduced shank is captured within an encircling flange integrally formed to an interior surface of said lower planar member, and
wherein a coil spring is captured between said lower planar member and said upper planar member, and
wherein said coil spring is secured within opposed and aligned sockets formed within opposed interior surfaces of said upper and lower planar members respectively, and said sockets include a centrally formed nipple to maintain alignment of said coil spring between said upper and lower planar members, and
wherein said upper planar member includes a plurality of aligned chamfered openings wherein chamfered portions of said chamfered openings are formed within interior surfaces of said upper planar member directed to a through-extending aperture opening to an exterior surface

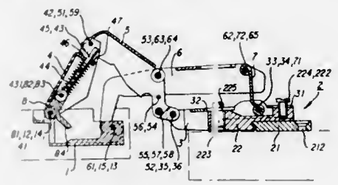
of said upper planar member with aligned aperture formed in said lower planar member in alignment with said aligned chamfered openings for providing access to said aligned chamfered openings.

4,837,894

SPRING BIASED ARM SNAP-TOGGLE HINGE

Tsong-Chi Lin, 146, Min Chyuan Rd., TaFu Village, FuNe Shiang, Kaohsiung Hsien, Taiwan

Filed May 23, 1988, Ser. No. 197,168
Int. Cl.[4] E05F 1/08
U.S. Cl. 16—288 **3 Claims**



1. An improved snap-toggle hinge for furniture comprising;
a base plate to be fixed on the door of an article of furniture;
setting plates including a fixing plate and a sliding plate to be fixed on the side wall of the article of furniture;
a connecting member to be assembled with said setting plates;
four pivot arms connected with one another between said base plate and said connecting member; and
a toggle segment connected with the first pivot arm by means of first shaft, a second pivot arm having two fixing pins spaced from the pivot axes of the second pivot arm, said first pivot arm being connected with the pin by means of a second shaft and an integral shaft hole in said pin, said pin having the shaft hole at one end and a free opposite end, said free end extending through and being supported by a hole in the first pivot arm, said pin being surrounded by a helical spring said toggle segment provided with an integral foot for inserting in between two fixing pins secured in the second pivot arm when said hinge is in the closed position.

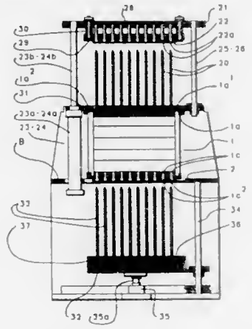
4,837,895

MACHINE FOR THE AUTOMATIC PRODUCTION OF KEBABS OF MEAT AND/OR VEGETABLES THREADED ONTO SKEWERS

Michel Emsens, Aurec, France, assignor to Emsens Antoine S.A.R.L., France

Filed Dec. 28, 1986, Ser. No. 936,080
Claims priority, application France, Nov. 27, 1985, 85 17975; Oct. 31, 1986, 86 15643
Int. Cl.[4] A22C 7/00
U.S. Cl. 17—1 S **2 Claims**

1. Apparatus for automatic production of kebabs of food, said apparatus including: a cutting and skewering container for receiving multiple layers of said food; cutting means for slicing said layers of food; control means connected to said cutting means for reciprocating said cutting means in a generally horizontal plane and for moving said cutting means generally vertically for slicing all of said layers of food in said container during one continuous vertical pass therethrough; said apparatus having cover plate means (**4, 21**) disposed above said container and means on said plate means for loosely receiving an end of each of a plurality of skewers vertically disposable within vertical openings in said cover plate axially above said container and supportable upon said layers of food; and means for moving said plurality of skewers downwardly for simultaneously forcing all of said skewers through all of said multiple layers of food during a single downward movement; wherein said apparatus includes a rotary plate (2), means for slidably connecting said container to said rotary plate, and means for rotating said rotary plate and said container through a 90 angle;



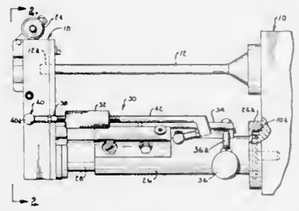
and wherein said apparatus includes a plurality of thrust fingers (**28**) carried by plate means (**21**) and is in alignment with said vertical openings in said cover plate.

4,837,896

CONTROL LINKAGE FOR SAUSAGE STUFFING MECHANISM ON SAUSAGE STUFFING MACHINE

Thomas A. Lockard, Detroit, Mich., assignor to Koch Supplies, Inc., Kansas City, Mo.

Filed Dec. 4, 1987, Ser. No. 128,612
Int. Cl.[4] A22C 11/02
U.S. Cl. 17—35 **6 Claims**



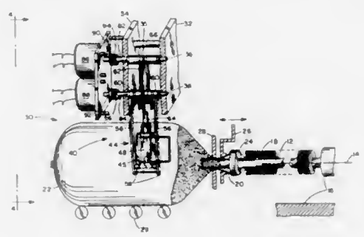
1. A sausage stuffing machine having a casing filling tube with a discharge tip and a casing brake ring adjacent said tip, the combination therewith of
a casing brake ring support,
means mounting said support to permit movement thereof and of said brake ring axially relative to said tip, said means including a fixed member connected with said machine and a movable member supported by said fixed member and carrying said support,
an external link assembly interconnecting said fixed member with said support and operable to cause movement of said moveable member relative said fixed member, said assembly including a link rod having one end pivotally connected with said support and a crank arm pivotally connected to said fixed member, said link rod having another end connected with said crank arm, said link rod operable in response to pivotal movement of said crank arm to move said support and casing brake ring relative to said discharge tip,
said link assembly further including manually adjustable means for shortening and lengthening said link rod whereby to effect movement of said support and brake ring independently of movement of said crank means.

4,837,897

APPARATUS FOR MONITORING THE WIDTH OF A STUFFED FOOD CASING

Salvatore P. Lamartino, Orland Park, Ill., assignor to Viskase Corporation, Chicago, Ill.

Filed Apr. 18, 1988, Ser. No. 182,531
Int. Cl.[4] A22C 7/00
U.S. Cl. 17—35 **11 Claims**



1. Apparatus for monitoring the width of a stuffed food casing comprising:
(a) a frame extending transverse and above a longitudinal axis along which a said stuffed casing moves during stuffing;
(b) first and second shafts journaled to said frame, said shafts being oriented substantially parallel to said longitudinal axis;
(c) first and second shoes disposed at diametrically opposite sides of said longitudinal axis for tracking against the sides of a said stuffed casing, said shoes being suspended from said shafts for swinging movement in a plane transverse said longitudinal axis;
(d) a first floating support including a connector element pivotally connected to said first shoe and journaled to said first shaft, and a drive element pivotally connected to said first shoe and fixed to said second shaft such that movement of said first shoe in said transverse plane rotatably drives said second shaft;
(e) a second floating support including a connector element pivotally connected to said second shoe and journaled to said second shaft and a drive element pivotally connected to said second shoe and fixed to said first shaft such that movement of said second shoe in said transverse plane rotatably drives said first shaft; and
(f) means driven by said shafts for issuing a signal responsive to the distance moved by each of said shoes as represented by the rotation of said shafts.

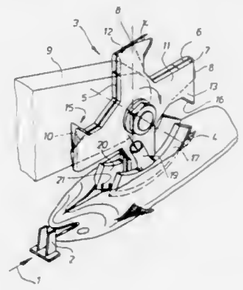
4,837,898

APPARATUS FOR CLEANING THE ABDOMINAL CAVITY OF FISH

Franz Hartmann, Bad Oldesloe, and Dieter Wulff, Lübeck, both of Fed. Rep. of Germany, assignors to Nordischer Maschinenbau Rud. Baader GmbH+CO KG, Lubeck, Fed. Rep. of Germany

Filed Jun. 14, 1988, Ser. No. 206,618
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1987, 3720253
Int. Cl.[4] A22C 25/14
U.S. Cl. 17—58 **6 Claims**

1. An apparatus for processing fish having an abdominal cavity which has been opened in a previous processing step, in which cavity viscera, and at least one of an air bladder and kidneys are present, which apparatus comprises
(a) tool means driven to revolve in a predetermined revolving direction for removing said viscera, which viscera-removing tool means define two flanks and comprise
(aa) knife blade means, which define peripherally arranged cutting edge means for opening said at least one of an air bladder and kidneys, as well as
(ab) lateral cleaning means for tearing loose said viscera and arranged in the region of said cutting edge means, and



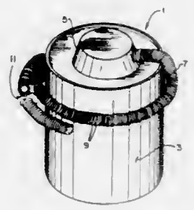
(b) stationary spreader means having a substantially circular-segment configuration, one each of said spreader means being associated with one of said flanks, and an outer diameter which substantially corresponds to the diameter of the path of revolution of said cutting edge means, and being arranged in a region of said viscera-removing tool means which faces said fish to be processed.

4,837,899

HOSE CLIP FOR FLEXIBLE HOSE

Jeffrey L. Young, St. Charles County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jul. 5, 1988, Ser. No. 215,719
Int. Cl.[4] A44B 21/00; B65D 63/00
U.S. Cl. 24—16 R **8 Claims**



1. A hose clip for engaging and holding two substantially identical flexible hose sections in juxtaposed and non-movable relationship to one another, said hose clip comprising an integrally molded one-piece plastic clip having opposed generally C-shaped sections, each generally C-shaped section having a pair of opposed flexible curvilinear arms in mirror image relationship to one another and forming a joint inner continuous gripping surface, the inside diameter of the joint inner continuous gripping surface of each pair of opposed flexible curvilinear arms being generally similarly shaped to the outside diameter of said substantially identical flexible hose sections, said opposed generally C-shaped sections of said hose clip being constructed for resiliently engaging and holding said two substantially identical flexible hose sections in juxtaposed, non-movable relationship to one another, and the opposed flexible curvilinear arms of one generally C-shaped section

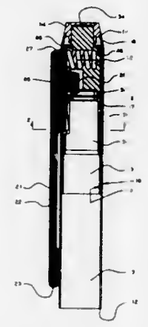
being constructed to securely grip one of said flexible hose sections and prevent easy removal therefrom for continuous gripping of said one flexible hose section, while the opposed flexible curvilinear arms of said other generally C-shaped section are constructed to allow easy insertion and removal of said other flexible hose section from said hose clip.

4,837,900

POCKET CLIP ASSEMBLY AND ASSEMBLY METHOD

Stephen V. Boyce, North Scituate; Robert V. Lozeau, Cumberland, and Lawrence R. Farmer, Barrington, all of R.I., assignors to A.T. Cross Company, Lincoln, R.I.

Filed Apr. 18, 1988, Ser. No. 182,854
Int. Cl.[4] B43K 25/00
U.S. Cl. 24—11 P 21 Claims



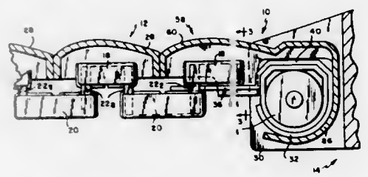
17. A writing instrument cap assembly comprising: a tubular body having a rectangular slot, a sleeve press-fitted into the tubular body, the sleeve having a rectangular cutout transversely aligned with the rectangular slot, a plastic insert inserted into the sleeve with an axial slot transversely aligned with the rectangular cutout, said plastic insert including an axial bore of circular cross-section communicating with said axial slot, and a ring mounted in the axial bore adjacent the axial slot, a pocket clip including a projection arranged longitudinally on the outside of the tubular body projected partially through the rectangular slot and the cutout, and the projection including a hook having a hook groove, the ring being received in the hook groove and embedded in the insert, and resilient means in the insert engaged with the projection for biasing the clip to a neutral position.

4,837,901

END CONNECTOR FOR EXPANSIBLE WATCH BAND

Stephen F. Bert, North Scituate, R.I., assignor to Textron, Inc.

Filed Apr. 25, 1988, Ser. No. 185,920
Int. Cl.[4] A44C 5/14
U.S. Cl. 24—265 B 16 Claims



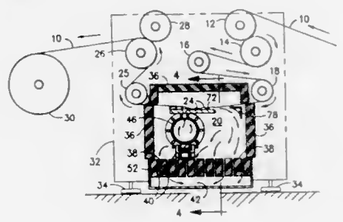
1. For use in combination with an expansible watch band of the type having top and bottom links interconnected by pairs of U-shaped staples, the staples of each pair being located along opposite edges respectively of the band in a mutually spaced confronting relationship, with legs on the staples received in opposite ends of the links interconnected thereby, a connector for connecting an end of the band to a spring bar or the like carried on a watch case, said connector comprising: a base member having a generally planar shank with engagement means at one end thereof for engagement with the end most pair of staples interconnecting the endmost top and bottom links of the band to prevent separation of the base member from the band, a hook portion at the opposite end thereof, and with side edges extending along said shank from said hook portion to said engagement means, wherein the width of said base member at said engagement means is greater than the spacing between the endmost pair of staples interconnecting the endmost top and bottom links of the band, said shank being dimensioned for insertion between said endmost top and bottom links and said side edges being configured to accommodate manipulation of the thus inserted shank in the plane of said shank in directions required to position said engagement means behind said endmost pair of staples, with separation of said base member from the band being prevented by engagement of said endmost staples with the thus positioned engagement means and the side edges of the thus inserted shank, said hook portion being configured to engage the spring bar, and a cover member overlying and engageable with said endmost top link and the thus inserted shank in a manner preventing reverse manipulation of said shank in directions opposite to said first mentioned directions.

4,837,902

FABRIC SOFTENING APPARATUS

Louis Dischler, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Jul. 17, 1987, Ser. No. 74,568
Int. Cl.[4] D06C 19/00
U.S. Cl. 26—1 13 Claims



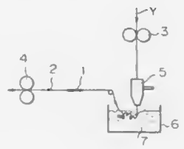
8. Apparatus to condition a moving web of fabric comprising: a conditioning zone, means to supply a web of fabric into said conditioning zone, means to take up the web of fabric from said conditioning zone, a gaseous fluid manifold mounted in said conditioning zone, means to supply a gaseous fluid into said manifold, gas jet means in communication with said manifold and located on only one side of the path of travel of the web of fabric to supply high velocity gaseous fluid from said manifold tangentially to the passage of the web of fabric through said conditioning zone to cause saw-tooth waves to form in said web of fabric in said zone and cause the created waves to travel down the web of fabric in a direction opposite to the path of travel of said web of fabric and means to exhaust said gaseous fluid from said zone.

4,837,903

METHOD AND APPARATUS FOR PRODUCING SLUB YARN

Shigeru Takemae, and Mitsuhiro Kodama, both of Nagoya, Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed Jan. 30, 1985, Ser. No. 696,461
Int. Cl.[4] D02G 1/16; D02J 1/06, 1/08
U.S. Cl. 28—254 5 Claims



1. A method for producing a slub yarn like a silk douppion from a yarn, comprising steps of:
a. causing a multifilament yarn composed of a plurality of single filaments successively to impinge onto a surface of a liquid medium at a first rate by a first gas stream directed to accelerate feed of said yarn,
b. holding a length of said yarn freely in said liquid medium, in which said single filaments are individually opened and folded and/or entangled with each other to form a thicker portion in said yarn,
c. whirling said liquid medium to form a vortex therein to facilitate folding and entanglement of said filaments,
d. withdrawing said yarn from the liquid medium successively at a second rate lower than said first rate,
e. doubling a carrier yarn of synthetic multifilament to said yarn after withdrawing from the liquid medium, and
f. interlacing said yarn after said doubling.

3. An apparatus for producing a slub yarn like a silk douppion from a yarn, comprising a feed roller for introducing a yarn to be treated into a texturing zone and a delivery roller for withdrawing said yarn therefrom, wherein a first gas nozzle for creating a first gas stream and a bath for accommodating a liquid medium therein are provided in said texturing zone, said bath being provided with a rotating vane for creating a vortex in said liquid medium, said first gas stream accelerating said yarn to a surface of said liquid medium, whereby said yarn fed into said texturing zone by said feed roller impinges onto the surface of said liquid medium along with said first gas stream and, thereafter, is withdrawn therefrom by said delivery roller.

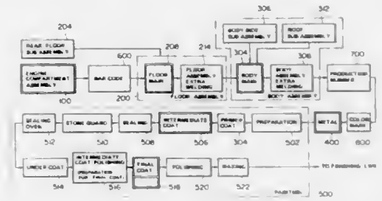
4,837,904

BAR-CODE LABEL APPLICABLE FOR BAR-CODE CONTROLLED MANUFACTURING INCLUDING PAINTING PROCESS AND PRODUCTION METHOD THEREFOR

Kazuyoshi Abe, Hoya, and Kazuhiko Yazaki, Musashimurayama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Division of Ser. No. 564,672, Dec. 23, 1983, Pat. No. 4,764,667.
This application Aug. 12, 1988, Ser. No. 231,834
Claims priority, application Japan, Dec. 28, 1982, 57-232972
Int. Cl.[4] B23B 11/00
U.S. Cl. 29—34 R 24 Claims

1. A method for preparing a bar-code label with a plurality of identical first slots and a plurality of identical second slots, the first and second slots being of different size so as to indicate specific binary numbers and thus being combinable to encode binary data, comprising the steps of:
converting specific binary data into a bar-code pattern which consists of a specific combination of first and second slots;
determining the specific locations on a rigid blank label at which to form said first and second slots according to said determining bar-code pattern;
feeding said blank label to a punch press with a first punch adapted to form said first slots and a second punch adapted to form said second slots;
moving said blank label below said first punch and stopping said blank label at the specific location of each of said first slots according to the determined bar-code pattern;



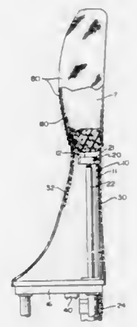
operating said first punch to form said first slot at said specific location while said blank label is stopped below said first punch;
moving said blank label below said second punch and stopping said blank label at the specific location of each second slot according to determined bar-code pattern; and
operating said second punch to form said second slots at said specific location while said blank label is stopped below said second punch.

4,837,905

METHOD AND APPARATUS OF SEAT ASSEMBLY

Daniel P. Sullivan; Terrel L. Scherman, both of Rochester Hills, and Elmer H. Drew, Grosse Pointe Woods, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 1, 1988, Ser. No. 200,341
Int. Cl.[4] B68G 7/00
U.S. Cl. 29—91.5 7 Claims



1. A method of enclosing an elastomeric foam bun assembly with a prefitted membrane cover, said method in combination comprising:
enclosing said bun assembly with a generally impermeable membrane, said impermeable membrane having a lower coefficient of friction with said bun assembly than said cover with said bun assembly;
subjecting said bun assembly to a vacuum to contract said bun assembly and to adhere said impermeable membrane to said bun assembly;
enclosing said bun assembly and said impermeable membrane with said cover; and

removing said impermeable membrane from between said cover and said bun assembly by translating said impermeable membrane relative to said bun assembly.

4,837,906

ROLLING ROLL WITH VARIABLE PROFILE AND OF THE TAPERED PISTON TYPE

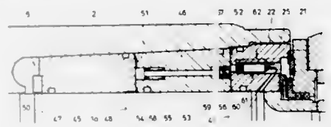
Takaaki Mori; Kinichi Higuchi, both of Yokohama; Tsukasa Oyauchi, Yokohama; Masao Nitanda Setagaya; Kohei Hosoi, Yokohama; Isao Imai, Fujisawa; Heiji Kato, Yokosuka, and Mitsuhiko Ichikawa, Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Japan

Filed Apr. 5, 1988, Ser. No. 177,779

Claims priority, application Japan, May 21, 1987, 62-124585; Dec. 15, 1987, 62-317239

Int. Cl.[4] B21B *27/00*

U.S. Cl. 29—112 **14 Claims**



1. A rolling roll comprising a ring piston fitted into a cylindrical space which is defined between a roll core and longitudinal axial end of a sleeve shrinkage - fitted thereon, the roll core at said longitudinal axial end having a smaller diameter than said sleeve, and the cylindrical space having a longitudinal axial outer end sealed by a seal ring, an oil passage which is in communication with oil chambers defined at longitudinal axial outer and inner end surfaces of said ring piston through said fitting-in of said ring piston, extends through said roll core and is communicated through rotary joint means at an end of the rolling roll with valves which adjust the longitudinal position of said ring piston in the cylindrical space, position sensor means for detecting the longitudinal axial position of said ring piston and a control unit for controlling said valves in response to any difference between a setting signal and a detection output signal from said position sensor means.

4,837,907

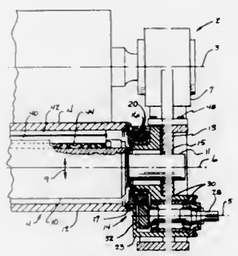
SELF-LOADING CONTROLLED DEFLECTION ROLL

Arnold J. Roerig, Beloit, Wis., and Richard R. Hergert, Rockton, Ill., assignors to Beloit Corporation, Beloit, Wis.

Filed Aug. 20, 1987, Ser. No. 87,555

Int. Cl.[4] B21B *27/00*

U.S. Cl. 29—115 **2 Claims**



1. A self-loading controlled deflection roll for use in engaging a mating roll along a nip line of contact therebetween, said roll comprising:

a stationary support beam;

a rotatable roll shell disposed about the beam and defining a space therebetween;

end support means pivotally supporting the ends of the support beam;

roll end assembly means secured on each end of the roll shell, including a ring gear at one end of the roll shell, said ring gear being rigidly secured relative to the end of the roll shell;

bearing housings disposed about the ends of the roll shell and movably linked and supported on the end support means;

bearings mounted in the bearing housings intermediate the roll end assembly means which rotatably support the roll shell and maintain rigid alignment between the roll shell and the bearing housings;

roll shell support element means mounted in the beam in the space for providing laterally-movable and rotatable support of the roll shell relative to the beam;

drive means mounted in a bearing housing, independent of the end support means, the drive means including a gear engaging the ring gear for providing rotatable movement of the roll shell relative to the support beam.

4,837,908

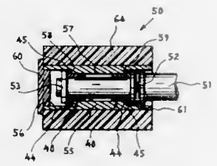
ROLL ASSEMBLY FOR FIBER DRAFTING MACHINE

Hugh K. Beveridge, Jr., Gastonia, N.C., assignor to Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 878,703, Jun. 26, 1986, abandoned. This application Jun. 28, 1988, Ser. No. 212,669

Int. Cl.[4] B21B *27/00*

U.S. Cl. 29—130 **16 Claims**



1. A roll assembly for a fiber drafting machine having an elongate spindle with first and second rolls mounted for rotation on opposite ends of the spindle, each of the first and second rolls comprising:

(a) first and second locking collars mounted on the spindle in spaced-apart relation;

(b) first and second bearings formed of a low friction, high temperature resin and mounted for rotation on the spindle in spaced-apart relation within the space defined by the first and second spaced-apart locking collars, each of the bearings comprising an annular ring of a relatively small diameter and an integrally-formed concentric flange of increased diameter thereon, the flange on each of the first and second bearings being respectively adjacent to the first and second locking collars; and

(c) an annular bearing sleeve mounted on the spindle for receiving an elastic cover; the bearing sleeve having inner support surface portions complementary to the shape of the first and second bearings in the radial direction, and in bearing contact with the increased diameter flange in the axial direction, whereby the first and second bearings each provide a radial and thrust bearing function to the roll assembly.

4,837,909

METHOD FOR THE ASSEMBLY OF AN INNER RACE FOR A ROLLER BEARING AND AN ANNULAR CAGE WHOSE OPENINGS CONTAIN ROLLING ELEMENTS

Bart Schalk, Zeist, Netherlands, assignor to SKF Industrial Trading and Development Co., Nieuwegein, Netherlands

Continuation of Ser. No. 74,365, Jul. 16, 1987, abandoned, Division of Ser. No. 750,916, Jul. 1, 1985, Pat. No. 4,700,443.

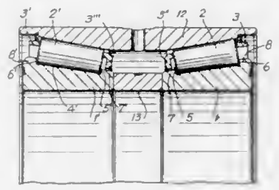
This application May 24, 1988, Ser. No. 198,671

Claims priority, application Netherlands, Jul. 2, 1984, 84002100

The portion of the term of this patent subsequent to Oct. 20, 2004, has been disclaimed.

Int. Cl.[4] B21D *53/12;* **B21K** *1/04*

U.S. Cl. 29—148.4 A **1 Claim**



1. Method for the assembly of an inner race for a roller bearing and an annular cage with rolling elements contained in openings in this cage separated by ridges, said inner race being placed essentially concentrically within the cage with the rolling elements retained by the cage contained in a track fashioned in the outer circumferential surface of the inner race, said track being bordered on both sides by shoulders formed by opposing lateral surfaces or radially revolving flanges at, respectively, the inner and outer top surfaces of the inner race, which track is tapered from the outside toward the inside with regard to the cardioid line of the inner race and the rolling elements are formed by basically cylindrical elements whose circumferential surface are slightly tapered from the outside toward the inside, a revolving end plane of the inner flange with regard to the cardioid line of the ring is tapered from the inside toward the outside of the flange, comprising the steps:

(a) inserting said rolling elements into said cage openings;

(b) supporting said cage containing said rolling elements with the narrow diameter end of said cage on a bearing plane which is formed with a annular groove of diameter and width corresponding to the inside narrower end of said inner race, said groove being recessed to a depth below said bearing plane,

(c) aligning said inner race with said cage,

(d) pressing said inner race onto said cage, said race entering from the outer, larger diameter end of said cage,

(e) continue pressing until the inner end of said race extends beyond said cage and is contained in said annular groove below said bearing plane and said rolling elements seat on said track.

4,837,910

METHOD AND APPARATUS FOR ASSEMBLING ANTI-FRICTION BEARINGS

Jean H. Nantel, 624 Manotic, Lakeville, Mich. 48036

Filed Nov. 30, 1987, Ser. No. 126,725

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—149.5 R **19 Claims**

1. A system for assembling anti-friction, needle bearings into a cylindrical opening of a receiving object, said receiving object to be subsequently inserted with said bearings over a shaft, said system comprising:

(a) a recover block having a longitudinally-extending cylindrical bore extending therethrough of diameter substantially equal to said opening in said receiving object, said recover block further having a longitudinally-extending slot in communication with said bore and a forward axial face at one end of said bore and a rearward axial face at the other end of said bore;

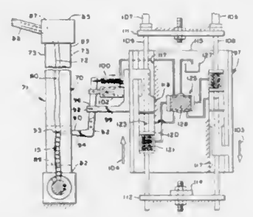
(b) a collecting mandrel having a stepped shaft including a first longitudinally-extending cylindrical shaft portion of a first diameter, a second longitudinally-extending cylindrical shaft portion of a second diameter extending therefrom, said first and second diameters being smaller than the diameter of said opening in said receiving object and said bore in said recover block;

(c) transfer station means for locating said receiving object adjacent said rearward axial face with said opening concentric with said bore;

(d) mandrel actuating means for longitudinally moving and positioning said mandrel from a first position whereat said first shaft diameter portion is centered within said bore to define an annular bearing space and a second position whereat said second shaft portion is centered within said bore and said first shaft portion is centered within said opening of said receiving object;

(e) lubricating means for providing a grease lubricant in said annular space when said mandrel actuating means is in said first position, said lubricating means further includes at least one annular groove in said recover block opening toward said block's bore, and means for injecting grease lubricant under pressure into said annular groove whereby said grease lubricant is interspersed between adjacent needle bearings;

(f) pin feeding means for positively feeding by exteriorly applied forces a discrete number of said needle bearings



through said slot so that said annular space is filled with said needle bearings longitudinally aligned side by side when said mandrel actuating means is in said first position, said mandrel actuating means further effective to transfer said needle bearings in an annular array into said opening of said receiving object in said second position and to rotate said first portion in said first position while said pin feeding means is actuated, said rotation continuing while said lubricating means is activated; said pin feeding means includes track means for holding a plurality of needle bearings in longitudinal alignment, generally one on top of the other, in a vertically extending column configured to prevent all said bearings from freely falling by gravity therethrough; and

(g) said pin feeding means further includes kicker means interacting with said track means to force a discrete number of said needle bearings into said annular space.

9. A method for assembling needle bearings within a cylindrical opening of a receiving object, comprising the steps of:

(a) providing a recover block having a longitudinally-extending bore therethrough, a slot at the top of said block in fluid communication with said bore and at least one annular groove in said block in communication with said block's bore;

(b) providing a stepped shaft mandrel having shaft portions of first and second diameters less than said diameter of said cylindrical opening;

(c) providing a track having a serpentine vertically extending opening in communication with said slot;

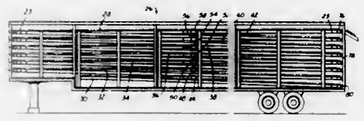
(d) positioning said first shaft portion of said mandrel in centered relationship within said bore to define an annular bearing space;
(e) feeding a plurality of needle bearings, one on top of the other within said track into said annular bearing space while rotating said mandrel;
(f) injecting a grease lubricant under pressure from said groove at least after said needle bearings have filled said annular bearing space while rotating said first stepped portion of said shaft to insure said grease substantially surrounds all said needle bearings in said annular bearing space;
(g) longitudinally moving said mandrel's second shaft portion into said opening in said receiver block whereby said needle bearings around said first shaft portion are displaced from said bore into said opening in said receiving member; and
(h) providing a kicker member, and inserting said kicker member into said track between adjacent needle bearings, and moving said kicker member downwardly a discrete distance to force said needle bearings into said space.

4,837,911

METHOD OF ASSEMBLING AND TRANSPORTING VEHICLE WHEEL ASSEMBLIES IN A SEQUENTIAL ORDER

William L. Noble, Sr., Village of Wolverine Lake, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Dec. 16, 1988, Ser. No. 285,686
Int. Cl.[4] B65G *13/02 67/00*
U.S. Cl. 29—159.1 **3 Claims**



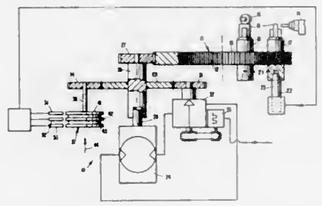
1. A method for assembling vehicle wheels at a location remote from a vehicle assembly plant for transport to the vehicle assembly plant comprising the steps of:
a. providing a supply of vehicle wheel rims and tires of various sizes and types at a location remote from a vehicle assembly plant,
b. mounting designated tires on designated wheel rims to form vehicle wheel assemblies in accordance with a predetermined sequence dictated by the order of use at the vehicle assembly plant,
c. inflating the tires of the thus formed vehicle wheel assemblies in said predetermined sequence,
d. then balancing the vehicle wheel assemblies in said predetermined sequence,
e. providing a highway cargo trailer having therewithin a conveyer in the form of a plurality of interconnected vertically spaced apart tiers,
f. providing a conveyer inlet at one of the uppermost or lowermost tiers,
g. providing a conveyer outlet at the other of the uppermost and lowermost tiers,
h. and then loading the vehicle wheel assemblies onto the conveyer via the conveyer inlet in said predetermined sequence to thereby permit unloading of the wheel assemblies from the conveyer via the conveyer outlet in said predetermined sequence at the vehicle assembly plant after the highway cargo trailer has been transported to the vehicle assembly plant.

4,837,912

HYDRAULIC DRIVING ARRANGEMENT FOR POSITIONING WORKPIECES IN CORRECT RELATIONSHIP TO TOOL HEADS OF A MULTI-STATION MACHINE TOOL

Eckehart Schulze, Weissach, Fed. Rep. of Germany, assignor to Hartmann & Lammle GmbH Co., KG, Schuckertstrabe, Fed. Rep. of Germany

Continuation of Ser. No. 817,625, Jan. 10, 1986, abandoned. This application Feb. 25, 1987, Ser. No. 18,401
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1983, 3321120
Int. Cl.[4] B23Q *39/04*
U.S. Cl. 29—38 C **3 Claims**



1. A hydraulic driving arrangement for positioning workpiece in a correct relationship to tool heads of a machine tool having a plurality of stations arranged at preferably equal angular spacings about an axis of a circular indexing table, the workpieces being subjected to a sequence of different processing operations carried out at respective ones of the plurality of different working stations, and cyclically advanced from working station to working station, an exact position of the workpieces being defined by an index which, after the circular indexing table has been moved to an approximate position, within pre-determined tolerances, enters into a locking engagement with one of a plurality of index bodies associated with different positions of the circular indexing table so as to move and retain the workpieces in the correct position relative to the individual tool heads required for precise processing, the hydraulic driving arrangement comprising a hydraulic motor for driving the indexing table, an electro-hydraulic follow-up governor means for controlling the hydraulic motor including a stepping motor for setting desired values and mechanical actual value indication means, monitoring means are positively coupled with at least one of the circular indexing table and a driving gear of the hydraulic motor for indicating whether the circular indexing table is in a position suitable for bringing an indexing gear into engagement and for supplying a signal for triggering the indexing process and deactivating the indexing mechanism if the indexing table is not in a suitable position.

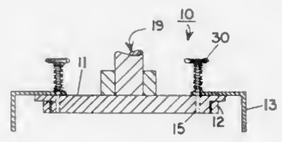
4,837,913

EMBROIDERY FRAME PRESS PLUNGER HEAD

Edgar F. Moore, III, 4447 Old Randleman Rd., Greensboro, N.C. 27405

Filed Jun. 15, 1987, Ser. No. 62,086
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—238 **10 Claims**

7. A plunger head for framing cloth by sandwiching cloth tightly between a first and second hoop for embroidering thereon comprising: a hoop retaining means, said hoop retaining means including a plurality of mounting studs, a plurality of coil springs, said coil springs positioned on said mounting studs, a pretension member, said pretension member having a plurality of mounting tabs, each of said tabs defining an aperture, said tabs for positioning on said studs and resting on said coil springs with said studs penetrating said tab apertures to provide resilient attachment, spring stop means, said stop means positioned on said studs for controlling the movement of said tabs along said studs by adjustably positioning said stop means from said tabs, said pretension member extending below said hoop retaining means whereby said pretension member



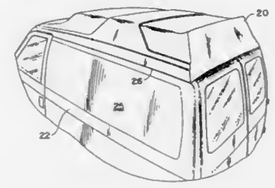
contacts the cloth prior to contact with said hoop retaining means to grip the cloth in a steady, tensioned manner prior to sandwiching the cloth between the first and second hoop.

4,837,914

CONVERSION ROOF FOR VANS

Otis C. Borum, Silver Springs; Martin O. Borum, Green Cove Springs, and Robert H. Arn, Jacksonville, all of Fla., assignors to A & S Fiberglass, Inc., Jacksonville, Fla.

Filed Feb. 1, 1988, Ser. No. 150,737
Int. Cl.[4] B62D *25/06*
U.S. Cl. 29—401.1 **20 Claims**



1. A system for preparing a conversion roof member for a vehicular van having a roof, a windshield doors and sidewalls which comprises:
(a) a peripheral flange member made of a thermosetting resinous material having a lower supporting web which rests against said conforms to the periphery of the roof of the van and an upwardly standing web for attachment to the conversion roof, said flange member being positioned and shaped to be free of interference with the opening and closing of the doors of the van;
(b) a conversion roof member to be joined around its periphery to said flange member;
(c) adhesive means for attaching said conversion roof member at its inside periphery to said standing web without any attachment extending through said conversion roof member and without any moulding to cover same; and
(d) attaching means for said conversion roof member extending through only said lower supporting web and the roof of the van at spaced locations thereabout in a manner to produce a water-tight joint, said attaching means positioning the lower edge of said conversion roof member very closely adjacent the roof of the van so that the joint there between is substantially unnoticeable.

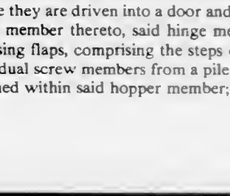
4,837,915

METHOD OF BREAKING BEARINGS

Richard G. Willms, Griswold, Iowa, assignor to James D. Welch, Omaha, Nebr., a part interest

Filed Jan. 4, 1988, Ser. No. 140,656
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—426.4 **2 Claims**

1. A method of removing bearings, having inner and outer rings, or collars from shafts comprising:
obtaining a device for use in removing bearings or collars from shafts, said device comprising a frame to which is attached a slider, which slider is attached to a slider mechanism, which slider mechanism can be adjusted to set said device for use in removing bearings or collars of different sizes from shafts; and to which frame is attached mechanisms by which breaking point members can be positioned at opposite sides of a bearing or collar such that force can be imparted to a bearing by way of the breaking point members to cause the bearing or collar to break and thereby be removed from the shaft, at least one of said mechamisms being a bolt to which a breaking point member is attached;



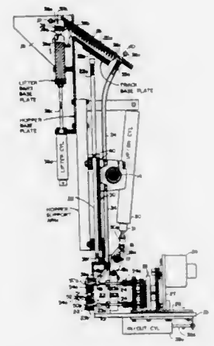
placing a bearing or collar into the device for use in removing bearings or collars from shafts and adjusting the slider mechanism and breaking point member mechanism so that the slider and breaking points firmly contain the outer ring of a bearing, or a collar, the slider being to one side of the bearing or collar and the breaking point members being at the top and bottom positions; and
hitting the bolt to which one breaking point member is attached to impart a force on the outer ring of the bearing, or to a collar, to cause to outer ring of the bearing, or the collar, to break.

4,837,916

METHOD OF APPLYING A DOOR HINGE

Erling S. Jangaard, Maderia Beach, Fla., assignor to Ruvo Automation Corporation, Largo, Fla.

Division of Ser. No. 932,265, Nov. 19, 1986. This application Apr. 6, 1988, Ser. No. 178,388
Int. Cl.[4] B23P *11/00*
U.S. Cl. 29—434 **8 Claims**



1. A method of delivering screw members from a hopper member to a remote location, that is downward of said hopper member, where they are driven into a door and a door jamb to secure a hinge member thereto, said hinge member having a post and opposing flaps, comprising the steps of:
lifting individual screw members from a pile of screw members retained within said hopper member;

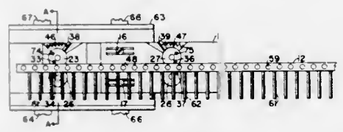
aligning said screw members into a plurality of queues;
fixedly position a plurality of downwardly extending conduit means between said queued screw members and the remote location;
transferring individual screw members from the queues by blowing said screw members through said conduit means;
positioning a head member having a plurality of screw-receiving chambers formed therein at the discharge end of said conduit means;
moving said head member from a first, upper and outward position, relative to said remote location, said first position being contiguous to said discharge end of said conduit means to a second, downward and inward position contiguous to said remote location;
driving said screw members into said door and door jamb when said head member is in its second position;
locking said head member against further movement when said head member is in its second position; and
accomplishing said locking of said head member by pivotally mounting said head member to a lower end of a lever means having a fulcrum so that when said lower end of said lever means is in its downwardmost and inwardmost position, said fulcrum is upward and outward of said lower end of said lever means and thus holds said head member against upward and rearward movement relative to said remote location.

4,837,917

METHOD OF GRIPPING CARRIER STRIP

Sigmund Ege, Oslo, Norway, assignor to Kloften & Kloften A/S, Oslo, Norway

Division of Ser. No. 937,814, Dec. 4, 1986, Pat. No. 4,729,553, which is a continuation of Ser. No. 742,008, Jun. 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 601,950, Apr. 19, 1984, Pat. No. 4,563,563. This application Dec. 7, 1987, Ser. No. 129,742
Int. Cl.[4] B23Q 7/04
U.S. Cl. 29—559 **4 Claims**



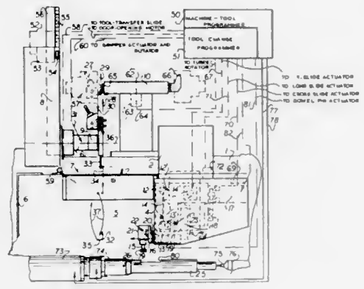
1. A method for holding carrier strip, said carrier strip being supported upon a surface and comprising a ribbon having parallel edges and regularly spaced elements projecting from at least one of said edges, comprising the steps of:
(A) bringing first and second pairs of pin means projecting upwardly from said surface to positions with one pin means of said first pair and one pin means of said second pair being grippingly disposed against one of said edges and the other pin means of said first pair and the other pin means of said second pair being grippingly disposed against the other of said edges,
(B) disposing one pin means of at least one of said pairs of pin means against one of said elements.

4,837,918

MACHINE TOOL ASSEMBLY

Franz Holy, and Hans Nader, both of Stockerau, Austria, assignors to Maschinenfabrik Heid Aktiengesellschaft, Stockerau, Austria

Filed May 26, 1988, Ser. No. 198,972
Claims priority, application Austria, May 26, 1987, 1350/87
Int. Cl.[4] B23Q 3/157
U.S. Cl. 29—568 **1 Claim**



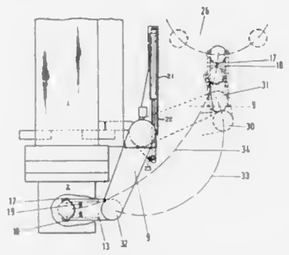
1. A machine tool, comprising:
a headstock and a tailstock positioned to receive a workpiece between them, at least said headstock being provided with means for rotating said workpiece about a generally horizontal axis;
an inclined bed extending along said axis and formed with a longitudinal guideway parallel to said axis but located rearwardly of a vertical plane of said axis;
moveable enclosure means cooperating with said bed and disposed forwardly of said plane and above said axis for enclosing a working space around said workpiece between said headstock and said tailstock;
a longitudinal carriage shiftable on said longitudinal slide in a longitudinal-slide plane parallel to said axis but inclined to said vertical plane;
a crossfed carriage shiftable on said longitudinal carriage in a direction perpendicular to the direction of displacement of said longitudinal carriage on said longitudinal guideway but in a crossfed plane parallel to said longitudinal-feed plane;
a y-direction slide carriage mounted on said crossfeed carriage and displaceable in a y-direction perpendicular to said crossfeed and longitudinal-feed planes, said carriages together forming a tool-carriage assembly;
a circulating ball nut spindle device operatively connected with said y-direction slide carriage for displacing same in said y-direction;
a single tool receiver formed on said y-direction slide carriage for detachable mounting of selective rotatable tools thereon;
a tool drive on said tool-carriage assembly having a coupling located laterally of said tool receiver for formfitting connection of said tool drive to a tool detachably mounted on said tool receiver for rotating said tool;
a closable opening formed in said bed and said enclosure means and communicating with a space rearwardly of said inclined bed;
a tool magazine having a plurality of tools replaceably mounted thereon and selectively positionable at a location in alignment with said opening;
a tool-transfer member linearly shiftable between said location and said opening; and
a double gripper pivotable on said tool-transfer member for engagement of a tool at said location with one gripper portion, engagement of a tool on said receiver with another gripper portion, rotation of said gripper portions to enable said receiver to accept a tool from said magazine and said magazine to accept a tool from said receiver upon linear shifting of said tool-transfer member between said location and said opening.

4,837,919

TOOL CHANGING ASSEMBLY FOR UNIVERSAL MILLING AND DRILLING MACHINES

Gerd Hoppe, Habichtswald, Fed. Rep. of Germany, assignor to MAHO Aktiengesellschaft, Pfronten, Fed. Rep. of Germany

Filed Sep. 6, 1988, Ser. No. 241,083
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731280
Int. Cl.[4] B23Q 3/157
U.S. Cl. 29—568 **6 Claims**



1. A tool changing assembly for program controlled milling and drilling machines generally having a vertical milling head with a work spindle having an axis, a vertically movable knee-type unit and a tool magazine having a plurality of tool holders thereon, said tool magazine being horizontally disposed laterally behind the milling head, said assembly comprising:
a vertical column mounted to said knee-type unit for vertical motion therewith;
bracket means mounted at one end to said vertical column for horizontally pivotable movement;
gripping plier means coupled to the end of said bracket, means spaced from said one end, said plier means having means for selectively gripping tool elements;
means mounted to said vertical column and coupled to said bracket for selectively rotating said bracket through a predetermined arc; and
driving means coupled to said bracket means for rotating said plier means in a direction opposite to the direction of rotation of said bracket means resulting from the pivoting movement of said bracket means;
said plier means being adapted to transfer a tool element between said tool magazine and said work spindle.

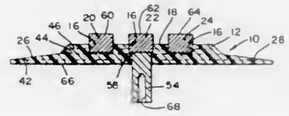
4,837,920

SLIP RING ASSEMBLY AND METHOD OF MANUFACTURE

David B. Sweet, Hartville, and James T. Hindel, Munroe Falls, both of Ohio, assignors to The BFGoodrich Company, Akron, Ohio

Filed Sep. 26, 1983, Ser. No. 536,031
Int. Cl.[4] H01R 43/06
U.S. Cl. 29—597 **9 Claims**

1. A method of making a slip ring assembly having slip rings mounted on a base member rotatable about an axis comprising
(a) positioning layers of resin impregnated reinforcing fabric in overlapping relation to form said base member,
(b) curing said layers of resin impregnated reinforcing fabric of said base member at elevated temperatures to provide a unitary body of dielectric composite material,



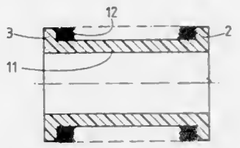
(c) positioning said slip rings on said base member in concentric relationship,
(d) adhering said slip rings to said base member.

4,837,921

PROCESS FOR MANUFACTURING A GROOVELESS STATOR FOR ELECTRIC MOTOR

Giampiero Tassinario, Florence, Italy, assignor to Mavilor Systemes S. A., Switzerland

Filed Feb. 16, 1988, Ser. No. 156,174
Claims priority, application Switzerland, Oct. 21, 1987, 4116/87
Int. Cl.[4] H02K 15/02
U.S. Cl. 29—596 **7 Claims**



1. A process for manufacturing a grooveless stator for an electric motor, essentially comprising a cylindrical winding and a yoke of magnetic material surrounding the winding, which process comprises the following steps:
forming a cylindrical winding having an axis and having two peripheral circular ends with edges and coils having turns, bending the turns of the coils at the edges of the two peripheral ends of the winding back radially outwardly, thus forming two external shoulders,
introducing the winding into an appropriate mold and injecting a synthetic resin into the mold, cooling the mold, after cooling, removing the mold which step produces a rigid winding having a cylindrical surface and two external shoulders extending radially therefrom,
coiling a wire of magnetic material around the cylindrical surface of the rigid winding and between said shoulders such that the winding partly or completely fills the space between the two shoulders to thereby mount and secure the yoke of magnetic material around the winding, and fastening a unit thus obtained in a frame of the motor.

4,837,922

PROCESS FOR MANUFACTURING A COMPOSITE MAGNETIC HEAD STRUCTURE

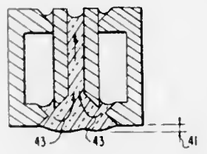
Jirou Toriu; Katsuhiro Ohno, both of Amagasaki, and Jun Miyajima, Koriyama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Division of Ser. No. 824,324, Jan. 30, 1986, abandoned. This application Jun. 27, 1988, Ser. No. 213,465

Claims priority, application Japan, Jan. 30, 1985, 60-15831; May 8, 1985, 60-97006

Int. Cl.[4] G11B 5/42

U.S. Cl. 29—603 7 Claims



1. A process for forming a composite magnetic head structure, comprising the steps of:

fixing a first center core (5) to a first side core (4) to form a first head core block (27) having a first sliding surface (28) for slidably contacting a record medium, said first sliding surface having a first magnetic gap (8) between said first center and side cores;

fixing a second center core (7) to a second side core (6) to form a second head core block (34) having a second sliding surface for slidably contacting said record medium, said second sliding surface having a second magnetic gap (9) between said second center and side cores;

forming at least one first notch (14, 14') in said first head core block for controlling the width (TW) of said first magnetic gap at said first sliding surface;

forming at least one second notch in said second head core block for controlling the width (TW) of said second magnetic gap at said second sliding surface; and

fixing said first and second head core blocks to one another with said first and second center cores facing one another and said first and second magnetic gaps substantially parallel to one another to form said composite magnetic head structure,

wherein said first notch extends from said first sliding surface to an adjacent surface (29) of said first center core and crosses said first magnetic gap, and said second notch extends from said second sliding surface to an adjacent surface of said second center core and crosses said second magnetic gap,

wherein said first center and side cores meet to form a first apex portion (19) behind said first sliding surface, and said first notch passes through said apex portion, and wherein said second center and side cores meet to form a second apex portion behind said second sliding surface, and said second notch passes through said second apex portion,

wherein said step of fixing said first and second head core blocks to one another comprises:

orienting said first and second head core blocks with said adjacent surfaces facing one another and separated by a desired distance, and with said first and second sliding surfaces aligned with one another and facing downwardly, disposing a welding material (40) in at least one of said first and second apex portions; and heating said welding material above its melting point whereby said welding material flows downward through said notches in said first and second sliding surfaces and upward by capillary action into the space between said adjacent surfaces.

4,837,923

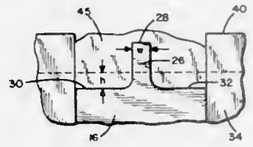
SURFACE FINISHING FOR MAGNETIC TRANSDUCERS

Amarjit S. Brar, Edina; Jimmie E. Mims, and Jagdish P. Sharma, both of Bloomington, all of Minn., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Apr. 29, 1988, Ser. No. 187,968

Int. Cl.[4] G11B 5/42

U.S. Cl. 29—603 17 Claims



1. A process for fabricating a magnetic transducing head formed by the bonding of two ferrite sections to form a rigid ferrite body including said sections and a non-magnetic flux gap between the sections, cutting an individual core from said ferrite body, bonding said core to a ceramic pad with a non-magnetizable binding material, and removing material from said core and pad to form in said core and flux gap a predetermined throat height measured in a selected direction, said material removal including the steps of:

grinding said core and said binding material with a grinding tool having a grit of a first nominal diameter, to form in said core a generally flat surface lying in a plane substantially normal to said selected direction, until there remains an excess of said core over said predetermined throat height of approximately one-half of said first nominal diameter;

following grinding, lapping said core on a slowly moving soft metal lapping plate covered with a slurry containing a diamond grit of a second nominal diameter substantially less than said first nominal diameter and with a selected alkaline pH, to simultaneously etch and polish said core until substantially all of said excess is removed; and

following said lapping, hand-finishing said core on a stationary soft metallic plate covered with a slurry containing a diamond grit of a third nominal diameter substantially less than said first diameter, and at said selected pH.

4,837,924

PROCESS FOR THE PRODUCTION OF PLANAR STRUCTURE THIN FILM MAGNETIC HEADS

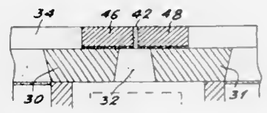
Jean-Pierre Lazzari, Corenc, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 8, 1987, Ser. No. 94,292

Claims priority, application France, Sep. 17, 1986, 86 13010

Int. Cl.[4] G11B 5/42

U.S. Cl. 29—603 1 Claim



1. A process for producing planar structure thin film magnetic heads, which comprises:

forming a first insulating film on an insulating substrate,

etching the insulating film and the substrate to form a first recess,

depositing thereon a first conductive film, which is then selectively etched in such a way that it only remains at the bottom of the first recess,

depositing a first magnetic film by a first electrolysis taking the conductive film as the electrode so that said first magnetic film fills the recess and is level with the surface of the first insulating film,

depositing a second insulating film thereon wherein an electric coil is formed in said second insulating film,

etching in the second insulating film, on either side of the coil, two openings reaching the first magnetic film,

filling said openings by a second electrolysis using the first conductive film as the electrode, to thereby produce magnetic contact pads, which have a good magnetic continuity with the first magnetic film and are level with the surface of the second insulating film,

depositing thereon a third insulating film,

etching in said third insulating film, above the magnetic contact pads, second and third recesses, leaving between said second and third recesses a central insulating island,

depositing thereon a second conductive film, which is then selectively etched so as to leave it at the bottom of the second and third recesses,

filling the second and third recesses with a second magnetic film subdivided into two parts and located on either side of the central insulating island, said second magnetic film being level with the surface of the third insulating film, by a third electrolysis using the second conductive film as the electrode,

depositing thereon a fourth hard protective insulating film, into which is etched a fourth recess above the central insulating island and reaching the second magnetic film,

forming in said fourth recess a thin amagnetic spacer centered on the central insulating island,

depositing thereon a third conductive film, which is then selectively etched so as to only leave it at the bottom of the fourth recess on either side of the spacer,

filling the fourth recess with a third magnetic film subdivided into two parts located on either side of the amagnetic spacer, said third magnetic film being level with the surface of the hard protective film, by a fourth electrolysis using the third conductive film as the electrode.

4,837,925

METHOD OF MANUFACTURE OF AN ELECTRICAL TERMINAL ON AN INJECTION MOLDING NOZZLE

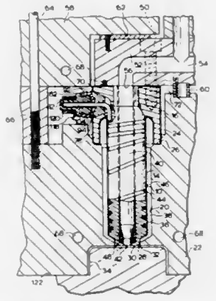
Jobst U. Gellert, 7A Prince Street, Georgetown, Ontario, Canada L7G 2X1

Filed Oct. 24, 1988, Ser. No. 261,732

Claims priority, application Canada, Sep. 30, 1988, 578975

Int. Cl.[4] H01C 17/28

U.S. Cl. 29—619 11 Claims



1. In a method of making an integral elongated heated injection molding nozzle with a forward end and a rear end to be seated in a well in a cooled mold with minimal contact bridging an insulative air space provided between the heated nozzle and the surrounding cooled mold, the nozzle having a melt bore extending therethrough from a central inlet at the rear end to convey pressurized melt received at the inlet towards at least one gate extending from the well to a cavity in the mold, the nozzle having a steel main body portion with a generally cylindrical outer surface extending from a steel collar portion adjacent the rear end, the method including the steps of integrally vacuum brazing the nozzle together wit a portion of an electrical heating element brazed in a spiral channel extending around the cylindrical outer surface of the main body portion, the heating element having a resistance wire extending through an electrical insulating material in an outer casing and a rear end extending out through a radial opening in the collar portion to a terminal, the improvement including,

(a) forming a plug having a front face, an outer surface and a heating element bore extending therethrough and seating the plug in the radial opening in the collar portion by inserting the rear end of the heating element into the bore and sliding the plug to a position where it is seated in the radial opening with a rear end portion of the heating element projecting at least a predetermined minimum distance from the front face of the plug,

(b) forming a terminal body with a heating element bore extending centrally therethrough from a rear end to a front end, the terminal body having a front portion with a threaded outer surface adjacent the front end and a rear portion with an outer surface adjacent the rear end,

(c) stripping the outer casing and insulating material from the heating element to expose the resistance wire for a short distance adjacent the rear end,

(d) surrounding the casing of the rear end portion of the heating element projecting from the front face of the plug with insulating material and applying a thin coating of insulating material to the outer surface of the rear portion of the terminal body,

(e) forming a protective cap having an inner surface which matches the outer surface of the rear portion of the terminal body and an outer surface which matches the front surface of the plug,

(f) mounting the protective cap on the rear portion of the terminal body in position to protect the coating of insulating material and pressing the protective cap in place to prevent relative rotation between the cap and the terminal body,

(g) mounting the terminal body and the protective cap on the nozzle by inserting the rear end of the heating element into the heating element bore therethrough and sliding the terminal portion to a position wherein the outer surface of the protective cap abuts against the front face of the plug and securing the terminal body and the protective cap in that position, and

(h) electrically connecting the exposed resistance wire of the heating element adjacent the rear end to the front portion of the terminal body.

4,837,926

WORK HOLDER FOR ELECTRICAL CONNECTORS

Andrew G. Boutcher, Jr., Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 31, 1988, Ser. No. 200,334

Int. Cl.[4] B23P 19/02

U.S. Cl. 29—747 16 Claims

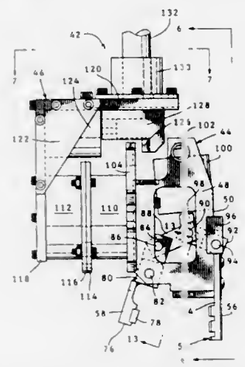
1. A work holder for holding an electrical connector housing during insertion of terminals into terminal receiving cavities in the housing, the housing having oppositely directed first and second faces, the terminal receiving cavities extending inwardly from the first face, the work holder comprising:

a housing positioning fixture having oppositely directed first and second major fixture surfaces, a plurality of terminal guiding openings extending through the positioning fixture at locations conforming to the locations of the cavities in the housing,

a clamping member located in spaced aligned relationship to the first major fixture surface, the clamping member and the positioning fixture being movable relatively towards

and away from each other between open and closed positions, the clamping member and the positioning fixture being spaced apart by a distance sufficient to permit placement of the housing therebetween with the first face of the housing opposed to the first major fixture surface when the fixture and the clamping member are in their open positions, the housing being clamped between the clamping member and the positioning fixture with the first face adjacent to the first major fixture surface when the clamping member and the positioning fixture are in their closed positions,

clamp actuating means for moving the positioning member and the clamping fixture between their open and closed positions, and



guiding and aligning means on the first major fixture surface of the positioning fixture, the guiding and aligning means having surface portions which engage portions of the housing, during movement of the fixture and the clamping member to their closed positions, and which align the cavities with the terminal guiding openings whereby,

upon placement of the housing between the positioning fixture and the clamping member with the cavities in approximate alignment with the terminal guiding openings when the positioning fixture and the clamping member are in their open positions, and thereafter moving the positioning fixture and the clamping member to their closed positions, the guiding and aligning means will cause the housing to be guided towards the first major fixture surface and the cavities will be brought into precise alignment with the terminal guiding openings.

4,837,927

METHOD OF MOUNTING CIRCUIT COMPONENT TO A CIRCUIT BOARD

John M. Savage, Jr., 538 B Via De La Valle, Solana Beach, Calif. 92075

Continuation-in-part of Ser. No. 56,051, Jun. 1, 1987, Pat. No. 4,727,648, which is a continuation-in-part of Ser. No. 918,295, Oct. 14, 1986, abandoned, which is a continuation of Ser. No. 725,565, Apr. 22, 1985, abandoned. This application Feb. 1, 1988, Ser. No. 151,201

The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.

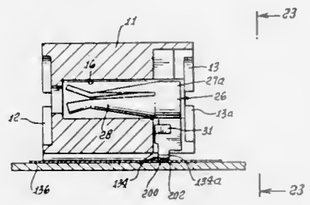
Int. Cl.[4] H05K *3/34*

U.S. Cl. 29—839 **18 Claims**

1. In the method of mounting a circuit component to a circuit board means in any of a plurality of modes, using a multi-way mount, said component comprising an electrical unit having a base and terminal means projecting endwise from the base, the steps that include:

(a) providing a mounting body to support the unit on the circuit board means, the body defining an axis, cavity means, and slot means intersecting the cavity means and extending generally axially of the body, the body capable of supporting said unit at either of two ends of the body which are axially spaced apart, via said terminal means in said cavity means,

(b) providing conductive means including contact structure for electrically connecting said unit with said circuit board means, the contact structure including spring fingers spaced about at least one zone adapted to receive the unit terminal means, in electrical contact therewith, said conductive means including auxiliary terminal means to be integral with said contact structure and the contact structure assembled into the cavity means so that the



auxiliary terminal means projects outwardly of the body via said slot means, said contact structure and said auxiliary terminal means being defined by a single metallic sheet having tab means for anchoring the sheet to the body, and said sheet having a bridge portion between said contact structure and said auxiliary terminal means, said tab means offset from a plane defined by said bridge portion, said plane extending generally parallel to the axis of the body, and said assembling carried out to locate said bridge portion in said slot means,

(c) assembling the conductive means to the body as aforesaid and the electrical unit to the contact structure so that the unit extends at one of said ends of the body, and

(d) joining the auxiliary terminal means to a circuit board.

4,837,928

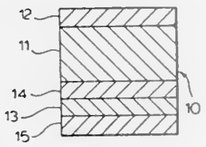
METHOD OF PRODUCING A JUMPER CHIP FOR SEMICONDUCTOR DEVICES

Robert L. Trevison, Spokane, Wash.; William E. McKee, Coeur D'Alene, Id., and Larry B. Hunnel, Otis Orchards, Wash., assignors to Cominco Ltd., Canada

Division of Ser. No. 920,081, Oct. 18, 1986, Pat. No. 4,745,036. This application Jan. 26, 1988, Ser. No. 148,618

Int. Cl.[4] H05K *3/34*

U.S. Cl. 29—840 **10 Claims**



1. A method for producing a laminate consisting of a substrate, an upper layer on one side of said substrate, a gold-alloy layer, an intermediate gold layer at one side of said gold-alloy layer intermediate the other side of said substrate and said gold-alloy layer, and a lower gold layer on the other side of said gold-alloy layer, said method comprising the steps of

(a) coating one side of said substrate with a coating of gold;

(b) coating both sides of said gold-alloy layer with a layer of gold;

(c) placing said coating of gold on said substrate in contact with the layer of gold on one side of said gold-alloy layer to form an assembly; and

(d) hot rolling said assembly to create a bond between said coating of gold on said substrate and said layer of gold on one side of said gold-alloy layer;

whereby a laminate is obtained wherein said intermediate gold layer has a distinct thickness.

4,837,929

DRY SHAVER WITH A READILY REPLACEABLE OUTER SHEARING FOIL

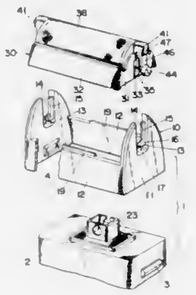
Masao Tanahashi, and Shiro Yada, both of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Japan

Filed Feb. 4, 1988, Ser. No. 152,304

Claims priority, application Japan, Feb. 20, 1987, 62-37444; Aug. 25, 1987, 62-211189

Int. Cl.[4] B26B *19/04*

U.S. Cl. 30—43.92 **12 Claims**



1. A dry shaver comprising:

a housing mounting on its top a generally elongated inner blade assembly driven to reciprocate along the longitudinal axis of said inner blade assembly; and

a head frame demountable mounted on said housing and carrying a shearing foil, said head frame being of rectangular configuration including a pair of opposed end walls connected by opposed side walls and detachably mounted on the top of said housing so that the inner blade assembly projects into the head frame for shearing engagement with the undersurface of said shearing foil, each of said end walls having a hook engageable with a corresponding stop formed as a stationary element on the side of said housing for retaining said head frame on the top of said housing;

each of said end walls further including a release lever extending integrally from the end wall adjacent to said hook and being allowed to flex resiliently for disengaging said hook from the corresponding stop, said hook extending inwardly of said release lever and said hook being flexible resiliently inwardly, the arrangement being such as to permit said head frame to be removed from the housing by inward flexing of the release lever to cause the hook to flex inwardly for disengagement of the hook from the stop and each of said release levers having a finger engaging portion exposed to be accessible by a finger of a user.

4,837,930

SAFETY RAZOR

Nardino Righi, Milan, Italy, assignor to Eurafrica S.r.l., Milan, Italy

Filed Jan. 22, 1988, Ser. No. 147,186

Claims priority, application Italy, Jan. 30, 1987, 12411 A/87; Mar. 18, 1987, 12437 A/87

Int. Cl.[4] B26B *21/00*

U.S. Cl. 30—47 **10 Claims**

1. A safety razor comprising:

a shaving head having a longitudinal head axis upon which a shaving blade is mounted;

a handle including an upper handle part and a longitudinal handle axis;

a head mounting means for mounting said shaving head to said upper handle part for rotation about a head rotation axis over at least 90° between a rest position where said longitudinal head axis is parallel to said longitudinal handle axis and a use position where said longitudinal head axis is perpendicular to said longitudinal handle axis;

a shaving head locking bar having a free end;

a bar mounting means for mounting said locking bar for movement in said handle between a locked position where said free end engages said shaving head against rotation and a free position where said free end does not engage said shaving head; and

a moving means for moving said locking bar between said positions.

4,837,931

DEVICE FOR CUTTING PIECES FROM A SUBSTANTIALLY CYLINDRICAL ARTICLE

Ewald H. Beermann, Solingen, Fed. Rep. of Germany, assignor to Martor-Argentax E.H. Beermann KG, Solingen, Fed. Rep. of Germany

Filed Jun. 26, 1987, Ser. No. 67,593

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1986, 3621399

Int. Cl.[4] B26B *27/00*

U.S. Cl. 30—92 **10 Claims**

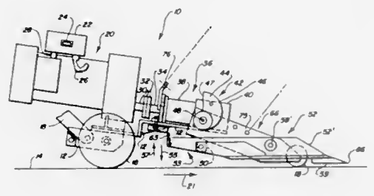
1. In a device for cutting a piece from a generally cylindrical article, the device comprising a handle having a gap-like cavity

in which a knife blade carried in a blade holder is pivotable, the improvement wherein
said blade holder is substantially U-shaped and has arms provided with a plurality of supporting surfaces for said knife blade,
said supporting surfaces are formed by a plurality of recesses in said blade holder and are overlapped by a cover,
said blade holder is provided with a transverse pivot passage beyond the contour of said knife blade and traversed by a pivot bolt anchored in said handle, and
said transverse pivot passage of said blade holder is formed at an enlarged inner end of a slot extending straight from the pivot passage to the periphery of said blade holder, said blade holder being engageable in a snap fit at the passage on said pivot bolt by sliding of same along said slot.

4,837,932
LOCKING BLADE POCKET-KNIFE
Carl Elsener, Ibach-Schwyz, Switzerland, assignor to Victorinox AG, Ibach, Switzerland
Filed Jul. 28, 1986, Ser. No. 890,860
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1985, 3528105; Switzerland, May 30, 1986, 2182/86
Int. Cl.[4] B26B *3/06*
U.S. Cl. 30—161 **13 Claims**

1. A locking blade pocket-knife, comprising
a handle;
a knife blade received within said handle, said knife blade being pivotally mounted at an end of said handle for movement between an extended and a retracted position, said knife blade including a tang portion and cam means,
a beam spring pivotally mounted within said handle for limited rocking movement, said beam spring including an aperture, a projection partially enclosing said aperture, and a cam guide adjacent said projection, said cam means and cam guide cooperating to control pivotal movement of said knife blade, said cam means traveling along cam guide and causing said beam spring to rock when said knife blade is pivoted,
a pawl key movable between a locking position in said aperture and an unlocked position outside of said aperture,
biasing means urging said pawl key into locking position when said knife is in its extended position, said projection engaging said pawl key to prevent rocking movement of said beam spring and travel of said cam means along said cam guide and thereby to prevent retraction of said knife blade when said pawl key is in its locking position, and
a pawl mounted in said handle for manual sliding movement, said pawl being connected to said pawl key whereby movement of said pawl disengages said pawl key from said projection.

4,837,933
MACHINE FOR REMOVING TILES AND LIKE COVERING MATERIAL FROM ROOF SURFACES
Ward W. Chapman, 2700 W. Third Ct., Hialeah, Fla. 33010
Filed Jan. 22, 1988, Ser. No. 147,280
Int. Cl.[4] E04D *15/00*
U.S. Cl. 30—120 **8 Claims**

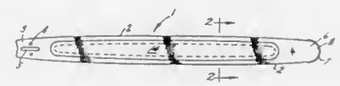


1. A machine for removing roof tiles or like covering material from the exterior surface of a roof, said machine comprising:
a. a frame means for supporting operable components of the machine and structured to travel over the exterior roof surface in a forward direction,
b. separating means pivotally mounted on said frame means and comprising a lifting member disposed in a leading disposition and in engaging relation to the covering material for separation thereof from the exterior roof surface,
c. drive means mounted on said frame means and disposed in driving, engageable relation with said separating means for imparting a pivotal, material separating motion to said separating means,
d. said frame means comprising a mounting structure fixedly disposed on a leading portion of said frame means, said separating means pivotally connected to said mounting structure at a location between said lifting member and a trailing portion of said separating means,
e. said lifting member reciprocally disposed between a separating engagement with the cover material and a raised position disposed in lifting engagement with the removed cover material relative to an under surface thereof,
f. a biasing means interconnected between said trailing portion and said frame means and structured for normally biasing said lifting member out of said raised position and into said separating engagement with the removed covering material,
g. a drive motor mounted on said frame means and movable therewith over the exterior roof surface, said drive motor drivingly connected to said drive means for activation thereof, and
h. said lifting member movable in an operative motion defined by forward movement of said frame means and concurrent, reciprocal lifting motion of said lifting member, upon activation of said drive means, relative to the covering material being removed from the exterior surface of the roof.

4,837,934
LIGHTWEIGHT CHAIN SAW BAR
Paul F. Krohn, Elsie Route Box 1335, Seaside, Oreg. 97138
Filed Jul. 31, 1987, Ser. No. 79,931
Int. Cl.[4] B27B *17/02*
U.S. Cl. 30—387 **3 Claims**

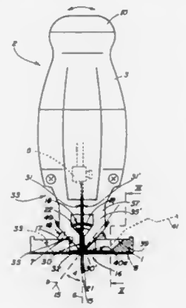
1. A saw bar for a powered chain saw, said saw bar including,

internal edge structure defining an open area, said edge structure including shoulders and a flange therebetween extending substantially about the open area, said flange having an inner edge, and
an insert member of non-metallic material in place in said



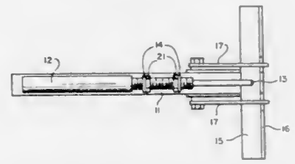
open area of the saw bar and in partial surfacial engagement with surfaces of the flange, said insert member being of a composite nature and formed during installation in said open area and including plies of fibrous sheet material, some of said plies in surfacial engagement with the surfaces of said flange.

4,837,935
JIG SAW
Peter Maier, Gerokstrasse 1, D-7311 Neidlingen, and Rolf Simen, Birnblütenweg 15, D-7000 Stuttgart 80, both of Fed. Rep. of Germany
Filed Apr. 13, 1987, Ser. No. 37,710
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1986, 3613279
Int. Cl.[4] B23D *49/16;* **B27B** *19/02*
U.S. Cl. 30—392 **13 Claims**



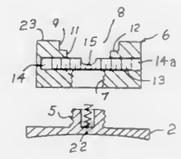
1. A jig saw for cutting in a cutting direction, comprising:
a saw foot adapted to be rested on a support and having a sliding face for engaging such support and being moved along a line thereon in a cut direction;
a drive unit tiltably mounted on said foot for pivoting about a drive unit axis extending in the cutting direction:
a tool holder connected with and adapted to be reciprocated by said drive unit:
an elongated tool having tool sides substantially parallel to the cutting direction, said tool extending through said foot so that a cutting section thereof extends downwards beyond said foot, said elongated tool being adapted to be held by said tool holder, and
guide means pivotally mounted on said jig saw foot adapted to laterally support said tool at a position adjacent to said foot, said guide means being able to be tilted with said drive unit such that points on said drive unit and on said guide unit move in parallel planes that are normal with respect to said axis of said drive unit, said tool being supported by said guide means in the tilted position thereof, said guide means including at least one holder fixedly secured to said drive unit and carrying said steadying elements so as to position guide faces adjacent to said tool directly over the sliding face of said saw foot, said drive unit including a housing part integral with said holder, said holder being a casting with two holding arms, said holding arms extending from adjacent said drive unit towards said tool near said foot so that a holding arm is positioned on each side of said tool, said guide faces being adapted to steady said tool.

4,837,936
UNDERWATER MEASURING GAGE
James L. Lockhart, Pocatello, Id., assignor to The United States of America as represented by The United States Department of Energy, Washington, D.C.
Filed Nov. 30, 1987, Ser. No. 126,157
Int. Cl.[4] G01B *5/08;* **G21C** *17/00*
U.S. Cl. 33—783 **15 Claims**



1. A measuring device comprising:
a base; a linear variable displacement transducer having a reciprocable anvil; means supporting said transducer on said base; guide means attached to said base for guiding an object to be measured into position relative to said anvil for measurement of said object; clamping jaw means pivotally mounted on said base for clamping said object into position in said guide means; elongated handle means with one end attached to said base and the other end thereof adapted for remote manual manipulation of said anvil and guide means relative to said object, and a movable handle means mounted adjacent said other end of said handle means, said movable handle means being connected to said clamping jaws means by connection means whereby said jaw means can be moved out of its object-clamping position when it is desired to position said anvil and guide means adjacent an object for another measurement.

4,837,937
ADJUSTABLE REAR SIGHT UNIT FOR A GUN
Harold Hasselbusch, 144-21 68th Dr., Flushing, N.Y. 11367
Filed Aug. 1, 1988, Ser. No. 226,797
Int. Cl.[4] F41G *1/10, 1/26*
U.S. Cl. 33—257 **9 Claims**



1. A rear gun sight unit comprising a body having a vertically extending slot in a top end thereof and having a vertically extending threaded socket in a bottom end thereof, a base plate mountable atop a rear area of a gun and having a vertically extending neck threadedly engaged in the socket, a sighting screw of substantially uniform diameter extending across opposed walls of the slot and threadedly engaged in its end portions in complementary bores in the walls of the slot, the screw having a sighting notch in its midarea disposed between the

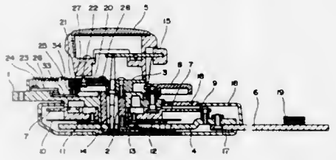
walls of the slot, the body having a normal condition seated upon the base plate and adapted to being adjustably threaded upwardly of the neck to elelvate the sighting notch, and the screw being threadedly ajustable relative to the walls of the slot to selectively vary the position of the notch between the walls from a normal center position to either side of center.

4,837,938

SCALE BALANCING DEVICE IN DRAWING MACHINE

Masahiro Tanaka, Tokyo, Japan, assignor to Asahi Seimitsu Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1987, Ser. No. 116,237
Claims priority, application Japan, Nov. 5, 1986, 61-262944
Int. Cl.[4] B43L *13/02*
U.S. Cl. 33—438 **19 Claims**



1. A scale balancing device incorporated into a scale manipulating head of a drawing machine comprising:

a bearing base plate provided in the scale manipulating head;

a scale rotating shaft rotatably supported in said bearing base plate;

a rotatable member having a rotational radius and being rotatable concentrically and integrally with said scale rotating shaft;

an engaging member provided position-adjustably in a direction of the rotational radius of said rotatable member;

a tension member having two ends, one end of said tension member being connected to said engaging member and having a tensile elasticity;

a biasing mechanism provided on said bearing base plate and having two ends, one end of said biasing mechanism being connected to the other end of said tension member; and

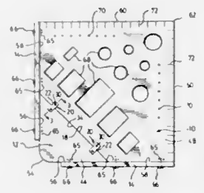
the other end of said biasing mechanism bearing against said rotatable member under the tensile elasticity of said tension member.

4,837,939

TEMPLATE FOR MARKING OR CUTTING A SHAPED CORNER ON A WORKPIECE

Adrian C. Pullen, 9 Jenoves Place, Toronto, Ontario, Canada M5A 4A6

Filed Feb. 1, 1988, Ser. No. 150,853
Int. Cl.[4] B27C *5/10*
U.S. Cl. 33—562 **8 Claims**



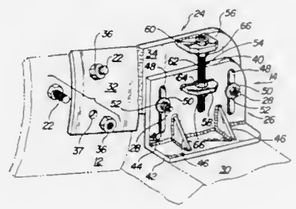
1. A template for marking or cutting a shaped corner on a workpiece, said template comprising a substantially planar main board-like body having a first side edge provided with first attachment means, and a series of separate and different corner portions, each corner portion having a second side edge buttable with the first side edge of the main body portion and provided with second attachment means releasably co-operable with the first attachment means to detachable secure a selected corner portion to the main body portion with said first and second side edges abutting, each corner portion having a further side edge of desired shape operable, when the corner portion is secured to the main body portion, as a guide for marking or cutting a corner of said desired shape on a workpiece, the main body portion having a pair of mutually perpendicular further side edges extending form opposite ends of said first side edge, and the further side edge of the corner portion merging smoothly therewith in a linear manner when a corner portion is secured to the main body portion.

4,837,940

GRADER BLADE HEIGHT CONTROL

Michael K. Mahan, 720 Fielding Rd., Sidney, Ohio 45365

Filed Apr. 18, 1988, Ser. No. 182,965
Int. Cl.[4] E02F *5/00*
U.S. Cl. 33—624 **2 Claims**



1. An adjustable grade height establishing device for attachment to the end of a grader blade of a motor grader comprising:

a mounting plate having spaced mounting holes at one end for attachment to the face of a grader blade adjacent one end of the grader blade with bolts passing through said mounting holes and grader blade and a gage mounting area adapted to extend beyond the edge of the grader blade;

an L-shaped gage with a planar mounting surface constituting the longer leg of the L for abutment with the gage mounting area of said mounting plate and a curb contacting surface constituting the shorter leg of the L; and

means for adjustably attaching the planar mounting surface of said gage to the mounting area of said mounting plate, said means including a pair of spaced apertures in one of said gage mounting area of said mounting plate and the mounting surface of said gage and a pair of spaced substantially vertical slots in the other of said gage mounting area of said mounting plate and the mounting surface of said gage, and a pair of bolts passing through said apertures and slots and nuts on said bolts for securing said gage in a fixed position relative to said mounting plate;

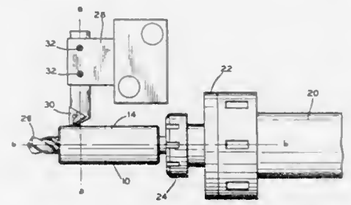
whereby said L-shaped gage will ride on said curb with the shorter planar curb contacting surface of the L establishing the working height of the grader blade, and the longer planar surface of the L clearing any material deposited on the curb.

4,837,941

PRESET TOOL GAUGE

Dennis R. Mullins, Oakwood, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Oct. 28, 1987, Ser. No. 113,943
Int. Cl.[4] B27G *23/00*
U.S. Cl. 33—626 **7 Claims**



1. A machine for removing material from a workpiece, including a cutting tool adapted to contact the workpiece along a first axis, means for support of the workpiece along a second axis orthogonal to said first axis, a cylindrical support member having an outer diameter supported by said means for support along said second axis, a system of gauges, each gauge adapted for positioning said cutting tool along said first axis to a predetermined distance from said second axis, each gauge comprising an annular cylindrical body including an inner-cylindrical surface and an outer-cylindrical surface, said inner-cylindrical surface defining an inner diameter slightly greater than the outer diameter of said cylindrical support wherein said body is snugly inserted over said cylindrical support member under a specific tolerance range, said outer-cylindrical surface defining an outer diameter located at said predetermined distance relative to said second axis.

4,837,942

CENTERING PUNCH OR OTHER CENTERING MARKER AND CLIP ASSEMBLY FOR BLIND MARKING OF MOUNTING APERTURES

William M. Watts, 813 Second Ave., Joliet, Ill. 60433

Filed Jun. 8, 1987, Ser. No. 59,652
Int. Cl.[4] G01B *3/02*
U.S. Cl. 33—666 **10 Claims**

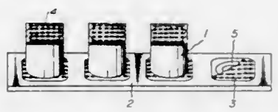
1. A centering marker and holding device assembly for blind marking of positions for fasteners on a mounting surface to secure a mountable object to said mounting surface in an exact pre-selected position and location, comprising said mounting surface and said mountable object, centering marker means to make a mark on said mounting surface, holding means on said mountable object to hold said centering marker means securely in place at a first pre-selected location on said mountable object until forcibly removed therefrom, impact means to transmit pressure applied to said mountable object in the direction toward said mounting surface to said centering marker means to make a mark on said mounting surface at a second pre-selected location on said mounting surface, and fastening means to secure said mountable object to said mounting surface at the place thereon wherein said first and second pre-selected locations are in registration with each other, wherein said centering marker means includes a punch member having a body portion, a conical portion extending therefrom having a sharply pointed tip at the free end of said portion, said fastening means includes a fastening member having a body portion of corresponding cross-sectional configuration and dimension to that of said body portion of said punch member, wherein said holding means holds said fastening member in place to secure said mountable object to said mounting surface when said centering marker means has been removed therefrom and said fastening member received by said holding means.

4,837,943

DIELECTRIC DRYING PROCESS FOR HONEYCOMB STRUCTURES

Isao Mizutani, Nagoya, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Dec. 22, 1987, Ser. No. 136,542
Claims priority, application Japan, Dec. 27, 1986, 61-309278
Int. Cl.[4] B01K *5/00*
U.S. Cl. 34—1 **2 Claims**



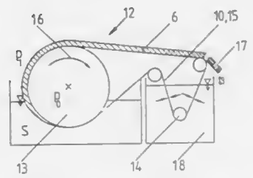
1. A process for dielectric-drying a honeycomb structure comprising placing a honeycomb structure on a drying support board comprising a perforated plate, a given region of which inclusive of a portion contacting with a lower opening end face of the honeycomb structure has a conductivity higher than that of a second portion, placing an upper plate comprising a perforated plate made from at least one material selected from the group consisting of aluminum, copper, aluminum alloy, copper alloy and graphite, the upper plate having a conductivity higher than that of the honeycomb structure on an upper opening end face of the honeycomb structure, and directing an electric current between an electrode arranged above the upper opening end face of the honeycomb structure and an electrode arranged beneath the lower opening end face thereof to conduct the drying.

4,837,944

PROCESS FOR THE FORMATION AND DRYING OF FILTER CAKE

Reinhard Bott, Karlsruhe, Fed. Rep. of Germany, assignor to Bokela Ingenieurgesellschaft fur Mechanische Verfahrenstechnik, Karlsruhe, Fed. Rep. of Germany

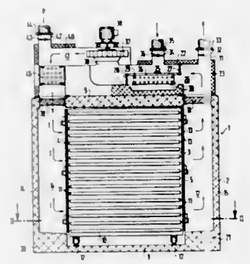
Filed Jun. 4, 1987, Ser. No. 58,198
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1986, 3629805
Int. Cl.[4] F26B *3/00*
U.S. Cl. 34—22 **21 Claims**



1. A process for forming and drying porous filter cake comprising the steps of:

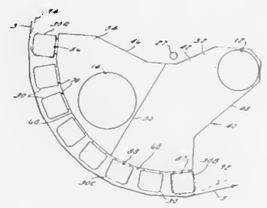
providing individual solid particles on a filter medium by means of a fluid acting on the filter cake,
providing a pressure difference at opposite sides of the filter medium,
using a filter medium with a higher capillary intake pressure for the fluid than a capillary intake pressure of the filter cake, and
applying a filtration pressure to the fluid which is at least slightly larger than the capillary intake pressure of the filter cake and is equal to or smaller than the capillary intake pressure of the filter medium.

4,837,945
DRYER, PARTICULARLY FOR THE CHEMICAL INDUSTRY
Gunter Wulf, Wangen, and Heinz Geisenhof, Weissenberg, both of Fed. Rep. of Germany, assignors to Hermann Waldner GmbH & Co., Fed. Rep. of Germany
Filed Oct. 13, 1987, Ser. No. 108,140
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1986, 3637737
Int. Cl.[4] F26B *21/06*
U.S. Cl. 34—77 **10 Claims**



1. A dryer, particularly for the chemical industry, said dryer comprising:
a housing having a right parallelepipedal drying chamber sized to accommodate a loading car;
a delivery side chamber and an exhaust side chamber in said housing for the delivery and exhaust of a flow of gas through said housing, said side chambers extending substantially along the length of opposite side walls of said drying chamber and having perforations in said walls between said side chambers and said drying chamber to allow gas to flow therebetween;
an inlet housing structure positioned above said drying chamber in communication with the exterior of said dryer, said inlet housing structure located adjacent to and in communication with said delivery side chamber, said housing structure further having a ventilator for introducing a flow of gas to said delivery side chamber;
a heating device positioned in the path of said gas flow;
an outlet housing structure positioned above said drying chamber in communication with the exterior of said dryer, said outlet housing structure located adjacent to and in communication with said exhaust side chamber, said outlet housing structure further in communication with said inlet housing structure, said outlet housing structure having a main chamber and a secondary chamber; and
means for directing said flow of gas exiting said drying chamber wherein said flow of gas exiting said drying chamber can be divided by said means for directing into a main flow of gas passing from said main chamber to said inlet housing structure and a secondary flow of gas passing from said secondary chamber past a condenser located in said secondary chamber to said inlet housing structure and wherein said entire flow of gas exiting said drying chamber can be directed by said means for directing to bypass both of said first and second chambers and be passed to the exterior of said dryer.

4,837,946
APPARATUS FOR FLOATINGLY SUSPENDING A RUNNING WEB THROUGH AN ARCUATE PATH
Jerry A. Hella, and Paul H. Stibbe, both of DePere, Wis., assignors to Advance Systems, Inc., Oneida, Wis.
Filed Mar. 9, 1988, Ser. No. 165,746
Int. Cl.[4] F26B *13/00*
U.S. Cl. 34—156 **10 Claims**

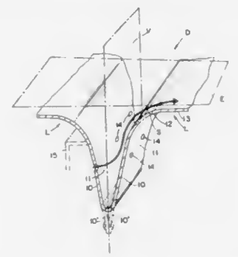


1. Apparatus for floatingly suspending a running web without contact and through an arcuate path, said apparatus including a generally hollow and enclosed chamber having an arcuate side with a series of elongated openings spaced apart circumferentially around the radially outer side of said arcuate side, said openings arranged generally in a transverse direction with respect to the direction of movement of said running web through said arcuate path; a series of elongated hollow air bars having an inner side directly and sealingly engaged with said openings, said bars each having an outer side, a pair of air nozzle slots in and along each of said outer sides of said air bar; means for providing pressurized air to said enclosed chamber, through said openings and then through said slots to floatingly support said running web; said bars thus forming an outwardly directed, arcuate array over which said running web passes; the last air bar in the array in respect to the direction of web travel over the array being adjustable about its longitudinal axis to thereby tilt the said last air bar and correct any non-symmetrical web-to-bar orientation.

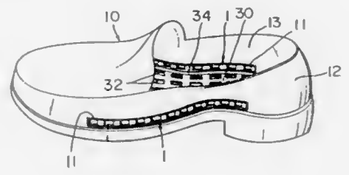
4,837,947
DEVICE FOR ACTING UPON WEBS OF MATERIAL WITH A FLOWING MEDIUM
Kurt Krieger, Oberlinstrasse 16, Düsseldorf, Fed. Rep. of Germany D-4000
PCT No. PCT/DE87/00336, § 371 Date Mar. 31, 1988, § 102(e) Date Mar. 31, 1988, PCT Pub. No. WO88/01038, PCT Pub. Date Feb. 11, 1988
PCT Filed Jul. 30, 1987, Ser. No. 183,733
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1986, 3626016
Int. Cl.[4] F26B *13/00*
U.S. Cl. 34—156 **37 Claims**

1. A device for acting upon and guiding in hovering manner webs of a flowing medium, comprising:
an air duct,
at least one nozzle region extending over the width of the air duct with a curved wall surface formed by a boundary of the air duct and an adjacent flat wall surface running substantially parallel to the plane of the movement of the web, and
individual outlets for air provided in wall sections defining the air duct opposite a respective guide surface for guiding

the air flow issuing from the outlets in the nozzle region on either side of a transverse plane arranged in the longitudinal direction of the air duct and perpendicularly to the plane of movement of the web.

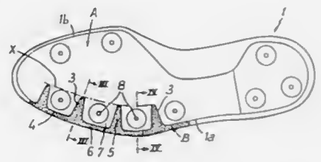


4,837,948
NATURAL VENTILATION TYPE FOOTWEAR
Kang-Rai Cho, 207-305 Garak-Samik Mansion, 395 Pangi-dong, Songpa-ku, Seoul, Rep. of Korea
Filed Jun. 3, 1988, Ser. No. 201,900
Int. Cl.[4] A43B *7/06*
U.S. Cl. 36—3 A **3 Claims**



1. An article of footwear, comprising:
an outsole;
an upper attached to an upper surface of the outsole, said upper having a heel end, a toe end, and two opposing side walls, wherein a rectangular slot is formed in each opposing side wall;
an insole located in said upper and having an upper surface and an outer lateral surface, said upper surface having a plurality of openings located therein, said outer lateral surface having a plurality of passages therein, said openings and said passages being in communication with each other;
a vent frame member attached to each opposing side wall of the upper and having a rectangular boundary frame which defines an opening aligned with one of the rectangular slots and an inner peripheral wall, a groove located in the inner peripheral wall of the boundary frame, and a plurality of alternating vent holes and blind parts located in the opening defined by the boundary frame, the vent holes of each vent frame member communicating with the passages located in the outer lateral surface of the insole; and
a shutter member located in each of the vent frame members, and having opposing edge portions which are slidably engaged in the groove of each of the vent frame members and a plurality of vent holes and blind parts, each of said shutter members being movable between a position where the vent holes of the shutter member are aligned with the vent holes of one of the vent frame members, and a position where the blind parts of the shutter member are aligned with the vent holes of one of the vent frame members.

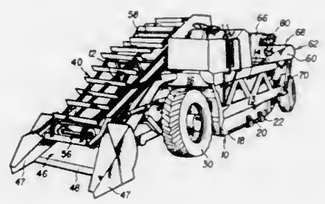
4,837,949
SHOE SOLE
Pierre Dufour, Annecy, France, assignor to Salomon S. A., Annecy Cedex, France
Filed Dec. 23, 1987, Ser. No. 137,127
Claims priority, application France, Dec. 23, 1986, 86 18113
Int. Cl.[4] A43B *5/00, 13/14*
U.S. Cl. 36—127 **18 Claims**



1. Walking sole for a sport shoe, having in at least one of its lateral edges a series of spaced, substantially transverse grooves terminated in an edge of said sole and extending toward a central part of said sole, said grooves being filled with a material having greater elasticity than the material making up the sole and forming individual elastic filling pieces embedded in respective said grooves, grooves being provided in a front portion of said at least one of said lateral edges (1*a*, 1*b*) which extends the length of said front portion of said sole (1) which gives support to the front part of the foot of the wearer of the shoe, and wherein said grooves delimit the boundaries of at least one flexible tongue (7) transversely around an axis of flexion (X) joining internal ends of said grooves (3).

18. Sports shoe, especially a golf shoe, equipped with a walking sole according to claim 1.

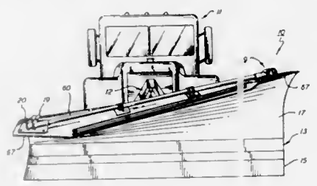
4,837,950
END LOADING MOTOR SCRAPER
Herbert J. Vesper, 1331 Park Ave., S.W. #1002, Albuquerque, N. Mex. 87102
Filed May 27, 1988, Ser. No. 199,649
Int. Cl.[4] E02F *1/00*
U.S. Cl. 37—4 **2 Claims**



1. An earthmover comprising
a bowl having a bottom, opposing side walls, and front and back walls, said bottom having a dump opening provided with doors and means for controlling operation of the doors;
a loading apparatus pivotally connected to said front wall at the top thereof, said loading apparatus comprising a bucket having a cutter blade for cutting material, and a material elevator connected between said bucket and said bowl, said elevator extending at its forward end into said bucket for removing material therefrom to said bowl;

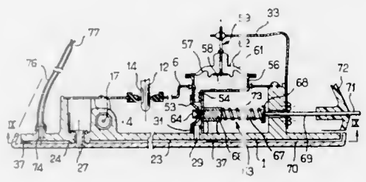
a pair of front wheels supporting said bowl,
a steering unit comprising a pair of rear wheels at the rear of the bowl,
a yoke supported by the steering unit, said yoke having a pair of forwardly extending arms each pivotally connected to a side wall of the bowl,
means for raising the yoke with respect to the rear wheels whereby the bowl elevation may be varied,
said yoke being pivotable around a longitudinal axis, with respect to the steering unit, and
means for tilting the bowl with respect to the front wheels, whereby the bowl and the loading apparatus may be tilted with respect to the ground during operation of the earth-mover.

4,837,951
REVERSIBLE MOLDBOARD ASSEMBLY
Jan H. Verseef, Clayton, N.Y., assignor to Frink America, Inc., Clayton, N.Y.
Filed Sep. 23, 1988, Ser. No. 248,180
Int. Cl.[4] E01H *4/00, 5/06*
U.S. Cl. 37—197 **21 Claims**



1. A moldboard assembly for use in a snowplow that includes
an elongated scraper blade means,
a rectangular flexible moldboard sheet attached along its bottom edge in the top of the scraper blade means,
a pair of adjusting arms, each arm being connected at its distal end to one top corner of the moldboard sheet, and
actuating means for independently positioning each of the adjusting arms whereby the moldboard sheet can be contoured to a desired shape.

4,837,952
STEAM IRON HAVING VARIABLE HEAT CONDUCTIVITY BETWEEN THE HEATING BASE AND SOLE PLATE
Jean Hennuy, Villefranche/Saone, and Bernard Louison, Stetienne, both of France, assignors to SEB S.A., Selongey, France
Filed Oct. 22, 1987, Ser. No. 111,158
Claims priority, application France, Oct 31, 1986, 86 15196
Int. Cl.[4] D06F *75/24, 75/38*
U.S. Cl. 38—77.7 **32 Claims**

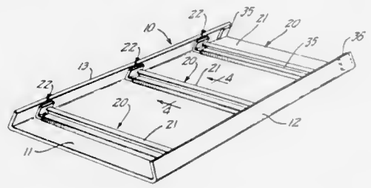


1. A steam iron including a heating base, a sole-plate mounted beneath said heating base so as to provide an intercalary space for containing a fluid between the heating base and the sole plate, ironing steam-generating means for generating steam by bringing a supply of water into contact with a top face of the heating base, means for regulating the steam ironing temperature, and heat conductivity control means for alternatively and selectively introducing into the intercalary space, during steam ironing, two different fluids having different heat conductivities.

4,837,953
DEVICE FOR DISPLAYING PHOTOGRAPHS AND THE LIKE
Ken Tannenbaum, 16 W. 21st St., New York, N.Y. 10010
Filed May 20, 1988, Ser. No. 197,110
Int. Cl.[4] G09F *1/10*
U.S. Cl. 40—124 **11 Claims**

1. A device for displaying photographs or the like, which comprises:
a sheet-holding assembly comprising first and second plastic members each having a planar face and an outer edge defining the boundary thereof, adhesive means located interiorly of said edges for securing said members together in face-to-face relationship, said members being spaced apart thereby defining between said faces an empty slot means having an opening extending completely around said edges, said members being so closely spaced as to frictionally engage and secure a photograph or the like having a thickness of a few mils inserted into said slot means; said members being beveled at the opening of said slot means to facilitate entry of said photograph or the like into said slot means for frictional engagement by said members; and
attachment means for attaching one of said members to a vertical surface with said slot means disposed substantially in a vertical plane.

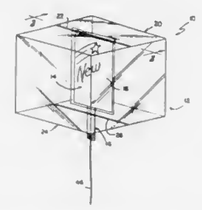
4,837,954
TRANSPARENT PICTURE FRAME CONSTRUCTION
Julius Shultz, North White Plains, N.Y., assignor to Dax Manufacturers Inc., Yonkers, N.Y.
Filed Aug. 21, 1987, Ser. No. 88,056
Int. Cl.[4] A47G *1/06; G09F 1/12*
U.S. Cl. 40—152 **4 Claims**



1. A transparent frame construction comprising

(a) a generally rectangular thermoplastic main frame plate having a rectangular flat transparent front face;
(b) side edge walls extending inwardly and rearwardly from the long side of said front face at a predetermined acute angle, said walls having end edges;
(c) a plurality of rigid non-flexible rectilinear clamping members engage the inner surfaces of said front face;
(d) each of said non-flexible clamping members comprising a hollow extruded rigid longitudinal bar;
(e) said bars defining at their opposite free ends narrow cavities;
(f) resilient flexible spring finger means congruent in shape with said acute angles supported on friction plates;
(g) said friction plates force fitted into said narrow cavities;
(h) said flexible spring finger means being of sufficient resilience to apply a strong clamping force through said rigid elongated hollow bar toward said front face independently of the spacing of said bar from said face;
(i) whereby sheet material to be displayed, regardless of its thickness, will be clamped securely and firmly against said face by said clamping members.

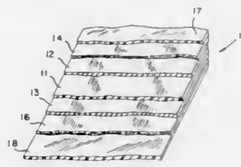
4,837,955
BALLOON STRUCTURE
Robert H. Grabhorn, Indianapolis, Ind., assignor to Blodot International, Incorporated, Indianapolis, Ind.
Filed Mar. 7, 1988, Ser. No. 165,022
Int. Cl.[4] G09F *21/06*
U.S. Cl. 40—214 **11 Claims**



10. The transparent display apparatus comprising a transparent balloon having a plurality of exterior surfaces, one of the exterior surfaces having a slit defining an opening therein, and
a transparent receptacle having an exterior surface and an interior opening for receiving an article to be displayed,
said receptacle exterior surface sealably coupled to said balloon opening suspending the transparent receptacle inside the transparent balloon,
whereby said article can be removably disposed in the transparent receptacle and is observable through the transparent balloon.

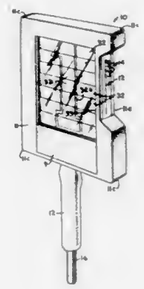
4,837,956
PLASTIC ADVERTISING INSERT FOR FOOD PACKAGES
Dale E. Dolence, Carbondale, Ill., assignor to Lustour Corporation, Murphysboro, Ill.
Filed Apr. 9, 1987, Ser. No. 36,388
Int. Cl.[4] G09F *3/100; B32B 3/00*
U.S. Cl. 40—299 **4 Claims**

1. A two side printed message-carrying insert comprising a grease and oil resistant, plastic film laminate adapted for insertion into packages containing food, said laminate including a central core layer of biaxially oriented polymeric film printed on both sides in register with a message to be displayed, a first layer of adhesive disposed above and adjacent said central core layer, a second layer of adhesive disposed below and adjacent said central core layer, a first layer of transparent, grease-resistant, biaxially oriented polymeric film disposed above and adjacent said first layer of adhesive, a second layer of transparent, grease-resistant, biaxially oriented polymeric film disposed below and adjacent said second layer of adhesive, whereby said adhesive and film layers seal the printed message on both



sides of said core layer and prevents contact between moisture from the food product and the printing ink disposed on both sides of said central core, resulting in a plastic insert of high clarity which is substantially unaffected by contact with food.

4,837,957
DIGITAL NUMBER INDICATOR
James J. Egender, Kansas City, Mo., assignor to Dial-A-Down, Inc., Kansas City, Mo.
Filed Jul. 24, 1987, Ser. No. 77,224
Int. Cl.[4] G09F *7/00*
U.S. Cl. 40—488 **21 Claims**



1. A display device for visually displaying a plurality of different numbers, said device comprising:
a display housing presenting a substantially enclosed interior and a transparent display window;
at least four sets of slats located within the housing; each set including a plurality of slats cooperating with the other slats in a respective set to display a different number than is associated with the slats in each of the other sets located in the housing for display in said display window; each of said sets of slats being movable between an exposed position wherein the slats of one of said sets are visible through said window and a concealed position wherein the respective slats are hidden;
a plurality of operating levers each having an end accessible outside of said housing, each of said levers being mounted in the housing for generally up and down movement of said accessible end of the lever;
linkage means for coupling each lever with a corresonding set of slats in a manner to effect movement of the corresponding set of slats between the exposed and concealed positions thereof in response to generally up and down movement of said accessible end associated with the corresponding lever; said operating levers and said linkage means cooperating so as to allow an operator to select to expose any one of said sets of slats with each subsequent single movement of an operating lever by the operator

such that any one of at least four numbers can be selected by the operators;

a frictional detent surface on the housing at a location to align with said accessible ends of the levers when the lever ends are in preselected positions; and

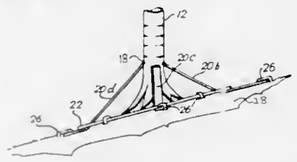
said accessible ends of the levers being bowed generally toward said detent surface to frictionally engage same in said preselected positions of the levers to thereby frictionally retain the levers in said preselected positions.

4,837,958

INFLATABLE INDOOR/OUTDOOR DISPLAY FIGURE

JoAnn K. Radovich, 162 Elm St., Struthers, Ohio 44471

Filed Jan. 19, 1988, Ser. No. 145,472
Int. Cl.[4] G09F 1/08
U.S. Cl. 40—538 **1 Claim**



1. An indoor/outdoor inflatable display figure comprising:

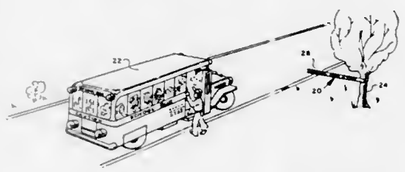
an inflatable member having a top and a bottom, a base member secured to the bottom of the inflatable member, said base member being circular, and having a plurality of slots inwardly of its peripheral edge, a plurality of strap members disposed in said slots, each of said strap members having two ends, a first end of each of said strap members secured to the bottom of the inflatable member; a second end of each strap member secured to a support surface, whereby said base is slideable on said straps, and one of the straps can be pulled through one of the slots, thereby moving the inflatable member relative to the base, enabling the inflatable member to maintain a vertical position regardless of the angle of the support surface to which the base is secured.

4,837,959

MARKER DEVICE

Joseph M. A. Celico, Iroquois Ave., Westerly, R.I. 02891

Continuation-in-part of Ser. No. 835,151, Mar. 3, 1986, abandoned. This application May 15, 1987, Ser. No. 53,506
Int. Cl.[4] G09F 7/00
U.S. Cl. 40—584 **11 Claims**



1. A portable system of marking a site with marker apparatus adapted to be releasably attached to a supporting structure comprising:

a continuous supply of elongated pennant material capable of being hand held;

an elongated pennant having a first end drawn from said continuous supply of elongated pennant material and severable from the remainder of said pennant material to thereby define a second end a preselected distance from said first end;

independent fastener means including a base member and an integral bridge thereon defining a reception region therebetween;

attachment means for fixing said base member to said first end, said attachment means including a plurality of tab members on said base member extending away therefrom, said tab members being foldable, when said base member overlies one side of said first end, to engage the opposite side of said first end, and joining means extending, respectively, through each of said tab members, through said base member and through said pennant to thereby attach said base member to said first end;

said first end of said pennant with said fastener means thereon adapted to be positioned adjacent the supporting structure with said second end extending away from said first end;

the reception region defined by said fastener means lying generally tangent to the supporting structure for slidably receiving said second end therethrough enabling said pennant, preceded by said second end, to encircle the supporting structure and extend through the reception region such that with continued movement of said second end away from said first end, said pennant can be manually drawn to tightly engage the supporting structure;

said fastener means including resilient gripping means freely allowing said pennant member to advance through the reception region, said gripping means being movable between an engaged position seized with said pennant to prevent it from retracting through the reception region, said fastener means including a release member on said gripping means for selectively moving said gripping means between said engaged position and said disengaged position;

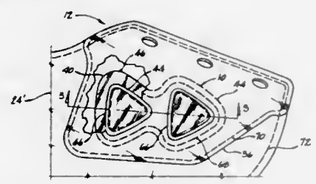
whereby said pennant and said fastener means lie in parallel, contiguous planes when said pennant is drawn to tightly engage the supporting structure.

4,837,960

ARTICLE WITH IDENTIFYING DEVICE

Joseph J. Skaja, San Antonio, Tex., assignor to Kaepa, Inc., San Antonio, Tex.

Continuation of Ser. No. 734,738, May 17, 1985, abandoned. This application Aug. 15, 1988, Ser. No. 233,839
Int. Cl.[4] A44C 3/00
U.S. Cl. 40—636 **6 Claims**



1. In an article of footwear having an identifying device attached thereto:

(a) an article portion including a first ply of material and a second ply of material attached to the first ply of material in overlying relation, said second ply including a socket-accessible opening,

(b) a retainer including a base and a peripherally extending wall defining a socket of substantially the same size as the socket-accessible opening, the base being, at least in part, sandwiched between said first and second plies of material, said base extending outwardly to provide a lower flange, said flange being fixedly attached to at least one of said plies of material for attaching the base to the article portion,

(c) an identifying element interfitting the socket and having substantially the same size thereof, and

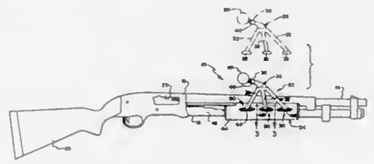
(d) means between the retainer and the element for removably holding the element, in captive snap-fitting relation in the socket, at least one of said retainer and identifying element being of resilient material.

4,837,961

RECOIL ASSEMBLY FOR PUMP GUNS

James P. Keenan, P.O. Box 1243, Alfred, N.Y. 14802

Filed May 3, 1988, Ser. No. 189,630
Int. Cl.[4] F41C 23/00
U.S. Cl. 42—72 **10 Claims**



1. A recoil assembly adapted to be removably secured to a pump gun of the type having a reciprocal magazine tube disposed below a barrel, said assembly comprising:

a body portion having a top section and at least one pair of opposed downwardly extending legs projecting away from said top section in a face-to-face relation to form a yoke;

a handle mounted on the top section of the body portion, the handle having a gripping section of sufficient size for the gripping thereof with either a gloved or ungloved hand;

a tubular slide handle adapted to be mounted about the magazine tube for reciprocating movement relative to the barrel between a forward firing position and a rearward retracted position; and

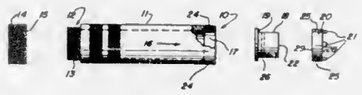
fastening means carried by the slide handle for removably fastening the lower portion of each leg of said body portion to said slide handle whereby the gripping section of the handle is disposed directly above the barrel for manual reciprocating of said slide handle by gripping said gripping section above the barrel with a hand and moving the hand in either a forward or rearward direction.

4,837,962

SHOTGUN CHOKE CONTAINER/WRENCH

Raymond E. Longerot, 5785 Equador Way, Buena Park, Calif. 90620

Filed Jun. 21, 1988, Ser. No. 210,818
Int. Cl.[4] F41C 27/00
U.S. Cl. 42—90 **10 Claims**



1. An implement for containing, transporting, installing and removing tubular shotgun chokes of the type having a plurality of slots cut longitudinally into the front transverse annular end wall thereof for engagement by the protruding lugs of a spanner-type wrench comprising:

(a) an elongated hollow cylindrical tube having at its front end a removable closure cap, the hollow cylindrical interior space of said tube being adapted to coaxially receive at least one of said tubular chokes;

(b) a cylindrical boss of smaller diameter than the outer diameter of said tube protruding axially rearward from the read end of said tube, in coaxial alignment with said tube, and

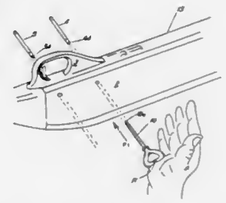
(c) at least one pair of diametrically oppositely positioned lugs protruding axially rearward from the rear end of said tube, said lugs being of the proper size and diametric spacing to engage said slots of said choke.

4,837,963

FIELD STRIPPING KEY PUNCH FOR FIREARM TRIGGER ASSEMBLIES

L. Marvin Slappey, Jr., 416 W. Lamar St., P.O. Box 744, Americus, Ga. 31709-3541

Continuation-in-part of Ser. No. 794,005, Nov. 1, 1985, Pat. No. 4,700,500. This application Oct. 14, 1987, Ser. No. 108,149
The portion of the term of this patent subsequent to Oct. 20, 2004, has been disclaimed.
Int. Cl.[4] F41C 27/00
U.S. Cl. 42—90 **2 Claims**



1. A punch tool adapted to push out retaining pins that hold in place a trigger plate assembly in a firearm receiver, comprising:

(a) a member having a handle means;

(b) a leg member extending outwardly from said handle means and having at one end thereof a tapered portion for engaging a substantial surface of the ends of said retaining pins in said firearm to push out said retaining pins from said receiver when a linear force is exerted on said handle means; and

(c) said leg member being made of rounded stock material, within a range from substantially one-eighth inch to three-sixteenths of an inch, inclusive.

4,837,964

FISH HARNESS

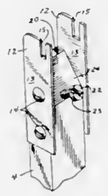
Darrell Aleckson, Rural Rte. #2 Box 917, Soldotna, Ak. 99669

Filed Mar. 21, 1988, Ser. No. 170,809
Int. Cl.[4] A01K 83/06, 97/14
U.S. Cl. 43—4 **3 Claims**

1. A harness to restrain a fish comprising, in combination:

an elongate flexible cable having a loop defined in one end thereof;
a rigid "L" shaped hook fastening bracket carried by the flexible cable for slidable motion and adjustable positioning thereon, said hook fastening structure
having a fastening arm defining a cable hole with a diameter to allow slidable motion of the cable therein and provide adjustable positioning upon the cable by canting of the bracket relative to the cable and
a fastening ring arm movably carrying a fastening ring interconnecting the hook therewith; and
a hook carried by the hook fastening structure.

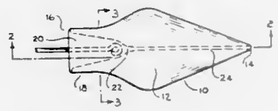
4,837,965
ICE FISHING TIP-UP
Donovan B. True, 5509 Lake Rd., Oshkosh, Wis. 54901
Filed Apr. 14, 1988, Ser. No. 181,485
Int. Cl.[4] A01K *97/12*
U.S. Cl. 43—17 9 Claims



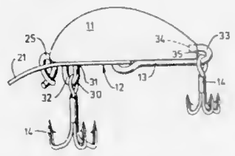
1. An ice-fishing tip-up comprising:
(a) a supporting base;
(b) a support attached to and extending upwardly from the base;
(c) a rod and reel combination having one end of the rod extending outwardly from the support for supporting a fishing line and having a weight distribution which causes the rod and reel combination to rotate from a horizontal resting position to a more vertical resting position once downward movement of the outwardly extending rod end is initiated;
(d) pivot means for demountably attaching the rod and reel combination to the support for rotation about an axis normal to the axis of the rod;
(e) said pivot means positioned to hold the rod and reel combination about the axis of the pivot means to a second position in response to a downward force on the rod; and
(f) the support base further including an extension in a plane generally parallel to the axis of the rod and extending outward from the support in a direction generally from the base toward the end of the rod to maintain the support upright when a downward force is applied to the end of the rod.

4,837,966
CAM ACTION FISHING SINKER DEVICE
Bob J. Bethel, 308 Triangle Ranch Rd., Trinidad, Tex. 75163
Filed Oct. 30, 1987, Ser. No. 114,513
Int. Cl.[4] A01K *95/00*
U.S. Cl. 43—43.1 17 Claims

1. A fishing sinker device comprising:
an elongate flattened body having first and second ends, said body gradually increasing in width from its first end toward its second end, and gradually increasing in thickness from its first end toward its second end;
a shank having first and second ends, interconnected at its first end to the second end of said body in coaxial alignment therewith;
a slot-like aperture extending into the interior of said shank from the second end thereof in coaxial alignment with said shank and lying generally in the same plane as said body, to receive the eye and a portion of the shaft of a fishing hook to be inserted therein; and
an elongate aperture penetrating said body along its longitudinal axis from said first end of said body through the interior thereof to said second end, and connecting with said slot-like aperture in coaxial alignment therewith to form a continuous passageway through said body and through said shank to receive a fishing line therethrough.

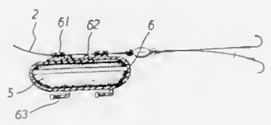


4,837,967
FISH LURE
James C. Dunbar, 4397 Hunt Rd., Cincinnati, Ohio 45242
Filed Jan. 3, 1989, Ser. No. 292,921
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.09 7 Claims



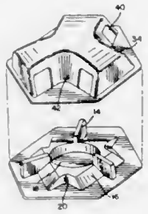
1. A fish lure having a readily assembled unitary structure, further characterized in having enhanced water action with reduced hook hang-up, said lure comprising:
(a) a buoyant elongated body having a generally flat bottom surface with a forward bore and a rearward bore, each extending substantially vertically through a mid-section of the body and opening at the bottom surface and a lateral slot connecting said bores near a top surface of the body;
(b) a lip longitudinally extending along the bottom surface of the elongated body, said lip having a downwardly inclined projecting portion which protrudes forwardly of the body and a main portion which is dimensioned to be secured to the bottom surface of the lure to fit within the bottom surface's peripheral edges, said lip further characterized in having means in the inclined projecting portion to receive a fish line and two holes in the main portion, each of said two holes being positioned to be in alignment with the bore openings found in the body;
(c) a one piece wire member, wherein a portion of said wire member is bent in a generally U-shape such that one leg of the U-shape wire passes through the forward bore with a first end of the one piece wire member extending out the bore opening and through one hole in the main portion of the lip and bent back unto itself to form a loop, a mid-leg of the U-shaped wire positioned in the lateral slot, and a second leg of the U-shaped wire passes through the rearward bore and extends out the bore opening and through a second hole in the main portion of the lip, further wherein the remaining portion of the one piece wire member is bent to be substantially parallel with the elongated body's bottom surface and extends rearwardly to a rear extremity of the body whereupon the wire members second end is bent back unto itself to form a loop with the extremity of the second end embedded in the body; and
(d) at least two fish hooks, with one hook attached to the first loop formed by the first end of the wire member and a second hook attached to the second loop formed by the second end of the wire member.

4,837,968
SELF DETACHABLE SINKER ASSEMBLY FOR FISHING
Kuo-Yang Lin, No. 601, Chung Chen Road, Tsao Tun Chen, Nan Ton Hsien, Taiwan
Filed Oct. 27, 1988, Ser. No. 263,071
Int. Cl.[4] A01K *95/00*
U.S. Cl. 43—43.12 3 Claims



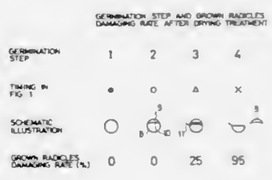
1. A self detachable sinker assembly comprising a flexible buckle belt and a sinker means wherein said buckle belt is of elongate form and can be properly bent into a loop to wrap said sinker means therein; on the first end of the top surface of said buckle belt are disposed a number of protruding buckle members being in buckle engagement with a number of corresponding buckle holes disposed on the second end of said buckle belt; a pair of attachment blocks are spacedly disposed on the second end of said buckle belt with said buckle holes located therebetween and each of said blocks is provided with a through hole near the top portion thereof; a pair of L-shaped hook members are spacedly disposed at the middle of said buckle belt in a manner to be in operative engagement with the through holes of attachment blocks of another consecutively placed sinker assembly so that a number of sinker assemblies can be grouped together in a cluster; said sinker means is provided with a longitudinal groove on the top and bottom surface thereof, the groove having approximately the same width as that of said buckle belt so that the buckle belt can be located therein in assembly; whereby the buckle belt can be joined end to end by means of said protruding buckle members as well as said buckle holes to constitute a loop to wrap said sinker means therein with said attachment blocks disposed on the top and said L-shaped hooks on the bottom of the looped buckle belt, permitting a number of sinker assemblies to be grouped together in consecutive order.

4,837,969
BAIT STATION
Scott W. Demarest, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Sep. 27, 1988, Ser. No. 249,937
Int. Cl.[4] A01M *1/20*
U.S. Cl. 43—131 4 Claims



1. A bait station comprising a base portion and a cover portion, said base portion further comprising:
a peripheral flat floor;
an inner ramp structure angled upwardly and inwardly from the inner periphery of the floor to create a central well area;
a plurality of wall structures extending radially inward perpendicular to the floor spaced at intervals around and intersecting the ramp structure; and
a plurality of indentations spaced at intervals around the ramp structure,
said cover further comprising:
a peripheral flat section for contacting the corresponding peripheral flat floor of the base portion;
a multilobed structure rising above said flat section, the number of such lobes corresponding to the number of wall structures of the base so that, upon assembly of the device, an inner wall structure extends medially through each lobe, said cover having therein a plurality of apertures for insect access, said apertures being positioned along radially oriented sides of said lobes.

4,837,970
METHOD OF SELECTING LIVE SUGAR BEET SEEDS FROM A MIXTURE OF LIVE AND DEAD SEEDS
Yukio Sasaki, Obihiro, Japan, assignor to Nippon Tensaiseito Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 10, 1987, Ser. No. 37,228
Claims priority, application Japan, Oct. 9, 1986, 61-241100
Int. Cl.[4] A01C *1/00*
U.S. Cl. 47—14 3 Claims

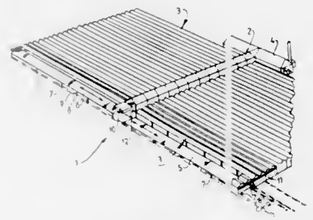


1. A method for selecting live seeds of sugar beet from dead seeds comprising the following steps:
a first water-absorbing step including immersing a mixture of live seeds and dead seeds in water to raise the water content of the seeds to prepare the live seeds for germination;
drying the mixture of live seeds and dead seeds;
a second water-absorbing step comprising allowing the dried mixture of live seeds and dead seeds to absorb water in a controlled high humidity condition to bring the live seeds to germination wherein the seed caps are ready to be released; and
releasing seed caps from the mixture of live seeds and dead seeds by mechanical vibrations to the mixture obtained from the second step and sorting live seeds which have released their seed caps from dead seeds which have retained their seed caps.

4,837,971
APPARATUS OR GREENHOUSE FOR GROWING OF PLANTS
Anthony Visser, 's-Gravendeel, Netherlands, assignor to 501 Visser 'S-Gravendeel Holding B.V., Netherlands
Filed Jun. 4, 1987, Ser. No. 58,323
Claims priority, application Netherlands, Jun. 13, 1986, 8601534
Int. Cl.[4] A01G *9/00*
U.S. Cl. 47—17 10 Claims

1. A greenhouse comprising the combination of a first greenhouse growing area having a longitudinal length and a transverse width, a second greenhouse growing area similar in transverse width to the first growing area and having a longitudinal length, the longitudinal lengths of the growing areas extending in line with each other and being separated by a

relatively narrow space, a treatment area in said relatively narrow space and having a width defined by said relatively narrow space and having a length substantially greater than its width, first support means having a width substantially equal to said transverse width for supporting containers containing plants, first guide means for guiding said first support means along a first path extending longitudinally through the lengths of both growing areas and bridging therebetween through the width of the treatment area, second support means having a width substantially equal to said transverse width for supporting containers containing plants, second guide means for guiding said second support means along a second path extending longitudinally through the lengths of both growing areas and bridging therebetween through the width of the treatment area, the first and second paths being of different heights so that the first and second support means may be disposed at any position along their respective paths without interference between each other, drive means for separately driving the first and second support means along their respective paths, and treatment means within said treatment area and above said paths for treating plants positioned along one or the other of the paths in bridging relation to the treatment area.

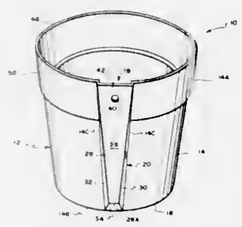


4,837,972

STRAIGHT-HANGING TAPERED PLANT POT

Edward W. Reed, 537 Calle Grande Cir., Santa Maria, Calif. 93455

Filed Jul. 26, 1988, Ser. No. 224,364
Int. Cl.[4] A01G *9/02*
U.S. Cl. 47—67 **18 Claims**



1. A straight-hanging tapered plant pot, comprising:

(a) a cylindrical pot having a body composed of a side wall said side wall being tapered to define a larger circumference at an upper end to a smaller circumference at a lower end, and a bottom wall connecting said side wall at said lower end thereof, said side wall containing an interrupted section at a side of said body extending along a generally vertically-extending narrow region thereof; and

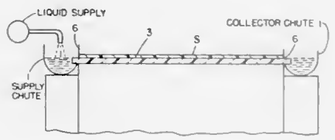
(b) a hollow mounting structure connected to, and bridging said interrupted section of, said side wall at said side of said body, said structure being entirely open along and across said interrupted section of said side wall and projecting outwardly therefrom so as to define a substantially flat surface disposed outside of the circumference of said side wall and said substantially flat surface being perpendicular to said bottom wall and being adapted to rest against a generally vertical surface for supporting said body in an upright, non-tilted fashion from the vertical surface in which said bottom wall is disposed in a generally horizontal plane.

4,837,973

WATERING SYSTEM FOR AREAS FOR THE GROWTH OF PLANTS

Torbjörn A. Snekkenes, Brunla, 3290 Stavern, Norway

Continuation of Ser. No. 708,656, Mar. 6, 1985, abandoned. This application Mar. 30, 1987, Ser. No. 32,948
Claims priority, application Norway, Mar. 8, 1984, 840884
Int. Cl.[4] A01G *25/00, 27/00;* **E02B** *11/00*
U.S. Cl. 47—81 **7 Claims**



1. In a watering system for areas for the growth of plants in which water is supplied from below with respect to the plants, the area for the growth of the plants comprising a backing structure consisting of a substantially planar channel element sheet of water impervious material having a plurality of hollow parallel tubular channels extending therethrough which are open at their opposite longitudinal ends and closed at the tops and the bottoms thereof and being separated from each other through longitudinal partition walls so as to prevent fluid communication between the channels, a water supply source at one end of the element sheet communicating with said channels for supplying water to each of said channels so as to fully maintain said channels filled with water, said channel element sheet having microapertures extending through the upper wall thereof penetrating into at least some of the separate channels of said channel element sheet enabling water supplied from said water supply source to said channels to flow upwardly through the microapertures, the improvement wherein a watering mat is positioned on the upper surface of said channel element sheet, the lower surface of said watering mat being in contact with the upper ends of each of said microapertures, the cross-sectional area of each said separate channel being not above about 16 mm^2 in order to cause water supplied at one end of the channel element sheet to be continually sucked into the channels by capillary action without the need for hydrostatic pressure upwardly through said microapertures from the channels responsive to capillary forces imparted thereto by said watering mat on the upper surface of the channel elemet sheet.

4,837,974

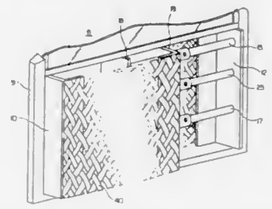
WINDOW INSTRUSION BARRIER

Isidore Jokel, 4201 Newport "H", Deerfield Beach, Fla. 33441

Continuation-in-part of Ser. No. 948,204, Dec. 31, 1986, abandoned, Continuation-in-part of Ser. No. 854,428, Apr. 21, 1986, Pat. No. 4,680,890. This application Jul. 27, 1988, Ser. No. 224,673
Int. Cl.[4] E06B *3/68*
U.S. Cl. 49—55 **7 Claims**

1. A barrier apparatus for a vertically adjustable window, comprising:

(a) a first and second gridwork panels horizontally spaced in slidable juxtaposition, said panels comprising rigid rectangular frames adapted to border and support said window, each frame comprising horizontally disposed upper and lower rods, each frame having an inner and outer vertically oriented border, and inner borders facing each other, said facing inner borders having vertically spaced guide holes, said inner and outer vertically oriented borders further comprising plate metal means respectively secured thereto at an offset horizontally transverse to the axes of said rods, which offset is approximately equal in extent to an outer transverse edge of a casement of said window, said plate metal means proportioned to respectively cover each of said first and second gridwork panels, in which said sheet metal means will thereby move with its respective panel as one panel is moved relative to the other of said panels, defining a subsystem having an adjustable length adapted for insertion into a window casement, and slidable positionable and repositionable within said casement;



(b) first and second horizontally directed posts respectively affixed medially between respectively upper and lower pairs of horizontal rods of each panel, said posts affixed to said borders and adapted to slidably penetrate said guide holes; and

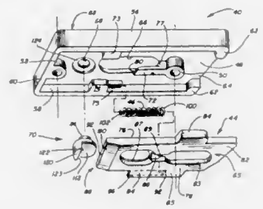
(c) locking means for securing one of said posts of one of said panels to an inner border of an opposite of said panels to prevent relative movement therebetween, thereby effectively defining the position of said first panel relative to said second panel.

4,837,975

EXTERNALLY MOUNTED LATCH FOR SLIDABLE SASH WINDOW

Harold Simpson, Hazel Crest, Ill., assignor to Ashland Products Company, Chicago, Ill.

Filed Jan. 25, 1988, Ser. No. 148,035
Int. Cl.[4] E05D *15/22*
U.S. Cl. 49—175 **13 Claims**



1. In a pivotal window sash adapted for installation in a master frame of a double-hung sash window assembly having opposed, vertically extending guide rails to enable vertical reciprocal sliding movement of the sash in the master frame while cooperatively engaged with the guiderails, the sash having a header, a base and a pair of stiles cooperatively connected together at adjacent extremities thereof to form a rectangular sash frame; a manually operable latch adapted to be installed as a preassembled unit on an exterior surface of the header for releasably securing said sash to said master frame to permit pivotal movement of said sash and comprising:

a housing including a top wall having an access opening therethrough, a pair of opposing end walls, one of said end walls having a passageway therethrough;

a latch bolt slidably received in said housing and having a beveled end aligned with and reciprocal in said passageway and arranged to be engaged in a guide rail for locking the window sash against pivotal movement;

said latch bolt having an opening therethrough with a peripheral edge therearound;

spring means in said housing and engaging said latch bolt normally to bias said beveled end into said guide rail;

said top wall having means integral therewith and depending therefrom for engaging and retaining the latch bolt in operable assembly in the housing and permitting reciprocal sliding movement thereof said engaging means including a post which extends through said bolt opening and a retainer member extending laterally therefrom and extending over said opening peripheral edge at least in said normally biased position to retain said bolt in said housing; and

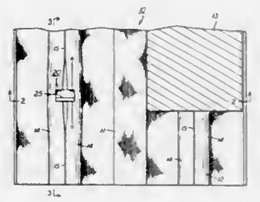
said latch bolt having means integral therewith for engaging said spring means and retaining said spring means in operable assembly in the housing.

4,837,976

WINDOW BALANCE SPRING COVER FRICTION SYSTEM

Norman R. Westfall, Rochester, and Patrick E. Milligan, Kendall, both of N.Y., assignors to Caldwell Manufacturing Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 58,796, Jun. 5, 1987, Pat. No. 4,779,380. This application Mar. 21, 1988, Ser. No. 170,781
Int. Cl.[4] E05F *1/00*
U.S. Cl. 49—430 **17 Claims**



1. A spring cover for an extruded resin jamb liner, said spring cover extending for the full length of said jamb liner and comprising:

a. a slit dividing said spring cover into two vertical halves disposed to contact each other to keep said spring cover closed along the length of said slit; and

b. said spring cover halves being resilient enough to be spread apart to allow a sash platform to extend through said slit and move up and down in said slit while said slit remains closed in regions spaced from said platform.

4,837,977

WOOD CLAD WINDOWS

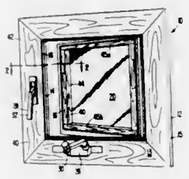
Gerald D. Mauro, 135 Springhouse La., Pittsburgh, Pa. 15238

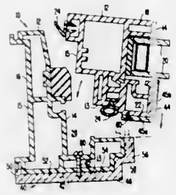
Continuation of Ser. No. 211,873, Jun. 27, 1988, abandoned. This application Nov. 22, 1988, Ser. No. 274,981
Int. Cl.[4] E06B *3/00*
U.S. Cl. 49—501 **25 Claims**

1. Wood cladding for mounting on the inner surface of nonwooden windows having common interior cross sections

in which the sash is mounted on the frame from the outside of the window, the windows including a frame having a substantially planar inner surface with a screen recess disposable in the interior of a building, an outer surface opposite the inner surface and disposable on the exterior of the building, an exterior side surface between the inner and outer surfaces mountable inside a wall of the building, and an interior side surface between the inner and outer surfaces for receiving a sash, and a sash having a substantially planar inner surface disposable in the interior of the building, an outer surface opposite the inner surface and disposable on the exterior of the building, an exterior side surface between the inner and outer surfaces and receivable in the interior side surface of the frame, and an interior side surface between the inner and outer surfaces for receiving a pane of glass, said wood cladding comprising:

first and second sections of wood shaped to conform to the inner surface of the window, each said wood section having a uniform cross section along its entire length, being attachable to both the frame and the sash of the window without substantially altering the length and width dimensions of the window or affecting the fit of the window within a wall opening, said wood cladding providing an unmarred, unblemished wood appearance on the inner surface of the window;





said first wood section being mountable on the inner and interior side surfaces only of the frame of the window and having a uniform cross section conforming to the shape of the frame, said first wood section comprising a frame body portion disposed against the substantially planar inner surface of the window frame, a frame retaining lip disposed on one end of said frame body portion, said frame retaining lip being substantially perpendicular to said frame body portion and fitting around an outer peripheral edge of the substantially planar inner surface of the window frame, and a zig-zag portion disposed on the other end of said frame body portion and conforming to the screen recess formed on the substantially planar inner surface of the window frame, the outer surface portion of said frame zigzag portion being capable of receiving window screens;

said second wood section being mountable on the inner and interior side surfaces only of the sash of the window and having a uniform cross section conforming to the shape of the sash, said second wood section being L-shaped and comprising a sash body portion disposed against the substantially planar inner surface of the window sash, and a sash side portion disposed on one end of said sash body portion, said sash side portion being substantially perpendicular to said sash body portion and fitting against the interior side surface of the sash; and

fastening means for fastening said wood first and second sections to the nonwooden window without being visible on the exterior of said wood sections.

4,837,978

MACHINE FOR GRINDING THE EDGES OF LENSES

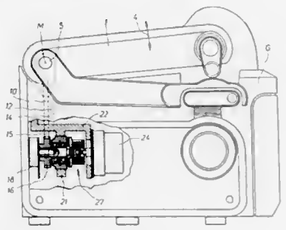
Fritz Kötting, Dormagen, and Günter Barwasser, Neuss, both of Fed. Rep. of Germany, assignors to Wernicke & Co. GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Aug. 27, 1987, Ser. No. 90,164

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1986, 3629252

Int. Cl.[4] B24B *17/02*

U.S. Cl. 51—101 LG 9 Claims



1. A machine for grinding the edges of a lens, with said machine including a machine housing that has a longitudinal direction and in which are mounted a set of different grinding wheels for rough and finish grinding of lenses, said machine further comprising:

a horizontal shaft that is mounted on said housing in such a way that it is parallel to, and displaceable in, said longitudinal direction thereof;

an arm that carries said lens and is pivotably mounted on said horizontal shaft in such a way as to be displaceable in said longitudinal direction of said housing, along with said horizontal shaft, at right angles to its direction of pivot;

a bridge that is mounted in said housing in such a way as to be displaceable in said longitudinal direction thereof, with said bridge being connected to said horizontal shaft in such a way that the latter is pivotable relative thereto yet is displaceable along with said bridge, thus also displacing said arm;

a support element provided on said housing;

a motor specifically mounted on said support element;

a coupling also specifically mounted on said support element and operatively connected to said motor;

a toothed-wheel gearing for effecting said longitudinal displacement of said bridge, and hence of said horizontal shaft and said arm, with said gearing including a toothed rack disposed on said bridge, and a cooperating pinion that is mounted on said support element and is operatively connected to said coupling; and

a rotary potentiometer that is mounted also specifically on said support element and is in engagement with said gearing, whereby said motor, said coupling, said rotary potentiometer, and said pinion are all coaxially disposed in common on said support element as a unitary arrangement.

4,837,979

POLISHING DEVICE

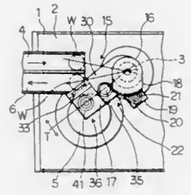
Takao Ishida, Aichi; Hiroshi Hagiwara, and Ichizo Kakumu, both of Nagoya, all of Japan, assignors to Sintobrator, Ltd., Nagoya, Japan

Filed Mar. 16, 1988, Ser. No. 168,819

Claims priority, application Japan, Mar. 17, 1987, 62-62109; Mar. 17, 1987, 62-62110; Mar. 27, 1987, 62-75638

Int. Cl.[4] B24B *7/16*

U.S. Cl. 51—131.4 2 Claims



1. A polishing device, comprising:

a grindstone rotatably supported on a frame, wherein the grinding surface of the grindstone faces upwardly, said grindstone being stationary with respect to upward and downward movement;

a supply means, disposed on said frame, for supplying a workpiece from an external source;

a delivery means, disposed on said frame, for delivering a workpiece already ground, from said polishing device to an external position;

a movable arm, supported on a support column mounted on said frame, said movable arm being movable in a generally horizontal manner in order to be sequentially positioned above said supply means, said delivery means, and said grindstone;

a pressurizing means, attached to said movable arm, for pressurizing a workpiece against the grindstone, said pressurizing means including,

(a) a casing having a raising and lowering body disposed therein and being movable upwardly and downwardly within said casing,

(b) a vertical shaft rotatably extending into said casing and being engaged with said raising and lowering body by way if a ball-threaded portion thereon,

(c) a motor fixed to said movable arm for driving said vertical shaft,

(d) a pair of coil springs, one positioned above said raising and lowering body, and the other positioned below said raising and lowering body, in order to be located between said raising and lowering body and said casing, such that said casing is substantially suspended from said vertical shaft, said springs and said raising and lowering body, such that in response to the rotation of said motor, said raising and lowering body moves upward or downward depending on the motor direction to provide upward force and movement or downward force and movement, respectively, to said casing by way of the elasticity of said springs;

an autorotating means attached to said casing and movable upward and downward with said casing, for imparting rotation to the workpiece; and

a holding means attached to a rotating portion of said autorotating means for holding the workpiece beneath the autorotating means.

4,837,980

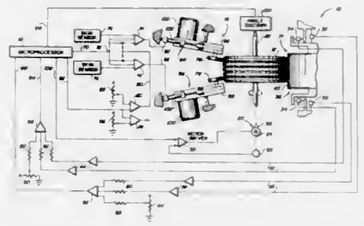
METHOD AND APPARATUS FOR TIRE UNIFORMITY CORRECTION

Clarence L. Rogers, Jr., Hartville, Ohio, assignor to The Uniroyal Goodrich Tire Company, Akron, Ohio

Filed Jul. 1, 1987, Ser. No. 68,687

Int. Cl.[4] B24B *49/00*

U.S. Cl. 51—165 R 14 Claims



1. A tire uniformity machine to process a rubber pneumatic tire by sensing its force variations while it is rotating and by then grinding rubber therefrom in selected amounts and regions corresponding to the sensed force variations, said tire uniformity machine comprising, in combination:

mechanical means to rotate a pneumatic tire at a first speed higher than the industry standard of 60 revolutions per minute and at a second speed less than the first speed while selectively grinding rubber therefrom;

sensor means to detect force variations in the tire while rotating at such higher speed and, in response thereto, to produce frequency modified electrical signals corresponding to the detected force variations at a frequency higher than the industry standard of 60 cycles per minute;

rubber removal means responsive to the produced signals for selectively removing rubber from the tire while rotating at the second speed in accordance with the detected force variations;

a summer amplifier to receive and filter the produced signals from said sensor means and to forward such filtered signals;

a microprocessor to receive the forwarded filtered signals from said summer amplifier, to interpret such filtered signals, to store such interpreted signals, and then to activate said mechanical means and said rubber removal means in a programmed manner in accordance with such stored signals.

4,837,981

POWER OPERATED SANDING MACHINE

Toshimitu Hashii, Hiroshima, Japan, assignor to Ryobi Limited, Hiroshima, Japan

Filed Jun. 30, 1988, Ser. No. 214,040

Claims priority, application Japan, Jul. 6, 1987, 62-104237[U]; Jul. 9, 1987, 62-106205[U]; Jul. 10, 1987, 62-106637[U]; Jul. 20, 1987, 62-111705[U]

Int. Cl.[4] B24B *23/04*

U.S. Cl. 51—170 MT 14 Claims

1. A sanding machine comprising:

a housing having a lower skirt portion;

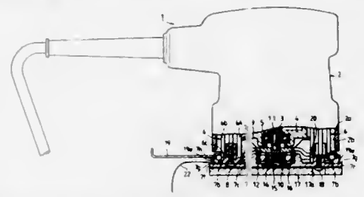
a pad base having an upper and lower surfaces;

a pad having an upper and lower surfaces; suspension means for suspending said pad base from said housing, said suspension means being formed of elastic material;

fixing means for detachably fixing said pad base to said suspension means;

sand paper clamping means having a fixing portion for providing a sand paper over said lower surface of said pad;

attaching means for detachably securing said pad to said pad base; and,



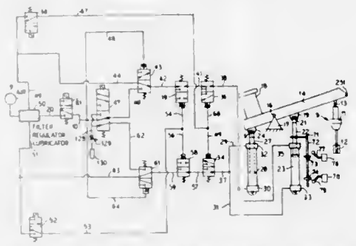
restraint means for restraining distortional rotation of said suspension means when said pad base is secured to said suspension means by said fixing means.

4,837,982

CONTROL CIRCUIT FOR A HONING MACHINE

James E. Berkeley, and Timothy D. Franck, both of Cedar Rapids, Iowa, assignors to Kwik-Way Manufacturing Corporation, Marion, Iowa

Filed Dec. 2, 1987, Ser. No. 127,371
Int. Cl.[4] B24B *49/08 5/08*
U.S. Cl. 51—165.9 **3 Claims**



1. A control circuit for an automatic honing machine comprising, a pivot shaft, a frame pivot arm pivotally supported by said pivot shaft from said frame, a honing tool pivotally connected to one end of said pivot arm for honing an engine block, a first pneumatic cylinder with a piston rod which extends from one end pivotally attached to said pivot arm on one side of said pivot shaft and with its other end connected to said frame, a second pneumatic cylinder with a piston rod which extends from one end pivotally attached to said pivot arm on a second side of said pivot shaft and with its other end connected to said frame, a pair of spaced trip discs attached to the piston rod of said first cylinder, an upper and a lower limit switch spaced from each other and, respectively, engageable by said pair of spaced trip discs as said piston of said first cylinder moves, a source of compressed gas, and a control means connected to said source of compressed gas, to said upper and lower limit switches and to said first and second cylinders to control the up and down movement of said pivot arm so as to cause said honing tool to hone said engine block, including means for adjusting the distance between said pair of spaced trip discs to vary the amount of movement of said pivot arm, wherein said control means includes a first solenoid valve, a control switch connected to said solenoid valve and first piloted valves means connected to said first solenoid valve and to said first and second cylinders to move said pivot arm in a first direction and second piloted valve means connected to said first solenoid and to said first and second cylinders to move said pivot arm in a second direction, wherein said first piloted valve means includes first, second and third piloted valves, wherein said second piloted valve means includes fourth, fifth and sixth piloted valves, and including a third solenoid valve connected to said second and fifth piloted valve means to hold said honing tool in the down position and a push button switch for engaging said third solenoid valve.

4,837,983

DRILL BIT SHARPENING APPARATUS

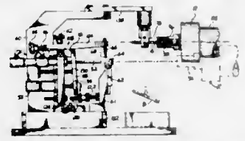
Robert L. Fuller, Jr., Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 822,198, Jan. 24, 1986, abandoned. This application Dec. 10, 1987, Ser. No. 130,933
Int. Cl.[4] B24B *3/26*
U.S. Cl. 51—215 AR **14 Claims**

1. Mechanism for sharpening drill bits, comprising:

a grinding machine including a rotary grinding wheel, a drill bit holder for receiving a drill bit, point end first, and moving it against the grinding wheel during a grinding cycle, said drill bit holder including a holder collet comprising a plurality of angularly spaced jaws, said jaws together defining a central drill bit receiving opening, spring means normally biasing the jaws apart, to establish an opening position for such collet, in which the drill bit receiving opening is larger than a drill bit to be received in it, means for squeezing the jaws of the collet, in opposition to the spring force, for moving the jaws together, to reduce the size of the opening, said opening having a designed minimum size which is reached when the jaws are squeezed an amount sufficient that they contact each other;

a robotic feeder for feeding drill bits into the drill bit holder, including a drill bit carrier having a carrier collet which is movable between open and closed positions, said carrier collet being in axial alignment with the holder collet when the carrier is in its drill bit inserting position, and means for extending and retracting the carrier collet along its axis, when it is in axial alignment with the holder collet, said carrier collet having an open position of a size which provides frictional engagement of the collet with a drill bit to be sharpened, resulting in a drill bit staying in the carrier collet until it is pulled relatively out from the carrier collet, means for moving the drill bit carrier between a



drill bit receiving position and a drill bit inserting position, whereby, if a drill bit to be sharpened is inserted by the robotic feeder into the drill bit holder, and the holder collet is squeezed to close it, and such holder collet reaches the minimum size of the opening without gripping the drill bit, due to the drill bit being undersized, the frictional fit of the drill bit in the carrier collet will causes the drill bit to stay with the carrier;

sensor means operable to detect an undersized drill bit in the carrier, when the carrier is being moved back from its drill bit inserting position to its drill bit receiving position; and

reject means operable by detection of an undersized drill bit in the carrier, for removing the undersized drill bit, so that a new drill bit can be inserted into the carrier collet, for delivery to be sharpening machine.

4,837,984

WOOD SURFACE TREATMENT METHOD AND SYSTEM EMPLOYING TANDEMLY ORIENTED CROSS-BELTS AND ROTARY ABRADERS

Eugene C. David, New Hope, Minn., assignor to Timesavers, Inc., Minneapolis, Minn.

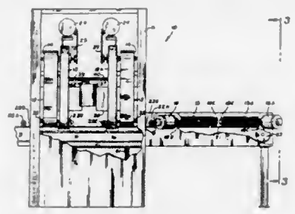
Division of Ser. No. 928,790, Nov. 10, 1986, Pat. No. 4,733,500, which is a continuation of Ser. No. 753,869, Jul. 11, 1985, abandoned. This application Jul. 10, 1987, Ser. No. 71,905
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—326 **5 Claims**

1. A method of treating a wood surface of a wooden workpiece for enhancing the smoothness of the wood surface which comprises the steps of:

placing the wooden workpiece to be treated on a continuously moving base support for continuous linear movement in a transport direction through first, second and third sequentially arranged treating zones;

exposing the wood surface of said wooden workpiece while in said first treating zone to the action of an endless first abrasive belt moving about belt axes substantially parallel to said transport direction and along a path including a linear path segment with the path segment of the belt moving generally transversely to said transport direction; and

exposing the wood surface of said wooden workpiece to the action of first and second angularly disposed flexible rotary abraders while moving said workpiece through said second and third treatment zones respectively, said flexible rotary abraders each being rotated about respective first and second angularly disposed axes and wherein said first and second axes are each disposed at a certain acute angle relative to said workpiece transport direction;



said first flexible rotary abrader contacting the wood surface in said second treating zone along a surface treating axis disposed generally at right angles to the surface treating axis of said second flexible rotary abrader in said third treating zone.

4,837,985

REVOLVING GRINDING TOOL

Tatsushige Mayama, Osaka, Japan, assignor to Nippon Tensha-shi Kabushiki, Osaka, Japan

Filed May 23, 1988, Ser. No. 197,139
Int. Cl.[4] B24B *45/00*
U.S. Cl. 51—364 **15 Claims**

1. A revolving grinding tool comprising:

a cylindrical support having a cylindrical surface with a groove in the cylindrical surface;

an interrupted, metallic, cylindrical abrasive sleeve having sides parallel to each other, having first and second butting ends each being substantially at a right angle to said sides, having numerous abrasive grains on its surface, and being mounted on said cylindrical support, said butting ends being unattached to one another, said cylindrical abrasive sleeve having a smaller diameter than the support such that said sleeve must be expanded to place it on said support;

radially-directed tongues formed on one of said first and second butting end of said abrasive body for engaging said groove, said tongues and groove being sized and shaped to secure said abrasive body onto said support during rotation of said support and thereby prevent relative rotation therebetween when said abrasive body is used for grinding;

recesses formed on said second butting end of said abrasive body; and,

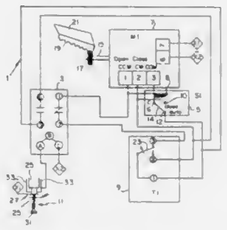
tabs formed on the first butting end for complementing said recesses.

4,837,986

AUTOMATIC SKYLIGHT ACTUATOR

Serge G. Gagne, 15 Westfield St., Manchester, Conn. 06040

Filed May 24, 1988, Ser. No. 180,565
Int. Cl.[4] E04H *9/00*
U.S. Cl. 52—1 **6 Claims**



1. In a skylight including a frame mounted about an opening in a room in a building, and a closure actuable between open and closed positions with respect to said frame, an actuator for said skylight comprising:

(a) an electric motor having a rotary output shaft operatively connected to said closure whereby rotation of said shaft in a first direction opens said closure and rotation of said shaft in a second opposite direction closes said closure;

(b) an actuation circuit connected to said motor and comprising:

(i) temperature sensing means in said room for sensing the temperature in said room and causing said motor to open said closure when the temperature in said room exceeds a first predetermined level and causing said motor to close said closure when the temperature in said room drops below a second predetermined level;

(ii) rain gauge means mounted on said building adjacent said opening for sensing rain and responsive thereto causing said motor to close said closure; and

(iii) disabling sub-circuit means interconnected between said rain gauge means and said motor for disabling said motor from operation when said closure is closed and rain is sensed.

4,837,987

RAIN WATER RECEIVING APPARATUS WITH DUMPING FEATURE

Ronald V. Fender, 200 Falls St., Morganton, N.C. 28655

Filed Sep. 15, 1988, Ser. No. 244,997
Int. Cl.[4] E04D *13/04*
U.S. Cl. 52—11 **12 Claims**

1. An apparatus for receiving rain water from the lower edge of a sloped roof and for directing the rain water to a downspout, and characterized by the ability to be inverted to permit any debris collected therein to fall therefrom, said apparatus comprising

a plurality of fixed supporting brackets mounted at spaced intervals along the lower edge of the sloped roof;

an elongate rod rotatably supported by said fixed supporting brackets and extending along the lower edge of the sloped roof at a spaced distance therefrom, and so as to define a rotational axis;

an elongate trough having a generally U-shape in cross-section;

means mounting said trough to said rod so that the trough extends parallel to said rotational axis of said rod and is rotatable with said rod about said axis; and

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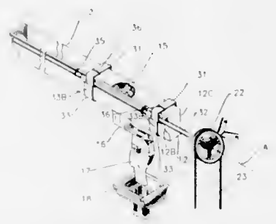
rotatable drive means connected to said rod for rotating said rod and said trough about said rotational axis and between an operative position wherein said trough is upright and adapted to receive rain water from the lower edge of the



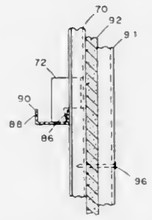
roof, and a dumping position wherein said trough is inverted to permit debris to fall therefrom, and such that the rotational torque is transmitted essentially by said rod and not by said trough.

4,837,988

UNIVERSAL SECONDARY STUD

Robert J. Menchetti, Buffalo, and Richard P. Weir, Kenmure, both of N.Y., assignors to National Gypsum Company, Dallas, Tex.

Filed Jan. 29, 1988, Ser. No. 150,121
Int. Cl.[4] A47G *29/02*; E04B *2/30*
U.S. Cl. 52—36 **6 Claims**



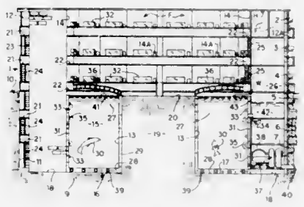
1. A partition wall comprising at least one vertical secondary stud for use on one side of a wall framework comprising an inner portion and an outer portion, an elongate web in said outer portion with a pair of opposed elongate side edges, a pair of elongate inwardly directed flanges extending perpendicularly inwardly from each said side edge of said elongate web and means for supporting said secondary stud on a plurality of upwardly opening, spaced apart, horizontal channels, said means for supporting said secondary stud comprising a slot formed in said secondary stud, said slot being located in said inner portion of said secondary stud and extending upwardly forming a narrow inner section, said slot being suitable for the reception of and retention by an upwardly extending flange of an upwardly opening horizontal channel, vertical primary studs disposed at spaced parallel locations along the length of said partition wall, elongate webs in said vertical primary studs having a lateral extent which is perpendicular to the general plane of said partition wall, a plurality of openings at spaced vertical positions in said primary stud webs, and a plurality of horizontal channels, each said channel being disposed and supported in a plurality of said openings in said primary stud webs, said vertical secondary stud being disposed on one side of said plurality of horizontal channels with one upwardly extending flange of each said horizontal channel disposed in said slot of said vertical secondary stud, said wall further comprising wallboard affixed against said vertical primary studs and against said vertical secondary stud, wherein wall furniture is affixed against said wallboard by fastening means extending through the plane of said wallboard, said fastening means being mechanically affixed to said vertical secondary stud.

4,837,989

COMBINED ABOVE AND BELOW GRADE DWELLING WITH MARINE HABITAT

Jacques S. Levy, Aurelio Miroquesada 576, Depto. 1301, San Isidro, Lima, Peru

Filed Apr. 15, 1988, Ser. No. 182,201
Int. Cl.[4] B63B *35/00*
U.S. Cl. 52—27 **6 Claims**



1. An on-shore structural installation for the cohabitation of humans and marine life comprising;

a housing assembly including a plurality of vertically or horizontally stacked levels having a continuous inside wall and outside wall,

each said level provided with a plurality of adjacently connected individual units at least some of which comprise independent living quarters,

one or more said levels defining lowermost levels and disposed within an excavation below ground level,

one or more other ones of said levels defining uppermost levels disposed above ground level,

a plurality of walkways exteriorly of both said housing assembly inside and outside walls each joining adjacent ones of said individual units on a respective said level,

doors in said housing assembly walls providing communication between said units and said walkways,

as water containment located juxtaposed said housing assembly inside wall and disposed laterally adjacent at least one of said levels disposed below ground level,

an island centrally disposed within the confines of said water containment,

a bridge spanning said water containment and joining one said walkway exteriorly of said housing assembly inside wall to said island,

windows within said housing assembly inside wall permitting occupants within said units in at least one of said levels below ground level to view at their level into water within said water containment,

a dome-like roof extending from said housing assembly inside wall and overlaying said water containment and island,

access means for movement of humans exteriorly of said housing assembly outside wall and connecting to all said walkways above and below ground level and accessible from ground level,

access means for movement of humans exteriorly of said housing assembly inside wall and connecting to all said walkways above ground level,

at least one passage disposed between adjacent ones of said units and extending between said inside and outside walls,

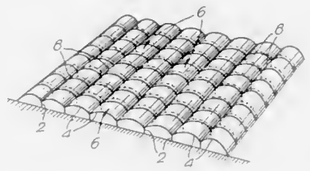
said access means permitting occupants of the housing assembly to move between all said levels, and said access means permitting occupants to have direct entry into water within said containment.

4,837,990

SHELTERING STRUCTURES AND A METHOD OF ASSEMBLING SAME

Alexander Peleg, Moshav Betzaron, Near Gadera, Israel

Filed Jun. 22, 1987, Ser. No. 67,417
Claims priority, application Israel, Jun. 24, 1986, 79203
Int. Cl.[4] E04B *1/12*
U.S. Cl. 52—63 **17 Claims**



1. A sheltering structure essentially constructed of four different framework and sheet material components, each component having a longitudinal axis, said components comprising:

(a) a plurality of arched bars arranged in a plurality of rows, forming adjoining columns, wherein at least most of said bars are supported at their end portions at least indirectly by the ground;

(b) wire or rod-like elements extending between, and connected to, at least some of said arched bars disposed along a column;

(c) strips of sheet material, wherein

(i) each strip extends along and is supported by, said arched bars,

(ii) each strip extends across and is supported by, said elements, and

(iii) adjacent strips are partly overlapping, and

(d) securing means for securing said strips above said bars, said securing means extending across said strips along troughs formed between said adjoining columns of arched bars,

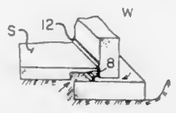
whereby there is formed a structure of four superposed different components, wherein the longitudinal axis of each of said components (a) to (d) transverses the longitudinal axis of one of said different components immediately adjacent thereto.

4,837,991

CHANNEL MEANS FOR USE IN CONJUNCTION WITH BUILDING FOOTING

Jack R. Shaw, 1247 Fox Creek Dr., St. Louis, Mo. 63126

Filed Oct. 26, 1987, Ser. No. 112,411
Int. Cl.[4] E04C *2/52*; E04B *1/70*
U.S. Cl. 52—98 **2 Claims**



1. An integral channel means for use in conjunction with the construction of a building footing, and a floor slab formed in connection therewith, said channel means provided for furnishing drainage of any moisture generated within the vicinity of the footing, and to provide a clean out of any debris that should enter into the channel means during and subsequent to the formation of said footing, said channel means having an angled portion providing a passageway at the junction of the footing within a foundation wall integrally formed thereon, said angled portion having a lower edge and an upper edge, a base flange integrally formed with and extended from the lower edge of the formed angled portion, an upright flange integrally formed and extended upwardly from the upper edge of the said angled portion of the channel means, said angled portion of the channel means having an upright wall, and said angled portion having an integral horizontal wall formed with said upright wall, said upright wall including at least one aperture therethrough to allow seepage of ground water into the channel means during its installation, said upwardly extending flange having a series of break lines provided horizontally thereof, and providing for the break off and removal of upper segments of said upwardly extending flange in accordance with the height required for the said flange depending upon the thickness of the floor slab poured in conjunction with the formed footing, and wherein said channel means having a length equivalent to the full length of any formed footing.

4,837,992

FOLDED/TELESCOPED DRILL RIG MAST FOR LIMITED SPACE PLATFORM

Tom T. Hashimoto, Conroe, Tex., assignor to Branham Industries, Inc., Conroe, Tex.

Filed Oct. 13, 1987, Ser. No. 108,195
Int. Cl.[4] E04H *12/34*
U.S. Cl. 52—118 **17 Claims**

1. A folding, telescoping drill rig mast, comprising:

a base structure;

a lower mast including a lower support section pivotally connected to the base structure and an intermediate mast section cantilevered to the lower support section and rotatable from a first horizontal position to a second vertical position;

a lower guide rail extending longitudinally through the intermediate mast section;

an upper mast slideably nested within the intermediate mast section;

an upper guide rail included within said upper mast;

a dolly mounted on the upper mast to engage the lower guide rail to guide the upper mast vertically from a first position within the lower mast to a second position extending vertically beyond the upper end of the lower mast; and

a transfer frame at the upper end of the lower mast, in which the upper mast is secured, and moveable laterally relative

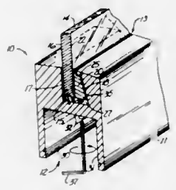
to the lower mast between a first position with the upper guide rail offset from the lower guide rail to a second position with the upper guide rail in longitudinal alignment with the lower guide rail.

4,837,993

TEMPERED GLASS DOOR FITTING APPARATUS

Arnold H. Studenski, 1875 NE. 154th Ter., North Miami Beach, Fla. 33162

Filed Sep. 6, 1988, Ser. No. 240,718
Int. Cl.[4] E06B *3/6*
U.S. Cl. 52—208 **2 Claims**



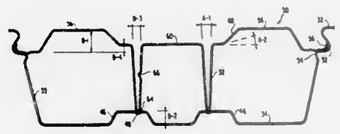
1. a metal frame and glass panel structure comprising:
a metal shoe;
means for forming a first channel in one side of said metal shoe, said first channel having a first horizontal wall and a first and a second generally vertical wall disposed on each side of said horizontal wall respectively;
means for forming a second channel on the opposite side of said metal shoe from said one side, said second channel having a second horizontal wall, a third generally vertical wall on one side thereof and a slanted wall extending away from said second horizontal wall and toward said third generally vertical wall;
a sheet of glass having a portion thereof extending into said second channel, said portion of said sheet of glass having an edge adjacent to said second horizontal wall, one generally vertical wall which lies alongside said third generally vertical wall and another generally vertical wall;
resilient strip means disposed between and in abutment with said edge of the sheet of glass and the second horizontal wall;
an elongated wedge-shaped member disposed in said second channel, a generally vertical sidewall of said wedge-shaped member being in abutment with said other generally vertical wall of said sheet of glass and a generally non-vertical sidewall opposite to said gnerally vertical sidewall of said elongated wedge in abutment with the slanted wall of said second channel forming means;
a threaded opening extending through said shoe between the first and second horizontal wall; and
threaded means threadably extending through said threaded opening for abutment with the wedge-shaped member for selectively engaging one end of said wedge-shaped member and forcing the wedge-shaped member toward said slanted wall of the second channel and thereby holding said portion of the sheet of glass against said second generally vertical wall.

4,837,994

COMPOSITE METAL/CONCRETE FLOOR AND METHOD

Larry A. Stohs, Columbia, S.C., assignor to Consolidated Systems, Inc., Columbia, S.C.

Continuation-in-part of Ser. No. 626,721, Jul. 2, 1984, Pat. No. 4,726,159. This application Oct. 22, 1985, Ser. No. 790,240
The portion of the term of this patent subsequent to Feb. 23, 2005, has been disclaimed.
Int. Cl.[4] E04B *5/48;* **E04F** *19/08;* **H02G** *3/18, 3/28*
U.S. Cl. 52—221 **32 Claims**



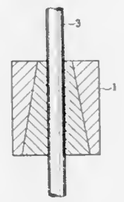
1. A metal floor comprising:
a plurality of decking members, each having a plurality of alternating substantially coplanar crests and substantially coplanar valleys joined by slanting sidewalls,
the upper portion of each of said sidewalls having a groove adjacent the junction with the adjacent one of said crests;
a plurality of snap-in cover plates each having a knock-out in an upper surface and outwardly convex lateral edges adapted to engage one of the grooves in said sidewalls to support said cover plate over a valley to thereby form a longitudinally cell; and
a preset insert including a housing having upright side walls and end walls, the lower portion of said end walls being adapted to overlie said cover plate in conformity therewith on opposite ends of said knock-out, the lower portion of said side walls terminating in an outwardly convex lateral edge adapted to be received in the groove in said sidewalls in an overlying relation to the lateral edges of one of said cover plates when engaged therein,
said groove and the lateral edges of said cover plates and said preset inserts being configured to permit the ingress of concrete into said groove beneath said crests with the lateral edges of both said cover plate and said preset insert in place therein.

4,837,995

ANCHORING DEVICE FOR A TENSION MEMBER OF PRESTRESSED CONCRETE

Hitoshi Omizono, Tokyo; Hiroshi Sasaki; Yasuo Fukatsu, both of Omiya; Saburo Ota, Tokyo, and Yoshio Ueda, Suzuka, all of Japan, assignors to Mitsubishi Mining and Cement Co., Ltd. and Kimpo Electronics Co., Ltd., both of Tokyo, Japan

Filed May 13, 1987, Ser. No. 50,251
Int. Cl.[4] E04C *5/12, 5/07;* **B29C** *43/20*
U.S. Cl. 52—223 L **11 Claims**



1. An anchoring device for securely fixing end portions of a tension member to a concrete to provide prestressed concrete, comprising,

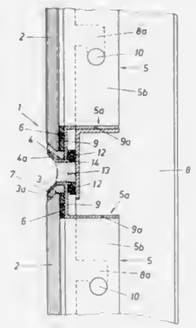
an outer member having an inner hole with an internal cone shaped surface, said outer member being formed by alternately superposing cloths of glass fibers and carbon fibers, impregnating the cloths of glass fibers and carbon fibers with a thermosetting synthetic resin, and solidifying the resin, and
an inner member with an external cone shaped surface to be situated in the inner hole of the outer member, said inner member being formed of a plurality of wedges and having at least one hole for frictionally holding the tension member, each wedge of the inner member being formed by separately impregnating a cloth of glass fibers and a cloth of carbon fibers with a thermosetting synthetic resin to prepare prepregs, cutting the prepregs to a desired size, alternately superposing the prepregs of glass fibers and carbon fibers, and press-molding the prepregs to thereby form the wedge.

4,837,996

GLASS FACADE

Josef Eckelt, Saass 56, A-4421 Aschach, Austria

Filed Mar. 11, 1988, Ser. No. 166,685
Claims priority, application Austria, Mar. 20, 1987, 668/87
Int. Cl.[4] E04B *2/88*
U.S. Cl. 52—235 **3 Claims**



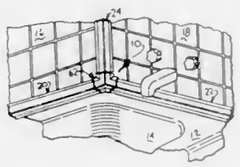
1. A glass facade comprising
(a) a plurality of prefabricated glass panels, each panel including
(1) a glass plate having an outside face, an inside face, two vertically spaced edges and two horizontally spaced edges, the edges extending between the outside and inside faces of the glass plate,
(2) a frame comprised essentially of two vertically spaced carrying bars and two horizontally spaced side bars connecting the carrying bars, each of the bars including a side face having a portion inclined outwardly towards the outside face of the glass plate and extending no farther than the outside face, a web subtending the inside face of the glass plate, the side face and web of the bar defining a groove receiving a respective one of the edges of the glass plate, and each of the edges having a beveled portion extending substantially parallel to the outwardly inclined portion of the side face, and a mounting flange integral with the web and extending inwardly away from the inside face of the glass plate, at least two of said glass panels being laterally adjacent each other whereby the frames of the laterally adjacent panels have laterally adjacent side bars, and
(3) a permanently elastic sealing compound filling the grooves between the edges and the side faces, and
(b) a carrying structure behind the inside face of the glass plate whereon the flanges of the frame bars are mounted, the carrying structure including a channel-shaped aligning bar extending vertically between the laterally adjacent side bars.

4,837,997

SEALING SYSTEM INCLUDING T-JOINT CORNER PIECE

Alan Zeilinger, Cleveland, Ohio, assignor to Magic American Corporation, Cleveland, Ohio

Filed Jul. 15, 1988, Ser. No. 219,144
The portion of the term of this patent subsequent to Nov. 17, 2004, has been disclaimed.
Int. Cl.[4] E04H *1/00*
U.S. Cl. 52—280 **15 Claims**



1. A sealing system for sealing a junction between a horizontal surface such as a top surface of a bathtub, countertop or sink and two adjacent vertical surfaces, the vertical surfaces and horizontal surface being substantially mutually perpendicular and defining two horizontal joints, one vertical joint, and a corner at an intersection of the horizontal and vertical joints, the system comprising:
three generally L-shaped sealing strips each having a pair of legs extending lengthwise parallel to a respective one of the joints, a first one of the strips sealing the vertical joint and extending vertically from the corner, the second and third strips each sealing a respective one of the horizontal joints and each stopping a predetermined distance short of the corner, and
a one piece corner piece having a first wall adjacent the horizontal surface and second and third walls respectively approximately parallel to the adjacent vertical surfaces, the first, second and third walls having side edge flanges for receipt of an end portion of the second and third sealing strips behind the flanges with the flanges overlapping the second and third sealing strips, the second and third walls each having a land projecting rearwardly therefrom defining a passage between the lands for receipt of an end portion of the first sealing strip behind the second and third walls.

4,837,998

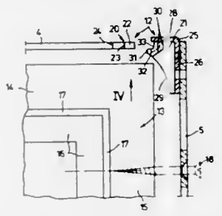
STABILIZER CORNER CONNECTION

Ernst Roth, Wilnsdorf, Fed. Rep. of Germany, assignor to Siegenia-Frank KG, Siegen, Fed. Rep. of Germany

Filed Aug. 29, 1988, Ser. No. 237,968
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 3729215
Int. Cl.[4] E04B *1/38*
U.S. Cl. 52—288 **6 Claims**

1. A cover rail corner connection between two fitting components of connecting rod fittings which are mountable at right angles to each other on the wing or at the frame of a window or of a door, in which cover rails are braceable against groove steps of a connecting rod slot in the profile of the wing or the frame by longitudinal edges and are fixable with fasteners directed transverse to their planes in the bottom of the slot and are connectable with the aid of connecting links which can be brought into mutually positively locking engagement, wherein the connecting links comprise first and second double hooks which firmly intermesh in a claw-like manner provided

at the cover rail ends and wherein the second double hook has an approximately C-shaped cross-sectional configuration in longitudinal direction and has side-flanks with ends which are facing one another and has outer surfaces, wherein the second double hook on the second cover rail has an approximately T-shaped outer contour transverse to its plane and has side flanks facing away from one another, wherein the C-shaped double hook is embodied in a shaped part which is firmly connected with the first cover rail and is closed by limit tang which forms a supporting plate for the T-shaped double hook of the second cover rail, characterized by the fact that, the



C-shaped double hook (**21**) has a projection (**31**) at each of the mutually facing ends (**30**) of its side flanks (**27**) the projections facing away from the cover rail (**5**) which carries the C-shaped double hook, that an edge (**32**) of each projection (**31**) facing towards the limit tang (**28**) of the shaped part (**25**) has a spacing from the limit tang (**28**) which corresponds to the thickness of the first cover rail (**4**) which carries the T-shaped double hook (**20**), and that the projections (**31**) have edges facing the limit tang which form effective stops in opposition to the limit tang (**28**) which edges supportingly undercut the end of the second cover rail (**4**), at its transverse edges.

4,838,000

ARRANGEMENT FOR IMPROVED VENTILATION AND METHOD OF USING THE ARRANGEMENT

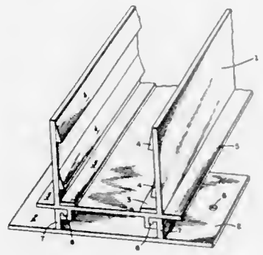
Stig-Ake Ljungkvist, Backvagen 34, S-541 35 Skovde, Sweden

Continuation of Ser. No. 819,511, Nov. 21, 1985, abandoned. This application Nov. 5, 1987, Ser. No. 119,229

Claims priority, application Sweden, Mar. 22, 1984, 8401586

Int. Cl.⁴ E04B *1/70, 5/48;* **E04F** *15/18*

U.S. Cl. 52—376 **2 Claims**



1. A moisture barrier for protecting bars of wood against attacks of moisture from one direction comprising a plurality of horizontal mountings having a top side, each mounting defining parallel rails extending at right angles to each of said mountings from the top side thereof and a joist of greater length than a plurality of said mountings slidably mounted on a plurality of said mountings; said joist defined by two vertical parallel plastic walls interconnected by a horizontal plastic wall having top and bottom sides, a longitudinal rib extending along the juncture of each of said vertical plastic walls and said horizontal plastic wall on the top side of said horizontal plastic wall; downwardly extending parallel tracks on the bottom side of said horizontal plastic wall, and a support shelf on a side of each of said vertical walls opposite to said horizontal plastic wall and in alignment therewith, said vertical parallel plastic walls being in direct alignment with said parallel rails, said vertical parallel plastic walls defining barbs on facing surfaces between which surfaces a bar of wood is positionable, said tracks on the bottom side of said horizontal plastic wall being complementary with and slidable relative to said rails of each of said mountings, said tracks holding said rails in contact therewith.

4,837,999

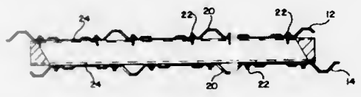
PREFABRICATED BUILDING PANEL

Vance Stayner, 139 Mona Dr., Sugar Grove, Ill. 60554

Filed Dec. 17, 1987, Ser. No. 134,466

Int. Cl.⁴ E04C *1/00*

U.S. Cl. 52—309.11 **9 Claims**



1. A prefabricated building panel suitable for use as a wall panel and a roof panel, said building panel comprising;

a center core;

a pultrusion coupled to the center core;

an inner skin coupled to the pultrusion forming an envelope of air between the center core and the inner skin;

an outer skin coupled to the pultrusion forming an envelope of air between the center core and the outer skin;

a vapor barrier formed by the circulation of air created in the air envelope between said inner skin and center core and between said outer skin and center core; said circulation of air occuring as the warmer air within said air envelope rises and the cooler air therein falls.

4,838,001

WINDOW GRID LATCH

Laurence Battles, Roosevelt, Minn., assignor to Marvin Lumber and Cedar Company, Warroad, Minn.

Filed Feb. 2, 1988, Ser. No. 151,523

Int. Cl.⁴ E06B *3/68*

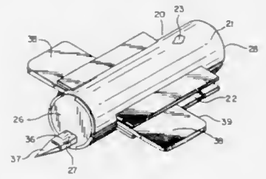
U.S. Cl. 52—456 **7 Claims**

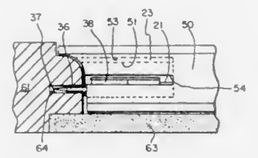
1. A window grid latch comprising an elongated housing adapted to be carried by a window grid;

pin means carried by the housing and including an elongated pin movable between extended and retracted positions with respect to the housing, said pin means and housing having cooperating surfaces permitting and confining movement of the pin means to substantially a single plane with respect to the housing;

spring means carried within the housing for biasing the pin into its extended position;

the housing having a forward wall with an internal surface and with a forwardly open orifice located in said plane to receive therethrough the pin, the pin having a forward end extendable through the orifice and movable, when in its retracted position, transversely of its length in said plane within the housing between a latched position in which the forward end of the pin contacts the internal surface of the front wall of the housing and an unlatched





position in which the pin is aligned with the housing orifice.

4,838,002

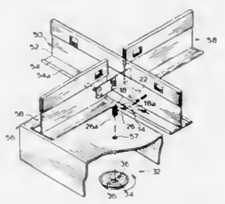
CLIP FASTENER SECURABLE TO CEILING T-BAR TO RETAIN WALL PARTITION IN POSITION

Milan A. Dajnko, 32 Neeland Rd.; Marjan J. Dajnko, 96 Kyla Crescent, and Daniel M. Dajnko, 165 Highglen Avenue, all of Markham, Ontario L3S 1W9, Canada

Filed Jun. 27, 1988, Ser. No. 192,065

Int. Cl.⁴ E04B *1/40*

U.S. Cl. 52—489 **3 Claims**



3. "A ceiling T-Bar intersection and clip fastener assembly for securing a partition wall to the T-Bar intersection, said T-Bar intersection comprising a main T-Bar and a pair of cross T-Bars extending perpendicularly thereto on opposite sides thereof, the clip fastener comprising a clip portion of a resilient material having a main body with opposed side edges, one side edge having a pair of longitudinally spaced shorter tabs overlying the main body, and each shorter tab being a folded-over extension of said one side edge, and the opposite side edge being a pair of longitudinally spaced longer tabs overlying the main body, each longer tab being a folded-over extension of said opposite side edge, the width of the main clip being greater than the width of opposed flanges of the main T-bar by an amount slightly greater than the length of the shorter tabs in the direction of the longer tabs to enable the clip portion to have been assembled with the opposed flanges of the main T-Bar by causing one flange to pass between the longer tabs and the main clip body, with the longer tabs being located on opposite side of one cross T-Bar, and then causing the opposite flange of the main T-Bar to pass between the shorter tabs and the main clip body, with the shorter tabs being located on opposite sides of the other cross T-Bar, to position both the shorter tabs and the longer tabs in engagement with upper surfaces of the flanges of the main T-Bar, the main clip body having a depressed portion with a threaded aperture, and the clip fastener also including a bolt comprising a head and a shank, the shank extending downwardly through the aperture in the depressed portion of the main clip body and the head engaging a lower surface of the main T-Bar to fixedly secure the clip fastener thereto, said bolt providing means for retaining partition wall supporting means."

4,838,003

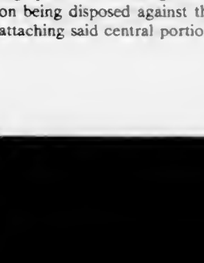
HUB ASSEMBLY FOR COLLAPSIBLE STRUCTURES

Theodore R. Zeigler, 205 S. Columbus St., Alexandria, Va. 22314

Filed Dec. 11, 1986, Ser. No. 941,485

Int. Cl.⁴ E04H *12/18*

U.S. Cl. 52—646 **14 Claims**



1. A hub assembly for collapsible frames which comprises the combination of a pair of similar rigid hub members having radiating arms, said arms being rigidly secured to said hub members in fixed relationship thereto, the hub members being disposed in contact such that the arms thereof are in interdigitated relation, and a strut pivotally attached to each arm member wherein the pivot axes of the struts to the arms are substantially in the same plane.

4,838,004

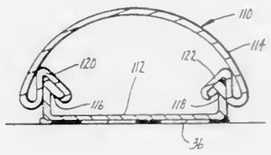
MOLDING FOR AUTOMOBILE BODY PANELS, SUCH AS DOORS

Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Division of Ser. No. 932,778, Nov. 19, 1986, Pat. No. 4,709,525. This application Nov. 30, 1987, Ser. No. 126,480

Int. Cl.⁴ E04F *19/02;* **B60R** *13/02*

U.S. Cl. 52—718.1 **1 Claim**



1. In combination with the exterior surface of a vehicle body panel, such as a door, a decorative molding comprising an inner elongated metal part having a central portion and longitudinal marginal edge portions bounding said central portion, said central portion being disposed against the vehicle body panel and means attaching said central portion to the vehicle

body panel, a layer of non-metallic insulating material disposed between said inner part and said body panel to insulate the metal of the inner part from the body panel, and an outer elongated metal part comprising a central portion bounded by longitudinal marginal edge portions, said longitudinal marginal edge portions of said inner and outer parts comprising mutually interlocking channels via which the outer part attaches to the inner part, in which the channels of said inner part face each other across the central portion thereof, and in which the outer part is constructed and arranged in relation to the inner part such that the longitudinal marginal edge portions of the inner part are not fully concealed by the outer part and the outer part does not contact the exterior surface of the vehicle body panel, in which the outer part is formed from an elongated metal strip that has an interior surface of the central region thereof facing said inner part and the channels of said outer part are formed by displacing the longitudinal marginal edge portions of the strip back inwardly in a direction toward said interior surface, and in which the longitudinal marginal edge portions of the strip are displaced inwardly back against and into contact with the strip adjacent opposite sides of the central region of the outer part.

4,838,005

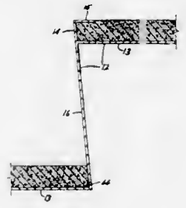
STAIRWAY APPARATUS AND METHOD OF MANUFACTURE

James M. Graham, Myrtle Beach, and Edward F. Schaack, Greenville, both of S.C., assignors to Duraflite, Inc., Danbury, Conn.

Division of Ser. No. 799,270, Nov. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 745,434, Jun. 17, 1985, abandoned. This application Nov. 13, 1986, Ser. No. 929,826

Int. Cl.⁴ E04B *1/00*

U.S. Cl. 52—741 **6 Claims**



1. Method for prefabricating complete metal stair assemblies at a site removed from the intended erected location of the stair assemblies, comprising the steps of positioning a pair of stringer elements (**10,11**) in predetermined spaced relation in a fixture, positioning a plurality of tread pan riser elements (**12**) each having portions forming a tread pan portion (**13**) and a frontal flange (**14**) and an inturned flange (**15**) and an angular riser (**16**) and parallel end edges between said stringer elements in said predetermined relation in said fixture, urging at least one of said stringer elements toward the other to establish firm engagement between said end edges of said tread pan riser elements and the adjacent surfaces of said stringer elements, welding said end edges of said tread pan riser elements to said stringer elements while said firm engagement is maintained to provide a rigid dimensionally stable stair frame assembly with said tread pan riser elements forming with said stringer elements a series of upwardly open spaces each being defined by a frontal flange (**14**) and an inturned flange (**15**) of a lower one of said plurality of tread pan riser elements and by a tread pan portion (**13**) and an inwardly sloping portion (**16**) of one of said angular risers of an upper one of said plurality of tread pan riser elements, pouring a flowable material into each of said open spaces which flowable material being constrained between a portion of said pair of stringer elements and a respective tread pan portion and a respective frontal flange and a respective inturned flange and said inwardly sloped portion of one of said respective angular risers to form durable tread pads upon curing of said flowable material securely constrained within each said respective open spaces to complete said stair assemblies for subsequent delivery to the intended installation site.

4,838,006

SPACER FOR PANES OF MULTIPLE-PANE WINDOWS

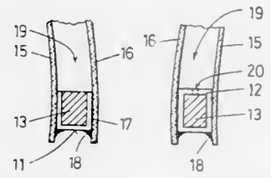
Karl Grosch, Wuppertal, Fed. Rep. of Germany, assignor to Julius & August Erbslöh GmbH & Co., Velbert, Fed. Rep. of Germany

Filed Aug. 20, 1987, Ser. No. 87,577

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1986, 3628275

Int. Cl.⁴ E04C *2/54*

U.S. Cl. 52—790 **10 Claims**



1. A spacer for arcuate panes of a multiple-pane window, comprising a self-supporting frame including a solid first elongated section and a hollow second elongated section defining an internal space for a supply of desiccant and having at least one opening which establishes communication between said space and the surrounding atmosphere, said first section having at least one arcuate portion and the cross-sectional area of said second section exceeding the cross-sectional area of said first section.

4,838,007

HAND DEVICE FOR VARYING THE PRESSURE OF VALVE-LESS BALLS

Bernhard Graf, Pfaffstr. 14, 7500, Karlsruhe 41, Fed. Rep. of Germany

Filed Mar. 16, 1988, Ser. No. 168,774

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1987, 3708842

Int. Cl.⁴ B65B *31/00*

U.S. Cl. 53—84 **18 Claims**

1. A hand device for varying the gas pressure in a valve-less ball comprising an elongate holding means for non-rotatably accomodating a said ball including:

a base plate extending transversely with respect to the longitudinal direction of the holding means of supporting the ball, the base plate having a substantially central opening therethrough,

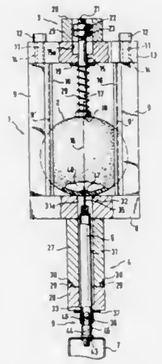
a cover means disposed at a spacing from the base plate in the longitudinal direction of the holding means, for accomodating the ball between the base plate and the cover means,

a handle portion connected to the base plate on the side thereof in opposite relationship to the cover means and having a conduit therethrough for a flow of compressed air in relation to the ball,

an injection syringe having a hollow injection needle and a syringe cylinder adapted to be inserted into said conduit in said handle portion until said syringe cylinder is in a predetermined abutment position in said conduit, in which said hollow needle projects through said opening in said base plate and is thereby operable to pierce the ball supported by the base plate, to extend into the interior of the ball,

said conduit in said handle portion having a reduced end portion whose inside diameter is adapted to the outside diameter of the syringe cylinder in such a way that the injection syringe is held without play in said conduit end portion, the conduit increasing in width from the reduced end portion towards the base plate, and said opening in said base plate being a bore which extends said conduit and whose smallest inside diameter is larger than the outside diameter of the syringe cylinder, and the abutment position of said injection syringe in said handle portion being so selected that in operation the injection needle remains with a part of its length outside the ball,

a ball pressure measuring means comprising a measuring



member which is movable in the axial direction of the holding means and which in the operative position of the device is capable of bearing against the ball on the side thereof which is in opposite relationship to the base plate, the measuring member having a first measuring marking means thereon, a spring means operable to urge the measuring marking towards said ball, and a stationary measuring marking means on the holding means, alignment of the first and second measuring marking means indicating the attainment of a desired gas pressure in the ball,

and means operatively associated with said syringe cylinder for sealingly connecting said syringe cylinder to an air pump for introducing compressed air through the injection syringe, with the piston thereof removed therefrom, and by way of the injection needle into the interior of the ball.

4,838,008

CLOSING PLASTICS CONTAINERS

Peter D. Hardy, Oxfordshire, United Kingdom, assignor to Metal Box plc, Reading, United Kingdom

Filed Sep. 9, 1987, Ser. No. 94,553

Claims priority, application United Kingdom, Sep. 12, 1986, 8622089

Int. Cl.⁴ B65B *7/28*

U.S. Cl. 53—407 **7 Claims**

1. A method of closing a plastics container of a product, which method comprises:

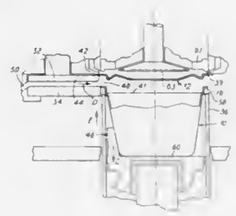
(a) locating a lidding material which is heat-sealable to the container, over a mouth-defining rim of the container,

(b) directing steam between the lidding material and the container rim and into the space between the lid and the product in the container to purge said space of gas,

(c) and heat sealing the lidding material to the rim using a heated element located on the side of the lidding material remote from the container

characterised in that:

(d) the lidding material is in the form of an individual lid for the container, and



(e) during step (b) the circumference of said lid is maintained in engagement with an element which, in conjunction with the lid, forms a moisture barrier between the steam-containing region and the heated element so as to keep steam away from the heated element.

4,838,009

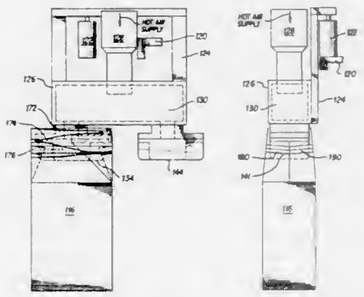
METHOD OF HEAT ACTIVATING TOP CLOSURE PANELS

Richard J. Connor, Pine Bush, N.Y., and Gerald F. Justice, Tracy, Calif., assignors to International Paper Company, Purchase, N.Y.

Filed Aug. 31, 1988, Ser. No. 238,423

Int. Cl.⁴ B65B *51/20, 7/18*

U.S. Cl. 53—477 **6 Claims**



1. A method of heating the heat activatable PE coated interior surfaces of generally vertically extending top closure flaps of an erected and filled paperboard carton, said closure flaps including a first pair of oppositely disposed, fin forming panels each of whose facing interior surfaces is to be heat activated over a horizontally oriented U-shaped area, said method including the steps of, (1) partially inserting between said first pair of fin forming panels a first hot air nozzle in the latter's up position, said first hot air nozzle having an up and a down position, said first hot air nozzle having air holes for producing horizontally directed hot air jets against the upper U legs of each of said first pair of fin forming panels, said air holes being in horizontal rows and defining a generally horizontal T pattern, (2) moving the carton horizontally relative to the first nozzle to cause the air jets forming the head of the T pattern to move toward the bights of the U-shapes, (3) moving said first nozzle to its down position toward the carton interior to cause the T head forming air jets to move across the bights of the U-shapes, (4) maintaining said first hot air nozzle at a level

corresponding to the level of the lower U legs of each said first pair of fin forming panels, whereby the U shapes are at least partially heat activated to an adhesive condition but the remaining areas of each of said first pair of fin forming panels between the U legs are not heat activated.

4,838,010

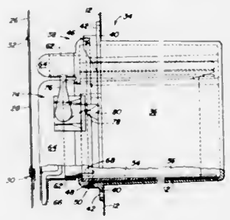
ELECTRONICS ENCLOSURE FOR AN AGRICULTURAL COMBINE

Duane H. Ziegler, Colona; Dennis A. Kerckhove, East Moline; Jerry W. Hansen, Port Byron, all of Ill., and Barry K. Denning, Central City, Nebr., assignors to Deere & Company, Moline, Ill.

Continuation of Ser. No. 67,759, Jun. 29, 1987, abandoned. This application Jun. 27, 1988, Ser. No. 212,363

Int. Cl.[4] A01D *47/00*

U.S. Cl. 56—10.2 **14 Claims**



1. A self-propelled agricultural combine for harvesting a crop from a field, and threshing and separating grain from straw and chaff of the harvested crop the agricultural combine comprising:

a supporting structure;

operating means are mounted to the supporting structure and include, a propulsion means for propelling the supporting structure, a harvesting means extending from the supporting structure for harvesting a crop from a field, threshing and separating means located inside the supporting structure for separating grain from straw and chaff of the harvested crop, and a feeder house means for directing a harvested crop from the harvesting means to the threshing and separating means;

ground engaging means extending from the supporting structure for supporting the supporting structure above a field and when rotated by the propulsion means, the ground engaging means provides a means for propelling the supporting structure about a field;

electronic control means for controlling the operations of at least one of the operating means, the electronic control means being mounted on electronic controller cards;

operator control assemblies for controlling the propulsion means, the harvesting means, and the threshing and separating means through the electronic control means;

wiring means for electrically coupling the operator control assemblies to the electronic control means and the operating means;

a box having an open side is fixedly mounted to the supporting structure;

a covering for closing the open side of the box has an inwardly facing side and an outwardly facing side, the inwardly facing side is provided with a plurality of fingers for holding the electronic controller cards, the cover is further provided with a plurality of openings through which the electronic controller cards can be accessed; and

latching means for latching the cover to the box so that the electronic controller cards extend inside the box as the cover is attached to the box.

4,838,011

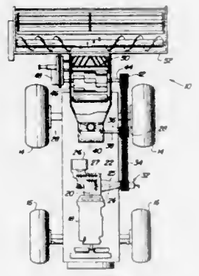
FLUID ACTUATED CLUTCH HAVING FLUID SLIP FITTING SAFETY INTERLOCK

Gerd Bramstedt, Zweibrucken, Fed. Rep. of Germany; Mahlon L. Love, Geneseo, Ill., and John J. Heanen, Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Feb. 19, 1988, Ser. No. 157,558

Int. Cl.[4] A01D *69/08*

U.S. Cl. 56—11.7 **6 Claims**



1. In a self-propelled harvester including a plurality of crop gathering and/or processing components each including a transversely extending drive shaft carrying a driven sheave at its outboard end, an engine having an output shaft coupled for driving a transversely extending, main drive input shaft, a multi-groove main drive sheave mounted on the input shaft and drive belt means coupled between the drive and driven sheaves, the improvement comprising: said drive sheave being freely rotatably mounted on the input shaft; a hydraulically operable clutch having a first portion mounted for rotation with said input shaft, a second portion mounted for rotation with said drive sheave and hydraulically actuatable means including an axially shiftable piston for selectively effecting a driving connection between the first and second clutch portions upon pressurizing said piston; said input shaft having a splined section extending outboard of the clutch and drive sheave and adapted for receiving a dynamometer drive element whereby the engine output can be easily measured; a clutch fluid passage means coupled to the piston for conveying fluid to and from the piston and including a fluid passage extending axially in the input shaft from an outboard end of the shaft and including a slip fitting normally mounted to the axially outer end of the input shaft and being removable for allowing mounting of the dynamometer drive element of the splined section of the shaft whereby inadvertent pressurization of the clutch for effecting driving of the drive sheave is prevented when checking the engine output.

4,838,012

VEGETABLE HARVESTER

Perry G. Bowen, III, P.O. Box 1949, Prince Frederick, Md. 20678

Filed Apr. 30, 1987, Ser. No. 44,439

Int. Cl.[4] A01D *46/00*

U.S. Cl. 56—13.1 **4 Claims**

1. A vegetable harvester comprising

a frame adapted to be pivotally mounted on a conventional three point tractor hitch for vertical and tilting adjustment relative to the tractor,

a slide mounted on said frame for vertical movement thereon,

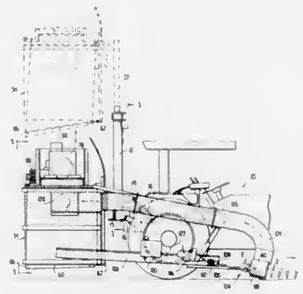
first drive means mounted on said frame for moving said slide relative to said frame,

a substantially closed rectilinear container having a top, four sides and a bottom pivoted on one of said sides for pivotal movement into open and closed relation with respect to said side,

connection means for detachably connecting said container to said slide whereby said container may be raised and lowered with said slide relative to said frame,

support means secured to one side of said container and adapted to extend forwardly along one side of said tractor,

cutting means mounted on a forward end of said support means,



conduit means having one end disposed adjacent said cutting means and the opposite end thereof disposed in communication with the interior of said container,

blower means mounted on the top of said container and disposed in communication with the interior of said container and

means on said container for moving said bottom of said container to open and close the bottom of said container.

4,838,013

MOWING MACHINE

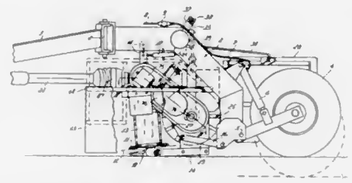
Louët Feisser, Arnold, Riel; Koorn, Maarten, Vlaardingen, and Sape Sikkema, Maassluis, all of Netherlands, assignors to C. van der Lely, N.V., Maasland, Netherlands

Filed Nov. 10, 1987, Ser. No. 119,384

Claims priority, application Netherlands, Nov. 12, 1986, 8602866

Int. Cl.[4] A01D *34/66*

U.S. Cl. 56—13.6 **34 Claims**



1. A mowing machine, comprising:

a mobile frame, said mobile frame, during operation, being offset at an oblique angle to the rear and sidewards of a prime mover and further comprising a first frame, said first frame having accommodated therein a mowing unit having a supporting beam and a plurality of mower members, said mower members being rotatable about substantially upwardly directed axes; at least one mower member drive means provided within said supporting beam, said supporting beam during operation extending substantially transversely to the direction of travel; a processing member attached to said first frame such that it is rotatable about a substantially horizontal axis and extends through a large part of the width of said mowing unit; a second frame, connected to the prime mover, in which said first frame is suspended capable of movement such that there is exerted an upwardly directed force on said first frame by a spring which is attached at its one end to said second frame and at its other end to a tilting element also having pivotally attached a tensile member which is also pivotally attached to said first frame, so that, when the spring is tensioned or slackened, an approximately equal upwardly directed force is exerted on said first frame; and a pivotal arm for coupling said mobile frame to the prime mover, said pivotal arm being provided with drive means comprising a coupling means and a driveshaft such that when said pivotal arm moves the mowing machine relative to the prime mower, the length of said drive shaft remains substantially constant.

4,838,014

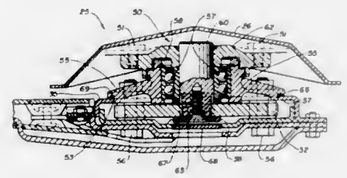
DISC CUTTER ROTOR ASSEMBLY

Earl E. Koch, deceased, late of Mohnton, Pa. (by Agnes E. Koch, legal representative); Franja F. Voler, and Edmund O. Howell, both of New Holland, Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Continuation-in-part of Ser. No. 846,655, Mar. 31, 1986, abandoned. This application Sep. 23, 1987, Ser. No. 99,971

Int. Cl.[4] A01D *35/26*

U.S. Cl. 56—13.6 **3 Claims**



1. In a disc cutterbar for severing standing crop material from the ground and having a plurality of disc cutter assemblies rotatably mounted on a transmission casing housing a plurality of intermeshed power transmission gears including a drive gear associated with each respective disc cutter assembly to effect rotation thereof and idler gears positioned between said drive gears to transfer rotational power between said drive gears, said transmission casing having an upper surface portion and a spaced apart lower surface portion, said upper surface portion having an opening therein corresponding to each said disc cutter assembly, an improved disc cutter assembly comprising:

a bearing housing detachably connectable to the upper surface of said transmission casing and having a size sufficient to cover said opening, said bearing housing mounting a bearing assembly having an outer race removably engaged with said bearing housing and an inner race;

a shaft member detachably engaged with the inner race of said bearing assembly and extending through said bearing housing, said shaft member being rotatably relative to said bearing housing and having an end extending beyond said bearing assembly and terminating within said transmission casing;

a hub affixed to said shaft member and rotatably therewith above said bearing housing;

a disc cutter detachably mounted on said hub for rotation therewith, said disc cutter carrying at least one knife to engage and sever standing crop material upon rotation of said disc cutter;

said drive gear being detachably connected to the end of said shaft member by a fastener and washer assembly positioned below said drive gear and being operatively interengaged with the other said power transmission gears to

cause rotation of said shaft member said drive gear being positioned within said transmission casing between said upper and lower surface portions and being selectively detachable from said shaft member without disengaging said bearing assembly from said shaft member; and

the lower surface portion of said transmission casing including a hole positioned beneath said fastener and washer assembly to permit access to said fastener and washer assembly so that said drive gear can be disconnected from said shaft member before said bearing housing is removed from said transmission casing.

4,838,015

FARM PRODUCT PICKUP BALER

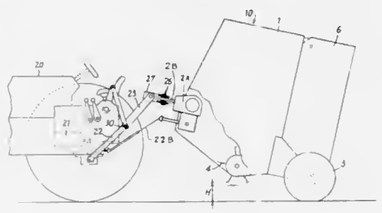
Patrick Mouret, Mardie, and Jean-Claude Galant, Saint Jean de Braye, both of France, assignors to Rivierre Casalis, Fleury Les Aubrais, France

Filed Apr. 15, 1987, Ser. No. 38,701

Claims priority, application France, Apr. 25, 1986, 86 06004

Int. Cl.⁴ A01P *59/00*

U.S. Cl. 56—15.7 **1 Claim**



1. A pickup baler for harvesting a crop adapted to be driven by a tractor provided with a lifting device, said baler comprising:

a frame attaches to wheels vesting on the ground;

baling means mounted within said frame;

toothed pickup means mounted on said frame and protruding therefrom substantially downwardly towards the ground for picking up said crop such as hay, said wheels being positioned rearwardly of said toothed pickup means;

a hitching tongue having an extension is connected to said frame;

a two-legged U-shaped hitching bar pivotally connected to said extension of said hitching tongue about a pivot pin axis that is substantially vertical;

two sets of lifting arms controlled by the lifting device of the tractor and pivotally mounted at one of their ends onto said tractor and pivoted at their other ends to the respective ends of the two legs of said U-shaped hitching bar about a substantially horizontal pivoting axis;

wherein said extension is rotatably mounted to hitching tongue so as to turn around an axis that is orthogonal to said pivot pin axis and extends parallel to the longitudinal axis of the baler, whereby said lifting arm, when moved by said lifting device, vertically move the hitching bar which correspondingly changes its direction relative to said lifting arms and varies the height of said toothed pickup means above the found while preventing the application of torsion to the baler frame.

4,838,016

BALING MACHINES AND BALED PRODUCTS

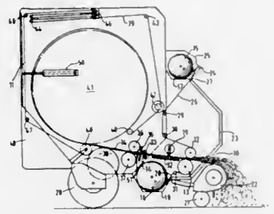
Kenneth H. L. Frogbrook, Stagwell Dairy Farm, Hillis Gate Road, Northwood, Nr. Cowes, Isle of Wight, and Nigel W. Meek, Aylesbury, both of England, assignors to Kenneth H. L. Frogbrook, Cowes, England

Filed Mar. 4, 1987, Ser. No. 21,883

Claims priority, application United Kingdom, Mar. 4, 1986, 8605301

Int. Cl.⁴ A01D *39/00*

U.S. Cl. 56—341 **23 Claims**



1. A baling machine for producing a mat encased in an apertured material and for rolling the encased mat in the form of a bale, said baling machine comprising, in combination:

a housing;

means defining an inlet in said housing for receiving material for a mat;

a baling chamber defined within said housing for progressively accumulating a rolled bale of encased mat;

means defining a conveyance path between said inlet means and said baling chamber;

means defined along said conveyance path for forming material received through said inlet means into a continuous, elongated mat of said material;

means for mounting a supply of apertured encasing material to said housing; and

means for guiding said apertured encasing material from said mounting means to said conveyance path so that said apertured encasing material is received at said conveyance path both under mat material being conveyed along said conveyance path and on top of said mat material so as to define a mat material encased with said apertured encasing material;

whereby material received through said inlet is progressively encased on top and bottom surfaces with an apertured encasing material and formed into an elongated mat and the encased mat is rolled into a rolled bale within the baling chamber and whereby said bale can be unrolled so as to define an elongated encased mat.

4,838,017

WIRE WRAPPED YARN FOR PROTECTIVE GARMENTS

Nathaniel H. Kolmes, 1740 5th St. Dr. N. W., Hickory, N.C. 28601, and Harold F. Plemmons, Route 1, Box 628, Millers Creek, N.C. 28651

Continuation of Ser. No. 915,140, Oct. 3, 1986, Pat. No. 4,777,789. This application Jun. 6, 1988, Ser. No. 202,338

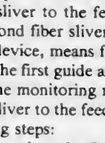
Int. Cl.⁴ D02G *3/12, 3/36;* **A41D** *19/00*

U.S. Cl. 57—210 **15 Claims**

1. A yarn for use in making strong, flexible products comprising:

a core including at least one longitudinally positioned strand;

a covering wrapped on said core, said covering including at least two fiber strands wrapped in opposite directions, relative to each other, around the core; and



at least two additional wire strands wrapped in opposite directions, relative to each other, around the longitudinal core strand.

4,838,018

PROCESS AND DEVICE TO START A NEW STAPLE FIBER SLIVER AUTOMATICALLY

Werner G. Hoeber, Weckenweg 32, D-8070 Ingolstadt, Fed. Rep. of Germany

Filed Jun. 24, 1988, Ser. No. 211,238

Int. Cl.⁴ D01H *7/882, 15/02*

U.S. Cl. 57—263 **13 Claims**

1. A process for the automatic starting of a staple fiber sliver on a textile machine equipped with a feeding device, a first guide being in a feeding position relative to the feeding device and feeding the staple sliver to the feeding device, a second guide maintaining a second fiber sliver in a readiness position relative to the feeding device, means for monitoring the presence of a staple fiber in the first guide and a device for emitting a signal responsive to the monitoring means for starting feeding of the second fiber sliver to the feeding device, the process comprising the following steps:

(a) inserting a first sliver into the first guide;

(b) positioning the first guide at the feeding position relative to the feeding device;

(c) feeding the first sliver into the feeding device;

(d) positioning the second guide at its readiness position relative to the feeding device;

(e) inserting a second sliver into the second guide;

(f) moving the first guide from the feeding position to the readiness position when the feeding of the first staple fiber sliver to the feeding device is interrupted;

(g) moving the second guide to the feeding position as the first guide is moving away from the feeding position upon interruption of the feeding of the first staple fiber sliver to the feeding device;

(h) monitoring the first guide at its readiness position for the presence of a staple fiber sliver;

(i) emitting a signal from the signal emitting device for as long as a staple fiber sliver is absent from the first guide at its readiness position; and

(j) stopping emission of the signal from the signal emitting device in conjunction with the insertion of a new staple fiber sliver into the first guide at its readiness position.

4,838,019

SPINNING FRAME CONTROL SYSTEM

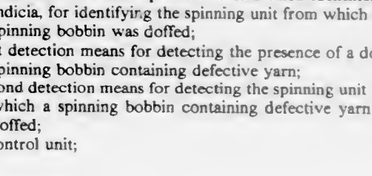
Yutaka Ueda, Nara, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Aug. 13, 1986, Ser. No. 896,393

Claims priority, application Japan, Aug. 19, 1985, 60-182626

Int. Cl.⁴ D01H *9/18, 13/26, 13/32;* **B65H** *67/06*

U.S. Cl. 57—264 **9 Claims**



1. A spinning frame control system comprising:

a spinning frame having a plurality of spinning units for producing and doffing spinning bobbins in a sequence, wherein the position of a bobbin in said sequence is dependent on the spinning unit which produced said bobbin;

a winder;

a bobbin conveyance path for conveying doffed spinning bobbins from said spinning frame to said winder;

an empty bobbin return path for conveying empty bobbins from said winder to said spinning frame;

a plurality of conveyance mediums, each of said conveyance mediums being associated with a doffed spinning bobbin located in said sequence;

a corresponding plurality of identification indicia, each of said identification indicia being applied to a respective conveyance medium;

a first reader for reading said identification indicia applied to a conveyance medium before the bobbin associated with said conveyance medium is conveyed to said winder;

a second reader for reading said identification indicia applied to a conveyance medium after the bobbin associated with said conveyance medium has been conveyed to said winder; and

identification means for identifying the spinning unit which produced and doffed a bobbin in response to the reading, by said readers, of the identification indicia applied to the conveyance medium associated with said bobbin.

9. A spinning frame control system comprising:

a spinning frame having a plurality of spinning units, each of said spinning units being operable to doff a spinning bobbin;

a plurality of conveyance mediums, each of said conveyance mediums being associated with one doffed spinning bobbin;

fixed identification indicia provided on each conveyance medium;

identification means responsive to said fixed identification indicia, for identifying the spinning unit from which each spinning bobbin was doffed;

first detection means for detecting the presence of a doffed spinning bobbin containing defective yarn;

second detection means for detecting the spinning unit from which a spinning bobbin containing defective yarn was doffed;

a control unit;

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at least one winding unit operable to wind yarn from one of said bobbins;

a lamp on said at least one winding unit;

said first detection means being a yarn breakage sensor for sensing a yarn breakage during the winding operation and for generating a first signal in response thereto, said first signal being conveyed to, and stored in, said control unit;

wherein said control unit generates a second signal for illuminating said lamp when then number of first signals produced during the yarn winding operation on said bobbin exceeds a predetermined number.

4,838,020

TURBOCOMPRESSOR SYSTEM AND METHOD FOR CONTROLLING THE SAME

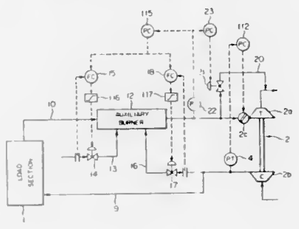
Masashi Fujitsuka, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 921,425, Oct. 22, 1986, abandoned. This application Apr. 12, 1988, Ser. No. 183,350

Claims priority, application Japan, Oct. 24, 1985, 60-236426; Oct. 25, 1985, 60-237477; Oct. 30, 1985, 60-241308; Nov. 20, 1985, 60-258640

Int. Cl.[4] F02C *7/26;* **H01M** *8/04*

U.S. Cl. 60—39.07 **48 Claims**



1. A turbocompressor system comprising:

a load section requiring air for its operation and discharging exhaust gas;

a compressor connected with said load section and delivering compressed air, which is at a pressure adjusted to a predetermined value, to said load section;

a turbine having an inlet side connected with said load section and adapted to be driven by the exhaust gas discharged from said load section to said inlet side, said turbine being operably connected to drive said compressor;

a flow control valve disposed at said turbine inlet side and cooperatively arranged with said turbine to directly control flow rate of all the exhaust gas supplied to said turbine inlet side; and

a control means connected in a closed feedback loop with said compressor and said flow control valve for controlling degree of opening of said flow control valve in response singularly only to the air pressure of the compressed air delivered from said compressor whereby the pressure of the compressed air delivered from said compressor to said load section is adjusted to the predetermined value by control of exhaust gas flow rate to the inlet side of said turbine from the outlet side of said compressor through the closed feedback loop.

4,838,021

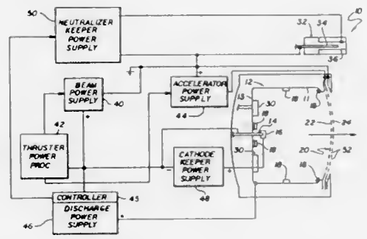
ELECTROSTATIC ION THRUSTER WITH IMPROVED THRUST MODULATION

John R. Beattie, Westlake Village, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 11, 1987, Ser. No. 131,978

Int. Cl.[4] F02C *1/00*

U.S. Cl. 60—202 **6 Claims**



1. An electrostatic ion thruster with improved thrust modulation comprising:

means for ionizing a gaseous propellant within a chamber to produce a plasma, said ionizing means including:

cathode means for providing electrons; and

anode means for accelerating said electrons to ionize said gaseous propellant;

ion extraction means for extracting an ion beam from said plasma; and

control means for modulating the current of said ion beam by modulating the current through said anode means to change the concentration of ions in said chamber.

4,838,622

CONTROL SYSTEM FOR CONTROLLING DC CONTROL MOTOR WHICH CONTROLS OPERATION CONDITION OF INTERNAL COMBUSTION ENGINE

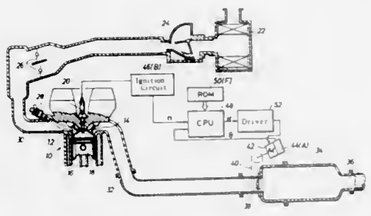
Toshiyasu Terui, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Feb. 29, 1988, Ser. No. 161,851

Claims priority, application Japan, Mar. 2, 1987, 62-45286; Mar. 2, 1987, 62-45287

Int. Cl.[4] F02B *27/02*

U.S. Cl. 60—312 **11 Claims**



1. A control system for controlling a DC control motor which controls an internal combustion engine to follow-up a target value varying continuously depending on the operation condition of said engine, the current flowing through said DC control motor- being controlled through pulse width modulation, said control system comprising:

means for detecting the operation condition of said engine;

processor means for calculating and setting a target value depending on said operation condition of said engine;

detector means for detecting the up-to-date value of said DC control motor;

discriminator means for discriminating a difference between said target value and said up-to-date value to supply an output signal for changing the duty ratio of the current flowing through said DC control motor depending on said difference;

a driver for energizing said DC control motor in response to said output signal from said discriminator means; and

controller means for controlling said duty ratio of the current flowing through said DC control motor and for stopping said DC control motor for a predetermined time period when the time duration during which said duty ratio takes a value higher than a programmed duty ration reaches a pre-set time duration.

4,838,023

FLUID PRESSURE CIRCUIT WITH ACCUMULATOR CHARGING AND SAFETY VALVE SYSTEM INCLUDING CHECK VALVE BYPASS

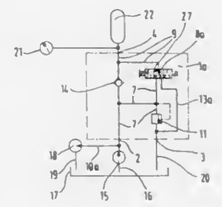
Karl E. Baldauf, Saarbrucken, Fed. Rep. of Germany, assignor to Gesellschaft Fur Hydraulik-Zubehor mbH, Fed. Rep. of Germany

Filed Apr. 20, 1987, Ser. No. 40,137

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1986, 3613689

Int. Cl.[4] F15B *1/02, 20/00*

U.S. Cl. 60—413 **14 Claims**



8. A safety system for connecting a pressure medium source, a user and a pressure accumulator, comprising:

user port means for attaching the user;

pressure port means for attaching the pressure medium source;

supply port means for attaching a fluid supply container;

accumulator port means for attaching the pressure accumulator;

a three-way valve having a positive overlap and coupled by a first passage to said accumulator port means, by a second passage to pressure port means, by a third passage to said user port means and by a fourth passage to said supply port means, said three-way valve being movable between a first position connecting said pressure port means with said accumulator port means and a second position connecting said accumulator port means with said supply port means;

a pressure relief valve connected to said second passage;

a check valve in a fifth passage connecting said accumulator port means with said pressure port means and said user port means and bypassing said three-way valve, said relief valve and said three-way valve being connected to said fifth passage between said pressure port means, said user port means and said check valve.

4,838,024

HYDRAULICALLY OPERATED CONTINUOUSLY VARIABLE TRANSMISSION

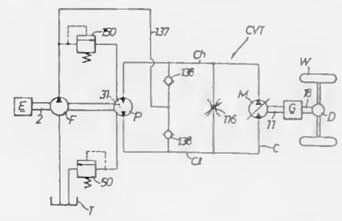
Noboru Yamamoto; Mitsumasa Furumoto; Eiichiro Kawahara, and Kenichi Ikehjiri, all Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1987, Ser. No. 122,775

Claims priority, application Japan, Nov. 19, 1986, 61-275755; Nov. 19, 1986, 61-275756

Int. Cl.[4] F16D *39/00*

U.S. Cl. 60—488 **7 Claims**



1. A hydraulically operated continuously variable transmission comprising:

an input shaft;

a hydraulic pump coupled to said input shaft and having a pump swash plate and a pump cylinder supporting an annular array of slidable pump plungers held in slidable contact with said pump swash plate through mutually sliding surfaces;

an output shaft;

a hydraulic motor coupled to said output shaft and having a motor swash plate and a motor cylinder supporting an annular array of slidable motor plungers held in slidable contact with said motor swash plate through mutually sliding surfaces;

a closed hydraulic circuit interconnecting said hydraulic pump and said hydraulic motor;

a hydraulically hermetic chamber surrounding at least one of said hydraulic motor and said hydraulic pump, said hydraulically hermetic chamber communicating with the sliding surfaces of said at least one of said hydraulic motor and said hydraulic pump;

a replenishing pump operatively coupled to said input shaft and connected to said closed hydraulic circuit through a replenishing oil passage;

a relief valve through which said hydraulically hermetic chamber is connected to said replenishing oil passage, said relief valve being openable when the oil pressure in said replenishing oil passage exceeds a first pressure level; and

a pressure control valve disposed in a discharge passageway of said hydraulically hermetic chamber and openable when the oil pressure in said hydraulically hermetic chamber exceeds a second pressure level which is lower than said first pressure level.

4,838,025

HYDRAULIC MOTOR WITH BUOYANT TUBULAR MEMBERS

Marc Nelis, 10340 Boul. Olympia, Montreal, Quebec, Canada H2C 2W2

Filed Jan. 20, 1988, Ser. No. 146,026

Int. Cl.[4] F03C *1/02*

U.S. Cl. 60—505 **21 Claims**

1. A hydraulic motor comprising:

at least a first and second tank means, each tank means having a bottom wall and a peripheral upstanding side wall for containing water;

an upstanding first tubular member extending upwardly

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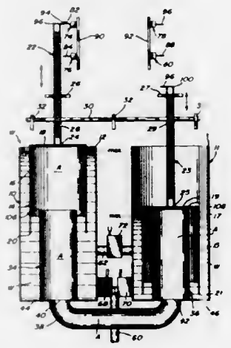
from the bottom wall and spaced inwardly from the side wall of the tank means and defining a space therewith, the first tubular member being open at the top and a second tubular member having a top wall and a peripheral side wall having inner transverse dimensions greater than the outer transverse dimensions of the first tubular member and less than the inner transverse dimensions of the side wall of the tank means such that the second tubular member can telescope onto the first tubular member within the tank means;

guide means for guiding telescopic reciprocating movement of the second tubular member relative to the first tubular member;

means for supplying water from a water supply source to said space between a side wall of the first tubular member and the side wall of the tank means, the water being effective to float the second tubular member and move said second tubular member along said guide means to an upper limit in said tank means from a lower limit in said



tank means in a telescopic extended position relative to said first tubular member from a telescopic compressed position;

a gaseous fluid provided within a variable volume first chamber defined by the first and second telescopic tubular members arrangement and conduit means communicating between the first chamber in the first tank means with a second variable volume chamber defined by the arrangement of the first and second telescopic tubular members in the second tank means in order to maintain a constant pressure in the first and second chambers;

means for alternately supplying to and exhausting water from the first and second tank means whereby the telescopic first and second tubular arrangements in the respective tank means are alternately extended and compressed by means of the water rising or lowering in said space in the respective tank means, and means coupled to the second tubular members in each of the first and second tank means for extracting the mechanical energy derived from the reciprocal movement thereof.

4,838,026

ICE PIECE EJECTION MECHANISM FOR ICEMAKER

Stephen Searl, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Sep. 28, 1988, Ser. No. 250,302

Int. Cl.[4] F25C *5/08*

U.S. Cl. 62—137 **12 Claims**

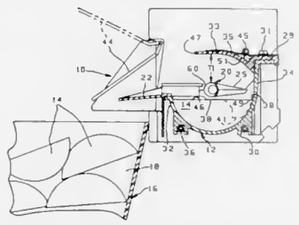
1. An icemaker comprising:

a freezer mold having a front wall and a back wall with a plurality of partitioned walls disposed within the mold to define a plurality of cavities along the longitudinal central axis of the mold in which water is to be frozen to form ice pieces with a crescent shape with a flat side and an arcuate side joined to form two opposite edge portions and having a first half and a second half,

a stripper member disposed longitudinally along the front wall of the mold,

means for ejecting the ice pieces from the mold including an ejector rotable in only one direction and having an axle along the longitudinal central axis of the mold,

an ice piece ejector guide having a rear portion portion secured to the back wall of the mold and located above the cavities longitudinally along the mold, and a resilient forward portion movable from a first position to a second position and extending laterally from the back wall of the mold past the axle of the rotating ejector and spaced from the rotating ejector axle a distance less than the maximum



thickness of the ice pieces when in its first position and a distance equal to the maximum thickness of the ice pieces when in its second position, and

means for spring biasing the forward portion of the ejector guide when it is moved to its second position, said ejector guide and rotating cooperating to move the ice pieces above the cavities between the ejector guide and axle of the rotating ejector to move the forward portion of the ejector guide from its first position to its second spring biased position with the first half of the ice pieces and subsequently eject the ice pieces from the icemaker by squeezing the second half of the ice pieces between the axle and spring biased forward guide portion to exert propellent force on the ice pieces in the direction of movement of the ice pieces.

4,838,027

POWER CYCLE HAVING A WORKING FLUID COMPRISING A MIXTURE OF SUBSTANCES

Serafin M. Rosado, and Luiz E. D. Vallejo, both of Madrid, Spain, assignors to Carnot, S.A., Spain

Filed Mar. 31, 1988, Ser. No. 175,906

Claims priority, application Spain, Apr. 8, 1987, 8701019

Int. Cl.[4] F01K *25/00*

U.S. Cl. 60—671 **22 Claims**

1. A power cycle which utilizes a working fluid comprising a mixture of water and a second substance, the second substance having a lower volatility, a molecular weight greater than water and the ability to superheat in isentropic expansion, comprising:

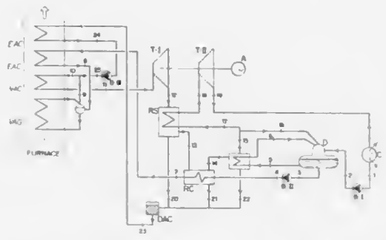
(a) vaporizing the working fluid at maximum cycle pressure and variable temperature with heat from an external energy source;

(b) expanding the working fluid at least once from the maximum cycle pressure to a lower pressure;

(c) cooling the expanded working fluid at variable temperature and constant pressure less than the maximum cycle pressure to condense at least part of the second fluid as a first condensate and produce heat;

(d) condensing the expanded working fluid to produce a second condensate;

(e) pumping the first and second condensate up to the maximum cycle pressure;



(f) heating the first and second condensate with the heat from step c; and,

(g) recycling the first and second condensate to step a.

4,838,028

COOLING AND DAMPING ARRANGEMENT FOR GAS TURBINE BEARINGS

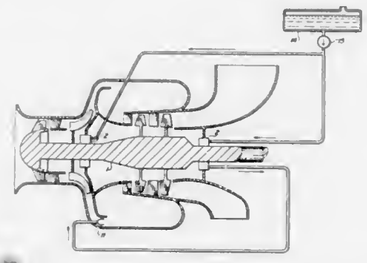
Arnold Witt, Oberursel, Fed. Rep. of Germany, assignor to Kloeckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Continuation of Ser. No. 13,360, Feb. 11, 1987, abandoned. This application Apr. 25, 1988, Ser. No. 186,776

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1986, 3604625

Int. Cl.[4] F02C *7/12*

U.S. Cl. 60—736 **5 Claims**



1. In combination: a gas turbine housing for a gas turbine having a turbine side and a compressor side, a gas turbine combustion chamber, a gas turbine rotor, an annular bearing surrounding and rotatably said rotor on said turbine side, a bearing support structure including a bushing concentrically surrounding and mounting said bearing presenting a radially outward facing cylindrical surface, a radially inward facing cylindrical surface on said housing in radially outward spaced and generally coaxial relation to said radially outward facing cylindrical surface, said cylindrical surfaces defining a ring-shaped, sealed-off cylindrical cavity concentrically surrounding said bearing and extending axially a distance at least equal to the axial width of said bearing, a fuel inlet connected to one axial end of said cylindrical cavity, a fuel outlet passageway connected to the other axial end of said cylindrical cavity, said fuel outlet passageway being connected to said combustion chamber and a source of fuel connected in fuel supplying relation to said fuel inlet whereby fuel is supplied to said cavity, said cavity acting as a hydraulic compression film bearing damping device when filled with fuel and said fuel cooling said bearing as it passes by laminar flow axially across substantially the full axial width of said cylindrical surfaces and exits via said outlet passageway.

4,838,029

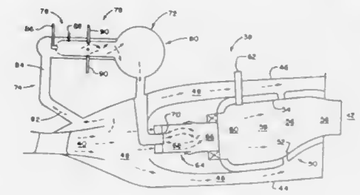
EXTERNALLY VAPORIZING SYSTEM FOR TURBINE COMBUSTOR

Clifford C. Gleason, deceased, late of Cincinnati, Ohio (by Mary J. Gleason, executor), and Edward E. Ekstedt, Montgomery, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 10, 1986, Ser. No. 905,439

Int. Cl.[4] F02C *1/00*

U.S. Cl. 60—732 **1 Claim**



1. A lean premixed-prevaorized combustor for a jet turbine engine, said combustor being located between a compressor section having a diffuser and a turbine section, said combustor comprising:

an inner annular casing;

an outer annular casing, said inner and said outer annular casings being connected together to form an annular space therebetween, said casings being connected to said diffuser of said compressor and said turbine section whereby air flows through said combustor;

an inner annular wall,

an outer annular wall, said inner and said outer annular walls being connected together and located in said annular space of said casings, said walls forming an annulus shaped combustion chamber, said combustion chamber having a primary combustion zone and an annular outlet;

premixing and swirling means, said premixing and swirling means having input and output ends, said output end connected to said combustion chamber, said input end receiving air form said diffuser; and

an externally vaporizing system including a source of liquid fuel to be vaporized, said externally vaporizing system being located outside said casings, said externally vaporizing system receiving input air in a controlled manner, said system vaporizing said liquid fuel and inputting said fuel into said means for pre-mixing and swirling,

at least one air flow control means, said air flow control means receiving said input air;

at least one auxiliary burner,

air from said air flow control means being supplied to said burner at substantially a stoichiometric fuel-air ratio whereby, said axuiliary burner outputs fuel/inert gas mixture;

at least one main stage fuel injector section, said injector section having a plurality of main fuel injectors, said at least one main state fuel injector section receiving said fuel/inert gas mixture from said auxiliary burners, said injector section outputing vaporized fuel;

a vaporized fuel manifold, said manifold receiving said vaporized fuel and distributing by ducting said vaporized fuel in a controlled manner: and

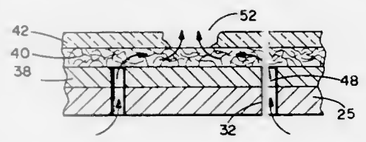
a plurality of vaporized fuel injectors, said vaporized fuel injectors receiving said distributed vaporized fuel from said manifold, said injectors inputting said vaporized fuel into said means for premixing and swirling.

4,838,030

COMBUSTION CHAMBER LINER HAVING FAILURE ACTIVATED COOLING AND DECTECTION SYSTEM

Paul S. Cramer, Naugatuck, Conn., assignor to Avco Corporation, Providence, R.I.

Filed Aug. 6, 1987, Ser. No. 82,808
Int. Cl.⁴ F02C *3/00*
U.S. Cl. 60—753 **15 Claims**



1. A failure activated emergency cooled combustion chamber liner for use in a combustor having a combustion chamber wall and a combustion zone, the liner having a plurality of liner panels, each panel comprising:

first layer means of refractory material adjacent the combustion zone of the combustor, said first layer means being substantially impervious;

second layer means of porous material adjacent said first layer means, said second layer means having a coolant reservoir means for storing and transporting a supply of coolant, the coolant being relatively pressurized relative to gases in the combustion zone, said coolant reservoir means having substantial access to said first layer means adjacent said second layer means;

third layer means of metallic material adjacent said second layer means, said third layer means having coolant passage means therethrough for circulating a coolant through said third layer means into said coolant reservoir means such that a substantially constant supply of relatively pressurized coolant is maintained in said coolant reservoir means whereupon in the event of damage such as a fracture or void through the first layer means, the stored coolant in said coolant reservoir means will be directed to and through the fracture or void in said first layer means into the combustion zone thereby cooling the combustion chamber liner and preventing further damage to the liner; and

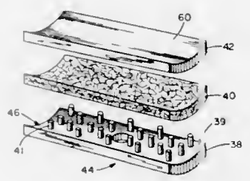
means for mounting the panels to a combustion chamber wall to thereby protect the chamber wall from heat in the combustion zone.

4,838,031

INTERNALLY COOLED COMBUSTION CHAMBER LINER

Paul S. Cramer, Naugatuck, Conn., assignor to Avco Corporation, Providence, R.I.

Filed Aug. 6, 1987, Ser. No. 82,861
Int. Cl.⁴ F02C *3/00*
U.S. Cl. 60—753 **11 Claims**



1. A combustion chamber liner having an internal cooling layered assembly comprising:

first layer means of refractory material, said first layer being substantially impervious and having a first thermal expansion rate;

second layer means of porous material, said second layer being structurally adaptable;

third layer means of heat transfer members, said third layer also having paths for coolant to flow through; and

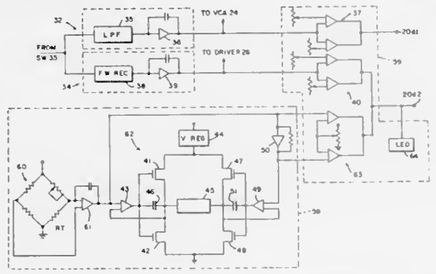
fourth layer means of metallic material having a second thermal expansion rate and coolant passage means passing through said fourth layer means from a first side to an opposite second side proximate said third layer means whereby coolant can enter the liner through said coolant passage means into said third layer means to internally cool the liner so as to withstand high temperature and said second layer means allows said first and fourth layer means to expand at different thermal expansion rates with substantially no risk of damage to the liner from said different expansion rates.

4,838,032

OPTICAL SIGNAL POWER MEASUREMENT METHOD AND APPARATUS

Michael J. Maslaney, Atlanta; Dinal S. Andreasen, Marretta, and Clifford D. Brown, Atlanta, all of Ga., assignors to General Signal Corporation, Stamford, Conn.

Division of Ser. No. 826,616, Feb. 6, 1986, Pat. No. 4,726,676.
This application Dec. 30, 1987, Ser. No. 139,631
Int. Cl.⁴ F25B *21/02*
U.S. Cl. 62—3.1 **3 Claims**



1. A temperature compensation circuit comprising:

a cooler and heater means having a first and a second terminal for providing cooling when current flows into said first terminal and out of said second terminal, and providing heating when current flows into said second terminal and out of said first terminal;

a four switch bridge having two pairs of opposed terminals, a power supply connected across one pair of opposed terminals and said cooler and heater means across the other pair of opposed terminals;

error means for sensing a temperature, comparing the sensed temperature to a desired temperature and producing a temperature error signal; and

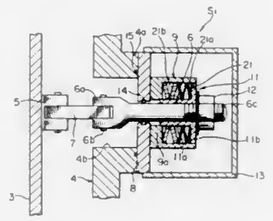
control means connected to said error means and said four switch bridge for activating diagonally opposed pairs of switches in said bridge to control the direction of current flow through said cooler and heater means as a function of said error signal.

4,838,033

HEAT INSULATING SUPPORT DEVICE FOR CRYOGENIC EQUIPMENT

Yuuichi Yamamoto; Tadaaki Nakamura; Takashi Murai, and Akemi Hijikata, all of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 910,641, Sep. 23, 1986, abandoned. This application Feb. 19, 1988, Ser. No. 163,128
Claims priority, application Japan, Sep. 24, 1985, 60-211571; Mar. 27, 1986, 61-67195
Int. Cl.⁴ F17C *1/00*
U.S. Cl. 62—45.1 **15 Claims**



1. A heat-insulating support device for supporting a coolant tank to a vacuum vessel in a heat insulating manner, said coolant tank being adapted to store a cryogenic coolant and subject to thermal deformation upon cryogenic cooling thereof as well as being subject to large external forces after the cryogenic cooling, said device comprising:

a heat insulating support member disposed outside said coolant tank and having its one end connected with said coolant tank;

a mounting rod having its one end connected with said heat-insulating support member and its other end projected outwardly through said vacuum vessel; and

a spring means for resiliently mounting the other projected end portion of said mounting rod on said vacuum vessel, said spring means having a first spring constant for deformations in a first direction having magnitudes less than a first predetermined amount to absorb thermal contraction of said coolant tank and a second spring constant larger than said first spring constant for deformations in said first direction having magnitudes greater than said first predetermined amount to suppress displacement of said coolant tank due to large external forces acting thereon after the thermal contraction of said coolant tank.

4,838,034

COMPRESSED-GAS POWER SOURCE FOR PORTABLE GAS-DRIVEN TOOLS

Rex D. Leonard, and Noel E. Short, both of Indianapolis, Ind., assignors to International Cryogenics, Inc., Indianapolis, Ind.

Filed Jul. 22, 1988, Ser. No. 222,791
Int. Cl.⁴ F17C *7/02*
U.S. Cl. 62—50.2 **8 Claims**

1. A portable system for providing a gas under pressure sufficient to drive a gas-powered tool, comprising:

a container for storing liquefied gas including an outer casing and an inner container adapted to provide gas pressures in excess of 30 psi, the casing and container each having an opening at the top;

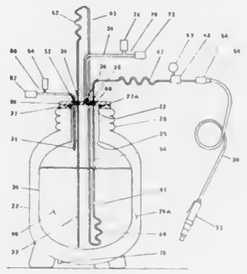
a flexible neck portion extending upwardly at the upper portion of the casing and carrying a flange at its upper end;

a gas-tight tubular connection sealed at its periphery with the flange, said tubular connection extending between the flange and the inner container, said flexible neck portion being adapted to provide acceptance of mechanical vibration and shock and associated variations in spacing between the outer casing and the inner container;

thermal insulation between the outer casing and inner container inhibiting heat transfer therebetween, said storage container forming an evacuable space between the outer casing and the inner container;

a gas-tight manifold for the opening of the inner container supported by the flange on the outer casing and forming a plurality of openings, said manifold being sealed to the upper end of the flexible neck portion;

a withdrawal tube carried by said manifold in one of said openings, said withdrawal tube extending outside of the outer casing and being connected with a first warming coil encircling the flexible neck portion, said first warming coil extending to another of said openings in the manifold



and being connected with a tube adapted to transfer heat within the inner container, said heat transfer tube extending from within the inner container to another of said openings in the manifold where it is connected with a second warming coil for vaporizing liquid cryogen flowing therethrough, said second warming coil encircling the flexible neck portion and being connected with a pressure regulating valve; and

means adapted for connection to a gas-operated tool, said withdrawal tube, first warming coil, heat-transfer tube, and second warming coil forming a non-restrictive, pressure-maintaining flow path for cryogen and vapor whereby the pressure of the inner container is maintained at a preset tool-operating value and a continuous tool-operating flow of gas can be drawn from the inner container for long periods of time.

4,838,035

CONTINUOUS CRYOPUMP WITH A METHOD FOR REMOVAL OF SOLIDIFIED GASES

Larry W. Carlson, Oswego, and Harold Herman, Park Forest, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

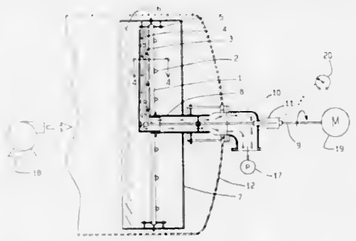
Filed May 5, 1988, Ser. No. 190,567
Int. Cl.⁴ B01D *8/00*
U.S. Cl. 62—55.5 **16 Claims**

1. A method for removing gases from a high vacuum environment, which comprises the steps of:

introducing gas at low pressure into an evacuated vacuum vessel;

conducting said gas to a circular cryopanel maintained at cryogenic temperatures;

selectively applying heat to portions of said cryopanel by means of a heater mounted within a channel which moves



azimuthally around an axis located near the center of said cryopanel; and

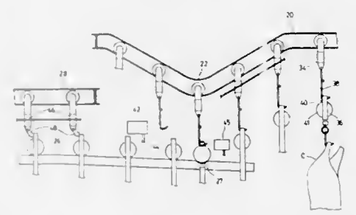
exhausting sublimed gas from said channel.

4,838,036

CARCASS CONVEYOR FOR CHILLING CHAMBER

Lyle W. Norrie, Etobicoke, Canada, assignor to Knud Simonsen Industries Limited, Rexdale, Canada

Filed Aug. 26, 1988, Ser. No. 236,833
Int. Cl.[4] F25D *13/06*
U.S. Cl. 62—63 **9 Claims**



7. A method of processing products leaving a first facility, and prior to entry into a second facility, said products being carried on wheeled carriers riding on a carrier rail in said first facility at plant ambient conditions and comprising the steps of:

delivering said products on said carriers riding on said first facility carrier rail to a chiller room pick-up point at a predetermined first height;

moving a plurality of processing trolleys along a processing conveyor rail at a predetermined second height, said trolleys having wheel means adapted for operation in conditions different from plant ambient condition whereby to move said processing trolleys in sequence over said pick-up point, at an elevation above said carriers on said first facility carrier rail;

causing suspension means on said trolleys to move downwardly at an angle and to engage respective said carriers, and moving the same off said first facility carrier rail, and moving same upwardly at an angle;

continuously moving said processig trolleys along said processing conveyor rail with respective carriers suspended therefrom, whereby to procure a predetermined dwell time of said products in said processing condition, and thereafter delivering same to a drop-off point;

transporting said carriers, on said processing trolleys downwardly into engagement with carrier rail means for said second facility at said drop-off point;

disengaging said suspension means from said carriers, thereby releasing said carriers for movement along said second facility carrier rail means independent of said processing trolleys; and,

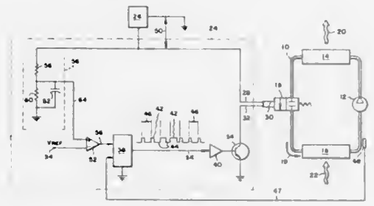
moving said trolleys upwardly away from said drop off point.

4,838,037

SOLENOID VALVE WITH SUPPLY VOLTAGE VARIATION COMPENSATION

Tony J. Wood, West Salem, Wis., assignor to American Standard Inc., New York, N.Y.

Filed Aug. 24, 1988, Ser. No. 235,590
Int. Cl.[4] F25B *41/04*; G05B *11/28*
U.S. Cl. 62—225 **1 Claim**



1. A refrigeration system comprising:

a refrigeration compressor, a condenser, and an evaporator, all of which are connected in series to comprise a refrigeration circuit;

a solenoid valve adapted to be coupled to a current supply and coupled to said refrigeration circuit by way of a pressure actuated valve connected between in series with said condenser and said evaporator, said solenoid valve being adapted to move between a fully open and a fully closed position upon receiving a DC electrical current supplied by said current supply, said pressure actuated valve having an opening that varies in response to the degree of opening of said solenoid valve, whereby said solenoid valve serves as a pilot valve for said pressure actuated valve, which in turn regulates a flow of refrigerant through said refrigeration circuit;

a PWM circuit coupled in heat transfer relationship with said refrigeration circuit by way of a temperature sensor and electrically coupled to said solenoid valve and said current supply, said PWM circuit including a microcomputer for generating a PWM control signal having a pulse width that varies in response to a temperature signal provided by said temperature sensor, said PWM control signal being communicated to a transistor that repeatedly interrupts said electrical current at a frequency that is sufficiently high to generally balance said valve at an intermediate position between said fully open and said fully closed position, said PWM circuit including a comparator that compares the voltage level of said current supply to a reference voltage to facilitate further varying of said pulse width to compensate for some variation in the voltage level of said current supply, whereby said intermediate position is generally independent of variations in the voltage level of said current supply.

4,838,038

TEMPERATURE INSULATING APPARATUS FOR IMPROVING THE EFFICIENCY OF AN EVAPORATIVE COOLING UNIT

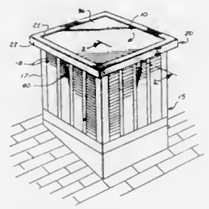
Dale A. Uecker, 10011 N. 40th Dr., Phoenix, Ariz. 85051, and Keith R. Boltz, 4470 N. Bonanza, Tucson, Ariz. 85749

Filed Jan. 11, 1988, Ser. No. 142,706
Int. Cl.[4] F28D *5/00*
U.S. Cl. 62—304 **2 Claims**

1. Apparatus for improving the efficiency of an evaporative cooling unit having a top and side louvre fins, said apparatus including:

(A) a unitary multi-layer insulating/reflecting assembly positioned above said evaporative cooling unit, said insulating/reflecting assembly comprising:

1. an insulating core of rigid-type thermal insulating material having a thickness of at least one inch, said insulating core having top and bottom surfaces;
2. a first intermediate fibrous paper layer covering said top surface of said insulating core;
3. a second intermediate fibrous paper layer covering said bottom surface of said insulating core;
4. a first outer reflective layer covering an outwardly facing surface of said first fibrous paper layer;
5. a second outer reflective layer covering an outwardly facing surface of said second fibrous paper layer; and
6. a circumferentially encompassing rim member for providing structural integrity; and



(B) coupling means for detachably securing said insulating-/reflecting assembly to said evaporative cooling unit, said coupling means comprising:

(1.) a plurality of circumferentially distributed holes in said rim member; and

(2.) a plurality of spring-type connectors, each said spring-type connector including:

a. an upper hook portion;

b. a lower hook portion; and

c. a spring portion intermediate said upper and lower hook portions;

such that said insulating/reflecting assembly may be detachably and reversibly secured to the top of said evaporative cooling unit by individually inserting said upper hook portions of said connectors into said holes in said rim member, stretching said spring portions of said connectors and connecting said lower hook portions of said connectors to louvre fins of said evaporative cooling unit.

4,838,039

DIRECT CONTACT EVAPORATOR/FREEZER

Bryan D. Knodel, Plainfield, Ill., assignor to CBI Research Corporation, Plainfield, Ill.

Continuation-in-part of Ser. No. 919,986, Oct. 17, 1986, abandoned. This application Apr. 21, 1988, Ser. No. 184,272
Int. Cl.[4] F25D *13/00*
U.S. Cl. 62—330 **24 Claims**

7. Apparatus for producing an aqueous slurry of ice particles comprising;

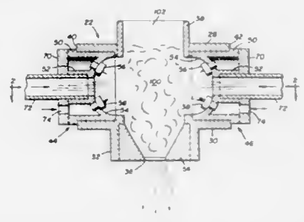
an insulated storage tank for an aqueous slurry of ice particles;

a direct contact evaporator-freezer positioned in the upper interior space of the tank above a predetermined maximum level of slurry to be stored in the tank;

the contact evaporator-freezer comprising:

a body defining a chamber having an upper vapor discharge opening and a lower aqueous slurry discharge opening;

means to supply an aqueous liquid to the chamber at a rate which produces a pool of liquid which fills the chamber to maintain the fluidity of the aqueous slurry, such that the aqueous slurry can flow therefrom; and



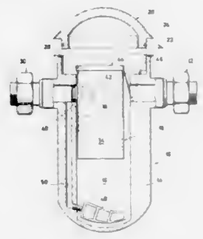
means to feed a liquid refrigerant in the form of small high velocity droplets into the pool of aqueous liquid in the chamber.

4,838,040

AIR CONDITIONER DRYER UTILIZING WATER-ENCAPSULATING POLYMERS

Clarence S. Freeman, P.O. Box 1079, Channelview, Tex. 77530

Filed Mar. 30, 1988, Ser. No. 175,345
Int. Cl.[4] F25B *43/04*
U.S. Cl. 62—475 **9 Claims**



2. A dehydrator for removing water from the refrigerant of a refrigeration system, said refrigerant including lubricating oil and accumulating water vapor, said dehydrator being suitable for location between the evaporator and the compressor, comprising

a housing having an input connection for connecting to the evaporator and an output connection for connecting to the compressor,

said housing including a quick-disconnect opening means for exposing the inside of said housing without disconnecting said housing from either the evaporator of the compressor, and

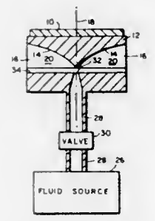
a canister secured internally within said housing and connected to said output connection thereof, said canister being readily openable to accommodate water-encapsulating polymers therein and having at least one opening to permit refrigerant vapor to pass into said canister, said water-encapsulating polymers encapsulating water from the refrigerant.

4,838,041

EXPANSION/EVAPORATION COOLING SYSTEM FOR MICROELECTRONIC DEVICES

Alfred H. Bellows, Wayland, and Glenn A. Duchene, Marlboro, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Feb. 5, 1987, Ser. No. 10,914
Int. Cl.[4] F25B *19/02;* **H02B** *1/00;* **H05K** *7/20*
U.S. Cl. 62—51.2 **10 Claims**



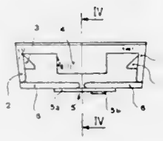
1. Apparatus for cooling a circuit component comprising:
heat exchanger means in thermal contact with said circuit component and including a heat exchange surface; and
an open loop cooling assembly comprising a source of fluid under pressure and expansion valve means for releasing a stream of expending gas from said source of fluid, said expansion valve means being positioned in proximity to said heat exchange surface so that said stream of expanding gas passes over said heat exchange surface and absorbs thermal energy from said heat exchange surface by thermal expansion cooling and then is released into the ambient environment, said heat exchange surface including a plurality of fins defining grooves which direct said stream of expanding gas outwardly away from said expansion valve means, said grooves having an axial dimension parallel to an initial direction of said stream of expanding gas as it is released through said expansion valve means, said initial direction being substantially perpendicular to said heat exchange surface, said grooves increasing in axial dimension with distance from said expansion valve means.

4,838,042

METAL PLATE FOR PERSONALIZING A BRACELET

Carmelo Cintolo, 9, Via delle Terme, Florence, Italy

Filed May 2, 1988, Ser. No. 189,339
Claims priority, application Italy, Nov. 6, 1987, 11792/87[U]
Int. Cl.[4] A44C *5/00*
U.S. Cl. 63—3 **4 Claims**



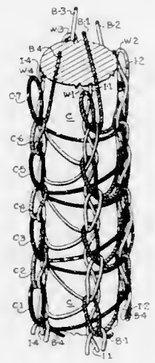
1. A metal plate, particularly of precious metal, for personalizing a bracelet of the type formed by at least three side-by-side rows of substantially tubular links, wherein each link of the central row is articulated to two pairs of links of the two side rows, said metal plate comprising a plate member adapted to be removably connected to the bracelet and having two perpendicular extending, opposite walls from which two pairs of opposed teeth means protrude towards each other for engaging between adjacent links of the side rows of the bracelet, said plate member being further provided with at least one tab means perpendicular to said opposite walls extending in parallel with respect to said opposed teeth means for engaging between adjacent links of the central row of the bracelet, and fastening means hinged to said walls for securing the plate member to the bracelet.

4,838,043

CIRCULAR WARP KNIT COMPOSITE CORD

Davis C. Jencks, Seekonk, Mass., assignor to New England Overseas Corporation, Inc., Providence, R.I.

Filed Apr. 18, 1988, Ser. No. 182,497
Int. Cl.[4] D04B *21/14, 25/02*
U.S. Cl. 66—170 **4 Claims**



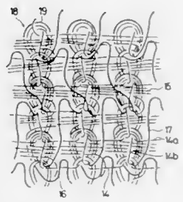
1. A circular warp knit composite cord comprising a circular warp knit tube including a plurality of wales of base yarn needle loops circumferentially spaced around said tube, the base yarns forming the wales of needle loops also forming laps extending between and interconnecting said circumferentially spaced wales of base yarn needle loops, and inlaid yarns interlaced in selected ones of said wales of base yarn needle loops and extending therealong to control longitudinal stretchability of said circular warp knit tube.

4,838,044

WARP-KNIT TAPE FOR HOOK-AND-LOOP FASTENERS

Yoshio Matsuda, Toyama, and Mitsutoshi Ishihara, Kurobe, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Mar. 22, 1988, Ser. No. 172,270
Claims priority, application Japan, Mar. 24, 1987, 62-43183
Int. Cl.[4] D04B *7/12*
U.S. Cl. 66—190 **3 Claims**



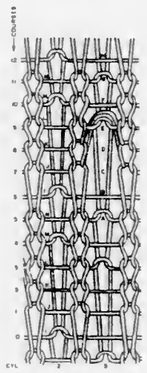
1. A warp-knit tape for hook-and-loop fasteners which comprises a pile portion and selvage portions extending on opposite sides of said pile portion, said pile portion being formed with two needle stitches forming a plurality of wales extending longitudinally of said tape, laid-in weft thread interlaced with said two needle stitches to make up a foundation structure of said tape, and a pile-forming thread knitted in said foundation structure and forming pile-loops extending longitudinally in a meandering fashion between at least two adjacent wales of said tape.

4,838,045

DOUBLE KNIT FABRIC WITH HOLES THERETHROUGH AND KNITTED COLOR BANDS

Andre Cournoyer, Ste Rosalie; Serge Berard, and Denis Cote, both of St-Hyacinthe, all of Canada, assignors to Sport Maska Inc., St.-Hyacinthe, Canada

Filed Dec. 2, 1986, Ser. No. 937,077
Int. Cl.[4] D04B *7/04*
U.S. Cl. 66—196 **12 Claims**



1. A fabric of double knit construction for use in a sports garment to allow control of body heat with respect to perspiration of the player wearing same, said fabric comprising:
a repeating pattern of at least four courses and two cylinder wales,
a first cylinder wale of said two cylinder wales including at least two consecutive courses having tuck stitches to form a hole, said pattern being repeated to form the fabric with a plurality of holes, a minimum spacing between adjacent holes formed by the consecutive tuck stitches including at least three cylinder wales in a horizontal direction within the same at least two consecutive courses as said tuck stitches, at least seven courses in a vertical direction within said first cylinder wale and at least one cylinder wale and at least four courses diagonally, and
a second cylinder wale of said two cylinder wales including at least two welt stitches and at least two knit stitches in the same at least four courses as said at least two consecutive courses with tuck stitches.

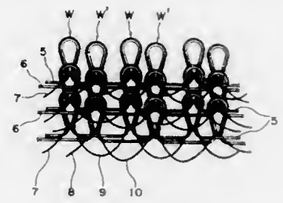
4,838,046

COVER FOR A DAMPENING ROLLER OF AN OFFSET PRESS

Akio Yasukawa, Higashiosaka, Japan, assignor to Katsura Roller Mfg. Co., Ltd., Osaka, Japan

Continuation of Ser. No. 694,175, Jan. 23, 1985, abandoned. This application Sep. 8, 1986, Ser. No. 904,801
Claims priority, application Japan, Feb. 3, 1984, 59-19215
Int. Cl.[4] D04B *7/12, 7/16*
U.S. Cl. 66—202 **1 Claim**

1. A cover for a dampening roller of an offset press, comprising a tubular knitted fabric having two water-shrinkable ground yarns and two hydrophilic pile yarns, said ground yarns being the one selected from the group consisting of yarns of chemical fibers having a shrinkage percentage higher than 20%, said pile yarns being the one selected from the group consisting of yarns of viscose rayon fibers and acetate fibers, said ground yarns being intertwined and respectively forming a tubular double plain weft-knitted fabric structure in which two ground yarns are alternatively knitted so that wales



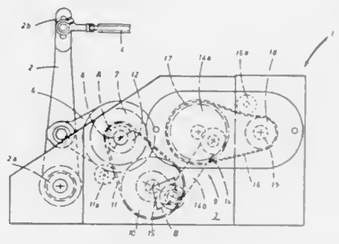
formed by one ground yarn are interposed between two adjacent wales formed by the other ground yarn so that all the wales appear on the face of the fabric, the course of each plain knitted structure including long sinker loops, and said pile yarns being knitted into the respective plain-knitted ground fabric structure to form raised loops, said tubular knitted fabric having a radial shrinkage percentage of 20 to 25% and an axial shrinkage percentage of 25 to 30%.

4,838,047

OPERATING DEVICE FOR THREAD GUIDE RAILS IN CROCHET GALLOON LOOMS

Luigi O. Zorini, Viale Industria 12, 27024 Cilavegna Pavia, Italy 27024

Filed Nov. 23, 1987, Ser. No. 124,066
Claims priority, application Italy, Jul. 31, 1987, 21545 A/87
Int. Cl.[4] D04B *23/00*
U.S. Cl. 66—207 **5 Claims**



1. An operating device for thread guide rails in crochet galloon looms, comprising: a drive lever having one end pivoted on a fixed structure and the other end connected to a thread guide rail; an eccentric connected to the drive lever via a connecting rod; actuating means acting upon the eccentric imparting to the thread guide rail an alternate longitudinal motion, said actuating means comprises an idle wheel keyed on a shaft supporting said eccentric, a drive wheel operatively connected to the idle wheel to impart the latter a rotatory motion and a kinematic connecting rod-crank mechanism acting on the drive wheel to operate it according to an alter-

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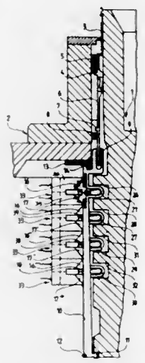
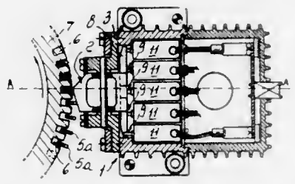
nate rotatory motion; wherein said eccentric is operated, upon command of said actuating means, so that it carries out an alternate rotatory motion according to an arc slightly bigger than 180° in order to prolong the pause time of the thread guide rail at the dead centers of said alternate motion.

4,838,048
KNITTING MACHINE
Gerhard Müller, Esslingen 1, and Werner Engelfried, Sindelfingen, both of Fed. Rep. of Germany, assignors to Terrot Strickmaschinen GmbH, Stuttgart, Fed. Rep. of Germany
Filed Jan. 11, 1988, Ser. No. 142,541
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1987, 3701743
Int. Cl.⁴ D04B *15/74*
U.S. Cl. 66—220 **10 Claims**



1. A knitting machine including in combination
a plurality of stitch-forming needles (3) selectively adjustable for movement to one of a knitting, floating and tucking operation positions in operation of said machine,
pattern bars (10) for adjusting said needles,
first and second selector elements (16, 17) displaceably mounted on each of said pattern bars (10),
a spring (22) on each of said pattern bars for biasing the selector elements (16, 17) of the bar to an initial position,
an eccentric steering means (39) for urging both selector elements (16, 17) of a bar (10) against the biasing action of the associated spring (22) to first positions which trigger the knitting position of the knitting needles (3),
electromagnetic selector means (33) controlled in accordance with a pattern for releasably holding said selector elements (16, 17) in said first positions,
a first steering cam means (41) for bringing the first selector element (16) and the associated pattern bar (10) to a second position which triggers the floating position of the knitting needles (3) after the first selector element (16) has been moved back from its first position to its initial position by said spring (22) upon the release of said first element (16) by the electromagnetic selector means (33) in accordance with said pattern,
and a second steering cam means (42) for bringing the second selector element (17) and the associated pattern bar (10) to a third position which triggers the tucking position of the knitting needles (3) after the second selector element (17) has been moved back from its first position to its initial position by said spring (22) upon the release of said second element (17) by the electromagnetic selector means in accordance with said pattern.

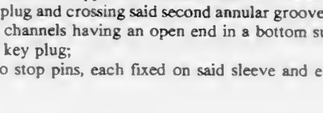
4,838,049
DEVICE FOR SELECTING THE NEEDLES IN A KNITTING MACHINE, PARTICULARLY FOR STOCKINGS
Francesco Lonati, Brescia, Italy, assignor to Lonati S.P.A., Brescia, Italy
Continuation of Ser. No. 916,904, Oct. 7, 1986, abandoned. This application May 4, 1988, Ser. No. 188,768
Claims priority, application Italy, Oct. 14, 1985, 22465 A/85
Int. Cl.⁴ D04B *15/78*
U.S. Cl. 66—222 **2 Claims**



1. A device for selecting the needles in a circular knitting machine of the type including selectors having heels, particularly for stockings, comprising a supporting structure, a plurality of superimposed selecting levers defining an extension, and actuating means, each selecting lever in said plurality of superimposed selecting levers having at least one end, at least one other end, and an intermediate portion, each of said selecting levers being individually pivoted at said intermediate portion thereof to said supporting structure and selectively oscillable in a selection plane extending substantially parallel to said extension of said plurality of selecting levers from a first position, whereat said at least one end is at a level which is intermediate between the heels of the selectors so as to avoid interfering therewith, to a second position whereat said at least one end is at the level of the heels of the selectors, so as to interfere therewith and push the related selectors into an inoperative position, at least a portion of said at least one other end of each of said selecting levers being shaped to define a plane blade-like portion having opposite faces, said actuating means comprising a plurality of actuating levers, each actuating lever in said plurality of actuating levers being pivotally connected to said supporting structure and having an engagement end, said engagement end of each of said actuating levers being adapted for engagement with said opposite faces of said plane blade-like portion of at least one of said selecting levers and oscillatable in an actuation plane extending substantially parallel to said selection plane for moving said at least one of said selecting levers from said first position to said second position and vice versa, said actuating levers being located at different levels from each other and at progressively variable distances with respect to said selection plane, wherein said actuating levers define a plurality of laterally interspaced actuation planes, wherein said blade-like portion of said at least one of said selecting levers defines a lateral extension, and wherein said lateral extension of said blade-like portion intersects said plurality of laterally interspaced actuation planes.

4,838,050
OPERATION MODE SELECTING DEVICE FOR WASHING MACHINES
Yoshiyuki Azuma, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Mar. 13, 1987, Ser. No. 25,721
Claims priority, application Japan, Nov. 21, 1986, 61-279018; Nov. 21, 1986, 61-279019; Nov. 21, 1986, 61-279020
Int. Cl.⁴ D06F *33/02*
U.S. Cl. 68—12 R **4 Claims**

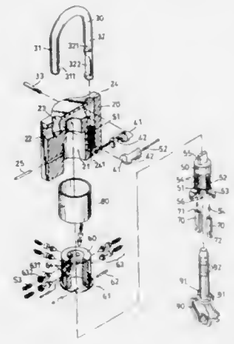
1. An operation mode selecting device for washing machines comprising:
(a) a microcomputer-based control circuit comprising a memory unit for storing data of a plurality of water stream modes wherein water stream strength differs from one another, data of at least three wash modes which have different control processes from one another, data of a plurality of rinse modes which have different control processes from one another, and data of a plurality of predetermined operation courses which have different control processes from one another and each of which includes wash and rinse steps, and a central processing unit for controlling a selection predetermined operation course;
(b) a manually operated switch for selecting one of the water stream modes, the data of which are stored in said memory unit;
(c) a manually operated push switch for sequentially selecting one of the wash modes, the data of which are stored in



said memory unit, every time when manually operated, so that the wash mode set for the wash step of the selected predetermined operation course may be changed;
(d) a manually operated push switch for sequentially selecting one of the rinse modes, the data of which are stored in said memory unit, every time when manually operated, so that the rinse mode set for the rinse step of the selected predetermined operation course may be changed;
(e) means provided in said control circuit for automatically selecting one of the predetermined operation courses which has a predetermined relation to the water stream modes when one of the water stream modes is selected with said water stream mode selection switch; and
(f) first preferential selection means for changing the wash mode initially selected by first operation of said wash node selecting switch in accordance with the selected water stream mode.

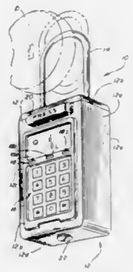
4,838,051
PADLOCK AND KEY ASSEMBLY WITH TRANSVERSELY MOVABLE TUMBLER UNITS AND VERTICALLY MOVABLE TUMBLER UNITS
Yaw-Mein Yang, No. 5, Lane 88, Min-Tsu St., Pei-Tou Chen, Changhua Hsien, Taiwan
Filed Apr. 27, 1988, Ser. No. 186,902
Claims priority, application Taiwan, Feb. 10, 1988, 75203983
Int. Cl.⁴ E05B *67/24*
U.S. Cl. 70—38 A **1 Claim**

1. A padlock used with a cylindrical key, said cylindrical key including a plurality of first annular grooves formed in its outer surface, and two opposed push blocks extending radially from said key, each of said first annular grooves being spaced from upper ends of said push blocks at a predetermined distance, said padlock comprising:
(1) a lock body;
(2) a spring biased shackle having long and short legs connected movably to an upper portion of said body;
(3) a locking bolt member for retaining releasably said short leg of said shackle on said body;
(4) a sleeve fixed in said body;
(5) a key plug mounted rotatably within said sleeve and having a second annular groove formed in its outer surface, and two opposed channels formed vertically in said key plug and crossing said second annular groove, each of said channels having an open end in a bottom surface of said key plug;
(6) two stop pins, each fixed on said sleeve and extending through a portion of said second annular groove of said key plug near one of said channels;
(7) two spring biased tumbler plates, mounted slidably within said respective channels, each of said plates having a cutout therein and being biased to extend across a portion of said second annular groove of said key plug to obstruct said corresponding stop pin for preventing rotation of said key plug relative to said body; and



(8) a plurality of spring biased tumbler pin units transversely extending through said sleeve and said key plug for preventing rotation of said key plug relative to said sleeve;
whereby, when said key is inserted into said key plug, said tumbler pin units engage with said respective first grooves so that said tumbler pin units are released, and said plates are moved by said respective push blocks to align said stop pins with said cutouts of said plates so that said stop pins can circulate along said second annular groove, thereby permitting rotation of said key plug relative to said body.

4,838,052
LOCK SYSTEM
John P. Williams, Barrington, Ill.; Chin-Jung Huang, and Wen-Chyi Shyu, both of Shien, Taiwan, assignors to Segwill Corp., Barrington, Ill.
Filed Jul. 23, 1987, Ser. No. 76,610
Int. Cl.⁴ E05B *65/52*
U.S. Cl. 70—63 **30 Claims**



1. A lock system with a predetermined plurality of valid lock opening sequences with each member of the plurality usable for unlocking only a predetermined number of times, the lock system comprising:
a housing;

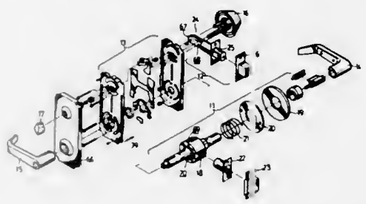
electrically, activated means, carried by said housing, for moving an unlocking member from a first position toward a second position in response to applied electrical energy;
means fixedly attached to said housing for entering an operator selectable sequence and for generating a plurality of electrical signals responsive thereto
means for comparing said generated plurality of electrical signals to a predetermined plurality of lock opening sequences of electrical signals;
means for detecting a match between said generated plurality of electrical signals and one of said lock opening sequences and for generating an indicium thereof;
means for testing whether or not said matched sequence has been previously used the predetermined number of times and for electrically activating said moving means in response to said matched sequence not having been previously used the predetermined period of times thereby causing said unlocking member to move; and
means for automatically setting an indicium indicating that said matched sequence has been used the predetermined number of times.

4,838,053

HEAVY-DUTY PANIC PROOF LOCK UNIT

Richard Shen, No. 233, Hai Tien Road, Sec. 2, Tainan, Taiwan

Filed Mar. 21, 1988, Ser. No. 171,417
Int. Cl.[4] E05B 65/10
U.S. Cl. 70—92 **4 Claims**



1. A heavy-duty panic proof lock unit (10) having a latch bolt mechanism (11), a dead bolt mechanism (12), and a cartridge mechanism (13); said latch bolt mechanism (11) being coupled with a key actuated exterior lever type handle (14) and an interior lever type handle (15) for easier operation, and cooperating with a primary spindle (18); said dead bolt mechanism (12) being coupled with a key actuated rosette (16) on an exterior and a thumb turn (17) on an interior, and cooperating with a secondary cylinder (24);
characterized in that said cartridge mechanism (13) comprises a first cartridge plate (27), a second cartridge plate (28), a rocker lever (29), a collar (30), an H-shaped slide (31), a rotary lever (32), a spring-loaded catch (33); four screws (34), and four screw supporting shells (35);
said cartridge plates, (27) and (28), being separate and distinct, and generally a rectangular flat plate, each plate being pierced by an opening (37) large enough to accommodate said primary cylindrical spindle (18) for ready rotation and another opening (38) large enough to accommodate said secondary spindle (24) for rotation; said cartridge plates (27) and (28) being arranged with respect to each other so as to leave an intervening space (37) therebetween; said cartridge plates (27) and (28) having two pair of apertures (45) and (46) to receive screws (34) and screw supporting shells (35) therethrough; apertures (45) being provided at both sides of said opening (38) horizontally, apertures (46) being provided at an upper and lower part of said opening (37) vertically; a pair of arcuate circumferential folds (47) being provided proximate to and around said opening (38), and a pair of arcuate circumferential folds (48) proximate to and around said opening (37) both for strengthening said structure thereof; a pair of partial circumferential rims (49) around said opening (37) being provided to reinforce said structure thereof; three shallow grooves (50) being provided to facilitate the up-and-down movement of said H-shaped slide (31); four short assembly screws (a), (b), (c), (d) being provided to combine said cartridge plates (27) and (28);
said rocker lever (29) being slidably assembled on said primary cylindrical spindle (18); said rocker lever (29) being symmetrical about a median plane and including a drive ring (51) having an opening (52) therethrough of a size to accommodate said primary cylindrical spindle (18); said drive ring (51) having two oppositely spaced, inwardly concave notches (53) designed to cooperate with said collar (30); said rocker lever (29) having a pair of lever arms (51) partially forming an intervening arcuate window and letting said screw supporting shells (35) and said screws (34) passing therethrough;
said collar (30) being a ring-shaped plate having approximately a same size with said opening (52) of said drive ring (51) and comprising two outwardly projecting teeth (56) at opposite locations for cooperating with said notches (53) respectively; said collar (30) also having an inwardly projecting tooth (57) designed to fit in and to slide along said spindle slot and to transmit rotary force between said primary cylindrical spindle (18) and said rocker lever (29);
said H-shaped slide (31) cooperating with said rocker lever (29); said slide (31) being generally a flat plate including two downwardly extending legs (58) and two upwardly extending legs (59) said two downwardly extending legs (58) being initially constant in width and at a suitable position begin to be tapered in width; said two upwardly extending legs (59) being both constant in width; an inwardly projecting tab (60) being formed on each of said downwardly extending legs (58); said two inwardly projecting tabs (60) facing toward each other being provided such that said configuration of said H-shaped slide (31) cooperates better with said rocker lever (29);
said rotary lever (32) being provided to cooperate with said secondary spindle (24); said rotary lever (32) being generally an arch-shaped flat plate including a central circular journal (61) having a rectangular slot (62) pierced therethrough to receive and slide on said secondary spindle (24) and to make said rotary lever (32) non-rotatable with respect thereto; said configuration of said rotary lever (32) forms arcuate cutout portions (63) and (64) which define passages for screws (34) and screw supporting shells (35); said rotary lever (32) including a tail (65) having inclined face which matches said leg (59) of said H-shaped slide (31), such that said rotary lever (32) cooperates better with said slide (31);
said spring-loaded catch (33) being a resilient metal wire emplaced below said rocker lever (29);
said collar (30) being entrapped in said opening (52) of said drive ring (51), with said two outwardly projecting teeth (56) thereof retained within said notches (53) of said rocker lever (29); said notches (53) being slightly larger than said outwardly projecting teeth (56) so as to permit an extra 20 degrees rotation of said collar (30) in either direction with respect to said rocker lever (29);
a first screw (34*a*) passing through one of said apertures (45) of said second cartridge plate (28), said arcuate cutout portion (61), a first screw supporting shell (35*a*), said corresponding aperture (45) on said first cartridge plate (27), and engaging with a first retention slot (67) of said dead bolt mechanism (12);
a second screw (34*b*) passing through another aperture (45) of said second cartridge plate (28), said arcuate cutout portion (62), a second screw supporting shell (35*b*), said corresponding aperture (45) on said first cartridge plate (27), and engaging with a second retention slot (68) of said dead bolt mechanism (12);
a third screw (34*c*) passing through one of said apertures (46) of said second cartridge plate (28), a space between said

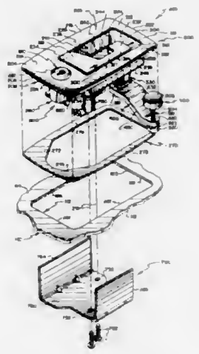
H-shaped slide (31) and said rocker lever (29), a third screw supporting shell (35*c*), said corresponding aperture (46) on said first cartridge plate (27), and engaging with a third retention slot (69) of said latch bolt mechanism (11);
a fourth screw (34*d*) passing through another aperture (46) of said second cartridge plate (28), said arcuate window of said rocker lever (29), a fourth screw supporting shell (35*d*), said corresponding aperture (46) on said first cartridge plate (27), and engaging with a fourth retention slot (70) of said latch bolt mechanism (11);
said primary cylindrical spindle (18) comprising a hub (71), an exterior spindle (72), a locking plug assembly (73), an interior spindle (74), a housing (75), and a plunger assembly (76) fabricated in a conventional manner; characterized in that said hub (71) has an opening through which a threaded tube (77) is insertable, an exterior hub plate (78) having two stops (79) being fitted on an abutting face of said the hub (71), said stops (79) and two rivets (80) being provided to reinforce and to strengthen the structure thereof;
said hub (71) being provided in an interior cavity thereof with two slide springs (81), a plunger catch (82), and a slide (83) placed on said two slide springs (81), in sequence; two horizontally placed slide spring seats (84) being provided between said slide springs (81) and said slide (83); each of said slide spring seats (84) having a downward concave recess to urge the inner side of the slide spring (81) so as to avoid any undesirable displacement thereof; said plunger catch 82 being provided with a plunger catch spring (85) on the bottom side thereof; a hook member (86) being provided on an upper face of said slide (83) such that said hook member (86) is exactly caught by a cutout (87) of said housing (75) when said hub (71) is entirely installed within said housing (75);
said exterior spindle (72) which passes through the bore of said threaded tube (77) being generally a hollow tube fabricated with a set of locking plug assembly (73);
said locking plug assembly (73) including a key cam (88), a lower plug swivel (89), an upper plug swivel (90), a spacer (91), a locking ring (92), and a locking plug (93); said key cam (88) having three cylindrical sections of differing diameters; a middle cylindrical section being flattened at two sides so as to be received by said lower plug swivel (89) having an opening with two flattened sides thereon; when assembling said components, a key cam spring (94) being installed within said key cam (88), said lower plug swivel (89) being inserted into said key cam (88), and a swivel spring (95) being placed on said lower plug swivel (89), such that projecting parts of the lower plug swivel (89) and upper plug swivel (90) are mounted on open end of said swivel spring (95); a key cam pin (96) being inserted into a small hole of said key cam (88) and thereby fixing said upper plug swivel (90) to prevent any undesirable drop out thereof;
said locking plug assembly (73) being installed in said exterior spindle (72) with an extended part of said locking plug (93) inserted into the cavity of said key cam (88); said end part which presses said key cam spring (94) and said locking plug (93) being provided with a notch (97) to retain said key cam pin (96) therein; said projecting part of said upper plug swivel (90) being retained in a notch of said exterior spindle (72), thereby causing said swivel spring (95) to be counter-clockwise and clockwise rotatable; said spacer (91) being placed on said the exterior spindle (72) to fix said whole assembled body; said locking ring (92) being combined with said locking plug (93) such that said locking ring (92) and said locking plug (93) move simultaneously either counter-clockwise or clockwise;
corresponding ends of said exterior spindle (72) and said interior spindle (74) being respectively provided with a pair of sidewardly extending wing members (98) and (99); when said primary spindle (18) is adjusted either by said exterior or interior lever handle (14) or (15), said wing members (98) and (99) press the two ends of said slide (83) respectively; said slide (83) pressing said slide spring (81) to thereby retracting said latch bolt (22); said exterior spindle (72) and said interior spindle (74) being provided with knob catches (100) and (101) at one side respectively and another side thereof provided with protruders (102) and (103) respectively;
when said exterior spindle (72) passes through said exterior hub plate (78) or said interior spindle (74) passing through said housing (75) and said central opening of an interior hub plate (104), said protruders (102) pass through said notches on the central opening, thereby fixing the protruders (102) on said exterior hub plate (78), and said protruders (102) pass through said notches on said central opening, thereby fixing said protruders (103) on said exterior hub plate (78);
an interior cavity of said interior spindle (74) being provided with a plunger assembly (76); said plunger assembly (76) including a balance cap (105) on a plunger cylinder (106); said plunger cylinder (106) includes an extension on each side for the purpose of balancing effect; a plunger bar (107), a button (108), a cotter pin (109), together with a plunger swivel (110) being assembled and installed within said interior spindle (74);
when said button (108) of said plunger assembly (76) is being pressed, said plunger bar (107) presses said locking plug (93) and said locking ring (92); said protruder of said locking ring (92) being entrapped by the notch of said exterior spindle (72) and the notch of said exterior hub plate (78); said two notches (111) on said plunger bar (107) being entrapped by said two pointed edges of said plunger catch (82), to prevent said plunger bar (107) from bounding out, and thereby causing said key cam spring (94) under pressure and said exterior lever handle (14) not rotatable.

4,838,054

LATCH AND LOCK ASSEMBLIES WITH LIFT AND TURN HANDLES

Lee S. Weinerman, Medina; Frank R. Albris, Parma, both of Ohio; Thomas V. McClinden, Oxford, and Timothy H. Wentzell, South Windsor, both of Conn., assignors to The Eastern Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 859,194, Apr. 28, 1986, Pat. No. 4,683,736, which is a continuation-in-part of Ser. No. 601,648, Apr. 18, 1984, abandoned. This application Jul. 10, 1987, Ser. No. 72,175
Int. Cl.[4] E05B 13/10
U.S. Cl. 70—208 **34 Claims**



1. A flush-mountable latch, comprising:
(a) housing means including a pan-shaped housing having a front wall, and having recess-defining wall formations that

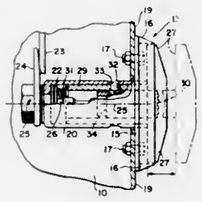
define a forwardly facing recess, with portions of the front wall forming a mounting flange that surrounds the recess;
(b) the housing being formed as a rigid, one-piece molded structure with the recess-defining wall formations including a back wall at the rear of the recess, with the back wall defining a rearwardly facing mounting surface;
(c) threaded fastener means rigidly connected to the back wall at spaced locations;
(d) handle means including a handle connected to the housing and being pivotally movable relative to the housing between a non-operated position and an operated position, and being rotatable relative to the housing while in its operated position;
(e) opening means formed through the recess-defining wall formations of the housing to establish a path of communication between the forwardly facing recess and a region that is located behind the back wall, including an opening formed through the back wall;
(f) handle-connected means extending through the opening means for connection to the handle and having a portion that extends into said region located behind the back wall for being moved within said region in response to movement of the handle between its non-operated and operated positions, including an elongate shaft-like shank that extends through the opening formed through the back wall and that is connected to the housing for axial movement along the axis of the shank and for rotary movement about the shank axis in response to pivotal and rotary movements of the handle, respectively;
(g) latch bolt means connected to the housing for movement relative to the housing between latched and unlatched positions, including a latch arm connected to the shank for rotation and translation therewith;
(h) a foot formation means carried on the latch arm for movement therewith to engage and disengage a surface on another structure;
(i) locking means for selectively engaging the shank of the handle-connected means to selectively lock the shank against movement relative to the housing, as by being configured to inhibit neither axial nor rotary movement of the shank when the locking means is in an unlocked position, and by being configured to engage and to cooperate with the shank so as to prevent both axial and rotary movement of the shank relative to the housing when the locking means is in a locked position; and,
(j) means for mounting the locking means on the housing for movement relative thereto between said locked and unlocked positions.

4,838,055

ANTI-THIEF KEY LOCK FOR VENDING MACHINES

Francis E. Gallagher, 1470 E. Old Badillo Covina, Calif. 91724

Filed May 2, 1988, Ser. No. 189,020
Int. Cl.[4] E05B *29/04*; B60R *25/02*
U.S. Cl. 70—208 **8 Claims**



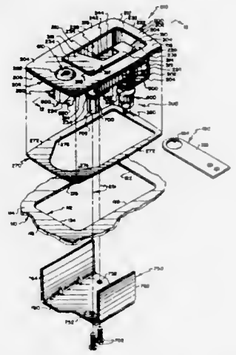
1. A key lock comprising a cylindrical case having a cylindrical cavity extending from one of its end faces, and a bore extending from a side surface thereof at right angles to the cavity,
key-operated tumbler means rotatably disposed within the cavity,
a locking bolt slidably disposed within the bore for rectilinear motion along the bore axis.
motion-transmitting means interconnecting the tumbler means and locking bolt, whereby rotation of the tumbler means produces slidable motion of the bolt,
an annular plug having a screw bit in the mouth of the case cavity to overlie the tumbler means, said annular plug having an axial thickness that is at least thirty percent of the plug diameter, and
a set screw extended radially through a cylindrical wall of the case into a blind hole in the annular plug to prevent removal of the plug out of the cavity.

4,838,056

LATCH AND LOCK ASSEMBLIES WITH EXPANSIBLE LATCH ELEMENTS

Lee S. Weinerman, Medina; Steven A. Mayo, Akron, both of Ohio; Thomas V. McLinden, Oxford, and Timothy H. Wentzell, South Windsor, both of Conn., assignors to The Eastern Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 859,194, Apr. 28, 1986, Pat. No. 4,683,736, which is a continuation-in-part of Ser. No. 601,648, Apr. 18, 1984, abandoned. This application Jul. 10, 1987, Ser. No. 72,250
Int. Cl.[4] E05B *13/10*
U.S. Cl. 70—208 **34 Claims**



1. A flush-mountable latch having a resilient, expansible latch member that is insertable into a receiving formation of a keeper and is expansible and contractible after being inserted therein to selectively establish latching engagement between the latch member and the keeper, comprising:
(a) housing means including a pan-shaped housing having a front wall, and having recess-defining wall formations that define a forwardly facing recess, with portions of the front wall forming a mounting flange that surrounds the recess;
(b) the housing being formed as a rigid, one-piece molded structure with the recess-defining wall formations including a back wall at the rear of the recess, with the back wall defining a rearwardly facing mounting surface;
(c) threaded fastener means rigidly connected to the back wall at spaced locations;
(d) handle means including a handle connected to the housing and being pivotally movable relative to the housing between a non-operated position and an operated position;
(e) opening means formed through the recess-defining wall formations of the housing to establish a path of communication between the forwardly facing recess and a region that is located behind the back wall, including an opening formed through the back wall;

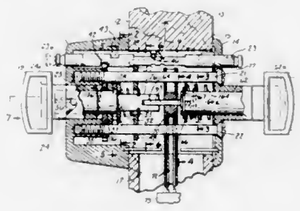
(f) handle-connected means extending through the opening means for connection to the handle and having a portion that extends into said region located behind the back wall for being moved within said region in response to movement of the handle between its non-operated and operated positions, including an elongate shaft-like shank that is connected to the handle and extends through the back wall and that is connected to the housing for axial movement along the axis of the shank in response to pivotal movement of the handle; and
(g) resilient, expansible latch means including a resilient, expansible latch member that has a latching formation having first and second portions that are movable relatively toward and away from each other to effect expansion and contraction of the latch member, with the first of the relatively movable portions being connected to the housing means, and with the second of the relatively movable portions being connected to the shank for movement toward and away from the first of the relatively movable portions in response to movement of the shank in response to movement of the handle between its non-operated and operated positions to effect expansion and contraction of the latching formation in response to handle movement, and with the latching formation being insertable into a receiving formation that is defined by a keeper, with the latching formation being selectively expansible and contractible after being inserted into the receiving formation to releasably grip the keeper so as to selectively establish and release latching engagement with the keeper in response to said movement of the handle between its non-operated and operated positions.

4,838,057

COMBINATION DOOR LOCK

Fred N. Schwend, Mira Loma, Calif., assignor to Francis R. Schwend, Santa Ana, Calif.

Filed Feb. 29, 1988, Ser. No. 162,217
Int. Cl.[4] E05B *13/00*
U.S. Cl. 70—214 **9 Claims**



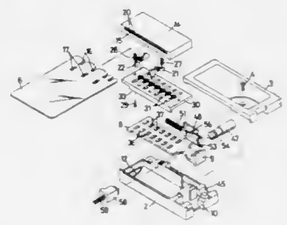
1. In a door lock:
exterior and interior housing parts for mounting on respective interior and exterior sides of a door,
an exterior knob spindle rotatably supported by said exterior housing part,
a ward member rotatable from a home position by said spindle,
a plurality of pins supported for endwise movement between set and reset positions,
certain of said pins having notches registerable with said ward member only when said certain pins are in set positions whereby to free said ward member and others of said pins having notches registerable with said ward member only when said other pins are in reset positions whereby to free said ward member,
a pin retractor member carried by said spindle for movement endwise of said pins, and
means responsive to rotation of said spindle for moving said spindle endwise to cause said retractor member to move set ones of said pins to reset positions.

4,838,058

CARD LOCK

Haruo Matsumoto, Amagasaki, Japan, assignor to Matsumoto Metal Mfg. Co., Ltd., Hyogo, Japan

Filed Jul. 7, 1987, Ser. No. 70,717
Claims priority, application Japan, Jul. 10, 1986, 61-105950[U]; Dec. 20, 1986, 61-196022[U]
Int. Cl.[4] E05B *25/00*
U.S. Cl. 70—355 **2 Claims**



1. A card-operated lock comprising:
a lock box;
a card slot in said lock box for receiving a card;
a locking member mounted in said lock box;
a slot in said locking member and aligned with said card slot of said lock box for receiving a card;
a plurality of holes in said bottom cover;
a plurality of first and second engaging pieces pivotably mounted between said locking member and said bottom cover and received in said plurality of holes;
a slide member slidably mounted in said lock box for locking said lock;
a plurality of engaging holes in said slide member;
said first ones of said plurality of first and second engaging pieces having means for engaging ones of said plurality of engaging holes of said slide member for restraining said slide member for locking said lock, said engaging means of said first ones of said engaging pieces being normally engaged with said ones of said plurality of engaging holes, and disengaging from said ones of said plurality of engaging holes of said slide member only when a right card is inserted into said slots and pivots said first engaging pieces; and
said second ones of said plurality of first and second engaging pieces having means for engaging ones of said plurality of engaging holes of said slide member for restraining said sliding member, said engaging means of said second ones of said engaging pieces being normally disengaged from said ones of said plurality of engaging holes, and engaging said ones of said plurality of engaging holes of said slide member only when a wrong card is inserted into said slots and pivots said second engaging pieces.

4,838,059

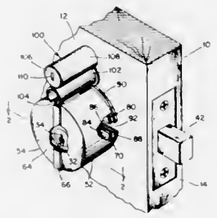
COMBINED COVER AND ATTACHING MEANS FOR CONCEALING A DEADBOLT LOCK

Gordon E. Johnson, P.O. Box 778, Cando, N. Dak. 58324

Filed Jul. 11, 1988, Ser. No. 217,661
Int. Cl.[4] E05B *13/00*
U.S. Cl. 70—209 **10 Claims**

1. The combination of a door and deadbolt lock having a portion thereof projecting from one side of the door, said projecting portion having a keyhole therein, a cover for concealing said keyhole including a pair of shells for enclosing said projecting portion, at least one of said shells having an inturned flange having a predetermined thickness, fixed means positioned relative to said door forming a groove having a width slightly greater than the thickness of said flange for receiving

said flange therein, and means for maintaining said shells in a mated or closed relationship with each other when said flange



is received in said groove so that said mated shells conceal and block access to said keyhole.

4,838,060

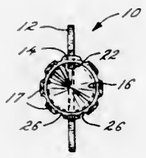
TUBULAR KEY AND CORRESPONDING LOCK HOUSING KEY ENTRY CONSTRUCTION

John T. Hutzenlaub, River Grove, Ill., assignor to Fort Lock Corporation, River Grove, Ill.

Filed May 12, 1988, Ser. No. 193,780

Int. Cl.[4] E05B *27/04*

U.S. Cl. 70—491 **11 Claims**



1. For uses with an axial pin tumbler lock having an annular keyway and axially directed combination pins, a tubular key comprising a handle portion and a cylindrical shank portion, the forward end of said cylindrical shank portion being adapted to receive a plurality of circumferentially spaced notches of different longitudinally extending lengths corresponding to the requisite axial movement of the lock combination pins, said shank having one or more longitudinally extending grooves projecting radially inward from a peripheral cylindrical portion of said shank circumferentially located between said shank peripheral portions which receive the combinated notches and a transverse annular recess positioned inwardly from the shank forward end of the key and inwardly of the longest longitudinal combination notch provided on the shank.

4,838,061

LOCK SET PROOF AGAINST PRIZE UP

Taw Tai-Seng, No. 20, Lane 43, Hansheng E. Rd., Pan Chiao City, Taipei Hsien, Taiwan

Filed Nov. 6, 1987, Ser. No. 118,202

Int. Cl.[4] E05B *27/04, 63/00*

U.S. Cl. 70—493 **2 Claims**

1. A tamper-proof lock, comprising, in combination:

an outer sleeve, said outer sleeve having a groove formation, an aperture for mounting a respective short tube in said outer sleeve, and radially extending holes for respective tumbler pins;

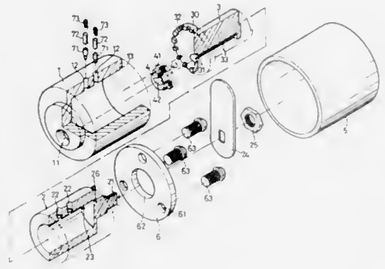
a hollow inner sleeve positioned in said outer sleeve, said inner sleeve having radially extending holes for respective tumbler pins, said inner sleeve including an exteriorly projecting formation adapted to cooperatingly engage said groove formation of said outer sleeve, and said inner sleeve including an interiorly projecting formation;

a lock strip operatively connected to said inner sleeve;

a pivot mounted in said hollow inner sleeve, said pivot having a cam formation terminus for cooperation with said interiorly projection formation of said hollow inner sleeve, said pivot having a plate terminus remote from said cam terminus, and said pivot including a keyhole formation;

first teeth arranged in a circular pattern on said plate terminus to axially project at a diameter which is greater than the outer diameter of said pivot;

a short tube mounted in said outer sleeve, said short tube having a central keyhole formation and a set of second teeth to rotate said pivot by meshingly engaging said first teeth of said pivot;



tumbler pins adapted to be positioned in said radially extending holes of said outer sleeve and said inner sleeve, and said tumbler pins being spring biassed by respective spring;

a spring for each tumbler pin;

a key, said key having a key head and a key stem releasably secured at said key head by means of a respective coupling; and

a coupling for securing said key stem to said key head;

wherein turning of said key imparts rotational movement to said inner sleeve by meshing cooperation of said first teeth of said pivot and said second teeth of said short tube for bringing said key stem to a first position in which said tumbler pins are moved to the respective shear line to open the lock, and for bringing said key stem to a second position in which said tumbler pins are moved to preclude opening of said lock.

4,838,062

PROCESS FOR UPSET FORGING OF LONG STANDS OF METAL BAR STOCK

Otto E. Prenn, Sherwood Park, Canada, assignor to Steleo Inc., Hamilton, Canada

Filed Dec. 15, 1987, Ser. No. 133,340

Claims priority, application Canada, Dec. 18, 1986, 525761

Int. Cl.[4] B21J *3/00, 5/08*

U.S. Cl. 72—41 **20 Claims**

1. A process for upset forging a long stand of solid malleable metal bar stock in a single pass to gather a large volume of the bar stock into a complex shaped element, said process comprising:

(1) selectively applying heat to said long stand of bar stock by heating an intermediate section thereof to desired upper forging temperature and heating an end section thereof to desired lower forging temperature;

(2) positioning said selectively heated long stand of bar stock in an upset forging die cavity comprising opposing mating die blocks within which said cavity is defined, said cavity having:

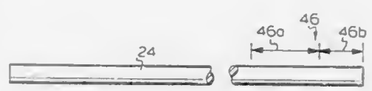
(a) a bar supporting section which intimately contacts said bar stock inwardly of said heated intermediate section in a direction away from said end section;

(b) a major upsetting section surrounding a major length of said heated intermediate section, and

(c) a secondary upsetting section surrounding a remaining minor length of said intermediate section and said end section,

said secondary upsetting section receiving and guiding a forging punch and having a cavity configuration different than a cavity configuration of said major upsetting section;

(3) said secondary upsetting section being provided with a high temperature lubricant capable of withstanding forging temperatures for reducing friction on cavity walls thereof;



(4) gripping said bar stock inwardly of said intermediate section to hold said gripped bar stock stationary relative to said die blocks in preparation for upset forging of said intermediate and said end sections of said bar stock;

(5) punching with said forging punch in a single blow said end section to upset said intermediate section to fill said major upsetting section of said cavity, said lower forging temperature of said end section being such that a controlled upset of said end section in said secondary upsetting cavity section having said friction reducing material provides for sliding of said end section along said secondary upsetting cavity section while said end section upsets and gathers said intermediate section in said major upsetting cavity section;

(6) continuing travel of said single punch blow to complete filling said secondary upsetting cavity section with said end portion.

4,838,063

METHOD FOR MANUFACTURING METALLIC TUBE MEMBERS

Sinichi Nishiyama; Hajime Abe; Kuniaki Seki, and Noboru Hagiwara, all of Ibaragi, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 761,919, Aug. 2, 1985. This application Jan. 25, 1988, Ser. No. 148,323

Claims priority, application Japan, Oct. 9, 1984, 59-189215; Oct. 9, 1984, 59-189217

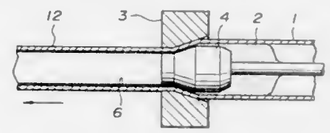
Int. Cl.[4] B21B *45/00*

U.S. Cl. 72—47 **11 Claims**

1. A method for coating the inner surface of a metal tube with a metal layer consisting of one or more metals, said metal layer having a melting point lower than that of the metal tube, the method comprising:

(a) thinly applying a mixture consisting of a low melting point powder and a flux composition to the inner surface of the tube by the use of a plug, and

(b) heating said tube to which said mixture has been applied at a temperature being at least the melting point of said



low melting point powder but lower than the melting point of the metal tube to fuse said powder.

4,838,064

APPARATUS FOR FLANGING AND SWAGING A CYLINDRICAL CAN BODY ON BOTH ENDS

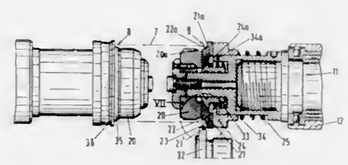
Hans-Uwe Päss, Lengede, Fed. Rep. of Germany, assignor to Lanico-Maschinenbau Otto Niemsch GmbH, Braunschweig, Fed. Rep. of Germany

Filed May 11, 1988, Ser. No. 193,249

Claims priority, application Fed. Rep. of Germany, May 13, 1987, 3715917

Int. Cl.[4] B21D *51/26*

U.S. Cl. 72—84 **6 Claims**



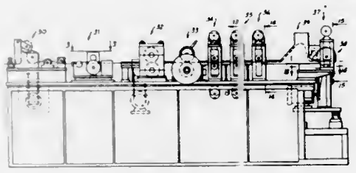
1. In an apparatus for flanging and swaging a cylindrical can body on both ends, especially an aerosol spray or beverage can, with which said flanging and swaging is effected in a single working process and in which at least two flanging and swaging heads held on a rotatably driven spindle slidable axially opposite each other into said can body to receive said can body, said flanging and swaging heads each having a radially slidable wobbler abutting on one side centrally on a conical piece slidable axially against an inner spring and in which each one of said flanging and swaging heads is associated with a pivoting arm equipped with a flanging and swaging roller which is pivotable by at least one cam about an axis parallel to the rotation axis of said spindle so that said flanging and swaging roller is brought into and out of engagement with said wobbler for formation of a flanged and indented edge of said can body by radial displacement of said wobbler, the improvement wherein at least one wobbler of said swaging heads cooperating with each other comprises two concentric ring members engaged with each other, of which the outer one having a larger outer diameter is stepped for receiving the inner one of a smaller outer diameter and supports itself on a collar guided axially slidable against an outer spring on said spindle so that said inner one of said ring members whose said outer diameter at most corresponds to the inner diameter of said can body before said flanging supports itself on said conical piece and said disklike abutting member and said ring members have bounding surfaces whose outer circumference fits the shape of said flanged and indented edge.

4,838,065

CORRUGATED FIN FORMING APPARATUS

Bernard J. Wallis, 2215 Dacosta, Dearborn, Mich. 48128

Filed Dec. 31, 1987, Ser. No. 139,917
Int. Cl.[4] B21D *13/04*
U.S. Cl. 72—185 15 Claims



1. A corrugated web forming apparatus for receiving selectively one of a plurality of webs of flat material and slitting one of said webs to form two strips which are thereafter shaped to form corrugations and severed to form shaped portions having predetermined lengths, predetermined heights and predetermined spacing between the corrugations which comprises

a slitting station including at least two sets of slitting rolls adapted to be used selectively for slitting a respective web,

a forming station including laterally spaced sets of forming rolls, each set including forming rolls for transversely corrugating two strips severed from a web simultaneously,

said forming station including means for selectively driving only one of said sets of forming rolls,

a plurality of longitudinally or laterally spaced sets of roll packing stations for controlling the longitudinal spacing between the corrugations on two strips,

each roll pack station comprising a set of packing rolls,

means for driving said packing rolls in synchronization,

a web accumulating station including rolls for engaging and intermittently interrupting the movement of the two corrugated strips, and

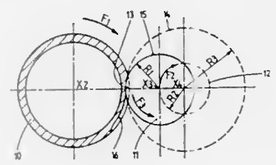
a cutting station for cutting predetermined lengths from said two corrugated strips.

4,838,066

PROCESS AND A DEVICE FOR THE PRODUCTION OF GROOVES ON A WALL OF REVOLUTION

Charles Marcon, Chagny, and Jean Poulain, Chalon-sur-Saone, both of France, assignors to Escofier Technologie, S.A., Chalon-sur-Saone, France

Continuation of Ser. No. 919,147, Sep. 2[illegible], 1986, abandoned. This application Aug. 31, 1988, Ser. No. 238,591
Claims priority, application France, Jan. 23, 1985, 85 01330
Int. Cl.[4] B21H *3/14*
U.S. Cl. 72—95 22 Claims



1. The process of forming helical grooves in the wall of revolution of a tubular body (2) without removal of the material from which said body is made, the helical grooves forming threads for screw threaded assemblies, comprising the steps of:

(1) supporting said tubular body (2) for rotation around its own axis (X1);

(2) mounting at least one profiling tool of revolution, freely rotatable, around an axis perpendicular to a radius of said tube;

(3) moving said tool axis in parallel with itself along a determined closed curve (12, 22), the enveloping curve (14, 23) of the path of the edge of the profiling tool including a portion effecting cyclical engagement of said tool and said wall and wherein the diameter of said tool is greater than the length of a diagonal (DE) of the determined closed curve (22) of which the extension cuts the region of engagement (25) as well as the axis (X5) of the tubular body, the length of that diagonal (DE) being at least equal to the deepness of penetration (e1) of the edge of the profiling tool within the wall (20);

(4) applying sufficient pressure to said profiling tool against said tubular body to form a continuous complementary profile on the wall of said tubular body, the displacement without removal of said body material in at least one profiling step; and

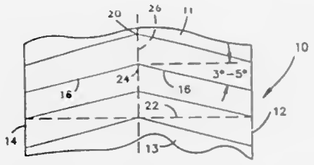
(5) rotating said tubular body and moving cyclically the axis of the profiling tool along the determined closed curve while longitudinally displacing said tube and said tool relative to each other to form a helical groove over a predetermined area of said tubular body.

4,838,067

CORROSION RESISTANT CORRUGATED METAL FOIL FOR USE IN WOUND AND FOLDED HONEYCOMB CORES

Richard C. Cornelison, Hiram, Ohio, assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed May 18, 1987, Ser. No. 50,412
Int. Cl.[4] B21D *13/04, 13/10*
U.S. Cl. 72—196 3 Claims



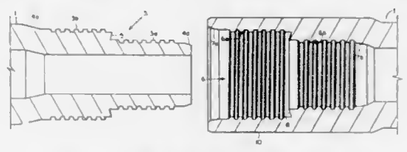
1. A corrugated thin metal strip of predetermined length and having longitudinally extending marginal edges and being resistant to corrosion at elevated temperatures, said strip being corrugated along its longitudinal axis throughout its length from its leading portion to its trailing portion to provide a longitudinally running series of alternating peaks and valleys, each of said peaks and valleys having a single longitudinally extending displacement across the width of said metal strip which deviates from and returns to an imaginary straight line substantially perpendicular to said marginal edges, said displacement extending in the direction of the leading portion, and the maximum of said displacement from said straight line is in compression.

4,838,068

METHOD OF FABRICATING THREADED CONNECTION FOR PIPES

Frank J. Carlin, Houston, Tex., and Terrell F. Wafford, Wilburton, Okla., assignors to Baker Hughes Incorporated, Houston, Tex.

Division of Ser. No. 101,653, Sep. 28, 1987, Pat. No. 4,796,928.
This application Jul. 14, 1988, Ser. No. 218,839
Int. Cl.[4] B21D *41/02, 41/04;* F16L *15/00*
U.S. Cl. 72—340 1 Claim



1. The method of fabricating threaded ends on pipe produced to A.P.I. specifications, one pipe end constituting a pin and the other pipe end a box, and each threaded end comprising two axially spaced threads respectively having a large pitch diameter and a small pitch diameter, comprising the steps of:

swaging the entire pin end of the pipe inwardly to produce an internal diameter less than the drift diameter of the pipe;

machining the inner diameter of the entire swaged portion of the pin end to a diameter from "0.001 to 0.003" greater than said drift diameter;

machining said two axially spaced threads on the exterior of said machined inner diameter portion of said pin end;

swelling the entire box end of the pipe outwardly to a diameter in excess of the max A.P.I. outer diameter specified for the pipe;

machining the swelled box end to a dimension corresponding to said max A.P.I. outer diameter plus 0.000 "and minus 0.002"; and

machining said two axially spaced threads in the interior of said machined outer diameter portion of said box end, said axially spaced threads in said pin and box ends being complemental and respectively engagable with identical axially spaced threads formed on box and pin ends of other pipes; said axially spaced threads in said pin and box ends being machined in accordance with the following dimensional relationship:

$$P1 = B1 = A1 + A2;$$

where P1 is the root diameter of the large diameter thread on the pin end of the pipe; B1 is the difference between the root diameter of the small diameter thread in the box end of the pipe and said machined outer diameter of said box end; A1 is the difference between the root diameter of said large diameter thread in said box end of the pipe and said machined outer diameter of said box end; and A2 is the difference between the root diameter of the large diameter thread on said pin end and said machined inner diameter of said pin end.

4,838,069

APPARATUS FOR FABRICATING INTEGRALLY BLADED ROTORS

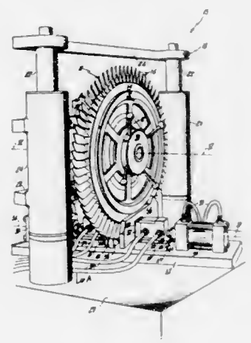
Rayond M. Walker, Lucie, and Donald G. MacNitt, Singer Island, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 12, 1988, Ser. No. 155,323
Int. Cl.[4] B21K *3/04*
U.S. Cl. 72—342 16 Claims

1. Apparatus for superplastic forming an integrally bladed rotor to twist a rotor blade from a first degree of twist to a second degree of twist, the rotor comprising a disk having an axis, a rim, and a plurality of circumferentially spaced apart blades extending radially outwardly from the rim and integral therewith, the apparatus comprising:

(a) first and second blade forming die means movable along a common axis, said die means having surfaces for contacting substantially the entire blade surface, wherein said die surfaces cooperate to form a blade cavity, and said blade cavity substantially corresponds to a blade having said second degree of twist;

(b) means for securing the rotor in a fixed position between said first and second die means such that one of the rotor blades is aligned with the die axis;



(c) means for providing a heating zone for raising the temperature of the blade aligned with the die axis to a temperature sufficient to render the blade superplastic; and

(d) means for moving each of said die means along the die axis and between first and second die positions, such that in said first die position said contact surfaces are in twisting contact relation with substantially the entire blade surface in said heating zone, and in said second die position said contact surfaces are in noncontacting relation with the blade in said heating zone and said die means are out of said heating zone.

4,838,070

METHOD AND APPARATUS FOR DRY TESTING WATER-IMMERSIBLE ACOUSTIC TRANSDUCERS

Liam P. Bradley, Dunfermline, Scotland, assignor to Marconi Instruments Limited, England

Filed Jul. 9, 1987, Ser. No. 71,321
Claims priority, application United Kingdom, Jul. 11, 1986, 8616924
Int. Cl.[4] H01L *41/22;* G01L *25/00;* H04B *17/00;* H04R *29/00*
U.S. Cl. 73—1 DV 15 Claims

1. A method of dry testing an acoustic transducer of the type operative, when immersed in a liquid which presents an acoustic impedance characteristic to an active head of the acoustic transducer, for processing acoustic signals, comprising the steps of:

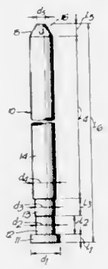
(a) simulating said acoustic impedance characteristic by a solid material, elongated, acoustic coupling rod operative for propagating the acoustic signals between a test end region of the rod and a detector end region of the rod;

(b) acoustically coupling the test end region of the rod to the active head of the transducer;

(c) acoustically coupling the detector end region of the rod to an acoustic detector;

(d) energizing the acoustic transducer for propagating an

acoustic signal along the rod from the test end region to the detector end region; and



(e) detecting the propagated acoustic signal by the acoustic detector.

4,838,071

METHOD OF DETERMINING THE FILLING CAPACITY OF AND CALIBRATING A PNEUMATIC CONVEYING ARRANGEMENT

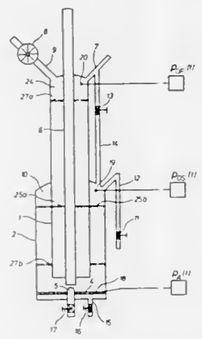
Ernst Hoppe, Welver, and Franz-Josef Adrian, Lippetal, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany

Filed Apr. 28, 1988, Ser. No. 187,306

Claims priority, application Fed. Rep. of Germany, May 15, 1987, 3716427

Int. Cl.[4] G01F *13/00, 25/00;* **B65G** *53/18, 53/66*

U.S. Cl. 73—3 **6 Claims**



1. The method of determining the filling capacity (m(t)) of pneumatic conveying apparatus having a storage vessel having a known cross-sectional area (A_S), a conveyor vessel having a known cross-sectional area (A_F), the storage and conveyor vessels being connected to one another by communicating pipes and having a common pneumatic aerating base, a conveying pressure supply, and top pressure regulating means in both of said vessels, said method comprising:

(a) measuring the conveying pressure ($P_A(t)$);

(b) measuring the top pressure ($P_{OS}(t)$) in the storage vessel;

(c) measuring the top pressure ($P_{OF}(t)$) in the conveyor vessel; and

(d) solving the equation:

$$m(t)=A_S(P_A(t)-P_{OS}(t))+A_F(P_A(t)-P_{OF}(t)).$$

4,838,072

METHOD AND APPLIANCE FOR EVALUATING THE SOUND EMISSION PROPERTY OF HOLLOW COMPONENTS

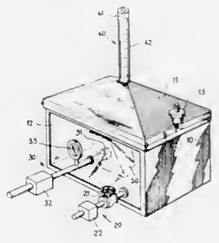
Jean C. Vera, Valentigney, France, assignor to ECIA - Equipements et Composants Pour L'Industrie Automobile, Audincourt, France

Filed Dec. 7, 1987, Ser. No. 129,194

Claims priority, application France, Dec. 11, 1986, 86 17370

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—37 **13 Claims**



1. Method for evaluating the sound emission behaviour of a hollow component, the casing of which delimits a cavity opening to the outside via at least one orifice, characterized in that the hollow component is sealed, if appropriate, this orifice in the hollow component is connected to a source of fluid, the component so connected is submerged in a specific volume of an incompressible liquid, the cavity of the hollow component is filled with this fluid, the fluid in the cavity is pressurized, and the variation in volume of the liquid resulting from the deformations of the component casing which are caused by the set pressure of the fluid prevailing in it is measured.

4,838,073

METHOD AND APPARATUS FOR DETECTING LEAKS

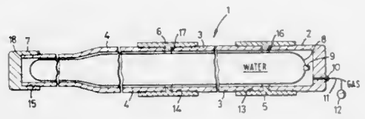
Manfred Jansch, Moorkamp 25, D-3008 Garbsen 5, Fed. Rep. of Germany

Filed Mar. 28, 1988, Ser. No. 174,236

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1987, 3710443

Int. Cl.[4] G01M *3/20*

U.S. Cl. 73—40.7 **14 Claims**



1. A method for detecting leaks, the method comprising

inserting a hollow member of resiliently flexible material into a chamber;

introducing a liquid under pressure into the hollow member;

introducing a test gas into the space defined between the hollow member which contains the liquid under pressure and the wall of the chamber; and

sensing the escape of any test gas from the chamber.

4,838,074

STEERING TORQUE DETECTING DEVICE

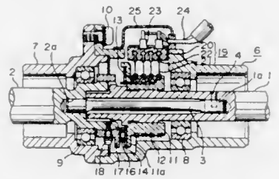
Mitsuharu Morishita; Shinichi Kobge; Tadayuki Hara; Yasuaki Hata, and Hisato Umemaru, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1988, Ser. No. 177,085

Claims priority, application Japan, Apr. 6, 1987, 62-52839[U]; Apr. 6, 1987, 62-52840[U]; Apr. 22, 1987, 62-61811[U]; Apr. 22, 1987, 62-61812[U]

Int. Cl.[4] G01M *13/02*

U.S. Cl. 73—118.1 **4 Claims**



1. A steering torque detecting device which comprises:

a steering shaft consisting of an input shaft and an output shaft,

a torsion bar connecting said input shaft with said output shaft,

a printed wiring board of a circular plate form which is provided at one surface thereof with a resistance layer and an output electrode radially spaced apart from said resistance layer, said resistance layer and said output electrode constituting a potentiometer, and which is attached to one of said input shaft and said output shaft,

a plurality of slip rings which are fixed to one of said shafts and connected to electrodes formed at ends of said resistance layer and said output electrode,

a plurality of brushes in contact with said slip rings to receive detection signals, and

a slider mounted on a second of said input shaft and said output shaft and having a portion extending in the radial direction of said circular printed wiring board so as to have contacting areas for contacting said resistance layer and said output electrode wherein a zero point electrode having a portion extending in the circumferential direction to have a zero point contact part with a small width at its one end and a paired electrode formed radially apart from said zero point electrode are provided in the same surface as said resistance layer and said output electrode on said printed wiring board.

4,838,075

METHOD AND A FASTENER FOR CLOSING AND SEALING PIPES SUBJECTED TO INTERNAL PRESSURE

Pawel Friedrich; Wieslaw Placzek; Leszek Mynarz; Krzysztof Karpi ski; Jerzy Gaszewski, and Tadeusz Tarasiuk, all of Warsaw, Poland, assignors to Instytut Chemii Przemyslowej, Warsaw, Poland

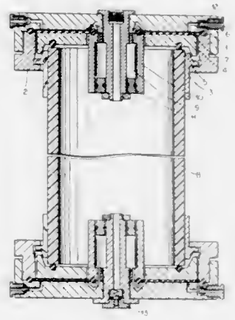
Continuation of Ser. No. 868,617, May 29, 1986, abandoned. This application Feb. 18, 1988, Ser. No. 161,327

Claims priority, application Poland, May 31, 1985, 253726; Apr. 4, 1986, 258771

Int. Cl.[4] G01M *3/02*

U.S. Cl. 73—49.8 **5 Claims**

1. In a seal for a plastic pipe comprising a length of pipe, fasteners on opposite ends of said pipe length, interacting conical surfaces for creating a seal, and means for supplying pressurized fluid to said fasteners, the improvement according to which each of said fasteners comprises a clamping ring having an inner and outer cylindrical surfaces with a cut-out at the bottom of the inner cylindrical surface, a conical ring surrounding the outer cylindrical surface end of the pipe and having a flange extending into said cut-out, a movable element within said clamping ring and extending over the pipe end, and an elastic packing between said movable element and said pipe end, one of said interacting conical surfaces being on the inside of said movable element and the other of said conical surfaces being constituted by the outside of said conical ring, the motion of said movable element being effected by said pressurized fluid supplied to the space between the bottom of said clamping ring and said movable element.



4,838,076

DISPLAY FOR DISPLAYING THE VELOCITY OF A VEHICLE AND THE ROTATIONAL SPEED OF THE VEHICLE ENGINE

Stephen Ferrada, Unterreichenbach, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jun. 2, 1988, Ser. No. 201,455

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1987, 3718439

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—489 **5 Claims**

1. A display for displaying a velocity of a vehicle and a rotational speed of a vehicle engine comprising:

a. an instrument disc having a center and a scaled, annular segment including an inner annulus;

b. a luminous band display movable along the scaled annular segment for representing the velocity of the vehicle;

c. a scaled, acute-angled, sector-shaped electronic indicator opening radially outward from the center of the disc and constantly following the movement of the luminous band display; and

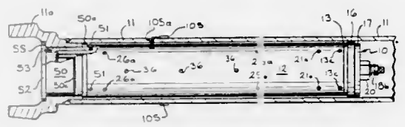
d. a radially, outward-running, luminous band display movable radially within the scaled, acute-angled sector-shaped electronic indicator for representing the rotational speed of the vehicle engine.

4,838,077

APPARATUS AND METHOD FOR MONITORING THE OPERATION OF A VEHICLE DRIVE SHAFT

Glenn Shifflet, Minnetonka; Herbert C. Johnson, Minneapolis, both of Minn., and Paul W. Revenaugh, Oak Harbor, Ohio, assignors to Dana Corporation, Toledo, Ohio

Filed Dec. 17, 1987, Ser. No. 134,407
Int. Cl.[4] G01M *13/02*
U.S. Cl. 73—118.1 32 Claims



26. In an instrument for monitoring the performance of a rotatable hollow shaft during use, a means for generating a signal when the shaft is rotated about an axis comprising:

a switch board mounted within the shaft for rotation therewith;

at least one switch means mounted on said switch board for rotation therewith, said switch means adapted to be opened and closed as the angular orientation thereof changes as it is rotated with said switch board and the shaft; and

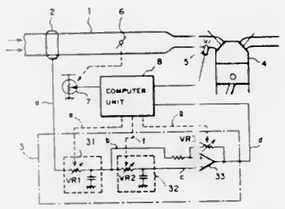
means responsive to said opening and closing of said switch means for generating a signal when the shaft is rotated.

4,838,078

SUCTION AIR AMOUNT MEASURING DEVICE FOR AN ENGINE

Kazumichi Tsutsumi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP87/00516, § 371 Date Dec. 18, 1987, § 102(e) Date Dec. 18, 1987, PCT Pub. No. WO88/00686, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 15, 1987, Ser. No. 188,392
Claims priority, application Japan, Jul. 17, 1986, 61-168413; Jul. 17, 1986, 61-168414
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118.2 4 Claims



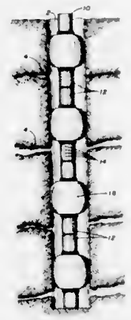
1. A suction air amount measuring device for an engine, characterized in that said device comprises a Karman's vortex street flow rate sensor located in a suction air path of said engine, a binary digitizing circuit for binary digitizing an output of said Karman's vortex street flow rate sensor to produce Karman's vortex street pulses, and means for changeably setting an operating constant of said binary digitizing circuit in response to operating states of said engine at least including a throttle opening.

4,838,079

MULTI-CHANNEL PIPE FOR MONITORING GROUNDWATER

Richard K. Harris, 4123 55th Ave. SW., Seattle, Wash. 98116

Filed May 20, 1987, Ser. No. 52,587
Int. Cl.[4] E21B *47/06, 49/00*
U.S. Cl. 73—155 12 Claims



1. A multi-channel pipe for monitoring groundwater and the like at one or more subsurface aquifer levels, said multi-channel pipe comprising:

a longitudinally extending outer wall defining an interior volume;

a longitudinally extending interior element further comprising a central core coaxial with the outer wall and radial segments extending between the core and outer wall, said interior element dividing the interior volume into multiple continuous channels defined in part by the outer wall, wherein at least two of the continuous channels each include a monitoring port opening through the outer wall, each of said two channels having its monitoring port at an aquifer level different from the aquifer level of other channels, so that each channel communicates between the surface and its own aquifer level; and

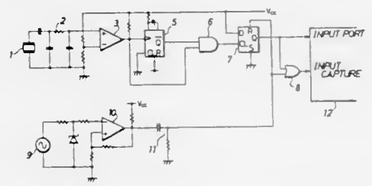
means for plugging each of said two channels below the respective monitoring port of each channel.

4,838,080

CIRCUIT FOR DISTINGUISHING DETECTED LIFT SIGNAL OF THE VALVE ELEMENT OF FUEL INJECTION VALVE

Masami Okano, Higasimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1988, Ser. No. 186,076
Claims priority, application Japan, Apr. 25, 1987, 62-101139
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—119 A 4 Claims



1. A circuit for distinguishing a detected signal indicating the lifting of the valve element of a fuel injection valve having a valve element lift sensor including pressure-sensitive means positioned for being pressed by the valve element, said circuit comprising:

a waveform shaper for converting a detected valve element lifting signal produced by said valve element lift sensor into a first pulse;

pulse generating means triggerable by said first pulse from said waveform shaper for producing a second pulse having a pulse duration shorter than the minimum period of time during which the valve element is being lifted in one lifting cycle thereof, and longer than the duration of a first pulse issued from said waveform shaper after the supply of fuel to the fuel injection valve has been cut off; and

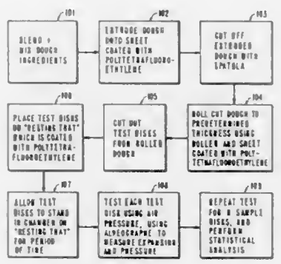
logic processing means for processing the first pulse from said waveform shaper and the second pulse from said pulse generating means to remove an output signals from said valve element lift sensor after fuel has been fed to said fuel injection valve.

4,838,081

METHOD AND APPARATUS FOR IMPROVING THE RELIABILITY FOR DOUGH TESTING RESULTS

John W. Finley, Whippany, and Hamed A. Faridi, Lake Hiawatha, both of N.J., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Continuation of Ser. No. 834,369, Feb. 28, 1986, abandoned.
This application Feb. 26, 1988, Ser. No. 161,137
Int. Cl.[4] G01N *33/10*
U.S. Cl. 73—169 7 Claims



1. A method of improving the reliability of dough test results by reducing the variability in burst-testing type of apparatus and reducing the standard deviation of test results of a batch of dough by means of producing the samples to be tested using a process comprising the steps of:

forming a dough;

extruding a samples of said dough onto a receiving tray;

rolling the dough samples to a uniform thickness;

resting the uniform thickness dough samples on a resting tray;

cutting the rested dough samples into uniform dough test samples, and

testing said dough test samples in a burst testing type of apparatus and determining a parameter associated with dough extension as a function of time;

said improvement in dough test results being derived from a process of preparing more uniform dough test samples comprising:

extruding said dough samples onto a receiving tray having a low-friction coating thereon;

rolling said dough samples to a uniform thickness using a roller and a roller tray each having a low-friction coating thereon;

resting said uniform thickness dough samples on a resting tray having a low-friction coating thereon;

cutting said rested dough samples into uniform dough test samples using a cutter having a low-friction coating thereon and

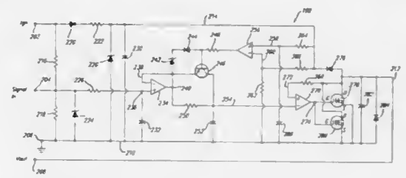
testing said uniform test samples in said burst testing type of apparatus and thereby get test results having a reduced variability and reduced standard deviation.

4,838,082

FUEL GAUGE DAMPER CIRCUIT

Blane K. McCoy, Madison, and James R. Garrison, Hazelgreen, both of Ala., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jan. 15, 1988, Ser. No. 144,217
Int. Cl.[4] G01F *23/36*
U.S. Cl. 73—313 2 Claims



1. A fuel gauge damper circuit for supplying an indicator signal to a fuel gauge of a vehicle comprising:

a damper circuit input coupled for receipt of a variable resistance signal from a fuel tank sender;

bias potential means coupled to an ignition switch of the vehicle for receipt of power from a vehicle power supply whenever the ignition switch is placed in a predetermined position, the bias potential means operative to generate the predetermined bias potential level at its output;

a resistive input circuit coupled to the ignition switch and the damper circuit input, operative to generate at its output a damper circuit input voltage varying proportionally with the variable resistance fuel tank sender signal;

filter means including a charging resistor having a first terminal coupled to the output of the resistive input circuit, and a charging capacitor coupled between a second terminal of the charging resistor and ground potential, the filtering means operative to generate the indicator signal across the charging capacitor; and

initializing means comprising:

an initializing resistor with a first terminal coupled to the bias potential means output

an initializing capacitor having a first terminal coupled to a second terminal of the initializing resistor and a second terminal coupled to ground potential;

first and second series-coupled bias resistors coupled between the bias potential means output and ground potential;

an operational amplifier comparator having a first input coupled to the first terminal of the initializing capacitor and a second input coupled to the junction of the first and second bias resistors; and

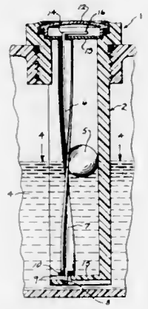
a transistor switch having a base electrode coupled to an output of the operational amplifier comparator, and an emitter electrode coupled to the first terminal of the charging resistor and a collector electrode coupled to the second terminal of the charging resistor.

4,838,083

FLOAT ACTIVATED GAUGE

James E. Blomquist, Cedarburg, Wis., assignor to Kelch Corp., Cedarburg, Wis.

Filed Jan. 22, 1988, Ser. No. 146,994
Int. Cl.[4] G01F 23/66, 23/76
U.S. Cl. 73—320 7 Claims



1. A float activated gauge for indicating the level of liquid in a tank comprising:

a float;

a float following member positionable vertically in the tank and having an abutment surface for contact with the outer peripheral surface of the float, and the abutment surface being twisted about a vertical axis and the float following member being free to rotate about said vertical axis;

guide means for retaining the float captive between the abutment surface of the float following member and the guide means while allowing the float to move vertically with the tank liquid level; and

indicating means attached to the float following means, the indicating means being visible from outside of the tank for providing a visual indication of the angular position of the float following member about the vertical axis;

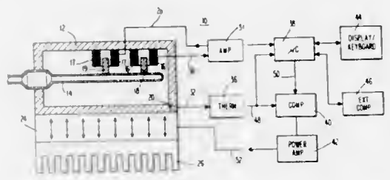
wherein vertical movement of the float due to changes in the level of the liquid causes the float following member to rotate, thereby positioning the indicating means at an angle indicative of the level of liquid in the tank.

4,838,084

DENSITY MEASURING INSTRUMENT

Hans Leopold, August-Musgergasse 4, A-8010 Graz, and Hans Stabinger, Peterstalstrasse 156, A-8042 Graz, both of Austria

Filed Aug. 30, 1988, Ser. No. 238,305
Int. Cl.[4] G01N 9/00
U.S. Cl. 73—32 A 9 Claims



1. An apparatus for measuring the density of a fluid by the determination of the frequency of oscillation of a vibrating tube filled with said fluid, comprising:

mechanical oscillator means wherein the frequency of oscillation is representative of the density and the temperature of the fluid,

means for measuring the frequency of oscillation of the oscillator means,

temperature control means for controlling the temperature of the fluid during oscillation, the temperature control means including:

single set point means for storing a single reference temperature set point,

thermometer means for measuring the temperature of said sample,

comparison means for comparing the measured temperature with said single reference temperature set point and determining whether the measured temperature is greater than said single reference temperature set point or less than said single reference set point and providing a comparison signal in response to the comparison,

thermal means for both heating and cooling said sample and

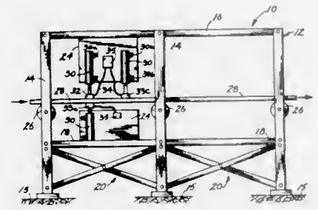
thermal control means for controlling the thermal means to heat said sample when the measured temperature is below said single reference temperature set point and to cool said sample when said measured temperature is above said single reference temperature set point in response to said comparison signal.

4,838,085

METHODS AND APPARTAUS FOR NON-DESTRUCTING EVALUATION OF THE MECHANICAL PROPERTIES OF COMPOSITE MATERIALS

Roy F. Pellerin, and Robert J. Ross, both of Pullman, Wash., assignors to Washington State University Research Foundation, Inc., Pullman, Wash.

Filed Mar. 25, 1986, Ser. No. 843,717
Int. Cl.[4] G01N 29/00
U.S. Cl. 73—597 6 Claims



1. An apparatus for automatically and nondestructively testing a panel made of composite materials to quantitatively predict mechanical properties of the panel, comprising:

a frame;

means for conveying the panel with respect to the frame to allow a panel to enter into and be removed from at least one test position;

at least one testing head movably mounted to the frame for motion toward and from a panel when in a test position;

at least one stress wave producing means for engagement with said panel to produce at least one self-propagating stress wave in the panel which originates from at least one stress wave originating position on said panel;

a plurality of stress wave sensing means mounted to at least one of the testing heads; the plurality of stress wave sensing means serving to detect stress wave propagation speed and stress wave attenuation; the plurality of stress wave sensing means being positioned at a plurality of sensor positions which detect stress wave action in the panel at positions which are spaced from the stress wave originating position; at least two of said stress wave sensing means being spaced apart to detect stress waves which propagate through said panel along stress wave paths which are distinct from one another;

means for automatically moving at least one testing head toward the panel when the panel is in the testing position and away from the panel when testing is completed;

means for automatically interpreting test data produced by said stress wave sensing means to produce measures of stress wave speed and stress wave attenuation; said means for interpreting test data including means for storing experimentally derived predetermined parameters;

Means for analyzing measured test data and the predetermined parameters to derive a predicted measure of the elastic or strength property being tested; and

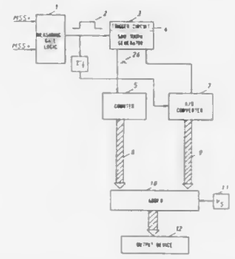
wherein the plurality of stress wave sensing means includes at least one stress wave sensing means spaced substantially across the panel from a stress wave originating position, and at least one stress wave sensing means spaced along a length direction of the panel which is different in direction than across said panel.

4,838,086

METHOD FOR MEASURING THE WALL THICKNESS OF A WORKPIECE BY ULTRA-SOUND

Rudolf Bender, Lich, and Jörg Quittkat, Neuberg, both of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

Filed Dec. 29, 1987, Ser. No. 138,730
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1987, 3700086
Int. Cl.[4] G01N 29/00
U.S. Cl. 73—597 8 Claims



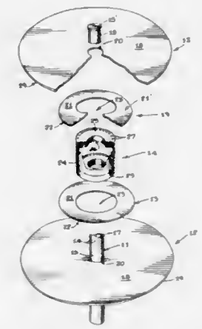
1. Method for measuring the wall thickness of a workpiece by ultra-sound, in which the surface echo of an ultrasonic wave generates a start pulse and the rear wall echo generates a stop pulse for a saw tooth generator and in which the amplitude of a saw tooth signal obtained when the stop pulse occurs provides a measure for the wall thickness, said method comprising the steps of generating a sequence of equal triangular saw teeth in response to the start pulse, generating a counting pulse corresponding to each reversal point of the signal curve of the saw teeth, and adding the number of counting pulses generated before the stop pulse appears and a value represented by the amplitude of a saw tooth existing when the stop pulse appears, each counting pulse defining a constant unit of the wall thickness and the value represented by the amplitude defining a fraction of the unit of the wall thickness.

4,838,087

QUAD DISK STATIC PRESSURE PROBE

Randall T. Nishiyama, and Alfred J. Bedard, Jr., both of Boulder, Colo., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C. and Univ. of Colo. Found., Inc., Boulder, Colo.

Filed Jun. 23, 1988, Ser. No. 210,546
Int. Cl.[4] G01L 7/00; G01P 5/165
U.S. Cl. 73—700 11 Claims



1. A static pressure probe apparatus comprising:

an elongated hollow tubular stem member having a closed end and a plurality of static pressure ports disposed around the periphery of the tubular stem member;

a generally cylindrical collar member provided with apertured end caps; wherein, each of the end caps are provided with an enlarged central aperture, that is dimensioned to sealingly engage the periphery of the tubular stem member at locations spaced from the static pressure ports in the tubular stem member; and, wherein each of the end caps are further provided with a plurality of pressure port apertures that are in open fluid communication with the static pressure ports in the tubular stem member; and,

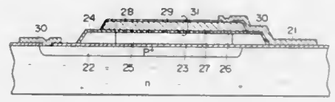
a plurality of disk members operatively associated with the tubular stem member.

4,838,088

PRESSURE TRANSDUCER AND METHOD FOR FABRICATING SAME

Koichi Murakami, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 16, 1987, Ser. No. 74,893
Claims priority, application Japan, Jul. 18, 1986, 61-168079
Int. Cl.[4] G01L 7/08, 9/12
U.S. Cl. 73—724 18 Claims



1. A pressure transducer comprising;

a substrate,

a diaphragm layer,

a support layer interposed between said substrate and said diaphragm layer, said support layer having an opening, both sides of which are closed by said substrate and said diaphragm layer to form a hermetically sealed internal cavity serving as a reference pressure chamber, and

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means for converting a displacement of said diaphragm layer into an electrical signal,

wherein said diaphragm layer comprises an inner layer extending over said cavity of said support layer to constitute an interior surface of said cavity, and having a plurality of perforations opening into said cavity, and a cover layer which is formed on said inner layer and closes said perforations to seal said cavity, wherein said support layer is made of a doped semiconductor and said inner layer comprises a first layer of an insulating material, and wherein said diaphragm layer is spaced apart from said substrate by said support layer.

4,838,089

SEMICONDUCTOR PRESSURE SENSOR

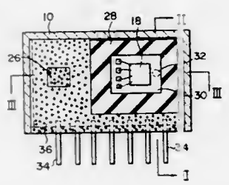
Hiroshi Okada, Hekinan; Yukihiro Kato, Kariya; Osamu Ina, Anjo, and Kazuhisa Ikeda, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 6, 1987, Ser. No. 46,582

Claims priority, application Japan, May 7, 1986, 61-104458; Jan. 16, 1987, 62-8594; Feb. 12, 1987, 62-30079

Int. Cl.[4] G01L 7/08, 9/06

U.S. Cl. 73—727 **13 Claims**



1. A semiconductor pressure sensor for measuring a pressure of a pressure medium, comprising:

a housing;

a board located in the housing and having a circuit face on which a wiring pattern in formed;

a pressure-sensing chip formed of a semiconductor and assembled on the circuit face of the board, the pressure-sensing chip being adapted to measure the pressure of the pressure medium;

at least one semiconductor chip assembled on the circuit face of the board and operating in cooperation with the pressure-sensing chip;

a shielding member which is located in the housing in such a manner as to isolate the pressure-sensing chip from the semiconductor chip and to define a storage chamber for the pressure-sensing chip in the housing, together with the housing and the board;

means, provided in the housing, for guiding a pressure medium to be measured into the storage chamber; and

a filler which fills at least the interior of the housing outside the storage chamber such that the semiconductor chip is embedded in the filler.

4,838,090

MULTICOIL BOURDON TUBE TYPE PRESSURE GAUGE

John Hestich, Glendora, Calif., assignor to Dwyer Instruments, Inc., Michigan City, Ind.

Filed Sep. 30, 1988, Ser. No. 251,339

Int. Cl.[4] G01L 7/14

U.S. Cl. 73—738 **19 Claims**

1. A Bourdon tube type pressure gauge comprising:

a casing defining a relatively planar main chamber,

said casing being indented rearwardly to define a supplemental chamber,

a mounting plate secured to said casing over said supplemental chamber and within said main chamber, with one side of said mounting plate facing said supplemental chamber,

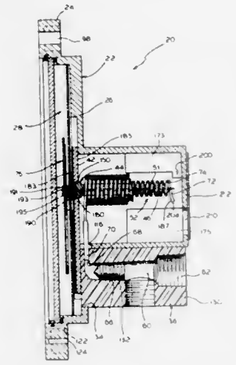
a tubular spool cantilever mounted on said mounting plate adjacent one end of same and extending through said mounting plate and into said supplemental chamber,

a rectilinear shaft journaled in said spool and having one end of same disposed in said main chamber and the other end of same projecting from said spool within said supplemental chamber,

a multicoil Bourdon tube defining a bore extending the length thereof and encircling said spool,

with one end of said tube being sealed,

said tube being fixed to said shaft, adjacent said other end of said shaft, and adjacent said tube one end,



fitting means anchored to said mounting plate and including a gas pressure cavity,

means for connecting said pressure cavity to a source of pressure fluid,

with the other end of said tube being anchored to said fitting means with said tube bore exposed to said cavity,

a scale plate, including a zero datum, fixed to said mounting plate on the side of said mounting plate facing away from said supplemental chamber with said shaft one end extending through said scale plate,

said one end of said shaft mounting an indicator,

and means for setting said indicator on said zero datum, said scale plate forming the face of said gauge.

4,838,091

FLUDIC OSCILLATOR FLOWMETERS

Eric Markland, Penylan, Wales; Graham M. Tofield, Wincham, England; Gary P. Lucas, Bolton, England, and Hardyal S. Kalsi, Sale, England, assignors to Thorn EMI Flow Measurement Limited, Stretford, England

Filed Jun. 26, 1987, Ser. No. 66,426

Claims priority, application United Kingdom, Jun. 27, 1986, 8615702

Int. Cl.[4] G01F 1/20

U.S. Cl. 73—861.19 **23 Claims**

1. A flowmeter including a fluidic oscillator wherein the oscillator comprises:

(a) an inlet nozzle by which fluid the flow of which is to be measured enters the oscillator;

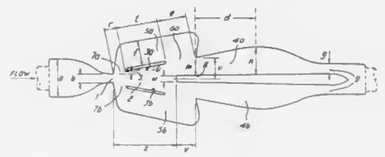
(b) an exit by which fluid leaves the oscillator;

(c) first walls joining the inlet nozzle and exit forming opposing sides of the meter and defining an axially symmetric interaction region through which the flow first passes and an axially symmetric outlet region downstream of the interaction region;

(d) diverging, parallel sided narrow side walls disposed in the interaction region symmetrically on opposing sides of the axis of symmetry of the interaction region to define respective feedback channels and an interaction chamber therebetween, the feedback channels each having an exit disposed adjacent said inlet nozzle to form a control port of the interaction chamber and an entrance disposed downstream of the respective exit;

(e) downstream corners of the entrances to said feedback channels being defined by the conjunction of adjacent portions of said first walls wherein the angle between adjacent portions at each said corner is less than 90°;

(f) a splitter located along the axis of symmetry of said outlet region and protruding into said interaction region;



(g) a splitter face formed at one end of said splitter opposing said inlet nozzle on the axis of symmetry of the interaction region and having generally sharp corners to promote, in use, separation of flow incident thereon to one side or other of said splitter, wherein the splitter face is located so that at least part of each feedback channel entrance lies upstream thereof and each downstream feedback channel entrance corner lies downstream thereof such that in use oscillating flow develops across the splitter face and each downstream feedback channel entrance corner intercepts the parts of the oscillating flow separating from the respective corner of said splitter face to promote flow of fluid, lying between on the one hand the respective side wall and on the other hand directed to the splitter face, into the respective feedback channel.

4,838,092

VORTEX FLOW METER

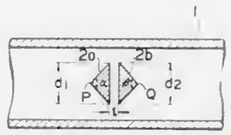
Masao Misumi, and Koji Atsumi, both of Tokyo, Japan, assignors to Oval Engineering Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1987, Ser. No. 24,294

Claims priority, application Japan, Mar. 15, 1986, 61-37995[U]; Mar. 15, 1986, 61-37996[U]; Mar. 16, 1986, 61-37828[U]; Mar. 16, 1986, 61-57766; Mar. 17, 1986, 61-58975; Nov. 19, 1986, 61-178079[U]

Int. Cl.[4] G01F 1/32

U.S. Cl. 73—861.22 **21 Claims**



1. A vortex generator for measuring fluid flow in an elongated conduit having a central axis, comprising an upstream and a downstream vortex generator disposed transversely in said conduit, said upstream vortex generator having an upstream side and a downstream base side, said downstream vortex generator having a downstream side and an upstream base side, said upstream and downstream base sides being in spaced relationship to one another to provide a combinational vortex frequency of said upstream and downstream vortex generators, said upstream and downstream vortex generators each having a generated vortex frequency, when installed singly within said conduit, such that the ratio of said generated vortex frequency of said downstream vortex generator, when singly installed, relative to said generated vortex frequency of said upstream vortex generator, when singly installed, is within the range of 0.7 to 0.9.

4,838,093

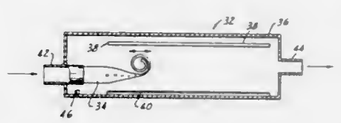
FLOW METER AND METHOD OF MEASURING FLOW

George Corser, Flint; Gary C. Hammond, Bancroft, and Dale P. Eddy, Flint, all of Mich., assignors to GMI Engineering & Management Institute, Flint, Mich.

Filed Dec. 11, 1987, Ser. No. 131,921

Int. Cl.[4] G01F 1/22

U.S. Cl. 73—861.53 **24 Claims**



1. A fluid flow meter comprising:

a wall member defining an elastically expandable volume, said wall member having a fluid inlet, a fluid outlet formed by a plurality of ports extending through said wall member for allowing fluid to exit the expandable volume, said ports being substantially closed in the no-flow condition, and having an increasing effective open area with increasing wall member volume, and means for resisting the deformation of the expandable volume;

wherein said expandable volume varies in size as a function of fluid flow rate to provide an indication thereof.

4,838,094

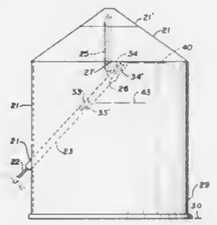
GRAIN SAMPLE APPARATUS

Donald V. Baldock, Cummings, N. Dak. 58223

Filed Mar. 30, 1987, Ser. No. 32,020

Int. Cl.[4] G01N 1/20

U.S. Cl. 73—863.81 **4 Claims**



1. A grain conveying apparatus in combination with a grain bin having a base and an upright cylindrical wall, said apparatus comprising an inner and outer elongated sleeve, said inner sleeve having its lower end rotatably mounted to the wall of the bin with its lowermost end projecting out through the cylindrical wall to the exterior surface of the wall thereof, handle means on said lowermost end of the inner sleeve to rotate the inner sleeve relative to the outer sleeve and wall of the bin, said sleeves being inclined upward relative to the bin with their upper ends near the top of the bin, means connecting said upper ends of the sleeves with the bin to support the sleeves in their inclined position, said outer sleeve having an opening near the top, said inner sleeve having an opening in the top thereof in a position whereby the inner sleeve may be rotated to one position relative to the outer sleeve to align the

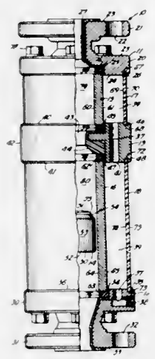
openings relative to one another, said inner sleeve having an opening in its lowermost end which is exterior to said bin, cap means to close said lower opening, whereby grain may be filled into the bin to near the top of the bin above the openings in the upper end of the sleeves and said handle may be rotated to rotate said upper opening in said inner sleeve relative to said upper opening in said outer sleeve to align the openings to allow grain to gravitate into the upper openings of the sleeves and through the inner sleeve and out the lower opening in the inner sleeve on the exterior of the wall of the bin for obtaining a sample of the grain in the bin near the top of the bin.

4,838,095

SIGHT GLASS CONSTRUCTION

Michael Sheridan, Old Bridge, N.J., and Kenneth Jaffe, Boulder, Colo., assignors to Ethylene Corp., Murray Hill, N.J.

Filed Feb. 1, 1988, Ser. No. 151,169
Int. Cl.[4] G01N *1/10*
U.S. Cl. 73—864.63 **4 Claims**



1. An improved sight glass for sampling fluids, comprising: first and second end elements, a first inner transparent tubular element of chemically resistant material interconnecting said end elements to form a chamber for retaining fluids for visual examination, a second outer transparent tubular element interconnecting said end elements in substantially coaxial relation relative to said first tubular element to define a cylindrical interstice therebetween in non-communicating relation relative to said chamber, one of said end elements having fluid drain means incorporated therein communicating with said interstice whereby upon the fracture of said inner tubular element during use, fluids within said chamber will flow into said interstice to be collected by said fluid drain means.

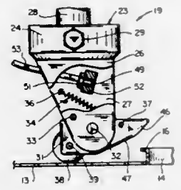
4,838,096

BUNG OPENING LOCATOR AND METHOD

Terry B. Lowe, 133 Pagosa Way, Fremont, Calif. 94539

Filed May 6, 1988, Ser. No. 191,281
Int. Cl.[4] B67L *3/02*
U.S. Cl. 73—865.8 **17 Claims**

1. In apparatus for locating the bung opening of a liquid container: a locator pin adapted to be received in the opening, a follower arm pivotally mounted on the pin for movement between a first position in which the arm is generally perpendicular to the longitudinal axis of the pin and a second position in which the arm is aligned with the longitudinal axis of the pin



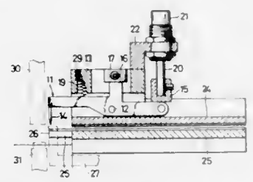
and can be received in the opening with the pin, and sensor means for determining when the arm is in the second position.

4,838,097

DETECTING APPARATUS FOR DETECTING REINFORCING STRIP ON SLIDE FASTENER CHAIN

Hideo Shimai, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 8, 1988, Ser. No. 229,851
Claims priority, application Japan, Aug. 10, 1987, 62-122403[U]
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—865.9 **6 Claims**



1. A detecting apparatus for detecting the presence and position of a reinforcing strip on a continuous slide fastener chain having a pair of tapes and coupling elements, which apparatus comprises:

(i) a pair of identical lever means, each rotatable between a horizontal retracted position and a downwardly tilted operative position and having at one end a vertically extending detecting probe movable into and away from the passage of the slide fastener chain;

(ii) a position detecting means responsive to the operation of said lever means for discontinuing the operation of said apparatus;

(iii) a shutter means connected to and rotatable with said lever means for coming into and out of intercepting relation to said position detecting means; and

(iv) a biasing means normally urging said probe counterclockwise toward the passage of the fastener chain, said biasing means having a biasing force adjusted to an extent to allow said probe to pass through the fastener tape but not through the reinforcing strip.

4,838,098

CONTAINED RADIOLOGICAL ANALYTICAL CHEMISTRY MODULE

David M. Barney, Scotia, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 2, 1987, Ser. No. 127,311
Int. Cl.[4] G01N *7/00*
U.S. Cl. 73—19 **18 Claims**

1. a system for providing analytical determination of a plurality of water chemistry parameters with respect to water samples subject to radiological contamination, said system comprising:

a containment;

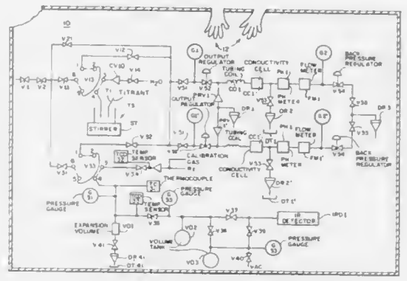
water sample analyzing means, disposed within said containment, for analyzing water samples received within said containment, said analyzing means comprising:

a sampling section for providing a predetermined volume of sample for analysis;

a flow control section for controlling the flow through the system; and

a gas analysis section for analyzing samples provided by said sampling section,

said sampling section including a controllable multiple port valve means for, in one position, metering out a sample of a predetermined volume and for, in a second position, delivering the water sample for analysis;



said flow control section including means for reducing the pressure in a portion of the system to provide a low pressure region, and measurement means located in said low pressure region for measuring at least one sample parameter at low pressure; and

said gas analysis section including means for isolating a portion of the water samples from the sampling section, means for extracting dissolved gases from the sample into a small expansion volume; means for measuring the gas pressure of the volume of extracted gas within said expansion volume; means for determining the thermoconductivity of the extracted gas within the expansion volume so as to enable the amount of hydrogen in the gas to be determined; means for providing dilution of the gases from the sample with an inert gas; and infrared detector means for detecting the amount of at least one other gas contained in the extracted gas.

4,838,099

GYROCOMPASS

Thomas R. Quermann, Huntington Station, N.Y., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Jun. 25, 1987, Ser. No. 66,282
Int. Cl.[4] G01C *19/28, 19/48*
U.S. Cl. 74—5.47 **11 Claims**

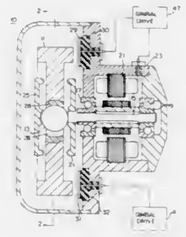
1. A gyroscope comprising:

a housing;

a rotor within said housing having a central aperture with a predetermined diameter and a circumferential outer surface for said aperture;

a drive shaft having a spherical end section, of diameter less than said predetermined diameter, positioned in rolling contact with said outer surface;

means for detecting orientations of said rotor with repect to said housing; and



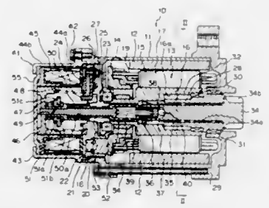
means coupled to said detecting means for rotating said drive shaft.

4,838,100

STARTER FOR ENGINE

Toshinori Tanaka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1988, Ser. No. 159,377
Claims priority, application Japan, Feb. 23, 1987, 62-40962
Int. Cl.[4] F02N *15/06*; H01F *7/02*; H02K *21/28*
U.S. Cl. 74—7 A **10 Claims**



1. In a starter for an engine that includes:

a d.c. motor having a tubular yoke for forming a magnetic path, an armature rotary shaft disposed inside said yoke and having an interior passage, and magnetic pole means which is disposed on the inner surface of said yoke;

an overrunning clutch provided inside the interior passage of said armature rotary shaft;

an output rotary shaft axially slidably supported inside the interior passage of said armature rotary shaft, said output rotary shaft receiving rotational force from said armature rotary shaft through said overrunning clutch; and

an electromagnetic switch disposed coaxially of said armature rotary shaft comprising actuating means connected thereto, said actuating means disposed coaxially of said output rotary shaft;

said electromagnetic switch causing said rod to move axially, to urge said output rotary shaft to move axially and also permitting power supply to said d.c. motor;

the improvement comprising;

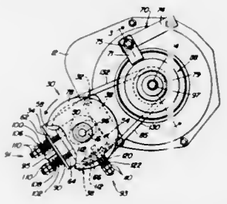
said magnetic pole means comprising on the order of six magnetic poles defined by respective permanent magnets, and means for supporting the permanent magnets on the inner surface of said yoke with the permanent magnets being spacedly disposed about the circumference of the yoke, and with there being defined substantially the same spacing between all adjacently disposed permanent magnets.

4,838,101

POWER TAKE-OFF SHAFT STABILIZER UNIT

Dale R. Dobberpuhl, and Edward C. Kruel, both of Horicon, Wis., assignors to Deere & Company, Moline, Ill.

Filed Sep. 1, 1987, Ser. No. 91,699
Int. Cl.[4] F16H *37/10*
U.S. Cl. 74—15.63 **10 Claims**



1. A power take-off shaft stabilizer unit for stabilizing the position of a power take-off shaft relative to an output shaft of an engine and for tensioning a belt carried between them, said stabilizer unit comprising:

means for operatively connecting said stabilizer unit directly to said engine, said connecting means including a first flange with at least one hole therein and a second flange with a slot formed therein;

bearing means operatively associated with said connecting means for allowing rotation of said power take-off shaft;

first means operatively connected to said bearing means and registrable with the hole of the first flange for maintaining an approximately constant belt tension between the belt of said engine output shaft and said power take-off shaft; and

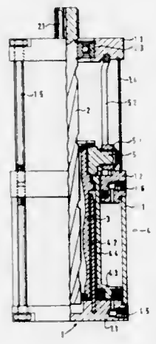
second means operatively connected to said bearing means and registrable with the slot in the second flange for maintaining the relative positions of said power take-off shaft and said connecting means.

4,838,102

ROTATING DRIVE MECHANISM FOR SWINGING DOORS ESPECIALLY ON VEHICLES

Jurgen Bode, Kassel, and Manfred Horn, Kaufungen, both of Fed. Rep. of Germany, assignors to Gebr. Bode & Co, GmbH, Kassel, Fed. Rep. of Germany

Filed Feb. 19, 1988, Ser. No. 158,182
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1987, 3705370
Int. Cl.[4] E05F *15/04*; F01B *3/04*; F16H *21/44*
U.S. Cl. 74—89.15 **8 Claims**



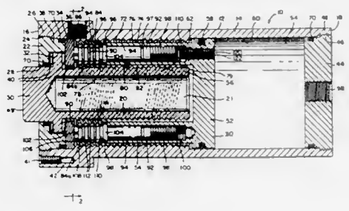
1. In a rotating drive mechanism for swinging doors, the mechanism having a housing, a drive shaft, a helical transmission comprising a stator that is rigidly connected to the housing of the rotating drive mechanism, a rotatable rotor rigidly connected to the drive shaft and axially fixed, a coupling component axially movable to rotate the rotor relative to the stator, and a drive cylinder with a piston rod connected to the coupling component to axially move the coupling component, the improvement wherein the drive cylinder comprises a double-acting annular cylinder accommodating portions of the rotor or of the drive shaft and having an outer and an inner jacket, a base, a cap and an annular piston positioned tightly against the outer and inner jackets and wherein the piston rod comprises a tubular piston rod extending between the inner jacket and the cap and connected outside of the cylinder to the coupling component.

4,838,103

FLUID-POWER DEVICE WITH ROLLERS

Paul P. Weyer, 48811 284th SE., Enumclaw, Wash. 98022

Continuation-in-part of Ser. No. 931,223, Nov. 14, 1986, Ser. No. 881,904, Jul. 3, 1986, Ser. No. 662,256, Oct. 17, 1984, Ser. No. 692,293, Jan. 17, 1985, and Ser. No. 803,954, Dec. 2, 1985, each is a continuation-in-part of Ser. No. 575,228, Jan. 30, 1984, Pat. No. 4,590,816. This application Jan. 20, 1987, Ser. No. 6,007
The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.
Int. Cl.[4] F01B *3/00*; F16H *25/24, 55/18*
U.S. Cl. 74—89.15 **93 Claims**



1. A fluid-power device, comprising:

a body;

an axially extending drive member supported for movement relative to said body and connectable to an external device, one of said body or said drive member having a plurality of helical grooves with ridges therebetween formed on a surface portion thereof and having an axial pitch and a lead angle with a left-hand or right-hand turn;

a plurality of rollers, each having at least one circumferential ridge;

an axially reciprocating member reciprocally mounted within said body, said reciprocating member rotatably retaining said rollers in fixed axial and circumferential position relative to said reciprocating member during powered operation of the fluid-power device, said rollers being retained by said reciprocating member in circumferentially distributed arrangement in seated rolling engagement with said grooved surface portion for transmitting force between said reciprocating member and the one of said body or said drive member having said grooved surface portion, each ridge of said rollers being positioned for rolling travel in the corresponding grooves of said grooved surface portion, said rollers being retained by said reciprocating member in an axially skewed position relative to said body or drive member with which engaged, such that the angle of skew corresponds to said hand turn of said engaged helical groove so as to improve angular alignment of said roller ridges with said engaged helical grooves of said grooved surface portion;

means for transmitting torque between said reciprocating member and the other of said body or said drive member; and

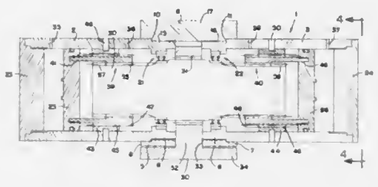
at least one piston mounted for reciprocal movement and operatively engaging said reciprocating member.

4,838,104

CENTER MOUNTED AND CENTER DRIVE HELICAL SPLINE ACTUATOR

Thomas N. Riley, Portage, Mich., assignor to Pneumo Abex Corporation, Boston, Mass.

Filed Aug. 7, 1987, Ser. No. 83,029
The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.
Int. Cl.[4] F16H *25/18*
U.S. Cl. 74—99 R **24 Claims**



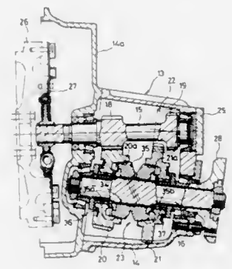
1. An actuator comprising a pair of cylinder housings connected together in end-to-end aligned relationship, a shaft having opposite ends extending into respective inboard ends of said cylinder housings, means mounting said shaft interiorly within said cylinder housings for rotation relative to said cylinder housings, piston means simultaneously axially movable within said cylinder housings toward and away from each other and the respective ends of said shaft, means for converting axial movement of said piston means into rotational movement of said shaft, and a drive member connected to said shaft interiorly within said cylinder housings intermediate the ends of said shaft for rotation therewith, said drive member extending outwardly from said shaft exteriorly of said cylinder housings intermediate the ends of said actuator.

4,838,105

REVERSING GEAR ASSEMBLY FOR YACHTS

Kazuhiko Yano, Toyonaka; Kazuhiko Ohtsuki, Takarazuka, and Gen Yoshii, Mukonoso-Honmachi, all of Japan, assignors to Kanzaki Kokyukoki Mfg. Co., Ltd., Amagasaki, Japan

Filed Jun. 19, 1987, Ser. No. 63,822
Claims priority, application Japan, Aug. 11, 1986, 61-188014
Int. Cl.[4] F16H *3/14*
U.S. Cl. 74—377 **3 Claims**



1. A reversing gear assembly for use in yachts between an engine, mounted in a stern portion of the hull of a yacht with the output end of the engine directed towards the stern, and a propeller shaft extending backwardly and downwardly from the hull, the reversing gear assembly comprising:

a gear casing (**14**) in which are arranged a horizontal input shaft (**15**) extending forwardly from said casing, an inclined output shaft (**16**) extending backwardly and downwardly from said casing, and an intermediate shaft (**17**) disposed in parallel with said output shaft;

axially spaced first cylindrical gear (**18**) and second cylindrical gear (**19**) which are fixedly mounted on said input shaft (**15**), axially spaced conical gear (**20**) and third cylindrical gear (**21**) which are rotatably mounted on said output shaft (**16**), said conical gear meshing with said first cylindrical gear and said third cylindrical gear being offset in position slightly from said second cylindrical gear in the fore and aft direction, a skew cylindrical gear (**22**) mounted on said intermediate shaft (**17**) and meshing with both of said second and third cylindrical gears, center of engagement between said second cylindrical gear and said skew cylindrical gear being located substantially on a common perpendicular line of said input and intermediate shafts; and

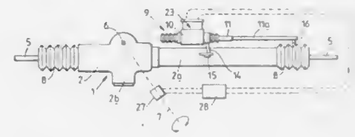
a clutch means (**23**) disposed on said output shaft (**16**) and between said conical gear (**20**) and said third cylindrical gear (**21**) for coupling one of the said gears selectively to said output shaft.

4,838,106

POWER ASSISTANCE MEANS FOR A STEERING GEAR AND A STEERING GEAR ASSEMBLY WHICH INCLUDES SUCH MEANS

Frederick J. Adams, Clevedon, Great Britain, assignor to TRW Cam Gears Limited, Clevedon, Great Britain

Filed Nov. 12, 1987, Ser. No. 119,538
Claims priority, application United Kingdom, Nov. 28, 1986, 8628557
Int. Cl.[4] B62D *5/04*
U.S. Cl. 74—388 PS **15 Claims**



1. Power assistance means for a rack and pinion steering gear having a main rack bar longitudinally displaceable in a main housing, a main pinion rotatably mounted in the main housing and engaging teeth of the main rack bar, said pinion being rotated in response to a steering input to effect in longitudinal displacement of the rack bar, and wherein the power assistance means comprises an auxiliary rack bar longitudinally displaceable in an auxiliary housing; an auxiliary pinion rotatably mounted in the auxiliary housing and engaging teeth of the auxiliary rack bar; electric motor means carried by the auxiliary housing, said electric motor means providing a sole input drive to rotate the auxiliary pinion for displacing the auxiliary rack bar; mounting means for mounting the auxiliary housing in a fixed position relative to the main housing; coupling means for coupling the auxiliary rack bar for movement in unison with the main rack bar, and switch means for controlling operation of the electric motor means, said switch means being intended to be responsive to the steering input so that the auxiliary rack bar is driven by the electric motor means in unison with the main rack bar to provide power assistance thereto.

4,838,107

VIBRATION DAMPING ROTARY DRIVE ELEMENT

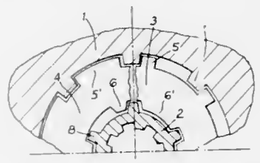
Gert Herrmann, Solingen, Fed. Rep. of Germany, assignor to Uni-Cardan Aktiengesellschaft

Filed Nov. 3, 1987, Ser. No 116,392

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637383

Int. Cl.⁴ F16D *3/14*

U.S. Cl. 74—411 **7 Claims**



1. A rotary drive element comprising an axially extending inner part connectable to a shaft or other rotary element; an axially extending outer part coaxial with said inner part and axially unmovable but rotatably supported on the inner part and connectable to a further rotary element; and an annular space defined between the inner part and the outer part and containing a viscous fluid and a plurality of annular plates extending transversely of the axis of said inner and outer parts and having radially inner and outer circumferentially extending teeth engaging circumferentially extending teeth in the inner and outer parts for the torque transmission therebetween, wherein the plates comprise a first set of plates whose inner teeth engage the teeth in the inner part substantially without circumferential clearance and whose outer teeth engage the teeth in the outer part with a circumferential clearance, and a second set of plates which alternate with the plates of the first set and whose outer circumferential teeth engage the teeth in the outer part substantially without circumferential clearance and whose inner teeth engage the teeth in the inner part with a circumferential clearance so that the inner and outer parts can move angularly relative to one another and such movement is damped by the viscous fluid between the plates.

4,838,108

BEVEL GEAR ANGLE DRIVE

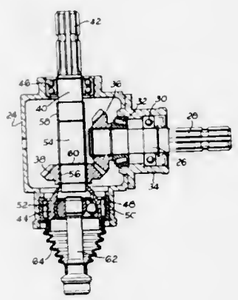
Michael Flanhardt, Cologne, and Karl Clemens, Siegburg, both of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Fed. Rep. of Germany

Filed Mar. 3, 1988, Ser. No. 164,064

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1987, 3709769

Int. Cl.⁴ F16H *1/14, 1/26*

U.S. Cl. 74—417 **6 Claims**



1. A bevel gear angle drive comprising a drive housing; input and output shafts supported in said housing; a bevel gear mounted on each of said shafts within said housing, said bevel gears being interengaged with one another; one of said shafts comprising a journal connected for torque transmission to an outer joint part of a constant velocity ratio universal joint, said universal joint having an inner joint part disposed relative to said outer joint part to permit relative angular movement between said parts; first bearing means in said housing rotatably supporting said journal; second bearing means in said housing spaced axially of said journal from said first bearing means and rotatably supporting said outer joint part; said bevel gear on said one shaft being disposed on said journal between said first and second bearing means, said journal includes two locations spaced axially apart for said journal for selective disposal thereon of said bevel gear in torque transmitting connection with said journal, each of said two locations comprises a set of teeth extending radially outwardly of said journal, and said bevel gear including a set of cooperating teeth at a central bore thereof engaged with a said set of teeth at one of said locations providing a said torque transmitting connection of said bevel gear with said journal.

4,838,109

REACTION CABLE ASSEMBLY INCLUDING CABLE SLACK ADJUSTING MEANS

Vernon E. Stewart, Moberly, Mo., assignor to Orscheln Co., Moberly, Mo.

Filed Mar. 4, 1988, Ser. No. 164,422

Int. Cl.⁴ F16C *1/22*

U.S. Cl. 74—501.5 R **9 Claims**

1. A parking brake operating system for a vehicle or the like including an operating member movably connected with the vehicle chassis, and a pair of wheel brake operating means, comprising:

(a) a floating reaction bracket housing , including:

(1) a horizontal wall portion; and

(2) first and second transversely-extending vertical wall portions extending upwardly and downwardly from said horizontal wall portion, respectively, said first and second vertical wall portions containing first and second openings, respectively;

(b) a reaction cable assembly including:

(1) a first outer tubular conduit connected at opposite ends with said reaction housing and with said chassis, respectively; and

(2) a first inner strand mounted for relative longitudunal movement within said first conduit, said first strand extending through said first housing opening, opposite ends of said first strand being connected with said operating member and with one of said wheel brake operating means, respectively;

(c) a second inner strand connected at one end with the other of said wheel brake operating means; and

(d) cable slack adjusting means connecting the other end of said second strand with said housing;

(e) said housing first and second vertical wall portions having different angle of inclination relative to said horizontal wall portion, thereby to cause said reaction cable assembly to normally have a slighty bent condition when said first and second strands are untensioned and said brake operating means are each in a brake-disengaged condition, whereby upon tensioning of said first strand by operation of said operating member to operate the associated wheel brake means, the cable assembly is at least partly straightened to tension said second strand and thereby operate the other wheel brake means.

4,838,110

CONNECTING DEVICE FOR CONNECTING BOWDEN CABLE CONTROL ELEMENTS, AND THE LIKE

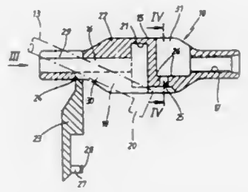
Heinz Koukal, and Klaus Arold, both of Sindelfingen, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 16, 1988, Ser. No. 156,025

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1987, 3704640

Int. Cl.⁴ F16C *1/10*

U.S. Cl. 74—502.6 **21 Claims**



1. A connecting device for connecting together and fixedly adjusting the axial distance between a pair of axially aligned control elements, such as rods, Bowden cables or the like, comprising:

a connecting element having first bore means at a first axial end thereof for receiving an end of a first control element to be connected thereat;

said first bore means having a first section extending from the first axial end of the connecting element and adjoining second section of a larger cross-section than the first section to form an accommodating space for anchoring an angled end of a first control element;

said connecting element including screw thread means for threadably attaching the connecting element to a threaded end of a second control element; and

wherein said accommodating space is constructed as a ring-shaped groove which permits relative rotation of the connecting element and the first control element without relative axial movement therebetween and whereby the connecting element can be rotated for precisely adjusting the axial distance between the first and second control element connected thereto without rotating said control element.

4,838,111

LIMITING STOP FOR THE SWINGING ANGLE OF A PIVOTED ARM

Karl H. Schmidt, Wilnsdorf-Niederdielfen, Fed. Rep. of Germany, assignor to Siegenia-Frank KG, Siegen, Fed. Rep. of Germany

Filed Apr. 4, 1988, Ser. No. 176,856

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1987, 8705069[U]

Int. Cl.⁴ G05G *1/04;* E05D *15/30*

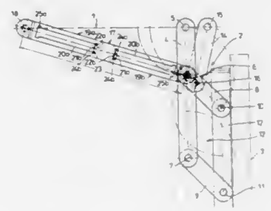
U.S. Cl. 74—526 **5 Claims**

1. A limiting stop for the swinging angle of an arm which is movable around a bearing axis, on which one end of a strut is pivoted at the structural part which carries the bearing axis, the other end of the strut being pivotally connected to the arm at a distance from said bearing axis, said stop being characterized in that:

the strut consists of two structurally similar links , each of said links having an elongated slot and a stop tongue which extends at an angle to the plane of the link,

that the stop tongue of each link extends into the elongated slot of the other link for lengthwise movement,

that one end of the elongated slot of each link which lies adjacent to its stop tongue functions as a stop for the stop tongue of the other link,



that each stop tongue displays at its end projecting supporting flanges which extend laterally of the longitudinal edges of the elongated slot of the opposite link except at an enlarged opening in the slot which is distant from the stop end of the slot and that the relative displacement of the links is less than the distance between the stop end and the enlarged end of each of said slots

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4,838,112

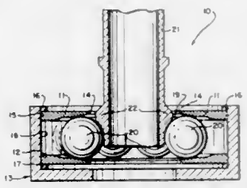
MULTIPLE RATE FORCE AND MOVEMENT ACTUATOR

William H. Barner, Laguna Beach, Calif., assignor to Inotek-Westmoreland Joint Venture, Mission Viejo, Calif.

Filed Sep. 1, 1987, Ser. No. 91,904

Int. Cl.⁴ G05G *5/06;* F16F *1/34*

U.S. Cl. 74—527 **5 Claims**



1. A selectively controlled rate and force actuator having a pair of spaced apart annular leaf springs, a housing for holding the outer edges of said annular springs and leaving the inner edges free to distend, a plurality of ball bearings arranged in a closed path adjacent the inner edges of the springs, a shaft located within bearings and annular spring bore adapted for reciprocating movement, and a cam carried by said shaft for engaging the ball bearings and moving them between the springs to reactively distend the springs outwardly, comprising:

the surface of each spring facing the other spring having,

a first region adjacent the spring inner edge of a first predetermined radially extending curved surface configuration;

a second region adjacent the first region having a second predetermined curved surface configuration differing from said first region surface configuration; and

said first and second configurations effecting a substantially constant reactive force urging the ball bearings toward the shaft.

4,838,113

THROTTLE ACTUATOR FOR A VEHICLE

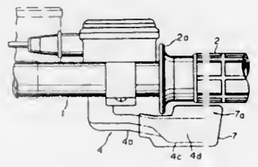
Selya Matsushima; Takeshi Yanagisawa; Nobuo Miura, and Kuniaki Arakawa, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1986, Ser. No. 918,991

Claims priority, application Japan, Oct. 15, 1985, 60-157621[U]; Oct. 30, 1985, 60-243262; Oct. 30, 1985, 60-243264; Oct. 30, 1985, 60-243263; Nov. 1, 1985, 60-245339; Nov. 1, 1985, 60-245338; Jun. 12, 1986, 60-89579[U]

Int. Cl.[4] B62K *21/12*

U.S. Cl. 74—551.8 4 Claims



1. A throttle mechanism in combination with a vehicle having a steering device including a handlebar, a handle grip on the end of said handlebar containing a flange extending substantially perpendicularly to the inner end thereof, said throttle mechanism being attached to said handlebar and comprising:

a throttle lever disposed subjacent said handle grip and being pivotally mounted to said throttle mechanism for movement toward said handle grip flange in a generally horizontal plane substantially parallel to the plane of said handlebar;

a shield plate mounted on said throttle lever including a flange portion extending upwardly to a position to locate the upper peripheral edge of said flange portion above the lowermost portion of said handle grip flange, whereby said flange portion cooperates with said handle grip flange to restrict a gap between said throttle lever and said handle grip when pivotal movement of said throttle lever places said shield plate adjacent said handle grip.

4,838,114

ARRANGEMENTS FOR CONVERTING ROTARY MOTION TO LINEAR MOTION

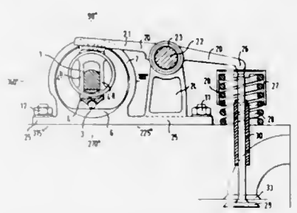
Frederick M. Stidworthy, 2 Butlers Close, Long Compton, Nr. Shipston-on-Stour, Warwickshire, United Kingdom CV36 5JY

PCT No. PCT/GB85/00547, § 371 Date Jul. 17, 1987, § 102(e) Date Jul. 17, 1987, PCT Pub. No. WO87/03333, PCT Pub. Date Jun. 4, 1987

PCT Filed Nov. 29, 1985, Ser. No. 95,572

Int. Cl.[4] F16H *53/00*

U.S. Cl. 74—568 R 20 Claims



1. A poppet valve arrangement comprising:

a follower member rotatable with a drive shaft about the axis of rotation of the shaft;

the follower member being rotatable within a hollow cam member having an internal cam profile with which the follower member is held in contact;

one of the follower member and cam member being capable of limited linear movement in a direction transverse to the axis of rotation of the shaft; and

the said one of the follower member and cam member being coupled to the poppet valve so that rotation of the shaft is translated into movement of the said one of the follower member and cam member and thereby into linear movement of the poppet valve.

4,838,115

PEDAL FOR A BICYCLE

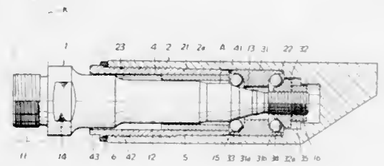
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Apr. 22, 1988, Ser. No. 184,681

Claims priority, application Japan, Apr. 30, 1987, 62-66746

Int. Cl.[4] G05G *1/14*

U.S. Cl. 74—594.4 5 Claims



1. A pedal for a bicycle, comprising:

(a) a shaft unit comprising (i) a pedal shaft, (ii) a tubular member having a pair of bearing surfaces and first and second end surfaces positioned at both axial ends of said tubular member, (iii) a pair of bearing members for rotatably supporting said tubular member to said pedal shaft, (iv) a pusher comprising means for adjusting the rotational condition of said tubular member and for holding said tubular member on said pedal shaft, said pusher having a bearing surface for contacting one of said bearing members, and (v) a lock member for securing said pusher at the adjusting position thereof;

(b) a pedal body rotatably mounted on said shaft unit and including (i) a receiving bore for receiving therein said shaft unit, said receiving bore being open at at least one axial end and having an inside diameter substantially equal to or slightly larger than an outside diameter of said tubular member, (ii) a first contact position positioned in said receiving bore and abutting against said first end surface of said tubular member, and (iii) a screw thread positioned at a side of said receiving bore adjacent said at least one open axial end of said receiving bore; and

(c) a lock bush having (i) a second contact portion abutting against said second end surface of said tubular member and (ii) a screw thread engageable with said screw thread of said pedal body, said tubular member being detachable from said pedal body, said screw thread of said lock bush comprising thread means for engaging with said screw thread of said pedal body to bring said tubular member into press-contact with said first contact portion of said pedal body responsive to rotation of said lock bush relative to said pedal body in a first direction to thereby secure said tubular member thereto and to enable said pedal body to be removed from said shaft unit responsive to rotation of said lock bush relative to said pedal body in a second direction opposite to said first direction.

4,838,116

CRANK

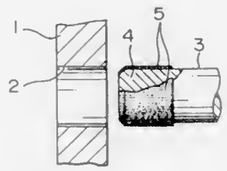
Yasuo Saito, Fujisawa; Tadashi Ozaki, Yokosuka, and Isao Masuda, Tachikawa, all of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Aug. 16, 1988, Ser. No. 232,785

Claims priority, application Japan, Aug. 31, 1987, 62-214992

Int. Cl.[4] F16C *3/04*

U.S. Cl. 74—595 2 Claims



1. A crank comprising:

a crank arm having a hole;

a crank pin having an end to be press fitted into said hole; and

a tri-iron tetroxide thin film formed over at least one of the inner surface of said hole and the outer periphery of said end;

said crank being arranged such that said end of said crank pin is press fitted into said hole formed in said crank arm.

4,838,117

CAMERA PANNER

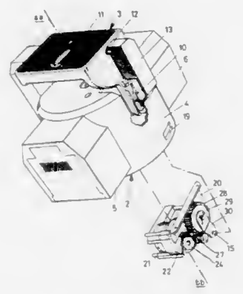
Wilfried A. A. Bittner, Kowloon, Fed. Rep. of Germany, assignor to Maxwell Electronics Limited, Kowloon, Hong Kong

Filed Aug. 24, 1987, Ser. No. 88,258

Claims priority, application United Kingdom, Aug. 26, 1986, 8620625

Int. Cl.[4] F16H *37/14, 55/22;* F16M *11/12*

U.S. Cl. 74—665 C 11 Claims



1. An electrically operated panner for a camera or the like comprising a base, a housing mounted on said base, first and second drive means wholly contained within said housing, said first drive means comprising an electric motor including a motor shaft, said motor being fixed relative to said housing, a worm on said motor shaft, a first wormwheel in mesh with said worm, a second worm co-axial with and connected to said first wormwheel, a second wormwheel in mesh with said second worm, said second wormwheel being drivingly connected to said base and rotating said base relative to said housing about a first axis upon actuation of said motor; said second drive means comprising another electric motor including a motor shaft, said another motor being fixed relative to said housing, a worm on said motor shaft of said another motor, a first wormwheel in mesh with said worm, a second worm co-axial with and connected to said first wormwheel, a second wormwheel in mesh with said second worm, a first are eccentrically mounted on said second wormwheel which moves arcuately on rotation of said second wormwheel, a support for said camera or the like mounted above said housing and pivoting about a second axis perpendicular to said first axis; and a second arm extending from said support into said housing, the distal end of said second arm being drivingly connected to the distal end of said first arm and which upon actuation of said second drive means rotates said support about said second axis.

4,838,118

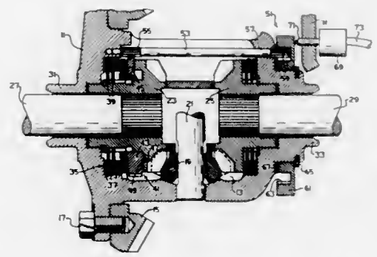
ANTI-SPIN DIFFERENTIAL

Carl R. Binkley, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 10, 1988, Ser. No. 166,273

Int. Cl.[4] F16H *1/44*

U.S. Cl. 74—711 8 Claims



1. A differential gear mechanism of the type including a gear case disposed within an outer differential housing and defining an axis of rotation and a gear chamber; differential gear means disposed in said gear chamber, said differential gear means including at least one input gear and first and second output gears; lock-up means for locking up said differential gear means to retard differentiating action, said lock-up means including clutch means operable between an engaged condition, effective to retard relative rotation between said gear case and said output gears, and a disengaged condition, said lock-up means further including cam means operatively associated with said clutch means, and including first and second cam members, said second cam member being axially movable relative to said first cam member in response to relative rotation therebetween to effect said engaged condition of said clutch means, one of said first and second cam members defining an outer peripheral retarding surface; an elongated engagement member defining an axis of rotation, being mounted for rotation relative to said gear case, and operably associated with said outer peripheral retarding surface, whereby rotation of either of said output gears relative to said gear case causes rotation of said engagement member relative to said gear case; and retarding means for retarding rotation of said elongated engagement member relative to said gear case; characterized by:

(a) said elongated engagement member being supported by said gear case at two axially spaced-apart locations, and including a terminal portion extending through said gear case to the exterior thereof;

(b) said retarding means including a retarding mechanism, including a portion fixedly mounted relative to said outer differential housing, said retarding mechanism including an actuation member movable, in repsonse to an external signal, between a first position and a second position;

(c) said retarding means further including a retarding member, disposed to rotate about the axis of rotation of the

gear case, and operably associated with said terminal portion of said engagement member, whereby, in said first position, said actuation member permits said retarding member and said engagement member to rotate relative to said gear case, and in said second position, said actuation member engages said retarding member, retarding its rotation relative to said gear case, thus retarding rotation of said engagement member about its axis, and retarding the rotation of said one of said cam members defining said outer peripheral retarding surface.

4,838,119

DIFFERENTIAL GEAR ASSEMBLY WITH VISCOUS AND FRICTION CLUTCH MECHANISMS

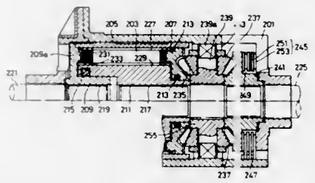
Masao Teraoka; Osamu Ishikawa, and Yukio Yuhashi, all of Tochigi, Japan, assignors to Tochigifujisangyo Kabushiki Kaisha, Japan

Filed Apr. 20, 1987, Ser. No. 40,315

Claims priority, application Japan, Apr. 24, 1986, 61-060893[U]; Nov. 12, 1986, 61-172516[U]

Int. Cl.⁴ F16H *1/455*; F16D *35/10, 25/063*

U.S. Cl. 74—711 **3 Claims**



1. A differential gear assembly comprising:
a pair of said gears mounted for relative rotation about a common axis within a differential casing;
a pinion gear in meshed relationship with and interconnecting the respective side gears;
an operating chamber formed between an outer member and an inner member integral with an axle, said chamber extending in the direction of said axis and being filled with a viscous fluid;
a plurality of resistance plates disposed within the operating chamber and alternately joined to the outer member and the inner member, whereupon relative rotation of said resistance plates occasioned by relative rotation of said outer and inner members will result in an increase in fluid pressure within said operating chamber;
a fictional clutch mechanism adjacent to one of the side gears for restricting the differential rotation of the side gears; and
force transmitting means responsive to said increase in fluid pressure for applying a thrust force to the friction clutch mechanism, the arrangement of said force transmitting means being such that the meshed relationship between said pinion gear and said side gears is isolated from and thus unaffected by the application of said thrust force.

4,838,120

CENTRIFUGALLY ACTUATE CLUTCH FOR A LIMITED SLIP DIFFERENTIAL

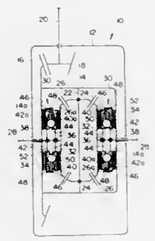
Tadashi Okada, Kanagawa; Yuuji Furukawa, Tachikawa, and Makoto Murata, Tokyo, all of Japan, assignors to Nissan Motor Company, Limited, Yokahama, Japan

Filed Apr. 21, 1983, Ser. No. 487,300

Claims priority, application Japan, May 21, 1982, 57-74360[U]

Int. Cl.⁴ F16H *1/44*

U.S. Cl. 74—711 **11 Claims**



1. A limited slip differential comprising:
a casing adapted to be rotatably driven;
a pair of pinion gears retained within said casing;
a pair of side gears retained within said casing and engaging said pinion gears to form a differential gear mechanism; and
centrifugal clutch means for providing a direct drive between said casing and both of said side gears when said side gears are driven to rotate in the same direction at a substantially equal speed, said speed being any speed which is higher than a predetermined value.

4,838,121

MANUALLY OPERATED CHANGE-SPEED MECHANISM IN POWER TRANSFER DEVICE

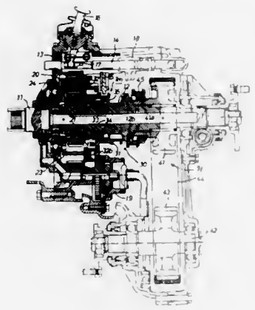
Keiji Takeshita; Hideo Hamano, and Shuichiro Ida, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Mar. 4, 1988, Ser. No. 164,410

Claims priority, application Japan, Mar. 10, 1987, 62-34817[U]

Int. Cl.⁴ F16H *3/44*

U.S. Cl. 74—785 **2 Claims**



1. A manually operated change-speed mechanism in a power transfer device for automotive vehicles, comprising:
an input shaft;

an output shaft arranged coaxially with said input shaft for relative rotation thereto;
a planetary gear unit mounted on said input shaft and having an input element mounted on said input shaft for rotation therewith and an output element connectable to said output shaft;
an internally splined clutch sleeve axially slidably mounted on an externally splined portion of said output shaft and shiftable between a first portion in which it is engaged with the output element of said gear unit to provide a low speed drive power train between said input and output shafts and a second position in which it is engaged with an externally splined portion of said input shaft to provide a high speed drive power train between said input and output shafts; and
a synchronizer assembly arranged to effect synchronous engagement between said clutch sleeve and the externally splined portion of said input shaft in shifting operation of said clutch sleeve toward the second position;
wherein said input shaft has an innermost end in the form of a conical portion, and said clutch sleeve is axially slidably mounted on an externally splined hub member fixed to said output shaft for rotation therewith, and wherein said synchronizer assembly comprises a synchronizer ring mounted on the conical portion of said input shaft for frictional engagement therewith, and thrust means for moving said synchronizer ring toward the externally splined portion of said input shaft in shifting operation of said clutch sleeve toward the second position to effect the frictional engagement of said synchronizer ring with the conical portion of said input shaft.

4,838,122

SPEED CHANGE DEVICE FOR BICYCLE

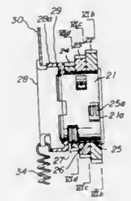
Kikuzo Takamiya, Kitamoto; Sadao Mabuchi, and Kazuhiro Inoue, both of Ageo, all of Japan, assignors to Bridgestone Cycle Co., Ltd., Tokyo, Japan

Filed Sep. 14, 1987, Ser. No. 95,851

Claims priority, application Japan, Sep. 18, 1986, 61-218225; Sep. 18, 1986, 61-218226; Sep. 18, 1986, 61-218227; Sep. 18, 1986, 61-218228; Sep. 18, 1986, 61-218229; Sep. 18, 1986, 61-218230

Int. Cl.⁴ F16H *3/44, 57/10*; F16D *13/04, 23/00*

U.S. Cl. 74—781 B **7 Claims**



1. A speed change device for a bicycle, comprising a carrier jointed to a crank arm, a plurality of planet gears rotatably supported on a plurality of shifts arranged in a circle on said carrier, each of said planet gears including a plurality of planet gear elements different in number of teeth, an internal gear in mesh with one of said planet gear elements of each of the planet gears and formed in an outer circumference with a sprocket to form a driven rotary body, rotary body one-way clutches for connecting said driven rotary body to said carrier, a plurality of sum gears provided on a crankshaft and in mesh with said planet gear elements of said planet gears, respectively, sun gear one-way clutches provided between inner circumferences of said sun gears and a fixed bearing enclosing said crankshaft, said sun gear one-way clutches being selectively connectable to selectively bring said sun gears into engagement with corresponding said planet gear elements, a pawl sleeve in the form of a hollow cylinder, said pawl sleeve being fitted on said fixed bearing, and a speed change cylinder rotatably fitted between said pawl sleeve and the sun gears, said pawl sleeve having a plurality of extendable and retractable pawls, said speed change cylinder being formed with openings corresponding to said pawls such that said sun gear one-way clutches may be selectively connected by rotating said speed change cylinder.

4,838,123

MOUNTING OF A PLANETARY GEAR ASSEMBLY ON A CASING

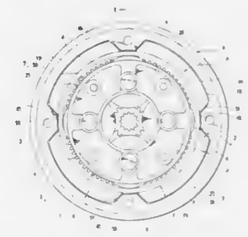
Hideyasu Matoba, 6-10,, Ajiharahonmachi, Tennoji-ku, Osaka, Japan

Filed Feb. 27, 1987, Ser. No. 19,789

Claims priority, application Japan, Mar. 27, 1986, 61-69674

Int. Cl.⁴ F16H *57/00, 1/28*

U.S. Cl. 74—801 **14 Claims**



1. Mounting for a planetary gear assembly of the type having a casing, a sun gear, a plurality of planetary gears and an outer inner-toothed gear within said casing, comprising:
a plurality of coupling projections formed on the inner surface of the casing, coupling arc parts formed on one side of the external surface of the outer inner-toothed gear and loosely fitted to said coupling projections, the coupling projections and casing being formed so that a clearance exists between the coupling arc parts and a round surface of the casing for permitting radial displacement of the outer inner-tooth gear with respect to the casing, the coupling arc parts further having slant edges which are formed to engage the coupling projections with a clearance defined therebetween for permitting angular displacement, the outer coupling arc parts also acting to distance an outer cylindrical surface of the outer inner-toothed gear from the round surface of the casing by a relatively wide space whereby vibration between the outer inner-toothed gear and the casing is attenuated.

4,838,124

SYSTEM FOR INTEGRALLY CONTROLLING AUTOMATIC TRANSMISSION AND ENGINE

Yukio Hamano, Kobe; Yuji Kashihara, Toyota; Keita Sakurai, Toyota; Hideki Yasue, Toyota, and Kagenori Fukumura, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jun. 22, 1987, Ser. No. 64,614

Claims priority, application Japan, Jun. 30, 1986, 61-153606; Aug. 8, 1986, 61-186494

Int. Cl.⁴ B60K *41/08*

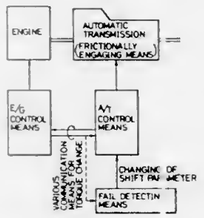
U.S. Cl. 74—866 **14 Claims**

1. A system for integrally controlling an automatic transmission and an engine, wherein engaged states of frictionally engaging devices are switched in accordance with a preset shift point so that gear stages can be automatically switched, and engine torque is changed during shifting to maintain satis-

factory shift characteristics and durability of the frictionally engaging devices, said system comprising:

communication means for carrying out said engine torque change;

detecting means for detecting whether or not said communication means is in a failed state; and



means for changing at least one shift parameter in said automatic transmission in a direction for securing durability of said frictionally engaging devices in accordance with detection by the detecting means of the failed states of said communication means.

4,838,125

SYSTEM FOR SHIFT CONTROL IN AUTOMATIC TRANSMISSION

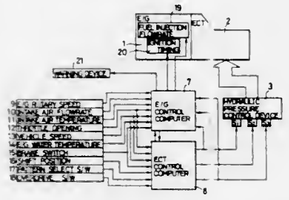
Yukio Hamano, Kobe; Hideo Tomomatsu, Nagoya; Fumiaki Izumi, Toyota, and Yutaka Taga, Aichi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Feb. 6, 1987, Ser. No. 12,136

Claims priority, application Japan, Feb. 7, 1986, 61-25433; Feb. 10, 1986, 61-27380; Apr. 18, 1986, 61-89248

Int. Cl.[4] B60K *41/18*

U.S. Cl. 74—866 **26 Claims**



1. A system for shift control in an automatic transmission, wherein gear stages are automatically switched in accordance with a preset shift pattern, comprising:

means for determining whether detected shifting data deviates from predetermined shifting data thereby determining whether a shifting was abnormal; and

means for changing said shift pattern in the subsequent shifting to a fail shift pattern, wherein shift points are set slightly lower when said shifting was determined abnormal.

4,838,126

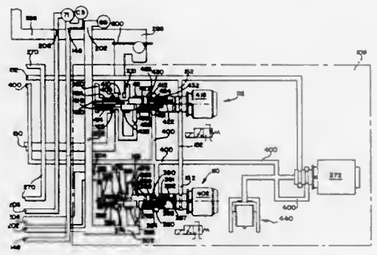
ELECTRO/HYDRAULIC CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION

Erich L. Wilfinger, Livonia; Ronald J. Polomski, Pinckney, both of Mich., and Darren L. Firth, Baulkham Hills, Australia, assignors to BTR Engineering (Australia) Limited, Melbourne, Australia

Filed Nov. 25, 1987, Ser. No. 125,121

Int. Cl.[4] B60K *41/10*

U.S. Cl. 74—869 **48 Claims**



1. An automatic transmission for a vehicle having an engine capable of producing torque, said transmission including gear elements capable of developing at least two different gear ratios between an input member and an output member, a first fluidically actuatable friction unit operable in combination with said gear elements for establishing a first gear ratio, a second fluidically actuatable friction unit operable in combination with said gear elements for establishing a second gear ratio, and an electrohydraulic control system for said automatic transmission comprising:

means for generating an actuating fluid pressure deliverable through separate fluidic circuits to said first and second friction units;

first shift valve means disposed in a fluidic circuit leading to said first fluidicially actuatable friction unit;

second shift valve means disposed in a fluidic circuit leading to said second fluidically actuatable friction unit;

first regulator means shiftable between two operable states in response to electrical signals being delivered thereto and arranged in combination with said first shift valve means for controlling fluid flow to said first fluidically actuatable friction unit as a function of the operable state of said regulator means;

second regulator means shiftable between two operable states in response to electrical signals being delivered thereto and arranged in combination with said second shift valve means for controlling fluid flow to said second fluidically actuatable friction unit as a function of the operable state of said regulator means;

at least one variable pressure solenoid whose variable pressure output is multiplexed to said first and second regulator means in a manner influencing the operable state of said first and second regulator means; and

electronic control means for converting input signals thereto relating to operating conditions of said transmission into output signals in accordance with a predetermined set of criteria and for providing shift quality between gear ratios by selectively operating said regulator valves such that a programmably profiled fluid output from said variable pressure solenoid is delivered to an on-coming friction unit to effect a smooth transition between gear ratios and then full actuating fluid pressure is delivered to the on-coming friction unit by either maximizing the pressure output of the variable pressure solenoid or changing the present state of the respective regulator valve to allow full

actuating fluid pressure to pass to the respective friction unit.

4,838,127

ULTRASONIC FLOW METER

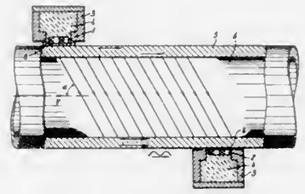
Pieter Herremans, Alblasserdam; Christiaan J. Hoogendijk, Sleeuwijk; Adriaan H. Boer, Sliedrecht, and Aart J. Van Bekkum, Hoornaar, all of Netherlands, assignors to Altometer, Produktiebedrijf Van Rheometron A.G., Netherlands

Filed Sep. 25, 1987, Ser. No. 101,263

Claims priority, application Netherlands, Sep. 29, 1986, 8602458

Int. Cl.[4] G01F *1/66*

U.S. Cl. 73—861.28 **4 Claims**



1. An ultrasonic flow meter for the measurement of the flow rate of a liquid in a pipeline comprising:

two piezoelectric transmitting-receiving transducers, each having a housing with means for attachment to a pipeline, said attachment being on opposite sides thereof, and in axially offset positions with respect to each other, said transducers alternatively transmitting ultrasonic pulses into the pipeline and receiving ultrasonic pulses therefrom in order to determine the flow rate from the transit time of the sonic pulses in the upstream and downstream directions;

each piezoelectric transmitting-receiving transducer comprising a row of adjacent subtransducers, the pulse emission face of which row is coupled over its entire length in the axial direction to the pipe wall;

means to produce control signals to activate the subtransducers, the phase difference between the control signals at every two adjacent subtransducers and the distance between the centers thereof being matched to each other in a manner such that the transducer deforms approximately sinusoidally with a periodic length which corresponds to the wavelength of Lamb surface waves to be generated in the pipe wall in the A_0 mode, which waves propagate in the axial direction along the pipe wall and, on the inside thereof, are converted into longitudinal waves in the adjacent liquid.

4,838,128

CORKSCREW

Wolfgang Tischler, Weinbergstrasse 33, D-8740 Bad Neustadt-/Saale, Fed. Rep. of Germany

Filed Mar. 18, 1988, Ser. No. 170,238

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1987, 8704060[U]

Int. Cl.[4] B67B *7/06*

U.S. Cl. 81—3.48 **4 Claims**

1. A cork removing device comprising in combination:

(a) a shaft portion

that is longitudinally divided into two shaft halves (2, 3) and

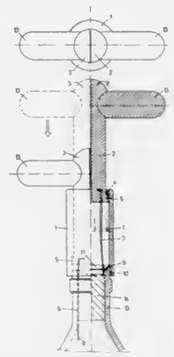
that has a top end that terminates in handle tabs (13),

(b) a guide sleeve (1)

that is slidably fitted around a bottom end of said shaft portion so that said bottom end of said shaft portion can be slidably moved within said guide sleeves (1), and

that contains a centering collar (10) that is adapted to fit onto the neck (12) of a bottle, and

(c) two metal tongues (6, 7) which serve as a cork pulling tool



that are attached to diametrically opposed halves (2, (3) of said shaft portion, and

that are located at a spaced apart distance approximating the diameter of the cork that is to be removed.

4,838,129

WIRE INSULATION STRIPPING APPARATUS

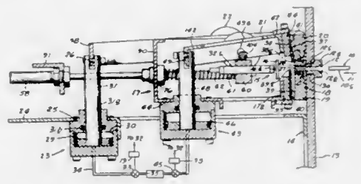
Richard L. Cope, Glendora, Calif., assignor to Eubanks Engineering Co., Monrovia, Calif.

Continuation of Ser. No. 877,204, Jun. 23, 1986, abandoned, which is a continuation of Ser. No. 652,958, Sep. 21, 1984, Pat. No. 4,601,093. This application Apr. 23, 1987, Ser. No. 43,681

The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.

Int. Cl.[4] H02G *1/12*

U.S. Cl. 81—9.5 **26 Claims**



1. Wire stripping apparatus for stripping insulation of a wire core, comprising:

(a) a guide forming at least one opening to receive an insulated wire end,

(b) wire end sensor means for sensing a wire end inserted through said opening,

(c) wire end clamping means operable in response to said sensing to clamp said insulated wire inserted through said opening,

(d) cutter means operable in response to said sensing to sever a predetermined length of insulation on said insulated wire end inserted through said opening,

(e) and carriage structure carrying said sensor means and said cutter means to retract same relatively away from said clamp means after said clamp means has clamped said wire end and after said cutter means has severed said insulation, thereby to pull said selected length of insulation off the wire core,

(f) A housing for said apparatus, the housing having a front

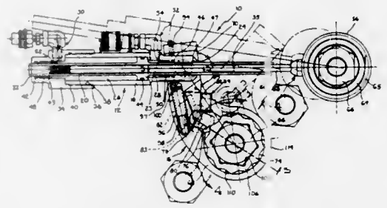
panel, there being multiple of said guides carried by said front panel and forming different size bores to receive different diameter wires, there being one each of said clamping means, and cutter means associated with each of the guides,

(g) said carriage structure carrying said sensor means and cutter means to retract them relatively away from the clamp means and guides.

4,838,130
POWER WRENCH

Robert F. Snyder, Hamden, Conn., assignor to Raymond Engineering Inc., Middletown, Conn.

Continuation-in-part of Ser. No. 867,466, May 23, 1986, Pat. No. 4,748,873. This application Jul. 1, 1987, Ser. No. 69,371
Int. Cl.[4] B25B *13/46*
U.S. Cl. 81—57.39 **25 Claims**



1. A fluid powered wrench for turning a member comprising:

cylinder means having at least a pair of fluid input/output lines and including an internal cavity;

piston means slidably received in said internal cavity of said cylinder means, said piston means having a piston rod and a piston on said piston rod, said piston contacting said internal cavity whereby said internal cavity is divided is divided into a pair of chambers with at least one of said fluid input/output lines communicating with each chamber wherein said cylinder means is adapted for linear movement between a power stroke and a return stroke as fluid enters and exits each chamber from said input/output lines, said piston rod extending outwardly of said cylinder means at one end of said cylinder;

reaction assembly means attached to as portion of said extending piston rod, said reaction assembly means including means for removable engagement with a reaction element;

lever arm means pivotably attached to said cylinder means;

ratchet assembly means in said lever arm means, said ratchet assembly means including engagement means having an opening therethrough for removable engagement with a member to be turned, and ratchet means communicating with said opening for actuating the member to be turned;

means for establishing a preselected angle between said lever arm means and said cylinder means at the beginning of each power stroke; and

said ratchet means further including;

a driving pawl;

ratchet release lever means connected to said driving pawl to selectively move said pawl from an engaged position to a disengaged position;

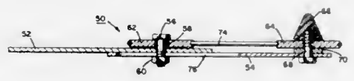
latch means on said release lever means for latching together said release lever means and said driving pawl in a disengaged position; and

latch receiving means in said lever arm means for engagement by said latch means when said release lever means and said driving pawl are in a disengaged position.

4,838,131
NUT STARTER

Clark J. Rhoades, 181 Tweed Blvd., Nyack, N.Y. 10960

Filed Feb. 9, 1988, Ser. No. 154,097
Int. Cl.[4] B25B *13/00*
U.S. Cl. 81—57.43 **5 Claims**



1. A nut starter for nuts of the type each having an internally threaded, centrally disposed, cylindrical opening extending therethrough between first and second faces thereof, comprising:

(a) a resilient nut engaging member, comprising a stepped series of at least two cylinders decreasing in diameter from the base thereof to the top thereof, a surface of each said cylinder being substantially orthogonal to the central axis of said nut engaging member and a wall of each said cylinders being substantially parallel with said central axis, the top of which member may be advanced into the end of said cylindrical opening at said first face of said nut until the wall of one of said cylinders engages the threads of said nut and one of said surfaces of said cylinders engages said first face of said nut, thereby to releasably hold said nut thereon;

(b) mounting means secured to the base of said nut engaging member, which mounting means may be manually positioned to bring said cylindrical opening at said second face of said engaged nut into contact with the end of a threaded fastener and engage the threads thereof, said mounting means having its major axis substantially orthogonal to the central axis of said nut engaging member;

(c) said mounting means comprises an elongate handle having first and second ends;

(d) said nut engaging member is rotatably mounted near said first end of said elongate handle, with the central axis of said nut engaging member substantially orthogonal to the major axis of said elongate handle; and

(e) said elongate handle includes motion translating means to translate manually generated motion to said nut engaging member from a point on said elongate handle distant from said first end of said elongate handle, so as to cause said nut engaging means to rotate; whereby, when said nut engaging member is grippingly advanced into said nut and said second end of said elongate handle is manually grasped so as to move said cylindrical opening at said second face of said nut into contact with said threaded fastener, said manually generated motion will cause said nut to rotate and to advance onto said threaded fastener.

4,838,132
ADJUSTABLE WRENCH

Donald Pyles, Rte. 9, Box 1116, Kemp, Tex. 75143, assignor to Donald Pyles, Dallas, Tex.

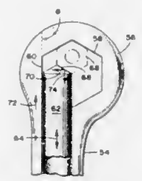
Continuation of Ser. No. 357,062, Mar. 11, 1982, abandoned. This application Sep. 10, 1987, Ser. No. 97,329
Int. Cl.[4] B25B *13/78, 13/16*
U.S. Cl. 81—111 **23 Claims**

1. An adjustable wrench comprising:

a. a handle,

b. a stationary jaw member integrally formed at an angle with said handle and having at least one work face and movable jaw support surface separated by a 60? included angle, said stationary jaw member being closed to form a closed end adjustable wrench with a stationary jaw member face and a movable jaw member face forming two parallel sides of a hexagon; wherein said movable jaw is a bolt having a jaw member face parallel to said stationary jaw member face and wherein said stationary jaw member and said movable jaw support surface are elongated in a convergent direction to accommodate various size objects; and

c. a movable jaw riding on said support surface and continuously supported thereby when under stress during its entire range of movement, said movable jaw having only a single work face thereon, said single face being parallel

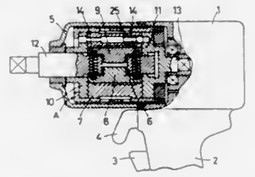


to said stationary member face such that pressure applied to an object placed in between said stationary jaw member face and said movable jaw member face creates a force a part of which is applied to said movable jaw member in a direction perpendicular to the direction of travel of said movable jaw member so as to force said movable jaw member against said support surface to prevent bending or twisting of said movable jaw member.

4,838,133
HYDRAULIC PULSE WRENCH

Takashi Dainin, Higashiosaka, Japan, assignor to Nippon Pneumatic Manufacturing Co., Ltd., Japan

Filed Sep. 28, 1987, Ser. No. 101,963
Int. Cl.[4] B25B *7/02*
U.S. Cl. 81—465 **2 Claims**



1. A hydraulic pulse wrench, comprising:

a casing;

an output shaft in said casing;

a drive means in said casing; and

a hydraulic pulse generator in said casing connected between said drive means and said output shaft and having a liner driven by said drive means about a liner axis of rotation, an anvil rotatably mounted for rotation about an anvil axis of rotation in said liner and which is eccentric to the liner axis of rotation, said anvil having a longitudinal slit therethrough, and two blades loosely mounted in said longitudinal slit and having edges projecting out of said slit in opposite directions from each other and coacting with said liner and said anvil to form oil chambers when said anvil is in predetermined angular positions with respect to said liner for causing oil pressure sealed in said oil chambers to produce impact torques, said liner having an elliptic inner periphery, said two blades having their outer edges beveled in different directions whereby a line connecting the tips of the two blades will be offset with respect to the anvil axis of rotation, said anvil having a pair of anvil sealing ridges extending parallel to the anvil axis of rotation on the outer periphery thereof at the opposite ends of a line through the anvil axis of rotation and perpendicular to said longitudinal slit, and said liner having on its inner periphery an opposed pair of first sealing ridges extending parallel to the liner axis of rotation and at positions corresponding to the ends of the minor axis of the elliptic shape of the inner periphery, a single sealing ridge extending parallel to the liner axis of rotation and at a position corresponding to one end of the major axis of the elliptic shape of the inner periphery and two further sealing ridges extending parallel to the liner axis of rotation and at positions corresponding to the other end of the major axis and spaced circumferentially of the liner a distance for causing said blades to be simultaneously engaged with said single sealing ridge and one of said two further sealing ridges only once during each rotation of said liner.

4,838,134
TORQUE WRENCH

Fred F. Ruland, Weston, Mass., assignor to Ruland Manufacturing Company, Inc., Watertown, Mass.

Filed Jun. 9, 1988, Ser. No. 204,709
Int. Cl.[4] B25B *7/02*
U.S. Cl. 81—467 **19 Claims**

1. A torque wrench comprising:

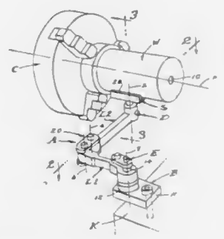
torque transmitting rod including a first leg, and a second leg connected end-wise to said first leg, and having a fastener engaging tip at a distal end of said second leg, said distal end being opposite to the end connected to said first leg a read-out member; and

holder member including means for establishing slip-on attachment of said holder member to said second leg and means for supporting said read-out member adjacent to at least of portion of said first leg.

4,838,135
WORK TRANSPORT FOR MACHINE TOOLS

Varoujan H. Hevoyan, 6318 W. 77th St., Los Angeles, Calif. 90045

Continuation-in-part of Ser. No. 891,114, Jul. 31, 1986, abandoned. This application May 11, 1987, Ser. No. 48,567
Int. Cl.[4] B23B *13/00*
U.S. Cl. 82—124 **20 Claims**



1. A workpiece transport for machine tools and the like, wherein a workpiece is to be moved between a lateral loading or unloading position and an aligned chucking or working position, and including:

a horizontally disposed inner lever arm with a vertical coupling axis at its outer distal end,

means for pivotally securing an inner end of said inner lever arm to a part of the machine tool on a vertical supporting axis to swing horizontally and laterally of the machine tool,

a horizontally disposed outer lever arm with a vertical adapter axis at its outer distal end,

right-left radius means pivoting an inner end of said outer lever arm on the vertical coupling axis at the distal end of the inner lever arm to swing horizontally of the machine tool and to position the vertical coupling axis at opposite sides of the inner lever arm and with respect to the vertical support axis,

workpiece support means pivoted on the vertical adapter axis at and perpendicular to the distal end of the horizontally disposed outer lever arm to move therewith between the lateral loading or unloading position and the aligned chucking or working position underlying and supporting the workpiece with respect to the machine tool,

and height adjustment means at the distal end of the outer lever arm for controlling the height position of the workpiece support means and comprised of a mounting pin-member depending from the workpiece support means and slideably received in a boss at the distal end of the outer lever arm.

4,838,136

ROTARY TOOL FOR OUTER WORKING OF ROTATION-SYMMETRICAL WORKPIECES

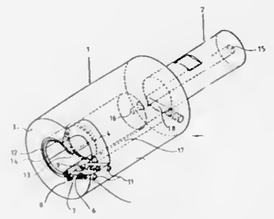
Dieter Kress, Aalen, and Friedrich Häberle, Lauchheim, both of Fed. Rep. of Germany, assignors to Nupal Fabrik für Prazisionswerkzeuge Dr. Kress KG, Aalen, Fed. Rep. of Germany

Filed Nov. 24, 1987, Ser. No. 124,821

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1986, 3640202

Int. Cl.[4] B23B *5/00*; B26D *1/12*, B23D *15/28*

U.S. Cl. 82—20 **21 Claims**



1. A rotary tool for outer working of rotation-symmetrical workpieces, comprising

a cutting head formed as a hollow body having a side wall and a groove and rotatable in a predetermined direction;

cutting means having a predetermined length and arranged in said groove of said side wall; and

a guide for a workpiece, provided at an inner side of said cutting head at least in the region of said cutting means, wherein said guide is formed as a sleeve provided in said side wall of said cutting head and connected with said cutting head and wherein said guide extends over the whole length of said cutting means and wherein the guide has a first inner radius in an angular region which is located after said cutting means when advancing in the direction of the rotation, and a second inner radius in a remaining region, said first inner radius being greater than said second inner radius.

4,838,137

APPARATUS FOR INTRODUCING A BELT-SHAPED MATERIAL TO A CUTTING MACHINE

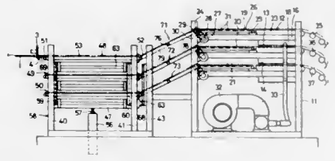
Toshio Azuma, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Mar. 5, 1987, Ser. No. 21,940

Claims priority, application Japan, Mar. 5, 1986, 61-47919

Int. Cl.[4] B26D *5/20*

U.S. Cl. 83—42 **6 Claims**



1. A method of conveying a belt-shaped material to a cutting machine, comprising the steps of:

conveying a plurality of belt-shaped materials in respective vertically stacked parallel horizontal first planes along respective first directions which are non parallel to each other in their respective horizontal planes:

transferring said belt-shaped materials from a respective one of said first planes to a respective one of plurality of conveyors;

conveying said transferred belt-shaped materials on said respective conveyor in a place parallel to said first planes along a first direction corresponding to a first direction of said respective first plane:

moving said respective conveyor vertically to a position adjacent a belt-shaped introducing position of a cutting machine; and

cutting said conveyed transferred belt-shaped materials.

4,838,138

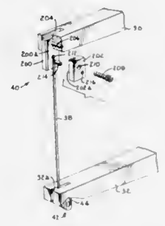
SCROLL SAW BLADE HOLDER AND BLADE ALIGNING DEVICE

Verle Rice, Harrisonville; William Curtis, Pleasant Hill; Richard Keener, Garden City, and Robert Raffurty, Pleasant Hill, all of Mo., assignors to R. B. Industries, Inc., Harrisonville, Mo.

Filed Apr. 13, 1987, Ser. No. 37,544

Int. Cl.[4] B27B *19/06*

U.S. Cl. 83—698 **2 Claims**



1. A blade clamp for holding one end of a saw blade in a scroll saw having a pair of reciprocating arms, said blade clamp comprising:

a pair of separable clamp elements having a pair of aligned apertures;

means for pivotably coupling one of the clamp elements to one of the arms of the saw for movement about a pivot axis offset from said apertures;

a fastener extending between said clamp elements at a location offset from said apertures and from said pivot axis, said fastener having a tightened condition for clamping the end of the saw blade between said clamp elements and a loose condition for releasing the blade from the clamp elements; and

a pin fitting closely in the aligned apertures to prevent said clamp elements from pivoting relative to one another about said fastener, said pin being disposed at a location to provide a guide against which the saw blade can be held during tightening of said fastener, said pin being disposed to maintain the blade in a preselected aligned location when the blade is held against said pin with the end of the blade butted against fastener between the clamp elements.

4,838,139

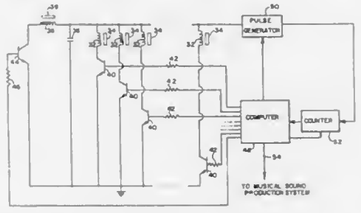
MUSICAL KEYBOARD

David Fiori, Jr., Yardley, Pa., assignor to Sensor Technologies, Inc., Bensalem, Pa.

Filed Mar. 18, 1986, Ser. No. 840,935

Int. Cl.[4] G10H *1/18, 1/34*

U.S. Cl. 84—1.1 **23 Claims**



1. A musical keyboard comprising:

a plurality of movable keys positioned side-by-side;

an inductance coil sensor system having (a) a plurality of sensor tank circuits each having a sensor inductance coil associated with one of said keys and positioned in the path of movement of its associated key, and (b) a plurality of metal spoiler means, one mounted on each of said keys, for changing the resonance frequencies of said sensor tank circuits, the amplitudes of the resonance peaks of said sensor tank circuits, and the phases about the resonance peaks of said sensor tank circuits in response to movements of said metal spoiler means toward and away from said sensor inductance coils;

first circuit means responsive to a selected one of said changing characteristics comprising resonance frequencies of said sensor tank circuits, amplitudes of the resonance peaks of said sensor tank circuits, and phases about the resonance peaks of said sensor tank circuits for developing indications of positions of said keys;

means for supplying to said first circuit means a reference signal in a domain corresponding to said selected changing characteristic and representative of a predetermined value against which said position indications are referenced;

and second circuit means responsive to said first circuit means for sequentially connecting said sensor tank circuits to said first circuit means.

4,838,140

VIOLIN

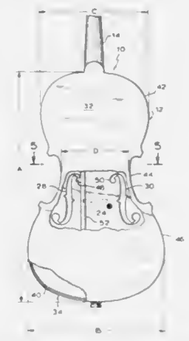
Henry Meissner, 4585 El Caro La., Carpinteria, Calif. 93013

Filed Dec. 24, 1987, Ser. No. 137,880

Int. Cl.[4] G10D *1/02*

U.S. Cl. 84—275 **16 Claims**

1. A three-quarter sized violin comprising: a body assembly, and a neck affixed to the body assembly at one end, said body assembly including a top plate having a pair of f-holes formed therein, a back plate, and a generally continuous ribwood, therebetween, fixed proximate to and generally conforming to the periphery of said plates, said ribwood including an upper rib section, a center rib section, and a lower rib section, said upper rib section defining an upper bout section of said body assembly, said center rib section defining a center bout section of said body assembly, and said lower rib section defining a



lower bout section of said body assembly, wherein the volume of air of said violin is approximately equal to the volume of air of a full-size violin, and the length of said body assembly is approximately equal to the length of the body assembly of a three-quarter size violin.

4,838,141

BAGPIPES AND A BAG THEREFOR

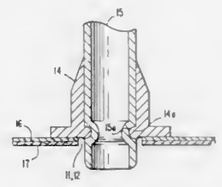
Gary Gilbert, Edinburgh, Scotland, assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Jul. 13, 1988, Ser. No. 218,713

Claims priority, application United Kingdom, Oct. 22, 1987, 8724743

Int. Cl.[4] G10D *7/06*

U.S. Cl. 84—380 B **7 Claims**



1. A pipe bag, for bagpipes, made of a flexible composite material which is air-impermeable and has a moisture vapour transmission rate exceeding 1000 gms/m^2 day the material comprising at least two layers, one layer being a continuous hydrophilic layer and a second layer external of said one layer being a supporting layer.

4,838,142

REGENERATIVE ELECTRICAL IGNITER FOR A LIQUID PROPELLANT GUN

Aviezer Birk, Aberdeen, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 19, 1988, Ser. No. 183,125

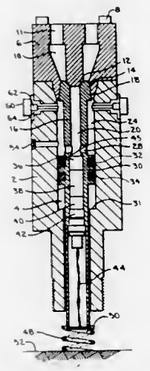
Int. Cl.[4] F41F *1/04*

U.S. Cl. 89—7 **6 Claims**

1. An electrical igniter comprising:

body means;

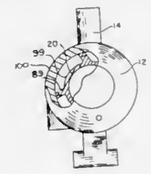
means defining an interior cavity in said body means for receiving a liquid charge to be ignited;
inlet port means in said body means communicating with said interior cavity;
outlet port means in said body means communicating with said interior cavity;
means for closing said inlet port means;
electrode means at said interior cavity for igniting a charge therein; and

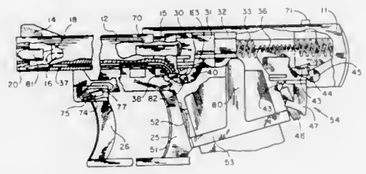


valve means for opening and closing said interior cavity to said outlet port means;
said valve means including an outlet valve positioned proximate said electrode means for releasing hot combustible gas generated during combustion;
said valve means further including means for releasing a discrete discharge of the liquid charge to interact with the releasing hot combustible gas such that the discharging liquid charge is combusted by the hot combustible gas.

4,838,143
POLYMER WEAPON APPARATUS WITH COUNTER-TORQUE DEVICE
David E. Byron, Casselberry, Fla., assignor to Red Eye Arms, Inc., Winter Park, Fla.
Continuation of Ser. No. 683, Jan. 5, 1987, abandoned, which is a division of Ser. No. 702,635, Feb. 4, 1985, Pat. No. 4,703,826. This application Jan. 28, 1988, Ser. No. 148,095
Int. Cl.[4] F41C *21/18*
U.S. Cl. 89—14.3 **2 Claims**

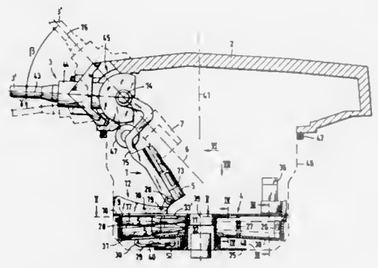
1. A weapon apparatus comprising:
a barrel having rifling and a muzzle chamber in the inside thereof, said barrel being monolithic and having a completely closed circumferential surface exterior to said chamber;
an operating assembly means for operating said weapon; and
a muzzle cap in the muzzle end of said chamber, said muzzle cap having a completely closed annular front surface, a center ring, a plurality of internal vanes extending between said circumferential surface and said center ring, said ring having an opening therein for the passage of the bullet, all of said vanes being angled opposite from the rifling in said barrel, and said chamber and vanes being in





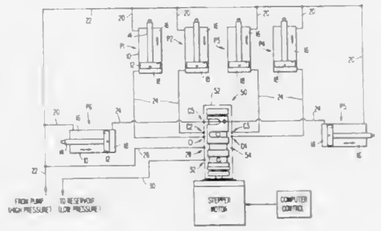
direct flow contact whereby the gases filling said chamber impinge directly against said plurality of vanes.

4,838,144
AUTOMATIC LOADING DEVICE FOR A GUN
Adolf-Peter Bierwirth, Kaarst; Walter Sauerwald, Düsseldorf; Hülsewis, Ratingen, and Josef Metz, Neuss, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany
Filed May 25, 1988, Ser. No. 198,499
Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3717857
Int. Cl.[4] F41F *9/10*
U.S. Cl. 89—46 **13 Claims**



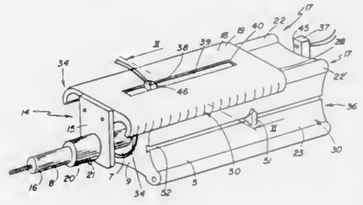
1. In a turret gun assembly including
a turret,
a gun having a barrel being adjustable in inclination about a trunnion axis and disposed in a front region of said turret,
a magazine for accommodating rounds of ammunition, and
a loading device for advancing rounds of ammunition from the magazine into a position behind the barrel in a longitudinal alignment therewith;
the improvement wherein said loading device comprises
(a) means defining a discharge location of said magazine; said discharge location orienting the round of ammunition situated therein such that a front tip thereof is directed rearward relative to the barrel;
(b) a cam drive having a cam track mounted at said discharge location and a follower slidably guided in said cam track;
(c) a transfer arm having first and second ends, said first end being mounted for pivotal motion about said trunnion axis;
(d) a holding clamp articulated to said second end of said transfer arm by a hinge connection and being arranged for gripping said ammunition; said follower being connected to said holding clamp; and
(e) means for pivoting said transfer arm about said trunnion axis for causing said follower to slide within said cam track to rotate said holding clamp and the round of ammunition gripped thereby, about the hinge connection and to simultaneously swing said holding clamp and the round of ammunition gripped thereby, about said trunnion axis to position the gripped ammunition parallel with said transfer arm and into said longitudinal alignment with said barrel and with said front tip oriented towards said barrel.

4,838,145
MULTIPLE ACTUATOR HYDRAULIC SYSTEM AND ROTARY CONTROL VALVE THEREFOR
Alexander H. Slocum, McLean, Va., and James P. Peris, Germantown, Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.
Filed Jun. 18, 1987, Ser. No. 63,558
Int. Cl.[4] F15B *11/00, 13/00*
U.S. Cl. 91—536 **36 Claims**



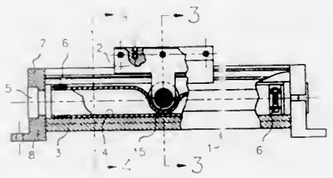
1. A hydraulic system comprising a plurality of hydraulically operated devices, each device having an activation chamber for receiving hydraulic fluid under pressure to operate that device in a first operating direction, and a rotary hydraulic valve including a housing and a valve member rotatably received within said housing and having a radially outer surface proximate an inner wall of said housing, said housing having high pressure fluid inlet means, low pressure fluid outlet means, and a plurality of control ports disposed substantially at a plane transverse to a rotation axis of said valve member and each having a corresponding activation chamber connected thereto by fluid delivery means, said valve member having high pressure fluid distribution means which includes fluid port means formed in said radially outer surfaces of said valve member in communication with said high pressure fluid inlet means of said housing by way of first internal passageway means within said valve member for distributing high pressure fluid to said control ports, said valve member further having low pressure fluid vent means which includes partial fluid commutator means formed in said radially outer surface of said valve member and which is in communication with said low pressure fluid outlet means of said housing by way of second fluid passageway means within said valve member for venting said control ports to said low pressure fluid outlet means of said housing, said fluid port means and said partial fluid commutator means being disposed in circumferentially spaced relationship on said valve member and substantially at said plane such that said fluid port means may be positioned by rotation of said valve member on said rotation axis to align with said control ports selectively, with said partial fluid commutator means simultaneously being in alignment with non-selected control ports, whereby said valve is operable to distribute high pressure fluid selectively to the activation chambers of said devices and simultaneously to vent the activation chambers of non-selected devices to low pressure.

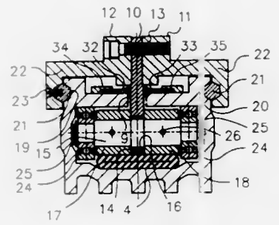
4,838,146
FLUID PRESSURE ACTUATOR WITH ANTI-ROTATION SLIDE ATTACHED TO PISTON ROD
Kurt Stoll, Lenzahlde 72, 7300 Esslingen, Fed. Rep. of Germany
Filed Mar. 17, 1987, Ser. No. 27,158
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1986, 3609605
Int. Cl.[4] F15B *14/14, 15/28*
U.S. Cl. 92—5 R **14 Claims**



1. A linear motor with a cylinder containing an axially movable piston to which a piston rod extending through at least one of the end faces of the cylinder is fitted, the section of the piston rod which is outside the cylinder being secured against torsion by being fixed to a co-moving torsion protection element movable in the axial direction of the cylinder in conjunction with a sliding guide fixed thereto, wherein the sliding guide (**17**) comprises at least two guide ribs (**22, 22'**), for example projecting substantially radially from the surface of the cylinder (**5**) relative to its longitudinal axis and located on the circumference of the cylinder (**59**), said guide ribs being arranged at a distance from each other and at least approximately extending along the entire length of the cylinder (**5**), and wherein the torsion protection element (**18**) is a slide irremovably attached to the outside of the cylinder (**5**) and guided flat along the guide ribs (**22, 22'**), said slide at least partially surrounding or encompassing the guide ribs (**22, 22'**), whereby, for example, the axial dimension of the slide (**19**) may substantially correspond to the length of the cylinder (**5**).

4,838,147
PRESSURE FLUID ACTUATOR
Grigory Grishchenko, 76 Surrey La., River Edge, N.J. 07661
Filed Jan. 26, 1988, Ser. No. 148,557
Int. Cl.[4] F01B *29/00*
U.S. Cl. 92—88 3 Claims

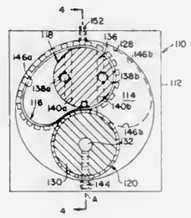




1. A pressure fluid actuator comprising:
an elongated tubular chamber having a side wall and a slot extending longitudinally through said side wall;
a hose member attached at its respective ends to the inner portion of said tubular chamber and having its ends portions connected with end fittings in such a way that curved surfaces of said end fittings are facing the interior of said hose member;
a transfer bracket reciprocally movable within said tubular chamber and extending through said slot of the actuator;
force tranfser means including a shaft rotatably mounted in the lower portion of said transfer bracket and having a pair of rollers for displacing engagement with said hose member and a pair of radial bearings disposed on both ends of said shaft for engagement with inner surface of said tubular chamber and adapted coaxially with said rollers on said shaft for causing opposite directions of rotation of said rollers and outer rings of said radial bearings;
means for supporting and guiding said transfer bracket during its movement including a pair of guide plates fastened to the upper portion of the transfer bracket and having hexagonal bearing rods for guiding said plates along retaining grooves constructed on the outside wall of said tubular chamber; and
means facilitating the cushioning of said transfer bracket and comprising a curved portion of said end fitting so that its center of curvature coincides with the center of said rollers at the end position of said transfer bracket.

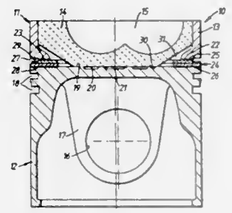
4,838,148
ACTUATOR
James M. Denker, 711 First Parish Rd., Scituate, Mass. 02066
Filed Jan. 5, 1988, Ser. No. 141,044
Int. Cl.[4] F01B *19/00*; F16J *3/00*
U.S. Cl. 92—90 20 Claims

1. An actuator for converting fluid pressure and flow into mechanical movement and force comprising:
a housing defining an interior cavity having generally parallel top and bottom walls;
a flexible and generally inextensible belt mounted at least partially within said cavity, a portion of the belt within the cavity provid an open loop, the belt being movable within the cavity to vary the area of the open loop, and being so positioned that the top and bottom of the belt portion forming the loop are closely adjacent the top and bottom walls of the cavity;



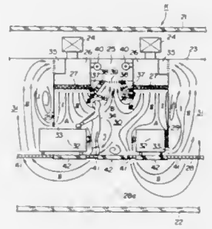
a seal closing the open end of said open loop, said seal sealingly engaging spaced-apart portions of the inner surface of said loop adjacent the opposite ends of said open loop; and,
means for causing the pressure of fluid within the open loop to be greater than the pressure of fluid within the cavity but outside the open loop such that the difference in pressure causes the belt to move so as to increase the area enclosed by said seal and said loop, said movement of said belt being adapted to provide a mechanical output of said actuator.

4,838,149
PISTONS
Geoffrey M. Donnison, Midlands; Robert A. Wordsworth, and Michael L. P. Rhodes, both of Warwickshire, all of England, assignors to AE PLC, Rugby, England
Filed Sep. 15, 1987, Ser. No. 96,901
Claims priority, application United Kingdom, Sep. 18, 1986, 8622538
Int. Cl.[4] F16J *1/04*
U.S. Cl. 92—222 11 Claims



1. A piston for an internal combustion engine comprising a crown component and a skirt component wherein the crown component consists of an iron-based or nickel-based alloy annular portion having fitted therein a ceramic insert which is retained by interference, said crown component being joined to said skirt component by an annular composite laminated member of steel and aluminium alloy, the steel of the laminated member being energy beam welded to said annular portion of said crown component, and the aluminium alloy of said laminated member being energy beam welded to said skirt component, there being after welding a sealed, hollow, annular chamber disposed at the junction between said crown component and said skirt component.

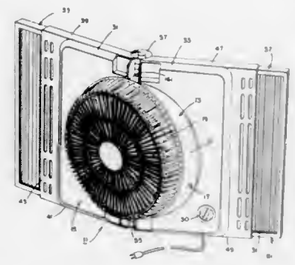
4,838,150
CLEAN ROOM
Yoshinobu Suzuki, Fujishiro, and Mitsufusa Manabe, Yokohama, both of Japan, assignors to Shimizu Construction Co., Ltd., Japan
PCT No. PCT/JP86/00603, § 371 Date Apr. 21, 1987, § 102(e) Date Apr. 21, 1987, PCT Pub. No. WO87/03356, PCT Pub. Date Jun. 4, 1987
PCT Filed Nov. 26, 1986, Ser. No. 57,525
Claims priority, application Japan, Nov. 26, 1985, 60-265456; Dec. 5, 1985, 60-274236; Dec. 5, 1985, 60-274237; Dec. 19, 1985, 60-286571; Dec. 20, 1985, 60-287330; Dec. 27, 1985, 60-294699
Int. Cl.[4] F24F *7/007*
U.S. Cl. 98—31.5 18 Claims



17. A clean room comprising: a ceiling; a floor; an indoor space defined by the ceiling and the floor; air supply means for supplying an air of ultra high cleanliness to the indoor space; air exhausting means for exhausting the air supplied to the indoor space; and straightening means for smoothly forming a line of an air stream flowing into the air exhausting means, said indoor space being divided into a first region requiring high cleanliness and a second region adjacent to the first region and requiring ultra high cleanliness higher than that of the first region, said air supply means comprising an air outlet port arranged in a ceiling of said second region, the air outlet port blowing the air downward, said air exhausting means comprising a first air inlet port arranged in a ceiling of said first region, the first air inlet port exhausting the air upward, thereby generating a transverse air stream flowing from said second region to said straightening means comprising a straightening plate extending obliquely relative to a horizontal plane, between said air outlet port and said inlet port.

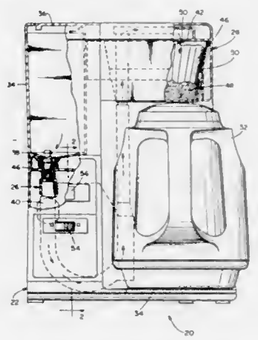
4,838,151
COMBINATION WINDOW AND FLOOR FAN
Shao Shin-Chin, San-Chung, Taiwan, assignor to Holmes Products Corp., Holliston, Mass.
Filed Jan. 27, 1988, Ser. No. 148,838
Int. Cl.[4] F24F *7/013*
U.S. Cl. 98—94.1 27 Claims

27. A combination window and floor fan comprising:
a. a pair of panel sections,
b. means hingedly interconnecting said panel sections in end-to-end relationship for pivotal movement relative to each other,



c. means for locking said panel sections at 180 degrees apart,
d. a fan unit attached to one of said panel sections.

4,838,152
AUTO-OFF COFFEE BREWING SYSTEM
Robert E. Kubicko, Shelton, Conn.; Gregory E. Moores, Reisterstown, Md., and William H. Younger, Huntington, Conn., assignors to Black & Decker, Towson, Md.
Filed Jul. 21, 1988, Ser. No. 222,195
Int. Cl.[4] A47J *31/00*
U.S. Cl. 99—280 20 Claims



1. A coffee brewing machine comprising:
a water reservoir of finite capacity;
a brewing station;
a water supply conduit in communication with and extending between said reservoir and said brewing station;
a first electrically energizable heat generator intermediate said water reservoir and said brewing station for heating water in said water supply conduit to a sufficient extent as it flows from said reservoir to said brewing station to enable coffee to be brewed at said brewing station, said reservoir being substantially depleted of water at the end of a normal complete brew cycle;
first and second temperature sensitive switches electrically in series with said first heat generator, said first switch being biased to a closed position and responsive to the temperature at said first heat generator and automatically movable to an open position when the temperature at said first heat generator exceeds a predetermined magnitude and automatically returning to a closed position when the temperature at said first heat generator falls below said predetermined magnitude by reason of the cooling effect

of the continued flow of water through said supply conduit; and

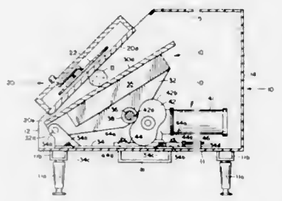
a second heat generator associated with said second switch electrically in parallel with said first switch and operable to generate heat upon opening of said first switch, said second switch being responsive to operation of said second heat generator to open if, after a predetermined lapse of time, said first switch is also open, a condition indicative of the absence of the flow of water through said supply conduit.

4,838,153

METHOD AND APPARATUS FOR FORMING AND BAKING FLAT, THIN DISCS OF DOUGH

Robert M. Escamilla, San Antonio; Elias Escamilla, III, Helotes; Elias Escamilla, Jr., San Antonio; Gregg E. Johnson, Boerne; Robert M. Arnold, and Thomas Tatner, both of San Antonio, all of Tex., assignors to Bakery Equipment and Service Co., Inc., San Antonio, Tex.

Continuation-in-part of Ser. No. 103,291, Oct. 1, 1987, Pat. No. 4,769,252. This application Jun. 15, 1988, Ser. No. 206,805
Int. Cl.[4] A47J 39/14
U.S. Cl. 99—349 26 Claims



1. Apparatus for forming dough balls into a flat disc shaped configuration comprising:

a box-like support structure having an open frontal wall portion with horizontally inclined, upwardly facing side wall surfaces;

a first pressing plate defining a first planar dough contacting surface;

means for securing said first pressing plate on said horizontally inclined, side wall surfaces as a non-vertical frontal wall portion of said box-like support structure with said planar dough contacting surface facing downwardly at a selected angle to the horizontal;

a second pressing plate defining a second planar dough contacting surface;

means for shiftably mounting said second pressing plate in said box-like support structure with said second planar dough contacting surface facing upwardly and movable between a first position and a second position relative to said first planar dough contacting surface;

in said first position, said second planar dough contacting surface being angularly disposed relative to said first planar dough contacting surface with the lower ends of said planar dough contacting surfaces being closely adjacent, whereby a ball of dough dropped between the upper ends of said planar dough contacting surfaces will be trapped between the medial portions of said planar dough contacting surfaces;

in said second position, said planar dough contacting surfaces being parallel and spaced apart by a distance corresponding to the desired thickness of the pressed disc of dough;

said selected angle being greater than that required to gravitationally release and discharge the pressed disc of dough while said second pressing plate returns from said second position to said first position; and

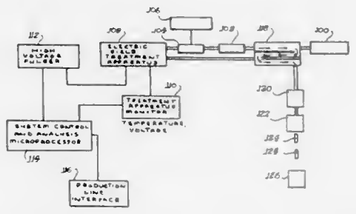
said open frontal wall portion having a dough ball feeding opening above said first pressing plate and a dough disc discharge opening below said first pressing plate.

4,838,154

APPARATUS FOR EXTENDING THE SHELF LIFE OF FLUID FOOD PRODUCTS

Joseph E. Dunn, Rancho LaCosta, and Jay S. Pearlman, San Diego, both of Calif., assignors to Maxwell Laboratories, Inc., San Diego, Calif.

Division of Ser. No. 740,004, May 31, 1985, Pat. No. 4,695,472.
This application May 18, 1987, Ser. No. 51,841
Int. Cl.[4] A23L 3/32
U.S. Cl. 99—451 7 Claims



1. Pulsed field treatment apparatus for preservation of fluid foodstuffs comprising an electric field treatment chamber comprising a first electrode means for making electrical contact with fluid foodstuff disposed adjacent said first electrode means in said chamber, a second electrode means spaced apart from said first electrode means for making electrical contact with fluid foodstuff disposed in said chamber between said first electrode means and said second electrode means, an inlet conduit means for introducing a fluid foodstuff to be treated into said electric field treatment chamber, heating means for providing said fluid foodstuff at a treatment temperature of at least about 45° C. in said treatment chamber, an outlet conduit means for discharging said fluid foodstuff which has passed through said treatment chamber, electric pulse generating means for applying high voltage electrical pulses to said first and second electrode means at a rate of at least about one pulse per minute to provide a substantially uniform electric field between said electrodes through a fluid foodstuff located therebetween of at least about 5,000 volts per centimeter, said electrodes and said electric pulse generating means cooperating to provide a substantially uniform electric field free of current filaments through said fluid foodstuff in said treatment chamber, and means for pumping a fluid foodstuff in said treatment chamber, and means for pumping a fluid foodstuff through said inlet conduit means at a rate such that all of said fluid foodstuff is subjected to a least two of said high voltage pulses in transit through said high voltage treatment zone before it is conducted from the chamber through said outlet conduit means.

4,838,155

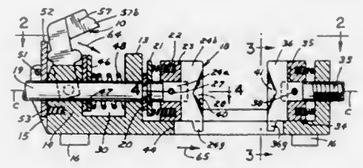
NUTCRACKER APPARATUS

Vern G. Steffel, 3380 Texas Ave. South, St. Louis Park, Minn. 55426

Filed Nov. 25, 1987, Ser. No. 125,347
Int. Cl.[4] A23N 5/00
U.S. Cl. 99—572 21 Claims

1. Nutcracker apparatus for cracking and/or splitting a nut having an edible nut meat, comprising a longitudinally elongated frame having longitudinally spaced front and rear ends, a first head assembly, the frame having first means for mounting the first head assembly adjacent to the frame front end, a second head assembly, second means that at least in part includes a frame part for mounting the second head assembly

rearwardly of the first head assembly and moving the second head assembly relative to the first head assembly between a first position sufficiently longitudinally spaced from the first head assembly to permit a nut moving between said assemblies and a second position sufficiently closely adjacent to the first head assembly to crack a nut, at least one of the head assemblies including a head having a generally transverse nut engaging first surface facing the other head assembly and a knife slot opening through said first surface, a knife at least in part located in the knife slot and having an edge abuttable against a nut, a longitudinal rod having a first end portion, the knife



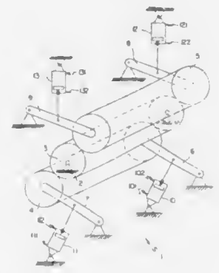
being mounted to the the rod first end portion in fixed longitudinal relationship thereto and the head being mounted on the rod first end portion for movement relative thereto between a head first position and a head second position, third means mounted on the rod for resiliently retaining the head in the head first position relative to the knife, the head in its second position relative to the knife being more remotely spaced from the other head assembly than in the head first position and the knife edge being located longitudinally outwardly of the first surface such that the knife extends further longitudinally outwardly of the slot in the head second position than in the head first position.

4,838,156

ROLLER PRESS WITH A DEVICE FOR THE RELIEF OF THE PRESSURE ROLL

Paul Hafner, and Christian Schiel, both of Heidenheim, Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Apr. 26, 1988, Ser. No. 186,248
Claims priority, application Fed. Rep. of Germany, May 9, 1987, 3715548
Int. Cl.[4] B30B 15/16
U.S. Cl. 100—47 15 Claims



1. A roller press comprising:

a press roll;

means for fixing the press roll in position;

at least one pressure roll, arranged parallel to the press roll; the press and pressure rolls having respective surfaces for being pressed against one another; a plurality of positioning cylinders connected to each pressure roll for displacing the pressure roll with respect to the press roll, for separating the surface of the pressure roll off the surface of the press roll in a direction transversely to the longitudinal axis of the pressure roll;

operating means connected with each of the positioning cylinders; the operating means comprising a respective safety valve connected with each of the positioning cylinder for being operated by the respective positioning cylinder to an open condition of the safety valve for relieving the pressure in the positioning cylinder and for operating the cylinder to separate the pressure roll from the press roll upon a disturbance in the press nip between the press roll and the pressure roll which momentarily increases the pressure in any of the positioning cylinders; and

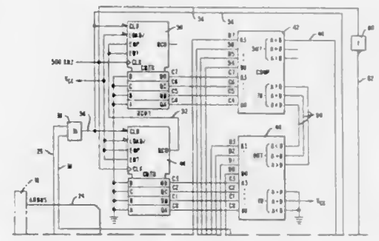
connecting means functionally connecting all of the safety valves with each other such that upon an increase in pressure in one positioning cylinder, which causes the opening of the respective safety valve, all of the safety valves are correspondingly moved to the open condition so that all of the pressure cylinders are relieved.

4,838,157

DIGITAL PRINTHEAD ENERGY CONTROL SYSTEM

James R. D. Signore, II, Trumansburg, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Mar. 25, 1988, Ser. No. 173,386
Int. Cl.[4] B41J 7/92, 9/38
U.S. Cl. 101—93.03 10 Claims



1. A digital printhead energy control system for controlling the energy applied to a plurality of print hammer solenoids, comprising:

clock signal means;

first storage means for storing digital pulse duration data for controlling the duration of print hammer energizing pulses;

second storage means for storing digital print hammer energization data and providing hammer operating output signals for selective operation of a plurality of print hammers, said second storage means also having a control output for producing a control signal;

bus means for supplying pulse duration data to said first storage means during a first period and for supplying hammer energization data to said second storage means during a second period;

first signal means for causing said pulse duration data to be entered into said first storage means during said first period;

second signal means for causing said hammer energization data to be entered into said second storage means during said second period;

counter means controlled by said clock signal means for counting incrementally from a first value to a second value and then returning to said first value;

comparator means coupled to said first storage means and to said counter means for comparing the value of data stored in said first storage means with the value stored in said counter means and for providing an output signal on an

output thereof when a predetermined relationship occurs between said first storage means value and said counter value;

latching means coupled to the output of the comparator means and to said clock signal means for providing an end pulse signal in response to receipt of an output signal from the comparator means;

reset means for providing reset signals;

first gate means for clearing the counting means, coupled to the control output of the second storage means and to the reset means; and

second gate means coupled to said latching means and to said reset means having an output coupled to said second storage means for terminating said hammer operating output signals following the occurrence of the predetermined relationship in the comparator means between said first storage means value and said counter value.

4,838,158

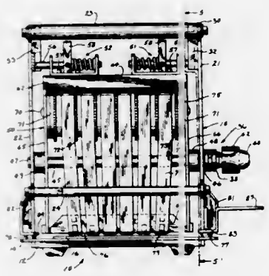
SELF-INKING ARTICLE MARKING DEVICE

Steven F. Marshall, Menomonee Falls, Wis.; Richard E. Haden, Jr., and Darrell R. Johnson, both of Nashville, Tenn., assignors to United Health, Inc., Milwaukee, Wis.

Filed Apr. 25, 1988, Ser. No. 186,037

Int. Cl.[4] B41K *1/42*

U.S. Cl. 101—105 **8 Claims**



1. An apparatus for marking an article comprising:

a frame including two support structures each having a fulcrum channel;

a carriage having a plurality of printing characters and means for selecting ones of the characters for marking the article;

a means for applying ink to said selected characters;

two fulcrum assemblies attached to said carriage, each having a shaft and means for releasably engaging the shaft with one of the fulcrum channels of said frame;

a first lever pivotally coupled to one of said support structures and pivotally coupled to said character carriage;

a second lever pivotally coupled to said character carriage; and

a drive shaft pivotally coupled to the other support structure and fixed to said second lever.

4,838,159

LIFTING DEVICE FOR TEMPLATES

Walter Böhm, Kirchbichl, Austria, assignor to Johannes Zimmer Gesellschaft M.B.H., Kufstein, Austria

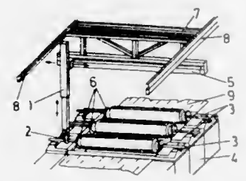
Filed Jun. 16, 1988, Ser. No. 207,751

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1988, 8804950[U]

Int. Cl.[4] B41L *13/00*

U.S. Cl. 101—119 **2 Claims**

1. Lifting device for cylindrical templates in printing machines, with an inking tube extending through each cylindrical template, the lifting device travelling along a rail running parallel to the direction of the cylindrical template and along a rail travelling in a direction normal thereto and which can be releasably connected to the inking tube, characterized in that



the lifting device is constructed in the form of a rigid arm (1) of variable length, always extending in the vertical direction, especially a hydraulically or pneumatically operated telescopic arm, which carries a tong-like gripper (2) for releasable connection with the inking tube (3).

4,838,160

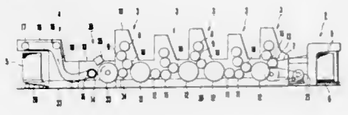
SHEET-FED ROTARY PRINTING PRESS

Kenji Nozawa, Ibaraki, Japan, assignor to Komori Printing Machinery Co., Ltd., Japan

Filed Nov. 30, 1987, Ser. No. 126,581

Int. Cl.[4] B41F *5/02, 7/06, 31/02, 33/00*

U.S. Cl. 101—183 **14 Claims**



1. In combination with a sheet-fed rotary printing press for printing a paper sheet of the type wherein a paper sheet feeder is attached to a first printing unit of a printing press having at least one printing unit, and further wherein a paper sheet delivery apparatus is attached to a last printing unit of said printing press having at least one printing unit, said paper sheet printing units and paper sheet delivery apparatus establishing a paper path for said paper sheet from said paper sheet feeder to said paper sheet delivery apparatus, the improvement comprising:

means for separating said paper sheet delivery apparatus from said last printing unit of said printing press having at least one printing unit; and

an abnormal sheet detecting unit located between said paper sheet delivery apparatus and said last printing unit of said printing press having at least one printing unit, said abnormal sheet detecting unit comprising:

a first frame member having one end attached to said paper sheet delivery apparatus and an opposite end attached to said last printing unit;

a second frame member located adjacent said first frame member in spaced relationship thereto, said second frame member having one end attached to said paper sheet delivery apparatus and an opposite end attached to said last printing unit;

printed sheet stabilizing means mounted to said first and second frame members for stabilizing said printed sheet, said printed sheet stabilizing means keeping said paper sheet taut; and

abnormal sheet detecting means mounted to said first and second frame members and adjacent said printed sheet stabilizing means for detecting a predetermined printing density of ink on said paper sheet while said paper sheet is kept taut by said printed sheet stabilizing means.

4,838,161

ARRANGEMENT FOR REVERSING PRESSURE OF CYLINDERS AND ROLLERS IN PRINTING MACHINES

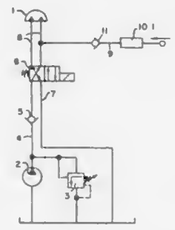
Johannes Naumann, and Hans-Jürgen Tappert, both of Coswig, German Democratic Rep., assignors to Werner Lambertz Leipzig Veb Kombinat Polygraph, Leipzig, German Democratic Rep.

Filed Oct. 30, 1986, Ser. No. 926,403

Claims priority, application German Democratic Rep., Oct. 31, 1985, 282282

Int. Cl.[4] B41F *13/40*

U.S. Cl. 101—247 **7 Claims**



1. An arrangement for reversing printing pressure of cylinders of a printing machine, comprising a main pressure controlling circuit including a fluid power motor having a fluid inlet port and a fluid outlet port and being coupled to said cylinders; a main pump connected via a back-pressure valve to said inlet port to deliver to the motor a flow of fluid at a requisite control pressure, and flow direction control means arranged between said back-pressure valve and said ports to reverse the direction of the control pressure application to said cylinders; and an auxiliary fluid pressure circuit connected between said outlet port and said direction control means to add an auxiliary high pressure to said motor when said flow direction control means reverses the control pressure on said cylinders.

4,838,162

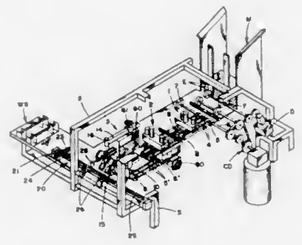
SYSTEM FOR PRINTING BOTH SIDES OF ENVELOPES

Gilbert L. Horton, Kernersville; Eddie D. Poole, Lexington, and William A. Borst, Burlington, all of N.C., assignors to Sara Lee Corporation, Winston-Salem, N.C.

Filed Oct. 29, 1987, Ser. No. 113,988

Int. Cl.[4] B41F *1/12, 1/20*

U.S. Cl. 101—296 **11 Claims**



1. A printing system for printing indicia on opposite sides of relatively thin paper board article receiving envelopes, of the type having a frame along which envelopes are intermittently advanced to be momentarily positioned at plural generally aligned printing stations, the system comprising; a supply magazine for said envelopes; a plurality of spaced and generally aligned printing stations, each station including an anvil and a printing plate; conveying means for feeding the envelopes one at a time from said supply magazine to and through said printers between said printing plate and said anvil in an intermittent fashion, said conveying means including elongated, laterally spaced endless belts substantially spanning the distance from the supply magazine through the exit end of the most remote printer, said printing plates and said anvils being positioned for movement between the laterally spaced belts; means located at each printing station to sense an incoming envelope to momentarily interrupt the movement of the envelope and actuate said printer to print said envelope; and means locating at least one of said printers on one side of the path of movement of said envelope and another of said printers on the opposite side thereof to thereby print indicia on opposite sides of said envelope.

4,838,163

DRIVE SYSTEM WITH DRIVE MEANS FOR AXIAL RECIPROCATION OF DISTRIBUTOR ROLLERS OF AN INKING UNIT

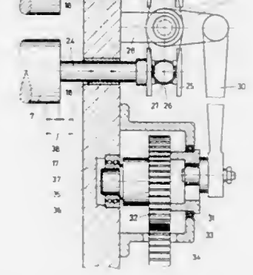
Willi Jeschke, Heidelberg, and Werner Weber, Sandhausen, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Continuation of Ser. No. 921,899, Jul. 5, 1978, abandoned. This application Jul. 11, 1980, Ser. No. 167,661

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1977, 2731124

Int. Cl.[4] B41F *31/14*

U.S. Cl. 101—349 **3 Claims**



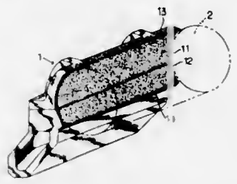
1. In combination with an inking unit having an ink duct and a train of ink rollers including a distributor roller for transferring ink from the ink duct to a plate cylinder of a printing machine, the distributor roller being mounted so as to be axially reciprocable, a drive system comprising first drive means for axially reciprocating the distributor roller with a main stroke of given length, and second drive means for superimposing an additional oscillatory movement of the distributor roller in axial direction in the form of a stroke having a length which is a minor fraction of the given length of the main stroke whereby said second drive means periodically accelerates and retards the distributor roller during movement along the path of the main stroke.

4,838,164

INK-FURNISHING APPARATUS

Masahiko Miyoshi, Ayase, and Masayoshi Sato, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Tokyo Kikai Seisakusho, Tokyo, Japan

Filed Jul. 22, 1986, Ser. No. 888,562
Int. Cl.[4] B41F *31/02*
U.S. Cl. 101—365 5 Claims



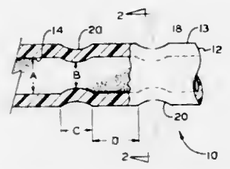
1. An ink furnishing comprising:
an ink rail having a concave ink transfer surface formed of cast iron;
an ink cylinder having a peripheral surface cooperating with said concave surface to form a gap therebetween;
means for furnishing ink to said ink rail and said concave ink transfer surface for thus applying said ink to said ink cylinder surface:
said ink rail having a cast iron surface treated with a first solid substance;
said treated cast iron surface having a decreased wetting property and a decreased affinity for said ink when compared with the wetting property of an untreated cast iron surface;
said treated cast iron surface functioning to enable an increased ink surface tension and thus a greater contact angle of said ink relative to said treated surface as compared with the ink surface tension and contact angle of said ink relative to an untreated cast iron surface;
said ink cylinder peripheral surface having a surface treated with a second solid substance; said treated ink cylinder surface having an increased wetting property and an increased affinity for said ink when compared with the wetting property of said treated cast iron ink transfer surface;
said treated ink cylinder surface functioning to enable a decreased ink surface tension and thus a lesser contact angle of said ink relative to said treated cylinder surface as compared with said ink surface tension and contact angle of said ink relative to said treated cast iron surface.

4,838,165

IMPEDED VELOCITY SIGNAL TRANSMISSION LINE

Ernest L. Gladdeo, Granby, and Sanford B. Tavelli, Simsbury, both of Conn., assignors to The Ensign-Bickford Company, Simsbury, Conn.

Filed Apr. 30, 1987, Ser. No. 44,039
Int. Cl.[4] C06C *5/00*
U.S. Cl. 102—275.8 6 Claims



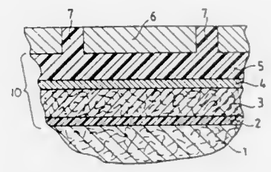
1. Signal transmission tube comprising a length of elongated hollow tube and a self-oxidizing combustible substance disposed along the interior surface of said tube for transmitting a blasting signal along the interior of said tube length, said tube having mechanical means for controlling blasting signal velocity including a plurality of discrete locations of reduced axial cross-sectional area at longitudinally spaced intervals along said tube length for reducing and controlling the velocity of said blasting signal and reduced areas being permanently set, said tube having a continuous open interior passageway throughout its length permitting bidirectional blasting signal transmission therein.

4,838,166

CASING FOR THE PROTECTION OF EXPLOSIVE CHARGES

Hans Spies, Pfaffenhofen, and Ulrich Weigel, Sinzig, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Fed. Rep. of Germany

Filed Dec. 15, 1986, Ser. No. 941,615
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1985, 3544929
Int. Cl.[4] F42B *41/00*
U.S. Cl. 102—481 11 Claims



1. A casing for the protection of explosive charges, comprising a plurality of layers of different compositions surrounding the explosive charge, said layers being successively arranged including an innermost layer adjacent said charge, an outermost layer the furthest from the charge in an envelope layer covering said outermost layer, said layers having successively different shock wave impedances alternating between a relatively high shock wave impedance and a relatively low shock wave impedance relative to each other and having different melting points, said envelope surrounding said outermost layer having at least one opening therein, the melting points of successive layers being different with the outermost layer having the lowest melting point and said layer adjacent said charge having the highest melting point so that upon heating the temperature at the explosive charge is the smallest, said outermost layer contiguous to the surrounding envelope having a high shock wave impedance, the next innermost layer having a low shock wave impedance, the next innermost layer having a high shock wave impedance and the layer contiguous to the explosive charge again having a low shock wave impedance.

4,838,167

METHOD AND DEVICE FOR PROTECTION OF TARGETS AGAINST APPROACHING PROJECTILES, WHICH PROJECTILES ARE PROVIDED WITH INFRARED-SENSITIVE TARGET FINDERS

Georg Prahauser, Oberalm, Austria; Paul Huber, deceased, late of Unterjettenberg, and Alois Schiessl, legal representative, Bad Reichenhall, all of Fed. Rep. of Germany, assignors to Firma Buck KG, Bad Uberkinged, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 525,284, Nov. 15, 1974, abandoned. This application Jun. 16, 1978, Ser. No. 921,581
Int. Cl.[4] F42B *13/00*
U.S. Cl. 102—334 9 Claims

1. A method for the protection of surface targets against projectiles equipped with infrared sensitive target finders, comprising the steps of:

(a) detecting the approach of a projectile; and
(b) providing an infrared jamming radiator in the airspace near the surface target in the form of a jamming cloud comprising a plurality of discrete burning foil particles each having a thickness between about 0.1 and 0.5 mm, a surface area between about 10 and 100 cm^2, and a shape and weight adapted for a slow rate of descent in the air-

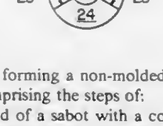
space, said foil particles being dispersed to provide an infrared radiating area at least as large as the surface target, the intensity of the infrared radiation from said cloud of burning particles being at least as great as that of the surface target over a time period at least as long as the active detecting time of the infrared sensitive target finder of the projectile.

4,838,168

ULTRAVIOLET CURED GAS SEAL FOR DISCARDING SABOT PROJECTILE

Michael C. Manion, Hopkins; Loren J. Walensky, Brooklyn Park, and Francis J. Walker, Maple Grove, all of Minn., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Feb. 17, 1988, Ser. No. 156,859
Int. Cl.[4] F42B *13/16*
U.S. Cl. 102—522 9 Claims



1. A method for forming a non-molded gas seal on the aft end of a sabot, comprising the steps of:
coating an aft end of a sabot with a compound capable of photo-initiation and rapid polymerization;
exposing said compound to ultraviolet radiation, whereby said ultraviolet radiation photo-initiates a polymerization reaction of said compound; and
forming a non-molded gas seal on said aft end of said sabot by polymerizing nearly all of said compound to form a hard, cured compound.

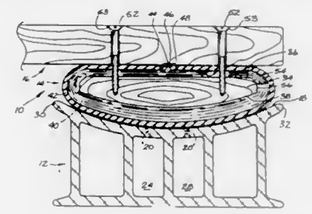
4,838,169

MINIMUM FILLER RUNNER FOR AIR CONVEYOR SYSTEM

Herbert E. Gladish, Ottawa, Canada, assignor to E. B. Eddy Forest Products, Ltd., Ottawa, Canada

Filed Jun. 23, 1988, Ser. No. 210,387
Int. Cl.[4] B65G *51/03*
U.S. Cl. 104—23.2 11 Claims

1. A load supporting means for positioning between a load and a concave load supporting surface for supporting said load above said surface, said means comprising an elongated core member having a generally flat upper surface and a generally transversely convex lower surface, pad means of flexible, compliant material covering at least said lower surface, and an outer cover generally enclosing said pad means and said core, said pad means and said cover being formed of material which



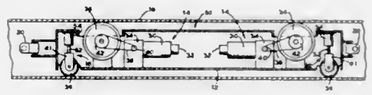
is capable of deformation under load and at least partial recovery when the load is removed.

4,838,170

DRIVE WHEEL UNIT

Jan Illakowicz, New Orleans, La., assignor to McDermott International, Inc., New Orleans, La.

Filed Oct. 17, 1988, Ser. No. 258,419
Int. Cl.[4] B61B *13/10*
U.S. Cl. 104—138.2 7 Claims



1. A drive wheel unit for moving equipment inside a pipe, comprising:
a. a housing;
b. a drive motor mounted in said housing;
c. a drive wheel in operative engagement with said drive motor and extending above the upper edge of said housing; and
d. means mounted in said housing for lifting said housing into a driving position whereby said drive wheel is in driving engagement with the top inside surface of said pipe.

4,838,171

FRICTIONALLY DRIVEN ROLLER TYPE TRANSFER APPARATUS

Satoru Yokoi, Kawagoe, and Toru Kai, Hanno, both of Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

Filed Mar. 14, 1988, Ser. No. 167,788
Claims priority, application Japan, Mar. 13, 1987, 62-35989[U]; Mar. 13, 1987, 62-35990[U]; Aug. 8, 1987, 62-120986[U]
Int. Cl.[4] B61B *13/12*
U.S. Cl. 104—166 9 Claims

1. In a transfer apparatus having a driving shaft, means to guide a pallet along a travel path parallel to said shaft, and a driven roller supported by a member on said pallet to engage said driving shaft, in which the pallet is stationary when the

crossing angle between the axes of rotation of the driven roller and the driving shaft is zero, and the pallet may be driven when the angle is greater than zero, a stop-start apparatus comprising:

a cam rail extending generally parallel to said travel path;

a cam follower on the support member of said driven roller to engage said cam rail and angularly position the axis of said driven roller;

a stopper block in said cam rail guided and supported at a stop position of the pallet in its travel path so as to move in the directions of the pallet's travel and having a notch into which said cam follower fits so as to keep said crossing angle zero;

a movable cam having a proximal end pivotally supported in advance of said stop position, and having a cam surface on which said cam follower makes contact; and

a spring urging said cam to a predetermined position;

said movable cam having a distal end in said predetermined position near said notch, and said cam surface being so shaped as to increase said crossing angle from zero to 45 degrees as said follower travels from said distal end toward the proximal end.

4,838,172

TRANSPORTING SYSTEM OF FLOATED CARRIER TYPE

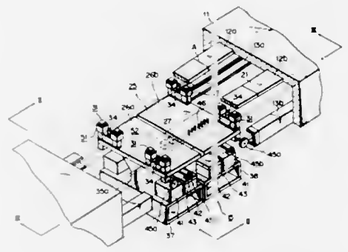
Mimpei Morishita, and Teruo Azukizawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 13, 1987, Ser. No. 49,346

Claims priority, application Japan, May 14, 1986, 61-109915

Int. Cl.[4] B60L *13/06*

U.S. Cl. 104—281 **8 Claims**



1. A transporting system for transporting cargo to a predetermined position, comprising:

a carrier for carrying cargo;

at least one rail extending along a running path of said carrier and having a bottom section made of a ferromagnetic material;

floating means including a plurality of magnetic units having respective combinations of permanent magnets and electromagnets provided on said carrier such as to face said rail, said carrier being caused to float with respect to said rail by electromagnetic attractive forces acting between said magnets and said bottom section of said rail, each magnetic unit comprising two faces which are located opposite the bottom section of said rail, each magnetic unit producing a magnetic flux which emerges from one of said faces and extends through a gap to the bottom section of said rail, passes through said bottom section, and returns to the magnetic unit through a gap between the bottom section and the other face;

means, provided on said carrier, for generating an exciting current;

sensing means provided on said carrier for sensing one of said gaps between each magnetic unit and said rail and for sensing the exciting current to generate an output signal;

means for controlling the exciting current, which includes zero steady-state power control means for maintaining the steady-state exciting current supplied to said electromagnets to be substantially zero in a stable floating condition in response to the output signal of said sensing means, even when an external force is applied to said carrier; and

means for generating a gradually varying target value and setting said controlling means in one of a zero steady-state power control mode, a soft start mode and a soft landing mode in accordance with an external command, said zero steady-state power control means being energized in the zero steady-state power control mode, said zero steady-state power conrtrol means being deenergized and said control means being operated in accordance with a target value and the output signal of the sensing means;

wherein said setting means includes mechanically noncontacting signal transmitting means, and an external command is externally transmitted to said setting means through said signal transmitting means.

4,838,173

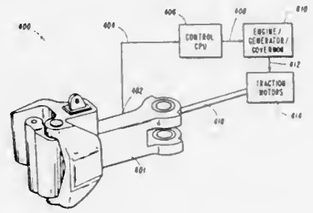
DRAW BAR FORCE SENSING LOCOMOTIVE CONTROL SYSTEM

Paul K. Schroeder, Center Point, and Gary W. Sampson, Marion, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 15, 1988, Ser. No. 169,257

Int. Cl.[4] B61C *3/00*

U.S. Cl. 105—35 **1 Claim**



1. A locomotive control system comprising:

a locomotive frame;

a locomotive draw bar coupled with said locomotive frame for providing coupling capabilities with other rail cars;

a locomotive draw bar force sensor, operatively associated with said locomotive draw bar, for generating force signals;

a locomotive engine generator coupled with said locomotive frame, for generating electric power;

a locomotive engine generator sensor coupled with said locomotive frame and said locomotive engine generator for generating locomotive engine generator signals which correspond to the locomotive engine generator output;

means for monitoring said force signal and said generator signal and issuing a command signal to said locomotive engine generator to operate the locomotive engine generator at a level having the locomotive engine generator signal which corresponds to the maximum of said force signals; and

a traction motor interconnected with said locomotive engine generator capable of receiving electrical power from said locomotive engine generator for causing rotation of at least one locomotive wheel; whereby said locomotive draw bar force sensor detects strain within said draw bar and generates a sensing signal corresponding to the draw bar strain which is supplied to the means for monitoring, where trend information is compared and the command signal is generated for manipulating the operation of the locomotive engine generator at the locomotive engine generator level which corresponds to the maximum of said force signals from said draw bar force sensor; thereby, maximizing the draw bar force.

4,838,174

RAILWAY TRUCK BOLSTER WITH IMPROVED BRAKE ATTACHMENT

Charles Moehling, Arlington Heights, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed May 31, 1988, Ser. No. 200,466

Int. Cl.[4] B61F *1/08*

U.S. Cl. 105—226 **12 Claims**

1. A railway truck bolster comprising

a top, generally flat section having an elongated, generally flat configuration, a raised circular centerplate extending from the center structure of said top section,

a bottom section and two end sections, said bottom section having two sloped surfaces extending downwardly from said end sections,

two side sections joining said top and bottom sections,

two bolt receiving openings in one of said side sections spaced laterally from each other and located an equal distance below the top section, said bolt receiving openings being laterally spaced from said raised circular centerplate,

and a raised flange extending upwardly from said one side section, said raised flange having a bolt receiving opening therein, and said raised flange located laterally generally between said bolt receiving openings in said one side section.

4,838,175

LABORATORY TABLE

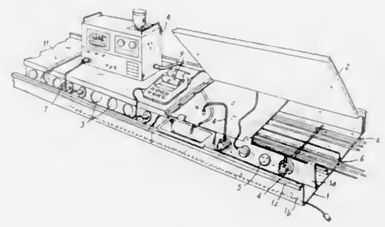
Francois P. Hauville, 264, rue de la Villette, Saint-Pierre les Elbeuf, 76320 Caudebec les Elbeuf, France

Continuation of Ser. No. 000,899, Jan. 6, 1987. This application Jul. 7, 1988, Ser. No. 218,483

Claims priority, application France, Jan. 23, 1986, 86 00951

Int. Cl.[4] A47C *35/00*

U.S. Cl. 108—25 **8 Claims**



1. A laboratory table comprising:

a substantially rectangular, longitudinally extending, horizontal working plane, said working plane having a front longitudinal edge, a rear longitudinal edge, a top work surface and a bottom surface;

a substantially U-shaped channel comprising a substantially vertical, longitudinally extending rear member having a top edge and a bottom portion, a substantially vertical, longitudinally extending front member having a top edge and a bottom portion, and a substantially horizontal, longitudinally extending bottom member conjoining said bottom portions of said front member and said rear member;

said U-shaped channel extending longitudinally substantially parallel to said front longitudinal edge of said working plane, said top edge of said rear member engaging said bottom surface of said working plane, said top edge of said front member disposed forwardly of and spaced apart from said front longitudinal edge of said working plane;

a plurality of apertures formed in said rear member of said U-shaped channel, each of said apertures receivable of a utility supply fitting;

whereby said U-shaped channel may contain at least a portion of a connection member connecting a utility supply fitting to an apparatus disposed on said top work surface and said front member protects and utility supply fitting from inadvertent contact with a human operator.

4,838,176

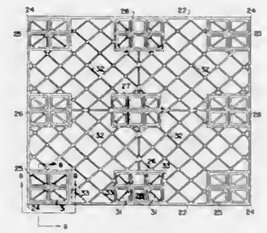
NESTING AND STACKING PALLET

Harold R. Bowser, Sr., and Monty C. Chapman, Jr., both of Jacksonville, Fla., assignors to Bowser Pallet Co., Jacksonville, Fla.

Filed Aug. 24, 1988, Ser. No. 235,647

Int. Cl.[4] B65D *19/04*

U.S. Cl. 108—53.3 **25 Claims**



1. A rigid load carrying rectangular pallet formed of a molded synthetic plastic foam comprising a planar top loading surface, a bottom surface substantially parallel to said top surface, and four substantially vertical side walls depending downwardly from said top surface to said bottom surface and meeting in four right angle corners, a plurality of spaced geometrically shaped functional sections in said pallet having top surfaces coplanar with said top loading surface and vertical walls extending downwardly from said top loading surface to said bottom surface, four of said sections being in said four right angle corners, four other said sections being positioned along said side walls substantially midway between adjacent pairs of said four right angle corners, and the remainder of said sections being spaced away from said side walls and positioned to permit unobstructed insertion of the tines of a fork lift truck under said bottom surface from any side of said pallet, each of said sections having a recess extending downwardly from said top loading surface substantially to said bottom surface, each of said recesses having a tubular leg extending downwardly in vertical alignment with said recess from said bottom surface a distance not greater than the vertical height of said recess and being of a size and shape in outside dimensions of said leg as to fit freely telescopically into said recess, and the space between said four side walls, except for that occupied by said functional sections being filled with a plurality of spaced intersecting vertical parallel stiffening webs extending from one said side wall to another across all open portions of said space from said

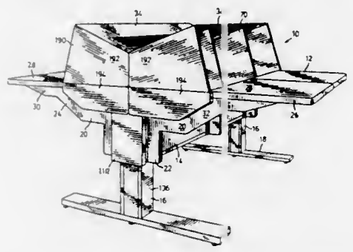
top loading surface to said bottom surface forming a honeycomb structure of enhanced stacking strength.

4,838,177

BEAM-TYPE WORK STATION SYSTEM

Antonius A. Vander Park, Oakville, Canada, assignor to Nova-Link Limited, Ontario, Canada

Filed Apr. 29, 1987, Ser. No. 43,892
Claims priority, application Canada Nov. 14, 1986, 523031
Int. Cl.[4] A47B *3/06*
U.S. Cl. 108—155 **20 Claims**



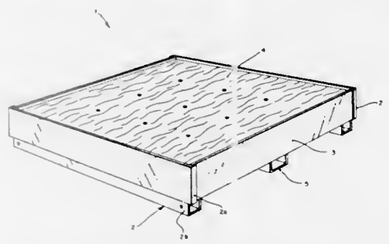
1. A work station suitable for mounting electrical and/or communication equipment comprising a straight, elongate hollow support beam adapted to extend horizontally in use and suitable as a passageway for wiring; support legs for mounting said beam in a horizontal position above a floor; support brackets each detachably connected to a side of said beam and solely supported thereby, said brackets including arm portions with inner sections that extend outwardly and upwardly and outer sections that extend horizontally and outwardly from top ends of said inner sections; work surface means mounted on said outer sections of said arm portions, said work surface means being positioned horizontally away from and above the top of said support beam; and enclosure means for mounting said equipment on said inner sections of said arm portions so that a lower portion of the said equipment is positioned below a horizontal plane defined by the top of said work surface means, said enclosure means being located on said inner sections.

4,838,178

HAZARDOUS MATERIAL SHIPPING PALLET

Eugene Chriske, El Paso, Tex.; Theodore Leno, Jr., Gilroy, and Alva L. Fudge, San Martin, both of Calif., assignors to Haz Pal, Inc., El Paso, Tex.

Filed Jun. 2, 1988, Ser. No. 201,603
Int. Cl.[4] B32B *9/00*
U.S. Cl. 108—55.1 **18 Claims**



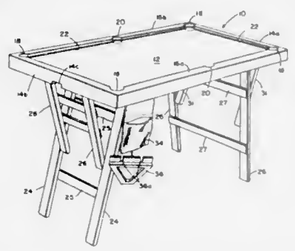
1. A reusable shipping pallet comprising:
a substantially rectangular leak-proof container comprising:
(1) a substantially planar base;
(2) side walls upwardly extending perpendicularly upward;
a rigid support member fixedly mounted to the bottom surface of said container;
an internal load bearing rail fixedly mounted to the uppermost surface of the inside of said container;
a removeable platform
positioned on said internal load bearing rail.

4,838,179

PORTABLE COLLAPSIBLE GAME TABLE

Ting S. Bing, 12 Jalan 13-4, 46200 Petaling, Jaya, Malaysia

Filed Mar. 21, 1988, Ser. No. 170,805
Int. Cl.[4] A47B *3/00*
U.S. Cl. 108—132 **7 Claims**



1. A collapsible and portable table for playing games comprising four walls joined to form a rectangular frame of predetermined height, a playing surface mounted in said frame in a plane beneath that of the top of said frame, resilient cushions disposed upon the inwardly facing interior surfaces of said walls above said playing surface, a plurality of recesses and pockets formed at predetermined points about said playing surface, support means including legs, hinges and braces for normally supporting said frame and said playing surface at a height convenient to players utilizing said table, said hinges connecting said legs beneath said playing surface and said braces having first ends pivotably connected to said legs and second ends bearing upon and adjustably retainable at points beneath said playing surface whereby said playing surface may be adjusted, said support means being sized and configured to be collapsed for storage within a given volume defined by the bottom of said playing surface, the portions of the walls of said frame disposed beneath said playing surface and a plane which includes the bottom of said frame, and means including cue sticks for locking said support means collapsed for storage within said given volume.

4,838,180

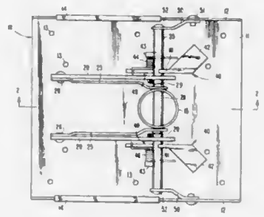
FOLDING TABLE LEG APPARATUS

David R. Gutgsell, Japser, Ind., assignor to Ditto Sales, Inc., Jasper, Ind.

Filed Mar. 4, 1988, Ser. No. 163,896
Int. Cl.[4] A47B *3/00*
U.S. Cl. 108—132 **13 Claims**

1. A folding table leg apparatus for a folding table having a tabletop and a number of legs operable between a folded and an extended position, said folding table leg apparatus comprising:
a top plate;
means for mounting said top plate to the tabletop;
a pair of side flanges projecting from said top plate, each of said side flanges having a height greater than the effective diameter of said one leg and each having a free edge, said side flanges defining an envelope between said top plate and said free edges; and

means, attachable to one each of the number of legs, for folding said one leg from the extended position in which said one leg supports the tabletop to the folded position in which said one leg is folded within said envelope, said folding means being fully contained within said envelope when said one leg is in its folded position, said folding means including;
a pair of brace links straddling said one leg, each of said pair of brace links being pivotably mounted at a first end to said top plate and pivotably connected at a second end to diametrically opposite portions of the leg, such that said brace links provide support for the leg in its extended position;



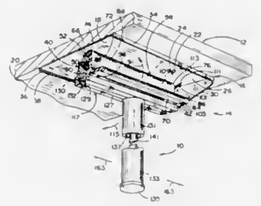
a pair of swivel brackets straddling the leg, each of said swivel brackets being pivotably mounted at a first end to said side flanges and including means for pivotably connecting said swivel bracket at a second end to diametrically opposite portions of the leg adjacent the top of the leg, said connecting means including a first pivot rod;
a support surface associated with said top plate for vertically supporting said first pivot rod when said one leg is in its extended position; and
locking means for releasably engaging and urging said first pivot rod into said support surface when said one leg is in its extended position, said locking means including a pair of independent lever arms straddling the leg and pivotably mounted to said top plate.

4,838,181

TABLE LEG COUPLING ASSEMBLY

Harley E. Luyk, Hudsonville, Mich., assignor to L.H.L. Incorporated, Grand Rapids, Mich.

Filed Jun. 20, 1988, Ser. No. 208,880
Int. Cl.[4] A47B *3/06*
U.S. Cl. 108—156 **13 Claims**



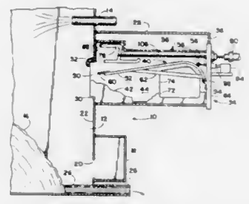
1. A table comprising:
a table top having an underside;
at least one table leg for supporting said table top, said table leg having a follow construction and including an stop structure fixedly mounted therein which has a central aperture and an abutment surface facing away from said mounting member;
at least one coupling assembly including an elongated mounting member having a guideway said guideway including an elongate surface adapted to abuttingly engage one end of said leg in the support of said table top, said guideway further including a channel intermediately positioned along said elongated surface, said channel being defined by first and second intersecting passages, wherein said first passage is oriented substantially parallel with said elongated surface; and
a locking means operable between said mounting member and said leg for releasably locking said leg to said mounting member to thereby facilitate lateral adjustment of said leg along said underside of said table top, said locking means providing infinite adjustment of said leg along said elongated surface; said locking means including a bolt and a nut, wherein said bolt includes a head and a threaded portion and is passed through said aperture of said top structure to extend axially through said leg, wherein said threaded portion is threadedly received in said nut, and wherein one of said head and nut is positioned within said first passage and the other of said head and nut is positioned adjacent said abutment surface of said stop, such that said head and bolt may be tightened to lock said table leg in a desired position along said guideway and loosened to permit infinite adjustment therealong.

4,838,182

APPARATUS FOR REGULATING AIR FLOW THROUGH AN AIR PORT OF A CHEMICAL RECOVERY FURNACE

Byron L. Goodspeed, 1111 Holcomb Rd., Kelso, Wash. 98626

Filed May 26, 1988, Ser. No. 199,126
Int. Cl.[4] F23L *5/00*
U.S. Cl. 110—182.5 **7 Claims**



1. Apparatus for regulating air flow through an air port of a firebox, said apparatus comprising:
a plenum chamber having first and second openings therein, said plenum chamber receiving air under pressure through the first opening and supplying the air through the second opening to the air port;
means movably mounted in said plenum chamber between the first and second openings for damping the flow of air through said plenum chamber to the air port;
first means for selectively moving said damping means to a first position in a locus of movement of said damping means, the first position resulting in a predetermined flow of air through said plenum chamber to the air port;
means movably mounted in said plenum chamber for cleaning, during periodic cleaning cycles, excrescent material blocking the air port, said cleaning means being in a retracted position in said plenum chamber during periods between the periodic cleaning cycles, said cleaning means in the retracted position being in non-interfering relation with the locus of movement of said damping means, said cleaning means having a locus of movement that is mutually interfering with a substantial portion of the locus of movement of said damping means; and
second means connected to said cleaning means and operable during the periodic cleaning cycles for moving said cleaning means into the air port to dislodge the excrescent

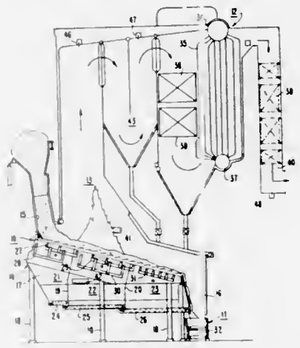
material therefrom and to return said cleaning means to the retracted position said first moving means including means operable before starting a cleaning cycle for moving said damping means from the first position to a second position in the locus of movement of said damping means, the second position being in non-interfering relation with the locus of movement of said cleaning means, and returning said damping means to the first position after said cleaning means returns to the retracted position.

4,838,183

APPARATUS AND METHOD FOR INCINERATING HETEROGENEOUS MATERIALS

Thomas Tsaveras, Elmont; Matthew J. Gaskin, Williston Park, and John T. Maidhof, Massapequa, all of N.Y., assignors to Morse Boulger, Inc., Flushing, N.Y.

Filed Feb. 11, 1988, Ser. No. 154,880
Int. Cl.[4] F23H *5/02*
U.S. Cl. 110—190 **74 Claims**



1. An apparatus for burning waste refuse having a heterogeneous composition comprising:

means defining a combustion chamber having an inlet for charging waste refuse therein and an outlet for discharging combustion gases therefrom,

means disposed within said combustion chamber for agitating waste refuse charged therein,

means for sensing the temperature differential of combustion gases emanating from burning waste refuse disposed on said agitating means, between spaced points along the path of flow of said emanating combustion gases, and

means responsive to variations of said sensed temperature differential relative to a preselected temperature differential for adjusting the operation of said agitating means.

4,838,184

METHOD AND APPARATUS FOR DISPOSING OF LANDFILL PRODUCED POLLUTANTS

John D. Young, Tulsa, Okla., and Ernest A. Fischer, Cherry Hill, N.J., assignors to John Zink Company, Tulsa, Okla.

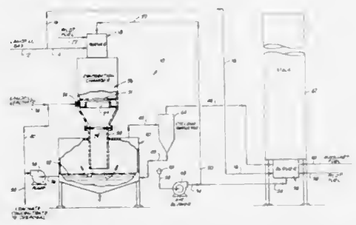
Filed May 23, 1988, Ser. No. 197,639
Int. Cl.[4] F23G *7/04*
U.S. Cl. 110—346 **14 Claims**

1. A method of disposing of noxious landfill produced leachate using noxious landfill produced gases as fuel comprising the steps of:

(a) combusting at least a first portion of said landfill produced gases with air in a first combustion zone to produce a stream of hot combustion products;

(b) contacting said leachate with said stream of hot combustion products to vaporize a portion of said leachate and form a concentrated leachate residue and a composite gas stream;

(c) withdrawing said concentrated leachate residue for disposal; and



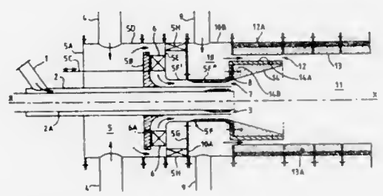
(d) combusting said composite gas stream with additional air in a second combustion zone to thereby convert noxious components remaining therein to non-polluting compounds.

4,838,185

FLUID FUEL COMBUSTION PROCESS AND TURBULENT-FLOW BURNER FOR IMPLEMENTING SAME

Gérard Flament, Douai, France, assignor to Charbonnages De France, Paris, France

Continuation of Ser. No. 856,975, Apr. 29, 1986, abandoned. This application Sep. 8, 1987, Ser. No. 96,306
Claims priority, application France, May 3, 1985, 85 06750
Int. Cl.[4] F23D *1/02*; F23K *5/00*
U.S. Cl. 110—347 **9 Claims**



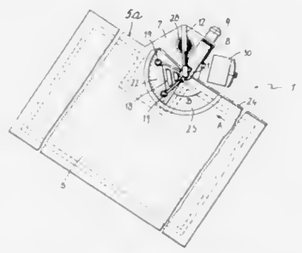
1. Combustion process in which a fluid fuel comprising a pulverized fuel mixed with primary air is injected along an axis, through a burner outlet extended by a frustoconical throat having an upstream end and a downstream end, said fructoconical throat extending outwardly downstream at a half angle of about 10°–35°, injecting secondary air along a helical path around said axis and through the burner outlet, and injecting unheated tertiary air in a ring from a plane defined by said downstream end of said frustoconical throat, downstream and substantially parallel to said axis around the combustible fluid and the secondary air as a substantially circumferentially continuous coaxial cylindrical air jacket laterally confined from outward expansion by a cylindrical, coaxial combustion chamber, said tertiary air being injected as a ring having a diameter between 1.8 and 3.6 times the diameter of the burner outlet, said plane from which said tertiary air is injected being downstream of the burner outlet discharging at a distance between 0.5 and 1.5 times the diameter of the burner outlet, discharging the tertiary air along and adjacent to a refractory material lined confinement wall of said cylindrical combustion chamber, said lined confinement wall extending downstream over a distance between 0.2 and 1 times the diameter of the ring.

4,838,186

AUTOMATIC APPARATUS FOR THE MANUFACTURE OF MATTRESS-SACKS

Rodolfo Resta; Mario Resta, and Roberto Resta, all of Faenza, Italy, assignors to Resta Commerciale S.r.l., Faenza, Italy

Filed Sep. 14, 1987, Ser. No. 96,192
Claims priority, application Italy, Sep. 26, 1986, 3522 A/86
Int. Cl.[4] D05B *11/00, 21/00*
U.S. Cl. 112—2.1 **6 Claims**



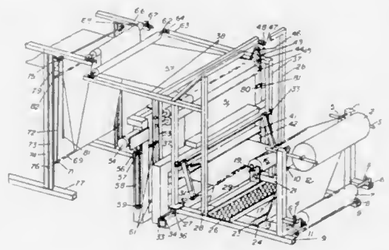
1. Automatic apparatus for the manufacture of mattress-sacks, comprising a base plane for the sack to be manufactured provided with a work side, a sewing machine supported and overhanging by said side and adapted to operate along a border of said sack parallel to said side, an auxiliary work plane rotatable on said base plane about a vertical axis, and presser elements rotatably supported about said vertical axis and adapted to secure on said rotatable plane the border of said sack being sewn so as to allow its rotation for the sewing of a following border perpendicular to said border.

4,838,187

QUILTING MACHINE DEVICE

Harold Tatum, 5009 E. Manslick Rd., Louisville, Ky. 40219

Filed Sep. 18, 1987, Ser. No. 99,337
Int. Cl.[4] D05B *11/00*
U.S. Cl. 112—118 **4 Claims**



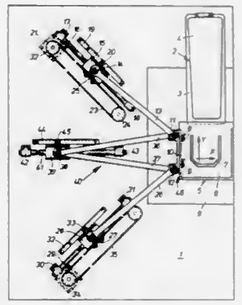
1. Quilting apparatus for quilting overlying layers of textile material including at least first and second reel unwind devices to supply at least first and second webs of textil material; tensioning device to maintain the first and second webs of textile material at a selected tension; horizontally extending first and second pairs of nip rollers located in spaced apart generally vertical orientation where the said first and second webs of textile material is fed therebetween in overlying relation to provide a sewing area therebetween; generally horizontally extending sewing machine means adapted to sew the first and second overlying layers of textile material together in the sewing area; frame means to carry said first and second overlying layers of textile material together in the sewing area; frame means to carry said first and second pairs of nip rollers which frame means includes adjustment means capable of moving said first and second overlying layers of textile material in said sewing area laterally to the direction of movement of the fabric through the sewing area; drive means to rotate said first and second pairs of nip rollers in cooperative relation to selectively advance and retract the material in the sewing area so that by proper coordination selected sewn configurations can be provided in the first and second overlying layers of textile material in the sewing area.

4,838,188

SEWING GROUP WITH A FEED DEVICE

August Martin, Morbach, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Sep. 2, 1988, Ser. No. 241,020
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 3729256
Int. Cl.[4] D05B *21/00*
U.S. Cl. 112—121.12 **8 Claims**



1. A sewing group drive for use with a sewing machine and a feed device which includes a drivable work-holder, comprising first and second slide guides, a slide movable on each of said first and second guides, first and second links having one ends supported on the respective first and second slide and having opposite ends, first and second stationary positioning motors in drive connection with respective first and second slides, said first and second link opposite ends being articulatedly connected with the work-holder for transmission of exclusively axial forces, a stationary slide guide, a guide arm having one end connected to the work-holder and having an opposite other end received displaceably and rotatably on said stationary guide.

4,838,189

MAST ATTACHMENT FOR QUICK CONNECT AND DISCONNECT

Jaakko Kurhi, 5284 Camino Alta Mira, Castro Valley, Calif. 94546

Filed Oct. 6, 1987, Ser. No. 106,697
Int. Cl.[4] B63H *9/00*
U.S. Cl. 114—39.1 **2 Claims**

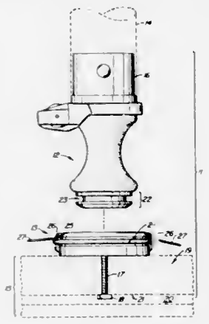
1. Apparatus for detachably connecting a mast to a sailboard, said apparatus comprising:

a connecting member securable to an end of said mast, said connecting member terminating in a circular end having a circumferential groove;

a receiving member securable to said sailboard, said receiving member containing a recess to receive said circular end of said connecting member;

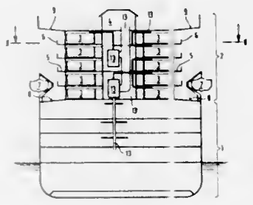
at least one tongue mounted to said receiving member in a manner permitting sliding thereof to a groove-engaging position in which said tongue protrudes into said recess to engage said circumferential groove of said connecting member; and

an elastic band encircling said receiving member and engaging said tongue, said elastic band retained in a first band-



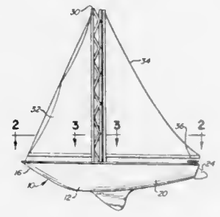
retaining groove in said receiving member and second band-retaining groove in said tongue.

4,838,190
PASSENGER SHIP
Kai Levander, Grankulla, Finland, assignor to Oy Wärtsilä Ab, Helsinki, Finland
Continuation of Ser. No. 433,361, Oct. 7, 1982, abandoned. This application Nov. 23, 1988, Ser. No. 277,478
Claims priority, application Finland, Oct. 13, 1981, 813162
Int. Cl.[4] B63B *1/00*
U.S. Cl. 114—56 **39 Claims**



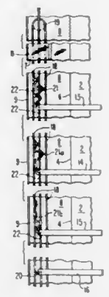
14. A big passenger ship comprising a hull, a number of through-going decks integral with said hull and defining general purpose spaces and service rooms therebetween, and a multifloor unit disposed over the uppermost through-going deck, said multifloor unit defining two ranks of passenger cabins disposed at the outside of the multifloor unit and at opposite sides respectively of the multifloor unit and having between them, in a central portion of the ship, a wide vertical space that extends over the major part of the length of the multifloor unit and passes through at least two floors of said multifloor unit, and the ship also comprising an air conditioning system and said wide vertical space containing bulky components of said air conditioning system, and substantially all passenger cabins above the uppermost through-going deck being in the multifloor unit.

4,838,191
LOW-DRAG SAILBOAT MAST
Edwin H. Corlett, and Edwin H. Corlett, Jr., both of c/o Corlett & Associates, 110 W. Madison St., Oak Park, Ill. 60302
Continuation-in-part of Ser. No. 67,547, Jun. 29, 1987, abandoned. This application Jun. 24, 1988, Ser. No. 210,826
Int. Cl.[4] B63B *35/00*
U.S. Cl. 114—90 **12 Claims**



1. A sail control device for a sail-driven vehicle having a stern, comprising:
a plurality of spaced parallel bars arranged as a polygon in cross-section, the bars being of a size to permit air flow therebetween and being oriented such that one of the bars is disposed nearer the stern of the sail-driven vehicle than the remaining bars wherein the bars are of one of two types: (a) solid and of decreasing diameter toward a top of the sail control device, and (b) hollow and having wall thickness which decrease toward the top of the sail control device;
bracing members secured between the bars; and
means for securing a luff edge of a sail to the one bar.

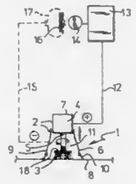
4,838,192
MARINE SAILS WITH BATTENS AND FURLING SYSTEMS THEREFOR
William H. Stevenson, IV, 417 Talbot St., St. Michaels, Md. 21663; William H. Stevenson, III, Rt. 5, Box 532 Travelers Rest, Easton, Md. 21601, and Aulby E. Bates, III, St. Michaels, Md.
Filed Oct. 8, 1987, Ser. No. 105,742
Int. Cl.[4] B63H *9/10*
U.S. Cl. 114—105 **12 Claims**



11. A marine sail, the combination comprising:
a generally triangular sail body having a first edge, a second edge, and a third edge;
means, extending along said second edge, for defining an elongated pocket having an entrance opening;
an elongated flexible batten having a first end portion and a second end portion;

means, coupled to said sail body and to said batten, for supporting said batten on said sail body; and
means, extending within said pocket and connected to said first end portion of said batten, for moving said batten along said entrance opening and upwardly along said pocket.

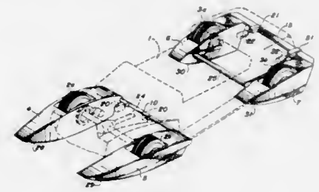
4,838,193
SCRUBBING MACHINE
Josephus A. M. van der Tak, Wassenaarseweg 47, 2596 CG The Hague, Netherlands
Filed Dec. 23, 1987, Ser. No. 137,177
Claims priority, application Netherlands, Dec. 23, 1986, 8603270
Int. Cl.[4] B63B *59/06*
U.S. Cl. 114—222 **2 Claims**



1. A scrubbing machine comprising:
a holder carrying at least one rotary brush;
a drive means for rotating said one brush;
a single control means for controlling said drive means and for applying suction force to suck said brush onto a surface to be brushed, whereby the scrubbing machine is operated by said single control means;
adjustable spacer means in association with said brush to control brush depression under said suction force;
a control line connected to said control means and further wherein said control means comprises a single pump having a pressure side and a suction side, each connected into said control line in a closed control circuit;
a reservoir connected to said pump, said reservoir adapted to act on said control line when said pump is switched off by syphon action and wherein said reservoir is adapted to be replenished or pressurized by said pump; and
pressure sensors to act on said pump at a predetermined high and low pressure limit, to switch said pump off and on, respectively.

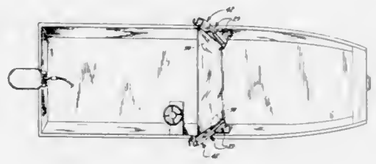
4,838,194
AMPHIBIOUS VEHICLE HAVING AN EFFICIENT WATER-BORNE OPERATIONAL MODE
Roger L. Williamson, MPV, INC., P.O. Box 1176, San Antonio, Tex. 78294
Filed Dec. 2, 1987, Ser. No. 127,800
Int. Cl.[4] B63B *35/00*
U.S. Cl. 114—270 **17 Claims**

1. An amphibious venhicle for travel on land and in the water, comprising:
a vehicle body;
at least three wheels supporting said vehicle body;
engine means for providing torque to at least two of said wheels;
at leat three fender/sponson units, each of said fender/sponson units encompassing and being rotatably mounted about one of said wheels whereby, when said fender/sponson units are rotated to a first position, said wheels project downwardly therethrough for contact with the land and, when said fender/sponson units are rotated to a second position, said fender/sponson units provide floatation support to said vehicle body;
a gear assembly of rotatably mounting said fender/sponson units about said wheels, said gear assembly comprising:
a ring member having teeth along an inner annular surface, being attached to said fender/sponson unit;
a support ring sized to fit inside said ring member, said



support ring having an aperture therein, through which projects a toothed gear, said toothed gear meshing with said teeth along said inner surface of said ring member, said support ring further being fixedly attached to said vehicle body; and
drive means for turning said toothed gear.

4,838,195
OPEN BOAT WINDSCREEN
Arlen J. Carter, 214 Mechanic St., Franklin, La. 70538
Filed Apr. 21, 1987, Ser. No. 40,637
Int. Cl.[4] B63B *17/00*
U.S. Cl. 114—343 **16 Claims**



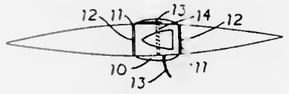
1. An open boat windscreen apparatus, comprising:
(a) a pair of spaced-apart, elongated spool posts, each being angled outwardly and rearwardly with respect to the longitudinal axis of the boat;
(b) a flexible fabric-like screen extending between the spool posts and having left and right side portions for wrapping upon the spool posts respectively;
(c) a pair of left and right brackets for rotatably supporting the spool posts;
(d) ratchet means for tightening at least one spool post in at least one rotational direction;
(e) handle means on the upper portion of at least one spool post for rotating the spool post;
(f) connection means for removably mounting the spool posts upon the left and right brackets so that the spool posts and fabric-like screen can be quickly removed from the boat; and
(g) left and right brackets each having an upper and lower bracket and a racket support bar which spans the distance between the lower and upper brackets.

4,838,196

KAYAK SAFETY SPONSONS

Robert T. Ingram, SS 1 Site 7 Comp 19, Penetanguishene, Ontario, Canada L0K 1P0

Filed Aug. 30, 1988, Ser. No. 238,130
Int. Cl.[4] B63B *35/71*
U.S. Cl. 114—347 2 Claims



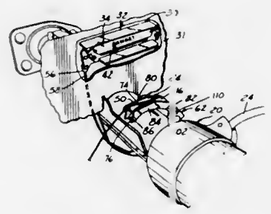
1. An adjustable buoyancy system for attachment to a kayak having a cockpit comprising:
a pair of tapered buoyancy tubes extending along the waterline, one on each side of said kayak, said buoyancy tubes having a length approximately the length of said cockpit of said kayak,
a first connecting means extending between said pair of buoyancy tubes adapted to extend under said kayak,
a second connecting means extending between said buoyancy tubes and adapted to extend over said kayak, said second connecting means including attachment means to facilitate attachment and removal of said buoyancy tubes from said kayak, and
a pair of inflation tubes, one attached to each of said buoyancy tubes, said inflation tubes having a length sufficient to reach the user seated in said cockpit to allow the user to inflate said buoyancy tubes from a non-inflated condition with said buoyancy tubes lying flat against said kayak, to an inflated condition to stabilize said kayak.

4,838,197

GEARSHIFT INDICATOR CABLE MOUNTING CLIP

James A. Watson, Washington, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Sep. 2, 1988, Ser. No. 239,920
Int. Cl.[4] G01D *5/04*; B60Q *11/00*
U.S. Cl. 116—28.1 5 Claims



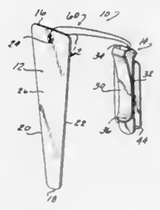
1. In a gearshift indicator mechanism for a vehicle automatic transmission control system having a transmission shift tube which is supported within a cylindrical outer jacket of a vehicle steering column apparatus and which shift tube is rotatable to a plurality of positions by a gearshift lever to effect different transmission settings, an actuating arm fixed on said shift tube and extending outwardly through an aperture in said column jacket, said aperture being rectangular shaped defining parallel side edges and parallel fore and aft edges, means supporting an indicator housing having a dial on its front side displaying a plurality of spaced indicia corresponding to different transmission settings, a tension coil spring fixed to said housing, a carrier is movably supported in housing guide means and connected to said spring such that said spring biases said carrier in a first direction, a pointer extending from said carrier and adapted to move across said dial to provide visual indication of the transmission settings by successive alignment with each said indicia, a flexible cable having an intermediate portion slidable within a plastic shielding conduit, one end of said cable connected to said carrier tensioned to act in opposition to said spring bias and the other end of said cable connected to said shift tube actuating arm, a steering column cable mounting clip apparatus for said indicator mechanism comprising:
a one-piece clip molded of plastic material having snap-in means adapted for releasably securing said clip in said column jacket aperture;
said clip formed with an elongated adjustment tongue portion extending outwardly from said clip such that its principal axis extends in a direction substantially orthogonal to the principal axis of said column, a slide member slidably disposed on said tongue for reciprocal travel thereon along said tongue principal axis;
an adjustment screw having a journal portion intermediate a drive head and a threaded shank, said screw journal portion rotatably supported on said slide member with its shank threadably received in an aligned bore in said clip such that the principal axis of said screw is oriented parallel to said tongue principal axis;
said plastic shielding conduit defining a curvilinear looped path having a first end connected to said slide member and its second end connected to said indicator housing;
one section of said cable exiting said conduit first end with its free end fixed to said carrier, the other end of said cable fixed to said tube actuating arm;
cable reel means integral with said clip guiding said cable for travel on said clip, said cable operative to move said carrier in one direction against the bias of said spring means upon movement of said shift lever in one direction, and whereby the bias of said spring means operative to move said carrier in the opposite direction upon movement of said shift lever in the opposite direction;
whereby upon linear adjustment of said slide member away from said clip by rotation of said screw in one direction increasing the tension exerted by said cable on said spring such that said carrier is moved an incremental distance in said one direction, and whereby adjustment of said slide toward said clip by rotation of said screw in the opposite direction decreasing the tension exerted by said cable on said spring such that said carrier is moved an incremental distance in said other direction wherein said pointer on said carrier is adapted to be selectively adjusted into correct alignment with each of said dial indicia.

4,838,198

BOOK MARK

Darryl T. Knox, 47650 Burton, Utica, Mich. 48067

Filed Apr. 20, 1988, Ser. No. 184,005
Int. Cl.[4] B42D *9/00*
U.S. Cl. 116—239 6 Claims



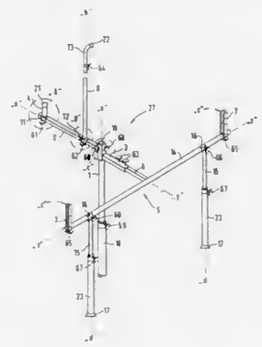
1. A book mark comprising:
an elongated planar book page indicator member;
a clip separate from the book page indicator member and detachably securable over an edge of a book; separate connector means flexibly connecting the clip and the book page indicator member together and means for separably attaching the book page indicator member to the clip when the book page indicator member is not in use to locate a page in a book.

4,838,199

UNIVERSAL VARNISHING MACHINE WITH RETAINING AND SWINGING DEVICE

Martin Weber, Mandlstrasse 11, 8253 Buchbach, Fed. Rep. of Germany

Filed Dec. 3, 1986, Ser. No. 937,411
Int. Cl.[4] B05C *13/00*
U.S. Cl. 118—500 5 Claims



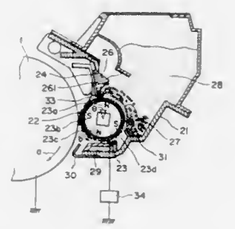
1. A universal varnishing machine for two sided varnishing at least one body part of motor vehicles, comprising:
(a) a round support tube rotatably connected at a right angle to a baseframe;
(b) a headpiece mounted on the support tube and provided with first set screw means; and
(c) means for retaining and rotating the at least one body part, mounted on the headpiece,
wherein the retaining and rotating means comprises first and second cross struts, the first cross strut being provided with first and second support elements, and the second cross strut including a telescopic arm adjusted by second set screw means, an end portion of which is fastened to a double-T-shaped support frame provided with at least one first clamp holder.

4,838,200

DEVELOPING APPARATUS

Atsushi Hosoi, Tokyo, and Hatsuo Tajima, Matsudo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1986, Ser. No. 911,765
Claims priority, application Japan, Sep. 30, 1985, 60-217557
Int. Cl.[4] G03G *15/09*
U.S. Cl. 118—658 29 Claims



1. A developing apparatus for developing a latent image using a developer containing carrier particles and toner particles in a developing position, comprising:
a container for containing developer which contains toner particles and magnetic particles;
a developer carrying member, opposed to a latent image bearing member, for forming the developing position at which the toner particles are supplied to the latent image bearing member and for carrying the developer from said container to the developing position;
magnetic field generating means, disposed across said developer carrying member from its developer carrying surface, and including first and second generating portions, for generating a stationary magnetic field;
means for regulating an amount of the toner particles and carrier particles to be applied on the surface of said developer carrying member; and
a magnetic member disposed upstream of said regulating means and downstream of the developing position with respect to the movement direction of said developer carrying member, said magnetic member having a surface spaced from the surface of said developer carrying member to form a clearance which decreases toward a downstream side from an upstream side, wherein a minimum of the clearance occurs downstream of a center of said first generating portion which is closer to said magnetic member with respect to the movement direction of said developer carrying member;
wherein said magnetic member is positioned and arranged relative to said first generating portion to be effective to enhance the magnetic field formed therebetween such that the enhanced magnetic field allows the developer to return to said container after passing through the developing position to enter said developer container while preventing the magnetic particles in said container from leaking out of said container;
wherein the surface of said magnetic member is disposed downstream of said first generating portion with respect to the movement direction of said developer carrying member; and
wherein the surface of said magnetic member is flat, and an angle formed from the flat surface to a plane connecting a center of the magnetic field generated by said first generating portion and a middle of the length of the flat surface measured substantially along the movement direction of the developer carrying member, is more than 90 degrees and less than 180 degrees.

4,838,201

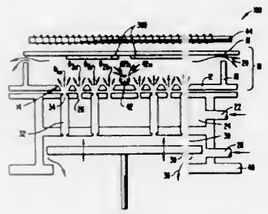
APPARATUS AND PROCESS FOR VACUUM CHEMICAL EPITAXY

Lewis M. Fraas, El Sobrante; Paul S. McLeod, Berkeley, and John A. Cape, San Rafael, all of Calif., assignors to Daido Sanso K. K., Osaka, Japan

Filed Dec. 12, 1986, Ser. No. 941,005
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—719 11 Claims

1. A gas injection block for a vacuum chemical epitaxy apparatus comprising:
a first mixing chamber;
said first chamber having an inlet, said inlet suitable for passing metal-organic gaseous materials and n-type and p-type dopants into said chamber;
a plurality of outlets from said first chamber, said outlets suitable for directing the flow of said metal-organic gases and n-type and p-type dopants toward a substrate;
a second mixing chamber disposed below said first chamber, said second chamber having an inlet suitable for passing a metal-organic gaseous material and n-type and p-type dopants into said second chamber, said second chamber having a plurality of passages through said first chamber and an outlet for each passage, said outlets from said

passages are in substantially the same plane with the outlets of said first chamber; and



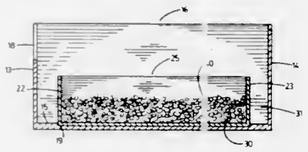
means for exhausting said metal-organic gaseous materials and said n-type and p-type dopants from said second chamber.

4,838,202

ANIMAL LITTER CONTAINER

Larry R. Neu, Fresno, Calif., assignor to Bernice Woock, Atwater, Calif., a part interest

Filed Nov. 27, 1987, Ser. No. 125,932
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—1 3 Claims



1. An animal litter container comprising:
a first housing having a floor with upstanding walls and a substantially rectangular recessed area of predetermined dimensions having borders substantially equally spaced from the corresponding walls of the first housing; and
a second housing having a floor removably positioned in said recessed area of the floor of the first housing and having upstanding walls defining a chamber adapted to receive animal litter, whereby in use litter scattered from the chamber of the second housing is substantially confined by said walls of the first housing.

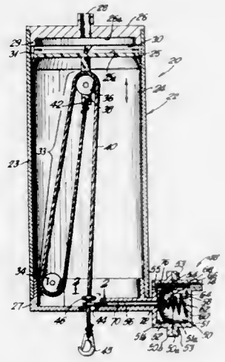
4,838,203

MILKING CLAW RETRACTION AND RETENTION DEVICE FOR MILKING MACHINE

Michael W. Ellis, Kansas City, Mo., and Mofazzal H. Chowdhury, Lenexa, Kans., assignors to Alfa-Laval, Inc., Fort Lee, N.J.

Filed Jul. 21, 1987, Ser. No. 75,974
Int. Cl.[4] A01J *5/04*
U.S. Cl. 119—14.08 24 Claims

22. In an apparatus for removing a milking claw from an animal and retracting the claw therefrom, the milking claw being connectable to a milk line and a vacuum line of a milking machine, the apparatus comprising a cylindrical housing having a generally cylindrical housing cavity having first and second housing ends, a piston reciprocable within the cavity between the housing ends, an inlet adjacent said first housing end for selectively introducing negative pressure into the space between the piston and said first housing end, and cord having one end coupled to the piston and the other end extending through an aperture in said second housing end for coupling with the milking claw, said negative pressure being supplied to draw said piston to a position adjacent said first housing end and thereby retract said cord into said housing, the improvement comprising means for fixing the length of cord extending outwardly from said housing through said aperture following



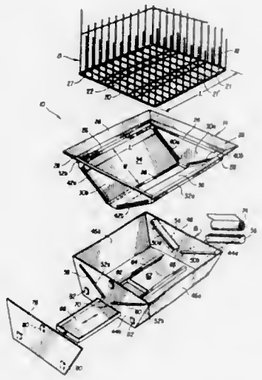
retraction of the milking claw from the animal and cessation of the introduction of negative pressure to the space between the piston and the first housing end wherein a retaining member is secured to a predetermined portion of the cord.

4,838,204

ANIMAL CAGE ASSEMBLY

Joseph D. Young, Rte. 2, Box 35, Brookline, Miss. 65619

Filed Jun. 24, 1987, Ser. No. 65,733
Int. Cl.[4] A01K *31/00*
U.S. Cl. 119—17 16 Claims



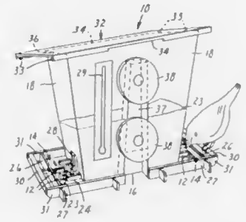
1. An animal cage assembly comprising:
a cage for holding an animal, said cage having a floor comprising slats with relatively large opening therebetween through which excrement and other material from an animal in said cage can fall;
a base assembly positioned below said cage, said base assembly comprising a baffle means positioned below the floor of said cage for defining at least two substantially vertical sides and at least one sloping guide surface leading downwardly to a gap positioned at bottom edges of said downwardly sloping guide surfaces, each said downwardly sloping guide surface and said gap having a length which is at least approximately as long as the floor of the cage for all those portions of the guide surface positioned below the floor of the cage, substantially the entire area located vertically under said cage floor being covered by a downwardly sloping guide surface and said gap, whereby materials falling vertically downwardly through the openings in the cage floor come into contact with a guide surface or pass directly through the gap located therebelow, said base assembly further comprising a tray positioned below said gap, and having a length dimension approximately as great as that of said gap, for receiving materials passing vertically downwardly through said gap, said base assembly further comprising a paper roll holder positioned adjacent each said sloping guide surface whereby a leading-end portion of a roll of paper in each said roll holder can be pulled across its respective sloping guide surface and left there to protect said baffle means;
whereby virtually all excrement and other materials falling vertically downwardly from said animal cage either pass directly through any part of said gap located therebelow into said tray or strike paper on a sloping guide surface so that sticky materials stick to said paper and non-sticky materials are directed through said gap into said tray, and whereby a dirty, leading end portion of each said paper roll can be periodically pulled across its respective sloping guide surface while simultaneously bringing a fresh portion of paper onto the guide surface and the leading dirty end portion can be torn from said paper roll and discarded.

4,838,205

BIRD FEEDER WITH SCATTER RESTRICTING FEEDING TRAY

Donald A. Larson, Circle Pines, Minn., assignor to North States Industries, Inc., Minneapolis, Minn.

Filed Jan. 25, 1988, Ser. No. 148,047
Int. Cl.[4] A01K *39/00*
U.S. Cl. 119—52 R 6 Claims



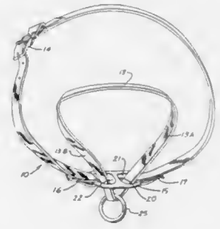
1. A bird feeder comprising a bottom wall having a top surface; side walls having inner and outer surfaces, said side walls being attached together and to said bottom wall and projecting above the top surface of said bottom wall so that a portion of said bottom and side walls define a cavity adapted to contain a supply of bird feed; said bottom wall including a tray portion extending past the outer surface of a first one of said side walls and said feeder further including an elongate outer edge wall attached to the tray portion of said bottom wall and projecting above said top surface at a position spaced from said first one of said side walls to define with said tray portion a shallow feeding tray between said first one of said side walls and said edge wall adapted to contain bird feed; said walls defining a passageway between said cavity and said shallow feeding tray located centrally along said first one of said side walls and affording the flow of bird feed from said cavity to said shallow feeding tray; perch means for allowing birds to perch along said edge wall facing said feeding tray generally at a right angle to the length of said edge wall; and a plurality of spaced vertical partitions within said shallow feeding tray and oriented at generally a right angle to said outer edge wall to restrict bird feed being blown from the shallow feeding tray and brushing of bird feed from the shallow feeding tray by side to side motion of the bill of a bird perched on said perch means, said spaced partitions extending less than the distance between said first one of said side walls and said outer edge wall with said partitions being alternately positioned adjacent said side wall and adjacent said edge wall to form a labyrinth defining tortuous paths for movement of bird feed through said opening and along said feeding tray in two directions away from said opening.

4,838,206

COMBINATION COLLAR AND MUZZLE HUMANE TRAINING AID

Robert K. Anderson, Roseville; Ruth E. Foster, Minneapolis, and Jeffrey A. Levine, Bloomington, all of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation of Ser. No. 922,156, Oct. 23, 1986, Pat. No. 4,741,288, which is a continuation-in-part of Ser. No. 719,697, Apr. 4, 1985, Pat. No. 4,621,591. This application Mar. 17, 1988, Ser. No. 169,294
The portion of the term of this patent subsequent to Nov. 11, 2003, has been disclaimed.
Int. Cl.[4] A01K *25/00*
U.S. Cl. 119—130 8 Claims



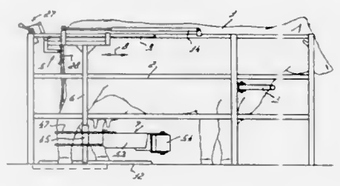
1. A combination collar and muzzle humane training aid for dogs having a head with a muzzle, a neck and ears, said humane training aid comprising:
an adjustable collar adapted to fit closely around the neck of a dog on which the humane training aid is placed on an upper side of the neck immediately behind the ears of such dog and extending closely behind the head along lateral sides of the neck to a lower side of the neck;
a ring carried by said collar, said collar being fitted to position the ring against the lower side of the neck immediately to the rear of the lower jaw of a dog on which the collar is fitted; and
a muzzle loop freely slidably passing through said ring and forming a substantially continuous loop over the muzzle of a dog on which the humane training aid is placed and having a portion extending out of said ring for attachment to a leash, the ring being held by the collar so that when the muzzle loop is pulled pressure is applied downwardly on the muzzle by the loop sliding through the ring and by the collar bearing on the upper side and lateral sides of the neck of a dog wearing the humane training aid.

4,838,207

IMPLEMENT FOR AND A METHOD OF MILKING AN ANIMAL

Cornelis J. G. Bom, Rozenburg, and Karel van den Berg, Bleskensgraaf, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

Filed Jul. 21, 1988, Ser. No. 222,611
Claims priority, application Netherlands Jul. 23, 1987, 8701735
Int. Cl.[4] A01J 3/00
U.S. Cl. 119—14.02 30 Claims



1. An implement for milking an animal, such as a cow, comprising:

a milking parlor for retaining the animal in a substantially fixed position, said fixed position generally aligned with said milking parlor's longitudinal axis;

a frame, said frame being attached to a side wall of said milking parlor such that said frame is capable to slidable movement along said side wall parallel to said longitudinal axis;

a robot arm, said robot arm being pivotally attached to said frame by a substantially vertical first pivot pin, said first pivot pin being located outside said side wall of said milking parlor and behind a vertical plane transverse to said longitudinal axis and tangential to the front side of the animal's udder, said robot arm further comprising two portions, a first portion attached via said first pivot pin to said frame and a second portion pivotally attached to said first portion by a substantially vertical second pivot pin, wherein said robot arm is capable of pivoting in a substantially horizontal plane around said first pivot pin such that said second pivot pin may be positioned between the animal's front and rear legs and at least one teat cup carried near an end of said second portion may approach the front side of the animal's udder; and

means for applying each said teat cup to a teat by independent substantially upward movement of each said teat cup.

27. A method of milking an animal, such as a cow, comprising the steps of:

guiding the animal to a milking parlor;

recognizing the animal in said milking parlor by means of an animal recognition system;

moving a robot milking arm to an initial position beneath the animal's underside and between its front and rear legs, said robot milking arm approached the animal's udder from the front side;

attempting to detect, by means of a sensor the presence and position of one or more teats of the animal's udder;

adjusting the height of said robot arm when the teats are not detected and repeating the attempted detection step until detection occurs;

orienting said sensor on one teat;

moving one said teat cup under the teat oriented on by said sensor;

sliding said teat cup upwardly while inducing a vacuum therein;

attaching said teat cup to teat; and

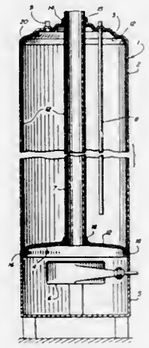
withdrawing said robot arm from said teat cup.

4,838,208

CATHODICALLY PROTECTED WATER HEATER

James S. Stubbe, Milwaukee; James L. Chevalier, Mequon, and Edwin C. Pow, Menomonee Falls, all of Wis., assignors to A.O. Smith Corporation, Milwankee, Wis.

Division of Ser. No. 131,576, Dec. 11, 1987, Pat. No. 4,783,896, which is a continuation-in-part of Ser. No. 940,430, Dec. 11, 1986, abandoned. This application May 31, 1988, Ser. No. 200,468
Int. Cl.[4] F22B 5/00
U.S. Cl. 122—17 50 Claims



1. A water heater for containing and heating water, said heater including a steel, generally cylindrical shell having an annular shape, a steel head having a surface interior to said heater disposed in lapping relation to the interior surface of said shell, a thermally sprayed coating of a metal anodic to steel disposed on said interior surface of said head so as to be in lapping relation to said shell, a layer of a material resistant to water corrosion disposed on said interior surface of said shell and in contact with said coating on said head, and a weld connecting said surfaces and extending through said anodic metal coating into said head whereby said metal coating on said head flows about said weld and contacts said material on said shell to hydraulically seal off said weld from contained water and to provide a corrosion barrier and anodic surface to contained water at the location of said weld.

4,838,209

ENERGY PLANT WITH HEAT EXCHANGER IN A BLOW-OFF DEVICE FOR HOT GASES

Lennart Hjalmarsson, Finspong, Sweden, assignor to ABB Stal AB, Sweden

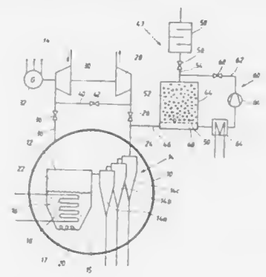
Filed Apr. 14, 1988, Ser. No. 181,505
Claims priority, application Sweden, Apr. 14, 1987, 8701557
Int. Cl.[4] F22B 1/00
U.S. Cl. 122—4 D 8 Claims

1. A power plant comprising:

a vessel in a PFBC power plant generating hot propellant gas for a gas turbine at a pressure considerably exceeding the atmospheric pressure;

means for rapid de-pressurization of the vessel by blowing off the hot gas through a blow-off device having a blow-off valve in a drain line communicating with said vessel; and

a heat exchanger in said drain line, said heat exchanger having a lump-formed, rod-formed or plate-formed heat-absorbing material ahead of said blow-off valve, said



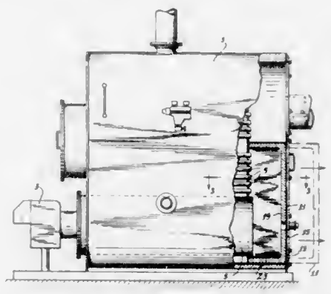
heat-absorbing material cooling said hot gas during blowing when depressurizing said vessel.

4,838,210

PRE-FORMED INSULATING REVERSING CHAMBER FOR MODIFIED SCOTCH BOILER OR THE LIKE

Richard H. Kirby, Arlington, Vt., assignor to Burnham Corporation, Lancaster, Pa.

Filed Jul. 7, 1988, Ser. No. 216,098
Int. Cl.[4] F22B 7/12
U.S. Cl. 122—149 4 Claims



1. In a boiler having a first pass furnace and a set of second pass tubes, a reversing recess proximate to said passes positioned for reversing the flow of gases between said passes, and a rear access door providing access to said recess, that improvement including

an integral, self-sustaining reversing chamber, said chamber being formed of insulating material and being sized and configured to fit within and be removably held by said recess, said chamber being enclosed by walls on all sides thereof except the side facing said recess, with said side facing said recess defining a concave portion,

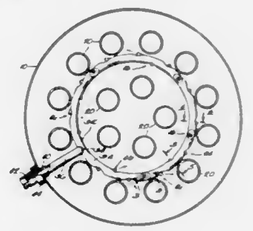
whereby hot gases exiting from said first pass furnace will enter said concave portion and be deflected to said set of second pass tubes, and said reversing chamber can readily be replaced in said recess.

4,838,211

WATER HEATER CONSTRUCTION AND METHOD OF HEATING WATER

Otto Z. Vago, Burns, Tenn., assignor to State Industries, Inc., Ashland City, Tenn.

Continuation of Ser. No. 498,019, May 25, 1983, abandoned. This application Apr. 28, 1988, Ser. No. 188,168
Int. Cl.[4] F22B 7/00
U.S. Cl. 122—159 25 Claims



1. A water heater comprising;

a water tight tank means adapted to contain water under pressure;

a source of heat for heating water inside said tank means;

a hot water outlet means located in the top portion of said tank means through which hot water can be periodically withdrawn from the top portion of said tank means;

an agitator assembly means mounted in the bottom portion of said tank, said agitator assembly means including a circular tubular member connected to a source of water under pressure, said circular tubular member having a first row of orifice means mounted around the inner side thereof and a second row orifice of orifice means mounted around the outer side thereof, said orifice means directed at an angle with respect to a radius line through each of said orifice means, each of said orifice means including a flow passageway through which a jet-like stream of water is directed into said tank means each time water is drawn out of the top portion of said tank means through said hot water outlet means, said orifice means all directed in the same direction with respect to the axis of said circular tubular member to produce a swirling action in the bottom portion of said tank means each time hot water is drawn out of said hot water outlet means, said swirling action effective to cause solid materials which have either settled to the tank bottom or are in the process of settling to the tank bottom to be maintained in suspension in the water so that ultimately at least a portion of such materials will be carried upwardly in said tank means and out said hot water outlet means.

4,838,212

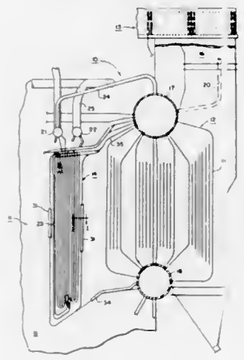
SUPERHEATER UNIT OF A STEAM GENERATING SYSTEM

Matthew J. Gaskin, Williston Park, N.Y., assignor to Morse Boulger, Inc., Long Island, N.Y.

Continuation of Ser. No. 915,012, Oct. 3, 1986, abandoned. This application Oct. 12, 1988, Ser. No. 256,260
Int. Cl.[4] F23B 37/52
U.S. Cl. 122—392 7 Claims

1. In a stream generating system utilizing refuse as a fuel, having a furnace for incinerating said refuse, a primary steam generating unit communicating with said furnace, a superheater unit disposed between said furnace and said primary steam generating unit, said superheater unit including a plurality of banks of tubes lined with a refractory material for shielding said superheater tubes from the harmful effects of corrosive gases and abrasive particles generated by the burning refuse, and soot blowing means operable for injecting a spray of

stream toward said refractory lined superheater tubes for dislodging soot deposited thereon, the improvement comprising at least one screen tube connected to a source of coolant,



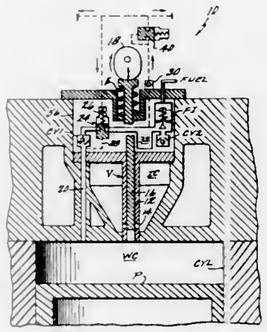
disposed between said soot blowing means and an end tube of a bank of superheater tubes for shielding said bank of superheater tubes from direct impingement of the spray of steam infected by said soot blowing means.

4,838,213

THERMAL IGNITION METHOD AND APPARATUS FOR INTERNAL COMBUSTION ENGINES

Anthony Gerace, 28 Allegheny Ave., #2601, Towson, Md. 21204

Filed Aug. 8, 1988, Ser. No. 229,507
Int. Cl.[4] F02B *75/00*
U.S. Cl. 123—27 R **10 Claims**



1. An apparatus for inducing thermal ignition in internal combustion engines having a working chamber that has at least a compression stroke pressurizing inlet air to effect a temperature rise thereof above the ignition temperature of the fuel, comprising:

an injector body connected to and in fluid communication with a working chamber of an internal combustion engine;

an ignition chamber within said injector body;

means for selectively introducing fuel into said ignition chamber;

transfer valve means for selectively interrupting and opening the fluid communications between the working chamber and said ignition chamber;

an air passage extending between the working chamber and said ignition chamber and having a valve therein to prevent air from flowing from said ignition chamber to the working chamber; and

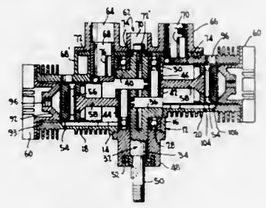
means for controlling said fuel introduction means to introduce fuel into the air in said ignition chamber to effect ignition thereof in said ignition chamber and for controlling said transfer valve means to open during the compression stroke to introduce the ignited fuel and air in said ignition chamber into the working chamber.

4,838,214

INTERNAL COMBUSTION ENGINE ASSEMBLY

George M. Barrett, R.R. #5, Galt, Ontario, Canada N1R 5S6

Filed Jun. 18, 1987, Ser. No. 64,111
Int. Cl.[4] F01L *7/00*
U.S. Cl. 123—41.69 **13 Claims**



1. An internal combustion engine comprising a cylinder, a cylinder sleeve mounted in said cylinder for axial reciprocating circumferential oscillating movement, said cylinder sleeve forming a valve member and having a head end, said cylinder sleeve having at said head end a single set of circumferentially spaced control ports, said cylinder having a set of circumferentially spaced intake ports and a set of circumferentially spaced exhaust ports alternating with said intake ports, the relationship of said control ports and said intake and exhaust ports being one wherein in an advanced position of said cylinder sleeve said control ports are axially beyond said intake and exhaust ports with said cylinder sleeve closing both said intake ports and said exhaust ports, in an intermediate advancing position of said cylinder sleeve said control ports are in communication with said intake ports, and in an intermediate retracting position of said cylinder sleeve said control ports are in communication with said exhaust ports.

4,838,215

INERTIA SUPERCHARGING INDUCTION SYSTEM FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Makoto Yasuda, Yokohama; Syousabu Ura, Fujisawa; Shuichi Nishimura; Isaya Matsuo, both of Yokohama; Masami Kato, and Munehiro Sagata, both of Nagoya, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Aichi Machine Industry Co., Ltd., Nagoya, both of, Japan

Division of Ser. No. 810,685, Dec. 19, 1985, Pat. No. 4,741,294.
This application Apr. 21, 1988, Ser. No. 184,357
Claims priority, application Japan, Dec. 21, 1984, 59-270368
The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.
Int. Cl.[4] F02B *27/00*
U.S. Cl. 123—52 MB **12 Claims**

1. In an internal combustion engine:

a first group of cylinders, the ignition sequence of said first group of cylinders being discontinuous;

a second group of cylinders, the ignition order of said second group of cylinders being discontinuous; and

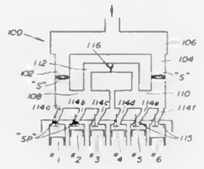
an induction system for supplying air to said first and second group of cylinders, said induction system comprising:

a first elongate collector section with which said first group of cylinders fluidly communicate via branch runners, said first collector section having first and second ends;

a second elongate collector section fluidly discrete from said first collector section and with which said second group of cylinders fluidly communicate via branch runners, said second collector setion having first and second ends;

a surge tank;

first and second induction conduits leading from said surge tank to said first and second collector sections respectively, said first and second conduits fluidly communicating with said first and second collector sections at the respective first ends thereof;



a connection passage leading from said first collector section to said second collector section; and

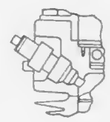
a valve disposed in said connection passage, said valve being arranged to assume a closed position wherein communication between said first and second collector sections is prevented and an open position wherein communication is permitted, said valve being arranged to change from said closed position to said open position upon the magnitude of a selected operational parameter of said engine exceeding a predetermined level.

4,838,216

FOUR CYCLE, DUAL PISTON INTERNAL COMBUSTION ENGINE AND PUMP

Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Division of Ser. No. 791,461, Oct. 25, 1985, Pat. No. 4,745,886.
This application Mar. 14, 1988, Ser. No. 167,903
Int. Cl.[4] F02B *75/40*
U.S. Cl. 123—59 BS **4 Claims**



1. A fluid pump driven by a four-cycle internal combustion engine having a crankcase, comprising:

an integral fluid pump assembly and four-cycle internal combustion engine, said engine driving said fluid pump assembly;

said integral pump/engine including an engine block comprised of a bi-diameter cylinder including a top cylinder portion and a bottom cylinder portion, said bi-diameter cylinder receiving a bi-diameter piston having a top piston portion and a bottom piston portion;

an engine gas chamber defined by said top cylinder portion and said top piston portion;

a ring-shaped pumping chamber defined by said top piston portion, said bottom cylinder portion, and said bottom piston portion;

one-way inlet means for permitting fluid from outside the pump/engine to enter said pumping chamber;

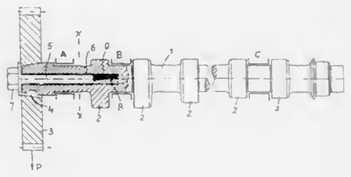
one-way outlet means for permitting fluid to exit said pumping chamber to outside the pump/engine.

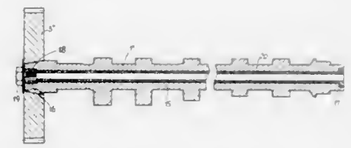
4,838,217

CAST IRON CAMSHAFT FOR INTERNAL COMBUSTION ENGINES

Max Ruf, Obereisesheim, and Erwin Korostenski, Oedheim, both of Fed. Rep. of Germany, assignors to Audi AG, Fed. Rep. of Germany

Filed Feb. 10, 1988, Ser. No. 154,187
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1987, 3705114
Int. Cl.[4] F01L *1/04*
U.S. Cl. 123—90.6 **7 Claims**





1. A cast iron camshaft for an internal combustion engine having at one end a drive pulley or pinion connected to an endless tension member and including means for creating in the camshaft a longitudinal compressive stress in at least zone extending from said end to a point at which the bending moment exerted by the tension member on the camshaft becomes zero, in which the means for creating the compressive stress includes a screw threaded member which bears longitudinally on part of the camshaft adjacent end and extends along an internal bore in the camshaft and has a threaded part engaging an internal screw thread in the bore positioned close to the point at which the bending moment becomes zero.

3. A cast iron camshaft for an internal combustion engine having at one end a drive pulley or pinion connected to an endless tension member and including means for creating in the camshaft a longitudinal compressive stress in at least a zone extending from said end to a point at which the bending moment exerted by the tension member becomes zero, in which said means for creating a compressive stress includes an internal tie member which is cast into said cam shaft and extends substantially the entire length of the camshaft an is formed form a material whose linear coefficient of expansion is greater than that of the camshaft material, said tie member expanding during casting of the camshaft and contracting during cooling of the camshaft to a greater extent than the camshaft, and means for transmitting longitudinal stresses from the tie member to the cast iron material of the camshaft which occur when the casting cools.

4,838,218

CERAMIC VALVE SUPPORTING STRUCTURE IN USE FOR INTERNAL COMBUSTION ENGINE

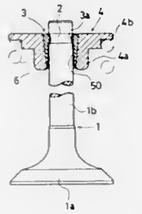
Yasushi Sato; Shigeru Nagasaki; Masato Taniguchi; Junichi Kagawa, and Mitsuyoshi Kawamura, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Jun. 12, 1987, Ser. No. 61,138

Claims priority, application Japan, Jun. 12, 1986, 61-136737; Jun. 12, 1986, 61-136738; Jun. 12, 1986, 61-136739; Jul. 23, 1986, 61-113280[U]; Aug. 21, 1986, 61-127315[U]

Int. Cl.⁴ F01L *3/10*

U.S. Cl. 123—188 AA **20 Claims**



1. A ceramic valve supporting structure comprising:

(a) a ceramic valve having an integral stem, an upper portion of which is provided with a circular groove therearound, and arranged to be axially displaced to alternately open and close an intake and exhaust port communicating with a combustion chamber of an internal combustion engine;

(b) a frusto-conical shaped cotter comprising a a pair of semi-cylindrical pieces, each inner surface of which has a lock projection (3a) located within said groove when secured to an outer surface of said stem;

(c) an annular retainer secured to an outer surface of said cotter to support said valve through said cotter;

(d) said retainer having an inner surface tapered to engage said outer surface of said cotter by wedging action by spring force upon said retainer to bring said cotter into tight engagement with said stem; and

(e) stress relief means comprising an elastic layer provided at least between an inner surface of said cotter and the outer surface of said stem to absorb stress caused when said cotter locally engages with said stem.

4,838,219

CURVED INTAKE DUCT HAVING IMPROVED FLOW CHARACTERISTICS

James J. Feuling, 4035 N. Ventura Ave., Ventura, Calif. 93001

Continuation of Ser. No. 929,902, Nov. 13, 1986, abandoned. This application Aug. 1, 1988, Ser. No. 227,472

Int. Cl.⁴ F02M *35/10*

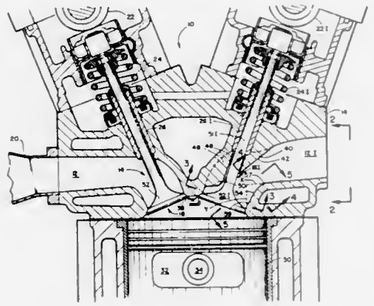
U.S. Cl. 123—188 M **20 Claims**

1. An intake duct system having an intake valve having a valve stem therein which comprises:

(a) a curvilinear intake duct having said valve and said valve stem disposed intermediate the upstream and downstream ends thereof,

(b) a first fairing in said upstream portion of said duct, spaced from said valve stem and disposed between said upstream end and said valve stem; and

(c) a second fairing in said downstream portion of said duct, spaced from said valve stem and said first fairing and



disposed between said downstream end and said valve stem.

4,838,220

ROTARY VALVES

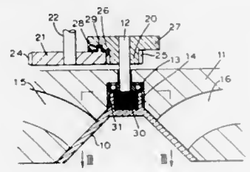
Bryan N. V. Parsons, Stoney Stanton, England, assignor to Jaguar Cars Limited, United Kingdom

Filed Apr. 1, 1988, Ser. No. 176,633

Claims priority, application United Kingdom, Apr. 3, 1987, 8708037

Int. Cl.⁴ F01L *7/00*

U.S. Cl. 123—190 D **10 Claims**



1. A rotary valve comprising a valve rotor having an annular discontinuity, the valve rotor being mounted for rotation relative to a port so that as it rotates, the discontinuity will open and close the port, drive means being provided to rotate the rotor, said drive means including means to reduce the speed of the rotor when the port is closed, the port being surrounded by a seating area and means being provided to move the rotor so that it engages the seating area and closes the port, when the speed of the rotor is reduced and move the rotor away from the seating area when the speed of the rotor is increased.

4,838,221

AUTOMOTIVE ENGINE CONSTRUCTION

Tadao Suemori, Higashihiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 19, 1988, Ser. No. 145,240

Claims priority, application Japan, Jan. 21, 1987, 62-11735; Feb. 4, 1987, 62-24137

Int. Cl.⁴ F02F *7/00;* **F16M** *1/025;* **F16C** *9/02*

U.S. Cl. 123—195 H **13 Claims**

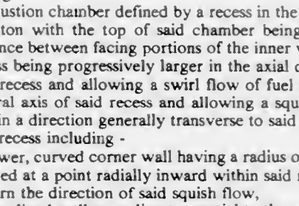
7. An engine construction which comprises:

a cylinder block having front and rear end walls and a pair of side walls and also having a series of bearing seats formed therein for the support of a crankshaft;

a lower block having a front and rear end walls and a pair of side walls and also having bearing caps formed integrally therewith and adapted to be secured from below to the cylinder block to define a joint with the bearing caps aligned with the corresponding bearing seats for the support of the crankshaft, the rear end wall of the lower block being formed with a flange section that is adapted to be connected to a clutch housing;

a balancer shaft having a balance weight laterally offset relative to the axis of rotation of the balancer shaft;

balancer shaft bearing means defined at the joint between the cylinder block and the lower block for supporting the balancer shaft;



a drive transmitting means for transmitting the drive of a crankshaft to the balancer shaft, said drive transmitting means being accommodated within a oil recovery space which is defined between one of the bearing caps closest to the rear end wall of the lower block and the rear end wall of the lower block; and

an oil pan adapted to be removably fitted from below to the lower block and positioned on one side of the lower block opposite to the cylinder block.

4,838,222

COMBUSTION CHAMBER FOR INTERNAL COMBUSTION ENGINES

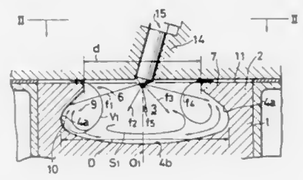
Naoki Yanagisawa; Yoshihiko Sato, and Noriyuki Sakurai, all of Fujisawa, Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Nov. 25, 1987, Ser. No. 125,521

Claims priority, application Japan, Nov. 25, 1986, 61-278766

Int. Cl.⁴ F02B *19/08*

U.S. Cl. 123—263 **4 Claims**



1. A combustion chamber for an internal combustion engine, comprising:

a combustion chamber defined by a recess in the top part of a piston with the top of said chamber being open, the distance between facing portions of the inner wall of said recess being progressively larger in the axial direction of said recess and allowing a swirl flow of fuel around the central axis of said recess and allowing a squish flow of fuel in a direction generally transverse to said swirl flow, said recess including -

(1) a lower, curved corner wall having a radius of curvature located at a point radially inward within said recess so as to turn the direction of said squish flow,

(2) an inclined wall extending tangential to the upper end of said lower corner wall so as to allow said squish flow to flow along and downward therefrom, and,

(3) a bottom wall extending smoothly from the lower end of the corner wall and having a center of radius located in the radially inward direction of said recess so as to reinforce the swirl flow flowing in the axial direction of said recess as a result of the squish flow colliding with the swirl flow; and,

fuel injection nozzle means disposed approximately on said central axis of said recess for supplying fuel toward the junction of said lower corner wall and said inclined wall of said recess, so that said recess is circumferentially divided into at least five approximately equal sections by fuel sprays supplied by said fuel injection nozzle means, and that there is a fuel-air mixture produced which is enclosed by said squish flow and fuel which is transferred toward said central axis of said recess by said swirl flow.

4,838,223

FUEL SUPPLY CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES

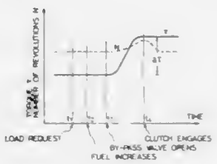
Yoshiyuki Tanabe, and Mineo Kashiwaya, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 29, 1988, Ser. No. 162,083

Claims priority, application Japan, Mar. 6, 1987, 62-49983

Int. Cl.⁴ F02D *41/08*

U.S. Cl. 123—339 **7 Claims**



5. A fuel supply control apparatus for an internal combustion engine comprising:

suction air amount control means for supplying a predetermined amount of air for the engine;

fuel supply means for supplying a predetermined amount of fuel in response to a fuel supply signal;

additional air amount control means, responsive to an air increment signal, for supplying a predetermined amount of additional air for the engine in addition to the air supplied by said suction air amount control means;

engine speed detecting means for detecting the number of revolutions of the engine;

switch means, which is manipulated when auxiliary equipment is required to be operated, for producing a load request signal corresponding to the auxiliary equipment required to be operated; and

control unit means for producing the fuel supply signal in response to the amount of the air supplied by said suction air amount control means and the number of revolutions detected by said engine speed detecting means, said control unit means including means for executing the following steps:

(a) determining an amount of an increment of fuel on the basis of the load request signal;

(b) correcting the fuel supply signal in accordance with the determined incremental amount of fuel and outputting a corrected fuel supply signal to said fuel supply means;

(c) determining an amount of additional air on the basis of the incremental amount of fuel and outputting an air increment signal at a predetermined time after output of the corrected fuel supply signal; and

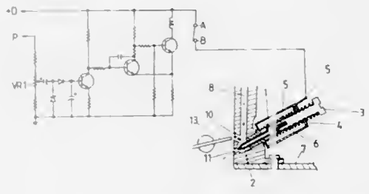
(d) producing an actuating signal for actuating the auxiliary equipment required to be operated after the air increment signal is produced.

4,838,224

METHOD AND APPARATUS FOR CONTROL OF ENGINE IDLING CIRCUIT

Huan-Sung Cheng, No. 222, I-Ming Rd., Ping-Tzeng Hsiang, Tao Yuan, Taiwan

Filed Jul. 9, 1987, Ser. No. 71,511
Int. Cl.[4] F02M *3/045, 3/00*
U.S. Cl. 123—339 10 Claims



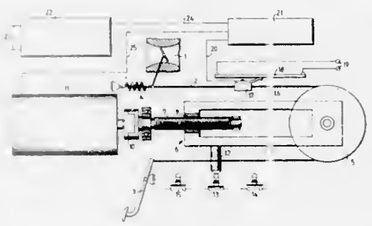
1. A method for controlling an idle circuit of a carburetor in an internal combustion engine comprising the steps of
providing said carburetor with a solenoid activated valve whereby activation of said valve is necessary to complete the idle circuit of said carburetor;
providing means responsive to engine speed to activate said solenoid;
choosing a preset limit for engine speed at which limit said solenoid will be deactivated;
constantly monitoring engine speed such that said means responsive to engine speed deactivates said solenoid when engine speed exceeds said preset limit and activates said solenoid when engine speed falls below said preset limit.

4,838,225

THROTTLE REGULATOR

Helmut Steffes, Hattersheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt, Fed. Rep. of Germany

Filed Apr. 14, 1988, Ser. No. 181,456
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1987, 3713947
Int. Cl.[4] B60K *28/16, 31/00;* F02D *9/02, 11/02*
U.S. Cl. 123—342 9 Claims



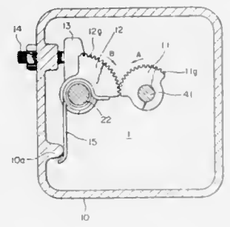
1. A regulating unit for the throttle of a combustion engine of an automotive vehicle for controlling the traction slip or the speed, comprising first and second devices influencing the position of the throttle in an adding manner, wherein said first device is operated by the driver by means of a pedal and wherein said second device is operated on the basis of an electronically formed signal, wherein the basic position of the second device corresponds to a mid-position whereby the position of the throttle is influenceable both in the closing and in the opening directions, wherein an actual signal is formed which corresponds to the throttle position and which is compared with a reference signal formed by a control electronics and wherein for traction slip control and speed control, the second device of said regulating unit is actuated so as to conform the reference and actual signals.

4,838,226

APPARATUS FOR CONTROLLING INTAKE AIR FLOW RATE IN INTERNAL COMBUSTION ENGINE

Toshio Matsuzawa, Kariya; Kazuji Minagawa, tokoname; Akira Muramatsu, Kariya; Tomoaki Abe, Obu; Masashi Kiyono, Anjo; Shigeru Kamio, Nagoya; Katsuya Maeda, and Mitsunori Takao, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 6, 1988, Ser. No. 191,218
Claims priority, application Japan, Dec. 12, 1986, 61-297396; May 9, 1987, 62-112887; Aug. 9, 1987, 62-199489
Int. Cl.[4] F02D *9/10, 11/10*
U.S. Cl. 123—399 8 Claims



1. An apparatus for controlling intake air flow rate in an internal combustion engine, said apparatus comprising:
throttle valve means disposed in intake air passage means of said engine for swing movement so as to change a flow rate of air to be supplied to combustion chamber means of said engine;
means for determining a full closed position of said throttle valve;
resilient means for continually urging said throttle valve towards said full closed position;
a control unit for determining a desired opening degree of said throttle valve in accordance with requirements on said engine;
actuator means for generating a driving force for swinging said throttle valve means towards said desired opening degree in accordance with a command signal from said control unit; and
a geared mechanism for transmitting said driving force to said throttle valve means, said geared mechanism including a pair of gears, each of which has a gear tooth portion, said gears being able to engage with each other exclusively at said gear tooth portions thereof, and said gear tooth portion so extending that both of said gear tooth portions mesh with each other between full closed position and full open position of said throttle valve, and they are pushed out of mesh from each other over full open position of said throttle valve.

4,838,227

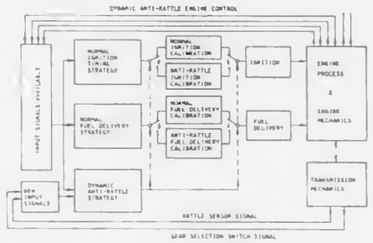
METHOD OF PREVENTING VIBRATION NOISE IN CHANGE-SPEED GEARBOXES, IN PARTICULAR OF MOTOR VEHICLES

Gerhard Abromeit, Cologne, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 15, 1987, Ser. No. 132,385
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643943
Int. Cl.[4] F02D *43/04;* B60K *41/04*
U.S. Cl. 123—419 2 Claims

1. A method of preventing vibration noise in change-speed gearboxes, in particular of motor vehicles, with an electronic

control of the ignition and the fuel measuring control of the internal combustion engine which is variable timewise as a function of events, characterized by:
controlling the internal combustion engine as a function of the occurrence of gearbox vibration noise; and



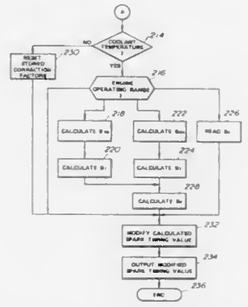
changing the combustion process of the said internal combustion engine so that no irregularities occur in the rotational vibration behaviour.

4,838,228

IGNITION TIMING CONTROL APPARATUS

Shuuichi Yoneyama, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Apr. 20, 1988, Ser. No. 184,125
Claims priority, application Japan, Apr. 21, 1987, 62-59277[U]
Int. Cl.[4] F02P *5/04*
U.S. Cl. 123—425 3 Claims



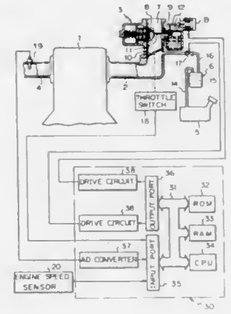
1. An apparatus for controlling an internal combustion engine including ignition control means for controlling the ignition timing or the engine. comprising:
a load sensor for generating an electrical signal indicative of the load on the engine;
a speed sensor for generating an electrical signal indicative of the speed of the engine;
a knock sensor for generating and electrical signal indicative of the knock intensity; and
a control circuit coupled to the sensors, the control circuit including means for calculating sn appropriate ignition timing value corresponding to a setting of the ignition control means as a function of engine speed and engine load, means for determining one of engine operating regions where the engine is operationg from a relationship programmed therein, the relationship defines engine operating region as a function of engine speed and engine load, the relationship defining a knock control unnecessary region at low engine speeds or at low engine loads, a knock control necessary region at intermediate engine speeds and at high engine loads and a knock control impossible region at high engine speeds and at high engine loads, the knock control necessary region being divided into a plurality of knock control necessary region segments having different engine speed ranges, means for calculating correction factors for the respective knock control necessary region segments based on the knock intensity, the correction factor calculating means including means for calculating a feed-forward correction factor for the knock control impossible region based on the correction factors calculated for the respective knock control necessary region segments, means for modifiying the calculated ignition timing value based on the correction factor calculated for the determined engine operation region, and means for converting the modified ignition timing value into a setting of the ignition control means.

4,838,229

AIR-FUEL RATIO CONTROL DEVICE OF AN INTERNAL COMBUSTION ENGINE

Kouji Uranishi, Susono, and Takaaki Itou, Mishima, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 1, 1988, Ser. No. 177,289
Claims priority, application Japan, Apr. 8, 1987, 62-084862
Int. Cl.[4] F02D *41/22;* F02M *7/24, 25/08*
U.S. Cl. 123—440 11 Claims



1. An internal combustion engine having at least one cylinder, an intake passage and an exhaust passage, said engine comprising:
a carburetor arranged in the intake passage and having a fuel passage which is open to the intake passage;
an electric air-fuel ratio control valve controlling an air-fuel ratio of an air-fuel mixture fed into the cylinder in response to an electric control signal, said air-fuel ratio of the air-fuel mixture increasing as a level of said electric control signal rises;
an oxygen concentration detector arranged in the exhaust passage to produce a lean signal when said air-fuel ratio of air-fuel mixture fed into the cylinder is larger than a predetermined air-fuel ratio and to produce a rich signal when said air-fuel ratio of air-fuel mixture is smaller than the predetermined air-fuel ratio;
first control means controlling the level of said electric control signal in response to said lean signal and said rich signal to raise the level of said electric control signal when said rich signal is produced and lower the level of said electric control signal when said lean signal is produced;
a charcoal canister containing activated carbon therein;
a purge control valve arranged between said charcoal canister and the intake passage to control the supply of purge gas fed into the intake passage from said charcoal canister; and

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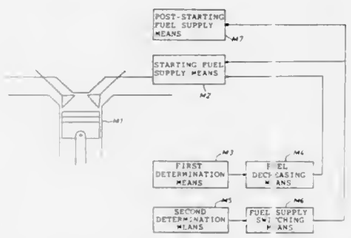
second control means controlling the level of said electric control signal in response to both a rate of rising of the level of said electric control signal and an opening operation of said purge control valve to instantaneously raise the level of said electric control signal by a predetermined level when said rate of rising exceeds a predetermined rate and when said purge control valve is open.

4,838,230

FUEL INJECTION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE WHEN STARTING

Hiroki Matsuoka, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 25, 1988, Ser. No. 173,660
Claims priority, application Japan, Apr. 6, 1987, 62-84451
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—491 **7 Claims**



1. A fuel injection control system for an internal combustion engine comprising:

starting fuel supply means for supplying an amount of fuel to the engine, the amount being determined exclusively for a starting state of the engine;

post-starting fuel supply means for supplying another amount of fuel to the engine, said another amount being determined based on an air-fuel ratio control;

first determination means for determining whether a rotational speed of the engine exceeds a first predetermined speed, the first predetermined speed corresponding to a rotational speed of the engine at which complete combustion starts in a combustion chamber of the engine;

fuel decreasing means for gradually decreasing the amount of fuel to be supplied to the engine by the starting fuel supply means when the first determination means determines that the rotational speed of the engine exceeds the first predetermined speed;

second determination means for determining whether the rotational speed of the engine exceeds a second predetermined speed, the second predetermined speed being greater than the first predetermined speed and corresponding to an engine speed at which stable running of the engine occurs after the starting state; and

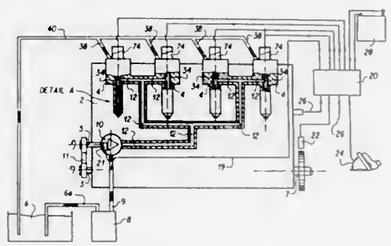
fuel supply switching means for switching from fuel supply by the starting fuel supplying means to fuel supply by the post-starting fuel supply means when the second determination means determines that the rotational speed of the engine exceeds the second predetermined state.

4,838,231

ELECTRONICALLY CONTROLLED FUEL INJECTION SYSTEM

Marco A. Ganser, Zürich, Switzerland, assignor to Ganser-Hydromag, Zurich, Switzerland

Filed Sep. 25, 1987, Ser. No. 101,101
Claims priority, application Switzerland, Sep. 25, 1986, 3836/86
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—467 **13 Claims**



1. A fuel injection system for an internal combustion engine comprising:

at least one electromagnetically operated fuel injector for injecting pressurized fuel into a combustion chamber of the internal combustion engine, said at least one fuel injector having a body portion with a valve seat, at least one discharge orifice and an injector valve member cooperating with said valve seat for closing said discharge orifice and being shiftable to be momentarily lifted from said valve seat for opening said discharge orifice and discharging pressurized fuel into a combustion chamber of the internal combustion engine;

a high pressure fuel pump driven by the internal combustion engine; and

at least one injection line leading from said pump to said at least one fuel injector and providing a fuel flow path from said pump to a region immediately upstream of said valve seat, the cross-sectional area of said fuel flow path leading from said pump to said region upstream of said valve seat being substantially larger than the total cross-sectional area of all injection orifices of said at least one fuel injector, said fuel flow path being substantially free of flow restrictions to allow a substantially unrestricted fuel communication between said pump and said region around and immediately upstream of said valve seat, the fuel pressure in said fuel flow path before, during and after an injection event as well as in the time interval between any two subsequent injection events being substantially equal to the fuel injection pressure.

4,838,232

FUEL DELIVERY CONTROL SYSTEM

Thomas J. Wich, Springfield, Mass., assignor to AIL Corporation, Columbia, S.C.

Continuation of Ser. No. 15,495, Feb. 5, 1987, abandoned, which is a continuation of Ser. No. 640,640, Aug. 14, 1984, abandoned. This application Nov. 30, 1987, Ser. No. 125,740
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—506 **14 Claims**

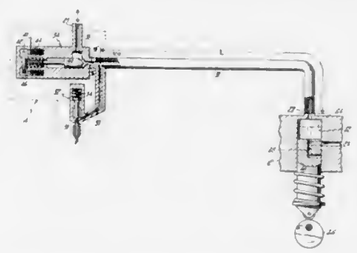
1. A system for controlling delivery of fuel from a fuel source to a compression-ignition engine having at least one cylinder provided with a respective fuel injector, said engine having a predetermined characteristic ignition delay time and said fuel injector being biased to a normally-closed position, comprising:

positive-displacement pump means for receiving fuel from said source and providing intermittent, pressurized pulses of fuel flow;

first conduit means of a preselected length extending from said pump means to a node, said fuel injector being operatively connected to said first conduit means at said node;

bypass control valve means responsive to an electrical control signal for moving rapidly between open and closed positions, said valve means having a first port operatively connected to said first conduit means at said node and having a second port connected to a region of relatively low pressure, said control valve being normally open to permit the pulsed fuel to flow from said pump means to said low pressure region thereby bypassing said injector;

closure of said control valve diverting said pulsed flow to



said injector to cause a rapid pressure rise at the injector to a first level sufficient to initiate a pilot injection, said control valve closure creating a pressure wave in said first conduit means traveling from said node toward said pump means, said pressure wave being reflected at said pump means back to said node to effect a consequent rapid pressure increase at said injector to a second level greater than said first level and thereby effecting the main fuel injection;

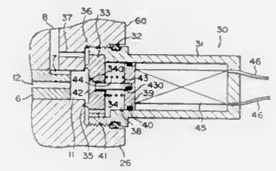
said first conduit means having a length preselected so as to return said pressure wave to said injector at a predetermined time following the initiation of pilot injection to provide a hydraulic delay between initiation of pilot injection and main injection, said hydraulic delay being substantially equal to the engine ignition delay time.

4,838,233

PILOT INJECTION SYSTEM FOR FUEL INJECTION PUMP

Satoshi Hayashi, Nagoya; Masahiro Tomita, Anjo; Hitoshi Niwa, and Hirokatsu Mukai, both of Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 21,331, Mar. 3, 1987, abandoned. This application Nov. 8, 1988, Ser. No. 268,659
Claims priority, application Japan, Mar. 5, 1986, 61-47713
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—506 **7 Claims**



1. A pilot injection system for a fuel injection pump, which has a pump chamber and supplies a pressurized fuel in the pump chamber to a combustion chamber of an internal combustion engine through an injection nozzle, comprising:

a casing attached to the fuel injection pump, the inside of the casing communicating with the pump chamber of the pump;

a partition wall provided in the casing and dividing the pump chamber and the inside of the casing in a liquid-tight manner;

a movable wall disposed in the casing and dividing the inside of the casing between a fuel-spill chamber, situated closer to the pump chamber and connected to a low pressure, and a holding chamber situated farther from the pump chamber;

a valve unit for controlling the connection between the pump chamber and the fuel-spill chamber, the valve unit including a valve hole formed in the partition wall and connecting the pump chamber and the fuel-spill chamber, the valve hole having a seat surface facing the pump chamber, a valve plug adapted to be seated on the seat surface, thereby closing the valve hole, a coupling rod attached to the valve plug, extending through the valve hole into the fuel-spill chamber, and coupled to the movable wall, and a coil spring located between the movable wall and the partition wall and pressing the movable wall toward the holding chamber, whereby the valve plug is seated on the seat surface of the valve hole, by means of the movable wall and the coupling rod, urged by the coil spring, the coupling rod including means for adjusting a distance between the valve plug and the movable wall; and

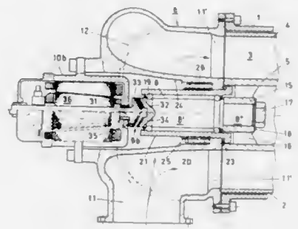
actuator means disposed in the holding chamber of the casing for operating the valve plug, the actuator including a stack of piezoelectric elements, coupled to the movable wall and capable of extending or contracting in accordance with a voltage applied to each piezoelectric element, so that the valve plug may be lifted from the seat surface of the valve hole, against the urging force of the coil spring, through the medium of the movable wall and the rod, when the stack extends, whereby the adjusting means and the coil spring provide both a predeterminable preload on the piezoelectric elements and a predeterminable sealing force on the valve plug.

4,838,234

FREE-RUNNING PRESSURE WAVE SUPERCHARGER

Andreas Mayer, Niederrohrdorf, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed Apr. 14, 1988, Ser. No. 181,573
Claims priority, application Switzerland, Apr. 16, 1987, 1504/87
Int. Cl.[4] F02B *33/42*
U.S. Cl. 123—559.2 **1 Claim**



1. Free-running pressure wave supercharger for an internal combustion engine, comprising: a rotor casing , one end surface of which is closed by a gas casing with an exhaust gas inlet duct for the supply of high-pressure gas to a cell rotor and with an exhaust duct for the removal of low-pressure gas from the

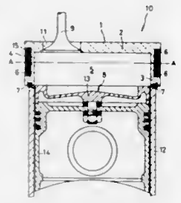
cell rotor and the other end surface of which is closed by an air casing with an air induction duct for the supply of lowpressure air into the cell rotor and with a supercharged air duct for the supply of the charged air compressed in the cell rotor to the internal combustion engine , said air casing having bearing means for mounting a rotor shaft of the cell rotor, an electric motor mounted in the air casing a clutch which is operable to provide a drive connection between the shaft of the electric motor and the rotor shaft when the electric motor is switched on and there is insufficient drive energy from the gas flow, said clutch having a convex clutch member on the motor shaft and a concave clutch member on the rooter shaft, said clutch member clutch friction linings, said motor having an axial displacement armature for engaging said clutch members, and said electric motor includes means for retarding rotation of its armature after the current is switched off.

4,838,235

HEAT-INSULATING ENGINE STRUCTURE AND METHOD OF MANUFACTURING THE SAME

Hideo Kawamura, Kanagawa, and Hiroshi Matsuoka, Yamato, both of Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Mar. 30, 1988, Ser. No. 175,506
Claims priority, application Japan, Apr. 11, 1987, 62-87924
Int. Cl.[4] F02B *77/11*
U.S. Cl. 123—668 **15 Claims**



1. A heat-insulating engine structure, comprising:
a cylinder head lower surface portion having a suction/exhaust port thereon and consisting of a ceramic material such as silicon nitride or the like;
a cylinder liner top connected to a cylinder liner through a gasket and consisting of a ceramic material such as silicon nitride or the like;
a head liner for which said cylinder head lower surface portion and said cylinder liner top are unified structurally; and
a cylinder head having a cylindrical part in which said head liner is fitted; wherein,
a heat insulating laminate is constructed by winding up alternately and spirally the metallic sheet and a heat insulating material with potassium titanate as a principal component;
said heat insulating laminate being disposed on an outer peripheral surface of said cylinder liner top of said head liner with a compressive force exerted thereon.

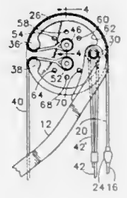
11. A manufacturing method for heat-insulating engine structure, comprising:
a head liner for which a cylinder head lower surface portion consisting of a ceramic material such as silicon nitride or the like and a cylinder liner top consisting of a ceramic material such as silicon nitride or the like are unified structurally is formed;
a metallic sheet is heated for thermal expansion, and a heat insulating material is placed and so disposed on said metallic sheet;
said metallic sheet on which said heat insulating material is placed is wound up spirally to an outer peripheral surface of said cylinder liner top of said head liner;
a compressive force is exerted on said cylinder liner top by contraction of said metallic sheet after said metallic sheet is wound up.

4,838,236

COMPOUND ARCHERY BOW WITH ADJUSTABLE DRAW LENGTH AND PULL WEIGHT

Donald S. Kudlacek, 3412 Oak St., Longview, Wash. 98632

Filed Jul. 1, 1988, Ser. No. 214,497
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—23 R **10 Claims**



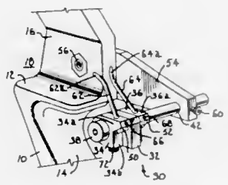
1. In a compound archery bow having a central handle member, a pair of limbs extending outwardly from opposite ends of the handle member, a cam member on the outer end of each limb, a bowstring extending between and attached to said cam members, and a pair of power cables each attached at one end to a different cam member and at the opposite end operatively to the opposite limb, the method of varying the pull weight of the bow within a range of pull weights, comprising changing the position of attachment of each power cable to the associated cam member to any one of a plurality of attachment positions, to change the distance between said position of attachment and the point of attachment of the opposite end operatively to the opposite limb, by securing said one end of each power cable selectively to any one of a plurality of attachment positions on the associated cam member to change the distance between selective attachment positions of each power cable.

4,838,237

ARROW REST FOR ARCHERY BOWS

Samuel D. Cliburn, 7320 Hwy. 50 West, Jefferson City, Mo. 65109

Filed Jun. 6, 1988, Ser. No. 202,585
Int. Cl.[4] F41B *5/00*
U.S. Cl. 124—41 A **11 Claims**



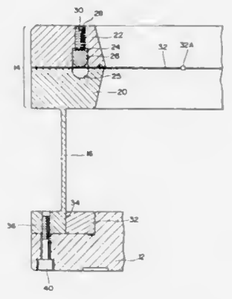
1. An arrow rest for an archery bow, said arrow rest comprising:
a mounting base;
means for attaching said mounting base to the bow at a preselected location;
a pair of finger elements each having an arrow receiving tip portion;
means for mounting said finger elements on said base for movement independently of one another between first and second positions, said finger elements being situated in the first positions thereof with said tip portions located to receive and support an arrow applied in the bow in position for shooting;
said mounting means comprising a block for each finger element, means for mounting said blocks on said base for pivotal movement, independently of one another about a pivot axis, and means for securing said fingers to the respective blocks in extension therefrom; and
yieldable means for biasing each finger element toward the first position thereof, said yieldable means being arranged to permit each finger element to deflect away from the first position thereof independently of the other finger element.

4,838,238

INTERNAL PERIPHERAL EDGE TYPE BLADE HOLDING DEVICE

Katsuo Honda; Susumu Sawafuji, and Tomio Tomita, all of Mitaka, Japan, assignors to Tokyo Seimitsu Co., Ltd., Tokyo, Japan

Filed Jun. 27, 1988, Ser. No. 212,056
Claims priority, application Japan, May 23, 1988, 63-125359
Int. Cl.[4] B28D *1/04*
U.S. Cl. 125—15 **7 Claims**



1. An internal peripheral edge type blade holding device comprising:
a rotary plate fixedly mounted to a spindle shaft;
a plurality of resilient pieces located on said rotary plate, spaced at regular intervals from one another in the circumferential direction of said direction of said rotary plate and respectively displaceable in the radial direction of said rotary plate;
a tension head assembly supported by said resilient pieces on said rotary plate; and,
an internal peripheral edge blade stretched and held by said tension head assembly.

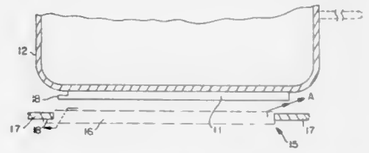
4,838,239

LOCKABLE MOUNTING FOR RETAINING A REMOVABLE ITEM TO A BASE

John Ordeman, 35 Tendring Way, Girrawheen, Western Australia, Australia

PCT No. PCT/AU85/00095, § 371 Date Mar. 14, 1986, § 102(e) Date Mar. 14, 1986, PCT Pub. No. WO85/04792, PCT Pub. Date Nov. 7, 1985
PCT Filed Apr. 24, 1985, Ser. No. 828,321
Claims priority, application Australia, Apr. 26, 1984, PG4709
Int. Cl.[4] F24C *3/00*; F16G *11/00*
U.S. Cl. 126—39 R **7 Claims**

1. An arrangement for detachable mounting a movable member to a base member for free rotation of said movable member relative to aid base member about a perpendicularly extending axis while preventing perpendicularly movement of said movable member relative to said base member in all rotated positions of said movable member, said mounting arrangement comprising a female element fixed relative to one of said members and have a continuous flange defining a continuous circular opening, around said perpendicularly expending axis and a male element fixed relative to the other of said members and having a first disk-like part complementary to and adapted to be received in said female element opening for supporting said members for relative rotation about the axis of said opening, said male element further having a second part eccentrically disposed relative to said first part and defining an



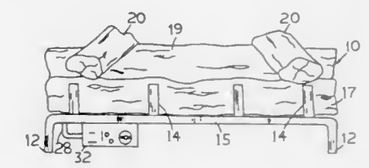
eccentric flange adapted to underlie said continuous flange for detachable connecting said members together and preventing perpendicular movement of said male element relative to said female element, said eccentric flange of said male member and said circular opening of said female member being assembled and interlocked by sliding said eccentric flange and said circular opening transversely relative to each other until said eccentric flange underlies said female element and then moving said elements to bring first disk-like part of said male member into registry with said female element opening so that said eccentric flange interlocks with said female element.

4,838,240

FIREPLACE GAS BURNER ASSEMBLY

Heinz H. Rieger, 17 Martin Road, Toronto, Ontario, Canada M4S 2V1

Filed Mar. 16, 1988, Ser. No. 169,234
Claims priority, application Canada, Aug. 13, 1987, 544506
Int. Cl.[4] F24C *3/04*
U.S. Cl. 126—92 R **11 Claims**



1. In a fireplace gas burner assembly, a burner means comprising,
a substantially rectangular casing, said casing having an opened top,
a differential cover means disposed in said casing and dividing said casing into an upper portion and a lower portion, said lower portion being operative as a fuel mixing chamber,
an orifice means mounted at one end of said casing and in communication with said fuel mixing chamber,
fresh air inlet means formed in said casing and located immediately adjacent to said orifice means,
a plurality of small transfer openings formed in said differential cover means and operative to pass gas and air mixture from said fuel mixing chamber to said upper portion of of said casing,
an air guide panel means having one end secured in a cantile-

ver manner to said differential cover means at one end therein immediately adjacent to said orifice means and extending slopingly downwardly in said fuel mixing chamber to a flat portion disposed in a closed spaced manner to the bottom panel of said casing to form a narrow air gap adjacent to said fresh air inlet means,

gas distribution tile means located in said upper portion of said casing, said distribution tile means having a plurality of vertical through openings formed therein communicating between said upper portion of said casing and said opening top.

5. A fireplace gas burner assembly comprising,

a grate means,

a burner means mounted on said grate means, said burner means comprising, a substantially rectangular casing having an opened top and closed sides,

a differential cover means mounted inside said casing and dividing the interior of said casing into an upper portion and a lower portion, said lower portion being operative as a fuel mixing chamber,

an orifice means mounted at one end of said casing and in communication with said fuel mixing chamber,

a plurality of small transfer openings formed in said differential cover means and operative to pass gas and air mixture from said fuel mixing chamber to said upper portion of said casing,

an air guide panel means mounted in a cantilever manner to the underside of said differential cover means and extending slopingly downwardly in said fuel mixing chamber to a flat portion disposed in a close spaced manner to the bottom panel of said casing,

fresh air inlet means formed in said casing, and located immediately adjacent to said orifice means,

two baffle insert means having an inverted V-shaped cross section with a gable top including a ridge extending along the entire longitudinal length therein and two downwardly extending and mutually parallel skirting lateral side panels ,

distribution tile means located in said upper portion of said casing, said distribution tile means having a pluraity of vertical through openings,

a coupler means mounted to said orifice means and operative for connection to a combustible gas supply,

a first artificial log member disposed on said grate means and located in a spaced relation to a front side of said burner means,

a second artificial log member disposed on said grate means and located in a spaced relation to a rear side of said burner means,

a pilot lighter means mounted to said grate means and operative to ignite the gas and air mixture emitting to the top of said casing through said through openings of said distribution tile means,

control means mounted under said grate means and connected to said coupler means and operative to control the supply of said combustible gas to said burner means and said pilot lighter means.

11. An artificial log comprising an elongated flexible integral section of aluminum tubular member,

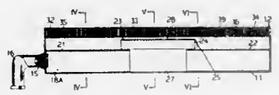
a ceramic fibre sheet member wrapping over said aluminum tubular member, said ceramic fibre sheet member being impregnated with a thermally set colloidal compound and thermally cured, a second layer of thermally set colloidal compound disposed over said colloidal impregnated ceramic fibre sheet member, said second layer of colloidal compound being textured, painted and thermally cured to simulate a natural wood surface.

4,838,241

FIREPLACE NATURAL GAS AND PROPANE BURNER ASSEMBLY

Heinz H. Rieger, 17 Martin Road, Toronto, Ontario, Canada M4S 2V1

Filed Aug. 5, 1988, Ser. No. 228,474
Int. Cl.[4] F24C *3/02*
U.S. Cl. 126—92 R **8 Claims**



1. A natural gas and propane burner assembly comprising

an elongated rectangular casing having an opened top, two side panels, two end panels and a bottom panel,

an orifice means mounted to one end panel of said casing,

extension openings formed on said one end panel and location adjacent to said orifice means,

fresh air port means formed on a bottom corner of a first side panel of said casing and located immediately adjacent to said orifice means,

a first channel member having an inverted U-shaped cross section and located in said casing and disposed adjacent to said orifice means,

a second channel member having an inverted U-shaped cross section and located in said casing and disposed distal from said orifice means,

a transfer cap member having an inverted U-shaped cross section and located in said casing and positioned in a bridging manner over two opposing end portions of said first channel member and second channel member,

said transfer cap member having an over-hanging baffle end panel means located at one end therein distal from said orifice means, and said baffle end panel having a lower edge spaced from a top panel of said second channel means and forming a predetermined slot opening therewith,

said transfer cap member having a plurality of transfer openings formed on a top panel therein,

a distribution tile means located at said opened top of said casing, said distribution tile means having a plurality of vertical through openings formed therein in a honeycomb pattern in areas located above said first channel member and said second channel member, and at least one rew of vertical through openings being formed along a selected longitudinal edge portions therein located above said transfer cap member.

4,838,242

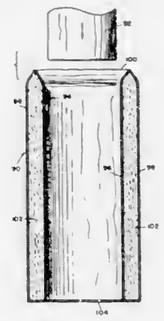
DEVICE FOR CHANGING TEMPERATURE OF MATERIAL THEREIN

Ronald P. Oblon, 19 Silver St., Meriden, Conn. 06450

Division of Ser. No. 890,017, Jul. 28, 1986, Pat. No. 4,722,323.
This application Nov. 5, 1987, Ser. No. 97,688
Int. Cl.[4] F24J *1/00*
U.S. Cl. 126—263 **3 Claims**

1. A device for changing the temperature of material placed therein by a user, said device comprising an inner flexible cylindrical member having an open end for receiving and containing the material the temperature of which is to be changed with said inner member engaging the material, an outer flexible cylindrical member coaxial with said inner member and providing said device with an outer envelope, said members providing an annular space therebetween, and a multi-component temperature changing composition within said annular space and activatable by mixing, said inner and outer members being movable relative to each other by squeezing to agitate and mix and activate said composition, wherein

said members are sealed together adjacent said open end of said inner member and said device further comprises a bottom



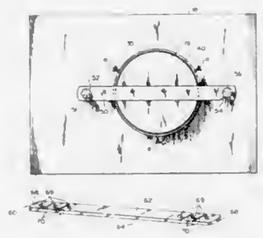
sealed to the ends of said members remote from said open end to retain said composition in said annular space.

4,838,243

CHIMNEY CLEANOUT TEE CAP LOCK

Stephen Kuber, 52 Cumberland Dr., Brick Town, N.J. 08723

Filed Apr. 17, 1987, Ser. No. 39,330
Int. Cl.[4] F24C *15/14*
U.S. Cl. 126—280 **2 Claims**



1. A chimney lock removably attachable to the support plate of prefabricated chimneys, said chimneys having vertically downwardly depending cleanouts, said cleanouts being enclosed by an end cap, said end cap frictionally engaged in said downwardly depending cleanout, comprising:

a planer longitudinal bar having a first transverse end and a second transverse end, said first transverse end having a plurality of longitudinally aligned apertures, said longitudinally aligned apertures having alternately positioned therebetween, a plurality of serrated grooves permitting the selective adjustment of the length of said longitudinal bar to accommodate said cleanouts and said end caps of varying diameters,

a U-shaped notch positioned proximate to said second transverse end of said longitudinal bar,

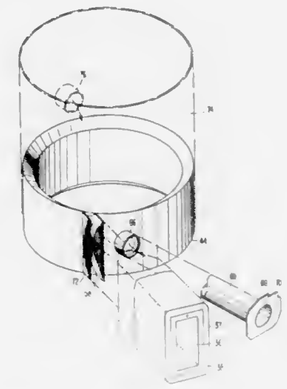
securing means, comprising a first and a second downwardly depending threaded fastener, said first downwardly depending threaded fastener for engaging said apertures proximate to said first transverse end of said longitudinal bar, said second downwardly depending threaded fastener for engaging said U-shaped notch proximate to said second transverse end of said longitudinal bar, said downwardly depending fasteners positioned downwardly from said support plate permitting the rotation of said longitudinal bar about first threaded fastener so as to permit said U-shaped notch to engage said second downwardly depending threaded fastener.

4,838,244

DEEP-FAT FRYING APPARATUS

William O. Giles, Sr., Montgomery, and William T. McNeal, Pratville, both of Ala., assignors to Giles Enterprises, Inc., Montgomery, Ala.

Filed Dec. 21, 1987, Ser. No. 135,278
Int. Cl.[4] A47J *27/00*
U.S. Cl. 126—391 **15 Claims**



1. Frying apparatus comprising:

vessel means for containing cooking fat;

heat exchange means comprising an annular chamber having an inner wall and an outer wall for containing heated air extending substantially circumferentially around the inside of said vessel means;

burner means for heating air communicating with said annular chamber, said burner means including electronic ignition means for igniting a stream of gas-air mixture;

directing means secured to at least one wall of the annular chamber for directing flow of heated air within the annular chamber of said heat exchange means;

entry means in the outer wall of the annular chamber for enabling heated air to enter the heat exchange means; and

exit means in the outer wall of the annular chamber for exhausting heated air from the annular chamber.

4,838,245

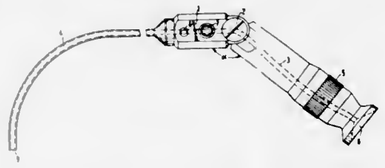
INSTRUMENT FOR THE INSERTION OF ANESTHETIC CATHETERS

Karl Storz, Auf dem Schildrain 39, 7200 Tuttlingen, Fed. Rep. of Germany

Continuation of Ser. No. 524,135, Aug. 17, 1983, abandoned.
This application Apr. 29, 1988, Ser. No. 188,657
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1983, 8301892[U]
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 **4 Claims**

1. An instrument comprising: a flexible light guide element and a flexible image-transmitting element, both having a distal end; a head receiving and connecting to said elements; an eyepiece member connected to said image-transmitting element; and a line-axis hinge joining said head and said eyepiece member, said image-transmitting element extending to said distal end and including a flexible portion disposed between said eyepiece member and said head or said length, which is not restrained by either said head or said eyepiece member, to

enable them to be pivoted relative to one another, the hinge enabling a torque exerted on the eyepiece member to rotate the



head, and a torque on the head to rotate the eyepiece member, but relative rotation of the head and eyepiece member being limited to movement in a plane normal to said hinge.

4,838,246

APPLICATION PART FOR AN ENDOSCOPE

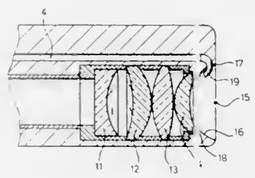
Andreas Hahn, Sauerlach; Fritz Wondraczek, Pfaffenhofen, and Frank Frank, Ebersberg, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 13, 1987, Ser. No. 85,396

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1986, 3627522

Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—6 **15 Claims**



1. In an application part for an endoscope, said application part comprising a viewing channel and a working channel extending parallel to said viewing channel; said working channel including a guiding means and a defined stop for slidable insertion of a fiber optic waveguide, selectively coupled to a laser light source, an improvement in said application part wherein said working channel includes an optics arrangement for concentrating the laser light emerging from the fiber optic wave guide onto a punctiform region, and further said working channel being arranged to extend beyond the optics arrangement in the direction of said punctiform region to form a shock wave reflector and further comprising a flushing channel having an outlet opening which is at least partially directed toward the face of said optics arrangement from which the light emerges.

4,838,247

DUAL-VIEW ARTHROSCOPE

John F. Forkner, Laguna Beach, Calif., assignor to Baxter International, Inc., Deerfield, Ill.

Filed Oct. 6, 1988, Ser. No. 254,468

Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—6 **7 Claims**

1. A dual-view arthroscope, comprising:

(a) as barrel having an axis;

(b) a rigid, elongated channel disposed in said barrel for pivotal movement about said barrel axis between two limit positions;

(c) an optical train mounted in said channel for movement therewith, said optical train having an axis spaced from but substantially parallel to said barrel axis; and

(d) a face optics assembly so constructed as to project an image of a first field of view along said optical train axis when said channel is in one of said limit positions, and an

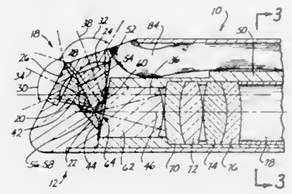


image of a second field of view along said optical train axis when said channel is in the other of said limit positions.

4,838,248

SHOCK WAVE HEAD FOR NON-CONTACTING DISINTEGRATION OF CALCULI

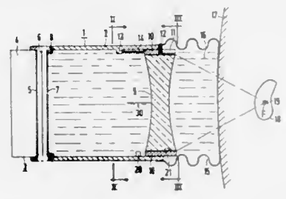
Franz Grasser, Eggolsheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 11, 1987, Ser. No. 133,283

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643971

Int. Cl.[4] A61B *17/22*

U.S. Cl. 128—24 A **5 Claims**



1. In a shock wave head for non-contact disintegration of calculi situated in the body of a life form, said shock wave head comprising a shock wave tube having a shock wave generator for generating shock waves in essentially one plane, and a lens arrangement for focussing the shock waves to an in-focus range in a target region, the improvements comprising said shock wave tube having a first stop at one end of the tube, means for displaceably mounting said lens arrangement at said one end of said shock wave tube, and means for yieldably urging the lens arrangement against said first stop so that when the lens arrangement is contacted by a patient it can move in said tube in a direction toward the shock wave generator and away from said first stop.

4,838,249

LOWER BACK THERAPY DEVICE

Anthony S. Jannotta, 2814 Kingswell Dr., Wheaton, Md. 20902

Continuation-in-part of Ser. No. 865,363, May 21, 1986, abandoned. This application Feb. 12, 1988, Ser. No. 155,525

Int. Cl.[4] A61H *1/02*

U.S. Cl. 128—25 R **21 Claims**

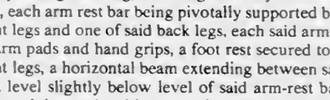
1. An exercise therapy device for the back, comprising:

a rigid base member being thin and flat having a floor-engaging bottom, a top face, a front and a rear end;

a body support cushion fastened to the top face of said rigid base member, and a downward restraint cushion having a length substantially equal to the width of the body support cushion;

a mechanical connecting member having a front and a rear end;

means for attaching said downward restraint cushion to said rear end of said mechanical connector member and means for attaching said front end of said mechanical connecting



member to said rigid base member so that said downward restraint cushion is elevated above and located directly behind the rear of said body support cushion; and

means for gripping attached to the front end of said rigid base member wherein at least a first portion of said gripping means is generally perpendicular to the rigid base member.

4,838,250

BACK RELEASE APPARATUS

Ross P. Angelo, 5211 Victor St., Dallas, Tex. 75214, assignor to Ross P. Angelo, Dallas, Tex.

Filed Apr. 29, 1988, Ser. No. 187,912

Int. Cl.[4] A61H *1/02*

U.S. Cl. 128—75 **4 Claims**

1. A massage and exercise apparatus for adjusting the spinal column of a user while applying a deep massage to the user's body comprising a generally A-shaped collaspable frame with inclined front and back sides including front and back legs pivotally connected at their upper ends by holed securing members, side brace member extending from each front leg to its corresponding back leg, two longitudinally extending arm-rest bars, each arm rest bar being pivotally supported by one of said front legs and one of said back legs, each said arm rest bar having arm pads and hand grips, a foot rest secured to each of said front legs, a horizontal beam extending between said back legs at a level slightly below level of said arm-rest bars, two massage applying pads with protruding ends attached to said horizontal beam and spaced from each other to press into the muscles that lie along side a user's spinal column when a user supports his arms on the arm rest pads and his feet on the foot rests whereby he can lean back against said massage applying pads, and stretch his spine and massage his back by hanging his feet.

4,838,251

DYNAMIC KNEE BRACE

Jean-Jacques P. Chignon, 15, rue du Jeu de Paume, F 78180 Montigny Le Bretonneux, and Jean-Claude Chignon, Résidence Val Fleuri - Bâtiment 34 - rue A. Bickart F, F 77500 Chelles, both of France

Filed Nov. 20, 1987, Ser. No. 123,366

Int. Cl.[4] A61F *3/00*

U.S. Cl. 128—80 C **25 Claims**

1. A knee brace comprising a thigh-piece and a legging suitable for partially enveloping the thigh and the lower leg respectively of a patient, and hinged to each other about an axis in order to allow the brace and the patient's knee to bend between and extended position corresponding to standing, a half-bent intermediate position, and a bent position corresponding to sitting, the brace further comprising at least one traction spring suitable for urging the thigh-piece and the legging to pivot relative to each other selectively towards each of said extended and said bent positions, said spring being disposed laterally relative to the thigh-piece and to the legging to enable the brace to reach the bent position, an anchor element fixed to the thigh-piece and an anchor element fixed to the legging, said spring fixed to and extending rectilinearly between said anchor elements, the anchor element fixed to the thigh-piece pivoting, relative to the legging, about the hinge axis and thereby simultaneously varying both the length of the spring, and thus its tension and the magnitude of the force which it exerts on the thigh-piece, and the orientation of the spring relative to the hinge axis to define a lever arm with which said force is applied, with a lever arm being an inverse function of said force, said force exerted on the thigh-piece additionally causing it to spread laterally sideways toward the spring when in the bent position, said spring, in the intermediate position, aligning over the hinge axis, said spring, to each side of the hinge axis toward the extended and bent positions, urging the brace toward the respective extended or bent position and away from the intermediate position.

4,838,252

OSTEOSYNTHETIC COMPRESSION PLATE

Kaj Klaue, Sierre, Switzerland, assignor to Synthes, Paoli, Pa.

Filed Aug. 6, 1986, Ser. No. 893,705

Claims priority, application Switzerland, Aug. 30, 1985, 03752/85

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 YP **6 Claims**

1. An osteosynthetic compression plate having:

a top surface,

a bone application surface,

lateral surfaces connecting the top surface with the bone application surface wherein the lateral surfaces form an exterior angle with a lateral extension of the bone application surface in the range from about 10° to about 70°, and

a plurality of holes extending through the plate from the top surface to the bone application surface for the insertion of bone screws, said plate having a cross-section perpendicular to the longitudinal direction, which, over substantially the entire length of the plate, is wider towards the top surface than it is at the bone application surface.

4,838,253

SILICONE GEL COATED PERMEABLE WOUND DRESSING

Nigel J. Brassington, Crosshills, United Kingdom, and John A. Gilbert, Henley-on-Thames, England, assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Jun. 22, 1987, Ser. No. 64,376

Claims priority, application United Kingdom, Apr. 7, 1986, 8616418

Int. Cl.[4] A61L *15/00*

U.S. Cl. 128—156 10 Claims

1. A liquid permeable wound dressing which is non-adherent to wounds comprising one or more sheets of apertured liquid permeable material coated with a sufficient amount of cross-linked tacky silicone gel to effectively encapsulate the one or more sheets of apertured liquid permeable material but insufficient to occlude the apertures therein.

9. A method of forming a wound dressing which is non-adherent to wounds comprising coating one or more sheets of apertured material with an amount of silicone gel precursor which is sufficient to effectively encapsulate the one or more sheets of apertured material, but insufficient to occlude the apertures therein, and curing said precursor to form gel.

4,838,254

SURGICAL FASTENING CLIP

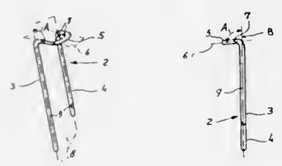
Georges Gauthier, 85 Cours Albert Thomas, Lyon 3e, Rhone, France

Filed Aug. 17, 1987, Ser. No. 87,993

Claims priority, application France, Aug. 18, 1986, 86 12052

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 YF 6 Claims



1. A surgical fastening clip comprising:

two lateral rods, each rod having a distal end and a median axis, said rods being of unequal lengths;

a bridge-forming part connecting said two lateral rods in approximately parallel configuration;

said bridge-forming part consisting of a single curve which curves in a single direction between its points of connection with said two rods so that a first plane containing the single curve forms a bending angle with a second plane containing the median axes of the two lateral rods, said bending angle being greater than 90° and said chip being formed of a biocompatible material having a good elasticity and a good mechanical strength.

4,838,255

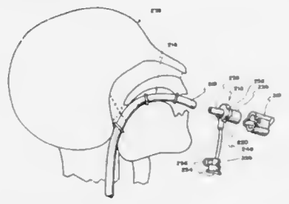
NEONATAL CLOSED SYSTEM FOR INVOLUNTARY ASPIRATION AND VENTILATION, AND METHOD

Richard C. Lambert, Lehi, Utah, assignor to Ballard Medical Products, Midvale, Utah

Division of Ser. No. 24,436, Mar. 11, 1987. This application Feb. 18, 1988, Ser. No. 157,237

Int. Cl.[4] A61M *15/00*

U.S. Cl. 128—202.16 3 Claims



1. A non-assembled coupling member for nonrotatably and linearly releasibly joining an exposed proximal end of an indwelling endotracheal tube and a distal end fitting having no side port of an apparatus comprising a retractable lung aspirating catheter tube, the non-assembled coupling member comprising:

body means defining an axially-directed substantially linear bore and comprising first male extension means which linearly couple to a female opening in an exposed proximal end of a hollow indwelling endotracheal tube in sealed relation under at-patient manual force so that the axially directed bore is substantially linearly aligned with the hollow of the indwelling endotracheal tube at the proximal end thereof, second male extension means which linearly couple to a hollow female distal end fitting having no side port of an apparatus comprising a retractable lung aspirating catheter tube in sealed relation under at-patient manual force so that the axially-directed bore is substantially linearly aligned with the hollow of the female distal end fitting, and means preventing relative rotation of the coupling member in respect to the distal end fitting;

the coupling member further comprising selectively openable side port means comprising a side bore in fluid communication with the axial bore by which lavage solution may be selectively introduced into the axial bore and thence into the lungs for loosening lung secretions either when the aspirating catheter tube is advanced into or withdrawn from the respiratory system of the patient.

4,838,256

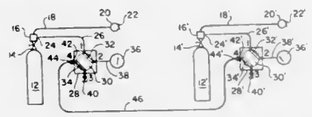
METHOD AND APPARATUS FOR AIR TRANSFER BETWEEN SCUBA DIVERS

Arthur I. Miltz, 212 Mayhew Dr., South Orange, N.J. 07079

Filed Apr. 28, 1988, Ser. No. 187,556

Int. Cl.[4] A62B *9/04, 7/00*

U.S. Cl. 128—202.27 5 Claims



1. In scuba diving, an underwater method of transferring air from donor to donee tank supplies wherein said donor air supply is normally connected to a donor control valve having at least an air supply port and an air transfer outlet port and said donee tank air supply is normally connected to a donee control valve having at least an air supply port, an air transfer inlet port, and an air bubble signal port, said method comprising the steps of connecting said donor and said donee air supplies to said respective control valve air supply ports so as to allow the monitoring of the contents of said tank air supplies during an underwater dive, arranging in said donee control valve for communication of the air transfer inlet port thereof to said air bubble signal port thereof preparatory to providing an air bubble signal using air exiting from said air bubble signal port, connecting opposite ends of an air transfer hose between said donor control valve air transfer outlet port and said donee control valve air transfer inlet port for establishing air flow communication therebetween, arranging in said donor control valve for communication of the air supply port thereof to said air transfer outlet port thereof to thereby cause air from said donor tank air supply to flow through the previously connected air transfer hose and exit from said donee control valve air bubble signal port to clear said air transfer hose of any water located therein, and then to provide an air bubble signal of completion of said clearing step to said divers, and disconnecting the connection of said donee control valve air transfer inlet port to said air bubble signal valve and in lieu thereof establishing communication of said donee air transfer inlet port to said donee air supply port while maintaining air flow into said transfer hose, whereby said air from said donor tank air supply previously providing said air bubble signal is instead allowed to flow into said donee air supply and thereby replenish said air supply of said tank without the entry of water into said air supply.

4,838,257

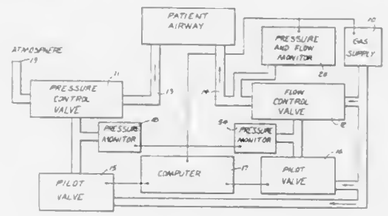
VENTILATOR

Guy M. Hatch, 550 E. 1400 North, Suite Q, Logan, Utah 84321

Filed Jul. 17, 1987, Ser. No. 74,730

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—204.18 18 Claims



1. A respirator system capable of ventilating the lungs of a patient by providing cycle rate, pressure and flow wave form requiremnts needed over a full range of operational control from Continuous Positive Airway Pressure, through Intermittent Mandatory Ventilation, to High Frequency Ventilation, comprising:

a control valve including a control port leading to a pilot-operated movable valve member interposed between two pneumatic ports, one of which is adapted to be in communication with a patient's airway;

a pilot valve having an inlet port, an exhaust port, and a Venturi port, the inlet and exhaust ports of the pilot valve being directed across a region of gaseous flow intersected perpendicularly by an opening leading to the Venturi port;

the Venturi port of the pilot valve being operably connected to the control port of the movable valve member of the control valve for adjustably shifting the movable valve member as a function of the gaseous pressure at the Venturi port;

the exhaust port being centered about a reference axis;

flow restrictor means adjustably positioned in the exhaust port of the pilot valve for motion within a range of movement between first and second limits while centered along the reference axis;

electromagnetic linear actuator means centered coaxially along the reference axis and coupled to the flow restrictor means for selectively shifting the positioning of the flow restrictor means relative to the exhaust port along the reference axis; and

electronic processing means operably connected to the electromagnetic linear actuator means for generating electrical signals as a function of a stored computer program, the electrical signals being directed to the electromagnetic linear actuator means for selecting the instantaneous position of the flow restrictor relative to the exhaust port along the refernce axis;

the electromagnetic linear actuator means comprising:

a stationary loudspeaker permanent magnet centered coaxially along the reference axis;

a moving loudspeaker electromagnetic coil member centered coaxially along the reference axis adjacent to the permanent magnet, the flow restrictor means being mounted to the coil member for conjoint movement with it relative to the permanent magnet along the reference axis; and

spring means yieldably connected to the coil member for biasing it parallel to the reference axis in opposition to forces imparted to the coil member by the adjacent permanent magnet.

4,838,258

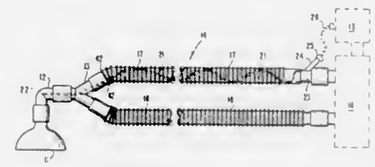
GAS SAMPLING LUMEN FOR BREATHING SYSTEM

Paul E. Dryden, Indianapolis, Ind.; Richard J. Autieri, Hatfield, Pa., and Robert G. Daly, Indianpolis, Ind., assignors to Gibeck-Dryden Corporation, Indianapolis, Ind.

Filed Oct. 26, 1987, Ser. No. 113,538

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—204.18 17 Claims



1. In a breathing system, the combination comprising:

a gas machine for providing inspiratory gas;

a flexible breathing hose;

first adaptor means at one end of the hose and coupled to said gas machine at a location remote from the subject using the hose for breathing, said first adaptor means having sampling port means as the wall thereof for passage of a gas sample therethrough;

a breathing device to be attached to the subject;

second adaptor means at the opposite end of the hose;

gas sampler means for conducting a gas sample from beyond the said opposite end of the hose through most of the length of the hose to said sampling port means, said sampler means being located internally of the hose;

a third adaptor means mounted to said second adaptor means and having said breathing device mounted to said third adaptor means;

a gas sampling monitor;

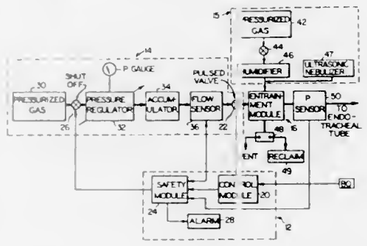
said sampler means having one end adjacent said breathing device and continuing through the inside of said hose and connected to said monitor to deliver gas samples from the breathing device to the monitor.

4,838,259

MULTI-FREQUENCY JET VENTILATION TECHNIQUE AND APPARATUS

Eric H. Clark, West Hartford; Henry McDonald, S. Glastonbury; Jayant S. Sabnis, Glastonbury, and Bernard C. Weinberg, West Hartford, all of Conn., assignors to Advanced Pulmonary Technologies, Inc., Glastonbury, Conn.

Division of Ser. No. 822,535, Jan. 27, 1986, Pat. No. 4,747,403.
This application Mar. 14, 1988, Ser. No. 167,586
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—201.21 12 Claims



1. A method for generating gas pulses for use in respiration therapy comprising the steps of:

providing a flow of primary gas;

periodically interrupting the primary gas flow by means of a normally closed solenoid actuated valve;

generating solenoid control voltage pulses having first and second voltage magnitude levels, said voltage levels including an initial magnitude in excess of the rated voltage of the solenoid and a second contiguous magnitude less than the said rated voltage and sufficient to hold the solenoid in the actuated state; and

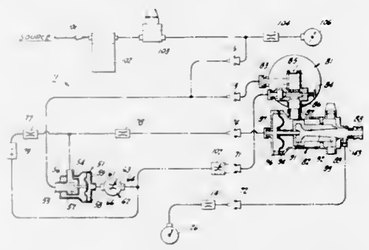
applying said voltage pulses to the valve solenoid to cause the generation of gas pulses.

4,838,260

VENTILATOR

Forrest M. Bird, P.O. Box 817, Sandpoint, Id. 93964

Continuation of Ser. No. 866,790, May 23, 1986, abandoned.
This application Oct. 19, 1987, Ser. No. 111,139
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—204.25 6 Claims



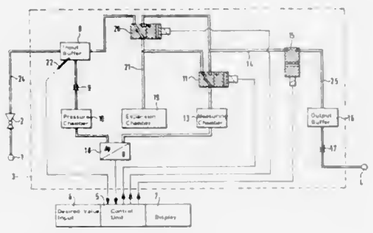
1. In a small compact light weight ventilator adapted to be connected to a source of gas and adapted to be carried on the person of a patient so that gas can be supplied to the airway of the patient, a case, an inlet mounted on the case adapted to be connected to the source of gas, an oscillator cartridge mounted in the case and having a body, the body having an inlet and an outlet and a flow passage interconnecting the inlet and the outlet, diaphragm means mounted within the body, a valve member disposed on one side of the diaphragm means and connected to the diaphragm means and being movable between open and closed positions with respect to the outlet, a servo port on the other side of the diaphragm means for supplying gas to the other side of the diaphragm means to cause movement of the diaphragm means to thereby move the valve member between open and closed positions to interrupt the flow of gas from the inlet to the outlet, means connecting the inlet of the oscillator cartridge to the inlet mounted on the case, an adjustable impact metering valve having an inlet and an outlet, a patient adapter adapted to be coupled to the airway of the patient, pneumatic clutching means having an output coupled to the patient adapter, one-way check valve means coupling the inlet of the adjustable impact metering valve to the outlet of the oscillator cartridge, means coupling the outlet of the impact metering valve to the servo port, range oscillation means connected to the inlet of the impact metering valve and, via said one-way check valve means, to the outlet of the oscillator cartridge, manually operated valve means connecting the range calibration means to the pneumatic clutching means, said adjustable impact metering valve providing a single control for the ventilator and in combination with said one-way check valve means and said range calibration means making it possible to stack successive volumes of gas on the airway of the patient, said manually operated valve being movable between open and closed positions and in an open position coupling the servo port to the pneumatic clutching means to interrupt the stacking of successive volumes of gas, and means mounted on the case to facilitate carrying the case on the person of the patient.

4,838,261

GAS METERING ARRANGEMENT

Tronje von dem Hagen, Lübeck, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Mar. 11, 1988, Ser. No. 167,131
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1987, 3707942
Int. Cl.[4] A62B *9/02*
U.S. Cl. 128—205.24 1 Claim



1. A gas metering arrangement comprising:

gas supply means;

a gas supply conduit;

a pressure chamber permanently connected to said gas supply means via said supply conduit;

an outlet conduit for supplying metered gas to a consumer;

a diverting conduit;

a controllable blocking valve having an input connected to said diverting conduit and an outlet connected to said outlet conduit and being switchable between a first position wherein said outlet conduit is blocked and a second position wherein said outlet conduit is clear so that metered gas can flow to the consumer;

a measuring chamber;

an expansion chamber;

a controllable measuring-chamber change-over valve having an input connected to said expansion chamber and an output connected to said diverting conduit, said change-over valve being connected to said measuring chamber and being switchable between a first position wherein said measuring chamber is connected to said expansion chamber and a second position wherein said measuring chamber is connected to said diverting conduit;

an expansion-chamber change-over valve having an input connected to said supply conduit and an output connected to said diverting conduit, said expansion-chamber change-over valve being connected to said expansion chamber and being switchable between a first position wherein said expansion chamber is connected to said supply conduit and a second position wherein said expansion chamber is connected to said diverting conduit;

sensor means for detecting a plurality of predetermined pressure differences between respective sets of gas pressures in said pressure and measuring chambers and for issuing a plurality of signals indicative of corresponding ones of said pressure differences;

control means for selectively switching said valves from a base mode wherein no gas is metered to the consumer into a low-flow mode wherein a first quantity of gas is metered to the consumer at a first flow velocity and from said base mode into a high-flow mode wherein a second quantity of gas is metered to the consumer at a second flow velocity, said second quantity being greater than said first quantity and said second flow velocity being greater than said first flow velocity;

said base mode corresponding to a base condition wherein said valves are all in their respective first positions thereby causing said measuring chamber and said expansion chamber to be both connected to said gas supply means and causing said outlet conduit to be blocked;

said low-flow mode corresponding to a low-flow condition wherein said measuring-chamber change-over valve and said blocking valve are in their respective second positions;

said high-flow mode corresponding to a high-flow condition wherein said expansion-chamber change-over valve and said blocking valve are in their respective second positions;

for metering said first quantity of gas to the consumer, said control means responding to a first one of said signals to switch said measuring-chamber change-over valve and said blocking valve into said second positions thereof thereby establishing said low-flow condition and causing said measuring chamber to be connected to said output line for discharging said first quantity of gas from said measuring chamber at said first velocity into said output conduit and to said consumer; said control means then responding to a second one of said signals for switching said blocking valve into said first position thereof and thereafter switching said measuring-chamber change-over valve into said first position thereof to thereby return said valves to said base-mode condition; and,

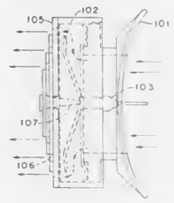
for metering said second quantity of gas to the consumer, said control means responding to a third one of said signals to switch said expansion-chamber change-over valve and said blocking valve into said second positions thereof thereby establishing said high-flow condition and causing said expansion chamber and said measuring chamber to be connected to said output conduit for discharging said second quantity of gas conjointly from both of said expansion and measuring chambers at said second velocity into said output conduit and to said consumer; said control means then responding to a fourth one of said signals for switching said blocking valve into said first position thereof and thereafter switching said expansion-chamber change-over valve into said first position thereof to thereby return said valves to said base-mode condition.

4,838,262

EXHALATION VALVE

Richard Katz, Pittsburgh, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed May 2, 1988, Ser. No. 189,329
Int. Cl.[4] A67B *18/02*
U.S. Cl. 128—205.24 2 Claims



1. A one-direction breathing valve comprising:

a. a hollow cylindrical housing having a peripheral valve seat at a first end thereof and a means adapted to connect to a breathing mask at a second end thereof;

b. a resilient disk flapper valve axially secured in the housing positioned to engage said valve seat during inhalation and when in a neutral position and having a central substantially flat portion and pre-formed peripheral inclined flange around the edge of said flapper valve that extends beyond and below said valve seat to both prevent air flow into a breathing mask through said housing and permit air flow out of a breathing mask through said housing;

c. a cup-shaped valve cap secured to said housing covering said first end and having an opening in said cap to permit air flow therethrough; and,

d. a means formed in said cap to fixedly compress two diametrical opposite points of the inclined flange around the valve periphery against said valve seat to reduce the bending moment of inertia of said flapper valve.

4,838,263

CHEST COMPRESSION APPARATUS

Warren J. Warwick, Minneapolis, and Leland G. Hansen, St. Paul, both of Minn., assignors to Regents of the University of Minnesota, St. Paul, Minn.

Filed May 1, 1987, Ser. No. 45,888
Int. Cl.[4] A61H *31/00*
U.S. Cl. 128—30.2 8 Claims

1. Oscillatory chest compression apparatus for a person, comprising:

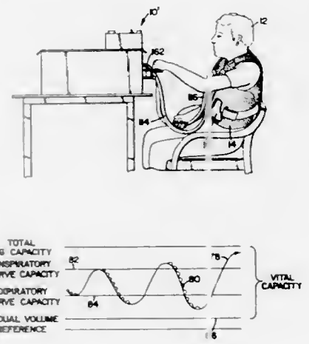
means for applying a force to the chest of said person, said force applying means including a bladder for receiving pressurized air;

means for supplying a continuous regular pattern of pulses of said pressurized air to said bladder at a frequency irrespective of and greater than the breathing frequency of said person;

means for venting said pressurized air from said bladder; and

means for controlling said pressurized air in said bladder so that the pressure therein can be increased and decreased in correspondence with the expiration and inspiration breathing frequency of said person wherein said force is applied by said applying means at the pulse frequency of

said supplying means with greater impact when said controlling means allows increased air pressure in said bladder and with lessor impact when said controlling means allows decreased air pressure in said bladder.

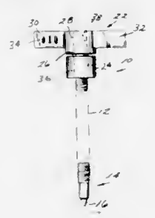


4,838,264

TORQUE LIMITING DEVICE FOR USE WITH BONE PENETRATING PINS

Paul W. Bremer, Jacksonville, Fla., and David A. Kesselman, Sonoma, Calif., assignors to Bremer Orthopedics, Inc., Jacksonville, Fla.

Filed Aug. 18, 1987, Ser. No. 86,709
Int. Cl.[4] A61B 17/00
U.S. Cl. 128—303 B **30 Claims**



1. In combination with a bone penetrating pin, a device for anchoring said pin in bone material comprising separable cap means adapted for engagement with an elongated shank, said cap means including torque applying means and means for transferring torque to said elongated shank; said means for transferring torque to said elongated shaft including torque limiting means designed to fail upon application of torque exceeding a predetermined maximum, said pin further including means for facilitating removal of said pin from the bone whether or not said torque limiting means has failed.

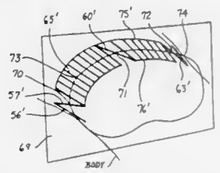
4,838,265

LOCALIZATION DEVICE FOR PROBE PLACEMENT UNDER CT SCANNER IMAGING

Eric R. Cosman, 872 Concord Ave., Belmont, Mass. 02178, and Gary M. Onik, 9 Nancy Rd., Milton, Mass. 02186

Continuation of Ser. No. 738,167, May 24, 1985, abandoned. This application Jan. 21, 1988, Ser. No. 147,115
Int. Cl.[4] A61B 17/00
U.S. Cl. 128—303 B **18 Claims**

1. A localizer for use with CT scanning comprising at least one N-type structure, said structure comprising a planar arrangement of two parallel rods and one diagonal element running non-parallel to said rods, so that a CT scan cutting said rods and said diagonal element will enable the point of CT plane intersection with the diagonal element to be determined from the positions of the image points of said rods and said diagonal element on the CT image of the CT scan plane and rom the known positions of said rods and said diagonal element in said N-type structure, and a plurality of additional rods running substantially parallel to the two parallel rods of said N-type structure when said localizer is laid flat down on a surface, said localizer being so adapted that it can be conformed closely to the skin of a patient during CT scanning so that when said localizer is laid close to the patient's skin said rods and said diagonal element will be cut my bhe CT plane and then from the said determined intersection of said CT plane with said diagonal element and from the knowledge of the orientation of said CT plane to said localizer on the skin, one can determine the intersection point of said CT piane with any of said additional rods which in turn can be used as an entry point near the skin for passage of a probe into the patient's body.

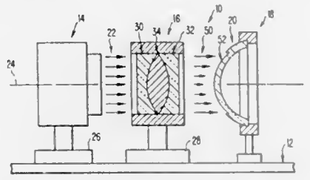


4,838,266

LENS SHAPING DEVICE USING A LASER ATTENUATOR

Jeffrey E. Koziol, 5 Dogwood, Rolling Meadows, Ill. 60008, and Gbolam A. Peyman, 123 Walnut St., New Orleans, La. 70118

Continuation-in-part of Ser. No. 904,408, Sep. 8, 1986, abandoned. This application Sep. 30, 1988, Ser. No. 251,522
Int. Cl.[4] A61N 5/06
U.S. Cl. 128—303.1 **23 Claims**



1. A device for modifying the surface of an optical element to vary its refractive power, the combination comprising:
means for generating a laser beam, said laser beam having a central axis and an outer periphery;
laser energy attenuator means, aligned to intercept said laser beam, for varying the energy distribution of said laser beam between said central axis and said outer periphery of said laser beam without refracting said laser beam within said laser energy attenuator means; and
means for supporting the optical element in a position to intercept said laser beam after said laser beam has been intercepted by said laser energy attenuator means,
said laser energy attenuator means including a laser energy absorbing optical lens-shaped portion having a central axis, and having an axial thickness that varies radially of said central axis thereof in a predetermined manner in proportion to the desired change in refractive power of the optical element.

4,838,267

GLYCOLIDE/P-DIOXANONE BLOCK COPOLYMERS

Dennis D. Jamiolkowski, Long Valley; Shalaby W. Shalaby, Lebanon; Rao S. Bezwada, Whitehouse Station, and Hugh D. Newman, Jr., Chester, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Feb. 12, 1988, Ser. No. 155,348
Int. Cl.[4] A61L 17/00; C08G 63/08
U.S. Cl. 128—335.5 **10 Claims**

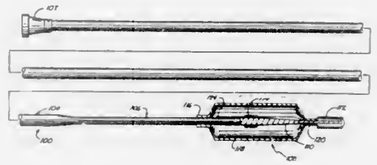
1. A glycolide/p-dioxanone block copolymer which consists essentially of from 40 to 90 weight percent polymerized glycolide, the remainder being polymerized p-dioxanone, and which has an overall crystallinity of from about 25 to 45 percent, a glycolide-based crystallinity of from about 15 to 40 percent, and a melting temperature, by hot stage microscopy, within the range of from 140° C. to about 230° C.

4,838,268

NON-OVER-THE WIRE BALLOON CATHETER

Peter T. Keith, Edina, and Gerald G. Voegele, St. Bonifacius, both of Minn., assignors to Scimed Life Systems, Inc., Minneapolis, Minn.

Filed Mar. 7, 1988, Ser. No. 164,511
Int. Cl.[4] A61M 29/02
U.S. Cl. 128—344 **30 Claims**



1. A balloon catheter comprising:
an elongate hollow, thin wall, tube having a lumen extending therethrough from a proximal end to a distal end;
a hollow, flexible torque transmitting shaft having a first end connected to the distal end of the tube and having a flow lumen therethrough which is in communication with the lumen of the tube;
an elongate core member extending distally from a second end of the shaft; and
an inflatable balloon surrounding the core member and having a proximal end bonded to the second end of the shaft and a distal end bonded to the core member, an interior of the balloon being in communication with the flow lumen.

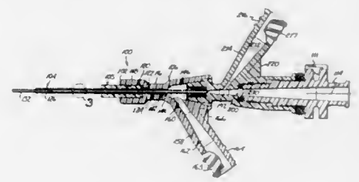
4,838,269

MANIFOLD FOR ANGIOPLASTY BALLOON CATHETER

David B. Robinson, Chanhassen, and William H. Penny, St. Anthony, both of Minn., assignors to SciMed Life Systems, Inc., Maple Grove, Minn.

Filed Mar. 24, 1988, Ser. No. 172,659
Int. Cl.[4] A61M 29/02
U.S. Cl. 128—344 **20 Claims**

1. An angioplasty device comprising:
an angioplasty balloon catheter having a first lumen extending therethrough in fluid connection with a distally located balloon and a second lumen extending therethrough capable of receiving a guide wire; and
a manifold comprising:
a first chamber connecting the first lumen to a first port;
a second chamber connecting the second lumen to a second port and a guide wire entry port;
means for progressively and reversibly sealing the guide wire entry port about the guide wire; and



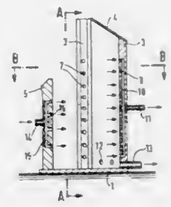
means for coupling an elastic diaphragm guide wire feed through device to the means for reversibly sealing.

4,838,270

CABIN FOR CARRYING OUT CRYOTHERAPY ON THE ENTIRE BODY

Andreas Donnerhack, Krefeld; Klemens Thoma, Krefeld-Huls; Wolfgang Volker, Tonisvorst; Rolf-Dieter Gallmeister; Thomas Stratz, both of Bad Sackingen, and Ludwig Lammers, Idstein, all of Fed. Rep. of Germany, assignors to Messer. Griesheim GmbH, Fed. Rep. of Germany

Filed Nov. 20, 1986, Ser. No. 933,015
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1985, 3541332; Jul. 23, 1986, 3624822
Int. Cl.[4] A61H 33/06, 33/00; A61F 7/00; F25D 23/12
U.S. Cl. 128—371 **12 Claims**



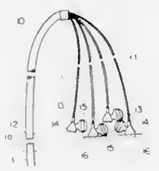
1. In a device for carrying out cryotherapy on the entire body of a patient with a cryogenic treatment gas consisting of a treatment chamber of insulating material for taking up the patient, which has connections for the supply and exhaust of the cryogenic treatment gas, the improvement being in that said treatment chamber is designed as a half shell, said half shell having a rear part and a side part on each side of said rear part with substantially its entire front being permanently open to permit a patient to freely walk into and out of said half shell and to permit an operator to readily monitor the treatment and to readily walk into said half shell during the treatment, said rear part having exhaust openings for the exhaust of the cryogenic treatment gas; and cryogenic treatment gas supply means, supply openings in said side parts of said half shell, said supply means feeding said cryogenic treatment to said supply openings, said supply openings being located laterally opposite said exhaust openings whereby the location of said supply and exhaust opening comprises means for flowing the treatment gas in a generally horizontal direction across said half shell.

4,838,271

VISIBLE LIGHT RAY RADIATION DEVICE FOR USE IN MEDICAL TREATMENT

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Nov. 30, 1987, Ser. No. 126,387
Claims priority, application Japan, Dec. 10, 1986, 61-293899
Int. Cl.[4] A61N 33/00
U.S. Cl. 128—398 1 Claim



1. A solar-ray energy radiation device for the application of the visible light rays component of solar rays to localized areas of a person's body, comprising a solar-ray collecting device for collecting the visible light rays component of solar rays from which ultraviolet rays and infrared rays have been excluded, optical conductor means receiving said visible light rays component, said optical conductor means having a light-emitting end portion, optical cable means comprising a bundled section and an unbundled section, said bundled section comprising a plurality of bundled cables, said bundled section having one end juxtaposed to said light-emitting end portion of said optical conductor means such that said visible light rays component is transmitted from said light-emitting end portion to said bundled section, said unbundled section comprising a plurality of separate and independent unbound optical cables each separately movable relative to one another, each of said unbound optical cables being a continuation of one of the plurality of optical cables which constitute said bundled section, each of said unbound optical cables having an end portion, a hollow skirted member made of a transparent resilient material attached to each of said end portions of each of said unbound optical cables, each of said end portions having a light-emitting end disposed within said hollow skirted member for emitting said visible light rays component within said hollw skirted member, and air suction member attached to each of said hollow skirted members for effecting a reduced pressure in the respective hollow skirted member, said skirted member being adapted to be placed on the skin of a person being treated, said reduced pressure and the resulting vacuum in said hollow skirted member holding said hollow skirted member to said person's skin, whereby each of said skirted members may be placed and held on different locations of said person's skin as each of said light-emitting ends of each of said unbound optical cables emit said visible light rays component onto localized areas of a person's skin encompassed within each hollow skirted members with the condition of the light emission at each of said localized areas being readily observable through said transparent skirted member.

4,838,272

METHOD AND APPARATUS FOR ADAPTIVE CLOSED LOOP ELECTRICAL STIMULATION OF MUSCLES

Richard L. Lieber, Carlsbad, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

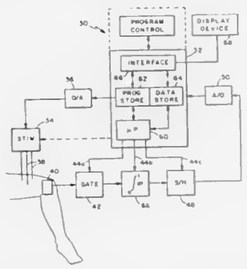
Filed Aug. 19, 1987, Ser. No. 87,470
Int. Cl.[4] A61N 000/00; H05G //00
U.S. Cl. 128—421 24 Claims

1. A method of strengthening skeletal muscles, comprising the steps of:

applying to said muscles a series of stimulation signals having predetermined signal characteristics comprising frequency, pulse-width, and amplitude so as to couple electrical energy into said muscles;

measuring work output by the muscles in response to a stimulation signal over a predetermined period N;

comparing the measured work output to a prestored work value and providing a difference therebetween; and



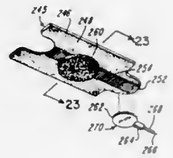
adjusting the energy coupled into said muscles by adjusting signal characteristics of subsequently applied stimulation signals in response to said difference.

4,838,273

MEDICAL ELECTRODE

James V. Cartmell, Dayton, Ohio, assignor to Baxter International Inc., Deerfield, Ill.

Division of Ser. No. 608,188, May 9, 1984, Pat. No. 4,674,511, which is a continuation-in-part of Ser. No. 246,873, Mar. 23, 1981, abandoned, which is a continuation-in-part of Ser. No. 34,394, Apr. 30, 1979, Pat. No. 4,257,424. This application Jun. 22, 1987, Ser. No. 65,277
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—640 6 Claims



1. A disposable medical electrode assembly comprising a plurality of medical electrodes aligned to form a ribbon of said medical electrodes, each medical electrode comprising a substrate having a tongue at one end thereof and a corresponding opening at the opposite end thereof, said tongue of the one of said substrates at one end of said ribbon projecting therefrom and said tongue of each of the others of said substrates interfitting said corresponding opening of an adjacent substrate, each substrate coated on one face thereof with a first adhesive layer, each electrode having a strip of plastic material adhered to said first adhesive layer, each strip having a paintable conductive layer on the face of said strip facing away from said first adhesive layer and each medical electrode having a deposit of conductive adhesive placed between its tongue and its corresponding opening and lying over a part of said paintable conductive layer.

2. The disposable medical electrode of claim 1 wherein said strip of plastic material extends lengthwise of said tongue and is narrower than said tongue, whereby portions of said first adhesive layer not contacted with said strip flank said strip for adhesive attachment to an electrode connector.

4,838,274

PERFLUORO-CROWN ETHERS IN FLUORINE MAGNETIC RESONANCE IMAGING

Frank K. Schweighardt, Allentown, and Joseph A. Rubertone, Coatesville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 18, 1987, Ser. No. 99,442
Int. Cl.[4] A61B 6/00; A61K 49/00; G01N 24/00
U.S. Cl. 128—654 8 Claims

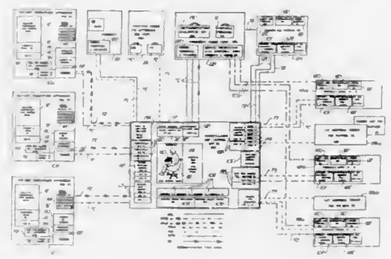
1. In a method for obtaining fluorine magnetic resonance images of body organs or tissues by adminstering to a mammal a fluorine-containing agent in a sufficient amount to provide fluorine magnetic resonance images of said organs or tissues and imaging said organs and tissues, the improvement comprising using as said fluorine-agent an aqueous isotonic emulsion of perfluoro 15-crown-5 ether.

4,838,275

HOME MEDICAL SURVEILLANCE SYSTEM

Arnold St. J. Lee, 1033 Hilts Ave., Los Angeles, Calif. 90024

Continuation of Ser. No. 803,123, Nov. 29, 1985, abandoned. This application Jul. 20, 1987, Ser. No. 76,998
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—670 18 Claims



1. A system for medical surveillance and care of spatially distributed, passively-cooperating patients, each of who has a primary physician having a physician's office, by a remote, trained observer, comprising:

(a) a patient subscriber apparatus located proximate one of said patients operable by the patient without physical interaction with a trained medical personnel including:

(i) sensing means for automatically sensing, with only passive cooperation by said patient, multiple parameters related to the state of health of said patient constituting in the aggregate a comprehensive profile of said patient's state of health;

(ii) first electronic means for automatically generating, transmitting and receiving electronic health-parameter signals related to said health parameters;

(b) at least one surveillance and control office remote from said patient for accommodating said observer, including:

(i) second electronic means for receiving, generating and transmitting electronic signals to and from said patient subscriber apparatus;

(ii) display means for selecting and displaying indicia derived from said health-parameter signals;

(iii) third electronic means for transmitting and receiving data relating to said health parameters of said patient to and from said patient's primary physician's office;

(iv) means for accommodating such observer, said accommodating means being particularly adapted to afford such observer ready access to the indicia displaying means, and to the second electronic means; and

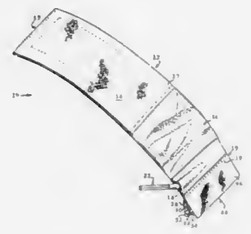
(c) fourth electronic means, located in said patient's primary physician's office, for receiving and transmitting data relating to said health parameters of said patient.

4,838,276

BLOOD PRESSURE CUFF

Toshihiko Nagai, and Tsuoeo Nakagawa, both of Komaki, Japan, assignors to Nippon Colin Co., Ltd., Komaki, Japan

Filed Dec. 2, 1987, Ser. No. 127,369
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—686 6 Claims



1. A blood pressure cuff, comprising:

a flexible band of predetermined width and length, said length having a first end and a second end;

buckle means formed of a closed loop of rigid material with two sides substantially straight for a distance greater than said band width for removably securing said band to a person one of said two sides being connected to said first end of said band;

means secured within said band for applying pressure for sensing pulses; and

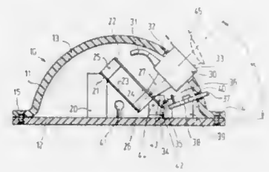
shield means formed of a substantially rigid elastic material having a rough first surface and a smooth second surface connected to said first end of said band so as to be positioned intermediate said buckle means and said person when said band is in position to function as a blood pressure cuff.

4,838,277

VASOMETRIC TEST APPARATUS FOR FINGER TESTING

Karl-Heinz Affeldt, and Ulrich Hantel, both of Berlin, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 16, 1988, Ser. No. 194,462
Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717045
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—691 11 Claims



1. Vasometric test apparatus for testing blood supply to a finger (45) of a patient, comprising

a domed housing (11) defining an outer surface and forming a support for the hand of the patient;

a pulse sensor (30) having a sensing surface (33), said sensor being retained in the housing, the housing being formed with an opening (32) to permit the pulse sensor to extend therethrough; and

resilient means (22, 35) securing the pulse sensor in the

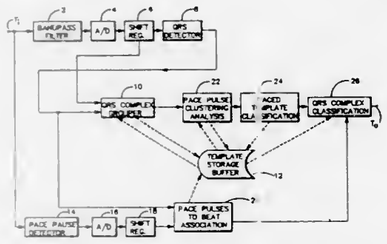
housing such that the sensing surface (33) projects slightly above the outer surface of the domed housing to permit engagement of the finger of a patient with said testing surface while the hand of the patient is cupped over the domed housing, whereby the volume of blood supplied to the finger is sensed.

4,838,278

PACED QRS COMPLEX CLASSIFIER

Jyh-Yun Wang, Newton, and Mousa N. Shaya, Waltham, both of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 26, 1987, Ser. No. 19,270
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—697 **7 Claims**



1. An apparatus for classifying the type of pacing of QRS complexes in an ECG wave signal of a paced patient comprising,

statistical means for detecting the times of occurrence of said QRS complexes in said ECG wave signal,

means for detecting the times of occurrence of pace pulses in said ECG wave signal,

means coupled to both of said means for determining the value of the time interval between each detected pace pulse and the next detected QRS complex to thereby provide at least one time interval value associated therewith,

means for assigning said detected QRS complexes to respective groups in accordance with their shape,

clustering means coupled to said last two means for detecting the existence of at least one cluster of time interval values occurring during a given number of most recent assigned QRS complexes of each group,

means for deriving a representative interval value for each said cluster, and

means for classifying a current QRS complex including means for comparing said at least one time interval value associated with it and the representative interval value or values for the at least one cluster of the group to which it has been assigned.

4,838,279

RESPIRATION MONITOR

Don C. Fore, 324 N. Brown, Vinita, Okla. 74301

Filed May 12, 1987, Ser. No. 48,896
Int. Cl.[4] A61B 5/08
U.S. Cl. 128—721 **52 Claims**

1. A respiration monitor for monitoring respiration motion of a individual, comprising:

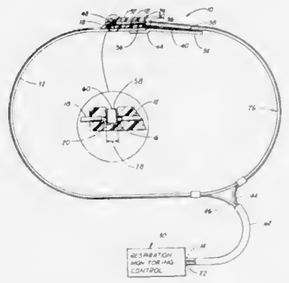
a sending light conductor having a receiving end and a sending end, the sending light conductor being suitable for conducting light between the receiving and sending ends thereof;

a receiving light conductor having a receiving end and a sending end, the receiving light conductor being suitable for conducting light between the receiving and sending ends thereof;

light conductor support means, the sending end portion of the sending light conductor being affixed to the light conductor support means and the receiving end of the receiving light conductor being disposed on the light conductor support means with the sending light conductor and the receiving light conductor being positioned so that the sending end of the sending light conductor is spaced a distance from and in alignment with the receiving end of the receiving light conductor said support means being constructed to maintain substantial linear alignment at all times whereby the light passing therebetween will at all times define a substantially straight line,

means for positioning the light conductor support means near a portion of the individual which moves in response to respiration motion of the individual and for varying the distance between the sending end of the sending light conductor and the receiving end of the receiving light conductor in response to respiration motion;

a light source for emitting light, the light source and being



positioned near the receiving end of the sending light conductor and the sending light conductor receiving light from the light source and conducting such received light therethrough toward the sending end of the sending light conductor and the light being emitted from the sending end of the sending light conductor, the receiving end of the receiving light conductor receiving light from the sending end of the sending light conductor and conducting such received light therethrough toward the sending end of the receiving light conductor and the light being emitted from the sending end of the receiving light conductor, the intensity of the light receiving by the receiving end and emitted from the sending end of the receiving light conductor being indicative of the distance between the sending end of the sending light conductor and the receiving end of the receiving end of the receiving light conductor; and

means for receiving light from the sending end of the receiving light conductor and determining indications or respiration motion in response to changes in the intensity of the received light and providing an output indication indicative of respiration motion.

4,838,280

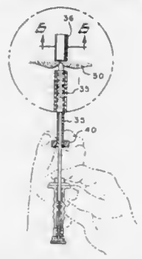
HEMOSTATIC SHEATH FOR A BIOPSY NEEDLE AND METHOD OF USE

John R. Haaga, 3409 N. Hilltop, Chagrin Falls, Ohio 44022

Filed May 26, 1988, Ser. No. 199,130
Int. Cl.[4] A61B 10/00
U.S. Cl. 128—751 **19 Claims**

1. A biopsy needle for taking a biopsy specimen from a patient, said needle having an unactuated position defined by the relative position of its parts prior to insertion in the patient, an actuated position defined by the relative position of its parts while said specimen is being taken and a retracted position defined by the relative position of its parts when said needle is removed from the site where the biopsy was taken, said needle comprising:

(a) an inner cutting cannula having a distal portion for insertion into said site and a contiguous proximal portion extending from said distal portion, said distal portion defined as that length of said inner cannula which is inserted into said patient in said actuated position, and including means to sever said specimen from said patient;



(b) an outer hollow cannula co-axial with and receiving said inner cannula, said outer cannula having a proximal portion and a separable distal portion, said distal portion being separated from said proximal portion and remaining at said site in said retracted position of said needle;

(c) positioning means associated with said proximal portions of said inner and outer cannulas to cause movement of one of said cannulas relative to the other when said needle moves from one of said positions to the other; and

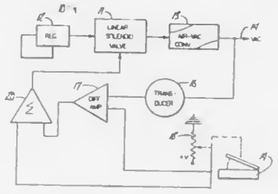
(d) said distal portion of said outer cannula being made of biodegradable gelatin material for minimizing bleeding of said patient from said biopsy site.

4,838,281

LINEAR SUCTION CONTROL SYSTEM

Wayne W. Rogers, Napa, and Carl C. T. Wang, Piedmont, both of Calif., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation of Ser. No. 706,654, Feb. 28, 1989, Pat. No. 4,706,687. This application Oct. 13, 1987, Ser. No. 107,971
The portion of the term of this patent subsequent to Nov. 17, 2004, has been disclaimed.
Int. Cl.[4] A61M 13/00
U.S. Cl. 128—752 **23 Claims**



1. A surgical suction control system for aspirating and cutting tissue comprising:

valve means for regulating the flow of pressurized fluid;

means for converting the pressurized fluid into a vacuum, which converting means is adapted to communicate with a device for aspirating and cutting tissue; transducer means for sensing the vacuum and for generating

a first signal in response thereto; adjustable controller means for selecting an appropriate vacuum

level for aspirating and cutting tissue and for generating, in response to adjustment of the controller means, a p1 second signal which corresponds to said level; comparator means for comparing the first and second signals and

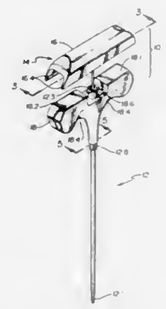
generating a third signal to drive the valve means to regulate the flow of pressurized fluid and the vacuum in order to regulate the aspirating and cutting of tissue.

4,838,282

BONE BIOPSY NEEDLE ASSEMBLY

Robert K. Strasser, Nashua, N.H., and Robert L. Netsch, Spirit Lake, Iowa, assignors to Manan Manufacturing Co., Inc., Skokie, Ill.

Filed Feb. 26, 1987, Ser. No. 19,062
Int. Cl.[4] A61B 10/00
U.S. Cl. 128—754 **10 Claims**



I. A bone biopsy needle assembly, comprising:

(a) an elongated tubular cannula having an axially extending lumen therethrough and having distal and proximal ends;

(b) a cannula handle having proximal and distal sides positioned on the proximal end of said cannula, a proximal portion of the proximal end of the cannula retained within the cannula handle, said proximal portion of the cannula being provided with longitudinal flute knurling around the external perimeter of said cannula for allowing the cannula to be securely held within the cannula handle by injection insert molding; wherein

(c) said cannula handle extends perpendicularly to the axis of said cannula; and wherein

(d) said cannula handle is comprised of two equal generally rectangular halves extending in diametrically opposed directions to each other from said cannula axis;

(e) each of said equal halves of said cannula handle having proximally extending shoulder projections substantially parallel to the axis with one of the said shoulder projections reaching closer to the cannula axis than the other said shoulder projection, with a distally extending slot formed between one of the shoulder projections and the cannula axis;

(f) an orifice in said cannula handle in flow communication with said cannula lumen, said orifice being coaxial with said cannula lumen;

(g) a stylet handle having distal and proximal sides removably positioned on the proximal end of said cannula handle, wherein

(h) said stylet handle extends perpendicularly to the axis of said cannula and includes an elongated palm contacting surface on the proximal side thereof; and wherein

(i) said stylet handle is comprised of two equal generally rectangular halves extending in diametrically opposed directions to each other from said cannula axis along the same diameter and substantially to the same extent as said equal halves of said cannula handle;

(j) an elongated stylet extending from the distal side of said stylet handle and slidably received within said cannula

lumen, said stylet being retained within said stylet handle by injection insert molding and terminating in an anchor bend at a distal terminus within said stylet handle, and said stylet having a sharpened distal tip which extends distally from the distal end of said cannula and said cannula having a sharpened beveled distal end edge;

(k) and wherein the distal side of each of said equal halves of said stylet handle further includes a recess means, each of said recess means being mated exclusively to one of said shoulder projections with a distally extending tang formed between one of the recesses and the stylet axis, said tang being matingly received by the slot on the cannula handle when the shoulder projections are mated with the recess means, thus allowing relative movement between the stylet and cannula handles only in the axial direction of said cannula and assuring bevel alignment between the sharpened beveled distal end edge of the cannula and the sharpened distal tip of the stylet;

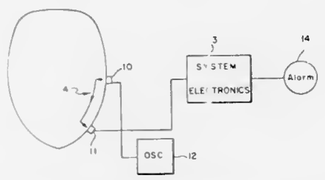
(l) whereby when said shouldered projections on said cannula handle halves are received in the exclusively mated recesses of said stylet handle halves, force may be rotatingly applied around either axial direction of said elongated stylet positioned in said elongated cannula lumen without relative rotation between said elongated stylet and said elongated cannula.

4,838,283

ANTI-BRUXISM DEVICE

Alexander Y. Lee, Jr., 1075 S. Jefferson St., Apt. 321, Arlington, Va. 22204

Filed Nov. 13, 1987, Ser. No. 120,359
Int. Cl.[4] A61F 5/56
U.S. Cl. 128—777 3 Claims



1. An apparatus for the control and prevention of bruxing of a subject comprising:

sound generating means adapted to be mounted on one of a subject's lower jaw or bony structure connected to the upper jaw for generating a sound,

sound receiving means adapted to be mounted on the other of the subject's lower jaw or bony structure connected to the upper jaw for receiving the sound generated by said sound generating means and for producing a signal voltage in response thereto,

alarm means for alerting the subject when bruxing occurs, bruxing causing a characteristic amplitude of said generated sound to be received,

electronic control means for activating said alarm means when said sound generating means generates a predetermined signal voltage in response to a received sound which is at said characteristic amplitude, and

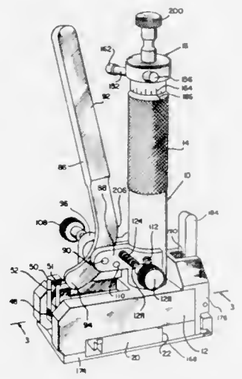
an adjustable electrical signal generator means for transmitting a signal to said sound generating means.

4,838,284

METHOD OF USING A DERMATOME

Morris V. Shelanski, 431 Wister Rd., Wynnewood, Pa. 19096

Division of Ser. No. 941,157, Dec. 12, 1986, Pat. No. 4,754,756.
This application Jul. 5, 1988, Ser. No. 214,746
Int. Cl.[4] A61B 17/322
U.S. Cl. 128—898 4 Claims



1. The method of cutting specimens of skin with dermatome of the type comprising a body, a blade containing crosshead horizontally reciprocal within the body, a bottom plate bottomly covering the crosshead and the blade, the bottom plate having an opening and a plunger assembly including a bottom plunger pin vertically movable relative to the body comprising

lowering the plunger assembly and projecting the bottom plunger pin through the botton plate the opening and below the bottom plate;

equipping the bottom of the plunger pin with a skin attracting media;

contacting the sking below the bottom plate with the plunger pin and adhering the skin to the plunger pin;

raising the plunger assembly and drawing the skin upwardly through the bottom plate opening and above the bottom plate; and

horizontally moving the crosshead above the bottom plate and severing the skin with the blade above the bottom plate.

4,838,285

GOLF TEE CIGARETTE HOLDER

Louis Petrone, 5384 Greenridge Dr., Pittsburgh, Pa. 15236

Filed Aug. 27, 1987, Ser. No. 89,763
Int. Cl.[4] A24F 13/08, 13/12
U.S. Cl. 131—259 2 Claims

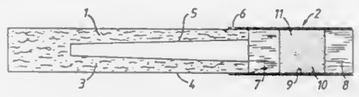
1. A golf tee having a top, golf ball supporting portion and having a stem portion of circular cross-section, said top portion being of substantially greater diameter than that of said stem portion, and a U-shaped opening extending from said top portion into said stem portion, together with a clip entending vertically underneath said top portion and alongside said stem portion.

4,838,286

SMOKING ARTICLES

James W. P. Phelpstead, Southampton, Great Britain, assignor to British-American Tobacco Company Limited, London, England

Continuation of Ser. No. 664,591, Oct. 25, 1984, abandoned.
This application Mar. 27, 1987, Ser. No. 32,984
Claims priority, application United Kingdom, Apr. 11, 1983, 8329501
Int. Cl.[4] A24F 1/00
U.S. Cl. 131—360 5 Claims



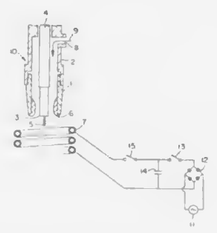
1. A smoking article comprising a smoking rod and a mouthpiece, said rod comprising a wrapped body of particles of tobacco and/or particles of other smoking material, the packing density of said body of particles being in a range of from 100 to 400 mg cm^3, a passage extending within said rod, said passage being in direct and unobstructed communication with said mouthpiece so as to provide a direct gas-flow communication to said mouthpiece, said passage providing for the flow of hot smoke therealong, and said smoking article comprising vapor-release material at said mouthpiece and/or at a mouthpiece-end zone of said passage, the thermal energy of said hot smoke for liberating said flavor being greater than the thermal energy available from the smoke of a conventional smoking rod.

4,838,287

METHOD AND DEVICE FOR ELECTROMAGNETIC REMOVAL OF SPATTER ON NOZZLE OF ARC WELDING TORCH

Hitoshi Matsui, and Hiroshi Suzuki, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Aug. 11, 1987, Ser. No. 83,809
Int. Cl.[4] B08B 7/00
U.S. Cl. 134—1 3 Claims



1. An arc welding torch comprising:

a tubular nozzle having an open end portion with an axially extending central bore communicating with the open end portion and defining an axially extending internal wall of the nozzle, the central bore being adapted to contain an arc welding rod that extends through the open end portion and is annularly spaced from the internal wall;

an annular electromagnetic coil mounted substantially concentric with the tubular nozzle and movable axially relative to the nozzle for positioning the coil remote from the nozzle adjacent the open end thereof; and

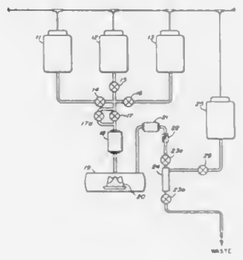
means for energizing the electromagnetic coil at times when the coil is in the remote position for creating an electromagnetic field having sufficient force in a direction parallel to the central axis for removing through the open end portion of the nozzle metallic spatter deposits adhering to the internal wall of the nozzle.

4,838,288

HEART VALVE AND XENOGRAFT WASHING SYSTEM

Diana R. Wright, Conifer, Colo., and David W. Schlerf, Martinez, Calif., assignors to Pioneering Technologies, Inc., Wheat Ridge, Colo.

Filed Mar. 14, 1988, Ser. No. 167,707
Int. Cl.[4] B08B 3/04, 11/02
U.S. Cl. 134—110 6 Claims



1. A system for washing a prosthesis with a biologically compatible wash solution, comprising, in combination,

at least one container of wash solution;

a sterile filter in fluid communication with said container; and

a flow-through wash chamber having a fluid inlet and a fluid outlet for positioning the prosthesis to permit wash solution to flow freely over and wash the same, the fluid inlet being connected in fluid communication with sterile filter, said wash chamber comprising a funnel and a cap forming said wash chamber, said wash chamber being constructed, configured and dimensioned to receive a xenograft prosthesis and, in use, to direct fluid flow over all surfaces thereof, said cap being removeably connected to said funnel, and in fluid communication with said sterile filter.

4,838,289

APPARATUS AND METHOD FOR EDGE CLEANING

Rickie A. Kottman, Dallas; Robert E. Terrill, Carrollton, and Ann E. Wise, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

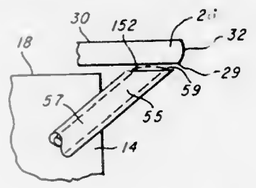
Continuation of Ser. No. 936,877, Dec. 2, 1986, abandoned, Division of Ser. No. 834,651, Feb. 27, 1986, Pat. No. 4,685,975, which is a continuation of Ser. No. 637,687, Aug. 3, 1984, abandoned, which is a continuation of Ser. No. 404,679, Aug. 3, 1982, abandoned. This application Apr. 25, 1988, Ser. No. 186,783
Int. Cl.[4] B08B 3/04
U.S. Cl. 134—153 9 Claims

1. Apparatus for removing a deposit of material from an outer convex edge of an object having a substantially flat surface adjacent said edge, comprising:

(a) a nozzle with an outlet end located in proximity to said surface near said edge;

(b) a solvent at said outlet end of said nozzle in the form of a convex shaped reservoir created by surface tension

forces of said solvent sufficiently close to said substantially flat surface to enable solvent transfer thereto; and

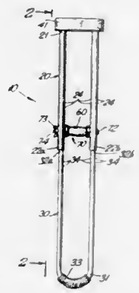


(c) a chuck for engaging and spinning said object to bring the transferred solvent into contact with said edge to thereby remove said material deposit.

4,838,290
SLIMLY-FOLDED UMBRELLA HAVING EXTENDIBLE BRIM PORTION
Tsun-Zong Wu, P.O. Box 10160, Taipei, Taiwan
Filed May 31, 1988, Ser. No. 200,566
Int. Cl.[4] A45B *21/00*
U.S. Cl. 135—25 R **7 Claims**

1. An umbrella comprising:
a plurality of main links securing an umbrella hood or cloth thereon, each said main link having an inner end pivotally secured to an upper notch formed on an upper portion of a central shaft and having an outer end secured to a lower periphery of the umbrella hood, the main links radially disposed around said shaft generally occupying an area larger than half a circle of the umbrella hood from a top view of the hood;
a plurality of stretcher links each stretcher link having an inner end pivotally secured to a lower runner slidably mounted on the central shaft and having an outer end pivotally secured to a middle portion of said main link;
a plurality of shortened main links securing a remaining hood portion of the umbrella hood and generally occupying an area less than half a circle of the umbrella hood from a top view of the hood, each shortened main link having an inner end pivotally secured to said upper notch and having a middle portion pivotally secured to an outermost end of said stretcher link;
a plurality of tail links each tail link having an innermost end pivotally secured to an outermost end of each said shortened main link and having an outer end secured with a lower periphery of said hood; and
a plurality of supporting links each supporting link having an outer portion protruding outwardly through a slot formed in an outer portion of each said shortened main link to pivotally connect an inner portion of a tail link proximate to the innermost end of the tail link, and having an inner end pivotally secured to an outer portion of said stretcher link proximate to the outermost end of said stretcher link;
each said supporting link crossly protruding through said shortened main link to horizontally suspend each said tail link to operatively form a generally X-shaped configuration by said shortened link, said supporting link crossing said shortened link, an upper stretcher link and a lower horizontal tail link when opening the umbrella, said horizontal tail link being flattened to serve as a brim and being higher than a periphery of said outer ends of said main links.

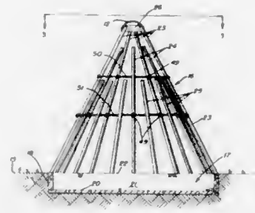
4,838,291
AXILLIARY CRUTCH
Fred DiVito, Asharoken, N.Y., assignor to Lumex, Inc., Bay Shore, N.Y.
Continuation of Ser. No. 33,398, Apr. 1, 1987, abandooed. This application Oct. 25, 1988, Ser. No. 263,980
Int. Cl.[4] A61H *3/02*
U.S. Cl. 135—68 **3 Claims**



1. An improved axially crutch to aid ambulation comprising:
an underarm bend section having a top end, a bottom end and two sides, the sides of the underarm bend section being in parallel relation to one another except at the top end of the underarm bend section; a foot bend section having a top end, a bottom arcuate end and two sides, the sides of the foot bend section being in parallel relation to one another except at the bottom arcuate end of the foot bend section, wherein the bottom arcuate end comes into contact with the floor during ambulation and wherein the arcuate design of the bottom arcuate end of the foot bend section is derived from the natural arcing motion of the crutch during ambulation, wherein the underarm bend section and the foot bend section each comprise a single piece of hollow tubing and the top end of the foot bend section telescopes into the bottom end of the underarm bend section;
a handle located intermediate the top end of the underarm bend section and the bottom arcuate end of the foot bend section; means for inter-connecting and securing the bottom end of the underarm bend section, the top end of the foot bend section and the handle; and an arcuate crutch tip attached to the bottom arcuate end of the foot bend section.

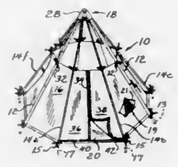
4,838,292
TEEPEE STRUCTURE
Sebree J. Allen, Rte. 2, Kevil, Ky. 42053
Filed May 23, 1988, Ser. No. 197,333
Int. Cl.[4] E04H *15/24*
U.S. Cl. 135—100 **17 Claims**

1. A teepee structure comprising:
(a) a circumferential foundation base,
(b) a conical frame comprising a plurality of poles having bottom end portions seated on said foundation base at spaced intervals and having upper end portions converging upward, said poles having exterior and interior surfaces,
(c) said poles comprising a first set of circumferentially spaced long poles and a second set of circumferentially spaced shorter poles of lesser height than said long poles, said shorter poles being alternately spaced between said long poles,
(d) a top ring member,
(e) top fastener means securing the upper end portions of said long poles to said top ring member,
(f) said top ring member being spaced above the upper end portions of said shorter poles,



(g) fastening means securing said shorter poles in spaced relationship to said long poles, and
(h) an insulated cover member secured to the exterior surfaces of said poles from said foundation base to said top ring member, said cover member and poles enclosing a living space.

4,838,293
TEPEE TENT
Terry Novak, P.O. Box 1147, Melrose Park, Ill. 60160
Filed Mar. 31, 1988, Ser. No. 175,857
Int. Cl.[4] A45F *1/16*
U.S. Cl. 135—100 **18 Claims**

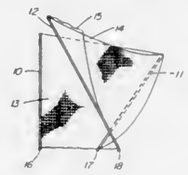


1. A tepee tent comprising three rigid telescopic tent poles, at least three non-rigid and resilient tent poles, all of said tent poles having lower ends, spaced from each other and extending upwardly and converging toward a common point, an apex cup securing upper ends of said tent poles at said common point, said tent poles and apex cup defining a skeletal structure, a polygonal floor panel integrally formed with a tent cover positioned within said structure and conically tapering toward said common point, fasteners for attaching said floor panel and said tent cover at polygonal corners to said tent poles, and means for attaching the upper portion of said tent cover to said tent poles, whereby said tent cover is supported on the interior of said structure.

4,838,294
OPENABLE ENCLOSURES AND STRUCTURES INCORPORATING SUCH ENCLOSURES
Rowland D. Hunt, 1118 Manitou Rd., Santa Barbara, Calif. 93101
Filed Feb. 4, 1988, Ser. No. 152,424
Int. Cl.[4] E04B *1/347*
U.S. Cl. 135—102 **22 Claims**

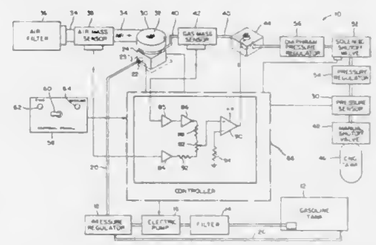
1. An openable enclosure comprising:

a plurality of arched frames spaced apart and including a forward frame and an intermediate frame;
each frame comprising opposed straight wall portions and opposed straight roof portions, each portion comprising at least one straight section, the wall portions each connected at an upper end to a lower end of a roof portion, the roof portions being connected together at their upper ends;
at least one of said wall portions and said roof portions on each side of said forward frame being longer than the corresponding portions of said intermediate frame;



a fabric panel extending between each adjacent pair of frames;
ground anchorage means at a lower end of each wall portion and including pivotal means for pivotting of each frame at said ground anchorage means, the ground anchorage means being spaced forward of and outward of said ground anchorage means for said intermediate frame;
whereby said forward frame can pivot up and over said intermediate frame and the panel between the forward and intermediate frames can pass over said intermediate frame.

4,838,295
SYSTEM FOR CONTROLLING MASS FLOW RATES OF TWO GASES
David H. Smith, Mercer Island, and Kenneth E. Miller, Edmonds, both of Wash., assignors to AirSensors, Inc., Seattle, Wash.
Filed Aug. 21, 1986, Ser. No. 897,541
Int. Cl.[4] G05D *11/13*
U.S. Cl. 137—9 **2 Claims**



2. A method for controlling the relative mass flow rates of two gases, comprising:
providing a first conduit for the flow of a first gas comprising air, the flow being variable over a range of mass flow rates;
providing a first hot wire anemometer operating at a substantially constant temperature without appreciably altering the temperature of said first gas, said first hot wire anemometer being positioned to directly sense the mass flow rate of said first gas in said first conduit;
sensing the mass flow rate of said first gas in said first conduit with said first hot wire anemometer and generating a first

flow rate signal indicating the mass flow rate of said first gas;

providing a second conduit for the flow of a second gas comprising a combustible gaseous fuel, the flow being adjustable over a range of mass flow rates;

providing a second hot wire anemometer operating at a substantially constant temperature without appreciably altering the temperature of said second gas, said second hot wire anemometer being positioned to directly sense the mass flow rate of said second gas in said second conduit, said first and second hot wire anemometers having a substantially identical nonlinear output characteristic relative to the mass flow being sensed;

sensing the mass flow rate of said second gas in said second conduit with said second hot wire anemometer and generating a second flow rate signal indicating the mass flow rate of said second gas;

selecting a predetermined ratio for the mass flow rates of said first and second gases;

providing said first and second conduits with interior flow cross-sectional areas sized relative to each other to correspond approximately to said predetermined ratio of the mass flow rates of said first and second gases, whereby the output characteristic of said first and second hot wire anemometers will be generally scaled by the choice of cross-sectional areas for said first and second conduits such that both said first and second hot wire anemometers operate in substantially the same region of their nonlinear output characteristic curves, and even though the output characteristic of said first and second hot wire anemometers are nonlinear, said first and second flow rate signals will remain comparable during operation over a wide range of flow rates without introducing unacceptable error;

comparing said first and second flow rate signals, and generating a control signal if said first and second flow rate signals vary indicating variation in mass flow rates from said predetermined ratio;

providing a valve positioned in said second conduit and adjustable for controlling the flow rate of said second gas; and

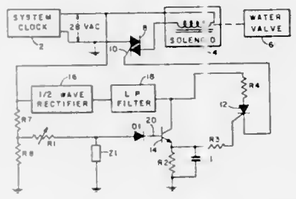
controlling said valve in response to said control signal to maintain said predetermined ratio of mass flow rates, whereby the flow rate of said second gas is controlled responsive to variations in the flow rate of said first gas to maintain the mass flow rates of said first and second gases in the desired ratio.

4,838,296

MOISTURE SENSING SWITCH

James L. Brooks, 903 Sandpiper Pl., La Jolla, Calif. 92037

Filed May 2, 1988, Ser. No. 187,743
Int. Cl.[4] A01G *25/16*
U.S. Cl. 137—78.3 16 Claims



1. In a ground watering system including a water valve means which opens when energized and a means for periodically providing energization for said water valve means, the improvement comprising:

(a) a sensing element disposed in the ground, said element having at least one characteristic which changes generally predictably in relation to changes in the moisture content of an atmosphere ambient to said sensing element,

(b) means for isolating the sensing element from the ground, said isolation means being permeable to air and moisture,

(c) means for producing a signal whenever said characteristic of the sensing element is at or beyond a threshold and the periodic energization is present, said signal remaining for the duration of said periodic energization, and

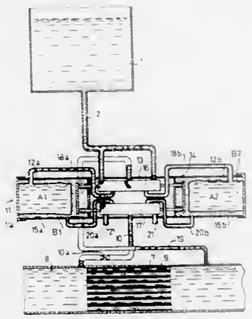
(d) means for communicating the periodic energization to the water valve means in response to and for the duration of said signal.

4,838,297

APPARATUS FOR INJECTING A FLUID INTO A NETWORK

Marc Dumont, 19 rue de l'Egalité , 32700 Lectoure, France

PCT No. PCT/FR87/00014, § 371 Date Nov. 30, 1987, § 102(e) Date Nov. 30, 1987, PCT Pub. No. WO87/04586, PCT Pub. Date Aug. 13, 1987
PCT Filed Jan. 15, 1987, Ser. No. 138,850
Claims priority, application France, Jan. 30, 1986, 86 01419
Int. Cl.[4] A01C *23/04*; A01M *7/00*; F04B *13/02*
U.S. Cl. 137—99 22 Claims



1. An injector for injecting a fluid into a network (8) comprising in combination:

a first switchable valved distributor (16) having at least one inlet for fluid to be injected, at least one outlet for fluid to be injected and two fluid passage openings, said distributor being adapted to present two states, one state in which the inlet and outlet for the fluid to be injected is found respectively in communication with one and the other opening and a state in which these communications are reversed,

a second switchable valved distributor (17) having at least one auxiliary fluid inlet, at least one auxiliary fluid outlet and two fluid passage openings, said distributor being adapted to presenty two states, one state in which the inlet and outlet of the auxiliary fluid are found respectively in communication with one and the other opening and one state in which the communications are reversed,

a hollow body divided by two sealing walls (14) into three enclosures (12*a*, 12*b*, 13), a first enclosure (12*a*) hermetically divided internally into two chambers (A1, B1) of variable volume and having a constant total volume, each of said chambers being provided with a fluid passage opening, a second enclosure (12*b*) hermetically divided internally into two chambers (A2, B2) of variable volume, having a constant total volume, each of said chambers being provided with a fluid passage opening, and a central enclosure (13) closing said distributors (16, 17), said first and second enclosures being laterally positioned on opposite sides of said central enclosure,

first conduit means (18) connecting the opening of one of the chambers (A1, A2) of each enclosure and one opening of the first distributor (16) such that in one state of said distributor, one of said chambers (A1) is filled with fluid while the other chamber (A2) is emptied and that in the other state, the role of the chambers is reversed,

second conduit means (20) connecting the opening of one chamber (B1, B2) of each enclosure and an opening of the second distributor (17) in such a manner that in one state of said distributor, one of said chambers (B2) is filled with fluid while the other chamber (B1) is emptied and that in the other state the role of these chambers is reversed,

actuating means (22-27; 28-37; 48, 49, 50; 28, 29, 38-48, 50; 55-59) for the two distributors (16, 17) adapted to generate in synchronism their switching between their two states, for arranging them into configurations wherein said states are reversed:

one configuration in which one chamber (A1) of one enclosure is filled and the other chamber (B1) of said enclosure is emptied while in the other enclosure the chamber (B2) is filled with fluid and the chamber (A2) is emptied,

another configuration in which the role of the chambers (A1, A2) is reversed according to the role of the chambers (B1, B2), and

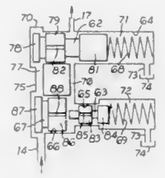
one of said chambers (A1, A2) of each enclosure being formed of a sealed and deformable pouch (15) adapted to occupy a variable volume in the interior of said enclosure (12), and the other chamber (B1, B2) of each enclosure comprising the volume of said enclosure exterior of said pouch (15).

4,838,298

HYDRAULIC LATCH DEVICE

Kenneth G. Cleasby, Chichester, England, assignor to Vickers Systems Limited, Havant, England

Filed Jun. 16, 1988, Ser. No. 208,141
Claims priority, application United Kingdom, Jun. 20, 1987, 8714519
Int. Cl.[4] G05D *16/00*
U.S. Cl. 137—110 13 Claims



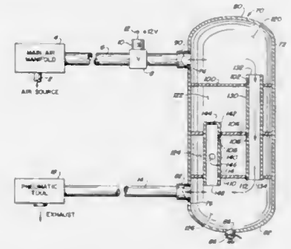
1. An hydraulic latch device comprising a housing having an inlet for hydraulic fluid, an outlet for hydraulic fluid, and first and second spool means slidably mounted in the housing and operable to control the flow of hydraulic fluid from the inlet to the outlet, each of the first and second spool means having resilient means associated therewith and being operable to bias the spool means in one direction of sliding movement, the resilient means being arranged such that that associated with the first spool means determines the inlet pressure which places the device in a latched mode in which a first relationship is established between the inlet and outlet, and the resilient means associated with the second spool means determines the inlet pressure at which the device is placed in the unlatched mode in which mode a second relationship is established between the inlet and the outlet, with the latch pressure being higher than the unlatched pressure, and means provided to assist in maintaining the device in the latch mode by way of the first spool means being stepped so as to provide first and second surfaces against which the inlet pressure can act, the surface area to which the inlet pressure is applied in the latched mode being greater than that to which the inlet pressure is applied in the unlatched mode.

4,838,299

PULSATION DAMPENER APPARATUS

Robert N. Behrens, 4802 W. Laurel La., Glendale, Ariz. 85304

Filed May 23, 1988, Ser. No. 197,640
Int. Cl.[4] F16L *55/04*
U.S. Cl. 137—203 11 Claims



1. Pulsation dampening apparatus for compressed air, comprising, in combination:

cylinder means for receiving compressed air and out of which the compressed air flows;

plate means, including a first plate and a second plate, for dividing the cylinder means into a plurality of chambers, including a first expansion chamber, a second expansion chamber, and low pressure chamber means for dampening pulsations;

first pipe means for providing communication between the first and second expansion chambers;

second pipe means for providing communication between the second expansion chamber and the low pressure chamber means;

orifice means in the second pipe means in the low pressure chamber means;

first coupling means communicating with the first expansion chamber for providing a flow of pressurized air to the cylinder means and to the first pipe means; and

second coupling means communicating with the second expansion chamber, adjacent to the second pipe means and remote from the first pipe means in the second expansion chamber, for providing a flow of pressurized air out of the second expansion chamber and aligned with the second pipe means for impressing a differential pressure on the low pressure chamber means through the second pipe means in response to the flow of pressurized air from the first pipe means past the second pipe means and out of the cylinder means and for receiving pulsations and for transmitting the pulsations to the second expansion chamber and to the low pressure chamber means for dampening the pulsations.

4,838,300

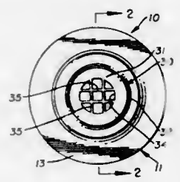
PRESSURE RELIEF CARTRIDGE

Peter P. Seabase, 1800 26th St., Cuyahoga Falls, Ohio 44223

Filed Mar. 25, 1988, Ser. No. 173,065
Int. Cl.[4] F16K *17/04*
U.S. Cl. 137—224 19 Claims

1. A pressure relief cartridge for venting fluid to the atmosphere from a low pressure inflatable member comprising, housing means mounted in fluid-tight relation to the inflatable member, said housing means having base means and projecting annular sidewall means, aperture means in said base means of said housing communicating with the interior of the inflatable member, poppet means positioned within said annular sidewall means of said housing means having plate means at an axial

extremity thereof, sealing means on said plate means adapted to engage said base means peripherally surrounding said aperture means, orifice means formed between said plate means and said annular sidewall means, skirt means on said poppet means projecting from said plate means and interiorly communicating with the atmosphere, slot means in and extending only a portion of the axial length of said skirt means, retainer means



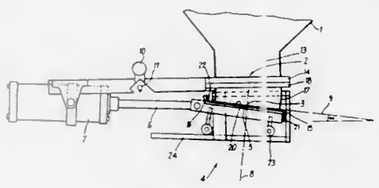
positioned in said annular sidewall means of said housing means, and biasing means interposed between said retainer means and said poppet means normally urging said sealing means to seat on said base means and permitting said sealing means to unseat and vent fluid from the inflatable member through said orifice means and said slot means to the atmosphere when the fluid in the inflatable member exceeds a predetermined pressure.

4,838,301

DRAINING VALVE FOR WASTE PAPER PROCESSING APPLIANCES

Jean-Pierre Lamort, Vitry Le Francois, France, assignor to E & M Lamort, France

Filed Jan. 29, 1988, Ser. No. 150,373
Claims priority, application France, Jan. 30, 1987, 87 01139
Int. Cl.[4] F16K *3/00, 31/122;* **F08B** *3/04*
U.S. Cl. 137—240 **17 Claims**



1. A valve arrangement, comprising:

an outflow seat section defined by at least a tubular side wall, said outflow seat section having a free end with an engaging part extending along the entire periphery of the side wall,

said engaging part being adapted for close engagement with an engaging surface of a movable obturating plate,

said engaging surface being substantially parallel to a plane of said engaging part and remains substantially parallel to said plane during movement of the obturating plate toward and from said free end of the outflow seat section,

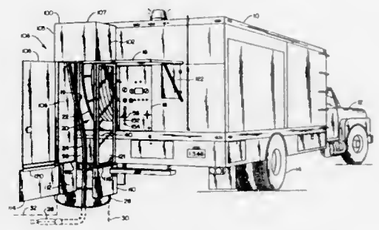
whereby during operation of the valve arrangement said engaging surface of the obturating plate simultaneously engages the entire plane of the engaging part of the outflow seat section causing closing of the valve arrangement, while simultaneously and proportionately moving and spacing the obturating plate away from the entire plane of the engaging part of the outflow seat section during movement of the obturating plate by operating means so as to permit cleaning means to be activated to clean the entire face of the obturating plate when it has moved proportionately away from the entire plane of the outflow seat section.

4,838,302

SEWER CLEANING EQUIPMENT

Charles J. Prange, Cridersville, Ohio, assignor to Sewer Rodding Equipment Co., Lima, Ohio

Filed Feb. 1, 1988, Ser. No. 151,197
Int. Cl.[4] A62C *35/00;* **B65H** *59/00*
U.S. Cl. 137—355.12 **29 Claims**



1. Protection apparatus in a mobile sewer cleaning machine having a compartment enclosing a reel and a hose wound thereon, the compartment having an opening through which the hose can be unwound into a sewer through a sewer opening, a portion of the hose between the opening in the compartment and the sewer being exposed, the reel and the hose being viewable through the opening in the compartment and being rotated by a motor to advance the hose through the sewer, comprising:

shield means for enclosing the periphery of the exposed portion of the hose received through an opening therein and extending substantially the full length of the exposed portion of the hose toward the sewer opening, said shield means having a transparent portion for viewing the reel and the hose; and,

means for fastening said shield means to the cleaning machine so that said shield means covers the opening in the compartment;

whereby said shield means will deflect fragments and contents of a bursting hose, while permitting the reel and the hose to remain viewable.

4,838,303

BUOYANCY OPERABLE LIQUID LEVEL SENSOR FOR CONTROLLING AN ALARM PRESSURE FLUID SUPPLY RESPONSIVE TO CHANGES OF LIQUID LEVEL IN A PRESSURE VESSEL

Kip B. Goans, 2576 Apollo Ave., Harvey, La. 70058

Filed Oct. 14, 1986, Ser. No. 917,591
Int. Cl.[4] F16K *31/28, 33/00, 37/00*
U.S. Cl. 137—423 **3 Claims**

1. A liquid level indicator operable by a float mounted in a vessel containing the liquid comprising, in combination:

a generally cylindrical body defining oppositely disposed open and closed ends;

means for securing said cylindrical body in a vertical wall opening in said vessel with said open end disposed outwardly of said vessel;

said closed end defining a central passage into said vessel;

annular, flexible seal means disposed in said central passage;

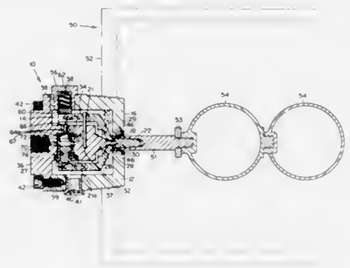
a first linkage member having a small diameter solid stem portion projecting through said flexible annular sealing means into said vessel and sealably engagable with said flexible annular sealing means, thereby permitting limited vertical movement of said first linkage member;

means for securing said stem portion to said float;

said first linkage member also having an enlarged diameter hollow cylindrical portion secured to said solid stem portion and disposed within said generally cylindrical body;

spring biasing means radially disposed in the wall of said generally cylindrical body and engaging said enlarged cylindrical portion of said first linkage member to oppose the weight of said float and position said first linkage member in a neutral position when the liquid in said vessel is at a desired level;

a second linkage member having a cylindrical cap portion overlying and secured to said open end of said generally cylindrical body, a medial cylindrical portion insertable within said hollow cylindrical portion of said first linkage member, and a solid reduced diameter end portion defining a horizontal fulcrum engaging the outer end of said stem portion of said first linkage member;



a passage in said second linkage member for receiving a pressure fluid;

pressured fluid outlet means in the wall of said generally cylindrical body connectable to a pressure actuated warning device; and

normally closed valve means in said second linkage member controlling flow of pressured fluid to said pressured fluid outlet means, said valve means being operable to an open position by a selected vertical movement of said first linkage member produced by a change in liquid level in said vessel, whereby said selected vertical movement is achieved by said first linkage member cooperating with said second linkage member through said fulcrum of said second linkage member.

4,838,304

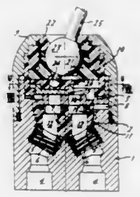
COMPACT CARTRIDGE FOR A SINGLE HANDLE FAUCET VALVE

Alfons Knapp, Biberach/Riss, Fed. Rep. of Germany, assignor to Masco Corporation, Taylor, Mich.

PCT No. PCT/US87/00800, § 371 Date Feb. 16, 1988, § 102(e) Date Feb. 16, 1988
PCT Filed Apr. 7, 1987, Ser. No. 207,402
Claims priority, application Italy, Apr. 9, 1986, 67283 A/86; Apr. 9, 1986, 67284 A/86
Int. Cl.[4] F16K *11/074*
U.S. Cl. 137—454.6 **30 Claims**

1. In a fluid flow control cartridge adapted to be disposed in a faucet valve body of a single-handle faucet in order to regulate the mixing ratio and rate of fluid flow through the faucet, said cartridge comprising:

a body housing a pair of flow control valve plates formed of a hard, wear-resistant material, one of said valve plates being fixed and one of said valve plates movable, said body including interior framing means for limiting the movement of said movable valve plate, said interior framing means comprising an inner outline edge of said body within which said movable valve plate is disposed; and



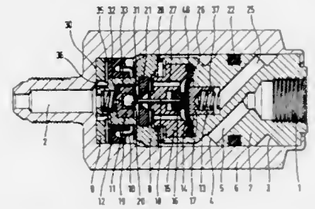
means for controlling the movement of said movable valve plate.

4,838,305

PRESSURE DIFFERENTIAL VALVE

Hans-Dieter Reinartz, Frankfurt am Main; Helmut Steffes, Hattersheim, and Edwin Czarnetzki, Elz, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 3, 1987, Ser. No. 128,127
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1986, 3641968
Int. Cl.[4] G05D *16/08*
U.S. Cl. 137—505.13 **4 Claims**



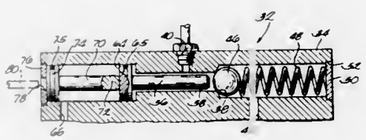
1. A pressure differential valve, comprising a housing, a valve arrangement in said housing, said valve arrangement being loaded by a preload force and controlling a connection between an inlet and an outlet, the preload force determining the difference in pressure between an inlet pressure and an outlet pressure, said valve arrangement including a valve body and an overflow cup in contact with said outlet and fluidly connected to said inlet around a stepped outer contour of said valve body, such that a pressure compensation between said inlet pressure and said outlet pressure is effected when said overflow cup overflows with pressure fluid and said pressure fluid flows from said outlet to said inlet around said stepped outer contour of said valve body, a diaphragm, said diaphragm being pressurized responsive to said inlet pressure only and on the side facing said outlet, a tappet being connected for movement by said diaphragm and said tappet connected to actuate said valve arrangement, whereby said valve arrangement is movable in dependence upon the position of the diaphragm.

4,838,306

PNEUMATIC LOCKING VALVE WITH MANUAL OVERRIDE

Edward R. Horn, Nashotah, and Derek Hopkinson, Menomonee Falls, both of Wis., assignors to Aladdin Engineering & Mfg., Inc., Brookfield, Wis.

Filed Aug. 10, 1987, Ser. No. 83,170
Int. Cl.[4] F16K *15/00*; F15B *11/08*
U.S. Cl. 137—522 1 Claim



1. A locking valve assembly for inhibiting the movement of a piston of an air cylinder upon interruption of a source of air pressure supplied to the air cylinder, and wherein the air cylinder includes a first and second ports and slideably houses the piston for movement between extended and retracted positions, and wherein the source of air pressure alternately is supplied to the first and second ports, the locking valve assembly comprising;

a valve body having a valve bore and wherein the valve bore includes a first, second, and third portions, the first portion of the valve bore disposed in fluid communication with the source of air pressure, the second portion of the valve bore disposed in fluid communication with both the first portion of the valve bore and with the first port, and the third portion of the valve bore disposed in fluid communication with both the first portion of the valve bore and with the second port, and a valve seat is positioned between the first and second portions of the valve bore;

a valve member moveably housed in the second portion of the valve bore and selectively engageable with the valve seat;

means for biasing the valve member against the valve seat thereby substantially inhibiting the movement of air from the second portion of valve bore into the first portion of the valve bore;

a plunger moveably housed in the first portion of the valve bore and selectively moveable into and out of engagement with the valve member;

a plunger piston slideably and sealingly housed in the third portion of the valve bore and mounted on the plunger, the plunger piston urging the plunger into engagement with the valve member when the source of air pressure is supplied to the second port thereby urging the valve member away from the valve seat;

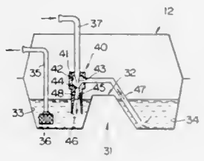
a manually moveable release plunger slideably and sealingly mounted in the third portion of valve bore and disposed in force transmitting relation to the plunger piston, the manually moveable release plunger being operable to be manually engaged whereby the release plunger forces the plunger to move the valve member away from the valve seat thereby allowing the movement of air from the second portion of the valve bore to the first portion of the valve bore.

4,838,307

FUEL TANK ARRANGEMENT

Michiaki Sasaki, and Kiyokazu Yamamoto, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited and Jidosha Denki Kogyo Kabushiki, both of Yokohama, Japan

Filed Sep. 12, 1986, Ser. No. 906,241
Claims priority, application Japan, Sep. 18, 1985, 60-206140
Int. Cl.[4] F02M *33/02*; F02F *5/02*
U.S. Cl. 137—574 14 Claims



12. An arrangement comprising:

(a) a fuel tank having a bottom wall defining an inwardly extending projection which separates at least a lower segment of an interior of the fuel tank into a first fuel chamber and a second fuel chamber;

(b) means for pumping fuel out of the first fuel chamber;

(c) ejector pump located in a region within the fuel tank outside the second fuel chamber;

(d) means for returning a portion of the fuel, pumped out of the first fuel chamber by the pumping means, to the first fuel chamber by way of the ejector pump and thus allowing the return fuel to drive the ejector pump; and

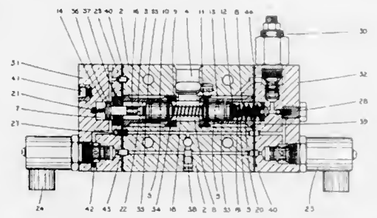
(e) means for enabling the ejector pump to transport fuel from the second fuel chamber, to the first fuel chamber, the enabling means comprising a communication pipe connecting the second fuel chamber to the ejector pump so that a siphonage action is produced in response to said fuel passing through said ejector pump when the fuel is supplied to the ejector pump via the means returning a portion of the fuel.

4,838,308

MULTIPURPOSE CONTROL VALVE

Charles E. Thomas, deceased, late of Ramona, Calif., and by Vivian Thomas, executrix, 97 Gladstone Avenue, Chatham, Ontario N7L 2C5, Canada

Filed Oct. 16, 1987, Ser. No. 108,952
Int. Cl.[4] F15B *13/043*
U.S. Cl. 137—596.16 6 Claims



1. A multipurpose fluid control valve which provides fluid control functions in a fluid system comprising:

a valve body;

first, second and third ports, in said valve body connected to control points within said fluid system;

a generally cylindrical fluid passage intersecting and connecting said first, second and third main fluid ports within said valve body at different axial locations of the fluid passage, said fluid passage including first and second outboard cavities each cavity extending beyond one of the outlying intersections of said main ports;

a first poppet segment in slidable contact with said fluid passage said first poppet segment shaped and dimensioned to preclude fluid passage between said first and second main ports at one end of sliding travel within said fluid passage, and shaped and dimensioned to allow fluid passage between said first and second main ports at the other end of sliding travel within said fluid passage, said first poppet segment also shaped and dimensioned to preclude fluid passage between said main ports and said first cavity throughout sliding travel;

a generally cylindrical poppet stem attached to first poppet segment within said fluid passage, extending from said first poppet segment towards the intersection of said fluid passage and third main port;

a second poppet segment in slidable contact with said fluid passage and in slidable contact with said poppet stem proximate to said intersection of said fluid passage and said third main port, said second poppet segment shaped and dimensioned to preclude fluid passage between said second and third main ports at one end of sliding travel within said fluid passage independent of the sliding position of said poppet stem, and said second poppet segment shaped and dimensioned to allow fluid passage between said second and third main ports at the other end of sliding travel within said fluid passage and also shaped and dimensioned to preclude fluid passage between said main ports and said second cavity throughout sliding travel;

means to supply a first pilot fluid to said first outboard cavity in said fluid passage;

means to supply a second pilot fluid to said second outboard cavity in said fluid passage;

a first spring placed proximate to said poppet stem within said fluid passage and biasing, said first and second poppet segments providing forces in opposite directions generally along said axis;

a second spring proximate to said second outboard cavity of said fluid passage and biasing, on said second poppet segment;

a third spring proximate to said second spring, biasing said poppet stem;

a piston cylinder cavity with an axis generally aligned with, and adjacent to, said first outboard cavity in said fluid passage within said valve body, said piston cavity connected to said first outboard cavity with an intercavity bore;

a piston in sliding contact with the inside surface of said piston cylinder cavity, said piston shaped and dimensioned to preclude fluid passage from a first portion of piston cavity to the other portion;

a piston stem attached to said piston, said piston stem extending through said intercavity bore and abutting the outboard portion of said seated first poppet segment at least one point of piston end travel, said piston stem shaped and dimensioned to preclude fluid passage between said first outboard cavity and one portion of said piston cavity;

a fourth spring placed proximate to one portion of said piston cylinder cavity biasing on said piston;

a piston bore within said piston and piston stem, allowing said first pilot cylinder fluid within first outboard cavity to one portion in said piston cylinder cavity; and

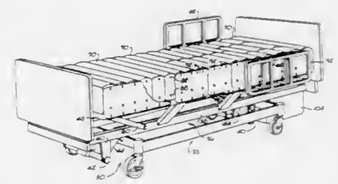
means to supply third pilot fluid quantities to the remaining portion of said piston cavity.

4,838,309

VARIABLE FLOW GAS VALVE

Vernon L. Goodwin, Charlotte, N.C., assignor to SSI Medical Services, Inc., Charleston, S.C.

Division of Ser. No. 912,774, Sep. 26, 1986, Pat. No. 4,768,249, which is a continuation-in-part of Ser. No. 814,610, Dec. 30, 1985, Pat. No. 4,745,647. This application Oct. 27, 1987, Ser. No. 114,097
The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.
Int. Cl.[4] F16K *37/00*, *31/02*; A47C *27/10*
U.S. Cl. 137—554 14 Claims



1. A multi-outlet, variable flow gas valve, comprising:

(a) a housing defining an inlet and a passageway, said inlet communicating with said passageway;

(b) at least two cylinder chambers defined within said housing and communicating with said passageway, each said chamber having a longitudinal centerline therethrough;

(c) a discrete outlet defined in said housing for each said cylinder chamber and communicating therewith, said outlet being disposed perpendicularly to said longitudinal centerline of said cylinder chamber; and

(d) means for variably controlling communication of said inlet with each said outlet through said passageway and each said cylinder chamber, said variable communication control means comprising:

(i) a piston slidably received within each said cylinder chamber, said piston blocking all communication between each said outlet and said inlet when said piston is oriented at at least one predetermined location within said cylinder chamber, said piston permitting maximum communication between said outlet and said inlet through said cylinder chamber when said piston is oriented at another predetermined location within said cylinder chamber, said piston permitting a predetermined degree of communication between said outlet and said inlet through said cylinder chamber depending on the orientation of said piston within said cylinder chamber; and

(ii) means for orienting said piston at a predetermined location within said cylinder chamber, said means for orienting said piston comprising:

(i') a threaded opening extending through said piston and concentric with said longitudinal center line thereof;

(ii') a rotatable shaft having a threaded exterior portion engaging said threaded opening of said piston;

(iii') means for rotating said shaft whereby rotation of said shaft causes displacement of said piston along said shaft in said cylinder chamber, the direction of said displacement depending on the direction of rotation of said shaft; and

(iv') means for precluding full rotation of each said piston, said rotation preclusion means comprising a channel formed in a wall of said cylinder chamber and extending generally along the longitudinal axis thereof and a projection associated with said piston and having a free end extending into and confined within said channel of said cylinder chamber.

4,838,310

PRESSURE REGULATOR

Ronald E. Bowen, Lake Forest, Ill., assignor to Fisher Controls International, Inc., Clayton, Mo.

Filed Jan. 25, 1988, Ser. No. 147,555
Int. Cl.[4] G05D *16/06*
U.S. Cl. 137—505.18 6 Claims

1. A pressure regulator comprising:

a body having a fluid inlet, a fluid outlet, a fluid passageway between the inlet and the outlet, a valve seat in the passageway, and a valve port in the valve seat;

a valve member movable relative to the valve port to control the flow of fluid through the valve port;

a diaphragm operatively connected to the valve member;

a first chamber on one side of the diaphragm;

a second chamber on the other side of the diaphragm;

a first passageway connecting the first chamber to the fluid passageway;

a second passageway connecting the second chamber to the fluid passageway;

a first orifice in the first passageway;

a second orifice in the second passageway;

a first valve member movable relative to the first orifice to control the flow of fluid through the first orifice;

a second valve member movable relative to the second orifice to control the flow of fluid through the second orifice;

a first spring biasing the first valve member relative to the first orifice;

a second spring biasing the second valve member relative to the second orifice;

a first adjustment member operatively connected to the first spring to adjust the force of the first spring on the first valve member; and

a second adjustment member operatively connected to the second spring to adjust the force of the second spring on the second valve member.

4,838,311

FLUID FLOW CONTROL VALVE

Jerry L. Hall, Tulsa, Okla., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Jan. 25, 1988, Ser. No. 147,556
Int. Cl.[4] F16K *31/12*
U.S. Cl. 137—505.18 6 Claims

1. A fluid flow control valve comprising:

a valve body having a fluid inlet, a fluid outlet, a fluid passageway between the inlet and the outlet, a valve seat in the passageway, and a valve port in the valve seat;

a valve member movable relative to the valve port to control the flow of fluid through the valve port;

a diaphragm operatively connected to the valve member;

a first chamber on one side of the diaphragm;

a second chamber on the other side of the diaphragm;

a first passageway connecting the first chamber to the fluid passageway;

a second passageway connecting the second chamber to the fluid passageway;

a first orifice in the first passageway;

a second orifice in the second passageway;

a first valve member movable relative to the first orifice to control the flow of fluid through the first orifice;

a second valve member movable relative to the second orifice to control the flow of fluid through the second orifice;

a first spring biasing the first valve member relative to the first orifice;

a second spring biasing the second valve member relative to the second orifice;

a first adjustment member operatively connected to the first spring to adjust the force of the first spring on the first valve member; and

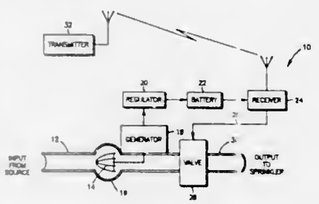
a second adjustment member operatively connected to the second spring to adjust the force of the second spring on the second valve member.

4,838,310

HYDROELECTRICALLY POWERED, REMOTELY CONTROLLED IRRIGATION SYSTEM

George R. Scott, Scottsdale, Ariz.; John C. Gray, Austin, Tex., and Eric M. Scott, Sacremento, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 28, 1988, Ser. No. 174,053
Int. Cl.[4] F16K *31/02*
U.S. Cl. 137—624.14 6 Claims



1. A remote control irrigation system, comprising, in combination:

a fluid source for supplying a fluid to be distributed;

distribution means, coupled to said fluid source, for distributing said fluid;

a plurality of remote control valves, coupled to said distribution means, at least one of said plurality of remote control valves comprising:

generating means for generating an electric potential, wherein said generating means comprises a means capable of rotational operation, in response to said fluid flowing through said distribution means, for operating a generator thereby providing said electric potential,

storage means for storing said electric potential, receiver means, coupled to said storage means, for receiving command codes, and transmitting instruction codes in response thereto;

means, coupled to said receiver means, for receiving said instruction codes, and for operating a valve in response thereto; and

means for transmitting said command codes to said receiver means;

whereby, said at least one of said plurality of remote controlled values may be commanded to facilitate or impede said fluid from flowing through said distribution means.

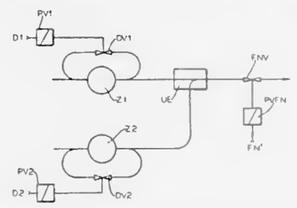
4,838,311

CONTROL SYSTEM FOR A PROGRAMMED SPRAYING DEVICE

Kurt Vetter, Remseck, Fed. Rep. of Germany, assignor to Behr Industrieanlagen GmbH & Co., Fed. Rep. of Germany

Filed Apr. 18, 1988, Ser. No. 182,853
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1987, 3714000
Int. Cl.[4] B05C *5/00*
U.S. Cl. 137—624.2 6 Claims

1. A control system for a program-controlled spraying device comprising: at least one fluid conduit line; a pump (Z1, Z2) having a fluid inlet and a fluid outlet for moving fluid through said conduit line; a main valve (FNV) moveable between an open position and a closed position over a variable switching time period for automatically switching on and off the fluid flow through said conduit line at predetermined times; a return circuit directing fluid flow from said fluid outlet of said pump (Z1, Z2) to said fluid inlet of said pump (Z1, Z2), said return circuit including a flow-control valve (DV1, DV2) closed to fluid flow therethrough when said main valve (FNV) is open and open to fluid flow therethrough when said main valve (FNV) is closed; said control system characterized by including an external control unit (ZST) for supplying a control signal (D1, D2) to automatically open and close said control valve (DV1, DV2) at predetermined adjustable times in response to the switching time of said main valve (FNV).

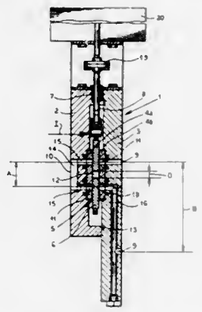


4,838,312

THREE-WAY VALVE

Rütger Berchem, Essen, and Georg Prokscha, Recklinghausen, both of Fed. Rep. of Germany, assignors to Metallpraecis Berchem+Schaberg Gesellschaft Für Metallformgebung m.b.H., Gelsenkirchen, Fed. Rep. of Germany

Filed Sep. 20, 1988, Ser. No. 247,113
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1987, 3731754
Int. Cl.[4] F16K *11/065*
U.S. Cl. 137—625.48 6 Claims



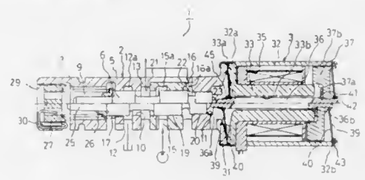
1. In a three-way valve comprising a pressure-tight housing, a valve seat, a closing member moveable in said valve seat and an operating member moveable in said housing through a shaft seal, in which said housing has three connecting channels, said valve seat has associated connecting passages and said closing member has a metering passage by which two of said connecting channels are alternately connectable with a third of said connecting channels to form a complete path through said three-way valve and in which said closing member seals said connecting channels from each other in an additional control position, the improvement wherein said closing member is formed as a sliding plate, said plate having a single metering passage, said valve seat has two sealing disks between which said sliding plate is positioned moveable up and down, said sealing disks being equipped with said connecting passages and at least one of said sealing disks having said connecting passages in a controlling spacing which is greater than the diameter of said metering passage in said sliding plate, said housing consists essentially of a front and a rear housing cover, and said controlling space is at least twice as large as said diameter of said metering passage in said sliding plate.

4,838,313

SOLENOID-OPERATED PRESSURE CONTROL VALVE

Kouji Kobayashi, Toyota; Nobuaki Miki, Kariya, and Akira Suzuki, Obu, all of Japan, assignors to Aisin AW Co., Ltd., Anjo, Japan

Filed May 25, 1988, Ser. No. 198,405
Claims priority, application Japan, May 28, 1987, 62-133589; May 28, 1987, 62-133590
Int. Cl.[4] F15B *13/044*
U.S. Cl. 137—625.65 5 Claims



1. A solenoid-operated pressure control valve, comprising:

a magnetic section having a coil assembly and a rod slidably situated inside the coil assembly, said rod being moved by means of the coil assembly, and

a pressure modulating valve section connected to the magnetic section and including,

a valve sleeve connected to the magnetic section at one end thereof and having a side portion, an application port, an output port, a drain port, and a feedback port communicating the output port, said application, output and drain ports being formed on the side portion,

a spring attached to an end of the valve sleeve at a side opposite the magnetic section, and

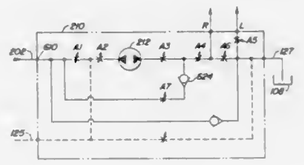
a spool slidably situated inside the valve sleeve between the spring and the rod of the magnetic section so that the movement of the spool is controlled by the spring and the magnetic section, said spool comprising a first land for controlling a flow ratio between the output port and the drain port, a second land for controlling a flow ratio between the application port and the output port, a third land situated adjacent to one of the first and second lands and having a diameter different from that of the land adjacent thereto, and a feedback area formed between the third land and one of the first and second lands situated adjacent the third land, forces exerted from the magnetic section, spring and feedback area due to a difference of diameters between the third land and the adjacent land being applied to the spool to balance in the valve sleeve so that pressure in the application port is modulated to pressure which corresponds to an input electric level of the magnetic section and is supplied to the output port.

4,838,314

SECONDARY HYDRAULIC STEERING SYSTEM

Douglas M. Gage, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 12, 1988, Ser. No. 257,257
Int. Cl.[4] F15B *13/10*
U.S. Cl. 137—625.24 6 Claims



1. A controller operable to control the flow of fluid from a source of pressurized fluid to a fluid pressure operated device, the controller being of the type including a housing defining an inlet port for connection to a source of pressurized fluid, a return port for connecting to a reservoir, and first and second control fluid ports for connection to the fluid pressure operated device;

valve means disposed in the housing and defining a neutral position and a first operating position;

the housing and the valve means cooperating to define a main fluid path communicating between the inlet port and the first control fluid port and between the second control fluid port and the return port when the valve means is in the first operating position;

fluid actuated means for imparting follow-up movement to the valve means proportional to the volume of fluid flow through the main fluid path; the main fluid path including a first variable flow control orifice disposed between the inlet port and the first control fluid port, and having its minimum flow area when the valve means is in the neutral position, and an increasing flow area as the valve means is displaced from the neutral position toward the first operating position, the first variable flow control orifice having its maximum flow area when the valve means is moved to its maximum displacement from said neutral position; and

a bypass fluid path for directing fluid from the inlet port to one of the control fluid ports bypassing the fluid actuated means for imparting follow-up movement to the valve means; characterized by:

the bypass fluid path is provided with means for preventing reverse fluid flow in the bypass fluid path from the control fluid ports to the inlet port when pressurized fluid is not being supplied to the inlet port from the source of pressurized fluid; and

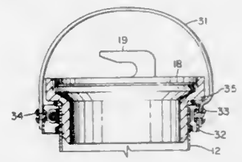
a fluid supply path for supplying fluid to the fluid actuator means for imparting follow-up to the valve means when pressurized fluid is not being supplied to the inlet port from the source of pressurized fluid.

4,838,315

HANDLE FOR A SEPTIC SYSTEM DRAIN HOSE

Gordon W. Gunn, 2296 Pillon Rd., Twin Lake, Mich. 49457

Filed Mar. 29, 1988, Ser. No. 174,828
Int. Cl.[4] A01G *25/09*
U.S. Cl. 137—899.3 6 Claims



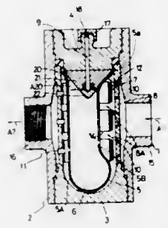
1. In combination with a tubular storage receptacle and a drain hose for a septic system, said hose having an end coupling providing an end surface having a pair of horns each defining a peripheral slot axially beyond the end surface of said flange, a handle engageable with said coupling including a grip portion extending transversely with respect to and beyond said end surface, said grip portion being moveable to a position wherein said horns and end surface are unobstructed, said handle being at least partially receivable in said receptacle.

4,838,316

ACCUMULATOR PROVIDED WITH AN INSERT

Nobuyuki Sugimura, 308, Mabase, Shimizu-shi, Shizuoka-ken, Japan

Filed Mar. 28, 1988, Ser. No. 174,362
Claims priority, application Japan, Apr. 7, 1987, 62-052552[U]
Int. Cl.[4] F16L 55/04
U.S. Cl. 138—30 8 Claims



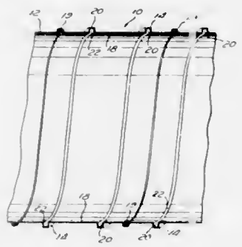
1. An accumulator provided with an insert, comprising a vessel main body having a feed/discharge port or ports, a bladder for partitioning the interior of said vessel main body into a gas chamber and a liquid chamber, an inner tube provided between said feed/discharge port or ports and said bladder, said inner tube including a plurality of communication holes inclined with respect to an axis of said vessel main body so that streams of liquid passing through said communication holes may collide obliquely, and an insert disposed so as to project into the bladder for the purpose of reducing a volume of the gas chamber.

4,838,317

HYDRAULICALLY EFFICIENT RIBBED PIPE

James R. Andre, P.O. Box 2450, Newport Beach, Calif. 92658, and Larry Daniels, 43 Andreas Ct., Novato, Calif. 94945

Continuation of Ser. No. 579,319, Feb. 13, 1984, abandoned, which is a continuation-in-part of Ser. No. 196,180, Oct. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 896,374, Apr. 14, 1978, abandoned. This application Oct. 21, 1988, Ser. No. 260,815
Int. Cl.[4] F16L 9/16, 9/06
U.S. Cl. 138—135 4 Claims



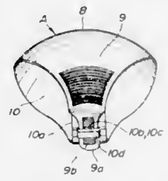
1. A hydraulically efficient underground pipe of single piece construction for use in buried storm drains, said pipe consisting essentially of a cylindrical metal wall having an 18–12 gauge thickness and defining a pipe diameter within the range of 24–120 inches, a rigid lock seam extending helically about and along the length of said wall and a plurality of outwardly projecting walled-structural supporting ribs extending helically about and along the length of said wall and being integrally formed therewith, said ribs defining a corresponding plurality of open channels formed interiorly thereof, the width and depth of said open channels being within the range of 0.5 to 1.5 inches and the spacing between said ribs being within the range of 6 to 12 inches to render the pipe substantially rigid and possess sufficient structural strength to withstand the stresses of being buried underground, means to increase the hydraulic efficiency of fluid flowing through the pipe consisting of substantial portions of said wall extending between said open channels being of constant radius, and said lock seam being disposed in said portions of constant radius to provide a substantially uninterrupted smooth flow.

4,838,318

ELBOW COVER FOR AN ELBOW IN PIPEWORK

Kazuo Karakawa, Koga, Japan, assignor to Yamato Kogyo Kabushiki Kaisha, Ibaraki, Japan

Filed Jan. 12, 1988, Ser. No. 142,952
Claims priority, application Japan, Jan. 20, 1987, 62-6612
Int. Cl.[4] F16L 11/12
U.S. Cl. 138—166 10 Claims



1. An elbow cover for an elbow or curved section of piping, comprising: a housing section of substantially quarter-spherical shape which, in its operative or closed condition, defines two openings interconnected by a curved or angled bore, the housing section being correspondingly curved thereby defining a radially shaped outer region and a radially shaped inner region, the radically shaped inner region being split from one opening to the other when the housing section is in its inoperative or open condition, the housing section having a pair of tabs, one on each side of the split, the tabs including interengaging means such that the tabs may be interengaged, thereby closing the split when the housing section is in its closed condition wherein the tabs comprise first and second fan-shaped sections, the first fan-shaped section including a first tongue having a first engagement portion formed at a free end of said first tongue, the second fan-shaped section including a second tongue formed with a second engagement portion at a free end of said second tongue, and wherein said first and second fan shaped sections have, as viewed exteriorly, substantially completely concave first and second end portions, respectively, the first and second fan-shaped sections each having a series of arcuate reinforcing ribs formed on an outer surface thereof having successively increasing radii of curvature.

4,838,319

APPARATUS AND METHOD FOR STARTING A JET LOOM

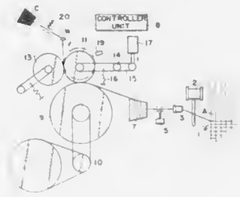
Mituru Suwa, Kanazawa, Japan, assignor to Tsudakoma Kogyo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 934,731, Nov. 25, 1986. This application Jun. 21, 1988, Ser. No. 209,436
Claims priority, application Japan, Jan. 29, 1986, 61-019025
Int. Cl.[4] D03D 47/08
U.S. Cl. 139—116 R 11 Claims

1. In a method of removing a faulty weft from a shed of a jet loom upon stoppage of the loom and of restarting the loom thereafter; the loom having a supply source of weft to be delivered therefrom, a main nozzle for inserting the weft delivered from the supply source into the shed, and a weft removal unit for removing a faulty weft from the shed upon activation

thereof prior to severing the faulty weft from the supply source, the improvement comprising:

generating a detection signal upon detecting the presence of the delivery of the weft from the supply source upon



removal of the faulty weft from the shed upon activation of the weft removal unit, and

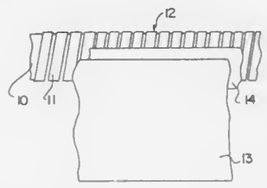
allowing restarting of the loom after complete removal of the faulty weft from the shed and upon confirming the presence of the detection signal.

4,838,320

CONTACT BAR FOR ELECTRICAL WARP STOP MOTION

Ernst Steiner, Richterswil, Switzerland, assignor to Grob & Co. Aktiengesellschaft, Horgen, Switzerland

PCT No. PCT/CH86/00102, § 371 Date Mar. 18, 1988, § 102(e) Date Mar. 18, 1988, PCT Pub. No. WO88/00626, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 22, 1986, Ser. No. 180,109
Claims priority, application Switzerland, Jul. 22, 1986, 102/86
Int. Cl.[4] D03D 51/30
U.S. Cl. 139—351 9 Claims



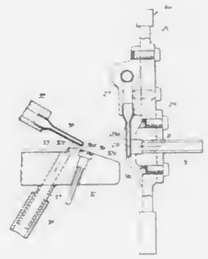
1. A contact bar adapted for use in an electrical warp stop motion device of a textile machine, said bar comprising two electrical conductive carriers extending parallel and being insulated from each other, and adapted to project as one assembly through contact slots of numerous drop wires of the stop motion device which are hanging from warp ends in the textile machine, said carriers capable of coming into electrical connection in the event of a breakage of one warp end by means of the associated drop wire which results, due to the electrical conection, in a switch being tripped which consequently stops the textile machine, one of said electrical conductive carriers being a body of insulating material on which an electrical conductor is provided having an electrical resistance which increases linearly along the entire length of the carrier as a measurable value at any desired point, wherein the electrical conductor has an unvarying cross section, and a substantially larger length than the lenght of the bar and is attached to a body of insulating material, and follows a line which runs continuously both in a longitudinal direction and in a transverse direction of the bar.

4,838,321

MULTIPLE-PHASE WEAVING FLUID JET LOOM

Takao Ishido; Shougo Sasaki, and Takao Takahashi, all of Tokyo, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 3, 1987, Ser. No. 92,519
Claims priority, application Japan, Sep. 4, 1986, 61-134798[U]; Nov. 25, 1986, 61-179664[U]
Int. Cl.[4] D03D 47/30
U.S. Cl. 139—20 19 Claims



1. A fluid jet loom comprising:

means for forming a first warp yarn array which has first and second opposite edges;

a first weft inserting nozzle disposed near the first edge of said first warp yarn array and arranged to project a first weft yarn into a shed of said first warp yarn array; and

a weft yarn end portion treating device for treating an end portion of the first weft yarn inserted into the shed of the first warp yarn array, said end portion being projected over the first edge of said first warp yarn array, said weft yarn end portion treating device including a first weft yarn end portion tensioning mechanism for said first warp yarn array being disposed near the second edge of said first warp yarn array and including (a) a first weft yarn end portion tensioning means for keeping the weft yarn end portion in a tensioned state before beating-up via a reed, said first weft yarn end portion tensioning means being incorporated with said reed, wherein said first weft yarn end portion tensioning means includes a first fluid ejection nozzle fixedly secured to said reed to eject fluid, and a pipe fixedly secured to said reed to receive the fluid ejected from said first fluid ejection nozzle and to be supplied with said weft yarn end portion, and (b) a second weft yarn end portion tensioning means which maintains the tensioned state of said weft yarn end portion as established by said first weft yarn end portion tensioning means, said second weft yarn end portion tensioning means being located between said first warp yarn array second edge and said first weft yarn end portion tensioning means, wherein said second weft yarn end portion tensioning means includes a second fluid ejection nozzle fixedly connected to the frame of the loom to eject fluid, and a hole into which the fluid ejected from said second fluid ejection nozzle is fed so that said weft yarn end portion is supplied into said hole, and means for positioning said weft yarn end portion to be supplied to said hole.

4,838,322

METHOD FOR ASSEMBLING THREE-DIMENSIONAL METAL STRUCTURES, MACHINE FOR THE MANUFACTURING THEREOF, AND STRUCTURES OBTAINED WITH SUCH A METHOD

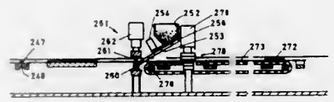
André DeSchutter, Laarne-Kalken, Belgium, and Casalatina Silvano, Aosta, Italy, assignors to Sismo International, Laarne-Kalken, Belgium

Division of Ser. No. 725,655, Apr. 22, 1985, Pat. No. 4,667,707. This application Mar. 6, 1987, Ser. No. 22,865

Claims priority, application European Pat. Off., Apr. 24, 1984, 84 870056.3

Int. Cl.[4] B21F *15/08*

U.S. Cl. 140—112 3 Claims



1. A method for assembling plane wire nettings of the type having a plurality of lengthwise wires and a plurality of brace wires, for use with an assembling apparatus comprising a welding unit and a lengthwise wire feed mechanism, the welding unit defining a welding area and being operable for welding the brace wires with the lengthwise wires, and the lengthwise wire feed mechanism being operable for moving a set of feeding teeth along a trajectory to intercept a welded brace wire, said method comprising the steps:

(a) providing a frame alignment means supported in a middle area and including guides next to said welding area for guiding the plurality of lengthwise wires into a coplanar position, and for holding the lengthwise wires spaced apart and parallel with one another in said welding area;

(b) providing a brace wire feed mechanism including a hopper disposed forwardly of said welding area and holding a multitude of said brace wires, an actuator for selectively releasing each brace wire from the hopper, slanted bars for guiding a released brace wire backwardly toward said welding area, and stop flanges for stopping said released brace wire at said welding area and in a position perpendicular to the lengthwise wires;

(c) providing a cutting mechanism defining a cutting plane adjacent to the lengthwise wires and perpendicular to said plane thereof and defining the width of the netting;

(d) laying a plurality of the lengthwise wires on said alignment means;

(e) actuating the brace wire feed mechanism to arrange a brace wire abutting the stop flanges and crossing the lengthwise wires at right angles thereto;

(f) actuating the welding unit for welding the lengthwise wires with said brace wire at the respective crossing points;

(g) actuating the cutting mechanism for cutting portions of said welded brace wire lying outside the lengthwise wires of the netting;

(h) moving said set of feeding teeth to engage the welded brace wire;

(i) moving said feeding teeth forward to shift the welded brace wire and the lengthwise wires forwardly a given brace wire pitch distance;

(j) repeating steps (e), (f), (g) and (i) a given number of times to weld a plurality of brace wires to the lengthwise wires to thereby form a wire netting;

(k) removing the netting from the welding unit; and

(l) returning the feeding teeth to said welding area;

wherein the assembling apparatus includes only one set of feeding teeth, and during the formation of each netting, only one of the brace wires welded to the lengthwise wires is engaged by any of the feeding teeth of the set of feeding teeth, the feeding teeth move forward step-by-step, with each step equal to the given brace wire pitch distance, and the feeding teeth return to the welding area only after the netting has been formed.

4,838,323

MISFUELLING PREVENTION DEVICE AND METHOD

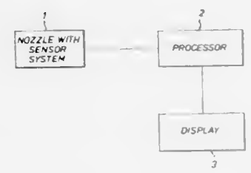
Andrew J. Watts, Ince (Nr. Chester), United Kingdom, assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 46,370, May 6, 1987, abandoned. This application Mar. 31, 1988, Ser. No. 175,812

Claims priority, application United Kingdom, May 16, 1986, 8612020

Int. Cl.[4] B65B *1/04, 1/30*

U.S. Cl. 141—1 16 Claims



1. A method of preventing the misfuelling of a fuel tank, said tank containing a first fuel therein, said method comprising the steps of connecting a fuel delivery pump to the tank, said delivery pump being adapted to deliver a second fuel from the pump to the tank, measuring a parameter representative of the hydrocarbon vapor pressure above the fuel in the tank before the second fuel is delivered from the pump to the tank, comparing the value of said measured parameter with a predetermined value, deriving from this comparison information concerning the kind of fuel in the tank, determining that the fuel in the tank is different from the fuel to be delivered by the delivery pump, and disconnecting the delivery pump before the second fuel is delivered from the pump to the tank, said disconnecting step being in response to said determining step.

4,838,324

BEVERAGE CONTAINER PRESSURIZER

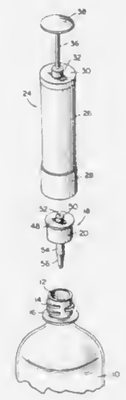
Cecil Boyd, Neosho, Mo., assignor to Judith Brock, Neosho, Mo., a part interest

Filed Sep. 29, 1987, Ser. No. 102,349

Int. Cl.[4] B65B *31/00*

U.S. Cl. 141—64 3 Claims

1. In combination, a carbonated beverage container having an externally screw threaded neck and a screw threaded closure cap which is removed and replaced each time that carbonated beverage is poured from the container which vents the pressure in the container above the liquid level of the beverage thereby permitting the beverage to become "flat" as the carbonating agent egresses from the beverage into the void space above the liquid level of the beverage in the container even when the closure cap is replaced, a screw threaded replacement cap sealingly mounted on the threaded neck of the container in place of the existing closure cap that has been removed, said replacement cap including a passageway having a one-way check valve therein to permit entry of air under pressure to pressurize the space in the container above the liquid level of the beverage thereby reducing egress of carbonating agent from the beverage into the space above the liquid level of the beverage, and a manually operated pump including means sealingly engaged with the passageway in the replacement cap for pressurizing the interior of the beverage container through the passageway in the replacement cap past the check valve therein, whereby the pump provides means to open the check valve said pump being separable from the replacement



cap to enable the pump to be utilized with various beverage containers having replacement caps thereon.

4,838,325

METHOD AND AN ARRANGEMENT FOR A FILLING VALVE IN A PACKING MACHINE

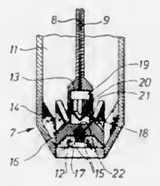
Giorgio Bordini, Modena, Italy, assignor to Tetra Dev-Co, Modena, Italy

Filed Dec. 10, 1987, Ser. No. 130,940

Claims priority, application Italy, Dec. 16, 1986, 22706 A/86

Int. Cl.[4] B65B *3/04;* B67C *3/28*

U.S. Cl. 141—90 3 Claims



1. A filling valve for use in filling operations of a packing machine comprising a filling valve outer surface and a pressure fluid channel having an outlet opening directed towards the outer surface and adapted to permit pressure fluid fed through the channel to be directed onto the outer surface of the valve body to clean the body between filling operations, the channel having a valve arrangement which is adapted to open during a downwardly directed closing movement of the valve body and to close during the upwardly directed opening movement of the valve body.

4,838,326

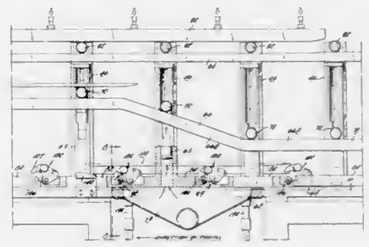
LINEAR VOLUMETRIC SYSTEM WITH AUTOMATIC LATCHING MEANS FOR CLAMPING TOGETHER ADJACENT FILLER CYLINDERS

John R. Colacci, Pennsauken, and James L. Nesbitt, Jr., Willingboro, both of N.J., assignors to Campbell Soup Company, Camden, N.J.

Filed Oct. 29, 1987, Ser. No. 113,990

Int. Cl.[4] B65B *43/42;* B67C *3/02*

U.S. Cl. 141—147 8 Claims



1. A system for dispensing product into containers moving in a series train along a substantially straight-line path, comprising:

a set of product dispensers;

dispenser conveying means for moving said set of product dispensers orbitally about a closed loop having a substantially-straight first portion extending adjacent said substantially straight-line path of said containers;

dispenser filling means disposed along a second portion of said closed loop for delivering product into said product dispensers, said second portion of said closed loop having an inlet end to which said product dispensers are delivered by said conveying means and an exit end at which said product dispensers leave said second portion of said closed loop;

dispenser actuating means for actuating said dispensers as they travel along said substantially-straight first portion of said closed loop, to dispense product from said dispensers into said containers;

said dispenser filling means comprising a source of product and means for causing said product to flow from said source into said containers, said filling means also tending undesirably to cause said product to flow into any space between said dispensers as they travel along said second portion of said closed loop; and

means for automatically sealing each of said dispensers to its neighbors as they travel along said second portion of said loop, and for automatically unsealing each of said dispensers from each other after they have been filled by said filling means and before they reach said substantially-straight first portion of said loop, thereby to minimize flow of said product between said dispensers.

4,838,327

RECEPTACLE BAG ASSEMBLY

Kevin Ambler, 16496 Northdale Oaks Dr., Tampa, Fla. 33624, and Irwin Hanopole, 33 Colonial Woods Dr., West Orange, N.J. 07052

Filed Jan. 20, 1987, Ser. No. 5,519

Int. Cl.[4] B65B *43/32*

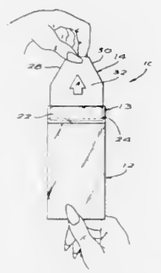
U.S. Cl. 141—114 11 Claims

1. A bag assembly comprising:

a bag having a first open end, wherein said bag is formed with a band secured laterally across the inside of said bag, with at least the lowermost end of said band being unattached to said bag;

a chute insert which is formed to lie substantially flat for allowing said chute insert to be at least partially slid into

and out from said bag through said open end, said chute insert being at least lengthwise elastically deformable to allow for its selective manipulation to be arcuately flexed, said chute insert being formed with a flap secured substantially across said insert, said flat being formed to normally angle upwardly and outwardly away from said insert, whereby said flap will engage said bund when said chute insert is being withdrawn from said bag to restrain further movement of said insert out from said bag;



collar means positioned along said bag open end with said collar means formed to lie in a substantially flat relationship with said chute insert, said collar means being selectively operable to be arcuately flexed away from said chute insert when said chute insert is manipulated to be arcuately flexed, whereby said chute insert and said collar means, when selectively operated to be arcuately flexed, push said two bag walls away from each other to open said bag open end; and

closure means associated with said bag for at least temporarily closing said bag's open end.

4,838,328

METHOD FOR MECHANIZED THINNING OF A FOREST, AND A HARVESTER AND FORWARDER FOR CARRYING OUT THE METHOD

Olof Herolf, Sundsvall, Sweden, assignor to OSA AB, Alfta, Sweden

PCT No. PCT/SE87/00002, § 371 Date Aug. 25, 1987, § 102(e) Date Aug. 25, 1987, PCT Pub. No. WO87/04045, PCT Pub. Date Jul. 16, 1987

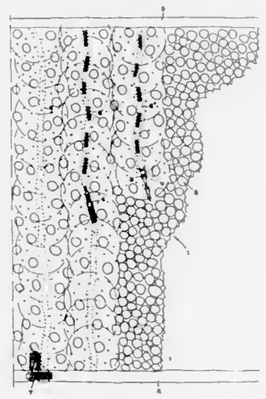
PCT Filed Jan. 5, 1987, Ser. No. 101,295

Claims priority, application Sweden, Jan. 10, 1986, 8600120

Int. Cl.[4] A01G *23/08*

U.S. Cl. 144—336 **4 Claims**

1. A method for mechanically thinning a forest comprising the steps of: (a) advancing a wheeled harvester provided with means for cutting, longitudinally feeding and delimbing trees through a selected cleared route between main haul or strip roads, said route being only slightly wider than the width of said wheeled harvester; (b) stopping said harvester at different locations along said route; (c) felling one or more trees at said location by means of said wheeled harvester, said trees being felled by cutting a standing tree, moving said felled tree into an upright position in an area in front of said wheeled harvester, tilting said felled tree into a horizontal position, longitudinally feeding said tree into said means for delimbing, thereby providing a delimbed tree, and storing said tree at least partially beneath said wheeled harvester and between its wheels, whereby when a plurality of trees is cut at a given location, a pile of delimbed trees is built-up beneath said wheeled harvester; (d) advancing said wheeled harvester to another location along said route, and repeating said felling step (c); (e) following said wheeled harvester by a wheeled forwarder having a crane, a driver's cab and a load carrier behind said cab for loading and transporting delimbed trees along substantially the same route of travel as said harvester; and (f) loading said pile of delimbed trees disposed along said route onto the carrier of said forwarder by movement, by means of said crane, of said pile of delimbed trees along the longitudinal path of said selected route.



4,838,329

NONSKID DEVICE

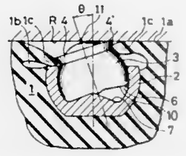
Kiyoyuki Ohuchi, and Ken'ichi Shimizu, both of Ibaraki, Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Jul. 16, 1987, Ser. No. 74,032

Claims priority, application Japan, Jul. 17, 1986, 61-168663

Int. Cl.[4] B60C *11/16*

U.S. Cl. 152—210 **6 Claims**



1. A nonskid device comprising a stud embedded in a hole formed radially inwardly from a tread surface of a body made of a resilient material, said stud comprising a cup open at its radially outer surface and having an inner surface at least one portion of which constitutes a spherical guide surface, a ball retained in said cup so as to be rotatable along said spherical guide surface and so as to have one portion thereof exposed above the open radial outer surface of said cup, and an annular stud tip attached to and projecting from the exposed portion of said ball, said stud being supported in said hole by a support means formed by an edge of the body surrounding said hole, said support means exerting a biasing force on said stud tending to hold its apex at the same height as said tread surface and at the center of said hole, said ball and said annular stud tip being sized, shaped, and positioned so that, when a force parallel to said tread surface is applied to said stud, said stud rotates so that said annular stud tip projects from said tread surface, but when such force is removed, the resilience of said body causes said ball to rotate relative to said cup so that said annular stud tip no longer projects from said tread.

4,838,330

PNEUMATIC TIRE

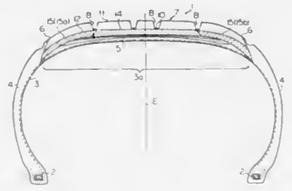
Masahiro Takayama, Nishitama, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 23, 1987, Ser. No. 136,999

Claims priority, application Japan, Mar. 23, 1987, 62-68372

Int. Cl.[4] B60C *11/24*

U.S. Cl. 152—537 **6 Claims**



1. A pneumatic tire comprising:

a carcass having a crown portion, a belt for reinforcing said crown portion, a tread arranged outwardly of said belt and having an outer tread portion arranged at a radially outer side of said tire and composed of one kind of rubber and an inner tread portion arranged radially inward of an outer surface of a tread wear indicator and composed of several kinds of rubber, and a pair of sidewalls each arranged between said tread and a bead,

said inner tread portion being axially divided into at least three regions and having a central region extending across an equatorial line of said tire and side end regions arranged on opposite sides of said central region,

the hardnesses of the rubbers of said inner tread portion being gradually increased axially from said central region to said side end regions, and the hardnesses of the rubber of the axially outermost side end regions being smaller than that of the rubber of said outer tread portion.

4,838,331

SLAT OPENING/CLOSING DRIVE MECHANISM IN SHUTTER EQUIPMENT

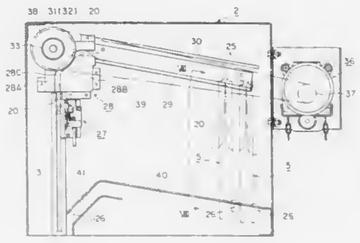
Masanori Kasai, Akishima, Japan, assignor to Bunka Shutter Co., Ltd. and Lumitter Industry Co., Ltd., both of Tokyo, Japan

Filed Sep. 30, 1987, Ser. No. 102,633

Claims priority, application Japan, Oct. 6, 1986, 61-152458[U]; Oct. 6, 1986, 61-152459[U]; Oct. 6, 1986, 61-152460[U]; Oct. 6, 1986, 61-152461[U]; Oct. 6, 1986, 61-152462[U]; Oct. 6, 1986, 61-152463[U]

Int. Cl.[4] E04F *10/08*

U.S. Cl. 160—36 **9 Claims**



1. A slat drive mechanism for a shutter equipment having vertical guide rails disposed on both sides of a shutter opening and provided with a slat stowing box, and a plurality of slats movably retained by and between said vertical guide rails and interconnected by a pair of flexible right and left chains which are movable into the slat stowing box, the slats being movable between a pulled-out position in which the slats are disposed adjacent to each other in the form of a single vertical plane between the vertical guide rails and a stowed position in which said slats are disposed in said box, comprising:

a vertical slat drive means for moving the slats vertically along said vertical guide rails, a first sprocket connected to an output shaft of said vertical slat drive means; a second sprocket mounted on a rotative shaft disposed in said box, an endless chain drivingly connecting said second sprocket with said first sprocket; third and fourth sprockets mounted respectively on each end of said rotative shaft; and said right and left chains being drivingly engaged with lower portions of said third and fourth sprockets.

4,838,332

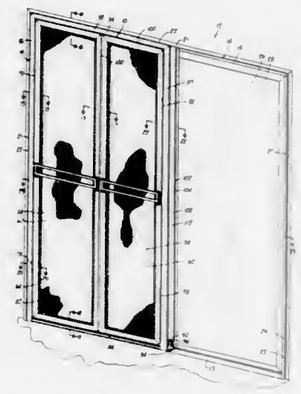
SWINGING SCREEN DOOR FOR SLIDING GLASS DOORS

Patrick L. Mlenek, 9800 Southridge Dr., Oklahoma City, Okla. 73159

Continuation-in-part of Ser. No. 923,876, Oct. 28, 1986, abandoned. This application Apr. 27, 1987, Ser. No. 43,170

Int. Cl.[4] E06B *9/01*

U.S. Cl. 160—90 **49 Claims**



1. A secondary door assembly for a primary doorway which connects an inside and an outside and which is defined by a primary frame having two primary uprights, a primary header and a primary threshold and which has at least one primary door which is slidably mounted within the primary frame so that when the sliding door is retracted a portion of the primary doorway is opened forming a primary opening, comprising:

a secondary frame receivable within the primary frame, the secondary frame having a secondary header and two secondary uprights, the secondary header being receivable within a portion of the primary header and each secondary upright being receivable adjacent a primary upright and also being adapted for free standing within the primary frame, and wherein the secondary frame defines a secondary doorway substantially coextensive with the primary opening of the primary doorway;

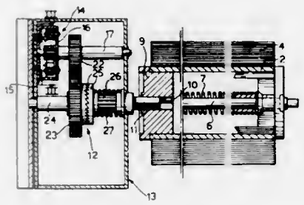
means for securing the secondary frame within the primary frame so that the secondary doorway is parallel to the plane of the primary opening;

a secondary door receivable within the secondary frame; and

means for mounting the secondary door within the second-

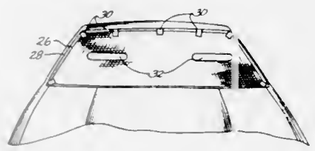
ary frame so that the secondary door is supported for pivotation about a vertical axis from a closed position parallel to the primary opening.

4,838,333
ROLLER BLIND WITH A CENTRIFUGAL-MASS BRAKE LOCATED OUTSIDE THE ROLLER AND AN END SUPPORT CONTAINING THE BRAKE
Sergio Mottura, Torino, Italy, assignor to Mottura S.p.A., Italy
Filed Apr. 15, 1988, Ser. No. 181,938
Claims priority, application Italy, Dec. 17, 1986, 54213/86[U]
Int. Cl.[4] E06B 9/205
U.S. Cl. 160—305 5 Claims



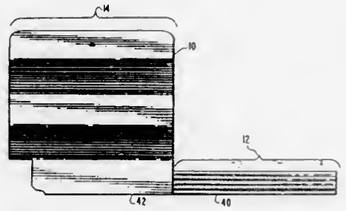
1. A roller blind of the type comprising a horizontal roller for supporting the blind and mounted for rotation about its own axis, a blind having an upper edge fixed to the roller and a free lower edge, resilient means tending to bias the roller towards a position in which the blind is rolled up, and a centrifugal-mass brake for slowing the rotation of the roller during rolling up of the blind,
wherein the centrifugal-mass brake is carried by a fixed support structure, outside the roller, and wherein the rotor of the brake is connected to the roller through the interposition of a pair of step-up intermeshing gears and a one-way clutch device adapted to break the connection between the rotor of the brake and the roller when the blind is lowered, the step-up wheels also being carried by the fixed support structure, outside the roller.

4,838,334
SUNSHIELD WITH OPENINGS
Judy S. Hogg, 7300 S. 175 E., Midvale, Utah 84047; Michael Abbondandolo, 1800 Bestland Ave., Deltona, Fla. 32738, and Patricia J. Brink, 3720 Sweeten La., Barstow, Calif. 92311
Filed Nov. 6, 1987, Ser. No. 118,203
Int. Cl.[4] E06B 9/24
U.S. Cl. 160—370.2 4 Claims



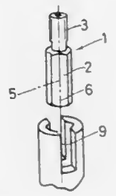
1. A sunshield for use with a motor vehicle window comprising:
an opaque shield which can be removably mounted between a motor vehicle window and the passenger compartment;
at least one opening cut into the shield allowing outward vision from the passenger compartment; and
a moveable cover for the opening, the cover substantially blocking all light entering the motor vehicle through the opening when the opening is covered but allowing outward vision from the passenger compartment when the opening is uncovered.

4,838,335
AUTOMOBILE WINDOW SHADE CONVERTIBLE TO HORIZONTAL EXPANSION OR VERTICAL EXPANSION
Ezra D. Eskandry, 1925 Brickell Ave., D901, Miami, Fla. 33131, and Eli Weinberg, 13367 SW. 4th La., Miami, Fla. 33175
Filed Nov. 2, 1988, Ser. No. 266,068
Int. Cl.[4] E06B 9/24
U.S. Cl. 160—84.1 18 Claims



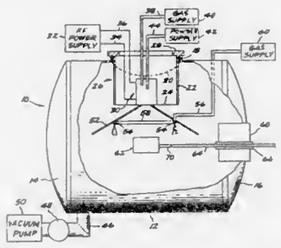
1. A foldable window shade for an automobile comprising:
a first plurality of substantially rigid, planar elements joined together by hinges along adjoining edges such that said first plurality of elements form a first accordion fold portion;
a second plurality of substantially rigid, planar elements joined together by hinges along adjoining edges such that said second plurality of elements form a second accordion fold portion;
a further hinge linking one of said first plurality of elements and one of said second plurality of elements along adjoining edges normal to accordion folds in said first and second accordion fold portions.

4,838,336
HOT METAL SAMPLING
Adrian L. Gray, Craighall Park, South Africa, assignor to Foseco International Limited, Birmingham, England
Filed Feb. 22, 1988, Ser. No. 158,621
Claims priority, application South Africa, Feb. 24, 1987, 87/1321
Int. Cl.[4] G01N 1/12
U.S. Cl. 164—4.1 13 Claims



1. A sampler for sampling molten metal, comprising:
a tube having at least an outer layer of non-reactive refractory material and a slot located in a first end thereof;
a split metal mould located in said slot;
said mould encased in a body of non-reactive refractory material covering the tube; and
wherein the non-reactive refractory material of both the tube and the body comprises at least the exposed surfaces thereof a material which forms glass, or includes glass, so that upon immersion into the molten metal and resulting contact of the molten metal therewith, thermal shock is compensated for by the pre-existing or formed glass forming a layer filling and welding closed any cracks which may result from the thermal shock.

4,838,337
METHOD OF FABRICATING TITANIUM ALLOYS IN FOIL FORM
Paul A. Siemers, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.
Filed Feb. 4, 1987, Ser. No. 10,655
Int. Cl.[4] B22D 23/00
U.S. Cl. 164—46 10 Claims

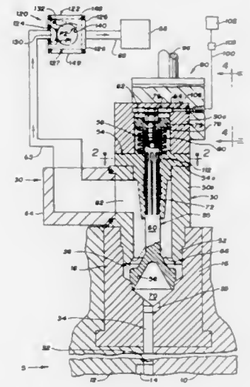


1. The method of forming foil of alloys of titanium with other metals which comprises,
providing a powder of a titanium based alloy to be formed into a foil,
providing a drum adapted to being rotated in a low pressure plasma spray deposit apparatus,
mounting a preformed foil of a metal of high melting point onto the drum to cover a cylindrical surface thereof,
disposing the drum and foil in a low pressure plasma spray deposit apparatus,
low pressure plasma spray depositing said powder onto the surface of the foil on said drum,
separating the preformed foil and the titanium alloy deposit from the drum, and
separating the preformed foil from the titanium alloy foil formed by the low pressure plasma deposit.

4,838,338
MOLD CAVITY GAS REMOVAL SYSTEM WITH GAS FLOW INDICATOR
Barry L. Priem, Bedford, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 29, 1988, Ser. No. 174,572
Int. Cl.[4] B22D 17/70
U.S. Cl. 164—113 6 Claims

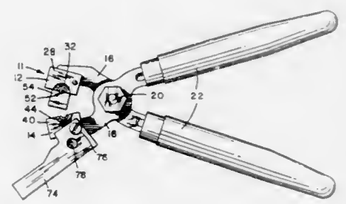
1. A gas evacuation system incorporated with a mold for evacuating gas from a mold cavity, said system comprising a vacuum source, a vacuum conduit disposed between the mold cavity and source, a valve disposed in the vacuum conduit between the mold cavity and source and movable to an open position where the mold cavity is interconnected to the source through the vacuum conduit or to a closed position where the mold cavity is not so interconnected, and a gas flow indicator disposed in the vacuum conduit between said valve and source, said gas flow indicator including a flapper movable in a particular manner in response to evacuation of gas from the mold cavity and window means for viewing flapper movement to indicate whether the gas evacuation system is operative to remove gas from the mold cavity.

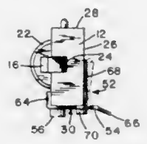
6. A method for evacuating gas from a mold cavity, comprising:
interconnecting the mold cavity and a vacuum source by opening a valve disposed therebetween, positioning a movable flapper between the valve and vacuum source



such that the flapper moves in a particular manner in response to evacuation of the mold cavity, and applying a relative vacuum to the mold cavity to evacuate gas therefrom and move the flapper in a manner indicating that gas is being evacuated from the mold cavity with the valve open.

4,838,339
MOLD FOR HOLLOW POINT BULLET
Kendrick L. French, Lebanon, Me., assignor to K. W. Thompson Tool Company, Inc., Rochester, N.H.
Filed Aug. 26, 1987, Ser. No. 89,723
Int. Cl.[4] B22D 17/24
U.S. Cl. 164—340 4 Claims





4. A mold for a hollow point bullet having at least one annular groove which is coaxial with the central longitudinal axis of the bullet, said mold comprising:

(a) a first mold half having a first end surface, a second end surface which is opposite said first end surface, a first flat parting surface which extends from said first end surface to said second end surface, said first flat parting surface having a deep groove which is adjacent said first end surface and which extends into said first end surface, and a shallow groove which is adjacent said second end surface and which extends into said first deep groove,
(b) a second mold half which is similar to said first mold half and which includes a second flat parting surface having a deep groove and a shallow groove
(c) means for joining and aligning said first and second mold halves so that their flat parting surfaces abut, their deep grooves combine to form a bullet cavity, and their shallow grooves combine to form a bore which leads into said bullet cavity,
(d) an elongated pin which extends through said bore and partially into said cavity for causing a hollow point to be formed in a bullet which is cast in said mold,
(e) a bracket for supporting said pin outside of said shallow groove so that said pin extends freely into said shallow groove, said pin being held by said bracket for limited pivoting movement relative to the bracket away from said first parting surface so that when the mold halves are separated said pin is able to move away from said first parting surface sufficiently to allow a bullet which is cast in said mold to clear the ridge in the deep groove of said first mold half and be removed from said mold,
(f) means for fastening said bracket in a fixed position on said first mold half, wherein said bracket is removably mounted on said first mold by removable fastening means, said bracket comprising a slot which has an elongated, relatively narrow portion at one end of the slot and a relatively wide portion at the opposite end of the slot, for receiving said fastener and, wherein said pin has a central longitudinal axis and comprises:
(g) a main body portion which occupies said bore and which is wider transversely of said longitudinal axis than the narrow portion of said slot,
(h) a head portion which is wider transversely of said longitudinal axis than the narrow portion of said slot, at least one of said head and narrow portions being narrower than the wide portion of said slot to allow said, in to move axially into the wide portion of said slot, and
(i) a neck portion between said head portion and said main body portion, said neck portion being narrower transversely of said longitudinal axis than the narrow portion of said slot, the length of said neck portion along said axis being greater than the thickness of said bracket to enable said neck portion to be located in said narrow portion so that the head and main body portions of said pin are on opposite sides of said bracket.

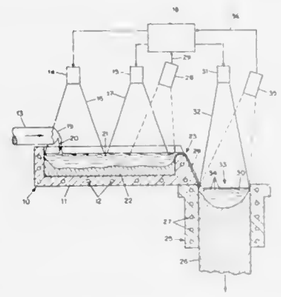
4,838,340

CONTINUOUS CASTING OF FINE GRAIN INGOTS

Charles H. Entrekin, Coatesville, and Howard R. Harker, Malvern, both of Pa., assignors to Axel Johnsoo Metals, Inc., Lionville, Pa.

Filed Oct. 13, 1988, Ser. No. 257,227
Int. Cl.[4] B22D *11/22*
U.S. Cl. 164—455 **25 Claims**

1. A method for continuous casting of a metal ingot comprising supplying molten metal to the upper portion of a mold, cooling the molten metal in the mold to form a solid ingot which is withdrawn from a lower portion of the mold, and controlling the temperature in the central region of the surface of the molten metal in the mold to maintain it at a level at which the molten metal solidifies to form crystallites without



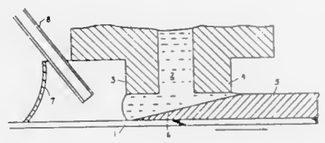
forming larger masses of solid material in the central region of the surface of the molten metal the mold.

4,838,341

PRODUCTION OF LOW TEMPERATURE ALUMINUM BASED BRAZING ALLOYS

Richard L. Bye, Jr., Morristown; Debasis Bose, Piscataway; Santosh K. Das, Randolph; Amitava Datta, Morris Township, Morris County, and Colin M. Adam, Morristown, all of N.J., assignors to Allied Signal Inc., Morris Township, N.J.

Continuation of Ser. No. 873,277, Jun. 9, 1986, abandoned, which is a continuation of Ser. No. 558,655, Dec. 6, 1983, abandoned. This application Mar. 9, 1988, Ser. No. 169,123
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—463 **3 Claims**



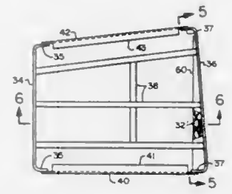
1. A process for continuously casting metal strip composed of a low density, readily oxidizable aluminum alloy, the process comprising the steps of feeding a melt of said alloy through a slotted nozzle arranged proximate a moving chill substrate to deposit the melt on said substrate for solidification into a strip, the improvement which comprises in combination:
(a) providing scraping means located upstream of said slotted nozzle to cooperate with said substrate to remove from the substrate any gaseous boundary layer associated therewith and to create a region between said scraping means and said nozzle of reduced pressure;
(b) supplying a combustible gas at a location between said scraping means and said slotted nozzle;
(c) igniting said gas to produce a reduced density atmosphere upstream of said nozzle, which atmosphere is then carried on said substrate to said nozzle; and
(d) providing a shielding means cooperating with said scraping means and a portion of said moving surface to define a semi-enclosed chamber surrounding said nozzle, said shielding means comprising side walls extending in a direction of movement of said moving substrate from said scraping means to a location downstream of said nozzle.

4,838,342

ELEMENT BASKET ASSEMBLY FOR HEAT EXCHANGER

Gary C. Goetschius, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Jun. 1, 1988, Ser. No. 200,887
Int. Cl.[4] F28D *19/04*
U.S. Cl. 165—10 **4 Claims**



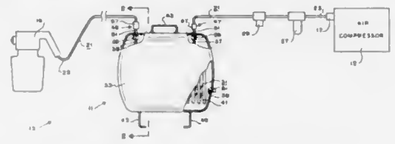
1. An element basket assembly for use in a rotary regenerative heat exchanger, said element basket assembly of the type adapted to be housed in a cylindrical rotor shell adjacent the outer peripheral wall of the cylindrical rotor shell, said element basket assembly comprising:
a. a plurality of heat transfer element plates juxtaposed in a stacked array;
b. a basket frame surrounding said stacked array of heat transfer element plates in supporting relationship therewith, said basket frame comprising first and second end members disposed at opposite ends of stacked array of heat transfer elements in abutting relationship therewith and at least a pair of side members disposed along sides of said stacked array of heat transfer element plates interconnecting the first and second end members, the second end member defining a segment-shaped region within said basket frame adjacent the second end member; and
c. a pair of blanking plates mounted to the second end member, one of said blanking plates disposed so as to extend across said segment-shaped region along the top side of the said basket frame and the other of said blanking plates disposed so as to extend across said segment-shaped region along the bottom side of said basket frame whereby that portion of the stacked array of heat transfer elements disposed within the segment-shaped region of said basket frame are held in place between said blanking plates.

4,838,343

PORTABLE APPARATUS FOR COOLING COMPRESSED AIR

Kenneth D. Bogue, Rte. 1, Box 123A, Potts Camp, Miss. 38659

Filed Jan. 11, 1988, Ser. No. 142,827
Int. Cl.[4] F04B *39/06, 39/16;* **F28D** *20/00*
U.S. Cl. 165—47 **8 Claims**



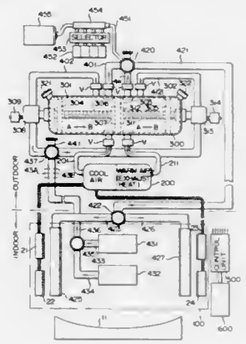
1. A portable compressed air cooling apparatus for a compressed air system of the type including an air compressor having a compressed air outlet port, a compressed air output means, and a compressed air supply line having a first end coupled to said compressed air outlet port of said air compressor and having a second end coupled to said compressed air output means, said apparatus comprising:
(a) an elongated tube provided between said compressed air outlet port of said air compressor and said compressed air output means, all of said compressed air passing from said compressed air outlet port of said air compressor to said compressed air output means passing through said tube before passing to said compressed air output means, said tube having a first end, a second end and a colled midportion;
(b) a hollow tank, said tank having a closed interior surrounding at least said coiled midportion of said tube; and
(c) a liquid coolant sealed within said tank for cooling said compressed air as said compressed air passes through said tube.

4,838,344

ATMOSPHERE CONTROL APPARATUS FOR THEATERS

Kanji Murakami, 7-1-12-102, Minamiaoyama, Minato-ku, Tokyo, Japan

Filed Jul. 30, 1987, Ser. No. 79,698
Claims priority, application Japan, Sep. 2, 1986, 61-206114
Int. Cl.[4] G03B *21/32;* **F25B** *29/00*
U.S. Cl. 165—48.1 **3 Claims**



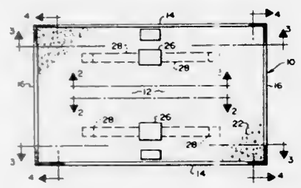
1. An atmosphere control apparatus comprising:
an air-conditioner for air-conditioning the audience seating section in a movie theater or other theater;
a storage space for enabling cool or warm air, produced by the operating of the air conditioner, to be conducted to first and second chambers via respective air paths separated from air paths to the audience seating section;
first and second piston means for independently compressing the air within the first and second chambers;
a first electromagnetic valve unit, having means for passing either the air exhausted from the first chamber or the air from the second chamber, or the air exhausted from both first and second chambers to a second electromagnetic valve unit;
a second electromagnetic valve unit, having means for receiving the air selected by the first electromagnetic valve unit and for selectively supplying the air into a plurality of exhaust devices provided at a plurality of locations within the audience seating sections;
a feedback path having means for selectively recovering the air from the audience seating sections and returning it to the first and second chambers; and
system control means which, in order for the audience to experience the same atmosphere as that in a movie scene or on stage scene, controls at least the first and second piston units and first and second electromagnetic valve units in synchronism with data corresponding to the atmosphere in said scene.

4,838,345

COMBINED AIR CONDITIONING AND VENTILATION ASSEMBLY

Dewey H. Dolison, 4645 SW. 64 Ave., Miami, Fla. 33155, and William H. Rahn, 1200 N. Shore Dr., No. 205, St. Petersburg, Fla. 33701

Filed Mar. 24, 1986, Ser. No. 843,496
Int. Cl.[4] F25B *29/00*
U.S. Cl. 165—48.1 12 Claims



1. A system for the cooling and heating of the interior of a building structure, said, system comprising:

(a) an air conditioning assembly mounted on the building structure, said air conditioning assembly structured to selectively heat and cool air passing into the building interior,

(b) a delivery duct assembly connected to said air conditioning assembly substantially at one end thereof and extending into the building interior at an opposite end of said delivery duct assembly,

(c) said delivery duct assembly including at least one elongated delivery duct disposed and structured to direct conditioned air issuing from said air conditioning assembly into said building interior,

(d) air return means for delivering air to an intake portion of said air conditioning assembly and comprising at least one return duct disposed at least in part within the building interior,

(e) said one return duct comprising a first air intake located along the length of said return duct in a lowermost zone of the building interior and a second air intake located along the length of said return duct in an uppermost zone of the building structure,

(f) said first and said second air intakes each comprising an air damper structured for selective movement between an open and a closed position, said air dampers interconnected to one another for concurrent reverse positioning; and motor means for electrically positioning said interconnected air dampers between said open and closed positions, thermostatic control means connected in activating relation to said motor means and said air conditioning assembly for concurrent positioning of said air dampers by activation of said motor means and operation of said air conditioning assembly.

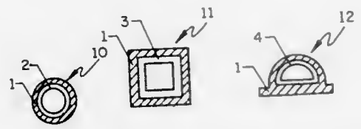
4,838,346

REUSABLE HIGH-TEMPERATURE HEAT PIPES AND HEAT PIPE PANELS

Charles J. Camarda, Virginia Beach, and Philip O. Ransone, Hayes, both of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 29, 1988, Ser. No. 237,036
Int. Cl.[4] F28D *15/02*; F28F *19/02*
U.S. Cl. 165—104.14 6 Claims

1. A reusable, durable heat pipe which is capable of operating at temperatures up to about 3,000° F. in an oxidizing environment and at temperatures above 3000° F. in an inert or



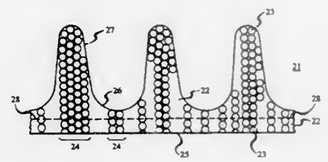
vacuum environment, which comprises a refractory metal pipe embedded within a carbon-carbon composite structure.

4,838,347

THERMAL CONDUCTOR ASSEMBLY

Mark S. Dentini, Holland, Pa.; Joe A. Fulton, Ewing; Sungho Jin, Millington, both of N.J.; John J. Mottine, Jr., West Keansburg; Lloyd Shepherd, Madison, both of N.J., and Richard C. Sherwood, New Providence, N.J., assignors to American Telephone and Telegraph Company AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 2, 1987, Ser. No. 69,792
Int. Cl.[4] F28F *7/00*; H05K *7/20*
U.S. Cl. 165—185 27 Claims



14. An assembly comprising

(a) a plurality of spaced heat-producing members mounted in an enclosure

(b) compressible means thermally coupled to said heat-producing members for conducting heat away from said plurality of heat-producing members, and

(c) means for dissipating said heat from said enclosure which is thermally coupled to said compressible means wherein said compressible means comprises one or more sheets of a compliant elastomeric polymer having dispersed therein thermally conductive, magnetic particles which have been magnetically aligned so as to form spaced columns of said particles across the thickness of said sheet including a base portion and a multiplicity of protrusions extending from said base portion.

26. A compressible thermally conductive sheet comprising a base portion and finger-like protrusions extending from at least one major surface of the base portion, said sheet comprising a compliant polymer filled with thermally conductive particles forming a multiplicity of spaced columns in said polymer, said protrusions being of such a length as to overlap one another at least when said sheet is compressed.

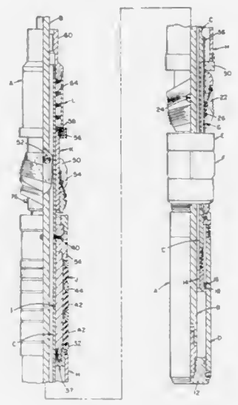
27. A compressible thermally conductive sheet comprising a base portion and finger-like protrusions extending outwardly from at least one major surface of said base portion, said sheet comprising a compliant polymer filled with thermally conductive particles forming a multiplicity of spaced columns in said polymer, said particles being composites of two or more layers.

4,838,348

WELL PACKER BRAKE

David G. Dearing, Duncanville, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 28, 1988, Ser. No. 149,639
Int. Cl.[4] E21B *23/06*
U.S. Cl. 166—136 21 Claims



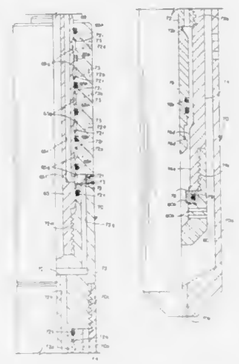
1. A brake mechanism including friction brake means for selectively applying a friction braking force and being movable inwardly and outwardly toward and away from a longitudinal axis between released and operating positions, biasing means for biasing said brake means outwardly to said operating position, opposite rings cooperating with said brake means for holding said brake means inwardly in said released position against the force of said biasing means, and said rings being movable away from one another for releasing said brake means for outward movement to said operating position by action of said biasing means.

4,838,349

APPARATUS FOR TESTING SELECTED ZONES OF A SUBTERRANEAN BORE

Vel Berzin, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Nov. 16, 1987, Ser. No. 79,703
Int. Cl.[4] E21B *33/127*
U.S. Cl. 166—187 14 Claims



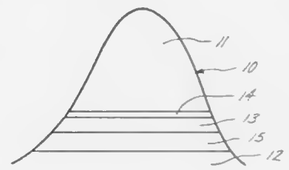
11. Apparatus for conducting hydrological tests of selected earth formations adjacent a bore traversing said formations comprising a tubing string insertable in said bore; a pair of inflatable packers secured in said tubing string in axially spaced relation; said inflatable packers each having a fluid pressure inlet; a plurality of peripherally spaced, axially extending fluid passages formed in the wall of said tubing string; means for connecting one of said fluid passages to both of said fluid pressure inlets of said inflatable packers; means for supplying fluid pressure to said one fluid passage to concurrently inflate both said inflatable packers, thereby isolating a formation zone A between said inflated packers from formation zones B and C on each side of formation zone A; means for connecting a second, third and fourth one of said fluid passages to respectively monitor fluid pressure in formation zones A, B, and C; three fluid pressure responsive transducers mounted in the bore of said tubing string and respectively responsive to fluid pressure in said second, third and fourth fluid passages to generate electrical signals respectively proportional to fluid pressures in formation zones A, B and C; and cable means for transmitting said electrical signals to monitoring equipment at the bore entrance.

4,838,350

GRAVITY STABLE SURFACTANT FLOODING IN GAS DEPLETED RESERVOIRS

Kevin P. McCoy, Calgary, Canada, and George P. Kokolis, Houston, Tex., assignors to Texaco Inc., White Plains, N.Y. and Texaco Canada Resources, Alberta, Canada

Filed Dec. 28, 1987, Ser. No. 137,992
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—274 13 Claims



1. A method of recovering hydrocarbons from an underground vertical hydrocarbon reservoir having a substantial vertical thickness, and at least one injection well and at least one production well penetrating the reservoir, which comprises:

injecting a surfactant slug through an injection well into the bottom of a vertical reservoir above any water zone, said vertical reservoir having a gas cap and an oil saturation relatively near residual oil saturation to gas;

driving the surfactant slug upwards through the vertical reservoir by producing the gas cap of the reservoir, producing hydrocarbons banked above the surfactant slug or injecting fluid below the surfactant slug; and

recovering hydrocarbons at the production well.

4,838,351

PROPPANT FOR USE IN VISCOUS OIL RECOVERY

Alfred R. Jennings, Jr., and Lawrence R. Stowe, both of Plano, Tex., assignors to Mobil Oil Corp., New York, N.Y.

Filed Aug. 27, 1987, Ser. No. 90,062
Int. Cl.[4] E21B *43/267*, *43/24*
U.S. Cl. 166—280 13 Claims

1. A method for propping a fracture in a formation where a fused refractory crystal provides for more effective heat transfer comprising:

injecting into a fracture a fused refractory crystal which consists essentially of silicon carbide or silicon nitride

having a Mohs hardness of about 9 and of a size sufficient to prop a fracture while providing substantially increaseed heat conductivity into a formation due to said crystal's substantially high degree of thermal conductivity.

4,838,352

PROCESS FOR PLUGGING SUBTERRANEAN FORMATIONS

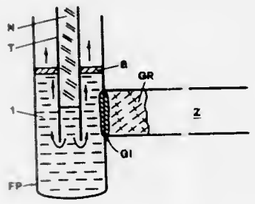
Rüdiger Oberste-Padtberg; Hervé Perthuis; Philippe Parcevaux, and Sylvie Peulet, all of St-Etienne, France, assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Nov. 19, 1987, Ser. No. 122,958

Claims priority, application France, Nov. 25, 1986, 86 16528; Jul. 27, 1987, 87 10669

Int. Cl.⁴ E21B *33/138 33/16*

U.S. Cl. 166—291 **5 Claims**



1. Process to plug and/or consolidate a permeable geological formation traversed by a borehole, comprising:

(a) injecting into the formation an overdelayed gelling composition comprising a gelable component and at least one hardener, said hardener being a water soluble amino-plastic resin in which an aldehyde component is selected from formaldehyde, glyoxal and mixtures thereof and a nitrogenous component comprising urea, and having a setting time considerably longer than a required pumping time, whereby the gelling compound permeates the formation over a significant distance from the borehole injecting into the borehole, following a mechanical or fluid plug, a rapid-action gelling agent, chosen such that it provokes instantaneous gelling of that part of the overdelayed gelling compound adjacent an interface between the borehole and the formation to be treated thereby preventing the overdelayed gelling compound from being displaced a substantial distance from the borehole.

4,838,353

SYSTEM FOR COMPLETING AND MAINTAINING LATERAL WELLS

Edward O. Anders, Kerrville, Tex., assignor to Anders Energy Corporation, Conroe, Tex.

Filed Aug. 2, 1988, Ser. No. 227,198

Int. Cl.⁴ E21B *43/12 43/24*

U.S. Cl. 166—369 **14 Claims**

1. Apparatus for completing a well in a subsurface formation capable of producing a fluid, the well including a lower, laterally disposed well section which extends into the formation, and an upper, vertically disposed well section which extends to the earth's surface, comprising:

a fitting disposed in the well above the lower well section and defining an annular space with the well, such fitting having a first, vertically disposed passageway extending therethrough, and a second passageway terminating at a first end in the first passageway and at a second end at the upper end of the fitting;

a first section of producing tubing extending upward from the upper end of the first passageway;

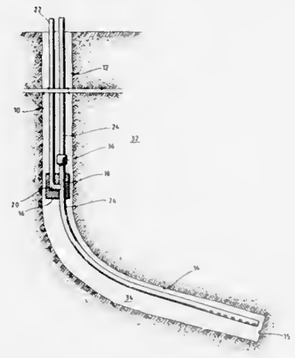
a second section of producing tubing extending from the lower end of the first passageway into the lower well section, said second section of producing tubing being closed at its distal end within the lower section and perforated proximate the distal end; and

an auxiliary tubing extending upward from the second end of the second passageway.

8. A method of injecting fluid into a well which has an upper, vertically disposed well section extending downward from the surface of the earth and a lower, laterally disposed well section which extends from the lower end of the upper well section to a distal point within a petroleum producing formation, comprising:

providing a first conduit in the well to extend from a distal end within the lower well section within the formation to the earth's surface;

closing the distal end of the first conduit if not already closed;



perforating the first conduit proximate the distal end of the first conduit if not already perforated;

providing a second conduit in the well to provide for fluid communication between first conduit above the lower well section and the earth's surface;

sizing the first and second conduits to leave an annular space within the well extending from the distal end of the first conduit above the point where the second conduit communicates with the first conduit;

closing off the first conduit above the point where the second conduit communicates with the first conduit; and

passing a fluid down the second conduit in a quantity sufficient to flow through the perforations into the annular space.

4,838,354

DOWN HOLE OIL FIELD CLEAN-OUT METHOD

Robert L. Jenkins, New Iberia, La., assignor to C. "Jerry" Wattigny, New Iberia, La., a part interest

Filed Dec. 11, 1986, Ser. No. 940,267

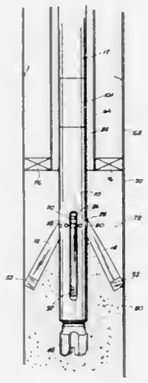
Int. Cl.⁴ E21B *37/04*

U.S. Cl. 166—311 **6 Claims**

1. A method of removing debris located in a production zone below a packer in an oil well or the like having an inner tubular member of a relatively small diameter of about 2½–4½ inches in diameter which extends longitudinally downward through a generally vertical outer tubular member longitudinally disposed in the well and terminates in a zone isolated from the annulus between the tubular members by the packer for producing the well through the interior of the inner tubular member, which debris is restricting flow from the zone to the interior of the inner tubular member, comprising the steps of:

(a) lowering an elongated body having a relatively small horizontal cross-section having an effective diameter of less than said relatively small diamter connected to the

end of a tubing string downward through the inner tubular member, the effective diameters of said body and said tubing string being less than that of said inner tubular member, until said body is located below the packer, positioning an elongated blade disposed within the body by means of longitudinal movement of the tubing string so that at least said body is positioned down within the zone;



(b) moving the blade radially outward toward the interior surface of said outer tubular member;

(c) limiting the movement of the blade radially outward preventing the blade from cuttingly engaging the interior surface of the outer tubular member; and

(d) rotating the tubing string, rotating and moving the blade within the zone, loosening the debris located in the zone within the interior of the outer tubular member.

4,838,355

DUAL HYDRAULIC SAFETY VALVE

Dwayne D. Leismer, Pearland, and William A. Blizzard, Jr., Houston, both of Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Sep. 9, 1988, Ser. No. 242,747

Int. Cl.⁴ E21B *34/10, 43/12*

U.S. Cl. 166—375 **16 Claims**

1. In a subsurface well safety valve for controlling the fluid flow through a well conduit and including a housing having a bore and a valve closure member moving between open and closed positions for controlling the fluid flow through the bore, a tubular member telescopically moving in the housing for controlling the movement of the valve closure member, the improvement in fluid actuating means for actuating the valve closure member comprising,

a first piston and cylinder assembly in the housing adapted to be connected to a hydraulic control line, said first assembly connected to the tubular member,

a second piston and cylinder assembly in the housing adapted to be connected to a hydraulic control line, said second assembly disconnected from the tubular member, and

means for disconnecting the first assembly from the tubular member and connecting the second assembly to the tubular member.

11. The method of operating a subsurface well safety valve for controlling the fluid flow through a well conduit in which the valve includes a housing having a bore and a valve closure member moving between open and closed positions for controlling the fluid flow through the bore, a tubular member telescopically moving in the housing for controlling the movement of the valve closure member, means biasing the tubular member to a closed position, a first piston and cylinder assembly in the housing connected to the tubular member and connected to a hydraulic control line, and a second piston and cylinder assembly in the housing disconnected from the tubular member and connected to a hydraulic control line comprising,

disconnecting the first assembly from the tubular member, and connecting the second assembly to the tubular member.

4,838,356

FIRE EXTINGUISHER FOAM CHAMBER WITH REMOTE MAINTENANCE AND TESTING FOR OIL TANKS

Yukio Akatsu, Tokyo, Japan, assignor to Tokyo Bosai Setsubi Company, Limited, Tokyo, Japan

Filed Apr. 2, 1987, Ser. No. 33,268

Claims priority, application Japan, Apr. 17, 1986, 61-87139

Int. Cl.⁴ A62C *37/56*

U.S. Cl. 169—66 **8 Claims**

1. A fire extinguishing assemblage for oil tanks comprising:

A. a foam chamber means for producing extinguishing foam;

B. a first supply line for admitting a mixture of air and extinguishant to said foam chamber;

C. a second supply line for admitting said extinguishing foam from said foam chamber to the oil tank;

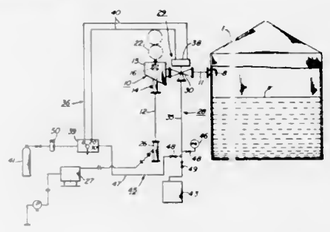
D. a sealing cap within said foam chamber for sealing the end of said first supply line as will automatically open when the pressure in said first supply line reaches a predetermined value and will automatically reseal said first supply line when the pressure in said first supply line falls below said predetermined value;

E. an emergency test means for remotely testing the emergency readiness of the fire extinguishing assemblage, said means comprising:

(a) a remotely operated 3-way valve means within said

second supply line as can be selectively set to direct extinguishing foam from said foam chamber to either the oil storage tank or a foam collector independent of said oil tank through a foam collector line; and

(b) control mean for remotely operating said 3-way valve means; and



F. a leak detector means for testing the effectiveness of said sealing cap, said leak detector means comprising;

(a) means for admitting compressed gas to said foam chamber at a predetermined pressure; and

(b) mean for determining the gaseous pressure in said foam chamber.

4,838,357

SOIL TILLING MACHINE

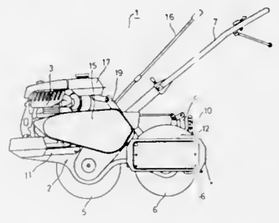
Hitoyuki Adachi, Yasugi, and Masahiro Ozoe, Yonago, both of Japan, assignors to Mitsubishi Agricultural Machinery Co., Ltd., Shimane, Japan

Filed Mar. 25, 1987, Ser. No. 29,982

Claims priority, application Japan, Apr. 4, 1986, 61-077842; Jul. 28, 1986, 61-176996

Int. Cl.[4] A01B *63/111*

U.S. Cl. 172—43 9 Claims



1. A soil tilling machine comprising:

a machine frame;

a rotary plow incorporated with said machine frame;

means for switching a rotation of said rotary plow from a forward direction to a reverse direction;

a drag bar movably mounted with respect to said machine frame; and

means for interlocking movement of said drag bar with said means for switching such that said drag bar is lowered when the rotation of said plow is switched to said forward direction, and raised when the rotation of said plow is switched to said reverse direction.

4,838,358

COUPLING DEVICE FOR CONNECTING A WHEELED FIELD IMPLEMENT TO A TRACTOR

Jan Freudendahl, Sonderborg, Denmark, assignor to JF-Fabriken - J. Freudendahl A/S, Sonderborg, Denmark

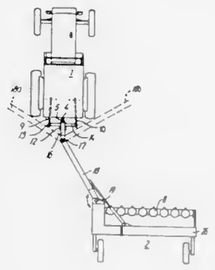
PCT No. PCT/DK86/00057, § 371 Date Jan. 30, 1987, § 102(e) Date Jan. 30, 1987, PCT Pub. No. WO86/06927, PCT Pub. Date Dec. 4, 1986

PCT Filed May 26, 1986, Ser. No. 14,065

Claims priority, application Denmark, May 30, 1985, 2411/85

Int. Cl.[4] A01B *59/04*

U.S. Cl. 172—125 6 Claims



1. A coupling device for connecting a wheeled agricultural implement having a hydraulically driven working tool means with a tractor provided with a mechanical power take-off comprising:

a towbar and a towing hitch device;

a coupling joint means forming a pivotal connection between the towing hitch device and one end of the towbar;

the other end of the towbar being pivotally connected with the implement;

a hydraulic pump mechanically connected with the power take-off of the tractor;

a flexible hose for providing a fluid power transfer from the hydraulic pump to the working means of the implement while allowing a wide-ranging pivoting of the towbar in the coupling joint means;

the towing hitch device being permanently pivotally connected with the towbar so that said towbar can pivot freely at least about an approximately vertical axis;

said towing hitch device including bearing pins for releasably mounting to the lower lift arms of a three-point hitch means of the tractor and be solely supported thereby so that the towing hitch device can freely pivot in relation thereto during operation on an approximately horizontal axis and wherein the coupling joint is located upwardly and rearwardly of said horizontal pivot axis and is behind the rearmost point of the tractor;

the hydraulic pump being permanently secured to the towing hitch device and permanently connected by means of the flexible hose to a hydraulic motor associated with the working tool means of the implement and wherein the hydraulic pump is adapted to be releasably connected with the power take-off of the tractor by means of a connecting shaft.

4,838,359

SOIL WORKING MACHINE HAVING A ROTOR DRIVEN AROUND AN OBLIQUE AXIS

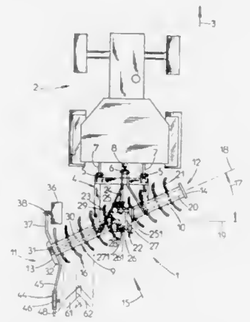
Michel Kirch, Etting, France, assignor to Kuhn S. A., Saverne, France

Continuation of Ser. No. 911,449, Sep. 25, 1986, abandoned. This application Nov. 25, 1988, Ser. No. 275,618

Claims priority, application France, Sep. 25, 1985, 85 14314

Int. Cl.[4] A01B *33/02*

U.S. Cl. 172—123 26 Claims



1. A farm machine for working the soil, said farm machine comprising:

(a) a frame comprising an upper structure at each end of which there is a downwardly extending side structure having each a lower end;

(b) a hitching structure attached to said frame and by which said farm machine is hitched, during use, to a pulling source;

(c) a rotor rotatably supported between said lower ends of said side structures, said rotor being equipped with soil working means and having a longitudinal axis which extends obliquely in relation to a work direction of the machine, said rotor having a forward end and a rearward end considering said work direction, adjacent soil working means working, during use, strips of soil that are very close to each other, that are continuous to each other, or that only slightly overlap each other, said soil working means each comprising a group of spades each one of which is mounted in a removable manner on said rotor, each group of spades is angularly offset around the longitudinal axis of said rotor in relation to the adjacent group of spades, the angular offset between adjacent groups of spades is at least approximately constant along said rotor, each one of said spades having an active part which is curved, the curvature of the active part of all of said spades being directed in the same direction and towards said forward end of said rotor;

(d) lateral stabilization means which comprise at least one chisel share;

(e) height-adjustable support means connected to said frame and by which the working depth of said soil working means is regulated; and

(f) transmission means coupled, during use, to a driving source for positively driving said rotor around its longitudinal axis so that said soil working means are moving forward at their highest positions.

4,838,360

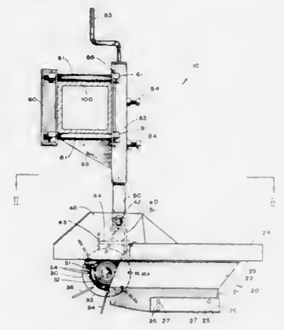
MINIMUM TILLAGE IMPLEMENT

Larry N. Shoemaker, P.O. Box 1051, Rayville, La. 71269

Filed Apr. 2, 1987, Ser. No. 34,090

Int. Cl.[4] A01B *35/22*

U.S. Cl. 172—176 7 Claims



1. A minimum tillage implement comprising:

a shaper for topping a row of a field, said shaper having a lower portion for engaging a row of a field, and a top edge;

a lip portion adjacent said top edge of said shaper, said lip portion extending substantially perpendicularly from said top edge and extending forwardly of said shaper a sufficient distance to prevent dirt from going over the top edge of said shaper; and

means for tilling a row of a field.

4,838,361

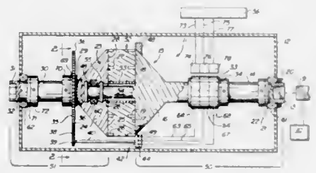
ATTACHMENT FOR POWER TOOL

Marc L. O'Toole, 7614 Fourth St., Scottsdale, Ariz. 85251

Filed Oct. 6, 1983, Ser. No. 539,642

Int. Cl.[4] B23Q *5/00*

U.S. Cl. 173—12 10 Claims



1. An attachment for monitoring and regulating the torque output of a power driven tool comprising:

(a) a driving subassembly for detachably securing said attachment to a power tool and receiving rotational force therefrom;

(b) a driven subassembly for detachably engaging a fastener with said attachment and transmitting rotational force thereto; and

(c) intermediate means operatively interposed between said driving subassembly and said driven subassembly for transmitting rotational forces therebetween, said intermediate means comprising

(i) a first and second plate each having a planar facing surface disposed in spaced opposing relationship to each other, said first plate being integrally joined with said driving subassembly and said second plate being integrally joined with said driven subassembly.

(ii) a flexible mass operatively interposed, between and

secured by said first and second plate in surface-to-surface engagement therewith and adapted to transmit rotational forces from said first plate to said second plate and flex when said second plate resists said transmission of rotational force,

(iii) monitoring means for measuring the flex in said flexible mass resulting from a different rotational characteristic of said second plate relative to said first plate and transmitting an electrical signal reflective thereof, and

(iv) means for receiving said electrical signal, comparing it to a preselected standard, and reacting to said comparison to maintain or disconnect the power source to said power driven tool.

4,838,362

APPARATUS FOR MANIPULATING A TOOL

Eric A. Jackson, Swanwick, United Kingdom, assignor to Anderson Strathclyde plc, Sheffield, United Kingdom

Filed Aug. 19, 1988, Ser. No. 234,304

Claims priority, application United Kingdom, Aug. 25, 1987, 8719991

Int. Cl.[4] E21C 9/00

U.S. Cl. 173—36 **16 Claims**

1. Apparatus for manipulating a tool comprising:

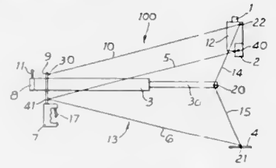
a reaction support member, which can rest against a support surface, to provide a reaction support for the tool;

a chuck for holding the tool;

mounting means in which the chuck is mounted;

a lever linkage connected between the mounting means and the support member, said lever linkage comprising parallel chuck orienting members;

a control member connected to the parallel chuck orienting members, said control member being adapted to manipulate the chuck orienting members to control the orientation of the chuck;



the lever linkage further comprising first and second links each having first and second ends, said links being pivotally attached to each other at the first ends thereof, the first link being pivotally attached at the second end thereof to the mounting means, and the second link being pivotally attached at the second end thereof to the support member; and

moving means arranged to supply a force to the first ends of the links to cause movement of the mounting means.

4,838,363

ROCK-BREAKING APPARATUS

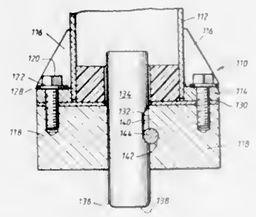
Ewen R. A. MacOnochie, Dunkeld, Australia, assignor to Quarry Engineering Developments Pty. Ltd., South Melbourne, Australia

Filed May 11, 1987, Ser. No. 47,482

Int. Cl.[4] B25D 17/24

U.S. Cl. 173—139 **10 Claims**

1. In an apparatus for breaking rocks, said apparatus including a guide column, said guide column having a base end and a peripheral wall inward of said base end, a tool at said base, said tool being adapted for limited movement in the direction of the axis of said guide column, a weight movable within said guide column and adapted to fall under the influence of gravity to strike the tool at said base end, the improvement comprising shock-absorbing material provided at said base end, said shock-absorbing material being located within said peripheral wall in the path of fall of the weight and including an upper impact surface for impact of the falling weight, said peripheral wall defining a cross-sectional area, said material occupying a cross-sectional area less than that defined by said wall, said material being adapted to absorb direct impact of said weight thereon,



at least partly by deforming into the greater cross-sectional area of said peripheral wall to minimize the effect of the impact of said weight generally on said apparatus while enabling force to be transferred from said weight to said tool, said shock-absorbing material including an aperture adapted to allow a portion of said tool to pass therethrough, said tool in a first position, at which it is at the upper limit of its limited movement, having part thereof extending above said upper surface, being adapted to be first impacted by said weight, said weight subsequently impacting said upper surface when said part of said tool is moved below said upper surface as a result of the impact of said weight or said tool.

4,838,364

ELECTRICALLY POWERED SCREW TIGHTENING TOOL

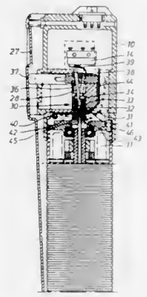
Gunnar C. Hansson, of 72, Karlavägen, S-114 59 Stockholm, Sweden

Filed Nov. 23, 1987, Ser. No. 123,796

Claims priority, application Sweden, Nov. 27, 1986, 8605086

Int. Cl.[4] B23B 45/00

U.S. Cl. 173—170 **7 Claims**



1. An electrically powered screw tightening tool, comprising:

a housing (10);

an electric rotation motor (11);

torque transmitting means (12) connecting said motor (11) to an output shaft (13) and including a torque responsive clutch (16) and a trip means (19) associated with said clutch (16);

an axially displaceable release rod (23) supported by said trip means (19) and extending axially through said motor (11);

switch means (14) located in said housing (10) and being shiftable between an ON-condition and an OFF-condition for controlling a power supply to said motor (11);

manoeuver means (37) supported in said housing (10) and being movable in a direction substantially transverse to the rotation axis of said motor (11) between a rest position and an active position;

activating means (28) coupled to and conjointly movable with said release rod (23) and which is also coupled to said manoeuver means (37) for displacement together with said manoeuver means (37) in said substantially transverse direction, said activating means (28) including means for engaging said switch means (14) and for causing shifting of said switch means (14) from said OFF-condition to said ON-condition when displaced together with said manoeuver means (37) as said manoeuver means (37) is moved from said rest position to said active position and for causing shifting of said switch means (14) from said ON-condition to said OFF-condition when displaced axially together with said release rod (23) as said release rod (23) is released by said trip means (19).

4,838,365

SEAL ASSEMBLY FOR ROTARY DRILL BITS

Robert J. Kotch, Humble, Tex., assignor to Reed Tool Company, Houston, Tex.

Filed Apr. 25, 1988, Ser. No. 186,022

Int. Cl.[4] E21B 10/22

U.S. Cl. 175—371 **3 Claims**

1. A triple cone rotary drill bit for drilling a well bore and comprising:

a bit body having a threaded upper end adapted to be removably connected to a drill string for rotating the bit and for supplying pressurized drilling fluid to the bit, and three elongated body lugs below said threaded upper end each lug having a bearing journal at the lower extending end thereof;

nozzles on the bit body for the discharge of drilling fluid in a plurality of streams;

a roller cutter for each of said three lugs, each roller cutter comprising a generally conical roller cutter body mounted for rotation on an associated bearing journal about the longitudinal centerline of the journal and including a plurality of cutting elements extending about the cutter body;

a lubricant reservoir in said bit body;

a lubricant channel between said lubricant reservoir and said associated bearing journal for supplying lubricant to said bearing journal;

pressure compensating means for equalizing the pressure of the lubricant adjacent the bearing journal and the hydrostatic pressure of the drilling fluid outside said drill bit;

an annular space formed in said generally conical roller cutter body adjacent the juncture of said bearing journal and associated lug, said annular space being of a generally rectangular cross-section to define generally opposed spaced concentric planar radial surfaces on said journal and said roller cutter body, and generally opposed spaced cylindrical axial surfaces on said roller cutter and said associated bearing journal;

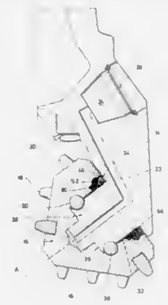
an improved sealing means mounted in said annular space for sealing between the lubricant adjacent the journal and the drilling fluid outside the drill bit and including:

a first rigid annular seal in said annular space for said roller cutter adjacent said planar radial surface on said roller cutter;

a first elastomeric seal for said roller cutter positioned and sealing between said first rigid seal and said cylindrical axial surface on said roller cutter;

a second rigid annular seal in said annular space for said journal adjacent said planar radial surface on said journal and in face-to-face contact with said first rigid seal;

a second elastomeric seal for said journal positioned and sealing between said second rigid annular seal and said



planar axial surface on said journal and normally spacing said second rigid annular seal from said adjacent planar radial surface on said journal; and

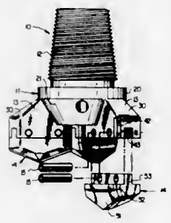
a mechanical spring in contact with said first rigid annular seal and acting in opposed relation to said second elastomeric seal, said mechanical spring being mounted on said roller cutter in spaced relation to and between said opposed cylindrical planar axial surfaces for rotation with said roller cutter, said rigid seals being mounted for floating back and forth axial movement between said compression spring and said second elastomeric seal and being urged continuously thereby in an axial direction into fact to face sealing contact with each other for compressing said second elastomeric seal into sealing engagement with said radial planar surface on said journal, said second annular rigid seal being spaced axially from the adjacent planar radial surface of said journal a distance sufficient to accommodate permanent compression set of said second elastomeric seal and radial journal wear.

4,838,366

DRILL BIT

A. Raymond Jones, 11431-A Ferrell Dr., Dallas, Tex. 75234

Filed Aug. 30, 1988, Ser. No. 238,335
Int. Cl.[4] E21B *10/42, 10/46*
U.S. Cl. 175—410 16 Claims



16. A drill bit comprising:
a body;
means on said body for securing said bit to a drill stem for rotating and advancing said bit;
radial cutting blade support wings on said body circumferentially spaced around and extending radially outwardly from said body, each said wing having a bottom face in a plane perpendicular to the longitudinal axis of said bit body and a mounting slot formed in said bottom face extending the length of said wing, said bottom face on each side of said slot being a bearing surface for axial and torque loads on said bit body when drilling; and
a cutting blade removably mounted on each of said wings, said cutting blade having integral end cutting edges and peripheral side cutting edges formed of a material different from and substantially harder than the remainder of said blade and said cutting blade having a mounting tongue sized and shaped to engage said mounting slot of said wing and seat surfaces along opposite sides of said tongue engageable with said surfaces on said wing on opposite sides of said slots defining load bearing surfaces on each said blade for axial and torque forces between each said blade and each said wing during drilling.

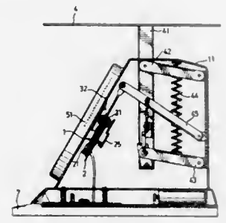
4,838,367

PRICE INDICATING MEANS FOR A WEIGHING SCALE

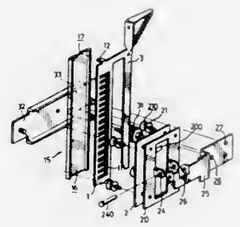
Tai A. Tsai, No. 2, Hsing Ai Road, Taipan, Taiwan

Continuation-in-part of Ser. No. 154,749, Feb. 10, 1988. This application Aug. 23, 1988, Ser. No. 235,942
Int. Cl.[4] G01G *23/22, 3/14, 3/00*
U.S. Cl. 177—25.15 10 Claims

1. A price indicating means for a weighing scale which has a dial face, a tray supported by a supporting frame, a pair of spring elements, a pivot arm respectively pivoted on said supporting frame, a housing of said weighing scale and a rack to drive said rack according to a movement of said tray, a gear engaged to said rack and connected to a pointer to drive said pointer to indicate a scale on said dial face, comprising:
(a) an inducing component having an etched pattern of an inducing strip, being mounted on said rack to be shifted according to the movement of said rack;
(b) a guide plate receiving said inducing component by tabs provided on upper and lower portions of said inducing component lodged in respectively recesses formed on the rear side thereon to prevent said inducing component from deformation;
(c) a transducing component having another etched pattern thereon opposite to said inducing component for sensing the amount of movement of said inducing component;
(d) a sloted plate on which said transducing component is mounted and secured by a plurality of rollers, each roller



having a notch for said guide plate slidable therebetween;
(e) a retaining plate on which said sloted plate is mounted fixed on said housing by posts provided therebetween; and
(f) a keyboard to enter an unit price of an article to be weighed and be provided with display means.



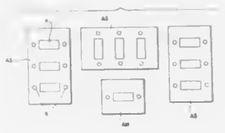
4,838,368

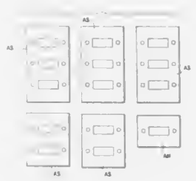
MANUAL COMBINATORIAL WEIGHING APPARATUS

Hirokazu Sato, Kyoto; Yasuhiro Goto, Obtsu; Kazufumi Horiuchi, Uji; Yasuo Michibayashi, Ohtsu; Hideo Nobutsugu, Kyoto, and Takumi Kawamura, Ohmihachiman, all of Japan, assignors to Ishida Scales Mfg. Co., Ltd., Kyoto, Japan

Filed Dec. 10, 1987, Ser. No. 131,627
Claims priority, application Japan, Dec. 10, 1986, 61-294158; Dec. 10, 1986, 61-294159; Mar. 19, 1987, 62-064892; Mar. 19, 1987, 62-064893; Mar. 19, 1987, 62-064894; Apr. 18, 1987, 62-095679
Int. Cl.[4] G01G *13/00, 21/28*
U.S. Cl. 177—25.18 11 Claims

1. A manual combinatorial weighing apparatus, having a plurality of weighing devices for carrying articles that are manually placed thereon, for combining weight data items obtained from the weighing devices to determine an optimum weight combination with respect to a preset target weight, said manual combinatorial weighing apparatus comprising:
a plurality of casings housing respective groups of said weighing devices;
a plurality of indicators mounted on said casings in association with said weighing devices, respectively, for indicating those weighing devices which are selected as giving the optimum weight combination;
processing means for combining weight data items obtained from said weighing devices to select a weight combination having a total weight identical or close to said target weight;
control means for generating signals to energize the indicators corresponding to the weighing devices which give the selected weight combination;
hold means operable either manually or automatically for holding said indicators energized when a hold key is





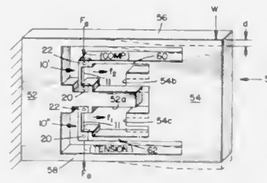
operated or when the articles are removed from those weighing devices which are selected as giving the optimum weight combination; and
control means for detecting when the data items from those weighing devices which are selected as giving the optimum weight combination are cleared to zero or a negative value to de-energize said indicators.

4,838,369

LOAD CELL HAVING DIGITAL OUTPUT

William C. Albert, Boonton, N.J., assignor to Crystal Gage Inc., Franklin Lakes, N.J.

Filed Sep. 2, 1988, Ser. No. 241,029
Int. Cl.[4] G01G *3/14, 3/08;* G01L *1/10*
U.S. Cl. 177—210 FP 10 Claims



1. Apparatus for measuring forces or weights comprising, in combination:
a load cell structure including first and second support portions, at least first and second fixed fixed load beams attached at their respective opposite ends to said first support portion and to said second support portion and with said support portions forming a parallelogram-like structure that is adapted to deflect in response to application of a force to one of said support portions, and at least one compliant cantilever sensor beam having one end attached to said one support portion and extending toward the other support portion and terminating at a free end; and
at least one force-sensitive vibrating beam resonator having mounts at the ends thereof, one attached to the free end of said at least one compliant cantilever sensor beam and the other attached to said other support portion;
wherein the applied force to be measured is transferred by deflection of said parallelogram-like structure and said compliant cantilever sensor beam to said at least one resonator to cause the vibration frequency of said at least one resonator to vary with changes in applied force according to a predetermined relationship.

4,838,370

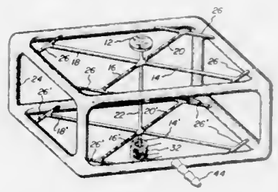
Patent Not Issued For This Number

4,838,371

CONSTRAINED LINEAR MOTION INERTIAL BALANCE

Georg Rupprecht, and Harvey Patashnick, both of Voorheesville, N.Y., assignors to Rupprecht & Patashnick Co., Inc., Albany, N.Y.

Filed Jan. 22, 1988, Ser. No. 147,252
Int. Cl.[4] G01G *3/14, 21/24*
U.S. Cl. 177—210 FP 21 Claims



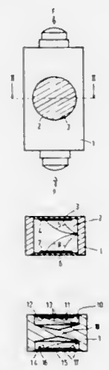
1. A suspension system for an inertial balance in which a weighing platform is made to oscillate at a resonant frequency and changes in the resonant frequency of oscillation due to mass loading of the weighing platform are sensed, the suspension system comprising:
a supporting framework; and
suspending means for suspending the weighing platform from the supporting framework in a manner which constrains the platform when oscillated to undergo uniform linear motion along a desired direction with respect to said framework, said suspending means applying restoring forces in directions orthogonal to said desired direction, which restoring forces are orders of magnitude greater than restoring forces applied by the suspending means in the desired direction, whereby platform motion is constrained to said desired direction.

4,838,372

LOAD CELL

Matthias R. Krause, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 24, 1988, Ser. No. 235,855
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1987, 3730703
Int. Cl.[4] G01G 3/14; G01L 1/22
U.S. Cl. 177—211 4 Claims



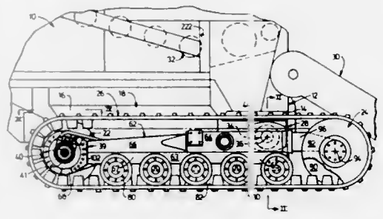
1. A load cell, in particular for weighing systems, comprising a deformable member which has at least one aperture extending transversely of the direction of the force, to which at least one disc-shaped support which corresponds to the cross-section of the aperture and extends transversely of the axis of the aperture is welded, strain gauges being deposited on this support by means of a film technique, characterized in that at least one support (3,6; 11,15; 22,23) is welded to the outer edge of the aperture (2; 10,14; 21) which fully covers the aperture and is provided on its interior side with the strain gauges (4,7; 12,16; 25,26).

4,838,373

SUSPENSION STRUCTURE FOR A TRACKED VEHICLE

Robert J. Price, Dunlap; James E. Gee, Washington; Andrew J. Tonsor, East Peoria; Ronald L. Satzler, Princeville, and Samuel B. Stevens, Pekin, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jun. 30, 1988, Ser. No. 213,793
Int. Cl.[4] B62D 55/00, 55/27
U.S. Cl. 180—9.46 27 Claims



1. A suspension structure for a vehicle including a main frame, a track-type undercarriage having a track roller fame, and pivot means for connecting the track roller frame to the main frame for pivotal movement about a first axis, comprising:

the undercarriage including a wheel having inner and outer wheel portions and support means extending between the wheel portions for connecting the wheel to the track roller frame for rotation about a second axis; and

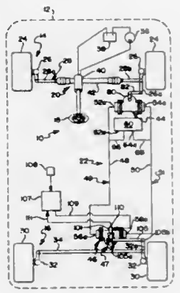
a pivoting support apparatus including a cross member having a central portion and opposite distal ends, first coupling means for pivotally connecting the central portion of the cross member to the main frame, and second coupling means for coupling one of the distal ends of the cross member to the wheel substantially along the second axis while permitting the support means to maintain the second axis substantially parallel with the first axis.

4,838,374

SPEED RESPONSIVE REAR WHEEL STEERING

Erlen B. Walton, Farmington Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 28, 1987, Ser. No. 138,762
Int. Cl.[4] B62D 5/08
U.S. Cl. 180—140 28 Claims



1. A mechanism for converting rotational movement to substantially linear movement, the mechanism comprising:

support means mounted for rotation about an axis;

slidable means secured for rotation with the support means and mounted thereon for sliding movement along a path normal to and intersecting the support means axis, said slidable means including a through opening receiving a shaft having an axis disposed along the path, said slidably means also including guide means extending radially outward therefrom with respect to the shaft axis and received by slot means defined by the support means, and said slot means having oppositely facing surfaces embracing the guide means to limit rotational free play of the slidable means about the shaft axis;

motor means operative to move the slidable means along the path for varying the distance of the slidable means from the support means axis and thereby varying the arcuate distance the slidable means moves in response to a given rotation of the support means, said motor means including means for positioning the slidable means on opposite sides of the support means axis for effecting movement of the linkage means in opposite senses in response to a given rotation of the support means; and

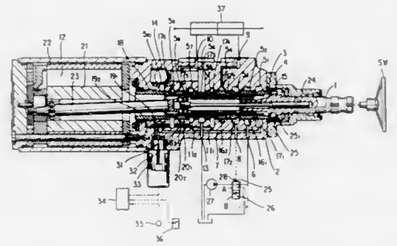
attachment means defined by the slidable means for pivotal connection to driven means moved substantially linearly in proportion to the arcuate distance the slidable means moves.

4,838,375

STEERING SYSTEM

Takao Nagai, Yokohama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP87/00273, § 371 Date Jan. 29, 1988, § 102(e) Date Jan. 29, 1988, PCT Pub. No. WO87/06553, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 30, 1987, Ser. No. 144,921
Claims priority, application Japan, Apr. 30, 1986, 61-098062; Apr. 30, 1986, 61-098063
Int. Cl.[4] B62D 5/08
U.S. Cl. 180—142 4 Claims



1. A steering system of a fully hydraulically-operated type constructed such that a fluid under pressue is supplied, at a flow rate corresponding to the amount of rotational movement of an actuating shaft adapted to be rotatively driven by turning a steering wheel, through a port whose area of opening is controlled by the amount of rotational movement of the actuating shaft adapted to be rotatively driven by the turning of the steering wheel, and then through a fluid measuring unit into a steering cylinder so that a steering operation corresponding to the amount of rotation of the steering wheel is caused by the action of the fluid pressure force and the amount of pressurized fluid supplied into the steering cylinder, characterized as comprising an apparatus for regulating actuating force applied by an actuating shaft by the action of the fluid pressure force to be controlled in accordance with the running speed of the vehicle; and further characterized in that said apparatus for regulating the actuating force applied by said actuating shaft includes a valve spool slidably inserted in a valve bore formed in a valve housing so that it may be axially moved in accordance with the amount of rotational movement of the actuating shaft; a piston portion projecting as an integral unit of a part of the outer periphery of the valve spool and along the outer periphery and which is kept in sliding contact with the inner peripheral surface of the valve housing formed in a part of the valve bore and along the inner periphery; two annular reaction force chambers formed axially on both sides of the piston portion; and a pressure control means interposed between the annular reaction force chambers and a pressurized fluid supply source and adapted to control the fluid pressure forces within the two reaction force chambers in accordnce with the running speed of the vehicle.

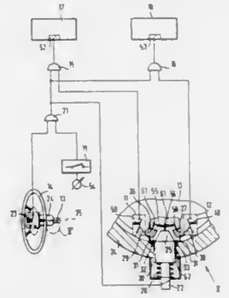
4,838,376

POWER STEERING DEVICE FOR PARKING

Hans-Christof Klein, Hattersheim, and Peter Drott, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 2, 1987, Ser. No. 57,422
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1986, 3618527
Int. Cl.[4] B62D 5/09
U.S. Cl. 180—142 9 Claims

1. A power steering device operative during the parking of an automotive vehicle having a steering wheel and an associated steering column, said device comprising a left-turn switch and a right-turn switch associated with the steering column, each of said switches having a first position and a second position, an electrically operated left turning valve and an electrically operated right turning valve which are connected by hydraulic lines to a hydraulic steering system, associated electronic logic means operating in connection with said switches and said valves for opening one of said valves when one of said switches is on its second position and for closing said valves when both of said switches are in their first positions, two parts arranged for rotation relative to each other within narrow limits from a mid-position upon a turn of the steering wheel, a linking element operatively connected to one of said parts comprising a radially displaceable locking pin that is movable between a first position where said two parts are nonrotatably coupled in mid-position by a positive connection and a second position wherein said two parts are rotatable within said narrow limits, a coupling relay associated with said linking element that radially displaces said linking element for moving said linking element to its second position, said electronic logic means including a speed-AND-gate for energizing said coupling relay, one of said switches being moved to their second position when said linking element is in its second position and when one of said two parts is moved to one of its limits.

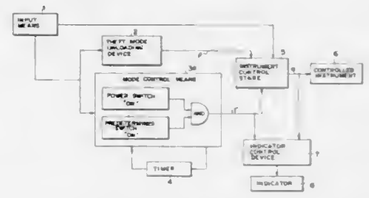


4,838,377

CAR ELECTRONIC DEVICE HAVING ANTITHEFT MECHANISM

Kengo Kozaki, and Toshiyuki Nakazaki, both of Tokyo, Japan, assignors to Clarion, Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 160,517
Claims priority, application Japan, Mar. 2, 1987, 62-030237[U]; Mar. 2, 1987, 62-030238[U]; Mar. 12, 1987, 62-036413[U]
Int. Cl.[4] B60R 25/00
U.S. Cl. 180—287 10 Claims



1. A car electronic device having an input arrangement and having an antitheft mechanism which can take a normal operative mode continuously permitting normal operation of said electronic device, a theft mode inhibiting normal operation of

said electronic device, and a line mode permitting normal operation of said electronic device for a limited time and then subsequently effecting a change to said theft mode, said theft mode being replaced by said normal operative mode when a secret code unique to said device is inputted through said input arrangement and being replaced by said line mode when a common operation is effected.

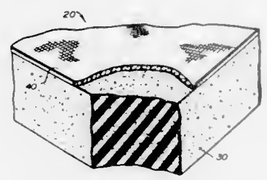
4,838,378
STRAP COVER
Rene J. Copes, 203 Church St., Chesaning, Mich. 48616
Filed Jan. 25, 1988, Ser. No. 148,046
Int. Cl.[4] B60R *21/00*
U.S. Cl. 280—808 9 Claims

1. A cover for a length of strap such as an automotive seat or torso belt comprising an elongate body having a length corresponding to a selected length of said strap, said body being formed of resilient, rubbery, deformable material and having a cavity extending longitudinally therethrough for the accommodation of said length of strap, and an access opening formed in said body in communication with said cavity and extending the full length of said body at one side thereof, said opening comprising a series of interlocking dovetail segments, the endmost dovetail segment at each end of said body being substantially one-half the width and length of the remaining dovetail segments.

4,838,379
GEOPHONE IMPLANTING AND POSITIONING APPARATUS
Peter W. Maxwell, Voorschoten, Netherlands, assignor to Geosource, Inc., Ft. Worth, Tex.
Filed Oct. 23, 1987, Ser. No. 113,138
Int. Cl.[4] G01V *1/16*
U.S. Cl. 181—122 13 Claims

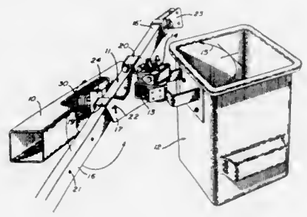
1. An implement for use by an operator in the implanting and positioning of an encased geophone assembly, said encased geophone assembly having at least one geophone mounted therein, said implement comprising:
a receptacle for receiving and retaining said encased geophone assembly;
a magnetic compass fixedly mounted to said receptacle for providing an indication of azimuth relative to the position of said encased geophone assembly, said magnetic compass mounted a substantial distance from said receptacle wherein errors induced in said magnetic compass due to any ferromagnetic properties of said encased geophone assembly are minimized; and
means for releasing said encased geophone assembly from said receptacle.

4,838,380
NYLON IMPRESSION FABRIC-ACOUSTICAL APPLICATION
B. Dean Lassiter, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.
Filed Sep. 10, 1986, Ser. No. 905,399
Int. Cl.[4] E04B *1/82*
U.S. Cl. 181—291 7 Claims



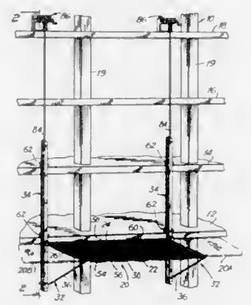
1. Sound absorbing means for use in high frequency noise environments, said means comprising:
(a) an acoustical material substrate;
(b) a fabric facing covering said substrate, wherein said sound absorbing means has a high frequency noise reduction coefficient of at least about 0.80, and said facing fabric has a fractional cover factor of substantially equal to, but not greater than about 0.80, a coefficient of friction of less than about 0.30, an air porosity of 10–50 cfm, and a Taber abrasion resistance of greater than about 400 cycles.

4,838,381
ARTICULATED BOOM JIB ASSEMBLY
Paul Michaud; Jean T. Bédard, and Bertrand Poudrier, all of Québec, Canada, assignors to Posi-Plus Technologies Inc., Quebec, Canada
Filed Mar. 28, 1988, Ser. No. 172,804
Claims priority, application Canada, Mar. 17, 1988, 561719
Int. Cl.[4] B66F *11/04*
U.S. Cl. 182—2 10 Claims



1. A jib assembly displaceably attached to a boom, said jib assembly comprising an elongated jib member having an attachment sleeve secured thereto, a planetary gear reducer having a driving element coupled to a gear train and securable inside said boom, said gear train having an output drive gear protruding adjacent a side wall of said boom, a drive gear coupling element secured to said attachment sleeve and in toothed engagement with said output drive gear for rotatably connecting said attachment sleeve closely spaced to said boom side wall to reduce stress on the gear coupling caused by the load associated with said jib assembly and also to reduce stress on a bucket support shaft also associated with said boom by providing a closer spacing of said bucket to said boom.

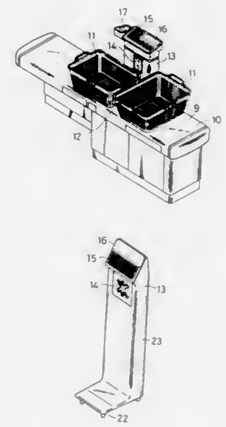
4,838,382
BUILDING SAFETY NET
Arthur Nusbaum, 1500 Palisada Ave., Fort Lee, N.J. 07024
Filed Oct. 26, 1988, Ser. No. 262,896
Int. Cl.[4] E04G *21/32*
U.S. Cl. 182—138 9 Claims



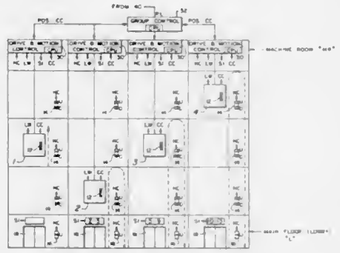
1. A safety arrangement for multi-floor buildings under construction, comprising:
(a) a safety net having inner and outer peripheral edges and opposite end regions;
(b) a pair of support structures, each positioned at a respective end region of the net for supporting the same, each support structure having an upright elongated support operatively connected to the inner edge of the net and positioned adjacent an outer face of a building, and a cantilevered support on the upright support and extending generally outwardly therefrom away from the outer building face, said cantilevered support being operatively connected to the outer edge of the net for suspending the same in a fully deployed condition adjacent the outer building face;
(c) a plurality of holders attached to the building adjacent the outer building face, and operative for holding each upright support at discrete locations spaced apart lengthwise of the respective upright support; and
(d) means for raising each support structure and the net in the fully deployed condition relative to the holders.

4,838,383
APPARATUS FOR CHECKING OUT PURCHASES
Kiyoshi Saito, Tokyo; Yoshiro Yamamoto, Chiba, and Takeo Sakuragi, Tokyo, all of Japan, assignors to Tokyo Electrical Co., Ltd., Tokyo, Japan
Filed Mar. 15, 1988, Ser. No. 168,385
Claims priority, application Japan, Mar. 16, 1987, 62-60803; May 29, 1987, 62-135514
Int. Cl.[4] G07C *11/00*
U.S. Cl. 186—59 4 Claims

1. An apparatus for checking out purchases comprising a commodity counter with a commodity receiving surface being flat and elongated leftward and righward, a basket, a columnar commodity reader portion provided on the commodity counter located in a center portion thereof and leaving a passing portion for said basket to be positioned in front of said commodity reader portion, a reading window provided in the front face of the columnar commodity reader portion and at a position above the basket, and a control portion and a display portion provided on the columnar commodity reader portion.



4,838,384
QUEUE BASED ELEVATOR DISPATCHING SYSTEM USING PEAK PERIOD TRAFFIC PREDICTION
Kandasamy Thangavelu, Avon, Conn., assignor to Otis Elevator Company, Farmington, Conn.
Filed Jun. 21, 1988, Ser. No. 209,744
Int. Cl.[4] B66B *1/20*
U.S. Cl. 187—125 27 Claims



1. An elevator dispatcher for controlling the assignment of hall calls among a plurality of elevator cars serving a plurality of floors in a building in response to hall calls made during peak time conditions, in association with traffic volume measuring means for measuring the traffic volume on a per floor and per direction basis, characterized by:
signal processing means for providing signals for determining when the system is in a peak time condition, such as up-peak, noontime and down-peak periods, and, when a peak time condition exists, for providing further signals for measuring and collecting passenger traffic data in the building and predicting passenger traffic levels as functions of time, a short period of time before the occur-

rence of the specific levels, said traffic data including at least that day's real time data of actual passenger traffic;

for determining if historic passenger traffic data is available for at least a past few days similar time period, and, if such historic passenger traffic data is available, including said historic passenger data in predicting passenger traffic levels; and

for assigning hall calls to the cars based on the expected passenger queue levels on a floor-by-floor basis and computed waiting time of hall calls in dispatching the cars.

4,838,385

METHOD FOR COORDINATING ELEVATOR GROUP TRAFFIC

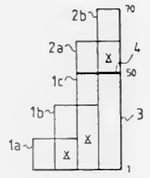
Ralf Ekholm, Helsinki, Finland, assignor to Kone Elevator GmbH, Switzerland

Filed Sep. 24, 1987, Ser. No. 100,448

Claims priority, application Finland, Sep. 24, 1986, 863861

Int. Cl.[4] B66B 1/02

U.S. Cl. 187—101 **7 Claims**



1. A method for coordinating elevator group traffic in a building having at least one transfer level constituting an end station for groups of elevators operating above and below said transfer level, comprising the steps of:

controlling at least some of said elevator groups operating above and below said transfer level through a centralized control algorithm;

altering control parameters for the control of said elevator groups in dependence upon traffic conditions and upon whether the main direction of traffic is upwards or downwards, including the steps of

causing elevators operating above said transfer level to arrive more quickly at said transfer level and retarding the departure of elevators stopped at said transfer level to accommodate passengers arriving on elevators operating below said transfer level, when said main direction of traffic is upwards, and

causing elevators operating above said transfer level to arrive more quickly at said transfer level and retarding the departure of elevators operating below said transfer level when said main direction of traffic is downwards.

4,838,386

SIDE-PULL CALIPER BRAKE DEVICE

Kenichi Yoshigai, Osaka, Japan, assignor to Yoshigai Kikai Kinzoku Co., Ltd., Osaka, Japan

Filed May 23, 1988, Ser. No. 197,163

Claims priority, application Japan, May 29, 1987, 62-85359[U]

Int. Cl.[4] B62L 1/12

U.S. Cl. 188—24.12 **9 Claims**

1. A side-pull caliper brake device comprising an arch support pivot fixed to the frame of a bicycle or an equivalent thereto, a first arch and a second arch rotatably supported by the pivot, a pair of brake shoes fixed to the respective lower ends of the first and second arches and opposed to opposite sides of the rim of a wheel of the bicycle or the equivalent, means for biasing the first and second arches to move the brake shoes away from the rim sides, and operating means interconnecting the first and second arches of maintaining the brake shoes at a specified distance from each other against the biasing means and for moving the first and second arches toward each other to press the brake shoes against the respective rim sides, the device being characterized in that the biasing means comprises a first return spring and a second return spring each in the form of a coil and fitted around the pivot concentrically therewith, the first return spring having one end engaged with

the pivot and the other end engaged with the first arch, the second return spring having one end engaged with the second arch and the other end engaged with an adjusting ring rotatably mounted on the pivot, fixing means being provided for preventing the adjusting ring and the pivot from rotating relative to each other whereby, upon adjusting of the tension of said first return spring via said adjusting ring, torque is transmitted via said operating means to said second return spring for holding said arches in balance.

4,838,387

CENTER-PULL CALIPER BRAKE

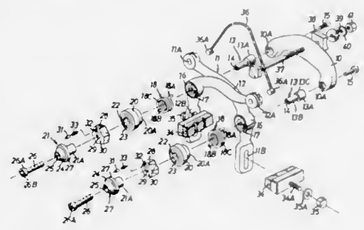
Kenichi Yoshigai, Osaka, Japan, assignor to Yoshigai Kikai Kinzoku Co., Ltd., Higashi-Osaka, Japan

Filed May 23, 1988, Ser. No. 197,162

Claims priority, application Japan, May 29, 1987, 62-85358[U]

Int. Cl.[4] B62L 3/02

U.S. Cl. 188—24.21 **3 Claims**



1. A center-pull caliper brake including a pair of brake arms movable toward or away from each other, each brake arm having a brake shoe, an arm bracket attachable to the body of a bicycle and supporting the brake arms thereon, the arm bracket having a pivot, and a pair of coiled return springs provided for the pair of brake arms for biasing the brake arms away from each other to move the brake shoes away from each other, the brake being characterized by:

a boss portion formed on each brake arm with a cavity around the pivot;

a fastening bolt for each brake arm tightly attached to the

pivot from the front, and passing through a respective boss portion;

a ratchet sleeve fixedly fitted around the fastening bolt; and

the return spring having an adjusting member and a coil portion provided around the pivot and accommodated in the cavity and having first and second ends, the first end having an engaging portion engaged with the boss portion and immovable relative thereto, the second end having an engaging portion engaged with the adjusting member, and the adjusting member being supported by the pivot, substantially closing the front opening of the cavity, and being rotatable only in the coil portion winding direction, the adjusting member being fitted around the sleeve rotatably about its axis, the adjusting member and the ratchet sleeve being provided on their opposed portions with ratchet means for permitting the adjusting member to rotate in the coil portion winding direction but preventing the rotation thereof in the other direction.

4,838,388

CLAMPING MEANS FOR A STRAP

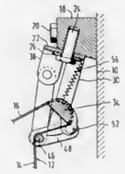
Douglas J. Cunningham, Portsmouth, England, assignor to Britax Limited, United Kingdom

Filed Jul. 21, 1987, Ser. No. 76,150

Claims priority, application United Kingdom, Aug. 6, 1986, 8619161

Int. Cl.[4] B60R 21/10, 22/20

U.S. Cl. 188—65.1 **12 Claims**



1. Clamping means for a strap adapted to be located between a strap storage location and a strap utilisation location and comprising a base member, a reaction member, a first support link pivotally mounting the reaction member on the base member for angular movement about a reaction member pivot axis, guide means secured to the base member, a guide member having grooves slidably mounted with a guide track of the guide means for movement in a direction having a component perpendicular to the reaction member pivot axis, retention means for retaining the guide member and the reaction member in respective rest positions in which the strap is freely movable between the guide member and reaction member until the tension applied to the strap exceeds a predetermined level, and coupling means interconnecting the reaction member and the guide member so that, when the tension in the belt exceeds said predetermined level, movement of the guide member causes corresponding movement of the reaction member, thereby wrapping the strap round both the reaction member and the guide member so that one layer of the strap is clamped against the reaction member by another layer of the strap.

4,838,389

PROTECTIVE DEVICE FOR DRUM-BRAKE OPERATING SHAFT

Gaby Mamery, Lousy-sur-Marne, 51300 Vitry-le-Francois, France

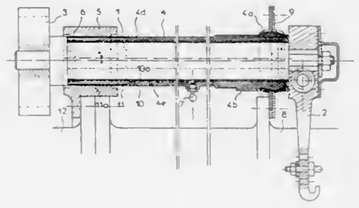
Filed Jun. 23, 1987, Ser. No. 72,989

Claims priority, application France, Jun. 24, 1986, 86 09245

Int. Cl.[4] B65D 53/00; F16D 65/22, 65/30

U.S. Cl. 188—78 **16 Claims**

1. Protective device of an operating shaft (1) of a control cam (3) of drum-brake shoes of heavy duty vehicles characterized in that the protective device is constitute by a lengthening of a sleeve (4) of the bushing (5) of an operating shaft (1) up to an actuating lever (2) of the operating shaft (1), in that a bore (4d) of this sleeve (4) is equipped, at each one of its extremities, with a packing 6 and in that it comprises a lubricator (7), an overflow opening (4e), and a means for mounting at a connection bridge (8) of axles (12) and wherein the bore (4d) of the sleeve (4) is upwardly offset by a distance X equal to half of the clearance existing between the operating shaft (1) and the bore (4d) of the sleeve (4), wherein the mounting means of the



protective device at the connecting bridge (8) of the axles (12) is constituted by an annular collar (4a) and an indexing key (4b) situated on the side and in proximity of the actuating lever (2) and of the connecting two-part housing (9) existing at the beginning; and wherein the wearing plate (10), the lubricator (7), the indexing key (4b) of the sleeve (4) are situated at the lower portion of the sleeve (4), in relation to the mounting housing (9) and the tab (4c) of direct mounting to the sleeve (4) at the connecting bridge (8) of the axles (12).

4,838,390

AUTOMATIC ADJUSTER FOR A VEHICLE SHOE-DRUM BRAKE

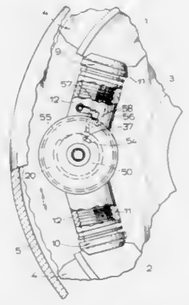
John A. Urban, Plainwell, Mich., assignor to Lucas Industries Public Limited Company, Birmingham, United Kingdom

Filed Jan. 28, 1988, Ser. No. 149,635

Claims priority, application United Kingdom, Feb. 3, 1987, 8702341

Int. Cl.[4] F16D 65/56

U.S. Cl. 188—79.55 **8 Claims**



1. An automatic adjuster for a vehicle shoe-drum brake of the type comprising a torque plate, a pair of brake shoes mounted on said torque plate and carrying friction linings for

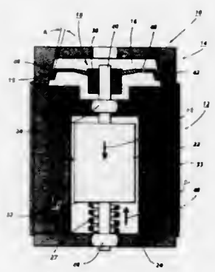
engagement with a rotatable drum, a cam shaft journalled in said torque plate for rotation about a fixed axis, and a cam located between adjacent ends of said shoes and rotatable with said cam shaft to generate a brake-applying load arranged to separate said adjacent ends in order to apply said shoes to said drum, wherein said adjuster comprises a pair of thrust assemblies, each said thrust assembly being adapted to act between said cam and a respective one of said adjacent ends, and each said thrust assembly comprising first and second, intrengaged, screw threaded members which are relatively rotatable to increase the effective length of said thrust assembly to compensate for wear of said lining of said respective shoe, transmission means co-operating with corresponding said members of said two thrust assemblies so that both said corresponding members are adapted to rotate together, whereby said effective lengths of both said thrust assemblies can be increased by equivalent amounts, a drive mechanism through which said transmission means is coupled to said cam, said drive mechanism including means defining a lost-motion connection which determines said braking clearances, and a two-way clutch, said transmission means being movable in first and second opposite directions in a brake-applying mode and a brake-release mode, inhibit means being incorporated for inhibiting movement of said transmission means in said brake-release mode, and release means for releasing said inhibit means to permit limited movement of said transmission means in said second direction in said brake-release mode, said two-way clutch comprising two clutch parts which are engageable during said brake-applying mode to take up the lost-motion in said lost-motion connection and thereafter to drive said transmission means in said first direction to increase said effective lengths of said two thrust assemblies until a critical point is reached at which said two clutch parts slip relative to each other in one direction, and said inhibit means being operative during said brake-release mode to restrain movement of said transmission means in said second direction causing said two clutch parts to slip relative to each other in the opposite direction after said lost-motion has been taken up and until said cam reaches a predetermined distance from the end of its release stroke when said release means is operable to release said inhibit means to allow limited movement of said transmission means in said opposite direction to decrease said effective lengths of said thrust assemblies for the remainder of said brake-release mode.

4,838,391

BRAKING DEVICE

Richard C. Schenk, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 6, 1988, Ser. No. 240,337
Int. Cl.[4] F16D 59/02
U.S. Cl. 188—171 11 Claims



1. A device for braking a drive motor of the type having a rotor adapted to be axially displaced when the motor winding is de-energized, wherein the improvement includes:

a braking member rotatably coupled to the rotor and having a pivotable exterior circumferential surface; and

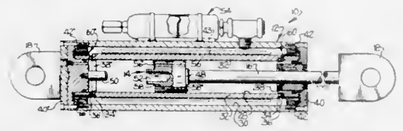
a stationary member positioned to be spaced from the exterior circumferential surface of said braking member when the motor winding is energized, said braking member moving axially with the rotor when the motor winding is de-energized so that the exterior surface of said braking member engages said stationary member and pivots to position substantially the entire surface of the exterior circumferential surface in contact with said stationary member to frictionally stop the rotation of the rotor, said braking member moving with the rotor away from said stationary member when the motor is energized and the exterior surface of said braking member pivoting to disengage from said stationary member to enable the rotor to rotate.

4,838,392

SEMI-ACTIVE DAMPER FOR VEHICLES AND THE LIKE

Lane R. Miller, Raleigh; Charles M. Nobles, Jr., Fuquay-Varina, both of N.C., and Dennis P. McGuire, Erie, Pa., assignors to Lord Corporation, Erie, Pa.

Filed Aug. 5, 1987, Ser. No. 81,841
Int. Cl.[4] F16F 9/52
U.S. Cl. 188—277 15 Claims



1. In a hydraulic damper assembly for damping the transmission of motion between spaced and relatively movable members interconnected thereby, said assembly including a double-wall cylinder adapted to be connected to one of said members and having an inner fluid chamber and an outer annular fluid chamber encircling said inner chamber, a piston disposed within and movable longitudinally of said inner chamber, a rod connected to said piston and having an end portion extending from said cylinder and adapted to be connected to the other of said relatively movable members, the improvement comprising:

means defining a pair of first and second parallel passageways interconnecting said inner and outer chambers adjacent one end thereof;

means defining another pair of first and second parallel passageways interconnecting said chambers adjacent the opposite end thereof;

pressure responsive check valve means associated with said first passageways for inhibiting fluid flow therethrough from said inner chamber to said outer chamber, and for at times permitting relatively free fluid flow through said first passageways from said outer chamber to said inner chamber;

control valve means associated with said second passageways for controlling fluid flow therethrough, said control valve means including two movable control valve members associated with and located adjacent respective ones of said second passageways, each of said movable valve members being moveable between a flow-restricting position and a flow-permitting position wherein said valve member respectively permits only relatively restricted fluid flow and relatively unrestricted fluid flow through the therewith associated one of said second passageways, said control valve means having a first operating condition wherein one of said valve members occupies said flow-permitting position thereof while the other of said valve members occupies said flow-restricting position thereof, and having a second operating condition wherein said one of said valve members occupies said flow-restricting position thereof and said other of said valve members occupies said flow-permitting position thereof;

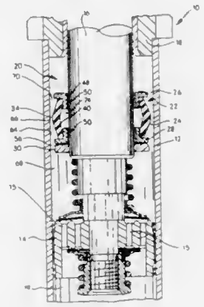
electromagnetic drive means for selectively effecting rapid transition of said valve means between said operating conditions and for thereby effecting rapid and substantially simultaneous reversals of the positions of said valve members, the movements of each of said valve members between said flow-restricting and flow-permitting positions thereof being produced by electromagnetic forces imparted thereto by said drive means.

4,838,393

HYDRO-MECHANICAL STOP HAVING A RESTRICTIVE PASSAGE

Jack W. Mourray, West Bloomfield, and James P. Nagy, Romulus, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US82/01304, § 371 Date Sep. 20, 1982, § 102(e) Date Sep. 20, 1982
PCT Filed Sep. 20, 1982, Ser. No. 434,643
Int. Cl.[4] F16F 9/49
U.S. Cl. 188—284 3 Claims



1. In a telescopic shock absorber including a working cylinder, a piston slideably received within said working cylinder and defining a boundary for a rebound chamber within said cylinder, a piston rod connected to said piston and extending through one end of said working cylinder means for closing said one end of said cylinder and slideably mounting said piston rod, the improvement comprising a hydro-mechanical stop characterized by:

a resiliently flexible ring mounted about said piston rod;

said ring having an annular outer wall with a diameter smaller than the diameter of an inner wall of said working cylinder;

first and second collars pressed fit into opposite axial open ends of said flexible ring;

each collar having an axial extending portion;

said axial extending portion having an inner wall with a diameter sized to receive said piston rod with a clearance therebetween and an outer diameter sized to be pressed fit within said flexible ring;

each collar having a radially outwardly extending shoulder, said shoulder having a surface facing axially inwardly for abutting an axial end of said flexible ring and a surface facing axially outwardly;

said surface facing axially outwardly having a plurality of axially extending protrusions circumferentially spaced thereabout;

said flexible ring and pressed fit collars interposed between said closure means and a shoulder fixed to said piston rod such that, at the end of a rebound stroke of said piston rod, said shoulder and said closure means axially compress said ring by pressing against said protrusions of said respective second and first collars;

said flexible ring being sufficiently flexible such that, when it is axially compressed a predetermined amount, the diameter of an annular portion of said annular wall enlarges to abut said inner wall of said working cylinder and forming with said cylinder and said closure means a hydraulic chamber;

the inner wall of said flexible ring spaced from said piston rod defining an annular chamber therebetween;

said second collar, when in abutment with said shoulder fixed to said piston rod forming a second restrictive passage section between said annular chamber and said rebound chamber, said second restrictive passage section running radially between said shoulder fixed to said piston rod and said shoulder of said second collar and thence along the axial, annular space formed by the inner wall of said second collar and said piston rod;

said first collar and said closure means, when in abutment with each other, forming a first restrictive passage section from said hydraulic chamber to said annular chamber, said first restrictive passage section running radially between said closure means and said shoulder of said first collar and thence along the axial, annular space formed by the inner wall of said first collar and said piston rod; and

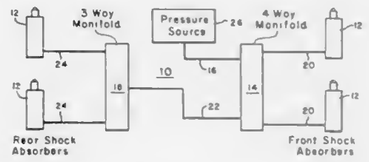
said first restrictive passage section restricting hydraulic fluid flow in a controlled manner from said hydraulic chamber into said annular chamber and said second restrictive passage section restricting hydraulic fluid flow in a controlled manner from said annular chamber into that portion of said rebound chamber lying between said shoulder fixed to said piston rod and said piston upon further compression of said flexible ring beyond said predetermined amount.

4,838,394

ADJUSTABLE SHOCK ABSORBER AND SYSTEM

Charles D. Lemme, 820 N. Igo Way, Tucson, Ariz. 85710, and Fredrick J. Furrer, W12464 Boots Rd., Wisconsin Dells, Wis. 53965

Filed Sep. 6, 1988, Ser. No. 241,119
Int. Cl.[4] F16F 9/46
U.S. Cl. 188—299 34 Claims



1. An adjustable hydraulic shock absorber system comprising:

a plurality of shock absorbers, each operative to pass fluid through a respective passage in response to at least one of elongation and shortening of the shock absorber, each shock absorber comprising means for adjustably controlling at least one fluid flow restriction characteristic of the passage;

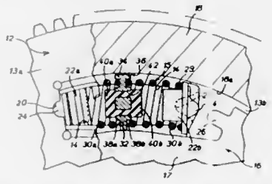
a plurality of fluid powered actuator means, each coupled to a respective one of the controlling means, for adjusting the respective controlling means in response to a control fluid pressure;

a control fluid circuit interconnecting each of the actuator means to supply a control fluid to each of the actuator means; and

means for adjusting control fluid pressure in the control fluid circuit in order to cause the fluid powered actuator means to adjust each of the controlling means, thereby varying at

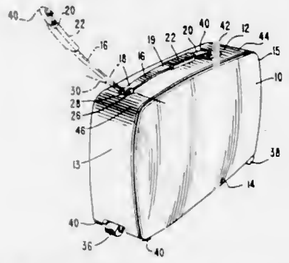
least one damping characteristic of the shock absorbers in parallel.

4,838,395
TORSION DAMPING DEVICE
Gustave Chasseguet, Taverny; Jacky Naudin, and Pierre Casse, both of Ermont, all of France, assignors to Valeo, Paris, France
Filed Sep. 7, 1988, Ser. No. 241,258
Claims priority, application France, Sep. 10, 1987, 87 12546
Int. Cl.[4] F16F *15/12*
U.S. Cl. 188—378 **6 Claims**



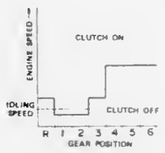
1. A torsion damping device of the kind comprising two coaxial rotatable parts mounted for relative angular displacement with respect to each other, with circumferentially acting coil springs interposed between them, said springs being mounted in one of said rotatable parts between thrust members pivoted to the latter, while at least one radial plate of the other of said rotatable parts is adapted to cooperate with said thrust members, one of the said rotatable parts defining contact zones towards which the springs tend to deform under the effect of centrifugal force, wherein between two said thrust members disposed circumferentially in facing relationship, there is interposed a damping means comprising two springs and an insert between the two said springs, with each said spring bearing at one end thereof against a respective one of said thrust members and the other end bearing against the said insert, said insert being so shaped that, when the damping means tends to deform under the action of centrifugal force, contact with the said contact zone of the said rotatable parts is made by the insert rather than by the remainder of the damping means.

4,838,396
LUGGAGE HANDLE
Ronald L. Krenzel, Boulder, Colo., assignor to Delsey Luggage Company, Jessup, Md.
Continuation of Ser. No. 23,008, Mar. 6, 1987, abandoned. This application Jul. 14, 1988, Ser. No. 219,808
Int. Cl.[4] A45C *5/14, 13/20, 13/38*
U.S. Cl. 190—18 A **13 Claims**



13. Luggage comprising:
case means for containing articles, the case means including a top side having two ends, a bottom side, a front side facing in a forward direction and a rear side, the case means being longer in the horizontal direction from the front side to the rear side than in the vertical direction from the top side to the bottom side;
handle means attached to said case means for manual engagement by a user to transport the case means; said handle means having two end portions and a rigid portion extending substantially across the top side of the case means between the two ends of the top side when in a first position; means pivotably attaching one end portioin of the handle means to one end of the top side of the case means, means selectively securing the other end portion of the handle means to the other end of the top side of the case means, said handle means being movably positionable through said pivotable attachment both in said first position in which both end portions of the handle means are positioned relatively proximate to the case means and said other end portion of the handle means is secured to the other end of the side of the case means for enabling a user to manually engage the handle means to lift and carry the case means, and in a second position in which one end portion of the handle means is positioned proximate to the case means and the other end portion is positioned at a substantially greater distance from the case means and forward of the front side for enabling a user to manually engage said other end portion of the handle means to drag the case means in the forward direction along the ground while allowing the user to maintain a relatively upright position; and
wheel means attached to the case means which define a plane along the ground for enabling the case means to roll along the ground when dragged by a user who is in a relatively upright position.

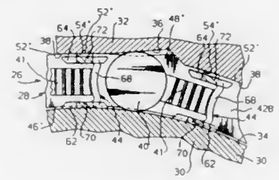
4,838,397
APPARATUS FOR CONTROLLING VEHICLE HAVING AN AUTOMATIC TRANSMISSION SYSTEM
Kazumasa Kurihara, and Kenji Arai, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan
Filed Oct. 30, 1987, Ser. No. 114,950
Claims priority, application Japan, Nov. 5, 1986, 61-261820
Int. Cl.[4] B60K *41/28*
U.S. Cl. 192—0.044 **12 Claims**



1. An apparatus for controlling a vehicle having an automatic transmission which includes a gear transmission, a clutch and separate actuating means for actuating said gear transmission and said clutch so as to automatically shift said transmission into a target position in response to at least one operation parameter of the vehicle, said apparatus comprising:
a first detecting means for detecting the amount of operation of an acceleration member;
a selector means having a special position for enabling said clutch to be controlled in a special ON/OFF control mode in which the vehicle can be driven so as to run at low speed even when the amount of operation of the acceleration member becomes not more than a prescribed low level;
a second detecting means for detecting a position selected by said selector means;
a first discriminating means responsive to said first detecting means for discriminating whether or not the amount of operation of the acceleration member is no more than the prescribed low level;

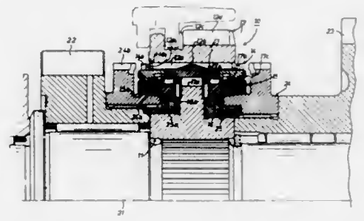
a second discriminating means responsive to said second detecting means for discriminating whether or not said selector means is in the special position;
a third discriminating means for discriminating whether or not the transmission is shifted into a predetermined position;
a first determining means responsive to said first through third discriminating means for determining whether or not the vehicle should be run at low speed even when the amount of operation of the acceleration member becomes not more than the prescribed level;
memory means for storing a plurality of sets of data corresponding to different characteristics for ON/OFF controlling of said clutch;
a selecting means responsive to said first determining means for selecting a set of data from said plurality of sets of data stored in said memory means; and .
a control means for controlling the engaging/disengaging of said clutch in accordance with the set of data selected by said selecting means such that said clutch is engaged in accordance with said selected set of data in order to operate said vehicle at a low speed when said selector means is in said special position, when said transmission is shifted into said predetermined position and when the amount of operation of said acceleration member is not more than said prescribed low level.

4,838,398
METAL ROLLER CLUTCH CAGE
Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Feb. 16, 1988, Ser. No. 156,322
Int. Cl.[4] F16D *15/00*
U.S. Cl. 192—45 **2 Claims**



1. A metal roller clutch cage for use between a pair of metal clutch races, comprising:
a pair of generally annular metal side rails, each having a first and second edge, sized so as to fit between said races when said races are located substantially coaxial to one another, with said first and second edges of said side rails further including a series of pairs of radially opposed and circumferentially spaced rectangular notches therein,
a plurality of cross bars folded from flat metal stock with a thickness that is substantially equal to the depth of said notches with each of said cross bars having first and second generally rectangular, radially opposed walls joined by a radially extending web, with the side edges of said walls being abutable with the inside of said side rails, said first wall further having an arcuate outside surface conformable to said pathway and a pair of axially extending tabs sized so as to fit closely within said side rail first edge notches, said second wall further having a pair of axially extending tabs sized so as to fit within said side rail second edge notches.
whereby, said cage may be assembled by interfitting said respective cross bar tabs and side rail notches and then delorming said cross bar second wall tabs down over the outside of said side rails, thereby drawing said side rails into abutment with said cross bar side edges and retaining said side rails together in rigid, axially spaced relation.

4,838,399
GEAR SYNCHRONIZER FOR POWER TRANSMISSION
Masaki Inui, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed May 20, 1988, Ser. No. 196,551
Claims priority, application Japan, May 20, 1987, 62-122781
Int. Cl.[4] F16D *11/00*
U.S. Cl. 192—53 F **9 Claims**



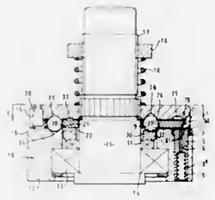
1. A gear synchronizer comprising a gear member rotatable on a transmission shaft, a hub member formed thereon with external splines and being mounted on said transmission shaft for rotation wherewith, a spline piece formed at one side thereof with a frustoconical portion and thereon with external splines and being provided on a hub portion of said gear member for rotation therewith, a clutch sleeve encircling said hub member and having internal splines in continual engagement with the external splines of said hub member, said clutch sleeve being axially shiftable toward and away from said gear member to be engaged at the internal splines thereof with the external splines of said spline piece, a plurality of circumferentially spaced strut keys assembled with the inner circumference of said clutch sleeve and loaded radially outwardly into engagement with said clutch sleeve,
a support ring arranged in surrounding relationship with the frustoconical portion of said spline piece to be thrusted by abutment with said strut keys toward said gear member and having external splines engageable with the internal splines of said clutch sleeve;
a synchronizer ring coupled with said support ring and having an internal frustoconical surface for frictional engagement with the frustoconical portion of said spline piece;
an operation ring disposed between said support and synchronizer rings and being axially movably coupled with said support ring for rotation therewith and axially movably coupled with said synchronizer ring for relative rotation, said operation ring having an internal frustoconical surface;
a connecting ring rotatably mounted on one side of said hub member and connected to said spline piece, said connecting ring having an external frustoconical surface for frictional engagement with the internal frustoconical surface of said operation ring;
resilient means disposed between said support and operation rings to bias said support ring for engagement with said synchronizer ring and to bias said operation ring for engagement with said synchronizer ring; and
cam means arranged to effect relative axial displacement of said support and operation rings against the biasing force of said resilient means in response to relative rotation between said synchronizer and operation rings.

4,838,400

TORQUE LIMITING CLUTCH

David J. Fortune, Weston, United Kingdom, assignor to GIB Precision Limited, Cirencester, United Kingdom

Filed Aug. 20, 1987, Ser. No. 87,669
Claims priority, application United Kingdom, Aug. 20, 1986, 20214
Int. Cl.[4] F16D 43/20
U.S. Cl. 192—56 R 10 Claims



1. A torque limiting clutch comprising a driving part, a driven part, a cage, means mounting said parts and cage for relative rotation and each of said parts having at least one torque transmitting abutment, a rolling torque transmitting element disposed between said parts and guided by said cage, biasing means to bias axially said element into torque transmitting engagement with said torque transmitting abutments of said parts when said clutch is engaged, said rolling element being movable out of engagement with said torque transmitting abutments to disengage the clutch on application of a torque exceeding a predetermined torque to one of said parts, a torque transmitting element receiving means in one of said parts to accommodate said element when the clutch is disengaged, a spacer, movable by said cage into spacing relationship with said parts on disengagement of the clutch wherein said clutch can be disengaged by relative rotation between said parts in either direction and said clutch can be re-engaged by relative rotation between said parts in the opposite direction to that which caused disengagement, said clutch including two sets of inter-engageable abutments, the inter-engageable abutments of a first of said sets being provided on the cage and the inter-engageable abutments of the second of said sets being provided on the other of said parts and being operable to cause inter-engageable abutments of the first and second sets to inter-engage to cause said cage and said other of said parts to rotate together, each of said sets including a plurality of inter-engageable abutments, a first plurality of inter-engageable abutments of each set being operable on relative rotation between the clutch parts in the opposite direction to that in which a second plurality of inter-engageable abutments of each set is operable, biasing means normally to bias the inter-engageable abutments in a direction towards said inter-engagement, first control means being provided on said one clutch part

(a) to prevent inter-engagement of said inter-engageable abutments of the first plurality when said clutch is disengaged as a result of relative rotation in one direction whilst permitting inter-engagement of a pair of said inter-engageable abutments of the second plurality on resetting by relative rotation in the reverse direction to said one direction; and

(b) to prevent inter-engagement of said inter-engageable abutments of the second plurality when said clutch is disengaged as a result of relative rotation in the opposite direction to said one direction whilst permitting inter-engagement of a pair of said inter-engageable abutments of the first plurality on resetting by relative rotation in the reverse direction to said other direction

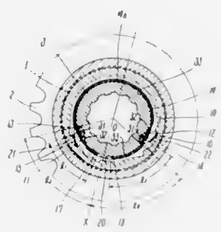
and second control means to maintain said inter-engageable abutments of both pluralities out of inter-engagement during the initial stages of disengagement of said clutch.

4,838,401

UNIDIRECTIONAL ROTARY TRANSMISSION MECHANISM FOR BICYCLE PARTS

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Mar. 23, 1987, Ser. No. 28,770
Claims priority, application Japan, Mar. 26, 1986, 61-44499
Int. Cl.[4] F16D 41/12
U.S. Cl. 192—64 2 Claims



1. A unidirectional rotary transmission mechanism for a bicycle, comprising:

a rotatable driving member;

a driven member rotatably driven responsive to rotation of said drivning member;

one of said driving member and said driven member including ratchet teeth and the other of said driving member and said driven member supporting a first transmission pawl and a second transmission pawl each having (i) engaging portions engageable with said ratchet teeth and (ii) substantially semicircular-shaped base portions;

a substantially C-shaped pawl spring wrapped around said other of said driving member and said driven member which supports said transmission pawls, for (i) holding said first transmission pawl and said second transmission pawl to said other of said driving member and said driven member which supports said transmission pawls and (ii) biasing said first transmission pawl and said second transmission pawl in a direction such that said engaging portions engage with said ratchet teeth of said one of said driving member and said driven member; and

a locking means for preventing rotation of said pawl spring relative to said other of said driving member and said driven member;

said pawl spring having a first free end and a second free end;

said first transmission pawl being positioned such that its said engaging portion is oriented toward said first free end and said second transmission pawl being positioned such that its said engaging portion is oriented away from said second free end; and

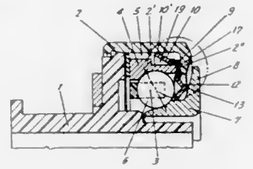
said first transmission pawl and said second transmission pawl being located at position such that a distance between an engaging portion of said pawl spring with said base of said first transmission pawl and said first free end of said pawl spring and a distance between an engaging portion of said pawl spring with said base of said second transmission pawl and said second free end of said pawl spring are made equal to each other.

4,838,402

SLIDING SLEEVE OF A CLUTCH OF AN AUTOMOTIVE VEHICLE

Winfried Feser, Schoungen, Fed. Rep. of Germany, assignor to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed Feb. 25, 1988, Ser. No. 160,144
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709237
Int. Cl.[4] F16D 23/14
U.S. Cl. 192—98 12 Claims



1. A sliding sleeve of a clutch, comprising:

the clutch including a radially adjustable anti-friction bearing comprising an outer ring having a radially exterior rim surface, an inner ring radially inward of the outer ring, the inner ring having a respective radially exterior rim surface, the outer and inner rings having respective axially outward ends toward one axial side thereof; and rolling elements disposed between the inner and outer rings for rolling between them;

a cap having an inner surface around and space radially outwardly of the rim surface of the outer ring and defining an annular slot between the outer ring rim surface and the inner surface of the cap; the sliding sleeve including a radially outwardly projecting flange located axially inward of the outer and inner rings of the bearing, the cap being supported on and being positioned by the flange;

a generally L-shaped spring ring having a first axial leg which extends in the annular slot along the rim surface of the outer ring, the first leg extending obliquely radially outward in the direction axially inward of the bearing, the first leg of the spring ring extending sufficiently to rest against the inner surface of the cap for forming a seal at the cap and also for centering the bearing on the sleeve;

the spring ring having a second radial leg which extends radially inward past the axially outward end of the outer ring and which is shaped for gripping to the outer ring at the axially outward end thereof to engage and lock against the second leg, the second leg extending radially further inward, the second leg including a sealing lip that extends into engagement with the inner ring at the sealing lip of the second leg for sealing the bearing by sealing passage of material past the second leg between the inner and the outer rings.

4,838,403

OVERTRAVEL STOP ACTIVATED CONTROL VALVE

John C. Layer, Caledonia, Ill., assignor to Sundstrand Corp, Rockford, Ill.

Filed May 27, 1988, Ser. No. 199,461
Int. Cl.[4] F16D 11/04
U.S. Cl. 192—141 29 Claims

1. An overtravel stop for a rotary shaft comprising:

a fixed stop having at least one stop jaw;

a movable stop which rotates with the shaft within an axial travel path along the shaft having a pair of travel limits and having at least one stop jaw;

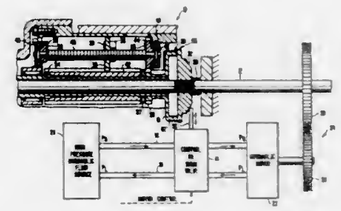
means for causing the at least one stop jaw of the movable stop to engage the at least one stop jaw of the fixed stop when the movable stop has reached one of the axial travel limits to stop the shaft;

the at least one stop jaw of the movable and fixed stops upon engagement applying a first braking torque to the shaft;

a hydraulic motor having a drive shaft for rotatably driving the shaft;

a source of pressurized hydraulic fluid in fluid connection with the hydraulic motor for causing the hydraulic motor to rotate when pressurized hydraulic fluid is coupled thereto;

a valve disposed in fluid connection at least between a low pressure discharge port of the hydraulic motor and a low pressure return port of the source of pressurized hydraulic fluid, the valve having a control movable between a first



position which permits unrestricted flow of hydraulic fluid between a high pressure port of the source of pressurized hydraulic fluid and a high pressure port of the hydraulic motor and the low pressure discharge port and the low pressure return port and a second position which blocks at least the return of hydraulic fluid to the low pressure return port; and

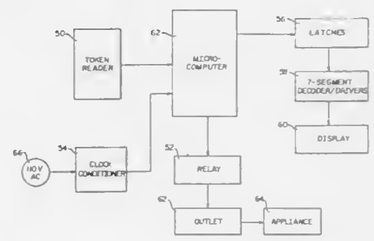
control means, associated with the movable stop and the control of the valve, for causing the control of the valve to move to the second position in response to the movable stop reaching one travel limit within the axial travel path to cause the shaft to have a second braking torque applied thereto by the hydraulic motor.

4,838,404

TOKEN OPERATING SYSTEM FOR AN ELECTRONIC DEVICE

James E. Smith, and Mark A. Nash, both of Morgantown, W. Va., assignors to West Virginia University, Morgantown, W. Va.

Filed Nov. 28, 1986, Ser. No. 935,830
Int. Cl.[4] G07F 7/08
U.S. Cl. 194—212 8 Claims



1. A device for electronically operating an electronic apparatus which device is photoelectrically actuated by a token which passes between a light source and receiving system, comprising:

a housing comprising:

slot means into which said token is inserted by a user and which travels past said light source and receiving system,

containment means having a plug for electrically connecting said electronic apparatus to said device and for retaining spent said tokens,

said token being a body of material having a plurality of regions on opposite faces of said token, each said region having light transmitting and light restricting portions and being arranged in said body of material to facilitate receipt of said light source and activation of control signals in said system irrespective of the orientation of said token in said device,

said light and receiving system being an optical reader with a plurality of emitters and a plurality of cooperative detectors for generating said control signals,

said portions of each region of said token being an encoded time value pattern in the form of four bit binary coded decimal digits and triggering areas along said opposite faces of said token adapted to indicate the reading of and the preparation for the reading of said binary coded decimal digits in logical order by said optical reader, and

an electronic circuit means for operating said device and said electronic apparatus, including said optical reader, a microprocessor for receiving and processing said control signals, counter means for accumulating time acquired by insertion of a plurality of said spent tokens, and digital readout means for displaying the remaining time for said operation of said electronic apparatus,

said regions of said token consisting of two top adjacent quadrants and two bottom adjacent quadrants, each having said encoded information pattern,

said triggering area of said token being located along a central longitudinal axis separating two of said quadrants from said other two quadrants of said opposite faces of said token, and being adapted for registering said light transmitting portions and said light restricting portions on said body material in a predetermined sequence for said activation of said control signals,

said body of material consisting of at least two sheets of a transparent material and a photo-developed plastic film encased between said two sheets upon which said encoded pattern is recorded.

4,838,405

COIN CHECKING DEVICE FOR DISCRIMINATING DENOMINATION OF A COIN AND DETECTING A COIN ABNORMALITY

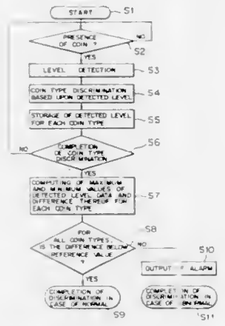
Toyoki Kimoto, Urawa, Japan, assignor to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1987, Ser. No. 137,373

Claims priority, application Japan, Dec. 29, 1986, 61-200869[U]

Int. Cl.[4] G07D 5/00

U.S. Cl. 194—318 **4 Claims**



1. A coin checking device for discriminating demonination of coins and detecting a coin abnormality, said coin checking device comprising:

magnetic detecting means for detecting magnetic characteristics of each coin introduced into the coin checking device,

coin sorting means for comparing a level signal denoting the magnetic characteristics detected by said magnetic detecting means for each coin against a predetermined sorting reference level zone for each denomination of coins and storing said level signal in accordance with the determined denomination of each coin,

differential calculating means for finding a maximum value and a minimum value of said level signals stored in said coin sorting means for each denomination of coin and determining a difference between said maximum value and said minimum value of said level signals for each denomination of coins, and

coin abnormality detecting means for comparing said difference between said maximum value and said minimum value of said level signals for each denomination of coins against a different predetermined abnormality reference value for each of the denominations of coins and judging an abnormality of the coins for a particular denomination of coins when said difference between said maximum value and said minimum value of said level signals in said particular denomination is greater than said abnormality reference value for said particular denomination.

4,838,406

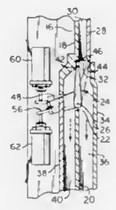
COIN DIVERTING ASSEMBLY

Joseph L. Levasseur, Chesterfield, Mo., assignor to Coin Acceptors, Inc., St. Louis, Mo.

Continuation of Ser. No. 922,830, Oct. 22, 1986, abandoned, which is a continuation of Ser. No. 659,368, Oct. 10, 1984, abandoned. This application Aug. 16, 1988, Ser. No. 233,887

Int. Cl.[4] G07F 1/04

U.S. Cl. 194—346 **14 Claims**



3. A coin divertor assembly comprising:

(a) a body defining a coin-entry path and first and second coin-exit paths,

(b) a divertor member mounted to the body and movable between a first, coin diverting stable equilibrium position leading from the coin-entry path to the first coin-exit path and a second coin-diverting stable equilibrium position leading from the coin-entry path to the second coin-exit path,

(c) holding means providing a holding force acting on the divertor member and tending to maintain the divertor member in a position of stable equilibrium, and

(d) impulse actuating means selectively providing alternately first and second short duration impulse forces succeeding each other, the first impulse force overcoming the holding force and moving the divertor member from the first position of stable equilibrium to the second position of stable equilibrium and the second impulse force overcoming the holding force and returning the divertor member to said first position, the holding force holding the divertor member in each of said first and second positions between said short duration impulse forces.

4,838,407

HARNESS-RECEIVING APPARATUS

Katsumi Komuro, Tokyo, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

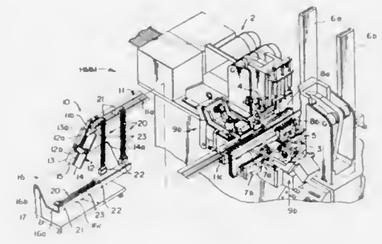
PCT No. PCT/US88/00184, § 371 Date Sep. 12, 1988, § 102(e) Date Sep. 12, 1988, PCT Pub. No. WO88/06354, PCT Pub. Date Aug. 25, 1988

PCT Filed Jan. 20, 1988, Ser. No. 288,643

Claims priority, application Japan, Feb. 20, 1987, 62-024064

Int. Cl.[4] B65G 47/24

U.S. Cl. 198—406 **5 Claims**



1. A harness-receiving apparatus for receiving an assembled electrical harness comprising a plurality of electrical wires connected at respective ends thereof to electrical connectors and fed from a harness-making machine (HMM), said apparatus including a first, generally horizontal, carrier rail positioned with respect to the harness-making machine (HMM) having a channel in which one connector of the connectors is received and moved therealong while the other connector hangs down during movement of the harness along the first carrier rail, and a second carrier rail at an outer end of the first carrier rail and directed downwardly with respect to the first carrier rail so that the one connector is transferred from the first carrier rail to the second carrier rail while the other connector continues to hang down during the movement of the one connector and the harness along the second carrier rail, and the harness-receiving member positioned below the second carrier rail for receiving the harness from the second carrier rail and arranging the harness in the direction of the second carrier rail.

4,838,408

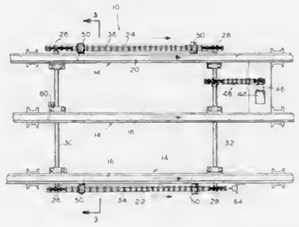
VENEER STRAIGHTENER

Philip E. Brawn, Eugene, Oreg., assignor to Brawn-Cardin Mill Equipment Manufacturing, Inc., Eugene, Oreg.

Filed Jun. 6, 1988, Ser. No. 202,814

Int. Cl.[4] B65G 47/26

U.S. Cl. 198—434 **5 Claims**



1. An apparatus for straightening the orientation of skewed sheets of veneer being transported by conveyor means, in combination with the conveyor means, which comprises:

a. conveyor means, having a forward moving surface upon which sheets of veneer are transported, wherein the conveyor means are operating at a first speed and the direction of movement of the conveyor means corresponds to the forward edge of the sheets of veneer;

b. veneer sheet restraining means formed to engage the forward edge of the sheets of veneer at spaced locations, a line extending between the spaced locations of engagement being transverse to the direction of movement of the conveyor means; and to move in the same direction of movement as the conveyor means but at a second speed, the second speed of the restraining means being slower than the first speed of the conveyor means;

c. said veneer sheet restraining means comprising:

two parallel endless chains outwardly flanking the conveyor means, the parallel endless chains each being mounted between an idler sprocket and a drive sprocket, the two drive sprockets being mounted on a common powered shaft; and a first pair of upwardly projecting lugs, a lug being attached at a common transverse location on each of the parallel endless chains, so as to, when moving forward adjacent to the forward moving surface of the conveyor means, extend above the forward moving portion of the conveyor means so as to engage the leading edge of the sheets of veneer moving on the conveyor means; wherein, with a sheet of veneer proceeding at an angular or skewed position with respect to the direction of movement of the conveyor, the forward edge of the skewed sheet will engage one lug before the other lug, so that the portion of the sheet of veneer engaging the first engaged lug will be slowed to the speed of said first engaged lug and the sheet of veneer will pivot about said first engaged lug until the forward edge also engages with the other lug; whereat the forward edge of the sheet of veneer will be at a right angle to the direction of travel of the conveyor and therefore squared with its direction of movement on the conveyor; the lugs, upon reaching a sprocket, will move from the plane of, and disengage from, the sheet of veneer, and the squared sheet of veneer will continue onward at the speed of the conveyor means;

switch means which comprise a first switch to be triggered by a sheet of veneer on the conveyor means approaching the veneer straightener, said first switch initiating power drive means, through the powered shaft, drive sprockets and endless chains, to move the pair of extending lugs forward at the said second speed; and a second switch positioned to be triggered by the passing of a lug, said second switch terminating said power drive means; and

a second pair of lugs which are positioned on the endless chains midway around said endless chains, there thus being two equally spaced lugs on each endless chain; so that, when the second switch terminates the movement of the endless chains, the second set of lugs is stopped at a starting position relative to the first switch for use with a succeeding skewed sheet of veneer.

4,838,409

SCRAPER DEVICE FOR CONVEYOR BELTS

Albert Rappen, Mülheim/Ruhr, Fed. Rep. of Germany, assignor to VSR Engineering GmbH Fordertechnik, Fed. Rep. of Germany

Filed Mar. 2, 1987, Ser. No. 20,590

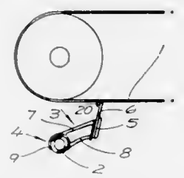
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608193

Int. Cl.[4] B65G 45/00

U.S. Cl. 198—497 **4 Claims**

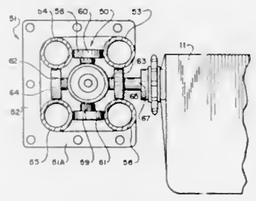
1. A scraper device for a conveyor having an upper and a lower reach, comprising a bearing axle adapted to be supported below the lower reach, a blade holder having an intermediate resilient arm portion, said holder having a hub portion adjacent one end of said resilient arm portion engageable with said bearing axle and a blade holder member adjacent the

opposite end of said resilient arm portion said blade holder member and disposed in a substantially vertically extending orientation, said blade being held against said lower reach at an angle of no more than 10° from a perpendicular to said lower



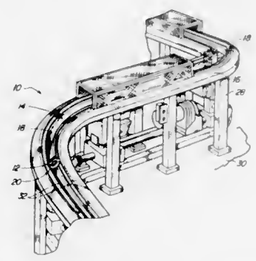
reach, said resilient arm portion comprising spaced apart substantially parallel rods of resilient material, said resilient intermediate arms portion comprising upper and lower chords formed of spring steel rods, said blade holder member comprising a single part having said steel rods embedded therein.

4,838,410
CHAIN AND CHAIN TRACK FOR ROTATING CONVEYOR BUCKET
George T. Gough, Charlotte, N.C., assignor to REFAC International, Limited, West Palm Beach, Fla.
Filed Jun. 11, 1987, Ser. No. 60,604
The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.
Int. Cl.[4] B65G *17/30*
U.S. Cl. 198—706 **5 Claims**



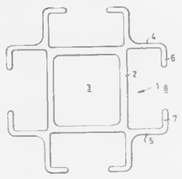
1. A bucket conveyor comprising:
(a) a plurality of buckets;
(b) a chain on which the buckets are mounted in series;
(c) a chain track on which the chain is mounted for linear movement thereon;
(d) drive means for moving the chain whereby buckets are moved along a circuitous conveyor path between at least one bucket filling station and at least one bucket emptying station, said drive means comprising at least one 90 degree drive tension sprocket around which the chain passes in making at least a 90 degree turn; and
(e) bucket rotating means for rotating the buckets around the longitudinal axis of movement of the chain from the inside of the circuitous path of the chain to the outside of the circuitous path of the chain in advance of said drive tension sprocket and from the outside of the circuitous path of the chain to the inside of the circuitous path of the chain after each bucket has passed the drive tension sprocket, said bucket rotating means comprising a continuous, twisted track section in said chain track in advance of said drive tension sprocket and a second twisted continuous track section after said drive tension sprocket.

4,838,411
LIFT AND CARRY ACCUMULATING CONVEYOR
Frank W. Rainey, and Harvey R. Clement, both of Holly, Mich., assignors to Excel Corporation, Fenton, Mich.
Filed Jan. 11, 1988, Ser. No. 142,444
Int. Cl.[4] B65G *25/00*
U.S. Cl. 198—774 **8 Claims**



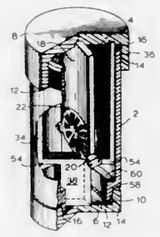
1. A conveyor comprising:
a frame having a pair of elongated, spaced apart and parallel stationary rails,
a pair of elongated, spaced apart and parallel movable rails,
means for mounting said movable rails to said frame so that said movable rails are movable between a forward and a retracted position and between an upper and a lower position and so that said movable rails extend generally parallel to said stationary rails,
a shaft rotatably mounted to said frame,
means for rotatably driving said shaft,
first means mechanically coupled to said shaft for sequentially moving said movable rails between said upper and lower position, and
second means mechanically coupled to said shaft for sequentially moving said movable rails between said forward and said retracted positions,
said second moving means includes a disk mounted to said shaft so that the axis of the disk is oblique with respect to the axis of said shaft.

4,838,412
CONVEYOR
Ralf Backman, Eksjö, Sweden, assignor to Wamac AB, Sweden
Filed Dec. 9, 1987, Ser. No. 130,421
Claims priority, application Sweden, Jan. 23, 1987, 8700262
Int. Cl.[4] B65G *15/60*
U.S. Cl. 198—838 **7 Claims**



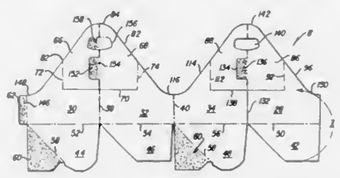
1. A rail for guiding a chain, comprising a plurality of prefabricated rail modules detachably connected together, and each module comprising a section with a quadratic, quadrilateral, hollow cross section with four sides and having a respective guide for receiving a chain therein located on each of its four sides.

4,838,413
CONTACT LENS DISINFECTION CASE WITH LOCKING MECHANISM
Martin Monestere, Kendall Park, N.J., assignor to Allergan, Inc., Irvine, Calif.
Filed Sep. 21, 1987, Ser. No. 99,188
Int. Cl.[4] A45C *11/00*
U.S. Cl. 206—5.1 **14 Claims**



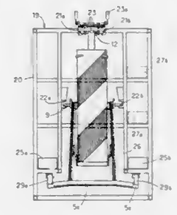
1. A contact lens disinfection case, which comprises:
a fluid-tight housing, the housing having two open ends and first and second end caps removably mounted on the open ends;
means for removably supporting a contact lens in the housing; and
means for selectively locking the first end cap to the housing and for preventing the removal thereof when the second end cap is mounted on the housing, said locking means being formed as an elongate member having a first end adapted to engage the first end cap, and an opposite second end adapted to engage the second end cap, the first end being in engagement with the first end cap when the first and second end caps are mounted on the open ends of the housing.

4,838,414
BASKET CARRIER AND INTERNESTING BLANKS THEREFOR
Stephen M. Blackman, Westmont, Ill., assignor to Federal Paper Board Company, Inc., Montvale, N.J.
Continuation-in-part of Ser. No. 940,617, Dec. 11, 1986, Pat. No. 4,782,943. This application Jul. 9, 1987, Ser. No. 71,300
Int. Cl.[4] B65D *5/46*
U.S. Cl. 206—175 **17 Claims**



10. A blank for a basket-like carrier, said blank comprising a lower portion, an intermediate portion and an upper portion, said lower portoin being in the form of a plurallty of bottom forming panels and flaps, said intermediate portion being in the form of a plurality of body forming panels, and said upper portion being in the form of a plurality of handles for defining a combined separator and handle structure, said handles including two sets of handles joined togther, each set of handles including two of said handles joined together along a fold line, the configuration of the space between said sets of handles corresponding to the configuration of each of said sets of handles.

4,838,415
FOLDABLE TEMPORARY ROADMARKERS AND CONTAINERS FOR STORING AND/OR TRANSPORTING SAME
Jean M. Rebecq, Toulon, France, assignor to Societe Civile Pour La Realisation D'Inventions Techniques—S.C.R.I.T., Toulon, France
Filed May 19, 1987, Ser. No. 52,607
Claims priority, application France, Jun. 5, 1986, 86 08247
Int. Cl.[4] B65D *77/00*
U.S. Cl. 206—216 **5 Claims**



1. A container for storing foldable roadmarkers, comprising a flat panel which is mounted on a foldable support comprising two pairs of feet, each pair being composed of two feet articulated together and located respectively in two vertical planes, perpendicular to the plane of said panel and located respectively on either side of said panel, wherein at least one of the two feet of each pair is articulated about a transverse rod which slides freely in two vertical slots cut out along the two vertical edges of said panel and which projects on both sides of said panel and wherein said panel is extended upwardly by a bar bearing a transverse handle, which container comprises, in its upper part, at least one pair of horizontal and longitudinal rails of which the spaced apart relationship is slightly greater than the length of the handles of the roadmarkers which slide in said rails, and it comprises at least one pair of horizontal and longitudinally slideways of which the spaced apart relationship is slightly greater than the length of the transverse rods of said roadmarkers which slide in said slideways and the height between said rails and said slideways is equal to the height between the handle and the upper ends of the slots of said roadmarkers.

4,838,416
GOLF CLUB HOLSTER
Edward R. Carman, Rte. 1, Box 518, Garden Rd., Elmer, N.J. 08318
Filed Jan. 11, 1988, Ser. No. 142,518
Int. Cl.[4] B65D *85/20*
U.S. Cl. 206—315.2 **6 Claims**

1. A holster for a golf club comprising:
tubular means for containing and protecting a golf club shaft portion and grip portion,

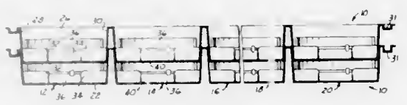
open contoured means for receiving and protecting a golf club head portion extending from the tubular means, and hook means attached to the open contoured means for securing to a golf bag.

4,838,417

STORAGE PACK COMPRISING AT LEAST TWO STACKED AND NESTED TRAYS EACH LOADED WITH A PLURALITY OF SEMI-CIRCULAR SPLIT RING BEARING HALVES

Thomas M. Jeruzal, Brighton, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.

Filed Aug. 18, 1988, Ser. No. 233,393
Int. Cl.[4] B65D 85/58
U.S. Cl. 206—318 **3 Claims**



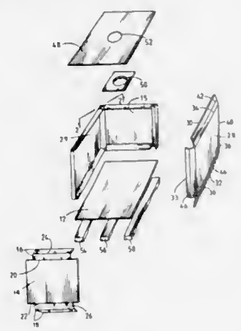
1. A storage pack comprising at least two stacked and nested trays each loaded with a plurality of semi-circular split ring bearing halves, each tray including a plurality of elongated compartments each comprising a bottom wall from which extends a pair of upstanding oppositely disposed end walls and a pair of upstanding oppositely disposed side walls, the compartments being arranged in a row in side-by-side relationship, the upper edges of the side walls of each pair of adjacent compartments being connected, each compartment having a row of spaced apart upstanding ribs on the bottom wall thereof adjacent each side wall, each rib in each row being oppositely disposed with respect to a rib in the other row, each rib extending inwardly of the compartment from the adjacent side wall and angled towards one end wall of the compartment to define a herringbone structure, the ribs being of substantially less height than the side and end walls of each compartment and of less height than the width of the bearing halves loaded in the tray, the side and end walls of each compartment being of greater height than the width of the bearing halves loaded in the tray, the bearing halves being loaded in the tray compartments with one side edge thereof resting on a bottom wall with the concave surface thereof facing the other of said end walls of the compartment and with a pair of oppositely disposed ribs being present between each pair of adjacent bearing halves, the side and end walls of each tray compartment being angled inwardly of the compartment to facilitate stacking of one tray on top of another with superadjacent compartments nesting within subjacent compartments, the trays being so stacked and nested with the bottom walls of superadjacent compartments resting on and supported by the bearing halves loaded in the subjacent tray compartments.

4,838,418

HAZARDOUS WASTE CONTAINER

Norman J. Teixeira, Santa Maria, Calif., assignor to Teixeira Farms, Inc., Santa Maria, Calif.

Continuation-in-part of Ser. No. 54,017, May 26, 1987, Pat. No. 4,756,417. This application Jun. 10, 1988, Ser. No. 204,702
Int. Cl.[4] B65D 19/06, 19/20, 85/84
U.S. Cl. 206—386 **3 Claims**



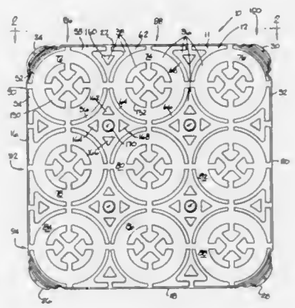
1. A container for hazardous waste, comprising:
a bottom consisting of a flat rectangular sheet of corrugated board;
a top including a flat rectangular sheet of corrugated board;
two ends, each including a flat generally rectangular sheet of corrugated board having flaps extending from its upper and lower edges, said flaps folded twice in the same direction parallel to the upper edge and lower edge, respectively to form upper and lower laterally-extending shoulders of triangular cross section extending along the upper and lower edges;
two sides; each including a flat generally rectangular sheet of corrugated board having flaps extending from its upper, lower, left and right edges, each of said flaps folded twice in the same direction parallel to the edge it extends from to form upper and lower laterally-extending shoulders of triangular cross section extending along the upper and lower edges and to form vertically-extending shoulders of triangular cross section extending along the left and right edges;
said two ends and said two sides all being of the same height, the left and right edges of said ends overlapping the vertically extending shoulders of said sides and affixed to them, said bottom affixed to the lower laterally-extending shoulders of said two sides and of said two ends, said top affixed to the upper laterally-extending shoulders of said two sides and of said two ends to form a container having an inside surface and an outside surface; and,
a layer of resin impregnated with glass fibers covering said inside surface and said outside surface, whereby said container is strengthened, rendered watertight, and rendered impervious to chemical attack by said hazardous waste.

4,838,419

KEG BOARD

Ferdinand Weits, Westminster; William F. Mekelburg, Arvada, both of Colo., and Marc R. Latour, Lafayette, Calif., assignors to Adolph Coors Company, Golden, Colo.

Filed Mar. 18, 1987, Ser. No. 27,266
Int. Cl.[4] B65D 71/00
U.S. Cl. 206—386 **14 Claims**



1. A keg board for use in stacking beer kegs and the like in an upright orientation during storage and transportation of the kegs comprising:
(a) a generally planar surface for engaging and supporting a generally planar end surface of each keg;
(b) pocket means operatively associated with said planar surface for limiting relative lateral shifting movement of said kegs such as caused by shocks and vibration associated with transporting of said kegs;
said keg boards being constructed from two identical plastic sheets, each sheet having planar surfaces on opposite sides thereof, each sheet having a plurality of projecting portions thereon projecting outwardly from one of said planar surfaces and inwardly from the other, said planar surfaces of said two sheets from which said projecting portions project inwardly being adhered together in abutting mirror image relationship whereby the keg board is provided with identical outwardly projecting configurations on opposite exposed surfaces thereof, said outwardly projecting configurations defining said pocket means.

2. A keg board for use with beer kegs and the like of the type having a circular recess in opposite end portions thereof defining ring-shaped, generally planar keg support surfaces, for use in stacking the kegs in an upright orientation during transportation and storage comprising:
a first formed sheet of high density, high molecular weight, weather resistant, ultraviolet radiation resistant, relatively thin, flexible, plastic material;
said sheet having a generally rectangular shape defined by four generally linear peripheral edge portions and four corner portions and having a front side surface and a back side surface;
said formed sheet comprising a flat portion and a plurality of projecting portions, said projecting portions defining a plurality of outwardly extending raised portions on said front side surface and a plurality of corresponding recessed portions on said back side surface;
said projecting portions comprising a plurality of pocket forming projections arranged in a plurality of generally ring-shaped configurations, said ring-shaped pocket configurations each comprising an interior diameter slightly larger than the exterior diameter of an end portion of one of said kegs, said ring-shaped pocket configurations being arranged in a rectangular gridwork of closely spaced rows and columns which are separated by a sufficiently small distance to prevent kegs received in said pocket configurations from being separated by a distance of more than one inch;
each of said ring-shaped pocket configurations being provided by four arcuate projecting portions each having a projection height of approximately 0.4 inches and a projection width of between approximately 0.4 inches and approximately 1.3 inches and having upper rounded shoulders having a radius of approximately 0.2 inches which are adapted to facilitate seating of a keg in an associated pocket, said four arcuate projecting portions defining each ring-shaped pocket configurations being separated by relatively small circumferential gaps of sufficient dimension to enable drainage of moisture from an area of sad flat portion of said sheet which is circumscribed by said four arcuate projecting portions;
said plurality of projecting portions of said sheet further comprising a plurality of pocket interior stiffening portions positioned within each of said ring-shaped pocket configurations and adapted to stiffen said sheet of material, said pocket interior portions being positioned in centered relationship within said ring-shaped pocket configurations and having projection diameter adapted to be positioned within said recess portion of a keg received within an associated pocket and having a projection height approximately equal to said projection height of said pocket forming projections;
said plurality of projecting portions further comprising plurality of pocket exterior stiffening portions having a projection height approximately equal to the height of said pocket forming projections and positioned within areas of said sheet between said ring-shaped pocket configurations and adapted to further stiffen said sheet;
said plurality of projecting portions further comprising corner shock absorber forming projecting portions comprising three concentric arcuate-portions arranged symmetrically about an axis bisecting an associated corner portion and having an arc which is concave toward the center of said sheet, each of said concentric arcuate portions comprising a projection height approximately equal to the height of said pocket forming projection and having a rounded top portion having a radius of approximately 0.2 inches, said concentric arcuate portions being positioned approximately 0.3 inches apart;
said projecting portions of said sheet being constructed and arranged to provide gaps within all flat areas enclosed by said projections for enabling drainage of moisture from all areas of said sheet;
said corner portions of said sheet comprising a plurality of inwardly projecting curved edge portions adapted to facilitate stacking of the sheets.

8. A keg board and keg assembly comprising:
(a) a plurality of kegs of the type having circular end portions defining generally planar keg support surfaces for use in stacking the kegs in an upright orientation during transportation and storage;
(b) a first formed sheet of high density, high molecular weight, weather resistant, ultraviolet radiation resistant, relatively thin, flexible, plastic material;
said sheet having a generally rectangular shape defined by four generally linear peripheral edge portions and four corner portions and having a front side surface and a back side surface;
said formed sheet comprising a flat portion and a plurality of projecting portions, said projecting portions defining a plurality of outwardly extending raised portions on said front side surface and a plurality of corresponding recessed portions on said back side surface;
said projecting portions comprising a plurality of pocket forming projections arranged in a plurality of generally ring-shaped configurations, said ring-shaped pocket configurations each comprising an interior diameter slightly larger than the exterior diameter of an end portion of one of said kegs, said ring-shaped pocket configurations being arranged in a rectangular gridwork of closely spaced rows

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and columns which are separated by a sufficiently small distance to prevent kegs received in said pocket configurations from being separated by a distance of more than one inch at the maximum diameter of the kegs;

said plurality of projecting portions of said sheet further comprising a plurality of stiffening portions having a projection height approximately equal to said projection height of said pocket forming projections and adapted to stiffen said sheet of material.

14. A keg board for use in a stacking beer kegs and the like in an upright orientation during storage and transportation of the kegs comprising:

(a) a generally planar surface for engaging and supporting a generally planar end surface of each keg;

(b) pocket means operatively associated with said planar surface for limiting relative lateral shifting movement of said kegs such as caused by shocks and vibration associated with transporting of said kegs;

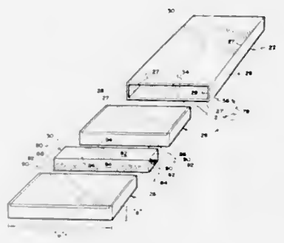
(c) peripheral shock absorbing means for absorbing shocks associated with dropping of the keg board on a peripheral edge portion thereof such as is often encountered during collection and stacking of keg boards subsequent to unloading of kegs therefrom, said peripheral shock absorbing means comprising a plurality of concentric arcuate projections located at at least one peripheral portion of said keg board; each of said concentric arcuate projections providing a resiliently collapsible bellows chamber; each of said bellows chambers formed by said concentric arcuate projection comprising a vent passageway for venting air within said bellows chamber to the atmosphere for enabling shock absorbing collapse of the associated bellows chamber in response to a compressive shock.

4,838,420

PACKAGING FOR POINT OF SALE DISPLAY, SHIPMENT AND STORAGE OF CASSETTE RECORDINGS AND METHODS

Michael F. Collett, Kaysville, and Peggy J. Rankin, Kearns, both of Utah, assignors to Bonneville International Corporation, Salt Lake City, Utah

Filed Sep. 24, 1987, Ser. No. 100,511
Int. Cl.[4] B65D *85/672*
U.S. Cl. 206—387 3 Claims



1. An assembly for point of sale display, shipment and retrievable storage of cassette recordings comprising:

open ended external substantially rectangular sleeve means of sheet material comprising exposed exterior surface means comprised of opposed side wall means and opposed front and rear wall means, and a hollow interior within the wall means between an opening at each end the opening at each end being defined by end edges of the opposed side, front and rear wall means disposed in a common plane, at least some of the exposed exterior surface means of the sleeve means comprising identifying indicia visually observable both when the assembly is displayed at a point of sale and after sale when vertically placed on one of the end edges in library-like storage;

cassette recording means;

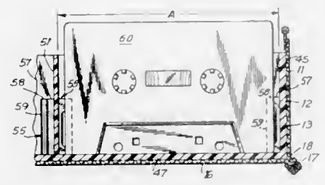
cushion insert means having a cross-sectional configuration substantially duplicative of the cross-section configuration of the hollow interior of the sleeve means, the cushion insert means being dimensioned to linearly slide into the hollow interior of the sleeve means through one of the end openings by manual force but comprising means creating a snug assembled relation between the cushion insert means and the sleeve means prohibiting inadvertent separation, the cushion insert means further comprising means contiguously engaging the cassette recording means when the cassette recording means are placed within the sleeve means whereby the cassette recording means may not be inadvertently removed from the sleeve means, the cushion insert means being located centrally within the sleeve means and the cassette recording means comprising at least two boxes each containing a cassette recording, one of which is snugly received through one end opening of the sleeve means so as to be exposed at said one end opening and the other being snugly received through the other end opening of the sleeve means so as to be exposed at said other open end, the cushion insert means being centrally interposed between the two cassette recording boxes.

4,838,421

MULTIPLE USE CASSETTE CARRYING CASE

Patrick Mastronardo, Stamford, Conn., assignor to Lebo Peerless, Inc., Bloomfield, N.J.

Continuation of Ser. No. 868,265, May 29, 1986, abandoned.
This application Jan. 3, 1989, Ser. No. 293,568
Int. Cl.[4] B65D *85/672*
U.S. Cl. 206—387 26 Claims



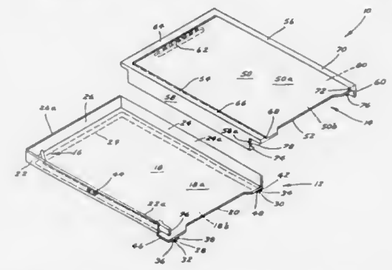
1. A multiple use cassette carrying case comprising; a fabric case having a bottom wall and sides forming a recess, and a rigid molded plastic tray having sides and a bottom wall connecting the sides, wherein the case fabric grippingly frictionally engages the tray sides, and the tray being removably insertable in the recess, said tray being formed with means for receiving magnetic tape enclosures, whereby with the tray inserted in the case, the case is self-supporting and is useful in carrying said tape enclosures, and with the tray removed, the case is useful for carrying other objects in the recess, and the removed tray is independently useful for magnetic tape enclosure storage, said fabric case further comprising a fabric cover integrally formed with one fabric side, and further comprising a piece and means to connect the piece to the fabric cover, and said cover being formed with an opening so that the cover and second piece form a pocket and further comprising a zipper for closing the pocket, whereby with the tray inserted there is magnetic tape enclosure storage in the tray and a multiple use pocket, and with the tray removed, there is a recess and a pocket for multiple use and a separate tray for independent magnetic tape enclosure storage.

4,838,422

DATA STORAGE CONTAINER

Barry Gregerson, Shorewood, Minn., assignor to Empak, Inc., Chanhassen, Minn.

Filed Nov. 23, 1987, Ser. No. 124,285
Int. Cl.[4] B65D *85/30*
U.S. Cl. 206—444 5 Claims



1. An open-ended data storage container for storage of a disk cartridge comprising:

a. package top having two flexible opposing sides, each including inwardly extending and tapering lip portions;

b. package bottom having two opposing sides adapted to engage between the sides of said package top and tapered so as to be retained by said lip portions; and,

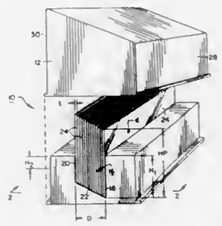
c. flexible retainer means including ejector spring affixed to said package bottom and further including an annular deflectable end portion for engaging the back wall of an inserted disk cartridge, and a movable catch portion for engaging and retaining an inserted disk cartridge.

4,838,423

CONTAINER FOR THIN GLASS PLATES

Irwin S. Lerner, Orange, Conn., and Thomas J. Babbitt, York, Me., assignors to Manufacturers Hanover Trust Company, New York, N.Y.

Filed Apr. 30, 1987, Ser. No. 44,207
Int. Cl.[4] B65D *85/48*
U.S. Cl. 206—454 21 Claims



1. A storage, shipping and dispensing container for a plurality of pieces of cover glass comprising:

a plurality of substantially identical size pieces of cover glass disposed adjacent each other within said container;

a base portion having at least one well for receiving said plurality of pieces of cover glass, said well having front wall, a back wall and a pair of side walls and having a single substantially planar bottom surface disposed at an acute angle with respect to a plane perpendicular to the vertical plane of said pieces of cover glass placed in said well so as to allow all of said adjacent pieces of cover glass to extend above adjacent pieces to facilitate removal thereof by the fingers of a user;

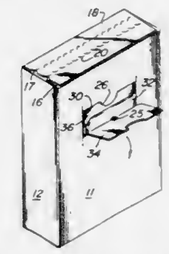
a top cover mating with said base portion whereby completely enclosing said pieces of cover glass.

4,838,424

CARTON STRUCTURE FOR FORMING LINED CARTON WITH INTERIOR INSERT

George D. Petzelt, Montgomery, Ohio, assignor to American Packaging Corporation, Philadelphia, Pa.

Filed Oct. 8, 1987, Ser. No. 105,918
Int. Cl.[4] B65D *5/42*
U.S. Cl. 206—459 11 Claims



1. A flat container structure in knocked-down form adapted to be squared-up for forming a lined carton comprising:

a blank having an upper end and a lower end and including a pair of opposing sidewalls and a pair of opposing endwalls, said blank being formed into a flattened tubular condition to provide an inner surface including inner surface portions of said sidewalls and said endwalls,

a tubular liner adhered to said inner surface of said blank and extending in opposed relation thereto throughout its extent,

top closure flaps formed at said upper end of said blank,

bottom closure flaps formed at said lower end of said blank,

an insert positioned within the interior of said flattened tubular blank between said inner surface portion of one of said sidewalls and the opposing portion of said liner, and

means for retaining said insert in said position between the blank and the liner while permitting manual removal thereof without opening said liner,

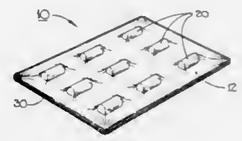
said one sidewall being provided with a thumb notch adapted to form an access opening in said one sidewall.

4,838,425

TAMPER INDICATOR FOR A BLISTER PACKAGE

Denise M. O'Brien, Whippany, and Carlo P. Croce, Leonia, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 17, 1987, Ser. No. 134,342
Int. Cl.[4] B65D *83/04*
U.S. Cl. 206—531 7 Claims



1. A tamper indicator for a package having a base formed with a recess and a rupturable lid positioned thereon for holding articles in the recess and to define a margin therebetween which comprises:

a frangible polyvinylchloride film dimensioned for covering

said base with a periphery of said film overlapping said margin; and

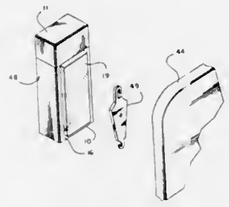
means to secure the periphery of said film to said lid.

4,838,426

COMBINATION OF NEEDLE CASE AND NEEDLE THREADER FOR NEEDLEWORK

Emil J. Dalbo, Tucker, Ga., assignor to Dal-Craft, Inc., Tucker, Ga.

Filed Jan. 11, 1988, Ser. No. 142,660
Int. Cl.[4] B65D *69/00*
U.S. Cl. 206—574 1 Claim



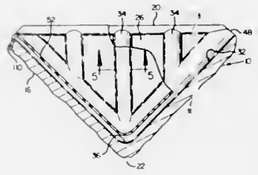
1. In combination a needle case for receiving a plurality of needles for use in needlecraft work, said case including a body defining a neck at one end thereof, a cap receivable over said neck, said body defining a space for receiving said plurality of needles and said neck defining an opening into said space, said cap covering said opening into said space, and a magnet fixed to one side of said body of said needle case, a needle threader including an elongate body and at least one threading member extending therefrom, said needle threader being formed of ferromagnetic material and being received on said magnet, said combination further including a magnet board for holding instructions for use in needlework, said needle case being carried on said magnet board by adherence of said magnet to said magnet board, said needle threader being disposed between said magnet and said magnet board.

4,838,427

SHIPPING PROTECTOR

Richard D. Hurley, 3210 NW. McKinley Dr., Corvallis, Oreg. 97330

Filed Jul. 26, 1988, Ser. No. 224,365
Int. Cl.[4] B29C *49/00, 51/00;* B65D *81/02, 85/30*
U.S. Cl. 206—586 12 Claims



1. A unitary protector adapted for interposition between a shipping container and an object being shipped for spacing said object within said container, comprising:

a plurality of substantially rigid walls joined at first edges thereof to provide an article having an exterior side and an interior side adapted for receiving said object, said article having open second edges between which said object is received,

said walls being indented on said interior side to provide said article with an interior relief including pads adapted for positioning adjacent said object being shipped, and

a layer of resilient plastic material self adhered to the interior of said article and substantially conforming to said interior relief of said article for resiliently receiving said object being shipped between said pads in bearing relation.

4,838,428

OPENING ARRANGEMENT ON PACKING CONTAINERS

Hans Rausing, Wadhurst, Great Britain, assignor to AB PROFOR, Lund, Sweden

Filed Jan. 22, 1988, Ser. No. 147,299
Claims priority, application United Kingdom, Feb. 24, 1987, 8704289
Int. Cl.[4] B65D *3/26*
U.S. Cl. 206—603 15 Claims

1. In packing containers for pourable contents, an opening arrangement comprising:

a pouring pipe joined to a wall of a packing container, said pouring pipe having a side facing toward the packing container, said side having an opening therein;

a slide displaceable relative to said pipe so as to define a closed position and an open position of the opening arrangement, said slide having a tearing component which is movable from a raised position to a lowered position extending through said pipe opening, and opening means on said pipe for engaging said tearing component to displace said tearing component through said pipe opening upon displacement of said slide relative to said pipe, thereby allowing the contents of the container to be poured through said opening and through said pipe.

4,838,429

FLEXIBLE THERMOPLASTIC POUCHES HAVING EASY-OPEN TEAR STRIP MEANS AND APPARATUS FOR MAKING SAME

Eugene Fabisiewicz, Mount Prospect, and Jack R. Fagan, Lindenhurst, both of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Filed Oct. 10, 1986, Ser. No. 918,166
Int. Cl.[4] B65D *17/32*
U.S. Cl. 206—605 12 Claims

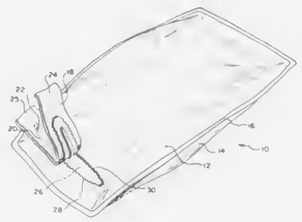
1. A flexible thermoplastic pouch comprising:

(a) an imperforate first sidewall having an outer surface and an inner peripheral edge;

(b) a second sidewall having an inner peripheral edge continuously sealed to said inner peripheral edge of said first sidewall;

(c) tear strip secured to said outer surface of said imperforate first sidewall along at least two securement lines having a substantially W-shaped area of convergence, thereby providing two points of high stress concentration, said tear strip having a single grasping tab connected to both points of high stress concentration; and

(d) whereby intitial manual separation of said single grasping tab from said outer surface of said imperforate first sidewall will rupture at said two points of high stress concentration, and subsequent manual separation of said tear strip from said imperforate sidewall will tear said first sidewall



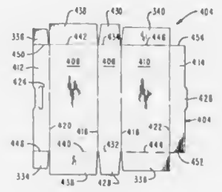
along said securement lines, thereby providing said pouch with a dispensing opening of predetermined size and shape.

4,838,430

SIDE LOADING CARTON

John A. Beeman, Dayton, Ohio; Floyd R. Solt, Garland, Tex.; James L. Leep, Martin, Mich.; Wayne S. Marvin, and Troy F. Smith, both of Kalamazoo, Mich., assignors to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 4,366, Jan. 16, 1987, abandoned. This application May 12, 1988, Ser. No. 195,347
Int. Cl.[4] B65D *5/54*
U.S. Cl. 206—624 6 Claims



1. For use as a side-loading carton, a blank comprising:

a full bottom panel;

a pair of bottom flaps attached to opposite ends of said bottom panel along score lines and having widths equal to that of said bottom panel;

first and second side panels joined to opposite sides of said bottom panel along score lines;

first and second pairs of end flaps attached to said first and second side panels, respectively along a score lines;

an inner partial top panel being narrower in width than said bottom panel and including a slit therethrough;

a pair of top flaps attached by perforated score lines to opposite ends of said inner top panel and having widths equal thereto such that said top flaps are narrower in width than said bottom flaps; and

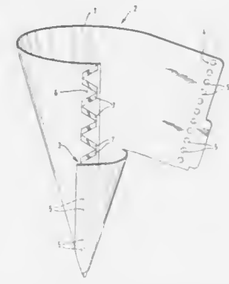
an outer partial top panel being devoid of flaps and having end edges collinear with said score lines of said inner partial top panel, said outer partial top panel including a tab projecting sidewardly therefrom.

4,838,431

PACK, FOR FOOD PRODUCTS IN PARTICULAR

Erich Sanz, Ronsberg, and Erhard Heinz, Kempten, both of Fed. Rep. of Germany, assignors to Unilever Patent Holdings B.V., Rotterdam, Netherlands

PCT No. PCT/EP87/00402, § 371 Date Dec. 4, 1987, § 102(e) Date Dec. 4, 1987, PCT Pub. No. WO88/00909, PCT Pub. Date Feb. 11, 1988
PCT Filed Jul. 25, 1987, Ser. No. 138,196
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1986, 3625220
Int. Cl.[4] B65D *3/26*
U.S. Cl. 206—631 2 Claims



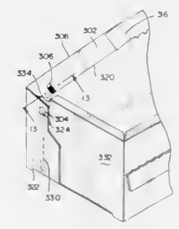
1. A pack for food products including a material having a longitudinal seam defined by two edges of said material positioned to overlap each other with engaging portions, one of said portions being disposed under the other of said portions, one of said portions having a material coated thereon in a zig-zag pattern and the other of said portion having a hotmelt adhesive applied thereto in the form of a plurality of spaced apart spots to thereby provide spaces without an adhesive to thereby diminish the adhesive power of said other of said portions, said material being of a type that diminishes adhesion with said hotmelt adhesive.

4,838,432

CARTON AND BLANK FOR PACKAGING ICE CREAM AND THE LIKE

Richard E. DePaul, Williamsburg, Va., assignor to Somerville Packaging Corporation, Newport News, Va.

Continuation-in-part of Ser. No. 106,877, Oct. 13, 1987, Pat. No. 4,757,902. This application Jun. 7, 1988, Ser. No. 203,122
Int. Cl.[4] B65D *5/54*
U.S. Cl. 206—632 12 Claims



1. A carton for packaging ice cream or the like, comprising:

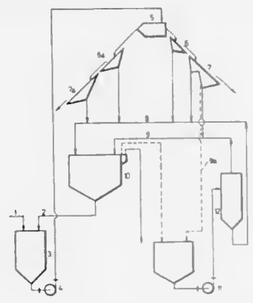
(a) a receptacle, including operably connected front, bottom and rear panels;

(b) said front panel and rear panels each having top, bottom, left and right edges;

(c) said bottom panel having front, rear, left and right edges;
(d) said front panel being operably connected at its bottom edge to said front edge of said bottom panel;
(e) said bottom panel being operably connected at its rear edge to said bottom edge of said rear panel;
(f) a cover including a cover panel having front, rear, left and right edges;
(g) said cover panel being operably connected at its rear edge to said top edge of said rear panel of said receptacle;
(h) said cover further including a closure flap operably connected to said front edge of said cover panel;
(i) means for securing said closure flap to said front panel;
(j) said panels of said receptacle each having left and right end flaps connected to said left and right edges respectively;
(k) said end flaps each having top, bottom, front and rear edges;
(l) said left end flaps of said receptacle and said cover being dimensioned to form a substantially sealed left end of said carton;
(m) said right end flaps of said receptacle and said cover being dimensioned to form a substantially sealed right end of said carton;
(n) at least one of said end flaps of said receptacle and said cover having a breakaway tab means including first and second surfaces;
(o) said first surface of said breakaway tab means being detachably connected to one of said at least one of said end flaps of said receptacle and said cover;
(p) said at least one of said end flaps of said receptacle and said cover including a surface laminate;
(q) said second surface of said breakaway tab means being fixed to the other of said at least one of said end flaps of said receptacle and said cover in order that said breakaway tab means is readily severed from said at least one of said end flaps of said receptacle and said cover upon initial opening of said carton; and
(r) said breakaway tab means extending only through the thickness of said surface laminate of said at least one of said end flaps of said receptacle and said cover.

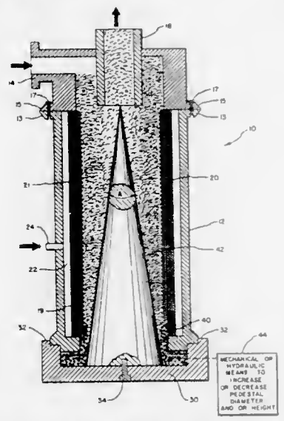
4,838,433
PROCESS FOR THE SEPARATION OF ROCK REFUSE AND COAL PRODUCTS
Gyula Kulcsár, both of Tatabánya, and András Solymos, both of Tatabánya I., Hungary, assignors to Tatabányai Szénbányák, Tatabánya, Hungary
Continuation of Ser. No. 670,113, Jan. 8, 1984, abandoned, which is a continuation of Ser. No. 552,841, Nov. 14, 1983, abandoned, which is a continuation of Ser. No. 423,946, Sep. 27, 1982, abandoned, which is a continuation of Ser. No. 319,375, Nov. 9, 1981, abandoned, which is a continuation of Ser. No. 130,396, Mar. 14, 1980, abandoned. This application Mar. 6, 1987, Ser. No. 22,478
Claims priority, application Hungary Apr. 11, 1979, TA 1516
Int. Cl.[4] B03B *5/34, 5/44*
U.S. Cl. 209—3 **11 Claims**

9. A process for separating a coal containing rock material into a first rock fraction that is rich in coal and into a second rock fraction that is poor in coal, which comprises mixing a starting material consisting essentially of coal-containing rock that contains not more than 50% by weight coal, said starting material having a maximum particle size of 50 mm, and at least 7% by weight of said starting material comprises rock particles having a maximum particle size of 0.5 mm, with a suspension having a preadjusted density, the solids content of said suspension originating entirely from the starting material, introducing the resulting mixture into a hydrocyclone, passing the material obtained from the hydrocyclone through a sieve while separating coal rich and coal poor fractions, respectively, adjusting the suspension flowing through the sieve to have a preselected



density, and then recirculating the suspension to be mixed with new starting material.

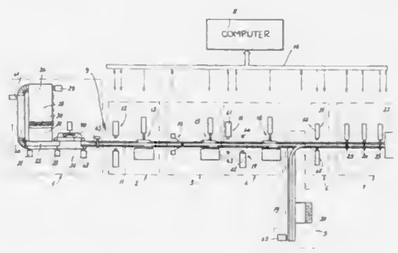
4,838,434
AIR SPARGED HYDROCYCLONE FLOTATION APPARATUS AND METHODS FOR SEPARATING PARTICLES FROM A PARTICULATE SUSPENSION
Jan D. Miller, and Ye Yi, both of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah
Continuation-in-part of Ser. No. 842,697, Mar. 21, 1986, Pat. No. 4,744,890, which is a continuation of Ser. No. 680,613, Dec. 11, 1984, abandoned, which is a continuation of Ser. No. 465,748, Feb. 11, 1983, abandoned, which is a continuatioo-in-part of Ser. No. 323,336, Nov. 20, 1981, Pat. No. 4,397,741, which is a continuation-in-part of Ser. No. 182,524, Aug. 29, 1980, Pat. No. 4,399,027, which is a continuation-in-part of Ser. No. 94,521, Nov. 15, 1979, Pat. No. 4,279,743. This application May 17, 1988, Ser. No. 194,823
Int. Cl.[4] B03D *1/02;* **B04C** *5/103, 5/16*
U.S. Cl. 209—164 **31 Claims**



25. A flotation method for separating particles from a particulate suspension, comprising the steps of:
obtaining a generally cylindrical vessel having a generally circular cross-section and a generally vertical orientation said vessel having an upper portion terminating in an upper end and a lower portion terminating in a lower end, the vessel further having a pedistal extending upwardly from the base of of the pedistal located at the lower end of the vessel to at least one-half of the length of the vessel,

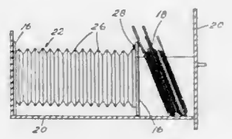
the pedistal having a linearly or non-linearly decreasing diameter going from a maximum diameter at its base to a minimum diameter at its uppermost end and the cross-sectional area of the pedistal being substantially circular at any transverse plane along the pedistal and the diameter of the base of the pedistal being at least half of the diameter of the vessel;
introducing a particulate suspension into the upper portion of the vessel in a generally tangential fashion;
introducing gas into the particulate suspension adjacent a wall of the vessel, the gas forming small bubbles which separate particles from the particulate suspension by flotation, thereby leaving a fluid discharge, the separated particles and bubbles forming a froth within the vessel; and
removing the froth from the vessel.

4,838,435
INSTALLATION FOR PROCESSING PHOTOGRAPH ENVELOPES
Bernard Alexandre, Vienne; Jean-Paul Cornillon, Annonay, and Georges Rollet, Les Cotes d'Arey, all of France, assignors to Societe Inter-Color, Lyons, France
Filed May 25, 1988, Ser. No. 198,805
Claims priority, application France, Jun. 11, 1987, 87 08566
Int. Cl.[4] B07C *5/00, 1/10*
U.S. Cl. 209—555 **6 Claims**



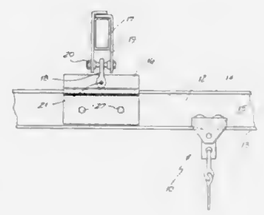
1. An installation for processing of photograph envelopes, at the input and output of a laboratory for processing these photographs, comprising a series of stations in cascade forming a continuous line with:
a device for automatic feeding and picking of envelopes, arranged to provide these envelopes one by one, standing on edge and on their large side, to an advancing conveyor belt;
a device for automatic reading of bar codes carried on the envelope, followed by a device for automatic ejection of unread envelopes;
a device for automatic checking the thickness of the envelopes, followed by a device for automatic ejection of envelopes that are too thick;
a device for automatic recognition of the shape of the films contained in the envelopes, as well as of the characters written on the envelope, followed by a device for automatic ejection of envelopes whose shape has not been recognized and/or whose characters have not been read;
a device for manual inputting and introducing into the line the previously rejected envelopes or envelopes having special characteristics;
a device for automatic marking of the envelopes;
a device for automatic synchronization and feeding of envelopes to a sorting machine; and
computer means for receiving and recording various data coming from the different stations, and consequently providing synchronized orders to these stations.

4,838,436
SELF-ADJUSTING FILE DRAWER FILLERS
Dan H. Bailey, P.O. Box 6488, Chico, Calif. 95927
Filed Jul. 5, 1988, Ser. No. 215,306
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—51 **8 Claims**



1. A self-adjusting file drawer filler for supporting documents in a substantially vertical position, comprising:
a. a thin-walled strip formed by folds into step-like panel segments hingedly attached edge to edge producing a substantially rectangular pleated panel structure with said folds transversely positioned; said folds forming at least six equally sized said panel segments with the first said panel segment and the last said panel segment forming vertical end panels; said pleated panel structure arranged for placement in said file drawer with said panel segments angled in said file drawer and said folds, the transversed edges thereof, substantially horizontally aligned with one of said end panels positioned towards a back wall or a side wall of said file drawer and the other of said end panels positioned towards filed materials as a vertical support therefor;
b. a self-adjustment means.

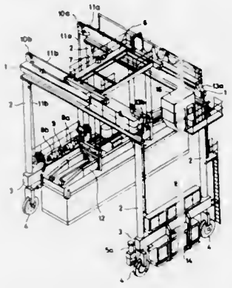
4,838,437
MONORAIL AND FISHPLATE ASSEMBLY
Philip W. Newby, Mona Vale, Australia, assignor to W. R. Carpenter & Co. Ltd., Artarmon, Australia
Continuation of Ser. No. 18,194, Feb. 24, 1987, abandoned. This application Aug. 31, 1988, Ser. No. 240,410
Claims priority, application Australia, Feb. 28, 1986, PH4827
Int. Cl.[4] B66C *19/00*
U.S. Cl. 212—71 **3 Claims**



1. A girder support for a girder having a web with at least one flange extending transverse of the web so as to protrude therefrom, said support comprising a fish plate consisting of a unitary body of "T-shaped" configuration so as to have a base portion and a leg portion terminating at and extending normally from the base portion, said body being provided with a T-shaped recess complementary to the transverse cross section of a girder so as to encompass a flange and web portion thereof to enable removable fixing thereto, said body having a pair of generally parallel coextensive legs, providing said leg portion, and a hollow flange portion extending generally normal thereto and providing said base portion, with the flange por-

tion providing a portion of said recess which encompasses said flange and said legs co-operating to define a further portion of said recess which encompasses said web, a mounting flange extending from said body enabling attachment of the support to a supporting structure, and wherein said body is formed of resilient material so that said legs are resiliently deflectable apart to facilitate installation and removal of the support on the girder by deflection of the legs apart thereby effectively increasing the cross sectional area of said recess.

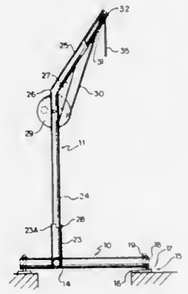
4,838,438
CRANE AND DRIVING SYSTEM THEREFOR
Ryohei Ishige, Hikari, and Kazuo Hanakeyama, Kudamatsu, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 638,422, Aug. 7, 1984, abandoned. This application May 26, 1987, Ser. No. 53,482
Claims priority, application Japan, Aug. 8, 1983, 58-143875
Int. Cl.[4] B66C *13/16*
U.S. Cl. 212—159 1 Claim



1. A steerable crane comprising a crane frame, traveling wheels having rubber tires mounted on respective sides of said crane frame for steerable travelling of the crane, at least one AC hoist motor means for driving a hoist apparatus mounted on said crane frame, at least one AC travel motor means for driving said traveling wheels, a DC generator driven by an engine for generating DC power, at least one inverter means for receiving the DC power and converting the DC power into an AC power of a frequency corresponding to a speed instruction, and for outputting said AC power, and switch means for supplying the AC power from at least said one inverter means, either to said hoist motor means, or to said travel motor means, whereby one motor means is inoperative while the other motor means is operative.

4,838,439
HOIST FOR USE AT A MANHOLE
Morris Baziuk, Box 53, Group 6, R.R. #1, Winnipeg, Manitoba, Canada R3V 1L2
Filed Feb. 16, 1988, Ser. No. 156,030
Claims priority, application United Kingdom, Dec. 11, 1987, 8728994
Int. Cl.[4] B66C *23/18*
U.S. Cl. 212—254 1 Claim

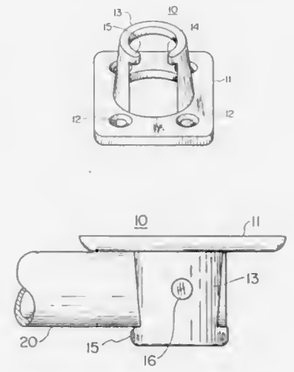
1. A hoist for use with a manhole comprising a substantially planar horizontal base member and a swivel arm member, the base member consisting of a pair of tubular side struts, each side strut having ground engaging means thereon consisting solely of a pair of vertical ground engaging legs arranged at respective ends of the side strut extending downwardly therefrom and mounted thereon for vertical adjustment, each leg having a flat horizontal plate on its lower end, a cross member interconnecting the side struts at a position offset to one side of a center line of the side struts such that a shorter portion of each side strut extends rearwardly of the cross member and a longer portion of each side strut extends forwardly therefrom, the side struts and the cross member lying in a common horizontal plane, each side strut being cranked at the cross member so as to extend forwardly and outwardly therefrom, and a vertically upstanding sleeve welded on the cross member; the swivel arm member consisting solely of a vertical tubular post portion having an outside diameter such that it can be releasably mounted in said sleeve for pivotal movement about a vertical axis, a tubular jib portion welded to the post portion at a fixed acute angle thereto less than 90° so as to extend upwardly and outwardly to one sie of the post portion such that



an outer end of the jib portion is a fixed distance from the sleeve, a hand-operated cable winch mounted on the post portion and a pulley contained within the end of the jib portion remote from the post portion over which a cable from the winch passes to extend downwardly from the end of the jib portion through the base member and into the manhole, the sleeve having an upper edge which has a rebated portion over an arc of the order of 180° and the post portion having a lug projecting radially from an outer surface thereof which cooperates with the rebated portion to restrict the pivotal movement of the post portion to an arc substantially lying forwardly of the cross member.

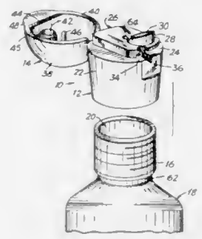
4,838,440
DUAL-POSITION TABLE LEG BRACE
David M. Thompson, 834 Mantoloking Rd., Brick Town, N.J. 08723
Filed Jun. 27, 1988, Ser. No. 213,125
Int. Cl.[4] A47B *3/00*
U.S. Cl. 248—188 3 Claims

1. A bracket for mounting a table leg to the underside of a table top comprising; a molded plastic unit having a base portion, and a tubular pedestal portion extending from said base portion; means for securing said base portion to said under side of said taple top; a table leg having a tubular upper end fitting within said said tubular pedestal portion; said pedestal portion having an opening on one side, and having a fixed pivoting pin extending through said pedestal and said upper end of said table leg, whereby said table leg can be pivoted between a downward position for supporting said table top, and an upward position for storing or carrying said table; a pair of resilient lugs, extending past said opening on either side of the bottom of said pedestal portion, wrapping around said tubular upper end of said table leg to secure it in either said downward



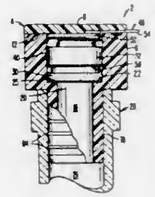
position for supporting said table top or in said upward position for storing or carrying said table.

4,838,441
CHILD RESISTANT CLOSURE
Milton P. Chernack, 399 June Pl., W. Hempstead, N.Y. 11552
Filed Apr. 11, 1988, Ser. No. 180,220
Int. Cl.[4] B65D *55/02*
U.S. Cl. 215—216 16 Claims



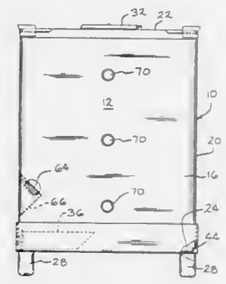
1. A child resistant closure for a container having an opening, said closure comprising:
- a base securable to said container about said opening, said base having an orifice therein communicating with said opening, a first engaging means, and means for fixedly securing the base to a container;
- a cover having a second engaging means engageable with said first engaging means for releasably securing said cover to said base and an inwardly deformable portion which, upon inward deformation, moves said second engaging means outwardly and out of engagement with said first engaging means; and
- a hinge joining said cover to said base;
- said cover being movable about said hinge between a closed position wherein said cover obturates said orifice and wherein said first and second engaging means are engaged, and an open position wherein said orifice is exposed, said cover being movable to said open position by inwardly deforming said deformable portion for disengaging said second engaging means from said first engaging means whereupon said cover may be pivoted about said hinge.

4,838,442
PRODUCT PRESERVING STOPPER
Glenn W. Merry, San Francisco, Calif., assignor to Matsi, Inc., San Francisco, Calif.
Filed Jun. 29, 1988, Ser. No. 212,808
Int. Cl.[4] B65D *85/72*
U.S. Cl. 215—228 16 Claims



1. A product preserving stopper for removing oxygen from the interior of a container, the container having a container opening, the stopper comprising:
- a stopper body having a portion sized to sealably engage the container opening;
- a metal-air primary cell, of the type which produces electricity as it uses oxygen, mounted to the stopper body, the cell having an anode, and a cathode adapted to be fluidly connected to the interior of the beverage container;
- a conductive electrical path between the anode and the cathode so that the cell depletes any oxygen in the interior of the container.

4,838,443
VACUUM DISCHARGE BIN FOR BULK MATERIALS
Gene F. Cripe; Robert W. Luebbe, and Andrew W. Snyder, all of Beatrice, Nebr., assignors to Thomas Conveyor Company, Fort Worth, Tex.
Filed Feb. 4, 1988, Ser. No. 152,150
Int. Cl.[4] B65D *88/54*
U.S. Cl. 220—1 B 2 Claims



1. A bin for storing and transporting bulk material, said bin comprising a hollow body of generally cubic shape having a top wall, front and back walls, side walls and a bottom wall, means forming an inlet opening in said top wall, means forming a discharge opening in said front wall at the juncture thereof with said bottom wall and one of said side walls, said discharge opening being aligned with an internal corner of said bin at the juncture of said back and bottom walls with said one side wall

so that when said bin is tipped upwardly about a generally horizontal axis located to one side of the bin and inclined with respect to said back and one side wall said internal corner is located at an elevation below the remainder of the interior of the bin, said bin being internally structured to provide an unobstructed flow path from all parts of the interior of said bin to said internal corner, a discharge tube in said bin generally parallel to said bottom wall and said one wall and located in close proximity thereto in substantial alignment with said discharge opening, the interior of said bin being unobstructed between said discharge opening and said internal corner so that a suction tube can be directed inwardly of the bin straight through said discharge opening and guided through said discharge tube into said internal corner for fully emptying the bin of its contents.

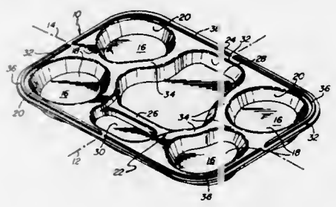
2. A bin for storing and transporting bulk material, said bin comprising a hollow body of generally cubic shape having a top wall, front and back walls, side walls and a bottom wall, means forming an inlet opening in said top wall, and means forming a discharge opening in said front wall at the juncture thereof with said bottom wall and one of said side walls, said discharge opening being aligned with an internal corner of said bin at the juncture of said back and bottom walls with said one wall so that when said bin is tipped upwardly about a generally horizontal axis located to one side of the bin and inclined with respect to said back and one side wall to locate said internal corner at an elevation below the remainder of the interior of the bin, a suction tube can be directed inwardly of the bin straight through said discharge opening and into said internal corner for fully emptying the bin of its contents and a valve housing secured to said front wall and extending into said bin at an angle such that in said tipped position of said bin said housing extends downwardly into said bin, and a selectively movable valve member in said housing movable to an open position enabling samples of the bin contents to be removed through said housing.

4,838,444

FOOD SERVICE TRAY AND ASSEMBLY THEREOF

Vincent J. Bitel, Rockfall, Conn., assignor to The Rogers Manufacturing Company, Rockfall, Conn.

Filed Dec. 29, 1987, Ser. No. 139,280
Int. Cl.[4] B65D *6/12*
U.S. Cl. 220—4 E **13 Claims**



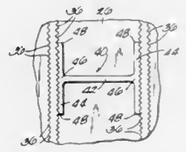
1. A food service tray member comprised of a body divided by a medial axis into generally symmetrical sections, said body having a compartment portion and a peripheral flange portion extending thereabout, said flange portion having a plurality of engagement elements thereon originating in a common reference plane, said compartment portion having depending pockets formed therein and extending outwardly of said reference plane, and said pockets each having a depending peripheral wall and a base wall defining a plurality of compartments within said peripheral portion opening at said reference plane, said engagement elements being of at least two complementary, interengageable forms including elongated ribs projecting upwardly from said plane and elongated recesses extending downwardly from said plane and dimensioned and configured to seat said ribs, each element disposed on one of said sections being transversely aligned with a complementary, interfittable element disposed on the other of said sections, and said complementary elements being equidistantly spaced from said axis, at least one pair of pockets disposed on opposite sides of said medial axis being dimensioned and configured to exhibit mirror image identity to one another, as viewed in said plane, and being equidistantly spaced from said axis and being transversely aligned with one another in each of said sections, whereby said member can be assembled with a second said member inverted thereupon, with said engagement elements being interengaged and said compartments of at least said one pair being in cooperating registry, respectively, with the complementary elements and the compartments of a corresponding pair thereof of the second member, to provide a pair of chambers of regular configuration within the assembly, symmetrical as regarded from the opposite sides of the medial plane of the assembly.

4,838,445

CONTAINER INCLUDING VARIABLE POSITION COMPARTMENT DIVIDERS

Charles A. Lanlus, Prairie Du Sac, Wis., assignor to Flambeau Corporation, Baraboo, Wis.

Filed Feb. 17, 1988, Ser. No. 157,282
Int. Cl.[4] A65D *25/06*
U.S. Cl. 220—22.3 **3 Claims**



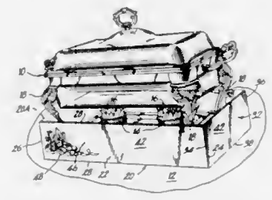
1. A compartmental container comprising a molded plastic container including a bottom and sides, said molded plastic container also including a plurality of spaced apart partitions molded integrally with said container, said integral partitions extending between the sides and defining a plurality of compartments, each of said partitions having opposite faces, at least one of the faces including a plurality of uniformly spaced, generally linear and parallel ribs extending in a direction generally perpendicular to said bottom of said container, and a plastic divider member extending between a pair of said partitions and dividing the compartment into a first compartment portion and a second compartment portion, the divider having opposite ends, one of the opposite ends having a first end flange and a second end flange, said first and second end flanges having an edge integrally joined with said first opposite end, said first end flange and said second end flange extending in generally opposed directions, said first end flange having a first face and said second end flange having a second face, said first face and said second face being in opposed facing relation to one of said faces of said partitions and having a plurality of uniformly spaced, generally linear and parallel ribs adapted to engage the ribs of said one of said faces of said one of said partitions, the other opposite end having a third end flange and a fourth end flange, said third and fourth end flanges having an edge integrally joined with said other opposite end and extending in generally opposed directions, said third end flange having a third face and said fourth end flange having a fourth face, said third face and said fourth face in opposed facing relation to one of said partitions and each having a plurality of uniformly spaced generally linear and parallel ribs adapted to engage the ribs on the face of the other of said partitions, said first and second and third and fourth end flanges each being resiliently flexible and resiliently biased into engagement with said partitions, said divider member being slidable between a retracted position wherein said divider is removed from between said pair of partitions and an inserted position wherein said divider is positioned between said pair of partitions and wherein said ribs prevent slidable movement of said divider in the longitudinal direction of said parallel partitions, and said divider member having a resiliently flexible central wall portion extending between said opposite ends.

4,838,446

WIND SHIELD FOR CHAFING DISH BURNER

George Ali, 25 W. Grand Ave., Montvale, N.J. 07645

Filed Aug. 17, 1987, Ser. No. 86,071
Int. Cl.[4] B65D *47/00*
U.S. Cl. 220—85 R **8 Claims**



1. The combination which includes a chafing dish having a burner and a wind shield for shielding the burner of the chafing dish from spurious drafts which otherwise might extinguish the flame of the burner, the wind shield being capable of nesting with a like wind shield for compact storage and transportation of multiple wind shields, the chafing dish having a longitudinal length and a lateral width and being supported in a position spaced altitudinally above a support surface with the burner placed beneath the chafing dish, and the windshield comprising:

a first wall extending longitudinally and having altitudinally opposed edges extending longitudinally between opposite ends, an obverse surface on the first wall and contiguous with at least one of the opposed edges and a reverse surface on the first wall and contiguous with said one of the opposed edges; and

a second wall extending laterally and having altitudinally opposed edges extending laterally between opposite ends, an observe surface on the second wall and contiguous with at least one of the opposed edges of the second wall and a reverse surface on the second wall and contiguous with said one of the opposed edges of the second wall, said one of the opposed edges of the second wall corresponding to said one of the opposed edges of the first wall;

the first and second walls being joined at confronting ends to establish an integral structure having a generally L-shaped edge configuration, the structure being self-supporting in an erect position resting along corresponding longitudinal and lateral edges upon the support surface with the obverse and reverse surfaces oriented altitudinally such that when the wind shield is in use the walls are placed adjacent the corresponding space between the chafing dish and the support surface and the burner is placed behind the reverse surfaces to be shielded by the walls from the spurious drafts; and

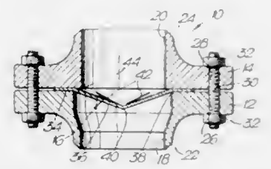
the obverse surfaces, the reverse surfaces and the said ones of the opposed edges of the first and second walls being arranged such that upon said nesting of the wind shield with the like wind shield, the reverse surfaces of one of the nested wind shields will be contiguous with the corresponding obverse surfaces of the other of the nested wind shields for compact storage and transportation of said multiple wind shields.

4,838,447

PRESSURE RELIEF DEVICE WITH CONICAL REVERSE BUCKLING DISC

Karl L. Albracht, Tulsa, Okla., and William J. Walker, Limerick, Ireland, assignors to BS&B Safety Systems, Inc., Tulsa, Okla.

Filed Jun. 29, 1987, Ser. No. 68,110
Int. Cl.[4] B65D *25/00*; F16K *13/04*
U.S. Cl. 220—89 A **28 Claims**



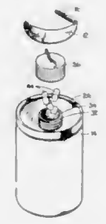
1. A pressure relief apparatus comprising:
inlet support means;
outlet support means; and
reverse buckling rupture means disposed between said inlet and outlet support means and supported thereby, said rupture means comprising a self-supporting conical portion with a tip thereof generally facing said inlet support means.

4,838,448

TAMPER INDICATOR LID

Anthony P. Piano, Sparta, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 30, 1987, Ser. No. 139,878
Int. Cl.[4] B65D *41/32*
U.S. Cl. 220—257 **10 Claims**



1. A tamper indicator cover for an article receptacle which comprises:
a layer having an edge attached to said receptacle and said layer formed with an orifice;
means engageable with said layer to cover said orifice;
a lid having a periphery, said periphery being joined to said edge of said layer; and
means attached to said lid for separating said lid from said layer.

4,838,449

SECTIONAL STORAGE TANKS

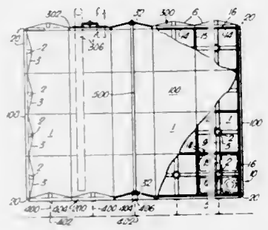
Frank T. Jarnott, Southampton, and Leslie S. Norwood, Rushden, both of England, assignors to Scott Bader Company Limited, Wellingsborough, England

Continuation of Ser. No. 531,824, Sep. 13, 1983, abandoned. This application Oct. 30, 1985, Ser. No. 793,718

Claims priority, application United Kingdom, Sep. 17, 1982, 8226555

Int. Cl.[4] B65D *6/34, 6/00, 88/02*

U.S. Cl. 220—5 A 8 Claims



1. A fluid storage fluid tank having side walls each assembled from a plurality of panels interconnected with one another, each said panel being of hyperbolic paraboloid shape arranged to have its concave surface facing out, and each said panel having lateral edges along which run raised portions which together define a continuous flange and a plurality of spine beams extending essentially from respective mid points of the lateral edges of the panels to a reinforcing boss at a raised central region to provide interconnection between the bosses and flanges within each panel and the adjacent panels being interconnected at their flanges, means for supporting said side walls by applying support to said bosses whereby liquid load of a filled tank on the surfaces of the respective panels is transmissible to the said flanges and spine beams which are in turn, by said support means, capable of distributing the load throughout the tank.

4,838,450

CONTAINER DESIGNED FOR FIZZY DRINKS AND MADE OF HEAT-MOULDED PLASTIC MATERIAL

Luigi Bocchi, via dei Cignoli, 1, 20151 Milano, Italy

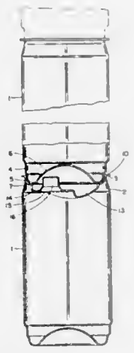
Filed Jun. 25, 1987, Ser. No. 66,856

Claims priority, application Italy, Jul. 3, 1986, 21022 A/86

Int. Cl.[4] B65D *43/03*

U.S. Cl. 220—270 4 Claims

1. A container for a fizzy liquid drink made of polyethylene or polyethylene terephthalate which comprises a heat-sealed cover, a body, a base (6) a pull-off tab, said cover and said base having a convex profile towards the interior of said container and being capable of elastically changing shape under the pressure from the liquid contained therein; said base and said cover having a convex part of a profile essentially of a spherical crown, wherein said convex part of said base is of diameter smaller than the diameter of the body of said container and is connected to said body by means of a portion having the profile of an upper step (4) and a lower step (5), the convex part of said base being connected to the lower step (5) by means of a toroidal area (7) of small curvature, wherein the convex part (13) of said cover is attached to the body of the container by means of an intermediate portion convex towards the interior of the container and having a profile with one upper step (11) and one lower step (12), said cover being attached to the body of the container by means of a flat perimetrical sealing ring (10), wherein said upper step (11) has a form complementary with said step (5) and wherein the convex part



(13) of the cover has a flat area (14) in the plane of the lower step (12), said flat area being the site of said pull-off tab.

4,838,451

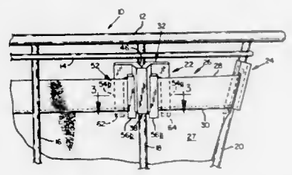
WIRE BASKET WITH FLEXIBLE LINER SECURED BY A CLIP

Nigel J. Arkell, Portland; Brian G. Sartor, Aloha, and David L. Prevost, Portland, all of Oreg., assignors to Leslie Ford Brown, Lake Oswego, Oreg.

Filed Mar. 31, 1988, Ser. No. 176,299

Int. Cl.[4] B65D *90/04*

U.S. Cl. 220—401 10 Claims



1. The combination of:

a basket constructed of interconnecting wire-like rods,

a basket liner of flexible sheet material extending inside said basket, and

a clip securing a portion of said sheet material to said basket which is mounted on a rod of said basket, said clip comprising a body, a channel extending along a side of said body having a channel opening along said side, the rod seating within said channel and the opening being deformable to enable removal of the clip, and gripping means on said body disposed to a side of said channel gripping the sheet material.

4,838,452

SHUTTER SYSTEM FOR ELECTRICAL COMPONENT SUPPLY TAPE FEEDER

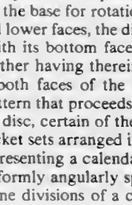
Daniel A. Hamilton, Garland, Tex.; James R. Spowart, Canoga Park, Calif., and Richard Porterfield, Binghamton, N.Y., assignors to Universal Instruments Corporation, Binghamton, N.Y.

Filed Nov. 27, 1987, Ser. No. 127,991

Int. Cl.[4] B65H *5/28, 5/08*

U.S. Cl. 221—1 14 Claims

1. In a method of feeding a tape and presenting pockets in a substrate of said tape to a pick-up station for pick-up of components from said pockets by a vacuum nozzle of a pick-up head wherein said tape has a cover enclosing components in said pockets, said method comprising the steps of: removing said cover from said pockets sequentially in order to provide access to said components at said pick-up station wherein said feeding is a step-wise indexing; and providing a shutter for substantially covering at least one of said pockets and retaining a component therein in preparation for retrieval of said component from said pocket by said vacuum nozzle at said pick-up station, the improvement comprising the steps of:



providing a shutter actuator finger on said pick-up head and a shutter actuating pivotal lever operatively associated with said shutter; and

engaging said finger with said lever in order to effect moving of said shutter from said pocket by said actuator, upon positioning said vacuum nozzle at said pick-up station and during advancing of said vacuum nozzle generally along a normal to a surface of said component for pick-up of said component by said surface, in order to allow retrieval of said component from said pocket while minimizing an amount of time during which said component is uncovered for said retrieval.

4,838,453

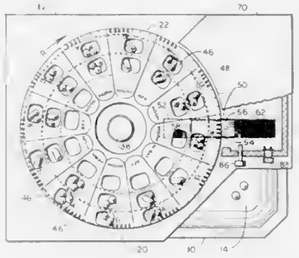
PILL DISPENSER

Jon D. Luckstead, R.R. 2, Bellevue, Iowa 52031

Filed Feb. 16, 1988, Ser. No. 155,789

Int. Cl.[4] B65D *83/04*

U.S. Cl. 221—2 13 Claims



1. A pill and like dispenser, comprising a base having a flat top, a disc carried by the base for rotation about a vertical axis and having upper and lower faces, the disc being superimposed over the base top with its bottom face closely overlying the base top, the disc further having therein a plurality of dosage pockets opening at both faces of the disc and arrayed in a mono-plane spiral pattern that proceeds centrifugally from the center portion of the disc, certain of the pockets comprising a plurality of multi-pocket sets arranged in radially-spaced apart relation, each set representing a calendar day and the pockets in each set being uniformly angularly spaced apart and representing successive time divisions of a calendar day, the time-division pockets of each set corresponding respectively to and lying respectively on the same radii as the time-divisions of the other sets, drive means carried by the base and having a driving connection to the disc for driving the disc at a constant rate and in the direction of centrifugal progression of the spiral, the relationship between the top of the base and the bottom face of the disc being such that a major portion of the top of the base closes the bottoms of the pockets, the base top having therein a radial slot having a width on the order of the lateral dimension of a pocket and extending from an inner end adjacent to the center of the disc to an outer end proximate to the locus of the outermost pocket, the base having an interior receiver portion and the slot opening upwardly to the bottom of the disc and downwardly to the receiver portion, dispensing control means carried by the base and including a slot-blocking gate extending lengthwise of the slot and flush with the top of the base and movable back and forth in the slot, and the control means further including mechanism for moving the gate progressively radially outwardly in the slot as the disc rotates and thereby to uncover the bottoms of the pockets sequentially in accordance with time divisions in a set and days in successive sets.

4,838,454

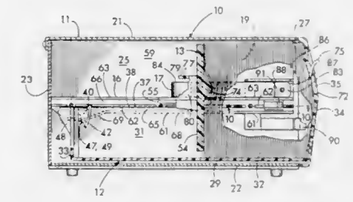
NAPKIN DISPENSER

Ferdinand F. Salzmann, Prairie du Sac, and Gregory J. Wenkman, Middleton, both of Wis., assignors to Traex Corporation, Dane, Wis.

Filed Nov. 2, 1987, Ser. No. 115,116

Int. Cl.[4] A47G *21/16;* B65H *1/02*

U.S. Cl. 221—57 19 Claims



5. A napkin dispenser for receiving, holding and dispensing a stack of folded napkins, the dispenser comprising:

(a) a housing which includes a top, a bottom, a rear and two side walls, and which has an open front;

(b) a drawer for containing the napkins, the drawer including a bottom wall, two side panels joined thereto and a front face panel which is connected to the front of the bottom wall and the side panels, the front panel having an opening through which individual folded napkins may be removed, the drawer side panels including outwardly extending flanges at their upper edges;

(c) a push plate apparatus including a plate for pushing the stack of napkins forwardly toward the opening, two slides which are connected to opposite sides of the plate apparatus and which extend outwardly therefrom, and two horizontal fins which project forwardly from the plate near the opposite sides of the apparatus, the horizontal fins being tapered inwardly and rearwardly so that they guide napkins to be centered in front of the plate;

(d) a pair of unitary molded track members which are each affixed to an interior face of one of the housing walls to extend longitudinally along the side wall, each track member including three inwardly extending flanges which are parallel to the adjacent flanges for most of their length and which form a lower slot and an upper slot, the drawer side panel flanges received in the lower slots to allow the drawer to slide forwardly and rearwardly between the

open position and a closed position where the drawer front panel substantially closes the open front of the housing, the plate apparatus slides received in the upper slots to allow the plate apparatus to slide forwardly and rearwardly within the drawer and to prevent lateral and vertical movement of the plate apparatus; and

(e) at least one spring which biases the plate apparatus to move forwardly.

4,838,455

VENDING MACHINE FOR HEATED FOOD, NOTABLY COOKED FRENCH FRIES

Jean M. M. Hoeberigs, Grote Maagdens raat 45, Sluis, Netherlands

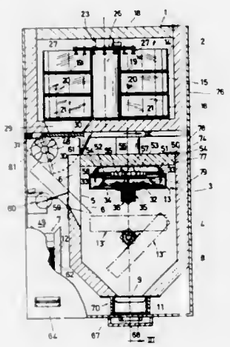
PCT No. PCT/NL86/00016, § 371 Date Apr. 16, 1987, § 102(e) Date Apr. 16, 1987, PCT Pub. No. WO86/07648, PCT Pub. Date Dec. 31, 1986

PCT Filed Jan. 17, 1986, Ser. No. 30,846

Claims priority, application Belgium, Jun. 17, 1985, 215202

Int. Cl.[4] A47J *37/00*

U.S. Cl. 221—82 15 Claims



1. Equipment for heating pre-cooked french fries and similar foods comprising:

at least one tray for receiving food to be heated,

flexible members mounted vertically above said tray so as to have a lower free end thereof hanging freely from above said tray, said lower free ends of said flexible members being freely movably independently of one another, and

means for moving the tray and the members relative to one another,

whereby the lower free ends of said members are in contact with food disposed in the tray so as to maintain food thereon in continuous motion while evenly and uniformly distributing the same within the tray.

4,838,456

ENCLOSED VAPOR DISPENSING APPARATUS AND METHOD

Jerry F. Hamlin, 874 Shirley La., Boulder City, Nev. 89005

Filed Feb. 4, 1988, Ser. No. 152,232

Int. Cl.[4] B67B *7/00;* A61H *33/00*

U.S. Cl. 222—1 9 Claims

1. A dispensing apparatus comprising:

a housing having a chamber, said housing having a plurality of walls enclosing the chamber, and an opening for insertion of the hands into the chamber;

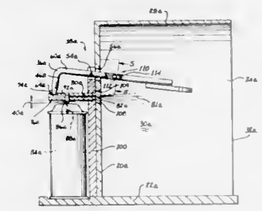
mechanically actuating means in the form of a pivotable lever having a portion disposed in the chamber and a portion outside of the housing to actuate a pressurized aerosol container and a member having passage means for conducting the pressurized substance from the aerosol container to the chamber upon applying a force to the portion of the actuating lever disposed in the chamber, the member having passage means and being a resilient cantilever beam having a first portion with a recess for receiving a cap portion defining an outlet valve from said aerosol container and having a second portion fixedly connected to a wall, and the passage means having a passageway from the recess extending through the first portion and the second portion to an orifice disposed within the chamber for spraying therein.

4. A method for dispensing a substance comprising the steps of:

providing a housing having a chamber;

adapting the housing with a plurality of walls enclosing the chamber, and with an opening for inserting of the hands into the chamber;

providing a mechanically actuating means in the form of a pivotable lever having a portion disposed in the chamber



and a portion outside the housing to actuate a pressurized aerosol container;

providing a member having passage means for conducting a pressurized substance from the aerosol container to the chamber;

adapting the member having passage means as a resilient cantilever beam having a first portion with a recess for receiving a cap portion defining an outlet valve of the aerosol container and having a second portion fixedly connected to a wall, and having the passage means as a passage way from the recess extending through the first portion and the second portion to an orifice disposed within the chamber for spraying therein; and

applying a force to the portion of the actuating lever disposed in the chamber to cause the substance within said container to be dispensed into the chamber beneath said actuating means.

4,838,457

LOTION BLENDING AND DISPENSING UNIT

James C. Swahl, and Debra A. Swahl, both of 4141 Kling St., #2, Burbank, Calif. 91505

Filed May 9, 1988, Ser. No. 191,380

Int. Cl.[4] B65D *35/28;* B67D *5/22*

U.S. Cl. 222—48 12 Claims

1. A device for proportionally blending and dispensing

selected substances from a variety of substances, the combination comprising:

a deformable housing having an internal storage chamber communicating to ambient environment via a control hole;

a plurality of flexible containers within said housing storage chamber, each of which includes a nozzle for discharging a substance held in a respective container;

means fixedly carried on said housing for dispensing blended and mixed substances;

rotating regulatory means operably disposed between said dispensing means and said container nozzles and having a plurality of apertures registering selectively with said respective nozzles and said dispensing means; and

selector means operably connected to said rotating regulatory means for positioning said regulatory means to align desired apertures with said nozzles and said dispensing means.

4,838,458

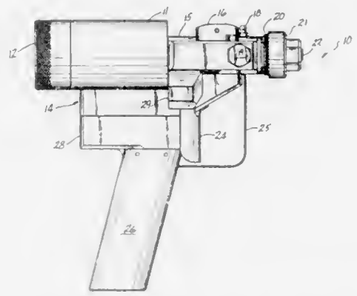
ADJUSTABLE VALVING ROD

C. Marshall Davidson, Hamden, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Feb. 23, 1988, Ser. No. 159,611

Int. Cl.[4] B67D *5/60*

U.S. Cl. 222—135 26 Claims



12. In a plural component dispensing apparatus having a valve block with a hollow valving rod passage and a mixing chamber with an elongate bore corresponding to an in alignment with the valving rod passage, cylinder means, a valving rod reciprocably movable within the valving rod passage and the bore by the cylinder means to control the feed of the plural components into the mixing chamber and to help clean the bore, the improvement comprising:

valving rod position adjustment means within the cylinder means and cooperative with the cylinder means and the valving rod to control the positioning of the valving rod so the valving rod selectively can be adjustment in a more extended or a more retracted position in the bore and the valving rod passage to extend a greater or lesser distance beyond the mixing chamber during reciprocal operating.

4,838,459

AEROSOL STRUCTURE

Tomio Nitta, Kanagawa, Japan, assignor to Tokai Corporation, Kanagawa, Japan

Filed Jan. 20, 1988, Ser. No. 146,156

Claims priority, application Japan, Mar. 10, 1987, 62-33814[U]

Int. Cl.[4] B67D *5/52*

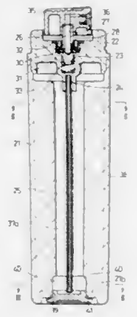
U.S. Cl. 222—136 5 Claims

1. An improved aerosol structure comprising:

(a) a container having a plurality of longitudinal compartments disposed around a central longitudinal space, the central longitudinal space being defined by its surrounding wall, and each of the longitudinal compartments being defined by longitudinal walls integrally connected to the surrounding wall of the central longitudinal space and to the inner surface of the container, portions of the bottom edge of the central longitudinal space terminating short of the bottom of the container to define passages to allow intercommunication between the compartments and the central longitudinal space;

(b) a top closure hermetically sealed to a top opening of the container, said top closure having a central reentrancy and a longitudinal hole communicating with the central reentrancy;

(c) a spring-biased ejection rod having a longitudinal hole and a lateral hole communicating between said longitudinal hole and opening out on the side of the ejection rod, the ejection rod being snugly accommodated in said central reentrancy;



(d) an annular gasket fixed to the ejection rod at the level at which the lateral hole of the ejection rod opens thereby permitting the gasket to close the lateral hole while the ejection rod is spring-biased to its upper closing position;

(e) a cap nozzle fixed to a top of the ejection rod, the cap nozzle having a hole communicating with the longitudinal hole of the ejection rod and opening out on the side of the cap nozzle;

(f) an elongated tube communicating between the longitudinal hole of the top closure and extending down to the bottom of the central longitudinal space in the region of the passages intercommunicating with the longitudinal compartments and the central longitudinal space; and

(g) a bottom closure hermetically sealed to a bottom opening of the container for charging said container with a gas under pressure.

4,838,460

PRODUCT DISPENSER HAVING ACTUATOR LOCKING COLLAR AND SHROUD

David G. Moore, and Donald D. Foster, both of Lee's Summit, Mo., assignors to Calmar Corporation, Lee's Summit, Mo.

Filed Oct. 9, 1987, Ser. No. 107,291

Int. Cl.[4] B67D *5/32*

U.S. Cl. 222—153 15 Claims

1. A dispenser comprising:

a body having walls defining a product holding chamber;

a piston reciprocable in said chamber;

structure connected to said piston for movement therewith and having walls defining a passageway for the flow of products from said chamber;

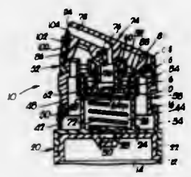
a depressible actuator connected to said structure for shifting of the latter to thereby move said piston,

said actuator including walls defining a channel there-

through and an outlet in communication with said channel,

said actuator being pivotally connected to said structure for selective, rocking movement through an arc between a first position and a second position,

said channel being in communication with said passageway when said actuator is in said first position for enabling products to flow from said chamber and through said outlet during at least a portion of a depression stroke of said actuator,



said channel being substantially out of communication with said passageway when said actuator is in said second position for generally precluding the flow of products through said outlet; and

means comprising a rotatable cam ring in sliding engagement with said actuator for shifting said actuator toward a selected one of said first position and said second position and for retaining said actuator in said selected position.

4,838,461

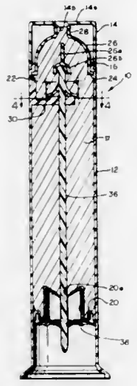
DISPENSING PACKAGE FOR A VISCOUS PRODUCT

James E. Santerelli, Toledo, Ohio, assignor to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Apr. 14, 1988, Ser. No. 181,343

Int. Cl.[4] G01F *11/00*

U.S. Cl. 222—259 **22 Claims**



1. A dispensing package for containing and dispensing a viscous product, said dispensing package comprising:

a container having a generally cylindrical body portion, with an inside, a first end, and a second end, one of said first end and said second end serving as a dispensing end, said container being adapted to contain the viscous product and further having perforate means extending across said container at a location spaced from said dispensing end;

generally rigid, concave pumping means slidingly secured to said container at said dispensing end, said pumping means being reciprocable with respect to said container along an axis extending between said first end and said second end and having an opening for dispensing the product therethrough;

a follower piston positioned within said container away from said dispensing end, said follower piston being in contact with the viscous product and being adapted to move toward said dispensing end to move the viscous product toward said dispending end, said follower piston further having an opening extending therethrough;

a rodlike member, said rodlike member being affixed to said pumping means and being reciprocable with said pumping means with respect to said container, said rodlike member slidingly extending through said perforate means of said container and extending through said opening in said follower piston, said rodlike member being movable through said follower piston as said pumping means move toward said follower piston and being unmovable with respect to said follower piston as said pumping means moves away from said follower piston; and

biasing means normally biasing said pumping means away from said follower piston, said biasing means comprising flexible means formed integrally with said rodlike member and extending outwardly and toward said follower piston therefrom and engaging said perforate means of said container to be distorted as said pumping means moves toward said follower piston.

4,838,462

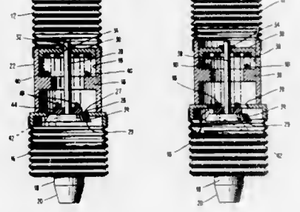
DOUBLE BELLOWS PURGE VALVE

Donald G. Corniea, Inver Grove, Minn., assignor to Liquipak International, Inc., St. Paul, Minn.

Filed Apr. 10, 1987, Ser. No. 36,992

Int. Cl.[4] B67D *5/40*

U.S. Cl. 222—377 **10 Claims**



6. A liquid dispensing unit comprising:

a stationary liquid supply pipe;

a stationary discharge nozzle;

a body mounted for reciprocating movement between said pipe and said nozzle;

a first expandable bellows between said body and said pipe and a second expandable bellows between said body and said nozzle;

said body including a valve having a valve seat and a movable valve element, said valve element being positioned relative to said valve seat to be urged away from said valve seat in response to greater fluid pressure in said first bellows than in said second bellows and to be urged toward said valve seat in response to greater fluid pressure in said second bellows than in said first bellows;

first spring means urging said valve element toward said valve seat; said valve element having air vents for conducting air through said element; and

vent control means including a vent closure element and second spring means urging said closure element to close said vents, said closure element being urged to open said vents when the fluid pressure in said second bellows is greater than the pressure in said first bellows.

4,838,463

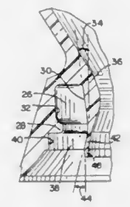
DECANTER WITH MOLDED INTERLOCKING HANDLE

Melvin F. Roberts, Niles, Ill., assignor to Bloomfield Industries, Inc., Chicago, Ill.

Filed Apr. 15, 1987, Ser. No. 38,642

Int. Cl.[4] A47G *19/14*

U.S. Cl. 222—465.1 **9 Claims**



1. A decanter vessel comprising:

a. a rigid receptacle having a central axis and having an integral neck portion formed thereon about said central axis,

b. a pouring spout unit concentrically located on said neck portion and having formed therein a continuous cavity shaped to freely accommodate said neck portion without stress, the width of said cavity being greater than the thickness of said neck portion, forming a gap between said neck portion and the wall of said cavity,

c. flexible means joining said rigid receptacle and said pouring spout unit, said flexible means

(i) generally surrounding said neck portion within said cavity and substantially filling the remainder of said cavity unoccupied by said neck portion.

(ii) adhering to said neck portion and said pouring spout unit, forming a mechanical lock therebetween and sealing the gap between the neck portion of the rigid receptacle and pouring spout unit to prevent liquid flow therebetween, and

d. a trough extending coterminally with said cavity, said trough spanning opposite sides of said neck portion and forming an overflow receptacle for said flexible means when liquid, during formation of said decanter vessel, said trough being of decreasing dimension in a direction away from said cavity, enhancing the mechanical lock between the neck portion and said pouring spout unit.

4,838,464

VENTED PLASTIC BOTTLE

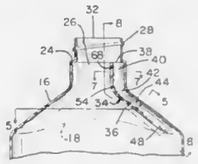
Milton Briggs, Dallastown, Pa., assignor to Graham Engineering Corporation, York, Pa.

Continuation-in-part of Ser. No. 61,538, Jun. 11, 1987, abandoned. This application Sep. 20, 1988, Ser. No. 246,871

Int. Cl.[4] B67D *3/00*

U.S. Cl. 222—478 **11 Claims**

1. A hand held blow molded plastic bottle with improved pour characteristics, said bottle having a continuous and handle-free outer surface generally symmetrical about an axis and including a generally cylindrical body easily gripped in a single hand for manipulation and pouring of liquid out through the mouth; a base on the bottom of the body; a shoulder on the top of the body; a generally cylindrical neck on the top of the shoulder; a generally cylindrical neck flash on the top of the neck, the neck flash having a diameter less than the diameter of the neck; a radial inward step joining the neck to the neck flash; a thread on neck flash; a dam partially closing the interior of the neck at the radial inward step, the dam and the neck defining a pouring mouth communicating with the interior of the bottle, an integral vent tube extending along the one side of the neck and shoulder and having an upper mouth opening through the dam a distance from the pouring mouth and facing outwardly of the bottle and a lower mouth opening into the interior of the body; a continuous weld seam joining the length of the vent tube to the shoulder and neck of the bottle without breaks extending through the weld seam, the vent tube having an outer wall spaced from the axis of the bottle a distance approximately equal to the distance the surface of the neck and shoulder on the opposite side of the bottle from the outer wall



is spaced from the axis of the bottle, a pair of angled interior walls joined to and extending to either side of the weld seam along the length of the vent tube between the upper and lower mouths, said interior walls joining the outer wall to the weld seam at the shoulder so that the shoulder portion of the vent tube is generally triangular in transverse cross section, and a pair of opposed side walls extending along the neck, said opposed side walls joining the outer wall to the interior walls at the neck so that the neck portion of the vent tube is generally pentagonal in transverse cross section, and a pair of vee-shaped recesses each extending along one side of the weld seam between the ends of the vent tube.

4,838,465

GUIDE BAR FOR A HOSE WHICH IS PHYSICALLY MANIPULATED BY WORKERS TO DELIVER A HIGH DENSITY MATERIAL TO A PREDETERMINATED SITE

Lynn Metzger, 4860 Dungan Rd., Circleville, Ohio 43113

Continuation-in-part of Ser. No. 500,302, Jun. 2, 1983, abandoned. This application May 22, 1986, Ser. No. 866,116

Int. Cl.[4] A62C *23/04*

U.S. Cl. 222—526 **7 Claims**

1. A guide bar for the positioning of a hose used for the delivery of a high density concrete-like material to a predetermined location which facilitates the carrying, lifting and positioning of the hose to dispense the material at a predetermined location comprised of:

(A) a rigid "T" shaped bar terminating at one end with the

crossing portion of the "T" and having handle means for grasping and holding the bar at each end of the crossing portion of the "T"; said bar having at the lower end opposite the crossing portion of the "T" a first loop, integrally molded and rigidly connected to the lower end of the "T" bar to interconnect the lower end of said "T" bar to a hose clamping means;

(B) a molded second loop connecting the loop of the lower end of the "T" bar to a hose clamping means, said second loop allowing controllable bi-axial rotational movement between the lower end of the "T" bar and the hose clamping means at the point of connection of the two loops; and

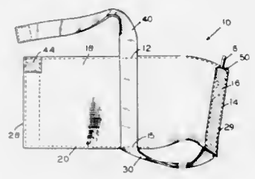
(C) a hose clamping means comprising a cylindrically shaped clamping means having a closing latch mechanism that securely attaches the clamp to the hose at a predetermined position on the hose and including a loop on a top side thereof integrally molded and rigid to the hose clamping means, said loop on the hose clamping means being the second loop that is interconnected to the corresponding loop connected to the loop on the lower end of the "T" bar.

4,838,466

COLLAPSIBLE HOLDER FOR AEROSOL DISPENSERS

Carl A. Holmstrom, 3230 Lindsay Ave., Boise, Id. 83705

Filed Feb. 8, 1988, Ser. No. 153,076
Int. Cl.[4] A45C *11/00, 11/38*
U.S. Cl. 224—250 10 Claims



1. A flexible holder for a fluid dispenser of the type having a removable lid and a tubular spray dispensing stem, said holder comprising:

a flexible, substantially rectangular sidewall comformable to the dispenser, said sidewall having an interior surface engageable with the dispenser and an opposing exterior surface, said sidewall provided with first fastening means for opening said side wall and for closing said side wall to hold said side wall in a closed dispenser engaging mode;

a bottom strap connected to opposing portions of the lower edge of said sidewall for engaging the bottom of the dispenser;

a top strap connected to opposing portions of the top edge of said sidewall for engaging the lid of said dispenser to hold said lid in place;

second fastening means for opening and closure of said top strap relative to said sidewall; and

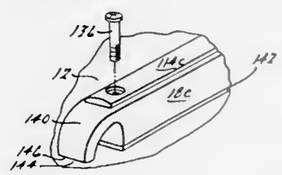
a stem receptacle mounted on the exterior surface of said sidewall, said receptacle including opposing side walls and a bottom wall and defining a top opening for insertion and removal of a detached stem.

4,838,467

MOLDED PLASTIC LUGGAGE CARRIER CONSTRUCTION

John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236, and John S. Cucheran, 1069 Inca Trail, Lake Orion, Mich. 48035

Continuation of Ser. No. 879,534, Jun. 23, 1986, abandoned, which is a continuation of Ser. No. 672,125, Nov. 16, 1984, abandoned. This application Feb. 2, 1987, Ser. No. 11,430
Int. Cl.[4] B60R *9/00*
U.S. Cl. 224—326 25 Claims



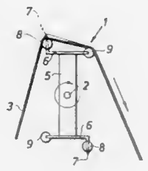
1. An article carrier for mounting on a planar surface of a motor vehicle comprising at least one generally horizontally arranged article supporting slat having two end portions, an upward opening channel extending longitudinally thereof, said channel being defined by at least two sidewalls, and means for fixedly mounting said slat to said surface, said slat including at one end thereof integrally formed means for typing down articles to be carried, said tie down means being formed as a monolithic piece of material with said channel in the formation of said slat.

4,838,468

REEL FOR REGISTRY OF A MATERIAL WEB PROVIDED WITH CREASE LINES

Hakan Lesse, Södra Sandby, Sweden, assignor to AB Tetra Pak, Lund, Sweden

Filed Mar. 26, 1984, Ser. No. 593,403
Claims priority, application Sweden, Mar. 31, 1983, 8301823
Int. Cl.[4] B65H *20/00*
U.S. Cl. 226—76 9 Claims



1. A rotating reel for supporting an advancing web of flexible material that has crease lines extending transversely to the direction of advance of said material, said reel comprising:

a central axis;

means for rotating said reel about a central axis;

a plurality of rules mounted on said reel, said rules being spaced radially from said central axis and each rule having an edge with a central major portion extending substantially parallel to said axis and comparatively smaller end portions whose distance from said central axis is less than that of said central major portion;

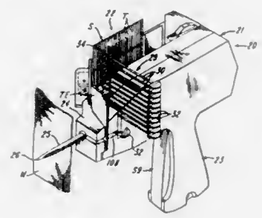
said rules having a support element mounted on said smaller end portions of the edge, said support elements having a support surface spaced from said central axis a distance less than said central major portion, whereby the central portion of said advancing web is tensioned over said central major portion as the reel rotates, while the lateral edges of said web are carried over said support surfaces.

4,838,469

HAND-HELD TAG ATTACHER

Larry D. Strausburg, Kettering, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 136,303, Dec. 22, 1987, Pat. No. 4,785,987, which is a division of Ser. No. 6,858, Jan. 27, 1987, Pat. No. 4,715,521, which is a division of Ser. No. 654,333, Sep. 25, 1984, Pat. No. 4,673,120. This application Oct. 7, 1988, Ser. No. 262,852
Int. Cl.[4] B65C *7/00*; A43D *69/00*
U.S. Cl. 227—67 1 Claim



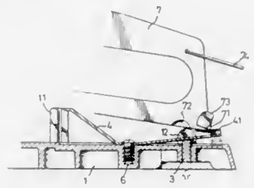
1. A hand-held tag attacher for attaching tags to merchandise using fasteners, each fastener having a bar section and a button section joined by a filament section, the attacher comprising: an attacher body, a hopper on the attacher body, the hopper being adapted to receive a stack of tags, the attacher body having a manually engageable handle, a needle mounted to the body and having an elongate needle bore and a side opening communicating with the needle bore, means for advancing one bar section at a time into alignment with the needle bore, a push rod engageable with a bar section of a fastener for driving the bar section through the needle bore while its filament section extends through the side opening, a tag feeder engageable with an endmost tag in the hopper for feeding the endmost tag from its position in the stack along a path to an attaching position in alignment with the needle, a single manually operable actuator disposed at the handle, and means effective upon operating and releasing the single actuator twice for operating the push rod, the tag feeder and the advancing means to attach a tag to merchandise.

4,838,470

STAPLER BASE

Ted S. Chang, 3F., No. 27, Lane 154, Hsing I Road, Pei Tou District, Taipei, Taiwan

Filed Mar. 9, 1988, Ser. No. 166,045
Int. Cl.[4] B25C *5/02*
U.S. Cl. 227—120 1 Claim



1. A stapler base for use with a tacker to staple a thick stack of paper, comprising:

(a) a base (1);

(b) a plate (2) disposed in a first cavity (13) at a front side of said base (1), said plate being attached to said base (1) by a rivet (5);

(c) said plate (2) having a groove (21) therein;

(d) holder means (11) attached to each side of said base (1) at a middle portion of said base (1) for positioning said tacker during pressing of said tacker;

(e) resilient plate means (4) mounted in a second cavity (15) at a rear side of said base (1), said plate means being attached to said base (1) by a bolt (6), said plate means (4) for resiliently supporting said tacker;

(f) a projection (12) and a recess (18) being disposed on each side of a rearmost end of said base (1), a rear end of said tacker being seated on said projections (12) so that arched grooves (72) in said tacker engage said projections (12);

(g) a bending plate (41) attached to a rear end of said resilient plate means (4);

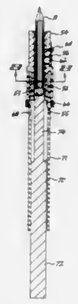
(h) T-shaped block means (3) slidably engaging a block groove (17) in said base (1) such that a top surface of said T-shaped block means (3) is in planar alignment with said second cavity (15) in a first position, said T-shaped block means (3) for raising a rear portion of said resilient plate means (4) by pushing said T-shaped block means (3) upward to a second position so that a staple remover (71) attached to said tacker can be engaged to said bending plate (41) in order to assemble said tacker to said base (1).

4,838,471

NAILING DEVICE

David Chiesa, 528 Powers Ave., Johnsonburg, Pa. 15845

Filed Dec. 11, 1987, Ser. No. 131,451
Int. Cl.[4] B25C *1/02*
U.S. Cl. 227—142 3 Claims



1. A nailing device, comprising:

a hollow cylindrical barrel;

a longitudinal bore in said cylindrical barrel;

an external thread at a first end of said barrel;

a lock washer threaded on said first end of said cylindrical barrel;

a replaceable adaptor tip threaded on said first end of said cylindrical barrel, said adaptor tip mounted for axial adjustment with respect to said cylindrical barrel, depending on the intended length and driving depth of a nail to be driven;

said adaptor tip having a double walled portion forming an annular recess with an internal thread for engagement with said first end of said cylindrical barrel;

an inner wall of said double walled portion received in said longitudinal bore of said cylindrical barrel and forming an abutment shoulder;

a ball receiving aperture formed through a side wall of said adaptor tip;

a spherical ball in said aperture;

a spring retainer secured to the side wall of said adaptor tip for retaining said ball in said aperture;

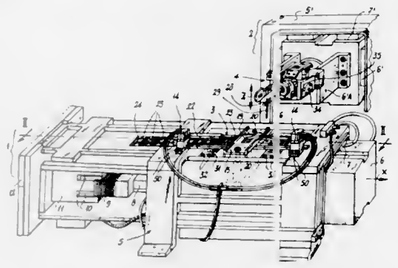
a stepped diameter cylindrical ram having a larger diameter portion and a smaller diameter portion;
said ram slidably received in said barrel; and
an annular stop face formed at an intersection of said larger and smaller diameter ram portions for cooperation with said internal abutment shoulder.

4,838,472

ORTHOGONAL AXIS DEVICE WITH LINEAR MOTORS FOR POSITIONING AND BONDING WIRES ONTO ELECTRONIC COMPONENTS

Mario Scavino, Via Alla Cava, 5-20050 Lesmo(Como), Italy

Filed Mar. 17, 1988, Ser. No. 169,413
Claims priority, application Italy, Mar. 20, 1987, 19899 A/87
Int. Cl.[4] B23K *1/20*
U.S. Cl. 228—4.5 **17 Claims**



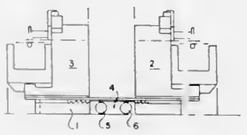
1. A device with movement along first and second orthogonal directions for positioning and processing workpieces, in particular for bonding wires onto electronic components, characterized in that on said orthogonal directions there are positioned two non-superposed components, the first of which is positioned along the first direction and comprises a workholding table, grippers fixed to a stationary housing of the first component and having a mobile element and a fixed element for clamping the workpiece, a presser in which an operating aperture is provided, and a heating element, said presser, heating element, grippers, and workholding table also forming a feed mechanism for the workpiece, the second component being positioned along the second direction and carrying an operating head for operating on said workpiece.

4,838,473

MACHINE ARRANGEMENT CONSISTING OF A PLURALITY OF WORKING MACHINES

Peter Schreiber, Ipsach, and Michel Richner, Hauterive, both of Switzerland, assignors to Fael S.A., Saint-Blaise, Switzerland

Filed Dec. 18, 1987, Ser. No. 134,807
Claims priority, application Switzerland, Dec. 18, 1986, 5101/86
Int. Cl.[4] F16M *5/00*
U.S. Cl. 228—45 **7 Claims**



1. An arrangement of machines consisting of a plurality of working machines having substantially the same structure, in which two respective similar machines are arranged on a floor frame and in which means are provided for laterally dislocating each machine individually from a normal operating position where both machines adjoin each other directly along one of their longitudinal sides, into a non-operative position.

4,838,474

METHOD OF DIFFUSION BONDING OF ALUMINUM OR ALUMINA CERAMICS

Osamu Ohashi, Sayama, and Ken Sasabe, Tokorozawa, both of Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed Mar. 3, 1988, Ser. No. 163,724
Claims priority, application Japan, Mar. 6, 1987, 62-50342
Int. Cl.[4] B23K *31/00*
U.S. Cl. 228—121 **12 Claims**

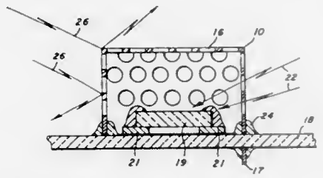
1. A method of diffusion bonding aluminum or an alumina ceramic to aluminum, an alumina ceramic or a metal other than aluminum which comprises the steps of interposing an aluminum alloy comprising 0.1 to 1.5% by weight of lithium between the surfaces to be bonded and heating said surfaces under pressure to a temperature at which said lithium diffuses.

4,838,475

METHOD AND APPARATUS FOR EMI/RFI SHIELDING AN INFRARED ENERGY REFLOW SOLDERED DEVICE

Aaron B. Mullins, Hurst, and Michael H. Bartlett, Fort Worth, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 28, 1987, Ser. No. 91,150
Int. Cl.[4] B23K *31/02*; **H05K** *9/00*
U.S. Cl. 228—179 **5 Claims**



1. A method of reflow soldering a device to a substrate with infrared energy, the method comprising:
(A) positioning said device on said substrate;
(B) positioning an EMI/RFI shield on said substrate and about said device to thereby substantially encapsulate said device, wherein said EMI/RFI shield comprises a box having apertures formed therethrough, which apertures are of a size to substantially allow infrared energy to pass therethrough and to substantially block EMI/RFI energy;
(C) exposing said EMI/RFI shield to infrared energy, such that said infrared energy substantially passes through said EMI/RFI shield to cause said device to be reflow soldered to said substrate.

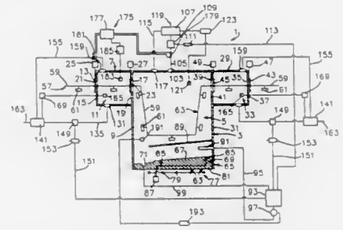
4,838,476

VAPOUR PHASE TREATMENT PROCESS AND APPARATUS

Armin Rahn, St. Jean sur Richelieu, Canada, assignor to Fluocon Technologies Inc., Quebec, Canada

Filed Nov. 12, 1987, Ser. No. 119,567
Int. Cl.[4] B23K *1/12*; **H05K** *3/34*
U.S. Cl. 228—180.1 **24 Claims**

6. A process for treating workpieces in a normally closed treatment chamber which comprises: maintainin a pressure within the treatment chamber which is less than atmospheric so as to cause atmosphere to flow into the treatment chamber when it is opened to the atmosphere; generating an unsaturated treatment vapour within the treatment chamber by vapourizing a liquid within the treatment chamber; heating the unsaturated treatment vapour within the treatment chamber to a desired temperature above the boiling point of the liquid; and moving a workpiece into the chamber and through the heated, unsaturated vapour in the chamber to be treated by the vapour.

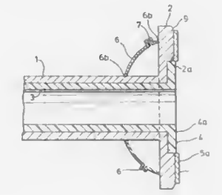


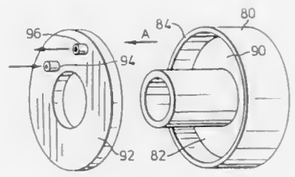
4,838,477

METHOD OF WELDING FLANGED PIPE SECTIONS AND APPARATUS THEREFOR

Max J. Roach, Longview, Tex., and Jack C. Taylor, Mississauga, Canada, assignors to Du Pont Canada Inc., Mississauga, Canada

Filed May 13, 1988, Ser. No. 193,758
Int. Cl.[4] B23K *31/02, 35/38*
U.S. Cl. 228—222 **32 Claims**





1. A method for welding together at a welding location, a pair of metal pipe sections each having a flange at the end thereof, said sections having heat sensitive material juxtaposed to, in contact with or bonded to the interior thereof, said method comprising the steps of:
(a) providing coolant passages, each of said passages being located directly in contact with a respective flange to create a heat sink between the welding location and the heat sensitive material adjacent to a respective one of said flanges in proximity to said heat sensitive material for heat exchange therewith;
(b) bringing said flanges into a welding position and passing coolant through said passages;
(c) welding together said flanges at said welding location; and
(d) continuing to pass coolant through said passages until the resultant welded flanges have cooled.

4,838,478

HALOGEN-FREE FLUX MIXTURE AND USE THEREOF

Gerd Froebel, Duesseldorf, and Hans W. Stang, Duisburg, both of Fed. Rep. of Germany, assignors to Alpha Grillo-Lotsysteme GmbH, Fed. Rep. of Germany

Filed Apr. 20, 1988, Ser. No. 184,402
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1987, 3713553
Int. Cl.[4] B23K *35/34*
U.S. Cl. 228—223 **11 Claims**

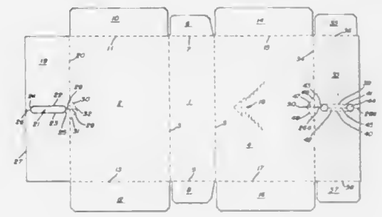
1. A halogen-free flux mixture for solder wires having one flux core or a plurality of flux cores based on natural and/or synthetic resins, organic acids, and optionally further additives, characterized in that
(a) the resin content is about 20 to 80% by weight;
(b) at least 2 organic acids are present in a ratio of about 1:5 to 5:1; and
(c) the total mixture has an acid value of at least 200.

4,838,479

HEAVY DUTY CARRYING HANDLE FOR A CAN CARTON

Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Sep. 26, 1988, Ser. No. 249,115
Int. Cl.[4] B65D *5/46*
U.S. Cl. 229—52 B **8 Claims**



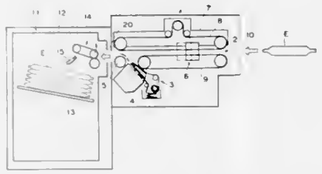
1. A carrying handle for a carton formed from a unitary blank for packaging a plurality of cans and having interconnected single ply bottom and side walls and a double ply top wall having inner and outer panels together with end closure panels, said handle comprising a transverse elongated opening formed in said inner panel and having spaced apart side edges, a pair of transverse fold lines formed in said outer panel in near coincidence with said side edges of said transverse elongated opening, a pair of transverse handle flaps struck from said outer panel and respectively joined thereto along said transverse fold lines, said transverse handle flaps having coincidental transverse edges defined by a transverse perforated slit along which said handle flaps are separable to accommodate inward folding of said handle flaps through said transverse elongated opening.

4,838,480

DEVICE FOR ACCOMODATING CASH ENCLOSING ENVELOPES

Kiyotaka Takahashi, Muko, and Kathuhiko Arimoto, Omihachiman, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 738,415, May 24, 1985, abandoned. This application Aug. 7, 1987, Ser. No. 82,997
Claims priority, application Japan, May 31, 1984, 59-112764
Int. Cl.[4] B65D *91/00*
U.S. Cl. 232—43.3 7 Claims



1. A depositing device for handling and accommodating cash enclosing envelopes comprising:
an envelope container having an inlet at an upper side portion thereof:
an envelope receiving member disposed substantially horizontally and slightly inclined downwardly toward the inlet within the container and guidable upward and downward,
means for detecting the quantity of cash enclosing envelopes placed on the receiving member,
drive means for moving the receiving member upward or downward in response to a detection signal from the detecting means to position the uppermost of the cash enclosing envelopes on the receiving member at a substantially predetermined level at all times, and
biasing means for biasing said receiving member upwardly to prevent said receiving member from falling down when said drive means is disengaged.

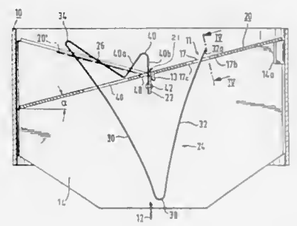
4,838,481

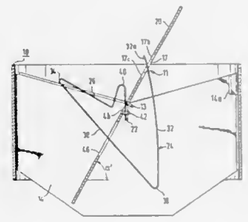
DRAFT CONTROL ARRANGEMENT FOR VENTING OF COMBUSTION APPARATUS

Werner Diermayer, 1275 Panorama Dr., Lafayette, Calif. 94549, and Luitpold Kutzner, Bosettistr. 8, 8000 München 60, Fed. Rep. of Germany

Filed Apr. 29, 1988, Ser. No. 188,263
Claims priority, application Fed. Rep. of Germany, May 12, 1987, 3715855
Int. Cl.[4] G05D *23/00*
U.S. Cl. 236—1 G 18 Claims

18. A thermally actuated damper unit for use in the vent of a heating apparatus, specifically a gas-fired heating appliance in which the damper, at increasing temperature, yields an increasing opening to the flow of vent gases, the damper unit comprising the combination of housing means forming a flow passage (10), flow control means comprising at least one damper element (20) swiveling at a stationary support (22) around a transverse axis (A—A), at least one thermally-actuated element (24) actuating the damper element (20), which at its one end is fixedly fastened at a stationarly support (42) and at its other end (32*a*) engages damper element (20) at knife-edge connection (11), forming between its ends a strip shaped as a loop, the axis of the loop (26, 30, 32) being essentially parallel to axis A—A, the overall length of the loop being much greater than the distance between the two ends (40*b*, 32*a*), the other end (32*a*) of loop (26, 30, 32) being pivotally connected at knife-edge connection (11) the axis of said pivotal connection being essentially parallel to axis A—A, at a distance from stationary support (42), said element (24) is a bimetal loop (26, 30, 32) which describes an open polygon from the stationary support (42) to knife-edge connection (11), said pivotal engagement at knife-edge connection (11) formed by interlocking parts of damper element (20) and the second end (32*a*) of bimetal element (24), said damper element (20) having an opening (17) through which the second end (32*a*) of bimetal element (24) protrudes, the longitudinal edges of the second end (32*a*) of bimetal element (24) having notches (15) engaging





the edge of opening (17*a*), said slots (17*b*, 17*c*) formed at the opposite sides of opening (17) at positions which are rotationally offset from the bimetal element (24) for insertion of the twisted end (32*a*) of bimetal element (24), said material of slots (17*b*') and (17*c*') forming tabs (19*a*) and (19*b*) which are bent back to their original positions in the plane of damper element (20*b*') to prevent disengagement of damper element (20*b*') and bimetal element (24).

4,838,482

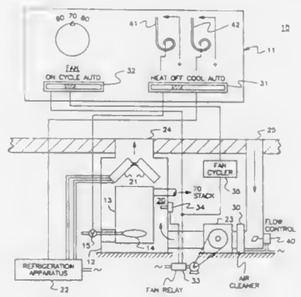
AIR CONDITIONING SYSTEM WITH PERIODIC FAN OPERATION

John H. Vogelzang, Scarborough, Canada, assignor to Honeywell Limited, Canada

Filed Feb. 26, 1988, Ser. No. 160,896
Int. Cl.[4] F23N *5/20*
U.S. Cl. 236—11 2 Claims

1. In a space forced air temperature conditioning system comprising:
a thermostat mounted in a space in which the air is to be conditioned;
air temperature conditioning apparatus remotely located from the space;
circuit means connecting said thermostat to control the operation of said air temperature conditioning apparatus;
air moving fan means connected to said conditioning apparatus for delivering temperature conditioned air through ducts to the space from said air temperature conditioning apparatus to maintain a desired temperature in the space as set by said thermostat;
said air moving fan means normally being operated when said temperature conditioning apparatus is energized;
cycling means connected to said air moving means and

connected to be controlled by a switch on said thermostat to cycle said air moving means to periodically deliver air



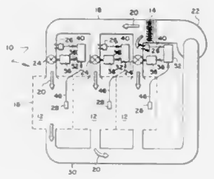
to said space when said conditioning apparatus is not operating.

4,838,483

VAV VALVE CONTROL WITH TRANSDUCER TOLERANCE COMPENSATION

Mark E. Nurczyk, Eastman, and Tedd P. Johnson, La Crosse, both of Wis., assignors to American Standard Inc., New York, N.Y.

Filed Apr. 11, 1988, Ser. No. 179,790
Int. Cl.[4] F24F *7/00*
U.S. Cl. 236—49.5 23 Claims



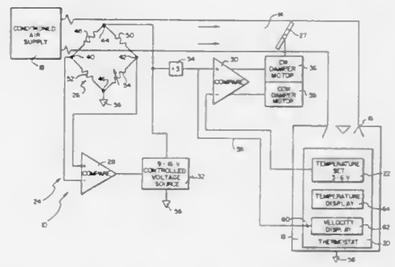
1. An airflow control comprising:
a variable position valve adapted to be connected to a supply air duct for regulating the flow rate of an airflow through said duct, said supply air duct being connected to convey said airflow to a comfort zone;
a sensor that provides a transducer signal that varies as a function of the flow rate of said airflow;
a temperature sensor that provides a temperature feedback signal that varies in response to a temperature associated with said comfort zone;
a feedback compensation circuit generating a flow rate feedback signal in response to said transducer signal and a flow rate compensation signal;
a microcomputer associated with a memory and being adapted to receive said temperature feedback signal and said flow rate feedback signal, said microcomputer being operative in a run mode and in a calibration mode, in said calibration mode, said sensor provides a substantially constant transducer signal and said memory stores a digital reference number having a value at least partially based upon said substantially constant transducer signal, and in said run mode, said microcomputer provides said flow rate compensation signal based upon said digital reference number and provides a drive signal that controls the position of said valve in response to said temperature feedback signal and said flow rate feedback signal.

4,838,484

VARIABLE VOLUME AIR CONDITIONING SYSTEM WITH VELOCITY READOUT AT THE THERMOSTAT

Paul E. Kreuter, Thief River Falls, Minn., assignor to Kreuter Manufacturing Co., Inc., New Paris, Ind.

Filed Jul. 31, 1987, Ser. No. 88,347
Int. Cl.[4] F24F *7/00*
U.S. Cl. 236—49.3 15 Claims



1. For use in conjunction with an air distribution system of the type having a duct for distributing air to a room, a damper for regulating the flow of air through the duct, and a damper actuator responsive to damper drive control signals for controlling the damper, a circuit for providing the damper drive control signals, including:
stat means to be positioned in the room for providing a stat signal representative of a desired flow of air through the duct;
sensor means for sensing the flow of air and for and for providing an actual flow signal representative of the actual instantaneous flow of air through the duct;
control means responsive to the stat means and the sensor means for providing damper drive control signals as a function of the stat signal and the actual flow signal; and
transmission means having a first end coupled to the sensor means and a second end coupled to the stat means for providing the actual flow signal to the room.

4,838,485

WATER DISTRIBUTION DEVICE AND SYSTEM INCLUDING SAME

Isaac Rinkewich, 12 Fishman Maimon St., Tel Aviv, Israel

Filed Sep. 30, 1982, Ser. No. 429,672
Claims priority, application Israel, Sep. 17, 1982, 66826
Int. Cl.[4] A01G *27/00*
U.S. Cl. 239—70 22 Claims

1. A water distribution device adapted to be connected to a pressurized water supply line, characterized in that it includes: a valve controlling the flow of water from said water supply line to a water distributor; a cyclically-operable-timer; means for driving said timer through cycles of operation by the energy of the pressurized water in said supply line; said cyclically-operable-timer comprising a displaceable member; means for reciprocating said displaceable member in a continuous manner by the energy of the pressurized water in the supply

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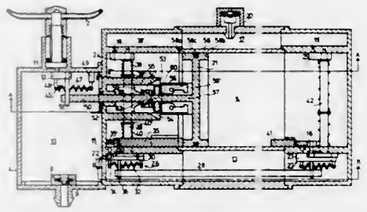
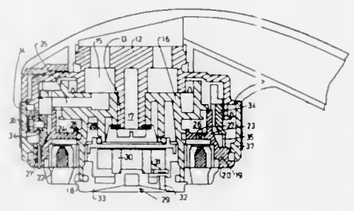
line through a forward stroke and a return stroke during each cycle; a retarding device acting on the displaceable member to slow down its movement during at least one of said strokes; a valve actuator; and a coupling between said displaceable member and said valve actuator effective, during predetermined



points in said forward and return strokes of the displaceable member, to cause the valve actuator to actuate the valve to its open position for a minor portion of each cycle, and to actuate the valve to its closed position for a major portion of each cycle.

4,838,486
SHOWER HEAD
Werner Finkbeiner, Schiltach, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany
Filed Mar. 9, 1988, Ser. No. 165,757
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1987, 3707885
Int. Cl.[4] B05B *15/02, 1/18*
U.S. Cl. 239—117 12 Claims



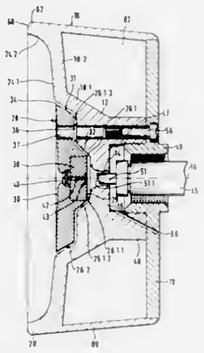
1. A shower head, comprising:

a first shower device having a first plurality of shower holes (21), as well as with a plurality of pins (35) arranged along an extension of the first shower holes (21), the pins having a diameter that corresponds to that of the first shower holes (21), one of said pins (35) and an element containing the first shower holes (21) being constructed so as to be displaceable relative to the other of said pins (35) and said element containing the first shower holes (21), thereby to permit the pins (35) to penetrate into and pass through the first shower holes (21);

a second separate shower device having a second plurality of shower holes separate from the first shower holes of the first shower device, the second shower device being operable apart from operation of the first shower shower device; and,

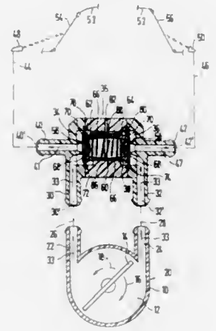
a changeover device for changing between the two shower devices and which on changing from the first to the second shower device moves the pins (35) into the first shower holes (21) of the first shower device.

4,838,487
DEVICE FOR ATOMIZING LIQUID PAINT
Rolf Schneider, Burgstetten, Fed. Rep. of Germany, assignor to BEHR Industrieanlagen GmbH & Co., Fed. Rep. of Germany
Filed Jun. 10, 1988, Ser. No. 205,151
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1987, 8708312[U]
Int. Cl.[4] B05B *3/10*
U.S. Cl. 239—223 4 Claims



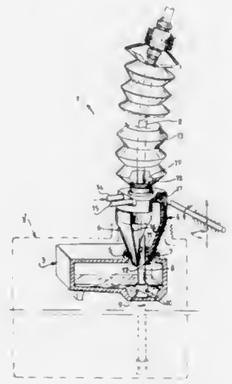
1. Device for the atomization of liquid paints, comprising an atomizer bell (10) which is rotatable about a central axis (16) and has an axial opening bore (14) at its base (26.1) and an axially forwardly facing and radially inwardly facing, profiled, annular, coaxial overflow surface (24) whose radially inner edge is connected with the axially front end of the opening by means of a profiled, annular, coaxial transition surface (26) which forms the axially front boundary to the base; and further comprising a coaxial, centrally perforated deflecting member (28) of which the centre of its axially rear surface (29) is situated axially opposite to the front end of the opening in the bell while its radially outer edge cooperates with the bell to form an annular gap (34) which interrupts the transition from an axially front surface (30) of the deflecting member to the overflow surface of the bell, the transition surface of the bell cooperating with the axially rear surface and the radially outer surface (31) of the deflecting member to form the boundaries of a chamber (32) in the form of a gap between the bell and the deflecting member, which chamber has only localized interruptions in the form of spacers (36) between the bell and the deflecting member, characterized in that the axially rear surface (29) of the deflecting member (28) and the base part (26.1) of the transition surface (26) facing said rear surface (29) have each an obtuse angled step in cross-section, which step is so arranged, while preserving the gap (32), that in a middle section (at 26.1.2) the paint in this gap flows both axially forwards and radially outwards; and in that the axially rearwardly projecting centre of the axially rear surface (29) of the deflecting member (28) is bounded at its radially outer region by a sharp deflecting edge (28.1) of the step of this rear surface (29) while the other bends in the cross-sections of the two complementary steps are rounded off.

4,838,488
DEVICE FOR DELIVERING WASHING LIQUID TO TWO SPACED SPRAYING NOZZLES FOR MOISTENING A WINDSHIELD OF A MOTOR VEHICLE
Christoph Heier, Iffezheim; Gerd Lentz, and Rainer Ritter, both of Buehl, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany
Filed Feb. 2, 1988, Ser. No. 151,476
Claims priority, application Fed. Rep. of Germany, Mar. 14, 1987, 3708327
Int. Cl.[4] B05B *1/10*
U.S. Cl. 239—284.1 11 Claims



1. A device for delivering liquid to two spraying nozzles positioned at two pane regions of a motor vehicle to be moistened and spaced from each other, comprising a feeding pump having a pump chamber having a first outlet and a second outlet, and a rotor positioned in said pump chamber and driven to rotate in two opposite directions; and delivery means connected to said pump to receive said liquid there from and including a first pressure chamber and a second pressure chamber, a limiter separating said chambers from each other, said rotor pumping said liquid in dependence on the direction of rotation thereof through said first outlet into said first pressure chamber or through said second outlet into said second pressure chamber said limiter being movable by pressure built up in either of said pressure chambers, each pressure chamber having an outlet connection connected to a respective one of said spraying nozzles, said limiter being subdivided transversely to a direction of the movement thereof into two portions, each portion having a wall which limits a respective one of said pressure chambers, said wall of each portion of said limiter having a sealing region which corresponds to a respective one of said outlet connections of the assigned pressure chamber, and means for generating a force on each of said sealing regions to urge each portion of said limiter to abut against the respective outlet connection when said pump is in non-operative position, said force being smaller than a feeding pressure of said pump, said delivery means including a common housing element in which said first and second pressure chambers are formed, said first and second pressure chambers being connected to each other by a passage in which said two portions of said limiter are movably guided, each portion of said limiter having a cup-shaped cross-section.

4,838,489
COUPLING DEVICE
Aloijsius C. M. van Steijn, Sassanheim, Netherlands, assignor to Multinorm B.V., Netherlands
Filed Jul. 8, 1988, Ser. No. 216,295
Claims priority, application Netherlands, Aug. 18, 1987, 8701944
Int. Cl.[4] B05B *7/26*
U.S. Cl. 239—310 10 Claims

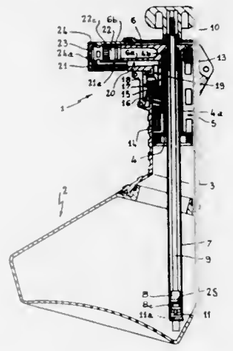


1. Coupling device (1) for connecting a machine (2) onto a reservoir (3), particularly one for substance dangerous to health, characterized by a conically tapering coupling element (4) connectable to the filler opening (5, 6) of said reservoir (3), a line (8) in a bore (7) in said coupling element (4) connectable to said machine (2), which line is axially movable between a position located outside said coupling element (4) and a position wherein said line (8) is located wholly within said coupling element (4) and is sealed relative thereto.

4,838,490
ROTATABLE NOZZLE ASSEMBLY FOR SPRAYERS
Robert Nissels, Saint-Georges de Reneins, France, assignor to Berthoud S.A., Belleville-sur-Saone, France
Filed Mar. 16, 1988, Ser. No. 169,235
Claims priority, application France, Mar. 26, 1987, 87 04444
Int. Cl.[4] B05B *9/043*
U.S. Cl. 239—333 15 Claims

1. A sprayer apparatus comprising a liquid reservoir and a dispenser head, said dispensing head having first and second portions, said first portion of said dispensing head being mounted to said liquid reservoir, said second portion of said dispensing head including a tube means having an elongated axis, a liquid passageway extending along said tube means, valve means for introducing liquid under pressure into said liquid passageway, a nozzle barrel rotatably mounted within said tube means in eccentric relationship with said elongated axis thereof, said nozzle barrel including an outer end portion which extends outwardly of said tube means, at least two annularly sapced orifices provided through said outer end portion of said nozzle barrel, at least two spaced depressions formed in said outer end portion of said nozzle barrel so as to be in communication with one of each of said at least two orifices and for selectively communicating said orifices with said liquid passageway, a cap means mounted about said nozzle barrel and having an outer end spaced from said tube means, said cap means having a discharge opening in said outer end thereof which is aligned with the axis of said tube means, each

of said orifices being spaced so as to be selectively and separately alignable and in open communication with said dis-

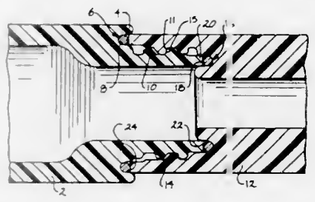


charge opening in said cap means as said nozzle barrel is rotated relative to said tube means.

4,838,491
COUPLING

Peter C. Bennett, Churt Surrey, England, and Rodney J. Clarke, Chichester, England, assignors to Imperial Chemical Industries PLC, England

Continuation of Ser. No. 515,266, Jul. 19, 1983. This application Sep. 30, 1988, Ser. No. 251,400
Claims priority, application United Kingdom, Aug. 18, 1982, 8223723
Int. Cl.[4] B05B *5/00*
U.S. Cl. 239—690 8 Claims

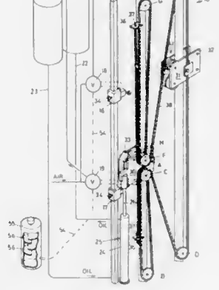


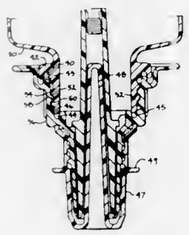
1. A coupling comprising:
a first tubular part;
a second tubular part, the first and second parts being sleeved one inside the other to form a junction between the parts;
a first sealing contact between the first and second parts, a second sealing contact between the first and second parts, the first and second contacts being spaced in an axial direction in which the first and second parts are relatively movable to effect separation thereof; and
constraining means for constraining relative movement between the first and second parts, the constraining means including opposed substantially radial shoulders formed on respective parts, each said radial shoulder having a side face disposed in a plane which is substantially perpendicular to an axis of said first and second parts, engagement between said side faces of said shoulders constraining relative movement between the first and second parts, said constraining means being defined at a first location between the first and second contacts so that upon a differential expansion or contraction of the first and second parts, relative movement between the first and second parts in an axial direction is constrained at said first location while a relative movement between the first and second parts at other locations between said first location and the first and second sealing contacts causes one of the sealing contacts to tighten and the other sealing contact to loosen, and vice versa.

4,838,492
SPRAY GUN RECIPROCATING DEVICE

Arnold R. Berry, 89 Bradley Grove, Mitchell Park, Australia (5043)

Filed Apr. 27, 1988, Ser. No. 186,523
Claims priority, application Australia, Apr. 28, 1987, P11624
Int. Cl.[4] B05B *3/18*
U.S. Cl. 239—752 8 Claims



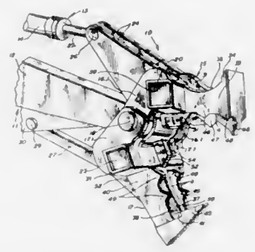


1. An improved spray gun reciprocating device comprising a frame,
said frame having a pair of vertical tracks spaced from but parallel to each other, each said track comprising two flat track surfaces defining an angle between one another,
two carriages each comprising a plurality of roller assemblies for movement along a respective said track, each roller assembly comprising two co-axial but independently rotatable roller portions which engage respective said track surfaces and rotate about an axis which is at an angle to track surfaces,
gun mounting means on a first said carriage,
a piston/cylinder assembly extending between the second said carriage and the frame,
and a chain multiplier comprising sprockets on the frame and sprockets on the second said carriage, a chain extending over said sprockets, and securing means securing the chain ends with respect to the frame, and further securing means securing the chain intermediate its ends to said first carriage thereby coupling said carriages such that actuation of the piston/cylinder assembly effects consequential movement of the second said carriage and increased movement of the first said carriage.

4,838,493
CONCRETE CRUSHER

Kenneth R. LaBounty, Rte. 1, Box 164B, Two Harbors, Minn. 55616

Filed Jun. 10, 1988, Ser. No. 205,422
Int. Cl.[4] B02C *1/06*
U.S. Cl. 241—101.7 23 Claims



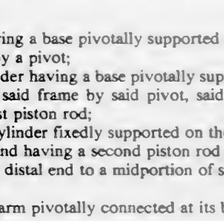
1. A heavy duty attachment for crushing articles of frangible rubble and building materials such as concrete and for connection to the boom structure and hydraulic system of a mobile machine such as a hydraulic excavator, comprising
a jaw structure including first and second relatively swingable jaws pivotally connected to each other, each of the jaws having an inner end portion adjacent the pivotal connection and also having an outer end portion,
means for mounting and connecting the jaw structure to the boom structure and hydraulic system of such a mobile machine in order to have at least one jaw and to open and close the jaws relative to each other and to grip and apply pressure onto such an article to be crushed,
and said first jaw having a rigid grid made of elongate rigid grid elements, certain of said grid elements extending transversely of each other and affixed together, certain of the grid elements being widely spaced from each other to define open areas therebetween and to permit crushed material from the articles to pass through the jaw.

4,838,494
ROLLER MILL, PARTICULARLY ROLL PRESS OR ROLL JAW CRUSHER

Willy Jakobs, Cologne, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 1, 1988, Ser. No. 150,845
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1987, 3705051
Int. Cl.[4] B02C *4/02, 23/00*
U.S. Cl. 241—226 3 Claims

1. A roller mill for receiving stock between rolls, comprising in combination:
a pair of rotatably supported rolls adapted to be driven in opposite directions with their upper surfaces moving toward each other for receiving stock in the nip therebetween in a pressing operation;
a vertical chute extending downwardly toward the nip and positioned for directing stock downwardly into the nip;
rigid supporting arms extending downwardly from sides of the vertical chute;
face plates having vertical planar surfaces at ends of the nip for defining said ends and confining material drawn into the nip from the chute;
a pivotal mount for each of said plates for supporting the plates on the chute;
a wear resistant lining on an inner surface of each of the face plates;
a lower extension plate mounted at each lower end of the face plates and facing the center of the nip;

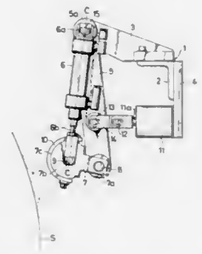


means for adjusting the location of the lower end of each of the face plates and for removably mounting the lower extension plates on the face plates; and
coil compression springs for each face plate between said rigid supporting arms and each face plate to separately resiliently urge the face plates toward the nip, said springs being triangularly arranged for each face plate with a lower spring facing the nip and two upper springs being spaced apart.

4,838,495
APPARATUS FOR STARTING ROTATION OF TAPE-SUPPLY SPOOL

Ryuichi Murasaki, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Apr. 27, 1988, Ser. No. 186,808
Claims priority, application Japan, Apr. 27, 1987, 62-63666[U]
Int. Cl.[4] B65H *16/00*; F16H *32/00*
U.S. Cl. 242—55 6 Claims



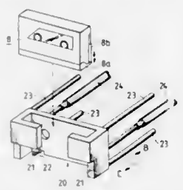
1. An apparatus for starting rotation of a non-driven spool, comprising:
(a) a frame;
(b) a lever having a base pivotally supported on one side of said frame by a pivot;
(c) a first cylinder having a base pivotally supported on said one side of said frame by said pivot, said first cylinder having a first piston rod;
(d) a second cylinder fixedly supported on the other side of said frame and having a second piston rod pivotally connected at its distal end to a midportion of said lever via a link; and
(e) a kick-out arm pivotally connected at its base to a distal

end of said lever and at its head to a distal end of said first piston rod of said first cylinder.

4,838,496
MAGNETIC TAPE LOADING METHOD AND APPARATUS

Kazuo Kubota, and Masaaki Sakaguchi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 19, 1988, Ser. No. 157,666
Claims priority, application Japan, Feb. 19, 1987, 52-34660
Int. Cl.[4] B65H *18/26*
U.S. Cl. 242—67.1 R **6 Claims**

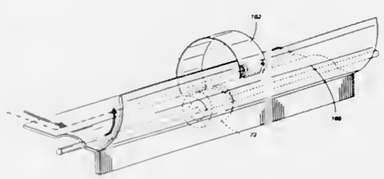


3. In a magnetic tape loading apparatus for loading a magnetic tape into a cassette case containing a pair of flangeless-type tape winding bodies connected to each other through a leader tape and at least one friction sheet contacting an edge of said magnetic tape, the improvement wherein said apparatus is provided with compressed air feeding means for feeding compressed air into said cassette case from at least one reel shaft insertion hole of said cassette case during winding of tape on at least one of said tape winding bodies, such that said compressed air enters a space formed between an inner wall surface of said cassette case and the friction sheet to thereby press said friction sheet against said edge of said magnetic tape.

4,838,497
APPARATUS FOR AUTOMATICALLY ROLLING UP MEDIA SHEETS

William E. Kramer, Fairport; John E. Forward, Penfield, and Michael J. Tracy, Hilton, all of N.Y. assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 12, 1988, Ser. No. 155,445
Int. Cl.[4] B65H *27/00, 29/64*
U.S. Cl. 242—67.2 **2 Claims**



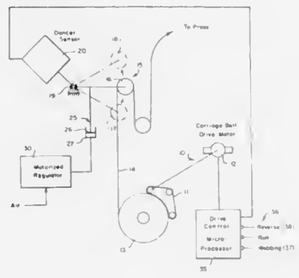
1. Apparatus for rolling one or more media sheets into a tubular configuration, the apparatus including:

means for accepting said media sheets from a media output station and for feeding said sheets into a roll-up assembly, the roll-up assembly including a guide member comprising a rigid semicircular member extending the width of the process path, and at least one flexible, curved guide member connected to the rigid member, the combination forming a circular assembly which defines a roll-up interior space, whereby the media sheets are fed into said guide member and are scrolled within the interior space, the guide member flexing radially outward to accommodate the rolling up of one or more copy sheets.

4,838,498
WEB TENSIONING SYSTEM

Michael Huth, LaGrange Park, Ill., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 22, 1988, Ser. No. 159,309
Int. Cl.[4] B65H *59/38*
U.S. Cl. 242—75.51 **5 Claims**



1. A system for controlling the feeding of web from a supply reel into a web fed printing unit comprising:

(a) drive means operably connected to the web supply reel to effect rotation thereof;

(b) web guide means mounted to receive the web and to guide it between the supply reel and the printing units, said guide means being movable by the web between first and second limit positions;

(c) sensor and signal generating means operatively connected to said web guide means to identify the positioning of said guide means when at said first and second limit positions and at a position intermediate therebetween;

(d) variable biasing means operatively connected to said web guide means;

(e) differential pressure means connected to said variable biasing means to selectively control the resistance to change in position of said web guide means; and

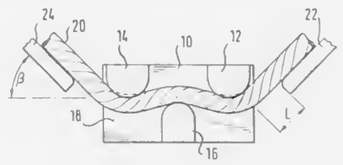
(f) drive control means interconnecting said sensor and signal generating means, said drive means and said differential pressure means, said drive control means including signal processing means to receive the output from said sensor and signal generating means and produce a processed output simultaneously controlling the pressure delivered by said differential pressure means and the speed of said drive means.

4,838,499
CABLE BRAKING MEMBER FOR THE DRIVE OF A SAFETY BELT RETIGHTENER

Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to TRW (Repa) GmbH, Alfdorf, Fed. Rep. of Germany

Filed Mar. 15, 1988, Ser. No. 168,188
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1987, 3710032
Int. Cl.[4] B60R *22/46*
U.S. Cl. 242—107 **11 Claims**

1. In a safety belt retightener associated with a retractor and including a pulley coupled to the reel of the retractor, a linear drive and a pulling cable wrapped around said pulley and having a first end connected to the linear drive a cable braking member through which said pulling cable extends and which restrains movement of said pulling cable therethrough, said cable braking member comprising means defining a guide surface and a plurality of obstructions projecting from said guide surface, each of said obstructions having a contact surface for frictionally engaging said pulling cable, the contact surface on at least one of said obstructions including means for urging said pulling cable into frictional engagement with said guide surface, said means for urging comprising a cable contact

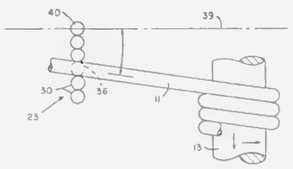


face inclined at an angle of inclination of less than 90° to said guide surface.

4,838,500
PROCESS AND APPARATUS FOR CONTROLLING WINDING ANGLE

Gregory S. Graham, Sylvania, Ala., assignor to United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 18, 1987, Ser. No. 63,611
Int. Cl.[4] B65H *54/28*
U.S. Cl. 242—158 R **6 Claims**



1. A process for controlling the angle at which a filament is wound onto a rotating bobbin, comprising:

a. directing the filament past a guide and over an array of light-sensing elements arranged in a row and onto the rotating bobbin, at least one of said guide and said bobbin being traversible back and forth at a desired (variable) rate of speed along a path generally parallel to the axis of the bobbin, said row being generally parallel to the axis of the bobbin and said elements being positioned on centers having a spacing substantially the same as the diameter of the filament,

b. projecting collimated light onto said array in such a manner that a shawdow of the filament is cast onto a single one of the light-sensing elements, said light-sensing elements each generating a signal having a strength which varies with the amount of light falling on said element,

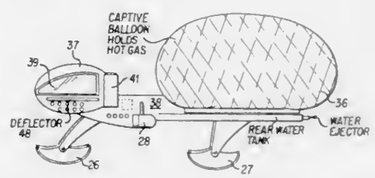
c. sensing said signals to determine upon which of the elements a shadow is falling, and

d. traversing at least one of said guide and said bobbin at a rate of speed controlled by the sensed signals such that the shadow of the filament falls onto and remains on a single predetermined (the particular) light-sensing element on which said shadow will fall when the filament is being wound onto the bobbin at the desired angle (said rate being controlled in response to said signals).

4,838,501
BALOPOD (HYBRID FLYING MACHINE)

Edward G. Judson, 1263 Union Ave., Newburgh, N.Y. 12550

Filed Apr. 3, 1986, Ser. No. 847,523
Int. Cl.[4] B64B *1, 20, 1/36, 1/70*
U.S. Cl. 244—29 **1 Claim**

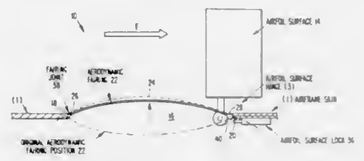


1. A hybrid aircraft including both static lift (lighter than air) and dynamic lift (heavier than air) means; said aircraft comprising a rigid frame connecting said static lift means and said dynamic lift means and extending from the front end to the rear end of said aircraft, a cockpit rigidly secured to the front of said frame containing pilot control means, vertically hinged turn panels attached to the rear of the cockpit and controlled by said control means to provide yaw control to said aircraft, jet engines mounted upon horizontal pivot axes attached to the front half of said rigid frame and controlled by said control means to be pivoted through 180° to provide both horizontal and vertical thrust to said aircraft, said static lift means comprises a lighter than air gas bag attached to the rear portion of said frame and provided with means to vary the buoyancy thereof; said dynamic lift means comprises pivoted deflectors mounted upon horizontal axes attached directly to said cockpit and the angle of the deflection thereof controlled by said control means; said aircraft further comprising ballast making means and ballast storage tanks located in the front and rear of said aircraft with shifting means to shift ballast from said front tank to said rear tank to balance the aircraft; whereby said dynamic lift means is solely located on the front of said frame and provided a lifting force to the front of said aircraft and said static lift means is solely located on the rear of said frame and provides a lifting force to the rear of said aircraft and the control means is used to control said lifting forces and said jet engines and thereby control the attitude and flight direction of said aircraft.

4,838,502
RESILIENTLY DEPLOYABLE FAIRING FOR SEALING AN AIRFRAME CAVITY

George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 16, 1988, Ser. No. 169,223
Int. Cl.[4] F42B *13/32*
U.S. Cl. 244—49 **10 Claims**

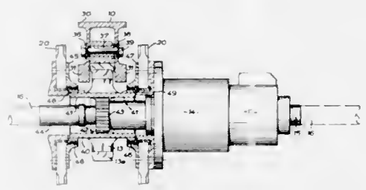


1. Apparatus for sealing a cavity in an airframe through which an airfoil has been deployed, the skin of the airframe defining fore and aft edges of the cavity relative to the intended direction of motion of the airframe, the apparatus comprising:

a fairing element having a longitudinal axis with opposed

fairing axial ends, said fairing being resilient to bending along said longitudinal axis;
means for attaching said fairing axial ends to the cavity fore and aft edges, respectively, said attached fairing element having an unbent state and a bent state,
wherein said attached fairing in said unbent state is positioned to provide to the flow of air past the airframe, an aerodynamically shaped transition between the skin portions fore and aft of the cavity,
wherein said attached fairing element in said bent state is positioned substantially within said cavity and has a continuous resilient bias toward said unbent position; and
means for retaining said fairing member in said bent state against said bias until deployment of the airfoil and then releasing said fairing member for movement to said unbent state.

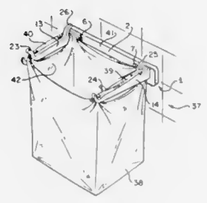
4,838,503
MECHANISM FOR SUPPORTING AND EXTENDING A HIGH LIFT DEVICE FOR AIRCRAFT WINGS
George H. Williams, Bristol, United Kingdom, assignor to British Aerospace PLC, London, United Kingdom
Filed May 13, 1988, Ser. No. 193,786
Claims priority, application United Kingdom, May 13, 1987, 8711252
Int. Cl.[4] B64C *3/50*
U.S. Cl. 244—214 5 Claims



1. A mechanism for supporting and extending a high lift device relative to an aerofoil, comprising one or more carrier beams adapted to be connected to said aerofoil, a pair of spaced apart chordwise extending wing ribs bounding said carrier beam(s), supporting means mounted between said wing ribs for supporting said carrier beam(s), said carrier beam(s) carrying a gear rack with gear teeth facing downwardly and a pinion gear in meshing engagement with said gear rack, and an actuator in driving engagement with said pinion gear to extend and retract the high lift device relative to said aerofoil, the improvement comprising means for rotatably supporting said pinion gear between said wing ribs about a generally transverse axis of rotation independently of said actuator and said means for rotatably supporting said pinion gear includes self-aligning bearings with inner bearing sleeves mounted fast in rotation with the pinion gear.

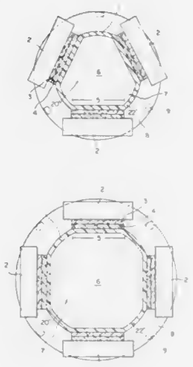
4,838,504
BAG-HOLDING ARTICLE
Stefan Bittenbinder, Apartment 5 6736 Los Verdes Dr., Rancho Palos Verdes, Calif. 90274
Filed Jan. 6, 1988, Ser. No. 142,000
Int. Cl.[4] B65B *67/04*
U.S. Cl. 248—100 9 Claims

1. An article adapted for use in holding, by its loops, in a substantially open position, a bag having at least two loops at or near the top of said bag, said article comprising: a base member including means for attaching said base member to a flat surface, and means for attaching, at substantially right angles to said base member, two bag-supporting members, two substantially similar bag-supporting, loop-engaging members, disposed substantially in parallel to one another, and attached to said base member at one end of said bag-supporting member, said bag-supporting members being spaced apart a distance sufficient to hold said bag open when said at least two loops on said bag are attached to said bag-supporting members, each of said bag-supporting, loop-engaging members comprising at least two loop-engaging hooks at substantially opposite ends of said bag-supporting members, the opening in one of said hooks



projecting upwardly and slightly forwardly with respect to the lateral axis of said bag-supporting member, the opening in another hook projecting upwardly and slightly rearwardly with respect to the longitudinal axis of said bag-supporting member, said hooks being spaced apart along said bag-supporting member a distance sufficient to hold said bag substantially open when said bag loops are attached to said bag hooks.

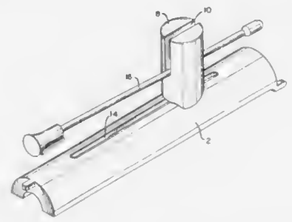
4,838,505
REMOTE CONTROL HOLDER
Terry J. Lowe, Rte. 2, Box 475A, Virginia Ave., Goodlettesville, Tenn. 37072
Filed Feb. 2, 1988, Ser. No. 151,614
Int. Cl.[4] F16M *11/00*
U.S. Cl. 248—176 15 Claims



1. A holder for holding one or more remote controllers for remotely controlling one or more corresponding electronic devices comprising:
a base;
a plurality of upstanding walls extending upwardly from said base, each of said walls presenting an outwardly facing surface and an inwardly facing surface;
a means, mounted to selected ones of said outwardly facing surfaces, for facilitating the releasable attachment of each one of the remote controllers to its coresponding said outwardly facing surface;
said upstanding walls and said base defining a storage volume therein; and
said upstanding walls present two generally flat surfaces to

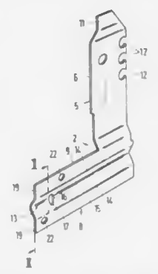
which said attachment means is mounted and each one of said flat surfaces contains an aperture by which the holder may be grasped.

4,838,506
GUIDANCE DEVICE FOR ULTRASOUND GUIDED SURGICAL PROCEDURES
William I. Cooper, 300 N. 14th St., Easton, Pa. 18042
Filed Jun. 15, 1988, Ser. No. 206,796
Int. Cl.[4] A61B *10/00*
U.S. Cl. 248—200 6 Claims



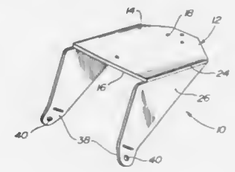
1. A guidance device for a needle guide sleeve, said device being adapted to fit securely onto the probe of an ultrasonic, intracavitary probe and comprising:
(a) a rigid elongated base portion having a lower semicircular contact surface configured to extend along and engage an upper surface of said probe; and,
(b) an upwardly extending arm secured to said elongated base portion, said arm having an axially-extending open-ended slot in the upper portion thereof, said slot being configured and oriented for removably positioning said needle guide sleeve in the two dimensions of the plane of the picture generated by said ultrasonic probe when it is in place withn the cavity being probed.

4,838,507
PANEL ANCHORING DEVICE
Siegfried Fricker, Wurmberger Strasse 30-34, 7135 Wiernsheim, Fed. Rep. of Germany
Filed Jan. 11, 1988, Ser. No. 141,796
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1987, 3700619
The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.
Int. Cl.[4] E04F *13/08*
U.S. Cl. 248—230 14 Claims



1. An anchoring device for anchoring panels on an anchoring base such as a building wall or the like, comprising:
(a) a pair of spaced angled holders each of which has a vertically extending holding part adapted to be mounted on an anchoring base, and a generally horizontally extending clamping plate,
(b) a serration tooth formed on at least one of said clamping plates and extending inwardly toward the other of said clamping plates,
(c) a tubular support member adapted to be positioned between said clamping plates and being further adapted to mount objects to be supported from said anchoring base through said anchoring device, and
(d) fastening means interconnecting said clamping plates for tightly clamping said holders around said tubular support member, said serration tooth during such tightening being pressed into and consequently deforming the wall of said tubular support member in such region, said tooth during such period of clamping precluding axial and rotational movement of said support member.

4,838,508
ACCESSORY SUPPORT BRACKET
Jack Legon, R.D. 6, Box 92, Newton, N.J. 07860
Filed Oct. 18, 1988, Ser. No. 259,262
Int. Cl.[4] A47B *91/00*
U.S. Cl. 248—346 7 Claims

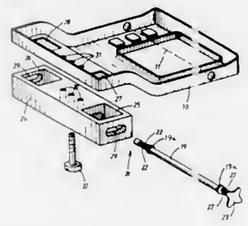


1. An accessory bracket for mounting accessory items in a vehicle employing available mounting facilities comprising:
a base portion having a first face and a second face and a first pair of parallel marginal edges;
a pair of side plates, one coupled to each of said marginal edges of said base portion;
said side plates extending generally perpendicular to said base portion second face and forming a generally inverted U-shape therewith;
and aperture means in each of said side plates adjacent the free ends thereof for receipt therethrough of the mounting bolts of items already mounted upon such vehicles;
wherein each of said side plates has a leading edge and a trailing edge and said aperture means is a series of slots in said side plates adjacent the free ends thereof each extending from said leading edge toward said trailing edge whereby the second face of said base portion may be placed at different distances above such mounting bolts.

4,838,509
TILT-ADJUSTABLE SEAT CUSHION FOR A VEHICLE SEAT
Josef Klink, Nagold, and Ulrich Maier, Sindelfingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Filed Aug. 19, 1987, Ser. No. 86,815
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1986, 3628685
Int. Cl.[4] A47C *3/00*; F16M *13/00*
U.S. Cl. 248—393 7 Claims

1. A tilt-adjustable seat cushion for a vehicle seat having an underframe for receiving an upholstered seat part, and having two frame parts which are arranged laterally of said underframe and swiveling shaft means for said underframe disposed in said frame parts that extends in transverse direction of a vehicle, each said frame part carrying at least one row of teeth

for interaction with at least two pinion gear teeth, and an adjusting shaft carrying said pinion gear teeth having, at one end, a handwheel, said seat cushion comprising: a unitary bearing block means in which said adjusting shaft is disposed,



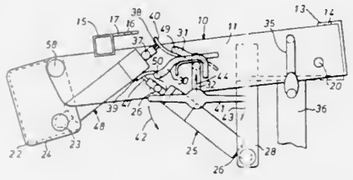
said bearing block means being connected to and forming a separate assembly with said frame parts and said adjusting shaft, said separate assembly being connected with said underframe by fastening means.

4,838,510

SEAT MOUNTING FOR OFFICE CHAIRS

Lars A. Holstensson, Södra Koltorpsgatan 37, S-571 00, Nässjö, Sweden

Filed Sep. 21, 1987, Ser. No. 98,083
Int. Cl.[4] A47C *1/02*
U.S. Cl. 248—397 **6 Claims**



6. A seat mounting for a chair having a base, a central column, a seat and a back-rest, comprising

a frame including a pair of spaced apart side members attached to a pair of cross members, said cross members adapted to be attached to a chair seat;

a first holder pivotally attached to said frame and attached to a central support column having a base;

a second holder pivotally attached to said frame and adapted to be attached to a back-rest;

a first gas spring means attached to said frame at one end and pivotally attached to said first holder at an opposite end for counteracting pivotal movement between said first holder and said frame and including a first actuating member;

a second gas spring means attached to said frame at one end and pivotally attached to sad second holder at an opposite end for counteracting pivotal movement between said second holder and said frame and including a second actuating member; and

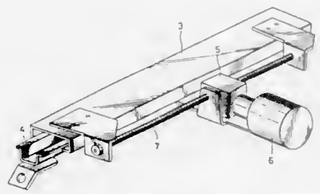
control means mounted on said frame and movable in at least three directions with respect to said frame, whereby upon movement of said control means in a frist direction said first actuating member is actuated to permit movement of said first holder, upon movement of said control means in a second direction said second actuating member is actuated to permit movement of said second holder, and upon movement of said control means in a third direction said first and second actuating members are actuated to permit movement of said first holder and said second holder simultaneously.

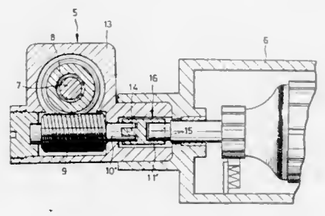
4,838,511

POWER SEAT APPARATUS FOR AUTOMOTIVE VEHICLES

Takami Terada, Toyota, and Hiroshi Nawa, Chiryu, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 16, 1987, Ser. No. 74,356
Claims priority, application Japan, Jul. 30, 1986, 61-179168
Int. Cl.[4] A47C *1/023*; F16D *1/00*
U.S. Cl. 248—429 **2 Claims**





2. A coupling adapted to connect a first shaft and a second shaft comprising:

a first end portion adapted to be coupled to said first shaft;

a second end portion adapted to be coupled to said second shaft;

a first axially extending bore terminating at said first end portion;

a second axially extending bore terminating at said second end portion and spaced from said first bore for providing a solid divider between said first and second bores;

a first wall portion for being inserted in a first groove in an end of said first shaft, said first end portion and said first wall portion being formed as a unitary body, said first wall portion extending the length of said first bore for dividing said first bore into two semi-cylindrical sections;

a second wall portion for being inserted in a second groove in an end of said second shaft, said second end portion and said second wall portion being formed as a unitary body, said second wall portion being substantially perpendicular to said first wall portion and extending the length of said second bore for dividing said second bore into two semi-cylindrical sections;

a first inner wall surface formed by said first bore for receiving an outer wall surface of the end of the first shaft;

a second inner wall surface formed by said second bore for receiving an outer wall surface of the end of the second shaft;

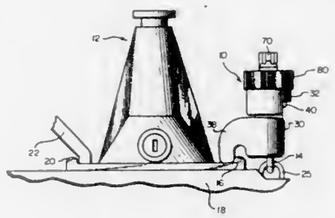
wherein the diameter of the first and second inner wall surfaces, the diameter of the outer wall surfaces, the thickness of the first and second wall portions and the thickness of said first and second grooves being relatively dimensioned for fitting said outer wall surfaces of said first and second shafts into said inner wall surfaces, respectively, and said first and second wall portions into said first and second grooves, respectively.

4,838,512

JACK HOLD DOWN DEVICE

Stephen P. Lisak, Arab, Ala., and James T. McGuire, Royal Oak, Mich., assignors to Ryder International and Textron, Inc., Providence, R.I.

Filed Aug. 17, 1988, Ser. No. 233,157
Int. Cl.[4] A47B *97/00*
U.S. Cl. 248—503 **10 Claims**



1. A jack hold down apparatus for threadably engaging an elongate, projecting externally threaded post member and advancing and retracting therealong for respectively engaging and disengaging an edge part of an automotive jack for holding the same in, and releasing the same from, engagement with a given surface, said apparatus comprising: a first component comprising jack-engaging means including a body having a through opening for receiving said post member therethrough and defining an axis, a radially projecting lip portion for engaging said edge part of said jack, and an axially projecting connecting portion for receiving a second component; said second component comprising manually graspable knob means having a through opening coaxially alignable with the through opening of said first component and a cooperating connecting portion alignable with said first component connecting portion for assembly therewith in a generally radial direction, so as to be non-removable therefrom in the axial direction; post-engaging means comprising an internally threaded body internally sized to threadably engage said post and externally sized to fit at least partly within one of said first and second components, and assembly means having an external configuration for interfitting within at least portions of both of said first and second component aligned through openings to thereby hold the first and second components and said post-engaging means together in assembled condition, such that rotation of the knob means results in threadable advancement and retraction of the assembly thus formed relative to said post member.

4,838,513

LOCK MECHANISM

Toru Kondo, Ayase, Japan, assignor to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Jul. 21, 1987, Ser. No. 77,143
Claims priority, application Japan, Jul. 22, 1986, 61-112201[U]
Int. Cl.[4] B60N *1/02*
U.S. Cl. 248—503.1 **2 Claims**

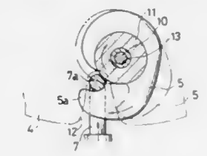
1. A lock mechanism for locking a fixing member to a movable member, comprising:

said striker erected from a fixing member;

a rod attached to a certain portion of a movable member, said movable member being engageable with the fixing member;

a hook swingably supported by the rod, said hook having a claw portion engageable with the striker along an inner surface of said claw portion;

a substantially disk-shaped, resilient bumper having an outer periphery facing an inner surface of said claw portion to hold a front portion of the striker between said outer periphery of said resilient bumper and said inner surface of



the claw portion, when said claw is engaged with said striker;

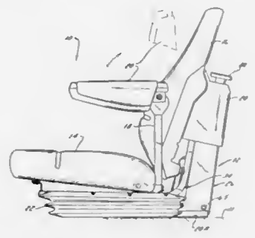
said resilient bumper being freely, rotatably, mounted on said rod supporting said hook, and thereby rotatably displaced upon engagement with said front portion of said striker.

4,838,514

VEHICLE SEAT

Kevin E. Hill, Milwaukee, Wis., assignor to Milsco Manufacturing Company, Milwaukee, Wis.

Filed Jun. 3, 1988, Ser. No. 201,945
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—577 **8 Claims**



1. A seat for a vehicle comprising:

a stationary support frame for mounting on said vehicle;

a movable seat frame for accommodating a seat occupant;

means for mounting said movable seat frame on said stationary support frame to enable said movable seat frame to move vertically relative to said stationary support frame in response to road shocks or the weight of a seat occupant, said means comprising guide means including a first member mounted on and movable with said movable seat frame and a second member mounted on said stationary support frame and engaged with said first member, said means further comprising a swing arm pivotally connected between said stationary support frame and said movable seat frame;

a helical tension spring having an upper end and a lower end for biasing said movable seat frame upwardly relative to said stationary support frame;

first means for connecting said upper end of said tension spring to said stationary support frame;

second means for connecting said lower end of said tension spring to said movable seat frame, said second means comprising a rod mounted on and movable with said movable seat frame, said second means further comprising a spring hanger mounted on and movable with said rod

and engaged with said lower end of said tension spring, said spring hanger being selectively movable axially to desired positions along said rod to thereby adjust the tension on said spring;

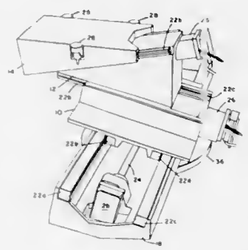
and extendable/retractable spring damper means connected in parallel with said tension spring between said movable seat frame and said swing arm.

4,838,515

ARTICLE POSITIONER AND METHOD

Thomas C. Prentice, Westford, Mass., assignor to Teledyne, Inc., Woburn, Mass.

Filed May 18, 1987, Ser. No 51,668
Int. Cl.⁴ F16M *11/12*
U.S. Cl. 248—661 **14 Claims**



1. An article positioner comprising:

first wedge means having a wedge axis and a wedging surface, said wedging surface intersecting the wedge axis at an acute angle;

second wedge means having a wedge axis, a left wedging surface and a right wedging surface, said weighing surfaces intersecting the second wedge means wedging axis at an acute angle and with said right wedging surface being positioned with respect to said first wedge means wedging surface for wedging movement relative thereto;

third wedge means having a wedge axis and a wedging surface, said wedging surface intersecting the third wedge means wedge axis at an acute angle and with said wedging surface being positioned with respect to said second wedge means left wedging surface for wedging movement relative thereto;

means for independently moving at least two of said wedge means with respect to each other along their respective wedge axes and with respect to the third of said wedge means.

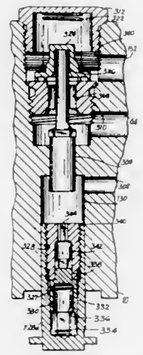
4,838,516

COMPRESSION RELEASE RETARDER WITH VALVE MOTION MODIFIER

Zdenek S. Meistrick, Bloomfield, and Raymond N. Quenneville, Suffield, both of Conn., assignors to The Jacobs Manufacturing Company, Bloomfield, Conn.

Continuation-in-part of Ser. No. 872,494, Jun. 10, 1986, Pat. No. 4,706,624. This application Nov. 16, 1987, Ser. No. 120,825
Int. Cl.⁴ F16K *31/44*
U.S. Cl. 251—77 **5 Claims**

1. A trigger valve for use in an hydraulic circuit comprising a body having a cavity formed therein and inlet and outlet ports, said body having a valve seat formed in the cavity portion thereof between said inlet and outlet ports, a valve having a valve seat engaging surface formed thereon, a cap in sealing engagement with respect to said cavity, spring means adapted to bias said valve against said valve seat, axially movable actuating means adapted to move said valve away from said valve seat against the bias of said spring means, and piston means



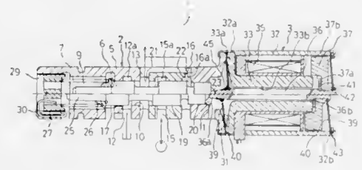
adapted to drive said actuating means, the axial length of said piston means being adjustable.

4,838,517

PRESSURE CONTROL VALVE

Nobuaki Miki, Kariya; Akira Suzuki, Obu, and Kouji Kobayashi, Toyota, all of Japan, assignors to Aisin Aw Co., Ltd., Anjo, Japan

Filed May 25, 1988, Ser. No. 198,432
Claims priority, application Japan, May 28, 1987, 62-133592
Int. Cl.⁴ F15B *13/044*
U.S. Cl. 251—129.16 **4 Claims**



1. A pressure control valve comprising,

a pressure modulating valve section including a valve sleeve having a space at one side and a drain communicating the space, and a spool situated inside the valve sleeve, and

a magnetic section connected to the pressure modulating valve section, said magnetic section including:

a cylindrical case attached to the valve sleeve at a side of the space,

a coil assembly concentrically installed in said case,

a cylindrical core concentrically installed inside said coil assembly,

a rod slidably situated inside the core,

a plunger fixed to the rod at a side opposite the space so that when the coil assembly is actuated, the plunger is moved to thereby allow the rod to slide inside the core,

a disc type supporting members made of leaf spring materials, each supporting member having a central hole, a plurality of through holes, an outer brim and an inner brim along the central hole, said outer brims of the supporting members being fixed to both axial ends of the cylindrical case and said inner brims of the supporting members being connected to the rod to slidably support the same inside the case, and

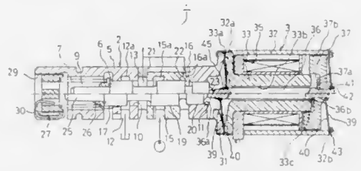
disc type filter members overlaid on the disc type supporting members, said filter members having semi liquid sealability and air permeability to prevent pressure change inside the magnetic section.

4,838,518

PRESSURE CONTROL VALVE

Kouji Kobayashi, Toyota; Akira Suzuki, and Nobuaki Miki, both of Obu, all of Japan, assignors to Aisin An Co., Ltd., Anjo, Japan

Filed May 25, 1988, Ser. No. 198,410
Claims priority, application Japan, May 28, 1987, 62-133591
Int. Cl.⁴ F15B *13/044*
U.S. Cl. 251—129.16 **5 Claims**



1. A pressure control valve comprising:

a pressure modulating valve section, and

a magnetic section connected to one side of the pressure modulating valve section, said magnetic section including;

a cylindrical case attached to the pressure modulating valve section,

a coil assembly concentrically installed in said case and having a central opening,

a cylindrical core concentrically installed in the central opening of said coil assembly and having a projection with an edge projecting beyond the coil assembly at a side opposite the pressure modulating valve section, and a hole therein,

a rod situated in the hole of the cylindrical core to move along the core and having an outer end at a side opposite the pressure modulating valve section,

a plunger fixed on the outer end of said rod and situated inside the cylindrical case at a minute distance therefrom, said plunger being made of a magnetic member and having a cylindrical concave formed in the center of the plunger at a side of the cylindrical core, the diameter of said concave being larger than that of the cylindrical core so that when the magnetic section is in non-magnetized condition, the edge of the cylindrical core is located adjacent to the plunger outside the cylindrical concave, and when the magnetic section is in magnetized condition, the projection of the cylindrical core is located in the cylindrical concave to allow magnetic flux to pass through the plunger and cylindrical core, said cylindrical concave and projection of said cylindrical core situated away from the pressure modulating valve section constituting a magnetic attractive section, and

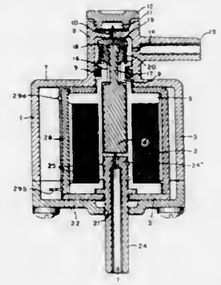
a stopper member made of a non magnetic material, said stopper member being installed in the cylindrical concave of the plunger so that when the magnetic section is in the magnetized condition, the projection of the core contacts the stopper member to prevent the plunger to directly contact the coil assembly.

4,838,519

ELECTRIC VACUUM ACTUATOR VALVE

Eric Buffet, MC-Monaco; Christian Dragoni, Nice, and Pierre Rey, Menton, all of France, assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 26, 1985, Ser. No. 705,840
Int. Cl.⁴ F16K *31/02*
U.S. Cl. 251—129.21 **7 Claims**



1. An electrically actuated valve comprising:

(a) structure defining a case and valve body attached thereto defining a control chamber with a first supply port adapted for connection to a vacuum source and signal port adapted for connection to a vacuum actuated device to be controlled;

(b) a bobbin received in said case and having an electrical winding thereon and adapted for electrical connection thereto;

(c) said bobbin having a first portion extending from said case and sealed against said body for closing said control chamber and a second portion disposed in said case with said winding thereon, said first portion defining a valve seat thereon communicating with a fluid passage through said first and second portions;

(d) a pole frame providing a magnetic flux path about said winding, said pole frame including a member extending axially within said bobbin second portion and defines an atmospheric inlet port communicating with said bobbin passage;

(e) a core member movably disposed in said bobbin second portion and having attached thereto a stem extending through said valve seat;

(f) a seal member attached to said stem, said seal member operative upon movement of said core, responsive to winding energization, to have first portions thereof contact said valve seat and block flow between said control chamber and said bobbin passage, said seal having second portions thereof contacting said supply port and blocking same when said winding is not energized and opening same when said winding is energized; and,

(g) means biasing said stem in a direction for causing said seal member second portions to block said supply port.

4,838,520

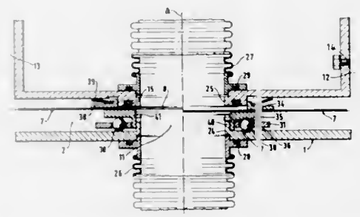
VALVE FOR A VACUUM ENCLOSURE

Sébastien Frindel, Annecy le Vieux, and Jacques Mimeur, Veyrier du Lac, both of France, assignors to Alcatel Cit, Paris, France

Filed Jun. 16, 1988, Ser. No. 207,483
Claims priority, application France, Jun. 16, 1987, 87 08363
Int. Cl.⁴ F16K *25/00*
U.S. Cl. 251—204 **1 Claim**

1. A valve for a vacuum enclosure, the valve comprising a valve body which is hollow about an axis Δ and which opens out to the outside via two opposite end openings of the valve

body, thereby enabling the valve to be inserted in a pumping circuit, the inside of said valve body being provided by closure means constituted by a strip which is movable in its own plane, which plane extends perpendicularly to the axis Δ, said strip being provided with at least one opening and being associated with two pay-out and take-up drums provided with drive means, said valve body being further provided with sealing means situated between the two drums and comprising a fixed gasket fixed to the valve body and situated on a first side of the strip and a moving gasket system capable of moving parallel to the axis Δ and situated on the other side of the strip from the fixed gasket, wherein said moving gasket system includes a plurality of balls which are held spaced apart from one another around a circumference by means of a rotatable cage, the



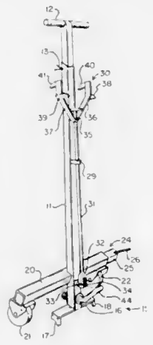
assembly comprising said balls and said cage being disposed between a clamping ring which is axially displacable and which is provided with conical depressions for receiving the balls and a plane portion of the valve body which is also provided with conical depressions for receiving the balls, said cage being associated with means enabling it to be rotated through an angle α, the clamping ring being axially slidable in sealed manner along a cylindrical bearing surface inside said valve body, and wherein the valve body includes a return ring situated on the same side of the strip as said fixed gasket and subjected to the force of a return spring directed towards said strip with said return spring exerting a light force on said return ring sufficient to move said clamping ring away from said fixed gasket with said balls received within said conical depressions.

4,838,521

APPARATUS FOR MANIPULATING MANHOLE COVERS

Gerald L. Moisan, 12555 N. 75th St., Longmont, Colo. 80501

Filed May 24, 1988, Ser. No. 197,930
Int. Cl.[4] B66F *11/00*
U.S. Cl. 254—131 11 Claims



1. Apparatus for facilitating the handling of a generally flat, heavy cover which has a relatively narrow edge around the perimeter thereof to fit into a recessed shoulder at the opening of a casing, comprising;

an elongated handle having a pair of spaced prong means extending from one end and in the same general direction as the length of said handle for engaging the cover perimeter edge at spaced contact points, each said prong means having a cam surface facing the casing opening for maintaining mechanical advantage for said elongated handle during rotation thereof until the cover is lifted from the casing shoulder,

swing arm means having one end gripper means for engaging the cover edge including a tooth having a surface for engaging the cover perimeter edge, with said tooth surface sloping toward the bottom edge of the cover, whereby said tooth surface maintains contact below the upper surface of the cover in response to rotation of said elongated handle, and means pivotally attaching the other end of said swing arm means to said handle in proximity to said pair of prong means,

said swing arm means having a length so that said gripper means tooth is adapted to enter between the cover edge and the casing on one side of the cover when said pair of prong means is inserted into the space between the cover edge and the casing on the opposite side of the cover, and

ground engaging means secured to said handle in a position above the ground when said pair of prong means is inserted into the space between the cover edge and the casing, but for subsequently contacting the ground in response to rotation of said handle in a direction away from the cover,

whereby placement of said pair of prong means and said gripper means tooth into engagement with respective edges of the cover, and rotation of said elongated handle in a direction away from the cover until said ground engaging means contacts the ground, results in removal of the cover from the casing in a secure and controlled manner.

4,838,522

DEEPWATER SUBSEA LOWERING/LIFTING SYSTEM

Dennis E. Calkins, Houston, Tex., assignor to McDermott International Inc., New Orleans, La.

Filed Feb. 1, 1988, Ser. No. 150,802
Int. Cl.[4] B66C *1/00*; B66D *1/00, 3/08*
U.S. Cl. 254—337 3 Claims

1. A lowering/lifting apparatus for lowering/lifting a load in a marine environment comprising:

a support from which said load is suspended, said support comprising the boom of a heavy lift crane;

a fixed block secured to said support at a relatively fixed elevation;

a traveling block suspended underneath said fixed block and movable with respect to said fixed block;

a separate cable suspending said traveling block from said fixed block;

winch means for moving said traveling block with respect to said fixed block via said separate cable;

a first cable grip assembly secured underneath to and movable with said traveling block;

a second cable grip assembly secured to said suport at an elevation underneath said fixed block;

a lowering/lifting cable passing through said first and second cable grip assemblies having one end secured to said load with the other end secured to a storage wheel, said storage wheel storing and maintaining the tension on said lowering/lifting cable;

said first and second cable grip assemblies each comprising a plurality of clamps configured to selectively engage and disengage said lowering/lifting cable, each said clamp comprising multiple wedges configured to wedge against and seize said lowering/lifting cable;

operating means for independently operating said first and second cable grip assemblies for selective engagement of said lowering/lifting cable;

whereby when said first cable grip assembly engages said lowering/lifting cable and said second cable grip assembly is disengaged from said lowering/lifting cable, said load is moved upon the movement of said traveling block; and,

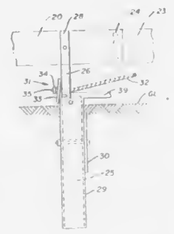
whereby, when said second cable grip assembly engages said lowering/lifting cable and said first cable grip assembly is disengaged from said lowering/lifting cable, said load remains stationary upon the movement of said traveling block.

4,838,523

ENERGY ABSORBING GUARD RAIL TERMINAL

Walter P. Humble; John C. Durkos; Nick A. DiMargio, all of Canfield; Dominick J. Cortell, Youngstown, and Charles W. Syak, Girard, all of Ohio, assignors to Syro Steel Company, Girard, Ohio

Filed Jul. 25, 1988, Ser. No. 223,926
Int. Cl.[4] A01K *3/00*
U.S. Cl. 256—13.1 5 Claims



1. An improvement to an energy absorbing guard rail terminal, the terminal comprises a plurality of pairs of transversely spaced parallel horizontally extending guard rails having overlapping ends, a plurality of break away support posts supporting said guard rails, mounting bolts securing the underlapping rails to said posts, spacer rods between said parallel rails and a box beam on some of said posts facing said spacer rods, multiple spaced openings in each of said guard rails aligned longitudinally for registration of the splice bolts therebetween,

the improvement comprises a first break away post having a notch portion on its above ground portion, a cable and support assembly extending from said first post below a break away point, means for spacing said guard rail pairs on said support posts, means for decreased telescopic resistance between said underlapping rail ends and a three-piece nose assembly secured between said first post and said cable support assembly.

4,838,524

NOISE BARRIER

Patrick D. McKeown, Mansfield, and Jack W. Neiger, Tuscarawas, both of Ohio, assignors to Cyclops Corporation, Pittsburgh, Pa.

Filed Sep. 8, 1987, Ser. No. 94,242
Int. Cl.[4] G10K *11/00*; E04B *1/86*
U.S. Cl. 256—24 22 Claims

1. A noise barrier panel for the abatement of noise from a noise source, comprising:

a. a perforated front sheet forming the front outer wall of the panel, said front sheet having a front surface in facing relation to said noise source and a rear surface;

b. a nonperforated rear sheet forming the rear outer wall of the panel and held in spaced, noncontacting relationship to the front sheet so as to define a chamber therebetween, said rear sheet having a front side in facing relation to said noise source and a rear side;

c. a central, perforated corrugated sheet element disposed in said chamber, said central element having a front face in facing relation to said noise source and a rear face;

d. a first noise absorbing blanket of material disposed between the rear surface of said front sheet and the front face of said central sheet; and

e. a second noise absorbing material disposed between the rear face of said central sheet and the front side of said rear sheet.

4,838,525

PORTABLE BARRIER MEANS

Claud R. Snow, 210 E., Highway No. 150 South, Crawfordsville, Ind. 47933; W. Robert Snow, 16361 McFadden, Apt. #53, Tustin, Calif. 92680, and White: William R., 15 Bent Tree Dr., Little Rock, Ark. 72212

Filed Nov. 27, 1987, Ser. No. 126,012
Int. Cl.[4] E04H *17/16*
U.S. Cl. 256—26 20 Claims

1. A barrier shield device for outdoor use, such as to provide protection for the user from the wind as on a beach, comprising:

a plurality of panel members;

hinge means joining adjacent panel members but permitting relative movement thereof from juxtaposed adjacency to a spaced-apart at least almost co-planar relation;

a plurality of ground-engagcable support spikes;

support means bridging the hinge means and carried by at least two of the panel members, and located at or adjacent the outer edges of the assembly of panel member when they are in said spaced-apart at least almost co-planar relation, and those support means are adapted to hold at least two of the spikes in widely spaced relationship for

holding the panel members in said spaced-apart at least almost co-planar relation, and supportingly connected to at least two of the panel members, but those support means permitting relative movement of the spikes between an upper position for ease of transport and a lower position firmly seated into the ground;

the relative movement permitted for the spikes being such

that, with the panel members standing on edge, the spikes may be pushed into the ground for firmly holding the panel members to the ground;

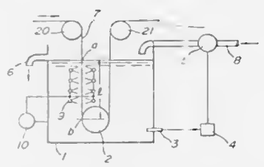
the support means being relatively positioned sufficiently low with respect to the ground-adjacent edge of the panel members that the spikes are supportingly engaging the support means in and between their said upper or transport position and their lower ground-engaging position.

4,838,526

APPARATUS OF COOLING STEEL STRIP

Sachihiro Iida, Kurashiki, Japan, assignor to Kawasaki Steel Corporation, Kobe, Japan

Division of Ser. No. 842,137, Mar. 20, 1986, Pat. No. 4,729,800. This application Nov. 16, 1987, Ser. No. 120,988
Claims priority, application Japan, Mar. 22, 1985, 60-56094
Int. Cl.[4] C21D *9/52*
U.S. Cl. 266—80 **4 Claims**



1. An apparatus for cooling a steel strip which has been cooled through a final cooling zone in a continuous heat treating line comprising

a cooling tank containing cooling water;

one or more sink-rolls arranged in the cooling water to guide the steel strip in the cooling tank

a guide roll provided at the inlet of the cooling tank for guiding the steel strip from the outlet of the final cooling zone to the first one of the sink-rolls in the cooling water;

a plurality of injection nozzles arranged along a portion of the steel strip in the cooling water between the surface of the cooling water and the first sink-roll such as to inject cooling water jets against the surface of said portion of the steel strip;

means for detecting the temperature (Tw) of the cooling water in which said first sink-roll is immersed;

means for detecting the temperature (Ts) of the steel strip at the inlet of the cooling tank; and

a processing unit adapted for operating one or more controllers to cool the steel strip immersed in the cooling water prior to reach to the first sink-roll to such a lower temperature as to prevent evaporation of a water film interposed between surface of the first sink-roll and the surface of the strip around the first sink-roll in accordance with the following formula:

$$l \geq \frac{\rho \cdot Cp \cdot v \cdot d}{2\alpha} \cdot \ln\left(\frac{Ts - Tw}{120 - Tw}\right)$$

here,

l is the length of the portion of a steel strip cooled by water jets injected from the injection nozzles (m)

Ts is the temperature of the steel strip at the inlet of the cooling tank (°C.)

Tw is the temperature of cooling water (°C.)

Cp is the specific heat of the steel strip (Kcal/kg°C.)

v is the feed speed of the steel strip (m/hr)

d is the thickness of the steel strip (m)

α is the coefficient of heat transfer (8,500–10,500) Kcal/m^{2}hr°C.

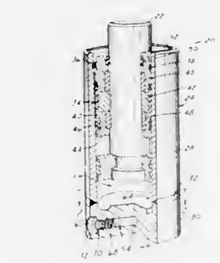
ρ is the density of the steel strip (kg/m^3).

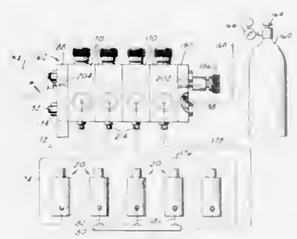
4,838,527

CONVERTIBLE GAS SPRING

David M. Holley, Whitmore Lake, Mich., assignor to Power Components, Inc., Redford, Mich.

Continuation-in-part of Ser. No. 21,324, Mar. 3, 1987, abandoned. This application Jan. 26, 1988, Ser. No. 148,577
Int. Cl.[4] F16F *9/34, 9/36, 9/43;* **F17D** *1/20*
U.S. Cl. 267—64.28 **42 Claims**





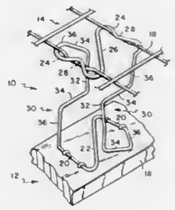
1. A combination comprising a gas spring having a rod which can be moved to compress a gas therein comprising, a cylinder defining at least in part a gas chamber, a piston rod slidably received in said cylinder, movable between extended and retracted positions, and constructed and arranged to compress a gas within said chamber when moving from its extended position toward its retracted position, a valve cavity within said cylinder and having an entrance opening to the exterior of said cylinder and an end spaced from said entrance, said cavity being constructed and arranged to interchangeably receive therein either one of a first valve assembly or a second valve assembly, a first valve assembly and a second valve assembly, one of said first valve assembly and said second valve assembly being received in said cavity, port means in said cylinder communicating said cavity with said chamber, all of said port means communicating said cavity with said chamber through said end of said cavity and said cavity communicating with said chamber only through said port means a bleed passage in said cylinder and communicating with said cavity for bleeding off gas under pressure in said chamber through said cavity and bleed passage, said bleed passage opening into said cavity and being spaced from and not opening directly into said chamber, said first valve assembly having a body constructed and arranged to be received in said cavity with a passage therethrough constructed and arranged to communicate with all of said port means and said entrance when said body is received in said cavity, a first valve carried by said first body and constructed and arranged to control the flow of gas through said passage through said first body, said first valve being normally closed and opening in response to gas supplied to the said cavity upstream of said first valve at a pressure substantially greater than the pressure of gas in said chamber and when such upstream pressure is relieved closes to retain gas under pressure in said chamber, a first gasket associated with said first body and constructed and arranged to provide in a first position a seal between said first body and said cavity while simultaneously permitting all of said port means to communicate with said passage in said first body and preventing all of said port means from communicating with said bleed passage and in a second position enabling said port means to communicate with said bleed passage, and releasable means associated with said first body and constructed and arranged to releasably retain said first body in said cavity with said first gasket in such first position and to enable movement of said first gasket to such second position without releasing said first body from said cavity, and said second valve assembly has a second body with generally opposed ends, said second body constructed and arranged to be slidably received in said cavity for movement between first and second spaced apart positions therein and having a passage therethrough constructed and arranged to communicate with all of said port means and said entrance when said second body is received in said cavity, a second valve carried by said second body and constructed and arranged to control the flow of gas through said passage through said second body, said second valve being normally closed and opening in response to gas supplied to said cavity upstream of said second valve at a pressure substantially greater than the pressure of the gas in said chamber and closing when the chamber gas pressure approaches such upstream gas pressure, a second gasket associated with said second body and constructed and arranged to provide in such first position of said second body a seal between said second body and said cavity which both permits all of said port means to communicate with said passage in said second body and prevents all of said port means from communicating with said bleed passage, and in such second position of said second body enables said port means to communicate with said bleed passage, said second body having generally opposed first and second effective areas, said first effective area communication with said cavity upstream of said second valve and said second effective area communicating with said port means downstream of said second valve, said second effective area being smaller than said first effective area and constructed and arranged so that when gas under pressure is applied to said cavity upstream of said second valve and said second body is in its first position, said second body is moved to its second position only when the pressure of the gas in said chamber is substantially greater than such pressure of such gas upstream of said second valve and acting on such first effective area, and removable retainer means constructed and arranged to retain said second body in said cavity while permitting said second body to move between said first and second positions thereof, whereby when said first valve assembly and releasable means are received in said cavity the gas spring can be utilized as a self-contained unit and when said second valve assembly and retainer means are received in said cavity such as gas spring can be utilized with an external source of gas under pressure.

4,838,528

BENT WIRE SPRING MODULE

Robert C. Hagemeister, Boston, Mass., assignor to Webster Spring Co. Inc., Oxford, Mass.

Filed Apr. 4, 1988, Ser. No. 179,208
The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.
Int. Cl.[4] A47C *23/02*
U.S. Cl. 267—103 **21 Claims**



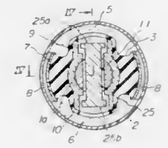
1. A spring module for disposition between a supporting frame and a grid frame to yieldably support the latter relative to the supporting frame comprising spaced top and bottom attaching means structured to be attached to the supporting frame and the the grid frame, respectively, and supports yeildably connecting the top and bottom attaching elements, said supports comprising vertically-disposed, spaced, parallel lengths of wire, first diverging lengths of wire connected at one end to, respectively, the upper and lower ends of said vertically-disposed, spaced, parallel lengths of wire, said spaced, parallel lengths of wire and said first diverging lengths of wire being situated in spaced, parallel planes perpendicular to the top and bottom attaching elements second diverging lengths of wire connected at one end to the opposite ends of the first diverging lengths of wire and extending from said opposite ends in opposite directions and connected at the opposite ends to the top and bottom attaching elements, said diverging lengths of wire being inclined in opposite directions, and being situated in planes disposed at obtuse angles to the planes of the first diverging lengths of wire.

4,838,529

LIQUID-FILLED VIBRATION ISOLATING DEVICES

Michihiro Orikawa, and Takeshi Noguchi, both of Yokohama, Japan, assignors to Bridgestone Corporation, Japan

Filed Nov. 18, 1986, Ser. No. 931,823
Claims priority, application Japan, Nov. 18, 1985, 60-256801
Int. Cl.[4] F16F *5/00, 9/34*
U.S. Cl. 267—140.1 **4 Claims**



1. A bush-type liquid-filled vibration isolating device com-

prising; a central member, an outer tubular sleeve arranged around the central member and having a circumferential direction, an elastic member connecting the central member to the outer tubular sleeve, at least two liquid chambers defined among the central member, elastic member and outer sleeve at intervals in said circumferential direction and filled with a liquid, a restricted passage communicating said liquid chambers with each other and a stopper means protruding from the central member toward each liquid chamber arranged at a position substantially separate from said elastic member in said circumferential direction to prevent excessive relative displacement of the central member and outer tubular sleeve, a through-hole opening to the liquid chambers through the stopper means arranged in the device and, a vibration member disposed in the through-hole and displaced in response to a difference in internal pressure between the liquid chambers.

4,838,530

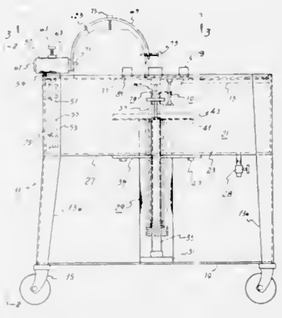
APPARATUS FOR HANDLING LARGE HEAVY COMPONENTS OF MOTOR VEHICLES

Joseph A. Chyba, 440 Leach St., Englewood, Fla. 33533; William M. Kihlmire, 411 Golden Beach Blvd., Venice, Fla. 33595, and Theodore J. Blackburn, P.O. Box 891, Nokomis, Fla. 33555

Continuation of Ser. No. 861,718, May 12, 1986, abandoned. This application Mar. 28, 1988, Ser. No. 175,619

Int. Cl.⁴ B25B *1/12*

U.S. Cl. 269—15 **9 Claims**



1. Apparatus for handling heavy components of a motor vehicle when such vehicle is elevated above ground level to a servicing position comprising a movable cart having a planar top member; first support means mounted to said cart; lift means attached to the cart for raising and lowering said first support means; means on said first support means for supporting one of said components in an underlying position, in position for work to be done on said component; means accomodated by said cart for receiving fluids from said motor vehicle;

further comprising a second means for supporting said component in suspension above said planar top member, said second means including a sleeve pivotably mounted to said cart about a vertical axis; a shaft having means for grasping and holding said component; said shaft being insertable into said sleeve; means for securing said shaft within said sleeve; whereby said sleeve, said shaft, said component holding means and said component are pivotable about said vertical axis between a first position where said component overlies said planar top member, and a second position where said component does not overlie said planar top member.

4,838,531

APPARATUS AND A METHOD OF SUPPORT AND RETAINING A CURVED SHEET IN POSITION

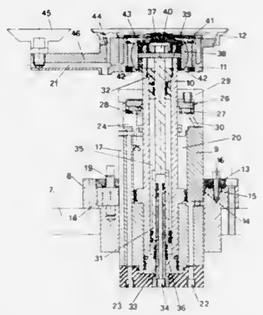
Armando Corsi, Piacenza, Italy, assignor to Jobs S.p.a., Italy

Filed Nov. 17, 1987, Ser. No. 122,047

Claims priority, application Italy, Jun. 4, 1987, 44805 A/87

Int. Cl.⁴ B25B *11/00*

U.S. Cl. 269—21 **5 Claims**



1. An apparatus for supporting and retaining a curved sheet in a desired position of the type comprising a plurality of support devices spaced apart at regular intervals on a support plane, which devices are capable of being positioned at predetermined heights to support and retain the sheet, wherein each support device comprises:

an upright member slidably mounted within a support flange and immobilizable in any desired position, a pneumatically actuated double-acting piston slidably displaceable within the upright member, a collar member located within a leaktight chamber extending around the double-acting piston, which collar is displaceable between a substantially horizontal position in which the piston is free to slide and an inclined position in which the collar engages the surface of the piston and immobilizes it, a suction cup mounted on the upper end of the piston through the intermediary of a ball joint so as to permit inclination of the suction cup in any desired direction; means for injecting and extracting air from the interior of the suction cup to provide detachable adhesion of a sheet resting upon the suction cup to the cup, and a single-acting piston slidably displaceable with the double-acting piston, the single-acting piston being attached to the ball joint, the end of the single-acting piston being connected to a movable portion of the ball joint on which a support of the suction cup is mounted.

4,838,532

FLUID OPERATED CLAMPING DEVICE INCLUDING FLUID PRESSURE LOCKING MEANS

Edward R. Horn, Nashotah, and Derek Hopkinson, Menomonee Falls, both of Wis., assignors to Aladdin Engineering & Mfg., Inc., Brookfield, Wis.

Continuation of Ser. No. 83,772, Aug. 10, 1987, abandoned. This application Oct. 6, 1988, Ser. No. 256,129

Int. Cl.⁴ B25B *5/06*

U.S. Cl. 269—23 **14 Claims**

1. An apparatus for clampingly engaging a workpiece to support the workpiece, the apparatus comprising:

a base,

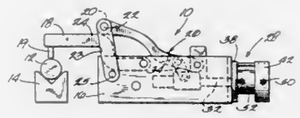
a workpiece engaging member supported by the base for shiftable movement between a workpiece engaging position and a workpiece release position, and

means for causing selective movement of the workpiece engaging member between the workpiece engaging position and the workpiece release position, the means for causing selective movement including a pneumatic cylinder assembly including:

a cylinder having a cylinder base, and

a piston housed in the cylinder and reciprocably moveable in the cylinder, the piston being connected to the workpiece engaging member such that movement of the piston in a first direction causes movement of the workpiece engaging member to the workpiece engaging position and movement of the piston in an opposite direction causes movement of the workpiece engaging member to a release position,

means for supplying air pressure to the cylinder, the means for supplying air pressure being adapted to be connected to an air pressure source and including means for selectively locking air in the cylinder in the event the supply of



air pressure to the cylinder is interrupted, the means for selectively locking air in the cylinder including a valve bore, a first portion of the valve bore being in communication with the source of air pressure, and a second portion of the valve bore communicating with one end of the cylinder whereby air can be supplied to the cylinder to cause movement of the piston in the first direction, a valve seat between the first portion of the valve bore and the second portion of the valve bore, a valve member selectively engageable with the valve seat, means for resiliently biasing the valve member against the valve seat to releasably prevent air flow from the air pressure source to the first end of the cylinder, and means for forcing the valve member away from the valve seat to thereby permit exhaust of air pressure from the one end of the cylinder in response to application of air pressure in an opposite end of the cylinder.

4,838,533

DEVICE FOR REPRODUCIBLE, HIGH-PRECISION DETERMINATION OF THE RELATIVE POSITION OF A FIRST OBJECT IN RELATION TO SECOND OBJECTS

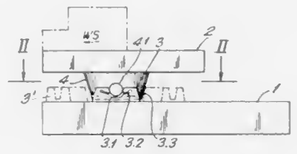
René Büchler, Oberbüren, Switzerland, assignor to Buchler B-Set AG, Flawil, Switzerland

Filed Mar. 6, 1987, Ser. No. 22,650

Claims priority, application Switzerland, Oct. 10, 1986, 04043/86

Int. Cl.⁴ B23Q *1/06*

U.S. Cl. 269—310 **21 Claims**



1. A device for reproducible highprecision determination of the relative position of a first object with respect to at least one second object, said device comprising:

a bearing member on which the first object is mounted; and

at least one set of first and second cooperating coupling elements, one of the first and second elements being secured to the bearing member, the other of the first and second elements being secured to the second object, said elements in the set being coupled together detachably to form a partially elastic coupling connection, either one of the first and second elements being rigid, the other one of the first and second elements being elastically deformable, said other one of the first and second elements which are elastically deformable being single pillow block parts with arbitrarily shaped individual base plates mounted along a circular arc, whereby one of said first and second coupling elements can be manufactured and positioned with high precision while greater tolerances are allowed for said other one of said first and second elements.

4,838,534

PAPER FEED APPARATUS

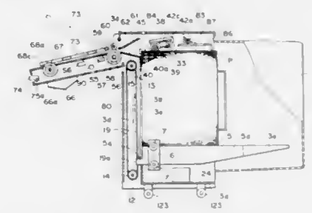
Tadashi Ishikawa, Urawa, and Yutaka Kikuchi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 933,368, Nov. 18, 1986, abandoned, which is a continuation of Ser. No. 542,728, Oct. 17, 1983, abandoned. This application Apr. 20, 1988, Ser. No. 186,670

Claims priority, application Japan, Oct. 25, 1982, 57-185961; Oct. 25, 1982, 57-185962

Int. Cl.⁴ B65H *5/06*

U.S. Cl. 271—10 **7 Claims**



1. A paper feed unit cooperable with an image forming apparatus, comprising:

a table for supporting thereon a stack of cut sheets;

a cut sheet conveying section adapted to be set to a sheet receiving portion formed in the image forming apparatus and adapted to cooperate with a feeding means of the image forming apparatus;

a cut sheet feed mechanism for feeding the cut sheets from the stack on said table one by one;

a cut sheet conveying mechanism in said cut sheet conveying section, for receiving and temporarily stopping the cut sheet fed from said cut sheet feed mechanism, conveying that cut sheet to a predetermined position in said conveying section and stopping and holding the cut sheet at said predetermined position; and

control means for operating said cut sheet feed mechanism prior to a trailing edge of a preceding sheet passing by said predetermined position, for causing said cut sheet conveying mechanism to receive and temporarily stop a next cut sheet after the trailing edge of the preceding sheet departs the cut sheet conveying mechanism, and for causing said cut sheet conveying mechanism to feed the next sheet to said predetermined position after the next sheet is temporarily stopped thereby.

4,838,535

SHEET FEEDING DEVICE WITH DETACHABLE HOLDER MEANS FOR THICK CUT SHEETS

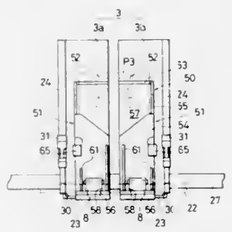
Takeshi Yokoi, Kagamigahara, and Toshiki Morita, Toyoake, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 4, 1987, Ser. No. 10,671

Claims priority, application Japan, Feb. 6, 1986, 61-16003; Oct. 15, 1986, 61-244935

Int. Cl.⁴ B65H 3/06

U.S. Cl. 271—22 **17 Claims**



1. In a sheet feeding device including first paper holder means for supporting a member of first paper sheets in a pile, and feed roller means in contact with the uppermost one of the first paper sheets supported by the first paper holder means and rotatable so as to deliver the first paper sheets one by one in a sheet feeding direction from the first paper holder means, said first paper holder means including a pair of paper guide members slidable across the sheets, each said guide member having a side plate extending in the sheet feeding direction,

said sheet feeding device further comprising:

second paper holder means for holding second paper sheets in a pile; and

mounting means for detachably mounting the second paper holder means inside side plates on the pair of paper guide members,

wherein said second paper sheets held by the second paper holder means, face the feed roller means so that the uppermost one of the second paper sheets comes into contact with the roller means, whereby the second paper sheets are delivered one by one when the second paper sheets are delivered one by one when the second paper holder means is mounted on the first paper holder means.

4,838,536

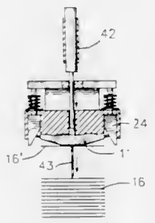
FABRIC PICKER AND SEPARATOR

Nabil Kamal, 2112 Favreau, Chomedey, Laval, Quebec, Canada H7T 1V1

Filed Oct. 13, 1987, Ser. No. 107,113

Int. Cl.⁴ B65H 3/22

U.S. Cl. 271—18.3 **29 Claims**



1. A fabric picking and transferring device for transferring one or more top fabric plies from a stack of such plies, said device comprising a support body having a fabric engaging end, means to displace said support body toward said stack to position said fabric engaging end on an uppermost ply of said stack, at least two picking needles supported by said body, said needles each having a pointed engaging end portion, said needles being disposed side by side in opposed offset facing relationship and at a shallow angle with respect to the plane of said uppermost ply with said pointed engaging end portion retracted inside said fabric engaging end, actuating means for moving said fabric engaging end of said needles a predetermined distance outwardly of said fabric engaging end with said fabric engaging end portions cross one another with said needles penetrating in each of said one or more uppermost fabric plies to positively engage said one or more fabric plies and a separating device displaceable with respect to said body and having a pressure biased fabric retention needle disposed transversely with respect to said fabric engaging end of said support body and having a ply retention free end portion extending forwardly of said fabric engaging end, said needle having an axial pressure biasing force sufficient to penetrate at least one ply when freely held against a tip of said free end portion but insufficient to penetrate said uppermost ply when supported on said stack.

4,838,537

AUTOMATIC SHEET WINDING AND DISCHARGING DEVICE

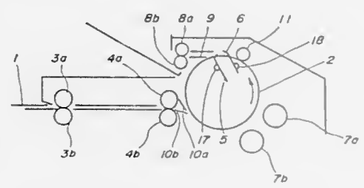
Hideo Matsuda, Nara, and Shinitiro Hiraoka, Yamatotakada, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 816,864, Jan. 7, 1986, abandoned. This application Apr. 4, 1988, Ser. No. 177,906

Claims priority, application Japan, Jan. 11, 1985, 60-3678; Feb. 26, 1985, 60-39766

Int. Cl.⁴ B65H 5/12

U.S. Cl. 271—277 **3 Claims**



1. An automatic sheet winding and discharging device in an electrophotographic copying machine, comprising:

a drum rotatable about a central axis for receiving a sheet thereon;

means, provided on the circumferential surface of said drum for gripping only the tip-end of the sheet in an automatic winding cycle for winding the sheet on to said drum;

sheet holding roller means for selectively pressing against the sheet wound onto the circumferential surface of said drum;

a sheet discharger unit operable only in an automatic sheet discharge cycle for discharging the sheet from said drum, said sheet discharger unit including a sheet discharging roller and sheet discharging guide; and

means for selectively actuating said sheet holding roller means to contact the sheet wound on the circumferential surface of said drum only in the automatic discharge cycle thereby preventing said sheet holding roller means from contacting said sheet in the automatic winding cycle, said means for selectively actuating including means for determining whether said copying machine is in a sheet winding cycle or a sheet discharging cycle, and means for counting a predetermined lapse of time in the sheet discharging cycle, whereby upon determination of the sheet discharging cycle the predetermined lapse of time is counted at the end of which said sheet holding roller means is moved out of contact with said drum.

2. An automatic sheet winding and discharging device for an electrophotographic copying machine, comprising:

a drum rotatable about a central axis for receiving a sheet thereon prior to a copying operation;

a first nail member, extending outwardly from an aperture provided in the periphery of the circumferential surface of said drum, for aligning only the tip-end of the sheet on the drum in an automatic sheet winding cycle;

a second nail member for gripping only the tip-end of the wound sheet together with said first nail member and for stripping only the tip-end of the wound sheet from the circumferential surface of said drum in an automatic sheet discharge cycle;

first and second shaft members positioned within said drum for enabling free rotation of said first and second nail members, respectively, about independent axes for free lateral movement of said first and second nail members within the aperture of said drum;

cam means for activating said first and second nail members in response to rotation of said drum, said cam means being provided on independent axes within said drum;

cam followers provided on each of said first and second shaft members, said cam followers being selectively engaged by said cam means; and

means for moving said cam means in an axial direction into and out of engagement with said cam followers provided on each of said first and second shaft members, wherein said drum having a draft sheet wound thereon can rotate a predetermined number of times without initiating the paper discharging cycle and upon engagement of said cam means with said cam followers will enable said paper discharge cycle;

said cam means operating to position the tip-end of said first nail member to be in contact with the aperture edge on the circumferential surface of the drum when the leading edge of the sheet is gripped between said first and second nail members in order to eliminate any openings in the periphery of said drum, thereby preventing a black streak from being copied onto a copy paper sheet.

4,838,538

SHEET MATERIAL POSITIONING APPARATUS

Kiyokazu Baba, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP87/00175, § 371 Date Nov. 12, 1987, § 102(e) Date Nov. 12, 1987, PCT Pub. No. WO87/05589, PCT Pub. Date Sep. 24, 1987

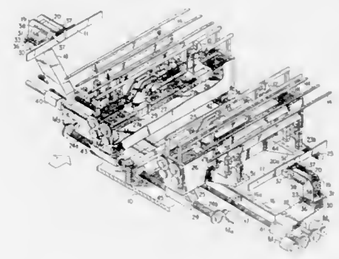
PCT Filed Mar. 20, 1987, Ser. No. 130,873

Claims priority, application Japan, Mar. 20, 1986, 61-39955[U]

Int. Cl.⁴ B65H 9/04

U.S. Cl. 271—238 **1 Claim**

1. A sheet material positioning apparatus comprising a body frame; at least each one pair of skid bars on the left and right sides, respectively, each pair of skid bars consisting of a plurality of skid bars extending longitudinally in the sheet material feeding direction and mounted on said frame in parallel with each other so that each pair may be moved freely up and down; at least a pair of left and right front gauges mounted on said frame so that they may be moved freely and independently with each other in the sheet material feeding direction and also in the vertical direction so as to receive the leading end of the sheet material in the feeding direction thereof; at least a pair of left and right rear gauges mounted on said frame so that they may be moved freely and independently with each other in the sheet material feeding direction and also in the vertical direction so as to abut against the trailing end of the sheet material in the feeding direction thereof thereby achieving the positioning of the sheet material; and at least a pair of left and right side guides mounted oppositely, on said frame so that they may be moved freely and independently with each other towards and away from each other in the direction at right angles to the sheet material feeding direction, characterized in that said pair of side guides are mounted in such a manner that they can be turned freely and independently with each other in a horizontal plane, the left and right combinations each comprising one



of said pair of skid bars, one of said pair of front gauges and one of said pair of rear gauges are mounted on a pair of left and right auxiliary frames, respectively, said pair of auxiliary frames being mounted on said frame so that they may be moved freely and independently with each other in the direction at right angles to the sheet material feeding direction.

4,838,539

STACKER FOR LETTERS

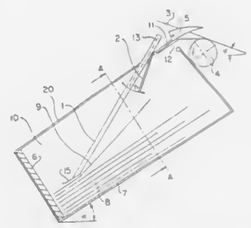
Armin Zimmermann, Constance, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs GmbH, Fed. Rep. of Germany

Filed Dec. 8, 1987, Ser. No. 129,992

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1986, 3642021

Int. Cl.⁴ B65H 39/10

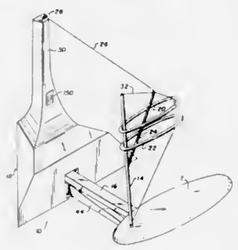
U.S. Cl. 271—305 **8 Claims**



1. A stacker for letters and similar flat, flexible conveyed material, comprising a plurality of stacked compartments to which the letters are fed successively in edge-to-edge relation, means mounting said compartments so that they are inclined at a specific angle in respect to the incoming letters, each stack compartment having an inlet end with an inlet opening adjacent said inlet end, a strap pivotally mounted adjacent said inlet end for rotation above the inlet opening for the receipt of letters by engagement with a front, leading edge of a leading letter in order to guide each letter face down in succession to the stack compartment, said inlet strap having an angle shaped cross section with spaced legs having leg ends pointing toward the stacking space, a pivot bearing pivotally supporting said strap adjacent said inlet opening and an additional guide device located in the interspace between said legs of said inlet strap and pivotally positioned in the vicinity of said pivot bearing, said additional guide device being of less pivoting length than the strap and making a specific angle in respect to said inlet

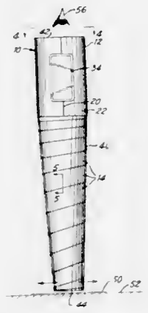
strap in a rest position and being pivotable into the interspace between said legs of said inlet strap by engagement with said front, leading edge of said leading letter and pivotable away from the interspace in engagement with a portion of said leading letter space rearwardly of said front, leading edge.

4,838,540
SAILBOARD SIMULATOR
George Ouellet, Powell River, Canada, assignor to Force 4 Enterprises Inc., Calif.
Filed Aug. 24, 1988, Ser. No. 235,559
Int. Cl.[4] G09B 9/05
U.S. Cl. 272—1 B 13 Claims



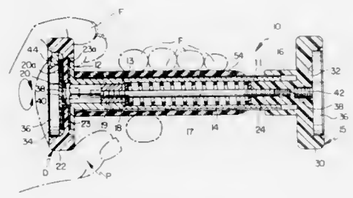
1. A sailboard simulator, comprising
a simulation sailboard;
means for movably supporting said simulated sailboard;
means for effecting movement of said simulation sailboard relative to said supporting means;
a mast extending upwardly from said simulation sailboard; and
a wishbone secured to said mast;
said means for effecting movement comprising: a pulling member;
means forming a flexible connection between said pulling member and said mast, at a point spaced from said mast; and
means for displacing said pulling member to simulate the action of a sail on said mast.

4,838,541
AMUSEMENT DEVICE
Myron Stone, 614B Gregory Ave., Weehawken, N.J. 07087
Filed Aug. 22, 1988, Ser. No. 234,938
Int. Cl.[4] B02C 27/08
U.S. Cl. 272—27 N 14 Claims



1. An amusement device for use in connection with a selected patterned target to enable viewing of the target with novel optical effects, the device comprising:
an elongate, thin strip of resiliently flexible material wound into a coiled configuration having a plurality of overlapping turns extending from a radially innermost turn to a radially outermost turn, an inner periphery along the innermost turn of the coiled configuration and an outer periphery along the outermost turn of the coiled configuration, a first end located along the outer periphery of the coiled configuration, and a second end located along the inner periphery of the coiled configuration;
the strip having opposite first and second surfaces, the first surface facing radially outwardly and the second surface facing radially inwardly such that upon displacement of the second end of the strip axially relative to the first end of the strip the coiled configuration will be elongated axially into an elongate tubular spiral configuration tapered from a larger diameter end at the outermost turn to a smaller diameter end at the innermost turn; and
light-reflective means on the strip for reflecting light radially inwardly such that upon placement of the smaller diameter end adjacent the selected target and viewing the target from the larger diameter end through the tapered tubular spiral configuration, multiple reflected images of the pattern of the target will be visible along the inner periphery of the spiral configuration to provide novel optical effects.

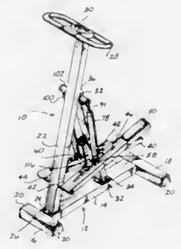
4,838,542
WRIST EXERCISE DEVICE
William T. Wilkinson, Chadds Ford, Pa., assignor to Whatnot, Inc., Cleveland, Ohio
Filed May 20, 1988, Ser. No. 196,296
Int. Cl.[4] A63B 21/22, 11/02
U.S. Cl. 272—67 11 Claims



1. In a wrist exercise device having a hollow shaft, a turning disk rotatably mounted at one end of said shaft, resistance means for providing a resistance force to oppose the rotation of said turning disk, a tension knob mounted to said shaft at the end of said shaft opposite said turning disk for controlling the amount of said resistance force, the improvement being in that weight means comprises at least one weight detachably mounted to at least one of said tension knob and said turning disk whereby said device additionally functions as a dumbbell.

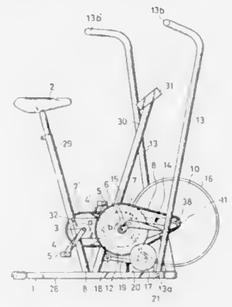
4,838,543
LOW IMPACT EXERCISE EQUIPMENT
Timothy O. Armstrong, Bellevue, Wash., and John W. Bull, Irvine, Calif., assignors to Precor Incorporated, Bothell, Wash.
Filed Oct. 28, 1988, Ser. No. 264,269
Int. Cl.[4] A63B 23/04
U.S. Cl. 272—70 19 Claims

1. An exercise apparatus comprising:
(a) a support frame including a ground engaging base; a first member mounted on said base and extending to a point upwardly and rearwardly from its mounting point on said base; and, a second buttress member, said buttress member being mounted on said base and extending to interconnect with said first member at a point between its ends;
(b) a pair of laterally adjacent foot beams pivotally mounted at one end on said first member at a location above said base member;
(c) pulley means mounted on said support frame above said foot beams;



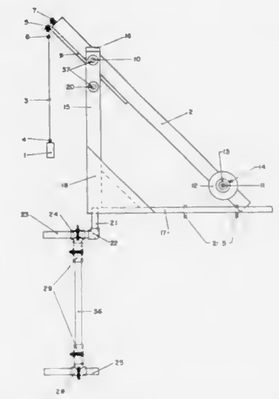
(d) flexible tie line means attached to each of said foot beams and extending through said pulley means; and,
(e) resistance means interconnected between said pivotally mounted foot beams and a location on said support frame above said foot beams and adapted to resist pivotal movement of said foot beams.

4,838,544
EXERCISE BICYCLE
Kazumasa Sasakawa, Minoo; Hisao Nishimura, Kitakatsuragi, and Kensuke Fujiwaka, Kashiwara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Sep. 29, 1987, Ser. No. 102,469
Claims priority, application Japan, Jun. 23, 1987, 62-155895
Int. Cl.[4] A63B 21/00
U.S. Cl. 272—73 3 Claims



1. An exerciser comprising:
a frame;
a saddle fixed to said frame;
a loading means acting upon a fly wheel rotatably mounted on said frame and outer periphery of said fly wheel for exerting load thereon which includes a roller which is pressed to an elastic body forming said outer periphery of said fly wheel for exerting load on said fly wheel, a bearing rotatably supporting said roller, a conductor disc connected to said roller by a shaft common thereto and at least one pair of magnets each disposed immediately adjacent to both surfaces of said conductor disc in a manner to interpose said conductor disc therebetween, and utilizes eddy currents generated by the rotation of said conductor disc for loading on said flywheel;
a pedal shaft which is rotatably mounted to said frame and is coupled to be rotated by pedal cranks to which respective pedals are fixed;
an intermediate shaft which is rotatably mounted to said frame and is coupled to a pair of cranks extending in the opposite axial directions thereof at the right and left sides of said frame, respectively;
a pair of handle bars each pivotally mounted to the lower front part of said frame at the right and left sides of one end of said frame and,
a rotation transmitting means provided with a one-way clutch for transmitting only one directional rotation of said pedal shaft to said intermediate shaft;
a pair of levers connected by one end thereof to opposite end of said intermediate shaft with different relative angular positions, respectively,
a pair of connection rods for pivotally connecting an intermediate part of said handle bars and the other ends of said levers, so that the swing motion of the handle bars is transmitted to said intermediate shaft and converted into the rotational movement of said intermediate shaft, and further into rotation of said flywheel.

4,838,545
EXERCISE DEVICE FOR USE ON A POOL DECK WEIGHTED LEVER
Charles Wilson, 6060 12th St., N., St. Petersburg, Fla. 33703
Filed Mar. 28, 1988, Ser. No. 174,242
Int. Cl.[4] A63B 21/00
U.S. Cl. 272—117 1 Claim



1. An exercise device for an exerciser suspended in water for doing chin-up exercise comprising:
a base having fastening means for removably fastening the base to a pool deck;
a pair of uprights mounted on and supported by the base;
an axle bar mounted between the uprights at a location above the exerciser's head;
a lever arm rotatably mounted on the axle bar;
a grasping bar and cable, the cable connecting the grasping bar to the lever arm;
weights mounted on the lever arm for resisting downward motion of the grasping bar, the weights being adjustable;
a safey bar mounted between the uprights to prevent the lever arm from making a full rotation and striking the user;
a pair of vertical guide pipes extending downwardly from the base;
a plurality of roller pipes mounted horizontally between the guide pipes for keeping the exerciser's body in alignment; and,

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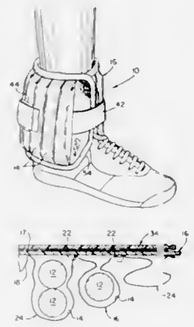
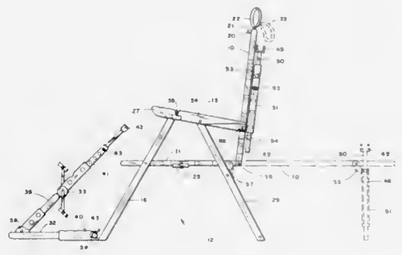
adjustable connectors mounting the roller pipes on the guide pipes for adjusting the vertical height of the roller pipes.

4,838,546
ANKLE EXERCISE WEIGHT
Edith Winston, 135 Hazelwood Dr., Jericho, N.Y. 11753
Continuation of Ser. No. 28,917, Mar. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 506,059, Jun. 20, 1983, abandoned. This application May 9, 1988, Ser. No. 191,397
Int. Cl.[4] A63B *21/12*
U.S. Cl. 272—119 1 Claim



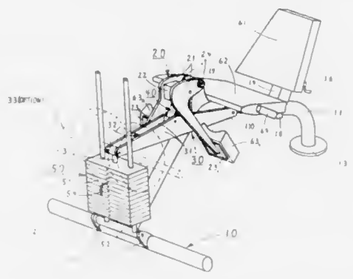
1. An exercise device comprising one or more elongated cylindrical weights and a band for supporting said weights about a user's ankle, said band comprising a medial fabric body of a rectangular shape having a lengthwise extent sufficient to encircle the user's ankle, an arrangement of plural side-by-side compartments each having opposite side panels and a front panel bounding an opening thereinto located adjacent an edge of said fabric body, said compartments being arranged into two groups, each of said compartments supporting one or more weights placed therein, and being dimensioned to accommodate at least two of the weights therein in a length-abutting side by side orientation and having a construction including an expandable gusset folded inwardly of one of said side panels such that in the folded position of said gusset the compartment is collapsed to receive and embrace a first weight therein and upon unfolding of said gusset upon insertion of a second weight the compartment is expanded to receive and embrace the second weight therein, said gusset adjusting the volume of said compartment to accept and retain the weights inserted therein, a pair of weights-covering flaps, each of said flaps having a resilient plastic foam body secured along said fabric body edge adjacent said compartment openings of one of said compartments groups and having an operative position folded over said openings of said one of said groups against said fabric body and occupying an interposed position between said exercise device and the user's ankle, and a pair of end flaps having a substantially straight, upwardly inclined edge, said lengthwise extent of fabric body and end flaps being such that said end flaps abut and slightly overlap when the device is wrapped about the user's ankle, said upwardly inclined edges cooperating to form an inverted V-shaped space to receive the ankle of the user and contributing to holding said device in position upon the user.

4,838,547
INDOOR OUTDOOR EXERCISE CHAIR
Joseph F. Sterling, 916 Daytona Ave., Holly Hill, Fla. 32017
Filed Dec. 27, 1988, Ser. No. 291,445
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 18 Claims



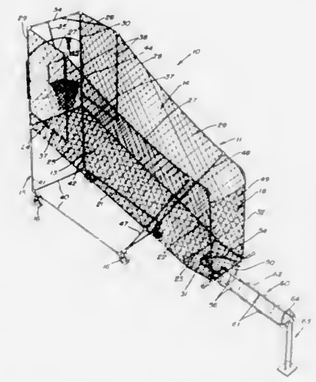
1. An indoor/outdoor exercising chair apparatus comprising in combination:
- a chair having a substantially vertical back, a pair of arms releasably attached to the chair back for supporting said chair back, two sides a seat, said seat having a space therebeneath, and legs for supporting said chair;
- a pair of back resilient exercising members mounted in said chair back and each having a handle extending from said back, and each said handle being extendible away from said back when grasped and pulled by a person seated in said chair;
- an arm resilient exercising member mounted in each arm of said chair and having a handle attached thereto and extending from the arm of said chair, each said handle being extendible away from said chair arm when pulled by a person seated in said chair;
- a seat resilient exercising member mounted in each side of said chair seat and each having a handle attached thereto and extending therefrom, each handle being extendible outward from the side of said chair seat when pulled by a person seated in said chair;
- a flexible resilient strap attached to said chair back and extending upwardly therefrom so that a seated person in the chair may grasp the strap to exercise their abdomen and legs;
- a resilient hand grip formed on one end of said each chair arm so that a seated individual can exercise his hands by compressing the resilient hand grips;
- an extendible and detachable exercise platform frame attached to said chair legs, said frame being extendible from a storage position under said chair seat to an extended position partially extending in front of said chair;
- a pedal mechanism having a pair of pedals and attached to said platform frame, said pedal mechanism having adjustment means for adjusting for an individual user so that the pedal mechanism can be used by a seated individual;
- extension support frame means attached to the chair back for converting said chair apparatus to a bench press platform when the chair back is detached from the chair arms, rotated to a substantially horizontal position and supported by said extension support frame means, said extension support frame means including means for supporting an exercise bar above said platform; and
- a platform base for supporting said chair apparatus in sand or the like, whereby a portable indoor and outdoor exercise chair allows exercising while seated in the chair.

4,838,548
FOUR-BAR VARIABLE RESISTANCE LEG EXTENSION MACHINE
Henry H. Maag, 5332 Clark Cir., Westminster, Calif. 92683
Filed Sep. 1, 1988, Ser. No. 239,606
Int. Cl.[4] A63B *21/00*
U.S. Cl. 272—134 3 Claims



1. An exercise machine which develops an operator's leg extending muscles through
- applying resistive forces to the fronts of the operator's shins which tend to make the lower legs move through circular paths about the knee joints in the direction of leg flexion, comprising:
- a rigid frame which includes means for fixing the positions of said operator's thighs on generally parallel lines which are generally perpendicular with the axes of rotation of said operator's knee joints;
- a rigid rotating effort arm which is journaled in said frame on a generally horizontal axis which is approximately common with the axes of rotation of said operator's knee joints while said operator's thighs are supported on said fixing means;
- said rigid rotating effort arm includes shin-engaging surfaces which, through body-machine contact, apply resistive forces to the operator's lower legs through circular paths about the operator's knee joints;
- a rigid rotating weight arm which is journaled in said frame on an axis which is both parallel with and separated by a specific distance from the axis of rotation of said rigid rotating effort arm;
- said rigid rotating weight arm includes means for loading weights onto at a point offset from its axis of rotation;
- said rigid rotating effort arm and said rigid rotating weight arm are mechanically linked to each other at axes which are both parallel with and offset by specific distances from their respective axes of rotation by a rigid connecting link which has a specific length between its centers of connection;
- said rigid rotating effort arm, said rigid rotating weight arm, said link mechanically joining said rigid rotating effort arm and said rigid rotating weight arm, and said frame of said leg extension exercise machine join together to form a four-bar linkage which, when acting in conjunction with the sinusoidally changing values of force applied by the machine's rotating weight arm as the applied weight swings through a circular path through the gravitational field, applies a predetermined variably resistive force which varies as a function of the degrees of rotation of the operator's knee joints and which is characteristic of the relationships in length and orientation of the four rigid members forming the four-bar linkage and the orientation of the rotating weight arm to the gravitational field throughout the range of the exercise movement;
- said specific distance between the axis of rotation of said rigid rotating effort arm and the axis of rotation of said rigid rotating weight arm, said specific distance between the axis of rotation of said rigid rotating effort arm and the axis of connection of said connecting link on said rigid rotating effort arm, said specific distance between the axis of rotation of said rigid rotating weight arm and the axis of connection of said connecting link on said rigid rotating weight arm, and said specific distance between the centers of connection on said connecting link all have a definite non-changing relationship to each other, which relationship, along with their orientations to each other, is determined through kinematic analysis of the moving parts of the four-bar linkage/rotating weight arm force-varying mechanism and is dependent on said predetermined variably resistive force which said four-bar linkage/rotating weight arm force-varying mechanism is designed to put out throughout the exercise movement.

4,838,549
BASKETBALL RETRIEVER DEVICE
Bliss T. Woodall, 625 Rebel Rd., Old Hickory, Tenn. 37138
Filed May 12, 1988, Ser. No. 192,913
Int. Cl.[4] A63B *69/00*
U.S. Cl. 273—1.5 A 12 Claims



1. A basketball retriever device adapted to be used on a basketball court in association with an elevated basketball basket and backboard, comprising:
- (a) an elongated ball collector chute including an elongated bottom panel having a rear edge portion, a front portion and opposite side portions, and opposed upright side panels having rear edge portions and projecting upward from said side portions of said bottom panel,
- (b) a mounting frame fixed to said chute for supporting the rear edge portion of said bottom panel beneath a basketball basket on a basketball court in an operative shooting position, said bottom panel declining longitudinally forward,
- (c) said side panels projecting upward substantially above the basket and backboard when said chute is in said operative position,
- (d) said rear edge portions of said bottom and side panels defining a rear opening receiving the basket in said operative position, and said side panels terminating in spaced top edges defining a top opening,
- (e) a discharge opening in the front portion of said chute permitting the discharge of a basketball from said chute,
- (f) a basketball receiver cradle,
- (g) means supporting said cradle beneath said discharge opening for receiving a basketball passing through said discharge opening, and

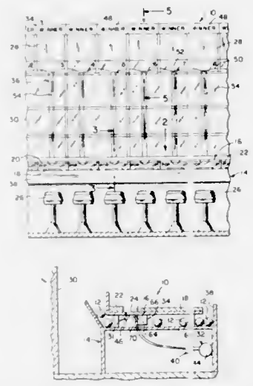
(h) an elongated ramp member adjustably positioned upon said cradle for receiving basketballs from said cradle.

4,838,550

PNEUMATIC BALL AMUSEMENT GAME

Howard Walker, and Charles Walker, both of 37 Amby Ave., Plainview, N.Y. 11803

Filed May 10, 1988, Ser. No. 192,775
Int. Cl.[4] A63F 7/00, 9/14
U.S. Cl. 273—86 R 7 Claims



1. A pneumatic ball amusement game which comprises:
(a) a plurality of balls;
(b) an elongated playing table having a plurality of separated playing tops, each of said tops having a rear aperture to hold one of said balls rolled thereupon by a player;
(c) a plurality of seats, each of which is positioned in front of one of said playing tops for the player to sit upon;
(d) a plurality of hoppers, spaced back from and elevated above said playing table;
(e) means for expelling any of said balls from said rear aperture on any of said playing tops before start of said game;
(f) means for pneumatically propelling said balls from said rear aperture on each of said playing tops into each of said hoppers;
(g) means for indicating winner of said game when a predetermined right amount of said balls are received into one of said hoppers; and
(h) a control circuit board electrically connected to said expelling means, said pneumatically propelling means and said winner indicating means.

4,838,551

CARD GAME PUZZLE PLAYING METHOD

Thomas R. Volpert, Chicago, Ill., assignor to Mind Over Matter Games, Inc., Chicago, Ill.

Continuation of Ser. No. 916,505, Oct. 8, 1986, abandoned. This application Jan. 25, 1988, Ser. No. 147,069
Int. Cl.[4] A63F 9/10
U.S. Cl. 273—157 R 5 Claims

1. A method of playing a card game puzzle for one or more players, comprising the steps of:
providing a plurality of supporting surfaces for cards of a plurality of playing card sets, said supporting surfaces comprising memory aids adapted to be used at the option of said players, each of said supporting surfaces having a different puzzle picture thereon; and
providing a plurality of playing card sets each adapted to be arranged in horizontal rows and vertical columns and on one of said playing card sets including a plurality of rectangular cards having first sides with different distinct segments of one of said different puzzle pictures thereon and second sides with means thereon identical to means on the remainder of said cards of the corresponding one of said playing card sets for identifying the one of said different puzzle pictures to be completed by arranging said cards of said playing card set in puzzle fashion, said playing card sets being such that said cards are adapted to be properly arranged to complete said different puzzle pictures and on one of said supporting surfaces at the option of said players;
shuffling and dealing said cards of said playing card sets in equal numbers and in substantially their entirety to all of said players with any of said cards of any of said playing card sets remaining after said cards have been dealt being placed in position with said first sides thereof facing upwardly, one of said players thereafter laying down one of said cards of one said playing card sets and thereafter

playing other of said cards of the one of said playing card sets so long as said cards are vertically or horizontally adjacent the one of said cards just played after which another of said players plays one of said cards of the one of said playing card sets and thereafter plays other of said cards of the one of said playing card sets in like fashion, said cards being played in turn by each of said players until said cards of the one of said playing card sets have all been played;
said player playing the last of said cards of the one of said playing card sets thereafter playing one of said cards of another of said playing card sets and thereafter playing other of said cards so long as the cards are vertically or horizontally adjacent the one of said cards just played with play continuing among said players until one of said players is without cards;
whereby the first player to be without cards is the game winner.

4,838,552

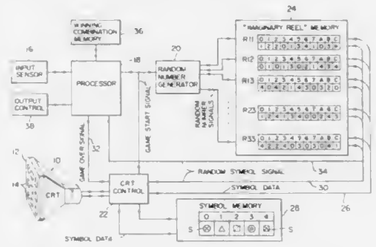
MULTILINE SLOT MACHINE

Takashi Hagiwara, Zama, Japan, assignor to Sigma Enterprises, Incorporated, Tokyo, Japan

Continuation of Ser. No. 846,502, Mar. 12, 1986, abandoned, which is a continuation of Ser. No. 541,231, Oct. 19, 1983, abandoned. This application Jun. 20, 1988, Ser. No. 210,195
Claims priority, application Japan, Oct. 15, 1982, 57-181170; Nov. 11, 1982, 57-198056; Nov. 17, 1982, 57-201388
Int. Cl.[4] A63F 09/22
U.S. Cl. 273—138 A 2 Claims

1. A multiline slot machine comprising:
(a) an electronic display means having a plurality of independent display zones for simultaneously displaying images flatly, the independent display zones being arrayed in rows and columns thereon wherein the number of rows and columns is greater than one and wherein each of said plurality of independent display zones respresents one of a plurality of independent imaginary reells of said multiline slot machine;
(b) memory means for storing therein a plurality of symbol groups one of which is provided for each independent display zone, each symbol group having M kinds of N

symbols, N being at least equal to M, each symbol being adapted to be successively displayed and randomly stopped on one independent display zone of the display means, the memory means comprising a storing means for storing therein a plurality of arrangements each having a plurality of storage locations or addresses and a plurality of coded symbolls one of which corresponds to one of the each storage location, one of the arrangements being provided fro each independent display zone, and an image symbol memory having an arrangement of a plurality of the coded symbols and a plurality of image symbols one of which corresponds to each coded symbol;
(c) display control means connected between the display means and the memory means for causing the display means to sequentially display the symbols of the symbols groups on the respective independent display zones of the display means, each randomly selected symbol being



displayed at the center of each display zone in a state wherein half of each of two symbols next to the selected symbol is respectively displayed on a upper and lower portion of each independent display zone; and
(d) means for randomly selecting one symbol of each symbol group stored in the memory means, the display control means being responsive to the randomly selecting means for causing the display means to stop the sequential display of the symbols at the randomly selected symbols;
whereby the slot machine shows, on the display means, alignment and non-alignment of matching randomly selected symbols in the horizontal, vertical and diagonal directions of the array of independent display zones of the display means, and said randomly selected symbol and said half of two symbols next to the selected symbol displayed in each of said plurality of independent display zones shows a player that each of said plurality of independent display zones is an independent imaginary reel.

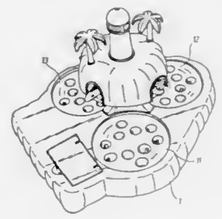
4,838,553

FISHING TOY

Chuang Chaun-Tien, 22296 S De Anza Cir., Cupertino, Calif. 95014

Filed Feb. 11, 1988, Ser. No. 715,509
Claims priority, application Taiwan, Aug. 22, 1987, 76208181
Int. Cl.[4] A63F 9/00
U.S. Cl. 273—1 GG 4 Claims

1. A fishing toy comprising:
a base rotatably mounting thereon a plurality of cylinders each of which includes a plurality of vertical holes each of which receives therein a toy fish;
a revolving structure rotatably mounted above said base and having a plurality of side holes;
a plurality of toy animals movably received in said structure and capable of protruding out of said structure from said respective side holes; and



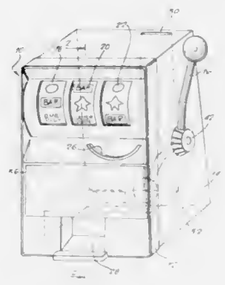
a revolving cam rotatably mounted in said structure for periodically protruding said animals out from said side holes so that to fish on said base is made difficult.

4,838,554

TOYS

James J. Sutter, 833 Blue Falls Pl., Reno, Nev. 89511, and Marvin Roberts, 2305 S. Arlington Ave., Reno, Nev. 89509

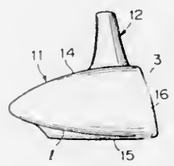
Continuation-in-part of Ser. No. 908,496, Sep. 17, 1986, abandoned. This application Apr. 28, 1987, Ser. No. 43,671
Int. Cl.[4] A63F 5/04
U.S. Cl. 273—143 R 15 Claims



1. A machine comprising an outer casing, a first coin inlet formed in said casing, a money store within said casing into which coins pass when inserted into said first coin inlet, a base to said money store movable to a normally closed position to retain coins in said store and an open jackpot position to release coins from said store, a number of rotatable chance wheels mounted in said casing and arranged to be spun and stopped at random orientations, indicia carried by said wheels, only certian of said indicia being winning indicia when a respective wheel stops with one of certain indicia in a winning orientation whereby when said wheels stop in a winning orientation the resulting array of indicia corresponds to movement of said base to said jackpot position, sensor means pivotably mounted in said casing for engaging said wheels to detect winning orientation of winning indicia and being capable of moving said base to said jackpot position when said winning orientation is detected, and drive means for rotating said chance wheels, said drive means including a manually operated handle hingedly mounted to and exterior of said casing, gear means driven by said handle and engaging a first one-way clutch mechanism for rotating a first chance wheel, a second one-way clutch mechanism between said first and second chance wheel for rotating said second chance wheel when said first chance wheel is rotated by said first one-way clutch mechanism, and additional one-way clutch mechanisms between subsequent adjacent

pairs of chance wheels for driving subsequent chance wheels sequentially after each preceding chance wheel is driven into rotation, said subsequent wheels and the one-way clutches between said wheels being freely rotatable about a common supporting shaft.

4,838,555
HEAD OF WOOD TYPE GOLF CLUB
Masashi Kobayashi, Matsudo, Japan, assignor to Maruman Golf Co., Ltd., Tokyo, Japan
Filed Feb. 1, 1988, Ser. No. 151,038
Claims priority, application Japan, Feb. 2, 1987, 62-020518
Int. Cl.[4] A63B 53/04
U.S. Cl. 273—167 A **3 Claims**



1. A head body of a wood type golf club formed integrally with a neck, comprising: a club face for hitting a golf ball; an upper surface extending rearward in a convex curve from the upper edge of the club face; a sole surface extending rearward on a substantially flat plane from the lower edge of the club face and having a smaller area than said upper surface; and lateral surfaces extending rearward between the upper and sole surfaces from the toe and heel edges of the club face, wherein each lateral surface has an inflection point which defines an upper convex portion of the lateral surface merging with said upper surface and a lower concave portion of the lateral surface merging with the sole surface, and wherein the height from the sole surface to said inflection point of the lateral surfaces is increased from the toe and heel edges of the club face toward the rear end of the head body.

4,838,556
GOLF BALL CORE BY ADDITION OF DISPERSING AGENTS
Michael J. Sullivan, Chicopee, Mass., assignor to Spalding & Evenflo Companies, Inc., Tampa, Fla.
Filed Dec. 24, 1987, Ser. No. 137,649
Int. Cl.[4] A63B 37/02, 37/06
U.S. Cl. 273—220 **15 Claims**

1. A golf ball comprising a cover and a molded spherical core;

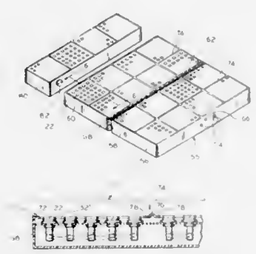
said core comprising a base elastomer selected from polybutadiene having a molecular weight of from about 50,000 to about 500,000 and admixtures of said polybutadiene with other elastomers,

at least one metallic salt of an alpha, beta-ethylenically unsaturated monocarboxylic acid,

a free radical initiator; and

a surfactant dispersing agent, in an amount from about 0.1 to about 5.0 parts by weight per 100 parts of rubber, selected from sulfated fats, sodium salts of aklylated aromatic sulfonic acids, substituted benzoid alkyl sulfonic acids, monoaryl and alkyl ethers of diethylene glycol and dipropylene glycol, ammonium salts of alkyl phosphates, sodium alkyl sulfates and monosodium salt of sulfated methyl oleate and sodium salts of carboxylated eletrolytes.

4,838,557
ELECTRICAL BINGO GAME BOARD
Eric M. Floyhar, Chicago, Ill., assignor to F & L Reserach Development and Manufacturing Co., Naperville, Ill.
Division of Ser. No. 21,167, Mar. 3, 1987, abandoned. This application Mar. 30, 1988, Ser. No. 178,900
Int. Cl.[4] A63F 3/00, 3/06
U.S. Cl. 273—237 **2 Claims**



1. A portable bingo game board comprising:

a carrying case including first and second sections hingedly connected to one another;

a plurality of switch groups in each section wherein each switch group includes one switch for each square on a bingo game card;

a plurality of display light groups in each section wherein each light group includes one display light for each square on a bingo game card;

means associated with each section for supporting sixteen bingo game cards in overlying relationship with each said switch and light group wherein one each of said switches and said lights is disposed below each bingo game card square;

means for electrically connecting said switches and said lights so that when a bingo player depresses a square on any bingo game card, the switch associated therewith is actuated to turn on its associated light and thereby illuminate said depressed bingo game card; and

an extender board including

an extender housing having an open top portion and a support structure below said top portion,

a plurality of manually actuable switches mounted to said support structure in a matrix configuration corresponding to the squares on a bingo game card,

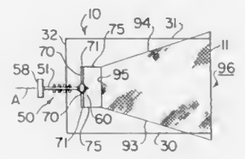
a plurality of display lights mounted to said support structure in a matrix configuration corresponding to the squares on a bingo game card wherein each of said lights is associated with one of said switches,

means for supporting a bingo game card at the top portion of said extender housing wherein each square on the bingo game card overlays one of said lights and its associated switch,

means for electrically connecting said switches and said lights so that when a bingo player depresses a square on the bingo game card the switch associated therewith is actuated to turn on its associated light and thereby illuminate said depressed square on the bingo game card, and

means for electrically connecting the extender board switches and lights to said switches and lights associated with said carrying case.

4,838,558
APPARATUS FOR SUPPORTING AND TENSIONING A NET
Brian L. Hauff, Vancouver, Canada, assignor to LeisureTech Sports Corp., Vancouver, Canada
Filed Oct. 11, 1988, Ser. No. 256,775
Int. Cl.[4] A63B 69/00
U.S. Cl. 273—395 **8 Claims**



1. Apparatus for supporting and tensioning a net, said net having a relatively large open end for receiving a ball or similar object projected therein, a relatively small back wall, and enclosing side walls extending from said open end to said back wall, said apparatus comprising: (a) a supporting framework, including:

(i) a forward support frame;

(ii) means for coupling the perimeter of the open end of said net with said forward support frame to hold said open end in a wide open condition;

(iii) a rear support frame; and,

(iv) frame stabilizing members for holding said forward support frame and said rear support frame in a spaced upright condition;

and,

(b) a net tensioning mechanism, comprising:

(i) a hub having a central axis, said hub being disposed between said back wall and said rear support frame;

(ii) a plurality of angularly spaced retainers supported by said hub equidistant and radially away from said axis;

(iii) means for coupling the perimeter of said back wall with said retainers; and

(iv) pulling means for ajustably drawing said hub along said axis rearwardly towards said rear support frame.

4,838,559
REACTOR COOLANT PUMP HYDROSTATIC SEALING ASSEMBLY WITH IMPROVED HYDRAULIC BALANCE
Richard F. Guardiani, Ohio Township, Allegheny County, and Charles P. Nyilas, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jun. 17, 1987, Ser. No. 63,331
Int. Cl.[4] F16J 15/34, 15/40
U.S. Cl. 277—3 **16 Claims**

1. In a pump having a shaft and a housing, said housing containing pressurized fluid variable in supply pressure between pump startup and pump operation, a hydrostatic sealing assembly for sealably and rotatably mounting said shaft within said housing, said sealing assembly comprising:

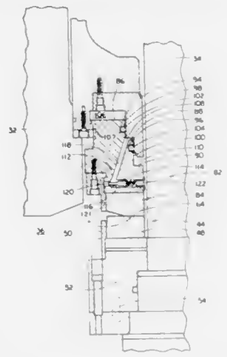
(a) an annular runner circumscribing and mounted around said shaft for rotation therewith;

(b) an annular seal ring circumscribing and mounted within said housing in non-rotational relationship thereto but for translatory movement along said shaft;

(c) said runner and seal ring having surfaces facing one another and between which the pressurized fluid within said housing creates a flowing film of low pressure fluid which prevents said facing surfaces of said respective runner and seal ring from coming into contact with one another so long as a predetermined minimum leakrate is maintained therebetween;

(d) means defining first and second surfaces on said seal ring facing in a direction opposite to that of its facing surface and in sealingly isolated relationship from one another, said first surface being in communication with the pressurized fluid at said supply pressure thereof; and

(e) control means disposed in said seal ring and being operable for opening communication of the pressurized fluid at said supply pressure thereof with said seal ring second surface at pump operation and for opening communication of the fluid film at said low pressure thereof with said seal ring second surface at pump startup such that a lifting force imposed on said seal ring facing surface by the pressurized fluid within said housing is effectively balanced by a seating force imposed on said seal ring first and second surfaces at both pump startup and operation so as to produce leakrates between said facing surfaces of said runner and seal ring during both pump startup and operation which are above said predetermined minimum thereof.



4,838,560
SLIDE RING SEAL
Antti-Jussi Heilala, Starnberg, Fed. Rep. of Germany, assignor to Oy Safematic Ltd., Muurame, Finland
Filed Sep. 16, 1987, Ser. No. 97,444
Claims priority, application Finland, Oct. 8, 1986, 864068
Int. Cl.[4] F16J 15/38
U.S. Cl. 277—42 **2 Claims**

1. A slide ring seal for sealing between a radially inner part which is rotatable about a longitudinal axis thereof and includes an outer circumferential surface having a radially outwardly projecting stop fixed thereon, and a non-rotatable radially outer part which spacedly surrounds at least a segment of the rotatable inner part and includes a radially inner circumferential surface having a sealing ring seat circumferentially provided in said inner circumferential surface at a site which is axially spaced from and faces said stop,

said slide ring seal comprising:

two identical sealing modules, each including, arranged in a respective longitudinally extending series of engaged elements, from an axially outer end to an axially inner and;

(a) an annular fastening element,
(b) an annular axially resilient element, and
(c) an annular slide ring;

each said annular fastening element having a radially outwardly projecting circumferential flange providing an external sealing ring seat facing axially outwardly;

each said annular fastening element having a radially inwardly opening circumferential groove providing an internal sealing ring seat;

each said annular fastening element having an axially outwardly facing end surface adapted to act as a stop; and

each said annular slide ring having an axially inwardly presented annular sliding surface

said two sealing modules being arranged with said annular sliding surfaces in sliding engagement with one another;

an external sealing ring received on said external sealing ring seat of said annular fastening element of one of said two sealing modules and arranged for sealing between said slide ring seal and said sealing ring seat provided in said inner circumferential surface of said non-rotatable outer part; and

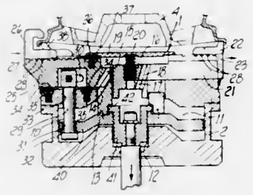
an internal sealing ring received on said internal sealing ring seat of said annular fastening element of the other of said two sealing modules and arranged, when said stop of said other annular fastening element is engaged with said stop of said rotatable inner part and said annular axially resilient elements of both of said sealing modules are axially resiliently at least partially compressed between respective said annular fastening elements and annular slide rings, for sealing between said slide ring seal and said outer circumferential surface on said rotatable inner part.

4,838,561

CHUCK, PARTICULARLY FOR MACHINE TOOLS

Cesare Baranzelli, San Vittore Olona; Claudio Frulla, Busto Arsizio, and Dario Gattolin, San Vittore Olona, all of Italy, assignors to TVA Holding S.p.A., Busto Arsizio VA, Italy

Filed May 2, 1988, Ser. No. 189,447
Claims priority, application Italy, May 15, 1987, 20546 A/87
Int. Cl.[4] B23B 31/19
U.S. Cl. 279—1 DA **11 Claims**



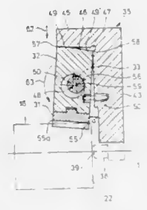
1. Chuck, particularly for machine tools, for centering and locking a workpiece to be machined, comprising a structure supporting a table provided with first sliding seats extending radially from the center of said table and accommodating workpiece centering means controllably movable towards and away from the center of the table and intended to contact portions of the workpiece arranged above said table and with second sliding seats extending radially from the center of said table and accommodating workpiece locking means controllably movable towards or away from the center of the table from a first position spaced from the portions of the workpiece to be contacted to a second position proximate to said portions of the workpiece to be contacted and controllably movable in a direction substantially perpendicular to the face of the table directed towards the workpiece from a release position, in which said locking means are disengaged from the workpiece, to an engagement position in which said locking means are engaged with the workpiece, said chuck further comprising control means acting on said centering means for their movement towards or away from the center of the table and on said locking means for their passage from said first to said second position and vice versa, there being provided means for connecting said control means to said locking means in said second position for the passage of said locking means from said release position to said engagement position or vice versa.

4,838,562

DRAWING-IN CLAMPING DEVICE FOR CHUCK OF LATHE OR THE LIKE

Yuji Akashi, Gifu, Japan, assignor to Yugen Kaisha Akashi Tekkosho, Gifu, Japan

Filed Mar. 4, 1988, Ser. No. 164,016
Claims priority, application Japan, Mar. 13, 1987, 62-58490
Int. Cl.[4] B23B 5/23, 5/34
U.S. Cl. 279—106 **6 Claims**



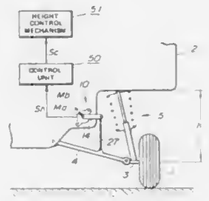
1. A drawing-in clamping device for a chuck of a lathe or the like comprising a plurality of pendulums each having a first end carrying a machinable clamp jaw detachably attached thereto and a second end providing a contact end surface, master jaws on a chuck body adapted to be driven in unison in a radial direction of the chuck, holders each attached to a front surface of the corresponding master jaw, each holder including an extension having a push surface engagable with said contact end surface of the corresponding pendulum substantially in a radial direction of the chuck, said push surface of each of said holders being inclined away from a chuck center line in a direction away from the chuck body, said contact end surface of each of said pendulums also being inclined substantially correspondingly to a push surface of the respective holders, each of said pendulums being formed with an opening, a pin loosely fitted through each of said openings such that said pin does not contact the wall of said opening when the surface of said pendulum adjacent to the holder is closely contacted to said front surface of the holder and said contact end surface of the pendulum is closely contacted to said push surface of the holder, said pin being mounted to its respective holder substantially in parallel with the front surface of the chuck body, springs each loaded between the corresponding holder and pendulum for normally pushing forwardly the jaw-attached end of the pendulum, stoppers attached to the front surface of the chuck body for receiving an end of a workpiece, the push surface of said extension closely contacting the contact end surface of the corresponding pendulum when said pendulum is swung into a position where a shaped end surface of a corresponding clamp jaw is substantially parallel with the chuck center line, and a non-contact portion defined between said contact end surface and the corresponding push surface and extending from a position closest to the chuck body to at least a position intersected by a line extending perpendicular to said chuck center line from that point of contact between the pin and a wall surface of the opening closest to said chuck body.

4,838,563

MOUNTING STRUCTURE FOR VEHICLE HEIGHT SENSOR

Junkichi Konishi, Hadano; Kenichi Tsukada, Yokohama; Tomoyoshi Sekiguchi, Atsugi; Masanori Kouda, Segamihara, and Minoru Suzuki, Machida, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Atsugi Motor Parts Company, Limited, Atsugi, both of, Japan

Filed May 26, 1988, Ser. No. 199,340
Claims priority, application Japan, May 27, 1987, 62-80371[U]
Int. Cl.[4] B60G 17/00
U.S. Cl. 280—840 **14 Claims**



1. A mounting structure for a vehicle height sensor for monitoring relative distance between a vehicular body and a suspension member rotatably supporting a vehicular wheel, comprising:

a sensor body housing therein a vehicular height sensor mechanism therewithin, said sensor body being mounted on said vehicular body, said vehicular height sensor mechanism including a movable member extending from said sensor body and to be associated with said suspension member for movement according to vertical displacement between said vehicular body and said suspension member;

a first means, associated with said vehicular body, for indicating a first reference point on said vehicular body, which first reference point is determined relative to a height position of said suspension member when the relative distance between said vehicular body and said suspension member is held at a predetermined first reference value; and

a second means, associated with said sensor body, for indicating a second reference point and to be aligned with said first reference point in mounting said sensor body onto said vehicular body, said second means deriving said first point based on a reference position of said movable member, at which a value of a vehicular height indicative sensor signal generated by said vehicle height sensor is held at a predetermined second reference value representative of said relative distance held at said first reference value.

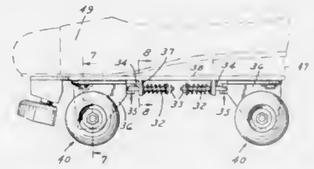
4,838,564

STEERABLE ROLLER SKATE

Patrick T. Jarvis, 6009 Highview St., Dearborn Heights, Mich. 48127

Filed Oct. 1, 1984, Ser. No. 656,479
Int. Cl.[4] A63C 1/24
U.S. Cl. 280—11.28 **2 Claims**

1. Roller skate comprising pair of longitudinally spaced roller means mounted on longitudinally extending member, each of said roller means having a roller axis and transversely arcuate longitudinally split rolling surfaces diminishing tranversely outwardly in rolling radius, each of said roller means having a truck with a vertical pivotal axis outboard of a horizontal displaceably mounted axle capable of providing steering action in an arcuate path, longitudinally extending progressive rate resilient means for biasing each truck to a neutral position, and means responsive to the weight of a skater leaning on said longitudinally extending member for displacing said truck and axle against progressively increasing rate resistance of said resilient means to steer said skate in the direction of leaning, said resilient means being preloaded to resist displacement from neutral position.

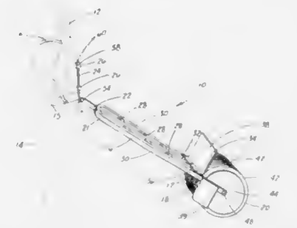


4,838,565

ROLLING TRAVOIS

George V. Douglas, and Vivian T. Douglas, both of Wheat Ridge, Colo., assignors to Douglas & Douglas, Inc., Wheat Ridge, Colo.

Filed Dec. 8, 1987, Ser. No. 130,078
Int. Cl.[4] B62D 51/04
U.S. Cl. 280—1.5 **8 Claims**



1. A rolling travois for carrying camping supplies and the like, the rolling travois adapted to be connected to an individual, the rolling travois comprising:

an elongated U-shaped support frame having an upper end with a tongue extending outwardly therefrom with a pivot attachment means thereat and a lower end having a pair of support frame legs extending outwardly therefrom;

an enlarged roller rotatably mounted on said pair of support frame legs extending outwardly from said lower end of said support frame, said roller comprising a plurality of cylindrically shaped disks supported between said support frame legs; and

attaching means for attaching said support frame to said individual so that said individual can pull said support frame behind said individual, said attaching means comprising a backpack swivel connecting rod having a pivot support member at one end thereof said tongue extending outwardly from the upper end of said support frame and pivotally connected to said pivot support member on said connecting rod.

4,838,566

SLIDER

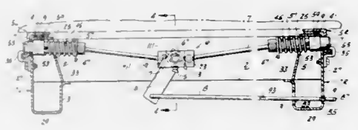
Bobby G. Baxter; Wendell B. Curtman, both of Warrenton, and Michael W. Peveler, Montgomery City, all of Mo., assignors to The Binkley Company, Warrenton, Mo.

Filed Jul. 11, 1988, Ser. No. 217,153
Int. Cl.[4] B60G 5/06
U.S. Cl. 280—149.2 **19 Claims**

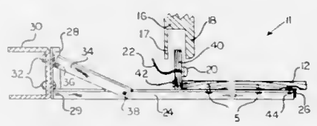
1. A slider for adjustment of the suspension of a vehicle longitudinally with respect to the body of the vehicle, the

slider comprising a pair of side rails adapted to be secured at the left and right sides of the body in fixed position extending longitudinally of the body, and a frame adapted to carry the suspension comprising left and right side members slidable longitudinally of the body on the side rails, and a plurality of locking pins for locking the frame in various positions of adjustment relative to the side rails, said locking pins being retractible for permitting adjustment of the frame to a selected position of adjustment and extensible for locking the frame in a selected position of adjustment, wherein the improvement comprises:

means for retracting said locking pins including linkage interconnecting said pins for conjoint movement of the pins between extended and retracted positions, said linkage including shaft means extending longitudinally of the frame, a crank for rotating said shaft means, and a plurality of links interconnecting said shaft means and the locking pins whereby rotation of the shaft means in one direction effects retraction of the locking pins and rotation of the shaft means in the opposite direction effects extension of the locking pins, an actuating member connected to said crank manually movable from a first position to a second position for rotating the crank to rotate the shaft means in said one direction to retract the locking pins, spring means connected at one end to means rigidly secured to said shaft means and connected at its other end to said crank, the arrangement being such that, in the event one or more of the locking pins are stuck in extended position the spring means is adapted to deflect to permit movement of the actuating member from said first position to said second position and rotation of the crank in said one direction while urging rotation of the shaft means to retract the locking pins, and means for securing the actuating member in said second position while said spring means is urging said shaft means to rotate in said one direction.



4,838,567
RUNNING BOARD
Gary F. Michanczyk, 48 Pond View Rd., Southington, Conn. 06489
Continuation-in-part of Ser. No. 67,100, Jun. 29, 1987, abandoned. This application Feb. 3, 1988, Ser. No. 153,489
Int. Cl.[4] B60R *3/00*
U.S. Cl. 280—163 1 Claim



1. A single board assembly attached to a frame of a vehicle comprising:

a plurality of carriers each having a first end and a second end;

a plurality of mounting bars attached to said frame in a vertical orientation each having a first end and a second end;

a plurality of cantilever bars each having a first end and a second end;

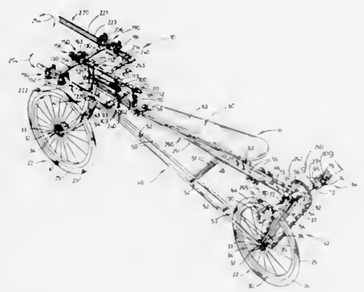
wherein, said first end of each said carrier is attached to said first end of one of said mounting bars, said first end of each said centilever bar is attached to one of said mounting bars and said second end of each said cantilever bar is attached to one of said carriers thereby forming a triangle;

said second ends of said plurality of carriers being interconnected by a support bar;

a platform fastened onto said plurality of carriers;

a cover panel attached to said platform and extending vertically into a cavity formed by a bifurcated lower end of a rocker panel of said vehicle.

4,838,568
PROPULSION APPARATUS
Joe Arroyo, 1970 S. Crystal, Fresno, Calif. 93706
Filed Feb. 8, 1988, Ser. No. 153,041
Int. Cl.[4] B62M *1/12*
U.S. Cl. 280—234 27 Claims



1. An apparatus for propelling an operator in earth traversing movement comprising

a frame having forward and rearward positions and mounting an operator's support adapted to receive said operator in rested relation thereon in an operational position, a fork having a spindle rotatably mounted on the forward portion of the frame mounting a first wheel and mounting a second wheel, said first and second wheels disposed for rolling movement along the surface of the earth;

a steering assembly borne by the frame including a steering bar mounted on the spindle, first and second supports, the first support mounted on the forward portion of the frame and disposed in close proximity to said fork and the second support mounted on the frame and disposed in spaced relation to the first support, the first and second supports disposed in substantial alignment one with the other, and a steering column mounting a pair of arms and a shaft rotatably mounted in a substantially horizontal attitude on the first and second supports, the shaft adapted to engage and move the steering bar thereby causing the fork to rotate when rotational movement is imported to the steering column to position the first wheel in selected operational attitudes for directing the frame during said rolling movement;

a pair of pedals rotatably borne by the frame and disposed in power transmitting relation to the second wheel for engagement by the operator; and

a pair of reciprocally movable members borne by the steering assembly and connected in force transmitting relation to said pedals for engagement by the operator and operable to impart physical force to said pedals for propelling the apparatus.

4,838,569
BICYCLE
Thomas R. Ford, 143 Whims La., Rochester, Mich. 48064
Filed Apr. 25, 1988, Ser. No. 185,480
Int. Cl.[4] B62K *3/04*
U.S. Cl. 280—275 20 Claims

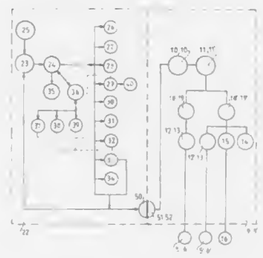
1. A bicycle comprising, in combination:

a generally elliptical resilient frame formed as a single continuous member from a wound fiber and plastic composite acting as a spring flexing to absorb varying road and riding conditions, said frame having forward and rearward ends and being laterally bifurcated from a point intermediate its ends to said rearward end so as to define upper and lower longitudinally extending portions each being bifurcated from said intermediate point rearward;

a steering pivot located at the forward end of said frame for mounting a front wheel fork assembly and handle bar; and

a modular seat post-pedal assembly mounted to said laterally bifurcated portion of said frame adjacent said intermediate point and extending between and above and below said upper and lower longitudinally extending frame portions.

4,838,570
METHOD, CONTROL SYSTEM AND EQUIPMENT TO PREVENT THE THEFT OF AN ARTICULATED VEHICLE AND/OR A TRAILER TO BE CONNECTED WITH A DRAWING VEHICLE
Ensio A. Toikka, Lukkarinkatu 9 C33, SF-21100 Naantali, and Arto E. Toikka, Otakaari 20 B 41, SF-02150 Espoo, both of Finland
PCT No. PCT/FI86/00118, § 371 Date Aug. 31, 1987, § 102(e) Date Aug. 31, 1987, PCT Pub. No. WO87/02947, PCT Pub. Date May 21, 1987
PCT Filed Oct. 17, 1986, Ser. No. 88,111
Claims priority, application Finland, Nov. 12, 1985, 854440
Int. Cl.[4] B60D *1/00*; B62D *53/08*
U.S. Cl. 280—507 15 Claims



2. A method for preventing the theft of a tractor trailer combination or trailer alone, comprising:

providing a first control system means on a tractor vehicle and a second control system means on a trailer adapted to be towed by said tractor vehicle;

programming and storing in said first control means a first predetermined reference code, said first control means having a resident task stored in its memory for comparing a subsequent reference code entered by a user and for generating a coded signal in response thereto;

sending said coded signal from said first control means to said second control means;

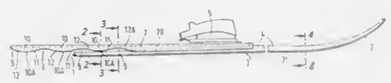
receiving said coded signal at said second control means;

programming and storing in said second control means a second predetermined reference code, said second control means having a resident task stored in its memory for comparing said coded signal with the stored second predetermined reference code; and

generating and sending a first control signal from said second control means when said coded signal sent from the first control means matches the second predetermined reference code in the second control means and for generating and sending a second control signal when said coded signal fails to match said second predetermined reference code;

providing locking means coupled to said second control means for rendering said trailer towable when in a first unlocked position upon receipt of said first control signal and upon receipt of said second control signal said locking means moves to a second position locking said trailer to prevent the trailer from being towed by the tractor vehicle.

4,838,571
SKIS
David Sevington, 5, Court Close, Corscombe, Dorchester, Dorset. DT2 OPE, United Kingdom
Division of Ser. No. 72,538, Jul. 13, 1987, abandoned. This application Mar. 21, 1988, Ser. No. 170,857
Int. Cl.[4] A63C *5/04*
U.S. Cl. 280—608 7 Claims



1. A ski having a turned up forward edged section, a trailing edged section with a tail end, and an intermediate edged section, the top of which latter section is provided with binding means for a ski boot, said sections forming a ski having an upper surface, and a running bottom face, said ski further comprising integral with the trailing edged section, and extending rearwardly therefrom has an inverted channel portion having a horizontal base substantially coplanar with the upper surface of said trailing section, and pair of side walls one of which depends downwardly from each side of the horizontal base in such manner that said side walls are disposed parallel to the side edges of the intermediate and trailing ski sections; each of said side walls having at least one recess along its lower edge and defining at least one projection extending downwardly from the horizontal base, the depth of each said projection being such that, when the running bottom face of the ski is laid on a flat horizontal surface, the lowermost tip of each said projection will be spaced slightly from and above said flat surface and a plane surface formed by said running bottom face to provide an air gap between said tip and said flat surface.

4,838,572

SKI WITH INCLINED LATERAL SURFACES

Jean-Luc Diard, Annecy, and Roger Pascal, Annecy Le Vieux, both of France, assignors to Salomon S.A., Annecy Cedex, France

Filed May 15, 1987, Ser. No. 49,933
Claims priority, application France, May 23, 1986, 86 07849
Int. Cl.[4] A63C 5/04
U.S. Cl. 280—609 45 Claims

1. A ski for use on snow or ice, comprising:

a lower sliding surface connected to an upper surface by two lateral surfaces along opposed sides of the ski, each of said lateral surfaces being inclined with respect to said lower surface and having at least one angle of inclination with respect to said lower surface, wherein the inclination angle of at least one of said lateral surfaces is variable along the longitudinal extent of said ski, said lower surface comprising a contact zone including a central zone and two end zone, the average inclination angle of said at least one lateral surface in said central zone of said ski being greater than the average inclination angle of said at least one lateral surface along at least one of said end zones, wherein said inclination angle of said at least one of said lateral surfaces decreases substantially continuously along at least a portion of the length of said ski from said central zone toward at least one of said end zones.

4,838,573

DEVICE FOR ADJUSTING TOE OF A VEHICLE WHEEL

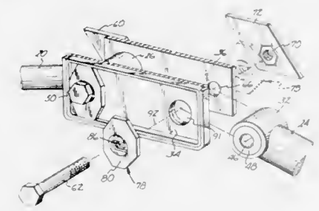
John Specktor, Golden Valley, and Gerald A. Specktor, St. Paul, both of Minn., assignors to Shim-A-Line, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 896,637, Aug. 15, 1986, Pat. No. 4,718,691. This application Oct. 2, 1987, Ser. No. 104,351
The portion of the term of this patent subsequent to Jan. 12, 2005, has been disclaimed.
Int. Cl.[4] B62D 17/00
U.S. Cl. 280—661 3 Claims

1. A device for adjusting a wheel attached to a vehicle by a suspension system that includes at least one arm member affecting wheel alignment, said member having an end with a first bore transversely disposed therethrough with respect to the axis of the member, said first bore being coaxially disposed along a first axis of a second bore disposed in mounting means attached to the vehicle and a bolt means extending through the first and second bores along the first axis, the device comprising:

a base having a third bore with a first center;

engaging means extending outwardly from the base for engaging the second bore, the engaging means having an outer arcuate surface that secures against an inner curvature of the first bore thereby centering the third bore a preselected distance from the first axis; wherein the bolt means extends through the first, second and third bores such that the bolt means lies along a second axis disposed from the first axis; and



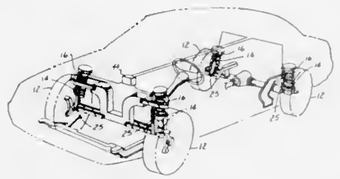
a plurality of prongs extending from a side of the base member facing the mounting means.

4,838,574

HYBRID SUSPENSION POSITION AND BODY VELOCITY SENSING SYSTEM FOR AUTOMOTIVE SUSPENSION CONTROL SYSTEM

Robert C. Baraszu, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 14, 1987, Ser. No. 133,098
Int. Cl.[4] B60G 17/00
U.S. Cl. 280—707 23 Claims



1. A system for generating a signal which is representative of the vertical velocity of the body of an automotive vehicle, comprising:

position sensor means for sensing the relative vertical position of a road wheel and tire assembly with respect to said body and for producing a suspension position signal corresponding to said road wheel and tire position; and

processor means operatively associated with said position sensor means for integrating said suspension position signal so as to produce a body velocity signal which is representative of the vertical velocity of said body, with said processor means further comprising means for employing said body velocity signal for controlling the vertical motion of said body.

4,838,575

IMPACT HEAD REST DEVICE FOR VEHICLE WINDOW

Michael F. Livingston, 21362 Fleet La., Huntington Beach, Calif. 92646

Filed Dec. 14, 1987, Ser. No. 132,016
Int. Cl.[4] B60R 21/02
U.S. Cl. 280—748 14 Claims

1. An impact head rest device for a vehicle window, comprising:

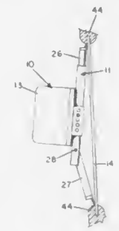
(a.) a support column moveable about midway along its length from a slightly bent, unlocked position to a straight, locked column position;

(b.) end cap members mounted at each end of the support column, the end cap members providing prong element end means for fitting between a window and an associated frame of the vehicle window;

(c.) a cushion support tray mounted on the support column; and,

(d.) a head cushion mounted on the support tray; whereby:

i. when the support column is in the bent and unlocked position, the prong element end means of the end cap members are insertable between the window frame and the window;



ii. when the support column is moved by compression from the unlocked position to the straight, locked position, the prong elements will be forced between the window and window frame, thereby maintaining the support column locked and wedged entirely along the window; and,

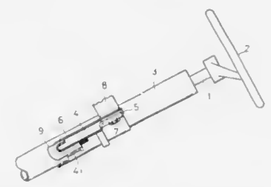
iii. the head cushion will provide a stationary protection and impact support between a driver's head and the window.

4,838,576

IMPACT ENERGY ABSORBING MECHANISM FOR A STEERING DEVICE OF A MOTOR VEHICLE

Yoshito Hamasaki; Akira Iwasaki, and Hiroaki Sue, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1989, Ser. No. 161,253
Claims priority, application Japan, Aug. 4, 1987, 62-118825[U]
Int. Cl.[4] B62D 1/18
U.S. Cl. 280—777 5 Claims



1. An impact energy absorbing mechanism for a steering device of a motor vehicle, comprising:

a steering column supported by a body of the motor vehicle in such a manner that, when a force of a magnitude greater than a predetermined magnitude is applied in an axial direction to said steering column, said steering column is movable in the same direction as said force;

a guide is securely coupled to and is movable in the same direction as said steering column when said steering column is moved in the axial direction; and

a deformable absorbing plate extending in the axial direction of said steering column and having one end being fixed to the body of the motor vehicle and the other end being left free;

said guide comprising a guide body having a generally U-shaped guide surface with which said absorbing plate makes contact, the longitudinal axis of said U-shaped being substantially parallel to the longitudinal axis of said steering column, and an absorbing plate retaining portion formed integrally with said guide body and at a predetermined distance from said guide surface;

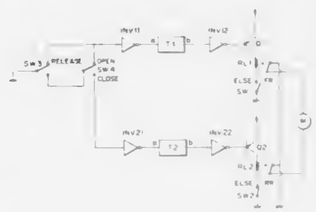
a part of said absorbing plate adjacent to said other end being inserted in and retained in a gap formed between said guide body and said absorbing plate retaining portion, whereby said absorbing plate is retained in a generally U-shaped bent position.

4,838,577

PASSIVE SEAT BELT SYSTEM

Osamu Kawai, and Shunzi Mizumura, both of Fujisawa, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1988, Ser. No. 176,330
Claims priority, application Japan, Apr. 6, 1987, 62-51072[U]
Int. Cl.[4] B60R 22/06
U.S. Cl. 280—804 3 Claims



1. A passive seat belt system for a vehicle, comprising:

a seat belt;

a slide anchor connected to one end of said seat belt and reciprocally movable from a fasten position, at which a person on the vehicle is bound, to a release position, at which the person on the vehicle is released;

a winder connected to another end of said seat belt and having an emergency lock mechanism for blocking feeding of said seat belt in an emergency case;

a forcible release device for unlocking said emergency lock mechanism;

detection switch means for detecting that said forcible release device is actuated to unlock said emergency lock mechanism; and

controller means for moving said slide anchor to said release position when said detection switch means detects that said forcible release device is actuated to unlock said emergency lock mechanism.

4,838,578

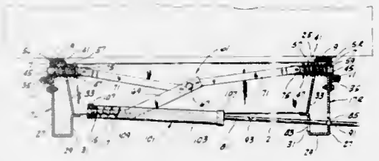
SLIDER

Bobby G. Baxter, Warrenton, Mo., assignor to The Binkley Company, Warrenton, Mo.

Filed Dec. 1, 1987, Ser. No. 127,422
Int. Cl.[4] B62D 53/06
U.S. Cl. 280—149.2 9 Claims

1. A slider for adjustment of the suspension of a vehicle longitudinally with respect to the body of the vehicle, comprising a pair of side rails adapted to be secured at the left and right sides of the body in fixed position extending longitudinally of the body, and a frame adapted to carry the suspension comprising left and right slide members slidable longitudinally of the body on the side rails, and a plurality of locking pins for locking the frame in various positions of adjustment relative to the side rails, said locking pins being retractable for permitting adjustment of the frame to a selected position of adjustment and extensible for locking the frame in a selected position of adjustment, wherein the improvement comprises means for

retracting said locking pins comprising linkage interconnecting said locking pins for conjoint movement of the pins between extended and retracted positions, an actuating member manually movable from a first position to a second position for effecting articulation of the linkage to retract the locking pins, spring means associated with said actuating member having a spring characteristic such that said spring means is not adapted to deflect substantially upon movement of the actuating member from said first position to said second position in the event said locking pins are not stuck in extended position but is



adapted to deflect upon movement of the actuating member from said first position to said second position in the event one or more of the locking pins is stuck in extended position, said spring means, when deflected, being adapted to urge articulation of said linkage to retract said one or more stuck locking pins, and means for securing said actuating member in said second position while said spring means is deflected thereby to maintain a force urging said one or more stuck locking pins toward said retracted position for retraction of the locking pins by the spring means on movement of the vehicle to loosen the stuck pin or pins.

4,838,579

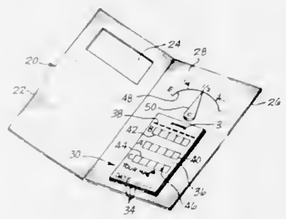
METHOD AND APPARATUS FOR DETERMINING MILEAGE

Richard C. McRoberts, 9101-68 Steilacoom Rd., SE., Olympia, Wash. 98503

Filed Sep. 29, 1988, Ser. No. 251,345

Int. Cl.[4] G09B *19/22;* **G01D** *13/00;* **G06K** *15/00*

U.S. Cl. 283—48.1 **10 Claims**



1. A device for facilitating calculation of units of distance travelled per unit of fuel consumed by a vehicle of the type having an odometer and a fuel gauge, said device comprising:

a recording surface; said surface including a first horizontal row of boxes for receiving a notation of an initial odometer reading, a second horizontal row of boxes positioned above and aligned with said first row for receiving a notation of a subsequent odometer reading taken following consumption of a predetermined number of units of fuel substantially equal to 10^n, with n being a whole number greater than zero, and a third horizontal row of boxes positioned below and aligned with said first and second rows for receiving a notation of the result of subtracting the notation in said first row from the notation in said second row; and

a decimal point positioned relative to said third row to automatically convert said result into, and to provide a visual display of, units of distance per unit of fuel.

4,838,580

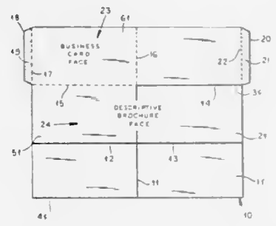
COMBINED VISITING CARD AND BROCHURE

Tapio Tuhkanen, Turku, Finland, assignor to Office Plus, Turku, Finland

Filed Dec. 23, 1987, Ser. No. 137,784

Int. Cl.[4] G09F *3/00;* **B42D** *15/00;* **B41L** *1/24;* **B65D** *27/00*

U.S. Cl. 283—56 **6 Claims**



1. A combined business card and brochure unit which comprises:

a flexible sheet formed with a separable panel connected by ready-separation means to the remainder of said sheet and having the shape and dimensions of a business card and provided with business contact information at least along one face of said panel, said sheet being further formed with fold lines enabling the remainder of said sheet to be folded into a folded state substantially the size and shape of said panel, said sheet being formed along opposite edges with tabs which overlie one another in said folded state and which are adhered to one another to retain said sheet in said folded state, said tabs being joined to said sheet by respective ready-separation lines permitting the joined tabs to be removed from said unit and said sheet to be unfolded so that said panel can then be removed from said sheet to form a business card separate from said sheet, said remainder of said sheet being provided with descriptive literature, said panel being provided at a corner of said sheet and having a short side along which one of said tabs is attached to said panel and another short side and one long side provided with said ready-separation lines.

4,838,581

JOINT STRUCTURE FOR A TUBE SUPPORT PLATE AND A TUBE

Noriyuki Oda, Chiba; Tetsuo Takehara, Yokohama; Katsumi Higashi, Iruma, and Keiji Muramatsu, Ichikawa, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Division of Ser. No. 825,642, Feb. 3, 1986, Pat. No. 4,753,457. This application Mar. 11, 1988, Ser. No. 167,115

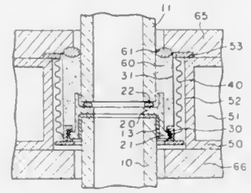
Claims priority, application Japan, Feb. 5, 1985, 60-19323[U]; Feb. 25, 1985, 60-25903; May 28, 1985, 60-113123

Int. Cl.[4] F16L *59/16*

U.S. Cl. 285—47 **6 Claims**

1. A joint structure for a tube support plate and a tube which is used in a hot gas system and comprises a ceramic filter tube aligned with a retaining hole of a tube support plate cooled by cooling medium and a metallic bellows having an end fixed directly or indirectly to said tube support plate and the other end linked to said filter tube, wherein an insulating layer is disposed in contact with the outer circumference of said insulating layer and the outer circumference of said insulating layer is surrounded by a metallic tube so as to be in mutual contact

so that frictional forces are respectively produced between said filter tube and said insulating layer and between said insulating



layer and said metallic tube, said bellows having its one end connected to said metallic tube.

4,838,582

FLEXIBLE EXPANSION PIPE COUPLING

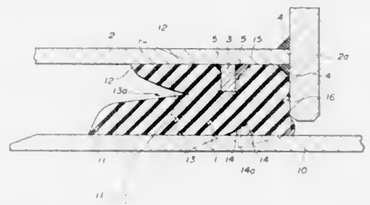
Ryoichi Hatakeyama, Urawa, and Shintaro Ikeda, Funabashi, all of Japan, assignors to The Victaulic Company of Japan, Ltd., Tokyo, Japan

Continuation of Ser. No. 780,022, Sep. 25, 1985, abandoned. This application Dec. 9, 1987, Ser. No. 130,465

Claims priority, application Japan, Sep. 26, 1984, 59-144311[U]

Int. Cl.[4] F16L *17/06*

U.S. Cl. 285—110 **6 Claims**



1. A flexible expansion coupling comprising:

a first pipe member having an outer surface;

a second pipe member having an outer surface;

a sleeve member provided with flange members disposed at the opposite ends thereof, said sleeve member containing annular projecting members extending from an inner surface thereof, said sleeve member having first and second ends, said first end being positionable around the first pipe member and said second end being positionable around the second pipe member simultaneously therewith; and

a plurality of packing members made of a resilient material, a first one of said packing members being positioned adjacent the first end of said sleeve member and a second one of said packing members being positioned adjacent the second end of said sleeve member, each of said packing members containing annular grooves on an outer side thereof for receiving one of said projecting members, each of said packing members including a pair of lips, each of said lips having an end portion, said end portions being space apart by a distance greater than the distance between the inner surface of said sleeve member and the outer surface of the pipe members before the packing members are inserted between said sleeve member and said first and second pipe members,

a first one of said pair of lips of each of said packing members being in contact with the inner surface of said sleeve member and out of contact with the outer surface of said pipe member while a second one of said pair of lips is in contact with the outer surface of the said pipe member and out of contact with the inner surface of said sleeve member when said packing members are inserted between said sleeve member and said first and second pipe members for forming a primary seal,

each of said packing members having a single recess on an inner side thereof, each of said single recesses being positioned at a point in said packing member opposite said annular groove, said inner side of each of said packing members being unbroken except for said single recess and being substantially flat except for said single recess when said packing member is inserted between said sleeve member and said pipe member,

each of said packing members further having a rearward edge adjacent said single recess, said rearward edge of each of said packing members pointing generally in the direction of the pair of lips for the packing member, each of said rearward edges contacting one of the pipe members when said packing member is inserted between the sleeve member and the one pipe member and being compressed upon contacting the pipe member for forming a secondary seal therewith.

4,838,583

FLUID COUPLING

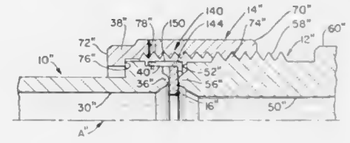
Gerald A. Babuder, Mentor, and Jeffrey L. Weigl, Northfield Center, both of Ohio, assignors to Cajon Company, Macedonia, Ohio

Continuation-in-part of Ser. No. 788,050, Oct. 16, 1985, Pat. No. 4,650,227, which is a continuation-in-part of Ser. No. 410,408, Aug. 23, 1982, Pat. No. 4,552,389. This application Mar. 5, 1987, Ser. No. 22,115

The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.

Int. Cl.[4] F16L *19/00*

U.S. Cl. 285—354 **6 Claims**



1. In a fluid coupling of the type having first and second generally cylindrical coupling components including fluid passageways extending longitudinally thereof, said components having opposed radial end faces including generally annular sealing beads extending axially therefrom toward each other for engagement with a sealing gasket interposed therebetween, said coupling further including means for moving said components into a close-spaced substantially coaxial relationship such that said sealing beads will sealingly engage opposite face areas of the gasket, the improvement comprising:

a generally annular gasket body having oppositely disposed seal faces and retainer means for maintaining said gasket in a predetermined located position relative to the end face of one of said components in a substantially coaxial relationship therewith, said retainer means including an annular end wall having an outer diameter slightly larger than said gasket body and a central opening with a periphery lying outside the maximum diameter of said beads but inwardly of the outer diameter of said gasket body, said retainer further including a generally cylindrical side wall integral with said end wall and encircling said gasket body and extending outwardly thereof in a direction generally normal to said seal faces in a retaining relationship with said one component at an area thereof spaced axially rearward from the associated radial end face such that said

gasket is held generally with its said seal faces parallel to the sealing bead at said one component end face said gasket body having an inside diameter less than the inside diameter of the annular sealing bead on the end face of the other of said components, whereby said gasket is positively located and held in a generally coaxial relationship with said components when they are moved toward said closely-spaced relationship by said moving means, said sealing beads each engaging substantially the same portion of the associated gasket face area during subsequent disassembly and reassembly of the coupling; and,

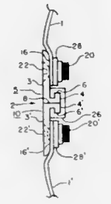
wherein said moving means comprises an open-ended first coupling member threaded from one end thereof toward the other for threaded engagement with said other component and wherein said first coupling member other end includes a radially inward extending shoulder which drivingly engages a radially outward flange on said one component axially spaced from the radial end face thereof, said one component including an area between said flange and said radial end face for receiving said generally cylindrical side wall axially thereonto for securing on said one component with said gasket body disposed in a desired position, said area between said flange and said radial end face having a diameter greater than the maximum radial extent of said sealing beads.

4,838,584

QUICK DISCONNECT DUCT COUPLER

Douglas D. Dierksmeier, Palm Beach Gardens, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 24, 1987, Ser. No. 100,385
Int. Cl.[4] F16L *21/0*
U.S. Cl. 285—419 **1 Claim**



1. A coupling device for detachably coupling first and second terminal duct portions of a substantially cylindrical duct together along a line substantially parallel with a longitudinal axis of said duct comprising:

a first coupling member having a base portion, a rib portion extending above said base portion, said rib portion having a side portion and a projection portion extending away from said side portion;

a second coupling member having a base portion, a rib portion extending above said base portion, said rib portion having a side portion, and a projection portion extending away from said side portion;

first coupling means for coupling said first terminal duct portion to the base portion of said first coupling member;

second coupling means for coupling said second terminal duct portion to the base portion of said second coupling member;

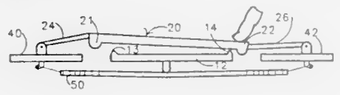
a clamp member positioned inside said substantially cylindrical duct having inner side portions facing each other, configured to grip each projection portion and each rib portion of said first and second coupling members to clamp said first and second coupling members together, and wherein said duct has an outer contour, and said terminal duct portions are indented to accommodate the base portions of said first and second coupling members without changing the outer contour of said duct, and wherein said first and second coupling means each comprise at least one bolt for coupling a terminal duct portion to an associated base portion and an adhesive layer for bonding a terminal duct portion to an associated base portions.

4,838,585

HANDLE-LATCH MECHANISM

Timothy J. Joodrow, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 18, 1987, Ser. No. 98,263
Int. Cl.[4] F05C *9/04, 9/24*
U.S. Cl. 292—8 **20 Claims**



1. A handle-latch mechanism for use in a portable carrying case of the type having an openable cover portion, wherein said handle-latch mechanism comprises:

(a) an elongated handle member having first and second ends; said handle member being movable between extended and retracted positions;

(b) first and second slider members carried by said case and being movable between inner and outer positions;

(c) first and second link members pivotally attached between said first and second ends of handle member and said first and second slider members, respectively;

(d) bias means adapted to urge said first and second slider members to their said inner positions;

(e) latch means carried by said case and being movable between open and closed positions; and

(f) latch actuator means adapted to move said latch means between said open and closed positions, said latch actuator means being slidably attached to said link member in a manner such that said actuator means is slidable between first and second positions when said handle member is in said retracted position;

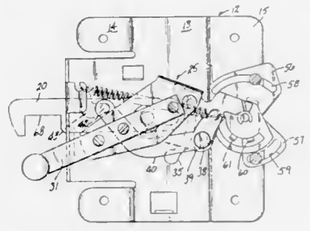
wherein said case includes a support against which said handle member rests when in said retracted position.

4,838,586

OVEN DOOR WITH MEANS FOR PREVENTING INADVERTENT LOCKING

John R. Henne, Burlington, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Sep. 22, 1987, Ser. No. 99,491
Int. Cl.[4] E05C *5/02*
U.S. Cl. 292—113 **3 Claims**



1. A latch for oven doors and the like comprising:

a support;

a latch assembly movable on said support between latching an unlatching positions, said assembly including a handle, a latch arm and a projecting arm, said handle being operative to move said latch arm between latching and unlatching positions and simultaneously to move said projecting arm:

a locking pawl having an abutment thereon engagable with said projecting arm to block its movement from latching to unlatching position; and

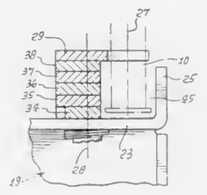
a thermal element operatively connected to said locking pawl and responsive to elevated temperatures to move said pawl from a first position wherein said abutment is removed from the path of movement of said projecting arm from its latching position to its unlatching position and moved to a second position wherein said abutment is disposed in said path of movement of said projecting arm to block its movement into its unlatching position, said thermal element being responsive to a subsequent decline in temperature to move said pawl from said second position to said first position, said projecting arm being configured to contact said abutment in said second position so that said projecting arm cannot be moved past said abutment, said projecting arm having leading and trailing edges configured to engage and be blocked by said abutment when said abutment is in said second position.

4,838,587

MECHANISM FOR CONTROLLABLY DEADLOCKING A DOOR TO A DOOR FRAME, FOR PANIC RELEASE

Mansam Choi, Monrovia, Calif., assignor to Adams Rite Manufacturing Company, City of Industry, Calif.

Filed May 2, 1988, Ser. No. 188,841
Int. Cl.[4] E05C *3/26*
U.S. Cl. 292—216 **12 Claims**



1. Mechanism for deadlocking a door member to a door frame member, one of the members rigidly supporting a bolt to project freely in the direction of a first axis, for captivation by said mechanism, said mechanism comprising:

(a) a body attachable to the other member,

(b) a rotary latching means carried by the body to pivot about a second axis generally parallel to the first axis, the latching means including a latch forming a recess to relatively receive the bolt as the members relatively close and so that the bolt pivots the latch about the second axis into full latching position, thereby to deadlock the two members,

(c) a confinement wall on the body to face and confine the bolt in said recess in said full latching position,

(d) the latching means including a latch dog,

(e) a blocking and unblocking part extending in co-operation with the body and movable from a first location in which the latch dog is blocked to prevent pivoting of the latch to release the bolt, to a second location in which the dog is unblocked, to allow said latch pivoting,

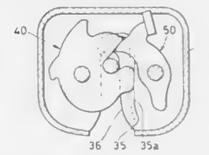
(f) the body including a side wall attachable to one of said members, a top wall relative to which said confinement wall projects upwardly proximate one end of the top wall, there being an upright shaft mounted on the top wall and mounting said latching means above said top wall to rotate at a level proximate the top of said confinement wall.

4,838,588

DOOR LOCK DEVICE FOR AUTOMOTIVE VEHICLE

Hatsuo Hayakawa, and Mikio Honma, both of Yokohama, Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama, Japan

Filed Apr. 10, 1987, Ser. No. 36,720
Claims priority, application Japan, Apr. 16, 1986, 61-87569; Jun. 20, 1986, 61-144104; Jun. 20, 1986, 61-144103; Oct. 24, 1986, 61-163024
Int. Cl.[4] E05C *3/26*
U.S. Cl. 292—216 **2 Claims**



1. A door lock device for an automotive vehicle attached to a vehicle door to lock/unlock the vehicle door to a vehicle body via a striker provided in the vehicle body, which comprises:

(a) a base housing having a mounting flange portion on opposite sides thereof;

(b) cover plate means having a joint flange portion on opposite sides thereof for mating engagement with said mounting flange portions for forming an enclosure with said base housing;

(c) cooperating latch means and lock plate means pivotally supported by respective support axles fixedly connected between said base housing and said cover plate means for locking engagement with the striker; and

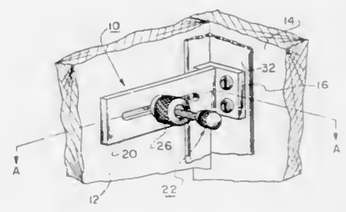
(d) said base housing including a surface having a projecting bead extending therefrom and spreading over an engagement area between said latch means and said lock plate means so as to reduce play between said base housing and said latch means for prevention of disengagement between said latch means and said plate against shock applied to the door lock device.

4,838,589

APPARATUS TO LOCK STORM DOORS AND AVOID DRAFT

John L. DiAmico, 3109 Dalton Ct., Bensalem, Pa. 19020

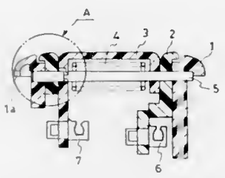
Filed Aug. 21, 1987, Ser. No. 87,765
Int. Cl.[4] E05B *13/00*
U.S. Cl. 292—258 **14 Claims**



1. A locking apparatus for a storm door, which door has an inside and an outside and which closes against a doorjamb, said apparatus comprising

attachment means affixed to the inside of said door;
retention means attached to said door jamb;
a locking member; and
means to tighten said locking member toward said attachment means and retain the locking member against the retention means so as to prevent the storm door from being opened from the outside;
wherein said attachment means comprises an internally threaded sleeve, and said sleeve extends at least partially through the door, is threaded at both ends, and is held in place by a bolt passing through the outside of the door and threading into a portion of the sleeve within the door.

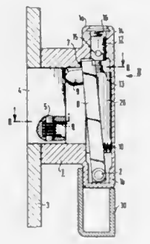
4,838,590
INSIDE HANDLE DEVICE FOR VEHICLE
Yukio Isomura, Chiryu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan
Filed Sep. 30, 1987, Ser. No. 102,729
Claims priority, application Japan, Sep. 30, 1986, 61-149873[U]
Int. Cl.[4] E05B *3/00*
U.S. Cl. 292—336.3 **7 Claims**



1. An inside handle device for a vehicle comprising
a bracket to be secured to a door of the vehicle, said bracket having side portions formed thereon,
a handle disposed inside said bracket,
a locking knob disposed inside said handle, and
a single hinge pin extending between the side portions of said bracket for pivotally mounting said handle and said locking knob within said bracket,
said hinge pin having a circumferential groove formed therein,
a plurality of elastic pawls formed in said handle device and projecting toward said hinge pin,
said elastic pawls being engaged in said groove of said hinge pin such that said hinge pin is prevented from shifting axially, and
each of said elastic pawls being formed between notches to permit said pawls to be easily deformed.

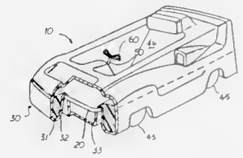
4,838,591
ELECTRIC DOOR OPENER
Fritz H. Fuss, Albstadt, Fed. Rep. of Germany, assignor to Fritz Fuss KG, Albstadt, Fed. Rep. of Germany
Continuation of Ser. No. 858,926, May 2, 1986, abandoned. This application May 20, 1988, Ser. No. 196,828
Int. Cl.[4] E05C *21/02*
U.S. Cl. 292—341.16 **2 Claims**

1. An electric door opener comprising a symmetrical T-shaped casing including a base portion and a cross-bar portion perpendicular to the base portion, the cross-bar portion having first and second T-arms, and a central part connecting the two T-arms;
a swing catch pivotally mounted on a spindle in the base portion of the casing;
a changer pivotally mounted on a pin perpendicular to the spindle and having a base and a free end;
the base being arranged in the first T-arm, the free end engaging with the swing catch and extending to the second T-arm;
an electromagnet including a coil and an armature slidingly arranged coaxial with the coil and having an end face;
the electromagnet being arranged in the central part of the casing connecting the two T-arms and parallel to the spindle with the end face of the armature extending to the second T-arm;
a spring loaded sliding bolt including means engaging with and disengaging from the free end of the changer;



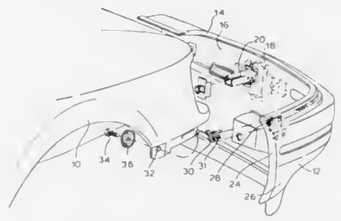
a recess in the second T-arm for housing the sliding bolt;
the sliding bolt having a longitudinal axis along which it slides and which is parallel to the spindle;
the end face of the armature being disposed for hammering against the sliding bolt when the electromagnet is energized;
the sliding bolt being in a locking position with respect to the changer when the electromagnet is not energized and being in a releasing position with respect to the changer when the electromagnet is energized.

4,838,592
IMPACT-ABSORBING AMUSEMENT VEHICLE
David W. Sobodos, Hermosa Beach, and David W. Chalmers, San Pedro, both of Calif., assignors to Agajanian Enterprises, Inc., Gardena, Calif.
Filed Apr. 15, 1987, Ser. No. 38,655
Int. Cl.[4] B60R *19/22*
U.S. Cl. 293—109 **13 Claims**



1. An amusement vehicle comprising:
a. a vehicle frame;
b. a body shell mounted on said vehicle frame; and
c. a resilient bumper provided on said body shell to form an open-ended gap between said bumper and said body shell inboard of said frame;
wherein, upon application of an impact force to said bumper, said bumper deforms resiliently into said gap between said bumper and said portions of said body shell inboard of said vehicle frame.

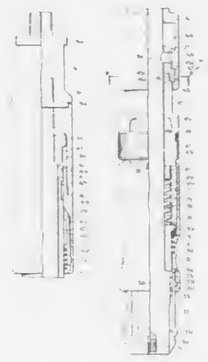
4,838,593
MOUNTING ARRANGEMENT FOR A VEHICLE BUMPER
Stephen D. Fleming, Rayleigh, and Martyn G. Lane, Hockley, both of United Kingdom, assignors to Ford Motor Company, Dearborn, Mich.
Filed Aug. 6, 1987, Ser. No. 82,603
Claims priority, application United Kingdom, Aug. 6, 1986, 8619194
Int. Cl.[4] B60R *19/18*
U.S. Cl. 293—126 **10 Claims**



1. A mounting arrangement for mounting a bumper having wrap-around ends onto a vehicle, comprising two parallel foward facing sockets provided between the vehicle body and the bumper, two parallel rearwardly projecting posts provided between the bumper and the vehicle body, the posts being received in frictionally gripped relationship in the sockets, and means for connecting the wrap-around bumper ends to the sides of the vehicle body to prevent disengagement of the posts from the sockets, wherein the connecting means for the bumper comprises snap-fit fastener means operatively carried between the bumper ends and the vehicle body for securing the bumper against movement except in the forward direction when the bumper is offered up to the vehicle and comprises secure fastener means engagable with the snap-fit fastener means for securing the bumper against movement in the forward direction which is put into place once the bumper is correctly positioned.

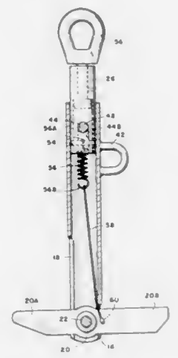
4,838,594
RUNNING AND PULLING TOOL
Roy P. Bullard, Grand Prairie, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.
Continuation-in-part of Ser. No. 916,024, Oct. 6, 1986, Pat. No. 4,767,145. This application Oct. 22, 1987, Ser. No. 111,184
Int. Cl.[4] E21B *23/00*
U.S. Cl. 294—86.18 **13 Claims**

1. A tool for releasably engaging an internal fishing neck comprising:
(a) an elongate mandrel;
(b) means mounted on said mandrel for engaging and releasing the fishing neck including a housing slidably mounted around said mandrel, said housing having walls, openings through said walls and an external groove thereon below said openings;
(c) unlockable locking means for locking said engaging and releasing means in fishing neck engaging position on said mandrel including
a recess on said mandrel,
a lug mounted for lateral movement in each engagement and releasing housing opening, said lugs engageable in said mandrel recess,
a locking housing slidably mounted around said engaging and releasing housing and said mandrel, said locking housing having an upper bore moveable over said lugs and a lower overbore therein,
a C ring mounted in said overbore, said C ring engageable in said engaging and releasing housing groove;
(d) connecting means for connecting to said locking means to unlock and move said engaging and releasing means to a position on said mandrel releasing the tool from the fishing neck;



(e) means in said engaging and releasing means for manual repositioning of said mandrel in said locking means; and
(f) means releasably connecting said connecting means to said mandrel.

4,838,595
REEL LIFTING DEVICE
Robert J. Spitlar, Tulsa, Okla., assignor to Tulsa Power Products, Inc., Tulsa, Okla.
Filed May 16, 1988, Ser. No. 194,280
Int. Cl.[4] B66C *1/66*
U.S. Cl. 294—90 **1 Claim**



1. In a lifting device for grasping an object having a hole therethrough, the device having an elongated tubular support member and a toggle member pivotally secured at a point of pivotation to the lower end of the support member and being moveable into an inoperative position wherein it is disposed longitudinally of the support member and an operative position wherein it is disposed transversely of the support member, the toggle member having a first portion extending in one direction from the point of pivotation and a second portion extending in the opposite direction from said point of pivotation and including a lifting member located at and connected to the upper end of the support member and being longitudinally movable relative to the support member through a predeter-

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mined distance, the lifting member having a downward, non-lifting position and an upward lifting position, the lifting member in its upper position co-acting with the support member and the toggle member to perform lifting operations, the lifting member having an upper portion for fastening to a lifting cable so that when the lifting member is moved to its upper lifting position the toggle member is pivoted to its operative position, the improvement comprising:

an extendable spring within said tubular support member having a first and a second end and having the first end affixed to said lifting member, the spring being extendable between a collapsed condition and an extended condition;

a cable within said tubular support member having a first and a second end and having the first end affixed to said spring second end and having the second end thereof affixed to said toggle member first portion at a point on said toggle member first portion displaced away from the said point of pivotation whereby when said lifting member is in its upward position said toggle member is in said operative position and said spring is in its extended condition and wherein said lifting member is in its downward position said toggle member is in it inoperative position and said spring is in its collapsed condition, and wherein said toggle member first portion is heavier than said toggle member second portion whereby when said lifting member is in its lower, non-lifting position said toggle member tends to automatically pivot to its said inoperative position.

4,838,596

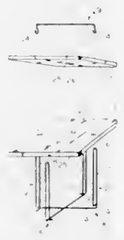
DISH CARRIER

John Stanfield, 425 Riverhill Dr., Atlanta, Ga. 30328

Continuation-in-part of Ser. No. 90,548, Aug. 28, 1987, Pat. No. 4,786,096. This application Apr. 11, 1988, Ser. No. 179,956

Int. Cl.[4] B25H *3/04*

U.S. Cl. 294—137 10 Claims



1. A dish carrier comprising a base formed with at least three slots located adjacent the base periphery about a base central portion;

at least three resilient wires adapted to be mounted to said base so as to extend through said slots, each of said resilient wires having two generally parallel arms that extend from a connecting bight to two generally parallel legs that extend angularly from said arms; and

three holding means mounted to the bottom of said base adjacent said three slots for holding said wire legs snuggly to said base bottom with said legs extending through said slots.

4,838,597

ARRANGEMENT IN TUBULAR PLATFORM STANCHIONS

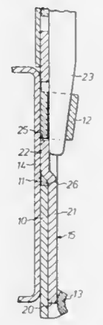
Lars O. Berg, Billdal, Sweden, assignor to Armaton AB, Vara, Sweden

Filed Nov. 4, 1987, Ser. No. 116,699

Claims priority, application Sweden, Nov. 4, 1986, 8604709

Int. Cl.[4] B62D *27/06, 33/04*

U.S. Cl. 296—36 5 Claims



1. A platform stanchion for detachable mounting to the edge surface of a truck platform comprising, in combination, an attachment plate having a flat wall portion, one face of which is adapted to be permanently secured to the platform edge surface of a truck, an upper yoke projecting from the upper part of the opposite face of the plate and having a vertical through opening, a lower horizontally extending yoke projecting from the lower part of the opposite face thereof and an opening in said plate below the upper yoke that exposes the edge surface of the platform, a stanchion having a wall portion, a tongue on the lower end of the wall portion adapted to be inserted into said lower yoke and an opening in the wall portion located and dimensioned so that it passes over the upper yoke when the tongue of the stanchion is inserted into and pivoted about the lower yoke, said wall portion of the stanchion having a central longitudinally extending raised portion for accommodating the attachment plate so that said raised portion lies against the plate and an offset portion above said raised portion a part of which extends into the opening in the plate for engagement with the platform edge surface and a part of which extends above the upper yoke, said opening in the stanchion wall being located in the offset portion of the wall and a wedge-shaped locking key insertable through the upper yoke that engages with the offset portion of the stanchion wall above and below the upper yoke to clamp the stanchion to the attachment plate.

4,838,598

SEGMENTED END GATE FOR BOX TYPE VEHICLE BODIES

Neal T. Hyde, P.O. Box 278, Lodgepole, Nebr. 69149

Filed Apr. 11, 1988, Ser. No. 180,354

Int. Cl.[4] B62D *25/00*

U.S. Cl. 296—50 9 Claims

1. An end gate comprising:

a body portion adapted to be fastened to the end panel of a truck;

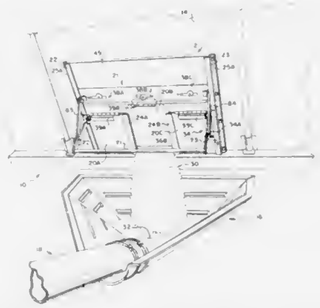
a plurality of door panels of between two and six in number each having a surface area of between 25 square inches and 4 square feet;

each of said door panels located substantially in the same plane;

drive means;

means for selectively connecting any of said door panels to said drive means; and

manually operable means for moving said drive means upwardly and downwardly whereby said door panels which are connected to said drive means are selectively moved upwardly to open a space for grain to flow therethrough or downwardly to close said space.



4,838,599

TILTING ASHTRAY FOR MOTOR VEHICLES

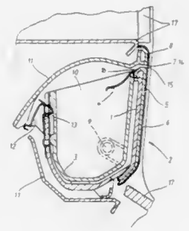
Ulrich Bruhnke, Ehningen; Jurgen Korber, Sindelfingen, and Ingo Jobmann, Grafenau, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jan. 29, 1988, Ser. No. 150,011

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1987, 3702554

Int. Cl.[4] B60N *3/08*

U.S. Cl. 296—37.9 5 Claims



1. Tilting ashtray for motor vehicles which comprises a cup housing which can be tilted to a limited extent towards the interior space of the vehicle for uncovering an ashtray opening, a cup housing surface facing the interior space of the vehicle which is covered by a surface-refined, temperature resistant facing part separated by milled-through encompassing gaps from a facing plate which covers the surroundings, and an upper edge of the cup housing surface which protrudes in the opened stated into the interior space of the vehicle being protected against temperature effects by a rounded-off burning-ash protection strip which is integrally formed, closely beneath an upper-lying milled-through transverse gap, with the temperature-resistant facing part in such a manner that the protection strip extends towards the ashtray opening from the facing part to protect the upper edge of the cup housing surface.

4,838,600

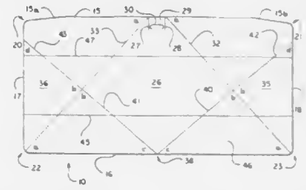
VEHICLE SUN SCREEN

Henry Wischusen, III, Lilburn, Ga., assignor to Rock-Tenn Company, Norcross, Ga.

Filed May 12, 1988, Ser. No. 193,397

Int. Cl.[4] B60J *3/00*

U.S. Cl. 296—97.8 25 Claims



1. A vehicle having a transverse window, a surface extending below said window, and a sun screen formed of a stiff, foldable sheet material, positioned inside said window, said sun screen comprising:

a generally triangular central portion positioned adjacent to said window and resting on said surface with the apex of said triangular center portion positioned adjacent to the top center of said window and the base of said triangular central portion extending parallel to said surface; and

a pair of wing members foldably connected to the sides of said triangular central portion, each of said wing members comprising a generally triangular panel extending along said central portion form its apex to one of its base corners, and each of said wing members being angled inwardly with respect to the plane of said central portion.

4,838,601

FOLDING TOP FOR PASSENGER CARS

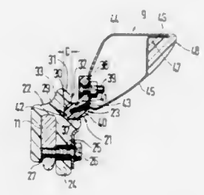
Eugen Kolb, Stuttgart, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 28, 1988, Ser. No. 174,222

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1987, 3709927

Int. Cl.[4] B60J *7/12, 7/185*

U.S. Cl. 296—128 14 Claims



1. A folding top for passenger vehicles comprising:

(a) a main bow pivotally attachable to a vehicle;

(b) a roof frame formed by lateral side members and a cross member;

(c) a toggle joint system for pivotally connecting the roof frame and the main bow, the toggle joint system including a roof frame control arm;

(d) a locking element positioned on a lateral side member of the roof frame having a semi-circular end section, the locking element having a substantially U-shape in cross-

section to form a channel for receiving an end face flange of the lateral side member of the roof frame; and

(e) a complementary receiving element having, on a side facing the lateral side member, a locking element receiving recess for receiving and releasably retaining in a a form-fitting manner the semi-circular end section of the locking element, the receiving element being positioned on the roof frame control arm of the toggle joint system so that when the folding top is moved from a closed position to a folded-back open position, the semi-circular end section of the locking element is received and retained by the receiving recess of the receiving element to maintain the folded top in the folded-back position.

4,838,602

PICKUP BED TONNEAU COVER MOUNTING

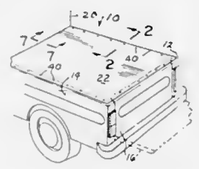
James A. Nett, P.O. Box 825, Norman, Okla. 73072

Continuation of Ser. No. 28,357, Mar. 20, 1987, Pat. No. 4,730,866. This application Feb. 25, 1988, Ser. No. 160,186

The portion of the term of this patent subsequent to Mar. 15, 2005, has been disclaimed.

Int. Cl.[4] B60J *7/10*

U.S. Cl. 296—100 **25 Claims**



1. A cover attachment apparatus for a vehicle bed having a sidewall which has a generally horizontal top portion and an inner downward depending flange, comprising:

an elongated rail means, adapted to overlie said sidewall top portion, for supporting a cover over said vehicle bed; and

clamp means for clamping said rail means to said sidewall, said clamp means including:

an upper portion adapted for attachment to said rail means;

an upwardly open throat means for receiving said flange of said sidewall; and

a lower portion having a lateral arm means extending outwardly for engaging an inward facing surface of said sidewall.

4,838,603

DEVICE FOR PREVENTING THE REAR LIGHT UNITS OF MOTOR VEHICLES FROM BECOMING DIRTY

Marco Masoero, Fiano, and Angelo Garrone, Cascine Vica-Rivoli, both of Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Filed Feb. 17, 1988, Ser. No. 156,635

Claims priority, application Italy, Feb. 17, 1987, 67109 A/87

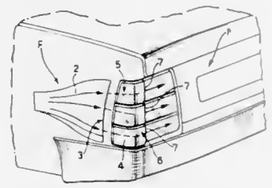
Int. Cl.[4] B62D *35/00*; **B60J** *1/00*

U.S. Cl. 296—180.1 **3 Claims**

1. A device for preventing, during travel, the deposition of dirt on a rear light unit of a motor vehicle situated generally in a corner position between a side panel and a rear panel of the body of the motor vehicle with a light transmitting portion of the unit extending along the side panel and the rear panel including:

an air intake recessed into a surface of the side panel adjacent the light unit and capable of inducing an air flow towards the light unit when the motor vehicle is moving; and

air flow directing means associated with the light unit and situated fluid-dynamically downstream of the air intake so as to direct the air flow in a manner to generate turbulence adjacent the light transmitting portion to prevent the deposition of dirt on the light unit;



wherein said air flow direction means includes at least one air passage extending through the light transmitting portion of said light unit extending along the rear panel.

4,838,604

OPEN-TOP VEHICLE BODY

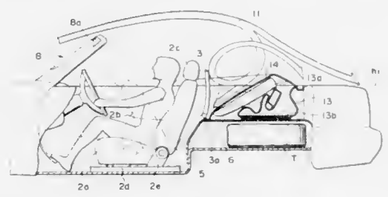
Yasuhisa Kochi, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 26, 1988, Ser. No. 148,548

Claims priority, application Japan, Jan. 28, 1987, 62-11769[U]

Int. Cl.[4] B62D *35/00*

U.S. Cl. 296—180.5 **31 Claims**



1. An open-top vehicle body comprising:

a front windshield,

a passenger compartment located behind said front windshield,

side walls defining opposite sides of said passenger compartment, said side walls each having an upper edge defining side belt lines,

a floor panel defining a bottom of said passenger compartment,

passenger seat members located in said passenger compartment,

a shield member located behind said seat members and extending in an upright position between said belt lines and from below said belt line to above said belt lines, said shield member extending in a transverse direction to the vehicle body and said shield member including a rigid panel member to prevent a swirling wind blast from flowing from behind said passenger compartment forwardly into said passenger compartment, and said shield member being swingably mounted on said floor panel by supporting means so that said shield member may swing forwardly from said upright position where said shield member projects from said floor panel to above said belt lines to block the wind blast into said passenger compartment to a retracted position where said shield member is retracted to below said belt lines to allow the wind blast to flow forward into said passenger compartment.

4,838,605

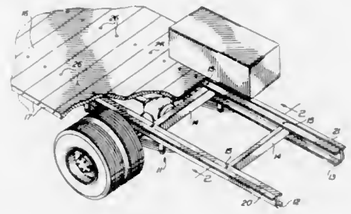
TRUCK BODY DECK MOUNT

John C. Abromavage, Tempe, Ariz., assignor to U-Haul International, Phoenix, Ariz.

Filed Apr. 11, 1988, Ser. No. 180,191

Int. Cl.[4] B62D *33/02*

U.S. Cl. 296—182 **2 Claims**



1. In an arrangement for mounting a truck body deck on the chassis of the truck wherein the chassis includes a pair of longitudinal frame members, said frame members being characterized by having C-shaped cross-sections disposed with the open regions facing each other and having protuberances on their upper surfaces, the combination with the chassis of an elongated angle member mounted on the outer face of each of said frame members, each angle member being substantially coextensive with that portion of its frame member which is disposed beneath the deck, each angle member having a vertical portion fastened to its respective frame member and a horizontal portion extending outwardly from its respective frame member, the horizontal portion of each angle member having its upper surface disposed at an elevation greater than the protuberances on said frame members, and transverse deck members overlying and secured directly to said angle members.

4,838,606

DOOR GUARD BAR

Tadashi Furubayashi, Yokohama; Kazuo Yamada, Zushi, and Hitoshi Fujitani, Yamato, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Yamato Kogyo Co., Ltd., Yamato, both of, Japan

Filed Aug. 31, 1987, Ser. No. 91,112

Claims priority, application Japan, Sep. 1, 1986, 61-205269

Int. Cl.[4] B60J *5/04*

U.S. Cl. 296—188 **23 Claims**

1. A vehicle door guard bar comprising:

a non-planar elongated main body portion having a first shorter side, a second shorter side opposite to said first shorter side and first and second elongated lateral edges extending between said first and second shorter sides;

a bent portion disposed along said first elongated lateral edge;

a substantially planar reinforcement portion joined via said bent portion to said elongated main body portion;

said elongated main body portion, said bent portion, and said reinforcement portion being formed out of a single plate;

said reinforcement portion contacting said elongated main body portion at a plurality of locations spaced from said bent portion thereby defining a plurality of tubular hollow spaces between the reinforcement portion and the elongated main body portion; and

said bent portion having a rounded cross-section.

4,838,607

ARRANGEMENTS FOR FORMING ROOF STRUCTURES OF VEHICLE BODIES

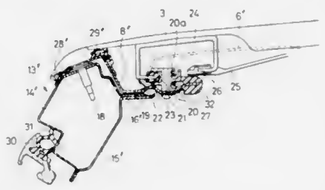
Takashi Mizuma, Hiroshima, and Koji Nakao, Higashihiroshima, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jun. 11, 1987, Ser. No. 60,401

Claims priority, application Japan, Jun. 16, 1986, 61/141014

Int. Cl.[4] B60J *7/06*

U.S. Cl. 296—219 **10 Claims**



1. An arrangement for forming a roof structure of a vehicle body comprising:

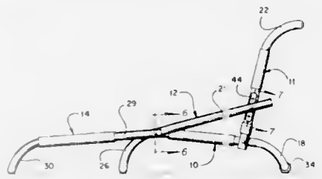
front and rear roof panel members disposed to face each other with an opening between and coupled with front and rear headers respectively to constitute front and rear frameworks,

a pair of roof rail members defining sides to said opening wherein one of said pair of roof rail members is disposed at a side of said front and rear roof panel members to extend in a direction of the length of the vehicle body and the other of said pair of roof rail members is disposed at an opposite side of said front and rear roof panel members to extend in a direction of the length of the vehicle body, each of said roof rail members comprising outer and inner rail panels connected with each other to form a closed cross section and a connecting flange portion which projects substantially horizontally toward the inside of the vehicle body and extends in the direction of the vehicle body to connect partially with an end portion of said front and rear roof panel members,

a frame member disposed to engage with said front and rear roof panel members and said roof rail members so as to surround said opening, said frame member having a pair of opposite outer portions extending along said roof rail members to be superposed on and connected to the outer rail panel of said roof rail members, a pair of opposite inner portions extending along said roof rail members on the inside of said outer portions wherein at least a part of each of said inner portions are to be superposed on and supported by the connecting flange portion of said roof rail members, a pair of guide rail members wherein one of said pair of guide rail members is provided on each of said pair of opposite inner portions interiorly of said connecting flange portion extending along said roof rail members, and a pair of opposite connecting portions provided between each of said outer and inner portions for interconnecting said outer and inner portions, each of said pair of connecting portions being spaced from the outer rail panel of each of said roof rail members, thus defining a double roof rail by said frame member at each of said roof rail members and

a foldable canvas top provided for covering the opening and accompanied with a plurality of sliding members engaging with said guide rail members.

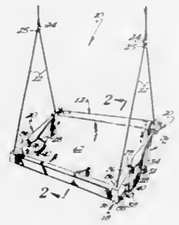
4,838,608
ADJUSTABLE BEACH CHAIR
Karen Hansen-Smith, 4456 Paces Battle Dr., Atlanta, Ga. 30327, and John E. Lewis, 808 Mill Pond Dr., Smyrna, Ga. 30080
Filed Apr. 19, 1988, Ser. No. 183,599
Int. Cl.[4] A47C *1/026, 5/10*
U.S. Cl. 297—27 6 Claims



1. In a beach chair, of the type having a tubular frame, with slings supported by said tubular frame for supporting a person thereon, said tubular frame comprising a seat member, a back rest extending generally upwardly from said seat member, and a support member fixed to said seat member and said back rest for selectively maintaining the relative positions of said seat member and said back rest, the improvement wherein said seat member includes a pair of generally parallel leg members, a first bent portion connects said leg members, said first bent portion curving out of the plane of said leg members for providing a rear support for said chair, and a seat sling extends between said leg members of said seat member, said back rest includes a pair of normally parallel leg members, each leg member of said pair of leg members of said back rest being pivotally fixed to one of said leg members of said pair of leg members of said seat member, a second bent portion like said first bent portion connects said pair of leg members of said back rest, and a back sling extends between said leg members of said back rest, said support member includes a pair of normally parallel leg members, a third bent portion like said first bent portion connects said leg members of said support member, said third bent portion curving out of the plane of said leg members of said support member for providing a front support for said chair, the extending ends of said leg members of said support member being selectively movable outwardly to be fixable to receiving means on said leg members of said back rest, said leg members of said support member being pivotally fixed to said leg members of said seat member adjacent to said third bent portion, the arrangement being such that said leg members of said back rest span said leg members of said seat member, and first pintle means fix said back rest to said seat member, and said leg members of said support member span said leg members of said back rest and said seat member, second pintle means pivotally fix said leg members of said support member to said leg members of said seat member, and third pintle means selectively fix said leg members of said support member to said back rest.

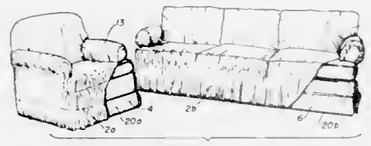
4,838,609
SWING COUCH
Daniel R. Christensen, 105 Walnut, Cleveland, Minn. 56017
Filed May 2, 1988, Ser. No. 189,383
Int. Cl.[4] A47D *13/10*
U.S. Cl. 297—277 19 Claims

1. Swing couch for sitting in by a user above a floor comprising, in combination: a generally rectangular frame including an upper horizontal cross beam, a lower horizontal cross beam, and first and second ends extending between the upper and lower horizontal cross beams; means for supporting the frame above the floor, with the user sitting on and being supported by the lower horizontal cross beam; a back support having a width generally equal to but of a size for receipt between the first and second ends of the frame, having a height less than the spacing between the upper and lower horizontal cross beams,



and having an upper edge and a lower edge; means for pivotally mounting the upper edge of the back support about an axis parallel to and adjacent the upper horizontal cross beam; and means extending between the back support and the ends of the frame adjustably supporting the lower edge of the back support relative to the frame.

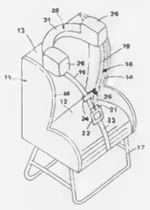
4,838,610
PROTECTIVE COVER DEVICES FOR UPHOLSTERED FURNITURE
Margy L. Perrin, 7507 San Carlos Dr., Ft. Pierce, Fla. 34951
Filed May 2, 1988, Ser. No. 188,846
Int. Cl.[4] A47C *27/00*
U.S. Cl. 297—225 6 Claims



1. A protective cover device for upholstered chairs, couches, divans and like upholstered furniture having arms, a back and at least one seat cushion which comprises:
- a fabric tub of size substantially larger than said piece of upholstered furniture to be protected thereby permitting said fabric tub to completely cover said piece of upholstered furniture while portions thereof can be tucked into spaces existing between said seat cushion and said arms and back to give the covered furniture a finished appearance,
- said fabric tub including dished portions that shape arm sections to cover said arms of said piece of upholstered furniture and a continuous integral peripheral bottom portion that defines a single opening thereinto,
- a hem continuously around said bottom portion,
- a drawstring carried in said hem and
- at least one opening in said hem through which said drawstring extends to permit said drawstring to be manipulated to tighten said bottom portion of said fabric tub against the base of said piece of upholstered furniture.

4,838,611
CAR SEAT PILLOW
Margie C. Talaugon, 615 Solano Ave., Sonoma, Calif. 95476
Filed May 5, 1988, Ser. No. 190,505
Int. Cl.[4] A47C *1/10;* B60R *22/28*
U.S. Cl. 297—391 15 Claims

1. In a pillow for supporting the head of a child in a car seat with shoulder straps for retaining the child in the seat: a pair, of side cushions engageable with opposite sides of the child's head, a neck cushion extending between the side cushions for engagement with the back of the child's neck, and tether straps on the under sides of the side cushions for engagement with the

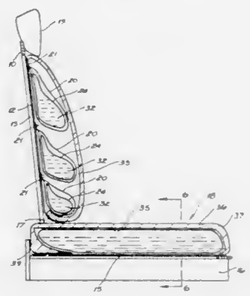


shoulder straps to mount the pillow on the shoulder straps in a generally semicircular position with the side cushions being positioned above the shoulder straps for supporting engagement with the sides of the child's head and the neck cushion being positioned toward the back of the car seat for engagement with the back of the child's neck.

4,838,612
OCCUPANT-ARISING ASSIST CHAIR
Michael G. Cross, Hornchurch, Great Britain, assignor to J. Cinnamon Limited, London, Great Britain
Filed Jul. 26, 1988, Ser. No. 225,082
Int. Cl.[4] A47C *1/02*
U.S. Cl. 297—338 6 Claims

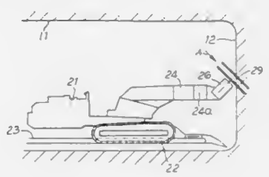
1. A chair comprising a frame and a seat, the seat being mounted for movement between a lowered position and a raised position, the lowered position being suitable for sitting, the chair comprising means for selectively urging the seat from the lowered position to the raised position to at least assist an occupant to rise from a sitting position to a substantially standing position, characterised in that the seat is mounted so that the front of the seat is made to rise as well as, but to a lower height than, the back of the seat when moving from the lowered position to the raised position, wherein the seat is mounted in the frame by a mechanism including pivotally-interconnected levers having lever arms engaging the frame and seat respectively, and the means for urging the seat includes a spring assembly for urging the lever arms apart, the spring assembly including a first transverse shaft extending from one of said lever arms, a second transverse shaft extending from the other of said lever arms, a helical torsion-spring surrounding the first shaft, the torsion-spring having first and second ends, the first end engaging the second shaft, the first shaft having a radially extending bracket and an adjustment screw connected between the bracket and a plate secured to the second end of the spring for adjustably pre-loading the spring so as to vary the force exerted on the seat by the spring, the force of the spring urging the seat toward the raised position and the chair including a releasable latch on the frame for engaging a part of said mechanism when the lever arms are pressed toward one another against the force of the spring to releasably hold the seat in the lowered position.

4,838,613
WATER CHAIR
Peter A. Smith, 593 Princes Highway, Rockdale, New South Wales 2216, Australia
Filed Mar. 1, 1988, Ser. No. 162,758
Claims priority, application Australia, Mar. 19, 1987, PI0956
Int. Cl.[4] A47C *7/02*
U.S. Cl. 297—452 13 Claims



1. A water chair comprising a frame having a seat portion and a backrest portion, a bag-like sling secured to the backrest portion, the sling being attached adjacent its upper edge to the backrest portion, a water impermeable bag located within and enveloped by the sling, the bag being partially filled with water and the space within the bag which is not occupied by water being substantially free of air whereby the bag and containing sling will function as a cushion which supports and adapts to the shape of a user of the chair, and the bag within the sling being secured to and suspended within the sling so that it does not collapse upon itself when partially filled with the water.

4,838,614
METHOD OF EXCAVATION AND APPARATUS THEREFOR
Sybil Pentith, and Gerald R. O. Pentith, both of Rotherham, United Kingdom, assignors to Dosco Overseas Engineering Limited, United Kingdom
Filed Jan. 22, 1988, Ser. No. 147,270
Claims priority, application United Kingdom, Jul. 8, 1987, 8716081
Int. Cl.[4] E21C *25/16*
U.S. Cl. 299—15 10 Claims



1. Apparatus for excavating a recess in a given direction in a face, comprising:
- a body having a longitudinal axis;
- an arm extending from the body in a forward direction so as to lie substantially along the axis of the given direction;
- a swivellably driven member operative for locating the arm

235-362 O.G.-89-10

in a multiplicity of angularly spaced positions around its axis;
transverse guide means mounted on the member;
support means drivably movable along the transverse guide means;
cutting means mounted on the support means;
means on the support means for advancing the cutting means relative thereto towards the face whereby the cutting means cuts into the face;
means between the transverse guide means and the cutting means for locating the cutting means to cut into the face at an acute angle thereto, whereby the support means may be driven along the transverse guide means to cut a transverse angled slot in the face; and
said member being swivellably adjustable for cutting a multiplicity of such angled slots through substantially 360°,
whereby said angled slots intersect to remove blocks of material from the face.

8. A method of excavating a recess in a given direction in a face comprising cutting a series of slots into the face, the slots being cut at an acute angle to said given direction, some of the slots intersecting with others of the slots, whereby blocks of material are separated from the face, and cutting each slot across an axis extending in said given direction and cutting said slots at angular spacings about said axis through substantially a complete circle.

4,838,615

APPARATUS FOR EXCAVATING A RECESS

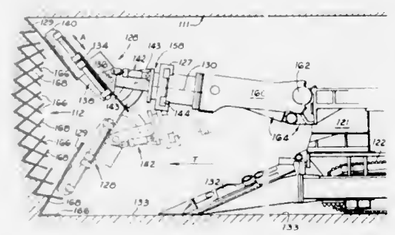
Gerald R. Oldham, Rotherdam, United Kingdom, assignor to Dosco Overseas Engineering Limited, United Kingdom

Filed Mar. 7, 1988, Ser. No. 165,148

Claims priority, application United Kingdom, Oct. 28, 1987, 8725285

Int. Cl.⁴ E21C *25/16, 35/08*

U.S. Cl. 299—73 **10 Claims**



1. Apparatus for excavating a recess in given direction in a face, the apparatus comprising:
cutting means for cutting a series of slots in the face at an acute angle to said given direction, some of the slots being inclined to and intersecting others of the slots whereby to separate blocks of materials from the face;
a body;
an arm extending from the body;
a support for the cutting means mounted on the arm and having first drive and guide means for guiding the cutting means in a slot-cutting action into the face;
second drive and guide means on the arm for moving the support to cause the cutting means to traverse the face so as to cut a slot across the face;
angle setting means mounted between the cutting means and said support for setting the cutting means to cut said slot at an acute angle to said given direction and said face; and
adjustment means for moving the support to cut a series of slots wherein some slots intersect other slots and are inclined thereto for separating blocks of material from the face; and
the adjustment means being operative to move the support so that the slots cut by the cutting means as the cutting means is traversed across the face by the second drive and guide means are generally parallel at the face.

4,838,616

MULTIPART RIM

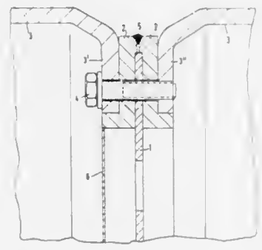
Adolf Koch, Waiblingen-Neustadt, Fed. Rep. of Germany, assignor to Sport-Service-Lorinser Sportliche Autoausrustung GmbH, Wiblingen, Fed. Rep. of Germany

Filed Mar. 2, 1988, Ser. No. 162,953

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1987, 3707514; Jun. 11, 1987, 3719453

Int. Cl.⁴ B60B *25/00*

U.S. Cl. 301—10 R **22 Claims**



1. A multipart tire time having an interior part of a rim for the mounting of the rim at an axle as well as having annular exterior parts that are arranged radially outwardly of the axle on both sides of said interior part of the rim and form a tire bed, wherein:
said interior part of the rim is made of titanium;
annular exterior rim parts are provided and connected with the interior part; and
wherein the exterior rim parts are made of softer light material that is easier to process than said titanium interior part.

4,838,617

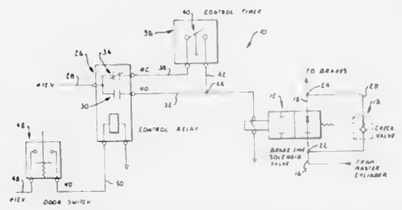
METHOD AND APPARATUS FOR BRAKE APPLICATION

Walter H. Deitchman, Shawnee Mission, and Gaylord R. Pearson, Kansas City, both of Kans., assignors to Pearson and Deitchman Research and Dev. Co., Inc., Shawnee Mission, Kans.

Continuation-in-part of Ser. No. 11,116, Feb. 5, 1987, abandoned. This application Feb. 22, 1988, Ser. No. 161,253

Int. Cl.⁴ B60T *13/00;* **B60K** *28/16;* **G05G** *1/14*

U.S. Cl. 303—6.1 **15 Claims**



1. Apparatus for preventing the release of a vehicle's brakes while a vehicle door is open and for preventing release of the brakes for a predetermined period of time after the door is closed, said apparatus comprising;

valve means coupled with the brakes and moveable between a first position preventing release of the brakes and a second position allowing release of the brakes;
positioning means coupled with the valve means for moving the valve means between the first position when the door is open and the second position when the door is closed; and
a timer coupled with the positioning means for delaying movement of the valve means to the second position until the predetermined period of time has elapsed after the door is closed, wherein the vehicle brakes are maintained in an applied condition for the predetermined period of time after the door is closed.

4,838,618

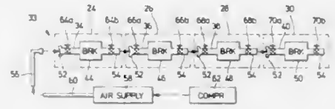
APPARATUS AND METHOD FOR CHARGING BRAKE LINES OF RAILWAY VEHICLES

Howard A. Blackmon, Jr., 7713 Crestland La., Knoxville, Tenn. 36938

Filed Aug. 19, 1988, Ser. No. 235,043

Int. Cl.⁴ B60T *11/26, 17/06*

U.S. Cl. 303—66 **18 Claims**



1. A method for charging the brake lines of a train of railway vehicles having an air-actuated braking system during the voluming-up phase of a charging operation, said method including the steps of:
providing a source of compressed air at relatively high pressure;
directing a flow of the compressed air from the source toward the brake line of a first of the railway vehicles;
amplifying the volume of air directed toward the brake line by utilizing the flow of compressed air to draw air external to the source toward the brake line with the flow of compressed air to thereby produce an amplified flow; and
routing the amplified flow of air to the brake line of the first railway vehicle.

4,838,619

HYDRAULIC BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES

Norbert Ocvirk, Offenbach, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

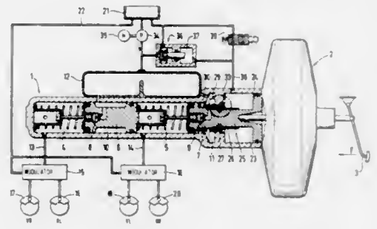
Continuation of Ser. No. 10,987, Feb. 5, 1987, abandoned. This application Apr. 19, 1988, Ser. No. 185,247

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1986, 3603697

Int. Cl.⁴ B60T *8/44, 15/36*

U.S. Cl. 303—114 **9 Claims**

1. A hydraulic brake system for automotive vehicles, comprising a master brake cylinder including a supply chamber connectible to a non-pressurized reservoir, and a working chamber connected to which is a brake line leading to pressure control valves of a brake slip control device, coupled to which is at least one wheel brake; wherein upon commencement of the operation of the brake slip control device, pressure fluid from a pressure fluid source is admitted to the supply chamber of the master brake cylinder, said pressure fluid source comprising a pump having a pump drive which is controllable by the brake slip control device, with an outlet pressure of said pressure fluid source on the master brake cylinder being controllable by a pressure control valve operated by a fluid pressure in response to an actuating force exerted on the master brake cylinder, said pressure control valve being so configured that braking pressure is produced in a proportionality to a brake pedal actuating force which is the same as that of a braking pressure produced by the master brake cylinder when brake slip control is inoperative; wherein the pressure control valve provided between a pump outlet and the non-pressurized reservoir is a throttle valve having a first control piston to which, in an opening direction, is applied the pump outlet pressure and, in a closing direction, is applied a fluid pressure from a control device transferring the actuating force; wherein



the control device comprises a control chamber disposed at an inlet of the master brake cylinder and a second control piston movable into the control chamber and operatively connected to a pedal side of a master cylinder piston; and wherein the control chamber is in communication with the pressure control valve via a pressure fluid passage and, by way of a valve passage blockable during driving of the pressure fluid source, is in communication with the non-pressurized reservoir, said valve passage being closed by an electromagnetically actuated shut-off valve which is controlled by said brake slip control device.

4,838,620

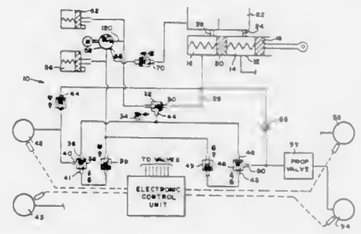
TRACTION SYSTEM UTILIZING PUMP BACK BASED ABS SYSTEM

James M. Sypniewski, Granger, Ind., assignor to Allied-Signal Inc., Morristown, N.J.

Filed May 18, 1987, Ser. No. 50,654

Int. Cl.⁴ B60T *8/40, 13/70*

U.S. Cl. 303—116 **10 Claims**



1. In a wheel slip control system comprising speed sensor means operatively connected to the wheels of a vehicle for generating a signal as a function of the rotation thereof, control means responsive to the rotational behavior of the wheels for generating control signals in response to wheel slip, means including a master cylinder and at least one wheel brake cylinder for applying braking force to said wheels, brake pressure modulating means for automatically modulating the application of braking force to said wheels in response to said control signals, the improvement wherein said modulator means includes pump means operable in a first state to pump braking fluid from a first source and operable in a second state to draw and pump fluid from a second source, first valve means operable in response to a traction control signal for blocking com-

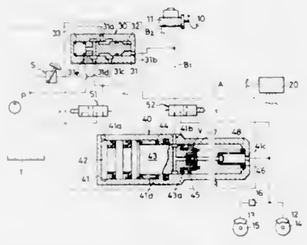
munication from said wheel cylinder to said master cylinder and providing communication therebetween in the absence of said traction control signal, and second valve means for connecting said pump means to said second source in response to said traction control signal and blocking communication therebetween in the absence of said traction control signal.

4,838,621

ANTI-SKID APPARATUS FOR AN AUTOMOTIVE VEHICLE

Youichi Furuta, Chiryu; Masamoto Ando, Toyota; Hiroaki Takeuchi, Toyota; Noboru Noguchi, Toyota, and Nobuyasu Nakanishi, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Feb. 25, 1988, Ser. No. 160,339
Claims priority, application Japan, Feb. 27, 1987, 62-46205
Int. Cl.[4] B60T *8/02*
U.S. Cl. 303—115 **13 Claims**



1. An anti-skid apparatus for an automotive vehicle for installation in a vehicle braking system between a master cylinder and a wheel brake cylinder, comprising:

a regulator valve for producing a hydraulic power pressure in accordance with a hydraulic braking pressure from said master cylinder;

a control cylinder disposed in a hydraulic circuit connecting said master cylinder to said wheel brake cylinder, said control cylinder including a cylinder body having a cylinder bore defined therein, a piston axially slidably disposed within said cylinder bore, said piston forming at one end thereof with said cylinder bore a pressure chamber communicating with said wheel brake cylinder, the volume of said pressure chamber being maximum at the initial position of said piston, and said piston being applied at the other end thereof with said hydraulic power pressure from said regulator valve, biasing means for biasing said piston toward said initial position and a normally open cutoff valve arranged to normally permit the flow of said hydraulic braking pressure from said master cylinder into said pressure chamber and to block said flow of said hydraulic braking pressure when said piston moves against said biasing means to an extent more than a predetermined distance from said initial position for decreasing the volume of said pressure chamber thereby to increase the hydraulic pressure in said pressure chamber to a level higher than the hydraulic braking pressure from said master cylinder; and

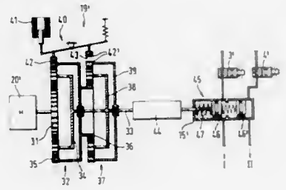
a changeover valve disposed in a hydraulic circuit connecting said regulator valve to said control cylinder and selectively placed in one of a first operating position for applying said hydraulic power pressure to said piston of said control cylinder, and a second operating position for discharging said hydraulic power pressure from said control cylinder.

4,838,622

BRAKE SYSTEM WITH ANTI-LOCK CONTROL AND/OR TRACTION SLIP CONTROL AS WELL AS BRAKING PRESSURE MODULATOR FOR SUCH A BRAKE SYSTEM

Dieter Kircher, Frankfurt am Main; Hubertus von Gruenberg, Bad Homburg, and Klaus-Dieter Blum, Kelkheim, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 17, 1988, Ser. No. 194,790
Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717238; May 22, 1987, 3717237; May 22, 1987, 3717236
Int. Cl.[4] B60T *8/42, 13/68;* **F16H** *3/44*
U.S. Cl. 303—115 **5 Claims**



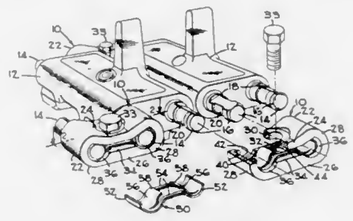
1. An anti-lock brake system for a vehicle having individual wheel brakes at each of a plurality of wheels, said system comprising pedal operated master cylinder means, a braking pressure modulator hydraulically connected to said master cylinder means by first conduit means and to said individual wheel brakes by second conduit means including individual branch conduits respectively connected to the individual brakes, sensors associated with each of said wheels for generating a first signal upon the sensing of an impending locking of the wheel, control means including a processor for generating a first braking pressure control signal in response to a first signal generated by any one of said sensors, first normally open valve means in said first conduit means and second normally open valve means in each of said individual branch conduits, said first and second valve means each being independently shiftable to a closed position in response to a control signal from said control means, said modulator including spring biased plunger piston means for modulating the pressure applied to said wheel brakes, rotatable drive means including a motor means and normally disengaged clutch means operable when engaged to couple said drive means to said plunger piston means to axially displace said plunger piston means to modulate the pressure applied to any wheel brake in fluid communication with said modulator via its associated second valve means, said clutch means including a normally disengaged first clutch means operable when engaged to couple said drive means to said plunger piston means to displace said plunger piston means in one direction in response to a first signal and second clutch means engageable in response to a second signal to cause said drive means to displace said plunger piston means in opposite direction, said control means being operable in response to a first signal from the sensor at one of said wheels to (1) shift the appropriate first and second valve means to isolate all wheel brakes other than the wheel brake of said one of said wheels from said modulator, (2) isolate said modulator from said master cylinder means, (3) engage said clutch means until the pressure applied to the brake of said one wheel has been changed by an amount predetermined by said processor, and (4) shifting all of the second valve means to maintain the predetermined pressure applied to the last mentioned brake and reconnecting the brakes of the remaining wheels to said modulator to enable said control system to respond to a first signal from a sensor at another of said wheels.

4,838,623

CONNECTOR WITH SPRING RETENTION DEVICE

Michael V. Mineart, Livermore, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Sep. 24, 1987, Ser. No. 100,645
Int. Cl.[4] B62D *55/20*
U.S. Cl. 305—58 PC **2 Claims**



1. A track shoe end connector comprising:

means defining a body having a first wall spaced from a second wall and integrally connected together by end walls with said first and second walls having aligned fastener openings therein;

means defining end openings in said end walls including arcuate portions for accommodating end portions of connector pins;

means defining an arcuate slot within each end opening means and having a radius larger than that of said associated end opening means;

resilient locking means formed from flat spring material having a fastener opening therein and including interconnected resilient arcuate sections received within said arcuate slots and further having resilient arcuate locking portions stressed to move radially inward of said arcuate slots when in locking position; and

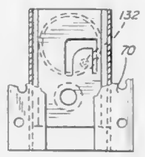
fastener means removably received in said fastener openings in said first wall, said second wall, and said resilient locking means for maintaining said locking means within said body, said resilient locking means being resiliently retained within said body when said fastener means is removed from said body.

4,838,624

FURNITURE ANTI-TIP AND LOCK MECHANISM

Gregg W. Walla, Lake Bluff, Ill., assignor to Timerline Supply, Lake Bluff, Ill.

Filed Feb. 3, 1988, Ser. No. 151,823
Int. Cl.[4] E05C *7/06*
U.S. Cl. 312—221 **13 Claims**



1. An actuator assembly comprising:

a slide plate having an L-shaped slot with first and second interconnecting legs;

channel means for guiding movement of the slide plate in a reciprocating path between a locked position and an unlocked position;

means for connecting the slide plate to a locking member so that the locking member can follow reciprocating movement of the slide plate;

a crank for rotation about an axis with an associated pin offset from said axis;

means mounting the crank to the channel means so that the crank is rotatable back and forth about the axis through a predetermined range with the pin in the slot to thereby cause the pin to engage and shift the slide plate between its locked position and its unlocked position as the crank is rotated;

said pin residing in the slot in a first position in alignment with both the first and second legs with the slide plate in an unlocked position and movable upon rotation of the crank in a first direction to a second position in one of the first and second legs out of alignment with the other of the legs with the slide plate in a locked position; and

cooperating means on the crank and slide plate for permitting rotation of the crank relative to the slide plate in the first direction with the pin in a third position in which the pin is in the other slot leg and out of alignment with the one leg and the slide plate in the locked position sufficiently to situate the pin in the second position to thereby prevent jamming of the crank with the pin in said third position.

4,838,625

ROTARY CLOSET WARDROBE

William D. Taylor, 5448 Encina Dr., San Diego, Calif. 92114

Filed Aug. 8, 1988, Ser. No. 229,718
Int. Cl.[4] A47B *49/00*
U.S. Cl. 312—252 **1 Claim**

1. A wardrobe structure rotatable in the horizontal plane around a vertical support column extending from floor to ceiling in a clothes closet wherein the improvement comprises:

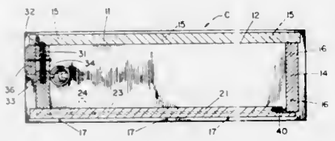
a. the top section of the rotatable wardrobe structure having three vertical rows of pie shaped drawer enclosures extending radialy from the vertical support column;

b. immediately below the drawer enclosure structure a horizontal clothes hanger support bar rotatably supported by a bearing on the vertical column;

c. a clothes hanger rod in the shape of a horizontal ellipse suspended beneath the clothes hanger support rod;

d. two vertical circular rows of pie shaped bins extending radialy from the vertical support column rotatably mounted on the vertical column on the floor beneath the wardrobe structure.

4,838,626
SECURITY CONTAINER
Ken D. Parr, 5400 Mimosa La., Richmond, Tex. 77469
Filed Jun. 10, 1988, Ser. No. 204,760
Int. Cl.[4] A47B 63/00
U.S. Cl. 312—333 17 Claims

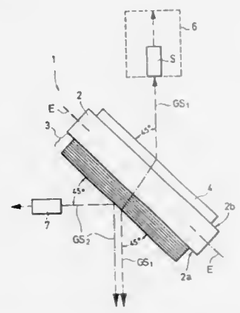


1. An improved security container comprising a housing and a drawer disposed therein, said drawer being forwardly movable from a recessed position within said housing, in which any contents of said drawer are inaccessible, to an extended position in which the contents of said drawer are accessible, wherein said improvement comprises:
latch means carried by said drawer and said housing and operable externally thereof to release said drawer for movement from said recessed position to said extended position, operation of said latch means first requiring limited rearward movement of said drawer; and
blocking means carried by said housing for preventing said limited rearward movement of said drawer and operation of said latch means and release of said drawer unless said blocking means is properly positioned, said blocking means comprising at least one rotating member carried by said housing and engageable with said drawer preventing said rearward movement thereof, said rotating member being rotatable to a predetermined position which allows said rearward movement of said drawer and operation of said latch means for said release of said drawer.

4,838,627
DRAWER MOUNTING MEANS
Jorge Macias, West Covina, Calif., assignor to Russ Bassett Company, Whittier, Calif.
Filed Feb. 22, 1988, Ser. No. 158,533
Int. Cl.[4] A47B 88/00
U.S. Cl. 312—341 R 2 Claims

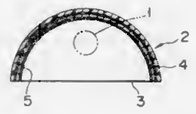
1. Means for mounting a cabinet drawer to a slide assembly having a first slide part for securement to the cabinet, a second intermediate slide part, and a third slide part with a side panel having an opening therein and an elongated rail mounted on an edge of said side panel, said slide arts being selectively extendibly related to each other, comprising:
the drawer has first and second side walls each of which side walls includes a metal sheet with an upper edge formed into a flange of generally U-shaped cross-section defining a guideway of such dimensions as to enable sliding receipt of the third slide part rail therewithin;
an opening formed in the drawer flange;
a portion of the third slide part rail extending into the flange guideway for lockingly engaging within the flange opening; and
a portion of the drawer side wall being formed into a lance bent away from said side wall for being lockingly engaged within the opening in the side panel of the third slide part when the second slide part is in the guideway and engaging the portion of the third slide part rail extending into the flange guideway.

4,838,628
PROCESS AND APPARATUS FOR PRODUCTION OF AN OPTICAL ELEMENT
Werner Lobsiger, Hanau am Main, and Hans-Georg Lotz, Erlensee, both of Fed. Rep. of Germany, assignors to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany
Filed Jul. 3, 1986, Ser. No. 881,642
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1985, 3543812
Int. Cl.[4] G02B 5/28, 27/14
U.S. Cl. 350—1.6 7 Claims



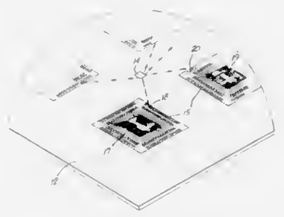
1. An optical system including an optical element having a reflective property relative to a wavelength λ_K of incident light in a range of the visible spectrum and having a transmissive property relative to a wavelength λ_L in the range of infrared radiation comprising:
(a) a beam path for radiation having a wavelength λ_K in the range of 400 to 800 nm;
(b) a beam path for radiation having a wavelength λ_L in the range of 2,000 to 20,000 nm;
(c) a planar substrate having a first side, a second side and a linear axis, said planar substrate positioned in said first and second beam paths to transmit the wavelength λ_L through the substrate; and
(d) a plurality of dielectric layers attached to the first side of said substrate and having an alternating arrangement of the layers, such that a layer having a high refraction index is positioned adjacent a layer having a lower refraction index, each of said dielectric layers having an optical thickness less than the wavelength λ_L and about the wavelength λ_K such that the plurality of dielectric layers reflects the wavelength λ_K, and said plurality of dielectric layers provides an antireflection layer for the wavelength λ_L.

4,838,629
REFLECTOR
Tatsuo Maruyama, and Nobuo Matsushita, both of Yokohama, Japan, assignors to Toshiba Electric Equipment Corporation, Tokyo, Japan
Filed Mar. 29, 1988, Ser. No. 174,954
Claims priority, application Japan, Mar. 30, 1987, 62-76837; Sep. 30, 1987, 62-246644
Int. Cl.[4] G02B 5/28
U.S. Cl. 350—1.6 2 Claims



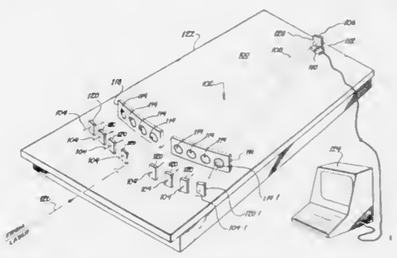
1. A reflector for reflecting light emitted from a light source, comprising:
a body made of a material selected from the group consisting of a polyimide-based resin and a polyether ketone-based resin, and having a thickness falling within a range of 50 μm to 300 μm; and;
a reflection film deposited on said body to allow infrared rays to pass and reflect visible light, said film formed by alternately stacking a plurality of layers having high refractive indeces and a plurality of layers having low refractive indeces.

4,838,630
HOLOGRAPHIC PLANAR OPTICAL INTERCONNECT
Tomasz P. Jannson; Joanna L. Jannson, and Peter C. Yeung, all of Redondo Beach, Calif., assignors to Physical Optics Corporation, Torrance, Calif.
Filed Dec. 21, 1987, Ser. No. 135,706
Int. Cl.[4] G02B 5/32, 6/26, 6/32
U.S. Cl. 350—3.7 19 Claims



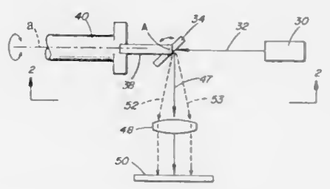
1. An optical interconnect comprising
a planar optical path for planar light waves, having input and output portions, and
a planar volume Bragg hologram disposed in the planar optical path, the Bragg hologram comprising Bragg surfaces which diffract the planar light waves from the input portion to the output portion.

4,838,631
LASER BEAM DIRECTING SYSTEM
Tushar S. Chande, Schenectady; Marshall G. Jones, Scotia; Angel L. Ortiz, Jr., Ballston Lake, and John L. August, Jr., Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Dec. 22, 1986, Ser. No. 944,771
Int. Cl.[4] G02B 5/172
U.S. Cl. 350—6.6 53 Claims



1. Apparatus for directing a beam of light into one of a plurality of optical fibers, comprising:
a lens for focusing said light beam;
means for supporting a group of said optical fibers with the tips thereof positioned proximate a focal point of said lens;
reflector means for directing said light beam through said lens to selectively focus said light beam separately onto each one of said fiber tips; and
said lens being the onlylens provided for the purpose of focusing said light beam onto each of said fiber tips.

4,838,632
TWO-DIMENSIONAL BEAM SCANNER
Bala S. Manian, Saratoga, Calif., assignor to Lumisys Inc., Sunnyvale, Calif.
Filed May 6, 1988, Ser. No. 191,004
Int. Cl.[4] G02B 27/17
U.S. Cl. 350—6.91 11 Claims



1. A beam scanning system comprising:
a beam source for emitting an incident beam along an axis,
means in the path of said incident beam axis for reflecting said incident beam,
means supporting said reflecting means for pivoting said reflecting means about a pivot axis, said pivot axis being perpendicular to said incident beam axis, and
means for pivoting said reflecting means about a rotational axis coinciding with the incident beam axis, the reflected beam intercepting an image plane parallel to the incident beam axis.

4,838,633

SEMICONDUCTOR DEVICE WITH HIGH SPEED SIGNAL TRANSMISSION ARRANGEMENT UTILIZING LIGHT

Toshio Katsuyama, Hachioji, and Hiroyoshi Matsumura, Iruma, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 10, 1986, Ser. No. 827,611
Claims priority, application Japan, Mar. 18, 1985, 60-52214
Int. Cl.[4] G02B 6/12; H01L 31/16
U.S. Cl. 350—96.11 24 Claims

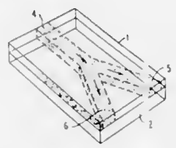
1. A semiconductor electronic circuit apparatus comprising:
a first integrated electronic circuit;
a first means for transmitting a light, wherein said first means is capable of transmitting light of at least one predetermined wavelength from a predetermined plurality of different wavelengths and is coupled to said first integrated circuit;
a second means for receiving the light transmitted from said first means for transmitting, wherein said second means for receiving includes means for selectively receiving light of said at least one predetermined wavelength;
a second integrated electronic circuit coupled to said second means for receiving; and
a third means for guiding the light from said first means for transmitting to said second means for receiving, wherein said third means is capable of transmitting the predetermined plurality of different wavelengths of said light,
whereby the transmission of a signal from the first integrated electronic circuit to the second integrated electronic circuit does not suffer from crosstalk from transmission of signals between other integrated electronic circuits coupled to said third means.

4,838,634

ORGANIC OPTICAL WAVEGUIDES AND METHOD OF FABRICATING WAVEGUIDE STRUCTURES

Ian Bennion, Ravensthorpe, United Kingdom; Clive Trundle, Silverstone, England; Jack Brettle, Towcester, England; Martin J. Goodwin, Northampton, Great Britain, and Robert Glenn, Kingsthorpe, England, assignors to The Plessey Company plc, United Kingdom

PCT No. PCT/GB87/00275, § 371 Date Dec. 28, 1987, § 102(e) Date Dec. 28, 1987, PCT Pub. No. WO87/06715, PCT Pub. Date Nov. 5, 1987
PCT Filed Apr. 24, 1987, Ser. No. 141,665
Claims priority, application United Kingdom, Apr. 25, 1986, 86/10227
Int. Cl.[4] G02B 6/10
U.S. Cl. 350—96.12 19 Claims



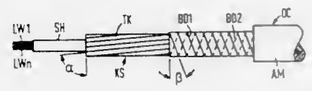
1. An organic channel waveguide which comprises a transparent, cured polymer substrate having surface portions defining one or more channels in a surface layer thereof, said one or more channels having a higher refractive index than that of the bulk polymer substrate and being formed by diffusing an organic dopant into predetermined areas of said surface layer, said organic dopant having intrinsically non-linear optical properties.

4,838,635

METAL-FREE, SELF-SUPPORTING OPTICAL CABLE

Ulrich Oestreich, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 24, 1988, Ser. No. 261,490
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1987, 3736529
Int. Cl.[4] G02B 6/44; H02G 3/00
U.S. Cl. 350—96.23 14 Claims



1. In a metal-free, self-supporting optical cable for use as an overhead cable in the field region between phase cables of a high voltage aerial line, said optical cable being composed of a cable core being slightly electrically conductive and being surrounded by a carrier member in the form of at least one ply of high-strength filament materials to form a carrier element and surrounded by a cable cladding, the improvements comprising the filament material being held together by an armoring layer firmly applied onto the outside of said filament material, said armoring layer being composed of a material having electrical properties that are at least similar to those of the filament material and being applied with a shorter length of lay than the length of lay of the filament material.

4,838,636

OPTICAL STAR COUPLER

Lothar Mannschke, Eckental-Eckenhaid, Fed. Rep. of Germany, assignor to U.S. Philips Corp., New York, N.Y.

Filed Oct. 5, 1987, Ser. No. 105,052
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1986, 3634064
Int. Cl.[4] G02B 6/28
U.S. Cl. 350—96.16 10 Claims

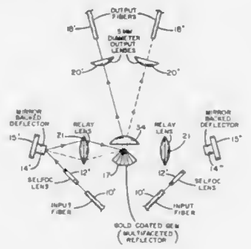
1. An optical star coupler comprising at least two cascaded three-ports, each three-port being formed by branching side channel branch circuits into a mixer zone comprising a continuous, central channel comprising a tapered region at the branch point,
wherein the branch angle between the side channels and the center channel is greater than or equal to 2.5° and the tapered region is reduced.

4,838,637

INTEGRATED SOLID STATE NON-VOLATILE FIBER OPTIC SWITCHBOARD

Ernest J. Torok, Minneapolis; John A. Krawczak, Minnetonka; Bernard S. Fritz, Eagan, and William A. Harvey, St. Paul, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed May 4, 1987, Ser. No. 45,481
Int. Cl.[4] G02B 6/32
U.S. Cl. 350—96.18 21 Claims



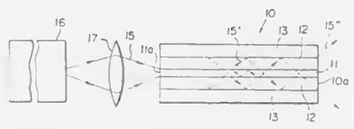
1. A fiber-optic switchboard comprising of n input optical fibers, n input lenses, n relay lenses, n deflector means, m output optical fibers, m output lenses, and a multifaceted reflector means with n facets wherein n and m are positive integers of two or more, positioned and constructed such that:
each of said input optical fibers is associated with one of said input lens, one of said deflector means, one of said relay lens and one of said facets of said reflector means;
each of said output optical fibers is associated with one of said output lens;
each of said input optical fibers is imaged by an associated one of said input lens onto the surface of an associated one of said deflector means;
each of said deflector means is imaged by an associated one of said relay lenses onto an associated one of said facets on the reflector means;
each output lens images all of said facets of said reflector means onto an associated one of said output optical fibers, and
each of said light deflector means is capable of steering light impinging on it to any one of said output lenses.

4,838,638

OPTICAL WAVELENGTH CONVERSION DEVICE

Kozi Kamiyama, and Yoji Okazeki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 16, 1988, Ser. No. 156,517
Claims priority, application Japan, Feb. 16, 1987, 62-32914
Int. Cl.[4] G02B 6/34
U.S. Cl. 350—96.19 4 Claims



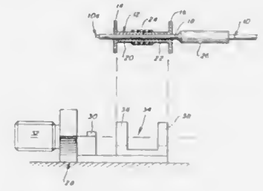
1. An optical wavelength conversion device composed of an organic nonlinear optical material, and a first cladding layer disposed outside the nonlinear optical material and having a refractive index lower than the refractive index of the organic nonlinear optical material and covering the organic nonlinear optical material, thereby to convert a fundamental wave entering the optical wavelength conversion device to a second harmonic, to guide the second harmonic through the first cladding layer, and to radiate the second harmonic,
wherein the improvement comprises a second cladding layer formed of a material having a refractive index lower than the refractive index of said first cladding layer, said second cladding layer being formed outside said first cladding layer,
wherein the refractive index n_2^{ω} of said first cladding layer with respect to said fundamental wave and the refractive index $n_3^{2\omega}$ of said second cladding layer with respect to said second harmonic satisfy the relationship expressed as $n_2^{\omega} < n_3^{2\omega}$.

4,838,639

METHOD AND APPARATUS FOR ORIENTING A FIBER OPTIC MEMBER

Sudhakar D. Morankar, Glenview; Hermando Esguerra, Streamwood; Patrice Kerevel, Downers Grove, and Michael J. Hilgart, Westmont, all of Ill., assignors to Dukane Corporation, St. Charles, Ill.

Filed Nov. 2, 1987, Ser. No. 115,860
Int. Cl.[4] G02B 6/42
U.S. Cl. 350—96.20 25 Claims



14. A laser diode package which comprises a frame which carries a light emitting diode, a frame assembly as an integral part of said frame which comprises a U-shaped retainer means; tubular means having a bore proportioned to slidingly receive a fiber optic member, said tubular means carrying outwardly projecting flange means, said U-shaped retainer means being proportioned to loosely receive said tubular means with the flange means being in essential contact with said retainer means to prevent relative longitudinal motion between said tubular means and retainer means, said tubular means carrying at least a pair of said projecting flange means which are in essential contact with said retainer means, whereby said fiber optic member may be moved with four degrees of freedom while within said tubular means to occupy its desired position, to then be affixed there by securing the fiber optic member to the tubular means and the flange means to the retainer means.

4,838,640

FIBER OPTIC IN-LINE SPLICE CASE ASSEMBLY

John J. Anderton, Oil City, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Dec. 19, 1983, Ser. No. 562,926
Int. Cl.[4] G02B 7/26
U.S. Cl. 350—96.20 2 Claims

1. A fiber optic in-line splicer case assembly comprising: a pair of end plugs exhibing axial apertures for mating optic fibers and associated fiber wands, torque bars rigidly joining said end plugs, at least one resilient clip rotatably attached to one of the torque bars at a point intermediate the end plugs, said clip for securing a fiber optic splice, a substantially cylindrical housing for surrounding said end plugs, said torque bars and said clip; said housing including threaded portions at opposite ends of interior surface, and a pair of end caps, each exhibiting a threaded portion whereby the end caps are to be threaded into the opposite ends of the housing, said end plugs

exhibiting surfaces complementary to an interior surface of the housing and flat surfaces to which said torque bars are attached, each of said end plugs having an axially extending

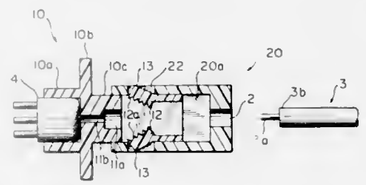
aperture for a glass fiber and each of said end plugs further having a threaded bore extending from a rounded surface of the end plug toward its interior for the insertion of a fastener for the fiber wand.

4,838,641

OPTICAL FIBER CONNECTOR

Yoshitaka Morimoto, and Hideya Tabe, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Oct. 8, 1985, Ser. No. 785,537
Claims priority, application Japan, Oct. 8, 1984, 59-210699
Int. Cl.⁴ G02B *6/33*
U.S. Cl. 350—96.21 **12 Claims**



1. An optical fiber connector comprising:

(a) an internal member having at least one operating for receiving a sheathed optical fiber,

(b) cantilevers formed on said internal member, said cantilevers having outwardly protruding projections protruding outward from said internal member and inwardly protruding projections protruding into an internal portion of said internal member for engagement with the sheathed optical fiber; and

(c) an external member having a first opening for receiving said internal member and having a second operating for receiving at least the optical fiber, said external member further having recesses formed on a portion thereof for engaging the projections protruding outward from said cantilevers, said portion comprising a rigid non-cantilevered part of a wall of said external member; and

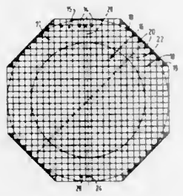
said external member slidable over said outwardly protruding projections without relative rotation of said internal and external members and said outwardly protruding projections slidable along said rigid, non-cantilevered part of said wall for biasing said cantilevers inwardly against the rigid non-cantilevered part of said wall thereby forcing said inwardly protruding projections into engagement with said sheathed optical fiber.

4,838,642

FIBRE PLATES HAVING CODING FIBRES

Augustinus C. G. De Jong, and Antonie Schrederhof, both of Eindhoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 53,769, May 22, 1987, abandoned. This application Nov. 14, 1988, Ser. No. 273,732
Claims priority, application Netherlands, May 23, 1986, 8601317
Int. Cl.⁴ G02B *6/08*
U.S. Cl. 350—96.27 **7 Claims**



1. An improved fibre plate comprising a stack of rows of bundles of glass fibres, such fibre bundles ending in a face of said plate and having a first kind of light transmission characteristic, the face of said place having an image forming area surrounded by a peripheral area and being symmetrical about an axis of symmetry; such improvement being characterized in that said plate further comprises:

a number of auxiliary bundles of glass fibres ending in the peripheral area of the face of said plate in predetermined positions relative to said axis of symmetry thereof, such positions of the ends of at least some of such auxiliary bundles being in accordance with a code identifying said plate;

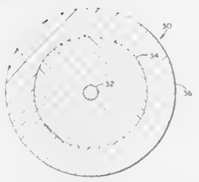
such auxiliary bundles having a second kind of light transmission characteristic defining from said first kind of light transmission characteristic.

4,838,643

SINGLE MODE BEND INSENSITIVE FIBER FOR USE IN FIBER OPTIC GUIDANCE APPLICATIONS

Leslie B. Hodges; Roger Charlton, both of Roanoke, and James H. Bowen, Salem, all of Va., assignors to Alcatel NA, Inc., Claremont, N.C.

Filed Mar. 23, 1988, Ser. No. 171,979
Int. Cl.⁴ G02B *6/22*
U.S. Cl. 350—96.33 **18 Claims**



1. A single mode optical fiber, comprising:

an inner core region having a refractive index n_c and a maximum radius r_c;

a first inner cladding surrounding said inner core region and having a refractive index n_1 and a maximum radius r_1; and

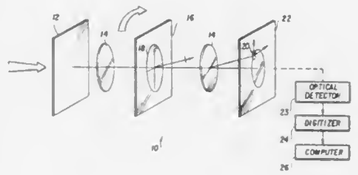
a second outer cladding surrounding said first inner cladding having a refractive index n_2, wherein the refractive indices have the following relationship:$n_1<n_2<n_c$ and the ratio r_1:4_c is not less than 6.5:1.0.

4,838,644

POSITION, ROTATION, AND INTENSITY INVARIANT RECOGNIZING METHOD

Ellen Ochoa, Pleasanton; George F. Schils, San Ramon, and Donald W. Sweeney, Alamo, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 15, 1987, Ser. No. 96,434
Int. Cl.⁴ G02B *27/46;* **G06G** *9/00;* **G06K** *9/76, 9/36*
U.S. Cl. 350—162.13 **6 Claims**



1. A method of recognizing the presence of a particular target in a field of view which is target position, rotation, and intensity invariant, comprising the steps of:

preparing a target-specific filter, which is invariant to geometric distortions in target pattern due to changes in position in the field of view, rotation and intensity, from a combination of all eigen-modes of a pattern of the particular target;

imaging coherent radiation from the field of view into an optical correlator;

rotating said filter in the frequency plane of an optical correlator in order to produce a constant-amplitude rotational response in a correlation output plane when the particular target is present in the field of view; and

detecting any constant amplitude response in the output plane to determine whether a particular target is present in the field of view, wherein said detecting step includes the steps of

imaging a temporal pattern in the output plane with an optical detector having a plurality of pixels, said imaging occuring at a plurality of different arbitrary angles of rotation of the filter with angular separation sufficient to decorrelate successive frames, and

determining a correlation coefficient for each pixel where a correlation coefficient of unity indicates the presence of a temporal signature of the particular target, wherein said step of determining a correlation coefficient includes the steps of accumulating the intensity and intensity-squared of each pixel such that the correlation coefficient is calculated from

$$(1/N)\,\Sigma_k I_k / \sqrt{(1/N)\,\Sigma_k I_k{}^2}$$

where

I_k=intensity value at each pixel k, and

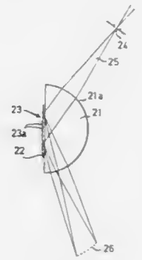
N=number of summations.

4,838,645

REFLECTING DIFFRACTION GRATING

Meinrad Mächler, Ellwangen; Reinhold Bittner, Mögglingen; Richard Sachse, Königsbronn, and Harry Schlemmer, Aalen, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Aug. 12, 1986, Ser. No. 896,134
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1985, 3528947
Int. Cl.⁴ G02B *5/18, 6/34*
U.S. Cl. 350—162.23 **16 Claims**



1. An optical device comprising:

an optically transparent body having an index of refraction n and defining a surface;

diffraction means disposed on said surface and including a plurality of grooves having respective flanks so as to cause said surface to be a blazed surface; and,

light directing means for directing a bundle of light rays through said optically transparent body onto said flanks so as to cause the same to strike said flanks at an angle $(\alpha+\rho_B)$ greater than the critical angle

$$\phi_T=\arcsin(1/n)$$

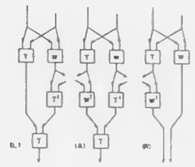
whereby said rays are totally reflected from said flanks.

4,838,646

OPTICAL ARITHMETIC LOGIC USING THE MODIFIED SIGNED-DIGIT REDUNDANT NUMBER REPRESENTATION

Mark E. Lasher; Richard P. Bocker; Barry L. Drake, and Thomas B. Henderson, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 29, 1986, Ser. No. 947,142
Int. Cl.⁴ G06F *7/56;* **G02B** *6/28, 6/34;* **G03H** *1/00*
U.S. Cl. 350—169 **49 Claims**



1. An apparatus for optically implementing the arithmetic processing of two trinary numbers, each digit of said trinary numbers being represented by an optical triad of beams in modified signed-digit number representations comprising:

means optically coupled to receive the two trinary numbers for optically providing pairs of first transfer and weight

digits in accordance with T and W truth table logic functions on digit-pairs made up of corresponding digits in each trinary number, all digit-pairs of the two trinary numbers being simultaneously received and being optically processed in parallel to produce simultaneous and parallel said pairs of optical first transfer and weight digits;

means optically coupled to receive the first transfer and weight digits from the optically providing means except for a leftmost pair of first transfer and weight digits and a rightmost pair of first transfer and weight digits for optically generating second transfer and weight digits in accordance with T' and W' truth table logic functions, the first transfer and weight digits being optically operated on simultaneously and in parallel to generate the second transfer and weight digits; and

means optically coupled to receive one digit of the leftmost pair of the first transfer and weight digits from said optically providing means for optically producing a leftmost second transfer digit in accordance with a T' truth table logic function, said one digit of the leftmost pair of the first transfer and weight digits being optically operated on simultaneously and in parallel with the other first transfer and weight digits to provide said leftmost second transfer digit;

means optically coupled to receive one digit of the rightmost pair of the first transfer and weight digits from said optically providing means for optically enabling a rightmost second weight digit in accordance with a W' truth table logic function, said one digit of the rightmost pair of the first transfer and weight digits being optically operated on simultaneously and in parallel with the other first transfer and weight digits to enable said rightmost second weight digit; and

menas optically coupled to receive said second transfer and weight digits, the other digit of said leftmost pair of the first transfer and weight digits and said leftmost second transfer digit for optically combining thereof in accordance with T truth table logic functions and to optically combine these digits simultaneously and in parallel with the other digit of said rightmost pair of the first transfer and weight digits and said rightmost second weight digit, which together form a composite trinary output signal.

4,838,647

DISPLAY DEVICE WITH A DISSOCIABLE STRUCTURE, PARTICULARLY FOR AIRCRAFT

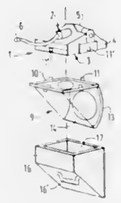
Pierre Fagard, Montigny Le Bretonneux, France, assignor to Societe Francaise d'Equipements pour la Navigation Aerienne (S.F.E.N.A), France

Filed Nov. 25, 1987, Ser. No. 125,664

Claims priority, application France, Nov. 28, 1986, 86 16620

Int. Cl.[4] G02B *27/14*

U.S. Cl. 350—174 **4 Claims**



1. A display device for superimposing, in a field of vision of a user, a synthetic light image formed on a partially reflecting mirror, by light rays emitted by an image generating means, said device comprising two dissociable modules, namely:

(i) an image generating module including, inside a case, the said image generating means, and means for focusing said light rays, said case being provided with an orifice for the passage of said rays and said focusing means comprising at least a focusing lens which closes said orifice, and

(ii) a removable optical module including at least said partially reflecting mirror, said modules being provided with coupling means for effecting a rapid disconnectable connection of said removable optical module on said image generating module.

4,838,648

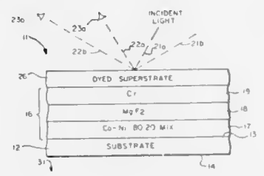
THIN FILM STRUCTURE HAVING MAGNETIC AND COLOR SHIFTING PROPERTIES

Roger W. Phillips, and Paul G. Coombs, both of Santa Rosa, Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed May 3, 1988, Ser. No. 189,779

Int. Cl.[4] G02B *5/28*

U.S. Cl. 350—166 **11 Claims**



1. In a thin film structure having magnetic properties and optically variable properties, a substrate and a multilayer interference coating carried by the substrate producing an inherent color shift with angle, said interference coating having a metal-dielectric design which includes a metal which has magnetic as well as reflective properties.

4,838,649

APPARATUS FOR DRIVING OBJECTIVE LENS

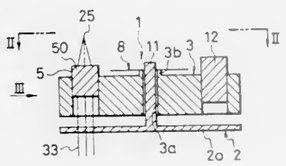
Atsushi Ichikawa; Masamichi Ito, both of Ibaraki, and Akira Saito, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 4, 1987, Ser. No. 128,578

Claims priority, application Japan, Dec. 12, 1986, 61-296027

Int. Cl.[4] G02B *7/04;* G11B *7/08*

U.S. Cl. 350—247 **8 Claims**



1. An apparatus for driving an objective lens characterized by comprising:

a slide shaft which is formed on a support portion and has an axis;

a lens support which is slidable and rotatably provided on said slide shaft;

an objective lens which is provided at one end of said lens support;

and a support spring which supports said lens support symmetrically with respect to a plane containing the axis of said slide shaft and parallel to a tracking direction and which has high rigidity to movement in the tracking direction and low rigidity to movement in the sliding direction.

4,838,650

REAR VIEW MIRROR

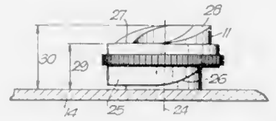
Anthony Stewart, 27 Binnie Street, Gourock, Renfrewshire, Scotland, and Juergen Schukey, Hamburg, Fed. Rep. of Germany, assignors to Anthony Stewart, Gourock, Scotland

Filed Jun. 20, 1986, Ser. No. 877,004

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1985, 3522204

Int. Cl.[4] G02B *17/00*

U.S. Cl. 350—280 **34 Claims**



1. A rear view mirror for a vehicle with an adjustable mirror surface to prevent the effects of dazzle; said rear view mirror comprising a mirror unit including a mirror, and a drive gear for automatically tilting the mirror unit from a normal position to a tilted position when a dazzle effect is present on the mirror in said normal position, said drive gear being housed in a drive gear casing, the mirror unit being pivotally mounted on the drive gear casing for pivoting relative to the drive gear casing: the drive gear comprising a cam member rotatably mounted in the drive gear casing said cam member comprising a pair of oppositely-facing annular cam surfaces, each cam surface having a first land lying in a flat plane and defining a datum, and a second land lying in a flat plane spaced from the plane of said first land and defining a lift surface portion, said first and second lands being joined by inclined connecting surface portions, an actuator engaging each of said annular cam surfaces and connected to the mirror unit so as to tilt the mirror unit on rotation of the cam member, the lift surface portion of one cam surface being diametrically opposed to the lift surface portion of the other cam surface whereby on rotation of the cam member one cam surface serves to move the actuator outwardly relative to the drive gear casing while successively the other cam surface serves to move the actuator inwardly relative to the drive gear casing, an electric motor drivingly connected to the cam member for driving the cam member in a constant single direction, and electric circuit means connected to said motor and including light sensing means for the provision of control signals and switch means controlling the driving of the electric motor.

4,838,651

PROJECTION TUBE HAVING AN INSULATING LAYER OF MAGNESIUM OXIDE AND A HIGH TRANSMISSION METAL GRATING

Jürgen Pottharst, Stuttgart, and Kurt M. Tischer, Wendlingen, both of Fed. Rep. of Germany, assignors to Nokia Graetz GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 1, 1987, Ser. No. 126,658

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1986, 3642321

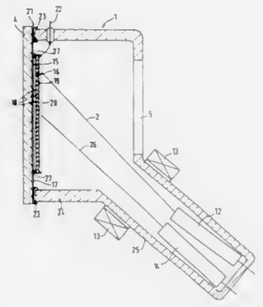
Int. Cl.[4] G02F *1/13;* H01J *29/12;* H04N *5/74*

U.S. Cl. 350—331 R **5 Claims**

1. A projection tube, comprising:

an electron-beam-addressed liquid crystal cell having liquid crystal material sandwiched between first and second plates, the first plate forms a faceplate for the projection tube, and the second plate is written on by an electron beam;

dot coatings of electrically conductive and transparent material are formed on a surface of the second plate facing the liquid crystal material; and



an insulating layer of magnesium oxide is formed on a surface of the second plate that is written on by the electron beam.

4,838,652

IMAGE FORMING APPARATUS

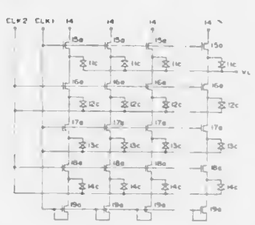
Yutaka Inaba, Kawaguchi, and Yasuyuki Tamura, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1986, Ser. No. 862,980

Claims priority, application Japan, May 15, 1985, 60-101589; Sep. 10, 1985, 60-199929

Int. Cl.[4] G02F *1/13;* G03G *15/00*

U.S. Cl. 350—331 R **39 Claims**



1. In an image forming apparatus comprising a light source, a photosensitive member, and a shutter array disposed between the light source and the photosensitive member comprising microshutters arranged in a plurality of rows and a plurality of columns so that light rays emitted from the light source are switched by the action of the microshutters corresponding to an information signal so as to provide an optical signal to be irradiated onto the photosensitive member; the improvement comprising means for applying information signals in parallel to at least one row of microshutters among the plurality of rows, transfer means for transferring the information signals in parallel to a subsequent row of microshutters and means for moving the photosensitive member in synchronism with the rate of the successive transfer of the information signals.

4,838,653

LIQUID CRYSTAL DISPLAY WITH PARTICULAR RELATIONSHIP OF THE CAPACITANCES

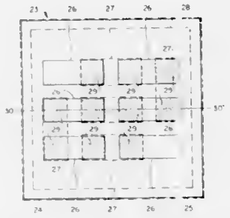
Manoochehr Mohebban, Foster City, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

PCT No. PCT/US87/01756, § 371 Date Mar. 18, 1988, § 102(e) Date Mar. 18, 1988, PCT Pub. No. WO88/00717, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 22, 1986, Ser. No. 197,771

Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—332 **10 Claims**



1. A liquid crystal display comprising an array of a plurality of liquid crystal elements, said array comprising:

(a) a first liquid crystal element having a capacitance in the non-energized state lower than the capacitance of any other of said liquid crystal elements and comprising a liquid crystal material having a positive dielectric anisotropy so that said liquid crystal element has a capacitance in the energized state higher than its capacitance in the nonenergized state; and

(b) a second liquid crystal element connected electrically in series with said first liquid crystal element, said second liquid crystal element having a capacitance in the non-energized state lower than the capacitance of the first liquid crystal element in its energized state.

4,838,654

LIQUID CRYSTAL DISPLAY DEVICE HAVING DISPLAY AND DRIVER SECTIONS ON A SINGLE BOARD

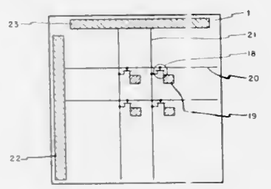
Tsueno Hamaguchi; Yoshihiko Hirai, and Setsuo Kaneko, all of Tokyo, Japan, assignors to NEC Corporation, Japan

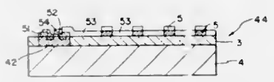
Filed Oct. 16, 1987, Ser. No. 109,227

Claims priority, application Japan, Oct. 17, 1986, 61-246653

Int. Cl.⁴ G02F 1/13; G09G 3/18, 3/36

U.S. Cl. 350—333 **5 Claims**





1. A liquid crystal display device comprising:

a first board made of a transparent material and having one surface;

a common electrode formed on said one surface of said first board, said common electrode being made of a transparent conductor;

a second board made of a transparent insulating material and having a main surface;

an insulating layer formed on said main surface of said second board;

a plurality of parallel disposed scan electrode stripes made of conductive layers and formed on said insulating layer;

a plurality of parallel disposed data electrode stripes made of other conductive layers and formed on said insulating layer, said scan electrode stripes and said data electrode stripes being arranged orthogonally and made of conductive layers physically attached on said insulating layer;

a plurality of thin film insulated gate field effect transistors, each of said thin film transistors being disposed on said insulating layer at every crossing points of said scan and data electrode stripes, said thin film transistors being formed with a use of polycrystalline or amorphous semiconductor and each of said thin film transistors having a source electrode connected to an adjacent one of said data electrode stripes, a gate electrode connected to an adjacent one of said scan electrode stripes and a drain electrode;

a plurality of picture element electrodes made of a transparent conductor, each of said picture element electrodes being disposed on said insulating layer adjacent to a corresponding one of every one of the thin film transistors, said picture element electrodes being connected to an adjacent one of said drain electrodes;

first and second monocrystalline semiconductor layers having the same thickness as said insulating layer and formed on said main surface of said second board in contact with said insulating layer to form a substantially flat upper surface plane with said insulating layer, said first monocrystalline semiconductor layer forming a first driver circuit for driving said scan electrode stripes, said first driver circuit being a semiconductor integrated circuit directly connected to said scan electrode stripes by said conductive layers on said upper surface plane, said second monocrystalline semiconductor layer forming a second driver circuit for driving said data electrode stripes, said second driver circuit being a semiconductor integrated circuit directly connected to said data electrode stripes by said other conductive layers on said upper surface plane; and

a liquid crystal interposed between said one surface of said first board and said main surface of said second board.

4,838,655

PROJECTOR USING GUEST-HOST LIQUID CRYSTAL CELLS FOR IMPROVED COLOR PURITY

Katuyuki Hunahata; Yoshiharu Nagae, both of Hitachi; Masahiro Takasaka, Hitachioota; Yuji Mori, Hitachi; Minoru Hoshino, Hitachi; Yasuyuki Kozima, Hitachi; Youhei Saito, Katsuta; Kyohei Fukuda, Fujisawa; Hayao Kozai, Mobara; Tadahiko Hasimoto, Katsuta, and Yoshiaki Tsuchihashi, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 6, 1988, Ser. No. 141,144

Claims priority, application Japan, Jan. 9, 1987, 62-1636

Int. Cl.⁴ G02F 1/13

U.S. Cl. 350—335 **17 Claims**

1. A projector having:

a light source for generating white light for projection;

means for collimating the white light generated by said light source;

polarizer means, arranged on the axis of light, for linearly polarizing the collimated light passing therethrough;

liquid crystal cell means arranged with the predetermined positional relationship with said polarizer means on the same axis of light and selectively excited or de-excited in accordance with video signals of an image to be reproduced to control the polarization plane of light passing therethrough; and

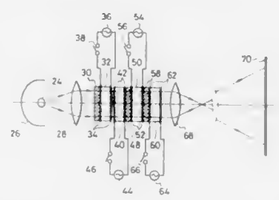
means for projecting light having passed said polarizer means and said liquid crystal cell means to reproduce the image on a screen in a full color,

characterized in

that at least one of said liquid crystal cell means is a Guest-Host type cell which is colored in a color selected from among three primary colors of an additive mixture and the remaining liquid crystal cell means are non-colored twisted nematic liquid crystal cells;

that at least one of said polarizer means is a color polarizer colored in a color selected from the remaining colors and the remaining polarizers are neutral polarizers; and

that a total number of the Guest-Host cell and the color polarizer is three, each being colored in a different one of the three primary colors in the additive mixture.



4,838,656

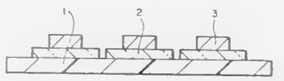
TRANSPARENT ELECTRODE FABRICATION

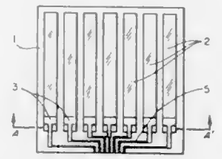
Darrell Stoddard, Malibu, Calif., assignor to Andus Corporation, Canoga Park, Calif.

Continuation of Ser. No. 915,355, Oct. 6, 1986, abandoned. This application Jun. 21, 1988, Ser. No. 211,107

Int. Cl.⁴ C23F 1/02; G02F 1/3; B44C 1/22

U.S. Cl. 350—336 **17 Claims**





1. A method of producing a transparent electrode, which comprises:

(a) applying a transparent conductive material to a transparent thin film substrate;

(b) applying a metal to the transparent conductive material;

(c) then etching the metal to form one or more busses; and

(d) optionally etching the transparent conductive material to form one or more elements connected to one or more of said busses.

10. A liquid crystal display comprising an electrode produced by a method according to claim 1, a panel, and a liquid crystal material therebetween.

4,838,657

LIQUID CRYSTAL SHUTTER

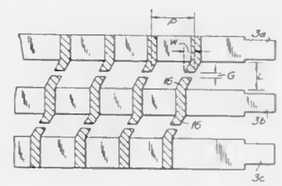
Teiji Miura; Hideo Yamazaki; Nobumasa Abe; Toshihide Okamura; Hideki Morozumi, and Tatsuki Matsuo, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Nov. 14, 1985, Ser. No. 798,093

Claims priority, application Japan, Nov. 15, 1984, 59-241295; Jul. 22, 1985, 60-161542

Int. Cl.⁴ G02F 1/37

U.S. Cl. 350—336 **18 Claims**



1. In a liquid crystal light shutter wherein light is transmitted through the shutter upon application of a voltage in a selection period and the amount of light transmitted through the shutter tends to fluctuate due to vibrations in the liquid crystal when the voltage is applied to the shutter for longer periods of time, including:

a first substrate;

at least two common electrodes disposed on the first substrate parallel to an spaced apart from each other;

a second substrate opposite to the first substrate spaced apart to form a cell therebetween;

a plurality of spaced apart signal electrodes disposed on the second substrate and arranged so that the signal electrodes are substantially perpendicular to the common electrodes on the first substrate; and

a liquid crystal material having frequency dependent dielectric anisotropy enclosed in the cell between the substrates the improvement which comprises:

at least one isolation electrode disposed on the first substrate parallel to and between the common electrodes, or by providing an opaque projection having a dimension P on the common electrodes at locations which cross the signal electrodes for minimizing light leakage and an effective gap distance between adjacent common electrodes that is at least about ten times greater than the distance between the opposing subtrates the effective gap distance L_{eff}, between common electrodes expressed as:

$$1/L_{eff}=((P-W)/P)\times 1/L+(W/P)\times 1/G$$

wherein W represents the width of each projection, L represents the gap distance between common electrodes, G represents the gap distance between each signal electrode, and P represents the pitch of repetitions of the projections.

6. In a liquid crystal light shutter wherein light is transmitted through the shutter upon application of a voltage in a selection period and the amount of light transmitted through the shutter tends to fluctuate due to vibrations in the liquid crystal when the voltage is applied to the shutter for longer periods of time, including:

a first substrate;

at least two elongated common electrodes disposed on the first substrate parallel to an spaced apart from each other;

a second substrate opposite to the first substrate spaced apart to form a cell therebetween;

a plurality of spaced apart signal electrodes disposed on the second substrate and arranged so that the signal electrodes are substantially perpendicular to the common electrodes on the first substrate; and

a liquid crystal material having frequency dependent dielec-

tric anisotrophy enclosed in the cell between the substrate, the improvement which comprises at least one isolation electrode on the first substrate parallel to and between the common electrodes.

4,838,658

LIQUID CRYSTAL ALIGNMENT LAYER WITH SIDECHAINS CONTROLLING TILT ANGLE

Rolf Zondler, Stuttgart, Fed. Rep. of Germany, assignor to Nokia Graetz GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 13, 1987, Ser. No 108,049

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1986, 3635331

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—339 R **11 Claims**

1. A liquid crystal cell having a predetermined tilt angle controlled by alignment layers of organic material provided on surfaces of the cell walls which face liquid crystal material, said material of the alignment layers comprising:

polymer chains; and

side chains attached to said polymer chains in a regular arrangement, said side chains having the same structure including end groups interacting at their free ends with at least one end of the molecules of the liquid crystal material, one end group of each side chain interacting with one end of a liquid crystal molecule in such a way that the ends of the liquid crystal molecules are held at the ends of the side chains, whereby said tilt angle is controlled by the arrangement and structure of the side chains.

4,838,659

LIQUID CRYSTAL DISPLAYS AND FLUORESCENT DYES FOR USE THEREIN

Robert L. Van Ewyk, Wimborne; Ingrid M. O'Connor, London; Alan Mosley, Berkhamsted; Francis Jones, Leeds; Christopher Blackburn, Abingdon, and John Griffiths, Leeds; all of England, assignors to The General Electric Company, p.l.c., England

PCT No. PCT/GB87/00196, § 371 Date Dec. 10, 1987, § 102(e) Date Dec. 10, 1987, PCT Pub. No. WO87/05617, PCT Pub. Date Sep. 24, 1987

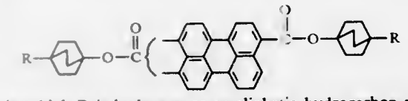
PCT Filed Mar. 20, 1987, Ser. No. 124,100

Claims priority, application United Kingdom, Mar. 21, 1986, 8607096

Int. Cl.⁴ G02F *1/13*; C09K *19/00*; C07C *69/76*

U.S. Cl. 350—337 **11 Claims**

1. Esters selected from the class consisting of di(bicyclo[2.2.2]oct-1-yl)perylene-3,9-dicarboxylates and di(bicyclo[2.2.2]oct-1-yl)perylene-3,10-dicarboxylates of the general formula I:



in which R is hydrogen or an aliphatic hydrocarbon radical containing not more than 20 carbon atoms and $—CH_2—$ between carbon atoms or adjacent to the bicyclo[2.2.2]octane residue may be replaced by-0-.

4,838,660

COLORED ENCAPSULATED LIQUID CRYSTAL APPARATUS USING ENHANCED SCATTERING

James L. Ferguson, Kent, Ohio, assignor to Manchester R & D Partnership, Pepper Pike, Ohio

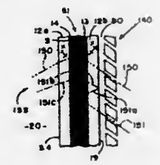
Division of Ser. No. 480,466, Mar. 30, 1983, Pat. No. 4,596,445.

This application Mar. 18, 1986, Ser. No. 840,934

The portion of the term of this patent subsequent to Mar. 6, 2001, has been disclaimed.

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—339 F **23 Claims**



I. Liquid crystal apparatus comprising liquid crystal means for selectively primarily scattering or transmitting light in response to a prescribed input, a support medium means for holding therein such liquid crystal means, said support medium means having a characteristic of total internal reflection, and dye means in at least one of said liquid crystal means and said support medium means for coloring light transmitted therein.

4,838,661

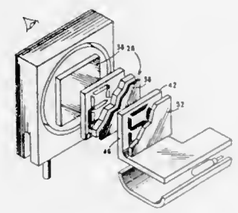
LIQUID CRYSTAL LIGHT EMITTING DISPLAY SYSTEM

John M. McKee, Coral Springs, and Marilyn S. Burger, Pompano, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 5, 1988, Ser. No. 141,015

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—345 **13 Claims**



1. A liquid crystal display device comprising:

a liquid crystal display cell including two opposed transparent substrates, each having at least one electrode deposited on the interior surface thereof, a layer of liquid crystal material being an optically nematic liquid crystal composition, the electrode having a display indicia:

a first and a second polarizer disposed on the exterior surfaces of the substrates, one of the polarizers having a rotatable axis of polarization capable of being rotated from a position where the axes of polarization of the two polarizers are substantially orthogonal to a position where the axes of polarization are substantially parallel; and

a first transparent panel adjacent the second polarizer having a display indicia corresponding in shape and spatial alignment to said electrode display indicia, the panel being comprised of an optically transparent material optically connected to a light collecting means wherein said first transparent panel display indicia are illuminated from light illuminating said light collecting means when the axes of polarization of the two polarizers are substantially parallel, said first transparent panel display indicia being comprised of a plurality of cones cut into an exterior surface of the first transparent panel, the cones intercepting internally reflected light to emit light from the interior surface of said first transparent panel, wherein the slant in the side of each of said plurality of cones ranges from 30 degrees to 40 degrees.

4,838,662

LIGHT SWITCHES UTILIZING ANISOTROPIC EMISSION

Cyril Hilsum, Pinner; Robert L. Van Ewyk, Rickmansworth, and Ingrid M. O'Connor, London, all of England, assignors to The General Electric Company, p.l.c., United Kingdom

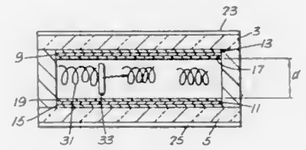
Continuation of Ser. No. 800,452, Nov. 21, 1985, abandoned.

This application Apr. 26, 1988, Ser. No. 186,365

Claims priority, application United Kingdom, Nov. 28, 1984, 8429991

Int. Cl.⁴ G02F *1/137*

U.S. Cl. 350—350 F **10 Claims**



1. A display device, comprising:

(A) a liquid crystal host material having molecules;

(B) a luminescent guest material having molecules, said guest material emitting radiation anisotropically and being dissolved in said host material such that the molecules of said guest material substantially align with the molecules of said host material; and

(C) means for applying an electric field across said host material to rotate said molecules of said host material between

(i) a first position at which the radiation emitted by said guest material is incident on an interface between two materials of different refractive indices at an angle less than the critical angle for said interface, and

(ii) a second position at which the radiation emitted by said guest material is incident on said interface at an angle greater than said critical angle,

whereby the device is switched between a radiation-emitting condition and a non-radiation-emitting condition.

4,838,663

DEVICE FOR SUBMICROSECOND ELECTRO-OPTIC MODULATION IN THE LIQUID CRYSTAL SMECTIC-A PHASE USING ORTHOGONAL BOOKSHELF GEOMETRY

Sven T. Lagerwall; Gunnar Andersson, both of Gothenburg; Ingolf Dahl, Mölndal; Wojciech Kuczynski, Gothenburg; Kent Sharp, Lindome, and Bengt Stebler, Gothenburg, all of Sweden, assignors to S.A.R.L. S.T. Lagerwall, Bandol, France

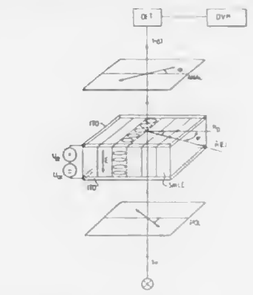
Filed Oct. 7, 1987, Ser. No. 105,254

Claims priority, application European Pat. Off., Oct. 7, 1986, 86850337.6

Int. Cl.⁴ G02F *1/13*

U.S. Cl. 350—350 S **6 Claims**

1. A light modulating device comprising two polarizing layers, two transparent confinement plates provided with electrodes, and a chiral smectic liquid crystal confined between the plates in a bookshelf geometry, said liquid crystal in a field-free state having its molecules orthogonal to its smectic layers, a voltage applied across said electrodes resulting in a tilting of the molecules of the liquid crystal and an ensuing change of its polarizing properties and in the transmission of a light ray passing through the device.



4,838,664

DIAGNOSTIC OVERLAY

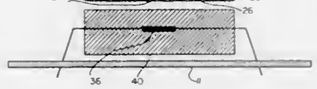
Brent Graham, 1734 - 196th Street, Langley, B.C., Canada V3A 4P4

Filed Jul. 9, 1987, Ser. No. 71,628

Claims priority, application Canada, Jul. 10, 1986, 513523

Int. Cl.⁴ G02F *1/13*; G01R *15/12*

U.S. Cl. 350—351 **21 Claims**



1. A method of diagnosing an electronic circuit comprising positioning an overlay substantially in contact with said electronic circuit, aligning at least one of a plurality of temperature responsive liquid encapsulated crystal zones on said overlay with at least a respective one of a plurality of electronic components on said electronic circuit and observing the color of said liquid encapsulated crystal zones while said electronic circuit is under operation for a predetermined time period.

4,838,665

TEMPERATURE-COMPENSATED LENS SYSTEM

Shinichi Hasegawa, and Takayuki Yoshioka, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 27, 1987, Ser. No. 77,723

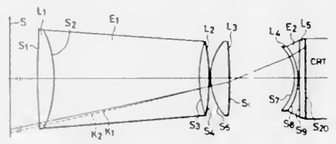
Claims priority, application Japan, Jul. 25, 1986, 61-175337; Jul. 25, 1986, 61-175338; Jul. 25, 1986, 61-175339; Jul. 25, 1986, 61-175340

Int. Cl.⁴ G02B *3/12, 13/18*

U.S. Cl. 350—418 **38 Claims**

1. A temperature-compensated lens system comprising a plastic lens having a convex surface, and a liquid lens of negative power made of a liquid or gel material and held against said convex surface of said plastic lens, said liquid lens having a temperature coefficient dn/dT ranging from -4×10^{-4} to

-2.0×10^{-4}/°C., said temperature coefficient indicative of a temperature-dependent variation in the refractive index of the



liquid lens, said lens system having positive power in its entirety.

4,838,666

WIDE ANGLE ZOOM LENS OF LONG BACK FOCAL DISTANCE

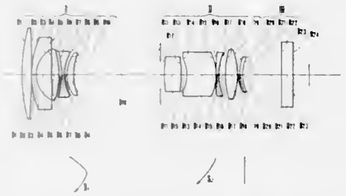
Akihiko Shiraishi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 25, 1987, Ser. No. 125,571

Claims priority, application Japan, Nov. 27, 1986, 61-282266

Int. Cl.[4] G02B *15/16, 9/54*

U.S. Cl. 350—427 **7 Claims**



1. A wide angle zoom lens of long back focal distance comprising, from front to rear, a first lens unit having a negative refractive power, a second lens unit having a positive refractive power, and a third lens unit having a positive refractive power, said third lens unit remaining stationary during zooming, and said first and said second lens units being axially moved to effect zooming, and satisfying the following conditions:

$$2.0 \leqq |f_1/f_W| \leqq 3.2$$

$$0.33 \leqq |f_1/f_2| \leqq 0.8$$

where f_W is the shortest focal length of the entire lens system, f_1 is the focal length of said first lens unit, and f_2 is the focal length of said second lens unit.

4,838,667

ZOOM LENS SYSTEM FOR USE IN MICROFILM PROJECTION APPARATUS

Toshihiko Ueda, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 8, 1987, Ser. No. 130,006

Claims priority, application Japan, Dec. 8, 1986, 61-291797

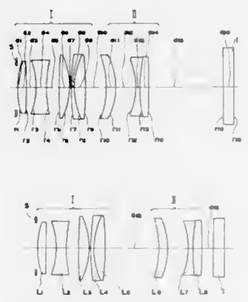
Int. Cl.[4] G02B *15/14*

U.S. Cl. 350—427 **5 Claims**

1. A zoom lens system for use in a microfilm projection apparatus in which the image projection is conducted at a condition of a definite object-image distance, the system consisting of, from the enlargement side to the reduction side:

a first movable lens group of a positive refractive power disposed at the screen side, the first lens group including an aperture stop disposed at the enlargement side of the first lens group, a positive lens element, a biconcave lens element and a positive lens unit composed of a positive lens element and a negative lens element cemented together; and

a second movable lens group of a negative refractive power disposed at the film side, the second lens group including a positive meniscus lens element with a concave surface



faced to the enlargement side and a negative lens unit composed of a negative lens element and a positive lens element cemented together,

wherein the first and second lens groups are moved independently along the optical axis while increasing a distance therebetween in an operation of zooming from the longest focal length side to the shortest focal length side.

4,838,668

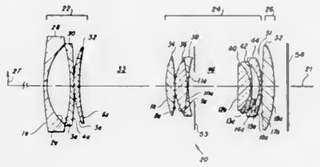
ZOOM LENS

Ellis I. Betensky, Redding, Conn., and Melvyn H. Kreitzer, Cincinnati, Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 9, 1987, Ser. No. 107,223

Int. Cl.[4] G02B *15/177, 9/64*

U.S. Cl. 350—427 **34 Claims**



1. A zoom taking lens for a photographic SLR camera having viewfinder means, said lens having a front to be towards an object to be photographed and an axis and including:

a first unit of lens elements at the front of the lens;

and a moving second unit of lens elements including an air space between elements of the unit; and

axially movable reflective means disposed in said air space and inclined to the axis of the lens, for directing light, received from the object through said first unit and through at least one element of the second unit, to the viewfinder means.

4,838,669

COMPACT ZOOM LENS SYSTEM

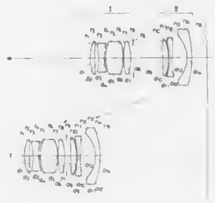
Yasuzi Ogata, and Takao Obi, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1988, Ser. No. 169,475

Claims priority, application Japan, Mar. 17, 1987, 62-60019; Apr. 24, 1987, 62-99875; May 12, 1987, 62-113569

Int. Cl.[4] G02B *15/14, 9/64*

U.S. Cl. 350—427 **12 Claims**



1. A compact zoom lens system comprising a front lens group having positive refractive power and a rear lens group having negative refractive power, and designed for changing focal length by varying an air-space reserved between said lens groups, said front lens group comprising in the order from the object side of a positive meniscus lens convex on the object side, a negative lens and at least one positive lens, said rear lens group comprising in the order from the object side, of a positive lens, a biconcave lens and a negative meniscus lens convex on the image side, and said zoom lens system beng so designed as to satisfy the following condition (1):

$$-1 < \frac{r_a + r_b}{r_a - r_b} < 0.2 \quad (1)$$

wherein the reference symbols r_a and r_b represent the radii of curvature on the object side surface and the image side surface respectively of the biconcave lens arranged in said rear lens group.

4,838,670

PROJECTION LENS FOR A PROJECTOR

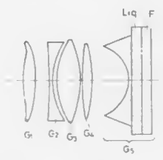
Kiichirou Ueda, Kunitachi, and Norikazu Arai, Komae, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 2, 1987, Ser. No. 92,035

Claims priority, application Japan, Sep. 5, 1986, 61-207999; Dec. 12, 1986, 61-294944; Jul. 29, 1987, 62-187735

Int. Cl.[4] G02B *13/18, 9/60*

U.S. Cl. 350—432 **6 Claims**



1. A projection lens for a projector comprising, in order from a screen side, a first positive lens unit having at least one aspherical surface, a second negative lens unit, a third positive lens unit, a fourth lens unit, and a fifth negative lens unit with a concave surface having a great curvature directed toward the screen, the projection lens fulfilling the following conditions:

(1) $\nu_2 < 40$, $50 < \nu_3$

(2) $-1.0 < f/(f_2 n_2) < -0.02$

where

ν_i: Abbe number of the i^{th} lens unit

f: focal length of the entire lens system

f_2: focal length of the second lens unit

n_2: refractive index of the second lens unit.

4,838,671

STEREO MICROSCOPE AND STEREO CHANGER

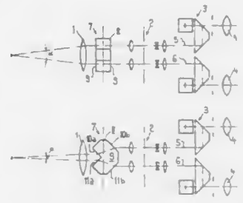
Franz Papritz, and Hansruedi Widmer, both of Niederscherli, Switzerland, assignors to Haag-Streit AG, Liebefeld, Switzerland

Continuation of Ser. No. 19,203, Feb. 26, 1987, abandoned. This application Oct. 20, 1988, Ser. No. 262,261

Claims priority, application Switzerland, Mar. 14, 1986, 01060/86

Int. Cl.[4] G02B *21/22, 27/22*

U.S. Cl. 350—516 **21 Claims**



1. A stereo microscope for viewing an object comprising:

an objective means for creating an image of an object;

a pair of oculars for transferring the image to a viewer's eye, said oculars having optical axes aligned substantially parallel to an optical axis of said objective and each ocular receiving a partial beam of rays from said objective means;

a stereo changer means disposed between said objective means and sid oculars for changing a stereoscopic angle of the microscope, said stereo changer means comprising:

an optical element rotatable about a first axis substantially perpendicular to said objective means' and oculars' optical axes and having a first and a second working position;

wherein said optical element, when in said first working position, displaces transmitted beams of rays from each other by a first displacement distance; and

wherein said optical element, when in said second working position displaces transmitted beams of rays from each other by a second displacement distance different from said first displacement distance.

4,838,672

FUNCTION-CONVERSION DEVICE FOR GROUND MONOCULAR TELESCOPE

Toshiaki Oonishi, 18-33, Tokumaru 2-chome, Itabashi-ku, Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 167,243

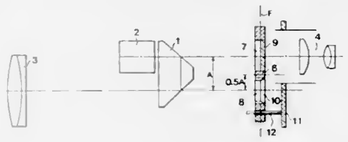
Claims priority, application Japan, Mar. 11, 1987, 62-35592[U]

Int. Cl.[4] G02B *23/00, 7/02, 15/02, 27/32*

U.S. Cl. 350—537 **11 Claims**

1. A function-conversion device for an erecting-prism type ground monocular telescope including a rotational plate so mounted as to be horizontally movable toward and away from an objective lens of the telescope so that the rotational plate can be located in the vicinity of the focal plane of the objective lens, a plurality of windows being provided in said rotational plate and an element selected from the group consisting of a

reticle, a visibility diaphragm and a second objective lens mounted on the rotational plate in alignment with one of said



windows, each of said windows being selectively movable to a position in alignment with the focal plane of the objective lens.

4,838,673

POLARIZED LENS AND METHOD OF MAKING THE SAME

Charles Richards, Lahaina, Hi., and Kazubiro Kobayashi, Sabae, Japan, assignors to J. R. Richards, Inc., Lahaina, Hi.

Filed Apr. 27, 1987, Ser. No. 42,821
Int. Cl.[4] G02C *7/10, 7/14;* B29B *19/00*
U.S. Cl. 351—44 **20 Claims**

1. A sunglass lens comprising,
two layers of ground mineral glass laminated together with a polarized film between the two glass layers, thereby forming a single lens having inner and outer surfaces,
an anti-reflectant coating adhered to the inner surface of the lens, and
a bigradient coating adhered to the outer surface of the lens on upper and lower portions thereof, wherein a horizontal axis of the lens is substantilly uncoated.

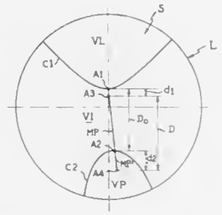
4,838,674

MULTIFOCAL OPHTHALMIC LENS

Maurice Dufour, Paris, France, assignor to Essilor International (Compagnie Générale d'Optique), France

Filed Jun. 23, 1988, Ser. No. 210,667
Claims priority, application France, Jul. 7, 1987, 87 09613
Int. Cl.[4] G02C *7/06*
U.S. Cl. 351—169 **4 Claims**

1. A multifocal ophthalmic lens comprising an aspherical surface having:
a first vision zone for far vision;
a second vision zone for near vision; and
a third vision zone between said first and second zones for intermediate vision, with the curvature in said third vision zone varying progressively along a main meridian curve of power progression, with the first and third vision zones being delimited by a first curve intersecting the meridian curve at a first point, and with the second and third vision zones being delimited by a second curve intersecting the main meridian curve at a second point;
wherein the curvature of the main meridian curve begins to vary in the third vision zone at a third point which is offset from the first point by a first predetermined distance $d1=f(A)$; and
wherein the curvature continues to vary in the second vision zone along an extension of the main meridian curve from said second point to a fourth point which is offset from the second point by a second predetermined distance $d2=h(A)$,
the curvature varying from said second point to said fourth point in the same direction of variation as from the third point to the second point;



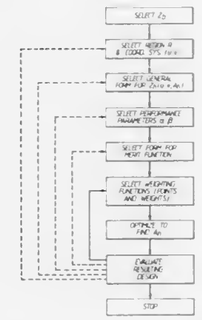
the curvature difference between the second and fourth points having a predetermined value $\Delta C=g(A)$; and
f(A), h(A), and g(A) being decreasing functions of the power addition A of the lens between said first and second points.

4,838,675

METHOD FOR IMPROVING PROGRESSIVE LENS DESIGNS AND RESULTING ARTICLE

Eric F. Barkan, and David H. Sklar, both of San Francisco, Calif., assignors to Sola International Holdings, Ltd., Morphett Vale, Australia

Filed Jun. 19, 1987, Ser. No. 63,971
Int. Cl.[4] G02C *7/06*
U.S. Cl. 351—169 **20 Claims**



1. A method for optimizing an ophthalmic progressive lens having a distance viewing zone, a near viewing zone and an intermediate zone in which there occurs a gradual change in optical power from the distance zone to the near zone, the ophthalmic progressive lens having at least one quantitative performance characteristic, comprising the steps of:
representing a surface of the progressive lens to be optimized by a base surface function;
using a merit function relating the at least one performance characteristic to a merit figure of the progressive lens;
choosing using an optimization function having at least one adjustable parameter;
defining a subregion of the surface of the progressive lens, the subregion having a boundary;
imposing at least one boundary condition on the optimization function along the subregion boundary;

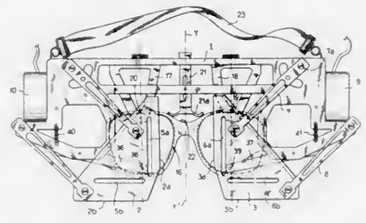
combining the base surface function and the optimization function to form a new surface function;
optimizing the merit figure of the new surface function having the at least one adjustable parameter of the optimization function to obtain an improved surface function representing an improved surface of the progressive lens; and
forming a lens surface responsive to said improved surface function.

4,838,676

OPTICAL DEVICE FOR MEASURING THE POSITION OF THE MAIN OR OTHER DIRECTIONS OF VISION OF BOTH EYES, AND ANOMALIES IN BINOCULAR VISION

Bernard Buget, 16 Place de l'Alma, 57600 Forbach, and Etienne Maurice, Rupt-sur-Moselle, both of France, assignors to Bernard Buget, Forbach, France

Filed Mar. 19, 1987, Ser. No. 28,381
Claims priority, application European Pat. Off., Mar. 19, 1986, 86400578.0
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—202 **14 Claims**



1. An optical device for measuring the position of the main or other directions of vision of the two eyes of a patient using the device and for measuring anomalies in binocular vision, the device being adapted for fitting in front of the patient's eyes and comprising a holder (1) bearing two movable screens (2, 3) of transparent polarizing material, means for moving the two screens (2, 3) in front of the eyes, means for locating the position of the screens relative to the holder (1), and a target (4) separated from the holder and adapted to be placed in front of the patient so as to be visible to the patient, said target (4) comprising a central area having an axis of a polarization perpendicular to that of the polarizing screens (2, 3), characterized in that each polarizing screen (2, 3), adjacent its side edge (2*a*, 3*a*) nearest to the axis of symmetry of the holder (1) extending between the two screens, contains a first slot (5*a*, 6*a*) substantially parallel to said axis of symmetry and adjacent its bottom edge (2*b*, 3*b*) contains a second slot (5*b*, 6*b*) substantially perpendicular to said first slot and said means for moving the two screens (2, 3) comprises a single actuating assembly for each screen and transmission means (7, 8) such that said first and second slots (5*a*, 6*a*; 5*b*, 6*b*) in the screens remain parallel to themselves, respectively, when the screens move.

4,838,677

EYE EXERCISING DEVICES

Michael J. Bronskill, Toronto, Canada, and Bai-Chuan Jiang, Shanghai, China, assignors to Ayetech Inc., Willowdale, Canada

Filed Apr. 6, 1987, Ser. No. 34,951
Int. Cl.[4] A61B *3/00*
U.S. Cl. 351—203 **21 Claims**

1. A single eye exercising device comprising an optical path, positioning means to position said eye along said optical path, said optical path extending through at least one limit of the range of accommodation for the eye being exercised;
an image to be interrogated by said eye and movable along said optical path;
means to adjust the range of movement of said image along said path to cross said one limit;

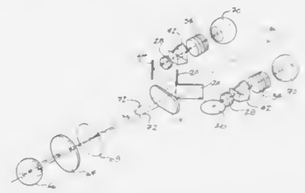
displacement means to displace continuously and cyclically during exercise of the eye said image along said optical path between first and second locations on opposite sides of said limit whereby a continuously variable size and blur cue is provided to the eye being exercised.

4,838,678

MAGNIFYING BINOCULAR OPHTHALMOSCOPE

Maximiliaan J. Hubertus, Coolbinia, Australia, assignor to Lyons Eye Institute of Western Australian Incorporated, Nedlands, Australia

Filed Dec. 8, 1987, Ser. No. 130,626
Claims priority, application Australia, Dec. 10, 1986, PH09448
Int. Cl.[4] A61B *3/10;* G02B *21/20*
U.S. Cl. 351—205 **4 Claims**



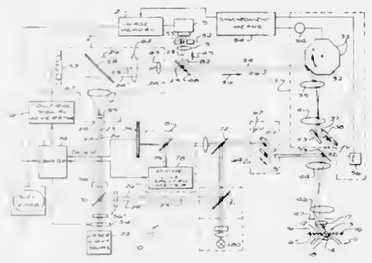
1. A magnifying binocular ophthalmoscope for use with an ophthalmoscopy lens to magnify an incoming image entering said ophthalmoscope, said ophthalmoscope comprising:
a light source housing containing a light source for illuminating the interior of a patient's eye;
mirror means and two image reflection means;
said mirror means having two mirror units arranged to reflect said incoming image into two paths;
each said image reflecting means being arranged to receive and reflect said incoming image from a respective said path;
each said image reflecting means reflecting said incoming image through a respective magnifying lens system comprising on objective lens, a Schmidt or Pechan prism and an eye-piece through which an observer views a magnified incoming image, and each magnifying lens system has an optical axis; wherein, each said image reflecting means, objective lens, Schmidt or Pechan prism and eye-piece are linearly aligned whereby each said optical axis is a single non-deviating line extending from a respective said image reflecting means to a respective said eye-piece and whereby the said optical axes are parallel.

4,838,679

APPARATUS FOR, AND METHOD OF, EXAMINING EYES

Josef Bille, Am Pferchelhang 2/4, 6900 Heidelberg, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 706,619
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1984, 3422144
Int. Cl.[4] A61B *3/10, 3/11*
U.S. Cl. 351—205 50 Claims



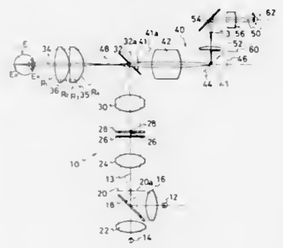
1. In combination for detecting aberrations in the characteristics of a patient'e eye,
means for providng a relatively broad beam of light,
means for directing the beam of light toward the patient's eye,
means including an entrance pupil displaced a particular distance from the patient's eye for focusing at the entrance pupil the light beam traveling to the patient's eye,
means for directing from the patient's eye the light beam reflected from the patient's eye,
a photodetector,
a pinhole displaced by the particular distance in front of the photodetector in the direction of travel of the light beam reflected from the patient's eye, and
means disposed in front of the photodetector and the pinhole, in the direction of travel of the light beam from the patient's eye, for focusing the light beam at the pinhole to produce at the photodetector signals representing the characteristics of the patient's eye.

4,838,680

OPTICAL SYSTEM FOR RETINAL CAMERA

Kazuo Nunokawa, Tokyo, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1988, Ser. No. 151,221
Claims priority, application Japan, May 30, 1984, 59-109896
Int. Cl.[4] A61B *3/14*
U.S. Cl. 351—206 6 Claims



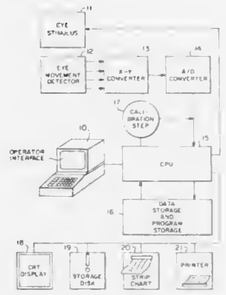
1. An optical system for a retinal camera comprising:
objective lens means adapted to be placed opposite to a patient's eye with an air space therebetween having a first biconvex type lens means with a first surface and second surface, and a second biconvex type lens means with a third surface and fourth surface, wherein when said objective lens means is placed opposite to a patient's eye said first biconvex type lens means is located between the eye and said second biconvex type lens means, and said first surface faces towards the patient's eye while said second surface faces away from the eye, said third surface faces toward said second surface while said fourth surfaces faces opposite said third surface, the radius of curvature of said first surface being greater than the radius of curvature of said second and fourth surfaces, the radius of curvature of said fourth surface being greater than that of said second surface but less than that of said first surface, the radius of curvature of said third surface being greater than that of said first, second and fourth surfaces,
an illumination optical system for projecting beams of illumination light through said objective lens means to said patient's eye, said illumination optical system including beam restriction means for passing selected beams of said illumination light to said objective lens means,
a photographing optical system for observing the retina of said patient's eye through said objective lens means,
optical path dividing means being provided on the opposite side of the objective lens means from that of the eye for dividing the optical path passing through the objective lens means into two sub-optical paths, said photographing optical system being located on one of the sub-optical paths, said illuminating optical system being located on the other sub optical path, said illuminating optical system further comprising harmful beam blocking means disposed so as to block images of the beam restriction means produced by light reflected at said convex surfaces of said first and second biconvex lens means, whereby said images are not introduced into said photographing optical system.

4,838,681

METHOD AND MEANS FOR DETECTING DYSLEXIA

George Pavlidis, Park Lane Apt. 9E, New Brunswick, N.J. 08901

Continuation-in-part of Ser. No. 823,464, Jan. 28, 1986. This application May 4, 1987, Ser. No. 46,459
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—210 17 Claims



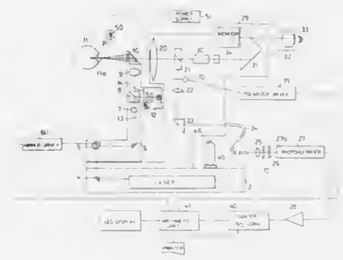
1. An automated system for determining the existence of temporary neurological impairment from alcohol, said system comprising:
(a) means for stimulating a predetermined pattern of eye movement in a subject to be evaluated for said impairment, said pattern including a slowly moving stimulus for a portion thereof to stimulate pursuit eye movement in the subject,
(b) means for detecting eye movement in a subject observing said means for stimulating eye movement, said detecting means providing an electrical output signal in response to said movement,
(c) processor means for receiving said electrical output signal, said processor means further including,
(i) means for sampling the output signal to obtain a series of successive eye positions,
(ii) means for converting said successive eye positions to data representing eye movements,
(iii) means for analyzing said data by direction, duration, and amplitude to categorize said eye movements and to differentiate between saccadic movements, pursuit movements and fixations,
(iv) means for comparing the number and placement of saccadic eye movements with respect to stimulated pursuit movements to diagnose the existence of the neurological impairment,
(d) output means for enabling display of said diagnosis.

4,838,683

OPHTHALMIC MEASURING METHOD AND APPARATUS

Tadashi Ichihashi, and Masunori Kawamura, both of Hino, Japan, assignors to Kowa Company Ltd., Aichi, Japan

Filed May 18, 1987, Ser. No. 51,666
Claims priority, application Japan, May 19, 1986, 61-112516; May 28, 1986, 61-121126
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—221 8 Claims



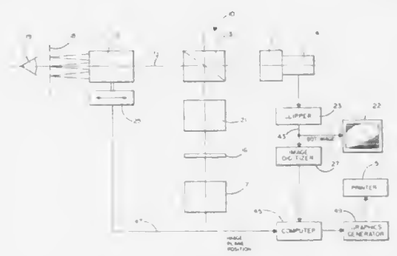
1. An ophthalmic measuring method for measuring the step of microparticles in the aqueous chamber of an eye to be examined which is irradiated with a laser beam to detect the scattering characteristics in the aqueous chamber of said eye, comprising the steps of:
projecting a laser beam with a predetermined wavelength into an aqueous chamber in a given direction;
receiving light scattered from the aqueous chamber in a direction perpendicular to the given direction through a polarizer which passes only horizontally polarized components;
receiving light scattered from the aqueous chamber perpendicular to said given direction without a linear polarizer; and
evaluating the changes between the characteristics of scattered light received with said linear polarizer and scattered light received without the linear polarizer to measure at least one of the number and concentration of microparticles present in said aqueous chamber.

4,838,682

OCULAR TOPOLOGY SYSTEM

Vladimir Portnoy, Irvine, Calif., assignor to Allergan, Inc., Irvine, Calif.

Continuation of Ser. No. 859,470, May 5, 1986, abandoned. This application Mar. 23, 1988, Ser. No. 172,948
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—212 15 Claims



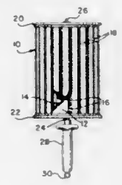
1. A method for optically determining the topology of an eye, comprising the steps of:
(a) projecting toward the eye a target image sharply focused in an image surface substantially perpendicular to the direction of projection;
(b) moving said image surface through at least part of said eye;
(c) detecting the in-focus portions of the reflection of said target image by surfaces of said eye; and
(d) producing a representation of the location of said in-focus portions of said reflected target image with respect to a reference point for a plurality of positions of said image surface.

4,838,684

APPARATUS FOR AND METHOD OF TESTING VISUAL ACUITY

Jeffery W. Smith, 9151 Sutton Ct., Orland Park, Ill. 60462

Filed Feb. 9, 1987, Ser. No. 12,506
Int. Cl.[4] A61B *3/00*
U.S. Cl. 351—239 3 Claims



1. A hand-held, portable visual acuity testing device including a spindle having a handle at one end, a cylindrical drum rotatably mounted on said spindle, said drum including a first flange disposed on top of said drum extending beyond the periphery of said drum and a second flange disposed on the bottom of said drum also extending beyond the periphery of

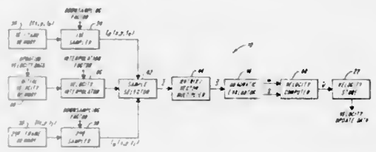
said drum, said first and second flanges defining a locating surface therebetween and a series of removable stimulus covers each of which is adapted to be releasably secured around said drum and consists of alternately adjacent, vertically disposed bars of equal width of two different colors, each cover in said series having bars of narrower width than the cover which precedes it in said series, whereby said drum may be used to measure the visual acuity of a patient.

4,838,685

METHODS AND APPARATUS FOR MOTION ESTIMATION IN MOTION PICTURE PROCESSING

Dennis M. Martinez, Dedham, and Jae S. Lim, Winchester, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 3, 1987, Ser. No. 34,771
Int. Cl.⁴ G03B *21/32*
U.S. Cl. 352—85 **31 Claims**



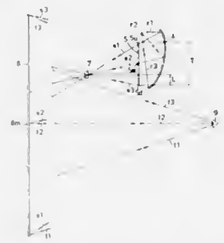
1. A method of estimating a velocity field within a motion picture, the method comprising:
obtaining a set of signal coefficients from a set of image intensity samples over a region of interest to generate a continuous signal representation;
computing directional gradients from said continuous signal representation; and
minimizing an average squared directional gradient residual by eigenvalue/eigenvector decomposition to obtain an estimate of the velocity field.

4,838,686

PROJECTOR APPARATUS

Stig Berglund, Stockholm, Sweden, assignor to Optica Nova ONAB AB, Stockholm, Sweden

Filed Dec. 2, 1987, Ser. No. 127,632
Claims priority, application Sweden, Jun. 22, 1987, 8700245; Mar. 30, 1987, 8701304
Int. Cl.⁴ G03B *21/132, 21/28*
U.S. Cl. 353—98 **8 Claims**



1. Projection apparatus comprising:
at least one light source;
at least one ellipsoidal mirror;
a projection head; and
a projection stage aperture for an object, the image of which is to be projected, the aperture being placed in the ray path between said at least one light source and the projection head said at least one ellipsoidal mirror being situated in the ray path between said at least one light source and the aperture;
one focal point of each ellipsoidal mirror substantially coinciding with a light source, the other focal point of each ellipsoidal mirror substantially coinciding with the projection head;
the projection head being positioned in a plane, which is orthogonal to the aperture and parallel with a tangent to the periphery of the aperture; the distance (L) between said plane and said tangent being substantially determined by the relation

$$0 \leq L \leq T/4$$

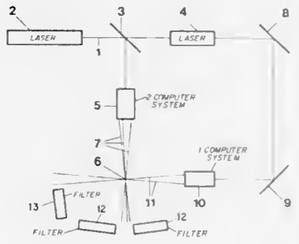
where T=the "height of the aperture.

4,838,687

METHOD FOR THE SIMULTANEOUS MEASUREMENT OF THREE VELOCITY COMPONENTS BY MEANS OF LASER DOPPLER ANEMOMETRY

Hans-Joachim Pfeifer, Rümmingen, Fed. Rep. of Germany, assignor to Institut Franco-Allemand De Recherches De Saint-Louis, Saint-Louis Cedex, France

Continuation of Ser. No. 864,356, May 19, 1986, abandoned.
This application Mar. 10, 1988, Ser. No. 169,136
Claims priority, application Fed. Rep. of Germany, May 24, 1985, 3518800
Int. Cl.⁴ G01P *3/36*; G01N *21/00*; G01B *9/02*
U.S. Cl. 356—28.5 **11 Claims**



1. A method for the simultaneous measurement of three velocity components with the aid of a laser Doppler anemometry, said method comprising the steps of:
using two continuous-wave lasers;
producing three interference fringe systems having three different wavelengths in a probe volume in which the three velocity components are to be measured;
aligning said three interference fringe systems at an angle up to 90° with respect to one another;
optically separating said three different wavelengths by at least 25 nm; using optical filters; and
measuring the modulation frequency of light scattered as an object passes through the probe volume to determine the three velocity components.

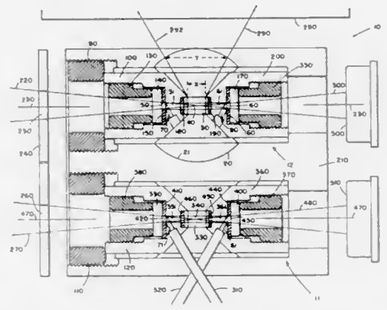
4,838,688

HIGH SENSITIVITY CHROMATOGRAPHY DETECTOR

Robert Rhoads, c/o Spectrovision, Inc. 14 Alpha Rd., Chelmsford, Mass. 01824

Continuation of Ser. No. 109,456, Oct. 16, 1987, abandoned.
This application Oct. 18, 1988, Ser. No. 259,488
Int. Cl.⁴ G01N *21/05, 21/64*
U.S. Cl. 356—72 **10 Claims**

1. A high sensitivity fluorescence and absorption detector comprising:
a substantially cylindrical flow cell connected to and receiving the outflow of a fluid chromatography column, the flow cell comprising a cylindrical capillary transparent to fluorescent radiation;
a housing comprising forward and rearward housing sections, each housing section including means for mounting one end of the capillary therein, the forward and rearward housing sections being spaced apart by the capillary mounted therebetween in the mounting means, the housing sections being configured around the capillary in the shape of a sectioned sphere;
means for projecting a fluorescence generating beam of radiation along an axis substantially coincident with the axis of the flow cell, the beam being projected to enter one end of the flow cell, focus at about the center point of the axis of the capillary, emanate through the other end of the flow cell and impinge upon a photodetector for detecting the portion of the beam which is not absorbed by the outflow flowing through the cell;



the surface of the housing sections around the capillary being reflective to fluorescent radiation and reflecting essentially all fluorescent radiation which emanates through the capillary and onto the surfaces of the housing sections through an aperture provided in the housing sections along a path offset from the axis of the flow cell;
the capillary being mounted in the housing sections such that the axial midpoint of the capillary coincides approximately with the center of the sectioned sphere formed by the housing sections;
the flow cell having a cross-sectional diameter and an axial length selected to cause the essential entirety of the beam directed into the flow cell and not absorbed to be directed along a direct or internally reflected path out of the flow cell;
the axis of the flow cell being disposed along and within the limits of a diameter of the sectioned sphere formed by the housing sections.

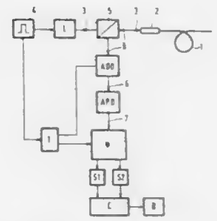
4,838,689

METHOD OF AND DEVICE FOR MEASURING THE ATTENUATION OF OPTICAL FIBERS BY MEANS OF THE BACKSCATTER METHOD

Ernst-Georg H. Neumann, Wuppertal, Fed. Rep. of Germany, assignor to U.S. Philips Corp., New York, N.Y.

Filed May 15, 1987, Ser. No. 50,828
Claims priority, application Fed. Rep. of Germany, May 17, 1986, 3616798
Int. Cl.⁴ G01N *21/84, 21/88*
U.S. Cl. 356—73.1 **10 Claims**

1. A method for the time dependent, partially automatic measurement of the backscattered portions of light pulses coupled into an optical fibre under test, comprising the steps of:
receiving said backscattered portions with an optical detector;
converting said received backscattered portions into electrical measurement signals;
amplifying said electrical measurement signals by a gain factor adjusted to the measurement range of the signals;
applying said amplified signals to an electronic evaluation circuit;



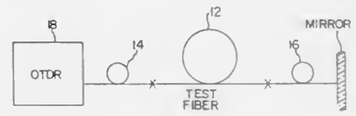
storing said amplified signals in memory means to enable same to be displayed on a display device;
measuring, during the course of an automatic measuring operation, at least two time adjacent time domains ($\Delta t1$, $\Delta t2$) of measurement signals with different gain factors; and
storing said measured signals in separate portions of memory (S1, S2) which are associated with said different gain factors and which are independently addressable.

4,838,690

SIMULTANEOUS BI-DIRECTIONAL OPTICAL TIME DOMAIN REFLECTOMETRY METHOD

Eric L. Buckland, Raleigh, and Masayuki Nishimura, Durham, both of N.C., assignors to Sumitomo Electric Fiber Optics Corporation, Research Triangle Park, N.C.

Filed Apr. 12, 1988, Ser. No. 180,545
Int. Cl.⁴ G01N *21/84, 21/88*
U.S. Cl. 356—73.1 **27 Claims**



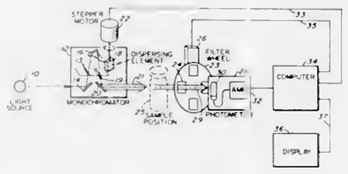
1. A simultaneous bi-directional testing method for measuring certain characteristics of an optical fiber by Optical Time Domain Reflectometry (OTDR) comprising the steps of:
splicing a test fiber between a launch fiber and a termination fiber, said launch fiber being operatively connected to an Optical Time Domain Reflectometry (OTDR) testing apparatus and said termination fiber being provided with a reflective coating at its terminal end;
introducing a light pulse into said launch fiber with said Optical Time Domain Reflectometry (OTDR) testing apparatus;
detecting the forward trace signal (T1) and the reverse trace signal (T2) from said light pulse;
correcting the reverse trace signal (T2) from said light pulse to remove reflected signals originating at the interface of said Optical Time Domain Reflectometry (OTDR) testing apparatus and said launch fiber; and
analyzing the forward trace signal (T1) and the corrected reverse trace signal (T2) to measure certain characteristics of said test fiber.

4,838,691

METHOD AND APPARATUS FOR DETERMINING CALIBRATION ACCURACY OF A SCIENTIFIC INSTRUMENT

Barry S. Master, Tustin, and Frank M. Aralis, Irvine, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 10, 1985, Ser. No. 753,741
Int. Cl.[4] G01J 3/18
U.S. Cl. 356—319 1 Claim



1. In a scientific instrument having a rotatable dispersing element in an optical system for generation of a select wavelength monochromatic light, a method for determining accuracy of calibration of the rotation position control of said dispersing element relative to a wavelength of light monochromatic generated as compared to the wavelength of light selected, comprising the steps of:

(a) determining an initial position of the light dispersing element;

(b) positioning a light absorbing medium in the path of said monochromatic light beam so as not to interfere with the sample position in the instrument, said medium comprising material having a plurality of identifiable light absorbance characteristics relative to light wavelength;

(c) rotating said dispersing element to scan a light spectrum through the optical system while detecting the energy level of the scanned wavelengths of monochromatic light obtained;

(d) determining a first angular position of said dispersing element by detecting a reduced light energy level when monochromatic light of the wavelength identifiable by a first absorbance characteristic of said absorbing medium is generated;

(e) determining a second angular position of said dispersing element by detecting a reduced light energy level when monochromatic light of a wavelength identifiable by a second absorbance characteristic of said light absorbing medium is generated;

(f) determining the difference between said first angular position and said second angular position to provide an initial reference value for said difference;

(g) determining the difference between said first angular position and said second angular position following calibration of said scientific instrument prior to use;

(h) comparing the difference determined between said initial reference difference between said angular positions and said measured difference between said angular positions with an empirically determined value;

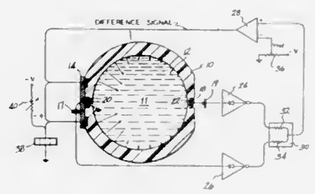
(i) indicating that the scientific instrument is not properly calibrated if the determined difference is greater than the empirical value.

4,838,692

TEMPERATURE-COMPENSATED APPARATUS AND METHOD FOR DETERMINING PULP STOCK CONSISTENCY

Irving R. Breuholdt, Stratford, Conn., assignor to Champion International Corporation, Stamford, Conn.

Continuation of Ser. No. 843,083, Mar. 24, 1986, abandoned.
This application Jan. 22, 1988, Ser. No. 147,263
The portion of the term of this patent subsequent to Mar. 26, 2002, has been disclaimed.
Int. Cl.[4] G01N 21/53
U.S. Cl. 356—343 2 Claims



1. Apparatus for measuring the percentage of solid particles in a suspension comprising:

a chamber adapted to contain a suspension to be measured;

a radiant energy source;

means for diffusing energy into said chamber;

first sensor means attached adjacent to the inside of said chamber for sensing diffused energy in said chamber which is forward-scattered when a suspension is present therein:

first compensation sensor means external to said chamber and operably connected with said first sensor means and having an electrical characteristic which varies in response to temperature changes the same way as the same electrical characteristic of said first sensor means varies in response to temperature changes:

second sensor means attached adjacent to the inside of said chamber for sensing diffused energy in said chamber which is back-scattered when a suspension is present therein; and

second compensation sensor means external to said chamber and operably connected to said second sensor means and having an electrical characteristic which varies in response to temperature changes the same way as the same electrical characteristic of said first means varies in response to temperature changes;

said first and second sensor means being radiation sensors,

said first and second compensation sensor means also being radiation sensors and being respectively connected in series reverse with said first and second sensor means,

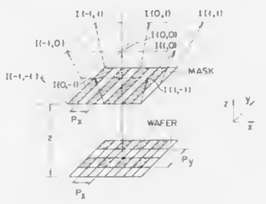
whereby said first and second compensation sensor means compensate for variations in temperature of said suspension whereby temperature variations will not create erroneous energy readings in the apparatus.

4,838,693

METHOD AND APPARATUS FOR SETTING A GAP BETWEEN FIRST AND SECOND OBJECTS TO A PREDETERMINED DISTANCE

Norio Uchida; Yoriyuki Ishibashi, both of Yokohama; Ryoichi Hirano, Tokyo; Masayuki Masuyama, Kumagaya, and Hiroaki Shimozono, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki and Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jun. 11, 1987, Ser. No. 60,601
Claims priority, application Japan, Jun. 11, 1986, 61-135172; Sep. 11, 1986, 61-212566; Nov. 29, 1986, 61-284586; Mar. 31, 1987, 62-78701
Int. Cl.[4] G01B 9/02
U.S. Cl. 356—356 40 Claims



1. A method for setting a gap between first and second objects, facing each other, to a predetermined distance, comprising the steps of:

arranging a first one-dimensional diffraction grating on said first object, the first diffraction grating having parallel bars extending in a first direction, perpendicular to a first plane, to which a second plane inclines at a predetermined angle (α), said second plane being symmetrical to a third plane with respect to said first plane;

arranging a second one-dimensional diffraction grating on said second object, the second diffraction grating having parallel bars extending in a second direction perpendicular to the first direction;

irradiating said first diffraction grating with light beam emitted from a light source, the light beam having an optical axis present in the second plane, so that the light beam is diffracted and transmitted through the first diffraction grating, and first diffracted light beams are emerged from said first diffraction grating;

transferring the first diffracted light beams to said second diffraction grating, so that the first diffracted light beams are diffracted and reflected by the second diffraction grating, and second diffracted light beams are emerged from said second diffraction grating;

transferring the second diffracted light beams to said first diffraction grating, so that the second diffracted light beams are diffracted and transmitted through the first diffraction grating, third diffracted light beams are emerged from said first diffraction grating, some of the third diffracted light beams are transferred in the third plane, and the other third diffracted light beams are transferred in any planes other than the third plane;

detecting one of the other third diffracted light beams; and

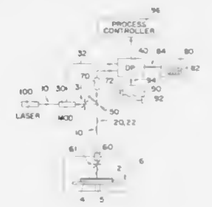
adjusting a distance of the gap between said first and second objects, in accordance with an intensity of the detected diffracted light beam, and setting the gap to a predetermined distance.

4,838,694

PROCESS FOR IMAGING LASERINTERFEROMETRY AND A LASERINTERFEROMETER FOR CARRYING OUT SAID PROCESS

Hans Betz, Berlin; Herman Mader, Unterhaching, and Joachim Pelka, Berlin, all of Fed. Rep. of Germany, assignors to Fraunhofer Gesellschaft zur Förderung, Munich, Fed. Rep. of Germany

PCT No. PCT/DE87/00002, § 371 Date Sep. 9, 1987, § 102(e) Date Sep. 9, 1987, PCT Pub. No. WO87/04237, PCT Pub. Date Jul. 16, 1987
PCT Filed Jan. 8, 1987, Ser. No. 113,275
Claims priority, application Fed. Rep. of Germany, Jan. 8, 1986, 3600346
Int. Cl.[4] G01B 9/02
U.S. Cl. 356—357 21 Claims



12. A laserinterferometer for examination of a surface of a layer on a substrate comprising:

laser means for producing a laser beam;

modulator means including an electrically modulated crystal for deflecting said laser means on to said layer;

detector means for detecting reflected laser beams and providing detector signals; and

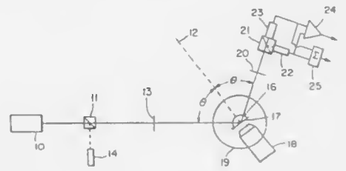
data processing means for analysis of said detector signals and providing a readout of information concerning said layer.

4,838,695

APPARATUS FOR MEASURING REFLECTIVITY

Masud Mansuripur, Newton Highlands; Michael Ruane, Brookline, and Robert Rosenvold, Brighton, all of Mass., assignors to Boston University, Boston, Mass.

Filed Jun. 12, 1987, Ser. No. 61,886
Int. Cl.[4] G01J 4/04
U.S. Cl. 356—369 16 Claims



1. Apparatus for measuring reflectivity comprising:

a polarized light source;

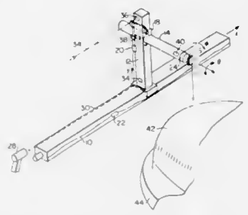
a first rotatable device to rotate a direction of polarization of polarized light from the source to any of a plurality of selectable angles;

a magnettooptic material illuminated by and reflecting light from the source;

a second device positionable in any of a plurality of selectable positions to alter the phase of the light reflected by the material;

a third device for rotating the direction of polarization of the reflected light;
first and second detectors to simultaneously measure the intensity of the electric field of light reflected by said material in two orthogonal planes; and
determining means for determining reflection coefficients of the magnetooptic material with the measured intensities.

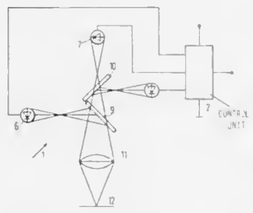
4,838,696
PULSED ROBOTIC INSPECTION
Timothy R. Pryor, Windsor, Canada, assignor to Diffracto Ltd., Windsor, Canada
Continuation of Ser. No. 761,315, Jul. 30, 1985, Pat. No. 4,585,350, which is a continuation of Ser. No. 462,127, Jan. 8, 1983, abandoned. This application Sep. 24, 1985, Ser. No. 779,457
The portion of the term of this patent subsequent to Apr. 29, 2003, has been disclaimed.
Int. Cl.[4] G01B *11/14, 11/24*
U.S. Cl. 356—375 **4 Claims**



1. A method for determining at least one dimension, location or other characteristic of a part being inspected utilizing an optical sensor attached to an inspection machined, said method comprising the steps of:
providing a read command signal to cause the optical sensor to begin sensing and, at essentially the same time, determining a first position of at least one axis of the inspection machine,
determining a second position of said at least one axis when the sensor, in sensing the part, has accumulated sufficient data from sensing the part to provide a useful reading,
determining, from the first and second positions of said at least one axis, data related to an intermediate position of said at least one axis between said first and second positions, and
determining from a combination of said intermediate location data and said sensor reading, the characteristic of the part.

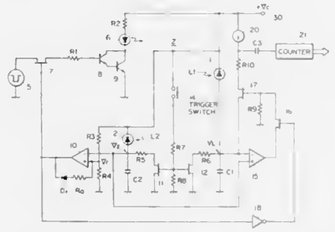
4,838,697
APPARATUS FOR RAPID COLORIMETRY ON DIFFERENT SAMPLES
Fritz Kurandt, Blankenhainer Strasse 21, D-1000 Berlin 46, Fed. Rep. of Germany
Filed Aug. 5, 1987, Ser. No. 81,905
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1986, 3626373
Int. Cl.[4] G01J *3/50*
U.S. Cl. 356—406 **7 Claims**

1. An apparatus for rapid colorimetry on different samples comprising:
(a) a transmitter capable of irradiating or through-radiating the particular sample;
(b) three semiconductor radiation sources located in the transmitter which irradiate in the red, green and blue spectral ranges, respectively;
(c) a unitary photoelectric receiver capable of receiving the radiation reflected or transmitted by the sample and generating signals;
(d) a filter unit arrangement capable of combining optical radiation emitted from the semiconductors associated with the transmitter by means of two dichroic mirrors, each located at an angle of 45 degrees to the direction of the radiation emitted by one of the semiconductor radiation sources;
(e) a computer capable of evaluating the signal supplied by the receiver;
(f) a lens arrangement associated with the transmitter capa-



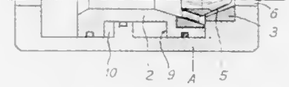
ble of focusing the combined optical radiation from the filter unit arrangement onto the particular sample;
(g) a control unit capable of providing successive pulses to control the semiconductor radiation sources, the control unit also capable of generating a signal permitting an association of the receiver signals with the radiation emitted in the different spectral ranges; and
(h) the semiconductor radiation sources, the filter unit and the lens arrangement adjusted in such a way that all the individual beams meet at one point forming an illuminating spot, the diameter of the illuminating spot being adaptable to the particular sample.

4,838,698
EXTINCTION TYPE DETECTOR
Hiromitsu Ishii, Chiba, and Takashi Ono, Yokohama, both of Japan, assignors to Hochiki Corp., Tokyo, Japan
Filed Mar. 31, 1987, Ser. No. 33,065
Claims priority, application Japan, Apr. 7, 1986, 61-79434
Int. Cl.[4] G01N *21/59*
U.S. Cl. 356—437 **11 Claims**



1. An extinction type detector which detects and determines a concentration or density of a gas or vapor in a space on the basis of an attenuation of light due to the gas or vapor present within the space, which detector comprises:
a light emitting device;
drive means for periodically and repeatedly driving the light emitting device for emitting light in a sequence of ON/-OFF cycles;
a first photodetector device which is disposed at a position where it can receive light from said light emitting device, a gas or vapor detecting space existing between said first photodetector device and said light emitting device;
a second photodetector device which is disposed at a position where it can receive light from said light emitting device, said light being received under the conditions that the gas or vapor does not intervene between said second photodetector device and said light emitting device;
first storage means for cumulatively storing photooutputs from said first photodetector device; second storage means for cumulatively storing photo-outputs from said second photodetector device, said stored outputs being accumulated as storage values from a plurality of said ON/OFF cycles of said light emitting device, the storage value in each said storage means increasing for each cycle wherein the associated photodetector device receives light, and
means for limiting the number of said cycles in said sequence of ON/OFF cycles,
determining means which, after said sequence of ON/OFF cycles is complete, detects a difference between the cumulative storage values of the first and the second storage means and determines a concentration or density of said gas or vapor within the space on the basis of said detected difference in cumulative values, said storage values representing said cumulative stored plurality of photo-outputs.

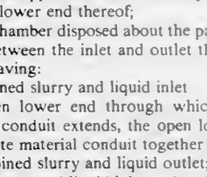
4,838,699
CEMENT MIXING PROCESS
Jean-Paul Jour; Jacques Orban, and André Salvaire, all of Saint-Etienne, France, assignors to Etudes et Fabrication, France
Filed Jan. 24, 1985, Ser. No. 694,379
Claims priority, application France, Feb. 21, 1984, 84 02594
Int. Cl.[4] B28C *1/16;* **B01F** *5/08*
U.S. Cl. 366—2 **4 Claims**



1. A process for homogenizing an abrasive fluid comprising the steps of applying to said fluid an energy of between 4.8 and 6.3 kJ/kg by pumping said fluid through a high pressure pump including at least one annular restruction, in line, at an outlet of said pump and mixing said fluid in said at least one annular restriction whereby a pressure drop through said at least one annular restriction is substantially independent of flow rate.

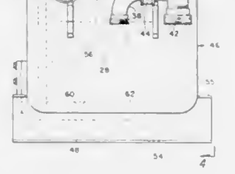
4,838,700
ASSEMBLIES FOR A WORM PRESS
Kirk E. Williamson, P.O. Box 1122, Luling, Tex. 78648
Filed Apr. 30, 1987, Ser. No. 44,197
Int. Cl.[4] B01F *7/08;* **B29B** *1/06*
U.S. Cl. 366—89 **15 Claims**

1. For combination with a worm type press or conveyor:
a hub, said hub having at least one keyway;
a cast tubular body composed of a material which is wear resistant or corrosion resistant or both, having end and inner and outer surfaces, said end surfaces each having an outwardly extending shoulder and at least one protruding axially extending key along said inner surface, said at least one key fitting into said at least one keyway in said hub;
an annular shoulder on one end of said hub that seats in said outwardly extending shoulder on one end of said cast tubular body, said cast tubular body further comprising a worm flight along said outer surface;



a retainer ring to secure said cast tubular body onto said hub to which said tubular body is adapted to fit;
and a shaft for driving said hub.

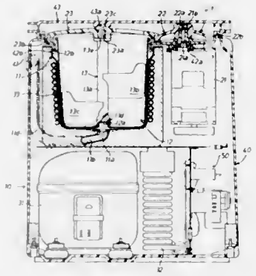
4,838,701
MIXER
D. W. Smith, Tulsa; R. D. Kennedy, Wagoner, both of Okla., and E. C. Garcia, Fabens, Tex., assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.
Continuation of Ser. No. 869,559, Jun. 2, 1986, abandoned. This application Apr. 25, 1988, Ser. No. 188,126
Int. Cl.[4] B01F *15/02;* **B28C** *7/12, 7/16*
U.S. Cl. 366—136 **14 Claims**



1. A mixer suitable for mixing a particulate material with at least one of a liquid and a slurry, comprising:
(a) a particulate material conduit having a particulate material inlet at an upper end thereof, and a particulate material outlet at a lower end thereof;
(b) a volute chamber disposed about the particulate material conduit, between the inlet and outlet thereof, the volute chamber having:
(i) a combined slurry and liquid inlet
(ii) an open lower end through which the particulate material conduit extends, the open lower end and the particulate material conduit together defining an annular combined slurry and liquid outlet;
the combined slurry and liquid inlet and outlet being disposed so that at least one of liquid and slurry entering the combined slurry and liquid inlet at sufficient velocity can leave the combined slurry and liquid outlet in the form of a vortex;
(c) a transition cone concentric with, outside of, and communicating with the combined slurry and liquid outlet of the volute chamber, and extending downward therefrom, the transition cone having a tapered portion starting above the combined slurry and liquid outlet and ending below it; and
(d) a combined slurry and liquid conduit communicating with the combined slurry and liquid inlet of the volute chamber, the combined slurry and liquid conduit having:

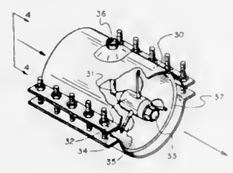
(i) a liquid carrying leg;
(ii) a nozzle disposed in the liquid carrying leg and aimed at the combined slurry and liquid inlet of the volute chamber so as to direct liquid flowing in the liquid carrying leg into the combined slurry and liquid inlet of the volute chamber; and
(iii) a slurry carrying leg, said slurry carrying leg joining with the liquid carrying leg, surrounding the nozzle and mating with the combined slurry and liquid inlet of the volute chamber, whereby slurry flowing in the slurry carrying leg enters the combined slurry and liquid inlet of the volute chamber.

4,838,702
ELECTRIC CONTROL APPARATUS FOR ICECREAM-MAKING MACHINE
Hiroshi Torimitsu; Yukimasa Takeda, and Koji Tsuchikawa, all of Toyoake, Japan, assignors to Hoshizaki Denki Kabushiki Kaisha, Toyoake, Japan
Filed Jul. 1, 1988, Ser. No. 214,359
Claims priority, application Japan, Jul. 2, 1987, 62-102190
Int. Cl.[4] B01F *15/06*
U.S. Cl. 366—149 **4 Claims**



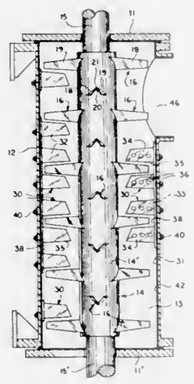
1. An electric control apparatus for an icecream-making machine wherein a stirring paddle is settled in an icecream-forming container in conditions for thermal exchange with an evaporator coil of a refrigerating system and is driven by an electric motor to whip icecream ingredients stored in the container, the electric control apparatus comprising:
sensing means for detecting the rotational speed of said stirring paddle for producing a pulse signal therefrom at a period inversely proportional to the detected rotational speed;
output means responsive to the pulse signal from said sensing means for producing an output signal therefrom when 1/n of the period of the pulse signal is more than a predetermined period of time and for ceasing production of the output signal when 1/n of the period of the pulse signal has become less than the predetermined period of time; and
power supply means for permitting supply of an electric power to said motor when said output means is conditioned to cease production of the output signal and for cutting off the supply of the electric power to said motor in response to the output signal from said output means.

4,838,703
INJECTION IMPELLER FOR AGRICULTURAL CHEMICALS
Galen M. McMaster, American Falls, and Donald W. Sunderman, Aberdeen, both of Id., assignors to G & D Whirlwind Inc., American Falls, Id.
Filed Jul. 25, 1988, Ser. No. 223,404
Int. Cl.[4] B01F *5/02*
U.S. Cl. 366—169 **4 Claims**



1. An apparatus for the injection and dispersal of liquid additives into irrigation sprinkler systems comprising in combination:
an L-shaped hollow spindle descending downwardly through and being integrally formed with the upper half of a saddle clamp, said hollow forming an inner bore through which fluid may pass, the horizontal arm of said spindle having therein an aperture to allow fluid to move from the inner bore outward;
a substantially cylindrical hollow hub rotatably disposed about the horizontal arm of said L-shaped hollow spindle, said hollow space forming an inner cavity for movement of fluid therethrough;
a plurality of hollow injection tubes extending radially outward from said hub, the inner bore of each said tube being contiguous with said inner cavity of said hub, each tube being open at its outermost end;
a substantial semi-circular impeller blade connected to each said injection tube along a degree of its length, each blade being transversely oriented to said hub.

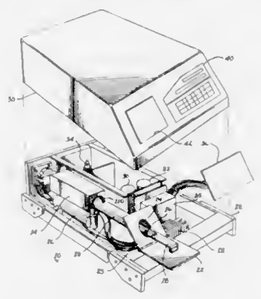
4,838,704
MIXER APPARATUS
David L. Carver, Carver Machine Works, Rte. 5, Box 76, Riverside Dr., Washington, N.C. 27889
Filed Dec. 15, 1987, Ser. No. 133,073
Int. Cl.[4] B01F *7/04*
U.S. Cl. 366—307 **4 Claims**



1. A pulp mixing apparatus, comprising,

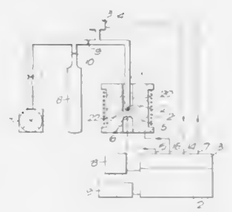
a cylindrical housing having a rotor shaft with an axis and circumferentially opposite sides rotationally mounted within said cylindrical housing, a curvilinear interior wall circumferentially disposed about said rotor shaft to form thereby a mixing cavity;
said housing having an inlet and an outlet thereon providing means for entry of material into said mixing cavity and means for egress therefrom, determining an upstream direction and a downstream direction,
a plurality of rotor vanes radially mounted along the axis on said rotor shaft, arrayed with pairs of said rotor vanes extending in opposite directions from said opposite sides of the rotor shaft,
said rotor vanes each having a rotor primary surface and a rotor secondary surface that forms a mirroredly imaged congruent surface of said rotor primary surface, said primary surface and said secondary surface joined in a cross sectional chevron symmetrically about and along a common edge,
said housing interior wall having radially affixed thereto a plurality of stators; said stators each having a stator primary surface and a stator secondary surface that forms in outline a mirroredly imaged congruent form of said stator primary surface, said stator primary surface and said stator secondary surface joined in chevron symmetrically about and along a common edge to define a wedge shaped cavity therebetween; said stators having a plurality of orifices therein;
certain of said rotor vane common edges facing in said upstream direction with the balance of said rotor vane common edges facing in said downstream direction, and
said rotor vanes and said stators arrayed with respect to one another such that said rotor rotates and said vanes pass in proximity to said stators, a mixing action is established such that a material mixing therewithin is displaced rotationally, and is compressed as it nears a stator; and is further subjected to a suction or negative atmospheric force as said rotor vanes continue past said stators; whereafter the material displaced from said rotors moves around said stators as a vacuum is relieved by said stator orifices and said material being further subjected to an implosion as a direct result of the atmospheric action thereon, whereby the material undergoes a homogeneous mixing action.

4,838,705
APPARATUS FOR DETERMINING PERCENT OF MOISTURE
Charles H. Byers, Jr., Phoenix; Terry L. Michl, Scottsdale, and Dennis E. Acord, Phoenix, all of Ariz., assignors to Arizona Instrument Corporation, Tempe, Ariz.
Filed Jun. 8, 1987, Ser. No. 59,112
Int. Cl.[4] G01G *19/00;* **G01N** *22/04*
U.S. Cl. 374—14 **45 Claims**



1. Apparatus for collecting and weighing a volatile fluid of interest from a sample under test, said apparatus comprising in combination:
(a) an oven for heating the sample under test and converting the volatile fluid of interest to a gaseous state;
(b) a collector for collecting the volatile fluid of interest, said collector increasing in weight during accretion of the volatile fluid of interest;
(c) means for conveying flow of the volatile fluid of interest from said oven to said collector; and
(d) means for determining the change in weight of said collector in response to collection of the volatile fluid of interest and during flow of the volatile fluid of interest into said collector, said weight change determining means including means for supporting said collector, means for accommodating repetitively downward movement of said supporting means from an initial position in response to the increase in weight of said collector and means for repetitively repositioning said collector to the initial position after each downward movement; and
(e) means for interconnecting said conveying means with said collector, said interconnecting means including a length of flexible tubing which accommodates repositioning of said collector relative to said conveying means without imposing any changes in forces acting upon said collector due to any flexing of said tubing.

4,838,706
THERMAL ANALYSIS
John M. D. Coey, and Dominic H. Ryan, both of Dublin, Ireland, assignors to The Provost, Fellows and Scholars of the College of the Holy and Undivided Trinity of Queen Elizabeth Near Dublin, Ireland
Filed Mar. 19, 1987, Ser. No. 27,951
Claims priority, application United Kingdom, Mar. 24, 1986, 8607231
Int. Cl.[4] G01N *25/00, 7/16*
U.S. Cl. 374—54 **14 Claims**



1. A method of thermal analysis of a solid or liquid sample which evolves or absorbs gas on heating or cooling, which comprises locating the sample in a portion of a closed volume, heating and/or cooling the sample, continuously monitoring both the temperature of the sample and the pressure of gas in the closed volume, inputting measurements of sample temperature and gas pressure to a data processor, controlling the temperature change of the sample by an output from the data processor, and using the data processor to monitor the value of gas pressure P as a function of sample temperature T.

4,838,707

ELECTRONIC THERMOMETER

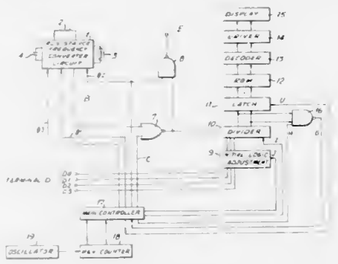
Masaki Ozawa; Toshiyuki Hosaka, both of Shiojiri, and Masayuki Yosbizawa, Suwa, all of Japan, assignors to Shiojiri Kogyo Kabushiki Kaisha, Nagano and Kabushiki Kaisha Suwa Seikosha, Tokyo, both of, Japan

Continuation of Ser. No. 696,385, Jan. 30, 1985, abandoned. This application Jul. 17, 1987, Ser. No. 77,086

Claims priority, application Japan, Feb. 1, 1984, 59-17499; Sep. 13, 1984, 59-202778

Int. Cl.[4] G01K 7/24

U.S. Cl. 374—171 23 Claims



1. An electronic measuring device comprising:
sensing means having a physical property which varies in response to a quantity to be measured;
reference means having a physical property like that of the sensing means but which is substantially invariant in response to variations of the quantity being measured;
permanently programmable storage means for providing a predetermined initial logic adjustment value which represents the difference between the absolute values of the sensing means and the reference means;
converter means for measuring the reference means during a first measurement period to provide a reference count value and for measuring the sensing means during a second measuring period to provide a sensing count value, each count value being proportional to the respective measurements;
comparing means having the initial logic adjustment value, the reference count value, and the sensing count value as inputs, the comparing means providing a signal when the sum of the reference count and the initial logic adjustment value attains a predetermined value and a corrected sensing count value as an output at the end of the second measuring period;
controller means responsive to the signal from the comparing means for establishing the length of the second measuring period; and
means for changing the corrected sensing count value into a digital value for display of the measured quantity.

4,838,708

SECURITY DEPOSIT BAG

Bruce A. Holcomb, Stillwater; Shaun D. McCracken, Oakdale, and Bryan J. McGinnis, Birchwood Village, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 7, 1988, Ser. No. 159,431

Int. Cl.[4] B65D 33/14

U.S. Cl. 383—5 21 Claims

1. A security deposit bag for receipt of articles, comprising:
(a) a first panel and a second panel, said panels being joined to form sides and a bottom of the bag, and the bag having an opening providing access to an interior of the bag;
(b) adhesive closure means adhered to said first panel and adapted to secure said panels together to close the opening of the bag;
(c) said adhesive closure means including tamper indicating means having a layer of low adhesion material applied in intimate surface to surface contact with one of said first

panel, said second panel and said adhesive closure means for creating indicia visually perceptible externally of the bag after said adhesive closure means has adhesively secured said panels together and said panels are separated to open the bag.

4,838,709

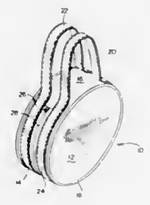
PORTABLE CASE FOR COMPUTER INFORMATION STORAGE MATERIALS

Jean R. Guerriero, 124 Sheldon Ave., Pittsburgh, Pa. 15220, and Melinda M. Carbonara, 535 Brazil St., Pittsburgh, Pa. 15227

Filed May 23, 1988, Ser. No. 197,202

Int. Cl.[4] B65D 33/06

U.S. Cl. 383—18 4 Claims



1. A portable case for transporting computer information storage materials, comprising
a pair of spaced apart closed loop members affixed to and circumscribing a major dimension of said case, each of said loop members extending in a single plane parallel to and separate from the plane of the other loop member,
a handle means formed by said loop members where said loop members are not affixed to said case, and
an elongated closure means disposed between said loop members and being parallel thereto where said loop members are affixed to said case, whereby said elongated closure means is disposed on said case generally opposite to that portion of said case bounded by said handle means where said loop members are not affixed to said case.

4,838,710

STATIC PRESSURE GAS BEARING ASSEMBLY

Jiro Ohta, Tokyo; Sadamu Tozawa, Ushiku; Koichi Matsushita, Chiba, and Yutaka Maruyama, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

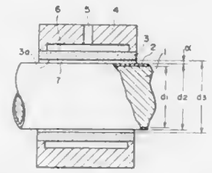
Filed Sep. 29, 1987, Ser. No. 102,358

Claims priority, application Japan, Sep. 14, 1986, 61-228578; Sep. 30, 1986, 61-230038; Sep. 30, 1986, 61-230037

Int. Cl.[4] F16C 32/06, 33/02

U.S. Cl. 384—100 9 Claims

1. A static pressure gas bearing assembly, comprising:
a porous graphite member disposed to provide a bearing surface and made by molding, calcining and graphitizing carbon particles, having particle diameters distributed in a range not more than approximately 40 microns, such that a number of pores are substantially uniformly distributed in said porous graphite member; and



means for supplying a gaseous fluid to said porous graphite member so that the gaseous fluid is discharged through said pores and form said bearing surface of said porous graphite member.

4,838,711

BEARING FOR AN EXHAUST-GAS TURBOCHARGER

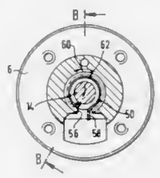
Uwe Münkel, Frankenthal, Fed. Rep. of Germany, assignor to Kuehnle, Kopp & Kausch, Fed. Rep. of Germany

Filed Apr. 8, 1988, Ser. No. 179,290

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 3712444

Int. Cl.[4] F16C 27/02

U.S. Cl. 384—215 16 Claims



1. A bearing for an exhaust-gas turbocharger comprising a bearing housing defining a bore and a recess opening into said bore, a sleeve arranged in a floating manner in said bore for radially mounting a turbocharger shaft, said sleeve having a bushing portion with an inner bearing face and an outer bearing face at each of its two axial end regions and webs joining said bushing portions defining at least two openings axially between the bushing portions, and means arranged in said bearing housing for preventing rotation of said sleeve around said shaft, said rotation preventing means comprising an at least substantially annular spring element which is elastic in the circumferential direction and which has a first end which engages in a groove in said sleeve and a second end which engages in said recess in said bearing housing.

4,838,712

BALL BEARING AND THE RETAINER THEREOF

Mutsuo Kubo, Hatano, and Yoshiaki Katsuno, Fujisawa, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

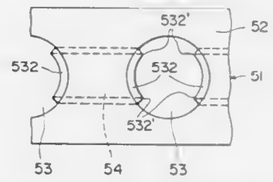
Continuation of Ser. No. 877,802, Jun. 24, 1986, abandoned. This application Oct. 8, 1987, Ser. No. 106,029

Claims priority, application Japan, Jun. 28, 1985, 60-97701[U]

Int. Cl.[4] F16C 33/38

U.S. Cl. 384—523 11 Claims

1. A ball bearing comprising:
an outer race and an inner race defining an annular space therebetween,
a plurality of balls disposed in said annular space in rolling engagement with said outer race and said inner race, and
a retainer ring disposed in said annular space and having a plurality of circumferentially spaced through holes extending substantially radially of said ring each retaining a corresponding one of said balls therein,
each through hole having, only near an open inner end thereof, restraining protrusion means for guiding said retainer ring in said annular space by engagement with the corresponding ball as said inner race and said outer race rotate relative to one another, said restraining protrusion



means including two discrete restraining protrusions which are disposed at opposite sides of said through hole relative to the circumferential direction of said retaining ring and which project generally radially inward of said through hole, said two protrusions each having respective ends disposed toward either axial end of said retaining ring and spaced circumferentially of said through hole from the ends of the other of said two protrusions, said two protrusions being positioned in engagement at their respective ends with opposite sides of the corresponding ball retained in said through hole so as to effect four-point support of the ball.

4,838,713

THERMAL TRANSFER PRINTER HEAD POSITION HOMING MECHANISM

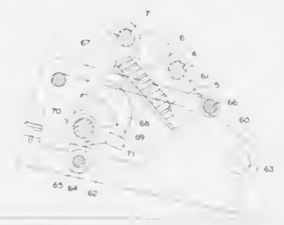
Michio Kunimitsu, Yawata; Hiroshi Tomita, Tsuzuki; Akio Akao, and Hiroshi Kano, both of Osaka, all of Japan, assignors to Sanyo Electric Ltd., Osaka, Japan

Filed Aug. 18, 1986, Ser. No. 897,382

Claims priority, application Japan, Aug. 20, 1985, 60-126653[U]; Dec. 16, 1985, 60-193974[U]

Int. Cl.[4] B41J 3/20

U.S. Cl. 400—120 6 Claims



1. A thermal transfer printer including a thermal transfer head and a platen, said head being shiftable between a contact position with said platen and a non-contact position comprising;
an eccentric cam rotationally controlled so as to be positionable between a first and second position;
a cam follower being mechanically connected to said thermal transfer head and biased against said eccentric cam wherein upon said eccentric cam rotating into its said first

position said thermal transfer head is biased into its said contact position with said platen, upon said eccentric cam rotating into its said second position, said thermal transfer head is biased into its said non-contact position;

a motor for rotationally driving said eccentric cam;

a sensor for detecting that said eccentric cam is in a predetermined zone, said predetermined zone of said eccentric cam being between the said first and second positions of said cam;

means for controlling the rotation of said motor to rotate said eccentric cam in a direction toward said second position upon said sensor detecting that said eccentric cam is in said predetermined zone, and after the rotation, said control means causing said motor to rotate said eccentric cam toward said second position a first predetermined amount (θ) upon said sensor detecting that said eccentric cam is out of predetermined zone.

4,838,714

NEEDLE PRINT HEAD

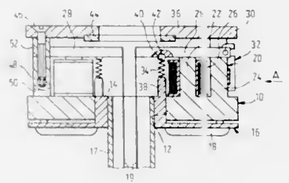
Herbert Beck; Karl-Heinz Anton, and Harald Homner, all of Paderborn, Fed. Rep. of Germany, assignors to Nixodorg Computer AG, Paderborn, Fed. Rep. of Germany

Filed Feb. 17, 1988, Ser. No. 156,833

Claims priority, application Fed. Rep of Germany, Mar. 2, 1987, 3706730

Int. Cl.[4] B41J *3/10*

U.S. Cl. 400—124 7 Claims



1. A needle print head including a plurality of hinged armature magnets arranged in a ring about a needle guide with each of said magnets having a U-shaped magnet yoke having legs, a print needle, a spring means, a stop, an insertable and removable cylindrical pin, support forks located on both sides of a yoke leg, a magnet coil surrounding one of the legs of the magnet yoke and an at least nearly radially directed hinged armature including inner and outer ends and is rigidly connected at its radially inner end with the print needle and is biased by the spring means to a rest position remote from the yoke at which it engages the stop, characterized in that the hinged armature is supported at its radially outer end by means of the cylindrical pin for pivotal movement about the axis of the pin such that the cylindrical pin is supported by the support forks located on both sides of the radially outer yoke leg, the support forks being made of plastic and including U-shaped fork legs enclosing between themselves a partially cylindrical support surface extending for slightly more than 180° so that during assembly of said pin with said fork legs said pin may be pushed sideways into engagement with said support surfaces of said forks with said fork legs of each fork elastically deflecting during such assembly to provide a snap action reception of said pin whereby after such assembly said pin is held by said fork legs in engagement with said support surfaces and against movement by itself from said forks.

4,838,715

INK RIBBON CASSETTE

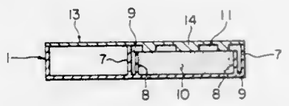
Hiromichi Ishikawa, Kanagawa, Japan, assignor to Pilot Man-Nen Hitsu Kabushiki Kaisha, Japan

Filed Feb. 24, 1988, Ser. No. 160,043

Claims priority, application Japan, Feb. 24, 1987, 62-26104[U]; Feb. 24, 1987, 62-26105[U]

Int. Cl.[4] B41J *32/02, 31/16*

U.S. Cl. 400—196.1 5 Claims



1. An ink ribbon cassette for supplying ink from an ink-impregnated material to an ink ribbon, comprising:

a cassette body having a container formed as a part thereof, said container being at least partly defined by an outer peripheral wall; and

a cover fixedly secured to said cassette body, said container accommodating said ink-impregnated material, at least one of said cover and said body including means forming a space between said ink-impregnated material and said cover, and an ink pool providing capillary action formed in an inner surface of said outer peripheral wall defining said container and being open to said space to hold by capillary action excess ink leaking from said ink-impregnated material.

4,838,716

RIBBON CARTRIDGE FOR A PRINTER

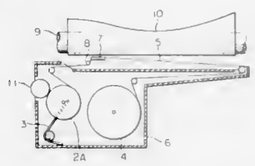
Mikio Shinada, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 907,836, Sep. 16, 1986, abandoned. This application May 19, 1988, Ser. No. 198,658

Claims priority, application Japan, Mar. 4, 1985, 60-48596

Int. Cl.[4] B41J *35/28*

U.S. Cl. 400—208 4 Claims



1. A ribbon cartridge for a printer comprising:

a ribbon cartridge casing housing therein a ribbon-feeding means and a ribbon-winding means with a printing ribbon entrained therebetween, said cartridge casing having means for enabling replacement of the contents of said cartridge comprising a detachable and replaceable lid member;

a ribbon-feeding roller having a projectionless outer periphery formed of a high friction rubber material and,

said ribbon-feeding roller being detachably and replaceably mounted in said cartridge casing, part of the ribbon-feeding roller being exposed outwardly of said cartridge casing and part of said ribbon-feeding roller being in pressure engagement with the winding side of the ribbon wound around said ribbon-winding means.

4,838,717

SERIAL DOT MATRIX PRINTER

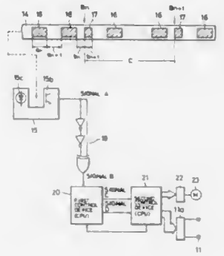
Wataru Ogura, Nagano, Japan, assignor to Chinon Kabushiki Kaisha, Nagano, Japan

Filed Jan. 28, 1988, Ser. No. 149,489

Claims priority, application Japan, Jan. 28, 1987, 62-17967

Int. Cl.[4] B41J *19/30, 29/20*

U.S. Cl. 400—322 7 Claims



1. A serial dot matrix printer for carrying out printing operations in accordance with a preset firing signal by shuttling a carriage having a printing head, said printer comprising:

motor means for driving said carriage;

slit encoder means for producing firing and block signals provided with firing signal slits each having a predetermined width and which are successively formed with a predetermined space therebetween, and provided with block signal slits each having a width smaller than said predetermined width of said firing signal slits and which are formed in every block composed of a plurality of said firing signal slits;

optical sensor means arranged to move along a length of said slit encoder meas as said carriage moves for producing a signal at every one of said firing signal and block signal slits;

first control means having block detecting means and firing timing means, said block detecting means measuring a transit time between each of said firing signal and block signal slits in response to said signal from said optical sensor and detecting a block signal when the measured transit time is less than a predetermined value, said firing timing means producing a firing timing signal by dividing the transit time through each of said firing signal slits by a predetermined number every time a firing signal slit is measured; and

second control means having carriage control means for controlling said motor means according to said detected block signals.

4,838,718

PRINTING DEVICE

Takashi Okumura, and Koshiro Yamaguchi, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 29, 1986, Ser. No. 947,915

Claims priority, application Japan, Jan. 8, 1986, 61-1535[U]; Jan. 8, 1986, 61-1536[U]

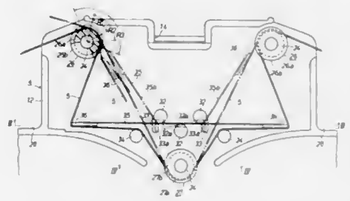
Int. Cl.[4] B41J *32/00*

U.S. Cl. 400—234 14 Claims

1. A printing device comprising a chamber, a supply of ribbon contained within said chamber, an opening for exit and entrance of said ribbon from and into said chamber;

a ribbon guiding means provided along a threading path on which said ribbon advances, for guiding said ribbon and for restraining lateral movement of said ribbon; and

a resiliently deformable, integrally constructed, elastic movement means for changing said threading path to change the tension on said ribbon, said movement means comprising a base member connected to a case, a contacting member which contacts said ribbon and a flexible member extending from said base member, said flexible member comprising a pair of elastic arms extending symmetrically from said base member, each having a support



member extending therefrom, said movement means selectively conforming to a first form and a second form, said movement means in said first form causing a decrease in a contact area established between said ribbon and said ribbon guiding means, and said movement means in said second form causing an increase in said contact area.

4,838,719

SHEET TENSIONING PRINTER ROLLERS

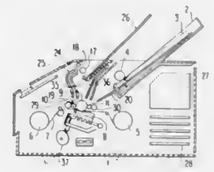
Ryuzo Une, Fukuyama, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1987, Ser. No. 59,364

Claims priority, application Japan, Sep. 29, 1986, 61-228347

Int. Cl.[4] B41J *11/24, 15/16*

U.S. Cl. 400—618 3 Claims



1. A thermal transfer color printer, comprising:

(a) a platen roller (**9**) mounted for forward and reverse rotation to advance a sheet of paper through a printing station in a first, print direction of conveyance and return said sheet of paper back through the printing station in a second, opposite direction of conveyance pursuant to the successive printing of different, overlying color separations on the paper,

(b) first and second pinch rollers (**11, 10**) individually disposed parallel to the platen roller, on opposite, feed and discharge sides of the printing station, and in biased engagement with the platen roller to define respective sheet conveying nips therewith, said first and only said first pinch roller being exclusively frictionally driven by the platen roller at a same peripheral speed as the platen roller in both directions of conveyance,

(c) drive means (**33**) for enabling the frictional driving of said second pinch roller by and at said same peripheral speed as the platen roller when conveying said sheet of paper in said first direction,

(d) reduction gears (**31, 32**) for positively driving said second pinch roller at a slower peripheral speed than that of the platen roller when conveying said sheet of paper in said second direction such that said sheet of paper is tensioned

and maintained in intimate contact with the platen roller to avoid mis-registrations between the color separations and attendant fringe patterns,

(e) a thermal print head (8) disposed at the printing station, and

(f) means (37) for:

(1) urging the print head against the platen roller during the conveyance of the sheet of paper in the first direction to thereby tension said sheet, and

(2) retracting the print head away from the platen roller during the conveyance of the sheet in the second direction whereat the sheet is exclusively tensioned by the reduction gears.

4,838,720

PAPER GUIDE OF PRINTER FOR WORD-PROCESSOR

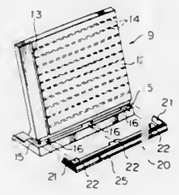
Masaaki Sakai, Toyokawa; Sadao Ishihara, Toyohashi, and Touma Shimoyama, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 32,959, Mar. 31, 1987, abandoned, which is a continuation of Ser. No. 746,341, Jun. 19, 1985, abandoned. This application Dec. 18, 1987, Ser. No. 135,541

Claims priority, application Japan, Jun. 25, 1984, 59-95854[U]

Int. Cl.[4] B41J *13/10, 29/16*

U.S. Cl. 400—642 7 Claims



1. In a word-processor which includes a display unit, a keyboard unit and a printer, said printer having an upper surface containing a paper inlet slot, and a paper guide means located on the upper surface of said printer for guiding paper positioned thereagainst downwardly into said paper inlet slot, and said display unit and said paper guide means being positioned to be simultaneously viewable by an operator typing on said keyboard unit, the improvement wherein said paper guide means comprises

a base element which provides a flat guide surface against which paper can be positioned, said flat guide surface being substantially planar throughout the entire extent thereof and having a straight lower edge and a horizontal opening in said flat guide surface, and

a tray element including a floor and a front wall which is connected to said floor, said tray element being movably mounted on said base element between a first position and a second position relative to said flat guide surface, and wherein when said tray element is in said first position, said floor is located within said horizontal opening and said front wall is flush with said flat guide surface on to allow paper to be printed on to pass downwardly relative to said flat guide surface and into said paper inlet, and when said tray element is in said second position, said floor extends away from said flat guide surface together with said front wall so as to be capable of retaining draft paper placed thereon, said tray element being located entirely ahead, in the direction of paper flow, of said paper inlet slot.

4,838,721

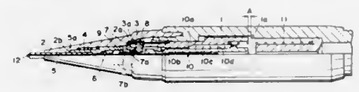
AUTOMATIC LEAD ADVANCE FOR MECHANICAL PENCILS

Hideaki Oikawa, Kasukabe, Japan, assignor to Pentel Kabusiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1988, Ser. No. 188,814

Int. Cl.[4] B43K *21/02, 21/16*

U.S. Cl. 401—53 3 Claims



1. An automatic lead advance for a mechanical pencil comprising:

a tubular casing,

a conical member adapted to a front end portion of said tubular casing,

a ring fixed to an inner surface of said conical member,

an annular pivotable member provided at a front side of said ring so that said annular pivotable member can be turned to an inclined posture, and to a vertically standing posture when in contact with said ring,

a lead guide tube having a lead retainer, said lead guide tube being urged backward by a spring, adapted to be slidable in the axial direction, and positioned so that a portion of a front end surface of said pivotable member contacts a rear end portion of said lead guide tube,

a ball chuck mechanism urged forward toward said conical member by a spring and adapted to be movable between a rear end surface of said ring and an end surface of a stepped portion formed on an inner surface of said tubular casing, and

a stopper provided at a front end of an outer tube of said ball chuck mechanism and contacting at a front end surface thereof a portion of a rear end surface of said pivotable member.

4,838,722

DEVICE FOR DISPENSING FLOWABLE SUBSTANCES

Otto Katz, Schwabach, Fed. Rep. of Germany, assignor to A.W. Faber-Castell Unternehmensverwaltung GmbH & Co., Stein, Fed. Rep. of Germany

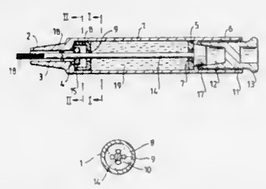
PCT No. PCT/DE86/00284, § 371 Date Mar. 13, 1987, § 102(e) Date Mar. 13, 1987, PCT Pub. No. WO87/00404, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 10, 1986, Ser. No. 41,083

Claims priority, application European Pat. Off., Jul. 13, 1985, 85 108 770.0; Jul. 13, 1985, 85 108 771.8; Fed. Rep. of Germany, Oct. 11, 1985, 35 36332

Int. Cl.[4] B43K *24/08;* B05C *17/00*

U.S. Cl. 401—101 19 Claims



5. A device for dispensing a flowable substance, comprising:

a. a longitudinally elongated housing having a front end and a rear end, said housing including

(1) a dosaging chamber,

(2) a supply vessel for storing a quantity of the flowable substance, rearward of said chamber,

(3) a discharge bore in said front end, forward of said chamber, and

(4) a front end opening, opening to the exterior of the housing forward of said discharge bore; said chamber having a front face and a rear face at respective opposite longitudinal ends thereof, said front and rear faces respectively having front and rear openings therein, said chamber respectively communicating with said discharge bore and said supply vessel through said front opening and said rear opening;

b. a longitudinally elongated member having a forward end and a rearward end and being axially longitudinally displaceable in said housing, said elongated member having

(1) a sealing face disposed in said chamber and facing said rear face, said sealing face alternately closing and opening said rear opening with rearward and forward displacement of said elongated member,

(2) a dosaging piston disposed in said chamber and opening and closing said front opening with rearward and forward displacement of said elongated member, and

(3) a shaft on a forward end of said dosaging piston so as to project into said discharge bore through said front opening, said shaft having a lesser diameter than a diameter of said front opening;

c. an applicator mounted to said a forward end of said shaft so as to be displaceable with rearward and forward displacement of said elongated member outward of said front end opening and into said discharge bore; and

d. an elastically deformable blocking piston on said elongated member at a rear end of said supply vessel opposite said rear opening of said chamber sealing said supply vessel against the rearward escape of the substance therefrom, said elongated member being longitudinally movable with respect thereto, such that a longitudinal movement of said elongated member with said shaft in said front opening causes a predetermined amount of the substance to pass through said front opening into said discharge bore to be retained by said applicator.

4,838,723

FLEXIBLE PEN NIB FOR WRITING PURPOSES

Churyo Suzuki, Ichikawa; Kozo Ando, Chiba, and Tooru Enomoto, Tokyo, all of Japan, assignors to Aubex Corporation, Japan

PCT No. PCT/JP82/00250, § 371 Date Feb. 11, 1983, § 102(e) Date Feb. 11, 1983, PCT Pub. No. WO83/00121, PCT Pub. Date Jan. 20, 1983

PCT Filed Jun. 30, 1982, Ser. No. 485,118

Claims priority, application Japan, Jun. 30, 1981, 56-101482

Int. Cl.[4] B43K *8/02*

U.S. Cl. 401—199 5 Claims

1. A pen nib for writing instruments, comprising a nib body made of a bundle of fibers and formed with capillary channels for passing ink therethrough:

said nib body (20) being a porous rod-like body including a number of longitudinally oriented crimped polyamide fibers (21), and synthetic resin elastomer (22) having an elongation of approximately 200% or more, and a 100% modulus of approximately 100 kg/cm^2 or less, said synthetic resin elastomer (22) cooperating with the polyamide fibers to form a rubber like elastic body in the form of a composite-fiber textures; said synthetic resin elastomer (22) having one or more of said polyamide fibers (21) as the core, to form random-shaped elements (23) having composite fiber-like sections, the random shaped elements being arranged in a randon aggregation in any cross-section of the nib body (20), leaving said capillary channels in the form of a number of fine gaps (24);

said gaps (24) having an orientation in the axial direction of the nib body (20) and, inside of the nib body (20), a porosity within a range of 35 to 70%; at least one end of the nib body (20) being formed as a writing end (25) having an elastic restoring characteristic provided by the synthetic resin elastomer (22) extending longitudinally of the polyamide fibers (21) of the random-shaped elements (23).

4,838,724

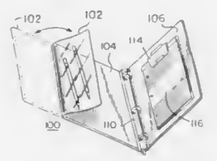
BINDER WITH PENCIL POCKET

Meredith Spence, Jr., Dayton, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 1, 1988, Ser. No. 162,436

Int. Cl.[4] B42F *13/00;* B42D *3/00;* B65D *65/02;* A41H *37/06*

U.S. Cl. 402—79 7 Claims



1. A binder comprising front and rear hingedly connected covers wherein at least one of said covers comprises:

a relatively stiff panel;

a plastic cover overlaying the outer surface of said panel and extending beyond one edge thereof to define a flap which forms a first wall of a pencil pocket;

wall means secured to said flap along three sides thereof for forming a second wall of said pencil pocket; and

fastener means for releaseably securing said wall means to said flap along a fourth side thereof to define a recloseable entryway for said pencil pocket.

4,838,725

DRIVING UNIT FOR MANDRELS AND THE LIKE

Hermann Fazis, Weil am Rhein, Fed. Rep. of Germany, assignor to Ludwig Boschert GmbH & Co. KG, Lörrach-Hauingen, Fed. Rep. of Germany

Filed Feb. 23, 1988, Ser. No. 159,078

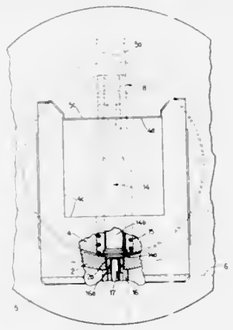
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1987, 3706166

Int. Cl.[4] B25G *3/18*

U.S. Cl. 403—322 20 Claims

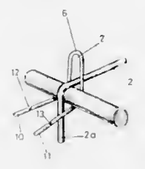
1. A driving unit for mandrels or other rotary driven parts, comprising a driving member rotatable about a first axis; a rotary confining member; a torque transmitting device provided on said driving member and defining for said confining member a pivot axis disposed at one side of and extending substantially at right angles to said first axis, said confining member being movable relative to said driving member between a first position of substantial coaxiality with said driving member and a second position in which its axis is inclined relative to said first axis; and means for moving said confining member between said first and second positions, including a toggle joint remote from said torque transmitting device and

including a first link pivoted to said driving member, a second link pivoted to said confining member and to said first link, and



means for pivoting said links relative to each other and relative to the respective members.

4,838,726
PROCESS AND DEVICES FOR TYING CROSSING ELEMENTS
Antonio Lucas Huerta, Elcano-Egües, Spain, assignor to Simes-Senco, S.A., Elcano-Egües, Spain
Division of Ser. No. 758,573, Jul. 24, 1985, Pat. No. 4,653,548, which is a division of Ser. No. 510,453 Jul. 1, 1983, abandoned. This application Aug. 25, 1986, Ser. No. 900,256
Claims priority, application Spain, Jul. 23, 1982, 514261
Int. Cl.[4] B25G *3/36*
U.S. Cl. 403—397 **4 Claims**



1. A device for the binding of intercrossing elements comprising

a clip having a general U shape including

a circular base portion;

arms extending from opposite ends of said base portion to free ends at the ends of each of said arms;

each of said arms having

an intermediate bent elbow along said arm;

a first straight portion between said elbow and said base portion;

a second straight portion between said elbow and said free end of said arm;

a recess along said arm in proximity to said free end, acting as a breakaway point;

said clip positioned relative to said intercrossing elements with

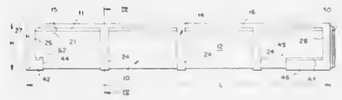
said base portion and a portion of said arms extending from opposite ends of said base portion extending around one of said intercrossing elements;

said intermediate bent elbows of both said arms cradling another of said intercrossing elements;

portions of each of said arms extending from said intermediate bent elbows to said free ends passing on opposite sides of said one of said intercrossing elements;

said free ends extending beyond said one of said intercrossing elements for forming twisted free ends against said one of said intercrossing elements.

4,838,727
SLOTTED DRAIN CONDUIT
Terry D. Capuano, Moreland Hills, Ohio, assignor to ACO Polymer Products, Inc., Chagrin Falls, Ohio
Filed Jun. 28, 1988, Ser. No. 212,667
Int. Cl.[4] E01C *11/22*
U.S. Cl. 404—2 **20 Claims**



1. A drainage apparatus, comprising:

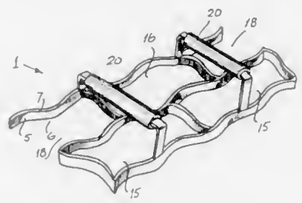
an open ended tubular conduit having formed therein a longitudinally extending channel and a longitudinally extending slot which opens into the channel;

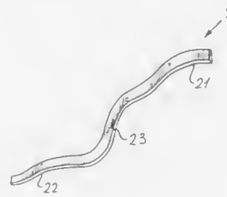
said tubular conduit including an inner body section and an external frame structure integrally secured to the exterior of said inner body section, said frame structure including two upper horizontal frame sections each extending longitudinally along an upper portion of said inner body section and each having a first edge which defines the slot in said tubular conduit;

said tubular conduit having recesses formed therein which extend longitudinally along the length of said tubular conduit and are positioned to have a first recess boundary wall defined by a bottom surface of a respective one of said horizontal frame sections and a second recess boundary wall defined by a respective exterior portion of said inner body section.

4,838,728
KIT OF HAND-HELD TOOLS FOR MAKING A PATTERNED IMPRESSION IN A CEMENTITIOUS MATERIAL
Michael J. McKeever, 8 Alphonsus Rd., Drumcondra, Dublin 9., Ireland
Filed Jan. 4, 1988, Ser. No. 140,722
Int. Cl.[4] E01C *23/02*
U.S. Cl. 404—89 **8 Claims**

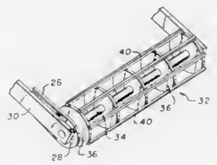
1. A kit of hand-held tools for forming a repeating patterned impression in a cementitious material, comprising at least two tools, each of the tools comprising consisting of shaped blade means arranged in a desired pattern to be impressed into a cementitious material to form said desired pattern therein, and a handle extending from the blade means for holding and pressing the blade means into the cementitious material for forming said desired pattern therein, each said blade means being comprised of blades which are substantially rectilinear in transverse cross-section and which have a lower cementitious material penetrating portion and an upper tamping surface, a first tool of the kit consisting of a blade means wherein the blades are arranged in at least one closed interior pattern and at least one exterior open pattern shaped to conform with a portion of the interior pattern, the tool having no platform means and wherein said handle extends directly from the upper tamping surface of the blades of the blade means thereof, and a second tool of the kit having an open perimeter blade means





shaped to conform with a portion of the closed interior pattern of the first tool.

4,838,729
SOIL STABILIZING APPARATUS
Donald A. Chennels, 308 - 8880 No. 1 Road, Richmond, British Columbia V7C 4C3, Canada
Continuation of Ser. No. 118,207, Nov. 6, 1987, abandoned. This application Nov. 4, 1988, Ser. No. 270,483
Int. Cl.[4] E01C *21/00*
U.S. Cl. 404—90 **7 Claims**



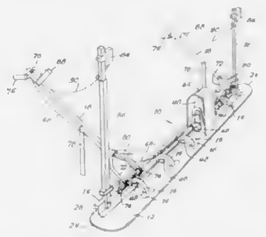
1. An apparatus for stabilizing a surface, the apparatus including a carrier arranged for movement over the surface to be stabilized, a reel mounted on the carrier for rotation about an axis of rotation transverse to the direction of movement of the carrier, the reel having a plurality of circumferentially spaced cutter bars that extend the length of the reel parallel to the axis of rotation, lifting means for lifting and lowering the reel relative to the surface the improvement comprising forming the trailing face of each cutter bar with means to produce a zone of reduced pressure at said trailing face as the cutter bar rotates.

4,838,730
PORTABLE SCREED WITH FLOATING SCREED PLATE
Joseph M. Owens, 842 Lake Holiday Dr., Sandwich, Ill. 60548
Filed Apr. 29, 1988, Ser. No. 188,041
Int. Cl.[4] E01C *19/35*
U.S. Cl. 404—114 **21 Claims**

1. A portable screed for working concrete, said screed being manually operated by an operator who physically guides the screed over an area of freshly poured concrete and manually levels the screed and the concrete by raising or lowering the screed while the screed is in motion, comprising

a. an elongated, single screed plate having opposite sides and opposite ends, said screed plate having a flat bottom bearing surface and having a width sufficient to permit the screed to float on the concrete while the screed is being guided, and

b. means for imparting uniform vibrations to the screed plate for tamping the concrete, comprising

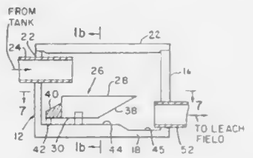


i. a brace extending substantially the length of said screed plate between the ends thereof and being rigidly secured thereto along one side of said screed plate,

ii. a series of rigid, spaced cross supports secured to said brace, each said cross support extending transversely from said brace substantially to an opposite side of said screed plate and being rigidly secured thereto, and

iii. a vibratory mechanism connected to vibrate said screed plate.

4,838,731
SEPTIC TANK DISTRIBUTION BOX SYSTEM
Norman Gavin, 2545 Ridge Rd., North Haven, Conn. 06473
Filed Sep. 3, 1987, Ser. No. 92,764
Int. Cl.[4] E02B *11/00;* **B01D** *21/02*
U.S. Cl. 405—40 **8 Claims**



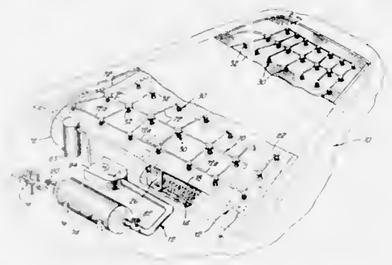
1. A system for periodically discharging a predetermined amount of septic effluent into a leaching field comprising a distribution box having an inlet opining and a plurality of outlet openings formed therein, said outlet openings being located at a level in said box below the level at which said inlet opening is located, an open-topped tray pivotally mounted in said distribution box at a level located between levels of said inlet and outlet openings in said box, said tray having an effective capacity approximately equal to said predetermined amount, a counterweight secured to said tray on one side of the pivotal mounting thereof and a first stop means for maintaining said tray in a horizontal position, against the action of the counterweight, when said tray is empty, said tray being located to receive effluent from said inlet opening and said counterweight being dimensioned to be overcome by effluent is in the tray when said predetermined amount of effluent is in the tray where by the tray pivots against the influence of the counter weight away from said first stop to empty the tray and dis-

charge said predetermined amount of effluent to said outlet pivotal movement of the tray away from the first stop to a predetermined effluent emptying position, each of said outlet openings being located at approximately the same level so that effluent periodically discharged from said tray will enter said outlet openings substantially simultaneously.

4,838,732
ELASTOMERIC SEALING DEVICE
Stephen E. Clark, 1344 Monterey Ave., and Earl A. Clark, 1143 Manchester Ave., both of Norfolk, Va. 23508
Filed May 12, 1982, Ser. No. 377,669
The portion of the term of this patent subsequent to Apr. 18, 2002, has been disclaimed.
Int. Cl.[4] E02B *3/16;* E02D *29/14;* A47K *1/14*
U.S. Cl. 405—52 3 Claims

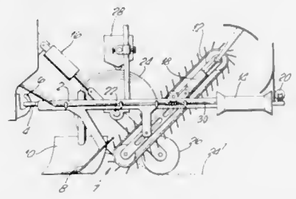
1. A device for sealing off holes that have irregular or non-planar boundaries from ingress of surface fluids into said holes comprising
a core elastomer having a top surface and a bottom surface; said core elastomer having a thickness as measured between said top surface and said bottom surface that is small relative to the legnth of the perimeter of said top surface; said core elastomer having extremely low shear resistance whereby said core elastomer conforms, under its own weight, to the shape of said boundaries of said holes when said device is placed against said boundaries;
a top film adjacent to said top surface of said core elastomer being flexible, impermeable to liquids, and thin relative to said core elastomer; and
a bottom film adjacent to said bottom surface of said core elastomer being flexible, impermeable to liquids, and thin relative to said core elastomer.

4,838,733
LANDFILL COMPACTION
Albert A. Katz, 707 N. Broad St., Elizabeth, N.J. 07208
Filed Dec. 5, 1988, Ser. No. 279,665
Int. Cl.[4] B09B *1/00*
U.S. Cl. 405—129 16 Claims



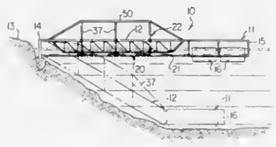
1. A landfill compaction system for reducing the volume of a landfill located on the ground from a given original volume to a reduced volume, the given original volume of landfill having a defined perimeter and a surface within the perimeter, the surface normally being exposed to the ambient atmosphere and the landfill extending into the ground to a depth along the perimeter of the given volume, the reduction in volume being the result of the simultaneous sudden extraction of gases from the original volume and impact of the ambient atmosphere upon the surface of the landfill within the perimeter of the volume thereof, the system comprising:
sealing means for essentially sealing the given original volume of landfill to a selected depth along the perimeter of the given original volume and over the surface of the given original volume surrounded by the perimeter;
a source of vacuum;
extraction passage means for penetrating the landfill, the extraction means including a plurality of extraction devices spaced apart throughout the landfill, within the perimeter of the essentially sealed original volume;
conduit means for interconnecting the extraction devices with the source of vacuum; and
valve means for effecting a rapid opening of communication, through the conduit means, between the extraction devices and the source of vacuum, thereby to cause the sudden extraction of gases from the original volume, the simultaneous sudden impact of atmospheric pressure upon the surface within the perimeter of the landfill volume, and the concomitant compaction of landfill from the original volume to the reduced volume.

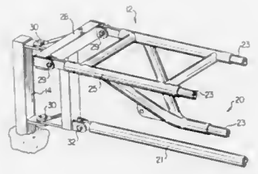
4,838,734
METHOD AND DEVICE FOR FORMING A FLUID PERMEATION CONTROL LAYER OF THE GROUND
Shlomo Pinto, 50 Balfour Street, Naharia, Israel
Continuation-in-part of Ser. No. 668,964, Nov. 7, 1984, Pat. No. 4,666,337. This application May 14, 1987, Ser. No. 49,550
Claims priority, application Israel, Nov. 8, 1983, 70170
The portion of the term of this patent subsequent to May 19, 2004, has been disclaimed.
Int. Cl.[4] E02B *13/00;* E02F *5/10*
U.S. Cl. 405—176 16 Claims



1. A method for forming a subterranean fluid permeation control layer in an area of ground for controlling fluid passage therethrough, comprising the steps of:
(a) forming a first portion of a trench of a predetermined depth from the surface of the ground;
(b) widening said trench along one side thereof to form a widened portion;
(c) applying a fluid permeation control layer substantially along the bottom surface of said first portion of said trench;
(d) only partly covering said layer with earth removed from a widened portion of said trench such that at least the edge of said layer adjacent said one side of the trench remains uncovered; and
(e) selectively repeating steps (b), (c) and (d) until the entire area of the ground is lined by the permeation control layer, wherein, in repeating step (c) a newly applied layer is applied along the bottom surface of an adjacent, previously widened portion of the trench, partly contacting and overlapping an adjoining applied layer.

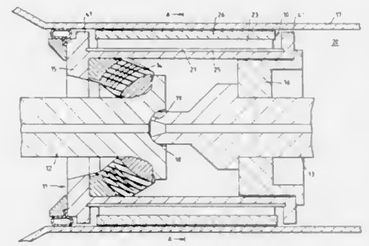
4,838,735
STABLE FLOATING PIER
Bert J. Warner, 504 Towncreek, Dallas, Tex. 75232
Filed Feb. 29, 1988, Ser. No. 161,781
Int. Cl.[4] B63B *27/14*
U.S. Cl. 405—220 3 Claims





1. A floating pier comprising:
a platform structure adapted to be floated on a body of water;
a base structure adapted to be anchored in a fixed position; said base structure comprising:
an anchored structure adapted to be fixed in position;
a support structure pivotably connected to said anchored structure for relative rotation therebetween about a vertical axis;
an articulated parallelogram linkage structure for connecting said platform structure to said base structure, said linkage structure comprising:
a top link comprised of an elongated element having a triangular cross-section having an upper side lying in a horizontal plane;
means for pivotably connecting a first end of said top link to said platform structure for relative rotation therebetween about a horizontal axis;
means for pivotably connecting the other end of said top link to said support structure for relative rotation therebetween about a horizontal axis;
means for pivotably connecting the other end of said top link to said support structure for relative rotation therebetween about a horizontal axis;
a bottom link positioned parallel to and spaced below said top link;
means for pivotably connecting a first end of said bottom link to said platform structure for relative rotation therebetween about a horizontal axis;
means for pivotably connecting the other end of said bottom link to said support structure for relative rotation therebetween about a horizontal axis;
vertical link means for pivotably connecting said top link and said bottom link together at spaced intervals to thereby form a parallelogram linkage structure; and
a walkway secured to and extending along said top link of said articulated parallelogram linkage structure.

4,838,736
RESILIENT BUSH
Alan F. Moore, Burbage, England, assignor to Dunlop Limited a British Company, United Kingdom
Filed Nov. 30, 1987, Ser. No. 126,871
Claims priority, application United Kingdom, Dec. 13, 1986, 8629816
Int. Cl.[4] B63B *21/50;* E02D *5/74*
U.S. Cl. 405—224 20 Claims

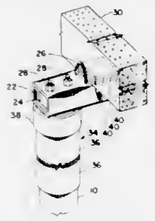


1. A resilient torsion bush comprising an inner rigid member, a substantially inextensible outer rigid member which extends around and is spaced from the inner rigid member and interposed between said rigid members at least one pair of resilient bearings, each resilient bearing comprising a layer of resilient material disposed between and adhered to a pair of rigid support members, one rigid support member of said pair being an inner support member supported by the inner rigid member and the other rigid member of said pair being an outer support member supported by the outer rigid member and said support members being movable or having been moved one relative to the other in a peripheral direction as considered in a plane perpendicular to the direction of the length of the bush whereby the resilient material becomes or is loaded in compression between said support members as considered in a generally radial direction of the bush, and at least one of the confronting surfaces of said inner and outer rigid support members of a resilient bearing being inclined relative to said peripheral direction of relative movement of the support members whereby said movement results in compression of the interposed resilient material, said pair of said bearing being disposed such that the sheer load of one bearing due to relative movement of its associated support members to effect compression loading substantially equals and opposes the shear load of the other bearing due to relative movement of its associated support members.

4,838,737
PIER FOR SUPPORTING A LOAD SUCH AS A FOUNDATION WALL
Harold L. Quimby, 8564 E. Monmouth Pl., Denver, Colo. 80327
Filed Aug. 15, 1984, Ser. No. 640,845
Int. Cl.[4] E02D *5/22, 5/60*
U.S. Cl. 405—230 20 Claims

1. A pier adapted to support a load comprising:
a concrete pillar having a substantially longitudinal axis adapted for disposition within the earth's surface such that the longitudinal axis thereof is substantially vertically oriented;
a tube having a substantially longitudinal axis; and
means for securing said tube to the top of said pillar such that the longitudinal axis of said tube extends substantially perpendicular to the longitudinal axis of said pillar with a portion of said tube extending beyond the periphery of said pillar and adapted to bear substantially the entire load supported by the pier, said securing means comprising at least one threaded rod embedded in said concrete pillar and wherein said rod extends upwardly through said tube,

and wherein said securing means further comprises a nut adapted to be threadably mounted on said threaded rod



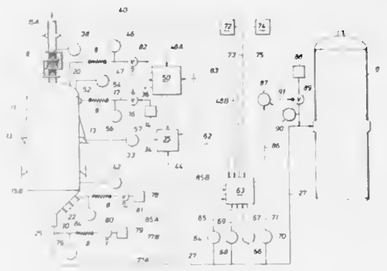
such that said tube rests against the top of said concrete pillar.

4,838,738

PRESSURE COMPENSATED WEIGH SYSTEM

James A. Salter, Katy; Thomas R. Schmidt, Houston; Thomas S. DeWitz, Houston; Charles M. Arbore, Houston; Frederick M. H. J. Duysings, Houston, all of Tex.; Johannes W. Van Der Meer; David Brown, and Henricus C. J. Venselaar, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 28, 1987, Ser. No. 113,313
Int. Cl.[4] B65G *51/16*
U.S. Cl. 406—14 **60 Claims**



1. A method for controlling a mass flow rate of a coal and gas mixture to a gasifier operated at elevated pressures, said method comprising:
feeding said mixture into a vessel operated at elevated pressures;
weighing said mixture in said vessel
supporting said vessel to minimize lateral and vertical deflections caused by elevated pressures and forces external to the vessel;
injecting a gas into said vessel to maintain a differential pressure between said vessel and said gasifier;
venting gas from the upper portion of said vessel to adjust the pressure between said vessel and said gasifier;
aerating said mixture at a lower portion of said vessel;
discharging said mixture from said vessel into means for transporting said mixture to said gasifier;
injecting a transport gas into said means for transporting said mixture;
transporting said mixture in said means for transporting said mixture to said gasifier;
obtaining a signal relative to the weight of said mixture contained in said vessel;
transmitting said signal relative to the weight of said mixture to a first mass flow rate-indicating means;
obtaining a signal relative to the deflections;
transmitting said signal relative to the deflections to the first mass flow rate-indicating means;
obtaining a signal relative to a temperature within said vessel;
transmitting said signal relative to the temperature to the first mass flow rate-indicating means;
obtaining a signal relative to a rate of venting gas from the upper portion of said vessel;
transmitting the signal relative to the rate of venting gas from the vessel to a pressure-controlling means;
obtaining a signal relative to a pressure within said vessel;
transmitting said signal relative to the pressure to the pressure-controlling means;
obtaining a signal relative to a rate of injecting the gas into the upper portion of said vessel;
transmitting the signal relative to the rate of injecting the gas to the pressure-controlling means;
combining the signals relative to the rates of venting and injecting gas, and the pressure within said vessel to obtain a signal relative to a pressure within said vessel;
transmitting said signal relative to the pressure to the first mass flow rate-indicating means;
combining the signals relative to the weight, deflections, the pressure within said vessel, and the temperature to obtain a first signal relative to a mass flow rate of said mixture exiting said vessel;
obtaining a signal relative to a density of said mixture in said means for transporting said mixture to said gasifier,
transmitting the signal relative to the density of said mixture in said means for transporting said mixture to a second mass flow rate-indicating means;
obtaining a signal relative to a velocity of said mixture in said means for transporting said mixture to said gasifier;
transmitting the signal relative to the velocity of said mixture in said means for transporting said mixture to the second mass flow rate-indicating means;
obtaining a signal relative to a pressure of said mixture in said means for transporting said mixture to said gasifier;
transmitting the signal relative to the pressure of said mixture in said means for transporting said mixture to the second mass flow rate-indicating means;
obtaining a signal relative to a temperature of said mixture in said means for transporting said mixture to said gasifier;
transmitting the signal relative to the temperature of said mixture in said means for transporting said mixture to the second mass flow rate-indicating means;
obtaining a signal relative to a water content of said mixture;
transmitting the signal relative to the water content of said mixture to the second mass flow rate-indicating means;
obtaining a signal relative to an ash content of said mixture;
transmitting the signal relative to the ash content of said mixture to the second mass flow rate-indicating means;
obtaining a signal relative to a rate of injecting said transport gas into said means for transporting said mixture to said gasifier;
transmitting the signal relative to the rate of injecting said transport gas into said means for transporting said mixture to the second mass flow rate-indicating means;
obtaining a signal relative to a rate of aerating said lower end of said vessel;
transmitting the signal relative to the rate of aerating said lower end of said vessel to said second mass flow rate-indicating means;
transmitting the signal relative to the rate of venting gas from the vessel to the second mass flow rate-indicating means;
combining the signals relative to the density, velocity, pressure, temperature, water and ash content of said mixture, and the rates of injecting aeration and transport gases, and venting gas from said vessel to obtain a second signal relative to a mass flow rate of said mixture in said means for transporting said mixture to said gasifier;

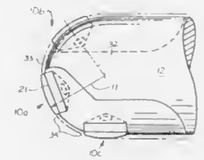
combining said first and second signals to obtain a corrected mass flow rate of said mixture,
transmitting a signal relative to the corrected mass flow rate of said mixture from the second mass flow rate-indicating means to a means for controlling the mass flow rate of said mixture to said gasifier;
controlling the mass flow rate of said mixture to said gasifier, said step of controlling includes adjusting the rate of injecting transport and aeration gases, and adjusting the rate of venting gas;
transmitting a signal relative to the corrected mass flow rate of said mixture from the second mass flow rate-indicating means to a means for controlling a rate of oxygen introduced into said gasifier; and
adjusting the rate of oxygen introduced into said gasifier.

4,838,739

BALL NOSE END MILL AND METHOD OF MANUFACTURE

Daniel R. Stashko, Holly, Mich., assignor to GTE Valenite Corporation, Troy, Mich.

Filed Sep. 18, 1987, Ser. No. 98,172
Int. Cl.[4] B23C *5/02*
U.S. Cl. 407—42 **17 Claims**



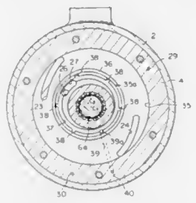
1. Hemispherical ball nose end mill with an axially rotatable body and a plurality of generally triangular replaceable cutting inserts characterized by each insert having a single arcuate cutting edge and a pair of side walls formed as planar surfaces obliquely related to a mounting face for effective dovetail retention, an exposed insert face having a convex surface segment formed thereon terminating in a cutting edge for generating a hemispherical segment, a V-groove formed across the third cutting edge side wall intersecting said corner surface segment at said cutting edge to provide a positive rake cutting angle, and a mounting pocket in said body for each insert including a planar mounting surface and a pair of matching dovetail walls for engaging said insert sidewalls.

4,838,740

VARIABLE DISPLACEMENT VANE COMPRESSOR

Yasushi Watanabe; Masahiro Kawaguchi; Shinichi Suzuki, and Tatsuya Nakai, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Jul. 20, 1988, Ser. No. 221,717
Int. Cl.[4] F04B *49/02*; F04C *29/08*
U.S. Cl. 417—295 **9 Claims**



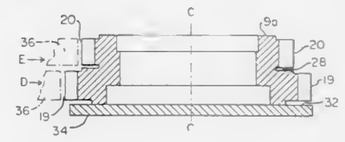
1. A variable displacement vane compressor comprising a housing having therein a cylinder secured thereto, a pair of side plates secured to the axial opposite ends of the cylinder, a rotor rotatably supported between the side plates and having a plurality of vanes movably supported in the rotor and coming into contact with the inner peripheral surface of the cylinder to define a plurality of compression chambers between the inner peripheral surface of the cylinder and the outer peripheral surface of the rotor, volumes of said compression chambers being changed in accordance with the rotation of the rotor, said cylinder being provided with refrigerant inlet ports and refrigerant outlet ports which can be selectively connected to the compression chambers, and a reciprocally rotatable displacement control plate located between the rotor and one of the side plates for controlling the largest displacement of the compression chambers when closed, wherein the improvement comprises a spool chamber provided in said one side plate and opposed to the displacement control plate, a spool which reciprocates in the spool chamber to define a first pressure chamber in which a refrigerant having a pressure corresponding to the discharge pressure of the compressor is introduced and a second pressure chamber in which an oil having a pressure corresponding to the discharge pressure is introduced through a control valve means in response to the suction pressure of the compressor, said spool and said displacement control plate being interconnected by a connecting member and moving together, an annular sealing means between said displacement control plate and said one side plate for isolating a high pressure area from a low pressure area of the compressor, and feed passage means for introducing the oil having a pressure corresponding to the discharge pressure into the sealing means, said one side plate being provided with an elongated hole which permits movement of said connecting member extending therethrough, the annulus of said annular sealing means having a diameter smaller than that of an imaginary circle centered on the axis of rotation of the rotor and circumscribing the elongated hole, the annulus of said annular sealing means being eccentric to the axis of rotation of the rotor and including the elongated hole in the annulus of the annular sealing portion.

4,838,741

METHOD FOR MAKING AN EPICYCLIC SPEED REDUCER WITH TWO STAGE INTEGRAL ROTOR

Jacques Dumoulin, Boulder, Colo., assignor to Primaxis Corporation, Boulder, Colo.

Filed May 1, 1987, Ser. No. 644,484
Int. Cl.[4] B23C *9/00*; B24B *1/00*
U.S. Cl. 409—131 **3 Claims**



1. In an epicyclic power transmission drive, the method of making a two-stage integral epicyclic rotor including the steps of
providing a metal blank,
securing said blank in a fixed position to a supporting surface,
rotating said blank and said supporting surface in a plane parallel with said surface,
moving a machining tool into engagement with the edge of said blank,
adjusting the radial position of said machining tool in predetermined relationship with the orbital and rotary motion

of said surface to form on the outer perimeter of said blank a first epitrochoidal contour,

moving a machining tool into engagement with the edge portion of said blank at a point removed a predetermined distance from said surface,

adjusting the radial position of said machining tool in predetermined relationship with the rotary and orbital motion of said surface to form on the outer perimeter of said blank at a point removed by said predetermined distance from said surface a second epitrochoidal contour having a maximum diameter less than the minimum diameter of said first epitrochoidal contour, and machining a central opening in said blank for mounting in said drive, all of said operations being accomplished while said blank remains in fixed position on said surface.

4,838,742

METHOD AND APPARATUS FOR MAKING AN UNDERCUT DRILLED HOLE IN A FIXED BASE

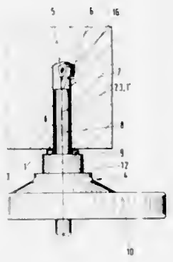
Siegfried Fricker, Wurmberger Strasse 30-34,, 7135 Wiernsheim, Fed. Rep. of Germany

Filed Jan. 14, 1988, Ser. No. 143,941

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1987, 3700831

Int. Cl.⁴ B23C 3/14

U.S. Cl. 409—131 **9 Claims**



1. A process for the production of an undercut bore in a fixed base consisting of a hard substance, such as concrete, masonry or the like, and in which a cylindrical bore is predrilled in the base, comprising the steps of:

(a) mounting a cutting head eccentrically in a separate cylindrical supporting sleeve, said cutting head having a plurality of cutting surfaces;

(b) inserting said cutting head into the predrilled bore hole to a desired depth, and rotating said head about a first axis;

(c) inserting said supporting sleeve a substantial distance into the bore during rotation of said cutting head to a position closely adjacent the bottom of said cutting head so as to support said cutting head against radial forces on the bore hole wall during the undercutting operation, the sleeve being adapted to rotate about a second axis spaced from said first axis and defining therewith a circular radius equal to the radial undercut in the bore;

(d) nonrotatably fixing said sleeve to a control handle by which the sleeve can be rotated while said cutting head is rotated;

(e) moving said handle through an arc of at least 360° whereby the cutting head removes the substance to form an annular undercut equal in depth to said circular radius;

(f) withdrawing said sleeve from said bore following undercutting; and

(g) subsequently removing said cutting head from said bore.

4,838,743

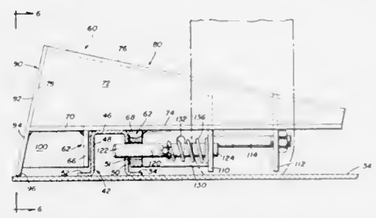
VEHICLE CANTILEVER CHOCK BLOCK APPARATUS FOR RAILROAD CAR TRANSPORT OF VEHICLES

Donald J. Blunden, Plymouth, and Michael J. Rench, Wyandotte, both of Mich., assignors to Thrall Car Manufacturing Company, Chicago Heights, Ill.

Continuation-in-part of Ser. No. 928,560, Nov. 10, 1986, abandoned. This application Mar. 9, 1988, Ser. No. 165,845

Int. Cl.⁴ B60P 3/07

U.S. Cl. 410—9 **26 Claims**



18. Transportation equipment having at least one deck for supporting and transporting four-wheel vehicles such as automobiles and trucks;

at least one track secured to the deck;

the track having a pair of substantially upwardly extending spaced apart surfaces;

chock blocks for a vehicle transported on the deck to secure the vehicle against longitudinal movement;

each chock block consisting essentially of a first member, a second member and means on the first member for removably securing the first member to the track;

the first member nesting with the track and being quickly removable from such nesting arrangement by upward displacement;

the second member being substantially horizontally positioned and permanently laterally joined to the first member;

the second member having a sufficient length to extend along, and terminate beyond, the tread face of a tire of a vehicle located along side the track;

the chock block having means on the first member for removably securing the first member to the track, when in nesting position therewith, to prevent the first member and chock block from horizontal movement along the track and upward movement from the track; and

the second member having means on opposite sides of, and separate from and spaced from, the first member, which maintains the second member substantially horizontal when upward and downward forces are applied to the second member.

4,838,744

INTERMODAL SYSTEM FOR TRANSPORTING A SEMI-TRAILER ON TWO RAILWAY VEHICLES

Charles M. Bakka, Chicago, Ill.; Roger D. Sims, Munster, and James T. Stevenson, Hammond, both of Ind., assignors to Trailer P. H. Corporation, Chicago, Ill.

Filed Apr. 13, 1988, Ser. No. 181,207

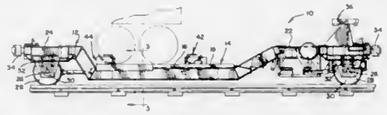
Int. Cl.⁴ B60F 1/04

U.S. Cl. 410—53 **22 Claims**

1. In a system for transporting by rail a highway semi-trailer having rubber-tired highway wheels, said semi-trailer being supported between first and second rail bogies, each of said rail bogies comprising:

a drop deck frame structure supported on wheeled axles positioned adjacent opposite ends thereof, said frame structure defining a central drop deck section having a stationary, longitudinally extended, planar platform defining an upper surface for supporting the wheels of said semi-trailer; and

a trailer securement system comprising a chock assembly for facilitating simultaneous rotational movement of said semi-trailer's wheels through an arc on the platform and translatory movement of said wheels along a predetermined longitudinal path on the platform, said chock assembly including a transversely spaced pair of joined chock block means normally arranged on one side of said semi-trailer's wheels, with each of said chock block means including means for securing said chock block means



relative to said platform in a manner securing said semi-trailer's wheels against movement in a first longitudinal direction, and means for positioning said chock assembly on said platform in a manner limiting movement of said chock assembly about a substantially vertical axis and along a predetermined longitudinal path; and, at least two separate and independent chock block means each of which having means for securing said separate and independent chock block means relative to said platform on an opposite side of said semi-trailer's wheels in a manner securing said semi-trailer's wheels against movement in a second longitudinal direction.

4,838,745

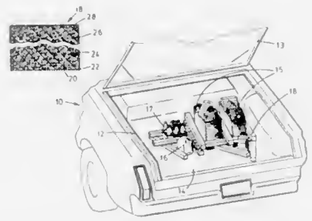
TRUNK ORGANIZER

Joseph P. Haydock, 508 Arnold Ave., Streamwood, Ill. 60107-3014

Filed Nov. 27, 1987, Ser. No. 125,937

Int. Cl.⁴ B63B 25/24

U.S. Cl. 410—121 **2 Claims**



1. A space divider for use in an automobile to restrain movement of an article on a fibrous surface in the automobile, comprising:

an elongated body of flexible foam rubber;

a rubber coating covering said body;

a plurality of hooks of a hook and loop fastener affixed to an underside surface of said body and selectively fastenable to the fibrous surface in the automobile to restrict movement of said elongated body and thereby restrain movement of the article;

a plurality of said elongated bodies;

each of said plurality of elongated bodies having hooks of a hook and loop fastener on a lower surface, at least some of said elongated bodies having loop portions secured on surfaces of said elongated bodies distinct from said lower surface.

4,838,746

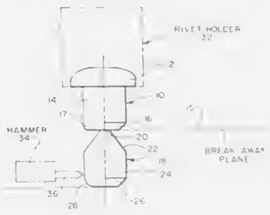
BREAK-AWAY RIVET CONFIGURATION

Ottavio Giannuzzi, Baldwin, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jan. 12, 1988, Ser. No. 143,095

Int. Cl.⁴ F16B 19/06

U.S. Cl. 411—504 **1 Claim**



1. A rivet configuration comprising:

a head;

a first cylindrical section extending from the head to an outer end section;

an integral extension coaxial with the first cylindrical section to form an overall rivet length exceeding the diameter of the rivet, the extension having a necked-down section joined to the outer end section of the first cylindrical section along a plane, the necked-down section being frusto-conical and non-symmetric with respect to the outer end section; and having a longer length and greater undercut angle than the outer end section, with respect to the plane, for permitting the integral extension to break away cleanly from the first cylindrical section along the plane upon receipt of impact.

4,838,747

DEVICE FOR TRANSPORTING AND FORMING BATCHES OF FLAT PIECES WITH DECREASING THICKNESS

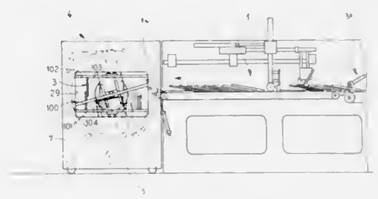
Jean-Bernard Morisod, Crissier, Switzerland, assignor to Bobst SA, Switzerland

Filed Mar. 15, 1988, Ser. No. 168,512

Claims priority, application Switzerland, Mar. 16, 1987, 00979/87

Int. Cl.⁴ B65G 61/00

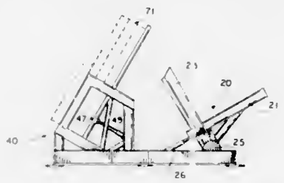
U.S. Cl. 414—790.3 **9 Claims**



7. A piling device for receiving batches of blanks from an end of a conveyor, said piling device comprising a main frame having an opening on one side, means mounting a sub-frame for rotation about an axis in said main frame, said sub-frame having two groups of rollers arranged in spaced apart planes and a partition extending diagonally between said two groups of rollers to form two chambers, means for moving batches from said chambers along the axis of rotation through said opening on the one side of the frame, said means for moving

including a carriage mounted on a hollow axle provided on the axis of rotation, a magnetic piston disposed in said hollow axle and pneumatic means for shifting the magnetic piston and carriage along said axis.

4,838,748
HOIST AND ACCUMULATOR ARM APPARATUS
Alan T. Johnson, 20434 S. Spring Water Rd., Estacada, Oreg. 97023
Filed Mar. 23, 1988, Ser. No. 172,291
Int. Cl.[4] B65G *59/02 59/08*
U.S. Cl. 414—796.7 **10 Claims**



1. An apparatus for lifting loads of tiered material and for continuously feeding tiers of material from said tiered loads, comprising:

(a) hoist means for receiving and then hoisting a tiered first load from a load base along a load path;

said hoist means including:

a base;

a plurality of pivoting vertical support members for guiding the elevation of said load of tiered material and for restraining the horizontal movement of said load of tiered material;

a plurality of horizontal support members for supporting said load while it is being elevated, slidably joined to said vertical support members, the movement of which defines a load path from a load base to the top ends of said vertical support members, along which said tiered load is elevated;

a rotatable support base upon which said vertical support members are mounted, the rotation of said support base defining the extent to which said vertical support members pivot, which pivoting action in a forward direction causes the tiered load to exert pressure against said vertical support members;

(b) load receiving and discharging means for receiving said load of tiered material and continuously discharging successive tiers of said load, said load receiving and discharging means including:

a base;

a pair of angularly disposed load receiving members for guiding the elevation of said load of tiered material after said hoist means has been rotated in a forward direction whereupon the tops of said vertical support members come in contact with, and align themselves with, said load-receiving members, and after said horizontal support members have been elevated to the point where the top tier of said tiered load is elevated beyond the tops of said vertical support members;

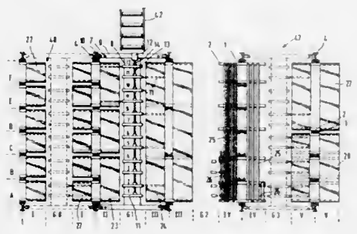
load discharging members angularly connected to said load-receiving members for continuously and slidably discharging successive tiers of material from the top of said load of material aligned so that when a tier of material is elevated beyond the top edges of said load-receiving members, said tier will slide down said load-discharging members to a discharge point;

said discharge point having a fixed and predeterminable location;

a load-accepting carriage slidably mounted to move from the bottom to the top of said load-receiving members; and

said load-accepting carriage further including a plurality of independently-extendible accumulator arms for extending into an extension of said load path, beneath said first load of tiered material after the bottom of said load has been elevated to at least the bottom of said load-receiving members, thereby allowing the horizontal support members of said hoist means to retract along the load path, pivot downwardly, and accept a second load of tiered material while said accumulator arms continue to elevate and discharge the remainder of said first load of tiered material.

4,838,749
STORAGE ASSEMBLY
Tomislav Potocjnak, Lauffen, Fed. Rep. of Germany, assignor to Tepora Transportsysteme Entwicklungs-GmbH, Lauffen, Fed. Rep. of Germany
Filed Nov. 20, 1987, Ser. No. 123,384
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639649
Int. Cl.[4] B65G *1/04;* **B66F** *9/14*
U.S. Cl. 414—277 **17 Claims**



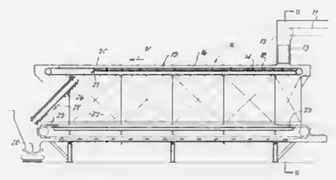
1. A storage assembly comprising:

shelving means defining a multiplicity of storage compartments disposed in at least one vertically oriented planar array for receiving and supporting items to be stored; and

deposition and removal means for depositing into said compartments and subsequently removing therefrom selected items to be stored, said deposition and removal means including an elongate substantially horizontally extending tie bar shiftable in a vertical direction in juxtaposition to said planar array, said deposition and removal means further including a lifting jack operatively connected to said tie bar for shifting same in said vertical direction,

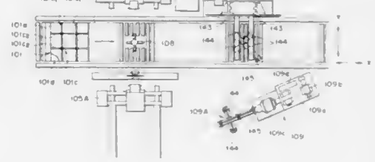
said planar array being organized into a plurality of rows and a plurality of columns, said columns having a common width in a longitudinal direction parallel to said tie bar, a smallest of said compartments occupying only one of said columns and having a length parallel to said tie bar equal to said common width, each of said compartments having a length parallel to said tie bar equal to a multiple of said common width, said deposition and removal means also including on said tie bar a plurality of pairs of receiver members, each of said pairs being juxtaposed to and associated with a respective one of said columns, said receiver members having drive means operatively connected thereto, said drive means being capable of shifting a selectable number of said receiver members simultaneously, said drive means including a drive motor, a shaft rotatably mounted to said tie bar and extending longitudinally therealong, and switchable coupling means operatively engageable with said shaft and said receiver members for selectively coupling said shaft to said receiver members.

4,838,750
STORAGE BUNKER
Maurice Finch, Rushwick, England, assignor to Henley Barrowes & Company Limited, Worcester, England
Filed Mar. 20, 1987, Ser. No. 28,704
Int. Cl.[4] B65G *65/30*
U.S. Cl. 414—300 **5 Claims**



1. A storage bunker for substantially dry and loose materials such as shredded paper waste, comprising a receptacle having an interior, a top, and a longitudinal axis or major dimension generally horizontal, first conveyor means for feeding the material into the receptacle at one end thereof, second conveyor means within an upper region of the receptacle for driving material accumulated therein towards an opposite end thereof so as to compact same therein, third conveyor means forming a floor of the receptacle for conveying compacted material forwardly and horizontally towards an output end thereof at said one end of the receptacle, and an output conveyor at said one end in the form of an inclined toothed conveyor band disposed so as to define a wedge-like front end of the receptacle, a toothed lower run of the output conveyor toward the interior of the receptacle moving downwardly and serving to strip material from a compacted mass thereof downwardly into an outlet at the output end of the third conveyor means, said first conveyor means including a plate extending longitudinally over the top of the receptacle to form a ceiling thereto, said first conveyor means having spaced upstanding flights driven in one direction towards said one end of the receptacle thus serving as a scraping and levelling conveyor, there being a zone of restricted height between the plate and a fixed top above the plate, through which said flights travel to convey the material thus to cause the material to assume a substantially constant depth, said plate being broken at said one end of the receptacle to permit the material to enter the interior of the receptacle at a point toward the interior of the receptacle relative to an upper end of the output conveyor, said first and second conveyor means being commonly mounted on a pair of pulleys at opposite ends of said first and second conveyor means, a first one of said pulleys being located outwardly of the upper end of the output conveyor and with a second of said pulleys located in proximity to said opposite end of the receptacle.

4,838,751
BALE UNPACKING METHOD AND SYSTEM THEREFOR
Morimasa Hanaya; Tsunemoto Miura, both of Mishima; Satoru Mamiya, Numazu; Hiroshi Isozaki, Zushi, and Kiyoshi Miyajima, Kawasaki, all of Japan, assignors to Tokushu Paper Manufacturing Co., Ltd., Suntoh and Ishikawajima Industrial Machinery Co., Ltd., Tokyo, both of, Japan
Filed May 12, 1988, Ser. No. 193,048
Claims priority, application Japan, Jul. 11, 1985, 60-249355; Jul. 11, 1985, 60-249356; Jul. 11, 1985, 60-249357
Int. Cl.[4] B65B *69/0, 43/28, 43/30*
U.S. Cl. 414—412 **34 Claims**



1. A method of unpacking bales each having an article, a packaging sheet material wrapping up the article and at least one strap extending around the article in a vertical plane to tie the article through the packaging sheet material, said method comprising the steps of:

(a) transporting the bales one by one along a predetermined path;

(b) cutting the strap of the bale on said predetermined path;

(c) removing the cut strap from the bale; and

(d) removing the packaging sheet material from the bale having removed therefrom the strap, to expose the article,

wherein at least one of said steps (b) and (c) includes the steps of:

(i) preparing a body frame capable of being translated along said predetermined path and movable toward and away from a side face of the bale on the predetermined path, the side face being confronted with said body frame, strap handling means mounted on said body frame for handling the strap of the bale, a contact plate member mounted on said body frame for movement relative thereto toward and away from the side face of the bale, biasing means mounted between said contact plate member and said body frame for biasing said contact plate member relatively to said body frame toward the side face of the bale, and sensor means mounted on said contact plate member for detecting a position of the strap of the bale;

(ii) moving said body frame together with said contact plate member toward the side face of the bale to bring said contact plate member into contact with the side face of the bale, continuing to move said body frame toward the side face of the bale while increasing biasing force of said biasing means until contact pressure, with which said contact plate member is urged by said biasing means against the side face of the bale, reaches a predetermined value, and halting movement of said body frame toward the side face of the bale when said contact pressure reaches said predetermined value;

(iii) translating said body frame together with said contact plate member along said predetermined path while maintaining said contact plate member in contact with the side face of the bale, to cause said sensor means to scan the side face of the bale for detecting the position of the strap of the bale;

(iv) when said contact plate member is urged by the side face of the bale, during the scanning of said sensor means, in such a direction as to increase the biasing force of said biasing means, moving said body frame away from the side face of the bale to maintain said contact pressure at said predetermined value; and

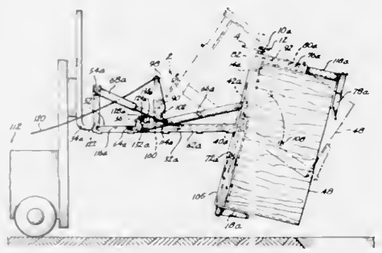
(v) when said sensor means detects the position of the strap of the bale, moving said body frame toward the side face of the bale while maintaining said contact plate member in contact with the side face of the bale, to bring said strap handling means into engagement with the strap of the bale.

4,838,752

FORKLIFT ATTACHMENT FOR DUMPING CONTAINERS

Harold C. Bryant, Kennewick, Wash., assignor to Columbia Equipment, Inc., Pasco, Wash.

Filed Mar. 14, 1988, Ser. No. 167,353
Int. Cl.[4] B66F 9/06
U.S. Cl. 414—421 13 Claims



1. A container dumping apparatus for attachment to a powered vehicle comprising:

base frame and means for mounting said base frame on said vehicle;

carriage means pivotally mounted on said base frame for receiving a container of predetermined size, said carriage means pivoted to said base frame such that the weight of the container will cause the carriage means to tip forwardly, said carriage means having a fore end spaced forwardly from said base frame, and an aft end spaced rearwardly from the location at which said carriage means is pivoted to said base frame, said carriage means further having an upper surface for receiving said container;

retaining means mounted on the fore end of said carriage means for movement between a retracted position below said surface to an extended position above said surface to retain said container on said carriage means as it tips forwardly; and

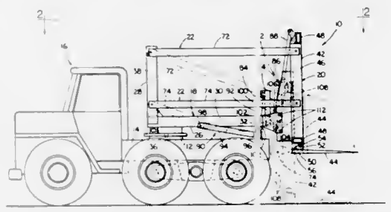
safety means cooperating between said carriage means and said base frame to prevent said carriage means from tipping in reaction to nonmovement of said retaining means to said extended position caused when said container is positioned over said retaining means.

4,838,753

TRUCK TRACTOR FIFTH WHEEL-MOUNTED LIFTING AND TOWING UNIT

Roland P. Gehman, Stevens, and Raymond G. Martin, East Earl, both of Pa., assignors to MGS, Inc., Denver, Pa.

Filed Mar. 1, 1988, Ser. No. 162,775
Int. Cl.[4] B60P 3/12
U.S. Cl. 414—563 30 Claims



1. A lifting and towing unit for use by a towing vehicle having a fifth wheel supported on a frame of the towing vehicle, said unit comprising:

(a) an anchoring frame assembly having a generally horizontal structure with front and rear portions and being adapted to be coupled at said front portion to a fifth wheel of a towing vehicle, said anchoring frame assembly also having a generally vertical structure rigidly mounted upright to said front portion of said horizontal structure;

(b) a lifting frame assembly having an upright structure and load engaging structure mounted to said upright structure and being adapted to support a portion of a mobile load and to be releasably attached thereto;

(c) a linkage arrangement extending between and interconnecting said upright structure of said lifting frame assembly to said vertical structure of said anchoring frame assembly for providing pivotal movement of said lifting frame assembly relative to a frame of the towing vehicle away from and toward a lowered position wherein said load engaging structure of said lifting frame assembly is capable of being placed in a supporting relationship with the mobile load portion for lifting the mobile load into a towing relationship behind the towing vehicle and a fully raised position wherein said load engaging structure of said lifting frame assembly is capable of supporting the mobile load at the portion thereof to maintain the mobile load in said towing relationship behind the towing vehicle;

(d) an actuating mechanism being selectively operable to move said lifting frame assembly relative to the frame of the towing vehicle from said fully raised to said lowred position for placing said load engaging structure of said lifting frame assembly in said supporting relationship with the mobile load portion and from said lowered to said fully raised position for lifting the mobile load into said towing relationship; and

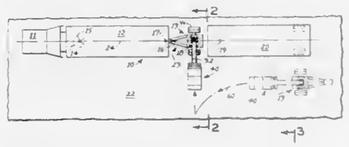
(e) locking means for connecting said upright structure of said lifting frame assembly to said rear portion of said horizontal structure of said anchoring frame assembly after said lifting frame assembly is moved to a partially raised position to form said anchoring and lifting frame assemblies into a substantially rigid towing beam interconnecting the fifth wheel of the towing vehicle and the mobile load.

4,838,754

METHOD AND APPARATUS FOR CONNECTING A REAR TRAILER IN A TANDEM TRACTOR-TRAILER ASSEMBLY

Homer J. Beliles, 4136 Celina Dr., Nashville, Tenn. 37207; M. Dale Cantrell, 6206 Laramie Ave., Nashville, Tenn. 37209, and Carl H. Sanders, Ashland City, Tenn., assignors to Homer J. Beliles, Nashville and M. Dale Cantrell, Hendersonville, both of, Tenn.

Filed Jun. 20, 1988, Ser. No. 208,764
Int. Cl.[4] B60P 3/07
U.S. Cl. 414—607 8 Claims



1. An apparatus to facilitate the connection of a rear trailer to a front trailer in a tandem tractor-trailer assembly, comprising:

(a) a mobile connector carrier comprising a chassis, ground-engaging wheels supporting said chassis, a tongue projecting forward from said chassis and terminating in a front connector adapted to be coupled to a cooperative connector on a rear end portion of a front trailer, a fifth wheel connector including a slide plate having a rearward opening slot therein supported on top of said chassis, said slot being adapted to receive and interlock with a king pin on a front end of a rear trailer,

(b) an elongated boom member having front and rear end portions,

(c) mounting means on the rear end portion of said boom member for supporting said boom member on a mast of a lift truck for vertical movement,

(d) an elongated bearing member having a vertical axis mounted in the front end portion of said boom member,

(e) an elongated lock pin having upper and lower end portions rotatably and coaxially journaled in said bearing member,

(f) said lower end portion of said lock pin being adapted to be received in said slot and locked in said fifth wheel connector for rotational movement with said fifth wheel connector about said vertical axis, and

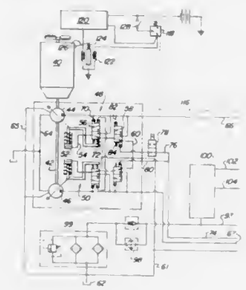
(g) drive means in said boom member operatively connected to said lock pin for selectively rotating said lock pin.

4,838,755

AUTOMATIC ENGINE CONTROL FOR AN EXCAVATOR

Steven H. Johnson, and Lary L. Williams, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Continuation of Ser. No. 16,428, Feb. 19, 1987, abandoned. This application Aug. 17, 1988, Ser. No. 233,927
Int. Cl.[4] F16D 31/02
U.S. Cl. 414—699 5 Claims

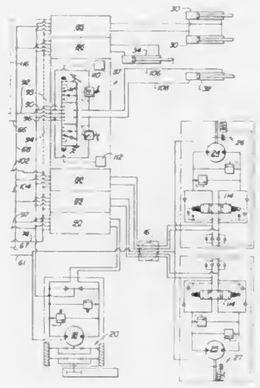


4,838,756

HYDRAULIC SYSTEM FOR AN INDUSTRIAL MACHINE

Steven H. Johnson, and Lary L. Williams, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Continuation of Ser. No. 016,319, Feb. 19, 1987, abandoned. This application Jul. 15, 1988, Ser. No. 220,357
Int. Cl.[4] F16D 31/02
U.S. Cl. 414—699 2 Claims



1. In an industrial machine having a plurality of engine driven variable displacement hydraulic pumps with a common associated reservoir, and a common outlet line, a plurality of hydraulic motors for respectively operating different machine functions, and control valve means for controlling the flow of pressurized fluid from the outlet line to the respective motors and from the motors to the reservoir, the improvement comprising: a load sensing conduit; load sensing means associated with each control valve means for connecting the outlet line to the load sensing conduit when one of the motors is connected to the outlet line; a stroke control means operatively connected to each pump and to the load sensing conduit for increasing the displacement of the respective pumps when the pressure in the load sensing conduit exceeds a predetermined value; and shut-off valve means in the connection between the load sensing conduit and the stroke control means for only one of the pumps

1. In an industrial machine having an engine with a throttle control for adjusting the engine speed, a source of electric power, at least one variable displacement hydraulic pump having an outlet and driven by the engine, a plurality of hydraulic motors for respectively operating different machine functions; and a plurality of control valve means connected directly to the pump outlet for respectively controlling the flow of pressurized fluid from the pump outlet to the respective hydraulic motor, the improvement comprising:

a load sensing conduit separate from the pump outlet;

each control valve means including means for connecting the pressurized side of the respective motors to the load sensing conduit only when pressurized fluid is being supplied to the respective motors;

pressure actuated electric switch means operatively connected to the electric power source and the load sensing conduit to shift to a closed condition as a result of pressure in the conduit falling below a predetermined value;

an electrically controlled actuator operatively connected to the engine throttle control for shifting the throttle control to an engine idle condition when the actuator is actuated;

and a time delay circuit means operatively connected to the switch means and the actuator to connect the actuator to the electric power source a predetermined time interval after the switch shifts to its closed condition.

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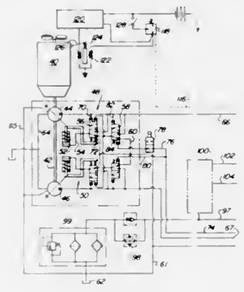
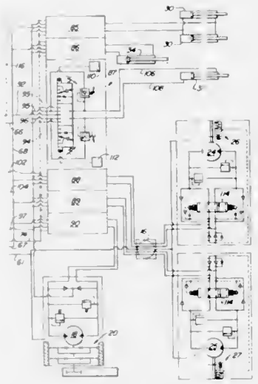
and selectively shiftable between open and closed positions, whereby said one pump does not increase its displacement in





response to an increase in pressure in the load sensing conduit when the shutoff valve is in its closed position.

4,838,757

WIND TURBINE SYSTEM USING A SAVONIUS TYPE ROTOR

Alvin H. Benesh, 120 S. Adams Ave., Pierre, S. Dak. 57501

Division of Ser. No. 801,069, Nov. 22, 1985, Pat. No. 4,715,776. This application Oct. 7, 1987, Ser. No. 105,885

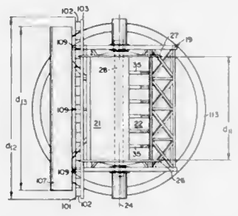
Int. Cl.[4] F03D *3/04*

U.S. Cl. 415—4.4 **27 Claims**

1. A Savonius rotor assembly for interacting with a moving fluid, comprising:

(a) a support framework; and

(b) a rotor mounted on the support framework for rotation about an axis, the rotor having two blades disposed symetrically about the axis, each of the blades having an outer edge and an inner edge with respect to the axis, the outer edges of the blades lying on a circle defining a diameter of the rotor, the blades further having a first curved portion and a second curved portion, the first curved portion beginning at the outer edge and terminating at the second curved portion with the first curved portion defining a surface generally concave with respect to the axis, the first curved portion having a radius of curvature which becomes progressively less from the outer edge to the second curved portion, the second curved portion coming progressively closer to a plane containing the axis and the outer edge of the blade as the second curved portion extends from the first curved portion to the inner edge of the blade, the maximum displacement of the blades from



the plane being less than one-quarter of the diameter of the rotor.

4,838,758

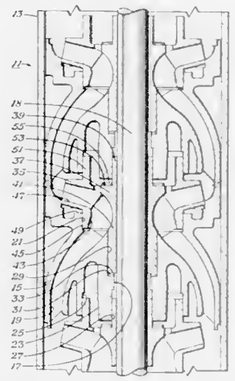
REDUCED DIAMETER DOWNTHRUST PAD FOR A CENTRIFUGAL PUMP

Ketankumar K. Sheth, Tulsa, Okla., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Dec. 28, 1987, Ser. No. 138,628

Int. Cl.[4] F04D *29/04*

U.S. Cl. 415—140 **4 Claims**



1. In a submersible centrifugal pump having a housing containing a plurality of stages, a driven shaft extending through the housing, each stage having an impeller with a central hub mounted to the shaft for rotation therewith, the impeller having an intake on its lower side for a plurality of passages which incline upward and outward for discharging fluid to a stationary diffuser having a central bore an a plurality of passages leading upward and inward to an annular outlet, the hub having an upper section which is rotatably received inside the bore, the improvement comprising:

an upward facing thrust shoulder located in the bore of each diffuser, the thrust shoulder having an outer diameter less than the outer diameter of the diffuser outlet and being recessed below an upper end of the diffuser, defining a cylindrical wall surface within the bore above the thrust shoulder; and

means including an extension sleeve extending downward from the hub of each impeller for engaging the hub of each impeller with the thrust shoulder of a next lower stage for transmitting downward thrust, the extension sleeve being rotatable with the impeller of the next upward stage and engaging the cylindrical wall surface in sliding rotating contact.

4,838,759

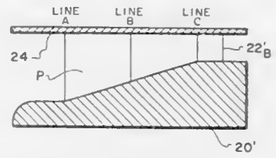
CAVITATION-RESISTANT INDUCER

Charlton Dunn, Calabasas, and Maria R. Subbaraman, Canoga Park, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 36,627, Apr. 10, 1987, abandoned. This application Mar. 29, 1988, Ser. No. 178,819

Int. Cl.[4] F04D *29/68*

U.S. Cl. 415—143 **10 Claims**



1. An inducer for a pump including a wall member wherein said inducer and pump are required to pump a liquid capable of becoming a two-phase fluid and operate over a wide range of flow rates, the improvement in the inducer comprising:

(a) a ratchet-shaped hub;

(b) a plurality of blades attached to said hub and having suction and pressure sides wherein the suction and pressure sides of each blade are of equal heights; and

(c) a flow passage having a rectangular-shaped cross-section formed by the ratchet-shaped hub, at least two blades each adjacent one to the other, and the wall member.

4,838,760

FAN WITH MOTOR COOLING ENHANCEMENT

Stephen E. Brackett, Blenheim, Canada, assignor to Bendix Electronics Limited, Chatham, Canada

Filed Apr. 27, 1987, Ser. No. 43,276

Int. Cl.[4] F04D *29/28*

U.S. Cl. 416—93 R **6 Claims**

1. A fan to be driven by a motor, the motor including a cylindrical housing and openings through the housing to permit air to flow therethrough, comprising

a hub comprising:

an end member adapted to be driven by a motor;

a cylindrical outer wall extending rearward of the end member to envelope an end of the motor when the hub is attached thereto;

a plurality of circumferential openings in the outer wall;

a plurality fan extending radially from the hub positioned about each opening;

a first plurality of arcuate first webs extending radially inward from the outer wall and axially from the end member, each first web including an outer end contacting the end wall and an inner end, each inner end terminating at the same radial distance as measured from the center of the end member, such that when the hub is positioned upon a motor the inner ends are closely and circumferentially spaced about the motor housing wherein the height of each inner end of each first web, is greater than the height of a corresponding outer end, wherein each first web further includes an inclined surface extending from its inner end toward the outer end; and

wherein each first web includes an elevated portion, formed as part of the inner end, axially extending beyond its corresponding inclined surface and the cover includes a support ring axially extending parallel to each elevated portion such that when the cover is seated upon the first webs the inclined surface and inclined walls mate and the inner edge of the support ring engages corresponding outer edges of each elevated portion.

4,838,761

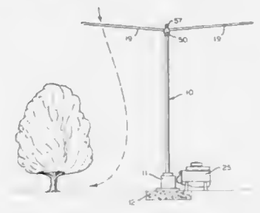
METHODS AND APPARATUS FOR PREVENTING OR RETARDING FRUIT AND VEGETABLE FREEZING

Alan R. Sheppard, 204 Cornwall Dr., Pittsburgh, Pa. 15238

Continuation of Ser. No. 716,325, Mar. 26, 1985, abandoned, which is a continuation-in-part of Ser. No. 523,737, Aug. 16, 1983, abandoned. This application Sep. 29, 1986, Ser. No. 913,083

Int. Cl.[4] F04D *29/34;* **A01G** *13/00*

U.S. Cl. 416—170 R **9 Claims**



1. An apparatus for protecting crops, particularly tree or orchard crops, from frost damage in situtaions where an inversion layer is present comprising a vertical tower fixed to earth against gyration at a level above the crop, a vetical shaft extending lengthwise through said tower, said shaft sized to hold a blade at a position within the inversion layer, a rotor attached to the shaft above the tower so as to be at a position within the inversion layer which will produce a ground effect when the rotor turns, said rotor including a blade retaining member bent upward to form a conical angle, at least two blades of airfoil section, means connecting said blades to said blade retaining member at a pitch angle satisfying the rotor's aerodynamic requirements and drive means drivingly connected to the drive shaft at the bottom of the tower, wherein said blades are positioned at a height sufficient to pick up air in the inversion layer and direct it to the ground to spread out radially along the earth generally beneath the foliage of the crop and then upwardly through and between the foliage and positioned at a height within the ground effect zone of said rotor.

4,838,762

FAN BODY AND ROTOR CUP ASSEMBLY

Jack W. Savage, Centerville, and Lloyd L. Kuck, Beavercreek, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 11, 1988, Ser. No. 179,691

Int. Cl.[4] F04D *29/20*

U.S. Cl. 416—187 **6 Claims**

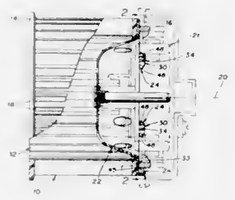
1. A bladed fan body and rotor cup assembly adapted to be driven about an axis of rotation by motor means disposed to one side of said assembly comprising:

(a) a fan cage of plastics material having first and second sides laterally spaced from one another and interconnected by a plurality of transversely extending blades

disposed in a predetermined pattern about said axis for pumping fluid in paths through said cage,

(b) a side plate disposed adjacent to a first of said sides of said cage, said side plate having a plurality of openings formed therein and defined by inner and laterally spaced edges disposed at predetermined points around said axis, and

(c) locator and fastener means extending laterally from said first of said sides through said side plate openings, said



locator and fastener means being formed as an integral part of said cage and having a

(i) radially inward fixed locator arm for direct contact with said inner edge of said opening, said locator arm having side edges spaced apart a distance less than said spaced edges of said opening, and

(ii) a pair of fastener legs having springing hinge connection with said cage and extending through said opening into releasable connection with the outer side of said plate.

4,838,763

CANNED MOTOR PUMP

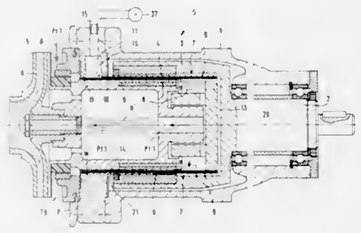
Roland Krämer, Gundelfingen, and Robert Neumaier, Glottertal, both of Fed. Rep. of Germany, assignors to Heyko Reinecker, Freiburg, Fed. Rep. of Germany

Filed Nov. 20, 1987, Ser. No. 123,610

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639720; European Pat. Off., Jun. 6, 1987, 87108088.3

Int. Cl.[4] F04B *49/00*

U.S. Cl. 417—63 45 Claims



1. A canned motor pump, comprising a hollow driving unit; a rotary driven unit which is at least partially surrounded by said driving unit; means for sealing fluids about said units from each other, comprising a can interposed between said units and including a plurality of walls which define a space; and means for monitoring said space for fluid leaks, said monitoring means including external sensing means responsive to leakage through said walls.

4,838,764

OIL PUMP FOR TRANSAXLE

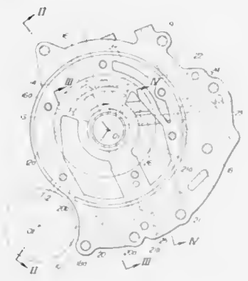
Kazuya Murota, Ebina, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 31, 1988, Ser. No. 176,013

Claims priority, application Japan, Mar. 31, 1987, 62-79335

Int. Cl.[4] F04B *21/00*; F04C *15/00*

U.S. Cl. 418—170 6 Claims



1. An oil pump comprising:

a pump casing including a pump housing formed with a recess receiving therein movable pump elements including a pump element rotatable about an axis, and a pump cover secured to said pump housing, said pump cover including an integral flange section extending radially outward of said pump housing with regard to said axis;

said pump cover being formed with an oil inlet opening and an oil outlet opening at said flange section, a pump inlet port and a pump discharge port, an inlet passage extending from said inlet opening to said pump inlet port, and an outlet passage extending from said pump discharge port to said outlet opening;

said flange section being cutout at a portion disposed radially outward of said pump inlet port with regard to said axis.

4,838,765

AXIAL PISTON PUMP

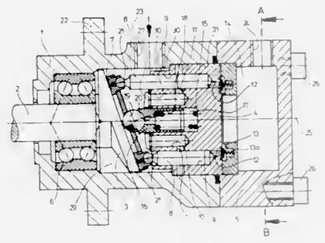
Peter Wusthof, Lohr; Egon Eisenbacher, Karlstadt; Manfred Lotter, Neu-Ulm, and Rainer Stölzer, Ulm, all of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Jahnstrasse, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 796,437, Nov. 8, 1985, abandoned. This application Aug. 20, 1986, Ser. No. 898,837

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1984, 3440850

Int. Cl.[4] F04B *23/14, 1/04*

U.S. Cl. 417—203 17 Claims



1. An axial pump comprising:

a housing have a chamber and an inlet channel into said chamber for fluid;

a swash plate mounted for rotation in said chamber, rotation of said swash plate within said chamber producing a pressure gradient in the fluid disposed in said chamber adjacent the plate surface so that the pressure of fluid adjacent the central axis of said swash plate is less than the pressure of fluid adjacent the peripheral edge of said swash plate, the pressure gradient increasing with increasing rotational speed of said swash plate;

a plurality of axial pistons mounted for reciprocal axial movement in response to rotation of said swash plate to pump said fluid; and

a cylinder housing having a plurality of piston bores each mounting one of said pistons having at least a single suction bore which is connected to one of said piston bores for supplying fluid to that piston bore, such suction bore having a single opening immediately adjacent said plate surface adjacent said central axis of said plate so as to be in communication with an area of low pressure fluid generated by said plate, said cylinder housing having a plurality of exhaust channels for transmitting fluid from said piston bores to an exhaust.

4,838,766

METHOD FOR CONTROLLING DISPLACEMENT OF A VARIABLE DISPLACEMENT WOBBLE PLATE TYPE COMPRESSOR

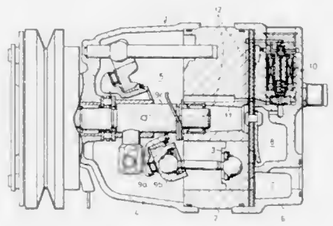
Kazuya Kimura; Akira Nakamoto, and Jun Hasegawa, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Dec. 3, 1987, Ser. No. 128,269

Claims priority, application Japan, Dec. 5, 1986, 61-291140

Int. Cl.[4] F04B *1/26*

U.S. Cl. 417—222 3 Claims



1. A method for controlling the compressor displacement of a variable displacement wobble plate type compressor of the type including a housing element having therein a suction chamber for a refrigerant to be compressed and a discharge chamber for a compressed refrigerant; a cylinder block defining therein a plurality of cylinder bores in which associated reciprocatory pistons are disposed to draw the refrigerant from the suction chamber and then discharge the refrigerant after compression to the discharge chamber; a closed crankcase defining therein a chamber for an assembly of wobble and drive plates to drive the reciprocatory pistons; a first passageway for fluidly communicating the crankcase chamber with the discharge chamber; a second passageway for fluidly communicating the crankcase chamber with the suction chamber; and a solenoid-operated control valve unit arranged in the first passageway and energized by an electric pulsive current to control the amount of compressed refrigerant flowing from the discharge chamber to the crankcase chamber, thereby adjustably changing a pressure differential between a pressure in the crankcase chamber and a pressure in the suction chamber, which pressure differential changes the stroke length of the pistons while changing the angularity of the assembly of wobble and drive plates and the compressor displacement, comprising the steps of:

energizing said solenoid-operated control valve unit by an electric pulsive current having a given duty ratio (δ);

setting and holding a frequency (f) of said electric pulsive current at a predetermined low value equal to or less than 1 Hz so that said pressure in said crankcase chamber changes within a pressure range between a first and a second predetermined pressure levels, wherein said first and second pressure levels are defined as pressure levels preventing a commencing of a change of the angularity said assembly of wobble and drive plates from an angular position determined by said preselected duty ratio;

maintaining said given duty ratio (δ) of said electric pulsive current for said solenoid-operated control valve unit so that said assembly of wobble and drive plates is held at an angular position determined by said given duty ratio (δ); and

controlling said duty ratio (δ) of said electric pulsive current having said preselected frequency value from said given duty ratio value to adjustably change said pressure differential, thereby changing said angularity of the assembly of wobble and drive plates in response to a required compressor displacement.

4,838,767

BALANCED VANE TYPE OIL PUMPS

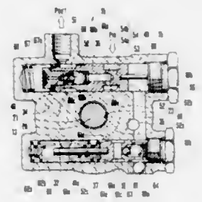
Takeshi Ohe, and Hiroshi Ohsaki, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Japan

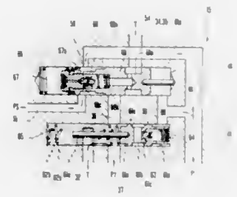
Filed Nov. 18, 1983, Ser. No. 553,302

Claims priority, application Japan, Nov. 22, 1982, 57-205116

Int. Cl.[4] F04G *49/08*

U.S. Cl. 417—299 4 Claims





1. An oil pump comprising:

a pump body having a rotary shaft;

a single rotor mounted to said rotary shaft for rotation therewith, said single rotor having a plurality of radially movable vanes; a cam ring coaxially mounted with said single rotor and rotatably containing said single rotor to define a pair of pump chambers, each of said pump chambers comprising:

an inlet passage;

a first discharge passage spaced a predetermined distance

in a direction of rotation of said single rotor from said inlet passage; and

a second discharge passage spaced a predetermined distance in a direction of rotation of said single rotor from said first discharge passage;

a first valve bore extending in a direction substantially perpendicular to said rotary shaft;

a second valve bore spaced a predetermined distance from said first valve bore and further being parallel thereto;

first and second spool valve means, said second spool valve means mounted in said second valve bore, said second spool valve means operative to selectively connect and disconnect said second discharge passage of each one of said pair of pump chambers to one of said inlet passages of said pump, said second spool valve means further operative to selectively connect said second discharge passages of said pump chambers to said first discharge passages of said pump chambers; and

said first spool valve means mounted in said first valve bore, said first spool valve means selectively operative to connect said first and second discharge passages of said pair of pump chambers to the other of said inlet passages.

4,838,768

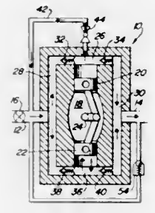
CONVERTIBLE PUMP SYSTEM

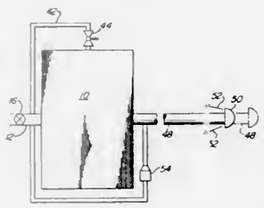
William J. Flaherty, 2536 East St., Davenport, Iowa 52803

Continuation-in-part of Ser. No. 108,604, Oct. 15, 1987, abandoned. This application Apr. 1, 1988, Ser. No. 176,514

Int. Cl.[4] F04B *49/00, 19/00;* B08B *3/00*

U.S. Cl. 417—308 6 Claims





1. A pulsating fluid jet system, comprising: a pump having a fluid inlet, a fluid outlet, first and second fluid chambers, first and second fluid intake lines connecting the first and second chambers respectively to the inlet, first and second discharge lines connecting the first and second chambers respectively to the outlet, first and second pumping elements associated respectively with the first and second chambers, means in the casing for driving the elements in alternating relation so that one element operates in a fluid intake phase while the other element operates in a fluid discharge phase, first and second intake check valve means respectively in the first and second intake lines, first and second fluid discharge check valve means respectively in the first and second discharge lines, a relief valve connected to the outlet and leading to the inlet, a flexible jetter line connected to the outlet, and selectively variable valve means for selectively effectuating and negativing the discharge phase of one pumping element exclusively of the other pumping element for enabling selective operation of the pump in either a one-element mode or a two-element mode, said variable valve means being selectively adjustable to meter fluid flow in said discharge phase for causing vibratory opening and closing of the relief valve and thus to agitate the jetter line.

4,838,769

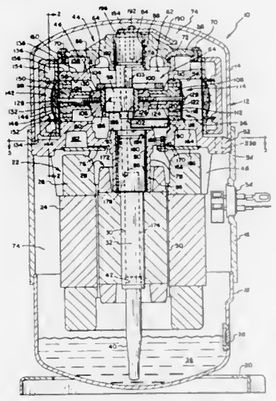
HIGH SIDE SCOTCH YOKE COMPRESSOR

Edwin L. Gannaway, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Jan. 25, 1988, Ser. No. 148,068

Int. Cl.[4] F04B *35/04, 39/02*

U.S. Cl. 417—312 15 Claims



1. A hermetic compressor comprising:

a hermetically sealed housing,

means dividing said housing into an upper chamber and a lower chamber,

a vertically oriented scotch yoke motor compressor unit in said housing comprising a compressor mechanism in said upper changer and a motor positioned in said lower chamber and being drivingly connected to said compressor mechanism,

said compressor mechanism comprising a crankcase having a yoke cavity therein at suction pressure and a plurality of cylinders and a scotch yoke means connected to a vertical crankshaft driven by said motor for compressing refrigerant gas in said cylinder, said crankshaft partially disposed in said yoke cavity and extending into said lower chamber, said yoke cavity being in said upper chamber,

a suction conduit connected directly to said yoke cavity and sealed from said chambers,

a discharge conduit connected to said lower chamber, said lower chamber and upper chamber being at discharge pressure, whereby discharge gas is discharged through said lower chamber to thereby cool said motor, and

seal means on said crankshaft for sealing said yoke cavity from said lower chamber.

4,838,770

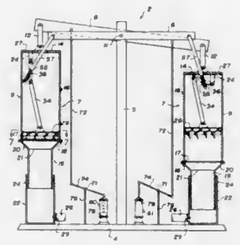
PUMPING DEVICE

Chester S. Jermyn, 3425 Ardingley Avenue, Burnaby, British Columbia, Canada V5B 4A7

Filed Apr. 18, 1988, Ser. No. 182,416

Int. Cl.[4] F04B *35/00*

U.S. Cl. 417—343 11 Claims



1. A pumping mechanism comprising:

a flat base having a central vertical post;

a pair of reciprocal pumping elements mounted on said flat base and situated on either side of said central post, each of said pumping elements comprising an upper movable assembly having an upper container and a lower portion, and a lower fixed assembly;

actuating means comprising a driven member pivotally mounted at the midpoint of its length on said central vertical post with each end pivotably connected to each of the reciprocating pumping elements, said driven member serving to raise and lower the pumping elements in a smooth and steady fashion;

a pair of collapsible piston assemblies located within the upper movable assemblies of the reciprocal pumping elements;

means for collapsing and forming said collapsible piston assemblies at the top and bottom of each stroke of the pumping elements;

said upper container of said upper movable assembly being pivotably connected to said actuating means and having internal and external lips about the perimeter of the upper container's lower edge;

and said lower portion of said upper movable assembly comprising a hollow cylinder communicating with said upper container and secured to the base of said upper container by fastening means on said external lip, said lower portion being slidably received in said lower fixed assembly with means to maintain a fluid tight seal.

4,838,771

BIASING FORCE ADJUSTING APPARATUS FOR ELECTROMAGNETICALLY DRIVEN RECIPROCATING PUMP

Katsuji Kikuchi, Tokyo, Japan, assignor to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1988, Ser. No. 201,200

Claims priority, application Japan, Jun. 3, 1987, 62-85815[U]

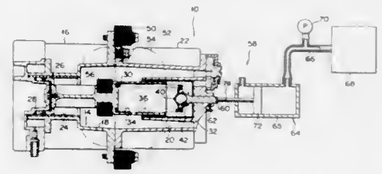
Int. Cl.[4] F04B *49/00*

U.S. Cl. 417—417 3 Claims

1. A biasing force adjusting apparatus for an electromagnetically driven reciprocating pump comprising a housing with a cylinder, an electromagnet arranged in said housing and supplied with an AC or DC pulse current so as to cyclically repeat magnetization and demagnetization, a piston slidable in said cylinder, a magnetic member mounted in said pump so as to be attracted by an electromagnetic force generated by said energized electromagnet and to cause said piston to slide in said cylinder in one direction along an axis of said cylinder, and biasing means for accumulating a biasing force or a set load by movement of said piston in the one direction caused by magnetization of said electromagnet and for causing said piston to slide in said cylinder in the other direction along the axis of said cylinder upon demagnetization of said electromagnet, said electromagnetically driven reciprocating pump reciprocating said piston in said cylinder so as to achieve pumping by a magnetic force generated by said electromagnet and said biasing force generated by said biasing means,

said biasing force adjusting apparatus comprising:

a biasing means support member, which is movable relative to said housing, cooperates with said piston to clamp said biasing means in a direction for causing said biasing means to accumulate the biasing force and a direction for causing said biasing means to discharge the biasing force and changes the clamping force or a preset load by the movement thereof; and



support member position adjusting means for adjusting a position of said biasing means support member relative to said housing so that the clamping force is set at the predetermined value, thereby adjusting the magnitude of the preset load to the predetermined value,

said support member position adjusting means comprising:

pressing means which is detachably connected to said biasing means support member and freely slidable in a sliding direction of the piston and presses said biasing means support member in a region, in which the biasing means is maintained in the set load in the direction for causing the biasing means to accumulate the biasing force; and

fixing means which is arranged in said housing to fix said biasing means support member to said housing after the set load adjustment operation of said biasing means support member by the pressing means.

4,838,772

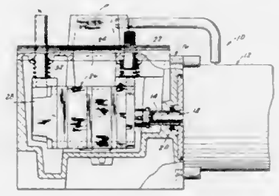
CARTRIDGE ROTARY VANE PUMP

Joseph A. LeBlanc, Glen Ellyn, Ill., assignor to Gast Manufacturing Corporation, Benton Harbor, Mich.

Continuation of Ser. No. 118,539, Feb. 4, 1980, abandoned, which is a continuation of Ser. No. 858,017, Dec. 6, 1977, Pat. No. 4,204,815. This application Apr. 23, 1984, Ser. No. 602,769

Int. Cl.[4] F04C *27/02, 23/00*

U.S. Cl. 418—13 9 Claims



1. A high vacuum rotary vane pump, comprising:

a prime mover including a rotary output shaft;

a pump housing connected to said prime mover and defining a first chamber having sidewalls and a floor for containing a lubricant, wherein one wall of said pump housing in-

cludes a seal through which said rotary output shaft of said prime mover extends;

a pump cartridge mounted in said first chamber, said pump cartridge including an inlet, an outlet and at least two pumping chambers respectively adjacent said inlet and outlet, one of said chambers being of less axial dimension than the other of said chambers, at least two serially-connected rotors, rotatably mounted in said chambers, one of said rotors being of complementary axial dimension to and disposed within said one chamber and the other rotor being of complemental axial dimension to and disposed within said other chamber;

means for interconnection of said rotors; and

coupling means extending between said rotary shaft of said prime mover and said rotors providing a disconnectable coupling located within said first chamber for permitting said cartridge to be lifted from said first chamber and simultaneously decoupled from said rotary shaft of said prime mover without removing said seal.

4,838,773

SCROLL COMPRESSOR WITH BALANCE WEIGHT MOVABLY ATTACHED TO SWING LINK

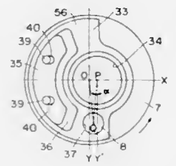
Yoshinori Noboru, Gunma, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jan. 5, 1987, Ser. No. 632

Claims priority, application Japan, Jan. 10, 1986, 61-4067

Int. Cl.⁴ F04C *18/04, 29/00*

U.S. Cl. 418—55 **5 Claims**



1. A scroll compressor for compressing gas, said compressor comprising:

a fixed scroll member having an end plate and a wrap attached to one surface of said end plate, said wrap extending in an involute curve;

an orbiting scroll member having an end plate, a wrap attached to one surface of said end plate of the orbiting scroll member, and a boss on the other surface of said end plate of the orbiting scroll member;

said wrap of said orbiting scroll member juxtaposed with that of said fixed scroll member and disposed adjacent thereto;

an electric motor, a driving shaft operatively connected to said electric motor for being driven thereby to rotate in a counter-clockwise direction, and an eccentric driving pin integral with said shaft and eccentric with respect to an axis of rotation of said shaft for rotating with said shaft eccentrically about said axis of rotation;

a swing link operatively connected between said orbiting scroll member and said driving shaft for tranferring a rotational force generated by said electric motor to said orbiting scroll member through said driving shaft,

said swing link having a boss opening therein in which said boss of the orbiting scroll member extends and an eccentric opening therein in which said driving pin extends,

said swing link also having a center of mass of such a magnitude and defined at such a location with respect to the center of mass of said orbiting scroll member that said swing link generates a centrifugal force that is smaller than that generated by said orbiting scroll member and that acts in a diametrically opposite direction relative to the centrifugal force generated by said orbiting scroll member as said swing link and said orbiting scroll member are rotated by said electric motor through said driving shaft; and

wherein the following conditions are satisfied:

a first distance between the center of said driving shaft and the center of said eccentric opening is larger than the radius of a circle along which said orbiting scroll member orbits, and the center of said boss opening is spaced from the center of said driving shaft, and

the center of said eccentric opening is located at the same side of a first straight line as is the center of said driving shaft, said first straight line extending through the center of said boss opening at a right angle to a second straight line, said second straight line extending between the center of said boss opening and the center of said driving shaft, and the center of said eccentric opening is located in a position offset in said counter-clockwise direction from a third straight line, said third straight line extending through the center of said driving shaft at a right angle to said second straight line, said position located within ninety degrees of said third straight line as taken in said counter-clockwise direction therefrom toward said second straight line and said position also located between said first straight line and said third straight line,

the difference between the centrifugal force exerted by said orbiting scroll member during normal operation of the compressor and the centrifugal force exerted by said swing link being greater than a resultant component of force, including a component of force exerted by the compressed gas, acting on said orbiting scroll member along said second straight line to create a sealing force between said wraps.

4,838,774

APPARATUS FOR MAKING A SPUN-FILAMENT FLEECE

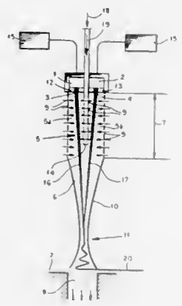
Hermann Balk, Troisdorf, Fed. Rep. of Germany, assignor to Reifenhäuser GmbH & Co Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Nov. 10, 1987, Ser. No. 119,398

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1987, 3701531

Int. Cl.⁴ D01D *5/12*

U.S. Cl. 425—66 **4 Claims**



1. An apparatus for making a spun-filament fleece, comprising:

a pair of separate spinnerets each having a plurality of spinning nozzles for emitting respective curtains of continuous thermoplastic filaments downwardly;

means forming a cooling shaft below said spinnerets receiving said curtains of continuous thermoplastic filaments, said cooling shaft having walls respectively juxtaposed with outer sides of said curtains and extending therealong;

a partition in said cooling shaft extending downwardly between said curtains, separating said curtains in said cooling shaft and juxtaposed with inner sides of said curtains;

nozzle means formed on said walls for directing jets of cooling air into said shaft and inwardly along said curtains of thermoplastic filaments opposite and along said partition;

a stretching shaft below said cooling shaft and formed with stretching-shaft walls narrowing to define a venturi-line air-accelerating stretching gap and thereafter widening downwardly from said gap, whereby said curtains merge in said stretching shaft and said thermoplastic filaments are stretched;

an air-permeable receiving conveyor displaceable below said stretching shaft for receiving a fleece of said thermoplastic filaments depositing from said curtains; and

an additional nozzle means formed on said partition and oriented to direct respective jets of cooling air outwardly against each of said curtains.

4,838,775

DEVICE FOR GRANULATING STRANDS OF THERMOPLASTIC MATERIALS

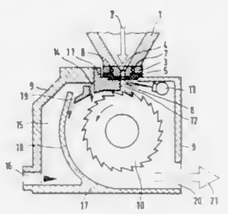
Friedrich Hunke, Grossostheim, Fed. Rep. of Germany, assignor to Automatik Apparate-Machinenbau GmbH, Grossostheim, Fed. Rep. of Germany

Filed Jan. 8, 1987, Ser. No. 1,396

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1986, 3600567

Int. Cl.⁴ B29B *9/06*

U.S. Cl. 425—67 **7 Claims**



1. A device for granulating strands of thermoplastic materials that are discharged from nozzle means in the molten state, said device comprising:

hopper means arranged to contain molten thermoplastic material;

an array of nozzle means disposed side by side and arranged to receive said thermoplastic materials from said hopper means and to extrude strands of said thermoplastic materials in a molten state therefrom;

a granulating device comprising a cutter roll and a counterknife, said cutter roll acting on said counterknife to granulate the extruded strands of thermoplastic materials, said counterknife further being disposed approximately radially to said cutter roll;

said granulating device further comprising a support face disposed on said counterknife, said support face on said counterknife being disposed for supporting said strands located between said nozzles and said cutter roll, said counterknife further filling essentially completely the space between the nozzles and the cutter roll; and

means for spraying cooling water onto said counterknife to harden said strands of thermoplastic material prior to contact with said cutter roll.

4,838,776

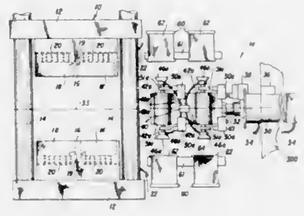
LABEL TRANSFERRING APPARATUS FOR BLOW MOLDING MACHINES

Siegfried C. Hasl, 80 Liberty Corner, Warren, N.J. 07060

Filed Aug. 18, 1983, Ser. No. 524,193

Int. Cl.⁴ B31B *1/12*

U.S. Cl. 425—112 **6 Claims**



1. A blow molding machine having a pair of opposed mold platens mounted on horizontally extending tie rods for movement horizontally toward and away from each other, each platen mounting a mold half thereon, each mold half having at least one cavity which mates with a cavity on the opposed mold half when the mold halves close against each other meeting along a meeting plane, thereby forming the shape of the object to be molded, said blow molding machine effecting blowing of a container at a same certain station during every cycle of its operation,

a main rod,

a mounting structure spaced outwardly generally horizontally from the platens, generally along said meeting plane, mounting means for mounting the main rod onto the mounting structure,

said main rod being supported solely at said mounting structure and extending generally horizontally toward the platens at said certain station, along said meeting plane, cantilevered out from the mounting structure,

said rod being extendible and retractable outwardly relative to said mounting structure, along a straight line between an extended position and a retracted position, and being cantilevered at both of said positions,

a label magazine positioned adjacent the blow mold platen and including means for supporting a pack of labels in a stack to be picked from the stack horizontally, one at a time, the stack extending horizontally in a direction parallel to the line of movement of the platens,

a label carrying head mounted on the end of the main rod opposite from said mounting means, said label carrying head including at least one applicator rod extendible and retractable along a straight line which is perpendicular to the straight line of movement of the main rod, said applicator rod including a vacuum head on the end of said applicator rod, and means for selectively applying vacuum to the vacuum head to selectively hold and release a label,

said label carrying head being located between the mold cavities at said certain station of the blow mold with the vacuum head facing the interior of one of the opposed mold cavities when the main rod is in its extended position, and the label carrying head being located adjacent the label magazine in the retracted position of the main rod, both said positions being located outwardly from the cantilever mounting means with the carrying head thereon cantilevered at both of said extended and retracted positions, and with the main rod in the retracted position, the space at the certain station and occupied by the mold halves in the open or closed positions is completely free of said main rod and structures associated therewith, allowing the mold halves to exist in a closed

condition at the same location at which the labels were applied, to form a container at that location with the labels applied to that container.

4,838,777

EXTRUSION EQUIPMENT FOR COATING WIRE

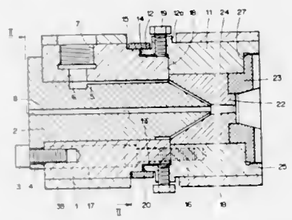
Kurt J. Weber, Préverenges, Switzerland, assignor to Maillefer SA, Switzerland

Filed May 13, 1988, Ser. No. 193,578

Claims priority, application Switzerland, May 29, 1987, 2065/87

Int. Cl.⁴ B29C *47/02*

U.S. Cl. 425—114 **9 Claims**



1. Extrusion equipment for continuously forming a sheath of plastic material on wire, comprising:

a support body having a first longitudinal axis;

a wire guide within said support body;

fixing means for fixing said wire guide within said support body coaxially thereto;

a die-base ring;

a die assembly insertable within said die-base ring and defining within said ring a second longitudinal axis;

first positioning means on said support body and on said ring, respectively, for fixing said ring relative to said support body in an adjustable position so that said axes are parallel and located at a predetermined distance from one another; and

second positioning means for fixing said ring relative to said support body in a predetermined position so that said axes are coincident.

4,838,778

COEXTRUSION HEAD

Rudolf Becker, Kornradenstrasse 32, West Berlin; Wilhelm Neubauer, Birkenstrasse 25, 7141 Oberstenfeld, Gronau; Hans Beyer, Malteserstrasse 48, D-1000 Berlin 46, and Harald Pohl, Kottbusser Damm 79, D-1000 Berlin 61, all of Fed. Rep. of Germany

Filed Dec. 23, 1987, Ser. No. 136,964

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1987, 3700237

Int. Cl.⁴ B29C *47/04*

U.S. Cl. 425—133.1 **6 Claims**

1. In a coextrusion head for the continuous production of coextruded tubes having a plurality of layers of synthetic resin including at least an inner supporting layer, an inner adhesive layer, a middle barrier layer, an outer adhesive layer and an outer supporting layer to be further worked as parison blanks in blow molding, the improvement comprising:

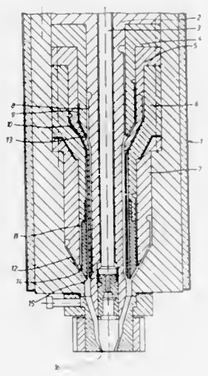
a central mandrel:

a plurality of annular, sheath-like segments surrounding said central mandrel, the walls of said annular sheath-like segments forming at least five coaxial annular feed passageways for carrying the synthetic resin layers being fed from associated extruders;

a plurality of junction points; and

a discharge nozzle;

wherein a first feed passageway for the barrier layer, deviating in molecular structure from the adjacent adhesive layers in flow characteristics, and a feed passageway each



for the inner and outer adhesive layers to be applied to the barrier layer on both sides, are joined at axially adjacent and proximately close junction points.

4,838,779

APPARATUS FOR A PELLETIZER HAVING HYDRAULICALLY ADJUSTABLE PRESSING ROLLS

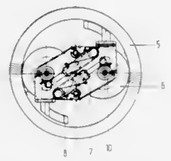
Hendrikus H. Vries, Herten, Netherlands, assignor to Van Aarsen Machinefabriek, B.V., Netherlands

Filed May 15, 1987, Ser. No. 50,926

Claims priority, application Netherlands, May 20, 1986, 8601270

Int. Cl.⁴ B29C *47/32*; B30B *3/06*

U.S. Cl. 425—331 **8 Claims**



1. A continuously operating pelletizer comprising:

an annular press mold mounted on a stationary main shaft located within a frame;

a supply hopper for feeding material into said press mold;

pressing rolls located within said mold such that an outer surface of each of said pressing rolls cooperates with an inner surface of said pressing mold to pelletize said material, wherein at least one of the pressing rolls is mounted on a pressing roll shaft that rotates between a pair of bearing journals and said one pressing roll is capable of being rotatively driven by said press mold, and wherein the pressing roll shaft is eccentrically oriented relative to the bearing journals;

means for adjustably varying a position of said one pressing roll relative to said annular press mold, wherein said adjustably varying means has at least one hydraulic adjustment cylinder in which one end of said hydraulic adjustment cylinder engages with an adjustment crank connected to one of said bearing journals so as to be capable of rotating said pressing roll shaft in order to move said outer surface of said one pressing roll towards or away from said inner surface of said mold; and

hydraulic supply and discharge pipes which extend through the main shaft of the pelletizer and are connected to said hydraulic cylinder.

4,838,780

CONSTANT SPEED RUNNING CONTROL DEVICE FOR AUTOMOBILE

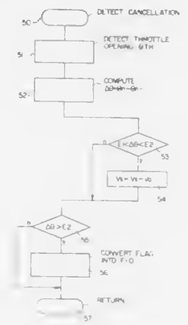
Testuo Yamagata, Bunkyo, and Shoji Yamashita, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1987, Ser. No. 137,778

Claims priority, application Japan, Dec. 24, 1986, 61-313807; Dec. 24, 1986, 61-313808

Int. Cl.⁴ F02D *11/10*

U.S. Cl. 123—352 **2 Claims**



1. In a constant speed operation control device for a vehicle, said device being adapted to determine an opening of an engine throttle according to an output command signal from a control circuit and to maintain a vehicle operating speed at a fixed set value, the improvement comprising means in said control circuit for cancelling an automatic constant speed operating condition when a throttle opening change in a closing direction of said engine throttle within a fixed period of time is greater than a predetermined value.

4,838,781

CONTAINERIZED FUEL FIREPLACE INSERT

Erwin C. Fischer, 745 N. State St., Hildale, Utah 84784

Filed Sep. 12, 1988, Ser. No. 242,716

Int. Cl.⁴ F23Q *2/32*

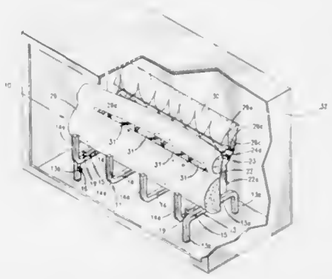
U.S. Cl. 431—125 **11 Claims**

1. A burner unit for burning unvented containerized alcohol fuels comprising

(a) a support stand having opposing parallel horizontal side rails terminating at either end thereof by downwardly extending legs said side rails being interconnected by a pair of transverse support bars;

(b) a grate pivotally mounted between said side rails at the forward portion of said side rails and forward of said transverse support bars by pivot means and pivotable forwardly, said grate containing a fuel cell housing transversely mounted across the rear portions thereof, the rear portion of said grate and said fuel cell housing being positioned to rest over said transverse support bars when the grate is in an unpivoted position, said fuel cell housing having a channel to contain fuel containers comprising a floor and a front wall and a back lip extending upwardly at right angles from said floor,

(c) a damper assembly comprising endwalls extending upwardly from said side rails and positioned to form ends to said fuel cell housing when said grate is in an unpivoted position, said endwalls having stop tabs extending inwardly at right angles at the rear edge thereof and an upper section extending above and behind said fuel cell housing and containing a generally horizontal offset slot therein said slot having a lower forward portion, an upwardly and backwardly intermediate slanting portion and a upper rearward portion terminating in a vertical plane rearwardly of the stop tabs, a damper lid generally rectangular in shape having guide tabs extending outwardly at the forward side ends thereof and having moving means on the top surface into which a tool may be inserted to move said lid in a forward or backward position, said damper lid being slidably mounted in the generally hori-



zontal slot with said guide tabs being slidably positioned in said slot such that, when said guide tabs are in their forwardmost position in said lower forward slot portion, said damper lid will cover the top of said fuel cell housing, said guide tabs having a width less than the width of the slot such that, when said lid is moved backwardly along said slot, said guide tabs will rotate in said intermediate slanting slot portion causing the forward edge of said damper lid to rotate upwardly and, upon further rearward movement, cause said guide tabs and damper lid to rotate to a fully vertical position with the damper lid resting against said stop tabs when said guide tabs are moved to the back end of said upper rearward slot portion.

4,838,782

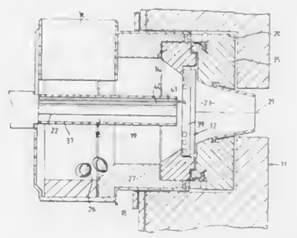
BURNER WITH REGENERATIVE BED

Brian Wills, "Sandbourne", Stoney Lane, Kniver, West Midlands, United Kingdom

Filed Aug. 6, 1987, Ser. No. 82,850

Int. Cl.⁴ F23D *11/44*

U.S. Cl. 431—166 **16 Claims**



9. A burner operable in fire and flue modes and comprising a housing defining an opening which is an air inlet opening when the burner is operating in the fire mode, an inner tubular structure extending within the interior of the housing and

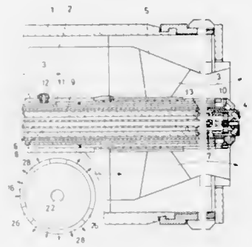
having disposed therein a fuel supply duct for supplying a fluent fuel to a mixing position adjacent to a downstream end of the fuel supply duct, a gas permeable, annular regenerative bed of a plurality of discrete randomly oriented heat storage bodies disposed in the housing and communicating with said inlet opening and surrounding said inner tubular structure, means defining a first end of the bed remote from the mixing position, means defining an airflow path from said inlet opening through the bed to the mixing position and a flame stabilizer separate from the inner tubular structure disposed at the mixing position for causing turbulent flow of the air and the fuel at the mixing position, wherein the flame stabilizer defines a second end of the bed adjacent to the mixing position and excludes the bed from the mixing position.

4,838,783

DUAL BURNER FACILITY WITH A FUEL OIL ATOMIZER

Cornel Füglistaller, Jonen; Jakob Keller, Dottikon, and Thomas Sattelmayer, Mandach, all of Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland

Filed Apr. 21, 1988, Ser. No. 184,365
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1987, 3714408
Int. Cl.[4] F23Q *9/00*
U.S. Cl. 431—284 2 Claims



1. A dual burner facility with a fuel oil atomizer, in which a combustion air duct, a premix gas line with premix gas nozzles, a diffusion gas line with diffusion gas nozzles, an atomizing air line which opens out into an intake funnel of the oil atomizer, and an oil supply line with an oil nozzle are arranged coaxially with respect to one another inside a burner casing;

the oil nozzle opens into the intake funnel, which intake funnel has an external thread that is used for connecting the intake funnel to the atomizing air line;

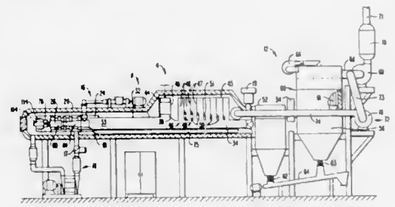
a resonance atomizer mounted to the external thread of the intake funnel, said resonance atomizer comprises a resonator ring, which resonator ring has an annular groove on a hollow cone surface, and a resonator cone, which has an annular groove on an outer cone surface, said resonator cone fits within said hollow cone surface such that the two annular grooves form a resonance chamber, which chamber communicates via an annular inflow duct with a hollow space on the oil nozzle side and via outflow ducts with a combustion space downstream of the burner facility, and wherein a baffle plate is arranged in an extension of the oil nozzle.

4,838,784

PULSE COMBUSTION ENERGY SYSTEM

Hanford N. Lockwood, Jr., San Mateo, Calif., assignor to NEA Technologies, Inc., San Mateo, Calif.

Division of Ser. No. 852,854, Apr. 16, 1986, Pat. No. 4,708,159.
This application Apr. 23, 1987, Ser. No. 41,794
Int. Cl.[4] F27B *15/00*; F27D *7/00*
U.S. Cl. 432—58 15 Claims



1. A drying apparatus comprising:

a pulse combustor having a combustion chamber and a generally tubular outlet in fluid communication with the combustion chamber for emitting high temperature pulses;

a processing tube for flowing a material to be processed therethrough, the processing tube having an axis including upstream and downstream ends, the upstream end being in fluid communication with the outlet of the pulse combustor for receiving the high temperature pulses emitted therefrom, the processing tube including a restriction proximate the downstream end of the processing tube for reflecting pulses emitted from the pulse combustor back toward the upstream end of the processing tube for creating standing pressure waves within the processing tube to facilitate the mechanical removal of moisture from the exterior of the material and therewith the drying of the material;

means for introducing a material to be processed into the high temperature pulses flowing through the upstream end of the processing tube; and

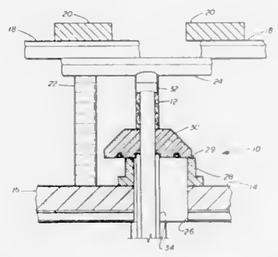
means, in fluid communication with the downstream end of the processing tube, for receiving the material flowing therefrom.

4,838,785

WALKING BEAM FURNACE INSULATION

Frank Campbell, Jr., Houston, Tex., assignor to Cameron Forge Company, Houston, Tex.

Filed Jul. 5, 1988, Ser. No. 214,940
Int. Cl.[4] F27B *9/00*
U.S. Cl. 432—121 6 Claims



1. A walking beam furnace insulation for each of the walking legs and openings in a floor of a walking beam furnace comprising

an insulating cap secured closely around the intermediate exterior of each of the walking legs, and

an insulating surface on the interior of the furnace surrounding each of the openings through the furnace floor through which the legs extend,

said openings and said insulating surface being only sufficiently large to immediately surround only said legs and to allow for movement of said legs,

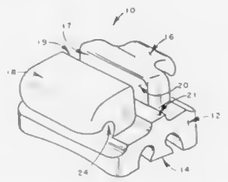
said caps being positioned on said legs to be in close space relationship immediately above said surface surrounding said openings at all time except when the legs are extended upwardly into the furnace for the movement of a work piece therein to limit flow through the openings and thereby to minimize the heat loss through the floor openings.

4,838,786

ORTHODONTIC BRACKET

James F. Reher, Pomona, and Farrokh Farzin-Nia, Inglewood, both of Calif., assignors to Manufacturers Hanover Trust Company, New York, N.Y.

Filed May 6, 1987, Ser. No. 46,430
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—9 12 Claims



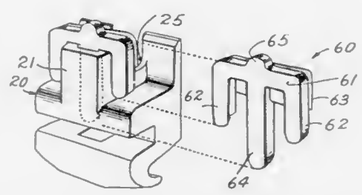
1. An orthodontic bracket comprising at least one tiewing having a slot for receiving an archwire, a base portion integrally formed with said tiewing having a surface for attachment to a tooth, said base portion having at least one longitudinally extending groove across said bracket and extending from said surface into said base portion and beyond at least a portion of the opening of said groove at said surface, said groove having no sharp edges internally of said base portion.

4,838,787

ORTHODONTIC BRACKET AND LOCK PIN

Harry Lerner, Apartado Postal No. 64753, C.C.C.T., Caracas 1060-A, Venezuela

Filed Sep. 15, 1987, Ser. No. 96,865
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—14 2 Claims



1. An orthodontic bracket device for use with a light wire technique and edge wise correction technique, comprising:

a backing plate for attachment to a tooth band or tooth; and,

a body portion connected to said backing plate having a frontal slot located therein along a midsection thereof for receipt of an arch wire, said body portion also having a passageway located therethrough which intersects said frontal slot, said passageway extending upwardly through and upwardly protruding portion of said body portion, said upwardly protruding portion being positioned relative to said backing plate so as to create a light wire receiving channel therebetween, said body portion also having a lower portion located immediately beneath said frontal slot;

said light wire receiving channel having a light wire received therein and said passageway having a locking pin means inserted therein for securing said light wire in said light wire receiving channel, said locking pin means having front and back sides and comprising a center shaft member connected on either side to a pair of lateral shaft members by a crossing T-member, the improvement comprising said center shaft extending through said crossing T-member to form an extension thereof, said lateral shaft members grippingly engaging the exterior side surfaces of said upwardly protruding portion, said center extending to, but not through, said frontal slot,

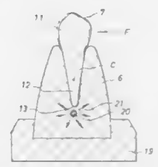
said frontal slot having a rectangular arch wire received therein with portions thereof extending beyond said body portion of said bracket device, said arch wire being held securely in said frontal slot by elastic ligature means, said elastic ligature means looping around behind both said extension of said center shaft and said lower portion of said body portion and riding over said portions of said rectangular arch wire.

4,838,788

ARTICULATOR FOR MASTERING DENTURE CORRECTING TECHNICS

Hajime Suya, 3-20-17 Shimoochiai, Shinjuku-ku, Tokyo, Japan

Continuation of Ser. No. 13,048, Feb. 10, 1989, abandoned. This application Dec. 8, 1987, Ser. No. 131,328
Claims priority, application Japan, Feb. 13, 1986, 61-29756
Int. Cl.[4] A61C *11/00*
U.S. Cl. 433—32 3 Claims



1. A dental articulator for mastering denture correcting technics comprising:

an artificial denture comprised of a plurality of artificial teeth each having a root portion;

an alveolar portion made of thermoplastic organic matter for supporting each root portion at one end thereof;

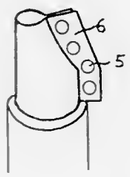
a mold connected to the other end of said alveolar portion for supporting the other end of said alveolar portion;

a resistance wire having a U-shaped portion disposed in the alveolar portion and end portions extending respectively from both ends of said U-shaped portion outside of said alveolar portion, said U-shaped portion embedded within said alveolar portion just beneath and apart from apexes of said root portions of said artificial denture and being out of contact with said artificial denture and extending along said apexes of said root portions, said resistance wire being adapted to heat a part of said alveolar portion beneath said apexes of said root portions by means of only said U-shaped portion when said resistance wire is connected to an electric power supply source.

4,838,789
MATERIAL PACKS FOR PREPARING PLATE DENTURES
Hisatoshi Tanaka, Morioka, and Masao Akiru, Omiya, both of Japan, assignors to G-C Dental Industrial Corp., Tokyo, Japan
Filed Sep. 30, 1987, Ser. No. 102,856
Claims priority, application Japan, Oct. 17, 1986, 61-245424
Int. Cl.[4] A61C *13/08*
U.S. Cl. 433—171 **2 Claims**

1. A material pack for the preparation of plate dentures, comprising an outer pack formed of a material capable of shielding active energy beams, said outer pack containing therein: (1) a matrix formed of a light transmitting material, (2) a photopolymerizable resin provided inside of said matrix, and (3) artificial teeth provided on said matrix while a part thereof projects from said matrix into said photopolymerizable resin such that said artificial teeth are finely adjustable; and wherein the necessary particulars including, the size and form of said matrix, the size, form and color tone of said artificial teeth and the color tone of said photopolymerizable resin are specified on said outer pack.

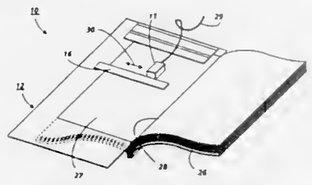
4,838,790
DENTAL SLEEVE AND ITS USE
Werner Koller, Unterdorfstrasse 22,, Lausen, Switzerland CH-4415
Filed Jun. 30, 1987, Ser. No. 68,187
Claims priority, application Switzerland, Jul. 7, 1986, 2739/86
Int. Cl.[4] A61C *5/08, 5/10*
U.S. Cl. 433—219 **4 Claims**



1. A dental sleeve adapted to enclose a tooth stump or a model for supporting a ceramic veneer in a composite ceramic crown, said dental sleeve consisting of a composite foil,
the composite foil having a weld segment and either a cylindrical portion, or a cylindrical bottom portion and a top portion that is defined by a front surface, lateral surfaces and a rear surface corresponding to the lingual surface of the crown,
of said surfaces, only the rear surface or the rear surface and the lateral surfaces inclined in a radially inward direction from the cylindrical bottom portion,
the composite foil comprising at least two layers including an inner layer and an outer layer,
of the inner and the outer layers, at least said inner layer consisting of fine gold or a gold alloy,
each of the remaining layer or layers consisting of either one of a group consisting of platinum, palladium, silver, indium, and iridium, or an alloy or alloys of at least two metals in said group, or at least one of the metals in said group and gold, or of an alloy made up of at least 50% of fine gold, and
said weld segment extending over the length of the sleeve and along which spot welds are disposed at which portions of said inner layer are joined to one another.

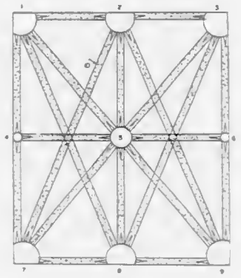
2. A method of producing a dental sleeve consisting of a composite foil for supporting a ceramic veneer in a composite crown,
the composite foil have at least two layers including an inner layer and an outer layer,
of the inner and the outer layers, at least said inner layer consisting of fine gold or a gold alloy,
each of the remaining layer or layers consisting of either one of a group consisting of platinum, palladium, silver, indium, and iridium, or an alloy or alloys of at least two metals in said group, or at least one of the metals in said group and gold, or of an alloy made up of at least 50% of fine gold, and
said method comprising:
providing a tooth stump or model having at least a cylindrical portion;
cutting the composite foil into a rectangular piece defined by a central rectangular section and a respective weld segment extending from each of the shorter sides of said rectangular section,
the width of said central rectangular section corresponding to the length of the tooth stump or model,
and the length of the central rectangular section corresponding to the circumference of the cylindrical portion of the tooth stump or model;
shaping the rectangular piece of composite foil into a cylinder around the cylindrical portion of the tooth stump or model with the shorter sides of the central rectangular section abutting one another in a nonoverlapping manner and with the weld segments confronting each other and extending over the length of the tooth stump or model; and
spot welding the inner layer of the composite foil at one of the weld segments to the inner layer of the composite foil at the other of the weld segments thereby securing the composite foil around the tooth stump or model with the shorter sides of the central rectangular section aligned.

4,838,791
MAGNETIC TRACKING AID FOR A HAND HELD SCANNER
Jasper Bogosian, Jr., Needham, and Mayer Spivack, Chestnut Hill, both of Mass., assignors to Xerox Corporation, Stamford, Conn.
Filed May 26, 1988, Ser. No. 198,887
Int. Cl.[4] G09B *21/00*
U.S. Cl. 434—116 **7 Claims**



1. A magnetic tracking aid for a hand held optical scanner of the type being mounted on rollers which provide for both directional mobility and maintenance of depth of field and having a bottom wall with a light transmissive window therein for optically sensing printed text when it is manually moved over the printed text by a user, the magnetic tracking aid comprising:
a flat substrate having a magnetizable surface and a top and side edge which are mutually perpendicular, alternate parallel lines of north and south poles being formed on the magnetizable surface parallel to each other and the top edge of the substrate and having a uniform equal spacing;
a magnet strip being hingedly mounted on the substrate top edge and being rotatable thereabout to form a clip board configuration capable of releasably holding and locking individual sheets or pages of a bound volume placed on the flat substrate; and
a magnetic flat member having a magnetizable surface in which alternate parallel lines of north and south poles are formed thereon having the same spacing and size as those on the substrate, the flat member being attached to the bottom of the hand held scanner, so that the lines of magnetic poles of the flat member align with and are attracted by the lines of poles of opposite polarity on the substrate, thereby preventing skew of the scanner as it is manually moved by a user across a page of printed text aligned and locked into position on the substrate by said magnetic strip.

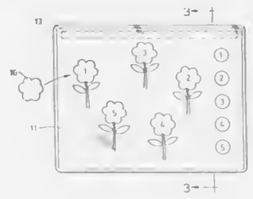
4,838,792
ONE LETTER ALPHABET (OLA)
Ralph H. Hoyeck, 80 Somerville, Westmount, Quebec, Canada H3Z 1J5
Filed Apr. 8, 1987, Ser. No. 35,885
Int. Cl.[4] G09B *11/04;* **G09F** *13/00*
U.S. Cl. 434—163 **19 Claims**



1. A guided writing system and a variable display variable assembly, for signs, illustrations, and displays or the like, comprising mobile guiding points located at the main intersections of the lines of a common symbol, representing a group of symbols, characters, letters, figures, codes, signs or the like, and mobile multi-directional displaying means along the lines of the individual symbols or characters to be displayed.

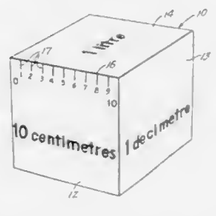
4,838,793
ACTIVITY DISPLAY ARTICLE WITH REMOVABLE MANIPULATIVES
Cheryl J. Taylor, 520 Chapel Rd., Amelia, Ohio 45102
Filed Oct. 5, 1988, Ser. No. 253,628
Int. Cl.[4] G09B *1/08*
U.S. Cl. 434—168 **9 Claims**

1. A children's activity display article for use in conjunction with a ferrous base surface wherein the article has multi-educational features for self-learning and directed learning, said article comprised of:
(a) two activity sheets each having a set of distinct visual objects printed on a front side, said activity sheets placed back to back with a magnetic strip positioned between the sheets for the purpose of holding said sheets in a fixed position with the ferrous base surface during use and further having a clear washable covering on each of the front sides for easy removal of any markings imparted thereon as a part of the learning use; and
(b) a set of small manipulatives for use with the activity sheets, said manipulatives being shaped to fit within the outlines of the printed visual objects and having magnetic



means for attraction to the ferrous base surface on which the activity sheets are positioned during use.

4,838,794
METRIC BLOCK TOY
Lyman Coddington, 2500 "Q" St., NW., Washington, D.C. 20007
Filed Jun. 16, 1988, Ser. No. 207,232
Int. Cl.[4] G09B *1/34*
U.S. Cl. 434—187 **2 Claims**



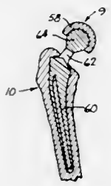
1. A set of toy blocks for teaching the metric system comprising: ten cubic blocks each of the dimension ten centimeters square, and having six square exposed surfaces; one of said exposed surfaces having a rectangular edge, said edge having nine equally spaced gradations thereon designating a distance of one centimeter, said surface having a legend indicating the total length of said edge; a second of said exposed surfaces having a legend indicating the volume of said block in terms of metric measurement; a third of said exposed surfaces bearing a legend indicating the mass of said block in terms of metric measurement; three similarly exposed gradated surfaces having legends corresponding to 0.1 meter, 100 millimeters, and 1 decimeter respectively.

4,838,795
ARTIFICIAL JOINT COMPONENTS FOR TEACHING, RESEARCH AND VISUAL AIDS
Klaus Draenert, Gabriel-Max-Strasse 3, D-8000 Munich 90, Fed. Rep. of Germany
Continuation of Ser. No. 799,392, Nov. 19, 1985, abandoned. This application Oct. 8, 1987, Ser. No. 106,139
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1984, 8433918
Int. Cl.[4] G09B *23/28;* **A61F** *2/32*
U.S. Cl. 434—274 **6 Claims**

1. An individualized simulated joint prosthetic device for teaching, research and visual aids comprising:
a bone portion separate from a body having a central cavity in at least an end portion where a simulated artificial joint component is to be positioned and cemented in place;
a simulated artificial joint component initially separated

from the bone portion and made of easily sawable material selected from a group consisting of injection moldable plastic and casting resin mounted on said bone portion at the end portion thereof at a position where an actual artificial joint component would be positioned on a similar bone portion in a body; and

cement means for holding the simulated artificial joint component in position on the bone end portion in the cavity in



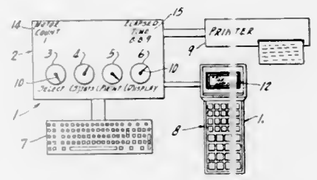
the bone used for such simulated artificial joint component to form the simulated prosthetic device, said prosthetic device being sectioned to form an exposed planar surface which passes through the bone portion, and the simulated artificial joint component and the cement means to permit visual inspection of the relative positioning of such simulated artificial joint component and cement means in the cavity of the bone portion.

4,838,796

MULTIPLE DIAL METER READING DEVELOPMENT APPARATUS AND METHOD

Gregory J. Gozdowiak, N101 W16134 Santa Fe Dr., Germantown, Wis. 53022

Filed Jun. 18, 1987, Ser. No. 64,176
Int. Cl.[4] G09B *19/0*
U.S. Cl. 434—224 9 Claims



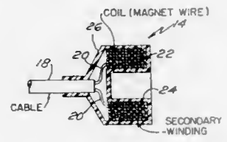
1. A dial reading development apparatus comprising a display means including means for generating a multiple of circular numeric reading dials one for each digit in a number and organized in side-by-side relation and simulating a quantative dial readout of a quantative meter number including a series of adjacent lesser significant digit number positions, each of said dial presentations being divided into ten equal segments, marking means on each of said dials located with respect to said segments and in cooperation therewith identifying a corresponding digit to a nearest whole digit, the whole digit being directly related to and controlled by the preceding digit of the adjacent dial including the lesser significant digit, a processor means connected to said display means and including programmed means, said programmed means sequentially presenting said dials with different readout numbers, a hand-held standard meter reading device coupled to said processor means and having digit input means connected to said processor means and operable to manually receive any one of the whole digits in accordance with a reading of the marking means and thereby to manually insert the whole digit for each of said dials into said processor means, said programmed means recording the inserted digits and comparing said digits with the correct digits establishing by said marking means, and output means coupled to said processor, said programmed means outputting the error and the identification of the digits to said display means.

4,838,797

UNDERWATER CONNECT AND DISCONNECT PLUG AND RECEPTACLE

Paul J. Dodier, Rollinsford, N.H., assignor to The United States of America as represented by the Secretayr of the Navy, Washington, D.C.

Filed Jun. 19, 1987, Ser. No. 67,529
Int. Cl.[4] H01R *13/523*
U.S. Cl. 439—38 4 Claims



1. A connector assembly unit comprising:

a first connector having a first transformer winding;

a second connector adapted to connect to and disconnect from said first connector, said second connector having a second transformer winding;

said first transformer winding and said second transformer winding form respective primary and secondary windings of the same transformer upon said first and second connectors being connected, and said first transformer winding and said second transformer winding are incapable of transformer coupling upon said first and second connectors being disconnected;

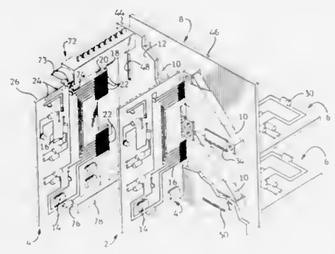
said primary winding is included in and completely enclosed in one of a plug and a receptacle, and said secondary winding is included in and completely enclosed in the other of said plug and said receptacle.

4,838,798

HIGH DENSITY BOARD TO BOARD INTERCONNECTION SYSTEM

William R. Evans, Mooresville, N.C.; Richard F. Granitz, Harrisburg, and George R. Schmedding, Hummelstown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 15, 1988, Ser. No. 207,411
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—61 17 Claims



1. An electrical connector for electrically connecting a plurality of first circuit boards having first conductive regions provided thereon with a plurality of second circuit boards

having second conductive regions provided thereon, the electrical connector comprising:

support means having a first planar member with a first major surface provided thereon, and a second planar member spaced from and parallel to the first planar member, the second planar member having a second major surface provided thereon;

positioning means positioned on the support means, first positioning means cooperate with the first conductive regions of the first printed circuit boards and second positioning means cooperate with the second conductive regions of the second printed circuit boards;

connector means mounted to the support means, the connector means having conductors provided thereon, a first mating end of each connector means is provided proximate a respective first positioning means, and a second mating end of each connector means is provided proximate a respective second positioning means, the connector means is positioned between the first planar member and the second planar member, the planar member having securing means which cooperates with the connector means to maintain the spacing of the planar members and to maintain the connector means therebetween;

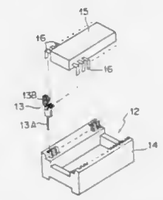
whereby upon insertion of a first circuit board into a respective first positioning means, the first conductive regions of the first circuit board are placed in electrical engagement with the conductors at the first mating end of the connector means, and upon insertion of a second circuit board into a respective second positioning means, the second conductive regions of the second circuit board are placed in electrical engagement with the conductors at the second mating end of the connector means, thereby placing the first circuit boards in electrical engagement with the second circuit boards.

4,838,799

I.C. SOCKET HAVING CONDUCTIVE PLASTIC CONTACTS

Takashi Tonooka, Suntougun, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 16, 1987, Ser. No. 74,122
Claims priority, application Japan, Jul. 25, 1986, 61-175313
Int. Cl.[4] H01R *9/09, 9/24;* H05K *1/00*
U.S. Cl. 439—70 5 Claims



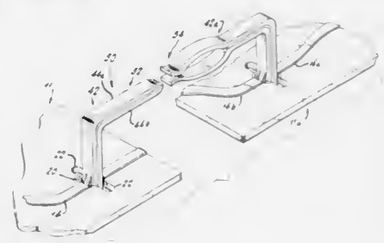
1. A socket for mounting an integrated circuit unit for burn-in testing of the unit having a plurality of conductive contacts, and a body mounting the contacts in a selected arrangement for contacting respective pins of an integrated circuit unit, characterized in that each contact comprises a metal pin at one end of the contact for attaching the contact to an external burn-in test circuit and a conductive resin material connected to the metal pin to provide the contact with a selected electrical resistance suitable for providing burn-in testing of an integrated circuit unit mounted thereon.

4,838,800

HIGH DENSITY INTERCONNECT SYSTEM

Thomas M. Lynch, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed May 23, 1988, Ser. No. 197,200
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—78 1 Claim



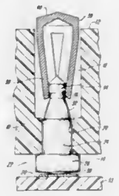
1. A high density interconnect system comprising: a first electrical circuit board having an insulating substrate with a plurality of discrete electrically conductive patterns formed thereon; at least one plated-through hole formed in said substrate within, and electrically connected to, one of said electrically conducting patterns, said plated-through-hole being segmented to provide at least first and second electrical conductors; and a duplex terminal pin within said plated-through-hole, said terminal pin having an electrically insulating core and first and second electrically conductive portions, said first portion being in electrical contact with said first conductor and said second portion being in electrical contact with said second conductor, one end of said duplex terminal pin being formed as a female receptacle with said portions arranged for receiving and electrically engaging a male contact pin.

4,838,801

LEADLESS COMPONENT SOCKET

Guido Bertoglio, Viganello, Switzerland; Michael C. Boyle, Norton; James S. Cooney, Attleboro, both of Mass., and William B. Walkup, Barrington, R.I., assignors to Augat Inc., Mansfield, Mass.

Filed Nov. 2, 1987, Ser. No. 115,511
The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—83 10 Claims



1. A leadless component socket comprising:

a socket body of electrically insulative material having a planar top surface and a substantially parallel planar bottom surface and a plurality of openings between the top and bottom surfaces in an array to provide an intended contact pattern;

a plurality of spring contact assemblies each retained in a respective opening, each spring contact assembly including:

a first element disposed within the opening adjacent the bottom surface of the socket body and having an outwardly extending lead for attachment to a contact element of a mounting member;
a second element disposed within the opening adjacent the top surface of the socket body and having a contact tip outwardly extending from the top surface for engaging a contact of a leadless component mounted on the socket;
one of the elements having a ramp surface;
the other one of the elements having a spring means cooperative with the ramp surface, the spring means being movable in a direction transverse to the axis of the first element and operative to bias the first element to a normally outward axial position

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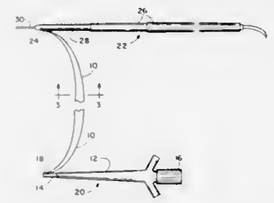
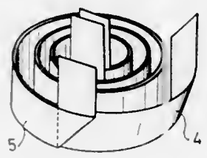
4,838,802
LOW INDUCTANCE GROUND LEAD
Steven E. Soar, Vancouver, Wash., assignor to Tektronix, Inc., Beaverton, Oreg.
Continuation of Ser. No. 71,130, Jul. 8, 1987, abandoned. This application Jul. 20, 1988, Ser. No. 222,353
Int. Cl.[4] H01R *4/66*
U.S. Cl. 439—98 **4 Claims**



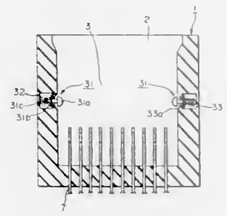
1. High frequency electrical signal measurement probe apparatus, comprising
a signal probe having a signal input tip and a ground conductor adjacent said input tip,
a ground probe having a conductive grounding tip and an adjacent ground conductor, and
a low inductance ground lead interconnecting the ground conductors of said signal probe and ground probe,
said ground lead comprising a monolithic, flexible strand of conductive foil having a maximum self inductance of about 20 nanohenries per inch.

4,838,803
CONNECTOR DEVICE
Shiro Kondo, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan
Filed Aug. 27, 1987, Ser. No. 90,165
Claims priority, application Japan, Oct. 21, 1986, 61-160084; Oct. 29, 1986, 61-164926
Int. Cl.[4] H01R *35/00*
U.S. Cl. 439—164 **2 Claims**



1. A connector device comprising:
a stationary body;
a movable body capable of rotating relative to the stationary body; and
a plurality of belt-like flat cables stacked on each other and mounted in the space formed between the stationary body and the movable body, each of the cables being wound with a given number of turns, each of the cables including a plurality of identical conductors juxtaposed on a base sheet of film, the stationary body being electrically connected with the movable body via the conductors;
wherein the conductors of a first cable of the plurality of cables are made from a material which differs in capacity of electric current per unit area from a material of which the conductors of a second cable of the plurality of cables are made.

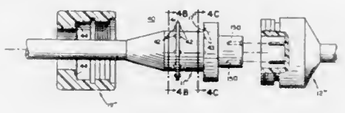
4,838,804
MECHANISM FOR CONNECTING IC CARD AND EXTERNAL DEVICE
Toshinobu Banjo; Tetsuya Ueda; Shigeo Onoda, and Yasushi Kasatani, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Mar. 25, 1988, Ser. No. 173,149
Claims priority, application Japan, Mar. 27, 1987, 62-75125; Mar. 27, 1987, 62-75126; Mar. 31, 1987, 62-79925
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—325 **12 Claims**



1. A connecting mechanism for connecting (i) an IC card package for containing an integrated circuit and including a plurality of electrode terminals for connecting the integrated circuit to an external device and (ii) an electrical connector connected to an external device and including a plurality of contacts for contacting said electrode terminals comprising:
an IC card package including at least one engagement recess;
an electrical connector connected to an external device, said connector including a card receiving portion having opposing side walls for receiving an inserted IC card package, a plurality of contacts for contacting said plurality of electrode terminals when said IC card package is inserted into said card receiving portion to a predetermined position, and at least one resilient retaining means for releasably engaging a said engagement recess to retain a said IC card package when said IC card package is inserted into said connector to said predetermined position, said retaining means comprising:
a retainer recess formed in at least one of said side walls communicating through an opening with said card receiving portion and including stop portions formed at said opening;
a retaining pin having a body at least partially disposed in said retainer recess, an engagement head on said body protruding into said card receiving portion for engaging said engagement recess, and a collar mounted on said body and disposed in said retainer recess for preventing said retaining pin from coming out of said recess by engaging said stop portion; and
a helical spring disposed inside said retainer recess around said body, engaging said collar and said side wall and

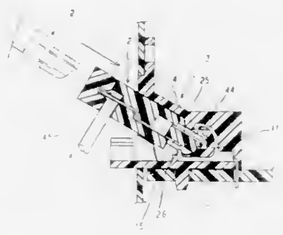
urging said retaining pin toward said card receiving portion.

4,838,805
CONNECTOR ENGAGING NUT LOCKING MECHANISM
James R. Sturges, Barrington, R.I., assignor to Raytheon Company, Lexington, Mass.
Continuation of Ser. No. 568,471, Jan. 5, 1984, abandoned. This application Jul. 8, 1985, Ser. No. 752,494
Int. Cl.[4] H01R *4/38*
U.S. Cl. 439—321 **15 Claims**



1. A connector assembly comprising:
a male and female connector;
one connector having a threaded end portion;
the other connector having a body, a radially outwardly projecting shoulder which is unitary with said body and a threaded connecting nut;
said other connector shoulder being an elastomer which is more compliant than said end portion and said nut;
said connecting nut threadedly engaged with said one connector;
said connecting nut being a substantially stiff plastic non-compliant material and having an inwardly projecting shoulder which is less compliant than said other connector shoulder and which has a surface transverse to the axis of said connecting nut;
said other connector shoulder having a surface transverse to the axis of said connecting nut; and
said surfaces being in sliding contact with each other, one of said contacting surfaces having at least one integral protrusion and the other of said surfaces having at least one recess, said other connector body and nut being of different materials.

4,838,806
ELECTRICAL CONNECTOR
Masazumi Igarashi, Atsugi, Japan, assignor to Molex Incorporated, Lisle, Ill.
Continuation of Ser. No. 42,930, Apr. 27, 1987, abandoned. This application Jan. 26, 1988, Ser. No. 149,996
Claims priority, application Japan, Feb. 5, 1986, 61-67469[U]
Int. Cl.[4] H01R *9/09*
U.S. Cl. 439—341 **3 Claims**



3. An electrical connector arrangement for connecting a plurality of insulated wire conductors to circuitry on a printed circuit board, said arrangement including:
a printed circuit board having a plurality of circuits defined thereon;
a receptacle connector mounted on said printed circuit board, said receptacle connector including a housing having a front end with a divergent entry space extending rearwardly from the front end into the housing, said divergent entry space being defined by a pair of opposed sidewalls, ceiling and a floor extending to a rear wall in the housing, said entry space being futher defined by a slant slot made on each of the sidewalls and a catch recess contiguous to said slant slot on each sidewall, said receptacle connector further including a plurality of terminals in said housing, each terminal including a generally C-shaped first contact portion having an upper portion disposed along the ceiling and a lower portion disposed along the floor of said entry space and a second contact portion extending out of the receptacle housing providing a lead terminal for connection to a circuit on the printed ciruit board; and
a plurality of insulated electrical wire conductors,
the improvement comprising:
a plug connector including a plug body having a rearward end, a front end and a lock piece projecting from each side of the plug body at a position extending rearwardly from the front end and situated at a lower level, said plug connector further including a plurality of terminals mounted in said plug body, each terminal having a first contact portion disposed adjacent the front end adapted to electrically engage the receptacle connector terminals and a second contact portion disposed adjacent the rearward end of the plug body adapted to electrically engage a said wire conductor, and
each of said insulated wire conductors electrically engage in said second contact portions of said plug terminals,
whereby said slant slots are effective to receive the lock pieces on the plug connector and guide the angled insertion of said plug connector into the entry space until the front end of the plug connector engages the rear wall of the entry space and the catch recesses permit the plug connector to rotate within the receptacle connector when the rear end of said plug connector is pushed down, and whereby upon said rotation each lock piece may engage its corresponding catch recess thereby locking the plug connector in the receptacle connector in mated position wherein the plug connector terminals are electrically engage by the

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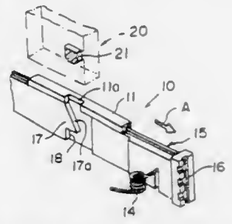
4,838,807
ELECTRICAL CONNECTOR LATCHING MECHANISM
Sasaki Takinori, Hino; Noriaki Takenaka, Tokyo; Akira Kawaguchi, Tachikawa, and Yukiharu Tayama, Tokyo, all of Japan, assignors to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 26, 1988, Ser. No. 160,978
Claims priority, application Japan, Mar. 28, 1987, 62-075773
Int. Cl.[4] H01R *13/62*
U.S. Cl. 439—347 **4 Claims**



1. An electrical connector for latachable engagement with a complementary electrical connector, comprising;
a dielectric housing having electrical contacts disposed therein and including an opening in which contact sections of the electrical contacts are positioned;
slide means movably mounted within said opening of said

housing along an inside surface of a side wall of said housing and being movable laterally relative to the side wall, said movable slide means having a slide-engaging section and a receiving area; and

spring means engaging said slide means biasing said slide means to a latching position so that when slide-operating means of the complementary connector engages said slide-engaging section during the insertion of the complementary connector into said opening of the housing, said slide means is moved in a direction opposite to the latching position against the bias of said spring means until the slide-operating means moves beyond the slide-engaging section into said receiving area with said contact sections electrically engaging complementary contact members of the complementary connector whereupon said slide means is moved back under the bias of said spring means to the latching position thereby latching the connector connectors together.

4,838,808

SHIELDED ELECTRICIAL CONNECTOR AND LATCH MECHANISM THEREFOR

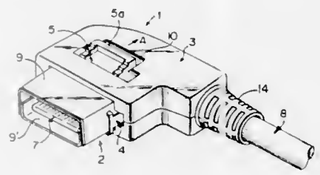
Yoshitsugu Fujiura, Tokyo, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 15, 1988, Ser. No. 208,621

Claims priority, application Japan, Jul. 17, 1987, 62-178823

Int. Cl.[4] H01R *13/627, 13/648, 13/629*

U.S. Cl. 439—357 **7 Claims**



1. An electrical connector, comprising:

a dielectric housing having an electrical contact assembly as part of a connecting section for electrical connection with a complementary electrical connector;

latch members mounted in said housing and extending along respective sides of said connecting section and including latch sections and engaging sections;

means provided by said housing and said latch members pivotally mounting said latch members in said housing so that said latch members can pivotally move from a latch position in latchable engagement with the complementary connector to a release position so as to be disconnected from the complementary connector; and

operating means mounted in said housing for movement from a first position to a second position and including engaging means engageable with said engaging sections of said latch members for simultaneously moving said latch members from the latch position to the release position.

4,838,809

POWER CONNECTOR

Bob Mouissie, EK Berlicum, Netherlands, assignor to E. I. DuPont de Nemours and Co., Wilmington, Del.

Filed Jan. 21, 1988, Ser. No. 146,406

Claims priority, application Netherlands, Jan. 28, 1987, 8700210

Int. Cl.[4] H01R *13/635 13/639*

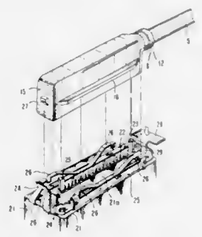
U.S. Cl. 439—155 **5 Claims**

1. A power connector for interconnecting a cable having a plurality of conductors with a printed circuit board, said power connector comprising:

a connector block having a base and two integral pivotable longitudinal walls, each longitudinal wall having a comb-like edge defining slots and being pivotable upwards until said slots receive and maintain in spaced apart relationship the conductors of said cable;

a connector cover which receives said connector block with the cable conductors engaged therein, said cover having longitudinal edges projecting outwardly from longitudinal sides of the cover; and

a pin holder having a plurality of electrical contact pins, said connector cover being mounted over said pin holder so



that each pin electrically contacts a respective one of said cable conductors; and

a base plate upon which said pin holder is disposed and a spring secured to said base plate and surrounding said pin holder, said spring having two longitudinal spring parts which are adapted to press against the corresponding longitudinal edges projecting from the longitudinal sides of the cover, and two end spring parts which are adapted to engage projections at each end of the cover and thereby ensure that the cover is latched and properly mounted on said base plate around said pin holder.

4,838,810

COUPLING ENGAGEMENT MECHANISM FOR ELECTRIC CONNECTOR

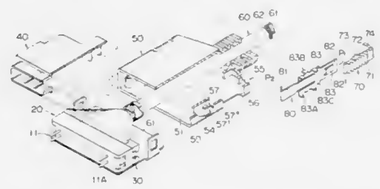
Yoshikazu Yoshimura, and Kihachiro Koike, both of Tokyo, Japan, assignors to Hirose Electric Co, Ltd. and NEC Corporation, both of Tokyo, Japan

Filed Apr. 26, 1988, Ser. No. 186,482

Claims priority, application Japan, Apr. 30, 1987, 62-65985

Int. Cl.[4] H01R *13/627, 13/648*

U.S. Cl. 439—358 **8 Claims**



1. A coupling engagement mechanism for an electric connector having engagement fixtures, and an insulating housing element which includes engagement fixture receiving portions for accommodating the engagement fixtures, said coupling engagement mechanism characterized in that said each engagement fixture is unitarily formed of a springy metal plate, that an engagement portion which engages an abutting portion of a mating connector is formed at one end of said each engagement fixture, while a manipulation portion is formed at the other end, that elastic portions having one of their ends continuous with an intermediate portion of said engagement fixture

and extending on both right and left sides of said engagement fixture toward the engagement portion, that said each elastic portion is formed with, at least, a first coming-off-preventive bend and a second coming-off-preventive bend at a predetermined interval in the direction of the extension, while said each engagement fixture receiving portion of said insulating housing element is formed with a first protuberance and a second protuberance at an interval in the extending direction, said engagement fixture being inserted into said engagement fixture receiving portion, with said first coming-off-preventive bend and said second coming-off-preventive bend held between said first protuberance and said second protuberance, whereby said engagement fixture is fitted and fixed in said insulating housing element.

4,838,811

MODULAR CONNECTOR WITH EMI COUNTERMEASURE

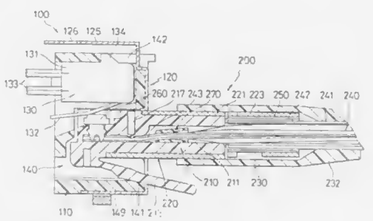
Masaru Nakamura, and Shuichi Matsuzaki, both of Tokyo, Japan, assignors to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Aug. 13, 1987, Ser. No. 92,768

Claims priority, application Japan, Aug. 22, 1986, 61-127903; Aug. 22, 1986, 61-127904

Int. Cl.[4] H01R *13/648*

U.S. Cl. 439—607 **7 Claims**



1. A modular connector comprising:

a plug which includes:

a first generally rectangular cross-section insulating housing having on the front portion a plurality of terminals to which conductors of a cable are connected;

a first metal case having a rectangular cross-section cylindrical portion mounted on the rear portion of said insulating housing, a clamp portion extending from the rear end of said cylindrical portion and clamping the shield wires of said cable, and at least one closing piece provided on the rear end of said cylindrical portion to close openings between said cylindrical portion and said cable terminated to said terminals; and

an insulating case mounting on the rear portion of said metal case; and

a jack which includes:

a second insulating housing having a lower front cavity for receiving said modular connector plug and a plurality of contacts projecting into said lower front cavity so that they may come into contact with said terminals;

a second metal case mounted on the front surface of said second insulating housing except for said lower front cavity; and

at least one connection piece with an outwardly projecting contact tongue and an inwardly projecting contact tongue, said connection piece attached to a side wall of said lower front cavity so that said outwardly and inwardly projecting contact tongues may come into contact with said second and first metal cases, respectively.

4,838,812

SHIELDED ELECTRIC CONNECTOR AND WIRE CONNECTING METHOD

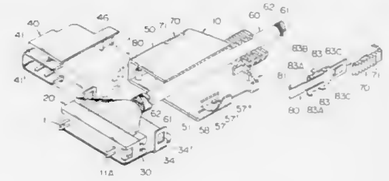
Yoshikazu Yoshimura, and Kihachiro Koike, both of Tokyo, Japan, assignors to Hirose Electric Co., Ltd. and NEC Corporation, both of Tokyo, Japan

Filed Apr. 26, 1988, Ser. No. 186,227

Claims priority, application Japan, Apr. 30, 1987, 62-106598

Int. Cl.[4] H07R *4/66*

U.S. Cl. 439—610 **4 Claims**



1. A shielded electrical connector comprising:

contact pins, each of said contact pins including a contact portion for contacting with a mating contact piece on one end thereof and a joint portion for connecting an electric wire to be connected on the other end thereof;

an insulating housing, said contact pins being disposed and held in said insulating housing, said insulating housing having an elongated rectangular cross-section having long sides and short sides;

a shield hood member; and

a shield lid member, said shield lid member being integrally made of a metallic material and including a flat portion for placing said insulating housing with a said long side of said insulating housing on a surface of said flat portion, a shield connecting portion provided at a generally central portion of a rear end of said flat portion and being substantially U-shaped and extending in a direction substantially perpendicular to a plane of said flat portion and to a side of said flat portion on which said insulating housing is placed and a pair of engaging arms each provided at each side of said flat portion and extending in a direction substantially perpendicular to the plane of said flat portion and to the side of said flat portion on which said insulating housing is placed, said shield hood member being integrally made of a metallic material and including a front envelope for completely surrounding at least said contact portions of said contact pins disposed in said insulating housing, said front envelope being hollow and having an elongatedly rectangular cross-section having long sides and short sides, a rear envelope connected to a rear end of said front envelope and an electric wire lead-out portion connected to a generally central portion of the rear end of said rear envelope and having a U-shaped groove, said rear envelope having walls which are completely continuous, except for an opening which is to be completely closed by said flat portion of said shield lid member, a portion of said rear envelope communicating with said front envelope and a portion of said rear envelope communicating with said electric wire lead-out portion, said walls including an enveloping flat wall portion extending from one of the long sides of the rear end of said front envelope to said electric wire lead-out portion, side wall portions set upright at each side of said enveloping flat wall portion and extending rearwardly from each of the short sides of the rear end of said front envelope, and shoulder side wall portions set upright at each side of said enveloping flat wall portion and extending from a rear end of each of said side wall portions to each side of said electric wire lead-out portion, each of said side wall portions being provided with an engaging portion which is to be engaged by one of said engaging arms of said shield lid member, whereby

said insulating housing is placed on said flat portion of said shield lid member with terminal end parts of said electric wire being connected to said joint portions of the corresponding contact pins and a shield layer of said electric wire being connected to said shield connecting portion by crimping, and said insulating housing is installed in said shield hood member with the contact portions of said contact pins being surrounded by said front envelope of said shield hood member and said shield connecting portion being disposed in said U-shaped groove of said electric wire lead-out portion, and said shield lid member is coupled to said shield hood member to close said opening of said shield hood member by engaging each of said engaging arms with the corresponding engaging portion of said shield hood member.

4,838,813

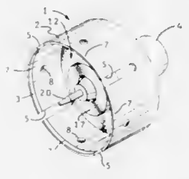
TERMINATOR PLUG WITH ELECTRICAL RESISTOR

William V. Pauza, Palmyra, and Wilmer L. Sheesley, Dauphin, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 197,785, May 10, 1988, abandoned. This application Nov. 1, 1988, Ser. No. 267,742

Int. Cl.[4] H01R *13/66*; H01P *1/26*

U.S. Cl. 439—620 **7 Claims**



1. A terminator comprising, a conductive shell, a disc of insulative material having rivets unitary therewith and passing through the shell, a center contact anchored concentrically in the disc, a resistor having forwardly extending electrical lead connected to the center contact and having a rearwardly extending electrical lead passing through the shell, and the shell is overlapped and engaged by the rivets and by the rearwardly extending electrical lead.

4,838,814

CONNECTOR APPARATUS FOR CONNECTING A SIGNAL LINE WITH AN EXTERNAL CIRCUIT

Nobuei Takai; Haruo Sakamoto, both of Machida; Kouzou Uekido, and Michiaki Nishiyama, both of Tokyo, all of Japan, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 936,421, Dec. 1, 1986, Pat. No. 4,725,698. This application Dec. 15, 1987, Ser. No. 133,355

Claims priority, application Japan, Nov. 30, 1985, 60-184571; Feb. 14, 1986, 61-19968; May 28, 1986, 61-80765

Int. Cl.[4] H01R *13/66*; *25/00*

U.S. Cl. 439—620 **5 Claims**

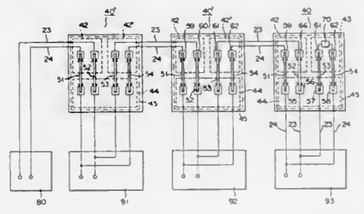
1. A connector apparatus for making a connection between a signal line and an external circuit, which comprises:

a connector body having first and second pairs of terminals, each pair of terminals comprising a pair of contact pins;

a first connector element having two terminals each attachable to and detachable from one end of each of the pair of contact pins of the first pair of terminals, the two terminals being connected to the signal lines;

a second connector element having two terminals each attachable to and detachable from one end of each of the pair of contact pins of the second pair of terminals; and

a terminating resistor connected between the two terminals in the second connector element,



in which the other end of each contact pin of the first and second pairs of terminals is used as an external circuit connection terminal.

4,838,815

CONNECTOR ASSEMBLY

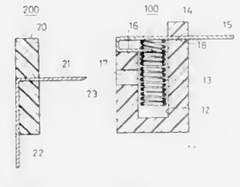
Kyousuke Tajima, Sawa; Goro Itoi, Maebashi, and Mitsuo Sorimachi, Isesaki, all of Japan, assignors to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Sep. 18, 1987, Ser. No. 97,773

Claims priority, application Japan, Sep. 26, 1986, 61-147555[U]; Sep. 26, 1986, 61-147556[U]; Sep. 26, 1986, 61-147557[U]

Int. Cl.[4] H01R *13/33*

U.S. Cl. 439—841 **10 Claims**



1. A socket connector comprising:

an insulation block having a spring housing hole formed in a first surface thereof, said spring housing hole being bent within said insulation block, and a plurality of contact insertion holes formed in said insulation block in different directions to communicate with said spring housing hole,

a coil spring of a conducting material housed in said spring housing hole, said coil spring having its barrel placed opposite to said contact insertion holes, and

at least one socket terminal supported by said insulation block, one end of said terminal being connected to said coil spring, and the other end of said terminal protruding from said insulation block.

4,838,816

ELECTRICAL TERMINAL HAVING A RECEPTACLE CONTACT SECTION OF LOW INSERTION FORCE

Yoshihide Matsusaka, Kawasaki; Kohji Aoyama, Tokyo, and Masaro Noguchi, Sagamihara, all of Japan, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 26, 1984, Ser. No. 665,339

Claims priority, application Japan, Dec. 27, 1983, 58-199108

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—861 **3 Claims**

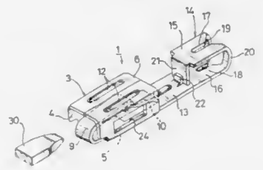
1. An electrical terminal comprising:

a receptacle contact section having a bottom wall and an upper wall;

a first cantilever spring member extending outwardly from a forward end of said bottom wall and being bent back so as to extend backward into said contact section along the bottom wall at an inclined angle relative to the bottom wall, a free end of the contact member spaced from said upper wall a distance less than the thickness of a matable contact member;

a second cantilever spring member being formed from said bottom wall and having a free end disposed beneath the free end of said first spring member in overlapping relationship but spaced therefrom;

said first spring member being initially engaged by the matable contact member upon insertion of the contact member into the contact section between the upper wall and the first spring member so that the insertion force at this position is low, and upon further insertion of the matable contact member into the contact section, the insertion force gradually increase because of the engagement between the free ends of the spring members, and when the contact member is fully inserted into the contact section,



high contact pressure is applied to the contact member by combined spring forces of the spring member;

a wire-terminating section is located adjacent said receptacle contact section, said wire-terminating section including parallel plate members spaced from each other, said plate members having wire-receiving slots therein;

bights connecting said plate members together at the ends having the entrances to the wire-receiving slots;

an extension of one plate member engaging the other plate member so that said bights and said extension maintain said plate members parallel; and

means provided by the other plate member to maintain the extension positioned at the other plate member so that when an insertion member is positioned between the bights in engagement with said extension, the extension is supported when the insertion member applies force onto the extension to insert the terminal into a terminal-receiving cavity of a housing.

4,838,817

TROLLING MOTOR HAVING PIVOTAL FOOT ELEMENT

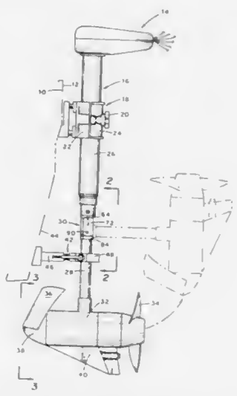
Steed Travis, Rte. 6, Box 73D, Maryville, Tenn. 37801

Filed May 5, 1988, Ser. No. 190,702

Int. Cl.[4] B63H *5/12*

U.S. Cl. 440—6 **2 Claims**

1. In a trolling motor for a boat including means mounting the trolling motor to the boat, a foot adapted to be disposed underneath the surface of a body of water, propeller means associated with said foot for propelling the boat through the body of water, said foot including a nose portion and a trailing portion serving to mount the propeller means, and shaft means connecting said foot to said mounting means, the improvement comprising blind hinge means interposed along the length of said shaft and dividing said shaft into first and second sections, said first section extending between said hinge means and said means mounting said motor to said boat, and said second section extending between said hinge means and said foot, and including means defining a water deflection shield disposed on said nose portion of said foot in position to exert a drag against forward movement of said foot through said body of water wherein said shield extends from a leading edge of said nose portion upwardly and rearwardly of said nose portion such that when said second shaft section is disposed substantially horizontally, a maximum area of said shield is exposed to the



flow of water therepast thereby tending to urge said second shaft section toward such horizontal position.

4,838,818

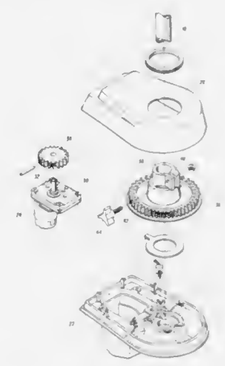
FRICTION STEERING DRIVE SYSTEM FOR ELECTRIC FISHING MOTORS

James R. Edwards, Dubuque, Iowa, assignor to The Eska Company, Dubuque, Iowa

Filed Jul. 16, 1986, Ser. No. 886,517

Int. Cl.[4] B63H *21/17*

U.S. Cl. 440—6 **3 Claims**



1. A drive system for steering an electric trolling motor for boats in which the motor assembly is supported at the lower end of a vertical motor tube and turnable with the motor tube to steer the boat, said drive system comprising a drive hub adapted to receive and frictionally engage the motor tube, the only connection between the drive hub and motor tube being by reason of the friction between them, an electrically powered steering motor for driving the drive hub, a large gear operatively connected to the drive hub so that the drive hub turns when the large gear turns, a smaller drive gear operatively connected to the steering motor and engaged with the large gear to transmit power from the steering motor to the drive hub and slowly turn the drive hub when the driving motor is actuated thereby turning the motor tube through the

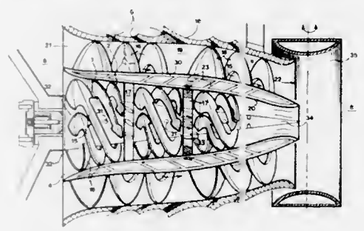
frictional connection so as to steer the boat, a support bracket through which the motor tube extends, means for varying the R.P.M. of the motor tube which means includes a vertical liner between the support bracket and the motor tube, and an adjustable knob engageable with the liner to increase the friction force between the liner and the drive tube.

4,838,819

MARINE PROPULSION UNIT

Dobrivoje Todorovic, 28 Horning Drive, Kitchener, Ontario, Canada N2K 1H6

Filed Apr. 28, 1988, Ser. No. 187,460
Claims priority, application Canada, May 22, 1987, 537806
Int. Cl.[4] B63H *11/103*
U.S. Cl. 440—47 3 Claims



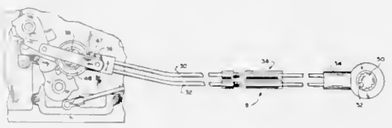
1. A marine propulsion unit comprising:
a main shaft having a proximal end for connection to a drive shaft;
a helical screw along said main shaft;
a duct surrounding said main shaft and screw thereby creating a ducted area, said ducted area having a water inlet near said proximal end and a water outlet near said distal end, said ducted area being tapered from inlet to outlet; whereby water is accelerated through said ducted area to provide propulsion when said water is expelled out said outlet;
further comprising a plurality of secondary inlet ports disposed along and passing through said duct into said ducted area, for drawing in water to minimize cavitation along said ducted area;
in which said main shaft is hollow, having a water inlet at its proximal end and a water outlet at its distal end, further comprising a plurality of secondary inlet ports disposed along and passing through said main shaft into said ducted area for drawing in water to minimize cavitation along said ducted area.

4,838,820

PREASSEMBLED THROTTLE CABLE LINKAGE

James C. Boda, Winneconne; Robert J. Baumhardt, Eden, and Bruce A. Heidel, Fond du Lac, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Aug. 26, 1987, Ser. No. 89,585
Int. Cl.[4] B60K *26/00*
U.S. Cl. 440—87 3 Claims



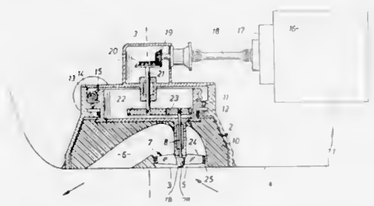
1. In a throttle system for an outboard marine engine in which rotational movement of a tiller handle results in corresponding rotational movement of a throttle linkage so as to control engine speed, a preassembled throttle cable linkage for translating tiller movement to throttle linkage movement, said linkage comprising:
a first pulley sealed within a first pulley casing and having fastening means for securing cables to said pulley in a predetermined configuration and said pulley having connecting means for securing said pulley and said casing to the tiller handle in a predetermined position so that rotational movement of the tiller handle results in rotational movement of said first pulley within said casing,
a second pulley sealed within a second pulley casing and having fastening means for securing cables to said pulley in a predetermined configuration and said second pulley having connecting means for securing said pulley and said casing to the throttle linkage in a predetermined position so that rotational movement of said second pulley within said casing results in a movement of said throttle linkage,
a first pulley cable having a first end attached to said first pulley and a second end attached to said second pulley so that rotation of said first pulley in a first direction results in rotation of said second pulley in a first direction, and
a second pulley cable having a first end attached to said first pulley and a second end attached to said second pulley so that rotation of said first pulley in a second direction results in rotation of said second pulley in a second direction, said first and second directions being predetermined and fixed by the sealing of said pulleys within said casings.

4,838,821

DRIVE MECHANISM PARTICULARLY FOR FLAT-BOTTOMED WATERCRAFTS

Franz Krautkremer, Spay, Fed. Rep. of Germany, assignor to Schottel-Werft Josef Becker GmbH & Co. KG, Spay, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 25,112, Mar. 12, 1987, abandoned. This application Sep. 2, 1988, Ser. No. 241,818
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1986, 3609032
Int. Cl.[4] B63H *11/02*
U.S. Cl. 440—40 2 Claims



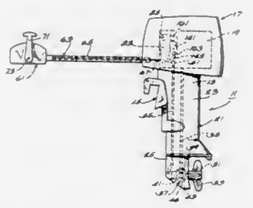
1. A hydro-jet propulsion device for driving and controlling shallow draught watercraft, comprising:
hull means;
means defining a downwardly opening recess in a bottom surface of said hull means, said recess having a central vertical axis and an inner surface contour over the entire axial extent thereof which is concentric with said central vertical axis;
elbow means and support means for rotatably supporting said elbow means in said downwardly opening recess and for movement about an axis of rotation which is coaxial with said central vertical axis, said elbow means having a bottom surface which is generally flush with the outer surface of said hull means, said elbow means additionally having a radially outer surface contour conforming to the contour of said inner surface of said downwardly opening recess and being spaced slightly radially inwardly therefrom, said elbow means having means defining a passageway therethrough, said passageway having first and second segments, each of said segments having a longitudinal axis inclined to said axis of rotation of said elbow means, each of said first and second segments opening outwardly of said bottom surface of said elbow means and at locations whereat the central axes of the two openings in said bottom surface of said elbow means are spaced radially outwardly from said axis of rotation of said elbow means; and
propeller pump means and drive means therefor, said propeller pump means being mounted in said first segment of said passageway for drawing in water through one of said two openings in said bottom surface and ejecting water from the other of said two openings in said bottom surface, the axis of rotation of a propeller of said propeller pump means being substantially parallel to said axis of rotation of said elbow means, said drive means including means facilitating a drive of said propeller about said axis of rotation thereof, wherein the axially lowest part of said propeller is substantially vertically aligned with said bottom surface of said hull means, and wherein said propeller includes a plurality of angularly spaced blades and includes a stiffening ring which is concentric to said axis of rotation of said propeller and which surrounds and is fixedly connected to said blades.

4,838,822

SHIFT LINKAGE FOR MARINE PROPULSION DEVICE

Dennis J. Friedle, Lake Villa; Richard P. Kolb, Prairie View, and M. Jeremy Lieb, Northbrook, all of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 7, 1987, Ser. No. 129,457
Int. Cl.[4] B63H *5/06*
U.S. Cl. 440—86 16 Claims



1. A marine propulsion device comprising a transmission supported on said marine propulsion device and including a clutch member movable between a neutral position and a drive position, a shift lever supported on said marine propulsion device by a pivotal mounting and connected to said clutch member to effect movement of said clutch member in response to movement of said shift lever, and cam and follower means adapted to be connected to a remotely actuated link and connected to said shift lever for displacing said shift lever to effect movement of said clutch member, and for permitting overtravel of the link without displacing said shift lever after shift lever movement effecting movement of said clutch member to said drive position.

4,838,823

DEVICE FOR MOORING A FLOATING BODY, FOR EXAMPLE A SHIP, TO A BODY ANCHORED TO THE SEABED, FOR EXAMPLE A MOORING TOWER

Jacob De Baan, Maassluis, and Marinus Uittenbogaard, Kamerik, both of Netherlands, assignors to Bluewater Terminal Systems N.V., Curacao, Netherlands Antilles

Filed Dec. 10, 1987, Ser. No. 131,353
Claims priority, application Netherlands, Dec. 19, 1986, 8603241
Int. Cl.[4] B63B *21/52*
U.S. Cl. 441—3 9 Claims

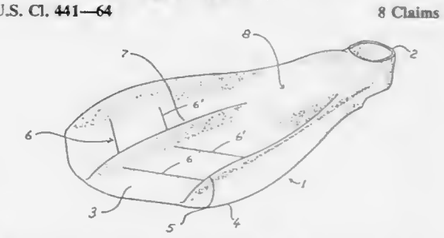
1. A mooring device for a floating body comprising:
a device anchored to the seabed, said device having at least one rigid arm pivotally connected thereto;
first weight means connected to said arm for exerting a force thereon;
tension means for connecting said arm to said floating body, said tension means having at least two components joined at a connection, the first component being attached to the floating body and the second component being attached to said first weight means;
second weight means attached to said tension means at the connection between said at least two components for exerting a force on said tension means, said floating body having a normal mooring force exerted thereon whereby said floating body will travel a first distance determined by the force of the first weight means and if said normal mooring force is exceeded, the floating body will travel a second distance determined by the combined forces of said first and second weight means, said second distance being greater than the first distance.

4,838,824

SWIMMING FLIPPER

Donald B. McCredie, 3/28 Carr Street, Coogee, New South Wales, Australia

Filed Nov. 6, 1987, Ser. No. 118,218
Int. Cl.[4] A63B *31/12*
U.S. Cl. 441—64 8 Claims



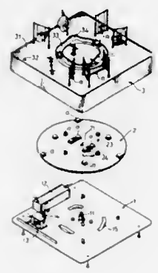
1. A swimming flipper comprising a shoe portion and a flipper portion extending therefrom, said flipper portion having a longitudinal midline substantially along which a fin member extends, said flipper portion having provided on each longitudinal edge thereof two opposed rails extending outwardly and diverging away from each other and defining between them a re-entrant angle along the edges of said flipper portion, the edges of the two divergent rails being equidistant from the midline and defining the widest part of the flipper portion measured from the midline.

4,838,825

TOY KIDDIELAND

Chi Yung Hwang, No. 1, Lane 20, Chung Cheng N. Rd., Sun Chong City, Taipei Hsien, and Lin Ping Chih, No. 29, Lane 426, Wor Long St., Taipei City, both of Taiwan

Filed Feb. 5, 1988, Ser. No. 152,848
Int. Cl.[4] A63H *33/26*
U.S. Cl. 446—136 5 Claims



1. A toy kiddieland comprising:
a base including a center shaft, a motor and a battery assembly mounted on the base; a drive wheel associated with the motor for being rotated thereby, three convexes being positioned on the base around the shaft; and several magnets placed on the base;
a rotary plate including at least three sticks and two I-shaped rotary shafts disposed extending therethrough, each of the sticks and shafts having respective magnets connected thereto; the rotary plate further having a center hole formed therein for receiving the center shaft therein, such that the rotary plate rotates thereon, the rotary plate further having a circumference engaged by the drive wheel, whereby the plate is rotated by the drive wheel;
a sheel covering the rotary plate, the shell including an upper display disk with a switch mounted thereon for controlling the operation of the motor, a sliding track having three projections formed thereon, each projection positioned above a respective convex; and a plurality of implements and human models being disposed on the upper display disk, each of said implements and models having a respective magnet disposed thereon, whereby rotation of the plate by the rotary wheel forms magnetic fields between the magnets on the base, the rotary wheel, the implements and the models moving the implements and models.

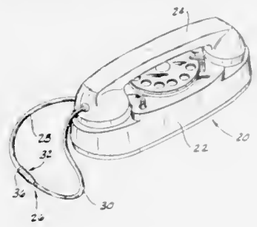
4,838,826

TOY TELEPHONES AND CORDS FOR TOY TELEPHONES

Robert J. Brown; Roberta Brown, both of Bonne Terre, and Carl Rhodes, St. Louis, all of Mo., assignors to Handi-Craft Company, St. Louis, Mo.

Filed Sep. 6, 1988, Ser. No. 240,510
Int. Cl.[4] A63H *33/10*
U.S. Cl. 446—141 21 Claims

1. A toy telephone comprising:
a telephone base;
a telephone handset; and
a cord extending between the base and the handset, the cord comprising first and second cord segments of preselected lengths, the first cord segment connected at one end to the base and the second cord segment connected at one end to the handset, and means for releasably connecting the other free ends of the first and second cord segments together to form a single continuous cord between the base and the handset that has an apparent length that is longer than the length of either cord segment and sufficiently long for play use, which cord, upon application of



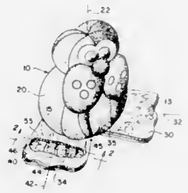
a force in excess of that normally encountered in play use, separates into the segments of pre-selected lengths.

4,838,827

WADDLING TOY FIGURE AND METHOD OF USING SAME

Roger L. Schlaifer, Atlanta, Ga., assignor to Schlaifer Nance & Co., Inc., Atlanta, Ga.

Filed May 19, 1987, Ser. No. 51,407
Int. Cl.[4] A63H *3/14, 3/02*
U.S. Cl. 446—327 3 Claims



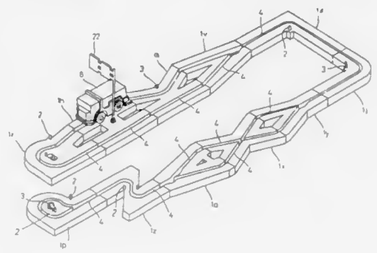
1. A toy figure capable of movement resembling waddling, which movement is effected by the sequential upward and downward movement of the user's hands, the toy figure comprising:
a generally round body;
a head atop the body;
a pair of feet serving as the base for the figure, wherein the head, the body and the feet are vertically arranged to give the figure the appearance of standing, the body being attached directly to the feet without any intermediate or leg portions therebetween, the feet extending perpendicularly to the vertical orientation of the standing figure and diverging away from each other in the forward direction in which the figure would waddle;
a pocket within each foot, each pocket extending forwardly in the same diverging direction as the longitudinal axis of the foot in which the pocket is contained, the pocket openings being adjacent to each other at their point of attachment to the body of the figure, each pocket receiving one of the user's hands;
wherein the direct attachment of the body to the feet, the orientation of the pockets and the movement of the user's hands cooperatively compel a movement of the figure resembling waddling.

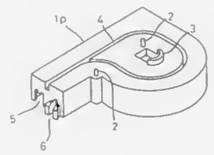
4,838,828

ENDLESS RAIL FOR RUNNING TOY

Nobuyoshi Ohnuma, and Akio Ueda, both of Mibu, Japan, assignors to Toybox Corporation, Tokyo, Japan

Filed May 26, 1988, Ser. No. 199,348
Claims priority, application Japan, Aug. 12, 1987, 62-122602[U]
Int. Cl.[4] A63H *18/00*
U.S. Cl. 446—446 6 Claims





1. An endless rail for a running toy, comprising:
(a) a first plurality of block bodies, each configured in a different shape and including a guide groove formed on a top surface thereof opening to and extending from one end surface to another end surface of said block body;
(b) a second plurality of block bodies, each configured in a different shape and including a guide groove formed on a top surface thereof opening to and extending form one end surface to the same end surface of said block body,
wherein each of the first and second pluralities of block bodies is configured as an alphabet letter;
(c) means formed on each block body for connecting the first and second pluralities of block bodies such that the guide grooves are connected to form an endless rail; and
(d) a single toy for running along the endless rail by cooperating with the connected guide grooves.

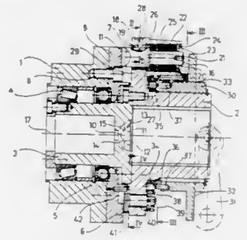
4,838,829

AUTOMATIC OVERLOAD CLUTCH RESET ARRANGEMENT

Reprecht Maurer, and Karlheinz Timtner, both of Bad Homburg, Fed. Rep. of Germany, assignors to Ringspann Albrecht Maurer KG, Bad Homburg, Fed. Rep. of Germany

Continuation of Ser. No. 5,485, Jan. 20, 1987, abandoned. This application Apr. 5, 1988, Ser. No. 180,607
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1986, 3602282
Int. Cl.[4] F16D *7/04*
U.S. Cl. 464—38 9 Claims

1. Automatic overload clutch comprising
two coaxial clutch parts (1, 2; 45, 46, 47, 48);
interfitting clutch elements (10, 11; 50, 51) located, respectively, on said clutch parts;
spring means (22; 57) engaging the clutch elements with each other while permitting axial separation of the clutch elements when torque being transferred between the clutch parts exceeds a predetermined value;
controllable reengagement operating means (30, 31, 32, 33; 58, 59) to reengage said clutch parts after separation due to overload; and
means for ensuring reengagement of the clutch elements with predetermined angular or rotational orientation of said clutch parts additionally including
an engagement lock element (34; 62) independent of said interfitting clutch elements (10, 11; 50, 51);
an engagment holding element (37; 60) independent of said interfitting clutch elements (10, 11; 50, 51), located on one (2) of the clutch parts and selectively engageable with the lock element; and



coupling means (38–42; 63–67) having a first part (42; 67) coupled to one (2; 46) of said clutch parts, and a second part (38–41; 63–66) coupled to the other (1; 47, 48) of said clutch parts and to one of said engagement elements and movable upon relative rotatin of said clutch parts with recurring or regular angular relative displacement of said clutch parts to determine coincidence of the engagement holding element and the engagement lock element; and
wherein said recurring or regular angular relative displacement of said clutch parts corresponds to interfitting coincidence, or a multiple of angular recurrences of said coincidence of said predetermined angular or rotational orientation of the clutch parts.

4,838,830

FLEXIBLE COUPLING

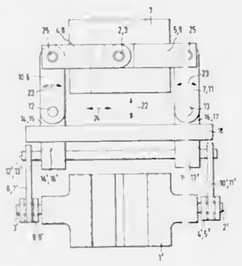
Otto F. Heinemann, Ennigerloh, Fed. Rep. of Germany, assignor to Renk Tacke GmbH, Fed. Rep. of Germany

Filed Mar. 21, 1988, Ser. No. 171,374
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709132
Int. Cl.[4] F16D *3/02, 3/56*
U.S. Cl. 464—69 6 Claims

1. A flexible coupling for transmitting a driving force from one shaft to another, comprising:
a pair of generally axially aligned collars, each adapted to receive a shaft,
a pair of generally parallel coupling rods associated with each collar and arranged off center relative to the axis of its respective collar and arranged symmetrically relative to the axis of its respective collar, and free to rotate about its axis,
an intermediate member extending generally transversely to the generally aligned collar axes between the two collars,
the two pairs of coupling rods lying in generally parallel planes on opposite sides of the intermediate member, the rods of one pair being offset 90° relative to the rods of the other pair,
each pair of coupling rods having associated therewith, on the same side of the intermediate member, two pairs of coupling arms, both pairs of coupling arms extending generally parallel to each other and lying in a plane gener-

ally parallel to the plane of their respective coupling rods, the coupling arms of each pair generally aligned with each other and articulated where they meet, for rotational movement relative to each other, and the two coupling arms being generally perpendicular to their respective coupling rods,

torque levers interconnecting the ends of each coupling rod



to the ends of two opposite coupling arms, the torque levers being non-rotationally fixed to their respective coupling rods, and rotatably articulated to their respective coupling arms,

and wherein on each side of the intermediate member, one of said coupling rods and coupling arms are connected to its respective collar while the other of said coupling rods and coupling arms are connected to the intermediate member.

4,838,831

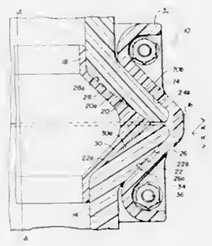
COUPLING FOR CONNECTING TWO SHAFTS

William E. Rumberger, Newtown Sq., Pa., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 429,408, Sep. 30, 1982, abandoned. This application Feb. 28, 1985, Ser. No. 706,242

Int. Cl.[4] F16D *1/10*

U.S. Cl. 464—88 **14 Claims**



1. A coupling for connecting two shafts for rotation, each shaft defining a longitudinal axis and having a hollow outwardly flared end portion relative to the longitudinal axis which defines an inner and an outer surface, at least one of said surfaces including alignment and torque transmitting means, comprising:

a reaction ring having an outer surface comprising two surface sections which subtend one another and define an acute angle between them, each surface section engaging a respective inner surface of the outwardly flared end portions;

adjustable clamping means having an inner surface comprising two surface sections which subtend one another and define an acute angle between them, each surface section engaging a respective outer surface of the outwardly flared end portions; and

adjustment means for adjusting the clamping means against the outer surface of each outwardly flared end portion to thereby increase the pressure at the engaged surfaces;

wherein:

(i) at least one surface section of at least one of the reaction ring and adjustable clamping means includes alignment and torque transmitting means compatible with the alignment and torque transmitting means of the shaft surfaces; and

(ii) the engagement of the compatible alignment and torque transmitting means substantially preventing relative movement between the engaged surfaces thereby aligning the longitudinal axes of the two shafts and permitting torque transmission and thereby rotation about the aligned longitudinal axes.

4,838,832

TOOTH SYSTEM FOR A SHAFT-HUB CONNECTION

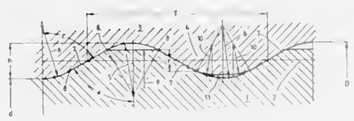
Manfred Schmitt, Blockäcker 17/1, and Wolfgang Hanke, Berliner Platz, both of 7920 Heidenheim, Fed. Rep. of Germany

Filed Oct. 22, 1987, Ser. No. 112,066

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1986, 3635916

Int. Cl.[4] F16D *1/06, 1/10*

U.S. Cl. 464—162 **8 Claims**



1. A tooth system for transmitting torque between two components disposed coaxially with one another, said two components being a shaft and a hub with each having a plurality of teeth, each tooth having a root, a tip and straight tooth surfaces with each straight tooth surface connecting one root to one adjacent tip, each root and each tip has a fillet radius and the fillet radius of each is one to two times the total height of the tooth wherein, each straight tooth surface is at a pressure angle which lies within the range of between 45 to 70 degrees, and wherein between the teeth of said shaft and the teeth of said hub there is formed a backlash and wherein the pressure angle of the teeth of said shaft is greater than the pressure angle of the teeth of said hub by an amount corresponding to half of a torsion angle needed to overcome the backlash between said shaft and said hub.

4,838,833

FIBER REINFORCED RESIN DRIVE SHAFT HAVING IMPROVED RESISTANCE TO TORSIONAL BUCKLING

Benjamin E. Coursin, Milwaukee, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

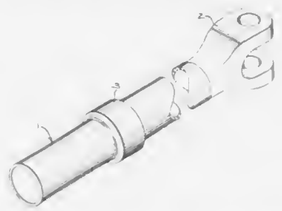
Filed Aug. 15, 1986, Ser. No. 897,041

Int. Cl.[4] F16C *1/02*

U.S. Cl. 464—181 **8 Claims**

1. A drive shaft, comprising a pair of end fittings, a continuous uninterrupted shaft connecting the end fittings and composed of fiber reinforced thermosetting resin, said shaft having a substantially uniform diameter throughout its length, the ends of said shaft being secured in lapping relation with the respective end fittings to provide lapping joints therebetween,

an annular rib integrally connected to said shaft and extending radially of said shaft, said rib being spaced longitudinally of



said lapping joints and having a radial thickness sufficient to increase the resistance of the shaft to torsional buckling.

4,838,834

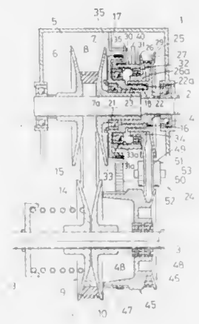
SPEED-SHIFTING DEVICE

Hirofumi Miyata, Kobe, Japan, assignor to Bando Chemical Industries, Ltd., Kobe, Japan

Filed Mar. 29, 1988, Ser. No. 174,887

Int. Cl.[4] F16H *11/02*

U.S. Cl. 474—11 **9 Claims**



1. In a speed-shifting device having first transmission shaft and a second transmission shaft parallel thereto, a driving pulley and a driven pulley each of which is composed of a fixed sideplate fixedly rotatably and axially non-slidably mounted on each of said transmission shafts and a movable sideplate axially slidably and fixedly rotatably mounted on each of said transmission shafts and forming a V-shaped groove with the corresponding fixed sideplate, and a belt member trained between said driving pulley and said driven pulley engaging in both V-shaped grooves whereby the transmission ratio between the transmission shafts can be changed by varying the effective radius of the engagement of each of said pulleys with said belt member by moving each said movable sideplate axially toward and away from the fixed sideplate facing thereto, the improvement comprising:

a moving member fixedly axially connected to and relatively rotatably connected to said movable sideplate on said first transmission shaft and being relatively rotatably and axially movably supported on said first transmission shaft, and screw thread means connected between said moving member and said first transmission shaft for causing relative axial movement of said moving member to said first transmission shaft when said moving member is rotated at a speed different from the speed of rotation of said first transmission shaft;

a speed shifting pulley mechanism adapted for adjusting the transmission ratio between said transmission shafts and having a first pulley member fixed on said moving member, a second pulley member fixedly rotatably mounted on said first transmission shaft, a third pulley member rotatably mounted for rotation around an axis parallel with said first transmission shaft and having two pulley parts, a first belt trained between said second pulley member and one of said pulley parts of said third pulley member and a second belt trained between said first pulley member and the other of said pulley parts of said third pulley member, means for changing the transmission ratio of one of said first and second belts from a normal transmission ratio to a shifted transmission ratio for transmitting the rotation of said first transmission shaft to said moving member at a shifted speed for rotating said moving member relatively around said first transmission shaft for moving the movable sideplate on said first transmission shaft relative to the fixed sideplate thereon.

4,838,835

VARIABLE SPEED PULLEY

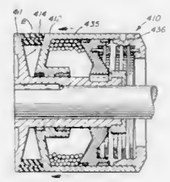
Hiroshi Takano, and Yasuhiro Hashimato, both of Miki, Japan, assignors to Mitsuboshi Belting, Ltd., Nagata, Japan

Division of Ser. No. 67,691, Jun. 29, 1987, Pat. No. 4,789,378. This application Aug. 4, 1988, Ser. No. 228,189

Claims priority, application Japan, Jun. 30, 1986, 61-153666

Int. Cl.[4] F16H *11/02*

U.S. Cl. 474—13 **17 Claims**



1. A variable speed pulley comprising:

a first sheave half;

means for fixedly mounting the first sheave half on a rotatable shaft defining an axis of rotation;

a second sheave half;

means for coaxially movably mounting said second sheave half on said shaft adjacent said first sheave half to define a belt receiving groove therebetween;

means for biasing said second sheave half axially of the shaft to vary the width of said belt receiving groove, said means for biasing said second sheave half comprising means for biasing said second sheave half away from said first sheave half to increase the width of said belt receiving groove;

means for urging said second sheave half axially of the shaft against the biasing force of said biasing means with a force proportional to the speed of rotation of said shaft to vary the width of said belt receiving groove, said urging means comprising means for urging said second sheave half toward said first sheave half to reduce the width of said belt receiving groove and comprising means movable with said second sheave half defining a movable surface;

means fixedly associated with said shaft defining a fixed surface;

force applying means extending between said movable surface and said fixed surface and having a variable extension parallel to said shaft axis proportional to the centrifugal force acting thereon as a result of said speed of rotation of the shaft; and

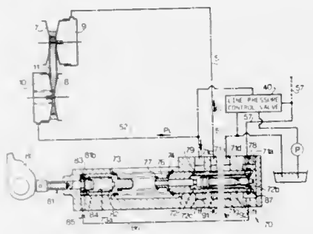
rearrangement means for varying the arrangement of said force applying means as an incident of a relative movement between said first and second sheave halves angularly about said axis of rotation.

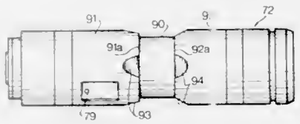
4,838,836

CONTROL VALVE FOR A CONTINUOUSLY VARIABLE TRANSMISSION

Yasuhito Sakai, and Yoichi Iijima, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 14, 1988, Ser. No. 144,309
Claims priority, application Japan, Jan. 14, 1987, 62-007298
Int. Cl.[4] F16H *11/12*
U.S. Cl. 474—28 **10 Claims**





1. In a control valve for a continuously variable transmission having a drive pulley forming a hydraulic chamber for changing transmission ratio of the transmission dependent on pressure in the chamber, the valve comprising valve body means for providing a first port communicating with the chamber, a second port communicating with a pressure source to produce line pressure, and a third port communicating with a drain passage, spool means slidably disposed in the valve body means and having a first land to close the second port, a second land to close the third port, and an annular groove between the first and second lands selectably in dependency on the position of the spool means communicatable with both the first and second ports together to supply the line pressure to the chamber for upshifting the transmission, and respectively, communicatable with both the first and third ports together to discharge pressure in the chamber, lower than the line pressure, to the drain passage for downshifting the transmission, and first and second circumferential edges formed on the first and second lands adjacent the annular groove, respectively, the improvement in the spool means comprising

first hollow means angularly equidistantly formed in a peripheral direction on the first land between a peripheral surface and a perpendicular surface of the first land at the first circumferential edge, for equalizing transient pressure occurring at starting of communication of the annular groove and the second port, and for producing a first characteristic representing a small opening area changing rate of the second port with respect to shifting of the spool means, and

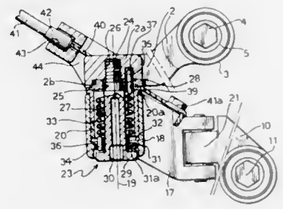
second hollow means angularly equidistantly formed in a peripheral direction on the second land between a peripheral surface and a perpendicular surface of the second land at the second circumferential edge, for equalizing transient pressure occurring at starting of communication of the annular groove and the third port, and for producing a second characteristic representing an opening area changing rate of the third port with respect to shifting of the spool means larger than that of the first hollow means, so as to provided an appropriate transmission ratio changing rate at upshifting and downshifting, respectively, preventing clogging of the first and second hollow means with dust and chips.

4,838,837

REAR DERAILLEUR FOR BICYCLE GEARS

Sandro Testa, Perarolo, Italy, assignor to Campagnolo S.p.A., Vicenza, Italy

Filed Jul. 5, 1988, Ser. No. 215,152
Claims priority, application Italy, Jul. 2, 1987, 67571 A/87
Int. Cl.[4] F16H *9/00*
U.S. Cl. 474—80 **8 Claims**



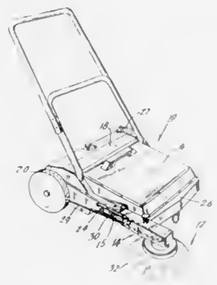
1. A rear derailleur for bicycle gears, comprising:
an upper body which can be fixed to the bicycle frame,
a lower body carrying transmission means for the bicycle chain and being connected to the upper body so as to be movable relative thereto to bring the chain into selective engagement with a series of sprockets carried by the hub of the rear wheel of the bicycle, and
flexible cable means for causing movement of the lower body,
wherein it further includes a member connected rigidly to the upper body, a control lever supported for rotation on said member and carrying the lower body, and a helical flexion spring operatively interposed between the control lever and the upper body with its axis coincident with an axis of rotation of the control lever.

4,838,838

BELT DRIVING PULLEY HAVING A ROUGHENED SURFACE TO REDUCE NOISE

Robert C. Berfield, Jersey Shore, Pa., assignor to Shop-Vac Corporation, Williamsport, Pa.

Filed Mar. 25, 1988, Ser. No. 173,425
Int. Cl.[4] F16H *7/10*
U.S. Cl. 474—113 **16 Claims**



1. A noise-reducing drive pulley, comprising:
a rotatable device;

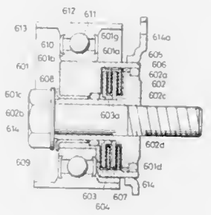
pulley means for rotating the device, the pulley means having a belt-contacting surface;
belt means coupled to and normally frictionally engaged with the belt-contacting surface on the pulley means; and
belt loosening means for selectively loosening the frictional engagement of the belt means with the pulley means in a manner that enables relative sliding therebetween, the belt-contacting surface of the pulley means being roughened and effective for reducing noise generated from relative sliding between the belt means and the pulley means.

4,838,839

MULTI-DISK FLUID VISCOSITY TYPE AUTO-TENSIONER

Toshiki Watanabe, Kamakura, and Toshiharu Honda, Fujisawa, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1987, Ser. No. 132,203
Claims priority, application Japan, Jan. 19, 1987, 62-8075; Jul. 16, 1987, 62-176032
Int. Cl.[4] F16H *7/12*
U.S. Cl. 474—135 **25 Claims**



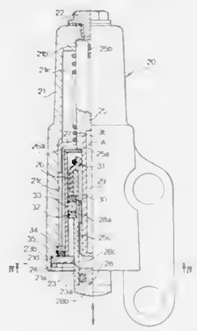
1. An auto-tensioner comprising:
a fixed portion fixed to a base;
displaceable means supported on said fixed portion for rocking movement about an axis of said fixed portion, said displaceable means having a cylindrical outer member which contacts a belt and surrounds said fixed portion, said outer member being rotatable about an axis offset from the first-mentioned axis;
tensioning means for biasing said displaceable means so as to impart a tension to said belt and for absorbing fluctuation in said tension; and
vibration absorbing means disposed between said fixed portion and said displaceable means for absorbing fluctuation in said tension;
wherein said vibration absorbing means includes a multi-disk fluid viscosity vibration damper having at least one fixed disk member fixedly attached to said fixed portion, at least one displaceable disk member attached to said displaceable means in such a manner as to be non-rotatable with respect to said displaceable means but axially displaceable with respect thereto, and a fluid which produces a viscosity resistance against displacement of said displaceable disk member with respect to said fixed disk member.

4,838,840

AUTOMATIC BELT TENSIONER

Naoto Mutoh, Fuchu, and Juji Ojima, Kanagawa, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo and NHK Spring Co., Ltd., Yokohama, both of, Japan

Filed Mar. 15, 1988, Ser. No. 168,228
Claims priority, application Japan, Mar. 23, 1987, 62-068713
Int. Cl.[4] F16H *7/12*
U.S. Cl. 474—138 **11 Claims**



1. An automatic belt tensioner comprising:
a cylindrical body having an axial chamber;
a shaft having an external thread and rotatably mounted in the chamber of the body;
a torsion spring provided between the body and the shaft so as to urge the shaft in a rotational direction;
a cylindrical rod having an internal thread engaged with the external thread of the shaft;
a lower end of the rod being projected from the body so as to be operatively connected to a tension pulley for a belt;
a bearing plate having a noncircular opening engaged with the rod so as to permit axial movement of the rod;
a plurality of lugs radially projecting from the periphery of the bearing plate;
the cylindrical body having an opening and a plurality of indentations formed on a circular inside wall of the opening, the periphery of the bearing plate being detachably engaged with the opening of the cylindrical body and the lugs being engaged with the indentations, thereby holding the bearing plate and permitting angular disposition of the bearing plate so that projected length of the rod is adjusted.

4,838,841

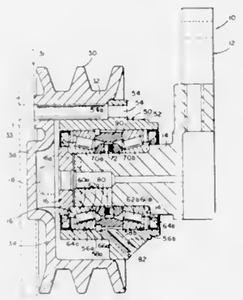
PULLEY AND HUB ASSEMBLY

William O. Harvey, Cadillac, Mich., assignor to Kysor Industrial Corporation, Cadillac, Mich.

Filed May 20, 1988, Ser. No. 196,284
Int. Cl.[4] F16H *55/48*
U.S. Cl. 474—190 **18 Claims**

1. A pulley for interfit with a bearing assembly comprising:
a polymeric pulley member having an annular rim with drive groove means in the outer periphery thereof for receiving a drive belt, and having an axial end integral with said rim;
said pulley axial end having an exterior face;
said polymeric pulley defining an internal chamber with said pulley axial end at one end of said chamber, and being open on the opposite axial end of said chamber;

said pulley axial end having axially oriented, connector receiving openings therethrough between said chamber and said exterior face, whereby said pulley axial end being



placed in compression between a bearing in said chamber and a member at said exterior face by connectors;

said chamber including bearing guide means for engaging a bearing assembly inserted into said chamber.

4,838,842

PULLEY IN WHICH CERAMIC PARTICLES ARE EXPOSED ON THE SURFACE

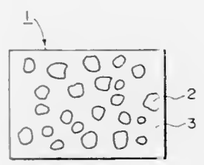
Ichizo Ohkata, Kamakura, and Hiroshi Takahashi, Yokohama, both of Japan, assignors to Kato Hatsujyo Co., Ltd., Yokohama, Japan

Filed Dec. 22, 1987, Ser. No. 136,299

Claims priority, application Japan, Mar. 31, 1987, 62-48387[U]

Int. Cl.⁴ F16H 55/48

U.S. Cl. 474—192 **2 Claims**



1. A pulley comprising a cylindrical outer ring composed of a composite material in which ceramic particles 50 to 300 microns in size are dispersed substantially 30% by weight in a matrix material of low melting point metal, said ceramic particles being exposed on the surface of said cylindrical member; and a bearing member made by light metal or resin material said bearing member being firmly inserted into a penetrating hole of said outer ring.

4,838,843

TOOTHED BELT

William L. Westhoff, Denver, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Apr. 16, 1982, Ser. No. 368,946

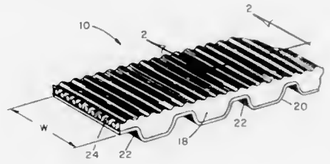
Int. Cl.⁴ F16G 1/28

U.S. Cl. 474—205 **4 Claims**

1. A toothed power transmission belt having width and comprising:

a polyurethane body having a 100 percent tensile modulus of at least about 1,500 psi, the body defining an outer layer and an inner layer with integrally molded and spaced belt teeth with flanks;

a wear-resistant fabric reinforcement disposed at a peripheral portion of the inner layer at the teeth flanks;



a tensile member of textile cord helically spiralled in spaced, side-by-side fashion and disposed between and bonded to the inner and outer layers, the cord made of aramid type II fiber having a greige filament tensile modulus of at least about 18×10^6 psi, and the cord occupying from about 56 to about 88 percent of the belt width.

4,838,844

ENDLESS TRANSMISSION BELT

Shiro Sakakibara, Toyokawa; Yoshinori Miyaishi, Okazaki, and Takashi Furuya, Chiryu, all of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

Filed Jan. 27, 1988, Ser. No. 148,785

Claims priority, application Japan, May 29, 1987, 62-137419

Int. Cl.⁴ F16G 1/22

U.S. Cl. 474—240 **7 Claims**

1. A V-block for an endless transmission belt adapted to contact a pair of sheaves, comprising:

an upper portion, a lower portion situated under the upper portion, and two pillar portions connecting said upper and lower portions to thereby constitute a symmetrical V-block, said upper and lower portions each having a center portion and two arm portions extending laterally outwardly from the center portion, said center portions of said upper and lower portions having curved configurations and flexibility against pressing force applied to both sides of the upper lower portions, said V-block having a through hole surrounded by the center portions of the upper and lower portions and two pillar portions, and two side openings at both sides of the V-block, each opening being surrounded by the arm portions of the upper and lower portions and the pillar portion.

4,838,845

POWER TRANSMITTING V-BELT

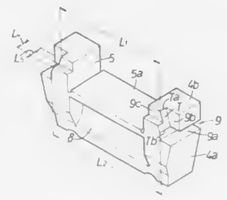
Torao Hattori, Saitama; Minoru Nishimura, Kanagawa, and Masaki Goto, Shizuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1988, Ser. No. 213,167

Claims priority, applicatioo Japan, Jul. 3, 1987, 62-101806[U]

Int. Cl.⁴ F16G 1/22

U.S. Cl. 474—242 **6 Claims**



1. A power transmitting V-belt comprising a multiplicity of V-shaped metal blocks linked to each other, an endless metal band and stopper members for holding said metal band on said V-shaped metal blocks, wherein each of said metal blocks includes a pair of retaining grooves distanced from each other and each of the stopper members includes a pair of free ends which are retained in the pair of retaining grooves, said pair of retaining grooves having parts which cooperate together to form a tapered guide section adapted to guide said pair of free ends of the stopper member from a free state thereof to a position retained in the retaining grooves at which the free ends of the stopper member are given stress therein.

4,838,846

APPARATUS FOR COATING GLUE ONTO PACKAGING BLANKS

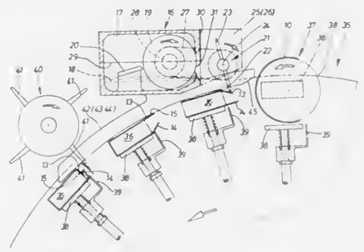
Heinz Focke, Verden, and Wolfgang Oertel, Kirchlinteln, both of Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed Dec. 30, 1987, Ser. No. 139,511

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1987, 3701427

Int. Cl.⁴ B31B 3/62, 3/32

U.S. Cl. 493—132 **4 Claims**



1. Apparatus for coating glue onto folding tabs of packaging blanks and having a glue unit including a rotating glue-coating member which transfers glue portions extracted from a glue vessel onto the packaging blank, wherein said glue-coating member (**21**) has at least one radially directed glue wing (**22, 23**) having an end face which serves as a glue face (**32**) which is movable up against a freely projecting, elastically deformable folding tab (**13**) and rolls on the folding tab while at the same time pivoting the folding tab (**13**) elastically; said apparatus comprising a rotating folding turret (**35**) which moves a blank (**10**) along an arc of a circle during contact of the folding tab by said glue face (**32**); and wherein the glue-coating member (**21**) is arranged outside the range of rotation of the folding turret (**35**) and adjacent to the periphery of the latter, so that a radially outer folding tab (**13**), pointing rearwards in the direction of rotation of the folding turret (**35**), is loaded with glue on the outside by the glue wing (**22, 23**) momentarily moved in the same direction.

4,838,847

PACKAGING MACHINE

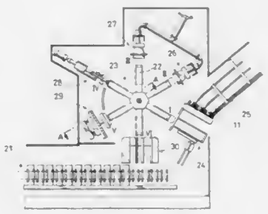
Tadaaki Kume; Yoshihiro Saijo, and Yasuji Fujikawa, all of Tokushima, Japan, assignors to Shikoku Kakoki Co., Ltd., Tokushima, Japan

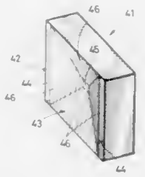
Filed Mar. 3, 1988, Ser. No. 163,588

Claims priority, application Japan, Mar. 4, 1987, 62-32414[U]

Int. Cl.⁴ B31B 1/64

U.S. Cl. 493—133 **2 Claims**





1. A packaging machine for preparing sealed containers to be filled with contents with each container formed from a tubular blank having a rectangular cross section and a thermoplastic synthetic resin layer over each of it sinner and outer surfaces each of the containers being recessed in the center of its bottom so as to seat stably, the packaging machine comprising:

a machine bed having a plurality of processing stations including a heating station, a folding station and a pressure bonding station,

an intermittently movable rotor having radial mandrels equal in number to the number of the processing stations and each adapted to support a tubular blank fitted thereabout with its bottom forming end portion projecting therefrom, each of the mandrels being stoppable at each of the processing stations while traveling from station to station, each mandrel having a forward end surface defining a substantially pyramidal cavity for recessing the bottom central portion of the container,

a heater disposed at the heating station for heating said bottom forming end portion of the blank,

a folding unit provided at the folding station for folding the heated end portion of the blank flat, and

a pressure bonding unit provided at the pressure bonding station and cooperative with the mandrel for bonding the folded end portion of the blank under pressure, the pres-

sure bonding unit comprising a press member, the press member having a press face for pressing the folded end portion of the blank against the forward end surface of the mandrel when the mandrel having the blank fitted thereabout is at rest at the bonding station and the press face having a projection complementary to the cavity of the mandrel.

4,838,848

CONTINUOUS PAPER BAND FOLDING APPARATUS TO FORM PILES

Mauro Lenzi, Via G. Paganino 2 I 56100, Pisa

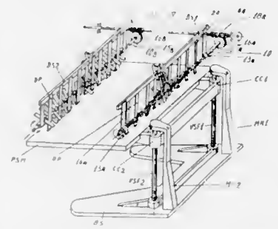
PCT No. PCT/IT87/00016, § 371 Date Oct. 6, 1987, § 102(e) Date Oct. 6, 1987, PCT Pub. No. WO87/04998, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 18, 1987, Ser. No. 113,281

Claims priority, application Italy, Feb. 19, 1986, 47671 A/86

Int. Cl.[4] B65H *45/20*

U.S. Cl. 493—414 7 Claims



1. In a continuous paper band folding apparatus to form piles of paper sheets from a paper band supplied from a storage reel and provided with tearing cross perforations, said apparatus comprising: a moving paper supporting plate on which the paper band is folded like an "accordion" by the action of gravity and a distributor of the known type; a paper band tractor feed system and two side cages retaining the paper pile to be formed and defining the dimension thereof; a device for folding the paper band at each crossperforation which is provided with two folding members, one on each side of the pile, said members folding the paper band in two distinct steps consisting of a first step of folding and a second step of compressing the paper band, and two devices, one for each folding member, guiding the paper band and causing it to keep on the natural fold at the beginning of said first step, characterized in that each folding member is provided with two sets of means acting on the paper band so that the folding action begins at the center thereof, i.e. at the longitudinal axis of the paper band, and carries on symmetrically from said center to the outer edges of the paper band.

4,838,849

CHUCK DEVICE FOR HOLDING A CELL FOR THE CENTRIFUGATION OF BLOOD

Alessandro Calari, Mirandola, Italy, assignor to Dideco S.p.A., Mirandola, Italy

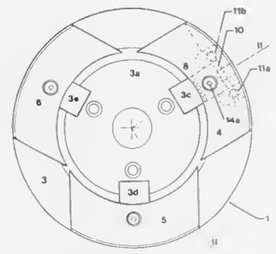
Filed Feb. 8, 1988, Ser. No. 153,176

Claims priority, application Italy, Feb. 10, 1987, 19331 A/87

Int. Cl.[4] B04B *15/00*

U.S. Cl. 494—85 8 Claims

1. A chuck device for holding a body, in particular a cell for the centrifugation of blood and the like, comprising a rotary support member defining an axis of rotation of the chuck device and a plurality of clamp members supported on said support member, and said clamp members being arranged around said axis of rotation for holding said body therebetween, and with at least one of said clamp members being supported on said support member pivotally about a pivot axis extending transversely to said axis of rotation to allow swinging of said clamp member from a closed position into an open position, and vice versa, wherein each of said clamp members has an inwardly-facing surface portion for mating engagement



with said body, said surface portion being conical and divergent in the direction towards said support member, and has a recessed portion between said surface portion and said support member.

4,838,850

ELECTROMEDICAL TREATMENT APPARATUS

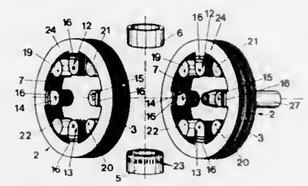
Henning Rosengart, Nevadavej 8, Slagelse, Denmark (4200)

Continuation of Ser. No. 627,884, Jul. 3, 1984, abandoned, which is a continuation of Ser. No. 385,656, May 26, 1982, abandoned.

This application May 7, 1987, Ser. No. 51,261

Int. Cl.[4] A61B *17/52*

U.S. Cl. 600—14 7 Claims



1. An apparatus for electromedically treating biological tissues by inducing the directed movement of electrically charged particles in said tissues, comprising:

magnetic field generating means for generating a magnetic field with regularly varying field strength in a treatment zone, in which treatment zone may be positioned a body part or the like to be treated, the generated magnetic field in said treatment zone being horizontally directed by said magnetic field generating means so as to be substantially perpendicular to a central axis of said treatment zone;

electric field generating means for generating an electrical field of regularly varying field strength in said treatment zone, the generated electric field in said treatment zone being vertically directed by said electric field generating means so as be substantially transverse to the magnetic field generated in said treatment zone by the magnetic field generating means, said generated electric field in said treatment zone being also directed by said electric field generating means so as to be substantially perpendicular to the central axis of said treatment zone; and

power source means for supplying a regularly varying voltage to said magnetic field generating means and electric field generating means, the strengths of the generated magnetic and electrical fields varying at the same rate as said supplied voltage;

said generated magnetic field and said generated electric field impressing respectively perpendicularly directed magnetic and electrical field forces in said treatment zone for inducing the directed movement of charged particles in said treatment zone with respect to the directions of said magnetic and electric fields.

4,838,851

APPLICATOR AND PACKAGE THEREFOR

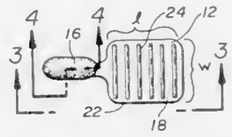
Alan L. Shabo, 10921 Wilshire Blvd., No. 1205, Los Angeles, Calif. 90024

Continuation of Ser. No. 935,442, Nov. 26, 1986, abandoned.

This application Apr. 14, 1988, Ser. No. 183,502

Int. Cl.[4] A61M *35/00*

U.S. Cl. 604—1 9 Claims



1. An applicator for scrubbing, and for applying a liquid to an eyelid, comprising:

a thin, one-piece handle formed to be grasped between the thumb and forefinger of a user and having front and rear major surfaces joined by a minor, edge surface;

a peg extending outwardly entirely perpandicularly from a first edge of said handle horizontally axially thereof; and

a swab on said peg adjacent said handle edge, formed of liquid absorbent material;

said swab, said handle and said peg each having a length dimension defining the horizontal axis of the applicator, a width dimension in a first plane and a thickness dimension transverse of said first plane, the length and width of the handle being each substantially greater than its thickness, the length of the handle being substantially greater than its width the distance between said swab and said handle edge being substantially less than either width or length of said handle, the thickness dimension of said handle being greater than the thickness dimension of said peg, and the width of said handle being greater than the width of said swab, said swab having greater length and width than thickness and greater length than width.

4,838,852

ACTIVE SPECIFIC IMMUNE SUPPRESSION

Richard L. Edelson, Westport, Conn., and Daniel J. Tripodi, Lebanon, N.J., assignors to Therakos, Inc., Westchester, Pa.

Filed Mar. 27, 1987, Ser. No. 31,490

Int. Cl.[4] A61M *37/00*

U.S. Cl. 604—4 25 Claims

1. A method for altering the immune system response of a patient to a specific antigen, comprising:

(a) artificially introducing the specific antigen into the patient's bloodstream or immune system by injection so as to artificially stimulate said immune system;

(b) withdrawing blood cell containing material, including antigen stimulated blood cells, from the patient;

(c) treating said material or cells with UV radiation in the presence of a photoactivatable agent; and

(d) returning the treated material or cells to the patient.

4,838,853

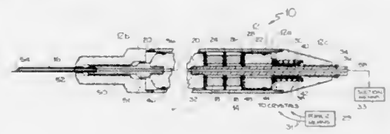
APPARATUS FOR TRIMMING MENISCUS

Tulio T. Parisi, San Diego, Calif., assignor to InterVentional Technologies Inc., San Diego, Calif.

Filed Feb. 5, 1987, Ser. No. 10,999

Int. Cl.[4] A61B *17/20*

U.S. Cl. 604—22 6 Claims



1. In combination for trimming a meniscus,

means for providing a vacuum,

means for providing energy at a particular ultrasonic frequency,

the vacuum means being coaxial with the ultrasonic energy means,

an insert operatively coupled to the ultrasonic energy means coaxially with the ultrasonic energy means and communicating with the vacuum means to introduce the ultrasonic energy to the insert to vibrate the insert at the ultrasonic frequency at the position of the meniscus and to provide for the removal by the vacuum means of cut fragments of the meniscus,

the insert being provided with two sharp edges in spaced relationship to each other, the two sharp edges being separated by an indented portion, each of the sharp edges being provided with a tapered thickness extending to the sharp edge,

the operative coupling between the insert and the energy means being provided by a pair of body members disposed at opposite ends of the energy means,

a housing,

a connecting tube coupled at its opposite ends to the housing and to the body member closest to the insert,

the connecting tube, the energy means and the body members being disposed within the housing, and

the insert, the housing, the connecting tube, the energy means and the body members being provided with axial opening communicating with one another to provide for the axial introduction of the vacuum from the vacuum means to the sharp edge of the insert.

4,838,854

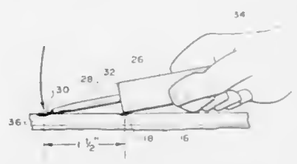
METHOD AND APPARATUS FOR SELECTING A MEDICINE INJECTION SITE

Zivko Kuzmanovich, 16030 Cantlay St., Van Nuys, Calif. 91406

Filed May 3, 1988, Ser. No. 189,823

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—49 1 Claim

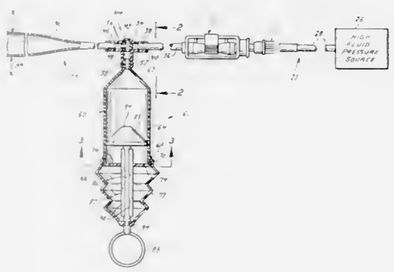


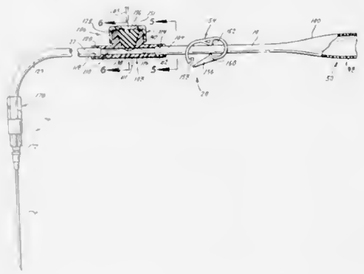
1. The method of selecting a site for injection of medicine through the skin of a human being, said method comprising the steps of:

utilizing a container having a removable cap to which is

attached a small brush extending a predetermined distance from said cap;
preloading said container with an opaque liquid which resists dissolving by water;
removing said cap and said brush from said container;
placing the edge of the cap nearest the brush against the skin at a selected location with the normal selected location being the site for the current injection;
rocking forward the brush until the brush contacts the skin leaving a small portion of the opaque liquid in the form of a small dot thereby to indicate to the human being the site for the subsequent injection;
removing the brush and the cap from the skin and replacing such on the container; and
removing the opaque mark for the current injection by using an appropriate solvent and then administering the current injection.

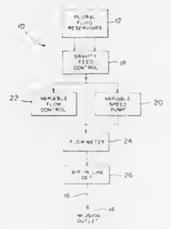
4,838,855
BLOOD ASPIRATION ASSEMBLY AND METHOD
Lawrence A. Lynn, 4877 Dublin Falls, Columbus, Ohio 43220
Filed Jul. 31, 1987, Ser. No. 80,406
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—49 **59 Claims**





1. A blood aspiration assembly for use with a blood removal means inserted in a blood vessel of a patient and a separate aspirating means to remove blood from a patient, comprising:
(a) means for providing a reservoir having a maximum displacement volume;
(b) an aspirator receiver means having a chamber for permitting blood flow therein;
(c) means for providing a first conduit for connecting the blood removal means to the aspirator receiver means so that the first conduit means is in liquid flow connection with the receiver chamber;
(d) means for providing a second conduit connecting the aspirator receiver to the reservoir means so that the second conduit means can be in liquid flow connection with the receiver chamber; the second conduit means having an internal volume which is greater than the maximum displacement volume of the reservoir;
(e) the aspirator receiver having a portion for receiving a part of the aspirating means to allow the aspirating means to be in blood flow connection with the aspirator receiver chamber so that blood drawn into the receiver chamber and into the first conduit means can be withdrawn from the aspirator receiver chamber and the first conduit means into the aspirating means.

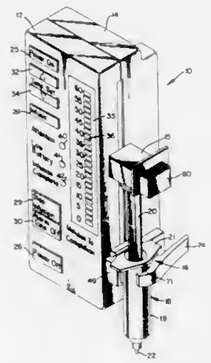
4,838,856
FLUID INFUSION FLOW CONTROL SYSTEM
Patrick A. Mulreany, Wellington, Nev.; Alan C. Kinney, Auberry, Calif., and Donald C. Presley, Sparks, Nev., assignors to Truckee Meadows Research & Development, Sparks, Nev.
Filed Jul. 2, 1987, Ser. No. 70,819
Int. Cl.[4] A61M *5/16*
U.S. Cl. 604—65 **14 Claims**

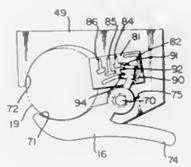


1. In a flow control system through which fluid is delivered to an outlet conduit, flow metering means for monitoring flow of the fluid delivered to said outlet conduit, a plurality of reservoirs from which the fluid is withdrawn, a fluid displacement pump, flow passage means connected to the reservoirs and the pump for establishing flow of the fluid between the reservoirs and the flow metering through the pump, and in bypass relation thereto and mode control means operatively connected to the flow passage means for selectively conducting the said flow of fluid therethrough alternatively and simultaneously under a gravity head from the reservoirs and from the pump under a positive pressure head to the metering means.

4,838,857
MEDICAL INFUSION DEVICE
Robert J. Strowe, Ramsey, N.J.; Floyd V. Edwards, Cedarville, Ohio, and Carl M. Stern, Lawrenceville, N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.
Continuation of Ser. No. 738,932, May 29, 1985, abandoned.
This application Feb. 9, 1987, Ser. No. 13,182
Int. Cl.[1] A61M *5/20*
U.S. Cl. 604—67 **36 Claims**

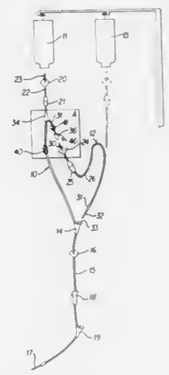
1. An infusion device for the administration of liquid from a syringe having a barrel for holding liquid and a plunger for expelling liquid comprising:
a housing;
a syringe retainer mounted on said housing for receiving therein a syringe barrel having liquid therein, said retainer including means for receiving syringe barrels of different sizes;
a movable syringe driver mounted on said housing adapted to engage a syringe plunger and push the plunger from a relative initial position into the syringe barrel to a relative final position to thereby force the liquid out of the syringe barrel, said initial position of the plunger being relative according to the amount of liquid within the syringe barrel;
sensor means for determining the size of the syringe barrel mounted on the housing, for determining said final position which is relative depending upon the size of the syringe barrel mounted on the housing, and for determining the relative distance the syringe plunger must travel from said initial position to said final position to expel the





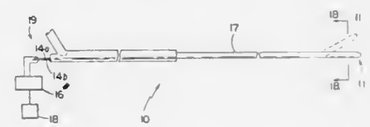
liquid from the barrel, and for providing information related to said determined distance;
control means for moving said syringe driver against said plunger to expel the liquid from said syringe barrel over a pre-selectable period of time at a rate of speed governed by said information received from said sensor means relating to the distance determination; and
a visual display for monitoring the period of time over which the liquid from said syringe barrel is expelled.

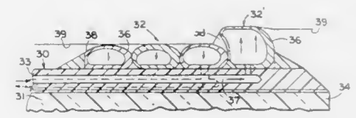
flow of a second fluid and means connected to the tubing means for receiving the detachable connector of the adminis-



tration set and directing at least a portion of the flow of the second fluid through the administration set.

4,838,859
STEERABLE CATHETER
Steve Strassmann, 796 Main St., Cambridge, Mass. 02139, assignor to Steve Strassmann, Cambridge, Mass.
Filed May 19, 1987, Ser. No. 52,263
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—95 **2 Claims**



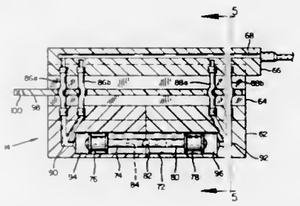


1. In a catheter comprising a conduit extending from a control end to a functional tip, an improvement comprising:
an inflatable, annularly shaped bladder positioned around the catheter axis at the catheter tip,
said bladder having a thin-walled portion positioned on the side of said bladder nearer the control end of the catheter, and a thick-walled portion positioned on the side of said bladder nearer the catheter tip; and
means to inflate said bladder in response to a controller positioned at the control end of said catheter,
whereby, as said bladder inflates, the thin-walled portion expands first until it engages its external environment, and then the thick-walled portion of said bladder expands and the thin-walled portion contracts, thereby creating a paristaltic wave along said bladder and advancing said catheter axially in the tip direction.

4,838,858
APPARATUS AND METHOD FOR ADMINISTERING FLUIDS
Samuel T. Wortham, Northport, N.Y., and Sidney Krakauer, Highland Beach, Fla., assignors to Pall Corporation, Glen Cove, N.Y.
Filed Mar. 11, 1986, Ser. No. 838,478
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—83 **26 Claims**

1. An apparatus for flushing an administration set which channels a flow of a first fluid to a patient and which includes a detachable connector mountable to a container of the first fluid, said apparatus comprising tubing means for channeling a

4,838,860
INFUSION PUMP
Leroy E. Groshong, Portland; Judson C. Groshong, Beaverton, both of Oreg., and R. James Brawn, deceased, late of Portland, Oreg. (by Stanley C. Fisher, Administrator), assignors to Pump Controller Corporation, Portland, Oreg.
Filed Jun. 26, 1987, Ser. No. 67,700
Int. Cl.[4] A61M *5/00*; F04B *19/02*
U.S. Cl. 604—152 10 Claims



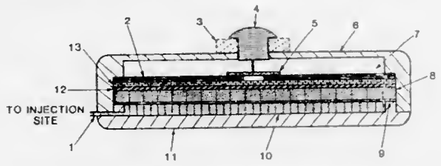
1. An infusion pump for administering fluid from a fluid to a patient comprising:
(a) a base member:
(b) an electric motor mounted on said base member:
(c) a cassette detachably connected to said base member, said cassette having a fluid inlet for connection to said fluid source and a fluid outlet for connection to said patient; and
(d) pump means, housed within said cassette and having a reciprocative piston assembly detachably connected to said motor and interacting with a pair of fluid chambers on opposite sides of said piston assembly, for pumping fluid through said outlet to said patient at a predetermined volumetric flow rate proportional, by a constant proportionality, that remains constant throughout a stroke of said piston assembly, to the rate of movement of said said inlet from said fluid source at said predetermined volumetric flow rate.

4,838,861
BLOOD PRESERVATION BY ULTRA HEMODILUTION
David E. Sharp, 36032 Derby Downs, Solon, Ohio 44139
Filed May 2, 1986, Ser. No. 858,740
Int. Cl.[4] A61M *37/00*
U.S. Cl. 604—6 11 Claims

1. A method of storing blood comprising the steps of:
diluting blood from a mammal by at least about 10 fold without a solution consisting essentially of isotonic saline:
storing said diluted blood;
centrifuging said diluted blood to form a plasma fraction and a red blood cell fraction;
separating said fractions;
reconstituting one of said fractions to produce a reconstituted blood product capable of supporting homeostasis in said mammal; and
infusing said reconstituted blood product to a mammal.

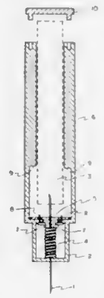
4,838,862
PORTABLE CONTROLLED RELEASE OSMOTIC INFUSION DEVICE
Richard Baker, Menlo Park; Verne Helm, Santa Clara, and Paul Shrock, Mt. View, all of Calif., assignors to Pharmetrix Corp., Menlo Park, Calif.
Filed Aug. 4, 1986, Ser. No. 892,991
Int. Cl.[4] A61K *9/22*
U.S. Cl. 604—892.1 11 Claims

1. A portable controlled release osmotic infusion device comprising:
(a) a housing, containing;
(b) a fluid-imbibing unit, comprising a solvent-containing chamber and a solute-containing chamber; the two chambers separated by a semipermeable membrane assembly, said assembly comprising a two-layer laminate of a semipermeable membrane layer and a solute-impermeable sealing layer;
(c) a drug-containing chamber separated from the fluid-imbibing unit by a leakproof impermeable elastic diaphragm; and



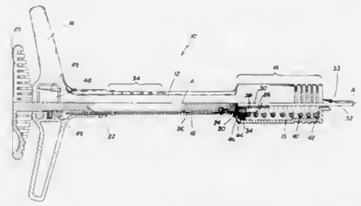
(d) an activating mechanism which breaks said sealing layer; said activating mechanism being disposed adjacent to, and in contact with, said fluid-imbibing unit;
said portable controlled release osmotic infusion device being characterized in that it may be filled with the contents of said solvent-containing, solute-containing and drug-containing chambers, and stored in an inactive state until required.

4,838,863
SAFE NEEDLE SYSTEM FOR COLLECTING FLUIDS
Edward F. Allard, 7830 Greeley Blvd., Springfield, Va. 22152, and Daniel Q. Longmire, 3410 Van Dyke St., Alexandria, Va. 22306
Filed Sep. 21, 1987, Ser. No. 99,013
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—110 2 Claims



1. A hypodermic needle wherein the needle is automatically retracted after use for rendering it inaccessible and non-usable, comprising a spring loaded needle open at each end, whereby fluid is drawn from one end and ejected through the other end whereby the ejected fluid is captured by a container and whereby the spring loaded needle is held in mechanical equilibrium by break-away tabs whereby the break-away tabs are broken by tab breakers whereby the force for the tab breakers is provided by pushing down on the container whereby when the tab holders are broken, the needle is free, whereby the freed needle is held in mechanical equilibrium until the container is removed whereby when the container is removed, the needle is pushed up into the container holder by the spring, whereby a stop prevents continued upward movement of the needle whereby the stop forces the needle from its centerline position whereby a cap prevents residual liquid inside the holder from leaking through its opening whereby a spring holder assembly holds the needle and spring in place and prevents liquid from leaking through the hole left by the retracted needle.

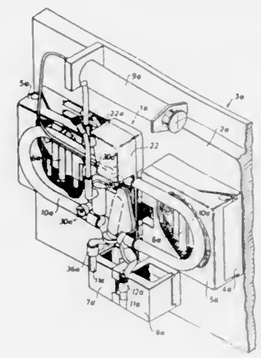
4,838,864
PRESSURE CONTROLLER
Carl W. Peterson, Blackstone, Mass., assignor to Mansfield Scientific, Inc., Mansfield, Mass.
Filed Nov. 13, 1987, Ser. No. 120,620
Int. Cl.[4] A61M *29/00*
U.S. Cl. 604—100 10 Claims



1. A pressure controller device for selectively applying and relieving a measured pressure upon a closed volume of fluid, comprising
a housing,
a barrel defining a fluid chamber,
a plunger sized and constructed for axial movement within said fluid chamber for applying pressure to a fluid within said fluid chamber,
said barrel defining a port for delivery of fluid at said pressure, and
said barrel adapted for movement axially within said housing in a first axial direction in response to increase of said pressure within said chamber,
first biasing means disposed between said housing and said barrel adapted to apply a known spring resistance in an opposed, second axial direction, to oppose said movement of said barrel, and
indicia means upon said barrel and upon said housing for indicating the relative positions of said barrel and said housing,
whereby, as pressure in said fluid chamber increases as a result of movement of said plunger relative to said housing, said barrel is urged in said first direction with a force proportional to said pressure to progressively overcome the known spring resistance in the second direction of said first biasing means, the relative positions of said barrel and said housing providing a measure of the pressure within said fluid chamber.

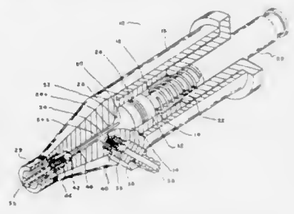
4,838,865
FLUID MONITOR SYSTEM
Hans P. Flank, Malmo, and Peter R. Staehr, Lund, both of Sweden, assignors to Gambro Lundia AB, Sweden
Continuation of Ser. No. 625,106, Jun. 27, 1984, abandoned.
This application Aug. 21, 1986, Ser. No. 898,885
Claims priority, application Sweden, Jun. 30, 1983, 03742/83
Int. Cl.[4] A61M *1/03*
U.S. Cl. 604—118 7 Claims

1. A kit for performing a series of fliud flow monitoring operations comprising:
(a) a monitor having a housing and fluid condition sensing and control means mounted to said housing in a predetermined pattern;
(b) a cassette adapted to be removably mounted on said housing at a preselected location, the cassette including permanently connected walls defining a fluid flow path of predetermined configuration and cassette coupling means disposed in a pattern corresponding to said predetermined pattern of said sensing and control means for coupling said fluid condition sensing and control means to said fluid flow path of said cassette when said cassette is mounted at said preselected location on said housing; and
(c) an adaptor adapted to be removably mounted on said housing at said preselected location instead of said cassette, the adaptor including mounting means for mounting on said adaptor a tube system formed separately from the apaptor and defining a fluid flow path different from said fluid flow path of predetermined configuration defined by said cassette, the adaptor also including adaptor coupling means disposed in a pattern corresponding to said predetermined pattern of said sensing and control means for coupling said fluid sensing and control means to the fluid path of said tube system when said adaptor is mounted at



said preselected location on said housing and said tube system is mounted on said adaptor,
said monitor having engagement means for mounting either said cassette or said adaptor on said housing at said preselected location so that said monitor can be used sequentially with said cassette and with said adaptor to perform said series of monitoring operations and so that said fluid condition sensing and control means of said monitor may be coupled either to said fluid flow path defined by said cassette when said cassette is mounted on said housing or to the fluid flow path defined by said tube set when said adaptor is mounted on said housing.

4,838,866
LIQUID PUMP AIR RELEASE SYSTEM
William M. Marshall, Sr., Rte. 1, Box 156, Salem, Va. 24153
Continuation-in-part of Ser. No. 914,809, Oct. 3, 1986, Pat. No. 4,758,227. This application Dec. 15, 1986, Ser. No. 941,049
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—152 6 Claims



1. A pump for drawing in a liquid charge and ejecting it against substantial superatmospheric back pressure, comprising a closed chamber, a piston reciprocable as a single unit in the chamber, said piston being the only piston in the chamber, means mechanically connected to the piston to reciprocate it in the chamber, an inlet passage and an outlet passage connecting with the chamber, inlet valve means adapted to back seat to

close the inlet passage during the compression stroke of the piston and oppositely movable to open the inlet passage, outlet valve means adapted to back seat to close the outlet passage during the return stroke of the piston and oppositely movable to open the outlet passage, resilient means biasing the outlet valve means closed, and means movable by the piston and adapted to cause a mechanical engagement which positively presses the outlet valve means open and which initiates such opening of the outlet valve near the end of the compression stroke of the piston, thereby positively opening the outlet valve means and thus facilitating escape of any air which might otherwise remain in the chamber.

4,838,867

UNIVERSAL CLAMP

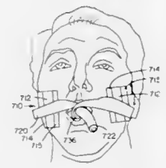
Glenda G. Kalt, Boca Raton, Fla.; Dale K. Straub, Los Angeles, Calif., and Peter Piwonka, Munich, Fed. Rep. of Germany, assignors to Glenda G. Kalt, Boca Raton, Fla.

Continuation-in-part of Ser. No. 28,927, Mar. 23, 1987, which is a division of Ser. No. 730,344, May 3, 1985 Pat. No. 4,702,736, and a continuation-in-part of Ser. No. 813,730, Dec. 27, 1985, Pat. No. 4,738,662, which is a continuation-in-part of Ser. No. 730,344, May 3, 1985. This application Aug. 18, 1987, Ser. No. 86,473

The portion of the term of this patent subsequent to Oct. 27, 2004, has been disclaimed.

Int. Cl.[4] A61M *25/02*

U.S. Cl. 604—180 **18 Claims**



1. A clamp for holding an article to an object comprising:
a. base means for adhering the clamp to the object wherein said base means is shaped to be positioned on both cheeks of a patient;
b. a flap;
c. securing means for securing said flap to said base means with said article positioned therebetween; and
d. resilient pad means adhered to said flap and having an adhesive surface for contacting said positioned article.

4,838,868

TAPE FOR SECURING A HYPODERMIC NEEDLE

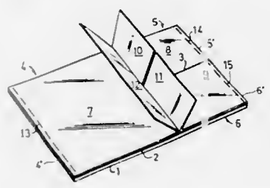
Monica Forgar, and Kerstin Björnson-Ljungblom, both of Gothenborg, Sweden, assignors to Molnlycke AB, Gothenborg, Sweden

Filed May 14, 1987, Ser. No. 61,632

Claims priority, application Sweden, May 23, 1986, 8602360

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—180 **2 Claims**



1. In a hypodermic needle attachment tape which comprises a carrier layer (1) for attachment to the skin of a patient across an inserted hypodermic needle, and which carrier layer is divided partially in one direction by a slit (3) and is provided with an adhesive coating (2) on the side thereof which contacts the hypodermic needle and the patient's skin, and which adhesive coating (2) is covered by sheets of release foil (7-9) the mutually adjacent ends of which sheets are free and are disposed adjacent each other and serve as pull tabs for the removal of said sheets, the adhesive coating (2) for application to the patient and to the hypodermic needle extending over only one side of the whole of the carrier layer (1), one of the release sheets (7) extending over the non-slitted section (4) of the carrier layer; the improvement in which each of two further separate release sheets (8,9) extends over a respective section (5,6) of the carrier layer separated by said slit (3) and is provided with a respective separate pull tab (10,11), said separate pull tabs (10,11) being disposed side by side of each other and being disposed endwise beyond their respective release sheets in a direction parallel to said slit (3).

4,838,869

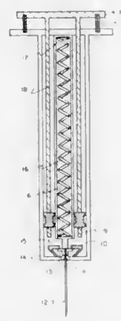
RETRACTABLE NEEDLE SYRINGE

Edward F. Allard, 7830 Greely Blvd., Springfield, Va. 22152

Continuation of Ser. No. 90,360, Aug. 29, 1987. This application Jul. 22, 1988, Ser. No. 223,077

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—195 **5 Claims**



1. A hypodermic syringe with a retractable needle comprising outer and inner cylinders, wherein said outer cylinder has a first opening in one end for effecting the protrusion of said retractable needle with a second opening in the other end allowing for the manipulation of a plunger actuator therethrough; said inner cylinder located within the confines of the outer cylinder for receiving and storing the needle when retracted; plunger means in slidable contact with the inner wall of the outer cylinder for effecting a vacuum upon actuating the plunger actuator in an outward direction, whereby a fluid may be drawn into the outer cylinder and expelled upon actuating the plunger inwardly said needle extending through the second opening of the outer cylinder having a head somewhat larger than the diameter of the needle to establish a rim that can be used to firmly hold the needle in place during use by holding tabs within the said other end of the outer cylinder, said needle being spring loaded, whereby upon contacting the holding tabs with the end of the plunger the spring loaded needle is caused to be disengaged and retracted into the inner cylinder for storage.

4,838,870

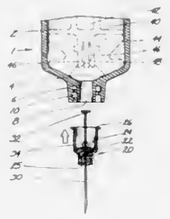
REMOVABLE NEEDLE ATTACHMENT HAVING A DETACHABLE NEEDLE

Terry M. Haber, Lake Forest, Calif.; Jack E. Maze, St. Louis, Mo., and Roger R. Crouse, De Land, Fla., assignors to Sherwood Medical Co., St. Louis, Mo., a part interest

Filed Jun. 8, 1987, Ser. No. 59,498

Int. Cl.[4] A61M *5/325*

U.S. Cl. 604—187 **15 Claims**



1. For a syringe including a cylinder having distal and proximal ends and a piston assembly movable axially and reciprocally through said cylinder, the improvement of a needle attachment to be attached to or removed from the distal end of said cylinder from a location at the exterior of said cylinder, said needle attachment releasably engaging a hypodermic needle so that said needle is attached to or removed from said syringe along with said needle attachment when said needle attachment is attached to or removed from said cylinder, said needle attachment being attached to said cylinder, such that one end of said needle projects outwardly from the distal end of said cylinder and the opposite end of said needle projects inwardly from the distal end of said cylinder, said piston assembly having means by which to engage the opposite end of said needle at the interior of said cylinder for detaching said needle from said needle attachment and removing said needle from said distal end for relocation to a relatively proximal position within said cylinder when said piston assembly is moved towards said proximal cylinder end.

4,838,871

NEEDLE GUARD, AND ASSEMBLY

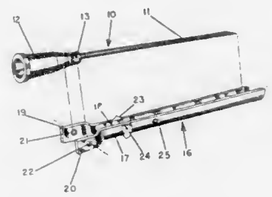
Ronald B. Luther, 530 Kings Rd., Newport Beach, Calif. 92663

Continuation-in-part of Ser. No. 74,693, Jul. 17, 1987, Pat. No. 4,747,836. This application Mar. 4, 1988, Ser. No. 164,455

The portion of the term of this patent subsequent to May 31, 2005, has been disclaimed.

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—192 **5 Claims**



1. An assembly of a needle guard for a hub and attached needle, comprising:
an elongate guard member mounted on the hub for rotatable movement thereon, the guard member including an elongate, longitudinal slit adapted to interfit with the needle prior to use, the guard member defining engaging means for a rotatable locking member; and,
a locking member mounted on the guard member, and adapted for rotational movement therealong, the locking member providing an elongate slit coinciding with the slit of the guard member; whereby:
i. prior to use, the needle is adapted to interfit into the slit of the guard member;
ii. during use, the guard member and attached locking member are adapted to rotate away from the needle;
iii. following use, the guard member and attached locking member are adapted to rotate back to interfit with the used needle; and,
iv. the locking member is adapted to be rotated around the needle guard and rotatably locked therewith while moving the locking slit out of alignment with, and to occlude the needle, thereby protecting against accidental needle stick injuries.

4,838,872

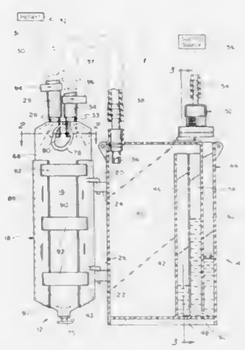
BLOOD COLLECTION DEVICE

Paul Sherlock, San Francisco, Calif., assignor to Sherwood Medical Company, St. Louis, Mo.

Filed Feb. 13, 1987, Ser. No. 14,513

Int. Cl.[4] A61M *1/00*

U.S. Cl. 604—319 **21 Claims**



1. A body fluid collection device comprising a collapsible bag having a pair of opposed sidewalls, and an inlet for receiving body fluid, and stiffener means including a pair of relatively stiff flexible members respectively adjacent said sidewalls and having opposed side edges, said members having portions between said side edges bendable outwardly in opposite directions from each other in response to the application of a force external to said bag tending to move said side edges generally toward each other to expand said bag for receiving body fluid through said inlet, and means external to said bag for maintaining a compressive force on said opposed side edges to maintain said bag expanded including a pair of opposed members spaced apart less than the distance between said side edges for receiving said bag and flexible members therebetween.

4,838,873

APPARATUS FOR INTRODUCING LIQUIDS AND/OR ELONGATED ELEMENTS INTO A BODY CAVITY

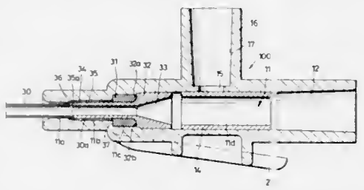
Jürgen Landskron, Bebra; Jörn Zahn, Kassel; Harald Heckmann, Lohfelden, and Georg Mohr, Wildeck-Honebach, all of Fed. Rep. of Germany, assignors to Intermedicat GmbH, Emmenbrucke, Switzerland

Continuation of Ser. No. 897,619, Aug. 18, 1986, abandoned. This application May 23, 1988, Ser. No. 198,591

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1985, 3530349

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—283 2 Claims



1. Apparatus for introducing liquids and/or elongated elements such as cannulae, mandrins, catheter and the like into a body cavity, comprising:

a catheter hub having a substantially cylindrical, longitudinal channel therethrough, said catheter hub defining an elongated orifice portion of said longitudinal channel,

a catheter capillary entending with loose fit into the elongated orifice portion of said longitudinal channel,

an intermediate section of said longitudinal channel having a diameter greater than said orifice portion of said longitudinal channel,

an internal stepped shoulder located where the intermediate section of said longitudinal channel meets the orifice portion of said longitudinal channel,

said catheter capillary having a thick head portion situated within said intermediate section, said thick head portion having mutually parallel first and second annular plane faces, said thick head portion having a central opening, the relative distance between said mutually parallel first and second annular plane faces of said thick head portion being less than the length of said elongated orifice portion of said longitudinal channel, said first annular plane face abutting against said internal stepped shoulder,

a radial annular collar formed by ultrasonic welding into the wall of the longitudinal channel, said annular collar having two mutually parallel, substantially flat surfaces extending normal to the longitudinal axis of the longitudinal channel, said second annular plane face of said thick head portion abutting against one of said substantially flat surfaces of said annular collar,

said annular collar acting against substantially all of said second annular plane face of said thick head portion to axially compress and radially enlarge and clamp said thick head portion in said intermediate section of said longitudinal channel

said annular collar defining a central opening adjacent said central opening of said thick head portion and having a diameter substantially equal to said central opening of said thick head portion, whereby a substantially stepless transition between said central opening of said thick head portion and said central opening of said annular collar is provided, and

whereby said thick head portion is axially limited by said internal stepped shoulder and one of said substantially flat surfaces of said annular collar.

4,838,874

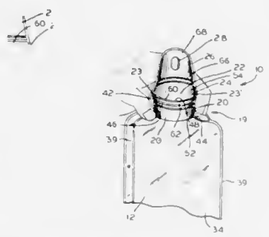
FLUID CONTAINER HAVING A ONE WAY VALVE

Melvin I. Eisenberg, 3849 Swanson Ct., Gurnee, Ill. 60031

Filed Jan. 5, 1987, Ser. No. 321

Int. Cl.[4] A61M *3/00*

U.S. Cl. 604—262 8 Claims



1. A container for fluid comprising:

a front flexible wall and a rear flexible wall secured together along certain edge portions thereof to define a body for holding said fluid, and unsecured along outer portions thereof to provide a fluid supply opening;

a valve means positioned in said supply opening and having a closed condition and an open condition, said valve means including:

a flexible inner sheet;

a spring sheet constructed from a flexible, rigid and resilient material, said inner sheet and said spring sheet being opposed to each other and attached to each other along opposite side margins thereof and unattached to each other at the upper and lower ends to form an open ended sleeve like configuration and provide a fluid inlet passageway between the inner sheet and spring sheet, each of said margins being attached to the front and rear walls, said spring sheet extending above said inlet passageway and formed to provide a handle for said container, said upper end of the inner sheet being attached to said front wall and the said rear wall being attached to said handle;

a first pocket formed between said one of the walls and said inner sheet; and

a second pocket formed between said other wall and said spring sheet, said pockets receiving fluid flowing back from the body of the container toward said valve means to more securely maintain the spring sheet in contact with the inner sheet, said inner sheet and said spring sheet being in contact with each other to provide said valve closed condition for closing said fluid inlet, said spring sheet and said inner sheet responding to the application of an external force and extending outward from each other to provide said open valve condition for opening said fluid inlet, said spring sheet and said inner sheet returning toward each other upon removal of said external force.

4,838,875

METHOD AND APPARATUS FOR DEALING WITH INTRAVENOUS FLUIDS

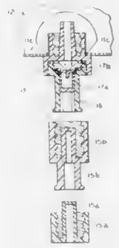
Andrew T. Somor, 2430 N. Parkside, Chicago, Ill. 60639

Filed Dec. 9, 1987, Ser. No. 130,442

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—262 13 Claims

1. An apparatus for intravenous administration of fluid wherein some fluid may or may not be already contained in a hollow portion of said apparatus, and the apparatus is fed with fluid through at least one opening therein, a normally closed backflow check valve securely received in said opening in fluid-tight fashion, said valve including as a component, a valve member, a receptacle for the introduction of fluid therethrough, a movable means within the receptacle, said receptacle having a first removable cap associated therewith, whereby removal of said cap can enable a non-invasive fluid feeding device to be associated with said receptacle to feed fluid into said apparatus, whereby the valve member is forced away from its sealed, flow-preventing position by movable means contacting against said valve member in response to the forceful introduction of fluid from this device, whereafter the feeding device is removed the valve member returns to its seated position, and the first cap is replaced on the receptacle.



4,838,876

SILICONE RUBBER CATHETER HAVING IMPROVED SURFACE MORPHOLOGY

Edward W. Wong, Lexington, and Daniel G. Ballan, Holden, both of Mass., assignors to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 857,262, Apr. 29, 1986, abandoned. This application Feb. 11, 1988, Ser. No. 157,171

Int. Cl.[4] A61M *5/325*

U.S. Cl. 604—265 15 Claims

1. A silicone rubber catheter having improved surface morphology, said catheter having a portion thereof adapted for insertion in the body, at least the said portion of said catheter having chemically bonded through crosslinking to the surface thereof a smooth continuous outer layer comprising a crosslinked polysiloxane, said outer layer further including an innocuous lubricating agent.

4,838,877

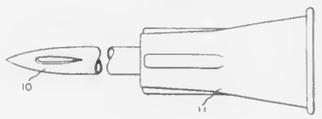
POLYMERIC HYPODERMIC DEVICE

Bruce A. Massau, 4339 Foxhaven NW., Canton, Ohio 44718

Continuation-in-part of Ser. No. 762,821, Aug. 6, 1985, abandoned. This application Dec. 19, 1986, Ser. No. 944,322

Int. Cl.[4] A61M *5/32*

U.S. Cl. 604—272 5 Claims



1. An injection device comprising an injection end and constructed of a polymeric material, said injection end is of a ported configuration that delivers the material to be injected in a direction other than parallel with the axis of the device and said injection end is conical in shape with portals above a solid conical penetrating point:

the improvement comprising the outer surfaces of the device converging uninterruptedly forward from opposite sides of a tube to a needle sharp point wherein two or more portals equally spaced along the outside diameter of the device are flush with the exterior of the outer surface of the device and wherein the longitudinal side walls of the portal are configured at difference angles so as to impart an angular momentum or torque to the fluid to be injected.

4,838,878

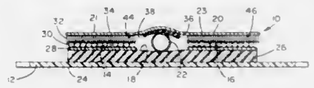
UNIVERSAL CLAMP

Glenda G. Kalt, 2640 Hollywood Blvd., Suite 200, Hollywood, Fla. 33020; Dale K. Straub, Los Angeles, Calif., and Peter Piwonka, Munich, Fed. Rep. of Germany, assignors to Glenda G. Kalt, Boca Raton, Fla.

Division of Ser. No. 730,344, May 3, 1985, Pat. No. 4,702,736, and a continuation-in-part of Ser. No. 813,730, Dec. 27, 1985, Pat. No. 4,738,662, which is a continuation-in-part of Ser. No. 730,344,. This application Mar. 23, 1987, Ser. No. 28,927

Int. Cl.[4] A61M *25/02*

U.S. Cl. 604—180 29 Claims



1. A clamp for holding an article to an object comprising:

a. base means for adhering said clamp to such object;

b. a flap;

c. securing means for securing said flap to said base means with such article positioned therebetween; and

d. resilient pad means adhered to said flap and having an adhesive surface for contacting said positioned article whereby said adhesive surface is movable with said positioned article without breaking said contact.

4,838,879

CATHETER

Susumu Tanabe, and Masahiro Nudeshima, both of Fujinomiya, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed May 1, 1987, Ser. No. 45,601

Claims priority, application Japan, May 8, 1986, 61-105744

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—280 10 Claims

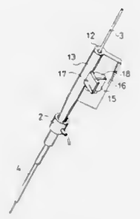
1. A catheter having one of a curved distal end portion and a flexible distal end portion able to bend when being used, comprising at least one radio opaque ring member circumferentially formed on said catheter, so as to cross an axial direction of said catheter, said radio opaque ring member satisfying the condition:

$$L \leqq D \tan(\pi/8)$$

where D is the inner diameter of said radio opaque ring member and L is the length thereof along the axial direction of said catheter, said radio opaque ring member being provided with

a slit-shaped portion having substantially no radio opaque function and extending along the axial direction of said catheter whereby said radio opaque ring member with it's slit-shaped portion enables determination of the inclining direction of said catheter.

4,838,880
PLASTIC INSERTER
Masaaki Honma, Yokohama, Japan, assignor to Nifco, Inc., Yokohama, Japan
Filed Aug. 20, 1987, Ser. No. 87,585
Claims priority, application Japan, Aug. 22, 1986, 61-127228
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—280 20 Claims



1. A gripping device, comprising:
a first jaw means for gripping an elongated member;
second jaw means movable with respect to said first jaw means between open and closed positions for permitting entry of said elongated member between said first and second jaw means, or removal of said elongated member from said first and second jaw means, when said first and second jaw means are relatively open, and for gripping said elongated member in a cooperative manner with said first jaw means when said first and second jaw means are relatively closed;
first handle means operatively connected to said first jaw means;
second handle means operatively connected to said second jaw means for cooperating with said first handle means such that when said first and second handle means are moved toward each other said first and second jaw means are relatively open, while when said first and second handle means are moved away from each other, said first and second jaw means are relatively closed with respect to each other;
cylindrical cavity means, defining a cylindrical cavity having a longitudinal axis along which said elongated member is housingly disposed when gripped by said first and second jaw means, for hingedly connecting said first and second jaw means together so as to permit said relative open and closed movements to occur about a hinge axis which is substantially parallel to said longitudinal axis of said cylindrical cavity,
wherein one of said first and second handle means is provided with means for biasing said first and second handle means apart so as to in turn bias said first and second jaw means together; and
the other one of said first and second handle means is provided with groove means for detachably receiving an end portion of said biasing means whereby said first and second handle means may be detachably connected together in a biased condition.

4,838,881
MULTILUMEN CATHETER AND ASSOCIATED IV TUBING
Laurence M. Bennett, Sandy, Utah, assignor to Deseret Medical, Inc., Franklin Lakes, N.J.
Continuation of Ser. No. 607,330, May 4, 1984, abandoned. This application Sep. 29, 1988, Ser. No. 250,871
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—280 4 Claims

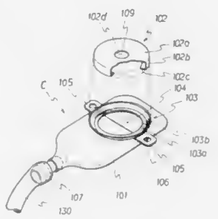
1. A device of unitary construction for infusing medical fluids to a patient comprising:
a catheter having a plurality of lumens of generally elliptical cross-section each lumen having a side wall inner surface surrounding the lumen;
a plurality of tubes each with a wall defining a generally circular inside and outside cross-section and each tube separately bonded into fluid communication with a respective catheter lumen of elliptical cross-section to form a welded and reformed continuous and integral attachment along a region of an interface between the reformed outside surface of each circular cross-section tube and the side wall inner surface of the respective catheter lumen by the changed shapes of the outside surface of each tube and the maintained elliptical cross-section shape of each catheter lumen for a direct conforming fit so that a structural continuum is formed at the juncture of the tube and the catheter lumen by the changed shape of the outside surface of the tube and the maintained relative shape of the catheter lumen; and
a chamfered tip from the circular inside cross-section of an end of each tube that is inserted into the respective catheter lumen.

4,838,882
MOUTH MOISTURIZING PAD
Henry C. Molinoff, 234 Edgewood Ave., Smithtown, N.Y. 11787
Filed Apr. 4, 1988, Ser. No. 148,087
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—286 4 Claims

1. A mouth moisturizing pad for treatment of an individual suffering from xerostomia comprising at least two sponge sections saturated with water and placed adjacent each other which are of a size such that together said sponge sections are approximately equal to but not significantly less than the size of

a cheek pouch of said individual and an envelope or covering made of cloth in which said sponge sections are held.

4,838,883
URINE-COLLECTING DEVICE
Iwao Matsuura, Osaka, Japan, assignor to Nissho Corporation, Osaka, Japan
Continuation of Ser. No. 10,664, Feb. 4, 1987, abandoned. This application Nov. 8, 1988, Ser. No. 270,380
Claims priority, application Japan, Mar. 7, 1986, 61-51098; Jul. 31, 1986, 61-180993
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—349 8 Claims

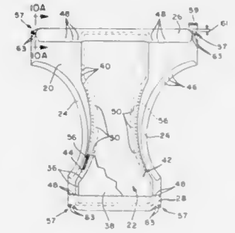


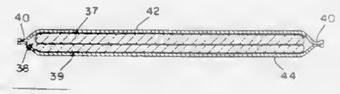
1. A urine-collecting device comprising:
a relatively flat urine-collecting bag having a substantially flat front side and a rear side, said front side being provided with a relatively large round opening;
a flange attached at the outside of said front side and to a round periphery of said large round opening of said substantially flat front side, said flange extending radially outwardly away from said round periphery at a substantial, substantially constant angle with respect to said substantially flat front side, said flange being provided with a relatively large opening; and
a cylindrical cap-shaped film made of a substantially thin elastic material and having a substantially flat front wall at one side thereof and a rear flange portion at the other side thereof, the thickness of said front wall being smaller than that of said rear flange portion, a relatively small inserting hole being provided at the center of said front wall, said inserting hole having a diameter such that said inserting hole is capable of gently and sealingly fitting around a circumferential surface of a penis, and said film being attached to said flange by elastically fitting said rear flange portion around an outside surface of said flange.

4,838,884
METHOD OF USING A SURGICAL REPAIR MESH
Barry L. Dumican, Newtown; Alan L. Kaganov, Stamford, and Thomas A. Ritter, Bristol, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.
Continuation of Ser. No. 604,104, Apr. 26, 1984, Pat. No. 4,633,873. This application Oct. 17, 1986, Ser. No. 887,686
Int. Cl.[4] A61F *13/00*
U.S. Cl. 604—364 2 Claims

1. A method of tamponading an organ in a warm blooded mammal comprising:
surgically opening the mammal;
pressure encapsulating the organ using a material manufactured from a stretchable, non-heat set knitted surgical mesh comprising a plurality of filaments, each filament manufactured from a polymer having a glycolic acid ester linkage, said filaments bundled or twisted into a yarn, and said yarn knitted into a mesh; and
surgically closing said mammal.

4,838,885
FORM-FITTING SELF-ADJUSTING DISPOSABLE GARMENT WITH A MULTILAYERED ABSORBENT
Leo J. Bernardin, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Division of Ser. No. 773,749, Sep. 6, 1985, Pat. No. 4,699,620. This application Mar. 18, 1987, Ser. No. 27,472
The portion of the term of this patent subsequent to Oct. 13, 2004, has been disclaimed.
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—385.1 72 Claims

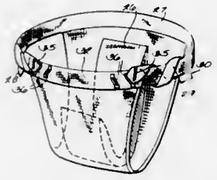




1. An anatomically form-fitting, generally self-adjusting disposable absorbent garment comprising:
a breathable elastomeric nonwoven outer cover comprising a nonwoven elastic web joined to one or more gatherable nonwoven webs, including a waist opening, a pair of leg openings, a central crotch section between said leg openings and front and rear panels separated by said crotch section;
an absorbent insert structure, substantially superposable on said front and rear panels and said crotch section having longitudinally opposed ends and including a liquid permeable bodyside liner and a liquid impermeable barrier with an absorbent core disposed therebetween, said absorbent core comprising a first absorbent layer, adjacent to said bodyside liner, with a first average pore size and a second absorbent layer, adjacent to said first layer, with a second average pore size; and

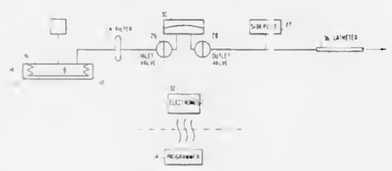
attachment means for attaching and integrating said insert to said outer cover while allowing substantially unrestricted functional stretchability thereof.

4,838,886
PAD HOLDER
Gail H. Kent, 3 Redfern St., Asheville, N.C. 28806
Filed Mar. 9, 1987, Ser. No. 23,420
Int. Cl.[4] A61F *13/16*; A41B *9/00*; A41D *1/14*
U.S. Cl. 604—392 9 Claims



1. A side-opening, breathable, flexible, adjustable, self-securing holder for absorbent pads, for babies or adults, said holder being generally hour-glass shaped and formed of a mesh material and including
a body portion
a flexible and adjustable front waistband portion attached to a first end of said body portion
a back waistband portion attached to a second end of said body portion and interlocking with said first waistband portion
said front waistband portion being shorter in length than said back waistband portion
at least one rib-reinforced opening formed in each end of said front waistband portion
at least one rib with adjacent indentions in each end of said back waistband portion constructed of width sufficient to interlock with the said rib reinforced opening of said front waistband portion, when said back waistband portion is inserted through said openings, and
a portion of said back waistband, at each end, extending outwardly beyond the said rib with adjacent indentions.

4,838,887
PROGRAMMABLE VALVE PUMP
Samir F. Idriss, Mattapan, Mass., assignor to Shiley Infusaid Inc., Norwood, Mass.
Filed Dec. 15, 1987, Ser. No. 133,400
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—891.1 27 Claims

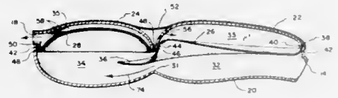


1. An implantable infusion apparatus comprising:
a housing containing,
a rechargeable positive pressure infusate reservoir,
an electronically controlled metering assembly receiving infusate from said reservoir, said metering assembly comprising a pair of normally closed valves and an accumulator positioned in fluid communication with each of said valves,
electronic means for controlling the operation of said valves, and
an outlet in fluid communication with said metering assembly to dispense infusate to a site in a living body, wherein when a first of said valves is open, infusate flows from said reservoir into said accumulator and when the other valve is open and the first closes, infusate flows from said accumulator into said outlet, said accumulator storing and discharging predetermined volume spikes of infusate at a frequency determined by the cycling rate of said pair of valves.

4,838,888
CALCIFICATION MITIGATION OF IMPLANTABLE BIOPROSTHESES
Aws S. Nashef, Huntington Beach, Calif., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Apr. 17, 1987, Ser. No. 39,295
Int. Cl.[4] A61F *2/24*
U.S. Cl. 623—2 18 Claims

1. A process for treating animal biological tissue prior to implantation in an animal to reduce calcification of said tissue following implantation, which comprises:
(a) fixing said tissue under tissue-fixing conditions, and
(b) contacting said tissue with a solution of acetylsalicylic acid for a time sufficient to covalently bind said acetylsalicylic acid directly to said tissue in an amount effective to reduce calcification of said tissue after implantation.

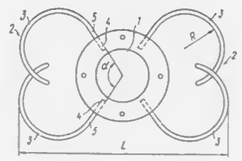
4,838,889
VENTRICULAR ASSIST DEVICE AND METHOD OF MANUFACTURE
Willem J. Kolff, Salt Lake City, Utah, assignor to University of Utah Research Foundation, Salt Lake City, Utah
Continuation of Ser. No. 516,490, Jul. 21, 1983, abandoned, which is a division of Ser. No. 298,420, Sep. 1, 1981, Pat. No. 4,427,470. This application Jul. 23, 1986, Ser. No. 890,792
Int. Cl.[4] A61F *2/22*
U.S. Cl. 623—3 13 Claims



1. A ventricular assist device comprising:
a housing, said housing having an inlet means through which blood is communicated to said housing, an outlet means through which blood is expelled from said housing, and means through which a drive fluid is pumped into and out of said housing;
a compliance membrane disposed within said housing, said compliance membrane dividing a first portion of the interior of said housing into an atrial blood chamber and an atrial compliance chamber;
a pumping membrane disposed within said housing, said pumping membrane dividing a second portion of the interior of said housing into a ventricular blood chamber and a drive fluid pumping chamber, said compliance membrane and said pumping membrane comprising a plurality of layers made from elastomers, each said layer being made from a different type of elastomer and adjacent layers being separated by a lubricant; and
a one-way valve means for controlling the flow of blood out of said atrial blood chamber and into said ventricular blood chamber, said one-way valve means comprising a flap which is formed as an integral extension of said compliance membrane, said flap extending into said ventricular blood chamber and being configured so as to conform to the contour of a wall of said ventricular blood chamber

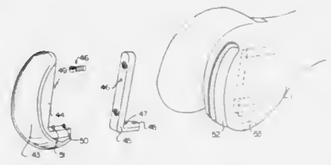
such that, when said flap is closed, one surface of the flap directly contacts the wall of the ventricular blood chamber so that blood within said ventricular blood chamber washes only the other side of the flap facing the blood in the ventricular blood chamber.

4,838,890
INTRAOCULAR PROSTHETIC LENS
Svyatoslav N. Fedorov, ulitsa Dostoevskogo,12,kv.32; Eleonora V. Egorova, ulitsa Kuusinena, 15,kv.44; Natalya A. Strusova, ulitsa Supruna, 4/10, kv.78; Viktor I. Glazko, ulitsa 26 Bakinskikh komissarov,12,korpus 4,kv.66, and Vladimir N. Trubilin, 4 Samo techny pereulok,3,kv.31, all of Moscow, U.S.S.R.
Filed Aug. 4, 1988, Ser. No. 228,541
Int. Cl.[4] A61F *2/16*
U.S. Cl. 623—6 1 Claim



1. An intraocular prosthetic lens, comprising:
—an optical lens;
—two loop shaped support elements arranged oppositely to each other and each having two ends which are fastened together with said optical lens;
—two pairs of arches made of an elastic material, each of said pairs establishing one of said support elements;
—a first end of each of said arches being at the same time one of said ends of the support element, fastened together with said optical lens;
—a portion of each of said arches directly adjoining its said first end and being essentially straight-line;
—a second curvilinear end of each of said arches, which is essentially a free end;
—said arches in each of said pairs being coplanar and said free curvilinear second ends thereof mutually intersecting;
—said straight-line portions of the arches in each of said support elements being set at an angle of 105 to 115 degrees to each other;
—a radius of curvature of said free curvilinear second ends of the arches standing to a maximum overall length of said optical lens with said support elements as 0.16 to 0.21.

4,838,891
JOINT PROTHESIS
Per-Ingvar Branemark, Ändergaten 3, S-431 39 Mölndal, and Björn Albrektsson, Rödhakevägen 1, S-430 Kullavik, both of Sweden
Continuation of Ser. No. 801,705, Nov. 26, 1985, abandoned. This application Aug. 8, 1988, Ser. No. 229,756
Claims priority, application Sweden, Nov. 28, 1984, 8405989
Int. Cl.[4] A61F *2/38*
U.S. Cl. 623—20 10 Claims



1. A joint prosthesis for permanent anchorage in bone tissue of a joint in a human body, for example, a knee joint, comprising:
at least two anchorage devices, at least one of them for implantation into bone tissue of each of the femoral and tibial components, respectively, during a first surgical operation, each of said anchorage devices including at least one fixture leg forming a healing surface towards surrounding bone tissue during a healing phase, said anchorage device remaining in an unloaded condition during said healing to allow functioning of the joint;
at least two articulation devices, at least one of them for each of the femoral and tibial components, respectively, each articulation device including a corresponding articulatory surface and connecting means for interconnecting said articulation device to said firmly anchored fixture leg during a second operation subsequent to said healing phase, wherein at least said anchorage devices are made of pure titanium; and,
wherein said anchorage device for the femoral component comprises at least two separate internally threaded tubular members forming said leg fixtures insertable from the femur joint surface and said articulation device for the femoral component further comprises an articulatory surface rail part and a separate interconnecting L-shape part connected to said tubular members by two locking screws screwed into threaded interior of said tubular members.

4,838,892

THERMOPLASTIC LEATHER MATERIAL AND ITS PREPARATION

Adolf Wyler, 25 Bayit Vegan Street, Jerusalem 96425, and Herbert J. Wagner, 3 Anderson St., Tel-Aviv, both of Israel 69107

Continuation of Ser. No. 827,255, Feb. 7, 1986, abandoned. This application Aug. 4, 1987, Ser. No. 81,656
Claims priority, application Israel, Mar. 1, 1985, 74480
Int. Cl.[4] C14C *13/00*
U.S. Cl. 8—94.1 R 3 Claims

1. Method for the production of a solid thermoplastic body from particulate leather scrap, said thermoplastic body having properties different from the leather from which it is formed, including thermoplasticity, which comprises

subjecting said particulate leather scrap in a closed die to a pressure of about 200–900 bar,

heating said particulate leather scrap in the closed die at said pressure at a temperature at about 50°–250° C. until said particulate leather scrap softens, becomes plastic and is densified, thus converting the same into a solid thermoplastic mass,

cooling said solid thermoplastic mass while maintaining the pressure thereon, until said mass reaches room temperature, and

removing the thus cooled mass from the die, thus obtaining a solid thermoplastic body capable of withstanding a pressure of 500 kg/cm^2.

4,838,893

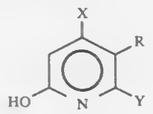
OXIDATION HAIR DYES COMPRISING SUBSTITUTED DIHYDROXYPYRIDINES AS COUPLING COMPONENTS

David Rose, Hilden; Norbert Maak, Neuss, and Edgar Lieske, Düsseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 816,952, Jan. 6, 1986, abandoned, which is a continuation of Ser. No. 583,144, Feb. 24, 1984, abandoned, which is a continuation of Ser. No. 349,835, Feb. 18, 1982, abandoned. This application Jun. 24, 1987, Ser. No. 65,142
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1981, 3115643
Int. Cl.[4] A61K *7/06, 7/13*
U.S. Cl. 8—405 22 Claims

1. An aqueous oxidation hair dye composition for the dyeing of human hair, comprising:

(A1) at least one first coupler consisting essentially of a compound of the formula



(I)

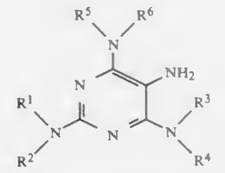
wherein

R is a C_{1-4}alkyl or hydroxyalkyl, and

one of X or Y is hydroxyl and the other is a C_{1-4}alkyl, or a salt of such compound with an inorganic or organic acid;

(A2) a second coupler which is 2-chloro-6-methyl-3-aminophenol;

(B) at least one developer, consisting essentially of a compound of the formula



(II)

wherein (1) R^1 to R^6 are, independently, H, C_{1-4}alkyl, or $-(CH_2)_nX$ in which n is an integer from 1 to 4 and X is OH, a halogen, or $-NR^7R^8$ in which R^7 and R^8 are, independently, H, or a C_{1-4} alkyl, or in which R^7 and R^8, together with a nitrogen, form a 5- or 6-membered heterocyclic ring which may contain an additional nitrogen or an oxygen replacement for a carbon;

(2) each of R^1 and R^2, R^3 and R^4, or R^5 and R^6, may form a 5- or 6-membered heterocyclic ring which may contain an additional nitrogen or oxygen replacement for a carbon; or

(3) an acid salt thereof; and wherein the mol ratio (A1+A2):(B) is 0.5–2:1.

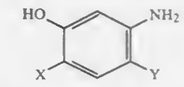
4,838,894

HAIR DYE COUPLER AND PROCESS FOR MAKING

James E. Kijek, Stamford; Keith C. Brown, New Canaan, and Bryan P. Murphy, Trumbull, all of Conn., assignors to Clairol Incorporated, New York, N.Y.

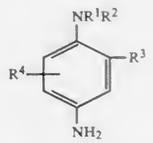
Continuation of Ser. No. 864,734, May 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 762,075, Aug. 2, 1985, abandoned. This application Dec. 21, 1987, Ser. No. 135,572
Int. Cl.[4] A61K *7/13;* C07C *93/06, 91/44*
U.S. Cl. 8—412 7 Claims

1. As a compound a meta aminophenol useful as a meta component in an oxidation dye composition having the formula



wherein x and y are selected from the group consisting of halogen and the group OR of which R is alkyl, aminoalkyl or hydroxyalkyl, at least one of x or y being the group OR.

7. An oxidation dye composition containing a para component selected from the group consisting of p-toluene diamine, p-aminophenol, p-aminodiphenylamine, 4,4'-diaminodiphenylamine, 2,6-dimethyl-p-pheylenediamine, 2,5-diaminopyridine, as well as from the class of compounds of the formula



(IX)

or its non-toxic salts, in which:

R_1 is hydrogen, alkyl or hydroxyalkyl;

R_2 is hydrogen or hydroalkyl;

R_3 is hydrogen, alkyl, alkoxy or halogen; and

R_4 occupies any one of the remaining positions on the benzene radical and is hydrogen, alkyl, alkoxy or halogen and as a meta component a compound of claims 1,2,3,4,5 or 6.

235–362 O.G.–89–13

4,838,895

PROCESS FOR THE PREPARATION OF CONCENTRATED AQUEOUS DYE FORMULATIONS BY DESALINATION AND CONCENTRATION BY MEMBRANE SEPARATION IN PRESENCE OF SODIUM SALT

Roberto Galli, and Petr Kvita, both of Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 8, 1988, Ser. No. 179,350
Claims priority, application Switzerland, Apr. 16, 1987, 1506/87
Int. Cl.[4] C09B *67/26*; D06L *3/12*
U.S. Cl. 8—527 9 Claims

1. A process for the preparation of a concentrated aqueous dye formulation of an anionic dye, which comprises adding a sodium salt of a mineral acid or lower organic carboxylic acid and optionally other customary additives to an aqueous crude dye solution or suspension which contains inorganic salts and in which the anionic dye is present at the potassium, sodium/-potassium or ammonium/potassium mixed salt, and desalinating and concentrating the solution or suspension by means of a membrane separation process.

4,838,896

COMPOSITION USEFUL FOR AFTERTREATING DYEINGS, PRINTINGS AND OPTICAL BRIGHTENINGS: EPIHALDHYDRIN-AMMONIA REACTION PRODUCT AND ALLYLAMINE POLYMER

Bruno Kissling, Hagendorf, and Tibor Robinson, Basel, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Feb. 1, 1988, Ser. No. 151,032
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1987, 3706176
Int. Cl.[4] C07C *91/04*; C08F *26/02*; D06L *3/12*; D06P *1/52*
U.S. Cl. 8—554 37 Claims

1. A synergistic mixture containing as active ingredients a textile auxiliary (T) and a polymeric compound (P), in which

T is the product of a 2-step reaction comprising the steps of (1) reacting an epihalohydrin with aqueous ammonia a 50°–90° C. in an initial mole ratio of 4 moles epihalohydrin to 8–10 moles of ammonia, and (2) reacting the product of step (1), after removal of excess ammonia, with a further 0.1 to 0.5 moles of epihalohydrin per each 4 moles of epihalohydrin initially reacted, and

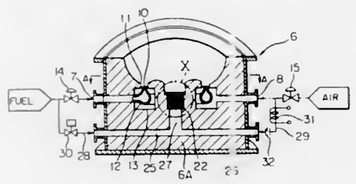
P is a water-soluble homopolymer of a mono- or di-allylamine, or a water-soluble copolymer consisting of mono-, di- or tri-allylamine units.

4,838,897

REFORMER

Yoshiaki Amano, Ibaraki; Eiji Yokoyama, Kashiwa, and Hideo Obyauchi, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 849,890, Apr. 9, 1986, abandoned. This application Nov. 9, 1987, Ser. No. 120,688
Claims priority, application Japan, Apr. 10, 1985, 60-74251
Int. Cl.[4] B01J *7/00*
U.S. Cl. 48—196 A 7 Claims



1. A reformer for producing a hydrogen rich gas by reaction of natural gas with steam through a catalytic action by passing the natural gas and the steam through heated reformer tubes filled with a catalyst, the reformer comprising: a reformer shell; a plurality of reformer tubes provided in the reformer shell; a catalyst supported in the reformer tubes; and a heater for heating the reformer tubes, the heater being arranged at the bottom of the reformer shell and comprising a first heating section comprising means for providing burner combustion of fuel and air, the means for providing burner combustion including a plurality of burner combustors, each burner combustor comprising a pair of a heating fuel nozzle and an air nozzle, and a second heating section comprising means for providing catalytic combustion of fuel and air, said means for providing catalytic combustion comprising a bed filled with a combustion catalyst for effecting combustion through the action of said combustion catalyst by passing a gas mixture of fuel and air through said combustion catalyst,

wherein said second heating section is provided at a center of the bottom of the reformer shell

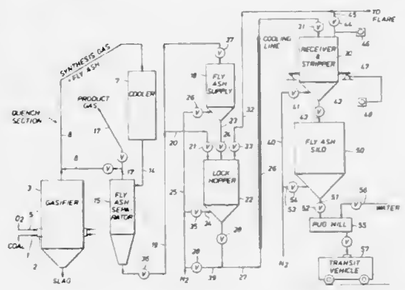
and said plurality of burner combustors are provided around said first heating section at a periphery of the bottom of said reformer shell.

4,838,898

METHOD OF REMOVAL AND DISPOSAL OF FLY ASH FROM A HIGH-TEMPERATURE, HIGH-PRESSURE SYNTHESIS GAS STREAM

Thomas R. Mifflin, and Thomas S. Dewitz, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 30, 1988, Ser. No. 213,410
Int. Cl.[4] C10J *3/46*, *3/84*, *3/86*
U.S. Cl. 48—210 16 Claims



1. In a process for the production of synthesis gas wherein coal is partially oxidized at an elevated temperature and pressure by feeding finely-divided coal and oxygen to a gasification zone of a reactor, the ratio of coal to oxygen being such as to maintain a reducing atmosphere, and producing raw synthesis gas having a temperature of from 2000° F. to 3000° F., said gas carrying with it a minor amount of at least one contaminating substance which is normally solid in form at room temperature, and partially cooling said synthesis gas sufficient to solidify said contaminating substance carried thereby, the invention comprising

separating the major portion of the partially-cooled solid contaminating substance in particle form from the synthesis gas flow stream under substantially the high pressure conditions present during the partial combustion of the coal and the partial cooling of the resultant product synthesis gas,

discharging the separated solid contaminating substance under high pressure conditions and storing a selected volume at a storage point together with a minor amount of synthesis gas entrained therewith,

providing a pressure isolatable first chamber having an inlet, an outlet and a vent line, into which a selected mass of solid substance and said entrained gas may be received at high pressure conditions and discharged therefrom at substantially atmospheric pressure in a batchwise manner,

transferring a selected first mass of the solid contaminating substance and any synthesis gas entrained therewith under high pressure conditions to said pressure-isolatable chamber with its outlet closed,

selectively isolating the first chamber from the high pressure storage point by closing the chamber inlet after said selected first mass of solid contaminating substance and entrained synthesis gas has been transferred,

venting the first chamber from its high pressure mode to a low pressure mode at substantially atmospheric pressure, providing a second chamber in solids-flow communication with the first chamber,

transferring the first mass of particles of solid contaminating substance and any residual entrained gas to a second chamber,

cooling the particles of the first mass of contaminating substance,

purging the first mass of solid particles of said substance in said second chamber of any synthesis gas entrained therewith by forcing a purging gas through said mass of particles and venting the purging gas and any residual synthesis gas from the second chamber until the synthesis gas in the vent gas stream has been reduced to a selected value, and

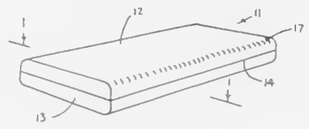
subsequently discharging the first mass of substantially gas-free mass of said particulate substance from said second chamber.

4,838,899

CURETTE SHARPENING HONE AND METHOD OF MAKING

Edward J. Bifuk, 1948 E. Keowood Dr., St. Paul, Minn. 55117

Filed Jan. 25, 1988, Ser. No. 148,370
Int. Cl.[4] B24D *3/00*
U.S. Cl. 51—293 37 Claims



1. A curette hone which comprises a block having an elongated flat surface forming elongated edges, said block comprising a uniform composition of fused aluminum oxide abrasive and magnesium oxide, the amount of aluminum oxide present in said composition being greater than about 83%, said aluminum oxide being in particle form, with the particles being irregular in shape and in a size range from about 0.5 microns to about 8.5 microns, at least one elongated edge of said block having a rounded surface with a radius of about 1/32 inch to about 3/32 inch, aluminum oxide particles being exposed on the flat surface and on the rounded edge of said block and said exposed particles having a flat polished surface intersecting irregular sides of said exposed particles to form a cutting edge on each such polished particle to provide the abrasive action of large abrasive particles and the fine honing qualities of small abrasive particles.

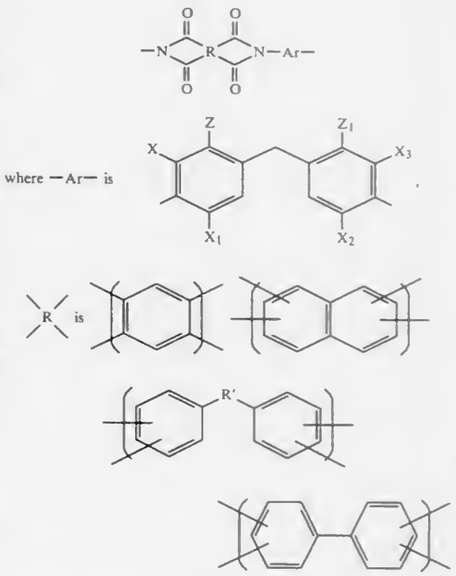
4,838,900

POLYIMIDE GAS SEPARATION MEMBRANES

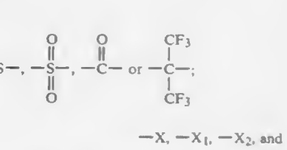
Richard A. Hayes, Hockessin, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

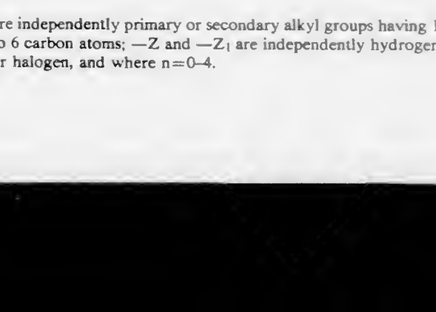
Filed Apr. 13, 1988, Ser. No. 175,503
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—16 14 Claims

1. A process of separating two or more gases comprising the steps of bringing two or more gases into contact with one side of a permselective membrane which is formed of an aromatic polyimide of the formula:

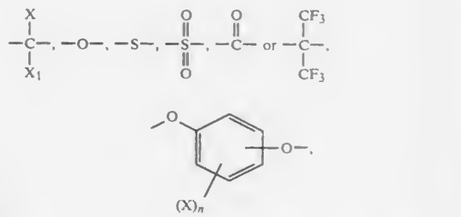


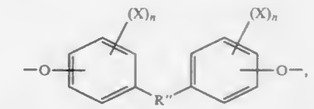
where —Ar— is





or mixtures thereof, —R'— is





linear alkylene groups of the formula $(CH_2)_{1\text{-}3}$ or mixtures thereof, where —R''— is

—X, —X_1, —X_2, and —X_3

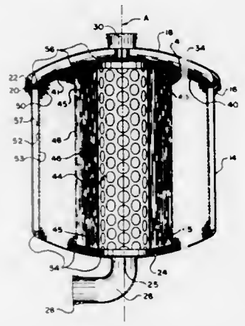
are independently primary or secondary alkyl groups having 1 to 6 carbon atoms; —Z and —Z_1 are independently hydrogen or halogen, and where n=0–4.

4,838,901

LIGHTWEIGHT FILTER

Robert N. Schmidt, Cleveland, and Hans K. Petruschke, Kirtland, both of Ohio, assignors to Life Systems, Inc., Cleveland, Ohio

Filed May 17, 1988, Ser. No. 194,835
Int. Cl.[4] B01D *53/14, 46/12*
U.S. Cl. 55—74 24 Claims



1. A lightweight snap together filter comprising:
(I) a housing comprising:
(A) a high strength plastic casing comprising a top section, a bottom section, and a central cavity, said bottom section is closed except for an inlet port and said top section is open, the top edge of said top section is dimensioned to receive sealing means and comprises means for snap locking a cover to the top section of said casing,
(B) sealing means for said casing, and
(C) a high strength plastic cover, said cover comprising an outlet port and means for snap locking said cover to said casing; and
(II) an inside-to-outside fluid filter assembly housed within said housing comprising:
(A) a plurality of concentrically disposed filter media, wherein said filter media is capable of removing solid particulate, and other components from said fluids and comprising at least one solid particulate filter and adsorbent means,
(B) sealing means for said fluid filter assembly, and
(C) a plate comprising means for directing the flow of filtered fluid out of said filter assembly located above said sealing means for said fluid filter assembly.

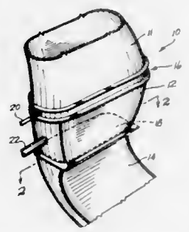
4,838,902

SYSTEM AND METHOD FOR SELF-CLEANING BARRIER-TYPE AIR FILTER

Christopher P. J. Lomax, Arlington, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Feb. 3, 1988, Ser. No. 152,036
Int. Cl.[4] B01D *46/04*
U.S. Cl. 55—96 5 Claims

1. In an aircraft having a cooling air delivery duct and a filter within said cooling duct, wherein normal airflow through the duct deposits airborne lint and the like on an upstream side of the filter, an apparatus for cleaning said filter comprising:
a discharge conduit interconnecting said cooling duct and the exterior of said aircraft, said conduit being connected to said duct at a position upstream of said filter and providing an airflow path from said duct to outside said aircraft;
flow limiting means operably positioned in said discharge conduit; and
valve means positioned in said discharge conduit and operable for opening and closing said airflow path provided by said conduit wherein a pressure differential between said cooling duct and outside of said aircraft is caused by aircraft movement, such differential causing reversal of



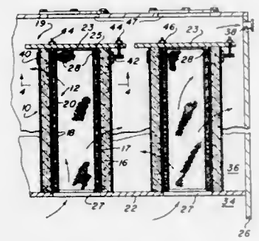
normal airflow through said filter in response to operation of said valve means to open said airflow path, thereby causing said deposited lint and the like to be removed from said filter and carried through said discharge conduit to said outside of said aircraft.

4,838,903

MULTI-PHASE THICK-BED FILTER

Lazarus Thomaides, North Wales, and Steven I. Taub, Narbeth, both of Pa., assignors to Ceco Filters, Inc., Conshohocken, Pa.

Filed May 20, 1987, Ser. No. 52,311
Int. Cl.[4] B01D *46/02*
U.S. Cl. 55—97 16 Claims



1. A fiber bed mist eliminator assembly for removal of aerosols, including liquid and solid particulate matter, from a moving gas stream, comprising: a main filter element secured in the assembly containing a first fiber bed for removing aerosols from the gas stream and a pre-filter element containing a second fiber bed adjacent said main filter element and located upstream thereof, said second filter bed adapted to remove solid particulate matter from said gas stream before the gas stream contacts the main filter element, and means for detachably retaining said pre-filter element in the assembly, said retaining means further adapted to permit easy removal of said pre-filter for cleaning or replacement without removing the main filter element.

4,838,904

SEMI-PERMEABLE MEMBRANES WITH AN INTERNAL DISCRIMINATING REGION

Edgar S. Sanders, Jr., Pittsburg; Daniel O. Clark, and John A. Jensvold, both of Benicia, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 7, 1987, Ser. No. 129,273
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—158 30 Claims

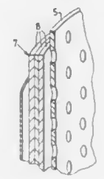
1. A semi-permeable membrane which comprises a polymeric matrix with two porous surfaces and a region which functions to separate one or more gases from one or more other gases; wherein the two porous surfaces and the region which functions to separate one or more gases from one or more other gases are comprised of the same polymeric material.

4,838,905

FILTER ELEMENT AND METHOD OF MAKING A FILTER ELEMENT

Colin T. Billiet, Durham; Robert M. Fielding, Blyth, and Stephen N. Smith, Sacriston, all of England, assignors to Domnick Hunter Filters Limited, County Durham, England

Filed Sep. 3, 1987, Ser. No. 92,673
Claims priority, application United Kingdom, Sep. 9, 1986, 8621660
Int. Cl.[4] B01D *46/02*
U.S. Cl. 55—486 11 Claims



1. A filter element comprising a relatively rigid, fluid-permeable cylinder, a body of non-woven fibrous filter material positioned around the outer surface of the cylinder, and a permeable jacket positioned around the outer surface of the filter material, the jacket being in the form of a tubular-woven fabric sleeve having weft yarns extending circumferentially of the jacket and warp yarns extending longitudinally of the jacket, the warp yarns and the weft yarns having different shrinkage characteristics, the jacket having been heat-shrunk on to the filter material, with the weft yarns having undergone greater shrinkage than the warp yarns during the heat-shrinking, and due to said shrinkage holding the filter material under substantially uniform radial compression over the whole of its area.

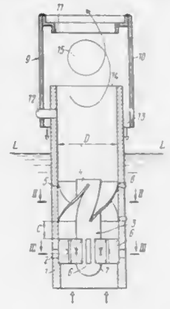
4,838,906

CONTACT-AND-SEPARATING ELEMENT

Viktor M. Kiselev, Kharkov, U.S.S.R., assignor to Ukrainsky-Nauchno-Issledovatelsky Institut Prirodnykh Gazov "Ukrniigaz", Kharkov, U.S.S.R.

PCT No. PCT/SU86/00085, § 371 Date May 11, 1988, § 102(e) Date May 11, 1988, PCT Pub. No. WO88/01894, PCT Pub. Date Mar. 24, 1988
PCT Filed Sep. 16, 1986, Ser. No. 235,684
Int. Cl.[4] B01F *3/04*
U.S. Cl. 55—238 6 Claims

1. A contact-and-separating element of a vortex tray of liquid-gas mass-transfer apparatus, comprising a nozzle (1) at whose inlet end there is provided at least one annular row of holes (2), an axial swirler (3) having at least two inclined vanes (5) and accommodated inside the nozzle (1), and a separator (9) situated at the outlet nozzle end, characterized in that a straight rib (6) arranged length-wise the nozzle (1) axis and facing the nozzle inlet end, is provided in front of each inclined vane (5) of the axial swirler (3), and at least one intermediate rib (7) is interposed between each pair of the straight ribs (6), while the



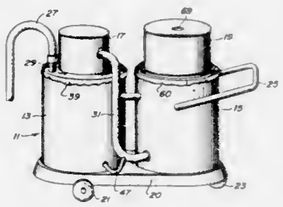
annular row of holes (2) is situated within the zone where the straight and intermediate ribs (6,7) are located.

4,838,907

HIGH EFFICIENCY INDUSTRIAL VACUUM CLEANER

Timothy J. Perry, Danville, Calif., assignor to Mello Manufacturing, Inc., Richmond, Calif.

Filed May 7, 1987, Ser. No. 47,894
Int. Cl.[4] B01D *46/00*
U.S. Cl. 55—381 3 Claims



1. A self cleaning high vacuum type suction cleaner comprising:
(a) a particulate receiver,
(b) a flexible polymer fabric filter having a relatively large mesh size disposed above and in effective contact on one side with the particulate receiver and on the other side with a vacuum enclosure connected to a rotatable suction means,
(c) an inlet into the particulate receiver for particulate laden air, said inlet opening into the receiver below the large mesh fabric filter in a downward direction away from said filter,
(d) said flexible fabric filter being formed from a substantially flat polymer thread material having a substantially smooth surface and having a filter open mesh ratio of from 8 to 19% and a total filter open area of 5 to 48 times the cross section of the most restricted portion of the inlet into the particulate receiver,
(e) the relatively large mesh fabric filter having a hollow open bottom closed top cylindrical form,
(f) the particulate receiver being arranged and constructed to receive a substantially impervious disposable bag in the lower portion thereof, and
(g) wherein the lower portion of the particulate receiver is connected to a vacuum source to maintain impervious bags in the bottom portion of said receiver away from the large mesh fabric cloth filter,
whereby the filter operates in accordance with Stokes law in

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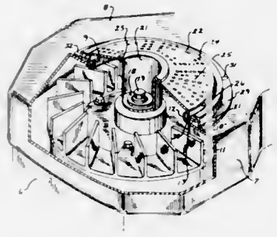
that an accumulation of particulates is deposited on the receiver side of the filter under the influence of gas passage through the filter until gravity overcomes mutual adhesion of the particulates and the force of the gas passage whereupon at least portions of the outer accumulation of particulates flakes off and falls into the particulate receiver.

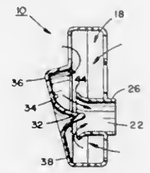
4,838,908
ENGINE AIR INTAKE SCREEN ASSEMBLY
Mark S. Bader, Sheboygan Falls, and Robert L. Miller, Sheboygan, both of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Jul. 27, 1988, Ser. No. 225,114
Int. Cl.[4] B01D *53/24*
U.S. Cl. 55—385.1 **5 Claims**



1. In an engine intake screen assembly of the type having:
(a) a shaft that rotates when the engine is running;
(b) a screen and a fan, both adapted to be operatively connected to and rotated by the shaft;
(c) a fan housing around the fan having a housing wall with an air intake port formed therein, the upstream side of said wall being formed with an upstream directed substantially continuous annular flange that surrounds the intake port; and
(d) the screen being positioned upstream of the intake port and flange; the improvement comprising:
the screen having a downstream directed substantially continuous peripheral skirt positioned radially outward of said annular flange so as to require foreign matter seeking to enter the air intake port by traveling outside the screen peripheral edge to follow a serpentine entry path in order to do so; and
the screen has a radially outwardly directed substantially continuous lip extension extending from the screen peripheral edge which forms part of the serpentine entry path.

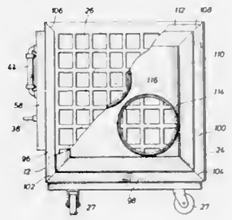
4,838,909
CARTRIDGE AIR FILTER AND METHOD OF MAKING THE SAME
Edward J. Bidanset, Charlotte, N.C., assignor to Textron, Inc., Providence, R.I.
Filed Sep. 6, 1988, Ser. No. 241,075
Int. Cl.[4] F02M *17/14*
U.S. Cl. 55—385.7 **18 Claims**

1. A shield for use in an air filter for an interval combustion engine, the shield comprising:
means for collecting spitback fuel having a surface means with a projecting portion and a non-projecting portion; and
means for substantially containing spitback fuel on said surface means for re-injection into the engine, said containing means comprising said surface means non-projecting portion having a relatively recessed portion for holding spiteback fuel therein and said projecting portion being at least partially insertable into a carburetor aperture of the air filter to form a venturi to accelerate air



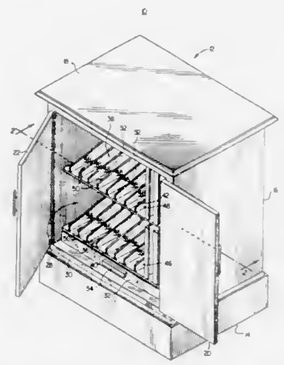
velocity and atomize spitback fuel on said surface means for reintroduction into the engine.

4,838,910
AIR DRIVEN FILTRATION SYSTEM
William R. Stollenwerk, and Paul A. Burns, both of Houston, Tex., assignors to Critical Systems, Inc., Houston, Tex.
Filed Sep. 18, 1987, Ser. No. 98,614
Int. Cl.[4] B01D *50/00*
U.S. Cl. 55—385.2 **12 Claims**



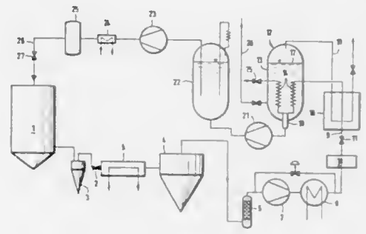
1. An air filtration apparatus for removing particulate contaminants from an enclosed work area, comprising:
(a) an air filtration housing defining a conduit for air flow through said filtration housing wherein said filtration housing includes a door hingedly mounted at the inlet end thereof, said door including a plurality of openings in a grid pattern for permitting air to flow through said filtration housing upon closing and latching said door to said housing, said door further including a channel formed on the exterior thereof, said channel extending along vertical sides and a bottom side of said door for receiving and retaining an intake adapter selectively mounted on said door;
(b) filter means mounted within said filtration housing at an inlet end thereof for filtering particulate contaminants from the air flow drawn through said filter means;
(c) air driven motor means mounted within said filtration housing at an outlet end thereof, said motor means including a fan driven by said motor means for drawing air from the work area and through said filtration housing;
(d) a plenum chamber located within said filtration housing separating said filter means and said motor means; and
(e) said filtration housing including an air inlet port for connection to an air supply source for operating said motor means.

4,838,911
VIDEO TAPE STORAGE CABINET
William M. Robertson, 209 Northwood, Lewisville, Tex. 75067; Edward J. Burke, 1700 Hearthstone, Plano, Tex. 75087, and Randy L. Clark, 1730 N. Jupiter Rd., #2119, Garland, Tex. 75042
Continuation of Ser. No. 77,392, Jul. 24, 1987, abandoned. This application Aug. 26, 1988, Ser. No. 237,695
Int. Cl.[4] F25B *21/02*
U.S. Cl. 62—3.3 **3 Claims**



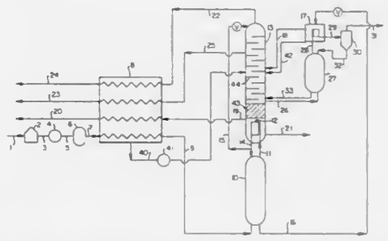
1. A storage cabinet for videotapes comprising:
a housing of ergonomic design having a base portion; an insulated cooling compartment including a removable drying agent drawer for a preselected amount of drying agent, and a shelf means; a heat removal compartment; a pair of doors; and a top surface; the base portion for supporting the insulated cooling compartment above the dirt and dust floor environment, the pair of doors hinged to side walls of the housing and corresponding one to the other to control access to the cooling compartment; and
a temperature controlled thermoelectric heat pump means for cooling the cooling compartment and having a heat sink mounted in the heat removal compartment, a block of conductive material connected to the cold sink, a thermoelectric element connected to the conductive block, and a heat sink connected to the thermoelectric element, the conductive block having a length sufficient for positioning the cold and heat sinks, respectively, within opposing sides of an insulated wall separating the cooling and heat sink compartments, said cold sink having a heat conductive member for connection to the cold side of the thermoelectric heat pump, and a plurality of spaced heat conductive arms normal to the heat conductive member for forming bottoms for the cooling compartment shelf means; said shelf means including vertical partitions coacting with the cold sink arms to form bins for receiving videotapes for storage, said portions of the cold sink arms forming the bottoms of the shelf bins being apertured for allowing air circulation throughout the cooler and drying agent compartments for cooling and drying the air, whereby the storage cabinet provides a dust free, smoke free, humidity and temperature controlled environment for the stored materials.

4,838,912
METHOD AND APPARATUS FOR THE PURIFICATION AND RECIRCULATION OF GASES
Heinrich Amlinger, Niddatal, Fed. Rep. of Germany, assignor to Leybold AG, Hanau, Fed. Rep. of Germany
Continuation of Ser. No. 92,460, Sep. 3, 1987, abandoned. This application Jul. 28, 1988, Ser. No. 226,528
Claims priority, application European Pat. Off., Sep. 5, 1986, 86112317.2
Int. Cl.[4] F25J *1/00*
U.S. Cl. 62—9 **13 Claims**



1. A method for purifying and recirculating operating gases in a plant for producing or compacting metal powder, the operating gases entering the plant at high pressure and exiting the plant at reduced pressure, the method comprising:
filtering the operating gas after it exits the plant to purify it;
compressing the gas after the gas is filtered;
liquifying the gas after compression by applying liquid nitrogen;
converting the liquid into a high pressure gas; and
reintroducing the filtered, high-pressure gas into the plant.

4,838,913
DOUBLE COLUMN AIR SEPARATION PROCESS WITH HYBRID UPPER COLUMN
Richard A. Victor, and Michael J. Lockett, both of Grand Island, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.
Filed Feb. 10, 1988, Ser. No. 154,301
Int. Cl.[4] F25J *3/04*
U.S. Cl. 62—22 **11 Claims**



1. Air separation process comprising compressing feed air, separating the feed air into nitrogen-rich and oxygen-rich components by countercurrent vapor-liquid contact in a double column air separation plant having lower pressure and higher pressure columns, removing nitrogen-rich component from the upper portion of the lower pressure column at a pressure not more than 3 psi greater than atmospheric, passing argon containing fluid from an intermediate point of the lower pressure column onto an argon column for separation into

argon-rich and oxygen-rich portions, and carrying out the countercurrent vapor-liquid contact in the lower pressure column on vapor-liquid contacting elements consisting essentially of packaging in the section of the lower pressure column below said intermediate point and on vapor-liquid contacting elements which comprise trays in the remainder of the lower pressure column.

4,838,914

PROCESS FOR PRODUCING SILICA GLASS FIBERS

Hironori Ohta, Yokohama; Toshiyasu Kawaguchi, Atsugi; Takashi Mukaiyama; Katsuhiko Matsuzaki, both of Yokohama; Junichi Ebisawa, Tokyo; Naoki Taneda, Yokohama; Daikichi Arai, Yokohama; Noriyuki Yoshihara, Yokohama; Yoshikazu Yamada, Yokohama, and Koushiro Kurii, Iwaki, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Dec. 15, 1987, Ser. No. 133,435

Claims priority, application Japan, Jul. 3, 1987, 62-165396; Oct. 16, 1987, 62-259630; Oct. 16, 1987, 62-259631; Dec. 8, 1987, 62-308585

Int. Cl.[4] C03B *37/06*

U.S. Cl. 65—2 **10 Claims**

1. A process for producing silica glass fibers, comprising:

(i) preparing a silica glass fiber spinning solution having a residual SiO_2 content of from 42—8% by weight when heated at 1,000° C., a water content of not greater than 2% by weight and a viscosity of from 50–100 poise at 25° C. by adding a polymerization regulator to a silica sol solution obtained by the hydrolysis and condensation of a silicon alkoxide in the presence of an acid catalyst;

(ii) spinning the spinning solution into gel fibers by extrusion of the solution through a plurality of nozzle holes;

(iii) applying an oiling agent substantially free of water or a lower alcohol to the gel fibers;

(iv) winding the oiled gel fibers on to a tube or bobbin thereby forming a fiber cake;

(v) aging the wound gel fibers at a temperature of 0°–60° C. in an atmosphere of a relative humidity of 10–90% for a time of about 1 hour to 10 days; and

(vi) sintering the gel fibers, unwound from the fiber cake after the aging step, in two steps, wherein, in the first step, the fibers are sintered at a temperature from 250° C. to less than 600° C. at a rate of temperature increase not exceeding 1,500° C./min while applying a tension to the fibers of from 100–10,000 g/mm^2 and, in the second step, the fibers are sintered at a temperature from 600° C.–1,100° C. while applying a tension to the fibers of from 1001–0,000 g/mm^2.

4,838,915

METHOD FOR HEATING THICK-WALLED GLASS TUBES AND APPARATUS THEREFORE

Yngve Hässler, Lidingö, Sweden, assignor to Stiftelsen Institutet for Mikrovagsteknik vid, Stockholm, Sweden

Continuation of Ser. No. 747,830, Jun. 24, 1985, abandoned. This application Nov. 16, 1987, Ser. No. 120,782

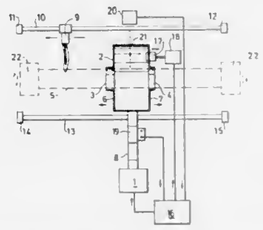
Claims priority, application Sweden, Jul. 3, 1984, 8403529; Jun. 3, 1985, 8502746

Int. Cl.[4] H05B *6/78*

U.S. Cl. 65—2 **24 Claims**

1. A method for heating a thick-walled glass tube, in the manufacture of optical fibres while using microwave energy, comprising the steps of: pre-heating the tube (5) to a temperature of about 1000° C.–1500° C., and subsequently collapsing the tube to a solid optical fibre preform by further heating the tube in a microwave cavity, having a longitudinal axis and confining wall surfaces with at least two opposite surfaces having means defining openings therein enabling passage of the tube into and through the cavity, by means of microwave energy generated by a microwave generator (1), the subsequent heating including introducing the tube (5) axially into and coaxially along the longitudinal axis of said microwave cavity (2,2') to extend through said openings (3,4; 3',4') the electrical field strength in said cavity being given a field image which includes solely field lines which are concentric with the longitudinal axis of the cavity according to TE(transverse electrical)-01n-mode, whereby the electrical field is formed as field lines concentric to the surfaces of the tube (5) in the cavity, and so formed that the electrical field strength is zero adjacent the surfaces of the cavity such that arcing will not occur; said further heating being continued until the tube is collapsed into an optical fibre preform which can be drawn into an optical fibre.

11. Apparatus for heating thick-walled glass tubes, in the manufacture of optical fibres, comprising: a microwave generator (1) and a microwave cavity having a longitudinal axis, said apparatus also including means, separate from said microwave cavity, for pre-heating a glass tube to a temperature of about 1000° C. to 1500° C., means for providing a glass tube, and



means for maintaining said tube, within said cavity; wherein said cavity (2;2') incorporates centrally located means having oppositely arranged openings (3,4; 3',4'), for throughpassage of a tube (5), in opposite wall surfaces of the cavity along said axis; and wherein the microwave generator (1) is coupled to the cavity (2) via a waveguide (8), in a manner such that the electrical field strength will solely include field lines that are concentric to said longitudinal axis of the cavity according to a TE-01n-mode, whereby the electrical field is formed as field lines concentric to the surfaces of an inserted tube (5) in the cavity, and so formed that the electrical field strength is zero adjacent the cavity surfaces; the apparatus being structured such that said microwave generator will operate at only one frequency and said frequency and the shape of said waveguide and said cavity will ensure that a TE-01n mode is provided such that a glass tube will be collapsed in the absence of arcing.

4,838,916

METHOD FOR MAKING SINGLE-POLORIZATION, SINGLE MODE OPTICAL FIBERS

Takao Edahiro; Tetsuo Miya; Yutaka Sasaki; Katusunari Okamoto, and Masao Kawachi, all of Mito, Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Continuation of Ser. No. 817,525, Mar. 31, 1986, abandoned, which is a division of Ser. No. 720,161, Apr. 5, 1985, abandoned, which is a continuation of Ser. No. 339,638, Jan. 15, 1982, abandoned. This application Oct. 29, 1987, Ser. No. 115,606

Claims priority, application Japan, Jan. 17, 1981, 56-4587

Int. Cl.[4] C03B *37/25*

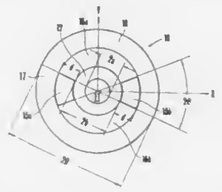
U.S. Cl. 65—3.11 **18 Claims**

1. A method of manufacturing a single-polarization single-mode optical fiber comprising the steps of:

preparing a core-cladding assembly including a core member made of silica glass having a first index of refraction, and a cladding member substantially uniformly surrounding said core member and made of silica glass having a second index of refraction smaller than said first index of refraction;

applying a jacket member about said cladding member to surround the same, said jacket member being made of silica glass;

disposing at least one stress applying member comprised of silica glass between an outer periphery of said cladding member and said jacket, wherein each of said stress applying members is disposed at discrete intervals about said outer periphery of said cladding member; and



drawing a resulting assembly to bond together said core, cladding, stress applying members and said jacket into an integral optical fiber;

wherein said stress applying members cause material stresses in said core so as to change the optical properties of said optical fiber.

4,838,917

PROCESS AND APPARATUS FOR THE PRODUCTION OF VERY FINE MINERAL FIBERS, IN PARTICULAR GLASS FIBERS

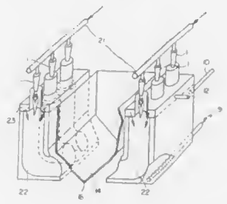
Wolfram Wagner; Roger Nyssen, both of Dormagen; Dirk Berkenhaus, Koeln, and Hans-Theo van Pey, Bedburg/Lipp., all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 1, 1988, Ser. No. 150,682

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1987, 3704692

Int. Cl.[4] C03B *37/06*

U.S. Cl. 65—5 **14 Claims**



1. In a process for the production of mineral wool fibres, having a diameter of from 0.1 μm to 5 μm, by the blast drawing process, comprising breaking up streams of melt issuing from the melt outlet apertures (18) at the bottom of a melt distributor (14), into fibres in a drawing nozzle (16) situated downstream of the distributor by means of a blast medium flowing substantially parallel to the streams of melt, the blast medium being sucked into the drawing nozzle (16) by a pressure gradient, and the flow velocity being reduced in a diffuser situated downstream, the improvement wherein

(a) an air stream, is directed into a combustion exhaust gas to form a homogeneous gas mixture having a temperature of 600° to 1500° C.,

(b) said gas mixture is supplied into the interspace (13) between the underside of the crucible and the top edge of the drawing nozzle from opposite broad-sides of the melt distributor,

(c) feeding at least 80% but not more than 99% of the gas mixture into the inlet of the drawing nozzle while the remaining portion flows aside from the inlet,

(d) and adjusting the flow velocity of the gas mixture in the interspace to a value below 100 m/s.

4,838,918

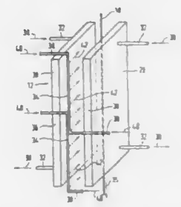
INERT ATMOSPHERE COOLER FOR OPTICAL FIBERS

A. Dahlgren Vaughan, Lenexa, Kans., and Dipak R. Biswas, Roanoke, Va., assignors to Alcatel NA, Claremont, N.C.

Filed Dec. 1, 1987, Ser. No. 127,167

Int. Cl.[4] C03B *37/027*

U.S. Cl. 65—12 **10 Claims**



1. An apparatus for manufacturing optical glass fibers, comprising:

means for providing a molten supply of optical glass;

means for drawing an optical fiber from said molten supply of optical glass and along a path;

means disposed along said path between said molten supply of optical glass and said drawing means for cooling said optical fiber produced by said means for drawing, said cooling means including means for supplying an inert gas and means for directing a laminar flow of inert gas across a length of said optical fiber to cool said optical fiber as said optical fiber travels along said path, wherein said means for directing a laminar flow of inert gas across said optical fiber includes a pair of spaced parallel plates with the path of said fiber therebetween; and

means disposed along said path between said cooling means and said drawings means for coating said fiber with an appropriate coating material.

4,838,919

PRETREATMENT OF FUSED CAST REFRACTORIES

Gerald E. Kunkle, New Kensington, and George A. Pecoraro, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 28, 1987, Ser. No. 138,748

Int. Cl.[4] C03B *19/02*

U.S. Cl. 65—18.1 **12 Claims**

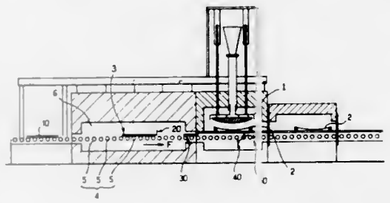
1. A method of treating a fused cast ceramic refractory having a crystalline phase in a substantially continuous glassy phase comprising: subjecting the refractory to pressure below atmospheric while at an elevated temperature sufficient to reduce the viscosity of the glassy phase to permit transport of gas through the glassy phase to extract gas from the glassy whereby subsequent exudation of the glassy phase from the cast refractory is reduced.

4,838,920

METHOD OF AND APPARATUS FOR POSITIONING OF SHEETS OF GLASS FOR CURVING SAME

Ignacio Blasquez-Gonzales, Tarragone, Spain; Rene Blanchard, Aniche, France; Bernard Letempe, Thourotte, France; Denis Mathivat, Thourotte, France, and Philippe Boutier, Thourotte, France, assignors to Saint-Gobain Vitrage, Paris, France

Filed Nov. 6, 1987, Ser. No. 117,514
Claims priority, application France, Nov. 6, 1986, 86 15488
Int. Cl.[4] C03B 35/15
U.S. Cl. 65—104 11 Claims



1. A method for positioning glass sheets passing flat on a conveyer from a point upstream of a reheating furnace means to means for curving said glass sheets all within a housing means, comprising a combination of at least two of the following steps:

orientation of the sheets of glass prior to their entry into said reheating furnace by retaining said sheets while the conveyer continues to operate using at least one retractable abutment at least until the sheets take support on two opposed lateral guide bars arranged substantially in the direction of the conveyer and on each side of the path of the sheets of glass,

orientation of the sheets of glass by abutment of the leading edge of said sheets against a retractable paddle or fingers, whose position can be adjusted and which is arranged across the conveyer, said paddle or said fingers holding the sheets of glass while the conveyer continues to advance them so as to force them to align their front edge in relation to said paddle or said fingers,

lateral thrust of the sheets of glass by pushing means acting substantially perpendicular to the direction of forward movement of the conveyer,

stopping of the sheets of glass with an adjustable delay by stopping the conveyer after the glass encounters a retractable finger on one roller of the conveyer in a known manner, and

precise stopping of the sheets of glass against abutments downstream of said pushing means, retractable finger and furnace means which are part of the curving means or the housing means.

precise stopping of the sheets of glass against abutments which are part of the curving equipment or the general housing.

6. A device for positioning sheets of glass passing flat on a conveyer comprising at least two of the following means:

orientation means arranged upstream of the glass reheating furnace for tempering comprising guide bars which are lateral in relation to the path of the conveyer and at least one stop abutment for the glass which is located in proximity to one of the guide bars,

orientation means comprising a retractable paddle or retractable fingers mounted on a bar arranged across the conveyer and which are capable of retaining the sheets of glass while the conveyer continues to operate, requiring said sheets of glass to align their front edge in accordance with the fingers or the paddle,

lateral pusher means acting on the sheets of glass in a direction substantially perpendicular to the direction of forward movement of the conveyer,

a detector finger carried by a stem or a free roller in rotation, which is parallel to the rollers of the conveyer and is retractable by rotation of the stem or the roller under the thrust of the glass, associated with a lever arm which is in contact with a microcontact when the detector finger is in the active position in projection above the plane of the conveyer, said micro-contact being coupled to the drive of the conveyer and interrupting same with an adjustable delay when the lever arm has left said drive following pivoting of the detector finger by the glass,

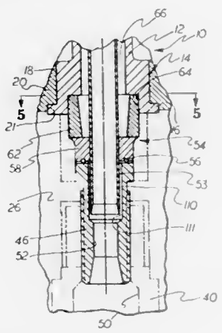
abutments perpendicular to the curving equipment and part of said equipment or the housing.

4,838,921

PLUNGER ASSEMBLY FOR A GLASSWARE FORMING MACHINE

Albert J. Trahan, Vernon, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Jun. 15, 1988, Ser. No. 207,344
Int. Cl.[4] C03B 11/12, 11/06
U.S. Cl. 65—229 3 Claims



1. A plunger assembly for a glassware forming machine comprising:

a hollow plunger having an elongated tapered top portion and a base portion,

a plunger holder having a top portion,

aperture means in said plunger holder top portion for securely engaging said plunger base portion with said plunger top portion extending beyond said plunger holder top portion,

cooling tube means including an elongated tube having a perforated top portion and an inlet portion,

means for securing said cooling tube means to said plunger including

annular recess means defined in said plunger base portion,

annular collar means secured around said tube,

a plurality of equally spaced wedges extending axially from said collar, said wedges adapted to be forcefully wedged into said annular recess of said plunger base portion until the tops thereof engage the top surface of said recess precisely centering and axially locating said perforated top portion within said tapered top plunger portion, and

the distance between the top of said wedges and said collar and between said wedges being selected to define uniformly sized and spaced discharge openings having a collective area through which cooling air discharged from the cooling tube perforations can exit said plunger top portion.

4,838,922

METHOD FOR PRODUCING MONOCALCIUM PHOSPHATE AND PRODUCTS PRODUCED THEREFROM

Billy J. Green, Mena, Ark., assignor to Green, Inc., De Queen, Ark.

Continuation-in-part of Ser. No. 70,302, Jul. 6, 1987, abandoned. This application Jan. 27, 1988, Ser. No. 148,941
Int. Cl.[4] C05B 11/10
U.S. Cl. 71—34 20 Claims

1. A method for producing monocalcium phosphate comprising the steps of:

mixing phosphoric acid with water; and

adding to a resultant phosphoric acid/water mixture brown mud.

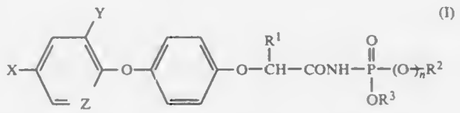
4,838,923

ORGANO-PHOSPHORUS COMPOUND AND HERBICIDE COMPRISING IT AS ACTIVE INGREDIENT

Shizuo Azuma; Toshiyuki Hiramatsu; Koji Nakagawa, all of Iwakuni, and Yataro Ichikawa, Tokorozawa, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Mar. 17, 1987, Ser. No. 26,987
Int. Cl.[4] C07F 9/40, 9/58; A01N 43/40, 57/06
U.S. Cl. 71—86 8 Claims

1. An organo-phosphorus compound represented by the following formula (I)



(I)

wherein X and Y are identical or different and each represents a hydrogen atom, a halogen atom, CF_3 or an alkyl group having not more than 5 carbon atoms; Z represents CH or N; R^1, R^2 and R^3 are identical or different and each represents a hydrogen atom or a lower alkyl group having 1 to 5 carbon atoms and n is zero or 1.

4. A method of eradicating weeds, which comprises applying the organo-phosphorus compounds of formula (I) according to claim 1 to a locus where narrow-leaved weeds are growing or are likely to grow in an amount effective for eradicating the weeds.

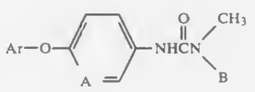
4,838,924

AROMATIC UREA DERIVATIVES AND THEIR USE AS HERBICIDE

Tetsuo Takematsu, Utsunomiya; Daisuke Fukuoka, Iwakuni; Katsuya Takahashi, Ohtake, and Isao Hashimoto, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP86/00398, § 371 Date Apr. 1, 1987, § 102(e) Date Apr. 1, 1987, PCT Pub. No. WO87/00840, PCT Pub. Date Feb. 12, 1987
PCT Filed Aug. 4, 1986, Ser. No. 39,457
Claims priority, application Japan, Aug. 5, 1985, 60-171025; Mar. 25, 1986, 61-64757
Int. Cl.[4] C07D 307/79; A01N 43/12
U.S. Cl. 71—88 24 Claims

1. A urea derivative represented by the following formula [I]



[I]

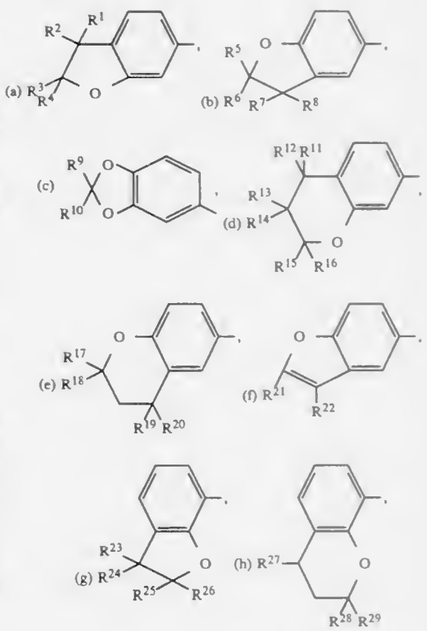
wherein

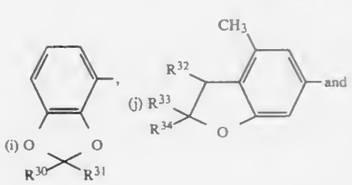
A represents the bond

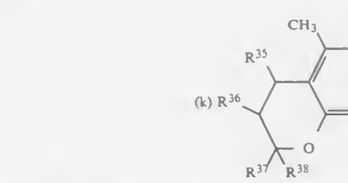
in which X is a hydrogen atom, a chlorine atom, a nitro group or a trifluoromethyl group;

B represents a hydrogen atom, a methyl group or a methoxy group; and

Ar represents one member selected from the group consisting of







in which R^1 to R^{38}, independently from each other, represent a hydrogen atom, a lower alkyl group or a lower alkoxy group; R^{16} may further represent a hydroxyl group; a pair of R^2 and R^3, and a pair of R^6 and R^7 each, taken together, may represent an alkylene linkage and

may form a 5- or 6-membered ring together with the two adjacent carbon atoms to which they are bonded; a pair of R^9 and R^{10}, taken together, may represent an alkylene linkage and may form a 5- or 6-membered ring together with the carbon atom to which they are bonded; R^{11} and R^{12}, taken together, may form an ethylenedioxy linkage —O—$(CH_2)_2$—O—, or R^{11} and R^{15}, taken together, may form an alkylene linkage and form a 5- or 6-membered ring together with the carbon atoms to which they are bonded, or R^{15} and R^{16}, taken together, may represent an alkylene linkage and form a 5- or 6-membered ring together with one carbon atom to which they are bonded, or R^{14} and R^{15}, taken together, may form a dichloromethylene linkage.

4,838,925

HETEROCYCLIC ACYL SULFONAMIDES

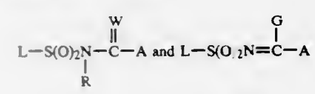
Chi-Ping Tseng, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 22,949, Mar. 17, 1987, abandoned, which is a continuation-in-part of Ser. No. 892,062, Aug. 1, 1986, abandoned, which is a continuation-in-part of Ser. No. 856,511, Apr. 25, 1986, abandoned. This application Sep. 25, 1987, Ser. No. 101,314

Int. Cl.[4] C07D *401/12, 401/14, 417/12, 487/04;* A01N *43/90, 43/54, 43/86, 43/88*

U.S. Cl. 71—90 **44 Claims**

1. A compound selected from



la lb

wherein

R is H; C_1–C_3 alkyl optionally substituted with halogen; C_1–C_3 thioalkyl optionally substituted with halogen; benzyl optionally substituted with F, Cl, OCH_3, SCH_3 or NO_2; allyl; propargyl; —C(O)(C_1–C_3 alkyl); CO_2CH_3; or $CO_2CH_2CH_3$;

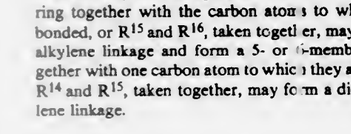
G is Cl, OR' or SR';

R' is C_1–C_3 alkyl optionally substituted with halogen;

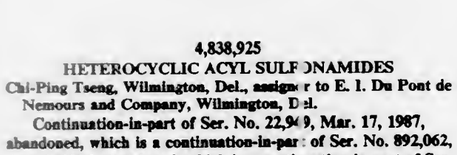
W is O, S, NR" or NOR";

R" is H or C_1–C_3 alkyl optionally substituted with halogen;

L is



L-1 L-2



L-3 L-4 L-5

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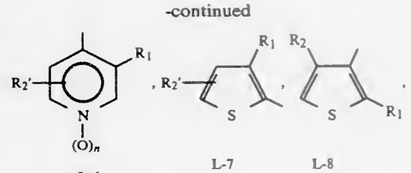
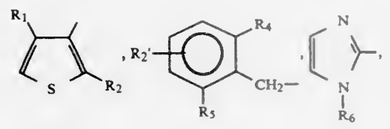
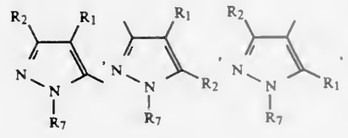


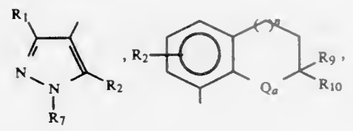
L-6 L-7 L-8



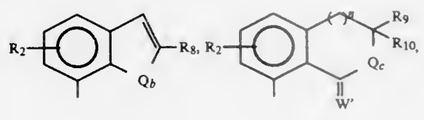
L-9 L-10 L-11



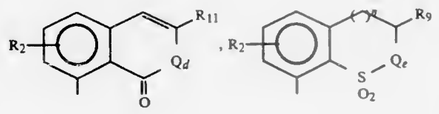
L-12 L-13 L-14



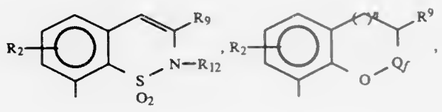
L-15 L-16



L-17 L-18



L-19 L-20



L-21 L-22

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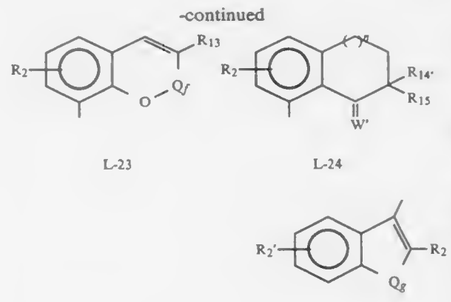


L-23 L-24 L-25

R_1 is H; halogen; NO_2; CH; C_1–C_4 alkyl optionally substituted with F, Cl, Br, CN, OCH_3 or SCH_3; C_2–C_4 alkenyl optionally substituted with F, Cl, Br, OCH_3 or SMe; C_3–C_4 alkynyl; C_3–C_5 cycloalkyl optionally substituted with F, Cl or CH_3; $C(O)R_{16}$; $C(OCH_2CH_2O)R_{16}$; $C(R_{16})(OR_{17})(OR_{18})$; CO_2R_{19}; $C(O)NR_{20}R_{21}$; N_3; $S(O)_2NR_{22}R_{23}$; $S(O)_2OR_{24}$; $OS(O)_2R_{25}$; phenyl optionally substituted by F, Cl, Br, CH_3 or OCH_3; ER_{26}; $(CH_2)_nQ$ or $(CH_2)_nQ_1$;

R_2 is H, halogen, CN, NO_2, C_1–C_3 alkyl optionally substituted with halogen, CO_2R_{19}, $S(O)_2NR_{27}R_{28}$; $NR_{29}R_{30}$; ER_{31}; or C_1–C_2 alkyl substituted with C_1–C_2 alkoxy, C_1–C_2 haloalkoxy, C_1–C_2 alkylthio, C_1–C_2 haloalkylthio, CN, OH or SH;

R_2' is independently H, F, Cl, Br, CH_3, OCH_3, or SCH_3;

R_3 is H, CH_3, OCH_3, OCF_2H, F, Cl, Br, CO_2R_{19}, $S(O)_2N(CH_3)_2$, $OS(O)_2CH_3$ or $S(O)_pCH_3$;

R_4 is Cl, NO_2, CO_2CH_3, $CO_2CH_2CH_3$, $C(O)N(CH_3)_2$, $OS(O)_2CH_3$, $S(O)_2CH_3$, $S(O)_2CH_2CH_3$, OCH_3 or OCH_2CH_3;

R_5 is H, C_1–C_3 alkyl, F, Cl, Br, NO_2, $S(O)_2NR_{32}R_{33}$, $S(O)_2N(OCH_3)CH_3$ or $S(O)_pR_{34}$;

R_6 is C_1–C_3 alkyl or phenyl;

R_7 is H, C_1–C_3 alkyl optionally substituted with halogen, C_3–C_4 alkenyl, or phenyl;

R_8 is H or CH_3;

R_9 is H, CH_3 or CH_2CH_3;

R_{10} is H, CH_3 or CH_2CH_3;

R_{11} is H, Cl or C_1–C_3 alkyl;

R_{12} is H, C_1–C_4 alkyl optionally substituted with F, Cl, Br or OCH_3; C_3–C_5 cycloalkyl optionally substituted with F, Cl or OCH_3; C_3–C_4 alkenyl; or C_3–C_4 alkynyl;

R_{13} is H or C_1–C_3 alkyl;

R_{14} is H, F, Cl, Br, CH_3 or CH_2CH_3;

R_{15} is H, F, Cl, Br, CH_3 or CH_2CH_3;

R_{16} is C_1–C_4 alkyl optionally substituted with F, Cl, Br or OCH_3; C_3–C_5 cycloalkyl optionally substituted with F or Cl; or C_3–C_4 alkenyl;

R_{17} and R_{18} are independently C_1–C_3 alkyl;

R_{19} is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl; C_2–C_4 haloalkyl, C_2–C_3 cyanoalkyl, C_3–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl or C_2–C_4 alkoxyalkyl;

R_{20} is H, CH_3 or CH_2CH_3;

R_{21} is CH_3, CH_2CH_3, $CH_2CH_2CH_3$, OCH_3 or OCH_2CH_3; or R_{20} and R_{21} may be taken together to form —$(CH_2)_2(CH_2)_n(CH_2)_2$— and —$CH_2CH_2OCH_2CH_2$—;

R_{22} is C_1–C_4 alkyl, C_2–C_3 cyanoalkyl, OCH_3, OCH_2CH_3, $N(CH_3)_2$, C_3–C_4 alkenyl, C_3–C_4 alkynyl, cyclopropylmethyl or C_3–C_4 cycloalkyl;

R_{23} is H, C_1–C_4 alkyl or C_3–C_4 alkenyl; or

R_{22} and R_{23} may be taken together as —$(CH_2)_3$—, —$(CH_2)_4$— or —$CH_2CH_2OCH_2CH_2$—;

R_{24} is C_1–C_3 alkyl or C_1–C_3 haloalkyl;

R_{25} is C_1–C_3 alkyl or $N(CH_3)_2$;

R_{26} is C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_2–C_4 alkoxyalkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, phenyl optionally substituted by F, Cl, Br, CH_3 or OCH_3, or C_2–C_4 haloalkenyl;

R_{27} is C_1–C_3 alkyl;

R_{28} is H, C_1–C_4 alkyl or methoxy;

R_{27} and R_{28} may be taken together to form —$(CH_2)_4$—, —$(CH_2)_5$— or —$CH_2CH_2OCH_2CH_2$—;

R_{29} and R_{30} are independently H, CH_3 or CH_2CH_3;

R_{31} is C_1–C_4 alkyl optionally substituted with F, Cl or OCH_3;

R_{32} is CH_3 or CH_2CH_3;

R_{33} is H, CH_3 or CH_2CH_3;

R_{34} is C_1–C_3 alkyl, C_3–C_4 alkenyl or C_3–C_4 alkynyl;

Q_a is O, S, S(O), $S(O)_2$ or NCH_3;

Q_b is O, S, or $S(O)_2$;

Q_c is O, S, NH, $N(C_1$–C_3 alkyl), $NCH_2CH{=}CH_2$ or $NCH_2C{\equiv}CH$;

Q_d is O, NH, $N(C_1$–C_3 alkyl), $NCH_2CH{=}CH_2$ or $NCH_2C{\equiv}CH$;

Q_e is O or NR_{12};

Q_f is C(O) or $S(O)_2$;

Q_g is O, S, NH or $N(C_1$–C_3 alkyl);

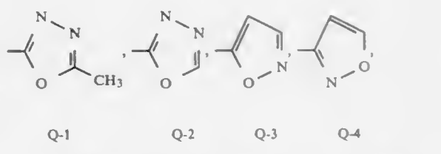
n is 0 or 1;

p is 0, 1 or 2;

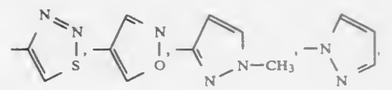
W' is O or S;

E is O, S, S(O) or $S(O)_2$;

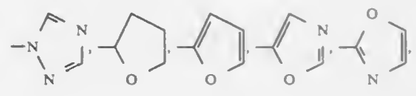
Q is



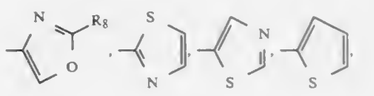
Q-1 Q-2 Q-3 Q-4



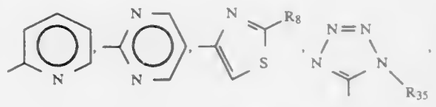
Q-5 Q-6 Q-7 Q-8



Q-9 Q-10 Q-11 Q-12 Q-13



Q-14 Q-15 Q-16 Q-17



Q-18 Q-19 Q-20 Q-21

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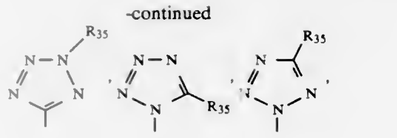
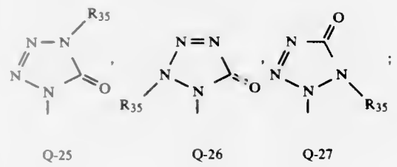
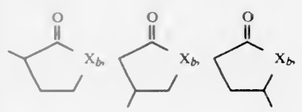


Q-22 Q-23 Q-24

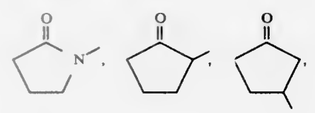


Q-25 Q-26 Q-27

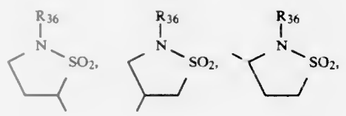
Q_1 is



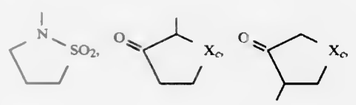
Q_1-1 Q_1-2 Q_1-3



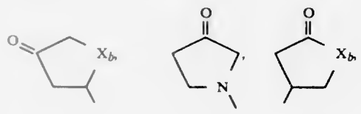
Q_1-4 Q_1-5 Q_1-6



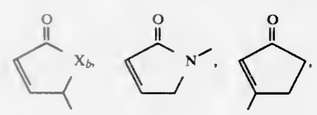
Q_1-7 Q_1-8 Q_1-9



Q_1-10 Q_1-11 Q_1-12



Q_1-13 Q_1-14 Q_1-15



Q_1-16 Q_1-17 Q_1-18

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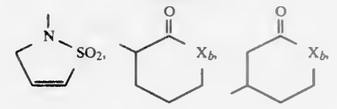
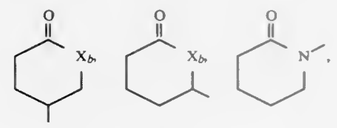
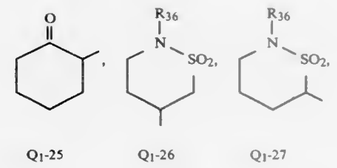


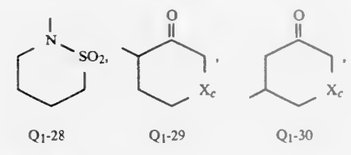
Q_1-19 Q_1-20 Q_1-21



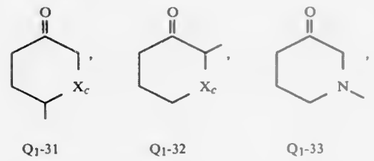
Q_1-22 Q_1-23 Q_1-24



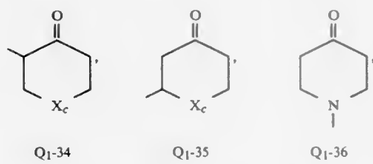
Q_1-25 Q_1-26 Q_1-27



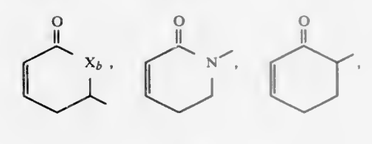
Q_1-28 Q_1-29 Q_1-30



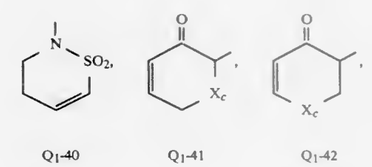
Q_1-31 Q_1-32 Q_1-33



Q_1-34 Q_1-35 Q_1-36



Q_1-37 Q_1-38 Q_1-39



Q_1-40 Q_1-41 Q_1-42

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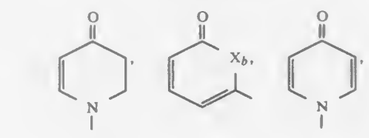
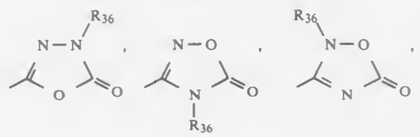
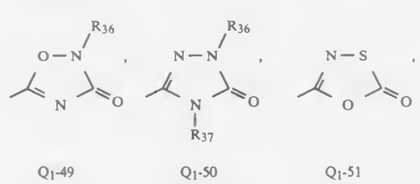


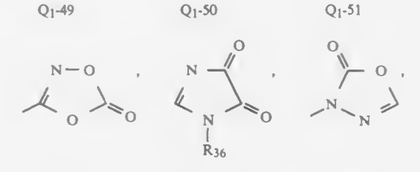
Q_1-43 Q_1-44 Q_1-45



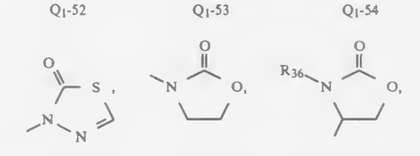
Q_1-46 Q_1-47 Q_1-48



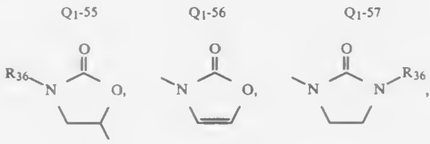
Q_1-49 Q_1-50 Q_1-51



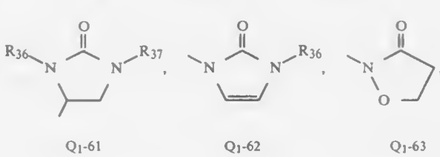
Q_1-52 Q_1-53 Q_1-54



Q_1-55 Q_1-56 Q_1-57



Q_1-58 Q_1-59 Q_1-60



Q_1-61 Q_1-62 Q_1-63

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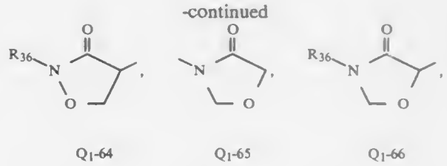
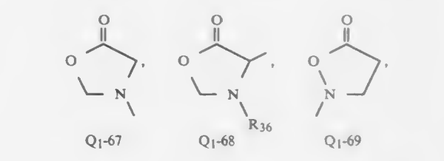
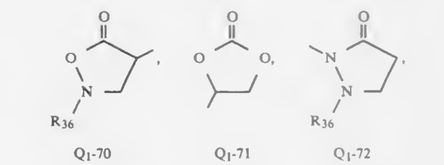


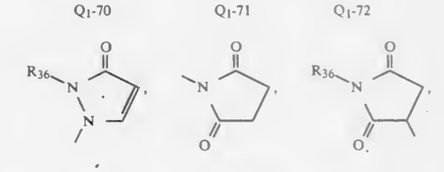
Q_1-64 Q_1-65 Q_1-66



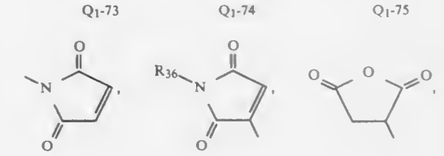
Q_1-67 Q_1-68 Q_1-69



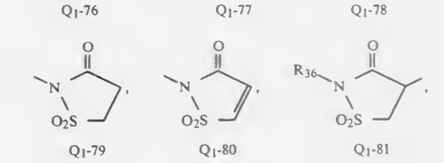
Q_1-70 Q_1-71 Q_1-72



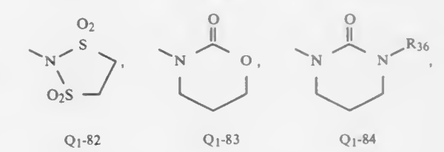
Q_1-73 Q_1-74 Q_1-75



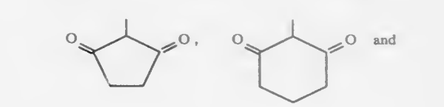
Q_1-76 Q_1-77 Q_1-78



Q_1-79 Q_1-80 Q_1-81



Q_1-82 Q_1-83 Q_1-84



$Q_1$85 and $Q_1$86

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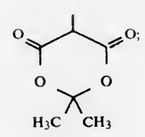


Q_1-87

wherein

Q_1-1 through Q_1-87 may be optionally substituted with 1 or 2 groups selected from C_1–C_2 alkyl or C_1–C_2 haloalkyl;

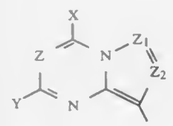
R_{35} is H, C_1–C_3 alkyl or allyl;

R_{36} and R_{37} are independently H or C_1–C_3 alkyl;

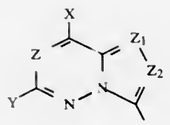
X_b is O or NR_{36}; and

X_c is O, S, S(O), $S(O)_2$ or NR_{36};

A is



A-1



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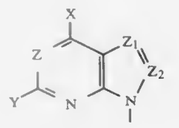

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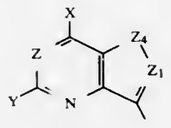

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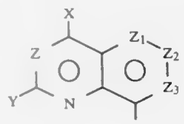

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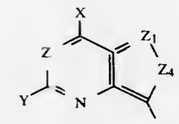

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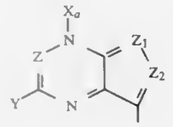

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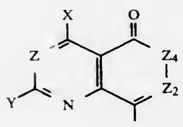

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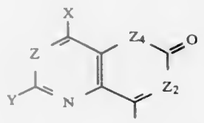

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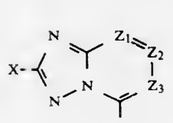

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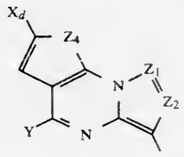

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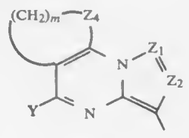

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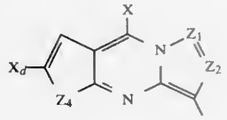

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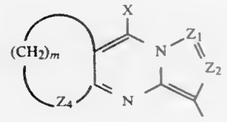

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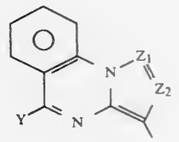

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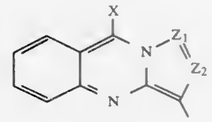

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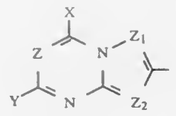
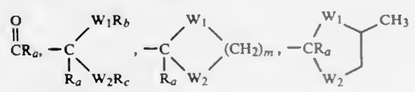


A-19

X or Y is H, halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkylsulfinylalkyl, C_1–C_4 haloalkyl, C_2–C_5 alkylsulfonylalkyl, C_3–C_5 cycloalkyl, C_2–C_4 alkynyl, C_2–C_5 alkylthioalkyl,



or $N(OCH_3)CH_3$;

W_1 and W_2 are independently O or S;

m and m' are independently 2 or 3;

R_a is H or CH_3;

R_b and R_c are independently C_1–C_2 alkyl;

Z is CH, N, CCH_3, CCH_2CH_3, CCl or CBr;

Z_1 is C—U, N or N—O;

Z_2 and Z_3 are independently N or C—U;

Z_4 is NCH_3, O, S or CH_2;

U is H, F, Cl, Br, C_1–C_2 alkyl optionally substituted by F, Cl, Br or OCH_3, CN, NO_2, NMe_2, OR''', SR''' or CO_2CH_3;

R''' is C_1–C_2 alkyl optionally substituted with F, Cl, Br or OCH_3;

X_a is CH_3, CH_2CH_3 or CH_2CF_3; and

X_d is H or CH_3;

and their agriculturally suitable salts; provided that

(1) the total number of carbon atoms of R_{22} and R_{23} is less than or equal to five;

(2) when X or Y is Cl, F, Br or I, then Z is CH and the remaining X or Y is OCH_3, OCH_2CH_3, $N(OCH_3)CH_3$, $NHCH_3$, $N(CH_3)_2$ or OCF_2H;

(3) when X or Y is C_1 haloalkoxy, then Z is CH;

(4) at least one of X or Y is X' where X' is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino or di(C_1–C_3 alkyl)amino;

(5) the total number of carbon atoms of R_{27} and R_{28} is less than or equal to five;

(6) when A is A-1, A-2, A-7 or A-19 then Z is a carbon value, and when A is A-3, A-4, A-5, A-6, A-8 and A-9 then Z is N; and

(7) when A is A-11 then one of Z_1, Z_2 or Z_3 is N.

37. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

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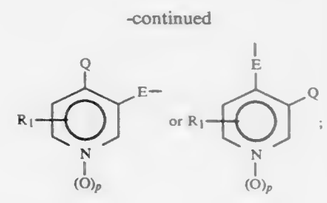


J-3 J-4

R is H or CH_3;

E is a single bond or CH_2;

W is O, S or NR_x;

p is 0 or 1;

R_x is H, OH, C_1–C_3 alkyl, C_1–C_3 haloalkyl, C_1–C_3 alkoxy, C_1–C_3 haloalkoxy, allyloxy, propargyloxy or NR_yR_z;

R_y is H or C_1–C_3 alkyl;

R_z is C_1–C_3 alkyl;

R_1 is H, C_1–C_3 alkyl, C_1–C_3 haloalkyl, halogen, nitro, C_1–C_3 alkoxy, $SO_2NR_aR_b$, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, CN, CO_2R_c, C_1–C_3 haloalkoxy, C_1–C_3 haloalkylthio, amino, C_1–C_2 alkylamino, di(C_1–C_3 alkyl)amino, L or $C(O)NR_dR_e$;

R_a is H, C_1–C_4 alkyl, C_2–C_3 cyanoalkyl, methoxy or ethoxy;

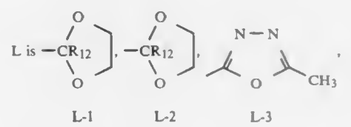
R_b is H, C_1–C_4 alkyl or C_3–C_4 alkenyl; or

R_a and R_b may be taken together as —$(CH_2)_3$—, —$(CH_2)_4$—, —$(CH_2)_5$— or —$CH_2CH_2OCH_2CH_2$—;

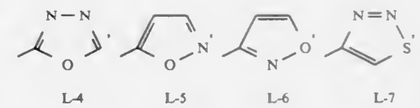
R_c is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_2–C_4 haloalkyl, C_1–C_2 cyanoalkyl, C_5–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl or C_2–C_4 alkoxyalkyl;

R_d is H or C_1–C_3 alkyl;

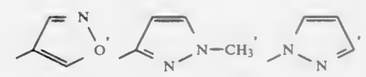
R_e is C_1–C_3 alkyl;



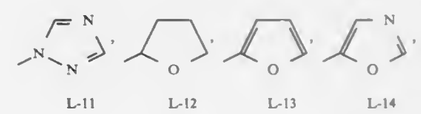
L-1 L-2 L-3



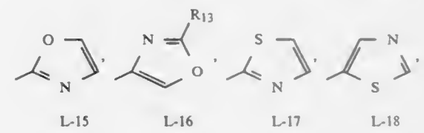
L-4 L-5 L-6 L-7



L-8 L-9 L 10



L-11 L-12 L-13 L-14



L-15 L-16 L-17 L-18

4,838,926

HERBICIDAL PYRIDINE SULFONAMIDES

Mary A. Hanagan, Newark, and Barry A. Wexler, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

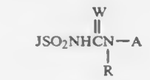
Continuation-in-part of Ser. No. 943,137, Dec. 18, 1986, abandoned. This application Sep. 14, 1987, Ser. No. 94,701

The portion of the term of this patent subsequent to Dec. 6, 2005, has been disclaimed.

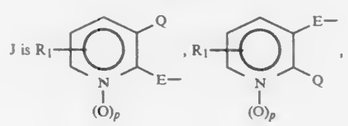
Int. Cl.[4] A01N *43/54*; C07D *401/12, 401/14*

U.S. Cl. 71—92 42 Claims

1. A compound having the formula



wherein



J-1 J-2

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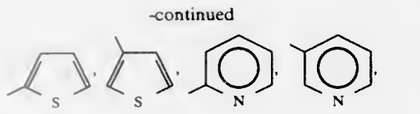
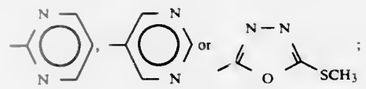
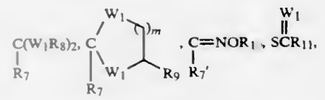


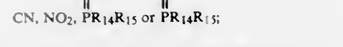
L-19 L-20 L-21 L-22



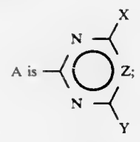
L-23 L-24 L-25

Q is C_1–C_4 alkyl substituted with R_2;
R_2 is OR_3, $S(O)_nR_4$, CO_2R_4, $CONR_5R_6$,



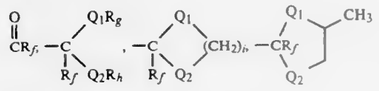


R_3 is H, C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_1–C_4 haloalkyl, C_3–C_4 haloalkenyl, C_3–C_4 haloalkynyl, C_2–C_4 alkylcarbonyl, C_2–C_4 haloalkylcarbonyl, C_1–C_4 alkylsulfonyl, C_2–C_4 alkoxyalkyl, C_2–C_4 alkylthioalkyl or C_2–C_4 cyanoalkyl;
R_4 is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_1–C_4 haloalkyl, C_3–C_4 haloalkenyl, C_3–C_4 haloalkynyl, C_2–C_4 alkoxyalkyl, C_2–C_4 alkylthioalkyl or C_2–C_4 cyanoalkyl;
R_4' is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_2–C_4 haloalkyl, C_3–C_4 haloalkenyl, C_3–C_4 haloalkynyl, C_2–C_4 alkoxyalkyl, C_2–C_4 alkylthioalkyl or C_2–C_4 cyanoalkyl;
R_5 is H or C_1–C_3 alkyl;
R_6 is C_1–C_4 alkyl, C_1–C_4 haloalkyl, cyclopropyl, allyl or propargyl;
R_5 and R_6 may be taken together to form $—CH_2—_3$, $—CH_2—_4$, $—CH_2—_5$ or $—CH_2CH_2OCH_2CH_2—$;
R_7 is H, C_1–C_4 alkyl or C_1–C_4 haloalkyl;
R_7' is H, C_1–C_4 alkyl, C_1–C_4 haloalkyl, Cl or CN;
R_8 is C_1–C_2 alkyl;
R_9 is H or CH_3;
R_{10} is H, C_1–C_4 alkyl, C_3–C_4 alkenyl or C_3–C_4 alkynyl;
R_{11} is C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylamino or di(C_1–C_4 alkyl)amino;
W_1 is O or S;
n is 0, 1 or 2;
m is 1 or 2;
R_{12} is H or CH_3;
R_{13} is H or CH_3;
R_{14} and R_{15} are independently C_1–C_2 alkyl, C_1–C_2 alkoxy, C_1–C_2 alkylthio, $NHCH_3$ or $N(CH_3)_2$;



A-1

X is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, halogen, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino or di(C_1–C_3 alkyl)amino;
Y is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkylthioalkyl, C_2–C_5 alkylsulfinylalkyl, C_2–C_5 alkylsulfonylalkyl, C_1–C_4 haloalkyl, C_2–C_4 alkynyl, C_3–C_5 cycloalkyl, azido, cyano,



or $N(OCH_3)CH_3$;
i is 2 or 3;
Q_1 and Q_2 are independently O or S;
R_f is H or C_1–C_3 alkyl;
R_g and R_h are independently C_1–C_3 alkyl; and
Z is CH, CCH_3, CC_2H_5, CCl or CBr;
and their agriculturally suitable salts; provided that
(1) when X is halogen, then Z is CH and Y is OCH_3, OC_2H_5, NH_2, $NHCH_3$, $N(CH_3)_2$, OCF_2H, OCF_2Br or $N(OCH_3)CH_3$;
(2) when X or Y is C_1 haloalkoxy, then Z is CH;
(3) when W is S, then R is H, E is a single bond, Z is CH, and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH=CH_2$, $OCH_2C\equiv CH$, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$ or

(4) when the total number of carbon atoms of X and Y is greater than four, then the combined number of carbons of R_1 and Q is less than or equal to six; when Y is CN then Q is other than CH_2OCH_3 or $CH_2OCH_2CH_3$;
(6) when Y is C_2–C_4 alkynyl then Q is other than CH_2OCH_3 or $CH_2OCH_2CH_3$; and
(7) when J is J-1, R_1 is H, Q is CH_2OR_3 and both of X and Y are selected from CH_3, OCH_3, OCH_2CH_3 or halogen, then R_3 is other than C_1–C_4 alkyl or C_1–C_4 haloalkyl.

15. A composition suitable for controlling the growth of undesired vegetation which comprises a herbicidally effective amount of a compound of claim 1 and a diluent, surfactant, or mixtures thereof.

4,838,927

DIVALENT METAL SALTS IMPROVE COMPOSITIONS OF ASYMMETRICAL TRIAZINE MIXTURES

William T. Hall, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 5, 1986, Ser. No. 938,613
Int. Cl.[4] A01 *25/22*
U.S. Cl. 71—93 **7 Claims**

1. A herbicidal mixture consisting essentially of a first herbicide selected from the group consisting of 4-amino-6-(1,1-dimethylethyl)-3-ethylthio-1,2,4-triazin-5(4H)-one or 4-amino-6-(1,1-dimethyl)-3-methylthio-1,2,4-triazin-5(4H)-one, a monovalent cation, a second herbicide, α,α,α-trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine, in a liquid medium and sufficient amounts of an agriculturally suitable divalent cation, present in such proportions as to retard the formation of crystals of the first herbicide and wherein the mole ratio of the monovalent cation to the divalent cation is less than 2.5.

4,838,928

HERBICIDE

Zeev Arenstein, Petah Tiqua, and Abraham Gotlieb, Kiryat Bialik, both of Israel, assignors to Agan Chemical Manufacturers Ltd., Ashdod, Israel

Continuation of Ser. No. 841,823, Mar. 20, 1986, abandoned. This application Nov. 16, 1987, Ser. No. 120,764
Claims priority, application Israel, Mar. 20, 1985, 74654
Int. Cl.[4] A01N *43/70*
U.S. Cl. 71—93 **11 Claims**

1. A postemergent herbicidal composition for use against broadleaved weeds comprising in combination terbutryne and ametryne in a weight ratio of from 1:1.3 to 1:3.

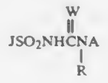
4,838,929

HERBICIDAL SULFONAMIDES

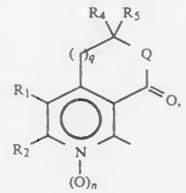
Mary A. Hanagan, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 853,094, Apr. 22, 1986, Pat. No. 4,723,987, which is a continuation-in-part of Ser. No. 732,091, May 9, 1985, abandoned. This application Sep. 14, 1987, Ser. No. 95,813
Int. Cl.[4] A01N *43/90, 43/66, 43/70, 43/68*
U.S. Cl. 71—93 **51 Claims**

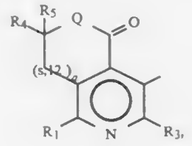
1. A compound of the formula:



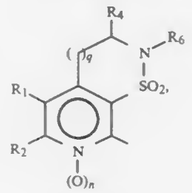
wherein J is:



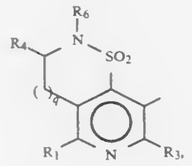
J1



J2



J3



J4

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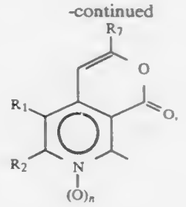
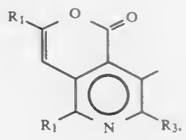
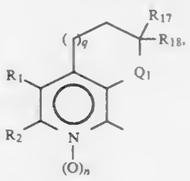


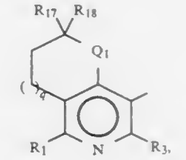
J5



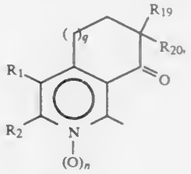
J6



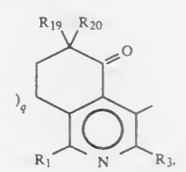
J7



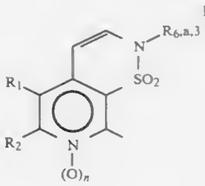
J8



J9



J10



J11

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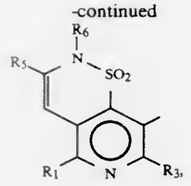
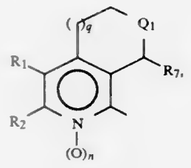
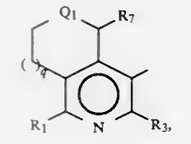
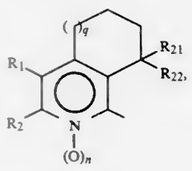
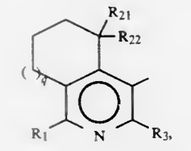
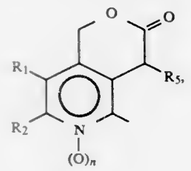
J_{12} 

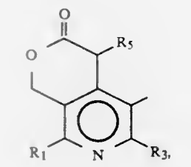
J_{13} 

J_{14} 

J_{15} 

J_{16} 

J_{17} 

J_{18} 

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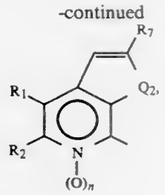
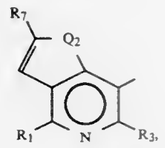
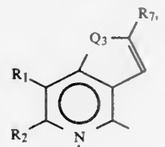
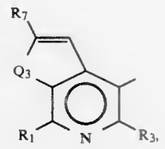
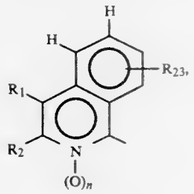
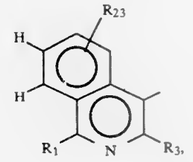
J_{19} 

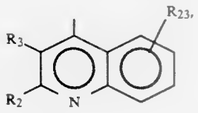
J_{20} 

J_{21} 

J_{22} 

J_{23} 

J_{24} 

J_{25} 

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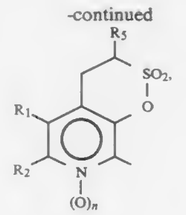
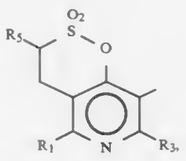
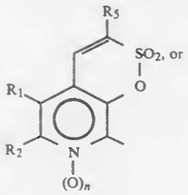
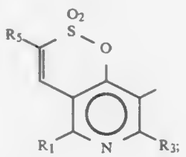








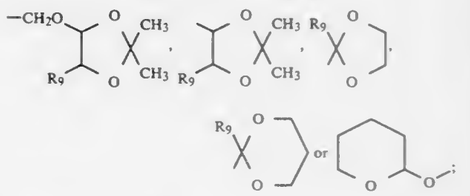
q is 0 or 1;
Q is O, S, or NR_4;
Q_1 is O, S, SO, SO_2, NH or NCH_3;
Q_2 is O, S, NH, NCH_3, CH_2 or $CHCH_3$;
Q_3 is O, S, NH, NCH_3 or CH_2;
R_4 is H or C_1–C_4 alkyl;
R_5 is H or CH_3;
R_7 is H or C_1–C_3 alkyl;
R_{17} is H or C_1–C_4 alkyl;
R_{18} is H or CH_3;
R_{19} is H, F, Cl or C_1–C_4 alkyl;
R_{20} is H, F, Cl or CH_3;
R_{21} is H, C_1–C_3 alkyl, C_1–C_3 alkoxy, F or Cl;
R_{22} is H, CH_3, C_1–C_3 alkoxy, F, Cl or OH; or
R_{21} and R_{22} can be taken together to form —OCH_2CH_2O— or —$OCH_2CH_2CH_2O$—;
R_{23} is H, C_1–C_3 alkyl, C_1–C_3 alkoxy, Cl, Br or F;
W is O or S;
R is H or CH_3;
n is 0 or 1;
R_1 is H, CH_3, OCH_3 or Cl;
R_2 is H, C_1–C_3 alkyl, Cl, Br, F, C_1–C_3 alkoxy, C_1–C_3 alkylthio, CF_3, CH_2OCH_3, CH_2SCH_3 or CH_2CN;
R_3 is H, C_1–C_3 alkyl, halogen, C_1–C_3 alkoxy, C_1–C_3 alkylthio, C_1–C_2 alkylsulfonyl, C_1–C_2 alkylcarbonyl, C_1–C_2 alkoxycarbonyl, C_3–C_4 alkenyl, NO_2, NH_2, C_1–C_2 alkylamino, di(C_1–C_2)-alkylamino, C_1–C_2 alkylsulfamoyl, di(C_1–C_2)-alkylsulfamoyl, (C_1–C_2 alkyl)aminocarbonyl, di(C_1–C_2 alkyl)aminocarbonyl or C_3–C_4 alkynyl;
R_6 is H, R_8′, SR_8′, SO_2R_8, OR_8′, $C(O)R_8$, CO_2R_8′, $(CO)_2OR_8$′, $(CO)_2R_8$′, $C(O)NR_9R_{10}$, C(O)NRA, $C(S)SR_8$′, NH_2, NR_9R_{10}, OH, CN, $P(O)R_{11}R_{12}$, $P(S)R_{11}R_{12}$ or $SI(CH_3)_2R_{13}$;

J_{26} R_8 is C_1–C_{10} alkyl, C_3–C_{10} alkoxyalkoxyalkyl, C_2–C_{10} alkenyl, C_3–C_{10} epoxyalkyl, C_2–C_{10} alkynyl, C_3–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl or phenyl optionally substituted with R_{14}; when R_8 is C_3–C_6 cycloalkyl or C_4C_7 cycloalkylalkyl, it may optionally be substituted by C_1–C_4 alkyl, 1 to 3 atoms of Cl or F or 1 Br; when R_8 is C_1–C_{10} alkyl, C_2–C_{10} alkenyl or C_2–C_{10} alkynyl, it may be optionally be substituted by one or more halogens and/or by $(R_{15})_r$ provided that when r is 2, the values of R_{15} may be identical or different;

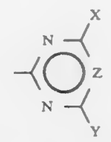
J_{27} R_8′ is C_1–C_{10} alkyl, C_3′C_{10} alkoxyalkoxyalkyl, C_3–C_{10} alkenyl, C_3′C_{10} epoxyalkyl, C_3–C_{10} alkynyl, C_3′C_6 cycloalkyl, C_4′C_7 cycloalkylalkyl or phenyl optionally substituted with R_{14}; when R_8′ is C_3′C_6 cycloalkyl or C_4′C_7 cycloalkyalkyl, it may optionally be substituted by C_1–C_4 alkyl, 1 to 3 atoms of Cl or F or 1 Br; when R_8′ is C_1–C_{10} alkyl, C_3–C_{10} alkenyl or C_3–C_{10} alkynyl, it may optionally be substituted by one or more halogens and/or by $(R_{15})_r$ provided that when r is 2, the values of R_{15} may be identical or different;

J_{28} r is 0, 1 or 2;
R_9 is H or C_1–C_4 alkyl;
R_{10} is H, C_1–C_{10} alkyl, C_1–C_{10} haloalkyl, C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, C_3–C_6 cycloalkyl or phenyl substituted with R_{14};
R_{10}′ is C_1–C_{10} alkyl, C_1–C_{10} haloalkyl, C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, C_3–C_6 cycloalkyl or phenyl substituted with R_{14};
R_{11} and R_{12} are independently C_1–C_4 alkyl, C_1–C_4 alkoxy or C_1–C_4 alkylthio;

J_{29} R_{13} is C_1–C_{10} alkyl, benzyl or phenyl optionally substituted with R_{14};
R_{14} is H, F, Cl, Br, CH_3, OCH_3, NO_2, SCH_3, SO_2CH_3 or CF_3;
R_{15} is OR_{10}, $OC(O)R_{10}$, $OC(O)NR_9R_{10}$, OSO_2R_{10}′ $OP(O)R_{11}R_{12}$, $OSi(CH_3)_2R_{13}$, SR_{10}, SOR_{10}′, SO_2R_{10}′, SCN, CN, $SP(O)R_{11}R_{12}$, $SP(S)R_{11}R_{12}$, $P(O)R_{11}R_{12}$, $P(S)R_{11}R_{12}$, NR_9R_{10}, $N{=}R_9R_{10}R_{13}$, $NR_9C(O)R_{10}$, $NR_9C(O)OR_{10}$′, $NR_9C(O)NR_9R_{10}$, $NR_9SO_2R_{10}$′, $NR_9P(O)R_{11}R_{12}$, $NR_9P(S)R_{11}R_{12}$, NO_2, $C(O)R_{10}$, $C(O)OR_{10}$, $C(O)NR_9R_{10}$, $C(R_{10}){=}NOR_{12}$, naphthyl, phenyl optionally substituted with R_{14} and/or R_{16},

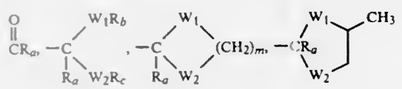


R_{16} is H, F, Cl, Br,
A is



X is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_2–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, halogen, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino or di(C_1–C_3 alkyl)amino;
Y is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_2–C_4 haloalkoxy,

C_1–C_4 haloalkylthio, C_1C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkylsulfinylalkyl, C_1–C_4 haloalkyl, C_2–C_5 alkylsulfonylalkyl, C_3–C_5 cycloalkyl, C_2–C_4 alkynyl, C_2–C_5 alkylthioalkyl,



or $N(OCH_3)CH_3$;

W_1 and W_2 are independently O or S;

m is 2 or 3;

R_a is H or CH_3;

R_b is C_1–C_2 alkyl;

R_c is C_1–C_2 alkyl; and

Z is N, and their agriculturally suitable salts; provided that:

(a) when W is S, then R is H, Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$ or

(b) when J is J_1, J_3, J_5, J_7, J_9, $J_{11}J_{13}$, J_{15}, J_{17}, J_{19}, J_{21}, J_{23}, J_{26}, or J_{28}, then either R_1 or R_2 must be H.

(c) when the total number of carbon atoms in X and Y is greater than 4, then the total number of carbon atoms in J is less than or equal to 15;

(d) the total number of carbon atoms in R_6 is less than or equal to 12; and

(e) when R_{15} and the bridging sulfonamide nitrogen of J_3, J_4, J_{11} or J_{12} is attached to the same carbon then R_{15} is other than OH, SH, $OC(O)R_{10}$, $OC(O)NR_9R_{10}$, OSO_2R_{10}, $OP(O)R_{11}R_{12}$, $OSi(CH_3)_2R_{13}$, $SPO(O)R_{11}R_{12}$, $SP(S)R_{11}R_{12}$, NR_9R_{10} or $N^+R_9R_{10}R_{13}$;

(f) the total number of carbon atoms in R_{19} and R_{20} is less than or equal to 4;

(g) the total number of carbon atoms in R_4 and R_5 is less than or equal to 4;

(h) when R_{21} is C_1–C_3 alkoxy, then R_{22} is H, CH_3 or C_1–C_3 alkoxy; and

(i) when R_{22} is OH, then R_{21} is H or C_1–C_3 alkyl, and when R_{22} is C_1–C_3 alkoxy, then R_{21} is H, C_1–C_3 alkyl or C_1–C_3 alkoxy.

44. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

4,838,930

3-FUOROPYRIDYL-2-OXY-PHENOXY DERIVATIVES HAVING HERBICIDAL ACTIVITY

Rolf Schurter, Binningen, and Peter J. Dodel, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

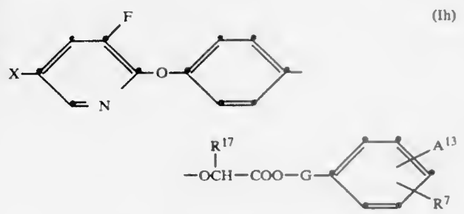
Division of Ser. No. 844,407, Mar. 26, 1986 Pat. No. 4,740,235. This application Feb. 1, 1988, Ser. No. 150,793

Claims priority, application Switzerland, Apr. 1, 1985, 1401/85

Int. Cl.[4] C07D *213/64*; A01N *43/40*

U.S. Cl. 71—94 6 Claims

1. A 3-fluoropyridyl-2-oxyphenoxy derivative which corresponds to the formula Ih



(Ih)

wherein X is chlorine or trifluoromethyl, G is C_1–C_3-alkylene, R^7 is hydrogen, halogen or methyl, A^{13} is halogen and R^{17} is methyl.

6. A method of reducing the growth of plants, in particular the growth of grasses, which method comprises applying thereto or to the locus thereof a herbicidally effective amount of a 3-fluoropyridyl-2-oxy-phenoxy derivative of the formula Ih according to claim 1.

4,838,931

1,2-DISUBSTITUTED PIPERIDINES, PROCESSES FOR THEIR PREPARATION AND THEIR USE IN PLANT PROTECTION

Rainer Liebl, Todtenweis; Michael Frey, Gersthofen; Hilmar Mildenberger, Kelkheim; Klaus Bauer, Rodgau, and Hermann Bieringer, Eppstein/Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

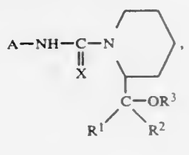
Filed Jan. 14, 1987, Ser. No. 3,202

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1986, 3601048

Int. Cl.[4] A01N *43/40*; C07D *211/22*

U.S. Cl. 71—94 5 Claims

1. A compound of the formula I



(I)

in which

X is oxygen or sulfur,

R^1,R^2 independently of one another are hydrogen or (C_1–C_4)-alkyl,

R^3 is hydrogen, (C_1–C_4)-alkyl which is unsubstituted or monosubstituted to trisubstituted by halogen, or benzyl which may be substituted up to three times by halogen, and

A is phenyl, which is unsubstituted or monosubstituted to tetrasubstituted by F, Cl, Br, (C_1–C_4)-alkoxy or (C_1–C_4)-alkoxycarbonyl-(C_1–C_4)-alkoxy.

4,838,932

CERTAIN 2-(2-SUBSTITUTED BENZOYL)-4-(SUBSTITUTED IMINO, OXIMINO OR CARBONYL)-1,3-CYCLOHEXANEDIONES

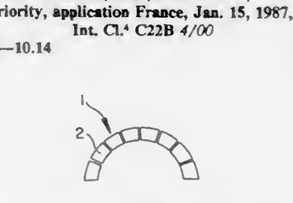
Christopher G. Knudsen, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 919,278, Oct. 16, 1986, abandoned. This application Aug. 20, 1987, Ser. No. 86,267

Int. Cl.[4] A01N *31/08*

U.S. Cl. 71—98 8 Claims

1. A method of controlling undesirable vegetation comprising applying to the locus where control is desired, an herbicidally effective amount of a compound having the formula



wherein

X is NR^9 wherein R^9 is hydrogen, C_1–C_4 alkyl or C_1–C_4 alkoxy;

R is halogen; C_1–C_2 alkyl; C_1–C_2 alkoxy; trifluoromethoxy or difluoromethoxy; nitro; cyano; C_1–C_2 haloalkyl; R^aSO_n- wherein n is 0 or 2 and R^a is C_1–C_2 alkyl, trifluoromethyl or difluoromethyl;

R^1 is hydrogen, C_1–C_4 alkyl, phenyl or substituted phenyl;

R^2 is hydrogen or C_1–C_4 alkyl; or

R^1 and R^2 together are C_2–C_5 alkylene;

R^3 is hydrogen, C_1–C_4 alkyl, phenyl or substituted phenyl, with the proviso that R^1 and R^3 are not both phenyl or substituted phenyl;

R^4 is hydrogen or C_1–C_4 alkyl;

R^5 is hydrogen or C_1–C_4 alkyl;

R^6 is hydrogen, C_1–C_4 alkyl or C_1–C_4 haloalkyl;

R^7 and R^8 independently are (1) hydrogen; (2) halogen; (3) C_1–C_4 alkyl; (4) C_1–C_4 alkoxy; (5) trifluoromethoxy; (6) cyano; (7) nitro; (8) C_1–C_4 haloalkyl; (9) R^bSO_n— wherein n is the integer 0, 1 or 2; and R^b is (a) C_1–C_4 alkyl; (b) C_1–C_4 alkyl substituted with halogen or cyano; (c) phenyl; or (d) benzyl; (10) —NR^cR^d wherein R^c and R^d independently are hydrogen or C_1–C_4 alkyl; (11) R^eC-(O)— wherein R^e is C_1–C_4 alkyl or C_1–C_4 alkoxy; or (12) —$SO_2NR^cR^d$ wherein R^c and R^d are as defined; and (13) —$N(R^c)C(O)R^d$ wherein R^c and R^d are as defined or its salts and an inert carrier therefor.

4,838,933

APPARATUS FOR MELTING AND CONTINUOUS CASTING OF METALS, THE PROCESS INVOLVED AND USE OF THE APPARATUS

Patrick Paillere; Edouard Alberitiere, both of Ugine; Marcel Garnier, Uriage; Jean Driole, and Annie Gagnoud, both of Grenoble, all of France, assignors to Compagnie Europeenne Du Zirconium Cezus, Courbevoie, France

Filed Jan. 11, 1988, Ser. No. 142,205

Claims priority, application France, Jan. 15, 1987, 87 00814

Int. Cl.[4] C22B *4/00*

U.S. Cl. 75—10.14 11 Claims

1. In an apparatus for continuously casting metals comprising a vertical, conductive, cold crucible having at least part of its wall in the form of longitudinal sectors which are electrically insulated from each other and are adapted for circulation of a cooling fluid therethrough; an inductor comprising helical coils surrounding the crucible over part of its height and adapted for connection to a source of alternating current for heating and confining the metal; and means for drawing down the cast metal; the improvement wherein said crucible comprises an upper zone divided into longitudinal sectors with surfaces having parallel vertical generating lines, and a lower zone joined to said upper zone and divided into longitudinal sectors with surfaces having generating lines diverging in a downward direction from the junction between the zones, the lowermost coil of said inductor being at the level of the junction between upper and lower zones.

4,838,934

PROCESS FOR A DIRECT REDUCTION OF IRON OXIDE CONTAINING MATERIALS IN A ROTARY KILN

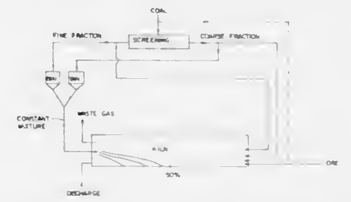
Gerd Elsenheimer, Frankfurt am Main, and Wolfram Schnabel, Willich, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 16, 1987, Ser. No. 62,731

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1986, 3620842

Int. Cl.[4] C21B *11/06*

U.S. Cl. 75—36 7 Claims



1. In a process for a direct reduction of iron oxide-containing materials to form sponge iron in a rotary kiln, wherein a charge of such material is moved through the rotary kiln counter-currently to a gas atmosphere, solid carbonaceous reducing agent having a high content of volatile constituents is charged into the rotary kiln at its charging end, solid carbonaceous reducing agent having a high content of volatile constituents is blown into the rotary kiln at its discharge end and is distributed over the charge in part of the length of the kiln, and oxygen-containing gases are introduced into the rotary kiln through its shell at a plurality of locations, the improvement comprising separating a solid carbonaceous reducing agent having a high content of volatile constituents into a coarser fraction and a finer fraction, forming a mixture of a part of the coarser fraction and a part of the finer fraction, blowing the resulting mixture into the rotary kiln only at its discharge end, wherein said mixture consists of an amount of 10 to 40% of the finer fraction and of an amount of 90 to 60% of the coarser fraction and is blown at a rate of up to 50% of the total feed rate of solid carbonaceous reducing agent, distributing the blown mixture over up to 50% of the length of the kiln, and charging the remaining solid carbonaceous reducing agent into the rotary kiln at its charging end.

4,838,935

METHOD FOR MAKING TUNGSTEN-TITANIUM SPUTTERING TARGETS AND PRODUCT

John A. Dunlop, Veradale, Wash., and Hans Rensing, Rossland, Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed May 31, 1988, Ser. No. 200,344

Int. Cl.[4] C22C *29/00*

U.S. Cl. 75—230 28 Claims

4. A method for the manufacture of a sputtering target having improved characteristics and consisting essentially of tungsten and titanium comprising the sequential steps of:

(a) providing a heat-resistant pressing die having a cavity with a configuration and dimensions desirable for producing a sputtering target, said die having at least one mov-

able pressing ram adapted for application of axial compaction forces to material in said cavity;
(b) mixing tungsten powder and a second powder consisting of at least one material chosen from the group consisting of titanium hydride and titanium hydride and titanium to form a homogeneous mixture, said second powder containing titanium hydride in an amount sufficient to improve characteristics of said target; said mixture having a binodal particle size distribution with respect to said tungsten powder and said second powder, and said mixture containing tungsten powder and second powder in amounts sufficient to provide the desired composition of said sputtering target;
(c) adding mixture to said cavity in an amount sufficient to yield a compact having substantially the dimensions of said sputtering target;
(d) placing said die with added mixture in a vacuum hot-press chamber;
(e) applying a containment pressure to said mixture in said die by means of said at least one ram, said containment pressure being sufficient to contain said mixture in said die;
(f) evacuating said chamber and said die to a vacuum of at least about 10^{-4} torr;
(g) heating said die and said mixture in said chamber to a first temperature sufficient to dehydride said titanium hydride and to volatilize alkali metals while maintaining said containment pressure and while continuing said evacuating;
(h) maintaining said first temperature for a time sufficient to remove gases and any alkali metals substantially from said mixture;
(i) heating said die and said mixture in said chamber to a second temperature in the range of about 1350° to 1550° C. while maintaining said containment pressure and said vacuum;
(j) applying a compaction force to said mixture at a value in the range of about 2000 to 5000 psi by means of said at least one ram when said second temperature is attained to form a compact of said mixture, said value of said compaction force being dependent on the configuration and dimensions of said sputtering target;
(k) maintaining said compaction force under said vacuum and at said second temperature for a time sufficient to effect full compaction of said mixture
(l) releasing said compaction force;
(m) releasing said vacuum;
(n) slowly cooling said die to a temperature of about 300° C. or less to relieve stress in said compact;
(o) removing the cooled compact from said die;
(p) recovering a sputtering target having improved characteristics.

4,838,936

FORGED ALUMINUM ALLOY SPIRAL PARTS AND METHOD OF FABRICATION THEREOF

Kiyoaki Akechi, Hyogo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 23, 1988, Ser. No. 197,173

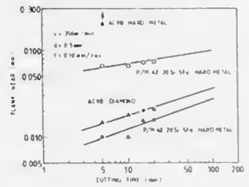
Claims priority, application Japan, May 23, 1987, 62-126402; May 23, 1987, 62-126403; Oct. 16, 1987, 62-261290

Int. Cl.⁴ C22C *39/12*

U.S. Cl. 75—249 **21 Claims**

1. A method of producing spiral parts such as orbiting or fixed scroll plates with involute wraps by forging aluminum alloy powder, said method comprises the following steps:

forming a preform from aluminum alloy powder having fine and homogeneous micro-structures as raw material by one



of compressing with die assembly and cold isostatic pressing; and
hot-forging said preform.

4,838,937

STABILIZED ALKALINE GOLD BATH FOR THE ELECTRO-LESS DEPOSITION OF GOLD

Walter Ott, Graz, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Mar. 9, 1988, Ser. No. 165,832

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1987, 3707817

Int. Cl.⁴ B05D *5/12*; C23C *16/00*

U.S. Cl. 106—1.23 **18 Claims**

1. Stabilized, aqueous, alkaline gold bath, containing a dycyano-gold(1)-complex in an amount of 0.05 - 30 grams per liter gold, calculated as metal, 10 - 100 grams per liter of a complex-former, 5 - 100 grams per liter of an alkali hydroxide and 10 - 100 grams per liter of a reducing agent, for the electroless deposition of gold onto gold, metals which are more electro-negative than gold, as well as alloys of these metals, characterized by a content of 50 - 700 grams per liter of at least one compound selected from the group consisting of glycol derivatives and polyethylenimine as stabilizer.

4,838,938

RECORDING LIQUID AND RECORDING METHOD BY USE THEREOF

Yasuko Tomida, Atsugi, and Shoji Koike, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1988, Ser. No. 154,883

Claims priority, application Japan, Feb. 16, 1987, 62-33711; Feb. 16, 1987, 62-33717; Jan. 26, 1988, 63-16206

Int. Cl.⁴ C09D *11/02*

U.S. Cl. 106—22 **20 Claims**

1. A recording liquid, comprising a dye as a component for forming an image and a liquid medium for dissolving or dispersing said dye, said liquid containing a compound having a three-dimensional molecular structure with inclusion ability and having a molecular weight of 400 or more and a solubility of 3% or more in water.

4,838,939

COMPOSITION PARTICULARLY ADAPTED TO DAMPING SHEETS FOR VEHICLES

Shigeru Kanda; Manabu Shibata; Masayoshi Ono, all of Kanagawa, and Michikazu Okano, Hiroshima, all of Japan, assignors to Nihon Tokushu Toryo Co., Ltd., Tokyo and Hirotani Co., Ltd., Hiroshima, both of, Japan

Filed Dec. 17, 1987, Ser. No. 134,182

Claims priority, application Japan, Dec. 18, 1986, 61-299872

Int. Cl.⁴ C08L *95/00*; C09D *3/24*

U.S. Cl. 106—281.1 **5 Claims**

1. A composition particularly adapted to damping sheets containing a binder component and a filler component consiting of inorganic fillers and an organic filler, which comprises

from 1 to 25 parts by weight, based on the total amount of the filler, of an organic fibrous filler having a fiber length of from about 50 to about 300 μ, the means length being about 100μ, and from 0.05 to 10 parts by weight, based on the total amount of the filler, of quick lime, as one of the inorganic fillers.

4,838,940

IMAGE RECORDING INK

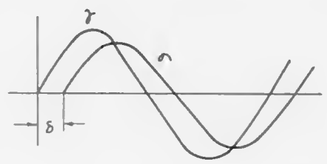
Fumitaka Kan, Tokyo; Kohzoh Arahara; Noboru Tohyama, both of Kawasaki; Toshiya Yuasa, Mitaka, and Hiroshi Fukumoto, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 18, 1988, Ser. No. 156,978

Claims priority, application Japan, Feb. 21, 1987, 62-36904; Jan. 25, 1988, 63-15241; Jan. 25, 1988, 63-15242

Int. Cl.⁴ C09D *11/00*

U.S. Cl. 106—22 **15 Claims**



1. A nonadhesive image recording ink, comprising: a dispersion medium which is liquid at room temperature; substance which is a reversible crosslinked structure selected from the group consisting of irregularly crosslinked, or a network, honeycomb or helix and impregnated with the dispersion medium; and a pH buffering electrolyte, wherein said ink is imparted with adhesiveness upon application of electric current and has a ratio (G″/G′) of loss elasticity modulus (G″) to storage elasticity modulus (G′) of from 0.1–10, and said crosslinked structure is at least partially reversibly converted into a sol. state upon application of electric current.

4,838,941

MAGNESIUM CEMENT

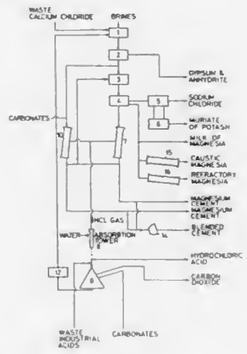
Robert G. D. Hill, Hendon, Australia, assignor to Ausmintec Corp. Limited, Hendon, Australia

Filed Jan. 6, 1987, Ser. No. 599

Claims priority, application Australia, Jan. 7, 1986, PH4143

Int. Cl.⁴ C04B *9/02, 9/04*

U.S. Cl. 106—106 **18 Claims**



1. A cement product which requires only the addition of water to produce a cement, in which the cement product is composed of two basic cementing ingredients, one ingredient consisting essentially of a material selected from the group consisting of a mixture of dried and calcined magnesium sulphate, calcium chloride, sodium chloride, and anhydrous magnesium oxychloride, and a combination of said mixture with one or more other halides and salts of alkalis and alkali earth elements, which are in general, neutral to mildly acid in reaction,
the other ingredient consisting essentially of a material selected from the group consisting of carbonates, and a mixture of carbonates and a member selected from the group consisting of bicarbonates, borates, phosphates, silicates, and alumino silicates, all of the foregoing of alkalis and alkali earth elements which are, in general, neutral to mildly alkaline in reaction,
the two basic ingredients in each case containing substantial amounts of magnesium oxide and being finely ground and intimately mixed.

4,838,942

DISPERSION FOR PROTECTIVE COATINGS AND METHOD FOR APPLYING SUCH COATINGS

Frans Puchinger, Niederscheyern, and Gerhard Wydra, Oberschleissheim, both of Fed. Rep. of Germany, assignors to MTU-Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 23, 1987, Ser. No. 137,176

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644116

Int. Cl.⁴ C09D *1/00*; B05D *1/18*

U.S. Cl. 106—286.1 **6 Claims**

1. A dispersion for forming a protective coating on a substrate, comprising a binder solution and a metal powder dispersed in said binder solution, said binder solution comprising chromic acid (CrO_3) 10 to 20 percent by weight of the binder solution, phosphorous acid (H_3PO_3) 20 to 30 percent by weight, phosphoric acid (H_3PO_4) 20 to 30 percent by weight, aluminum phosphate ($AlPO_4$) 0 to 5 percent by weight, and the remainder being water, said binder solution and said metal powder being present in about equal weight proportions, said dispersion having a baking temperature within the range of about 150° C. to about 200° C.

4,838,943

COMPOUNDS USEFUL AS PIGMENTS CONTAINING ONE OR MORE 2,2,6,6-TETRAALKYLPIPERIDINE GROUPS

Peter Bitterli, Reinach, Switzerland; Manfred Geisel, Lörrach, Fed. Rep. of Germany; Jürgen Goldmann, Münchenstein, Switzerland, and Bansi L. Kaul, Biel-Benken, Switzerland, assignors to Sandoz Ltd., Balse, Switzerland

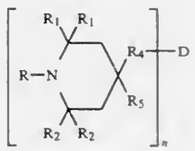
Filed Apr. 8, 1987, Ser. No. 35,954

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1986, 3612148; May 30, 1986, 3618216; Sep. 10, 1986, 3630717; Sep. 20, 1986, 3632039; Nov. 13, 1986, 3638763

Int. Cl.⁴ C08K *5/16*

U.S. Cl. 106—400 **27 Claims**

1. A pigment of formula I or II



(I)

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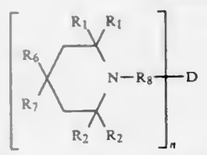


(II)

in which R is hydrogen, C_{1-8}alkyl, C_{3-10}alkenyl, phenyl, phenyl-C_{1-4}alkyl or $—COR_{5a}$ where R_{5a} is hydrogen, $—C(R_{10a})=CH_2$, C_{1-6}alkyl, phenyl, $—COOC_{1-4}$alkyl or $—NR_{21}R_{22}$, were R_{10a} is hydrogen or C_{1-4}alkyl; R_{21} is hydrogen, C_{1-12}alkyl, C_{5-6}cycloalkyl, phenyl, phenylC_{1-4}alkyl or C_{1-12}alkylphenyl and R_{22} is C_{1-12}alkyl or hydrogen;

each R_1 independently is $—CH_3$ or $—CH_2(C_{1-4}$alkyl) or both groups R_1 form a group $—(CH_2)_5—$;

each R_2 independently is $—CH_3$ or $—CH_2(C_{1-4}$alkyl) or both groups R_2 form a group $—(CH_2)_5—$;

R_4 is a direct bond or a bridging group; and

R_5 is hydrogen or C_{1-4}alkyl; or

R_4 and R_5 together with the carbon atom to which they are attached form an isocyclic or heterocyclic bridging group;

R_6 is $—NH_2$, mono or di$—C_{1-4}$alkylamino, C_{1-2}alkylcarbonylamino, benzoylamino, hydrogen, OH or $—CO—C_{1-4}$alkyl or $—CO—C_{1-4}$alkoxy; and

R_7 is hydrogen or C_{1-4}alkyl or

R_6 and R_7 together with the carbon atom to which they are attached form an isocyclic or heterocyclic ring;

R_8 is a direct bond or a bridging group

D is a residue of a pigment; and

n is an integer from 1 to 4 inclusive.

4,838,944

DEGRADATION OF GRANULAR STARCH

Leo H. Kruger, Kendall Park, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Jun. 17, 1987, Ser. No. 63,193

Int. Cl.[4] C08B *31/00, 30/12*

U.S. Cl. 127—71 **14 Claims**

1. A process for degrading granular starch with hydrogen peroxide at a temperature of from 0°–55° C. and below the gelatinization temperature of said starch, the steps comprising providing an aqueous slurry of said granular starch at a pH level of 11.0 to 12.5, adding an effective catalytic amount of manganese ions to said aqueous slurry, adding said hydrogen peroxide to said aqueous slurry in an amount ranging from 0.01 to 2.0%, anhydrous, based on starch solids, to initiate a degradation reaction and allowing the reaction to continue over a period of from about 2 to 36 hours.

4,838,945

THERMOPLASTIC RESIN COMPOSITION FOR CLEANING

Hiroyuki Fujii, Ichihara; Takamichi Kudo, Higashikurume; Haruhiko Furukawa, and Nobusuke Yamamoto, both of Ichihara, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Feb. 20, 1987, Ser. No. 16,864

Claims priority, application Japan, Feb. 20, 1986, 61-35859; Sep. 8, 1986, 61-210855

Int. Cl.[4] B08B *7/00, 9/02;* **C11D** *1/22, 3/37*

U.S. Cl. 134—7 **10 Claims**

1. A thermoplastic resin composition for cleaning a shaping apparatus, comprising

(1) 2–30% by weight of at least one sodium salt of sulfonic acid selected from the group consisting of sodium salt of alkylbenzenesulfonic acid having from 6 to 20 carbon atoms in alkyl group, sodium salt of alkylsulfonic acid having from 8 to 20 carbon atoms in alkyl group and sodium salt of diester of sulfosuccinic acid and alcohol having from 6 to 16 carbon atoms in alcohol residue,

(2) 0.5–10% by weight of at least one water-repellent compound selected from the group consisting of metal salt of higher fatty acid, wax, liquid paraffin, synthetic wax and silicone, and

(3) 60–97% by weight of a thermoplastic resin.

5. A composition according to claim 1 wherein (a) is a sodium salt of an alkylbenzene sulfonic acid.

4,838,946

ABSORBENT OF CHLOROSILANE COMPOUND

Hisayoshi Yamaguchi, Tokyo; Tamotsu Yanagisawa, and Minoru Kobayashi, both of Niigata, all of Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

Filed May 25, 1988, Ser. No. 198,483

Int. Cl.[4] C07C *7/13, 7/135;* **B08B** *7/00*

U.S. Cl. 134—7 **1 Claim**

1. In a method for absorbing a liquid chlorosilane compound by use of an absorbent material contacted with the chlorosilane compound, an improvement which comprises using, as the absorbent, a silica-, silica/alumina-based porous ceramic material or a mixture of them of which the pores have a pore diameter in the range from 0.1 to 100 μm, the content of silicon dioxide SiO_2 in the silica-based material being at least 80% by weight and the total content of silicon dioxide SiO_2 and aluminum oxide Al_2O_3 in the silica/alumina-based material being at least 90% by weight.

4,838,947

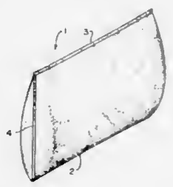
SPUN-WOVEN ABSORBENT PAD CONTAINING CORN COB GRANULES FOR APPLICATION IN REMOVAL OF COOKING OILS FROM VESSEL

Marvin H. Levy, 12432 Merrick Dr., St. Louis, Mo. 63146, and Robert S. Steinfort, R.R. 3, Lincoln, Ill. 62656

Filed Oct. 16, 1987, Ser. No. 109,209

Int. Cl.[4] B01D *15/00*

U.S. Cl. 134—7 **1 Claim**



1. A method for picking up oil from a cooking vessel, comprising arranging a piece of fabric formed as a woven or spun cloth from a natural or polymer material, folding said fabric member over into a tubular shape, sealing an upper edge and one end seam of said tubular member, applying a quantity of ground fiberous organic absorbent material comprising ground corn cob into the tubular member before complete sealing, sealing the opposite end seam of the said folded over fabric material, and then applying said absorbing pad to a vessel following a cooking session to absorb and remove a substantial remaining quantity of oil located within the cooking vessel from said cooking vessel.

4,838,948

PROCESS FOR CLEANING POLYMER PROCESSING EQUIPMENT

Fay W. Bailey, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 27, 1987, Ser. No. 78,338

Int. Cl.[4] B08B *9/04*

U.S. Cl. 134—8 **2 Claims**

1. In a process for cleaning polymeric processing equipment by purging with a flux polymeric composition; the improvement which comprises conducting said purging with a polymeric purging composition which further comprises:

(a) from 92–97.4 weight percent of a polymeric composition, wherein said polymeric composition, is selected from the group consisting of homopolymers of α-olefins, copolymers of α-olefins, homopolymers of conjugated dienes, homopolymers of monovinyl arenes, copolymers of conjugated dienes and monovinyl arenes, homopolymers of polyamides, copolymers of polyamides, homopolymers of polyphenylene sulfide, copolymers of polyphenylene sulfide, fluoroplastics and acrylic resins;

(b) from 2.4–6.4 weight percent of a mild abrasive, wherein said mild abrasive is selected from the group consisting of calcium carbonate, calcium phosphate, calcium silicate and aluminum silicate; and

(c) from 0.2 to 1.6 weight percent of a sulfonated surfactant, wherein said sulfonated surfactant is selected from the group consisting of:

(1) alkyl sulfonates of the formula $RSO_3^-M^+$, wherein R is selected from the group consisting of alkyl groups containing from 8 to 20 carbon atoms and M is selected from the group consisting of sodium, calcium and lithium;

(2) alkyl benzyl sulfonates of the formula $RC_6H_4SO_3^-M^+$, wherein R is selected from the group consisting of alkyl groups containing from 8 to 20 carbon atoms and M is selected from the group consisting of sodium, calcium and lithium; and

(3) α-olefin-sulfonates of the formula $RCH=CHSO_3^-M^+$, wherein R is selected from the group consisting of alkyl groups containing from 6 to 18 carbon atoms.

4,838,949

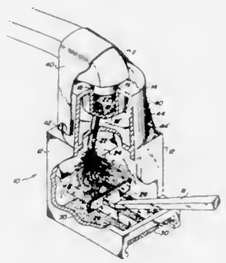
SHAVING RAZOR CLEANER

Felipe Dugrot, 5022 N.W. 168 Ter., Carol City, Fla. 33055

Continuation-in-part of Ser. No. 52,502, Jul. 20, 1987, abandoned. This application Mar. 22, 1988, Ser. No. 171,754

Int. Cl.[4] B08B *3/02*

U.S. Cl. 134—32 **5 Claims**



5. A method for cleaning a shaving razor comprising the steps of:

connecting a shaving razor cleaner to a conventional tap water faucet, said shaving razor cleaner comprising:

a body member having an upper chamber and a lower chamber;

said upper chamber being sized and shaped for watertight engagement with a conventional tap water faucet;

said body member defining a passageway which fluidly communicates said upper chamber with said lower chamber, said passageway adapted to allow tap water to flow from said upper chamber into said lower chamber;

said passageway having a lower discharge end positioned relative to a deflector plate mounted in said lower chamber such that water issuing from said discharge end impacts upon said deflector plate;

said waterflow passageway being generally cylindrical and of a smaller cross sectional diameter than that of said upper chamber;

said deflector plate causing the flow of water issuing from said discharge end to fan out energetically into a volume therebelow within said cleaning chamber, said volume being sized and shaped to receive the shaving head portion of a conventional shaving razor;

further comprising guiderail means disposed generally horizontally along the lower surface of said body member, said guiderail means for guiding the head of a shaving razor so that said head of said shaving razor can be passed under the fanned out stream of water issuing from said deflector plate in reciprocal motion;

causing water to issue through said faucet by turning on a flow of water therefrom to thereby cause a high energy flow of water to issue from said waterflow passageway and deflect off of said deflector plate;

passing the shaving head portion of said conventional shaving razor into and out of exposure to said fanned out stream of water issuing from said deflector plate in reciprocal motion, while sliding said shaving head portion along said guiderail means.

4,838,950

STABILIZATION OF INTRACONNECTIONS AND INTERFACES

Kackadasam R. Ramaprasad, Lawrenceville, N.J., assignor to Chronar Corp., Lawrenceville, N.J.

Filed Apr. 22, 1988, Ser. No. 185,070

Int. Cl.[4] H01L *27/14, 31/18*

U.S. Cl. 136—244 **16 Claims**

11. A device with intraconnected electrodes, comprising:

a substrate;

a first electrode upon said substrate;

an amorphous semiconductor upon said first electrode;

a metal hydroxide adsorbed on portions of said first electrode and on said amorphous semiconductor, brought about by dipping in a colloidal solution or a well stirred suspension of the said metal hydroxide in water;

and a second electrode upon said semiconductor extending into contact with said first electrode at the interface of said first electrode with metal hydroxide.

14. The invention of claim 11 wherein the said device

is a solar panel comprising a substrate with a plurality of discrete, transparent, first electrodes thereon;

a layer of amorphous semiconductor upon the transparent electrode;

a plurality of second, back electrodes upon said semiconductor layer and opposite the transparent electrodes;

an interface between a portion of each discrete transparent, first electrode and the opposite, second, back electrode with said metal hydroxide present at said interface;

and an interface between the amorphous semiconductor and each of the second, back electrode with metal hydroxide at each said interface;

thereby to enhance the thermal stability of said device.

4,838,951

SOLAR MODULE MOUNTING ARRANGEMENT USING ANGLE BRACKETS

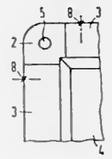
Manfred Riermeier, Neuching, and Viktor Schuber, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 837,234, Mar. 7, 1986, abandoned. This application Jul. 10, 1987, Ser. No. 72,198

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1985, 3513894

Int. Cl.[4] H02N *6/00*

U.S. Cl. 136—251 4 Claims



1. Apparatus for a planar solar module including means for mounting said solar module to a support base, the apparatus comprising:

four elongated frame members and four joining members, each joining member in the form of an angle bracket being disposed between two adjacent elongated frame members, and each angle bracket having a single aperture for mounting said solar module to a support base, the aperture passing completely through the angle bracket in a direction perpendicular to the plane of said solar module, and each angle bracket also having two projection means extending in an orientation parallel to the plane of said solar module, each one of said two projections means engaging one of the the two adjacent elongated frame members, said two projections means defining an angle therebetween, and securing means for attaching each elongated frame member to one of the two projections means to provide an angular orientation between the two adjacent elongated frame members commonly secured to an angle bracket corresponding to said angle.

4,838,952

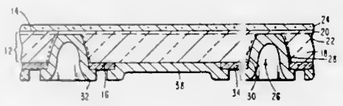
CONTROLLED REFLECTANCE SOLAR CELL

Hans G. Dill, San Marcos, and David R. Tillington, Van Nuys, both of Calif., assignors to Spectrolab, Inc., Sylmar, Calif.

Filed Apr. 29, 1988, Ser. No 188,505

Int. Cl.[4] H01L *31/06, 3 /18*

U.S. Cl. 136—256 22 Claims



1. A solar cell comprising:

A semiconductor body having a front layer of a first conductivity type and an adjacent back layer of a second conductivity type opposite of said first conductivity type, said front and back layers forming front and back major surfaces, respectively said semiconductor body further having a plurality of openings through said back major surface and back layer which form recesses extending to said front layer, said recesses having walls which are doped to said first conductivity type;

a first electrical contact disposed in said recesses making electrical contact to said first conductivity type layer; and

a second electrical contact disposed on said back major surface making electrical contact to said second conductivity type layer.

4,838,953

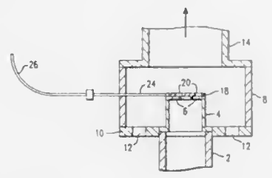
ADJUSTABLE OIL EJECTOR

Joseph Pankowiecki, Casselberry, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 22, 1988, Ser. No. 209,715

Int. Cl.[4] F04F *5/48;* F16K *3/00*

U.S. Cl. 137—625.3 6 Claims



1. An oil ejector for conveying a quantity of oil under pressure to a region to be lubricated, said ejector comprising a nozzle member having an inlet end for receiving a supply of oil under pressure and an outlet end for ejecting oil supplied to the inlet end, said outlet end having an outlet passage through which oil is ejected at a higher velocity and lower pressure than the oil entering the inlet end, the ejection pressure being a function of outlet passage cross-sectional area, wherein said nozzle member comprises, at said outlet end, a fixed part having a plurality of openings and a movable part mounted to said fixed part for movement in one direction relative to said fixed part transverse to the ejection direction and having a plurality of openings each at least partiy overlapping a respective opening in said fixed part, with the regions of overlap between said pluralities of openings defining said outlet passage, said openings in said fixed part and said movable part being elongated in the direction of relative movement between said parts, said openings providing partial and maximum flow, said partial flow being at one point of the relative movement between the fixed and moveable plates at which said openings provide a generally circular cross-section and at said maximum flow said openings providing an elliptical cross-section when the fixed and moveable plates assume a second position, and said ejector further comprises remotely actuatable displacing means coupled to said movable part for moving said movable part relative to said fixed part in order to vary the cross-sectional area of said outlet passage.

4,838,954

PRESSURE REGULATOR

Asi Perach, 29650 White Hall Dr., Farmington Hills, Mich. 48018

Filed Apr. 25, 1988, Ser. No. 186,026

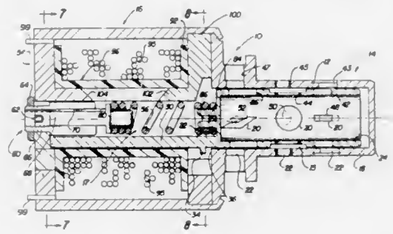
Int. Cl.[4] F15B *13/44*

U.S. Cl. 137—625.65 20 Claims

1. A pressure regulator having a hydraulic compartment and an electromagnetic compartment, the regulator maintaining a fluid flow at an essentially constant control pressure within a flow range, the regulator comprising:

(a) an armature which is generally centrally disposed within the regulator and extending in both the hydraulic compartment and the electromagnetic compartment, the armature having a hydraulic portion and an electromagnetic portion, the hydraulic portion of the armature being generally centrally disposed within a valve body, the armature having a plurality of ports and the valve body having a plurality of ports, some of the valve body ports being aligned with some of the armature ports, the armature ports cooperating with the valve body ports which enable fluid to enter and leave therefrom, wherein axial forces are applied to the armature as a function of the fluid flow through the ports;

(b) spring means secured to the armature which enable axial and tangential displacement of the armature; and



(c) an electromagnetic actuator which is positioned in the electromagnetic compartment within a stationary housing, wherein tangential forces are applied to the armature as a function of the magnitude of the magnetism in the actuator.

4,838,955

METHOD FOR THE MANUFACTURE OF HARD STEEL SHEET FROM AL-KILLED CONTINUOUS-CAST CARBON-MANGANESE STEEL

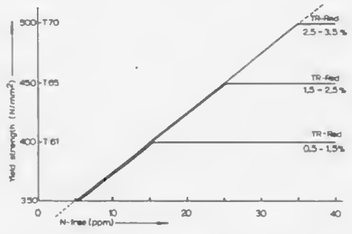
Arie B. C. Edelman, Heiloo; Jan B. Kleijn, Krommenie; Maarten A. de Haas, Heerhugowaard, and Thomas M. Hoogendoorn, Aerdenhout, all of Netherlands, assignors to Hoogovens Groep B.V., IJmuiden, Netherlands

Division of Ser. No. 890,290, Jul. 29, 1986. This application Dec. 2, 1987, Ser. No. 127,377

Claims priority, application Netherlands, Jul. 29, 1985, 8502145

Int. Cl.[4] C21D *8/02*

U.S. Cl. 148—2 5 Claims



1. Method of manufacturing steel sheet having a hardness in one of the hardness categories T61, T65 and T70 of European Standard 145-78, including the steps, in the order given, of

(i) continuously casting an Al-killed steel containing 0.03 to 0.10% by weight C and 0.15 to 0.50% by weight Mn

(ii) hot-rolling the steel

(iii) cold-rolling the steel into sheet

(iv) continuously annealing the steel sheet thereby to produce a steel sheet which contains an amount of uncombined dissolved nitrogen (N_{free}) which for the respective hardness categories is given by the following table:

Hardness category	N_{free}(ppm)
T61	≧5
T65	≧15
T70	≧25

(v) skin-passing the steel sheet with a thickness reduction TR-RED (in %) during said skin-passing step which for the respective hardness categories, is within the ranges given by the following table:

Hardness category	TR-RED (%)
T61	0.5–1.5
T65	1.5–2.5
T70	2.5–3.5

(vi) performing a thermal (heat) after-treatment in which free dislocations produced in the steel by the skin-passing are fixed by the uncombined nitrogen, so as to increase the hardness and yield-strength above the values after the skin passing.

4,838,956

METHOD OF PRODUCING A SPHEROIDAL GRAPHITE CAST IRON

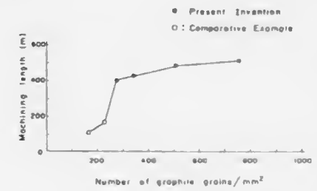
Kazuo Satou, and Ken Okazaki, both of Higashihiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 14, 1988, Ser. No. 181,428

Claims priority, application Japan, Apr. 16, 1987, 62-95918; Apr. 16, 1987, 62-95919; Apr. 16, 1987, 62-95921

Int. Cl.[4] C21D *5/14*

U.S. Cl. 148—3 9 Claims



1. A method of producing spheroidal graphite cast iron, comprising the steps of:

providing a molten metal for a casting which contains 2.5–4.1 wt. % of carbon, 1.5–3.5 wt. % of silicon, 0.3–1.0 wt. % of manganese, not more than 0.15 wt. % of phosphorus, not more than 0.03 wt. % of sulfur, 0.005–0.08 wt. % of magnesium, at least one of 0.3–1.5 wt. % of copper, 0.27–0.5 wt. % of molybdenum and 0.1–3.5 wt. % of nickel, and a remainder of iron;

forming a casting of spheroidal graphite cast iron containing not less than 250 graphite grains/mm^2 from the molten metal while adding an inoculant to the molten metal by a pouring inoculation method or an in-mold inoculation method at the time of forming the casting;

annealing the casting by heating and holding the casting at a temperature of not more than the A_1 transformation point for 0.5 to 8 h. so as to change its matrix to ferrite;

machining the casting; and

austempering the casting so as to subject the casting to austenitizing and isothermal transformation.

4,838,957

PHOSPHATE COATINGS FOR METAL SURFACES

Satoshi Miyamoto, and Masamichi Nagatani, both of Neyagawa-shi, Japan, assignors to Amchem Products, Inc., Ambler, Pa.

Continuation of Ser. No. 770,031, Aug. 27, 1985, abandoned, which is a continuation-in-part of Ser. No. 526,177, Aug. 24, 1983, abandoned. This application Feb. 16, 1988, Ser. No. 159,474

Claims priority, application Japan, Aug. 24, 1982, 57-147226

Int. Cl.[4] C23C *22/12, 22/18*

U.S. Cl. 148—260 25 Claims

1. A process for reducing white spots during phosphating a galvanized metal surface comprising treating the galvanized metal surface with an acidic aqueous substantially chlorate-free phosphate solution consisting essentially of:

(a) from about 0.1 to about 1.5 g/l of zinc ion,

(b) from about 5 to about 50 g/l of phosphate ion,

(c) from about 0.2 to about 4 g/l of manganese ion,

(d) at least about 0.05 g/l of a fluoride ion,

(e) less than 0.5 g/l of chloride ion, and

(f) at least one phosphating accelerator of the following:

(i) from about 0.01 to about 0.2 g/l of nitrite ion,

(ii) from about 1 to about 10 g/l of nitrate ion,

(iii) from about 0.5 to about 5 g/l of hydrogen peroxide (based on 100% H_2O_2),

(iv) from about 0.05 to about 2 g/l of m-nitrobenzene-sulfonate ion,

(v) from about 0.05 to about 2 g/l of m-nitrobenzoate ion, and

(vi) from about 0.05 to about 2 g/l of p-nitrophenol.

4,838,958

ALUMINUM-ALLOY ROLLED SHEET AND PRODUCTION METHOD THEREFOR

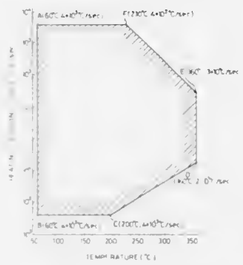
Toshio Komatsubara; Toshiki Muramatsu and Mamoru Matsuo, all of Fukaya, Japan, assignors to Sky Aluminum Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1987, Ser. No. 94,207

Claims priority, application Japan, Sep. 9, 1986, 61-212030

Int. Cl.[4] C22F *1/04*

U.S. Cl. 148—11.5 A 26 Claims



11. A process for producing a heat treated aluminum alloy rolled sheet for forming, which does not exhibit the formation of Lüder's marks, comprising the steps of: providing an ingot which consists, by percentage weight, of from 1.5 to 5.5% of Mg, from 0.18 to 1.5% of Cu, the balance being aluminum and unavoidable impurities including from 0.05 to 0.4% of Fe and 0.05 to 0.4% of Si; homogenizing the ingot at a temperature of from 450° to 560° C.; rolling to a required thickness; and subsequently solid solution treating at a temperature of from 350° to 560° C., followed by rapid cooling at a cooling rate of 300° C./min or more.

4,838,959

METHOD FOR MANUFACTURING HIGH STRENGTH COPPER ALLOY WIRE

Tom Inagaki, Lagrangeville, N.Y., assignor to Hudson International Conductors, Ossining, N.Y.

Continuation of Ser. No. 869,402, Jun. 2, 1986, Pat. No. 4,727,002, which is a continuation of Ser. No. 635,890, Jul. 30, 1984, Pat. No. 4,594,116. This application Nov. 16, 1987, Ser. No. 121,297

The portion of the term of this patent subsequent to Jun. 10, 2003, has been disclaimed.

Int. Cl.[4] C22D *1/08*

U.S. Cl. 148—11.5 C 1 Claim

1. A method for manufacturing a wire from a copper precipitation hardenable alloy wherein the alloy comprises from 0.2–1.0 beryllium, 1.4–2.2 nickel or cobalt and the remainder copper, said method comprising one or more processing steps and characterized in that said steps conclude with cold working the alloy to a wire and to an area reduction of at least 99% followed by precipitation heat treatment at a temperature of 750–950 degrees F. for a period of 1–4 hours and wherein the resulting wire has a tensile strength of at least 95,000 psi and an electric conductivity of at least 60% IACS.

4,838,960

METHOD OF MANUFACTURING MARTENSITIC STAINLESS STEEL EXCELLENT IN RESISTANCE TO STRESS CORROSION CRACKING

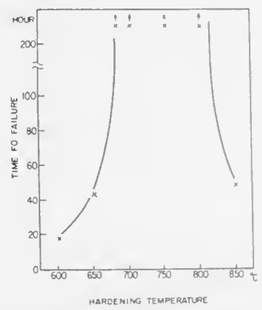
Yuichi Yoshino, Fuchu, Japan, assignor to The Japan Steel Works, Ltd., Tokyo, Japan

PCT No. PCT/JP86/00537, § 371 Date Jun. 17, 1988, § 102(e) Date Jun. 17, 1988, PCT Pub. No. WO88/03176, PCT Pub. Date May 5, 1988

PCT Filed Oct. 24, 1986, Ser. No. 210,513

Int. Cl.[4] C21D *6/00*

U.S. Cl. 148—135 3 Claims



1. A method for manufacturing a martensitic stainless steel having excellent resistance to stress corrosion cracking, consisting of:

preparing a steel containing 2–6% by weight of nickel and 15–18% by weight of chromium;

heating said steel homogeneously to a temperature between the Ac_1 point and the Ac_3 point of the steel; and

cooling said steel, wherein, in said heating step, from 25–75 volume percent of the steel is converted to the austenite phase, and upon cooling thereof, a mixed structure of martensite and tempered martensite is formed.

4,838,961

METHOD OF MANUFACTURING HIGH STRENGTH BLANK A BOLT

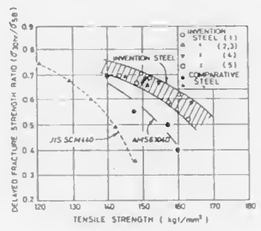
Kazunori Fukizawa, Kiyose; Mitsushi Higuchi, Ichinomiya, and Kunio Namiki, Nagoya, all of Japan, assignors to Nagoyo Screw Mfg. Co., Ltd.; Daido Tokushuko Kabushiki Kaisha, both of Aichi and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, all of, Japan

Division of Ser. No. 802,608, Nov. 25, 1985, Pat. No. 4,778,652. This application Apr. 8, 1988, Ser. No. 179,501

Claims priority, application Japan, Nov. 29, 1984, 59-250540

Int. Cl.[4] C21B *9/00*

U.S. Cl. 148—12.4 8 Claims



1. A method of manufacturing a high strength blank for a bolt, comprising the steps of:

preparing a steel material of an iron base alloy consisting essentially of 0.30–0.50% by weight of carbon, not more than 0.15% by weight of silicon, not more than 0.40% by weight of manganese, 0.30–1.50% by weight of chromium, 0.10–0.70% by weight of molybdenum, and 0.15–0.40% by weight of vanadium, the balance being composed of iron and, as inevitable impurities, not more than 0.015% by weight of phosphorus and not more than 0.010% by weight of sulphur;

hardening by quenching said steel material heated at a temperature of 940°±10° C.; and

tempering said hardened material at a temperature of 575°±25° C.

4,838,962

MAGNETO-OPTICAL RECORDING MEDIUM

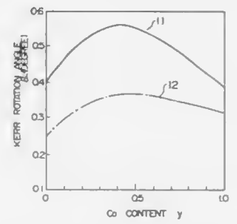
Shinji Takayama, Mitaka; Fumiyoshi Kirino, Tokyo, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 883,762, Jnl. 9, 1986, abandoned. This application Jun. 15, 1988, Ser. No. 206,813

Claims priority, application Japan, Jul. 12, 1985, 60-152215

Int. Cl.[4] H01F *1/04*

U.S. Cl. 148—304 13 Claims



1. A magneto-optical recording medium comprising a substantially amorphous film exhibiting increased coercivity, being a perpendicular magnetizing film, and being made of an alloy represented by the formula:

$$(R_{1-x}M_x)_a(Fe_{1-y}Co_y)_{100-a} \quad (1)$$

wherein R is at least one element selected from the group consisting of La, Ce, PR, Nd, Sm and Yb; M is at least one element selected from the group consisting of Tb, Dy and Gd; x and y mean atomic ratios; and a means an atomic percent, each satisfying the following conditions:

$0 \leqq x < 0.5$

$0 < y < 1$

$20 \leqq a \leqq 30.$

4,838,963

MICRO-ALLOYED STEELS

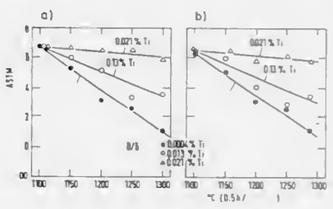
Bernd Huchtemann; Serosh Engineer, and Volker Schüler, all of Krefeld, Fed. Rep. of Germany, assignors to Thyssen Edelstahlwerke AG, Krefeld, Fed. Rep. of Germany

Filed Jul. 6, 1987, Ser. No. 70,047

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1987, 3719569; Jul. 5, 1987, 3722735

Int. Cl.[4] C22C *38/28*

U.S. Cl. 148—328 6 Claims



1. Micro-alloyed structural steel having a pearlite microstructure and a high grain resistance of up to 1300° C., containing

0.2 to 0.5	% carbon
0.4 to 1.0	% silicon
0.8 to 1.8	% manganese
0.008 to 0.2	% sulphur
0 to 0.7	% chromium
0 to 0.1	% aluminum
0 to 0.04	% nitrogen
0.01 to 0.05	% titanium

the remainder being iron and impurities resulting from the melting process and whereby sulfide prrecipitates are at the grain boundaries.

4,838,964

PROCESS FOR PREPARING BELTS

Karl V. Thomsen, Ontario; John J. Darcy, Webster; Augustus W. Griswold, Rush; Boris W. Haritonoff, Geneseo, and Jacob Pond, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

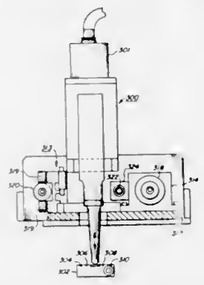
Continuation of Ser. No. 28,807, Mar. 20, 1987, abandoned. This application Aug. 8, 1988, Ser. No. 231,629

Int. Cl.[4] B29C *53/42, 65/74*

U.S. Cl. 156—73.1 13 Claims

1. A process for fabricating belts comprising conveying the leading edge of a web from a supply roll into a belt loop forming station, cutting said web a predetermined distance from

said leading edge to form a web segment having said leading edge at one end and a trailing edge at the opposite end, gripping only the lower surface of said web a lajcent said leading edge, gripping only the lower surface of sa d web adjacent said trailing edge, inverting said lower surface of said web adjacent said leading edge, inverting said lower surface of said web adjacent said trailing edge, overlapping sa d leading edge and said trailing edge to form a loop of said v eb segment loosely suspended from the joint formed by the overlapped leading edge and trailing edge, transferring said loop of said web segment at said belt loop forming station to a first anvil, conveying said loop of said web segment on said first anvil to a welding station while maintaining said joint formed by said overlapped leading edge and trailing edge imparting a linear movement and a rotary movement to said first anvil while conveying said loop to said welding station, simultaneously conveying another anvil to said belt loop forming station, welding said overlapped leading edge and trailing edge together on said anvil to form a belt welded at said joint, and simultaneously forming another loop from a fresh web segment at said belt loop forming station.

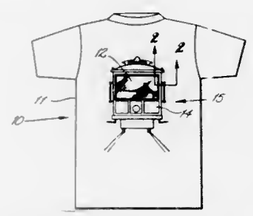


4,838,965

HOLOGRAPHIC ART APPLIED TO T-SHIRTS OR OTHER TEXTILE PRODUCTS

Janice W. Bussard, 201 N. Fruitport Rd., Spring Lake, Mich. 49456

Filed Jan. 25, 1988, Ser. No. 147,492
Int. Cl.[4] B32B *31/02*
U.S. Cl. 156—83 **4 Claims**



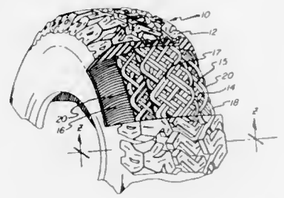
1. A process of applying a holographic art element to a T-shirt or other textile product, comprising, in sequence, first developing a hologram upon a metalized polyester film and backing said film with a hot-stamped adhesive to form said holographic art element, then, using a printing ink compound containing finely ground cellular polystyrene printing a graphic upon a surface of said T-shirt or textile, placing said T-shirt or textile in a dryer for curing said printing ink compound and wherein applying heat and air causes said finely ground cellular polystyrene in said ink compound to puff up, placing said holographic art element upon a portion of said printed ink compound, leaving a remaining portion of said printed ink compound uncovered to view, applying heat to soften and somewhat melt both said printed ink compound and said hot-stamped adhesive, while applying pressure for bonding said compound and said adhesive together and squeezing said printed ink compound up around edges of said holographic art element, embedding said edges therein.

4,838,966

WOVEN ENDLESS TIRE REINFORCING BELT AND METHOD FOR PRODUCING SAME

Richard W. Oswald, Madison, Conn., assignor to The Armstrong Rubber Co., New Haven, Conn.

Filed Nov. 12, 1986, Ser. No. 929,602
Int. Cl.[4] B65H *81/08;* **B60C** *9/18*
U.S. Cl. 156—117 **22 Claims**



1. A method for weaving an endless tire reinforcing belt of a predetermined circumference from coated continuous cord reinforcement on an endless weaving surface comprising:

(a) supporting an endless weaving surface having a perimeter effective to produce a reinforcing belt of predetermined circumference and a width greater than that of the reinforcing belt to be woven about at least one support member rotatable about an axis;

(b) forming a first belt portion by laying a first portion of coated continuous cord reinforcements on said endless weaving surface in a zig-zag pattern having a width W_1 from edge to edge, said cord being positioned in timed relation with said support members across said surface from one side to the other, at an angle to the edges of the belt with reversals at the edges, and lengths of said cord reinforcement between reversals being interleaved with lengths disposed at an opposite angle along at least one line substantially parallel to and intermediate the edges of said belt being formed, said belt having a thickness in the areas of said edges greater than the belt thickness between said edges; and

(c) after said first belt portion has been formed, reducing the width W_1 to width W_2 and continuing to lay said reinforcement in a similar zig-zag pattern onto said weaving surface and superimposed onto the radially outward side of said first belt portion, thereby forming a second belt portion superimposed onto said first belt portion to fit between said edges of said first belt portion,

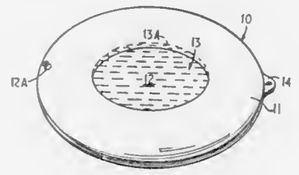
whereby said reinforcing belt has increased uniform stiffness from edge to edge.

4,838,967

BABY'S BATH

Vern L. Todd, and James Edye, both of 49 John Street, Woollahra, New South Wales, 2025, Australia

Continuation of Ser. No. 676,761, Apr. 14, 1976, abandoned, which is a division of Ser. No. 540,927, Jan. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 297,149, Oct. 12, 1972, abandoned. This application Oct. 21, 1977, Ser. No. 844,343
Claims priority, application Australia, Oct. 15, 1971, 6667
Int. Cl.[4] B32B *31/26*
U.S. Cl. 156—145 **2 Claims**



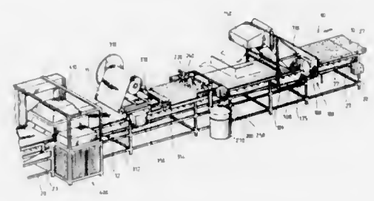
1. A method of manufacturing an inflatable bath comprising the steps of providing a first thickness of flexible, polyvinyl chloride air-impermeable sheet material with a valve, and sealing a second thickness of flexible, polyvinyl chloride air-impermeable sheet material to said first thickness along first and second closed paths, said first path lying wholly within the second path and the valve lying between the first and second paths, thereby to form an inflatable annulus of substantially uniform cross section between said first and second paths and a web within the annulus, and the method also comprising heating the bath while uninflated by contact with a hot fluid, removing the uninflated bath from contact with the hot fluid, inflating the bath while it is hot and allowing the bath to cool while inflated to provide an article which is smooth and wrinkle-free on subsequent reflation.

4,838,968

APPARATUS AND METHOD FOR MAKING V-GROOVE INSULATION

Charles M. Nelson, 6303 Brookhill Dr., Houston, Tex. 77087

Filed Nov. 12, 1987, Ser. No. 119,821
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—64 **22 Claims**



9. A process for the fabrication of a grooved length of insulation material from sectional ungrooved lengths of said material, said process comprising:

positioning sectioned ungrooved lengths of a flat insulation material in an abutting relationship along a movable track conveyor, such that the material progresses downstream in a longitudinal direction along the conveyor;

reducing the thickness of the sectional ungrooved lengths;

preparing the upper surface of the sectional ungrooved lengths by automatically applying an adhesive solution to the upper surface of the sectional ungrooved lengths;

automatically affixing a continuous length of backing material to the prepared surface such as to form a continuous integrated length of the insulation materials from the sectional lengths;

forming a series of grooves or notches in the bottom of said material spaces along the integrated length where said spacing of the grooves or notches is determined by a microprocessor assembly; and

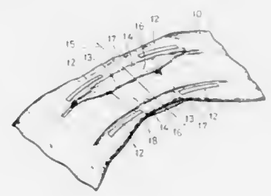
severing the integrated length at selected intervals.

4,838,969

METHOD FOR APPLYING AN ELASTIC BAND ONTO A MOVING WEB

Hironori Nomura, Iyomishima; Shimakawa Taiji, Kawanoe; Junji Shinohara, Iyomishima; Shigetoyo Kobayashi, Kagawa, and Hiroki Yamamoto, Kawanoe, all of Japan, assignors to Uni-Charm Corporation, Ehime, Japan

Filed Jul. 5, 1988, Ser. No. 215,359
Claims priority, application Japan, Jul. 3, 1987, 62-166523
Int. Cl.[4] B32B *31/16*
U.S. Cl. 156—160 **8 Claims**



1. A method for continuously feeding a web as a primary component of continuous article to a process to combine said web with longitudinally elastic band and for affixing said elastic band onto said web, said method comprising the steps of:

at said process of combination, folding (first folding) a predetermined length of said web at least corresponding to a single individual article at opposite side portions thereof so that said opposite side portions are opposed to each other at a predetermined angle with a central portion of said web and then partially folding (second folding) each of said opposite folded portions outwardly, these foldings occurring so that a first folding line and a second folding line being opposed to each other at each side of said web and include portions in non-parallel relationship and said folding defines a deformation of the web out of the plane of the web;

affixing the elastic band onto said web along a portion defined between said second folding line and the outermost edge at each side of said web, parallel to the longitudinal direction of said web and substantially in parallel to the elastic band on the other side of said web; and

flattening said web from said folded condition so as to achieve a desired final disposition of said elastic band, that said elastic band affixed onto said web at opposite sides thereof each has a diagonal orientation symmetrically with respect to the direction in which said web travels.

4,838,970

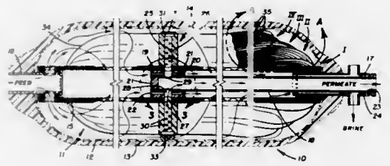
METHOD OF MAKING AN ASSEMBLY COMPRISING A FORAMINOUS CORE, SELF-LOCKING, HELICALLY WOUND, HOLLOW FIBER BUNDLE

Patricia A. Thibos, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 747,629, Jun. 24, 1985. This application Nov. 18, 1987, Ser. No. 121,974

Int. Cl.[4] B31C *1/00*; B65H *81/00, 81/06*

U.S. Cl. 156—169 6 Claims



1. A method of forming a stable, self-anchored, generally cylindrical hollow fiber bundle having generally dome-shaped ends, by back and forth helical winding of one or more hollow fibers on a rotating core;

said method comprising controlling the winding so that said bundle consists of a plurality of successively shorter formations, each formation being of successively longer strata, each stratum consisting of from about one to a plurality of coverages, and each formation having somewhat enlarged end portions,

thereby ensuring that the enlarged end-portions of each formation are axially located with respect to the corresponding such end-portions in adjacent formations so that the bundle itself does not have a substantially dog-boned shape and said bundle ends are generally dome-shaped.

4,838,971

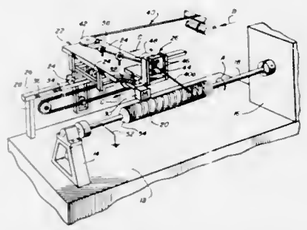
FILAMENT WINDING PROCESS AND APPARATUS

Harold L. Cacak, Lincoln, Nebr., assignor to Brunswick Corporation, Skokie, Ill.

Filed Feb. 19, 1987, Ser. No. 16,579

Int. Cl.[4] B29C *19/06*

U.S. Cl. 156—173 30 Claims



1. A method of filament winding an object from electrically conductive filament means impregnated with a thermomatrix binder, comprising the steps of:

providing pre-impregnated, solidified filament means;

winding the pre-impregnated filament means onto an appropriate mandrel defining the shape of the object; and

conducting an electrical current through the preimpregnated filament means during said winding to thermally alter the thermomatrix binder as the filament means are being wound on the mandrel.

16. An apparatus for filament winding an object from electrically conductive filament means impregnated with a thermomatrix binder, comprising:

supply means for pre-impregnated, solidified filament means;

means for winding the pre-impregnated filament means onto an appropriate mandrel defining the shape of the object; and

means for conducting a constant electrical current supply through the pre-impregnated filament means during said winding regardless of the filament length to thermally alter the thermomatrix binder as the filament means are being wound on the mandrel.

4,838,972

PROCESS FOR THE MANUFACTURE OF BUNDLES OF SEMI-PERMEABLE HOLLOW FILAMENTS FOR USE IN BLOOD, PLASMA AND DIALYSATE FILTERS

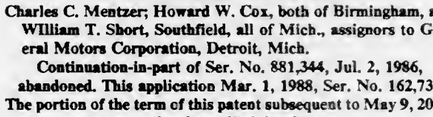
Jacobus J. H. G. Daamen, Bladel; Peter J. De Haan, Veldhoven, and Evert J. Klip, Hilvarenbeek, all of Netherlands, assignors to Organon Teknika B.V., Netherlands

Filed Sep. 2, 1987, Ser. No. 91,999

Claims priority, application Netherlands, Sep. 25, 1986, 8602416

Int. Cl.[4] B31C *13/00*

U.S. Cl. 156—175 13 Claims



1. A process for the manufacture of filament bundles, each comprising at least 1000 semi-permeable hollow filaments for use in a filter, comprising winding one or more hollow filaments onto a reel to form a skein comprising the total number of filaments required for a filter bundle, fixing said skein on said reel in at least one place by fastening means, severing said skein, thereby producing a free skein end and a fixed end, inserting said free skein end into an overall sleeve while said fixed end is fixed on said reel, said sleeve and said skein disposed therein having a length at least three times that length of the hollow filament bundle in the filter, and cutting said sleeve and the filaments disposed therein while in a rectilinear state into at least three portions each portion having the length of the hollow filament bundle in the filter.

4,838,973

METHOD OF APPLYING PAINTED CARRIER FILMS TO AUTOMOBILE BODY PARTS

Charles C. Mentzer; Howard W. Cox, both of Birmingham, and William T. Short, Southfield, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 881,344, Jul. 2, 1986, abandoned. This application Mar. 1, 1988, Ser. No. 162,731

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.[4] B32B *31/12, 31/20, 31/26*

U.S. Cl. 156—212 6 Claims

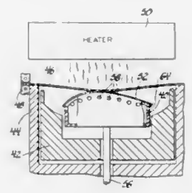
1. A method of making paint coated parts each comprising a stretched facing sheet layer and an underlying substrate layer, said method comprising the steps of:

providing a facing sheet layer having a top surface and a bottom surface wherein said top surface is first painted to a predetermined color by a color coat formulation containing flakes and then coated with at least one layer of a clear coat such that the total clear coat thickness is no less than 15 microns,

curing said color coat and said at least one layer of clear coat,

heating said facing sheet to a temperature at which said sheet becomes sufficiently pliable and stretchable for vacuum forming,

positioning said heating facing sheet over said substrate,



introducing a layer of an adhesive between said heated facing sheet and said substrate layer before contacting said facing sheet with said substrate, and

drawing vacuum from under said substrate layer such that said facing sheet stretches to a strain of at least 10% under said vacuum, and conforms and adheres to said substrate in such a way that said clear coat layer retains the gloss appearance of said facing sheet at a gloss reading of at least 50 as measured by a Gardner 20° gloss meter.

4,838,974

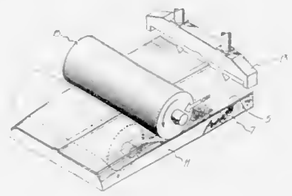
METHOD OF FORMING MULTILAYER COMPOSITE PANELS WITH SPECULAR SURFACE

Herman F. Nied, Clifton Park, and Louis P. Inzinna, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 940,452, Dec. 10, 1986, abandoned. This application Apr. 5, 1988, Ser. No. 177,711

Int. Cl.[4] B29C *65/02*; B32B *27/00, 31/20*

U.S. Cl. 156—222 9 Claims



1. A method of forming a multilayer composite thermoplastic panel comprising the steps of:

overlaying a reinforced thermoplastic sheet on a monolithic theremoplastic sheet;

heating the two sheets to forming temperature with the reinforced sheet stacked on top of the monolithic thermoplastic sheet;

plaacing the two sheets on a form having a predetermined curvature; and

exerting a normal force using a roller which extends axially across the width of the two sheets and is rolled sequentially across the length of the sheets, thereby bending the two sheets to the desired shape and simultaneously laminating the two sheets together.

4,838,975

ARRANGEMENT FOR PRESSURE ADJUSTMENT IN A VENEER ASSEMBLYING MACHINE

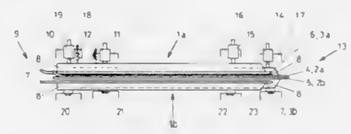
Oskar Bernath, Umiken, Switzerland, assignor to Georg Fischer AG Brugg

Filed May 19, 1988, Ser. No. 196,136

Claims priority, application Switzerland, May 19, 1987, 01921/87

Int. Cl.[4] B27D *3/04*

U.S. Cl. 156—564 9 Claims



1. An arrangement for pressure adjustment in a veneer assembling machine having an input side and an output side, the veneer assembling machine comprising at least two conveying units including alternatingly raisable and lowerable heating and conveying rails, the heating and conveying rails being arranged parallel next to each other on transverse support members, each rail having on the input side and the output side of the veneer assembling machine a pressure cylinder each to which a pressure medium can be admitted for applying pressure to the veneer, the pressure cylinders at the input side being arranged in a row extending transversely of the travel direction of the veneer, means for admitting differently adjustable pressures to at least the pressure cylinders at the input side, and a workpiece edge scanning device, the pressure cylinders being differently controllable through a valve control operated in dependence upon the workpiece edge scanning device.

4,838,976

METHOD FOR MANUFACTURING A STEERING WHEEL

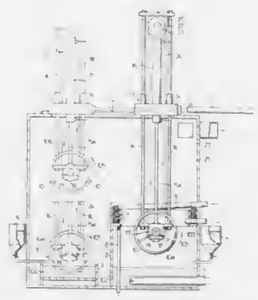
Kenji Sato, Aichi, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jun. 15, 1987, Ser. No. 62,780

Claims priority, application Japan, Aug. 30, 1986, 61-204910; Aug. 30, 1986, 61-204911

Int. Cl.[4] B29C *45/14*

U.S. Cl. 156—245 4 Claims



1. A process for manufacturing a steering wheel comprising:

(a) washing a metal core with a heated vapor of an organic solvent for oil, for degreasing said metal core in order to improve adherence of a selected thermosetting adhesive thereto, while transferring heat to said metal core via said heated vapor;

(b) providing a coating of said thermosetting adhesive on said degreased metal core;
(c) dielectrically heating said coated metal core by use of high-frequency to activate said thermosetting adhesive thereon, at an outer surface of said thermosetting adhesive;
(d) moldingly coating a layer of soft synthetic resin onto said activated surface of said thermosetting adhesive after setting said metal core, while said metal core remains heated, in an insert die and thereby bonding the soft synthetic resin to the metal core.

4,838,977

PROCESS AND APPARATUS FOR MAKING PLASTIC CARRYING BAGS OR SACKS

Wilfried Ebmeyer, Enger; Fritz Achelpohl, and Friedhelm Mundus, both of Lengerich, all of Fed. Rep. of Germany, assignors to Windmoeller & Holscher, Lengerich Fed. Rep. of Germany

Filed Aug. 22, 1986, Ser. No. 899,697
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1985, 3530070; May 14, 1986, 3616262
Int. Cl.[4] B31B *1/64*
U.S. Cl. 156—252 **11 Claims**

Fig 2

1. A process of making plastic carrying bags or sacks, said process comprising:
forming a plastic bag from gusseted tubular webs,
forming corner seam welds which are separately formed in two gussets at each side of the bag, said corner seam welds diverging obliquely from outer fold lines of the bag toward the bottom of the bag and terminate short of an inner fold line of said gussets of the bag,
forming said corner seam welds in only one fold of each of the two gussets before a transverse seam weld and when said corner seam welds have cooled, forming the other corner seam weld in the other fold of each of the two gussets on each side of the bag.

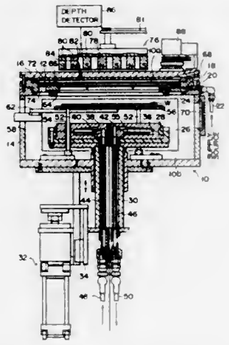
4,838,978

DRY ETCHING APPARATUS

Makoto Sekine, Yokohama; Haruo Okano, Tokyo; Tsunetoshi Arikado, Tokyo, and Yasuhiro Horiike, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 20, 1987, Ser. No. 123,353
Claims priority, application Japan, Nov. 21, 1986, 61-277984
Int. Cl.[4] C23F *1/02*
U.S. Cl. 156—345 **13 Claims**

1. A dry etching apparatus for etching a workpiece, comprising:
a vacuum vessel having a loading chamber;
an anode and a cathode which are arranged to face each other in said vacuum vessel;
high-frequency power means for being applied to said cathode;
a flange section extending from an inner wall of said vacuum vessel and located between said anode and said cathode;
loading means for loading a workpeece into said loading chamber between said flange section and said cathode from outside said vacuum vessel;
drive means for moving said cathode together with the workpiece toward said anode and urging an edge portion of said cathode against said flange section, said cathode partitioning an interior of said vacuum vessel into an etching chamber in which the workpiece is stored when the edge portion of said cathode is urged against said flange section;
means for introducing an etching gas into said etching chamber, said introducing means including at least one supply hole, formed in said flange section, for supplying the etching gas toward said etching chamber;
means for applying a magnetic field into said etching chamber, so that a plasma is generated in said etching chamber by the magnetic field and the high-frequency power applied to said cathode, said means for applying a magnetic field including a magnetic unit which is positioned outside said vacuum vessel such that said anode is located between said magnetic unit and said cathode; and



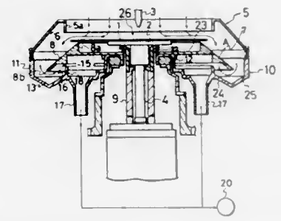
evacuation means for evacuating the interior of said etching chamber to maintain a predetermined pressure in said etching chamber, said evacuation means including a plurality of exhaust holes formed in said flange section at predetermined intervals in a circumferential direction and opening to a surface of said flange section faces said etching chamber, said exhaust holes communicating with said etching chamber and said loading chamber of said vacuum vessel.

4,838,979

APPARATUS FOR PROCESSING SUBSTRATE SURFACE

Masami Nishida, Kyoto, and Nobutoshi Orgami, Shiga, both of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Sep. 18, 1987, Ser. No. 98,476
Claims priority, application Japan, Sep. 19, 1986, 61-223334
Int. Cl.[4] C23F *1/02*
U.S. Cl. 156—345 **10 Claims**



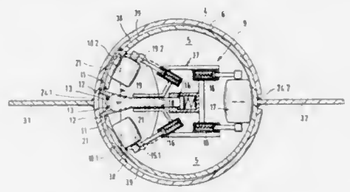
1. Apparatus for processing a substrate surface, said apparatus comprising:
an approximately cylindrical housing defining a processing chamber therein, said housing having a rim on the top end thereof, said rim defining an opening through which air is introduced into the chamber;
rotation means for fixedly holding a substrate to be processed along a horizontal surface substrate plane at the center of said chamber and for rotating said substrate about a rotary axis;
solution supply means for supplying a predetermined processing solution onto a top surface of said substrate;
a rectifying plate mounted immediately under said horizontal substrate plane, said rectifying plate having a frustoconical outer surface which is coaxial with said rotary axis of said rotation means, said outer surface extending downwardly and outwardly and having a bottom peripheral edge;
means defining a first auxiliary chamber located in a peripheral bottom part of the housing for collecting any surplus solution leaving the substrate surface;
means defining a second auxiliary chamber located under said rectifying plate, said second chamber being separated from and pneumatically communicating with said first chamber;
evacuation means cooperating with said rectifier plate for causing air entering said opening at said rim of said housing to flow along a path from said top surface of said substrate to said first auxiliary chamber, then to said second auxiliary chamber;
means for preventing most of the surplus solution collected in said first auxiliary chamber from entering said second auxiliary chamber; and
drain means for removing the surplus solution collected in said first auxiliary chamber.

4,838,980

METHOD AND APPARATUS FOR INTRODUCING AND JOINING DIAPHRAGMS IN SLOTTED WALLS

Eberhard Gläser, Aichwald; Eberhard Beitinger, Stuttgart, and Manfred Nussbaumer, Leonberg, all of Fed. Rep. of Germany, assignors to Ed. Züblin Aktiengesellschaft, Stuttgart-Möhringen, Fed. Rep. of Germany

Division of Ser. No. 768,458, Aug. 22, 1985, abandoned. This application Apr. 10, 1987, Ser. No. 37,082
Claims priority, application Fed. Rep. of Germany, Aug. 22, 1984, 3430789; Jun. 11, 1985, 3520820; Jun. 11, 1985, 3520817
Int. Cl.[4] B29C *47/12*
U.S. Cl. 156—497 **11 Claims**



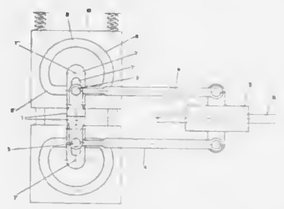
1. An apparatus for joining together the slotted inner connecting pipe of a diaphragm section with the slotted outer connecting pipe of another diaphragm section in a slotted wall, with said inner connecting pipe being inserted in said outer connecting pipe; said apparatus comprising:
an extruder for extruding fusable material;
at least one guide means which extends to, and opens into, said extruder, and in which a welding rod can be moved to said extruder;
a granulating part connected to said extruder, in the vicinity of where said guide means opens into the latter, for shearing off said welding rod in a granulation manner;
a heating mechanism connected downstream of said granulating part, when viewed in the direction of movement of said welding rod, for melting the individual granules separated from the latter; and
at least one welding shoe, which is connected to said extruder downstream of said granulating part, and has at least one outlet opening directed at the location which is to be fused.

4,838,981

DEVICE FOR SEALING ENVELOPES MADE OF PLASTIC

Pietro Fioravanti, Schio, Italy, assignor to P.F.M. S.p.a., Vicenza, Italy

Filed May 2, 1988, Ser. No. 189,235
Claims priority, application Italy, May 7, 1987, 85542 A/87
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—515 **6 Claims**



1. A device for sealing envelopes made of plastic material which comprises a pair of heads, two paddles (1) having parallel axes and rotating synchronously in opposite directions, a cam plate (8) being located on each of the heads of the device corresponding to both said paddles, means connected to said paddles sliding within said cam plates, whereby said paddles are adapted to carry out an eccentric path, said cam plates having a rectilinear section, both the extremities of said rectilinear section being joined by a portion having the shape of a circumferential sector, a support bar (3) to which each one of said paddles is fixed, a pair of rods (7) adapted to place in rotation each of said bars, each of said rods having a slot (7'), the portions close to the extremity of each of said bars being located within each of said slots in said rods (7), the ends of said bar (3) being located within said cam plate (8), said rods (7) rotating synchronously, the rods of each of the pairs placed in correspondence to each of said paddles rotating in a direction opposite to the direction of the other pair, a pair of arms (4) being fixed to each of said bars, each of said arms (4) having an axis perpendicular with respect to the transversal central plane of the paddles, said arms being pivoted on a carriage (5), said carriage sliding along a guiding staff (6) horizontally arranged.

4,838,982

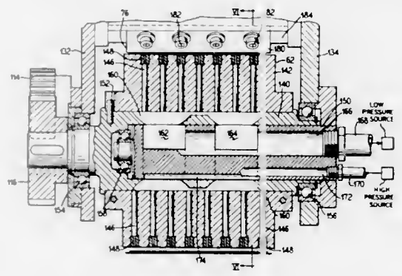
PATCH APPLICATOR VACUUM CYLINDER FOR WEB MATERIAL

Richard Klaeser, and Glenroy G. Blatz, both of Kiel, Wis., assignors to H.G. Weber & Co., Inc., Kiel, Wis.

Filed Jun. 26, 1987, Ser. No. 66,520
Int. Cl.[4] B32B *31/00*; B65H *3/64*; B21B *31/08*
U.S. Cl. 156—520 **2 Claims**

1. A patch applicator for cutting patches from a supply roll of patch material and applying the patches to a traveling web, comprising:
a rotatable vacuum cylinder having an outer cylindrical surface abutting said traveling web and including:
means for applying a low pressure air flow to a first arcuate portion of said outer cylindrical surface,
means for applying a high pressure air flow to a second arcuate portion of said outer cylindrical surface to release patches that have been applied to the traveling web, and
means for selectively changing said outer cylindrical surface of said rotatable vacuum cylinder for surfaces of different outside diameters including a first outer sleeve and a second inner sleeve coaxially and fixedly mounted

with respect to one another, said first outer sleeve being removable and replaceable with outer sleeves of various outside diameters, said first outer sleeve having generally elongated radially extending air channels, said second inner sleeve having axially extending slots, said axially extending slots each having a generally double arcuate profile to provide communication between high pressure means and low pressure means of limited axial



extent and said radially extending air channels over a greater axial extent;

a stationary inner core disposed within said second inner sleeve;

means for cutting patches of predetermined size from said supply roll, said cutting means cutting patches from the supply roll as the patch is against said first low pressure portion of said outer cylindrical surface so that a cut patch is carried on said first portion of said vacuum cylinder.

4,838,983

GAS TREATMENT APPARATUS AND METHOD

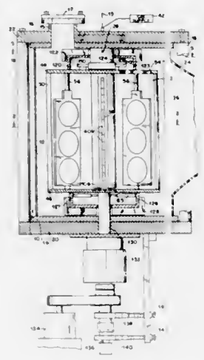
Norman E. Schumaker; Richard A. Stall, both of Warren; Craig R. Nelson, Green Village, and Wilfried R. Wagner, Basking Ridge, all of N.J., assignors to Emcore, Inc., South Plainfield, N.J.

Continuation of Ser. No. 881,628, Jul. 3, 1986, Pat. No. 4,772,356. This application Mar. 18, 1988, Ser. No. 169,621

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.[4] C23C *16/00*

U.S. Cl. 156—613 **22 Claims**



1. A method of treating a substrate having a front face with an active gas comprising moving said substrate along a predetermined circular path in a first direction such that said substrate has an instantaneous velocity vector along said predetermined circular path, said predetermined circular path being disposed in a predetermined plane, projecting said active gas from a point within said predetermined circular path outwardly across said predetermined circular path, whereby said active gas passes outwardly substantially parallel to said predetermined plane and traverses said predetermined circular path and maintaining the front face of the substrate transverse to said predetermined circular path in a manner such that a vector normal to said front face of said substrate lies between said instantaneous velocity vector of said substrate along said predetermined circular path and said radius of said circular path whereby each portion of said active gas impinges only once on said front face of said substrate as it traverses said said predetermined circular path in said predetermined plane.

4,838,984

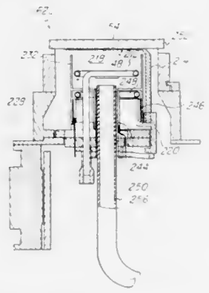
METHOD FOR ETCHING FILMS OF MERCURY-CADMIUM-TELLURIDE AND ZINC SULFID

Joseph D. Luttmer, Richardson; Cecil J. Davis, Greenville; Patricia B. Smith, Euless; Rudy L. York; Lee M. Loewenstein, both of Plano, and Rhett B. Jucha, Celeste, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 16, 1987, Ser. No. 74,451

Int. Cl.[4] H01L *21/306;* **B44C** *1/22*

U.S. Cl. 156—643 **34 Claims**



1. A method for etching zinc sulfide film forming at least a part of a wafer comprising:

(a) disposing said wafer into a process chamber at low pressure;

(b) generating a remote plasma from a source of hydrogen;

(c) introducing said remote plasma into said chamber and to a face of said wafer; and

(d) generating an in situ plasma within said chamber from a source of hydrocarbon.

4,838,985

APPARATUS FOR COATING AND LAMINATING SHEET MATERIALS

Constantinos Karagiannis, Xenophontos Str. 139, Kalithea,

Filed May 8, 1987, Ser. No. 47,176

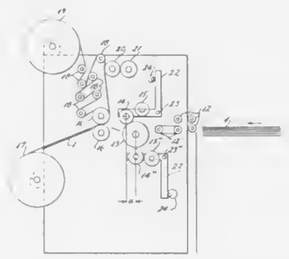
Claims priority, application Greece, Sep. 17, 1986, 86.2375/H

Int. Cl.[4] B32B *31/04, 31/18*

U.S. Cl. 156—522 **13 Claims**

1. An apparatus for coating and laminating sheet materials where the materials are fed from a sheet material supply and collected as a completed product comprising sheet feed means, said sheet feed means including first and second sheet engaging means mounted in generally parallel relationship with respect to one another, first cam means for reciprocally driving said sheet engaging means with respect to the sheet material supply, conveyor means mounted adjacent said sheet feed means, at least one coating cylinder means spaced from said conveyor

means for receiving sheet means from said conveyor means, means for supplying coating materials to said coating cylinder means, a pressure cylinder means mounted adjacent to said coating cylinder means, means for adjusting the spacing between said pressure cylinder means and said coating cylinder means, laminating means spaced from said coating cylinder means, said laminating means including a supply of film material, at least one second pressure cylinder means, said film extending from said film supply beyond said second pressure cylinder means to a collection means, whereby sheet materials passing between said coating cylinder means and said pressure cylinder means are introduced adjacent to said second pressure cylinder means into contact with said film material and thereafter collected on said collection means.



4,838,986

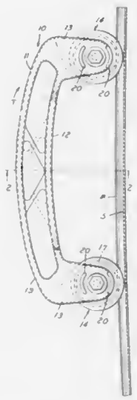
TOOL FOR APPLYING BODY SIDE MOLDING STRIP

James J. Rhoades, 30924 Rosslyn, Garden City, Mich. 48135, and Steven D. Kopriva, 2740 Pine Ridge Dr., West Bloomfield, Mich. 48033

Filed Dec. 8, 1986, Ser. No. 938,836

Int. Cl.[4] B32B *35/00*

U.S. Cl. 156—574 **16 Claims**



9. A tool comprising

an elongated body defining a handle,

a pair of rollers for applying a molding strip onto an automobile or the like,

each said roller having an annular groove about the central portion thereof which is concave in cross section and has integral radial flanges extending radially beyond the edges of the groove about the periphery of the groove,

means at each end of the handle for mounting a said roller for rotation about transverse axes with respect to the handle,

said means for mounting each said roller comprising integral flange portions extending transversely from the handle and an axle mounted between the flange portions, said rollers being mounted on said axles,

the length of the handle being about the width of the hand,

the position and size of the rollers being such that the palm can engage the outer surface of the handle and the fingers and the thumb can be wrapped about the handle,

the distance between the underside of the handle and the surface to which the strip is applied being such to accommodate fingers and the hand but at the same time maintaining minimal distance between the handle and the strip,

said body having an outer surface and an inner surface on the underside of the handle adjacent said rollers, said outer surface being convex in longitudinal cross section along an axis perpendicular to the roller axes,

said outer surface of said body having a width such that it is readily grasped and fits within the palm of the hand while at the same time the force of the palm of the hand is distributed over a wide area of the body,

such that when the strip is placed on a surface and the rollers are engaged with the strip, movement of the tool along the length of the strip will progressively apply pressure to spaced points along the length of the strip without excessive pressure at any point so that solid adhesion is achieved and application time is reduced.

4,838,987

METHOD OF ETCHING A SEMICONDUCTOR BODY

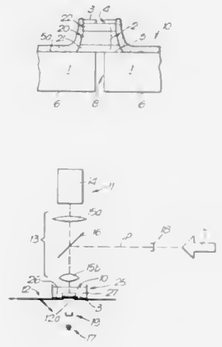
Peter J. Dobson, South Croydon, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 21, 1988, Ser. No. 184,322

Claims priority, application United Kingdom, Apr. 24, 1987, 8709727

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—626 **10 Claims**



1. A method of etching a semiconductor body, which method comprises providing a semiconductor body having first and second opposed surfaces and a first semiconductor region adjacent the first surface, bringing an etchant and the first surface into contact with each other, directing a radiation source towards the first surface, activating the radiation source to produce radiation having a wavelength or range of wavelengths shorter than or equal to that at which the first semiconductor region first absorbs radiation so as to induce etching of the first semiconductor region where the radiation is incident on the first surface, characterised by providing the semiconductor body with an optically distinguishable feature on the

second surface and by aligning the radiation source with the optically distinguishable feature so that the radiation induces etching of the first semiconductor region in alignment with the optically distinguishable feature of the second surface.

9. A method according to **1**, **2**, **3** or **4**, which comprises using a radiation detector to detect the amount of radiation from the radiation source(s) passing through the semiconductor body to monitor the etching of the first semiconductor region.

4,838,988

PROCESS FOR OBTAINING CRYSTALS OF INTERMETALLIC COMPOUNDS, IN PARTICULAR ISOLATED MONOCRYSTALS, BY COOLING ALLOYS IN THE MOLTEN STATE

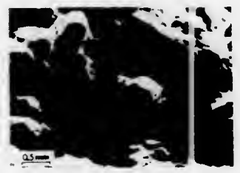
Jean-Marc Lang, La Troche, and Bruno Dubost, St Egrève, both of France, assignors to Pechiney, Paris, France

Filed Oct. 22, 1987, Ser. No. 111,193

Claims priority, application France, Nov. 5, 1986, 86 15774

Int. Cl.⁴ C30B *29/52*

U.S. Cl. 156—624 **16 Claims**



1. In a process for obtaining crystals of an intermetallic compound, comprising the steps of

completely melting in a crucible an alloy having a composition such that the first phase to crystallize is said intermetallic compound, and cooling said melted alloy to crystallize said intermetallic compound, the improvement comprising:

cooling said melted alloy to a temperature within the liquidus-solidus range of said intermetallic compound, and subsequently cyclically stirring the melted alloy while subjecting the melted alloy to a plurality of cycles of heating and cooling, while continuing the overall cooling of said melted alloy at a rate of less than 5° C. per minute, without attaining a temperature at which a further solid phase appears, crystals of said intermetallic compound appearing within said liquidus-solidus range; and

expelling said melted alloy from said crucible before further crystallization can occur.

4,838,989

LASER-DRIVEN FUSION ETCHING PROCESS

Carol I. H. Ashby, Edgewood; Paul J. Brannon, and James B. Gerardo, both of Albuquerque, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 25, 1987, Ser. No. 89,206

Int. Cl.⁴ B44C *1/22*

U.S. Cl. 156—628 **16 Claims**

1. A process for etching a solid ionic substrate comprising:

(a) applying a layer of coating material to a surface of said substrate, said coating material capable of reacting with said substrate when said substrate is in molten form,

(b) selectively irradiating regions of said substrate surface to melt at least a portion of said substrate and form a fusion reaction product at the irradiated regions, and

(c) removing said fusion reaction product and any excess coating material from said surface of said substrate by dissolving said fusion reaction product and said excess coating material with a solvent which does not substantially dissolve said substrate to thereby form an etched pattern in said substrate surface.

4,838,990

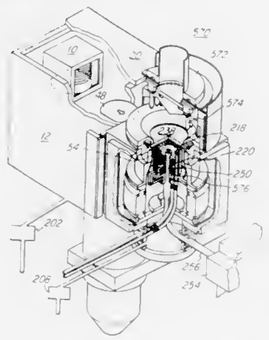
METHOD FOR PLASMA ETCHING TUNGSTEN

Rhett B. Jucha, Celeste; Cecil J. Davis, Greenville, and John I. Jones, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 16, 1987, Ser. No. 74,450

Int. Cl.⁴ B44C *1/22*; **C23F** *1/02*; **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **11 Claims**



1. A method for etching Tungsten on a wafer comprising:

(a) transferring a wafer into a vacuum processing chamber;

(b) applying a pressure to said chamber less than ambient to maintain said chamber at less than ambient;

(c) providing fluorine containing gas to a remote plasma chamber separated from said chamber and producing a remote plasma;

(d) adding a very weak oxygen source gas to said remote plasma chamber;

(e) adding a bromine containing gas and a resist selectivity enhancement has to said remote plasma chamber;

(f) applying a radio frequency signal across two electrodes one of which is adjacent to the wafer and causing a plasma to be formed whose dark space is in the vicinity of the surface of the slice; and

(g) flowing the gas mixture over said wafer disposed within said chamber.

4,838,991

PROCESS FOR DEFINING ORGANIC SIDEWALL STRUCTURES

William J. Cote, Essex Junction; Donald M. Kenney, Shelburne; Michael L. Kerbaugh, Burlington; Michael A. Leach, Winooski; Jeffrey A. Robinson, and Robert W. Sweetser, both of Essex Junction, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 114,960, Oct. 30, 1987, abandoned.

This application Jun. 20, 1988, Ser. No. 218,515

Int. Cl.⁴ B44C *1/22*; **B29C** *37/00*; **C03C** *15/00, 25/06*

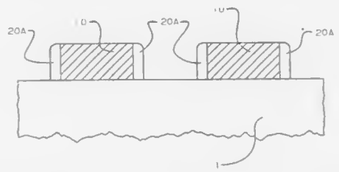
U.S. Cl. 156—643 **4 Claims**

1. A method for defining a masking structure on a substrate, comprising the steps of:

defining a plurality of organic mandrels having substantially vertical sidewalls on the substrate;

depositing a layer of parylene on the substrate and said mandrels; and

anisotropically etching said layers of parylene so as to define spacers on said sidewalls of said mandrels; and



exposing said spacers and said mandrels to dry etchants in which they posses analogous etch rates or to wet etchants in which they possess differing etch rates.

4,838,992

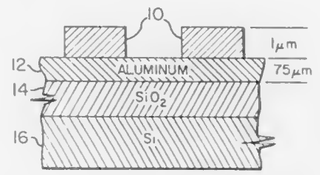
METHOD OF ETCHING ALUMINUM ALLOYS IN SEMI-CONDUCTOR WAFERS

Thomas Abraham, Kanata, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed May 27, 1987, Ser. No. 54,867

Int. Cl.⁴ C03C *15/00*

U.S. Cl. 156—643 **26 Claims**



1. A method of etching a layer of electrically conductive material, having aluminum as the principal element, formed on a semiconductor wafer, comprising forming a resist pattern on a layer of electrically conductive material having aluminum as the principle element, subjecting the wafer to a first plasma etching step using a gas mixture consisting essentially of BCl_3 and Cl_2 at predetermined flow rates and operating at low pressure until all the exposed electrically conductive material is removed whereby virtually vertical side walls of the electrically conductive material are obtained, and subjecting the wafer to a second plasma etching step using essentially the same components in the gas mixture and the same pressure and with the same flow rate of BCl_3 but with the flow rate of the Cl_2 reduced whereby tapering of the side walls is achieved, by lateral facet propagation of the resist using the chlorine species.

4,838,993

METHOD OF FABRICATING MOS FIELD EFFECT TRANSISTOR

Kenji Aoki, and Masafumi Shimbo, both of Tokyo, Japan, assignors to Seiko Instruments Inc., Tokyo, Japan

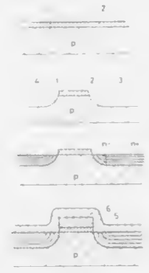
Filed Dec. 3, 1987, Ser. No. 128,088

Claims priority, application Japan, Dec. 4, 1986, 61-289162

Int. Cl.⁴ H01L *21/306*; **B44C** *1/22*; **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **4 Claims**

1. A process for fabricating a MOS field effect transistor comprising: a first step for thermally oxidizing a surface of a substrate of first semiconductor to form an oxide film, a second step for, after patterning, etching away said surface to form a gate insulated film, a source forming region and a drain forming region in said substrate, a third step for epitaxially depositing layers of second semiconductor in said source forming region and said drain forming region by applying an epitaxial growth method to form a source and a drain regions of second semiconductor having a lightly doped region and a heavily doped region therein, a fourth step for depositing a layer of



polysilicon or other high melting point materials on said oxide film and said source and drain regions, and a fifth step for, after patterning, etching away said layer to form a gate on said gate insulated film.

4,838,994

METHOD FOR STRUCTURING A COPPER AND/OR PERMALLOY LAYER BY MEANS OF DRY ETCHING

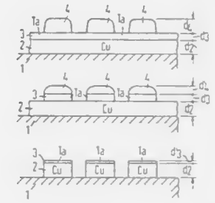
Peter Gulde, Berlin, and Christian Scholz, Stockdorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 6, 1988, Ser. No. 602,307

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1987, 3721180

Int. Cl.⁴ B44C *1/22*; **C03C** *15/00, 25/06*; **C23F** *1/02*

U.S. Cl. 156—643 **12 Claims**



1. A method for structuring by dry etching a copper or permalloy alloy layer on a substrate surface, comprising steps of:

applying a tantalum layer to be made into a metallic mask for transferring a desired structure to said copper or permalloy alloy layer;

photolithographically generating a photoresist layer having said desired structure on the tantalum layer;

transferring onto the tantalum layer metallic mask the desired structure of the photoresist layer through reactive ion etching, and continuing this procedure until the copper or permalloy alloy layer to be structured is exposed; and

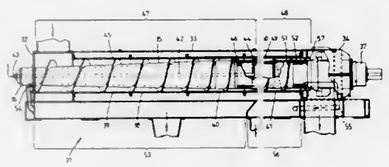
employing ion beam etching in connection with the structured tantalum layer metallic mask to structure the copper or permalloy alloy layer.

4,838,995

PROCESS FOR BLEACHING CELLULOSE PULP, A PLANT FOR PREFORMING SAID PROCESS, AND A SCREW PRESS FOR USE WITH SAID PROCESS AND PLANT

Arne I. Klausen, Sande, Norway, assignor to Thune-Eureka A/S, Tranby, Norway

Filed Jan. 28, 1987, Ser. No. 7,564
Claims priority, application Norway, Oct. 23, 1986, 864241
Int. Cl.[4] D21C 9/00
U.S. Cl. 162—18 5 Claims



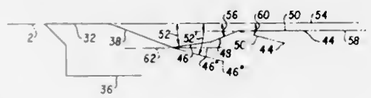
1. A process for bleaching cellulose pulp or fractions thereof, comprising introducing material comprising cellulose pulp or fractions thereof having a concentration of 0.5–10% by weight into a screw press having a screw supported on a screw shaft having a longitudinal bore providing communication between an inlet and outlet longitudinally displaced from one another along said screw shaft, said screw press comprising at least a first and a second dewatering zone through which said screw shaft extends, said outlet of said screw shaft positioned within said second dewatering zone, dewatering said material in said first zone to a concentration of 20–40% by weight, feeding a bleach liquor to said inlet of said screw shaft to treat the pulp in said second zone of said screw press, further dewatering said treated pulp in said second zone to a pulp concentration of 15–50% by weight, recovering any liquid removed from the pulp during dewatering in said second zone, and mixing said liquid with fresh bleach chemicals to form an admixture of bleach liquor which is subsequently fed to the inlet of said screw shaft.

4,838,996

HYDROFOIL BLADE FOR PRODUCING TURBULENCE

Otto J. Kallmes, Danvers, Mass., assignor to M/K Systems Inc., Danvers, Mass.

Filed Jan. 29, 1988, Ser. No. 150,206
Int. Cl.[4] D21F 1/48, 1/54
U.S. Cl. 162—352 11 Claims



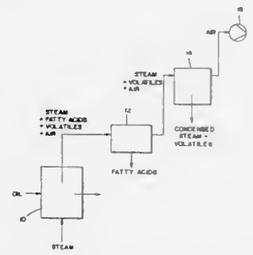
1. A hydrofoil blade for use in a paper making machine of the type wherein hydrofoil blades are positioned beneath a forming medium and extended in the cross machine direction relative to said forming medium for draining water through said forming medium while a paper web is being formed on said forming medium and for forming said paper web, said hydrofoil blade comprising a plurality of separate and distinct surfaces including a forming medium bearing surface lying in a first plane and having a leading edge, a lower surface lying in a second plane and spaced from said forming medium bearing surface, at least one dewatering surface diverging downward towards said lower surface from a respective of at least one crease line, and at least one intermediate surface extending from a respective of said at least one dewatering surface to a respective of at least one other crease line, each of said at least one intermediate surface including in tandem in the machine direction (a) a vacuum decay surface extending from said at least one dewatering surface, (b) a turbulence generating surface extending upward from said vacuum decay surface and upwardly of said lower surface, and (c) a trailing surface lying in a third plane and extending from said turbulence generating surface to said at least one other crease line, said third plane lying between said first plane and said second plane.

4,838,997

DEODORIZATION PROCESS FOR TRIGLYCERIDE OIL

Werner Merk, Buchholz, Fed. Rep. of Germany, assignor to Atlas-Danmark A/S, Denmark

Continuation of Ser. No. 825,111, Feb. 3, 1986, abandoned, which is a continuation of Ser. No. 613,132, May 23, 1984, abandoned. This application Nov. 13, 1987, Ser. No. 122,548
Claims priority, application United Kingdom, May 25, 1983, 8314496
Int. Cl.[4] B01D 3/10, 3/38
U.S. Cl. 203—92 1 Claim



1. A process for deodorizing a triglyceride oil to produce a condensate without undesirable emulsions, comprising the steps of:

(a) heating the oil in a chamber to a temperature of about 160°–280° C. under a headspace pressure of about 0.1–8.0 mbar;

(b) passing dry steam through the heated oil to form a vapor including steam, volatile materials, and oil;

wherein said dry steam comprises steam in which the equilibrium vapor pressure of water is more than the pressure under which the steam is maintained prior to passage through the oil, and wherein the velocity of the steam is between about 1.7 and 16.0 kg/hr per m^2 cross-sectional area of headspace above the oil;

(c) maintaining the oil content in the vapor to about 0.01–100 mg/m^3;

(d) increasing the pressure of the vapor to above about 10 mbar by mechanical pump means;

(e) directing the pressurized vapor into the inlet of an indirect condenser;

(f) passing the vapor through the indirect condenser along a flow path of decreasing cross-sectional area at a pressure less than about 60 mbar and at a substantially constant flow rate having a Reynolds number less than about 2300;

wherein the decrease is such that the ratio of the cross-sectional area of the inlet to the outlet of the indirect condenser is between about 50:1 and 5:1;

(g) indirectly condensating the vapor by passing coolant at a temperature of about 0°–25° C. along another separate flow path through the indirect condenser;

(h) collecting the resultant condensate from the indirect condenser; and

(i) exhausting the remaining vapor from the outlet of the indirect condenser.

4,838,998

PROCESS FOR SEPARATING SULFURIC ACID AND CARBOXYLIC ACIDS

Philip D. T. Davies, Seabrook, Tex., and Lawrence S. Kirch, Meadowbrook, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 809,323, Dec. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 690,076, Jan. 9, 1985, abandoned. This application Dec. 4, 1987, Ser. No. 128,749
Int. Cl.[4] B01D 3/34
U.S. Cl. 203—96 5 Claims

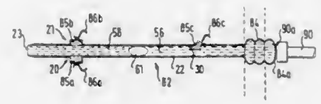
1. A method of separating components of a mixture comprising from about 10 to about 50 weight percent of a isobutyric acid having, by itself or as an azeotrope with water, a boiling point lower than that of sulfuric acid, from about 75 to 85 weight percent of sulfuric acid, and up to about 5 weight percent of water, which comprises feeding the mixture into a multistage distillation column operated at a temperature in the range of from about 100° C. to about 160° C. and at a pressure of from about 30 mm to about 50 mm; feeding dilution water into the column below the point of entry of said mixture; diluting the mixture while in the column with said dilution water to provide a distillation mixture having a water:sulfuric acid mole ratio of from 1:1 to 1.5:1; and distilling the mixture, wherein the dilution water is fed into the column at an amount sufficient to provide from about 10 to about 20 weight percent total water in the distillation mixture at the outset of the distillation;

4,838,999

METHOD FOR THE ELECTROCHEMICAL ANALYSIS OF ELECTROLYTIC COMPONENTS IN A SAMPLE LIQUID

Hans-Peter Haar, Weilheim; Hermann Edelmann, Tutzing; Horst Herrmann, Bernried, and Joachim Thiery, Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 591,780, Mar. 21, 1984, abandoned. This application Aug. 17, 1988, Ser. No. 233,329
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1983, 3312922
Int. Cl.[4] G01N 1/14, 27/26
U.S. Cl. 204—1 T 10 Claims



1. A method of making an electrochemical analysis of electrolytic components in a sample liquid, especially of a body fluid, utilizing a device comprising a selective measurement electrode for a kind of ion to be analyzed, a reference half-cell which includes a conducting-off element co-operating in the operational state with a reference electrolyte, a voltage measurement device for the measurement of the voltage between the measurement electrode and the conducting-off element, a pipe provided with a sucking-in opening for the sample liquid and having the measurement electrode disposed thereon, the conducting-off element of the reference half-cell being arranged on the pipe in the sucking-in direction behind the measurement electrode in such a manner that it directly contacts a liquid reference electrolyte present in the pipe which liquid contains a species of ions in fixed concentration which makes a reversible electrochemical reaction with the conducting-off element, comprising:

sucking-in into the pipe a sample liquid and transporting the sample liquid, together with the liquid reference electrolyte present in the pipe, with respect to the pipe in the same direction as the sucking-in direction in the pipe for causing the sample liquid to contact the measurement electrode and for causing the reference electrolyte to contact the conducting-off element simultaneously while both liquids are in contact with each other,

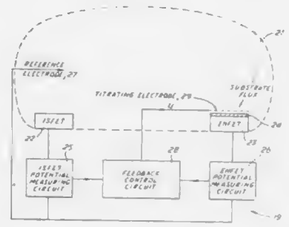
activating the voltage measurement device in a measurement operational state in that the sample liquid contacts the measurement electrode and the reference electrolyte contacts the conducting-off element and both liquids are in contact with one another.

4,839,000

BUFFER COMPENSATION IN ENZYME-MODIFIED ION SENSITIVE DEVICES

Mark J. Eddowes, Uxbridge, England, assignor to Thorn EMI plc, London, United Kingdom

Filed Nov. 21, 1986, Ser. No. 933,246
Claims priority, application United Kingdom, Nov. 22, 1985, 8528794
Int. Cl.[4] G01N 27/46
U.S. Cl. 204—1 T 15 Claims



1. A system for measuring the concentration of a first substance in a solution, the system comprising a first and a second ion-sensitive device, one of said devices including a second substance which causes ions to be produced when said second substance is exposed to said first substance, the number of ions produced being related to the concentration of said first substance, each device incorporating ion-sensitive means sensitive to said ions, whereby a concentration of said ions can be sensed by said ion-sensitive means; and

an electrical control circuit for passing a current to control the concentration of said ions detected by one of said devices, so as to cause substantial equality of the concentration of said ions at said first and said second devices, the magnitude of said current being indicative of said concentration of said first substance.

4,839,001

ORIFICE PLATE AND METHOD OF FABRICATION

Joseph J. Bakewell, Boxford, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.

Filed Mar. 16, 1988, Ser. No. 168,665
Int. Cl.[4] C25D 1/08
U.S. Cl. 204—11 12 Claims

1. An orifice plate, comprising:

a first layer of a metal electroformed to a desired thicken to form a desired pattern of holes of selected first cross section greater than 2 mils in diameter and spaced apart 5 mils or less center to center; and

a second layer of the metal electroformed onto the first layer to a thickness of 2 mils or less to form a pattern of holes of

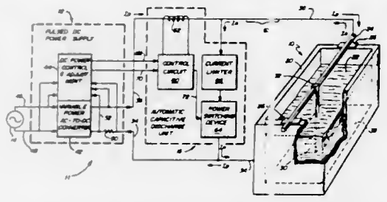
selected cross-section 2 mils or less in diameter in registration with the holes of the first layer.

4,839,002

METHOD AND CAPACITIVE DISCHARGE APPARATUS FOR ALUMINUM ANODIZING

Jeffrey R. Pernick, Union Lake, and Frederick Tourtellotte, Birmingham, both of Mich., assignors to International Hardcoat, Inc., Detroit, Mich.

Filed Dec. 23, 1987, Ser. No. 137,516
Int. Cl.⁴ C25D *11/04, 17/00*
U.S. Cl. 204—58 **14 Claims**



11. In an anodizing system using an electrolyte, anode and cathoe, for anodizing at least one workpiece of aluminum or alloys thereof in liquid bath including the electrolyte, a method of controllably discharging any inherent capacitance existing between the anode and workpiece being anodized and the electrolyte and cathode during an anodizing process involving the intermittent supplying of positive current from the anode into the workpiece, the method comprising the steps of:

(a) providing automatic switchable shunt discharge means for intermittently providing negative current to the workpiece by shunting the anode to the cathode, the discharge means being arranged to produce such negative current solely by the unassisted discharge of accumulated charge present on the inherent capacitance;

(b) detecting the cessation of positive current flow into the workpiece; and

(c) immediately after detecting such cessation of the positive current flow, providing such negative current in an amount sufficient to discharge the inherent capacitance substantially completely prior to the next intermittent supplying of positive current from the anode into the workpiece.

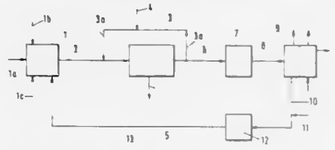
4,839,003

PROCESS FOR PRODUCING ALKALI HYDROXIDE, CHLORINE AND HYDROGEN BY THE ELECTROLYSIS OF AN AQUEOUS ALKALI CHLORIDE SOLUTION IN A MEMBRANE CELL

Rainer Dworak, Wiesbaden, and Karl Lohberg, Heusenstamm, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 3, 1987, Ser. No. 116,433
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1986, 3637939
Int. Cl.⁴ C25B *1/02, 1/16, 1/26*
U.S. Cl. 204—98 **1 Claim**

1. A process for producing alkali hydroxide, chlorine and hydrogen by the electrolysis of an aqueous alkali chloride solution in a membrane electrolytic cell, comprising in a dissolver dissolving in water a high-NaCl solid salt which contains calcium and magnesium impurities to form a salt solution, adding precipitating chemicals to the salt solution to precipitate the impurities, feeding the resulting mixture to a thickener and separately withdrawing therefrom calcium and magnesium-containing precipitates and clarified raw brine, removing the withdrawn precipitates from the process, dividing the clarified raw brine withdrawn from the thickener into a first and a second partial stream at a ratio between 2:1 and 10:1, mixing the larger first partial stream with the salt solution and the precipitating chemicals before entering the thickener, feeding the resulting mixture to the thickener, subjecting the second partial stream to a fine purification, supplying to the membrane electrolytic cell the finely purified brine containing magnesium not in excess of 1 mg/l and calcium not in excess of 3 mg/l, and feeding spent brine from the cell to the salt dissolver.

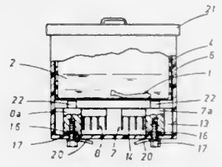


4,839,004

METHOD AND AN APPARATUS FOR COLD STERILIZATION OF SURGICAL INSTRUMENTS, IN PARTICULAR DENTAL SURGERY INSTRUMENTS

Franco Castellini, Bologna, Italy, assignor to Castellini, S.P.A., Bologna, Italy

Filed Feb. 24, 1988, Ser. No. 159,718
Claims priority, application Italy, Feb. 27, 1987, 3365 A/87
Int. Cl.⁴ C25B *1/26*
U.S. Cl. 204—128 **20 Claims**



1. A method for the cold sterilization of surgical instruments comprising:

immersing the instruments in a bath of a water electrolyte solution having pH-value of less than 7.5 and a concentration of chloride ions between 0.45 and 0.85 g/l;

without having the instruments contacting an electrode, or anode inducing electrolysis of the electrolyte for a predetermined time whereby active chlorine is generated in the electrolyte and the instruments are sterilized.

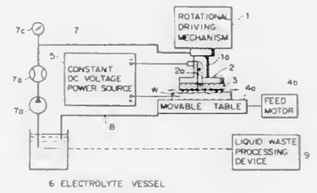
4,839,005

ELECTROLYTIC-ABRASIVE POLISHING METHOD OF ALUMINUM SURFACE

Kenichi Katsumoto, Ashiya; Shigeo Isoda, Nagoya; Takahiro Yuuki, Kobe; Shiro Koike, Kobe; Yutaka Yamamoto, Kobe; Suguru Motonishi, Akashi; Tadashi Kawaguchi, Kobe; Tetsuya Gotoh, Kobe, and Shiro Horiguchi, Hyogo, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Apr. 28, 1988, Ser. No. 187,464
Claims priority, application Japan, May 22, 1987, 62-126330
Int. Cl.⁴ B23H *5/06, 5/14*
U.S. Cl. 204—129.46 **5 Claims**

1. A method of fabricating an aluminum surface for applying mirror-smooth fabrication to the surface of aluminum or aluminum alloy by combining an electrolytic anode dissolving effect to said surface and a polishing effect of removing the protruded portions of passivated films formed on said surface to be fabricated by lapping with abrasive grains, setting the voltage between the aluminum material and the tool electrode to within 2.1±0.3 V, utilizing an electrolyte at less than 10% concentration as a passivation type electrolyte, setting the urging pressure of the tool electrode to the surface to be fabricated to less than 2.0 kgf/cm² and using free abrasive grains with the average grain size of less than 1.0 μm as said abrasive grains.



4,839,006

SURFACE TREATMENT PROCESS FOR CARBON FIBERS

Fujio Nakao, and Hirofumi Uno, both of Hiroshima, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed May 27, 1988, Ser. No. 199,453
Claims priority, application Japan, Jun. 1, 1987, 62-137980
Int. Cl.⁴ C25F *5/00*
U.S. Cl. 204—130 **10 Claims**

1. A process for the surface treatment of carbon fiber having a modulus of not less than 30 ton/mm², in two steps, which comprises the steps of:

subjecting a carbon fiber as an anode to a first electrolytic treatment in an aqueous solution at a temperature of not less than 60° C. of an inorganic acidic electrolyte or an neutral salt electrolyte; and then

subjecting the treated fiber to a second electrolytic treatment in an aqueous solution of an ammonium salt of carbonic acid or of an inorganic alkaline electrolyte.

4,839,007

METHOD FOR PURIFYING INDUSTRIAL WASTE WATER BY DIRECT OXIDATION OF THE ORGANIC POLLUTANTS

Rüdiger Kötz, Unterehrendingen; Claus Schüler, Widen, and Samuel Stucki, Nussbaumen, all of Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland

Filed Feb. 17, 1988, Ser. No. 156,890
Claims priority, application Switzerland, Feb. 20, 1987, 660/87
Int. Cl.⁴ C02F *1/46*
U.S. Cl. 204—149 **9 Claims**

1. A method for purifying industrial waste water by direct oxidation of organic pollutants contained therein, which comprises electrochemically oxidizing said waste water in a cell, wherein an anode used is an electrode having a high oxygen overvoltage which does not contain noble metals in any form, nor PbO_2, nor graphite in its part, nor in an intermediate layer, and wherein an active outer coating of said anode in contact with said waste water consists of SnO_2 doped with an element selected from the group consisting of F, Cl, Sb, Mo, W, Nb and Ta or with a mixture of at least two of the above-mentioned elements.

4,839,008

HOMOGENEOUS CATALYTIC PHOTOCHEMICAL FUNCTIONALIZATION OF ALKANES BY POLYOXOMETALATES

Craig L. Hill, Atlanta, Ga., assignor to Emory University, Atlanta, Ga.

Filed Jun. 10, 1987, Ser. No. 60,337
Int. Cl.⁴ B01J *19/08*
U.S. Cl. 204—157.15 **16 Claims**

1. A method for functionalizing alkanes, which comprises:

(a) combining one or a mixture of alkanes with a photochemically active polyoxometalate compound to obtain a reaction medium;

(b) allowing said photochemically active polyoxometalate compound to catalyze homogeneously functionalization of said alkane in the presence of visible or ultraviolet light wherein said functionalization is carried out by said polyoxometalate in an excited state and produces a reduced polyoxmetalate; and

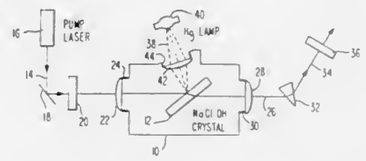
(c) obtaining said functionalized alkane from said reaction medium.

4,839,009

NACL: ON COLOR CENTER LASER

Clifford R. Pollock; Josepb F. Pinto, and Efstratios Georgiou, all of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jun. 5, 1986, Ser. No. 870,810
Int. Cl.⁴ H01S *3/16*
U.S. Cl. 204—157.48 **4 Claims**



1. A method of producing a tunable laser material which comprises a sodium chloride crystal incorporating oxygen impurities, said crystal having a crystallographic structure containing point defects comprising anion vacancy —O⁻⁻ centers having adjacent thereto F_2^+ color centers forming F_2^+:O⁻⁻ centers thereby providing a lasing capability, which method comprises:

forming a sodium chloride crystal containing an oxygen-impurity dopant;

additively coloring said doped sodium chloride crystal;

exposing the resultant crystal to UV light to produce a broad absorption band centered at about 1.04 μm; in said crystal;

cooling said crystal and again exposing it to UV light to shift said absorption band to about 1.07 μm;

thereby providing said F_2^+:O⁻⁻ color centers.

4,839,010

FORMING AN ANTIREFLECTIVE COATING FOR VLSI METALLIZATION

Cloves R. Cleavelin, Lubbock, and Danny Phillips, Levelland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

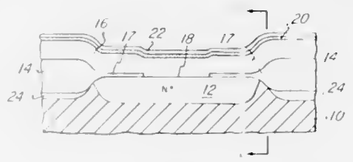
Continuation of Ser. No. 771,521, Aug. 30, 1985, abandoned.
This application Nov. 6, 1986, Ser. No. 928,691
Int. Cl.⁴ C23C *14/00;* **B05D** *5/12*
U.S. Cl. 204—192.28 **12 Claims**

8. A method of forming an antireflective coating on a face of a semiconductor, comprising:

(a) depositing a first metal layer on said face;

(b) forming a metal oxide layer on said first metal layer;

(c) heating the metal oxide layer to a temperature in the range of 325° C. to 375° C.; and
(d) sputtering a second layer of metal selected from the

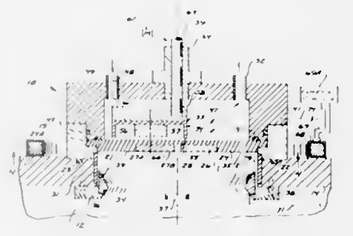


group consisting of aluminum and aluminum alloys over the oxide layer of a sufficient thickness such that bumps are formed which reduce the specularity of a surface of the second layer.

4,839,011
ARC COATING OF REFRACTORY METAL COMPOUNDS

Subbiah Ramalingam, Roseville, and Rongfeng Chang, Minneapolis, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation of Ser. No. 848,720, Apr. 4, 1986, abandoned, which is a continuation-in-part of Ser. No. 825,958, Feb. 4, 1986, Pat. No. 4,673,477, which is a continuation of Ser. No. 585,845, Mar. 2, 1984, abandoned. This application Jun. 10, 1988, Ser. No. 206,988
Int. Cl.[4] C23C *14/22*
U.S. Cl. 204—192.38 **10 Claims**

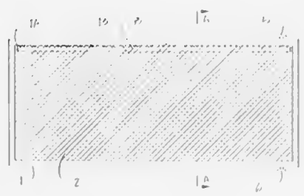


1. A method of providing an alloy film on a member comprising the steps of providing an anode and a cathode for forming a plasma discharge arc;
forming the cathode to have an active target surface of at least two dissimilar materials having the capability of supporting an arc in different active surface portions, the active surface portions being adjacent the anode;
forming an arc between the anode and cathode to generate a flux containing a desired proportion of each of the dissimilar materials for forming a deposited coating on the member; and
providing a magnetic field adjacent the cathode of sufficient strength and field orientation to define a closed arc track in which the arc is confined to travel regardless of the materials forming the active surface portions by presence of the magnetic field on both of the different active surface portions of the cathode, so that as the arc moves in the closed arc track the arc thereby travels over regions of both of said different surface portions, the arc track length being defined in relation to the arc speed of travel so that cathode materials remain molten in the arc track as the arc moves in said arc track during operation.

4,839,012
ANTISURGE OUTLET APPARATUS FOR USE IN ELECTROLYTIC CELLS

Harry S. Burney, Jr., Richwood, Tex.; Gregory J. E. Morris, Milan, Italy; Richard N. Beaver, Angleton, and Robert D. Spradling, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 5, 1988, Ser. No. 140,845
Int. Cl.[4] C25B *9/00, 15/08*
U.S. Cl. 204—255 **59 Claims**



1. A dampening device for use in a vertically disposed electrochemical cell unit of the type at least having:
(a) a peripheral flange which defines at least one electrode chamber, said peripheral flange having a upper, substantially horizontally disposed flange portion, a lower substantially horizontally disposed flange portion, and two disposed side flange portions; and (b) at least one outlet port passing through the upper horizontally disposed flange portion or through one of the two vertical side flange portions or through the lower flange portions and connecting the exterior of the cell with the electrode chamber, said dampening device comprising:
an elongated, hollow dampening device positioned across at least a portion of the top of the electrode chamber adjacent to the upper, horizontally disposed flange portion, said dampening device being in fluid flow communication with said electrode chamber and with said outlet port(s), wherein the dampening device has at least one opening near its top which connects the interior of the dampening device with the electrode chamber, wherein said opening(s) has a total cross sectional area less than or equal to the greatest internal cross sectional area of the dampening device, wherein the size and shape of said dampening device is adapted to cause an increase in flow velocity of any fluid passing from the electrode chamber into the opening(s) in the dampening device.

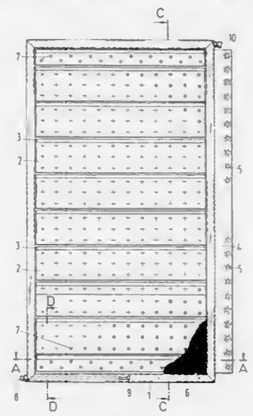
4,839,013
ELECTRODE ASSEMBLY FOR GAS-FORMING ELECTROLYZERS

Karl Lohrberg, Heusenstamm, and Peter Kohl, Neuberg, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 9, 1987, Ser. No. 107,181
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1986, 3640584
Int. Cl.[4] C25B *9/00*
U.S. Cl. 204—258 **6 Claims**

1. An electrode assembly for a gas-forming monopolar membrane electrolyzer, said assembly comprising: a frame, at least one anode, at least one cathode, an ion-selective membrane between the anode and cathode, wherein the anode and cathode each comprises a vertical plate electrode and an ante-electrode electrically conductively connected at many points to the plate electrode, wherein said plate electrode is composed of platelike metal strips with gaps between the strips, wherein said strips are electrically conductively fastened to the frame, wherein the surface of the plate electrode which faces the

membrane has an activating coating to activate electrolysis, wherein said ante-electrode is at the surface of the plate electrode facing the membrane, wherein said ante-electrode is a

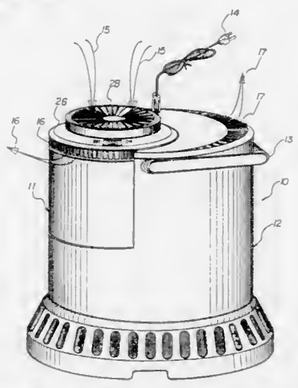


vertical, planar, electrically conducting screenlike or sievelike metal structure covering at least one surface of the plate electrode and the distance between the plate electrode and the ante-electrode fastened thereto is 1–5 mm.

4,839,014
CLEANER ASSEMBLY, HUMIDIFIER, GAS ALARM AND DETOXIFICATION SYSTEM

Sea C. Park, and In P. Park, both of 3836 Birchwood, Skokie, Ill. 60076

Filed Dec. 16, 1987, Ser. No. 133,924
Int. Cl.[4] C25B *9/00*
U.S. Cl. 204—265 **6 Claims**

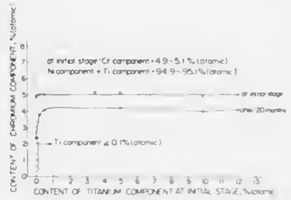


1. An appliance assembly for use in a room which comprises:
an air processing structure for air cleaning and humidifying the room, said air processing structure including a water tank, a filter chamber disposed in said water tank, an electrical turbo fan disposed within said filter chamber, a motor mount housing disposed within said water containing member, a motor rotor supported by said housing operatively associated with said turbo fan, a filter cover containing six filter stages, a cover grille as an air intake disposed on said filter cover for receiving unfiltered air, and a plurality of apertures for exhausting cleaned and humidified air to the atmosphere, wherein said six filter stages include a first stage containing impingement fiber for filtering large size airborne particles, a second stage containing a coated filter for absorbing the particles, a third stage containing an activated charcoal filter for absorbing odors, a fourth stage containing a woven fabric filter for filtering contaminants, a fifth stage containing a coated filter for electrostatically absorbing the particles, and a sixth stage containing a filter for eliminating submicron airborne pollutants; and
an electrochemical reactor operatively connected to said air processing structure for activating a gas alarm and supplying oxygen to the room, said electrochemical reactor being detachable from said air processing structure, and said electrochemical reactor including an electrolysis system for supplying oxygen, an oxygen controlling system for controlling the supply of oxygen at a predetermined percentage in the room and a gas alarm system for monitoring carbon monoxide,
wherein the assembly is constructed so as to be used as an air cleaner, humidifier, gas alarm, and oxygen-supplier.

4,839,015
HYDROGEN-EVOLUTION ELECTRODE AND A METHOD OF PRODUCING THE SAME

Hisashi Wakamatsu, and Yasuhide Noaki, Nobeoka, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 916,647, Oct. 8, 1986, abandoned. This application Mar. 3, 1988, Ser. No. 166,805
Claims priority, application Japan, Oct. 9, 1985, 60-225424
Int. Cl.[4] C25B *11/04*
U.S. Cl. 204—290 R **4 Claims**



1. A hydrogen-evolution electrode comprising an electrically conductive substrate having thereon a coating comprising a chromium component, a titanium component and an oxide of at least one metal selected from the group consisting of nickel and cobalt, said chromium component and titanium component being present in proportions, in term of atomic percentage, of 0.5 to 20% and 0.1 to 3.5%, respectively, the said atomic percentage of chromium being defined by following formula

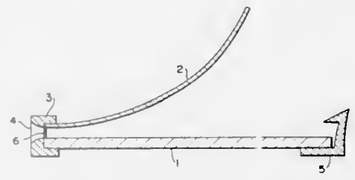
$$\frac{A_{Cr}}{A_T} \times 100(\%) \quad (1)$$

wherein A_{Cr} represents the number of chromium coating and A_T represents the total number of atoms of chromium, titanium and said at least one metal in the coating, said atomic percentage of titanium being defined by the following formula

$$\frac{A_{Cr}}{A_T} \times 100(\%) \quad (1)$$

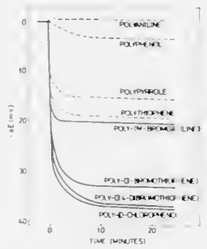
wherein A_{Ti} represents the number of titanium atoms in the coating and A_T is as defined above.

4,839,016
CURVED SURFACE CASSETTE/GEL SYSTEM
Norman L. Anderson, Washington, D.C., assignor to Large Scale Biology Corporation, Rockville, Md.
Filed Jan. 19, 1988, Ser. No. 147,320
Int. Cl.[4] G01N *27/26*
U.S. Cl. 204—299 R **25 Claims**



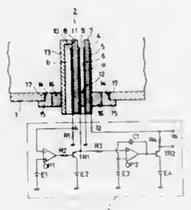
1. A slab-shaped electrophoresis gel in a cassette comprising:
a slab-shaped electrophoresis gel having two major surfaces; and
a cassette for containing a slab-shaped electrophoresis gel, the cassette having first and second walls, the walls having closed and open positions and means for joining them at one edge;
the first and second walls defining a gel cavity therebetween when in the closed position and the gel being placed between the walls;
whereby the walls of the cassette and the major surfaces of the gel coact to exert at all points on the walls and at all points on the gel's major surfaces a substantially uniform normal force which substantially excludes liquid or gas from between either wall and the major surfaces of the gel.

4,839,017
POTENTIAL-CAUSING MEMBRANE FOR IMMUNOSENSOR
Isao Taniguchi; Kazuo Yasukouchi; Ichiro Tsuji, and Takeshi Fujiyasu, all of Kumamoto, Japan, assignors to Juridical Foundation the Chemo-Sero-Therapeutic Research Institute, Kumamoto, Japan
Filed Mar. 30, 1987, Ser. No. 31,264
Claims priority, application Japan, Mar. 31, 1986, 61-74726
Int. Cl.[4] G01N *27/26*
U.S. Cl. 204—403 **2 Claims**



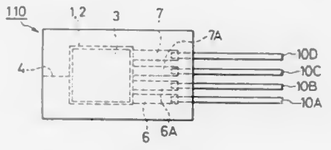
1. A potential-causing membrane for use in immunosensors, which comprises an electrically-conductive film of polymer being prepared by electrolytic polymerization of electrolytic polymerizable monomer, said polymer having at least one functional group capable of binding an antigen or an antibody per monomer unit thereof in which the functional group is selected from the group consisting of halogen, —CHO, —NH_2 and —COOH, and binding the antigen or the antibody through the functional group thereonto, wherein the monomer unit of said polymer is selected from the group consisting of pyrrole, thiophene, furan, phenol and aniline, and wherein the thickness of the film is between about 0.5μ and about 5 μ.

4,839,018
AIR/FUEL RATIO DETECTOR
Tetsuyo Yamada, and Sadao Ichikawa, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan
Continuation of Ser. No. 807,086, Dec. 10, 1986, abandoned. This application Feb. 1, 1988, Ser. No. 150,468
Claims priority, application Japan, Dec. 11, 1984, 59-261314
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—425 **14 Claims**



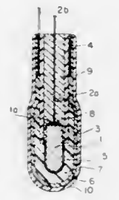
1. An A/F ratio detector for providing continuous unidirectional detection signal indicative of the A/F radio in combustion gases over the detector's entire operating region, including both a fuel-rich region and a fuel-lean region, comprising:
(1) a sensor unit comprising two elements, each of said two elements comprising an oxygen ion-conductive solid electrolyte having a respective porous electrode formed on both surfaces, said two elements being disposed to each face a diffusion compartment between said elements which receives a limited inflow of exhaust gas; and
(2) A/F ratio signal detecting means for operating one of said two elements as an oxygen-concentration-difference-actuated electrochemical cell and the other as an oxygen pump cell, said detecting means comprising means for controlling a predetermined one of a voltage produced by said electrochemical cell and a current flow through said pump cell so as to produce a continuous, unidirectional A/F ratio detection signal indicative of a concentration of oxygen in said exhaust gas, said sensor unit further comprising means for defining an air compartment, said electrochemical cell contacting the atmosphere at the one of its electrodes disposed opposite to said diffusion compartment, and said A/F ratio signal detecting means comprising constant current supplying means for supplying a predetermined current to said electrochemical cell so that oxygen is pumped at a predetermined rate from the atmosphere into said diffusion compartment by means of said electrochemical cell, the electrode of said oxygen pump cell disposed opposite to said diffusion compartment directly facing said exhaust gas.

4,839,019
OXYGEN SENSOR
Teizo Takahama; Masahiko Masuda; Keisuke Sugimoto, and Yuji Sugiyama, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan
Filed Nov. 17, 1987, Ser. No. 121,806
Claims priority, application Japan, Nov. 20, 1986, 61-177537; Dec. 4, 1986, 61-186952
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—425 **6 Claims**



1. A limited current oxygen sensor, comprising:
a body having an internal enclosed space therein defined by opposing walls, one of said opposing walls having a diffusion orifice for restricting the amount of oxygen diffused and for connecting the interior space with the exterior of the body; and,
a solid electrolyte detection means including a heater element and spaced positive and negative electrodes of a predetermined area, said heater and positive electrode being embedded within the walls of the body and not being in communication with said internal space said positive electrode further being porous and being disposed between said negative electrode and said heater element, said negative electrode being disposed in communication with the internal space adjacent another of said opposing walls.

4,839,020
GAS SENSOR
Shuichiro Yamaguchi, Fuji; Norio Daikuhara, and Takeshi Shimomura, both of Fujinomiya, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed May 22, 1987, Ser. No. 53,280
Claims priority, application Japan, May 26, 1986, 61-120565
Int. Cl.[4] G01N *27/26*
U.S. Cl. 204—431 **14 Claims**



1. A gas sensor comprising:
a pH electrode which includes an electrically conductive substrate, a redox layer coating a surface of said electrically conductive substrate, and a hydrogen ion carrier layer coating a surface of said redox layer;
a reference electrode;
an insulating layer for insulating said pH electrode and said reference electrode;
a gas-sensitive layer coating exposed surface portions of said pH electrode, said insulating layer and said reference electrode; and
a gas-permeable layer coating a surface of said gas-sensitive layer.

4,839,021
TREATMENT OF PETROLEUM DERIVED ORGANIC SLUDGES AND OIL RESIDUES
Christian Roy, St. Nicolas, Canada, assignor to Recherche Carbovac Inc., St-Nicolas, Canada
Continuation-in-part of Ser. No. 876,071, Jun. 19, 1986, Pat. No. 4,740,270. This application Dec. 11, 1987, Ser. No. 131,432
Claims priority, application Canada, Feb. 10, 1987, 529379
Int. Cl.[4] C10G *17/00*
U.S. Cl. 208—13 **7 Claims**

1. A method of producing pyrolytic oils suitable for petroleum reprocessing, which comprises subjecting petroleum-derived organic sludges or oil residues in a solid/liquid phase to vacuum pyrolysis under temperature and sub-atmospheric pressure conditions such as to prevent gas and vapor phase secondary cracking reactions and thereby to increase the yield of pyrolytic oils to the detriment of hydrocarbon gases.

4,839,022
METHOD AND APPARATUS FOR TREATING OIL-WATER-SOLIDS SLUDGES AND REFINERY WASTE STREAMS
James L. Skinner, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.
Continuation-in-part of Ser. No. 677,658, Dec. 3, 1984, abandoned. This application Nov. 8, 1985, Ser. No. 796,349
Int. Cl.[4] C10G *17/00*
U.S. Cl. 208—13 **7 Claims**

1. A method for treating a sludge stream comprising a quantity of solids particles including particles of heavy metals and heavy hydrocarbon substances which are coated on said solids including said heavy metals, said method comprising the steps of:
providing a dryer apparatus for receiving said sludge stream and including means for discharging vapors of liquids boiled off in said dryer, means for discharging solids comprising particles dried in said dryer and heat exchange surface means operable to dry said sludge substantially only by contact with said sludge such that substantially only dried solids of said sludge are discharged by said means for discharging solids and substantially only vapors of said liquids are discharged through said means for discharging vapors;
providing oxidizer means for receiving dried solids and exposing said dried solids to an oxygen containing gas;
introducing said sludge stream into said dryer and heating said sludge stream to evaporate substances having a boiling point less than about 700° F.;
discharging vapors generated in said dryer from heating said sludge stream in said dryer;
discharging dried solids from said dryer and introducing said dried solids to said oxidizer means;
subjecting all of said dried solids in said oxidizer means to an oxygen-containing gas by passing a gas flow stream through said oxidizer means at a sufficient flow rate to thoroughly mix said dried solids and oxidize hydrocarbons coated on said dried solids having a boiling temperature greater than about 500° F. and to reduce the portion of said dried solids which comprise heavy metals selected from a group consisting of chromium, vanadium and nickel, to oxides of said heavy metals;
conducting gases from said oxidizer means; and
conducting substantially hydrocarbon free, oxidized and dried solids from said oxidizer means for disposal.

4,839,023

ONCE-THROUGH COKING WITH HYDROTREATING AND FLUID CATALYTIC CRACKING

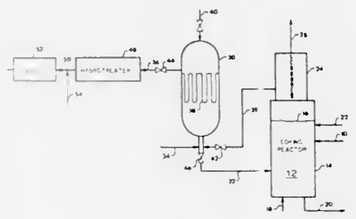
Francis X. Mayer; William E. Lewis, both of Baton Rouge, La.; Joseph P. Matula, Randolph Twsp., Dover County, N.J., and David W. Staubs, Batoo Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Sep. 16, 1987, Ser. No. 97,122

The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.

Int. Cl.[4] C10G *69/06, 13/16*

U.S. Cl. 208—50 9 Claims



1. In a process wherein heavy hydrocarbonaceous oil is cracked to vaporous products, including normally liquid hydrocarbons, and to coke, in a fluidized bed of solid particles in a coking zone maintained under fluidized coking conditions wherein a hot vaporous product from said coking zone is passed to a scrubbing zone, the improvement which comprises:

(a) passing at least a portion of the resulting solids-containing bottoms fraction from said scrubbing zone to a microfiltration system characterized as containing a filtering means comprised of a sintered porous ceramic or metal membrane and having a substantially uniform pore size capable of retaining at least about 95 percent of the solids and capable of maintaining a flux rate from about 0.1 to about 0.5 gpm/ft^2;

(b) recycling the filtered solids to the coking zone;

(c) hydrotreating at least a portion of the substantially solids-free filtrate at a temperature from about 600° F. to 800° F., a pressure from about 400 to 10,000 psi, and a hydrogen treat rate from about 500 to 10,000 standard cubic feet per barrel; and

(d) passing at least a portion of the hydrotreated filtrate to a catalytic cracking unit per operated at a temperature from about 875° F. to 1050° F. and a catalyst to oil ratio from about 3 to 9.

4,839,024

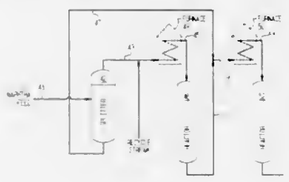
SPLIT-FEED NAPHTHA REFORMING PROCESS

Michael P. Ramage, Moorestown, N.J., and Donald C. Wong, New York, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 10, 1987, Ser. No. 95,489

Int. Cl.[4] C10G *35/04*

U.S. Cl. 208—64 12 Claims



1. A process for reforming a naphtha feed which comprises splitting the naphtha feed into a C_6 and lower fraction had a C_7 and higher fraction, feeding the C_6 and lower fraction to a first reforming reactor and into contact with a reforming catalyst under reforming conditions, combining the effluent from the first reforming reactor with the C_7 and higher fraction to form a combined stream, and feeding the combined stream to a second reforming reactor into contact with a reforming catalyst, and recovering an effluent from the second reforming reactor.

4,839,025

MILD HYDROCRACKING WITH A CATALYST CONTAINING NON-HYDROLYZABLE HALOGEN

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 711,452, Mar. 13, 1985, abandoned, which is a continuation-in-part of Ser. No. 531,924, Sep. 13, 1983, Pat. No. 4,517,074, which is a division of Ser. No. 84,761, Oct. 15, 1979, Pat. No. 4,419,271. This application Jun. 15, 1987, Ser. No. 61,045

Int. Cl.[4] C10G *47/20*

U.S. Cl. 208—111 42 Claims

1. A process for mild hydrocracking a hydrocarbon oil, said process comprising contacting said hydrocarbon oil under conditions of elevated temperature and pressure with a particulate catalyst comprising at least one active metal component on a support material containing a zeoliee having at least one non-hydrolyzable halogen component, said conditions being such as to yield about a 10 to about a 50 volume percent conversion of the hydrocarbon oil fraction boiling above 700° F. to hydrocarbon products boiling at or below 700° F. and wherein at least 85 volume percent of said hydrocarbon products boiling at or below 700° F. boil in the midbarrel range from about 300° F. to about 700° F.

4,839,026

CATALYTIC CRACKING WITH REDUCED EMISSIONS OF SULFUR OXIDES

Stanley M. Brown, Scotch Plains; John W. Byrne, Saddle Brook, both of N.J., and Harry E. Jacobs, Glenwood, Ill., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 191,763, Sep. 29, 1980, abandoned, which is a continuation of Ser. No. 940,946, Sep. 11, 1978, abandoned. This application Jun. 28, 1985, Ser. No. 750,645

Int. Cl.[4] C10G *11/02, 11/04, 11/05, 11/18*

U.S. Cl. 208—120 14 Claims

1. A process of continuous cyclic fluid catalytic cracking with reduced emission of sulfur oxides from regenerator gaseous effluent which comprises (a) contacting a hydrocarbon feedstock containing organic sulfur compounds in the absence of added hydrogen with a circulating inventory comprising cracking catalyst microspheres and separate discrete fludizable attrition-resistant particles of rare earth metal impregnated on dense microspheres of gamma alumina in a reaction zone in a riser cracker at about 900° to 1000° F. for about 0.5 to about 5 seconds to produce lower boiling hydrocarbons and to cause deposition on said catalyst microspheres of solid deactivating sulfur-containing carbonaceous material, said dense microspheres of gamma alumina having been prepared by slurrying particles of alpha alumina monohydrate in an acid solution, spray drying the slurry to form microspheres and heating the resulting microspheres to convert the alumina to gamma form before impregnating rare earth metal thereon; (b) removing said catalyst microspheres and said separate particles containing said deposit from the reaction zone and stripping volatiles therefrom with steam in a stripping zone; (c) regenerating said stripped particles by oxidation at elevated temperature in a regenerating zone at a temperature in the range of about 1100° to about 1400° F. for about 3 to about 120 minutes with combustion of carbon monoxide to carbon dioxide to burn off residual sulfur-containing carbonaceous deposit, producing a gaseous regeneration zone effluent containing oxides of sulfur and (d) removing regenerated catalyst microspheres and said separate particles from said regenerating zone and recycling them to the reaction zone, whereby emissions of oxides of sulfur in said gaseous regeneration zone effluent are reduced substantially as a result of association of oxides of sulfur with said separate particles during step (c) and disassociation of associated oxides of sulfur into a gaseous product consisting essentially of hydrogen sulfide during steps (a) and (b).

4,839,027

CATALYTIC REFORMING PROCESS

Robert P. Absil, Mantua, N.J.; Albin Huss, Jr., Chadds Ford, Pa.; William D. McHale, Swedesboro, and Randall D. Partridge, Trenton, both of N.J., assignors to Mobil Oil Corp., New York, N.Y.

Continuation of Ser. No. 128,359, Dec. 3, 1987, abandoned. This application Nov. 16, 1988, Ser. No. 273,708

Int. Cl.[4] C10G *35/06*

U.S. Cl. 208—138 14 Claims

1. A catalytic reforming process which comprises contacting a naphtha range feed with a low acidity extrudate comprising an intermediate and/or a large pore acidic zeolite bound with a low acidity refractory oxide under reforming conditions to provide a reaction product of increased aromatic content, said extrudate having been prepared with at least an extrusion-facilitating amount of a low acidity refractory oxide in colloidal form and containing at least one metal species selected from the platinum group metals.

4,839,028

HYDROTREATING WITH CATALYSTS PREPARED FROM HYDROGELS

Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 924,221, Oct. 28, 1986, Pat. No. 4,717,704. This application Aug. 13, 1987, Ser. No. 84,780

Int. Cl.[4] C10G *45/08*

U.S. Cl. 208—216 PP 78 Claims

1. A process for hydrotreating hydrocarbon feeds by contacting said feeds at a temperature in the range of from about 300° F. to about 850° F. and a pressure in the range of from about 200 psig to about 2500 psig with a hydrotreating catalyst which has a surface area above about 300 m^2/g and at least about 80% of the pore volume in pores having diameters less than about 70 Å, wherein said catalyst is prepared by a process which comprises:

(a) precipitating an aqueous solution of one or more aluminum salt(s) in the presence of a phosphorus-containing compound in an amount from about 0.06 to about 0.30 moles of phosphorus per mole of aluminum by adjusting the pH of said solution to a range between about 5.5 and about 10.0 at a temperature in the range between about 20° C. and about 90° C.,

(b) aging the precipitate at a temperature ranging from about 20° C. to about 90° C. for at least about 15 minutes at a pH ranging from about 8.0 to about 12.0,

(c) washing the precipitate,

(d) mixing the precipitate with dry, water-soluble salts of cobalt and a heavy metal selected from the group consisting of molybdenum, tungsten and mixtures thereof, at a pH in the range between about 4.0 and about 10.0 and a temperature in the range between about 25° C. and about 100° C. to yield a final catalyst having from about 1%w to about 5%w cobalt and from about 8%w to about 32%w heavy metal,

(e) extruding the product of step (d), and

(f) drying and calcining the product of step (e) at a temperature ranging from about 300° C. to about 900° C.

4,839,029

PROCESS FOR REMOVING ARSENIC FROM A PETROLEUM FRACTION

Shinichi Ichikawa; Unkichi Yoshida; Yoshihisa Matsushima, and Hisatake Hashimoto, all of Kanagawa, Japan, assignors to Tonen Sekiyu Kagaku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP87/00257, § 371 Date Dec. 23, 1987, § 102(e) Date Dec. 23, 1987, PCT Pub. No. WO87/06604, PCT Pub. Date Nov. 5, 1987

PCT Filed Apr. 22, 1987, Ser. No. 146,168

Claims priority, application Japan, Apr. 23, 1986, 61-95680

Int. Cl.[4] C10G *25/00*

U.S. Cl. 208—251 R 5 Claims

1. A process for removing arsenic in a petroleum fraction which comprises the step of contacting the petroleum fraction containing arsenic in the form of arsine or an organic arsine compound with an adsorbent comprising a substrate having a sulfur element introduced thereinto, said sulfur element being in the form of mercapto moieties, thioethers, thioaldehydes, thiocarboxylic acids, dithiocarboxylic acids, thioamides or thiocyanates.

4,839,030

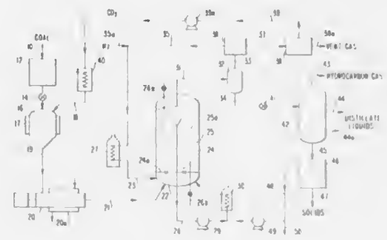
COAL LIQUEFACTION PROCESS UTILIZING COAL/CO_2 SLURRY FEEDSTREAM

Alfred G. Comolli, Yardley, Pa., and Joseph B. McLean, S. Somerville, N.J., assignors to HRI, Inc., Lawrenceville, N.J.

Filed May 27, 1988, Ser. No. 199,493

Int. Cl.[4] G10G *1/06*

U.S. Cl. 208—403 15 Claims



1. A process for hydrogenation and liquefaction of coal utilizing a coal/CO_2 slurry feedstream for producing hydrocarbon liquid and gas products, comprising:

(a) pressurizing particulate coal to an intermediate pressure of at least about 500 psig and mixing it with liquid carbon dioxide to provide a flowable coal/carbon dioxide slurry feedstream containing at least about 50 W % coal;

(b) further pressurizing the coal/CO_2 slurry and feeding it and hydrogen separately into a reation zone containing an ebullated catalyst bed maintained at 650°–850° F. temperature, 1000–4000 psig hydrogen partial pressure and a coal feed rate of 10–100 lb coal/hr ft^3 reactor volume, and producing an effluent material containing hydrocarbon gas and liquid fractions;

(c) separating said gas and liquid fractions, and recovering CO_2 and hydrogen from the gas fraction for recycle in the process; and

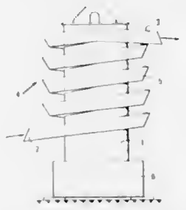
(d) removing unconverted coal and ash from the hydrocarbon liquid fraction, and distilling the remaining hydrocarbon liquid to produce gas and low boiling hydrocarbon liquid products.

4,839,031

PROCESS FOR PERFORMING THE SI PARATION OF EXTRUDED MATERIALS WHICH MA' OR MAY NOT SHOW IMPERFECTIONS

Francois Ackermann, La Voulte sur Rhone, and Georges Berrebi, Bourg les Valence, both of France, assignors to Europeenne de Retraitement de Catalyseurs Eurecat, La Voulte sur Rhone, France

Filed Dec. 9, 1987, Ser. No. 130,571
Claims priority, application France, Dec. 9, 1986, 86 17317
Int. Cl.[4] B07B *13/11*
U.S. Cl. 209—2 4 Claims



1. A process for separating fines from refining catalysts wherein the catalysts are extruded rod shaped elements, the process comprising the steps of:

depositing a mixture of the extruded rod shaped elements and fines at a lower location on a spiral track having an inner periphery and an outer periphery, and a slope in the range of 2 to 20 degrees; and

initially separating the refining catalyst from the fines by subjecting the spiral track to vibratory motion varying between 0.2 and 15 mm to advance the mixture up the spiral track while causing the elements defining the refining catalysts to migrate toward the inner periphery of the track and causing the fines to migrate toward the outer periphery of the track; and

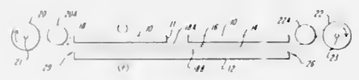
finally separating the fines from the elements as the mixture leaves the spiral track at an upper end thereof.

4,839,032

SEPARATING CONSTITUENTS OF A MIXTURE OF PARTICLES

David R. Whitlock, Burlington, Mass., assignor to Advanced Energy Dynamics Inc., Natick, Mass.

Filed Jun. 6, 1986, Ser. No. 872,082
Int. Cl.[4] B03C *7/00, 7/03*
U.S. Cl. 209—3 45 Claims



1. Process for separating different species of the material constitutents of a mixture of particles passing through an electric field established between electroles and without requiring gravitational or pneumatic conveyance, said process comprising the steps of:

(a) triboelectrically charging particles of each specie by surface contact,

(b) mechanically transporting particles of like net polarities in two streams each of opposite net polarity running near each other between said electrodes both said streams moving transversely to said electric field, and

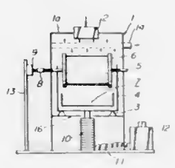
(c) electrostatically separating charged particles of each specie in the electric field established between electrodes spaced not more than about 10 mm apart, substantially exclusively according to their respective polarities, by motion of charged particles in the direction of said field, said streams being in communication parallel to said electric field, so as to transfer particles of at least one of said species to the other of said respective streams by virtue of continued particle contact and field separation of charged particles as said streams progress transversely to said electric field.

4,839,033

APPARATUS FOR SEPARATING SPHERICAL FROM NON-SPHERICAL PARTICLES

Shigeru Sano, Ichinoseki, and Saburo Yashima, Sendai, both of Japan, assignors to Ichinoseki National College of Technology, Ichinoseki, Japan

Filed May 25, 1988, Ser. No. 198,498
Claims priority, application Japan, Aug. 7, 1987, 62-196449
Int. Cl.[4] B07B *13/00;* B07C *9/00*
U.S. Cl. 209—4 3 Claims



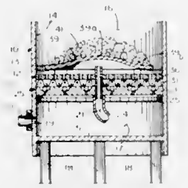
1. An apparatus for separating particles, comprising a housing with a top wall, a hopper arranged on the top wall of said housing, for storing mixed particles and for supplying the mixed particles into inside of the housing, a cylindrical rotor with a horizontal shaft, arranged within the housing and below the hopper, a frame mounted on dampers and rotatably supporting said cylindrical rotor thereon, a pair of receptacles arranged on both sides of said shaft of the cylindrical rotor, one for receiving separated non-spherical particles, and the other for receiving separated spherical particles, a drive motor coupled with said shaft for driving said cylindrical rotor, a vibrator for subjecting the frame to a vertical vibration, and an inlet for supplying into said housing air with a desired humidity, said inlet being arranged close to said hopper.

4,839,034

BENEFICIATOR FOR RECOVERY OF METAL FRACTIONS FROM PARTICULATE GANGUE

Carl H. Dahlberg, P.O. Box 753, Bonners Ferry, Id. 83805

Filed Jan. 25, 1988, Ser. No. 148,371
Int. Cl.[4] B03B *7/00, 5/62*
U.S. Cl. 209—44 8 Claims



1. Apparatus to beneficiate particulate ores containing more dense metalliferous particles and less dense gangue particles comprising, in combination:

a vertical container divided into a lower fluid input chamber and an upper processing chamber by a medially positioned valving disk defining a plurality of areally spaced, valved orifices permitting only upward flow of water therethrough;

an entrapment structure for more dense particles above the valving disk including at least one disk defining plural spaced substantially vertically oriented orifices;

an ore support structure at a spaced distance above the entrapment structure to support particulate ore and allow passage of that ore downwardly to the processing chamber, and

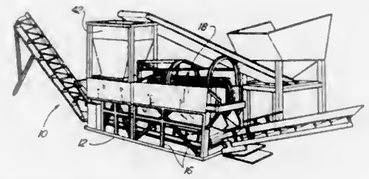
means for introducing pressurized fluid into the lower fluid input chamber and means for exhausting fluid and gangue particles from the entrapment structure.

4,839,035

CYLINDRICAL SCREEN SEPARATOR WITH SPIRALLY ARRANGED CLEARING AND CONVEYING BLADES

John A. Iafrate, 1471 Grandville Ave., Pontiac, Mich. 48055

Filed Feb. 25, 1988, Ser. No. 160,207
Int. Cl.[4] B07B *1/20*
U.S. Cl. 209—300 11 Claims



1. A separator for treating material having two or more different components with different sizes, said separator comprising:

a generally cylindrical screen, said screen comprising a plurality of stationary circular bars, said circular bars being spaced apart and generally parallel to each other about an axis of said screen,

a shaft rotatably mounted to said screen so that said shaft extends coaxially through said screen,

a plurality of blades secured to and extending radially outwardly from said shaft,

means for feeding a material into one end of said screen,

means for rotatably driving said shaft so that said material is transported by said blades from said one end of said screen and toward the other end of said screen,

an opening at said other end of said screen,

wherein components of the material less in size than the spacing between said bars pass radially through said screen which the remaining components are transported to said opening,

wherein an outer end of at least one blade extends through the space between two adjacent bars.

4,839,036

VIBRATORY SCREENING MACHINE

Vladimir F. Slesarenko, Leningrad, U.S.S.R., assignor to Vsesojuzny Nauchno-Issledovatelsky I Proektny Institut Mekhanicheskoi, Leningrad, U.S.S.R.

Filed Dec. 3, 1987, Ser. No. 128,275
Claims priority, application U.S.S.R., Dec. 10, 1986, 4158005
Int. Cl.[4] B07B *1/28, 1/54*
U.S. Cl. 209—315 1 Claim

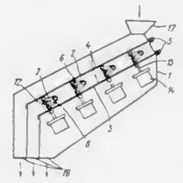
1. A vibratory screening machine comprising:

a frame;

an upper sieve extending in an upper plane and a lower sieve extending in a lower plane, with meshes provided in said sieves, arranged in said frame so that an intersieve space is formed between said sieves, the size of said meshes in said upper sieve exceeding that of said meshes in the lower sieve;

supports mounted in said frame in said intersieve space;

pushers for transmitting vibrational movements to the sieves primarily in a direction substantially perpendicular to said upper and lower planes, made in the form of two levers having each a first end and a second end, said first ends of said levers being hinged to one of said supports, said



second end of each said first lever being unattached to and contacting the upper sieve and the second end of each said second lever being unattached to and contacting the lower sieve, and elastic element means being disposed between said levers for controlling the vibrational movements of one of said sieves, said pushers and said elastic element means being located in the intersieve space;

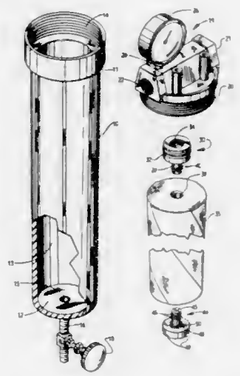
vibrating drives coupled to said pushers for imparting vibrational movements thereto.

4,839,037

TAPERED, SPIRALLY WOUND FILTER CARTRIDGE AND METHOD OF MAKING SAME

Robert A. Bertelsen, St. Louis Park, and David J. Paulson, Minnetonka, both of Minn., assignors to Osmonics, Inc., Minnetonka, Minn.

Continuation-in-part of Ser. No. 23,192, Mar. 9, 1987, abandoned. This application Apr. 6, 1987, Ser. No. 37,113
Int. Cl.[4] B01D *27/04, 29/06*
U.S. Cl. 210—97 19 Claims



1. A spirally wound, cross flow filter cartridge comprising:

an elongated, centrally disposed permeate tube having a first set of openings;

a sheet of filtration materials spirally wound around said permeate tube, said sheet of filtration materials comprising a pair of membrane elements and a permeate carrier disposed therebetween, said pair of membrane elements

having corresponding edge portions sealed to said permeate tube with said first set of openings disposed therebetween and the remaining edge portions sealed to one another;

said cartridge having first and second transverse ends generally circular in configuration and an outer surface portion joining said ends in which said first end is greater in diameter than said second end and said outer surface is tapered from said first end to said second end, said first end defining an inlet end which is uncapped and capable of receiving fluid flow and said second end defining an outlet end which is uncapped and capable of providing fluid flow whereby fluid to be filtered enters said inlet end and flows longitudinally in a direction generally parallel to said permeate tube toward said outlet end with at least a portion of said fluid passing through one of said membrane elements and into said permeate tube through said first set of openings.

4,839,038

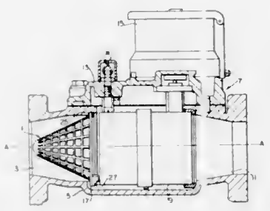
FLUID STRAINER AND FLOW CORRECTOR FOR FLUID MEASUREMENT DEVICE

Thomas N. McLain, II, Montgomery, Ala., assignor to Schlumberger Industries, Inc., Atlanta, Ga.

Filed Jun. 9, 1988, Ser. No. 204,322

Int. Cl.[4] B01D *35/02*

U.S. Cl. 210—137 **4 Claims**



1. A fluid strainer and flow corrector for use with a fluid flow measurement device of the type including a housing having an inlet and an outlet connected to a conduit through which the fluid to be measured flows and a fluid measurement element disposed in the housing between the inlet and outlet for measuring a parameter of the fluid, the strainer/flow corrector comprising:

an annular flange portion;

a substantially conical ribbed portion connected to the flange portion, the ribbed portion comprising:

(a) a plurality of spaced-apart annular ribs disposed substantially parallel to a plane containing the annular flange portion, the annular ribs being formed having successively smaller diameters at increasing longitudinal distances from the annular flange portion., and

(b) a plurality of spaced-apart radial support ribs arranged about and each connected at one end to the annular flange and connected together at their other end at substantially an apex of a cone whose side is defined by the radial support ribs and whose base is defined by the annular flange portion;

the fluid strainer/flow corrector being disposed in the inlet of the measurement device housing with said apex being disposed upstream of said flange portion with respect to the direction of fluid flow through the inlet.

4,839,039

AUTOMATIC FLOW-CONTROL DEVICE

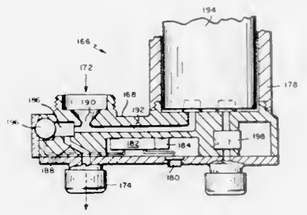
Natan E. Parsons, Brookline, and Joel S. Novak, Sudbury, both of Mass., assignors to Recurrent Solutions Limited Partnership, Cambridge, Mass.

Filed Feb. 28, 1986, Ser. No. 834,741

The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.

Int. Cl.[4] B01D *36/00;* **E03C** *1/05*

U.S. Cl. 210—143 **36 Claims**



33. For controlling the flow of fluid through a faucet, a flow-control device comprising:

A. a housing having a device inlet and first and second device outlets;

B. a first fluid conduit disposed in the housing for conducting fluid from the inlet to the outlet;

C. a second fluid conduit disposed in the housing for conducting fluid from the inlet to the second device outlet;

D. mounting means on the housing for mounting the device on the faucet with the device inlet in fluid communication with the faucet outlet;

E. sealing means for sealing the device inlet to the faucet outlet when the mounting means mounts the housing on the faucet so that fluid can flow from the faucet only by flowing through the flow-control device;

F. an electric valve interposed in the conduit and operable by application of control signals thereto to switch between an open state, in which the valve permits fluid flow through the first conduit, and a closed state, in which the valve prevents flow through the first conduit;

G. a filter element interposed in the second conduit and presenting enough flow resistance so that fluid does not flow through the second conduit when the valve permits fluid flow in the first conduit, the filter element permitting fluid flow therethrough when the valve is closed so that filtered water flows through the second outlet; and

H. a sensor circuit for sensing the presence of objects in the vicinity of the second outlet and to close the valve when it senses an object near the second outlet, the flow-control device thereby permitting flow of unfiltered water through the first-mentioned outlet when no object is sensed near the first outlet and directing fluid flow through the filter element so that filtered water issues through the second outlet when an object is near the second outlet.

4,839,040

FILTER APPARATUS FOR REMOVING HYDROCARBON CONTAMINANTS FROM WATER, PARTICULARLY FOR PURIFYING OIL CONTAMINATED WATER

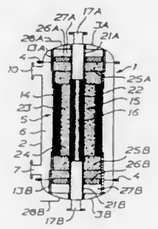
Lars E. Alm, Vollsjö, Sweden, assignor to Environmental Pollution Control System EPCON AB, Horby, Sweden

Continuation of Ser. No. 2,675, Feb. 2, 1987, abandoned. This application Jun. 27, 1988, Ser. No. 214,920

Claims priority, application Sweden, Apr. 9, 1985, 8501721

Int. Cl.[4] B01D *29/26, 29/38*

U.S. Cl. 210—167 **6 Claims**



1. Filter apparatus for removing hydrocarbon contaminants from water, comprising:

(a) a container (**1**) designed as a pressure vessel having a pressure resistant cylindrical outer shell (**2**), the ends of which being closed by means of pressure resistant end walls (**3A, 3B**);

(b) a first cylindrical inner shell (**5**) disposed concentrically inside the outer shell (**2**) and extending from one end wall (**3A**) to the other (**3B**) and defining together with said outer shell (**2**) an annular space (**6**);

(c) a second inner shell (**15**) disposed radially inside said first inner shell, said first cylindrical inner shell together with the second inner shell defining therebetween a filter chamber, said filter chamber enclosing therein a filter material;

(d) said outer cylindrical shell (**2**) having disposed therein a supply connection (**7**) for supplying contaminated water to said annular space (**6**) and a discharge connection (**10**) for discharging contaminated water from said annular space (**6**);

(e) said second inner shell (**15**) also extending from one end wall (**3A**) to the other (**3B**) and defining a tubular, central axial channel (**16**) through the container (**1**), said axial channel (**16**) by means of at least one connection (**17A, 17B**) being connected to a line (**18**) for discharging purified water, and via a connection (**30**) to a line for supplying regeneration liquid into said axial channel (**16**);

(f) the filter material (**24**) enclosed in said filter chamber (**23**) consisting of a particulate, elastic, oil-absorbing, regeneratable filter material;

(g) said first cylindrical inner shell (**5**) and said second cylindrical inner shell (**15**) each comprising two fluid-tight cylindrical end portions (**13A, 13B; 21A, 21B**), which are sealingly attached to the respective end wall (**3A, 3B**), and an intermediate cylindrical portion (**14; 22**), which is permeable to fluid but impermeable to particulate filter material; and that

(h) disposed in each one of the annular chambers (**27A; 27B**) defined by said fluidtight end portions (**13A, 13B; 21A, 21B**) and axially movable therein is a transverse fluidtight wall (**26A, 26B**), said transverse walls limiting the filter chamber (**23**) in the axial direction and being movable towards each other in the axial direction for compressing the particulate filter material in the filter chamber (**23**).

4,839,041

MAGNETIC OIL STRAINER

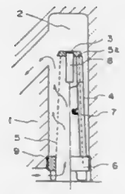
Yoshinari Kuwayama, Tokoname; Fumitomo Yokoyama, Anjo; Koujiro Kuramochi, and Tatsuo Kyushima, both of Okazaki, all of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 895,434, Aug. 11, 1986, abandoned. This application Jun. 17, 1988, Ser. No. 207,933

Claims priority, application Japan, Aug. 14, 1985, 60-179106

Int. Cl.[4] B01D *35/06*

U.S. Cl. 210—168 **4 Claims**



1. A strainer mounted in an oil passage within a valve body in an automatic transmission, comprising:

a frame having a longitudinal axis for being fitted into the oil passage, said frame including an annular portion at one upstream end, a disk-shaped portion at another downstream end, and a plurality of circumferentially spaced bar-shaped ribs interconnecting said annular-shaped portion and said disk-shaped portion;

a reticulate member fixedly secured to said frame, said reticulate member being secured over interstices between adjacent ribs; and

a permanent bar magnet secured to said frame upstream from said reticulate member, said magnet being positioned axially so as to act substantially uniformly on the flow of oil through the oil passage.

4,839,042

IMMOBILIZED REAGENT FOR THE DECONTAMINATION OF HALOGENATED ORGANIC COMPOUNDS

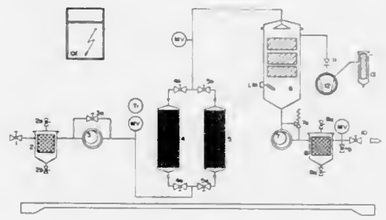
Wander Tumiatti; Gilberto Nobile, and Pietro Tundo, all of Turin, Italy, assignors to Sea Marconi Technologies S.p.A., Turin, Italy

Continuation-in-part of Ser. No. 632,718, Jul. 20, 1984, abandoned. This application Oct. 8, 1986, Ser. No. 916,533

Claims priority, application Italy, Jul. 22, 1983, 22215 A/83

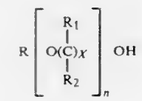
Int. Cl.[4] B01D *27/02;* **A62D** *3/00;* **B01J** *20/26, 27/02*

U.S. Cl. 210—194 **6 Claims**



1. A device for use in the decontamination of a fluid containing halogenated organic compounds consisting of at least one column or cartridge, said column or cartridge containing an

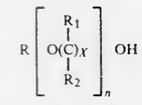
immobilized reagent which consists essent ally of 40–90% of a solid, carrier from the group consisting of alkali and alkaline-earths metal carbonates and bicarbonates, said carrier having absorbed thereon 2.5–25% of componen (a) which is (1) a polyethylene glycol of formula



wherein X is >2 and n is an integer of 2 to 400: R is hydrogen, a straight or branched-chain C_1–C_{20} alkyl aralkyl or acyl; R_1 and R_2 are the same or different and are hydrogen, straight or branched-chain alkyl, unsubstituted or substituted by C_5–C_8 cycloalkyl or aryl; or (2) a random copolymer of alkene oxides in different proportions; and (b) 0.5–15% of an alkali or alkaline earth metal C_1–C_6 alcoholate, an inlet for said fluid, a sampling valve and an outlet for said fluid.

6. A device for use in the decontamination of a fluid containing halogenated organic compounds consisting of at least one column or cartridge, said column or cartridge containing an immobilized reagent which consists essent ally of 40–90% of a solid, carrier from the group consisting of alkali and alkaline-earth metal carbonates and bicarbonates, said carrier having absorbed thereon 2.5–25% of component (a) which is:

(1) a polyethylene glycol of formula



wherein X is >2 and n is an integer of 2 to 400; R is hydrogen, a straight or branched-chain C_1–C_{20} alkyl, aralkyl or acyl; R_1 and R_2 are the same or different and are hydrogen, straight or branched-chain alkyl, unsubstituted or substituted by C_5–C_8 cycloalkyl or aryl; or

(2) a random copolymer of alkene oxides in different proportions; (b) 0.15–15% of an alkali or alkaline earth metal C_1–C_6 alcoholate; and (c) as a source of radicals or as an oxidizing agent, a peroxide or a persalt in the amount up to 5% of said reagent, an inlet for said fluid, a sampling valve and an outlet for said fluid.

4,839,043

LIQUID-TO-LIQUID OIL ABSORPTION SYSTEM

Paul C. Broussard, Sr., P.O. Box 32504, Lafayette, La. 70503

Continuation-in-part of Ser. No. 938,397, Dec. 5, 1986, Pat. No. 4,728,428. This application Feb. 26, 1988, Ser. No. 180,864

The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.

Int. Cl.[4] B01D *12/00*

U.S. Cl. 210—195.1 **21 Claims**

1. A system for removing dissolved and undissolved oil from contaminated water, comprising:

(a) absorber means for receiving, mixing and treating said contaminated water with an absorbing fluid;

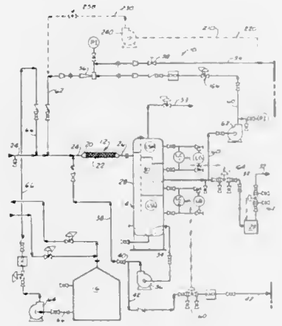
(b) a source of absorbing fluid connected to said absorber means;

(c) processing separator means for receiving said treated water from said absorbing means and separating oil-decontaminated water from said absorbing fluid contaminated with oil;

(d) means connected to said absorber means and processing separator means for recycling unspent oil-contaminated absorbing fluid to said absorber means;

(e) means connected to said processing separator for receiving spent absorbing fluid and reclaiming said absorbing fluid for further use; and,

(f) means connected to said absorbing fluid reclaiming mean, said processing means and said absorber means for reintroducing reclaimed absorbing fluid into said system, said reintroducing means including an eductor jet pump driven by oil-decontaminated water discharged from said processing separator means and connected to said absorbing fluid reclaiming means and said absorber means.



4,839,044

MAGNET FILTER

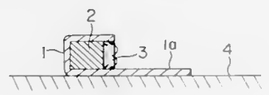
Kazuyuki Tomita, 12-7, Yamate-cho 2-chome, Suita-shi, Osaka-fu, Japan

Continuation of Ser. No. 1,728, Jan. 7, 1987, abandoned. This application Sep. 26, 1988, Ser. No. 251,030

Claims priority, application Japan, Apr. 3, 1986, 61-49020

Int. Cl.[4] B01D *35/06*

U.S. Cl. 210—222 **2 Claims**



1. A magnetic filter comprising:

a container-like magnetically permeable housing, having a plurality of sides and an open end defining a space therein, for containing a magnet;

a magnet having a plurality of sides, contained in said container-like housing and attached at an end of said housing and spaced from said open end thereof, said magnet having north and south poles and forming a magnetic field within said housing, the spacing between the extent of the magnetic field and said open end being sufficiently great for containing the magnetic field substantially within said housing; and

said plurality of sides of said housing covering each side of said plurality of sides of said magnet except for one pole of said north and south poles of said magnet, at least one side of said plurality of sides of said housing being a long side, at least one side of said plurality of sides of said housing being a short side, said long side being longer than said short side, said long and short sides extending away from said magnet and past the said except for one pole of said north and south poles of said magnet for defining a subspace of said space in said housing, said subspace being between said magnet and said open end of said housing for containing magnetic particles therein, said long side of said plurality of sides of said housing retaining, when in use, attracted magnetic particles which, under influence of centrifugal forces or forces owing to the flow of magnetic particle-laden material flowing past said container-like housing, overflow the subspace of said container-like housing.

4,839,045

THERMOPLASTIC FILTER PLATE FOR A FILTER PRESS

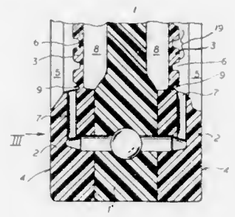
Gerhard Wildner, Nersingen, Fed. Rep. of Germany, assignor to Lenser Verwaltungs-GmbH, Senden, Fed. Rep. of Germany

Filed Aug. 24, 1987, Ser. No. 88,874

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3701862

Int. Cl.[4] B01D *25/12*

U.S. Cl. 210—228 **15 Claims**



1. In a filter plate made of a thermoplastic material for a filter press in which a plurality of said filter plates are clamped together edgewise forming a plurality of filter chambers between themselves, said filter plate having a press wall on one or both side thereof which is at least flexible in an edge region and which is movable by action of a pressurizing medium into one of said filter chambers, each of said filter plates including a supporting wall and a compression chamber for said pressurizing medium acting on said press wall, said supporting wall being located between adjacent ones of said compression chambers, the improvement wherein said press wall is made in one piece with a plate frame of said filter plate, said plate frame being rigid and composed of a hard plastic material resistive to the closing pressure of said filter press and said press wall being composed of an elastic plastic material different from said hard plastic material and permitting said press wall to flex relative to said frame.

4,839,046

BIO-REACTOR CHAMBER

Joseph A. Chandler, Dickinson, Tex., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 20, 1987, Ser. No. 87,358

Int. Cl.[4] B01D *29/04, 29/42*

U.S. Cl. 210—355 **5 Claims**

1. A bio-reactor for cell culture comprising

a container;

means to seal the top of said container;

an inlet for fresh medium into said container;

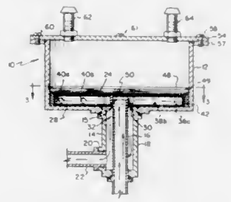
an outlet for depleted medium from said container;

a filter fitted in the inside perimeter of the container;

liquid medium-driven rotating means disposed within said container below said filter;

said rotating means including means for delivery of fresh medium from the inlet through the filter into the container causing gentle circulation within the container and causing the filter to continuously backwash with the flow of fresh medium into the container;

said rotating means further including means for the egress of depleted medium from the container through said filter to said outlet; and



means retaining said filter adjacent to said means for delivery and said means for egress of medium.

4,839,047

INTERMITTENT-ACTION APPARATUS FOR FILTERING LIQUID

Viktor V. Shishkin, ulitsa Festivalnaya, 16, kv.5; Nikolai F. Kryazhevskikh, ulitsa Krasnykh Partizan, 559, kv.13, and Jury P. Shapovalov, ulitsa Turgeneva, 18, all of Krasnodar, U.S.S.R.

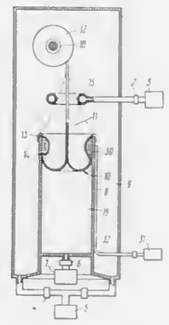
PCT No. PCT/SU86/00133, § 371 Date Jul. 24, 1987, § 102(e) Date Jul. 24, 1987, PCT Pub. No. WO87/03822, PCT Pub. Date Jul. 2, 1987

PCT Filed Dec. 17, 1986, Ser. No. 112,564

Claims priority, application U.S.S.R., Dec. 24, 1985, 3988604; Dec. 24, 1985, 3988605; Dec. 24, 1985, 3988612

Int. Cl.[4] B01D *33/00*

U.S. Cl. 210—356 **12 Claims**



1. An intermittent-action apparatus for filtering liquids, comprising:

a sealed casing having a feed means that can communicate with a system for supplying liquids to be filtered;

a hollow cylinder arranged in said casing so as to define an annular space positioned below feed means, said cylinder having an inner surface, an outer surface, an open mouth region and a closed bottom region;

a precipitate removal system communicating with a bottom portion of said annular space;

a clean liquid removal system communicating with said bottom region of said hollow cylinder; and

a flexible filtering

element, having an open ended substantially cylindrical shape, said element being moveable within said casing, and having a first end secured to said hollow cylinder and a second end connected to a pulley system mounted above said cylinder,

a portion of said filter element being adaptable to be positioned inside said hollow cylinder to define an interior filter element volume opening toward said open mouth region and in flow communication with said feed means, a drive

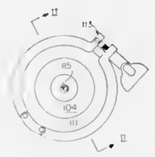
means for rotating said pulley to an extent sufficient to discharge accumulated precipitate from said interior volume into the annular space.

4,839,048

CONTAINER FOR PRESSURIZED FLUID

Clayton L. Reed, Cortland, and John D. Miller, Ithaca, both of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Filed Jul. 8, 1986, Ser. No. 883,504
Int. Cl.[4] B01D *25/04*
U.S. Cl. 210—450 **13 Claims**



1. A container for pressurized fluid, comprising a plastic fluid vessel including a shell and first and second end means for sealingly engaging the shell and sliding along the shell in response to pressurization of the vessel, the first and second end means including first and second end caps mounted within the shell, each end cap having a peripheral groove and an O-ring disposed within the groove for forming a slideable seal against the shell; a sheath arrangement which may be fitted around the fluid vessel; and means for releasably tightening the sheath arrangement around the plastic fluid vessel whereby the vessel may be safely removed from the sheath and discarded while the sheath and tightening means are maintained for reuse.

4,839,049

CERAMIC COMPOSITION

John W. Kinney, Jr., New Richmond, and John W. Graham, Cincinnati, both of Ohio, assignors to Astro Met Associates, Inc., Cincinnati, Ohio

Division of Ser. No. 794,956, Nov. 4, 1985, Pat. No. 4,760,038, which is a continuation of Ser. No. 523,737, Sep. 1, 1983, abandoned. This application May 19, 1988, Ser. No. 198,449
Int. Cl.[4] B01D *39/20*
U.S. Cl. 210—510.1 **5 Claims**

4. A thermal shock resistant ceramic foam filter having an open cell structure of interconnected voids surrounded by a web of ceramic and being comprised of the following:

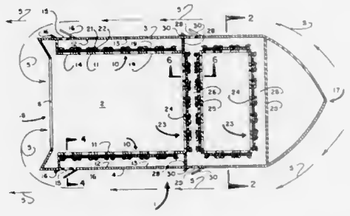
a principal ingredient of 60–99.3% Al_2O_3; a first additive of about 5–35% ZrO_2; and about 0.25–5% combined dry weight at TiO_2 as a second additive and MnO_2 as a third additive.

4,839,050

SKIMMER SYSTEM

Harold J. Beard, and Raleigh L. Cox, both of 11328 Pennywood Ave., Baton Rouge, La. 70809-4138

Continuation of Ser. No. 732,578, May 10, 1985, abandoned. This application Jun. 8, 1987, Ser. No. 59,739
Int. Cl.[4] C02F *3/12, 1/40*; B01D *21/24*
U.S. Cl. 210—540 **7 Claims**



1. In combination with an intrachannel clarifier structure having an interior defined by a floor, two side walls, a front, a rear and at least one entry opening, and said structure being semi-submersibly positioned in a moving liquid stream so as to allow liquid from said stream to assume an interior level within said interior, a skimmer system, comprising at least one side trough having a bottom, an interior trough wall and an exterior trough wall, said exterior trough wall being fixedly connected within said interior of said structure to one of said side walls, said interior trough wall being provided with at least one trough entry opening communicating between said interior of said structure and the interior of said trough at a point so as to intercept said interior level, and said exterior trough wall being provided with at least one trough exit opening communicating between the interior of said side trough and the exterior of said structure so as to intercept the surface of said liquid stream, said skimmer system further comprising at least one adjustment plate, slidingly positionable over at least one said through entry opening.

4,839,051

METHOD FOR TREATING WATER

Teruo Higa, Ginowan, Japan, assignor to Saken Co., Ltd., Fukuoka and Ryoko Co., Ltd., Tokyo, both of, Japan

Continuation-in-part of Ser. No. 863,575, May 15, 1986, abandoned. This application Jun. 11, 1987, Ser. No. 62,351
Claims priority, application Japan, Sep. 12, 1985, 60-202281
Int. Cl.[4] C02F *3/32*
U.S. Cl. 210—602 **7 Claims**

1. A method for treating contaminated water, comprising the steps of:

providing a treatment zone having water-impermeable side and bottom walls, said treatment zone being located beneath the surface of the earth, said bottom walls descending downward in a series of steps, the bottom surface of each of said steps being substantially horizontal, from an input end to an output end, said treatment zone containing only soil or other constituents naturally occurring in said zone or artificially added thereto and having plants growing therein which vary from shallow-rooted plants positioned near the input end to deep-rooted plants positioned near the output end;

applying the contaminated water to said soil at said input end;

allowing the water to flow through said soil from said input end solely by force of gravity;

collecting treated water at the bottom portion of said output end; and

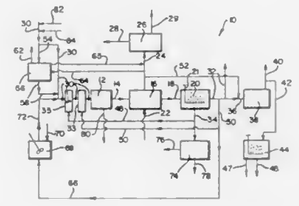
receiving said treated water.

4,839,052

BIOLOGICAL TREATMENT OF WATER

Johannes P. Maree, Pretoria, South Africa, assignor to Council for Scientific and Industrial Research, Pretoria, South Africa

Continuation of Ser. No. 24,042, Mar. 10, 1987, abandoned. This application Jun. 23, 1988, Ser. No. 212,037
Int. Cl.[4] C02F *3/30*
U.S. Cl. 210—603 **12 Claims**



1. A process for the treatment of acid mine effluent water containing dissolved calcium ions and sulphate ions, which comprises the steps of:

adding calcium hydroxide to a supply of said water in a neutralization stage:

passing the water containing the dissolved calcium and sulphate ions at a neutral pH of 5 - 8.5 through an anaerobic biological sulphate removal stage wherein microorganisms utilize the sulphate ions in the water to produce hydrogen sulphide:

passing the water from the anerobic stage through a hydrogen sulphide removal stage where hydrogen sulphide is removed therefrom;

passing the water from the hydrogen sulphide removal stage through an aerobic biological treatment stage wherein microorganisms cause at least partial biodegradation of any organic material remaining in the water, and wherein precipitation of calcium carbonate takes place; and

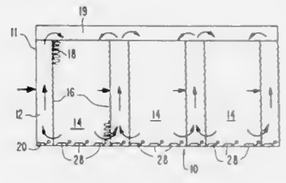
recirculating the calcium carbonate precipitate from the aerobic stage to the neutralization stage to assist in the neutralization of the pH of the water, the process including the step of feeding into the anaerobic biological sulphate removal stage a source of carbon which is metabolizable by the microorganisms which utilize the sulphate ions.

4,839,053

BIOMASS GROWTH PROCESS WITH SEPARATE AERATION AND MEDIA COMPARTMENTS

Charles E. Tharp, Columbia, Mo., assignor to Ashbrook-Simon-Hartley Corp., Houston, Tex. and Simon-Hartley, Manchester, England

Filed Sep. 30, 1987, Ser. No. 102,672
Int. Cl.[4] C02F *3/04, 3/08*
U.S. Cl. 210—616 **4 Claims**



1. A horizontal flow process for enhancing the growth of biomass comprising the steps of:

connecting an open face of a media-free compartment with the open face of a media compartment;

positioning a screen at the location of the connection of said compartments;

depositing a number of biomass support bodies in said media compartment;

circulating effluent comprising liquid and nutrient through said media compartment so that said effluent passes into contact with said biomass support bodies, thereby allowing some of the nutrient to contribute to the growth of biomass;

permitting said effluent to pass horizontally through said screen into said media-free compartment;

recirculating by means of a mechanical fluid circulator said effluent passing into said media-free compartment through said media compartment; and

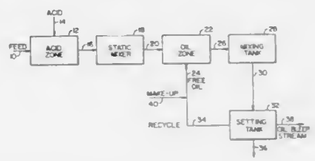
successively repeating the effluent circulation and recirculation process through additional alternately interconnected media compartments and media-free compartments, with screens positioned therebetween at the points of intersection.

4,839,054

PROCESS FOR REMOVING WATER-SOLUBLE ORGANICS FROM PRODUCED WATER

Ann M. Ruebush, San Francisco; Samuel L. Davis, Jr., Solvang, and Vern A. Norviel, Castro Valley, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 23, 1987, Ser. No. 112,844
Int. Cl.[4] C02F *1/26*
U.S. Cl. 210—639 **2 Claims**



1. A process for removing water-soluble organics from oil field produced water, said organics including one or more dissolved metal salts of oxygenated hydrocarbons, alkane acids, and cyclic acids comprising:

a. acidifying said oil field produced water with a mineral

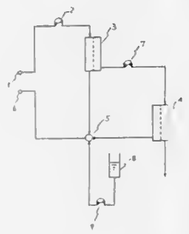
acid sufficient to achieve an acidified water having a pH of 6.0 or less;
b. contacting said acidified water with an effective amount of crude oil having an API gravity of from about 22 API to 35 API to form a mixture;
c. agitating said mixture to produce a thoroughly mixed emulsion free phase; and
d. separating said mixed phase to produce a crude oil phase which includes at least the major portion of said water-soluble organics and a substantially clean water phase.

4,839,055

METHOD FOR TREATING BLOOD AND APPARATUS THEREFOR

Makoto Ishizaki, Sendai; Takateru Sato, Kurashiki; Soichi Tanaka, Tokorozawa, and Keiki Kariu Sagamihara, all of Japan, assignors to Kuraray Co., Ltd. and Kawasumi Laboratories, Inc., both of, Japan

Filed May 29, 1986, Ser. No. 868,267
Claims priority, application Japan, May 31, 1985, 60-119369
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—641 **4 Claims**



1. A method for selectively removing IgG from blood which comprises:
separating the blood withdrawn from a patient's body with a first membrane into a blood fraction containing human blood plasma immunoglobulin M, and a plasma fraction;
separating the plasma fraction with a second membrane into a low molecular weight protein fraction and a high molecular weight protein fraction containing human blood plasma immunoglobulin G; and
mixing the blood fraction and the low molecular weight protein fraction with a substitute liquid to return the combined liquid into the patient's body;
said first membrane containing micropores, exhibiting an average pore diameter of 0.005–0.45 micron, uniformly distributed on at least one surface of the membrane, and having a permeability of albumin of not less than 50% and a permeability of human blood plasma immunoglobulin M of not more than 40%;
said second membrane containing micropores, exhibiting an average pore diameter of 0.005–0.20 micron, uniformly distributed on at least one surface of the membrane, and having a permeability of albumin of 30–80% and a permeability of human blood plasma immunoglobulin G of 10–50%.

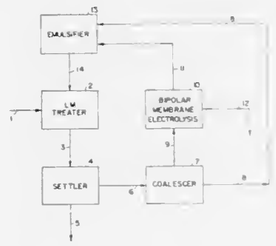
4,839,056

RECOVERY AND CONCENTRATION OF AQUEOUS ACIDS AND BASES

Robert P. Cahn, 799 Ridgewood Rd., Millburn, N.J. 07041

Filed Jun. 2, 1988, Ser. No. 201,632
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—643 **15 Claims**

15. A process for removing and recovering phenol from an aqueous feedstream by treatment with a fresh emulsion comprising a dispersed aqueous phase comprising both sodium hydroxide and sodium phenolate, maintaining contact between the emulsion and feedstream for sufficiently long time and under enough agitation to remove more than 90% of the phenol in the feedstream, absorbing said phenol into the emulsion, separating the treated feed from the spent emulsion, demulsifying the spent emulsion in an electrostatic coalescer into a spent aqueous dispersed phase and an oil-based membrane phase, subjecting said spent aqueous dispersed phase to bipolar membrane electrolysis in a cell having at least (i) one salt-depleting compartment, (ii) one caustic-regenerating compartment, and



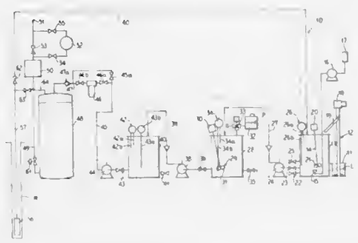
(iii) one phenol-regenerating compartment, feeding said spent aqueous dispersed phase to said salt-depleting compartment, and feeding the effluent from this compartment to said caustic-regenerating compartment, feeding the effluent from this caustic-regenerating compartment to an emulsification step together with the membrane phase separated out in said electrostatic coalescer to make said fresh emulsion, and subjecting the effluent from said phenol-regenerating compartment to distillation to recover phenol in concentrated form, and recycling the aqueous residue from said distillation as feed to said phenol-regenerating compartment.

4,839,057

WATER TREATMENT SYSTEM

Harold R. White, New Lenox, Ill., assignor to Alar Engineering Corporation, Mokena, Ill.

Filed Sep. 30, 1987, Ser. No. 102,635
Int. Cl.[4] C02F *9/00*
U.S. Cl. 210—667 **20 Claims**



1. The method of purifying contaminated water which comprises sequentially feeding impure water from a source through a plurality of tanks, feeding lime into a first tank, agitating the lime and water in the first tank, aerating the lime and water in the first tank, settling a residue from the treated water in the first tank, transferring clarified water from the first tank to a second tank, agitating the water in the second tank, feeding an acid into the water in the second tank, settling residue from the water in the second tank, transferring clarified water from the second tank to a reservoir tank, pumping water from the reservoir tank through a filter, transferring the filtered water to a

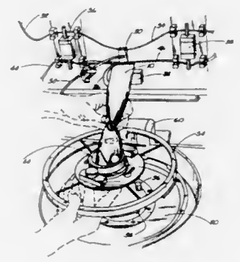
pressurized storage tank, and selectively feeding the water from the storage tank through a water softener or direct to piping for end use.

4,839,058

ON-LINE PLASMA MODIFICATION METHOD

Leo P. Cawley; Steven A. Bryant, and Barbara J. Minard, all of 550 N. Hillside, Wichita, Kans.

Continuation of Ser. No. 727,924, Apr. 29, 1985, Pat. No. 4,722,790, which is a continuation-in-part of Ser. No. 417,704, Sep. 13, 1982, abandoned. This application Oct. 1, 1987, Ser. No. 103,453
Int. Cl.[4] B01D *15/00*
U.S. Cl. 210—670 **19 Claims**



1. A method for liquid modification comprising the steps of:
(a) installing into a centrifuge bowl means a pliable liquid impervious bag means having a plurality means being made of an inert solid material an coated with a binder covalently coupled thereto, said binder is selected from the group consisting of antigen, antibody, toxins, cells, specific protein, bacteria, viruses, and mixtures thereof;
(b) securing a centrifuge cover means to the centrifuge bowl means;
(c) introducing a liquid including matter to be removed into the pliable bag means;
(d) spinning the centrifuge bowl means at a predetermined speed in order to mix vigorously the liquid with the bead means in the bag means in order to expose the bead means to the matter within the liquid such that the exposure enables the matter to attach and adsorb to the exterior surface of the bead means, leaving a stripped liquid phase essentially not containing any of the matter;
(e) separating the stripped liquid phase from the pliable bag means and the bead means having the absorbed matter that has been removed from the liquid.

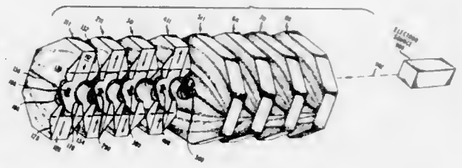
4,839,059

CLAD MAGIC RING WIGGLERS

Herbert A. Leupold, Eatontown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 23, 1988, Ser. No. 210,687
Int. Cl.[4] H01F *7/00*
U.S. Cl. 210—335 **12 Claims**

1. A periodic permanent magnet structure comprising:
a plurality of truncated magic rings arranged in a linear array, each said magic ring having an interior working space and producing a substantially uniform magnetic flux vector therein,
a plurality of cladding magnets between each pair of said magic rings, said cladding magnets substantially covering said working spaces and having exterior spaces contoured to substantially prevent the escape of magnetic flux from said working space,



said magic rings being arranged so that the angular change in direction of the said magnetic flux vector from one ring to the next ring is constant.

4,839,060

METHYLATED STARCH COMPOSITIONS AND THEIR USE AS FLOCCULATING AGENTS FOR MINERAL WASTES, SUCH AS BAUXITE RESIDUES

Raymond N. Yong, Beaconsfield, and Amar J. Sethi, Fort McMurray, both of Canada, assignors to Suncor, Inc., North York, Canada

Filed Oct. 21, 1987, Ser. No. 110,815
Claims priority, application Canada, Apr. 28, 1987, 535765
Int. Cl.[4] C02F *1/54;* **B03D** *3/06*
U.S. Cl. 210—731 **16 Claims**

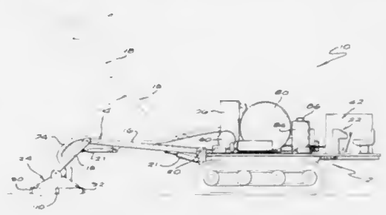
1. A process of the flocculation of aqueous dispersions of mineral wastes which comprises adding to said waste dispersion a flocculating amount of a methylated starch containing acetal and methoxy groups.

4,839,061

METHOD AND APPARATUS FOR TREATMENT OF HAZARDOUS MATERIAL SPILLS

Frank Manchak Jr., and Frank Manchak III, both of 330 Golden Shore Dr., Ste. 280, Long Beach, Calif. 90802

Filed Jun. 13, 1988, Ser. No. 206,192
Int. Cl.[4] B01D *57/00*
U.S. Cl. 210—743 **17 Claims**



1. A method of treating a spill of hazardous material comprising the steps of:
(a) supporting a spill pickup and treatment head from a mobile apparatus and sensing the distance between said head and the spill surface;
(b) automatically maintaining a substantially constant distance between said head and the spill surface to permit said head to efficiently draw a sample from the spill surface without said head directly contacting the spill surface;
(c) vacuum drawing a sample of said hazardous material

with said head from the site of the spill to said mobile treatment apparatus;

(d) measuring preselected physical or chemical properties of said hazardous material sample on board said apparatus;

(e) using said measured properties to select one or more treatment agents for treating the spilled hazardous material;

(f) transferring said treatment agent or agents from supplies thereof aboard said mobile treatment apparatus to the spill of the hazardous material; and

(g) repeatedly drawing samples of a mixture of the spilled hazardous material and treatment agent from the spill site aboard the mobile apparatus and evaluating, on board said mobile apparatus, effectiveness of said agent or agents in treatment of said spill.

4,839,062

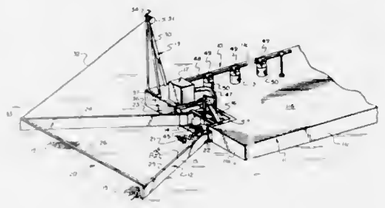
METHOD OF HARVESTING AND HARVESTING DEVICE FOR BRINE SHRIMP EGGS

Bruce C. Sanders, Ogden, Utah, assignor to Sanders Brine Shrimp Company, Ogden, Utah

Continuation-in-part of Ser. No. 561,111, Jun. 1, 1987, abandoned. This application Dec. 29, 1987, Ser. No. 139,580

Int. Cl.[4] A01K *61/00, 79/00;* **C02F** *1/40;* **E02B** *15/00*

U.S. Cl. 210—776 **21 Claims**



1. A method for harvesting brine shrimp eggs comprising the steps of:

locating a layer of buoyant brine shrimp eggs on a body of salt water;

positioning a concentrating funnel having a flat leading edge and a lower trailing inlet port in the salt water with the flat leading edge slightly below the layer of brine shrimp eggs and surface level of the body of water;

causing relative movement between the leading edge of the concentrating funnel and the eggs to collect a portion of the layer of eggs within the funnel and inlet port as a slurry mixture of salt water and eggs;

pumping the slurry mixture to at least one porous receiving container which passes the salt water and retains the collected brine shrimp eggs.

4,839,063

CLEANING OF A BODY OF LIQUID

David A. Brooks, Roodepoort, South Africa, assignor to Spooner Est, Vaduz, Liechtenstein

Continuation-in-part of Ser. No. 710,069, Mar. 11, 1985, Pat. No. 4,652,366. This application Nov. 7, 1986, Ser. No. 927,872

Claims priority, application South Africa, Mar. 12, 1984, 84/1829

The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.

Int. Cl.[4] E04H *3/16*

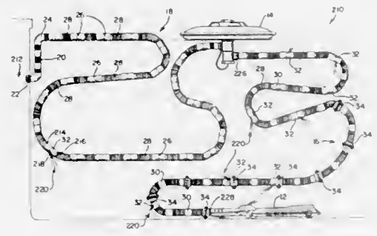
U.S. Cl. 210—780 **22 Claims**

16. A method of cleaning a body of liquid having a surface which includes

supporting an inlet end of a length of drive hose at the surface of the body of liquid by means of a buoyant support unit;

charging pressurized liquid into the inlet end of the drive hose;

releasing liquid from the drive hose at a plurality of positions along its length so that at each position a thrust is exerted on the hose which has a transverse component and a longitudinal component which is directed in an upstream direction, and at an outlet end of the drive hose which is



remote from the inlet end in a generally downstream direction to displace the drive hose through the body of liquid in a generally upstream direction and to push the support unit across the surface; and

pulling a non-buoyant bag-like cleaning member attached to the drive hose, by means of the drive hose, to collect debris in the body of liquid.

4,839,064

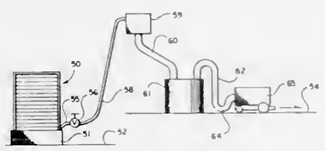
METHOD AND APPARATUS FOR CLEANING COOLING TOWER BASINS

Kevin B. McBurney, 1470 Ashbrook Dr., Lawrenceville, Ga. 30245, and Javier Aleman, 2171 Whitebluff Way, Buford, Ga. 30518

Continuation-in-part of Ser. No. 771,276, Aug. 30, 1985, Pat. No. 4,683,067. This application Jul. 27, 1987, Ser. No. 78,110 The portion of the term of this patent subsequent to Jul. 28, 2004, has been disclaimed.

Int. Cl.[4] B01D *35/16, 35/28, 36/04*

U.S. Cl. 210—806 **8 Claims**



1. A cooling tower basin cleaning apparatus, for cleaning debris-containing sludge from below water in a tower basin, comprising a cleaning tool having a nozzle thereon, and siphon means for creating continuous suction on said cleaning tool and for carrying said sludge from said tower basin, said siphon means including a first pipe means connected to said cleaning tool and extending upwardly to a point above the level of water in said tower basin, a reservoir disposed at said point above the level of water, said reservoir having said first pipe means fixed thereto and in communication with said reservoir, a second pipe means in communication with said first pipe means through said reservoir above the level of water in said tower basin, said second pipe means extending downwardly and having a lower end, filter means connected to and in communication with said lower end of said second pipe means, a trap defined in said second pipe means before said filter means, a first valve for selectively closing said second pipe means at said lower end, and water supply means for filling said second pipe means and said reservoir with water while said first valve is closed, the arrangement being such that said second pipe means can be filled with water with said first valve closed, and said first valve can be opened to establish a siphon action to provide suction on said cleaning tool.

4. A method for cleaning the basin of a cooling tower having debris-containing sludge on the bottom of said basin while cooling water is flowing into and out of said basin, said method including the steps of placing a cleaning tool in said tower basin with the end of said cleaning tool carrying a nozzle beneath the level of water in said basin, providing continuous suction on said cleaning tool, and moving said cleaning tool with said nozzle about said basin to allow said suction to pick up said sludge and some water, and continually replenishing the water in the basin, said step of providing continuous suction on said cleaning tool including the steps of filling a first pipe means with water to a level above the level of water in said basin, connecting a second pipe means from said cleaning tool to said first pipe means at said level above said level of water in said basin, connecting a receiver to the lower end of said first pipe means, allowing said water to flow from said first pipe means to establish a siphon, and using pump means to remove material from said receiver and to lower the pressure within said receiver and within said first pipe means to enhance said siphon so that said siphon will operate with said receiver above the level of water in said basin.

4,839,065

FIRE RETARDANT CONCENTRATES AND METHODS FOR PREPARATION THEREOF

Howard L. Vandersall, Upland, Calif., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 30, 1987, Ser. No. 9,305

Int. Cl.[4] C09K *21/00;* **C09D** *5/16, 5/18;* **A62D** *1/00*

U.S. Cl. 252—603 **4 Claims**

1. An aqueous concentrate that is adapted to be diluted with water to produce an aqueous fire retardant mixture exhibiting a viscosity of between about 1000 centipoise and about 2000 centipoise and containing between about 5% and about 20% by weight fire retardant and between about 0.2% and about 3% by weight thickening agent, the concentrate exhibiting a viscosity of less than about 50 centipoise and containing at least about 24% by weight of the fire retardant and at least about 1.5% by weight of a thickening agent, the characteristics of said fire retardant being such that (a) the fire retardant in solid form releases phosphoric acid or sulfuric acid or both at a temperature below the ignition temperature of cellulose; and (b) mixing of one part by weight said fire retardant with between about 6 and about 20 parts by weight water and between about 0.055 and about 0.2 parts by weight of the thickening agent produces a mixture having a viscosity of between about 1000 and about 2000 centipoise; but (c) mixing of one part by weight of said fire retardant with less than about 4 parts by weight water and between about 0.055 and about 0.2 parts by weight of the thickenng agent produces a mixture having a viscosity less than 1000 centipoise.

4,839,066

FABRIC-SOFTENING DETERGENT

Wolfgang von Rybinski, Duesseldorf; Horst Upadek, Ratingen, and Winfried Wichelhaus, Mettmann, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jan. 22, 1988, Ser. No. 146,991

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1987, 3702067

Int. Cl.[4] D06M *13/26*

U.S. Cl. 252—8.75 **20 Claims**

1. A fabric-softening detergent composition comprising a surfactant, a builder, a fabric-softening layer silicate of the smectite type, and a fabric incrustation-inhibiting, water-insoluble, synthetic layer silicate having a smectite-like crystal structure corresponding to the oxide summation formula

$$MgO \cdot a\ M_2O \cdot b\ Al_2O_3 \cdot c\ SiO_2 \cdot n\ H_2O \quad (I)$$

wherein M represents sodium or sodium and lithium, with the proviso that the molar ratio of Na to Li is at least 2, and wherein a is equal to about 0.05 to about 0.4, b is equal to 0 to about 0.3, c is equal to about 1.2 to about 2.0, and n is equal to about 0.3 to about 3.0, wherein n represents the water bound in the crystal structure, said fabric-softening layer silicate being present in an amount sufficient to soften a fabric washed with said detergent composition, and said fabric incrustation-inhibiting layer silicate being present in an amount sufficient to provide a reduction of incrustation on said fabric, said fabric incrustation-inhibiting layer silicate being further characterized as having a limited swelling power in water and contributing substantially no fabric-softening effect.

4,839,067

PROCESS FOR LUBRICATING AND CLEANING OF BOTTLE CONVEYOR BELTS IN THE BEVERAGE INDUSTRY

Georg Jansen, Kreuzau, Fed. Rep. of Germany, assignor to Akzo N.V., Arnhem, Netherlands

Filed Sep. 2, 1987, Ser. No. 92,200

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1986, 3631953

Int. Cl.[4] C10M *133/04*

U.S. Cl. 252—11 **16 Claims**

1. A process for conveying bottles on chain-type bottle conveyor belts, comprising the steps of lubricating the chain-type bottle conveyor belts with at least one belt lubricant comprising a base of neutralized primary fatty amine, and cleaning the bottle conveyor belts with at least one cleaning agent selected from the group consisting of cationic cleaning agents and organic acids.

4,839,068

POLYSUCCINATE ESTERS AND LUBRICATING COMPOSITIONS COMPRISING SAME

Richard M. Lange, Euclid, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 103,634, Oct. 1, 1987, abandoned. This application May 26, 1988, Ser. No. 199,223

Int. Cl.[4] C10M *145/22*

U.S. Cl. 252—33.6 **39 Claims**

1. A lubricating composition comprising a major amount of a mineral oil of lubricating viscosity and a minor amount of at least one polysuccinate ester having a molecular weight between about 1000 and about 4000, and which is essentially free of cycloaliphatic groups, and wherein succinic groups of the polysuccinate ester contain alkyl or alkenyl substituents having from about 4 to about 28 carbon atoms.

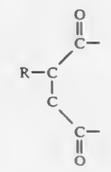
28. A polysuccinate ester of the formula

$$A—S—E—S—E)_n S—B \quad (II)$$

wherein

n is a number between 1 and about 8,

each S is a group of the formula



(III)

wherein
R is an alkyl or alkenyl group having from 4 to about 28 carbon atoms, and
each E is a group of the formula

$$-O(R'O)_aH \quad (IV)$$

wherein
R' is selected from the group consisting of
alkylene groups having from 2 to about 28 carbon atoms,
hydroxy substituted alkylene groups having from 2 to about 28 carbons, and containing from one to about 6 hydroxy groups, with the proviso that the number of hydroxy groups does not exceed the unsatisfied valences of R', and
succinate ester substituted alkylene groups, and wherein a is a number ranging from 1 to about 8, wherein each A and each B is independently
—OH,
—OR^2, wherein R^2 is an alkyl group containing from 1 to about 28 carbons, —$O(R'O)_bH$, wherein R' is an alkylene group containing from about 2 to about 28 carbon atoms, and b is a number ranging from 1 to about 8, and
—NR_2^3, wherein each R^3 is independently H or an alkyl group having from 1 to about 18 carbon atoms, with the proviso that at least one of A or B is not —OH, or, when A or B is —OH, a salt may be formed by reaction with a basic metal containing reagent, ammonia or an amine, and which polysuccinate ester has a molecular weight between about 1000 and about 4000.

4,839,069

OLEFIN POLYSULFIDE COMPOSITIONS THEIR MANUFACTURE AND USE AS ADDITIVES FOR LUBRICANTS

Maurice Born, Nanterre; Lucienne Briquet, Rueil Malmaison; Jacques Lallement, Aubervilliers, and Guy Parc, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Oct. 16, 1987, Ser. No. 109,006
Int. Cl.[4] C10M *135/00, 159/12*
U.S. Cl. 252—45 **15 Claims**

1. An olefin polysulfide composition obtained by a process comprising the steps of:
(1) reacting at least one compound selected from sulfur monochoride and dichloride with at least one aliphatic monoolefin having 2 to 5 carbon atoms, complying with the formula $R^1—C(R^2)=CH_2$, wherein R^1 is a hydrogen atom or an alkyl radical having from 1 to 3 carbon atoms and R^2 is a hydrogen atom or a methyl radical, so as to form an addition product, and
(2) reacting said addition product with at least one polysulfide complying with general formula R^3S_xM, wherein R^3 represents an aliphatic radical, optionally carrying a functional group, an aromatic radical, optionally substituted with at least one aliphatic radical or an heterocyclic radical, M is a monovalent atom or group corresponding to an inorganic base of formula MOH, and x has an average value of at least 1.2.

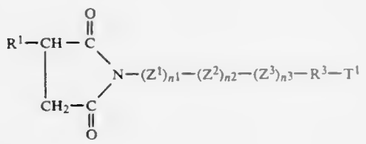
4,839,070

POLYOLEFINIC SUCCINIMIDE POLYAMINE ALKYL ACETOACETATE ADDUCT DISPERSANTS

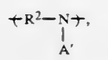
Antonio Gutierrez, Mercerville, and Robert A. Kleist, Bayonne, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed May 18, 1987, Ser. No. 51,146
The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.
Int. Cl.[4] C10M *133/16*
U.S. Cl. 252—51.5 A **48 Claims**

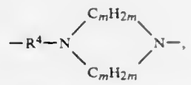
1. An oleaginous composition comprising: a lubricating oil and a dispersant effective amount of an adduct of the formula:



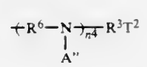
wherein Z^1 and Z^3 are the same or different and are moities of the formula:



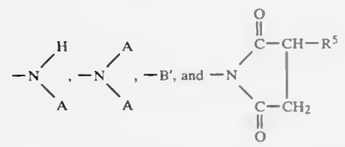
Z^2 ia a moiety of the formula:



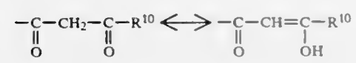
wherein R^2, R^3 and R^4 are the same or different and are alkylene of from 1 to 6 carbon atoms, m is an integer of from 1 to 5, each A' is independently selected from the group consisting of H, A and the moiety:



wherein A'' is H or A, R^3 is as defined above, R^6 is alkylene of from 1 to 6 carbon atoms, T^1 and T^2 are the same or different and each comprises a member selected from the group consisting of moieties of the formula:



wherein B' is substituted or unsubstituted alkyl or aryl-containing group, n^1 is an integer of 0 to 10, n^2 is an integer of 0 to 10, n^3 is an integer of from 0 to 10, n^4 is an integer of from 0 to 10, with the provisos that the sum of n^1, n^2, n^3 and n^4 is from 3 to 10 and the sum of n^1, n^3 and n^4 is at least 1, wherein R^1 and R^5 are independently an olefin polymer having a number average molecular weight ($\overline{M}_n$) between about 650 and 3,500, and wherein A comprises a tautomeric substituent of the formula:



wherein R^{10} is substituted or unsubstituted alkyl or aryl containing groups, with the proviso that at least one of the A' or A'' groups comprises said tautomeric substituent.

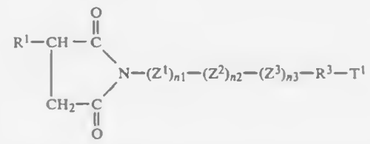
4,839,071

POLYOLEFINIC SUCCINIMIDE POLYAMINE ALKYL ACETOACETATE ADDUCTS AS DISPERSANTS IN LUBRICATING OIL COMPOSITIONS

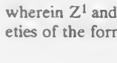
Antonio Gutierrez, Mercerville; Robert D. Lundberg, Bridgewater; Robert A. Kleist, Bayonne, and Ricardo Bloch, Scotch Plains, all of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed May 18, 1987, Ser. No. 51,273
The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.
Int. Cl.[4] C10M *133/16*
U.S. Cl. 252—51.5 A **37 Claims**

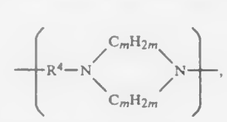
1. An oleaginous composition comprising:
a lubricating oil, and a dispersant effective amount of an adduct of the formula:



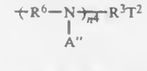
wherein Z^1 and Z^3 are the same or different and are moieties of the formula:



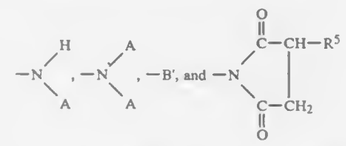
Z^2 is a moiety of the formula:



wherein R^2, R^3 and R^4 are the same or different and are alkylene of from 1 to 6 carbon atoms, m is an integer of from 1 to 5, each A' is independently selected from the group consisting of H, A and the moiety:

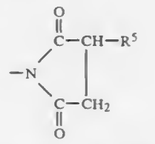


wherein A'' is H or A, R^3 is as defined above, R^6 is alkylene of from 1 to 6 carbon atoms, T^1 and T^2 are the same or different and each comprises a member selected from the group consisting of moieties of the formula:



wherein B' is substituted or unsubstituted alkyl or aryl-containing group, n^1 is an integer of 0 to 10, n^2 is an integer of 0 to 10, n^3 is an integer of from 0 to 10, n^4 is an integer of from 0 to 10, with the provisos that the sum of n^1, n^2, n^3 and n^4 is from 3 to 10 and the sum of n^1, n^3 and n^4 is at least 1, wherein R^1 and R^5 are independently an olefin polymer having a number average molecular weight ($\overline{M}_n$) between about 650 and 3,500, and wherein A comprises a tautomeric substituent of the formula:

wherein R^{10} is substituted or unsubstituted alkyl or aryl containing groups, with the proviso that at least one of the A' or A'' groups comprises said tautomeric substituent, wherein at least about 95% of T^1 and T^2 groups in said adduct dispersant comprise said succinimide moiety of the formula:



wherein R^5 is as defined above.

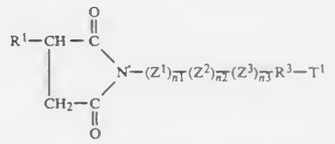
4,839,072

POLYOLEFINIC SUCCINIMIDE POLYAMINE ALKYL ACETOACETATE ADDUCTS

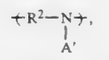
Antonio Gutierrez, Mercerville, and Robert A. Kleist, Bayonne, N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed May 18, 1987, Ser. No. 51,276
Int. Cl.[4] C10M *133/16*
U.S. Cl. 252—51.5 A **59 Claims**

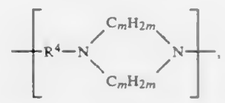
1. An adduct of the formula:



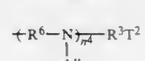
wherein Z^1 and Z^3 are the same or different and are moities of the formula:



Z^2 is a moiety of the formula:

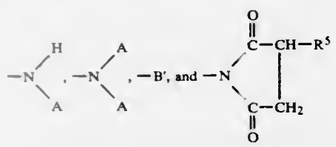


wherein R^2, R^3 and R^4 are the same or different and are alkylene of from 1 to 6 carbon atoms, m is an integer of from 1 to 5, each A' is independently selected from the group consisting of H, A and the moiety:

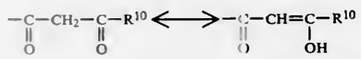


wherein A'' is H or A, R^3 is as defined above, R^6 is alkylene of from 1 to 6 carbon atoms, T^1 and T^2 are the same or different

and each comprises a member selected from the group consisting of moieties of the formula:



wherein B' is substituted or unsubstituted alkyl or aryl-containing group, n^1 is an integer of 0 to 10, n^2 is an integer of 0 to 10, n^3 is an integer of from 0 to 10, n^4 is an integer of from 0 to 10, with the provisos that the sum of n^1, n^2, n^3 and n^4 is from 3 to 10 and the sum of n^1, n^3 and n^4 is at least 1, wherein R^1 and R^5 are independently an olefin polymer having a number average molecular weight ($\overline{M}_n$) between about 200 and 3,500, and wherein A comprises a tautomeric substituent of the formula:



wherein R^{10} is substituted or unsubstituted alkyl or aryl containing group, with the proviso that at least one of the A' or A" groups comprises said tautomeric substituent.

4,839,073

POLYOLEFINIC SUCCINIMIDE POLYAMINE ALKYL ACETOACETATE AND SUBSTITUTED ACETATE ADDUCTS AS COMPATIBILIZER ADDITIVES IN LUBRICATING OIL COMPOSITIONS

Antonio Gutierrez, Mercerville, N.J.; Jacob Emert, Brooklyn, N.Y.; Robert A. Kleist, Bayonne, and Malcolm Waddoups, Westfield, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed May 18, 1987, Ser. No. 51,275

The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.

Int. Cl.[4] C10M *133/16*

U.S. Cl. 252—51.5 A **61 Claims**

1. An oleaginous composition comprising:

(a) from about 1 to 70 wt.% of an ashless nitrogen or ester containing dispersant compound selected from the group consisting of:

(i) oil soluble salts, amides, imides, oxazolines and esters, or mixtures thereof, of long chain hydrocarbon substituted mono- and dicarboxylic acids or their anhydrides;

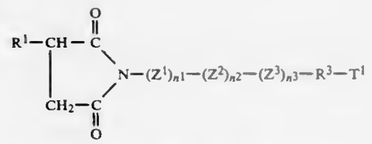
(ii) long chain aliphatic hydrocarbon having a polyamine attached directly thereto; and

(iii) Mannich condensation products formed by condensing about a molar proportion of long chain hydrocarbon substituted phenol with about 1 to 2.5 moles of formaldehyde and about 0.5 to 2 moles of polyalkylene polyamine, wherein said long chain hydrocarbon group in (i), (ii), or (iii) is a polymer of a C_2 to C_5 monoolefin, said polymer having a molecular weight of about 700 to about 5000;

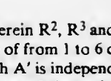
(b) from about 2 to 40 wt.% of an overbased detergent material;

(c) at least one of a zinc dihydrocarbyl dithiophosphate antiwear material, and a copper carboxylate antioxidant material, said antiwear material, when present, being employed in a concentration of from about 2 to 40 wt.%, and said copper carboxylate material, when present, being employed in a concentration of from about 0.5 to 25 wt.%; and

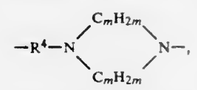
(d) a compatibilizing effective amount of an adduct of the formula:



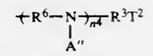
wherein Z^1 and Z^3 are the same or different and are moities of the formula:



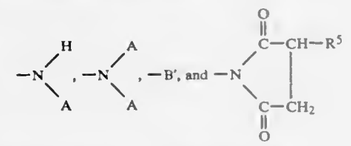
Z^2 is a moiety of the formula:



wherein R^2, R^3 and R^4 are the same or different and are alkylene of from 1 to 6 carbon atoms, m is an integer of from 1 to 5, each A' is independently selected from the group consisting of H, A and the moiety:

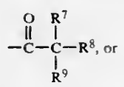


wherein A" is H or A, R^3 is as defined above, R^6 is alkylene of from 1 to 6 carbon atoms, T^1 and T^2 are the same or different and each comprises a member selected from the group consisting of moieties of the formula:

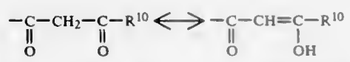


wherein B'is substituted or unsubstituted alkyl or aryl-containing group, n^1 is an integer of 0 to 10, n^2 is an integer of 0 to 10, n^3 is an integer of from 0 to 10, n^4 is an integer of from 0 to 10, with the provisos that the sum of n^1, n^2, n^3 and n^4 is from 3 to 10 and the sum of n^1, n^3 and n^4 is at least 1, wherein R^1 and R^5 are independently an olefin polymer having a number average molecular weight ($\overline{M}_n$) between about 650 and 3,500, and wherein A comprises:

(i) a substituted acetyl moiety of the formula:



(ii) a tautomeric substituent of the formula:



wherein R^7, R^8 and R^9 are the same or different and are H or alkyl of from 1 to 4 carbon atoms, and wherein R^{10} is substituted or unsubstituted alkyl or aryl containing groups, with the proviso that at least one of the A' or A" groups comprises said substituted acetyl or said tautomeric substituent.

4,839,074

SPECIFIED C_{14}-CARBOXYLATE/VINYL ESTER POLYMER-CONTAINING COMPOSITIONS FOR LUBRICATING OIL FLOW IMPROVEMENT

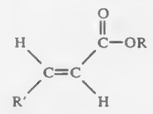
Albert Rossi, Warren, N.J.; Robert Tack, Oxford; Kenneth Lewtas, Wantage, both of United Kingdom, and Jose Alves, Rio de Janeiro, Brazil, assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed May 22, 1987, Ser. No. 53,698

Int. Cl.[4] C10M *129/26, 129/68*

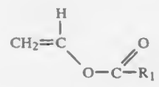
U.S. Cl. 252—56 D **84 Claims**

1. A composition capable of improving at least the low temperature flow properties of a lubricating oil composition containing a Viscosity Index Improver, comprising, as a first component at least one of (a) low molecular weight polymer of unsaturated carboxy ester having the formula:



(I)

wherein R' is selected from the group consisting of hydrogen and COOR and wherein R is a C_{14} alkyl group and (b) low molecular weight copolymer of the carboxy ester of formula (I), and vinyl ester represented by the formula:



(II)

wherein R_1 comprises an alkyl group containing from 1 to 18 carbon atoms, and as a second component at least one lubricating oil flow improver comprising low molecular weight nonethylene containing polymer or interpolymer containing pendent ester groups, having repeating methylene units derived from a mixture of alcohols present within the structure of said pendant ester groups; the weight ratio of said second component to said first component in said composition varying from about 1:0.3 to about 1:0.9.

4,839,075

FABRIC-SOFTENING DETERGENT

Rolf Puchta, Haan; Hans Nuesslein, Langenfeld, and Hannelore Casper, Erkrath, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 2, 1988, Ser. No. 151,388

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1987, 3702968

Int. Cl.[4] D06M *13/26*

U.S. Cl. 252—8.7 **18 Claims**

1. A granular, phosphate-reduced, builder-containing detergent composition containing the combination consisting essentially of;

(a) from about 4 to about 20% by weight of natural layer silicate, and

(b) from about 0.3 to about 10% by weight of fatty acid condensate obtained by reaction of a fatty acid triglyceride with a hydroxyalkyl polyamine, based on the weight of said detergent composition wherein the ratio by weight of said layer silicate to said fatty acid condensate is between 5:1 and 1:2.

4,839,076

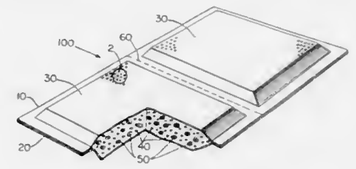
POUCHED THROUGH THE WASHER AND DRYER LAUNDRY ADDITIVE PRODUCT HAVING AT LEAST ONE WALL COMPRISED OF FINELY APERTURED POLYMERIC FILM

Kenneth W. Willman, Fairfield; June T. Brennock; David C. O'Neill, both of Cincinnati, and Joan B. Szkutak, Fairfield, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 7, 1988, Ser. No. 178,747

Int. Cl.[4] C11D *17/00*

U.S. Cl. 252—90 **28 Claims**



1. A pouched through the washer and dryer laundry additive product for distributing a substantially predetermined quantity of washer additive into the water during the wash cycle and for applying a substantially predetermined quantity of dryer additive substantially uniformly onto the surfaces of the laundered textile articles during the tumble drying cycle, said laundry additive product comprising:

(a) a predetermined quantity of particulate water soluble washer additive;

(b) a predetermined quantity of particulate dryer additive which is substantially insoluble in water, said particulate dryer additive having a softening temperature which is greater than the temperature of the wash water, but less than the temperature normally encountered in an automatic clothes dryer; and

(c) a pouch formed from at least two pliable opposing walls, said pouch including at least one discrete compartment formed by said pliable opposing pouch walls, at least one of said pliable opposing pouch walls being comprised of substantially water impermeable synthetic polymeric film which has a softening temperature greater than the maximum temperature to which it will be exposed during the washing and drying cycles, said film also being substantially nonabsorbent to said washer additive and said dryer additive, said compartment totally enclosing said particulate washer additive and said particulate dryer additive, said polymeric film pouch wall further exhibiting a pattern of protuberances which are outwardly oriented relative to the interior of said compartment, each of said protuberances exhibiting an aperture at its tip, each of said apertures being of substantially predetermined size, said pattern having a density in the range of between about 1,600 and about 14,400 apertures per square inch, substantially all of said apertures in said polymeric film pouch wall exhibiting a maximum cross-section which is small enough to prevent the bulk of said particulate washer additive and the bulk of said particulate dryer additive from passing therethrough so long as they remain in a substantially dry, solid state, said apertures in said polymeric film pouch wall also being large enough to permit said wash water to enter said pouch, dissolve said particulate washer additive and form a wash liquor which thereafter exits said pouch through said apertures during said wash cycle without dissolving said substantially water insoluble particulate dryer additive, said apertures in said polymeric film pouch wall also functioning during the tumble drying cycle to substantially uniformly distribute said dryer additive onto the surfaces of the laundered textiles which come in contact with said apertured pouch

wall during the tumble drying cycle while said dryer additive is in a softened and viscous state.

4,839,077

THICKENED BLEACH COMPOSITION

Randall J. Cramer, Ridgecrest, and William L. Smith, Pleasanton, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation-in-part of Ser. No. 894,234, Aug. 7, 1986, abandoned. This application Mar. 23, 1988, Ser. No. 173,000
Int. Cl.[4] C11D 1/29, 3/37, 3/395
U.S. Cl. 252—98 23 Claims

1. A thickened pourable aqueous bleach composition comprising

(a) a bleaching-effective amount of an active halogen compound;

(b) a thickening effective amount of a soluble polymeric thickener having a weight average molecular weight of between about one thousand and one hundred thousand, the polymeric thickener comprising a charged comonomer and an uncharged comonomer in proportions such that the resultant polymer has an acid number, in its acid form, of between about 80–400 mg KOH/g polymer, the polymeric thickener being soluble in a surfactant system; and

(c) a surfactant system including a bleach-resistant uncharged surfactant and a bleach-resistant anionic surfactant, the surfactant system being present in an amount sufficient to solubilize the polymeric thickener; and wherein the polymeric thickener, halogen compound and surfactant system comprise a solution substantially free of undissolved solids.

4,839,078

DETERGENT TABLETS OF UNIFORM COMPOSITION FOR DISHWASHING MACHINES

Hans Kruse, Korschenbroich; Jochen Jacobs, Wuppertal; Theodor Altenschoepfer, Duesseldorf, and Peter Jeschke, Neuss, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Nov. 17, 1986, Ser. No. 931,776
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1985, 3541145
The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.
Int. Cl.[4] C11D 7/18
U.S. Cl. 252—99 18 Claims

1. A detergent tablet having a uniform composition and a broad solubility profile for use in automatic dishwashing machines, said tablet consisting of alkaline-reacting components selected from the group consisting of alkali metal metasilicate, penta-alkali metal triphosphate, an active chlorine compound, and tabletting aids, wherein said alkali metal metasilicate consists of a mixture of anhydrous sodium metasilicate and sodium metasilicate nonahydrate and said penta-alkali metal triphosphate consists of anhydrous pentasodium triphosphate, and the ratio by weight of said anhydrous sodium metasilicate to said sodium metasilicate nonahydrate is from about 1:0.3 to 1:1.5, and the ratio by weight of said anhydrous pentasodium triphosphate to said anhydrous sodium metasilicate is from about 2:1 to 1:2, wherein at least about 10% by weight of said tablet is dissolved in the pre-rinse cycle of said dishwashing machines by the cold tap water flowing in producing a pH value of at least about 10 in the wash liquor, and wherein at least about 65% by weight of said tablet is available for the main wash cycle of said dishwashing machines by virtue of its solubility in warm water.

10. A dishwashing process comprising introducing a detergent tablet into a zone of an automatic dishwashing machine which exposes said tablet to the dissolving power of the inflowing stream of cold water during the pre-rinse cycle of said machine, said detergent tablet having a uniform composition and a broad solubility profile for use in automatic dishwashing machines, said tablet consisting of alkaline-reacting components selected from the group consisting of alkali metal metasilicate, penta-alkali metal triphosphate, an active chlorine compound, and tabletting aids, wherein said alkali metal metasilicate consists of a mixture of anhydrous sodium metasilicate and sodium metasilicate nonahydrate and said penta-alkali metal triphosphate consists of anhydrous penta-sodium triphosphate, and the ratio by weight of said anhydrous sodium metasilicate to said sodium metasilicate nonahydrate is from about 1:0.3 to 1:1.5, and the ratio by weight of said anhydrous pentasodium triphosphate to said anhydrous sodium metasilicate is from about 2:1 to 1:2, and starting said machine, whereby at least about 10% by weight of said tablet is dissolved in the pre-rinse cycle of said dishwashing machines by the cold water flowing in producing a pH value of at least about 10 in the wash liquor, and wherein at least about 65% by weight of said tablet is available for the main wash cycle of said dishwashing machines by virtue of its solubility in warm water.

4,839,079

HYPOCHLORITE: TERTIARY ALCOHOL DISINFECTANTS WITH REDUCED OFFENSIVE ODOR

Mark A. Wainberg, Montreal, and Chiu-Ming Wong, Winnipeg, both of Canada, assignors to KAM Scientific Inc., Manitoba, Canada

Filed Oct. 22, 1987, Ser. No. 112,205
Int. Cl.[4] A61L 2/18, 9/01; C11D 7/26, 7/54
U.S. Cl. 252—104 2 Claims

1. A stabilized disinfectant composition, comprising, in aqueous solution:

0.5% w/w of hypochlorite selected from the group consisting of sodium hypochlorite, lithium hypochlorite, potassium hypochlorite and calcium hypochlorite;

5.0% w/w of t-butanol;

0.01% w/w sodium dodecyl sulphate; and

0.01% w/w lemon fragrance.

2. The disinfectant composition of claim 1, comprising:

0.5% w/w sodium hypochlorite;

5.0% w/w tertiary-butanol;

0.01% w/w sodium dodecyl sulphate; and

0.01% w/w lemon fragrance.

4,839,080

ANTIBACTERIAL IODOPHOR SOAP BASE COMPOSITION AND METHOD OF MAKING SAME

Eric Jungermann, Phoenix, Ariz., and Richard A. Scott, Burbank, Calif., assignors to Neutrogena Corporation, Los Angeles, Calif.

Filed Apr. 30, 1987, Ser. No. 44,220
Int. Cl.[4] C11D 9/06, 9/50, 9/60, 13/60
U.S. Cl. 252—107 6 Claims

1. An antibacterial soap composition capable of delivering iodophores as its active germicide while providing the gentleness of fatty acid soaps consisting essentially of, in weight percent: from about 4.0 percent to about 8.0 percent of isostearic acid; from about 3.0 percent to about 10.0 percent of n-dodecanoic acid; from about 1.0 percent up to about 5.0 percent stearic acid; from about 2.1 percent up to about 5.0 percent caustic soda (50%); from about 2.1 percent up to about 4.0 percent triethanolamine; from about 40 percent up to about 50 percent distilled DI water; from about 1.0 percent up to about 5.0 percent sodium N-methyl taurate; from about 1.0 percent up to about 5.0 percent lauric diethanolamide; from about 1.0 percent up to about 5.0 percent sodium lauroyl sarcosinate; from about 10.0 percent up to about 20.0 percent glycerine; from about 0.2 percent up to about 0.4 percent of a reagent selected from the group consisting of hydroxyethylene diaminotetraacetic acid, trisodium salt of ethylene diaminotetraacetic acid and mixtures thereof; about 1.0 percent of an antioxidant selected from the group consisting of butylated hydroxyanisole, butylated hydroxytoluene α-tocopherol and mixtures thereof; from about 6.0 percent up to about 10.0 percent of an iodophore; and the balance being citric acid to provide the composition a pH of at least 8.6 and not more than 8.8.

3. An antibacterial soap composition for molding into a bar consisting essentially of, in weight percent: 14.25 hydrogenated tallow; 8.1 caustic soda; 6.2 distilled water; 33.4 triethanolamine; 20.5 isostearic acid; 3.5 coco diethanolamide; 10.0 glycerine; 0.05 α-tocopherol; and 4.0 povidone-iodine.

4,839,081

AUTOGENOUSLY HEATED LIQUID SOAP COMPOSITION

John A. Church, Princeton Junction, and Umesh J. Mehta, South Plainfield, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Jun. 7, 1988, Ser. No. 202,472
Int. Cl.[4] C11D 9/00
U.S. Cl. 252—108 2 Claims

1. An autogenously two step heated liquid soap composition consisting essentially of a first component of glycerine in the amount by weight of between 3–7 parts, coco monoglyceride sulfate in the amount of between 10–20 parts, tallow coconut oil soap in the amount of between 0.5–2 parts, stearic acid in the amount of between 2–4 parts, alkali metal sulfite is in the amount of between 3–5 parts, ascorbic acid as an organic reductant in the amount of between 3–5 parts, a catalyst for oxidation of the organic reductant in the amount of between 0.1–0.3 parts and the balance of the said first component being pH-adjusted water, and a second component of hydrogen peroxide solution in an approximately stoichiometric amount with respect to the reductants said heating occurring when said first and second components are mixed.

4,839,082

CONTACT LENS CLEANING COMPOSITIONS CONTAINING A CARBOXY VINYL POLYMER

Rajkumar P. Bhatia, Arlington, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation of Ser. No. 946,343, Dec. 24, 1986, abandoned. This application Aug. 4, 1988, Ser. No. 229,766
Int. Cl.[4] C11D 3/14
U.S. Cl. 252—174.12 2 Claims

1. A method of cleaning a contact lens which comprises:

applying to the lens a small amount of an aqueous contact lens cleaning composition consisting essentially of water and a carboxy vinyl polymer in an amount sufficient to facilitate physical removal of deposits and debris present on the lens, said carboxy vinyl polymer having a molecular weight of from about 1,000,000 to about 6,000,000;

rubbing the composition over the surface of the lens to form an abrasive precipitate of the carboxy vinyl polymer which polymer is present in an amount effective to substantially reduce deposits and debris present on the surface of the lens; and

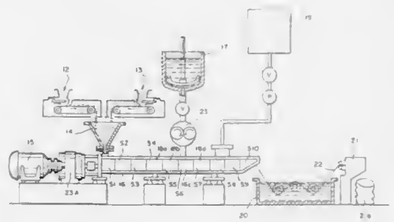
rinsing the lens to resolubilize the abrasive precipitate and remove the remaining composition and debris from the surface of the lens.

4,839,083

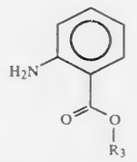
SCHIFF BASE REACTION PRODUCTS OF MIXTURES OF ALDEHYDES INCLUDING HELIONAL AND ALKYL ANTHRANILATES; DERIVATIVES THEREOF; AND ORGANOLEPTIC USES THEREOF

Braja D. Mookherjee, Holmdel; Robert W. Trenkle, Point Pleasant, both of N.J.; Nicholas Calderone, Laurel Hollow, N.Y.; Lisa Schreck, Tinton Falls, and Keith P. Sands, Marlboro, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

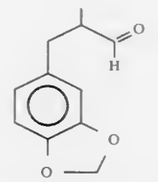
Continuation-in-part of Ser. No. 114,247, Oct. 29, 1987, Pat. No. 4,775,720. This application Mar. 4, 1988, Ser. No. 164,503
Int. Cl.[4] C11D 3/50
U.S. Cl. 252—174.11 17 Claims



1. A schiff base reaction product produced according to the process of reacting an alkyl anthranilate having the structure:



wherein R_3 is methyl or ethyl with helional having the structure:

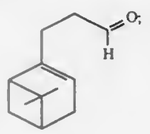


and an aldehyde having the structure:

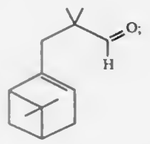
wherein the aldehyde having the structure:

is selected from the group consisting of:

(a) Pinoacetaldehyde having the structure:

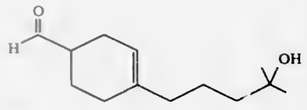


(b) Pinoisobutyraldehyde having the structure:



and

(c) Lyral, a mixture of compounds having the structures:



and

4,839,084

BUILT LIQUID LAUNDRY DETERGENT COMPOSITION CONTAINING AN ALKALINE EARTH METAL OR ZINC SALT OF HIGHER FATTY ACID LIQUEFYING AGENT AND METHOD OF USE

Trazollah Ouhadi, Liege; Louis Dehan, Seraing, and Marie L. Rossi, Flemalle, all of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Jan. 27, 1987, Ser. No. 6,846

Int. Cl.⁴ C11D 1/56

U.S. Cl. 252—174.21 **27 Claims**

1. A nonaqueous liquid fabric treating composition which comprises 20 to 70% by weight of a liquid nonionic surfactant, 10 to 60% by weight of fabric treating inorganic particles suspended in the nonionic surfactant, and an effective amount of 0.1 to 3% by weight of an alkaline earth metal or zinc salt of a straight or branched, saturated or unsaturated carboxylic acid having about 8 to 22 carbon atoms to increase the pourability of the composition.

4,839,085

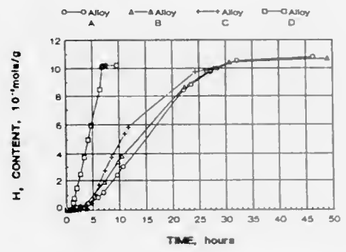
METHOD OF MANUFACTURING TOUGH AND POROUS GETTERS BY MEANS OF HYDROGEN PULVERIZATION AND GETTERS PRODUCED THEREBY

Gary D. Sandrock, Ringwood, and Winfred L. Woodward, III, Midland Park, both of N.J., assignors to Ergenics, Inc., Wyckoff, N.J.

Filed Nov. 30, 1987, Ser. No. 126,750

Int. Cl.⁴ C22C 16/00

U.S. Cl. 252—181.6 **28 Claims**



1. A process for manufacturing a nonevaporable getter comprising steps as follows:

providing a solid alloy body of Zr V and E wherein E consists of Fe Ni Mn and/or Al such that the proportions of each species are in weight percent

E up to 7

V from 10 to 35

Zr balance to make 100

introducing the body into a chamber and removing the air therefrom,

charging the body with hydrogen for hydride formation to induce spontaneous pulverization of the body into hydride powder and/or granules, and

removing a major portion of the hydrogen from the powder and/or granules to yield the nonevaporable getter.

4,839,086

COMPOSITION FOR REGENERATING CATION EXCHANGE RESIN

Najib H. Zaid, 213 Monroe, Sterling, Kans. 67579

Filed Feb. 12, 1988, Ser. No. 155,208

Int. Cl.⁴ C09K 3/00; C11D 7/08

U.S. Cl. 252—182.3 **19 Claims**

1. A composition for addition to sodium chloride to yield a regenerating medium for cation exchange resins, said composition comprising:

from about 0.1 to 10% by weight of citric acid;

from about 0.01 to 1% by weight of an anti-caking agent for said regenerating medium, said agent being an alkyl substituted napthalene sulfonate; and

at least about 50% by weight of a salt of citric acid,

the pH of a saturated solution of said composition in water at room temperature

being from about 4 to 8.

10. A composition for regenerating a cation exchange resin, comprising:

a quantity of sodium chloride;

respective minor amounts of citric acid and a salt of citric acid admixed with said sodium chloride.

4,839,087

STORAGE STABLE BLEND COMPRISING A LONG CHAIN POLYOL, A SHORT CHAIN DIOL AND A URETHANE

Timothy A. Tufts, Columbus, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

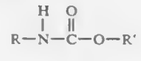
Continuation of Ser. No. 71,236, Jul. 9, 1987, abandoned. This application Apr. 20, 1988, Ser. No. 185,252

Int. Cl.⁴ C09K 3/00; H05B 33/00; C08G 18/08

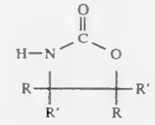
U.S. Cl. 252—182.27 **19 Claims**

1. A method for making a storage stable blend of a long chain polyol and a short chain diol which blend phase separates under storage, which comprises:

incorporating into said blend a compatibilizing amount of a urethane corresponding to Formula I or II



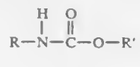
I



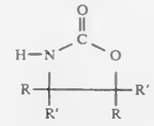
II

wherein R and R′ independently represent an alkyl group having from 1 to 20 carbon atoms, an aryl group having from 6 to 12 carbon atoms, an alkaryl group having from 7 to 20 carbon atoms, hydroxyl, hydroxyalkyl or hydroxyaryl.

15. A storage stable blend which comprise: a long chain polyol, a short chain diol, and an effective amount of a urethane corresponding to Formula I or II



I



II

wherein R and R′ independently represent an alkyl group having from 1 to 20 carbon atoms, an aryl group having from 6 to 12 carbon atoms, an alkaryl group having from 7 to 20 carbon atoms, hydroxyl, hydroxyalkyl or hydroxyaryl said diol being present in an amount whereby the diol and polyol form an incompatible blend in the absence of said urethane.

4,839,088

POLYSACCHARIDE COMPOSITIONS

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 673,358, Nov. 20, 1984, Pat. No. 4,664,717, which is a continuation-in-part of Ser. No. 455,268, Jan. 3, 1983, which is a continuation-in-part of Ser. No. 455,317, Jan. 3, 1983, which is a continuation-in-part of Ser. No. 442,296, Nov. 17, 1982, abandoned, which is a continuation-in-part of Ser. No. 444,667, Nov. 26, 1982, abandoned, which is a continuation-in-part of Ser. No. 453,282, Dec. 27, 1982, Pat. No. 4,522,644, which is a continuation-in-part of Ser. No. 453,496, Dec. 27, 1982. This application Feb. 2, 1987, Ser. No. 9,829

The portion of the term of this patent subsequent to Apr. 23, 2002, has been disclaimed.

Int. Cl.⁴ C09K 3/00; C13K 1/02; C05C 9/00; A23K 1/22

U.S. Cl. 252—183.13 **20 Claims**

1. A composition comprising urea, sulfuric acid, water, and a polysaccharide in which the urea/sulfuric acid molar ratio is at least about ¼ and less than 2, and wherein a sufficient proportion of said urea and sulfuric acid is present as the monourea-sulfuric acid adduct to hydrolyze said polysaccharide.

4,839,089

SUBSTANCE FOR CONVERTING WASTE COOKING OIL INTO LIQUID SOAP

Kazuo Shimizu, Kasukabe, Japan, assignor to Mimasu Oil Chemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 56,772, Jun. 2, 1987, Pat. No. 4,792,416. This application Jul. 18, 1988, Ser. No. 220,163

Int. Cl.⁴ C11D 13/00, 9/30

U.S. Cl. 252—183.11 **7 Claims**

1. A substance for converting waste cooking oil into liquid soap, comprising:

an amino derivative, a surface active agent and an alkali metal salt and/or alkali hydroxide, where the content of the amine derivative is greater than 50 wt %, the content of the surface-active agent is from 0.5 to 30 wt % and the amount of alkali metal salt and/or hydroxide is less than 50 wt %,

wherein the pH of the resulting substance is 10 or higher.

4,839,090

EXTRUSION OF MACROCRYSTAL SCIENTILLATION PHOSPHORS

King H. Rosette, Chagrin Falls, and Herbert Packer, Cleveland Heights, both of Ohio, assignors to Harshaw/Filtrol, Cleveland, Ohio

Continuation of Ser. No. 215,732, Dec. 12, 1980, which is a continuation of Ser. No. 90,506, Oct. 31, 1979, abandoned, which is a continuation of Ser. No. 875,318, Feb. 6, 1978, abandoned, which is a continuation of Ser. No. 524,968, Nov. 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 180,087, Sep. 13, 1974, abandoned, which is a continuation-in-part of Ser. No. 139,217, Apr. 30, 1971, abandoned. This application Aug. 3, 1983, Ser. No. 519,886

Int. Cl.⁴ C09K 11/61

U.S. Cl. 252—301.4 H **5 Claims**

1. A scintillation phosphor formed by extrusion of a cleavable macrocrystal melt-grown starting material selected from an alkali metal halide containing an activator and an alkaline earth metal halide containing an activator, said extrusion being affected at a temperature in excess of one-half the melting point of said macrocrystal, measured in degrees centigrade, but below its melting point, at a pressure sufficient to force said macrocrystal through an orifice which is smaller in cross section than the cross section of said macrocrystal so as to form a fully dense, entirely polycrystalline scintillator extrudate having grains in a size range from about 10 microns to about 1 centimeter, said extrudate being further characterized by: being at least twice as strong and resistant to shock and less subject to cleavage than the macrocrystal starting material; having essentially the same or better scintillation properties decay time and light disseminating efficiency as said macrocrystal, being free from intergranular or intercrystalline voids on a macroscopic scale greater than about 100 times the interatomic distances within the crystal lattice structure; and being pervious to the wavelength of the light generated as a result of the impact of ionizing radiation within the crystal.

4,839,091

TOLAN DERIVATIVE AND LIQUID CRYSTAL COMPOSITION CONTAINING THE SAME

Yasuyuki Goto, Ichihara, and Tetsuya Ogawa, Futtsu, both of Japan, assignors to Chisso Corporation, Japan

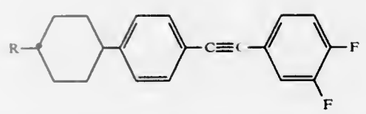
Filed Jun. 10, 1988, Ser. No. 205,286

Claims priority, application Japan, Jun. 13, 1987, 62-147796

Int. Cl.⁴ C09K 19/30, 19/54; C07C 25/24

U.S. Cl. 252—299.63 **7 Claims**

1. A 4-(trans-4-alkylcyclohexyl)-3′,4′-difluorotolan expressed by the formula



wherein R represents an alkyl group of 1 to 10 carbon atoms.

4,839,092

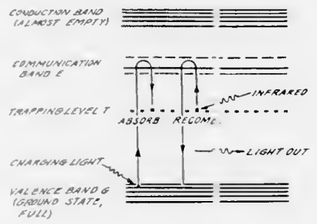
PHOTOLUMINESCENT MATERIALS FOR OUTPUTTING ORANGE LIGHT

Joseph Lindmayer, Potomac, Md., assignor to Quantex Corporation, Rockville, Md.

Continuation of Ser. No. 870,809, Jun. 6, 1986, Pat. No. 4,830,875, which is a continuation-in-part of Ser. No. 786,095, Oct. 10, 1985, Pat. No. 4,705,952. This application Apr. 3, 1987, Ser. No. 34,332

Int. Cl.[4] C09K *11/08;* **B05D** *5/06;* **G03C** *5/16*

U.S. Cl. 252—301.4 S **11 Claims**



1. An electron trapping photoluminescent material, comprising:

a base material of substantially strontium sulfide;

a first dopant of samarium in a quantity of about 100 ppm by weight; and

a second dopant selected from the group of europium oxide, europium fluoride, europium chloride, and europium sulfide, said second dopant being provided in a quantity of about 500 ppm by weight.

4,839,093

PROCESS AND APPARATUS FOR CONTINUOUS MANUFACTURE OF AN EMULSION

Paul Wenmaekers, 2/4, Ave. Paul Déroulède, 75015 Paris, France

Filed Feb. 12, 1986, Ser. No. 828,832

Claims priority, application France, Feb. 15, 1985, 85 02241

Int. Cl.[4] B01F *15/04, 15/06;* **B01J** *13/00*

U.S. Cl. 252—314 **15 Claims**

1. A process for the continuous manufacture of an emulsion comprising, in a first liquid, a plurality of components in suspension, said process consisting in:

bringing said components to the liquid state in a manner to constitute a plurality of second liquids able to be introduced in suspension into said first liquid,

introducing in mass proportion into a melting potdosimeter all or part of said components in liquid form and bringing the contents of said melting pot-dosimeter to the temperature of emulsion,

bringing a predetermined quantity of said first liquid to the temperature of emulsion,

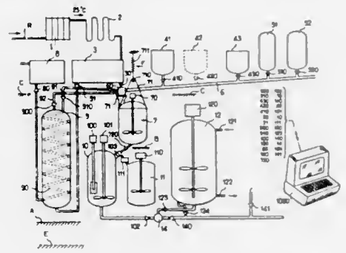
pouring of said quantity of said first liquid and said contents of said melting pot-dosimeter into an emulsion vat, and

causing emulsion in said emulsion vat by agitation.

7. Apparatus for continuous manufacture of an emulsion, containing in a first liquid a plurality of components in suspension, said apparatus comprising:

means for bringing said components to the liquid state in order to constitute a plurality of second liquids able to be introduced in suspension into said first liquid,

means permitting bringing of a predetermined quantity of said first liquid to the temperature of emulsion,



a melting pot-dosimeter adapted to receive in mass proportions said components in liquid form and said first liquid, said melting pot-dosimeter being in addition capable of bringing its contents to the temperature of emulsion, and

an emulsion vat adapted to receive said quantity of said first liquid and said contents of said melting pot-dosimeter, said emulsion vat being provided with means for causing emulsion.

4,839,094

OVERBASED ALKALI METAL ADDITIVES

John F. Marsh, Abingdon, and John A. Cleverley, Didcot, both of United Kingdom, assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Aug. 24, 1987, Ser. No. 88,791

Claims priority, application United Kingdom, Sep. 4, 1986, 86-21343

Int. Cl.[4] C10M *135/30*

U.S. Cl. 252—42.7 **8 Claims**

1. A process for making an oil solution of an overbased alkali metal sulphurized phenate, which comprises

(a) heating an alkali metal hydroxide with an alkoxyalkanol and a solvent to remove water as an azeotrope with said alkoxyalkanol and said solvent so as to form a mixture comprising substantially anhydrous alkali metal alkoxyalkoxide;

(b) adding to the mixture a surfactant comprising a sulphurized phenol and continuing the azeotroping to remove substantially all of the water formed;

(c) thereafter introducing carbon dioxide into the reaction mixture so as to form a carbonated alkali metal alkoxyalkoxide;

(d) hydrolysing the carbonated alkali metal alkoxyalkoxide; and

(e) removing solvent by distillation, base oil being added to the process during one of steps (b), (c), (d) or (e) so that the desired product is obtained.

4,839,095

STABLE MUD DRILLING FLUID ADDITIVE, COMPOSITION AND PROCESS FOR MAKING THE SAME

Shawqui Lahalih; Issam Dairanieh, and Ma'mun Absi-Halabi, all of P.O. Box 24885, Safat, Kuwait

Filed Sep. 14, 1987, Ser. No. 95,688

Int. Cl.[4] C09K *7/02*

U.S. Cl. 252—8.514 **13 Claims**

1. A well serving fluid having improved heat stability comprising in combination brackish water having total dissolved solids of at least 2,600 parts per million, bentonite within the range of about 15 to about 30 pounds per barrel, a weighting agent, about 1 to 3 pounds per barrel of a sulfonated amino-aldehyde resin prepared from formaldehyde and a material selected from the group consisting of urea, and mixtures of melamine and urea with the percentage of urea in the amino component of the resin in the range of up to 100%, the ratio of formaldehyde to amino groups in the range of 0.8–1.5, and the ratio of sulfonate groups to amino groups in the range of 0.25–0.4, and a material selected from the group consisting of methyl cellulose in the range of 0.1 to 0.5 pounds per barrel and polyvinyl alcohol in the range of 0.2 to 0.5 pounds per barrel and mixtures thereof, in which the sulfonate-amino-formaldehyde resin has an average molecular weight within the range of about 700,000 and 1,200,000 and in which the polyvinyl alcohol has an average molecular weight in the range of about 15,000 to 100,000 and the methyl cellulose has a degree of substitution in the range of 1.6 to 1.8 and water solution viscosity at 20° C. for a 2% by weight solution in the range of 400 to 4,000 centipoise.

4,839,096

LOW TOXICITY OIL COMPOSITION AND USE THEREOF IN DRILLING FLUIDS

Robert W. Dennis, North Humberside; Charles J. Dye, Hull, and Alan Keasey, Sussex, both of England, assignors to BP Chemicals Limited, London, England

Filed Jun. 12, 1987, Ser. No. 62,156

Claims priority, application United Kingdom, Jun. 25, 1986, 8615478

Int. Cl.[4] C09K *7/06*

U.S. Cl. 252—8.515 **7 Claims**

1. A base oil composition suitable for use in organophilic clay-containing drilling fluids, said composition consisting essentially of: an oil component with an aromatic hydrocarbon content of less than 10% w/w; and from 1–5% of a polar activator which is an aliphatic or aromatic ether alcohol or is a mixture of ether alcohols selected from one or more of butoxypropanol, isobutoxypropanol, phenoxypropanol and phenoxypropoxy propanol.

4,839,097

VOLTAGE-DEPENDENT NON-LINEAR RESISTANCE CERAMIC COMPOSITION

Keiichi Noi, Kyoto; Akihiro Takami, Katano; Kazubide Ebine, Katano, and Kimiko Kumazawa, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 708,079, Feb. 26, 1985, abandoned. This application Feb. 9, 1987, Ser. No. 13,176

Claims priority, application Japan, Jun. 28, 1983, 58-117569; Jun. 28, 1983, 58-117580; Jun. 28, 1983, 58-117581

Int. Cl.[4] H01B *1/06;* **C04B** *35/46*

U.S. Cl. 252—520 **1 Claim**

1. A voltage-dependent non-linear resistance ceramic composition consisting essentially of:

90.800–99.996 mol % of $SrTiO_3$,

0.001–0.200 mol % of Nb_2O_5,

0.001–5.000 mol % of Ta_2O_5,

0.001–2.000 mol % of MnO_2, and

0.001–2.000 mol % of an oxide of at least one of element selected from the group consisting of Ga, Pt, Tl, Si, Ti, Cs, Au, S, Be, Al, Ca, Cd, In, Ba, Eu, Gd, Tb, Tm, Lu, Th, Ir, Os, Hf, Ru, Mg, Zr, Sn and Sb.

4,839,098

LIQUID DETERGENT

Klaus-Dieter Wisotzki, Erkrath; Ortburg Guirr, Krefeld; Peter Jeschke, Neuss; Klaus Schumann, Erkrath; Karl-Heinz Schmid, Mettmann, and Manfred Biermann, Muehlheim/-Ruhr, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 18, 1988, Ser. No. 157,681

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1987, 3706015

Int. Cl.[4] C11D *1/12*

U.S. Cl. 252—557 **11 Claims**

1. A liquid, manual dishwashing detergent composition containing from about 15 to about 50% by weight of a surfactant mixture, based on the weight of said composition, said surfactant mixture consisting essentially of an alkyl glucoside containing from about 10 to about 18 carbon atoms in the alkyl radical and from about 1 to about 1.4 glucose units in the molecules, and a dialkyl sulfosuccinate containing from about 7 to about 9 carbon atoms in the alkyl radical.

4,839,099

FIRE-RETARDANT FOR WOODY MATERIALS

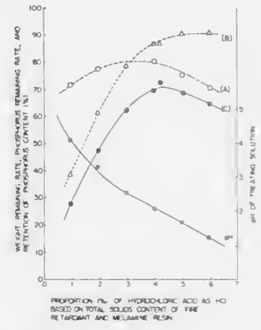
Kiyoshi Umehara, Izumi-ohtsu; Hisaomi Yamamoto, Chiba; Nobuo Kobayashi, Tokyo, and Tsutomu Imai, Izumi-ohtsu, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 832,401, Feb. 24, 1986, abandoned. This application Jan. 15, 1988, Ser. No. 147,018

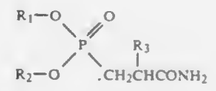
Claims priority, application Japan, Feb. 27, 1985, 60-36279

Int. Cl.[4] C09K *21/00;* **C09D** *5/16, 5/18;* **B27N** *9/00*

U.S. Cl. 252—607 **21 Claims**



1. A fire retardant which is an aqueous solution comprising 100 parts by weight as solids content of a water-soluble 3-(dialkylphosphono)propionamide represented by the following general formula



wherein each of R_1 and R_2 represents an alkyl group having 1 to 3 carbon atoms, and R_3 represents a hydrogen atom or a methyl group, and at least 100 parts by weight as solids of a watersoluble melamine resin as essential ingredients and having a pH of not higher than 3.

4,839,100

DECONTAMINATION OF SURFACES

George H. Goodall, Merseyside, England, and Barry E. Gillespie, Sychdyn NR Mold, Wales, assignors to British Nuclear Fuels PLC, Warrington, England

Filed May 14, 1987, Ser. No. 49,573

Claims priority, application United Kingdom, Jun. 4, 1986, 8613522

Int. Cl.[4] G21F *9/00*; C23G *1/02*; B08B *9/00*; G21C *19/42*

U.S. Cl. 252—626 8 Claims

1. A method of decontaminating a surface of a component containing aluminum contaminated with technetium trapped under an oxide layer present on the surface, said method comprising chemically treating the surface to remove the layer so as to expose the technetium, converting the exposed technetium into a soluble form in the presence of an oxide scavenger and an oxidizing agent so as to substantially prevent reduction of the soluble form of the technetium to an insoluble form and hence prevent redeposition of the technetium on the surface.

4,839,101

PROCESS FOR IMPROVING THE EFFECTIVENESS OF THE REMOVAL OF ZIRCONIUM FROM A NUCLEAR FUEL AND/OR FERTILE MATERIAL SOLUTION

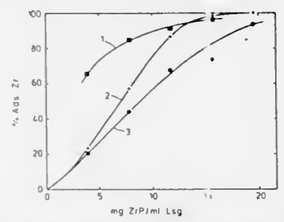
Zdenek Kolarik, Karlsruhe, and Robert Schuler, Germersheim, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jan. 29, 1987, Ser. No. 7,995

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1986, 3602591

Int. Cl.[4] G21C *19/42, 19/50*; C01G *56/00*

U.S. Cl. 252—627 3 Claims



1. A process for removing zirconium from uranium and plutonium during recycling of spent nuclear fuel or fissionable material, comprising the steps of:

dissolving spent nuclear fuel or fissionable materials in nitric acid to produce an acidic solution containing dissolved uranium, plutonium and zirconium;

adding zirconium phosphate to said acidic solution to selectively adsorb said dissolved zirconium into a filterable or centrifugible solid phase;

removing said zirconium phosphate and therewith said adsorbed zirconium from said acidic solution; and

recovering uranium and plutonium from the acidic solution.

4,839,102

BLOCK FOR CONTAINING AND STORING RADIOACTIVE WASTE AND PROCESS FOR PRODUCING SUCH A BLOCK

Claude Kertesz, Puy Sainte Reparade; Gerard Koehly, Bievres; Frank Josso, Villeneuve Les Avignon, and André Bernard, Chatillon, all of France, assignors to Commissariat a l'Energie Atomique, France

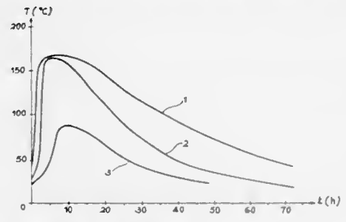
Filed Nov. 30, 1987, Ser. No. 126,855

Claims priority, application France, Dec. 5, 1986, 86 17081

Int. Cl.[4] G21F *9/16*

U.S. Cl. 252—628 8 Claims

1. Block for containing and storing acidic waste, in which the waste is coated in a composite matrix of hardened cement and epoxy resin, wherein the proportion of waste is between 35 and 45% by weight, the proportion of cement is between 25 and 35% by weight, and the proportion of resin is between 20 and 40% by weight; the block being produced by mixing the waste with the cement to form a mixture; adding to the mixture



water in a quantity adequate for hydration of the cement; mixing the hydrated cement product obtained with epoxy resin; and allowing the cement and resin to harden, to produce the block.

4,839,103

METHOD FOR OBTAINING A SOLUTION OF NUCLEAR FUEL NOT READILY DISSOVABLE, ESPECIALLY OF $PuOHD_2$ OR $(U/PU)O_2$ MIXED OXIDE

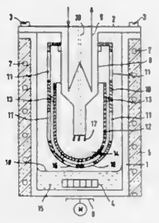
Michael Steinhauser, Eichenau; Günter Hoffmann, Munich; Fritz Weigel, deceased, late of Munich (Anne Weigel, Matthias Weigel, heirs); Kurt Wittmann, Erlensee, and Dieter Schäfer, Leidersbach, all of Fed. Rep. of Germany, assignors to Alkem GmbH, Hanau, Fed. Rep. of Germany

Filed Jan. 21, 1987, Ser. No. 5,832

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1986, 3601826

Int. Cl.[4] C09K *11/04*; G21G *4/00*; C01G *56/00, 43/025*

U.S. Cl. 252—643 3 Claims



1. A method for obtaining a solution of a nuclear fuel formed of PuO_2 or $(U/Pu)O_2$ not readily dissolvable in nitric acid, which comprises, disposing a body of nitric acid in an airtight closed vessel and also disposing the nuclear fuel not readily dissolvable in said closed vessel outside the body of nitric acid, heating the nitric acid to effect evaporation of the nitric acid inside the vessel, condensing the vapors of nitric acid to form a fresh nitric acid condensate, and trickling the fresh nitric acid condensate over the nuclear fuel not readily dissolvable to effect dissolution of the nuclear fuel, adjusting the condensate flow on the nuclear fuel to trickle over the nuclear fuel without causing the nuclear fuel to float, and adjusting the resultant liquid solution to drip back into the nitric acid condensate.

4,839,104

PROCESS FOR PREPARING SERTRALINE INTERMEDIATES

George J. Quallich, North Stonington, Conn., and Michael T. Williams, Deal, England, assignors to Pfizer, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 60,577, Jun. 11, 1987, Pat. No. 4,777,288. This application Jun. 16, 1988, Ser. No. 207,579

Int. Cl.[4] C07C *97/18*

U.S. Cl. 260—396 R 19 Claims

1. A process for preparing 4-(3,4-dichlorophenyl)-3,4-dihydro-1(2H)-naphthalenone, which comprises reacting 4-(3,4-dichlorophenyl)-4-hydroxybutanoic acid or 5-(3,4-dichlorophenyl)-dihydro-2(3H)-furanone with benzene in an excess of said reagent as solvent or in a reaction-inert organic solvent in the presence of a protic or Lewis acid catalyst at a temperature of from about −20° C. to about 180° C. until the alkylation of benzene by either the aforesaid hydroxy acid or the corresponding gamma-butyrolactone compound, followed by ring closure to form the desired ring ketone final product is substantially complete.

4,839,105

PROCESS FOR THE PREPARATION OF ALKANEPHOSPHONOUS ACIDS

Hans-Jerg Kleiner, Kronberg, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

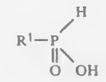
Continuation of Ser. No. 91,318, Aug. 28, 1987, abandoned, which is a continuation of Ser. No. 692,836, Jan. 18, 1985, abandoned. This application Jun. 29, 1988, Ser. No. 217,132

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1984, 3402018

Int. Cl.[4] C07F *9/48*

U.S. Cl. 260—502.4 R 4 Claims

1. A process for the preparation of an alkanephosphonous acid of the formula



(I)

in which R^1 denotes $(C_1–C_{12})$-alkyl, which comprises reacting a monoalkylphosphane of the formula

$$R^1—PH_2 \quad \text{(II)}$$

with an essentially stoichiometric amount of hydrogen peroxide in concentrated hydrochloric acid at a temperature between 0° C. and the boiling point of the mixture, such that the alkanephosphonous acid is formed in the hydrochloric acid solution in a purity of over 95%.

4,839,106

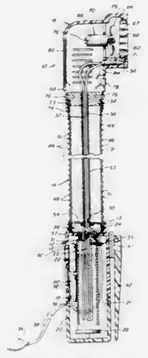
PORTABLE MISTING FAN

Gregory Steiner, Lisle, Ill., assignor to Gregory A. Steiner, Lisle, Ill.

Filed May 12, 1988, Ser. No. 192,964

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—28 10 Claims



1. A self-contained portable fan device including atomizing means for atomizing a liquid carried therein comprising in combination,

a base,

an intermediate neck portion mounted on said base at a lower end and extending upwardly therefrom, terminating in an upper end,

said intermediate neck portion framed by a flexible tubular member,

said upper end of said neck portion carrying a head portion mounted thereon, said head portion including an open front face having a baffle vent mounted therein,

fan means mounted within said head portion adjacent and in the direction of said open front face and rearward of said baffle vent,

said baffle vent being positioned forwardly of said fan means and above said atomizing means,

said atomizing means being mounted within said head portion in operative relation with said fan means,

said base adapted to contain a source of fluid therein,

said source of fluid being in fluid communication with said atomizing means and including vacuum means associated therewith for moving fluid from said source of fluid to said atomizing means,

said fan device provided with self-contained electrical means including switch means associated therewith,

said electrical means comprises battery means electrically wired to said fan means through said switch means and being removably mounted within said device, thereby to alternatively activate and deactivate said fan means,

whereby said fan means may be activated by said electrical means via said switch means while simultaneously, said vacuum means may be activated to move fluid from said fluid source to said atomizing means and dispense the same therefrom thereby to create a fan blown misting effect.

4,839,107

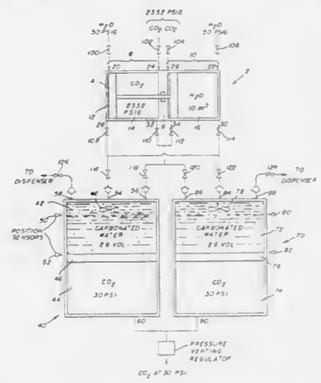
MICROGRAVITY CARBONATOR SYSTEM

Arthur G. Rudick, Marietta; William S. Credle, Jr., Stone Mountain; Richard H. Heenan, Atlanta, and Gary V. Paisley, Lilburn, all of Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed May 14, 1987, Ser. No. 49,521

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—82 20 Claims



1. A carbonator system for producing carbonated water comprising:

a meter assembly having two chambers with an interconnected piston assembly extending therebetween, said chambers alternatively receiving water and carbon dioxide in order to shift said piston assembly to cause the other of said chambers to discharge water and carbon dioxide contained therein;

holding tank means for receiving said dispensed water and carbon dioxide from the chambers, said holding tank means containing said dispensed water and carbon dioxide

for a sufficient time and at a sufficient pressure for the water and carbon dioxide to mix to form carbonated water, said holding tank means further being capable of selectively dispensing said carbonated water; and

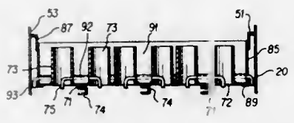
a movable membrane located within said holding tank means and forming a first and second portion in said holding tank means, each portion having a variable volume due to movement of the membrane, said first portion receiving said water and carbon dioxide dispensed from the meter assembly, said second portion receiving carbon dioxide from a carbon dioxide source, said holding tank means being sealed from the meter assembly after a predetermined amount of water and carbon dioxide is dispensed whereafter said movable membrane moves in a manner to cause the volume of said first portion to be reduced, said reduction in volume in the first portion increasing pressure in the first portion to cause the sufficient pressure to be reached for mixing the water and carbon dioxide to form carbonated water.

4,839,108

LIQUID DISTRIBUTION DEVICE AND PAN

Frank C. Silvey, Plainsboro, N.J., assignor to Mobil Oil Corp., New York, N.Y.

Filed Dec. 21, 1987, Ser. No. 136,081
Int. Cl.[4] B01F 3/0
U.S. Cl. 261—97 **14 Claims**



1. A device for uniformly distributing a liquid over a surface of a packed material bed, comprising:

a housing confining a packed material bed;

a first liquid distributor supported above said packed material bed and comprising at least one elongated main conduit having a bottom, and side walls extending upwardly therefrom, said conduit having holes spaced along its bottom, and at least one pair of branch conduits having first ends, and closed second ends, said first ends being connected to the sidewalls of said at least one main conduit, and being in open communication with said at least one main conduit to receive a liquid therefrom, said branch conduits being substantially perpendicular to said at least one main conduit and having a plurality of bottom holes spaced therealong;

a second liquid distributor located below said first distributor, said second distributor comprising a deck for receiving liquid flowing downwardly through the holes of said first liquid distributor, a sidewall surrounding said deck, and at least two parallel rows of risers supported on said deck, said risers being located horizontally displaced from bottom holes provided in said first liquid distributor, said risers permitting gas to pass upwardly through said deck, said deck having a plurality of holes therein positioned about said risers to permit liquid flow from said deck to said packed material bed;

each of said risers housing an ell having a first extension opening through a wall of an associated riser and a second extension extending downwardly within said riser, said ells causing liquid on said deck to pass below said deck to said packed material bed.

4,839,109

PROCESS FOR PRODUCING A CONTACT LENS

Isao Kaetsu; Minoru Kumakura, both of Gunma; Hidenari Suyama, Kanagawa; Nobuo Kameda, Tokyo, and Hideo Kôyama, Saitama, all of Japan, assignors to Japan Atomic Energy Research Institute and Tokyo Contact Lens Research Institute, both of Tokyo, Japan

Filed Jul. 16, 1986, Ser. No. 886,266
Claims priority, application Japan, Jul. 19, 1985, 60-158072
Int. Cl.[4] B29D 11/00; C08F 230/08, 220/18
U.S. Cl. 264—1.4 **3 Claims**

1. A process for producing a contact lens comprising the steps of:

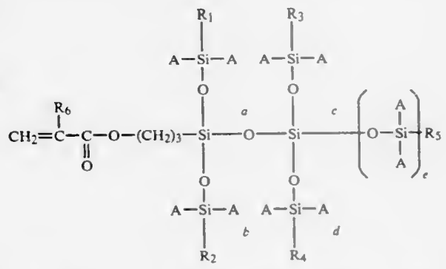
polymerizing a monomer mixture containing a siloxanylalkyl ester monomer within Group I shown below, a vinyl monomer within Group II or Group III shown below in the presence of a crosslinking agent within Group IV shown below by exposure to gamma ray radiation at a temperature between −100° C. and 0° C.;

and forming resulting polymer into a contact lens by working on a lathe;

said Groups I, II, III and IV being defined as follows:

Group I:

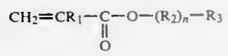
a siloxanylalkyl methacrylate or acrylate monomer represented by the following general formula:



where A, R_1, R_2, R_3, R_4, and R_5 are each a methyl or phenyl group; R_6 is a hydrogen atom or a methyl group; a and b are each an integer of 0. to 3; c and d are each an integer of 0 to 2; and e is 0 or 1;

Group II:

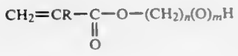
a methacrylate or acrylate monomer represented by the following formula:



where R_1 is a hydrogen atom or a methyl group; R_2 is a methylene or oxymethylene unit; R_3 is one member selected from the group consisting of methyl, ethyl, propyl, cyclohexyl, phenyl, fluorine-containing alkyl and fluorine-containing aryl groups; and n is an integer of 0 to 14;

Group III:

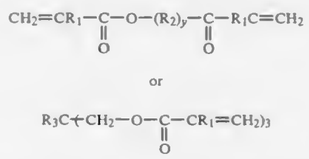
a compound represented by the following formula, or N-vinylpyrrolidone:



where R is a hydrogen atom or a methyl group; and n is an integer of 0 to 14, an m is 0 when n is 0 and 1 when n is more than 1; and

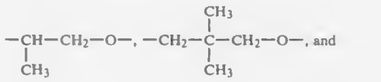
Group IV:

a crosslinking agent represented by the following formula:



or

where R_1 is a hydrogen atom or a methyl group; R_2 is one member selected from the group consisting of —CH_2—CH_2—O—,



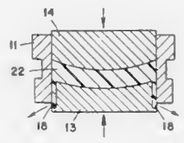
R_3 is one member selected from the group consisting of CH_3—, CH_3CH_2— and -CH_2OH; and y is an integer of 1 to 14.

4,839,110

METHOD OF MOLDING USING GATED DIES

Jeffrey M. Kingsbury, Santa Rosa, Calif., assignor to Sola USA, Inc., Petaluma, Calif.

Filed Mar. 2, 1988, Ser. No. 163,308
Int. Cl.[4] B29D 11/00
U.S. Cl. 264—2.2 **5 Claims**



1. A method for producing molded articles, comprising the steps of:

providing a bore in a molding apparatus,

providing a pair of molding dies, said molding dies being received in said bore in sliding engagement, at least one of said dies having an article forming surface, an opposed, outer die surface, and a peripheral edge surface disposed to impinge on said bore in slidable, sealing fashion,

providing at least one gate channel in said peripheral edge surface, said gate channel extending from an intersection with said article forming surface to a point adjacent to and spaced apart from said outer die surface,

inserting said dies partially into said bore in confronting relationship with a charge of flowable molding material disposed therebetween, said article forming surface impinging on said molding material,

urging said dies together to compress said charge of molding material and to cause said molding material to flow and assume the configuration of said article forming surface, the compression of said molding material also causing excess molding material to flow through and discharge from said gate channel,

inserting said one of said dies into said bore to a depth sufficient to seal said gate channel and terminate discharge from said gate channel, and

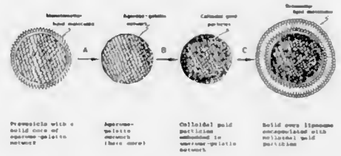
solidifying said molding material to form a finished article.

4,839,111

PREPARATION OF SOLID CORE LIPOSOMES

Leaf Huang, Knoxville, Tenn., assignor to The University of Tennessee Research Corporation, Knoxville, Tenn.

Filed Feb. 2, 1987, Ser. No. 9,427
Int. Cl.[4] A61K 9/66, 37/22; B01J 13/02
U.S. Cl. 264—4.6 **12 Claims**



1. A method of forming solid core liposomes comprising the steps of:

(a) forming prevesicles with encapsulated solid cores consisting essentially of a polymer gel in an organic solvent containing one or more emulsifiers;

(b) extracting lipophilic components from the prevesicles to obtain microspherules; and

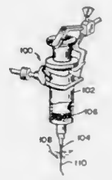
(c) encapsulating the microspherules in liposomes formed from a lipid mixture consisting essentially of phosphatidylcholine or derivatives thereof; one or more negatively charged lipids, cholesterol and triolein.

4,839,112

METHODS FOR FABRICATING A LOW DIMENSIONALLY ELECTROCONDUCTIVE ARTICLE

Kenneth J. Wynne, Falls Church, Va.; Tobin J. Marks, Evanston, and Tamotsu Inabe, both of Evanston, Ill., assignors to Northwestern University, Evanston, Ill.

Division of Ser. No. 787,514, Oct. 15, 1985, Pat. No. 4,622,170, which is a division of Ser. No. 451,408, Dec. 20, 1982, Pat. No. 4,563,300. This application Oct. 8, 1986, Ser. No. 916,706
Int. Cl.[4] D01F 1/09; B29C 71/00
U.S. Cl. 264—22 **18 Claims**



1. A method for fabricating a low dimensionally electroconductive article including the steps of providing a forming composition comprising a solution of cofacially stacking ionically bonding porphyrazine of the general formula $(Pc)M_n$ where Pc comprises pyrrole nuclei linked by nitrogen atoms to form a conjugated planar ligand having in a neutral state a 22 pi electron conjugation system, M comprises an ion selected from the group consisting of hydrogen ion and polyvalent transition metal ions and n is an integer; at least about three weight percent of an aromatic polyamide; and a strong Bronsted acid solvent; the weight ratio of said porphyrazine to said aromatic polyamide being at least about 1:3; forming the composition into a predetermined shape, solidifying the shaped composition by removing at least a portion of said solvent, and subjecting the shape solidified composition to redox conditions

to provide said cofacially stacking porphyrazine in crystalline form and fractional valence conductive state.

4,839,113

ANISTROPIC COMPOSITIONS OF CELLULOSE ESTERS; PROCESSES FOR OBTAINING SUCH COMPOSITIONS; FIBERS OF CELLULOSE ESTERS OR CELLULOSE

Philippe Villaine, Dübendorf, Switzerland, and Claude Janin, Riom, France, assignors to Michelin Recherche et Technique S.A., Basel, Switzerland

PCT No. PCT/CH85/00065, § 371 Date Dec. 19, 1985, § 102(e) Date Dec. 19, 1985, PCT Pub. No. WO85/05115, PCT Pub. Date Nov. 21, 1985

PCT Filed Apr. 24, 1985, Ser. No. 822,419

Claims priority, application France, Apr. 27, 1984, 84 06912

Int. Cl.⁴ C08L 1/10; D01F 2/28

U.S. Cl. 264—28 **24 Claims**

1. A composition having a base of at least one cellulose derivative containing cellulose ester groups, at least a part of these ester groups being formate groups, such that it is an anisotropic solution which can give fibers or films and comprises:

(a) a cellulose derivative or derivatives, the concentration of the cellulose derivative or of all of the cellulose derivatives in the solution being at least equal to 10.2% by weight, the degree of polymerization DP of the cellulose in the cellulose derivative or derivatives being greater than 150 and less than 1500 and the degree of substitution DS of the cellulose in ester groups other than formate of the cellulose derivative or derivatives being zero or less than 15%;

(b) an organic acid phase of formic acid or at least two compounds selected from the group consisting of monocarboxylic organic acids and the anhydrides and halides of these acids, one of these compounds being formic acid; and

(c) a phosphoric acid phase of at least one phosphoric acid, or at least one phosphoric acid and phosphoric anhydride.

15. A fiber formed at least in part of a filament having a base of at least one cellulose derivative containing cellulose ester groups, at least a part of these ester groups formate groups, comprising the following properties:

(a) the degree of substitution DS of the cellulose by formate groups is at least equal to 2%, the degree of substitution DS of the cellulose in other ester groups is zero or less than 10% and the degree of polymerization DP of the cellulose is greater than 150 and less than 1500;

(b) the tenacity T and the initial modulus M_i of the fiber verify the following relationships T and M_i being expressed in cN/tex: $T > 20$; $M_i > 100$;

(c) this filament has a morphology such that it is formed at least in part by layers embedded in each other, these layers surrounding the axis of the filament, and such that in each layer the optical direction and the direction of crystallization vary pseudoperiodically along the axis of the filament.

4,839,114

METHOD OF MANUFACTURING AN ELECTRICALLY CONDUCTIVE THERMOPLASTIC MATERIAL

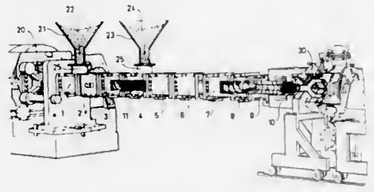
René Delphin, Fontenay aux Roses, and Bernard Regnaut, Antony, both of France, assignors to Occidental Chemical Corporation, Conn.

Filed Dec. 18, 1985, Ser. No. 810,122

Claims priority, application France, Dec. 18, 1984, 8419359

Int. Cl.⁴ B29C 47/92, 47/50, 47/76; C08K 3/04

U.S. Cl. 264—40.4 **4 Claims**



1. A method of manufacturing of electrically conductive large surface area thin plates such as bipolar plates for fuel cells of high conductivity with good mechanical properties formed of a thermoplastic material comprising a mixture of thermoplastic resin and carbon fill, using a two-screw mixer having a screw length of more than twenty times the screw diameter, said method comprising the steps of; continuously introducing thermoplastic resin into a first zone of a two-screw mixer and compacting and preheating said thermoplastic resin, passing said resin into a second zone and kneading and plastifying said thermoplastic resin, continuously inserting into a third zone of said two-screw mixture a particulate carbon fill, the fill constituting 30% to 50% by weight of the mixture and being dispersed in said third zone, the speed of rotation of said two-screw mixer lying in the range of between 150 to 250 RPM, the temperatures of said zones lying in the range of 165° C. to 300° C., and, removing the mixture via an outlet from an extrusion head to form said thin plates, and wherein a copolymer of propylene and ethylene is chosen as the thermoplastic resin and wherein a carbon black is chosen as the particulate carbon fill, said carbon black constituting 35% to 45% by weight.

4,839,115

METHODS FOR FORMING SHAPES OR BLOCKS OF NO MIX CEMENTS

H. Nash Babcock, Old Greenwich, and Edward P. Holub, Bethel, both of Conn., assignors to Nomix Corporation, Fairfield, Conn.

Division of Ser. No. 53,561, May 21, 1987, Pat. No. 4,732,782, which is a continuation-in-part of Ser. No. 843,316, Mar. 24, 1986, abandoned. This application Sep. 28, 1987, Ser. No. 101,908

Int. Cl.⁴ B28B 1/14; B29C 39/02

U.S. Cl. 264—42 **27 Claims**

1. A method for molding a cementitious composition into an article having a desired shape or configuration which comprises:

preparing molding means in a predetermined shape or configuration corresponding to the desired shape or configuration of the article;

substantially filling the molding means with water to provide a substantial excess of that needed for hydration of the cementitious composition which is used to make the article;

introducing into the water in the molding means a dry cementitious composition in the form of finely divided particles including at least one cement binder in an amount of greater than 20 percent by weight of the composition and an additive adapted to promote setting or curing of the

composition in the presence of the substantial excess of water, the major proportion of the particles having approximately the same drop rate, by pouring the composition into the water without any type of physical mixing of the cementitious composition and the water other than the mixing which occurs when the composition is poured into the water, such that the cementitious composition becomes completely hydrated by combining with a portion of the water and displacing excess water from the molding means; and

allowing the hydrated cementitious composition to set or cure to a self supporting solid in the desired shape or configuration.

4,839,116

METHOD OF MOLDING A FOAMED CORE SHORT DISTANCE GOLF BALL

Troy L. Puckett, and Lauro C. Cadorniga, both of Albany, Ga., assignors to MacGregor Golf Company, Albany, Ga.

Continuation-in-part of Ser. No. 701,840, Mar. 14, 1985, abandoned, which is a division of Ser. No. 588,190, Mar. 12, 1984, abandoned. This application Oct. 24, 1985, Ser. No. 790,913

Int. Cl.⁴ C08J 9/34; B29C 67/22, 45/23

U.S. Cl. 264—45.3 **9 Claims**

1. A process for manufacturing a one-piece short distance golf ball comprising the steps of:

a. forming a mixture of a thermoplastic rein, which is the product of the reaction of an olefin and metallic salt of an unsaturated monocarboxylic; acid, a chemical blowing agent, and a filler material for improving the impact resistance of the resulting golf ball which is microscopic hollow glass spheres;

b. injecting in one second or less between 15 and 35 grams of the mixture into a cooled golf ball mold cavity that is approximately 1.68 inch in diameter;

c. holding the mixture in the mold cavity for a time sufficient to form a dense skin adjacent the outside surface of the molded golf ball;

d. opening the mold cavity and removing the golf ball therefrom; and

e. quenching the golf ball in cooled water.

6. A process for manufacturing a one-piece short distance golf ball comprising the steps of:

a. forming a mixture by weight of approximately 100 parts of uncured thermoplastic resin, between 0.5 and 15 parts of a filler material, and between 0.25 and 2.0 parts of a chemical blowing agent;

b. injecting, in one second or less, between 15 and 35 grams of the mixture into a golf ball mold cavity that is cooled to approximately 40° F. to 70° and is approximately 1.68 inch in diameter;

c. holding the mold cavity temperature at approximately 40° F. to 70° F. to form a dense skin adjacent the outside surface of the molded golf ball;

d. opening the mold cavity and removing the golf ball therefrom; and

e. quenching the golf ball in cooled water.

4,839,117

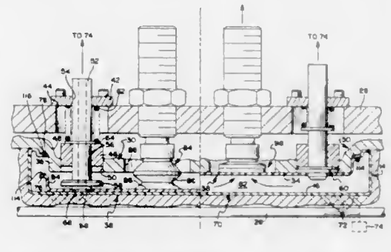
METHOD AND APPARATUS FOR FORMING A COMPOSITE FOAM SHELL AND INSERT ARTICLE

Harold W. Swenson, Dover, N.H., and Ken E. Tuttle, South Berwick, Me., assignors to Davidson Textron Inc., Dover, N.H.

Filed Feb. 8, 1988, Ser. No. 152,961

Int. Cl.⁴ B29C 67/22, 39/12

U.S. Cl. 264—46.4 **22 Claims**



1. In a method for manufacturing a composite product having a first member in the form of an outer shell and a second member forming a spaced outer surface on the composite product and wherein a layer of foamed material is formed in-situ between the outer shell and the second member the improvement comprising:

providing a peripheral flange on the first member;

providing a pour mold assembly having a mold cavity part and a lid moveable with respect to the cavity part to open the mold cavity part for loading a first member onto the cavity part;

providing locating means on said lid including a hollow pilot pin adapted to engage the second member only as the lid is closed against the mold cavity part to laterally position the second member with respect to the first member;

lifting the second member with respect to the lid to locate the second member in sealing engagement with the flange of the first member;

initiating lift of the insert once the second member is laterally positioned with respect to the first member to cause the second member to be automatically moved into sealed engagement with the flange of the second member while forming a space between the second member and the first member;

directing foam precursors into the space for reaction therein while simultaneously withdrawing air from the space through the hollow pilot pin to prevent air entrainment in the foam precursors during formation of the layer of foamed material bonded in situ to the first and second members; and

continuing to lift the second member following curing of the foamed layer and as the lid is opened from the mold cavity part to cause the composite part to be automatically released from the mold cavity part solely in response to lid opening movement.

4,839,118

METHOD OF FABRICATING AN INTERIOR TRIM FOAM PRODUCT

Craig B. Labrie, Dover, N.H., assignor to Davidson Textron Inc., Dover, N.H.

Continuation of Ser. No. 39,680, Apr. 20, 1987, abandoned. This application Aug. 10, 1988, Ser. No. 230,572
Int. Cl.[4] B29C *67/22, 5 1/00*
U.S. Cl. 264—46.5 4 Claims

1. A method for fabricating a vehicle interior trim component having a flexible outer shell and an insert which forms an integral back on the trim component comprising the steps of:
providing a mold cavity part having a support surface thereon;
providing a mold cover and tool insert means operatively associated to close the mold cavity part;
providing an shell of flexible material having a raw peripheral edge thereon and supporting the shell by positioning the outer surface thereof on the support surface of the mold cavity part while spacing the raw peripheral edge from the mold cavity part to form a foam space;
providing a multisided, generally planar insert with a continuous peripheral edge, an inner and outer surface, and an integral flange directed perpendicularly to the outer surface and formed in spaced parallelism inside the peripheral edge around the perimeter thereof to define side flanges and end flanges on the insert having lengths corresponding to that of the raw peripheral edge;
locating the insert within the foam space to form a gap between the raw peripheral edge and the outer surface of the insert while locating the integral flange outside of the foam space and inboard of the raw peripheral edge;
directing foam precursors into the foam space and the gap and reacting them therein so as to form a foam core in the foam space and the gap and to bond the inner surface of the insert and the shell to the core;
providing a post forming die;
removing the foamed shell and insert from the mold cavity part and supporting the outer surface of the shell against the post forming die to locate the integral flange in an upwardly facing direction;
thereafter applying a force against the integral flange to cause it to bend about ninety degrees to overlie the raw peripheral edge for holding the raw edge in place while covering both the raw peripheral edge and the gap formed between the raw peripheral edge and the insert.

4,839,119

PREPARATION OF VERY STRONG PORE-FREE CERAMIC SILICON CARBIDE MOLDINGS STABLE AT HIGH TEMPERATURE

Hans-Josef Sterzel, Dannstadt-Schauernheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 26, 1988, Ser. No. 160,995
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1987, 3707714
Int. Cl.[4] C04B *35/56*
U.S. Cl. 264—66 4 Claims

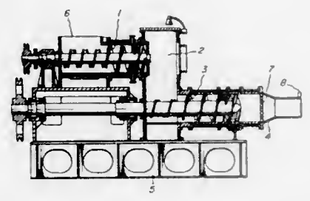
1. A process for the production of a compact, pore-free molding of silicon carbide by sintering silicon carbide powder at elevated temperatures, wherein, in a first stage, amorphous pure silicon carbide powder, the surfaces of which should be virtually free of silica, is compressed in a protective gas atmosphere in the absence of sintering assistants at from 1400° to 1800° C. and under from 100 to 2000 kp/cm^2 to give a compact glassy molding and, in a second stage, the amorphous silicon carbide is converted to crystalline α-silicon carbide at from 1950° to 2200° C.

4,839,120

CERAMIC MATERIAL EXTRUDING METHOD AND APPARATUS THEREFOR

Toshio Baba, Owariasahi; Hajime Matsushita, Nagoya, and Yasuji Katsuragawa, Okazaki, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Feb. 18, 1988, Ser. No. 156,885
Claims priority, application Japan, Feb. 24, 1987, 62-39242
Int. Cl.[4] B28B *3/24, 21/52;* B29B *7/84*
U.S. Cl. 264—102 7 Claims



1. A method of forming a ceramic extrudate to be subsequently extruded into a formed ceramic body through a plunger molding machine, said method comprising:
supplying a ceramic material to a vacuum auger machine to form a ceramic batch;
transporting the ceramic batch through a batch transfer section of said vacuum auger machine;
loosening and crushing the transported ceramic batch through a grid member located at an exit of said batch transfer section to remove laminations in the ceramic batch; and
extruding the loosened and crushed ceramic batch from the vacuum auger machine into a formed ceramic extrudate, which is of a size capable of being inserted into a cylinder of said plunger molding machine.

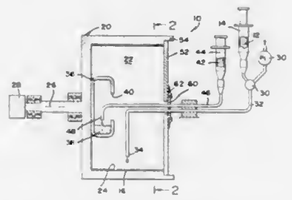
3. An apparatus for forming a ceramic extrudate to be subsequently extruded into a formed ceramic body through a plunger molding machine, said apparatus comprising of vacuum auger machine consisting essentially of:
a vacuum kneading section for kneading a ceramic material to produce a ceramic batch;
an extrudate body forming section for forming the kneaded ceramic batch into a formed extrudate body;
a batch transfer section having an auger for transferring the ceramic batch from said kneading section to said extrudate body forming section; and
a grid drum having a grid provided on an exit side of said batch transfer section between said kneading section and said extrudate body forming section, such that said grid loosens and crushes the kneaded ceramic batch to remove laminations therefrom before said batch is transferred into said extrudate body forming section.

4,839,121

HIGH DENSITY TAPE CASTING SYSTEM

Earl R. Collins, Jr., La Canada, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 21, 1986, Ser. No. 921,574
Int. Cl.[4] B28B *1/20;* B29C *67/00*
U.S. Cl. 264—114 6 Claims



3. Apparatus for molding a slurry containing particles in a solution, where the solution includes a solvent and a binder which can bind the particles into a sheet, to produce a heat containing particles bound together, comprising:
walls forming a chamber having an internal largely cylindrical molding surface which is curved about an axis, said chamber being substantially closed;
means rotating said chamber walls substantially about said axis of said surface to create centrifugal force thereon;
means for introducing said solvent in vaporous form in said substantially closed chamber prior to applying slurry to said molding surface;
means, separte from said means for introducing said solvent, or applying said slurry to said molding surface while said chamber remains substantially closed and said chamber walls rotate, to prevent the escape of vaporous solvent; and
means for venting said chamber to remove solvent therefrom.

6. A method for casting a slurry containing particles in a solution of a solvent and a binder, comprising:
applying solvent vapor to said chamber prior to casting said slurry to avoid premature drying of the initial applied slurry;
applying said slurry to a largely cylindrical internal surface of a chamber while rotating said surface and sealing the chamber against the rapid loss of solvent therefrom, to thereby pack the particles densely against the cylindrical surface;
said step of applying solvent vapor including applying liquid solvent to a container which is open to the passage of vapors therefrom to said chamber, while largely sealing said chamber against the rapid loss of vaporous solvent, to fill said chamber with solvent vapor, and
after said step of applying slurry, venting said solvent from said chamber to enable evaporation of said solvent, while continuing to rotate said surface, whereby to gradually allow the binder to bind closely packed particles.

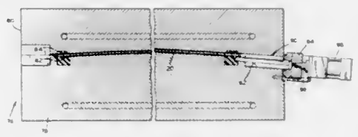
4,839,122

REACTION INJECTION MOLDING OF WINDOW GASKET

William R. Weaver, Toledo, Ohio, assignor to Libbey-Owens-Ford Co., Toledo, Ohio

Division of Ser. No. 535,870, Sep. 26, 1983. This application May 1, 1986, Ser. No. 858,338
Int. Cl.[4] B29C *45/14*
U.S. Cl. 264—129 7 Claims

1. A method for producing a window assembly of a sheet of transparent glass and a gasket adhered to treated predetermined portions of the sheet, the gasket having an exposed mounting surface for subsequent contact with an associated framing member and an outer exposed trim section adjacent one surface of the sheet, said method including the steps of:
(a) treating a predetermined marginal peripheral portion of the sheet of transparent glass with a primer coating which assists in formation of a stable bond between the sheet and the gasket;
(b) positioning the sheet within the interior of a mold chamber formed by a plurality of cooperating mold sections, said mold sections including a gasket shaping surface which cooperates with the predetermined marginal peripheral portion of the sheet for defining a gasket forming cavity having a shape corresponding to the desired shape of the gasket;
(c) injecting into the gasket forming cavity a composition which is capable of polymerization and cure to produce a



gasket which cures in contact with and adheres to the treated predetermined marginal peripheral portion of the sheet;
(d) controlling the pressure in the gasket forming cavity into which the composition is injected to one sufficiently low that the sheet is not damaged;
(e) controlling the pressure of the gasket forming cavity, the injection of the composition, and the amount of the composition injected so that the composition polymerizes after its injection and assumes by the autogenous pressure incident to polymerization intimate contact with the gasket forming cavity and with the treated predetermined marginal peripheral portion of the sheet and cures while in such contact with the treated peripheral portion of the sheet; and,
(f) removing the assembly from the mold cavity.

4,839,123

PROCESS OF APPLYING A SILICONE RELEASE COATING TO AN ORIENTED POLYMER FILM

Gary L. Duncan, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 18, 1986, Ser. No. 897,580
Int. Cl.[4] B29C *47/06*
U.S. Cl. 264—22 6 Claims

1. A process for making an oriented polymer film product which comprises:
(a) incorporating a solventless, curable silicone release composition into an extrudable, orientable polymer;
(b) extruding the polymer as a sheet or film;
(c) orienting the sheet or film such that curable silicone release composition migrates to at least one surface of the sheet or film forming a substantially continuous layer thereon; and,
(d) subjecting the oriented sheet or film to silicone-curing conditions whereby said curable silicone release composition forms a peelable release layer thereon.

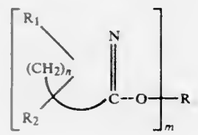
4,839,124

REDUCTION OF CARBOXYL END GROUPS IN POLYESTER FIBERS WITH LACTIM ETHERS

Yousef Mohajer, Midlothian; Stanley D. Luzarus, Petersburg, both of Va., and Robert S. Cooke, Morris Plains, N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Feb. 29, 1988, Ser. No. 161,553
Int. Cl.[4] D01F *6/62, 1/10*
U.S. Cl. 264—211 **19 Claims**

1. A method of melt spinning high molecular weight polyester polymer to produce fibers with reduced carboxyl end group concentration comprising admixing and reacting with molten polyester polymer an effective amount of at least one lactim compound of the formula



wherein

n is an integer of 2 to 15;

m is an integer of 1 to 4;

R_1 and R_2 are independently hydrogen, halogen, nitro, amine, C_1–C_{10} alkyl, C_5–C_{12} cycloalkyl, C_7–C_9 alkyl aromatic, or C_6–C_{10} aromatic; and

R_3 is a mono- to tetravalent organic radical selected from the group consisting of C_1–C_{32} alkyl, C_5–C_{14} cycloalkyl, C_7–C_{16} alkyl aromatic, and C_6–C_{14} aromatic;

forcing the reacted molten polymer under pressure to a spinneret;

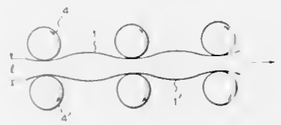
and extruding the lactim reacted polymer into a zone of lower pressure and temperature to form a fiber.

4,839,125

PROCESS FOR PREPARATION OF LIGHT-DIFFUSING METHACRYLIC RESIN PLATES

Kozo Ida, Otake, Japan, assignor to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed May 12, 1987, Ser. No. 49,776
Claims priority, application Japan, May 15, 1986, 61-112137
Int. Cl.[4] B29C *39/16;* **B29D** *11/00*
U.S. Cl. 264—216 **7 Claims**



1. A process for continuous preparation of light-diffusing methacrylic resin plates comprising

(a) introducing into a first end of a casting space a polymerizable material comprising

(i) methyl methacrylate or a partially polymerized product thereof;

(ii) 0.2 to 3.0% by weight of a light-diffusing agent that is insoluble in the polymerizable material, said light-diffusing agent having a maximum average diameter of 3 μm to 100 μm, a visible light transmittance of at least 20% and a refractive index, n, and a thickness, d, such that the product, n×d, is between 0.2 and 0.3 μm; said casting space being defined by facing surfaces of two moving belts and gaskets interposed between the belt surfaces in the vicinity of both edges of the belts and moving therewith;

(b) progressively polymerizing the polymerizable material while moving it with the belts from the first end of the casting space toward a second end of the casting space; and

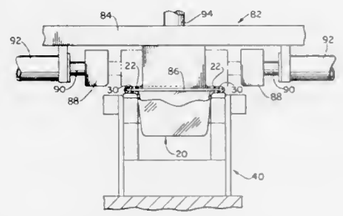
(c) applying a compressive force to the belts at at least one point between said first and second ends of the casting space at which the polymerizable material is still flowable such that the distance between the two belts is reduced to a minimum distance and then allowing the distance between the belts to expand such that the distance between the two belts increases to a maximum distance, wherein the amount of force applied is such that the maximum distance between the two belts has a value of between (l+1) mm and (l+0.2) mm and the minimum distance has a value of between (l−1) mm and (l−0.2) mm, l being the average distance between the two belts, said average distance being determined so as to yield a plate of particular thickness while accounting for effects of polymerization and temperature.

4,839,126

METHOD AND APPARATUS FOR FOLDING THE EDGES OF A SHEET OF MATERIAL

Carl P. Griesdorn, 9588 Humphrey Rd., Cincinnati, Ohio 45242

Continuation of Ser. No. 95,812, Sep. 14, 1987, abandoned. This application Jun. 14, 1988, Ser. No. 206,653
Int. Cl.[4] B29C *53/04*
U.S. Cl. 264—339 **6 Claims**



6. A method for folding the edges of a sheet of material comprising the steps of:

providing a die having walls on the sides and a compressible layer which rests on top of the die;

placing a sheet of material on top of the compressible layer so the edges of the sheet of material extend outside the walls of the die;

applying heat and force to the sheet of material from above to make the sheet of material pliable where the heat is applied and to compress the compressible layer to cause the edges of the sheet of material to be bent upward against inside of the walls of the die; and,

folding the edges of the sheet of material which have been bent upward on top of the unfolded portion of the sheet of material.

4,839,127

METHOD OF MAKING PARTIALLY CRYSTALLINE BIAXIALLY ORIENTED HOLLOW PLASTIC HEAT SET CONTAINERS

Prakash R. Ajmera, Toledo, and Saleh A. Jabarin, Holland, both of Ohio, assignors to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed Mar. 4, 1987, Ser. No. 21,894
Int. Cl.[4] B29C *49/18, 49/30, 49/32*
U.S. Cl. 264—526 **20 Claims**

1. A method for making a partially crystalline, biaxially oriented heatset hollow plastic container from a hollow parison having an open end and a closed end comprising

engaging the open end of a plastic parison which is at a temperature within its molecular orientation temperature range,

positioning a mold base in axial alignment with said engaged hot parison,

enclosing a hot mold about the mold base, said mold being at heatsetting temperature,

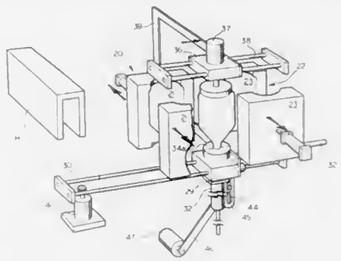
expanding said plastic parison within said hot mold and mold base by internal pressurization through the clamping and blow pin assembly to induce biaxial orientation of the plastic parison and force the plastic parison into intimate contact and conformance with the hot mold and to maintain contact by such internal pressurization between the mold and the biaxial oriented container for a time sufficient to induce partial crystallization in the biaxial oriented container,

reducing the internal pressurization of the container,

thereafter opening the hot mold while maintaining engagement of the open end of the hot blown container and maintaining engagement of the mold base with the hot blown hollow container,

maintaining a lower internal pressurization of the container to prevent significant shrinkage, and maintaining engagement of the mold base with the hot blown container to prevent distortion of of the base of the container when the hot mold is opened, and

cooling the container while maintaining engagement with the open end of the hot blown container and maintaining engagement with the base of the hot blown container and mainaining a lower internal pressurization.



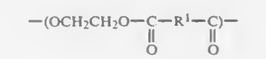
4,839,128

LOW-TEMPERATURE-PROCESSIBLE COPOLYESTERAMIDES, PREPARATION OF MOLDED ARTICLES THEREFROM AND COMPOSITIONS THEREOF

Kenji Yoshino; Tadahiro Wakui; Yumiko Kumazawa; Mitsuhiko Izumi, and Touru Yamagishi, all of Chiba, Japan, assignors to Kawasaki Steel Corp., Hyogo, Japan

Filed Jan. 28, 1988, Ser. No. 149,501
Claims priority, application Japan, Jan. 30, 1987, 62-20208; Apr. 24, 1987, 62-102714
Int. Cl.[4] C08G *69/44*
U.S. Cl. 264—328.1 **7 Claims**

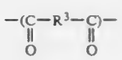
1. A copolyesteramide consisting essentially of units <I>, <II>, <III>, <IV>, and <V> of the following formulae:



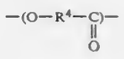
<I>

<II>

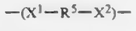
-continued



<III>



<IV>



<V>

wherein

each of R^1, R^2, R^3 and R^4 is independently at least one divalent radical selected from the group consisting of para-phenylene, 2,6-naphthalene, and 4,4'-biphenylene,

R^5 is a para- or meta-phenylene radical,

X^1 is —NH—,

X^2 is —NH—, —O—, or

R^1 through R^4 may be the same or different, and some of the hydrogen atoms on the aromatic rings in R^1 through R^5 may be replaced by a lower alkyl, halogen, nitro, cyano, or alkoxy radical,

in the following molar amounts:

unit <I>	3 to 30 mol %,
unit <II>	5 to 30 mol %,
unit <IV>	30 to 85 mol %, and
unit <V>	0.1 to 10 mol %.

based on the total molar amount of units <I>, <II>, <III>, <IV>, and <V>, with the molar ratio of unit <III>/(<II>+<V>) ranging from 8/10 to 11/10 when X^2 is —NH— or —O—, and the molar ratio of unit <III>/<II> ranging from 8/10 to 11/10 when X^2 is

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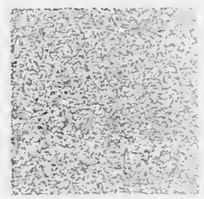
4,839,129

PROCESS FOR PRODUCING BIAXIALLY STRETCHED POLYPARAPHENYLENE SULFIDE FILM

Toshiya Mizuno, Tsuchiura; Hideyuki Yasumi, Iwaki, and Satoru Matsunaga, Dejima, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 33,613, Apr. 3, 1987, Pat. No. 4,775,571. This application Jul. 6, 1988, Ser. No. 215,544
Int. Cl.[4] B29C *71/02;* **B32B** *27/28;* **C08G** *75/00, 75/14*
U.S. Cl. 264—235 **4 Claims**



1. A process for producing a biaxially stretched

polyparaphenylene sulfide film, comprising the steps of melt-molding a resin of polyparaphenylene sulfide series into a sheet-form or a film-form, rapidly chilling the thus molded sheet or film, thereby obtaining an amorphous and non-stretched sheet or film, subjecting the amorphous and non-stretched sheet or film to thermal treatment for from 0.5 to 20 sec at a temperature of from 150° to 300° C., cooling the thus treated sheet or film to room temperature and subjecting the thus cooled sheet or film to biaxial stretching at a temperature of from 80° to 120° C., thereby obtaining the biaxially stretched polyparaphenylene sulfide film.

4,839,130

PROCESS OF MAKING AN ABSORBABLE SURGICAL DEVICE

Donald S. Kaplan, Weston; Matthew E. Hermes, Norwalk; Ross R. Muth, Brookfield, and John J. Kennedy, Stratford, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Division of Ser. No. 99,635, Sep. 22, 1917, Pat. No. 4,744,365, which is a continuation of Ser. No. 860,302, Jul. 17, 1986, abandoned, which is a continuation of Ser. No. 586,686, Mar. 6, 1984, abandoned. This application Nov. 5, 1987, Ser. No. 117,467

Int. Cl.⁴ B29C *71/02*

U.S. Cl. 264—235 **14 Claims**

8. A process for making a surgical device comprising the steps:

(a) polymerizing a first monomer mixture containing a predominant amount of lactide until the polymerization is substantially complete, thereby forming a first polymer;

(b) intimately mixing with the first polymer particles of a second polymer containing a predominant amount of glycolide moieties, thereby forming a final polymer having two-phases;

(c) forming a surgical device from the final polymer; and

(d) annealing the surgical device.

4,839,131

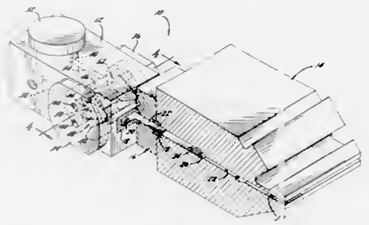
LAYER WIDTH CONTROL

Peter F. Cloeren, Orange, Tex., assignor to P.C.E. Corp., Orange, Tex.

Filed Sep. 3, 1987, Ser. No. 93,503

Int. Cl.⁴ B29C *47/92*

U.S. Cl. 264—171 **15 Claims**



13. A coextrusion apparatus comprising a first flow channel having a width equal to that of a combined flow passage formed by the convergence of said first flow channel and a second flow channel of less width than said first flow channel; adjustable divider means separating said first flow channel and said second flow channel, the divider means being removably mounted and having a width less than that of said first flow channel; and removably mounted, flow channel width-limiting means having an inner wall defining an end of said second flow channel, said flow channel width-limiting means being of uniform thickness equal to the difference between said width of said first flow channel and said width of said divider means, a portion of said flow channel width-limiting means being disposed between an end of said divider means and an inner wall of said coextrusion apparatus.

14. A process for adjusting the width of an isolating edge of a laminate, said process comprising adjusting the relative back pressures in adjacent flow channels by the movement of adjustable divider means separating said adjacent flow channels; allowing a first stream to flow transversely to a certain width in one of said adjacent flow channels; permitting a second stream to flow transversely to a width less than said certain width in the other of said adjacent flow channels; and thereafter limiting the widthwise flow of said second stream by the convergence of said first stream and said second stream, whereby an isolating edge preventing said second stream from extending to the full laminate width is formed;

a laminate having an isolating edge of a selected width thereby being formed.

4,839,132

PROCESS FOR THE PREPARATION OF LARGE DIAMETER ORIENTED MONOFILAMENTS

Teh-Chuan Wang, Parkersburg, W. Va., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Feb. 25, 1987, Ser. No. 18,385

Int. Cl.⁴ D01F *8/04*

U.S. Cl. 264—134 **7 Claims**

1. A process for the preparation of oriented monofilaments of semi-crystalline linear condensation polymer, which process comprises

(a) melt extruding a core of semi-crystalline linear condensation polymer,

(b) quenching the core to solidify the polymer in a substantially void-free condition;

(c) coating the core with additional molten semi-crystalline linear condensation polymer in a round configuration in an amount sufficient to increase the diameter of the core by about from 10 to 100 mils,

(d) quenching the resulting structure to solidify it in a substantially void-free condition, and

(e) orienting the structure by drawing at least about 3.5 times its original length within the orientation temperature range of the polymer to provide an oriented filament having a diameter of at least about 60 mils.

4,839,133

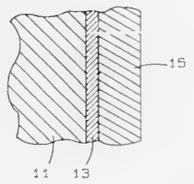
TARGET AND METHOD FOR THE PRODUCTION OF FISSION PRODUCT MOLYBDENUM-99

George F. Vandegrift, Bolingbrook; Donald R. Vissers, Naperville; Simon L. Marshall, Woodridge, and Ravi Varma, Hinsdale, all of Ill., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Oct. 26, 1987, Ser. No. 112,158

Int. Cl.⁴ G21G *1/02*; **C25C** *3/34*; **C25D** *3/54, 5/46*

U.S. Cl. 376—202 **20 Claims**



1. A target for the production of fission product Mo-99 from uranium comprising:

a structural support member,

a preparatory coating of an oxide-free substrate metal selected from the group consisting of Ni, Cu, Fe and alloys thereof deposited on said support member; and

an electrodeposited layer of oxide-free uranium metal on the preparatory coating, said uranium layer being free of dendrite formations.

4,839,134

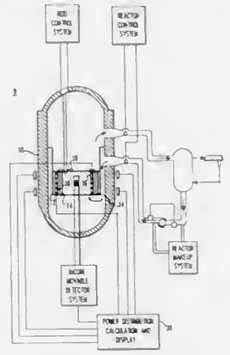
CONTINUOUS, ONLINE NUCLEAR POWER DISTRIBUTION SYNTHESIS SYSTEM AND METHOD

Albert J. Impink, Jr., Murrysville, and Louis R. Grobmyer, North Huntingdon, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 31, 1987, Ser. No. 140,065

Int. Cl.⁴ G21C *7/36*

U.S. Cl. 376—216 **6 Claims**



1. A continuous nuclear power distribution synthesis system for a nuclear reactor core, comprising:

fixed incore detectors positioned in the core and producing flux signals, a number of said detectors being less than a full complement of the fixed incore detectors;

a full complement of core exit thermocouples positioned at exits of core assemblies and producing temperature signals; and

computation means for determining power distribution of the entire core from the flux signals and temperature signals.

4,839,135

ANTI-VIBRATION FLUX THIMBLE

Daniel Merkovsky, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 21, 1987, Ser. No. 87,941

Int. Cl.⁴ G21C *21/00*

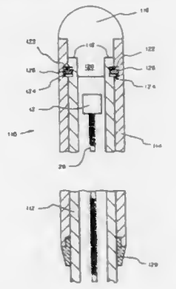
U.S. Cl. 376—254 **25 Claims**

9. A method of fabricating a thimble used to accommodate a movable in-core detector for monitoring power distribution in a nuclear reactor having a vessel including a wall, a sleeve penetrating the wall, a core plate supporting a fuel assembly, bore formed in the core plate, and a bottom-mounted instrumentation column communicating with the bore, the bottom mounted instrumentation column being coupled to the core plate and extending therefrom to the vessel penetration sleeve, said method comprising the steps of:

forming first tubular means for slidably guiding the detector within the nuclear reactor, said first tubular means being linearly movable through the bore in the core plate and into the fuel assembly;

sheathing said first tubular means with a second tubular means along a predetermined length thereof; and

fixedly attaching said second tubular means to said first tubular means at an attachment region having a length that is substantially less than the length of said second tubular means, so that said second tubular means is not immobilized with respect to said first tubular means except at said attachment region, said attaching step further comprising the step of forming a bullet-shaped member having a greatest diameter substantially equal to the outside diameter of said second tubular means, having a first shoulder portion adapted to seal said second tubular means, and having a second shoulder portion adapted to seal said first tubular means.



4,839,136

SPACER FOR NUCLEAR FUEL RODS

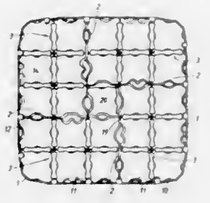
Edmund E. DeMario, Columbia, S.C.; Anders Johansson, and Olov Nylund, both of Västeras, Sweden, assignors to AB Asea-Atom, Västeras, Sweden

Filed Oct. 16, 1987, Ser. No. 109,832

Claims priority, application Sweden, Oct. 23, 1986, 8604531; Oct. 23, 1986, 8604530; Oct. 23, 1986, 8604529

Int. Cl.⁴ G21C *3/34*

U.S. Cl. 376—462 **10 Claims**



1. A bimetallic spacer for supporting a plurality of fuel rods and fixing said fuel rods in position in a nuclear reactor fuel assembly, said bimetallic spacer comprising

an elongated outer structural element which provides four sides and defines an interior space therein,

a plurality of interconnected inner structural elements which are connected to said outer structural element and which

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extend into said interior space to divide said interior space into a plurality of subspaces, and

a plurality of spring elements which are each connected to two sides of said outer structural element and to two of said plurality of inner structural elements so as to extend across an associated subspace, each spring element having a double cruciform shape and, together with the sides of the outer and inner structural elements to which it is attached, providing six interstices through which six fuel rods can be extended.

4,839,137

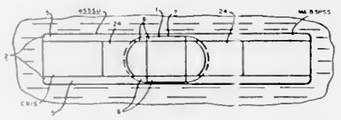
NUCLEAR STEAM SUPPLY SYSTEM AND METHOD OF INSTALLATION

Stephen N. Tower, Murrysville; James A. Christenson, Forward Township, Allegheny County, and Howard E. Braun, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 785,097, Oct. 4, 1985, abandoned, which is a continuation of Ser. No. 614,715, May 29, 1984, abandoned, which is a continuation of Ser. No. 350,268, Feb. 24, 1982, abandoned. This application May 16, 1988, Ser. No. 195,438

Int. Cl.[4] G21C *1/00*; G21D *1/00*

U.S. Cl. 376—260 **10 Claims**



1. A method of providing a nuclear reactor power plant at a predetermined use site accessible by predetermined navigable waterways, said method being practiced with apparatus including a nuclear reactor system, the said system having a nuclear steam-supply section including:

(a) a nuclear-reactor vessel, and

(b) steam-generator means, including a lowermost portion having primary coolant piping connected to said nuclear reactor vessel and an uppermost portion through which steam is transmitted to the point of use, said uppermost portion being free of primary coolant piping,

the said method comprising:

(A) constructing a nuclear reactor system at a manufacturing site remote from said predetermined use site but accessible to said predetermined waterways for transportation from said manufacturing site to said predetermined use site, said nuclear reactor system including a barge with said nuclear steam supply section constructed integrally with said barge, and said nuclear reactor system being substantially greater in its length dimension than in its height dimension and being oriented with its length dimension generally horizontally along said barge and its height dimension generally vertically of said barge, and with the overall height of said nuclear reactor system altered to enable said nuclear reactor system to pass under bridges along said predetermined waterway by removal selectively of at least one of at-least-two upper subsections, of said nuclear reactor system one of said upper subsections consisting of all parts of said nuclear reactor system, above a first horizontal plane, said first horizontal plane being above said uppermost portion of said steam generator means, and the other of said at-least-two upper subsections consisting of all parts of said nuclear reactor system above a second horizontal plane, said second horizontal plane being below said first horizontal plane and between said uppermost portion and said lowermost portion of said steam generator means, said second horizontal plane also being above said nuclear reactor vessel, whereby said removal can be accomplished without disturbance of the nuclear reactor vessel and primary coolant piping;

(B) simultaneously with the said construction of said nuclear reactor system, constructing facilities at said use site to be integrated with said nuclear reactor system to form said nuclear-reactor power plant;

(C) transporting said nuclear reactor system along said waterways to said predetermined use site;

(D) at said use site joining said removal parts of said altered nuclear reactor system to the remainder of said altered nuclear reactor system to complete said nuclear reactor system; and

(E) installing said nuclear reactor system at said predetermined use site and integrating said nuclear reactor system to interact with said facilities constructed at said predetermined use site to form said nuclear-reactor power plant.

4,839,138

PROCESS OF MAKING A SINTERED MOLDING

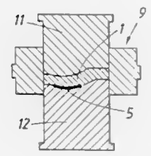
Friedrich Filz, Laakirchen, Austria, assignor to Miba Sintermetall Aktiengesellschaft, Laakirchen, Austria

Filed Mar. 10, 1988, Ser. No. 166,112

Claims priority, application Austria, Mar. 16, 1987, A 613/87

Int. Cl.[4] G22F *7/00*

U.S. Cl. 419—6 **7 Claims**



1. In a process of making a sintered molding having a base and at least one molybdenum-containing, wear-resisting facing on said base, wherein

a low-alloy iron powder intended to form said base and a carbon-free metal powder mixture intended to form said wear-resisting layer and consisting of unalloyed iron particles and unalloyed molybdenum particles are jointly molded to form a molding and

said molding is subsequently sintered,

the improvement residing in that

said metal powder mixture is separately compacted to form a compact, which has a profiled surface having an impressed profile, and

said compact in a coherent state and said iron powder in contact with said profiled surface are jointly molded to form said molding.

4,839,139

POWDER METALLURGY HIGH SPEED TOOL STEEL ARTICLE AND METHOD OF MANUFACTURE

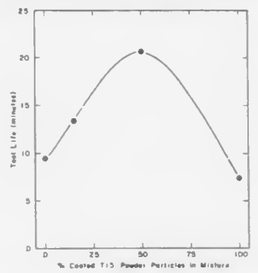
Edward J. Dulis, Pittsburgh, Pa.; Carl J. Dorsch, North Chili, N.Y., and William Stasko, West Homestead, Pa., assignors to Crucible Materials Corporation, Pittsburgh, Pa.

Filed Feb. 25, 1986, Ser. No. 832,734

Int. Cl.[4] C22C *1/05*

U.S. Cl. 419—35 **15 Claims**

1. A method for producing a powder-metallurgy produced high-speed tool steel article having an improved combination of tool life and wear resistance, said method comprising providing a particle charge of high-speed steel particles constituting a mixture of coated high-speed steel particles coated with a hard, wear resistant material and uncoated high-speed steel particles, said coated particles being present in an amount effective to improve tool life and wear resistance of said article and hot compacting said particle charge to essentially full density to produce said article.



4,839,140

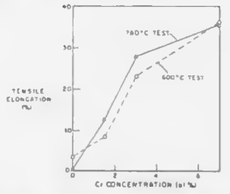
CHROMIUM MODIFIED NICKEL-IRON ALUMINIDE USEFUL IN SULFUR BEARING ENVIRONMENTS

John V. Cathcart, Knoxville, and Chain T. Liu, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 786,562, Oct. 11, 1985, Pat. No. 4,731,221. This application Aug. 31, 1987, Ser. No. 91,561

Int. Cl.[4] C22C *19/05*

U.S. Cl. 420—445 **1 Claim**



1. A composition of matter consisting essentially of 18 to 19 at. % aluminum, 10 to 11.5 at. % iron, 6.5 to 8.0 at. % chromium, 0.4 to 0.8 at. % molybdenum, 0.1 to 0.3 at. % zirconium, 0.05 to 0.2 at. % boron and the balance nickel.

4,839,141

GOLD-PALLADIUM-NICKEL-COPPER-MANGANESE FILLER METAL FOR JOINING SUPERALLOY PARTS

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Mar. 28, 1988, Ser. No. 174,278

Int. Cl.[4] C22C *30/02*

U.S. Cl. 420—587 **4 Claims**

1. A brazing alloy having a brazing temperature of 1025° to 1080° C., a solidus temperature above 1000° C., a liquidus temperature above 1018° C. consisting of, in weight percent, 5—30 Au, 15–35 Pd, 10–30 Ni, 20–48 Cu, 5–25 Mn.

4,839,142

HIGH TEMPERATURE, SHORT TIME HEATING SYSTEM AND METHOD OF STERILIZING OR PASTEURIZING HEAT SENSITIVE BIOLOGICAL FLUIDS

Stanley E. Charm, 21 Concolor Ave., Newton, Mass. 02158

Continuation-in-part of Ser. No. 782,019, Sep. 30, 1985, abandoned. This application Jul. 8, 1987, Ser. No. 71,733

Int. Cl.[4] A61L *2/12*; C07K *3/12*

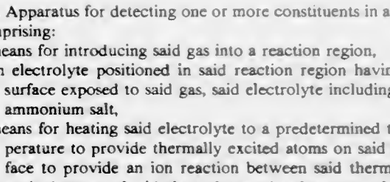
U.S. Cl. 422—21 **21 Claims**

1. A method for the high temperature, short time heating of a heat-sensitive biological fluid comprising proteinaceous material and a pathogenic organism agent, which method comprises:

a) rapidly heating the heat-sensitive biological fluid, having a dielectric constant of over about 90 at a rate of over about 25°C per second for a heating time period to a preselected *heating* temperature by the employment of microwave heating energy to provide a heated biological fluid;

b) holding the said heated biological fluid at the *heating* preselected temperature for a holding time period of up to about two seconds;

c) rapidly cooling the heated biological fluid to a preselected lower temperature for a cooling time period to provide a cooled biological fluid; *and*



d) circulating the heated biological fluid while rapidly heating, holding and rapidly cooling the biological fluid; [and] *wherein*

e) the heating, holding and cooling time periods *are* sufficiently short and the [selected temperature] *preselected heating temperature and the lower temperature are* sufficient not to effect the desirable properties of the proteinaceous material of the heat-sensitive biological fluid, but sufficient in time periods and selected temperature for at least the partial destruction of [undesirable microorganism agents] *said pathogenic organism agent* in the biological fluid.

4,839,143

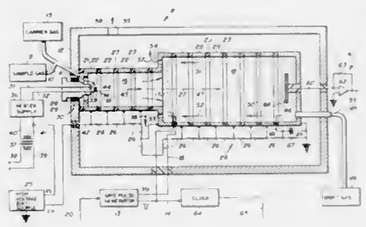
SELECTIVE IONIZATION OF GAS CONSTITUENTS USING ELECTROLYTIC REACTIONS

Kishore N. Vora, Annandale, Va.; Donald N. Campbell, Timonium, Md.; Robert C. Davis, Jr., Westminster, Md.; Glenn E. Spangler, Lutherville, Md., and Julio A. Reategui, Cockeysville, Md., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Feb. 15, 1985, Ser. No. 701,898

Int. Cl.[4] G01N *27/62*

U.S. Cl. 422—98 **4 Claims**



1. Apparatus for detecting one or more constituents in a gas comprising:

means for introducing said gas into a reaction region,

an electrolyte positioned in said reaction region having a surface exposed to said gas, said electrolyte including an ammonium salt,

means for heating said electrolyte to a predetermined temperature to provide thermally excited atoms on said surface to provide an ion reaction between said thermally excited atoms of said electrolyte and at least one of said gas constituents of said gas to form ion products in said gas, and

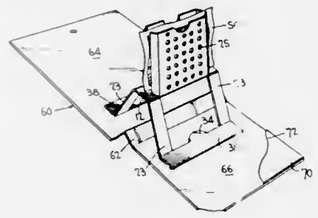
means for measuring the drift mobility and quantity of said ion products.

4,839,144

SUPPORT DEVICE FOR COMBUSTIBLE PACKAGE CONTAINING A HEAT-DISPERSIBLE MATERIAL AND A COMBUSTIBLE MATERIAL

John Martin, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Aug. 6, 1987, Ser. No. 82,157
Int. Cl.[4] A61L *9/02, 9/03*
U.S. Cl. 422—305 20 Claims



1. A device fabricated from a single rectangular sheetmetal blank for supporting a combustible package containing a heat dispersible material and a combustible material, the combustible package to be consumed while being supported in said device, said sheetmetal blank comprising an outer frame having the general shape of the number eight, said frame further comprising a central section defined by two spaced apart central scorelines extending across the width of the sheetmetal blank; two essentially U-shaped mirror image outer sections, extending outwards from the central section, each joined to the center section at two locations at the opposite ends of the center section forming the general shape of the number eight; and two essentially rectangular mirror image inner sections joined to the frame along the center scorelines of the center section, said sections each being bounded by, but unattached to, the respective outer sections of the frame along three sides and attached to the center section of the frame on a fourth side along a center scoreline, said support device being fabricated by folding said inner sections upwardly along the center scoreline into a parallel relationship with each other, thereby forming a compartment and folding the outer sections of the frame downward along the centerlines to form an oblique angle with the inner sections and form thereby a pair of legs for supporting the compartment.

4,839,145

CHEMICAL VAPOR DEPOSITION REACTOR

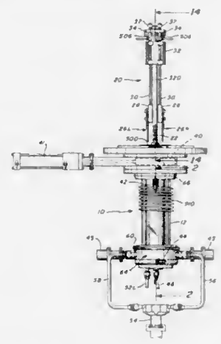
Ronald P. Gale, Sharon, and John C. C. Fan, Chestnut Hill, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 27, 1986, Ser. No. 900,886
Int. Cl.[4] C30B *35/00*
U.S. Cl. 422—245 34 Claims

1. A chemical vapor deposition system for depositing a reactant from a flowing reactant gas introduced into a reactant chamber on a substrate mounted on a susceptor in said chamber comprising:

(a) a reaction chamber for heating reacting gasses by a pair of opposing heatable susceptors to deposit a reactant from said gasses on said substrate as said gasses are heated and pass to a region beyond said susceptors; and

(b) the space between said suspceptors forming a reaction region at least one of said susceptors having means for mounting a substrate thereon with the substrate having an exposed surface facing the reaction region for deposition of said reactant on said exposed surface, the ratio of the lateral width of said susceptors transverse the direction of flow of reacting gasses to the distance between said opposing susceptors being greater than one;



(c) rotator means for solely rotating at least one such susceptor with the substrate about an axis transverse the flow of reactant gasses; and

(d) exhaust means for exhausting reactant gasses.

4,839,146

CATALYST FOR SIMULTANEOUS NO DECOMPOSITION AND CO OXIDATION UNDER CYCLED OPERATING CONDITIONS

Byong K. Cho, Rochester Hills, and Christopher J. Stock, Southfield, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 15, 1987, Ser. No. 38,717
Int. Cl.[4] B01D *53/36*
U.S. Cl. 423—213.5 7 Claims

5. In the method of treating the exhaust gas from a hydrocarbon-fueled internal combustion engine comprising continually cycling the air-fuel mixture supplied to the engine between a fuel-rich condition and a fuel-lean condition while contacting the exhaust gas with a catalyst comprising one or more noble metals dispersed on ceramic carrier particles, the improvement in which the carrier particles comprise a crystalline solid solution of 80 to 95 mole percent CeO_2 and 5 to 20 mole percent RE_2O_3 where RE is a rare earth metal, which solid solution is capable of absorbing more oxygen than pure ceria under net oxidizing conditions.

4,839,147

METHOD OF PURIFYING COMBUSTION PRODUCT GASES CONTAMINATED WITH DUST AND NOXIOUS GASES

Ralf Lindbauer, Graz, and Alfred Glasner, Passail, both of Austria, assignors to Waagner-Biro Aktiengesellschaft, Vienna, Austria

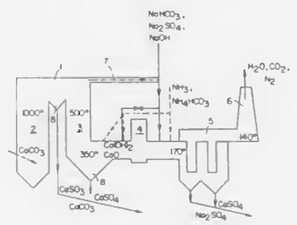
Continuation of Ser. No. 844,148, Mar. 26, 1986, abandoned. This application Feb. 25, 1988, Ser. No. 160,315
Claims priority, application Austria, Apr. 5, 1985, 1037/85
Int. Cl.[4] C01B *17/00, 21/00;* B01J *8/00*
U.S. Cl. 423—235 19 Claims

1. A method of purifying combustion product gases discharged from fossil fuel burning plants, which carry entrained dust including an alkaline earth compound as they leave the combustion chamber, comprising the steps of;

reacting at least a partial stream of the dust-containing combustion product gases in the temperature range below 500° C. with at least one member selected from the group consisting of NH_3, NH_4OH, hartshorn salt and substances which yield such compounds by thermal decomposition,

with attendant formation of pulverulent reaction products;

adding $NaHCO_3$ or a mixture of the $NaHCO_3$ with at least one alkaline compound selected from the group consisting of CaO, $Ca(OH)_2$, NaOH, Na_2SO_4 and Al_2O_3 in a dry and particulate condition thereof to the combustion product gases, with attendant formation of additional pulverulent reaction products; and



separating the pulverulent reaction products, together with the remaining entrained dust, from the combustion product gas in a dust separator;

wherein said separating step includes passing the combustion product gases through a dry separator constructed as a cloth filter to prolong the dwell time of the reaction products in the combustion product gases and to avoid the seperation of NH_3 or of NH_4-containing compounds in the separator.

4,839,149

AMMONIUM PLUTONATE URANATE, ITS PREPARATION PROCESS AND ITS USE FOR PRODUCING THE MIXED OXIDE $(U,PU)O_2$

Charles Madic, Thiais, and Jacques de Sanoit, Chevilly-Larue, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 12, 1988, Ser. No. 231,500
Claims priority, application France, Aug. 14, 1987, 87 11600
Int. Cl.[4] C01G *56/00, 43/025;* C25C *1/22;* G21C *3/62*
U.S. Cl. 423—251 12 Claims

1. Ammonium plutonate uranate of formula:

$$[(U,Pu)O_3]_2\,[NH_3]_x\,[H_2O]_y$$

in which x and y have a value from 0 to 5 with $x+y=5$.

2. Process for the preparation of ammonium plutonate uranate, characterized in that it comprises neutralizing by ammonia an aqueous solution of a uranium VI salt and a plutonium VI salt for precipitating the uranium and plutonium in the form of an ammonium plutonate uranate coprecipitate and for separating the coprecipitate from the solution.

4,839,150

PRODUCTION OF SILICON CARBIDE

Roy T. Coyle, and Phillman N. Ho, both Yorba Linda, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed May 15, 1987, Ser. No. 50,157
Int. Cl.[4] G01B *31/36*
U.S. Cl. 423—345 33 Claims

1. A method for producing silicon carbide comprising the steps of:

(a) dispersing silica particles in a residual oil;

(b) heating the silica-containing oil in a substantially nonoxidizing atmosphere at temperatures which carbonize the oil;

(c) heating the carbonized oil in a substantially nonoxidizing atmosphere at temperatures which induce a reaction between silica and carbon to form silicon carbide; and

(d) recovering a silicon carbide-containing product.

4,839,148

METHOD OF REMOVING SO_x AND NO_x FROM EFFLUENT GAS

Günter Ritter, Brühl; Peter Asmuth, Neuss, and Ludwig Raible, Bedburg, all of Fed. Rep. of Germany, assignors to Rheinische Braunkohlenwerke A.G., Cologne, Fed. Rep. of Germany

Filed Nov. 13, 1987, Ser. No. 120,267
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1986, 3639112
Int. Cl.[4] B01J *8/00;* C01B *17/00*
U.S. Cl. 423—239 7 Claims

1. A method of removing SO_x and NO_x from effluent gas comprising the steps of:

(a) passing the effluent gas through a main desulfurisation stage in order to remove a substantial portion of SO_x therefrom;

(b) passing the gas through a post desulfurisation stage which is in the form of a first coke bed in order to remove residual SO_x;

(c) feeding ammonia to the desulfurised gas;

(d) passing the gas through a selective catalytic reduction catalyst bed in order to reduce NO_x;

(e) recycling the coke previously used in the post desulfurisation stage to a second coke bed;

(f) passing the gas through the second coke bed in order to remove unreacted ammonia from the gas; and

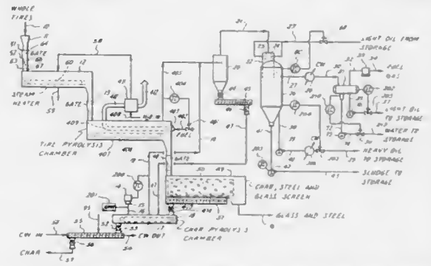
(g) recycling the loaded coke from the second coke bed to a boiler which produces effluent gas to be further processed.

4,839,151

RECOVERY PROCESS

Fred Apffel, 14607 Quail Creek Ct., Houston, Tex. 77070

Continuation-in-part of Ser. No. 742,724, Jun. 7, 1985, Pat. No. 4,647,443, which is a continuation-in-part of Ser. No. 660,420, Oct. 12, 1984, abandoned. This application Feb. 27, 1987, Ser. No. 19,638
The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.
Int. Cl.[4] C01B *31/02;* C09C *1/48*
U.S. Cl. 423—449 31 Claims



1. A process for manufacturing char and hydrocarbons from discarded used tires, comprising:

introducing the substantially whole tries into a reactor;

pyrolyzing the substantially whole tires in a reaction cham-

ber continuously at a temperature and pressure and for a reaction time sufficient to cause the tires to dissociate into a vapor and a solid phase;

said pyrolyzing step including directly heating the tires with a radient heat source at temperatures of 1000° to 3000° F.; producing char from the solid phase; and

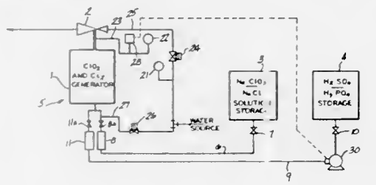
processing said vapor phase to produce hydrocarbons.

4,839,152

PROCESS FOR PRODUCING AN AQUEOUS SOLUTION CONTAINING CHLORINE DIOXIDE AND CHLORINE

Philip A. Vella, Lenexa, Kans., and Manfred G. Noack, Northford, Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Mar. 25, 1988, Ser. No. 173,476
Int. Cl.[4] C01B *11/02*
U.S. Cl. 423—478 **18 Claims**



1. A process for the production of an aqueous solution containing chlorine dioxide and chlorine, which comprises:

(a) feeding to a reaction zone a first reactant stream comprising an aqueous solution containing an alkali metal chlorate and an alkali metal chloride;

(b) feeding to said reaction zone a second reaction stream comprising an acid admixture of phosphoric acid and sulfuric acid, wherein the weight ratio of said phosphoric acid to said sulfuric acid, as expressed as H_3PO_4:H_2SO_4, is from about 1:16 to about 1:3;

(c) mixing said first and second reactant streams in said reaction zone; said streams being fed into said reaction zone at rates sufficient to form a reaction product stream comprising an aqueous solution of chlorine dioxide and chlorine in said reaction zone; and

(d) withdrawing the resulting aqueous reaction product stream from said reaction zone.

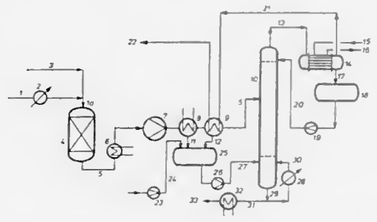
4,839,153

PROCESS FOR PURIFICATION OF HCL FROM PYROLYSIS OF EDC

Ludwig Schmidhammer, Haiming; Gerhard Dummer, Burgkirchen; Peter Hirschmann, Burghausen; Rudolf Strasser, Burghausen, and Franz Haunberger, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 813,624, Dec. 26, 1985, abandoned. This application Feb. 3, 1988, Ser. No. 151,817
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1985, 3508371
Int. Cl.[4] B01D *53/36*; C01E *7/07*
U.S. Cl. 423—488 **5 Claims**

1. In a process for the purification of hydrogen chloride from the pyrolysis of 1,2-dichloroethane, the improvement consisting essentially of (a) hydrogenation of the said contaminated hydrogen chloride in a reactor at a pressure of 5 to 20 bar and a temperature between 10° to 170° C. in the presence of a molar excess of hydrogen of 5:1 to 30:1 based on ethylene present on a catalyst with an aluminum and/or silicon oxide carrier containing 0.05 to 0.2 % by weight of palladium with a specific BET surface of 50 to 400 m^2/g, the gas mixture flow rate through the adiabatically operated reactor being 0.1 to 0.5 $msec^{-1}$ with a contact time of 3 to 10 seconds calculated with regard to the reactor cross-section and reactor no-load volume under operating conditions, respectively and (b) rectifying the resulting reaction mixture at a pressure of 7 to 15 bar in a column to partially condense hydrogen chloride at the head of the column at −20° to −40° C. and returning it as reflux to the column and maintaining the sump temperature of the column



at 50° to 80° C. by vinyl chloride addition or appropriate drain from the column sump so that the hydrogen chloride has (c) a maximum content of the whole of unsaturated hydrocarbons of 5 ppm by volume and a maximum content of the whole of saturated, and unsaturated chlorohydrocarbons of 5 ppm by volume.

4,839,154

PROCESS FOR CONVERTING SULFIDE ION TO INNOCUOUS, SOLUBILE SULFUR SPECIES

Joe D. Allison; Sally A. Thomas, both of Ponca City, and Kang Yang, deceased, late of Ponca City, all of Okla. (by Kumsu Yang, executrix), assignors to Conoco Inc., Ponca City, Okla.

Continuation of Ser. No. 947,442, Dec. 29, 1986, abandoned.
This application May 31, 1988, Ser. No. 199,721
Int. Cl.[4] C01B *17/96*
U.S. Cl. 423—544 **34 Claims**

1. A process for converting sulfide ion present in water which is produced is an oil field, to innocuous water soluble sulfur species, said process consisting essentially of:

admixing an effective amount of a surface active agent with said water to reduce the surface tension between said sulfide ion and said water thereby inhibiting formation of elemental sulfur and facilitating said conversion; and

oxidizing said sulfide ion to said water soluble sulfur species.

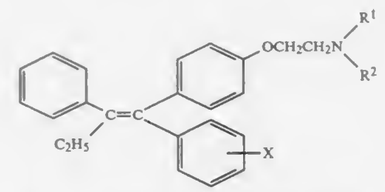
4,839,155

IODOTAMOXIFEN DERIVATIVES AND USE FOR ESTROGEN RECEPTOR-POSITIVE BREAST CANCER DETECTION AND THERAPY

Raymond McCague, Reigate, England, assignor to National Research Development Corporation, United Kingdom

Filed Sep. 9, 1987, Ser. No. 94,507
Claims priority, application United Kingdom, Sep. 11, 1986, 8621908; May 19, 1987, 8711790
Int. Cl.[4] A61K *49/02*; C07D *207/04*; C07C *93/06*
U.S. Cl. 424—1.1 **10 Claims**

1. 3- and 4-iodotamoxifen derivatives which are compounds of formula (3)



(3)

wherein X represents a 3- or 4- iodo substituent and R^1 and R^2, which may be the same or different, represent C_{1-3} alkyl groups or R^1 represents a hydrogen atom and R^2 a C_{1-3} alkyl group or R^1 and R^2 together with the nitrogen atom to which they are attached represent a saturated heterocyclic group and their pharmaceutically acceptable acid addition salts.

4,839,156

STABLE HYDROGEN PEROXIDE DENTAL GEL

Shirley M. Ng, Bridgewater, and Susan Wieckowski, Iselin, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 17, 1987, Ser. No. 40,439
Int. Cl.[4] A61K *7/20, 33/40*
U.S. Cl. 424—53 **15 Claims**

1. A rigid, clear, homogeneous stable aqueous hydrogen peroxide dental gel consisting essentially of about 1.5–3.5% by weight hydrogen peroxide as the sole chemically active agent, about 18–25% by weight of a solid flake or powder polyoxyethylene-polyoxypropylene block copolymer gelling agent, about 15–40% by weight of a polyethylene glycol humectant, a nonionic surfactant, and a flavor, said gel having an acid pH of about 4.5 to 6.

4,839,157

STABLE HYDROGEN PEROXIDE DENTAL GEL CONTAINING FUMED SILICAS

Shirley Mei-King Ng, Bridgewater, and Denise-Marie DiTomasso, Iselin, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 40,438, Apr. 17, 1988, Pat. No. 4,788,052.
This application Sep. 12, 1988, Ser. No. 243,342
Int. Cl.[4] A61K *7/20, 33/40*
U.S. Cl. 424—53 **12 Claims**

1. A stable aqueous hydrogen peroxide dental gel comprisisng about 1.5–3.5% by weight hydrogen peroxide as the sole chemically active agent, a combination of hydrophilic and hydrophobic fumed silica gelling agents, about 20 to 40% by weight of a polyethylene glycol humectant, a nonionic surfactant, sweetening agent, sodium benzoate and a flavor, said gel having an acid pH of about 3–6.

4,839,158

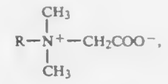
PROCESS AND COMPOSITION FOR ORAL HYGIENE

Edwin B. Michaels, Milford, Conn., assignor to E. B. Michaels Research Associates Inc., Milford, Conn.

Continuation of Ser. No. 833,333, Feb. 25, 1986, abandoned.
This application Jul. 31, 1987, Ser. No. 81,580
Int. Cl.[4] A61K *7/22*
U.S. Cl. 424—54 **20 Claims**

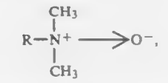
1. A process for enhancing oral hygiene by reducing oral microflora and for inhibiting the formation of dental plaque which comprises the step of: applying to the oral cavity a composition comprising:

(a) 0.1 to 40 parts, by weight, of a higher alkyl-N-betaine, having the structure



where R is a higher alkyl group of from 10 to 18 carbon atoms and

(b) 0.1 to 40 parts, by weight, of a higher alkyl-N,N-dimethylamine, having the structure



wherein R is a higher alkyl group of from 10 to 18 carbon atoms, and

(c) acid in an amount sufficient to adjust the pH of the composition from 4.2 to 7.5 when measured in an aqueous solution of components (a) and (b) in a orally acceptable carrier.

4,839,159

TOPICAL L-CARNITINE COMPOSITION

Susan C. Winter, Fresno, and Stefan Szabo-Aczel, Clovis, both of Calif., assignors to Topicarn, Inc., Fresno, Calif.

Filed Feb. 8, 1988, Ser. No. 153,243
Int. Cl.[4] A61K *7/40, 7/42, 7/44*
U.S. Cl. 424—59 **13 Claims**

1. A topical composition for improving or preventing deleterious skin conditions comprising an effective amount of L-carnitine in a pharmacologically acceptable vehicle for topical application selected from the group consisting of ointments, lotions, gels, suspensions, emulsions and creams.

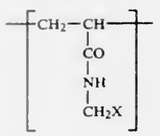
4,839,160

POLYMERS CAPABLE OF ABSORBING ULTRAVIOLET RADIATION, THEIR PREPARATION AND THEIR USE IN COSMETIC COMPOSITIONS

Serge Forestier, Claye Souilly, and Claude Mahieu, Paris, both of France, assignors to L'Oreal, Paris, France

Filed Mar. 25, 1987, Ser. No. 30,071
Claims priority, application France, Mar. 28, 1986, 86 04544
Int. Cl.[4] A61K *7/40, 7/42, 7/44*
U.S. Cl. 424—59 **9 Claims**

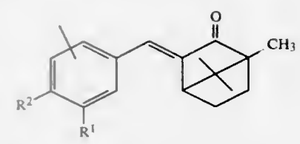
1. A cosmetic composition for protecting the skin against ultraviolet radiations having wavelengths ranging from 315–340 nm comprising in a cosmetically acceptable vehicle suitable for topical application to the skin an ultraviolet-absorbing polymer having units of formula I



(I)

wherein

X is a group derived from the benzyl dene-bornanone of formula II:



(II)

wherein

R^1 represents hydrogen or C_1-C_{12} alkoxy and R^2 represents C_4-C_{12} alkoxy, said polymer being present in an amount ranging from 0.2 to 20 weight percent based on the total weight of said composition.

4,839,161

COSMETIC PRODUCTS

Paul A. Bowser, Dorset House, Latchford Road, Gayton, Wirral L60 3RW, and Ingrid C. Sturmey, 141 Darnford Ave., Bronbrough, Wirral L62-6DX, both of England

Filed Aug. 25, 1987, Ser. No. 89,210

Claims priority, application United Kingdom, Aug. 29, 1986, 8620896

Int. Cl.[4] A61K *7/40, 7/42, 7/44*

U.S. Cl. 424—59 4 Claims

1. A method of alleviating the symptoms of sun-induced desquamation comprising topically applying to involved areas of the body an effective amount of composition comprising as active ingredients:

(i) a therapeutically effective amount of from 0.1 20% by weight of a desquamation inhibitor selected from group consisting of 2-hydroxyalkanoic acids and esters thereof, having the structure:

$CH_3(CH_2)_nCHOH\ COOR$

where

R is —H, $C_{2\text{-}10}$ alkyl or a monoglyceride, diglyceride or triglyceride residue, and

n is 0, or an integer of from 1 to 27, and mixtures thereof; and

(ii) a therapeutically effective amount of from 0.01 to 10% by weight of a sunscreen active ingredient or mixtures thereof, in a therapeutically acceptable vehicle for topical application.

4,839,162

COSMETIC

Takashi Komori; Masahiko Asahi, both of Tokyo, and Toshiyuki Suzuki, Ichikawa, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Dec. 18, 1987, Ser. No. 135,038

Claims priority, application Japan, Jan. 28, 1987, 62-18042

Int. Cl.[4] A61K *7/021*

U.S. Cl. 424—63 3 Claims

1. A moisturizing cosmetic comprising

(A) 1-50% by weight of a diglyceride which is liquid at room temperaure and has a melting point of not more than 20° C., and

(B) 2-90% by weight of a compound selected from the group consisting of polyethylene glycol, polypropylene glycol, dipropylene glycol, propylene glycol, butylene glycol, and hydroxypropyletherizedglycolipid ester.

4,839,163

FACIAL COSMETIC LIQUID CONTAINING CRYSTALLINE SILICA AND COLORS

Francis Busch, Jr., Southbury, Conn., assignor to Laura Lupton Inc., Rowayton, Conn.

Filed Sep. 9, 1986, Ser. No. 905,631

The portion of the term of this patent subsequent to Feb. 14, 2006, has been disclaimed.

Int. Cl.[4] A61K *7/021*

U.S. Cl. 424—63 7 Claims

1. A facial cosmetic liquid which when applied to the face of a user completely hides facial wrinkles, lines and pores without caking or appearing chalky, said liquid comprising:

a coloring phase containing crystalline mineral silica and coloring material, said silica having a plate-like structure and an average particle size falling within the range of 7.3 to 12.9 microns, the silica content falling within the range of 1-10 parts by weight of liquid;

a major water phase containing water, an emulsifying component and a thickening component; and

a minor oil phase containing emollient oils and emulsifying component.

4,839,164

TREHALOSE CONTAINING COSMETIC COMPOSITION AND METHOD OF USING IT

Walter P. Smith, Stamford, Conn., assignor to Estee Lauder, Inc., New York, N.Y.

Filed Feb. 24, 1987, Ser. No. 17,781

Int. Cl.[4] A61K *7/027, 7/06, 7/40, 7/48*

U.S. Cl. 424—64 20 Claims

1. A cosmetic composition comprising

(a) at least one ingredient selected from the group consisting of retinyl palmitate, pantethine, a cosmetically acceptable pantethine ester, superoxide dismutase, and epidermal growth factor;

(b) an amount of trehalose effective to enhance the penetration of said at least one ingredient into the skin; and

(c) a cosmetically acceptable vehicle.

4,839,165

COSMETIC AGENTS FOR HAIR

Udo Hoppe, Hamburg, and Walter Engel, Pinneberg, both of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Jan. 20, 1987, Ser. No. 5,518

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1986, 3603595

Int. Cl.[4] A61K *7/06, 7/08, 7/11, 7/13*

U.S. Cl. 424—70 8 Claims

1. In a water-based cosmetic agent for hair selected from the group consisting of agents for cleansing and caring for the hair, agents for improving and maintaining hair style and agents for improving hair color, including one or more customary constituents selected from the group consisting of detergents, emulsifiers, viscosity regulators, water-repellant substances, stabilizers, pearl luster agents, antioxidants, UV absorbers, preservatives, colorants and perfumes, the improvement comprising the water-based cosmetic agent additionally containing sericin and pelargonic acid as active ingredients, said active ingredients forming a complex.

4,839,166

COSMESTIC COMPOSITIONS CONTAINING A CATIONIC POLYMER AND AN ANIONIC POLYMER AS THICKENING AGENT

Jean F. Grollier, Paris; Claude Dubief, Le Chesnay, and Jean Mondet, Drancy, all of France, assignors to L'Oreal, Paris, France

Filed May 15, 1987, Ser. No. 49,785

Claims priority, application Luxembourg, May 16, 1986, 86 429

Int. Cl.[4] A61K *7/11, 7/48, 7/06;* B01J *13/00*

U.S. Cl. 424—71 15 Claims

1. Thickening agent resulting from the ionic interaction of a cationic polymer consisting of a copolymer of cellulose or of a cellulose derivative which is grafted with a quaternary ammonium salt of a water-soluble monomer, said cationic polymer having an absolute capillary viscosity at 1% in water at 30° C. which is less than 0.025 Pa s, and of a carboxylic anionic polymer having a molecular weight of 500 to 3,000,000, said carboxylic anionic polymer having an absolute capillary viscosity at a concentration of 5% in dimethylformamide or methanol at 30° C. which is less than or equal to 0.030 Pa s, said thickening agent having an Epprecht-Drage viscosity, module 3, higher than or equal to 0.45 Pa s in solution at a concentration of 1% in water at 21° C., and the weight ratio of said cationic polymer to said carboxylic anionic polymer in said thickening agent being in the range of 1/5 to 5/1.

4,839,167

EMULSION TYPE HAIR COSMETIC

Hiromi Yamamoto, Sakura, and Hideko Ishido, Tokyo, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Aug. 28, 1987, Ser. No. 90,343

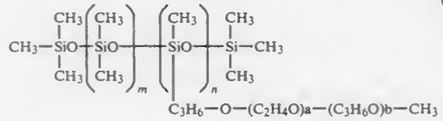
Claims priority, application Japan, Sep. 18, 1986, 61-220045

Int. Cl.[4] A61K *7/11*

U.S. Cl. 424—71 1 Claim

1. An emulsion type hair cosmetic consisting essentially of:

(A) 0.1 to 5% by weight of a dimethylpolysiloxane polyoxyalkylene copolymer having a cloud point of 20° to 45° C. and represented by the following formula (I):



(I)

in which a represents a value of from 10 to 25, b represents a value of from 25 to 35, m represents a value of from 60 to 80 and n represents a value of from 3 to 8,

(B) 0.02 to 2.5% by weight of a non-ionic surface active agent having an HLB value of not less than 10,

(C) 0.01 to 0.5% by weight of an ionic surface active agent,

(D) 0.05 to 10% by weight of silicone oil,

(E) 0.1 to 10% by weight of a polymer for fixing hair, which is soluble in water or an ethanol/water mixture of 50/50 weight ratio,

(F) 2 to 40% by weight of ethanol, and

(G) 30 to 97% by weight of water.

4,839,168

HAIR COSMETICS

Yoshiaki Abe, Tokyo, and Hidetoshi Iwabuchi, Yachiyo, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 583,698, Feb. 27, 1984, abandoned. This application Oct. 2, 1986, Ser. No. 914,510

Claims priority, application Japan, Feb. 25, 1983, 58-30445; Feb. 25, 1983, 58-30446

Int. Cl.[4] A61K *7/06, 7/00, 7/09*

U.S. Cl. 424—74 8 Claims

1. A hair cosmetic composition consisting essentially of:

(A) 0.001 to 10.0 wt. % of an extract obtained by extracting a plant selected from the group consisting of bark of birch and entire grass of rosemary with water or an aqueous solution containing an effective amount of one or more polar solvents selected from the group consisting of methanol, ethanol, propyleneglycol, 1,3-butyleneglycol and glycerine; and

(B) 0.1 to 5.0 wt. % of a polypeptide compound selected from the group consisting of hydrolyzates of silk, hydrolyzates of keratin, oxidative decomposition products of keratin and thiol group-modified compounds of reductive decomposition products of keratin, and wherein said hair cosmetic composition is selected from the group consisting of pre-shampoo treatment agents, shampoos, hair rinses, hair conditioners, hair setting lotions, and hair sprays.

4,839,169

SYNERGISTIC COMBINATION OF T-PA AND PROSTACYCLIN

Brendan J. R. Whittle, Beckenham, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Aug. 4, 1987, Ser. No. 81,242

Claims priority, application United Kingdom, Aug. 5, 1986, 8619098

Int. Cl.[4] A61K *37/547, 31/557*

U.S. Cl. 424—94.3 11 Claims

1. A method of removing a blood clot in a mammal in need thereof comprising the parenteral administration to said mammal of t-PA and prostacyclin or a pharmaceutically acceptable salt thereof, wherein said t-PA and prostacyclin or said pharmaceutically acceptable salt thereof are administered in amounts to provide a synergistic effect.

4,839,170

PROTEIN ABSORPTION ENHANCING AGENTS

Stanley Sarnoff, Bethesda, Md., and Burton E. Sobel, Webster Groves, Mo., assignors to Survival Technology, Inc., Bethesda, Md.

Continuation-in-part of Ser. No. 782,441, Oct. 1, 1985, Pat. No. 4,772,585. This application May 28, 1987, Ser. No. 54,898

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.[4] A61K *37/547*

U.S. Cl. 424—94.64 16 Claims

1. A method comprising intramuscularly administering t-PA to a mammal in need thereof and increasing the absorption of the t-PA in the blood comprising substantially at the same time intramuscularly administering (1) methylamine or a non-toxic salt thereof and (2) hydroxylamine or a non-toxic salt thereof, the hydroxylamine or non-toxic salt thereof being administered in an amount sufficient to increase the absorption of the t-PA and the methylamine or non-toxic salt thereof being administered in an amount sufficient to reduce the amount of hydroxylamine or non-toxic salt thereof required to give the increased absorption of t-PA.

14. A method comprising intramuscularly administering a clot selective protein thrombolytic agent to a mammal in need thereof and increasing the absorption of the clot selective protein thrombolytic agent in the blood comprising substantially at the same time intramuscularly administering (1) methylamine or a non-toxic salt thereof and (2) hydroxylamine or a non-toxic salt thereof, the hydroxylamine or non-toxic salt thereof being administered in an amount sufficient to increase the absorption of the clot selective protein thrombolytic agent and the methylamine or non-toxic salt thereof being administered in an amount sufficient to reduce the amount of hydroxylamine or non-toxic salt thereof required to give the increased absorption of the protein thrombolytic agent.

4,839,171
COMPOSITION FOR TREATING IMPAIRED LACTATION
Martin J. Nelson, Waconia, Minn., assignor to Techmix, Inc., Edina, Minn.
Continuation of Ser. No. 676,555, Nov. 30, 1984, abandoned. This application Feb. 27, 1987, Ser. No. 20,085
Int. Cl.[4] A61K 37/02, 35/78; A23K 1/18
U.S. Cl. 424—101 11 Claims

1. An orally administered composition as a nutritional aid for the treatment of impaired lactation and for obtaining optimum milk production in swine comprising: an amount of ground psyllium seed husks; an amount of blood albumin meal; and electrolytes, with the composition stimulating evacuation of the digestive tract without drawing fluids from outside the digestive tract wherein the administration thereof to said swine provides a daily intake of electrolytes in the range of 2.20 to 2.0 grams.

4,839,172
COMPOSITION OF ACCELERATING RECOVERY OF FUNCTION OF HEMATOPOIETIC ORGANS
Fukumi Morishige, Fukuoka, Japan, assignor to Nissan Chemical Industries, Ltd., Tokyo, Japan
Filed May 23, 1985, Ser. No. 737,048
Claims priority, application Japan, May 26, 1984, 59-106971
Int. Cl.[4] A61K 35/44
U.S. Cl. 424—105 15 Claims

1. A method for improving the hematopoietic function of bone marrow of a patient having a reduced hematopoietic function of bone marrow, which comprises orally administering to said patient a composition comprising milt extract from salmon, porgies, herrings, cods, sardines, swell fishes or bonitoes and at least one of vitamin C or a pharmaceutically acceptable salt thereof, said composition having a weight ratio of said at least one of vitamin C or a pharmaceutically acceptable salt thereof to said milt extract sufficient to inhibit an increased uric acid level in serum which occurs from administration of said milt extract.

4,839,173
MODIFIED CLAYS, PREPARATION THEREOF AND THERAPEUTICAL COMPOSITIONS CONTAINING THE SAME
Jean-Claude Plantefeve, Vernouillet, and Michel Rene, Paris, both of France, assignors to Societe de Conseils de Recherches et d'Applications Scientifiques, France
Continuation of Ser. No. 697,331, Feb. 1, 1985, abandoned, which is a continuation-in-part of Ser. No. 483,730, Apr. 11, 1983, abandoned. This application Apr. 10, 1987, Ser. No. 37,236
Claims priority, application United Kingdom, Apr. 29, 1982, 8212448
Int. Cl.[4] A61K 33/12
U.S. Cl. 424—683 7 Claims

1. A modified dioctahedral smectite clay mineral comprising a sheet-silicate clay with a plate separation of from 1.5 to 1.6 nm, with a neutralizing power of from 170 to 1200 mEq per 100 g, with a reduction of the plate separation to from 1.2 to 1.4 nm when heated to 490° C. said sheet-silicate clay having incorporated therein from about 0.05 to 0.5 parts by weight of magnesium hydroxide per part of clay, the incorporation being carried out at a sufficient temperature and for a sufficient period of time so that the characteristic X-ray spectrum of magnesium hydroxide is no longer present.

4,839,174
NOVEL TRANSDERMAL NICOTINE PATCH
Richard W. Baker, Palo Alto; Frank Kochinke, Mt. View, and Carl Huang, Palo Alto, all of Calif., assignors to Pharmetrix Corporation, Menlo Park, Calif.
Filed Oct. 5, 1987, Ser. No. 105,549
Int. Cl.[4] A61L 15/00; A61B 5/00
U.S. Cl. 424—447 7 Claims

1. A transdermal nicotine delivery device, comprising a laminate of:
(a) a matrix layer comprising between about 5% and 50% nicotine and between about 95% and 50% polyurethane, said matrix layer having a first and second face;
(b) an impermeable and opaque backing layer contacting said first face; and
(c) an amine-resistant bioadhesive layer contacting said second face.

4,839,175
LIPOSOMES WITH ENHANCED RETENTION ON MUCOSAL TISSUE
Luke S. S. Guo, Lafayette; Carl T. Redemann, Walnut Creek; Ramachandran Radhakrishnan, Palo Alto, and Annie Yau-Young, Los Altos, all of Calif., assignors to Liposome Technology, Inc., Menlo Park, Calif.
Filed Jul. 28, 1986, Ser. No. 890,315
The portion of the term of this patent subsequent to Feb. 14, 2006, has been disclaimed.
Int. Cl.[4] A61K 37/22, 9/66; B01J 13/02
U.S. Cl. 424—450 10 Claims

1. A method for enhancing the binding of liposomes to a mucosal surface which comprises
formulating the liposomes to contain and outer lipid layer containing between about 40–80 mole percent of neutral vesicle-forming lipids and between about 20–60 mole percent of positively charged vesicle-forming lipid component(s) selected from the group consisting of (a) dialiphatic lipid derivatives having (i) 2 aliphatic chains carried on a 3–4 carbon backbone, (ii) a polar atom attached to the backbone at a carbon atom which does not carry an aliphatic chain, (iii) an amine linked to the polar atom through a spacer at least 3 atoms long, and (iv) a net positive charge and (b) an amine-derivatized cholesterol having an amine group linked to the 6-membered cholesterol A ring by a carbon-containing spacer arm at least three atoms long, and
including in the liposomes, a total amount of cholesterol, in the form of free cholesterol or said amine-linked cholesterol derivative, of between about 20–50 mole percent.

4,839,176
THERAPEUTIC AGENTS
Mahendra G. Pankhania, Nottingham, England, and Michael C. Meyer, Gwent, Wales, assignors to Boots Company PLC, Nottingham, England
Filed Dec. 8, 1987, Ser. No. 130,061
Claims priority, application United Kingdom, Dec. 10, 1986, 8629567
Int. Cl.[4] A61K 9/20, 31/485
U.S. Cl. 424—465 12 Claims

1. A solid storage stable composition consisting essentially of ibuprofen or a pharmaceutically acceptable salt thereof in an amount of 10 to 90% by weight of the composition, codeine or a pharmaceutically acceptable salt thereof in an amount of 10 to 15% by weight of the composition and calcium caboxymethylcellulose in an amount of 0.5 to 10 parts by weight per part by weight codeine or the salt thereof, said amount of calcium carboxymethylcellulose being sufficient to prevent discoloration of the composition.

4,839,177
SYSTEM FOR THE CONTROLLED-RATE RELEASE OF ACTIVE SUBSTANCES
Paolo Colombo; Aldo La Manna, both of Pavia, and Ubaldo Conte, Busto Arsizio, all of Italy, assignors to Jagotec AG, Hergiswill, Switzerland
Filed Dec. 9, 1986, Ser. No. 939,810
Claims priority, application Italy, Dec. 20, 1985, 23321 A/85
Int. Cl.[4] A61K 9/32
U.S. Cl. 424—482 25 Claims

1. A system for the controlled-rate release of active substances, consisting of:
(a) a deposit-core comprising effective amounts of the active substances and having defined geometric form,
(b) a support-platform applied to said deposit-core wherein said deposit-core contains, mixed with the active substance, at least one member selected from the group consisting of (a) 5–80% by weight of the total weight of the deposit-core of a polymeric material having a high degree of swelling on contact with water or aqueous liquids and 90–10% by weight of the total weight of the deposit core of a gellable polymeric material, and (b) a single polymeric material having both swelling and gelling properties, and
other adjuvants able to provide the mixture with suitable characteristics for compression and for intake of water,
and wherein said support-platform consists of a polymeric material insoluble in aqueous liquids and partially coating said deposit-core.

4,839,178
METHOD FOR PRODUCING A PRE-PROOFED, FROZEN AND UNBAKED DOUGH HAVING AN IMPROVED SHELF LIFE
Bernard Seneau, Woodbridge, Conn., assignor to General Foods Corporation, White Plains, N.Y.
Filed Jun. 12, 1987, Ser. No. 62,093
Int. Cl.[4] A21D 10/02; A23C 21/06
U.S. Cl. 426—19 7 Claims

1. A method of improving the shelf-life of a pre-proofed, frozen, laminated dough comprising the steps of:
(a) forming a dough comprised of flour, water and leavening agent, the flour having a protein content of from about 11.5 to 12.5%;
(b) adding a mixture of skim milk and acid whey solids and about an equal amount by weight of water to said dough, the level of added skim milk and acid whey solids being about 2.2% to 5% by weight of the flour contained in the dough and the acid whey having a pH of from about 4.4 to 4.6; thereafter;
(c) adding fat to the dough; and thereafter;
(d) laminating, proofing and freezing the dough.

4,839,179
PREPARATION OF A COMPOSITION BASED ON A FINELY DIVIDED ACTIVE PRINCIPLE OF LOW WATER SOLUBILITY
Pierre Hirsbrunner, Les Monts-de-Corsier, Switzerland, assignor to Nestec S. A., Vevey, Switzerland
Continuation of Ser. No. 832,167, Feb. 20, 1986, abandoned. This application Jun. 10, 1988, Ser. No. 206,910
Claims priority, application Switzerland, Mar. 20, 1985, 1235/85
Int. Cl.[4] A23C 9/154, 9/18, 9/156
U.S. Cl. 426—98 23 Claims

1. A process for treating particles of a particulate composition, wherein the particles of the composition are substantially insoluble in water but are dispersible in water and range in size from about 0.2 microns to about 40 microns, for improving dispersion of the particles in water for obtaining a suspension of the particles in water comprising mixing the particles of the particulate composition with non-fat milk solids powder in an amount for obtaining a concentration of the particulate composition in an amount of from 0.4% to 10% by weight, and moving the mixture at a temperature above 40° C., but at a temperature at which the non-fat milk solids do not burn, for a time sufficient for at least partially encapsulating the particles of the particulate composition in the mixture with the non-fat milk solids powder.

4,839,180
PACKAGE FOR STORING, HEATING AND DISPENSING A MEAL
Antony R. Standerwick, 16 Albion Road, Selsey, Chichester W. Sussex, Great Britain P020 0DH, and Antony J. Standerwick, Beggar's Roost, High St., Selsey, Chichester, W. Sussex, Great Britain P020 0RD
PCT No. PCT/GB86/00390, § 371 Date Apr. 29, 1987, § 102(e) Date Apr. 29, 1987, PCT Pub. No. WO87/00150, PCT Pub. Date Jan. 15, 1987
PCT Filed Jul. 4, 1986, Ser. No. 26,719
Claims priority, application United Kingdom, Jul. 9, 1985, 8517383; Mar. 7, 1986, 8605645
Int. Cl.[4] B65D 33/36, 65/30
U.S. Cl. 426—115 16 Claims

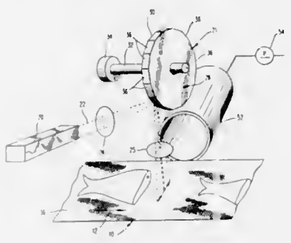
1. A package for storing, heating and dispensing a prepared meal comprising
an enclosure made of a flexible material capable of retaining food at a reduced temperature and also capable of withstanding food-heating techniques and temperatures without significant degradation, said enclosure including
a base sheet including an unperforated peripheral portion and a generally central portion with means defining a plurality of generally radial cut lines forming a plurality of edge-to-edge tongues extending inwardly from said peripheral portion toward a central point to substantially close said central portion of said base sheet, and
a cover portion extending from said base sheet to complete said enclosure; and
a prepared meal arranged within said enclosure on said base sheet, said meal being storable in said enclosure at reduced temperature, heatable in said enclosure without significant modification of said enclosure and dispensable from said enclosure onto a serving dish said cut lines and tongues being configured such that after thawing or heating of said meal and upon lifting the enclosure upwards, the weight of said meal causes the radial cut lines to automatically form an opening sufficiently large to allow said meal to dispense itself from said enclosure with minimal disturbance to the meal such that said meal is sewed in substantially the same arrangement as said meal occupied while stored in said enclosure.

4,839,181

METHOD OF REMOVING OUTER PROTECTIVE LAYER FROM EDIBLE MATERIALS USING LASER ENERGY

Thomas A. MacMurray, Sewickley, Pa.; William T. McComis, Worthington, Ohio; Anthony A. Boiarski, Columbus, Ohio; James R. Proffitt, Worthington, Ohio, and Glen R. Green, Ontario, Oreg., assignors to H. J. Heinz Company, Pittsburgh, Pa.

Filed Nov. 30, 1987, Ser. No. 126,904
Int. Cl.[4] A23L *1/212*
U.S. Cl. 426—237 21 Claims



1. A process of removing a thin naturally-occurring outer protective layer from an edible material comprising the steps of:

moving the edible material through a skin removal zone in a first direction at a first predetermined speed; and

ablatively removing the thin naturally-occurring outer protective layer from the edible material as the edible material moves through the skin removal zone using a focused continuous wave laser beam.

4,839,182

PROCESS FOR THE PRODUCTION OF FRIED POTATO STRIPS

Shinichi Makishima, and Keizo Mochizuki, both of Kawasaki, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Feb. 17, 1988, Ser. No. 156,680
Claims priority, application Japan, Nov. 24, 1987, 62-293938
Int. Cl.[4] A23L *1/217*
U.S. Cl. 426—242 3 Claims

1. A process for the production of strips of french-fried potatoes, which the comprises steps of cutting a potato into strips of raw potato, blanching the strips, subjecting the blanched strips to par-frying in an edible oil at a temperature of from 105° to 230° C. for 11 to 0.25 minutes, freezing immediately the resulting par-fried strips, and subjecting the frozen strips to a finish frying in an edible oil at a temperature of from 100° to 230° C. for 15 to 2 minutes, while simultaneously subjecting the strips being fried to microwave energy, to dehydrate them so as to bring their moisture content to a range of 10 to 0.1% by weight.

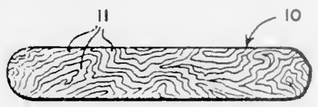
4,839,183

METHOD OF PRODUCING A SLICED MEAT PRODUCT

Paul M. Perrine, 14 Paku Drive, Tairua, New Zealand

Filed Jan. 15, 1987, Ser. No. 3,565
Int. Cl.[4] A23P *1/08, 1/10;* A23L *1/04*
U.S. Cl. 426—274 13 Claims

1. A method of producing a meat product, comprising the steps of mixing a temperature sensitive binder when such binder is in warm, substantially liquid form with a plurality of slices of meat; placing the meat-binder mixture into forming means; and cooling the meat-binder mixture in the forming means to solidify the mixture and form a solid, formed meat product whereby when in cooled condition, the individual slices are bound together in a solid, substantially inseparable meat product and upon subsequent heating of the solid meat



product, the binder liquifies producing individual slices of meat.

4,839,184

STABLE SWEETNER DELIVERY SYSTEM FOR USE WITH CINNAMON FLAVORS

Subraman R. Cherukuri, Towaco, N.J.; Gul Mansukhani, Staten Island, N.Y., and Kapakkamannil C. Jacob, Hackettstown, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 945,745, Dec. 23, 1986. This application Dec. 31, 1987, Ser. No. 140,005
The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.
Int. Cl.[4] H23G *3/30*
U.S. Cl. 426—307 6 Claims

1. A stable delivery system for effecting a controlled release of active ingredients, said delivery system comprising:

(A) a hydrogenated or partially hydrogenated fat selected from the group consisting of soybean oil, palm oil, palm kernel oil, peanut oil, rapeseed oil, rice bran oil, cottonseed oil, sunflower oil, safflower oil and mixtures thereof;

(B) polyethylene wax having a melting point of about 106° C. or greater;

(C) glyceride in the amount of about 0.5% to about 20% by weight of the delivery system; and

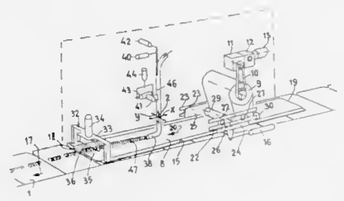
(D) an active ingredient wherein said active ingredient is selected from the group consisting of sweeteners, flavors, and mixtures thereof; wherein said active ingredient is encapsulated by the admixture of components A through C.

4,839,185

METHOD AND APPARATUS FOR DEPOSITING A CONTINUOUSLY EXTRUDED FORMATION UPON A CONTINUOUSLY DRIVEN CONVEYOR

Klaus Gram, Vojens, Denmark, assignor to Gram, Brodrene A/S, Vojens, Denmark

Filed May 16, 1988, Ser. No. 194,177
Claims priority, application Denmark, May 26, 1987, 2694/87
Int. Cl.[4] A23G *9/14;* A23P *1/00*
U.S. Cl. 426—512 8 Claims



1. Method for depositing a continuously extruded string of an edible product upon a continuously driven conveyor supported by a stand, said conveyor serving to feed a plant for treating said product, said method comprising the following steps:

(a) extruding the string upon the upper run of an endless depositing band,

(b) driving the upper run of the depositing band by means of a driving device with a constant speed which is slower than the speed of the conveyor,

(c) driving the depositing band around an end reversing location arranged above the conveyor,

(d) moving the end reversing location with respect to the driving device for the depositing band and in the same direction as the direction of movement of the conveyor and with a speed which at least is equal to the speed, with which the depositing band is driven by means of its driving device,

(e) reversing the movement of the end reversing location with respect to the driving device of the depositing band and depositing a portion of the string upon the conveyor,

(f) stopping the movement of the end reversing location with respect to the driving device for the depositing band and severing the string at the end reversing location, and

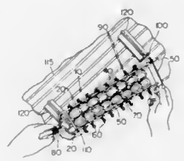
(g) moving the end reversing location with respect to the driving device of the depositing band in accordance with step (d) and repeating the steps (e), (f), (g) and (d) in succession.

4,839,186

APPARATUS FOR AND METHOD OF COOKING PIECES OF FOOD

Peter J. Boyle, 8033 Sunset Blvd., Suite 32, Los Angeles, Calif. 90046

Filed Dec. 23, 1987, Ser. No. 137,150
Int. Cl.[4] A23C *3/00;* A47J *37/04*
U.S. Cl. 426—523 12 Claims



12. A method of cooking, serving, and eating pieces of food comprising the steps of:

(a) piercing the pieces of food with a pin having at least two piercing prongs;

(b) movably supporting the pin on a skewer having at least two skewer members by orienting the prongs transverse to the skewer members and sliding the skewer members between the prongs;

(c) retaining the pin on the skewer members;

(d) positioning the skewer members spaced from and in superposition with a cooking surface;

(e) removing the skewer members from the cooking surface when a desired degree of doneness is achieved;

(f) removing the pins from the skewer members;

(g) serving the pieces of food still on the pin and;

(h) eating the pieces of food using the pin as a utensil to hold and bring the food to the mouth.

4,839,187

ANTIOXIDANT COMPOSITIONS

Jimbin Mai, New Milford; Laura J. Chambers, New Preston, and Richard E. McDonald, Brookfield, all of Conn., assignors to Nestec SA, Vevey, Switzerland

Continuation of Ser. No. 620,754, Jun. 14, 1984, abandoned, which is a continuation-in-part of Ser. No. 561,678, Dec. 15, 1983, abandoned. This application Jun. 30, 1987, Ser. No. 65,616
Int. Cl.[4] A23B *4/14;* A23L *3/34*
U.S. Cl. 426—542 10 Claims

1. A composition comprising a food susceptible to lipid oxidation and a black tea extract containing 0.005% to 1.5% tea solids based upon the weight of the food, wherein the extract has been obtained by aqueous extraction of black tea at a temperature of from 130° C. to 210° C. and is selected from the group consisting of aqueous extracts, spent tea leaves, residues from the extraction of the black tea, and instant tea powder and combinations thereof.

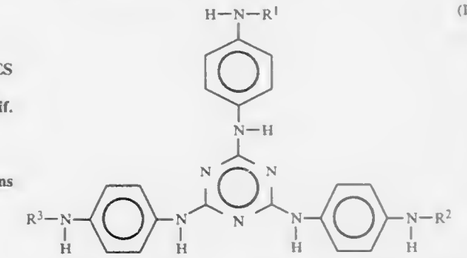
4,839,188

STABILIZED FAT COMPOSITIONS

Edward L. Wheeler, Watertown, and Robert J. Franko, Beacoo Falls, both of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Filed May 27, 1988, Ser. No. 199,989
Int. Cl.[4] A23D *5/04;* C07D *251/70*
U.S. Cl. 426—545 20 Claims

1. A stabilized fat composition comprising a fat having incorporated therein an antioxidatively effective amount of a compound of the general formula:



(I)

in which R^1, R^2 and R^3 are radicals independently selected form a C_{3-18} branched or linear alkyl, or a C_{3-12} cycloalkyl substituted with one or more C_{3-12} alkyl groups.

4,839,189

METHOD OF ENHANCING THE BITTERNESS OF BEER

Ian S. Forrest; James C. Seaton, both of Midlothian, and Michael Moir, Edinburgh, all of Scotland, assignors to Scottish & Newcastle Breweries p/c, Edinburgh, Scotland

Continuation of Ser. No. 721,927, Apr. 11, 1985, Pat. No. 4,717,580. This application Jan. 4, 1988, Ser. No. 147,732
Claims priority, application United Kingdom, Apr. 12, 1984, 8409498
Int. Cl.[4] C12C *3/00*
U.S. Cl. 426—600 8 Claims

1. A method of separating iso-alpha-acids and beta-acids in a mixture, said method consisting essentially of the steps of:

providing a mixture of iso-alpha-acids and beta-acids;

adjusting the pH of the mixture to a pH in the range between 7.5 and 9;

heating the mixture to a temperature below boiling so as to render the mixture fluid while avoiding humulinic acid formation;

allowing the heated fluid mixture to separate into a first liquid layer and a second liquid layer, said first liquid layer

being an aqueous layer containing the iso-alpha-acids, the second liquid layer containing the beta-acids; and withdrawing the liquid of one of said first and second liquid layers from the other of said liquid layers to separate said layers hence separately to recover the iso-alpha-acids in liquid form and the beta-acids in liquid form.

4,839,190

SPREADABLE PRODUCT HAVING ANHYDROUS MILK FAT COMPONENT

John E. Bumbalough, Shoreview, Minn., assignor to Wisconsin Milk Marketing Board, Inc., Madison, Wis.

Filed Apr. 24, 1987, Ser. No. 42,324
Int. Cl.⁴ A23D *3/00*
U.S. Cl. 426—603 **7 Claims**

1. A spreadable product having an anhydrous milk fat component consisting essentially of a stearine fraction obtained at approximately 29.5° C. and an olein fraction obtained at approximately 12.5° C. wherein the milk fat component includes 4 to 10 parts of the 12.5° C. olein fraction to 1 part of the 29.5° C. stearine fraction to 1 part of the 29.5° C. stearine fraction and the product being free standing without change at room temperature and being spreadable at a temperature as low as approximately 3° C.

4,839,191

FAT FRACTIONS AND MIXTURES THEREOF

Francis E. Luddy, Hatboro, Pa., and Sergio Longhi, Parma, Italy, assignors to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 812,274, Dec. 23, 1985, abandoned, which is a division of Ser. No. 517,508, Jul. 26, 1983, Pat. No. 4,601,857. This application Aug. 5, 1987, Ser. No. 83,861
The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.
Int. Cl.⁴ A23D *5/00*
U.S. Cl. 426—607 **6 Claims**

1. A confectionery fat comprising a mixture of from 5% to 25% of a high melting fat fraction and from 95% to 75% of a semi-solid fat fraction, wherein the high melting fat fraction is produced by a process comprising:

(a) dissolving a fat in a binary azeotropic solvent mixture wherein the volume of solvent is from 1.5 ml to 8.0 ml per gram of fat;

(b) cooling the solution from step (a) to 16° C. to 22° C. to form a precipitate;

(c) separating the precipitate and solvent phase of step (b);

(d) washing the precipitate from step (c) with fresh solvent mixture which has been cooled to about 2° C. below the solvent temperature utilized in step (b) using a volume of at least about 8% of the volume of solvent utilized in step (b); and

(e) separating the washed precipitate and solvent phase of step (d) to provide a solid fat fraction having a melting point above 40° C.;

and wherein the semi-solid fat fraction is produced by a process comprising:

(f) combining the solvent phases from above steps (c) and (e) and cooling the combined solvent phases to 2° C. to 8° C. to form a precipitate;

(g) separating the precipitate and solvent phase of step (f);

(h) washing the precipitate form step (g) with fresh solvent mixture which has been cooled to about 2° C. below the solvent temperature utilized in step (f) using a volume of at least about 8% of the volume of solvent utilized in step (f); and

(i) separating the washed precipitate and solvent phase of step (h) to provide a semi-solid fat fraction having a melting point above 32° C. and below 42° C.

4,839,192

HARD BUTTER COMPOSITION CONTAINING TRIGLYCERIDES, AND PROCESS FOR PRODUCTION THEREOF

Nobuo Sagi, Izumisano; Tsugio Izumi; Haruyasu Kida, both of Sennan, and Hirokazu Maeda, Sakai, all of Japan, assignors to Fuji Oil Company, Limited, Osaka, Japan

Filed Dec. 5, 1986, Ser. No. 939,709
Claims priority, application Japan, Dec. 7, 1985, 60-275804
Int. Cl.⁴ A23D *3/00*
U.S. Cl. 426—607 **5 Claims**

1. A hard butter composition for a cocoa butter substitute which comprises at least 90% by weight of triglycerides based on the total weight of the composition, at least 50% by weight of said triglycerides, based on the total weight of said triglycerides, being a β-unsaturated-α,α'-disaturated triglyceride constituent having a saturated fatty acid constituent of which 4 to 30% by weight, based on the weight of said saturated fatty acid constituent, is a fatty acid selected from the group consisting of behenic acid, lignoceric acid, cerotic acid and mixtures thereof.

4,839,193

PROCESS FOR PREPARING ALMOND PASTE

Christian Mange, Fraisses, and Georges-Aloin Allard, St. Etienne, both of France, assignors to Clextral, France

Filed May 27, 1987, Ser. No. 54,703
Claims priority, application France, May 27, 1986, 86 07573
Int. Cl.⁴ A23L *1/36*
U.S. Cl. 426—633 **2 Claims**

1. A process for preparing almond paste from blanched whole almonds; the entire preparation being carried out by cooking-extrusion within a screw conveyor having a plurality of regions with threads of different pitch in a continuous sequence of steps comprising, in the downstream direction of conveyance,

(a) introducing blanched whole almonds, saccharose, and water, and mixing the introduced products;

(b) malaxating the mixture with cooking of said mixture at a temperature between 140° and 170° C. for a period sufficient to permit the development of Maillard reactions;

(c) preliminarily dehydrating the mixture by sudden expansion of the water contained in the mixture by communication with atmosphere;

(d) compressing, then crushing and malaxating the mixture simultaneously with a second cooking of said mixture at a temperature between 100° C. and 140° C. to obtain mother almond paste;

(e) effecting a secondary final dehydration by sudden expansion of the water contained in the mother almond paste by communication with atmosphere, with cooling by lowering the temperature of the mother almond paste to below 100° C.;

(f) continuously introducing additives comprising glucose syrup, sorbitol and a complement of saccharose in the form of confectioner's sugar, said additives being successively introduced into the mixture;

(g) mixing the mother almond paste and the additives with progressive cooling to a temperature between 20° C. and 30° C. to obtain the almond paste; and

(h) extruding the almond paste through at least one die located at a downstream end of the screw conveyor.

4,839,194

METHODS OF PREPARING TISSUE SAMPLES

Hartmut H. Malluche, and Gisela Malluche, both of Lexington, Ky., assignors to Bone Diagnostic Center, Lexington, Ky.

Filed Jul. 5, 1985, Ser. No. 751,960
Int. Cl.⁴ A01N *1/00;* **G01N** *1/28, 1/30*
U.S. Cl. 427—2 **15 Claims**

1. A method of fixation of a tissue specimen comprising placing a tissue specimen in a liquid fixation medium at a temperature below about 10° C., said liquid fixation medium being present in an amount sufficient to provide a heat sink to allow the non-thermal effects of microwave radiation to act on said tissue specimen, and exposing said specimen in said fixation medium to microwave radiation for a time sufficient to fix said tissue specimen while controlling the temperature of said medium so as not to exceed about 40° C.

3. A method of dehydrating a tissue specimen comprising placing a tissue specimen in an alcoholic solution, said alcoholic solution being present in an amount sufficient to provide a heat sink to allow the non-thermal effects of microwave radiation to act on said tissue specimen, and exposing said specimen in said alcoholic solution to microwave radiation for a time sufficient to fix said tissue specimen while controlling the temperature of said medium so as not to exceed about 40° C.

4. A method of embedding a tissue specimen in plastic comprising

(1) placing a tissue specimen in a solution of plastic monomer and alcohol;

(2) thereafter, placing said tissue specimen in a solution of plastic monomer and exposing said specimen to microwave radiation;

(3) repeating step (2) twice so that the plastic monomer penetrates into said tissue specimen; and

(4) hardening said plastic monomer which has penetrated into said tissue specimen.

5. A method of removing plastic from a tissue specimen which is embedded in plastic and adhered to a slide comprising

(1) placing a slide having a tissue specimen adhered thereto in a container filled with an organic solvent;

(2) exposing said slide while in said organic solvent to microwave radiation;

(3) repeating steps (1) and (2), each time transferring said slide to a container filled with a fresh organic solvent solution; and

(4) transferring said slide to a fresh organic solvent solution and allowing said slide to cool.

7. A method of staining a tissue specimen comprising placing a tissue specimen in a container filled with a 100% alcoholic solution at room temperature with said tissue specimen remaining in said container for about 2–3 minutes, removing said tissue specimen from said alcoholic solution, placing said tissue specimen in a stain and exposing said tissue specimen to microwave radiation.

4,839,195

COATING BLADE FOR MICROTOME AND METHOD FOR THE PREPARATION THEREOF

Hajime Kitamura, Chiba, and Tamaki Iida, Tokyo, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 869,905, Jun. 3, 1986, abandoned. This application Feb. 9, 1988, Ser. No. 157,091
Claims priority, application Japan, Jun. 28, 1985, 60-141815
Int. Cl.⁴ B05D *3/06*
U.S. Cl. 427—38 **4 Claims**

1. A method for the preparation of a microtome blade coated with a layer of diamond which comprises the steps of:

(a) subjecting a base blade to a treatment of plasma-induced chemical vapor deposition of diamond by exposing the same to an atmosphere of plasma generated in a gaseous mixture composed of a hydrocarbon compound and hydrogen; and

(b) subjecting the base blade thus coated with a layer of diamond to a heat treatment at a temperature in the range from 700 to 1300° C. for a length of time in the range from 0.5 to 1.5 hours in an inert atmosphere.

4,839,196

PHOTOCHEMICAL FILM-FORMING METHOD

Hiromi Itoh, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 820,040, Jan. 21, 1986, abandoned. This application Dec. 14, 1987, Ser. No. 134,570
Claims priority, application Japan, Mar. 19, 1985, 60-57359
Int. Cl.⁴ C23C *16/00*
U.S. Cl. 427—53.1 **2 Claims**

1. A method for forming a film of uniform thickness on a main surface of a substrate, comprising:

(a) providing a substrate having a main surface in a reactive gas atmosphere; and

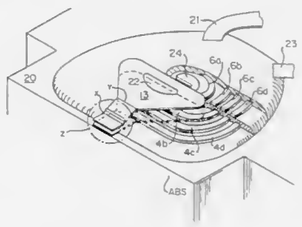
(b) radiating a light beam through a light beam focusing means to the reactive gas atmosphere and along the length of but not intersecting the main surface of the substrate, the light beam photochemically dissociating the reactive gas to form a reaction product which is deposited on the main surface of the substrate, and the focal point of the focusing means being positioned adjacent the main surface of the substrate where the intensity of the light beam would otherwise be at a minimum owing to a decrease in intensity of the light beam along its direction of irradiation if the light beam were not radiated through any focusing means.

4,839,197

PROCESS FOR FABRICATING THIN FILM MAGNETIC RECORDING HEADS HAVING PRECISION CONTROL OF THE WIDTH TOLERANCE OF THE UPPER POLE TIP

Watson R. Henderson, Broomfield, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

Filed Apr. 13, 1988, Ser. No. 181,208
Int. Cl.⁴ G11B *5/42;* **B05D** *5/12*
U.S. Cl. 427—116 **12 Claims**



1. A method of making a thin film head, said method comprising the steps of:

depositing a first layer of, magnetic material on a substrate to form a bottom pole piece comprising a front pole tip area and a back region area having a back gap portion,

depositing a gap forming layer of nonmagnetic material over said first layer,

depositing only in said front pole tip area a thin film mag-

netic layer on top of said gap forming layer to define an upper pole tip of said head,
depositing at least one layer containing coils over the portion of said gap forming layer not covered by said upper pole tip,
depositing at least one insulation layer over said coil layer, and
depositing over said one insulation layer an upper thin film layer of magnetic material to define an upper magnetic structure of said head
said last mentioned layer contacting said upper pole tip only at an end of said upper pole tip adjacent said back area of said head.

4,839,198

METHOD OF APPLYING A ROAD MARKING COMPOSITION

Carolus J. M. Lonis, Emst, and Klaas Nieuwenhuis, Heerde, both of Netherlands, assignors to Akzo N.V., Netherlands

Filed Apr. 19, 1986, Ser. No. 853,079
Claims priority, application Netherlands, Apr. 17, 1985, 8501122
Int. Cl.⁴ B05D *5/00, 7/24*
U.S. Cl. 427—137 **11 Claims**

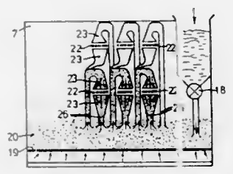
1. A method of applying a road marking composition comprising applying to a road surface an aqueous composition comprising a dispersion of a film forming binder having a minimum film forming temperature of 0°–60° C., and 30–70 percent by volume of filler calculated on the solid binder, and contacting the aqueous composition with a water soluble salt.

4,839,199

METHOD AND APPARATUS FOR APPLYING POWDERED MATERIALS TO FILAMENTS

Gui G. de Jager, Noordwyk, Netherlands, assignor to Flexline Services Ltd., Nicosia, Cyprus

PCT No. PCT/NL86/00019, § 371 Date Apr. 17, 1987, § 102(e) Date Apr. 17, 1987, PCT Pub. No. WO87/00563, PCT Pub. Date Jan. 29, 1987
PCT Filed Jul. 10, 1986, Ser. No. 36,673
Claims priority, application Netherlands, Jul. 16, 1985, 8502045; Oct. 29, 1985, 8502947
Int. Cl.⁴ B05D *1/10, 1/22*
U.S. Cl. 427—185 **8 Claims**



1. A process for treating material consisting of a plurality of monofilaments with a powder treating agent, characterized in that the treating agent is suspended in a fluidized bed in a gas stream and that at least one stream of powder to be directed to the material to be treated is withdrawn from the fluidized bed by suction power and is then directed to the material to be treated under a controllable pressure, so as to separate the monofilaments and thereby treat the separated monofilaments with the treating agent.

4,839,200

ENHANCED RESOLUTION INK JET PRINTING

William Hoffman, Horsham; Marcelo Lanas, Chalfont, and Donglas Weiss, Hatfield, all of Pa., assignors to Webcraft Technologies, Inc., N. Brunswick, N.J.

Filed May 4, 1987, Ser. No. 45,513
Int. Cl.⁴ B41M *5/00*
U.S. Cl. 427—265 **12 Claims**

1. A method for producing high resolution ink jet printing, comprising:
(a) printing a recording medium with an oil-based printing ink layer;
(b) drying said oil-based ink layer;
(c) applying a coating, which will effectively accept ink jet printing, over said oil-based ink layer;
(d) drying said ink jet acceptable coating;
(e) ink jet printing an aqueous-based ink layer onto the dried coating to at least partially cover the underlying oil-based printing layer; and
(f) drying said aqueous-based ink jet printed layer.

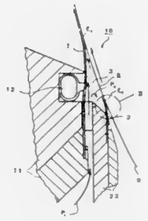
7. A pre-treated recording medium capable of receiving a high resolution aqueous-based ink jet printed layer, comprising:
(a) a recording medium substrate;
(b) an oil-based printing ink layer on said recording medium;
(c) a dry coating which will effectively accept ink jet printing covering said oil-based printing ink layer; and,
(d) an ink jet printed layer disposed on the coating and at least partially covering the underlying oil-based printing.

4,839,201

METHOD AND APPARATUS FOR APPLYING COATING LIQUID TO A MOVING BASE

Rauno Rantanen, Muurame, and Markku Lummila, Jyväskylä, both of Finland, assignors to Valmet Paper Machinery Inc., Finland

Filed Apr. 15, 1988, Ser. No. 182,152
Claims priority, application Finland, Dec. 3, 1987, 875333
Int. Cl.⁴ B05B *3/12;* **B05C** *5/02;* **B05D** *3/12*
U.S. Cl. 427—355 **15 Claims**



1. A method for applying coating material onto a moving base, such as the surface of a paper or board web, a counter-roll, or the like, comprising the steps of:
feeding coating material under pressure into a chamber defined by a region of the moving base to be coated and a coating device, said coating device including a coating member extending substantially transversely with respect to the direction of movement of said base at one edge of said base region, and a front member extending substantially transversely with respect to the direction of movement of said base at a front edge of said base region forward of said one edge; and
feeding a fluid material to an inlet side of said moving base region forward of said base region and front member in the direction of movement of said base so that said fluid material moves substantially parallel to and in the same direction as said moving base to seal said front member with respect to said moving base against the passage of air

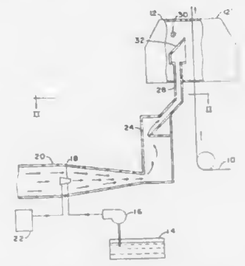
over said front edge of said base region and/or to lubricate said front member and moving base with respect to each other.

4,839,202

METHOD AND APPARATUS FOR COATING A MOVING SUBSTRATE

William H. Grassel, and Doak Borst, both of Delmont, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 912,422, Sep. 29, 1986, abandoned. This application Feb. 19, 1988, Ser. No. 161,250
Int. Cl.⁴ B05D *1/02*
U.S. Cl. 427—424 **7 Claims**



3. A method for electrostatically applying a very thin and uniform liquid coating to a moving substrate comprising:
pumping liquid coating material to a nozzle to atomize the liquid;
supplying atomizing air to the nozzle at a substantially constant and relatively high pressure to form a relative fine mist of the atomized liquid;
moving a substrate to be coated through a deposition chamber;
transporting the mist from the nozzle to the deposition chamber in a stream of air at a substantially constant velocity for application to the moving substrate in a relatively thin uniform coating;
controlling the amount of coating applied to the substrate by controlling the amount of liquid forced through the nozzle and the speed of the substrate through the chamber; and
varying the amount of liquid forced through the nozzle, without changing the pressure of the air supplied to the atomizing nozzle, to vary the amount of coating material supplied to the deposition chamber.

4,839,203

SEMI-PERMEABLE MEMBRANES PREPARED VIA REACTION OF CATIONIC GROUPS WITH NUCLEOPHILIC GROUPS

Thomas E. Davis, Lafayette, Calif.; Donald L. Schmidt, Midland, Mich.; Jee I. Kau, Concord, Calif.; Ritchie A. Wessling, Midland, Mich.; Sharon S. Whipple, Sanford, Mich.; Richard F. Fibiger, Midland, Mich., and Dale M. Pickelman, Auburn, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 790,287, Oct. 22, 1985, Pat. No. 4,704,324, which is a continuation-in-part of Ser. No. 719,037, Apr. 3, 1985, abandoned, which is a continuation of Ser. No. 313,051, Oct. 19, 1981, abandoned, which is a continuation-in-part of Ser. No. 162,356, Jun. 24, 1980, abandoned. This application Aug. 17, 1987, Ser. No. 86,122
Int. Cl.⁴ B32B *27/00*
U.S. Cl. 427—244 **44 Claims**

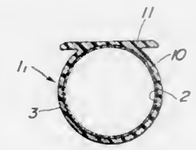
1. Method of forming a semi-permeable membrane comprising:
(a) contacting a permeable substrate bearing through physical contact or chemical bonding a plurality of reactive ionic groups of a first charge with a compound bearing reactive ionic groups of a charge opposite the first charge to form a coacervate layer, and
(b) subjecting the coated substrate to reaction conditions effective to convert a plurality of the ionic bonds in the coacervate layer to covalent bonds thereby rendering the layer derived from the coacervate essentially water insoluble.

4,839,204

RESIN COATED METAL PIPE HAVING A PLANE SURFACE FOR A LIGHTWEIGHT STRUCTURE

Syuji Yoshino; Satoshi Makino; Mitsuo Fujita, and Yukio Shimizu, all of Shizuoka, Japan, assignors to Yazaki Kakoh Co., Ltd., Shizuoka, Japan

Filed May 12, 1987, Ser. No. 48,683
Int. Cl.⁴ F16L *9/14*
U.S. Cl. 428—358 **18 Claims**



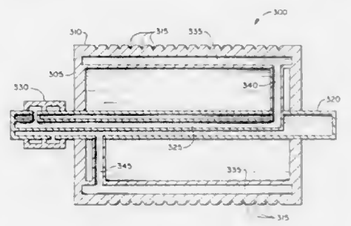
1. In a resin coated metal pipe for a lightweight structure including a synthetic resin coated and adhered on an outer surface of a thin metal pipe to form a resin coated pipe,
said resin coated metal pipe having a plane surface for said lightweight structure characterized in that a plane surface portion having a predetermined width can be formed with said resin as one body in the tangent direction of the outer surface of said resin coated metal pipe,
wherein a turndown edge is provided at a side end of said plane surface portion in parallel with a pipe axis.

4,839,205

HEATED SUPPLY SHEAVES FOR WIRE COATING APPARATUS

Paul E. Justus, and Mahammad F. Zaman, both of Fort Wayne, Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Jul. 27, 1987, Ser. No. 78,726
Int. Cl.⁴ D01D *1/00*
U.S. Cl. 428—34.1 **6 Claims**



1. A wire sheave comprising:
a cylindrical outer radial structure, said structure having a plurality of wire grooves around the outer surface thereof;
a centrally located supply tube coaxial with said structure;
means for supplying heating medium through said supply tube;
a cylindrical wall spaced from said outer radial structure, forming an annular chamber therebetween;

said supply tube in fluid communication with said annular chamber;

a first confining tube coaxially surrounding said supply tube forming a flow path therebetween;

said annular chamber in fluid communication with said flow path; and

said outer radial strucutre, said cylindrical wall and said first confining tube rotatable as a unit, but stationary with respect to each other, and

means for discharging heating medium from said flow path comprising a fixed structure including a rotatable fluid coupling communicating with said flow path.

4,839,206

DOUBLE SIDED ADHESIVE TAPE

Dean H. Waldenberger, Glens Falls, N.Y., assignor to Norton Company, Worcester, Mass.

Filed Sep. 15, 1987, Ser. No. 96,702

Int. Cl.[4] A61F *13/02*

U.S. Cl. 428—40 **5 Claims**

1. A double sided pressure sensitive adhesive tape comprising a flexible support with a first side thereof coated with a low surface energy pressure sensitive adhesive, a second side thereof being coated with a pressure sensitive adhesive which has a surface energy higher than the pressure sensitive adhesive on said fire side, and including a release liner.

4,839,207

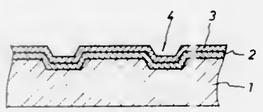
OPTICAL RECORDING MEDIUM AND PROCESS FOR PRODUCING THE SAME

Toshihiko Yoshitomi, Yokohama; Yoshimitsu Kobayashi, Tokyo; Yoshiyuki Kisaka, Yokohama; Hidemi Yoshida, Yokohama; Michikazu Horie, Yokohama; Takanori Tamura, and Mitsuaki Ohgaki, both of Kanagawa, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Continuation of Ser. No. 10,732, Feb. 4, 1987, abandoned. This application Feb. 16, 1988, Ser. No. 156,014

Int. Cl.[4] B32B *1/04*

U.S. Cl. 428—64 **12 Claims**



1. An optical recording medium for recording informations by irradiating the optical recording medium with a laser beam to form a hole or a deformed part thereon, said optical recording medium comprising a substrate and a recording layer having a thickness of 150 to 1,000 Å containing at least Te, Se and F in the amounts of from 35 to 94.9 atomic % of Te, from 5 to 25 atomic % of Se and from 0.1 to 40 atomic % of F, produced by a reactive sputtering, said Se being derived from a gaseous mixture comprising 0.01 to 50% by volume of selenium fluoride and a sputtering target comprising Te-Se-alloy.

4,839,208

OPTICAL INFORMATION RECORDING MEDIUM

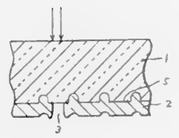
Katsuji Nakagawa; Masaki Itoh; Akio Morimoto, and Mitsuru Sakai, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Apr. 28, 1987, Ser. No. 43,626

Claims priority, application Japan, Apr. 30, 1986, 61-101368; Apr. 30, 1986, 61-101370; May 27, 1986, 61-122686; May 27, 1986, 61-122687; Jun. 17, 1986, 61-141739; Jul. 4, 1986, 61-158247; Jul. 4, 1986, 61-158248; Jul. 23, 1986, 61-174495; Jul. 23, 1986, 61-174496; Jul. 23, 1986, 61-174497; Jul. 23, 1986, 61-174498; Aug. 19, 1986, 61-194560; Sep. 25, 1986, 61-227652; Dec. 16, 1986, 61-300793; Jan. 19, 1987, 62-8137

Int. Cl.[4] B32B *3/02*; G11B *5/84*; G01D *15/10*

U.S. Cl. 428—64 **17 Claims**



1. An optical information recording medium, in which information is recorded is recorded by an irradiation of a laser beam, said recording medium comprising a substrate and a recording layer disposed on said substrate, said recording layer containing Te, Se and N and being evaporated by said irradiation of said laser beam so as to form pits in said recording layer, the thickness of said recording layer being in a range from 180 to 400 angstroms (Å).

4,839,209

SHEET-SHAPED, CORROSION RESISTANT PARTS OF APPARATUS

Gehard Simon; Peter Hahnel, both of Leverkusen, and Erhard-Günther Hoffmann, Ratingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 28, 1987, Ser. No. 7,801

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1986, 3604013

Int. Cl.[4] B32B *1/04*

U.S. Cl. 428—68 **6 Claims**

1. Column trays of corrosion resistant parts, each having a low thickness compared with its extension and dimensional stability under changing thermal and mechanical stresses, consisting of a multilayered structure of polymeric material comprising (a) a weight-bearing stable sheet-shaped core with even surfaces and a plurality of openings therein, said core being of epoxide, furan or phenol resin reinforced with glass or carbon fibres in an amount of 50 to 70% by weight, and (b) a jacket of thermally resistant and/or chemically resistant polymers surrounding said core and attached to said core on all sides thereof.

4,839,210

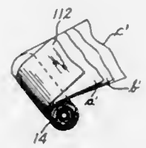
METHOD AND MECHANISM FOR PRODUCING CUSHIONING DUNNAGE PRODUCT

Anthony J. Komaransky, Mentor, and Raymond Q. Armington, Willoughby, both of Ohio, assignors to Ranpak Corp., Willoughby, Ohio

Division of Ser. No. 792,313, Dec. 28, 1985, Pat. No. 4,750,896. This application Jul. 31, 1987, Ser. No. 80,544

Int. Cl.[4] B32B *7/02*

U.S. Cl. 428—77 **5 Claims**



1. A stock roll of paper adapted for use with a dunnage producing converter mechanism for supplying paper stock material to the mechanism, so as to be converted into a pad-shaped, dunnage product of lateral resilient pillow-shaped portions connected by a generally central connecting section running lengthwise of the product, said stock roll comprising a multi-ply roll of paper webs wound about the lengthwise axis of the roll, with one web of said roll being of a lesser width but thicker gauge as compared to the width and gauge of other webs of said roll.

4,839,211

SAXONY CARPET HAVING IMPROVED APPEARANCE RETENTION

Arnold E. Wilkie, Satellite Beach, Fla., and Arthur Talley, Jr., Eva, Ala., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 31, 1988, Ser. No. 175,791

Int. Cl.[4] B32B *33/00*

U.S. Cl. 428—89 **17 Claims**

12. A saxony carpet comprising a primary backing and twisted, evenly sheared, heatset pile yarn, said yarn being in the form of individual lengths of plied yarn (tufts) each of which is attached to and projects upwardly from said backing and terminates as a cut end, said pile yarn prior to heatsetting thereof being characterized in comprising a blend of staple fibers having an average length in the range of 6 to 9 inches (15 to 23 centimeters) and consisting essentially of crimped carpet staple fibers and high shrinkage staple fibers in a weight ratio ranging from 60:40 to 95:5, carpet staple fibers to high shrinkage staple fibers, said carpet staple fibers being selected from the group consisting of nylon staple fibers, polyester staple fibers and mixtures thereof and having shrinkages less than 8%, deniers of at least 12 and a crimp frequency in the range of 5 to 17 crimps per inch (2 to 6 crimps per cm), said high shrinkage staple fibers being staple fibers having shrinkages of at least 12% and at least 10 shrinkage units higher than the shrinkages of said carpet staple fibers.

4,839,212

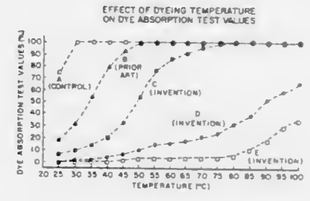
STAIN RESISTANT NYLON CARPETS

Randolph C. Blyth, Gulf Breeze, and Pompelio A. Ucci, Pensacola, both of Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 59,714, Jun. 8, 1987, abandoned, which is a continuation of Ser. No. 914,507, Oct. 2, 1986, Pat. No. 4,680,212, which is a continuation of Ser. No. 834,804, Mar. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 643,606, Aug. 23, 1984, abandoned, which is a continuation of Ser. No. 562,370, Dec. 16, 1983, abandoned. This application Apr. 7, 1988, Ser. No. 180,589

Int. Cl.[4] B32B *27/34*

U.S. Cl. 428—96 **6 Claims**



1. A dyed carpet having a pile composed of nylon fibers, said carpet being characterized in that said fibers are coated with a sufficient amount of a sulfonated condensation product containing $-SO_3X$ radicals, where X is hydrogen or a cation, to provide a carpet which, when 64 ounces (1892.5 ml) of an aqueous solution of cherry flavored soft drink premix containing 0.054 grams per liter of Red Dye No. 40 is poured onto said pile from a height of one meter and left overnight followed by washing of said pile with water for removal of excess solution therefrom, no visual evidence of said Red Dye No. 40 remains on said pile.

4,839,213

CONVEYOR BELT CONSTITUTED BY PLASTIC SPIRALS

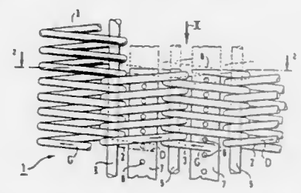
Maurice Gauthier, Hiersac, France, assignor to Cofpa, France

Continuation of Ser. No. 811,509, Dec. 20, 1985, Pat. No. 4,719,139, which is a continuation of Ser. No. 715,195, Mar. 22, 1985, Pat. No. 4,567,077, which is a continuation of Ser. No. 403,733, Jul. 14, 1982, abandoned. This application Nov. 25, 1987, Ser. No. 125,405

Claims priority, application France, Nov. 14, 1980, 80 22241; PCT Int'l Appl., Nov. 19, 1981, PCT/FR81/00146

Int. Cl.[4] D21F *1/10*; F26B *13/08*

U.S. Cl. 428—114 **1 Claim**



1. In a papermaker's fabric comprising a plurality of transverse synthetic spirals connected together serially to define a supporting surface for transporting a paper web through papermaking machinery, said supporting surface having a predetermined permeability, the improvement comprising:

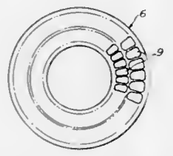
at least one generally flat synthetic bar disposed within selected spirals such that a desired reduction in the permeability of said papermaker's fabric is achieved.

4,839,214

CERAMIC ROTORS FOR PRESSURE WAVE SUPERCHARGERS AND PRODUCTION THEREOF

Isao Oda, and Kiminari Kato, both of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Mar. 23, 1988, Ser. No. 172,243
Claims priority, application Japan, Mar. 31, 1987, 62-78229
Int. Cl.[4] B32B 3/12
U.S. Cl. 428—116 25 Claims



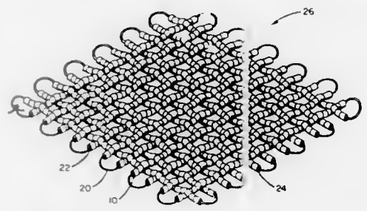
1. A ceramic rotor for a pressure wave supercharger, comprising a honeycomb structure having a plurality of partition walls therein defining a plurality of longitudinal through holes radially arranged around a rotating axis of said rotor, wherein said partition walls have an apparent density of not greater than 4.0 g/m^3, an open porosity of not greater than 3.0%, a coefficient of thermal expansion in a temperature range of about 25° C. to about 800° C. of not greater than 5.5×10^{-6}/°C., and a four point bending strength of not less than 30 kg/mm^2.

4,839,215

BIOCOMPATIBLE PARTICLES AND CLOTH-LIKE ARTICLE MADE THEREFROM

L. Brian Starling, Golden; James E. Stephan, Arvada, and William G. Hubbard, Lakewood, all of Colo., assignors to Ceramed Corporation, Lakewood, Colo.

Filed Jun. 9, 1986, Ser. No. 872,617
Int. Cl.[4] B32B 3/10
U.S. Cl. 428—131 51 Claims



1. A plurality of particles useful for tissue implantation said plurality of particles comprising biocompatible particles each of which is flexibly interconnected to at least one other biocompatible particle.

4,839,216

FORMED MATERIAL PRODUCED BY SOLID-STATE FORMATION WITH A HIGH-PRESSURE LIQUID STREAM

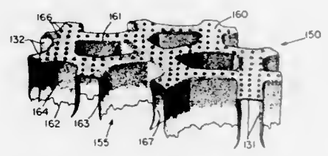
John J. Curro; Alan J. Trusty, and George M. Vernon, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 580,911, Feb. 16, 1984, Pat. No. 4,695,422.
This application Jun. 1, 1987, Ser. No. 56,831
Int. Cl.[4] B29D 7/01
U.S. Cl. 428—134 40 Claims

1. A debossed and perforated material comprising a polymeric film having a first surface and a second surface separated by a maximum thickness T, said material comprising a land area which has an upper surface which defines a plane and comprises a portion of said second surface of said film and a lower surface which comprises a portion of said first surface of said film, said film exhibiting a surface roughness on at least one of said upper and lower surfaces of said land area, said film comprising perforated protuberances, each of said protuberances comprising the following:

(a) a first aperture located in said plane, said first aperture having a cross-sectional area such that a circle of diameter D can be inscribed therein;

(b) a second aperture wholly remote from and below said plane;



(c) a sidewall which continuously interconnects said first and second apertures to one another, said sidewall having an inner surface comprising a portion of said second surface of said film and an outer surface comprising a portion of said first surface of said film, said sidewall having an average depth L from said plane, measured about the periphery of said second aperture in a direction perpendicular to said plane, said film exhibiting said surface roughness on at least one of said inner and outer surfaces of said sidewall to an average depth of at least about L/4 from said plane, said film exhibiting a surface smoothness on both said inner and outer surfaces of said sidewall adjacent said second aperture;

(d) a ratio of L/T of at least about 5; and

(e) a ratio of L/D of at least about 0.5.

4,839,217

AROMATIC POLYIMIDE FILM

Kanzo Tabata; Hiroshi Inoue; Tadao Muramatsu, and Yasuji Narahara, all of Hirakata, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed May 15, 1987, Ser. No. 50,729
Claims priority, application Japan, May 16, 1986, 61-112146
Int. Cl.[4] B32B 3/10, 5/16, 27/00
U.S. Cl. 428—156 12 Claims

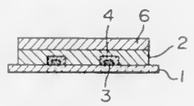
1. A self-supporting aromatic polyimide film obtained by reaction of an aromatic tetracarboxylic acid compound mainly containing a biphenyltetracarboxylic acid compound, with an aromatic diamine compound; said film containing particles of an inert inorganic material having an average particle diameter of 40 to 1,000 angstroms in an amount of 0.02 to 6.0 wt.%, and at least one surface of said film being provided with small sized protrusions having a maximum height of 50 to 500 angstroms and an average diameter of 50 to 2,000 angstroms, the number of protrusions being in the range of 2×10^5 to 1×10^8/mm^2, and the number of protrusions having a diameter of not less than 1.5 times as much as the average diameter is not more than 5% of the total number of the protrusions.

4,839,218

COMPOSITE POLYESTER SHEET AND PROCESS FOR ITS PRODUCTION

Satoru Sugino, Yokkaichi, Japan, assignor to Mitsubishi Kasei Vinyl Company, Tokyo, Japan

Filed Apr. 14, 1988, Ser. No. 181,669
Claims priority, application Japan, Apr. 24, 1987, 62-101375
Int. Cl.[4] B32B 7/02
U.S. Cl. 428—212 7 Claims



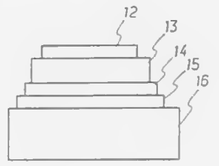
1. A composite polyester sheet which comprises a polyester film, a layer of a vinyl chloride plastisol composition (A) containing A polyisocyanate compound, a polyisocyanate polymer or a blocked product thereof, or a polyaminoamide as an adhesion-imparting agent, formed on the film and a layer of a vinyl chloride plastisol composition (B) containing no adhesion-imparting agent, formed on the layer of the composition (A).

4,839,219

THIN FILM AND DEVICE HAVING THE SAME

Masakazu Uekita, and Hiroshi Awaji, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 19, 1987, Ser. No. 51,350
Claims priority, application Japan, May 20, 1986, 61-116390; May 20, 1986, 61-116391
Int. Cl.[4] B32B 27/00, 27/34
U.S. Cl. 428—220 64 Claims



1. A thin film which is prepared by forming a thin film from a precursor by a Langmuir-Blodgett method wherein a monolayer of the precursor is formed by spreading a solution of the precursor on the surface of a non-solvent liquid and compressing the formed monolayer at a constant surface pressure, and converting the obtained film of said precursor into a polymer having a hetero atom-containing 5-membered or 6-membered ring, said precursor having as a basic skeleton linear recurring units of a formula selected from the group consisting of formula (1), formula (2) and formula (3):

$$—A—R^{1'}—AB—R^2—B— \quad (1)$$

$$—A—R^{1'}—BA—R^2—B— \quad (2)$$

$$—B—R^{1'}—BA—R^2—A— \quad (3)$$

wherein $R^{1'}$ is an organic group having a valence of at least 3 and having at least 2 carbon atoms, R^2 is an organic group having a valence of at least 2 and having at least 2 carbon atoms, A is an acid group having a hetero atom, B is a basic group having a hetero atom, each of AB and BA is a bivalent group produced by reacting said group A with said group B; each linear recurring unit having at least one hydrocarbon-containing group R^3 bonded by covalent bonding to the linear recurring unit, wherein R^3 has 12 to 30 carbon atoms, and each linear recurring unit has a precursor structure capable of forming a 5-membered ring having a hetero atom or a 6-membered ring having a hetero atom.

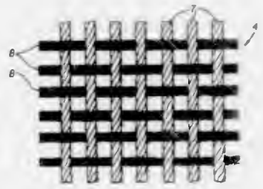
2. The thin film of claim 1, which has a thickness of not more than 1000 Å and has a dielectric strength of not less than 1×10^6 V/cm.

4,839,220

CONVEYOR BELT, IN PARTICULAR FOR A THROUGH CONVEYOR

Johan Stijntjes, Alkmaar, and Simon J. Roet, Barsingerborn, both of Netherlands, assignors to Ammeraal Conveyor Belting B. V., Heerhugowaard, Netherlands

Filed Jun. 20, 1988, Ser. No. 209,137
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1987, 8708636
Int. Cl.[4] B32B 7/00
U.S. Cl. 428—258 11 Claims



1. Conveyor belt, in particular for a trough conveyor, from synthetic material with at least one fabric embedded in it consisting of warp and weft, the thread material of the weft comprising monofilament threads, characterized in that the thread material of the weft (6) consists of two or more twisted monofilament threads (7).

4,839,221

GASKET CONTAINING (I) A SHEET COMPOSITION COMPRISING (A) PTFE (B) INORGANIC POWDER (C) CLAY MINERAL AND (II) A METAL SUPPORT FOR THE SHEET

Hiroshi Asaumi, Kamakura; Zenji Shimura, Odawara; Takehiro Yoshida, Tokyo; Kenji Tadakuma, Chigasaki; Shinzaburo Suzuki, Yokohama; Norio Takada, Tokyo; Kenichi Nakamura, Yokohama, and Takene Hirai, Tokyo, all of Japan, assignors to Nichias Corporation, Tokyo, Japan

Filed Oct. 9, 1987, Ser. No. 106,254
Claims priority, application Japan, Jan. 9, 1987, 62-1841; Mar. 12, 1987, 62-57613; Apr. 3, 1987, 62-81244; Apr. 3, 1987, 62-81243; Jun. 26, 1987, 62-157847
Int. Cl.[4] F16J 15/12; C08K 3/34
U.S. Cl. 428—283 5 Claims

1. A gasket, comprising a sheet of a composition consisting essentially of a fibrillated polytetrafluoroethylene resin and a fine inorganic powder having an average particle size of not larger than 100 μm and containing at least 30% by weight of a clay mineral, based on the total weight of the fine inorganic powder, said composition characterized in that the polytetrafluoroethylene resin is at least 5% by weight and the fine inorganic powder is at least 40% by weight, based on the total amount of the polytetrafluoroethylene resin and the fine inorganic powder, the polytetrafluoroethylene resin and the fine inorganic powder are mutually uniformly dispersed and mixed with each other, and further comprising a metal support for said sheet.

4,839,222

FIBERGLASS INSULATION COATED WITH A HEAT COLLAPSIBLE FOAM COMPOSITION

Surendra Jain, Easley, S.C., assignor to The Reynolds Company, Greenville, S.C.

Filed Mar. 25, 1988, Ser. No. 173,418
Int. Cl.[4] B32B 3/26, 17/10, 5/20
U.S. Cl. 428—290 15 Claims

14. A fiberglass insulation article covered with an aqueous, foamable coating composition, said aqueous, foamable coating composition comprising an aqueous medium having dispersed therein solid material consisting essentially, by weight, of

(a) 6 to 26 percent of a strong and soft, non-halogenated, vinyl type polymer;

(b) 6 to 26 percent of a halogenated vinyl polymer;

(c) 40 to 80 percent of at least one inorganic filler, selected from the group of clay, calcium carbonate, aluminum trihydrate, magnesium trihydrate, antimony oxide, barium sulfate and encapsulated asbestos, or a mixture thereof;

(d) 0.1 to 1 percent of a foaming agent; and

(e) 0.2 to 2 percent of a thickening agent.

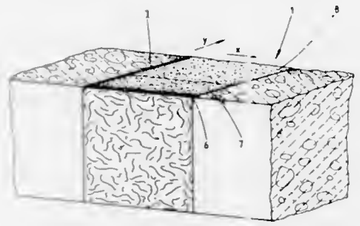
15. A fiberglass insulation article covered with an aqueous, foamable coating composition according to claim 14 wherein said aqueous, foamable coating composition is being foamed by whipping air into said aqueous foamable coating composition to give an aqueous foam having a liquid to air ratio by volume of 1:1 to 1:20, said aqueous foam being coated upon said fiberglass insulation article and being dried to give a smooth surface coating.

4,839,223

FIRE-PROTECTIVE SEALING ELEMENT

Rolf Tschudin-Mahrer, Lausen, Switzerland, assignor to Irbit Research & Consulting AG, Fribourg, Switzerland

Filed Oct. 24, 1988, Ser. No. 261,137
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1987, 3735779
Int. Cl.[4] B32B 3/26, 5/00
U.S. Cl. 428—317.1 8 Claims



1. A sealing element for sealing openings in fire protective structures, said sealing element comprising a precompressed foam strip containing an essentially uniform distribution of a heat-expanding intumescent compound

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4,839,224

THERMAL TRANSFER RECORDING MATERIAL CONTAINING CHLORINATED PARAFFIN WAX

Hsin-hsin Chou, and Wu-Shyong Li, both of Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 11, 1988, Ser. No. 255,320
Int. Cl.[4] B41M 5/20
U.S. Cl. 428—323 16 Claims

1. A thermal transfer donor article comprising a non-porous substrate having coated thereon a transparent ink layer, said ink layer comprising a chlorinated wax binder and a colorant, said chlorinated wax comprising the greatest proportion of said binder in said ink layer said chlorinated wax having a chlorine content of at least 40% by weight chlorine, a softening point above 100° C., and a molecular weight of at least 500, said colorant being finely dispersed in said wax and having an average particle diameter of less than 0.8 microns said indices of refraction of said chlorinated wax binder and said colorant being sufficiently close as to provide transparency in said ink layers.

4,839,225

MAGNETIC RECORDING MEDIUM

Akihiro Matsufuji, and Shigeo Komine, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanawaga, Japan

Filed Apr. 14, 1987, Ser. No. 38,171
Claims priority, application Japan, Apr. 14, 1986, 61-84273
Int. Cl.[4] G11B 5/70
U.S. Cl. 428—336 12 Claims

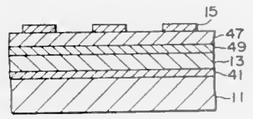
1. A magnetic recording medium comprising a non-magnetic support having provided thereon, in sequence, an intermediate layer and a magneic layer coated with a dispersion of ferromagnetic particles in a binder, wherein said intermediate layer contains at least on binder containing 20 mol% or more of a monomer component having at least one of a hydroxyl group and an amino group per molecule thereof which is available for further reaction with an isocyanate compound, said binder being contained in said intermediate layer in an amount of 10 wt. % or more based on the total weight of binder in said intermediate layer, and said magnetic layer contains an isocyanate compound.

4,839,226

MAGNETO-OPTICAL RECORDING MEDIUM

Yasuo Sawada, Machida, and Hajime Machida, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 5, 1987, Ser. No. 104,217
Claims priority, application Japan, Oct. 3, 1986, 61-236016
Int. Cl.[4] G11B 11/10
U.S. Cl. 428—336 21 Claims



1. A magneto-optical recording medium comprising a transparent substrate, a magnetic oxide layer formed on said substrate, and band-shaped reflection layers in the same plane formed on said magnetic oxide layer,

wherein said magnetic oxide layer comprises:

a magnetoplumbite-type ferrite having general formula (I):

$$MeO.n(M_xFe_{(2-x)}O_3) \quad (I)$$

wherein Me represents at least one element selected from the group consisting of Ba, Pb, Sr and La; M represents one element or a combination of at least two elements which constitute a three-valence element or element group as a whole; x, $0<x\leqq 2$; and n, $5\leqq n\leqq 6$,

a garnet-type magnetic oxide having general formula (II):

$$(R_3)(M^{3+}{}_yFe^{3+}{}_{5-y})O_{12} \quad (II)$$

wherein R represents at least one element selected from the group consisting of Y, Bi, Pb, Ca, Sr, Ba, La, Sm, Eu, Gd, Er, Tm, Yb, Lu, Pr, Nd, Ho and Dy; M represents at least one element selected from the group consisting of Ga, Al, V, Si, Ge, Co, Zn, Lu, Sc, Cr, Zr, Ti, Tb, Gd and Dy, by which Fe can be replaced; y, $0\leqq y\leqq 3$;

or a cobalt spinel-type magnetic oxide having general formula (III):

$$Co_xM_yFe_{2-(x+y)}O_4 \quad (III)$$

wherein M represents at least one element selected from the group consisting of Al, Cr, Mn, Ni, Ti, Zn, Sn, Cu, Mg, Rh, V, Ga, Sb, Sc, Bi, Y, Su, Eu, Tb, Er, Yb, Ho, Dy, Tm, Gd, Sm, Pb, Re and Ru, by which Fe can be replaced; and x, y, $0<x+y<3$, $0\leqq y\leqq 2$; and

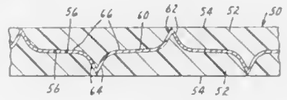
wherein said band-shaped reflection layer has a reflectance of 30% or 80%, and a heat conductivity of less than 0.25 cal/cm.sec.°C. at 20° C.

4,839,227

RESILIENT ELECTRICALLY AND THERMALLY CONDUCTIVE FLEXIBLE COMPOSITE

Timothy L. Hoopman, Kinnikinnic Township, St. Croix County, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 12, 1987, Ser. No. 24,997
Int. Cl.[4] C09V 7/02
U.S. Cl. 428—343 9 Claims



1. A flexible composite capable of joining and maintaining two members in electrical and thermal contact throughout wide temperature fluctuations comprising:

a continuous resilient structured conductive member extending the length of the composite between opposite surfaces of said composite and a polymeric coating on each side of said conductive member to define therewith said opposite surfaces, wherein said conductive member includes a plurality of tapered elements extending to opposite surfaces of said composite, defining oppositely disposed structured surfaces defined by longitudinally extending ridges and grooves filled with said polymeric coating to form a composite of substantially uniform thickness, wherein the structure of said conductive member is adapted to compress and return towards its original shape as a force is applied and decreased, thereby enabling the conductive member to follow the expansion and contraction of the polymeric coating due to temperature fluctuations.

4,839,228

BICONSTITUENT POLYPROPYLENE/POLYETHYLENE FIBERS

Zdravko Jezic, and Gene P. Young, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 10,651, Feb. 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 909,345, Sep. 19, 1986, abandoned, and a continuation-in-part of Ser. No. 946,562, Dec. 24, 1986, abandoned. This application Feb. 12, 1987, Ser. No. 13,853
Int. Cl.[4] C08L 23/12, 23/18/23/08; D01F 8/06
U.S. Cl. 428—401 19 Claims

1. A blend of highly crystalline polypropylene and LLDPE, said blend being in the form of biconstituent fibers produced in a fiber-making process which uses and intensive mixer-extruder in melt-blending and melt-extruding said blend of highly crystalline polypropylene and LLDPE,

said LLDPE being characterized as having a melt flow rate in the range of about 12 to about 120 gms/10 min. as measured in accordance with ASTM D-1238(E),

said polypropylene being characterized as being a constant rheology grade,

with the ratio of polypropylene/LLDPE being within the range of about 78/22 to about 55/45, and

wherein said fibers have a size less than about 30 denier.

4,839,229

COMPOSITE MATERIALS OF MULTILAYER DUROPLASTIC PREPREGS

Karl Jellinek, Iserlohn-Letmathe; Bert Meier, Wesel, and Jürgen Zehrfeld, Voerde, all of Fed. Rep. of Germany, assignors to Rutgerswerke AG, Fed. Rep. of Germany

Filed Mar. 26, 1987, Ser. No. 31,232
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1986, 3613990
Int. Cl.[4] B32B 27/38, 27/42, 7/00
U.S. Cl. 428—413 6 Claims

1. A composite produced by hot pressing multilayer duroplastic prepregs of reinforcing materials impregnated with a duroplastic resin systems, the improvement comprising at least one layer of an epoxy resin prepreg and at least one layer of a phenolic resin prepreg are hot pressed together to cure the resins and bond the layers to each other.

4,839,230

RADIATION-POLYMERIZABLE CELLULOSE ESTERS

Phillip M. Cook, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

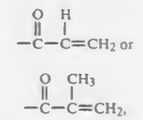
Filed Jan. 25, 1988, Ser. No. 147,474
Int. Cl.[4] B32B 27/00
U.S. Cl. 428—423.1 26 Claims

1. An ethylenically unsaturated self-crosslinkable grafted cellulose ester of the formula

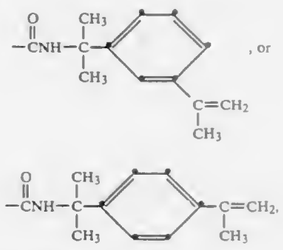
$$[C_6H_7O_2(OCCH_3)_x(OR^1)_y(OR^2)_z(OR^3)_{3-(x+y+z)}]_n$$

wherein:

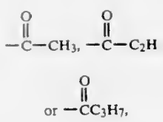
R^1 is a (meth)acrylate moiety of the formula



R^2 is α-methylstyrene moiety of the formula



R^3 is, independently, H,



or $-CC_3H_7$,

x is about 0.1 to 2.5,
y is about 0.1 to 2.0,
z is about 0.1 to 2.0, and
n is 30–250,
provided that (x+y+z) is in the range of 0.3 to 3.0.

4,839,231

AGENTS AND PROCEDURES FOR THE TRANSFER OF PROTEINS AND/OR NUCLEIC ACIDS ONTO A SUPPORTED RECEPTOR SURFACE

Joel S. Vandekerckhove, Loppem, Belgium, assignor to Plant Genetic Systems N.V., Brussels, Belgium

Continuation-in-part of Ser. No. 866,250, May 23, 1986. This application Sep. 2, 1987, Ser. No. 92,242

Claims priority, application France, Jan. 10, 1985, 85 14579; Feb. 9, 1985, 85 13046; European Pat. Off., Sep. 2, 1986, 86401933.6

Int. Cl.[4] B32B *17/10, 27/08;* **G01N** *33/552;* **C07K** *17/00*

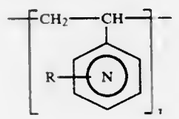
U.S. Cl. 428—441 **9 Claims**

1. A coated support for use in the transfer and immobilization of proteins or nucleic acids, or mixtures thereof, which coated support comprises:

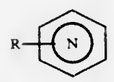
(i) a chemically inert support capable of resisting the aqueous and organic solvents commonly used in the techniques of sequencing and of acid hydrolysis, and

(ii) at least a monomolecular film of a vinylpyridine polymer, said vinyl pyridine polymer being immobilized and insolubilized with respect to said aqueous or organic solvents on a surface of said chemically inert support,

wherein said vinyl pyridine polymer has the general formula:



in which:



is a pyridyl moiety in which the nitrogen atom is in position 2, 3 or 4 of the ring and is substituted by an alkyl group containing 1 to 20 carbon atoms, and n is a whole number large enough so that the vinylpyridine polymer is rendered insoluble in non polar organic solvents but not exceeding the value which would lead the vinylpyridine polymer to become insoluble in water.

4,839,232

FLEXIBLE LAMINATE PRINTED-CIRCUIT BOARD AND METHODS OF MAKING SAME

Moritsugu Morita, Yokosuka; Kazuo Miyazaki, Yokohama; Akihiro Yamaguchi, Kamakura; Masahiro Ohta, Yokohama; Shoji Tamai, Yokohama, and Kunio Nishihara, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

PCT No. PCT/JP86/00554, § 371 Date Jun. 25, 1987, § 102(e) Date Jun. 25, 1987, PCT Pub. No. WO87/02620, PCT Pub. Date May 7, 1987

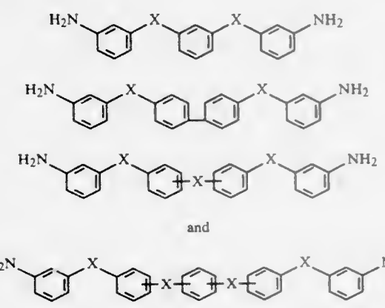
PCT Filed Oct. 31, 1986, Ser. No. 69,449

Claims priority, application Japan, Oct. 31, 1985, 60-242935; Oct. 29, 1986, 61-255908

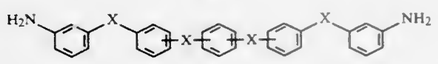
Int. Cl.[4] B32B *3/00, 27/00, 31/00;* **B05D** *5/12*

U.S. Cl. 428—473.5 **14 Claims**

1. A flexible laminate for printed-circuit board comprising a metal foil and a polyimide film directly bonded thereto, said polyimide film having been formed by mixing a symmetrical aromatic meta-substituted primary diamine selected from the group consisting of:



and



wherein X is selected from the group consisting of O, SO_2, S, CO, CH_2, $C(CH_3)_2$ and $C(CF_3)_2$, and the radicals represented by X can be the same, with a symmetrical aromatic parasubstituted primary diamine in an equivalent weight ratio of 10–60:90–40, and then reacting the resultant mixture with an aromatic tetracarboxylic acid anhydride.

4,839,233

MEDICAL GRADE FILM AND METHOD OF STERILIZING THE SAME AND STERILIZED MEDICAL GRADE FILM

Arthur A. Arena, Trenton, N.J., assignor to Huls America, Inc., Edison, N.J.

Filed Apr. 10, 1987, Ser. No. 37,043

Int. Cl.[4] B32B *27/22, 27/20;* **C08K** *5/15, 3/30*

U.S. Cl. 428—220 **18 Claims**

1. A radiation sterilized medical grade film which does not exhibit any color change upon sterilization by gamma radiation, comprising a vinyl chloride resin and barium sulfate, wherein said medical grade film has been sterilized by irradiation with 1 to 5 megarads of gamma radiation.

13. A radiation sterilizable medical grade film comprising a vinyl chloride resin, barium sulfate and a plasticizer, wherein said film is capable of being sterilized by high energy radiation without exhibiting a change in color, and wherein said film is capable of being sterilized by 1 to 5 megarads of gamma radiation without exhibiting a change in color.

4,839,234

POLYPROPYLENE FILM

Masahiro Kakugo, Narashino, and Selichiro Ima, Ichihara, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 4, 1987, Ser. No. 45,433

Claims priority, application Japan, May 13, 1986, 61-110231; Jun. 11, 1986, 61-135593

Int. Cl.[4] B32B *27/00*

U.S. Cl. 428—349 **5 Claims**

1. A multilayer film composed of a polypropylene film layer and a substrate film layer, which is characterized in that at least one of said film layers has a composition comprising 100 parts by weight of a crystalline polypropylene and, incorporated therein, a slipping agent [A] having a melting point of 100° C. to 125° C. and a slipping agent [B] having a melting point of 70° to 90° C., where the ratio of the slipping agant [A] to [B] is in the range of from 0.2 to 20, in a total amount of 0.05 to 1.0 part by weight, said polypropylene film constituting said polypropylene film layer having a initial coefficient of friction being 0.7 or below, the temperature at which said coefficient of friction becomes 0.7 being 45° C. or above.

4,839,235

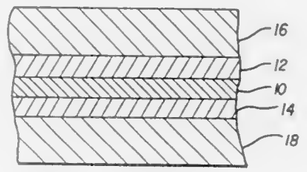
OXYGEN BARRIER FILM

Gautam P. Shah, Simpsonville, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Continuation of Ser. No. 880,259, Jun. 30, 1986, abandoned. This application Sep. 28, 1987, Ser. No. 102,273

Int. Cl.[4] B32B *27/08*

U.S. Cl. 128—516 **7 Claims**



1. An oriented multilayer film comprising:

(a) a cross-linked core layer comprising an ethylene vinyl alcohol copolymer;

(b) two cross-linked interior layers, each layer bonded to a respective surface of the core layer and comprising a copolymer or terpolymer having a polyolefin or ethylene-ester copolymer component modified with an unsaturated carboxylic acid or acid anhydride; and

(c) two cross-linked outer layers each consisting essentially of a blend of between about 10% and 50% ethylene butyl, acrylate copolymer, between about 25% and 50% linear low density polyethylene having a density in a range of from about 0.916 grams per cubic centimeter to about 0.925 grams per cubic centimeter, and between about 25% and 40% linear medium density polyethylene having a density in a range of from about 0.926 grams per cubic centimeter to about 0.941 grams per cubic centimeter.

4,839,236

INGOT FORM

Lucelio Sulprizio, 3059 Frandoras Cir., Oakley, Calif. 94561

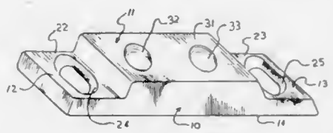
Filed May 11, 1987, Ser. No. 48,369

Int. Cl.[4] B22D *7/00*

U.S. Cl. 428—576 **5 Claims**

1. A metal ingot, comprising:

a rectangular elongate center body extending between longitudinal ends and characterized by tapered peripheral edges extending between said longitudinal ends and a first and second handle structure extending from said longitudinal ends of said center body each said handle being formed to a thickness less than half of the thickness of said center body and including recesses therein, and said center body having formed therein a first and second opening respectively adjacent said first and second handles for reducing the section of said center body thereat to control the heat transfer therethrough.



4,839,237

METHOD OF LAYING A COBALT-CHROMIUM-TUNGSTEN PROTECTIVE COATING ON A BLADE MADE OF A TUNGSTEN ALLOY INCLUDING VANADIUM, AND A BLADE COATED THEREBY

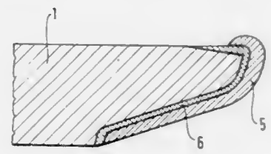
André Coulon, Bessoncourt, and Ulrich Bech, Buochs, both of France, assignors to Alsthom, France

Filed May 28, 1987, Ser. No. 54,963

Claims priority, application France, May 28, 1986, 86 07662

Int. Cl.[4] B32B *15/04;* **C23C** *10/30*

U.S. Cl. 428—610 **7 Claims**



1. A steam turbine blade made of an alloy of titanium including vanadium, the improvement wherein the titanium alloy blade includes a coating layer of cobalt-chromium-tungsten alloy over a portion of the blade to be protected, said coating layer being at least 1 mm thick and an underlayer of vanadium of a thickness in the range of 0.5 mm to 1.5 mm with diffusion bonding of the vanadium underlayer to the titanium alloy blade and the coating layer to the vanadium underlayer to the extent of low dilution of the vanadium into the titanium alloy blade giving rise locally to a beta structure at the interface therebetween and wherein the dilution of the cobalt-chromium-tungsten alloy into the underlayer of vanadium is sufficiently limited such that no adverse effect occurs on the bond between the underlayer of vanadium and the titanium alloy blade with the steam turbine blade having very high resistance to abrasion by water droplets under steam turbine operating conditions wherein the blade operates at high peripheral speed.

4,839,238

FIBER-REINFORCED METALLIC COMPOSITE MATERIAL

Mitsuhisa Nakatani, Funabashi, and Ken-ichi Nishio, Shiga, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 146,579, Jan. 21, 1988, abandoned. This application Dec. 27, 1988, Ser. No. 289,524

Claims priority, application Japan, Feb. 10, 1987, 62-28578

Int. Cl.[4] C22C *1/09*

U.S. Cl. 428—614 **12 Claims**

1. A fiber-reinforced metallic composite material, which comprises as a matrix a metal selected from the group consist-

ing of aluminum, magnesium, copper, nickel and titanium and an alloy thereof, and as a reinforcing material an inorganic fiber of 15 to 70% by volume, said metal alloy composing the matrix containing a combination of 0.05 to 10% by weight of lead and 0.01 to 5% by weight of at least one metal selected from the group consisting of sodium, potassium, calcium, strontium, cesium, barium and radium.

4,839,239

METALLIC COATING ON AN INORGANIC SUBSTRATE

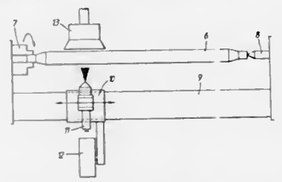
Maurice P. Ducos, Morsas, and André L. Serio, Meudon, both of France, assignors to TOTAL Compagnie Francaise des Petroles, Paris, France

Filed Nov. 4, 1987, Ser. No. 116,300

Claims priority, application France, Nov. 4, 1986, 86 15319

Int. Cl.[4] B21D *39/00*; B05D *1/08*

U.S. Cl. 428—623 **9 Claims**



1. A method of metallic coating on an inorganic substrate including the steps of: hot-spraying on said inorganic substrate an intermediate layer of refractory material selected from the group consisting of nickel chromium alloys, nickel aluminide and titanium aluminide; and hot-spraying on said intermediate layer a layer of metal alloy, wherein the inorganic substrate comprises an elongate cylinder consisting of a plurality of cylindrical cores each taken from a natural formation and arranged axially end to end against each other.

7. A metallic coating on an inorganic substrate comprising an intermediate layer of a refractory metal alloy selected from the group consisting of nickel-chromium alloys, nickel aluminide and titanium aluminide, and a layer of a metal alloy covering said intermediate layer, wherein said inorganic substrate comprises an elongate cylinder consisting of a plurality of cylindrical cores taken from a natural formation and arranged axially, end to end against each other.

4,839,240

MULTILAYER PHOTOCONDUCTIVE MATERIAL

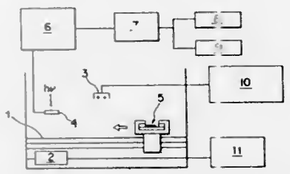
Isamu Shimizu, Yokohama, and Minori Yamaguchi, Akashi, both of Japan, assignors to Kanegafuchi Chemical Industry Co., Ltd., Osaka, Japan

Continuation of Ser. No. 946,153, Dec. 23, 1986, abandoned, Continuation of Ser. No. 710,247, Mar. 11, 1985, abandoned. This application Dec. 18, 1987, Ser. No. 135,517

Claims priority, application Japan, Sep. 14, 1983, 58-170309

Int. Cl.[4] H01L *45/00*

U.S. Cl. 428—635 **9 Claims**



1. A multilayer photoconductive material comprising at least six alternately laminated layers of a wide energy band gap material and a narrow energy band gap material, both composed of amorphous alloys containing an element selected from the group consisting of silicon and germanium, and mixtures thereof, and an additional element selected from the group consisting of carbon, fluorine and hydrogen.

4,839,241

COMPOSITE ZINC-SILICA ELECTRO-GALVANIZED STEEL SHEET EXCELLENT IN CORROSION RESISTANCE

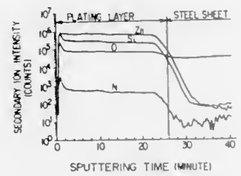
Masaki Abe; Yukimitsu Shiohara; Takeshi Adaniya, and Hiroshi Naemura, all of Tokyo, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1988, Ser. No. 183,779

Claims priority, application Japan, May 11, 1987, 62-112626

Int. Cl.[4] B32B *15/18*

U.S. Cl. 428—659 **7 Claims**



1. In an electro-galvanized steel sheet excellent in corrosion resistance, having on at least one surface thereof an outer zinciferous plating layer into which silica particles are uniformly dispersed;

the improvement wherein:

said zinciferous plating layer consists essentially of:

silica particles: from 0.1 to 20 wt. %,

nitrogen compounds: from 0.0005 to 0.5 wt. % as converted into nitrogen, and

the balance being essentially zinc.

4,839,242

TITANIUM-CLAD STEEL AND A METHOD FOR THE MANUFACTURE THEREOF

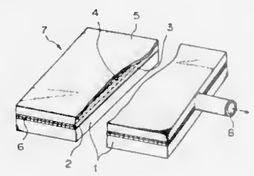
Junichiro Murayama, Takarazuka, and Yuichi Komizo, Nishinomiya, both of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Feb. 24, 1987, Ser. No. 17,754

Claims priority, application Japan, Feb. 24, 1986, 61-038887; Jan. 19, 1987, 62-009552; Jan. 19, 1987, 62-009554

Int. Cl.[4] B32B *15/18*

U.S. Cl. 428—660 **8 Claims**



1. A titanium-clad steel comprising:

a steel base metal;

a nickel or nickel alloy insert which is bonded to said steel base metal;

a low-carbon ferrous metal insert which contains at most 0.01 weight % of carbon and which is bonded to said nickel insert; and

cladding which is made of a titanium-based metal and which is bonded to said low-carbon ferrous metal insert;

wherein the combined thickness of said inserts is approximately 0.1–10% of the total thickness of said clad steel.

4,839,243

RADIOGRAPHIC INTENSIFYING SCREEN

Etsuo Shimizu, Tokyo; Noboru Kotera, Odawara; Shinichi Onogi, and Teiichi Hitomi, both of Chigasaki, all of Japan, assignors to Kasei Optonix, Ltd., Tokyo, Japan

Filed Jul. 12, 1988, Ser. No. 217,984

Claims priority, application Japan, Jul. 16, 1987, 62-176010; Jul. 20, 1987, 62-178944

Int. Cl.[4] B32B *9/00*; G03C *5/17*; C09K *11/78*

U.S. Cl. 428—690 **7 Claims**

1. A radiographic intensifying screen comprising a support and a fluorescent layer formed thereon, said fluorescent layer consisting essentially of at least one terbium-activated rare earth oxysulfide phosphor of the formula:

$$(Ln_{1-x-y}, Tb_x, A_y)_2O_2S \quad (I)$$

wherein Ln is at least one element selected from the group consisting of Y, La, Gd and Lu, A is at least one element selected from the group consisting of Ce, Pr, Nd, Dy, Er and Tm, and x and y are numbers within the ranges of $0.002 \leqq x \leqq 0.20$ and $0 \leqq y \leqq 0.01$ respectively, and at least one terbium-activated rare earth tantalate complex oxide phosphor of the formula:

$$(Ln'_{1-z}, Tb_z)_2O_3.mTa_2O_5.nB_2O_3 \quad (II)$$

wherein Ln' is at least one element selected from the group consisting of Y, La, Gd and Lu, and z, m and n are numbers within the ranges of $0.0005 \leqq z \leqq 0.1$, $0.95 \leqq m \leqq 1.05$ and $0.01 \leqq n \leqq 5.0$, respectively wherein the content of the terbium-activated rare earth tantalate complex oxide phosphor in said fluorescent layer is from 10 to 90% by weight based on the total amount of the phosphors.

7. A complex oxide phosphor represented by the formula:

$$(Ln_{1-z}, Tb_z)_2O_3.mTa_2O_5.nB_2O_3 \quad (III)$$

wherein Ln is at least one element selected from the group consisting of Y, La, Gd and Lu, and m, n and z are numbers within the ranges of $0.95 \leqq m \leqq 1.05$, $0.01 \leqq n \leqq 5.0$ and $5 \times 10^{-4} \leqq z \leqq 0.1$, respectively.

4,839,244

MAGNETIC RECORDING MEDIUM WITH PROTECTIVE LAYER USING GRAPHITE FLUORIDE AND METHOD OF PRODUCING SAME

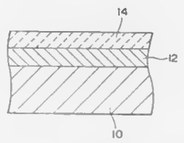
Yuji Tsukamoto, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Apr. 13, 1988, Ser. No. 181,232

Claims priority, application Japan, Apr. 24, 1987, 62-99899

Int. Cl.[4] G11B *5/64*

U.S. Cl. 428—694 **19 Claims**



1. A magnetic recording medium, comprising: a substrate;

a magnetic recording layer which is a thin ferromagnetic metal film formed on the substrate; and

a protective layer which overlies the magnetic recording layer and is formed of a mixture of graphite fluoride and at least one inorganic nonmetallic hard compound, said graphite fluoride occupying 10–50 volume percent of said mixture.

4,839,245

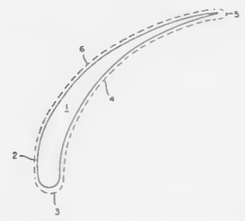
ZIRCONIUM NITRIDE COATED ARTICLE AND METHOD FOR MAKING SAME

Jiinjen A. Sue, Indianapolis, and Harden H. Troue, Plainfield, both of Ind., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 911,510, Sep. 25, 1986, abandoned, which is a continuation-in-part of Ser. No. 905,510, Sep. 10, 1986, which is a continuation-in-part of Ser. No. 781,459, Sep. 30, 1985, abandoned. This application Feb. 22, 1988, Ser. No. 159,545

Int. Cl.[4] B23P *15/02, 15/04*

U.S. Cl. 428—698 **18 Claims**



1. An erosion resistant article comprising a substrate chosen from the group consisting of refractory metal, titanium alloy, refractory alloy, aluminum alloy, superalloy based on Fe, Co, or Ni, stainless steel, and ceramic composite, and a coating upon the surface of the substrate of zirconium nitride, said coating having a thickness of at least about 5 μm, and an average grain size of less than 3000 Angstroms.

4,839,246

GENERATOR SYSTEM UTILIZING A FUEL CELL

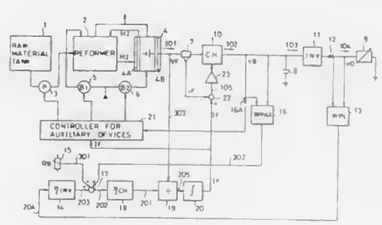
Yasuhiro Takabayashi, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed May 19, 1988, Ser. No. 195,960

Claims priority, application Japan, May 20, 1987, 62-121147

Int. Cl.[4] H01M *8/04*

U.S. Cl. 429—12 **19 Claims**



1. A method for controlling a generator system having a fuel cell and a battery to which the output current from said fuel cell is supplied, said method comprising the steps of:

performing a first adjustment of adjusting the supply of the power to a load by said battery in response to the sudden

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variation in load until said fuel cell responds to said sudden variation in load; and

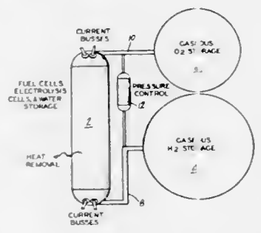
controlling the power supplied from said fuel cell while performing a second adjustment of adjusting the supply of the power to said load by said fuel cell after said fuel cell responds to the sudden variation in load.

4,839,247

STATIC REGENERATIVE FUEL CELL SYSTEM FOR USE IN SPACE

Alexander H. Levy, Bloomfield; Leslie L. VanDine, Manchester, and John C. Trocciola, Glastonbury, all of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Filed Nov. 13, 1987, Ser. No. 120,439
Int. Cl.[4] H01M *8/18;* **C25B** *9/00*
U.S. Cl. 429—21 **16 Claims**



1. A repeating component within an electrochemical cell stack comprising:

(a) means forming a flat fuel cell electrolyte matrix;

(b) a flat porous fuel cell electrolyte reservoir plate abutting said fuel cell electrolyte matrix and operable to draw and store product water from said fuel cell electrolyte matrix when the stack is operating in a fuel cell mode;

(c) a flat porous electrolysis cell electrolyte reservoir plate adjacent to said fuel cell electrolyte reservoir plate;

(d) means forming a flat electrolysis cell electrolyte matrix abutting said electrolysis cell electrolyte reservoir plate, the latter being operable to draw water from said fuel cell electrolyte reservoir plate to said electrolysis cell electrolyte matrix for consumption when the stack is operating in an electrolysis cell mode;

(e) a first formed metallic separator plate adjacent to said fuel cell electrolyte matrix;

(f) a first flat current conductor plate adjacent to and in contact with said first formed plate;

(g) a first insulating sheet adjacent said first conductor plate;

(h) a second formed metallic separator plate adjacent to said electrolysis cell electrolyte matrix;

(i) a second flat current conductor plate adjacent to and in contact with said second formed plate;

(j) a second insulating sheet adjacent said second conductor plate; and

(k) a flat cooling plate adjacent at least one of said insulating sheets.

4,839,248

SYSTEM AND METHOD FOR DEPASSIVATING A PASSIVATED LITHIUM BATTERY IN A BATTERY POWERED MICROPROCESSOR CONTROLLED DEVICE

Haakon T. Magnussen, Jr., Orinda; Roy P. Moeller, Hayward; Phillip S. Palmer, Oakland, and Gary L. Smith, Walnut Creek, all of Calif., assignors to Rainin Instrument Co., Inc., Emeryville, Calif.

Filed Jan. 15, 1988, Ser. No. 144,179
Int. Cl.[4] H01M *10/48*
U.S. Cl. 429—49 **11 Claims**

1. Apparatus for depassivating a passivated lithium battery, comprising:

means for momentarily drawing current from the passivated battery to cause a depassivation thereof; and

means for monitoring the power delivery condition of the battery and for controlling the momemtary drawing of current from the passivated battery until salt crystals on an electrode in the battery are dissipated and the battery has returned to a useful power delivery condition.

4,839,249

LOW TEMPERATURE MOLTEN COMPOSITION COMPRISED OF TERNARY ALKYL SULFONIUM SALTS

Steven D. Jones, Brook Park, and George E. Blomgren, Lakewood, both of Ohio, assignors to Eveready Battery Company, Inc., St. Louis, Mo.

Filed Jul. 25, 1988, Ser. No. 223,313
Int. Cl.[4] H01M *10/39, 10/40*
U.S. Cl. 429—194 **33 Claims**

15. An electrochemical cell comprising

(a) an anode,

(b) a cathode,

(c) a separator, and

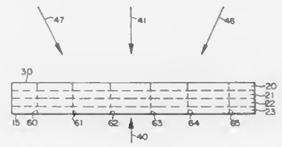
(d) a low temperature molten electrolyte composition comprising a mixture of a metal halide and a ternary alkyl sulfonium salt.

4,839,250

METHOD OF REPLICATING VOLUME PHASE REFLECTION HOLOGRAMS

James J. Cowan, Lexington, Mass., assignor to Polaroid Corporation, Patent Department, Cambridge, Mass.

Division of Ser. No. 84,568, Aug. 10, 1987. This application Jun. 10, 1988, Ser. No. 205,204
Int. Cl.[4] G03H *1/04*
U.S. Cl. 430—1 **4 Claims**



1. A method of replicating a hologram comprising the steps of:

(A) forming a volume phase reflection hologram in a medium by:

(1) projecting two beams of light into the medium from opposite sides thereof, one of the beams having first impinged upon an object to form a reflection hologram of the object, and

(2) opening a portion of the interference fringes of said reflection hologram by projecting two further beams onto a surface on the same side of the medium, which beams are disposed at an angle with respect to each other;

(B) developing the medium;

(C) coating the surface of volume phase reflection hologram with a metal to form a master; and

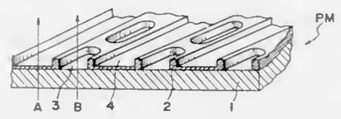
(D) embossing the master in a new medium.

4,839,251

PHOTO-MASK FOR USE IN MANUFACTURING AN OPTICAL MEMORY DISC, A METHOD FOR MAKING THE PHOTO-MASK AND A METHOD FOR MANUFACTURING THE OPTICAL MEMORY DISC

Kenji Ohta; Akira Takahashi; Tetsuya Inui, all of Nara; Junji Hirokane, Tenri, and Hiroyuki Katayama, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 9, 1987, Ser. No. 36,426
Claims priority, application Japan, Apr. 11, 1986, 61-84448
Int. Cl.[4] G03F *1/00*
U.S. Cl. 430—5 **10 Claims**



1. A photo-mask for use in manufacturing an optical memory disc, said photo-mask consisting essentially of:

a substrate having a disk shape and made of a transparent material; and

a film deposited on said substrate, said film comprising a predetermined pattern of grooves extending spirally or concentrically to the center of the disc shaped substrate wherein said grooves include a thin portion of said film at the bottom of said grooves, and a number of microscopic pits in the form of minute indentations with predetermined spacing so as to be aligned along said grooves wherein said indentations include no film at the bottom of said indentations,

whereby light which passes through said thin film at the bottom of said grooves is weakened and light which passes through said indentations loses substantially no power, and light which is applied elsewhere on said film is cut off,

wherein said film is made of a material selected from the group consisting of Cr, Ti, Ta, Nb and Ni.

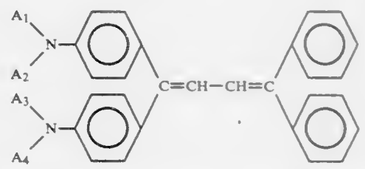
4,839,252

ELECTROPHOTOGRAPHIC PHOTORECEPTOR

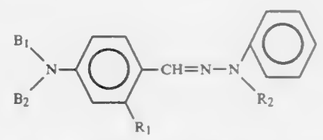
Tadaichi Murata; Tsuneo Isomura; Kenichi Fujimori; Fuminori Tsuruta; Kazuhito Dohi; Masahiro Horigome; Yoshitarou Nakayama, and Sachio Oomori, all of Kofu, Japan, assignors to Shindengen Electric Manufacturing Co., Ltd, Tokyo and Yamanashi Electronics Co. Ltd., Yamanashi, both of, Japan

Filed Feb. 26, 1988, Ser. No. 160,930
Claims priority, application Japan, Mar. 13, 1987, 62-58414
Int. Cl.[4] G03G *5/06*
U.S. Cl. 430—59 **3 Claims**

1. An electrophotographic photoreceptor comprising a support having thereon a photosensitive layer, in which said photosensitive layer contains a butadiene compound represented by general formula



wherein A_1-A_4, which may be the same or different, are each an alkyl group, and a hydrazone compound represented by general formula



wherein B_1 and B_2, which may be the same or different, are each an alkyl group, a benzyl group or a methoxyphenyl group; R_1 is a hydrogen, an alkyl group or an O—R in which R is a linear or branched chain alkyl groups of 5 to 10 carbon atoms, an alkenyl group, an alkadienyl group or an aralkyl group of 7 to 10 carbon atoms; and R_2 is an alkyl group, a phenyl group, a p-methoxy benzyl group, an ethoxyphenyl group, a benzyl group, a methoxyphenyl group, a tolyl group and a naphthyl group.

4,839,253

PHOTOSENSITIVE AND ELECTRODEPOSITABLE PHENOLIC RESIN WITH QUINONE DIAZIDE SULFONYLOXY GROUP

Christopher G. Demmer, Cherry Hinton, and Edward Irving, Burwell, both of United Kingdom, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 800,846, Nov. 22, 1985, abandoned. This application Aug. 28, 1987, Ser. No. 91,328
Claims priority, application United Kingdom, Dec. 1, 1984, 8430377
Int. Cl.[4] G03C *1/54, 1/495;* **C08G** *8/32;* **C08L** *61/14*
U.S. Cl. 430—190 **9 Claims**

1. A phenolic novolak resin having aromatic rings substi-

tuted by phenolic hydroxyl groups, said resin being modified to render it photosensitive and electrodepositable by having

(i) at least 4% of the phenolic hydroxyl groups replaced by a quinone diazide sulfonyloxy group, the resin having sufficient free phenolic hydroxyl groups to render it soluble or dispersible in an aqueous medium, and

(ii) at least 4% of the aromatic rings substituted in a position ortho or para, or ortho and para, to a phenolic hydroxyl group or quinone diazide sulfonyloxy group by a group of formula $-CH(R^1)R^2$ where

R^1 represents a hydrogen atom,

R^2 represents a group of formula $-SCH_2COOH$ or $-N(R^4)-R^3-X$,

R^3 represents a divalent aliphatic group of 1 to 10 carbon atoms or a phenylene group,

R^4 represents a hydrogen atom, a C_1–C_{10} alkyl group or a C_1–C_{10} alkyl group substituted by a carboxylic acid group or by a hydroxyl group, or R^3 and R^4 together represent an alkylene chain of 2 to 5 carbon atoms linked to the indicated nitrogen atom, or said chain containing an oxygen atom or an additional nitrogen atom, and

X denotes a hydrogen atom, a hydroxyl group or a carboxyl acid group.

4,839,254

PHOTOSENSITIVE MIXTURE AND PHOTOSENSITIVE RECORDING MATERIAL PRODUCED THEREFROM WITH POLYMERIC BINDER WHICH IS REACTION PRODUCT OF (THIO) PHOSPHINIC ACIDISO (THIO) CYANATE AND ACTIVE HYDROGEN CONTAINING POLYMER

Georg Pawlowski, Wiesbaden, and Hans Jerg Kleiner, Kronberg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

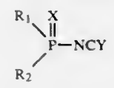
Filed May 8, 1987, Ser. No. 47,103

Claims priority, application Fed. Rep. of Germany, May 9, 1986, 3615613

Int. Cl.[4] G03C *1/60, 1/68, 1/71*

U.S. Cl. 430—175 **11 Claims**

1. A photosensitive mixture comprising (a) a photosensitive negative-working substance present in an amount sufficient to render said mixture sensitive to light, and (b) a polymeric binder which is insoluble in water and soluble or swellable in aqueous-alkaline solutions, wherein said polymeric binder is present in an amount sufficient to make the photosensitive mixture soluble in an aqueous-alkaline solution and is a product of reacting (i) a compound represented by the formula



(I)

wherein

X and Y are the same or different, and each is oxygen or sulfur,

R_1 and R_2 are the same or different, and each is an unsubstituted or substituted alkyl, cycloalkyl or alkoxy radical containing from 1 to 6 carbon atoms; an unsubstituted or substituted aryl or aryloxy radical containing from 6 to 10 carbon atoms; or, together with the phosphorus atom in formula (1), a 5- or 6-membered heterocyclic ring which is unsubstituted or substituted or carries a fused benzene ring,

with (ii) a polymer containing active hydrogen, wherein said polymer contains hydroxyl or amino groups and the active hydrogen is supplied by hydroxyl or amino groups.

4,839,255

PROCESS FOR PRODUCING TONER FOR DEVELOPING ELECTROSTATIC IMAGES

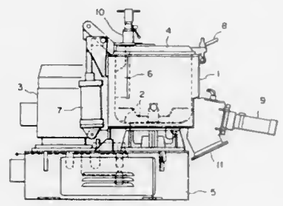
Yoshihiko Hyosu, Machida; Norio Hikake, and Katsuhiko Tanaka, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1988, Ser. No. 174,896

Claims priority, application Japan, Mar. 31, 1987, 62-078029; Mar. 31, 1987, 62-078030

Int. Cl.[4] G03G *9/00*

U.S. Cl. 430—137 **33 Claims**



1. A process for producing a toner for developing electrostatic latent images comprising:

mixing resinous base particles (A) comprising at least a binder resin with modifier particles (B) comprising a colorant or a charge controller thereby to attach the modifier particles (B) to the surfaces of the base particles (A); and

introducing the base particles (A) and the modifier particles (B) to a fixing means which has an impact zone having a minimum clearance of 0.5–5 mm between a rotating member and a fixed member or between at least two rotating members, and passing the particles through the impact zone at a temperature of 10°–100° C., thereby to fix the modifier particles (B) to the surfaces of the base particles (A) under the action of a mechanical impact force exerted in the impact zone.

4,839,256

PERFLUOROALKYL GROUP-CONTAINING 1,2-NAPTHOQUINONE DAIZIDE COMPOUNDS AND REPRODUCTION MATERIALS PRODUCED THEREFROM

Werner H. Müller, E. Greenwich, R.I., assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

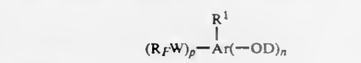
Continuation of Ser. No. 742,418, Jun. 7, 1985, abandoned. This application Aug. 21, 1987, Ser. No. 88,980

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1984, 3421471

Int. Cl.[4] G03C *1/54*

U.S. Cl. 430—192 **6 Claims**

1. A perfluoroalkyl group-containing 1,2-naphthoquinone-2-diazide sulfonic acid ester corresponding to the formula (1).



(I)

wherein

Ar denotes a mononuclear to trinuclear aromatic radical

D is a 1,2-naphthoquinone-2-diazide-4-sulfonyl radical or a 1,2-naphthoquinone-2-diazide-5-sulfonyl radical,

R_F is a perfluoroalkyl radical having from 5 to 15 carbon atoms,

W is a single bond or is selected from the group consisting of

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$-(CH_2)_mCOO-$

-continued

$-(CH_2)_mOOC-CHR^2-O-$
$-(CH_2)_mO-C_oH_{2o}-COO-$
$-(CH_2)_mOOC-$
$-(CH_2)_mOOC-C_oH_{2o}-COO-$
$-(CH_2)_mSO_2NH-$
$-(CH_2)_mOOC-CH=CH-COO-$
$-C_6H_4SO_2NH-$
$-(CH_2)_mCO-$
$-(CH_2)_mCONH-$
$-(CH_2)_mSO_3-$
$-(CH_2)_mOOC-C_oH_{2o}-CONH-$
$-C_6H_4SO_3-$
$-(CH_2)_mOOC-CH=CH-CONH,$

---

wherein R_F is bonded to $-(CH_2)_m$ or $-C_6H_4$,

R^1 is selected from the group consisting of hydrogen, halogen, an alkyl or alkoxy group having from 1 to 5 carbon atoms, acetyl and propionyl,

R^2 is an alkyl group having from 1 to 12 carbon atoms,

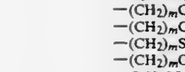
m is 0 or a number from 1 to 6,

n is a number from 1 to 3,

o is a number from 1 to 12, and

p is a number from 1 to 3.

4. A light-sensitive reproduction material for use in the production of planograph printing plates for waterless printing, comprising a support and a light-sensitive layer containing an admixture of (a) from about 35 to about 90% by weight of a polymeric binder and (b) from about 5 to about 65% by weight of a 1,2-naphthoquinone diazide, wherein the 1,2-naphthoquinone diazide is a compound corresponding to the formula (I).



(I)

wherein

Ar denotes a mononuclear to trinuclear aromatic radical

D is a 1,2-naphthoquinone-2-diazide-4-sulfonyl radical or a 1,2-naphthoquinone-2-diazide-5-sulfonyl radical,

R_F is a perfluoroalkyl radical having from 5 to 15 carbon atoms,

W is a single bond or is selected from the group consisting of

---

$-(CH_2)_mCOO-$
$-(CH_2)_mOOC-CHR^2-O-$
$-(CH_2)_mO-C_oH_{2o}-COO-$
$-(CH_2)_mOOC-$
$-(CH_2)_mOOC-C_oH_{2o}-COO-$
$-(CH_2)_mSO_2NH-$
$-(CH_2)_mOOC-CH=CH-COO-$
$-C_6H_4SO_2NH-$
$-(CH_2)_mCO-$
$-(CH_2)_mCONH-$
$-(CH_2)_mSO_3-$
$-(CH_2)_mOOC-C_oH_{2o}-CONH-$
$-C_6H_4SO_3-$
$-(CH_2)_mOOC-CH=CH-CONH,$

---

wherein R_F is bonded to $-(CH_2)_m$ or $-C_6H_4$,

R^1 is selected from the group consisting of hydrogen, halogen, an alkyl or alkoxy group having from 1 to 5 carbon atoms, acetyl and propionyl,

R^2 is an alkyl group having from 1 to 12 carbon atoms,

m is 0 or a number from 1 to 6,

n is a number from 1 to 3,

o is a number from 1 to 12, and

p is a number from 1 to 3.

4,839,257

COLOR DIFFUSION TRANSFER PHOTOGRAPHIC FILM UNIT

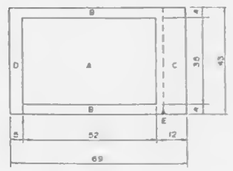
Shigeru Nakamura; Minoru Minoda, and Keisuke Shiba, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 23, 1987, Ser. No. 111,827

Claims priority, application Japan, Oct. 23, 1986, 252685/86; Oct. 27, 1986, 254879/86; Sep. 16, 1987, 231374/87; Sep. 16, 1987, 231375/87

Int. Cl.[4] G03C *5/54*

U.S. Cl. 430—207 **15 Claims**



1. A color diffusion transfer photographic film unit comprising a photosensitive sheet comprising a light-reflective support having disposed thereon in order outwardly from said support (a) a layer having neutralizing function, (b) a dye image-receiving layer, (c) a separating layer and (d) at least one light-sensitive emulsion layer comprising a light-sensitive silver halide, said light-sensitive emulsion layer being associated with a dye image-forming material; a transparent cover sheet superposed on the outermost layer of said photosensitive sheet; and rupturable storage means for providing a developing solution substantially opaque to light between said light-sensitive emulsion layer and said transparent cover sheet; provided that at least one of said light-reflective support and a layer thereon disposed on the side of said light-sensitive emulsion layer opposite said transparent cover sheet is substantially opaque to light, and further provided that a layer which is substantially opaque to light is disposed on the surface of said light-reflective support opposite said light-sensitive emulsion layer.

4,839,258

SUPER-HIGH CONTRAST NEGATIVE TYPE PHOTOGRAPHIC MATERIAL CONTAINING HYDRAZINE AND A REDUCTONE

Kazunobo Katoh, Ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

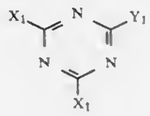
Filed Apr. 8, 1987, Ser. No. 36,753

Claims priority, application Japan, Apr. 8, 1986, 61-80636

Int. Cl.[4] G03C *1/28, 1/06*

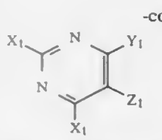
U.S. Cl. 430—264 **18 Claims**

1. A super-high contrast negative type silver halide photographic material comprising a support having provided thereon at least one silver halide emulsion layer, said emulsion layer or layers or other hydrophilic colloidal layer or layers containing a hydrazine derivative, wherein said photographic material further contains a compound selected from reductones and at least one compound represented by formula (I) or (II)



(I)

-continued



(II)

wherein X_1 represents a halogen atom, an N-methylolamino group, or a glycidoxy group; Y_1 and Z_1 each represents a hydrogen atom, a halogen atom, a hydroxyl group, —OM (wherein M represents an alkali metal ion), a substituted or unsubstituted amino group, an alkyl ether group, a phenyl ether group, an alkyl thioether group, a phenyl thioether group, a sulfonamide group, or an alkylsulfonamide group.

4,839,259

SILVER HALIDE PHOTOGRAPHIC MATERIAL AND METHOD FOR FORMING AN IMAGE USING THE SAME

Senzo Sasaoka; Nobuaki Inoue, and Eiichi Okutsu, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 849,635, Apr. 9, 1986, abandoned. This application Dec. 9, 1987, Ser. No. 130,482

Claims priority, application Japan, Apr. 9, 1985, 60-77489

Int. Cl.[4] G03C 1/42, 5/26

U.S. Cl. 430—264 **8 Claims**

1. A silver halide photographic material having at least one silver halide emulsion layer on a support, said at least one silver halide emulsion layer containing (a) a contrast-promoting hydrazine compound represented by formula (I)

$$R_1—NHNH—CHO \quad (I)$$

wherein R_1 represents a substituted or unsubstituted aliphatic group or a substituted or unsubstituted aromatic group in an amount of from 10^{-6} to 10^{-1} mol per mol of silver in said at least one silver halide emulsion layer, and (b) at least two types of developing agents selected from the group consisting of ascorbic acids, dihydroxybenzenes 3-pyrazolidones and aminophenols in an amount of from 0.1 to 0.005 mol per mol of silver in said at least one silver halide emulsion layer, said at least two types being a combination of developing agents wherein at least one of said dihydroxybenzenes or said ascorbic acids is present in combination with at least one of said 3-pyrazolidones or said aminophenols.

4,839,260

NOVEL POLYMETHINE DYES AND UV ABSORBERS AND IMAGING MATERIALS FOR THEIR USE

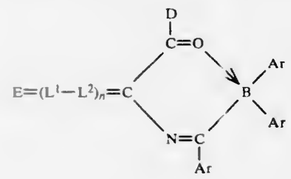
Margaret E. Logan, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 30, 1987, Ser. No. 67,842

Int. Cl.[4] G03C 1/71, 1/12, 1/40, C07F 5/02

U.S. Cl. 430—281 **18 Claims**

1. A polymethine dye or ultraviolet absorber of the formula:



where

Ar is independently in each occurrence an aromatic nucleus containing from 6 to 10 ring carbon atoms;

D is an oxy or amino group; and

E is chosen from the class consisting of

(i) a heterocyclic nucleus comprised of a five or six membered heterocyclic ring containing at least one heteroatom chosen from the class consisting of nitrogen and chalcogen and

(ii) an aminomethine group;

L^1 and L^2 are methine groups; and

n is the integer 0, 1, or 2.

17. A photographic imaging system comprised of

an imaging dye or precursor thereof,

a hardenable organic component containing ethylenic unsaturation sites and capable of imagewise modulating mobility of said dye or dye precursor as a function of addition at the sites of ethylenic unsaturation, and

coinitiators for ethylenic addition comprised of

an azinium salt activator and

a polymethine dye or ultraviolet absorber according to claim 1.

4,839,261

PHOTOCURABLE LAMINATE

Nobuo Nakazaki; Hideo Ai, and Manabu Miyao, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 15, 1987, Ser. No. 96,479

Claims priority, application Japan, Sep. 29, 1986, 61-231058; Jul. 7, 1987, 62-169507; Jul. 7, 1987, 62-169508

Int. Cl.[4] G03C 5/00, 1/68, 1/71, 1/76

U.S. Cl. 430—313 **24 Claims**

1. A process for forming electroless copper plating patterns comprising:

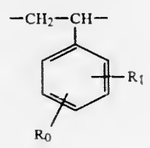
(a) laminating a substrate with a photocurable laminate,

(b) exposing said photocurable laminate to a high energy ray,

(c) removing unexposed parts of the laminate, and

(d) electrolessly plating a desired part of the laminate with copper;

wherein said photocurable laminate comprises a photocurable layer and a film-shaped substrate capable of substantially transmitting high-energy rays, said photocurable layer comprises (a) 100 parts by weight of a compound having recurring units represented by the following formulae [A] and [B]



[A]

[B]

wherein R_0 is a vinyl group, an epoxy group or an episulfide group; R_1 is a hydrogen atom, an alkyl group of 1 to 6 carbon atoms or a halogen atom; and R_1 and R_0 are attached to the position ortho, meta or para to the carbon atom of the main chain; and wherein W, X, Y and Z are each a hydrogen atom, a halogen atom, a cyano group, an alkyl group of 1 to 6 carbon atoms, a halogenated alkyl group of 1 to 6 carbon atoms, an aryl group of 6 to 30 carbon atoms substituted with alkyl or halogenated alkyl groups of 1 to 6 carbon atoms, an aryl group of 6 to 30 carbon atoms substituted with silicon-containing groups, an aryl group of 6 to 30 carbon atoms, —$COOR_2$, —COR_2, —O—COR_2 (R_2 is an alkyl or halogenated alkyl group of 1 to 12 carbon atoms, an aryl group of 6 to 30 carbon atoms substituted with alkyl or halogenated alkyl groups of 1 to 6 carbon atoms, an aryl group of 6 to 30 carbon atoms substituted with silicon-containing groups, or an aryl group of 6 to 30 carbon atoms), a nitro group, a silicon-containing group, or a substituent having heterocyclic rings substituted with at least one R_3 (R_3 is a hydrogen atom, a hydroxyl group, a carboxyl group, a halogen atom, a nitro group, an amino group, a cyano group, an alkyl or halogenated alkyl group of 1 to 6 carbon atoms, an aryl group of 6 to 30 carbon atoms or a silicon-containing group) and (b) 5 to 1,000 parts by weight of a compound, which is compatible with compound (a), having a group represented by the formula

$$—(R_4)_n$$

wherein R_4 is a group having a double bond and n is an integer of 1 to 50 and characterized by a viscosity at 20° C. of from 0.001 to 500 poises.

4,839,262

BLEACH-ACCELERATING COMPOSITIONS COMPRISING SORBITAN ESTER COMPOUNDS AND USE THEREOF IN PHOTOGRAPHIC COLOR PROCESSING

Paul A. Schwartz, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 1, 1988, Ser. No. 162,437

Int. Cl.[4] G03C 5/50, 5/44

U.S. Cl. 430—379 **20 Claims**

1. A bleach-accelerating composition that is useful in color reversal photographic processing, said composition comprising a bleach-accelerating agent and, as a scum-preventing agent, an ethyleneoxy-substituted fatty acid ester of sorbitan.

4,839,263

METHOD OF FORMING DYE IMAGE HAVING SUPERIOR RAPID PROCESSING PERFORMANCE

Masanobu Miyoshi; Makoto Kajiwara; Kaoru Onodera, all of Odawara, and Eiichi Sakamoto, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

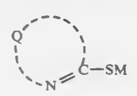
Filed Jul. 29, 1987, Ser. No. 79,220

Claims priority, application Japan, Jul. 31, 1986, 61-180974

Int. Cl.[4] G03C 5/26, 1/30, 1/34

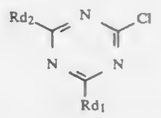
U.S. Cl. 430—384 **11 Claims**

1. A method of forming a dye image comprising a step of imagewise exposing a light-sensitive silver halide photographic material which comprises a support and, provided thereon, at least one silver halide emulsion layer, said silver halide emulsion layer containing silver halide grains containing 90 mole % or more of silver chloride, a dye-forming coupler and a compound represented by general formula;



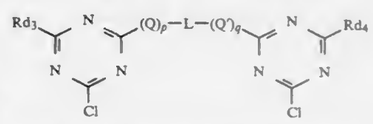
[S]

wherein Q is a group of atoms necessary to complete a 5- or 6-membered heterocyclic ring or a 5- or 6-membered ring fused with a benzene ring and M is a hydrogen atom, an alkali metal or an ammonium group; and said silver halide emulsion layer having been hardened by a hardener represented by formula [HDA] or [HDB];



[HDA]

wherein Rd, is selected from the group consisting of a chlorine atom, a hydroxyl group, an alkyl group, an alkoxy group, an alkylthio group, an -OM group, wherein M is an mono-valent metal atom, a -NR'R" group, wherein R' and R" are independently selected from the group consisting of a hydrogen atom, an alkyl group and an aryl group and a —NHCOR'" group, in which R'" is selected from the group consisting of a hydrogen atom, an alkyl group and an aryl group; Rd_2 is selected from the group consisting of a hydroxyl group, an alkyl group, an alkoxy group, an alkylthio group, an -OM group, wherein M is an mono-valent metal atom, a -NR'R" group, wherein R' and R" are independently selected from the group consisting of a hydrogen atom, an alkyl group and an aryl group and a —NHCOR'" group, in which R'" is selected from the group consisting of a hydrogen atom, an alkyl group and an aryl group;



[HDB]

wherein Rd_3 and Rd_4 are independently selected from the group consisting of a chlorine atom, a hydroxyl group, an alkyl group, an alkoxy group and an -OM group, in which is a monovalent metal atom; Q and Q' is a divalent atom or group selected from —O—, —S— and —NH—; L is an alkylene group or an arylene group; and p and q are independently integers of 0 or 1; and a step of processing said imagewise exposed photographic material with a color developing solution which contains a sulfite ion in a quantity of 2×10^{-4} to 1×10^{-2} mole/-liter and is substantially free of bromide ion.

4,839,264

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Shuji Kida; Yutaka Kaneko; Kenji Kadokura; Shinji Yoshimoto, and Kosaku Masuda, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 880,925, Jul. 1, 1986, abandoned. This application Nov. 18, 1987, Ser. No. 124,401

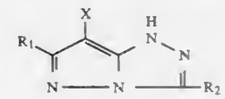
Claims priority, application Japan, Jul. 4, 1985, 60-147456

Int. Cl.[4] G03C 7/38, 1/46

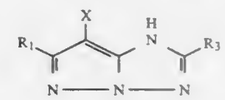
U.S. Cl. 430—505 **14 Claims**

1. A silver halide photographic material containing at least one coupler of formula [II], [III], [IV], [V], [VI], or [VII] and at least one compound of formula [XII]:

Formula [II]

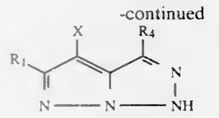


Formula [III]

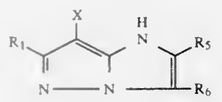


-continued

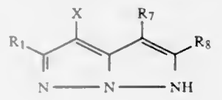
Formula [IV]



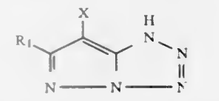
Formula [V]



Formula [VI]

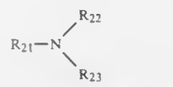


Formula [VII]



wherein R_1 and R_8 each is a hydrogen atom or a monovalent substituent, and X is a hydrogen atom or a substituent cabable of being released upon reaction with the oxidation product of a color developing agent; and R is a hydrogen atom or a substituent;

Formula [XII]



wherein R_{21} represents a hydrogen atom or a group selected from the group consisting of an alkyl group, an alkenyl group, a cycloalkyl group and aryl group; R_{22} and R_{23} independently represent a group selected from the group consisting of an alkyl group, an alkenyl group, a cycloalkyl group and an aryl group.

4,839,265

SILVER HALIDE PHOTOSENSITIVE MATERIAL CONTAINING AN INFRARED ABSORPTION DYE

Shigeru Ohno; Yuji Mihara, and Keiichi Adachi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

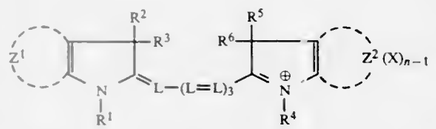
Continuation of Ser. No. 894,017, Aug. 7, 1986, abandoned. This application Jan. 19, 1988, Ser. No. 147,571

Claims priority, application Japan, Aug. 8, 1985, 60-174940

Int. Cl.[4] G03C *1/84*

U.S. Cl. 430—522 **18 Claims**

1. A silver halide photosensitive material which comprises a support, at least one silver halide photosensitive layer and a hydrophilic colloid layer wherein at least one of said layers contains 10^{-3} g/m^2 to 1 g/m^2 of at least one dye represented by formula (I):



wherein R^1, R^2, R^3, R^4, R^5, and R^6, which may be the same or different, each represents a substituted or unsubstituted alkyl group, and Z^1 and Z^2 each represents a group of non-metallic atoms necessary for the formation of a substituted or unsubstituted benzo-condensed ring or naptho-condensed ring, with a proviso that R_1, R^2, R^3, R^4, R^5, R^6, Z^1 and Z^2 represent those groups which permit the dye molecule to have at least three acid radicals; L represents a substituted or unsubstituted methine group; X represents an anion; and n represents 1 or 2, n being 1 when the dye forms an inner salt.

4,839,266

RECORDING SYSTEM FOR IRRADIATION THERAPY

Gunther Demuth, Langen, Fed. Rep. of Germany, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 24, 1987, Ser. No. 17,890

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1986, 3614476

Int. Cl.[4] G03C *1/02, 5/16, 1/94*

U.S. Cl. 430—524 **9 Claims**

1. Recording system for verification and documentation in X-ray irradiation therapy with photon energies greater than 1 MeV, whereby the recording is made by the therapeutic irradiation throughout the period of irradiation comprising

(a) a photographic recording material having at least one silver halide emulsion layer, and

(b) at least one metal foil in contact with at least one silver halide layer,

characterized in that the photographic recording material contains silver halide grains having an average size of 0.05 to 0.34 μm, a maximum silver coating weight of 5 g Ag/m^2, and a narrow grain size distribution so that when the material is exposed with radiation of a wavelength range of 430 to 550 nm an average gradation of at least 4 in the density range of 0.5 to 2.0 is produced, and that the at least one metal foil contains one or more metals having an atomic number in the range of 22 to 50.

4,839,267

COLOUR PHOTOGRAPHIC MOTION PICTURE ELEMENT

Marcel J. Monbaliu, Mortsel, and Paul L. Van Meerbeeck, Hulshout, both of Belgium, assignors to AGFA-Gevaert, N.V., Mortsel, Belgium

Filed Oct. 21, 1987, Ser. No. 110,798

Claims priority, application European Pat. Off., Nov. 21, 1986, 86202066.6

Int. Cl.[4] G03C *1/38, 7/34, 7/24*

U.S. Cl. 430—546 **7 Claims**

1. Photographic element comprising a support and a plurality of photosensitive silver halide emulsion layers for forming a multicolour photographic dye image and an integral, infrared-absorbing, dye sound track, one of said photosensitive silver halide emulsion layers or a non-photosensitive hydrophilic colloid layer in water-permeable relationship therewith comprising at least one dispersed 1-hydroxy-2-N-(5-ballasted-thiazol-2-yl)-naphthamide coupler capable of forming an infrared-absorbing quinone imine dye by reaction with an oxidized aromatic primary amino developing agent, said naphthamide coupler having been dispersed in said emulsion layer or in said colloid layer with the aid of at least one water-immiscible, high-boiling, oil-type solvent or oil-former, wherein said naphthamide coupler at the 4-position of its thiazol-2-yl ring bears a phenyl group and said water-immiscible, high-boiling, oil-type solvent or oil-former is a hydrocarbon.

4,839,268

SILVER HALIDE COLOR REVERSAL PHOTOSENSITIVE MATERIAL

Shinsuki Bando, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 22, 1987, Ser. No. 136,592

Claims priority, application Japan, Dec. 22, 1986, 61-306028

Int. Cl.[4] G03C *1/02, 5/50, 7/30, 7/26*

U.S. Cl. 430—567 **19 Claims**

1. A silver halide color reversal photosensitive material

comprising a plurality of silver halide emulsion layers on a substrate, wherein 50% or more of the total projected area of silver halide grains contained in at least one of said silver halide emulsion layers is occupied by tabular silver iodobromide grains having an average thickness of 0.5 micron or less, an average diameter of 0.5 micron or more, an average aspect ratio of at least 5/1, and a silver iodide content of 4.0 mol % or less, and said tabular silver iodobromide grains are negative-type silver halide grains forming a latent image mainly inside the grains.

4,839,269

LIGHT-RESPONSIVE MATERIAL CONTAINING A DYE COMPRISING TWO CYCLODEXTRIN GROUPS

Masaki Okazaki, and Junichi Yamanouchi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 17, 1987, Ser. No. 97,894

Claims priority, application Japan, Sep. 17, 1986, 61-219017

Int. Cl.[4] G03C *1/02, 1/08, 1/12, 1/19*

U.S. Cl. 430—570 **12 Claims**

1. A light-responsive material comprising a lightsensitive material containing therein a dye containing two or more cyclodextrin groups or derivatives thereof.

4,839,270

RAPIDLY PROCESSABLE SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Takaaki Kojima, and Mitsuhiro Okumura, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 31, 1987, Ser. No. 80,298

Claims priority, application Japan, Aug. 13, 1986, 61-189926; Aug. 14, 1986, 61-191104

Int. Cl.[4] G03C *1/19, 1/34*

U.S. Cl. 430—583 **12 Claims**

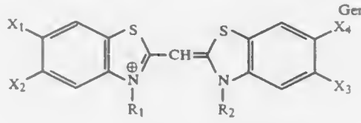
1. A silver halide photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer comprising

(a) silver halide grains comprising not less than 95 mol % of silver chloride,

(b) at least one optical sensitizing dye represented by the following general formula I, and

(c) at least one compound represented by the following general formula II:

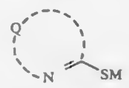
General formula I



$(X^{\ominus})_n$

wherein X_1, X_2, X_3 and X_4 are a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, an aryl group or a hydroxy group; R_1 and R_2 are an alkyl group; $X^{\ominus}$ is a counter anion and n is 0 or 1,

General formula II



wherein Q is an atomic group necessary for completing a five-membered heterocylic ring, a five-membered heterocylic ring condensed with a benzene ring or a 1,3,5-triazine ring and M is a hydrogen atom, an alkali atom or an ammonium group.

4,839,271

DIRECT POSITIVE DIMETHINE CYANINE DYES CONTAINING 1-ARYL-2-HETEROARYL INDOLE NUCLEUS

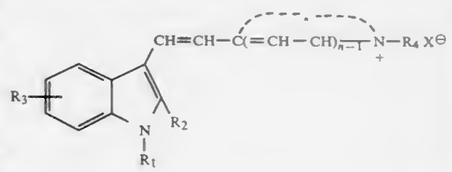
Thomas D. Weaver, Rochester, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 26, 1987, Ser. No. 66,552

Int. Cl.[4] G03C *1/00, 1/02*

U.S. Cl. 430—596 **3 Claims**

1. A fogged direct-positive photographic silver halide emulsion containing a sensitizing amount of at least one cyanine dye of the following general formula:



wherein

R_1 is an aryl group of 6 to 10 carbon atoms;

R_2 is a heterocyclic azaaryl group selected from the group consisting of pyridyl, methyl substituted pyridyl and quinolyl;

R_3 is a member selected from the group consisting of a hydrogen atom, an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, an aryloxy group of 6 to 10 carbon atoms, a halogen atom and a nitro group;

R_4 is a member selected from the group consisting of an alkyl group of 1 to 4 carbon atoms; an alkyl group of 1 to 4 carbon atoms substituted with a member selected from the group consisting of halogen, nitrile, sulfonate, sulfate, hydroxyl, alkoxy and carboxy; an alkenyl group of 1 to 4 carbon atoms and an aryl group of 6 to 10 carbon atoms;

n is a positive integer of from 1 to 2;

X is an acid anion; and

Z is the non-metallic atoms necessary to complete a desensitizing nucleus containing from 5 to 6 atoms in a heterocyclic ring.

4,839,272

HEAT-DEVELOPABLE PHOTOSENSITIVE MATERIAL

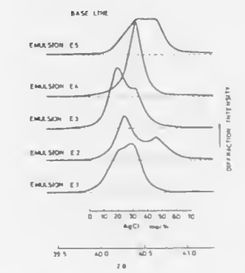
Hideki Ohmatsu, and Hiroyuki Hirai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 27, 1987, Ser. No. 30,647

Claims priority, application Japan, Mar. 28, 1986, 61-70056

Int. Cl.[4] G03C *1/50*

U.S. Cl. 430—617 **10 Claims**



1. In a heat-developable photosensitive material comprising at least a silver halide emulsion, a reducing agent for the silver halide emulsion, and a binder on a support, the improvement

wherein at least a portion of said silver halide emulsion is an emulsion of silver halide grains having a distinct double-layered structure in the grain interior and an average grain size of at least 0.3 μm, and the photosensitive material further comprises at least one member selected from the group consisting of compounds having the general formula (I) and (II):

wherein Ball contains at least 8 carbon atoms and is selected from the group consisting of an alkyl radical, an acylamino radical, an acyl radical, an acyloxy radical, an alkoxy radical, an alkylthio radical, and radicals as represented by the general formulae (A) and (B),

(A) $-(L)_m-CONR^3-Ball$

(B) $-SO_2NR^3Ball$

wherein R^3 is hydrogen, an alkyl radical, a cycloalkyl radical or an aryl radical, L is an alkylene radical, a phenylene radical, or a divalent arylthio radical, m is equal to 0 or 1, Ball represents an organic ballast radical capable of rendering the compounds of these formulae non-diffusible, all radicals represented by Ball being substituted or unsubstituted with the proviso that Ball may be absent when R is a non-diffusible radical;

Y represents a group of carbon atoms necessary to complete a bezene or naphthalene nucleus;

R^1 is selected from the group consisting of a substituted or unsubstituted alkyl, cycloalkyl, aralkyl, aryl, amino, and heterocyclic radical;

R^2 is selected from the group consisting of hydrogen, a halogen atom, a substituted or unsubstituted alkyl, cycloalkyl, aralkyl, aryl, heterocyclic, alkoxy, aryloxy, acyl, alkyloxycarbonyl, arylosycarbonyl, carbamoyl, sulfamoyl, alkylsulfonyl, arylsulfonyl, acylamino, alkylthio, and arylthio radical; and

n is an integer having a value of 0 to 5;

wherein when n is 2 to 5, a corresponding plurality of R^2 may be the same or different and may be combined together to form a ring, and

when Y represents a group of carbon atoms necesary to complete a naphthalene nucleus, Ball and R^2 may be attached to either of the thus formed rings.

4,839,273

PROCESS FOR THE DEVELOPMENT OF SILVER HALIDE PHOTOGRAPHIC MATERIAL

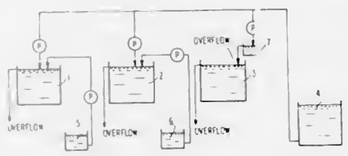
Minoru Yamada; Takashi Toyoda, and Kunio Seto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 2, 1987, Ser. No. 103,874

Claims priority, application Japan, Oct. 2, 1986, 61-233295

Int. Cl.[4] G03C *1/02, 5/24, 5/38, 11/00*

U.S. Cl. 430—634 **14 Claims**



1. A process for development, fixing, and washing or stabilization of a silver halide photographic light-sensitive material by means of an automatic developing machine, which process comprises:

(1) developing and/or fixing said photographic light sensitive material in a developing bath and/or a fixing bath supplied with:

(a) a concentrated developing solution and/or a concentrated solution having a fixing capacity, respectively, and

(b) water which has been treated by at least one antifungal means selected from the group consisting of irradiation with ultraviolet rays, irradiation with magnetic fields, processing with ion exchange resins, and incorporation of at least one compound selected from the group consisting of aminopolycarboxylic acids and phosphonic acids, and

(2) washing or stabilizing said silver halide photographic light-sensitive material with said water treated with antifungal means or with a combination of said water treated with antifungal means and/or wash water or a stabilizing solution, wherein the amount of washing water or stabilizing solution used is 3 l or less (including 0 l) per 1 m^2 of said silver halide photographic light-sensitive material.

4,839,274

NOVEL POLYMETHINE DYES AND UV ABSORBERS CONTAINING A TRIARYLBORYLISOCYANO GROUP AND IMAGING COMPOSITIONS CONTAINING THESE DYES

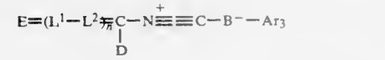
Margaret E. Logan, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 30, 1987, Ser. No. 67,841

Int. Cl.[4] G03C *1/71, 1/12, 1/40;* **C07F** *5/02*

U.S. Cl. 430—281 **18 Claims**

1. A polymethine dye or ultraviolet absorber of the formula:



where

Ar is independently in each occurrence an aromatic nucleus containing from 6 to 10 ring carbon atoms;

D is an electron withdrawing group having a cyano, sulfo, or carbonyl group;

E is chosen from the class consisting of

(i) a heterocyclic nucleus comprises of a five or six membered heterocyclic ring containing at least one heteroatom chosen from the class consisting of nitrogen and chalcogen and

(ii) an aminomethine group;

L^1 and L^2 are methine groups; and

n is the integer 0, 1, or 2.

17. A photographic imaging system comprised of

an imaging dye or precursor thereof,

a hardenable organic component containing ethylenic unsaturation sites and capable of imagewise modulating mobility of said dye or dye precursor as a function of addition at the sites of ethylenic unsaturation, and

coinitiators for ethylenic addition comprised of

an azinium salt activator and

a polymethine dye according to claim 1.

4,839,275

CIRCULATING ANTIGENS OF DIROFILARIA IMMITIS, MONOCLONAL ANTIBODIES SPECIFIC THEREFOR AND METHODS OF PREPARING SUCH ANTIBODIES AND DETECTING SUCH ANTIGENS

Gary J. Weil, Creve Coeur, Mo., assignor to The Jewish Hospital, St. Louis, Mo.

Continuation-in-part of Ser. No. 730,728, May 6, 1985, which is a continuation of Ser. No. 557,117, Dec. 1, 1983, abandoned.

This application Dec. 30, 1985, Ser. No. 814,684

Int. Cl.[4] G01N *33/535;* **A61K** *39/2;* **C07K** *15/00*

U.S. Cl. 435—7 **14 Claims**

7. An assay method for determining the presence of circulating parasite antigens of *Dirofilaria immitis* in the serum of plasma of *D. immitis*-infected dogs which comprises combining a sample of serum or plasma from a dog infected with *Dirofilaria immitis* and to which no parasite antigen or extract derived from *D. immitis* is added with a first antibody bound to the surface of a solid support, adding thereto a conjugate composed of a second antibody and an enzyme and thereafter adding an enzyme substrate to indicate the presence of absence of said circulating parasite antigens in said sample.

4,839,276

INTERFERENCE - RESISTANT LIPOSOME SPECIFIC BINDING ASSAY

Robert H. Adolfsen, Montrose; Eddie Hedaya, Hartsdale; C. Lam Mak, Valley Cottage, and Moshe Schwarzberg, Hastings-on-Hudson, all of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Dec. 5, 1984, Ser. No. 678,531

Int. Cl.[4] G01N *33/53, 33/543, 33/554*

U.S. Cl. 435—7 **20 Claims**

1. A liposome immunoassay method for determining analyte in a sample with reduced interference from endogenous species comprising the steps of:

(a) mixing with said sample to form a reaction mixture:

(i) a first liposome containing an encapsulated marker or component of a marker system and a first ligand or ligand analogue of said analyte incorporated into the membrane of said liposome to provide a first binding domain;

(ii) a binding partner reactive with said analyte and said first binding domain of said first liposome;

(iii) at least one substrance which modifies the permeability of said first liposome in response to binding of said ligand or ligand analogue and said binding partner; and

(iv) a second liposome comprising a protein or second ligand analogue of said analyte incorporated into the membrane of said second liposome to provide at least one second binding domain non-cross-reactive with said first binding domain for said binding partner;

(b) incubating said reaction mixture, wherein binding of said endogenous species to said at least one second binding domain reduces the amount of interfering species which bind to said first liposome;

(c) measuring said marker from first liposomes displaying modified permeability in response to said at least one substance; and

(d) relating said measurement to the determination of said analyte.

4,839,277

METHOD FOR PURIFICATION OF HBC ANTIGEN AND METHOD FOR MEASUREMENT OF HBC ANTIBODY BY USING SAID PURIFIED HBC ANTIGEN

Keishin Sugahara; Takayuki Imamura, both of Kumamoto; Fukusaburo Hamada, Nishigoshi; Nobuya Ohtomo, Kumamoto; Haruo Fujita, Kumamoto, and Kazuhide Yagami, Kumamoto, all of Japan, assignors to Juridical Foundation The Chemo-Sero-Therapeutic Research Institute, Kumamoto, Japan

Filed Dec. 20, 1985, Ser. No. 811,399

Claims priority, application Japan, Dec. 21, 1984, 59-271432; Mar. 14, 1985, 60-51578

The portion of the term of this patent subsequent to Sep. 16, 2003, has been disclaimed.

Int. Cl.[4] C12P *21/00;* **G01N** *33/576*

U.S. Cl. 435—7 **11 Claims**

11. In a method for measuring hepatitis B virus core antibody comprising contacting the sample with a hepatitis B virus core antigen and determining the presence of hepatitis B virus core antibody according to a passive hemagglutination method, an enzyme immunoassay method, or a radioimmunoassay method, wherein the improvement comprises using a purified hepatitis B core antigen obtained by treating a solution containing the hepatitis B core antigen which is expressed in a transformed yeast obtained by a DNA recombination technique with an acid, and then subjecting the acid-treated solution to an ion exchange chromatography with an anion exchanger.

4,839,278

INTEGRAL MULTILAYER ANALYTICAL ELEMENT FOR MEASUREMENT OF ALKALINE PHOSPHATASE ACTIVITY

Kaoru Terashima; Takushi Miyazako, and Harumi Katsuyama, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 22, 1986, Ser. No. 866,349

Claims priority, application Japan, May 23, 1985, 60-111187

Int. Cl.[4] C12Q *1/42;* **G01N** *31/22*

U.S. Cl. 435—21 **12 Claims**

1. An integral multilayer analytical element for the measurement of alkaline phosphatase activity, which comprises a porous spreading layer containing a self-developable substrate in response to contact with alkaline phosphatase, a buffer layer containing a diffusion-resistant basic polymer containing a repeating unit having a tertiary amine structure and a support in a laminated form with said buffer layer being positioned between said porous spreading layer and said support.

4,839,279

METHOD FOR THE QUANTITATIVE DETERMINATION OF PHYSIOLOGICAL COMPONENTS IN BIOLOGICAL FLUIDS

Akira Kosaka, Seto; Sawao Murao, Sakai; Kenichi Hirano, Iwakura; Noriaki Tanaka, Sakai, and Kuniyoshi Matsunaga, Ichinomiya, all of Japan, assignors to Amano Pharmaceutical Co., Ltd., Japan

Division of Ser. No. 436,385, Oct. 25, 1982, Pat. No. 4,554,249. This application Jun. 27, 1985, Ser. No. 749,425

Claims priority, application Japan, Feb. 18, 1982, 57-25613; Jul. 23, 1982, 57-127632; Jul. 23, 1982, 57-127633

Int. Cl.[4] C12Q *1/25;* **G01N** *33/48*

U.S. Cl. 435—25 **16 Claims**

1. A method for differential determination of bilirubin in biological fluids, comprising the steps of:

allowing bilirubin oxidase produced by a microorganism of the genus Myrothecium to act on an aliquot of a biological fluid to determine conjugated bilirubin in the biological fluid, allowing an enzyme selected from the group consisting of bilirubin oxidase and laccase, together with at least one reaction accelerator selected from the group consisting of surface active agents, aromatic carboxylic acids, sulfa drugs and proteases to act on another aliquot of said biological fluid for a sufficient amount of time to react with both conjugated and unconjugated bilirubins without the formation of hydrogen peroxide to determine the total bilirubin in the biological fluid, whereby conjugated and unconjugated bilirubins are determined differentially.

4,839,280

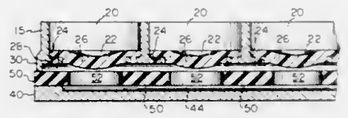
APPARATUS FOR APPLYING STRESS TO CELL CULTURES

Albert J. Banes, 2021 Bivins Rd., Durham, N.C. 27712

Division of Ser. No. 46,440, May 4, 1987, Pat. No. 4,789,601. This application Apr. 11, 1988, Ser. No. 180,168

Int. Cl.[4] C08G *77/04;* **C12M** *1/00*

U.S. Cl. 435—285 **5 Claims**



1. An apparatus for applying stress to cell cultures comprising: at least one cell culture plate having one or more wells

thereon, with each of said wells having a substantially planar base formed at least partially of an elastomeric membrane made of a biocompatible polyorganosiloxane composition, with said elastomeric membrane having an upper surface treated to permit cell growth and attachment thereto by means of the incorporation at said upper surface of a substance selected from the group consisting of an amine, a carboxylic acid, or elemental carbon, and vacuum means for controlling subjecting said elastomeric membrane to the pulling force of a vaccum.

4,839,281

LACTOBACILLUS STRAINS AND METHODS OF SELECTION

Sherwood L. Gorbach, Chestnut Hill, and Barry R. Goldin, W. Newton, both of Mass., assignors to New England Medical Center Hospitals, Inc., Boston, Mass.

Filed Apr. 17, 1985, Ser. No. 724,114
Int. Cl.[4] C12Q *1/04*; C12N *1/36, 1/20*; C12R *1/225*
U.S. Cl. 435—34 **6 Claims**

1. A biologically pure culture of bacteria of a Lactobacillus species, said bacteria being characterized in that they have the same ability to attach mucosal cells of the human intestinal tract as that exhibited by the Lactobacillus bacteria deposited in the American Type Culture Collection and given ATCC Accession No. 53103.

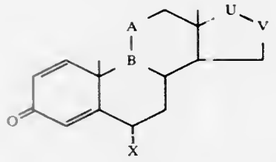
4,839,282

PREPARATION OF 3-OXO-$\Delta^{1,4}$-STEROIDS

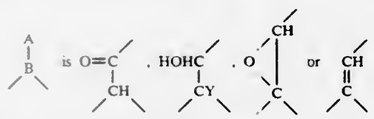
Alfred Weber, and Mario Kennecke, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Continuation of Ser. No. 561,510, Dec. 15, 1983, abandoned, which is a continuation of Ser. No. 334,045, Dec. 23, 1981, abandoned. This application Dec. 17, 1985, Ser. No. 809,810
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3049399
Int. Cl.[4] C12P *33/02, 33/16*
U.S. Cl. 435—61 **6 Claims**

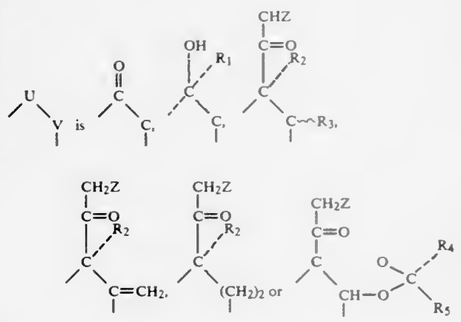
1. A process for the preparation of a 3-oxo-$\Delta^{1,4}$-steroid of the formula



wherein X is hydrogen, chlorine, fluorine or methyl,



wherein Y is hydrogen, fluorine, or chlorine, and



wherein

Z is hydrogen, hydroxy, fluorine, or chlorine,

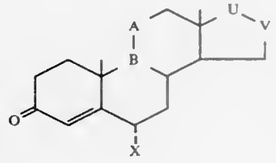
R_1 is hydrogen or an alicyclic hydrocarbon residue of 1–4 carbon atoms,

R_2 is hydrogen, hydroxy, alkyl of 1–6 carbon atoms optionally interrupted by an oxygen atom or a sulfur atom, alkanoyloxy of 1–6 carbon atoms, or benzoyloxy,

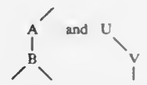
R_3 is hydrogen, hydroxy or methyl, and

R_4 and R_5 each independently is alkyl or 1–4 carbon atoms, comprising

fermenting a corresponding 3-oxo-Δ^4-steroid of the formula



wherein X,



are as defined above, or a 21-ester thereof with an alkanecarboxylic acid of 1–6 carbon atoms, with a living culture of *Arthrobacter simplex* in the presence of 0.04 g to 0.12 g of cobalt(II) ions per liter of culture broth.

4,839,283

METHOD OF EXPRESSING ALPHA-1-ANTITRYPSIN IN YEAST

Glenn H. Kawasaki, and Richard Woodbury, both of Seattle, Wash., assignors to ZymoGenetics, Inc., Seattle, Wash.

Filed Dec. 30, 1986, Ser. No. 946,640
Int. Cl.[4] C12N *5/00, 15/00*; C12P *21/00*
U.S. Cl. 435—68 **5 Claims**

1. A method of producing a polypeptide having the protease inhibition activity of humane alpha-1-antitrypsin, comprising the steps of transforming a DNA transfer vector into a yeast culture comprising cells of the mutant strain GK-100 and growing said culture under conditions suitable for expression of said polypeptide, said vector comprising a segment coding

for human alpha-1-antitrypsin and a promoter capable of controlling expression of said polypeptide in said yeast culture.

4,839,284

MURINE HOST-VECTOR SYSTEM CAPABLE OF AMPLIFYING AND EXPRESSING TRANSFECTED GENES

Francis G. Kern, Rutherford, N.J., assignor to New York University, New York, N.Y. and Claudio Basilico, New York, N.Y.

Filed May 16, 1985, Ser. No. 349,220
Int. Cl.[4] C12P *21/00*; C12N *15/00, 5/00*; C07H *15/12*
U.S. Cl. 435—68 **17 Claims**

1. A method for amplifying transfected genes which comprises:

providing a host cell transfected with a first plasmid comprising the region of virus DNA that codes for a temperature-sensitive large T antigen and a non-functional origin of replication for said virus;

transfecting said host cell with a second plasmid comprising a selectable marker gene, a functional origin of replication for said virus, and a gene directing the production of a desired protein,

selecting a host cell containing said second plasmid on the basis of said selectable marker gene;

exposing and maintaining the selected host cells at a first predetermined temperature at which said cells express non-functional virus large T antigen thereby impeding replication and excision of said second plasmid; and

shifting and maintaining the selected host cells to a second predetermined temperature at which said cells express functional viral large T antigen thereby inducing excision and replication of said second plasmid.

4,839,285

METHOD FOR PRODUCTION OF CYTIDINE AND/OR DEOXYCYTIDINE

Satoru Asahi; Yutaka Tsunemi, both of Suita, and Muneharu Doi, Takarazuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 25, 1985, Ser. No. 802,344
Claims priority, application Japan, Dec. 6, 1984, 59-258788
Int. Cl.[4] C12P *19/38*; C12R *1/07*; C12N *15/00*
U.S. Cl. 435—87 **10 Claims**

1. A method for the production of cytidine and/or deoxycytidine, which comprises culturing a cytidine deaminase activity-defective microorganism of *Bacillus subtilis* selected from the group consisting of *Bacillus subtilis* AU-50 (FERM BP-907), *Bacillus subtilis* FU-11 (FERM BP-908), *Bacillus subtilis* 6AU-500 (FERM BP-909) and *Bacillus subtilis* 2TU-200 (FERM BP-910), having resistance to at least one member selected from the group consisting of 6-azauracil, 2-thiouracil, 5-fluorouracil, 5-fluoroorotic acid, and their ribosides and ribotides, and with ability to produce cytidine and/or deoxycytidine, in a culture medium to obtain cytidine and/or deoxycytidine produced and accumulated in the culture medium.

4,839,286

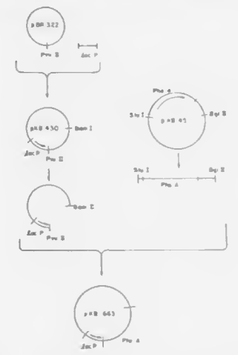
METHOD OF BIOSYNTHESIS AND CELLS THEREFOR

Keith C. Backman, Bedford, Mass., assignor to Biotechnica International, Inc., Cambridge, Mass. and H. J. Heinz Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 540,190, Oct. 7, 1983, abandoned. This application Sep. 24, 1984, Ser. No. 653,193
Int. Cl.[4] C12P *13/22*; C12N *1/20, 15/00*; C12R *1/19*
U.S. Cl. 435—108 **10 Claims**

1. An expression vector for transforming a host bacterial cell and producing phenylalanine, said vector comprising:

(a) a pheA gene, said gene being free from naturally associated transcriptional regulatory sequences reducing transcription responsive to phenylalanine; and



(b) a promoter positioned to express said pheA gene, said promoter being heterologous to said gene and substantially insensitive to the presence of phenylalanine.

4,839,287

PROCESS FOR THE TRANSESTERIFICATION OF TRIGLYCERIDES IN AN AQUEOUS MICROEMULSION REACTION MEDIUM IN THE PRESENCE OF LIPASE ENZYME

Krister Holmberg, Molndal, and Eva Osterberg, Goteborg, both of Sweden, assignors to Berol Kemi AB, Stenungsund, Sweden

Filed Mar. 10, 1987, Ser. No. 24,282
Int. Cl.[4] C12D *7/62*
U.S. Cl. 435—135 **14 Claims**

1. A process for the rapid transesterification of triglycerides with fatty acids in the presence of lipase enzyme, which comprises tranesterifying a triglyceride with a fatty acid in the presence of lipase enzyme and in an aqueous microemulsion reaction medium comprising a water-immiscible hydrophobic component, a surface-active component, and water.

4,839,288

RETROVIRUS CAPABLE OF CAUSING AIDS, ANTIGENS OBTAINED FROM THIS RETROVIRUS AND CORRESPONDING ANTIBODIES AND THEIR APPLICATION FOR DIAGNOSTIC PURPOSES

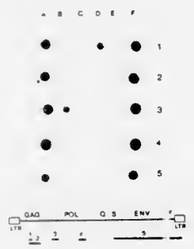
Luc Montagnier, Robinson; Denise Gueta rd, Paris; Francoise Brun-Vezinet, Paris, and Francois Clavel Paris, all of France, assignors to Institut Pasteur, Paris, France

Filed Mar. 3, 1986, Ser. No. 835,228

Claims priority, application France, Jan. 22, 1986, 86 00910; Jan. 22, 1986, 86 00911; Feb. 6, 1986, 86 01635; Feb. 13, 1986, 86 01985

Int. Cl.[4] C12Q *1/70;* C12N *7/02, 7/06;* A61K *39/21*

U.S. Cl. 435—235 48 Claims



1. A human retrovirus, wherein the retrovirus is Human Immunodeficiency Virus Type 2 (HIV-2) in a biologically pure form.

4,839,289

MONOCLONAL ANTIBODIES TO A BROAD RANGE OF MAMMALIAN TERMINAL DEOXYNUCLEOTIDYL TRANSFERASES

R. Graham Smith, Dallas, Tex., assignor to The Board of Regents of the University of Texas System Austin, Tex.

Filed Nov. 26, 1985, Ser. No. 802,039

Int. Cl.[4] C12N *5/00*

U.S. Cl. 435—240.27 2 Claims

1. A hybrid cell line derived from murine genus which produces a monoclonal antibody which specifically binds to an epitope on terminal deoxynucleotidyl transferase (TdT) derived from a group of mammalian cells consisting of cells of human, mouse, rat, rabbit and bovine origin; said cell lines on deposit with the American Type Culture Collection having A.T.C.C. deposit numbers HB 9178 (TdT1), HB 9179 (TdT2) and HB 9180 (TdT3).

4,839,290

PROCESS FOR PRODUCING CYTOTOXIC T-CELLS AND COMPOSITIONS PRODUCED BY SAID PROCESS

Takeji Kaieda; Kimimasa Yamada, and Nobukuni Yamawaki, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 678,415, Dec. 5, 1984, abandoned. This application Sep. 8, 1987, Ser. No. 96,259

Claims priority, application Japan, Dec. 5, 1983, 58-228496; May 29, 1984, 59-107605; Oct. 2, 1984, 59-205559; Oct. 5, 1984, 59-208066; Oct. 15, 1984, 59-214326; Oct. 15, 1984, 59-214327

Int. Cl.[4] C12N *5/00*

U.S. Cl. 435—240.23 8 Claims

1. A process for producing T cells cytotoxic to tumor cells comprising:

contacting leucocytes comprising T cells not cytotoxic to tumor cells with a water-insoluble material which binds to and induces T cells, said material comprising a water-insoluble carrier and a ligand covalently bonded to the surface of said carrier on its surface by means of a covalent bond wherein said ligand converts said T cells to activated T cells cytotoxic to tumor cells, for a time and under conditions sufficient to induce T cells cytotoxic to tumor cells, thereby converting said T cells to activated T cells cytotoxic to tumor cells; and

separating said leucocytes comprising said activated T cells from said water-insoluble, material, thus obtaining said activated T cells in substantially ligand-free form.

4,839,291

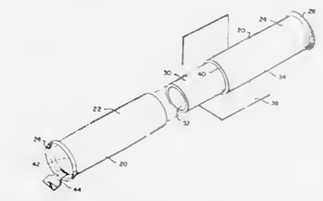
DISPOSABLE BIOLOGICAL INDICATOR TEST PACK FOR MONITORING STEAM AND ETHYLENE OXIDE STERILIZATION CYCLES

Jon D. Welsh, Fairview, and Denis G. Dyke, Edinboro, both of Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed May 15, 1987, Ser. No. 50,585

Int. Cl.[4] C12Q *1/22;* C12M *1/16*

U.S. Cl. 435—296 13 Claims



1. A device for monitoring the efficacy of steam and ethylene oxide sterilization cycles comprising:

a housing having an interior made of a material having heat sink, insulating and moisture absorbent properties, said housing being configured to define at least one tortuous path for entry of sterilant into said housing, said tortuous path having a moisture absorbent surface and being dimensioned to promote intimate contact between said sterilant and said surface as said sterilant moves along said tortuous path;

means for optionally providing an alternate path of entry of sterilant into said housing; and

a biological indicator within said housing which includes a calibration of microbes which are resistant to sterilization by steam and ethylene oxide.

4,839,292

CELL CULTURE FLASK UTILIZING A MEMBRANE BARRIER

Joseph G. Cremonese, 227 Maple Dr., Greensburg, Pa. 15601

Filed Sep. 11, 1987, Ser. No. 95,759

Int. Cl.[4] C12M *1/04*

U.S. Cl. 435—313 28 Claims

1. A cell culture flask comprising a hollow housing, a gas permeable and liquid impervious membrane disposed within said housing and dividing said housing into a first chamber and a second chamber, retaining means for removably securing said gas permeable membrane within said housing and forming a liquid-tight seal between said first chamber and said second chamber, a gas inlet into said housing and communicating with said first chamber for supplying gas thereto, and a media inlet into said housing and communicating with said second chamber for supplying cell growth media thereto.

25. An apparatus for cell culture growth comprising:

a cell culture flask including a hollow housing, a gas permeable and liquid impervious membrane disposed within said housing and dividing said housing into a first chamber and a second chamber, a retaining means for removably securing said gas permeable membrane within said housing and forming a liquid-tight seal between said first chamber and said second chamber; a gas inlet into said housing and communicating with said first chamber for supplying gas thereto; and a media inlet into said housing and communicating with said second chamber for supplying cell growth media thereto;

an incubator for receiving one or more of said culture flasks, said incubator having means to permit gas exiting from said flask to exit said incubator, said incubator having means for supplying media to each of said flasks and said incubator having means for supplying gas to each of said flasks;

at least one gas source under pressure;

means for blending the gas and selectively controlling the gas flow to said flasks; and

a pump for depositing liquid media into said flasks.

4,839,293

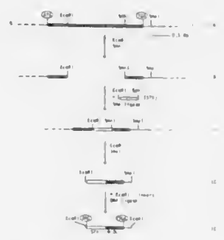
DNA ENCODING STREPTAVIDIN, STREPTAVIDIN PRODUCED THEREFROM, FUSED POLYPEPTIDES WHICH INCLUDE AMINO ACID SEQUENCES PRESENT IN STREPTAVIDIN AND USES THEREOF

Charles R. Cantor; Richard Axel, and Carlos Argarana, all of New York, N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Feb. 24, 1986, Ser. No. 833,324

Int. Cl.[4] C12N *15/00;* C12P *21/00, 21/02;* C07H *15/12*

U.S. Cl. 435—320 25 Claims



1. An isolated DNA molecule encoding streptavidin and comprising the nucleic acid coding sequence set forth in FIG. 3.

4,839,294

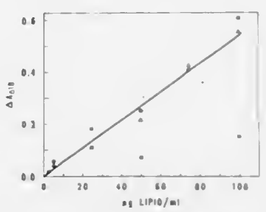
COLORIMETRIC ASSAY AND METHODS FOR USING SAME

Rami Almog, Albany; Carol Anderson-Samsonoff, Glenmont, and Donald S. Berns, Albany, all of N.Y., assignors to Health Research Inc., Albany, N.Y.

Filed Aug. 24, 1987, Ser. No. 88,627

Int. Cl.[4] G01N *33/92*

U.S. Cl. 436—71 11 Claims



9. An enzyme-free, non-hydrolyzing assay useful for evaluation of respective concentrations of anionic and zwitterionic phospholipids and total phospholipid content of a phospholipid-containing fluid, which comprises

forming a dye-detergent complex of a charged dye and an oppositely charged detergent, which complex when deposited onto support strata will interact with said support strata,

incubating the dye-detergent complex in an aqueous dispersion of phospholipid-containing fluid to form a dye-detergent-phospholipid colored solution,

separating the dye-detergent-phospholipid colored solution into a colored aqueous phase and a colored organic phase each phase exhibiting light absorbance, and

measuring the respective light absorbance of the aqueous and organic phases to determine the respective concentrations of anionic and zwitterionic phospholipids and the total phospholipid content of the fluid sample.

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4,839,295

MEASUREMENT OF PROTEIN USING BICINCHONINIC ACID

Paul K. Smith, Roscoe, Ill., assignor to Pierce Chemical Company, Rockford, Ill.

Continuation of Ser. No. 618,727, Jun. 8, 1984, abandoned. This application May 26, 1987, Ser. No. 53,708

Int. Cl.[4] G01N *33/68*

U.S. Cl. 436—86 **1 Claim**

1. A method for measuring protein concentration in a fluid containing protein comprising the steps of

(a) combining the fluid with an alkaline aqueous reagent system containing Cu^{++} and the ion of bicinchoninic acid, whereupon Cu^{++} is reduced to Cu^{+} in proportion to the amount of protein present in the fluid and said Cu^{+} so produced combined with said ion of bicinchoninic acid to form a purple colored complex;

(b) measuring the absorbance of said colored complex; and

(c) determining the protein concentration in the fluid by comparing the measured absorbance with the absorbance obtained on measurements of fluid samples containing known concentrations of protein.

4,839,296

BLOOD PLASMA TEST METHOD

Paul R. Kennedy, Warsaw; Ernest C. Adams, North Webster, and William E. Woenker, Pierceton, all of Ind., assignors to Chem-Elec, Inc., North Webster, Ind.

Filed Oct. 18, 1985, Ser. No. 788,793

Int. Cl.[4] G01N *21/78, 33/52*

U.S. Cl. 436—170 **10 Claims**

1. A process of testing whole blood to determine the concentration of certain plasma components thereof comprising the steps of:

treating an expanded hydrophobic polytetrafluoroethylene containing semipermeable membrane with a surfactant to make the membrane hydrophilic and capable of passing plasma components of whole blood while retaining cellular and particulate components of whole blood, the semipermeable membrane having pores which are made hydrophilic by treatment with the surfactant;

superposing the semipermeable membrane over a blood plasma component reactive area;

subjecting the semipermeable membrane to a whole blood sample so that plasma components of the sample pass through the membrane and onto the reactive area while cellular and particulate blood components are blocked by the membrane;

separating the polytetrafluoroethylene containing membrane from the reactive area; and

determining the concentration of plasma components in the sample by measuring the extent of any plasma component induced change in the reactive area.

4,839,297

TEST CARRIER AND METHOD FOR THE ANALYTICAL DETERMINATION OF A COMPONENT OF A BODY FLUID

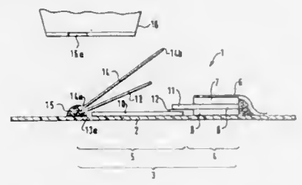
Helmut Freitag, Indianapolis, Ind.; Joachim Steinbiss, Darmstadt, and Anselm Rothe, Birkenau, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Nov. 9, 1987, Ser. No. 117,867

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1986, 3638654

Int. Cl.[4] G01N *33/52*

U.S. Cl. 436—170 **21 Claims**



1. Test carrier assembly for the analytical determination of a component of a body fluid, comprising a base layer and at least two planar test layers which, in the initial state of the assembly, before the determination is carried out, are separate from one another but can be contacted by external manipulation, wherein a first test layer and a second test layer are arranged on the base layer essentially next to one another but separated by a gap, and a capillary-active material contact element is movable between two positions, an initial position and a contacting position, with the initial position being located so that the contact element does not contact at least one of the test layers, and the contacting position being such that upon the application of external pressure the contact element assumes the contacting position to bridge the gap and contacts both test layers to permit liquid exchange thereinbetween.

4,839,298

VIRUS INACTIVATING DILUENTS USED IN IMMUNOASSAYS

John W. D. Kay, and Glen M. Ford, both of Raleigh, N.C., assignors to Akzo N.V., Arnhem, Netherlands

Continuation of Ser. No. 830,670, Feb. 14, 1986, abandoned, Continuation-in-part of Ser. No. 788,735, Oct. 17, 1985, abandoned. This application Jun. 30, 1987, Ser. No. 68,283

Int. Cl.[4] G01N *1/00*

U.S. Cl. 436—175 **19 Claims**

1. A virus inactivating diluent composition for preparing specimens for immunoassay, comprising a salt and a surfactant in amounts effective for inactivating viruses in said specimens without reducing the accuracy of the immunoassay, wherein the diluent composition has an ionic strength of from about 21 to about 35 mS/cm and a surfactant concentration of from about 0.05 to about 1% by weight, wherein the salt is an inorganic salt having an anion selected from Cl^{-} or an anion of essentially equal or smaller molecular weight, and wherein the surfactant is a non-ionic surfactant.

4,839,299

ASSAY FOR THE FREE PORTION OF SUBSTANCES IN BIOLOGICAL FLUIDS

John C. Charlton; John E. Midgley, and Terence A. Wilkins, all of Amersham, England, assignors to Amersham International plc., Little Chalfont, England

Continuation of Ser. No. 748,702, Jun. 25, 1985, abandoned, which is a continuation of Ser. No. 475,113, Mar. 14, 1983, abandoned. This application Jul. 17, 1987, Ser. No. 75,254

Claims priority, application United Kingdom, Mar. 22, 1982, 82-08273

Int. Cl.[4] G01N *33/567, 33/566, 33/53;* **B65D** *69/00*

U.S. Cl. 436—500 **16 Claims**

1. A method of determining the concentration of the free portion of an analyte which is a member of a specific binding pair consisting of the analyte and a specific binder therefor, said free portion of the analyte being present in a biological fluid which also contains a portion of the analyte bound to one or more natural binders for the analyte, the bound and free portions of the analyte being equilibrium with one another, by

(a) forming a mixture of a sample of the biological fluid with an amount of a labelled version of a specific binder for the analyte and with a derivative of the analyte, the amount of said labelled specific binder being insufficient to substantially affect said equilibrium and said derivative of the analyte being substantially non-reactive with said natural binders;

(b) maintaining said mixture for a time sufficient to permit the free portion of the analyte and the derivative thereof to become bound to the labelled specific binder in proportions which depend on the concentration of the free portion of the analyte present in the sample;

(c) separating the analyte derivative bound to the specific binder from said mixture;

(d) measuring the amount of the said labelled specific binder bound to the derivative of the analyte and/or the amount of the said labelled specific binder not bound to the derivative of the analyte; and

(e) using the measurement to determine the concentration of free analyte in the biological fluid, and

wherein the analyte derivative is bound to a solid matrix prior to step (c) and wherein the labelled binder has a dissociation constant, with respect to its binding to the analyte, within a factor of 10 times more or less than the free analyte concentration.

4,839,300

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE HAVING TRAPEZOIDAL SHAPED SUBSTRATE SECTIONS

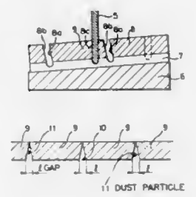
Yukito Kawahara; Hiroshi Muksinakano, and Satoshi Machida, all of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Dec. 3, 1986, Ser. No. 937,532

Claims priority, application Japan, Dec. 20, 1985, 287442

Int. Cl.[4] H01L *21/463*

U.S. Cl. 437—002 **7 Claims**



1. A method for manufacturing a semiconductor device, comprising for the steps of: providing a semiconductor substrate having opposed major surfaces and having a plurality of spaced-apart circuits formed on one of the major surfaces; cutting the substrate obliquely in the depthwise direction thereof in the regions between adjacent circuits to separate the substrate into plural substrate sections each containing one circuit with each substrate section having one acute-angled cut side and one obtuse-angled cut side; cutting the substrate sections obliquely in the depthwise direction thereof to cut off the obtuse-angled cut sides to form substrate sections having cross-sections of generally trapezoidal configuration; and connecting together the substrate sections in end-to-end relation so that the circuits on the substrate sections extend in a line to thereby form a semiconductor device.

4,839,301

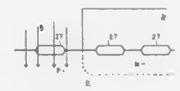
BLANKET CMOS CHANNEL STOP IMPLANT EMPLOYING A COMBINATION OF N-CHANNEL AND P-CHANNEL PUNCH-THROUGH IMPLANTS

Ruojia R. Lee, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Dec. 19, 1988, Ser. No. 286,361

Int. Cl.[4] H01L *21/265, 27/08*

U.S. Cl. 437—29 **4 Claims**



1. Method of fabricating transistor circuits having complimentary p-channel and n-channel transistors, in which n-wells are formed in a semiconductor wafer in areas at which p-type transistors are formed, the n-wells being defined by implanting the wafer with impurities sufficiently to define the n-wells, and areas of the wafer outside of the n-wells being p areas, the method characterized by:

(a) applying a supplemental implant material to the areas at which p type transistors are formed, the supplemental implant material being an n type dopant and having a diffusion coefficient which is less than that of the implant material used to define the n-wells;

(b) applying an impurity to the wafer which is sufficient to result in p areas being formed outside of the n-wells, but insufficient to overcome the definition of the n-wells where the supplemental implant is applied, said insufficiency resulting in p areas not being formed in the n-wells because said impurity is counteracted by the supplemental implant;

(c) growing field oxide areas on the p areas;

(d) masking the n-wells;

(e) applying a high energy implant of dopant to the p areas subsequent to said growth of field oxide areas and said masking; and

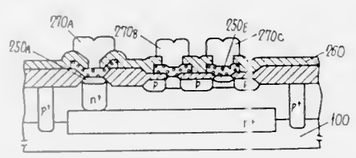
(f) said high energy implant being sufficient to pass through the field oxide areas on the p areas.

4,839,302

METHOD FOR FABRICATING BIPOLAR SEMICONDUCTOR DEVICE

Shuichi Kameyama, Itami; Tadao Komeda, Ikoma; Kazuhiro Kobushi, Osaka, and Hiroyuki Sakai, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 13, 1987, Ser. No. 107,633
Claims priority, application Japan, Oct 13, 1986, 61-242489; Nov. 6, 1986, 61-264553
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—31 1 Claim



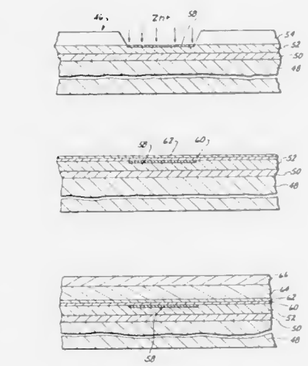
1. A method of fabricating a bipolar semiconductor device comprising the steps of:
selectively forming an insulation film around a prospective portion for forming a base on an epitaxial semiconductor layer of a first type of conductivity;
forming an oxidation-resistant film material pattern on the prospective portion for forming a base;
selectively leaving a mask material pattern on a prospective portion for forming an emitter on the oxidation-resistant film material pattern;
selectively etching the oxidation-resistant film material pattern using the mask material pattern as a mask;
forming a first semiconductor region as a part of the base by implanting impurity atoms of a second type of conductivity which is different from the first type of conductivity into the prospective portion for forming the base using the selectively formed insulation film and the mask material pattern as the mask;
diffusing the impurity atoms of the second type of conductivity in a lateral direction;
forming an insulation film on a surface of the first semiconductor region by selectively oxidizing using the oxidation-resistant film material pattern as the mask;
forming a second semiconductor region of the second type of conductivity in the base region around the prospective portion for forming an emitter;
exposing an emitter contact by removing the oxidation-resistant film material pattern used in the selective oxidation.
forming a polycrystalline semiconductor electrode on the emitter contact;
forming a third semiconductor region of the second type of conductivity as an intrinsic base beneath the prospective portion for forming the emitter by implanting impurity atoms of the second type conductivity into the polycrystalline semiconductor electrode and diffusing the impurity atoms of the second type of conductivity so as to prevent damage in the intrinsic base; and
forming a fourth semiconductor region of the first type of conductivity as the emitter in the prospective portion or forming the emitter by implanting impurity atoms of the first type of conductivity into the polycrystalline semiconductor electrode an diffusing the impurity atoms of the first type of conductivity so as to prevent damage in the emitter;
whereby the diffusion of the impurity atoms of the second type of conductivity of the first semiconductor region in the lateral direction of the emitter side is controlled by a dose of implantation to improve the electric breakdown voltage of the junction of the emitter and base.

4,839,303

PLANAR BIPOLAR TRANSISTORS INCLUDING HETEROJUNCTION TRANSISTORS AND METHOD

John W. Tully, Rolling Hills Estates; Benedict B. O'Brien, Manhattan Beach; William Hant, Los Angeles, and King L. Hu, Torrance, all of Calif., assignors to Northrop Corporation, Hawthrone, Calif.

Filed Oct. 13, 1987, Ser. No. 107,617
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—31 18 Claims



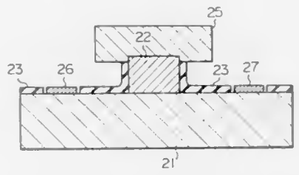
1. A process of forming a bipolar transistor on a semiconductor substrate made of Group III–Group V semiconductor materials forming an active first layer thereon comprising:
implanting an ion dopant into a portion of said first layer to form a base region;
annealing said base region to remove damage sites resulting from the implantation and to activate implanted dopant;
forming a second active layer over said first layer including said implanted base region in said first layer;
forming a base contact region in said second layer such that said base contact region extends through said second layer into said base region and makes electrical contact to said base region, said base contact region formed so as to isolate a region of said second layer from the remainder of said second layer,
forming on the surface of said second layer a first electrical contact to said base contact region;
forming on the surface of said second layer a second electrical contact to said isolated region; and
forming on the surface of said second layer in electrical isolation from said isolated region a third electrical contact to said second layer which electrically conducts to said first layer through said second layer;
whereby said first, second, and third contacts are coplanar on said surface of said second layer.

4,839,304

METHOD OF MAKING A FIELD EFFECT TRANSISTOR WITH OVERLAY GATE STRUCTURE

Hiroshi Morikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 17, 1987, Ser. No. 134,123
Claims priority, application Japan, Dec. 18, 1986, 61-303104
Int. Cl.[4] H01L *21/265, 21/44*
U.S. Cl. 437—39 11 Claims



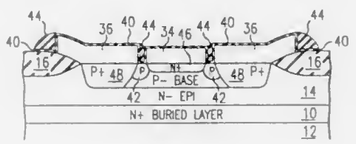
1. A process of fabricating a metal-semiconductor type field effect transistor, comprising the steps of :
(a) preparing s semi-insulating substrate with a surface having a gate forming area and a remaining area;
(b) forming a gate electrode on the gate forming area of the surface of said semi-insulating substrate, said gate electrode having an upper surface and side walls;
(c) forming a protection film on the upper surface and the side walls of said gate electrode and the remaining area of the surface of said semi-insulating substrate;
(d) covering said protection film with a material which is different in etching rate from said protection film;
(e) forming a filling layer of said material for creating a generally smooth topography by removing a part of said material over said gate electrode and a part of said protection film on the upper surface of said gate electrode, said filling layer having an upper surface substantially coplanar to the upper surface of said gate electrode;
(f) forming a conductive layer on the upper surface of said gate electrode and the upper surface of said filling layer; and
(g) removing said filling layer so as to cause said conductive layer to be spaced from a part of said protection film on the remaining area of the surface of said semi-insulating layer.

4,839,305

METHOD OF MAKING SINGLE POLYSILICON SELF-ALIGNED TRANSISTOR

Jeffrey E. Brighton, Katy, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 28, 1988, Ser. No. 212,554
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—41 18 Claims



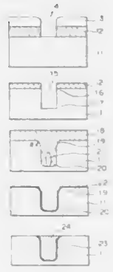
10. A method of forming a self-aligned transistor, comprising the steps of:
forming a base region in a semiconductor surface;
forming a material layer overlying said base region;
forming a first masking layer overlying said material layer having a window exposing said material layer and defining an emitter in said base region;
forming spacer regions on the sidewalls of said window;
doping a portion of said material layer overlying said defined emitter;
forming a second masking layer on portions of said material layer not covered by said first masking layer or said spacer regions;
removing said spacer regions;
removing portions of said material layer not covered by said first or second masking layers; and
diffusing dopants from said material layer into said base region.

4,839,306

METHOD OF MANUFACTURING A TRENCH FILLED WITH AN INSULATING MATERIAL IN A SEMICONDUCTOR SUBSTRATE

Hidetoshi Wakamatsu, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1988, Ser. No. 174,453
Claims priority, application Japan, Mar. 24, 1987, 62-69785
Int. Cl.[4] H01L *21/306*
U.S. Cl. 437—67 8 Claims



1. A method of manufacturing a trench filled with an insulation material in a semiconductor substrate including the steps of:
forming a trench in the substrate;
subjecting the substrate to an RF bias sputtering to form an oxide layer on the substrate, form a slope at an upper corner of the trench and to produce a roundness at a lower corner of the trench;
removing said oxide layer; and
filling the trench with the insulating material.

4,839,307

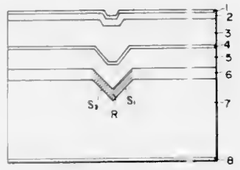
METHOD OF MANUFACTURING A STRIPE-SHAPED HETEROJUNCTION LASER WITH UNIQUE CURRENT CONFINEMENT

Koichi Imanaka, Kyoto, and Hiroshi Imamoto, Takatsuki, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed May 11, 1987, Ser. No. 48,616
Claims priority, application Japan, May 14, 1986, 61-108652; Mar. 10, 1987, 62-52964
Int. Cl.[4] H01L *33/00;* H01S *3/19*
U.S. Cl. 437—129 6 Claims

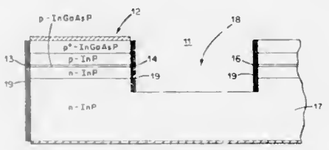
1. A method of manufacturing a semiconductor laser having an internal current restriction, comprising the steps of:
(a) forming a groove or difference in level exposing an (n11) (n=1-5) A face on a (100) face-oriented p-type GaAs

substrate or GaAs substrate having a (100) face-oriented p-type GaAs layer as a surface layer;
(b) growing Si-doped AlGaAs or GaAs layer thereon; and



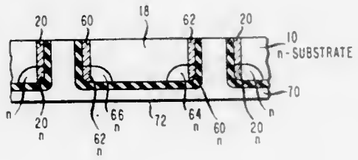
(c) providing thereon a double heterojunction structure having an n-type cladding layer in the form of tin-doped AlGaAs.

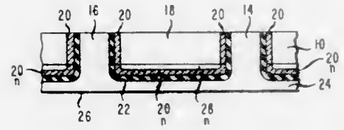
4,839,308
METHOD OF MAKING AN EXTERNAL-COUPLED-CAVITY DIODE LASER
Donald M. Fye, Wayland, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.
Division of Ser. No. 887,467, Jul. 21, 1986, Pat. No. 4,726,030. This application Oct. 30, 1987, Ser. No. 114,922
Int. Cl.[4] H01L *21/20, 21/203, 21/205*
U.S. Cl. 431—129 **2 Claims**



1. A method of making a monolithic external-coupled-cavity diode laser comprising the steps of:
providing an n-doped InP substrate having a pair of opposed surfaces;
epitaxially depositing a layer of n-doped InP on one of said surfaces of said substrate;
epitaxially depositing an active layer of InGaAsP on said epitaxial layer of n-doped InP,
epitaxially depositing a layer of p-doped InP on said active layer;
epitaxially depositing a layer of p+-doped InGaAsP on said p-doped layer;
forming a cavity into at least said p+ doped InGaAsP layer, said p-doped InP layer, said active layer of InGaAsP, and said n-doped InP layer so as to provide an opposing rear facet of said diode laser at said active layer and to provide an opposing external mirror, a portion of said layers opposed to said rear facet being a front facet;
depositing coatings of a common material on said facets and said mirror;
forming a p-contact on said p+-layer of InGaAsP; and
forming an n-contact on a second surface of said substrate.

4,839,309
FABRICATION OF HIGH-SPEED DIELECTRICALLY ISOLATED DEVICES UTILIZING BURIED SILICIDE OUTDIFFUSION
William G. Easter, and Anatoly Feygenson, both of Reading, Pa., assignors to American Telephone and Telegraph Company, AT&T Technologies, Inc., Berkeley Heights and AT&T Bell Laboratories, Murray Hill, both of, N.J.
Filed Mar. 30, 1988, Ser. No. 175,016
Int. Cl.[4] H01L *21/225*
U.S. Cl. 437—160 **12 Claims**



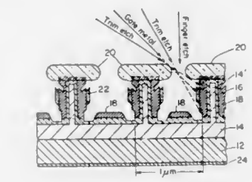


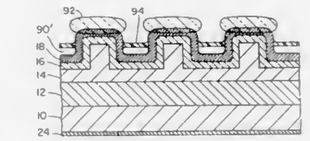
1. A method of forming a semiconductor device within a dielectrically isolated tub region of a silicon substrate, the method comprising the steps of:
a. forming a metal silicide layer within said tub so as to be contiguous with the dielectric isolation;
b. doping said silicide layer in a selective manner with an impurity of a predetermined conductivity type; and
c. heating said substrate to a temperature sufficient to diffuse the implanted impurities into the adjacent tub region, wherein said diffusion region is defined as an active portion of the semiconductor device structure.

4,839,310
HIGH MOBILITY TRANSISTOR WITH OPPOSED-GATES
Mark A. Hollis, Concord; William D. Goodhue; Kirby B. Nichols, both of Chelmsford, and Normand J. Bergeron, Jr., New Bedford, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Jan. 27, 1988, Ser. No. 149,125
Int. Cl.[4] H01L *29/80*
U.S. Cl. 437—41 **7 Claims**

1. The method of forming vertical transistors with opposed gates comprising the steps of:
(a) forming a first layer of high electron affinity material on a substrate;
(b) removing laterally adjacent portions of said first layer to provide spaced columns having top walls and sidewalls of high electron affinity material projecting orthogonal to said substrate;
(c) forming a second layer of high electron affinity material on said top walls and sidewalls;
(d) forming a third layer of heavily doped n-type low electron affinity material over said second layer;

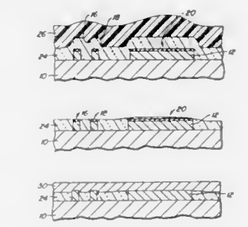
(e) forming ohmic contacts on the portions of the third layer overlying the top walls and on the bottom of the substrate;





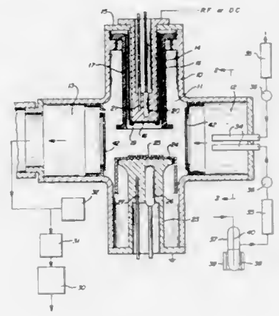
(f) forming gate electrodes on portions of the third layer adjacent the sidewalls.

4,839,311
ETCH BACK DETECTION
Paul E. Riley, Columbia, Md.; Vivek D. Kulkarni, Sunnyvalle, and Egil D. Castel, Cupertino, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.
Continuation of Ser. No. 85,998, Aug. 14, 1987, abandoned. This application Nov. 21, 1988, Ser. No. 275,655
Int. Cl.[4] H01L *21/306*
U.S. Cl. 437—228 **37 Claims**



1. A method for planarizing an interlevel dielectric layer, said method comprising: applying an indicator layer capable of evolving a volatile detectable species during planarization, said layer being applied over at least a portion of an uneven topographic surface;
applying a dielectric layer over the indicator layer;
planarizing the dielectric layer under conditions which etch back both the dielectric layer and the indicator layer;
monitoring for the presence of the volatile detectable species; and
terminating planarization within a predetermined time period of detection of the volatile detectable species.

4,839,312
FLUORINATED PRECURSORS FROM WHICH TO FABRICATE AMORPHOUS SEMICONDUCTOR MATERIAL
Stanford R. Ovshinsky, Bloomfield Hills, and Arun Madan, Birmingham, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.
Continuation of Ser. No. 917,336, Oct. 9, 1986, abandoned, which is a continuation of Ser. No. 710,359, Apr. 18, 1985, abandoned, which is a continuation of Ser. No. 540,153, Oct. 7, 1983, Pat. No. 4,520,380, which is a continuation of Ser. No. 427,688, Sep. 29, 1982, Pat. No. 4,409,605, which is a continuation of Ser. No. 222,489, Jan. 5, 1981, abandoned, which is a continuation-in-part of Ser. No. 104,284, Dec. 17, 1979, abandoned, Division of Ser. No. 887,353, Mar. 16, 1978, Pat. No. 4,226,898. This application Mar. 9, 1987, Ser. No. 23,756
The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.
Int. Cl.[4] B05D *0/36;* **C23C** *16/00*
U.S. Cl. 437—233 **2 Claims**



1. A method of producing a semiconductor film comprising a solid amorphous semiconductor host matrix with electronic configurations which have an energy gap and a low density of localized states therein; said method comprising the steps of providing a substrate; providing a precursor gaseous mixture including at least one set of compounds chosen from the group consisting essentially of:

$SiH_4 + F_2$;

$SiH_4 + SiF_4$; $SiF_4 + H_2$; $SiH_3F + H_2$; SiH_3F;

$SiH_2F_2 + H_2$; SiH_2F_2; $SiHF_3 + H_2$; $SiHF_3$;

$SiHCl_3 + F_2$;

$SiH_2Cl_2 + F_2$; $SiH_3Cl + F_2$;

$SiCl_3F + H_2$; $SiCl_2F_2 + H_2$; $SiClF_3 + H_2$,

or combinations thereof with or without n- or p-dopants or band gap modifiers; and depositing on said substrate a solid semiconductor host matrix by the glow discharge decomposition of said precursor gaseous mixtures; whereby there is incorporated in said semiconductor host matrix during the glow discharge deposition thereof a plurality of different, complementary alterant elements.

4,839,313

GLAZE COMPOSITIONS FOR CERAMIC SUBSTRATES

Kazuo Kondo; Tatsunori Kurachi, and Masahiko Okuyama, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Continuation of Ser. No. 847,480, Apr. 3, 1986, which is a continuation-in-part of Ser. No. 689,690, Jan. 18, 1985, abandoned. This application Nov. 17, 1987, Ser. No. 121,831
Claims priority, application Japan, Jan. 9, 1984, 59-1694; Jan. 24, 1984, 59-10812
Int. Cl.[4] C03C 8/00
U.S. Cl. 501—14 10 Claims

1. A glaze composition for a ceramic substrate consisting essentially of 55 to 75 mol% SiO_2, 1 to 15 mol% Al_2O_3, 3 to 20 mol% CaO, 1 to 13 mol% BaO, 1 to 5 mol% Y_2O_3, 0 to 25 mol% SrO, 0 to 7 mol% B_2O_3, 0 to 2 mol% ZnO, and 0 to 2 mol% MgO, and containing at least one of SrO, B_2O_3, ZnO and MgO.

4,839,314

CHEMICALLY DURABLE, HIGH INDEX, LOW DENSITY GLASSES

Jean E. Boudot, and Jean P. Mazeau, both of Avon, France, assignors to Corning Glass Works, Corning, N.Y.

Filed May 6, 1988, Ser. No. 190,839
Claims priority, application France, Aug. 14, 1987, 87 11586
Int. Cl.[4] C03C 3/068 4/00
U.S. Cl. 501—78 2 Claims

1. Glasses useful in the production of ophthalmic lenses having an index of refraction between about 1.699–1.703, an Abbe number equal to or greater than 41.0, a density less than 3.25 g/cm^3, and good chemical durability in an acid medium, characterized in that they are essentially free of Al_2O_3 and consist essentially, expressed in terms of weight percent on the oxide basis, of:

SiO_2	33–37	CaO	8–9.5
B_2O_3	7.5–13	SrO	2–4
$SiO_2 + B_2O_3$	44–48	La_2O_3	12.3–14.5
Li_2O	5–8	ZrO_2	4–6
Na_2O	0–2.5	Nb_2O_5	8–10.5
K_2O	0–2	TiO_2	5–7
$Li_2O + Na_2O + K_2O$	5–8	As_2O_3	0–0.8.

4,839,315

PROCESS FOR THE PRODUCTION OF CERAMIC MATERIALS HAVING HEAT AND WEAR RESISTANCE

Junichiro Suzuki, Gifu, and Tatsuji Kimukawa, Nagoya, both of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 754,545, Jul. 15, 1985, abandoned. This application Aug. 17, 1987, Ser. No. 86,244
Claims priority, application Japan, Jul. 13, 1984, 59-146481
Int. Cl.[4] C04B 35/10 35/56
U.S. Cl. 501—87 15 Claims

1. A process for the production of a heat- and wear-resistant ceramic material as a highly densified sintered body, said process comprising:

(a) preparing a composition consisting essentially of 5 to 35% by weight of Al_2O_3, 0.05 to 4% by weight of a sintering aid and 61 to 94.95% by weight of a TiC component in which 4 to 30% by weight of TiC are substituted with Ti, and

(b) sintering said composition until Ti cannot be detected as a metallic phase such that Ti is incorporated in TiC to produce TiC_x where $0.65 < x < 0.95$ forming a main phase having a continuous, uniform network that extends through the entire sintered body

4,839,316

PROTECTIVE COATING FOR ALUMINA-SILICON CARBIDE WHISKER COMPOSITES

Terry N. Tiegs, Lenoir City, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 26, 1987, Ser. No. 112,167
Int. Cl.[4] C04B 35/56, 35/10, 35/80
U.S. Cl. 501—89 6 Claims

1. A method for forming a protective coating on a ceramic composite consisting essentially of an alumina matrix having about 1 to 60 volume percent silcon carbide whiskers dispersed therein, comprising the steps of heating the composite in an oxidizing atmosphere to a temperature greater than about 1200° C., and maintaining the composite at temperature greater than about 1200° C. for a duration sufficient to form an essentially oxygen impervious coating of mullite or mullite plus silicon oxide and alumina on the surface of said composite for inhibiting oxidation of silicon carbide whiskers in the composite underlying the coating.

5. A method for forming a protective coating on a ceramic composite consisting essentially of an alumina matrix having about 1 to 60 volume percent silicon carbide whiskers dispersed therein, comprising the steps of coating exposed surface portions of the composite with a layer formed of a slurry of silicon oxide or silicon oxide and alumina, heating the slurry coated composite in an inert atmosphere to a temperature greater than 1200° C., and maintaining the composite at temperature greater than about 1200° C., for a duration sufficient to form an essentially oxygen impervious coating of mullite or mullite plus silicon oxide and alumina on the surface of said composite for inhibiting oxidation of silicon carbide whiskers in the composite underlying the coating.

4,839,317

LIGHTWEIGHT HEAT-INSULATING TUNDISH COATING MATERIAL

Yoshihiko Uchida; Kotaro Kuroda; Akihiko Kusano, and Shinichi Fukunaga, all of Fukuoka, Japan, assignors to Kurosaki Refractories Co., Ltd., Fukuoka and Nippon Steel Corporation, Tokyo, both of, Japan

Filed Oct. 6, 1987, Ser. No. 105,133
Claims priority, application Japan, Oct. 8, 1986, 61-238091
Int. Cl.[4] C04B 35/04
U.S. Cl. 501—108 1 Claim

1. In an interior coating material for continuous caster tundishes which consists essentially of a mixture of aggregate, a binder, a hardening agent and fibers, the improvement wherein the aggregate is a mixture of 5 to 60% by weight of a lightweight magnesia aggregate having a bulk density of 2.0 or less, and 40 to 95% by weight of a member selected from the group consisting of electrically molten magnesia clinker, seawater magnesia clinker, burnt clinker prepared from natural magnesite, dolomite clinker, spinel clinker and a mixture thereof, based on the total weight of the aggregate.

4,839,318

METHOD FOR PRODUCTION OF FINELY POROUS ARTICLE USING SMECTITE MINERAL AS MAIN COMPONENT

Kaoru Kawase; Hiroshi Sakami, and Shozo Iida, all of Nagoya, Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade and Industry, both of Tokyo, Japan

Filed Feb. 3, 1988, Ser. No. 151,980
Claims priority, application Japan, Feb. 3, 1987, 62-22818; Feb. 3, 1987, 62-22819; Mar. 17, 1987, 62-62116; Mar. 17, 1987, 62-62117
Int. Cl.[4] B01J 20/12, 20/16
U.S. Cl. 502—62 18 Claims

1. A method for the production of a finely porous article, characterized by adding an ion-exchange resin to an aqueous

sodium silicate solution thereby obtaining a colloidal liquid phase containing silica particles, mixing said colloidal liquid phase with a smectite type mineral, then drying the resultant mixture.

5. The method according to claim 1, wherein said mixture is obtained by adding at least one member selected from the group consisting of organic compounds selected from the consisting of primary amines, secondary amines, tertiary amines and quaternary amines of lower aliphatic hydrocarbons and at least one metal compound selected from the group consisting of sodium aluminate, oxyzirconium chloride, titanium chloride, cobalt chloride and aluminum chloride in an amount in the range of 0.0001 to 10% by weight, based on silica particles, to said colloidal liquid phase and said smectite type minereal.

4,839,319

HYDROCARBON CRACKING CATALYSTS AND PROCESSES FOR UTILIZING THE SAME

William L. Schuette, and Lloyd A. Pine, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 884,522, Jul. 11, 1986, abandoned. This application Aug. 17, 1987, Ser. No. 86,384
Int. Cl.[4] B01J 29/08
U.S. Cl. 502—64 9 Claims

1. A catalyst comprising: (a) a non-zeolitic inorganic oxide matrix, and (b) an ultrastable Y-type crystalline zeolite, said zeolite having been pretreated by contacting said zeolite with a phosphorus compound selected rom the group consisting of phosphoric acid, phosphorous acid, a salt of phosphoric acid, a salt of phosphorous acid, and mixtures thereof for a time sufficient to composite an effective amount of phosphorus with said zeolite.

4,839,320

METHOD FOR TREATING AND STABILIZING ZEOLITE CATALYSTS

Theodore D. Trowbridge, Madison, and Shun C. Fung, Bridgewater, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 13, 1987, Ser. No. 107,211
Int. Cl.[4] B01J 29/06, 37/00
U.S. Cl. 502—66 13 Claims

8. A method for treating a zeolite catalyst comprising the steps of:

contacting a formed, substantially sulfur-free, catalyst containing a large pore zeolite, at least one alkali metal or alkaline earth metal, and platinum in an alumina-bearing binder with an aqueous solution of the hydroxide or oxide of the alkali metal or alkaline earth metal such that the solution, upon separation of the formed zeolite catalyst has a pH between 10.5 and 12.0,

reducing the platinum,

dispersing the platinum metal using oxychlorination.

4,839,321

SOLID CATALYST COMPONENT FOR OLEFIN POLYMERIZATION CATALYSTS

Atsushi Murai; Minoru Terano; Kohei Kimura, and Masuo Inoue, all of Kanagawa, Japan, assignors to Toho Titanium Co., Ltd., Tokyo, Japan

Filed Jan. 7, 1988, Ser. No. 141,523
Claims priority, application Japan, Jan. 7, 1987, 62-462
Int. Cl.[4] C08F 4/64
U.S. Cl. 502—127 26 Claims

1. A solid catalyst component for olefin polymerization catalysts prepared by subjecting diethoxymagnesium, oalcium chloride and a silicon compond of the general formla: $Si(OR)_4$ wherein R is an alkyl or aryl group to an initial contact treatment in the presence of an organic solvent to form a treated composition; suspending said treated composition in an aromatic hydrocarbon which is a liquid at normal temperature to form a suspension; and bringing the suspension into a first contact with titanium tetrachloride to form a product and bringing said product into a second contact with titanium tetrachloride in such manner that a diester of an aromatic dicarboxylic acid is introduced at any stage of the above said suspending and/or contact stages with the exception of said initial contact treatment, said calcium chloride being used in an amount of 1–2 g per gram of said diethoxymagnesium.

4,839,322

HIGH SURFACE AREA POLYMERS OF PYRROLE OR COPOLYMERS OF PYRROLE

Richard Yodice, Willoughby, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 859,571, May 5, 1986, abandoned. This application Jun. 24, 1987, Ser. No. 65,159
Int. Cl.[4] C25B 3/02; B01J 31/06
U.S. Cl. 502—159 27 Claims

1. A pulverant catalytic composition comprising a polymer of pyrrole a copolymer of pyrrole and mixtures thereof obtained by treating pyrrole or a co-polymerizable mixture containing a pyrrole at an electronically conductive surface in an electrolytic bath comprising the steps of:

(A) immersing an electronically conductive surface in an electrolytic bath comprising at least one liquid and at least one non-miscible liquid or gas or finely divided solid particles wherein a pyrrole or co-polymerizable mixture containing a pyrrole is one of the liquids or is dissolved in at least one of the liquids, and

(B) passing an electric current through said bath at a voltage sufficient to electropolymerize the pyrrole or co-polymerizable mixture containing a pyrrole at the electronically conductive surface thereby obtaining the polymer of pyrrole or copolymer of pyrrole,

(C) treating the of polymer pyrrole or copolymer of pyrrole in the presence of a strong base to substantially increase the surface area of, and substantially deprotonate the polymer of pyrrole or copolymer of pyrrole, and

(D) reacting the high surface area polymer of pyrrole or copolymer of pyrrole with a catalytic active material.

4,839,323

INSOLUBLE COMPLEX OXIDATION CATALYSTS

Gerald L. Goe; Thomas D. Bailey, both of Greenwood, and James R. Beadle, Plainfield, all of Ind., assignors to Reilly Tar & Chemical Corporation, Indianapolis, Ind.

Division of Ser. No. 934,014, Nov. 24, 1986. This application Nov. 2, 1987, Ser. No. 115,962
Int. Cl.[4] B01J 31/00; C07C 45/00
U.S. Cl. 502—159 6 Claims

1. A process for the oxidation of Tetralin ® to α-tetralone, comprising the steps of

combining 1,2,3,4-tetrahydronaphthalene within a reaction vessel with an insoluble oxidation catalyst having a chromium salt bound on an insoluble polymer support having pendant pyridine groups and with an oxygen-containing gas; and

heating the resultant mixture to a temperature sufficient to bring about the oxidation of 1,2,3,4-tetrahydronaphthalene.

4. A process for the oxidation of ethylbenzene to acetophenone, comprising the step of

combining ethylbenzene within a reaction vessel with an insoluble oxidation catalyst having a chromium salt bound on an insoluble polymer support having pendant pyridine groups and with an oxygen-containing gas; and

heating the resultant mixture to a temperature sufficient to bring about the oxidation of ethylbenzene.

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4,839,324

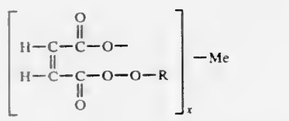
COMPOSITION FOR POLYMERIZATION WITH IMPROVED ACTIVATOR SYSTEM

Donald E. Swarts, Grand Island, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 26, 1988, Ser. No. 236,785
Int. Cl.[4] B01J *31/04, 31/06*
U.S. Cl. 502—160 4 Claims

1. An initiator system for α,β-ethylenically unsaturated monomers consisting essentially of

A. a metal salt of hemi-perester of maleic acid having the formula:



wherein

Me is a metal selected from the group consisting of Group IA metals, Group IIA metals, zinc, lead, cobalt, nickel, manganese and copper;

x is an integer having a value from 1 to the valence of the metal; and

R is a saturated tertiary alkyl radical;

B. an activator which is a salt of an oxo acid of sulfur selected from the group consisting of bisulfite, metabisulfite and thiosulfate salts or the free acid, said activator salt having a cation selected from the group consisting of Group IA metals, Group IIA metals, and ammonium, and said activator being present in a weight ratio to said metal salt of hemi-perester of maleic acid of from approximately 1:7 to 4:1; and

C. a polar liquid,

wherein said activator is provided in the form of a water-in-oil emulsion.

4,839,325

STABILIZED METAL DRIER

Christopher J. Hardiman, Belchertown, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 24, 1987, Ser. No. 88,915
Int. Cl.[4] C08F *4/80*
U.S. Cl. 502—170 3 Claims

1. A metal drier composition consisting of a free radical polymerization-catalyzing fatty acid metal salt and a fluorinated 2,4 pentanedione.

4,839,326

PROMOTED MOLYBDENUM AND TUNGSTEN SULFIDE CATALYSTS, THEIR PREPARATION AND USE

Thomas R. Halbert, Annandale; Edward I. Stiefel, Bridgewater; Russell R. Chianelli, Somerville, and Teh C. Ho, Bridgewater, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Apr. 22, 1985, Ser. No. 725,662
Int. Cl.[4] B01J *27/047*
U.S. Cl. 502—220 29 Claims

1. A hydroconversion predecessor catalyst comprising at least one of molybdenum or tungsten sulfide promoted by reaction of said molybdenum or tungsten sulfide with transition metal containing organometallic complex wherein the valence of metal is 0 or +1 at said reaction.

4,839,327

METHOD FOR THE PRODUCTION OF ULTRA-FINE GOLD PARTICLES IMMOBILIZED ON A METAL OXIDE

Masatake Haruta, Kawanishi, and Tetsuhiko Kobayashi, Ikeda, both of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade, both of Tokyo, Japan

Filed Mar. 22, 1988, Ser. No. 171,810
Claims priority, application Japan, Apr. 8, 1987, 62-87472
Int. Cl.[4] B01J *21/04, 21/08, 23/52*
U.S. Cl. 502—243 16 Claims

1. A method for the production of ultra-fine gold particles immobilized on a metal oxide, characterized by adding dropwise an aqueous gold compound solution kept at a pH value of 7 to 11 to a metal oxide-containing water similarly kept at a pH value of 7 to 11 thereby obtaining an aqueous solution of said metal oxide having gold hydroxide immobilized thereon, separating said metal oxide having gold hydroxide immobilized thereon from said aqueous solution, and heating the separated metal oxide at a temperature in the range of 100° to 800° C.

4,839,328

CATALYST MATERIAL AND A PROCESS FOR ITS PREPARATION

Ricardo C. Pastor, Manhattan Beach; Luisa E. Gorre, Oxnard, and Lorna D. Christensen, Thousand Oaks, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 15, 1987, Ser. No. 61,619
Int. Cl.[4] B01J *21/04, 23/42, 23/44, 23/46*
U.S. Cl. 502—334 12 Claims

1. A catalyst material for catalyzing the regenertion of carbon dioxide comprising:

a substrate selected from the group consisting of aluminum oxide and tin oxide; and

a metal selected from the group consisting of platinum, iridium, rhodium, and palladium, located at the surface of said substrate, the metal being present in an amount from about 0.25 to about 1 atomic percent of the substrate so as to substantially populate only those surface sites having an activation energy of about 3 kilocalories per mole to enable the catalyst material to be activated at a lower activation energy such that enhanced catalytic activity is provided at lower temperatures.

4,839,329

PROCESS FOR MANUFACTURING A TITANIA SUPPORTED PALLADIUM CATALYST

Sun K. Ihm, and Dong K. Lee, both of Seoul, Rep. of Korea, assignors to Korea Advanced Institute of Science and Technology, Seoul, Rep. of Korea

Filed Oct. 23, 1987, Ser. No. 111,663
Claims priority, application Rep. of Korea, Mar. 11, 1987, 2169/1987
Int. Cl.[4] B01J *23/44*
U.S. Cl. 502—339 3 Claims

1. A process for manufacturing a titanium oxide supported palladium catalyst to convert acetylene to ethylene consisting essentially of:

(a) removing moisture in an amount of titanium oxide in a vacuum at a temperature of 450° C. for 12 hours to produce dried titanium oxide,

(b) dissolving an amount of palladium chloride in hydrochloric acid to produce a palladium solution and mixing sodium acetate with said palladium solution to produce an initial mixture,

(c) diluting said initial mixture with distilled water,

(d) pouring said diluted mixture into said dried titanium oxide to produce a second mixture,

(e) mixing said second mixture at a pressure of 10 torr and a temperature of 80° C. to produce a third mixture, and

(f) calcining said third mixture at a temperature of 500° C. for 3 hours and cooling to produce the catalyst composed of palladium in an amount of 0.01% to 0.2% by weight and titanium oxide carrier in an amount of 99.99% to 99.8% by weight, wherein said catalyst is selective in converting acetylene to ethylene but prevents the conversion of ethylene to ethane.

4,839,330

ISOTOPE EXCHANGE IN OXIDE-CONTAINING CATALYST

Robert V. Hess, Newport News; Billy T. Upchurch; Kenneth G. Brown, both of Virginia Beach; Irvin M. Miller, Newport News; David R. Schryer, Hampton; Barry D. Sidney, Gloucester; George M. Wood, Newport News, and Ronald F. Hoyt, Tabb, all of Va., assignors to The United States of America as repesented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 874,304, Jun. 12, 1986, abandoned.
This application Jan. 15, 1988, Ser. No. 145,719
Int. Cl.[4] B01J *38/10, 38/12*
U.S. Cl. 502—53 15 Claims

1. A process for modifying an existing oxide-containing catalyst for use in recombining carbon monoxide molecules with diatomic oxygen molecules to form carbon dioxide, wherein said carbon monoxide molecules contain a rare isotope of oxygen which is identical to a rare isotope of oxygen which is contained in said diatomic oxygen molecules, and wherein there is no exchange of said rare isotope of oxygen with a common isotope of oxygen found in the surface of said oxide-containing catalyst, which process comprises:

providing an oxide-containing catalyst having reactive common isotope oxygen atoms on the surface layers thereof;

removing such reactive common isotope oxygen atoms from the surface layers of the catalyst; and

reoxidizing the surface layers of the catalyst with rare isotope oxygen atoms, wherein each of the rare isotope oxygen atoms is a member selected from the group consisting of ^{17}O and ^{18}O isotopes.

4,839,331

CARBONACEOUS ADSORBENTS FROM PYROLYZED POLYSULFONATED POLYMERS

Stephen G. Maroldo, Harleysville; William R. Betz, Port Matilda, and Noah Borenstein, Oreland, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 29, 1988, Ser. No. 150,183
Int. Cl.[4] B01J *20/02*
U.S. Cl. 502—416 24 Claims

1. Carbonaceous adsorbent particles which comprise the product of controlled pyrolysis of a polysulfonated macroporous crosslinked, vinylaromatic polymer, the particles having multimodal pore-size distribution and a minimum micropore volume of about 0.02 cm^3/g.

4,839,332

HEAT-SENSITIVE RECORDING MATERIAL

Kensuke Ikeda; Naoto Yanagihara, and Ken Iwakura, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 15, 1988, Ser. No. 144,143
Claims priority, application Japan, Jan. 16, 1987, 62-7937; Jan. 19, 1987, 62-9541; Jan. 23, 1987, 62-13775
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—212 13 Claims

1. A heat-sensitive recording material comprising a support having thereon a heat-sensitive color forming layer comprising at least one electron-donating colorless dye and at least on electron-accepting compound, wherein said electron-donating colorless dye is a fluorene derivative having at least one substituted amino group and said electron-accepting compound has an acid group and a solubility in ethanol of 10 or less at 25° C.

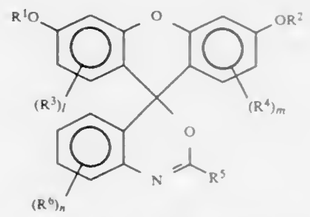
4,839,333

RECORDING MATERIAL CONTAINING LEUCO DYE

Toru Harada; Naoki Saito, and Kozo Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 7, 1988, Ser. No. 178,935
Claims priority, application Japan, Apr. 7, 1987, 62-85533
Int. Cl.[4] B41M *5/16, 5/18, 5/22*
U.S. Cl. 503—218 12 Claims

1. A recording material comprising a support and a layer containing a leuco dye, wherein the leuco dye has the formula (I):



(I)

in which each of R^1 and R^2 independently is a monovalent group selected from the group consisting of an alkyl group, a cycloalkyl group and an aralkyl group; each of R^3 and R^4 independently is a monovalent group selected from the group consisting of a halogen atom, an alkyl group, a cycloalkyl group, and aralkyl group, an alkoxy group and an acylamino group; R^5 is a monovalent group selected from the group consisting of an alkyl group, a cycloalkyl group, and aralkyl group, an alkoxy group, an aryloxy group, a dialkylamino group, an alkoxycarbonyl group, an aryloxycarbonyl group, a dialkylcarbamoyl group, an aryl group and a heterocyclic group; R^6 is a monovalent group selected from the group consisting of a halogen atom, an alkyl group, an alkoxy group, hydroxyl, amino, an alkylamino group, an dialkylamino group, an acylamino group, nitro, cyano, carbamoyl, sulfamoyl, an arloxycarbonyl group, an alkoxycarbonyl group, an alkylsulfonyl group, an arylsulfonyl group, an alkylsulfonylamino group, an arylsulfonylamino group and an aryl group; l is 0 or 1; m is 0 or 1; n is 0, 1, 2, 3 or 4 (when n is 2, 3 or 4, the groups represented by R^6 may be different from each other); each of R^1, R^2, R^3, R^4, R^5 and R^6 may have one or more substituent groups.

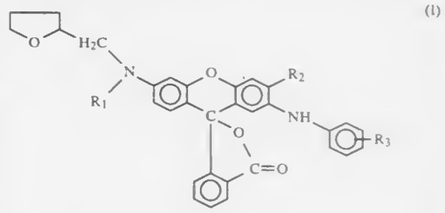
4,839,334

HEAT SENSITIVE RECORDING SHEET

Toshiyuki Abe; Katsumasa Kikkawa; Michihiro Gonda; Hideyuki Sensui, and Mikiko Kanasugi, all of Tokyo, Japan, assignors to Hodogaya Chemical Co, Ltd., Tokyo, Japan

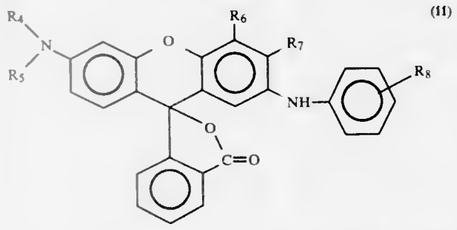
Filed Jan. 12, 1987, Ser. No. 2,235
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—221 3 Claims

1. A heat sensitive recording sheet having a heat sensitive color forming layer wherein a mixture of fluoran compounds of the following formulas I and II is used as a color former:



(I)

wherein R_1 is a hydrogen atom, an alkyl group having from 1 to 8 carbon atoms, a tetrahydrofurfuryl group, a substituted or unsubstituted phenyl group or a cycloalkyl group, R_2 is a hydrogen atom, a chlorine atom, a fluorine atom, a lower alkyl group, a lower alkoxy group, a lower alkoxyalkyl group, a phenyl group or a benzyl group, and R_3 is a hydrogen atom, a chlorine atom, a fluorine atom, a bromine atom, a lower alkyl group or an acyl group; and



(II)

wherein each of R_4 and R_5 is a hydrogen atom, an alkyl group having from 1 to 8 carbon atoms, a substituted or unsubstituted phenyl group or a cycloalkyl group, or R_4 and R_5 may, together with the adjacent nitrogen atom, form a ring of the formula

each of R_6 and R_7 is a hydrogen atom, a chlorine atom, a fluorine atom, a bromine atom, a lower alkyl group, a lower alkoxy group, a lower alkoxyalkyl group, a phenyl group or a benzyl group, and R_8 is a hydrogen atom, a chlorine atom, a fluorine atom, a bromine atom, a lower alkyl group or an acyl group.

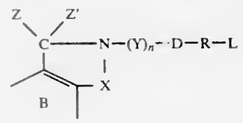
4,839,335

HEAT SENSITIVE RECORDING ELEMENT

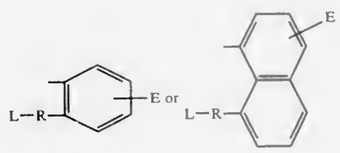
Ernest W. Ellis, Carlisle, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 28, 1987, Ser. No. 102,126
Int. Cl.[4] B41M *5/18*
U.S. Cl. **503—224** **5 Claims**

1. A heat sensitive recording medium comprising a support and a recording layer therein containing a compound which when heat activated undergoes irreversible intramolecular alkylation of the nitrogen atom and visible color change, said compound having the formula:



wherein:
D-R-L is:



n is 0 or 1;
R is a substituted or unsubstituted methylene or ethylene radical;
L is displacable group;
X is carbonyl, sulfonyl, methylene or substituted or unsubstituted ethylene radical;
Y is a carbonyl, sulfinyl or sulfonyl radical or a substituted or unsubstituted methylene or ethylene radical provided that when X is methylene Y, if present, is carbonyl, sulfinyl or sulfonyl;
Z and Z' taken individually are moieties to complete the auxochromophoric system of a di- or triarylmethane dye when the nitrogen is not attached to the meso carbon and when taken together represent bridged moieties to complete the auxochromophoric system of a bridged triarylmethane dye when the nitrogen is not attached to the meso carbon, provided that if Z and Z' have a nitrogen atom in the auxochromic portion, then Y must be methylene or be absent with N and D being directly bonded;
B is substituted or unsubstituted carbocylic ring or rings or a hetrocylic ring; and
E is hydrogen, an electron donating or withdrawing group or a group that undergoes fragmentation upon heating to liberate a group that renders said intramolecular alkylation more efficient.

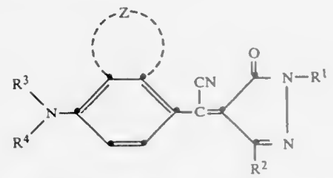
4,839,336

ALPHA-CYANO ARYLIDENE PYRAZOLONE MAGENTA DYE-DONOR ELEMENT FOR THERMAL DYE TRANSFER

Steven Evans, Rochester, and Helmut Weber, Webster, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 16, 1988, Ser. No. 168,838
Int. Cl.[4] B41M *5/035, 5/26*
U.S. Cl. **503—227** **20 Claims**

11. In a process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye layer comprising a dye dispersed in a polymeric binder and transferring a dye image to a dye-receiving element to form said dye transfer image, the improvement wherein said dye has the formula:



wherein R^1 represents a substituted or unsubstituted alkyl group having from 1 to about 10 carbon atoms; a cycloalkyl group having from about 5 to about 7 carbon atoms or an aryl group having from about 6 to about 10 carbon atoms;
R^2 represents a substituted or unsubstituted alkoxy group from 1 to about 10 carbon atoms; a substituted or unsubstituted aryloxy group having from about 6 to about 10 carbon atoms; NHR^5; or NR^5R^6;

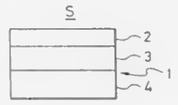
R^3 and R^4 each represents R^1; or either or both of R^3 and R^4 can be joined to the carbon atom of the aromatic ring at a position ortho to the position of attachment of the anilino nitrogen to form a 5- or 6-membered ring; or R^3 and R^4 can be joined together to form, along with the nitrogen to which they are attached, a 5- or 6-membered heterocyclic ring;
R^5 and R^6 each independently represents a substituted or unsubstituted alkyl group having from 1 to about 10 carbon atoms; a cycloalkyl group having from about 5 to about 7 carbon atoms or an aryl group having from about 6 to about 10 carbon atoms; or R^5 and R^6 may be joined together to form, along with the nitrogen to which they are attached, a 5- or 6-membered heterocyclic ring; and
Z represents hydrogen or the atoms necessary to complete a 5- or 6-membered ring.

4,839,337

DYE-RECEIVING SHEETS FOR THERMAL DYE TRANSFER PRINTING COMPRISING A COMPOSITE FILM SUBSTRATE

Akihiro Imai, Ikoma; Hiromu Matsuda; Keiichi Yubakami, both of Osaka, and Nobuyoshi Taguchi, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Oct. 21, 1987, Ser. No. 111,433
Int. Cl.[4] B41M *5/35, 5/26*
U.S. Cl. **503—227** **27 Claims**



1. A dye-receiving sheet which is used in combination with a sublimable dye transfer sheet, said dye-receiving sheet comprising film made of an extruded sheet of white fine particles and a polyester resin and a layer of a polymer material formed on at least one side of said extruded sheet and having a thermal deformation temperature or softening point lower than said extruded sheet, and a dye-receiving layer formed on the polymer material layer or on the other side of said extruded sheet, said dye-receiving layer being formed from an aqueous composition comprising a water-soluble or water-dispersable dye-receiving resin, an aqueous dispersion of colloidal silica in a silane copolymer emulsion, and a surface active agent.

4,839,338

RECEIVER SHEET

Richard A. Marbrow, Middlesbrough, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Apr. 19, 1988, Ser. No. 183,146
Claims priority, application United Kingdom, Apr. 24, 1987, 8709799
Int. Cl.[4] B41M *5/035, 5/26*
U.S. Cl. **503—227** **11 Claims**

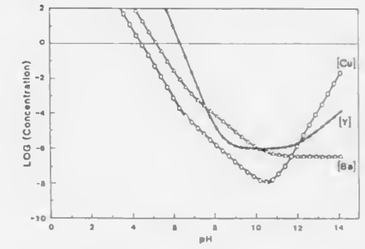
1. A thermal transfer printing receiver sheet for use in association with a compatible donor sheet, the receiver sheet comprising a supporting substrate having, on at least one surface thereof, a dye-receptive receiving layer to receive a dye thermally transferred from the donor sheet, said receiving layer having thereon a release medium comprising a dye-permeable release agent containing an effective amount of an adjuvant in the form of discrete particles of average size not exceeding 0.75 micron.

4,839,339

SUPERCONDUCTOR PRECURSOR MIXTURES MADE BY PRECIPITATION METHOD

Bruce C. Bunker; Diana L. Lamppa, and James A. Voigt, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 25, 1988, Ser. No. 160,443
Int. Cl.[4] C01F *17/00;* **C01G** *3/02;* **C04B** *35/50;* **H01L** *39/12*
U.S. Cl. **505—1** **2 Claims**



1. A method for preparing a precursor powder which can be calcined to form a superconducting ceramic, said method comprising:
(a) forming an aqueous solution of metal salts composed of the metals that will constitute part of the ceramic and of pyrolyzable counter anions, said metal salts being present in the stoichiometric proportions necessary to form said ceramic;
(b) forming an aqueous solution comprising a lower alkylammonium hydroxide and carbonate anions;
(c) instantaneously and completely mixing said solutions together at pH's within the range of 9 to 12 under controlled pH conditions and in quantities that will yield the precursor powder with the exact cation ratios required for the final superconducting ceramic; and
(d) collecting the resulting precipitated precursor powder which consists of the desired superconductor cations, hydroxide and carbonate anions, and minor quantities of pyrolyzable counter ions.

2. A method for preparing a precursor powder which can be calcined to form a superconductor ceramic, said method comprising:
(a) forming an aqueous solution of salts of yttrium, barium, and copper in molar proportions substantially equal to 1:2:3 with a pyrolyzable counter anion;
(b) forming a precipitating anion solution consisting of a stoichiometric quantity of an about 0.5 aqueous tetramethylammonium hydroxide containing about 0.14 M carbonate ions and 0.2 molar aqueous oxalic acid;
(c) instantaneously and completely mixing said solutions together at a pH within the range of 9 to 12 under controlled pH conditions; and
(d) collecting the resulting precipitated precursor powder, which consists of the desired superconductor cations, the pyrolyzable precipitating anions, and minor quantities of pyrolyzable counter ions.

VOL 1103 ISS 2 JE 13 1989 UMI

4,839,340

BORNANE-3-SPIRO-1'-CYCLOPENTANE DERIVATIVES AND PERFUMERY COMPOSITIONS CONTAINING THEM

Yoshiaki Fujikura; Tomohito Kitsuki, both of Utsunomiya; Manabu Fujita, Kashiwa, and Nao Toi Sakura, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jun. 29, 1988, Ser. No. 213,151

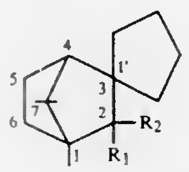
Claims priority, application Japan, Jun. 29, 1987, 62-162137

Int. Cl.⁴ A61K *7/46*

U.S. Cl. 512—9 **8 Claims**

1. A derivative of bornane-3-spiro-1'cyclopentane represented by the general formula

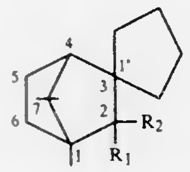
(1)



in which R_1 represents a hydrogen atom or a hydroxyl group and R_2 represents a methoxyl group, an ethoxyl group, a formuloxyl group or an acetoxyl group in the cases in which said R_1 is a hydrogen atom or represents a methyl group or an ethyl group in the cases in which said R_1 is a hydroxyl group.

8. A perfumery composition comprising a derivative of bornane-3-spiro-1'-cyclopentane represented by the general formula

(1)



in which R_1 represents a hydrogen atom or a hydroxyl group and R_2 represents a methoxyl group, an ethoxyl group, a formyloxyl group or an acetoxyl group in the cases in which said R_1 is a hydrogen atom or represents a methyl group or an ethyl group in the cases in which said R_1 is a hydroxy group.

4,839,341

STABILIZED INSULIN FORMULATIONS

Eddie H. Massey, and Theodore A. Shelign, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 8,493, Jan. 29, 1987, abandoned, which is a continuation of Ser. No. 749,371, Jun. 27, 1985, abandoned, which is a continuation-in-part of Ser. No. 614,355, May 29, 1984, abandoned. This application Nov. 13, 1987, Ser. No. 120,443

Int. Cl.⁴ A61K *37/26*

U.S. Cl. 514—4 **12 Claims**

1. An insulin formulation comprising, in a pharmaceutically acceptable aqueous diluent and per each milliliter of formulation, from about 40 U to about 500 U of insulin, from about 1 to about 6 milligrams of a hydroxybenzene, and from about 0.05 to about 10 milligrams of a polyethylene glycol-polypropylene glycol polymer of the formula

$$HO(CH_2CH_2O)_a-(\underset{\displaystyle CH_3}{\underset{|}{C}}HCH_2O)_b-CH_2CH_2O)_cH$$

having an average molecular weight of about 8350 and in which the average number of ethyleneoxy units per molecule, designated by the sum of a and c, is about 150, and the average number of propyleneoxy units per molecule, designated as b, is about 30.

4,839,342

METHOD OF INCREASING TEAR PRODUCTION BY TOPICAL ADMINISTRATION OF CYCLOSPORIN

Renee Kaswan, Athens, Ga., assignor to University of Georgia Research Foundation, Inc., Athens, Ga.

Filed Sep. 3, 1987, Ser. No. 92,466

The portion of the term of this patent subsequent to Jun. 13, 2006, has been disclaimed.

Int. Cl.⁴ A61K *37/02*

U.S. Cl. 514—11 **18 Claims**

1. A method for enhancing or restoring lacrimal gland tearing comprising topically administering cyclosporin to the eye in a pharmaceutically acceptable vehicle.

4,839,343

PREPARATION CONTAINING HEXATRIACONTAPEPTIDES AND METHODS OF USE

Bernard Waeber, Marly, and Hans R. Brunner, Pully, both of Switzerland, assignors to Debiopharm, S.A., Lausanne, Switzerland

Filed Mar. 13, 1987, Ser. No. 25,305

Int. Cl.⁴ A61K *37/02;* **C07K** *7/10*

U.S. Cl. 514—12 **14 Claims**

1. A method for increasing the blood pressure of a subject experiencing hypotension which comprises administering to said subject a therapeutically effective amount of a composition comprising:

a peptide of the formula

$$Y\ P\ X_3\ K\ P\ X_6\ X_7\ P\ G\ E\ D\ A\ X_{13}-$$
$$-X_{14}\ E\ X_{16}\ X_{17}\ X_{18}\ R\ Y\ Y\ X_{22}\ X_{23}\ L\ R\ H-$$
$$-Y\ X_{28}\ N\ L\ X_{31}\ T\ R\ Q\ R\ Y\ \text{(amide)}$$

wherein X_3 is A or S; X_6 is E or D; X_7 is A or N; X_{13} is S or P; X_{14} is P or A; X_{16} is E or D; X_{17} is L or M; X_{18} is S or A; X_{22} is A or S; X_{23} is S or A; X_{28} is L or I; and X_{31} is V or I; said peptide present in a therapeutically effective amount for treatment of hypotension but below that which would induce vasoconstrictor effects or natriuretic, neurotransmitter or neuromodulator properties in said subject; and

a physiologically acceptable diluent as a solvent for said peptide; said diluent also being compatible with vasoactive amines; said composition administered for a time sufficient to increase the blood pressure of the subject to a predetermined satisfactory level.

4,839,344

POLYPEPTIDE COMPOUNDS HAVING GROWTH HORMONE RELEASING ACTIVITY

Cyril Y. Bowers, New Orleans, La.; Frank A. Momany, Concord, Mass.; Ching H. Chang; Wayne L. Cody, both of Kingsport, Tenn.; John C. Hubbs, Gray, Tenn., and Charles H. Foster, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 12, 1987, Ser. No. 60,877

Int. Cl.⁴ A61K *37/43;* **C07K** *7/06*

U.S. Cl. 514—16 **6 Claims**

1. A polypeptide capable of promoting the release and elevation of growth hormone levels in the blood of a recipient animal, wherein said polypeptide is selected from the group consisting of polypeptides defined by the generic structure:

X-AA1-AA2-AA3-AA4-Trp-AA6-AA7-Z,

wherein X is selected from the group consisting of H, DOPA,

Lys, Phe, Tyr, Cys, Tyr-DAla-Phe-Gly, Tyr-DAla-Gly-Phe and Tyr-Ala-Gly-Thr:

AA1 is selected from the group consisting of:
all naturally occurring L-amino acids,
Met (0).
DOPA and
Abu:

AA2 is selected from the group consisting of His and 3(NMe)His (i.e., wherein the imidazole ring is methylated at the 3-position):

AA3 is selected from the group consisting of DTrp, 5-fluoro-D or D/LTrp: 6-fluoro-D or D/LTrp (i.e., wherein the indole ring is fluorinated at the 5- or 6-position), (formyl)DTrp (i.e., DTrp which is formylated at the indole nitrogen), and *XTrp, wherein *XTrp is selected from the group consisting of the N-monomethylated DTrp isomers (i.e., (N^αMe)DTrp and (indole NMe)DTrp:

AA4 is selected from the group consisting of Ala, Gly and Ser:

AA6 is selected from the group consisting of DPhe and (NMe)DPhe:

AA7 is selected from the group consisting of Arg, iLys, Lys and Orn: and

Z represents the C terminal end group of said polypeptide or the C terminal amino acid (s) plus end group, wherein Z is selected from the group consisting of —$CONH_2$, —COOH, —COOR, —CONHR, —$CONR_2$, —CH_2OH and —CH_2OR, wherein R is an alkyl group having 1-6 carbon atoms or an aromatic ring having up to 12 carbon atoms: and wherein Z is alternatively selected from the group consisting of —Gly —Z', —Met—Z',—Lys—Z', —Cys—Z'(when a Cya moiety is also present in the 1 position of the polypeptide (i.e., X or AA1 is Cys), the resulting peptide can exist in the linear form or in the cyclic form), —Gly—Tyr—Z', and —Ala—Tyr—Z', wherein Z' is selected from the group consisting of —$CONH_2$, —COOH, —CONHR, —COOR, —$CONR_2$, —CH_2OH, and —CH_2OR, wherein R in as defined above:

and organic or inorganic addition salts of any of said polypeptides:

wherein the amino acid residue abbreviations used are in accordance with the standard peptide nomenclature:

Gly =	Glycine
Tyr =	L-Tyrosine
Ile =	L-Isoleucine
Glu =	L-Glutamic Acid
Thr =	L-Threonine
Phe =	L-Phenylalanine
Ala =	L-Alanine
Lys =	L-Lysine
Asp =	L-Aspartic Acid
Cys =	L-Cysteine
Arg =	L-Arginine
Gln =	L-Glutamine
Pro =	L-Proline
Leu =	L-Leucine
Met =	L-Methionine
Ser =	L-Serine
Asn =	L-Asparagine
His =	L-Histidine
Trp =	L-Tryptophan
Val =	L-Valine
DOPA =	3,4-L-Dihydroxyphenylalanine
Met(O) =	L-Methionine sulfoxide
iLys =	N^ϵ—Isopropyl-L-lysine
Abu =	alpha-L-Aminobutyric acid
Orn =	L-Ornithine
Pal =	3-Pyridyl-L-alanine
Pgl =	L-Phenylglycine
(beta)Ala =	beta alanine (i.e., 3-aminopropanoic acid)

All three letter amino acid abbreviations preceded by a "D" indicate the D-configuration of the amino acid residue.

4,839,345

HYDRATED ADHESIVE GEL AND METHOD FOR PREPARING THE SAME

Hiroshi Doi, Takarazuka, and Masanori Inoue, Nishinomiya, both of Japan, assignors to Nippon Oil and Fats Co., Ltd., Japan

Filed Mar. 4, 1986, Ser. No. 836,080

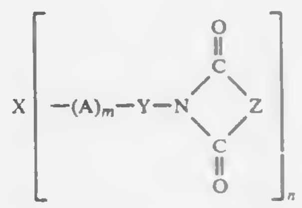
Claims priority, application Japan, Mar. 9, 1985, 60-45765; Jun. 8, 1985, 60-124740

Int. Cl.⁴ C07K *3/08;* **A61K** *37/12*

U.S. Cl. 514—21 **6 Claims**

1. A hydrated adhesive gel comprising a product obtained by cross-linking an aqueous solution consisting essentially of protein having amino groups at the side chains thereof, the protein being selected from the group consisting of gelatin, proteose, pepton, casein, albumin, globulin, prolamin, protamine, histone, and glutelin, with an N-hydroxyimidoester compound represented by the following formula (1):

(1)

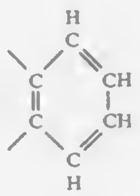


wherein X is a residue of a compound having 2 to 6 carbons and 2 to 6 hydroxyl groups, A is at least one group selected from the group consisting of oxyethylene, oxypropylene, and oxybutylene groups,

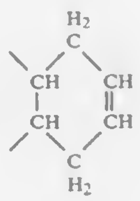
Y is a residue of dibasic acid, and is connected to A and N by ester bonds,

Z is selected from the group of chemical groups consisting of:

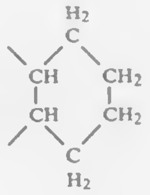
a group of (2)



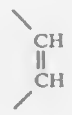
a group of (3)



a group of (4)



a group of (5)



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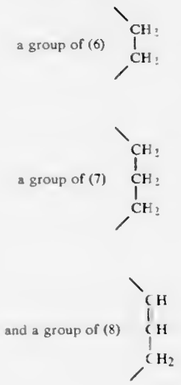


m is 1–3000, n is 2–6.

4,839,346

ANTITUMOR ANTHRACYCLINE GLYCOSIDES, INTERMEDIATES THEREOF, AND COMPOSITION AND USE THEREOF

Alberto Bargiotti; Teresa Bordoni, both of Milan; Pierangelo Zini, Cesano Boscone, and Sergio Penco, Milan, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

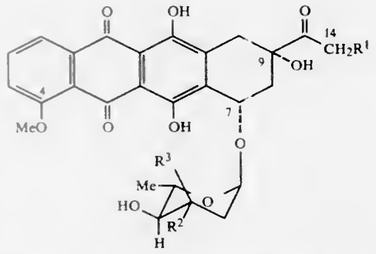
Filed Sep. 28, 1987, Ser. No. 101,382

Claims priority, application United Kingdom, Oct. 15, 1986, 8624687

Int. Cl.[4] A61K *31/70*; C07H *15/24*

U.S. Cl. 514—34 8 Claims

1. An anthracycline of the formula (I):



wherein R^1 is hydrogen or hydroxy and either R^2 or R^3 is hydrogen with the other being $—CH_2NH_2$, and pharmaceutically acceptable addition salts thereof.

8. A pharmaceutical composition for inhibiting the growth of a tumor selected from the group consisting of P 388 leukemia and Gross leukemia comprising a therapeutically effective amount of the anthracycline glycoside or pharmaceutically acceptable salt thereof of claim 1 in admixture with a pharmaceutically acceptable diluent or carrier.

4,839,347

COMPOSITION FOR TREATING DEHYDRATION

Peter H. Franz, Edina, Minn., assignor to Techmix, Inc., Edina, Minn.

Filed Nov. 29, 1984, Ser. No. 675,981

Int. Cl.[4] A61K *31/70*

U.S. Cl. 514—53 18 Claims

1. Composition for treatment of enteric and gastrointestinal diseases, including dehydration, in mammals having digestive tracts, with the treatment composition being orally administered in the drinking water or feed of the mammal for introduction into the digestive tract comprising: an amount of citric acid effective to reduce the pH level of the contents of the digestive tract of the mammal for restoring the digestive tract to normal pH levels form pH levels of the digestive tract present during dehydration to increase water, protein, and electrolyte absorption by the digestive tract, with the citric acid being in the range of 20 to 33 percent of the total ingredients and sufficient to reduce the pH of the daily water intake of the mammal in the range of at least 2 to 3 units; and an amount of four types of saccharides selected from monosaccharides and disaccharides effective as a source of energy for metabolic use by the mammal to provide a wide spectrum and prolonged energy reservoir and to provide a wide spectrum of tastes for further enhancing the palatability of the treatment composition to increase treatment composition intake, wherein the monosaccharides are dextrose and fructose and with the disaccharides being sucrose and lactose.

4,839,348

1,4-DIHYDROPYRIDINES

Carmelo A. Gandolfi; Marco Frigerio; Silvano Spinelli; Odoardo Tofanetti, and Sergio Tognella, all of Milan, Italy, assignors to Boehringer Biochemia Robin S.p.A., Milan, Italy

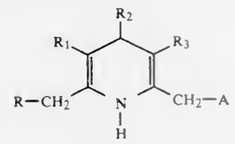
Filed Jul. 25, 1986, Ser. No. 889,380

Claims priority, application Italy, Aug. 6, 1985, 21875 A/85

Int. Cl.[4] C07D *401/04, 401/12, 211/86*; A61K *31/455*

U.S. Cl. 514—89 6 Claims

1. A compound of the formula 1



(I)

wherein

R is hydrogen or C_1–C_5 lower alkyl;

R_1 represents acetyl, benzoyl, cyano, nitro, an esterified carboxy group CO_2R_4 or an amide $—CONR_5R_6$;

R_2 is a member selected from the group consisting of:

(a) a phenyl group unsubstituted or substituted by one or more C_1–C_6 alkoxy, halo-C_1–C_6 alkyl, halo-C_1–C_4 alkoxy, halogen, nitro, cyano, C_1–C_6 alkoxycarbonyl, C_1–C_6 alkylthio, C_1–C_6 alkylsulphinyl groups;

(b) pentafluorophenyl;

(c) α- or β-naphthyl;

(d) 2-thienyl or β-pyridyl;

(e) α-benzo[2,3-b]-1,4-dioxane-α-yl, or

(f) α-benzo[3,4-c]-furoxanyl;

R_3 is an esterified carboxy group CO_2R_4;

R_4 is a member selected from the group consisting of a C_1–C_6 alkyl chain unsubstituted or substituted by hydroxy, amino, benzylamino, alkylamino selected from the group consisting of methylamino, ethylamino and isopropylamino, dialkylamino selected from the group consisting of dimethylamino and diethylamino, heterocycle selected from the group consisting of pyrrolidin-1-yl, piperidin-1-yl, piperazin-1-yl, imidazol-1-yl, and 2-alkoxycarbonyl-pyrrolidin-1-yl, and C_1–C_6 alkoxy groups; C_3–C_6 alkenyl; phenyl or (C_1–C_4 alkyl) phenyl; each of R_5 and R_6, which are the same or different, may be hydrogen, C_1–C_6 alkyl, benzyl or phenyl;

A represents a phosphonium group or a quaternary ammonium grop, said phosphonium group having the formula $(+)PR_7R_8R_9X^-$ wherein each of R_7, R_8 and R_9, which are the same or different, may be a C_1–C_6 lower alkyl, phenyl, or (C_1–C_4alkyl) phenyl; said quaternary ammonium group being selected from the formulas IX, X and XI:

$$(+)NR_{10}R_{11}R_{12}X^- \quad \text{(IX)}$$

wherein each of R_{10}, R_{11} and R_{12}, which are the same or different, is a C_1–C_6 lower alkyl;

(X)

wherein R^{10} is a C_1–C_6 lower alkyl, and E is a group which forms with the quaternary nitrogen atom a piperidinium ring;

(XI)

wherein G is a group which forms with the quaternary nitrogen atom an unsubstituted or a substituted heterocyclic ring selected from the group consisting of pyridinium, pyrimidinium, pyrazinium, 1-imidazolinium, oxazolium, thiazolium, pyrazolium, and diaza[2,2,2]bicyclooctanium, wherein said substituted heterocyclic ring carries at least one substituent selected from the group consisting of a halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, a free or esterified CO_2R_4 group as above defined, $—C\equiv N$, $—CONH_2$, and phenyl;

X^- is a pharmaceutically acceptable anion,

a salt, enantiomer, or diastereoisomer thereof.

4,839,349

PHOSPHORUS SUBSTITUTED TETRAZOLINONES AND PESTICIDAL USE

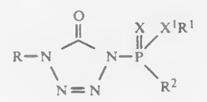
Rupert A. Covey, Bethany, and Richard C. Moore, Wallingford, both of Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Filed Jun. 3, 1988, Ser. No. 202,071

Int. Cl.[4] A01N *57/32*; C07F *9/65*

U.S. Cl. 514—92 14 Claims

1. A compound of tetrazolinones having the structural formula (I):



(I)

wherein

X is
- O, S;

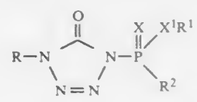
X^1 is:
- O, S, NH or NH^3;

R is:
- C_1–C_{12} alkyl,
- C_2–C_{13} alkoxyalkyl,
- C_7–C_9 aralkyl,
- C_5–C_6 cycloalkyl
- C_3–C_{12} alkenyl,
- naphthyl,
- phenyl,
- phenyl substituted with at least one member selected from the group consisting of:
  - fluorine,
  - chlorine,
  - bromine,
  - iodine,
  - C_1–C_4 alkyl,
  - C_1–C_4 alkoxy,
  - methylenedioxy,
  - NR^4R^5 wherein R^4 and R^5 are the same or different and are hydrogen or C_1–C_6 alkyl,
  - C_2–C_5 alkoxycarbonyl,
  - carboxy,
  - phenoxy,
  - nitro,
  - cyano,
  - trihalomethyl wherein halo is fluorine, chlorine or bromine,
  - trihalomethoxy wherein halo is fluorine, chlorine or bromine,
  - C_1–C_6 alkylthio, and
  - C_1–C_6 fluoroalkylthio; or
- benzyl substituted with at least one member selected from the group consisting of:
  - fluorine,
  - chlorine,
  - bromine
  - iodine,
  - C_1–C_4 alkyl,
  - C_1–C_4 alkoxy,
  - methylenedioxy,
  - C_2–C_5 alkoxycarbonyl,
  - phenoxy,
  - nitro,
  - cyano,
  - trihalomethyl wherein halo is fluorine, chlorine or bromine,
  - trihalomethoxy wherein halo is fluorine, chlorine or bromine,
  - C_1–C_6 alkylthio, and
  - C_1–C_6 fluoroalkylthio;

R^1, and R^3 may be the same or different and are C_1–C_4 alkyl; and

R^2 is C_1–C_4 alkyl,
- C_1–C_4 alkoxy,
- C_1–C_4 alkylthio,
- C_1–C_4 alkylamino.

11. A method of controlling insects comprising applying the to the locus to be protected an insecticidally effective amount of a compound having the formula:



(I)

wherein

X is
- O, S;

X^1 is:
- O, S, NH or NR^3;

R is:
- C_1–C_{12} alkyl,
- C_2–C_{13} alkoxyalkyl,
- C_7–C_9 aralkyl,
- C_5–C_6 cycloalkyl
- C_3–C_{12} alkenyl,
- naphthyl,
- phenyl,
- phenyl substituted with at least one member selected from the group consisting of:
  - fluorine,
  - chlorine,
  - bromine,
  - iodine,
  - C_1–C_4 alkyl,
  - C_1–C_4 alkoxy,
  - methylenedioxy,
  - NR^4R^5 wherein R^4 and R^5 are the same or different and are hydrogen or C_1–C_6 alkyl,

C_2–C_5 alkoxycarbonyl,
carboxy,
phenoxy,
nitro,
cyano,
trihalomethyl wherein halo is fluorine, chlorine or bromine,
trihalomethoxy wherein halo is fluorine, chlorine or bromine,
C_1–C_6 alkylthio, and
C_1–C_6 fluoroalkylthio; or
benzyl substituted with at least one member selected from the group consisting of:
fluorine,
chlorine,
bromine
iodine,
C_1–C_4 alkyl,
C_1–C_4 alkoxy,
methylenedioxy,
C_2–C_5 alkoxycarbonyl,
phenoxy,
nitro,
cyano,
trihalomethyl wherein halo is fluorine, chlorine or bromine,
trihalomethoxy wherein halo is fluorine, chlorine or bromine,
C_1–C_6 alkylthio, and
C_1–C_6 fluoroalkylthio;
R^1, and R^3 may be the same or different and are C_1–C_4 alkyl; and
R^2 is C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylamino.

4,839,350

CEPHALOSPORIN COMPOUNDS AND THE PRODUCTION THEREOF

Kunio Atsumi; Kenji Sakagami, both of Kawasaki; Yuichi Yamamoto, Yokohama; Takashi Yoshida, Tokyo; Ken Nishihata; Shinichi Kondo, both of Yokohama, and Shunzo Fukatsu, Tokyo, all of Japan, assignors to Meiji Seika Kaisha, Ltd. and Susumu Mitsuhashi, both of Tokyo Japan

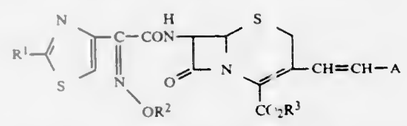
Continuation of Ser. No. 769,746, Aug. 27, 1985, abandoned. This application Apr. 7, 1987 Ser. No. 36,124

Claims priority, application Japan, Sep. 7, 1984, 59-186464; Jul. 18, 1985, 60-157005

Int. Cl.[4] A61K *31/545;* **C07D** *501/24*

U.S. Cl. 514—202 14 Claims

1. A cephalosporin compound of the formula (I)



(I)

wherein R^1 is an amino group or a protected amino group; R^2 is a lower alkyl group, a carboxymethyl group or a protected carboxymethyl group; R^3 is a hydrogen atom, a salt-forming cation or a carboxyl-protecting group; A is thiazolyl group, a lower-alkyl-thiazolyl group, a halo-thiazolyl group, or a 3-lower-alkylthiazolio group optionally substituted with one lower alkyl group, with an iodide or tirfluoroacetate counterion, and a pharmaceutically acceptable salt or ester of said cephalosporin compound.

4,839,351

ANTIBACTERIAL COMPOUNDS, AND USE

Tatsuo Nishimura, Toyonaka; Yoshinobu Yoshimura, Ibaraki; Akio Miyake, Hirakata, and Naoto Hashimoto, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

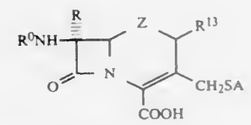
Filed Dec. 12, 1986, Ser. No. 941,069

Claims priority, applicatioo Japan, Dec. 13, 1985, 60-281724

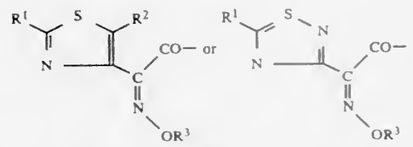
Int. Cl.[4] C07D *501/36;* **A61K** *31/545*

U.S. Cl. 514—206 12 Claims

1. A compound of the formula



wherein R^0 is a group of the formula



wherein R^1 is amino or an amino group which is protected by an amino protective group used in the field of β-lactams and peptides, R^2 is hydrogen, a halogen or nitro, R^3 is hydrogen, a C_{1-6} alkyl group which is unsubstituted or substituted by hydroxy, a C_{1-6} alkoxy or a di-C_{1-6} alkylamino, or a C_{2-6} alkynyl group, Z is S or S→O, R^4 is hydrogen, methoxy or formamido, R^{13} is hydrogen, methyl, hydroxyl or a halogen, and A is a condensed cyclic group selected from the group consisting of imidazo[1,2-a]-pyridyl, imidazo[1,2-a]pyrazinyl, imidazo[1,2-a]pyrimdinyl, imidazo[1,5-a]pyridyl and imidazo[1,5-a]-pyridazinyl group, which is unsubstituted or substituted by a C_{1-6} alkyl group, the number of the substituent being 1 to 2, or pharmaceutically acceptable salt thereof or a metabolically unstable, nontoxic ester thereof.

4,839,352

N-ACYL DERIVATIVES OF THIENAMYCIN

Louis Barash, Westfield; Burton G. Christensen, Metuchen; John Hannah, Matawan; William J. Leanza, Berkeley Heights, and David H. Shih, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

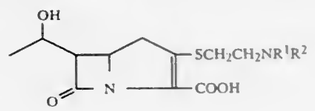
Continuation of Ser. No. 778,165, Sep. 18, 1985, abandoned, which is a continuation of Ser. No. 321,496, Nov. 16, 1981, abandoned, which is a continuation of Ser. No. 160,718, Jun. 18, 1980, abandoned, which is a continuation of Ser. No. 861,247, Dec. 16, 1977, abandoned, which is a continuation of Ser. No. 733,653, Oct. 18, 1976, abandoned, which is a continuation of Ser. No. 634,291, Nov. 21, 1975, abandoned. This application Aug. 27, 1987, Ser. No. 90,400

The portion of the term of this patent subsequent to Nov. 25, 1997, has been disclaimed.

Int. Cl.[4] C07D *487/04;* **A61K** *31/40*

U.S. Cl. 514—210 12 Claims

1. A compound having the structural formula:



and the non-toxic, pharmaceutically acceptable salts thereof; wherein R^1 is hydrogen and R^2 is

type acyl wherein X is O or S, with the proviso that R^2 is not formyl or acetyl.

4,839,353

ANTI-ULCER SUBSTITUTED PYRIDINE DERIVATIVES

Masaaki Hosoi, Kawasaki; Ryo Nishioka, Ichikawa; Yoshio Hioki; Yoshiaki Iida, both of Yokohama; Hiroshi Takeshita, Ichikawa; Kenji Niiyama, Ichikawa, and Yusuke Hidaka, Tokyo, all of Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan

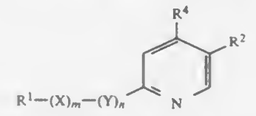
Filed Oct. 20, 1987, Ser. No. 110,369

Claims priority, application Japan, Oct. 21, 1986, 61-248363; Aug. 10, 1987, 62-199597

Int. Cl.[4] A61K *31/55;* **C07D** *401/04*

U.S. Cl. 514—212 7 Claims

1. A substituted pyridine derivative of the formula (I)



(I)

wherein R^1-$(X)_m$ represents a phenyl, phenoxy, phenylthio, 4-biphenylyl, 4-biphenyloxy, naphthyl or napththylthio group and wherein said groups are unsubstituted or substituted by one or two substituents selected from the group consisting of C_{1-4} alkyl, C_{1-4} alkoxy, C_{5-8} cycloalkyl, and halogen atoms; Y represents methylene, ethylene or vinylene, n is 1, R^2 represents hydrogen or C_{1-4} alkyl; and R^4 represents a C_{1-4} alkyloxy, benzyloxy, diethylamino, cyclohexyloxy, piperidino or perhydroazepin-1-yl group, which groups are unsubstituted or substituted by a C_{1-4} alkyl; or an acid addition salt thereof.

6. A method of treating ulcer in a mammal which comprises administering to the mammal a therapeutically effective amount of a substituted pyridine derivative of the formula (I) given in claim 1 or a pharmaceutically acceptable acid addition salt thereof.

4,839,354

COUGH/COLD MIXTURES COMPRISING NON-STEROIDAL ANTI-INFLAMMATORY DRUGS

Abraham Sunshine, New York; Eugene M. Laska, Larchmont, and Carole E. Siegel, Mamaroneck, all of N.Y., assignors to Analgesic Associates, Larchmont, N.Y.

Division of Ser. No. 887,205, Jul. 21, 1986, Pat. No. 4,738,966, which is a division of Ser. No. 752,546, Jul. 8, 1985, Pat. No. 4,619,934, which is a division of Ser. No. 598,502, Apr. 9, 1984, Pat. No. 4,552,899. This application Feb. 19, 1987, Ser. No. 16,344

Int. Cl.[4] A61K *31/27, 31/34, 31/40, 31/54*

U.S. Cl. 514—226.5 18 Claims

1. A pharmaceutical composition of matter for use in the treatment of cough, cold, cold-like and/or flu symptoms in a mammalian organism, said composition comprising a sympathomimetically, analgesically and anti-inflammatorily effective amount of (i) at least one of the acetic acid NSAIDs, tolmetin, zomepirac, sulindac, indomethacin, or pharmaceutically acceptable salt thereof, in combinatory immixture with (ii) at least one of the sympathomimetic amines, pseudoephedrine, phenylpropanolamine, phenylephrine, or pharmaceutically acceptable salt thereof.

4,839,355

TRICYCLIC-PYRIDINYLQUINOLINE COMPOUNDS, THEIR PREPARATION AND USE

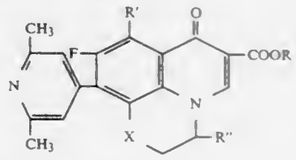
George Y. Lesher, Schodak, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 94,611, Sep. 9, 1987, abandoned. This application Jul. 18, 1988, Ser. No. 220,717

Int. Cl.[4] A61K *31/535, 31/54;* **C07D** *498/06, 513/06*

U.S. Cl. 514—224.5 10 Claims

1. A compound having the formula:



wherein:
R is hydrogen or lower-alkyl;
R′ is selected from the group consisting of hydrogen, fluoro and —SR‴, where R‴ is benzyl, phenyl or lower-alkyl;
R″ is alkyl of 1–3 carbon atoms;
X is O or S; a pharmaceutically acceptable acid-addition salt thereof; or an alkali metal or amine salt of a compound where R is hydrogen.

2. A compound according to claim 1 wherein R is hydrogen and R′ is hydrogen or fluoro.

8. A composition for combating bacteria, which comprises an antibacterially effective amount of a compound according to claim 2 together with one or more pharmaceutically acceptable excipients or diluents.

4,839,356

THIAZINONE DERIVATIVES

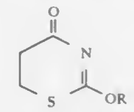
Mandy E. Coombs, Kent, United Kingdom, assignor to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

Filed May 13, 1987, Ser. No. 49,247

Int. Cl.[4] C07D *279/06;* **A61K** *31/54*

U.S. Cl. 514—227.2 6 Claims

1. A thiazinone compound of formula



(I)

wherein R represents a phenyl group substituted by 1 or 2 substituents selected from the group of consisting of chlorine atoms, methyl groups and trifluoromethyl groups.

4,839,357

RENIN INHIBITORS CONTAINING PHENYLALANYL-HISTIDINE REPLACEMENTS

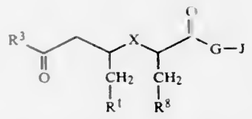
Arthur A. Patchett, Westfield; William J. Greenlee, Teaneck; William H. Parsons, Rahway, and Prasun K. Chakravarty, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 2, 1987, Ser. No. 102,203

Int. Cl.[4] A61K *31/16, 31/18, 31/41, 31/505;* **C07D** *279/10, 413/00, 265/30, 235/04;* **C07C** *143/78, 103/00, 149/41, 143/67*

U.S. Cl. 514—235.8 5 Claims

1. A peptide of the formula



where:

R^1 is aryl, wherein aryl is unsubstituted or mono-, di- or trisubstituted phenyl or naphthyl where each substituent is independently selected from the group consisting of C_1–C_8-alkyl, amino, mono- or di-C_1–C_4-alkylamino, amino-C_1–C_4-alkyl, hydroxy-C_1–C_4-alkyl, mono- or di-C_1–C_4-alkylamino-C_1–C_4-alkyl, guanidyl, guanidyl-C_1–C_4-alkoxy, CF_3, halo, CO_2H, CO_2-C_1–C_4-alkyl, NR^5R^6, and $N(R^5)^+{}_3A^-$, wherein R^5 and R^6 are independently hydrogen, unsubstituted C_1–C_4-alkyl, and A^- is an anion;

R^3 is aryl as defined above; Het where Het is a 5 to 7-membered monocyclic or 7 to 10-membered bicyclic ring containing one nitrogen atom; a Het as defined containing an additional heteroatom selected from N, NO, S, SO or SO_2; a substituted heterocyclic ring in which the heteroatoms are as defined and the substituent is on a ring carbon atom and selected from —OH, —CO_2H, —CO_2-C_1–C_4-alkyl, —SO_3H, —SO_2NH_2, aryl as defined above, —CF_3, -halo, or unsubstituted mono-, or di-C_1–C_4-alkylamino; a Het as defined containing a quaternary nitrogen atom; a quaternized ring as defined in which the nitrogen is substituted with one or two substituents where the first substituent is selected from C_1–C_4-alkyl, hydroxy-C_1–C_4-alkyl, —CO_2H, —CO_2-C_1–C_4-alkyl, —SO_3H, —SO_2NH_2, -aryl as defined above, —CF_3, -halo, or unsubstituted mono- or di-C_1–C_4-alkylamino, and the second substituent is C_1–C_4-alkyl; $NR^{20}R^{21}$ where R^{20} and R^{21} are independently selected from hydrogen, C_1–C_4-alkyl, aryl-C_1–C_2-alkyl or Het wherein Het and aryl are as defined above;

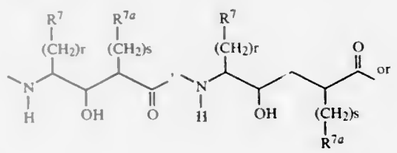
R^4 is C_1–C_4-alkyl or aryl-C_1–C_2-alkyl in which aryl is as defined above;

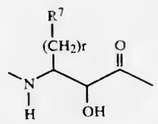
R^8 is C_1–C_4-alkyl, imidazol-4-yl, thiazol-5-yl, or aryl, as defined above;

R^7 and R^{7a} are independently H, C_1–C_7-alkyl or C_3–C_7-cycloalkyl;

X is —SO_2NH—, —SO_2CH_2—, or —$SOCH_2$—;

G is:





J is —Y—$(CH_2)_x$-$[CH(R^5)]_y$-$(CH_2)_z$-R^{10}

Y is O, NH, or N-C_1–C_4-alkyl

x is 0 to 1

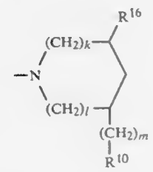
y is 0 to 1

z is 0 to 4

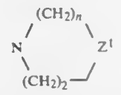
s is 0 to 2

R^5 is as defined above

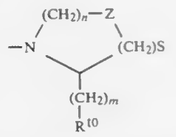
R^{10} is hydrogen; —OH; aryl as defined above; Het, as defined above; —NH_2; —$NR^{17}R^{18}$; —NHR^{18}; —$N(R^{17}R^{18}R^{19})^+A^-$, where R^{17} and R^{19} are independently C_1–C_4-alkyl, R^{18} is aryl, Het or C_1–C_4-alkyl substituted with a substituent chosen from the group consisting of aryl, Het, —OH, —NH_2, —NH—C_1–C_4-alkyl, —$N(C_1$–C_4-alkyl$)_2$, —CO_2H, or aryl, and A^- in which aryl and A^- are as defined above;



where k=1, 2; l=0, 1; R^{16}=—H, —OH, C_1–C_4-alkyl, aryl, or aryloxy wherein aryl is as defined; and R^{10} is as defined above;



where k' and n=2 or 3; s'=1 or 2; R^{10} is as defined above; and Z^1 is O, S, SO, SO_2, NH, NR^{18} or $(N^+R^{17}R^{18})$ A^- where R^{17}, R^{18} and A^- are defined above;



where k', s', R^{10}, and Z^1 are as defined above;

where t' is 2 or 3; k' is as defined above, and Z^2 is NR^{18} or $N(R^{17}R^{18})^+A^-$, where R^{17}, R^{18} and A^- are as defined above;

or a pharmaceutically acceptable salt thereof.

4,839,358

ALPHA-MERCAPTOMETHYL-BENZENE PROPANAMIDES, PHARMACEUTICAL COMPOSITIONS AND USE

Jean-Paul Vevert, Pantin; Francoise Delevallee, Fontenay-sous-Bois; Jean-Claude Gasc, and Francis Petit, both of Bondy, all of France, assignors to Roussel Uclaf, Paris, France

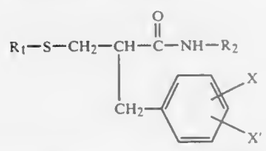
Filed Feb. 23, 1988, Ser. No. 159,265

Claims priority, application France, Feb. 26, 1987, 87 02546

Int. Cl.[4] A61K *31/40, 31/535;* C07D *295/22*

U.S. Cl. 514—237.8 **18 Claims**

1. A compound selected from the group consisting of α-mercaptomethyl-benzene propanamides of the formula



wherein R_1 is selected from the group consisting of hydrogen and

R_1' is selected from the group consisting of alkyl of 1 to 5 carbon atoms and aryl optionally substituted with at least one member of the group consisting of —OH, —NO_2, halogen and alkyl and alkoxy of 1 to 5 carbon atoms, X and X' are individually selected from the group consisting of hydrogen, alkyl and alkoxy of 1 to 5 carbon atoms, —OH, halogen and —CF_3, R_2 is selected from the group consisting of pyrrolidinyl, morpholinyl piperidinyl, piperazinyl, tetrahydrothiazinyl and hexahydroazepinyl, all optionally substituted with at least one member of the group consisting of alkyl and alkoxy of 1 to 5 carbon atoms, —OH, —NO_2, —CF_3, halogen and acyl of an organic carboxylic acid of 1 to 7 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

7. An analgesic composition comprising an analgesically effective amount of at least one compound of claim 1 and an inert pharmaceutical carrier.

4,839,359

TRISUBSTITUTED 1,3,5-TRIAZINE-2,4,6-TRIONES

Wolfgang Führer, Cologne; Engelbert Kühle, Bergisch Gladbach; Alfons Adler, Cologne, and Gerd Hänssler, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

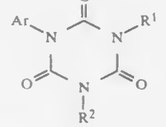
Continuation-in-part of Ser. No. 50,981, May 15, 1987, abandoned. This application Nov. 5, 1987, Ser. No. 118,110

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1986, 3618662

Int. Cl.[4] A01N *43/66;* C07D *251/34*

U.S. Cl. 514—241 **8 Claims**

1. A trisubstituted 1,3,5-triazine-2,4,6-trione of the formula



in which

Ar represents phenyl, which is mono-, di-, tri-, tetra- or pentasubstituted by identical or different substituents from the group comprising halogen, alkyl with 1 to 4 carbon atoms, halogenoalkyl, with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, alkoxy with 1 to 4 carbon atoms, halogenoalkoxy with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, alkylthio with 1 to 4 carbon atoms, halogenoalkylthio with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, halogenosulphonyl, dialkylamino with identical or different straight-chain or branched alkyl radicals with in each case 1 to 4 carbon atoms or nitro,

R^1 represents straight-chain or branched alkyl which has 1 to 12 carbon atoms and is optionally mono- or polysubstituted by identical or different substituents from the group comprising alkoxy with 1 to 3 carbon atoms, halogenoalkoxy with 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, alkylthio with 1 to 3 carbon atoms, halogenoalkylthio with 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms and furyl and phenyl, which can likewise be mono-, di-, tri-, tetra- or pentasubstituted by identical or different halogen atoms; or represents cycloalkyl which has 3 to 8 carbon atoms and is optionally mono-, di-, tri-, tetra-, penta- or hexasubstituted by identical or different substituents from the group comprising halogen, alkyl with 1 to 4 carbon atoms, alkoxy with 1 to 3 carbon atoms, halogenoalkoxy with 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, alkylthio with 1 to 3 carbon atoms and halogenoalkylthio with 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, and

R^2 is different from R^1 and represents alkyl with 1 to 4 carbon atoms, alkenyl with 3 to 5 carbon atoms, alkinyl with 3 to 5 carbon atoms, alkoxyalkyl with in each case 1 to 3 carbon atoms in the alkoxy part and in the alkyl part, alkylthioalkyl with in each case 1 to 3 carbon atoms in the alkylthio part and in the alkyl part of alkoxycarbonylalkyl with 1 to 3 carbon atoms in the alkoxy part and 2 or 3 carbon atoms in the alkyl part, or represents cyanoalkyl with 1 to 5 carbon atoms in the alkyl part.

8. A fungicidal composition comprising a fungicidally effective amount of a compound according to claim 1 and a diluent.

4,839,360

LACTAM DERIVATIVES

Yasuhiko Sato, Urawa; Koichiro Yamada, Kawaguchi; Sumihiro Nomura, Omiya; Ryuichi Ishida, Suita, and Michio Yamamura, Tondabayashi, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Japan

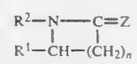
Filed Nov. 20, 1987, Ser. No. 123,314

Claims priority, application Japan, Dec. 3, 1986, 61-288079

Int. Cl.[4] A61K *31/505, 31/445;* C07D *401/10, 211/76*

U.S. Cl. 514—252 **24 Claims**

1. A lactam of the formula:



wherein

R^1 is a phenyl group or a phenyl group having 1 or 2 substituents selected from a halogen atom, a lower alkoxy group, a lower alkyl group, hydroxy group, a lower alkylthio group, a thiol group, cyano group, a lower alkanoyloxy group, a lower alkylsulfinyl group, a lower alkylsulfonyl group, a trihalogeno-lower alkyl group, nitro group, amino group, a lower alkanoylamino group, carboxyl group and a carboxy-lower alkyl group;

R^2 is a phenyl group or a phenyl group having 1 to 2 substituents selected from a halogen atom, a lower alkoxy group, a lower alkyl group, hydroxy group, a lower alkylthio group, thiol group, cyano group, a lower alkonoyloxy group, a lower alkylsulfinyl group, a lower alkylsulfonyl group, a trihalogeno-lower alkyl group, nitro group, amino group, a lower alkanoylamino group, carboxyl group and a carboxy-lower alkyl group; a cycloalkyl group of 3 to 7 carbon atoms, pyridyl group, pyrazinyl group, pyrimidyl group or pyridazinyl group;

Z is a oxygen atom or sulfur atom; and n is 2 or 3.

15. A pharmaceutical composition for the therapeutic treatment of or amelioration of central dopaminergic system disorders which comprises a therapeutically effective amount of a compound claimed in claim 1 and a pharmaceutically acceptable carrier therefor.

4,839,361

DIHYDROPYRIDINE-5-PHOSPHONIC ACID CYCLIC PROPYLENE ESTER

Kiyotomo Seto, Funabashi; Sakuya Tanaka, Hasuda, and Ryozo Sakoda, Kashiwa, all of, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 654,473, Sep. 26, 1984, Pat. No. 4,576,934. This application Oct. 30, 1985, Ser. No. 792,981

Claims priority, application Japan, Sep. 26, 1983, 58-177710; Aug. 3, 1984, 59-163649

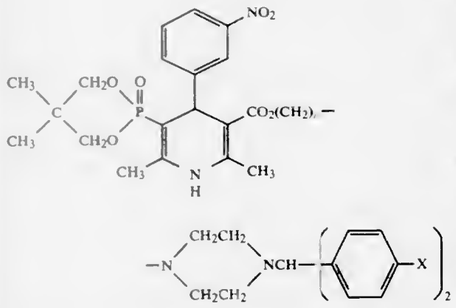
The portion of the term of this patent subsequent to Mar. 18, 2003, has been disclaimed.

Int. Cl.[4] C07D *401/12;* **A61K** *31/44*

U.S. Cl. 514—252 **9 Claims**

1. A compound of the formula:

VOL 1103 ISS 2 JE 13 1989 UMI



wherein X is hydrogen or fluorine and n is 2 or 3; or its pharmaceutically acceptable salt.

4,839,362

EBURNAMENINE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS AND METHODS EMPLOYING THEM AND PROCESSES FOR THEIR PREPARATION

János Kreidl; György Visky; László Czibula; Béla Stefkö; Mária Farkas née Kirják; Zsolt Szombathelyi; Egon Kárpáti, all of Budapest; Béla Kiss, Vecsés; Katalin Csomor, Budapest; László Szporny, Budapest; Lilla Forgách, Budapest; Csaba Kuthi, Budapest, and Anikó Gere, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

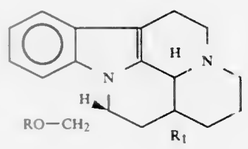
Filed Apr. 18, 1986, Ser. No. 853,844

Claims priority, application Hungary, Apr. 19, 1985, 1516/85

Int. Cl.[4] A61K *31/475;* **C07D** *461/00*

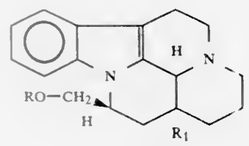
U.S. Cl. 514—283 **8 Claims**

1. A racemic or optically active trans-eburnamenine epimer of the Formula (Ia)



(Ia)

or (Ib)



(Ib)

wherein

R_1 stands for a $C_{1\ to\ 4}$ alkyl group; and

R stands for hydrogen, or a pharmaceutically acceptable acid addition salt thereof.

5. Method for treating mammals suffering from conditions which can be treated by a peripheral vasodilatory agent, characterized by using a therapeutically effective amount of a trans stereoisomer of a racemic or optically active eburnamenine derivative of the formula (Ia) or (Ib), as defined in claim 1, or a therapeutically useful acid addition salt thereof.

4,839,363

ERGOLINYL HETEROCYCLES FOR THE TREATMENT OF PARKINSON'S DISEASE AND DYSKINETIC SYMPTOMS

Enzo Brambilla, Mariano Comense; Sergio Manteganí; Lorenzo Pegrassi, both of Milan; Alessandro Rossi, and Aldemio Temperilli, both of Milan, all of Italy, assignors to Farmitalia Carlo Erba, Milan, Italy

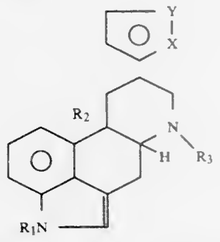
Filed Jan. 27, 1988, Ser. No. 149,012

Claims priority, application United Kingdom, Feb. 3, 1987, 8702364

Int. Cl.[4] A61K *31/48;* **C07D** *457/02*

U.S. Cl. 514—288 **10 Claims**

1. A method of treatment of Parkinson's disease, which comprises administering to a patient in need of said treatment a therapeutically effective amount of an ergoline derivative having the formula I



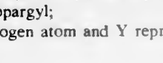
I

wherein R_1 represents a hydrogen atom or a methyl group;

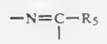
R_2 represents a hydrogen atom or a methoxy group;

R_3 represents a hydrocarbon group which is one member selected from the group consisting of methyl, ethyl, n-propyl, isopropyl, butyl, t-butyl, isobutyl, methylcyclopropyl, allyl and propargyl;

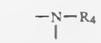
X represents a nitrogen atom and Y represents an oxygen atom, a



group wherein R_4 represents a hydrogen atom, a C_1–C_4 alkyl, or a phenyl group, R_5 represents a hydrogen atom, a C_1–C_4 alkyl, a phenyl, an amino or di(C_1–C_4 alkyl)amino group and the nitrogen atom of the group

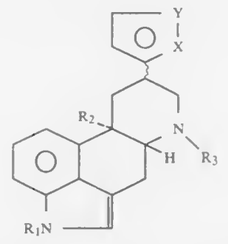


is not joined to the nitrogen atom represented by X, or Y represents a nitrogen atom and X represents an oxygen atom or a



group wherein R_4 is defined as above; and pharmaceutically acceptable salts thereof.

6. A method of treatment of dyskinetic symptoms, which comprises administering to a patient in need of said treatment a therapeutically effective amount of an ergoline derivative having the formula I



I

wherein

R_1 represents a hydrogen atom or a methyl group;

R_2 represents a hydrogen atom or a methoxy group;

R_3 represents a hydrocarbon group which is one member selected from the group consisting of methyl, ethyl, n-propyl, isopropyl, butyl, t-butyl, isobutyl, methylcyclopropyl, allyl and propargyl;

X represents a nitrogen atom and Y represents an oxygen atom,

wherein R_4 represents a hydrogen atom, a C_1–C_4 alkyl, or a phenyl group, R_5 represents a hydrogen atom, a C_1–C_4 alkyl, a phenyl, an amino or di(C_1–C_4 alkyl)amino group and the nitrogen atom of the group

is not joined to the nitrogen atom represented by X, or Y represents a nitrogen atom and X represents an oxygen atom or a

group wherein R_4 is defined as above; and pharmaceutically acceptable salts thereof.

4,839,364

9-AMINO-3,4-DIHYDROACRIDINES AND RELATED COMPOUNDS USEFUL FOR ENHANCING MEMORY

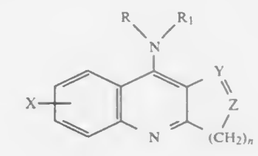
Gregory M. Shutske, Somerset, N.J., and Frank A. Pierrat, Coventry, R.I., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Continuation of Ser. No. 781,155, Oct. 1, 1985, Pat. No. 4,695,573, which is a continuation-in-part of Ser. No. 664,731, Oct. 15, 1984, Pat. No. 4,631,286. This application Jan. 28, 1987, Ser. No. 7,885

Int. Cl.[4] A61K *31/47;* **C07D** *219/10*

U.S. Cl. 514—290 **14 Claims**

1. A compound of the formula



wherein n is 1, 2 or 3; X is hydrogen, loweralkyl, loweralkoxy, halogen, hydroxy, nitro, trifluomethyl, $NHCOR_2$ where R_2 is loweralkyl, or NR_3R_4 where R_3 and R_4 are independently hydrogen or loweralkyl; R is hydrogen or loweralkyl; R_1 is hydrogen, loweralkyl, diloweralkylaminoloweralkyl, aryllowerakyl, diaryllowerakyl, furyllowerakyl, thienylloweralkyl, oxygen-bridged aryllowerakyl, oxygen-bridged diaryllowerakyl, oxygen-bridged furyllowerakyl, oxygen-bridged thienylloweralkyl; Y is CR_5, R_5 being hydrogen or loweralkyl; and Z is CH; and optical antipode thereof, or a pharmaceutically acceptable acid addition salt thereof.

9. A pharmaceutical composition which comprises an effective memory enhancing amount of a compound defined in claim 1.

12. A method of treating a patient in need of memory enhancement, wherein an effective memory enhancing amount of a compound defined in claim 1 is administered to the patient.

4,839,365

THIENOPYRIDINE DERIVATIVES USEFUL IN TREATING GASTRIC ULCERS

Kentaro Hirai, Kyoto; Yukio Mizushima, and Masami Doteuchi, both of Osaka, all of Japan, assignors to Shinogi & Co., Ltd., Osaka, Japan

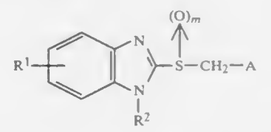
Filed May 6, 1988, Ser. No. 191,057

Claims priority, application Japan, May 19, 1987, 62-122217

Int. Cl.[4] A61K *31/44;* **C07D** *495/04*

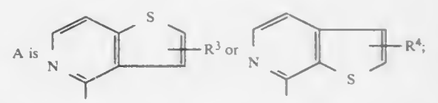
U.S. Cl. 514—301 **4 Claims**

1. A compound of the formula:



(I)

(wherein R^1 is hydrogen, C_1–$_5$ alkyl, C_1–$_5$ alkoxy, C_1–$_5$ alkoxycarbonyl, or trifluoromethyl; R^2 is hydrogen, C_1–$_5$ alkoxycarbonyl, C_6–$_{12}$ aryloxycarbonyl, C_1–$_5$ alkanoyloxy-C_1–$_5$ alkyl, C_1–$_5$ alkoxycarboyloxy-C_1–$_5$ alkyl, C_1–$_5$ acylamino-C_1–$_5$ alkyl, 2-hydroxy-1-C_2–$_5$ alkenyl, phthalimido-C_1–$_5$ alkyl, halogeno-C_1–$_5$ alkoxycarbonyl-C_1–$_5$ alkyl, hydroxy-C_1–$_5$ alkyl, C_1–$_5$ alkylthioC_1–$_5$ alkyl, or C_1–$_5$ alkylsulfinyl-C_1–$_5$ alkyl;



m is an integer of 0 or 1; R^3 and R^4 each is hydrogen, halogen, cyano, C_1–$_5$ alkyl, amino, C_1–$_5$ alkoxy, C_6–$_{12}$ aryl-C_1–$_5$ alkoxy, C_1–$_5$ alkoxycarbonyl, fluoro-C_1–$_5$ alkoxy, C_1–$_5$ alkanoylamino, or carbamoyl) or a pharmaceutical acceptable salt thereof.

4,839,366

METHYLTHIOQUINOLYL GUANIDINE DERIVATIVE, PROCESS OF PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS THEREFROM

Giuseppe Quadro, Milan, Italy, assignor to Chemesi Farmaceutici S.p.A., Parma, Italy

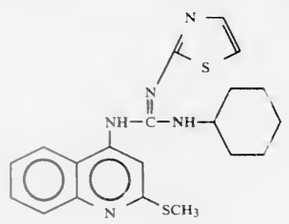
Continuation of Ser. No. 828,314, Feb. 11, 1986, abandoned, which is a continuation-in-part of Ser. No. 583,037, Mar. 23, 1984, abandoned. This application Feb. 23, 1988, Ser. No. 159,226

Claims priority, application Italy, Apr. 6, 1983, 20468 A/83

Int. Cl.[4] A61K *31/47;* C07D *401/12*

U.S. Cl. 514—312 4 Claims

1. The compound N-cyclohexyl-N''-4-(2-methylthioquinolyl)-N'-2-thiazolyl-guanidine of formula



I

4,839,367

ANTIHYPERTENSIVE AMIDE COMPOUNDS

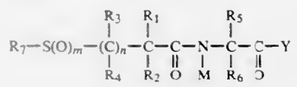
Raymond D. Youssefyeh, Tarrytown, N.Y., and Howard Jones, Holmdel, N.J., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Division of Ser. No. 703,054, Feb. 19, 1985, Pat. No. 4,619,944, which is a division of Ser. No. 269,166, Jun. 1, 1981, Pat. No. 4,507,136. This application Aug. 11, 1986, Ser. No. 895,107

Int. Cl.[4] A61K *31/47;* C07D *209/02, 209/36, 211/72*

U.S. Cl. 514—312 9 Claims

1. A compound of the formula:



wherein

R_1, R_2, R_3, R_4, R_5 and R_6 are hydrogen, C_1-C_6 alkyl, C_1-C_6 alkenyl, C_2-C_6 alkynyl, phenyl-C_1-C_6 alkyl, or C_3-C_7 cycloalkyl, and may be the same or different,

m is an integer from 1 to 2 inclusive,

n is an integer from 0 to 4 inclusive,

M is indolyl, pyridyl, or quinolyl, and

M may be substituted with C_{1-6} alkyl, C_{2-6} alkenyl, C_2-C_6 alkynyl, hydroxy, mercapto, amino, C_1-C_6 alkoxy, C_1-C_6 alkyl thio, C_{1-6} alkylamino, or halo,

Y is hydroxy, C_1-C_6 alkoxy, amino, amino-C_1-C_6 alkanoyl, phenoxy, amino C_{1-6} alkoxy, or hydroxy-C_1-C_6 alkoxy and

R_7 is C_{1-6} alkyl, phenyl, phen-C_{1-6} alkyl, C_1-C_{16} cycloalkyl, C_3-C_{16} cycloalkyl-C_{1-6} alkyl, indolyl, pyridyl, quinolyl,

wherein

R is hydrogen, C_{1-6} alkyl or phenyl, and

where Y is hydroxy, or a pharmaceutically acceptable, non-toxic alkali metal, alkaline earth metal, and amino salt thereof.

9. A method of treating hypertension which comprises administering to the hypertensive animal an effective amount of a compound according to claim 1.

4,839,368

1-ACYL-2,3-DIHYDRO-4(1H)-QUINOLINONE-4-OXIME DERIVATIVES

Ei Mochida, Tokyo; Akio Uemura; Kazuo Kato, both of Mishima; Hiroki Tokunaga, Tokyo, and Akinori Haga, Kawasaki, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd. and Hodogaya Chemical Co., Ltd., both of Tokyo, Japan

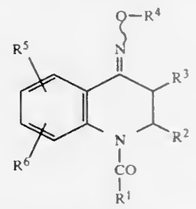
Filed Apr. 27, 1987, Ser. No. 42,784

Claims priority, application Japan, May 2, 1986, 61-102847; Apr. 15, 1987, 62-92788

Int. Cl.[4] C07D *215/42, 401/06;* C07F *9/60;* A61K *31/47*

U.S. Cl. 514—313 38 Claims

1. A 1,acyl-2,3,dihydro-4(1H)-quinolinone-4-oxime compound represented by formula (I):



(I)

wherein R^1 represents an alkyl of straight or branched chain having from 1 to 8 carbon atoms, a halogenated alkyl of straight or branched chain having from 1 to 4 carbon atoms, a cycloalkyl having from 3 to 6 carbon atoms, a lower alkyloxy, a methoxymethyl, a methoxycarbonylethyl, a benzyl, a styryl, a naphthyl, a pyridyl, a thienyl, a phenyl or a phenyl substituted with 1 to 5 substituents which are the same or different and selected from a group consisting of an alkyl of straight or branched chain having from 1 to 4 carbon atoms, a hydroxyl group, nitro group, a lower alkyloxy, a trifluoromethyl group and a halogen atom, provided that the summation of a nitro group or an iodo atom is not greater than three, R^2 and R^3 are the same or different and represent hydrogen atoms or methyl, R^4 represents a sulfo, a methanesulfonyl or a methoxyphospho, R^5 and R^6 are the same or different and represent hydrogen atoms, halogen atoms, hydroxyl groups, methylthio, methylsulfinyl, methanesulfonyl, N,N-dimethylamino, nitro groups, acetyl, methyl, trifluoromethyl groups, methoxycarbonyl or methoxy, and the bond shown with a wavy line represents a bond of anti-form or syn-form, and a pharmaceutically acceptable salt thereof as well as a non-toxic solvate of said compound and a non-toxic solvate of said salt.

4,839,369

ARYL AND HETEROARYL ETHERS AS AGENTS FOR THE TREATMENT OF HYPERSENSITIVE AILMENTS

Raymond Youssefyeh, Tarrytown; Utpal Chakraborty, Bedford Hills; Ernest Magnien, Flushing, and Rohit Desai, Millwood, all of N.Y., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Continuation of Ser. No. 723,781, Apr. 16, 1985, abandoned. This application Mar. 13, 1986, Ser. No. 839,410

Int. Cl.[4] A61K *31/47;* C07D *215/00*

U.S. Cl. 514—314 17 Claims

1. A therapeutic composition comprising an effective antihypersensitive amount of a compound of the formula

$(R_1)(R_2)Ar—Z—M—Z_1—Ar_1(R_3)(Z_2—Y—Z_3—R_4)$

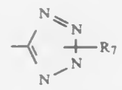
wherein

Ar is quinoline or isoquinoline;

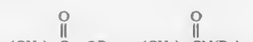
Ar_1 is phenyl;

R_1, R_2, and R_3 are independently H, lower alkyl, lower alkoxy, hydroxy, halo, trihalomethyl, hydroxy-lower alkyl, alkyl carboxy, carboxy, formyl, lower alkyl carbonyl, aryl, aryloxy, benzyloxy, lower alkylamino, diloweralkylamino, cyano, lower alkanoyloxy, carbamoyl, lower alkoxy-lower alkoxy, lower carbalkoxy-lower alkoxy, nitro, amino, tetrahydro-pyranylmethyl, or tetrazole, or tetrazole lower alkyl;

R_4 is



R_7 is H, lower alkyl,



R_8 is H or lower alkyl;

each M is independently O, S, or NR_8;

m is 0 to 5;

n is 0 or 1;

X is O, S, NR_8;

Z, Z_1, Z_2, and Z_3 are independently a chemical bond or an alkylene chain containing up to 5 carbon atoms in the principal chain and up to a total of 8 carbon atoms;

Y is a chemical bond, O, S, NR, CO, $CHOR_8$, CH=CH, CH_2—CH=CH, COO—, or CH_2;

or a pharmaceutically acceptable salt thereof; and a pharmaceutically acceptable carrier.

4,839,370

NOVEL DERIVATIVES OF 3-ARYL-3-CYCLOALKYL-PIPERIDINE-2,6-DIONE

Rolf W. Hartmann, Bad Abbach, and Christine Batzl, Schwandorf, both of Fed. Rep. of Germany, assignors to Asta-Pharma AG, Bielefeld, Fed. Rep. of Germany

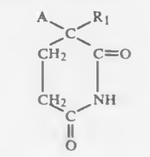
Filed Jul. 31, 1987, Ser. No. 79,964

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1986, 3625415

Int. Cl.[4] A61K *31/45;* C07D *211/88*

U.S. Cl. 514—328 7 Claims

1. 3-aryl-3-cycloalkyl-piperidine-2,6-dione derivatives useful for inhibiting estrogen biosynthesis of the general formula I:



I

in which A is a 4-aminophenyl radical and R_1 is a saturated C_3-C_{10}-cycloalkyl radical as well as physiologically acceptable salts thereof.

7. A method for the treatment of an estrogen dependent disease which comprises administering to a subject in need thereof an effective amount of the compound of claim 1.

4,839,371

3-ARALKYL-2-MERCAPTOYRIDINES AS DOPAMINE-β-HYDROXYLASE INHIBITORS

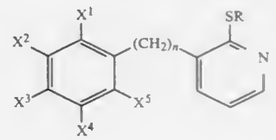
Lawrence I. Kruse, Hertfordshire, England, and Stephen T. Ross, Berwyn, Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Sep. 17, 1987, Ser. No. 97,988

Int. Cl.[4] A61K *31/44;* C07D *213/70*

U.S. Cl. 514—345 10 Claims

1. A compound of structure (I):



(I)

in which:

X^1 to X^5 are hydrogen, halogen, hydroxy, or C_{1-4}alkoxy;

n is 1 to 5; and

R is hydrogen or C_{1-4}alkyl; or a pharmaceutically acceptable salt thereof.

8. A method of inhibiting DBH activity which comprises administering to a mammal in need thereof an effective amount of a compound as claimed in claim 1.

4,839,372

ANTIMICROBIAL N-[1-(ALKYL OR ARYLMETHYL)-4(1H)-PYRIDINYLIDINE]-ALKANAMINES AND ACID ADDITION SALTS THEREOF AND METHODS OF USE AND COMPOSITIONS THEREOF

Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

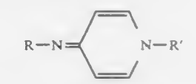
Continuation-in-part of Ser. No. 649,587, Sep. 12, 1984, Pat. No. 4,598,082. This application Dec. 16, 1985, Ser. No. 809,371

The portion of the term of this patent subsequent to Jul. 1, 2003, has been disclaimed.

Int. Cl.[4] C07D *213/74;* A61K *31/44*

U.S. Cl. 514—352 22 Claims

1. N-[1-(Alkyl or arylmethyl)-4(1H)-pyridinylidine]-alkanamine having the structural formula



wherein

R is alkyl having from 6 to 18 carbon atoms; and

R' is alkyl having from 2 to 12 carbon atoms, phenylmethyl or halophenylmethyl; or

except that R and R' cannot both be octyl; or

an acid addition salt thereof.

4,839,373

QUATERNARY AMMONIUM AND BENZOTHIAZOLE MICROBICIDAL PRESERVATIVE COMPOSITION

Yosuke Ito, Otsu; Yasuhiro Nomura, Takatsuki, and Sakae Katayama, Osaka, all of Japan, assignors to Buckman Laboratories International, Inc., Memphis, Tenn.

Filed Oct. 2, 1987, Ser. No. 103,819

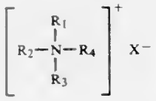
Claims priority, application Japan, May 28, 1987, 62-132871

Int. Cl.[4] A01N *43/78*

U.S. Cl. 514—367 30 Claims

1. A composition comprising

(a) a quaternary ammonium compound of the formula (I):



(I)

wherein

R_1 is selected from the group consisting of an alkyl group having from 8 to 18 carbon atoms and an alkenyl group having from 8 to 18 carbon atoms;

R_2 is selected from the group consisting of an alkyl group having from 1 to 5 carbon atoms, an alkyl group having from 8 to 18 carbon atoms, an alkenyl group having from 8 to 18 carbon atoms and an aralkyl group;

R_3 and R_4 are independently alkyl groups having from 1 to 5 carbon atoms; and

X is a halogen atom;

and (b) 2-(thiocyanomethylthio)benzothiazole, wherein the weight ratio of the quaternary ammonium compound of the formula (I) to the 2-(thiocyanomethylthio) benzothiazole ranges from 30:1 to 1:10.

4,839,374

4-((BICYCLIC HETEROCYCLYL)-METHYL AND -(HETERO)-PIPERIDINES

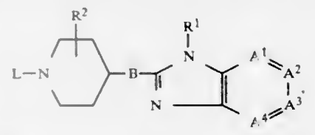
Frans E. Janssens, Bonheiden; Ludo E. J. Kennis, Turnhout; Jozef F. Hens, Nijlen; Joseph L. G. Torremans, Beerse, and Gaston S. M. Diels, Ravels, all of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

Division of Ser. No. 747,754, Jun. 24, 1985, Pat. No. 4,695,575, which is a continuation-in-part of Ser. No. 671,135, Nov. 13, 1984, abandoned, which is a continuation-in-part of Ser. No. 569,369, Jan. 9, 1984, abandoned. This application Sep. 10, 1987, Ser. No. 94,987

Int. Cl.[4] A61K *31/455*

U.S. Cl. 514—394 **6 Claims**

1. A method of treating allergic diseases in warm-blooded animals suffering from same which method comprises the systemic administration to warm-blooded animals of an anti-allergic effective amount of a compound having the formula



(1)

a pharmaceutically acceptable acid addition salt or a possible stereochemically isomeric form thereof, wherein:

$A^1=A^2-A^3=A^4$ is a bivalent radical having the formula

—CH=CH—CH=CH—	(a-1),
—N=CH—CH=CH—	(a-2),
—CH=N—CH=CH—	(a-3),
—CH=CH—N=CH—	(a-4), or
—CH=CH—CH=N—	(a-5),

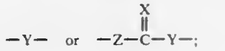
wherein one or two hydrogen atoms in said radicals (a-1)–(a-5) may, each independently from each other, be replaced by halo, lower alkyl, lower alkyloxy, trifluoromethyl or hydroxy;

R^1 is a member selected from the group consisting of hydrogen, alkyl, cycloalkyl, Ar^1 and lower alkyl substituted with one or two Ar^1 radicals;

R^2 is a member selected from the group consisting of hydrogen and lower alkyl;

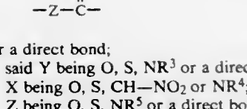
B is CH_2, O, S, SO or SO_2;

L is a member selected from the group consisting of a radical of formula



(b-1); and

a radical of formula



(b-2)

wherein one or two hydrogen atoms in the bivalent radical $-C_sH_{2s}-$ may, each independently from each other, be replaced by halo, hydroxy, mercapto, isothiocyanato, isocyanato, lower alkyloxy, lower alkylthio, Ar^1, Ar^1O-, Ar^1S-, Ar^1SO_2-, or NR^3R^5; and

n is 0 or the integer 1 or 2;

r and s are, independently from each other, 0 or an integer of from 1 to 6 inclusive;

T^1 is

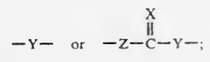
or a direct bond;

wherein one or two hydrogen atoms in the bivalent radical $-C_sH_{2s}-$ may, each independently from each other, be replaced by halo, hydroxy, mercapto, isothiocyanato, isocyanato, lower alkyloxy, lower alkylthio, Ar^1, Ar^1O-, Ar^1S-, Ar^1SO_2-, or NR^3R^5; and

n is 0 or the integer 1 or 2;

r and s are, independently from each other, 0 or an integer of from 1 to 6 inclusive;

T is



T^1 is

or a direct bond;

said Y being O, S, NR^3 or a direct bond;

X being O, S, CH—NO_2 or NR^4;

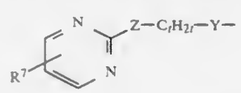
Z being O, S, NR^5 or a direct bond; and

said R^3 being hydrogen, lower alkyl, (Ar^2)lower alkyl, 2-lower alkyloxy-1,2-dioxoethyl or a radical of formula —C(=X)—R^6, R^6 being hydrogen, lower alkyl, Ar^2, Ar^2-lower alkyl, lower alkyloxy, Ar^2-lower alkyloxy, mono- or di(lower alkyl)amino, Ar^2-amino, Ar^2-lower alkylamino or Ar^2-lower alkyl(lower alkyl)amino;

said R^4 being hydrogen, lower alkyl, cyano, nitro, Ar^2-sulfonyl, lower alkylsulfonyl, lower alkylcarbonyl or Ar^2-carbonyl; and

said R^5 being hydrogen or lower alkyl;

wherein L^1 is a member selected from the group consisting of hydrogen; halo; hydroxy; lower alkyloxy; lower alkylthio; cyano; mercapto; isocyanato; isothiocyanato; Ar^1; Ar^1-carbonyl; Ar^1-sulfonyl; lower alkylsulfonyl; cycloalkyl being optionally substituted with up to two substituents each independently selected from the group consisting of lower alkyl, cyano and Ar^2; [10,11-dihydro-5H-dibenzo[a,d]cycloheptene-5-ylidene]methyl; Het; and furan substituted with substituted lower alkyl; said substituted lower alkyl being lower alkyl substituted with a member selected from the group consisting of hydroxy, mercapto, lower alkyloxy, lower alkylthio, aminolower alkylthio, Ar^2-oxy and a radical of formula



(c)

wherein: t is 0 or an integer of from 1 to 6 inclusive; and

R^7 is hydrogen or lower alkyl;

provided that: when in said radical of formula (c) t is 0, then Z or Y is a direct bond; and

where r is 0, L^1 may also be lower alkenyl, Ar^1-lower alkenyl or lower alkyl substituted with two lower alkyloxy radicals; and where r is 0 and T is NR^3, or T is —N(R-5)—C(=X)—Y or T^1 is —N(R^5)—C(=X)—, L^1 may also be amino, lower alkylamino or Ar^1-amino; and

where r is 0, and T is —N(R^5)—C(=X)—Y or T^1 is —N(R-5)—C(=X)—,

L^1 may also be nitro;

said Het being a five- or six-membered heterocyclic ring containing a number of heteroatoms which varies of from 1 to 4, said heteroatoms being selected from the group consisting of oxygen, sulfur and nitrogen, provided that no more than two oxygens or sulfurs are present, said five or six-membered ring being optionally condensed with a five- or six-membered carbocyclic or heterocyclic ring also containing a number of heteroatoms which varies from 1 to 4, the latter heteroatoms being selected from the group consisting of oxygen, sulfur and nitrogen, provided that no more than 2 oxygens or sulfurs are present, and wherein said Het being a bicyclic ring system may optionally be substituted with up to six substituents, or said Het being a monocyclic ring system may optionally be substituted with up to 3 substituents, said substituents of Het being selected from the group consisting of a bivalent radical of formula =X, said =X independently having the same meaning of the previously defined X; halo; isocyanato; isothiocyanato; nitro, cyano, trifluoromethyl; a radical of formula R—Y— R is hydrogen, then Y is other than a direct bond, or (ii) when in the radical R—Z—C(=X)—Y— R is hydrogen and Y is NR^3, O or S, then Z is other than O or S

provided that:

(i) when L is a radical of formula (b-1) wherein L^1 is hydrogen and wherein T is —Z—C(=X)—Y— wherein Y is other then a direct bond and Z and X are each independently O or S, then r is not 0; or when L is a radical of formula (b-2) wherein L^1 is hydrogen and wherein T^1 is —Z—C(=X)— wherein Z and X are each independently O or S, then r is not 0;

(ii) when L is a radical of formula (b-1) wherein L^1 is halo, hydroxy, lower alkyloxy, mercapto, lower alkylthio, isocyanato, isothiocyanato or Het connected to C_rH_{2r} on a nitrogen atom, and wherein r is 0, then T is a direct bond or a radical —C(=X)—Y—; or when L is a radical of formula (b-2) wherein L^1 is halo, hydroxy, lower alkyloxy, mercapto, lower alkylthio, isocyanato, isothiocyanato or Het connected to C_rH_{2r} on a nitrogen atom, and wherein r is 0, then T^1 is a radical —C(=X)—;

(iii) when L is a radical of formula (b-1) wherein T is Y, said Y being other than a direct bond, or wherein T is —Z—C(=X)—Y—, wherein Y is other than a direct bond, then s is not 0;

wherein Ar^1 is a member selected from the group consisting of phenyl, substituted phenyl, naphthalenyl, thienyl, halothienyl, lower alkylthienyl, pyridinyl, mono- and di(lower alkyloxy)pyridinyl, pyrrolyl, lower alkylpyrrolyl, furanyl, furanyl substituted with lower alkyl, pyrazinyl, thiazolyl, imidazolyl, lower alkylimidazolyl; said substituted phenyl, being phenyl substituted with up to 3 substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, lower alkyl, lower alkyloxy, lower alkylthio, mercapto, amino, mono- and di(lower alkyl)amino, lower alkylsulfonyl, lower alkylsulfonyllower alkyl, phenyllower alkylsulfonyl, phenylsulfonyllower alkyl, a radical of formula R^8—C_pH_{2p}—Y—, a radical of formula R^9—Z—C(=X)—Y—, and a radical of formula $R^{10}SO_2Y$—; wherein p is an integer of from 1 to 6 inclusive and R^8 is a member selected from the group consisting of amino, cyano, phenyl aminocarbonyl, mono- and di(lower alkyl)aminocarbonyl, lower alkyloxycarbonyl, phenyllower alkyloxycarbonyl, 4-morpholinylcarbonyl, 1-piperidinylcarbonyl, 1-pyrrolidinylcarbonyl, and lower alkenyl; wherein R^9 is member selected from the group consisting of hydrogen, lower alkyl and Ar^2; provided that, when R^9 is hydrogen and Y is other than a direct bond, then Z is not O or S; and wherein R^{10} is lower alkyl or Ar^2;

wherein Ar^2 is a member selected from the group consisting of phenyl, substituted phenyl, thienyl and furanyl, said substituted phenyl being phenyl optionally substituted with up to three substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, lower alkyl, lower alkyloxy, lower alkylthio, mercapto, amino, mono- and di(lower alkyl)amino, carboxyl, lower alkyloxycarbonyl and (lower alkyl)—CO.

4,839,375

(ARYL OR HETEROAROMATIC METHYL)-2,2'-BI-1H-IMIDAZOLES AND THEIR USE AS ANTI-HYPERTENSIVE AGENTS

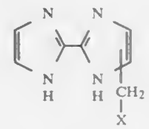
Donald P. Matthews, West Chester, Ohio; Jeffrey P. Whitten, Zionsville, Ind., and James R. McCarthy, West Chester, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Jul. 28, 1987, Ser. No. 78,352

Int. Cl.[4] A61K *31/38, 31/415;* C07D *403/04*

U.S. Cl. 514—397 **17 Claims**

1. A compound of the formula I



I

wherein X is 2- or 3-thienyl, 2- or 3-furyl, or phenyl, with each of said groups optionally being substituted; the optional substitution on said thienyl or furyl goups being 1 or 2 moieties selected from the group consisting of chloro, fluoro, bromo and lower alkyl of from 1 to 6 carbon atoms; the optional substitution on said phenyl group being 1 or 2 or moieties selected from the group consisting of chloro, bromo, fluoro, lower alkyl of from 1 to 6 carbon atoms, alkoxy of from 1 to 6 carbon atoms, trifluoromethyl, amino, sulfhydryl, and $S(O)_mR$ wherein m is 0, 1 or 2 and R is lower alkyl of from 1 to 6 carbon atoms.

16. A composition comprising a compound of claim 1 in an effective antihypertensive amount and a pharmaceutically acceptable carrier.

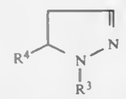
4,839,376

PYRAZOLINE DERIVATIVES FOR TREATING CEREBROVASCULAR DISEASES

Hiroyuki Yamashita; Makoto Odate; Hajime Iizuka, all of Kanagawa; Hiroshi Kawazura, Chiba; Yoshio Shiga, Chiba, and Hiroshi Namekawa, Chiba, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Jun. 15, 1988, Ser. No. 206,812
Claims priority, application Japan, Jun. 17, 1987, 62-148919
Int. Cl.[4] A61K *37/02, 31/51;* A01N *43/78, 35/00*
U.S. Cl. 514—406 8 Claims

1. A pharmaceutical composition for the treatment of cerebrovascular diseases containing, as active ingredient, a 2-pyrazoline derivative represented by the formula (G):



(G)

wherein R^3 is a hydrogen atom, an alkyl, acetyl, an alkoxycarbonyl, amino, benzoyl, a substituted benzoyl, a pyridylcarbonyl, a furylcabonyl, a thienylcarbonyl, pyrazylcarbonyl, an N-substituted carbamoyl, an N-substituted thiocarbamoyl, or carboxyl group; and R^4 is a hydrogen atom, an alkyl, a pyridyl, a thienyl, a furyl, cyclohexyl, phenyl or a substituted phenyl group or a pharmaceutically acceptable salt thereof together with a pharmaceutically acceptable carrier or diluent.

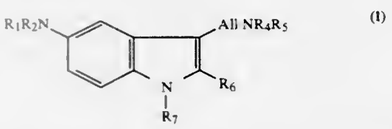
4,839,377

5-SUBSTITUTED 3-AMINOALKYL INDOLES

David E. Bays, Ware; Colin F. Webb, Royston, and Michael D. Dowle, Ware, all of United Kingdom, assignors to Glaxo Group Limited, London, England

Continuation of Ser. No. 711,152, Mar. 14, 1985, abandoned, which is a continuation of Ser. No. 431,297, Sep. 30, 1982, abandoned, which is a continuation of Ser. No. 292,023, Aug. 11, 1981, abandoned. This application Aug. 6, 1987, Ser. No. 82,132
Claims priority, application United Kingdom, Aug. 12, 1980, 8026287
Int. Cl.[4] A61K *31/40;* C07D *209/16*
U.S. Cl. 514—415 10 Claims

1. A compound of formula (I):



(I)

wherein

R_1 represents a group CHO, COR_8, CO_2R_8, $CONR_9R_{10}$, $CSNR_9R_{10}$ or $SO_2NR_9R_{10}$, where R_8 represents C_{1-6} alkyl optionally substituted by 1–3 halogen atoms; cyclo C_{5-7} alkyl, phenyl, phenyl C_{1-4} alkyl, wherein said phenyl groups are unsubstituted or substituted by one or more C_{1-6} alkyl groups, halogen atoms, hydroxy or C_{1-6} alkoxy groups;

R_9 represents a hydrogen atom or a C_{1-6} alkyl group, and

R_{10} represents a hydrogen atom or a C_{1-6} alkyl, cyclo C_{5-7} alkyl, phenyl or phenyl C_{1-4} alkyl group wherein said phenyl groups are unsubstituted or substituted by one or more C_{1-6} alkyl groups, halogen atoms, hydroxy or C_{1-6} alkoxy groups;

R_2, R_4, R_6 and R_7, which may be the same or different, each represents a hydrogen atom or a C_{1-3} alkyl group;

R_5 represents a hydrogen atom or a C_{1-6} alkyl, cyclo C_{5-7} alkyl, C_{3-6} alkenyl, or a phenyl C_{1-4} alkyl group, wherein said phenyl group is unsubstituted or substituted by one or more C_{1-6} alkyl groups, halogen atoms, hydroxy or C_{1-6} alkoxy groups; and

Alk represents an alkylene chain containing two or three carbon atoms which may be unsubstituted or substituted by not more than two C_{1-3} alkyl groups;

with the provisos that when R_4 and R_5 both represent alkyl groups R_1 does not represent the group CHO or COR_8 and that when R_4, R_5, R_6 and R_7 all represent hydrogen R_1 does not represent the group SO_2NH_2; and physiologically acceptable salts and solvates thereof.

10. A pharmaceutical composition comprising an effective amount for the treatment of migraine of a compound of formula (I) of claim 1 or a physiologically acceptable salt or solvate thereof together with a physiologically acceptable carrier or excipient.

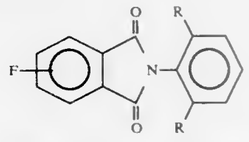
4,839,378

FLUOROPHTHALIMIDES AND AGRICULTURAL AND HORTICULTURAL FUNGICIDES CONTAINING THEM

Masao Koyama; Michiaki Iwata; Kunihiko Kurihara, and Masaji Sezaki, all of Yokohama, Japan, assignors to Meiji Seika Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1987, Ser. No. 43,330
Claims priority, application Japan, Apr. 30, 1986, 61-100541
Int. Cl.[4] A01N *37/32;* C07D *209/48*
U.S. Cl. 514—417 7 Claims

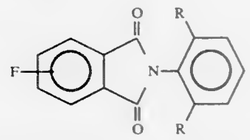
1. A fluorophthalimide compound represented by the following formula (I):



(I)

wherein R each stands for an ethyl group or an isopropyl group.

6. An agricultural and horticultural fungicide which comprises as an active ingredient a fluorophthalimide represented by the formula (I):



(I)

wherein R each stands for an ethyl group or an isopropyl group.

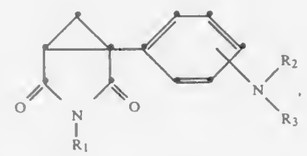
4,839,379

SUBSTITUTED AZABICYCLOALKANES, THE USE THEREOF, PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Jaroslav Stanek, Birsfelden, and Ernst Schweizer, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 758,835, Jul. 24, 1985, abandoned, which is a continuation of Ser. No. 562,258, Dec. 16, 1983, abandoned. This application Jul. 28, 1987, Ser. No. 80,240
Claims priority, application Switzerland, Dec. 21, 1982, 7450/82
The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.
Int. Cl.[4] C07D *221/22;* A61K *31/435*
U.S. Cl. 514—421 16 Claims

1. A compound of the formula



(I)

wherein

R_1 is C_1–C_{18} alkyl, C_2–C_{18} alkenyl, C_2–C_7 alkynyl, C_3–C_{10} cycloalkyl, C_3–C_{10} cycloalkenyl, C_3–C_{10} cycloalkyl-C_1–C_7 alkyl, C_3–C_{10} cycloalkyl-C_2–C_7 alkenyl, or C_3–C_{10} cycloalkenyl-lower alkyl;

R_2 is hydrogen, C_1–C_7 alkyl, sulfo, R^b—CO—, R^a—O—CO—, $(R^b)_2NCO$—, R^bSO_2—, or $(R^b)_2NSO_2$—; wherein R^a and R^b are each, independently C_1–C_{18} alkyl, C_2–C_{18} aklkenyl, C_2–C_7 alkynyl, phenyl, phenyl-C_1–C_7 alkyl, C_3–C_{10} cycloalkyl, C_3–C_{10} cycloalkenyl, C_3–C_{10} cycloalkyl-C_1–C_7 alkyl, C_3–C_{10} cycloalkyl-C_2–C_7 alkenyl, or C_3–C_{10} cycloalkenyl-C_1–C_7 alkyl; and R^b may also be H; and

R_3 is H or C_1–C_7 alkyl, or a pharmaceutically acceptable salt thereof.

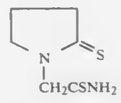
4,839,380

1-THIOCARBAMOYLMETHYLPYRROLIDINE-2-THIONE, MEDICAL COMPOSITIONS OF, AND ANTI-HYPOXIC AND NOOTROPIC USE THEREOF

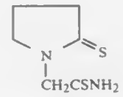
Vladimir G. Granik, Kona-kovsky proezd, 19, kv. 64, Moscow; Tatyana V. Stezhko, ulitsa Severnaya, 8, kv. 30, Moskovskaya oblast, Odintsovo; Robert G. Glushkov, ulitsa Gorkogo, 43, kv. 90, Moscow; Mikhail D. Mashkovsky, Lenin-gradsky prospekt, 75a, kv. 55, Moscow; Lidia F. Roschina, Rostovskaya naberezhnaya, 3, kv. 135, Moscow; Antonina I. Polezhaeva, ulitsa 13 Parkovaya, 25, korpus 1, kv. 6, Moscow; Roza B. Parimbetova, ulitsa I. Babushkina, 3, kv. 217, Moscow; Jury G. Bobkov, ulitsa Latsisa, 33, korpus 1, kv. 7, Moscow; Alexandr S. Losev, ulitsa Bekhtereva, 7, korpus 1, kv. 42, Moscow, and Irina A. Ivanova, Voloko-lamskoe shosse, 14, kv. 41, Moscow, all of U.S.S.R.

PCT No. PCT/SU86/00080, § 371 Date Apr. 4, 1988, § 102(e) Date Apr. 4, 1988, PCT Pub. No. WO88/01620, PCT Pub. Date Mar. 10, 1988
PCT Filed Aug. 25, 1986, Ser. No. 198,999
Int. Cl.[4] C07D *207/24;* A61K *31/40*
U.S. Cl. 517—424 4 Claims

1. 1-Thiocarbamylmethylpyrrolidine-2-thione of the following formula:



2. A pharmaceutical composition useful for imparting antihypoxic and nootropic activity, said composition comprised of 1-thiocarbamylmethylpyrrolidine-2-thione of the formula



and a pharmaceutically acceptable carrier.

3. A method for imparting an antihypoxic effect to a subject which comprises administering to said subject an antihypoxic-effective amount of the pharmaceutical composition of claim 2.

4. A method for imparting nootropic activity to a subject which comprises administering to said subject a nootropic-effective amount of the pharmaceutical composition of claim 2.

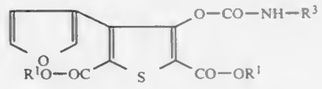
4,839,381

CARBAMOYLOXYTHIOPHENE FUNGICIDES

Werner Daum, Krefeld; Gerd Hänssler, Leverkusen, and Pieter Ooms, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 37,918, Apr. 13, 1987, Pat. No. 4,757,085.
This application Mar. 9, 1988, Ser. No. 165,685
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1986, 3613792
Int. Cl.[4] A01N *43/02;* C07D *409/00*
U.S. Cl. 514—444 9 Claims

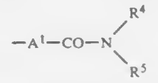
1. A carbamoyloxythiophene derivative of the formula



in which

R^1 represents alkyl, alkoxyalkyl, alkylthioalkyl, fluoroalkyl, cyanoalkyl, alkenyl, alkynyl, or cycloalkyl,

R^3 represents aliphatic or carbocyclic cyanoalkyl, the



radical or the $—A^2—CO—OR^6$ radical, where

A^1 represents an alkylene radical,

A^2 represents an alkylene radical or denotes a direct bond,

R^4 and R^5, independently of one another, represent alkyl, and

R^6 represents alkyl.

4,839,382

ANTICOCCIDIAL COMPOSITIONS

Gianpaolo Maestrone, Staten Island, N.Y.; Eugene G. Schildknecht, Hackettstown, and Govind G. Untawale, Wayne, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 11, 1987, Ser. No. 48,169
Int. Cl.[4] A61K *31/35*
U.S. Cl. 514—453 17 Claims

1. A composition for combatting coccidiosis in animals comprising a first component (a) which is frenolicin B or a pharmaceutically acceptable salt or ester thereof and a second component (b) selected from the group consisting of ionophorous polyether anticoccidial agents and the pharmaceutically acceptable salts and esters thereof wherein each of the said first and second components is present in amounts which in combination are synergistically effective in combatting at least one coccidiosis-causing strain of Eimeria.

4,839,383

COMPOSITIONS FOR COMBATTING BARK BEETLES

Jean Pierre Vité, Freiburg, Fed. Rep. of Germany, assignor to Celamerck GmbH & Co., Ingelheim am Rhein, Fed. Rep. of Germany

Continuation of Ser. No. 925,892, Oct. 31, 1986, abandoned, which is a continuation of Ser. No. 806,741, Dec. 9, 1985, abandoned. This application Aug. 28, 1987, Ser. No. 90,524
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1984, 3444976
Int. Cl.[4] A01N *35/00, 43/16*
U.S. Cl. 514—456 6 Claims

1. A method of controlling an infestation of trees by bark beetles of the dendroctonus genera, which comprises applying to at least one of said trees an effective repellent amount of a compound selected from the group consisting of (−)-verbenone, (−)-exo-brevicomine and (−)-endo-brevicomine.

4,839,384

METHOD OF INHIBITING ONSET OF OR TREATING MIGRAINE HEADACHE USING A THROMBOXANE A2 RECEPTOR ANTAGONIST

Martin L. Ogletree, Newtown, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 7, 1988, Ser. No. 254,899
Int. Cl.[4] A61K *31/36, 31/38, 31/41, 31/435*
U.S. Cl. 514—277 11 Claims

1. A method for inhibiting onset of or treating migraine headache in a mammalian species, which comprises administering to a mammalian species in need of such treatment an effective amount of a thromboxane A_2 receptor antagonist over a prolonged period of treatment to reduce frequency and/or severity of migraine headaches during such period of treatment, which thromboxane A_2 receptor antagonist is a 7-oxabicycloheptane prostaglandin analog.

4,839,385

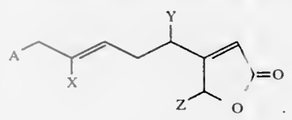
USE OF MANOALIDE AND ITS DERIVATIVES FOR MODIFYING CALCIUM HOMEOSTASIS

Shmuel Maullem; George Sachs, both of Los Angeles, and Larry Wheeler, Irvine, all of Calif., assignors to The Regents of the University of California, Berkeley and Allergan, Inc., Irvine, both of, Calif.

Continuation of Ser. No. 825,310, Feb. 3, 1986, abandoned. This application Aug. 25, 1987, Ser. No. 89,936
Int. Cl.[4] A61K *31/34*
U.S. Cl. 514—473 10 Claims

1. A method for controlling a condition treatable by modifying calcium homeostasis in a mammal, wherein said condition is hypertension, cardiac infarction, atherosclerosis, ulcer, diarrhea, motility due to secretion of acid or Cl^-, metabolic acidosis, alkalosis, or psoriasis, which method comprises:

administering an amount of a compound of formula I effective to treat hypertension, cardiac infarction, atherosclerosis, ulcer, diarrhea, motility due to secretion of acid or Cl^-, metabolic acidosis, alkalosis, or psoriasis, alone or in combination with a pharmaceutically acceptable excipient, to a mammal in need thereof, where formula I is



I

wherein

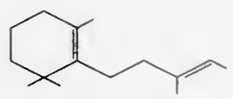
X is $—CH_3$, $—CH_2OH$, —CHO, or —COOH;

Y is —H or —OH;

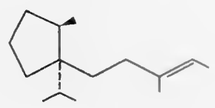
Z is H or OH; and

the dotted line represents either a single bond or a double bond which may be in either the E or Z configuration; and

A is Rm or Rn



R_m



R_n

and where Y is —OH and X is —CHO or —COOH, the compound of formula I includes the hemiacetal or del-talactone, respectively; and

when X is —COOH, the corresponding alkyl esters derived from alcohols of 1 to 10 carbon atoms; and

when X is $—CH_2OH$ and/or Y is —OH and/or Z is —OH, the corresponding acyl esters of acids from 1 to 10 carbon atoms; and

the pharmaceutically acceptable salts derived from those compounds where X is —COOH.

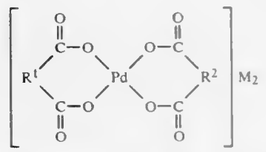
4,839,386

IONIC BIS (DICARBOXYLATO) PALLADATE (II)

Alan R. Amundsen, Somerville, and Eric W. Stern, Mountainside, both of N.J., assignors to Engelhard Corporation, Menlo Park, N.J.

Continuation of Ser. No. 798,202, Nov. 14, 1985, abandoned, Division of Ser. No. 642,235, Aug. 17, 1984, Pat. No. 4,578,490, Continuation of Ser. No. 392,817, Jun. 28, 1982, abandoned. This application Aug. 12, 1987, Ser. No. 85,283
Int. Cl.[4] A61K *31/28*
U.S. Cl. 514—492 21 Claims

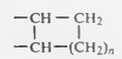
1. A method of treating malignant tumor cells in animals sensitive to a palladium (II) compound of the formula:



wherein R^1 and R^2 are the same or different and represent the following:

(a) methylene or ethylene;

(b) cycloalkylene of the formula:

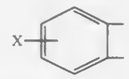


wherein n is an integer having a value of 2–3;

(c) alkylidene of 2–4 carbon atoms;

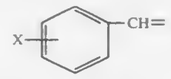
(d) cycloalkylidene containing 4–6 nuclear carbon atoms;

(e) o-phenylene of the formula:



wherein X is selected from the group consisting of hydrogen, halogen and C_{1-6} alkyl;

(f) aralkylidene of the formula:



(g) substituted methylidene of the formula: $=CR^3R^4$ wherein R^3 and R^4 are selected from the group consisting of hydrogen, halogen and hydroxy; or

(h) keto; and

M is an alkali metal or M_2 is an alkaline earth metal which comprises administering said compound to an animal afflicted with said tumor cells in an amount sufficient to cause regression of the same.

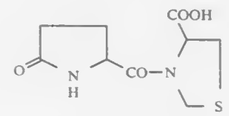
4,839,387

DERIVATIVE OF THIAZOLIDINE-4-CARBOXYLIC ACID, ITS PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING IT

Stefano Poli, Quinto De Stampi-Rozzano, Italy, assignor to Poli Industria Chimica S.P.A., Milan, Italy

Filed Jan. 15, 1988, Ser. No. 144,528
Claims priority, application Italy, Jan. 26, 1987, 19165 A/87
Int. Cl.[4] C07K *5/06;* A61K *37/02*
U.S. Cl. 514—19 6 Claims

1. 3-L-pyroglutamyl-L-thiazolidine-4-carboxylic acid of formula I



(I)

and its pharmaceutically acceptable salts.

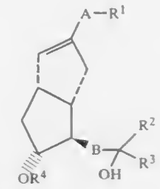
4,839,388

PROSTACYCLINS AND PHARMACEUTICALS CONTAINING THE SAME

Masakatsu Sibasaki, Mitaka; Mikiko Sodeoka, Sagamihara; Katsuhiko Iseki, Abiko; Masaki Shinoda, Ibaraki; Chiyoko Aoki, Sagamihara; Yosio Hayasi, Ushiku, and Toshiji Kanayama, Ibaraki, all of Japan, assignors to Mitsubishi Chemical Industries Limited and Sagami Chemical Research Center, both of Tokyo, Japan

PCT No. PCT/JP86/00486, § 371 Date May 18, 1987, § 102(e) Date May 18, 1987, PCT Pub. No. WO87/01696, PCT Pub. Date Mar. 26, 1987
PCT Filed Sep. 18, 1986, Ser. No. 60,870
Claims priority, application Japan, Sep. 18, 1985, 60-204538
Int. Cl.[4] A61K *31/557*
U.S. Cl. 514—530 2 Claims

1. A pharmaceutical having circulation ameliorating effect and antiulcer effect and comprising an effective amount of prostacyclins represented by the formula [1]:



(I)

wherein R^1 represents $—CO_2R^5$ group (in the group, R^5 represents a hydrogen atom, or a straight or branched alkyl group having 1 to 12 carbon atoms, or an aralkyl group having 7 to 12 carbon atoms, or a cycloalkyl group having 4 to 7 carbon atoms which may be unsubstituted or substituted by at least one alkyl group having 1 to 4 carbon atoms, an unsubstituted phenyl group, a phenyl group substituted by at least one selected from the group consisting of a halogen atom, a hydroxy group, an acyloxy group having 2 to 7 carbon atoms, an alkyl group having 1 to 4 carbon atoms which may be substituted by a halogen atom, an alkoxy group having 1 to 4 carbon atoms which may be substituted by a halogen atom, a nitrile group, a carboxy group or an alkoxycarbonyl group having 2 to 7 carbon atoms, or a monoequivalent cation), or $—CONR^6R^7$ group (in the group, R^6 and R^7 each may be the same or different, represents a hydrogen atom, an alkyl group having 1 to 10 carbon atom, or an unsubstituted 5- or 6-membered ring combined with nitrogen atom bonded thereto which may have further hetero atoms or a 5- or 6-membered ring combined with nitrogen atom bonded thereto which may have further hetero atoms and substituted by at least one selected from an alkyl group having 1 to 4 carbon atoms which may be substituted by a halogen atom); A represents

$—CH=CH—CH_2CH_2—$;

B represents $—C\equiv C—$ group; R^2 represents a straight or branched alkyl group; having 3 to 10 carbon atoms, a cycloalkyl group having 4 to 7 carbon atoms which may be unsubstituted or substituted by at least one alkyl group having 1 to 4 carbon atoms, or a straight or branched alkenyl group having 3 to 12 carbon atoms, or a straight or branched alkynyl group having 3 to 8 carbon atoms, or a substituted alkyl group having 1 to 3 carbon atoms which is substituted by a phenyl group or a phenoxy group which may be substituted by at least one as mentioned for substituents for R^5, or an alkoxy group having 1 to 6 carbon atoms, or a cycloalkyl group having 5 to 8 carbon atoms; R^3 represents a hydrogen atom, a methyl group or a vinyl group; R^4 represents a hydrogen atom, or an acyl group having 1 to 7 carbon atoms, a tri(1 to 7 carbon atoms)hydrocarbyl-silyl group or a group forming an acetal bond with an oxygen atom of a hydroxy group; a double bond in the substituent represented by A is E or Z, or a mixture thereof; asymmetric center in the substituent represented by R^2 is an R-configuration or S-configuration, or a mixture thereof, or non-toxic salt of its acid, or their cyclodextrin-inclusion compound in admixture with an inert carrier or excipient.

4,839,389

POLYPRENYL ALCOHOL-CONTAINING INJECTIONS

Noritoshi Koyama; Takayuki Ikeuchi, both of Saitama; Seiichi Araki, Gifu; Kyosuke Kitoh, Ibaraki, and Katsumi Ida, Saitama, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1987, Ser. No. 6,083
Claims priority, application Japan, Jan. 24, 1986, 61-11085
Int. Cl.[4] A61K 31/045, 31/685
U.S. Cl. 514—724 1 Claim

1. A polyprenyl alcohol-containing injection preparation comprising 0.01 to 10% (w/w) of a polyprenyl alcohol of the formula:

wherein n is an integer of 5 to 7, 0.01 to 10% (w/w) of lecithin, and the balance consisting essentially of water.

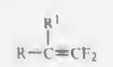
4,839,390

HALOGENOOLEFINS AS ARTHROPOCIDES AND NEMATOCIDES

Klaus Naumann, Leverkusen; Benedikt Becker, Mettmann; Wolfgang Behrenz, Overath; Bernhard Homeyer, Leverkusen, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 8, 1987, Ser. No. 47,968
Claims priority, application Fed. Rep. of Germany, May 30, 1986, 3618115
Int. Cl.[4] A01N 29/02; C07C 21/18
U.S. Cl. 514—746 7 Claims

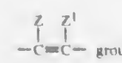
1. A method of combating arthropods and nematodes which comprises applying thereto, to a habitat thereof or to an area from which they are to be excluded an arthropodicidally or nematocidally effective amount of at least one long-chain halogenoolefin of the formula (I)



(I)

in which

R represents a straight-chain or branched alkyl radical with 8 to 25 carbon atoms in the straight chain, the alkyl radical being interrupted zero to six times by —C≡C— and/or



grouping,

in which

Z and Z^1 are identical or different and represent hydrogen or methyl and

R^1 represents hydrogen, alkyl or halogen.

4,839,391

METHOD AND REACTOR FOR CATALYTIC METHANIZATION OF A GAS CONTAINING CO, CO_2 AND H_2

Jochen Range, Jülich; Bernd Höhlein, Linnich-Tetz; Hans Niessen, Düren; Volker Vau, Jülich-Broich; H. J. R. Schiebahn, Niederzier; Horst Hoffmann, Aldorf, and Manfred Vorwerk, Erkelenz, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich GmbH, Julich and Rheinische Braunkohlenwerke AG, Cologne, both of, Fed. Rep. of Germany

Continuation of Ser. No. 39,604, Apr. 16, 1987, abandoned. This application Jun. 13, 1988, Ser. No. 207,024
Claims priority, applicatinn Fed. Rep. of Germany, Apr. 16, 1986, 3612734
Int. Cl.[4] C07C 1/02
U.S. Cl. 518—712 6 Claims

1. Process for catalytic methanization of a synthesis gas containing carbon monoxide, carbon dioxide and hydrogen in a reactor containing a bed of solid catalyst which is cooled by cooling water, wherein said synthesis gas flows, in passing through said catalyst bed, successively through an inflow region for the synthesis gas, a hot spot region and an outward gas flow region of temperature substantially declining along an outward gas flow path therein, said cooling water being converted into steam by the transfer of heat arising from methanization and said steam being superheated in said hot spot region, and wherein:

said cooling water flows, in countercurrent to said synthesis gas flowing through said catalyst bed, in a cooling water path includes one complete transit through said catalyst bed, and

the conversion of water from its liquid state into steam is produced by heat transfer both in said outward gas flow region and in said hot spot region.

4,839,392

METHOD FOR RECOVERING A SOLID FLOWABLE POLYMER MEDIUM

Robert V. Kromrey, Campbell, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 10, 1986, Ser. No. 907,982
Int. Cl.[4] C08J 11/06, 11/04
U.S. Cl. 521—45 7 Claims

1. A method for recovering a polymer medium that is particularly adapted for high temperature high pressure molding comprising:

(a) molding an article by causing a particulate silicone rubber, having a nominal flow rate of at least 0.6 gram per second through a 1.1 centimeter diameter pipe 7.6 centimeters long under applied pressure of 10.3 MPa, to apply pressure to the article wherein said silicone rubber is exposed to temperatures in excess of about 316° C. causing contaminants including contaminant oils to form, resulting in a polymer mixture comprising said particulate silicone rubber;

(b) grinding said polymer mixture;

(c) disposing said ground polymer mixture in a solution, said solution having a specific gravity greater than said silicone rubber and containing surfactants, emulsifiers and detergents;

(d) mixing said polymer mixture containing solution to emulsify the contaminant oils, said oils having a density less than that of said solution;

(e) separating the particulate silicone rubber from the solution; and

(f) rinsing the particulate silicone rubber to remove the emulsified oils;

wherein said recovered silicone rubber is capable of being used as a pressurizing medium for high temperature molding.

4,839,393

POLYURETHANE FOAMS CONTAINING ORGANOFUNCTIONAL SILANES

Michael S. Buchanan, Baltimore; Gregory B. Davis, Towson, and Walter V. V. Greenhouse, Baltimore, all of Md., assignors to Wm. T. Burnett & Co., Inc., Baltimore, Md.

Filed Jul. 8, 1988, Ser. No. 216,428
Int. Cl.[4] C08G 18/14
U.S. Cl. 521—53 20 Claims

1. A polyurethane foam structure obtained through the steps of (a) providing an admixture of flexible polyurethane foam and a filler material; (b) uniformly applying to said mixture of (a) a liquid flexible resinous binding agent, said admixture of (a) or said binding agent including an organofunctional silane having at least one hydrolyzable group and one ethylenically unsaturated group; and (c) curing said composition of (b) so as to provide a cured foam structure; the relative amounts of materials in said foam structure being such that for each 100 parts by weight of polyurethane foam particles about 10 to 500 parts of filler material; about 0.2 to about 20 parts organofunctional silane, and about 10 to 250 parts of binding agent is employed.

4,839,394

FILLERS FOR USE IN CASTING MARBLE PRODUCTS

Clive A. Champion, Oakville, Canada, assignor to Watercolour Bath Products, Inc., Ontario, Canada

Filed Oct. 30, 1986, Ser. No. 925,784
Int. Cl.[4] C08J 9/32
U.S. Cl. 521—85 15 Claims

1. A filler composition for mixing with a resin to form a castable product, said filler composition comprising an inorganic mineral filler material in powder form admixed with hollow ceramic spheres of a diameter ranging from 10 to 300 microns and hollow plastic spheres having an average diameter of approximately 3 to 5 microns.

4,839,395

ABSORBING ARTICLE

Koji Masamizu, Houya; Shinya Hirokawa, Chiba, and Sanae Fujita, Tokyo, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Division of Ser. No. 922,991, Oct. 24, 1986. This application Feb. 18, 1988, Ser. No. 157,225
Claims priority, application Japan, Nov. 2, 1985, 60-246623; Jul. 17, 1986, 61-168806; Sep. 1, 1986, 61-205281
Int. Cl.[4] C08J 9/28
U.S. Cl. 521—56 5 Claims

1. An absorbing article comprising an absorbing layer containing dried spherical water-insoluble water-absorbing polymer particles having voids in their interiors such that the void volume of the particles range from about 0.05 to about 0.4

ml/g, the polymer being prepared from monomer comprising more than 50% by weight of water-soluble monomer.

4,839,396

EXPANDABLE AND EXPANDED ALKENYL AROMATIC POLYMER PARTICLES AND METHODS OF MAKING THE SAME

Martin H. Tusim, Newark, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 22, 1988, Ser. No. 234,986
Int. Cl.[4] C08J 9/16
U.S. Cl. 521—88 10 Claims

1. A method for making an expandable particle comprising:

(a) preparing a heat-plastified mixture of:

(1) an alkenyl aromatic polymer;

(2) a volatile fluid blowing agent; and

(3) a density modifier selected from the group consisting of ethylene bis(oxyethylene)bis(3-tert-butyl-4-hydroxy-5-methylhydrocinnamate) and octadecyl 3,5-di-tert-butyl-4-hydroxyhydrocinnamate in an amount from about 0.005 percent to about 0.5 percent by weight of the total mixture; and

(b) extruding the mixture to form expandable alkenyl aromatic polymer particles.

4,839,397

POLYURETHANE SOFT FOAM WITH SOUND INSULATING AND VIBRATION DAMPING PROPERTIES

Ernst Lohmar, Adelheidsdorf, and Gerhard Burak, Wienhausen, both of Fed. Rep. of Germany, assignors to Dr. Alois Stankiewicz GmbH, Adelheidsdorf, Fed. Rep. of Germany

Filed Mar. 29, 1988, Ser. No. 174,692
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710731
Int. Cl.[4] C08G 18/14
U.S. Cl. 521—159 16 Claims

1. Polyurethane foam materials with sound insulating and vibration damping properties, obtainable by reacting a polyisocyanate or polyisocyanate prepolymer with an excess of polyols or mixtures thereof whilst maintaining an NCO index of ≦80, for the purpose of obtaining an adhesive surface and further characterized by a density of 80 to 250 kg/m^3, a modulus of elasticity of <300,000 N/m^2 and a loss factor of at least 0.4.

4,839,398

POLYIMIDE FOAMS AND THEIR PREPARATION

David M. Indyke, Arlington Heights, Ill., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 187,493, Apr. 28, 1988. This application Aug. 1, 1988, Ser. No. 227,098
Int. Cl.[4] C08J 9/02
U.S. Cl. 521—183 29 Claims

1. A polyimide foam prepared by reaction of an organic tetracarboxylic acid or derivative thereof with (a) about 1 to about 50 mol percent of a diester of (i) a primary amino-sub-

stituted aromatic carboxylic acid, and (ii) a polymethylene glycol, and (b) at least one aromatic or heterocyclic primary diamine.

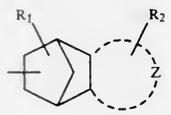
4,839,399

ACTIVE ENERGY BEAM-CURABLE TYPE RESIN COMPOSITION

Yasufumi Sato; Megumi Munakata, and Hiromichi Noguchi, all of Atsugi, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

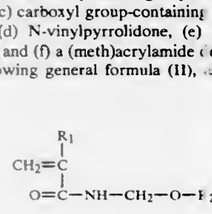
Filed Mar. 5, 1987, Ser. No. 22,052
Claims priority, application Japan, Mar. 10, 1986, 61-50559
Int. Cl.[4] C08F 265/06
U.S. Cl. 522—14 **18 Claims**

1. An active energy beam-curable type resin composition, which comprises (A) a graft copolymer comprising a main chain including structural units containing both a monomer containing one (meth)acryloyl group and a dicyclopentenyl derivative group represented by the following general formula (I):



(I)

where Z represents a five-membered ring given by or, and R_1 R_2 represent hydrogen atoms or alkyl groups having 1 to 3 carbon atoms, in one molecule, and at least one monomer selected from the group consisting of alkyl(meth)acrylate, acrylonitrile, and styrene, and side chains comprising units prepared from at least one monomer selected from the group consisting of (a) hydroxyl group-containing (meth)acryl monomer, (b) amino or alkylamino group-containing (meth)acryl monomer, (c) carboxyl group-containing (meth)acryl or vinyl monomer, (d) N-vinylpyrrolidone, (e) vinylpyridine or its derivatives, and (f) a (meth)acrylamide derivative represented by the following general formula (II), as added to the main chain:



(II)

wherein R_1 represents a hydrogen atom or a methyl group, and R_2 represents a hydrogen atom or a hydroxyl group-containing alkyl having 1 to 4 carbon atoms or acyl group; and (B) a monomer having an ethylenic unsaturated bond.

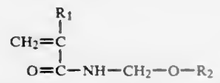
4,839,400

ACTIVE ENERGY RAY-CURABLE RESIN COMPOSITION

Yasufumi Sato; Megumi Munakata, and Hiromichi Noguchi, all of Atsugi, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

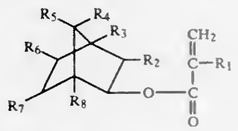
Filed Mar. 6, 1987, Ser. No. 22,930
Claims priority, application Japan, Mar. 10, 1986, 61-050560
Int. Cl.[4] C08F 265/06
U.S. Cl. 522—14 **22 Claims**

1. An active energy ray-curable resin composition comprising: (A) a graft copolymerized polymer comprising graft chains composed mainly of structural units derived from at least one monomer selected from the group consisting of (a) hydroxyl containing (meth)acrylic monomers, (b) amino or alkylamino containing (meth)acrylic monomers, (c) carboxyl containing (meth)acrylic or vinyl monomers, (d) N-vinylpyrrolidone, (e) vinylpyridine or its derivatives and (f) (meth)acrylic amide derivatives represented by the general formula (II) shown below:



(II)

wherein R_1 is hydrogen or methyl group and R_2 is hydrogen or an alkyl or acryl group having 1 to 4 carbon atoms which may have a hydroxyl group, added to trunk chains comprising both structural units formed from at least one monomer represented by the general formula (I) shown below:



(I)

wherein R_1 to R_8 each represent hydrogen or methyl group, and structural units formed from at least one monomer selected from the group consisting of alkyl (meth)acrylates, acrylonitrile and styrene, and (B) a monomer having an ethylenically unsaturated bond.

4,839,401

LIGHT CURABLE DENTAL PIT AND FISSURE SEALANT

Samuel Waknine, Wallingford, Conn., assignor to Jeneric/Pentron, Inc., Wallingford, Conn.

Continuation-in-part of Ser. No. 754,236, Jul. 12, 1985, abandoned. This application Sep. 30, 1986, Ser. No. 913,617
Int. Cl.[4] C08F 2/50, 20/30, 20/34; C08K 5/47
U.S. Cl. 522—14 **15 Claims**

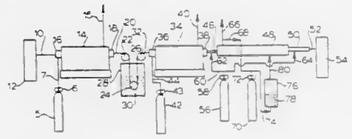
1. A visible light curable dental composition for filling and sealing pits and fissures which composition comprises from about 40 to about 70 weight percent of the condensation product of bisphenol A and glycidyl methacrylate (BIS-GMA), from about 30 to 60 weight percent of triethylene glycol dimethacrylate (TEGDM), up to about 2 weight percent of titanium dioxide powder, from about 0.6 to about 1.6 percent of a UV-absorber, from about 0.1 to about 0.4 percent of diethylaminoethylmethacrylate (DEA-EMA) of at least 95 percent purity and from about 0.05 to about 0.30 weight percent of a polymerization initiator, the weight ratio of BIS-GMA to TEGDM being about 30–80:70–20.

4,839,402

SOL GEL FORMATION OF POLYSILICATE, TITANIA, AND ALUMINA INTERLAYERS FOR ENHANCED ADHESION OF METAL FILMS ON SUBSTRATES

Ward C. Stevens, New Fairfield, Conn., assignor to Advanced Technology Materials, Inc., New Milford, Conn.

Division of Ser. No. 912,964, Sep. 26, 1986, Pat. No. 4,738,896.
This application Feb. 11, 1988, Ser. No. 154,923
Int. Cl.[4] B32B 15/08; C08K 9/00
U.S. Cl. 523—200 **3 Claims**



1. A material composite comprising a plurality of metal

coated fibers dispersed in a continuous phase matrix material, wherein the metal coated fibers comprise an interlayer of porous microstructure between the fiber substrate and the metal coating, comprising material selected from the group consisting of polysilicate, titania, an alumina, formed on the fiber by application thereto of a sol gel dispersion comprising said material, and drying of the applied sol gel dispersion to form the porous microstructure, under selected temperature and drying conditions to partially collapse the pores of the microstructure and provide the interlayer with an average pore size of between about 20 and about 300 Angstroms and render it adherent to the substrate and scratch-resistant in character, the thickness of the interlayer being from about 30 to 2500 Angstroms, and the thickness of the metal coating being from about 0.01 to about 3.0 microns.

4,839,403

CROSS-LINKED EMULSION COPOLYMERS IN THERMOSETTING AQUEOUS COATINGS

Kazys Sekmakas, Des Plaines, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Jul. 28, 1987, Ser. No. 78,640
Int. Cl.[4] C08K 05/04; C08L 33/10, 33/12, 33/26
U.S. Cl. 523—412 **13 Claims**

1. An aqueous thermosetting coating composition comprising water having dispersed therein: (1) an oxirane-free epoxy phosphate dispersed in water as a salt with a volatile base; (2) a methylol-functional curing agent reactable with the hydroxy groups of said epoxy phosphate to cure the same, said curing agent being dispersed in the aqueous medium containing said component (1) in an amount of at least about 5% of the total weight of resinous material; and (3) an aqueous emulsion of cross-linked emulsion copolymer of copolymerized ethylenically unsaturated monomers comprising, by weight: (A) from 2% to 20% of polyethylenically unsaturated monomer; (B) from 3% to 30% of hydroxy-functional monoethylenically unsaturated monomer; (C) from 0% to 20% of monoethylenically unsaturated carboxylic acid monomer; and (D) the balance of the copolymer consisting essentially of copolymerizable nonreactive monoethylenically unsaturated monomer, said emulsion copolymer being present in an amount of from 10% to 80% of the total weight of resinous material.

4,839,404

BITUMINOUS COMPOSITIONS HAVING HIGH ADHESIVE PROPERTIES

Dane Chang, Houston, Tex., and David L. Wolfe, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 28, 1986, Ser. No. 889,664
Int. Cl.[4] C08L 33/02, 95/00
U.S. Cl. 524—69 **6 Claims**

1. A composition comprising a bitumen from about 98 to about 99.9 percent by weight, about 0.1 to about 2 percent by weight of at least one copolymer of an α-olefin monomer and an α,β-ethylenically unsaturated carboxylic acid comonomer or ionomer thereof wherein the copolymer comprises from about 5 to about 30 weight percent of the α,β-ethylenically unsaturated carboxylic acid comonomer and about 95 to about 70 weight percent of the α-olefin monomer and wherein the composition is further characterized as being substantially free of α-olefin/ester copolymers.

4,839,405

ULTRAVIOLET STABILIZER COMPOSITIONS, STABILIZED ORGANIC MATERIALS, AND METHODS

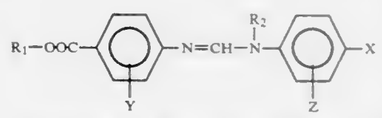
David J. Speelman, Ashtabula, and Allen J. Virant, Geneva, both of Ohio, assignors to Plasticolors, Inc., Ashtabula, Ohio

Continuation of Ser. No. 883,082, Jul. 8, 1986, abandoned. This application Sep. 8, 1987, Ser. No. 96,208
Int. Cl.[4] C08K 5/34
U.S. Cl. 524—99 **38 Claims**

1. Organic materials normally subject to deterioration caused by ultraviolet light which contain an ultraviolet stabilizing effective amount of a mixture comprising

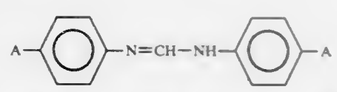
(A) from one to about 5 parts by weight of at least one hindered amine light stabilizer,

(B) from one to about 5 parts by weight of at least one formamidine of the formulae



(I)

wherein R_1 is an alkyl group containing 1 to about 5 carbon atoms; Y is a H, OH, Cl or an alkoxy group; R_2 is a phenyl group or an alkyl group containing 1 to about 9 carbon atoms; X is selected from the group consisting of H, carboalkoxy, alkoxy, alkyl, dialkylamino and halogen; and Z is selected from the group consisting of H, alkoxy and halogen, or



(II)

wherein A is —COOR, —COOH, —CONR'R'', —NR'-COR, —CN, or a phenyl group; and wherein R is an alkyl group of from 1 to about 8 carbon atoms; R' and R'' are each independently hydrogen or lower alkyl groups of from 1 to about 4 carbon atoms, and

(C) from one to about 5 parts by weight of at least one hindered phenolic antioxidant compound.

4,839,406

FLUIDITY CONTROLLING AGENT FOR PAINTS

Osamu Nagura, Chigasaki; Osamu Inoue, Yokohama; Yoshimasa Kamikuri, Yokohama, and Norikazu Takizuka, Yokohama, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Japan

Filed Sep. 14, 1987, Ser. No. 95,676
Claims priority, application Japan, Sep. 25, 1986, 61-224944; Aug. 12, 1987, 62-200063
Int. Cl.[4] C08K 5/21
U.S. Cl. 524—196 **5 Claims**

1. A fluidity controlling agent for paints, comprising a reaction product obtained by reacting paratoluidene and hexamethylene diisocyanate at an equivalent ratio of NH_2 to NCO ranging from 0.8/1 to 1.2/1.

4. The fluidity controlling agent according to claim 1, wherein said reaction product is produced in a resin used as an organic binder component.

5. The fluidity controlling agent according to claim 4, wherein a concentration of said reaction product in said resin is from 0.1 to 3% by weight.

4,839,407

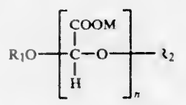
PARTICULATE POLYACETAL CARBOXYLATE AND METHODS FOR PREPARATION THEREOF

David A. Martin, Baldwin; Edward L. Ries, Kirkwood; William VanderHide, Creve Coeur, and Marvin J. Young, St. Charles, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 8, 1988, Ser. No. 153,118
Int. Cl.[4] C08L 59/00
U.S. Cl. 524—389 **45 Claims**

1. A method for preparation of solid particulate polyacetal carboxylate, the method comprising agglomerating an aqueous solution comprising less than about 1% by weight methanol and between about 30% by weight and about 60% by weight

polyacetal carboxylate onto a substrate to produce a free-flowing particulate solid comprising between about 30% by weight and about 55% by weight said polyacetal carboxylate, said polyacetal carboxylate corresponding to the formula:



where n is at least about 4 and represents the average chain length of the polyacetal carboxylate in the mixture, R_1 and R_2 are independently selected chemically stable groups that stabilize the polymer against rapid depolymerization in alkaline solution, and M is selected from the group consisting of alkali metals, ammonium, alkyl groups of 1 to about 4 carbon atoms, tetraalkyl ammonium groups, and alkanolamine groups having from 1 to about 4 carbon atoms in the alkyl chain.

4,839,408

STABILIZED POLYOLEFIN COMPOSITION

Yoshiharu Fukui; Kazuhisa Kuroda, both of Ichihara; Tamaki Ishii, Suita, and Manji Sasaki, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 927,712, Nov. 7, 1986, abandoned. This application Aug. 15, 1988, Ser. No. 233,891

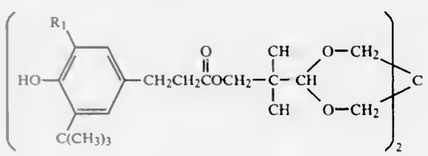
Claims priority, application Japan, Nov. 8, 1985, 60-251725; Nov. 8, 1985, 60-251726

Int. Cl.[4] C08K *5/34, 5/15*

U.S. Cl. 524—100 **18 Claims**

1. A polyolefin composition which comprises 100 parts by weight of a resin composition comprising 100 to 35 wt.% of a polyolefin and 0 to 65 wt.% of an inorganic filler in combination with the following components:

(A) 0.01 to 1 part by weight of a phenolic compound represented by the formula (I),

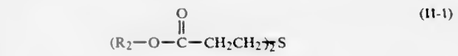


wherein R_1 represents a C_1–C_3 alkyl group,

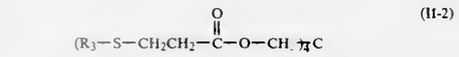
(B) 0.01 to 10 parts by weight of a metal deactivator having one or more

groups in the side chain, and

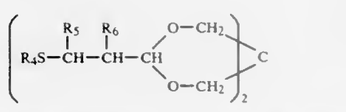
(C) 0.01 to 1 part by weight of a sulfur containing compound represented by the formula (II-1), (II-2), (II-3) or (II-4):



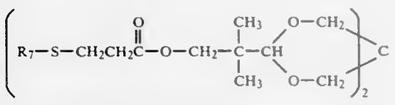
wherein R_2 represents a C_4–C_{20} alkyl group,



wherein R_3 represents a C_4–C_{20} alkyl group,



wherein R_4 represents a C_3–C_{18} alkyl group, and R_5 and R_6 independently represent a hydrogen atom or a C_1–C_6 alkyl group,



wherein R_7 represents a C_3–C_{18} alkyl group.

4,839,409

STABILIZERS FOR RIGID HALOGEN-CONTAINING ORGANIC POLYMERS COMPRISING A PRIMARY HEAT STABILIZER AND AN ESTER OF A POLYHYDROCARBYL ETHER GLYCOL

Gary M. Conroy, Cincinnati, Ohio, assignor to Morton Thiokol, Inc., Chicago, Ill.

Continuation of Ser. No. 945,782, Dec. 23, 1986, abandoned. This application Sep. 17, 1987, Ser. No. 98,754

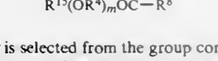
Int. Cl.[4] C08K *5/57, 5/56, 5/09, 5/10*

U.S. Cl. 524—179 **24 Claims**

11. A composition comprising a rigid halogen-containing organic polymer and, in an amount sufficient to stabilize said polymer against the deteriorative effects of heat, ultra-violet light and weathering, a stabilizer composition comprising a mixture of:

(a) an organotin or non-tin metal salt primary heat stabilizer; and

(b) in an amount sufficient to synergize the stabilization of the halogen-containing organic polymer but insufficient to plasticize said polymer, an ester of a polyhydrocarbyl ether glycol of the formula:



wherein R^4 is selected from the group consisting of alkylene, alkenylene, cycloalkylene and cycloalkenylene, R^8 is selected from the groups consisting of alkyl, alkenyl, cycloalkyl and cycloalkenyl, R^{15} is

and m is an integer of 2 or more.

4,839,410

FLAME-RETARDANT RUBBER-MODIFIED STYRENE RESIN COMPOSITION

Seiichi Atomori, Kuwana; Teruo Inagaki, Yokkaichi; Tateki Furuyama, Yokkaichi, and Akira Kamiya, Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1988, Ser. No. 154,045

Claims priority, application Japan, Mar. 10, 1987, 62-54338

Int. Cl.[4] C08K *5/13*

U.S. Cl. 524—281 **15 Claims**

1. A flame-retardant rubber-modified styrene resin composition, comprising:

(A) a rubber-modified styrene resin,

(B) a halogenated bisphenol type polycarbonate oligomer,

(C) a halogenated bisphenol type compound, and

(D) a halogenated polyolefin compound having a halogen content ranging from 20 to 50% by weight, wherein 1 to 25 parts by weight of the component (B), 0.5 to 25 parts by weight of the component (C), and 0.5 to 10 parts by weight of the component (D) are compounded with 100 parts by weight of the component (A), and further wherein the molar ratio of the components (B)/(C) is within the range of 97/3 to 5/55.

4,839,411

SOLID STATE CURING OF POLY(ARYLENE SULFIDE) RESINS IN REDUCED OXYGEN ATMOSPHERES

Kenneth C. Hoover; Fred T. Sherk, and Joseph E. Figard, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 22, 1987, Ser. No. 99,870

Int. Cl.[4] C08K *3/26;* **C08L** *81/04*

U.S. Cl. 524—424 **47 Claims**

1. A process for oxidatively curing a virgin poly(arylene sulfide) resin which comprises heating said resin in the form of solid particles, in the presence of a gaseous oxiding atmosphere comprising an oxygen content ranging from about 1 volume % to about 15 volume % oxygen, to a temperature in the range of about 10° C. to about 70° C. below the melting point of said resin for time sufficient to effect said curing.

4,839,412

ETHYLENE COPOLYMER COMPOSITIONS

Jerald R. Harrell, and Lawrence C. Muschiatti, both of Wilmington, Del., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 935,708, Nov. 25, 1986, abandoned. This application Sep. 1, 1987, Ser. No. 93,561

Int. Cl.[4] C08K *3/10*

U.S. Cl. 524—436 **6 Claims**

1. A thermoplastic ethylene polymer composition comprising:

(a) 20–100 parts of an ethylene polymer matrix comprising at least one thermoplastic ethylene copolymer of ethylene and at least one comonomer selected from vinyl acetate, esters and of methacrylic acid or esters of acrylic acid;

(b) 10–80 parts of at least one copolymer selected from the class consisting of (i) an ethylene/proylene/diene copolymer grafted with 0.1 to 5 weight % anhydride functionality, (ii) at least one polyolefin grafted with 0.1 to 5 weight % anhydride functionality, or (iii) a mixture of both;

(c) 75–130 parts per 100 parts of polymeric components present of magnesium hydroxide or aluminum trihydrate, or a mixture of both; and

(d) 0–80 parts of polyethylene; provided that the combined parts of components (a) and (d) is at least 80 parts.

4,839,413

RESIN-FORTIFIED EMULSION POLYMERS AND METHODS OF PREPARING THE SAME

Richard A. Kiehlbauch, and Sheng-Liang Tsaur, both of Racine, Wis., assignors to S.C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 899,281, Aug. 22, 1986. This application Mar. 2, 1988, Ser. No. 162,790

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.[4] C08F *2/16*

U.S. Cl. 524—460 **60 Claims**

1. A method for producing a resin-fortified polymer emulsion having Newtonian-like flow characteristics, utilizing an emulsion-polymerization reaction, wherein particles of an emulsion-polymer product form in the emulsion as a result of the utilization of the emulsion-polymerization reaction, the method comprising the steps of:

adding, to a reactor means, water and a first portion of a surfactant stabilizer, wherein the surfactant stabilizer is present in an amount effective for preventing coagulation of the emulsion-polymer product particles;

agitating the reactor contents, and subjecting the agitated reactor contents to an inert atmosphere;

heating the agitated reactor contents to a predetermined reaction temperature;

adding to the agitated-and-heated reactor contents a first portion of an emulsion-polymerizable monomer mixture comprising ethylenically-unsaturated emulsion-polymerizable monomers selected from the group consisting of olefins, monovinylidene aromatics, alpha,beta-ethylenically unsaturated carboxylic acids and esters thereof, ethylenically-unsaturated carboxylic anhydrides, halo substituted olefinics, and combinations thereof;

adding to the emulsion-polymerizable monomer-containing agitated-and-heated reactor contents an effective amount of an initiator for initiating the emulsion-polymerization reaction;

adding to the initiator-containing agitated-and-heated reactor contents a second portion of the emulsion-polymerizable monomer mixture together with the remainder amount of the surfactant stabilizer;

thereafter adding to the agitated-and-heated reactor contents a polymeric resin, soluble or dispersible in water or in alkali, said resin having been produced either by a solution-polymerization method or by a bulk-polymerization method, wherein the polymeric resin is produced from at least one ethylenically-unsaturated monomer selected from the group consisting of olefins, mono vinylidene aromatics, alpha beta ethylenically-unsaturated carboxylic acids and esters thereof, ethylenically-unsaturated dicarboxylic anhydrides, and mixtures thereof; and

adding to the polymeric resin-containing agitated reactor contents the remainder of the emulsion-polymerizable monomer mixture.

4,839,414

PIGMENT DISPERSION AND ITS USE

Klaus Bederke, Sprockhovel; Thomas Brock, Hurth; Hermann Kerber, Wuppertal, and Paul Rupieper, Velbert, all of Fed. Rep. of Germany, assignors to Herberts Gesellschaft mit beschrankter Haftung, Wuppertal, Fed. Rep. of Germany

Filed Aug. 18, 1987, Ser. No. 86,931

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1986, 3628123

Int. Cl.[4] B01F *17/52;* **C09B** *67/20;* **C09D** *3/48*

U.S. Cl. 524—507 **8 Claims**

1. A pigment dispersion composition suitable for the preparation of coating compounds and containing at least one pigment and an organic solvent and a pigment dispersing agent, said pigment dispersing agent comprising a copolymer containing OH groups and having a hydroxyl number of at least 60, and ethylenically unsaturated monomers incorporated by poly-

merization, characterized in that the copolymer is obtainable by the reaction of:

(A) 80 to 95% by weight of a copolymer of:

(a) 0.5 to 40% by weight of N,N-di-C_1 to C_4-alhylamino-C_1 to C_8-alkyl(meth)acrylamides and/or a mixture of N,N-di-C_1 to C_4-alkylamino-C_1 to C_8-alkyl(meth)acrylates and N- substituted (meth)acrylamides and/or (meth)acrylamide in which the ratio of amino(meth)acrylates to amido(meth)acrylates are in the range of from 1:2 to 2:1,

(b) 10 to 40% by weight of hydroxy-C_2-C_8-alkyl (meth)acrylates and

(c) 20 to 89.5% by weight of copolymerizable, α,β-olefinically unsaturated compounds with

(B) 5 to 20% by weight of polyisocyanate containing unmasked and optionally also masked isocyanate groups as well as biuret, urethane or isocyanurate groups.

4,839,415

PAPER SIZING AGENTS, THE MANUFACTURE AND USE OF SAME

Horst Schürmann, Düren; Hans-Joachim Weissen, and Klaus Schloter, both of Kreuzau, all of Fed. Rep. of Germany, assignors to Akzo N.V., Arnheim, Netherlands

Filed May 7, 1987, Ser. No. 46,697

Claims priority, application Fed. Rep. of Germany, May 10, 1986, 3615855

Int. Cl.⁴ C08L *37/00*

U.S. Cl. 524—549 **12 Claims**

1. A process for the manufacture of a cationic sizing agent for paper, comprising:

reacting an alpha-olefin with maleic anhydride at a molar ratio of alpha-olefin to maleic anhydride of 1:0.8 to 1:2 to form a copolymer with an average molecular weight of 3,000 to 30,000;

reacting said copolymer with a polyamine having at least one tertiary amino group and one primary amino group at a molar ratio of anhydride group to polyamine of 2:1 to 1:1 to form a polymeric imide-amine;

neutralizing 1 to 50% of the amino groups of said imide-amine with an acid;

diluting said partially neutralized imide-amine with water to a 5 to 50 weight % emulsion; and

quaternizing said diluted, partially neutralized imide-amine with epichlorohydrin.

4,839,416

LOW TACK MICROSPHERE ADHESIVE

Richard A. Orenstein, Longmeadow, and Arthur F. Dionne, Wilbraham, both of Mass., assignors to Ampad Corporation, Holyoke, Mass.

Filed Jun. 9, 1987, Ser. No. 59,797

Int. Cl.⁴ C08F *2/30, 20/10*

U.S. Cl. 524—558 **2 Claims**

1. A suspension polymerization process for preparing inherently tacky elastomeric polymeric microspheres consisting essentially of the steps of:

(a) charging to a reaction vessel;

(i) de-ionized water;

(ii) at least one non-ionic alkyl acrylate ester monomer;

(iii) at least one non-ionic emulsifier;

(iv) a substantially water insoluble polymerization initiator; and

(v) a non-ionic suspension stabilizer;

(b) agitating said charge to said reaction vessel;

(c) heating said charge while maintaining said agitation; and whereby inherently tacky, elastomeric polymeric microspheres are formed.

4,839,417

METHOD FOR MAKING ODORLESS AQUEOUS SOLUTIONS OF WATER SOLUBLE POLYMERS OR COPOLYMERS

Norbert Suetterlin, Mühltal-Nieder-Beerbach; Hans-Dieter Blitz, Darmstadt, and Hans Trabitzsch, Seebeim-Jugenheim, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/DE87/00268, § 371 Date Feb. 8, 1988, § 102(e) Date Feb. 8, 1988

PCT Filed Jun. 12, 1987, Ser. No. 163,825

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1986, 3620149

Int. Cl.⁴ C08L *31/00*

U.S. Cl. 524—833 **9 Claims**

1. A method for making a clear viscous aqueous solution of a water soluble polymer or copolymer of acrylic acid or of methacrylic acid having a molecular weight between 800 and 100,000, which method comprises polymerizing from 50 to 100 mol percent of a monomer selected from the group consisting of acrylic acid and methacrylic acid and from 0 to 50 mol percent of one or more other monomers copolymerizable therewith and selected from the group consisting of alkyl esters of acrylic acid and of methacrylic acid, acrylonitrile, methacrylonitrile, and hydroxyalkyl esters of acrylic acid and of methacrylic acid having 2 to 4 carbon atoms in the hydroxyalkyl group, said percentages being based on the total moles of polymerizable monomers present, in an aqueous solution in the presence of an initiator which is a mixture of 10 to 100 parts per million of iron ion, 0.5 to 10 percent of hydrogen peroxide, and from 0.5 to 20 percent of a water soluble mercaptan, said parts and percentages being by weight of the monomers.

4,839,418

THERMOPLASTIC MOLDING MATERIALS AND THEIR PREPARATION

Hans-Dieter Schwaben, Freisbach; Adolf Echte, Ludwigshafen; Rainer Buescbl, Roedersheim-Gronau; Rainer Schlichtmann, Ludwigshafen; Peter Klaerner, Battenberg, and Hubert Kindler, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 5, 1988, Ser. No. 141,098

Int. Cl.⁴ C08F *279/02;* **C08L** *53/02*

U.S. Cl. 525—53 **3 Claims**

1. A thermoplastic molding material consisting essentially of from 80 to 60% by weight of a hard matrix (A) composed of polystyrene and

from 20 to 40% by weight of a soft phase (B), the soft phase (B) being uniformly distributed in the hard phase and having a particle diameter of less than 0.8 μm, its median particle diameter d_{50} (volume average) being from 0.25 to 0.38 μm, the width of the particle size distribution, (d_{95}–d_5), being from 0.2 to 0.6 μm, the d_{60} value being from 0.26 to 0.40 μm and the d_{90} value being from 0.40 to 0.75, said molding material being obtained by batchwise polymerization of a solution of from 10 to 18% by weight of a linear styrene/butadiene block copolymer having an ill defined transition, containing from 35 to 45% by weight of styrene and from 65 to 55% by weight of butadiene and having a block polystyrene content of from 25 to 35% by weight, in from 82 to 90% by weight of styrene in the presence of conventional amounts of assistants in a cascade consisting of 2 kettles, wherein, in the first kettle, the polymerization is carried out as a mass polymerization, at least up to the end of phase inversion and up to a conversion of not more than 40% by weight, based on styrene, with stirring and with formation of the subsequent soft phase, and thereafter, in the second kettle, the polymerization is continued in suspension until complete conversion is achieved, these steps being followed by conventional working up to obtain the desired product.

4,839,419

METHOD FOR IMMOBILIZING DISSOLVED PROTEINS

Dieter Kraemer, Mainz; Hermann Plainer, Reinheim; Bruno Sproessier; Helmut Uhlig, both of Rossdorf, and Reiner Schnee, Darmstadt, all of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 853,736, Apr. 18, 1986, abandoned.

This application Feb. 16, 1988, Ser. No. 161,204

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1985, 3515252

Int. Cl.⁴ C07K *17/00;* **C12N** *9/84, 11/00;* **C12Q** *1/00*

U.S. Cl. 525—54.1 **7 Claims**

1. A method for immobilizing a dissolved protein on a solid, macroporous, water insoluble support having pores of a diameter of at least 10 nanometers and a pore volume greater than 0.1 cm^3/g, in the presence of an electrolyte innocuous for said protein, which method comprises washing a supernatant aqueous solution of the protein over said support until the protein has been adsorbed onto the support, said solution having an ionic strength of the electrolyte of at least 0.15 mole/liter but insufficient to coagulate the protein from the solution, and adding to the electrolyte-containing solution, after adsorption of the protein onto the support, a water soluble coupling component effecting crosslinking of the protein adsorbed onto the support.

4,839,420

PREPARATION OF POLYVINYLAZIDES FROM POLYVINYLNITRATE

Everett E. Gilbert, Morristown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 16, 1984, Ser. No. 600,869

Int. Cl.⁴ C08F *8/30*

U.S. Cl. 525—61 **10 Claims**

1. A process of producing a polyvinylazide optionally containing nitrate groups, which comprises reacting a polyvinylnitrate with a metal azide in the presence of an inert organic solvent for at least one of the metal azide and polyvinylnitrate reactants at a temperature and for a time sufficient to effect replacement of a nitrate group by an azide group.

4,839,421

ANTISTATIC, THERMOPLASTIC MOULDING COMPOUND BASED ON POLYCARBONATES AND AROMATIC VINYL POLYMERS

Hans-Josef Buysch; Norbert Schön, both of Krefeld; Herbert Eichenauer, Dormagen, all of Fed. Rep. of Germany; Hans-Jürgen Kress, Pittsburgh, Pa., and Josef Buekers, Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkasen, Fed. Rep. of Germany

Filed Feb. 1, 1988, Ser. No. 151,288

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1987, 3704488

Int. Cl.⁴ C08L *69/00, 51/04*

U.S. Cl. 525—67 **4 Claims**

1. Thermoplastic moulding compositions comprising:

99.8 to 95% by weight of a mixture of an aromatic polycarbonate and

(A) 0–100% by weight of the sum of (A) and (B) of one or more graft polymers comprise the monomers styrene, α-methyl styrene, methyl methacrylate, or a mixture of 95–50% by weight of styrene, α-methyl styrene, ring substituted styrene, methyl methacrylate or mixtures thereof with 5–50% by weight of methacrylonitrile, acrylonitrile, maleric acid anhydride, N-substituted malerimides or mixtures thereof, grafted onto a rubber substrate, and

(B) 100 to 0%, by weight of one or more thermoplastic vinyl copolymers, and

II. 0.2 to 5% by weight of a polyalkylene ether which is modified at 50° C. to 150° C. with a radical former.

4,839,422

TERNARY ADHESIVE COMPOSITIONS

Kenneth O. McElrath, Humble, Tex.; Martha L. Robertson, Zachary, La., and Wai Y. Chow, Houston, Tex., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Dec. 23, 1987, Ser. No. 137,391

Int. Cl.⁴ C08F *8/32;* **C08L** *51/04, 51/06*

U.S. Cl. 525—74 **26 Claims**

1. An adhesive composition having enhanced strength and high temperature resistance, comprising:

(a) a thermoplastic elastomer having grafted thereto a C_3 to C_{10} unsaturated mono- or polycarboxylic acid, anhydride and derivatives thereof.

(b) A tackifying resin selected from petroleum hydrocarbon resins, polyterpene resins, and cyclopentadiene resins; and

(c) a cross-linking agent selected from di- or polyamine hydrocarbyl compounds having from 2 to about 20 carbon atoms.

4,839,423

METHOD FOR PRODUCTION OF GRAFT RESIN COMPOSITION

Yasuo Moriya; Nobuyoshi Suzuki, and Hiroshi Goto, all of Aichi, Japan, assignors to Nippon Oil & Fats Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1988, Ser. No. 204,263

Claims priority, application Japan, Jun. 16, 1987, 62-147837; Jun. 16, 1987, 62-147838

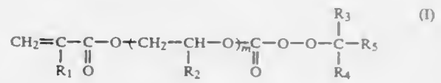
Int. Cl.⁴ C08L *255/02, 51/06*

U.S. Cl. 525—80 **12 Claims**

1. A method for the production of a graft resin composition, characterized by the steps of:

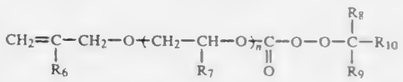
a. suspending a propylene polymer in water thereby obtaining a propylene polymer suspension,

b. then dissolving in a vinyl monomer 0.1 to 10 parts by weight, based on 100 parts by weight of the vinyl monomer, of at least one member selected from the group consisting of radically (co)polymerizable organic peroxides represented by the formula:



(I)

wherein R_1 stands for a hydrogen atom or an alkyl group of 1 or 2 carbon atoms, R_2 for a hydrogen atom or a methyl group, R_3 and R_4 independently for an alkyl group of 1 to 4 carbon atoms, R_5 for an alkyl group of 1 to 12 carbon atoms a phenyl group, or an alkyl-substituted phenyl group or a cycloalkyl group of 3 to 12 carbon atoms, and m for 1 or 2, and radically (co)polymerizable organic peroxides represented by the formula:



(II)

wherein R_6 stands for a hydrogen atom or an alkyl group of 1 to 4 carbon atoms, R_7 for a hydrogen atom or a methyl group, R_8 and R_9 independently for an alkyl group 1 to 4 carbon atoms, R_{10} for an alkyl group of 1 to 12 carbon atoms, a phenyl group, or an alkyl-substituted phenyl group or a cycloalkyl group of 3 to 12 carbon atoms, and n for 0, 1, or 2, and 0.01 to 5 parts by weight, based on 100 parts by weight of the total said vinyl monomer and said radically (co)polymerizable organic peroxide, or a radical polymerization initiator possessing a half

life of 10 hours and exhibiting a decomposition temperature in the range of 40° to 90° C.,

c. mixing resultant solution of b with said propylene polymer suspension in a ratio of 5 to 400 parts by weight of said vinyl monomer to 100 parts by weight of said propylene polymer thereby forming an aqueous suspension,

d. heating said aqueous suspension under conditions incapable of inducing substantial decomposition of said radical polymerization initiator thereby enabling said propylene polymer to be impregnated with said vinyl monomer, said radically (co)polymerizable organic peroxide, and said radical polymerization initiator,

e. elevating the temperature of said aqueous suspension after the amount of said vinyl monomer, said radically (co)-polymerizable organic peroxide, and said radical polymerization initiator which escape the impregnation has decreased to less than 50% by weight of the original amount thereby inducing the copolymerization of said vinyl monomer and said radically (co)polymerizable organic peroxide in said propylene polymer and consequent formation of a graft precursor, and

f. melting and kneading said graft precursor at a temperature in the range of 100° to 300° C. thereby inducing a grafting reaction thereof.

4,839,424

RESIN COMPOSITION OF POLYPHENYLENE ETHER AND POLYAMIDE BLOCK COPOLYMER

Katuyoshi Murabayashi, Sakai, Japan, assignor to Daicel Chemical Industries, Ltd., Sakai, Japan

Division of Ser. No. 743,536, Jun. 11, 1985, Pat. No. 4,716,198. This application Sep. 4, 1987, Ser. No. 93,486

Claims priority, application Japan, Jun. 19, 1984, 59-124493

Int. Cl.[4] C08L *53/00, 71/00*

U.S. Cl. 525—92 **13 Claims**

1. A resin composition suitable for injection molding, comprising:

(1) 100 parts by weight of a thermoplastic injection moldable resin component consisting of

(a) a first thermoplastic injection moldable polyphenylene ether resin and

(b) up to 40 percent by weight of a second resin different from said polyphenylene ether resin, and

(2) 0.01 to 50 parts by weight of a polyamide block copolymer consisting essentially of

(a) 10 to 99 percent by weight of polyamide blocks prepared by polymerizing amino carboxylic acids having 6 to 12 carbon atoms, lactams having 6 to 12 carbon atoms, nylon salts prepared from diamines having from 6 to 12 carbon atoms and dicarboxylic acids having from 6 to 12 carbon atoms, and the balance is

(b) (1) polyester blocks or (2) polyol blocks linked to said polyamide blocks by ester bonds, wherein said second resin is different from said polyamide block copolymer.

4,839,425

THERMOPLASTIC RESIN COMPOSITION COMPRISING A POLYPHENYLENE ETHER AND A POLYAMIDE

Masaaki Mawatari, Suzuka; Tetsuo Itoh, Matsuzaka; Syuji Tsuchikawa, and Shinichi Kimura, both of Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1987, Ser. No. 31,579

Claims priority, application Japan, Mar. 28, 1986, 61-70579

Int. Cl.[4] C08L *53/00;* **C08F** *283/08*

U.S. Cl. 525—92 **22 Claims**

1. A thermoplastic resin composition obtained by first melt-mixing the following (a), (c) and (d) components in the presence of the following (e) component and (f) a peroxide, and then melt-mixing the following (b) component therewith:

(a) 4 to 95% by weight of a polyphenylene ether resin,

(b) 4-95% by weight of a polyamide,

(c) 1-50% by weight of a rubbery polymer selected from the group consisting of polybutadiene, styrene-butadiene random copolymers, styrene-isoprene copolymers, acrylonitrile-butadiene copolymers, ethylene-α-olefin copolymers, ethylene-α-olefin-polyene copolymers, acrylic rubbers, polyisoprene, styrene-butadiene butadiene block copolymers, styrene-isoprene block copolymers, hydrogenated styrene-butadiene block copolymers, styrene-grafted ethylene-propylene elastomers and ethylenic ionomer resins, and

(d) 91% by weight or less of a styrene resin selected from the group consisting of polystyrene, styrene-unsaturated acid copolymers, styrene-epoxy group-containing unsaturated compound copolymers, styrene-acid anhydride group-containing unsaturated compound copolymers, styrene-alkali (meth)acrylate copolymers, styrene-alkenyl cyanide compound copolymers, styrene-maleimide compound copolymers, styrene-amino group-containing ethylenically unsaturated compound copolymers and styrene-hydroxyl group-containing unsaturated compound copolymers,

wherein the sum of the (a), (b), (c) and (d) components is 100% by weight;

(e) 0.001-10% by weight based on the total weight of the (a), (b), (c) and (d) components, of at least one monomeric functional group-containing unsaturated compound having at least one group selected from the group consisting of carboxyl, acid anhydride, epoxy, hydroxy, amino and amido groups;

the amount of the (f) component being 0.001-5% by weight based on the total weight of the (a), (b), (c) and (d) comoonents.

4,839,426

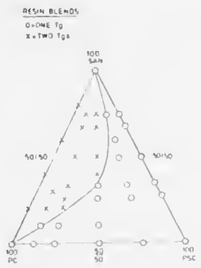
MISCIBLIZING BLENDS OF POLYCARBONATE AND STYRENE COPOLYMERS

Robert R. Gallucci, Mt. Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Aug. 10, 1987, Ser. No. 83,116

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—146 **16 Claims**



1. A thermoplastic molding composition, which comprises; a miscible blend of

from 25 to 87 parts by weight of a polycarbonate resin of a non-dihydric phenol sulfone;

from 10 to 75 parts by weight of a thermoplastic copolymer of a styrenic monomer with acrylonitrile monomer having from 20 to 35 percent acrylonitrile segments; and

a miscibilizing proportion of a polysulfonecarbonate copolymer.

4,839,427

RESIN SYSTEMS CURED WITH BLOCKED ACID CATALYSTS

Patrick J. Mormile, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 3, 1987, Ser. No. 92,491

The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.

Int. Cl.[4] C08L *61/00*

U.S. Cl. 525—162 **14 Claims**

1. An acid curing resin system comprising an amino resin, a resin containing hydroxy, carboxy, primary amide or secondary amide groups and a sulfonic acid catalyst blocked by reaction with a glycidamide.

4,839,428

METHOD FOR IMPROVING GREEN STRENGTH PROPERTIES OF VULCANIZABLE RUBBER COMPOSITIONS

James A. Davis, Uniontown, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 853,074, Apr. 17, 1986, abandoned. This application Aug. 15, 1988, Ser. No. 232,341

Int. Cl.[4] C08L *7/00, 9/00, 9/06, 11/00*

U.S. Cl. 525—215 **7 Claims**

1. A method for improving the green strength properties of uncured vulcanizable rubber compositions comprising the step of:

mixing polychloroprene with said vulcanizable rubber composition prior to curing in an amount ranging between 5 to 25 weight percent of the rubber in said composition;

wherein said rubber composition comprises blends of natural rubber and at least 10 percent by weight of synthetic rubbers, wherein said synthetic rubbers are selected from the group consisting of styrene butadiene rubber, polybutadiene and synthetic isoprene rubber.

4,839,429

SANITARY RUBBER COMPOSITION OR ARTICLE

Masao Tajima, Tokyo, Japan, assignor to Kabushiki Kaisha Toritsu Industry, Tokyo, Japan

Division of Ser. No. 833,713, Feb. 27, 1986. This application Mar. 28, 1988, Ser. No. 175,410

Int. Cl.[4] C08K *3/34;* **C08L** *9/00*

U.S. Cl. 525—232 **1 Claim**

1. A sanitary article consisting of a rubber composition consisting essentially of a synthetic rubber and a fine powder of polyethylene with a mean molecular weight of 1×10^6 to 1×10^9, wherein the fine powder of polyethylene is in a proportion of 3 to 43 parts by weight to 100 parts by weight of the synthetic rubber, and has a particle size of 1 to 74 microns, and the synthetic rubber and fine powder of polyethylene are blended, bridged and shaped and wherein the synthetic rubber, obtained by solution polymerization, is butadiene rubber.

4,839,430

PREPARATION OF TRIBLOCK COPOLYMERS

Kent S. Dennis, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 1, 1987, Ser. No. 33,444

Int. Cl.[4] C08F *297/02, 297/04*

U.S. Cl. 525—280 **23 Claims**

1. A method for the preparation of a block copolymer of the ABA configuration, the steps of the method comprising:

(a) providing a first anionically polymerizable monomer portion used in polymerizing the A block polymer chains, which first monomer portion has at least one monomer selected from the group consisting of styrene, α-methylstyrene, m-ethylstyrene, p-methoxy-α-methylstyrene, p-ethyl-α--mehylstyrene, p-ethyl-α-ethylstyrene, 2,4-diethylstyrene, m-isopropylstyrene,, butadiene, dimethylbutadiene, isoprene, piperylene, mono- or diortho-, halo-substituted styrenes, or conventional combinations thereof;

(b) anionically polymerizing the first monomer portion to provide A block polymer chains having living ends;

(c) contacting the A block polymer chains with a second anionically polymerizable monomer portion used in polymerizing the B block polymer chain, which second monomer portion has at least one monomer selected from the group consisting of styrene, α-methylstyrene, m-ethylstyrene, p-methoxy-α-methylstyrene, p-ethyl-α-methylstyrene, p-ethyl-α-ethylstyrene, 2,4-diethylstyrene, m-isopropylstyrene, vinylpyridine, butadiene, dimethylbutadiene, isoprene, piperylene, mono- or diortho-, halo-substituted styrenes, or combinations thereof, provided that at least one monomer selected from the second monomer portion is different from at least one monomer selected from the first monomer portion;

(d) anionically polymerizing the second monomer portion in the presence of the A block polymer chains to form A-B block polymer chains having living ends; and

(e) coupling the A-B block polymer chains with PEB to bring about substantial coupling.

4,839,431

ELASTOMER COMPRISING AT LEAST ONE CONJUGATED OLEFIN GROUP AND METHOD OF MAKING SAME

Antonius A. Broekhuis, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 31, 1986, Ser. No. 948,336

Int. Cl.[4] C08F *279/02*

U.S. Cl. 525—298 **12 Claims**

1. A method for preparing an elastomeric homopolymer or copolymer containing at least one conjugated diolefin linkage comprising the steps of:

(a) reacting an elastomeric homopolymer or copolymer having at least one active group containing an alkali metal atom with a 2,3-ethylenically unsaturated aldehyde or ketone to produce an alkali metal salt;

(b) converting the alkali metal salt from step (a) to the corresponding alcohol; and

(c) dehydrating the alcohol from step (b).

4,839,432

METHOD OF MANUFACTURING A GRAFTED RESIN COMPOSITION

Yasuo Moriya; Nobuyoshi Suzuki, and Hiroshi Goto, all of Chita, Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 156,317

Claims priority, application Japan, Mar. 18, 1986, 62-63187; Feb. 18, 1987, 62-34941; May 11, 1987, 62-114022; May 11, 1987, 62-114023; Aug. 10, 1987, 62-199613; Aug. 10, 1987, 62-199614; Aug. 10, 1987, 62-199615; Aug. 10, 1987, 62-199617; Aug. 10, 1987, 62-199620; Aug. 10, 1997, 62-199619

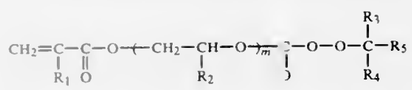
Int. Cl.[4] C08F *120/36, 112/08, 6/00*

U.S. Cl. 525—303 **13 Claims**

1. A method of manufacturing a grafted resin composition by grafting a graft polymerization precursor or a mixture consisting of 1 to 99% by weight of said graft polymerization precursor and 99 to 1 % by weight of a polymer, by melting said graft polymerization precursor or mixture at a temperature of 100° to 300° C. and kneading it,

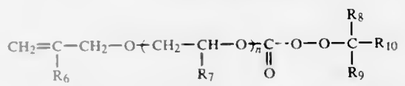
said graft polymerization precursor being a resin composition prepared by suspending in water (a) 100 parts by weight of an etylene polymer, adding to the resultant suspension a solution obtained by dissolving in (b) 5 to 400 parts by weight of one or more vinyl monomers selected from a group consisting of aromatic vinyl monomers, methacrylic ester monomers, acrylic ester monomers, methacrylonitrile, acrylonitrile and vinyl ester monomers, (c) from 0.1 to 10 parts by weight, per 100 parts by weight

of said vinyl monomer or monomers, of one or more radical polymerizable organic peroxides represented by the formula



(I)

where R_1 is a hydrogen atom or an alkyl group with a carbon number of 1 to 2, R_2 is a hydrogen atom or a methyl group, R_3 and R_4 are alkyl groups with carbon numbers of 1 to 4 and R_5 is an alkyl group, a phenyl group or a alkyl-substituted phenyl group with a carbon number of 1 to 12 or a cycloalkyl group with a carbon number of 3 to 12, and m is 1 or 2, or a formula



(II)

where R_6 is a hydrogen atom or an alkyl group with a carbon number of 1 to 4, R_7 is a hydrogen atom or a methyl group, R_8 and R_9 are alkyl groups with carbon numbers of 1 to 4, R_{10} is an alkyl group, a phenyl group or an alkyl-substituted phenyl group with a carbon number of 1 to 12 or a cycloalkyl group with a carbon number of 3 to 12, and n is 0, 1 or 2, and (d) 0.01 to 5 parts by weight, per 100 parts by weight of the sum of said vinyl monomers and radical polymerezable organic peroxides, of a radical polymerization initiator having a decomposition temperature of 40° to 90° C. for obtaining a half reduction period of 10 hours, heating the resultant mixture under a condition that said radical polymerization initiator is not substantially decomposed whereby to cause impregnation of said ethylene polymer with said vinyl monomer or monomers, said radical polymerizable organic peroxides and said radical polymerization initiator, and, when the content of free vinyl monomer or monomers, radical polymerizable organic peroxide or peroxides and radical polymerizable initiator becomes less than 50% weight of the initial amount, elevating the temperature of said water suspension to cause copolymerization of said vinyl monomer or monomers and said radical polymerizable organic peroxide or peroxides in said ethylene (co-and/or) polymer,

said polymer forming the mixture with said graft polymerization precursor being either one or both members of a group consisting of (i) ethylene polymer and (ii) a vinyl polymer obtained through polymerization of one or more members selected from the group consisting of aromatic vinyl monomers, methacrylic ester monomers, acrylic ester monomers, methacrylonitrile, acrylonitrile and vinyl ester monomers.

4,839,433

SALICYLIMINES AS CURE ACTIVATORS FOR NONHALOGENATED RUBBERS

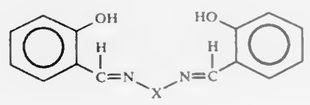
Carl R. Parks, Akron, and Donald J. Burlett, Wadsworth, both of Ohio, assignors to The Goodyear Fire & Rubber Company, Akron, Ohio

Filed Dec. 7, 1987, Ser. No. 129,200

Int. Cl.[4] C08F 8/34

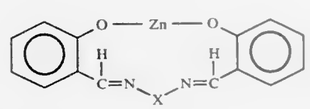
U.S. Cl. 525—329.3 **7 Claims**

1. A sulfur vulcanizable rubber composition comprising a nonhalogenated sulfur vulcanizable rubber, a vulcanizing agent, accelerator and a cure activator, wherein said cure activator has the structural formula:



(I)

or



(II)

wherein X is a radical of the structural formula:

$$-CH_2-CH_2-NH-CH_2-CH_2-_y$$

wherein y is 0, 1, 2 or 3 and said sulfur vulcanizable rubber is selected from the group consisting of natural rubber, polybutadiene, polyisoprene, styrene/butadiene copolymers, terpolymers of acrylonitrile, butadiene and styrene, EPDM and blends thereof.

4,839,434

PREPARATION OF HOMO- AND COPOLYMERS HAVING TERMINAL MERCAPTO GROUPS AND THEIR USE

Klaus Bronstert, Carlsberg; Hans-Michael Walter, Ruppertsberg, and Hans-Dieter Schwaben, Freisbach, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 10, 1988, Ser. No. 205,178

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1987, 3720322

Int. Cl.[4] C08F 8/34

U.S. Cl. 525—350 **3 Claims**

1. A process for the preparation of a homo- or copolymer which has terminal mercapto groups, is composed of one or more monomers from the group consisting of butadiene, isoprene and styrene and is obtained by anionic polymerization of one or more of the stated monomers in the presence of one or more organolithium compounds followed by reaction of the living anions with an episulfide of the formula I

I

where R is hydrogen, alkyl of 1 to 18 carbon atoms or aryl of 6 to 10 carbon atoms, with formation of one or more primary or secondary mercapto groups at the end of the polymer chain(s), wherein a thiolcarboxylic acid of the formula II

where R^1 is hydrogen, alkyl of 1 to 10 carbon atoms or $-CH_2-COOH$ and R^2 is 0 or from 1 to 10 CH_2 units, is added directly to the resulting reaction mixture in an amount of from 0.5 to 2 moles of the thiolcarboxylic acid per mole of episulfide, and the reaction product of the thiolcarboxylic acid and polymer derived from episulfide and polymer with living anions is subjected to an heat aftertreatment.

4,839,435

POLYMER BLEND OF CARBON MONOXIDE/OLEFIN COPOLYMER AND A POLY(ARYLSULFONE) POLYMER

William P. Gergen, Houston, Tex., and Robert G. Lutz, Santa Rosa, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 8, 1988, Ser. No. 203,958

Int. Cl.[4] C08L 81/06

U.S. Cl. 525—391 **8 Claims**

1. A composition comprising a non-miscible blend of a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and a poly(arylsulfone) polymer.

4,839,436

POLYPHENYLENE OXIDES WITH HIGH MOLECULAR WEIGHT AND A PROCESS FOR THEIR PREPARATION AND THEIR USE

Walter Heitz, Kirchhain, and Karl-Heinrich Schaeider, Marburg, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Jan. 19, 1988, Ser. No. 145,822

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1987, 3702919; Mar. 13, 1987, 3708109

Int. Cl.[4] C08G 65/48

U.S. Cl. 525—397 **7 Claims**

1. Polyphenylene oxide with high molecular weight corresponding to the formula

wherein

m represents the number 2, 3 or 4,

Ar represents an aromatic group with 6 to 20 carbon atoms,

R represents a polyphenylene oxide chain of the formula

wherein

X represents a halogen and

n represents an integer with a value from 10 to 10,000.

4,839,437

BLENDS OF POLYKETONE POLYMER WITH AN AT LEAST PARTIALLY CRYSTALLINE POLYAMIDE POLYMER

William P. Gergen, Houston, Tex., and Robert G. Lutz, Santa Rosa, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 29, 1988, Ser. No. 187,790

Int. Cl.[4] C08L 23/08

U.S. Cl. 525—426 **29 Claims**

1. A composition comprising a blend of a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon and an at least partially crystalline nylon polyamide polymer having a number average molecular weight of at least 5,000.

4,839,438

CRYSTALLINE UNSATURATED POLYESTER AND THE PREPARATION THEREOF

Johannes T. Evers, Maarn, and Robertus G. Berenbak, Hoek van Hollan, both of Netherlands, assignors to DSM Resins B.V., Zwolle, Netherlands

Continuation of Ser. No. 811,441, Dec. 20, 1985, abandoned. This application Jul. 24, 1987, Ser. No. 77,244

Claims priority, application Netherlands, Dec. 21, 1984, 8403883

Int. Cl.[4] C08L 75/06; C08G 18/28

U.S. Cl. 525—440 **14 Claims**

1. The crystalline unsaturated polyester urethane consisting of polyester segments derived from crystalline and essentially linear hydroxy terminated polyesters bound through urethane bonds to units derived from a (poly)isocyanate, said linear hydroxy-terminated polyesters having an acid value of at most 10 and a hydroxyl value of between 20 and 550 mg KOH/g polyester and having a degree of unsaturation between 1 and 6 moles of double bonds per 1000 grams of polyester, wherein said polyester segments are derived to at least 80 wt. % from units selected from the group consisting of fumaric acid, symmetrical aliphatic C_2 to C_{12} dicarboxylic acids and symmetrical C_2 to C_{12} diols, wherein said crysalline polyester urethane has a sharp melting point.

4,839,439

PREPARATION OF POLYMER BASED ON POLYVINYLENE CARBONATE AND/OR POLYHYDROXYMETHYLENE

Otto Mauz, Liederbach, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

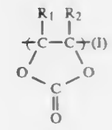
Division of Ser. No. 1,918, Jan. 9, 1987, Pat. No. 4,788,278, which is a continuation of Ser. No. 721,913, Apr. 11, 1985, abandoned. This application Jun. 17, 1988, Ser. No. 207,788

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1984, 3413904

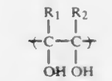
Int. Cl.[4] C08F 34/02

U.S. Cl. 526—203 **7 Claims**

1. A process for the preparation of a polymer consisting substantially of a base polymer having units (II) or a mixture of units (I) and (II), said units (I) and (II) having the following structural formulas

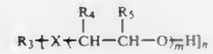


(I)



(II)

in which R_1 and R_2 are hydrogen or a monovalent hydrocarbon radical with up to 8 carbon atoms, which polymer also contains units which are derived from at least one compound of formula (III)



(III)

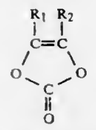
and grafted onto the base polymer in which:

R_3 is a hydrocarbon radical with 4 to 30 carbon atoms;

X is a member selected from the group consisting of —O—, COO— and mixture thereof;

R_4 and R_5 are hydrogen or a monovalent hydrocarbon radi-

cal with 1 to 8 carbon atoms, with the proviso that at least one of the radicals R_4 and R_5 is hydrogen;
m is an integer from 1 to 40; and
n is an integer from 1 to 4,
which comprises polymerization of a compound of the formula (IV)



(IV)

in which R_1 and R_2 are defined above, in the presence or absence of small amounts of other monomers copolymerizable with these compounds, the polymerization being carried out in a liquid dispersant in the presence of a free radical initiator, a dispersion stabilizer, and in the presence of at least one compound of the formula (III), in which R_3, R_4, R_5, X, m and n are as defined above, and using as the dispersion stabilizer a copolymer of maleic anhydride and at least one component selected from the group consisting of a vinyl alkyl ether, a vinyl ester and a longer-chain alpha-olefin to obtain a graft polymerization product per se or subjecting said product to hydrolysis of the cyclic carbonate groups.

4,839,440

N,N'-BIS(MALEIMIDE)/ALKENYLOXYANILINE COPOLYMERIZATE

Pascal Barthelemy, Lyons, France, assignor to Rhone-Poulenc Chimie, Courbevole, France

Filed Dec. 17, 1987, Ser. No. 134,043

Claims priority, application France, Dec. 17, 1986, 86 17917; Mar. 5, 1987, 87 03205

Int. Cl.[4] C08F 22/40

U.S. Cl. 526—262 **15 Claims**

1. A thermosetting imido polymer comprising the copolymerizate of (a) at least one N,N'-bis(maleimide), (b) at least one alkenyloxyaniline, and (c) admixture of (i) at least one N-[(methi)allyloxyphenyl]maleimide with (ii) at least one N-[(methy)allyloxy-(meth)allylphenyl]maleimide.

4,839,441

POLYESTERAMIDES, POLYETHERESTERAMIDES AND PROCESS FOR PREPARATION THEREOF

Daniel Cuzin, Port Marly, and Didier Judas, Paris, both of France, assignors to Atochem, Puteaux, France

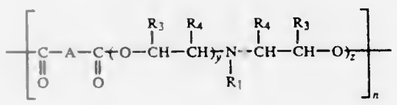
Filed Feb. 17, 1988, Ser. No. 157,370

Claims priority, application France, Feb. 26, 1987, 87 02569

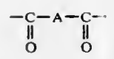
Int. Cl.[4] C08G 69/44

U.S. Cl. 528—328 **12 Claims**

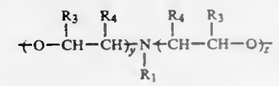
1. Polyesteramides and polyetheresteramides of the formula



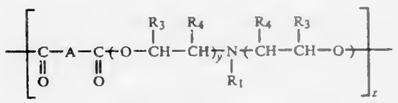
wherein



represents a dicarboxylic acid polyamide sequence having a medium molecular weight between 300 and 15,000;
R_3 and R_4 represent hydrogen or only one of the two represents hydrogen the other one being an alkyl radical containing from 1 to 24 carbon atoms;
R_1 is a linear or branched, saturated or unsaturated alkyl radical containing from 1 to 24 carbon atoms or an aromatic or cycloaliphatic radical;
y+z has a value between 2 and 100, each being at least equal to 1; and
n represents the number of recurrent units that constitute the macromolecular chain; and wherein the proportion by weight of the group



represents from 2 to 90% of the total group



wherein A, R, —R_4, y and z are as indicated.

4,839,442

LOW VISCOSITY NONCRYSTALLINE DICYANATE ESTER BLENDS WITH PREPOLYMERS OF DICYANATE ESTERS

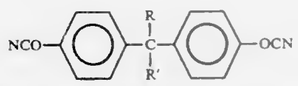
Wallace M. Craig, Jr., Fairdale, Ky., assignor to Hi-Tek Polymers, Inc., Louisville, Ky.

Continuation of Ser. No. 934,189, Nov. 24, 1986, abandoned. This application Jun. 20, 1988, Ser. No. 210,175

Int. Cl.[4] C08G 73/00

U.S. Cl. 528—422 **19 Claims**

1. A curable composition comprising a blend of:
(a) a dicyanate ester of a dihydric phenol having the formula:



wherein R and R' are difference and wherein R is H or C_1 to C_3 alkyl and R' is C_1 to C_4 alkyl, and
(b) a prepolymer of dicyanate esters of dihydric phenols different from the dicyanate ester of (a) wherein about 5 to about 50 percent of the cyanate functional groups are cyclotrimerized, wherein (a) and (b) are present in the amount of about 1 to about 99 parts by weight of (a) and about 99 to about 1 parts by weight of (b), the total weight being 100 parts.

4,839,443

POLYSILOXANE CONTAINING HYDROXYL GROUPS AND A SILICONE-MODIFIED POLYURETHANE USING THE SAME

Yoshinori Akutsu, Kawasakishi; Takaharu Nakano, Yokohamashi; Takahiro Saho, Yokohamashi; Nobumasa Ohtake, Yokohamashi; Hirofumi Yasuda, Yokohamashi, and Tamio Kimura, Yokohamashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

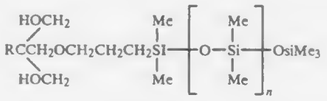
Filed Jan. 14, 1988, Ser. No. 143,746

Claims priority, application Japan, Feb. 4, 1987, 62-23888; May 22, 1987, 62-125177

Int. Cl.[4] C08F 283/00

U.S. Cl. 525—474 **2 Claims**

1. A polysiloxane compound expressed by the formula



(I)

wherein R represents H,Me or Et, Me represents methyl group, Et represents ethyl group and n represents an integer of 0 to 4,000.

4,839,444

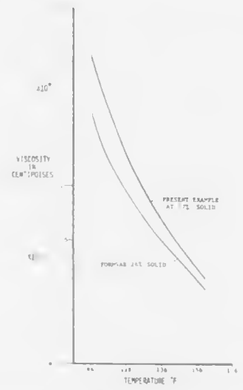
HIGH SOLIDS ENAMEL

Francois A. Lavallee, Fort Wayne, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Continuation-in-part of Ser. No. 947,293, Dec. 29, 1986, abandoned. This application Feb. 23, 1988, Ser. No. 159,624

Int. Cl.[4] C08L 63/00

U.S. Cl. 525—481 **8 Claims**



1. A high solids, low viscosity enamel resistant to both water and oil, for insulating magnet wire used in oil filled transformers consisting essentially of: a mixture of non-reactive high molecular weight and reactive low molecular weight linear hydroxy polyethers, a phenolic resin, an isocyanate and a melamine resin dissolved in an organic solvent wherein the phenolic resin is present at about 25 percent to about 50 percent by weight, the isocyanate is present at about 0 percent to about 20 percent by weight and the melamine is present at about 0.0 percent to about 2 percent by weight and the linear hydroxy polyethers are the balance by weight of the solids content of the resin, wherein said low molecular weight polyether acts as a cross-linking agent during the curing of said enamel on said wire and said enamel has a significantly lower viscosity at the same solids concentration as the present industry standard enamel.

4,839,445

SPHERICAL PARTICLES OF THERMOSETTING PHENOLIC RESIN AND PROCESS FOR PRODUCING THE SAME

Yoshiaki Echigo, Kyoto; Kenichi Sugawara, Nara; Mutsunori Yamao, Kyoto; Yoshiyuki Suematu, Kyoto; Keiichi Asami, Kyoto, and Tuneyuki Ohsawa, Kyoto, all of Japan, assignors to Unitika, Ltd., Hyogo, Japan

Continuation of Ser. No. 907,254, Sep. 15, 1986. This application Jan. 6, 1988, Ser. No. 141,167

Claims priority, application Japan, Sep. 17, 1985, 60-206103

Int. Cl.[4] C08G 8/28

U.S. Cl. 525—503 **20 Claims**

1. A process for producing spherical thermosetting phenolic resin particles with a size of no larger than about 1,000 microns which comprises reacting a novolak resin with a nitrogenous basic compound at a temperature sufficient to produce said phenolic resin particles for a period of time sufficient to produce said phenolic resin particles while they are suspended in an aqueous medium in the presence of a suspension stabilizer.

4,839,446

THERMOSETTING BIS OXAZOLINE-POLYPHENOL BASED RESINS FOR RESIN TRANSFER MOLDING WHICH CONTAIN A MONOOXAZINE OR MONOOXAZOLINE DILUENT

Billy M. Culbertson, Worthington, and Omar Tiba, Dublin, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Aug. 8, 1988, Ser. No. 229,289

Int. Cl.[4] C08G 65/40, 69/44, 69/40

U.S. Cl. 525—504 **10 Claims**

1. A polymerizable composition which is a flowable liquid at temperatures in the range of from about 100° C. to about 125° C. comprising a mixture of:
(A) from about 75% to about 95% by weight of a mixture of:
(1) from about 80% to about 20% by weight of a bisoxazoline and
(2) from about 20% to about 80% by weight of a polyphenolic compound and
(B) from about 5% to about 25% by weight of at least one member selected from the group consisting of a monooxazoline and a monooxazine.

4,839,447

POLYMERIZATION OF CHLOROPRENE

Rudolf Casper; Peter Wendling, both of Leverkusen, Fed. Rep. of Germany; Wolfgang Konter, Houston, Tex., and Gerhard Hohmann, Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 141,273, Jan. 6, 1988, which is a continuation of Ser. No. 12,182, Feb. 9, 1987, abandoned. This application Jul. 22, 1988, Ser. No. 223,092

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1986, 3605332; European Pat. Off., Feb. 12, 1987, 87101978; Japan, Feb. 19, 1987, 62-34697

Int. Cl.[4] C08F 2/24

U.S. Cl. 526—225 **11 Claims**

1. Process for the preparation of chloroprene polymers by aqueous emulsion polymerization of phenothiazine compound-stabilized chloroprene or a mixture of chloroprene and up to 20% by weight of one or more monomers which can be copolymerized with chloroprene, using a polymerization initiator comprising a mixture of:
(a) a reducing agent selected from the group consisting of
(i) sodium dithionite,
(ii) formamidine sulphinic acid, and
(iii) a mixture from (i) and (ii),

(b) potassium peroxidisulphate as an oxidizing agent and, optionally,

(2) sodium anthraquinone-β-sulphonate as a co-activator

in the presence of oxygen, which is characterized in that from 10 to 90% by weight of the initiator are present at the commencement of polymerization and the remainder is added during the polymerization, and as from 1 to 20% below the desired final degree of conversion the reducing agent is the only component of redox system (1) which remains to be added, this finally added portion of reducing agent being from 5 to 40% of the total amount of reducing agent (a).

4,839,448

SOLUBLE ACRYLATE COPOLYMER CONTAINING CARBOXYL GROUPS, PROCESSES FOR ITS PREPARATION AND COATING AGENTS BASED ON THE ACRYLATE COPOLYMER

Werner Jung, Ascheberg, and Axel Sievers, Munster, both of Fed. Rep. of Germany, assignors to BASF Lacke & Farben Akt, Munster, Fed. Rep. of Germany

PCT No. PCT/EP86/00488, § 371 Date May 29, 1987, § 102(e) Date May 29, 1987, PCT Pub. No. WO87/02041, PCT Pub. Date Apr. 9, 1987

PCT Filed Aug. 20, 1986, Ser. No. 60,243

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1985, 3534858

Int. Cl.⁴ C08F *22/40, 3/02*

U.S. Cl. 526—262 **34 Claims**

1. A soluble acrylate copolymer of monomer a1 with at least two polymerizable, olefinically unsaturated double bonds, monomer a2 carrying at least one function group selected from the group consisting of carboxylic acids, carboxylic esters, tertiary amines, carboxylic anhydrides, glycidyl esters and glycidyl ethers and other polymerizable monomers with an olefinically unsaturated double bond, wherein more than 5 to 30% by weight, based on the total weight of the monomers, of monomer a1 is copolymerized into the acrylate copolymer, the acrylate copolymer contains carboxyl groups and its acid number is 15 to 200.

4,839,449

POLYSACCHARIDES CONTAINING AROMATIC ALDEHYDES AND THEIR DERIVATIZATION VIA AMINE-ALDEHYDE INTERACTIONS

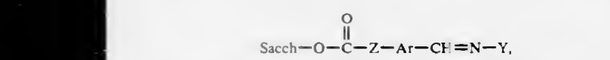
Robert L. Billmers, Stockton; David M. Del Giudice, Somerset; Martin M. Tessler, Edison, and Michael J. Hasuly, South Plainfield, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Oct. 26, 1987, Ser. No. 112,634

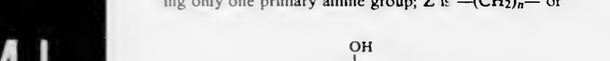
Int. Cl.⁴ C08F *89/00*; C08L *1/08*; D02G *3/02*

U.S. Cl. 526—238.2 **24 Claims**

1. A polysaccharide derivative having the structure Sacch—O—Z—Ar—CH=N—Y or



where Sacch—O— represents a polysaccharide molecule; Y is a monovalent group derived from a water-soluble substituted or unsubstituted alipatic or cycloaliphatic compound containing only one primary amine group; Z is $-(CH_2)_n-$ or



Ar is a divalent aromatic group; n is one or greater; and m is zero or greater.

4,839,450

MOISTURE-SHRINKABLE FILMS FROM STARCH GRAFT COPOLYMERS

George F. Fanta, and Felix H. Otey, both of Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 17, 1987, Ser. No. 123,411

Int. Cl.⁴ C08L *1/14, 3/16*

U.S. Cl. 527—313 **17 Claims**

1. A moisture-shrinkable, film-forming composition comprising: (1) a graft copolymer of a hot water-soluble modified starchy material and a synthetic monomer, wherein said monomer is characterized as yielding upon polymerization a polymer having a glass transition temperature of less than about 35° C.; and (2) a plasticizer.

4,839,451

PROCESSES FOR THE PREPARATION OF POLYSILYLENES

Santokh S. Badesha, Pittsford; Milan Stolka, Fairport; Kathleen M. McGrane, Rochester, and Ronald J. Weagley, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 4, 1988, Ser. No. 177,213

Int. Cl.⁴ C08G *77/00*

U.S. Cl. 528—10 **16 Claims**

1. A process for the preparation of high weight average molecular weight polysilylenes which comprises (1) simultaneously adding an alkali metal and a monomer selected from the group consisting of dihalodialkyl silane monomers, dihalodiaryl silane monomers, and dihaloarylalkyl silane monomers to an inert solvent; (2) heating the aforementioned mixture, followed by cooling; and (3) subsequently separating the product therefrom.

4,839,452

POLYORGANOSILOXANE COMPOSITION

Atsushi Kurita; Yasuji Matsumoto, both of Ohta, and Sam Huy, Minato, all of Japan, assignors to Toshiba Silicone Co., Ltd., Japan

Filed Jun. 28, 1988, Ser. No. 212,464

Claims priority, application Japan, Jul. 3, 1987, 62-165516

Int. Cl.⁴ C08G *77/06*

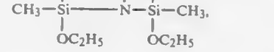
U.S. Cl. 528—15 **5 Claims**

1. A polyorganosiloxane comosition comprising:

(A) An alkenyl group-contaiing polyorganosiloxane containing structural units represented by the following general formula:

in which R^1 represents an alkenyl group; R^2 represents a substituted or unsubstituted monovalent hydrocarbon group containing no unsaturated fatty bonds; "a" represents an integer of from 1 to 3; "b" represents an integer of from 0 to 2; and (a+b) is an integer of from 1 to 3;

(B) A polyorganohydrogensiloxane containing structural units represented by the following general formula:



in which R^3 represents a substituted or unsubstituted monovalent hydrocarbon group; "c" represents an integer of form 0 to 2; "d" represents an integer of from 1 to 3 and (c+d) is an integer of from 1 to 3;

(C) A catalyst selected from the group consisting of platinum and a platinum compound; and

(D) One or more compounds selected from the group consisting of (i) a silane compound represented by the following general formula;

in which R^4 represents a member selected from the group consisting of a hydrogen atom and a subsituted or unsubstituted monovalent hydrocarbon group; R^5 represents a substituted or unsubstituted monovalent hydrocarbon group containing a —C≡C— bond; "n" represents an integer of from 1 to 3; and at least one member selected from the group consisting of Si—H, Si—CH=CH_2 and Si—C≡CH bonds is contained in the molecule and (ii) an organosilane compound obtainable by subjecting the above silane compound to addition reaction between Si—H and —C≡C— bonds contained therein.

4,839,453

NOVEL SCAVENGERS FOR ONE-COMPONENT RTV COMPOSITIONS

Rack H. Chung, Clifton Park; Roger T. Swiger, Schenectady, both of N.Y., and Melvin D. Beers, Hudson, Ohio, assignors to General Electric Company, Waterford, N.Y.

Division of Ser. No. 912,641, Sep. 25, 1986, Pat. No. 4,720,531, Continuation of Ser. No. 428,038, Sep. 29, 1982, abandoned. This application Oct. 21, 1987, Ser. No. 113,411

The portion of the term of this patent subsequent to Jan. 19, 2005, has been disclaimed.

Int. Cl.⁴ C08G *77/06*

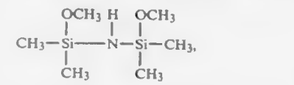
U.S. Cl. 528—18 **20 Claims**

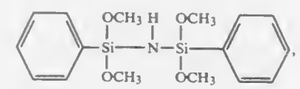
1. A stable, one-package, substantially anhydrous and substantially acid-free, room temperature vulcanizable organopolysiloxane composition stable under ambient conditions in the substantial absence of moisture over an extended period of time and convertible to a tack-free elastomer, comprising:

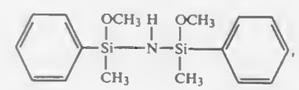
(A) an organopolysiloxane wherein the silicon atom at each polymer chain end is terminated with at least two alkoxy radicals;

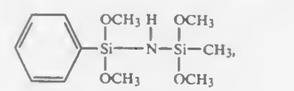
(B) an effective amount of condensation catalyst; and

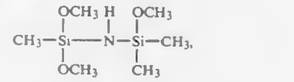
(C) a stabilizing amount of scavenger for hydroxy functional groups selected from the group consisting of:











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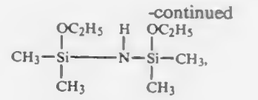
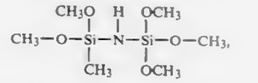
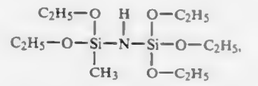
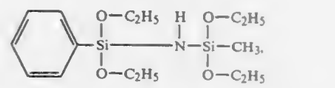
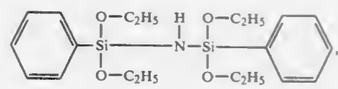
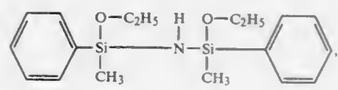


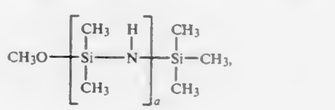








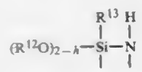




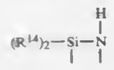
a = 1-5 and mixtures thereof

divinyltetramethoxydisilazane,
1-Methyl-3-ethyl-1,1,3,3-tetramethoxydisilazane,
1,3-Diethyl-1,1,3,3-tetramethoxydisilazane,
1-Methyl-3-propyl-1,1,3,3-tetramethoxydisilazane,
1-Ethyl-3-propyl-1,1,3,3-tetramethoxydisilazane,
1,3-Dipropyl-1,1,3,3-tetramethoxydisilazane,
1,1,3-Trimethyl-1,3,3-trimethoxydisilazane,
1,1-Dimethyl-3-ethyl-1,3,3-trimethoxydisilazane,
1,1-Dimethyl-3-propyl-1,3,3-trimethoxydisilazane,
1,1-Dimethyl-3-butyl-1,3,3-trimethoxydisilazane,
1,1-Diethyl-3-methyl-1,3,3-trimethoxydisilazane,
1,1-Dipropyl-3-methyl-1,3,3-trimethoxydisilazane,
1,1-Dibutyl-3-methyl-1,3,3-trimethoxydisilazane,
1,1,3-Trimethyl-1,3,3-trimethoxydisilazane,
1,1,3-Triethyl-1,3,3-trimethoxydisilazane,
1,1,3-Tripropyl-1,3,3-Trimethoxydisilazane,
1,1-Dimethyl-1,3,3,3-Tetramethoxydisilazane,
1,1-Diethyl-1,3,3,3-Tetramethoxydisilazane,
1,1-Dipropyl-1,3,3,3-Tetramethoxydisilazane,
1,3-Dimethyl-1-ethoxyl -1,3,3-trimethoxydisilazane,
1,3-Diethyl-1-ethoxy-1,3,3-trimethoxydisilazane,

and cyclic silazane scavengers having at least one or all of the units of the formula:



and the rest of the units, if any, having the formula:



where h is 0 or 1, R^{12} is a C_{1-8} aliphatic organic radical selected from the group consisting of alkyl, alkylether, alkylester, alkylketone, alkyl cyano, and aryl, and R^{13} and R^{14} is a C_{1-8} monovalent substituted or unsubstituted hydrocarbon radical.

4,839,454

TITANATE/ORGANOSILANE COMPOSITIONS

Chia-Cheng Lin, Gibsonia, and Thomas G. Rukavina, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 910,050, Sep. 22, 1986, Pat. No. 4,741,931, Division of Ser. No. 812,666, Dec. 23, 1985, Pat. No. 4,743,503. This application Feb. 8, 1988, Ser. No. 153,633

Int. Cl.[4] C08G 77/12

U.S. Cl. 528—32 **4 Claims**

1. A composition comprising a titanate/organosilane copolymer which is essentially a reaction product of an organic titanium compound and an organoalkoxysilane.

4,839,455

ONE PART MOISTURE CURABLE URETHANE COMPOSITION

James J. Fong, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 28, 1987, Ser. No. 90,859

Int. Cl.[4] C08G 77/00

U.S. Cl. 528—28 **6 Claims**

1. One-part moisture-curable polyurethane composition, consisting essentially of triisocyanate prepolymer, an amount of an epoxy silane compund effective to crosslink said prepolymer and sufficient compatible liquid vehicle to make the composition suitable for application, said epoxy silane compund being sufficiently free of active hydrogen-containing functional groups to avoid premature gelation of the prepolymer when combined therewith.

4,839,456

SELF-ADHESIVE, DRAG REDUCING POLYMERIC COATING

Keith Kent, 12515 Sugar Pine Way, Tampa, Fla. 33624

Continuation-in-part of Ser. No. 512,872, Jul. 12, 1983, Pat. No. 4,623,593. This application Oct. 4, 1985, Ser. No. 784,218

Int. Cl.[4] C08G 77/04

U.S. Cl. 528—33 **9 Claims**

1. A method for producing a drag reducing polymeric composition comprising the steps of:

mixing a silicone polymer with a catalyst, the quantity of catalyst being sufficient to polymerize essentially all of said silicone polymer;

immediately adding a cross-linking inhibitor which is an inhibitor for said silicone polymer and inhibits the resulting silicone polymer mixture and permanently arrests polymerization; and

polymerizing the resulting inhibited silicone polymer mixture to form a drag reducing polymeric composition, the consistency of the resulting drag reducing polymeric composition is in the range of a wax-like substance to a running liquid even when the resulting polymeric composition is subjected to a temperature of 100° C. for twenty minutes.

4,839,457

DEVELOPING COMPOSITION AND A SHEET FOR PRESSURE-SENSITIVE COPY PAPER

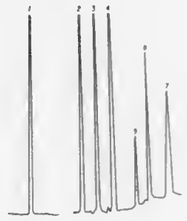
Kazuhide Hayama, and Yukio Saitoh, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1988, Ser. No. 170,344

Claims priority, application Japan, Mar. 20, 1987, 62-63998; Jul. 17, 1987, 62-178592

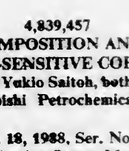
Int. Cl.[4] C08G 8/04, 14/04

U.S. Cl. 528—86 **7 Claims**



1. A developing composition for a pressure-sensitive copy paper comprising a phenolic resin which is obtained by condensating with formaldehyde using 100 parts by weight of a p-substituted phenol expressed by the following formula:

(wherein R^1 denotes an alkyl group having 1 to 12 carbon atoms, an aryl group having 6 to 12 carbon atoms, or an aralkyl group having 7 to 12 carbon atoms) with 22 to 150 parts by weight of a 2,4-di-substituted phenol expressed by the following formula:



(wherein R^2 and R^3 each denote an alkyl group having 1 to 12 carbon atoms, an aryl group having 6 to 12 carbon atoms, or an aralkyl group having 7 to 12 carbon atoms, and which may be the same or different from each other) and/or 2,6-di-substituted phenol expressed by the following formula:

(wherein R^4 and R^5 each denotes an alkyl group having 1 to 12

carbon atoms, an aryl group having 6 to 12 carbon atoms, or an aralkyl group having 7 to 12 carbon atoms, and which may be the same or different from each other).

4,839,458

PREPARATION WITH CONTROLLED AMOUNTS OF POLYCARBONATE CARBON TETRACHLORIDE

Shinichiro Koga, Nohgata; Akira Matsuno, Kitakyushu; Katsuyuki Sakata; Yoshiaki Ohtani, both of Nakama, and Isao Akihara, Kitakyushu, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Jun. 17, 1987, Ser. No. 63,001

Claims priority, application Japan, Jun. 18, 1986, 61-142164; Jun. 18, 1986, 61-142165; Oct. 3, 1986, 61-235829

Int. Cl.[4] C08G 63/62

U.S. Cl. 528—196 **10 Claims**

1. A process for producing a resin having carbonate bonding, comprising polymerizing a dihydroxydiaryl compound and phosgene containing carbon tetrachloride in an organic solvent of methylene chloride such that the concentration of carbon tetrachloride in the phosgene and methylene chloride satisfies the following equation:

$$A+5B\leqq 200$$

wherein A represents the ppm carbon tetrachloride concentration in the phosgene and B represents the ppm carbon tetrachloride concentration in the methylene chloride.

4,839,459

PROCESS FOR THE PREPARATION OF POLY(ETHER-KETONE) POLYMERS

W. Ronald Darnell, Weber City, Va., and Winston J. Jackson, Jr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 27, 1988, Ser. No. 211,733

Int. Cl.[4] C08G 65/00

U.S. Cl. 528—220 **11 Claims**

1. Process for the preparation of a poly(ether-ketone) containing at least 50 mole percent of monomer segments derived from an aromatic dicarboxylic acid and a bis(4-phenoxybenzoyl)hydrocarbon, which comprises reacting at a temperature of about 0° to 150° C. until the desired degree of polymerization is achieved an aromatic dicarboxylic acid and a bis(4-phenoxybenzoyl)hydrocarbon in the presence of a perfluoroalkanesulfonic acid in an amount which is at least three times the theoretical amount of poly(ether-ketone) product and (1) an oxide of phosphorus and/or (2) a perhaloalkanoic anhydride in an amount of at least a total of two gram-moles of —P—O—P— unit and/or gram-moles of perhaloalkanoic anhydride per gram-mole of dicarboxylic acid reactant.

4,839,460

NOVEL POLYMERS FROM AMINATED POLYETHERS AND FORMALDEHYDE

David C. Molzahn, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 25, 1988, Ser. No. 160,468

Int. Cl.[4] C08G 14/02

U.S. Cl. 528—230 **23 Claims**

1. A process for preparing polymers, comprising reacting a primary polyether polyamine of the formula

$$A(E_pNH_2)_m$$

wherein A is the residue of a polyether initiator having m initiator groups, E is an ether moiety from an oxirane compound, p is 5–90 and m is 2–8, with an aqueous solution of monomeric formaldehyde or with paraformaldehyde in the absence of a diluent.

4,839,461

POLYASPARTIC ACID FROM MALEIC ACID AND AMMONIA

Günther Boehmke, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 3, 1987, Ser. No. 80,844

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1986, 3626672

Int. Cl.[4] C08G 69/00

U.S. Cl. 528—363 **2 Claims**

1. A process for the preparation of a salt of polyaspartic acid comprising reacting maleic acid and ammonia in a molar ratio of 1:1–1.5 at 120°–140° C., and converting the resultant acid into a salt by adding a metal hydroxide or ammonium hydroxide to the acid.

4,839,462

CYCLIC POLYCARBONATE OLIGOMERS: INHIBITION OF POLYMERIZATION TO LINEAR POLYCARBONATES

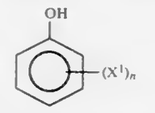
Thomas L. Evans, Clifton Park, and Carol B. Berman, Hartsdale, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 14, 1987, Ser. No. 85,496

Int. Cl.[4] C08G 63/62

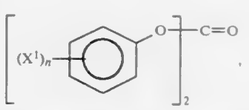
U.S. Cl. 528—370 **20 Claims**

1. A composition at least one cyclic polycarbonate oligomer and about 0.005–5.0 mole percent, based on structural units in said oligomer, of a substituted phenol of the formula



(1)

or a substituted phenyl carbonate of the formula



wherein X^1 is a monovalent electron-withdrawing substituent and n is at least 1.

4,839,463

ULTRA FINE POLYMER PARTICLE AND COMPOSITE MATERIAL OF PREPARATION FOR METHODS

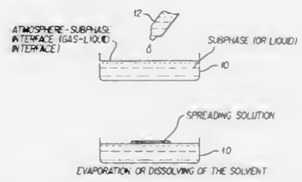
Jiro Kumaki, Tokyo, Japan, assignor to Research Development Corporation of Japan, Japan

Filed Mar. 19, 1986, Ser. No. 841,189

Claims priority, application Japan, Apr. 1, 1985, 60-66556

Int. Cl.[4] C08J 3/14

U.S. Cl. 528—499 **9 Claims**



1. A method for preparing a cumulatable ultrafine polymer

particle consisting of one molecular chain of the polymer, which comprises the steps:

dropping a dilute solution of the polymer on the surface of a subphase which has a weak affinity for the polymer to spread the solution on the subphase, and

evaporating the spreading solvent or dissolving the solvent into the subphase,

the dilute solution of the polymer having a concentration of not more than c* represented by the formula:

$$C^* = 3M/(4\pi N_A \langle S^2 \rangle^{3/2}$$

where C* is the concentration, M is the molecular weight of the polymer, π is the ratio of the circumference of a circle to its diameter, N_A is the Avogadro number, and S^2 is the square mean of the radius of gyration of the polymer chain.

4,839,464

POLYPEPTIDES WITH FIBRONECTIN ACTIVITY

James B. McCarthy, and Leo T. Furcht, both of Minneapolis, Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Aug. 25, 1987, Ser. No. 89,073
Int. Cl.[4] C07K 7/08
U.S. Cl. 530—326 **3 Claims**

1. A polypeptide of the formula:

tyr-glu-lys-pro-gly-ser-pro-pro-arg-glu-val-val-pro-arg-pro-arg-pro-gly-val,

lys-asn-asn-gln-lys-ser-glu-pro-leu-ile-gly-arg-lys-lys-thr-asp-glu-leu, or mixtures thereof.

4,839,465

D1-(D-TRYPTOPHYL AND/OR TETRAHYDROPYRIDOINDOLYLCARBONYL)-CONTAINING PEPTIDE AMIDES AND PROCESS FOR PREPARATION THEREOF

Jasbir Singh, and Barry A. Morgan, both of Albany, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Jan. 20, 1987, Ser. No. 5,495
Int. Cl.[4] C07K 7/06
U.S. Cl. 530—330 **18 Claims**

1. The peptide amide having the structural formula

$$H—X_1—X_2—X_3—X_4—X_5—X_6—NH_2$$

wherein

X_1 is a direct linkage or Pro;

X_2 is trp, Tpi, or tpi;

X_3 is Phe, Bpa or bpa;

X_4 is trp or tpi;

X_5 is Leu or a direct linkage; and

X_6 is Phe or a direct linkage; or a pharmaceutically acceptable acid addition salt or solvate or acid addition salt-solvate thereof.

4,839,466

INSULIN ACTIVITY MESSENGERS

Alan R. Saltiel, Irvington, N.Y., assignor to The Rockefeller University, New York, N.Y.

Continuation-in-part of Ser. No. 850,942, Apr. 11, 1986. This application Apr. 7, 1987, Ser. No. 33,075
Int. Cl.[4] C07K 15/00
U.S. Cl. 530—395 **5 Claims**

1. A insulin activity messenger material comprising at least one carbohydrate-based compound capable of modulating the activity of the enzymes pyruvate dehydrogenase, adenylate cyclase, acetyl CoA carboxylase, and low Km cAMP phosphodiesterase from fat cells, and thereby effectuating the activity of insulin on the cellular level.

4,839,467

RADIOACTIVE RHENIUM COMPLEXED TO 2-HYDROXY ISOBUTYRIC ACID

Edward A. Deutsch, Cincinnati, Ohio, assignor to University of Cincinnati, Cincinnati, Ohio

Filed Jun. 15, 1988, Ser. No. 206,880
Int. Cl.[4] C07F 13/00; C01G 47/00
U.S. Cl. 534—10 **6 Claims**

1. Rhenium selected from the group consisting of rhenium-186 and rhenium-188 complexed to 2-hydroxy isobutyric acid.

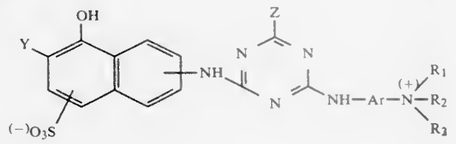
4,839,468

N-(HYDROXY-SULPHO-NAPHTHYAMINO-TRIAZINYL)-ARYLENE-DIAMINES

Horst Nickel, Leverkusen; Peter Wild, Alten Buseck, and Frank-Michael Stöhr, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 607,332, May 4, 1984, abandoned, which is a continuation-in-part of Ser. No. 360,288, Mar. 22, 1982, abandoned. This application Nov. 13, 1984, Ser. No. 670,683
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1981, 3114087
Int. Cl.[4] C09B 44/00, 44/08, 62/00; D06P 1/41
U.S. Cl. 534—604 **16 Claims**

1. A triazine compound which in its betaine form corresponds to the formula

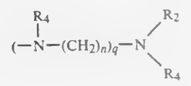


in which

Y is hydrogen or the radical of an azo dyestuff,

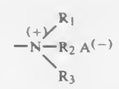
Ar is phenylene or phenylene substituted by halogen, C_1–C_4-alkyl or C_1–C_4-alkoxy,

Z is



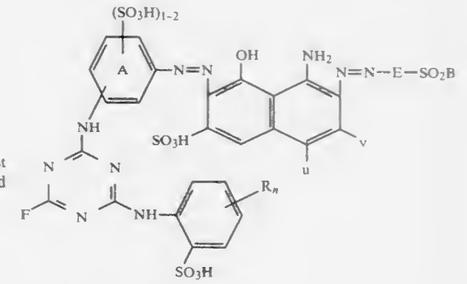
R_1, R_2 and R_3 are hydrogen, C_1- to C_4-alkyl or benzyl any of which is unsubstituted or substituted by hydroxyl, C_1- to C_4-alkoxy, halogen or cyano, or benzyl also substituted by C_1–C_4-alkyl,

R_4 is R_3 or phenyl which is unsubstituted or substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or



$A^{(-)}$ is an anion,

n is 2 or 3 and q is 0, 1 or 2, and the molecule contains at least one basic or cationic group more than sulfonic acid groups.



4,839,469

REACTIVE DISAZO DYESTUFFS HAVING A FLUOROCONTAINING REACTIVE GROUP AND A SULPHATOETHYLSULPHONE SUBSTITUENT

Horst Jäger, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 847,072, Apr. 1, 1986, abandoned. This application Nov. 13, 1987, Ser. No. 120,292
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1985, 3513261
Int. Cl.[4] C09B 62/03, 62/09, 62/513; D06P 1/382
U.S. Cl. 534—637 **2 Claims**

1. A reactive dyestuff of the formula

wherein

B=CH=CH_2 or $CH_2CH_2OSO_3H$,

u and v=H or SO_3H, with u≠v,

R=Cl, Br, C_1–C_4-alkyl, C_1–C_4-alkoxy, COOH, SO_3H, $NHCOCH_3$, $SO_2CH_2CH_2OSO_3H$

n=0, 1 or 2

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4,839,470

UNDERWATER (SUBMERSIBLE) JOINT OR SPLICE

Robert M. Ventura, 127 New Providence Rd., Mountainside, N.J. 07092

Filed Dec. 21, 1987, Ser. No. 135,979
Int. Cl.[4] H01R *4/20, 43/04;* **H02G** *15/08*
U.S. Cl. 174—84 R **4 Claims**

1. A splice for a submersible electrical cable the ends of which are stripped of insulation, which comprises in combination:

a tubular housing having bores which are interposed from each of its ends and extend inwardly along the axis of said housing to an internal chamber centered between said bores, and coaxial with and connected at each of its ends to said bores, the material of said tubular housing comprising an elastomer having a percent resilience of at least 70 as measured by the Yerzley method (ASTM 945);

a metal crimping connector of general hollow cylindrical shape constructed whereby in a pair of cables each having a stripped end, the connector secures the stripped ends of said cables in crimped relation prior to being imposed in said housing;

said internal chamber constructed to accommodate and relase internally said crimping connector including said stripped ends when the same has been pulled into place and seated snugly in said housing chamber;

means comprising a lubricant interposed into said tubular housing, and filling the interstices between said cable ends and the bores and internal chamber of said housing;

wherein the inner diameter of said bores is slightly less than the diameter of the cable to be accommodated in said splice; and

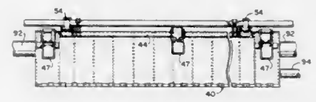
wherein the inner diameter of said chamber is slightly less than the external diameter of said crimping connector.

4,839,471

SEALS

Gordon P. Clark, Beaconsfield; Zbigniew T. Karwowski, Dollard des Ormeaux, and Henry Tebinka, Ile Bizard, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 18, 1988, Ser. No. 156,878
Int. Cl.[4] H02G *15/113*
U.S. Cl. 174—92 **14 Claims**



13. A splice closure for telecommunications cable comprising:

a closure having two housing portions which are closable together circumferentially of the closure; and

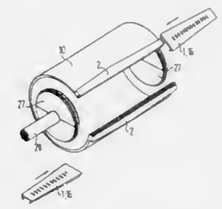
two seals which are axially spaced-apart along the closure, each seal comprising two elastomeric sealing members carried one by each housing portion, each sealing member of unitary construction having a maximum Shore hardness of 15 and side surfaces each of which defines a recess, the side surface abutting together in the closed together condition of the housing portions to join the recesses together to define a substantially cylindrical cavity for location therethrough of a substantially cylindrical article, each sealing member having a sealing rib extending around and projecting into its said recess, the ribs lying end-to-end in the closed together condition of the housing portions effectively to provide an annular rib projecting into the defined cavity, and each sealing member being provided with a base for its sealing rib, the base supported by the inner surface of the associated housing portion, and a rib stiffening element which is spaced axially of the base, is radially resiliently movable relative to the base and to its said recess and, in a normal unstressed condition, defines a space between the rib stiffening element and said inner surface, the sealing rib lying radially within and axially ridging from the base to the rib stiffening element, radial outward deflection of the rib effecting radial outward movement of the rib stiffening element towards said inner surface.

4,839,472

CLOSURE SYSTEM FOR A LONGITUDINALLY DIVIDED CABLE SLEEVE

Klaus Pichler, Otterfing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 17, 1988, Ser. No. 194,957
Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3717980
Int. Cl.[4] H02G *15/113*
U.S. Cl. 174—92 **20 Claims**



1. In a closure system for a longitudinally divided cable sleeve of a plastic material having two undercut beads expanded wedge-shaped along a parting line of the sleeve, said closure system being composed of two undercut beads and a wedge-shaped clamp rail engaging behind said beads and having draw-on means for aiding in a forcing of the clamp rail onto and off of the beads, the improvements comprising means for preventing longitudinal shifting of the beads relative to each other and the draw-on means being formed by a separate plate having supporting elements being spaced therein along a direction of the parting line of the cable sleeve in a relatively fixed position and abutment openings being arranged in the clamp rail corresponding to the supporting elements, said means for preventing longitudinal shifting of the beads including said plate having a pair of spaced recesses for receiving projections provided on the two beads to fix the plate in a fixed position relative to the beads and the clamp rail having guides for engaging the plate as the clamp rail move toward a closed position, said supporting elements and abutment openings being offset relative to one another in the longitudinal direction of the cable sleeve and being matched so that for every longitudinal position of the clamp rail on siad beads, at least one abutment opening is accessible through at least one supporting element to be engaged by a leverage tool intorduced through the one supporting element to displace the clamp rail along said beads.

12. In a closure system for a longitudinally divided cable sleeve of a plastic material having two undercut beads expanded wedge-shaped along a parting line of the sleeve, said closure system being composed of two undercut beads and two

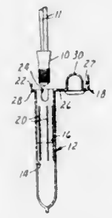
wedge-shaped clamp rails engaging behind said beads and having draw-on means for aiding in a forcing of the clamp rails onto and off of the beads, the improvements comprising means for preventing longitudianl shifting of the beads relative to each other and the draw-on means being formed by supporting elements being arranged on the beads and being spaced along the parting line of the cable sleeve in a relatively fixed position and abutment openings being arranged in each of the clamp rails corresponding to the supporting elements said supporting elements and abutment openings being offset relative to one another in the longitudinal direciton of the cable sleeve and being matched so that for every respective longitudinal position of each rail on said beads, at least one supporting element will be accessible through at least one abutment opening to be engaged by a leverage tool introdnced through the one abutment opening to displace each clamp rail along the beads.

4,839,473

WATERPROOF ELECTRICAL SPLICE ENCLOSURE

Albert H. Fox, and Ronald C. Johansson, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 23, 1986, Ser. No. 910,480
Int. Cl.[4] H01R *4/22*
U.S. Cl. 174—138 F **4 Claims**



1. A waterproof electrical splice enclosure for receiving an electrical connector connecting the ends of a plurality of insulated electrical conductors extending out of the connector in the same direction and parallel to one another and having a specified length parallel to the insulated electrical conductors and specified cross-sectional dimensions in a plane perpendicular to the insulated electrical conductors, said splice enclosure, comprising:

an elongate hollow tube having one open end and one closed end, the cross-sectional dimensions of the hollow space within said tube in a plane perpendicular to its length being slightly greater than the specified cross-sectional dimensions of the electrical connector in a plane perpendicular to the length of the insulated electrical conductors extending out of the connector, said open end of said tube being formed with a broadened entrance area having at least one insulated conductor receiving channel leading into said open end of said tube,

means for retaining the electrical connector at a connector retention position adjacent said closed end of said tube with the insulated electrical conductors extending from the connector out of said open end of said tube,

a waterproofing fluid within said tube, said waterproofing fluid under normal conditions of use having a sufficient viscosity so that it will not flow out of said tube but being capable of flowing around the connector as it is slid into said tube to said connector retention position adjacent said closed end of said tube to fill the space around the connector and around and between the insulated conductors extending out of the connector to provide a waterproof seal around the connector and the connector ends of the insulated conductors,

the length of said hollow space within said elongate hollow tube being sufficiently greater than the specified length of the electrical connector to provide a confined space sufficiently long to force said waterproofing fluid to flow around the connector and around and between the insulated conductors as the connector is slid into said tube to said connector retention position, and

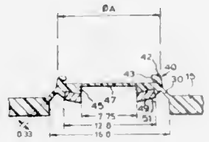
a cap for closing said open end of said tube after the connector and the connected ends of the insulated electrical conductors have been inserted into said tube and retained adjacent said closed end of said tube, said cap being formed on one surface with a bulbous protrusion to fit into said open end of said tube, said bulbous protrusion being deformable by any insulated conductors in said insulated conductor receiving channel.

4,839,474

SWITCHES AND KEYBOARDS

Richard P. Hayes-Pankhurst, and Brian D. Smith, both of London, United Kingdom, assignors to Key Innovations Limited, London, United Kingdom

Continuation-in-part of Ser. No. 897, Jan. 6, 1987, abandoned, which is a continuation-in-part of Ser. No. 783,927, Sep. 26, 1985, Pat. No. 4,634,818. This application Dec. 10, 1987, Ser. No. 131,630
Claims priority, application United Kingdom, Feb. 3, 1984, 8402974
The portion of the term of this patent subsequent to Jan. 6, 2004, has been disclaimed.
Int. Cl.[4] H01H *13/70*
U.S. Cl. 200—5 A **30 Claims**



23. A two-component switch comprising a keymat arranged as a cover on a substrate or board having electrically conductive contact areas or surfaces thereon, and wherein the keymat comprises a membrane of resiliently deformable material having at least one integrally formed dome key whose top surface constitutes a touch button joined to the membrane by a frusto-conical wall, and whose bottom surface has an electrically conductive contact area or surface thereon for contacting the underlying conductive surface on the substrate, thus defining an electrical switch, and wherein:

(a) the membrane and at least the periphery of the touch button are relatively thick and the wall is relatively thin so that deformation during the keystroke is localized in the wall;

(b) the length of the wall is approximately equal to the keystroke; and

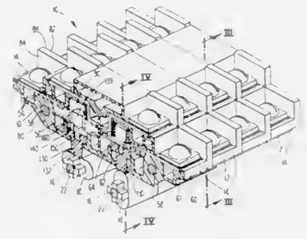
(c) the junction between the wall and the membrane is located at a distance less than the keystroke below the junction between the wall and the touch button so that on depression of the touch button the wall deflects from its initial upstanding attitude through a dead-center condition and then suddenly collapses to provide a tactile feedback.

4,839,475

MODULAR SWITCH ASSEMBLY HAVING WIPING CONTACTS

Ivan E. Wilkinson, Lynchburg, and Robert W. Auxier, Forest, both of Va., assignors to Limitorque Corporation, Lynchburg, Va.

Filed Apr. 29, 1988, Ser. No. 188,357
Int. Cl.[4] H01H *1/18*
U.S. Cl. 200—5 R **8 Claims**



1. In switch unit comprising:

a housing including a central cavity and an upper cavity;

a movable contact plate member having a plurality of contacts, the movable contact plate member being mounted for movement in the central cavity of the housing between a fully open position and a closed position;

a plurality of stationary contact members, each of the stationary contact members being provided with a stationary contact disposed opposite a corresponding predetermined contact of the movable contact plate member, stationary contacts abutting the corresponding predetermined movable contacts when the contact plate member is in the closed position;

a plunger member mounted in the housing for reciprocating motion in a line between a first position and a second position;

first resilient biasing means extending between the movable contact plate member and the reciprocating plunger member for biasing the contact plate member toward the stationary contacts;

second resilient biasing means positioned in the upper cavity of the housing having a first and a second predetermined range of lengthwise extension, extending between the housing and the movable contact plate member for biasing the movable contact plate member away from the stationary contacts in the first predetermined range, and extending between the housing and the plunger member for biasing the plunger member away from the movable contact plate member in the second predetermined range;

the movable contact plate member being mounted between the first and second biasing means such that as the plunger member moves between the first position and the second position the movable contact plate member is displaced from the fully open position in a first predetermined direction toward and into contact with the stationary contacts and as the plunger member moves between the second position and the first position the movable contact plate member moves from the fully closed position in a second predetermined direction generally opposite the first predetermined direction away from and out of contact with the stationary contacts;

the improvement comprising:

the movable contact plate member having an inner camming edge; and a camming aperture having an inner camming edge;

the reciprocating plunger member including a camming means having a camming surface, the plunger member camming surface being adapted to engage the inner camming edge of the aperture of the movable contact plate member as the plunger member is displaced in the first predetermined direction and to displace the movable contact plate member in a first transverse direction generally perpendicular to the line of plunger member motion from an initial closed position to the fully closed position; and

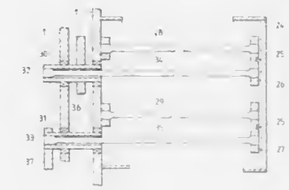
the central cavity including a camming surface for engaging the outer camming edge of the movable contact plate member as the movable contact plate member is displaced in the second predetermined direction, the camming surface being adapted to displace the contact plate member in a second transverse direction generally perpendicular to the line of plunger member motion and generally opposite the first transverse direction to return the movable contact plate member to the fully open position when the plunger member is again in the first position.

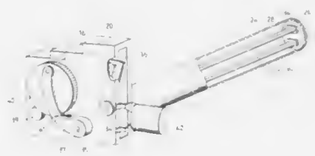
4,839,476

SWITCH OPERATING MECHANISM

Michiharu Okuno, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jun. 3, 1988, Ser. No. 201,720
Claims priority, application Japan, Jun. 4, 1987, 62-140201
Int. Cl.[4] H01H *3/00, 5/00*
U.S. Cl. 200—17 R **2 Claims**





1. A switch operating mechanism for operating a movable contactor (22) of a circuit breaker, said mechanism comprising:

a stationary housing (1);

a link means (23, 36) connected to said movable contactor (22);

a circuit breaking spring means for opening said movable contactor (22) including a first torsion bar (28) and a second torsion bar (34), said first torsion bar (28) having a first end which is fixedly secured to a first rotatable member (26), and a second end which is fixedly secured to said stationary housing (1), said second torsion bar (34) having a third end which is fixedly secured to said first rotatable member (26) in such a manner that said third end is disposed diametrically opposite to said first end of said first torsion bar (28), and a fourth end which is rotatably supported by said stationary housing (1) and coupled to said link means (23, 36).

4,839,477

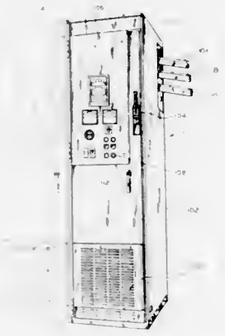
CONTROLLER HAVING INTERCHANGEABLE VACUUM OR AIR BREAK CONTACTORS AND HAVING EASILY SERVICED PARTS

Miklos J. Orosz; Dominick Tringali, both of Columbia; Donald B. Monson, Eastover, and Gerald J. Kuiper, Columbia, all of S.C., assignors to Square D Company, Palatine, Ill.

Continuation of Ser. No. 754,876, Jul. 12, 1985. This application Mar. 7, 1988, Ser. No. 168,563

Int. Cl.[4] H01H *9/20;* H02B *1/04*

U.S. Cl. 200—50 AA 12 Claims



1. A controller for electric current comprising:
an enclosure:
an isolation switch mounted within said enclosure:
a receptacle connected electrically downstream from said isolation switch, said receptacle being capable of accepting a contactor having plug in electric connectors, and
said contactor selected from the group consisting of
an air break contactor, and
a vacuum break contactor.

4,839,478

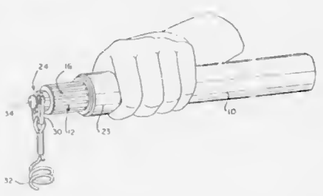
PUSH BUTTON SAFETY SWITCH

William A. Howard, Burton, Ohio, assignor to Delta Systems, Inc., Streetsboro, Ohio

Filed Feb. 19, 1988, Ser. No. 157,883

Int. Cl.[4] H01H *27/00*

U.S. Cl. 200—52 R 17 Claims



1. Apparatus for controlling the operation of a boat motor comprising:
(a) a housing;
(b) a movable plunger disposed in the housing having first and second contacts;
(c) a switch terminal in continuous sliding contact with the plunger, said switch terminal coupleable to a motor control circuit for de-activating the boat motor when the switch terminal contacts one of said first and second contacts;
(d) biasing means coupled to the plunger for urging the plunger toward a first position in which the switch terminal contact the first contact;
(e) an actuator coupled to the plunger for allowing a boat operator to move the plunger toward the second position; and
(f) a clip movably engageable with the actuator so that the clip counters the bias of the biasing means when engaged with the actuator.

4,839,479

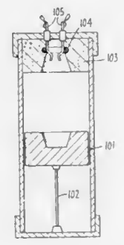
ARTICLE USING SHAPE-MEMORY ALLOY TO IMPROVE AND/OR CONTROL THE SPEED OF RECOVERY

Thomas O. Davis, Jr., 1950 Camino Redondo, Los Alamos, N. Mex. 87544

Division of Ser. No. 58,886, Jun. 17, 1987, Pat. No. 4,759,293, which is a continuation-in-part of Ser. No. 880,022, Jun. 20, 1986, Pat. No. 4,704,968. This application Jul. 18, 1988, Ser. No. 220,781

Int. Cl.[4] H01H *35/14, 37/16;* G01V *1/16*

U.S. Cl. 200—61.45 R 6 Claims



1. A shock-sensitive switch comprising:
an element of shape-memory alloy, said shape-memory alloy having a martensitic state and an austenitic state, said element being dimensionally deformed prior to exposure to shock while said shape-memory alloy is in its martensitic state, a change from its martensitic state to its austenitic state recovering said element upon exposure to shock to its non-deformed dimension due to the shape-memory effect exhibited by said alloy to alter the geometric shape of said element; and
indicating means in operative contact with said element, said indicating means being actuated by said element upon recovery of said element to its non-deformed dimension to signal such exposure to shock.

4,839,480

VEHICLE SENSING DEVICE

Alan Bickley, Gretna, Scotland, assignor to The Gates Rubber Company, Denver, Colo.

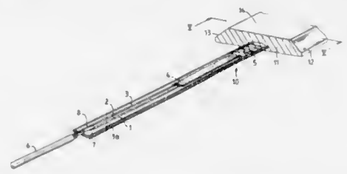
Filed Nov. 4, 1987, Ser. No. 117,280

Claims priority, application United Kingdom, Nov. 5, 1986, 8626395; Apr. 4, 1987, 8708106

Int. Cl.[4] H01H *3/16*

U.S. Cl. 200—86 A 15 Claims

1. A sensing device comprising an electrically insulating elongate carrier; two electrically conductors extending longitudinally of the carrier and spaced apart transversely of the carrier so that there is not direct contact between the conductors; a strip of elastomeric material overlying and in contact with both conductors in areas distributed along substantially the whole of their length, the strip being such that in the absence of a given level of applied pressure the strip formsd a barrier of high electrical resistance between the conductors, and that in the presence of applied pressure above the given level in any region of the strip, that region of the strip forms an electrically conductive path between the conductors; and a



jacket of water-resistant and abrasion-resistant elastomeric material, wholly encapsulating the carrier, conductors and strip.

4,839,481

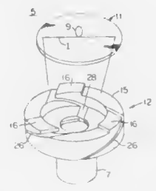
VACUUM INTERRUPTER

William H. Nash, South Milwaukee, and Ernest F. Bestel, Franklin, both of Wis., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Feb. 16, 1988, Ser. No. 156,251

Int. Cl.[4] H01H *33/66*

U.S. Cl. 200—144 B 6 Claims



1. A vacuum interrupter, comprising:
at least one pair of substantially disk-shaped main electrodes disposed in a vacuum vessel so as to be movable toward and away from each other, said main electrodes generating an arc current when moved away from each other;
rods extending out of said vacuum vessel from rear surfaces of said main electrodes, respectively; and
a cylindrical coil electrode means electrically connected between the rear surface of both of said main electrodes providing an axial magnetic field to diffuse the arc current between said main electrodes, said cylindrical coil electrode means including:
a cylindrical body having a first opening at a first end, and a central opening at a second end, said first end electrically connected to said main electrode, and said second end electrically connected to said rod;
a plurality of electrical connections provided between an edge surface along the first opening of said cylindrical body and said main electrodes;
a plurality of inclined slits communicating at one end thereof with the central opening at the second end of said cylindrical body and said slits extending to the edge surface of said cylindrical body;
wherein the inclined slits on the first cylindrical coil electrode means are generally parallel to the inclined slits on the second cylindrical coil electrode means attached to the other of said pair of said main electrodes.

4,839,482

GAS-BLAST BREAKER

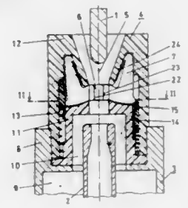
Ulrich Ackermann, Turgi; Kurt Faller, Brugg; Krzysztof Guzek, Thalwil, and Arnold Meier, Wettingen, all of Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland

Filed Mar. 25, 1988, Ser. No. 173,547

Claims priority, application Switzerland, Mar. 25, 1987, 01139/87

Int. Cl.[4] H01H *33/70*

U.S. Cl. 200—148 B 9 Claims



1. Gas-blast breaker having an insulating-gas-filled housing, two contact members (1, 2) which are located in the housing and can be brought into or out of engagement with one another along an axis (5), between which an arc burns during a switching process, and having an insulating material nozzle (4), the nozzle constriction (6) of which, exposed to the action of the arc, is formed by several segments (7) which follow one another in the circumferential direction, can be moved in the radial direction and can be loaded with a centripetally acting force, wherein the segments (7) exhibit in each case at least two side faces (16, 17, 18, 19, 20, 21) which are parallel to one another and to the axis (5) and which are delimited in each case by an edge (22, 23) extending in the surface of the nozzle constriction (6) and that adjacent segments (7) are supported on one another with their edges delimiting the side faces (19, 20) of these segments (7) are opposite to one another.

4,839,483

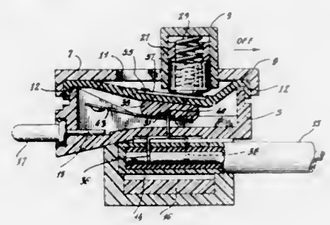
MODULAR WATERTIGHT SWITCH FOR USE IN PERSONAL CARE APPLIANCES

Edward J. Doyle, Hatboro, Pa., assignor to Conair Corporation, Stamford, Conn.

Filed Oct. 22, 1986, Ser. No. 921,751

Int. Cl.[4] H01H *9/04*

U.S. Cl. 200—302.1 2 Claims



1. A miniature, modular waterproof double-pole personal care appliance switch system capable of carrying line voltage and capable of easy assembly, said switch system including
a housing, a covering diaphragm therefor, and a cover plate, said cover plate and said housing having complementary interengaging members for permanent snap-fit assembly, and said diaphragm being in waterproof sealing engage-

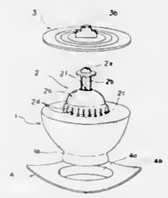
ment with said housing and positioned between said housing and said cover plate;
said cover plate including a slide-switch button and an associated actuator, said actuator being biased towards said diaphragm,
a pair of input terminals entering said housing and a pair of output terminals leaving said housing, both pairs of terminals being sealed to said housing, a rocker arm pivoted about a fixed point and so positioned within said housing as to be operatively associated with said actuator and said diaphragm, a pair of contacts carried by said rocker arm to connect and disconnect said input and said output terminals in response to motion of said rocker arm, an input line cord sealed to said input terminals,
a slot in said cover plate and in which said button is positioned within said slot, and including complementary latch members on said cover plate and said button for snap-fit positioning of said button within said slot, said actuator being positioned within said button and being spring-biased towards said diaphragm, and
a recess in said diaphragm proximate to said actuator and a contact pad conforming to the shape of said recess and positioned in said recess, for receiving forces from said actuator,
whereby sliding said button serves to rotate said rocker arm and thereby open and close said switch.

4,839,484

GRUEL COOKER FOR MICROWAVE RANGES

Ayumi Senba, Tokyo, Japan, assignor to Hario Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1988, Ser. No. 198,559
Claims priority, application Japan, Nov. 18, 1987, 62-176208
Int. Cl.[4] H05B *6/80*
U.S. Cl. 219—10.55 E **5 Claims**



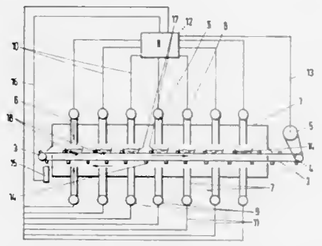
1. A gruel cooker for microwave ranges comprising a microwave permeable bowl having a base, a circumferential skirt extending upwardly from the base, and a circumferential bowl wall extending upwardly from the skirt, the bowl wall defining an upper edge of the bowl, a microwave permeable rice container having an open end portion with a plurality of circumferentially juxtaposed slits, the end portion defining a rim of the container which is configured for snap engagement in the skirt of the bowl when the container is inverted thereby defining a cooking space between the container and the base of the bowl and a liquid space between the container and the bowl wall with said slits providing communication between the cooking space and the liquid space, the cooker further including a bowl lid and support means for detachably mounting the lid above the upper edge of the bowl.

4,839,485

APPARATUS FOR THE UNIFORM AND RAPID HEATING OF FOODSTUFFS

Klaus Koch, and Manfred Klemm, both of Laatzen, Fed. Rep. of Germany, assignors to Herman Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Apr. 8, 1988, Ser. No. 179,642
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1987, 3712753
Int. Cl.[4] H05B *6/78*
U.S. Cl. 219—10.55 A **9 Claims**



1. Apparatus for the continuous, uniform and rapid microwave heating of a load contained in sealed packs permeable to microwaves, comprising:
(a) an elongate treatment chamber,
(b) conveyor means carrying a plurality of sealed packs permeable to microwaves and each containing a load to be heated when passing through said chamber, said conveyor means being provided with longitudinally spaced markers correlating with the placement of said packs on said conveyor means,
(c) a plurality of upper and lower microwave guide means projecting into said chamber above and below said packs and directed toward said packs, said microwave guide means including outlets operatively connected to the ends thereof, and means for varying the spacing of said outlets from the surface of said packs,
(d) microwave generator means associated with each of said guide means for generating microwave energy of a fixed predetermined wavelength,
(e) control means for controlling said conveyor means and said generator means,
(f) scanning means for detecting said markers, said scanning means being connected to said control means, and wherein
(g) the cross-sectional shape of said outlets generally corresponds to the geometrical surface shape of said packs, and said outlets are spaced from the surfaces of said packs by a distance equal to or less than one wavelength of the microwave energy used for irradiation of said packs.

4,839,486

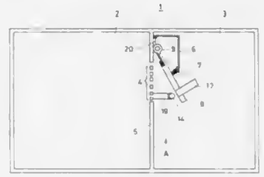
MICROWAVE OVEN DAMPER MECHANISM ACTIVATED BY A SHAPE MEMORY ALLOY

Masanobu Tanigawa, Ikoma, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 13, 1983, Ser. No. 484,460
Claims priority, application Japan, Jun. 9, 1982, 57-86281
Int. Cl.[4] H05B *6/64*
U.S. Cl. 219—10.55 R **1 Claim**

1. A combined oven having microwave and convection heating capability comprising:
a heating chamber having an air inlet port for introducing air into said heating chamber;
a damper operatively associated with said air inlet port for opening and closing said air inlet port of said heating chamber;

a first shape memory alloy spring element operatively connected to said damper for selectively controlling operations of said damper by controlled contraction and expansion, wherein during microwave heating, current is fed to said first shape memory alloy spring element so that a spring force causes said damper to open whereas when performing heating by a mode other than microwave, said air inlet port is closed by a force generated by a bias spring secured to said damper;
means for suppyling said current to said first shape memory alloy during microwave heating and for interrupting current supply to said first shape memory alloy during a



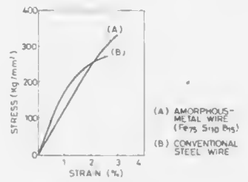
heating mode other than microwave such that said first shape memory alloy is energized only during the microwave oven mode of operation and prohibited from operating during any other mode of operation other than the microwave oven mode;
a locking mechanism capable of retaining said damper in an open position, said locking mechanism comprising a weight means connected to a second shape memory spring element; and
means for releasing said locking mechanism by applying current to said second shape memory alloy spring element.

4,839,487

WIRE ELECTRODE FOR WIRE-CUT ELECTRICAL DISCHARGE MACHINING

Haruhiko Ito; Yosbio Shibata; Masato Banzai, and Takeshi Yatomi, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 628,538, Jul. 6, 1984, abandoned. This application Dec. 3, 1986, Ser. No. 937,428
Claims priority, application Japan, Jul. 6, 1983, 58-122621; Jul. 11, 1983, 58-125716
Int. Cl.[4] B23H *7/08*
U.S. Cl. 219—69.12 **27 Claims**



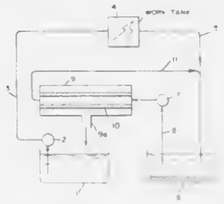
1. In an electrical discharge machining (EDM) apparatus for machining a workpiece, said apparatus comprising a pulsed voltage source and an EDM electrode, said pulsed voltage source applying a pulsed voltage between said EDM electrode and said workpiece to machine said workpiece, the improvement wherein said EDM electrode comprises a wire made of at least one of an amorphous metal and an amorphous alloy.

4,839,488

ELECTRIC DISCHARGE MACHINE USING A CERAMIC FILTER TO FILTER THE WORKING FLUID

Yoshibisa Katoh, Toyota; Takashi Ogawa, and Mitsumasa Hasegawa, both of Kariya, all of Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1987, Ser. No. 87,351
Claims priority, application Japan, Aug. 20, 1986, 61-194593
Int. Cl.[4] B23H *1/10*
U.S. Cl. 219—69.18 **9 Claims**



1. An electric discharge machine, comprising:
a clean work fluid tank for storing a clean work fluid;
a work tank connected to the clean work fluid tank for receiving and storing the work fluid in which an electric discharge is designed to occur through a small space between two charge electrodes which are a workpiece and a tool so that at each discharge a small amount of workpiece material is removed, producing particles which are suspended in the work fluid;
a settling tank connected to the work tank for receiving and storing the work fluid containing the particles in such a way that the particles can settle;
a filter container connected to the clean work fluid tank and the setting tank; and
a ceramic filter set in the filter container in such a manner that the work fluid containing the particles is supplied from the settling tank and passes through the ceramic filter, and after that the work fluid which has not been filtered by the ceramic filter is sent back to the settling tank,
wherein the ceramic filter comprises a support layer having an inner surface for forming at least one filter passage and a filter layer on the inner surface of the support layer and having an inner surface functioning as a filter surface, the filter layer having a thickness of 10 to 40 microns from the filter surface,
wherein all pores in the filter layer have a cumulative intrusion volume of 0.2 cc/g or less, pores having pore diameters of 0.1 to 3.0 microns have a cumulative intrusion volume of 0.1 cc/g or more, and pores ranging within a pore diameter width (W) of 0.1 microns around a center pore diameter (PD) have a cumulative intrusion volume (IV) which is 50% or more of the cumulative intrusion volume of all pores in the filter layer.

4,839,489

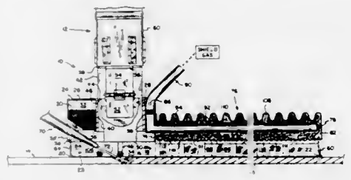
TRAILER SHIELD ASSEMBLY FOR A WELDING TORCH

Gerald E. Dyer, Canoga Park, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 16, 1988, Ser. No. 156,059
Int. Cl.[4] B23K *9/16*
U.S. Cl. 219—74 **6 Claims**

1. A shield gas distributing apparatus for a welding torch comprising:
a housing having front and rear walls, a pair of side walls, an

upper wall, and a lower open region defined by said walls, said housing disposed to cover a workpiece to be welded;
a welding torch having a welding tip portion and means for latchably and sealably mounting said torch rigidly in said housing so that said welding tip portion is disposed in said lower open region to engage said workpiece in welding relation therewith;
a flexible gas guide enclosure having a rear end wall and being affixed at a front region to said rear wall of said housing and having an interior in communicating relation with an interior region of said housing;
a tubular, flexible shield gas manifold coupled to a source of shield gas and extending from said housing lengthwise into an upper region of said gas guide, said shield gas



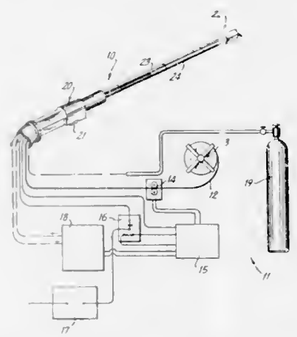
manifold having a plurality of spaced, upwardly directed openings for providing shield gas into said interior of said gas guide, and at least one opening in said tubular shield gas manifold communicating with said interior region of said housing;
a first diffuser in said gas guide and surrounding said shield gas manifold for receiving shield gas from said plurality of upwardly directed openings and diffusing shield gas downwardly over a welded portion of said workpiece; and
a second diffuser mounted in said housing a spaced distance from said upper wall and adjacent said front wall, for receiving said shield gas from said one opening and diffusing same over a portion of said workpiece preheated by welding.

4,839,490

GAS SHIELDED METAL ARC WELDING TORCH FOR LIMITED ACCESS WELDING

Fred A. DeSaw, Columbus, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 9, 1987, Ser. No. 107,146
Int. Cl.[4] B23K *9/16*
U.S. Cl. 219—74 12 Claims



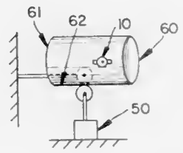
1. An improved gas shielded metal arc welding torch for joining first and second internal walls in a workpiece defining between them a joint to be welded, said apparatus comprising:
a fluid cooled electrically insulating torch head having external walls adapted to contact said internal workpiece walls and to direct consumable electrode wire and shielding gas toward said joint,
a torch body spaced a distance at least 10 times the width of said torch body from said torch head and having means for controllably supplying consumable electrode wire, electric welding power, shielding gas, and coolant fluid,
an assembly of mutually coaxial fluid conduction tubes connected to conduct shielding gas electric welding power, and coolant between said torch head and said torch body said assembly being adapted to remotely support the torch head from the torch body, and
means for spring biasing the torch head against said internal walls from the torch body while a weld is performed.

4,839,491

METHOD FOR FORMING A METAL CYLINDRICAL CONTAINER

Thomas A. Gallagher, Chagrin Falls, Ohio, assignor to Van Dorn Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 120,471, Nov. 13, 1987. This application Jan. 19, 1988, Ser. No. 145,620
Int. Cl.[4] B23K *11/32*
U.S. Cl. 219—117.1 5 Claims



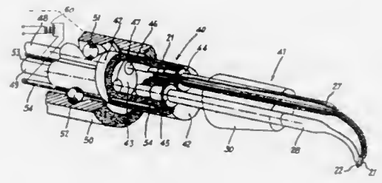
1. In a method for forming a metal cylindrical container for paint and the like from a stock of tin coated sheet metal cut into a plurality of flat rectilinear sheets, each sheet having a pair of length edges approximately equal to the circumference of said container and a pair of width edges approximately equal to the height of said container, the improvement comprising the following steps performed sequentially in the order set forth below:
(a) providing two bale ears for each sheet, each ear having a cup shaped body, said body having a base portion with an opening therein for receiving a wire bale and a circular rim portion, each ear having a pair of diametrically opposed generally rectilinear tabs extending from a portion of said rim portion;
(b) positioning a pair of ears at discrete locations on a flat sheet, each ear orientated so that both of its tabs extend in an aligned direction generally parallel to said width edges;
(c) resistance welding said tabs to said sheet at said locations;
(d) rolling said sheet about said length edges into a cylinder with one of said width edges overlapping the other width edge; and
(e) seaming said width edges.

4,839,492

PLASMA SCALPEL

Guy Bonchier, 106 rue Jean-Jaurès, Saint Laurent, 77440 Lizy sur Ourcq, and Francois Lhuisset, Pavillon 19, 14ter rue des Vallées, 91800 Brunoy, both of France

Filed Feb. 18, 1988, Ser. No. 157,222
Claims priority, application France, Feb. 19, 1987, 87 02197
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121.48 11 Claims



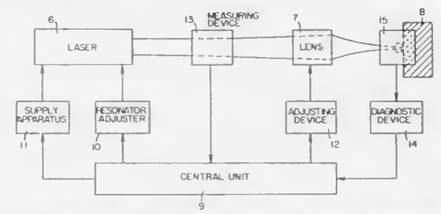
1. A device of the plasma scalpel type, comprising: a scalpel handle having at least two spaced-apart electrodes subjected to differences in electrical potential such that electric arcs occur therebetween, and means for producing at least one fluid flow passing through a region of space where said electric arcs occur, wherein said potential differences are alternating differences at medium or high frequency, wherein the ends of said electrodes are substantially filiform or pointed and form an acute angle therebetween, and wherein a voltage step-up transformer is incorporated in said handle to deliver said alternating potential differences, said fluid flows arriving from inside said angle or along at least one of said electrodes.

4,839,493

ARRANGEMENT FOR MACHINING WORKPIECES BY MEANS OF A LASER BEAM BY BUILDING UP A PLASMA THAT IS TO BE KEPT WITHIN LIMITS

Gerd Herziger, Fasanenweg 2, 6101 Rossdorf; Eckhard Beyer, Alsbach; Peter Loosen, Mainz, and Reinhart Poprawe, Königstein, all of Fed. Rep. of Germany, assignors to Gerd Herziger, Rossdorf, Fed. Rep. of Germany

PCT No. PCT/EP85/00328, § 371 Date Apr. 17, 1986, § 102(e) Date Apr. 17, 1986, PCT Pub. No. WO86/00552, PCT Pub. Date Jan. 30, 1986
PCT Filed Jul. 5, 1985, Ser. No. 862,235
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1984, 3424825
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.69 11 Claims



1. A method for machining workpieces in a machining zone by means of a laser beam wherein
I_L=laser intensity value,
I_C=lower laser intensity value where abnormal absorption $\simeq 1$,
I_D=critical upper limiting laser intensity value, at which shielding of the workpiece by a plasma is almost complete comprising the steps of
building up a plasma in the machining zone of the workpiece,
continuously sensing stochastically influenced processes taking place in the machining zone by measuring the intensity of a plasma luminance at a predetermined distance from the workpiece and
modulating laser irradiation in response to said sensing so that the range of value for I_L satisfies the relation:

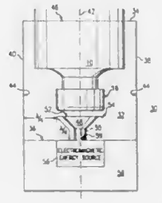
$$I_C \leq I_L < I_D.$$

4,839,494

ELECTROMAGNETIC CONTAINER SEALING APPARATUS

Alexei Vnlpe, Dallas, Tex., assignor to Ntronix, Inc., Nashville, Tenn.

Filed Jun. 3, 1988, Ser. No. 202,231
Int. Cl.[4] H05B *6/80*
U.S. Cl. 219—10.55 A 12 Claims



1. A sealing apparatus for use with a container having an open end with a sealing rim therearound, a closure on the open end and a membrane in the closure disposed against the sealing rim, the membrane having at least one plastic layer adapted for being sealed to the sealing rim of the container, the sealing apparatus comprising:
a resonant cavity having first and second ends, a central axis and an inner peripheral surface located around the central axis, the first end of the resonant cavity having an opening for receiving the open end of the container having the closure thereon;
an electrode extending into the resonant cavity from the second end thereof and having a sealing rim therearound, the sealing rim including an outer edge located a predetermined length from the second end of the cavity along an outer peripheral surface of the electrode and located from the inner peripheral surface of the cavity by the predetermined length; and
means connected to the electrode for exciting the cavity with electromagnetic energy to thereby seal the layer to the sealing rim of the container.

4,839,495

LASER BEAM WELDING APPARATUS FOR AN INNER CIRCUMFERENTIAL SURFACE OF A TUBE

Takuya Kitera; Shoichi Urushibata; Masatoshi Sato; Tadashi Nagashima; Shoichi Hamada; Isao Shirasu, all of Kobe; Yasumi Nakura, Takasago; Michito Sakamoto, Takasago; Takashi Ishide, Takasago; Naruo Sakamoto, Takasago; Masahiko Meka, Takasago, and Masaru Tomeoka, Kobe, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 21, 1988, Ser. No. 222,179
Claims priority, application Japan, Jul. 21, 1987, 62-181960; Jul. 24, 1987, 62-183670
Int. Cl.[4] B23K *26/00*
U.S. Cl. 219—121.63 6 Claims

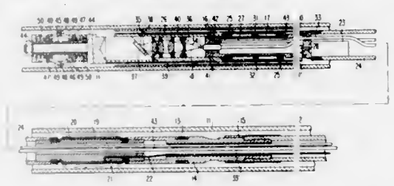
1. A laser beam welding apparatus for an inner circumferential surface of a tube, comprising:
an elongated flexible tube containing an optical fiber ex-

tended along the length thereof so as to transmit a laser beam;

position detecting means disposed in the vicinity of the tip end of said flexible tube to determine relative positioning thereof with respect to a work tube in which said flexible tube is inserted;

holding means provided with an expander and disposed adjacent to said position detecting means for holding said tip end of the flexible tube in said work tube;

rotary drive means disposed closer to said tip end of the flexible tube than said holding means;



a rotary cylinder connected to said rotary drive means to be rotated with respect to said flexible tube;

guide means mounted on said rotary cylinder in a relatively rotatable manner with respect to said rotary cylinder and held in contact with the inner surface of said work tube for supporting said rotary cylinder in a concentric relation to said work tube; and

an optical train arranged within said rotary cylinder for receiving a laser beam emitted from said optical fiber and focusing a reflected laser beam onto the inner surface of said work tube.

4,839,496

LASER WELDING DEVICE FOR WELDING HOLLOW SECTIONS AND FLAT SECTIONS

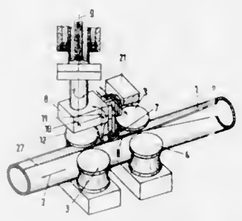
Karl-Heinz Arnier, Hamburg, and Bernhard Müller, Rellingen, both of Fed. Rep. of Germany, assignors to Rofin-Sinar Laser GmbH, Hamburg, Fed. Rep. of Germany

Filed Sep. 29, 1988, Ser. No. 251,151

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1987, 8713417[U]

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121.63 10 Claims



1. Laser welding device for welding hollow sections and flat sections which are to be welded flush to one another, having a detection device for one or both edges to be welded and having a tracking device for the welding head which is adjustable transversely to the direction of the weld seam, characterized in that it exhibits deflecting mirrors (10, 11) for the laser light which are disposed obliquely in relation to the laser beam axis (9) and which are pivotable about this axis (9), in that the detection device is designed as a mechanical scanner (7), and in that the scanner (7) and the deflection mirrors (10, 11) are connected to one another for common pivoting movement.

4,839,497

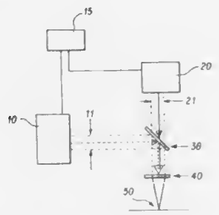
DRILLING APPARATUS AND METHOD

Nott G. Sankar, Andover; Victor T. Pileeki, Townsend, and George A. Zahaykevich, Watertown, all of Mass., assignors to Digital Equipment Corporation, Maynard and Advanced Laser Systems, Inc., Waltham, both of, Mass.

Filed Sep. 3, 1987, Ser. No. 92,558

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121.71 19 Claims



1. A method of drilling holes in a printed wiring board which comprises a first material and a second material comprising:

generating a first laser beam;

generating a second laser beam having a wavelength different from the wavelength of said first laser beam wherein said first laser beam and said second laser beam are selected to maximize vaporization of said first and second materials respectively; and

directing said first laser beam and said second laser beam along a common beam path.

4,839,498

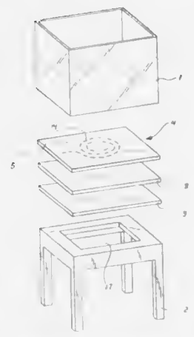
ELECTRICALLY HEATED FISH TANK UNIT

Maryan Chak, 2901 Ocean Pkwy., Apt. C-4, Brooklyn, N.Y. 11235

Filed Feb. 29, 1988, Ser. No. 161,718

Int. Cl.[4] H05B *1/02, 3/00;* H01K *63/00*

U.S. Cl. 219—311 7 Claims



1. A heated fish tank unit, comprising

a frame having an upper surface with a central opening;

a fish tank having a bottom and standing with said bottom on said upper surface of said frame; and a one piece flat heater placed under said bottom of said fish tank and having two opposite sides such that one of said sides placed against said bottom of said fish tank from below so as to heat water in said fish tank through its bottom, said flat heater having a predetermined outer contour and a centrally located resistance heating element, said one piece flat member further including a peripheral portion devoid of said heating element which extends along said contour of said heater so that when said fish tank is installed on said upper surface of said frame said peripheral portion is held between said bottom of said fish tank and said upper surface of said frame while said heating element is located inwardly of said opening of said frame in heat transfer relation to said bottom of said fish tank.

4,839,499

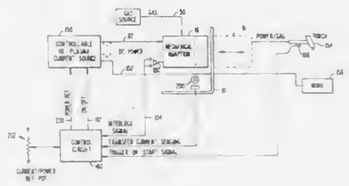
SYSTEM FOR SUPPLYING POWER TO DIFFERENT CUTTING TORCHES

Mariusz B. Kotecki, San Diego, and James M. Thommes, Escondido, both of Calif., assignors to Cyclomatic Industries, Inc., San Diego, Calif.

Filed Jun. 13, 1988, Ser. No. 206,107

Int. Cl.[4] B23K *9/10*

U.S. Cl. 219—121.39 3 Claims



1. A plasma cutting power supply for supplying gas and power to one of at least two different cutting torches, said torches each including a gas and power connector for receiving gas and power from the power supply, said power supply comprising:

a housing having an opening;

a gas source;

a power source in the housing;

a connector plug adapted for connection with the gas and power connector for supplying gas and power from the power and gas sources to a torch;

a member connected to the housing so that it is slidable through the opening between a closed position inside the housing and open positions where the member is away from its closed position, said member carrying the connector plug;

switch means located in the housing so that when the member is in an open position, the member causes the switch means to generate an interlock inhibit signal, wherein the switch means generates no interlock inhibit signal when it is in the closed position;

wherein the torch generates a triggering signal for starting the torch, wherein the power and gas sources supply a D.C. current and gas to the torch through the connector plug and gas and power connector upon receiving a triggering signal from the torch, said power source responsive to the interlock inhibit signal to stop supplying current to the torch even though said supplying means has also received a triggering signal from the torch, and wherein the connector plug is accessible for connecting and disconnecting the gas and power connector by sliding the member to an open position.

4,839,500

COVERING FOR WALL, CEILING OR FLOOR LININGS

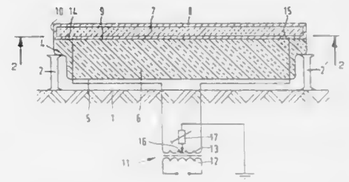
Gottfried Cremer, Cologne, and Martin Bard, Amberg, both of Fed. Rep. of Germany, assignors to Buchtal Gesellschaft mit beschrankter Haftung, Schwarzentfeld Opf, Fed. Rep. of Germany

Filed Feb. 3, 1987, Ser. No. 10,510

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1986, 3603233

Int. Cl.[4] H05B *3/26*

U.S. Cl. 219—213 18 Claims



17. A compound covering element for a double wall, ceiling or floor construction wherein a plurality of such elements are bedded directly or indirectly on supports disposed at predetermined intervals on a stable substructure, the compound cover element comprising:

a ceramic tile having a visible surface and a back surface;

an electrically conductive first glaze over the back surface of the ceramic tile, with the first glaze adapted to be electrically charged to heat the glaze and the ceramic tile; and

an electrically conductive second glaze over the visible surface of the ceramic tile, with the second glaze having an electrical resistance higher than the electrical resistance of the conductive first glaze on the back surface of the ceramic tile to dissipate static electricity.

4,839,501

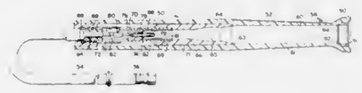
CARTRIDGE SOLDERING IRON

Mark J. Cowell, San Carlos, Calif., assignor to Metcal, Inc., Menlo Park, Calif.

Filed Sep. 8, 1986, Ser. No. 904,298

Int. Cl.[4] B23K *3/06*

U.S. Cl. 219—237 15 Claims



1. A heater structure comprising

a cartridge having a low heat conductive tube, a heat generating means including a coil permanently fixed in one end of the tube, and

a first electrical connector permanently fixed in the other end of the tube, and

an elongated, hollow holder of non-heat conducting material having first and second ends,

a second electrical connector located adjacent one end of said holder and adapted to couple with, mechanically support and removably retain said cartridge in said holder and apply electricity to said first connector,

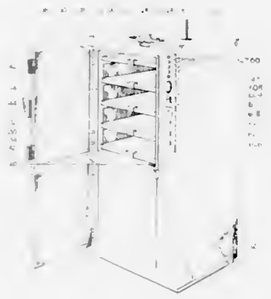
first means for laterally supporting said cartridge located adjacent the other end of said holder and substantially isolating said holder from the heat of said heat generating means.

4,839,502

COOKING APPARATUS

David L. Swanson, 1670 Lake Largo, Green Bay, Wis. 54301, and Gilbert Trick, 888 St. Charles Dr., Green Bay, Wis. 54302

Filed Mar. 21, 1988, Ser. No. 170,912
Int. Cl.[4] A21B *1/22*; F27D *1/00*
U.S. Cl. 219—401 7 Claims



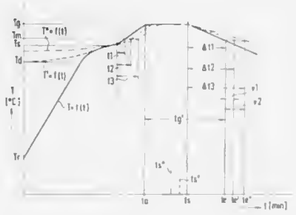
1. A cooking oven in operative combination, comprising:
A top, bottom, rear, oppositely disposed side walls and a door defining an enclosure;
a cooking deck mounted within the enclosure;
a first heating element, mounted within the enclosure, operative to radiate longwave length and shortwave length radiation, when energized;
a first black body, having a top surface and a bottom surface, mounted within the enclosure, below the first heating element, said black body being operative to absorb longwave and shortwave radiation, from the heating element, through the black body's top surface and to reradiate longwave length radiation uniformly through the black body's bottom surface; the bottom surface of the first black body defining the top of the cooking deck;
a second black body, mounted within the enclosure, below the first black body, having a top surface and a bottom surface; the top surface of the second black body defining the bottom of the cooking deck;
a second heating element, mounted within the enclosure, below the second black body, operative to radiate longwave and shortwave radiation, when energized, to be absorbed by the second black body, through the bottom surface of the second black body, to be reradiated uniformly through the top surface of the second black body as longwave length radiation;
temperature regulating means operable to vary the energy supplied to the heating elements;
a foodstuff to be cooked within the cooking deck, such foodstuff containing water;
injection means operative to insert steam into the cooking deck, during at least part of a cooking cycle, the volume of steam being selectable to provide enough moisture to suppress evaporation of water from the foodstuff, without condensation of the steam, until the vapor pressure of the water in the foodstuff attains a desired level;
a first vent operative to vent steam out of the enclosure;
a second vent operative to allow air to pass through the enclosure, during at least part of a cooking cycle.

4,839,503

CONTROLLING THE SIMMERING OR COOKING TIME IN A COOKING VESSEL

Kurt Wolf, and Wolfram K. Andre, both of Wildbad, Fed. Rep. of Germany, assignors to Fissler GmbH, Idar-Oberstein, Fed. Rep. of Germany

Filed Dec. 9, 1987, Ser. No. 130,787
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1986, 3642180
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—497 11 Claims



1. An apparatus for controlling a cooking time in a cooking vessel which is heated by means of an electrical cooking plate with a control circuit defining a cooling time, in which the temperature in the cooking vessel is determined and utilized by the control circuit to regulate the heat output of the electrical cooking plate, in which the cooking time can be set by means of an adjustable time element, in which the cooking plate can be shut off at a length of time before completion of a predetermined cooking time, such length of time being greater the greater the heat quantity determined from data from the heating phase, and thereby results in a cooling process after the cooking plate is switched off, said apparatus comprising: a time measuring circuit (tM) for measuring a time period (tn) defined as the time from the reaching of a boiling temperature (Ts) to the reaching of a predetermined measuring temperature (Tm) above said boiling temperature (Ts) in a heating phase with a starting temperature (T) between the temperature (Td) necessary for the initiation of a significant steam formation and the boiling temperature (Ts) of the water; and a correction circuit (K) for correcting said determined time period (tn) of a time span (Δtn) for a premature disconnection time (ts) of said cooking plate which is a function of the starting temperature (T) and is reduced by an amount (Δs), which is greater the higher said starting temperature (T).

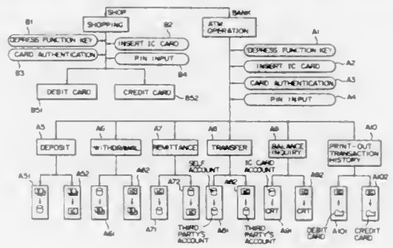
4,839,504

IC CARD SYSTEM COMPATIBLE WITH BANK ACCOUNT SYSTEM

Harumi Nakano, Oome, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jul. 17, 1987, Ser. No. 75,064
Claims priority, application Japan, Jul. 28, 1986, 61-177442
Int. Cl.[4] G06F *15/30*
U.S. Cl. 235—379 8 Claims

1. An IC card system, comprising:
an IC card device containing at least one IC (integrated circuit) chip which includes:
first memory means, for storing personal identification number (PIN) data;
first comparing means for comparing said PIN data, stored in said first memory means, with externally entered PIN data; and
second memory means, said second memory means having:
a first area for storing data for a debit function, and
a second area for storing data for a credit function;
said IC card system further including
a terminal device for communicating various items of data to said IC card device when said IC card device is inserted in said terminal device, the terminal device including selecting means for determining whether said IC card device is



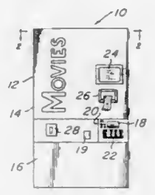
to be used as a debit card or a credit card, said selecting means being arranged to be activated when said first comparing means detects a coincidence of said PIN data.

4,839,505

APPARATUS AND METHOD FOR STORING AND RETRIEVING ARTICLES

L. Jack Bradt; Robert L. Brown; G. Stephen Fogt, all of Easton, Pa.; Ron Laroy, Rockaway, N.J.; Allen R. Lewis, Easton, Pa., and James S. Love, Newport News, Va., assignors to Videomat Associates, Easton, Pa.

Continuation-in-part of Ser. No. 868,815, May 29, 1986, Pat. No. 4,814,592. This application May 22, 1987, Ser. No. 53,380
The portion of the term of this patent subsequent to Mar. 21, 2006, has been disclaimed.
Int. Cl.[4] G06F *15/24*; G11B *17/26*
U.S. Cl. 235—381 84 Claims



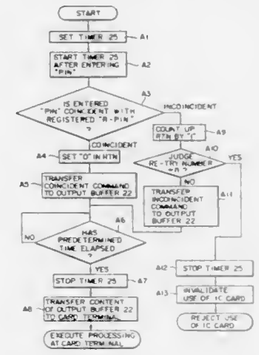
1. Apparatus for selectably vending articles, said apparatus comprising storage means for storing a plurality of articles in identifiable locations, mode selection means for enabling operation of said apparatus among a purchase mode or a rent mode and a return mode, article selection means for enabling selection of a desired article in the purchase mode or rent mode, access means for dispensing the selected article in the purchase mode or rent mode and receiving an article in the return mode, and transport means for transporting the selected article from the storage means to the access means in the purchase mode or rent mode and transporting the article from the access means to the closest available empty location proximate said access means in the storage means in the return mode.

4,839,506

IC CARD IDENTIFICATION SYSTEM INCLUDING PIN-CHECK TIME MEANS

Satoshi Homma, and Toru Watanabe, both of Tokyo, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Apr. 16, 1987, Ser. No. 39,325
Claims priority, application Japan, Apr. 25, 1986, 61-96530
Int. Cl.[4] G06F *15/30*
U.S. Cl. 235—379 7 Claims



1. An IC (integrated circuit) card, comprising:
means for comparing a first identification number entered by a cardholder with a second identification number previously stored in the IC card, and for determining whether or not said first identification number is coincident with said second identification number;
storage means for storing at least said second identification number;
means for holding a comparison result obtained by said comparing means, wherein said comparison is indicative of a coincidence or a non-coincidence with said second identification number;
first count means for counting a predetermined time period after the cardholder enters the first identification number; and
output means for outputting the comparison result when said first count means ends counting of said predetermined time period;
wherein a time lapse from an entry by a cardholder of said first identification number until a comparison result indicative of a coincidence is output by said output means, is equal to the time lapse from entry of said first identification number until a comparison result indicative of non-coincidence is output.

4,839,507

METHOD AND ARRANGEMENT FOR VALIDATING COUPONS

Lance May, 44 Victoria Street, North Sydney, New South Wales, Australia 2060, assignor to Lance May, Kirribilli, Australia

Filed Mar. 17, 1988, Ser. No. 169,576
Claims priority, application Australia, Nov. 6, 1987, P15296
Int. Cl.[4] G06F *7/08*
U.S. Cl. 235—381 13 Claims

1. A method of coupon verification, wherein at least two juxtaposed coupons each having a bar code printed or formed

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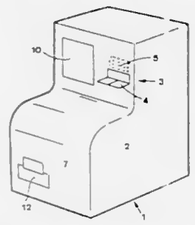
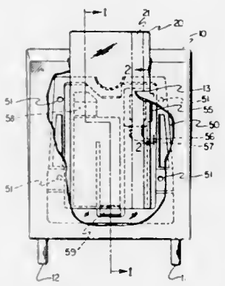
thereon, are passed substantially simultaneously through or relative to bar code reader means, such that said juxtaposed



coupons if accepted by said bar code reader means cause matter to be dispensed from a holding and dispensing means.

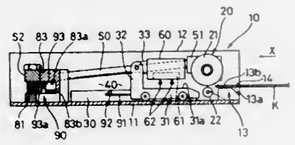
4,839,508
CARD READER
George Frolov, Farmington, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.
Filed Sep. 23, 1987, Ser. No. 99,929
Int. Cl.[4] G06K *13/00*
U.S. Cl. 235—477 **6 Claims**



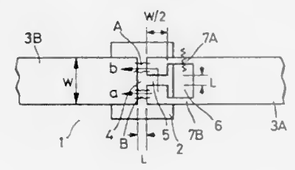
1. A magnetic card reader comprises:
a cover;
a slot in said cover to accept a card;
a magnetic reading head movably mounted within said cover;
a first switch means positioned within said cover to initiate entry reading of the card;
a second switch means positioned within said cover to terminate entry reading of the card and to initiate withdrawal reading of the card;
spring means responsive to insertion of said card to actuate said first and second switch means.

4,839,509
CONNECTOR DEVICE FOR CONNECTING IC CARD TO READING AND/OR WRITING APPARATUS
Jun-ichi Yasuma; Tadashi Kobayashi, and Masakuni Ishikawa, all of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan
Filed Jun. 3, 1988, Ser. No. 201,878
Claims priority, application Japan, Jun. 19, 1987, 62-151457; Jul. 9, 1987, 62-169659; Jul. 16, 1987, 62-175932
Int. Cl.[4] G06K *13/00*
U.S. Cl. 235—482 **9 Claims**

1. A connector device for electrically connecting an IC card provided on its front side with a plurality of contacts, to a reading and/or writing apparatus, said connector device comprising:
(a) casing means having an insertion opening for the IC card;
(b) first guide means arranged within said casing means, said first guide means defining a transport path for the IC card, said transport path extending from said insertion opening;
(c) second guide means extending in inclined relation to said transport path for the IC card;
(d) contact-probe support means guided by said second guide means, said contact-probe support means having supported thereon a plurality of contact probes projecting toward said first guide means and corresponding respectively to the contacts on said IC card, and elastic means biasing said contact probes toward said first guide means; and
(e) engaging means associated with said contact-probe support means and arranged in crossing relation to said transport path for the IC card, wherein as a leading edge of the IC card is abutted against said engaging means, said contact-probe support means moves, together with the IC card, away from said insertion opening and, simultaneously therewith, approaches the IC card under guidance of said second guide means, to bring said contact probes into contact respectively with the contacts on the IC card.

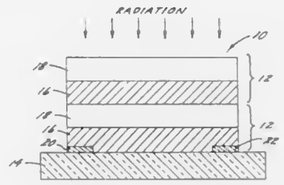


4,839,510
OPTICAL SENSOR INCLUDING SHORTCIRCUIT PROTECTION HAVING NOTCHED ELECTRODE REGIONS
Kazuya Okabe, Furukawa; Yasuhiko Kasama; Hitoshi Seki, both of Izumi, and Chisato Iwasaki, Furukawa, all of Japan, assignors to Alps Electric Co., Ltd., Japan
Filed Feb. 26, 1988, Ser. No. 160,703
Claims priority, application Japan, May 25, 1987, 62-127679
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—211 J **6 Claims**



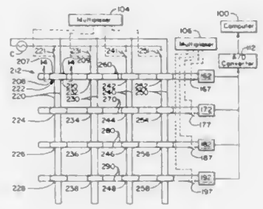
1. An optical sensor comprising:
a photoconductive body;
a pair of band-shaped electrodes each having a width of "W", positioned opposite to each other on said photoconductive body via a gap having an interval of "L" defined by the opposite electrodes;
a band-shaped first notch portion having a length of "W/2" and also a width of "L", positioned at a substantially center of one of said opposite electrodes with being opened to said gap; and
a second notch portion formed in said electrode under the condition that all of the second notch portion other than portion thereof communicated with said first notch portion is closed.

4,839,511
ENHANCED SENSITIVITY PHOTODETECTOR HAVING A MULTI-LAYERED, SANDWICH-TYPE CONSTRUCTION
James C. Thompson, Austin, Tex.; Uzi J. Even, Tel Aviv, Israel, and Chi-Woo Kim, Austin, Tex., assignors to Board of Regents, The U. of Texas System, Austin, Tex.
Filed Jan. 29, 1988, Ser. No. 149,707
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—211 R **34 Claims**



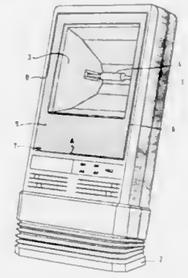
1. A photoconductive member with increased sensitivity to incident radiation of a predefined range of wavelength and with increased photo-yield in response thereto, said member comprising:
at least two composite layers formed one above the other, each composite layer comprising (i) a first layer of material capable of conducting charge and (ii) a second layer of material comprising molecular dipoles disposed upon said first layer in such a manner that said molecular dipoles are adsorbed on the surface of said charge-conducting material in an oriented fashion, whereby the alternating layers of charge-conducting material and molecular dipoles in combination increase the photo-yield of the photoconductive member in response to a given quantum of incident radiation and extend the range of wavelength of incident radiation to which the photoconductive member is sensitive.

4,839,512
TACTILE SENSING METHOD AND APPARATUS HAVING GRIDS AS A MEANS TO DETECT A PHYSICAL PARAMETER
Richard P. Speck, Denver, Colo., assignor to Tactilitics, Inc., Boulder, Colo.
Filed Jan. 27, 1987, Ser. No. 7,256
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 P **33 Claims**



1. Tactile sensing apparatus, comprising:
a grid having a plurality of elongated linear input means positioned in spaced apart relation to each other over a surface area for conducting input power to selected locations on said surface area and a plurality of elongated output means positioned in spaced apart relation to each other over the surface area for conducting power from said selected locations on said surface area, said output means intersecting said input means at said selected locations;
input energy feeder means connectable to said input means for feeding energy into said input means;
output energy detection means for detecting and measuring energy in said output means;
a plurality of transducer means positioned at said intersecting locations, each transducer means being connected one of said input means and to one of said output means for transferring energy from the input means to the output means in such a manner that the amount of energy transferred by the transducer means from an input means to an output means is a function of force applied to said transducer means;
input control means connected to said input energy feeder means for causing said input energy feeder means to feed energy to only selected ones of said input means at a time; and
data processing means for correlating output energy detected by said output energy detection means with said input control means for determining magnitudes and locations of forces applied to said respective transducers.

4,839,513
ULTRAVIOLET IRRADIATION DEVICE
Jorrit Wijtsma, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 899,703, Aug. 25, 1986, abandoned.
This application Jun. 6, 1988, Ser. No. 205,017
Claims priority, application Netherlands, Sep. 17, 1985, 8502534
Int. Cl.[4] A61N *5/00*; H01J *61/00*
U.S. Cl. 250—504 R **4 Claims**



1. An ultraviolet-radiation emitting device, which comprises a housing having an opening in one side; a reflector positioned in such housing with its reflecting surface facing such opening; an ultraviolet radiation source disposed in front of such reflecting surface; a glass plate secured to said one side of the housing and adapted to filter out relatively short-wave ultraviolet radiation originating from the radiation source, said glass plate covering the opening in such one side of the housing, the edge of the glass plate, except for a portion thereof, being secured to the housing by means of an adhesive layer; and, an electrical switch operable to switch off the radiation source, said switch including a depressed actuating element bearing against the inner surface of the glass plate and arranged, upon breakage of the glass plate, to be released from such depressed state to operate said switch; the actuating element being positioned near said non-adhered edge portion of the plate such that the non-adhered part of the plate is pushed outwards by the actuat-

ing element upon breakage of the plate and said switch is operated.

4,839,514

OPTICAL READER WITH SHADING CORRECTING MEANS

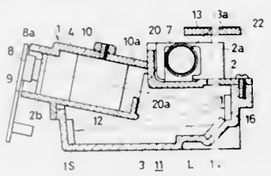
Kazunori Mine; Keisuke Murakami; Mamoru Tago, and Hiromasa Urata, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1987, Ser. No. 132,333

Claims priority, application Japan, Dec. 15, 1986, 61-192612[U]

Int. Cl.⁴ H01J *3/14, 5/16, 40/14*

U.S. Cl. 250—237 R **9 Claims**



1. A photoelectric converting device comprising:
a body case formed from an upper and lower element;
a light source held in said body case for irradiating a light beam onto a reading surface of ad document;
a light shielding plate held in said body case and which is part of said upper element, for shielding the light beam generated from said light source;
a reflecting mirror held in said body case and which is part of said lower element for reflecting the light beam reflected on a reading surface in a direction such that light will pass a part of said light shielding plate;
a photoelectric converting means held in said body case for receiving the light beam reflected on said reflecting mirror;
a lens located in said body case such that the light beam reflected on said reflecting mirror is focused on said photoelectric converting means; and
a shading correcting means held in said body case comprising a first shading correcting portion having such a shape as to restrict the light beam incident on said lens and formed by a part of said light shielding plate, and a second shading correcting portion for restricting the light beam incident on said lens more in a quantity of light at a portion nearer to an optical axis of said lens by a complementary shape defined by said first and second shading correcting portions

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4,839,515

FIBER OPTIC TRANSDUCER WITH FIBER-TO-FIBER EDGE COUPLING

Charles H. Kershaw, Houston, Tex., assignor to I.V.P. Co., Houston, Tex.

Filed Mar. 13, 1987, Ser. No. 25,711

Int. Cl.⁴ H01J *5/16*

U.S. Cl. 250—227 **42 Claims**

1. A method of using a transducer to determine a sensed condition, including the steps of:
transmitting a light signal through a first fiber optic conductor;
emitting at least a portion of the light signal from a side window provided in the first fiber optic conductor;
capturing at least a portion of the emitted light signal from the first fiber optic conductor with a second fiber optic conductor;
transmitting the light signal captured by the second fiber optic conductor through the second fiber optic conductor;
sensing a value for the light signal conducted through the fiber optic light conductor; and
determining the condition sensed by comparing the sensed value for the light signal conducted through the second fiber optic conductor with a reference value.

4,839,516

METHOD FOR QUANTITATIVE ANALYSIS OF CORE SAMPLES

David L. Freeman, Garland, Tex.; Mark G. Rockley, Stillwater, Okla., and Donald G. Harville, Grapevine, Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Nov. 6, 1987, Ser. No. 118,156

Int. Cl.⁴ G01N *21/85*

U.S. Cl. 250—255 **13 Claims**

1. A method for determining the mineral composition of the earth in a selected region of a borehole comprising the steps of:
(a) obtaining a core sample from said selected region of the borehole;
(b) cleaning said core sample to remove hydrocarbons;
(c) grinding at least a portion of said core sample to a particle size less than about 2 microns;
(d) mixing said ground sample portion with a carrier and pressing said mixture into a thin wafer;
(e) subjecting said thin wafer to infra-red energy in a Fourier transform infra-red spectrometer to obtain the sample spectral response; and
(f) comparing said sample spectral response with those of known mineral standards in a digital computer to determine the quantitative mineral composition of said core sample.

4,839,517

ROLL ELECTRODE AND DEVICE FOR PRETREATING THE SURFACES OF FILM WEBS BY MEANS OF ELECTRICAL CORONA DISCHARGE

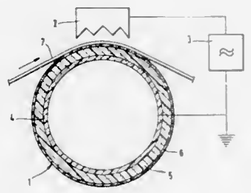
Peter Dinter, Haligarten, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 30, 1987, Ser. No. 126,497

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1986, 3641169

Int. Cl.⁴ H01T *19/04*

U.S. Cl. 250—325 **20 Claims**



1. A roll electrode for treating the surface of a film web with an electrical corona discharge, comprising:
an electrically conductive support roll comprising at least one electrically conductive layer comprised of fiber-reinforced synthetic resin the fibers of which are electrically conductive; and
a first insulating layer positioned radially outwardly with respect to said electrically conductive layer.

4,839,518

APPARATUSES AND METHODS FOR LASER READING OF THERMOLUMINESCENT PHOSPHORS

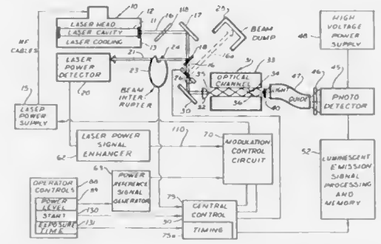
Peter F. Braunlich, SW. 730 City View, Pullman, Wash. 99163, and Wolfgang Tetzlaff, Pullman, Wash., assignors to Peter F. Braunlich, Pullman, Wash.

Continuation-in-part of Ser. No. 652,829, Sep. 20, 1984, Pat. No. 4,638,163. This application Jul. 7, 1986, Ser. No. 882,953

The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.

Int. Cl.⁴ G01T *1/115*

U.S. Cl. 250—337 **55 Claims**



1. A thermoluminescent phosphor reading apparatus for reading the level of ionization existing in a thermoluminescent phosphor as a result of exposure of the phosphor to ionizing radiation, comprising:
laser beam source means for generating and emitting a laser beam; said laser beam source means being capable of modulation to control power of an emitted laser beam;
laser beam power detection means for measuring the power of the laser beam at least once during an exposure period during which the laser beam is directed upon the thermoluminescent phosphor;
laser power control means for rapidly and adjustable modulating the power of the emitted laser beam to desired levels as a function of time; said laser power control means controlling the laser beam which is variable in power during an exposure period;
shutter means positioned to control exposure of the thermoluminescent phosphor to said laser beam; and
thermoluminescent emission measuring means for measuring any thermoluminescent emissions occurring when the thermoluminescent phosphor is heated by the laser beam.

4,839,519

TEMPERATURE MEASURING

Peter H. Fowler, 320 Canford Lane, Westbury-on-Trym, Bristol BS3 3PL, England

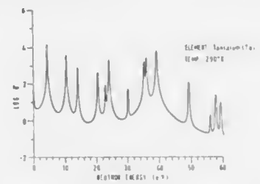
Continuation of Ser. No. 810,024, Dec. 17, 1985. This application Nov. 10, 1987, Ser. No. 118,969

Claims priority, application United Kingdom, Dec. 18, 1984, 8431870

Int. Cl.⁴ G01K *11/00*

U.S. Cl. 250—390.01 **14 Claims**

1. A system for measuring the temperature of a portion of a rotating item comprising:
means for supplying a beam of neutrons to expose said portion of the beam;
neutron detection means for detecting non-scattered neutrons which have passed through said portion;
counting means for counting neutrons detected by said detection means, said counting means including control means such that said counting means counts non-scattered neutrons at different energies which have passed through said portion, and said control means produces a signal related to a neutron-energy dependent neutron transmission spectrum for the said portion;
means for compensating for movement of said item due to rotation of said item; and



means responsive to said signal for utilizing at least a part thereof due to a resonance in said transmission spectrum resulting from a chemical element included in said portion to produce a representation of the temperature of said portion.

4,839,520

PRODUCTION OF PULSED ELECTRON BEAMS

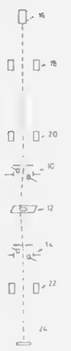
Simon C. J. Garth, St. Johns College, St. Johns Street, Cambridge, United Kingdom CB2 1TW

Filed Sep. 23, 1987, Ser. No. 100,012

Claims priority, application United Kingdom, Oct. 3, 1986, 8623842

Int. Cl.⁴ H01J *37/147*

U.S. Cl. 250—396 R **14 Claims**



1. Apparatus for producing a pulsed electron beam comprising:
scanning means for causing a continuous electron beam to scan a circle;
deflecting means comprising an array of electrostatic electrodes disposed around the circle scanned by the electron beam and acting to reflect the beam in a radial direction at selected locations around the circle, thereby creating electron pulses and
collecting means for collecting electron pulses from alternate locations to provide a pulsed electron beam along an optical axis.

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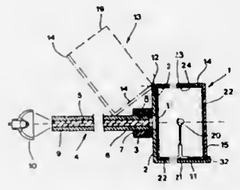
4,839,521

TREATMENT CHAMBER FOR THE PHOTOPOLYMERIZATION OF DENTAL PLASTICS

Steffen Oppawsky, Bad Homburg, Fed. Rep. of Germany, assignor to Kulzer & Co. GmbH, Wehrheim, Fed. Rep. of Germany

Filed Feb. 19, 1988, Ser. No. 157,929
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1987, 3708204
Int. Cl.[4] G21K 5/08
U.S. Cl. 250—453.1 14 Claims



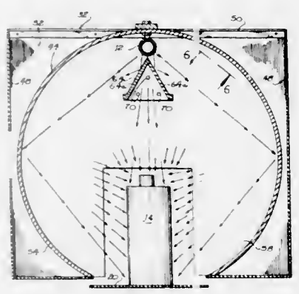
1. An accessory device for phtopolymerization of a dental plastic by a light input from an illuminator comprising:
- a light-tight chamber having walls with interior surfaces which are light reflective to reflect the light of the light input from the walls, one of said walls defining an opening to permit the light input from the illuminator into the chamber;
- a closure means attached to at least one of said walls for displaceably opening the chamber and providing access to the dental plastic in the chamber and
- a light conductor socket affixed to an exterior surface of the wall of the chamber defining the opening, the socket positioned between the chamber and the illuminator at the level of the opening such that the light input from the illuminator travels through the light conductor socket and the opening into the chamber.

4,839,522

REFLECTIVE METHOD AND APPARATUS FOR CURING INK

Robert A. Bourgeois, Orland Park; Phil Motev, Lincolnwood, and Ronald M. Schmetter, Skokie, all of Ill., assignors to American Screen Printing Company, Chicago, Ill.

Filed Jul. 29, 1987, Ser. No. 79,098
Int. Cl.[4] G01N 21/00
U.S. Cl. 250—455.1 12 Claims



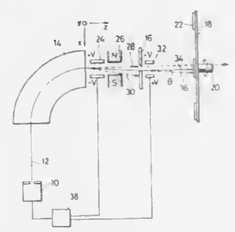
1. A curing apparatus for curing ink on the exterior surface of an article having upper, lower, and said exterior surfaces, the apparatus comprising:
- at least one source of light radiation;
- a housing surrounding the source of light radiation and defining an enclosed path for an article therethrough;
- said housing including a tunnel-shaped wall and having entrance and exit walls substantially closing an entrance to and an exit from said housing;
- a conveyor transporting the article along the enclosed path at a predetermined rate of speed so as to expose at least a portion of the article's side surface to the interior of the housing; and
- said housing having interior reflective surfaces on said tunnel-shaped wall and on said entrance and exit walls for reflecting and scattering the light to provide indirect and substantially uniform indirect light radiation onto the substantial entirety of the exposed portion of the article's side surface to cure ink thereon as the conveyor travels as said predetermined rate of speed.

4,839,523

ION IMPLANTATION APPARATUS FOR SEMICONDUCTOR MANUFACTURE

Shunroku Taya, Mito; Katsunobu Abe, and Atsushi Shibata, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 339,449, Dec. 31, 1981. This application Mar. 13, 1984, Ser. No. 588,981
Claims priority, application Japan, May 2, 1980, 55-57838; PCT Int'l Appl., Apr. 27, 1981, PCT/JP81/00099
Int. Cl.[4] H01J 37/317
U.S. Cl. 250—492.2 9 Claims



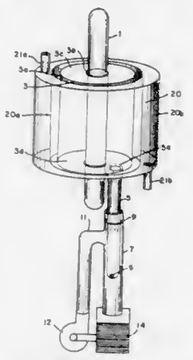
1. An ion implantation apparatus for the manufacture of semiconductor devices comprising:
- an ion source for emitting an accelerated ion beam including ions having a first energy level, ions having a second energy level, said second energy level being greater than said first energy level, and neutral particles;
- a mass-separating means for deflecting the ion beam depending upon the mass;
- a slit for selectively permitting the passage of the deflected ion beam, so that said ions of said second energy level are passed through said slit, and ions of said first energy level are intersected with said slit;
- a first deflection means installed between said mass-separating means and said slit to deflect both ions of said first energy level and said second energy level in the same direction as the deflection direction of said mass-separating means so that said ions of said first energy level are deflected by a different distance in said direction than said ions of said second energy level to separate said ions of said first energy level from ions of said second energy level;
- a second deflection means provided between said first deflection means and said slit to deflect the ion beam in the direction perpendicular to that of said mass-separating means wherein said ions of said second energy level are deflected by said first and second deflection means to be directed through said slit toward a predetemined point, said ions of said first energy level are deflected such that they do not pass through said slit and are not directed toward said predetermined point, and said neutral particles remain undeflected by either of said first or second deflection means so that said neutral particles are separated from ions of said first energy level and said second energy level and are not directed toward said predetermined point.

4,839,524

FILTER FOR ISOTOPIC ALTERATION OF MERCURY VAPOR

Mark W. Grossman, Belmont, and William A. George, Gloucestor, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 947,216, Dec. 29, 1986, Pat. No. 4,800,284. This application Jul. 22, 1988, Ser. No. 223,148
Int. Cl.[4] G01N 21/00
U.S. Cl. 250—505.1 2 Claims



1. A filter for altering ^{196}Hg isotope of a mercury feedstock including ^{196}Hg isotope in a mercury feedstock which flows through a reactor, said filter comprising:
- an enclosure, at least a portion of which is transparent to the passage of ultraviolet light; and
- a fill of vapor that produces radiation which excites a chemical reaction in isotopic forms of mercury, and hydrogen included in said enclosure.

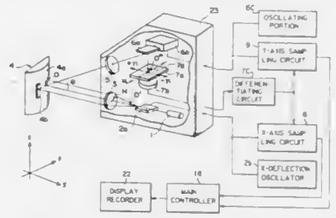
4,839,525

METHOD OF AND APPARATUS FOR MEASURING COORDINATES OF EDGES OF TAPE

Yukio Kano; Kuniyuki Yoshikawa; Hideaki Kishida; Hiroshi Ito, and Mitsutoshi Maeda, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho and Kabushiki Kaisha Toyota Chuo Kenkyusho, both of Aichi, Japan

Filed Sep. 9, 1987, Ser. No. 94,751
Claims priority, application Japan, Sep. 10, 1986, 61-213429
Int. Cl.[4] G01N 21/86
U.S. Cl. 250—560 7 Claims

1. A method of measuring the coordinates of an object with respect to a coordinate system, comprising the steps of:
- (a) attaching a tape having edges to a surface of said object to be measured such that at least one edge of said tape is placed along a measurement line on said surface, said tape and said surface differing from each other in reflectance;
- (b) projecting a spot beam in a scanning manner onto an area of said surface of said object that includes said edges of said tape such that said area reflects said spot beam, said scanning being accomplished by deflecting said spot beam within a predetermined width which allows said spot beam to traverse said edges; and
- (c) detecting the portion of said area at a predetermined angle with respect to the direction of the projection of received spot beam, where the reflectance of said reflected spot beam varies sharply, and producing signals representative of said detected reflectance; and



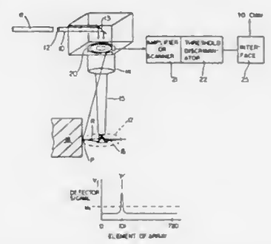
- (d) processing said signals to obtain the two-dimensional coordinates of said edges of said tape and thereby determine the position of said object.

4,839,526

COORDINATE MEASURING METHOD AND DEVICE

Timothy R. Pryor, Tecumseh, Canada, assignor to Diffracto Ltd., Windsor, Canada

Continuation of Ser. No. 831,724, Feb. 21, 1986, Pat. No. 4,594,184, Division of Ser. No. 592,028, Mar. 22, 1984, Pat. No. 4,583,000, Continuation of Ser. No. 207,081, Nov. 14, 1980, Pat. No. 4,453,082. This application Sep. 2, 1987, Ser. No. 92,361
The portion of the term of this patent subsequent to Jun. 5, 2001, has been disclaimed.
Int. Cl.[4] G01N 21/86
U.S. Cl. 250—561 17 Claims



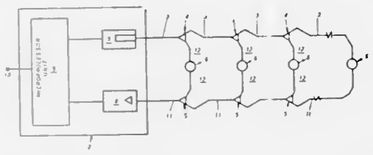
1. An apparatus for optically sensing the presence of an object at a predetermined point along a line extending from a reference axis comprising:
- a light directing means for directing a light beam outwardly from adjacent the reference axis along the line whereby a spot of light is formed on the object where the object is located along the line at the predetermined point;
- a light detector means for detecting a spot of light imaged thereon;
- an image forming means for forming an image of the spot of light on said light detector means only when the spot of light is formed on the object at the predetermined point from the reference axis; and
- a presence detecting means for detecting the presence of the image of the spot of light on said light detector means and for indicating the presence of the object at the predetermined point along the line.

4,839,527

OPTICAL-FIBRE SMOKE DETECTION/ANALYSIS SYSTEM

Alan Leitch, 11 Hampden Street, Beverly Hills 2209, New South Wales, Australia

Filed Oct. 27, 1987, Ser. No. 113,556
Claims priority, application Australia, Oct. 28, 1986, PH8724
Int. Cl.[4] G08B *17/10*
U.S. Cl. 250—573 11 Claims



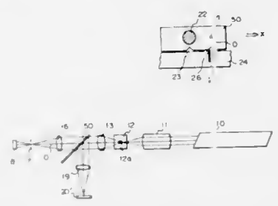
1. A sensor system, comprising:
a source adapted to emit electromagnetic energy signals of predetermined frequencies,
detection means having at least one detection cell adapted to admit gaseous substances into the path of said electromagnetic energy signals,
a receiver adapted to receive resultant electromagnetic energy signals after transmission of said electromagnetic energy signals through said detection means;
an optical fiber circuit connecting said detection means to said source and to said receiver, and microprocessor means adapted to control the emission of said electromagnetic energy signals of predetermined frequencies and to process said resultant electomagnetic energy signals returned to said receiver by spectrophotometry to identify the composition of said gaseous substances.

4,839,528

PARTICLE ANALYZING APPARATUS USING AN AFOCAL LIGHT BEAM

Yuji Itoh, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1987, Ser. No. 49,522
Claims priority, application Japan, May 17, 1986, 61-112987; Mar. 30, 1987, 62-078211
Int. Cl.[4] G01N *15/00, 21/51*
U.S. Cl. 250—574 7 Claims



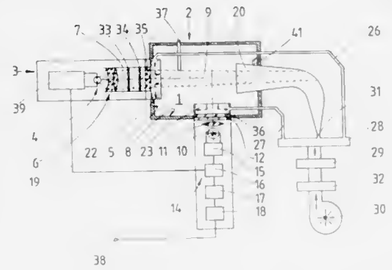
1. A particle analyzing apparatus comprising:
an irradiating system for applying a light to particles to be examined in a cell;
means for converting the scattered light from the particles to be examined to an afocal light beam;
a beam splitter provided in the afocal light beam;
a photometering system provided in a first optical path branched off by said beam splitter for photometering the scattered light from the particles to be examined;
an observation system provided in a second optical path branched off by said beam splitter for observing the cell;
a stopper for eliminating a direct light from said irradiating system and preventing direct light from reaching said photometering system is provided on a reflecting surface of said beam splitter, said stopper being provided on the optical axis of said beam splitter; and
a total reflection area for observing the cell, said total reflection area being provided discretely from said stopper, with said total reflection area being on said beam splitter and being larger than said stopper.

4,839,529

ARRANGEMENT FOR IN SITU DETERMINATION OF QUANTITY OF TURBID MATTER AEROSOL AND/OR DUST IN FLUID WHICH FLOWS THROUGH A SPACE

Frank Fruengel, Hamburg-Schenefeld, Fed. Rep. of Germany, assignor to Impulsphysik GmbH, Hamburg-Schenefeld, Fed. Rep. of Germany

Filed Aug. 18, 1987, Ser. No. 86,688
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1986, 3628072; European Pat. Off., Jul. 3, 1987, 87109609.5
Int. Cl.[4] G01N *21/53*
U.S. Cl. 250—574 50 Claims



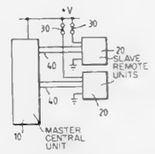
1. An arrangement for in situ determination of the quantity of aerosol in a flue gas which freely flows through a space in situ by measurement of light scattered on particles of aerosol which freely flows in the space, characterized by an optical transmitter with a light source which emits a light into the space in situ toward the freely flowing aerosol; and a detector which is arranged so that from the light emitted by the optical transmitter it receives only light which is scattered on the particles of the aerosol which freely flows in the space in situ.

4,839,530

INFORMATION HANDLING AND CONTROL SYSTEMS

Jeremy J. Greenwood, Sutton Coldfield, England, assignor to Salplex Limited, United Kingdom

Filed Jan. 7, 1988, Ser. No. 141,537
Int. Cl.[4] B62D *45/00*; J02J *1/00*
U.S. Cl. 307—10.1 9 Claims



1. An information handling and control system, comprising:
(a) a central unit and a plurality of remote units each connected to the central unit by a respective signalling link;
(b) battery means for operating the system when connected to the central unit and to at least some of the remote units;

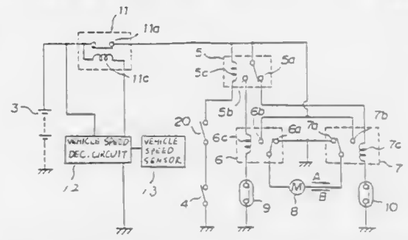
(c) said central unit including processing and control means and power supply means, the latter being turned on to operate the processing and control means in an active mode of the system and being turned off in a sleep mode of the system;
(d) said processing and control means being operative for applying, during said active mode, an operation voltage in pulse form to a data line in each signalling line;
(e) one of said data lines being connected to power supply control means in the central unit and to activation voltage drive means in the respective remote unit;
(f) said power supply control means and the activation voltage drive means being fed by the battery means during both the sleep mode and the active mode;
(g) said activation voltage drive means being enabled during the sleep mode by operation of an activation switch connected to that remote unit so as to apply an activation voltage, different from said operation voltage, to that data line;
(h) said power supply control means being enabled responsive to the activation voltage so as to turn on the power supply means; and
(i) said activation voltage drive means being then disabled responsive to the operation voltage consequently applied at the start of the active mode.

4,839,532

CONTROL SYSTEM FOR VEHICULAR PASSIVE SEAT BELT ARRANGEMENT

Yoshiki Kokuryo, Yokohama; Sachiro Kataoka, Ebina; Tomokazu Inaba, Yokohama; Kazuyoshi Terunuma, Chofu, and Toshiharu Asano, Tokyo, all of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Jun. 5, 1987, Ser. No. 58,771
Claims priority, application Japan, Jun. 5, 1986, 61-85537[U]
Int. Cl.[4] B60R *22/04, 22/48*
U.S. Cl. 307—10.3 5 Claims



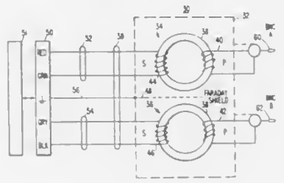
1. A control system for a vehicular passive seat belt arrangement comprising:
driving means for operating the passive seat belt arrangement and selectively taking a restrained state in which the seat belt arrangement restrains an occupant to the vehicle and a released state in which the seat belt arrangement does not restrain the occupant, said driving means including an electric motor which operates in a first direction to put said driving means into the restrained state upon being supplied with a first directional current and in a second direction to put said driving means into the released state upon being supplied with a second directional current which is opposite in direction to the first directional current;
a door handle installed on the inside of a door of the vehicle and located so as to be operable by the occupant and being operated when the occupant opens the door;
switching means for enabling only the first directional current to flow through said electric motor when said door handle is not operated and enabling only the second directional current to flow through said electric motor when said door handle is operated; and
speed-sensitive preventing means for preventing the second directional current from being supplied to said electric motor when the vehicle is moving.

4,839,531

COMPUTER NETWORK INTERCONNECTING APPARATUS

Duane G. Stemmons, Wichita, and John P. Noonan, Derby, both of Kans., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 14, 1987, Ser. No. 108,069
Int. Cl.[4] H02J *3/00*; H03H *5/00*
U.S. Cl. 307—17 7 Claims



1. Apparatus for interconnecting a computer to a network comprising:
a housing of conductive material;
a pair of toroidal transformers mounted in said housing, each of said transformers comprising a toroidal core of ferrite material, a balanced winding, and an unbalanced winding;
a pair of first connection means for receiving a balanced conductor, each of said first connection means being connected to a separate one of said balanced windings; and
a pair of second connection means mounted on said housing for receiving an unbalanced conductor, each of said second connection means being connected to a separate one of said unbalanced windings.

4,839,533

REMOTE SAFETY SWITCH

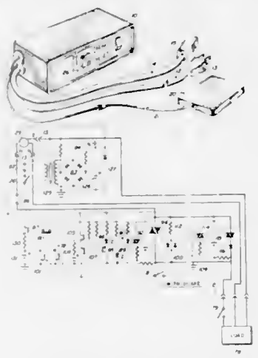
Steven M. Aga, 6337 W. Ocotillo Rd., Glendale, Ariz. 85301

Filed Nov. 24, 1986, Ser. No. 934,353
Int. Cl.[4] H01H *3/14*
U.S. Cl. 307—140 7 Claims

1. A safety switch system for an electrically operated device having on/off switch means with an on position and an off position for respectively connecting and disconnecting such device from a source of electric current through a power cord, including in combination:
a source of relatively high voltage electric current;
means coupled with said source of relatively high voltage electric current for providing relatively low voltage power;
an electronic switch having a control input and connected in series between said source of relatively high voltage electric current and said power cord for said on/off switch means for controlling the application of current from said source of relatively high voltage electric current to said power cord in response to control signals applied to the control input thereof;
reset means coupled with said low voltage power means for

operation thereby and responsive to the condition of operation of said on/off switch means and further coupled to the control input of said electronic switch for preventing the resupplying of current from said source of relatively high voltage electric current to said power cord through said electronic switch until said on/off switch means first is operated from its off position to its on position;

safety switch means including a cut-off switch having first and second states of operation, coupled between said means for providing relatively low voltage power and the



control input of said electronic switch for applying said control signals to the control input of said electronic switch; and

means coupled to said reset means for operating said reset means to prevent the resupplying of current from said source of relatively high voltage electric current to said power cord following a temporary loss of power from said source of relatively high voltage electric current to prevent operation of said device until said on/off switch means is turned off and then back on with said cut-off switch in a predetermined one of its first and second states of operation.

4,839,534

METHOD AND APPARATUS FOR ESTABLISHING A SYSTEM CLOCK IN RESPONSE TO THE LEVEL OF ONE OF TWO CLOCK SIGNAL SOURCES

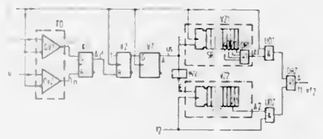
Peter-Michael Clasen, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 16, 1987, Ser. No. 109,840

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1986, 3635294

Int. Cl.[4] H03K *5/13;* **H03L** *7/00*

U.S. Cl. 307—269 **5 Claims**



1. A method for supplying a line with system clock signals which are formed either form first clock signals over a first line (t1) having level fluctuations or are formed from digital block pulses transmitted via a second line (t2), in response to the level of the clock signals transmitted on the first line, comprising the steps of:

comparing each of said first clock signals (t1) with a lower and with an upper level threshold (u1,u2) and, in the case of transgression of the upper level threshold (u1), forming a setting signal (si) and, given downward transgression of the lower level threshold (u2), forming a reset signal (ri);

forwarding said setting signal and said reset signal to the set and reset inputs (S,R) of a first trigger circuit;

conducting an output signal (i) formed by the first trigger circuit (K1) to a reset input (R) of a second trigger circuit (K2) clocked by a clock signal (tl) on said first line;

in the case of a downward transgression of the lower level threshold (u2) occurring following an upward transgression of the upper level threshold (u1), conducting an information change signal (us) from an output of the second trigger circuit (k2) to an input of a first logic element (UD1) with a prescribed, first time delay period, to suppress forwarding of the clock signals (Tl) to a line with the system clock and, simultaneously, delaying the output signals of the second trigger circuit (K2) by a second time period longer than the first time period and supplying them to a first input of a second logic element (UD2) to conduct the clock pulses (t2) from said second line to an output of the second logic element (UD2);

and in the case of a downward transgression of the upper level threshold (ul) occurring following a preceding upward transgression thereof, conducting the information change (us) to said second logic element (UD2) delayed with said first time period, whereby the output of said second logic element (UD2) is inhibited; and simultaneously delaying the information change (us) by a third time period which is shorter than the first time period and supplying the information change signal (us) to said first logic element (UD1), whereby the clock signals (t1) are forwarded to an output of the first logic element (UD1); and

conducting the clock signals (t1) or the clock pulses (t2) to different inputs of a logic element (OR2) whereby either the clock signals (t1) or the clock pulses (t2) are manifested as system clock pulses at an output thereof.

4,839,535

MOS BANDGAP VOLTAGE REFERENCE CIRCUIT

Ira Miller, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 22, 1988, Ser. No. 158,423

Int. Cl.[4] H03K *3/26, 3/01*

U.S. Cl. 307—296.7 **21 Claims**

15. A circuit comprising:

a first supply voltage terminal;

a second supply voltage terminal;

current source means having a voltage output terminal and a current output terminal for mirroring a first current sourced from said voltage output terminal to said current output terminal;

a first bipolar transistor having a collector coupled to said first supply voltage terminal, a base coupled to said current output terminal, and having an emitter;

a second bipolar transistor having a collector coupled to said first supply voltage terminal, a base coupled to said current output terminal, and having an emitter;

first MOS current mirror means coupled between the emitter of said first bipolar transistor and said second supply voltage terminal, and coupled to said voltage output terminal for sinking a second current from the emitter of said first bipolar transistor;

second MOS current mirror means coupled between the emitter of said second bipolar transistor and said second supply voltage terminal, and coupled to a bandgap reference node for sinking a third current from the emitter of said second bipolar transistor and sinking a fourth current from the bandgap reference node;

first means coupled between the base of said second bipolar transistor and the bandgap reference node for providing an output voltage at the bandgap reference node;

start-up means coupled between said first and second supply voltage terminals, and coupled to said voltage output terminal for sinking a start-up current from said voltage output terminal when power is initially applied to said first and second supply voltage terminals;

output means coupled between said first and second supply voltage terminals, and coupled to the bandgap reference node, and having a feedback terminal and an output terminal for providing an output voltage at said output terminal; and

feedback means coupled between said first and second supply voltage terminals, and coupled to said current source means, and to the emitter of said second bipolar transistor for providing a feedback voltage to improve the bandgap voltage reference stability.

4,839,536

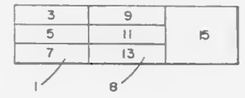
OPTICALLY NONLINEAR PYRIDINE-N-OXIDE COMPLEXES

Margaret C. Etter, St. Paul; Gayle M. Frankenbach, Minneapolis, and Thomas W. Panunto, St. Paul, all of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

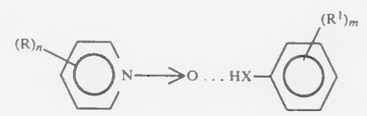
Filed Nov. 24, 1987, Ser. No. 124,886

Int. Cl.[4] H03F *7/00*

U.S. Cl. 307—425 **14 Claims**



1. A nonlinear optical device comprising, in combination: a harmonic-generating medium, means for introducing coherent radiation into said harmonic-generating medium to produce at least second harmonic generation, wherein said medium consists essentially of a crystalline body of an organic compound of the formula:



wherein n is about 0–5, m is about 0–5, R^1 is individually $-NO_2$, $-OR^2$, $-CN$, $-NR^2R^3$, $-CH_3$, $-CO_2H$, halo,

$$-\overset{\overset{O}{\|}}{C}NR^2R^3,\quad -\overset{\overset{O}{\|}}{C}NHCR^2 \text{ or } -NR^2\overset{\overset{O}{\|}}{C}NR^2R^3,$$

R is individually $-NO_2$, $-CH_3$, $-OR^2$, $-NR^2R^3$, $-CN$,

$$-\overset{\overset{O}{\|}}{C}NR^2R^3,\quad -\overset{\overset{O}{\|}}{C}NHCR^2 \text{ or } -NR^2\overset{\overset{O}{\|}}{C}NR^2R^3,$$

and X is —O—, —S—, $-N(R^2)-$,

$$-O-\overset{\overset{O}{\|}}{C}-,\quad -N(R^2)-\overset{\overset{O}{\|}}{C}-,\quad -\overset{\overset{O}{\|}}{C}- \text{ or } -C\equiv C-;$$

and wherein R^2 and R^3 are individually H, $(C_1$–$C_5)$alkyl, aryl or ar$(C_1$–$C_5)$alkyl.

4,839,537

BICMO LOGIC CIRCUIT

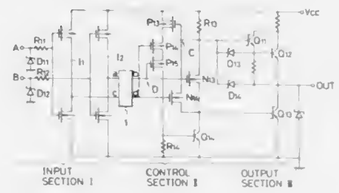
Masaji Ueno, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 16, 1987, Ser. No. 120,959

Claims priority, application Japan, Nov. 29, 1986, 61-285077; Jun. 29, 1987, 62-159884

Int. Cl.[4] H03K *19/02, 17/16, 19/094*

U.S. Cl. 307—446 **7 Claims**



1. A logic circuit comprising:

first and second bipolar transistors connected in series between a high voltage source and a low voltage source;

an output terminal connected between an emitter terminal of said first transistor and a collector terminal of said second transistor;

a first MOS transistor of a first channel type connected between respective base terminals of said first and second bipolar transistors;

an element having a first terminal connected to said high voltage source and a second terminal connected to the base terminal of said first bipolar transistor for increasing voltage level at the base terminal of said first bipolar transistor when said first MOS transistor is turned off and decreasing the voltage level at the base terminal of said first bipolar transistor when said first MOS transistor is turned on;

a third bipolar transistor connected between the base terminal of said second bipolar transistor and said low voltage source; and

a second MOS transistor of a second channel type opposite to said first channel type and a third MOS transistor connected to said second MOS transistor in series, a base terminal of said second MOS transistor being supplied with a logical input signal,

said third MOS transistor having a base terminal connected to the base terminal of said first or second bipolar transistors and being adapted to be turned on when said first MOS transistor is turned on and to be turned off when said first MOS transistor is turned off.

4,839,538

IMPACT BIPOLAR INTEGRATED CIRCUIT DESIGNED TO ELIMINATE OUTPUT GLITCHES CAUSED BY NEGATIVE CHIP GROUND SPIKES

Susan A. Curtis, Howe, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 16, 1986, Ser. No. 942,554

Int. Cl.[4] H03K *19/003, 19/088, 19/084, 17/06*

U.S. Cl. 307—456 **6 Claims**

1. A circuit for compensating for ground glitches in integrated circuits comprising:

(a) an integrated circuit having an input node and a variable internal ground having a predetermined desired reference voltage level, and

(b) compensating means coupled between said input node

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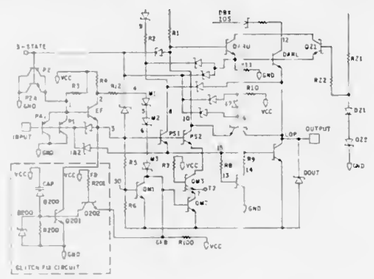
and said internal ground, said compensating means including:

(c) normally non-conducting switch means coupled between said input node and said internal ground,

(d) control means responsive to a negative voltage level of predetermined minimum magnitude from said predetermined desired reference voltage level at said internal ground for causing said switch means to become conducting to lower the voltage level of said input node in the



direction of said predetermined desired reference voltage level, and

(e) feedback means responsive to a predetermined condition in said integrated circuit to inhibit operation of said control means, wherein said feed back means comprises a transistor having first and second main electrodes and a control electrode, said first electrode being coupled to a node in said integrated circuit which is out of phase with said input and about one V_{on} above said internal ground.

4,839,539

PARTIALLY ENABLED PROGRAMMABLE LOGIC DEVICE

Akira Takata, Amagasaki, and Takeo Obata, Osaka, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 8, 1987, Ser. No. 93,976

Claims priority, application Japan, Sep. 11, 1986, 61-215552

Int. Cl.[4] H03K *19/177*

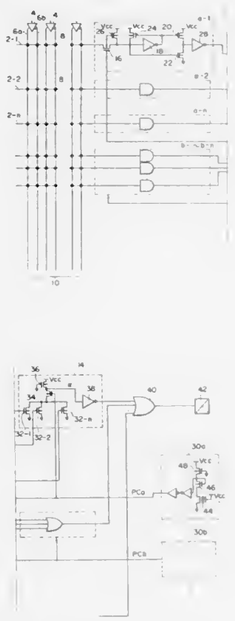
U.S. Cl. 307—465 **9 Claims**

1. A programmable logic device, comprising:

an AND plane, including a plurality of input lines, a plurality of product term lines, and a plurality of programmable elements each disposed at one of selected intersections between aid input and product term lines;

an OR plane operatively coupled to said AND plane; and

activating means for activating at least one of said plurality of product term lines selectively, said activating means including a switch connected between each of selected ones of said plurality of product term lines and said OR



plane and electing means for supplying a selection signal to each of said witches.

4,839,540

TRI-STATE OUTPUT CIRCUIT

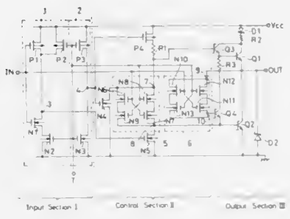
Masaji Ueno, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 31, 1988, Ser. No. 176,245

Claims priority, application Japan, Mar. 31, 1987, 62-76474

Int. Cl.[4] H03K *19/017, 17/16, 19/094, 19/092*

U.S. Cl. 307—473 **10 Claims**



1. A tri-state output circuit which comprises:

(a) an input section having a NOR gate circuit receptive of an input signal and a tri-state signal for taking an inverse OR logical sum, and an invertor circuit receptive of the tri-state signal for producing an inverted signal thereof, each of said circuits consisting of a plurality of complementary field effect transistors;

(b) a control section having

a first field effect transistor having a first conductivity type and a second field effect transistor having a second conductivity type, each of the gate terminals thereof being commonly connected to an output terminal of said invertor circuit, each of the source terminals thereof being connected to either a power supply or to a ground potential respectively,

a third field effect transistor of said second conductivity type having its gate terminal being connected to an output terminal of the NOR gate circuit and its source being connected to the ground potential,

a first electric current control circuit having a plurality of field effect transistors of said second conductivity type, coupled to said first, second, and third field effect transistors and

a second electric current control circuit having a plurality of field effect transistors of said second conductivity type, each gate of said transistors being connected to either an input terminal or to the tri-state terminal respectively; and

(c) an output section having first and second output transistors, and third and fourth transistors, said third transistor being Darlington-connected to said first output transistor, with its base terminal connected to one of the junction points of the first electric current control circuit, said fourth transistor being Darlington-connected to said second output transistor, with its base terminal connected to one of the junction points of the second electric current control circuit.

4,839,541

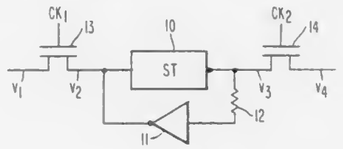
SYNCHRONIZER HAVING DUAL FEEDBACK LOOPS FOR AVOIDING INTERMEDIATE VOLTAGE ERRORS

Laszlo V. Gal, Poway; Fernando W. Arraut, and Christopher H. Khosravi, both of San Diego, all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Jun. 20, 1988, Ser. No. 208,464

Int. Cl.[4] H03K *19/096, 3/29, 5/13, 19/094*

U.S. Cl. 307—481 **10 Claims**



1. A circuit, for synchronizing a digital input signal with a clock where said digital input signal changes asynchronously with respect to said clock, said circuit being comprised of:

a Schmitt trigger in combination with an inverter;

said Schmitt trigger having an output terminal which is coupled through a resistor to an input terminal on said inverter, and said inverter having an output terminal which is coupled directly to an input terminal on said Schmitt trigger; and

a transistor means, having an output terminal which is coupled to said input terminal of said Schmitt trigger and having two input terminals that respectively receive said clock and said input signal, for passing a sample of said input signal in response to said clock to said Schmitt trigger input terminal;

wherein said Schmitt trigger together with said inverter operate on said sample to produce a signal on said Schmitt trigger output terminal, which represents said input signal and is synchronized with said clock.

4,839,542

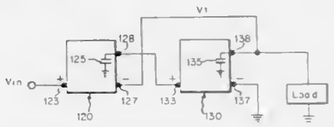
ACTIVE TRANSCONDUCTANCE FILTER DEVICE

Jeffrey I. Robinson, New Fairfield, Conn., assignor to General DataComm Industries, Inc., Middlebury, Conn.

Filed Aug. 21, 1984, Ser. No. 642,912

Int. Cl.[4] H03K *5/00;* **H03B** *1/00*

U.S. Cl. 307—520 **12 Claims**



1. An nth order high pass filter, n being an integer number greater than one, comprising:

a frequency independent amplifier having a positive differential input, a negative differential input, and an output;

an nth order low pass filter, n being an integer number greater than one, comprising:

n transconductance integrator devices connected in series, each said device comprising:

a transconductance amplifier having at least a differential input and an output, said amplifier having an output current that is proportional to the difference in voltages applied to its differential input; and

a capacitor connected between an output terminal of said amplifier output and ground, said capacitor coacting with the transconductance of said amplifier to provide an integrator gain g_m/C, where g_m is the transconductance of said amplifier and C is the capacitance of said capacitor;

means for connecting a positive differential input of each said device, except for the first device, to the output of the device immediately preceding it in the series;

means for connecting a negative differential input of a last such device to ground; and

means for connecting a negative differential input of each said device, except for the last such device, to the output of the device immediately following it in the series;

means for connecting an output of said frequency independent amplifier to the input of the nth order low pass filter;

means for connecting an output of said low pass filter to the negative differential input of said frequency independent amplifier; so that when said positive differential input terminal of said frequency independent amplifier has applied to it an input signal to be filtered said output of said frequency independent amplifier generates an electrical signal having a high band pass frequency spectrum and about an nth order attenuation at a lower end of said spectrum.

4,839,543

LINEAR MOTOR

Bruce E. Beakley, and Thomas E. Flanders, both of Houston, Tex., assignors to Trilogy Systems Corporation, Houston, Tex.

Filed Feb. 4, 1988, Ser. No. 152,315

Int. Cl.[4] H02K *41/02*

U.S. Cl. 310—12 **16 Claims**

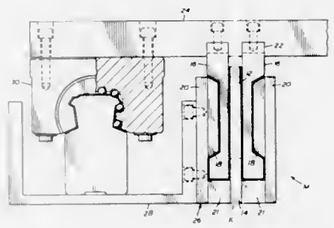
1. A linear motor, comprising:

a plurality of magnets aligned in a row forming a magnet plane and having a longitudinal axis, said magnets aligned with alternating pole orientations on the faces of said magnet plane;

first and second coil assemblies, each coil assembly located substantially in a plane substantially parallel to said magnet plane and on opposite sides of said magnet row,

each of said coil assemblies formed of a plurality of individual coil loops having sides and ends, said loop sides being

substantially perpendicular to the magnet row longitudinal axis and said loop ends being substantially parallel to the magnet row longitudinal axis, said individual coil loops connected to form at least two phases and at least two poles per phase; and



first and second magnetic circuit completing means, each means located in a plane substantially parallel to said magnet plane and located outside of said coil assemblies.

4,839,544

APPARATUS FOR DRIVING A CURTAIN

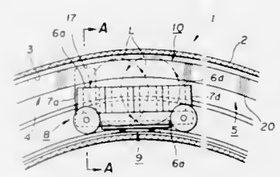
Masanori Sakai, Nagano, Japan, assignor to Johnan Seisakusho Co., Ltd., Ueda, Japan

Filed Mar. 4, 1988, Ser. No. 164,227

Claims priority, application Japan, Mar. 6, 1987, 62-52303

Int. Cl.[4] H02K *41/00;* **A47H** *5/02*

U.S. Cl. 310—12 **2 Claims**



1. A driving apparatus of a curtain comprising:

a linear motor disposed in a curtain rail including a curved portion, said linear motor including a field portion having a yoke and a magnet group disposed along said yoke and having magnetic poles disposed alternately so that adjacent poles are differnet from each other;

a movable portion movably guided on said curtain rail and including a core base opposed to said magnet group and having rollers each with a shaft disposed perpendicular to an attraction direction;

a plurality of cores projecting from said core base toward said magnet group and integrally formed in said core base with coils wound on said cores; and

a commutator for switching the polarity for said movable portion, whereby an end of a curtain being attached to said movable portion of the curtain is opened and closed by movement of said movable portion.

4,839,545

COOLING SYSTEM FOR LINEAR MOTOR

Anwar Chitayat, Duck Island, P.O. Box 107, Northport, N.Y. 11768

Filed Oct. 16, 1987, Ser. No. 109,204

Int. Cl.[4] H02K *41/00*

U.S. Cl. 310—12 **11 Claims**

1. Apparatus for cooling linear motor comprising:

an armature including a magnetic metal portion having windings adjacent a first surface thereof;

at least one coolant channel opening outward from a second surface of said magnetic metal portion:

said at least one coolant channel including means for receiving a coolant inflow and means for delivering a coolant outflow;

said at least one coolant channel including a sealing plate covering said coolant channel; and

means for preventing loss of coolant from said at least one coolant channel.

4,839,546

ROTATIONAL NOISE REDUCTION STRUCTURE IN DC MOTOR WITH ROTOR MAGNETS

Haruo Kitahara, Iijima, Japan, assignor to Shinano Tokki Corporation, Tokyo, Japan

Filed Oct. 6, 1987, Ser. No. 106,623

Claims priority, application Japan, Mar. 2, 1987, 62-45294

Int. Cl.[4] H02K *5/24*

U.S. Cl. 310—51 **6 Claims**

1. A magnet rotor type dc motor, said motor having a stator core and a rotor magnet, characterized in that the magnetic center plane of said rotor magnet, providing for a maximum value of the magnetic flux density, is spaced from the geometric center plane of the rotor magnet and is axially aligned with the geometric center plane of said stator core to attract said stator core toward the magnetic center plane of the rotor magnet instead of toward the geometric center plane of the rotor magnet, whereby rotational noise of the motor is suppressed.

4,839,547

MOTOR FRAME AND MOTOR WITH INCREASED COOLING CAPACITY

Robert E. Lordo, Forth Mill, S.C., and Walter E. Rudisch, Ft. Lauderdale, Fla., assignors to Wertec Corporation, Pineville, N.C.

Filed Mar. 28, 1988, Ser. No. 174,228

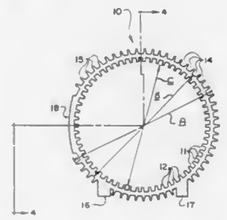
Int. Cl.[4] H02K *9/00*

U.S. Cl. 310—60 A **18 Claims**

1. A frame for an electric machine characterized by increased cooling capacity, and comprising:

(a) an integral frame member having a pre-determined length defined by outer walls and inner walls, said inner walls defining a through void within which to accommodate stationary and rotating parts of the machine;

(b) a multitude of closely spaced-apart outer fins integrally-formed with and projecting outwardly from the outer walls of said frame member for convection cooling of the frame by fluid contact with the enlarged surface area of the fins; and



(c) a multitude of closely spaced-apart inner fins integrally-formed with and projecting inwardly from the inner walls of said frame member into the void defined thereby for, the innermost ends of said fins adapted to support thereon the stationary parts of the machine, and being flat for providing a relatively large surface area of support for the stationary parts of the machine.

4,839,548

ADJUSTABLE ROLLER DYNAMO WITH TORSION SPRING

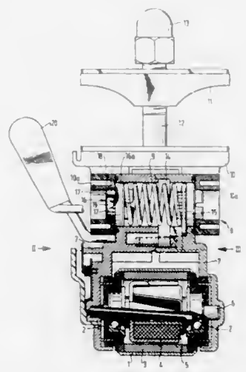
Hans Bech, Fröndenberg/Ruhr, Fed. Rep. of Germany, assignor to Union Sils, Van de Loo & Co., Frondenberg/Ruhr, Fed. Rep. of Germany

Filed Mar. 14, 1988, Ser. No. 167,566

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1987, 8703886

Int. Cl.[4] H02K *5/26;* **F16F** *1/06*

U.S. Cl. 310—67 A **10 Claims**



1. A roller generator for a bicycle, comprising:

a support having a median plane and being operatively connected with a bicycle, said support provided with a cylindrical bore traversing said support along a pivoting axis perpendicular to said median plane, the support being formed with:

a first cylindrical lug coaxial with said bore,

a second cylindrical lug coaxial with said bore and spaced from said first lug along said pivoting axis, said second lug being formed with a cavity having an inner peripheral surface, said surface provided with uniformly spaced apart formations,

a first bearing axially fixed in said first lug in said bore,

a second bearing having means for engaging with said formations, said second bearing axially movable along said pivoting axis in said bore, and

a torsion spring biased between said first and second bearings, so that said torsion spring being wound up by externally actuated axially movable second bearing pushes said second bearing back to said second lug upon termination of the external actuation for an angularly engaging said means with said formations at selective angular positions; and

a rotor operatively connected with said torsion spring and rotatable about an axis of rotation parallel to said pivoting axis, so that said rotor presses a tire of the bicycle with a force induced by said torsion spring and dependent upon said certain angular positions defining the angular engagement of said means for engaging with said formations.

4,839,549

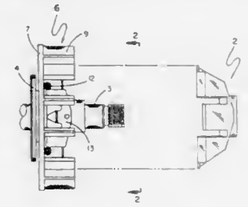
COVER ASSEMBLY TO PROTECT AN ELECTRIC MOTOR CENTRIFUGAL ACTUATOR

Nicholas R. Daniels, St. Louis County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 4, 1988, Ser. No. 177,058

Int. Cl.[4] H02K *5/10, 9/06*

U.S. Cl. 310—68 E **8 Claims**



1. In an electric motor rotor shaft assembly on which is compactly mounted a blower and a centrifugal actuator having spring-loaded lever members, the blower having a back plate with spaced blade members projecting therefrom to extend in radial fashion on said back plate between centrally disposed recess means in said back plate and the outer periphery of said back plate with said spaced blade members forming passageways extending therebetween in communication with said recess means and with said spring-loaded lever members of said centrifugal actuator projecting freely through said centrally disposed recess means in said back plate, a cover assembly for said recess means in said back plate comprising:

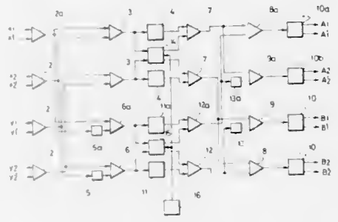
an open-ended cover member adapted to be mounted on said rotor shaft and the central portion of said back plate in spaced relation from the outer periphery thereof and in cooperative covering relation with said centrally disposed recess means in said back plate of said blower, said cover member including end and side walls with said end wall snuggly gripping said rotor shaft and said end and side walls being sized and shaped along the external surface thereof to efficiently direct air flow to said blade members on said back plate and spacedly surround said centrifugal actuator extending through said recess means to cover said recess means and said lever members of said centrifugal actuator projecting therethrough to prevent particulate contaminant build-up on said centrifugal actuator.

4,839,550

CONTROLLED TYPE MAGNETIC BEARING DEVICE

Takeshi Mizuno, and Toshiro Higuchi, both of Tokyo, Japan, assignors to Seiko Seiki Kabushiki Kaisha, Chiba, Japan

Continuation of Ser. No. 550,960, Nov. 10, 1983. This application Dec. 13, 1985, Ser. No. 808,237
Int. Cl.[4] F16C *39/06*
U.S. Cl. 310—90.5 3 Claims



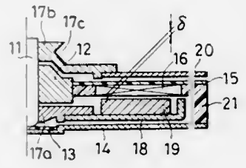
1. A magnetic bearing apparatus for magnetically rotatably supporting a rotatable body for rotation about a rotating axis comprising: a pair of radial magnetic bearings disposed in axially spaced relation along the rotatable body, each radial magnetic bearing having at least two electromagnets operative when excited to produce a magnetic field for magnetically rotatably supporting the rotatable body in radial directions; sensing means associated with each radial magnetic bearing for sensing the radial deviation of the rotatable body along at least two radial axes and producing corresponding output signals; and circuit means responsive to the output signals for deriving therefrom compensating signals effective to suppress any swing rotation of the rotatable body about the rotating axis during rotation of the rotatable body and for processing the compensating signals to produce control signals for controlling the excitation of the electromagnets so that they produce magnetic fields which effectively eliminate swing rotation of the rotating rotatable body, said circuit means including a static and a dynamic unbalance compensator circuit including in each circuit a crossing closed loop circuit comprised of a pair of integrators, a pair of adders and a pair of multipliers all interconnected in a crossing closed loop configuration.

4,839,551

BRUSHLESS MOTOR STRUCTURE ENABLING ACCURATE RELATIVE POSITIONING OF ROTOR AND STATOR COILS

Takehiko Tomisawa, Kakuda, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Mar. 25, 1988, Ser. No. 173,671
Claims priority, application Japan, Jul. 17, 1987, 62-109599
Int. Cl.[4] H02K *5/15*
U.S. Cl. 310—90 2 Claims



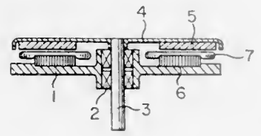
1. A brushless motor comprising:
a plurality of planar stator coils arranged circumferentially around a rotatable shaft;
a radial bearing for radially supporting said rotatable shaft;
a thrust bearing fixed to a center of a casing, said thrust bearing for axially supporting said rotatable shaft;
a stator coil supporting member formed of a resin material, said plurality of stator coils being integrally formed within said resin material, said radial bearing being integrally formed with, and totally supported by,
said stator coil supporting member, said casing being fixed to said stator coil supporting member;
a rotor magnet supported on a first yoke fixed to said rotatable shaft and opposed to a first side of said planar stator coils; and
a second yoke fixed to said rotatable shaft and opposed to a side of said planar stator coils opposite said first side.

4,839,552

BRUSHLESS DC MOTOR

Yosuke Takaba, Tokyo, Japan, assignor to Tamagawa Seiki Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1987, Ser. No. 55,030
Claims priority, application Japan, Jun. 11, 1986, 61-133835
Int. Cl.[4] H02K *29/00, 3/04*
U.S. Cl. 310—268 3 Claims



1. A brushless DC motor comprising in combination a rotatable shaft mounted in a bearing assembly in a stator housing, a disc-like rotor yoke having a flat central portion fixedly mounted on one end of said rotatable shaft perpendicular to the longitudinal axis of said shaft, a flat annular magnet member mounted on said central portion of said rotor yoke on the side of said yoke that faces said shaft, a return yoke of flat ring shape mounted on a face of said stator housing spaced from and facing said magnet member parallel thereto, a plurality of circumferentially extending cavities in said return yoke which cavities extend in the axial direction relative to said shaft completely through said return yoke and are spaced apart from each other in the radial direction relative to said shaft, as least one triangularly shaped generally flat driving coil mounted on said return yoke on the side facing said rotor yoke parallel to and spaced from said magnet member, whereby high speed motor operation is obtained with reduced core losses in said return yoke.

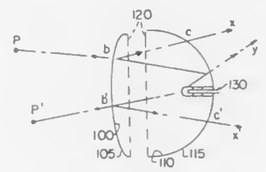
4,839,553

REFLECTOR LAMP HAVING COMPLEMENTARY DICHROIC FILTERS ON THE REFLECTOR AND LENS FOR EMITTING COLORED LIGHT

Charles E. Mellor, Salem, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Dec. 21, 1987, Ser. No. 135,804
Int. Cl.[4] H01K *1/26, 1/30*
U.S. Cl. 313—111 17 Claims

1. A reflector lamp which emits colored light, said lamp comprising:
(a) a reflector partially enclosing an interior, said reflector having a first dichroic filter thereon, said first filter having the ability to reflect a desired band of wavelengths of visible light and to transmit substantially all other wavelengths;
(b) a tungsten-halogen light-source capsule mounted within said interior; and
(c) a lens mounted on said reflector such that said interior is hermetically closed, said lens having a second dichroic filter thereon, said second filter having the ability to transmit said desired band of wavelengths of visible light and to reflect substantially all other wavelengths;



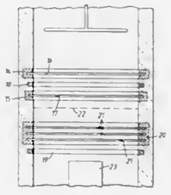
(d) whereby said lamp emits colored light, the color of said light being determined by said desired band of wavelengths of visible light.

4,839,554

APPARATUS FOR FORMING AN ELECTRON BEAM SHEET

Arthur Maitland, St. Andrews, Scotland; Ian A. Strudwick, and Clifford R. Weatherup, both of Chelmsford, United Kingdom, assignors to English Electric Valve Company Limited, Chelmsford, United Kingdom

Filed Aug. 28, 1987, Ser. No. 90,454
Claims priority, application United Kingdom, Aug. 30, 1986, 8621022
Int. Cl.[4] H01J *1/16*
U.S. Cl. 313—446 14 Claims



1. Apparatus for forming an electron beam sheet comprising an envelope filled with a gas, a metal cathode member in said envelope, having an elongate slot in a surface thereof, and an anode member in said envelope in a predetermined position relative to said cathode, such that on application of a suitably large potential difference between said anode and cathode members to produce electrical discharges in said gas so as to bombard said slot with ions of said gas, an electron beam sheet including secondary emission of electrons from surface of said slot is formed extensive in a direction away from said slot.

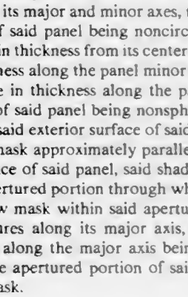
4,839,555

LAMINATED LIGHTING DEVICE

Patrick J. O'Mahoney, 18717 Nathans Place, Gaithersburg, Md. 20708

Continuation of Ser. No. 862,795, May 13, 1986, abandoned. This application Jul. 8, 1987, Ser. No. 85,541
Int. Cl.[4] H01J *5/22, 9/26, 61/36*
U.S. Cl. 313—493 22 Claims

1. A laminated lighting device comprising:
a base layer having an external lower surface and an internal upper surface;
a second layer disposed above said base layer, having an external upper surface and an internal lower surface;
an adhesive sealingly contacting said internal lower surface of said second layer with said internal upper surface of said base layer,
said adhesive being capable of bonding porous rigid materials, is transparent and non-conductive and capable of withstanding high temperatures, and capable of sealing the layers without giving off vapor which would interfere with the lighting device;



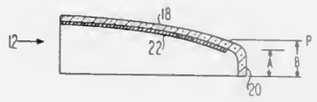
wherein at least one of said internal upper surfaces and said internal lower surface has at least one channel formed therein, each channel forming at least one opening in said device; and
vapor lighting means, in each channel, for emitting light in response to electrical power applied thereto.

4,839,556

CATHODE-RAY TUBE HAVING AN IMPROVED SHADOW MASK CONTOUR

Frank R. Ragland, Jr., Lancaster, Pa., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Feb. 25, 1983, Ser. No. 469,772
Int. Cl.[4] H01J *29/10, 29/86*
U.S. Cl. 313—408 8 Claims



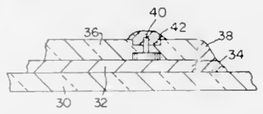
1. A rectangular cathode-ray tube including a substantially rectangular faceplate panel and a substantially rectangular shadow mask mounted within said panel, said panel and mask each having two long sides and two short sides with a central major axis of each paralleling the long sides and a central minor axis of each paralleling the short sides, said faceplate panel having a nonspherical external surface with different curvatures along its major and minor axes, the curvature along the major axis of said panel being noncircular, said faceplate panel increasing in thickness from its center to its sides with the increase in thickness along the panel minor axis being different than the increase in thickness along the panel major axis, an interior surface of said panel being nonspherical and differing in contour from said exterior surface of said panel, the contour of said shadow mask approximately paralleling the contour of the interior surface of said panel, said shadow mask including a rectangular apertured portion through which electron beams pass, said shadow mask within said apertured portion having different curvatures along its major axis, and the cross-sectional curvature along the major axis being greater near the short sides of the apertured portion of said mask than at the center of said mask.

4,839,557

FILL MEMBER FOR ELECTROLUMINESCENT PANELS

Martin P. Schrank, Ipswich, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Dec. 18, 1987, Ser. No. 134,646
Int. Cl.[4] H05B *33/04, 33/10*
U.S. Cl. 313—509 12 Claims



4. A thin-film electroluminescent display panel comprising:
a non-conductive cover plate and a non-conductive substrate disposed so as to define a cavity therebetween;
a composite member comprising a thin film electroluminescent layer sandwiched between a pair of dielectric layers, said composite member being transparent to light emitted by said electroluminescent layer when activated;
a pair of opposing electrodes positioned to define and activate said composite member therebetween;
a protective liquid disposed within said cavity defined by said cover plate and said substrate and being in contact with said dielectric layers;
the cover plate being provided with at least two diagonally disposed fill holes with each fill hole retaining a fill tube therein;
each fill hole comprising complementary planar concentrically positioned recesses, the outer recesses being of larger diameter, but smaller depth than the inner recesses, each of the inner, smaller diameter recesses forming a passageway through the cover plate from one outer recess to its complementary outer recess in the opposing plane of the cover plate.

4,839,558

INTEGRATED DC ELECTROLUMINESCENT DISPLAY SYSTEM

Eugene P. Mierzwinski, Fort Wayne, Ind., assignor to Hamilton Standard Controls, Inc., Farmington, Conn.

Filed May 23, 1988, Ser. No. 197,194
Int. Cl.[4] H05B *33/14, 33/22,* G09G *3/30*
U.S. Cl. 313—510 9 Claims

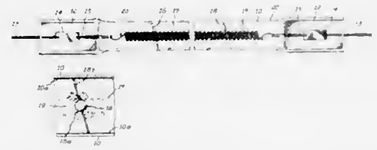
1. An electroluminescent display (DCEL) system, including a printed circuit substrate, comprising:
an electronic assembly substrate having printed circuit means thereon for electrically interconnecting other electrical components in addition to the DCEL;
DCEL printed conductive segment patterns on said substrate having at least the same general physical characteristics as said printed circuit means having been made on said substrate concurrently with said printed circuit means;
DCEL phosphor layer(s) on top of the etched conductive segment patterns; and
a glass element having on its inner surface a DCEL pattern of tin oxide positioned over the phosphor depositions, said glass element being affixed to said substrate and said pattern of tin oxide being electrically interconnected into said printed circuit means; the DCEL being an integral part of the electronic assembly substrate, and the substrate being an integral part of the DCEL.

4,839,559

RADIANT ENERGY INCANDESCENT LAMP

Frederic F. Ahlgren, Shaker Heights; Rolf S. Bergman, Cleveland Heights; John M. Davenport, Lyndhurst; Richard L. Hansler, Pepper Pike; Robert G. Hantman, Chagrin Falls, and Leonard E. Hoegler, Solon, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 22, 1988, Ser. No. 158,509
Int. Cl.[4] H01K *1/24, 1/50, 3/06, 3/12*
U.S. Cl. 313—579 2 Claims



1. An electric incandescent lamp for selective radiant energy distribution which comprises:
an elongated hermetically sealed light transmissive envelope containing a filling of inert gas and a relatively small quantity of halogen gas,
a coiled refractory metal filament extending the axial length of said envelope while being mechanically and electrically connected at both ends to inlead conductors hermetically sealed at said envelope ends,
support means having a ball shape body portion with projections extending outwardly from the body portion, said support means maintaining said filament centered within said envelope and located intermediate the length of said filament, said support means comprising a refractory metal body enclosed within the central cavity of said coiled refractory metal filament and which includes at least one of said extending outwardly projections between the coil turns of said filament to physically engage the inner wall of said envelope, and
a reflective film located on the surface of said envelope, said reflective film having a pass-band and a stop-band characteristic such that a major portion of the desired visible radiation being emitted by said filament is transmitted outwardly from said envelope whereas a major portion of the infrared radiation being emitted by said filament is reflected by said reflective film backwardly toward said filament.

4,839,560

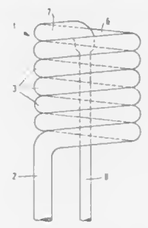
HEATABLE ELECTRODE FOR HIGH-PRESSURE GAS DISCHARGE LAMPS

Hans G. Ganser, Stolberg; Ralf Schäfer, Aachen, and Hans P. Stormberg, Stolberg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 1, 1985, Ser. No. 707,322
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1984, 3408431
Int. Cl.[4] H01J *61/06*
U.S. Cl. 313—628 4 Claims

1. A heatable electrode for igniting and reigniting high-pressure gas discharge lamps, comprising a self-supporting cylindrical open coil of tungsten or molybdenum wire, and a metal lead wire of tungsten or molybdenum which passes coaxially through the coil and is connected thereto,

characterized in that the turns of the coil engage each other, the lead wire has a smaller diameter than the coil wire, and



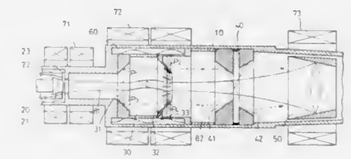
the lead wire terminates before the outermost turn of the coil.

4,839,561

GYROTRON DEVICE

Yasuyuki Ito, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 12, 1985, Ser. No. 807,969
Claims priority, application Fed. Rep. of Germany, Dec. 26, 1984, 59-281106
Int. Cl.[4] H01J *25/00*
U.S. Cl. 315—4 13 Claims



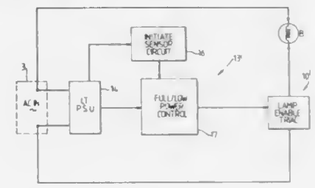
1. A gyrotron device comprising:
an electron gun for emitting a hollow electron beam defining a beam axis;
magnetic field generating means for generating a magnetic field to produce a cyclotron movement in the electron beam emitted from said electron gun;
an optical resonator for resonating electromagnetic waves generated as the electron beam is injected along the magnetic field lines, said optical resonator comprising means for reflecting the electromagnetic waves propagating within said resonator such that said electromagnetic waves intersect and interact with the electron beam plural times; and
a plurality of ring mirrors arranged downstream of the resonator in the direction of the beam axis of said electron beam for transmitting electromagnetic waves resonated by said resonator;
wherein said reflecting means comprises,
a slotted reflecting mirror for reflecting a portion of said electromagnetic waves in a direction substantially transverse to said electron beam and then upstream in the direction of the beam axis and for transmitting remaining portions of said electromagnetic waves downstream toward said plurality of ring mirrors through slots formed in said slotted reflecting mirror, and
at least one reflecting ring for reflecting electromagnetic waves reflected upstream by said slotted reflecting mirror in a direction substantially transverse to said electron beam and then downstream back towards said slotted reflecting mirror.

4,839,562

ELECTRICAL DEVICES

Colin R. Francis, Bellegreve House, Les Banques, St. Peter Port, Guernsey, C.I., Channel Islands, and Wojciech W. Giller, Le Friquet a Driot, Sausmarez Rd., St. Martins, Guernsey C.I., Channel Islands

Filed Apr. 22, 1986, Ser. No. 854,849
Int. Cl.[4] H05B *37/02*
U.S. Cl. 315—149 1 Claim



1. An electrical device comprising a body adapted to be interposed between a light bulb and a light socket and having an electrical connector for insertion into the light socket to receive electrical power therefrom and an electrical socket for receiving the light bulb to supply electrical power thereto, the body comprising; a housing which is to be interposed between the lamp and its socket and houses electronic circuitry including bulb energisation control means arranged to detect a pattern of energisation of the device by the electrical supply comprising a predetermined series of on and off periods of the mains supply and having a number of operating modes and effective to control the energisation of the light bulk so as to be at different power levels in different ones of said operating modes and including monitoring means, responsive to a first pattern of energisation of the device by the electrical supply to said light socket into which the device is, in use inserted, to set the light output of the light bulb at a first lower level and responsive to a second pattern of energisation of the device by the electrical supply to said light socket into which, in use, the device is inserted to set the light output of the light bulb at a second power level, said first power level being lower than said second power level, and said first pattern of energisation comprising the means supply being turned off for no more than a short predetermined time and then being turned on again; and a sound producing device for producing music or other reassuring noise housed in said housing; sound energisation control means to control the energisation of the sound producing device and effective in response to the said first pattern of energisation of the device by the electrical supply to the socket as detected by the sound energisation control means to control the sound producing device to produce said music or other reassuring noise when the bulb energisation control means is operative to energize the light bulb at said first, lower, power level and is not responsive to the second pattern of energisation so that the sound producing device is not energized when the light output of the light bulb is at said second, higher, power level.

4,839,563

PULSE BURST PANEL DRIVE FOR ELECTROLUMINESCENT DISPLAYS

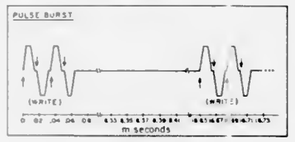
Robert A. Boudreau, Hampton, and Robert E. Brown, Stratham, both of N.H., assignors to GTE Products Corporation, Danvers, Mass.

Filed May 28, 1987, Ser. No. 55,493
Int. Cl.[4] G09F *9/00*
U.S. Cl. 315—169.3 20 Claims

8. Electroluminescent display apparatus comprising:
a plurality of thin film electroluminescent display devices arranged in rows and columns to form a display panel,

each of said display devices comprising a single pixel of said display panel, each display device comprising a pair of electrodes and being responsive to the application between the electrodes of a voltage above a light emission threshold voltage to emit a light pulse having a prescribed decay time, each display device having one electrode connected to a row conductor for the row in which it is located and the other electrode connected to a column conductor for the column in which it is located;

row driver circuit means for sequentially energizing row conductors of said display panel during sequential time intervals of a display frame;



column driver circuit means for energizing selected display devices in the row addressed by said row driver circuit means so as to form a desired image on said display panel;

said row driver circuit means and said column driver circuit means including means for applying between the electrodes of each selected display device during one of said time intervals at least two energizing pulses, each having an amplitude at or above said light emission threshold voltage, said at least two energizing pulses being applied to said selected display device during a time period not greater than said decay time.

4,839,564

LARGE IMAGE DISPLAY APPARATUS

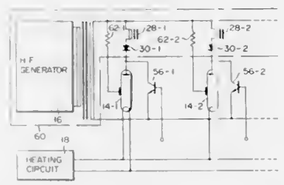
Katsuyuki Ide, Yokohama; Hisao Kobayashi, Kanagawa, and Nanjou Aoike, Yokohama, all of Japan, assignors to Toshiba Electric Equipment Corporation, Tokyo, Japan

Continuation of Ser. No. 749,435, Jun. 27, 1985, abandoned. This application Jun. 17, 1988, Ser. No. 207,932

Claims priority, application Japan, Jun. 30, 1984, 59-136357

Int. Cl.[4] G09G *3/10*

U.S. Cl. 315—169.4 **13 Claims**



1. A large image display apparatus comprising:

a plurality of DC operating discharge lamps each having an anode, a cathode and a light emitting tube;

a display board having the plurality of discharge lamps;

high frequency generating means having first and second terminals and for generating a high frequency voltage between said first and second terminals;

a plurality of rectifying means, each connected between said anode of said respective discharge lamps and said first terminal of said high frequency generating means, for generating a DC voltage including a high frequency ripple voltage component between said first and second terminals, a voltage of said first terminal being higher than that of said second terminal;

a plurality of current limiting means each series connected with said respective rectifying means, for limiting a current flowing through said respective discharge lamps;

means for commonly connecting said second terminal with said cathodes of the plurality of discharge lamps;

heating means for commonly heating the cathodes of the plurality of discharge lamps;

image signal generating means for generating an image signal; and

a plurality of switching means comprises a bipolar transistor having a base receiving a control signal dependent on the image signal and an emitter-collector path connected in parallel with said discharge lamp, arranged in parallel between the anode and cathode of said respective discharge lamps, for turning on/off the respective discharge lamps in response to the image signal, terminals of said plurality of switching means which are connected to the respective cathodes being commonly connected to said second terminal of said high frequency generating means.

4,839,565

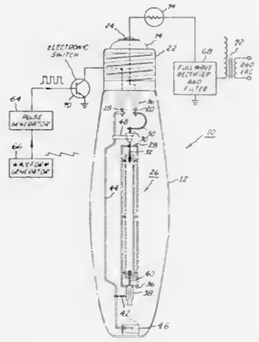
HIGH PRESSURE DOUBLE WALL SODIUM ARC TUBE AND METHODS OF OPERATING SUCH

Mitchell M. Osteen, Zirconia, N.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 3, 1987, Ser. No. 33,932

Int. Cl.[4] H05B *37/02*

U.S. Cl. 315—209 R **19 Claims**



1. A high intensity discharge metal vapor lamp comprising:

support and electrical connection means; and

an arc tube connected to said support and electrical connection means, said arc tube having disposed therein means to support an inner chamber comprised of a translucent material, said inner chamber containing appropriate fill constituents and may be closed at both ends have appropriate venting ports such as at least one opening between its inner and outer surfaces longitudinally located along its wall portion, said inner chamber being suitably vented to the arc tube to allow readily unimpeded gaseous exchange of the constituents of the fill ingredients within the inner chamber and the arc tube, said arc tube further having a pair of thermionic electrodes sealed therein, said thermionic electrodes being spaced apart from each other by a predetermined distance effective when energized to cause an arc therebetween within said inner chamber, said arc tube containing a metal partial pressure.

4,839,566

CIRCUIT FOR SUPPLYING POWER TO A DENTAL PHOTOPOLYMERIZING APPARATUS

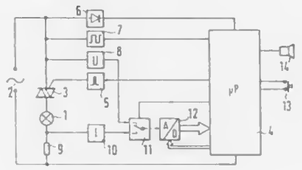
Wolf-Dietrich Herold, Seefeld; Karl L. Grafwallner, Munich, and Michael Keller, Graefelfing, all of Fed. Rep. of Germany, assignors to ESPE Stiftung and Co. Produktions-und Vertriebs KG, Seefeld, Fed. Rep. of Germany

Filed Feb. 19, 1987, Ser. No. 16,601

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1986, 3605278

Int. Cl.[4] H05B *37/02*

U.S. Cl. 31—308 **7 Claims**



1. A circuit for supplying power to a low-voltage lamp of a type used in a photopolymerizing apparatus from an a.c. voltage source comprising:

control means for keeping the electric power input to said low-voltage lamp constant, said control means including a memory for storing signal values representative of a plurality of different duty factors predetermined for respective pairs of different values of lamp current and lamp voltage;

first means for continuously detecting the lamp voltage and generating a first output signal indicative thereof;

second means for continuously detecting the lamp current and generating a second output signal indicative thereof;

sampling means synchronized with said a.c. voltage for sampling instantaneous values of said first and second output signals in each cycle of said a.c. voltage "converting the sampled instantaneous values to digital output signals". and supplying the digital output signal to said control means; and

a switching element, controlled by a signal value read from said memory by said control means based on the sampled values received from said sampling means and supplied to said switching element, for switching the lamp current on and off in cycles synchronous with said a.c. voltage from said a.c. voltage source with a duty factor dependent on the lamp current and lamp voltage.

4,839,567

ILLUMINATED AERIAL MARKER

R. M. Milton, 5004 Fort Clark, Austin, Tex. 78745, and Daniel C. Barnes, 6002 Diamond Head Dr., Austin, Tex. 78745

Continuation of Ser. No. 945,398, Dec. 23, 1986. This application Jun. 29, 1987, Ser. No. 67,367

Int. Cl.[4] H01J *15/04*

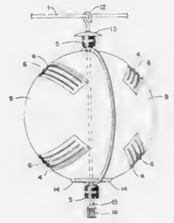
U.S. Cl. 315—344 **5 Claims**

1. An illuminated aerial marker comprising:

A. an alternating current high voltage source,

B. means comprise a bolted clamp on each side of said spherical shell to fasten two halves of an opaque spherical insulating shell with interior means to form a capacitor around said high voltage source to form a spherical capacitor, the following "said high voltage source is an electrical line and said interior means to form a capacitor is a conductive glass fiber mat integrally connected with said opaque spherical insulating shell"

C. a plurality of gas filled lamps mounted in depressions of the exterior of said spherical capacitor with said plurality of gas filled lamps connected in series with an electrode on a beginning end of said series connected with said high voltage source line and an electrode on a terminal end of said series connected with said interior means to form a capacitor,



D. proper spacing and sizing of said plurality of gas filled lamps to provide continuous light with nighttime conspicuity of as least 4,000 feet when said plurality of gas filled lamps is activated.

4,839,568

MAGNETIC DEFLECTOR FOR TRICHROMATIC TUBE WITH SHIELD AND METHOD TO SET THIS DEFLECTOR

Alain Dumesnil, Genlis, and Jean-Marc Perreaut, Dijon, both of France, assignors to Videocolor, Montrouge, France

Filed Sep. 28, 1987, Ser. No. 101,787

Claims priority, application France, Jul. 17, 1987, 87 10123

Int. Cl.[4] H01J *29/70, 29/76*

U.S. Cl. 315—368 **8 Claims**

1. A magnetic deflector of the saddle-saddle type for trichromatic tubes with external shielding including three in-line guns and containing round luminophors as well as a high definition screen, herein said tube is planned for operation with a saddle-torus type of deflector, said saddle-type magnetic deflector comprising:

a horizontal deviation coil of the saddle-type surrounding the tube at the flared portion of the tube near the neck wherein said coil has front lead-out wires of reduced dimensions as well as rear lead-out wires laid flat and parallel with the axis of said tube;

a vertical deviation coil of the saddle-type surrounding said horizontal deviation coil wherein said vertical deviation coil has front lead-out wires of reduced dimensions as well as rear lead-out wires laid flat and parallel with the longitudinal axis of said tube;

a flare-shaped sleeve made of ferromagnetic material surrounding said vertical deviation coil, wherein said flare-shaped sleeve having a rear section terminating in a circular-sectioned cylinder which entirely covers said rear lead-out wires of both said vertical and horizontal deviation coils;

a ferrite ring set around said neck in the immediate vicinity of the rear portion of said sleeve and in the immediate vicinity of the horizontal and vertical deviation coils wherein said ring has at least one quadrupole coil; and

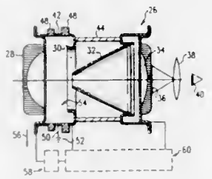
means for causing a current to flow in said at least one quadrupole coil of said ferrite ring wherein the intensity of said current varies parabolically.

4,839,569

METHOD AND APPARATUS FOR PROVIDING GAIN CONTROL FOR AN IMAGE INTENSIFIER TUBE

William M. Dallin, II, Dallas, Tex., assignor to Varo, Inc., Garland, Tex.

Filed Dec. 8, 1987, Ser. No. 129,997
Int. Cl.[4] H01J *29/52*
U.S. Cl. 315—383 **22 Claims**



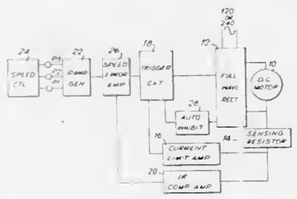
1. An improved apparatus for viewing objects under low light conditions, comprising:
- a photocathode for emitting electrons when the low level light rays strike the photocathode;
- a screen for receiving the electrons;
- an anode cone for directing the electrons onto said screen;
- a housing for supporting said photocathode, said anode cone and said screen;
- an adjustable power supply voltage for accelerating the electrons from said photocathode to said screen;
- a guard conductor in said housing proximate said photocathode and electrically isolated from said screen and said photocathode, said guard conductor utilized for removing tray current; and
- means for sensing a current generated by the light striking said photocathode and for adjusting the accelerating voltage in response to changes in the photocathode current.

4,839,570

CURRENT LIMITING CONTROL CIRCUIT FOR D.C. MOTORS

Abraham Saganovsky, Brooklyn, N.Y., assignor to K. B. Electronics Inc., Brooklyn, N.Y.

Filed Apr. 27, 1988, Ser. No. 186,597
Int. Cl.[4] G05B *5/00*
U.S. Cl. 388—815 **5 Claims**



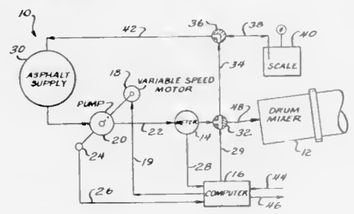
1. In a control system for controlling the operational speed of a d.c. motor having an armature and full wave bridge circuit connected to the motor for energizing the same, wherein the bridge circuit includes a pair of silicon controlled rectifiers, sensing means for sensing the voltage drop across the armature of the motor, a trigger circuit connected to the bridge circuit for controlling the phase at which the rectifiers become operative and thereby controlling the level of voltage induced upon the motor, current limiting circuit means connected to the sensing means arranged for comparing the sensed voltage to a reference voltage and producing a signal indicative of the current through the armature above a pre-set value, and an operator speed control circuit operatively associated with the bridge circuit for producing a speed control voltage for permitting operator settable speed control of the motor, the improvement comprising:
- means for connecting the output of the current limiting circuit means directly to the input of the trigger circuit for impressing the signal thereon in the event the current through the armature is above the pre-set value,
- a compensating circuit arranged to sense the voltage drop across the armature indicative of the inherent internal resistance of the armature and to produce a compensating voltage in accordance thereof, and
- means for connecting the output of said compensating circuit to the output of the speed control circuit for adding said compensating voltage to said speed control voltage.

4,839,571

SAFETY BACK-UP FOR METERING PUMP CONTROL

Robert E. Farnham, Naperville, and Fredric W. Prill, North Aurora, both of Ill., assignors to Barber-Greene Company, DeKalb, Ill.

Filed Mar. 17, 1987, Ser. No. 26,964
Int. Cl.[4] G05B *5/00*
U.S. Cl. 340—606 **9 Claims**



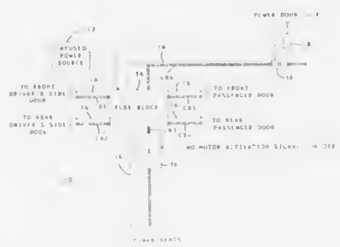
1. A system for detecting undesirably large variance in a precision meter used to measure the flow of fluid from a pump, the system comprising:
- a fluid supply vessel for containing a fluid;
- a deposit area to receive fluid from the supply vessel through a conduit;
- a pump associated with the conduit to pump fluid from the supply vessel and through the conduit to the deposit area;
- a precision meter associated with the conduit to measure the flow of fluid through the conduit;
- pump sensing means communicating with the pump for sensing the volume of fluid pumped by the pump; and
- computer means communicating with the pump sensing means and with the meter, the computer means capable of comparing information regarding the volume of pumped fluid measured and the flow of fluid through the meter;
- wherein the computer means will detect and signal if variance between the pumped volume of fluid and the flow of fluid measured by the meter exceeds a predetermined amount.

4,839,572

MULTIPLEX MOTOR CONTROL SYSTEM WITH AUTOMATIC MOTOR DEACTIVATION

Lee W. Steely, Reinholds, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 8, 1987, Ser. No. 130,351
Int. Cl.[4] G05B *19/29*
U.S. Cl. 318—603 **17 Claims**



1. In a motor control system of the type having a motor; a switch comprising means for generating a motor activation signal; a motor power source; a multiplex system comprising a first remote station coupled to receive the motor activation signal from the switch and to generate a first signal in response thereto, a second remote station connected between the motor and the motor power source to selectively activate and deactivate the motor, and control means, interconnected between the first and second remote stations, for controlling the second remote station to activate the motor in response to the appearance of the first signal and to deactivate the motor in response to disappearance of the first signal; the improvement comprising the following elements included in the control means:
- means for sampling the first signal on a periodic basis;
- a counter adapted to store a count;
- means for incrementing the count when the first signal is in a first state indicative of motor activation;
- means for decrementing the count when the first signal is in a second state indicative of motor deactivation;
- means for supplying an upper threshold and a lower threshold;
- means for setting a motor control signal to activate the motor when the count of the counter is greater than the upper threshold;
- means for setting the motor control signal to deactivate the motor when the count is less than the lower threshold;
- means for starting a timer when the count is incremented past the upper threshold;
- means for storing a maximum activation time;
- means for setting the motor control signal to deactivate the motor when the timer reaches the maximum activation time; and
- means for leaving the motor control signal and the timer unchanged when the count is between the upper and lower thresholds.

4,839,573

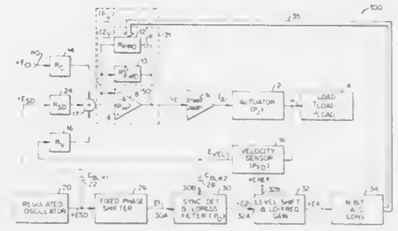
METHOD AND APPARATUS FOR FEEDBACK CONTROL LOOP BANDWIDTH AND PHASE MARGIN REGULATION

William L. Wise, 3568 Amherst Ct., Mountain View, Calif. 94040

Filed Aug. 18, 1986, Ser. No. 897,676
Int. Cl.[4] G05B *5/01*
U.S. Cl. 318—615 **19 Claims**

1. A feedback control loop system for controlling an element by an element control loop, said element having a variable element frequency response defined by a primary frequency-domain pole in a complex frequency plane and produces an output signal inversely proportional to said element frequency response, said system comprising:
- means for generating a feedback signal corresponding to the difference between a desired value of an element operating parameter and an actual value of the element operating parameter in said element output signal; and
- means defined by a primary frequency-domain zero in the complex frequency plane for compensating said feedback signal for variations in said element frequency response by applying to said feedback signal generating means a compensating signal, said compensating signal being manifest as said primary frequency-domain zero, said primary frequency-domain zero tracking said primary frequency-domain pole while maintaining as constants any other poles and zeroes in order to cancel step-response loop effect changes caused by changes in frequency of said primary frequency-domain pole, whereby the total loop gain, bandwidth, (step-response rise/fall time), and phase margin (step-response overshoot) of the element control loop are regulated.

13. A method for controlling the operation of an element by an element control loop, said element having a variable element frequency response defined by a primary frequency-domain pole in a complex frequency plane and produces an output signal inversely proportional to said element frequency response, said method comprising the steps of:
- generating a feedback signal corresponding to the difference between a desired value of an element operating parameter and an actual value of the element operating parameter in said element output signal; and
- applying to means generating said feedback signal a compensating signal defined by a primary frequency-domain zero in the complex frequency plane, said compensating signal being manifest as said primary frequency-domain zero, said primary frequency-domain zero tracking said primary frequency-domain pole while maintaining as constants any other poles and zeroes in order to cancel frequency response effects of said primary frequency-domain pole and to compensate for variations in said element frequency response for compensating said feedback signal for variations in said element frequency response, whereby the total loop gain, bandwidth (step-response rise/fall time), and phase margin (step-response overshoot) of the element control loop is regulated.



4,839,574

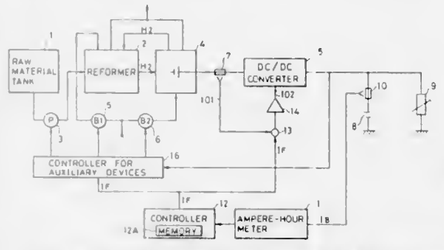
GENERATOR SYSTEM UTILIZING A FUEL CELL

Yasuhiro Takabayashi, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed May 6, 1988, Ser. No. 191,033
Claims priority, application Japan, May 8, 1987, 62-110634
Int. Cl.[4] H02J *7/00;* **H01M** *8/04, 10/44*
U.S. Cl. 320—3 **11 Claims**

1. A method for controlling a generator system having a fuel cell and a battery to which the output current from said fuel cell can be supplied, comprising the steps of:
- performing a first adjustment of adjusting the output current delivered from said fuel cell;

performing the second adjustment of adjusting the output current produced in said fuel cell;
storing into a memory means a predetermined relationship between the charged amount of said battery and the control signal for controlling the output current from said fuel cell;
detecting the energy stored in said battery;



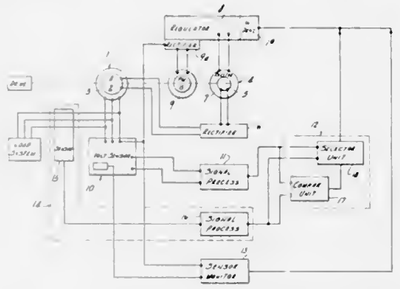
looking up said predetermined relationship in relation to the detected signal representative of the energy stored in said battery to form a control signal for controlling the output current from said fuel cell; and
controlling said first and second adjustment in response to said control signal, so that the output current generated by said fuel cell is increased when the energy stored in said battery is decreased.

4,839,575

ALTERNATOR REGULATOR HAVING OUTPUT MONITORING AND LIMITING CONTROLS

Alistair A. MacFarlane, East Kilbride, Scotland, assignor to Marathon Electric Manufacturing Corporation, Wausau, Wis.

Filed Aug. 15, 1986, Ser. No. 897,134
Int. Cl.[4] H02H 7/06; H02P 9/00
U.S. Cl. 322—25 **21 Claims**



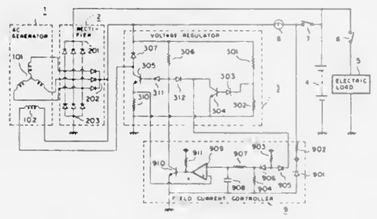
1. A voltage regulator for controlling an alternator establishing an electrical output including an output voltage and an output current to a connected load, comprising
a control circuit means having output means controlling the electrical output of such alternator,
a current sensing means having connection means adapted to be connected to the output of the alternator and establishing a current-related signal proportional to the level of the output current from the alternator, a voltage sensing means having an input means and connection means adapted to connect said input means to the output of the alternator and establishing a voltage-related signal proportional to the level of the voltage output of the alternator, a voltage/current selection means having a first input connected to said current sensing means and a second input connected to said voltage sensing means and having an output means for controlling transmission of signals from said sensing means for controlling said alternator, said selection means transmitting a single one of said signals from said sensing means,
a sensor continuity detector connected to the connection of said voltage sensing means to said alternator and operable to separately detect the lack of continuity in the connection means of the voltage sensor means to said alternator and to thereby detect an essentially open circuit condition in said connection means, and
means connecting said sensor continuity detector to said control circuit means to control said alternator and override the signal from said selection means.

4,839,576

CONTROLLER FOR AC GENERATOR IN VEHICLES

Kazutoshi Kaneyuki, and Shiro Iwatani, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1988, Ser. No. 160,417
Claims priority, application Japan, Feb. 26, 1987, 62-29321[U]
Int. Cl.[4] H02J 7/14
U.S. Cl. 322—25 **12 Claims**



1. A controller for an alternating current (AC) generator having a field coil in vehicles, the controller comprising in combination
a battery charged with a rectified output of the AC generator;
a voltage regulator including means for detecting an output voltage of said AC generator to produce an output when the output voltage exceeds a predetermined voltage, and means for adjusting the output voltage of said AC generator by controlling a field current through the field coil of said AC generator; and
a field current controller including time delay means responsive to the output of the detecting means, field current detecting means for determining the field current, and means for comparing an output of said time delay means with an output of said field current detecting means and for operating said adjusting means so as to change the field current in said field coil with a time constant greater than a time constant of said field coil.

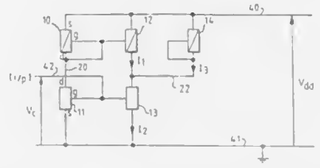
4,839,577

CURRENT-CONTROLLING CIRCUIT

Peter A. Gardner, Harestock, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 29, 1988, Ser. No. 250,648
Claims priority, application United Kingdom, Oct. 8, 1987, 8723644
Int. Cl.[4] G05F 3/16
U.S. Cl. 323—316 **17 Claims**

1. A current-controlling circuit for producing a current defined by an input control voltage comprising
a direct current voltage supply having first and second supply rails defining an electrical potential therebetween,
first means connected to the first rail for controlling a first current flowing to or from said first rail, the value of which is determined by said input control voltage,
second means connected to the second rail for controlling a second current flowing from or to said second rail, the value of which is also determined by said input control voltage but of a different value to that of said first current, and
third means connected to the first rail for passing a third current flowing to or from said first rail,



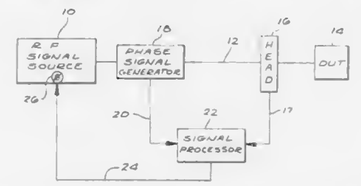
wherein said first, second and third means are connected to each other such that said first current and said third current sum together to form said second current,
the arrangement being such that an increase in potential from said direct current voltage supply causes an increase in said first current which equals or exceeds any increase caused in said second current, whereby said third current is either unchanged or reduced.

4,839,578

METHOD FOR REMOVING PHASE INSTABILITIES CAUSED BY FLEXURE OF CABLES IN MICROWAVE NETWORK ANALYZER MEASUREMENTS

Mark D. Roos, San Carlos, Calif., assignor to EIP Microwave, Inc., San Jose, Calif.

Filed Jun. 4, 1987, Ser. No. 59,701
Int. Cl.[4] G01R 27/06, 25/04
U.S. Cl. 324—58 B **5 Claims**



1. A method of removing phase errors in any signal caused by movement of a cable carrying the signal comprising:
terminating said cable with a reflection means having a stable phase;
providing a source of microwave frequency electromagnetic energy signals;
transmitting a microwave frequency electromagnetic energy signal from said source along said cable from an input to an output thereof;
sampling said transmitted signal;
reflecting a portion of said transmitted signal from the reflection means terminating said cable;
sampling said reflected signal;
measuring the phase difference between said transmitted and reflected signals to establish a predetermined reference signal representative of said phase difference;
removing said reflection means from termination of said cable;
connecting a device under test (DUT) to said cable;
applying said transmitted microwave freqeuncy signal to said DUT;
sampling said transmitted signal and any signal reflected by said DUT;
measuring the phase difference between said transmitted and DUT reflected signals to establish an error signal;
comparing said error signal to said predetermined reference signal to develop a correction signal; and
applying said correction signal to said source of microwave frequency signals for changing the characteristics of said transmitted signal to compensate for said error.

4,839,579

RESISTIVE STEERING SENSOR

Wataru Ito; Tomoki Kubota; Koji Sumiya, and Shoji Yokoyama, all c/o Aisin AW Co., Ltd., 10, Takane, Fujii-cho, Anjo-shi, Aichi-ken 444-11, Japan

Filed Jul. 8, 1988, Ser. No. 217,503
Claims priority, application Japan, Jul. 10, 1987, 62-173621
Int. Cl.[4] G01R 27/02; B60Q 1/42
U.S. Cl. 324—63 **2 Claims**

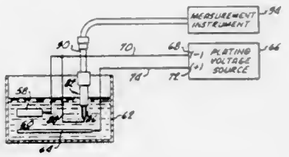
1. A steering sensor for an automotive vehicle having a steering wheel and a turn signal switch assembly, comprising:
a first gear mounted in a clearance between the steering wheel and the turn signal switch assembly;
a second gear meshing with said first gear; and
a variable resistor rotated by said second gear.

4,839,580

PLATED SENSOR FOR MONITORING CORROSION OR ELECTROPLATING

Clifford G. Moore, 240 W. Lemon Ave., Arcadia, Calif. 91006; Herbert P. Silverman, 6551 50th Ave. NE., Seattle, Wash. 98115, and James R. Bredow, 510 Martinez Dr., La Habra, Calif. 90630

Continuation of Ser. No. 821,013, Jan. 21, 1986, Pat. No. 4,755,744. This application Jun. 20, 1988, Ser. No. 210,162
The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.
Int. Cl.[4] G01R 27/00
U.S. Cl. 324—65 R **20 Claims**



1. An electrical resistance sensor comprising
a test element adapted to be exposed to an environment in which monitoring is to be accomplished,
a reference element protected from such environment, and
means for comparing electrical resistances of said elements for determination of test element thickness,
said test element comprising a substrate formed of electrically conductive material having a relatively high electrical resistivity, and an electrically conductive test

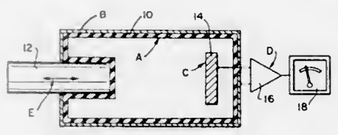
coating on said substrate, said test coating having an electrical resistivity considerably less than said substrate resistivity.

4,839,581

ABSOLUTE ELECTRICAL POTENTIAL MEASURING APPARATUS AND METHOD

Thomas F. Peterson, Jr., 3060 Lander Rd. Pepper Pike, Ohio 44124

Filed Nov. 13, 1986, Ser. No. 930,815
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—72 24 Claims



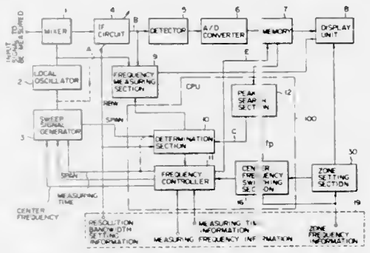
20. A method of measuring electrical potential comprising:
changing charge density within a closed insulating enclosure that has an electrically conductive cage therearound and an electrode disposed therein;
measuring charge transfer to and from the electrode as the charge density is changed.

4,839,582

SIGNAL ANALYZER APPARATUS WITH AUTOMATIC FREQUENCY MEASURING FUNCTION

Seiryo Fukaya, Ebina; Mitsuyoshi Takano, Tokyo, and Narushi Amamoto, Fujisawa, all of Japan, assignors to Anritsu Corporation, Tokyo, Japan

Filed Jun. 29, 1988, Ser. No. 212,935
Claims priority, application Japan, Jul. 1, 1987, 62-165040
Int. Cl.[4] G01R *23/16*
U.S. Cl. 324—77 B 17 Claims



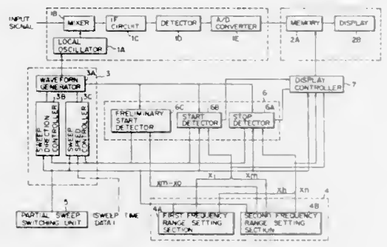
1. A signal analyzer apparatus comprising:
input means for receiving an input signal to be measured;
sweep width information generating means for generating sweep width information for performing sweeping/measurement with a predetermined frequency width;
local oscillation signal generating means for receiving the sweep width information from said sweep width information generating means and generating a local oscillation signal having a predetermined frequency;
frequency converting means, connected to said input means and said local oscillation signal generating means, for converting the input signal to be measured into an intermediate-frequency signal corresponding to the local oscillation signal;
resolution bandwidth setting means for setting predetermined resolution bandwidth information associated with extraction of the intermediate-frequency signal;
extracting means, connected to said frequency converting means and said resolution bandwidth setting means, for extracting the intermediate-frequency signal in accordance with the predetermined resolution bandwidth information;
detecting means for detecting an output from said extracting means;
A/D-converting means for converting a detected analog signal from said detecting means into a corresponding digital signal;
memory means for storing the digital signal from said A/D-converting means, in correspondence with a frequency;
display means for displaying the digital signal stored in said memory means, as data developed on a frequency axis;
frequency measuring range setting means for setting predetermined frequency measuring range information corresponding to predetermined data of the data to be displayed on said display means;
determination means, connected to said sweep width information generating means and said resolution bandwidth setting means, for outputting a determination result for allowing frequency measurement when the predetermined resolution bandwidth information and the sweep width information satisfy a predetermined relationship;
frequency measuring means, connected to said local oscillation signal generating means, said extracting means, and said determination means, for measuring the signal to be measured on the basis of frequencies of the local oscillation signal and the output from said extracting means, in response to the determination result;
control means, connected to said determination means, said frequency measuring range setting means, and said sweep width information generating means, for changing an initial sweep width of the sweep width information to a sweep width corresponding to the frequency measuring range information prior to reception of the determination result, and setting the sweep width information to be zero upon reception of the determination result; and
output means, connected to said frequency measuring means, for outputting a measurement result of the frequency of the signal to be measured.

4,839,583

SIGNAL ANALYZER APPARATUS WITH ANALOG PARTIAL SWEEP FUNCTION

Mitsuyoshi Takano, Tokyo, and Seiryo Fukaya, Ebina, both of Japan, assignors to Anritsu Corporation, Tokyo, Japan

Filed Jun. 27, 1988, Ser. No. 211,964
Claims priority, application Japan, Jul. 1, 1987, 62-165039
Int. Cl.[4] G01R *23/16*
U.S. Cl. 324—77 B 7 Claims



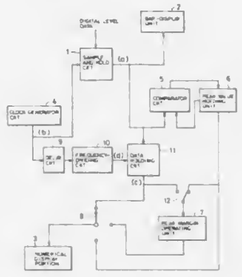
1. A signal analyzer apparatus comprising:
input means for receiving an input signal to be measured;
local oscillator means for oscillating a local oscillation signal to be analog-swept in accordance with an analog sweep signal;
frequency conversion means for converting the input signal from said input means into an intermediate frequency signal corresponding to the local oscillation signal to be analog-swept from said local oscillator means;
detecting means for detecting the intermediate frequency signal from said frequency conversion means;
A/D conversion means for converting the detection analog signal from said detecting means into a corresponding digital signal;
memory means for storing the digital signal from said A/D conversion means in accordance with its frequency;
display means for displaying the digital signal stored in said memory means along a frequency axis;
sweep range setting means for selectively setting a desired first sweep measurement frequency range and a desired second sweep measurement frequency range present in the first sweep measurement frequency range;
sweep signal generating means for receiving first or second sweep measurement frequency range setting data from said sweep range setting means and supplying the data to said local oscillator means as the analog sweep signal for an entire or partial sweep operation; and
display control means, connected between said sweep range setting means and said memory means, for, upon reception of the first sweep measurement frequency range setting data, causing said display means to display the digital signal stored in said memory means in correspondence with the analog sweep signal for the entire sweep operation, and for, upon reception of the second sweep measurement frequency range setting data, causing said display means to update and display the digital signal of a portion corresponding to the second sweep measurement frequency range which is updated in said memory means in correspondence with the analog sweep signal for the partial sweep operation.

4,839,584

SIGNAL LEVEL DISPLAY DEVICE FOR RECORDING/REPRODUCING APPARATUS

Nobutoshi Fukuda; Masashi Tanabe; Yoshiki Furuta; Tatsuro Nagao; Naoto Arifuku, and Shinichi Yamamisaka, all of Saitama, Japan, assignors to Pioneer Electronics Corporation, Tokyo, Japan

Filed Dec. 28, 1987, Ser. No. 137,912
Claims priority, application Japan, Dec. 27, 1986, 61-201196[U]
Int. Cl.[4] G01R *19/16*
U.S. Cl. 324—103 P 3 Claims



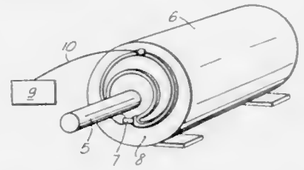
1. A signal recording/reproducing device comprising: a sample-and-hold circuit for sampling and holding an input signal at a first predetermined rate; first display means for displaying in bar form sample values held by said sample-and-hold circuit; a data holding circuit for sampling and holding said values held by said sample-and-hold circuit at a second predetermined rate slower than said first predetermined rate; and second display means for numerically displaying sample values held by said data holding circuit.

4,839,585

MAGNETIC FIELD SENSOR COIL FOR BEING FITTED AROUND A MOTOR SHAFT

John Bicknell, Alfold Bars, near Loxwood, England, assignor to Bonar Bray Limited, Waltham Cross, England

Filed Jun. 2, 1987, Ser. No. 57,218
Claims priority, application United Kingdom, Jun. 6, 1986, 8613789
Int. Cl.[4] G01R *31/34, 33/028;* H02K *11/00;* H01F *27/28*
U.S. Cl. 324—158 MG 5 Claims



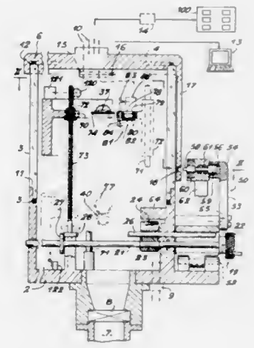
1. A magnetic field sensor coil having first and second generally C-shaped portions, one within the other, screening means surrounding said first portion for screening said first portion of said sensor coil from magnetic flux, said sensor coil further having said second portion unscreened to allow detection to flux, the shape of the coil being alterable such that the coil can be fitted around a motor shaft and reformed so that both the first screened portion and the second unscreened portion substantially surround the shaft.

4,839,586

APPARATUS FOR IRRADIATING ELECTRONIC CIRCUITS

Olivier Musseau, Longjumeau, and Gerard Deschazeaux, Brunoy, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 22, 1987, Ser. No. 52,983
Claims priority, application France, May 27, 1986, 86 07568
Int. Cl.[4] G01R *31/28;* G21K *5/10*
U.S. Cl. 324—158 F 10 Claims



1. An irradiation apparatus for electronic circuits comprising: an evacuated irradiation-tight enclosure which can be

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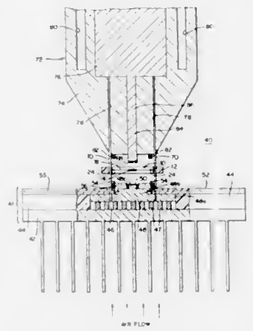
demounted into at least two portions; a means for setting up the vacuum in the enclosure; a movable carriage bearing a radioactive source; an ascensional plate for positioning the electronic circuit to be tested; a radiation detector; and controls for moving the electronic circuit and the detector, such controls being connected to one of the portions of the evacuated enclosure and manipulated from outside the enclosure; a source-moving control which is connected to one of the portions of the evacuated enclosure and manipulated from outside such enclosure so as to move the source successively into a first position wherein the source does not irradiate either said detector or said electronic circuit, a second detector-irradiating position and a third electronic circuit-irradiating position, means being provided for identifying the presence of the source in each of the three positions; mechanical blocking means which both prevents radiation when the enclosure is not assembled; and which prevents the enclosure from being demounted when the source is not in its said first position.

4,839,587

TEST FIXTURE FOR TAB CIRCUITS AND DEVICES

Robert Flatley, Ashland, and David Hobson, Waltham, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 29, 1988, Ser. No. 174,697
Int. Cl.[4] G01R *31/02, 31/28*
U.S. Cl. 324—158 F **9 Claims**



4. A test fixture for TAB type semiconductor circuits comprising:

means to receive a TAB circuit for testing;

transmission line means to supply power and test signals to a received circuit, said transmission line means including means to maintain a controlled impedance to the inner lead bond areas of a received TAB circuit, and comprising:

(a) a first horizontally disposed circuit board having embedded conductors disposed therein for supplying power and signals to a received circuit, said embedded conductors establishing a characteristic impedance for said first circuit board;

(b) a plurality of test pins positioned to contact the test pads of a received TAB circuit, said test pins being soldered to said first circuit board, electrically connected to said embedded conductors, and extending vertically from said first circuit board; and,

(c) a second horizontally disposed circuit board placed generally on top of said first circuit board, and having a substrate with a plurality of holes for reception of said test pins, said second circuit board including:

(i) a first conductive layer disposed on a plurality of edges thereof and including a top portion extending along a top surface thereof, said first conductive layer establishing a reference plane for said test pins to maintain a characteristic impedance therefore;

(ii) a dielectric layer disposed over the top portion of said first conductive layer to space a received TAB circuit from said conductive layer when it is position on said second circuit board, and thereby establish a characteristic impedance for conductor leads of a received circuit; and,

(iii) a second conductive layer that is horizontally embedded in said substrate to establish another reference plane for a received TAB circuit, said second conductive layer being electrically connected to at least one of said test pins when said second circuit board is in position on said first circuit board;

weight means to hold the test pads of a received TAB circut in secure engagement with said test pins; and,

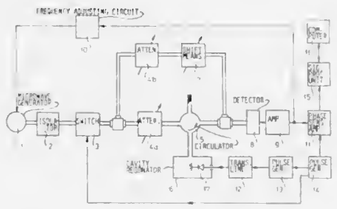
means to vary the temperature to which a received TAB circuit is exposed.

4,839,588

METHOD FOR THE EXAMINATION OF ELECTRICALLY ACTIVE IMPURITIES OF SEMICONDUCTOR MATERIALS OR STRUCTURES AND MEASURING ARRANGEMENT FOR CARRYING OUT THE METHOD

Wolfgang Jantsch, Linz, Austria, and György Ferenczi, Budapest, Hungary, assignors to Magyar Tudomanyos Akademia Muszaki Fizikai Kutato Intezet, Hungary

PCT No. PCT/HU87/00016, § 371 Date Nov. 25, 1987, § 102(e) Date Nov. 25, 1987, PCT Pub. No. WO87/05701, PCT Pub. Date Sep. 24, 1987
PCT Filed Mar. 17, 1987, Ser. No. 138,195
Claims priority, application Hungary, Mar. 17, 1986, 1096/86
Int. Cl.[4] G01R *31/26*
U.S. Cl. 324—158 D **18 Claims**



1. A method for the examination of electrically active impurities in a semiconductor material with electrically active defects, comprising the steps of:

(a) providing a junction capable of forming a space charge layer under reverse bias in a sample material, said junction being provided with a pair of contacts for biasing;

(b) providing a space charge layer in said junction by reverse biasing said junction through biasing means coupled to said contacts;

(c) filling the electrically active defects in said junction;

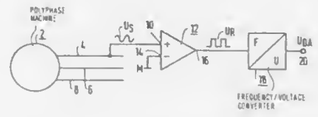
(d) detecting a thermal emission process, said thermal emission process progressing towards a thermal equilibrium state that takes place following said filling step, wherein said sample material incorporating said junction is inserted in a microwave field from a microwave source at least during said detection step and in said detection step measuring the change of said microwave field strength that takes place due to changes in microwave absorption of said sample during said thermal emission process.

4,839,589

METHOD AND CIRCUIT FOR DETERMINING THE SPEED OF ROTATION OF A ROTATING MACHINE

Georg Heinle, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 3, 1986, Ser. No. 926,443
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1985, 3543941
Int. Cl.[4] G01P *3/48*
U.S. Cl. 324—166 **14 Claims**



1. A method of determining the rotational speed of a rotating polyphase motor having stator windings and rotor windings comprising:

sensing at least two sinusoidal voltage signals induced in two corresponding stator windings by remanence from said rotor windings, said sinusoidal signals having corresponding phases and a frequency indicative of said rotational speed;

converting said sinusoidal signals into respective square wave signals wherein each square wave signal is converted by monostable multivibrators into first and second pulse signals, each pulse signal having a duty cycle, with said first pulse signals being separated in time from said second pulse signal; and

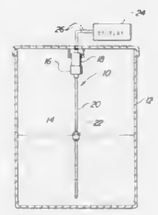
generating an output signal which is proportional to the frequency of said first and second pulse signal.

4,839,590

PIEZOELECTRIC ACTUATOR FOR MAGNETOSTRICTIVE LINEAR DISPLACEMENT MEASURING DEVICE

Richard D. Koski; William C. Kosco, both of Troy, and Arthur Dumais, Rochester, all of Mich., assignors to Magnetek Controls, Clawson, Mich.

Filed Sep. 24, 1987, Ser. No. 100,535
Int. Cl.[4] G01B *7/04;* **G01F** *23/30*
U.S. Cl. 324—208 **8 Claims**



1. A position transducer of the type which comprises a housing, a magnetostrictive wire disposed within the housing and mechanically anchored at opposite head and foot ends and defining a position measurement range between said ends, a magnet displaceably mounted on the housing for linear displacement along the wire, and signal process means for producing a signal representative of the position of the magnet along the wire, wherein the improvement comprises:

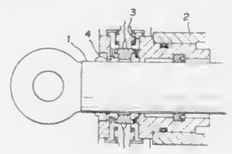
actuator means for imparting a torsional strain to the wire adjacent the head end, the actuator means comprising a piezoelectric crystal, clamping means frictionally holding said wire to said crystal, said clamping means including a first lower pad of elastomeric material between a base portion and said crystal, a second upper pad of elastomeric material and a removable clamp plate, and means for applying an actuation signal to the crystal to translate a surface of said crystal transverse to the linear axis of the wire thereby to twist the wire in the locale of the crystal.

4,839,591

MAGNETIC STROKE SENSOR FOR DETECTING THE STROKE OF A FLUID-POWER CYLINDER

Shinnya Nomura; Toshiro Toyoda, both of Kani, and Kazuhisa Ikenoya, Hatano, all of Japan, assignors to Kayaba Kogyo Kabushiki-Kaisha, Tokyo, Japan

Filed Dec. 9, 1987, Ser. No. 130,821
Claims priority, application Japan, Dec. 16, 1986, 61-193294[U]; Dec. 16, 1986, 61-193295[U]; Dec. 16, 1986, 61-193296[U]
Int. Cl.[4] G01B *7/14;* **F01B** *25/26, 31/12*
U.S. Cl. 324—208 **11 Claims**



1. A stroke sensor for a fluid power cylinder of the type having a piston rod having a magnetic scale and a cylinder means having a cover and a cylindrical wall disposed about said piston rod along with a passage opening up onto said cylindrical wall, the combination comprising a non-magnetic, friction-resistant means slidably mounted in said passage, a magnetic sensor means mounted on said non-magnetic, friction-resistant means, said non-magnetic, friction-resistant means having a front surface slidably engageable with said piston rod, said magnetic sensor means being spaced from said front surface, biasing means in said passage disposed between said cover and said non-magnetic, friction resistant means and biasing said non-magnetic, friction-resistant means toward said piston rod such that said front surface is in biasing and sliding contact with said piston rod, said biasing and sliding contact being maintained as said piston rod reciprocates in said cylindrical wall such that said magnetic sensor means is maintained at a constant spacing from said reciprocating piston rod as determined by said spacing between said front surface and said magnetic sensor means, and non-rotating means disposed between said non-magnetic, friction-resistant means and said cover to prevent said non-magnetic, friction-resistant means from rotating in said passage.

4,839,592

OPERATOR INPUT RESPONSIVE SYSTEM AND METHOD FOR SELECTIVELY IDENTIFYING VERIFIED OBJECT FLAWS

Joseph L. Vitulli, Jr., New Rochelle, N.Y., assignor to Magnetic Analysis Corporation, Mount Vernon, N.Y.

Filed Nov. 9, 1987, Ser. No. 118,059
Int. Cl.[4] G01N *27/72, 27/82;* **G01R** *33/12*
U.S. Cl. 324—227 **10 Claims**

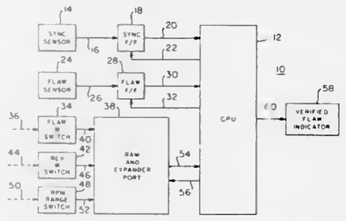
1. A system for verified detection of flaws in an object, comprising:

(a) sync sensor means for generating an output signal once per mutual rotational revolution as between said sync sensor means and said object;

(b) flaw sensor means for generating output signals respon-

sive to detection of flaws in said object and extraneous influences;

(c) switch means responsive to operator input and separately settable for providing output signals respectively indicative of a first preselectable number of flaws for such flaw verification and a second preselectable number of object revolutions for such flaw verification; and



(d) processor means responsive to said output signals of said sync sensor means, said flaw sensor means and said switch means for providing verified flow output indication, said output indication being selectively indicative of flaw verification for number of said object revolutions diverse from said preselected number of object revolutions when said switch means is set with respectively different first and second numbers.

4,839,593

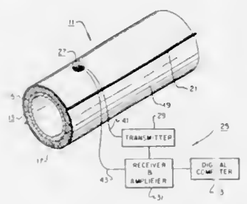
TRANSIENT ELECTROMAGNETIC METHOD FOR DIRECTLY DETECTING CORROSION ON CONDUCTIVE CONTAINERS

Brian R. Spies, McKinney, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 17, 1987, Ser. No. 133,952

Int. Cl.[4] G01N *27/82*; G01R *33/12*

U.S. Cl. 324—240 **14 Claims**



3. A method of detecting corrosion on electrically conductive walls of container means, comprising the steps of:

a. providing transmitting antenna means, receiving antenna means, transmitter means connected with said transmitting antenna means, and receiver means connected with said receiving antenna means;

b. placing said transmitting antenna means and said receiving antenna means in proximity to that portion of the container means wall which is to be investigated for corrosion;

c. providing an abruptly changing current to said transmitting antenna means from said transmitter means so as to induce current into the investigated container means wall portion;

d. detecting said induced current in said investigated container means wall portion with said receiving antenna means and said receiver means to produce a received signal, said received signal decaying into noise over a period of time, said received signal having a late time range;

e. examining said received signal late time range to determine if a corrosion component is present in said received signal, said corrosion component being due to the presence of corrosion products on said investigated container means wall portion which corrosion products have superparamagnetic properties, the presence of said corrosion component being indicated if the rate of decay of said received signal decreases at late times, wherein if said corrosion component is present in said received signal then said container means wall portion is corroded.

4,839,594

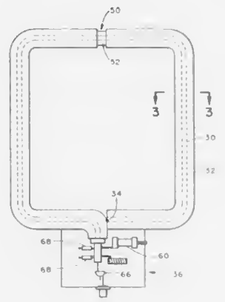
FARADAY SHIELD LOCALIZED COIL FOR MAGNETIC RESONANCE IMAGING

George J. Misic, Novelty; G. Neil Holland, Chagrin Falls; Mehrdad Mehdizadeh, University Hts., and John L. Patrick, Solon, all of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio

Continuation-in-part of Ser. No. 86,277, Aug. 17, 1987, and a continuation-in-part of Ser. No. 931,726, Nov. 17, 1986, Pat. No. 4,752,738, and a continuation-in-part of Ser. No. 765,708, Aug. 14, 1985, Pat. No. 4,793,356. This application Nov. 13, 1987, Ser. No. 120,475

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—318 **24 Claims**



1. A magnetic resonance apparatus comprising:

a main magnetic field generating means for generating a magnetic field through an examination region;

a magnetic resonance excitation means for exciting magnetic resonance of nuclei of a subject in the examination region;

a localized coil assembly for receiving radio frequency signals from the resonating nuclei, the coil assembly including:

an inner conductor having a first end, a second end, and defining a first current path adjacent a surface of the subject;

an outer conductor defining a current path along the inner conductor and at least partially therearound, the outer conductor being disposed between the surface of the subject and the inner conductor, the outer conductor having interconnected first and second ends and at least one opening therein between the subject surface and the inner conductor;

a connecting means for electrically connecting the inner conductor first end with the outer conductor second end; and,

an interface means connected with second ends of the inner and outer conductors for interconnecting the conductors with a cable extending to a receiver that is out of the magnetic field, the interface means being disposed within the magnetic field.

4,839,595

MAGNETIC RESONANCE APPARATUS WITH A DECOUPLING DETECTION SURFACE COIL

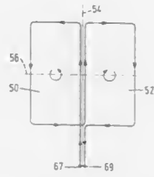
Eddy B. Boskamp, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 908,464, Sep. 17, 1986, abandoned. This application Aug. 12, 1988, Ser. No. 232,548

Claims priority, application Netherlands, Sep. 25, 1985, 8502612

Int. Cl.[4] G01N *24/02*

U.S. Cl. 324—318 **8 Claims**



1. A magnetic resonance apparatus comprising means for generating a stationary magnetic field in an examination space, an RF transmission coil for producing an RF magnetic field in said examination space, a separate RF measuring coil for detecting magnetic resonance signals produced by said RF field in an object disposed in said examination space, said measuring coil comprising at least two, planar coil portions each disposed on opposite sides of an axis of symmetry which divides said coil so that sum of the surface area of the coil portions on the respective sides of said axis are substantially equal, all coil portions on a respective side of said axis of symmetry lying in a single plane and being oriented with respect to the direction of the transmission field so that a current induced by said RF field in the coil portion on one side of said axis is compensated for by a current induced by said RF field in the coil portion on the other side of said axis to thereby reduce coupling between said transmission coil and said measuring coil

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4,839,596

TRANSMITTING/RECEIVING SYSTEM FOR MAGNETIC RESONANCE IMAGING SYSTEM

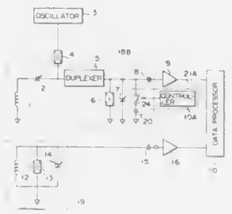
Satoshi Sugiura, Redwood City, Calif., assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 18, 1987, Ser. No. 135,177

Claims priority, application Japan, Dec. 19, 1986, 61-301366

Int. Cl.[4] G01R *33/20*

U.S. Cl. 324—322 **5 Claims**



1. A transmitting/receiving system for use in a magnetic resonance imaging system, comprising:

first high-frequency coil means used for both transmission and reception;

transmitter means for transmitting a high-frequency field for exciting a magnetic resonance phenomenon to an object through said first high-frequency coil means;

first receiver means which constitutes a first resonator, capable of resonating with a magnetic resonance signal from the object, together with said first high-frequency coil means, for receiving the magnetic resonance signal through said first high-frequency coil means;

second high-frequency coil means used for only reception;

second receiver means which constitutes a second resonator, capable of resonating with the magnetic resonance signal from the object, together with said second high-frequency coil means, for receiving the magnetic resonance signal through said second high-frequency coil means;

selection means for selectively enabling one of said first and second receiver means; and

resonance control means, operated in accordance with selection of said selection means, for, when said second receiver means is enabled, changing a resonance condition of said first resonator so as to suppress resonance of said first resonator with respect to the magnetic resonance signal from the object.

4,839,597

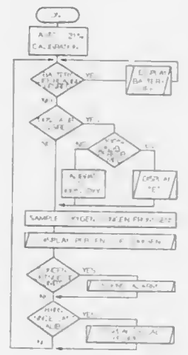
BATTERY CONDITION MONITORING SYSTEM

Robert O. Rowland, Hemet, Calif., assignor to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Division of Ser. No. 754,244, Jul. 12, 1985, abandoned. This application Oct. 8, 1987, Ser. No. 105,911

Int. Cl.[4] G01N *27/46*

U.S. Cl. 324—433 **8 Claims**



1. In an apparatus which uses a battery supply providing battery voltage and current to the apparatus and which comprises (1) means for monitoring the voltage of the battery supply, and (2) means for indicating when the battery supply voltage has dropped below a predetermined level, an improvement comprising:

means responsive to the means for monitoring the battery voltage for comparing the monitored battery voltage only against average discharge information for the battery supply recommended for the apparatus;

estimated battery life calculating means responsive to the comparing means for calculating the estimated battery life of the battery supply after receiving a prompt to do so;

estimated battery life display means responsive to the estimated battery life calculating means for displaying the estimated battery life of the battery supply after receiving a prompt to do so;

means for manually prompting the estimated battery life display means; and,

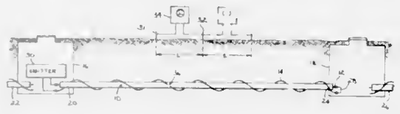
means for automatically and periodically prompting the estimated battery life calculating means.

4,839,598

METHOD FOR TESTING UNDERGROUND ELECTRIC CABLES

Douglas D. Calvert, Wales; Edward A. Bebrens, Milwaukee, and Donald K. Baver, Wauwatosa, all of Wis., assignors to Wisconsin Electric Power Company, Milwaukee, Wis.

Filed Feb. 8, 1988, Ser. No. 152,979
Int. Cl.[4] G01R *31/08*
U.S. Cl. 324—539 9 Claims



1. A method for testing underground electric cables having an insulated first conductor and a bare second conductor, said method comprising the steps of:
(a) coupling the first conductor to the second conductor at one end of the cable;
(b) applying an electrical signal between the first and second conductors at the other end of the cable, the electrical signal having a given frequency; and
(c) measuring the potential difference at the given frequency of the electrical signal between two spaced apart locations at the surface of the earth along the path of the cable.

4,839,599

MULTIPIECE CABLE TESTING DEVICE WHICH FUNCTIONS AS FLASHLIGHT, CONTINUITY CHECKER, AND CABLE IDENTIFIER

Montie R. Fischer, 1401 S. Nicolet Rd., Apt 49, Appleton, Wis. 54915

Filed Jul. 22, 1988, Ser. No. 222,813
Int. Cl.[4] G01R *19/00, 31/02*
U.S. Cl. 324—542 4 Claims

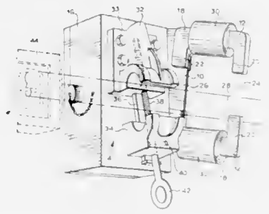
1. A modular cable testing device, comprising:
a battery pack, said battery pack including a first connecting means;
a detector section for determining cable continuity, identifying one cable from a plurality of cables, or detecting electrical shorts in a cable, said detector section including a visual signalling means for signalling a cable is continuous, a particular cable is identified, or an electrical short is present in a cable, said detector section including a second connecting means and a third connecting means;
a shorting plug providing a return path for electrical current, said shorting plug including a fourth connecting means;
said first connecting means being connectable to a first end of a cable or to said second connecting means of said detector section;
said second connecting means being connectable to a second end of a cable or to said first connecting means of said battery pack; and
said third connecting means being connectable to an end of a cable or to said fourth connecting means of said shorting plug.

4,839,600

AMMETER FOR USE WITH A.C. ELECTRIC POWER LINES

John C. Kuurstra, 40 Johnson Street, Thornhill, Ontario, Canada L3T 2N7

Continuation-in-part of Ser. No. 817,708, Jan. 10, 1986, abandoned. This application Mar. 17, 1987, Ser. No. 26,601
Int. Cl.[4] G01R *11/02, 11/04*
U.S. Cl. 324—127 11 Claims



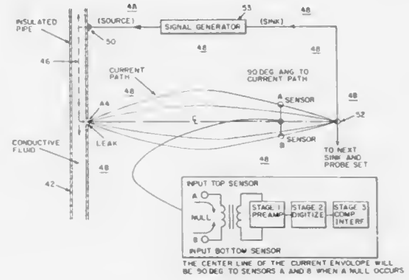
1. An ammeter for mounting on an A.C. electric power line for measurement of the current passing in the power line, the apparatus comprising:
(a) a support member;
(b) two at least approximately C-shaped flux-concentrating magnetic cores each comprising a base portion and two arm portions mounted oppositely to one another on the support member, the cores being separated at all times from one another to provide a power line receiving air gap between them with corresponding arm portions thereof disposed opposite to one another to define between the said oppositely disposed arm portions two respective opposed separate permanent non-magnetic gaps through one of which the power line passes while mounting the ammeter on and dismounting the ammeter from the power line;
(c) at least two opposed multi-turn inductive coils wound respectively on the cores and connected in series with one another;
(d) measuring means connected to the said coils for measuring directly the current flowing therein, thereby obtaining a measurement representative of the current passing in the power line; and
(e) means for locating the line within the power line receiving space at least approximately centrally between the two cores.

4,839,601

DIRECTIONAL CURRENT FINDER

Daniel E. C. Cotterell, 2150 Bromsgrove Road, Mississauga, Ontario, Canada L5J 4B3, and David J. Stewart, P.O. Box No. 4, R.R. #2, Loretto, Ontario, Canada L0G 1L0

Continuation-in-part of Ser. No. 746,888, Jun. 20, 1985, abandoned. This application Nov. 27, 1987, Ser. No. 127,040
Int. Cl.[4] G01R *31/16*
U.S. Cl. 324—559 15 Claims



1. An electrical detection system for locating a position of interest in a medium which is electrically conductive, comprising:
an electrical signal generator having an output terminal and a reference terminal;
a source connected to said output terminal and being disposed at a first position in said medium;
a sink connected to said reference terminal and being disposed at a second position, spaced from said first position, in said medium;
whereby, a signal generated by said generator flows from said source to said sink through said medium;
at least two probes, said probes being in contact with said medium at spaced third and fourth positions therein such that said third and fourth positions are equidistantly spaced from either said first position or said second position;
whereby, a signal generated by said signal generator will flow from said source to said probes;
a comparator having a first input terminal and a second input terminal and an output terminal;
display means connected to said output terminal;
a first one of said probes being connected to said first input terminal and a second one of said probes being connected to said second input terminal;
whereby, to compare the signal strength at said one probe with the signal strength at said second probe;
said probes being movable to different positions in said medium to determine a cross-over position such that, at said cross-over position, the perpendicular bi-sector of the line joining the probes indicates at said point of interest by pointing in the general direction thereof.

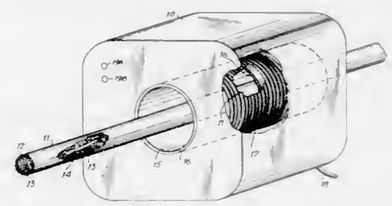
4,839,602

MEANS FOR DETECTING METAL IN A STREAM OF PARTICULATE MATTER

Charles D. Pletcher, Bon Air, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Nov. 4, 1986, Ser. No. 927,276
Int. Cl.[4] G01R *27/16*
U.S. Cl. 324—57 Q 18 Claims

1. Apparatus for detecting metal in a sample, said apparatus comprising:
an oscillator circuit, said circuit producing an output signal having a characteristic frequency and having, under nominal conditions, a characteristic AC amplitude and oscillating, under nominal conditions, about a characteristic DC baseline, said circuit including an impedance element having a nominal impedance;
means for passing a sample through the impedance element so that the impedance of the impedance element changes



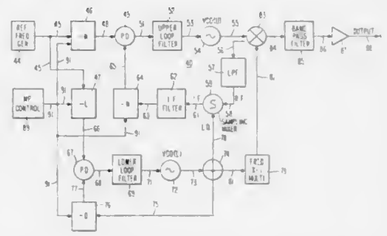
in response to the presence of metal in the sample which in turn changes the DC baseline value and AC amplitude of the output signal; and
analytical circuit means for determining when the output signal changes from its nominal DC baseline and AC amplitude.

4,839,603

MULTIPLE-LOOP MICROWAVE FREQUENCY SYNTHESIZER USING TWO PHASE LOCKLOOPS

Vaughn L. Mower, Bountiful; Ervo A. Deneris, Salt Lake City, and John B. Cox, West Bountiful, all of Utah, assignors to Unisys Corporation, Blue Bell, Pa.

Filed Sep. 24, 1987, Ser. No. 100,400
Int. Cl.[4] H03B *19/00*; H03L *7/00*
U.S. Cl. 328—14 12 Claims



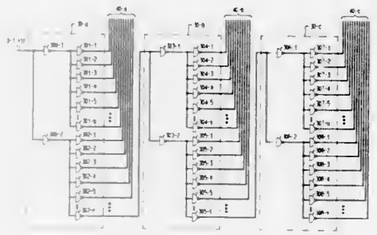
1. Apparatus for generating adjusable microwave frequencies of the type having an upper phased-locked loop and a lower phased-lock loop with individual outputs and inputs characterized in that:
said upper phased-lock loop and said lower phased-lock loop each having a feedback path.
a sampling mixer circuit connected in said feedback path of the upper phased-lock loop and connected at the output of the lower phased-lock loop, and
upconverting means connected to said output of the upper phased-lock loop and to the output of the lower phased-lock loop to provide an adjustable microwave frequency output from the upconverter.

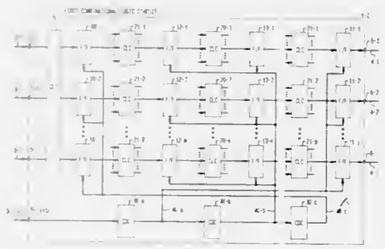
4,839,604

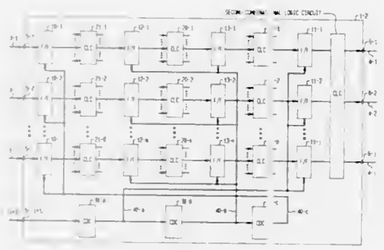
INTEGRATED CIRCUIT WITH CLOCK DISTRIBUTION MEANS FOR SUPPLYING CLOCK SIGNALS

Toshio Tanahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 16, 1988, Ser. No. 169,043
Claims priority, application Japan, Mar. 17, 1987, 63-63127
Int. Cl.[4] H03K *5/15, 5/22, 5/05, 17/00*
U.S. Cl. 328—62 7 Claims







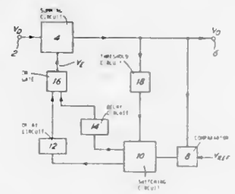
1. An integrated circuit comprising:
a plurality of input storage circuits, each of which has a first input terminal, a first output terminal and a first clock terminal, and, in synchronism with a clock signal fed to said first clock terminal, stores input signals sequentially appearing at said first input terminal to sequentially produce said input signals to said first output terminal;
a logic circuit section composed of at least one of a combinational logic circuit and a sequential logic circuit, said logic circuit section being connected to the first output terminals of said input storage circuits for receiving said input signals;
a plurality of output storage circuits, each of which has a second input terminals, a second output terminal and a second clock terminal, and, in synchronism with a clock signal fed to said second clock terminal, stores output signals sequentially supplied from said logic circuit section to said second input terminal to sequentially produce said output signals to said second output terminal; and
clock distribution means for generating said clock signal fed to said second clock terminal and said clock signal fed to said first clock terminal which is delayed in phase relative to said clock signal fed to said second clock terminal.

4,839,605

SIGNAL COMPENSATION CIRCUITS

John Trett, Marlow, and Peter F. Bradbeer, Slough, both of United Kingdom, assignors to Formula Systems Limited, Eynsham, United Kingdom

PCT No. PCT/GB87/00080, § 371 Date Sep. 25, 1987, § 102(e) Date Sep. 25, 1987, PCT Pub. No. WO87/04691, PCT Pub. Date Aug. 13, 1987
PCT Filed Feb. 4, 1987, Ser. No. 116,719
Claims priority, application United Kingdom, Feb. 6, 1986, 8602961
Int. Cl.[4] G06G *7/14;* H03K *5/13;* G08B *21/00;* G01C *25/00*
U.S. Cl. 328—146 12 Claims



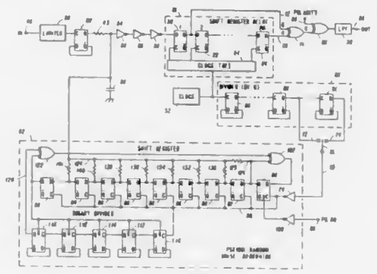
1. An error compensation system comprising:
an input terminal;
an output terminal;
a signal modifying circuit connecting said input terminal to said output terminal, said signal modifying circuit having a control input;
reference signal producing means;
comparison means having two inputs and one output, one input being connected to the output terminal and the other input being connected to said reference signal producing means for comparing the signal at the output terminal with the reference signal produced by the reference signal producing means and producing an error signal at said output;
a first delay circuit having an input and an output;
a second delay circuit having an input and an output, said second delay circuit having a substantially different time constant to the first delay circuit;
means connecting the output of each delay circuit to the control input of the signal modifying circuit; and
switch means connected to the output of the comparator and selectively connectable to the two inputs of the delay circuits, and having a control input responsive to a control signal to switch the output of the comparator to a selected one of the two delay circuits; and
means for monitoring a parameter of the signal fed to the output terminal and producing said control signal in response thereto, said control signal causing said switch means to switch when said parameter complies with a predetermined condition.

4,839,606

DIGITAL FM DEMODULATOR SIGNAL-TO-NOISE IMPROVEMENT

David B. Hallock, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 11, 1987, Ser. No. 84,662
Int. Cl.[4] H03D *3/06;* H03K *9/06*
U.S. Cl. 329—107 22 Claims



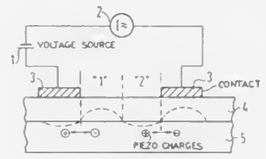
17. Method of reducing beat frequency signals produced in a digital FM demodulator, comprising the steps of:
producing a square wave signal related to an input FM signal; and
randomly varying the widths of pulses in the square wave signal to produce a modified square wave signal for input to said digital FM demodulator.

4,839,607

FREQUENCY-DOUBLING AMPLIFYING SURFACE WAVE RECEIVER

Helmut Schink, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 16, 1988, Ser. No. 245,371
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1987, 3732858
Int. Cl.[4] H03F *7/00*
U.S. Cl. 330—5.5 6 Claims



1. A frequency-doubling, amplifying surface wave receiver for a surface wave element formed of a material which has the piezo effect and which can be rendered electrically conductive by local doping or by applying a conductive layer, characterized in that a region is formed at the upper portion of an insulating substrate body (5) to form a surface wave element and composed of material that has a piezo-electric effect, said region forming a conductive channel (4) between two contact electrodes (3, 3') such that piezo charges occurring are positioned so as to modulate the conductivity of said channel (4); and the distance D between said contact electrodes (3, 3') is at least as large as a complete surface wave which has the length λ such that the condition

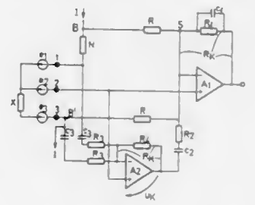
exists, and a voltage source (1) with one side connected to one of said contact electrodes (3), and an other side of said voltage source (1) is connected to the other of said contact electrode (3') through an alternating current detector (2).

4,839,608

CIRCUIT LAYOUT TO ELIMINATE ALTERNATING VOLTAGE INTERFERENCE SIGNALS

Ferdinand Gesell, Esslingen, Fed. Rep. of Germany, assignor to Eckardt AG, Stuttgart, Fed. Rep. of Germany

Filed Oct. 13, 1988, Ser. No. 257,222
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1987, 3735285
Int. Cl.[4] H03F *1/26*
U.S. Cl. 330—149 7 Claims



1. A circuit for eliminating alternating voltage interference signals superposed on direct voltage signals to be amplified, comprising:
a low-pass signal amplifier having a summing node for amplifying said dc signals;
an auxiliary signal amplifier; and
coupling means for coupling said dc signals and said ac signals to said low-pass signal amplifier, and an output of said auxiliary amplifier to said summing node of said low-pass signal amplifier;
whereby said ac signals undergo summing amplification by said auxiliary amplifier to produce a compensating signal and said compensating signal is coupled to said summing node in counter phase to said ac interference signals.

4,839,609

DIFFERENTIAL AMPLIFIER

Hiroyuki Hara, Sumida, and Yasuhiro Sugimoto, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 25, 1988, Ser. No. 173,657
Claims priority, application Japan, Mar. 27, 1987, 62-71881
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—253 6 Claims

1. A differential amplifier comprising:
(a) first and second potential terminals between which a supply voltage is applied;
(b) a pair of first and second voltage drop means connected to said first potential terminal;
(c) a pair of first and second differential field effect transistors, having source terminals coupled to each other and further having a constant current source connected between a junction of the source terminals of said first and

second field effect transistors and said second potential terminal and drain terminals connected to said first and second voltage drop means, for inputting a voltage difference between first and second voltage signals applied to the gates of said first and second field effect transistors, respectively;

(d) a pair of third and fourth bipolar transistors complementary to said first and second field effect transistors, having base terminals connected to a first bias voltage in common and emitter terminals respectively connected to the drain terminals of said first and second field effect transistors, for amplifying the inputted voltage difference, one of collector terminals thereof being connected to an output terminal; and

(e) a current mirror circuit composed of fifth and sixth field effect transistors of the same conductive type as said first and second field effect transistors, said current mirror circuit being connected between collector terminals of said third and fourth bipolar transistors and the second potential terminal.

4,839,610

SYSTEM FOR AUTOMATICALLY CONTROLLING THE GAIN-BANDWIDTH PRODUCT OF OPERATIONAL AMPLIFIERS

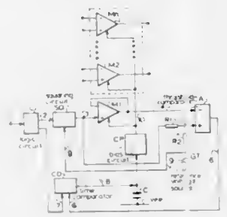
Michelangelo Mazzucco, Santa Maria Tempio; Vanni Poletto, Camino, and Mario Sartori, Turin, all of Italy, assignors to Cselt-Centro Studi E Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Nov. 10, 1987, Ser. No. 119,190

Claims priority, application Italy, Dec. 23, 1986, 67965 A/86

Int. Cl.[4] H03G *3/20*

U.S. Cl. 330—278 **2 Claims**



1. A system for automatically controlling a gain-bandwidth product G*B of plurality of operational amplifiers on a common chip, comprising:

a bias circuit having an output connected to all of the operational amplifiers on said chip whose gain-bandwidth products are to be controlled;

a logic circuit having an input receiving a control signal of a frequency fc for presetting said products of said operational amplifiers and a duty cycle of 50%, and first and second outputs respectively delivering a signal of half said frequency fc, and a signal obtained from a logic-AND operation between said control signal and said signal of said first output;

a squaring circuit having an input connected to said first output, a reference voltage input and an output, said output of said squaring circuit supplying a square-wave signal with positive and negative amplitudes equal to that of a reference voltage applied to said reference voltage input;

a reference voltage source connected to said reference voltage input of said squaring circuit for applying said reference voltage thereto;

means for connecting said output of said squaring circuit to a noninverting input of said operational amplifiers connected to present at a very low frequency a pole of a transfer function with a time constant which is a function of a reciprocal of the gain-bandwidth product thereof and also connected in a voltage-follower configuration, said one of said operational amplifiers having an output;

a threshold comparator having an inverting input connected to said output of said one of said operational amplifiers, a noninverting input connected to said output of said squaring circuit through a first resistor and to said source through a second resistor, and an output supplying a signal with leading edges coincident with those of a summation signal appearing at said noninverting input of said threshold comparator and trailing edges coincident in time with points in time at which voltages of the signals at said inverting and said noninverting inputs of the threshold comparator are equal;

a duration comparing circuit having a first input connected to said output of said threshold comparator, a second input connected to said second output of said logic circuit and an output at which is supplied a current signal with an outgoing direction when a high-level part of the signal supplied at said output of said threshold comparator exceeds the signal supplied by said second output of said logic circuit and with an incoming direction when a high-level part of the signal supplied at said output of said threshold comparator is less than the signal supplied by said second output of said logic circuit;

a capacitor having one terminal connected to a negative voltage source and a second terminal connected to said output of said duration comparing circuit for developing a control voltage across said capacitor as a function of said current signal; and

means for applying said control voltage to said bias circuit so as to vary the gain-bandwidth products of said operational amplifier inversely with the control voltage across said terminals.

4,839,611

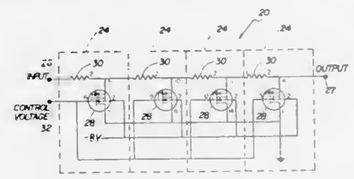
VOLTAGE CONTROLLED HIGH-FREQUENCY ATTENUATOR

David H. Kukulinsky, Stow, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 7, 1988, Ser. No. 164,817

Int. Cl.[4] H03G *3/30*

U.S. Cl. 330—284 **24 Claims**



1. A continuously variable, passive attenuator comprising

a signal path between an attenuator input node and an attenuator output node,

said signal path including a passive resistive element connected between said input and output nodes, and

a semiconductor element having a first terminal connected to said resistive element, a second terminal connected to a reference voltage, and a third terminal connected to a control signal node,

the resistance of said semiconductor element between said first and second terminals being continuously variable as a function of the value of a control signal provided to said third terminal,

the capacitance of said semiconductor element always being less than 4 pf.

4,839,612

HIGH-FREQUENCY POWER AMPLIFIER HAVING HETEROJUNCTION BIPOLAR TRANSISTOR

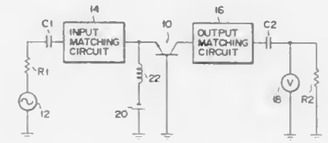
Junko Akagi, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 11, 1988, Ser. No. 167,108

Claims priority, application Japan, Mar. 13, 1987, 62-56855

Int. Cl.[4] H03F *3/191*

U.S. Cl. 330—302 **5 Claims**



1. A power amplifier circuit comprising:

a III-V compound semiconductor heterojunction bipolar transistor having a base, an emitter and a collector; and

voltage applying means connected between the base and the emitter of said transistor for applying a d.c. bias voltage to said transistor, and for reducing an externally supplied turn-on drive voltage required for rendering said transistor conductive;

said d.c. bias voltage having a voltage level which is less than 80% of a specific voltage level needed to turn on said transistor, said d.c. bias voltage ranging between 0.5 volts and 1.2 volts, said voltage applying means comprising a d.c. power source and an inductive element connected in series, said inductive element connected between the emitter of said transistor and said d.c. power source.

4,839,613

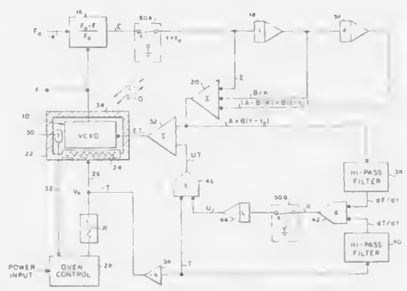
TEMPERATURE COMPENSATION FOR A DISCIPLINED FREQUENCY STANDARD

James D. Echols, Hutto, Tex.; James A. Barnes, Bolder, Colo., and Bruce M. Penrod, Weir, Tex., assignors to Austron, Inc., Austin, Tex.

Filed May 31, 1988, Ser. No. 200,637

Int. Cl.[4] H03B *1/00*

U.S. Cl. 331—69 **9 Claims**



1. In a disciplined frequency standard of the type having a variable frequency oscillator including a temperature dependent crystal resonator and an input circuit for driving the frequency of oscillation of the resonator in proportion to the magnitude of an electronic tuning signal applied to said input, and wherein said resonator is enclosed within an oven having an electrical heater for generating heat within the oven in response to the flow of electrical current through the heater, the improvement comprising a current sensing element coupled to said oven heater for producing an analog signal T proportional to the magnitude of current flowing through said sensing element, means for generating a parameter U proportional to the rate of change of frequency of the resonator with respect to the rate of change of temperature within said oven, and means for inputting an electronic tuning signal which includes as one of its components the product UT to the input circuit of said resonator circuit.

4,839,614

FREQUENCY REFERENCING SYSTEM AND METHOD

Godfrey R. Hill, Ipswich, and David W. Smith, Woodbridge, both of England, assignors to British Telecommunications Public Limited Company, Great Britain

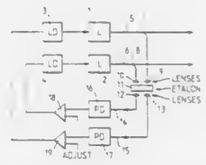
PCT No. PCT/GB86/00553, § 371 Date May 14, 1987, § 102(e) Date May 14, 1987, PCT Pub. No. WO87/01874, PCT Pub. Date Mar. 26, 1987

PCT Filed Sep. 16, 1986, Ser. No. 71,341

Claims priority, application United Kingdom, Sep. 16, 1985, 8522821

Int. Cl.[4] H01S *3/13*; H04J *1/00*

U.S. Cl. 332—7.51 **18 Claims**



1. A method of referencing the frequencies of radiation from a plurality of sources, the method comprising:

guiding the radiation from each source to a filter element having a replicated set of passbands spaced apart in frequency;

monitoring radiation at each of the wavelengths transmitted through the filter element; and

controlling the sources so that the radiation at each wavelength transmitted through the filter element is maintained substantially constant, the bandwidths of the radiation at each wavelength being smaller than the corresponding passbands of the filter element.

4,839,615

FREQUENCY MODULATING CIRCUIT FOR VIDEO TAPE RECORDER

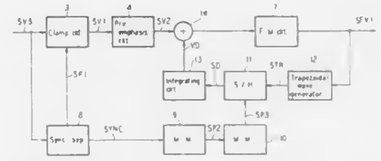
Ichitaro Sato, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 19, 1988, Ser. No. 145,330

Claims priority, application Japan, Jan. 27, 1987, 62-018095

Int. Cl.[4] H04N *9/80*

U.S. Cl. 332—18 **6 Claims**



1. A frequency modulating circuit for use in a video tape recorder, comprising:

input terminal means supplied with a video signal to be recorded;

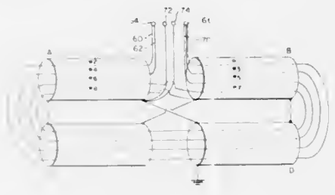
clamp circuit means for clamping a predetermined portion of said video signal to a reference level;
synchronizing signal separating means for separating a horizontal synchronizing signal from said video signal;
sampling pulse generating means for generating a sampling pulse in accordance with said horizontal synchronizing signal;
modulating means for modulating the frequency of a carrier signal by the output signal of said clamp circuit means and thereby generating a frequency modulated signal;
detecting means for detecting the phase of said frequency modulated signal at the timing of said sampling pulse; and
correcting means for correcting the level of the output signal of said clamp circuit means by the output of said detecting means such that the phase of said frequency modulated signal at the timing of said sampling pulse is stabilized.

4,839,616

BROADBAND IMPEDANCE TRANSFORMER

Will Herzog, Rochester, N.Y., assignor to Harris Corporation, Rochester, N.Y.

Filed Jul. 18, 1983, Ser. No. 514,884
Int. Cl.[4] H03H *7/38*
U.S. Cl. 333—32 **2 Claims**



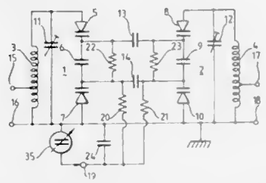
1. A transformer to modify the characteristic impedance of a transmission line, comprising:
two parallel sections of electrically conductive tubing, electrically connected to each other at one end;
a first terminal at the free end of one of said sections of tubing;
a second terminal at the free end of the other of said sections of tubing;
a first electrical conductor having:
one end electrically connected to said second terminal,
a plurality of turns through the interior of said sections of tubing, and
the other end electrically connected to a ground reference, and
a second electrical conductor electrically connected in parallel to said first conductor, said second conductor having a like plurality of turns through the interior of said two sections of tubing, wherein the first turn of said turns of said first and second conductors are made through different sections of said tubing, so that the current flowing through each of said two sections of tubing is equal in amplitude and opposite in direction to the sum of the current flowing through each of said turns of said first and second conductors passing through the interior of such section of tubing.

4,839,617

BANDPASS FILTER CIRCUIT ARRANGEMENT

John D. Speake, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 22, 1988, Ser. No. 275,044
Claims priority, application United Kingdom, Nov. 27, 1987, 8727831
Int. Cl.[4] H03H *7/01*
U.S. Cl. 333—174 **8 Claims**



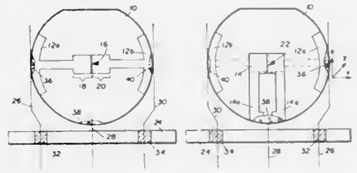
1. A bandpass filter circuit arrangement comprising first and second parallel-resonant circuits each of which comprises an inductive component and a capacitive component, each said capacitive component comprising a pair of capacitors in series, a capacitor of each pair being variable in step with variation of the corresponding capacitor of the other pair, a bidirectional reactive coupling being provided between a point on the connection between the capacitors of one pair and a point on the connection between the capacitors of the other pair, characterized in that each said capacitive component includes a respective further capacitor in series with the capacitors of the corresponding pair and in that a further bidirectional reactive coupling is provided between a point on the connection between one said further capacitor and the pair of capacitors corresponding thereto and a point on the connection between the other said further capacitor and the pair of capacitors corresponding thereto.

4,839,618

MONOLITHIC CRYSTAL FILTER WITH WIDE BANDWIDTH AND METHOD OF MAKING SAME

Gerald E. Roberts, Lynchburg; A. Gordon Staples, Evergreen, and Samuel Toliver, Rustburg, all of Va., assignors to General Electric Company, Lynchburg, Va.

Filed May 26, 1987, Ser. No. 53,658
Int. Cl.[4] H03H *9/56, 9/13, 9/205*
U.S. Cl. 333—191 **12 Claims**



1. A monolithic bandpass crystal filter comprising:
a crystal wafer having two sides;
a pair of juxtaposed electrodes formed with extended leads for connection to other circuits and disposed on a first side of said wafer without conductive coupling but with electroacoustic coupling via said wafer with a gap therebetween which is substantially less than 0.006 inch in width, said gap having been formed by a laser trimming operation which also thereby forms said pair of electrodes from a singular conductive member by separating it into two electrically unconnected portions;

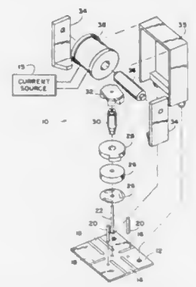
at least one further electrode disposed on the second side of said wafer opposite said pair of juxtaposed electrodes.

4,839,619

RELAY FOR WIDEBAND SIGNALS

Jon C. Matton, Milwaukie, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 28, 1988, Ser. No. 226,338
Int. Cl.[4] H01H *50/58*
U.S. Cl. 335—125 **12 Claims**



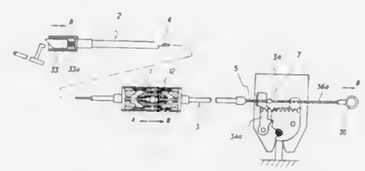
1. A relay for wideband signals comprising:
a. a stator attached to a mounting surface, the mounting surface having a first pattern of contact traces;
b. a rotor including a magnetic armature attached to a cruciform permanent magnet structure rotatably attached to the mounting surface, said rotor containing a second pattern of contact traces, such that the first pattern of contact traces is coupled to the second pattern of contact traces in a first stable state; and
c. means for momentarily energizing said stator to raise, rotate, and lower said rotor such that the first pattern of contact traces is coupled to the second pattern of contact traces in a second stable state.

4,839,620

SOLENOID ACTUATED CONTROL CABLE

Mikiya Yagi, Nishinomiya, Japan, assignor to Nippon Cable System Inc., Takarazuka, Japan

Filed Dec. 17, 1987, Ser. No. 134,485
Claims priority, application Japan, Dec. 20, 1986, 61-304864; Mar. 16, 1987, 62-38020[U]
Int. Cl.[4] H01F *7/00*
U.S. Cl. 335—219 **19 Claims**



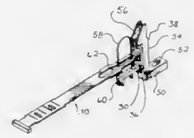
1. A solenoid-actuated control cable comprising:
(a) a solenoid having one moving core capable of moving along a direction and one set of a first coil and a second coil disposed along the direction of movement of the moving core, wherein to energize one coil makes the moving core attracted in one direction while to energize another coil makes the moving core attracted in another direction; and
(b) at least two inner cables connected to ends of the moving core in such a manner that each end of the moving core is connected with at least one inner cable.

4,839,621

ELECTROMAGNETIC ACTUATOR HAVING IMPROVED DAMPENING MEANS

Laura G. Bulson; Laura P. Misenheimer, and Robert A. Sebresky, all of Charlotte, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 18, 1988, Ser. No. 259,063
Int. Cl.[4] H01F *7/08*
U.S. Cl. 335—277 **6 Claims**



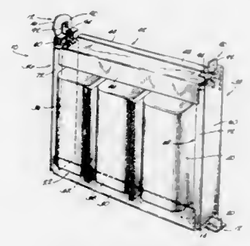
1. An electromagnetic actuator comprising:
an armature having a face and a tail:
a stator means having a core surrounded by a coil positioned adjacent to said armature for driving said armature in a forward direction when said coil is energized: and
a dampening assembly positioned adjacent to said armature tail for absorbing kinetic energy of said armature, said assembly further comprising a frame member. a three layer dampener fixed in said frame member and adjacent to said armature tail so that contact by said armature places said dampener in shear whereby the kinetic energy of said armature is transferred to said dampening assembly.

4,839,622

TRANSFORMER CORE CLAMPING STRUCTURE

Noah D. Hay, Mukwonago, Wis., assignor to Cooper Power Systems, Inc., Houston, Tex.

Filed Sep. 30, 1988, Ser. No. 252,182
Int. Cl.[4] H01F *27/02, 27/26*
U.S. Cl. 336—92 **27 Claims**



1. A transformer comprising
a container including a bottom wall having thereon an upwardly extending rib, and a side wall,
a core including first and second generally vertical, spaced-apart portions,
first and second coils respectively wound around said first and second portions of said core,
a clamping structure including a generally horizontal upper member disposed above said core and said coils, a generally horizontal lower member disposed below said core

and said coils, and a generally vertical end plate assembly which is disposed adjacent one of said coils, which extends between said upper and lower members and which includes a vertically extending end plate, said end plate having a lower end which has therein a vertically extending slot receiving said rib so that said clamping structure is located relative to said bottom wall, a first vertically exteoding member having a U-shaped cross section and including a base portion parallel to and spaced from said end plate, and spaced, parallel leg portions extending from said base portion and connected to said end plate, said first member being connected to said upper and lower members, and a second vertically extending member which is connected to said end plate, which is located between said end plate and said base portion of said first member and between said leg portions and which has a U-shaped cross section and includes a base portion parallel to and spaced from said end plate, and spaced, parallel leg portions extending from said base portion of said second member and connected to said end plate, and

means for securing said end plate assembly to said side wall so that said clamping structure is located relative to said side wall.

4,839,623

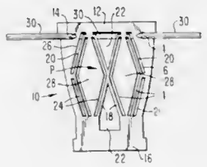
MAGNETIC CORE BLANKS OF MAGNETICALLY PERMEABLE SHEET MATERIAL

Erick O. Schonstedt, Reston, and Mohammed M. Hamzezadeh, Fairfax, both of Va., assignors to Schonstedt Instrument Company, Reston, Va.

Division of Ser. No. 936,629, Dec. 1, 1986. This application Feb. 8, 1988, Ser. No. 153,458

Int. Cl.[4] H01F 27/24

U.S. Cl. 336—213 **6 Claims**



1. A blank for the manufacture of a magnetic core, comprising a sheet of magnetically permeable material having a magnetic core preform including strip elements that define an X-configuration and stabilizer strip elements at opposite sides of the X-configuration, respectively and defining therewith two diamond configurations, said strip elements being partially separated from said blank by strip-shaped openings extending longitudinally along respective strip elements at opposite sides thereof, said diamond configurations including portions of said sheet adjoining said X-configuration at opposite sides thereof and having areas that are substantially greater than the areas of said strip elements at either side of said diamond configurations.

4,839,624

MAGNETIC CORES

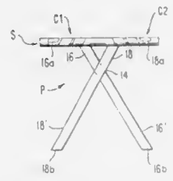
Erick O. Schonstedt, Reston, Va., assignor to Schonstedt Instrument Company, Reston, Va.

Division of Ser. No. 891,995, Aug. 1, 1986, Pat. No. 4,803,773. This application Feb. 9, 1988, Ser. No. 154,094

Int. Cl.[4] H01F 27/24

U.S. Cl. 336—213 **11 Claims**

1. A magnetic core comprising an elongated non-magnetic support having at least two superposed layers of magnetically permeable material thereon, one of said layers being constituted by a first set of helical convolutions with a helix angle in one direction followed longitudinally by a second set of helical convolutions with a helix angle in the opposite direction, and another of said layers being constituted by a third set of helical



convolutions superposed upon the first set but with a helix angle in said opposite direction and a fourth set of helical convolutions superposed upon said second set but with a helix angle in said one direction.

4,839,625

FUSE

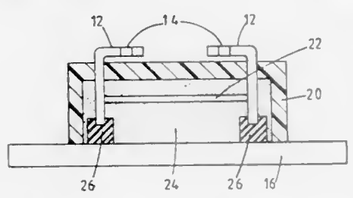
Percy G. Newbery, Leicester, and Nigel P. M. Nurse, West Bridgeford, both of United Kingdom, assignors to Brush Fusegear Limited, Leicestershire, England

Filed May 19, 1988, Ser. No. 196,142

Claims priority, application United Kingdom, May 19, 1987, 8711828

Int. Cl.[4] H01H 85/04

U.S. Cl. 337—166 **7 Claims**



1. A fuse comprising:

a multi-sided fuse element having two ends,

two elongate terminals, each terminal connected to a corresponding end of the fuse element for providing electrical connections to the fuse element,

a body encapsulating the fuse element and at least a part of each of the terminals, the body including

a baseplate comprising a thermally conductive material, the terminals projecting orthogonally with respect to the baseplate,

a layer of electrically insulating, heat conducting material provided on the baseplate for insulating the terminals from the baseplate, and

an arc quenching material substantially filling the body for permitting dissipation of heat, the arc quenching material surrounding the fuse element on at least three sides and surrounding the part of each terminal encapsulated by the body.

4,839,626

POWER CONTROL DEVICE

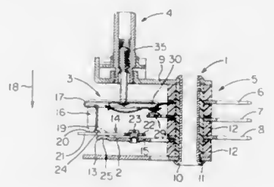
Walter Hollweck, Heroldsberg, Fed. Rep. of Germany, assignor to Thermostat-und Schaltgerateban GmbH Co. KG, Bad Kissingen, Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 175,521

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1987, 3710387

Int. Cl.[4] H01H 37/14, 37/52

U.S. Cl. 337—377 **18 Claims**



1. A power control device for controlling the power supplied to electrically heated devices, particularly cooking devices, such as stove burners, ovens, grills, microwave ovens and similar items, with

(a) a bimetallic element which can be electrically heated and having a root and a swing end,

(b) a switch with spring contacts which can be activated by a swing movement of the bimetallic element and having an activation end,

(c) a regulator which can be activated manually, to influence the switching point of the switch with spring contacts,

(d) a holder arm for supporting the regulator,

(e) contact elements,

(f) an extended carrier, to which the bimetallic element, the switch with spring contacts, contact elements and holder arm are attached, essentially at a right angle of projection,

(g) a transfer pin arranged essentially parallel to the carrier, between the swing end of the bimetallic element and the activation end of the switch with spring contacts, with initial tension,

(h) spacers of insulating material on the carrier separating the the bimetallic element, the switch with spring contacts, contact elements and holder arm attached thereto,

characterized in that

the swing end of the bimetallic element is provided with a carrier element and an electrical heating element, to which power can be applied independently of the supply of power to the power consumer of the device through a circuit parallel to the power consumer circuit of the device, such parallel circuit including the root of the bimetallic element, said electrical heating element and the transfer pin, said electrical heating element being structured as a metal film resistor arranged on said carrier element, the transfer pin applying initial tension to the electrical heating element.

4,839,627

VARIABLE RESISTOR

Atsushi Okazaki, Iruma; Masahiko Igarashi, Mitaka, and Tsuneo Horie, Iruma, all of Japan, assignors to Copal Electronics Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 841,459, Mar. 19, 1985, abandoned. This application Dec. 31, 1987, Ser. No. 140,239

Claims priority, application Japan, Mar. 22, 1985, 60-57865; Mar. 22, 1985, 60-57866; Mar. 22, 1985, 60-57867

Int. Cl.[4] H01C 10/34

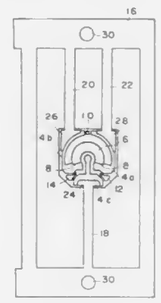
U.S. Cl. 338—174 **3 Claims**

1. A variable resistor comprising:

a housing;

a base disposed in said housing and between which a cavity is defined;

said base having disposed thereon a resistance track, spaced apart conductor elements operatively electrically connected to the resistance track, a collector element spaced from said conductor elements, and a respective filler element extending across each space between the conductor elements and the space between the collector element and the conductor elements,



a rotor having a wiper connected thereto within said cavity, the wiper in operative electrical contact with said resistance track and said collector element;

a plurality of terminal leads each having a respective end portion which is welded to a respective one of said conductor elements and said collector element,

said terminal leads plated with solder except on respective outwardly facing upper surfaces of said respective end portions thereof at which upper surfaces the terminal leads are respectively welded to said conductor elements and said collector element.

4,839,628

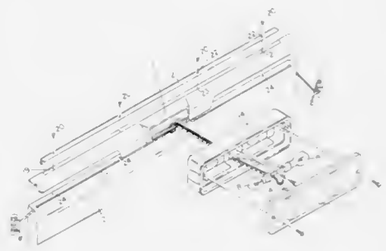
PAGING RECEIVER HAVING SELECTIVELY PROTECTED REGIONS OF MEMORY

Walter L. Davis, Coral Springs; Mario A. Rivas, West Palm Beach, both of Fla.; Kenneth R. Burch, and Vincent B. Deems, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 11, 1988, Ser. No. 141,802

Int. Cl.[4] G08B 3/10

U.S. Cl. 340—311.1 **26 Claims**



1. A paging device comprising:

means for receiving selective call signals transmitted from an external source, the selective call signals including an address to which the paging device is responsive, information intended for reconfiguring the operation of the paging device and coded information, the coded information including a coded signal to allow reconfiguring the operation of the paging device;

means for decoding the selective call signals to recover the reconfiguration information and coded signal in response to decoding said address;

memory means, having a temporary memory region and nonvolatile memory regions, said nonvolatile memory regions being readable for controlling the operation of the paging device, said memory means being responsive to said decoding means for temporarily storing said reconfiguration information in said temporary memory region;

means for selecting a nonvolatile region of memory corresponding to said information to be reconfigured;

means for comparing the received coded signal to a predetermined coded signal stored in the paging device; and

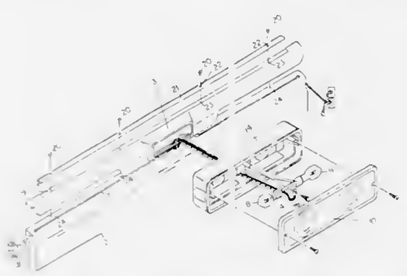
means for protecting said selected nonvolatile region of memory from being modified by said decoding means with said temporarily stored reconfiguration information, said protecting means being responsive to said comparing means to prevent said selected nonvolatile region of memory from being modified unless the received coded signal matches the predetermined coded signal.

4,839,629

PICKUP TRUCK TAILGATE PROTECTOR WITH THIRD TAIL LIGHT

James M. Brown, 5710 Oakview Ln. North, Plymouth, Minn. 55442

Filed Aug. 1, 1988, Ser No. 226,831
Int. Cl.[4] B60Q *1/26*
U.S. Cl. 340—468 5 Claims



1. A tailgate protector for pickup trucks having a third tail light for increased traffic safety comprising,

a plastic tailgate protecting portion having a top, a rear and a width,

a light housing section in the middle of the tailgate protecting portion's width which has an inside and an outside,

a tail light assembly having a right side and a left side,

a pair of lights on the tail light assembly, one light on the right of the tail light assembly and one light on the left side of the tail light assembly.

a box in which to insert the tail light assembly,

a lens cover to cover the lights in the box,

inserting the box with the tail light assembly inside the light housing section,

a means of securing the tail light assembly inside the box,

a means of securing the lens cover over the lights,

a means of wiring the lights in the light housing section with wires so that both lights on the tail light assembly are when the brake lights of the vehicle are on, so that the left light is on when the left turn signal of the vehicle is on and so that the right light is on when the left turn signal of the vehicle is on,

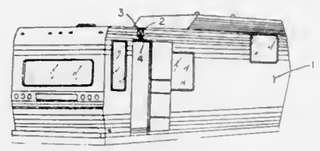
a means of attaching the tailgate protector to a tailgate on a pickup truck.

4,839,630

EMERGENCY SIGNAL DEVICE

Robert A. Miller, 538 Palmer Blvd., North Fort Myers, Fla. 33903

Filed Apr. 4, 1988, Ser. No. 177,115
Int. Cl.[4] G08B *13/00*
U.S. Cl. 340—574 5 Claims



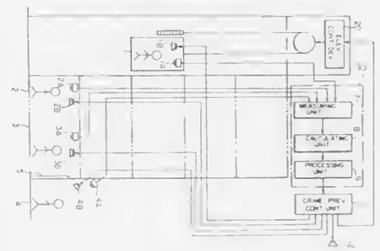
1. In a mobile home park having a source of a.c. house current, an emergency signal system for individual mobile homes comprising a box having top, bottom and side walls; a step-down transformer in said box, said transformer having a primary and a secondary winding, each with two sides; electrical connections between said primary winding of said transformer and said source of house current to energize said primary winding; a primary power lamp electrically connected between said two sides of said primary winding to be energized when said primary winding is energized to provide a constant indication that the house current power is on and to illuminate the said box to permit its location to be readily determined; an alarm circuit electrically connected to said secondary winding, said alarm circuit comprising a manually operated, maintained-action switch mounted in said box with a switch operating part projecting outwardly from said top wall of said box, electrically connected to one side of said secondary winding; a high intensity flashing alarm lamp and an electrically operated horn electrically connected to one side of said switch and to the other side of said secondary winding so as to be energized when said switch is closed; a base supporting said flashing lamp and horn, mounted on an outside wall of said mobile home; an alarm indicator lamp mounted in said top wall of said box and electrically connected with said lamp and horn, whereby said second lamp is energized when said alarm lamp and horn are energized; an extension cord receptacle mounted in a wall of said box and electrically connected across said switch; an extension cord with a plurality of wires electrically connected to said receptacle at one end of said extension cord and to a normally open, manually operated extension cord switch at the other, outer end of said extension cord; a housing physically mounted on said outer end of said extension cord, said extension cord switch being mounted in said housing and having an operator part projecting outside thereof to be easily accessible for manual operation, and an extension lamp, mounted in said housing, electrically connected in parallel with said switch to two wires of said extension cord.

4,839,631

MONITOR CONTROL APPARATUS

Shintaro Tsuji, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 862,793, May 13, 1986, abandoned.
This application Jun. 17, 1988, Ser. No. 208,837
Claims priority, application Japan, May 14, 1985, 60-102088
Int. Cl.[4] G08B *13/00;* H04N *7/18*
U.S. Cl. 340—541 15 Claims



1. In an elevator system including a plurality of cages for servicing a plurality of floors in a building,

a monitor control apparatus determining movements of passengers within designated areas and executing predetermined functions in accordance therewith so as to prevent crimes from being committed within and in the vicinity of the cages, said monitor control apparatus comprising:

measurement means monitoring images of individual passengers on a time basis for tracking passenger movements within designated areas and for generating tracking signals representative thereof;

analyzing means responsive to the tracking signals for analyzing the monitored images and determining behavior representing time-based patterns of movements of the individual passengers and for generating a feature signal indicative thereof; and

decision means responsive to the feature signal generated by said analyzing means to output a command signal for executing predetermined functions when the feature signal based on the monitored images satisfies a condition representing a given time-based behavior pattern of an individual passenger.

4,839,632

INTRUSION ALARM SCREEN ASSEMBLY

Richard A. Zahn, Jr., and Merle L. Stepp, both of c/o Window Protection Products, Inc., 2576 Stirling Rd., Hollywood, Fla. 33020

Continuation-in-part of Ser. No. 71,907, Jul. 10, 1987, abandoned. This application May 27, 1988, Ser. No. 199,692
Int. Cl.[4] G08B *13/00;* H01H *3/16*
U.S. Cl. 340—550 20 Claims

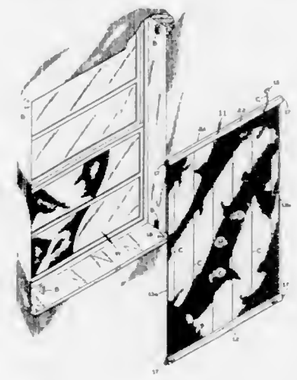
1. A roll-up intrusion alarm screen assembly comprising:

two substantially rigid opposite end piece assemblies;

a screen attached to and extending between said opposite end piece assemblies, said screen having opposite side edges, each extending between said opposite end piece assemblies, said screen being flexible throughout its extent between said end piece assemblies so that it can be rolled up around either of said end piece assemblies;

electrical wiring in said screen providing a continuous uninterrupted circuit between said end piece assemblies and entirely within said screen laterally inward from said opposite side edges of the screen;

respective holding means for supporting the opposite ends of said end piece assemblies to position said screen covering an access opening of premises to be protected;



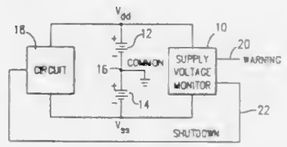
and circuit closing means acting only between each said holding means and the corresponding end of a respective end piece assembly for closing said circuit through said wiring in the screen when that end of the end piece assembly is held by said holding means and for opening said circuit when that end of the end piece assembly is removed from said holding means.

4,839,633

ASYMMETRIC VOLTAGE MONITOR FOR SERIES SUPPLIES

William R. Krenik, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 24, 1987, Ser. No. 65,979
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—661 39 Claims



1. A monitor circuit for use with dual voltage sources for providing an indication of an imbalance therebetween, comprising:

a common connection for electrically connecting the voltage sources together;

a voltage divider connected between the voltage sources, said voltage divider having an output which changes with respect to said common connection when the voltage of the sources changes asymmetrically;

a sensor transistor connected to said common connection and to said voltage divider output for generating an output current in response to a voltage difference between said common connection and said output of said voltage divider;

a further transistor responsive to current flow through said divider for producing a further output current; and

an output circuit for subtracting said output current of said sensor transistor from said output current of said further transistor to provide a monitor output logic signal indicative of said imbalance.

4,839,634

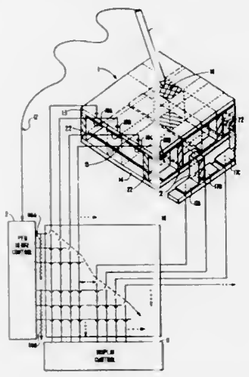
ELECTRO-OPTIC SLATE FOR INPUT/OUTPUT OF HAND-ENTERED TEXTUAL AND GRAPHIC INFORMATION

Edward S. More, 1301 Blake St., Berkeley, Calif. 94702, and John C. Aiken, 1389 E. 11400 S., Sandy, Utah 84092

Filed Dec. 1, 1986, Ser. No. 936,567

Int. Cl.[4] G09G *3/00*

U.S. Cl. 340—712 **35 Claims**



1. A portable interactive electronic graphics device, comprising:

input pen means configured to be held in the hand of a user;

non-mechanical, non-emissive display means comprising a plurality of display elements including display electrode means for operating electro-optic material located between the display electrode means, the display means being alternatively operable in two modes, including a first node in which the display electrode means is activated to excite the electro-optic material therebetween for displaying graphical information and a second mode in which the display electrode means is electrically coupled with the input pen means manipulated by the user proximate the display means along a path to form graphics;

pen sense control means associated with the display means and responsive to electrical coupling of the display electrode means with the input pen means for producing position signals corresponding to positions of the input pen means with respect to the display means as the user manipulates the input pen means along the path: and

display control means connected to the pen sense control means and display means and responsive to the position signals for energizing selected display electrode means of the display elements to display the graphics corresponding to the path followed by the input pen means;

whereby graphics are hand-entered by the user directly onto the display means.

4,839,635

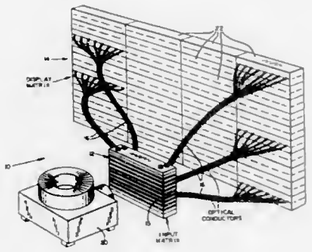
SIGNBOARD FOR DISPLAYING OPTICAL IMAGES

Lee M. Harris; Dix L. Evans, and Elizabeth A. Midwinter, all of Eugene, Oreg., assignors to Inwave Corporation, Eugene, Oreg.

Filed Jan. 12, 1987, Ser. No. 2,509

Int. Cl.[4] G09G *3/20*

U.S. Cl. 340—752 **10 Claims**



1. A display system that forms a display image corresponding to a source image provided by a heat-producing image source, comprising:

plural elongate optical conductors each of which includes at opposite ends thereof an input termination and an output termination;

an input matrix having a framework with a set of substantially parallel heat-conducting plates between which the input terminations are mounted in closely-packed rows and columns, the image source delivering light carrying the image and heat to the input terminations from which the heat is conducted by the heat-conductive plates; and

a display matrix receiving the optical conductors and having an array of output blocks, each one of the output blocks including a first substrate strip of resilient material and a second substrate strip that support between them a set of the output terminations of the optical conductors, the output terminations compressing the first substrate strips of resilient material to secure the output termination in place and the output blocks being arranged for supporting the output terminations in spaced-apart rows and columns corresponding to the rows and columns of the input matrix, whereby the light delivered to the input terminations is carried along the optical conductors and delivered to the output terminations to form the display image.

4,839,636

CONTROL OF DISPLAY HAVING BOTH DOT-MATRIX AND SEGMENT DISPLAY ELEMENTS

Manfred Zeiss, Rüsselsheim, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 17, 1985, Ser. No. 776,946

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1984, 3434118

Int. Cl.[4] G09G *3/00*

U.S. Cl. 340—752 **4 Claims**

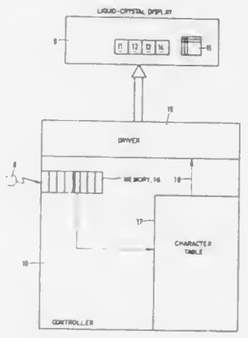
1. A system for controlling an opto-electronic display device, such as a liquid crystal display, having both dot-matrix display elements and segment display elements, the system comprising

a controller including an addressable dot-matrix character table for generation of characters, and a driver of the dot-matrix display elements and the segment display elements; and wherein

The addressable dot-matrix character table stores character

sets of both dot-matrix data and segment data; and wherein

the segment data are stored in a code corresponding to



segment connections of segment display elements, the character table being connected, via the driver, with the dot-matrix display elements and the segment display elements.

4,839,637

METHOD OF DRIVING GAS-DISCHARGE PANEL

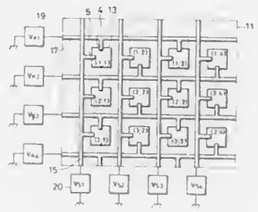
Shigeo Mikoshiba, Suginami; Shinichi Shinada, Kokubunji, and Takahiro Matsumoto, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 10, 1987, Ser. No. 13,123

Claims priority, application Japan, Feb. 10, 1986, 61-25854; Feb. 17, 1986, 61-30841

Int. Cl.[4] G09G *3/22, 3/28*

U.S. Cl. 340—775 **2 Claims**



2. A gas-discharge display panel, comprising:

a gas-filled envelope which is formed of an insulating substrate and a light-transmissive faceplate;

a plurality of discharge cells which are arranged in the form of a matrix within said envelope and which have anodes and cathodes;

an anode lead between the (n)th and (n+1)th rows of cells (n being an integer) being connected to only every even numbered cell in the (n)th row and to only every odd numbered cell in the (n+1)th row; and

a cathode lead between the (n)th and (n+1)th rows of cells being connected to only every even numbered cell in the (n)th row and to only every odd numbered cell in the (n+1)th row.

4,839,638

PROGRAMMABLE CIRCUIT FOR CONTROLLING A LIQUID CRYSTAL DISPLAY

Manfred Kosler, and Peter Hubski, both of Berlin, Fed. Rep. of Germany, assignors to Createc Gesellschaft für Elektrotechnik mgH, Berlin, Fed. Rep. of Germany

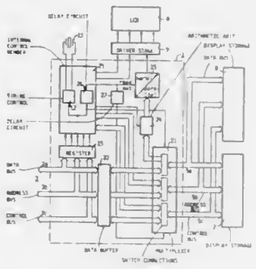
PCT No. PCT/DE86/00094, § 371 Date Nov. 6, 1986, § 102(e) Date Nov. 6, 1986, PCT Pub. No. WO86/05305, PCT Pub. Date Sep. 12, 1986

PCT Filed Mar. 6, 1986, Ser. No. 934,396

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1985, 3508321

Int. Cl.[4] G09G *3/36;* **G06F** *3/147*

U.S. Cl. 340—784 **22 Claims**



1. Programmable control circuit arrangement for controlling a liquid crystal display, comprising:

first and second complete, parallel separate bus structures, each including address, data and control lines, said first bus structure serving for the data exchange of data words with a computer, said second bus structure serving for the exchange of data with at least one addressable memory associated with the liquid crystal display; and

a programmable control circuit having internal control line means for interconnecting the liquid crystal display with said second bus structure and pulse producing means for producing an internal clock pulse, and having a first switching state in which said first and second bus structures are interconnected while bypassing said internal control line means, in such a manner that data exchange is possible between the at least one addressable memory and the computer, and a second switching state in which said second bus structure and said internal control line means are interconnected for the transmission of data between the liquid crystal display and the at least one addressable memory and said first and second bus structures are not interconnected in the manner that data exchange is possible between the at least one addressable memory and the computer, said control circuit including means for switching between said first switching state and said second switching state under timing control determined only by said internal time clock pulse.

4,839,639

PAGING RECEIVER HAVING BATTERY SAVING CIRCUIT

Toshifumi Sato, and Takashi Oyagi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jan. 12, 1987, Ser. No. 2,329

Claims priority, application Japan, Jan. 10, 1986, 61-1974

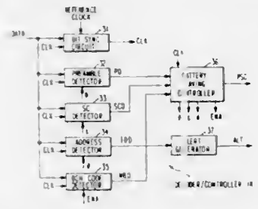
Int. Cl.[4] H04Q *7/00*

U.S. Cl. 340—825.44 **8 Claims**

1. A paging receiver comprising:

a receiving section for receiving a paging signal which includes a preamble signal, a synchronization codeward and an address codeword;

switch means for controlling the supply of power to said receiving section in response to a control signal;
means for detecting the preamble signal to produce a preamble detect pulse;
means for detecting said synchronization codeword to produce a synchronization codeword detect pulse;
means for detecting said address codeword to produce an address codeword detect pulse;
error detector means for detecting an error in said address codeword and producing an error detect pulse only when the number of bit errors detected in said codeword is equal to or greater than two, said error detector means being capable of correcting only a one-bit error in said codeword;
sync monitor means for counting said error detect pulses for a predetermined period of time and producing a sync monitor pulse when the number of error detect pulses counted is greater than a predetermined value; and



a controller arranged to receive said preamble detect pulse, said synchronization codeword detect pulse and said sync monitor pulse, said controller comprising means for generating said control signal intermittently at a predetermined interval while in a waiting mode, means for continuously generating said control signal for a predetermined duration in response to the reception of said preamble detect pulse during the intermittent generation of said control signal, means for generating said control signal at a predetermined timing in response to the reception of said synchronization codeword detect pulse during the continuous generation of said control signal, means for generating said control signal at said predetermined interval upon the reception of said sync monitor pulse during the generation of said control signal at said predetermined timing, and means for applying said generated control signal to said switch means.

4,839,640

ACCESS CONTROL SYSTEM HAVING CENTRALIZED/DISTRIBUTED CONTROL

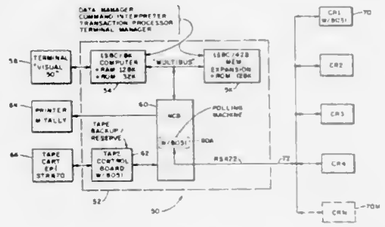
Richard Ozer, Brookline; Edward D. Santis, Boston, and Brett Tomlinson, Brighton, all of Mass., assignors to ADT Inc., Parsippany, N.J.

Continuation of Ser. No. 654,238, Sep. 24, 1984, abandoned. This application Mar. 17, 1988, Ser. No. 171,154

Int. Cl.[4] G06F 7/04; G06K 5/00

U.S. Cl. 340—825.31 **13 Claims**

1. An access control system, comprising:
a plurality of remote stations;
a central station; and
a data bus connected to said plurality of remote stations, wherein
said central station includes:
means for polling said remote stations, connected to said data bus to transmit to and receive data from a selected plurality of remote stations, wherein
said means for polling is responsive to an interrupt signal to commence transfer of data on said data bus and is responsive to a count signal providing an indication of the quantity of data to be transferred;
means for controlling said plurality of remote stations connected to said means for polling, and
a plurality of FIFO data registers connected to said means for polling and said remote stations to provide access control at said plurality of remote stations by said means for controlling, wherein



one of said plurality of FIFO data registers provides said interrupt signals to said means for polling to initiate receipt of data into said means for polling, and provides said count signal.

4,839,641

PAGER RECEIVER CAPABLE OF CONTROLLING AN INTERNAL STATE BY A CALL SIGNAL

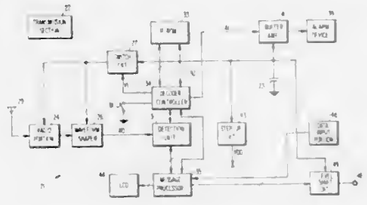
Toshihiro Mori, and Takashi Ohyagi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 786,935, Oct. 11, 1985, abandoned. This application Jun. 9, 1988, Ser. No. 205,018

Claims priority, application Japan, Oct. 12, 1984, 59-212594; Oct. 12, 1984, 59-212595; Oct. 12, 1984, 59-212596; Oct. 12, 1984, 59-212597; Oct. 12, 1984, 59-212598; Oct. 12, 1984, 59-212599; Oct. 12, 1984, 59-212600

Int. Cl.[4] H04Q 1/00

U.S. Cl. 340—825.47 **15 Claims**



1. In a pager receiver capable of responding to call signals, each comprising a first part, a second part, and an intermediate part between said first and second parts, said first part comprising a call number signal specific to said pager receiver while said second part comprises a message signal representative of a message, said pager receiver comprising a power source for supplying a voltage, controllable switching means connected to said power source and responsive to a switching signal for selectively switching the voltage from said power source between an on-state and an off-state, reception means adapted to be put into an operating mode and a nonoperating mode under control of said switching means for receiving said call signals in said operating mode and producing reception call signals representative of the call signals received during said operating mode, processing means responsive to said reception call signals for processing said first, second, and intermediate parts of each of the call signals received during said operating mode to produce a selection signal indicative of either of said on-state or said off-state, and signal supply means for supplying said

selection signal as said switching signal to said switching means to selectively put said reception means into said operating and said nonoperating modes, said reception means being controlled by said controllable switching means during reception of no call signals so that said reception means is periodically put into said operating mode which lasts a first interval of time, the improvement wherein:
said intermediate part comprises a time interval signal representative of a length of the message included in the second part following said intermediate part;
said processing means comprising:
producing means responsive to said reception call signals for producing said selection signal with reference to said time interval signal to switch said switching means in dependency upon said message length so that said first interval is modified into a second interval of time longer than said first interval when said pager receiver is initialized.

4,839,642

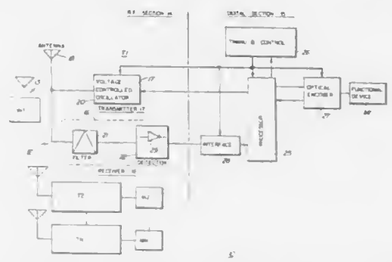
DATA TRANSMISSION SYSTEM WITH DATA VERIFICATION

James E. Batz, Northbrook; Dennis J. Martell, Naperville, and Steven A. Overmyer, DeKalb, all of Ill., assignors to Northern Illinois Gas Company, Aurora, Ill.

Continuation of Ser. No. 693,209, Jan. 22, 1985, abandoned. This application Oct. 8, 1987, Ser. No. 106,938

Int. Cl.[4] H04Q 1/00

U.S. Cl. 340—825.54 **5 Claims**



1. In a system for selectively obtaining data from a plurality of remotely located data indicating devices, including an interrogate source and a plurality of transponders each including information processing circuit means including signal receiver means, signal transmitter means and signal processor means, each transponder being associated with a different one of the data indicating devices, the improvement comprising: means at said interrogate source for transmitting an interrogate signal for effecting the readout of a selected indicating device, said interrogate signal including single cycles of binary signals of first and second time durations respectively in a coded sequence of signals comprising a multibit sync word and a multibit address word for addressing a selected transponder, and each of said transponders further comprising control circuit means including cycle timing circuit means, delay circuit means, and delay override circuit means, said cycle timing circuit means generating a periodically recurring inhibit signal of a predetermined time duration defining a low-power idle mode in which said information processing circuit means is inhibited, said delay circuit means controlling said cycle timing circuit means to delay the generation of each inhibit signal thereby providing a time interval between successive inhibit signals defining a processing mode in which said information processing circuit means is enabled, said information processing circuit means when in said processing mode operating to detect an interrogate signal, and characterized in that the duration of said inhibit signal is considerably longer than said processing mode duration in the absence of an interrogate signal, said signal receiver means including signal edge detecting circuit means enabled by said control circuit means to operate in said processing mode to provide an output signal for each cycle of the binary signals which comprise the interrogate signal, each output signal corresponding to the leading edge of a different one of the binary signals and the elapsed time between successive output signals being indicative of the time duration and the binary state of the bit of the interrogate signal detected, said signal processor means being enabled by said control circuit means to operate in said processing mode and being programmed to respond to the output signals provided by said signal edge detecting circuit means to control said delay circuit means to extend the duration of said processing mode and being further programmed to verify the validity of each bit of the received interrogate signal by determining the elapsed time between successive ones of the output signals provided by said signal edge detecting circuit means and comparing the value of elapsed time determined for each bit with stored reference signals representative of acceptable tolerances on said respective time durations of said detected bits, to determine whether each incoming bit is a first binary state, a second binary state or an invalid bit, said signal processor means accumulating a count of invalid bits and enabling said delay override circuit means to cause said cycle timing circuit means to generate its inhibit signal whereby said information processing circuit means is transferred immediately from the processing mode to the lowpower idle mode, thereby terminating further processing during detection if a predetermined number of invalid bits is detected before said interrogate signal ends, said signal processor means being further programmed to store detected valid bits and compare the same with stored reference signals representing said sync word of said interrogate signal and to cause said cycle timing circuit means to generate said inhibit signal to return said information processing circuit means to said low power idle mode if said sync word is not detected in a predetermined number of bits, and said signal processor means enabling said signal transmitter means to transmit data signals associated with the associated data indicating device only upon verification that the sync word of the received interrogate signal is received and the associated address word is received.

4,839,643

BROADBAND SIGNAL SWITCHING EQUIPMENT

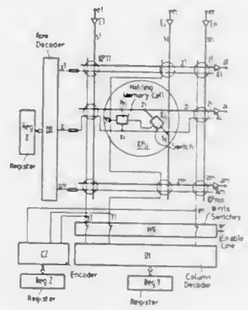
Wilhelm Koenig, Munich; Thomas Lang, Taufkirchen, and Gerhard Trumpp, Puchheim, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 16, 1987, Ser. No. 62,678

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1986, 3620507

Int. Cl.[4] H04Q 9/00

U.S. Cl. 340—825.91 **3 Claims**



1. A broadband signal switching apparatus, comprising:

a crosspoint matrix constructed in field effect trasistor technology devices and including a plurality of input lines and a plurality of output lines intersecting said input lines and forming crosspoints;

a plurality of output amplifiers each connected to a respective output line;

each said crosspoints comprising switch elements having a high forward resistance in the through connected condition compared to the internal resistance effective at the respective matrix input line; and

wherein each of said output amplifiers comprises a circuit including a comparator having a first comparator input which is connected to the respective output line and having a second comparator input, a sample-and-bold circuit including a holding memory which is connected to said second input of said comparator, said sample-and-hold circuit further including a switch which connects said second input of said comparator and said holding memory to the respective output line and having a control electrode which receives clock pulses which are subdividing a bit switching time interval into a preliminary phase and an actual switching phase and by way of which said holding memory is reloaded through said switch of said sample-and-hold circuit during every preliminary phase at least approximately to the potential momentarily prevailing on the respective output line, and maintaining such potential at said second input of said comparator during the following switch phase, said comparator further having an output; and

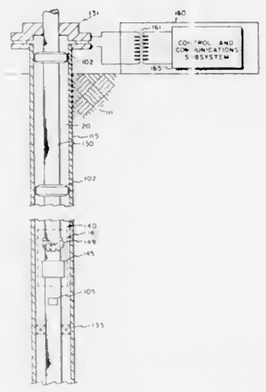
a memory element which receives an input from said comparator and also receives the clock pulses which are supplied to said switch of said sample-and-hold circuit and said memory element having an output which is the output of the respective amplifier.

4,839,644

SYSTEM AND METHOD FOR COMMUNICATING SIGNALS IN A CASED BOREHOLE HAVING TUBING

Kambiz A. Safinya, Ridgefield, Conn., and Roger W. McBride, Tulsa, Okla., assignors to Schlumberger Technology Corp., New York, N.Y.

Filed Jun. 10, 1987, Ser. No. 61,066
Int. Cl.[4] G01V *1/00*
U.S. Cl. 340—854 **57 Claims**



1. For use in an earth borehole which is cased with an electrically conductive casing and has electrically conductive tubing extending through the casing and spaced from the casing; a communication system for communicating between downhole and the earth's surface, comprising:

a downhole communications subsystem mounted on said tubing, said subsystem including: a downhole toroidal antenna means concentric the tubing for coupling electromagnetic energy in a TEM mode to the annulus between said casing and tubing and a downhole receiver coupled to said downhole antenna means for coupling signals to said antenna means;

an uphole communications subsystem at the earth's surface, including: uphole antenna means and an uphole receiver, said uphole antenna means coupling electromagnetic energy in a TEM mode from said annulus to said receiver;

substantially non-conductive fluid in said annulus in at least the region of said downhole antenna means and above; and

conductive means below said downhole communications subsystem for electrically coupling said tubing and casing.

4,839,645

WEATHER DATA TRANSMITTING SYSTEM

Thomas M. Lill, 3120 Brownwood Dr., Port Huron, Mich. 48060

Filed Aug. 6, 1987, Ser. No. 82,234
Int. Cl.[4] G08C *19/12*
U.S. Cl. 340—870.17 **23 Claims**

1. A system for transmitting a temperature sensed by a sensor disposed at a first location to a second location by modulation of a carrier, with a signal which is a function of the sensed temperature, transmitted by atmospheric transmission of the carrier between the first and second locations comprising:

(a) a transmitter, which is cyclically turned on to transmit the carrier modulated by the sensed temperature during a first time interval and turned off during a second time interval;

(b) a transmitter clock for controlling the cyclical turning on and off of the transmitter during the first and second time intervals;

(c) a battery power supply for providing operating power to the transmitter when turned on and power continually to the transmitter clock;

(d) a receiver, disposed at the second location, which is cyclically turned on for receiving the modulated carrier during a third time interval and turned off during a fourth time interval, the receiver including means for detecting the signal modulating the carrier, means for displaying the sensed temperature, and a receiver clock for controlling the cyclical turning on and off of the receiver during the third and fourth time intervals, the fourth time interval starting in response to a change in a level of the received modulated carrier; and

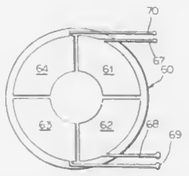
(e) a battery power supply for providing operating power to the receiver when turned on and power continually to the receiver clock.

4,839,646

MOVEMENT PARAMETER SENSOR

Graham R. Tyson, Nunawading, Australia, assignor to Royal Melbourne Institute of Technology Limited, Melbourne, Australia

Filed Feb. 24, 1987, Ser. No. 18,192
Claims priority, application Australia, Feb. 28, 1986, PH4832
Int. Cl.[4] G08C *19/00*
U.S. Cl. 340—870.30 **9 Claims**



1. A movement parameter sensor for sensing the speed of relative movement between a stationary member defining a frame of reference and a movable member movable relative to the stationary member along a movement line, the sensor including field providing means for generating an electric field located at the stationary member, the field providing means including a pole arrangement comprising an array of four source electrode means arranged adjacent to each other along a field line generally coincident with the movement line, the field providing means further including an excitation signal generating means for generating four equal frequency sinusoidal excitation signals at 90° increments of phase, each one of the four excitation signals being applied to a respective one of the four source electrode means such that a virtually moving electric field is created at each of the source electrode means whereby the electric field effectively moves relative to the stationary member along the field line, the movement parameter sensor further including field sensing means provided at the movable member, the field sensing means comprising a plurality of sensor electrode means for sensing at any time a resultant electric field produced as a result of the excitation signals applied to more than one of the source electrode means, each sensor electrode means comprising a plurality of electrically interconnected sensor electrodes, each sensor electrode having a length in the direction of the movement line sufficient to overlap two or partially overlap three source electrodes at all times, each sensor electrode increasing in width transverse to the movement line to a maximum midway along its length, the fields densing means being operable to generate an output signal indicative of the sensed resultant electric field whereby the output signal has a frequency linearly related to the speed of relative movement between the stationary member and the movable member, the frequency of the sinusoidal excitation signals being substantially greater than any frequency with which the sensor electrodes pass the source electrodes whereby, when there is relative movement between the stationary and movable members and also when there is a zero velocity relative movement, the output signal has a non-zero frequency.

4,839,647

ILLUMINATED TRAFFIC SIGNAL FOR COLOR BLIND PERSONS

R. Gordon Patterson, 233 N. Val Vista Dr.; sp. 563, Mesa, Ariz. 85203

Filed Feb. 8, 1988, Ser. No. 153,445
Int. Cl.[4] G08G *1/095*
U.S. Cl. 340—907 **8 Claims**

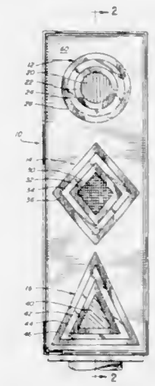
1. A traffic control signal comprising:

a main housing;

illuminating means in said main housing comprising a light source;

a control signal panel mounted to a front portion of said main housing;

control signal means in said panel comprising a first central region of a specified geometrical shape, a first opaque border region surrounding said central region and having the same geometrical shape as said central region, an illuminated track region through which emanates light from said light source of said illuminating means, said light



being white light, and a second opaque border region surrounding said track region, said first and second opaque border regions sandwiching therebetween said track region, each of said second opaque region and said track region also being and the same geometrical shape as said central region and each having substantially the same width;

said track region being of greater light intensity as compared with said central region, whereby said track region may be used by a color blind person.

4,839,648

METHOD OF DETERMINING THE TRAJECTORY OF A BODY SUITABLE FOR MOVING ALONG A PORTION OF A PATH, AND APPARATUS FOR IMPLEMENTING THE METHOD

Serge Beucher, Ury; Jean-Marc Blosseville, Clamart, and Francois Lenoir, La Varenne, all of France, assignors to Association Pour La Recherche et le Developpement Des Methodes et Processus Industriels (Armines) and Institut National De Recherche Sur Les Transports et Leur Securite (I.N.R.E.T.S.), France

Filed Jan. 14, 1988, Ser. No. 143,875
Claims priority, application France, Jan. 14, 1987, 87 00316
Int. Cl.[4] G08G *1/01*
U.S. Cl. 340—933 **13 Claims**

1. A method of determining the trajectory of a vehicle body on a relatively plane path portion, the method consisting of:

forming a main real image of said path portion in a plane at a non-zero angle with said path portion;

decomposing said main image as formed into a plurality of points;

determining the relationship between the size of a unit length taken substantially at the level of said path portion and the size of its image formed in said main image, said size being a function of the number of points covered by said image and the location of said unit length on said path portion;

determining a secondary image in said main image, said secondary image corresponding to a longitudinal refer-

ence mark related to a dimension of said vehicle of constant length on said path portion; and

determining the various successive positions of said second-

ary image by correlation of the number of points covered by said secondary image, given that said secondary image corresponds, according to said relationship, to said length which is constant on said path portion.

4,839,649

SIGNAL PROCESSING SYSTEM

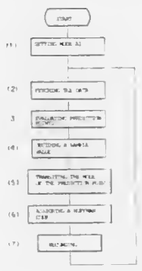
Hideki Imai, and Minoru Sasaki, both of Yokohama, Japan, assignors to Kabushiki Kaisya Advance Kaihatsu Kenkyujo, Tokyo, Japan

Continuation of Ser. No. 820,746, Jan. 22, 1986, abandoned. This application Jul. 9, 1987, Ser. No. 71,573

Claims priority, application Japan, May 22, 1984, 59-101777

Int. Cl.[4] H03M *7/40*

U.S. Cl. 341—65 7 Claims



1. A method of processing analog signals, comprising the steps of:

converting the analog input signals into digital data; and

receiving the converted digital data at periodic sampling intervals;

compressing the received converted digital data values, said step of compressing including the substeps of:

storing a plurality of delta modulation modes, each mode including a plurality of predetermined prediction values;

comparing each received detected data value with the predetermined prediction values of a selected mode;

determining the sample point value of each compared digital data value in accordance with a selected one of the plurality of prediction values of the selected mode; and

selecting one of the plurality of modes for comparing the presently received data in accordance with the selected one of the prediction value of previously received data.

4,839,650

ANALOG-TO-DIGITAL CONVERSION

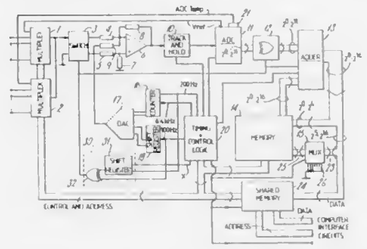
John A. Geen, and Brian Johnson, both of Bracknell, England, assignors to British Aerospace Public Limited Company, London, England

Division of Ser. No. 917,265, Oct. 8, 1986, which is a continuation of Ser. No. 752,723, Jul. 8, 1985, abandoned. This application Jun. 8, 1988, Ser. No. 204,026

Claims priority, application United Kingdom, Jul. 6, 1984, 8417324

Int. Cl.[4] H03M *1/06*

U.S. Cl. 341—118 6 Claims



1. Analog-to-digital conversion apparatus (A/D conversion apparatus) comprising multiplexer means for receiving analog signals via a plurality of input channels and forming samples of the signals in sequence over a time interval during which said sequence repeats a plurality of times, controllable means for inverting the polarity of the analog samples, an A/D converter for digitizing the samples, controllable means for inverting the polarity of the digitized samples, means for summing the digitized samples of each signal, and an auto-zero generator operative to generate an auto-zero sequence and to control the analog inverting means and the digital inverting means so as selectively to cause inversion and re-inversion of the polarity of the incoming samples in accordance with the auto-zero sequence, and wherein the auto-zero sequence comprises complementary halves so that, during each of said time intervals, offset errors in the A/D converter are cancelled, characterized in that the auto-zero sequence is a complex sequence so as to effect decorrelation of the polarities of the signals channels thereby reducing channel cross-talk.

4,839,651

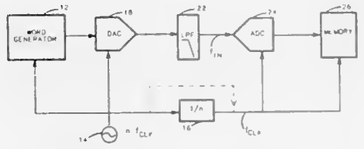
APPARATUS FOR MEASURING THE DYNAMIC CHARACTERISTICS OF AN ANALOG-DIGITAL CONVERTER

Takuo Banno, Hachiojishi, Japan, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 24, 1987, Ser. No. 77,156

Int. Cl.[4] H03K *13/02*

U.S. Cl. 341—120 4 Claims



1. Apparatus for providing information from which the dynamic characteristics of an analog to digital converter may be measured comprising:

a word generator having stored therein digital words representing the amplitudes at different points of at least one cycle;

means for providing a clock signal for said generator;

means for controlling said wave generator so that it outputs digital words in synchronism with said clock signal in such manner so as to provide the words for a plurality of cycles of an analog wave;

a digital to analog converter coupled to said latter means for providing said plurality of cycles of the analog wave;

an analog to digital converter to be measured coupled to receive said plurality of cycles of said analog wave; and

means for deriving clock signals of a predetermined frequency from said means for providing a clock signal and applying them to said analog to digital converter being measured, the ratio of the number of said clock signals occurring during said plurality of cycles to the number of said cycles being irreducible.

4,839,652

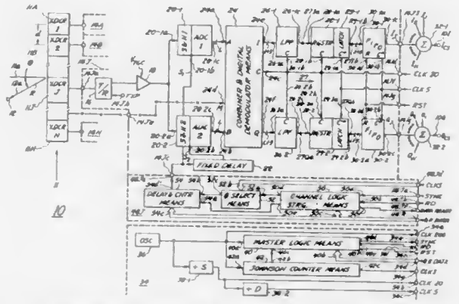
METHOD AND APPARATUS FOR HIGH SPEED DIGITAL PHASED ARRAY COHERENT IMAGING SYSTEM

Matthew O'Donnell, Schenectady; William E. Engeler, Scotia; Thomas L. Vogelsong, Schenectady; Steven G. Karr, Scotia, and Sharbel E. Noujaim, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 1, 1987, Ser. No. 56,177

Int. Cl.[4] H03M *1/64*

U.S. Cl. 341—122 16 Claims



1. A method for digitally forming a beam of energy substantially focussed at a range R at an angle θ with respect to a transducer array having a plurality N of transducers, each in a separate channel and receiving a portion of the beam energy, comprising the steps of:

(I) separately generating for each j-th channel, where $1 \leqq j \leqq N$, a stream of digital baseband data signals comprised of consecutive data words occurring at a first rate of F' samples per second with a substantially equally spaced first time interval T' between any sequential pair of data words, with each digital baseband data signal stream representing the amplitude and phase for an analog signal, from the associated j-th transducer, sampled at a second rate of F samples per second, where F is greater than F', and with a substantially equally spaced second time interval T between any sequential pair of samples, where T is less than T', by the steps of:

(a) separately converting the amplitude of that j-th analog signal to a stream of digital data words each responsive to a sample strobe S signal at a maximum conversion rate equal to the second rate of F samples per second;

(b) separately digitally demodulating the stream of data words for that j-th channel to obtain a stream of j-th channel baseband data words;

(c) separately digitally lowpass filtering each j-th channel stream of baseband data words; and

(d) separately decimating the j-th channel stream of filtered data words by a selected decimation factor D, which is substantially constant with respect to both time and channel number, to obtain a j-th channel output stream of data words each occurring at the reduced first rate of F' samples per second;

(II) separately delaying each j-th channel output data word stream by a selected channel delay time interval, which may be different for each different channel, responsive to the predetermined range R and angle θ; and

(III) coherently summing all N of the separately-delayed decimated output data word streams to obtain a single set of digital baseband data words representing at least amplitude information from the formed energy beam.

4,839,653

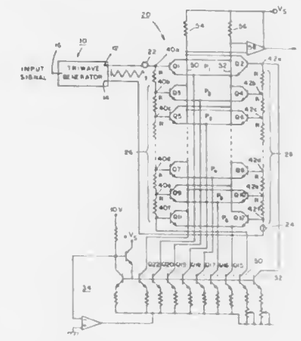
HIGH-SPEED VOLTAGE-TO-FREQUENCY CONVERTER

Lawrence M. Devito, Tewksbury, Mass., assignor to Analog Devices Incorporated, Norwood, Mass.

Filed May 29, 1987, Ser. No. 56,455

Int. Cl.[4] H03K *13/17*

U.S. Cl. 341—157 10 Claims



1. A voltage-to-frequency converter comprising:

a triwave generator responsive to an input signal and operable to produce an output triangular wave having a frequency corresponding to the magnitude of said input signal; and

a voltage-slope-to-periodic-function (VSTPF) generator coupled to the output of said triwave generator to produce a pulsed output signal with a frequency which is a multiple of that of said triwave generator.

4,839,654

SYSTEM FOR DETECTING UNDERGROUND OBJECTS

Masaaki Ito; Shiro Odagiri, both of Tokyo; Kouji Maeda; Yasuhiro Uekubo; Aiko Jitumori, and Teruo Usami, all of Hyogo, Japan, assignors to The Tokyo Electric Power Co., Inc. and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Mar. 10, 1988, Ser. No. 166,471

Claims priority, application Japan, Mar. 11, 1987, 62-55680; Mar. 11, 1987, 62-55682

Int. Cl.[4] G01S *13/90*; G01V *3/12*

U.S. Cl. 342—22 6 Claims

1. A system for detecting underground objects including:

means for collecting reflected wave profile data on a plane cutting through soil at right angles with the ground by having a transmitting antenna and a receiving antenna

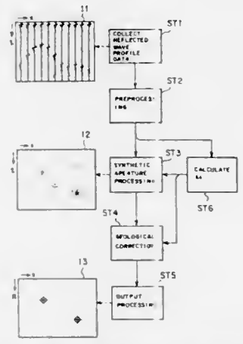
held at a predetermined mutual distance and moved in increments of a predetermined distance on the ground in a direction virtually at right angles with the direction in which the antennas are disposed, said receiving antenna at every increment in the movement receiving the wave reflected by the object of a pulse signal emitted into the soil by said transmitting antenna;

controlling and processing means for subjecting said reflected wave profile data to synthetic aperture processing to produce a detected image output of the targets; and

output display means for displaying said detected image output; wherein

said controlling and processing means comprises:

means for suitably varying the dielectric constant to be set therein and performing synthetic aperture processing of



said reflected wave profile data for each set value of the dielectric constant;

means for evaluating results of said processing to obtain the actual dielectric constant of the soil in which the targets are buried;

means for performing synthetic aperture processing of said reflected wave profile data using said obtained actual dielectric constant to obtain image data with respect to a time scale; and

means for converting the scale of said image data from time scale to length scale through geological correction using said actual dielectric constant, processing for outputting of the image data with respect to the length scale to obtain a detected image output of the targets, and delivering the same to said output display means.

4,839,65

MOVING TARGET DETECTOR SIGNAL PROCESSOR ENABLING SELECTED VIDEO OUTPUT WITH SMOOTH AMPLITUDE

Eiichi Kiuchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 23, 1986, Ser. No. 945,693

Claims priority, application Japan, Dec. 23, 1985, 60-289787; Jan. 7, 1986, 61-8590

Int. Cl.⁴ G01S *13/54*

U.S. Cl. 342—93 **9 Claims**

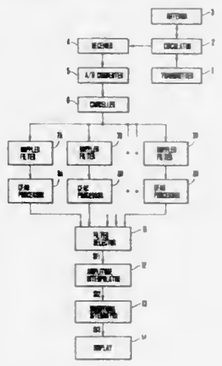
1. A radar system comprising:

N Doppler filters, each of which has a configuration of a digital filter with M stages; where N is an integer larger than 1 and M is an integer;

means, including N Weibull Constant False Alarm Rate processors for Constant False Alarm Rate processing outputs of said N Doppler filters, respectively, for totally approximately an amplitude distribution of spaciously spreading clutter signals including a ground clutter signal and a weather clutter signal to a Weibull distribution to simultaneously suppress the ground clutter and weather clutter signals;

a video selector, connected to output terminals of said N Weibull Constant False Alarm Rate processors, for selecting an output signal of any one thereof in units of radar range bins and synthesizing N channel signals into a single channel signal;

amplitude interpolating means supplied with the output signal of said video selector, when a signal level with respect to an azimuth in a range is smaller than a value uniquely determined as a function of signal levels with



respect to adjacent azimuths in said range, for providing an output signal level having the uniquely determined value with respect to said azimuth in said range thereby restoring an amplitude of a target signal which is lost due to a blind speed during moving target indication of one of said N Doppler filters; and

integrating means for performing smoothing integration of the output signal level from said amplitude interpolating means with respect to predetermined azimuths in a same range, thereby generating a blip signal amplitude-weighted according to an antenna pattern.

4,839,656

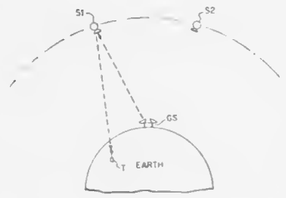
POSITION DETERMINATION AND MESSAGE TRANSFER SYSTEM EMPLOYING SATELLITES AND STORED TERRAIN MAP

Gerard K. O'Neill, Princeton, N.J., and Leslie O. Snively, Centreville, Va., assignors to Geostar Corporation, Washington, D.C.

Filed Aug. 16, 1984, Ser. No. 641,385

Int. Cl.⁴ G01S *13/78*

U.S. Cl. 342—357 **8 Claims**



1. A method for generating terrain map information representing local terrain elevations at a plurality of points on the earth's surface, comprising:

placing a transceiver at a position of known latitude and longitude on the earth's surface, said transceiver being operable to transmit a reply signal in response to a received interrogation signal;

transmitting an interrogation signal to said transceiver;

receiving a reply signal from said transceiver through a relay satellite at a known orbital location above the earth;

calculating the terrain elevation at the transceiver location based on the transmission time of the interrogation signal and the arrival time of the reply signal from the satellite;

entering said terrain elevation into a terrain map memory as a function of said latitude and longitude; and

moving the transceiver to a different position and repeating the foregoing method steps.

4,839,657

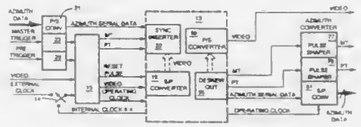
SYSTEM FOR RECORDING AND REPRODUCING RADAR SIGNAL INFORMATION

Rene J. Chikhani, Fremont, Calif., and Frank Weber, Rome, Italy, assignors to Ampex Corporation, Redwood City, Calif.

Filed Jun. 19, 1987, Ser. No. 65,244

Int. Cl.⁴ G01S *13/89*

U.S. Cl. 342—190 **17 Claims**



1. A system to accurately record and playback radar signal information including master trigger pulses comprising:

(a) first pulse stretcher means connected to detect occurrence of master trigger pulses and, upon each occurrence, to provide a stretched pulse having a leading edge coinciding in time with the leading edge of the detected master trigger pulse and having extended duration consistent with a selected recording channel bandwidth;

(b) detection means to detect the presence of each of the stretched pulses and, upon detection, to provide a binary information signal representative of occurrence of the leading edge of the master trigger pulse;

(c) echo pulse processing means to sample radar echo pulses and to quantize the sampled pulses to at least one bit level and then to convert a serial stream of the quantized echo pulses to parallel streams; and

(d) recorder means connected to the echo pulse processing means to record the parallel streams of quantized echo pulses on magnetic recording media and connected to the detection means to record the binary information signals on the recording media on a channel of selected bandwidth.

4,839,658

PROCESS FOR EN ROUTE AIRCRAFT CONFLICT ALERT DETERMINATION AND PREDICTION

Shawn Kathol, Diamond Bar, and Patrick R. Williams, Costa Mesa, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 28, 1986, Ser. No. 891,435

Int. Cl.⁴ G01S *3/02*

U.S. Cl. 342—455 **24 Claims**

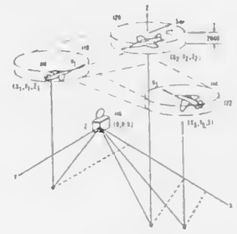
1. A process for determining en route airspace conflict alert status for a plurality of airborne aircraft for which the position, altitude and velocity of each aircraft are monitored in a substantially continuous manner and for which a height separation standard and lateral separation standard exists, the process comprising:

(a) pairing each said aircraft with at least one other of said aircraft to form at least one aircraft pair to be considered for conflict alert status;

(b) determining for each said aircraft pair whether the two aircraft involved meet the conditions of:

(i) having a height separation equal to, or less than, a preselected gross height separation distance (Condition 1),

(ii) converging in height or diverging in height at a rate equal to, or less than, a preselected small height diverging rate (Condition 2),



(iii) converging laterally or diverging laterally at a rate equal to, or less than, a preselected small lateral diverging rate (Condition 3),

(iv) having a height separation equal to, or less than, said height separation standard (Condition 4), and

(v) having a lateral separation equal to, or less than, said lateral separation standard (Condition 5); and

(c) establishing for each aircraft pair which meets all of Conditions 1 through 5 a current conflict alert status.

4,839,659

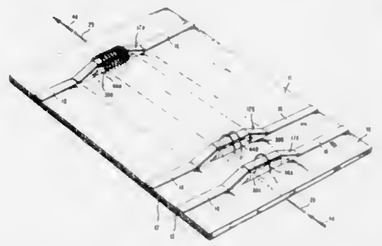
MICROSTRIP PHASE SCAN ANTENNA ARRAY

Richard A. Stern, Allenwood, and Richard W. Babbitt, Fair Haven, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 1, 1988, Ser. No. 227,644

Int. Cl.⁴ H01Q *00/00*

U.S. Cl. 343—700 MS **7 Claims**



1. A microstrip phase scan antenna array for planar radar scanning with a substantially pencil-shaped beam comprising

a microstrip transmission line dielectric substrate having top and bottom surfaces;

an electrically conductive ground plane mounted on the bottom surface of said substrate;

a plurality of microstrip antenna radiating elements mounted on the top surface of said substrate in a columnar array of columns and rows of said elements for radiating a substantially pencil-shaped beam in a first plane which is perpendicular to said columns of elements and in a second plane which is perpendicular to said first plane when the ele-

ments in each of said columns are serially interconnected and all of said columns are coupled to a source of millimeter wave energy, the sequence of the elements in each of said rows of elements defining the sequence of said columns in said array;

a plurality of rectangular ferrite rods mounted on the top surface of said substrate, the number of said rods being equal to the number of said columns in said array, each of said rods having

a first rod side thereof mounted on the top surface of said substrate,

a dielectric constant which is greater than the dielectric constant of said substrate,

a dielectric plate mounted thereon having top and bottom surfaces and a dielectric constant which is substantially the same as the dielectric constant of said substrate, said plate extending the length of the rod and having the bottom surface thereof mounted on another side of the rod which is parallel to said first rod side,

a pair of ramp-shaped dielectric waveguide members mounted on the top surface of said substrate at opposite ends of the rod, each of said ramp-shaped members having a dielectric constant which is substantially the same as the dielectric constant of the rod, a bottom surface abutting the top surface of said substrates and a downwardly-sloping top surface extending between the end of said plate and the top surface of said substrate, and

a length of electrically conductive microstrip conductor mounted on the top surfaces of said ramp-shaped members and the top surface of said plate and having an input end and an output end;

means mounted on said substrate for serially interconnecting the elements in each of said columns of elements;

means mounted on said substrate for supplying the input ends of the microstrip conductor lengths associated with said plurality of rods with millimeter wave energy of equal amplitude and phase and for coupling the output end of each of said conductor lengths to a different one of said columns of elements so that the sequence of columns in said array is coupled to a sequence of said rods; and

means for simultaneously magnetically biasing all of said rods along the longitudinal axes thereof to create magnetic biasing fields in the rods having simultaneous magnitudes which progressively increase from rod to rod in accordance with the sequential position of the rod in said sequence of rods.

4,839,660

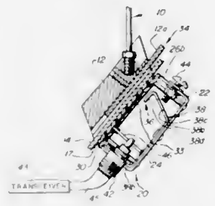
CELLULAR MOBILE COMMUNICATION ANTENNA

James Hadzoglou, Mayfield Heights, Ohio, assignor to Orion Industries, Inc., Solon, Ohio

Continuation of Ser. No. 535,273, Sep. 23, 1983, abandoned. This application Nov. 19, 1985, Ser. No. 799,202

Int. Cl.[4] H01Q *1/32*

U.S. Cl. 343—715 **52 Claims**



49. A mobile communications antenna system attachable to a dielectric member of a vehicle and usable to radiate radio frequency energy generated by a transceiver located in the vehicle at frequencies at least as high as 800 MHz comprising:

a radiating member and attached means for supporting said radiating member adjacent the dielectric member;

a coupling system affixable to the dielectric member of and insulated thereby from the remainder of the vehicle, said coupling system including,

conductive means defining a counterpoise for the antenna system and means for coupling radio frequency energy through the dielectric member to said radiating member; and

connector means having first and second ends with said first end electrically coupled to said counterpoise and with said second end of said connector means engageable with the transceiver with said counterpoise being electrically coupled at only said second end to a selected conductor in the transceiver.

4,839,661

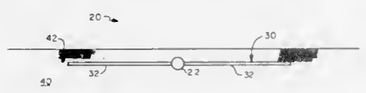
GUIDED WAVE ANTENNA SYSTEM AND METHOD

Ferril A. Losee, Provo, Utah, assignor to Eyring Research Institute, Inc., Provo, Utah

Continuation-in-part of Ser. No. 393,043, Jun. 23, 1982, which is a continuation-in-part of Ser. No. 308,080, Oct. 2, 1981. This application Oct. 9, 1984, Ser. No. 700,934

Int. Cl.[4] H01Q *1/04*

U.S. Cl. 343—719 **78 Claims**



1. A system for an underground guided wave antenna for transmitting and receiving electromagnetic signals, said system comprising:

a transmitter/receiver apparatus;

a radiating element buried in the earth and comprising means for enhancing the capacitive coupling between said radiating element and the earth, and means for establishing an effective electrical length for said radiating element equal to at least one-third wavelength of said electromagnetic signals when propagated through earth; and

means for electrically connecting said radiating element to said transmitter/receiver apparatus.

4,839,662

COMPOSITE WAVEGUIDE COUPLING APERTURE HAVING A VARYING THICKNESS DIMENSION

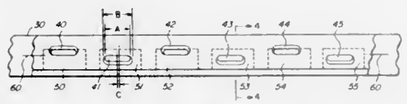
Peter J. Wood, Nepean, Canada, assignor to Canadian Astronautics Limited, Ontario, Canada

Continuation of Ser. No. 819,041, Jan. 15, 1986, abandoned. This application Dec. 1, 1988, Ser. No. 279,248

Claims priority, application Canada, Jan. 18, 1985, 472357

Int. Cl.[4] H01Q *13/10*

U.S. Cl. 343—771 **9 Claims**



1. A waveguide structure comprising:

a single primary waveguide having a longitudinal axis;

a plurality of secondary waveguides spaced from each other with respect to said primary waveguide longitudinal axis; and

a composite coupling aperture for each of said secondary waveguides for providing predetermined variations in the degree of coupling between said primary waveguide and the respective secondary waveguides, each said composite coupling aperture having first and second spaced apart coupling ends separated by a thickness dimension, said first and second coupling ends having corresponding lengths and widths, the length of each of said first and second ends being greater than the corresponding width and being parallel to said primary waveguide longitudinal axis, and said predetermined variations in the degree of coupling being obtained by varying the length of at least one of said first and second aperture ends from composite coupling aperature to composite coupling aperature.

4,839,663

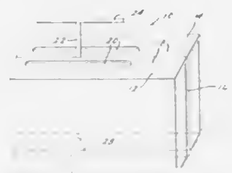
DUAL POLARIZED SLOT-DIPOLE RADIATING ELEMENT

Louis A. Kurtz, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 21, 1986, Ser. No. 933,453

Int. Cl.[4] H01Q *13/10*

U.S. Cl. 343—771 **22 Claims**



1. A method of radiating dual polarized electromagnetic energy, comprising:

using a pair of contiguous waveguides having a common wall and each having a non-resonant slot therein, said slots being positioned adjacent to one another and having mutually parallel longitudinal axes;

using a dipole radiating means disposed adjacent and parallel with said slots;

selectively exciting said waveguides in a first mode of excitation causing said slots to radiate electromagnetic energy in a transverse polarization; and

selectively exciting said waveguides in a second mode of excitation causing said dipole to radiate electromagnetic energy in a longitudinal polarization.

4,839,664

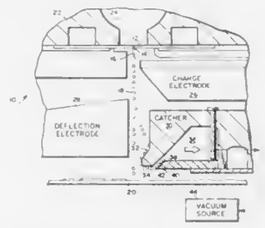
FLUID-JET CATCHER WITH REMOVABLE POROUS METAL INGESTION BLADE

Timothy H. V. Archer, and Richard Sutera, both of Centerville, Ohio, assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Jul. 2, 1987, Ser. No. 69,202

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—1.1 **22 Claims**



1. In a fluid-jet printing apparatus of the type which generates an array of droplet streams and deflects selected droplets of said streams from a normal droplet path, apparatus comprising:

a droplet catcher structure for catching the deflected droplets;

an ingestion blade carried by said droplet catcher structure, said insertion blade being formed of a porous material and spaced from a portion of said droplet catcher structure to define a slot therewith enabling the deflected droplets to flow about said portion onto said ingestion blade, said catcher structure defining a cavity above said ingestion blade in communication with said slot, means for drawing a vacuum in said cavity for flowing the droplets along a predetermined path; and

means carried by said droplet catcher structure for releasably mounting said ingestion blade whereby said ingestion blade may be selectively removed from said structure, said mounting means including a retainer plate carried along the underside of said catcher structure below said cavity and projecting toward said portion, said ingestion blade in part being disposed on said retainer plate and projecting beyond the edge of said plate toward said portion to substantially close the bottom of said cavity.

4,839,665

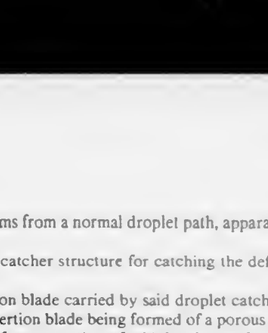
METHOD AND APPARATUS FOR CONTROLLING THE ELECTRICAL CHARGING OF DROPS IN AN INK JET RECORDING APPARATUS

Carl H. Hertz, Skolbänksvägen 8, S-22367 Lund, Sweden, and Bo A. Samuelsson, Lund, Sweden, assignors to Carl Hellmuth Hertz, Lund, Sweden

Filed Jul. 20, 1987, Ser. No. 75,139

Int. Cl.[4] G01D *18/00, 15/18*

U.S. Cl. 346—1.1 **12 Claims**



1. A method of controlling the relative timing of electrical pulses and a drop formation process in an ink jet printing process, in which

an ink jet is directed towards a record medium and disintegrates in the course of a drop formation process at a point of drop formation into a train of individual drops,

said drops are selectively charged by applying said electrical pulses between said ink jet and a charging electrode close to said point of drop formation,

said drops are subsequently passed through an electrical deflection field to determine, on the basis of the charge which a drop has received whether an individual drop process to said record medium or is intercepted, and relative motion is effected between said ink jet and said record medium, said method comprising

applying electrical pulses between said ink jet and said charging electrode with a predetermined phase relationship between the application of said pulses and said drop formation process,

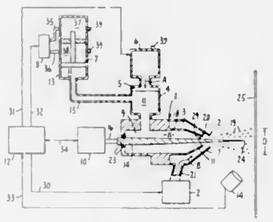
varying said phase relationship,
measuring an electrical current flowing into said ink jet to supply the electrical charges which are applied to said drops by the application of said electrical pulses,
monitoring said current flowing into said ink jet to detect a predetermined current level, and
maintaining the time relationship during a subsequent recording process after said current level has occurred.

4,839,666

ALL SURFACE IMAGE FORMING SYSTEM

William Jayne, P.O. Box 142, San Gregorio, Calif. 94074

Filed Nov. 9, 1987, Ser. No. 118,405
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—75 **11 Claims**



1. An image forming system, including:
(a) a reservoir for containing a deposition medium;
(b) a spray head having a wall, wherein a first orifice, a second orifice, and a third orifice extend through the wall, wherein the spray head is connected to the reservoir so that a volume of the deposition medium may flow from the reservoir through the first orifice into the spray head;
(c) a gas modulator connected to the spray head so that a volume of pressurized gas may flow through the second orifice into the spray head to produce a low pressure region adjacent the third orifice, wherein said low pressure region will draw the volume of the deposition medium out of the spray head through the third orifice, and wherein a first control signal triggers pressurized gas flow from the gas modulator into the spray head, and a second control signal terminates pressurized gas flow from the gas modulator into the spray head after a selected flow duration; and
(d) control means for generating each control signal.

4,839,667

PLATEN FOR USE IN THERMAL PRINTER

Sadatoshi Murakami; Satoru Yamasaki; Masayuki Tanaka; Sayoko Hirata; Hiromi Morimoto, all of Fukuyama; Kenji Nomura, Amagasaki; Kenichiro Oka, and Masaru Ohnishi, both of Kamakura, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 30, 1987, Ser. No. 114,607
Claims priority, application Japan, Oct. 31, 1986, 61-261203
Int. Cl.[4] G01D *15/10*
U.S. Cl. 346—76 PH **6 Claims**

1. A platen for use in a thermal printer of a type designed to effect a printing with the use of a least one thermal print head for printing a recording medium positioned between the platen and the thermal print head, which platen comprises a generally elongated elastic body having an exterior surface adapted to be brought into contact with the heating elements of the thermal print head assembly with at least the recording medium intervening therebetween, said exterior surface of the generally elongated elastic body being lined with a layer of porous material having a hardness greater than that of the elastic body and also having a thermal conductivity lower than that of the elastic body, said elastic body being made of a material selected from the group consisting of rubber, synthetic resin and foamed material.

4,839,668

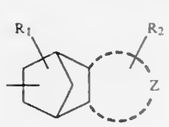
LIQUID JET RECORDING HEAD

Yasufumi Sato; Megumi Munakata, and Hiromichi Noguchi, all of Atsugi, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1987, Ser. No. 30,111
Claims priority, application Japan, Oct. 13, 1986, 61-241386
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **23 Claims**

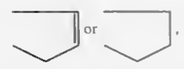
1. A liquid jet recording head, having a liquid pathway communicated to the discharging outlet of the liquid provided on a substrate surface, said pathway being formed by subjecting a layer of a resin composition curable with an active energy ray to a predetermined pattern exposure with the use of said active energy ray to thereby form a cured region of said resin composition and removing the uncured region from said layer, said resin composition being an active energy ray curable resin composition comprising:

(A) a graft copolymerized polymer comprising trunk chains comprising structural units formed from a monomer containing both a (meth)acryloyl group and a dicyclopentenyl group represented by the general formula (I) shown below:



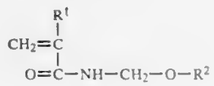
(I)

(where Z represents a 5-membered ring represented by



,

R_1 and R_2 each represents hydrogen atom or an alkyl group having 1 to 3 carbon atoms) and at least one monomer selected from the group consisting of alkyl (meth)acrylates, acrylonitrile and styrene, having graft chains comprising structural units prepared from at least one monomer selected from the group consisting of (a) hydroxyl containing (meth)acrylic monomers, (b) amino or alkylamino containing (meth)acrylic monomer, (c) carboxyl containing (meth)acrylic or vinyl monomers, (d) N-vinylpyrrolidone, (e) vinylpyridine or its derivatives and (f) (meth)acrylamide derivatives represented by the following general formula (II):



(II)

(wherein R_1 is hydrogen or methyl group, and R_2 is hydrogen or alkyl or acyl group having 1 to 4 carbon atoms which may have hydroxy group, added to said trunk chains; and

(B) a monomer having an ethylenically unsaturated bond.

4,839,669

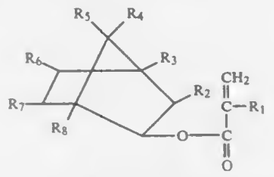
LIQUID JET RECORDING HEAD

Yasufumi Sato; Megumi Munakata, and Hiromichi Noguchi, all of Atsugi, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1987, Ser. No. 30,377
Claims priority, application Japan, Oct. 13, 1986, 61-241387
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—140 R **22 Claims**

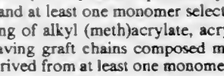
1. A liquid jet recording head, having a liquid pathway communicated to the discharging outlet of the liquid provided on a substrate surface, said pathway being formed by subjecting a layer of a resin composition curable with an active energy ray to a predetermined pattern exposure with the use of said active energy ray to thereby form a cured region of said resin composition and removing the uncured region from said layer, said resin composition being an active energy ray curable resin composition comprising;

(A) a graft copolymerized polymer comprising trunk chains comprising a monomer represented by the general formula (I) shown below:



(I)

(wherein R_1 to R_8 each represent hydrogen or methyl group) and at least one monomer selected from the group consisting of alkyl (meth)acrylate, acrylonitride and styrene, having graft chains composed mainly of structural units derived from at least one monomer selected from the group consisting of (a) hydroxyl containing (meth)acrylic monomers, (b) amino or alkylamino containing (meth)acrylic monomer, (c) carboxyl containing (meth)acrylic or vinyl monomers, (d) N-vinylpyrrolidone, (e) vinylpyridine or its derivatives and (f) (meth)acrylamide derivatives represented by the following general formula (II):



(II)

(wherein R^1 is hydrogen or methyl group, and R^2 is hydrogen or alkyl or acyl group having 1 to 4 carbon atoms which may have hydroxy group.), added to said trunk chains; and

(B) a monomer having an ethylenically unsaturated bond.

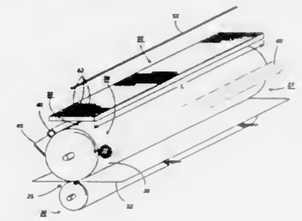
4,839,670

SYNCHRONIZED APERTURE MOTION IONOGRAPHY

Christopher Snelling, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 9, 1988, Ser. No. 191,511
Int. Cl.[4] G01D *15/06*
U.S. Cl. 346—153.1 **10 Claims**

1. In an ionographic image printing apparatus, the combination of:
(a) an ion generator;
(b) a movable charge receptor;
(c) an ion deposition control bar operatively interposed between said ion generator and said charge receptor for modulating the flow of ions produced by said ion generator to said charge receptor,
said control bar having n parallel rows of apertures therethrough extending in a direction substantially perpendicular to the direction of movement of said receptor,
each of said apertures having a control electrode for controlling the flow of ions through said apertures;
(d) a source of image signals for providing images for printing;
(e) image signall processing means for separating said image signals into successive lines and providing a block of n lines for use in controlling the flow of ions through said rows of apertures;
(f) line stepping means operative on each movement of said



charge receptor through a distance of one line to step the position of the lines in said block of lines by one step while providing the next successive line of image signals to the first step in said block of lines;
(g) modulating means for modulating said electrodes, said modulating means providing a first modulating potential facilitating the flow of ions through said apertures and a second modulating potential inhibiting the flow of ions through said apertures; and
(h) control means for selectively coupling said first or second modulating potentials to said electrodes individually in accordance with the image signal content of said lines in said block of lines whereby to provide a controlled line by line build-up of ions on said charge receptor in accordance with the image signal content of the lines in said block of lines.

4,839,671

SELECTABLE DENSITY CHARGE DEPOSITION PRINTING SYSTEM

Sotos M. Theodoulou, Bramalea; Christopher W. Thomson, Islington; Eric Vannerson, Don Mills; Wm. Keith Baker, Toronto; Alvin C. P. Son, Etobicoke, and Ken Hurley, Unionville, all of Canada, assignors to Delphax Systems, Randolph, Mass.

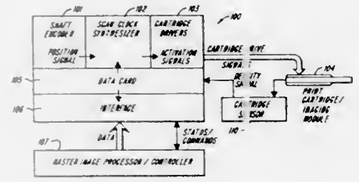
Filed Oct. 4, 1988, Ser. No. 253,138
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—159 **8 Claims**

1. In an ionographic raster scan printing apparatus including an imaging drum having a surface movable in a predetermined process direction, and a connector assembly for receiving a replaceable imaging module having a characteristic dot density corresponding to a set of control electrodes individually driven by clocked driver elements, a system for printing with selectable print density, the system comprising

A. sensor means, in association with the imaging assembly, for sensing the characteristic dot density of the imaging module and for generating density signals representative of the characteristic dot density,

B. position encoder means, in association with the imaging drum, for generating position signals representative of the instantaneous position of the imaging drum surface,

C. scan clock synthesizer means, responsive to said density signals and said position signals, for synthesizing clocked activation signals for clocking the driver elements, said clocked activation signals having a clock frequency proportional to an algebraic combination of said density signals and said position signals, and



D. raster image processor/controller means, responsive to said density signals, for configuring raster image data to the dot density represented by the density signals,

E. whereby print density in the process direction is selectable by said clock frequency, and print density in a direction transverse to the process direction is selectable by the characteristic dot density.

4,839,672

EXPOSURE DEVICE AND PRINTER WITH AN LED ARRAY

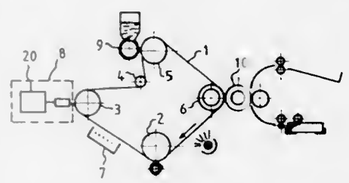
Hans Reinten, Velden, Netherlands, assignor to Oce-Nederland B.V., Venlo, Netherlands

Filed Jul. 5, 1988, Ser. No. 215,219

Claims priority, application Netherlands, Jul. 7, 1987, 8701592

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—160 **6 Claims**



1. An exposure device for the image-wise exposure of a photosensitive layer by means of an LED array, each LED in the array being energized in accordance with the image information to be reproduced, comprising:

a. first means for determining the cumulative energization level of each LED during a specific time interval,

b. second means electrically connected to said first means for determining the cumulative energization level of the LED or LED's in said array having the greatest energization level during said specific interval of time; and

c. third means connected to said second means for energizing individually at least each of the other LED's of the array to an additional energization during a correction interval after said specific time interval, said additional energization being equal to at least the difference between the energization level of the individual LED and said greatest energization level.

4,839,673

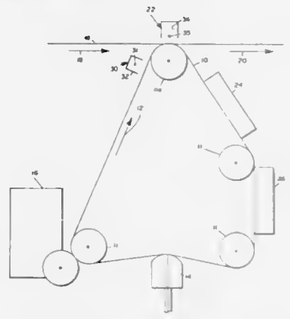
AC CORONA ENHANCEMENT FOR ELECTROSTATIC IMAGING DEVICES

Thomas D. Kegelman, Palm Harbor, Fla., and Michael W. Raymond, Bolton, Conn., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Dec. 11, 1987, Ser. No. 131,760

Int. Cl.[4] G03G *21/00*

U.S. Cl. 346—160.1 **18 Claims**



1. In a non-impact printer wherein a latent electrostatic image is developed with toner for transfer to paper, apparatus for suppressing image background clutter while improving image edge definition upon transfer to paper comprising:

an electrostatically charged surface for accepting toner to form a toned image;

means for moving said surface to a transfer station wherein the toned image is positioned to engage paper moving at the same speed as said surface;

means for moving the toned image from said surface to the paper; and

means providing an alternating current corona at a point in travel of the toned image immediately prior to the location of said means for moving the toned image to the paper for suppressing toner particles in background areas of said surface and at the image edge while enhancing the transfer of toner particles directly on the image.

4,839,674

RECORDER-MEDIUM REGISTRATION SYSTEM

Takayoshi Hanagata, Yamato, and Shigemitsu Tazaki, Matsudo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 879,546, Jun. 24, 1986, abandoned, which is a continuation of Ser. No. 609,200, May 11, 1984, abandoned. This application Jan. 25, 1988, Ser. No. 147,628

Claims priority, application Japan, May 25, 1983, 58-90761

Int. Cl.[4] B01D *15/24;* **B41J** *11/42;* **B65H** *54/64*

U.S. Cl. 346—136 **14 Claims**

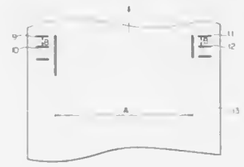
1. Printing apparatus operable for feeding a recording medium, comprising:

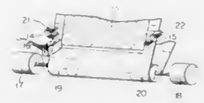
recording means disposed at a recording station for performing repeated recording operations on the recording medium to record, in parallel and in the same recording operation, description information and a separate control mark on the recording medium;

feed means for feeding the recording medium to said recording station before a recording operation;

detection means for detecting, before a recording operation, the control mark recorded on the recording medium by said recording means in a previous recording operation; and

control means for controlling said feed means in response to the output of said detection means to properly position the





recording medium at said recording station before the next recording operation.

4,839,675

CATCH AND RELEASE FISH DATA RECORDING SYSTEM

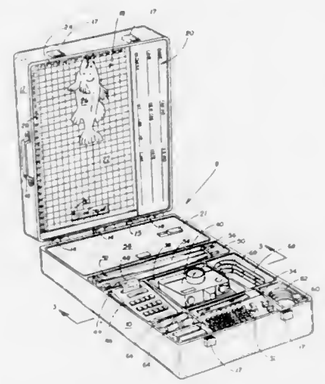
H. Drew Owen, 16 N. Bridlewood, Edmond, Okla. 73034

Continuation of Ser. No. 66,269, Jun. 25, 1987, Pat. No. 4,753,031. This application Apr. 13, 1988, Ser. No. 181,269

The portion of the term of this patent subsequent to Jun. 28, 2005, has been disclaimed.

Int. Cl.[4] G03B *29/00;* **A01K** *97/00;* **G01G** *19/00, 23/00*

U.S. Cl. 354—76 **14 Claims**



1. A portable system for recording information concerning a wildlife specimen, such system including:

a two-part carrying case defining a hollow interior when the two parts are closed, and having the two parts hinged to each other for pivotally opening apart from each other upon pivotation about the hinges by which the parts are joined;

an electronic weighing means mounted in a first of the parts of the carrying case for electronically weighing the wildlife specimen and developing a digital readout portrayal of the specimen weight while concurrently measuring, and visually portraying, at least one physical dimension of the specimen; and

recording means mounted in the second part of the carrying case for simultaneously making two records, one of which is a written record, each of said records recording said specimen weight and physical dimension, whereby one of said records can be mailed to an official wildlife specimen registry and one of said records can be retained by the specimen collector.

4,839,676

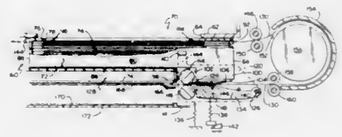
FILM CASSETTE-LIQUID SPREAD ROLLER ASSEMBLY INTERFACE

Irving S. Lippert, Lexington; John I. Sturgis, Stoneham, and George D. Whiteside, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 2, 1988, Ser. No. 188,970

Int. Cl.[4] G03B *17/52*

U.S. Cl. 354—86 **24 Claims**



1. Photographic apparatus comprising:

a film cassette having a chamber defined by forward and rear walls interconnected by a pair of side walls, a leading end wall and a trailing end wall, said forward wall including means defining an exposure aperture and said leading end wall including means defining an egress through which a film unit may be advanced from said chamber;

processing liquid spread control means extending from an exterior surface of said rear wall;

a plurality of film units located within said chamber in stacked relation with an endmost film unit in said stack being adapted to be urged into a position adjacent said exposure aperture with a leading edge of said endmost film unit being located in position to be moved through said egress, each of said film units including a supply of processing liquid;

means for locating said film cassette in position for the sequential exposure of said film units;

first means for advancing said endmost film unit in a first direction, subsequent to its exposure, toward the exterior of said film cassette;

second means for continuing the movement of said endmost film unit in said first direction and then in a second direction generally opposite to said first direction;

first pressure-applying means mounted in the path of travel of said endmost film unit as it is being advanced in said second direction, said pressure-applying means being adapted to spread said processing liquid across a layer said endmost film unit to initiate the formation of a visible image within said endmost film unit, said first pressure-applying means being mounted closely adjacent said processing liquid spread control means; and

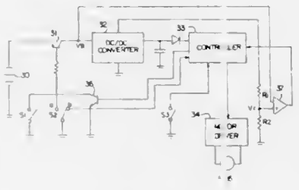
second pressure-applying means mounted in position to engage a major surface of said endmost film unit during the spreading of said processing liquid and urge its opposite into engagement with said processing liquid spread control means so as to control the distribution of the processing liquid being spread by said first pressure-applying means.

4,839,677

FOCAL LENGTH SWITCHING TYPE CAMERA

Yasushi Hoshino, Tokyo, and Masamori Makino, Hino, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 860,646, May 7, 1986, Pat. No. 4,740,807.
This application Feb. 26, 1987, Ser. No. 20,148
Claims priority, application Japan, May 14, 1985, 60-100382; May 14, 1985, 60-100383
Int. Cl.[4] G03B 5/00, 7/26
U.S. Cl. 354—195.1 2 Claims



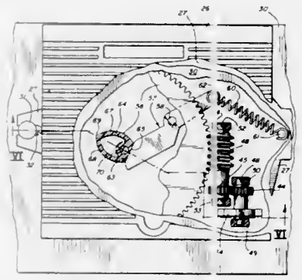
1. In a focal length switching type camera comprising moving means for moving a lens unit for holding a lens in a direction of an optical axis, operating means for actuating said moving means, and control means for controlling the operation of said moving means, whereby the lens unit is moved by said moving means to change the focal length, the improvement characterized by comprising battery checking means for judging whether or not a voltage of a battery is lower than a predetermined reference voltage, wherein a driving voltage of a motor for driving said moving means is set to a voltage lower than the reference voltage of said battery checking means.

4,839,678

FILM COUNTER FOR CAMERAS

Arthur Zawodny, Budd Lake, N.J., and Vladimir Fridman, New City, N.Y., assignors to Keystone Camera Corporation, Clifton, N.J.

Filed Feb. 26, 1988, Ser. No. 160,716
Int. Cl.[4] G03B 17/26
U.S. Cl. 354—217 21 Claims



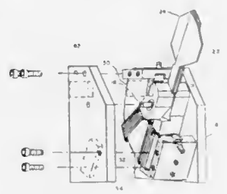
1. A camera comprising: housing means defining an exposure chamber and a film support at a rearward end of said exposure chamber to support the periphery of a section of film in an exposure region for exposure of a frame thereof, film supply spool receiving means and film advance means in said housing means for moving film in advance and rewind directions through said exposure region, door means on said housing means movable between an open position permitting access to said spool receiving and film advance means and a closed position behind said spool receiving and film advance means and said exposure region, frame count indicating means mounted on said door means and including indicia means for indicating the frame number of a section of film currently positioned in said exposure region, and film-driven means on said door means and including tooth means engageable in sprocket holes of a film moved over said film support to be driven by the film, said film-driven means being arranged for moving said frame count indicating means in response to movement of said film through said exposure region.

4,839,679

DUAL VOICE COIL SHUTTER

John F. Cameron, Mountain View; Jeffrey G. Knirck, Sunnyvale, and Lawrence A. Wise, Los Altos, all of Calif., assignors to General Electric Corp., Stamford, Conn.

Filed Jun. 18, 1987, Ser. No. 64,151
Int. Cl.[4] G03B 9/62
U.S. Cl. 354—234.1 6 Claims



1. Apparatus for controlling passage of light comprising a core,

a shutter type mechanism rotatably mounted about a common axis, said mechanism including a pair of blades having a scissors-like arrangement adapted to simultaneously open and close upon an optical path, said shutter mechanism including

a pair of voice-type coil means each of which is connected to a respective one of said pair of blades,

means for applying a DC electrical current to said coils to effect a coplanar rotation of said coil means about said core so as to rotate said blades between opened and closed positions about a single axis of rotation within a predetermined period of time where the rotation of said blades depends upon the direction of application of said electrical current.

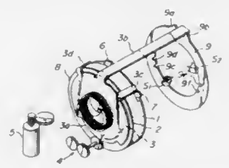
4,839,680

METHOD AND DEVICE FOR DRIVING LENS SHUTTER

Mitsumasa Amada, Soka; Hitosi Sibasaki, Funabashi, and Masami Nagasaka, Kiyose, all of Japan, assignors to Mamiya Camera Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1987, Ser. No. 133,479
Claims priority, application Japan, Dec. 27, 1986, 61-314535; Jan. 20, 1987, 62-9078
Int. Cl.[4] G03B 9/22, 9/52
U.S. Cl. 354—233 14 Claims

1. A method of driving a lens shutter built in a lens barrel to be equipped on a single-lens reflex camera, said method comprising steps of charging said lens shutter, opening shutter blades of the lens shutter, closing said shutter blades and releasing said lens shutter, all these steps being caused by rotating a shaft of a reversible motor in one direction and a reverse direction.

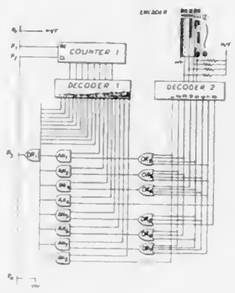


4,839,681

CAMERA ACCESSORY OUTPUT INFORMATION SYSTEM

Hideo Hamano, C-524, Dai-2 Koporasu, Kibougaoka 144-1, Nakakibougaoka, Asahi-Ku, Kanagawa-Ken, Japan

Continuation of Ser. No. 925,706, Oct. 30, 1986, abandoned.
This application Nov. 25, 1987, Ser. No. 125,473
Claims priority, application Japan, Nov. 1, 1985, 60-243889
Int. Cl.[4] G03B 17/00, 7/20
U.S. Cl. 354—286 2 Claims



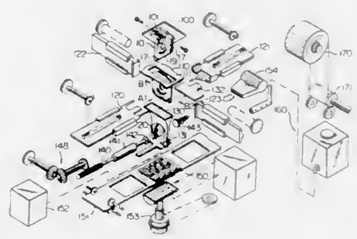
1. An output information system for an interchangeable camera lens accessory usable with a microprocessor based camera system for transmitting preset information to said microprocessor for use by said microprocessor in controlling the operation of the camera to which said lens is interchangeably attachable, said microprocessor being in said camera body, said microprocessor providing a clock pulse stream of n pulse in length to said camera lens accessory, said camera lens accessory comprising counter means for counting each of said n clock pulses transmitted from said microprocessor in a specific timing sequence, first pulse decoder means operatively connected to said counter means for decoding which pulse of said n pulse stream in said specific timing sequence is present and for selectively providing a corresponding predetermined logic high or low bit for a given potential output path from said first pulse decoder means in response to a predetermined clock pulse in said n pulse specific timing sequence clock stream, a condition responsive gate array operatively connected to a first portion of said given output paths for selectively receiving one of said corresponding logic high or low bits, and selectively calculating an output for said gate array for a given output path from said gate array based on the circuit configuration thereof for providing a first logic high or low serial output bit to said microprocessor through said condition responsive gate array circuit configuration in response to the condition of the inputs to a given gate in said gate array during said specific timing sequence of clock pulses in said n pulse stream; a second portion of said first decoder means output paths directly selectively providing a second logic high or low serial output bit to said microprocessor from said first decoder means in response to a different given clock pulse in said n pulse clock stream specific timing sequence; an output OR logic gate means having an input operatively connected in parallel to said gate array circuit configuration output paths and to said second portion of said first decoder means output paths for providing said n bit output pattern to said microprocessor from said OR logic gate means, said first portion of said first decoder means output paths being connected to said output OR logic gate means input through said gate array circuit configuration and said second portion of said first decoder means output paths being directly connected to said OR logic gate means input; whereby an n pulse serial clock stream specific timing sequence can be directly employed in a gate array circuit configuration to calculate a synchronized n bit serial bit output pattern to said microprocessor for controlling the operation of said camera without retrievable storage of lens information in said camera system.

4,839,682

PROCESSING APPARATUS FOR DISC FILMS

Shigeharu Koboshi; Satoru Kuse; Masayuki Kurematsu, and Nobutaka Gote, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Mar. 8, 1988, Ser. No. 165,582
Claims priority, application Japan, Mar. 10, 1987, 62-35745; May 14, 1987, 62-118669; Sep. 8, 1987, 62-138088; Sep. 16, 1987, 62-232927
Int. Cl.[4] G03D 3/02
U.S. Cl. 354—312 13 Claims



1. An apparatus for handling a disc film unit, said unit comprising a disc-shaped photographic film having a hub at a rotation center thereof and a cartridge having a light shielding structure for storing the film therein, said apparatus comprising;

a housing means having an open portion through which said film unit is introduced into said housing means and a cover member for covering said open portion and shielding the inside of said housing means from light,

a cartridge opening means for at least partially opening said cartridge housed in said housing means, and

a treatment means for treating the film in said housing means, said treatment means having a processing means for processing said film with a processing solution and an agitation means for agitating said processing solution,

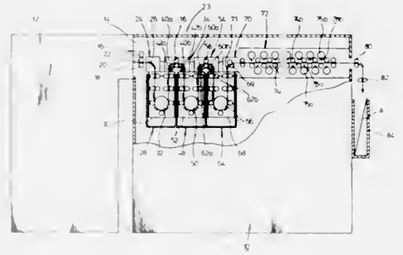
wherein said film remains inside the cartridge opened by said cartridge-opening means in said housing means during processing, said treatment means supplying processing solution to said housing means so that said film is contacted by the processing solution.

4,839,683

AUTOMATIC IMAGE DEVELOPING APPARATUS

Hiroshi Kushima, and Hideo Ishizaka, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 8, 1987, Ser. No. 59,301
Claims priority, application Japan, Jun. 6, 1986, 61-131338
Int. Cl.[4] G03D *3/02, 3/08*
U.S. Cl. 354—322 5 Claims



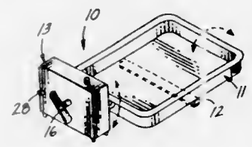
1. An automatic image developing apparatus for automatically developing an image recorded on a photographic photosensitive material, said apparatus comprising a feeder assembly for feeding the photographic photosensitive material successively to processing tanks for developing the image, fixing the developed image, and washing the photographic photosensitive material, said feeder assembly having at least one conduit for supplying cleaning water to remove processing solutions from the feeder assembly, said conduit being disposed near said feeder assembly and having openings defined in an outer peripheral wall thereof for ejecting the cleaning water therethrough against said feeder assembly to clean said assembly, wherein said feeder assembly and said conduit are exterior to said processing tanks, and wherein said feeder assembly comprises at least one guide plate and a pair of rollers, the conduit being positioned such that said cleaning water is ejected on said at least one guide plate and said pair of rollers simultaneously.

4,839,684

PHOTOGRAPHIC TRAY AGITATOR

Randi J. Michelson, 3235 Parkside Pl.-1E, Bronx, N.Y. 10467, and Mercedes B. Leonard, 430 E. 65th St. #2E, New York, N.Y. 10021

Filed Aug. 23, 1988, Ser. No. 235,203
Int. Cl.[4] G03D *3/04*
U.S. Cl. 354—327 6 Claims



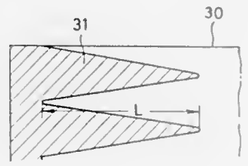
1. A photographic tray apparatus comprising,
a pivotally mounted frame means for containing a photographic washing solution, and
a housing including an energy releasing spring, and
a wind-up handle operatively secured to said spring and extending outwardly of said housing, and
a first drive gear operatively associated with said spring by a first drive shaft to receive rotational energy from said spring, and
a driven gear connected to said drive gear and formed with an elongate second axially extending drive shaft, and
a cam rotatable connected to said second drive shaft, and
an "L" shaped pivot arm means pivotally mounted rearwardly of said second drive shaft for maintaining contact with said cam, and
said pivot arm extending outwardly of said housing in engagement with said tray for oscillatingly moving said tray in a predetermined cycle.

4,839,685

LIGHT RECEIVING ELEMENT FOR A RANGEFINDER

Minoru Ishiguro, and Minoru Takahashi, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 12, 1987, Ser. No. 119,172
Claims priority, application Japan, Nov. 12, 1986, 61-173436[U]
Int. Cl.[4] G03B *3/00*
U.S. Cl. 354—403 2 Claims



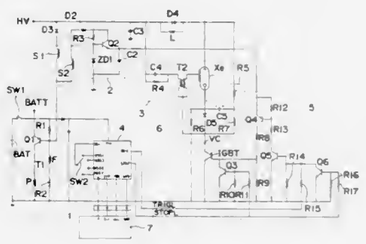
1. A light receiving element for use in a rangefinding device which comprises light projecting means for projecting a light toward an object to be measured and light receiving means for receiving a light reflected from said object, said light receiving element comprising a light detecting member and a saw-toothed mask having sharp teeth, said mask comprising a thin opaque aluminum layer on a light receiving surface of said light detecting member formed directly on said light receiving surface by means of vacuum evaporation, and a layer of exposed photo-resistive material on only said aluminum layer.

4,839,686

FLASH DEVICE

Hiroshi Hosomizu; Tsutomu Ichikawa; Makoto Kamiya; Masatoshi Yoneyama, and Kenzi Tuzi, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 8, 1988, Ser. No. 216,725
Claims priority, application Japan, Jul. 10, 1987, 62-173466
Int. Cl.[4] G03B *15/05*
U.S. Cl. 354—416 12 Claims



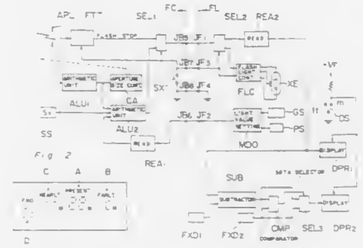
1. A flash device comprising:
a power source;
a main capacitor adapted to be charged by the power source;
a flash firing unit operable to consume charge stored in the main capacitor to emit a flash light;
a trigger means for exciting the flash firing unit in response to a flash firing command;
an insulated gate bipolar transistor disposed in a discharge loop for the main capacitor through the flash firing unit; and
a control means for applying a voltage to a gate of the insulated gate bipolar transistor in response to the flash firing command and for interrupting the application of the voltage to the insulated gate bipolar transistor in response to a flash terminating command.

4,839,687

FLASH PHOTOGRAPHY SYSTEM

Nobuyuki Taniguchi, Tondabayashi; Masaaki Nakai, Nara; Takanobu Omaki, Sennan; Hiroshi Hosomizu, Nara; Masatake Niwa, Sakai; Toru Inoue, Toyonaka, and Minoru Sekida, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 801,303, Nov. 25, 1985, Pat. No. 4,755,845, which is a division of Ser. No. 544,870, Oct. 24, 1983, Pat. No. 4,558,939. This application Dec. 11, 1987, Ser. No. 132,910
Claims priority, application Japan, Oct. 22, 1982, 57-186640; Oct. 29, 1982, 57-190996; Dec. 14, 1982, 57-219565
Int. Cl.[4] G03B *15/05*
U.S. Cl. 354—416 2 Claims



1. An electronic flash device, comprising:
means for emitting flash light;
a first terminal for receiving a flash synchronizing signal;
means, responsive to the flash synchronizing signal, for starting emission of flash light from said flash light emitting means;
means for providing data corresponding to a cone of light of said flash light emitting means;
a second terminal;
means for serially transmitting the data through said second terminal to the photographic camera in synchronism with a clock pulse train fed from the photographic camera; and
a third terminal for receiving the clock pulse train.

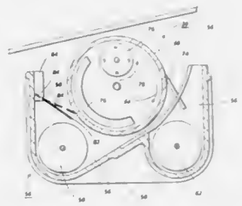
4,839,688

DEVELOPMENT APPARATUS

Jan Bares, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 25, 1988, Ser. No. 185,593
Int. Cl.[4] G03G *15/08, 15/01*
U.S. Cl. 355—253 12 Claims

1. An apparatus for developing a latent image recorded on a member with developer material, including:
means, positioned closely adjacent the member defining a development zone therebetween, for transporting the developer material into contact with the member in the development zone so as to develop the latent image recorded thereon with developer material; and
a blade member arranged to move from an operative position to a non-operative position, said blade member, in the operative position, having the free end portion thereof contacting said transporting means to prevent said transporting means from transporting developer material into contact with the member preventing development of the latent image recorded thereon, and said blade member, in the non-operative position, having the free end portion



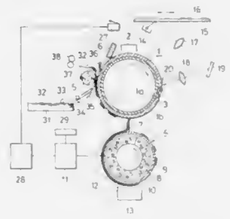
thereof spaced from said transporting means to enable said transporting means to transport the developer material into contact with the member to develop the latent image recorded thereon, said blade member, in the non-operative position, having the free end portion thereof spaced from said transporting means a preselected distance to control the quantity of developer material being advanced by said transporting means to the development zone.

4,839,689

IMAGE FORMING APPARATUS

Shunichi Ishihara, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 770,366, Aug. 29, 1985, abandoned, which is a continuation of Ser. No. 496,206, May 19, 1983, abandoned. This application Dec. 8, 1987, Ser. No. 131,325
Claims priority, application Japan, May 24, 1982, 57-87713
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—202 14 Claims



1. An image forming apparatus comprising:
(a) a latent image bearing member;
(b) means for forming an electrostatic latent image on said latent image bearing member;
(c) means for developing the latent image formed on said latent image bearing member, wherein said developing means comprises:
(i) developing electrodes which are mutually electrically independent between neighbouring electrodes and arranged in the widthwise direction of said latent image bearing member and adapted to receive image signal voltages of the same polarity as said electrostatic latent image;
(ii) means for supplying an electrically conductive and magnetic toner to said developing electrodes, wherein said toner is selectively deposited on said latent image

bearing member in accordance with a potential of said latent image and signal voltages supplied to said developing electrodes, and wherein said toner at the undeveloped latent image portion resists the charge applied to the toner by said electrodes and the latent potential, and the toner at the developing portion deposited on said image bearing member corresponding to the image signal voltage is charged by said electrodes and the latent potential.

4,839,690

IMAGE BEARING MEMBER USABLE WITH IMAGE FORMING APPARATUS

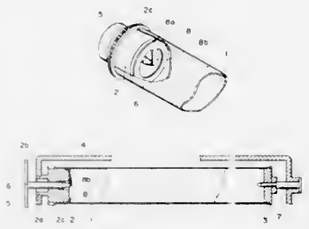
Shigeyoshi Onoda, Yokohama, and Tokihide Ebata, Tanashi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 906,032, Sep. 10, 1986, abandoned. This application May 26, 1988, Ser. No. 201,365

Claims priority, application Japan, Sep. 17, 1985, 60-141595[U]; Sep. 17, 1985, 60-205102

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—211 **19 Claims**



1. An image bearing member usable with an image forming apparatus, comprising:

an electrically conductive drum member having first and second ends and supporting thereon an image bearing layer;

an electrically insulative flange mounted adjacent said first end of said conductive drum member; and

a first electrically conductive member, engageable with a second electrically conductive member of the image forming apparatus, disposed at a inner side of said flange and engaged to a part of the conductive drum, wherein

said first electrically conductive member includes an arcuate portion substantially concentric with an interior portion of said conductive drum, a projection extending from said arcuate portion and contacting said interior portion of said conductive drum, and a spring portion adapted to contact an end of a drum shaft of the image forming apparatus.

4,839,691

IMAGE FORMING APPARATUS

Hajime Tagawa, Kawasaki, and Koji Yuminaga, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 17, 1987, Ser. No. 15,614

Claims priority, application Japan, Mar. 31, 1986, 61-72997; Mar. 31, 1986, 61-72998

Int. Cl.⁴ G03G *15/08*

U.S. Cl. 355—260 **8 Claims**

1. An image forming apparatus which transfers a developing agent to a sheet in accordance with image information comprising:

a body;

an image carrier disposed in said body on which an electrostatic latent image is formed;

a developing device for supplying said developing agent to said image carrier to develop said latent image, said developing means including a moveable handle having a transport position and a lock position;

a first connection disposed on said developing device for electrically connecting said developing device to said body;

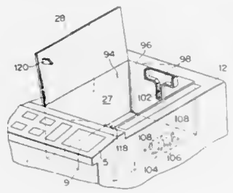
a mounting means disposed in said body for removably holding said developing device in a correct position relative to said image carrier;

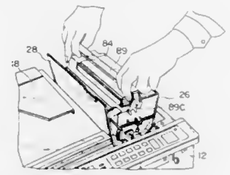
a second connection attached to said mounting means and adapted to be connected to said first connector in a connected position when said developing device is attached to said mounting means in said correct position so that operation of said image forming apparatus can take place;

a removable lid which

will fully close when said developing device is in said correct position and said handle is placed in said locked position and

will not fully close when said developing device is not in said correct position and said handle is in said transport position to give a clear indication that said developing device is not in said correct position.





4,839,692

APPARATUS FOR REPRODUCING MULTI-COLOR IMAGE

Hisashi Shoji; Satoshi Haneda, and Seiichiro Hiratsuka, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 772,651, Sep. 4, 1985, Pat. No. 4,696,880. This application Feb. 5, 1987, Ser. No. 11,514

Claims priority, application Japan, Sep. 6, 1984, 59-185439; Sep. 6, 1984, 59-185440; Sep. 6, 1984, 59-187044; Sep. 20, 1984, 59-198127

Int. Cl.⁴ G03G *15/01*

U.S. Cl. 355—211 **8 Claims**

1. An apparatus for reproducing a multi-color image comprising

a photoreceptor comprising an endless conductive member, a photoconductive layer, and an insulating layer having a plurality of colored filters wherein all of said layers are provided on an external surface of said conductive member,

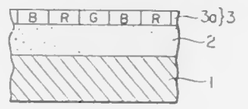
means for charging said photoreceptor,

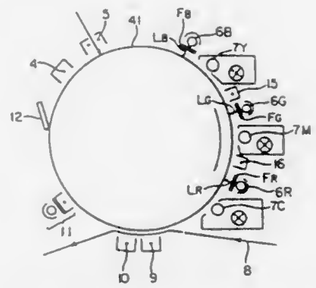
means for forming an electrostatic latent image upon said photoreceptor,

means for uniformly exposing said photoreceptor to a plurality of specific lights,

means for developing said electrostatic latent image to form a plurality of different toner images,

means for providing a uniform potential upon the surface of said photoreceptor after development, and





means for transferring said toner image on said photoreceptor to a transferring member wherein all of said means are arranged outside said photoreceptor and said uniform potential providing means is arranged between said image forming means and said transferring means along a rotating direction of said photoreceptor.

4,839,693

COPYING APPARATUS

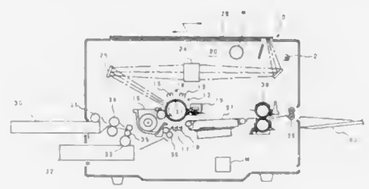
Toshikazu Kawaguchi, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 27, 1988, Ser. No. 149,147

Claims priority, application Japan, Jan. 28, 1987, 62-18848

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—234 **9 Claims**



1. A copying apparatus comprising:

a document table which carries originals and reciprocates in both a scanning direction for copying and a returning direction;

a driving means for reciprocating said document table in said scanning and returning directions;

a detecting means for detecting the moving speed of said document table; and

a control means for controlling said driving means on the basis of detected speed by said detecting means in order to move said document table at predetermined speeds in said scanning and returning directions, wherein said control means comprises, means for controlling the moving speed of said document table in said returning direction to a predetermined first speed, means for comparing the detected speed by said detecting means at predetermined timings during the returning of said document table with said first speed, and means for controlling the returning speed of said document table to a predetermined second speed which is slower than said first speed when the speed detected by said detecting means is slower than said first speed.

4,839,694

PRINTING APPARATUS

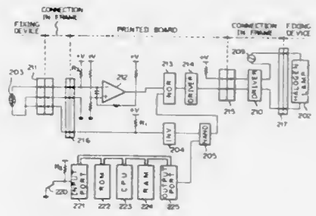
Masato Kawashima, and Kyohei Hashizume, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 890,511, Jul. 30, 1986, Pat. No. 4,791,448. This application Jul. 14, 1988, Ser. No. 218,918

Claims priority, application Japan, Aug. 20, 1985, 60-182207; Oct. 19, 1985, 60-234086

Int. Cl.⁴ G03G *15/20*

U.S. Cl. 355—208 **3 Claims**



1. A printing apparatus, comprising:

(a) means for forming a toner image;

(b) means for feeding a medium;

(c) means for transferring the toner image to the medium fed by said feeding means at an intermediate position along a medium path;

(d) a heat roller fixing unit, in which a pressure roller and a heat roller are arranged in opposition to each other, and said medium is passed between said rollers to fix said image formed thereon, said heat roller including a heater;

(e) a thermistor for detecting a temperature of said heat roller and providing a connecting terminal with an electric power source and a connecting terminal with a ground and detecting temperature variations by variations in a resistance of the thermistor;

(f) a temperature control circuit which, in accordance with the output of said thermistor, generates a command for driving said heater so that the temperature of said heat roller is brought to a predetermined temperature;

(g) means for connecting said thermistor to said temperature control circuit having at least a first terminal for supplying a current to said thermistor, and a second terminal connected to one of said electric source terminal and said ground connecting terminal; and

(h) a detector circuit which detects an electric potential at said second terminal,

wherein, when said connector means is disconnected, said driving command for said heater in said temperature control circuit is prevented by the output of said detector circuit.

4,839,695

DEVICE FOR CONTROLLING CHARGE AREA OF PHOTORECEPTOR

Haruo Yamamoto, and Shusaku Ogawa, both of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 21, 1986, Ser. No. 934,293
Claims priority, application Japan, Nov. 29, 1985, 60-270171
Int. Cl.[4] G03G 15/00
U.S. Cl. 355—218 13 Claims

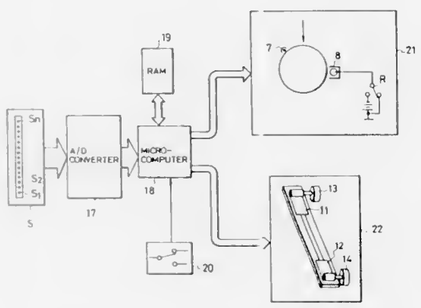
1. A device for controlling the charge area of a photoreceptor utilized in an image forming apparatus of the type in which an electrostatic latent image is formed on a photoreceptor charged by a main charger by projecting a light image of an original followed by developing the latent image by a developing means and transferring the developed image by transferring means to copying paper, comprising detecting means for detecting the length of a sheet of copying paper, operable means for calculating the length of an image projected area to be projected on the photoreceptor, selecting means for selecting the shorter one between the detected length of the copying paper sheet and the calculated length of the image projected area to be projected on the photoreceptor by comparing said two lengths with each other, and control means for controlling the charging time of the main charger so as to charge the photoreceptor over a charge area corresponding to the length selected by the selecting means.

4,839,696

IMAGE RECORDING APPARATUS FOR RECORDING A SELECTED PORTION OF AN ORIGINAL IMAGE

Kazuo Ohtani, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1987, Ser. No. 17,578
Claims priority, application Japan, Feb. 28, 1986, 61-043032; Jul. 1, 1986, 61-152672
Int. Cl.[4] G03G 15/00
U.S. Cl. 355—218 17 Claims



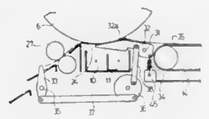
1. An image recording apparatus comprising:
detection means for detecting an image region of an original;
recording means for recording an image of the original onto a recording medium;
setting means for setting a range of the original to be recorded on said recording medium, said setting means being selectively set to a first mode for recording a first area inside the image region detected by said detection means and a second mode for recording a second area including a portion outside the image region and larger than said first area; and
recording control means for controlling said recording means based on an output from said detection means and said setting means.

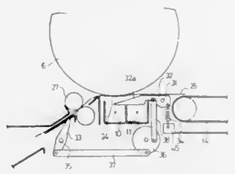
4,839,697

IMAGE FORMING APPARATUS

Manabu Kamitamari, and Hiroyoshi Hayama, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 1, 1988, Ser. No. 201,012
Claims priority, application Japan, Jun. 1, 1987, 62-138744; Jun. 1, 1987, 62-138745
Int. Cl.[4] G03G 15/00
U.S. Cl. 355—309 10 Claims





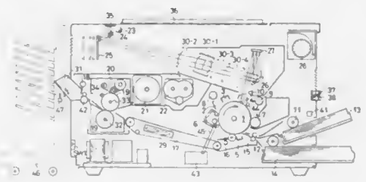
1. An image forming apparatus, comprising:
a rotatable photosensitive member;
means for forming an image on the photosensitive member;
means for transferring the image onto a paper, said transferring means including a transfer charger opposite to the photosensitive member to compose a transfer section;
feeding means provided in a paper feed path for feeding the paper through the transfer section;
a sheet guide provided in the transfer section movable between the first position adjacent to the photosensitive member and the second position away from the photosensitive member;
driving means for moving the sheet guide from the second position to the first position; and
controlling means for actuating the driving means to position the sheet guide at the first position when the rear portion of the paper passes the transfer section.

4,839,698

COPYING APPARATUS

Tsuneki Inuzuka, Machida; Katsuyoshi Maeshima, Tokyo, and Masahiro Tomosada, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 627,635, Jul. 3, 1984, abandoned, which is a continuation of Ser. No. 311,865, Oct. 15, 1981, abandoned. This application Aug. 26, 1987, Ser. No. 90,429
Claims priority, application Japan, Oct. 17, 1980, 55-145268; Oct. 17, 1980, 55-145269; Dec. 27, 1980, 55-188402; Jan. 19, 1981, 56-6946; Jan. 21, 1981, 56-8489
Int. Cl.[4] G03G 21/00
U.S. Cl. 355—243 21 Claims



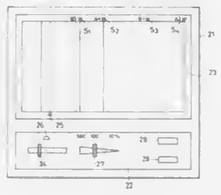
1. Image processing apparatus comprising:
a plurality of process means for processing an image;
first control means for controlling at least a first one of said plural process means in accordance with a control program for an image process;
second control means for controlling at least a second one of said plural process means in accordance with a control program for an image process; and
reset means for detecting a failure of said first and second control means in accordance with an output from one of said first and second control means, and for resetting both of said first and second control means .

4,839,699

IMAGE REPRODUCING APPARATUS

Masao Hosaka, Sagamihara, and Takashi Saito, Ichikawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 891,463, Jul. 31, 1986, abandoned. This application Dec. 10, 1987, Ser. No. 132,663
Claims priority, application Japan, Jul. 31, 1985, 60-167695; Jul. 31, 1985, 60-167696; Jul. 31, 1985, 60-167697; Jul. 31, 1985, 60-167698
Int. Cl.[4] G03B 27/52
U.S. Cl. 355—55 11 Claims



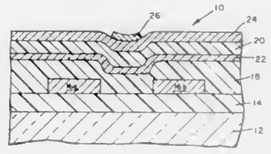
1. An image recording apparatus, comprising:
means for recording an image;
means for setting a linear magnification mode of said apparatus; and
means for controlling said recording means in accordance with said setting means so that parts of an image may be recorded in one recorded image at gradually varying magnification ratios, respectively.

4,839,700

SOLID-STATE NON-VOLATILE ELECTRONICALLY PROGRAMMABLE REVERSIBLE VARIABLE RESISTANCE DEVICE

Rajeshuni Ramesham; Sarita Thakoor, both of Pasadena; Taher Daud, La Crescenta, and Aniklumar P. Thakoor, Pasadena, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Dec. 16, 1987, Ser. No. 133,897
Int. Cl.[4] H01L 45/00, 27/12, 49/02, 29/12
U.S. Cl. 357—2 35 Claims



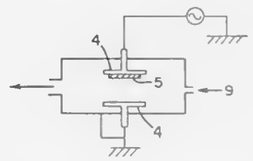
1. A solid state, non-volatile electrically programmable reversible variable resistance device comprising:
(a) a pair of contact electrodes formed on an insulating surface;
(b) a variable resistance layer comprising a material having a resistivity controllable by adjusting ion content thereof and physically contacting said pair of electrodes;
(c) a blocking layer comprising a non-linear blocking barrier formed on said variable resistance layer;
(d) a donor layer comprising an ion donor material for adjusting said ion content of said variable resistance material, said donor layer formed on said blocking layer; and
(e) a gate electrode for generating an electric field to control flow of ions between said ion donor material and said variable resistance material, said gate electrode formed on said donor layer.

4,839,701

HYDROGENATED AMORPHOUS SILICON FILM

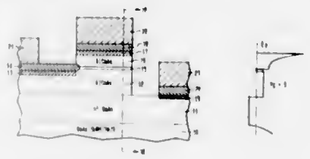
Osamu Imagawa; Masazumi Iwanishi, and Seiichiro Yokoyama, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 870,035, Jun. 3, 1986. This application Oct. 14, 1988, Ser. No. 258,118
Claims priority, application Japan, Jun. 3, 1985, 60-121217
Int. Cl.[4] H01L 45/80
U.S. Cl. 357—2 2 Claims



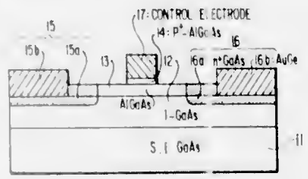
1. A hydrogenated amorphous silicon film having high photosensitivity at a long wavelength range of greater than 700 nm which consists essentially of a compound of silicon and hydrogen,
said amorphous film having a photosensitivity of not less than 0.1 cm^2/erg at 780 nm.

4,839,702
SEMICONDUCTOR DEVICE BASED ON CHARGE EMISSION FROM A QUANTUM WELL
Anatoly Grinberg, Minneapolis, Minn., and Alexander Kastalsky, Ocean Township, Monmouth County, N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.
Filed Nov. 20, 1987, Ser. No. 123,143
Int. Cl.[4] H01L 29/161, 29/205, 29/225
U.S. Cl. 357—16 **21 Claims**



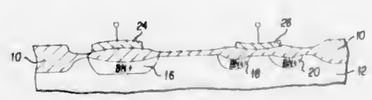
1. A semiconductor device implemented on a substrate comprising:
a first layer of semiconductor material of a first conductivity type disposed on said substrate and forming a first active region of said device,
a second layer of semiconductor material of a first conductivity type composed of a relatively wide energy bandgap semiconductor material, disposed on said first layer and forming a second active region of the device;
a third layer composed of a relatively narrow energy bandgap semiconductor material disposed on said second layer and defining a quantum well having an energy band step such that carriers are confined in that layer; and
a fourth layer of semiconductor material of a first conductivity type composed of a relatively wide energy bandgap material disposed on said third layer and forming a third active region of the device,
wherein said first layer of semiconductor material is composed of indium gallium arsenide and further comprising a layer of an insulating material deposed on said fourth layer, and a layer of a metallic material disposed over said layer of insulating material.

4,839,703
HIGH SPEED AND POWER TRANSISTOR
Keiichi Ohata; Hikaru Hida, and Masaki Ogawa, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Continuation of Ser. No. 807,935, Dec. 12, 1985, abandoned. This application Sep. 23, 1987, Ser. No. 102,788
Claims priority, application Japan, Dec. 12, 1984, 262043
Int. Cl.[4] H01L 29/78
U.S. Cl. 357—22 **2 Claims**



1. A transistor comprising:
a semi-insulating substrate;
a first layer of undoped GaAs formed on said semi-insulating substrate;
a second layer of undoped AlGaAs formed on said first layer, said second layer having a smaller electron affinity than said first layer;
first and second doped regions formed at both ends of said first and second layers in contact with said first and second layers;
a third layer of P-type AlGaAs formed on said second layer between said first and second doped regions;
first and second metal electrodes respectively connected to said first and second doped regions; and
a third metal electrode connected to said third layer, no electron channel being present between said first and second layers when said first to third metal electrodes have no potential applied thereto, an electron channel being induced when holes are injected into said second layer from said third layer when potential is applied to said first to third metal electrodes.

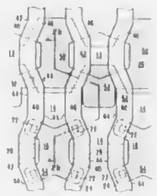
4,839,704
APPLICATION OF DEEP-JUNCTION NON-SELF-ALIGNED TRANSISTORS FOR SUPPRESSING HOT CARRIERS
Farrokh Mohammadi, Sunnyvale, and Chin-Min Shyu, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.
Filed Sep. 16, 1987, Ser. No. 97,525
Int. Cl.[4] H01L 29/78, 29/06
U.S. Cl. 357—23.3 **9 Claims**



1. A deep junction MOS transistor for suppressing hot carrier injection comprising:
(a) first and second spaced apart regions of a first conductivity type formed in a semiconductor substrate of a conductivity type opposite to the first conductivity type to define a channel region therebetween, the effective channel length being less than about 3.5 microns, the junction depth of the first and second regions being greater than about 4000 Angstroms;
(b) a layer of dielectric material formed on the channel region;
(c) a region of conductive material formed on the layer of dielectric material overlying the channel region, wherein the region of conductive material forms a non-self-aligned gate of the transistor.

4,839,705
X-CELL EEPROM ARRAY
Howard L. Tigelaar, Allen; Allan T. Mitchell, Garland; Bert R. Riemenschneider, Murphy, and James L. Paterson, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 16, 1987, Ser. No. 133,709
Int. Cl.[4] H01L 27/04, 29/78; G11C 11/40
U.S. Cl. 357—23.5 **18 Claims**

1. A plurality of electrically programmable and erasable memory cells formed at a semiconductor surface and a substrate, comprising:
first, second, third and fourth drain regions of a first conductivity type at said surface;
a shared source region of said first conductivity type at said surface;
first and second erase regions of said first conductivity type at said surface, each of said erase regions separated from said drain regions by a portion of said surface of a second conductivity type;
a first floating gate, overlying a portion of said surface of said second conductivity type disposed between said first drain region and said shared source region, and overlying a portion of said first erase region;
a second floating gate, overlying a portion of said surface of said second conductivity type disclosed between said second drain region and said shared source region, and overlying a portion of said first erase region;
a third floating gate, overlying a portion of said surface of said second conductivity type disposed between said third drain region and said shared source region, and overlying a portion of said second erase region;



a fourth floating gate, overlying a portion of said surface of said second conductivity type disclosed between said fourth drain region and said shared source region, and overlying a portion of said second erase region;
a first word line overlying said first and third floating gates; and
a second word line overlying said second and fourth floating gates.

4,839,706
AVALANCHE PHOTODETECTOR
Kevin F. Brennan, Atlanta, Ga., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Aug. 7, 1986, Ser. No. 894,004
Int. Cl.[4] H01L 27/14, 29/90
U.S. Cl. 357—30 **19 Claims**

1. In an avalanche photodetector device comprising:
at least one unit which includes the following contiguous layers in sequence:
a p^+ doped layer of a first material having a first ionization threshold,
an n^+ layer of the first material,
a substantially intrinsic layer of a second material having a smaller ionization threshold than the first material, and
a substantially intrinsic layer of the first material.

4,839,707
LCMOS DISPLAYS FABRICATED WITH IMPLANT TREATED SILICON WAFERS
Steven E. Shields, San Diego, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Continuation of Ser. No. 90,188, Aug. 27, 1987, abandoned. This application Oct. 13, 1988, Ser. No. 257,178
Int. Cl.[4] H01L 27/22, 27/12, 27/02
U.S. Cl. 357—23.7 **2 Claims**

1. In a liquid crystal device having a plurality of separately activatable liquid crystal cells, the structure comprising:
a substrate above which each of said liquid crystal cell is disposed;
an epitaxial layer on said substrate, said epitaxial layer including a semiconductor layer overlying a first dielectric layer;
a plurality of source, channel and drain elements formed in said semiconductor layer, each said source element comprising a first plate of a capacitor having first and second plates, the second plate comprising said substrate;
an insulating layer formed on said semiconductor layer;
a gate element formed on said insulating layer above each said channel element;

a second dielectric layer formed over each said gate element and said insulating layer; and
a plurality of electrodes, each for activating one of said cells formed on said second dielectric layer and having an extension extending through said second dielectric layer and insulting layer to contact one of said source elements;
wherein said substrate comprises a substrate free of localized diffusions.

4,839,708
ELECTROMECHANICAL SEMICONDUCTOR TRANSDUCER
Hiroyuki Kano, Nishikamo; Yuji Yagi, Aichi, and Hiroyuki Sakaki, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan
Filed Feb. 5, 1987, Ser. No. 11,243
Claims priority, application Japan, Feb. 8, 1986, 61-26452
Int. Cl.[4] H01L 29/84, 29/96
U.S. Cl. 357—26 **9 Claims**

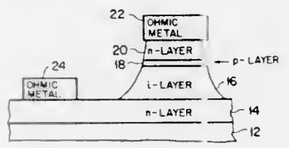
1. An electromechanical semiconductor transducer, comprising:
a semi-insulating high-resistance substrate of a first compound semi-conductor, said substrate deforming in response to a pressure or load applied thereto;
a conductive layer of a second compound semiconductor having a lattice constant equal to the lattice constant of said first substrate and formed on said substrate to thereby produce a piezoresistive effect;
an ohmic contact layer of a third compound semiconductor formed on said conductive layer; and
electrodes connecting said ohmic contact layer and conductive layer.

4,839,709

DETECTOR AND MIXER DIODE OPERATIVE AT ZERO BIAS VOLTAGE

Mark P. Zurakowski, Santa Rosa, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 754,693, Jul. 11, 1985, abandoned. This application Aug. 10, 1987, Ser. No. 87,953
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 11 Claims



1. A diode structure operative at zero volts DC bias to provide both efficient detection in diode detector applications and to provide effective harmonic suppression in anti-parallel mixer diode applications, comprising:

a. a single substantially intrinsic semiconductor layer of a predetermined thickness and impurity concentration and substantially depleted of a majority carriers,

b. a critical thin layer of one conductivity type disposed on one surface of said intrinsic layer and being sufficiently thin and of an impurity concentration level sufficient so that it is fully depleted of majority carriers at zero volts DC bias, said intrinsic layer being disposed on only one surface of said critical thin layer,

c. a layer of opposite conductivity type semiconductor material disposed on the surface of said critical thin layer and of a thickness sufficient to shield metal impurities from said critical thin layer,

d. a first ohmic contact on said layer of opposite conductivity type semiconductor material, and

e. a second ohmic contact in electrical contact with said intrinsic layer, whereby the potential barrier height of said structure, Φ_B, when multiplied by the charge on an electron, $-q$, is established at a minimum value somewhere between zero electron volts and the bandgap energy of the semiconductor material of said layers.

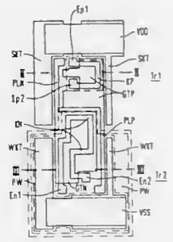
4,839,710

CMOS CELL WHICH CAN BE USED AS A RESISTOR, A CAPACITOR, AN RC COMPONENT OR A TERMINATING IMPEDANCE OF A SIGNAL

Heinz P. Holzapfel, Munich, and Peter Michel, Grafing, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 855,353, Apr. 24, 1986, abandoned. This application Jun. 8, 1988, Ser. No. 203,532
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1985, 3514849
Int. Cl.[4] H01L *27/10, 27/02, 29/78*
U.S. Cl. 357—45 7 Claims

1. A cell constructed in CMOS-technology, wherein at least one p-channel transistor and at least one n-channel transistor are provided each with a source, a drain and a gate electrode in particular for use in a gate array, wherein the channel (KP, KN) of each of said transistor (Tr1, Tr2) is constructed so that the length of the channel is in the direction of current flow and the width of the channel is in the direction transverse to current flow wherein each of said transistors (Tr1, Tr2) is designed so that the source and drain (Ep1, Ep2 and En1, En2) are positioned adjacent to each other and wherein the length of the channel (KP and KN) does not extend in a straight line between said source and drain, but is substantially longer than



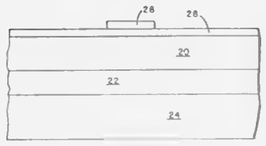
a straight line between said source and drain and the width of said channel is short.

4,839,711

DIELECTRIC FOR LASER TRIMMING

William E. O'Mara, Jr., Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 87,349, Aug. 20, 1987, abandoned, which is a division of Ser. No. 919,465, Oct. 16, 1986, Pat. No. 4,708,747. This application Jan. 13, 1989, Ser. No. 296,855
Int. Cl.[4] H01L *27/02, 27/12*
U.S. Cl. 357—51 4 Claims



3. In an integrated circuit having a semiconductor layer on whose top surface materials have been applied and laser-trimmed to desired dimensions with laser light from a laser and on whose bottom side is a layer of dielectric material, the improvement comprising the thickness of the layer of dielectric material is approximately an integer multiple of one half of the wavelength of the laser light in the dielectric material so that the layer of dielectric material would not reflect said laser light.

4,839,712

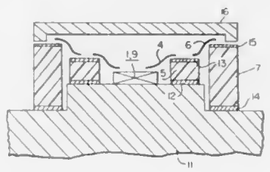
COMPACT COMBINER FOR SEMICONDUCTOR DEVICES OPERATING IN THE ULTRA-HIGH FREQUENCY RANGE

Narquise Mamodaly, Paris, and Alain Bert, Gif sur Yvette, both of France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 721,745, Apr. 15, 1985, abandoned. This application Apr. 6, 1987, Ser. No. 35,237
Claims priority, application France, Apr. 13, 1984, 84 05905
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—51 8 Claims

1. A compact combiner for semiconductor diodes operating in the ultra-high frequency range, and having circular symmetry, comprising:

a plurality of parallel connected semiconductor diodes each of which is affixed to a common surface of a metal base, each diode being adjacent at least one other diode, an impedance pre-matching cell associated with each diode, each pre-matching cell being formed by two chokes in series and two capacitors in parallel, each capacitor being connected between a choke and ground, the first capacitor of each impedance pre-matching cell being a discrete element fixed to the base, and the second capacitor, which is common to all the impedance pre-matching cells being formed by a dielectric material ring which is metallized on two opposite planar faces, and which is fixed to the base so that it is concentric to the combiner and encircles said diodes, chokes, and first capacitors, said chokes being parasitic chokes which are formed by metal tapes which



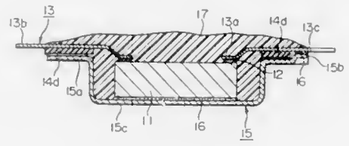
are thermally compressed between the chip and the first capacitor for the first choke and between the first and second capacitors for the second choke, and said diodes being located in the center area of the base, and the chokes and first capacitors extending radially from said diodes in a symmetrical configuration wherein the chokes and first capacitors extending from each diode are equidistant from the chokes and first capacitors associated with adjacent diodes.

4,839,713

PACKAGE STRUCTURE FOR SEMICONDUCTOR DEVICE

Yasuhiro Teraoka; Tetsuya Ueda; Hideya Yagoura; Haruo Shimamoto; Shigeyuki Nango; Toshinobu Banjo, and Hiroshi Seki, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 17, 1988, Ser. No. 156,571
Claims priority, application Japan, Feb. 20, 1987, 62-38555; Aug. 5, 1987, 62-196835
Int. Cl.[4] H01L *29/00;* H01R *43/02*
U.S. Cl. 357—70 4 Claims



1. A package structure for a semiconductor device to be manufactured by the TAB method and having a semiconductor chip having a first and a second electrode on the first and second major surfaces of the semiconductor chip, respectively, and lead conductors electrically connected to the electrodes, said package structure comprising:

a metallic cap having a bottom wall to which a bottom surface of a semiconductor chip is electrically and mechanically connected, a side wall extending from said bottom wall and surrounding a semiconductor chip, and a flange extending outwardly from said side wall substantially parallel to said bottom wall, said flange supporting lead conductors of the chip through an electrically insulating material; and

electrical connection means disposed between said flange of said metallic cap connected to the second electrode of the seimconductor chip and at least one of the lead conductors for connection to the second electrode and for establishing an electrical connection between said flange and at least one of the lead conductors and including an electrically conductive projection integrally disposed on said flange of said metal cap, extending through a notch in said insulating material, and electrically connected to the lead conductor.

4,839,714

HIGH-GAIN PHOTODETECTORS MADE FROM NIPI MESAS WITH SELECTIVE LATERAL CONTACTS

Gottfried H. Doehler, Erlangen, Fed. Rep. of Germany; Caroline J. Scott, Atherton, Calif.; Gary R. Trott, San Mateo, Calif., and Betty Boatman, Palo alto, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 14, 1988, Ser. No. 167,829
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—71 14 Claims

1. A selective contact to a NIPI superlattice having n-doped and p-doped layers, said contact comprising:

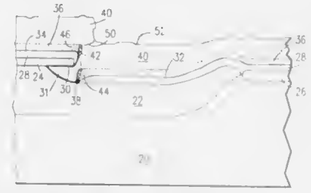
a first doped region that is substantially free of trap states and that is in contact with the n- and p-doped layers of the superlattice, said trap state free doped region forming an ohmic contact with a first one of the n- and p-doped layers and forming pn junctions with a second one of the n- and p-doped layers.

4,839,715

CHIP CONTACTS WITHOUT OXIDE DISCONTINUITIES

Joseph J. Gajda; Kris V. Srikrishnan, both of Wappingers Falls; Paul A. Totta, Poughkeepsie, and Francis G. Trudeau, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 20, 1987, Ser. No. 87,478
Int. Cl.[4] H01L *23/48*
U.S. Cl. 357—71 21 Claims



1. An integrated circuit chip, including

a first surface at a first approximate level;

a second surface at a second different level approximately parallel to said first surface;

a substantially abrupt transition between said first surface and said second surface, including a sidewall;

a first layer of a first conductive material disposed over said first surface and disposed over said second surface, but terminating on said first surface in a first end portion which extends up to but does not touch said sidewall, said first layer having a thickness of less than the difference between said first and second levels;

wherein said end portion of said first layer of conductive material has been converted to an insulator; and

a second layer of a second conductive material disposed on

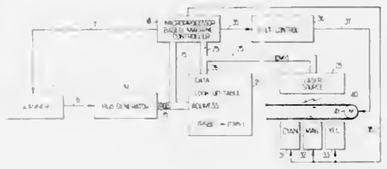
with relative to a maximal brightness attainable with said reference medium.

4,839,722

METHOD AND APPARATUS FOR PROVIDING IMPROVED COLOR CORRECTION IN A SUBTRATIVE COLOR PRINTING SYSTEM

Michael W. Barry, Duluth; E. Neal Tompkins, Atlanta, and Peter Zuber, Norcross, all of Ga., assignors to Colorocs Corporation, Norcross, Ga.

Filed Oct. 30, 1987, Ser. No. 115,440
Int. Cl.[4] G03F *3/08*; H04N *1/46*
U.S. Cl. 358—80 **7 Claims**



1. A method of creating a corrected color control table for use in a subtractive color printing system comprising the steps of:

(1) providing a first toner of a first pigment, a second toner of a second pigment, and a third toner of a third pigment;

(2) printing a first set of N pigment bars of said first toner on a first predetermined segment of an image receptor, each of said first set of bars having a predetermined density value and N being an integer greater than one;

(3) printing a second set of N pigment bars of said second toner on a second predetermined segment of an image receptor, each of said second set of bars having a predetermined density value;

(4) printing a third set of N pigment bars of said third toner on a third predetermined segment of an image receptor, each of said third set of bars having a predetermined density value;

(5) scanning each of said first, second and third sets of bars through a filter of a first color, a filter of a second color, and a filter of a third color to obtain a plurality of color/pigment values, each of said color/pigment values representing a density value for a particular one of said first, second and third colors from a particular bar of a particular one of said three pigments;

(6) creating a value table having at least N^3 entries of a plurality of input triplets, each of said input triplets being of a form: first color, second color, third color, into which a corresponding plurality of pigment triplets is mapped, each of said pigment triplets being of a form: first pigment, second pigment, third pigment;

(7) for each of said plurality of input triplets;

(a) calculating an output triplet by calculating color contributions for each of said three colors from each of said three pigments using a corresponding pigment triplet mapped by said input triplet and said color/pigment values;

(b) calculating an error value for said input triplet, said error value representing a mathematical difference between said input triplet and said output triplet;

(c) modifying said corresponding pigment triplet and repeating steps (a) and (b) until either said error value is less than a predetermined error value or said steps (a) and (b) have been repeated a predetermined number of times;

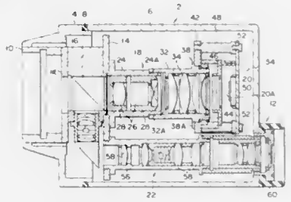
(8) storing said value table for use in said subtractive color printing system.

4,839,723

TV CAMERA

Jun Yoshinaga, Hino, and Nobuyoshi Yazawa, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 11, 1987, Ser. No. 48,059
Claims priority, application Japan, May 15, 1986, 61-111129
Int. Cl.[4] H04N *7/18*
U.S. Cl. 358—98 **12 Claims**



1. A TV camera adapted to be connected to an eyepiece section of an endoscope, comprising:

a camera body including a casing having an eyepiece section;

a camera mount means attached to a front portion of the inside of said casing, and for mounting the camera body on the eyepiece section of the endoscope;

a beam splitter means arranged in said casing at a rear portion of said camera mount means for splitting light incident into said camera body into first and second beams, said first beam being conducted in a light-incident direction;

an image pickup element block in said casing, and including:

an image pickup element means for receiving said first beam conducted in said light-incident direction; and

optical means for projecting said first beam as an image on a receiving surface of said image pickup element means;

said image pickup element block being located rearwardly of said beam splitter means and forwardly of said image pickup element means, in the direction of propagation of said incident light, and said image pickup element block being detachably mounted relative to said camera body; and

a finder optical system means in said casing, for receiving said second beam from said beam splitter means without said second beam passing through said optical means, and for conducting said second beam to said eyepiece section of said camera body;

whereby said image pickup element means and said optical means are replaceable as a unit by replacement of said image pickup element block without replacing said finder optical system means.

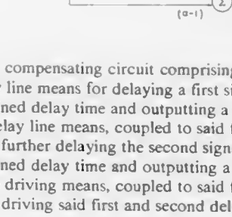
4,839,724

PROCESS FOR THE DIGITAL TRANSMISSION OF INFORMATION

Heinz-Werner Keesen, and Hartmut Peters, both of Hanover, Fed. Rep. of Germany, assignors to Deutsche AG für Unterhaltungselectronic OHG, Villingen-Schwenningen, Fed. Rep. of Germany

PCT No. PCT/EP87/00060, § 371 Date Oct. 13, 1987, § 102(e) Date Oct. 13, 1987, PCT Pub. No. WO87/05178, PCT Pub. Date Aug. 27, 1987
PCT Filed Feb. 7, 1987, Ser. No. 125,497
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1986, 3605032
Int. Cl.[4] H04N *7/12*
U.S. Cl. 358—138 **12 Claims**

1. In a method of transmitting digital data, including processing digital data as groups of values in a source coder, encoding the values of the groups in a variable codeword length encoder according to a defined variable codeword length code to provide signals corresponding to the values of the groups, feeding the signals corresponding to the values of the groups to a channel coder and then to a transmission channel, and finally feeding the signals corresponding to the values from the transmission channel through a channel decoder and a variable codeword length decoder to a source decoder, the improvement comprising:



adapting the defined variable codeword length code to a statistical frequency of the occurrence of the values of the groups being transmitted at desired time intervals; and

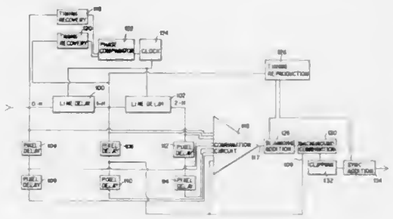
transmitting at least the changes in the adapted variable codeword length code via the channel coder, the transmission channel and the channel decoder to the variable codeword length encoder.

4,839,726

VIDEO ENHANCEMENT METHOD AND SYSTEM

Harvey L. Balopole, Little Neck; James J. Martinolich, Seaford; Arthur Roberts, Fresh Meadows, and Henry W. Sadowski, Plainview, all of N.Y., assignors to Fairchild Weston Systems, Inc., Syosset, N.Y.

Filed Jul. 31, 1987, Ser. No. 80,272
Int. Cl.[4] H04N *5/14, 5/57*
U.S. Cl. 358—166 **25 Claims**



1. A method for processing a video signal containing pixel values and synchronization information, comprising the steps of:

(a) passing said video signal through at least one signal delay device to produce a plurality of signals which are indicative of a set of pixels which possess a desired spatial relationship, said spatial relationship determined at least in part by the amount of delay introduced by said signal delay device;

(b) combining said plurality of signals to produce a modified version of said video signal; and

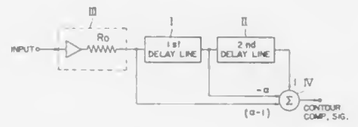
(c) repeatedly monitoring and adjusting the amount of delay produced by said delay device to cause said spatial relationship to remain essentially constant.

4,839,725

CONTOUR COMPENSATING CIRCUIT

Kazuhiko Ueda, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Kanagawa, Japan

Filed May 19, 1988, Ser. No. 195,976
Claims priority, application Japan, May 19, 1987, 62-122077
Int. Cl.[4] H04N *5/14, 5/208*
U.S. Cl. 358—160 **6 Claims**



1. A contour compensating circuit comprising:

(a) first delay line means for delaying a first signal by a first predetermined delay time and outputting a second signal;

(b) second delay line means, coupled to said first delay line means, for further delaying the second signal by a second predetermined delay time and outputting a third signal;

(c) delay line driving means, coupled to said first delay line means, for driving said first and second delay line means; and

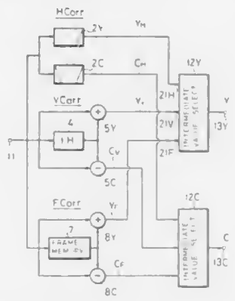
(d) matrix mixing means, coupled to said delay line driving means, said first delay line means and said second delay line means, for mixing the first, second and third signals at a matrix mixture ratio of $(\alpha-1):-\alpha:1$ and outputting a mixed signal as a contour compensating signal.

4,839,727

VIDEO SIGNAL PROCESSING APPARATUS FOR SEPARATING LUMINANCE AND CHROMINANCE SIGNALS BY MEANS OF SIGNAL CORRELATION

Yutaka Tanaka, and Osamu Matsunaga, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 51,911, May 19, 1987, Pat. No. 4,764,964.
This application May 2, 1988, Ser. No. 188,905
Claims priority, application Japan, May 20, 1986, 61-115032
Int. Cl.[4] H04N *9/64, 5/213, 5/14*
U.S. Cl. 358—167 **6 Claims**



1. A video signal processing circuit comprising:

a plurality of video signal correlation detecting means for detecting values of signal correlations in a plurality of

ways relative to a picture displayed from the video signal; and

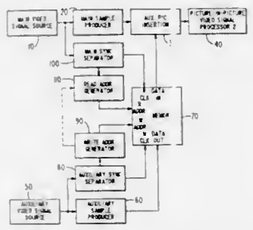
intermediate value selecting means for selecting an intermediate value among the values respectively detected by said plurality of correlation detecting means, wherein a video signal changing at any time is processed by utilizing a correlation of a proper way.

4,839,728

PICTURE-IN-PICTURE VIDEO SIGNAL GENERATOR

Robert F. Casey, Briarcliff Manor, N.Y., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Mar. 23, 1987, Ser. No. 29,036
Int. Cl.[4] H04N *5/26*, *5/272*
U.S. Cl. 358—183 **15 Claims**



1. A picture-in-picture video signal generator, comprising:

a source of an auxiliary video signal;

means for producing successive samples representing said auxiliary video signal;

a self-sequencing memory, having a data input terminal coupled to said means for producing samples having data output and address input terminals;

write control circuitry coupled between said source of said auxiliary video signal and said address input terminal of said self-sequencing memory for producing sequences of initial write address signals, said write address signals occurring in synchronism with and at the rate of horizontal line intervals of said auxiliary video signal;

a source of a main video signal;

read control circuitry coupled between said main video signal source and said address input terminal of said self-sequencing memory, for producing sequences of initial read address signals, said read address signals occurring in synchronism with and at the rate of horizontal line intervals of said main video signal; and

means coupled to said data output terminal of said self-sequencing memory and said main video signal source for generating a picture-in-picture video signal.

4,839,729

SOLID STATE IMAGE SENSOR

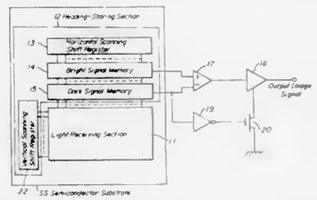
Fumihiko Ando; Junji Kumada; Yoshihiro Fujita; Hidetoshi Yamada, and Kazuhiko Nakamura, all of Tokyo, Japan, assignors to Nippon Hoso Kyokai and Olympus Optical Co., Ltd., both of, Japan

Filed Apr. 26, 1988, Ser. No. 186,225
Claims priority, application Japan, May 28, 1987, 62-129875
Int. Cl.[4] H04N *3/14*, *5/335*; H01J *40/14*
U.S. Cl. 358—213.16 **11 Claims**

1. A solid state image sensor comprising:

light receiving means including a plurality of light receiving cells arranged in matrix, each light receiving cells converting light input into electrical signals;

reading and storing means including a first memory for reading bright signals out of light receiving cells arranged in a row and storing the bright signal for a horizontal scanning period, a second memory for reading dark signals out of said light receiving cells arranged in a row and storing the dark signal for a horizontal scanning period, and a readout circuit for reading the bright and dark signals stored in said first and second memories simultaneously; and



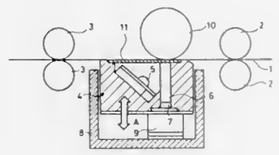
means for removing fixed pattern noises by processing the simultaneously read out bright and dark signals.

4,839,730

IMAGE READING APPARATUS

Hiroshi Shirakoshi; Matahira Kotani; Masafumi Matsumoto, all of Nara, and Hiroshi Morimoto, Sakurai, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 19, 1987, Ser. No. 51,371
Claims priority, application Japan, May 20, 1986, 61-117904
Int. Cl.[4] H04H *1/024*
U.S. Cl. 358—294 **5 Claims**



1. An image reading apparatus for reading information from a document, comprising:

an elongated optical system mounting member having an elongated slot, and an elongated groove inclined at a predetermined angle adjacent said slot;

a light source base and an LED light source array mounted on said base, said base and LED array being set into said elongated groove;

an elongated lens set into said elongated slot;

an image sensor base and an image sensor mounted on said image sensor base, located below said slot to contact one end of said elongated lens;

a transparent cover mounted on a top surface of said mounting member to contact another end of said elongated lens; and

transport means for transporting said document over said cover to be irradiated by said LED light source array;

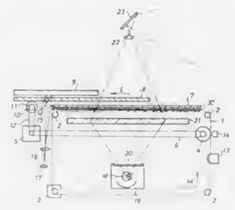
light reflected from said document passing through said lens and being sensed by said image sensor.

4,839,731

COLOR OVERHEAD PROJECTOR

Yasuhiko Saka, Yamato, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 15, 1988, Ser. No. 219,342
Claims priority, application Japan, Jul. 15, 1987, 62-174804
Int. Cl.[4] H04N *1/23*; G03B *21/00*
U.S. Cl. 358—296 **6 Claims**



1. A color overhead projector comprising:

a film which becomes optically transparent when heated to a first temperature, remains transparent even when temperature of the film returns to normal temperature, becomes opaque when heated to a second temperature higher than the first temperature and remains opaque even when temperature of the film is returned to normal temperature;

a color filter comprising red, green and blue areas and disposed opposite to the film;

erasing means for erasing an image formed on the film by heating the film to the first temperature;

reading means for reading an image in a color document to be projected with color separation into red, green and blue color components;

writing means for writing the image to be projected into the film erased by the erasing means by heating areas of the film each corresponding to either of said red, green and blue areas of the color filter to the second temperature in accordance with each value of said red, green and blue color components separated with respect to each other by the reading means; and

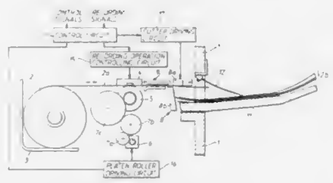
projection means for projecting the image written into the film by the writing means onto a screen by illumining the film via the color filter.

4,839,732

APPARATUS AND METHOD FOR TRANSPORTING AND CUTTING A RECORDING MEDIUM

Syogo Murakami, Hino, and Takashi Shimmyo, Musashino, both of Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Feb. 25, 1987, Ser. No. 18,553
Claims priority, application Japan, Feb. 25, 1986, 61-38229
Int. Cl.[4] H04N *1/21*
U.S. Cl. 358—304 **13 Claims**



1. A recording apparatus comprising:

a recording medium on which information can be recorded;

recording means for recording the information on a section of said recording medium;

transporting means for transporting said recording medium;

cutting means for cutting said section of said recording medium at a predetermined cutting point; and

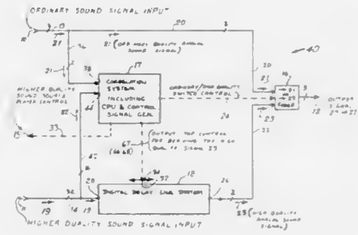
wherein said transporting means first transports said recording medium until said cutting point is a predetermined distance beyond said cutting means and thereafter transports said recording medium in the reverse direction until said cutting point is at said cutting means, all before said recording medium is cut by said cutting means, in order to reduce the likelihood that a bend in said section of said recording medium will interfere in the operation of said recording apparatus.

4,839,733

METHOD AND SYSTEM FOR SYNCHRONIZATION OF AN AUXILIARY SOUND SOURCE TO MOTION PICTURE FILM, VIDEO TAPE, OR OTHER PICTURE SOURCE CONTAINING A SOUND TRACK

John J. Karamon, 19 Berkeley St., Stamford, Conn. 06902, and Daniel W. Gravereaux, 602 Carter St., New Canaan, Conn. 06840

Filed Dec. 15, 1987, Ser. No. 132,295
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—341 **60 Claims**



1. In the showing of viewable images depicting motion and wherein the viewable images are provided by operation of a first medium containing first means providing a first sound signal to provide an audio message of first quality accompanying the viewable images and wherein said means for providing said first sound signal are made from a master recording, the method of synchronizing with said first sound signal a second sound signal of higher quality than said first quality but containing the same audio message to accompany the showing of the viewable images, said method comprising the steps of:

providing a second medium containing second means for providing said second sound signal;

making said second means from the master recording for enabling said second means to provide said second sound signal of said higher quality but containing the same audio message;

starting operation of said second medium a predetermined time interval before commencing the operation of the first medium;

thereafter simultaneously operating both said second medium and said first medium for simultaneously providing both said second sound signal and said first sound signal but wherein the audio message of said second sound signal is preceding by said predetermined time interval the audio message of said first sound signal;

accessibly placing in temporary storage a continuously updated current portion of said second sound signal occurring over a current time interval at least equal to said predetermined time interval; and

continiously removing from temporary storage successive increments of said second sound signal correlated with the

currently occurring first sound signal for providing said second sound signal synchronized with said first sound signal; and

utilizing the synchronized second sound signal for providing the same audio message as said first sound signal but at a higher quality to accompany the showing of the viewable images.

4,839,734

SOLID-STATE IMAGING DEVICE HAVING HIGH-SPEED SHUTTER FUNCTION

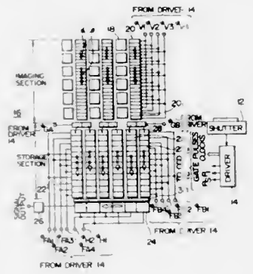
Yasuo Takemura, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 8, 1988, Ser. No. 179,545

Claims priority, application Japan, Apr. 10, 1987, 62-88175; Sep. 14, 1987, 62-230009

Int. Cl.[4] H04N *3/14, 5/335*

U.S. Cl. 358—213.22 **12 Claims**



1. A solid-state imaging device having a highspeed shutter function, comprising:

a photosensitive section for storing charges corresponding to an amount of received light and a period of time during which the light is received;

a vertical transfer section to which the storage charges in said photosensitive section are simultaneously transferred in response to a field shift pulse, said vertical transfer section vertically transferring the transferred charges in units of lines and at a high speed;

first field memory means, having a one-field storage capacity for storing charges transferred from said vertical transfer section;

second field memory means, having a one-field storage capacity for storing charges transferred from said vertical transfer section;

transfer means for alternately transferring, in units of lines, the charges transferred from said vertical transfer section to said first and second field memory means;

read means for reading out the charges stored in said first field memory means and reading out the charges stored in said second field memory means; and

a horizontal transfer section for horizontally transferring, in units of lines, the charges read out by said read means.

4,839,735

SOLID STATE IMAGE SENSOR HAVING VARIABLE CHARGE ACCUMULATION TIME PERIOD

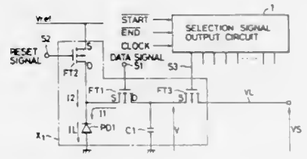
Mikio Kyomasu; Hitoshi Tanaka, and Seiichiro Mizuno, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Shizuoka, Japan

Filed Dec. 21, 1987, Ser. No. 135,382

Claims priority, application Japan, Dec. 22, 1986, 61-306048; Dec. 25, 1986, 61-309499; Dec. 25, 1986, 61-309498; Dec. 25, 1986, 61-309500; Apr. 12, 1987, 62-89606; May 15, 1987, 62-118280; Jul. 13, 1987, 62-174532

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—213.31 **31 Claims**



1. A solid state image sensor having a plurality of detector cells and outputting a video signal in accordance with a charge that is light-generated in a photoelectric conversion element provided in each of said detector cells, said solid state image sensor comprising:

capacitance means for accumulating said light-generated charge;

first switching means, connected in series with said capacitance means, for controlling current flow through said capacitance means, said first switching means being closed to permit current to flow to said capacitance means at least when during a period of accumulating charge said capacitance means accumulates said lignt-generated charge, said first switching means and said capacitance means forming a series circuit connected in parallel with said photoelectric conversion element; and

video output means for outputting a video signal in accordance with the amount of charge accumulated in said capacitance means.

4,839,736

FILTER FOR CRT SCREEN

Eiichi Sugihara, Zushi; Hideo Amemiya, Yokohama, and Koji Hayafune, Tokyo, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Feb. 10, 1988, Ser. No. 154,303

Claims priority, application Japan, Jul. 6, 1987, 62-168205; Dec. 22, 1987, 62-322696

Int. Cl.[4] H04N *5/72*

U.S. Cl. 358—253 **6 Claims**

1. A CRT filter which consists of a film having a thickness of 10 to 250 micron and a shape so as to be closely attached onto a front surface of a CRT, wherein a transparent conductive film whose light transmittance is 30 percent or more at a wavelength of 550 nm and whose surface electric resistance value is 100 kΩ/□ or less is provided on at least one side of said film.

4,839,737

FACSIMILE MACHINE WITH A RECORDING PAPER INFORMATION MEMORY

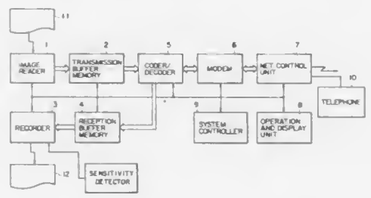
Yuichi Saito, Hadano, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 72,012, Jul. 10, 1987, abandoned. This application Aug. 22, 1988, Ser. No. 235,714

Claims priority, application Japan, Jul. 12, 1986, 61-164223

Int. Cl.[4] H04N *1/32*

U.S. Cl. 358—257 **10 Claims**



1. A facsimile machine comprising:

image reading means for optically reading an original;

transmitting means for transmitting an original image read by said image reading means;

receiving means for receiving data transmitted from a remote transmitter;

recording means for recording said data received by said receiving means, wherein said recording means comprises a storage means for storing a supply of recording paper and further wherein said recording means is provided with an electronic paper information storing means which is part of said receiving paper storage means for electronically storing predetermined information regarding said recording paper stored in said recording means; and

controlling means associated with each of the abovementioned means for controlling the overall operation of said facsimile machine, said controlling means being capable of reading said predetermined information stored in said electronic paper information storing means in controlling the overall operation of said facsimile machine.

4,839,738

APPARATUS FOR DECODING FACSIMILE CODED DATA TO IMAGE DATA WITH CODING AND REFERENCE LINE WINDOWING AND COLOR CHANGE DETECTION

Shinkyo Kaku, Los Gatos, and Chung-Li Yu, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 22, 1987, Ser. No. 41,261

Int. Cl.[4] H04N *1/419*

U.S. Cl. 358—261.2 **19 Claims**

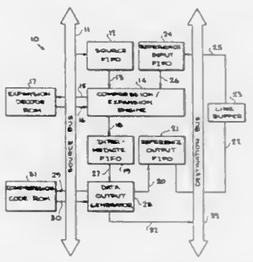
1. An apparatus for decoding input data words supplying a sequence of variable length codes specifying a facsimilar of an image, the facsimile being represented by a plurality of scan lines, each scan line being represented by a plurality of picture elements and each picture element being characterized by picture element data indicating a color of the picture element, to generate output words of picture element data for successive scan lines in the facsimile, comprising:

code windowing means, connected to receive the input data words and responsive to a code window control signal, for selecting a coding window of data including a variable length code from the input data words, the coding window having a fixed length at least as long as the maximum length of the variable length codes;

decoding means, connected to receive the data in the coding window, for generating a first intermediate code;

reference windowing means, connected to receive picture element data from a reference scan line and responsive to a reference window control signal, for selecting a reference window of picture element data from the reference scan line;

control means, connected to receive and responsive to the first intermediate code and the picture element data in the



reference window, for generating a second intermediate code, the code window control signal and the reference window control signa; and

output generator means, connected to receive the second intermediate code, for generating output data words of picture element data.

4,839,739

IMAGE SIGNAL BINARY CIRCUIT WITH A VARIABLE-FREQUENCY CLOCK SIGNAL GENERATOR FOR DRIVING AN IMAGE SENSOR

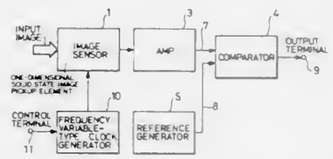
Tsuguji Tachiuchi, Odawara; Satoshi Konuma, Kamakura, and Nobuo Tsuchiya, Yokohama, all of Japan, assignors to Hitachi, Ltd. and Hitachi Video Engineering, Inc., both of Tokyo, Japan

Filed Mar. 9, 1987, Ser. No. 23,262

Claims priority, application Japan, Mar. 14, 1986, 61-54831; Mar. 19, 1986, 61-59229

Int. Cl.[4] H04N *1/40, 1/46, 3/15, 9/73*

U.S. Cl. 358—282 **20 Claims**



1. An image signal binary circuit, comprising:

clock signal generating means for varying the frequency of a generated clock signal in response to a control signal;

an image sensor for converting an object into an electric image signal and for outputting said image signal in synchronization with said clock signal; and

comparing means for comparing said image signal from said image sensor with a reference signal and for outputting a binary image signal;

wherein the signal level of one of said image signal from said image sensor and said reference signal is varied in accordance with the frequency of said generated clock signal.

3. An image signal binary circuit, comprising:

clock signal generating means for varying the frequency of a generated clock signal in response to a control signal;

an image sensor for converting an object into an electric

image signal and for outputting said image signal in synchronization with said clock signal;
comparing means for comparing said image signal from said image sensor with a reference signal and for outputting a binary image signal; and
amplifying means connected between said image sensor and said comparing means for amplifying said image signal;
wherein the frequency variation range of said clock signal generating means is set to a region exceeding the cut-off frequency of said amplifying means.

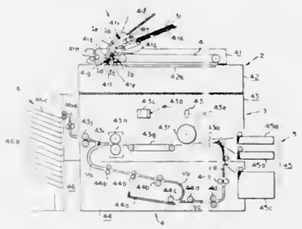
4. An image signal binary circuit, comprising:
clock signal generating means for varying the frequency of a generated clock signal in response to a control signal;
an image sensor for converting an object into an electric image signal and for outputting said image signal in synchronization with said clock signal;
comparing means for comparing said image signal from said image sensor with a reference signal and for outputting a binary image signal; and
amplifying means connected between said image sensor and said comparing means for amplifying said image signal;
wherein the cut-off frequency of said amplifying means is set to a frequency lower than the maximum frequency in the frequency variation range of said clock signal generating means.

4,839,740

IMAGE PROCESSING APPARATUS FOR DETERMINING THE PRESENCE OR ABSENCE OF AN IMAGE ON EACH SIDE OF A PLURALITY OF ORIGINALS PRIOR TO PRODUCING TWO-SIDED COPIES OF THE ORIGINALS TO AVOID PRODUCING ANY COPIES WITH BLANK SIDES

Eiichi Yoshida, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 2, 1986, Ser. No. 847,299
Claims priority, application Japan, Apr. 4, 1985, 60-69985; Apr. 4, 1985, 60-69986
Int. Cl.[4] H04N *1/17, 1/04, 1/40*; **G03B** *27/46*
U.S. Cl. 358—288 **19 Claims**



1. An image processing apparatus comprising:
determining means for determining the presence or absence of an image on an original; and
processing means for performing image processing according to a determination result of said determining means;
wherein said processing means comprises convey means for feeding the original to an exposure position and for removing the original from the exposure position, and control means for controlling the original-removing operation of the convey means according to the determination result; and
wherein said determining means determines the presence or absence of an image on the original while the original is located at the exposure position.

3. An image forming apparatus comprising:
convey means for feeding an original having two sides to an exposure postion and for removing the original from the exposure position;
image forming means for forming an image on a recording medium according to an image on the original while the original is located at the exposure position;
determining means for determining the presence or absence of an image on the original; and
control means for controlling said convey means according to a determination result of said determining means;
wherein said determining means determines the presence or absence of an image on the original while the original is located at the exposure position.

12. An image forming apparatus comprising:
determining means for determining the presence or absence of an image on each side of a plurality of two-sided originals; and
image forming means for forming images on a plurality of two-sided recording media such that an image is formed on both sides of each of said plurality of recording media, with the possible exception that no image is formed on the last side of the last recording medium, according to determination results of said determining means;
wherein said image forming means comprises convey means for feeding an original to an exposure position and for removing the original from the exposure position, and control means for controlling the original-removing operation of the convey means according to a determination result of said determining means; and
wherein said convey means comprises reversing means for reversing the orientation of an original located at the exposure position and wherein said reversing means reverses the orientation of the original located at the exposure position after said determining means determines the presence or absence of an image on a first side of the original so as to enable said determining means to determine the presence or absence of an image on a second side of the original.

13. An image processing apparatus comprising:
processing means including reading means for reading an image on an original, said processing means performing a predetermined processing operation for the original based on a signal output from said reading means;
discriminating means for discriminating the presence or absence of an image on the original based on the signal output from said reading means; and
control means for controlling the operation of said processing means in accordance with a discrimination result of said discriminating means, wherein when said discrimination result indicates the presence of an image on the original said control means controls said processing means to carry out the predetermined processing operation for the original, and when said discrimination result indicates the absence of an image on the original, said control means prohibits said processing means from carrying out the predetermined processing operation for the original.

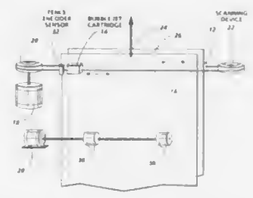
17. An image processing apparatus comprising:
processing means for sequentially reading a plurality of originals and for performing a predetermined processing operation based on image data obtained by sequentially reading images on the originals;
storage means for storing data indicating the presence or absence of an image on each of the originals before said processing means reads the images on the originals to obtain the image data; and
control means for determining whether said processing means is to read each original in obtaining the image data based on the data stored in said storage means, and for controlling said processing means in accordance with a determination result of said control means.

4,839,741

IMAGE REPRODUCING APPARATUS WITH CCD SCANNER AND BUBBLE JET PRINTER SIMULTANEOUSLY DRIVEN BY A COMMON BELT IN OPPOSITE DIRECTIONS AND OPERATED ASYNCHRONOUSLY

Charles D. Wilson, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 7, 1987, Ser. No. 129,195
Int. Cl.[4] H04N *1/14, 1/04*
U.S. Cl. 358—293 **5 Claims**



1. An apparatus for reproducing a document, comprising:
means for holding the document,
receiving means on which the document is to be reproduced,
a scanning array for sequentially converting portions of the document into digital signals,
a print head for sequentially printing reproductions of the portions of the document on the receiving means,
logic circuitry interconnecting the scanning array and the print head for converting the digital signals to print head signals, the logic circuitry including means for causing the scanning array to scan a first portion of the document, means for causing the print head to delay printing a reproduction of the first portion of the document for a first time period, means for causing the scanning array to scan a second portion of the document, and means for causing the print head to delay printing a reproduction of the second portion of the document for a second time period different from the first time period,
a driver to which the scanning array and the print head are mechanically secured, and
a first stepper motor connected to the driver to drive the scanning array in a first direction while at the same time driving the print head in a second direction in order to print a reproduction of the document on the receiving means.

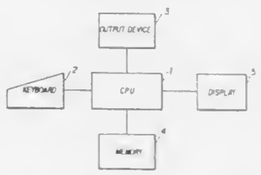
4,839,742

REFLECTED-CHARACTER PRINTING APPARATUS

Yukio Nakatani, Nagoya; Akihiro Ito, Chiryu, and Takashi Sakai, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Oct. 9, 1987, Ser. No. 107,288
Claims priority, application Japan, Oct. 13, 1986, 61-241270; Nov. 14, 1986, 61-272136
Int. Cl.[4] H04N *1/21*; **G01D** *15/10*
U.S. Cl. 358—296 **3 Claims**

1. A printing apparatus for creating a lettering tape comprising:
input means for inputting characters and symbols to said apparatus;
display means for displaying the inputted characters and symbols;
main memory means for storing information on the inputted characters and symbols;
one directional printing means including a print head and a printing ribbon for printing said inputted characters and symbols;
means for converting said characters and symbols in said main memory into dot pattern information;
means for inverting the dot pattern information upside down;



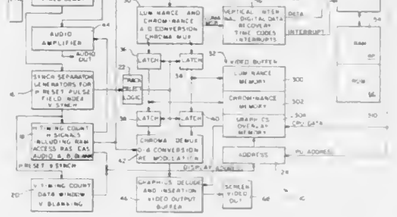
switching means for selecting between said inverted dot pattern information and for supplying said information to said printing means;
a lettering tape; and
lettering tape feed means for feeding said lettering tape past said printing means.

4,839,743

INTERACTIVE VIDEO AND AUDIO CONTROLLER

Robert J. Best, and David H. Claybaugh, both of San Jose, Calif., assignors to Worlds of Wonder, Inc., Fremont, Calif.

Continuation of Ser. No. 636,683, Aug. 1, 1984, abandoned. This application Sep. 21, 1987, Ser. No. 98,784
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—310 **48 Claims**



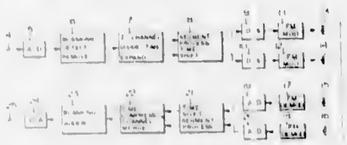
1. An interactive video controller for selecting between two or more tracks of video image data responsive to the input of a player and for displaying the selected video track, comprising:
means for receiving a single video signal which is comprised of a predetermined series of successive video fields, said successive video fields having a first series of fields comprising a first track, and a second series of fields intermixed with said first series of fields and comprising a second track;
means responsive to the input of a player for selecting between one of said first and second tracks;
memory means for storing at least one most recent video field of the selected track;
means for outputting successive fields of the selected track onto a video screen, said last named means including means for outputting the at least one most recent video field of the stored track in substitution for the non-selected track until the next successive field to the selected track becomes available so as to provide for a continuous video image.

4,839,744

VIDEO SIGNAL RECORDING METHOD AND ASSOCIATED RECORDING/REPRODUCING APPARATUS

Seishi Sasaki, Kobe; Shigeru Awamoto, Osaka; Tatsushi Bannai, Katano; Katsuya Yokoyama, and Hiromichi Shibaya, both of Machida, all of Japan, assignors to Nippon Hoso Kyokai, Osaka and Matsushita Electric Industrial Co., Ltd., Tokyo, both of, Japan

Filed Aug. 28, 1987, Ser. No. 90,441
Claims priority, application Japan, Sep. 1, 1986, 61-205433; Sep. 1, 1986, 61-205434
Int. Cl.[4] H04N 9/89
U.S. Cl. 358—320 4 Claims



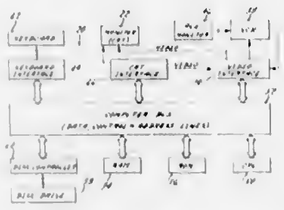
1. A video signal recording method, comprising:
(a) removing M scanning lines from N scanning lines per frame of an input video signal to obtain a reduced signal, where M and N are each a positive integer,
(b) producing a time-axis expanded luminance signal, a time-axis compressed chrominance signal and a sync signal based on said reduced signal obtained by step (a), and performed a time-axis multiplex operation on the three signals to produce sets of horizontally integral signals divided into n channels, where n is an integer greater than or equal to one, and
(c) dividing the horizontally integral signals provided by step (b) into L segments for each field and recording the segmented signals sequentially in L time scanning operations on a magnetic tape, where L is an integer greater than or equal to one.

4,839,745

COMPUTER MEMORY BACK-UP

Robert J. Tindall, Romeo, Mich., assignor to Kirsch Technologies, Inc., St. Clair, Mich.

Division of Ser. No. 624,034, Jun. 25, 1984, Pat. No. 4,652,944.
This application Nov. 13, 1986, Ser. No. 930,235
Int. Cl.[4] H04N 5/782, 5/94
U.S. Cl. 358—336 1 Claim



1. An apparatus for retrieving serial digital information which has been serially stored as a video signal on a video recording device, wherein said digital information has been stored a plurality of times to define at least a first block and a second block each block individually representing the same digital information, the recording device having an output for providing said video signal, and using a computer system having a processing unit for processing digital information through a parallel data channel, comprising:
means couplable to said output of said video recording device for extracting said serial digital information from said video signal;
serial to parallel conversion means coupled to said extracting means for receiving said serial digital information and converting it into a parallel digital signal comprising a plurality of data words, each word including at least one parity bit;
buffer means coupled to said serial to parallel conversion means for receiving said parallel digital signal and for storing at least one of said blocks, and stored block comprising a predetermined number of data words in a predefined ordered relationship;
control means coupled to said processing unit of said computer system and responsive to said conversion means for checking the integrity of each data word based on said parity bit and for storing an indication of the integrity of each data word so checked;
checksum generating means coupled to said processing unit of said computer system for deriving a checksum value from the data words stored in said buffer means and for comparing said value to a predefined value; and
means coupled to said processing unit of said computer system and responsive to said checksum means for causing said second block to be received through said serial to parallel conversion means if said checksum value does not match said predetermined value, said second block comprising a predetermined number of data words in a predefined ordered relationship;
wherein said means coupled to said processing unit, in the event said checksum value does not match said predetermined value, uses said second block and said stored indication of the integrity at least in part to ascertain said digital information.

4,839,746

INFORMATION REPRODUCTION METHOD FOR COMPLEX AND CD DISKS

Hitoshi Kanamaru, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 30, 1987, Ser. No. 102,706
Claims priority, application Japan, Sep. 30, 1986, 61-232654; Sep. 30, 1986, 61-232655
Int. Cl.[4] H04N 5/76; G11B 27/22
U.S. Cl. 358—342 5 Claims

1. An apparatus for reproducing a disk having provided on at least one side thereof a first region wherein only a prescribed digital signal is recorded and a second region wherein a video signal subjected to frequency modulation and a prescribed digital signal are recorded together in a superposed state, comprising: a video memory capable of storing an amount of video information for at least one field; means for selecting said video information from said video memory and supplying said video information as a video output during reproduction of at least said first region; and control means for reading said amount of video information for at least one field from said disk, writing said information into said video memory during reproduction of said second region, and reading said information from said video memory during reproduction of at least said first region to provide a video output.

4,839,747

IMAGE PROCESSING METHOD AND APPARATUS

Yasuo Fujiwara, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 25, 1987, Ser. No. 66,274
Claims priority, application Japan, Jun. 25, 1986, 61-148991
Int. Cl.[4] H04N 5/76
U.S. Cl. 358—342 15 Claims

1. An image processing method for reading an image recorded in an analog recording medium and then recording the read image digitally in a digital recording medium, said method comprising:
(a) a command data forming step in which command data which includes a retrieval data for enabling retrieval of the image of be recorded in said digital recording medium and a reading data for allowing said image recorded in said digital recording medium to be read is input and formed in a command data recording medium for subsequent use; and
(b) a digital image recording step in which, independently of said command data recording step, said command data is read from said command data recording medium, and said images recorded in said analog recording medium are read in accordance with said command data so as to be recorded digitally in said digital recording medium, thereby allowing the images recorded in said analog recording medium to be digitally recorded in said digital recording medium automatically without an operator manually inputting command data during said digital image recording step.

4,839,748

INITIAL STATE SETTING SYSTEM FOR STILL PICTURE RECORDING/REPRODUCTION DEVICE

Tsuneo Ishii, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 21, 1987, Ser. No. 99,380
Claims priority, application Japan, Sep. 20, 1986, 61-222739
Int. Cl.[4] H04N 5/781, 5/907, 5/93
U.S. Cl. 360—10.1 5 Claims

1. An initial state setting system for a still picture recording/reproduction device, said device being operable upon an application of electric power thereto, the system comprising:
disk recording/reproduction means for recording video information on a recording disk and for reproducing the recorded video information from said recording disk;
memory means for storing video information;
means for writing into said memory means the video information reproduced from the recording disk by said disk recording/reproduction means; and
means for thereafter repeatedly reading the video information written in said memory means to reproduce a still picture;
wherein the disk further includes data recorded thereon which represents a particular location on the disk where specified video information is recorded; and
wherein said writing means and reading means are operable, upon the application of electric power to said device, for initially writing into and reading from said memory means the specified video information corresponding to the particular location of the disk, thereby setting contents of said memory means in an initial state.

4,839,749

RECORDED VOICE WARNING SYSTEM FOR PROVIDING SAFETY ALERTS AND PERSONAL MESSAGES

Eustace B. Franklin, 11435 Oxford Ave., Hawthorne, Calif. 90250

Filed Sep. 2, 1986, Ser. No. 902,689
Int. Cl.[4] G11B 5/00; G08B 19/00
U.S. Cl. 360—12 10 Claims

1. A recorded voice warning system for providing safety alerts and personal messages to a device in a vehicle comprising:
(a) a modified reversible cassette tape recorder having a dual record and playback head assembly and an endless-loop magnetic tape that incorporates a set of prerecorded safety alert messages,
(b) a set of fault detecting sensors where each of said sensors provides an electrical signal when a change corresponding to a specific safety alert occurs and where each of said sensors is optimally located in a section of said vehicle that best provides the chanve,
(c) a set of electronic circuits where said circuits have the means to accept and process the signals from said respective sensors and to then turn on and off said recorder playback mode at a precise time to allow the playback of a selected ssfety alert message corresponding to the specific fault detected by the respective said sensor,
(d) means to annunciate each of said safety alert messages to the driver in said vehicle, and
(e) a timed message circuit that allows a timed personalized message to be recorded on said recorder where said circuit comprises:
A a digital clock that is programmed to provide an output signal at the expiration of any preselected time within a one-year period,
B a flip-flop that is set by the output signal from said clock,
C a two-input AND gate that is enabled when a signal from said flip-flip is received together with a signal from a speed timer that produces the second enabling signal when the drive exceeds a speed of 20 mph,
D a two-input OR gate that is enabled by the output signal from said AND gate, and
E an output timer that when triggered by the signal from the enabled OR gate produces an output signal F for a period of time that is needed by said endless loop tape to complete one revolution where said F signal simultaneously turns on said

tape motor and closes the respective switch on said multiplexer to allow the personal message to be annunicated over a speaker located in said tape recorder.

4,839,750

METHOD AND APPARATUS FOR RECORDING AND/OR REPRODUCING A PCM SIGNAL WITH ASYNCHRONOUS OPERATION

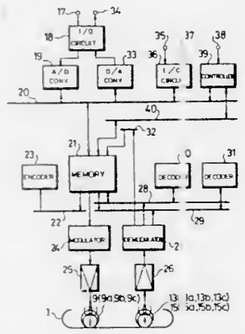
Tetsuro Kato, and Katsuichi Tachi, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 3, 1986, Ser. No. 903,255

Claims priority, application Japan, Sep. 3, 1985, 60-194397; Sep. 10, 1985, 60-200160

Int. Cl.[4] G11B *5/09*

U.S. Cl. 360—48 **24 Claims**



1. Method for recording a digital signal, comprising the steps of:

receiving a digital signal consisting of blocks each including a plurality of symbols, the number of symbols of said digital signal included in each block varying according to a predetermined sequence;

interleaving said plurality of symbols over the extent of each of said blocks;

dividing each of said blocks into a plurality of sub-blocks; and recording said symbols in said plurality of sub-blocks with a plurality of different recording heads at every sub-block, respectively, whereby said symbols of said digital signal may be received asynchronously from said recording of said sub-blocks.

23. Method for recording a video signal having a predetermined field frequency and a digital signal having a predetermined sampling frequency, comprising the steps of: receiving a digital signal including a plurality of symbols together with said video signal;

dividing said video signal into a plurality of units each including a first predetermined number J of fields;

dividing said respective units into a second predetermined number K of blocks each including a third predetermined number L (J=KL) of fields;

recording said digital signal so that a fourth predetermined number M of said symbols are included in every third predetermined number L of fields of one of said second predetermined number K of blocks and that said fourth predetermined number M of said symbols are included in one of third predetermined number L of fields and a fifth predetermined number N of said symbols are included in the other of third predetermined number L of fields of the other blocks.

4,839,751

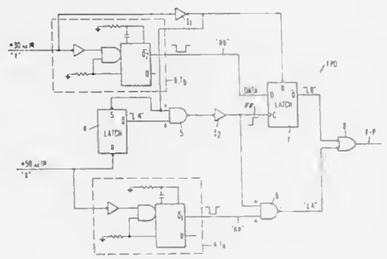
TRACK-FOLLOWING SERVO FOR DISK DRIVE WITH MULTIPLE REFERENCE WINDOWS AND TIME DEPENDENT LOGIC CIRCUITRY

William R. Revels, San Jose, Calif., assignor to Unisys Corporation, Detroit, Mich.

Filed Mar. 10, 1987, Ser. No. 24,280

Int. Cl.[4] G11B *15/04, 5/596*

U.S. Cl. 360—60 **12 Claims**



1. A disk drive servo system for controlling positioning of a servo actuator, based, in part, on servo signals "ss" from servo transducer means T_S, read-out from recorded servo data, this system including:

a plurality of servo referencing means R_n, each adapted to indicate whether said transducer means T_s has deviated from track-center T-C by one of several different respective deviation-distances ±dn, each referencing means R_n, being arranged and adapted to issue a respective positive output deviation signal S_n, indicating that transducer means has so deviated beyond its respective deviation distance ±dn, or to issue a negative output deviation signal $\overline{Sn}$ indicating that it has not so deviated;

a plurality of timer stages TT_n, each adapted to receive a respective deviation signal Sn or $\overline{Sn}$ and each issue a respective deviation-time output signal t-S_n indicating that a respective positive deviation Sn has been continuously applied thereto for a prescribed respective time t_n; and

logic circuit means, including a logic output stage L-0 adapted to issue negative output signals f-p indicating that said transducer means T_s is OFF-CENTER as defined by the logic circuit means.

4,839,752

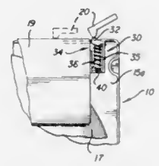
TEMPERATURE/HUMIDITY FLOPPY DISK CASSETTE DEFEAT MECHANISM

Victor B. van Blerk, San Jose, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.

Filed Nov. 19, 1987, Ser. No. 123,458

Int. Cl.[4] G11B *15/18, 17/00*

U.S. Cl. 360—69 **11 Claims**



1. For use with a drive mechanism, a cassette enclosing a rotatably mounted disk for recording data on and/or playing back data from a plurality of concentric record tracks on a recording surface thereof, a defeat mechanism for said cassette comprising:

(a) a control element mounted for movement between (1) a first normal position in which said cassette is adaptable to being operatively loaded into a drive mechanism, and (2) a second actuated position external to said cassette in which said element prevents said cassette from being operatively loaded into the drive mechanism; and

(b) a temperature-sensitive mechanism which retains said control element in its normal position so long as said cassette is not exposed to an environment having a temperature above a level that is harmful to the disk and which moves said element to its actuated position when said cassette is subjected to an environment having a temperature above the aforementioned level.

4,839,753

INFORMATION RECORDING DISK

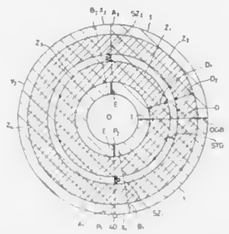
Jun Ide; Tomoo Iizumi; Yoshitaka Takahashi; Hiroshi Yoshida, all of Furukawa; Tooru Kaneko, and Yuichi Hishi, both of Miyagi, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Oct. 15, 1987, Ser. No. 108,773

Claims priority, application Japan, Dec. 8, 1986, 61-290528

Int. Cl.[4] G11B *5/09, 15/04*

U.S. Cl. 360—48 **10 Claims**



1. In an information recording disk made from a disk-shaped base plate and information recording layers formed on surfaces of the base plate and available for repeated writing thereon so that a head assembly writes or reads signals on the information recording disk, an improvement comprising: detection regions formed on surfaces of said information recording disk and used to confirm presence or absence of written signals; read/write regions formed on surfaces of said information recording disk and available for signal writing thereon; and write-protect regions formed on surfaces of said information recording disk and rejecting signal writing thereon, said detection regions and said read/write regions overlapping each other, and said overlapping regions being originally provided with a discriminating signal to distinguish them from at least the other regions.

4,839,754

WINCHESTER DISK DRIVE MOTOR CIRCUITRY

Bipin V. Gami, Chatsworth, and Ericson Dunstan, Port Hueneme, both of Calif., assignors to Micropolis Corporation, Chatsworth, Calif.

Filed Feb. 26, 1987, Ser. No. 19,543

Int. Cl.[4] G11B *15/46, 19/28*

U.S. Cl. 360—73.01 **20 Claims**

1. A hard disk drive system comprising:

a head positioner;

a hard disk drive assembly;

a DC motor, having a fixed stator surrounded by a movable rotor, for driving said disks;

a DC power supply;

a switching regulator means;

means including a series inductor and a shunt capacitor for coupling said switching regulator means to said DC power supply;

motor drive circuit means for driving said DC motor;

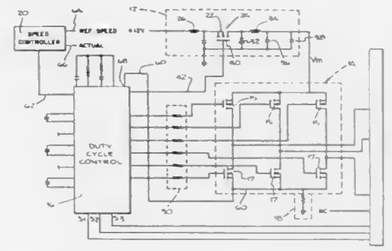
said motor drive circuit means receiving a regulated supply of voltage from said switching regulator means;

a motor drive logic means for sequentially activating said motor drive circuit means, said motor drive logic means including motor position sensing means;

a motor speed controller means for establishing an error signal representative of the difference between a desired reference speed and actual motor speed;

a duty cycle controller means for providing pulse width modulated control of said switching regulator means;

a variable set-point current limiting means, including means for varying the set-point to control the current flow to said motor;



said duty cycle controller means including means for providing a stable high frequency duty cycle control signal to said switching regulator means which is a function of (1) said error signal of said motor speed controller means and (2) the output of a variable set-point current limiting means;

current sensing means, connected between said motor drive circuit means, and said variable set-point current limiting means, for sensing the amount of current drawn by said DC motor, and

said current sensing means including means for providing feedback to said current limiting means, to shift the set-point of said duty cycle controller, thereby changing the duty cycle of said switching regulator.

4,839,755

ROTARY HEAD TYPE DIGITAL SIGNAL REPRODUCING APPARATUS WITH DIFFERENT MODES AND TRACKING CONTROL

Yasuhiro Yamada, Yokosuka; Shoji Ueno, Zama, and Shiro Yoshida, Maebashi, all of Japan, assignors to Victor Company of Japan, Ltd., Japan

Filed Aug. 31, 1987, Ser. No. 91,085

Claims priority, application Japan, Sep. 5, 1986, 61-209243; Oct. 2, 1986, 61-234961

Int. Cl.[4] G11B *5/584, 15/467*

U.S. Cl. 371—38 **5 Claims**

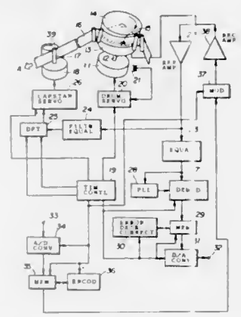
1. A rotary head type digital signal reproducing apparatus for playing a magnetic tape pre-recorded with a time division multiplexed signal in one of first and second modes, said time division multiplexed signal comprising a pulse code modulated audio data which is obtained by subjecting an original audio signal to a pulse code modulation and a tracking reference signal, said tracking reference signal which amounts to a predetermined time period being time division multiplexed before and after said pulse code modulated audio data which amounts to a certain time period, said time division multiplexed signal being recorded on successive tracks formed obliquely to a longitudinal direction of the magnetic tape by two rotary heads; on the recording in said second mode, a data quantity

per unit time, a frequency of said tracking reference signal, a rotational speed of the rotary heads and a tape transport speed of the magnetic tape being one-half those in said first mode, said rotary head type digital signal reproducing apparatus comprising:

reproducing means including two rotary heads for reproducing pre-recorded signals from the magnetic tape;

means for setting the tape transport speed to a speed identical to that in said second mode and for setting the rotational speed of the rotary heads to a speed identical to that in said first mode when playing the magnetic tape prerecorded in said second mode;

tracking control means for controlling tracking of the rotary heads based on reproduced tracking reference signals reproduced by said reproducing means, said reproduced tracking reference signals including out of reproduced



signals obtained from said reproducing means during a total of four successive scans made by the rotary heads with respect to two mutually adjacent tracks on the magnetic tape at least a reproduced tracking reference signal obtained in an ending portion of a first scan and a reproduced tracking reference signal obtained in a beginning portion of a second scan immediately after said first scan, said first and second scans being successive scans in which a large reproduced output is obtainable by the rotary heads from said two mutually adjacent tracks; and

decoding means for decoding the reproduced signals obtained from said reproducing means into the original audio signal based on a reproduced pulse code modulated audio data reproduced from one of said two mutually adjacent tracks during said first scan and a reproduced pulse code modulated audio data reproduced from the other of said two mutually adjacent tracks during said second scan.

4,839,756

APPARATUS FOR READ/WRITE HEAD LOADING AND UNLOADING IN A DATA RECORDING DISK FILE

David W. Chew, Richmond; Willi A. Hagenlocher, Cupertino; Chentung R. Jih, Los Gatos, and Ernie G. Nassimbene, Santa Cruz, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 919,739, Oct. 16, 1986, abandoned. This application Sep. 7, 1988, Ser. No. 243,395

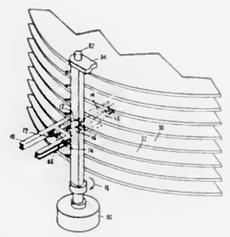
Int. Cl.[4] G11B *5/54, 5/012*

U.S. Cl. 360—105 **8 Claims**

1. In a data recording disk file having a rotatable data disk, an air-bearing slider with an attached head for reading data from or writing data to the disk, an actuator for positioning the slider and head to selected tracks on the disk, a generally rigid arm attached to the actuator, and a suspension of the type including a cantilever laod beam and a flexure element, the cantilever load beam having one end attached to the arm and its free end connected to and providing the sole support for the flexure element, the flexure element being connected to and providing the sole support for the slider, and the load beam being resiliently flexible near its attachment to the arm so as to provide a loading force on the slider, an improvement to the disk file comprising:

a rigid elongated rod located on the arm and movable relative to the arm in a direction generally parallel to the load beam for flexing the load beam near its attachment to the arm;

means secured to the load beam for engaging the rod;



means mounted on the arm and connected to an end of the rod for moving the rod to a first position whereby the rod contacts the engaging means on the load beam and the slider is unloaded from the disk, and to a second position whereby the rod is moved out of contact with the engaging means and the slider is loaded to its air-bearing relationship with the disk by the loading force of the load beam;

and means attached to the disk file beyond the outer periphery of the disk for actuating the rod moving means when the slider is at its radially outermost position on the disk.

4,839,757

MANUAL HEAD LOADING MECHANISM FOR FLEXIBLE DISK DRIVE

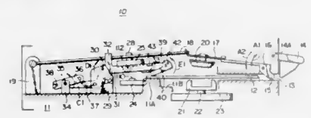
Masahiro Shigei; Shugo Suto, and Masahiro Tatsukami, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed May 26, 1987, Ser. No. 54,398

Claims priority, application Japan, May 26, 1986, 61-78081; Jun. 20, 1986, 61-93352; Jun. 23, 1986, 61-144739

Int. Cl.[4] G11B *5/016*

U.S. Cl. 360—99.05 **15 Claims**



6. An apparatus for use with a flexible disk drive for loading a magnetic head onto a floppy disk which is inserted into said disk drive, said apparatus comprising:

a housing provided with an opening for receiving the floppy disk and a door so supported as to selectively open and close said opening;

disk drive means supported by said housing for driving in a rotational motion the floppy disk which is inserted through said opening;

first rotatable arm means rotatably supported by said housing to selectively assume first and second positions in response to, respectively, opening and closing of said door;

second rotatable arm means carrying a magnetic head therewith and supported by said housing to be rotatable in

response to rotation of said first rotatable arm means, said second rotatable arm means selectively assuming a contact position where said magnetic head is in contact with the floppy disk and a non-contact position where said magnetic head is out of contact with the floppy disk;

toggle means connected between said rotatable arm means and said housing to normally bias said second rotatable arm means toward said non-contact position and, when said second rotatable arm means is rotated by a predetermined angle toward said contact position, inverting a biasing direction to bias said second rotatable arm means toward said contact position;

lock means responding to insertion of the floppy disk through said opening, said lock means locking said second rotatable arm means in said non-contact position when the floppy disk is not inserted; and

resiliency transmitting means supported at one end thereof by said lock means and engageable at the other end thereof with said first rotatable arm means, whereby;

while said lock means is responding to insertion of the floppy disk and when said first rotatable arm means is rotated toward said second position thereof, said resiliency transmitting means further promotes motion of said lock means and rotates said second arm means toward said contact position;

while the lock means is not operated and when said first rotatable arm means is rotated toward said second position thereof, said resiliency transmitting means causes said lock means to lock said second rotatable arm means in said non-contact position; and

said first rotatable arm means being linked with said second rotatable arm means and, when said first rotatable arm means in the second position is rotated toward the first position, rotating said second rotatable arm means toward said non-contact position.

4,839,758

MAGNETIC DISK CARTRIDGE LOADING-AND-UNLOADING DEVICE

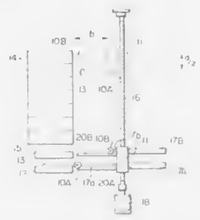
Akira Honjoh, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 11, 1986, Ser. No. 940,373

Claims priority, application Japan, Dec. 11, 1985, 60-278185

Int. Cl.[4] G11B *15/68, 31/00*

U.S. Cl. 360—99.06 **2 Claims**



1. A magnetic disk cartridge loading-and-unloading device for loading magnetic recording disk cartridges in a recording and reproducing system and unloading them from the recording and reproducing system comprising, first and second holding means adapted to grasp the magnetic recording disk cartridges, a movable means for moving said first and second holding means, said first and second holding means being mounted close to each other and being movable together with the movable means, and a control means for controlling the movable means and the first and second holding means so that the movable means brings the first holding means to a position in which the first holding means grasps a first magnetic disk cartridge supplied by a cartridge supply means for supplying said cartridges to said device, then brings the second holding means to a position in which the second holding means grasps a second magnetic disk cartridge ejected from the recording and reproducing system with the first holding means holding the first magnetic disk cartridge, then brings the first holding means to a position in which the first holding means loads the first magnetic disk cartridge in the recording and reproducing system with the second holding means holding the second magnetic disk cartridge, and brings the second holding means to a position in which the second holding means delivers the second magnetic disk cartridge to a cartridge discharge means for discharging said cartridges from said device while bringing the first holding means to a position in which the first holding means can take out a third magnetic disk cartridge from the cartridge supply means.

4,839,759

TAPE BED AND MODE-CHANGING MECHANISM ARRANGEMENT FOR THIN CASSETTE TYPE RECORDER

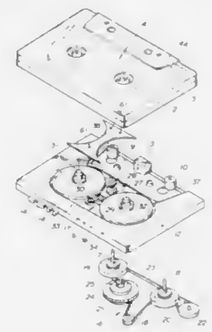
Mitsuru Ida, Tokyo, and Noriyuki Koga, Saitama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 896,221, Aug. 8, 1986, abandoned. This application Jun. 2, 1988, Ser. No. 205,031

Claims priority, application Japan, Aug. 20, 1985, 60-127099[U]

Int. Cl.[4] G11B *15/18*

U.S. Cl. 360—96.3 **16 Claims**



1. A cassette type recording and/or reproducing apparatus, comprising:

(a) chassis means capable of mounting a cassette on an upper surface thereof and defining a recess on the upper surface thereof, a portion of the upper surface being within said recess and a portion of the upper surface being outside said recess;

(b) a pair of reel beds rotatably mounted within said recess and above the portion of the upper surface within said recess, at least a portion of said reel beds being below the level of the portion of the upper surface outside said recess; and

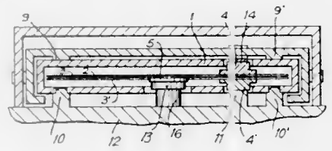
(c) actuation means for selectively rotating said reel beds, said actuation means being mounted within said recess and above the portion of the upper surface within said recess.

4,839,760

READ/WRITE APPARATUS FOR DISK CARTRIDGE

Noboru Yamada; Tomohiko Abe, and Osamu Miyazawa, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Jun. 17, 1987, Ser. No. 63,043
Int. Cl.[4] G11B 5/012
U.S. Cl. 360—97.01 8 Claims



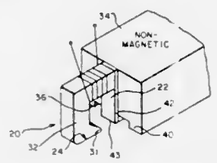
1. A read/write apparatus for a disk cartridge, comprising:
a chassis;
a moveable frame supported on the chassis for receiving a disk cartridge, the frame being moveable from an ejection position where the cartridge is inserted and removed to a loaded position for reading and writing;
the disk cartridge including a shell having at least one opening therein, a disk mounted within the shell with a hub member at the center of the disk, a liner supported within the shell on at least the side of the disk facing the opening, a plate mounted within the opening for pressing the liner against the disk;
driving means mounted on the chassis for rotating the disk;
biasing means for maintaining the frame in the loaded position with the hub member engaging the driving means and the biasing means pressing the plate against one surface of the disk; and
a pressing means for supporting the opposite surface of the disk, whereby the liner cleans the disk when the biasing means biases the frame to the loading position.

4,839,761

MAGNETIC HEAD FOR PERPENDICULAR MAGNETIC RECORDING SYSTEM

Hans-Heinrich O. P. Gatzen, Aptos, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Jul. 31, 1987, Ser. No. 80,063
Int. Cl.[4] G11B 5/60
U.S. Cl. 360—103 22 Claims



1. A perpendicular recording magnetic head comprising a slider supporting said head for positioning movement across one side of a recording medium, a main pole supported on an end face of said slider, and a flux collector comprising a C-shaped ferrite pole, one end of said collector being supported by said slider, the other end of said C-shaped pole being separated from said main pole by a recording gap to complete the magnetic circuit through the recording medium, said collector other end and said main pole each having a surface which faces said recording medium wherein the area of the surface of said collector other end is greater than the area of the main pole surface.

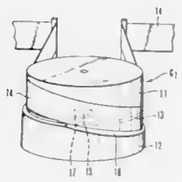
11. A perpendicular recording magnetic system including a recording medium comprising a non-magnetic substrate, a soft magnetic layer over said substrate and a hard magnetic layer with a vertical orientation around said soft magnetic layer, a slider for positioning an access transducer over the recording medium comprising a ferrite access head including, a main pole disposed on a face of the slider, a claw-shaped flux collector separated from said main pole by a gap substantially greater than said main pole thickness, said flux collector being magnetically coupled to said main pole and carried on the face of the slider, said collector having two ends separated by an intermediate portion with one end of said collector which faces said recording medium having an enlarged cross-section compared to a parallel section of said intermediate portion of the collector, a magnetic data access circuit being completed by selective passage of magnetic flux through the main pole, the soft magnetic layer and back to the flux collector on the same side of the recording medium as the main pole.

4,839,762

ROTARY HEAD DEVICE

Kou Yoneda, Tokyo; Hideaki Miyakawa, and Shinichi Hara, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1987, Ser. No. 62,793
Claims priority, application Japan, Jun. 25, 1986, 61-147078; Jun. 25, 1986, 61-147079
Int. Cl.[4] G11B 21/04, 15/60
U.S. Cl. 360—107 8 Claims



1. A rotary head device comprising:
(a) a stationary cylinder having a stationary outer peripheral surface on which a step portion to guide a tape-shaped medium is formed;
(b) a rotary cylinder rotatably supported relative to said stationary cylinder, said rotary cylinder having a rotary outer peripheral surface which has a diameter corresponding to a diameter of said stationary outer peripheral surface; and
(c) a rotary head arranged to project outwardly of said rotary outer peripheral surface of said rotary cylinder, said rotary outer peripheral surface including a continuous surface which is continuous with another surface of said rotary outer peripheral surface and is arranged between said stationary outer peripheral surface and said rotary head projecting outwardly of said rotary outer peripheral surface,
said rotary cylinder including a hole portion formed at a position spaced from an edge of said rotary outer peripheral surface which confronts said stationary cylinder by not less than 0.2 mm but not more than 2 mm.

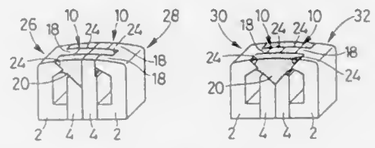
4. A rotary head device comprising:
(a) a stationary cylinder having a stationary outer peripheral surface on which a step portion to guide a tape-shaped medium is formed;
(b) a rotary cylinder rotatably supported relative to said stationary cylinder, said rotary cylinder having a rotary outer peripheral surface which has a diameter corresponding to a diameter of said stationary outer peripheral surface; and
(c) a rotary head arranged to project outwardly of said rotary outer peripheral surface of said rotary cylinder, said rotary outer peripheral surface including a continuous surface which is continuous with another surface of said rotary outer peripheral surface and is arranged between said stationary outer peripheral surface and said rotary head projecting outwardly of said rotary peripheral surface,
said continuous surface being formed by molding resins.

4,839,763

COMPOSITE MAGNETIC HEAD CORE

Soichiro Matsuzawa, Kuwana, Japan, assignor to NGK Insulators, Ltd., Japan

Continuation-in-part of Ser. No. 688,502, Jan. 2, 1985, Pat. No. 4,711,018. This application Sep. 23, 1987, Ser. No. 100,230
Claims priority, application Japan, Jan. 14, 1984, 59-5203; Jan. 14, 1984, 59-5204
Int. Cl.[4] G11B 5/147
U.S. Cl. 360—126 7 Claims



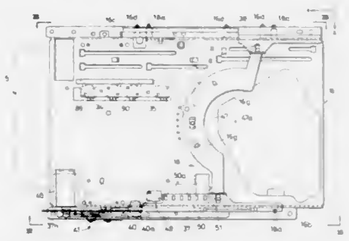
1. A composite magnetic head core, comprising:
a first integral core assembly and a second integral core assembly, each of said first and second integral core assemblies including a first ferrite core element having a C-shaped portion, and a second ferrite core element having a rectangular portion, said first and second ferrite core elements being butted and bonded together, so as to close an opening of the C-shaped portion with the rectangular portion, to thereby form a generally annular magnetic circuit which includes a magnetic gap of a predetermined width defined by opposed end portions of the first and second core elements at one end of a corresponding one of said first and second integral core assemblies, said magnetic gap being formed transversely across an annulus of the magentic circuit;
each of said first and second integral core assemblies having at least one inclined groove cut in said opposed end portions of the first and second ferrite core elements to define a width of at least one track, said at least one inclined groove being formed in a direction from said opposed end portion on said second core element toward said opposed end portion on said first ferrite core element, such that a bottom portion of said at least one inclined groove is inclined with its depth decreasing toward the first ferrite core element and such that a depth of said at least one inclined groove at the position corresponding to said magnetic gap is greater than a depth of said magnetic gap;
an adhesive layer disposed between said second core elements of said first and second integral core assemblies, to bond the first and second integral core assemblies at said second core elements thereof, such that said at least one inclined groove in said first integral core assembly is maintained in a predetermined positional relationship with said at least one inclined groove in said second integral core assembly in a direction along the length of said at least one track; and
a filler filling said at least one inclined groove in said first integral core assembly and said at least one inclined groove in said second integral core assembly.

4,839,764

DISK MECHANISM IN A DISK PLAYER

Yuji Ikedo; Takahiro Okajima, and Yasuyuki Tashiro, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 1, 1987, Ser. No. 32,694
Claims priority, application Japan, Apr. 1, 1986, 61-75011; Apr. 1, 1986, 61-75012; Apr. 1, 1986, 61-75014; Apr. 1, 1986, 61-75015
Int. Cl.[4] G11B 17/00, 5/012
U.S. Cl. 360—98.08 6 Claims



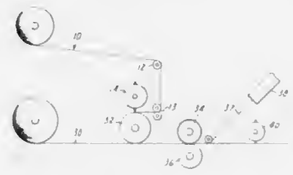
1. A disk player comprising:
a turntable having a disk bearing side; and
a clamp mechanism for clamping a disk put on said disk bearing side of said turntable, said clamp mechanism having pushing means with a disk pushing side for clamping the disk in cooperation with said turntable and moving means for moving said pushing means toward and away from said turntable, said moving means comprising a pair of support members, said pair of support members being swingable in planes nearly perpendicular to the disk bearing side of said turntable and having free ends capable of contacting with said disk pushing side of said pushing means and an opposite side of said pushing means, respectively, to pinch said pushing means therebetween, and drive means for driving said pair of supporting members.

4,839,765

MAGNETIC RECORDING DISKETTE WITH OFFSET WIPING FABRIC

Hung Q. Lam, Yukon, Okla., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 24, 1986, Ser. No. 831,839
Int. Cl.[4] G11B 23/03
U.S. Cl. 360—133 3 Claims



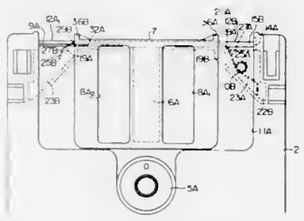
1. Diskette comprising wiping fabric panels laminated to the interior face of a jacket formed from a jacket blank which has been folded along a central line to cover both sides of a magnetic recording disk, wherein the improvement comprises:
the edge of each of said fabric panels proximate said central line are spaced from the central line along which the jacket blank is folded.

4,839,766

DISK CARTRIDGE WITH IMPROVED SHUTTER MOVING MECHANISM

Yoshitake Kato, Ibaraki, Japan, assignor to Hitachi Maxwell Ltd., Osaka, Japan

Filed Sep. 14, 1987, Ser. No. 95,776
Claims priority, application Japan, Sep. 13, 1986, 61-215007
Int. Cl.[4] G11B *23/03*
U.S. Cl. 360—133 20 Claims



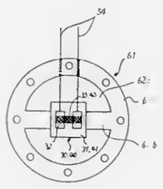
1. A disc cartridge comprising a casing for housing a double-sided disk recording medium therein and having two side walls each of which is formed therein with a head entry aperture and a spindle hole, and a U-shaped slidable shutter having two shutter walls between which said casing is operatively arranged and a connecting part between both walls, each of said shutter walls being formed therein with two openings spaced from each other with a cover part therebetween, said cover part normally closing an associated one of said entry apertures prior to insertion of the cartridge into a reproducing and recording machine, whereby one of said openings is operatively arranged to open said associated head entry aperture in each side wall when said slidable shutter is moved in one of two directions.

4,839,767

ELEMENT AND DEVICE FOR DETECTING INTERNAL FAULTS IN AN INSULATING GAS CHARGED ELECTRICAL APPARATUS

Takeo Yoshioka; Tadao Minagawa; Toshihiro Suzuki; Ichiro Yamasaki, and Yoshifumi Matsushita, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Jan. 27, 1988, Ser. No. 149,168
Claims priority, application Japan, Feb. 2, 1987, 62-12842[U]; Apr. 17, 1987, 62-93286; Jun. 30, 1987, 62-160838; Jul. 3, 1987, 62-165408
Int. Cl.[4] H02H *5/00*; G01N *27/12*
U.S. Cl. 361—42 26 Claims



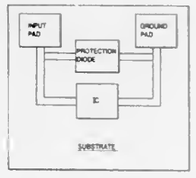
1. An element for detecting internal faults in an insulating gas charged electrical apparatus comprising:
a substrate formed of a non-conductive material;
a pair of electrodes disposed on said substrate in a spaced apart relationship; and
a thin metal film disposed on said substrate extending over said electrodes and electrically connecting them, said metal film reacting with decomposition components of a fluorine compound insulating gas, produced when electrical apparatus charged with said insulating gas fails, to form metallic fluorine compounds, thereby increasing the electrical resistance of said film.

4,839,768

PROTECTION OF INTEGRATED CIRCUITS FROM ELECTROSTATIC DISCHARGES

Vincenzo Daniele, Brugherio, and Mirella Benedetti, Vimercate, both of Italy, assignors to SGS Microelettronica S.p.A., Catania, Italy

Filed Oct. 27, 1987, Ser. No. 113,113
Claims priority, application Italy, Dec. 3, 1986, 83666 A/86
Int. Cl.[4] H02N *3/20*
U.S. Cl. 361—56 8 Claims



5. An integrated circuit comprising a voltage limiting diode connected between a pad of the integrated circuit and a common potential node of the integrated circuit for protecting from discharges of electrostatic nature an integrated semiconductor structure connected to said pad,

wherein the electrical connection between said diode and said common potential node of the integrated circuit has a resistance lower than a value R given by the expression

$$R = \frac{k}{V_{DAM}}$$

where:

V_{DAM} is a minimum value of an electrostatic discharge voltage which must be withstood by said integrated structure without damage and

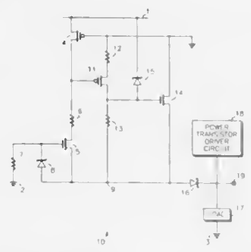
k is an experimentally pre-determined constant.

4,839,769

DRIVER PROTECTION CIRCUIT

David H. Soo, Mesa, and William C. Dunn, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 9, 1988, Ser. No. 191,934
Int. Cl.[4] H02H *3/12, 3/18, 3/24*
U.S. Cl. 361—84 11 Claims



6. A driver protection circuit for protecting the semiconductor devices of a driver circuit, said driver circuit providing an output voltage to an inductive load through an output terminal, said driver protection circuit having a first supply voltage terminal for receiving a first supply voltage and a second supply voltage terminal for receiving a second supply voltage, said driver protection circuit comprising:

first means coupled between said output terminal and a node for blocking the output voltage when the output voltage is greater than the second supply voltage and less than a predetermined magnitude for the output voltage, and passing the output voltage when the output voltage is less than the second supply voltage or greater than said predetermined magnitude for the output voltage;

second means coupled between the node and said second supply voltage terminal for selectively discharging the output voltage from the node; and

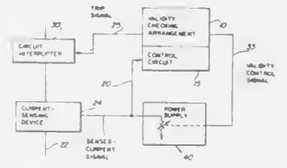
third means coupled between said first and second supply voltage terminals and coupled to both the node and said second means for enabling said second means when the second supply voltage is greater than the first supply voltage.

4,839,770

CONTROL CIRCUIT WITH VALIDITY-DETERMINING ARRANGEMENT

Joseph W. Ruta, Arlington Heights, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Jan. 25, 1988, Ser. No. 147,828
Int. Cl.[4] H02H *3/05*; H01F *40/06*
U.S. Cl. 361—93 11 Claims



1. A control circuit for generating a trip signal in the presence of overcurrent conditions, the control circuit being responsive to a sensed-current signal that represents the current in a line, the control circuit comprising:

means responsive to the sensed-current signal for detecting the presence of overcurrent conditions; and

means responsive to said detecting means for generating a trip signal, said trip-signal generating means comprising validity-checking means for determining that said sensed-current signal accurately represents the current in the line before generating said trip signal, said validity-checking means comprising means for changing the load presented to the sensed-current signal.

4,839,771

APPARATUS FOR PROVIDING A LIGHTNING PROTECTIVE VEHICLE SURFACE

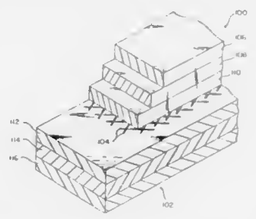
James H. Covey, Snohomish County, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 4, 1987, Ser. No. 128,992
Int. Cl.[4] H05F *1/02*
U.S. Cl. 361—218 17 Claims

1. A lightning protective skin member for a moving vehicle, said lightning protective skin member being made of a composite material and having a relatively high electrical conductivity, said lightning protective skin member comprising:

first and second structural panels constructed of a fibrous material in combination with an adhesive; and

a wire grid constructed of a plurality of wire members arranged at angles to create a grid-like pattern, said wire grid being disposed intermediate said first and second panels whereby said wire grid adds structural support to said first and second structural panels and provides a



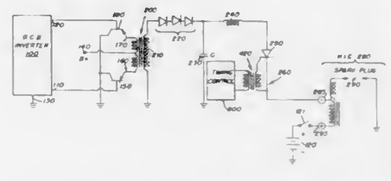
means for dissipating electrical current supplied to said first and second panels.

4,839,772

CAPACITIVE DISCHARGE ELECTRONIC IGNITION SYSTEM FOR AUTOMOBILES

Hyeong I. Choi, Evanston, Ill., and Keh-Kun Choi, Seoul, Rep. of Korea, assignors to Bang H. Mo, Chicago, Ill.

Filed Mar. 21, 1988, Ser. No. 171,460
Int. Cl.[4] F23Q *3/00*; F02P *3/06*
U.S. Cl. 361—256 3 Claims



1. Apparatus for providing ignition voltage to a spark plug in an ignition system, comprising:

inverter means for producing a high frequency voltage from a DC power source;

transformer means for stepping-up the high frequency voltage from said inverter means;

rectifier means for rectifying the stepped-up voltage from said transformer;

energy storage means, connected to said rectifier means, for storing a high voltage charge developed from said rectified voltage;

ignition coil means, connected to said spark plug, for developing an ignition voltage;

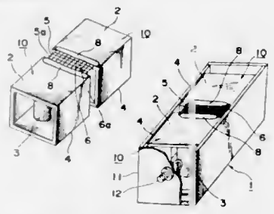
switch means, connected between said energy storage means and said ignition coil means, for discharging said energy storage means through said ignition coil means upon activation by a trigger pulse, said ignition coil including primary and secondary coils, said primary coil having a positive terminal connected to said DC power source and a negative terminal connected to said switch means, said secondary coil being connected to said spark plug;

timing means for producing a trigger pulse for activating said switch means, said timing means including transistor means connected to said DC power source for producing said trigger pulse;

delay means for triggering said transistor means in response to said pre-existing timing signal; and

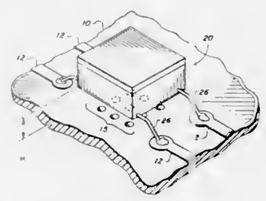
diode means in circuit with said transistor means for providing a triggering threshold level for said transistor means for utilizing a pre-existing timing signal of said ignition system to produce said trigger pulse.

4,839,773
DIELECTRIC FILTER
Youhei Ishikawa, Kyoto; Kikuo Tsunoda, Yawata; Toshiro Hiratsuka, and Hirotsugu Abe, both of Nagaokakyo, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan
Filed Jun. 22, 1988, Ser. No. 210,025
Claims priority, application Japan, Jun. 22, 1987, 62-155115; May 26, 1988, 63-69709[U]
Int. Cl.[4] H01P 1/205; H01G 1/14
U.S. Cl. 361—321 7 Claims



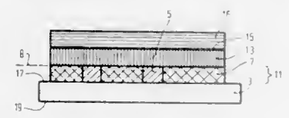
1. A dielectric filter, comprising:
a plurality of resonators, each including a ceramic case which has a pair of openings at both its ends and a conductive film thereon to form an actual current path on the surface of the ceramic case,
a dielectric solid body which has the same characteristic of linear expansion coefficient as the ceramic case being mounted and accommodated in the case,
a metallic housing in which the plurality of resonators are accommodated in series with each other with a space therebetween, so as to produce a given electromagnetic coupling between each two adjacent resonators as a function of the end opening areas thereof facing each other,
the metallic housing also having a pair of input and output terminals, and
a conductive plate interconnecting the ceramic cases and having means for lessening thermal expansion and contraction stresses of said conductive plate, so that thermal stresses of expansion and contraction which are generated between the ceramic cases and the metallic housing are eliminated by the conductive plate.

4,839,774
APPARATUS AND METHOD FOR COOLING ELECTRONIC COMPONENT PACKAGES USING AN ARRAY OF DIRECTED NOZZLES FABRICATED IN THE CIRCUIT BOARD
William R. Hamburgen, Menlo Park, Calif., assignor to Digital Equipment Corporation, Maynard, Mass.
Filed Jan. 25, 1988, Ser. No. 147,755
Int. Cl.[4] H02B 1/00; H05K 7/20
U.S. Cl. 361—383 15 Claims



8. Cooling apparatus for cooling component packages coupled to a circuit board, said apparatus comprising:
at least one location for mounting a one of said component packages on a first side of said circuit board, wherein said one component package is mounted a distance from said first side of said circuit board to permit a cooling fluid to flow between circuit board first side and a base of said one component package;
a reservoir adapted to contain said cooling fluid under pressure in a vicinity of said one location, said reservoir being positioned on a second side of said circuit board; and
an array of apertures formed in said circuit board permitting a flow of said cooling fluid from said reservoir toward a base of said one component package.

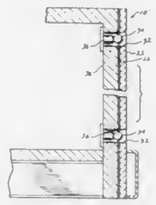
4,839,775
THICK-FILM CIRCUIT ARRANGEMENT HAVING A CERAMIC SUBSTRATE PLATE
Wolfgang E. Schnitker, Krefeld; Michael P. J. Nover, Essen, and Kay Appel, Monchen-Gladbach, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 7,154, Jan. 27, 1987, abandoned. This application Jun. 14, 1988, Ser. No. 208,853
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1986, 3602960
Int. Cl.[4] H05K 1/16
U.S. Cl. 361—402 42 Claims



1. In a thick-film circuit arrangement having an electronic circuit comprising a ceramic substrate, at least one thick-film conductor arrangement of conductor paths and integrated circuit components disposed on at least one surface of said ceramic substrate, said thick-film conductor arrangement having intermediate spaces between said conductor paths and said integrated circuit components, and at least one sintered non-conducting paste disposed in said intermediate spaces of said one thick-film conductor arrangement on said at least one surface of said ceramic substrate, the improvement comprising said thick-film conductor arrangement and said sintered non-conducting paste both having substantially the same height above said at least one surface of said ceramic substrate, and at least one thick-film anti-access layer disposed on said thick-film conductor arrangement and said sintered non-conducting paste, said at least one thick-film anti-access layer having observation impeding inclusions to prevent optical recognition of said thick-film conductor arrangement, wherein at least a second thick-film anti-access layer is disposed on said at least one thick-film anti-access layer.

4,839,776
ILLUMINATION MEANS FOR VEHICLE SIDE WALLS
Paul G. Grossnickle, 3413 Garfield Ave., Highland, Ind. 46322
Filed Aug. 3, 1987, Ser. No. 81,111
Int. Cl.[4] F21V 8/00
U.S. Cl. 362—31 1 Claim

1. In combination, a vehicle having a sidewall and illumination means for lighting said sidewall, the combination wherein said sidewall includes an opaque covering, a translucent plate adjacently overlying said opaque covering and including an edge, said translucent plate having a plurality of bores formed therein, said illumination means including light source means for directing light rays into said plate from its edge, said light source means being a plurality of lights, said lights positioned within said bores and within the plane of said translucent plate,



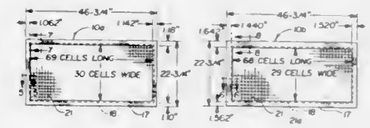
said lights constituting means for illuminating said transparent plate and opaque covering.

4,839,777
ILLUMINATED ARTICLE
Michael Janko, Richmond, and Matthew McAllister, Lexington, both of Mich., assignors to Alliko Unlimited, Corp., Richmond, Mich.
Continuation of Ser. No. 897,192, Aug. 15, 1986, Pat. No. 4,774,642. This application Feb. 22, 1988, Ser. No. 158,630
Int. Cl.[4] F21L 15/14
U.S. Cl. 362—108 9 Claims

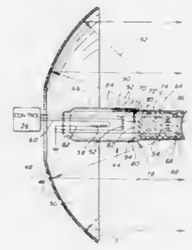
1. An illuminated object having an outer surface comprising:
at least one layer of translucent material;
an electrical power source mounted on the object;
a harness mountable on the object and electrically connectable to the electric power source, the harness including:
a housing;
a pair of electrical conductors connectable to the electric power source and mountable in the housing; and
illumination means mountable in the housing in electrical contact with the pair of electrical conductors; and
cover means, attached to the object, for forming a slot between itself and the outer surface of the object into which the harness is removably inserted.

4,839,778
LOUVER SYSTEM
Alfred J. Wall, Jr., Lake Forest, Ill., assignor to Louvers International, Wheeling, Ill.
Filed Feb. 24, 1987, Ser. No. 17,976
Int. Cl.[4] F21V 7/12
U.S. Cl. 362—150 36 Claims

1. A louver system for use with lower supports having inwardly opening perimetral end and side channels defining a rectangular louver space having a preselected length and a preselected width, said louver system comprising
a plurality of louvers having open cells, at least one of which plurality of louvers is provided with end and side flanges adapted to be received in the end and side channels respectively of such a louver support and having a first width, and at least one other of which plurality of louvers is provided with end and side flanges adapted to be received in the end and side channels respectively of such a louver support and having a second width of approximately 1½ times said first width.

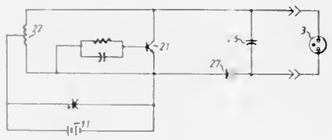


4,839,779
MULTIPLE COLOR LIGHT WITH STRUCTURE TO PREVENT COLOR BLEEDING
George C. Kasboske, Chicago, Ill., assignor to Quintech Corporation, Chicago, Ill.
Filed Dec. 8, 1987, Ser. No. 129,841
The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.
Int. Cl.[4] F21V 9/00
U.S. Cl. 362—214 16 Claims



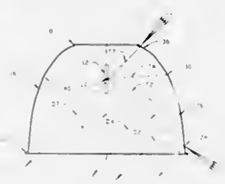
1. A lighting apparatus comprising:
a first source of light;
a first surface for causing light transmitted therethrough from the first source to have a first color;
a second source of light;
a second surface for causing light transmitted therethrough from the second source to have a second color; and
coating means on said second surface to prevent light from the first source that is transmitted through the first surface from passing through the second surface.

4,839,780
SIMULATIVE CANDLE
Chuang T. Chuan, and Der C. Cheng, both of Hsinchu, Taiwan, assignors to Ta Yu Electric Co., Ltd., Taiwan
Filed Jul. 18, 1988, Ser. No. 220,577
Int. Cl.[4] F21K 2/00
U.S. Cl. 362—265 **4 Claims**



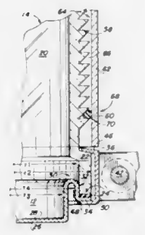
1. A simulative candle comprising:
a housing;
a battery receiving in said housing for providing a first d.c. electric power;
an oscillator electrically connected to said battery for converting said d.c. power into an a.c. electric power;
a half-wave-rectifying filtering network electrically connected to said a.c. power into an astatic high-voltage d.c. electric power;
a neon lamp electrically connected to said filtering network for being energized by said astatic high-voltage d.c. power;
said oscillator comprising a coil having a first end, and opposite second end and an intermediate tap connection, a transistor having an emitter and collector connected between said first and second ends of said coil, a parallel RC circuit connected between the base of said transistor and the first end of said coil, said battery being connected between said tap and said first end of said coil; and
said lamp having a pair of electrodes, said filtering network comprising a diode connected between one of said electrodes and the first end of said coil with a capacitor connected between said electrodes of said lamp.

4,839,781
REFLECTOR/REFRACTOR
Josh T. Barnes, Charlevoix, and Ronald L. Sitzema, Jr., Ellsworth, both of Mich., assignors to Lexalite International Corporation, Charlevoix, Mich.
Continuation-in-part of Ser. No. 181,185, Apr. 13, 1988. This application Jun. 21, 1988, Ser. No. 209,525
Int. Cl.[4] F21V 7/07, 5/02
U.S. Cl. 362—299 **20 Claims**



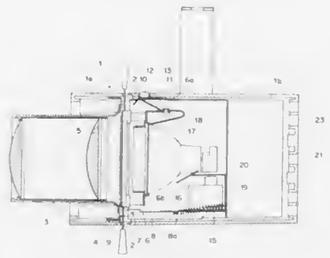
1. A reflector/refractor device used with a lighting fixture comprising:
a body having a predetermined profile, said body having an outside surface and an inside surface and defining a cavity;
illuminating means for emitting light disposed within said cavity substantially along a central vertical axis of said body; and
said body including a series of sectional zones defining said predetermined profile for selectively providing a variable predetermined light distribution pattern determined by a vertical location of said illuminating means, said sectional zones including;
one or more zones having a plurality of substantially vertical prism means formed on said outside surface for reflecting a first portion of the emitted light substantially unaffected by the vertical location of said illuminating means;
at least one sectional zone including a plurality of prism means for selectively varying component proportions of refracted and reflected light portions responsive to a change in an incident angle of the emitted light, said incident angle being selectively variable by the vertical location of said illuminating means, said refracted light component portion having an increased magnitude responsive to a decreased incident angle of the emitted light and said reflected light component portion having a decreased magnitude responsive to a decreased incident angle of the emitted light.

4,839,782
WEATHERPROOF LIGHTING FIXTURE WITH HERMETICALLY SEALED BASE PLATE
Thomas R. Sikora, Mesa, Ariz., assignor to Tomar Electronics, Inc., Tempe, Ariz.
Continuation of Ser. No. 139,286, Dec. 29, 1987, abandoned. This application Feb. 11, 1989, Ser. No. 311,459
Int. Cl.[4] F21Y 17/06
U.S. Cl. 362—363 **10 Claims**



1. A weatherproof lighting fixture for enclosing and supporting a light source, comprising:
a. an optically transmissive, substantially cylindrical enclosure for said light source including
i. a longitudinal axis;
ii. a closed upper surface centered about the longitudinal axis;
iii. a body centered about the longitudinal axis, extending downward from said upper surface and including a lower section having an outer surface and a substantially flat lower surface oriented perpendicular to the longitudinal axis, said lower surface commencing at a first radial distance from the longitudinal axis and terminating at a second radial distance from the longitudinal axis;
b. a circular base formed from a thin metal sheet and including
i. a circular disc section centered about the longitudinal axis, having an upper surface and terminating at a third radial distance from the longitudinal axis;
ii. a circular first flange section centered about the longitudinal axis and having an upwardly extending, vertically oriented inner surface coupled to said disc section at the third radial distance, said first flange section including a downwardly extending, vertically oriented outer surface joined to the inner surface and located at a fourth radial distance from the longitudinal axis where the fourth radial distance is approximately equal to or slightly shorter than the first radial distance for enabling said first flange section to fit coaxially within the lower section of said enclosure, the space between the inner and outer surfaces defining an unobstructed downwardly facing U-shaped gap located entirely within the first radial distance with vertically oriented, parallel sidewalls, a peak evaluation and a width;
iii. a horizontally oriented, circular second flange section defining the bottom of the U-shaped gap, having an inner surface coupled to and extending outward from said first flange section and having an upper surface for supporting the lower surface of said enclosure, the second flange section being elevated above the disc section and passively supporting the enclosure from below without contacting or exerting force on the outer surface of the lower section of said body, the distance between the bottom and the peak elevation of the U-shaped gap exceeding the width of the U-shaped gap; and
c. clamping means having an upper clamping surface engaging the lower section of said enclosure and a lower clamping surface extending below and under the second flange section of said base to firmly bias the upper surface of said second flange section toward the lower surface of said enclosure to form a horizontally oriented weatherproof seal between the flat lower surface of the body and the horizontally oriented second flange section.

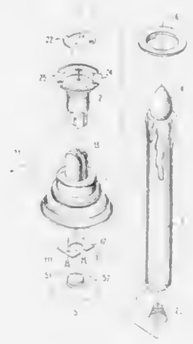
4,839,783
LIGHTING APPARATUS
Akira Arai, 32-7, Soshigaya 1-chome, Setagaya-ku, Tokyo, Japan
Filed Mar. 2, 1988, Ser. No. 163,287
Int. Cl.[4] F21V 29/00
U.S. Cl. 362—374 **6 Claims**



1. A lighting apparatus comprising:
a casing having two halves, said halves being separable along an intermediate parting line;
means for pivoting said two halves relative to one another to open and close said casing, said means for pivoting being laterally displaceable relative to said casing; and
means for urging said means for pivoting to a position within said casing for placing said means for pivoting inside said casing when said halves are closed.

4,839,784
CANDLE-LIKE LIGHTING DEVICE
Ling-Yung Lin, Taipei, Taiwan, assignor to New Fei Lien Enterprise Co., Ltd., Taipei, Taiwan
Filed Feb. 18, 1988, Ser. No. 157,234
Int. Cl.[4] F21V 35/00
U.S. Cl. 362—393 **1 Claim**

1. A candle-like lighting means comprising:
a candle base defined in a step like form having superimposedly disposed circular layers with reducing diameter from bottom to top with a pair of lugs disposed at a top of the base, and a space being defined between said lugs;
a candle holder having a flared cup portion at the top thereof and a downward joining extension disposed in between said lugs in assembly for effecting the pivotal coupling of the same to said candle base by a pin;
a metal plate received in the flared cup portion;
a spring disposed on top of said metal plate;
an elongate hollow candle body having a flange portion disposed on the bottom wall thereof, with batteries received therein, said flange portion being adapted to selectively contact said metal plate to turn the lighting means on or off;
a suction means removably disposed at the bottom of said candle base and having a circular projection on the top thereof with a metal ring disposed around a neck portion which connects the circular projection and the suction means;

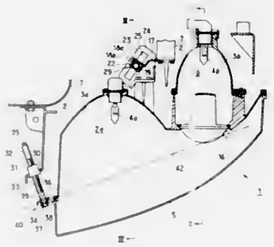


a bulb disposed at the topmost end of said candle body;
a rectangular iron plate having a central circular opening, and a cut disposed on one side thereof which is in communication with said central opening, and a pair of symmetric screw holes being disposed on said iron plate, and circular projection of said suction means engaging with said iron plate for attaching said suction means to said iron plate;
a ring element being disposed on top of said flared cup portion at the bottom of said candle body; and
a pair of projecting rods disposed at a concave bottom portion of said candle base and each having a screw hole for securing said rectangular iron plate to the projecting rods by means of a pair of screws for mounting of said suction means.

4,839,785
HEADLIGHT MOUNTING DEVICE
Kazutami Ohishi, Shizuoka, Japan, assignor to Koito Seisakusho Co. Ltd., Tokyo, Japan
Filed Jul. 12, 1988, Ser. No. 217,783
Claims priority, application Japan, Jul. 13, 1987, 62-174336
Int. Cl.[4] F21V 19/02
U.S. Cl. 362—418 **7 Claims**

1. A headlight mounting device for mounting a headlight on a body of a vehicle and including between the headlight and the body of the vehicle a stationary pivot means and two movable pivot means with each of the pivot means supporting pivotally the headlight at the location spaced apart from each

other, and one of said movable pivot means being movable in the vertical direction and the other movable pivot means being



movable in the horizontal direction, characterized in that these three pivot means are arranged generally in a common plane.

4,839,786

DC-DC CONVERTER

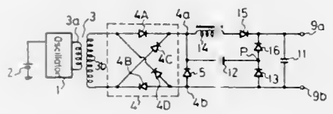
Ichirho Ohosuga, Tokyo, Japan, assignor to Minicam Research Corporation, Tokyo, Japan

Filed Oct. 7, 1988, Ser. No. 255,042

Claims priority, application Japan, Oct. 26, 1987, 62-163319[U]

Int. Cl.⁴ H02H *7/10*

U.S. Cl. 363—52 **3 Claims**



1. A DC-DC converter comprising

(a) oscillator means being oscillated by a dc power source;

(b) rectifying circuit means for rectifying an output signal from said oscillator means;

(c) fly-wheel diode means connected between a first output terminal of said rectifying circuit means and a second output terminal thereof;

(d) first series circuit means formed of capacitor means and first reverse-blocking diode means, said first series circuit means being connected between said first output terminal of said rectifying circuit means and said second output terminal thereof;

(e) second series circuit means formed of choke coil means and second reverse-blocking diode means, said second series circuit means being connected between said first output terminal of said rectifying circuit means and a first output terminal of the DC-DC converter;

(f) third reverse-blocking means connected between a junction of said capacitor means with said first reverse-blocking diode means and said first output terminal of said DC-DC converter, a second output terminal of said DC-DC converter being led out from said second output terminal of said rectifying circuit means; and

(g) smoothing capacitor means being connected between said first and second output terminal of said DC-DC converter.

4,839,787

INTEGRATED HIGH VOLTAGE GENERATING SYSTEM

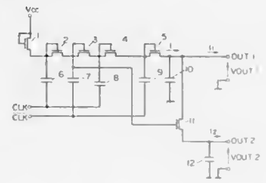
Makoto Kojima, Suita; Hirozumi Misaki, Takatsuki, and Yasuyuki Okada, Tkakatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 20, 1988, Ser. No. 197,448

Claims priority, application Japan, May 20, 1987, 62-122931

Int. Cl.⁴ H02J *11/00;* **H02M** *3/18*

U.S. Cl. 363—60 **9 Claims**



1. An integrated high voltage generating system comprising:

a charge pump composed of plural unit circuits, each of said plural unit circuits having a capacitor and a diode element, wherein one end of said capacitor is connected to an input end of said diode element in each of said plural unit circuits, and wherein each of said plural unit circuits represents a stage of said charge pump, and wherein said plural unit circuits are uniformly arranged according to a polarity of each diode element, and wherein an output end of said diode element of each preceding stage is sequentially connected to the input end of said diode element of each succeeding stage, whereby, when clock signals of mutually opposite phases are respectively applied to the other end of each capacitor of adjacent said plural unit circuits, an electric charge stored in said capacitor of each preceding stage is sequentially transferred to said capacitor of each succeeding stage, thereby raising a voltage level on a stage by stage basis;

a power supply input terminal connected to a first stage of said charge pump at said input end of said diode element of a first unit circuit;

a first power supply output terminal connected to a final stage of said charge pump at said output end of said diode element of a final unit circuit;

a second power supply output terminal; and

a first MOS transistor having source and drain electrodes connected between said first and second power supply output terminals, and having a gate electrode connected at the input end of any one of said plural unit circuits of said charge pump, wherein a voltage of said first power supply output terminal is stepped down according to a voltage applied to said gate electrode, and wherein said stepped down voltage is delivered to said second power supply output terminal.

4,839,788

BIPOLAR VOLTAGE TO FREQUENCY CONVERTER

Thomas R. Tullsen, San Jose, Calif., assignor to Dionex Corporation, Calif.

Filed Jan. 29, 1988, Ser. No. 150,139

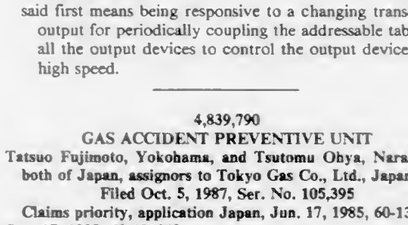
Int. Cl.⁴ H02M *7/02*

U.S. Cl. 363—63 **6 Claims**

1. A bipolar voltage to frequency converter comprising

a single integrator means responsive to a first bipolar input signal of varying voltage magnitude for generating a second signal representative of one polarity when said input signal has a positive polarity, and representative of another polarity when said input signal has a negative polarity,

first means responsive to said second signal only when having said one polarity for generating a pulsed signal corresponding to said positive polarity, and



second means responsive to said second signal only when having said another polarity for generating another pulsed signal corresponding to said negative polarity.

4,839,789

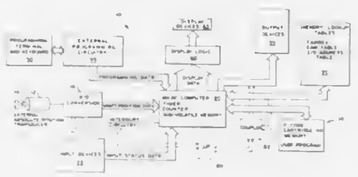
PROGRAMMABLE CONTROL DEVICE FOR HIGH SPEED PROCESSING OF DATA

Shalabh Kumar, Kildeer, and Duane Edgar, Schaumburg, both of Ill., assignors to Microfast Controls Corp., Carol Stream, Ill.

Continuation-in-part of Ser. No. 740,669, Jun. 3, 1985, Pat. No. 4,744,022. This application May 4, 1987, Ser. No. 46,229

Int. Cl.⁴ G06F *15/46*

U.S. Cl. 364—142 **52 Claims**



1. A programmable control device for controlling the outputs to a plurality of output devices relative to inputs from transducer means and input devices, said control device comprising:

first means for sequentially processing input data from said inputs relative to instructions in a user program,

second means for storing selected output data related to desired output states for different positions of the transducer means in addressable tables some of which have at least a portion of a changing transducer output as part of its address, and

said first means being responsive to a changing transducer output for periodically coupling the addressable tables to all the output devices to control the output devices at a high speed.

4,839,790

GAS ACCIDENT PREVENTIVE UNIT

Tatsuo Fujimoto, Yokohama, and Tsutomu Ohya, Narashino, both of Japan, assignors to Tokyo Gas Co., Ltd., Japan

Filed Oct. 5, 1987, Ser. No. 105,395

Claims priority, application Japan, Jun. 17, 1985, 60-131348; Jun. 17, 1985, 60-131349

Int. Cl.⁴ G01F *1/00;* **G05B** *13/02*

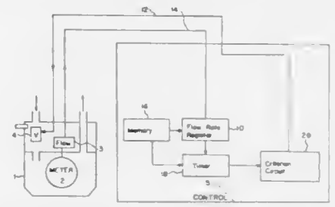
U.S. Cl. 364—184 **1 Claim**

1. A gas accident preventive unit for use with a plurality of gas consuming apparatuses, each gas consuming apparatus having a continuous service safety time and having a gas consumption volume per unit time which is used by that gas consuming apparatus, comprising;

a flow rate measuring unit for measuring the total flow rate per unit time of all gas consumed by all gas consuming apparatuses which are activated for consuming their respective gas consumption volumes;

an emergency shutoff valve for shutting off the flow of all gas being supplied to all gas consuming apparatuses and being responsive to a closed signal for closing the flow of gas; and

a control circuit means connected to said flow rate measuring unit for continuously receiving a flow rate value corresponding to the flow of all gas to all activated gas consuming apparatuses, for generating said closed signal and being connected to said emergency shutoff valve for applying said control signal to said emergency shutoff valve to close the flow of all gas to all gas consuming apparatuses, said control circuit comprising memory for storing the continuous service safety time for each gas



consuming apparatus, flow rate register means for receiving the flow rate value from the flow rate measuring unit and for identifying increases in the flow rate value which correspond to a gas consumption value of a newly activated gas consuming apparatus and for recognizing a decrease in the flow rate value corresponding to the gas consumption value of a newly deactivated gas consuming apparatus, timer means connected to said flow rate register means for initiating a timing period upon the sensing by the flow rate register means of a flow rate value corresponding to a gas consumption value of a gas consuming apparatus, said timer means continuing in response to said flow rate register means despite increases and decreases caused by the activation and deactivation of other gas consuming apparatuses, and criterion circuit means connected to said timer for generating said closed signal when said timer has indicated a time greater than the continuous service safety time for the gas consuming apparatus which is sensed to be activated by said flowrate register for closing said emergency shutoff valve.

4,839,791

INPUT/OUTPUT BUFFER SYSTEM

Koichi Ito, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 9, 1987, Ser. No. 23,620

Claims priority, application Japan, Mar. 8, 1986, 61-50932

Int. Cl.⁴ G06F *13/00*

U.S. Cl. 364—200 **5 Claims**

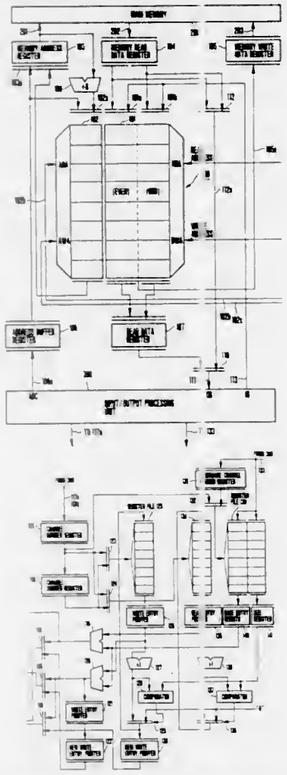
1. An input/output buffer system comprising:

a buffer memory connected between a main memory and an input/output processing unit having a plurality of physical channels, said buffer memory comprising an address area and a data area, all of said address and data areas being assigned to current physical channels, which are currently used, in said plurality of physical channels;

memory means connected to said input/output processing unit for storing start positions and capacities of said areas, which are to be assigned to said current physical channels, of said buffer memory and information relating to said

physical channels, said information representing data write and read positions in said areas of said buffer memory by relative values with respect to the start positions of said areas:

means connected to said memory means and said input/output processing unit for presetting in said memory means the start positions and capacities of said areas assigned to said current physical channels when said input/output buffer system is started up or modified; and



logic circuits connected to said buffer memory and said memory means for generating signals representing the data write and read positions for said buffer memory on the basis of a channel number supplied thereto and the start positions, the capacities and the information corresponding to the channel number in order to supply the signals to said buffer memory.

4,839,792

PORTABLE ELECTRONIC APPARATUS WITH A DEVICE FOR DETERMINING DATA VALIDITY

Yasuo Iijima, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 18, 1987, Ser. No. 63,653

Claims priority, application Japan, Jun. 20, 1986, 61-144113; Jun. 20, 1986, 61-144114

Int. Cl.[4] G06F *1/00*

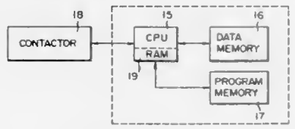
U.S. Cl. 364—200 **9 Claims**

1. A portable electronic apparatus comprising:

a contactor section connectable with a portable electronic apparatus handling system for transmitting a command for externally accessing said portable electronic apparatus;

storage means for storing a data string supplied from said portable electronic apparatus handling system;

reading means for reading out a data string from said storage means in response to a read instruction supplied from said portable electronic apparatus handling system;



appending means for appending information indicating whether the data string is valid or not to a start of the readout data string; and

outputting means for outputting the data string with said information appended thereto.

4,839,793

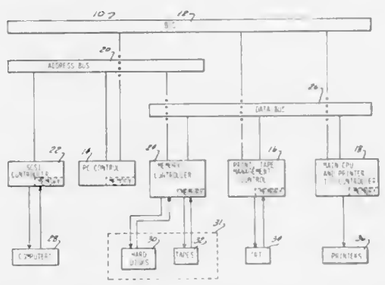
MULTIPLE COMPUTER INTERFACE

John L. Brunk, Brighton, Mich., assignor to Baytec, Inc., Livonia, Mich.

Filed Jul. 1, 1987, Ser. No. 68,946

Int. Cl.[4] G06F *15/16*

U.S. Cl. 364—200 **3 Claims**



1. A multiple computer interface for connecting a plurality of peripheral central processing units with a data communication network having a management control processing unit, a main memory and an I/O controller central processing unit, the multiple computer interface comprising:

a first controller central processing unit connected to the plurality of peripheral central processing unit for controlling data transferred to and from the plurality of peripheral central processing units;

a second control central processing unit, connected to the first controller central processing unit and having a memory and operating a stored control program, for controlling the transfer of data between the first controller central processing unit and the main memory; and

data communication bus means connected between the first controller central processing unit, the second control central processing unit and the main memory for data transfer therebetween.

4,839,794

PSEUDO-STATUS SIGNAL GENERATOR

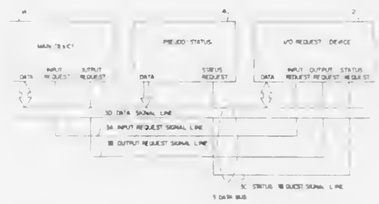
Makoto Okura, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 50,392, May 18, 1987, abandoned. This application Nov. 18, 1987, Ser. No. 122,131

Claims priority, application Japan, May 20, 1986, 61-113641

Int. Cl.[4] G06F *13/14*

U.S. Cl. 364—200 **3 Claims**



1. An electronic data transfer apparatus comprising:

a main device in which a ready state is always maintained connected to input and output data;

an input/output requesting device connected to said main device and controlling data input and output operations;

a data bus provided between said main device and said input/output requesting device to establish connection therebetween and transfer data; and

a pseudo-status signal generator interposed between said main device and said input/output requesting device and generating status signals representing ready and busy states of said main device in response to a status request from said input/output requesting device.

4,839,795

INTERFACE CIRCUIT FOR SINGLE-CHIP MICROPROCESSOR

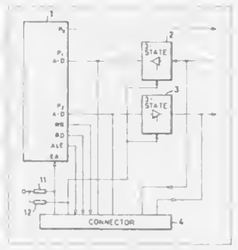
Masahiko Iwaksaki, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaishi, Tokyo, Japan

Filed Nov. 25, 1987, Ser. No. 125,151

Claims priority, application Japan, Nov. 26, 1986, 61-281504

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—200 **4 Claims**



1. An interface circuit for a microprocessor having internal ROM memory with a first program therein, control input means for selecting operation in first and second modes, said microprocessor in the first mode operating in accordance with the first program in internal memory, said microprocessor in the second mode operating in accordance with a second program in external memory, an address-data port which in the first mode is operable as a data input or output port and in the second mode is operable in a multiplexing mode alternately to output address signals and to input or output program instructions or data from external memory and memory mapped devices, the interface circuit comprising, comprising:

(a) an interface input and/or output port for functioning as the input and/or output port of the microprocessor;

(b) switch means connected between the address-data port of the microprocessor and the interface input and/or output port so as to control conduction or shutting-off of passage of signals between the address-data port of the microprocessor and the interface input and/or output port;

(c) connector means for connecting the address-data port of the microprocessor to external memory means, for connecting said control input means of the microprocessor to external circuitry to operate the microprocessor in the second mode, for connecting external circuitry which operates the switch means to shut-off passage of signals through the switch means, and for connecting an external I/O unit between the address-data port and the interface input and/or output port; and

(d) biasing means for operating the switch means to render the switch means conductive in the absence of the connection of the external switch means operating circuitry by the connector means.

4,839,796

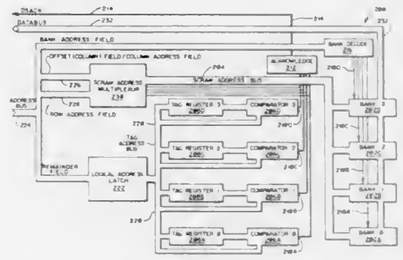
STATIC FRAME DIGITAL MEMORY

Randall J. Rorden, Orem; Ronald B. Arthur, Provo, and Mark Muhlestein, Orem, all of Utah, assignors to Icon International, Inc., Utah

Filed Jul. 16, 1987, Ser. No. 75,063

Int. Cl.[4] G06F *12/00*

U.S. Cl. 364—200 **56 Claims**



1. In a digital computer including a high speed address generating device, an address bus, and a data bus, a digital memory system for rapidly accessing and retrieving binary information, the binary information being organized into frames and words contained in the frames, the digital memory system comprising:

digital memory storage means comprising a plurality of memory arrays, each array comprising memory locations defined by a plurality of rows and columns by which individual locations in each array are addressable, corresponding rows from each array together providing storage for at least a portion of said frames, the digital memory storage means further comprising (a) row activation means for activating in response to a first row address presented on the address bus corresponding first rows storing at least a portion of one of said frames, and (b) column selecting means for selecting in response to a sequence of column addresses presented on the address bus a sequence of memory locations on the first rows and accessing the memory locations identified by the activated first rows and selected columns;

tag means for storing a row identification portion of a first

address presented on the address bus which identified and caused the activation of the first rows; and

comparator means for determining whether a second address presented on the address bus includes a row identification portion which is equivalent to the row identification portion stored in the tag means, the comparator means generating an acknowledge signal whenever the row identification portion of the second address is equivalent to the row identification portion stored in the tag means thereby allowing the binary information contained in the memory locations on the first rows and identified by a column address portion of the second address to be output by the memory storage means directly onto the data bus in response to the presentation of the second address.

4,839,797

MICROPROCESSOR COMPATIBLE WITH ANY SOFTWARE REPRESENTED BY DIFFERENT TYPES OF INSTRUCTION FORMATS

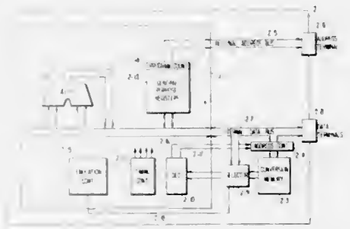
Shigetatsu Katori, and Yukio Maehashi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 25, 1985, Ser. No. 759,006

Claims priority, application Japan, Jul. 25, 1984, 59-154824

Int. Cl.[4] G06F *1/00*

U.S. Cl. 364—200 **10 Claims**



1. A microprocessor including a central processing unit capable of executing only instructions of a first type having a first bit length but incapable of executing instructions of a second type having a second bit length different from said first bit length which is different from said first type, said central processing unit having an instruction decoder for decoding only the instructions of the first type, said microprocessor further comprising:

receiving means for receiving an instruction of one of said first and second types which is indicative of a predetermined operation;

means for directly transferring the instruction indicative of said predetermined operation received by said receiving means only when said received instruction is of said first type;

conversion memory means provided outside said central processing unit for converting the received instruction of said second type indicative of said predetermined operation into an instruction of said first type indicative of said predetermined operation, said conversion memory means including storing means for storing instructions of said first type and applying means for applying at least a part of said instruction of said second type received by said receiving means to said storing means as an address for said storing means to thereby read out of said storing means at least one instruction of said first type indicative of said predetermined function; and

means provided outside said central processing unit for transferring the read-out instruction of said first type to said instruction decoder when the instruction received by said receiving means is of said second type, whereby the instruction of said second type indicative of a predetermined operation is converted to an instruction of said first type indicative of said predetermined operation through said conversion memory means and said central processing unit thereafter performs said predetermined operation.

4,839,798

METHOD AND APPARATUS FOR CONTROLLING JOB TRANSFER BETWEEN COMPUTER SYSTEMS

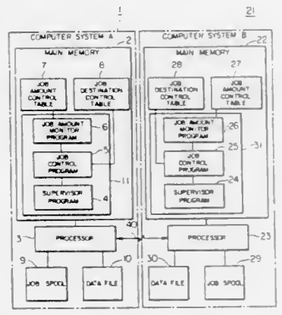
Hiroyoshi Eguchi; Norio Yamada; Itaru Kusuyama, and Chikara Saitou, all of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,463

Claims priority, application Japan, Nov. 7, 1984, 59-234472

Int. Cl.[4] G06F *15/16*

U.S. Cl. 364—200 **9 Claims**



1. A method for controlling a plurality of computer systems which are interconnected and operate respectively for processing jobs in a predetermined sequence, comprising the steps of:

(a) detecting, in one computer system, an amount of jobs to be processed in a predetermined sequence by that one computer system; and

(b) carrying out a job transfer between said one computer system and another computer system in accordance with the detected amount of jobs by transferring a job from a position in the sequence of jobs at the transferring to a receiving computer system computer system corresponding in time to a position following the last job in the sequence of jobs at the receiving computer system.

4,839,799

BUFFER CONTROL METHOD FOR QUICKLY DETERMINING WHETHER A REQUIRED DATA BLOCK IS IN THE BUFFER

Masami Takahashi; Eiji Tatsukawa, both of Yokohama; Shunichi Torii, Musashino, and Keiji Kojima, Kokubunji, all of Japan, assignors to Hitachi, Ltd. and Hitachi Computer Consultant, Ltd., both of Tokyo, Japan

Filed Jul. 24, 1986, Ser. No. 888,801

Claims priority, application Japan, Jul. 29, 1985, 60-167198; Jan. 9, 1986, 61-2773

Int. Cl.[4] G06F *12/06, 7/22*

U.S. Cl. 364—200 **8 Claims**

1. A method for controlling a buffer in a data processing system having a central processing unit (CPU), a main storage and a first storage wherein said first storage stores a plurality of data blocks, each data block having a plurality of recordings which are processed in a read or write operation of said CPU and said main storage stores location information indicating locations at which said data blocks are stored in said first storage, said buffer being provided in said main storage and coupled to a vector processor for buffering data blocks fetched from said first storage to said main storage for processing, said method comprising the steps of:

fetching desired data blocks from said first storage and storing said desired data blocks in said main storage;

providing a directory for data blocks stored in said main storage, said directory having pairs of an address of said main storage at which a data block is stored and location information indicating a location of said first storage at which said data block is stored; and

vectorially arranging said pairs of address and location information in said directory in a portion of said main memory in orders of magnitude of values of said location information, to enable rapid determination of whether said desired data block is in said buffer.

4,839,800

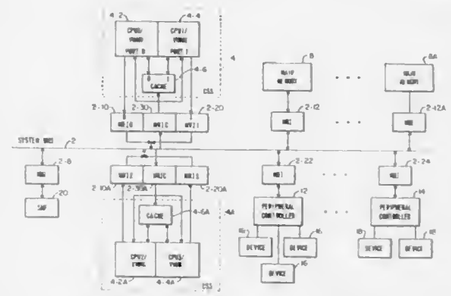
DATA PROCESSING SYSTEM WITH A FAST INTERRUPT

George J. Barlow, Tewksbury, Mass., and James W. Keeley, Nashua, N.H., assignors to BULL HN Information Systems Inc., Billerica, Mass.

Filed Aug. 29, 1986, Ser. No. 901,847

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—200 **12 Claims**



1. A data processing system wherein an emergency or top priority interrupt signal will by-pass a priority-level comparison to access an addressed processing unit, comprising:

a plurality of interrupting units and a plurality of processing units coupled in common to a system bus for asynchronously transferring commands between said plurality of interrupting units and each of said plurality of processing units during different bus cycles of operation, and further including:

command generating means coupled to said bus for applying commands to said bus during bus cycles of operation granted to said processing units, each of said commands including an address field coded to specify a channel number indicating an address of a processing unit to receive said command, said command further including a control field including a memory reference signal indicating that said address field is coded to specify said channel number, and an interrupt type signal in a first state specifying a normal interrupt or an interrupt type signal in a second state specifying a fast interrupt, said fast interrupt, second state signal by-passing a priority level comparison and directly accessing an addressed processing unit; channel decoder means coupled to said bus for generating an output signal upon detecting that said channel number is assigned to said processing unit and said memory reference signal has been applied to said bus by a respective one of said processing units;

logic array means coupled to said bus and said channel decoder means and responsive to said interrupt type signal in said second state specifying said fast interrupt, said output signal and a busy signal in a first state generated by a flip flop means for generating both a first acknowledge signal indicating that said processing unit is executing said command, and a set busy signal, said logic array means being further responsive to said interrupt type signal in said first state specifying said normal interrupt and said output signal for generating a compare signal;

comparison means coupled to said bus and said logic array means and responsive to said compare signal, said comparison means comparing a current interrupt priority level with a priority level of a command already being executed by a processing unit, and in response thereto, generating a second acknowledge signal if said current interrupt priority level is greater than said executed command interrupt priority level and generating a second not acknowledge signal if said current interrupt priority level is not greater than said executed command interrupt priority level;

busy means coupled to said bus and said logic array means and including said flip flop means responsive to an address signal included in said command and said set busy signal for generating said busy signal in a second state;

said logic array means being further coupled to said bus, said channel decoder means and said busy means and responsive to said interrupt type signal in said first state, said output signal from a subsequent command and said busy signal in said second state for generating a first not acknowledge signal indicating that said processing unit is not executing said command; and

response means coupled to said logic array means and said bus and responsive to said first acknowledge signal for sending an acknowledge response signal to said interrupting unit associated with said fast interrupt signal, and responsive to said first not acknowledge signal for sending a not acknowledge response signal to said interrupting unit associated with said normal interrupt signal, said response means further coupled to said comparison means and said bus and responsive to said second acknowledge signal for generating a second acknowledge response signal, and responsive to said second not acknowledge signal for generating a second not acknowledge response signal.

4,839,801

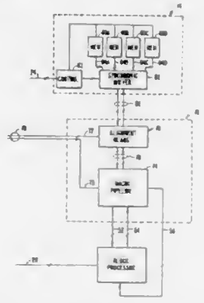
ARCHITECTURE FOR BLOCK PROCESSING COMPUTER SYSTEM

Mark C. Nicely, Mountain View; Ronald Leavitt, San Jose; Joel Mannion, Sunnyvale, all of Calif.; Rob Schreiber, Latham, N.Y.; Gary R. Lang, Saratoga, Calif.; Robert L. Papenberg, San Jose, Calif., and Joseph E. Straub, San Jose, Calif., assignors to Saxpy Computer Corporation, Sunnyvale, Calif.

Filed Nov. 3, 1986, Ser. No. 926,764

Int. Cl.[4] G06F *3/00, 13/12, 15/347, 9/22*

U.S. Cl. 364—200 **32 Claims**



1. A computing system for performing externally-specified mathematical operations on externally-specified subarrays of an array of data words stored in a system memory (SMEM) having a memory I/O port, the system comprising:

(a) a system bus, said system bus being coupled to the mem-

ory I/O port for transmitting data words to and from the SMEM;

(b) alignment means, said alignment means being coupled to said system bus for controllably selecting data words from said system bus;

(c) block processing means for performing a block operation on at least one computational block of data words, said block processor means comprising a set of processors and block storage means for storing said at least one computational block of data words, said block processing means being coupled to said alignment means.

(d) decomposition and control means for receiving an externally-supplied command packet specifying the location of at least one subarray in said SMEM and specifying an operation to be performed on said at least one specified subarray, for defining computational blocks of data words from said at least one specififfed subarray, for decomposing said operation into a series of block operations on said defined computational blocks, and for generating control and address signals to control and configure said SMEM to perform, at a burst transfer rate, at least one burst transfer of a plurality of data words onto said system bus, including the words contained in a first one of said defined computational blocks, and to control and configure said alignment means to select the words contained in said first defined computational block from said burst transferred plurality of data words on said system bus, and to control and configure said block processing means to transfer said selected words of said first defined computational block to selected storage locations of said block processing means, and to perform a first one of said series of block operations on said first defined computational block, said decomposition and control means being operatively coupled to said SMEM, said alignment means, and said block processing means.

4,839,802

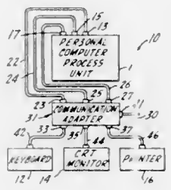
ADAPTATION OF COMPUTER TO COMMUNICATION OPERATION

Daniel C. Wonak, Wheeling; Steven J. Butz, Crystal Lake, and William A. Miller, II, Palos Hills, all of Ill., assignors to Extel Corporation, Northbrook, Ill.

Filed Nov. 19, 1986, Ser. No. 932,472

Int. Cl.[4] G06F 3/00

U.S. Cl. 364—200 **21 Claims**



1. A communication adapter for adapting a computer for operation as an intelligent telecommunication transceiver without modification of the hardware or software of the computer, the computer comprising a computer process unit, including a data store, connected to computer accessory units including a keyboard, a monitor, and a printer, the communication adapter comprising:

computer port means, including a keyboard port, a monitor port, and a printer port, for connecting the adapter to the computer process unit;

accessory port means, including a keyboard port, a monitor port, and a printer port, for connecting the adapter to the computer accessory units;

a communication port for connecting the adapter to a telecommunication circuit;

data storage means for storing data signals and actuation signals received through the accessory keyboard port, the communication port, and one of the computer printer and monitor ports;

transmission logic means for supplying data signals from the data storage means to the communication port;

accessory logic means for supplying data signals from the data storage means to the accessory printer and monitor ports;

program storage means for storing operating programs for the communication adapter; and

microprocessor control means operatively interconnected with all of the port means, both of the logic means, and both of the storage means, for controlling operation of the adapter in two basic modes:

A. a computer mode in which data is interchanged freely between the accessory units and the computer process unit so that the computer process unit and the computer accessory units all function as if the adapter were not present, and

B. a communication mode in which data is interchanged freely between the computer accessory units and the communication port so that the adapter and the computer accessory units function as if the computer process unit were not present;

the data storage means and the logic means remaining active to receive and store signals from the communication port and to transmit pre-recorded signals from the data storage means through the communication port when the adapter is in its computer mode of operation; and

the control means being responsive to signals from the keyboard, in both modes, for actuation of the adapter between its computer and communication modes of operation.

4,839,803

PLANNING SUPPORT METHOD AND SYSTEM

Kazuhiro Kawashima, Yokohama; Norihisa Komoda, Kawasaki; Shunichi Harada, Yokohama; Sadamichi Mitsumori, Hachioji, and Kouichi Taniguchi, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 10, 1987, Ser. No. 84,514

Claims priority, application Japan, Sep. 5, 1986, 61-207870; Apr. 10, 1987, 62-86852

Int. Cl.[4] G06F 15/21

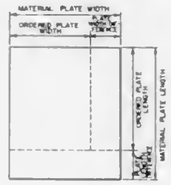
U.S. Cl. 364—403 **20 Claims**

1. A planning support system comprising:

planning logic storage means, for storing a planning logic described without regard to a preparation sequence of a plan;

logic conversion means for converting said planning logic into a planning program for the preparation of the plan; and

planning means for preparing the plan in a desired sequence on the basis of said planning program and previously



prepared planning information from a planning information storage means for storing planning information.

4,839,804

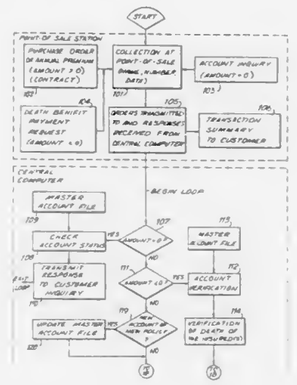
METHOD AND APPARATUS FOR INSURING THE FUNDING OF A FUTURE LIABILITY OF UNCERTAIN COST

Peter A. Roberts, and John D. Finnerty, both of New York, N.Y., assignors to College Savings Bank, Princeton, N.J.

Filed Dec. 30, 1986, Ser. No. 947,614

Int. Cl.[4] G06F 15/21

U.S. Cl. 364—408 **66 Claims**



1. A data processing system for administering an insurance program to insure, upon the death of a prospective purchaser of a floating rate zero coupon note, the availability of financial means for purchasing the floating rate zero coupon note, said note being issued by an issuer and designed to fully fund a future liability whose projected due date and whose present cost are known but whose future cost is unknown but can be projected with some risk factor, said system comprising:

means for issuing into a floating rate zero coupon note purchase insurance account a periodically renewable term life insurance policy to insure the availability of financial means to purchase a floating rate zero coupon note having a scheduled maturity date to fund the purchase of a particular service or commodity, each said prospective purchaser holding at least one policy in said floating rate zero coupon note purchase insurance account;

account list means for storing an account list of current information for each floating rate zero coupon note purchase insurance account into which said issuing means has issued a policy;

means for entering insurance purchase, periodic premium payment, and death benefit payment request data and customer inquiries;

means responsive to said entering means and operating on said account list means for processing periodically said insurance purchase, periodic premium payment, and death benefit payment request data to update said account list;

means responsive to a death benefit payment request entered through said entering means for calculating the amount of the death benefit payable upon the death of the insured to at least one designated beneficiary account;

means responsive to said issuing means for establishing the schedule of periodic premiums to be charged for said insurance based on a projected death benefit payment, type of life insurance policy selected, sex of the insured, age of the insured, and risk profile of the insured wherein the projected death benefit payment under said life insurance policy is determined on the basis of maturity of the floating rate zero coupon note cost of the service or commodity at time of purchase, current and forecasted future rate of escalation in the cost of the service or commodity, current and forecasted general inflation rates, projected yields available on investment instruments, the floating rate zero coupon note issuer's risk premium, and the floating rate zero coupon note issuer's target profit margin, said schedule including a premium payment grace period;

means for drawing automatic premium loans to make a premium payment at the end of the premium payment grace period;

asset position list means for storing an asset position list of current information concerning a portfolio of investments purchased with insurance policy premiums and interim investment cash flows;

portfolio management means for selecting portfolio of securities and updating said asset position list periodically, based on an amount of cash that is available for investment, current composition of the asset portfolio, projected cash need for the following period, projected aggregate floating rate zero coupon note purchase insurance liability schedule, and predefined portfolio selection criteria, in order to generate a stream of cash flows from the asset portfolio that will be sufficient to cover in full in a timely manner the cost of meeting death benefit payment obligations;

means for recording the selected security purchase and sale transaction data to update the asset position list;

management reporting means responsive to said issuing means, said account list means, said entering means, said processing means, said portfolio management means and said recording means for periodically generating a report including a summary of insurance purchases, periodic premium payments, and death benefit payment transactions, asset and liability position, and investment performance;

investor billing and reporting means responsive to said schedule establishing means and said account list means

for sending policy holders periodic premium notices and status reports of their accounts; and

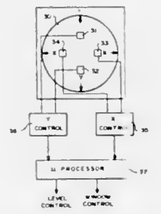
transaction and inquiry reporting means responsive to said entering means, said account list means, said schedule establishing means and said invoicing or billing and reporting means for confirming individual transactions and responding to inquiries from customers.

4,839,805

DUAL CONTROL OF IMAGE LEVEL AND WINDOW PARAMETERS OF A DISPLAY AND THE LIKE

Phil E. Pearson, Jr., Milwaukee, and Arthur K. Collins, Waukesha, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 17, 1983, Ser. No. 552,665
Int. Cl.[4] G05G *9/00*; H03K *29/00*
U.S. Cl. 364—413.14 **6 Claims**



2. Apparatus for controlling image level and window parameters in a computed tomography display comprising:

a trackball including an X encoder for generating an X count in response to rotation of said trackball along an X axis and including a Y encoder for generating a Y count in response to rotation of said trackball along a Y axis, and

control means responsive to rotation of said trackball for controlling said level and window parameters,

said control means responsive to rotation of said trackball within a first band including said X axis and to counts generated in response thereto for controlling one of said parameters,

said control means responsive to rotation of said trackball within a second band including said Y axis and to counts generated in response thereto for controlling the other of said parameters, and

said control means responsive to rotation of said trackball within a third band for inhibiting change in said parameters, said third band being positioned between said first band and said second band.

4,839,806

COMPUTERIZED DISPENSING OF MEDICATION

Jerome D. Goldfischer, 199 Charlotte Pl., Englewood Cliffs, N.J. 07632; Michael Smith, 86 Harriet Ave., Bergenfield, N.J. 07621, and Harvey Goldfisher, 161 E. 38th St., New York, N.Y. 10016

Filed Sep. 30, 1986, Ser. No. 913,734
Int. Cl.[4] G06F *15/42*
U.S. Cl. 364—413.02 **84 Claims**

1. A method for dispensing medication comprising the steps of:

storing, for each patient, patient information such as the name of the patient which is relevant to the dispensing of medication;

storing, for each patient, medication information which is directly required for the dispensing of medication including a plurality of prescribed drugs and corresponding respective dosages, frequency for administering each of the plurality of prescribed drugs, time period and dates during which a prescription order for each drug is valid, and conditions relevant to dispensation of a particular medication to a particular patient under particular circumstances;

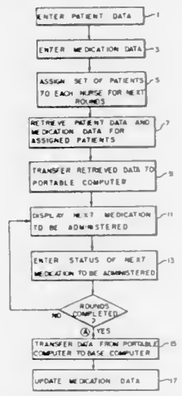
said patient information and said medication information for a plurality of patients being stored into a memory of a stationary base computer;

retrieving from said memory at least some of said patient information and said medication information for, respectively, designated ones of said plurality of patients;

transferring said retrieved patient information and said retrieved medication information to a portable computer adapted to be carried by as nurse assigned the task of dispensing medication to said designated patients;

inputting the data and time of a medication dispensing rounds;

identifying patients from among the designated patients and the prescribed drugs scheduled to be dispensed thereto



during said rounds by processing with the portable computer the retrieved patient and medication information transferred to the portable computer through selection of information based at least on the time of said rounds along with the frequency, time period and date medication information; and

for each of the identified patients, in sequence, displaying the processed information to said nurse in the form of only that medication information required by the nurse to identify the drugs scheduled to be dispensed during said rounds and the corresponding relevant conditions;

whereby, for said rounds, the nurse is sequentially apprised of all patients assigned to said nurse, all medications scheduled for dispensing to each of the assigned patients, and all the conditions relevant to the respective dispensation of each medication to each patient under particular circumstances.

4,839,807

METHOD AND SYSTEM FOR AUTOMATED CLASSIFICATION OF DISTINCTION BETWEEN NORMAL LUNGS AND ABNORMAL LUNGS WITH INTERSTITIAL DISEASE IN DIGITAL CHEST RADIOGRAPHS

Kunio Doi, Willowbrook, and Shigehiko Katsuragawa, Clarendon Hills, both of Ill., assignors to University of Chicago, Chicago, Ill.

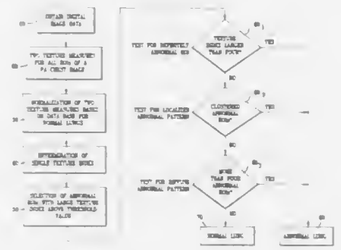
Continuation-in-part of Ser. No. 81,143, Aug. 3, 1987. This application Nov. 27, 1987, Ser. No. 126,847
Int. Cl.[4] G06F *15/42*
U.S. Cl. 364—413.13 **46 Claims**

1. A method for automated classification of distinction between normal and abnormal lungs with interstitial disease in digital chest radiographs, comprising:

sampling plural regions of interest (ROIs) of a subject digital radiograph;

producing digital data indicative of the texture of each of said ROIs;

determining from the digital data of each selected ROI texture measures indicative of the lung texture of the respective ROIs;



normalizing the texture measures determined in said determining step in relation to predetermined characteristics derived from a data base of normal lungs; and

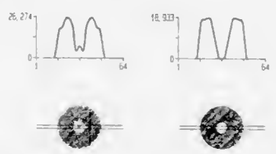
processing normalized texture measures obtained in said normalizing step to determine based on predetermined criteria whether or not a lung image of the subject digital radiograph is normal or abnormal.

4,839,808

CORRECTION FOR COMPTON SCATTERING BY ANALYSIS OF ENERGY SPECTRA

Kenneth F. Koral; W. Leslie Rogers, and Neal H. Clinthorne, all of Ann Arbor, Mich., assignors to The University of Michigan, Ann Arbor, Mich.

Filed May 22, 1987, Ser. No. 53,242
Int. Cl.[4] G01T *1/161*
U.S. Cl. 364—413.24 **13 Claims**



1. A method of reducing the effects of Compton scattered photons detected in a gamma ray detection arrangement, the method comprising the steps of:

receiving data responsive to energy states of the detected photons and storing said data in memory locations corresponding to predetermined image grid points;

calibrating the gamma ray detection arrangement by acquiring a spectral shape corresponding to a calibration function which is expected to correspond to a first data set corresponding to unscattered ones of the detected photons;

processing said stored data for at least selected ones of said predetermined grid points for separating said stored data into said first data set corresponding to unscattered ones of the detected photons and a second data set corresponding to scattered ones of the detected photons;

summing said first data set for each of said selected ones of said predetermined grid points for determining a number of said unscattered ones of said detected photons; and

forming an image utilizing said number of said unscattered ones of said detected photons.

10. A method of reducing the effects of Compton scattered photons detected in a gamma ray detection arrangement, the method comprising the steps of:

receiving data responsive to energy states of detected photons and storing said data in memory locations corresponding to a predetermined number of image grid points;

summing said stored data for each of said predetermined number of image grid points for determining a total number of said detected photons;

grouping said stored data, whereby a coarser grid having fewer image grid points is produced;

processing said data corresponding to said image grid points on said coarser grid for separating said stored data into a first data set corresponding to unscattered ones of said detected photons and a second data set corresponding to scattered ones of said detected photons;

summing said second data set for each of said predetermined grid points on said coarser grid for determining a number of said scattered ones of said detected photons;

interpolating from said second data set for each of said predetermined grid points on said coarser grid for producing a data set corresponding to said scattered ones of said detected photons for each of said predetermined number of grid points;

subtracting said data set corresponding to said scattered ones of said detected photons for each of said predetermined number of grid points from said total number of said detected photons, to produce at each of said predetermined number of grid points a data set corresponding to unscattered ones of said detected photons; and

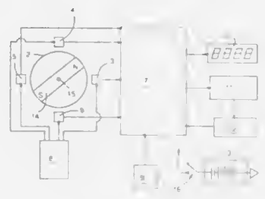
forming an image utilizing said number of said unscattered ones of said detected photons.

4,839,809

MAGNETIC PERSONAL TURNING MONITOR

Stephen B. Leighton, 93 Jefferson Ave., Maplewood, N.J. 07040, and John A. Tenney, 5907 Wood Acres Dr., Bethesda, Md. 20816

Filed Aug. 4, 1987, Ser. No. 83,947
Int. Cl.[4] A61B *5/10*; G06F *15/42*
U.S. Cl. 364—413.02 **5 Claims**



1. A magnetic personal turning monitor comprising

compass means for generating electronic signals which are determined by the direction that said monitor is pointed relative to the earth's magnetic field

signal comparing means for comparing successive signals and computing which direction said device is being turned;

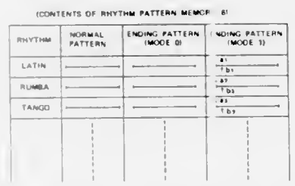
summing means for totalizing the number of turns, half turns and quarter turns both clockwise and counterclockwise independently; means for displaying the totals of said turns; and means for resetting said signal comparing means and summing means.

4,839,810

AUTOMATIC RHYTHM PERFORMANCE APPARATUS HAVING ENDING PERFORMANCE FUNCTION

Yasunao Abe, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Apr. 28, 1988, Ser. No. 187,283
Claims priority, application Japan, May 29, 1987, 62-133845
Int. Cl.[4] G01H *1/12*
U.S. Cl. 364—419 7 Claims



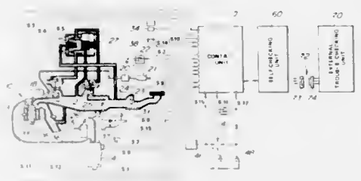
1. An automatic rhythm performance apparatus having ending performance function comprising:
(a) an ending manipulation member for commanding an ending performance to be executed;
(b) judging means for judging whether said ending manipulation member is manipulated before or after a set timing within one bar;
(c) ending start control means for controlling a start timing of said ending performance based on a judgment result of said judging means, said ending start control means starting said ending performance at a timing which advances by a predetermined timing from a start timing of a next bar when said ending manipulation member is manipulated before said set timing, said ending start control means starting said ending performance at said start timing of the next bar when said ending manipulation member is manipulated after said set timing; and
(d) ending performance means for executing said ending performance based on a predetermined ending pattern from a start timing determined by said ending start control means.

4,839,811

AUTOMOTIVE VEHICLE TROUBLE CHECKING APPARATUS

Hidetoshi Kanegae, Tokyo; Minoru Tomikashi, and Akira Hino, both of Kanagawa, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Sep. 21, 1987, Ser. No. 98,868
Claims priority, application Japan, Sep. 22, 1986, 61-222150
Int. Cl.[4] G06F *15, 20*
U.S. Cl. 364—424.03 3 Claims



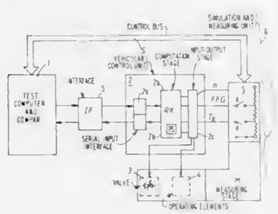
1. A trouble checking apparatus for use with an automotive vehicle having a plurality of means for controlling the automotive vehicle, and sensors sensitive to conditions of the automotive vehicle for producing sensor signals indicative of parameters reflective of the sensed conditions, comprising:
a control circuit responsive to the sensor signals for calculating values corresponding to settings of the means for controlling the automotive vehicle, the calculating being performed repetitively at uniform intervals from a relationship between the sensed condition and each of the means for controlling the automotive vehicle, the control circuit including means for converting the calculated values into settings of the corresponding means for controlling the automotive vehicle;
a self-checking unit connected to the control circuit for checking the sensor signals applied to the control circuit to provide a self-checking code indicative of a cause of trouble in the automotive vehicle; and
an external trouble checking unit connected through a detachable connector to the self-checking unit for utilizing the sensor signals fed to the control circuit and the self-checking code to find a cause of trouble in the automotive vehicle.

4,839,812

METHOD AND SYSTEM FOR TESTING INTERNAL COMBUSTION ENGINE COMPUTERIZED CONTROL UNITS

Claus-Dieter Nusser, Schwieberdingen, and Johannes Locher, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 16, 1987, Ser. No. 97,534
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1986, 3632569
Int. Cl.[4] G06F *15/20;* G05B *15/02*
U.S. Cl. 364—424.04 22 Claims



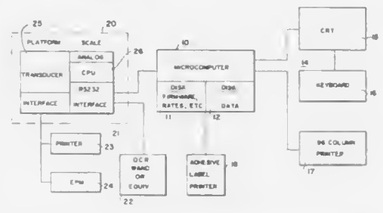
15. Testing system for testing an electrical computerized vehicular control unit (2) for proper operation,
said system including a test group (1, 1*a*, B, 6, S, M) and a vehicular control unit (2), wherein
said test group includes a test computer (1) and a simulation and measuring unit (6),
said test computer (1) being connected (B) to and controlling the simulation and measuring unit (6) for selective sequential transfer of signals to the vehicular control unit (2); and
an interface unit (IF, 5) connecting the test computer (1) to the vehicular control unit (2);
said vehicular control unit comprising a physically sealed integral structure having within said structure
a computation stage (2*b*) including a program store (PS, 2*b'*) which stores
(a) an operating program (OP) for controlling operation of elements of the vehicle, and
(b) a test program for testing operation of the control unit,
said vehicular control unit (2) having input terminals (13, 14, 15) for receiving input signals (n, FFG, T_K) representative of operating parameters of the vehicle, output terminals (16, 17, 18, 19) providing output signals for operating elements (3, 4) of the vehicle, and test input/output terminals (11, 12) for communicating signals between the vehicular control unit (2) and the interface (5) connected to the test computer (1),
said stimultation and measuring unit (6) of the test group comprising
a simulation stage (S) and a measuring stage (M),
said simulation and measuring unit being connected to at least said input terminals (13–15) of the vehicular control unit and generating signals simulating, selectively, different operating conditions and parameters of the vehicle for evaluation of said simulating signals in the vehicular control unit,
the vehicular control unit transferring signals representative of at least one of: data from the control unit (2); evaluated signals to at least one of: the test computer (1); the measuring stage (M); and
wherein the test computer includes means for checking said transferred computed values against standard, desired values and providing an output representing agreement or disagreement between the transferred computed values and standard or desired values.

4,839,813

COMPUTERIZED PARCEL SHIPPING SYSTEM

Karen F. Hills, Norwalk, and Paul H. Mitchell, Danbury, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 24, 1985, Ser. No. 790,712
Int. Cl.[4] G06F *15/22*
U.S. Cl. 364—464.03 14 Claims



1. A method of controlling a computer system to handle transactions, each related to one of a plurality of subjects and having one of a plurality of statuses; comprising the steps of:
(a) creating a file of records;
(b) reserving selected records of said file for a plurality of first and a plurality of second counters, wherein each of said subjects corresponds to one of said first counters and with one of said second counters;
(c) recording transactions in separate, unreserved records on said files;
(d) recording the number of said recorded transactions having a first status and relating to a selected one of said subjects in a one of said first counters corresponding to said particular subject; and,
(e) recording the number of said recorded transactions related to said particular subject in a one of said second counters corresponding to said particular subject.

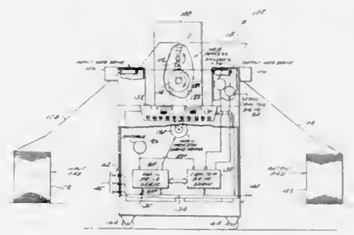
4,839,814

SIZE INDEPENDENT MODULAR WEB PROCESSING LINE AND MODULES

Leonard R. Steidel, Grand Island, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Continuation-in-part of Ser. No. 695,963, Jan. 29, 1985, Pat. No. 4,648,540, which is a continuation-in-part of Ser. No. 675,149, Nov. 27, 1984, abandoned. This application Nov. 27, 1985, Ser. No. 802,346
Int. Cl.[4] G06F *15/46;* B65H *20/24*
U.S. Cl. 364—469 47 Claims

1. A web processing module comprising:
web processing means for effecting a predetermined web process;
web driving means for transporting a web relative to said web processing means; and
electrically programmable web drive control means connected to the drive means to control the web motion by control of the drive means in accordance with a program that enables variation in web movement between successive process operations to alter the distances between successive process operations.

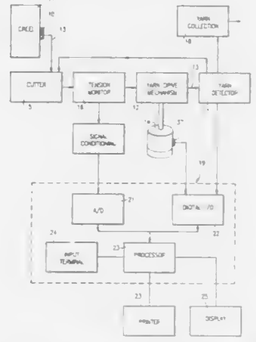


4,839,815

YARN PACKAGE OFFTAKE PERFORMANCE MONITORING

David C. Eaton, Buxton, and Christopher J. Lawrence, Macclesfield, both of England, assignors to Rieter Scragg Limited, Macclesfield, England

Continuation-in-part of Ser. No. 806,814, Dec. 10, 1985, abandoned. This application Aug. 3, 1987, Ser. No. 80,664
Claims priority, application United Kingdom, Jan. 19, 1985, 8501403
Int. Cl.[4] B65H *63/00;* G06F *15/46*
U.S. Cl. 364—470 20 Claims



1. A method of monitoring yarn package offtake performance comprising the steps of:
withdrawing yarn under tension from a package;
measuring the tension of said yarn at predetermined time intervals for a predetermined period of time, to obtain tension measurements;
including maximum and minimum tension measurements, during said step of withdrawing, to obtain a tension distribution; and
successively updating said obtained tension distribution with each tension measurement obtained.

4,839,816

LUMBER CUTTING SYSTEM

Thomas J. Cattrall, 7600 Seawood Rd., SE., Amity, Oreg. 97101, and Richard E. Lord, 1240 Calapooia St., Albany, Oreg. 97321

Filed Jun. 2, 1987, Ser. No. 56,957
Int. Cl.[4] B27B *1/00*
U.S. Cl. 364—474.09 8 Claims

1. A method for optimizing the board configuration from a flitch wherein specified rules determine the percentage of wane area permitted for the board, which comprises;

scanning a flitch to generate data determining the profile of the leading and trailing side edge lines of the minor face of the flitch and the relationship of one side edge line to the other,

entering the data into a computer,

determining the coordinates of each edge line at designated increments along the longitudinal length of the flitch,

as between each adjacent set of coordinates along an edge line, determining the lateral and longitudinal dimensions and treating the included rectangles defined by the lateral and longitudinal dimensions as consisting of equal triangles, one representing surface area and the other representing wane area,

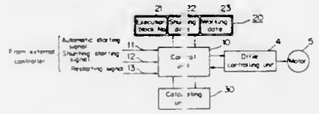
computing the lateral position of a longitudinal straight line as a selected board edge line that includes determining the percentage of wane area determined from the accumulated included rectangles relative to the total proposed designated area that satisfies a designated wane area percentage rule.

4,839,817

NUMERICALLY CONTROLLED APPARATUS INCLUDING SHUNTING CONTROLLER

Akihiko Fujimoto, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 7, 1987, Ser. No. 70,494
Claims priority, application Japan, Jul. 9, 1986, 61-159557
Int. Cl.[4] G05F *19/18*
U.S. Cl. 364—474.32 2 Claims



1. A numerically controlled apparatus for machining a workpiece with a tool, comprising:

memory means for storing a control program and a machining program;

calculating means for performing numerical calculations based at least on the machining program to produce numerical data;

drive controlling means for controlling drive means for driving said tool in response to said numerical data from said calculating means;

central controlling means for interpreting said machining program and then outputting corresponding transfer commands to said drive controlling means;

wherein said memory means includes,

a first memory section for storing an execution block number which is currently being executed and execution block numbers which have been executed,

a second memory section for storing machining data of said execution block number which is currently being executed,

a third memory section for storing shunting data which is used for shunting when the machining of said workpiece is interrupted, and

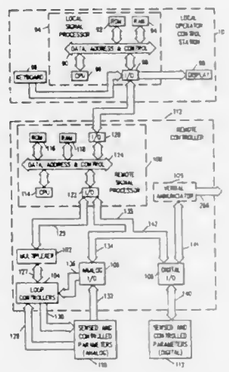
said central controlling means controlling said drive controlling means, comprising means for interrupting in response to a shunting signal, on the basis of the contents of said first memory section, said second memory section, and said third memory section, the execution block currently being executed and for causing the tool to be shunted to a shunting position specified by said shunting data in a sequence in which each one of the instructions of the execution block interrupted and of the execution blocks which have been executed is executed in a reversed sequence of the normal machining sequence.

4,839,818

MAGNET WIRE OVEN CONTROL APPARATUS

James L. Phillips, Fort Wayne, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Sep. 25, 1987, Ser. No. 101,325
Int. Cl.[4] G06F *15/46, 15/16*
U.S. Cl. 364—477 3 Claims



1. Apparatus for controlling a plurality of sensed parameters comprising:

an operator control station for locally controlling a system having a local signal processor, a keyboard and a display, said local signal processor responsive to operator input signals received via said keyboard for providing setpoint signals at an output of said operator control station; and

a remote controller, comprising:

a remote signal processor, responsive to said setpoint signals from said operator control station for conditioning said setpoint signals and for providing said conditioned setpoint signals at an output of said remote signal processor and for providing multiplexer channel select signals at an output of said remote signal processor;

a multiplexer responsive to said conditioned setpoint signals and to said channel select signals for providing said conditioned setpoint signals on selected output channels of said multiplexer; and

a plurality of loop controllers, each responsive to a selected one of said conditioned setpoint signals provided on a selected output channel of said multiplexer and responsive to a selected one of a second plurality of sensed analog signals for comparing the magnitude of said selected conditioned setpoint signal to the magnitude of said selected sensed analog signal and for providing an output analog control signal for controlling a parameter to a value indicated by the magnitude of said conditioned setpoint signal,

said multiplexer being responsive to a plurality of output analog control signals and to said conditioned setpoint signals from said plurality of loop controllers for routing said output analog control signals and said conditioned setpoint signals to said remote signal processor for storage therein,

said remote signal processor conditioning said output analog control signals and reconditioning said conditioned setpoint signals and for providing said conditioned output analog control signals and said reconditioned setpoint signals at an output of said remote signal processor,

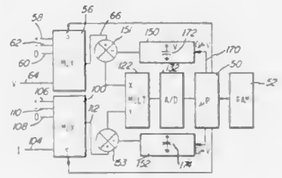
said operator control station's local signal processor responsive to said conditioned analog control signals and to said reconditioned setpoint signals for providing said conditioned analog control signals and said reconditioned setpoint signals to said display for display thereof.

4,839,819

INTELLIGENT POWER MONITOR

John D. Begin, Warren; James E. Berry, Royal Oak, and Paul D. Kretzmer, Oak Park, all of Mich., assignors to CTE Valeron Corporation, Troy, Mich.

Filed Aug. 14, 1986, Ser. No. 896,416
Int. Cl.[4] G06F *15/46;* G01R *7/00*
U.S. Cl. 364—483 22 Claims



1. Apparatus for measuring energy used by an electrical load, said apparatus comprising:

analog circuit means for providing electrical analog signals related to the energy used by the load, said analog circuit means including:

a first multiplexer having a plurality of inputs and an output, a first input being coupled to the load, a second input being coupled to a source of positive reference voltage, a third input being connection to a source of negative reference voltage, and a fourth input being connected to a substantially zero voltage source;

second multiplexer means having a plurality of inputs and an output, a first input being connected to the laod, a second input being connected to a source of positive reference voltage, a third input being connected to a source of negative reference voltage, and a fourth input being connected to a substantially zero reference voltage source; and

a multiplier having first and second inputs and an output, the first input of the multiplier being connected to the output of the first multiplexer, with the second input of the multiplier being connected to the output of the second multiplexer;

analog to digital converter means coupled to the output of the multiplier for converting said analog signal to a digital representation thereof;

digital processor means coupled for receipt of the digital representation from the converter means, said processor serving to select which inputs of the multiplexers are coupled to the outputs thereof, said processor in one mode of operation causing the first inputs of the first and second multiplexers to be coupled to the outputs thereof whereby the digital representation from the converter means is related to energy consumed by the load, with said processor means periodically selecting the second, third and fourth inputs of the first and second multiplexers in a predetermined sequence in a calibration mode of operation; and

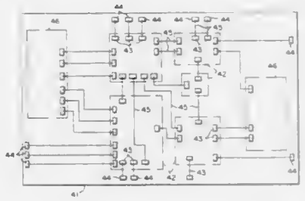
bidirectional communication means coupled to the digital processor means for providing two way communication between the processor and an external computer.

4,839,820

MONOLITHIC SEMI-CUSTOM LSI

Tsuneo Kinoshita, and Kazuyuki Sato, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 1, 1985, Ser. No. 750,472
Claims priority, application Japan, Jul. 2, 1984, 59-136940
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—491 4 Claims



1. A semi-custom large scale integration circuit comprising:

a substrate;

a plurality of macrocells formed in said substrate each having bonding pads and each including a plurality of individual customized bulk semiconductor elements arranged in conventional independent LSI mask patterns and interconnected by a first layer of wiring connected to said bonding pads, said macrocells having different sets of operating characteristics;

glue circuit means for converting said sets of operating characteristics to permit interactive operation of said plurality of macrocells, said glue circuit means comprising a plurality semi-custom integrated circuits formed in said substrate of a plurality of standard cells arranged in a array; and

a second layer of wiring interconnecting said macrocells and said glue circuit means so as to provide for operation of said large scale integration circuit.

4,839,821

AUTOMATIC CELL-LAYOUT ARRANGING METHOD AND APPARATUS FOR POLYCELL LOGIC LSI

Masami Murakata, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 23, 1986, Ser. No. 945,854
Claims priority, application Japan, Feb. 25, 1986, 61-39527
Int. Cl.[4] G06F *15/60*
U.S. Cl. 364—491 6 Claims

4. A method for automatically designing a cell-layout of a

semiconductor logic LSI device having standard cells, on a chip substrate, said method comprising the steps of:

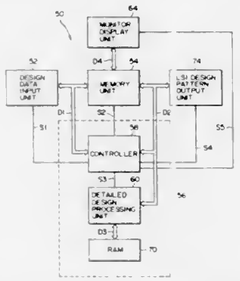
(a) inputting design data including an object function and cell-wiring requirements defining a desired logic function of said LSI device;

(b) arranging said standard cells in cell arrays, on said chip substrate; and

(c) determining electrical connection paths for wiring lines among said standard cells, in accordance with said cell-wiring requirements, so as to maximally satisfy said object function, thereby obtaining an LSI logic circuit, said connection paths-determining step comprising,

calculating a first number "N" of wiring lines which actually extend through each array of standard cells initially arranged on said chip substrate,

calculating a second number "m1" of wiring lines that are allowed to extend through each array of standard cells initially arranged on said chip substrate,



calculating a third number "K" representing a difference "m1−N" between said first and second numbers of each cell array, to determine whether or not said cell arrays include a certain cell array where said third number "K" is less than zero, and

rearranging said standard cells on said chip substrate, when it is found that said certain cell array is included in said cell array, such that said third number "K" of said certain cell array is increased to zero or to more than zero, thereby minimizing lengths of the cell arrays and ultimately minimizing a size of said chip substrate and stopping the designing execution if said third number "K" is zero or more than zero, and for causing the above calculating process executed by said first to third means to be repeated if said third number "K" remains negative after the rearrangement is executed.

4,839,822

COMPUTER SYSTEM AND METHOD FOR SUGGESTING TREATMENTS FOR PHYSICAL TRAUMA

Kenneth Dormond, Malvern, and Robert J. Friedman, Paoli, both of Pa., assignors to 501 Synthelabo (U.S.A.), Paoli, Pa.

Filed Aug. 13, 1987, Ser. No. 85,511

Int. Cl.[4] G06F *15/42*

U.S. Cl. 364—513 **17 Claims**

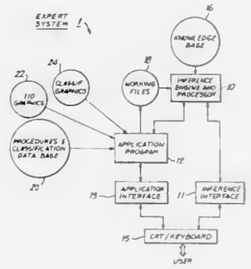
3. A method for providing to a user a suggested treatment for a patient having physical trauma, comprising the steps of:

creating at least one knowledge base containing rules that relate different types of physical trauma characteristics and patient characteistics to different types of treatments for physical trauma;

eliciting information from said user concerning characteristics of said patient including the type of physical trauma substained by said patient, to thereby develop at least one database containing patient and trauma characteristics;

applying said knowledge base and database to a computer; and

using said computer to infer the apropriate treatment for said patient from said rules and said database, by forward



chaining, in which a sequence of rules relating to a particular treatment is established, and backward chaining, in which said sequence of rules es reversed and said rules are tested based on said trauma and patient characteristics, to determine the desirability of said particular treatment.

4,839,823

AUTOMATIC TROUBLE ANALYSIS APPARATUS AND METHOD THEREOF

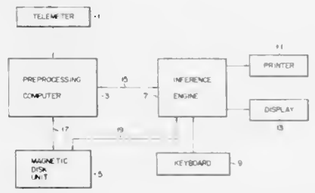
Yosbihiro Matsumoto, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 838,608, Mar. 11, 1986, abandoned. This application Aug. 10, 1988, Ser. No. 230,723

Claims priority, application Japan, Mar. 20, 1985, 60-56527

Int. Cl.[4] G06F *15/46, 11/30*

U.S. Cl. 364—513 **2 Claims**



1. An apparatus for monitoring an accident occurring in an electric power system including at least logical switches and protective relays, on the basis of a Dempster & Shafer theory and a Fuzzy theory,

wherein, assuming that elements constituting a phenomenon occurring in the electric power system are Ai (i=1, 2, . . .) which is a subset of a whole set A0={a1, a2, . . . an}, where a1, a2, . . . an represent states of logical switches or protective relays, the Dempster & Shafter theory defines the following:

basic probability m(Ai) is

$$m(\phi)=0$$
$$\sum_{Aj\ Ai0} m(Ai) = 1;$$

(ϕ: empty set),

and, when relationship m(Ai)>0 stands, lower probability P*(I) is

$$P^*(Ai) = \sum_{Aj\ Ai} m(Aj)$$

and upper probability P*(Ai) is

$$P^*(Ai) = 1 - P^*(\bar{A}i)$$
$$= 1 - \sum_{Aj\ Ai} m(Aj);$$

and, assuming that a whole set is U {u1, u2, . . . , un}, where ui (i=1, 2, . . . n) is any one of lower probability P*(Ai) and upper probability P*(Ai), and the Fuzzy set is F, the Fuzzy set defines the following:

$$F = \sum_{1}^{n} \{\mu F(ui)/ui\} = \mu F(u1)/u1 + \mu F(u2)/u2 + \ldots \mu F(un)/un$$

where μF(ui) is the grade of ui in a membership function of U; "/" is the separator and "+" means "or"; when propositions represented by

Compound Proposition: if (X is F) then (y is G) and

Propositions: (x if F') are given,

y is G'

for $G'=F'o[(F\times G)\cup(F\times V)]$

is inferred by the generalization of modus ponens, where each of F and F' is Fuzzy set in U and each of G and G' is Fuzzy set of V, which is a set of v1, v2, . . . vm, where vj (j=1, 2, . . . m) represents a cause of failure,

said apparatus comprising:

means for operating said electric power system in operating equipment types including

(1) Balanced-type dual-feeder system,

(2) Radial feeder system,

(3) Single feeder,

(4) Double bus,

(5) Single bus,

(6) Transformer,

(7) Center point grounding,

(8) Power-factor improvement and stabilizing equipment,

(9) 3-terminal balanced-type dual-feeder system, and

(10) 3-terminal single feeder;

first means for detecting operating conditions of said logical switches and said protective relays;

second means for creating a first list which lists, for each of said operating equipment types, cause/effect relationships including a plurality of causes of accidents that are empirically obtained, a plurality of effects associated with said causes, and basic probabilities of the respective effects, a sum of the basic probabilities being equal to 1; for creating a second list which lists logical switches and protective relays whose operating conditions have changed during time period t1 after detection of an accident; for creating a third list which lists logical switches and protective relays which are regarded as being associated with the accident among from those listed in said second list, when the occurrence of the accident is confirmed; for determining an operating equipment type of said electric power system from the logical switches and protective relays that are listed in said third list, and creating a fourth list in which names of logical switches of facilities that are regarded as being associated with the accident are related with those of logical switches of the operating equipment type as determined; for calculating any one of upper and lower probabilities for the cause/effect relationship listed in said first list, using the Dempster & Shafer theory, and producing a membership function; and for performing approximate reasoning by the use of the Fuzzy theory, on the names of the logical switches of the determined operating equipment type, using the membership function, to thereby infer facilities associated with the accident.

4,839,824

APPARATUS FOR MEASURING AN OBJECT BASED ON SPATIO-TEMPORALLY DERIVATED IMAGE SIGNALS

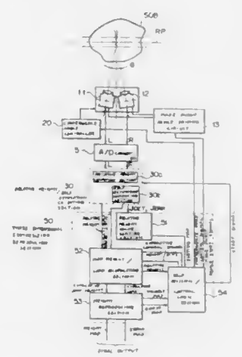
Shigeru Ando, Tokyo, Japan, assignor to Suncom Co., Ltd., Kanagawa, Japan

Filed Jul. 21, 1987, Ser. No. 76,436

Claims priority, application Japan, Jul. 22, 1986, 61-170882

Int. Cl.[4] H04N *7/18*

U.S. Cl. 364—516 **11 Claims**



1. An apparatus for measuring an object, comprising:

sensor means for picking up signals representing data concerning an object to be measured;

computing means for spatio-temporally differentiating said signals so as to determine physical amounts of said object and to determine self-estimation values, of a type that said physical amounts include an associated error to which said self-estimation values are proportional;

judging means for juding the validity of the physical amounts determined by said computing means, on the basis of said self-estimation values; and

control means for varying, in response to a judgment of any physical amount having a low validity, a measuring condition of said sensor means so as to enable said sensor means to obtain said signals again, while re-starting said computing means and said judging means.

4,839,825

FRAME POSITIONING METHOD

Masaru Ono, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 9, 1987, Ser. No. 12,652

Claims priority, application Japan, Mar. 7, 1986, 61-48555

Int. Cl.[4] G06F *15/40*

U.S. Cl. 364—518 **4 Claims**

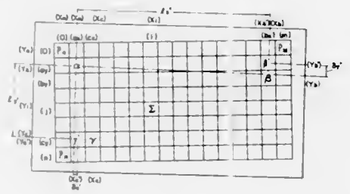
1. A frame positioning method which can precisely position a frame recorded on a microfiche, each frame having addresses and coordinates defining its location on the microfiche, comprising the steps of:

selecting three arbitrary frames recorded on the microfiche mounted on a retrieval device, the three arbitrary frames having images recorded thereon and having different addresses;

determining coordinates of the three arbitrary frames;

calculating reference frame coordinates, a reference frame

pitch, and a reference skew from the previously determined coordinates;



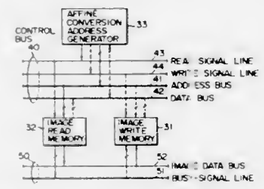
positioning a frame on the microfiche in accordance with the reference frame coordinates, the reference frame pitch, and said reference skew.

4,839,826

AFFINE CONVERSION APPARATUS USING A RASTER GENERATOR TO REDUCE CYCLE TIME

Yukio Urushibata, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 27, 1987, Ser. No. 43,021
Claims priority, application Japan, Apr. 30, 1986, 61-98222
Int. Cl.[4] G06K 9/32
U.S. Cl. 364—518 **6 Claims**



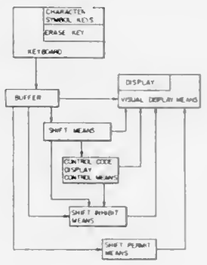
1. An image processing apparatus comprising:
an affine conversion address generator for generating an image data read affine conversion address based on a raster address and outputting image memory read and write signals;
a first image memory for storing original image data;
a second image memory for storing an affine-converted image data corresponding to an affine converted version of said original image data;
a control bus, connected to said affine conversion address generator and said first and second image memories, for conducting and transferring the image data read affine conversion address and the read and write signals from said affine conversion generator to said first and second memories;
an image bus, connected to said first and second image memories, for operating independently of said control bus in order to transfer the image data output from said first image memory to said second memory;
first image memory control means, coupled to said first image memory and to said image bus, for reading out the original image data from said first image memory, outputting the original image data onto said image bus, and for selectively producing a busy signal for said image bus, in response to the affine conversion address output from said affine conversion address generator and the read signal,
wherein said image bus is also for transferring said busy signal from said first image memory control means; and
second image memory control means, coupled to said second image memory and to said image bus, for storing, in response to the busy signal on said image bus, the original image data on said image bus in accordance with the raster address, said original data stored at said raster address constituting said affine-converted image data.

4,839,827

DOCUMENT PROCESSING APPARATUS

Keiiti Hirata, Kuwana; Yoshinari Morimoto, Nagoya; Tomohiro Ban, Iwakura; Tokihito Furushima; Tomoko Miura, both of Nagoya, and Yoshie Ikeda, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jul. 14, 1987, Ser. No. 73,015
Claims priority, application Japan, Jul. 15, 1986, 61-167098
Int. Cl.[4] G06F 3/14
U.S. Cl. 364—518 **9 Claims**



1. A document processing apparatus comprising a keyboard provided with at least character-symbol keys for inputting data of characters and symbols and an erase key for inputting a signal to erase the input data, a visual display means including a display to visually represent the input data from said keyboard, a buffer for storing the input data, a shift means for displacing the top position of the input data on the display toward the end of the line, and a control code displaying means for displaying a control code mark in the line where the data is existent, said code mark denoting the top position renewed by said shift means, the improvement which comprises by
a shift inhibit means for displaying a character or symbol instead of the control code mark when said character or symbol is input to the display position of said control code mark and inhibiting shift of the data displaced toward the end of the line by said shift means; and
a shift permit means for permitting displacement of the top position by said shift means after erasure of said control code mark by said erase signal.

4,839,828

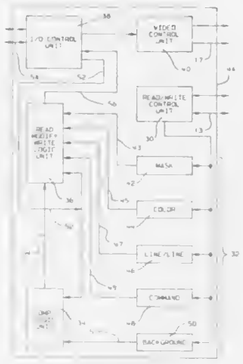
MEMORY READ/WRITE CONTROL SYSTEM FOR COLOR GRAPHIC DISPLAY

Matthew Elsner, Woodstock; Yoshio Iida, Lake Katrine; Edward Y. Kwong, West Hurley, and Omar M. Rahim, Rhinebeck, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 21, 1986, Ser. No. 821,102
Int. Cl.[4] G06F 3/15
U.S. Cl. 364—518 **8 Claims**

6. A memory control system for selectably modifying pixel data with new pixel data in response to a modification command, the pixel data being stored in a frame buffer at storage locations corresponding to display pixels, said pixel data indicating a color or shade of gray to be displayed, the system comprising:
means for reading the data contents of a storage location for which new pixel data is provided;
means for comparing the data contents read by said means for reading with data representing a display background characteristic, wherein said means for comparing generates a compare signal;

means responsive to said means for comparing and to said modification command for storing in said storage location, said means comprising:
means for generating modified data equal to new pixel data when said compare signal is positive;
means for generating modified data equal to said data contents read by said means for reading when said compare signal is negative and said modification command is "Underpaint";



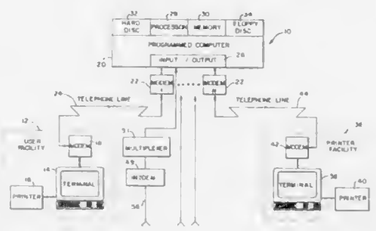
means for generating modified data equal to a line-on-line data value when said compare signal is negative and said modification command is "line-on-line";
means for generating modified data equal to a logical combination of said new pixel data and said data contents read by said means for reading when said modification command indicates a logical combination; and
means for storing said modified data in said storage location.

4,839,829

AUTOMATED PRINTING CONTROL SYSTEM

Henry B. Freedman, P.O. Box 324, Split Rock Rd., Lake Harmony, Pa. 18624

Filed Nov. 5, 1986, Ser. No. 927,886
Int. Cl.[4] G06F 15/46
U.S. Cl. 364—519 **64 Claims**
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 17 Pages)



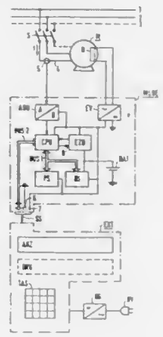
1. A telecommunications system for automated control of the printing of a work by a printing facility from a requester at a location remote from the printing facility comprising:
a first terminal for use by a printing requester for receiving from the requester information concerning printing parameters necessary to forecast at least the cost required to manufacture a printed work;
a second terminal located at the printing facility for receiving from the printing facility pricing and administrative information concerning the printing of a work; and
a programmed computer having a memory means for storing at least a set of printing rules, and input/output means, the computer being in communication with the first and second terminals, the computer including means for interacting with the printing requester by a series of queries and responses for receiving and storing in said memory means said printing parameters, for comparing said printing parameters with the stored printing rules and for informing the requester if a rule is violated through the first terminal via the input/output means, the computer including means for transmitting the printing parameter information necessary to forecast the cost required to manufacture the printed work to the second terminal for use by the printing facility, the computer further including means responsive to said remotely input printing parameters and interacting with the printing facility by a series of queries and responses through the second terminal via the input/output means for receiving and storing in the memory means pricing and administrative information concerning the printing of the work, and means for transmitting selected pricing and administrative information to the first terminal for use by the printing requester, the first terminal including means for displaying the selected pricing and administrative information to the printing requester and means for permitting the requester at the remote location to select whether to proceed with the printing of the work by the printing facility based upon the pricing and administrative information.

4,839,830

APPARATUS AND METHOD FOR THE PROCESSING OF OPERATING DATA OF AN ELECTRIC MOTOR

Walter Amey, Erlangen, and Reinhold Schneeberger, Seukendorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

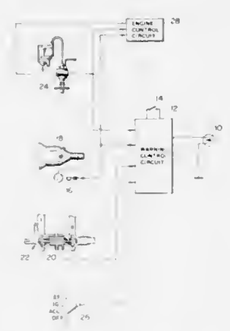
Filed Mar. 9, 1987, Ser. No. 23,655
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1986, 3607878
Int. Cl.[4] G07C 3/08; G06F 15/46
U.S. Cl. 364—551.01 **12 Claims**



1. Apparatus for processing operating stress data associated with a particular electric motor connected to a power network by an ON/OFF switch, the data processing apparatus comprising:
(a) a processing unit for processing data;
(b) a program memory storing operating programs of the process unit;
(c) a data memory storing the operating stress data associated with the particular electric motor, time of occurrence data of the operating stress data, and predetermined crite-

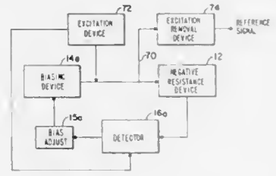
ria data for the particular electric motor, the data memory of a size such that operating stress data occurring over at least a portion of the life and duration of use of the motor may be stored;
(d) a real time clock connected to the processing unit for providing time of occurrence data;
(e) a first bidirectional bus system connecting the processing unit with the program memory and the data memory;
(f) means coupled to the motor for sensing a quantity related to motor operating stress as motor operating stress data, and for providing the operating stress as motor operating stress data, and for providing the operating stress data to the processing unit; and
(g) a power supply coupled to a power feed line for the associated particular electric motor from the power network for providing power to the processing unit, the real time clock, the program memory and the data memory,
the processing unit comparing the motor operating stress data with the predetermined criteria data and storing the motor operating stress data and the time of occurrence data in the data memory as a data collection when the motor operating stress data exceeds the predetermined criteria data.

4,839,831
OIL DEGRADATION WARNING SYSTEM
Minoru Imajo, Yokohama, and Tsunehiro Kawakita, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Mar. 11, 1986, Ser. No. 838,619
Claims priority, application Japan, Mar. 12, 1985, 60-48795
Int. Cl.[4] G01D *21/00*
U.S. Cl. 364—550 **6 Claims**



1. An oil degradation waning system for an engine equipped with a turbocharger, comprising:
first means for detecting the temperature of an engine oil which flows through said turbocharger;
second means for deriving a correction coefficient from informations issued from said first means;
third means for multiplying, a predetermined time increment by said correction coefficient thereby to derive a modified time increment;
fourth means for integrating said modified time increment thereby to derive a time dependent oil degradation value; and
fifth means for issuing a warning when said time dependent oil degradation value becomes equal to or larger than a predetermined value.

4,839,832
NEGATIVE RESISTANCE DEVICE LOCAL EXTREMUM SEEKING CIRCUIT
Francis A. Galler, Norfolk, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.
Filed Mar. 14, 1988, Ser. No. 167,874
Int. Cl.[4] G06F *15/20, 15/50*
U.S. Cl. 364—552 **46 Claims**



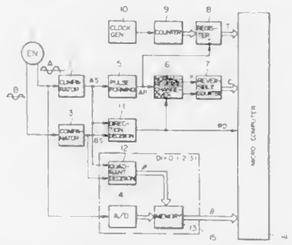
1. A negative resistance device local current extremum seeking circuit comprising:
a negative resistance device (NRD) having at least one local current extremum;
biasing means for providing a bias voltage to operate said NRD;
excitation means for providing a dither voltage to said NRD;
means for detecting the variation in the output of said NRD due to said dither voltage;
means for comparing the detected variation in the output of said NRD due to said dither voltage to the dither voltage; and
means, responsive to said means for comparing, for adjusting said bias voltage to operate said NRD at said local current extremum with the dither voltage bracketing said extremum.

4,839,833
PROGRAMMABLE DISPLAY ENGINEERING SCALE
Mustafa Parhiskari, 7615 Monrovia, Lenexa, Kans. 66216
Filed Jan. 21, 1987, Ser. No. 5,872
Int. Cl.[4] G01B *3/02;* **G09G** *3/18;* **G01C** *3/00*
U.S. Cl. 364—562 **18 Claims**

15. A programmable display scale comprising:
(a) a planar scale base;
(b) an electronic display device positioned on said base;
(c) said display device including a plurality of substantially parallel rows of display elements;
(d) selected groups of said display elements are being interconnected for simultaneous activation;
(e) a plurality of scale selection switches positioned on said base;
(f) circuit means interconnected among said switches and said display elements whereby the operation of said switches causes the activation of coordinated patterns of said display elements in said plurality of rows to form associated spacial scale divisions and subdivisions, said circuit means including a memory device and encoder means;
(g) said memory device being connected at least indirectly to said display device and storing, at selected memory addresses, bit patterns associated with patterns of activation of said display elements;

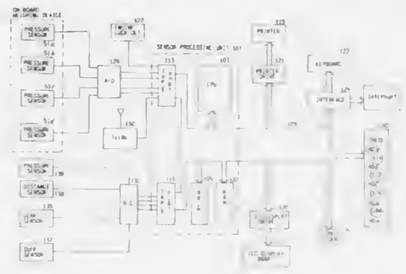
(h) said encoder means being connected to said switches and at least indirectly to said memory device and generating unique memory addresses upon the operation of switches associated with said addresses;
(i) the generation of a unique memory address causing a bit pattern stored at said address to be read out of said memory device to said display device to activate a pattern of display elements in said plurality of rows associated with said bit pattern;
(j) said scale base being sized and shaped as a drafting machine scale; and
(k) said scale base including clip means to removably attach said scale base to a drafting machine.

4,839,834
SPEED DETECTING APPARATUS
Tsutomu Omae; Toshihiko Matsuda; Youjirou Miyahara, and Kenzo Kamiyama, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 12, 1987, Ser. No. 2,202
Claims priority, application Japan, Jan. 13, 1986, 61-3453
Int. Cl.[4] G01P *3/48, 3/54*
U.S. Cl. 364—565 **11 Claims**



1. A speed detecting apparatus for detecting the rotational speed of a rotating body mechanically coupled to said apparatus, said apparatus comprising:
an encoder for generating one cycle of a sine-wave signal each time the encoder angular position changes by a predetermined unit amount;
pulse generating means responsive to the sine-wave signal for generating a zero-crossing pulse at each zero-crossing of the sine-wave signal;
phase angle detecting means responsive to the sine-wave signal for generating a phase angle signal indicative of the phase angle of the sine-wave signal;
a clock pulse source for providing clock pulses having a predetermined frequency;
time computing means responsive to the zero-crossing pulses and the clock pulses for generating a time signal by counting clock pulses generated between two zero-crossing pulses; and
speed computing means receiving the zero-crossing pulses, the phase angle signal, and the time signal as inputs, and responsive to the rotational speed of said encoder being above a predetermined level for detecting the rotational speed of said encoder on the basis of the reciprocal of the time interval between a first one and a last one of a plurality of the zero-crossing pulses, and responsive to the rotational speed of said encoder being below the predetermined level for detecting the rotational speed of said encoder on the basis of the number of zero-crossing pulses appearing within a predetermined period of time and the phase angle signal.

4,839,835
APPARATUS AND METHOD RESPONSIVE TO THE ON-BOARD MEASURING OF THE LOAD CARRIED BY A TRUCK BODY
LeRoy G. Hagenbuch, 4602 N. Rosemead, Peoria, Ill. 61604
Continuation-in-part of Ser. No. 604,739, Apr. 27, 1984, Pat. No. 4,630,227. This application Apr. 1, 1985, Ser. No. 717,042
Int. Cl.[4] G01G *19/08;* **G06F** *15/20*
U.S. Cl. 364—567 **94 Claims**

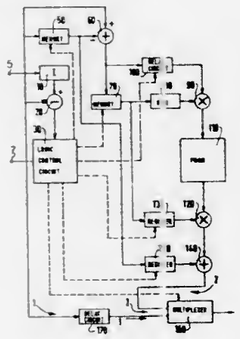


1. In a system of a plurality of vehicles, an apparatus on-board each of said vehicles for acquisitioning data indicative of vehicle operation and for relaying said data to a remote control center where the data is processed to create control signals that are delivered back to said apparatus for instructing a vehicle operator regarding vehicle movement, said apparatus comprising:
(1) means mounted to said vehicle for indicating a loading of material into a dump body of said vehicle by a loader;
(2) means mounted to said vehicle for indicating a dumping of a load carried by said body;
(3) means mounted to said vehicle for indicating a direction of movement by said vehicle;
a first processor means on-board said vehicle for acquiring data generated from means (1), (2) and (3) and processing said data for downloading to a remote control center; and
(4) means for sending said processed data to said remote control center and for receiving control signals therefrom.

4,839,836
SIGNAL TRANSIENT IMPROVEMENT ARRANGEMENT
Frédéric Fonsalas, Grigny, France, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 6, 1987, Ser. No. 22,464
Claims priority, application France, Mar. 11, 1986, 86 03425
Int. Cl.[4] G06G *7/25;* **H04N** *5/213, 9/69*
U.S. Cl. 364—582 **15 Claims**

1. A signal transient processing arrangement comprising means for replacing transient in an input signal with signal portions processed during said transients, sampling means for sampling said input signal for obtaining a plurality of input signal samples, and means for forming said processed signal portions, wherein said processed signal portions forming means comprises:
normalization means for normalizing values of the input signal samples obtained during said transients, said normalization means normalizing the value of a first transient signal sample to zero and normalizing the value of a last transient signal sample to one;
transformation means for replacing value of said transient signal samples normalized by the normalization means

with values determined in accordance with a predetermined transformation; and



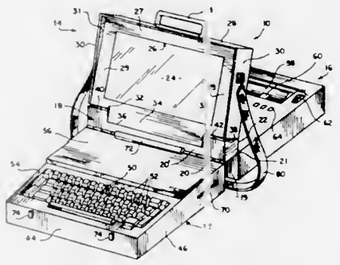
denormalization means for denormalizing signal samples transformed by the transformation means.

4,839,837

THREE LAYERED LAPTOP COMPUTER

Bo E. Chang, 22 Yearling Ct., Rockville, Md. 20850

Continuation-in-part of Ser. No. 870,854, Jun. 4, 1986, abandoned. This application Oct. 27, 1987, Ser. No. 112,999
Int. Cl.[4] G06F 1/00
U.S. Cl. 364—708 12 Claims



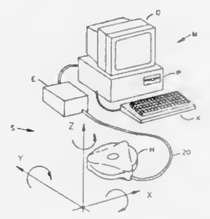
1. A three layered laptop computer assembly, comprising:
a keyboard component and an output component,
a mount element disposed intermediate said keyboard and output components, hinge means respectively joining said mount element to said keyboard and output components, and
a display component attached to said mount element, whereby
displacement of said keyboard and output components substantially 90 degrees about said hinge means alters said assembly between an open use position with said keyboard and output components substantially co-planar and said display component supported vertically, to a closed position with said display component sandwiched between said keyboard and output components with all three components defining a regular cubic configuration.

4,839,838

SPATIAL INPUT APPARATUS

Mitchell LaBiche, 307 Pecan Grove Rd. #3, Scott, La. 70583, and Alvin Derouen, 1600 Hopkins St., New Iberia, La. 70560

Filed Mar. 30, 1987, Ser. No. 32,305
Int. Cl.[4] G06F 3/033
U.S. Cl. 364—709.11 16 Claims.



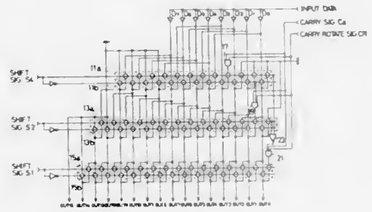
1. An apparatus for providing spatial orientation data signals, comprising:
an inertial platform accelerometer cluster having three orthogonal axes and a plurality of accelerometers arranged to provide signals indicative of linear acceleration of said platform along each of the three axes and rotational acceleration of said platform about each of the three axes, said accelerometers all having their centers of measurement coplanar;
processing means for receiving said accelerometer signals and providing output signals representative of linear acceleration along each of the three axes and rotational acceleration about each of the three axes.

4,839,839

BARREL SHIFTER INCLUDING ROTATE OPERATION

Takeji Tokumaru, and Miyuki Nagata, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 28, 1987, Ser. No. 101,640
Claims priority, application Japan, Sep. 26, 1986, 61-226220
Int. Cl.[4] G06F 7/00
U.S. Cl. 364—715.08 7 Claims



1. A barrel shifter comprising:
(a) shifting means for selectively shifting an N-bit input data by a given shift count in response to a plurality of shift signals indicative of a shift count in combination and outputting a 2N-bit output data;
(b) ANDing means connected to said shifting means for ANDing a carry signal and a carry rotate signal to insert a carry bit behind a least significant bit position of the shifted N-bit output in cooperation with the shift signals;
(c) ORing means connected to said shifting means for finding logical sums of each of N lower significant bits of the same in response to a rotate signal to obtain an N-bit

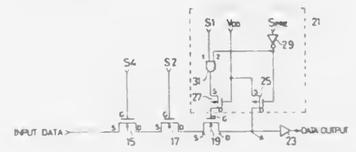
rotated data without carry and logical sums of each of N lower significant bits of the 2N-bit output data and each of (N−1) higher significant bits of the same in response to a carry rotate signal to obtain an N-bit rotated data with carry; and
(d) calculating means connected to said shifting means for calculating an actual shift count in accordance with a formula of x-(N+1)(i)(i=0, 1, 2, . . . where x denotes a rotate count and N denotes an input data bit length, when the rotate count x is more than the input data bit length N, and for outputting the calculated shift signals to said shifting means to rotate the N-bit data with carry by a rotate count more than the input data bit length N.

4,839,840

HIGHLY RESPONSIVE BARREL SHIFTER

Takeji Tokumaru, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 29, 1987, Ser. No. 102,343
Claims priority, application Japan, Sep. 30, 1986, 61-232357
Int. Cl.[4] G06F 7/00
U.S. Cl. 364—715.08 7 Claims



1. A barrel shifter for shifting an input data in response to each of shift signals, respectively, by a given shift count through a plurality of series-connected semiconductor switching elements arranged between an input terminal and an output terminal thereof, which comprises:
(a) means for precharging the output terminal to a supply voltage level before shifting an input data; and
(b) means for turning off a rearmost semiconductor switching element when the input data is at a high level, in order to output the precharged supply voltage through the output terminal as a high level shifted output data and for turning on the same rearmost semiconductor switching element when the input data is at a low level, in order to output a ground voltage from the same output terminal as a low level shifted output data, irrespective of a threshold voltage of the semiconductor switching element.

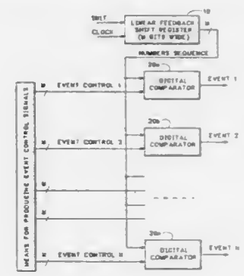
4,839,841

PROGRAMMABLE DIGITAL MULTIPLE EVENT GENERATOR

Michael S. Hagen, Vancouver, Wash.; Keith A. Taylor, Portland, and Ira G. Pollock, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 1, 1988, Ser. No. 150,674
Int. Cl.[4] G06F 7/04; H03B 29/00
U.S. Cl. 364—717 16 Claims

1. A circuit for generating a plurality of digital events each on a separate signal line whose timing relative to each other and an initialization signal is programmable, comprising:
means for producing at an output a numbers sequence composed of arbitrary non-repeating binary number, with the numbers in the sequence changing in a fixed progression through the sequence upon the occurrence of signals at a clock input and with the sequence being initialized to a starting point in the numbers sequence by the application of the initialization signal to an initialization input; and
means for comparing the numbers sequence to a plurality of event control signals and generating a plurality of respective events when a match occurs between one of the numbers in the numbers sequence and one of the event control signals;
such that the timing of the events relative to the initialization



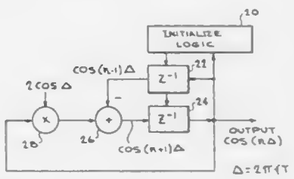
signal is programmable by the choice of values for the event control signals, and the absolute time associated with each number in the sequence is controllable by the frequency of the clock input to the producing means.

4,839,842

DIGITAL TONE DETECTION AND GENERATION

Hwa-Sheng Pyi, Sunnyvale, Calif., and Saf Asghar, Austin, Tex., assignors to Advanced Micro Devices, Sunnyvale, Calif.

Filed Jul. 24, 1987, Ser. No. 77,268
Int. Cl.[4] G06F 1/02
U.S. Cl. 364—721 4 Claims



1. A method of digitally generating with a digital signal processor a tone signal having a predetermined frequency "f" and amplitude "A" which comprises a sequence of samples "Sm" generated every "T" seconds, said tone signal having a waveform represented by the equation,

$$S = A \cos\{m(2\pi fT)\},$$

said method comprising the following combination of sequential steps,
(a) initializing said signal processor to cause said first two samples S_0 and S_1 that are generated to correspond respectively to the equations,

$$S_0 = 1 \text{ and } S_1 = \cos 2\pi fT,$$

(b) generating the next sequential said samples with said signal processor according to the equation,

$$S_{(m+1)} = 2S_{(m)}S_1 - S_{(m-1)},$$

(c) storing a predetermined threshold value in said signal processor,
(d) comparing with said signal processor the value of each said sample generated generated in step (b) to said stored threshold value,

(e) repeating step (b) to generate the next sample when the result of said comparison step indicates that the value of the last generated sample does not exceed said predetermined threshold value, and

(f) repeating step (a) to generate the next said sample when the result of said comparison step indicates that the value of said last generated sample does exceed said predetermined threshold whereby the further propagation of any rounding and truncating errors that might have been produced by said digital signal processor in generating previous said samples in step (b) is prevented.

4,839,843

METHOD AND APPARATUS FOR CORRECTING A SEQUENCE OF INVALID SAMPLES OF AN EQUIDISTANTLY SAMPLED SIGNAL

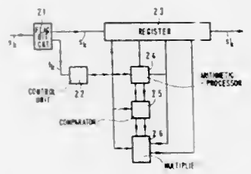
Raymond N. J. Veldhuis, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 20, 1986, Ser. No. 898,464

Claims priority, application Netherlands, Apr. 14, 1986, 8600932

Int. Cl.[4] G06F *7/38, 15/336*

U.S. Cl. 364—724.11 **5 Claims**



4. Apparatus for replacing a sequence s_{t+i} of m invalid samples of an equidistantly sampled signal, wherein i=0, 1, . . . m−1, and t is the ordinal time position of the first sample s_t in said sequence, with m corrected samples derived from an optimum test sequence of valid samples of such signal, said optimum test sequence being one of a plurality of test sequences s_{q+i} of valid samples of such signal, wherein q is the ordinal time position of the first sample s_q in each of said test sequences, said test sequences being of the same length as said sequence of invalid samples, the value of q for said optimum test sequence being q_{opt}; said apparatus comprising:

storage means for storing therein said sequence of invalid samples, said test sequences, samples in an environment of said sequence of invalid samples, and samples in environments of the respective test sequences;

arithmetic processing means coupled to said storage means for deriving correlation values of stored valid samples in said environment of said sequences s_{t+i} of invalid samples and stored valid samples in said environments of the respective test sequences, the respective test sequences occurring at respectively different periods of time prior to said sequence S_{t+i} of invalid samples;

comparator means coupled to said arithmetic processing means for determining the minimum correlation values derived by said arithmetic processing means, and producing control signals identifying the test sequence having such minimum correlation values, such test sequence being said optimum test sequence $s_{q_{opt}+i}$; and

selection means controlled by the control signals from said comparator means to select said optimum test sequence from the test sequences stored in said storage means, and which replaces said sequence of invalid samples with said optimum test sequence.

4,839,844

ORTHOGONAL TRANSFORMER AND APPARATUS OPERATIONAL THEREBY

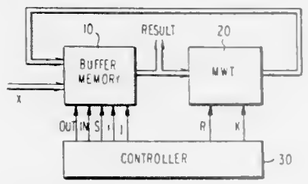
Masao Watari, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 56,017, Jun. 1, 1987, abandoned, which is a continuation of Ser. No. 599,119, Apr. 11, 1984, abandoned. This application Apr. 6, 1988, Ser. No. 177,799

Claims priority, application Japan, Apr. 11, 1983, 58-63186; Apr. 20, 1983, 58-69474

Int. Cl.[4] G06F *15/332*

U.S. Cl. 364—727 **15 Claims**



1. An orthogonal transformer, comprising: a buffer memory (10 or 11) for memorizing input time series data temporarily; an orthogonal transform means (20, 21, 22 or 23) for carrying out an orthogonal transform operation by multiplying each of the data read out of said buffer memory by predetermined twiddle factors; and a control means (30 or 31) for specifying the data read out of said buffer memory and for making a real and an imaginary part of each of said twiddle factors have a first and a second absolute value, respectively, with said first absolute value varied in accordance with a formula $r/2^l$ when said second absolute value is equal to one and with said second absolute value varied in accordance with the formula $r/2^l$ when said first absolute value is equal to one (l being a predetermined integer which is not negative, and r being integers between 0 and 2^l, both inclusive).

4,839,845

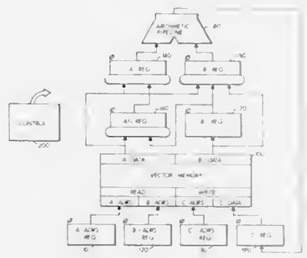
METHOD AND APPARATUS FOR PERFORMING A VECTOR REDUCTION

John T. Rusterholz, Roseville, and John R. Schomburg, Minneapolis, both of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Mar. 31, 1986, Ser. No. 846,414

Int. Cl.[4] G06F *15/347*

U.S. Cl. 364—736 **3 Claims**



1. A system for computing vector reductions comprising:

a vector memory means for storing and recalling data organized into vectors of elements and capable of simultaneously reading two vector elements and writing one vector element;

a first and a second read operand address register means coupled to said vector memory means to provide address location information thereto;

a first and a second read operand data staging register means also coupled to said vector memory means to receive and temporarily store operand data read from said vector memory means to thereby provide selective delay by the temporary storage;

a first and a second read operand data register means coupled to said first and second read operand data staging register means and also coupled to said vector memory means to selectively receive data from said first and second read operand data staging register means or from said vector memory means;

an arithmetic pipeline means coupled to said first and second read operand data register means to receive and combine a first vector element and a second vector element into a combined intermediate result vector element;

a write operand address register means coupled to said vector memory means to provide a write address thereto; and

a write operand data register means coupled between said arithmetic pipeline means and said vector memory means to provide a return loop for repeatedly returning the combined intermediate result vector element to the vector memory means at the address provided by said write operand address register means until the repeated returning of the combined intermediate result vector element to the vector memory means at the address provided produces a single final result vector element.

4,839,846

APPARATUS FOR PERFORMING FLOATING POINT ARITHMETIC OPERATIONS AND ROUNDING THE RESULT THEREOF

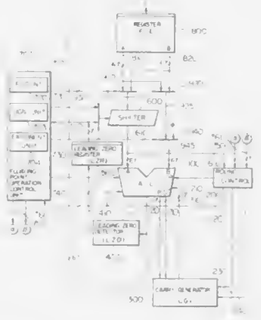
Kenji Hirose, Hitachi; Tadaaki Bandoh, Ibaraki; Hidekazu Matsumoto; Shinichiro Yamaguchi, both of Hitachi; Hirokazu Hirayama, Hitachi, and Hiroaki Nakanishi, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Engineering Co., Ltd., both of Tokyo, Japan

Filed Mar. 12, 1986, Ser. No. 838,941

Claims priority, application Japan, Mar. 18, 1985, 60-53975

Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—748 **10 Claims**



1. A floating point arithmetic operation apparatus comprising:

a floating point operation control unit for controlling the operation of said floating point arithmetic operation apparatus;

an operation unit for performing a floating point arithmetic operation on data provided to said floating point arithmetic operation apparatus;

a carry generator for generating a carry output in accordance with a carry propagate signal and a carry generate signal from said operation unit, and supplying the carry output to said operation unit;

a shifter for shifting an operand and supplying the shifted operand to said operation unit; and

a round control unit for rounding an operation result of said operation unit into a selected round precision of either single precision, double precision or extended precision in accordance with the shifted operand output from said shifter wherein said round control unit includes mantissa overflow detection means for detecting whether a mantissa overflow will take place due to the rounding process, said mantissa overflow detection means supplies a mantissa overflow signal to said floating point operation control unit and said operation unit causing said operation unit to produce a value of one as a result of an arithmetic operation on the mantissa;

said floating point operation control unit includes an exponent unit which responds to said mantissa overflow signal and provides one or two prepared exponent values as an output.

4,839,847

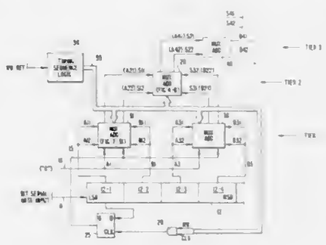
N-CLOCK, N-BIT-SERIAL MULTIPLIER

Kenneth C. Laprade, Palm Bay, Fla., assignor to Harris Corp., Melbourne, Fla.

Filed Apr. 14, 1987, Ser. No. 38,329

Int. Cl.[4] G06F *7/52*

U.S. Cl. 364—754 **20 Claims**



1. For use in a data processing apparatus wherein respective sequences of digital data codes representative of numerical values are subjected to at least one prescribed arithmetic signal processing operation, an arrangement for producing an output representative of the respective products of the numerical values represented by a sequence of digital data codes and a prescribed numerical value, said arrangement comprising:

first means, having a plurality of sequential storage locations, for sequentially receiving and shifting therethrough respective successive portions of a digital data code;

a plurality of multiplexer-adder means arranged in a tiered, tree-like configuration, each multiplexer adder means having a plurality of inputs and a plurality of outputs and including an adder circuit for providing at a selected one of said outputs the sum of data values coupled to selected ones of said plurality of inputs, and signal coupling means for coupling one of said plurality of inputs other than said selected ones of said plurality of inputs to an output other than said selected one of said outputs; and

second means for coupling selected storage locations of said first means to inputs of selected ones of said multiplexer-adder means, and for selectively coupling outputs of said multiplexer-adder means to inputs of selected others of said multiplexer-adder means.

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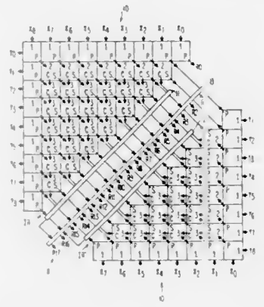
4,839,848

FAST MULTIPLIER CIRCUIT INCORPORATING PARALLEL ARRAYS OF TWO-BIT AND THREE-BIT ADDERS

LuVerne R. Peterson, San Diego, and Michael A. Rehart, El Toro, both of Calif., assignors to Unisys Corporation, Detroit, Mich.

Filed Sep. 14, 1987, Ser. No. 95,950
Int. Cl.[4] G06F 7/52
U.S. Cl. 364—757 10 Claims



1. A circuit for multiplying two multibit binary numbers together, comprising:

a first array of a plurality of logic cells and a second array of a plurality of logic cells, with each array having input lines for receiving the bits of said numbers;

every logic cell including a product means for producing a product term of a single power by multiplying a bit of one of said numbers with a bit of the other number;

said cells being arranged such that the product means in said first array form one respective product term of each of the powers 0, 1, 2n, 2n−1, and form two respective product terms of each of the powers 2, 3, 2n−2, 2n−3, and form three respective product terms of each of the powers 4, 5, 2n−4, 2n−5, and so forth in the same sequence for all powers between 0 and 2n where n is the power of the most significant bit of said numbers; and wherein the respective product means in said second array form all remaining single power product terms;

adder means in selected cells of the first array which are interconnected to add the single power product terms of that array, and adder means in selected cells of the second array which are interconnected to add the single power product terms of that array in parallel with the adder means of the first array; and

means for combining the results from the adder means of both arrays to produce the product of said numbers.

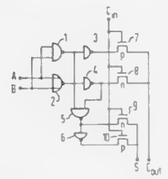
4,839,849

RIPPLE-CARRY ADDER

Karl Knauer, Grafing, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 2, 1986, Ser. No. 902,745
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1985, 3534892
Int. Cl.[4] G06F 7/50
U.S. Cl. 364—784 4 Claims

1. An adder cell for a ripple-carry adder suitable for complementary metal oxide semiconductor technology and having output capacitance, said adder cell has a voltage supply and comprising a gate arrangement for accepting two input variables and an input carry signal, and for supplying sum and carry output signals to a pair of sum and carry output terminals, in accordance with said inputs, said gate arrangement establishing a carry propagation path connecting said carry input signal to said carry output terminal, said gate arrangement comprising, in combination, first and second transistor gates connected in series, with the output of said first gate connected to the input of said second gate and the output of said second gate being connected to said carry output terminal, whereby the output capacitance of said adder cell is charged



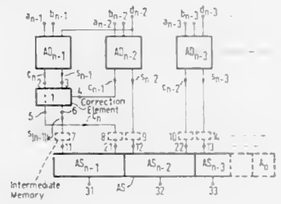
from said voltage supply through said two transistor gates, both of said first and second transistor gates having a single data input, said first transistor gate comprising a driving inverter not in series with said carry propagation path, and having a lower impedance than said second gate, whereby the size of said first gate is not affected by the layout geometry of said adder cell in an integrated circuit, and means for connecting said second gate to receive said input carrying signal.

4,839,850

APPARATUS FOR BIT-PARALLEL ADDITION OF BINARY NUMBERS

Tobias Noll, Neckartailfingen, and Walter Ulhrich, Puchheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 10, 1986, Ser. No. 883,942
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1985, 3524797
Int. Cl.[4] G06F 7/50
U.S. Cl. 364—787 9 Claims



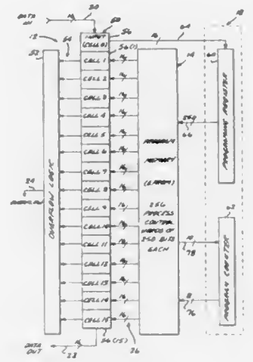
1. In an arrangement for bit-parallel addition of binary numbers in two's complement, having a group of first adders (AD_i) which respectively receive inputs for binary number bits of equivalent significance and produce intermediate sum and carry bits, and an adder means (AS) for the formation of a sum word from said intermediate sum and carry bits, said arrangement comprising, in combination ; means for replacing the carry bit (c_{n-1}) of the first adder (AD_{n-1}) having the second highest significance with the carry bit (cn) of the most significant first adder (AD_{n-1}); and a first correction element connected to receive the sum output of said most significant first adder and for replacing the intermediate sum bit (s_{n-1}) of this adder with the carry bit (c_n) of said most significant first adder (AD_{n-1}) when the carry bits (c_n, c_{n-1}) of the two most significant first adders (AD_{n-1}, AD_{n-2}) are unequal.

4,839,851

PROGRAMMABLE DATA PATH DEVICE

Gary K. Maki, Moscow, Id., assignor to Idaho Research Foundation, Inc., Moscow, Id.

Filed Jul. 13, 1987, Ser. No. 72,519
Int. Cl.[4] G06F 15/20, 15/31
U.S. Cl. 364—900 8 Claims



1. A programmable data path device, comprising:

a plurality of processing cells, each processing cell including means for receiving a data path control word that may be different from the data path control words received by the other processing cells, each processing cell further including ALU means having two ALU input ports, one ALU output port, and means for producing output data at the ALU output port based on input data provided at the ALU input ports and on the data path control word, each processing cell further including a register for receiving the output data from the ALU means of the processing cell of which the register is a part, and each processing cell further including multiplexer means connected to the registers of all the processing cells and responsive to the data path control word for selectively coupling the contents of the register of one of the plurality of processing cells to one of the input ports;

memory means coupled to the processing cells and including means for storing at least one data path control word associated with each processing cell; and

control means coupled to the memory means for providing data path control words stored in the memory means to the associated processing cells.

4,839,852

PROGRAMMABLE CONTROLLER WITH SELF TESTING I/O STRUCTURE

Neil W. Knutsen, Milwaukee, Wis., assignor to Allen-Bradley Company, Inc., Milwaukee, Wis.

Continuation of Ser. No. 780,832, Sep. 27, 1985, abandoned. This application Jun. 16, 1988, Ser. No. 208,848
Int. Cl.[4] G06F 13/10
U.S. Cl. 364—900 4 Claims

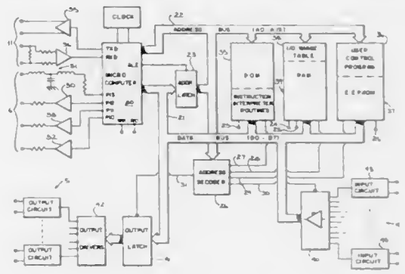
1. In a programmable controller having a processor unit which may be connected to one or more I/O expansion units, the combination comprising:

storage means in said processor unit for storing a user control program which includes instructions that direct the examination of input devices connected to I/O expansion units and instructions that direct the operation of output devices connected to I/O expansion units;

examination means coupled to the storage means for examining the user control program instructions and determining a highest number in a number range of the I/O expansion untis which are required to execute the user control program;

scanner means responsive to signals from the I/O expansion units for determining a number range of I/O expansion units which are connected to the processor unit;

comparison means coupled to the examination means and the scanner means for comparing a highest number in the number range of the I/O expansion units determined by



the scanner means with the highest number in the number range of I/O expansion units determined by the examination means; and

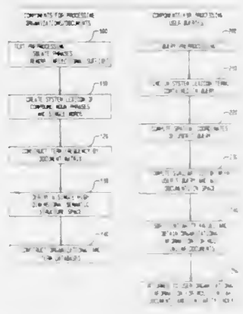
means responsive to said comparison means for preventing execution of the user control program when the highest number in the number range of the I/O expansion units determined by the scanner means does not match the highest number in the number range of I/O expansion units determined by the examination means.

4,839,853

COMPUTER INFORMATION RETRIEVAL USING LATENT SEMANTIC STRUCTURE

Scott C. Deerwester, Chicago, Ill.; Susan T. Dumais, Berkeley Heights; George W. Furnas, Madison, both of N.J.; Richard A. Harshman, London, Canada; Thomas K. Landauer, Summit, N.J.; Karen E. Lochbaum, Chatham, N.J., and Lynn A. Streeter, Summit, N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Sep. 15, 1988, Ser. No. 244,349
Int. Cl.[4] G06F 15/40
U.S. Cl. 364—900 11 Claims



1. An information retrieval method comprising the steps of generating term-by-data object matrix data to represent information files stored in a computer system, said matrix data being indicative of the frequency of occurrence of

selected terms contained in the data objects stored in the information files,

decomposing said matrix into a reduced singular value representation composed of distinct term and data object files,

in response to a user query, generating a pseudo-object utilizing said selected terms and inserting said pseudo-object into said matrix data, and

examining the similarity between said pseudo-object and said term and data object files to generate an information response and storing said response in the system in a form accessible by the user.

4,839,854

DATA COLLECTION SYSTEM HAVING STATIONARY UNIT WITH ELECTROMAGNETIC INDUCTION CIRCUITRY FOR BIDIRECTIONALLY RELAYING DATA

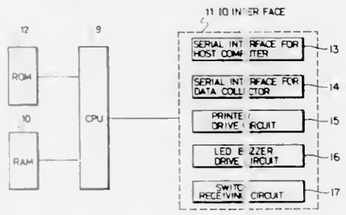
Yasuo Sakami; Shigetaka Okina; Junichi Tsubouchi; Shozo Izaki; Toshitaka Fukushima; Hiroyuki Watanabe, and Masao Ishizaki, all of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Sep. 12, 1986, Ser. No. 907,401

Claims priority, application Japan, Sep. 13, 1985, 60-202775; Sep. 13, 1985, 60-202776; Sep. 13, 1985, 60-202777; Sep. 13, 1985, 60-202778; Sep. 13, 1985, 60-202779; Sep. 13, 1985, 60-140495[U]; Sep. 13, 1985, 60-140497[U]

Int. Cl.[4] G06F *13/00, 3/00, 15/16, 15/74*

U.S. Cl. 364—900 **3 Claims**



1. A data collecting system for collection of data and entry of said data to a host computer comprising:

a portable hand held data collector for collecting data and for transmitting said data externally of the data collector, the data collector comprising

a case of a size and shape to be held by one hand during use,

a keyboard for inputting data and having numeral keys and function keys,

display means for displaying said data,

memory means for storing said data inputted by a user, and

interface means for transmitting said data stored in said memory means to a stationary data relay;

said stationary data relay having means for receiving said data from said data collector and for transmitting said data to said host computer, the data relay including

a case having means for removably setting said portable data collector thereon,

first interface means for receiving said data transmitted from said interface means in said data collector, and

second interface means for communicating bi-directionally to the host computer;

wherein said interface means in said data collector and said first interface means in said data relay have respective circuit means for transmitting said data bi-directionally using electromagnetic induction, and

wherein each said circuit means comprises a tuning unit having a coil, and a capacitor connected in parallel with said coil for generating an electromagnetic field when data are transmitted and for generating an electric signal by electromagnetic induction when data are received,

a transmitting unit for inputting an electric signal to said tuning unit when data are transmitted, and a receiving unit for outputting said electric signal generated in said tuning unit as serial data, said transmitting unit and said receiving unit being coupled together through a capacitor.

4,839,855

MULTIPLE REDUNDANT CLOCK CIRCUIT

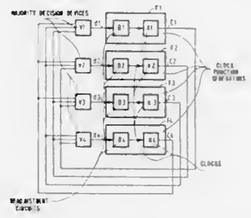
Carel-Jan L. Van Driel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 7, 1986, Ser. No. 916,348

Claims priority, application Netherlands, Oct. 10, 1985, 8502768

Int. Cl.[4] G06F *1/04*

U.S. Cl. 364—900 **17 Claims**



2. A multiple redundant clock device for use in a data processing device which includes four parallel-operating data processing modules, the clock device comprising:

a. four clock circuits, each clock circuit being assigned to a respective one of the parallel-operating data processing modules and comprising:

i. means for determining a binary two-thirds majority signal from output clock signals of the three other clock circuits;

ii. means for generating a clock function signal under control of said majority signal, said generating means gradually adjusting said clock function signal to reduce a deviation, between said majority signal and said clock function signal, by a deviation reduction factor which is substantially smaller than one for each signal transition in the majority signal;

iii. output means, responsive to the clock function signal, for supplying a respective local output clock signal; and

b. an interconnection network for communicating the output clock signals between the clock circuits.

4,839,856

MEMORY ACCESS CONTROL CIRCUIT

Koichi Tanaka, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 11, 1986, Ser. No. 940,725

Claims priority, application Japan, Dec. 23, 1985, 60-290209

Int. Cl.[4] G06F *12/06*

U.S. Cl. 364—900 **6 Claims**

1. A memory access control circuit comprising:

a memory access circuit for outputting memory address data consisting of upper and lower address data, an address strobe signal, and a count-up control signal for requesting the updating of a memory address, said upper address representing a memory row address, and said lower address representing a memory column address;

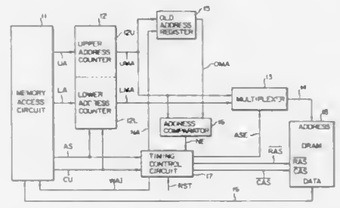
address retaining means, responsive to said memory access circuit, including an upper address counter and a lower address counter, for retaining said upper and lower address data, respectively, when said memory access circuit outputs said address strobe signal, and for updating said retained memory address data by a predetermined value when said memory access circuit outputs said count-up control signal;

upper address retaining means for retaining the value of said upper address data retained in said upper address counter prior to the updating of said retained memory address data;

signal output means for comparing said upper address data retained in said upper address counter with said upper address data retained by said upper address retaining means, and for outputting a non-coincidence signal when said compared addresses are not identical;

an address bus;

address switching means for sequentially switching and outputting to said address bus said upper and lower address data retained by said upper and lower address counters;



a memory for receiving from said address bus said upper and lower address data output from said address switching means, said upper and lower address data being used as a row address signal and a column address signal, respectively; and

control means, operational in response to said address strobe signal or said count-up control signal for controlling said address switching means to output said lower address data from said lower address counter to said address bus when said signal output means does not output said non-coincidence signal, and to output said upper and lower address data from said upper and lower address counters to said address bus when said signal output means outputs said non-coincidence signal, and for outputting a wait signal when said signal outputting means does not output said non-coincidence signal, said wait signal causing said memory access circuit to prolong the period during which said memory address data is output.

4,839,857

SYSTEM FOR FACILITATING THE CONTROL OF AUDIO INFORMATION WITHIN A WORD PROCESSING DOCUMENT WITH AUDIO INPUT

Lynda K. Mersiovsky, and Charles N. Sprott, both of Austin, Tex., assignors to IBM Corporation, Armonk, N.Y.

Filed Jun. 13, 1986, Ser. No. 873,755

Int. Cl.[4] G06F *1/00;* G11B *19/00;* H04R *29/00*

U.S. Cl. 369—25 **4 Claims**

1. A word processing system in which text can be displayed on a display device comprising:

audio recording and playback means for recording and playing back information spoken by a user of said system, said spoken information indicating changes to be made in said displayed text;

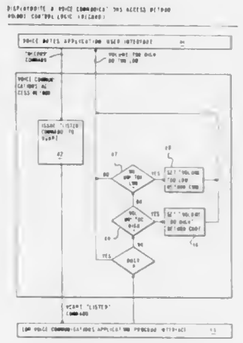
means for monitoring the volume level of said information spoken by said user;

means for notifying said user if said volume level of said information spoken by said user is too high or too low during recording of said spoken information;

means for playing back the audio information spoken by said user;

means for monitoring the volume level at which said played back information was recorded;

said means for notifying indicating to the user during playing back of said spoken audio information whether to increase or decrease the volume level of said played back information in order to compensate for a too low or too high volume level during recording of the spoken information;



said notifying means including means for presenting an indication on said display device adjacent to said displayed text; and

said word processing system including input means, under user control, said indication on said display device instructing said user to actuate said input means to raise or lower the volume level during recording or playing back of said audio information.

4,839,858

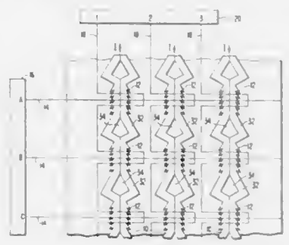
SERRATED MAGNETIC RANDOM MEMORY CELL AND MEANS FOR CONNECTING A PAIR OF ADJACENT CELLS

John F. Jackson, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 21, 1986, Ser. No. 933,516

Int. Cl.[4] G11C *19/08*

U.S. Cl. 365—87 **11 Claims**



1. A magnetic random access memory comprising:

an insulating substrate;

a thin film of magneto-resistive material disposed upon said substrate, said thin film having a plurality of spaced memory elements therein;

each said memory element being defined by a serrated edge pattern;

each said memory element being spaced from the other said memory elements by a non-serrated connecting region having a void in the magneto-resistive material, said void defining a polygon-shaped opening in said connecting region symmetrical about one axis thereof and non-symmetrical about an axis substantially perpendicular thereto; and

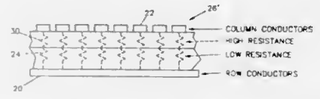
a plurality of spaced conductor means, insulated from and overlying said memory elements, for selectively detecting and changing the memory state of any selected one of said memory elements.

4,839,859

HIGH DENSITY ASSOCIATIVE MEMORY

Alexander W. Moopenn; Anilkumar P. Thakoor, both of Pasadena; Taher Daud, La Crescenta, all of Calif., and John J. Lambe, Redmond, Wash., assignors to The California Institute of Technology, Pasadena, Calif.

Filed Dec. 4, 1987, Ser. No. 128,872
Int. Cl.[4] G11C 11/40
U.S. Cl. 365—100 19 Claims



1. A multi-layered, thin-film, digital memory comprising:

(a) a first layer comprising a plurality of electrically separated row conductors;

(b) a second layer comprising a plurality of electrically separated column conductors intersect electrically separated from said row conductors; and,

(c) a plurality of resistance elements electrically connected between said row conductors and said column conductors at respective intersections of said row conductors and said column conductors, each resistance element comprising, in series, a first resistor of sufficiently high ohmage to conduct a sensible current therethrough with virtually no heat-generating power consumption when a low voltage as employed in thin-film applications is applied thereacross and a second resistor of sufficiently high ohmage to conduct no sensible current therethrough when a low voltage as employed in thin-film applications is applied thereacross, said second resistor having the quality of breaking down to create a short therethrough upon the application of a breakdown level voltage across said second resistor.

4,839,860

SEMICONDUCTOR DEVICE HAVING HEAD ONLY MEMORY WITH DIFFERENTIAL AMPLIFIER

Takashi Shinoda, Kodaira; Kikuo Sakai, Hachiohji; Masahiro Ogata, Kodaira; Hiroshi Kawamoto, Kodaira; Yoshiaki Onishi, deceased, late of Kokubunji, and by Junko Onishi, administratrix, Nagoya, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Division of Ser. No. 502,636, Jun. 9, 1983, Pat. No. 4,604,749. This application Jan. 17, 1986, Ser. No. 820,523
Claims priority, application Japan, Jun. 9, 1982, 57-97825; Jun. 9, 1982, 57-97826
Int. Cl.[4] G11C 17/00
U.S. Cl. 365—104 11 Claims

1. A semiconductor memory comprising:

a first data line;

first and second ground lines;

a plurality of memory cells provided between said first data line and said first ground line and between said first data line and said second ground line;

a plurality of first word lines each connected with a selecting terminal of one of the memory cells provided between said first data line and said first ground line and a selecting terminal of one of the memory cells provided between said first data line and said second ground line;

a second data line;

third and fourth ground lines;

a plurality of memory cells provided between said second data line and said third ground line and between said second data line and said fourth ground line;

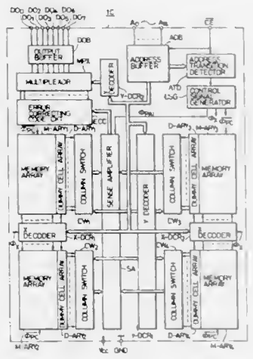
a plurality of second word lines each connected with a selecting terminal of one of the memory cells provided between said second data line and said third ground line and a selecting terminal of one of the memory cells provided between said second data line and said fourth ground line;

first, second, third and fourth dummy word lines;

a first dummy cell provided between said first data line and said first ground line and having a selecting terminal connected to said first dummy word line;

a second dummy cell provided between said first data line and said second ground line and having a selecting terminal connected to said second dummy word line;

a third dummy cell provided between said second data line and said third ground line and having a selecting terminal connected to said third dummy word line;



a fourth dummy cell provided between said second data line and said fourth ground line and having a selecting terminal connected to said fourth dummy word line;

first and second compensating circuits connected to said first and second dummy word lines respectively so that a capacitance having a value substantially equal to the value of the capacitance connected to said first word line will be connected to each of said first and second dummy word lines;

third and fourth compensating circuits connected to said third and fourth dummy word lines respectively so that a capacitance having a value substantially equal to the value of the capacitance connected to said second word line will be connected to each of said third and fourth dummy word lines;

a differential amplifier circuit having one input terminal connected with said first data line and another input terminal connected with said second data line; and

a selecting circuit having output terminals connected with said first and second word lines and output terminals connected with said first, second, third and fourth dummy word lines; and

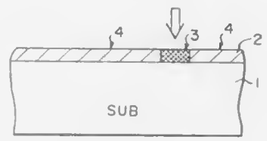
wherein when said selecting circuit operates such that the potential of one of said word lines is brougnt to the selection potential of the memory cells and the potential of one of said third and fourth dummy word lines is brought to the selection potential of one of said third and fourth dummy cells, the change in potential at the selecting terminal of one of said third and fourth dummy cells to be selected is made substantially equal to the change in potential at the selecting terminal of a memory cell to be selected, by one of said third and fourth compensating circuits, and when said selecting circuit operates such that the potential of one of said second word lines is brought to the selection potential of the memory cells and the potential of one of said first and second dummy word lines is brought to the selection potential of one of said first and second dummy cells, the change in potential at the selecting terminal of one of said first and second dummy cells to be selected is made substantially equal to the change in potential at the selecting material of a memory cell to be selected, by one of said first and second compensating circuits.

4,839,861

INFORMATION RECORDING MEDIUM REWRITABLE BY UTILIZING TWO METASTABLE PHASES OF A RECORDING LAYER AND METHOD USING THE SAME

Sumio Ikegawa, Tokyo; Shuichi Komatsu, Yokohama; Shinji Arai, Chigasaki; Sumio Ashida, Tokyo, and Nobuaki Yasuda, Zushi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 6, 1987, Ser. No. 12,074
Claims priority, application Japan, Feb. 6, 1986, 61-24508
Int. Cl.[4] G11C 13/00, 13/04; G11B 7/00
U.S. Cl. 365—113 27 Claims



1. A rewritable information recording medium comprising a recording layer containing, as two principal elements, a Group I transition element selected from the group consisting of Cu, Ag and Au and Group IV representative element selected from the group consisting of Si, Ge, Sn and Pb, and a support substrate for physically supporting said recording layer, wherein said recording layer is reversibly convertible between a written state and an erased state and has the following characteristics:

(a) first and second metastable phases having different energy levels can be formed in said recording layer by heating and immediately cooling the recording layer;

(b) the written state in the first metastable phase of the higher energy level has a higher reflectivity than that of the erased state in the second metastable phase of the lower energy level;

(c) the written state in the first metastable phase is obtained by heating the recording layer in another state by light beam irradiation; and

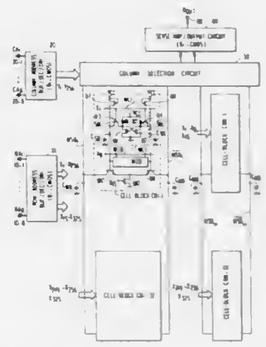
(d) upon being cooled after it is heated to a temperature lower than that for obtaining the first metastable phase, a portion in the written state is converted to the erased state.

4,839,862

STATIC RANDOM ACCESS MEMORY HAVING BI-CMOS CONSTRUCTION

Hiroshi Shiba, and Shoji Eguchi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 14, 1987, Ser. No. 85,575
Claims priority, application Japan, Aug. 15, 1986, 61-191321; Aug. 15, 1986, 61-191322; Aug. 15, 1986, 61-191323
Int. Cl.[4] G11C 7/02, 11/40
U.S. Cl. 365—154 7 Claims



1. A semiconductor memory comprising a pair of main-bit lines each having a first strong capacitance; a plurality of cell blocks, each of said cell blocks including a plurality of word lines, a pair of pre-bit lines each having a second strong capacitance, a plurality of memory cells each connected to one of said word lines and to said pre-bit lines, a first node connected to one of said main-bit lines, a second node connected to the other of said main-bit lines, a third node, a first transistor of a bipolar type having a base connected directly to one of said pre-bit lines and a collector-emitter current path connected between said first and third nodes, a second transistor of said bipolar type having a base connected directly to the other of said pre-bit lines and a collector-emitter current path connected between said second and third nodes, a third transistor connected between said third node and a reference point, each of said memory cells having fourth and fifth transistors of an insulated gate field effect type which are cross-coupled in a flip-flop form; and means responsive to a set of address signals for selecting one of said word lines and for turning on said third transistor in said one of said cell blocks, the number of said memory cells in each of said cell blocks being smaller than the number of said cell blocks to reduce said second stray capacitance and said first stray capacitance, wherein said second stray capacitance of one of said pre-bit lines is discharged through one of said fourth and fifth transistors and said first stray capacitance of one of said main-bit lines is discharged through one of first and second transistors and said third transistor.

4,839,863

MEMORY CELL CIRCUIT

Mitsuo Soneda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 28, 1987, Ser. No. 101,441
Claims priority, application Japan, Sep. 26, 1986, 61-227447
Int. Cl.[4] G11C 11/00
U.S. Cl. 365—154 19 Claims

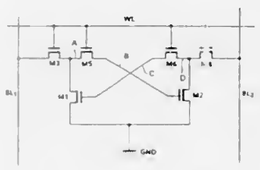
1. A memory cell circuit comprising:

first and second bit lines for transferring data therethrough;

a word line through which a selection signal passes;

first and second memory transistors having gates for storing

data, said first and second memory transistors are commonly grounded via sources thereof and having drains;
first means for connecting said drain of said first memory transistor to said gate of said second memory transistor;
second means for connecting said drain of said second memory transistor to said gate of said first memory transistor;
third means connecting said first means to said first bit line, said third means incorporating a first access transistor and being connected to said word line to receive said selection signal to be responsive to said selection signal to be switched into a conductive state;
fourth means connecting said second means to said second bit line, said fourth means incorporating a second access transistor and being connected to said word line to receive



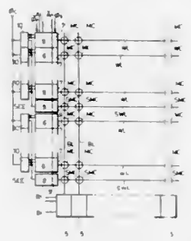
said selection signal to be responsive to said selection signal to be switched into said conductive state;
a third access transistor connected to said word line to be switched into the conductive state in response to said selection signal, said third access transistor being connected in series to said first access transistor in such a manner as to surpress channel leak of the potential in said first means;
a fourth access transistor connected to said word line to be switched into the conductive state in response to said selection signal, said fourth access transistor being connected in series to said second access transistor in such a manner as to surpress channel leak of the potential in said second means.

4,839,864

SEMICONDUCTOR MEMORY DEVICE COMPRISING PROGRAMMABLE REDUNDANCY CIRCUIT

Kazuyasu Fujishima, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1988, Ser. No. 163,015
Claims priority, application Japan, Mar. 9, 1987, 62-53613
Int. Cl.[4] G11C 7/00
U.S. Cl. 365—200 **13 Claims**



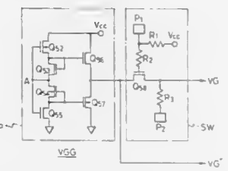
1. A semiconductor memory device having a programmable redundancy circuit, comprising:
a plurality of memory cells,
at least one spare memory cell,
a plurality of decoder means each responsive to a plurality of address signals for selecting any of said plurality of memory cells,
each one of said decoder means comprising (a) first logical circuit means responsive to a predetermined combination of said plurality of address signals for generating a decoder activating signal, (b) a link element which can be disconnected and (c) state determining means independent of the other ones of said decoder means and being responsive to said decoder activating signal when said link element is disconnected, and being responsive to said decoder activating signal from said first logical circuit means for outputting a memory cell selecting signal for selecting said memory cells when said link element is not disconnected, and
spare decoder means responsive to said spare decoder activating signal for generating a spare memory cell selecting signal for selecting said spare memory cells.

4,839,865

SELECTIVE APPLICATION OF VOLTAGES FOR TESTING STORAGE CELLS IN SEMICONDUCTOR MEMORY ARRANGEMENTS

Katsuynki Sato; Hiroshi Kawamoto, both of Kodaira, and Kazumasa Yanagisawa, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 24, 1986, Ser. No. 934,666
Claims priority, application Japan, Nov. 22, 1985, 60-261154
Int. Cl.[4] G11C 7/00, 11/42
U.S. Cl. 365—201 **15 Claims**



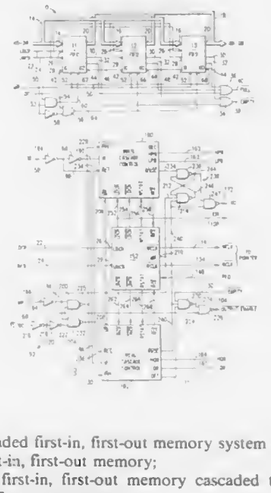
1. A semiconductor memory comprising:
a memory cell including a data storage capacitor, having a pair of electrodes, and a MISFET coupled in series with said capacitor;
a voltage generating circuit, powered by a power source voltage, for providing a voltage of about a half of said power source voltage to one of said pair of electrodes, the other of said pair of electrodes being coupled to said MISFET;
voltage supply means for supplying a predetermined test voltage to said one electrode;
switch means coupled for supplying either the voltage from said voltage generating circuit or the voltage from said voltage supply means to said one electrode; and
wherein said voltage generating circuit comprises a voltage dividing circuit which has a first resistor means having one end coupled to said power source voltage, a second resistor means having one end coupled to a predetermined source voltage, a first node, a first MISFET of a first channel conductivity type, configured to operate as a diode, coupled between a second end of said first resistor means and said first node, and a second MISFET of a second channel conductivity type, configured to operate as a diode, coupled between a second end of said second resistor means and said first node, a first output MISFET of said first channel conductivity type having a gate connected to the common connection of said first MISFET and said first resistor means, and a second output MISFET of said second channel conductivity type having a gate connected to the common connection of said second MISFET and said second resistor means and having its source connected to the source of said first output MISFET, and wherein said first and second MISFETs have threshold voltage levels of absolute value smaller than that of the corresponding first and second output MISFETs, respectively and wherein, an output voltage of about half of said power source voltage is obtained from said common source connection of said first and second output MISFETs.

4,839,866

CASCADABLE FIRST-IN, FIRST-OUT MEMORY

Morris D. Ward, Garland, and Kenneth L. Williams, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 29, 1987, Ser. No. 55,669
Int. Cl.[4] G11C 7/00, 8/00, 19/00
U.S. Cl. 365—221 **24 Claims**



1. A cascaded first-in, first-out memory system comprising:
a first first-in, first-out memory;
a second first-in, first-out memory cascaded to said first first-in first-out memory;
a controller for enabling write operations responsive to a first transition of a control transfer input signal and for enabling read operations responsive to a second transition of said control transfer input signal, said second transition being of opposite polarity from said first transition;
said controller operable to transmit a first transition of a control transfer output signal to said second first-in, first-out memory responsive to a first predetermined state in said first first-in, first-out memory, and operable to transmit a second transition of said control transfer output signal of opposite polarity to the last said first transition to said second first-in, first-out memory responsive to a second predetermined state in said first first-in, first-out memory, such that said second first-in, first-out memory will be enabled to perform write operations after receiving said first transition of said output signal and will be enabled to perform read operations after receiving said second transition of said output signal.

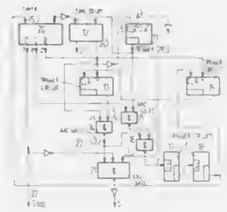
16. In a cascaded memory system having a plurality of memory units including a first unit and other units, each unit operable to have data written thereinto responsive to a stored predetermined control state and operable to have data read therefrom responsive to a second stored predetermined control state and an output enabling state thereof, an initialization and output control circuit comprising:
a first circuit operable to cause said first unit to store said first and second predetermined control states and to cause said other units not to store said first and second predetermined control states, all responsive to an external reset signal; and
a second circuit operable to cause each of said memory units not to be in said output enabling state responsive to an external output control signal.

4,839,867

METHOD FOR REFRESHING DATA IN A DYNAMIC RANDOM ACCESS MEMORY UNIT AND CONTROL UNIT FOR THE IMPLEMENTATION OF THE METHOD

Guenter Pochnitzsch, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 913,696, Sep. 30, 1986, abandoned. This application Jun. 17, 1988, Ser. No. 210,217
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1985, 3534835; Jul. 11, 1986, 3623472
Int. Cl.[4] G11C 7/00, 11/40
U.S. Cl. 365—222 **3 Claims**



1. A method for controlling refreshing of data in a random access memory which comprises a plurality of groups of memory cells, in which the refreshing is done in groups of memory cells so that normal read and/or write memory cycles can be executed between successive refreshing of two groups, which comprises a refresh generator for generating refresh voltages and a timer for measuring time intervals which comprise a predetermined short pause between the end of a memory cycle and the next following memory cycle, in which the memory cells are contained in at least one random access memory chip in which a predetermined maximum number of groups require the same predetermined maximum number of refresh cycles within a predetermined maximum time interval for refreshing all groups, the improvement comprising the steps of:
sensing the memory cycles;
controlling the time duration between successive refresh cycles differently in first and second time intervals generated by the timer, said second time interval immediately following and being shorter than said first time interval, said first time interval being longer than the minimum duration between the start times of two successive memory cycles, by triggering a refresh cycle at the beginning of said first time interval including generating a delayed clock in response to the leading edge of the start clock of a first memory cycle and terminating he refresh cycle before the beginning of the earliest possible next memory cycle, and preventing triggering of further refresh cycles after the first refresh cycle for each further memory cycle;
after the beginning of the second time interval, triggering the next refresh cycle for the next x^{th} memory cycle and terminating the same before the start of the earliest possible $x+1^{st}$ memory cycle and resetting the timer in response to a memory cycle start clock to trigger a new first time interval and a new refresh cycle therein and preventing triggering of further refresh cycles in response to each further memory cycle; and
triggering an emergency refresh cycle and a new first time interval in response to detecting the lack of the x^{th} mem-

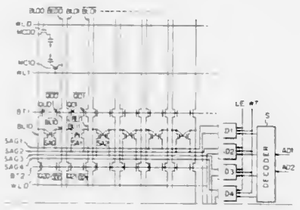
ory cycle and the associated refresh cycle in the second time interval.

4,839,868

SEMICONDUCTOR MEMORY DEVICE HAVING SENSE AMPLIFIERS WITH DELAYED AND STOPPED DRIVE TIMES

Kimiaki Sato, Tokyo, and Tool Khono, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 11, 1987, Ser. No. 95,199
Claims priority, application Japan, Sep. 18, 1986, 61-218170
Int. Cl.[4] G11C *7/00, 8/00*; G11R *19/00*
U.S. Cl. 365—230.06 **13 Claims**



1. A semiconductor memory device comprising:
a write data transfer means;
a plurality of groups of sense amplifiers;
a plurality of word lines;
a plurality of pairs of bit lines, each of said pairs of bit lines comprising a pair of inside bit line portions extending between said write data transfer means and each of said sense amplifiers, and a pair of outside bit line portions extending from each of said sense amplifiers in a direction opposite to that of a corresponding pair of inside bit line portions;
a plurality of memory cells connected between said word lines and said pairs of bit lines, respectively; and
delaying means for delaying a drive timing of a selected one of said groups of sense amplifiers connected to a selected one of said pairs of bit lines on which a transfer of write data is being performed, the drive timing being a delayed drive timing when compared with the drive timing of the sense amplifiers connected to remaining pairs of said bit lines on which the transfer of said write data is not being performed, said delaying means delaying the drive timing when the write data is transferred from said write data transfer means to part of the memory cells connected to a selected one of said outside bit line portions connected to said selected one of said groups of sense amplifiers.

4,839,869

METHODS FOR PROCESSING CONVERTED WAVE SEISMIC DATA

Chris T. Corcoran, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 6, 1986, Ser. No. 915,434
Int. Cl.[4] G01N *1/35*
U.S. Cl. 367—53 **22 Claims**

1. A method for improved resolution of reflection seismic data containing at least converted wave information, comprising:
providing seismic field records employing known multiple source and receiver locations having a known acquisition geometry,
selecting an appropriate layered earth model representative of the area of interest having known parameters,
ray tracing through said model to determine reflection points, two-way travel times, and values representative of signal amplitudes for converted waves, for a plurality of offsets,
determining for said plurality of offsets the variance between each of a plurality of fixed fractional sort points and said determined reflection points projected to the surface for at least one depth range of interest wherein said variance includes amplitude versus offset effects from said determined signal amplitudes and includes the effects of the geometry employed to generate the seismic field records,
determining a fixed fractional sort point that minimizes said variance for all the seismic field records in the area of interest, and
gathering the field records using said determined fixed fractional sort point.

4,839,870

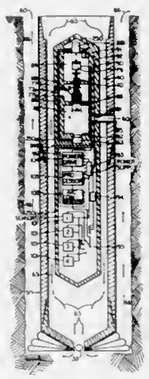
PRESSURE PULSE GENERATOR SYSTEM FOR MEASURING WHILE DRILLING

Serge A. Scherbatskoy, 3921 Clayton Rd. E., Forth Worth, Tex. 76116

Continuation of Ser. No. 75,848, Jul. 20, 1987, which is a continuation of Ser. No. 918,577, Oct. 10, 1986, abandoned, which is a continuation of Ser. No. 811,956, Dec. 20, 1985, abandoned, which is a continuation of Ser. No. 719,444, Apr. 2, 1985, abandoned, which is a continuation of Ser. No. 443,134, Nov. 19, 1982, abandoned, which is a division of Ser. No. 383,269, May 28, 1982, Pat. No. 4,520,468, which is a continuation of Ser. No. 68,526, Aug. 21, 1979, abandoned, and a continuation-in-part of Ser. No. 857,677, Dec. 5, 1977, abandoned. This application Jun. 3, 1988, Ser. No. 206,942
Int. Cl.[4] G01V *1/40*
U.S. Cl. 367—83 **8 Claims**

1. A measurement while drilling apparatus for use in a borehole in which information carrying signals are transmitted by fluid pressure changes in a borehole fluid circulation system employing a pump for forcing fluid flow through said system, a flow restriction in said system causing a well fluid high pressure zone and a fluid low pressure zone in different sides of said restriction,
a passageway interconnecting said zones and a power driven valve interposed in said passageway, the openings and closings of said valve causing openings and closings of said passageway, the amount of power required for each opening of said valve exceeding a determined magnitude,
a sensor for sensing the magnitude of downhole measurements and generating a succession of electric voltage changes to sequentially cause openings and closings of said valve in response to said downhole measurements,
said apparatus comprising:
a valve opening means to actuate said valve to cause openings of said passageway; and

a power drive comprising a capacitor means and a source of electrical voltage to supply electric current for charging said capacitor means;
said power drive being responsive to said electric voltage changes for initiating successive discharges of said capacitor means thus delivering an amount of power exceeding said magnitude with each of said discharges and applying said discharges to said valve opening means to produce successive openings of said passageway;



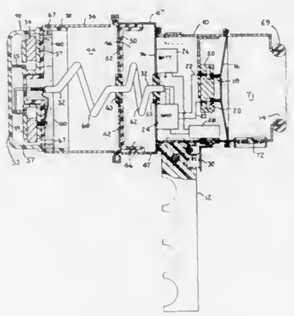
a valve closing means to actuate said valve to cause a closing of said passageway subsequently to each opening of said passageway whereby successive openings and closings of said passageway are produced;
said successive openings and closings of said passageway generating said pressure changes in said borehole fluid circulation system.

4,839,871

UNDERWATER COMMUNICATION DEVICE

Auldin J. Massey, 3437 Binkley, Dallas, Tex. 75205

Filed Jul. 5, 1988, Ser. No. 215,364
Int. Cl.[4] H04R *1/02*
U.S. Cl. 367—132 **6 Claims**



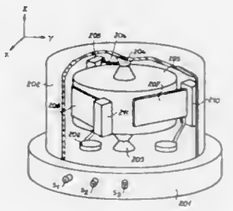
1. An underwater personal communication device comprising:
a housing structure (**10**) having a first end and a second end;
a rigid wall (**36**) located within the housing structure at an intermediate point between its ends;
an electrical microphone means (**16**) located in the first end of the housing structure adjacent one face of said rigid wall;
an electrical speaker means located in the second end of the housing structure, said speaker means including a vibratable membrane (**53**) having an inner surface and an outer surface exposed to underwater pressure;
a movable diaphragm (**42**) mounted within the housing structure between said intermediate rigid wall and said speaker means, to form a variable volume air chamber (**44**) communicating with the speaker means and a variable volume water chamber (**46**) communicating with the rigid wall;
electrical conductor means interconnecting said microphone means and said speaker means;
and port means (**47**) in the housing structure for admitting water into said water chamber whereby the water pressure is applied through the air chamber to the inner surface of the vibratable membrane.

4,839,872

GEOPHONE WITH A SENSITIVE ELEMENT MADE OF PIEZOELECTRIC POLYMER

Claude Gragnolati, Cannes; Didier Thollon, Juan les Pins, and Jean-Georges Malcor, Biot, all of France, assignors to Thomson-CSF, Paris, France

Filed May 19, 1988, Ser. No. 195,869
Claims priority, application France, May 19, 1987, 87 06990
Int. Cl.[4] H04R *17/00, 11/00*
U.S. Cl. 367—180 **6 Claims**



1. A geophone having a measuring plane, which comprises a casing having an internal face, a cylindrical inertials mass having an axis perpendicular to said measuring plane, two end surfaces and a lateral surface, two members made with a viscoelastic material presenting a modulus of transverse elasticity and being fixed to said internal face and to respectively said end surfaces for maintaining said inertial mass along said axis within said casing, and at least three two-strip sensors made of flexible piezoelectric polymer having a low natural resonance frequency, said sensors having two ends, being evenly distributed around said lateral surface resting freeing on said lateral surface and being embedded in said internal face by a single one of said ends, and wherein said members are twin-wheel shaped.

4,839,873

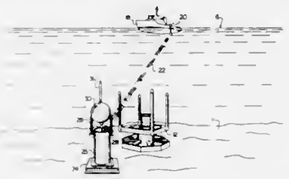
SUBSEA ACOUSTIC RELOCATION SYSTEM

Douglas A. Cochrane, Jr., and Fred W. Styer, both of Lafayette, La., assignors to Cochrane Subsea Acoustics, Inc., Lafayette, La.

Continuation of Ser. No. 395,918, Jul. 7, 1982. This application Aug. 7, 1985, Ser. No. 763,394
The portion of the term of this patent subsequent to Aug. 3, 2002, has been disclaimed.
Int. Cl.[4] H04B *1/59*
U.S. Cl. 367—133 **10 Claims**

1. A method of undersea relocation to the water surface of an anchor initially positioned on a seabed, comprising the steps of:

(a) positioning a line container having an elongated stored container line with a free end that can pay out from the container near the anchor on the seabed to be relocated at a future designated relocation time;
(b) providing an anchor pendant line initially positioned on the seabed, attached to the anchor to be relocated and of a sufficient length to extend between the seabed area and the water surface;
(c) providing an intermediate line for forming a connection between the container line and the anchor pendant line



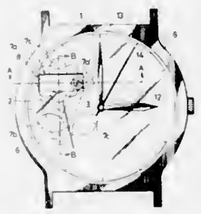
and of a length sufficient to extend between the seabed area and the water surface;
(d) emitting an acoustic signal at the designated relocation time, causing a buoyed structure and one end of the container line to rise to the water surface area as line dispenses from the line container;
(e) lifting the end of the intermediate line connected to the free end of the container line with the container line until it reaches the water surface; and
(f) raising an end of the anchor pendant line to the water surface using the intermediate line.

4,839,874

ELECTRONIC WATCH WITH MOVING MEMBER

Tooru Namisato, Tokyo, Japan, assignor to Seiko Instruments Inc., Tokyo, Japan

Filed Sep. 12, 1988, Ser. No. 243,594
Claims priority, application Japan, Sep. 17, 1987, 62-141817[U]; Dec. 22, 1987, 62-195638[U]
Int. Cl.[4] G04B *19/00, 19/06*
U.S. Cl. 368—76 **8 Claims**



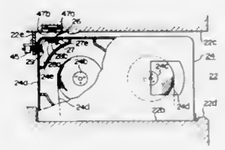
1. An analog type electronic watch for indicating the time by driving a gear train by means of a step motor including a rotor which exhibits a magnetic force, a stator and a coil block; said watch comprising:
a dial plate having a window portion within the range of influence of the magnetic force of said rotor,
a magnetic member arranged within said window portion so as to be synchronously moved by the magnetic force in accordance with the rotation of said rotor for acting as movement indicator, and
supporting means for supporting said magnetic member.

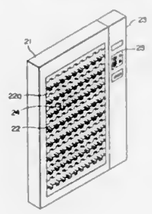
4,839,875

TECHNIQUE FOR AUTOMATIC TRACKING OF CASSETTE RENTALS AND MANAGING OF INFORMATION RELATED THERETO

Zenkichi Kuriyama; Masaho Aoba, both of Sagamihara, and Teruo Takeuchi, Ichikawa, all of Japan, assignors to Anritsu Corporation; Yuasa Shoji Co. and Dan Co., Ltd., all of Tokyo, Japan

Filed May 14, 1987, Ser. No. 50,711
Claims priority, application Japan, May 19, 1986, 61-73980[U]; Oct. 23, 1986, 61-252297; Oct. 23, 1986, 61-252298
Int. Cl.[4] G06F *15/24;* **G06K** *19/06*
U.S. Cl. 369—14 **17 Claims**





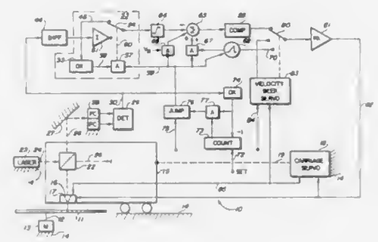
1. A rent control system for controlling the rent and return of cassettes, said system comprising:
a plurality of cassettes to be controlled, each internally containing an article, and being provided with IC circuit means for storing commodity information concerning said article, and signal output means for transferring said commodity information stored in said IC circuit means to outside;
a plurality of shelf means for respectively accommodating a plurality of said cassettes to be controlled; and
control means connected with said plurality of shelf means, and having a plurality of signal input means for receiving signals from said signal output means of said cassettes, and memory means being coupled with said control means so as to store signals from said plurality of signal input means;
wherein said control means includes detectors provided in said respective shelves, each detecting the cassette insertion into the shelf; a rent control memory including a plurality of tables respectively corresponding to said cassettes, said tables each consisting of a commodity information area for storing commodity information, a rent information area for storing rent information, and a shelf number area for storing a shelf number; a timer for measuring time from the instant that said detector detects the pull-out of the cassette from the shelf; rent registering means for registering rent information into the rent information area of the table corresponding to the number of the shelf from which said cassette is pulled out, in response to a rent key operation which has been done before the time measures a predetermined allowance time; status pending registering means for registering status pending information into the rent information area of the table corresponding to the number of the shelf from which said cassette has been pulled out, in response to the end of the allowance time measured by said time.

4,839,876

TRACK SEEKING USING A TRACK FOLLOWING LOOP

Alan A. Fennema, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1987, Ser. No. 123,675
Int. Cl.[4] G11B *7/085*
U.S. Cl. 369—32 **11 Claims**



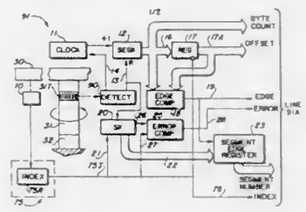
1. In a servo positioning system having motive means carrying an object to selectively position the object over one of any one of a plurality of spaced apart reference lines and having a position sensor for sensing and indicating the relative position of the object with respect to a closest one of the reference lines and supplying a position error signal indicative of the positional relationship of the object with respect to a closest one of said reference lines and supplying a sinusoidal signal alternation each time the object traverses a space between adjacent ones of the reference lines;
the improvement including, in combination:
command generator means for supplying a track reference signal for indicating keeping the object over a current one of the reference lines and a control reference signal of indicating a desired movement of the object from the current reference line to a second reference line spaced from the current reference line;
differentiating means connected to the position sensor for receiving the position error signal and differentiating the position error signal to create a differentiated error signal;
servo driver circuit means electrically interposed between said motive means, command generating means and the differentiating means for electrically coupling said differentiating means to said motive means for actuating the motive means to position the object with respect to the current reference line or a second reference line in response to the differentiated error signal and said reference signals;
zero axis crossing detecting means connected to said differentiating means for detecting and indicating the zero axis crossings; and
phase change means in the differentiating means connected to the command generator means and to the zero axis crossing detecting means for responding to the indications of the zero axis crossings for reversing the phase of the differentiated error signal when the object is traversing between a current and a second reference line by reversing the polarity of the differentiated position error signal between the zero crossings thereof occurring intermediate the current and second reference lines and coupled to the servo drive circuit means for supplying the reversed phase signal thereto.

4,839,877

ROTATIONAL POSITION CONTROLS FOR OPTICAL DISK PLAYERS USING REMOVABLE DISKS

John E. Kulakowski, and Rodney J. Means, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 2, 1987, Ser. No. 104,143
Int. Cl.[4] G11B *15/52, 27/22*
U.S. Cl. 369—48 **12 Claims**



1. In an optical disk player, a spindle for rotatably, removably receiving and supporting an optical disk having radially-extending index line on the data disk which extends radially across a data recording area;
a tachometer member on the spindle having a plurality of precise rotational reference marks;
a rotational-position index mark on the optical disk;
first circuit means operatively coupled to said tachometer and to an optical disk supported on the spindle for measuring the relative rotational position of the optical disk index mark to any one of the tachometer rotational reference marks, and for supplying a delta signal representative of such relative rotational position for each of said tachometer rotational reference marks;
second circuit means operatively coupled to said first circuit means for receiving said delta signal and for generating rotational position signals indicating the precise rotational position of the optical disk related to the tachometer member and recalibrating said precise rotational position at each of said tachometer rotational reference marks; and
third circuit means operatively coupled to said first and second circuit means for receiving said rotational position signals for synchronizing operation of the disk player to the delta signal.

4,839,878

APPARATUS FOR CONTROLLING THE WRITING OF DATA IN DISK SECTORS

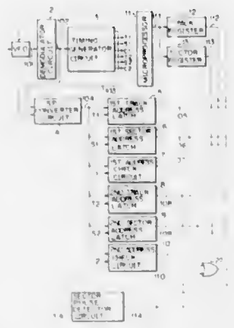
Ryuichi Inoue, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 166,939
Claims priority, application Japan, Mar. 11, 1987, 62-56306
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—54 **1 Claim**

1. A disk control device for writing and reading data out of sectors which are preformated on a disk and have address sections in each of which a plurality of identical track addresses and a plurality of identical sector addresses are written, comprising:
track address comparing means for comparing a designated track address for starting writing data and said track address;
sector address comparing means for comparing a designated sector address for starting writing data and said sector address;
sector-by-sector track address comparing means for comparing said track addresses stored in storage means and written in said address sections of said individual sectors

which are defined in one track of said disk and said designated track address; and

control means for controlling said track address comparing means, said sector address comparing means and said sector-by-sector track address comparing means such that said data are written in any of said sectors which has said address section having said designated address and said



designated sector address therein when a result of comparison outputted by said track address comparing means shows coincidence of one of said plurality of track addresses of said address section and said designated track address, and when a result of comparison outputted by said sector-by-sector track address comparing means is representative of coincidence.

4,839,879

METHOD FOR RECORDING DATA ON NON-DEFECTIVE SECTORS OF AN OPTICAL DISK

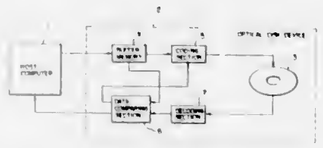
Kaname Sawada, Yokohama; Kazuo Suzuki, Funabashi; Shinji Hasunuma, Tokyo; Eiso Katayama, Yokohama; Motoyasu Ohno, Itabashi; Tsukasa Kanazawa, Tokyo, and Keiji Ueki, Yokohama, all of Japan, assignors to Matsushita Graphic Communication Systems, Inc., Tokyo, Japan

Filed Aug. 27, 1987, Ser. No. 90,104

Claims priority, application Japan, Sep. 3, 1986, 61-207258

Int. Cl.[4] G11B 7/00

U.S. Cl. 369—54 2 Claims



1. A method of recording data on an optical disc, said optical disc having a plurality of concentric tracks, each of said tracks being subdivided into a plurality of sectors, said method comprising the steps of:

designating, for each of said tracks, at least one of said sectors as preliminary sectors and designating the remaining sectors as user sectors;

recording basic data on said user sectors;

reproducing data from said user sectors;

comparing said basic data with said reproduced data to thereby identify defective user sectors;

recording data corresponding to said defective user sectors on said preliminary sectors.

4,839,880

APPARATUS FOR LOADING RECORD DISCS OF DIFFERENT DIAMETERS IN DISC PLAYERS

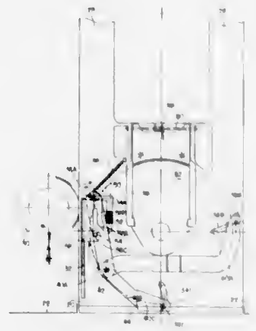
Stephane M. d'Alayer de Costenore d'Arc, and Philippe V. Denis, both of Genappe, Belgium, assignors to Staar S.A., Belgium

Filed Sep. 24, 1987, Ser. No. 100,631

Claims priority, application Belgium, Apr. 13, 1987, 8700386

Int. Cl.[4] G11B 1/00, 17/04, 25/04

U.S. Cl. 369—75.2 17 Claims



1. A record disc player apparatus comprising:

a turntable; and

loading means for carrying a record disc between a loading-/unloading position and an operating position on said turntable, said loading means including:

at least three movable studs disposed generally equidistantly about an axis of said loading means

which move inwardly generally toward the axis from a position spaced outwardly of the periphery of a larger of different diameter record discs which said loading means is adapted to carry concentric with the axis and which return to the outwardly spaced position upon operation of said loading means;

interconnected movable supports carrying said studs, the interconnection of said supports allowing one of said supports to be moved independently of the other of said supports upon operation of said loading means to move the one of said studs carried thereby inwardly independently of others of said studs to engage the periphery of a larger record disc supported on said loading means and thereby to sense the presence of a larger record disc while the others of said studs remain at the outwardly spaced position;

a guide member which guides said one support to return said one stud to the outwardly spaced position in response to said one stud sensing the presence of a larger record disc and which guides said one support into an actuating position only after a predetermined displacement of said one support indicating the absence of a larger record disc; and

an actuating structure which is operative when said one support is in the actuating position and which moves said interconnected supports and the studs carried thereby simultaneously inwardly to engage the periphery of and center a smaller of the different diameter record discs.

4,839,881

PICKUP TRANSPORT DEVICE FOR OPTICAL DISC APPARATUS

Ichiro Takahara, Hirakata; Masaaki Azumi, Osaka; Kazuo Shigetomi, Higashiosaka; Takaya Kamimura, Nara, and Hideki Ishida, Osaka, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

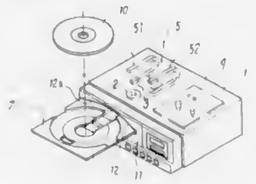
PCT No. PCT/JP87/00346, § 371 Date Feb. 3, 1988, § 102(e) Date Feb. 3, 1988, PCT Pub. No. WO87/07752, PCT Pub. Date Dec. 17, 1987

PCT Filed May 28, 1987, Ser. No. 150,422

Claims priority, application Japan, Jun. 5, 1986, 61-130717; Sep. 19, 1986, 61-144429; Sep. 19, 1986, 61-22200; Oct. 8, 1986, 61-239772; Apr. 20, 1987, 62-96489

Int. Cl.[4] G11B 1/00, 21/04, 25/04

U.S. Cl. 369—75.2 3 Claims



1. In an optical disc apparatus including a pickup for reproducing signals from opposite sides of an optical disc or recording signals on opposite sides of an optical disc as said optical disc is rotated in a plane spaced from said pickup, a pickup transport device comprising a support base having said pickup mounted thereon, and a guide assembly for guiding the travel of said support base, said guide assembly being positioned on a chassis having a disc drive motor, said support base being coupled to transport means and being reciprocatingly movable on said guide assembly, said guide assembly comprising left and right guide rails parallel to each other and each formed in a U-shape with a pair of straight travel guide portions disposed in parallel to each other and positioned on opposite sides of, and at equal distances from, said plane of rotation of said disc for moving said pickup along a parallel radial lines equally spaced from the opposite sides of said disc, and a circular portion positioned radially outward of said disc interconnecting the ends of said parallel disposed straight travel guide portions on said opposite sides of said plane of rotation of said disc, said support base, having said pickup mounted thereon, being supported at is opposite side portions on said left and right guide rails, and upper guide pole and a lower pole arranged above said chassis for guiding straight movement of said support base along said straight guide portions of one of said guide rails, said support base being formed with a slide groove for the guide poles to pass therethrough.

4,839,882

RECORD CARRIER WITH AN OPTICALLY READABLE TRACKWISE-ARRANGED INFORMATION STRUCTURE

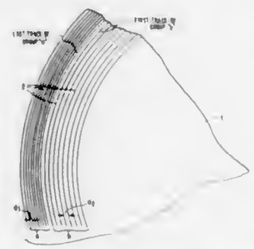
Peter J. M. Janssen, Eindhoven, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 853,093, Nov. 21, 1977, abandoned, which is a continuation of Ser. No. 623,641, Oct. 20, 1975, abandoned. This application Mar. 10, 1980, Ser. No. 128,417

Int. Cl.[4] G11B 7/00

U.S. Cl. 369—275 14 Claims

1. A record carrier for storing information comprising a substrate having thereon an optically readable information structure comprised of a plurality of generally parallel, spaced apart elongated information tracks containing information stored along the length thereof, which information is retrieved by a read beam of radiation which is directed onto the track to be read and is modulated in accordance with information stored in that track as the read beam traverses the length of the track to be read, said tracks being arranged in at least two juxtaposed groups each containing a plurality of said tracks, the spacing between tracks in at least contiguous portions of adjacent groups varying from group to group such that when said structure is scanned by a spot of radiation spanning a plurality of said tracks and moving relative to the record carrier in a direction transverse to the longitudinal direction of said tracks, the variation in the spacing between tracks produces a detectable change in the radiation comming from the record carrier as the spot moves from one to the other of said groups.



4,839,883

OPTICAL INFORMATION RECORDING MEDIUM

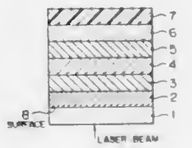
Kenichi Nagata, Neyagawa, and Noboru Yamada, Hirakata, both of Japan, assignors to Matsushita Electric Ind. Co., Ltd., Osaka, Japan

Filed Jun. 25, 1987, Ser. No. 66,229

Claims priority, application Japan, Jun. 30, 1986, 61-153114; Jun. 30, 1986, 61-153116

Int. Cl.[4] G11B 7/24

U.S. Cl. 369—286 16 Claims



1. A reversible optical information recording medium comprising:

a substrate;

an absorptive layer, overlying the substrate, which absorbs a light of a wavelength of an irradiating laser beam for any one of recording, reproducing, and erasing and which may be reversibly switched to a state having different optical properties;

a reflective layer, overlying the absorptive layer, for reflecting a considerable portion of the light of an irradiating laser beam; and

a spacer layer interposed between said absorptive layer and said reflective layer,

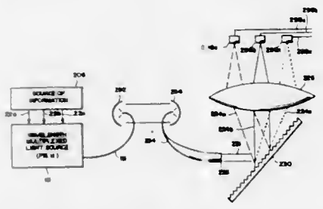
wherein said reflective layer comprises a thin film of an Ni-Cr alloy or an Au-Cr alloy.

4,839,884

MULTIPLE WAVELENGTH OPTICAL SOURCE AND MULTIPLEXED LIGHT COMMUNICATION SYSTEM

Robert P. Schloss, East Brunswick, N.J., assignor to General Electric Company, Camden, N.J.

Filed Mar. 4, 1988, Ser. No. 165,066
Int. Cl.[4] H04B 9/00
U.S. Cl. 370—3 **17 Claims**



5. A wavelength-multiplexed communication system, comprising:

a source of first information to be transmitted;

a source of second information to be transmitted;

a semiconductor block including a light-reflective surface and at least first and second elongated, spaced-apart, parallel light-conducting channels, each including first and second ends, each of said channels being orthogonal to and terminating at said first ends at said reflective surface, said semiconductor block being formed from materials which, when energized, generate and coupe to said channels a broad spectrum of incoherent light, and which is capable of stimulated emission of light for radiating first and second light beams from said second ends of said first and second channels, respectively;

means coupled to said sources of first and second information and to said first and second channels for modulating said first and second light beams with said first and second information, respectively, to generate first and second modulated beams of light;

a lens arrangement arranged for receiving said modulated beams of light from said channels for directing said first and second modulated beams of light at slightly differing angles toward a common region of space;

a partially reflective plane mirror for partially reflecting back light which is directed orthogonal to said plane mirror, and for transmitting the remainder of said light so directed;

a diffraction grating located at least in part within said region of space for receiving said first and second modulated beams of light at slightly differing angles, said grating being oriented and ruled in a manner for diffracting said first and second light beams at first and second wavelengths, respectively, orthogonally toward said plane mirror, whereby said first and second modulated beams of light are partially reflected back from said plane mirror toward said diffraction grating, and are diffracted by said diffraction grating back through said lens arrangement to said first and second channels for stimulating emission at said first and second wavelengths, respectively, and whereby said first and second modulated beams of light at said first and second wavelengths, respectively, are partially transmitted by said plane mirror;

a light transmission path including an output for, together, translating to said output said first and second modulated beams of light which are transmitted by said plane mirror;

a receiving diffraction grating ruled identically to said first order diffraction grating, said receiving diffraction grating being coupled to said output of said transmission path for receiving said first and second modulated beams of light therefrom, and for diffracting said first and second modulated beams of light at differing angles depending upon said first and second wavelengths for producing separated first and second modulated beams of light;

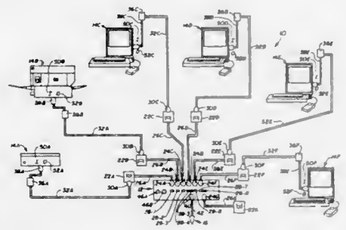
first and second light detectors coupled to said receiving diffraction grating for individually receiving and responding to said separated first and second modulated beams of light for reproducing said first information from said first light detector and said second information from said second light detector.

4,839,885

STAR CONFIGURED LOCAL AREA NETWORK

Ming-Daang Wu, Raleigh, N.C., assignor to E. I. DuPont De Nemours and Company, Wilmington, Del.

Filed Jun. 22, 1987, Ser. No. 65,234
Int. Cl.[4] H04B 9/00
U.S. Cl. 370—4 **4 Claims**



1. An electronic device for a local area network interconnecting a plurality of electronic apparatuses in a star configuration, at least one of the electronic apparatuses being of the type that is able to transmit a data stream in accordance with a code having a repetitive feature with a periodicity of at least a time T, each electronic apparatus having a data output and data input port associated therewith, the electronic device comprising:

an interface connected to each electronic apparatus, the interface having transmit and receive ports respectively connected to the input and output ports of the electronic apparatus;

a line driver having an input which is connected to the receive port of each interface and an output which is connected to the transmit port of each of the interfaces, the line driver having an enable terminal;

a timer connected to the receive port of each interface, each timer having an output connected to the enable terminal of the line driver;

each timer having a predetermined period that is equal to a time T plus and offset time "Delta", the timer being retriggerably responsive to each occurrence of the feature of the code to generate an enable signal that is applied to the line driver to assert the same, for the period of the timer.

4,839,886

STAR CONFIGURED LOCAL AREA NETWORK HAVING PRIORITY ALLOCATION

Ming-Daang Wu, Raleigh, N.C., and Charles J. Intrieri, Jr., Lewisberry, Pa., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Jun. 22, 1987, Ser. No. 65,229
Int. Cl.[4] H04B 9/00
U.S. Cl. 370—4 **3 Claims**

1. An electronic device for a local area network interconnecting a plurality of electronic apparatuses in a star configuration, at least one of the electronic apparatuses being of the type that is able to transmit a data stream in accordance with a code having a repetitive feature with a periodicity of at least a time T, each electronic apparatus having a data output and data input port associated therewith, the electronic device comprising:

an interface connected to each electronic apparatus, the interface having transmit and receive ports respectively connected to the input and output ports of the electronic apparatus;

a line driver having an input which is connected to the receive port of each interface and an output which is connected to the transmit port of each of the interfaces, the line driver having an enable terminal;

a timer connected to the receive port of each interface, each timer having an output connected to the enable terminal of the line driver;

each timer having a predetermined period that is equal to a time T plus an offset time "Delta", each timer being retriggerably responsive to each occurrence of the feature of the code to generate an enable signal that is applied to the line driver to assert the same, for the period of each timer; and

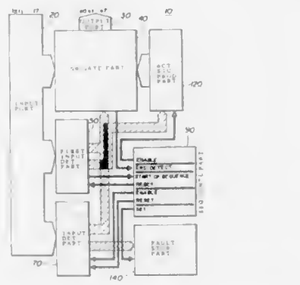
means responsive to the enable signal generated by a given one of the timers for disabling the other timers for the period during which the given timer produces the enable signal.

4,839,887

NODE APPARATUS FOR COMMUNICATION NETWORK HAVING MULTI-CONJUNCTION ARCHITECTURE

Takashi Yano, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 15, 1987, Ser. No. 96,532
Claims priority, application Japan, Sep. 18, 1986, 61-218023; Sep. 18, 1986, 61-218026
Int. Cl.[4] H04B 9/00; H04J 3/26
U.S. Cl. 370—60 **21 Claims**



1. A node apparatus for a communication network having a multi-junction architecture, said communication network having a plurality of transmission paths each coupling one node apparatus to another node apparatus or a terminal device, said node apparatus comprising:

an input port comprising a plurality of input channels connected to the transmission paths;

an output port comprising a plurality of output channels connected to the transmission paths;

a switching gate part for coupling said input and output channels of said input and output ports; and

control means for controlling said switching gate part to selectively couple said input and output channels,

said control means comprising first input detecting means coupled to said input port for detecting a first receiving input channel which receives a signal first out of said input channels, first time-out means for timing a second predetermined time after a first predetermined time elapses from the detection of said first receiving input channel in said first input detecting means, and input signal detecting means coupled to said first time-out means for detecting whether or not said input channels receive a signal from the transmission paths,

said control means controlling said switching gate part to maintain said input and output channels coupled to each other in an initial state when said input signal detecting means detects that no signal is received at said input channels so that each input channel is coupled to all of said output channels other than an output channel having a corresponding channel number,

said control means controlling said switching gate part responsive to the detection of said first receiving input channel in said first input detecting means so that all of said input channels other than said first receiving input channel are disconnected from said output channels, thereby transferring the signal received by said first receiving input channel to all of said output channels other than an output channel having a channel number corresponding to that of said first receiving input channel,

said input signal detecting means supervising whether or not a signal is received by arbitrary input channels having channel numbers corresponding to those of the output channels which transfer the signal received by said first receiving input channel and detecting a specific one of said arbitrary input channels which receives no signal during said second predetermined time,

said control means controlling said switching gate part responsive to the detection of said specific input channel in said input signal detecting means so that said specific input channel is coupled to said output channels including the output having the channel number corresponding to that of said first receiving input channel.

4,839,888

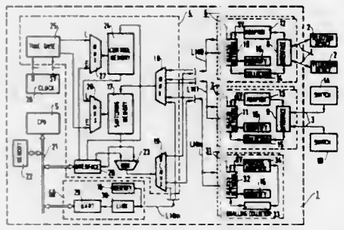
DIGITAL TIME-DIVISION MULTIPLEX SWITCH-BASED TELEPHONE SUBSCRIBER CONNECTION SYSTEM

Rainier Baltz, Lingolsheim, and Jean-Claude Fuhrer, Lipsheim, both of France, assignors to La Telephone Industrielle et Commerciale Telic Alcatel, Cedex, France

Filed Jul. 10, 1987, Ser. No. 71,955
Claims priority, application France, Jul. 10, 1986, 86 10094
Int. Cl.[4] H04Q 11/04
U.S. Cl. 370—68.1 **9 Claims**

1. A system of connecting telephone subscribers based on a digital time-division multiplex switch (1) which is controlled by a central processor (5) and is synchronized by a central clock (26), wherein said switch comprises a switching network (4) comprising a time-division switching memory (17) and junctors (6,7) connected to the switching network by time-division multiplex links (LMO through LMn) and either to telecommunication devices (2) by which the subscribers are connected to the switch via appropriate lines (L) to communicate with each other, or to other switches (1A, 1B), these junctors being specifically adapted according to the telecom-

munications devices (2) or switch equipment (1A, 1B) to which they are connected and said system being characterized in that the various junctors are connected to the switching network in the same way, each having the same number of time-division channels on one of the time-division multiplex links carrying all of the information concerning it in such a way that this information is systematically switched to another junctor or to the central processor (5), said central processor having direct



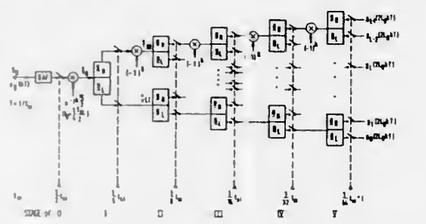
access to the switching memory (17) which it can read and write directly, and said central processor further having at least one access via a universal asynchronous receiver-transmitter circuit (29) connected in the same way as a junctor to a time-division multiplex link (LMn) via a link circuit (30) handling bidirectional conversion and transmission of signals between the time-division multiplex link and the universal asynchronous receiver-transmitter circuit concerned.

4,839,889

DIGITAL FILTER TREE

Heinz Gockler, Backnang, Fed. Rep. of Germany, assignor to ANT Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 29,761, Mar. 24, 1987, Pat. No. 4,792,943. This application Sep. 20, 1988, Ser. No. 246,692
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1986, 3610195; Sep. 24, 1987, 373208
Int. Cl.[4] H04J 1/02
U.S. Cl. 370—70 **2 Claims**



1. A frequency multiplex circuit including a plurality of digital filter cells, each including a digital filter bank for effecting conversion between a frequency multiplexed signal and a plurality of weighted filter signals and a discrete Fourier transformation means connected to the respective filter bank, the cells being connected to one another in successive stages in an outwardly branching tree structure such that, starting with the first stage, the frequency multiplexed signal is separated into L_ν individual complex signals appearing on separate lines at the νth stage, where $\nu=1, 2, \ldots$, the Fourier transformation means of each cell effecting a discrete Fourier transformation between the weighted filter signals of the cell and the L_ν individual complex signals, and the sampling rate is reduced at the νth stage by $M_\nu \leqq L_\nu$, wherein for all of said cells for each cell of the νth stage:

the frequency multiplexed signal contains component signals each associated with a respective individual complex signal and having a bandwidth B_ν;

the weighted filter signals have the form

$$V_\nu(k,q) = \sum_{p=-\infty}^{+\infty} s_\nu(k - i_\nu) \cdot h(i_\nu) \cdot \exp(j\pi i_\nu / L_\nu)$$

where

$i_\nu = p \cdot L_\nu + q$,

$q = 0, 1, 2, \ldots L_\nu - 1$, and

i_ν, p, q = (0, 1, 2, 3, . . .)

the frequency multiplexed signal is $s_\nu(k)$ and has a sampling rate of $f_{A\nu}$;

$h(i_\nu)$ is a coefficient representing a pulse response of a finite length for $i_\nu = 0, 1, 2 \ldots N_\nu - 1$;

the discrete Fourier transformation has the form

$$l_\nu(kM_\nu) = \sum_{q=0}^{L_\nu - 1} v_\nu(kM_\nu, q) \cdot \exp(j2\pi q l_\nu / L_\nu) = DFT\{v_\nu(kM_\nu, q)\}$$

where

$S_{l_\nu}(kM_\nu)$ represents the individual complex signals and DFT {·} is the discrete Fourier transformation, M_ν is a sampling rate reduction factor, $M_\nu \leqq L_\nu$, and the discrete Fourier transformation involves sampling with respect to every M_νth value of the weighted filter signals;

each component signal of the frequency multiplexed signal is associated with a respective channel having a channel number, l_ν, and a center channel frequency $f_{l\nu} = l_\nu \cdot B_\nu + B_\nu/2$ and $l_\nu = 0, 1, 2, \ldots L_\nu - 1$,

the frequency multiplexed signal is a complex signal, $s_D(kT_\nu) = s_{Re}(kT_\nu) + j s_{Im}(kT_\nu)$ with a real portion $Re = s_{Re}(kT_\nu)$ and an imaginary portion $Im = s_{Im}(kT_\nu)$, and k is a time factor = . . . , −1, 0, +1 . . . ; and

each filter bank in the νth stage comprising: two chains of $N_\nu - 1$ delay members each having a delay of $T_{\nu+1}$ and each processing a respective portion of the complex signal, where N_ν is the number of samples of the frequency multiplexed signal associated with each set of weighted filter signal values output by the filter banks of the νth stage and $T_\nu = 1/f_{A\nu}$; sampling means for sampling the signals associated with each delay member at a rate corresponding to the sampling rate of the frequency multiplexed signal reduced by M_ν; first processing means for effecting conversion between each sample signal associated with a given delay member and an associated weighted sample signal; and second processing means for effecting conversion between selected weighted filter signals and selected weighted sample signals;

for all stages ν, the sampling rate reduction factor $M_\nu = 2$ and the number of individual complex signals appearing on separate lines at the νth stage $L = 4$ are fixed, with only two signals of the $L_\nu = 4$ being utilized;

the frequency multiplex signal for the first stage $\nu = 1$ at the input side is real and the sampling rate at the input of the first stage is cut in half.

4,839,890

DATA BIT SYNCHRONIZER

Jon M. Semerau, Maplewood, and Christopher D. Sonnek, St. Paul, both of Minn., assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 31, 1986, Ser. No. 926,489
Int. Cl.[4] H04J 3/02
U.S. Cl. 370—84 **10 Claims**

1. A data bit synchronizer for use with a controller in a multiplexing character processor of the type that provides the interchange of information between a central process and a plurality of peripheral devices, each having at least one of a plurality of protocols and at least one of a plurality of interfaces, comprising:

RAM means having a plurality of memory address locations for storing a respective control/status word having a plurality of bytes for each of said plurality of peripheral devices;

addressing means for uniquely accessing each of the bytes of each control/status words as a function of the respective peripheral device under control of the controller;

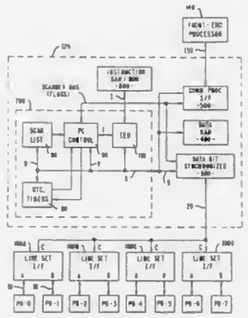
timing chain means for generating a first sequence of timing pulse signals in response to a falling edge of a controller clock and at substantially the same time generating a second sequence of timing pulse signals in response to a rising edge of the controller clock;

said timing chain means is connected to said addressing means to time sequence the accessing of each of said control/status words and said respective bytes thereof;

selectable clock divider means connected to said RAM means and said timing chain means for providing a respective timing rate which a selectabie division of said controller clock for each of said plurality of peripheral devices;

bit clock generating means connected to said RAM means and said selectable clock divider means for logically generating a respective output bit clock signal for each of said plurality of peripheral devices;

input data control means connected to said RAM means and multiplexed to a respective receive data signal of each of



said plurality of peripheral devices for logically demultiplexing and outputting each respective data bit received from each respective peripheral device to said controller for transfer to said central processor;

output data control means connected to said RAM means and to said bit clock synchronizing means for synchronizing each output data bit multiplexed to each respective peripheral device with each respective output bit clock signal;

interface control means connected to said RAM means and multiplexed to a respective receive control signal according to the respective interface and protocol of each of said plurality of peripheral devices for logically comparing a current state of each control signal with a previous state thereof and recording each respective change in each respective receive control signal from each respective peripheral device in the respective control/status word therefor; and

multiplexer means connected to said addressing means, said output data control means, and said input data control means for multiplexing during a cycle:

an output address of one of the plurality of peripheral devices and an input address of one of the plurality of said peripheral devices,

at least one output control signal and the output data signal to the peripheral device associated with said output address, and

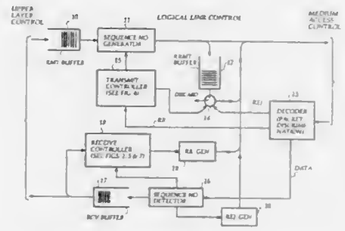
at least one input control signal and the input data signal to the peripheral device associated with said input address.

4,839,891

METHOD FOR CONTROLLING DATA FLOW

Kazutomo Kobayashi, and Hideyuki Fukuoka, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 22, 1988, Ser. No. 222,930
Claims priority, application Japan, Jul. 24, 1987, 62-185803; Aug. 31, 1987, 62-218810; Sep. 30, 1987, 62-248351
Int. Cl.[4] H04J 3/26
U.S. Cl. 370—94 **18 Claims**



1. A data communication system for exchanging information between a source data terminal and a destination data terminal having a receive buffer for storing data packets, comprising:

means for transmitting a data packet from said source data terminal, said data packet having a sequence number identifying the packet; and

means for receiving said data packet by said destination data terminal and storing the received packet into said receive buffer and returning an acknowledgment packet to said source data terminal in response to each data packet being withdrawn from said receive buffer, said acknowledging packet signaling correct receipt of said data packet and including a flow control variable incremented by a unit value in response to said data packet being withdrawn from said receive buffer,

said source data terminal transmitting one or more data packets having sequence numbers the largest of which is determined by a maximum number of outstanding data packets awaiting receipt of said acknowledging packet by said data terminal and said flow control variable contained in said acknowledging packet.

4,839,892

CONCENTRATOR SYSTEM CAPABLE OF COMPLETING EMERGENCY CALLS UNDER CONGESTED TRAFFIC

Yasutaka Sasaki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 29, 1988, Ser. No. 237,204
Claims priority, application Japan, Aug. 27, 1987, 62-213253; Aug. 27, 1987, 62-213257; Aug. 27, 1987, 62-213258
Int. Cl.[4] H04J 3/24
U.S. Cl. 370—95 **7 Claims**

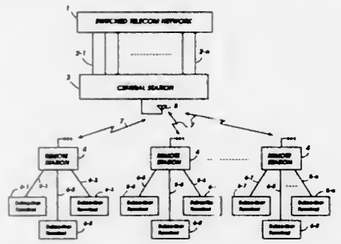
1. A concentrator system for connecting subscriber terminals to a switched telecommunication network through a plurality of demand-assigned two-way data channels, comprising:

means for detecting when said data channels are congested;

means for detecting an emergency call from one of said subscriber terminals occurring simultaneously with the detection of said congested channels;

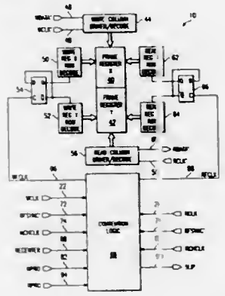
means for sending a dial tone to said one subscriber terminal when said emergency call is detected simultaneously with the detection of the congested channels to allow an emergency destination address to be dialled from said terminal and receiving said dialled emergency destination address;

means for verifying said emergency call by comparing said received address with a list of predetermined addresses; and



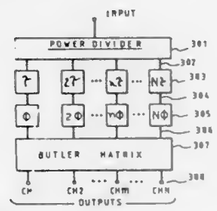
means responsive to the verification of said emergency call for transmitting said received emergency destination address from said system to said network and establishing an emergency channel between said subscriber terminal and said network.

4,839,893
TELECOMMUNICATIONS FIFO
Michael D. Smith, Lewisville, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.
Filed Oct. 5, 1987, Ser. No. 105,739
Int. Cl.[4] H04J 3/06
U.S. Cl. 370—100 **22 Claims**



1. A telecommunication FiFO memory, for receiving data which is synchronously formatted in frames each containing multiple channels which each contain multiple bits, in synchronization with a write clock and a write frame sync signal and for outputting serial data synchronized with a read clock and a read frame sync signal, comprising:
(a) a first storage register having at least 193 bit locations;
(b) a second storage register having at least 193 bit locations;
(c) means for writing data into said first register and said second register in synchronization with said wire clock signal;
(d) write register selection means for selecting which register data is to be written into;
(e) means for reading data from said first and second register in synchronization with said read clock signal;
(f) means for selecting which register data is to be read from;
(g) means
for detecting if the storage location being read from at the time said write frame sync signal is received meets a predetermined criterion,
said criterion including determination of whether the address being currently read from is less than a predetermined number of channel locations away from the address being written into at the time said write frame sync signal is received, wherein said predetermined criterion indicates whether a collision is predictable within the next frame of data,
and, if said criterion is satisfied, for causing said write register selection means to continue to write data into the same register that data was being written into immediately prior to the receipt or said write frame signal, and, if said criterion is not satisfied, for causing said write register selection means to change the register being written into from that which was being written into immediately prior to the receipt of said write frame signal.

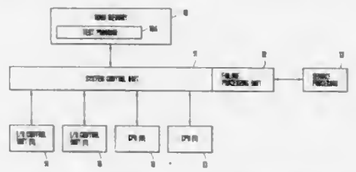
4,839,894
CONTIGUOUS CHANNEL MULTIPLEXER/DEMULTIPLEXER
Ronald M. Rudish, Commack, and Scott F. Hall, Plainview, both of N.Y., assignors to Eaton Corporation, Cleveland, Ohio
Filed Sep. 22, 1986, Ser. No. 910,098
Int. Cl.[4] H04B 9/00
U.S. Cl. 370—123 **12 Claims**



1. An apparatus for separating a plurality of contiguous frequency channels of an input signal comprising:
(a) signal dividing means for forming a plurality of samples of said input signal, each of said samples being designated in numerical order;
(b) delaying means coupled to said signal dividing means for non-dispersively, differentially delaying each of said samples in accordance with a first arithmetic progression;
(c) phase shifting means coupled to said delaying means for phase shifting each of said samples in accordance with a linear function of only one variable, said variable being a number designating said sample; and
(d) combining means coupled to said phase shifting means for combining approximately in-phase samples, said combined samples forming an output signal.

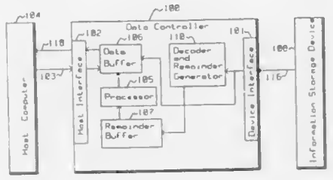
4,839,895
EARLY FAILURE DETECTION SYSTEM FOR MULTIPROCESSOR SYSTEM
Akihisa Makita, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Dec. 30, 1987, Ser. No. 139,829
Claims priority, application Japan, Jan. 7, 1987, 62-2235; Jan. 7, 1987, 62-2236; Feb. 10, 1987, 62-30156; Feb. 12, 1987, 62-30915
Int. Cl.[4] G06F 11/22
U.S. Cl. 371—16 **4 Claims**

1. An early failure detection system for a multiprocessor system having a plurality of central processing units for microprogram control, said early failure detection system comprising:
idle detecting means for detecting that at least one of said plurality of central processing units is idling;
a main memory, commonly connected to said plurality of central processing units, said main memory storing a test program which begins operation when idling of said at least one idling central processing unit is detected by said idle detecting means and which detects a hardware failure of said at least one idling central processing unit before said at least one idling central processing unit becomes busy;
reading means for reading out said test program from said main memory and for executing said test program during idling of said at least one central processing unit; and



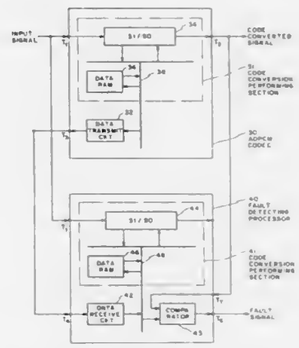
separating means, responsive to a failure of said at least one idling central processing unit during execution of said test program, for separating all failed central processing units from said multiprocessor system so as to allow at least one remaining central processing unit to operate, thereby maintaining continuous operation of said multiprocessor system.

4,839,896
FAST REMAINDER DECODING FOR A REED-SOLOMON CODE
Neal Glover, Broomfield, and Trent Dudley, Littleton, both of Colo., assignors to Data Systems Technology Corp., Broomfield, Colo.
Filed Feb. 10, 1987, Ser. No. 12,824
Int. Cl.[4] G06F 11/10
U.S. Cl. 371—37 **47 Claims**



1. A decoder for an error detection and correction system using a Reed-Solomon code or related code of degree $d-1$ for detection and correction of a plurality of errors in code words of n symbols comprised of k data symbols and $d-1$ check symbols, wherein each symbol is comprised of m binary bits of information and d, k, m, and n are positive integers, and further wherein $t=INT((d-1)/2)\geq 3$, said decoder comprising:
data buffer means for storing said k data symbols;
remainder generator means for dividing a codeword polynomial C(x) by a generator polynomial G(x) of said code and producing a remainder polynomial R(x) having remainder coefficients R_i;
remainder buffer means for storing said remainder coefficients R_i produced by said remainder generator means;
first table means comprising a table f(i,L) wherein each element is comprised of error correction information, and wherein $0\leq i<d-1$, and $d-1<L<2^m-1$; and
processor means comprising
means for accessing said remainder buffer to retrieve said remainder,
means for applying said remainder to index said first table means and retrieve said correction information, and
means for applying said correction information to said data symbols in said data buffer to correct symbols that are in error.

4,839,897
FAULT DETECTING SYSTEM FOR ADPCM CODEC
Yasushi Aoki, Tokyo, Japan, assignor to NEC Corporation, Japan
Filed Oct. 28, 1987, Ser. No. 114,302
Claims priority, application Japan, Oct. 29, 1986, 61-258902
Int. Cl.[4] G06F 11/00
U.S. Cl. 371—68 **8 Claims**



1. A fault detecting system for an ADPCM codec comprising a first signal input means for receiving an input signal, means for performing code conversion of said input signal between an ADPCM and PCM to produce a first code converted signal, first random access storage means for storing data used for the code conversion, and a signal output means for sending out said first code converted signal, which comprises:
said ADPCM codec further comprising data transmitting means for transmitting said data stored in said random access storage means; and
fault detecting processor means;
said fault detecting processor means comprising:
data receiving means coupled with said data transmitting means for receiving said data;
second random access storage means coupled with said data receiving means for storing said data received through said data receiving means;
generating means for converting said input signal based on said data stored in said second random access storage means in order to generate a second code converted signal;
second signal input means being coupled with said signal output means for receiving said first code converted signal; and
comparing means being coupled with said second signal input means and said generating means for comparing said first and said second code converted signals, said comparing means producing a fault signal representative of fault of said ADPCM codec when said first and said second code converted signals do not coincide with each other.

4,839,898

OPTICAL RESONATING DEVICE

David B. Payne, Wickham Market, and David B. Mortimore, Felixstowe, both of United Kingdom, assignors to British Telecommunications public limited company, United Kingdom

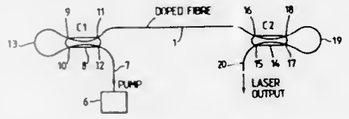
PCT No. PCT/GB87/00369, § 371 Date: Jan. 25, 1988, § 102(e) Date Jan. 25, 1988, PCT Pub. No. WO87/07445, PCT Pub. Date Dec. 3, 1987

PCT Filed May 28, 1987, Ser. No. 148,660

Claims priority, application United Kingdom, May 30, 1986, 8613192

Int. Cl.[4] H01S 3/10

U.S. Cl. 372—6 9 Claims



1. An optical fibre based laser device comprising an optical fiber resonant cavity having first and second reflectors for reflecting radiation at a predetermined resonating wavelength characterised in that:

at least one of said reflectors is an optical loop reflector comprising a directional optical coupler having a first and a second input and a first and a second output,

said first input being optically coupled to said optical fibre resonant cavity,

said first and second outputs being optically coupled together, and

the optical loop reflector being reflective at said resonating wavelength and at least partially transmissive at a predetermined pump wavelength.

4,839,899

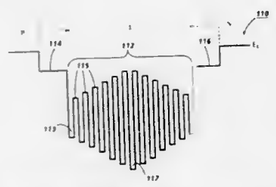
WAVELENGTH TUNING OF MULTIPLE QUANTUM WELL (MQW) HETEROSTRUCTURE LASERS

Robert D. Burnham, Wheaton, Ill., and Donald R. Scifres, Los Altos Hills, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 9, 1988, Ser. No. 165,863

Int. Cl.[4] H01S 3/19

U.S. Cl. 372—45 9 Claims



1. In a wavelength tunable semiconductor laser comprising a plurality of contiguous semiconductor layers deposited on a substrate,

one of said layers being an active region comprising a multiple quantum well configuration having two or more quantum wells separated by barriers wherein said wells are capable of quantization of electron states and having more than one energy band,

means to tune said laser to any wavelength represented by a plurality of subband electron hole states established within said well energy bands,

the elemental composition of said wells or of said barriers or both is sequentially changed across said active region to increase the number of allowable subbands between said energy bands and correspondingly increase the tuning wavelength selectivity of said laser,

said active region comprising N wells, W, of $Ga_{1-x}Al_xAs$ and M barriers, B, of $Ga_{1-x'}Al_{x'}As$ wherein either x increases sequentially across said wells so that x in $W_1>W_2>W_3>\ldots W_N$ or decreases sequentially across said wells so that x in $W_1<W_2<W_3<\ldots W_N$ in combination wherein either x' increases sequentially across said barriers so that x' in $B_1>B_2>B_3>\ldots B_M$ or decreases sequentially across said wells so that x in $B_1<B_2<B_3<\ldots B_M$.

4,839,900

BURIED TYPE SEMICONDUCTOR LASER DEVICE

Toshihiko Yoshida; Haruhisa Takiguchi, both of Tenri; Shinji Kaneiwa, Nara; Hiroaki Kndo, and Sadayoshi Matsui, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

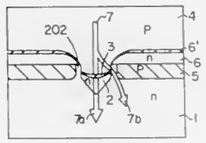
Filed Aug. 15, 1986, Ser. No. 897,337

Claims priority, application Japan, Aug. 21, 1985, 60-184650; Sep. 10, 1985, 60-201161; Sep. 11, 1985, 60-202463; Sep. 12, 1985, 60-203627; Sep. 19, 1985, 60-207869

The portion of the term of this patent subsequent to Mar. 8, 2005, has been disclaimed.

Int. Cl.[4] H01S 3/18

U.S. Cl. 372—46 3 Claims



1. In a semiconductor laser device comprising a semiconductor substrate and a multi-layer crystal structure formed on said substrate, the device wherein:

said structure is of a first conductivity type;

said multi-layer crystal structure comprises at least an active layer and a cladding layer disposed on said active layer, said cladding layer being of a second conductivity type;

a striped mesa-portion including at least one portion of said active layer and said cladding layer is formed at the upper region of said multi-layer crystal structure, said striped mesa-portion extending from one facet to the opposite facet;

each of the lateral sides of said striped mesa-portion is buried by a first burying layer of the second conductivity type;

the upper face of said first burying layer is covered by a second burying layer of the first conductivity type;

the upper faces of said striped mesa-portion and said second burying layer are covered by a third layer of the second conductivity type; and

a diffusion region of the first conductivity type is formed at each of the side walls of said striped mesa-portion.

4,839,901

SEMICONDUCTOR LASER WITH CONSTANT DIFFERENTIAL QUANTUM EFFICIENCY OR CONSTANT OPTICAL POWER OUTPUT

Albrecht Mozer, and Kurt Lösch, both of Stuttgart, Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

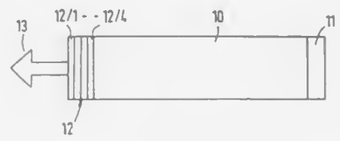
Filed Aug. 24, 1988, Ser. No. 235,933

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1987, 3728305

Int. Cl.[4] H01S 3/19

U.S. Cl. 372—49 3 Claims

1. A semiconductor laser diode comprising a front surface having a reflection coefficient R_1 and a rear surface having a reflection coefficient R_2, wherein the values of R_1 and R_2 are wavelength dependent and the product (R_1R_2) satisfies the relationship



$$(R_1R_2)_T = \exp\left(-2.1\,\frac{\alpha_{int}\,(T)}{\alpha_{int}\,(T = 0°\,C.)}\right)$$

where

T=temperature at which R_1·R_2 is measured

α_{int}=internal absorption coefficient.

4,839,902

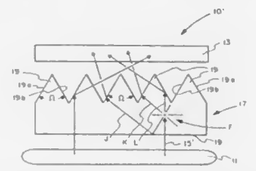
LASER WITH CONTROLLED GEOMETRY FLUORESCENT CONVERTER

Steve Guch, Jr., Saratoga, Calif., assignor to GTE Government Systems Corporation, Stamford, Conn.

Filed Aug. 31, 1987, Ser. No. 90,884

Int. Cl.[4] H01S 3/091

U.S. Cl. 372—70 13 Claims



1. In a solid state laser having a laser gain medium and a light source with output light for optically pumping said medium, said medium having a predetermined pump light absorption band, the improvement of means for transmitting to said medium output light within said absorption band and for converting at least part of said output light having a wavelength outside said band into light having a wavelength within said band and transmitting said to same medium, comprising:

a solid state fluorescent converter between said source and said medium being capable of transmitting part of said output light within said band and of producing fluorescent radiation within said band in response to excitation by the out-of-band output light, said converter having a first plane side facing said source and a second side facing said medium, said second side comprising a plurality of surfaces extending in directions transversely of the plane of said first side and at angles thereto having magnitudes selected to transmit a substantial part of said fluorescent radiation toward said medium.

4,839,903

RING LASER GYROSCOPES

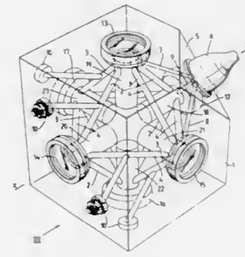
Graham J. Simms, and David J. Guppy, both of Bracknell, England, assignors to British Aerospace Public Limited Company, London, England

Filed Jun. 26, 1986, Ser. No. 878,592

Claims priority, application United Kingdom, Jun. 27, 1985, 8516286

Int. Cl.[4] H01S 3/083

U.S. Cl. 372—94 7 Claims



1. A ring laser gyroscope for sensing motion is a plurality of mutually orthogonal axes, the gyroscope comprising:

a plurality of lasing cavities defined in a mass of dielectric material, each cavity arranged to sense motion in one of said axes, each cavity being in the shape of a polygon and having a mirror positioned at each corner of the polygon, at least one of the corners belonging to one cavity connecting with a corner belonging to another cavity so that a mirror is shared between more than one cavity;

an electrode duct defined for each lasing cavity in said dielectric material;

a first electrode of one polarity connected to each lasing cavity by said electrode duct; and

at least one second electrode, having a polarity opposite from that of the first electrode, connected to each respective cavity;

wherein, for each cavity, the at least one second electrode is positioned relative to the respective first electrode and electrode duct so that an initial discharge path between each first electrode and second electrode in each cavity substantially follows respective electrostatic field lines that are produced across the respective first and second electrodes in each cavity, wherein said initial discharge path comprises a plurality of parts and each part of said initial discharge path subtends an obtuse angle to at least one adjacent part of said initial discharge path, whereby initiation of a desired initial discharge path is facilitated.

4,839,904

APPARATUS FOR THE MELTING OF METALS

Aljet Harberts, Bruchkoebel; Josef Heimerl, Linsengericht, and Horst Ranke, Alzenau, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Oct. 30, 1987, Ser. No. 114,782

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1987, 3723912

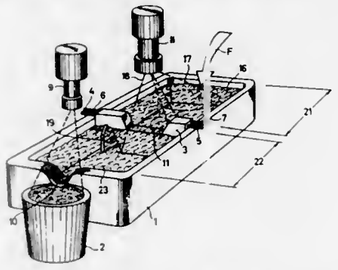
Int. Cl.[4] H01J 37/305

U.S. Cl. 373—10 7 Claims

1. An apparatus for melting metals comprising, in a vacuum chamber, a weir box having a floor and sides extending upwardly therefrom, an electron beam generator disposed above said weir box and adapted to form a melt from metal, in combination with a crucible for withdrawing said melt flowing out of said weir box, said weir box being characterized by a thin film weir which divides said weir box into two basins, said thin-film

weir being in the form of a substantially bar-shaped body which has in its middle part a notch-like recess at the top thereof, said melt flowing from the one basin into the other in a thin film, over said recess, said thin-film weir:

(a) having passages through which a coolant flows,



(b) having a plurality of passages through which gas flows and,

(c) being situated in the direct range of action of said electron beam generator.

4,839,905

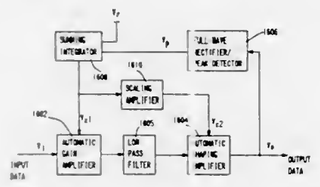
MULTIRATE AUTOMATIC EQUALIZER

John C. Mantovani, Lilburn, Ga., assignor to Conklin Instrument Corporation, Pleasant Valley, N.Y.

Filed Apr. 30, 1986, Ser. No. 857,307

Int. Cl.[4] H04L 27/08

U.S. Cl. 375—12 **11 Claims**



1. An automatic amplifying and equalizing circuit for bipolar data signals received over a data transmission line at a data transmission frequency wherein the data signals have frequency components within a frequency band extending from about 100 Hz to at least about the transmission frequency, the circuit comprising

a first voltage controlled amplifier for amplifying the bipolar data signals with even amplification of frequency spectrum components over the frequency band of the data signals in accordance with a first amplification control voltage,

a second voltage controlled amplifier having its input connected to the output of the first voltage controlled amplifier and including means for amplifying only the higher frequency components of the bipolar data signals within the frequency band of the data signals in accordance with a second amplification control voltage,

peak detector means for generating a peak voltage corresponding to the peak magnitude of the signals amplified by the first and second voltage controlled amplifiers, and

means responsive to the peak voltage for inversely controlling the first and second amplification control voltages so that the peak voltage is maintained at about a selected voltage.

4,839,906

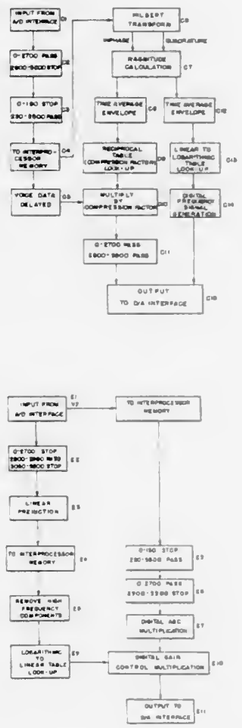
PROCESSOR BASED LINKED COMPRESSOR-EXPANDER TELECOMMUNICATIONS SYSTEM

James H. Leveque, Ellicott City, Md.; Frederick A. Williams, and John Eldon, both of Encinitas, Calif., assignors to AMAF Industries, Inc., Columbia, Md. and TRW, Inc., Cleveland, Ohio

Filed May 20, 1988, Ser. No. 196,235

Int. Cl.[4] H04L 27/00

U.S. Cl. 375—37 **10 Claims**



1. A linked compressor-expander telecommunications system comprising:

a compressor, including,

analog-to-digital converter means for converting an analog audio signal into a parallel data digital signal;

digital signal processor means for compressing said digital signal, said processor means performing the steps of,

filtering said digital signal to remove components above a predetermined frequency,

shifting the phase of said filtered digital signal by 90°,

supplementing the filtered digital signal with the phase-shifted digital signal to produce a complex signal, computing the magnitude of the audio signal from said complex signal,

time-averaging said magnitude to approximate a syllabic rate of said audio signal,

generating a digital control tone having a frequency representative of said time-averaged magnitude,

multiplying said digital signal by an amount inversely related to said time-averaged magnitude to produce a compressed digital signal having a compression factor,

filtering said multiplied digital signal to remove components above said predetermined frequency, and outputting said compressed digital signal and said digital control tone; and

digital-to-analog converter means for converting said compressed digital signal and said digital control tone to a combined analog signal for transmission on a transmission medium; and

an expander, including,

analog-to-digital converter means for converting a compressed analog signal containing data and modulated expander control components to a parallel data digital signal;

digital signal processor means for expanding said compressed data components of said digital signal, said processor means performing the steps of,

separating said compressed data components and said expander control components of said digital signal,

multiplying said modulated expander control component by components of a predetermined frequency to obtain a demodulated control component, said step of multiplying including,

multiplying consecutive samples of said expander control component by components of said predetermined frequency to obtain a plurality of complex signals,

multiplying said complex signals by the complex conjugate of a consecutive complex signal to obtain a product, and

converting said product into polar coordinate notation and obtaining an angle of said polar coordinate product as said demodulated control component,

computing a value representing the compression factor of a data component based upon said demodulated control component,

computing an expansion factor based upon said computed compression factor,

multiplying said data component by said expansion factor to produce an expanded data signal, and outputting said expanded data signal; and

digital-to-analog converter means for converting said expanded data signal to an audio frequency analog signal.

4,839,907

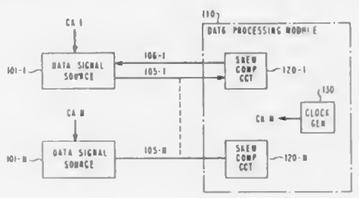
CLOCK SKEW CORRECTION ARRANGEMENT

Steven P. Saneski, Somerset, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 26, 1988, Ser. No. 161,066

Int. Cl.[4] H04L 7/06

U.S. Cl. 375—113 **11 Claims**



1. A circuit for adjusting the timing of data signals in a clocked digital processing module comprising;

means for generating a clock signal at a prescribed clock transition rate;

means for receiving an input data signal at the digital processing module, said received data signal being clocked at the prescribed clock transition rate;

means responsive to the input data signal for generating a data signal having a predetermined delay with respect to said input data signal;

means for storing the state of said input data signal at the occurrence of a transition in said clock signal;

means for storing the state of the data signal having the predetermined delay at the occurrence of said transition in said clock signal; and

means responsive to the stored state of the input data signal at said transition being different from the stored state of the data signal having the predetermined delay at said transition for generating a signal indicating an uncertainty in the state of the input data signal at the occurrence of said transition in said clock signal.

4,839,908

TRANSMISSION CONTROL APPARATUS

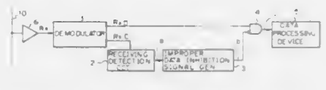
Haruyoshi Takayama, Yokosuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1987, Ser. No. 9,464

Claims priority, application Japan, Feb. 3, 1986, 61-21636; Feb. 3, 1986, 61-21637; Feb. 3, 1986, 61-21638; Feb. 3, 1986, 61-21639; Feb. 3, 1986, 61-21640; Feb. 3, 1986, 61-21641

Int. Cl.[4] H04B 1/10

U.S. Cl. 375—104 **17 Claims**



1. A transmission control apparatus comprising:

receiving means for receiving data, said receiving means further comprising demodulating means for receiving data modulated by a modulating method containing a time factor and a data factor, and demodulating the modulated data into a time component signal and a data component signal;

detecting means for detecting the start of data reception by said receiving means;

generating means for generating an inhibition signal for a predetermined period from the detection of the start of data reception by said detecting means; and

invalidating means for invalidating, in accordance with the inhibition signal, the data received by said receiving means for the predetermined period from the start of data reception by said detecting means.

4,839,909

REGISTER ACCESS DECADE COUNTING TECHNIQUE

David J. Warner, Weybridge, Great Britain, assignor to Hughes Microelectronics Limited, Glenrothes, Scotland

Filed Nov. 13, 1987, Ser. No. 119,922

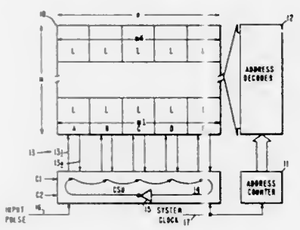
Claims priority, application United Kingdom, Jul. 10, 1986, 8616852

Int. Cl.[4] H03K 21/16, 21/12; G11C 7/00, 21/00

U.S. Cl. 377—24.1 **8 Claims**

1. An electronic counter comprising an array (10) of m rows and n columns of single flip-flop data latches and central shifting means (14) comprising a row of n data latches (33) for reading data from and writing data to each of the m rows of data latches of the array (10), such that the central shifting means (14) reads data from a row of data latches of the array (10), performs a shift operation on the data and an invert opera-

tion on the data in one of the n data latches and returns the data so operated on to the row of data latches in the array (10),



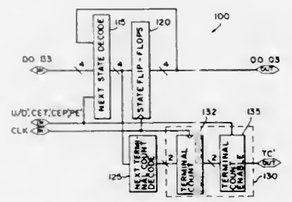
whereby the data is returned to the array with a counting operation having been performed on it.

4,839,910

COUNTER WITH GLITCHLESS TERMINAL COUNT INDICATION

Matthew C. P. Morrise, Provo, Utah, assignor to North American Philips Corporation, Signetics Division, Sunnyvale, Calif.

Filed Jan. 28, 1988, Ser. No. 149,286
Int. Cl.[4] H03K *21/40*
U.S. Cl. 377—28 14 Claims



1. A digital counter having a clock signal as an input thereto, comprising:

(a) a state logic means for providing a digital count, said state logic means having inputs and outputs, and said clock signal being an input thereto;

(b) a next state decode means having inputs and outputs for providing at its outputs a code representing the state that said state logic means is to assume at a next clock cycle, said digital count being an input to said next state decode means, and said state logic means being controlled by and being coupled to the output of said next state decode means and being controlled by said clock signal;

(c) next terminal count decode means for providing a first indication at its output that said digital output count will reach a terminal count at said next clock cycle, wherein said outputs of said next state decode means are coupled to the inputs of said next terminal count decode means;

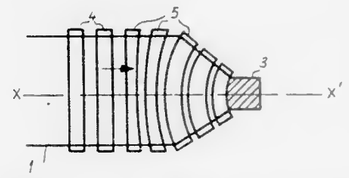
(d) terminal count logic means coupled to said next terminal count decode means and being controlled by said clock signal to obtain said first indication from said next terminal count decode means, and to provide a second indication at an output of said terminal count logic means at said next clock cycle that a terminal count has been reached.

4,839,911

CHARGER TRANSFER SHIFT REGISTER WITH VOLTAGE SENSING DEVICE USING A FLOATING-POTENTIAL DIODE

Gilles Boucharlat, St. Egreve, France, assignor to Thomson-LSF, Paris, France

Filed Apr. 16, 1987, Ser. No. 39,089
Claims priority, application France, Apr. 18, 1986, 86 05647
Int. Cl.[4] H01L *29/78;* G11C *19/28*
U.S. Cl. 377—57 3 Claims



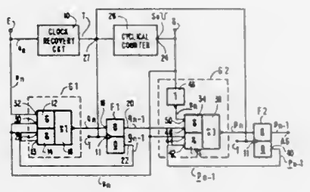
1. Charge transfer shift register having a device for voltage sensing with a floating-potential diode, said register comprising a channel for the transfer of charges, said diode being placed adjacent to one end of the register where it occupies the entire width of the channel, said channel having a first portion of constant width in a direction perpendicular to that of the charge transfer, and a second portion extending from one end of the first portion up to said diode, said second portion having a gradually diminishing width towards said diode, wherein most of the electrodes of said first portion have a rectangular shape, and the last electrodes of the register have a shape gradually varying from a rectangular shape on the first portion side opposite to said diode to an annular shape towards said diode.

4,839,912

SWITCHING CIRCUIT ARRANGEMENT FOR MONITORING A BINARY SIGNAL

Jürgen Bednarz, Munich, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 10, 1988, Ser. No. 154,567
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1987, 3704980
Int. Cl.[4] H03K *21/40, 23/50, 27/00*
U.S. Cl. 377—119 5 Claims



1. A circuit arrangement for monitoring level shifts in a binary signal (e_n) having an associated bit clock rate and exhibiting at least one level shift within a characteristic waiting period, said circuit arrangement comprising:

clock means for generating a sequence of clock pulses (T) at a frequency at least as high as the bit clock rate;

control means for generating a sequence of control pulses (s_n) having a period approximately equal to said characteristic waiting time;

first and second flip-flops (F1, F2) each having an output, a data input and a clock input, said clock means feeding the clock input of each flip-flop;

first and second gate circuits (G1, G2) each having an output and at least three inputs, with a first input of each gate circuit being coupled to the output of said control means;

the second inputs of said first and second gate circuits (G1, G2) being respectively coupled to the outputs of said first and second flip-flops (F1, F2);

the third input of said first gate circuit (G1) comprising means for receiving said binary signal (e_n);

the outputs of said first and second gate circuits (G1, G2) being respectively coupled to the data inputs of said first and second flip-flops (F1, F2);

the output of said first flip-flop (F1) being coupled to the third input of said second gate circuit (G2);

said first and second gate circuits (G1, G2) comprising means for obeying the following rules:

(a) if a control pulse is present, the output variable (q_n) of the first gate circuit (G1) assumes a first predetermined binary value and the output variable (p_n) of the second gate circuit (G2) is defined solely by the binary value stored in the first flip-flop (F1); but

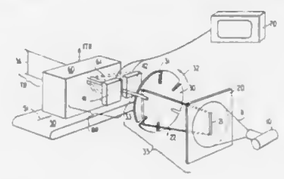
(b) if a control pulse is not present, the output variable (p_n) of the second gate circuit (G2) is defined solely by the binary value stored in the second flip-flop (F2) and if said binary signal (e_n) assumes a second predetermined binary value, the output variable (q_n) of the first gate circuit is defined solely by the binary value stored in the first flip-flop (F1), but if said binary signal assumes the inverse of said second predetermined binary value, the output variable (q_n) of the first gate circuit (G1) assumes the inverse of the first predetermined binary value.

4,839,913

SHADOWGRAPH IMAGING USING SCATTER AND FLUORESCENCE

Martin Annis, Cambridge, and Paul Bjorkholm, Sharon, both of Mass., assignors to American Science and Engineering, Inc., Cambridge, Mass.

Filed Apr. 20, 1987, Ser. No. 40,018
Int. Cl.[4] G21K *5/10*
U.S. Cl. 378—44 43 Claims



36. Apparatus useful in imaging for inspecting objects to highlight components of selected radiation responsive signatures comprising:

(a) a source of penetrating radiation selected to produce fluorescence from targeted components of said object,

(b) means for repeatedly scanning a pencil beam of radiation, from said source along a line in space,

(c) means providing relative motion between said object to be imaged and said line in space,

(d) first radiation energy detector means for producing first electrical signals, located to be responsive to radiation energy penetrating said object and emitted from said object, and

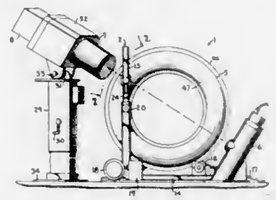
(e) radiation detector means responsive to a predetermined fluorescent radiation line emitted from targeted components of said object for generating second electrical signals.

4,839,914

PORTABLE TIRE X-RAY APPARATUS AND METHOD

Leonard O. Curry, 8363 Nieman Rd., Lenexa, Kans. 66214

Filed Jun. 10, 1987, Ser. No. 60,724
Int. Cl.[4] G01N *23/04*
U.S. Cl. 378—61 19 Claims



1. A tire inspection apparatus comprising:

(a) a frame supporting a tire during inspection;

(b) tire rotation means drivingly engaged with a tire supported on said frame and activated to cause rotation of said tire during inspection thereof;

(c) a fluoroscope positioned adjacent a tread of a tire supported on said frame and forming an image upon the irradiation of said fluoroscope by X-rays;

(d) an X-ray source aligned with said fluoroscope, said source positioned external to a tire on said frame and spaced from said fluoroscope substantially the length of a diameter of a tire on said frame;

(e) a video camera optically coupled to said fluoroscope to generate a video signal representing a radiographic image formed on said fluoroscope;

(f) a first video monitor operatively connected to said video camera and comprising means for displaying an image represented by said video signal

(g) a video recorder interconnected with said video camera for recording radiographic images of a tire supported on said frame during inspection of the tire; and

(h) a second video monitor interconnected with said video recorder and comprising means for displaying previously recorded radiographic images of a tire taken at an earlier time for direct visual comparison to currently generated radiographic images of the same tire displayed on said first video monitor.

4,839,915

INVERTER TYPE X-RAY APPARATUS

Kazuo Kaneko, Omiya; Takanobu Hatakeyama, Ryugasaki; Hirofumi Hino, Noda; Hideki Uemura, Kashiwa, and Kazuo Yamamoto, Ibaraki, all of Japan, assignors to Hitachi Medical Corp., Tokyo, Japan

Continuation of Ser. No. 816,409, Jan. 6, 1986, abandoned. This application Jan. 15, 1988, Ser. No. 145,715
Claims priority, application Japan, Jan. 9, 1985, 60-1863
Int. Cl.[4] H05G *1/20*
U.S. Cl. 378—105 12 Claims

1. An inverter type X-ray apparatus comprising:

an inverter including a plurality of pairs of switching elements to be alternately on-off operated at intervals of a predetermined period to invert a DC input voltage into an AC voltage;

a high voltage transformer connected to receive said A.C. voltage at a primary winding thereof for boosting said A.C. voltage;

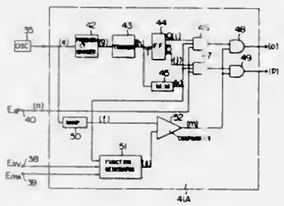
a high voltage rectifier circuit connected to receive an output voltage from said high voltage transformer for rectifying said output voltage into a DC voltage;

an X-ray tube to which said DC voltage from the high voltage rectifier circuit is applied;

an inverter drive circuit connected to said inverter for on-off

driving alternately each of said switching elements of said inverter; and

an inverter controller circuit means for supplying to said inverter driver circuit a control signal for controlling each



of the switching elements to perform a chopping operation such that said control signal corresponds to said predetermined period and includes a plurality of increasing on-periods at each starting point of said predetermined period.

4,839,916

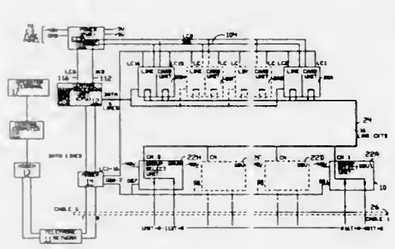
TELEPHONE TOLL INTEGRITY CHECKING SYSTEM

Gary C. Fields, and Mark E. Stamos, both of Oakland, Calif., assignors to Conway Engineering, Inc., Oakland, Calif.

Filed Sep. 25, 1987, Ser. No. 101,062

Int. Cl.[4] H04M *3/26*

U.S. Cl. 379—13 **14 Claims**



1. Apparatus for automatically generating and recording precisely timed telephone call test sequences useful to determine accuracy of telephone toll message accounting equipment and procedures nominally recording the fact and time of the calls made during each sequence, the apparatus connected to plural telephone network lines of the telephone system at a predetermined location for simultaneously dialing a plurality of predetermined long distance telephone numbers, each said number returning detectable information when successfully dialed up, for detecting the presence of said detectable information of each number so dialed and for thereupon logging the time of each call in which said detectable information has been detected, the apparatus comprising:

plural programmable digital line connection and calling means, each one thereof being capable of accessing and seizing at least one telephone line for placing a telephone call thereon to a predetermined long distance telephone number,

group switching unit means connected to said plural programmable digital line connection and calling means and to telephone lines for selectively connecting said ones of said telephone lines with said plural line connection and calling means,

digitally controlled call connection detection means for sequentially scanning all of the dialed up telephone lines and for detecting the presence or absence of said detectable information when a said number has been dialed, and

programmed digital controller means including memory and real time clock means connected by digital bus means to said plural line connection an calling means, to said group switching unit means and to said digitally controlled call connection detection means for carrying out a said sequence by controlling selective connections of said telephone lines with said plural line connection and calling means, for providing said predetermined long distance telephone numbers thereto via said digital bus means and thereupon controlling dial up operation of each said line connection and calling means and for causing said call connection detection means to scan the dialed up telephone lines, the controller means being programmed for recording in said memory as data base information the precise real time and result for each call attempted during a said sequence.

4,839,917

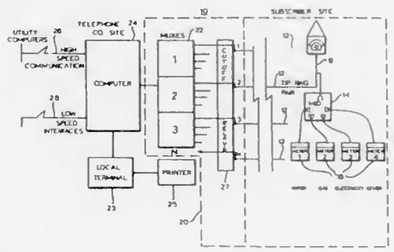
UNIVERSAL LINE STATUS MONITORING AND RESPONSE SYSTEM

Stewart W. Oliver, 688 Mildred Ave., Venice, Calif. 90291

Filed Oct. 29, 1987, Ser. No. 116,066

Int. Cl.[4] G08B *26/00, 1/08;* H04M *11/04*

U.S. Cl. 379—45 **26 Claims**



1. A universal telephone line status and reaction system for connection between a central office or a private branch exchange (PBX) and a pluraility of telephone substations via respective telephone line pairs comprising:

a line status monitor connected across the line pairs for each of the plurality of telephone substations;

said line status monitor including means for examining each of said line pairs to determine status thereof including at least receiver OFF-HOOK, DIALING IN PROGRESS and LINE IN RING condition;

means for timing receiver off hook duration;

means for detecting at least one sequence of dialed numbers indicative of an alarm condition; and

means reaponsive to an OFF HOOK condition greater than a predetermined time without detection of DIALING IN PROGRESS or LINE IN RING condition for generating a signal indicative of an alarm condition and identifying the substation with the alarm condition; and

a monitor station coupled to said line status detector for representing an alarm condition for a particular substation.

4,839,918

SWITCHING SYSTEM BETWEEN CORDLESS TELEPHONE AND ORDINARY TELEPHONE

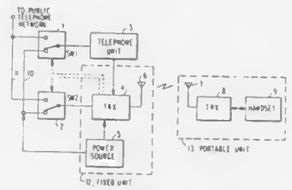
Mamoru Hata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 16, 1987, Ser. No. 97,023

Claims priority, application Japan, Sep. 17, 1986, 61-216994

Int. Cl.[4] H01A *7/04*

U.S. Cl. 379—61 **19 Claims**



1. A switching system for selectively connecting a cordless telephone and telephone unit, comprising:

a fixed unit, on a first side, and a portable unit, on a second side, connected to each other by radio;

a telephone unit provided on said first side;

an internal line applied with a D.C. voltage from a power source which is applied to said fixed unit;

a first switch responsive to a first switching control signal for selectively connecting said telephone unit to one of a subscriber line and said internal line, said subscriber line being connected to a telephone network;

a second switch responsive to a second switching control signal for selectively connecting said fixed unit to one of said subscriber line and said internal line; and

switching control means responsive to a switching command signal for generating said first and second switching control signals, said telephone unit receiving power from one of said internal line and said subscriber line in accordance with said first and second switching control signals such that said telephone unit continues to operate even during failure of said power source.

4,839,919

TELEPHONE AND DEMODULATOR

Marcos V. P. Borges, Rua Antonio Portugal 54; Marcelo V. Aragao, Avenida Antonio Paulino 286, and Carlos T. Dias, Rua Com. Custodio Ribeiro 547A, all of Santa Rita do Sapucai, M.G., Brazil

PCT No. PCT/BR86/00015, § 371 Date Apr. 13, 1987, § 102(e) Date Apr. 13, 1987, PCT Pub. No. WO87/01256, PCT Pub. Date Feb. 26, 1987

PCT Filed Aug. 15, 1986, Ser. No. 51,626

Claims priority, application Brazil, Aug. 16, 1985, PI 8504012

Int. Cl.[4] H04M *11/00, 3/42, 1/00*

U.S. Cl. 379—96 **9 Claims**

1. A telephone comprising a handset and an apparatus for receiving the handset provided with an alpha-numerical keyboard, an alpha-numerical display, a programmed data processing unit, a read only memory and a random access memory associated with each other and with said data processing unit, an automatic dialling circuit controlled by said data processing unit and a communications controller for modulating data produced by said unit for transmission by the telephone line and for demodulating signals received from said telephone, said unit being so programmed as to be able to command an operation by means of the telephone line in dependence upon data received therefrom or derived from the keyboard, said key board including a directory inquiries data bank key associated with said data processing unit so that, on pressing said directory inquiries key, said data processing unit causes said automatic dialling circuit and said communications controller to access a directory inquiries data bank by means of the telephone line, to search for information in the form of a telephone number in response to an inquiry previously written on said display by means of said key board, to receive said information in the form of a telephone number from the directory inquiries bank, to indicate receipt thereof on said display and to effect automatic dialling of said telephone number by means of said dialling circuit.

4,839,920

METHOD FOR DETERMINING TELEPHONE DIAL PULSE PARAMETERS INDEPENDENTLY OF SUBSCRIBER LINE LENGTH

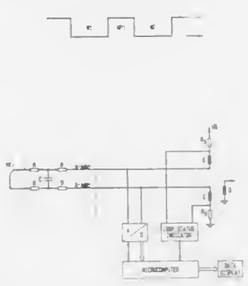
Gabriele Held-Elbert, Lochhofen; Wolfgang Kaiser; Wilhelm Koch, both of Munich, and Werner Schmutzler, Fuerstenfeldbruck, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 25, 1986, Ser. No. 900,039

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1985, 3534829

Int. Cl.[4] H04Q *1/36*

U.S. Cl. 379—377 **6 Claims**



1. A method for determining telephone dial pulse parameters independently of the length of a subscriber line of a telecommunication system, the dial pulses being produced by loop interruptions caused by a dial pulsing switch of a subscriber terminal connected via the subscriber line, characterized in that, during a first pulse interval (WP1) of a dial pulse series, a voltage produced by a supply voltage source on the subscriber line (TL) is measured, and that according to the voltage amplitude thus measured, which depends on the line length of the subscriber line, times determined by measurement of the pulse duration (W1, W2 . . .) and pulse interval (WP1 . . .) of a dial pulse series are corrected.

4,839,921

TELEPHONE STATION COMPRISING AN OPTICAL DISPLAY DEVICE

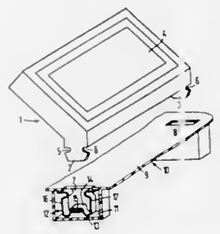
Erwin Awakowicz, Munich; Kurt Schiller, Mering, and Erwin Grassl, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 18, 1987, Ser. No. 27,429

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1986, 3613416

Int. Cl.[4] H04M *1/02, 1/21*

U.S. Cl. 379—428 **5 Claims**



1. A display device for a telephone station, wherein said display device is removably mounted on to a telephone station and includes one piece webs connected thereto which enter into a mechanical connection with spring elements accommodated in chambers of the telephone station, said chambers being accessible via passages.

4,839,922

CATV SCRAMBLING AND DESCRAMBLING METHOD

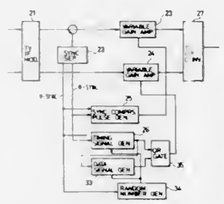
Kenji Imasaki; Toshiaki Ichihashi, and Masafumi Sasaki, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 686,792, Dec. 26, 1984, abandoned. This application Mar. 10, 1987, Ser. No. 24,181

Claims priority, application Japan, Dec. 26, 1983, 58-248496

Int. Cl.[4] H04N *7/167*

U.S. Cl. 380—15 **6 Claims**



1. A CATV scrambled and descrambling method in which the horizontal and vertical synchronizing signals of a television video signal are compressed in level, and a timing signal indicating the time positions of said horizontal and vertical synchronizing signals is superposed on a television audio signal and is transmitted, comprising:

on the television signal transmitting side:

generating a random number only in response to and during the interval of said vertical synchronizing signal;

generating said timing signal in response to the occurrence of both said horizontal and vertical synchronizing signals and moving said timing signal in time in response to the value of said random number;

superposing said timing signal on an audio signal while moving said timing signal in time, at random and in response to the vertical synchronization signal, prior to transmission, whereby the time difference between the compressed synchronization signals and said timing signal is varied at random;

providing an indication of the time position of said timing signal with a data signal generated in response to the value of said random number; and

superposing said data signal on said audio signal by ORing said data signal and said timing signal and controlling the amplitude of the audio signal with said ORed signal, in such a manner that, on said audio signal, said data signal is different in position from said timing signal before transmission, and

on the television signal receiving side:

decoding said data signal to detect the time position of said timing signal using the vertical sync signal as a decoding key; and

level correcting only horizontal and vertical synchronizing signals of said video signal to reproduce said video signal.

4,839,923

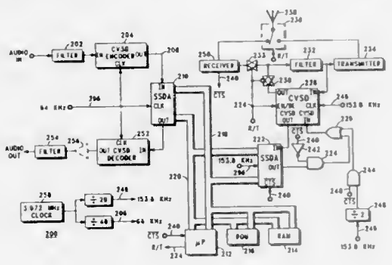
METHOD AND APPARATUS FOR TIME COMPANDING AN ANALOG SIGNAL

Michael D. Kotzin, Buffalo Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 12, 1986, Ser. No. 941,254

Int. Cl.[4] G10L *3/02;* **H04J** *3/06*

U.S. Cl. 381—31 **8 Claims**



1. A method for compressing an analog signal, comprising the steps of:

(a) digitizing the analog signal at a first rate using a continuously variable slope delta modulator to provide a digitized signal;

(b) storing said digitized signal at said first rate in a digital storage means to provide a stored signal;

(c) retrieving a time segment of said stored signal from said digital storage means at a second rate, said second rate being at least twice that of said first rate, to provide a time segment retrieved signal;

(d) converting said time segment retrieved signal into an analog signal using a continuously variable slope delta demodulator to provide a compressed signal.

301,518

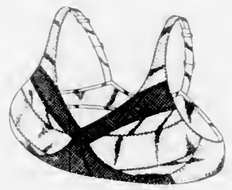
BRASSIERE

Hinda Schreiber-Miller, and Eugenie Zobian-Lindahl, both of Burlington, Vt., assignors to JBI, Inc., Burlington, Vt.

Filed Apr. 14, 1986, Ser. No. 851,794

Term of patent 14 years

U.S. Cl. D2—24



301,520

NECKTIE

Ian S. Campbell, 36 Bocastle Avenue, Toronto, Ontario, Canada M4N 2S4

Filed Mar. 13, 1986, Ser. No. 842,880

Term of patent 14 years

U.S. Cl. D2—608

301,519

VEST

Glibeerto B. Diaz, P.O. Box 3287, Taos, N. Mex. 87571

Division of Ser. No. 732,554, May 10, 1985, Pat. No. D. 298,581. This application Dec. 16, 1987, Ser. No. 135,132

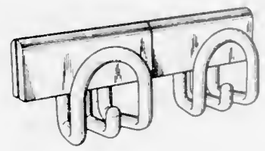
Term of patent 14 years

U.S. Cl. D2—190

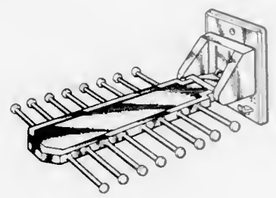
301,521
TIE KNOT
Carl A. Safford, 2353 Southern Hills, Mexico, Mo. 65265
Filed Jul. 29, 1986, Ser. No. 891,564
Term of patent 14 years
U.S. Cl. D2—609

301,522
SCARF HANGER
Chester Kolton, Westfield, and Stuart S. Spater, Livingston, both of N.J., assignors to B&G Plastics, Inc., New York, N.Y.
Filed Nov. 6, 1987, Ser. No. 117,660
Term of patent 14 years
U.S. Cl. D6—315

301,523
WALL COAT HOOK UNIT
Raul Barbieri, and Giorgio Marianelli, both of Via Faruffini 13, 20149 Milan, Italy
Filed Mar. 9, 1987, Ser. No. 23,302
Claims priority, application Italy, Sep. 16, 1986, 23053/86[U]
Term of patent 14 years
U.S. Cl. D6—323



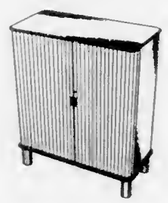
301,524
TIE RACK
Lawrence F. Trafford, London, Canada, assignor to Elgin Local Employment Assistance and Development Corporation, St. Thomas, Canada
Filed Jun. 11, 1986, Ser. No. 873,224
Term of patent 14 years
U.S. Cl. D6—324



301,525
MAGAZINE RACK
August F. Pohlig, 6500 Smoot Dr., McLean, Va. 22101
Filed Jul. 1, 1986, Ser. No. 880,910
Term of patent 14 years
U.S. Cl. D6—410

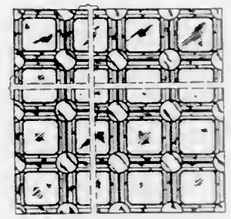
301,526
CABINET
Jan Jacobs, Korte Steigerstraat 3, 5301 CE Zaltbommel, and Peter de Boer, Nieuwe Keizersgracht 31, 1018 VB Amsterdam, both of Netherlands
Filed Mar. 4, 1986, Ser. No. 841,694
Claims priority, application Benelux, Sep. 4, 1985, 60342-02
The portion of the term of this patent subsequent to Jun. 13, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—433

301,527
CABINET
Jan Jacobs, Korte Steigerstraat 3, 5301 CE Zaltbommel, and Peter de Boer, Nieuwe Keizersgracht 31, 1018 VB Amsterdam, both of Netherlands
Filed Mar. 4, 1986, Ser. No. 841,695
Claims priority, application Benelux, Sep. 4, 1985, 60342-01
The portion of the term of this patent subsequent to Jun. 13, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—433

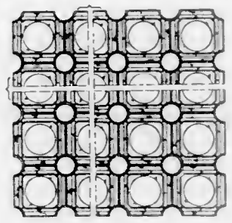


301,528
DRESSER
Daniel D. Wistehuff, Hickory, N.C., assignor to Ladd Furniture, Inc., High Point, N.C.
Filed Apr. 10, 1986, Ser. No. 851,374
Term of patent 14 years
U.S. Cl. D6—446

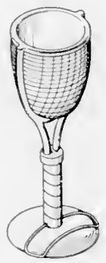
301,529
FLOOR MAT OR SIMILAR ARTICLE
Jens J. Jonker, Doetinchem, Netherlands, assignor to Vredestein Icopro B.V., Velp, Netherlands
Filed Jun. 30, 1986, Ser. No. 880,618
Claims priority, application Int'l Pat. Institute, Dec. 30, 1985, DMA/000458
Term of patent 14 years
U.S. Cl. D6—583



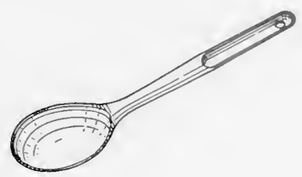
301,530
FLOOR MAT OR SIMILAR ARTICLE
Jens J. Jonker, Doetinchem, Netherlands, assignor to Vredestein Icopro B.V., Velp, Netherlands
Filed Jun. 30, 1986, Ser. No. 880,616
Claims priority, application Int'l Pat. Institute, Dec. 30, 1985, DMA/000458
Term of patent 14 years
U.S. Cl. D6—585



301,531
DRINKING GOBLET
David B. Pitzer, 1233 Ashbourne Dr., Baton Rouge, La. 70815
Filed Oct. 2, 1986, Ser. No. 914,747
Term of patent 14 years
U.S. Cl. D7—5

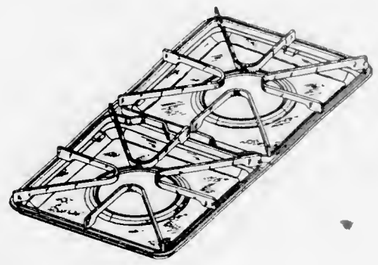


301,533
SPOON
Larry G. Zimmerman, North Smithfield, R.I., assignor to Dart Industries Inc., Deerfield, Ill.
Filed Apr. 1, 1986, Ser. No. 847,608
Term of patent 14 years
U.S. Cl. D7—104



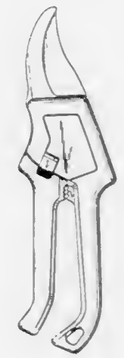
301,532
COMBINATION COASTER SET, CORKSCREW AND BOTTLE OPENER
Siegfried Hölterscheidt, Hückelhoven, Fed. Rep. of Germany, assignor to Walter Henkels GmbH, Fed. Rep. of Germany
Filed Apr. 10, 1986, Ser. No. 851,403
Claims priority, application Fed. Rep. of Germany, Jan. 6, 1986, MR 165
Term of patent 14 years
U.S. Cl. D7—45

301,534
COMBINED GRATE AND DRIP PAN ASSEMBLY FOR A GAS COOKING APPLIANCE
Thomas J. Binzer, Crestwood, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Apr. 27, 1987, Ser. No. 42,899
Term of patent 14 years
U.S. Cl. D7—408

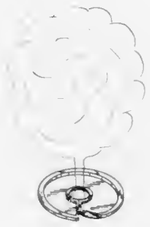


301,535
PECAN COLLECTING TOOL
Willie A. Cain, Rte. 6, P.O. Box 592, Burleson, Tex. 76028
Filed Dec. 22, 1987, Ser. No. 136,921
Term of patent 14 years
U.S. Cl. D8—1

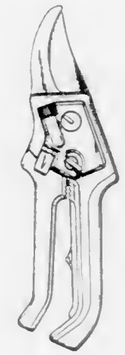
301,537
GARDEN PRUNER
Alan K. Pittaway, High Wycombe, England, assignor to Fiskars Limited, Bridgend, United Kingdom
Filed May 14, 1986, Ser. No. 863,407
Claims priority, application United Kingdom, Nov. 16, 1985, 1030520
The portion of the term of this patent subsequent to Apr. 14, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—4



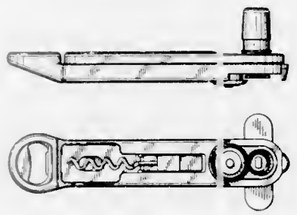
301,536
REMOVABLE GROUND COVER TO CATCH SHRUB CLIPPINGS
Frank M. Spear, 625 Todd Ave., Ellwood City, Pa. 16117
Filed Jul. 3, 1986, Ser. No. 882,157
Term of patent 14 years
U.S. Cl. D8—1



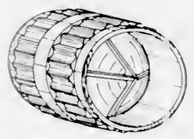
301,538
GARDEN PRUNER
Alan K. Pittaway, High Wycombe, England, assignor to Fiskars Limited, Bridgend, United Kingdom
Filed May 14, 1986, Ser. No. 863,409
Claims priority, application United Kingdom, Nov. 16, 1985, 1030521
The portion of the term of this patent subsequent to Apr. 14, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—4



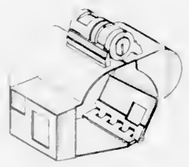
301,539
COMBINED CAN OPENER, CORKSCREW AND BOTTLE OPENER
Po W. Cheung, Kowloon, Hong Kong, assignor to Mike & Kremmel Limited, Kowloon, Hong Kong
Filed May 30, 1986, Ser. No. 869,119
Claims priority, application United Kingdom, Dec. 9, 1985, 1030991
Term of patent 14 years
U.S. Cl. D8—41



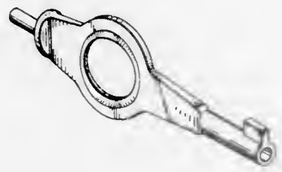
301,540
DEBURRING TOOL FOR TUBES OR THE LIKE
Emery J. Zahuranec, Novelty, and James C. Musil, Sagamore Hills, both of Ohio, assignors to Crawford Fitting Co., Solon, Ohio
Filed Jan. 17, 1986, Ser. No. 819,355
Term of patent 14 years
U.S. Cl. D8—98



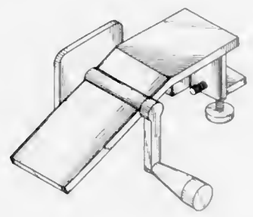
301,541
PORTABLE STEERING COLUMN LOCK
Mark Gifford, 8502 Woodcamp Dr., Houston, Tex. 77088
Filed Jan. 20, 1987, Ser. No. 5,568
Term of patent 14 years
U.S. Cl. D8—331

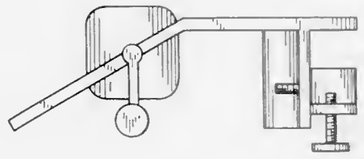


301,542
KEY FOR HANDCUFFS
James B. Kruger, Oxford, Conn., assignor to Smith & Wesson Corp., Springfield, Mass.
Filed Apr. 27, 1987, Ser. No. 42,657
Term of patent 14 years
U.S. Cl. D8—347



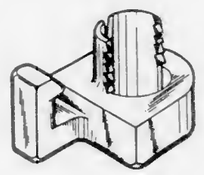
301,543
BELT WINDER
John F. Cook, and Louise J. Cook, both of 24953 Lee St., San Bernardino, Calif. 92408
Filed Nov. 27, 1985, Ser. No. 806,926
Term of patent 14 years
U.S. Cl. D8—359



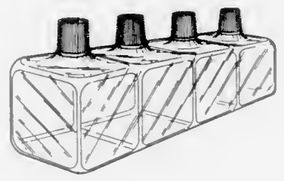


301,544
SAILBOAT MAST SPREADER ANCHOR
Philippe de Faucamberge, Boulogne, France, assignor to Ageca, Vitry sur Seine, France
Filed Jul. 2, 1986, Ser. No. 881,464
Claims priority, application France, Jan. 3, 1986, 86 0020
Term of patent 14 years
U.S. Cl. D8—382

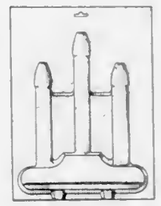
301,545
MATING CLIP FOR ELECTRIC FENCE WIRE OR THE LIKE
Andrew N. Wrigley, Titirangi, New Zealand, assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Oct. 2, 1986, Ser. No. 914,760
Term of patent 14 years
U.S. Cl. D8—382



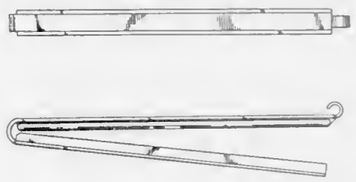
301,546
MULTIPLE LIQUID CONTAINER
William McCallister, 4009 Greenfern Dr., Orlando, Fla. 32810
Filed Aug. 29, 1986, Ser. No. 901,941
Term of patent 14 years
U.S. Cl. D9—341



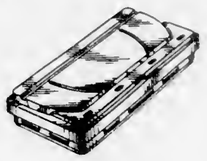
301,547
LIGHT CANDLE PACKAGE
Robert S. Keiner, 4101 NW. 132 St., Miami, Fla. 33054
Filed Apr. 14, 1986, Ser. No. 851,676
Term of patent 14 years
U.S. Cl. D9—415



301,548
BAG SEALER OR THE LIKE
Earl W. Weaver, P.O. Box 308, McIntosh, Ala. 36553
Filed Nov. 25, 1985, Ser. No. 806,214
Term of patent 14 years
U.S. Cl. D9—434



301,549
CONTAINER CLOSURE
John A. Foster, Rockford, Ill., assignor to J. L. Clark Manufacturing Co., Rockford, Ill.
Filed Jan. 6, 1986, Ser. No. 816,244
Term of patent 14 years
U.S. Cl. D9—435



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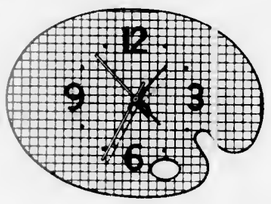
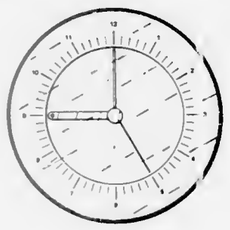
301,550
CONTAINER LID
Laura P. Mobberley, Kansas City, Mo., assignor to Sealright Co., Inc., Kansas City, Mo.
Filed May 15, 1986, Ser. No. 863,533
Term of patent 14 years
U.S. Cl. D9—453

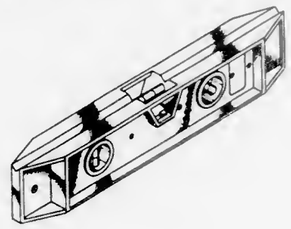
301,551
WALL CLOCK
Thomas J. Cannon, Box 2294, Montclair, N.J. 07042
Filed Sep. 2, 1986, Ser. No. 903,094
Term of patent 14 years
U.S. Cl. D10—6



301,552
CLOCK
Reinhold Weiss, Evanston, Ill., assignor to Fabrique d' Horlogerie LA VEDETTE S.A., Saverne, France
Filed Oct. 17, 1985, Ser. No. 788,234
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1985, MR 1255
Term of patent 14 years
U.S. Cl. D10—22

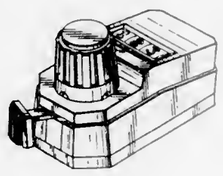


301,553
ILLUMINATED LEVEL
Ben Makofsky, and David Newman, both of 1512 NW. 113th Terr., Pembroke Pines, Fla. 33026
Filed Sep. 12, 1986, Ser. No. 906,786
Term of patent 14 years
U.S. Cl. D10—69

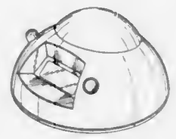


301,554
APPARATUS FOR LOCATING THE CENTER OF GRAVITY OF A GOLF BALL
Tadashi Ogawa, Tokyo, Japan, assignor to LEC Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 28, 1986, Ser. No. 858,224
Claims priority, application Japan, Jan. 21, 1986, 61-1748
Term of patent 14 years
U.S. Cl. D10—82

301,555
DIGITAL COUNTER FOR POTENTIOMETER
Akira Sakai, Saitama, Japan, assignor to Tokyo Metal Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 786,596, Oct. 11, 1985. This application May 7, 1986, Ser. No. 859,889
Claims priority, application Japan, Nov. 20, 1985, 60-48585; Jan. 31, 1986, 61-3261
Term of patent 14 years
U.S. Cl. D10—97



301,556
KNITTER'S COUNTING AID
Hidekazu Okada, Ashiya, Japan, assignor to Clover Mfg. Co., Ltd., Osaka, Japan
Filed May 16, 1986, Ser. No. 864,107
Claims priority, application Japan, Mar. 4, 1986, 61-7849
Term of patent 14 years
U.S. Cl. D10—97



301,557
ELECTRO-OPTICAL WATCH DIAL OR THE LIKE
Fabrizio Agostini, Florence, Italy, assignor to Trast Enterprise S.r.l., Florence, Italy
Filed May 28, 1985, Ser. No. 738,340
Claims priority, application Italy, Nov. 26, 1984, 54081/84[U]
Term of patent 14 years
U.S. Cl. D10—126

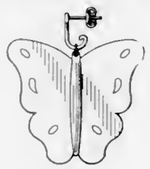
301,558
WATCH DIAL
Fernando Fontana, Sesto Calende, Italy, assignor to Omega, S.A., Bienne, Switzerland
Division of Ser. No. 159,974, Feb. 24, 1988, which is a division of Ser. No. 780,345, Sep. 26, 1985. This application Sep. 30, 1988, Ser. No. 251,711
Claims priority, application Italy, Mar. 26, 1985, 21244/85[U]
Term of patent 14 years
U.S. Cl. D10—126

301,559
RING OF CANDY OR SIMILAR ARTICLE
Nelson Wood, 20 Dean Rd., Brookline, Mass. 02146
Filed Dec. 2, 1986, Ser. No. 937,143
Term of patent 14 years
U.S. Cl. D11—2

301,560
RING
Claude Gozlan, W. Toronto, Canada, assignor to Jean-Claude International Corp., Scarborough, Canada
Filed Mar. 30, 1987, Ser. No. 32,098
Term of patent 14 years
U.S. Cl. D11—32

301,561
EARRING
Randy C. Westmoland, P.O. Box 92, Skiatook, Okla. 74070
Filed Aug. 22, 1986, Ser. No. 899,171
Term of patent 14 years
U.S. Cl. D11—45

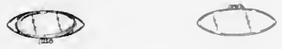
301,562
EARRING STUD HOOK
D. H. Gaskill, 800 Jane La., Weatherford, Tex. 76086
Filed Sep. 30, 1987, Ser. No. 102,895
Term of patent 14 years
U.S. Cl. D11—57



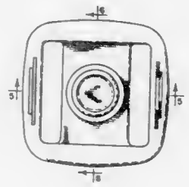
301,563
CHARM OR THE LIKE
James R. Miller, and Kathleen Miller, both of 3931 Boyce Ave., Los Angeles, Calif. 90039
Filed Jun. 9, 1987, Ser. No. 872,411
Term of patent 14 years
U.S. Cl. D11—84

301,564
NECKLACE PENDANT CIRCLET
James L. Gatsos, 13057 SE. 208th St., Kent, Wash. 98031
Division of Ser. No. 941,951, Dec. 9, 1986, Pat. No. Des. 294,335, which is a division of Ser. No. 524,483, Aug. 18, 1983, Pat. No. Des. 289,388. This application Jan. 27, 1988, Ser. No. 149,046
Term of patent 14 years
U.S. Cl. D11—86

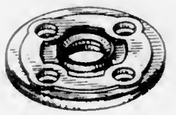
301,565
VASE
Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 6,572, Jan. 22, 1987. This application Sep. 4, 1987, Ser. No. 92,991
Term of patent 14 years
U.S. Cl. D11—152



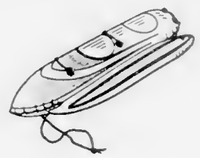
301,566
LOW PROFILE SNAP BUCKLE
Robert Heiberger, Norridge, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed May 12, 1986, Ser. No. 862,561
Term of patent 14 years
U.S. Cl. D11—218



301,567
SNAP FASTENER ELEMENT
James E. Burke, Shelton, Conn., assignor to Scovill Fasteners Inc., New York, N.Y.
Filed Apr. 4, 1986, Ser. No. 850,337
Term of patent 14 years
U.S. Cl. D11—220

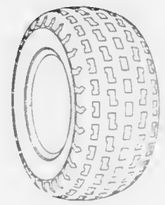


301,568
INFLATABLE SLED
Henry T. Kuan, Suan Kiang Road, Taipei, Taiwan
Filed Apr. 9, 1986, Ser. No. 850,915
Term of patent 14 years
U.S. Cl. D12—11



301,569
MOTORCYCLE TIRE
Shigehiko Sazaki, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Aug. 18, 1986, Ser. No. 897,201
Claims priority, application Japan, Jun. 19, 1986, 61-23564
Term of patent 14 years
U.S. Cl. D12—147

301,570
AUTOMOBILE TIRE
Tetsushi Fujiki, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Sep. 12, 1986, Ser. No. 906,772
Claims priority, application Japan, Mar. 12, 1986, 61-9154
Term of patent 14 years
U.S. Cl. D12—148



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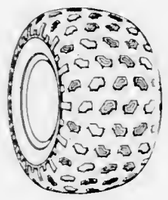
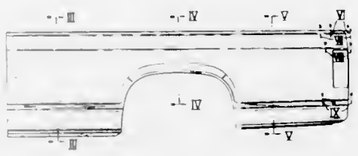
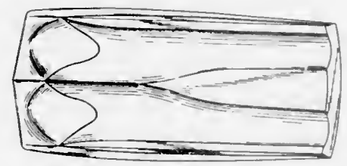
301,571
AUTOMOBILE TIRE
Tetsushi Fujiki, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Sep. 17, 1986, Ser. No. 908,523
Claims priority, application Japan, Jun. 6, 1986, 61-22030
Term of patent 14 years
U.S. Cl. D12—149



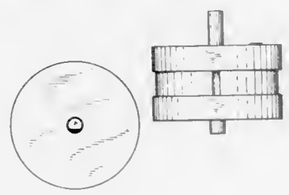
301,572
PICKUP TRUCK QUARTER PANEL
David C. McKinnon, Ann Arbor, Mich., assignor to Chrysler Motors Corporation, Highland Park, Mich.
Filed Apr. 4, 1986, Ser. No. 847,868
Term of patent 14 years
U.S. Cl. D12—196



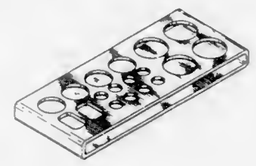
301,573
EXTERIOR SURFACE OF A BOAT HULL
Stephen M. Fuller, 5 Lucia Avenue, St. Ives, Sydney, New South Wales, Australia 2075
Filed Sep. 18, 1986, Ser. No. 909,077
Claims priority, application Australia, Jan. 9, 1986, 3808/86
Term of patent 14 years
U.S. Cl. D12—310



301,574
TORQUE MOTOR
William D. Riggs, Southington, Conn., assignor to North American Philips Corp., New York, N.Y.
Filed Oct. 24, 1986, Ser. No. 923,074
Term of patent 14 years
U.S. Cl. D13—1

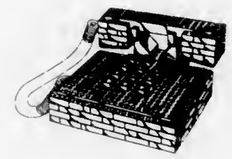


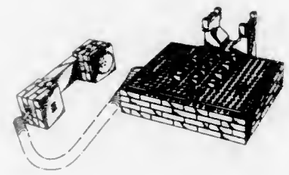
301,575
BATTERY HOLDER
Tom H. Crawford, Jr., 917 Clearview, Bedford, Tex. 76021
Filed Jul. 2, 1986, Ser. No. 881,202
Term of patent 14 years
U.S. Cl. D13—11



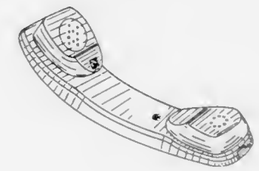
301,576
MULTIPLE OUTLET ELECTRICAL RECEPTACLE
Chung-Jang Wang, No. 3, Pei Chuang Rd., Shen Kang Hsiang, Taichung Hsien, Taiwan
Filed Jul. 28, 1986, Ser. No. 891,366
Claims priority, application Taiwan, Feb. 18, 1986, 75300803
Term of patent 14 years
U.S. Cl. D13—30

301,577
TELEPHONE SET
Howard J. Morrison, Riverwoods, and Brian P. Bullock, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Dec. 28, 1987, Ser. No. 138,020
Term of patent 14 years
U.S. Cl. D14—53





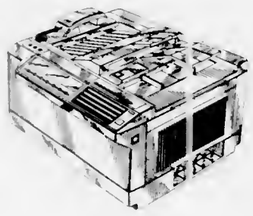
301,578
TELEPHONE HANDSET
Yoshio Sasaki; Hiroshi Ishizuka, both of Kawasaki; Iwamasa Nishikado, and Tsuneji Kimeda, both of Yokosuka, all of Japan, assignors to Nitsuko Limited and Nippon Telegraph and Telephone Corporation, both of Tokyo, Japan
Filed Oct. 22, 1986, Ser. No. 922,105
Claims priority, application Japan, May 13, 1986, 61-17644
Term of patent 14 years
U.S. Cl. D14—248



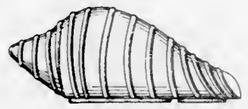
301,579
CAR RADIO RECEIVER
Petrus H. J. van de Ven, Valkenswaard, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sep. 10, 1986, Ser. No. 905,919
Claims priority, application United Kingdom, Mar. 26, 1986, 1.033.118
Term of patent 14 years
U.S. Cl. D14—157

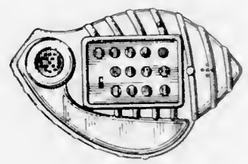
301,580
CLOCK RADIO RECEIVER
Grant M. N. Davidson, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 4, 1986, Ser. No. 826,043
Claims priority, application United Kingdom, Aug. 21, 1985, 1028730
Term of patent 14 years
U.S. Cl. D14—171

301,581
FACSIMILE TRANSCEIVER/RECEIVER
Hiroaki Watanabe, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Apr. 10, 1986, Ser. No. 851,398
Claims priority, application Japan, Oct. 15, 1985, 60-43149
Term of patent 14 years
U.S. Cl. D14—118

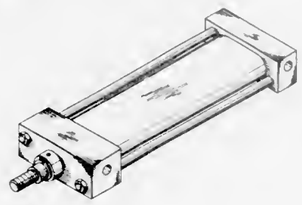


301,582
TELEPHONE
Kash Gobindram, Farmingdale, N.Y., assignor to Kash 'N' Gold, Ltd., Ronkonkoma, N.Y.
Filed Dec. 30, 1987, Ser. No. 139,715
Term of patent 14 years
U.S. Cl. D14—143



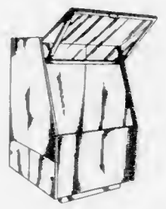


301,583
FLUID-OPERATED POWER CYLINDER
Ray H. Herner, Brookville, Ohio, assignor to Mosier Industries, Inc., Brookville, Ohio
Filed Mar. 30, 1987, Ser. No. 33,160
Term of patent 14 years
U.S. Cl. D15—7

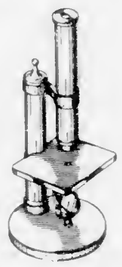


301,584
ELECTRICALLY POWERED HOE
Steven D. Praeter, Box 172, Kellerville, Ohio 45336
Filed Aug. 16, 1985, Ser. No. 766,414
Term of patent 14 years
U.S. Cl. D15—12

301,585
ENCLOSURE FOR A MACHINE TOOL
Thomas D. Linn, Holliston, Mass., assignor to Boston Digital Corporation, Milford, Mass.
Filed Nov. 10, 1986, Ser. No. 929,156
Term of patent 14 years
U.S. Cl. D15—138

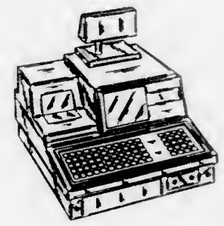


301,586
MICROSCOPE
Dennis Brock, 1950 Geronimo Trail, Maitland, Fla. 32751
Filed Feb. 17, 1987, Ser. No. 15,724
Term of patent 14 years
U.S. Cl. D16—131

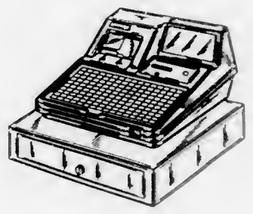


301,587
MICROSCOPE
Dennis Brock, 1950 Geronimo Trail, Maitland, Fla. 32751
Filed Feb. 17, 1987, Ser. No. 15,728
Term of patent 14 years
U.S. Cl. D16—131

301,588
CASH REGISTER
Mikio Kosako, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Feb. 21, 1986, Ser. No. 835,313
Claims priority, application Japan, Aug. 22, 1985, 60-35703
Term of patent 14 years
U.S. Cl. D18—4



301,589
CASH REGISTER
Tooru Makidera, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Jan. 28, 1987, Ser. No. 7,922
Claims priority, application Japan, Jul. 28, 1986, 61-29701
Term of patent 14 years
U.S. Cl. D18—4



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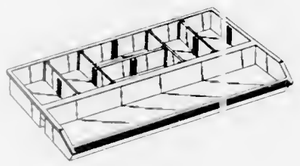
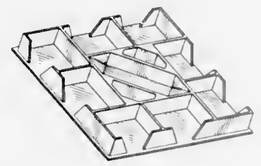
301,590
DRAWER ORGANIZER TRAY
Kenneth C. Foran, Wooster, and Thomas J. David, Worthington, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Aug. 7, 1986, Ser. No. 894,158
Term of patent 14 years
U.S. Cl. D19—77



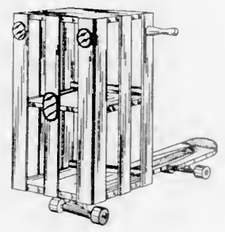
301,591
BASKETBALL SHOOTING TOY
Charles H. Herold, 505 W. Baseline, Apt. 1003, Tempe, Ariz. 85283
Filed Sep. 19, 1988, Ser. No. 246,178
Term of patent 14 years
U.S. Cl. D21—11

301,592
PLAYING CARD
Barry Needler, Aurora, Canada, assignor to C.N.D. Playing Card Company, Ltd., Ontario, Canada
Filed Sep. 26, 1986, Ser. No. 913,179
Claims priority, application Canada, Jan. 10, 1986, 10-06-86-5
Term of patent 14 years
U.S. Cl. D21—45

301,593
CARD AND PLAYING PIECE HOLDER FOR A GAME
Eugene D. Shershen, 475 Elgin St., Suite 914, Ottawa, Canada; William G. Berger, 1575 Reed Rd., West Trenton, N.J. 08628, and Barbara Welliver-Berger, P.O. Box 381, Millville, Pa. 17846
Filed Oct. 25, 1985, Ser. No. 791,565
Claims priority, application Canada, Apr. 26, 1985, 2604852
Term of patent 14 years
U.S. Cl. D21—54



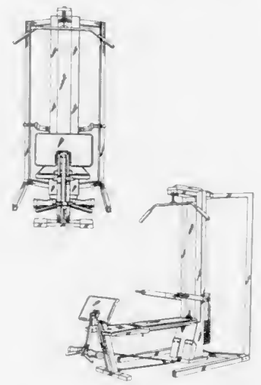
301,594
SCOOTER
Paul A. Simpson, 22844 Halburton Rd., Beachwood, Ohio 44122
Filed Feb. 12, 1987, Ser. No. 13,927
Term of patent 14 years
U.S. Cl. D21—81



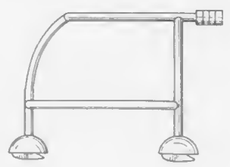
301,595
BALLOON
Matt Murray, Norwalk, Conn., assignor to The National Latex Products Company, Ashland, Ohio
Filed Jan. 27, 1988, Ser. No. 149,215
Term of patent 14 years
U.S. Cl. D21—84

301,596
WATER TOY TURTLE FIGURE
Wilson Leung, Kowloon, Hong Kong, assignor to Spalding & Evenflo Companies, Inc., Tampa, Fla.
Filed May 27, 1986, Ser. No. 867,871
Term of patent 14 years
U.S. Cl. D21—157

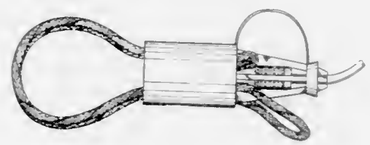
301,597
PHYSICAL EXERCISER
Kari Lehtonen, Kaarina, Finland, assignor to Tunturipyora Oy, Turku, Finland
Filed Nov. 20, 1986, Ser. No. 933,099
Claims priority, application Italy, May 30, 1986, 560/86
Term of patent 14 years
U.S. Cl. D21—195



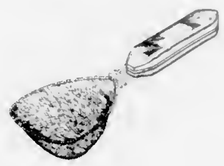
301,598
SKATER'S LEARNING AID
Lurener M. Harris, 119 Austin Ave., Albion, Mich. 49224
Filed Jun. 25, 1986, Ser. No. 878,479
Term of patent 14 years
U.S. Cl. D21—224



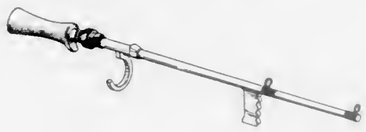
301,599
COMBINED SIGNAL TRANSMISSION DEVICE AND DETONATING CORD FOR BLASTING ASSEMBLY
Lars-Gunnar Lofgren, Gyttorp, Sweden, assignor to Nitro Nobel AB, Gyttorp, Sweden
Division of Ser. No. 655,332, Sep. 27, 1984, Pat. No. Des. 293,928. This application May 27, 1987, Ser. No. 54,665
Claims priority, application Sweden, Mar. 27, 1984, 84-1010; Mar. 27, 1984, 84-1009
The portion of the term of this patent subsequent to Jan. 26, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D22—112



301,600
HANDLE
Winstod E. Wilson, Crawfordsville, Ind., assignor to John D. Neff, Dallas, Tex.
Filed Jan. 28, 1987, Ser. No. 7,554
Term of patent 14 years
U.S. Cl. D22—135

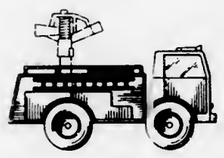


301,601
FISHING ROD
Randall L. Bice, 1450 E. Grove, Orange, Calif. 92665
Filed Jan. 28, 1987, Ser. No. 7,956
Term of patent 14 years
U.S. Cl. D22—142



301,602
SMALL GAME SI INNER
Frank A. Rose, 205 W. McKeen, Pa is, Ark. 72855
Filed Jun. 9, 1986, Ser. No. 872,459
Term of patent 1 years
U.S. Cl. D22—199

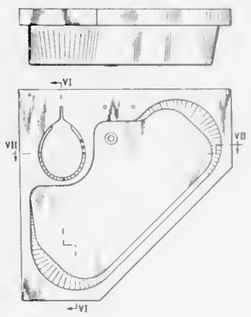
301,603
WATER SPRIN KLER
Freddy Herrera, P.O. Box 920970-/ 38, Houston, Tex. 77292
Filed Feb. 20, 1986, Se . No. 834,449
Term of patent 1 years
U.S. Cl. D23—215



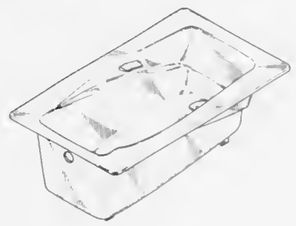
301,604
HANDLE
Herbert V. Kohler, Jr., Kohler, Wis , and Paul P. Kolada, Bexley, Ohio, assignors to Kohler Co , Kohler, Wis.
Filed Jan. 16, 1986, Se . No. 819,874
Term of patent 14 years
U.S. Cl. D23—252

301,605
WALL-MOUNTED FAUCET
Franz W. Jans, Offenbach am Main, Fed. Rep. of Germany, assignor to Armaturen & Presswerk GmbH, Rodermark, Fed. Rep. of Germany
Filed Jan. 14, 1987, Ser. No. 3,220
Term of patent 14 years
U.S. Cl. D23—255

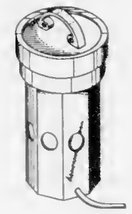
301,606
COMBINED BATHTUB AND WATER CLOSET COVER
Peter R. Harvey, Cobbs, 101 Park Road, North Leigh, Witney, Oxfordshire 0X8 6SB, England
Filed Nov. 28, 1986, Ser. No. 942,642
Term of patent 14 years
U.S. Cl. D23—271



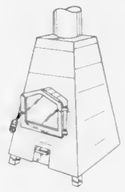
301,607
BATHTUB
Armando Macia, Monterrey, Mexico, assignor to Fabricas Orion, S.A., Monterry, Mexico
Filed Jan. 13, 1986, Ser. No. 818,019
Term of patent 14 years
U.S. Cl. D23—282



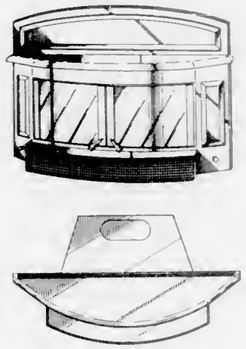
301,608
WET WIPE WARMER
Charles A. Ballard, and Deborah W. Ballard, both of 25 London La., Mebane, N.C. 27302
Filed May 12, 1986, Ser. No. 862,518
Term of patent 14 years
U.S. Cl. D23—332



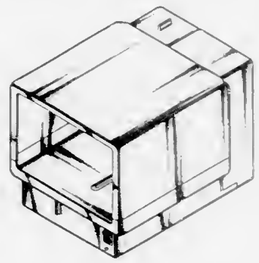
301,609
WOOD STOVE
Oaklan R. Senf, 4154 S. Sheridan Dr., Muskegon, Mich. 49444
Filed Jun. 9, 1987, Ser. No. 59,827
Term of patent 14 years
U.S. Cl. D23—343



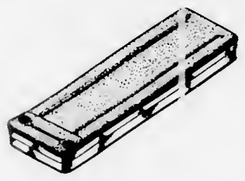
301,610
FIREPLACE INSERT
Richard D. Craver, Marshalville, Ohio, assignor to Orrville Products, Inc., Orrville, Ohio
Filed Apr. 16, 1987, Ser. No. 39,592
Term of patent 14 years
U.S. Cl. D23—344

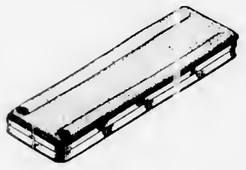


301,611
HAND SANITIZING MACHINE
Richard E. Peterson, Redondo Beach; George C. Hopkins, Westminster, and Gary H. Richards, El Segundo, all of Calif., assignors to Pacific Health Products, Inc., Redondo Beach, Calif.
Filed Aug. 20, 1986, Ser. No. 898,259
Term of patent 14 years
U.S. Cl. D24—1.1

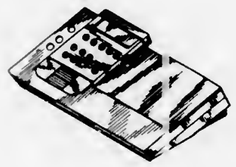


301,612
TABLE TOP FOR MASSAGING AND CHIROPRACTIC THERAPY
Terno Masuda, Tokyo; Kazuyuki Yamaguchi, Sayama, and Kazuhiko Ito, Urawa, all of Japan, assignors to France Bed Co., Ltd., Tokyo, Japan
Division of Ser. No. 805,273, Dec. 5, 1985. This application Jan. 25, 1988, Ser. No. 147,914
Claims priority, application Japan, Jul. 31, 1985, 60-32769
Term of patent 14 years
U.S. Cl. D24—3



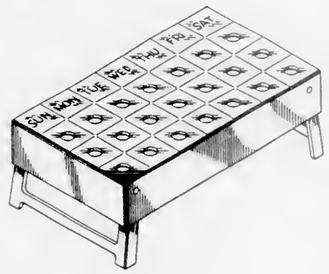


301,613
COMBINED DIABETIC DATA TRANSFER INTERFACE AND MATCHING INPUT RECORDER
W. J. P. Peters, RK Delft, Netherlands, assignor to Diva Medical Systems bv, Maastricht, Netherlands
Filed Oct. 22, 1986, Ser. No. 922,107
Term of patent 14 years
U.S. Cl. D24—17

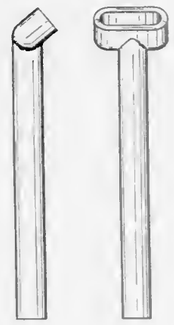


301,614
ROTATABLE SNARE HANDLE
Mark Kozak, Euclid, and Michael Nichols, Mentor, both of Ohio, assignors to Mill-Rose Laboratories, Inc., Mentor, Ohio
Filed May 13, 1986, Ser. No. 862,794
Term of patent 14 years
U.S. Cl. D24—30

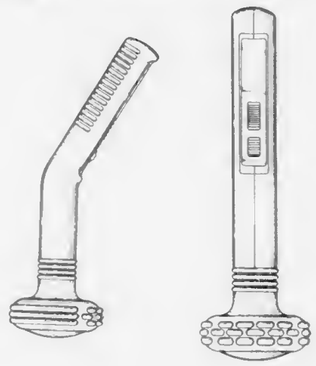
301,615
INSULIN SHOT REMINDER TRAY
Jocelyne Vitart-Liva, P.O. Box 90631, Honolulu, Hi. 96835
Filed Apr. 3, 1986, Ser. No. 847,470
Term of patent 14 years
U.S. Cl. D24—31



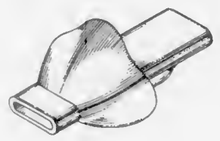
301,616
ANGULATED SINGLE PORT COUPLER FOR RESONANCE SPLITTING IN HEARING AIDS
Mas Harada, 3217 Flag Ave., Minneapolis, Minn. 55426
Filed Aug. 25, 1986, Ser. No. 899,944
The portion of the term of this patent subsequent to Apr. 11, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—35



301,617
ELECTRIC MASSAGER
Kazuyoshi Yonesawa, Suita; Kuniharu Ichikawa, Kyoto, and Taro Mochida, Hirakata, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Jan. 30, 1987, Ser. No. 9,125
Claims priority, application Japan, Aug. 18, 1986, 61-32117
Term of patent 14 years
U.S. Cl. D24—41

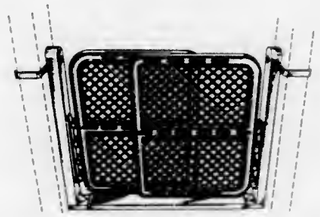


301,618
MOUTH TO MOUTH RESUSCITATOR
Ron P. Barros, 19116 Hamlin St., Reseda, Calif. 91335
Filed Oct. 7, 1986, Ser. No. 916,464
Term of patent 14 years
U.S. Cl. D24—62

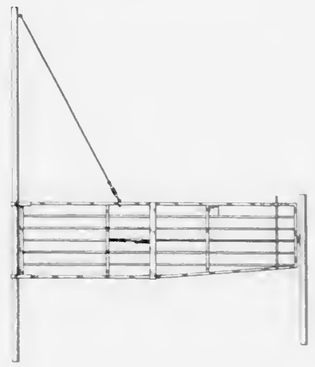


301,619
COMBINED LEG SUPPORT AND THERAPY HARNESS
Charles Boal, 19842 Ranger La., Huntington Beach, Calif. 92646
Filed Nov. 3, 1986, Ser. No. 926,248
Term of patent 14 years
U.S. Cl. D24—64

301,620
DOORWAY SAFETY GATE
Stanley A. Johnson, Jr., Brookfield, Wis., assignor to NuLine Industries, Suring, Wis.
Filed Apr. 14, 1986, Ser. No. 851,673
Term of patent 14 years
U.S. Cl. D25—50



301,621
VEHICLE ACTUATED GATE
Ronald L. Muntz, and Michelle D. Plevel, both of P.O. Box 1573, San Luis Obispo, Calif. 93401
Filed Sep. 8, 1986, Ser. No. 905,040
Term of patent 14 years
U.S. Cl. D25—50



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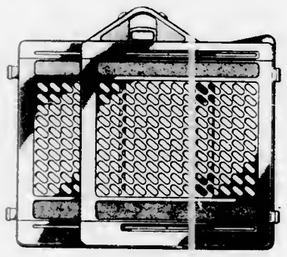
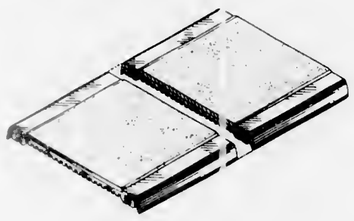
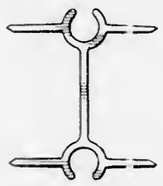
301,622
DOOR GATE
Stanley M. Kujawski, East Aurora N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Apr. 18, 1988, Ser. No. 182,567
Term of patent 14 years
U.S. Cl. D25—50



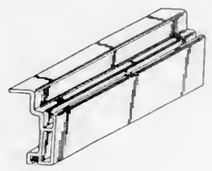
301,623
PROTECTIVE WALL RAIL
Michel Grosjean, Gieres, France, assignor to Dinac Diffusion d'Idees Nouvelles Appliquees a la Construction, Societe Anonyme, La Mure, France
Filed Jan. 17, 1986, Ser. No. 875,863
Claims priority, application France Dec. 30, 1985, 856217
Term of patent 14 years
U.S. Cl. D25—119



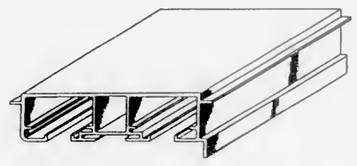
301,624
WALL GASKET SUPPORT STRUCTURE
Matthew R. Foster, Cambridge, Canada, assignor to The Marmon Group, Inc., Chicago, Ill.
Filed Jan. 22, 1986, Ser. No. 821,377
Term of patent 14 years
U.S. Cl. D25—123



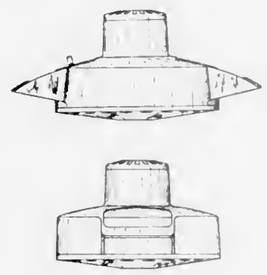
301,625
WINDOW FRAME EXTRUSION
Raymond Dallaire, and Dominique Dallaire, both of St. David, Canada, assignors to P. H. Tech Inc., Levis, Canada
Filed Feb. 3, 1987, Ser. No. 10,571
Claims priority, application United Kingdom, Aug. 8, 1986, 1035966; Aug. 14, 1986, 1036083
Term of patent 14 years
U.S. Cl. D25—124



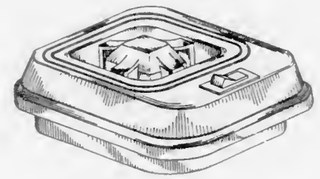
301,626
WINDOW FRAME EXTRUSION
Raymond Dallaire, and Dominique Dallaire, both of St. David, Canada, assignors to P. H. Tech Inc., Levis, Canada
Filed Mar. 18, 1987, Ser. No. 35,698
Claims priority, application United Kingdom, Sep. 18, 1986, 1036797
Term of patent 14 years
U.S. Cl. D25—124



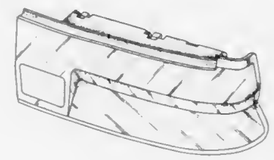
301,627
MEDICAL EXAMINATION LIGHT
Joseph T. Sestak, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.
Filed Mar. 24, 1986, Ser. No. 845,750
Term of patent 14 years
U.S. Cl. D26—24



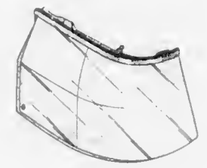
301,628
INTERIOR VEHICLE LIGHT
Dennis E. Fuller, Elkhart, Ind., assignor to North American Sales Associates, Inc., Elkhart, Ind.
Filed Apr. 4, 1986, Ser. No. 850,336
Term of patent 14 years
U.S. Cl. D26—28



301,629
REAR COMBINATION LAMP FOR AN AUTOMOBILE
Hironori Jiroubou, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Apr. 29, 1986, Ser. No. 857,192
Claims priority, application Taiwan, Apr. 7, 1986, 75301631
Term of patent 14 years
U.S. Cl. D26—28



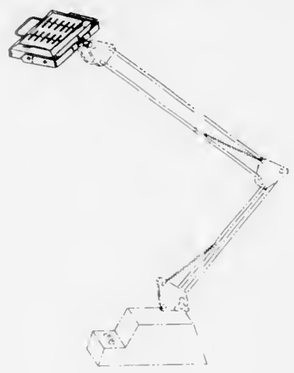
301,630
CLEARANCE LAMP FOR AN AUTOMOBILE
Mitsuo Ikeda, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Jun. 6, 1986, Ser. No. 871,587
Term of patent 14 years
U.S. Cl. D26—28



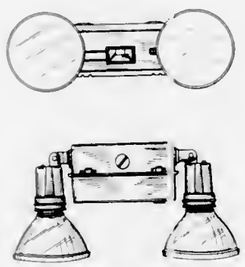
301,631
RECHARGEABLE FLUORESCENT LANTERN
Tak L. Leung, Hong Kong, Hong Kong, assignor to Brinkmann International (Hong Kong) Limited, Kowloon, Hong Kong
Filed Aug. 13, 1986, Ser. No. 895,948
Term of patent 14 years
U.S. Cl. D26—42

301,632
LAMP
Scott J. A. Lohrentz, 2805 W. Douglas, Wichita, Kans. 67213
Filed Jul. 15, 1987, Ser. No. 73,623
Term of patent 14 years
U.S. Cl. D26—61

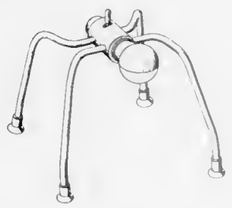
301,633
LAMP HEAD FOR AN ADJUSTABLE TASK LIGHT
Haim Shwisha, Westport, Conn., assignor to Electrix, Inc., New Haven, Conn.
Filed Feb. 26, 1986, Ser. No. 836,181
Term of patent 14 years
U.S. Cl. D26—63



301,634
COMBINED OUTDOOR FLOODLIGHT UNIT AND PHOTO ELECTRIC CONTROL THEREFOR
Giovanni DeCandia, Germantown, Tenn., assignor to FL Industries, Inc., Livingston, N.J.
Filed May 22, 1986, Ser. No. 866,095
Term of patent 14 years
U.S. Cl. D26—63

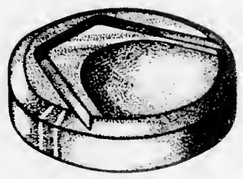


301,635
TABLE LAMP
Carlo Bellini, Milan, and Marco Ferreri, Imperia, both of Italy, assignors to Luxo Italina S.p.A., Italy
Filed Mar. 18, 1986, Ser. No. 845,377
Claims priority, application Italy, Sep. 18, 1985, 23064-B/85
Term of patent 14 years
U.S. Cl. D26—98

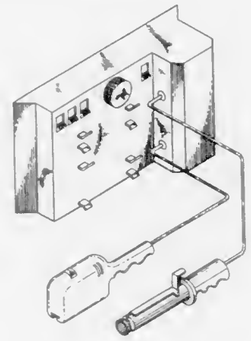


301,636
LIGHT BULB ATTACHMENT FOR SUPPORTING SCENT-RELEASING PEBBLES OR THE LIKE
Annick Goutal, Paris, France, assignor to Annick Goutal, a limited liability company, Paris, France
Filed Dec. 20, 1985, Ser. No. 814,533
The portion of the term of this patent subsequent to Jun. 20, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—113

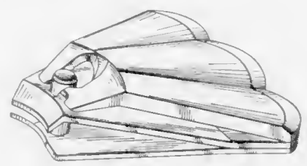
301,637
TABLET
Geoffrey D. Tovey, Harpenden, England, assignor to Smith Kline & French Laboratories Ltd, Mundells Welwyn Garden City, England
Filed Dec. 19, 1986, Ser. No. 943,540
Term of patent 14 years
U.S. Cl. D28—2



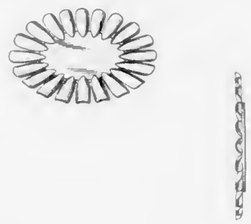
301,638
WALL MOUNTED DUAL DRYER SYSTEM
Kevin S. Russell, R.F.D. #1, Box 4A, Orleans, Vt. 05860
Filed Jan. 23, 1986, Ser. No. 821,778
Term of patent 14 years
U.S. Cl. D28—14



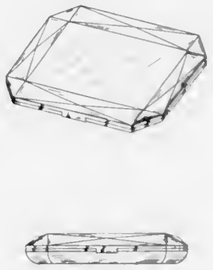
301,639
NAIL CLIPPER
Abbas M. Husain, 5 W. Chestnut Ave., Merchantville, N.J. 08109
Filed Aug. 7, 1987, Ser. No. 83,292
Term of patent 14 years
U.S. Cl. D28—60



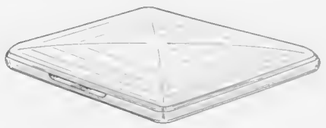
301,640
SAMPLE NAIL COLOR DISC
Martha L. Burton, Box 346, Pukalani, Maui, Hi. 96788
Filed Jun. 5, 1986, Ser. No. 871,607
Term of patent 14 years
U.S. Cl. D28—62



301,641
COSMETIC CASE
Roberto Trabattoni, 70 Route du Poot-Butin, 1213 Petit-Lancy, Switzerland
Filed Dec. 11, 1985, Ser. No. 807,820
Term of patent 14 years
U.S. Cl. D28—79



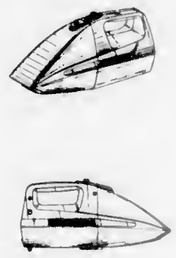
301,642
COSMETIC CASE
Karena Bakic, Munich, Fed. Rep. of Germany, assignor to Cosmede Anstalt, Vaduz, Liechtenstein
Filed Mar. 4, 1986, Ser. No. 841,706
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1985, URA 1264/85
Term of patent 14 years
U.S. Cl. D28—83



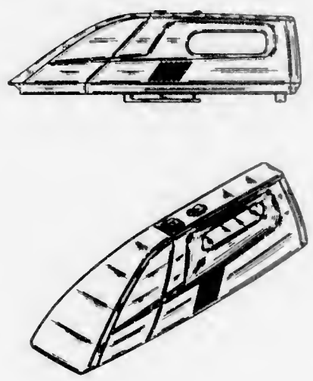
301,643
LIPSTICK CASE
Karena Bakic, Munich, Fed. Rep. of Germany, assignor to Comede Anstalt, Vaduz, Liechtenstein
Filed Mar. 7, 1986, Ser. No. 842,012
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1985, URA 1128/85
Term of patent 14 years
U.S. Cl. D28—85

301,644
HEADWORN IMAGING UNIT
Joseph T. Sestak, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.
Filed Nov. 15, 1985, Ser. No. 805,079
Term of patent 14 years
U.S. Cl. D29—18

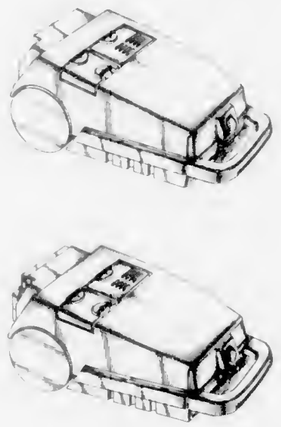
301,645
VACUUM CLEANER
Hideo Nishikawa, Osaka, Japan, assignor to Imanishi Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Dec. 10, 1984, Ser. No. 680,123
Claims priority, application Japan, Jun. 28, 1984, 59-26595
Term of patent 14 years
U.S. Cl. D32—18



301,646
VACUUM CLEANER
Sachio Yamamoto, and Chikashi Kuriya, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jun. 10, 1986, Ser. No. 872,760
Claims priority, application Japan, Dec. 13, 1985, 60-52024
Term of patent 14 years
U.S. Cl. D32—18



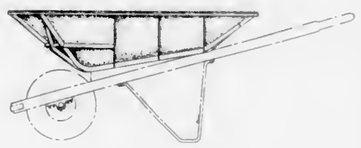
301,647
CANISTER VACUUM CLEANER
Stephen R. Burns, Norcross, Ga., and Frank R. Harris, Anderson, S.C., assignors to Ryobi Motor Products Corp., Pickens, S.C.
Filed Dec. 16, 1986, Ser. No. 942,571
Term of patent 14 years
U.S. Cl. D32—21



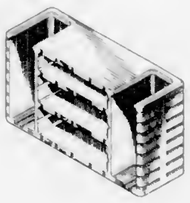
301,648
VACUUM CLEANER
Milton G. Kieft, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Jul. 15, 1986, Ser. No. 885,728
Term of patent 14 years
U.S. Cl. D32—22

301,649
VACUUM CLEANER
Sachio Yamamoto, and Chikashi Kuriya, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Sep. 2, 1986, Ser. No. 903,077
Claims priority, application Japan, Mar. 20, 1986, 61-10477
Term of patent 14 years
U.S. Cl. D32—22

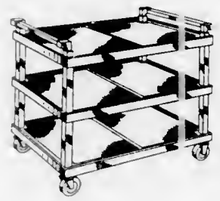
301,650
WHEEL BARROW TRAY
Robert A. Germain, Harrisburg, Pa., assignor to Emhart Industries, Inc., Farmington, Conn.
Filed May 14, 1986, Ser. No. 863,397
Term of patent 14 years
U.S. Cl. D34—16



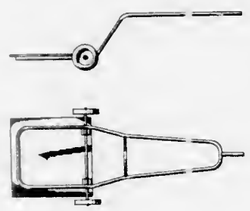
301,651
MOBILE CABINET
Isaac Rinkewich, 48-22 Garden View Ter., Hightstown, N.J. 08520
Filed Oct. 27, 1986, Ser. No. 923,695
Term of patent 14 years
U.S. Cl. D34—20



301,652
UTILITY CART
Melvin F. Roberts, Niles, Ill., assignor to Bloomfield Industries, Inc., Chicago, Ill.
Filed May 21, 1987, Ser. No. 52,356
Term of patent 14 years
U.S. Cl. D34—21

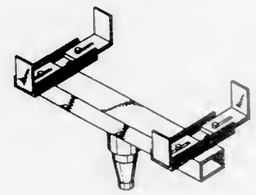


301,653
HAND CART
Anthony A. Cacioppo, 3702 Kenwood Ave., Davenport, Iowa 52807
Filed Jun. 13, 1986, Ser. No. 874,318
Term of patent 14 years
U.S. Cl. D34—24



301,654
OUTBOARD MOTOR CART
James M. Tipke, Spokane, Wash., assignor to Tipke Manufacturing Co., Inc., Spokane, Wash.
Filed Jul. 13, 1987, Ser. No. 72,588
Term of patent 14 years
U.S. Cl. D34—26

301,655
FLOOR JACK ATTACHMENT FOR SUPPORTING FRONT AND REAR AXLES OF A TRUCK
Dennis E. Otte, 2190 N. Rink Rd., Lena, Ill. 61048
Filed May 30, 1986, Ser. No. 875,357
Term of patent 14 years
U.S. Cl. D34—31



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF JUNE, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. O. Smith Corporation: *See*—
Coursin, Benjamin E., 4,838,833, Cl. 464-181.000.
Stubbe, James S.; Chevalier, James L.; and Pow, Edwin C., 4,838,208, Cl. 122-17.000.

A & S Fiberglass, Inc.: *See*—
Borum, Otis C.; Borum, Martin O.; and Arn, Robert H., 4,837,914, Cl. 29-401.100.

A.T. Cross Company: *See*—
Boyce, Stephen V.; Lozeau, Robert V.; and Farmer, Lawrence R., 4,837,900, Cl. 24-11.00P.

A.W. Faber-Castell Unternehmensverwaltung GmbH & Co.: *See*—
Katz, Otto, 4,838,722, Cl. 401-101.000.

AB Asea-Atom: *See*—
DeMario, Edmund E.; Johansson, Anders; and Nylund, Olov, 4,839,136, Cl. 376-462.000.

AB PROFOR: *See*—
Rausing, Hans, 4,838,428, Cl. 206-603.000.

AB Tetra Pak: *See*—
Lesse, Hakan, 4,838,468, Cl. 226-76.000.

ABB Stal AB: *See*—
Hjalmarsson, Lennart, 4,838,209, Cl. 122-4.00D.

Abbondandolo, Michael: *See*—
Hogg, Judy S.; Abbondandolo, Michael; and Brink, Patricia J., 4,838,334, Cl. 160-370.200.

Abdulwahab, Munib; Burkhardt, James L.; and McCann, John J., to Polaroid Corporation. Method of and apparatus for transforming color image data on the basis of an isotropic and uniform colorimetric space. 4,839,721, Cl. 358-80.000.

Abe, Hajime: *See*—
Nishiyama, Sinichi; Abe, Hajime; Seki, Kuniaki; and Hagiwara, Noboru, 4,838,063, Cl. 72-47.000.

Abe, Hirotsugu: *See*—
Ishikawa, Youhei; Tsunoda, Kikuo; Hiratsuka, Toshiro; and Abe, Hirotsugu, 4,839,773, Cl. 361-321.000.

Abe, Katsunobu: *See*—
Taya, Shunroku; Abe, Katsunobu; and Shibata, Atsushi, 4,839,523, Cl. 250-492.200.

Abe, Kazuyoshi; and Yazaki, Kazuhiko, to Nissan Motor Co., Ltd. Bar-code label applicable for bar-code controlled manufacturing including painting process and production method therefor. 4,837,904, Cl. 29-34.00R.

Abe, Kiyoshi: *See*—
Hamada, Takeaki; Okada, Akio; Abe, Kiyoshi; Udagawa, Katsuhiro; Okazaki, Fumitoshi; and Fujino, Kouji, 4,837,877, Cl. 5-10.00B.

Abe, Masaki; Shiohara, Yukimitsu; Adaniya, Takeshi; and Naemura, Hiroshi, to Nippon Kokan Kabushiki Kaisha. Composite zinc-silica electro-galvanized steel sheet excellent in corrosion resistance. 4,839,241, Cl. 428-659.000.

Abe, Nobumasa: *See*—
Miura, Teiji; Yamazaki, Hideo; Abe, Nobumasa; Okamura, Toshihide; Morozumi, Hideki; and Matsuo, Tatsuki, 4,838,657, Cl. 350-336.000.

Abe, Tomoaki: *See*—
Matsuzawa, Toshio; Minagawa, Kazuji; Muramatsu, Akira; Abe, Tomoaki; Kiyono, Masashi; Kamio, Shigeru; Maeda, Katsuya; and Takao, Mitsunori, 4,838,226, Cl. 123-399.000.

Abe, Tomohiko: *See*—
Yamada, Noboru; Abe, Tomohiko; and Miyazawa, Osamu, 4,839,760, Cl. 360-97.010.

Abe, Toshiyuki; Kikkawa, Katsumasa; Gonda, Michihiro; Sensui, Hideyuki; and Kanasugi, Mikiko, to Hodogaya Chemical Co, Ltd. Heat sensitive recording sheet. 4,839,334, Cl. 503-221.000.

Abe, Yasunao, to Yamaha Corporation. Automatic rhythm performance apparatus having ending performance function. 4,839,810, Cl. 364-419.000.

Abe, Yoshiaki; and Iwabuchi, Hidetoshi, to Kao Corporation. Hair cosmetics. 4,839,168, Cl. 424-74.000.

Abiru, Masao: *See*—
Tanaka, Hisatoshi; and Abiru, Masao, 4,838,789, Cl. 433-171.000.

Abraham, Thomas, to Northern Telecom Limited. Method of etching aluminum alloys in semi-conductor wafers. 4,838,992, Cl. 156-643.000.

Abromavage, John C., to U-Haul International. Truck body deck mount. 4,838,605, Cl. 296-182.000.

Abromeit, Gerhard, to Ford Motor Company. Method of preventing vibration noise in change-speed gearboxes, in particular of motor vehicles. 4,838,227, Cl. 123-419.000.

Absi-Halabi, Ma'mun: *See*—
Lahalih, Shawqui; Dairanieh, Issam; and Absi-Halabi, Ma'mun, 4,839,095, Cl. 252-8.514.

Absil, Robert P.; Huss, Albin, Jr.; McHale, William D.; and Partridge, Randall D., to Mobil Oil Corp. Catalytic reforming process. 4,839,027, Cl. 208-138.000.

Achelpohl, Fritz: *See*—
Ebmeyer, Wilfried; Achelpohl, Fritz; and Mundus, Friedhelm, 4,838,977, Cl. 156-252.000.

Ackermann, Francois; and Berrebi, Georges, to Europeenne de Retraitement de Catalyseurs Eurecat. Process for performing the separation of extruded materials which may or may not show imperfections. 4,839,031, Cl. 209-2.000.

Ackermann, Ulrich; Faller, Kurt; Guzek, Krzysztof; and Meier, Arnold, to BBC Brown Boveri AG. Gas-blast breaker. 4,839,482, Cl. 200-148.00B.

ACO Polymer Products, Inc.: *See*—
Capuano, Terry D., 4,838,727, Cl. 404-2.000.

Acord, Dennis E.: *See*—
Byers, Charles H., Jr.; Michl, Terry L.; and Acord, Dennis E., 4,838,705, Cl. 374-14.000.

Adachi, Hitoyuki; and Ozoe, Masahiro, to Mitsubishi Agricultural Machinery Co., Ltd. Soil tilling machine. 4,838,357, Cl. 172-43.000.

Adachi, Keiichi: *See*—
Ohno, Shigeru; Mihara, Yuji; and Adachi, Keiichi, 4,839,265, Cl. 430-522.000.

Adam, Colin M.: *See*—
Bye, Richard L., Jr.; Bose, Debasis; Das, Santosh K.; Datta, Amitava; and Adam, Colin M., 4,838,341, Cl. 164-463.000.

Adams, Ernest C.: *See*—
Kennedy, Paul R.; Adams, Ernest C.; and Woenker, William E., 4,839,296, Cl. 436-170.000.

Adams, Frederick J., to TRW Cam Gears Limited. Power assistance means for a steering gear and a steering gear assembly which includes such means. 4,838,106, Cl. 74-388.0PS.

Adams Rite Manufacturing Company: *See*—
Choi, Mansam, 4,838,587, Cl. 292-216.000.

Adaniya, Takeshi: *See*—
Abe, Masaki; Shiohara, Yukimitsu; Adaniya, Takeshi; and Naemura, Hiroshi, 4,839,241, Cl. 428-659.000.

Adell, Robert, to U.S. Product Development Company. Molding for automobile body panels, such as doors. 4,838,004, Cl. 52-718.100.

Adler, Alfons: *See*—
Fuhrer, Wolfgang; Kuhle, Engelbert; Adler, Alfons; and Hanssler, Gerd, 4,839,359, Cl. 514-241.000.

Adolfsen, Robert H.; Hedaya, Eddie; Mak, C. Lam; and Schwarzberg, Moshe, to Technicon Instruments Corporation. Interference - resistant liposome specific binding assay. 4,839,276, Cl. 435-7.000.

Adolph Coors Company: *See*—
Weits, Ferdinand; Mekelburg, William F.; and Latour, Marc R., 4,838,419, Cl. 206-386.000.

Adrian, Franz-Josef: *See*—
Hoppe, Ernst; and Adrian, Franz-Josef, 4,838,071, Cl. 73-3.000.

ADT Inc.: *See*—
Ozer, Richard; DeSantis, Edward; and Tomlinson, Brett, 4,839,640, Cl. 340-825.310.

Advance Systems, Inc.: *See*—
Hella, Jerry A.; and Stibbe, Paul H., 4,837,946, Cl. 34-156.000.

Advanced Energy Dynamics Inc.: *See*—
Whitlock, David R., 4,839,032, Cl. 209-3.000.

Advanced Laser Systems, Inc.: *See*—
Sankar, Nott G.; Pileeki, Victor T.; and Zahaykevich, George A., 4,839,497, Cl. 219-121.710.

Advanced Micro Devices: *See*—
Pyi, Hwa-Sheng; and Asghar, Saf, 4,839,842, Cl. 364-721.000.

Advanced Micro Devices, Inc.: *See*—
Kaku, Shinkyo; and Yu, Chung-Li, 4,839,738, Cl. 358-261.200.

Advanced Pulmonary Technologies, Inc.: *See*—
Gluck, Eric H.; McDonald, Henry; Sabnis, Jayant S.; and Weinberg, Bernard C., 4,838,259, Cl. 128-201.210.

Advanced Technology Materials, Inc.: *See*—
Stevens, Ward C., 4,839,402, Cl. 523-200.000.

AE PLC: *See*—
Donnison, Geoffrey M.; Wordsworth, Robert A.; and Rhodes, Michael L. P., 4,838,149, Cl. 92-222.000.

Affeldt, Karl-Heinz; and Hantel, Ulrich, to Robert Bosch GmbH. Vasometric test apparatus for finger testing. 4,838,277, Cl. 128-691.000.

Aga, Steven M. Remote safety switch. 4,839,533, Cl. 307-140.000.

Agajanian Enterprises, Inc.: *See*—
Sobodos, David W.; and Chalmers, David W., 4,838,592, Cl. 293-109.000.

Agan Chemical Manufacturers Ltd.: *See*—
Arenstein, Zeev; and Gotlieb, Abraham, 4,838,928, Cl. 71-93.000.

Agency of Industrial Science & Technology: *See—*
Haruta, Masatake; and Kobayashi, Tetsuhiko, 4,839,327, Cl. 502-243.000.
Kawase, Kaoru; Sakami, Hiroshi; and Iida, Shozo, 4,839,318, Cl. 502-62.000.
Ohuchi, Kiyoyuki; and Shimizu, Ken'ichi, 4,838,329, Cl. 152-210.000.

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Ahlgren, Frederic F.; Bergman, Rolf S.; Davenport, John M.; Hansler, Richard L.; Hantman, Robert G.; and Hoegler, Leonard E., to General Electric Company. Radiant energy incandescent lamp. 4,839,559, Cl. 313-579.000.

Ai, Hideo: *See—*
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Air Preheater Company, Inc., The: *See—*
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AirSensors, Inc.: *See—*
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Aisin An Co., Ltd.: *See—*
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Aisin Seiki Kabushiki Kaisha: *See—*
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Ajmera, Prakash R.; and Jabarin, Saleh A., to Owens-Illinois Plastic Products Inc. Method of making partially crystalline biaxially oriented hollow plastic heat set containers. 4,839,127, Cl. 264-526.000.

Akagi, Junko, to Kabushiki Kaisha Toshiba. High-frequency power amplifier having heterojunction bipolar transistor. 4,839,612, Cl. 330-302.000.

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Kunimitsu, Michio; Tomita, Hiroshi; Akao, Akio; and Kano, Hiroshi, 4,838,713, Cl. 400-120.000.

Akashi, Yuji, to Yugen Kaisha Akashi Tekkosho. Drawing-in clamping device for chuck of lathe or the like. 4,838,562, Cl. 279-106.000.

Akatsu, Yukio, to Tokyo Bosai Setsubi Company, Limited. Fire extinguisher foam chamber with remote maintenance and testing for oil tanks. 4,838,356, Cl. 169-66.000.

Akechi, Kiyoaki, to Sumitomo Electric Industries, Ltd. Forged aluminum alloy spiral parts and method of fabrication thereof. 4,838,936, Cl. 75-249.000.

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Akutsu, Yoshinori; Nakano, Takaharu; Saho, Takahiro; Ohtake, Nobumasa; Yasuda, Hirofumi; and Kimura, Tamio, to Chisso Corporation. Polysiloxane containing hydroxyl groups and a silicone-modified polyurethane using the same. 4,838,443, Cl. 525-474.000.

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Kay, John W. D.; and Ford, Glen M., 4,839,298, Cl. 436-175.000.
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Albracht, Karl L.; and Walker, William L., to BS&B Safety Systems, Inc. Pressure relief device with conical reverse buckling disc. 4,838,447, Cl. 220-89.00A.

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Aleckson, Darrell. Fish harness. 4,837,964, Cl. 43-4.000.

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Alm, Lars E., to Environmental Pollution Control System EPCON AB. Filter apparatus for removing hydrocarbon contaminants from water, particularly for purifying oil contaminated water. 4,839,040, Cl. 210-167.000.

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Arn, Robert H.: *See*—
Borum, Otis C.; Borum, Martin O.; and Arn, Robert H., 4,837,914, Cl. 29-401.100.
Arnold, Robert M.: *See*—
Escamilla, Robert M.; Escamilla, Elias, III; Escamilla, Elias, Jr.; Johnson, Gregg E.; Arnold, Robert M.; and Tatner, Thomas, 4,838,153, Cl. 99-349.000.
Arold, Klaus: *See*—
Koukal, Heinz; and Arold, Klaus, 4,838,110, Cl. 74-502.600.
Arraut, Fernando W.: *See*—
Gal, Laszlo V.; Arraut, Fernando W.; and Khosravi, Christopher H., 4,839,541, Cl. 307-481.000.
Arroyo, Joe. Propulsion apparatus. 4,838,508, Cl. 280-234.000.
Arthur, Ronald B.: *See*—
Rorden, Randall J.; Arthur, Ronald B.; and Muhlestein, Mark, 4,839,796, Cl. 364-200.000.
Asahi Glass Company Ltd.: *See*—
Oda, Noriyuki; Takehara, Tetsuo; Hirashi, Katsumi; and Muramatsu, Keiji, 4,838,581, Cl. 285-47.000.
Ohta, Hironori; Kawaguchi, Toshiyasu; Mukaiyama, Takashi; Matsuzaki, Katsuhiko; Ebisawa, Junichi; Taneda, Naoki; Arai, Daikichi; Yoshihara, Noriyuki; Yamada, Yoshikazu; and Kunii, Koushiro, 4,838,914, Cl. 65-2.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Kaieda, Takeji; Yamada, Kimimasa; and Yamawaki, Naokuni, 4,839,290, Cl. 435-240.230.
Nakazaki, Nobuo; Ai, Hideo; and Miyao, Manabu, 4,839,261, Cl. 430-313.000.
Wakamatsu, Hisashi; and Noaki, Yasuhide, 4,839,015, Cl. 204-290.00R.
Asahi, Masahiko: *See*—
Komori, Takashi; Asahi, Masahiko; and Suzuki, Toshiyuki, 4,839,162, Cl. 424-63.000.
Asahi, Satoru; Tsunemi, Yutaka; and Doi, Muneharu, to Takeda Chemical Industries, Ltd. Method for production of cytidine and/or deoxycytidine. 4,839,285, Cl. 435-87.000.
Asahi Seimitsu Kabushiki Kaisha: *See*—
Tanaka, Masahiro, 4,837,938, Cl. 33-[illegible]3.000.
Asami, Keiichi: *See*—
Echigo, Yoshiaki; Sugawara, Kenichi; Yamao, Mutsunori; Suematu, Yoshiyuki; Asami, Keiichi; and Ohsawa, Tuneyuki, 4,839,445, Cl. 525-503.000.
Asano, Toshiharu: *See*—
Kokuryo, Yoshiki; Kataoka, Sachiro; Inaba, Tomokazu; Terunuma, Kazuyoshi; and Asano, Toshiharu, 4,839,532, Cl. 307-10.300.
Asaumi, Hiroshi; Shimura, Zenji; Yoshida, Takehiro; Tadakuma, Kenji; Suzuki, Shinzaburo; Takada, Norio; Nakamura, Kenichi; and Hirai, Takene, to Nichias Corporation. Gasket containing (I) a sheet composition comprising (A) PTFE (B) inorganic powder (C) clay mineral and (II) a metal support for the sheet. 4,839,221, Cl. 428-283.000.
Asghar, Saf: *See*—
Pyi, Hwa-Sheng; and Asghar, Saf, 4,839,842, Cl. 364-721.000.
Ashbrook-Simon-Hartley Corp.: *See*—
Tharp, Charles E., 4,839,053, Cl. 210-616.000.
Ashby, Carol I. H.; Brannon, Paul J.; and Gerardo, James B., to United States of America, Energy. Laser-driven fusion etching process. 4,838,989, Cl. 156-628.000.
Ashida, Sumio: *See*—
Ikegawa, Sumio; Komatsu, Shuichi; Arai, Shinji; Ashida, Sumio; and Yasuda, Nobuaki, 4,839,861, Cl. 365-113.000.
Ashland Oil, Inc.: *See*—
Culbertson, Billy M.; and Tiba, Omar, 4,839,446, Cl. 525-504.000.
Tufts, Timothy A., 4,839,087, Cl. 252-182.270.
Ashland Products Company: *See*—
Simpson, Harold, 4,837,975, Cl. 49-175.000.
Asmuth, Peter: *See*—
Ritter, Gunter; Asmuth, Peter; and Raible, Ludwig, 4,839,148, Cl. 423-239.000.
Association Pour La Recherche et le Developpement Des Methodes et Processus Industriels (Armines): *See*—
Beucher, Serge; Blosseville, Jean-Marc; and Lenoir, Francois, 4,839,648, Cl. 340-933.000.
Asta-Pharma AG: *See*—
Hartmann, Rolf W.; and Batzl, Christine, 4,839,370, Cl. 514-328.000.
Astro Met Associates, Inc.: *See*—
Kinney, John W., Jr.; and Graham, John W., 4,839,049, Cl. 210-510.100.
AT&T Bell Laboratories: *See*—
Easter, William G.; and Feygenson, Anatoly, 4,839,309, Cl. 437-160.000.
Atlantic Richfield Company: *See*—
Brown, Stanley M.; Byrne, John W.; and Jacobs, Harry E., 4,839,026, Cl. 208-120.000.
Skinner, James L., 4,839,022, Cl. 208-13.000.
Spies, Brian R., 4,839,593, Cl. 324-240.000.
Atlas-Danmark A/S: *See*—
Merk, Werner, 4,838,997, Cl. 203-92.000.
Atochem: *See*—
Cuzin, Daniel; and Judas, Didier, 4,839,441, Cl. 528-328.000.
Atomori, Seiichi; Inagaki, Teruo; Furuyama, Tateki; and Kamiya, Akira, to Japan Synthetic Rubber Co., Ltd. Flame-retardant rubber-modified styrene resin composition. 4,839,410, Cl. 524-281.000.
Atsugi Motor Parts Company, Limited: *See*—
Konishi, Junkichi; Tsukada, Kenichi; Sekiguchi, Tomoyoshi; Kouda, Masanori; and Suzuki, Minoru, 4,838,563, Cl. 280-840.000.
Atsumi, Koji: *See*—
Misumi, Masao; and Atsumi, Koji, 4,838,092, Cl. 73-861.220.
Atsumi, Kunio; Sakagami, Kenji; Yamamoto, Yuichi; Yoshida, Takashi; Nishihata, Ken; Kondo, Shinichi; and Fukatsu, Shunzo, to Meiji Seika Kaisha, Ltd.; and Susumu Mitsuhashi. Cephalosporin compounds and the production thereof. 4,839,350, Cl. 514-202.000.
Aubex Corporation: *See*—
Suzuki, Churyo; Ando, Kozo; and Enomoto, Tooru, 4,838,723, Cl. 401-199.000.
Audi AG: *See*—
Ruf, Max; and Korostenski, Erwin, 4,838,217, Cl. 123-90.600.
Augat Inc.: *See*—
Bertoglio, Guido; Boyle, Michael C.; Cooney, James S.; and Walkup, William B., 4,838,801, Cl. 439-83.000.
August, John L., Jr.: *See*—
Chande, Tushar S.; Jones, Marshall G.; Ortiz, Angel L., Jr.; and August, John L., Jr., 4,838,631, Cl. 350-6.600.
Ausmintec Corp. Limited: *See*—
Hill, Robert G. D., 4,838,941, Cl. 106-106.000.
Austron, Inc.: *See*—
Echols, James D.; Barnes, James A.; and Penrod, Bruce M., 4,839,613, Cl. 331-69.000.
Autieri, Richard J.: *See*—
Dryden, Paul E.; Autieri, Richard J.; and Daly, Robert G., 4,838,258, Cl. 128-204.180.
Automatik Apparate-Machinenbau GmbH: *See*—
Hunke, Friedrich, 4,838,775, Cl. 425-67.000.
Auxier, Robert W.: *See*—
Wilkinson, Ivan E.; and Auxier, Robert W., 4,839,475, Cl. 200-5.00R.
Avco Corporation: *See*—
Cramer, Paul S., 4,838,030, Cl. 60-753.000.
Cramer, Paul S., 4,838,031, Cl. 60-753.000.
Awaji, Hiroshi: *See*—
Uekita, Masakazu; and Awaji, Hiroshi, 4,839,219, Cl. 428-220.000.

Awakowicz, Erwin; Schiller, Kurt; and Grassl, Erwin, to Siemens Aktiengesellschaft. Telephone station comprising an optical display device. 4,839,921, Cl. 379-428.000.
Awamoto, Shigeru: *See*—
Sasaki, Seishi; Awamoto, Shigeru; Bannai, Tatsushi; Yokoyama, Katsuya; and Shibaya, Hiromichi, 4,839,744, Cl. 358-320.000.
Axel Johnson Metals, Inc.: *See*—
Entrekin, Charles H.; and Harker, Howard R., 4,838,340, Cl. 164-455.000.
Axel, Richard: *See*—
Cantor, Charles R.; Axel, Richard; and Argarana, Carlos, 4,839,293, Cl. 435-320.000.
Ayetech Inc.: *See*—
Bronskill, Michael J.; and Jiang, Bai-Chuan, 4,838,677, Cl. 351-203.000.
Azukizawa, Teruo: *See*—
Morishita, Mimpei; and Azukizawa, Teruo, 4,838,172, Cl. 104-281.000.
Azuma, Shizuo; Hiramatsu, Toshiyuki; Nakagawa, Koji; and Ichikawa, Yataro, to Teijin Limited. Organo-phosphorus compound and herbicide comprising it as active ingredient. 4,838,923, Cl. 71-86.000.
Azuma, Toshio, to Bridgestone Corporation. Apparatus for introducing a belt-shaped material to a cutting machine. 4,838,137, Cl. 83-42.000.
Azuma, Yoshiyuki, to Kabushiki Kaisha Toshiba. Operation mode selecting device for washing machines. 4,838,050, Cl. 68-12.00R.
Azumi, Masaaki: *See*—
Takahara, Ichiro; Azumi, Masaaki; Shigetomi, Kazuo; Kamimura, Takaya; and Ishida, Hideki, 4,839,881, Cl. 369-75.200.
Baba, Kiyokazu, to Kabushiki Kaisha Komatsu Seisakusho. Sheet material positioning apparatus. 4,838,538, Cl. 271-238.000.
Baba, Toshio; Matsushita, Hajime; and Katsuragawa, Yasuji, to NGK Insulators, Ltd. Ceramic material extruding method and apparatus therefor. 4,839,120, Cl. 264-102.000.
Babbitt, Richard W.: *See*—
Stern, Richard A.; and Babbitt, Richard W., 4,839,659, Cl. 343-700.0MS.
Babbitt, Thomas J.: *See*—
Lerner, Irwin S.; and Babbitt, Thomas J., 4,838,423, Cl. 206-454.000.
Babcock, H. Nash; and Holub, Edward P., to Nomix Corporation. Methods for forming shapes or blocks of no mix cements. 4,839,115, Cl. 264-42.000.
Babuder, Gerald A.; and Weigl, Jeffrey L., to Cajon Company. Fluid coupling. 4,838,583, Cl. 285-354.000.
Backman, Keith C., to Biotechnica International, Inc.; and H. J. Heinz Company. Method of biosynthesis and cells therefor. 4,839,286, Cl. 435-108.000.
Backman, Ralf, to Wamac AB. Conveyor. 4,838,412, Cl. 198-838.000.
Bader, Mark S.; and Miller, Robert L., to Kohler Co. Engine air intake screen assembly. 4,838,908, Cl. 55-385.100.
Badesha, Santokh S.; Stolka, Milan; McGrane, Kathleen M.; and Weagley, Ronald J., to Xerox Corporation. Processes for the preparation of polysilylenes. 4,839,451, Cl. 528-10.000.
Bailey, Dan H. Self-adjusting file drawer fillers. 4,838,436, Cl. 211-51.000.
Bailey, Denis M., to Sterling Drug Inc. Antimicrobial N-[1-(alkyl or arylmethyl)-4(1H)-pyridinylidine]-alkanamines and acid addition salts thereof and methods of use and compositions thereof. 4,839,372, Cl. 514-352.000.
Bailey, Fay W., to Phillips Petroleum Company. Process for cleaning polymer processing equipment. 4,838,948, Cl. 134-8.000.
Bailey, Thomas D.: *See*—
Goe, Gerald L.; Bailey, Thomas D.; and Beadle, James R., 4,839,323, Cl. 502-159.000.
Baker Hughes Incorporated: *See*—
Carlin, Frank J.; and Wafford, Terrell F., 4,838,068, Cl. 72-340.000.
Sheth, Ketankumar K., 4,838,758, Cl. 415-140.000.
Baker Oil Tools, Inc.: *See*—
Berzin, Vel, 4,838,349, Cl. 166-187.000.
Baker, Richard; Helm, Verne; and Shrock, Paul, to Pharmetrix Corp. Portable controlled release osmotic infusion device. 4,838,862, Cl. 604-892.100.
Baker, Richard W.; Kochinke, Frank; and Huang, Carl, to Pharmetrix Corporation. Novel transdermal nicotine patch. 4,839,174, Cl. 424-447.000.
Baker, Wm. Keith: *See*—
Theodoulou, Sotos M.; Thomson, Christopher W.; Vannerson, Eric; Baker, Wm. Keith; Sun, Alvin C. P.; and Hurley, Ken, 4,839,671, Cl. 346-159.000.
Bakery Equipment and Service Co., Inc.: *See*—
Escamilla, Robert M.; Escamilla, Elias, III; Escamilla, Elias, Jr.; Johnson, Gregg E.; Arnold, Robert M.; and Tatner, Thomas, 4,838,153, Cl. 99-349.000.
Bakewell, Joseph J., to Dynamics Research Corporation. Orifice plate and method of fabrication. 4,839,001, Cl. 204-11.000.
Bakka, Charles M.; Sims, Roger D.; and Stevenson, James T., to Trailer P. H. Corporation. Intermodal system for transporting a semi-trailer on two railway vehicles. 4,838,744, Cl. 410-53.000.
Baldauf, Karl E., to Gesellschaft Fur Hydraulik-Zubehor mbH. Fluid pressure circuit with accumulator charging and safety valve system including check valve bypass. 4,838,023, Cl. 60-413.000.
Baldock, Donald V. Grain sample apparatus. 4,838,094, Cl. 73-863.810.
Balk, Hermann, to Reifenhauser GmbH & Co Maschinenfabrik. Apparatus for making a spun-filament fleece. 4,838,774, Cl. 425-66.000.
Ballan, Daniel G.: *See*—
Wong, Edward W.; and Ballan, Daniel G., 4,838,876, Cl. 604-265.000.
Ballard Medical Products: *See*—
Lambert, Richard C., 4,838,255, Cl. 128-202.160.
Balopole, Harvey L.; Martinolich, James J.; Roberts, Arthur; and Sadowski, Henry W., to Fairchild Weston Systems, Inc. Video enhancement method and system. 4,839,726, Cl. 358-166.000.
Baltz, Rainier; and Fuhrer, Jean-Claude, to La Telephone Industrielle et Commerciale Telic Alcatel. Digital time-division multiples switch-based telephone subscriber connection system. 4,839,888, Cl. 370-68.100.
Ban, Tomohiro: *See*—
Hirata, Keiti; Morimoto, Yoshinari; Ban, Tomohiro; Furushima, Tokihito; Miura, Tomoko; and Ikeda, Yoshie, 4,839,827, Cl. 364-518.000.
Bando Chemical Industries, Ltd.: *See*—
Miyata, Hirofumi, 4,838,834, Cl. 474-11.000.
Bando, Shinsuki, to Fuji Photo Film Co., Ltd. Silver halide color reversal photosensitive material. 4,839,268, Cl. 430-567.000.
Bandoh, Tadaaki: *See*—
Hirose, Kenji; Bandoh, Tadaaki; Matsumoto, Hidekazu; Yamaguchi, Shinichiro; Hirayama, Hirokazu; and Nakanishi, Hiroaki, 4,839,846, Cl. 364-748.000.
Banes, Albert J. Apparatus for applying stress to cell cultures. 4,839,280, Cl. 435-285.000.
Banjo, Toshinobu; Ueda, Tetsuya; Onoda, Shigeo; and Kasatani, Yasushi, to Mitsubishi Denki Kabushiki Kaisha. Mechanism for connecting IC card and external device. 4,838,804, Cl. 439-325.000.
Banjo, Toshinobu: *See*—
Teraoka, Yasuhiro; Ueda, Tetsuya; Yagoura, Hideya; Shimamoto, Haruo; Nango, Shigeyuki; Banjo, Toshinobu; and Seki, Hiroshi, 4,839,713, Cl. 357-70.000.
Bannai, Tatsushi: *See*—
Sasaki, Seishi; Awamoto, Shigeru; Bannai, Tatsushi; Yokoyama, Katsuya; and Shibaya, Hiromichi, 4,839,744, Cl. 358-320.000.
Banno, Takuo, to Hewlett-Packard Company. Apparatus for measuring the dynamic characteristics of an analog-digital converter. 4,839,651, Cl. 341-120.000.
Banyu Pharmaceutical Co., Ltd.: *See*—
Hosoi, Masaaki; Nishioka, Ryo; Hioki, Yoshio; Iida, Yoshiaki; Takeshita, Hiroshi; Niiyama, Kenji; and Hidaka, Yusuke, 4,839,353, Cl. 514-212.000.
Banzai, Masato: *See*—
Ito, Haruhiko; Shibata, Yoshio; Banzai, Masato; and Yatomi, Takeshi, 4,839,487, Cl. 219-69.120.
Baranzelli, Cesare; Frulla, Claudio; and Gattolin, Dario, to TVA Holding S.p.A. Chuck, particularly for machine tools. 4,838,561, Cl. 279-1.0DA.
Barash, Louis; Christensen, Burton G.; Hannah, John; Leanza, William J.; and Shih, David H., to Merck & Co., Inc. N-acyl derivatives of thienamycin. 4,839,352, Cl. 514-210.000.
Baraszu, Robert C., to Ford Motor Company. Hybrid suspension position and body velocity sensing system for automotive suspension control system. 4,838,574, Cl. 280-707.000.
Barber-Greene Company: *See*—
Farnham, Robert E.; and Prill, Fredric W., 4,839,571, Cl. 340-606.000.
Bard, Martin: *See*—
Cremer, Gottfried; and Bard, Martin, 4,839,500, Cl. 219-213.000.
Bares, Jan, to Xerox Corporation. Development apparatus. 4,839,688, Cl. 355-253.000.
Bargiotti, Alberto; Bordoni, Teresa; Zini, Pierangelo; and Penco, Sergio, to Farmitalia Carlo Erba S.p.A. Antitumor anthracycline glycosides, intermediates thereof, and composition and use thereof. 4,839,346, Cl. 514-34.000.
Barkan, Eric F.; and Sklar, David H., to Sola International Holdings, Ltd. Method for improving progressive lens designs and resulting article. 4,838,675, Cl. 351-169.000.
Barlow, George J.; and Keeley, James W., to BULL HN Information Systems Inc. Data processing system with a fast interrupt. 4,839,800, Cl. 364-200.000.
Barner, William H., to Inotek-Westmoreland Joint Venture. Multiple rate force and movement actuator. 4,838,112, Cl. 74-527.000.
Barnes, Daniel C.: *See*—
Milton, R. M.; and Barnes, Daniel C., 4,839,567, Cl. 315-344.000.
Barnes, James A.: *See*—
Echols, James D.; Barnes, James A.; and Penrod, Bruce M., 4,839,613, Cl. 331-69.000.
Barnes, Josh T.; and Sitzema, Ronald L., Jr., to Lexalite International Corporation. Reflector/refractor. 4,839,781, Cl. 362-299.000.
Barney, David M., to United States of America, Energy. Contained radiological analytical chemistry module. 4,838,098, Cl. 73-19.000.
Barrett, George M. Internal combustion engine assembly. 4,838,214, Cl. 123-41.690.
Barry, Michael W.; Tompkins, E. Neal; and Zuber, Peter, to Colorocs Corporation. Method and apparatus for providing improved color correction in a subtrative color printing system. 4,839,722, Cl. 358-80.000.
Barthelemy, Pascal, to Rhone-Poulenc Chimie. N,N'-bis(maleimide) /alkenyloxyaniline copolymerizate. 4,839,440, Cl. 526-262.000.
Bartlett, Michael H.: *See*—
Mullins, Aaron B.; and Bartlett, Michael H., 4,838,475, Cl. 228-179.000.
Barwasser, Gunter: *See*—
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BASF Aktiengesellschaft: *See*—
Bronstert, Klaus; Walter, Hans-Michael and Schwaben, Hans-Dieter, 4,839,434, Cl. 525-350.000.
Schwaben, Hans-Dieter; Echte, Adolf; Bieschl, Rainer; Schlichtmann, Rainer; Klaerner, Peter; and Kindler, Hubert, 4,839,418, Cl. 525-33.000.
Sterzel, Hans-Josef, 4,839,119, Cl. 264-66.000.
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Jung, Werner; and Sievers, Axel, 4,839,4[illegible]3, Cl. 526-262.000.
Basilico, Claudio: *See*—
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Bates, Aulby B., III: *See*—
Stevenson, William H., IV; Stevenson, William H., III; and Bates, Aulby B., III, 4,838,192, Cl. 114-105.00.
Battles, Laurence, to Marvin Lumber and Cedar Company. Window grid latch. 4,838,001, Cl. 52-456.000.
Batz, James E.; Martell, Dennis J.; and Overmeier, Steven A., to Northern Illinois Gas Company. Data transmission system with data verification. 4,839,642, Cl. 340-825.540.
Batzl, Christine: *See*—
Hartmann, Rolf W.; and Batzl, Christine, 4,839,370, Cl. 514-328.000.
Bauer, Klaus: *See*—
Liebl, Rainer; Frey, Michael; Mildenberger, Hilmar; Bauer, Klaus; and Bieringer, Hermann, 4,838,931, Cl. 71-94.000.
Baumhardt, Robert J.: *See*—
Boda, James C.; Baumhardt, Robert J.; and Heidel, Bruce A., 4,838,820, Cl. 440-87.000.
Baver, Donald K.: *See*—
Calvert, Douglas D.; Behrens, Edward A.; and Baver, Donald K., 4,839,598, Cl. 324-539.000.
Baxter, Bobby G.; Curtman, Wendell B.; and Peveler, Michael W., to Binkley Company, The. Slider. 4,838,566, Cl. 280-149.200.
Baxter, Bobby G., to Binkley Company, The. Slider. 4,838,578, Cl. 280-149.200.
Baxter International Inc.: *See*—
Cartmell, James V., 4,838,273, Cl. 128-64[illegible].000.
Fabisiewicz, Eugene; and Fagan, Jack R., 4,838,429, Cl. 206-605.000.
Forkner, John F., 4,838,247, Cl. 128-6.00
Baxter Travenol Laboratories, Inc.: *See*—
Nashef, Aws S., 4,838,888, Cl. 623-2.000.
Bayer Aktiengesellschaft: *See*—
Boehmke, Gunther, 4,839,461, Cl. 528-36[illegible].000.
Buysch, Hans-Josef; Schon, Norbert; Eichenauer, Herbert; Kress, Hans-Jurgen; and Buekers, Josef, 4,839,121, Cl. 525-67.000.
Casper, Rudolf; Wendling, Peter; Konter, Wolfgang; and Hohmann, Gerhard, 4,839,447, Cl. 526-225.00.
Daum, Werner; Hanssler, Gerd; and Ooms, Pieter, 4,839,381, Cl. 514-444.000.
Fuhrer, Wolfgang; Kuhle, Engelbert; Adler, Alfons; and Hanssler, Gerd, 4,839,359, Cl. 514-241.000.
Heitz, Walter; and Schneider, Karl-Heinrich, 4,839,436, Cl. 525-397.000.
Jager, Horst, 4,839,469, Cl. 534-637.000.
Naumann, Klaus; Becker, Benedikt; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, 4,839,390, Cl. 514-746.000.
Nickel, Horst; Wild, Peter; and Stohr, Frank-Michael, 4,839,468, Cl. 534-604.000.
Simon, Gehard; Hahnel, Peter; and Hoffmann, Erhard-Gunther, 4,839,209, Cl. 428-68.000.
Wagner, Wolfram; Nyssen, Roger; Berkenhaus, Dirk; and van Pey, Hans-Theo, 4,838,917, Cl. 65-5.000.
Bays, David E.; Webb, Colin F.; and Dowle, Michael D., to Glaxo Group Limited. 5-substituted 3-aminoalky indoles. 4,839,377, Cl. 514-415.000.
Baytec, Inc.: *See*—
Brunk, John L., 4,839,793, Cl. 364-200.00[illegible].
Baziuk, Morris. Hoist for use at a manhole. 4,838,439, Cl. 212-254.000.
BBC Brown Boveri AG: *See*—
Ackermann, Ulrich; Faller, Kurt; Guzel, Krzysztof; and Meier, Arnold, 4,839,482, Cl. 200-148.00B.
Englistaller, Cornel; Keller, Jakob; and Sattelmayer, Thomas, 4,838,783, Cl. 431-284.000.
Kotz, Rudiger; Schuler, Claus; and Stucki, Samuel, 4,839,007, Cl. 204-149.000.
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Beadle, James R.: *See*—
Goe, Gerald L.; Bailey, Thomas D.; and Beadle, James R., 4,839,323, Cl. 502-159.000.
Beakley, Bruce E.; and Flanders, Thomas E., to Trilogy Systems Corporation. Linear motor. 4,839,543, Cl. 310-12.000.
Beard, Harold J.; and Cox, Raleigh L. Skimmer system. 4,839,050, Cl. 210-540.000.
Beattie, John R., to Hughes Aircraft Company. Electrostatic ion thruster with improved thrust modulation. 4,838,021, Cl. 60-202.000.
Beaver, Richard N.: *See*—
Burney, Harry S., Jr.; Morris, Gregory J. E.; Beaver, Richard N.; and Spradling, Robert D., 4,839,012, Cl. 204-255.000.
Bech, Hans, to Union Sils, Van de Loo & Co. Adjustable roller dynamo with torsion spring. 4,839,548, Cl. 310-67.0 A.
Bech, Ulrich: *See*—
Coulon, Andre; and Bech, Ulrich, 4,839,237, Cl. 428-610.000.
Beck, Herbert; Anton, Karl-Heinz; and Hommer, Harald, to Nixodorg Computer AG. Needle print head. 4,838,714, Cl. 400-124.000.
Becker, Benedikt: *See*—
Naumann, Klaus; Becker, Benedikt; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, 4,839,390, Cl. 514-746.000.
Becker, Rudolf; Neubauer, Wilhelm; Beyer, Hans; and Pohl, Harald. Coextrusion head. 4,838,778, Cl. 425-133.100.
Beckman Instruments, Inc.: *See*—
Master, Barry S.; and Aralis, Frank M., 4,838,691, Cl. 356-319.000.
Becton, Dickinson and Company: *See*—
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Bertoglio, Guido; Boyle, Michael C.; Cooney, James S.; and Walkup, William B., 4,838,801, Cl. 439-83.000.
Boyle, Peter J. Apparatus for and method of cooking pieces of food. 4,839,186, Cl. 426-523.000.
BP Chemicals Limited: *See*—
Dennis, Robert W.; Dye, Charles J.; and Keasey, Alan, 4,839,096, Cl. 252-8.515.
Brackett, Stephen E., to Bendix Electronics Limited. Fan with motor cooling enhancement. 4,838,760, Cl. 416-93.00R.
Bradbeer, Peter F.: *See*—
Trett, John; and Bradbeer, Peter F., 4,839,605, Cl. 328-146.000.
Bradley, Liam P., to Marconi Instruments Limited. Method and apparatus for dry testing water-immersible acoustic transducers. 4,838,070, Cl. 73-1.0DV.
Bradt, L. Jack; Brown, Robert L.; Fogt, G. Stephen; Laroy, Ron; Lewis, Allen R.; and Love, James S., to Videomat Associates. Apparatus and method for storing and retrieving articles. 4,839,505, Cl. 235-381.000.
Brambilla, Enzo; Mantegani, Sergio; Pegrassi, Lorenzo; Rossi, Alessandro; and Temperilli, Aldemio, to Farmitalia Carlo Erba. Ergolinyl

heterocycles for the treatment of Parkinson's disease and dyskinetic symptoms. 4,839,363, Cl. 514-288.000.
Bramstedt, Gerd; Love, Mahlon L.; and Hennen, John J., to Deere & Company. Fluid actuated clutch having fluid slip fitting safety interlock. 4,838,011, Cl. 56-11.700.
Branemark, Per-Ingvar; and Albrektsson, Bjorn. Joint prothesis. 4,838,891, Cl. 623-20.000.
Branham Industries, Inc.: *See*—
Hashimoto, Tom T., 4,837,992, Cl. 52-118.000.
Brannon, Paul J.: *See*—
Ashby, Carol I. H.; Brannon, Paul J.; and Gerardo, James B., 4,838,989, Cl. 156-628.000.
Brar, Amarjit S.; Mims, Jimmie E.; and Sharma, Jagdish P., to Magnetic Peripherals Inc. Surface finishing for magnetic transducers. 4,837,923, Cl. 29-603.000.
Brassington, Nigel J.; and Gilbert, John A., to Johnson & Johnson. Silicone gel coated permeable wound dressing. 4,838,253, Cl. 128-156.000.
Braun, Howard E.: *See*—
Tower, Stephen N.; Christenson, James A.; and Braun, Howard E., 4,839,137, Cl. 376-260.000.
Braunlich, Peter F.; and Tetzlaff, Wolfgang, to Braunlich, Peter F. Apparatuses and methods for laser reading of thermoluminescent phosphors. 4,839,518, Cl. 250-337.000.
Brawn-Cardin Mill Equipment Manufacturing, Inc.: *See*—
Brawn, Philip E., 4,838,408, Cl. 198-434.000.
Brawn, Philip E., to Brawn-Cardin Mill Equipment Manufacturing, Inc. Veneer straightener. 4,838,408, Cl. 198-434.000.
Brawn, R. James, deceased: *See*—
Groshong, Leroy E.; Groshong, Judson C.; and Brawn, R. James, deceased, 4,838,860, Cl. 604-152.000.
Bredow, James R.: *See*—
Moore, Clifford G.; Silverman, Herbert P.; and Bredow, James R., 4,839,580, Cl. 324-65.00R.
Bremer Orthopedics, Inc.: *See*—
Bremer, Paul W.; and Kesselman, David A., 4,838,264, Cl. 128-303.00B.
Bremer, Paul W.; and Kesselman, David A., to Bremer Orthopedics, Inc. Torque limiting device for use with bone penetrating pins. 4,838,264, Cl. 128-303.00B.
Brenholdt, Irving R., to Champion International Corporation. Temperature-compensated apparatus and method for determining pulp stock consistency. 4,838,692, Cl. 356-343.000.
Brennan, Kevin F., to Polaroid Corporation. Avalanche photodetector. 4,839,706, Cl. 357-30.000.
Brenner, Robert A.; and Mason, Anthony, to Whirlpool Corporation. Flotation controlled drive for an automatic washer. 4,837,882, Cl. 8-159.000.
Brennock, June T.: *See*—
Willman, Kenneth W.; Brennock, June T.; O'Neill, David C.; and Szkutak, Joan B., 4,839,076, Cl. 252-90.000.
Brettle, Jack: *See*—
Bennion, Ian; Trundle, Clive; Brettle, Jack; Goodwin, Martin J.; and Glenn, Robert, 4,838,634, Cl. 350-96.120.
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Azuma, Toshio, 4,838,137, Cl. 83-42.000.
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Takayama, Masahiro, 4,838,330, Cl. 152-537.000.
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Briggs, Milton, to Graham Engineering Corporation. Vented plastic bottle. 4,838,464, Cl. 222-478.000.
Brighton, Jeffrey E., to Texas Instruments Incorporated. Method of making single polysilicon self-aligned transistor. 4,839,305, Cl. 437-41.000.
Brink, Patricia J.: *See*—
Hogg, Judy S.; Abbondandolo, Michael; and Brink, Patricia J., 4,838,334, Cl. 160-370.200.
Briquet, Lucienne: *See*—
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Williams, George H., 4,838,503, Cl. 244-214.000.
British Aerospace Public Limited Company: *See*—
Geen, John A.; and Johnson, Brian, 4,839,650, Cl. 341-118.000.
Simms, Graham J.; and Guppy, David J., 4,839,903, Cl. 372-94.000.
British-American Tobacco Company Limited: *See*—
Phelpstead, James W. P., 4,838,286, Cl. 131-360.000.
British Nuclear Fuels PLC: *See*—
Goodall, George H.; and Gillespie, Barry E., 4,839,100, Cl. 252-626.000.
British Telecommunications Public Limited Company: *See*—
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Payne, David B.; and Mortimore, David B., 4,839,898, Cl. 372-6.000.
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Broekhuis, Antonius A., to Shell Oil Company. Elastomer comprising at least one conjugated olefin group and method of making same. 4,839,431, Cl. 525-298.000.
Bronskill, Michael J.; and Jiang, Bai-Chuan, to Ayetech Inc. Eye exercising devices. 4,838,677, Cl. 351-203.000.
Bronstert, Klaus; Walter, Hans-Michael; and Schwaben, Hans-Dieter, to BASF Aktiengesellschaft. Preparation of homo- and copolymers having terminal mercapto groups and their use. 4,839,434, Cl. 525-350.000.
Brooks, David A., to Spooner Est. Cleaning of a body of liquid. 4,839,063, Cl. 210-780.000.
Brooks, James L. Moisture sensing switch. 4,838,296, Cl. 137-78.300.
Brother Kogyo Kabushiki Kaisha: *See*—
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Nakatani, Yukio; Ito, Akihiro; and Sakai, Takashi, 4,839,742, Cl. 358-296.000.
Okumura, Takashi; and Yamaguchi, Koshiro, 4,838,718, Cl. 400-234.000.
Yokoi, Takeshi; and Morita, Toshiki, 4,838,535, Cl. 271-22.000.
Broussard, Paul C., Sr. Liquid-to-liquid oil absorption system. 4,839,043, Cl. 210-195.100.
Brown, Clifford D.: *See*—
Maslaney, Michael J.; Andreasen, Dinal S.; and Brown, Clifford D., 4,838,032, Cl. 62-3.100.
Brown, David: *See*—
Salter, James A.; Schmidt, Thomas R.; DeWitz, Thomas S.; Arbore, Charles M.; Duysings, Frederick M. H. J.; Van Der Meer, Johannes W.; Brown, David; and Venselaar, Henricus C. J., 4,838,738, Cl. 406-14.000.
Brown, James M. Pickup truck tailgate protector with third tail light. 4,839,629, Cl. 340-468.000.
Brown, Keith C.: *See*—
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Brown, Kenneth G.: *See*—
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Brown, Robert J.; Brown, Roberta; and Rhodes, Carl, to Handi-Craft Company. Toy telephones and cords for toy telephones. 4,838,826, Cl. 446-141.000.
Brown, Robert L.: *See*—
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Brown, Roberta: *See*—
Brown, Robert J.; Brown, Roberta; and Rhodes, Carl, 4,838,826, Cl. 446-141.000.
Brown, Stanley M.; Byrne, John W.; and Jacobs, Harry E., to Atlantic Richfield Company. Catalytic cracking with reduced emissions of sulfur oxides. 4,839,026, Cl. 208-120.000.
Bruhnke, Ulrich; Korber, Jurgen; and Jobmann, Ingo, to Daimler-Benz Aktiengesellschaft. Tilting ashtray for motor vehicles. 4,838,599, Cl. 296-37.900.
Brun-Vezinet, Francoise: *See*—
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Brunk, John L., to Baytec, Inc. Multiple computer interface. 4,839,793, Cl. 364-200.000.
Brunner, Hans R.: *See*—
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Brunswick Corporation: *See*—
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Brush Fusegear Limited: *See*—
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Bryant, Harold C., to Columbia Equipment, Inc. Forklift attachment for dumping containers. 4,838,752, Cl. 414-421.000.
Bryant, Steven A.: *See*—
Cawley, Leo P.; Bryant, Steven A.; and Minard, Barbara J., 4,839,058, Cl. 210-670.000.
BS&B Safety Systems, Inc.: *See*—
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BTR Engineering (Australia) Limited: *See*—
Wilfinger, Erich L.; Polomski, Ronald J.; and Firth, Darren L., 4,838,126, Cl. 74-869.000.
Buchanan, Michael S.; Davis, Gregory B.; and Greenhouse, Walter V. V., to Wm. T. Burnett & Co., Inc. Polyurethane foams containing organofunctional silanes. 4,839,393, Cl. 521-53.000.
Buchler B-Set AG: *See*—
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Buchler, Rene, to Buchler B-Set AG. Device for reproducible, high-precision determination of the relative position of a first object in relation to second objects. 4,838,533, Cl. 269-310.000.
Buchtal Gesellschaft mit beschrankter Haftung: *See*—
Cremer, Gottfried; and Bard, Martin, 4,839,500, Cl. 219-213.000.
Buck KG, Firma: *See*—
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Buckland, Eric L.; and Nishimura, Masayuki, to Sumitomo Electric Fiber Optics Corporation. Simultaneous bi-directional optical time domain reflectometry method. 4,838,690, Cl. 356-73.100.
Buckman Laboratories International, Inc.: *See*—
Ito, Yosuke; Nomura, Yasuhiro; and Katayama, Sakae, 4,839,373, Cl. 514-367.000.
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Buffet, Eric; Dragoni, Christian; and Rey, Pierre, to Eaton Corporation. Electric vacuum actuator valve. 4,838,519, Cl. 251-129.210.
Buget, Bernard; and Maurice, Etienne, to Buget, Bernard. Optical device for measuring the position of the main or other directions of vision of both eyes, and anomalies in binocular vision. 4,838,676, Cl. 351-202.000.
BULL HN Information Systems Inc.: *See*—
Barlow, George J.; and Keeley, James W., 4,839,800, Cl. 364-200.000.
Bull, John W.: *See*—
Armstrong, Timothy O.; and Bull, John W., 4,838,543, Cl. 272-70.000.
Bullard, Roy P., to Otis Engineering Corporation. Running and pulling tool. 4,838,594, Cl. 294-86.180.
Bulson, Laura G.; Misenheimer, Laura P.; and Sebrosky, Robert A., to International Business Machines Corporation. Electromagnetic actuator having improved dampening means. 4,839,621, Cl. 335-277.000.
Bumbalough, John E., to Wisconsin Milk Marketing Board, Inc. Spreadable product having and anhydrous milk fat component. 4,839,190, Cl. 426-603.000.
Bunka Shutter Co., Ltd.: *See*—
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Bunker, Bruce C.; Lamppa, Diana L.; and Voigt, James A., to United States of America, Energy. Superconductor precursor mixtures made by precipitation method. 4,839,339, Cl. 505 1.000.
Burak, Gerhard: *See*—
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Burch, Kenneth R.: *See*—
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Burger, Marilyn S.: *See*—
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Parks, Carl R.; and Burlett, Donald J., 4,839,433, Cl. 525-329.300.
Burlington Industries, Inc.: *See*—
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Lassiter, B. Dean, 4,838,380, Cl. 181-291.000.
Burney, Harry S., Jr.; Morris, Gregory J. E.; Beaver, Richard N.; and Spradling, Robert D., to Dow Chemical Company, The. Antisurge outlet apparatus for use in electrolytic cells. 4,839,012, Cl. 204-255.000.
Burnham Corporation: *See*—
Kirby, Richard H., 4,838,210, Cl. 122-14[illegible].000.
Burnham, Robert D.; and Seifres, Donald R., to Xerox Corporation. Wavelength tuning of multiple quantum well (MQW) heterostructure lasers. 4,839,899, Cl. 372-45.000.
Burns, Paul A.: *See*—
Stollenwerk, William R.; and Burns, Paul A., 4,838,910, Cl. 55-385.200.
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Whittle, Brendan J. R., 4,839,169, Cl. 42[illegible]-94.300.
Busch, Francis, Jr., to Laura Lupton Inc. Facial cosmetic liquid containing crystalline silica and colors. 4,839,153, Cl. 424-63.000.
Bussard, Janice W. Holographic art applied to T-shirts or other textile products. 4,838,965, Cl. 156-83.000.
Butt, Sheldon H., to Olin Corporation. Semiconductor packaging. 4,839,716, Cl. 357-74.000.
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Buysch, Hans-Josef; Schon, Norbert; Eichenauer, Herbert; Kress, Hans-Jurgen; and Buekers, Josef, to Bayer Aktiengesellschaft. Antistatic, thermoplastic moulding compound based on polycarbonates and aromatic vinyl polymers. 4,839,421, Cl. 525-67.000.
Bye, Richard L., Jr.; Bose, Debasis; Das, Santosh K.; Datta, Amitava; and Adam, Colin M., to Allied Signal Inc. Production of low temperature aluminum based brazing alloys. 4,838,341, Cl. 164-463.000.
Byers, Charles H., Jr.; Michl, Terry L.; and Acord, Dennis E., to Arizona Instrument Corporation. Apparatus for determining percent of moisture. 4,838,705, Cl. 374-14.000.
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Bom, Cornelis J. G.; and van den Berg, Karel, 4,838,207, Cl. 119-14.020.
Louet Feisser, Arnold; Koorn, Maarten; and Sikkema, Sape, 4,838,013, Cl. 56-13.600.
Cacak, Harold L., to Brunswick Corporation. Filament winding process and apparatus. 4,838,971, Cl. 156-173.000.
Cadorniga, Lauro C.: *See*—
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Calari, Alessandro, to Dideco S.p.A. Chuck device for holding a cell for the centrifugation of blood. 4,838,849, Cl. 494-85.000.
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Calkins, Dennis E., to McDermott International Inc. Deepwater subsea lowering/lifting system. 4,838,522, Cl. 254-337.000.
Calmar Corporation: *See*—
Moore, David G.; and Foster, Donald D., 4,838,460, Cl. 222-153.000.
Calvert, Douglas D.; Behrens, Edward A.; and Baver, Donald K., to Wisconsin Electric Power Company. Method for testing underground electric cables. 4,839,598, Cl. 324-539.000.
Camarda, Charles J.; and Ransone, Philip O., to United States of America, National Aeronautics and Space Administration. Reusable high-temperature heat pipes and heat pipe panels. 4,838,346, Cl. 165-104.140.
Camco, Incorporated: *See*—
Leismer, Dwayne D.; and Blizzard, William A., Jr., 4,838,355, Cl. 166-375.000.
Cameron Forge Company: *See*—
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Cameron, John F.; Knirck, Jeffrey G.; and Wise, Lawrence A., to General Electric Corp. Dual voice coil shutter. 4,839,679, Cl. 354-234.100.
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Campbell, Frank, Jr., to Cameron Forge Company. Walking beam furnace insulation. 4,838,785, Cl. 432-121.000.
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Hosaka, Masao; and Saito, Takashi, 4,839,699, Cl. 355-55.000.
Hosoi, Atsushi; and Tajima, Hatsuo, 4,838,200, Cl. 118-658.000.
Hyosu, Yoshihiko; Hikake, Norio; and Tanaka, Katsuhiko, 4,839,255, Cl. 430-137.000.
Inaba, Yutaka; and Tamura, Yasuyuki, 4,838,652, Cl. 350-331.00R.
Inuzuka, Tsuneki; Maeshima, Katsuyoshi; and Tomosada, Masahiro, 4,839,698, Cl. 355-243.000.
Ishihara, Shunichi, 4,839,689, Cl. 355-202.000.
Ishikawa, Tadashi; and Kikuchi, Yutaka, 4,838,534, Cl. 271-10.000.
Itoh, Yuji, 4,839,528, Cl. 250-574.000.
Kan, Fumitaka; Arahara, Kohzoh; Tohyama, Noboru; Yuasa, Toshiya; and Fukumoto, Hiroshi, 4,838,940, Cl. 106-22.000.
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Sato, Yasufumi; Munakata, Megumi; and Noguchi, Hiromichi, 4,839,399, Cl. 522-14.000.
Sato, Yasufumi; Munakata, Megumi; and Noguchi, Hiromichi, 4,839,400, Cl. 522-14.000.
Sato, Yasufumi; Munakata, Megumi; and Noguchi, Hiromichi, 4,839,668, Cl. 346-140.00R.
Sato, Yasufumi; Munakata, Megumi; and Noguchi, Hiromichi, 4,839,669, Cl. 346-140.00R.
Shiraishi, Akihiko, 4,838,666, Cl. 350-427.000.
Takayama, Haruyoshi, 4,839,908, Cl. 375-104.000.
Tomida, Yasuko; and Koike, Shoji, 4,838,938, Cl. 106-22.000.
Yoneda, Kou; Miyakawa, Hideaki; and Hara, Shinichi, 4,839,762, Cl. 360-107.000.
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Cantor, Charles R.; Axel, Richard; and Argarana, Carlos, to Columbia University in the City of New York, The Trustees of. DNA encoding streptavidin, streptavidin produced therefrom, fused polypeptides which include amino acid sequences present in streptavidin and uses thereof. 4,839,293, Cl. 435-320.000.
Cantrell, M. Dale: *See*—
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Cape, John A.: *See*—
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Carl-Zeiss-Stiftung: *See*—
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Carlin, Frank J.; and Wafford, Terrell F., to Baker Hughes Incorporated. Method of fabricating threaded connection for pipes. 4,838,068, Cl. 72-340.000.
Carlson, Larry W.; and Herman, Harold, to United States of America, Energy. Continuous cryopump with a method for removal of solidified gases. 4,838,035, Cl. 62-55.500.
Carman, Edward R. Golf club holster. 4,838,416, Cl. 206-315.200.
Carnot, S.A.: *See*—
Rosado, Serafin M.; and Vallejo, Luiz E. D., 4,838,027, Cl. 60-671.000.
Carter, Arlen J. Open boat windscreen. 4,838,195, Cl. 114-343.000.
Cartmell, James V., to Baxter International Inc. Medical electrode. 4,838,273, Cl. 128-640.000.
Carver, David L. Mixer apparatus. 4,838,704, Cl. 366-307.000.
Casey, Robert F., to RCA Licensing Corporation. Picture-in-picture video signal generator. 4,839,728, Cl. 358-183.000.
Casio Computer Co., Ltd.: *See*—
Homma, Satoshi; and Watanabe, Tohru, 4,839,506, Cl. 235-379.000.
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Casper, Hannelore: *See*—
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Casper, Rudolf; Wendling, Peter; Konter, Wolfgang; and Hohmann, Gerhard, to Bayer Aktiengesellschaft. Polymerization of chloroprene. 4,839,447, Cl. 526-225.000.
Casse, Pierre: *See*—
Chasseguet, Gustave; Naudin, Jacky; and Casse, Pierre, 4,838,395, Cl. 188-378.000.
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Riley, Paul E.; Kulkarni, Vivek D.; and Castel, Egil D., 4,839,311, Cl. 437-228.000.
Castellini, Franco, to Castellini, S.P.A. Method and an apparatus for cold sterilization of surgical instruments, in particular dental surgery instruments. 4,839,004, Cl. 204-128.000.
Castellini, S.P.A.: *See*—
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Caterpillar Inc.: *See*—
Price, Robert J.; Gee, James E.; Tonsor, Andrew J.; Satzler, Ronald L.; and Stevens, Samuel B., 4,838,373, Cl. 180-9.460.
Cathcart, John V.; and Liu, Chain T., to United States of America, Energy. Chromium modified nickel-iron aluminide useful in sulfur bearing environments. 4,839,140, Cl. 420-445.000.
Cattrall, Thomas J.; and Lord, Richard E. Lumber cutting system. 4,839,816, Cl. 364-474.090.
Cawley, Leo P.; Bryant, Steven A.; and Minard, Barbara J. On-line plasma modification method. 4,839,058, Cl. 210-670.000.
CBI Research Corporation: *See*—
Knodel, Bryan D., 4,838,039, Cl. 62-330.000.
Ceco Filters, Inc.: *See*—
Thomaides, Lazarus; and Taub, Steven I., 4,838,903, Cl. 55-97.000.
Celamerck GmbH & Co.: *See*—
Vite, Jean Pierre, 4,839,383, Cl. 514-456.000.
Celico, Joseph M. A. Marker device. 4,837,959, Cl. 40-584.000.
Ceramed Corporation: *See*—
Starling, L. Brian; Stephan, James E.; and Hubbard, William G., 4,839,215, Cl. 428-131.000.
Chak, Maryan. Electrically heated fish tank unit. 4,839,498, Cl. 219-311.000.
Chakraborty, Utpal: *See*—
Youssefyeh, Raymond; Chakraborty, Utpal; Magnien, Ernest; and Desai, Rohit, 4,839,369, Cl. 514-314.000.
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Champion, Clive A., to Watercolour Bath Products, Inc. Fillers for use in casting marble products. 4,839,394, Cl. 521-55.000.
Champion International Corporation: *See*—
Brenholdt, Irving R., 4,838,692, Cl. 356-343.000.
Chande, Tushar S.; Jones, Marshall G.; Ortiz, Angel L., Jr.; and August, John L., Jr., to General Electric Company. Laser beam directing system. 4,838,631, Cl. 350-6.600.
Chandler, Joseph A., to United States of America, National Aeronautics and Space Administration. Bio-reactor chamber. 4,839,046, Cl. 210-355.000.
Chang, Bo E. Three layered laptop computer. 4,839,837, Cl. 364-708.000.
Chang, Ching H.: *See*—
Bowers, Cyril Y.; Momany, Frank A.; Chang, Ching H.; Cody, Wayne L.; Hubbs, John C.; and Foster, Charles H., 4,839,344, Cl. 514-16.000.
Chang, Dane; and Wolfe, David L., to Dow Chemical Company, The. Bituminous compositions having high adhesive properties. 4,839,404, Cl. 524-69.000.
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Ramalingam, Subbiah; and Chang, Rongfeng, 4,839,011, Cl. 204-192.380.
Chang, Ted S. Stapler base. 4,838,470, Cl. 227-120.000.
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Flament, Gerard, 4,838,185, Cl. 110-347.000.
Charles Stark Draper Laboratory, Inc., The: *See*—
Galler, Francis A., 4,839,832, Cl. 364-552.000.
Charlton, John C.; Midgley, John E.; and Wilkins, Terence A., to Amersham International plc. Assay for the free portion of substances in biological fluids. 4,839,299, Cl. 436-500.000.
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Charm, Stanley E. High temperature, short time heating system and method of sterilizing or pasteurizing heat sensitive biological fluids. 4,839,142, Cl. 422-21.000.
Chasseguet, Gustave; Naudin, Jacky; and Casse, Pierre, to Valeo. Torsion damping device. 4,838,395, Cl. 188-378.000.
Chaun-Tien, Chuang. Fishing toy. 4,838,553, Cl. 273-1.0GG.
Chem-Elec, Inc.: *See*—
Kennedy, Paul R.; Adams, Ernest C.; and Woenker, William E., 4,839,296, Cl. 436-170.000.
Cheng, Der C.: *See*—
Chuan, Chuang T.; and Cheng, Der C., 4,839,780, Cl. 362-265.000.
Cheng, Huan-Sung. Method and apparatus for control of engine idling circuit. 4,838,224, Cl. 123-339.000.
Chennels, Donald A. Soil stabilizing apparatus. 4,838,729, Cl. 404-90.000.
Chernack, Milton P. Child resistant closure. 4,838,441, Cl. 215-216.000.
Cherukuri, Subraman R.; Mansukhani, Gul; and Jacob, Kapakkamannil C., to Warner-Lambert Company. Stable sweetner delivery system for use with cinnamon flavors. 4,839,184, Cl. 426-307.000.
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Chevron Research Company: *See*—
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Chew, David W.; Hagenlocher, Willi A.; Jih, Chentung R.; and Nassimbene, Ernie G., to International Business Machines Corporation. Apparatus for read/write head loading and unloading in a data recording disk file. 4,839,756, Cl. 360-105.000.
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Chiesa, David. Nailing device. 4,838,471, Cl. 227-142.000.
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Chignon, Jean-Jacques P.; and Chignon, Jean-Claude. Dynamic knee brace. 4,838,251, Cl. 128-80.00C.
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Chikhani, Rene J.; and Weber, Frank, to Ampex Corporation. System for recording and reproducing radar signal information. 4,839,657, Cl. 342-190.000.
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Goto, Yasuyuki; and Ogawa, Tetsuya, 4,839,091, Cl. 252-299.630.
Chitayat, Anwar. Cooling system for linear motor. 4,839,545, Cl. 310-12.000.
Cho, Byong K.; and Stock, Christopher J., to General Motors Corporation. Catalyst for simultaneous NO decomposition and CO oxidation under cycled operating conditions. 4,839,146, Cl. 423-213.500.
Cho, Kang-Rai. Natural ventilation type footwear. 4,837,948, Cl. 36-3.00A.
Choi, Hyeong I.; and Choi, Keh-Kun, to Mo, Bang H. Capacitive discharge electronic ignition system for automobiles. 4,839,772, Cl. 361-256.000.

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Choi, Hyeong I.; and Choi, Keh-Kun, 4,839,772, Cl. 361-256.000.
Choi, Mansam, to Adams Rite Manufacturing Company. Mechanism for controllably deadlocking a door to a door frame, for panic release. 4,838,587, Cl. 292-216.000.
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Chuan, Chuang T.; and Cheng, Der C., to Tai Yu Electric Co., Ltd. Simulative candle. 4,839,780, Cl. 362-265.000.
Chubb, Charles F.: *See*—
DiMatteo, Paul; and Chubb, Charles F., 4,837,873, Cl. 5-81.00R.
Chung, Rack H.; Swiger, Roger T.; and Beers, Melvin D., to General Electric Company. Novel Scavengers for one-component RTV compositions. 4,839,453, Cl. 528-18.000.
Church, John A.; and Mehta, Umesh J., to Colgate-Palmolive Company. Autogenously heated liquid soap composition. 4,839,081, Cl. 252-108.000.
Chyba, Joseph A.; Kihlmire, William M.; and Blackburn, Theodore J. Apparatus for handling large heavy components of motor vehicles. 4,838,530, Cl. 269-15.000.
Ciba-Geigy Corporation: *See*—
Demmer, Christopher G.; and Irving, Edward, 4,839,253, Cl. 430-190.000.
Galli, Roberto; and Kvita, Petr, 4,838,895, Cl. 8-527.000.
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Cintolo, Carmelo. Metal plate for personalizing a bracelet. 4,838,042, Cl. 63-3.000.
Clairol Incorporated: *See*—
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Clark, Gordon P.; Karwowski, Zbigniew T.; and Tebinka, Henry, to Northern Telecom Limited. Seals. 4,839,471, Cl. 174-92.000.
Clark, Randy L.: *See*—
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Claybaugh, David H.: *See*—
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Cochrane Subsea Acoustics, Inc.: *See*—
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Coey, John M. D.; and Ryan, Dominic H., to Provost, Fellows and Scholars of the College of the Holy and Undivided Trinity of Queen Elizabeth Near Dublin, The. Thermal analysis. 4,838,706, Cl. 374-54.000.
Coffman, Jeff. Therapeutic waterbed apparatus and method. 4,837,880, Cl. 5-451.000.
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Gauthier, Maurice, 4,839,213, Cl. 428-114.000.
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Levasseur, Joseph L., 4,838,406, Cl. 194-346.000.
Colacci, John R.; and Nesbitt, James L., Jr., to Campbell Soup Company. Linear volumetric system with automatic latching means for clamping together adjacent filler cylinders. 4,838,326, Cl. 141-147.000.
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Ng, Shirley M.; and Wieckowski, Susan, 4,839,156, Cl. 424-53.000.
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Colorocs Corporation: *See*—
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Columbia University in the City of New York, The Trustees of: *See*—
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Comolli, Alfred G.; and McLean, Joseph B., to HRI, Inc. Coal liquefaction process utilizing coal/CO_2 slurry feedstream. 4,839,030, Cl. 208-403.000.
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Cooper, William I. Guidance device for ultrasound guided surgical procedures. 4,838,506, Cl. 248-200.000.
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Cope, Richard L., to Eubanks Engineering Co. Wire insulation stripping apparatus. 4,838,129, Cl. 81-9.500.
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Corcoran, Chris T., to Shell Oil Company. Methods for processing converted wave seismic data. 4,839,869, Cl. 367-53.000.
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Corser, George; Hammond, Gary C.; and Eddy, Dale P., to GM1 Engineering & Management Institute. Flow meter and method of measuring flow. 4,838,093, Cl. 73-861.530.
Corsi, Armando, to Jobs S.p.a. Apparatus and a method of support and retaining a curved sheet in position. 4,838,531, Cl. 269-21.000.
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Cotterell, Daniel E. C.; and Stewart, David J. Directional current finder. 4,839,601, Cl. 324-559.000.
Coulon, Andre; and Bech, Ulrich, to Alsthom. Method of laying a cobalt-chromium-tungsten protective coating on a blade made of a tungsten alloy including vanadium, and a blade coated thereby. 4,839,237, Cl. 428-610.000.
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Cournoyer, Andre; Berard, Serge; and Cote, Denis, to Sport Maska Inc. Double Knit fabric with holes therethrough and knitted color bands. 4,838,045, Cl. 66-196.000.
Coursin, Benjamin E., to A. O. Smith Corporation. Fiber reinforced resin drive shaft having improved resistance to torsional buckling. 4,838,833, Cl. 464-181.000.
Covey, James H., to Boeing Company, The. Apparatus for providing a lightning protective vehicle surface. 4,839,771, Cl. 361-218.000.
Covey, Rupert A.; and Moore, Richard C., to Uniroyal Chemical Company, Inc. Phosphorus substituted tetrazolinones and pesticidal use. 4,839,349, Cl. 514-92.000.
Cowan, James J., to Polaroid Corporation, Patent Department. Method of replicating volume phase reflection holograms. 4,839,250, Cl. 430-1.000.
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Coyle, Roy T.; and Ho, Phillman N., to Union Oil Company of California. Production of silicon carbide. 4,839,150, Cl. 423-345.000.
Craig, Wallace M., Jr., to Hi-Tek Polymers, Inc. Low viscosity non-crystalline dicyanate ester blends with prepolymers of dicyanate esters. 4,839,442, Cl. 528-422.000.
Cramer, Paul S., to Avco Corporation. Combustion chamber liner having failure activated cooling and dectection system. 4,838,030, Cl. 60-753.000.
Cramer, Paul S., to Avco Corporation. Internally cooled combustion chamber liner. 4,838,031, Cl. 60-753.000.
Cramer, Randall J.; and Smith, William L., to Clorox Company, The. Thickened bleach composition. 4,839,077, Cl. 252-98.000.
Createc Gesellschaft fur Elektrotechnik mgH: *See*—
Kosler, Manfred; and Hubski, Peter, 4,839,638, Cl. 340-784.000.
Credle, William S., Jr.: *See*—
Rudick, Arthur G.; Credle, William S., Jr.; Heenan, Richard H.; and Paisley, Gary V., 4,839,107, Cl. 261-82.000.
Cremer, Gottfried; and Bard, Martin, to Buchtal Gesellschaft mit beschrankter Haftung. Covering for wall, ceiling or floor linings. 4,839,500, Cl. 219-213.000.
Cremonese, Joseph G. Cell culture flask utilizing a membrane barrier. 4,839,292, Cl. 435-313.000.
Cripe, Gene F.; Luebbe, Robert W.; and Snyder, Andrew W., to Thomas Conveyor Company. Vacuum discharge bin for bulk materials. 4,838,443, Cl. 220-1.00B.
Critical Systems, Inc.: *See*—
Stollenwerk, William R.; and Burns, Paul A., 4,838,910, Cl. 55-385.200.
Croce, Carlo P.: *See*—
O'Brien, Denise M.; and Croce, Carlo P., 4,838,425, Cl. 206-531.000.
Cross, Michael G., to J. Cinnamon Limited. Occupant-arising assist chair. 4,838,612, Cl. 297-338.000.
Crouse, Roger R.: *See*—
Haber, Terry M.; Maze, Jack E.; and Crouse, Roger R., 4,838,870, Cl. 604-187.000.
Crucible Materials Corporation: *See*—
Dulis, Edward J.; Dorsch, Carl J.; and Stasko, William, 4,839,139, Cl. 419-35.000.
Crystal Gage Inc.: *See*—
Albert, William C., 4,838,369, Cl. 177-210.0FP.
Cselt-Centro Studi E Laboratori Telecomunicazioni S.p.A.: *See*—
Mazzucco, Michelangelo; Poletto, Vanni; and Sartori, Mario, 4,839,610, Cl. 330-278.000.
Csomor, Katalin: *See*—
Kreidl, Janos; Visky, Gyorgy; Czibula, Laszlo; Stefko, Bela; Farkas nee Kirjak, Maria; Szombathelyi, Zsolt; Karpati, Egon; Kiss, Bela; Csomor, Katalin; Szporny, Laszlo; Forgacs, Lilla; Kuthi, Csaba; and Gere, Aniko, 4,839,362, Cl. 514-283.000.
CTE Valeron Corporation: *See*—
Begin, John D.; Berry, James E.; and Kretzmer, Paul D., 4,839,819, Cl. 364-483.000.
Cucheran, John S.: *See*—
Bott, John A.; and Cucheran, John S., 4,838,467, Cl. 224-326.000.
Culbertson, Billy M.; and Tiba, Omar, to Ashland Oil, Inc. Thermosetting bis oxazoline-polyphenol based resins for resin transfer molding which contain a monooxazine or monooxazoline diluent. 4,839,446, Cl. 525-504.000.
Cunningham, Douglas J., to Britax Limited. Clamping means for a strap. 4,838,388, Cl. 188-65.100.
Curro, John J.; Trusty, Alan J.; and Vernon, George M., to Procter & Gamble Company, The. Formed material produced by solid-state formation with a high-pressure liquid stream. 4,839,216, Cl. 428-134.000.
Curry, Leonard O. Portable tire X-ray apparatus and method. 4,839,914, Cl. 378-61.000.
Curtis, Susan A., to Texas Instruments Incorporated. Impact bipolar integrated circuit designed to eliminate output glitches caused by negative chip ground spikes. 4,839,538, Cl. 307-456.000.
Curtis, William: *See*—
Rice, Verle; Curtis, William; Keener, Richard, and Raffurty, Robert, 4,838,138, Cl. 83-698.000.
Curtman, Wendell B.: *See*—
Baxter, Bobby G.; Curtman, Wendell B.; and Peveler, Michael W., 4,838,566, Cl. 280-149.200.
Cuzin, Daniel; and Judas, Didier, to Atochem. Polyesteramides, polyetheresteramides and process for preparation thereof. 4,839,441, Cl. 528-328.000.

Cyclomatic Industries, Inc.: *See*—
Kotecki, Mariusz B.; and Thommes, James M., 4,839,499, Cl. 219-121.390.

Cyclops Corporation: *See*—
McKeown, Patrick D.; and Neiger, Jack W., 4,838,524, Cl. 256-24.000.

Czarnetzki, Edwin: *See*—
Reinartz, Hans-Dieter; Steffes, Helmut; and Czarnetzki, Edwin, 4,838,305, Cl. 137-505.130.

Czibula, Laszlo : *See*—
Kreidl, Janos; Visky, Gyorgy; Czibula, Laszlo ; Stefko, Bela; Farkas nee Kirjak, Maria; Szombathelyi, Zsolt; Karpati, Egon; Kiss, Bela; Csomor, Katalin; Szporny, Laszlo ; Forgacs, Lilla; Kuthi, Csaba; and Gere, Aniko , 4,839, 62, Cl. 514-283.000.

Daamen, Jacobus J. H. G.; De Haan, Peter J.; and Klip, Evert J., to Organon Teknika B.V. Process for the manufacture of bundles of semi-permeable hollow filaments for use in blood, plasma and dialysate filters. 4,838,972, Cl. 156-175.000.

Dahl, Ingolf: *See*—
Lagerwall, Sven T.; Andersson, Gunnar; Dahl, Ingolf; Kuczynski, Wojciech; Sharp, Kent; and Stebler, Bengt, 4,838,663, Cl. 350-350.00S.

Dahlberg, Carl H. Beneficiator for recovery of metal fractions from particulate gangue. 4,839,034, Cl. 209-44.00 .

Daicel Chemical Industries, Ltd.: *See*—
Murabayashi, Katuyoshi, 4,839,424, Cl. 525-92.000.

Daido Sanso K. K.: *See*—
Fraas, Lewis M.; McLeod, Paul S.; and Cape, John A., 4,838,201, Cl. 118-719.000.

Daido Tokushuko Kabushiki Kaisha: *See*—
Fukizawa, Kazunori; Higuchi, Mitsush and Naniki, Kunio, 4,838,961, Cl. 148-12.400.

Daikuhara, Norio: *See*—
Yamaguchi, Shuichiro; Daikuhara, Norio and Shimomura, Takeshi, 4,839,020, Cl. 204-431.000.

Daimler-Benz Aktiengesellschaft: *See*—
Bruhnke, Ulrich; Korber, Jurgen; and Jo mann, Ingo, 4,838,599, Cl. 296-37.900.
Ferrada, Stephen, 4,838,076, Cl. 73-489.00 .
Klink, Josef; and Maier, Ulrich, 4,838,509 Cl. 248-393.000.
Koukal, Heinz; and Arold, Klaus, 4,838,1 0, Cl. 74-502.600.

Dainin, Takashi, to Nippon Pneumatic Manufacturing Co., Ltd. Hydraulic pulse wrench. 4,838,133, Cl. 81-465.00.

Dainippon Ink and Chemicals, Inc.: *See*—
Umehara, Kiyoshi; Yamamoto, Hisaomi; Kobayashi, Nobuo; and Imai, Tsutomu, 4,839,099, Cl. 252-607.0 0.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Nishida, Masami; and Orgami, Nobutoshi, 4,838,979, Cl. 156-345.000.

Dairanieh, Issam: *See*—
Lahalih, Shawqui; Dairanieh, Issam; and Absi-Halabi, Ma'mun, 4,839,095, Cl. 252-8.514.

Dajnko, Daniel M.: *See*—
Dajnko, Milan A.; Dajnko, Marjan J.; and Dajnko, Daniel M., 4,838,002, Cl. 52-489.000.

Dajnko, Marjan J.: *See*—
Dajnko, Milan A.; Dajnko, Marjan J.; and Dajnko, Daniel M., 4,838,002, Cl. 52-489.000.

Dajnko, Milan A.; Dajnko, Marjan J.; and Dajnko, Daniel M. Clip fastener securable to ceiling T-bar to retain wall partition in position. 4,838,002, Cl. 52-489.000.

Dal-Craft, Inc.: *See*—
Dalbo, Emil J., 4,838,426, Cl. 206-574.000

d'Alayer de Costenore d'Arc, Stephane M.; and Denis, Philippe V., to Staar S.A. Apparatus for loading record discs of different diameters in disc players. 4,839,880, Cl. 369-75.200.

Dalbo, Emil J., to Dal-Craft, Inc. Combination of needle case and needle threader for needlework. 4,838,426, Cl. 206-574.000.

Dallas Semiconductor Corporation: *See*—
Smith, Michael D., 4,839,893, Cl. 370-100 .000.

Dalfin, William M., II, to Varo, Inc. Method and apparatus for providing gain control for an image intensifier tube. 4,839,569, Cl. 315-383.000.

Daly, Robert G.: *See*—
Dryden, Paul E.; Autieri, Richard J.; and Daly, Robert G., 4,838,258, Cl. 128-204.180.

Dan Co., Ltd.: *See*—
Kuriyama, Zenkichi; Aoba, Masaho; and Takeuchi, Teruo, 4,839,875, Cl. 369-14.000.

Dana Corporation: *See*—
Mullins, Dennis R., 4,837,941, Cl. 33-626.000.
Shifflet, Glenn; Johnson, Herbert C.; and Revenaugh, Paul W., 4,838,077, Cl. 73-118.100.

Daniele, Vincenzo; and Benedetti, Mirella, to SGS Microelettronica S.p.A. Protection of integrated circuits from electrostatic discharges. 4,839,768, Cl. 361-56.000.

Daniels, Larry: *See*—
Andre, James R.; and Daniels, Larry, 4,838,317, Cl. 138-135.000.

Daniels, Nicholas R., to Emerson Electric Co. Cover assembly to protect an electric motor centrifugal actuator. 4,839,549, Cl. 310-68.00E.

Darcy, John J.: *See*—
Thomsen, Karl V.; Darcy, John J.; Griswold, Augustus W.; Haritonoff, Boris W.; and Pond, Jacob, 4,83 ,964, Cl. 156-73.100.

Darnell, W. Ronald; and Jackson, Winston J., Jr., to Eastman Kodak Company. Process for the preparation of poly(ether-ketone) polymers. 4,839,459, Cl. 528-220.000.

Das, Santosh K.: *See*—
Bye, Richard L., Jr.; Bose, Debasis; Das, Santosh K.; Datta, Amitava; and Adam, Colin M., 4,838,341, Cl. 164-463.000.

Data Systems Technology Corp.: *See*—
Glover, Neal; and Dudley, Trent, 4,839,896, Cl. 371-37.000.

Datta, Amitava: *See*—
Bye, Richard L., Jr.; Bose, Debasis; Das, Santosh K.; Datta, Amitava; and Adam, Colin M., 4,838,341, Cl. 164-463.000.

Daud, Taher: *See*—
Moopenn, Alexander W.; Thakoor, Anilkumar P.; Daud, Taher; and Lambe, John J., 4,839,859, Cl. 365-100.000.
Ramesham, Rajeshuni; Thakoor, Sarita; Daud, Taher; and Thakoor, Aniklumar P., 4,839,700, Cl. 357-2.000.

Daum, Werner; Hanssler, Gerd; and Ooms, Pieter, to Bayer Aktiengesellschaft. Carbamoyloxythiophene fungicides. 4,839,381, Cl. 514-444.000.

Davenport, John M.: *See*—
Ahlgren, Frederic F.; Bergman, Rolf S.; Davenport, John M.; Hansler, Richard L.; Hantman, Robert G.; and Hoegler, Leonard E., 4,839,559, Cl. 313-579.000.

David, Eugene C., to Timesavers, Inc. Wood surface treatment method and system employing tandemly oriented cross-belts and rotary abraders. 4,837,984, Cl. 51-326.000.

Davidson, C. Marshall, to Olin Corporation. Adjustable valving rod. 4,838,458, Cl. 222-135.000.

Davidson Textron Inc.: *See*—
Labrie, Craig B., 4,839,118, Cl. 264-46.500.
Swenson, Harold W.; and Tuttle, Ken E., 4,839,117, Cl. 264-46.400.

Davies, Philip D. T.; and Kirch, Lawrence S., to Rohm and Haas Company. Process for separating sulfuric acid and carboxylic acids. 4,838,998, Cl. 203-96.000.

Davis, Cecil J.: *See*—
Jucha, Rhett B.; Davis, Cecil J.; and Jones, John I., 4,838,990, Cl. 156-643.000.
Luttmer, Joseph D.; Davis, Cecil J.; Smith, Patricia B.; York, Rudy L.; Loewenstein, Lee M.; and Jucha, Rhett B., 4,838,984, Cl. 156-643.000.

Davis, Gregory B.: *See*—
Buchanan, Michael S.; Davis, Gregory B.; and Greenhouse, Walter V. V., 4,839,393, Cl. 521-53.000.

Davis, James A., to Firestone Tire & Rubber Company, The. Method for improving green strength properties of vulcanizable rubber compositions. 4,839,428, Cl. 525-215.000.

Davis, Robert C., Jr.: *See*—
Vora, Kishore N.; Campbell, Donald N.; Davis, Robert C., Jr.; Spangler, Glenn E.; and Reategui, Julio A., 4,839,143, Cl. 422-98.000.

Davis, Samuel L., Jr.: *See*—
Ruebush, Ann M.; Davis, Samuel L., Jr.; and Norviel, Vern A., 4,839,054, Cl. 210-639.000.

Davis, Thomas E.; Schmidt, Donald L.; Kau, Jee I.; Wessling, Ritchie A.; Whipple, Sharon S.; Fibiger, Richard F.; and Pickelman, Dale M., to Dow Chemical Company, The. Semi-permeable membranes prepared via reaction of cationic groups with nucleophilic groups. 4,839,203, Cl. 427-244.000.

Davis, Thomas O., Jr. Article using shape-memory alloy to improve and/or control the speed of recovery. 4,839,479, Cl. 200-61.45R.

Davis, Walter L.; Rivas, Mario A.; Burch, Kenneth R.; and Deems, Vincent B., to Motorola, Inc. Paging receiver having selectively protected regions of memory. 4,839,628, Cl. 340-311.100.

Dax Manufacturers Inc.: *See*—
Shultz, Julius, 4,837,954, Cl. 40-152.000.

Dearing, David G., to Dresser Industries, Inc. Well packer brake. 4,838,348, Cl. 166-136.000.

De Baan, Jacob; and Uittenbogaard, Marinus, to Bluewater Terminal Systems N.V. Device for mooring a floating body, for example a ship, to a body anchored to the seabed, for example a mooring tower. 4,838,823, Cl. 441-3.000.

Debiopharm, S.A.: *See*—
Waeber, Bernard; and Brunner, Hans R., 4,839,343, Cl. 514-12.000.

Deems, Vincent B.: *See*—
Davis, Walter L.; Rivas, Mario A.; Burch, Kenneth R.; and Deems, Vincent B., 4,839,628, Cl. 340-311.100.

Deere & Company: *See*—
Bramstedt, Gerd; Love, Mahlon L.; and Hennen, John J., 4,838,011, Cl. 56-11.700.
Dobberpuhl, Dale R.; and Kruel, Edward C., 4,838,101, Cl. 74-15.630.
Gage, Douglas M., 4,838,314, Cl. 137-625.240.
Johnson, Steven H.; and Williams, Lary L., 4,838,755, Cl. 414-699.000.
Johnson, Steven H.; and Williams, Lary L., 4,838,756, Cl. 414-699.000.
Ziegler, Duane H.; Kerckhove, Dennis A.; Hansen, Jerry W.; and Denning, Barry K., 4,838,010, Cl. 56-10.200.

Deerwester, Scott C.; Dumais, Susan T.; Furnas, George W.; Harshman, Richard A.; Landauer, Thomas K.; Lochbaum, Karen E.; and Streeter, Lynn A., to Bell Communications Research, Inc. Computer information retrieval using latent semantic structure. 4,839,853, Cl. 364-900.000.

De Haan, Peter J.: *See*—
Daamen, Jacobus J. H. G.; De Haan, Peter J.; and Klip, Evert J., 4,838,972, Cl. 156-175.000.

de Haas, Maarten A.: *See*—
Edelman, Arie B. C.; Kleijn, Jan B.; de Haas, Maarten A.; and Hoogendoorn, Thomas M., 4,838,955, Cl. 148-2.000.

Dehan, Louis: *See*—
Ouhadi, Trazollah; Dehan, Louis; and Rossi, Marie L., 4,839,084, Cl. 252-174.210.

Deitchman, Walter H.; and Pearson, Gaylord R., to Pearson and Deitchman Research and Dev. Co., Inc. Method and apparatus for brake application. 4,838,617, Cl. 303-6.100.

de Jager, Gui G., to Flexline Services Ltd. Method and apparatus for applying powdered materials to filaments. 4,839,199, Cl. 427-185.000.

De Jong, Augustinus C. G.; and Schrederhof, Antonie, to U.S. Philips Corp. Fibre plates having coding fibres. 4,838,642, Cl. 350-96.270.

Delevallee, Francoise: *See*—
Vevert, Jean-Paul; Delevallee, Francoise; Gasc, Jean-Claude; and Petit, Francis, 4,839,358, Cl. 514-237.800.

Del Giudice, David M.: *See*—
Billmers, Robert L.; Del Giudice, David M.; Tessler, Martin M.; and Hasuly, Michael J., 4,839,449, Cl. 526-238.200.

Delphax Systems: *See*—
Theodoulou, Sotos M.; Thomson, Christopher W.; Vannerson, Eric; Baker, Wm. Keith; Sun, Alvin C. P.; and Hurley, Ken, 4,839,671, Cl. 346-159.000.

Delphin, Rene; and Regnaut, Bernard, to Occidental Chemical Corporation. Method of manufacturing an electrically conductive thermoplastic material. 4,839,114, Cl. 264-40.400.

Delsey Luggage Company: *See*—
Krenzel, Ronald L., 4,838,396, Cl. 190-18.00A.

Delta Systems, Inc.: *See*—
Howard, William A., 4,839,478, Cl. 200-52.00R.

Demarest, Scott W., to S. C. Johnson & Son, Inc. Bait station. 4,837,969, Cl. 43-131.000.

DeMario, Edmund E.; Johansson, Anders; and Nylund, Olov, to AB Asea-Atom. Spacer for nuclear fuel rods. 4,839,136, Cl. 376-462.000.

Demmer, Christopher G.; and Irving, Edward, to Ciba-Geigy Corporation. Photosensitive and electrodepositable phenolic resin with quinone diazide sulfonyloxy group. 4,839,253, Cl. 430-190.000.

Demuth, Gunther, to Du Pont de Nemours, E. I., and Company. Recording system for irradiation therapy. 4,839,266, Cl. 430-524.000.

Deneris, Evan A.: *See*—
Mower, Vaughn L.; Deneris, Evan A.; and Cox, John B., 4,839,603, Cl. 328-14.000.

Denis, Philippe V.: *See*—
d'Alayer de Costenore d'Arc, Stephane M.; and Denis, Philippe V., 4,839,880, Cl. 369-75.200.

Denker, James M. Actuator. 4,838,148, Cl. 92-90.000.

Denning, Barry K.: *See*—
Ziegler, Duane H.; Kerckhove, Dennis A.; Hansen, Jerry W.; and Denning, Barry K., 4,838,010, Cl. 56-10.200.

Dennis, Kent S., to Dow Chemical Company, The. Preparation of triblock copolymers. 4,839,430, Cl. 525-280.000.

Dennis, Robert W.; Dye, Charles J.; and Keasey, Alan, to BP Chemicals Limited. Low toxicity oil composition and use thereof in drilling fluids. 4,839,096, Cl. 252-8.515.

Dentini, Mark S.; Fulton, Joe A.; Jin, Sungho; Mottine, John J., Jr.; Shepherd, Lloyd; and Sherwood, Richard C., to American Telephone and Telegraph Company AT&T Bell Laboratories. Thermal conductor assembly. 4,838,347, Cl. 165-185.000.

DePaul, Richard E., to Somerville Packaging Corporation. Carton and blank for packaging ice cream and the like. 4,838,432, Cl. 206-632.000.

Derouen, Alvin: *See*—
LaBiche, Mitchell; and Derouen, Alvin, 4,839,838, Cl. 364-709.110.

Desai, Rohit: *See*—
Youssefyeh, Raymond; Chakraborty, Utpal; Magnien, Ernest; and Desai, Rohit, 4,839,369, Cl. 514-314.000.

de Sanoit, Jacques: *See*—
Madic, Charles; and de Sanoit, Jacques, 4,839,149, Cl. 423-251.000.

DeSantis, Edward: *See*—
Ozer, Richard; DeSantis, Edward; and Tomlinson, Brett, 4,839,640, Cl. 340-825.310.

DeSaw, Fred A., to General Electric Company. Gas shielded metal arc welding torch for limited access welding. 4,839,490, Cl. 219-74.000.

Deschazeaux, Gerard: *See*—
Musseau, Olivier; and Deschazeaux, Gerard, 4,839,586, Cl. 324-158.00F.

DeSchutter, Andre ; and Silvano, Casalatina, to Sismo International. Method for assembling three-dimensional metal structures, machine for the manufacturing thereof, and structures obtained with such a method. 4,838,322, Cl. 140-112.000.

Deseret Medical, Inc.: *See*—
Bennett, Laurence M., 4,838,881, Cl. 604-280.000.

DeSoto, Inc.: *See*—
Sekmakas, Kazys, 4,839,403, Cl. 523-412.000.

Deutsch, Edward A., to University of Cincinnati. Radioactive rhenium complexed to 2-hydroxy isobutyric acid. 4,839,467, Cl. 534-10.000.

Deutsche AG fur Unterhaltungselectronic OHG: *See*—
Keesen, Heinz-Werner; and Peters, Hartmut, 4,839,724, Cl. 358-138.000.

Devito, Lawrence M., to Analog Devices Incorporated. High-speed voltage-to-frequency converter. 4,839,653, Cl. 341-157.000.

Dewitz, Thomas S.: *See*—
Mifflin, Thomas R.; and Dewitz, Thomas S., 4,838,898, Cl. 48-210.000.
Salter, James A.; Schmidt, Thomas R.; DeWitz, Thomas S.; Arbore, Charles M.; Duysings, Frederick M. H. J.; Van Der Meer, Johannes W.; Brown, David; and Venselaar, Henricus C. J., 4,838,738, Cl. 406-14.000.

Dial-A-Down, Inc.: *See*—
Egender, James J., 4,837,957, Cl. 40-488.000.

DiAmico, John L. Apparatus to lock storm doors and avoid draft. 4,838,589, Cl. 292-258.000.

Diard, Jean-Luc; and Pascal, Roger, to Salomon S.A. Ski with inclined lateral surfaces. 4,838,572, Cl. 280-609.000.

Dias, Carlos T.: *See*—
Borges, Marcos V. P.; Aragao, Marcelo V.; and Dias, Carlos T., 4,839,919, Cl. 379-96.000.

Dideco S.p.A.: *See*—
Calari, Alessandro, 4,838,849, Cl. 494-85.000.

Diel, Peter J.: *See*—
Schurter, Rolf; and Diel, Peter J., 4,838,930, Cl. 71-94.000.

Diels, Gaston S. M.: *See*—
Janssens, Frans E.; Kennis, Ludo E. J.; Hens, Jozef F.; Torremans, Joseph L. G.; and Diels, Gaston S. M., 4,839,374, Cl. 514-394.000.

Dierksmeier, Douglas D., to United States of America, Air Force. Quick disconnect duct coupler. 4,838,584, Cl. 285-419.000.

Diermayer, Werner; and Kutzner, Luitpold. Draft control arrangement for venting of combustion apparatus. 4,838,481, Cl. 236-1.00G.

Diesel Kiki Co., Ltd.: *See*—
Kurihara, Kazumasa; and Arai, Kenji, 4,838,397, Cl. 192-0.044.
Okano, Masami, 4,838,080, Cl. 73-119.00A.
Yasuma, Jun-ichi; Kobayashi, Tadashi; and Ishikawa, Masakuni, 4,839,509, Cl. 235-482.000.

Diffracto Ltd.: *See*—
Pryor, Timothy R., 4,838,696, Cl. 356-375.000.
Pryor, Timothy R., 4,839,526, Cl. 250-561.000.

Digital Equipment Corporation: *See*—
Flatley, Robert; and Hobson, David, 4,839,587, Cl. 324-158.00F
Hamburgen, William R., 4,839,774, Cl. 361-383.000.
Kukulinsky, David H., 4,839,611, Cl. 330-284.000.
Sankar, Nott G.; Pileeki, Victor T.; and Zahaykevich, George A., 4,839,497, Cl. 219-121.710.

Dill, Hans G.; and Lillington, David R., to Spectrolab, Inc. Controlled reflectance solar cell. 4,838,952, Cl. 136-256.000.

DiMargio, Nick A.: *See*—
Humble, Walter P.; Durkos, John C.; DiMargio, Nick A.; Cortell, Dominick J.; and Syak, Charles W., 4,838,523, Cl. 256-13.100.

DiMatteo, Paul; and Segnini, Robert, to Nova Technologies, Inc. Patient transfer arrangement. 4,837,872, Cl. 5-60.000.

DiMatteo, Paul; and Chubb, Charles F., to Med Bed Technologies, Inc. Reclinable wheelchair apparatus. 4,837,873, Cl. 5-81.00R.

Dinter, Peter, to Hoechst Aktiengesellschaft. Roll electrode and device for pretreating the surfaces of film webs by means of electrical corona discharge. 4,839,517, Cl. 250-325.000.

Dionex Corporation: *See*—
Tullsen, Thomas R., 4,839,788, Cl. 363-63.000.

Dionne, Arthur F.: *See*—
Orenstein, Richard A.; and Dionne, Arthur F., 4,839,416, Cl. 524-558.000.

Dischler, Louis, to Milliken Research Corporation. Fabric softening apparatus. 4,837,902, Cl. 26-1.000.

DiTomasso, Denise-Marie: *See*—
Mei-King Ng, Shirley; and DiTomasso, Denise-Marie, 4,839,157, Cl. 424-53.000.

Ditto Sales, Inc.: *See*—
Gutgsell, David R., 4,838,180, Cl. 108-132.000.

DiVito, Fred, to Lumex, Inc. Axilliary crutch. 4,838,291, Cl. 135-68.000.

Dobberpuhl, Dale R.; and Kruel, Edward C., to Deere & Company. Power take-off shaft stabilizer unit. 4,838,101, Cl. 74-15.630.

Dobson, Peter J., to U.S. Philips Corporation. Method of etching a semiconductor body. 4,838,987, Cl. 156-626.000.

Dr. Alois Stankiewicz GmbH: *See*—
Lohmar, Ernst; and Burak, Gerhard, 4,839,397, Cl. 521-159.000.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See*—
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Escamilla, Robert M.; Escamilla, Elias, III; Escamilla, Elias, Jr.; Johnson, Gregg E.; Arnold, Robert M.; and Tatner, Thomas, to Bakery Equipment and Service Co., Inc. Method and apparatus for forming and baking flat, thin discs of dough. 4,838,153, Cl. 99-349.000.
Escofier Technologie, S.A.: *See—*
Marcon, Charles; and Poullain, Jean, 4,838,066, Cl. 72-95.000.
Esguerra, Hernando: *See—*
Morankar, Sudhakar D.; Esguerra, Hernando; Kerevel, Patrice; and Hilgart, Michael J., 4,838,639, Cl. 350-96.200.
Eska Company, The: *See—*
Edwards, James R., 4,838,818, Cl. 440-6.000.
Eskandry, Ezra D.; and Weinberg, Eli. Automobile window shade convertible to horizontal expansion or vertical expansion. 4,838,335, Cl. 160-84.100.
ESPE Stiftung and Co. Produktions-und Vertriebs KG: *See—*
Herold, Wolf-Dietrich; Grafwallner, Karl L.; and Keller, Michael, 4,839,566, Cl. 31-308.000.
Essex Group, Inc.: *See—*
Justus, Paul E.; and Zaman, Mahammad F., 4,839,205, Cl. 428-34.100.
Lavallee, Francois A., 4,839,444, Cl. 525-381.000.
Phillips, James L., 4,839,818, Cl. 364-477.000.
Essilor International (Compagnie Generale d'Optique): *See—*
Dufour, Maurice, 4,838,674, Cl. 351-169.000.
Estee Lauder, Inc.: *See—*
Smith, Walter P., 4,839,164, Cl. 424-64.000.
Ethicon, Inc.: *See—*
Jamiolkowski, Dennis D.; Shalaby, Shalaby W.; Bezwada, Rao S.; and Newman, Hugh D., Jr., 4,838,267, Cl. 128-335.500.
Ethyl Corporation: *See—*
Indyke, David M., 4,839,398, Cl. 521-183.000.
Ethylene Corp.: *See—*
Sheridan, Michael; and Jaffe, Kenneth, 4,838,095, Cl. 73-864.630.
Etter, Margaret C.; Frankenbach, Gayle M.; and Panunto, Thomas W., to University of Minnesota, Regents of the. Optically nonlinear pyridine-N-oxide complexes. 4,839,536, Cl. 307-425.000.
Etudes et Fabrication: *See—*
Jour, Jean-Paul; Orban, Jacques; and Salvaire, Andre , 4,838,699, Cl. 366-2.000.
Eubanks Engineering Co.: *See—*
Cope, Richard L., 4,838,129, Cl. 81-9.500.
Eurafrica S.r.l.: *See—*
Righi, Nardino, 4,837,930, Cl. 30-47.000.
Europeenne de Retraitement de Catalyseurs Eurecat: *See—*
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Evans, Dix L.: *See—*
Harris, Lee M.; Evans, Dix L.; and Midwinter, Elizabeth A., 4,839,635, Cl. 340-752.000.
Evans, Steven; and Weber, Helmut, to Eastman Kodak Company. Alpha-cyano arylidene pyrazolone magenta dye-donor element for thermal dye transfer. 4,839,336, Cl. 503-227.000.
Evans, Thomas L.; and Berman, Carol B., to General Electric Company. Cyclic polycarbonate oligomers: inhibition of polymerization to linear polycarbonates. 4,839,462, Cl. 528-170.000.
Evans, William R.; Granitz, Richard F.; and Schmedding, George R., to AMP Incorporated. High density board to board interconnection system. 4,838,798, Cl. 439-61.000.
Even, Uzi J.: *See—*
Thompson, James C.; Even, Uzi J.; and Kim, Chi-Woo, 4,839,511, Cl. 250-211.00R.
Eveready Battery Company, Inc.: *See—*
Jones, Steven D.; and Blomgren, George E., 4,839,249, Cl. 429-194.000.
Evers, Johannes T.; and Berenbak, Robertus G., to DSM Resins B.V. Crystalline unsaturated polyester and the preparation thereof. 4,839,438, Cl. 525-440.000.
Excel Corporation: *See—*
Rainey, Frank W.; and Clement, Harvey R., 4,838,411, Cl. 198-774.000.
Extel Corporation: *See—*
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Exxon Chemical Patents Inc.: *See—*
Gutierrez, Antonio; and Kleist, Robert A., 4,839,070, Cl. 252-51.50A.
Gutierrez, Antonio; Lundberg, Robert D.; Kleist, Robert A.; and Bloch, Ricardo, 4,839,071, Cl. 252-51.50A.
Gutierrez, Antonio; and Kleist, Robert A., 4,839,072, Cl. 252-51.50A.
Gutierrez, Antonio; Emert, Jacob; Kleist, Robert A.; and Waddoups, Malcolm, 4,839,073, Cl. 252-51.50A.
Marsh, John F.; and Cleverley, John A., 4,839,094, Cl. 252-42.700.
McElrath, Kenneth O.; Robertson, Martha L.; and Chow, Wai Y., 4,839,422, Cl. 525-74.000.
Rossi, Albert; Tack, Robert; Lewtas, Kenneth; and Alves, Jose, 4,839,074, Cl. 252-56.00D.
Exxon Research and Engineering Company: *See—*
Halbert, Thomas R.; Stiefel, Edward I.; Chianelli, Russell R.; and Ho, Teh C., 4,839,326, Cl. 502-220.000.
Mayer, Francis X.; Lewis, William E.; Matula, Joseph P.; and Staubs, David W., 4,839,023, Cl. 208-50.000.
Schuette, William L.; and Pine, Lloyd A., 4,839,319, Cl. 502-64.000.
Trowbridge, Theodore D.; and Fung, Shun C., 4,839,320, Cl. 502-66.000.
Eyring Research Institute, Inc.: *See—*
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F & L Reserach Development and Manufacturing Co.: *See—*
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Fabisiewicz, Eugene; and Fagan, Jack R., to Baxter International Inc. Flexible thermoplastic pouches having easy-open tear strip means and apparatus for making same. 4,838,429, Cl. 206-605.000.
Fael S.A.: *See—*
Schreiber, Peter; and Richner, Michel, 4,838,473, Cl. 228-45.000.
FAG Kugelfischer Georg Schafer (KGaA): *See—*
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Fagan, Jack R.: *See—*
Fabisiewicz, Eugene; and Fagan, Jack R., 4,838,429, Cl. 206-605.000.
Fagard, Pierre, to Societe Francaise d'Equipements pour la Navigation Aerienne (S.F.E.N.A). Display device with a dissociable structure, particularly for aircraft. 4,838,647, Cl. 350-174.000.
Fairchild Semiconductor Corporation: *See—*
Phy, William S.; Early, James M.; and Negus, Kevien J., 4,839,717, Cl. 357-74.000.
Fairchild Weston Systems, Inc.: *See—*
Balopole, Harvey L.; Martinolich, James J.; Roberts, Arthur; and Sadowski, Henry W., 4,839,726, Cl. 358-166.000.
Faller, Kurt: *See—*
Ackermann, Ulrich; Faller, Kurt; Guzek, Krzysztof; and Meier, Arnold, 4,839,482, Cl. 200-148.00B.
Fan, John C. C.: *See—*
Gale, Ronald P.; and Fan, John C. C., 4,839,145, Cl. 422-245.000.
Fanta, George F.; and Otey, Felix H., to United States of America, Agriculture. Moisture-shrinkable films from starch graft copolymers. 4,839,450, Cl. 527-313.000.
Faridi, Hamed A.: *See—*
Finley, John W.; and Faridi, Hamed A., 4,838,081, Cl. 73-169.000.
Farkas nee Kirjak, Maria: *See—*
Kreidl, Janos; Visky, Gyorgy; Czibula, Laszlo ; Stefko, Bela; Farkas nee Kirjak, Maria; Szombathelyi, Zsolt; Karpati, Egon; Kiss, Bela; Csomor, Katalin; Szporny, Laszlo ; Forgacs, Lilla; Kuthi, Csaba; and Gere, Aniko , 4,839,362, Cl. 514-283.000.
Farmer, Lawrence R.: *See—*
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Farmitalia Carlo Erba: *See—*
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Farmitalia Carlo Erba S.p.A.: *See—*
Bargiotti, Alberto; Bordoni, Teresa; Zini, Pierangelo; and Penco, Sergio, 4,839,346, Cl. 514-34.000.
Farnham, Robert E.; and Prill, Fredric W., to Barber-Greene Company. Safety back-up for metering pump control. 4,839,571, Cl. 340-606.000.
Farzin-Nia, Farrokh: *See—*
Reher, James F.; and Farzin-Nia, Farrokh, 4,838,786, Cl. 433-9.000.
Fazis, Hermann, to Ludwig Boschert GmbH & Co. KG. Driving unit for mandrels and the like. 4,838,725, Cl. 403-322.000.
Federal Paper Board Company, Inc.: *See—*
Blackman, Stephen M., 4,838,414, Cl. 206-175.000.
Fedorov, Svyatoslav N.; Egorova, Eleonora V., Strusova, Natalya A.; Glazko, Viktor I.; and Trubilin, Vladimir N. Intraocular prosthetic lens. 4,838,890, Cl. 623-6.000.
Fender, Ronald V. Rain water receiving apparatus with dumping feature. 4,837,987, Cl. 52-11.000.
Fennema, Alan A., to International Business Machines Corporation. Track seeking using a track following loop. 4,839,876, Cl. 369-32.000.
Ferenczi, Gyorgy: *See—*
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Fergason, James L., to Manchester R & D Partnership. Colored encapsulated liquid crystal apparatus using enhanced scattering. 4,838,660, Cl. 350-339.00F.

Ferrada, Stephen, to Daimler-Benz Aktiengesellschaft. Display for displaying the velocity of a vehicle and the rotational speed of the vehicle engine. 4,838,076, Cl. 73-489.000.
Feser, Winfried, to FAG Kugelfischer Georg Schafer (KGaA). Sliding sleeve of a clutch of an automotive vehicle. 4,838,402, Cl. 192-98.000.
Feuling, James J. Curved intake duct having improved flow characteristics. 4,838,219, Cl. 123-188.00M.
Feygenson, Anatoly: *See—*
Easter, William G.; and Feygenson, Anatoly, 4,839,309, Cl. 437-160.000.
Fiat Auto S.p.A.: *See—*
Masoero, Marco; and Garrone, Angelo, 4,838,603, Cl. 296-180.100.
Fibiger, Richard F.: *See—*
Davis, Thomas E.; Schmidt, Donald L.; Kau, Jee I., Wessling, Ritchie A.; Whipple, Sharon S.; Fibiger, Richard F.; and Pickelman, Dale M., 4,839,203, Cl. 427-244.000.
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Billiet, Colin T.; Fielding, Robert M.; and Smith, Stephen N., 4,838,905, Cl. 55-486.000.
Fields, Gary C.; and Stamos, Mark E., to Conway Engineering, Inc. Telephone toll integrity checking system. 4,839,916, Cl. 379-13.000.
Figard, Joseph E.: *See—*
Hoover, Kenneth C.; Sherk, Fred T.; and Figard, Joseph E., 4,839,411, Cl. 524-424.000.
Filz, Friedrich, to Miba Sintermetall Aktiengesellschaft. Process of making a sintered molding. 4,839,138, Cl. 419-6.000.
Finch, Maurice, to Henley Burrowes & Company Limited. Storage bunker. 4,838,750, Cl. 414-300.000.
Finkbeiner, Werner, to Hans Grohe GmbH & Co. KG. Shower head. 4,838,486, Cl. 239-117.000.
Finley, John W.; and Faridi, Hamed A., to Nabisco Brands, Inc. Method and apparatus for improving the reliability for dough testing results. 4,838,081, Cl. 73-169.000.
Finnerty, John D.: *See—*
Roberts, Peter A.; and Finnerty, John D., 4,839,804, Cl. 364-408.000.
Fioravanti, Pietro, to P.F.M. S.p.a. Device for sealing envelopes made of plastic. 4,838,981, Cl. 156-515.000.
Fiori, David, Jr., to Sensor Technologies, Inc. Musical keyboard. 4,838,139, Cl. 84-1.100.
Firestone Tire & Rubber Company, The: *See—*
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Fischer, Ernest A.: *See—*
Young, John D.; and Fischer, Ernest A., 4,838,184, Cl. 110-346.000.
Fischer, Erwin C. Containerized fuel fireplace insert. 4,838,781, Cl. 431-125.000.
Fischer, Montie R. Multipiece cable testing device which functions as flashlight, continuity checker, and cable identifier. 4,839,599, Cl. 324-542.000.
Fisher, Stanley C., Administrator: *See—*
Groshong, Leroy E.; Groshong, Judson C.; and Brawn, R. James, deceased, 4,838,860, Cl. 604-152.000.
Fissler GmbH: *See—*
Wolf, Kurt; and Andre, Wolfram K., 4,839,503, Cl. 219-497.000.
Flaherty, William J. Convertible pump system. 4,838,768, Cl. 417-308.000.
Flambeau Corporation: *See—*
Lanius, Charles A., 4,838,445, Cl. 220-22.300.
Flament, Gerard, to Charbonnages De France. Fluid fuel combustion process and turbulent-flow burner for implementing same. 4,838,185, Cl. 110-347.000.
Flanders, Thomas E.: *See—*
Beakley, Bruce E.; and Flanders, Thomas E., 4,839,543, Cl. 310-12.000.
Flanhardt, Michael; and Coenen, Karl, to Jean Walterscheid GmbH. Bevel gear angle drive. 4,838,108, Cl. 74-417.000.
Flank, Hans P.; and Staehr, Peter R., to Gambro Lundia AB. Fluid monitor system. 4,838,865, Cl. 604-118.000.
Flatley, Robert; and Hobson, David, to Digital Equipment Corporation. Test fixture for tab circuits and devices. 4,839,587, Cl. 324-158.00F.
Fleming, Stephen D.; and Lane, Martyn G., to Ford Motor Company. Mounting arrangement for a vehicle bumper. 4,838,593, Cl. 293-126.000.
Flexline Services Ltd.: *See—*
de Jager, Gui G., 4,839,199, Cl. 427-185.000.
Floyhar, Eric M., to F & L Reserach Development and Manufacturing Co. Electrical bingo game board. 4,838,557, Cl. 273-237.000.
Fluocon Technologies Inc.: *See—*
Rahn, Armin, 4,838,476, Cl. 228-180.100.
FMC Corporation: *See—*
Mineart, Michael V., 4,838,623, Cl. 305-58.0PC.
Focke & Co.: *See—*
Focke, Heinz; and Oertel, Wolfgang, 4,838,846, Cl. 493-132.000.
Focke, Heinz; and Oertel, Wolfgang, to Focke & Co. Apparatus for coating glue onto packaging blanks. 4,838,846, Cl. 493-132.000.
Fogt, G. Stephen: *See—*
Bradt, L. Jack; Brown, Robert L.; Fogt, G. Stephen; Laroy, Ron; Lewis, Allen R.; and Love, James S., 4,839,505, Cl. 235-381.000.
Fohl, Artur, to TRW (Repa) GmbH. Cable braking member for the drive of a safety belt retightener. 4,838,499, Cl. 242-107.000.
Fong, James J., to Minnesota Mining and Manufacturing Company. One part moisture curable urethane composition. 4,839,455, Cl. 528-28.000.
Fonsalas, Frederic, to U.S. Philips Corporation. Signal transient improvement arrangement. 4,839,836, Cl. 364-582.000.
Force 4 Enterprises Inc.: *See—*
Ouellet, George, 4,838,540, Cl. 272-1.00B.
Ford, Glen M.: *See—*
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Ford Motor Company: *See—*
Abromeit, Gerhard, 4,838,227, Cl. 123-419.000.
Baraszu, Robert C., 4,838,574, Cl. 280-707.000.
Fleming, Stephen D.; and Lane, Martyn G., 4,838,593, Cl. 293-126.000.
Mourray, Jack W.; and Nagy, James P., 4,838,393, Cl. 188-284.000.
Ford New Holland, Inc.: *See—*
Koch, Earl E., deceased; Voler, Franja F.; and Howell, Edmund O., 4,838,014, Cl. 56-13.600.
Ford, Thomas R. Bicycle. 4,838,569, Cl. 280-275.000.
Fore, Don C. Respiration monitor. 4,838,279, Cl. 128-721.000.
Forestier, Serge; and Mahieu, Claude, to L'Oreal. Polymers capable of absorbing ultraviolet radiation, their preparation and their use in cosmetic compositions. 4,839,160, Cl. 424-59.000.
Forgacs, Lilla: *See—*
Kreidl, Janos; Visky, Gyorgy; Czibula, Laszlo ; Stefko, Bela; Farkas nee Kirjak, Maria; Szombathelyi, Zsolt; Karpati, Egon; Kiss, Bela; Csomor, Katalin; Szporny, Laszlo ; Forgacs, Lilla; Kuthi, Csaba; and Gere, Aniko , 4,839,362, Cl. 514-283.000.
Forgar, Monica; and Bjornson-Ljungblom, Kerstin, to Molnlycke AB. Tape for securing a hypodermic needle. 4,838,868, Cl. 604-180.000.
Forkner, John F., to Baxter International, Inc. Dual-view arthroscope. 4,838,247, Cl. 128-6.000.
Formula Systems Limited: *See—*
Trett, John; and Bradbeer, Peter F., 4,839,605, Cl. 328-146.000.
Forrest, Ian S.; Seaton, James C.; and Moir, Michael, to Scottish & Newcastle Breweries p/c. Method of enhancing the bitterness of beer. 4,839,189, Cl. 426-600.000.
Fort Lock Corporation: *See—*
Hutzenlaub, John T., 4,838,060, Cl. 70-491.000.
Fortune, David J., to GIB Precision Limited. Torque limiting clutch. 4,838,400, Cl. 192-56.00R.
Forward, John E.: *See—*
Kramer, William E.; Forward, John E.; and Tracy, Michael J., 4,838,497, Cl. 242-67.200.
Foseco International Limited: *See—*
Gray, Adrian L., 4,838,336, Cl. 164-4.100.
Foster, Charles H.: *See—*
Bowers, Cyril Y.; Momany, Frank A.; Chang, Ching H.; Cody, Wayne L.; Hubbs, John C.; and Foster, Charles H., 4,839,344, Cl. 514-16.000.
Foster, Donald D.: *See—*
Moore, David G.; and Foster, Donald D., 4,838,460, Cl. 222-153.000.
Foster, Ruth E.: *See—*
Anderson, Robert K.; Foster, Ruth E.; and Levine, Jeffrey A., 4,838,206, Cl. 119-130.000.
Fowler, Peter H. Temperature measuring. 4,839,519, Cl. 250-390.010.
Fox, Albert H.; and Johansson, Ronald C., to Minnesota Mining and Manufacturing Company. Waterproof electrical splice enclosure. 4,839,473, Cl. 174-138.00F.
Fraas, Lewis M.; McLeod, Paul S.; and Cape, John A., to Daido Sanso K. K. Apparatus and process for vacuum chemical epitaxy. 4,838,201, Cl. 118-719.000.
Francis, Colin R.; and Giller, Wojciech W. Electrical devices. 4,839,562, Cl. 315-149.000.
Franck, Timothy D.: *See—*
Berkeley, James E.; and Franck, Timothy D., 4,837,982, Cl. 51-165.900.
Frank, Frank: *See—*
Hahn, Andreas; Wondrazek, Fritz; and Frank, Frank, 4,838,246, Cl. 128-6.000.
Frankenbach, Gayle M.: *See—*
Etter, Margaret C.; Frankenbach, Gayle M.; and Panunto, Thomas W., 4,839,536, Cl. 307-425.000.
Franklin, Eustace B. Recorded voice warning system for providing safety alerts and personal messages. 4,839,749, Cl. 360-12.000.
Franko, Robert J.: *See—*
Wheeler, Edward L.; and Franko, Robert J., 4,839,188, Cl. 426-545.000.
Franz, Peter H., to Techmix, Inc. Composition for treating dehydration. 4,839,347, Cl. 514-53.000.
Fraunhofer Gesellschaft zur Forderung: *See—*
Betz, Hans; Mader, Herman; and Pelka, Joachim, 4,838,694, Cl. 356-357.000.
Freedman, Henry B. Automated printing control system. 4,839,829, Cl. 364-519.000.
Freeman, Clarence S. Air conditioner dryer utilizing water-encapsulating polymers. 4,838,040, Cl. 62-475.000.
Freeman, David L.; Reckley, Mark G.; and Harville, Donald G., to Western Atlas International, Inc. Method for quantitative analysis of core samples. 4,839,516, Cl. 250-255.000.
Freitag, Helmut; Steinbiss, Joachim; and Rothe, Anselm, to Boehringer Mannheim GmbH. Test carrier and method for the analytical determination of a component of a body fluid. 4,839,297, Cl. 436-170.000.
French, Kendrick L., to K. W. Thompson Tool Company, Inc. Mold for hollow point bullet. 4,838,339, Cl. 164-340.000.

Freudendahl, Jan, to JF-Fabriken - J. Freudendahl A/S. Coupling device for connecting a wheeled field implement to a tractor. 4,838,358, Cl. 172-125.000.

Frey, Michael: *See*—
Liebl, Rainer; Frey, Michael; Mildenberger, Hilmar; Bauer, Klaus; and Bieringer, Hermann, 4,838,931, Cl. 71-94.000.

Fricker, Siegfried. Panel anchoring device. 4,838,507, Cl. 248-230.000.

Fricker, Siegfried. Method and apparatus for making an undercut drilled hole in a fixed base. 4,838,742, Cl. 409-131.000.

Fridman, Vladimir: *See*—
Zawodny, Arthur; and Fridman, Vladimir, 4,839,678, Cl. 354-217.000.

Friedle, Dennis J.; Kolb, Richard P.; and Lieb, M. Jeremy, to Outboard Marine Corporation. Shift linkage for marine propulsion device. 4,838,822, Cl. 440-86.000.

Friedman, Robert J.: *See*—
Dormond, Kenneth; and Friedman, Robert J., 4,839,822, Cl. 364-513.000.

Friedrich, Pawel; Placzek, Wieslaw; Mynarz, Leszek; Karpinski, Krzysztof; Gaszewski, Jerzy; and Tarasiuk, Tadeusz, to Instytut Chemii Przemyslowej. Method and a fastener for closing and sealing pipes subjected to internal pressure. 4,838,075, Cl. 73-49.800.

Frigerio, Marco: *See*—
Gandolfi, Carmelo A.; Frigerio, Marco; Spinelli, Silvano; Tofanetti, Odoardo; and Tognella, Sergio, 4,839,348, Cl. 514-89.000.

Frindel, Sebastien; and Mimeur, Jacques, to Alcatel Cit. Valve for a vacuum enclosure. 4,838,520, Cl. 251-204.000.

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Fritz, Bernard S.: *See*—
Torok, Ernest J.; Krawczak, John A.; Fritz, Bernard S.; and Harvey, William A., 4,838,637, Cl. 350-96.180.

Fritz Fuss KG: *See*—
Fuss, Fritz H., 4,838,591, Cl. 292-341.160.

Froebel, Gerd; and Stang, Hans W., to Alpha Grillo-Lotsysteme GmbH. Halogen-free flux mixture and use thereof. 4,838,478, Cl. 228-223.000.

Frogbrook, Kenneth H. L.; and Meek, Nigel W., to Frogbrook, Kenneth H. L. Baling machines and baled products. 4,838,016, Cl. 56-341.000.

Frolov, George, to Emhart Industries, Inc. Card reader. 4,839,508, Cl. 235-477.000.

Fruengel, Frank, to Impulsphysik GmbH. Arrangement for in situ determination of quantity of turbid matter aerosol and/or dust in fluid which flows through a space. 4,839,529, Cl. 250-574.000.

Frulla, Claudio: *See*—
Baranzelli, Cesare; Frulla, Claudio; and Gattolin, Dario, 4,838,561, Cl. 279-1.0DA.

Fudge, Alva L.: *See*—
Chriske, Eugene; Leno, Theodore, Jr.; and Fudge, Alva L., 4,838,178, Cl. 108-55.100.

Fuglistaller, Cornel; Keller, Jakob; and Sattelmayer, Thomas, to BBC Brown Boveri AG. Dual burner facility with a fuel oil atomizer. 4,838,783, Cl. 431-284.000.

Fuhrer, Jean-Claude: *See*—
Baltz, Rainier; and Fuhrer, Jean-Claude, 4,839,888, Cl. 370-68.100.

Fuhrer, Wolfgang; Kuhle, Engelbert; Adler, Alfons; and Hanssler, Gerd, to Bayer Aktiengesellschaft. Trisubstituted 1,3,5-triazine-2,4,6-triones. 4,839,359, Cl. 514-241.000.

Fuji Electric Co., Ltd.: *See*—
Takabayashi, Yasuhiro, 4,839,246, Cl. 429-12.000.
Takabayashi, Yasuhiro, 4,839,574, Cl. 320-3.000.
Takahama, Teizo; Masuda, Masahiko; Sugimoto, Keisuke; and Sugiyama, Yuji, 4,839,019, Cl. 204-425.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Mutoh, Naoto; and Ojima, Juji, 4,838,840, Cl. 474-138.000.
Sakai, Yasuhito; and Iijima, Yoichi, 4,838,836, Cl. 474-28.000.

Fuji Oil Company, Limited: *See*—
Sagi, Nobuo; Izumi, Tsugio; Kida, Haruyasu; and Maeda, Hirokazu, 4,839,192, Cl. 426-607.000.

Fuji Photo Film Co., Ltd.: *See*—
Bando, Shinsuki, 4,839,268, Cl. 430-567.000.
Fujiwara, Yasuo, 4,839,747, Cl. 358-342.000.
Harada, Toru; Saito, Naoki; and Sato, Kozo, 4,839,333, Cl. 503-218.000.
Honjoh, Akira, 4,839,758, Cl. 360-99.060.
Ikeda, Kensuke; Yanagihara, Naoto; and Iwakura, Ken, 4,839,332, Cl. 503-212.000.
Ishiguro, Minoru; and Takahashi, Minoru, 4,839,685, Cl. 354-403.000.
Kamiyama, Kozi; and Okazaki, Yoji, 4,839,638, Cl. 350-96.190.
Katoh, Kazunobu, 4,839,258, Cl. 430-264.000.
Kubota, Kazuo; and Sakaguchi, Masaaki, 4,839,496, Cl. 242-67.10R.
Kushima, Hiroshi; and Ishizaka, Hideo, 4,839,683, Cl. 354-322.000.
Matsufuji, Akihiro; and Komine, Shigeo, 4,839,225, Cl. 428-336.000.
Nakamura, Shigeru; Minoda, Minoru; and Shiba, Keisuke, 4,839,257, Cl. 430-207.000.
Ohmatsu, Hideki; and Hirai, Hiroyuki, 4,839,272, Cl. 430-617.000.
Ohno, Shigeru; Mihara, Yuji; and Adachi, Keiichi, 4,839,265, Cl. 430-522.000.
Okazaki, Masaki; and Yamanouchi, Junichi, 4,839,269, Cl. 430-570.000.
Ono, Masaru, 4,839,825, Cl. 364-518.000.
Sasaoka, Senzo; Inoue, Nobuaki; and Okutsu, Eiichi, 4,839,259, Cl. 430-264.000.
Terashima, Kaoru; Miyazako, Takushi; and Katsuyama, Harumi, 4,839,278, Cl. 435-21.000.
Yamada, Minoru; Toyoda, Takashi; and Seto, Kunio, 4,839,273, Cl. 430-634.000.

Fujii, Hiroyuki; Kudo, Takamichi; Furukawa, Haruhiko; and Yamamoto, Nobusuke, to Chisso Corporation. Thermoplastic resin composition for cleaning. 4,838,945, Cl. 134-7.000.

Fujikawa, Yasuji: *See*—
Kume, Tadaaki; Saijo, Yoshihiro; and Fujikawa, Yasuji, 4,838,847, Cl. 493-133.000.

Fujikura, Yoshiaki; Kitsuki, Tomohito; Fujita, Manabu; and Toi, Nao, to Kao Corporation. Bornane-3-spiro-1'-cyclopentane derivatives and perfumery compositions containing them. 4,839,340, Cl. 512-9.000.

Fujimori, Kenichi: *See*—
Murata, Tadaichi; Isomura, Tsuneo; Fujimori, Kenichi; Tsuruta, Fuminori; Dohi, Kazuhito; Horigome, Masahiro; Nakayama, Yoshitarou; and Oomori, Sachio, 4,839,252, Cl. 430-59.000.

Fujimoto, Akihiko, to Mitsubishi Denki Kabushiki Kaisha. Numerically controlled apparatus including shunting controller. 4,839,817, Cl. 364-474.320.

Fujimoto, Tatsuo; and Ohya, Tsutomu, to Tokyo Gas Co., Ltd. Gas accident preventive unit. 4,839,790, Cl. 364-184.000.

Fujino, Kouji: *See*—
Hamada, Takeaki; Okada, Akio; Abe, Kiyoshi; Udagawa, Katsuhiro; Okazaki, Fumitoshi; and Fujino, Kouji, 4,837,877, Cl. 5-10.00B.

Fujishima, Kazuyasu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device comprising programmable redundancy circuit. 4,839,864, Cl. 365-200.000.

Fujita, Haruo: *See*—
Sugahara, Keishin; Imamura, Takayuki; Hamada, Fukusaburo; Ohtomo, Nobuya; Fujita, Haruo; and Yagami, Kazuhide, 4,839,277, Cl. 435-7.000.

Fujita, Manabu: *See*—
Fujikura, Yoshiaki; Kitsuki, Tomohito; Fujita, Manabu; and Toi, Nao, 4,839,340, Cl. 512-9.000.

Fujita, Mitsuo: *See*—
Yoshino, Syuji; Makino, Satoshi; Fujita, Mitsuo; and Shimizu, Yukio, 4,839,204, Cl. 428-358.000.

Fujita, Sanae: *See*—
Masamizu, Koji; Hirokawa, Shinya; and Fujita, Sanae, 4,839,395, Cl. 521-56.000.

Fujita, Yoshihiro: *See*—
Ando, Fumihiko; Kumada, Junji; Fujita, Yoshihiro; Yamada, Hidetoshi; and Nakamura, Kazuhiko, 4,839,729, Cl. 358-213.160.

Fujitani, Hitoshi: *See*—
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Fujitsu Limited: *See*—
Kawashima, Masato; and Hashizume, Kyohei, 4,839,694, Cl. 355-208.000.
Sato, Kimiaki; and Khono, Tool, 4,839,868, Cl. 365-230.060.

Fujitsuka, Masashi, to Mitsubishi Denki Kabushiki Kaisha. Turbocompressor system and method for controlling the same. 4,838,020, Cl. 60-39.070.

Fujiura, Yoshitsugu, to AMP Incorporated. Shielded electrical connector and latch mechanism therefor. 4,838,808, Cl. 439-357.000.

Fujiwaka, Kensuke: *See*—
Sasakawa, Kazumasa; Nishimura, Hisao; and Fujiwaka, Kensuke, 4,838,544, Cl. 272-73.000.

Fujiwara, Yasuo, to Fuji Photo Film Co., Ltd. Image processing method and apparatus. 4,839,747, Cl. 358-342.000.

Fujiyasu, Takeshi: *See*—
Taniguchi, Isao; Yasukouchi, Kazuo; Tsuji, Ichiroh; and Fujiyasu, Takeshi, 4,839,017, Cl. 204-403.000.

Fukatsu, Shunzo: *See*—
Atsumi, Kunio; Sakagami, Kenji; Yamamoto, Yuichi; Yoshida, Takashi; Nishihata, Ken; Kondo, Shinichi; and Fukatsu, Shunzo, 4,839,350, Cl. 514-202.000.

Fukatsu, Yasuo: *See*—
Omizono, Hitoshi; Sasaki, Hiroshi; Fukatsu, Yasuo; Ota, Saburo; and Ueda, Yoshio, 4,837,995, Cl. 52-223.00L.

Fukaya, Seiryo; Takano, Mitsuyoshi; and Amamoto, Narushi, to Anritsu Corporation. Signal analyzer apparatus with automatic frequency measuring function. 4,839,582, Cl. 324-77.00B.

Fukaya, Seiryo: *See*—
Takano, Mitsuyoshi; and Fukaya, Seiryo, 4,839,583, Cl. 324-77.00B.

Fukizawa, Kazunori; Higuchi, Mitsushi; and Namiki, Kunio, to Nagoyo Screw Mfg. Co., Ltd.; Daido Tokushuko Kabushiki Kaisha; and Honda Giken Kogyo Kabushiki Kaisha. Method of manufacturing high strength blank a bolt. 4,838,961, Cl. 148-12.400.

Fukuda, Kyohei: *See*—
Hunahata, Katuyuki; Nagae, Yoshiharu; Takasaka, Masahiro; Mori, Yuji; Hoshino, Minoru; Kozima, Yasuyuki; Saito, Youhei; Fukuda, Kyohei; Kozai, Hayao; Hasimoto, Tadahiko; and Tsuchihashi, Yoshiaki, 4,838,655, Cl. 350-335.000.

Fukuda, Nobutoshi; Tanabe, Masashi; Furuta, Yoshiki; Nagao, Tatsuro; Arifuku, Naoto; and Yamamisaka, Shinichi, to Pioneer Electronics Corporation. Signal level display device for recording/reproducing apparatus. 4,839,584, Cl. 324-103.00P.

Fukui, Yoshiharu; Kuroda, Kazuhisa; Ishii, Tamaki; and Sasaki, Manji, to Sumitomo Chemical Company, Limited. Stabilized polyolefin composition. 4,839,408, Cl. 524-100.000.

Fukumoto, Hiroshi: *See*—
Kan, Fumitaka; Arahara, Kohzoh; Tohyama, Noboru; Yuasa, Toshiya; and Fukumoto, Hiroshi, 4,838,940, Cl. 106-22.000.

Fukumura, Kagenori: *See*—
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Fukunaga, Shinichi: *See*—
Uchida, Yoshihiko; Kuroda, Kotaro; Kusano, Akihiko; and Fukunaga, Shinichi, 4,839,317, Cl. 501-108.000.

Fukuoka, Daisuke: *See*—
Takematsu, Tetsuo; Fukuoka, Daisuke; Takahashi, Katsuya; and Hashimoto, Isao, 4,838,924, Cl. 71-88.000.

Fukuoka, Hideyuki: *See*—
Kobayashi, Kazutomo; and Fukuoka, Hideyuki, 4,839,891, Cl. 370-94.000.

Fukushima, Toshitaka: *See*—
Sakami, Yasuo; Okina, Shigetaka; Tsubouchi, Junichi; Izaki, Shozo; Fukushima, Toshitaka; Watanabe, Hiroyuki; and Ishizaki, Masao, 4,839,854, Cl. 364-900.000.

Fuller, Robert L., Jr., to Boeing Company, The. Drill bit sharpening apparatus. 4,837,983, Cl. 51-215.0AR.

Fulton, Joe A.: *See*—
Dentini, Mark S.; Fulton, Joe A.; Jin, Sungho; Mottine, John J., Jr.; Shepherd, Lloyd; and Sherwood, Richard C., 4,838,347, Cl 165-185.000.

Fung, Shun C.: *See*—
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Furcht, Leo T.: *See*—
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Furnas, George W.: *See*—
Deerwester, Scott C.; Dumais, Susan T.; Furnas, George W.; Harshman, Richard A.; Landauer, Thomas K.; Lochbaum, Karen E.; and Streeter, Lynn A., 4,839,853, Cl. 364-900.000.

Furrer, Fredrick J.: *See*—
Lemme, Charles D.; and Furrer, Fredrick J., 4,838,394, Cl. 188-299.000.

Furubayashi, Tadashi; Yamada, Kazuo; and Fujitani, Hitoshi, to Nissan Motor Co., Ltd.; and Yamato Kogyo Co., Ltd. Door guard bar. 4,838,606, Cl. 296-188.000.

Furukawa, Haruhiko: *See*—
Fujii, Hiroyuki; Kudo, Takamichi; Furukawa, Haruhiko; and Yamamoto, Nobusuke, 4,838,945, Cl. 134-7.000.

Furukawa, Yuuji: *See*—
Okada, Tadashi; Furukawa, Yuuji; and Murata, Makoto, 4,838,120, Cl. 74-711.000.

Furumoto, Mitsumasa: *See*—
Yamamoto, Noboru; Furumoto, Mitsumasa; Kawahara, Eiichiro; and Ikehjiri, Kenichi, 4,838,024, Cl. 60-488.000.

Furushima, Tokihito: *See*—
Hirata, Keiiti; Morimoto, Yoshinari; Ban, Tomohiro; Furushima, Tokihito; Miura, Tomoko; and Ikeda, Yoshie, 4,839,827, Cl. 364-518.000.

Furuta, Yoshiki: *See*—
Fukuda, Nobutoshi; Tanabe, Masashi; Furuta, Yoshiki; Nagao, Tatsuro; Arifuku, Naoto; and Yamamisaka, Shinichi, 4,839,584, Cl. 324-103.00P.

Furuta, Youichi; Ando, Masamoto; Takeuchi, Hiroaki; Noguchi, Noboru; and Nakanishi, Nobuyasu, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Anti-skid apparatus for an automotive vehicle. 4,838,621, Cl. 303-115.000.

Furuya, Takashi: *See*—
Sakakibara, Shiro; Miyaishi, Yoshinori; and Furuya, Takashi, 4,838,844, Cl. 474-240.000.

Furuyama, Tateki: *See*—
Atomori, Seiichi; Inagaki, Teruo; Furuyama, Tateki; and Kamiya, Akira, 4,839,410, Cl. 524-281.000.

Fuss, Fritz H., to Fritz Fuss KG. Electric door opener. 4,838,591, Cl. 292-341.160.

Fye, Donald M., to GTE Laboratories Incorporated. Method of making an external-coupled-cavity diode laser. 4,839,308, Cl. 431-129.000.

G-C Dental Industrial Corp.: *See*—
Tanaka, Hisatoshi; and Abiru, Masao, 4,838,789, Cl. 433-171.000.

G & D Whirlwind Inc.: *See*—
McMaster, Galen M.; and Sunderman, Donald W., 4,838,703, Cl. 366-169.000.

Gage, Douglas M., to Deere & Company. Secondary hydraulic steering system. 4,838,314, Cl. 137-625.240.

Gagne, Serge G. Automatic skylight actuator. 4,837,986, Cl. 52-1.000.

Gagnoud, Annie: *See*—
Paillere, Patrick; Alheritiere, Edouard; Garnier, Marcel; Dnole, Jean; and Gagnoud, Annie, 4,838,933, Cl. 75-10.140.

Gajda, Joseph J.; Srikrishnan, Kris V.; Totta, Paul A.; and Trudeau, Francis G., to International Business Machines Corporation. Chip contacts without oxide discontinuities. 4,839,715, Cl. 357-71.000.

Gal, Laszlo V.; Arraut, Fernando W.; and Khosravi, Christopher H., to Unisys Corporation. Synchronizer having dual feedback loops for avoiding intermediate voltage errors. 4,839,541, Cl. 307-481.000.

Galant, Jean-Claude: *See*—
Mouret, Patrick; and Galant, Jean-Claude, 4,838,015, Cl. 56-15.700.

Gale, Ronald P.; and Fan, John C. C., to Massachusetts Institute of Technology. Chemical vapor deposition reactor. 4,839,145, Cl. 422-245.000.

Gallagher, Francis E. Anti-thief key lock for vending machines. 4,838,055, Cl. 70-208.000.

Gallagher, Thomas A., to Van Dorn Company. Method for forming a metal cylindrical container. 4,839,491, Cl. 219-117.100.

Galler, Francis A., to Charles Stark Draper Laboratory, Inc., The. Negative resistance device local extremum seeking circuit. 4,839,832, Cl. 364-552.000.

Galli, Roberto; and Kvita, Petr, to Ciba-Geigy Corporation. Process for the preparation of concentrated aqueous dye formulations by desalination and concentration by membrane separation in presence of sodium salt. 4,838,895, Cl. 8-527.000.

Gallmeister, Rolf-Dieter: *See*—
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Gallucci, Robert R., to General Electric Company. Misciblizing blends of polycarbonate and styrene copolymers. 4,839,426, Cl. 525-146.000.

Gambro Lundia AB: *See*—
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Gami, Bipin V.; and Dunstan, Ericson, to Micropolis Corporation. Winchester disk drive motor circuitry. 4,839,754, Cl. 360-73.010.

Gandolfi, Carmelo A.; Frigerio, Marco; Spinelli, Silvano; Tofanetti, Odoardo; and Tognella, Sergio, to Boehringer Biochemia Robin S.p.A. 1,4-dihydropyridines. 4,839,348, Cl. 514-89.000.

Gannaway, Edwin L., to Tecumseh Products Company. High side scotch yoke compressor. 4,838,769, Cl. 417-312.000.

Ganser, Hans G.; Schafer, Ralf; and Stormberg, Hans P., to U.S. Philips Corporation. Heatable electrode for high-pressure gas discharge lamps. 4,839,560, Cl. 313-628.000.

Ganser-Hydromag: *See*—
Ganser, Marco A., 4,838,231, Cl. 123-467.000.

Ganser, Marco A., to Ganser-Hydromag. Electronically controlled fuel injection system. 4,838,231, Cl. 123-467.000.

Garcia, E. C.: *See*—
Smith, D. W.; Kennedy, R. D.; and Garcia, E. C., 4,838,701, Cl. 366-136.000.

Gardner, Peter A., to International Business Machines Corporation. Current-controlling circuit. 4,839,577, Cl. 323-316.000.

Garnier, Marcel: *See*—
Paillere, Patrick; Alheritiere, Edouard; Garnier, Marcel; Driole, Jean; and Gagnoud, Annie, 4,838,933, Cl. 75-10.140.

Garrison, James R.: *See*—
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Garrone, Angelo: *See*—
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Garth, Simon C. J. Production of pulsed electron beams. 4,839,520, Cl. 250-396.00R.

Gasc, Jean-Claude: *See*—
Vevert, Jean-Paul; Delevallee, Francoise; Gasc, Jean-Claude; and Petit, Francis, 4,839,358, Cl. 514-237.800.

Gaskin, Matthew J., to Morse Boulger, Inc. Superheater unit of a steam generating system. 4,838,212, Cl. 122-392.000.

Gaskin, Matthew J.: *See*—
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Gast Manufacturing Corporation: *See*—
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Gaszewski, Jerzy: *See*—
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Gates Rubber Company, The: *See*—
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Gattolin, Dario: *See*—
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Gatzen, Hans-Heinrich O. P., to Seagate Technology, Inc. Magnetic head for perpendicular magnetic recording system. 4,839,761, Cl. 360-103.000.

Gauthier, Georges. Surgical fastening clip. 4,838,254, Cl. 128-92.0YF.

Gauthier, Maurice, to Cofpa. Conveyor belt constituted by plastic spirals. 4,839,213, Cl. 428-114.000.

Gavin, Norman. Septic tank distribution box system. 4,838,731, Cl. 405-40.000.

Gebr. Bode & Co, GmbH: *See*—
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Price, Robert J.; Gee, James E.; Tonsor, Andrew J.; Satzler, Ronald L.; and Stevens, Samuel B., 4,838,373, Cl. 180-9.460.

Geen, John A.; and Johnson, Brian, to British Aerospace Public Limited Company. Analog-to-digital conversion. 4,839,650, Cl. 341-118.000.

Gehman, Roland P.; and Martin, Raymond G., to MGS, Inc. Truck tractor fifth wheel-mounted lifting and towing unit. 4,838,753, Cl. 414-563.000.

Geisel, Manfred: *See*—
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Geisenhof, Heinz: *See*—
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Gellert, Jobst U. Method of manufacture of an electrical terminal on an injection molding nozzle. 4,837,925, Cl. 29-619.000.

General DataComm Industries, Inc.: *See*—
Robinson, Jeffrey I., 4,839,542, Cl. 307-520.000.

General Electric Company: *See*—
Ahlgren, Frederic F.; Bergman, Rol S.; Davenport, John M.; Hansler, Richard L.; Hantman, Robe t G.; and Hoegler, Leonard E., 4,839,559, Cl. 313-579.000.
Chande, Tushar S.; Jones, Marshall G ; Ortiz, Angel L., Jr.; and August, John L., Jr., 4,838,631, Cl. 350-6.600.
Chung, Rack H.; Swiger, Roger T ; and Beers, Melvin D., 4,839,453, Cl. 528-18.000.
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Gallucci, Robert R., 4,839,426, Cl. 525 146.000.
Isnardi, Michael A., 4,839,720, Cl. 358 12.000.
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O'Donnell, Matthew; Engeler, William E.; Vogelsong, Thomas L.; Karr, Steven G.; and Noujaim, Sharbel E., 4,839,652, Cl. 341-122.000.
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General Electric Company, p.l.c., The: *See*—
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Van Ewyk, Robert L.; O'Connor, Ingrid M.; Mosley, Alan; Jones, Francis; Blackburn, Christopher; and Griffiths, John, 4,838,659, Cl. 350-337.000.
General Electric Corp.: *See*—
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General Foods Corporation: *See*—
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General Motors Corporation: *See*—
Cho, Byong K.; and Stock, Christopher J., 4,839,146, Cl. 423-213.500.
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Mentzer, Charles C.; Cox, Howard M.; and Short, William T., 4,838,973, Cl. 156-212.000.
Priem, Barry L., 4,838,338, Cl. 164-11 .000.
Savage, Jack W.; and Kuck, Lloyd L. 4,838,762, Cl. 416-187.000.
Sullivan, Daniel P.; Scherman, Terre L.; and Drew, Elmer H., 4,837,905, Cl. 29-91.500.
General Signal Corporation: *See*—
Maslaney, Michael J.; Andreasen, Dir al S.; and Brown, Clifford D., 4,838,032, Cl. 62-3.100.
Georg Fischer AG Brugg: *See*—
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Georgiou, Efstratios: *See*—
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Geostar Corporation: *See*—
O'Neill, Gerard K.; and Snively, Leslie O., 4,839,656, Cl. 342-357.000.
Gerace, Anthony. Thermal ignition method and apparatus for internal combustion engines. 4,838,213, Cl. 123-2 .00R.
Gerardo, James B.: *See*—
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Gere, Aniko : *See*—
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Gergen, William P.; and Lutz, Robert G., to Shell Oil Company. Polymer blend of carbon monoxide/olefin copolymer and a poly(arylsulfone) polymer. 4,839,435, Cl. 525-391.00 .
Gergen, William P.; and Lutz, Robert G., to Shell Oil Company. Blends of polyketone polymer with an at least partially crystalline polyamide polymer. 4,839,437, Cl. 525-426.000.
Gesell, Ferdinand, to Eckardt AG. Circuit layout to eliminate alternating voltage interference signals. 4,839,6 8, Cl. 330-149.000.
Gesellschaft Fur Hydraulik-Zubehor mbH: *See*—
Baldauf, Karl E., 4,838,023, Cl. 60-413 .000.
Giannuzzi, Ottavio, to Grumman Aerospace Corporation. Break-away rivet configuration. 4,838,746, Cl. 411-5 4.000.
GIB Precision Limited: *See*—
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Gibeck-Dryden Corporation: *See*—
Dryden, Paul E.; Autieri, Richard J.; and Daly, Robert G., 4,838,258, Cl. 128-204.180.
Giercarz, Mieczyslaw; and Alfer, Jaroslaw G. Person lifting device. 4,837,874, Cl. 5-83.000.
Gilbert, Everett E., to United States of America, Army. Preparation of polyvinylazides from polyvinylnitrate. 4,839,420, Cl. 525-61.000.
Gilbert, Gary, to W. L. Gore & Associates, Inc. Bagpipes and a bag therefor. 4,838,141, Cl. 84-380.00B.
Gilbert, John A.: *See*—
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Giles Enterprises, Inc.: *See*—
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Giles, William O., Sr.; and McNeal, William T., to Giles Enterprises, Inc. Deep-fat frying apparatus. 4,838,244, Cl. 126-391.000.
Giller, Wojciech W.: *See*—
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Gillespie, Barry E.: *See*—
Goodall, George H.; and Gillespie, Barry E., 4,839,100, Cl. 252-626.000.
Gladden, Ernest L.; and Tavelli, Sanford B., to Ensign-Bickford Company, The. Impeded velocity signal transmission line. 4,838,165, Cl. 102-275.800.
Gladish, Herbert E., to E. B. Eddy Forest Products, Ltd. Minimum filler runner for air conveyor system. 4,838,169, Cl. 104-23.200.
Glaser, Eberhard; Beitinger, Eberhard; and Nussbaumer, Manfred, to Ed. Zublin Aktiengesellschaft. Method and apparatus for introducing and joining diaphragms in slotted walls. 4,838,980, Cl. 156-497.000.
Glasner, Alfred: *See*—
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Hara, Hiroyuki; and Sugimoto, Yasuhiro, to Kabushiki Kaisha Toshiba. Differential amplifier. 4,839,609, Cl. 330-253.000.

Hara, Shinichi: *See*—
Yoneda, Kou; Miyakawa, Hideaki; and Hara, Shinichi, 4,839,762, Cl. 360-107.000.

Hara, Tadayuki: *See*—
Morishita, Mitsuharu; Kohge, Shinichi; Hara, Tadayuki; Hata, Yasuaki; and Umemaru, Hisato, 4,838,074, Cl. 73-118.100.

Harada, Shunichi: *See*—
Kawashima, Kazuhiro; Komoda, Norihisa; Harada, Shunichi; Mitsumori, Sadamichi; and Taniguchi, Kouichi, 4,839,803, Cl. 364-403.000.

Harada, Toru; Saito, Naoki; and Sato, Kozo, to Fuji Photo Film Co., Ltd. Recording material containing leuco dye. 4,839,333, Cl. 503-218.000.

Harberts, Aljet; Heimerl, Josef; and Ranke, Horst, to Leybold-Heraeus GmbH. Apparatus for the melting of metals. 4,839,904, Cl. 373-10.000.

Hardiman, Christopher J., to Monsanto Company. Stabilized metal drier. 4,839,325, Cl. 502-170.000.

Hardy, Peter D., to Metal Box plc. Closing plastics containers. 4,838,008, Cl. 53-407.000.

Hario Kabushiki Kaisha: *See*—
Senba, Ayumi, 4,839,484, Cl. 219-10.55E.

Haritonoff, Boris W.: *See*—
Thomsen, Karl V.; Darcy, John J.; Griswold, Augustus W.; Haritonoff, Boris W.; and Pond, Jacob, 4,838,964, Cl. 156-73.100.

Harker, Howard R.: *See*—
Entrekin, Charles H.; and Harker, Howard R., 4,838,340, Cl. 164-455.000.

Harrell, Jerald R.; and Muschiatti, Lawrence C., to Du Pont de Nemours, E. I., and Company. Ethylene copolymer compositions. 4,839,412, Cl. 524-436.000.

Harris Corporation: *See*—
Herzog, Will, 4,839,616, Cl. 333-32.000.
Laprade, Kenneth C., 4,839,847, Cl. 364-754.000.
O'Mara, William E., Jr., 4,839,711, Cl. 357-51.000.

Harris, Lee M.; Evans, Dix L.; and Midwinter, Elizabeth A., to Inwave Corporation. Signboard for displaying optical images. 4,839,635, Cl. 340-752.000.

Harris, Richard K. Multi-channel pipe for monitoring groundwater. 4,838,079, Cl. 73-155.000.

Harshaw/Filtrol: *See*—
Rosette, King H.; and Packer, Herbert, 4,839,090, Cl. 252-301.40H.

Harshman, Richard A.: *See*—
Deerwester, Scott C.; Dumais, Susan T.; Furnas, George W.; Harshman, Richard A.; Landauer, Thomas K.; Lochbaum, Karen E.; and Streeter, Lynn A., 4,839,853, Cl. 364-900.000.

Hartmann, Franz; and Wulff, Dieter, to Nordischer Maschinenbau Rud. Baader GmbH+CO KG. Apparatus for cleaning the abdominal cavity of fish. 4,837,898, Cl. 17-58.000.

Hartmann & Lammle GmbH Co., KG: *See*—
Schulze, Eckehart, 4,837,912, Cl. 29-38.00C.

Hartmann, Rolf W.; and Batzl, Christine, to Asta-Pharma AG. Novel derivatives of 3-aryl-3-cycloalkyl-piperidine-2,6-dione. 4,839,370, Cl. 514 328.000.

Haruta, Masatake; and Kobayashi, Tetsuhiko, to Agency of Industrial Science & Technology; and Ministry of International Trade. Method for the production of ultra-fine gold particles immobilized on a metal oxide. 4,839,327, Cl. 502-243.000.

Harvey, William A.: *See*—
Torok, Ernest J.; Krawczak, John A.; Fritz, Bernard S.; and Harvey, William A., 4,838,637, Cl. 350-96.180.

Harvey, William O., to Kysor Industrial Corporation. Pulley and hub assembly. 4,838,841, Cl. 474-190.000.

Harville, Donald G.: *See*—
Freeman, David L.; Rockley, Mark G.; and Harville, Donald G., 4,839,516, Cl. 250-255.000.

Hasegawa, Jun: *See*—
Kimura, Kazuya; Nakamoto, Akira; and Hasegawa, Jun, 4,838,766, Cl. 417-222.000.

Hasegawa, Mitsumasa: *See*—
Katoh, Yoshihisa; Ogawa, Takashi; and Hasegawa, Mitsumasa, 4,839,488, Cl. 219-69.180.

Hasegawa, Shinichi; and Yoshioka, Takayuki, to Pioneer Electronic Corporation. Temperature-compensated lens system. 4,838,665, Cl. 350-418.000.

Hashii, Toshimitu, to Ryobi Limited. Power operated sanding machine 4,837,981, Cl. 51-170.0MT.

Hashimato, Yasuhiro: *See*—
Takano, Hiroshi; and Hashimato, Yasuhiro, 4,838,835, Cl. 474-13.000.

Hashimoto, Hisatake: *See*—
Ichikawa, Shinichi; Yoshida, Unkichi; Matsushima, Yoshihisa, and Hashimoto, Hisatake, 4,839,029, Cl. 208-251.00R.

Hashimoto, Isao: *See*—
Takematsu, Tetsuo; Fukuoka, Daisuke; Takahashi, Katsuya; and Hashimoto, Isao, 4,838,924, Cl. 71-88.000.

Hashimoto, Naoto: *See*—
Nishimura, Tatsuo; Yoshimura, Yoshinobu; Miyake, Akio; and Hashimoto, Naoto, 4,839,351, Cl. 514-206.000.

Hashimoto, Tom T., to Brenham Industries, Inc. Folded/telescoped drill rig mast for limited space platform. 4,837,992, Cl. 52-118.000.

Hashizume, Kyohei: *See*—
Kawashima, Masato; and Hashizume, Kyohei, 4,839,694, Cl. 355-208.000.

Hasimoto, Tadahiko: *See*—
Hunahata, Katuyuki; Nagae, Yoshiharu; Takasaka, Masahiro; Mori, Yuji; Hoshino, Minoru; Kozima, Yasuyuki; Saito, Youhei; Fukuda, Kyohei; Kozai, Hayao; Hasimoto, Tadahiko; and Tsuchihashi, Yoshiaki, 4,838,655, Cl. 350-335.000.

Hasl, Siegfried C. Label transferring apparatus for blow molding machines. 4,838,776, Cl. 425-112.000.

Hasselbusch, Harold. Adjustable rear sight unit for a gun. 4,837,937, Cl 33-257.000.

Hassler, Yngve, to Stiftelsen Institutet for Mikrovagsteknik vid. Method for heating thick-walled glass tubes and apparatus therefore. 4,838,915, Cl. 65-2.000.

Hasuly, Michael J.: *See*—
Billmers, Robert L.; Del Giudice, David M.; Tessler, Martin M., and Hasuly, Michael J., 4,839,449, Cl. 526-238.200.

Hasunuma, Shinji: *See*—
Sawada, Kaname; Suzuki, Kazuo; Hasunuma, Shinji; Katayama, Eizo; Ohno, Motoyasu; Kanazawa, Tsukasa; and Ueki, Keiji, 4,839,879, Cl. 369-54.000.

Hata, Mamoru, to NEC Corporation. Switching system between cordless telephone and ordinary telephone. 4,839,918, Cl. 379-61.000.

Hata, Yasuaki: *See*—
Morishita, Mitsuharu; Kohge, Shinichi; Hara, Tadayuki; Hata, Yasuaki; and Umemaru, Hisato, 4,838,074, Cl. 73-118.100.

Hatakeyama, Kazuo: *See*—
Ishige, Ryohei; and Hatakeyama, Kazuo, 4,838,438, Cl. 212-159.000.

Hatakeyama, Ryoichi; and Ikeda, Shintaro, to Victaulic Company of Japan, Ltd., The. Flexible expansion pipe coupling. 4,838,582, Cl. 285-110.000.

Hatakeyama, Takanobu: *See*—
Kaneko, Kazuo; Hatakeyama, Takanobu; Hino, Hirofumi; Uemura, Hideki; and Yamamoto, Kazuo, 4,839,935, Cl. 378-105.000.

Hatch, Guy M. Ventilator. 4,838,257, Cl. 128-204.180.

Hattori, Torao; Nishimura, Minoru; and Goto, Masaki, to Honda Giken Kogyo Kabushiki Kaisha. Power transmitting V-belt. 4,838,845, Cl. 474-242.000.

Hauff, Brian L., to LeisureTech Sports Corp. Apparatus for supporting and tensioning a net. 4,838,558, Cl. 273-395.000.

Haunberger, Franz: *See*—
Schmidhammer, Ludwig; Dummer, Gerhard; Hirschmann, Peter; Strasser, Rudolf; and Haunberger, Franz, 4,839,153, Cl. 423-488.000.

Hauville, Francois P. Laboratory table. 4,838,175, Cl. 108-25.000.

Hay, Noah D., to Cooper Power Systems, Inc. Transformer core clamping structure. 4,839,622, Cl. 336-92.000.

Hayafune, Koji: *See*—
Sugihara, Eiichi; Amemiya, Hideo; and Hayafune, Koji, 4,839,736, Cl. 358-253.000.

Hayakawa, Hatsuo; and Honma, Mikio, to Ohi Seisakusho Co., Ltd. Door lock device for automotive vehicle. 4,838,588, Cl. 292-216.000.

Hayama, Hiroyoshi: *See*—
Kamitamari, Manabu; and Hayama, Hiroyoshi, 4,839,697, Cl 355-309.000.

Hayama, Kazuhide; and Saitoh, Yukio, to Mitsubishi Petrochemical Co., Ltd. Developing composition and a sheet for pressure-sensitive copy paper. 4,839,457, Cl. 528-86.000.

Hayashi, Satoshi; Tomita, Masahiro; Niwa, Hitoshi; and Mukai, Hirokatsu, to Nippondenso Co., Ltd. Pilot injection system for fuel injection pump. 4,838,233, Cl. 123-506.000.

Hayasi, Yosio: *See*—
Sibasaki, Masakatsu; Sodeoka, Mikiko; Iseki, Katsuhiko; Shinoda, Masaki; Aoki, Chiyoko; Hayasi, Yosio; and Kanayama, Toshiji, 4,839,388, Cl. 514-530.000.

Haydock, Joseph P. Trunk organizer. 4,838,745, Cl. 410-121.000.

Hayes-Pankhurst, Richard P.; and Smith, Brian D., to Key Innovations Limited. Switches and keyboards. 4,839,474, Cl. 200-5.00A.

Hayes, Richard A., to Du Pont de Nemours, E. I., and Company Polyimide gas separation membranes. 4,838,900, Cl. 55-16.000.

Haz Pal, Inc.: *See*—
Chriske, Eugene; Leno, Theodore, Jr.; and Fudge, Alva L., 4,838,178, Cl. 108-55.100.

Health Research Inc.: *See*—
Almog, Rami; Anderson-Samsonoff, Carol; and Berns, Donald S., 4,839,294, Cl. 436-71.000.

Heckmann, Harald: *See*—
Landskron, Jurgen; Zahn, Jorn; Heckmann, Harald, and Mohr, Georg, 4,838,873, Cl. 604-283.000.

Hedaya, Eddie: *See*—
Adolfsen, Robert H.; Hedaya, Eddie; Mak, C. Lam; and Schwarzberg, Moshe, 4,839,276, Cl. 435-7.000.

Heenan, Richard H.: *See*—
Rudick, Arthur G.; Credle, William S., Jr.; Heenan, Richard H.; and Paisley, Gary V., 4,839,107, Cl. 261-82.000.

Heidel, Bruce A.: *See*—
Boda, James C.; Baumhardt, Robert J.; and Heidel, Bruce A., 4,838,820, Cl. 440-87.000.

Heidelberger Druckmaschinen AG: *See*—
Jeschke, Willi; and Weber, Werner, 4,838,163, Cl. 101-349.000

Heier, Christoph; Lentz, Gerd; and Ritter, Rainer, to Robert Bosch GmbH. Device for delivering washing liquid to two spaced spraying nozzles for moistening a windshield of a motor vehicle. 4,838,488, Cl. 239-284.100.

Heil, Dean. Sun, rain and wind deflector. 4,837,862, Cl. 2-12.000.

Heilala, Antti-Jussi, to Oy Safematic Ltd. Slide ring seal. 4,838,560, Cl. 277-42.000.

Heimerl, Josef: *See*—
Harberts, Aljet; Heimerl, Josef; and Ranke, Horst, 4,839,904, Cl. 373-10.000.
Heinemann, Otto F., to Renk Tacke GmbH. Flexible coupling. 4,838,830, Cl. 464-69.000.
Heinle, Georg, to Siemens Aktiengesellschaft. Method and circuit for determining the speed of rotation of a rotating machine. 4,839,589, Cl. 324-166.000.
Heinz, Erhard: *See*—
Sanz, Erich; and Heinz, Erhard, 4,838,421, Cl. 206-631.000.
Heitz, Walter; and Schneider, Karl-Heinrich, to Bayer Aktiengesellschaft. Polyphenylene oxides with high molecular weight and a process for their preparation and their use. 4,839,436, Cl. 525-397.000.
Held-Elbert, Gabriele; Kaiser, Wolfgang; Koch, Wilhelm; and Schmutzler, Werner, to Siemens Aktiengesellschaft. Method for determining telephone dial pulse parameters independently of subscriber line length. 4,839,920, Cl. 379-377.000.
Hella, Jerry A.; and Stibbe, Paul H., to Advance Systems, Inc. Apparatus for floatingly suspending a running web through an arcuate path. 4,837,946, Cl. 34-156.000.
Helm, Verne: *See*—
Baker, Richard; Helm, Verne; and Shrock, Paul, 4,838,862, Cl. 604-892.100.
Hemsky, Robert L.; and Tucker, Terry L., to Utah Scientific Advanced Development Center, Inc. Luminance selection apparatus for video signal control system. 4,839,718, Cl. 358-22.000.
Henderson, Thomas B.: *See*—
Lasher, Mark E.; Bocker, Richard P.; Drake, Barry L.; and Henderson, Thomas B., 4,838,646, Cl. 350-169.000.
Henderson, Watson R., to Storage Technology Corporation. Process for fabricating thin film magnetic recording heads having precision control of the width tolerance of the upper pole tip. 4,839,197, Cl. 427-116.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Kruse, Hans; Jacobs, Jochen; Altenschoepfer, Theodor; and Jeschke, Peter, 4,839,078, Cl. 252-99.000.
Puchta, Rolf; Nuesslein, Hans; and Casper, Hannelore, 4,839,075, Cl. 252-8.700.
Rose, David; Maak, Norbert; and Liesse, Edgar, 4,838,893, Cl. 8-405.000.
von Rybinski, Wolfgang; Upadek, Horst; and Wichelhaus, Winfried, 4,839,066, Cl. 252-8.750.
Wisotzki, Klaus-Dieter; Guirr, Ortburg; Jeschke, Peter; Schumann, Klaus; Schmid, Karl-Heinz; and Biermann, Manfred, 4,839,098, Cl. 252-557.000.
Henley Burrowes & Company Limited: *See*—
Finch, Maurice, 4,838,750, Cl. 414-300.000.
Henne, John R., to Stanley Works, The. Open door with means for preventing inadvertent locking. 4,838,586, Cl. 292-113.000.
Hennen, John J.: *See*—
Bramstedt, Gerd; Love, Mahlon L.; and Hennen, John J., 4,838,011, Cl. 56-11.700.
Hennuy, Jean; and Louison, Bernard, to SEB S.A. Steam iron having variable heat conductivity between the heating base and sole plate. 4,837,952, Cl. 38-77.700.
Hens, Jozef F.: *See*—
Janssens, Frans E.; Kennis, Ludo E. J.; Hens, Jozef F.; Torremans, Joseph L. G.; and Diels, Gaston S. M., 4,839,374, Cl. 514-394.000.
Herberts Gesellschaft mit beschrankter Haftung: *See*—
Bederke, Klaus; Brock, Thomas; Kerber, Hermann; and Rupieper, Paul, 4,839,414, Cl. 524-507.000.
Hergert, Richard R.: *See*—
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Herman Berstorff Maschinenbau GmbH: *See*—
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Herman, Harold: *See*—
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Hermes, Matthew E.: *See*—
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Herold, Wolf-Dietrich; Grafwallner, Karl L.; and Keller, Michael, to ESPE Stiftung and Co. Produktions-und Vertriebs KG. Circuit for supplying power to a dental photopolymerizing apparatus. 4,839,566, Cl. 31-308.000.
Herolf, Olof, to OSA AB. Method for mechanized thinning of a forest, and a harvester and forwarder for carrying out the method. 4,838,328, Cl. 144-336.000.
Herremans, Pieter; Hoogendijk, Christiaan J.; Boer, Adriaan H.; and Van Bekkum, Aart J., to Altometer, Prodktiebedrijf Van Rheometron A.G. Ultrasonic flow meter. 4,838,127, Cl. 73-861.280.
Herrmann, Gert, to Uni-Cardan Aktiengesellschaft. Vibration damping rotary drive element. 4,838,107, Cl. 74-411.000.
Herrmann, Horst: *See*—
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Hertz, Carl H.; and Samuelsson, Bo A., to Hertz, Carl Hellmuth. Method and apparatus for controlling the electrical charging of drops in an ink jet recording apparatus. 4,839,663, Cl. 346-1.100.
Hertz, Carl Hellmuth: *See*—
Hertz, Carl H.; and Samuelsson, Bo A., 4,839,665, Cl. 346-1.100.
Herziger, Gerd; Beyer, Eckhard; Loosen, Peter; and Poprawe, Reinhart, to Herziger, Gerd. Arrangement for machining workpieces by means of a laser beam by building up a plasma that is to be kept within limits. 4,839,493, Cl. 219-121.690.
Herzog, Will, to Harris Corporation. Broadband impedance transformer. 4,839,616, Cl. 333-32.000.
Hess, Robert V.; Upchurch, Billy T.; Brown, Kenneth G.; Miller, Irvin M.; Schryer, David R.; Sidney, Barry D.; Wood, George M.; and Hoyt, Ronald F., to United States of America, National Aeronautics and Space Administration. Isotope exchange in oxide-containing catalyst. 4,839,330, Cl. 502-53.000.
Hestich, John, to Dwyer Instruments, Inc. Multicoil bourdon tube type pressure gauge. 4,838,090, Cl. 73-738.000.
Hevoyan, Varoujan H. Work transport for machine tools. 4,838,135, Cl. 82-124.000.
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Doehler, Gottfried H.; Scott, Caroline J.; Trott, Gary R.; and Boatman, Betty, 4,839,714, Cl. 357-71.000.
Jondrow, Timothy J., 4,838,585, Cl. 292-8.000.
Wang, Jyh-Yun; and Shaya, Mousa N., 4,838,278, Cl. 128-697.000.
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Heyko Reinecker: *See*—
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Hida, Hikaru: *See*—
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Hidaka, Yusuke: *See*—
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Higa, Teruo, to Saken Co., Ltd.; and Ryoko Co., Ltd. Method for treating water. 4,839,051, Cl. 210-602.000.
Higashi, Katsumi: *See*—
Oda, Noriyuki; Takehara, Tetsuo; Higashi, Katsumi; and Muramatsu, Keiji, 4,838,581, Cl. 285-47.000.
Higuchi, Kinichi: *See*—
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Morankar, Sudhakar D.; Esguerra, Hermando; Kerevel, Patrice; and Hilgart, Michael J., 4,838,639, Cl. 350-96.200.
Hilgarth, Kurt, to Skischuhfabrik Dynafit Gesellschaft GmbH. Process for filling with foam the inner boot of skiboots and skiboot produced according to the process. 4,837,884, Cl. 12-142.00P.
Hill, Craig L., to Emory University. Homogeneous catalytic photochemical functionalization of alkanes by polyoxometalates. 4,839,008, Cl. 204-157.150.
Hill, Godfrey R.; and Smith, David W., to British Telecommunications Public Limited Company. Frequency referencing system and method. 4,839,614, Cl. 332-7.510.
Hill, Kevin E., to Milsco Manufacturing Company. Vehicle seat. 4,838,514, Cl. 248-577.000.
Hill, Robert G. D., to Ausmintec Corp. Limited. Magnesium cement. 4,838,941, Cl. 106-106.000.
Hills, Karen F.; and Mitchell, Paul H., to Pitney Bowes Inc. Computerized parcel shipping system. 4,839,813, Cl. 364-464.030.
Hilsum, Cyril; Van Ewyk, Robert L.; and O'Connor, Ingrid M., to General Electric Company, p.l.c., The. Light switches utilizing anisotropic emission. 4,838,662, Cl. 350-350.00F.
Hindel, James T.: *See*—
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Hino, Akira: *See*—
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Hioki, Yoshio: *See*—
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Hirai, Kentaro; Mizushima, Yukio; and Doteuchi, Masami, to Shinogi & Co., Ltd. Thienopyridine derivatives useful in treating gastric ulcers. 4,839,365, Cl. 514-301.000.
Hirai, Takene: *See*—
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Hiramatsu, Toshiyuki: *See*—
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Hiraoka, Shinitiro: *See*—
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Hirata, Keiiti; Morimoto, Yoshinari; Ban, Tomohiro; Furushima, Tokihito; Miura, Tomoko; and Ikeda, Yoshie, to Brother Kogyo Kabushiki Kaisha. Document processing apparatus. 4,839,827, Cl. 364-518.000.
Hirata, Sayoko: *See*—
Murakami, Sadatoshi; Yamasaki, Satoru; Tanaka, Masayuki; Hirata, Sayoko; Morimoto, Hiromi; Nomura, Kenji; Oka, Kenichiro; and Ohnishi, Masaru, 4,839,667, Cl. 346-76.0PH.
Hiratsuka, Seiichiro: *See*—
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Yoshimura, Yoshikazu; and Koike, Kihachiro, 4,838,810, Cl. 439-358.000.
Yoshimura, Yoshikazu; and Koike, Kihachiro, 4,838,812, Cl. 439-610.000.
Hirose, Kenji; Bandoh, Tadaaki; Matsumoto, Hidekazu; Yamaguchi, Shinichiro; Hirayama, Hirokazu; and Nakanishi, Hiroaki, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Apparatus for performing floating point arithmetic operations and rounding the result thereof. 4,839,846, Cl. 364-748.000.
Hirota, Yoshihiko; and Kishi, Masamichi, to Minolta Camera Kabushiki Kaisha. Color image reading apparatus with an improved sensor. 4,839,719, Cl. 38-75.000.
Hirotani Co., Ltd.: *See*—
Kanda, Shigeru; Shibata, Manabu; Ono, Masayoshi; and Okano, Michikazu, 4,838,939, Cl. 106-281.100.
Hirsbrunner, Pierre, to Nestec S. A. Preparation of a composition based on a finely divided active principle of low water solubility. 4,839,179 Cl. 426-98.000.
Hirschmann, Peter: *See*—
Schmidhammer, Ludwig; Dummer, Gerhard; Hirschmann, Peter; Strasser, Rudolf; and Haunberger, Franz, 4,839,153, Cl. 423-488.000.
Hishi, Yuichi: *See*—
Ide, Jun; Iizumi, Tomoo; Takahashi, Yoshitaka; Yoshida, Hiroshi; Kaneko, Tooru; and Hishi, Yuichi, 4,839,753, Cl. 360-48.000.
Hitachi Cable, Ltd.: *See*—
Nishiyama, Sinichi; Abe, Hajime; Seki, Kuniaki; and Hagiwara, Noboru, 4,838,063, Cl. 72-47.000.
Hitachi Computer Consultant, Ltd.: *See*—
Takahashi, Masami; Tatsukawa, Eiji; Torii, Shunichi; and Kojima, Keiji, 4,839,799, Cl. 364-200.000.
Hitachi Engineering Co., Ltd.: *See*—
Hirose, Kenji; Bandoh, Tadaaki; Matsumoto, Hidekazu; Yamaguchi, Shinichiro; Hirayama, Hirokazu; and Nakanishi, Hiroaki, 4,839,846, Cl. 364-748.000.
Hitachi, Ltd.: *See*—
Amano, Yoshiaki; Yokoyama, Eiji; and Ohyauchi, Hideo, 4,838,897, Cl. 48-196.00A.
Eguchi, Hiroyoshi; Yamada, Norio; Kusuyama, Itaru; and Saitou, Chikara, 4,839,798, Cl. 364-200.000.
Hirose, Kenji; Bandoh, Tadaaki; Matsumoto, Hidekazu; Yamaguchi, Shinichiro; Hirayama, Hirokazu; and Nakanishi, Hiroaki, 4,839,846, Cl. 364-748.000.
Hunahata, Katuyuki; Nagae, Yoshiharu; Takasaka, Masahiro; Mori, Yuji; Hoshino, Minoru; Kozima, Yasuyuki; Saito, Youhei; Fukuda, Kyohei; Kozai, Hayao; Hasimoto, Tadahiko; and Tsuchihashi, Yoshiaki, 4,838,655, Cl. 350-335.000.
Ichikawa, Atsushi; Ito, Masamichi; and Saito, Akira, 4,838,649, Cl. 350-247.000.
Ishige, Ryohei; and Hatakeyama, Kazuo, 4,838,438, Cl. 212-159.000.
Katsuyama, Toshio; and Matsumura, Hiroyoshi, 4,838,633, Cl. 350-96.110.
Kawashima, Kazuhiro; Komoda, Norihisa; Harada, Shunichi; Mitsumori, Sadamichi; and Taniguchi, Kouichi, 4,839,803, Cl. 364-403.000.
Mikoshiba, Shigeo; Shinada, Shinichi; and Matsumoto, Takahiro, 4,839,637, Cl. 340-775.000
Omae, Tsutomu; Matsuda, Toshihiko; Miyahara, Youjirou; and Kamiyama, Kenzo, 4,839,834, Cl. 364-565.000.
Sato, Katsuyuki; Kawamoto, Hiroshi; and Yanagisawa, Kazumasa, 4,839,865, Cl. 365-201.000.
Shinoda, Takashi; Sakai, Kikuo; Ogata, Masahiro; Kawamoto, Hiroshi; Onishi, Yoshiaki, deceased; and Onishi, Junko, administratrix, 4,839,860, Cl. 365-104.000.
Tachiuchi, Tsuguji; Konuma, Satoshi; and Tsuchiya, Nobuo, 4,839,739, Cl. 358-282.000.
Takahashi, Masami; Tatsukawa, Eiji; Torii, Shunichi; and Kojima, Keiji, 4,839,799, Cl. 364-200.000.
Takayama, Shinji; Kirino, Fumiyoshi; and Sugita, Yutaka, 4,838,962, Cl. 148-304.000.
Tanabe, Yoshiyuki; and Kashiwaya, Mineo, 4,838,223, Cl. 123-339.000.
Taya, Shunroku; Abe, Katsunobu; and Shibata, Atsushi, 4,839,523, Cl. 250-492.200.
Hitachi Maxwell Ltd.: *See*—
Kato, Yoshitake, 4,839,766, Cl. 360-133.000.
Hitachi Medical Corp.: *See*—
Kaneko, Kazuo; Hatakeyama, Takanobu; Hino, Hirofumi; Uemura, Hideki; and Yamamoto, Kazuo, 4,839,915, Cl. 378-105.000.
Hitachi Microcomputer Engineering Ltd.: *See*—
Shinoda, Takashi; Sakai, Kikuo; Ogata, Masahiro; Kawamoto, Hiroshi; Onishi, Yoshiaki, deceased; and Onishi, Junko, administratrix, 4,839,860, Cl. 365-104.000.
Hitachi Video Engineering, Inc.: *See*—
Tachiuchi, Tsuguji; Konuma, Satoshi; and Tsuchiya, Nobuo, 4,839,739, Cl. 358-282.000.
Hitomi, Teiichi: *See*—
Shimizu, Etsuo; Kotera, Noboru; Onogi, Shinichi; and Hitomi, Teiichi, 4,839,243, Cl. 428-690.000.
Hjalmarsson, Lennart, to ABB Stal AB. Energy plant with heat exchanger in a blow-off device for hot gases. 4,838,209, Cl. 122-4.00D
Ho, Phillman N.: *See*—
Coyle, Roy T.; and Ho, Phillman N., 4,839,150, Cl. 423-345.000.
Ho, Teh C.: *See*—
Halbert, Thomas R.; Stiefel, Edward I.; Chianelli, Russell R.; and Ho, Teh C., 4,839,326, Cl. 502-220.000.
Hobson, David: *See*—
Flatley, Robert; and Hobson, David, 4,839,587, Cl. 324-158.00F.
Hochiki Corp.: *See*—
Ishii, Hiromitsu; and Ono, Takashi, 4,838,698, Cl. 356-437.000.
Hodges, Leslie B.; Charlton, Roger; and Bowen, James H., to Alcatel NA, Inc. Single mode bend insensitive fiber for use in fiber optic guidance applications. 4,838,643, Cl. 350-96.330.
Hodogaya Chemical Co, Ltd.: *See*—
Abe, Toshiyuki; Kikkawa, Katsumasa; Gonda, Michihiro; Sensui, Hideyuki; and Kanasugi, Mikiko, 4,839,334, Cl. 503-221.000.
Mochida, Ei; Uemura, Akio; Kato, Kazuo; Tokunaga, Hiroki; and Haga, Akinori, 4,839,368, Cl. 514-313.000.
Hoeber, Werner G. Process and device to start a new staple fiber sliver automatically. 4,838,018, Cl. 57-263.000.
Hoeberigs, Jean M. M. Vending machine for heated food, notably cooked french fries. 4,838,455, Cl. 221-82.000.
Hoechst Aktiengesellschaft: *See*—
Mauz, Otto, 4,839,439, Cl. 526-203.000.
Hoechst Aktiengesellschaft: *See*—
Dinter, Peter, 4,839,517, Cl. 250-325.000
Kleiner, Hans-Jerg, 4,839,105, Cl. 260-502.40R.
Liebl, Rainer; Frey, Michael; Mildenberger, Hilmar, Bauer, Klaus; and Bieringer, Hermann, 4,838,931, Cl. 71-94.000.
Muller, Werner H., 4,839,256, Cl. 430-192.000.
Pawlowski, Georg; and Kleiner, Hans-Jerg, 4,839,254, Cl. 430-175.000.
Hoechst-Roussel Pharmaceuticals, Inc.: *See*—
Shutske, Gregory M.; and Pierrat, Frank A., 4,839,364, Cl. 514-290.000.
Hoegler, Leonard E.: *See*—
Ahlgren, Frederic F.; Bergman, Rolf S.; Davenport, John M.; Hansler, Richard L.; Hantman, Robert G.; and Hoegler, Leonard E., 4,839,559, Cl. 313-579.000.
Hoffman, William; Lanas, Marcelo; and Weiss, Douglas, to Webcraft Technologies, Inc. Enhanced resolution ink jet printing. 4,839,200, Cl. 427-265.000.
Hoffmann, Erhard-Gunther: *See*—
Simon, Gehard, Hahnel, Peter; and Hoffmann, Erhard-Gunther, 4,839,209, Cl. 428-68.000.
Hoffmann, Gunter: *See*—
Steinhauser, Michael; Hoffmann, Gunter, Weigel, Fritz, deceased; Wittmann, Kurt; and Schafer, Dieter, 4,839,103, Cl. 252-643.000.
Hoffmann, Horst: *See*—
Range, Jochen, Hohlein, Bernd; Niessen, Hans; Vau, Volker; Schiebahn, H. J. R.; Hoffmann, Horst; and Vorwerk, Manfred, 4,839,391, Cl. 518-712.000.
Hoffmann-La Roche Inc.: *See*—
Maestrone, Gianpaolo; Schildknecht, Eugene G.; and Untawale, Govind G., 4,839,382, Cl 514-453.000.
Hogg, Judy S.; Abbondandolo, Michael; and Brink, Patricia J. Sunshield with openings. 4,838,334, Cl. 160-370.200.
Hohlein, Bernd: *See*—
Range, Jochen; Hohlein, Bernd; Niessen, Hans; Vau, Volker; Schiebahn, H. J. R.; Hoffmann, Horst; and Vorwerk, Manfred, 4,839,391, Cl. 518-712.000.

Hohmann, Gerhard: *See*—
Casper, Rudolf; Wendling, Peter; Konner, Wolfgang; and Hohmann, Gerhard, 4,839,447, Cl. 526-22[illegible].000.

Holcomb, Bruce A.; McCracken, Shaun D.; and McGinnis, Bryan J., to Minnesota Mining and Manufacturing Company. Security deposit bag. 4,838,708, Cl. 383-5.000.

Holland, G. Neil: *See*—
Misic, George J.; Holland, G. Neil; Mehdizadeh, Mehrdad; and Patrick, John L., 4,839,594, Cl. 324-3[illegible].000.

Holley, David M., to Power Components, Inc. Convertible gas spring. 4,838,527, Cl. 267-64.280.

Hollis, Mark A.; Goodhue, William D.; Nichols, Kirby B.; and Bergeron, Normand J., Jr., to Massachusetts Institute of Technology. High mobility transistor with opposed-gates. 4,839,310, Cl. 437-41.000.

Hollweck, Walter, to Thermostat-und Schaltgeratebau GmbH Co. KG. Power control device. 4,839,626, Cl. 337-[illegible]77.000.

Holmberg, Krister; and Osterberg, Eva, to Berol Kemi AB. Process for the transesterification of triglycerides in an aqueous microemulsion reaction medium in the presence of lipase enzyme. 4,839,287, Cl. 435-135.000.

Holmes Products Corp.: *See*—
Shin-Chin, Shao, 4,838,151, Cl. 98-94.100.

Holmstrom, Carl A. Collapsible holder for aerosol dispensers. 4,838,466, Cl. 224-250.000.

Holstensson, Lars A. Seat mounting for office chairs. 4,838,510, Cl. 248-397.000.

Holub, Edward P.: *See*—
Babcock, H. Nash; and Holub, Edward P., 4,839,115, Cl. 264-42.000.

Holy, Franz; and Nader, Hans, to Maschinenfabrik Heid Aktiengesellschaft. Machine tool assembly. 4,837,918, Cl. 29-568.000.

Holzapfel, Heinz P.; and Michel, Peter, to Siemens Aktiengesellschaft. CMOS cell which can be used as a resistor, a capacitor, an RC component or a terminating impedance of a signal. 4,839,710, Cl. 357-45.000.

Homeyer, Bernhard: *See*—
Naumann, Klaus; Becker, Benedikt; Behrenz, Wolfgang; Homeyer, Bernhard; and Stendel, Wilhelm, 4,839,390, Cl. 514-746.000.

Homma, Satoshi; and Watanabe, Tohru, to Casio Computer Co., Ltd. IC card identification system including pin-check time means. 4,839,506, Cl. 235-379.000.

Homner, Harald: *See*—
Beck, Herbert; Anton, Karl-Heinz; and Homner, Harald, 4,838,714, Cl. 400-124.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Fukizawa, Kazunori; Higuchi, Mitsuhi; and Namiki, Kunio, 4,838,961, Cl. 148-12.400.
Hamasaki, Yoshito; Iwasaki, Akira; and Sue, Hiroaki, 4,838,576, Cl. 280-777.000.
Hattori, Torao; Nishimura, Minoru; and Goto, Masaki, 4,838,845, Cl. 474-242.000.
Matsushima, Seiya; Yanagisawa, Takeshi; Miura, Nobuo; and Arakawa, Kuniaki, 4,838,113, Cl. 74-[illegible]51.800.
Yamagata, Testuo; and Yamashita Shoji, 4,838,780, Cl. 123-352.000.
Yamamoto, Noboru; Furumoto, Mitsumasa; Kawahara, Eiichiro; and Ikehjiri, Kenichi, 4,838,024, Cl. [illegible]-488.000.

Honda, Katsuo; Sawafuji, Susumu; and Tomita, Tomio, to Tokyo Seimitsu Co., Ltd. Internal peripheral edge type blade holding device. 4,838,238, Cl. 125-15.000.

Honda, Toshiharu: *See*—
Watanabe, Toshiki; and Honda, Toshiharu, 4,838,839, Cl. 474-135.000.

Honeywell, Inc.: *See*—
Manion, Michael C.; Walensky, Loren J.; and Walker, Francis J., 4,838,168, Cl. 102-522.000.

Honeywell Limited: *See*—
Vogelzang, John H., 4,838,482, Cl. 236-11.000.

Honjoh, Akira, to Fuji Photo Film Co., Ltd. Magnetic disk cartridge loading-and-unloading device. 4,839,758, Cl. 360-99.060.

Honma, Masaaki, to Nifco, Inc. Plastic inserter. 4,838,880, Cl. 604-280.000.

Honma, Mikio: *See*—
Hayakawa, Hatsuo; and Honma, Mikio, 4,838,588, Cl. 292-216.000.

Hoogendijk, Christiaan J.: *See*—
Herremans, Pieter; Hoogendijk, Christiaan J.; Boer, Adriaan H.; and Van Bekkum, Aart J., 4,838,127, Cl. 73-861.280.

Hoogendoorn, Thomas M.: *See*—
Edelman, Arie B. C.; Kleijn, Jan B.; de Haas, Maarten A.; and Hoogendoorn, Thomas M., 4,838,955, Cl. 148-2.000.

Hoogovens Groep B.V.: *See*—
Edelman, Arie B. C.; Kleijn, Jan B.; de Haas, Maarten A.; and Hoogendoorn, Thomas M., 4,838,955, Cl. 148-2.000.

Hoopman, Timothy L., to Minnesota Mining and Manufacturing Company. Resilient electrically and thermally conductive flexible composite. 4,839,227, Cl. 428-343.000.

Hoover, Kenneth C.; Sherk, Fred T.; and Fugard, Joseph E., to Phillips Petroleum Company. Solid state curing of poly(arylene sulfide) resins in reduced oxygen atmospheres. 4,839,411, Cl. 524-424.000.

Hopkinson, Derek: *See*—
Horn, Edward R.; and Hopkinson, Derek, 4,838,306, Cl. 137-522.000.
Horn, Edward R.; and Hopkinson, Derek, 4,838,532, Cl. 269-23.000.

Hoppe, Ernst; and Adrian, Franz-Josef, to Krupp Polysius AG. Method of determining the filling capacity of and calibrating a pneumatic conveying arrangement. 4,838,071, Cl. 73-3.000.

Hoppe, Gerd, to MAHO Aktiengesellschaft. Tool changing assembly for universal milling and drilling machines. 4,837,919, Cl. 29-568.000.

Hoppe, Udo; and Engel, Walter, to Beiersdorf Aktiengesellschaft. Cosmetic agents for hair. 4,839,165, Cl. 424-70.000.

Horie, Michikazu: *See*—
Yoshitomi, Toshihiko; Kobayashi, Yoshimitsu; Kisaka, Yoshiyuki; Yoshida, Hidemi; Horie, Michikazu; Tamura, Takanori; and Ohgaki, Mitsuaki, 4,839,207, Cl. 428-64.000.

Horie, Tsuneo: *See*—
Okazaki, Atsushi; Igarashi, Masahiko; and Horie, Tsuneo, 4,839,627, Cl. 338-174.000.

Horigome, Masahiro: *See*—
Murata, Tadaichi; Isomura, Tsuneo; Fujimori, Kenichi; Tsuruta, Fuminori; Dohi, Kazuhito; Horigome, Masahiro; Nakayama, Yoshitarou; and Oomori, Sachio, 4,839,252, Cl. 430-59.000.

Horiguchi, Shiro: *See*—
Katsumoto, Kenichi; Isoda, Shigeo; Yuuki, Takahiro; Koike, Shiro; Yamamoto, Yutaka; Motonishi, Suguru; Kawaguchi, Tadashi; Gotoh, Tetsuya; and Horiguchi, Shiro, 4,839,005, Cl. 204-129.460.

Horiike, Yasuhiro: *See*—
Sekine, Makoto; Okano, Haruo; Arikado, Tsunetoshi; and Horiike, Yasuhiro, 4,838,978, Cl. 156-345.000.

Horiuchi, Kazufumi: *See*—
Sato, Hirokazu; Goto, Yasuhiro; Horiuchi, Kazufumi; Michibayashi, Yasuo; Nobutsugu, Hideo; and Kawamura, Takumi, 4,838,368, Cl. 177-25.180.

Horn, Edward R.; and Hopkinson, Derek, to Aladdin Engineering & Mfg., Inc. Pneumatic locking valve with manual override. 4,838,306, Cl. 137-522.000.

Horn, Edward R.; and Hopkinson, Derek, to Aladdin Engineering & Mfg., Inc. Fluid operated clamping device including fluid pressure locking means. 4,838,532, Cl. 269-23.000.

Horn, Manfred: *See*—
Bode, Jurgen; and Horn, Manfred, 4,838,102, Cl. 74-89.150.

Horton, Gilbert L.; Poole, Eddie D.; and Borst, William A., to Sara Lee Corporation. System for printing both sides of envelopes. 4,838,162, Cl. 101-296.000.

Hosaka, Masao; and Saito, Takashi, to Canon Kabushiki Kaisha. Image reproducing apparatus. 4,839,699, Cl. 355-55.000.

Hosaka, Toshiyuki: *See*—
Ozawa, Masaki; Hosaka, Toshiyuki; and Yoshizawa, Masayuki, 4,838,707, Cl. 374-171.000.

Hoshino, Minoru: *See*—
Hunahata, Katuyuki; Nagae, Yoshiharu; Takasaka, Masahiro; Mori, Yuji; Hoshino, Minoru; Kozima, Yasuyuki; Saito, Youhei; Fukuda, Kyohei; Kozai, Hayao; Hasimoto, Tadahiko; and Tsuchihashi, Yoshiaki, 4,838,655, Cl. 350-335.000.

Hoshino, Yasushi; and Makino, Masamori, to Konishiroku Photo Industry Co., Ltd. Focal length switching type camera. 4,839,677, Cl. 354-195.100.

Hoshizaki Denki Kabushiki Kaisha: *See*—
Torimitsu, Hiroshi; Takeda, Yukimasa; and Tsuchikawa, Koji, 4,838,702, Cl. 366-149.000.

Hosiden Electronics Co., Ltd.: *See*—
Tajima, Kyousuke; Itoi, Goro; and Sorimachi, Mitsuo, 4,838,815, Cl. 439-841.000.

Hosoi, Atsushi; and Tajima, Hatsuo, to Canon Kabushiki Kaisha. Developing apparatus. 4,838,200, Cl. 118-658.000.

Hosoi, Kohei: *See*—
Mori, Takaaki; Higuchi, Kinichi; Oyauchi, Tsukasa; Nitanda, Masao; Hosoi, Kohei; Imai, Isao; Kato, Heiji; and Ichikawa, Mitsuhiko, 4,837,906, Cl. 29-112.000.

Hosoi, Masaaki; Nishioka, Ryo; Hioki, Yoshio; Iida, Yoshiaki; Takeshita, Hiroshi; Niiyama, Kenji; and Hidaka, Yusuke, to Banyu Pharmaceutical Co., Ltd. Anti-ulcer substituted pyridine derivatives. 4,839,353, Cl. 514-212.000.

Hosomizu, Hiroshi; Ichikawa, Tsutomu; Kamiya, Makoto; Yoneyama, Masatoshi; and Tuzi, Kenzi, to Minolta Camera Kabushiki Kaisha. Flash device. 4,839,686, Cl. 354-416.000.

Hosomizu, Hiroshi: *See*—
Taniguchi, Nobuyuki; Nakai, Masaaki; Omaki, Takanobu; Hosomizu, Hiroshi; Niwa, Masatake; Inoue, Toru; and Sekida, Minoru, 4,839,687, Cl. 354-416.000.

Howard, William A., to Delta Systems, Inc. Push button safety switch. 4,839,478, Cl. 200-52.00R.

Howell, Edmund O.: *See*—
Koch, Earl E., deceased; Voler, Franja F.; and Howell, Edmund O., 4,838,014, Cl. 56-13.600.

Hoyeck, Ralph H. One letter alphabet (OLA). 4,838,792, Cl. 434-163.000.

Hoyt, Ronald F.: *See*—
Hess, Robert V.; Upchurch, Billy T.; Brown, Kenneth G.; Miller, Irvin M.; Schryer, David R.; Sidney, Barry D.; Wood, George M.; and Hoyt, Ronald F., 4,839,330, Cl. 502-53.000.

HRI, Inc.: *See*—
Comolli, Alfred G.; and McLean, Joseph B., 4,839,030, Cl. 208-403.000.

Hu, King L.: *See*—
Tully, John W.; O'Brien, Benedict B.; Hant, William; and Hu, King L., 4,839,303, Cl. 437-31.000.

Huang, Carl: *See*—
Baker, Richard W.; Kochinke, Frank; and Huang, Carl, 4,839,174, Cl. 424-447.000.

Huang, Chin-Jung: *See*—
Williams, John P.; Huang, Chin-Jung; and Shyu, Wen-Chyi, 4,838,052, Cl. 70-63.000.

Huang, Leaf, to University of Tennessee Research Corporation, The. Preparation of solid core liposomes. 4,839,111, Cl. 264-4.600.

Hubbard, David W., to Pitney Bowes Inc. Oscillating apparatus for vibrating tray weighing scale. 4,838,370, Cl. 177-210.00[illegible]P.

Hubbard, William G.: *See*—
Starling, L. Brian; Stephan, James E.; and Hubbard, William G., 4,839,215, Cl. 428-131.000.

Hubbs, John C.: *See*—
Bowers, Cyril Y.; Momany, Frank A.; Chang, Ching H.; Cody, Wayne L.; Hubbs, John C.; and Foster, Charles H., 4,839,344, Cl. 514-16.000.

Huber, Paul, deceased: *See*—
Prahauser, Georg; Huber, Paul, deceased; and Schiessl, Alois, legal representative, 4,838,167, Cl. 102-334.000.

Hubertus, Maximiliaan J., to Lyons Eye Institute of Western Australian Incorporated. Magnifying binocular ophthalmoscope. 4,838,678, Cl. 351-205.000.

Hubski, Peter: *See*—
Kosler, Manfred; and Hubski, Peter, 4,839,638, Cl. 340-784.000.

Huchtemann, Bernd; Engineer, Serosh; and Schuler, Volker, to Thyssen Edelstahlwerke AG. Micro-alloyed steels. 4,838,963, Cl. 148-328.000.

Hudson International Conductors: *See*—
Inagaki, Tom, 4,838,959, Cl. 148-11.50C.

Hudson Oxygen Therapy Sales Company: *See*—
Rowland, Robert O., 4,839,597, Cl. 324-433.000.

Huemer, Hermann. Reclining or seating member. 4,837,878, Cl. 5-191.000.

Hughes Aircraft Company: *See*—
Beattie, John R., 4,838,021, Cl. 60-202.000.
Kathol, Shawn; and Williams, Patrick R., 4,839,658, Cl. 342-455.000.
Kurtz, Louis A., 4,839,663, Cl. 343-771.000.
Pastor, Ricardo C.; Gorre, Luisa E.; and Christensen, Lorna D., 4,839,328, Cl. 502-334.000.
Shields, Steven E., 4,839,707, Cl. 357-23.700.

Hughes Microelectronics Limited: *See*—
Warner, David J., 4,839,909, Cl. 377-24.100.

Huls America, Inc.: *See*—
Arena, Arthur A., 4,839,233, Cl. 428-220.000.

Hulsewis, Hans: *See*—
Bierwirth, Adolf-Peter; Sauerwald, Walter; Hulsewis, Hans; and Metz, Josef, 4,838,144, Cl. 89-46.000.

Humble, Walter P.; Durkos, John C.; DiMargio, Nick A.; Cortell, Dominick J.; and Syak, Charles W., to Syro Steel Company. Energy absorbing guard rail terminal. 4,838,523, Cl. 256-13.100.

Hunahata, Katuyuki; Nagae, Yoshiharu; Takasaka, Masahiro; Mori, Yuji; Hoshino, Minoru; Kozima, Yasuyuki; Saito, Youhei; Fukuda, Kyohei; Kozai, Hayao; Hasimoto, Tadahiko; and Tsuchihashi, Yoshiaki, to Hitachi, Ltd. Projector using guest-host liquid crystal cells for improved color purity. 4,838,655, Cl. 350-335.000.

Hunke, Friedrich, to Automatik Apparate-Machinenbau GmbH. Device for granulating strands of thermoplastic materials. 4,838,775, Cl. 425-67.000.

Hunnel, Larry B.: *See*—
Trevison, Robert L.; McKee, William E.; and Hunnel, Larry B., 4,837,928, Cl. 29-840.000.

Hunt, Rowland D. Openable enclosures and structures incorporating such enclosures. 4,838,294, Cl. 135-102.000.

Hurley, Ken: *See*—
Theodoulou, Sotos M.; Thomson, Christopher W.; Vanderson, Eric; Baker, Wm. Keith; Sun, Alvin C. P.; and Hurley, Ken, 4,839,671, Cl. 346-159.000.

Hurley, Richard D. Shipping protector. 4,838,427, Cl. 206-586.000.

Huss, Albin, Jr.: *See*—
Absil, Robert P.; Huss, Albin, Jr.; McHale, William D.; and Partridge, Randall D., 4,839,027, Cl. 208-138.000.

Huth, Michael, to Rockwell International Corporation. Web tensioning system. 4,838,498, Cl. 242-75.510.

Hutzenlaub, John T., to Fort Lock Corporation. Tubular key and corresponding lock housing key entry construction. 4,838,060, Cl. 70-491.000.

Huy, Sam: *See*—
Kurita, Atsushi; Matsumoto, Yasuji; and Huy, Sam, 4,839,452, Cl. 528-15.000.

Hwang, Chi Yung; and Chih, Liu Ping. Toy kiddieland. 4,838,825, Cl. 446-136.000.

Hyde, Neal T. Segmented end gate for box type vehicle bodifs. 4,838,598, Cl. 296-50.000.

Hyosu, Yoshihiko; Hikake, Norio; and Tanaka, Katsuhiko, to Canon Kabushiki Kaisha. Process for producing toner for developing electrostatic images. 4,839,255, Cl. 430-137.000.

I.V.P. Co.: *See*—
Kershaw, Charles H., 4,839,515, Cl. 250-227.000.

Iafrate, John A. Cylindrical screen separator with spirally arranged clearing and conveying blades. 4,839,035, Cl. 209-300.000.

Ichihashi, Tadashi; and Kawamura, Masunori, to Kowa Company Ltd. Ophthalmic measuring method and apparatus. 4,838,683, Cl. 351-221.000.

Ichihashi, Toshiaki: *See*—
Imasaki, Kenji; Ichihashi, Toshiaki; and Sasaki, Masafumi, 4,839,922, Cl. 380-15.000.

Ichikawa, Atsushi, Ito, Masamichi; and Saito, Akira, to Hitachi, Ltd. Apparatus for driving objective lens. 4,838,649, Cl. 350-247.000.

Ichikawa, Mitsuhiko: *See*—
Mori, Takaaki; Higuchi, Kinichi; Oyauchi, Tsukasa; Nitanda, Masao; Hosoi, Kohei; Imai, Isao; Kato, Heiji; and Ichikawa, Mitsuhiko, 4,837,906, Cl. 29-112.000.

Ichikawa, Sadao: *See*—
Yamada, Tetsusyo; and Ichikawa, Sadao, 4,839,018, Cl. 204-425.000.

Ichikawa, Shinichi; Yoshida, Unkichi; Matsushima, Yoshihisa; and Hashimoto, Hisatake, to Tonen Sekiyu Kagaku Kabushiki Kaisha. Process for removing arsenic from a petroleum fraction. 4,839,029, Cl. 208-251.00R.

Ichikawa, Tsutomu: *See*—
Hosomizu, Hiroshi; Ichikawa, Tsutomu; Kamiya, Makoto; Yoneyama, Masatoshi; and Tuzi, Kenzi, 4,839,686, Cl. 354-416.000.

Ichikawa, Yataro: *See*—
Azuma, Shizuo; Hiramatsu, Toshiyuki; Nakagawa, Koji; and Ichikawa, Yataro, 4,838,923, Cl. 71-86.000.

Ichinoseki National College of Technology: *See*—
Sano, Shigeru; and Yashima, Saburo, 4,839,033, Cl. 209-4.000.

Icon International, Inc.: *See*—
Rorden, Randall J.; Arthur, Ronald B.; and Muhlestein, Mark, 4,839,796, Cl. 364-200.000.

Ida, Katsumi: *See*—
Koyama, Noritoshi; Ikeuchi, Takayuki; Araki, Seiichi; Kitoh, Kyosuke; and Ida, Katsumi, 4,839,389, Cl. 514-724.000.

Ida, Kozo, to Mitsubishi Rayon Co., Ltd. Process for preparation of light-diffusing methacrylic resin plates. 4,839,125, Cl. 264-216.000.

Ida, Mitsuru; and Koga, Noriyuki, to Sony Corporation. Tape bed and mode-changing mechanism arrangement for thin cassette type recorder. 4,839,759, Cl. 360-96.300.

Ida, Shuichiro: *See*—
Takeshita, Keiji; Hamano, Hideo; and Ida, Shuichiro, 4,838,121, Cl. 74-785.000.

Idaho Research Foundation, Inc.: *See*—
Maki, Gary K., 4,839,851, Cl. 364-900.000.

Ide, Jun; Iizumi, Tomoo; Takahashi, Yoshitaka; Yoshida, Hiroshi; Kaneko, Tooru; and Hishi, Yuichi, to Alps Electric Co., Ltd. Information recording disk. 4,839,753, Cl. 360-48.000.

Ide, Katsuyuki; Kobayashi, Hisao; and Aoike, Nanjou, to Toshiba Electric Equipment Corporation. Large image display apparatus. 4,839,564, Cl. 315-169.400.

Idriss, Samir F., to Shiley Infusaid Inc. Programmable valve pump. 4,838,887, Cl. 604-891.100.

Igarashi, Masahiko: *See*—
Okazaki, Atsushi; Igarashi, Masahiko; and Horie, Tsuneo, 4,839,627, Cl. 338-174.000.

Igarashi, Masazumi, to Molex Incorporated. Electrical connector 4,838,806, Cl. 439-341.000.

Ihm, Sun K.; and Lee, Dong K., to Korea Advanced Institute of Science and Technology. Process for manufacturing a titania supported palladium catalyst. 4,839,329, Cl. 502-339.000.

Iida, Sachihiro, to Kawasaki Steel Corporation. Apparatus of cooling steel strip. 4,838,526, Cl. 266-80.000.

Iida, Shozo: *See*—
Kawase, Kaoru; Sakami, Hiroshi; and Iida, Shozo, 4,839,318, Cl. 502-62.000.

Iida, Tamaki: *See*—
Kitamura, Hajime; and Iida, Tamaki, 4,839,195, Cl. 427-38.000.

Iida, Yoshiaki: *See*—
Hosoi, Masaaki; Nishioka, Ryo; Hioki, Yoshio; Iida, Yoshiaki; Takeshita, Hiroshi; Niiyama, Kenji; and Hidaka, Yusuke, 4,839,353, Cl. 514-212.000.

Iida, Yoshio: *See*—
Elsner, Matthew; Iida, Yoshio; Kwong, Edward Y.; and Rahim, Omar M., 4,839,828, Cl. 364-518.000.

Iijima, Yasuo, to Kabushiki Kaisha Toshiba. Portable electronic apparatus with a device for determining data validity. 4,839,792, Cl. 364-200.000.

Iijima, Yoichi: *See*—
Sakai, Yasuhito; and Iijima, Yoichi, 4,838,836, Cl. 474-28.000.

Iizuka, Hajime: *See*—
Yamashita, Hiroyuki; Odate, Makoto; Iizuka, Hajime; Kawazura, Hiroshi; Shiga, Yoshio; and Namekawa, Hiroshi, 4,839,376, Cl. 514-406.000.

Iizumi, Tomoo: *See*—
Ide, Jun; Iizumi, Tomoo; Takahashi, Yoshitaka; Yoshida, Hiroshi, Kaneko, Tooru; and Hishi, Yuichi, 4,839,753, Cl. 360-48.000.

Ikeda Bussan Co., Ltd.: *See*—
Kondo, Toru, 4,838,513, Cl. 248-503.100.

Ikeda, Kazuhisa: *See*—
Okada, Hiroshi; Kato, Yukihiro; Ina, Osamu; and Ikeda, Kazuhisa, 4,838,089, Cl. 73-727.000.

Ikeda, Kensuke; Yanagihara, Naoto; and Iwakura, Ken, to Fuji Photo Film Co., Ltd. Heat-sensitive recording material. 4,839,332, Cl 503-212.000.

Ikeda, Shintaro: *See*—
Hatakeyama, Ryoichi; and Ikeda, Shintaro, 4,838,582, Cl 285-110.000.

Ikeda, Yoshie: *See—*
Hirata, Keiiti; Morimoto, Yoshinari; Ban, Tomohiro; Furushima, Tokihito; Miura, Tomoko; and Ikeda, Yoshie, 4,839,827, Cl. 364-518.000.

Ikedo, Yuji; Okajima, Takahiro; and Tashiro, Yasuyuki, to Pioneer Electronic Corporation. Disk mechanism in a disk player. 4,839,764, Cl. 360-98.080.

Ikegawa, Sumio; Komatsu, Shuichi; Arai, Shinji; Ashida, Sumio; and Yasuda, Nobuaki, to Kabushiki Kaisha Toshiba. Information recording medium rewritable by utilizing two metastable phases of a recording layer and method using the same. 4,839,861, Cl. 365-113.000.

Ikehjiri, Kenichi: *See—*
Yamamoto, Noboru; Furumoto, Mitsunasa; Kawahara, Eiichiro; and Ikehjiri, Kenichi, 4,838,024, Cl. 6[illegible]488.000.

Ikenoya, Kazuhisa: *See—*
Nomura, Shinnya; Toyoda, Toshiro; and Ikenoya, Kazuhisa, 4,839,591, Cl. 324-208.000.

Ikeuchi, Takayuki: *See—*
Koyama, Noritoshi; Ikeuchi, Takayuki; Araki, Seiichi; Kitoh, Kyosuke; and Ida, Katsumi, 4,839,389, Cl. 514-724.000.

Illakowicz, Jan, to McDermott International, Inc. Drive wheel unit. 4,838,170, Cl. 104-138.200.

Ima, Seiichiro: *See—*
Kakugo, Masahiro; and Ima, Seiichiro, 4,839,234, Cl. 428-349.000.

Imagawa, Osamu; Iwanishi, Masazumi; and Yokoyama, Seiichiro, to Toyo Boseki Kabushiki Kaisha. Hydrogenated amorphous silicon film. 4,839,701, Cl. 357-2.000.

Imai, Akihiro; Matsuda, Hiromu; Yubakami, Keiichi; and Taguchi, Nobuyoshi, to Matsushita Electric Industrial Co., Ltd. Dye-receiving sheets for thermal dye transfer printing comprising a composite film substrate. 4,839,337, Cl. 503-227.000.

Imai, Hideki; and Sasaki, Minoru, to Kabushiki Kaisya Advance Kaihatsu Kenkyujo. Signal processing system. 4,839,649, Cl. 341-65.000.

Imai, Isao: *See—*
Mori, Takaaki; Higuchi, Kinichi; Oyauchi, Tsukasa; Nitanda, Masao; Hosoi, Kohei; Imai, Isao; Kato, Heiji; and Ichikawa, Mitsuhiko, 4,837,906, Cl. 29-112.000.

Imai, Tsutomu: *See—*
Umehara, Kiyoshi; Yamamoto, Hisaomi; Kobayashi, Nobuo; and Imai, Tsutomu, 4,839,099, Cl. 252-607.000.

Imajo, Minoru; and Kawakita, Tsunehiro, to Nissan Motor Co., Ltd. Oil degradation warning system. 4,839,831, Cl. 364-550.000.

Imamoto, Hiroshi: *See—*
Imanaka, Koichi; and Imamoto, Hiroshi, 4,839,307, Cl. 437-129.000.

Imamura, Takayuki: *See—*
Sugahara, Keishin; Imamura, Takayuki; Hamada, Fukusaburo; Ohtomo, Nobuya; Fujita, Haruo; and Yagami, Kazuhide, 4,839,277, Cl. 435-7.000.

Imanaka, Koichi; and Imamoto, Hiroshi, to Omron Tateisi Electronics Co. Method of manufacturing a stripe-shaped heterojunction laser with unique current confinement. 4,839,307, Cl. 437-129.000.

Imasaki, Kenji; Ichihashi, Toshiaki; and Sasaki, Masafumi, to Pioneer Electronic Corporation. CATV scrambling and descrambling method. 4,839,922, Cl. 380-15.000.

Imperial Chemical Industries PLC: *See—*
Bennett, Peter C.; and Clarke, Rodney J., 4,838,491, Cl. 239-690.000.
Marbrow, Richard A., 4,839,338, Cl. 501-227.000.

Impink, Albert J., Jr.; and Grobmyer, Louis R., to Westinghouse Electric Corp. Continuous, online nuclear power distribution synthesis system and method. 4,839,134, Cl. 376-216.000.

Impulsphysik GmbH: *See—*
Fruengel, Frank, 4,839,529, Cl. 250-574.000.

Ina, Osamu: *See—*
Okada, Hiroshi; Kato, Yukihiro; Ina, Osamu; and Ikeda, Kazuhisa, 4,838,089, Cl. 73-727.000.

Inaba, Tomokazu: *See—*
Kokuryo, Yoshiki; Kataoka, Sachiro; Inaba, Tomokazu; Terunuma, Kazuyoshi; and Asano, Toshiharu, 4,839,532, Cl. 307-10.300.

Inaba, Yutaka; and Tamura, Yasuyuki, to Canon Kabushiki Kaisha. Image forming apparatus. 4,838,652, Cl. 350-331.00R.

Inabe, Tamotsu: *See—*
Wynne, Kenneth J.; Marks, Tobin J.; and Inabe, Tamotsu, 4,839,112, Cl. 264-22.000.

Inagaki, Teruo: *See—*
Atomori, Seiichi; Inagaki, Teruo; Furuyama, Tateki; and Kamiya, Akira, 4,839,410, Cl. 524-281.000.

Inagaki, Tom, to Hudson International Conductors. Method for manufacturing high strength copper alloy wire. 4,838,959, Cl. 148-11.50C.

Indyke, David M., to Ethyl Corporation. Polyimide foams and their preparation. 4,839,398, Cl. 521-183.000.

Ingram, Robert T. Kayak safety sponsons. 4,838,196, Cl. 114-347.000.

Inotek-Westmoreland Joint Venture: *See—*
Barner, William H., 4,838,112, Cl. 74-527.000.

Inoue, Hiroshi: *See—*
Tabata, Kanzo; Inoue, Hiroshi; Muramatsu, Tadao; and Narahara, Yasuji, 4,839,217, Cl. 428-156.000.

Inoue, Kazuhiro: *See—*
Takamiya, Kikuzo; Mabuchi, Sadao; and Inoue, Kazuhiro, 4,838,122, Cl. 74-781.00B.

Inoue, Masanori: *See—*
Doi, Hiroshi; and Inoue, Masanori, 4,839,345, Cl. 514-21.000.

Inoue, Masuo: *See—*
Murai, Atsushi; Terano, Minoru; Kimura, Kohei; and Inoue, Masuo, 4,839,321, Cl. 502-127.000.

Inoue, Nobuaki: *See—*
Sasaoka, Senzo; Inoue, Nobuaki; and Okutsu, Eiichi, 4,839,259, Cl. 430-264.000.

Inoue, Osamu: *See—*
Nagura, Osamu; Inoue, Osamu; Kamikuri, Yoshimasa; and Takizuka, Norikazu, 4,839,406, Cl. 524-196.000.

Inoue, Ryuichi, to NEC Corporation. Apparatus for controlling the writing of data in disk sectors. 4,839,878, Cl. 369-54.000.

Inoue, Toru: *See—*
Taniguchi, Nobuyuki; Nakai, Masaaki; Omaki, Takanobu; Hosomizu, Hiroshi; Niwa, Masatake; Inoue, Toru; and Sekida, Minoru, 4,839,687, Cl. 354-416.000.

Institut Francais du Petrole: *See—*
Born, Maurice; Briquet, Lucienne; Lallement, Jacques; and Parc, Guy, 4,839,069, Cl. 252-45.000.

Institut Franco-Allemand De Recherches De Saint-Louis: *See—*
Pfeifer, Hans-Joachim, 4,838,687, Cl. 356-28.500.

Institut National De Recherche Sur Les Transports et Leur Securite (I.N.R.E.T.S.): *See—*
Beucher, Serge; Blosseville, Jean-Marc; and Lenoir, Francois, 4,839,648, Cl. 340-933.000.

Institut Pasteur: *See—*
Montagnier, Luc; Guetard, Denise; Brun-Vezinet, Francoise; and Clavel, Francois, 4,839,288, Cl. 435-235.000.

Instytut Chemii Przemyslowej: *See—*
Friedrich, Pawel; Placzek, Wieslaw; Mynarz, Leszek; Karpinski, Krzysztof; Gaszewski, Jerzy; and Tarasiuk, Tadeusz, 4,838,075, Cl. 73-49.800.

Intermedicat GmbH: *See—*
Landskron, Jurgen; Zahn, Jorn; Heckmann, Harald; and Mohr, Georg, 4,838,873, Cl. 604-283.000.

International Business Machines Corporation: *See—*
Bulson, Laura G.; Misenheimer, Laura P.; and Sebrosky, Robert A., 4,839,621, Cl. 335-277.000.
Chew, David W.; Hagenlocher, Willi A.; Jih, Chentung R.; and Nassimbene, Ernie G., 4,839,756, Cl. 360-105.000.
Cote, William J.; Kenney, Donald M.; Kerbaugh, Michael L.; Leach, Michael A.; Robinson, Jeffrey A.; and Sweetser, Robert W., 4,838,991, Cl. 156-643.000.
Elsner, Matthew; Iida, Yoshio; Kwong, Edward Y.; and Rahim, Omar M., 4,839,828, Cl. 364-518.000.
Fennema, Alan A., 4,839,876, Cl. 369-32.000.
Gajda, Joseph J.; Srikrishnan, Kris V.; Totta, Paul A.; and Trudeau, Francis G., 4,839,715, Cl. 357-71.000.
Gardner, Peter A., 4,839,577, Cl. 323-316.000.
Kulakowski, John E.; and Means, Rodney J., 4,839,877, Cl. 369-48.000.
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International Cryogenics, Inc.: *See—*
Leonard, Rex D.; and Short, Noel E., 4,838,034, Cl. 62-50.200.

International Flavors & Fragrances Inc.: *See—*
Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; Schreck, Lisa; and Sands, Keith P., 4,839,083, Cl. 252-174.110.

International Fuel Cells Corporation: *See—*
Levy, Alexander H.; VanDine, Leslie L.; and Trocciola, John C., 4,839,247, Cl. 429-21.000.

International Hardcoat, Inc.: *See—*
Pernick, Jeffrey R.; and Tourtellotte, Frederick, 4,839,002, Cl. 204-58.000.

International Paper Company: *See—*
Connor, Richard J.; and Justice, Gerald F., 4,838,009, Cl. 53-477.000.

InterVentional Technologies Inc.: *See—*
Parisi, Tulio T., 4,838,853, Cl. 604-22.000.

Intrieri, Charles J., Jr.: *See—*
Wu, Ming-Daang; and Intrieri, Charles J., Jr., 4,839,886, Cl. 370-4.000.

Inui, Masaki, to Toyota Jidosha Kabushiki Kaisha. Gear synchronizer for power transmission. 4,838,399, Cl. 192-53.00F.

Inui, Tetsuya: *See—*
Ohta, Kenji; Takahashi, Akira; Inui, Tetsuya; Hirokane, Junji; and Katayama, Hiroyuki, 4,839,251, Cl. 430-5.000.

Inuzuka, Tsuneki; Maeshima, Katsuyoshi; and Tomosada, Masahiro, to Canon Kabushiki Kaisha. Copying apparatus. 4,839,698, Cl. 355-243.000.

Inwave Corporation: *See—*
Harris, Lee M.; Evans, Dix L.; and Midwinter, Elizabeth A., 4,839,635, Cl. 340-752.000.

Inzinna, Louis P.: *See—*
Nied, Herman F.; and Inzinna, Louis P., 4,838,974, Cl. 156-222.000.

Irbit Research & Consulting AG: *See—*
Tschudin-Mahrer, Rolf, 4,839,223, Cl. 428-317.100.

Irving, Edward: *See—*
Demmer, Christopher G.; and Irving, Edward, 4,839,253, Cl. 430-190.000.

Iseki, Katsuhiko: *See—*
Sibasaki, Masakatsu; Sodeoka, Mikiko; Iseki, Katsuhiko; Shinoda, Masaki; Aoki, Chiyoko; Hayasi, Yosio; and Kanayama, Toshiji, 4,839,388, Cl. 514-530.000.

Ishibashi, Yoriyuki: *See—*
Uchida, Norio; Ishibashi, Yoriyuki; Hirano, Ryoichi; Masuyama, Masayuki; and Shimozono, Hiroaki, 4,838,693, Cl. 356-356.000.

Ishida, Hideki: *See—*
Takahara, Ichiro; Azumi, Masaaki; Shigetomi, Kazuo, Kamimura, Takaya; and Ishida, Hideki, 4,839,881, Cl. 369-75.200.

Ishida, Katsuyuki; Torita, Fumio; and Kohsaka, Yoshio, to Kabushiki Kaisha Toshiba. Method of washing clothes using a washing machine. 4,837,883, Cl. 8-159.000.

Ishida, Ryuichi: *See—*
Sato, Yasuhiko; Yamada, Koichiro; Nomura, Sumihiro; Ishida, Ryuichi; and Yamamura, Michio, 4,839,360, Cl. 514-252.000.

Ishida Scales Mfg. Co., Ltd.: *See—*
Sato, Hirokazu; Goto, Yasuhiro; Horiuchi, Kazufumi; Michibayashi, Yasuo; Nobutsugu, Hideo; and Kawamura, Takumi, 4,838,368, Cl. 177-25.180.

Ishida, Takao; Hagiwara, Hiroshi; and Kakumu, Ichizo, to Sintobrator, Ltd. Polishing device. 4,837,979, Cl. 51-131.400.

Ishide, Takashi: *See—*
Kitera, Takuya; Urushibata, Shoichi; Sato, Masatoshi; Nagashima, Tadashi; Hamada, Shoichi; Shirasu, Isao; Nakura, Yasumi; Sakamoto, Michito; Ishide, Takashi; Sakamoto, Naruo; Meka, Masahiko; and Tomeoka, Masaru, 4,839,495, Cl. 219-121.630.

Ishido, Hideko: *See—*
Yamamoto, Hiromi; and Ishido, Hideko, 4,839,167, Cl. 424-71.000.

Ishido, Takao; Sasaki, Shougo; and Takahashi, Takao, to Nissan Motor Co., Ltd. Multiple-phase weaving fluid jet loom. 4,838,321, Cl. 139-20.000.

Ishige, Ryohei; and Hatakeyama, Kazuo, to Hitachi, Ltd. Crane and driving system therefor. 4,838,438, Cl. 212-159.000.

Ishiguro, Minoru; and Takahashi, Minoru, to Fuji Photo Film Co., Ltd. Light receiving element for a rangefinder. 4,839,685, Cl. 354-403.000.

Ishihara, Mitsutoshi: *See—*
Matsuda, Yoshio; and Ishihara, Mitsutoshi, 4,838,044, Cl. 66-190.000.

Ishihara, Sadao: *See—*
Sakai, Masaaki; Ishihara, Sadao; and Shimoyama, Touma, 4,838,720, Cl. 400-642.000.

Ishihara, Shunichi, to Canon Kabushiki Kaisha. Image forming apparatus. 4,839,689, Cl. 355-202.000.

Ishii, Hiromitsu; and Ono, Takashi, to Hochiki Corp. Extinction type detector. 4,838,698, Cl. 356-437.000.

Ishii, Tamaki: *See—*
Fukui, Yoshiharu; Kuroda, Kazuhisa; Ishii, Tamaki; and Sasaki, Manji, 4,839,408, Cl. 524-100.000.

Ishii, Tsuneo, to Pioneer Electronic Corporation. Initial state setting system for still picture recording/reproduction device. 4,839,748, Cl. 360-10.100.

Ishikawa, Hiromichi, to Pilot Man-Nen Hitsu Kabushiki Kaisha. Ink ribbon cassette. 4,838,715, Cl. 400-196.100.

Ishikawa, Masakuni: *See—*
Yasuma, Jun-ichi; Kobayashi, Tadashi; and Ishikawa, Masakuni, 4,839,509, Cl. 235-482.000.

Ishikawa, Osamu: *See—*
Teraoka, Masao; Ishikawa, Osamu; and Yuhashi, Yukio, 4,838,119, Cl. 74-711.000.

Ishikawa, Tadashi; and Kikuchi, Yutaka, to Canon Kabushiki Kaisha. Paper feed apparatus. 4,838,534, Cl. 271-10.000.

Ishikawa, Youhei; Tsunoda, Kikuo; Hiratsuka, Toshiro; and Abe, Hirotsugu, to Murata Manufacturing Co., Ltd. Dielectric filter. 4,839,773, Cl. 361-321.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Mori, Takaaki; Higuchi, Kinichi; Oyauchi, Tsukasa; Nitanda, Masao; Hosoi, Kohei; Imai, Isao; Kato, Heiji; and Ichikawa, Mitsuhiko, 4,837,906, Cl. 29-112.000.

Ishikawajima Industrial Machinery Co., Ltd.: *See—*
Hanaya, Morimasa; Miura, Tsunemoto; Mamiya, Satoru; Isozaki, Hiroshi; and Miyajima, Kiyoshi, 4,838,751, Cl. 414-412.000.

Ishizaka, Hideo: *See—*
Kushima, Hiroshi; and Ishizaka, Hideo, 4,839,683, Cl. 354-322.000.

Ishizaki, Makoto; Sato, Takateru; Tanaka, Soichi; and Kariu, Keiki, to Kuraray Co., Ltd.; and Kawasumi Laboratories, Inc. Method for treating blood and apparatus therefor. 4,839,055, Cl. 210-641.000.

Ishizaki, Masao: *See—*
Sakami, Yasuo; Okina, Shigetaka; Tsubouchi, Junichi; Izaki, Shozo; Fukushima, Toshitaka; Watanabe, Hiroyuki; and Ishizaki, Masao, 4,839,854, Cl. 364-900.000.

Isnardi, Michael A., to General Electric Company. Compatible wide-screen television system with auxiliary subcarrier modulated by side panel high frequency information. 4,839,720, Cl. 358-12.000.

Isoda, Shigeo: *See—*
Katsumoto, Kenichi; Isoda, Shigeo; Yuuki, Takahiro; Koike, Shiro; Yamamoto, Yutaka; Motonishi, Suguru; Kawaguchi, Tadashi; Gotoh, Tetsuya; and Horiguchi, Shiro, 4,839,005, Cl. 204-129.460.

Isomura, Tsuneo: *See—*
Murata, Tadaichi; Isomura, Tsuneo; Fujimori, Kenichi; Tsuruta, Fuminori; Dohi, Kazuhito; Horigome, Masahiro; Nakayama, Yoshitarou; and Oomori, Sachio, 4,839,252, Cl. 430-59.000.

Isomura, Yukio, to Aisin Seiki Kabushiki Kaisha. Inside handle device for vehicle. 4,838,590, Cl. 292-336.300.

Isozaki, Hiroshi: *See—*
Hanaya, Morimasa; Miura, Tsunemoto; Mamiya, Satoru; Isozaki, Hiroshi; and Miyajima, Kiyoshi, 4,838,751, Cl. 414-412.000.

Isuzu Motors Limited: *See—*
Kawamura, Hideo; and Matsuoka, Hiroshi, 4,838,235, Cl. 123-668.000.
Yanagisawa, Naoki; Sato, Yoshihiko; and Sakurai, Noriyuki, 4,838,222, Cl. 123-263.000.

Ito, Akihiro: *See—*
Nakatani, Yukio; Ito, Akihiro; and Sakai, Takashi, 4,839,742, Cl. 358-296.000.

Ito, Haruhiko; Shibata, Yoshio; Banzai, Masato; and Yatomi, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Wire electrode for wire-cut electrical discharge machining. 4,839,487, Cl. 219-69.120.

Ito, Hiroshi: *See—*
Kano, Yukio; Yoshikawa, Kuniyuki; Kishida, Hideaki; Ito, Hiroshi; and Maeda, Mitsutoshi, 4,839,525, Cl. 250-560.000.

Ito, Koichi, to NEC Corporation. Input/output buffer system. 4,839,791, Cl. 364-200.000.

Ito, Masaaki; Odagiri, Shiro; Maeda, Kouji; Uekubo, Yasuhiro; Jitumori, Aiko; and Usami, Teruo, to Tokyo Electric Power Co., Inc., The; and Mitsubishi Denki Kabushiki Kaisha. System for detecting underground objects. 4,839,654, Cl. 342-22.000.

Ito, Masamichi: *See—*
Ichikawa, Atsushi; Ito, Masamichi; and Saito, Akira, 4,838,649, Cl. 350-247.000.

Ito, Wataru; Kubota, Tomoki; Sumiya, Koji; and Yokoyama, Shoji. Resistive steering sensor. 4,839,579, Cl. 324-63.000.

Ito, Yasuyuki, to Kabushiki Kaisha Toshiba. Gyrotron device. 4,839,561, Cl. 315-4.000.

Ito, Yosuke; Nomura, Yasuhiro; and Katayama, Sakae, to Buckman Laboratories International, Inc. Quaternary ammonium and benzothiazole microbicidal preservative composition. 4,839,373, Cl. 514-367.000.

Itoh, Hiromi, to Mitsubishi Denki Kabushiki Kaisha. Photochemical film-forming method. 4,839,196, Cl. 427-53.100.

Itoh, Masaki: *See—*
Nakagawa, Katsuji; Itoh, Masaki; Morimoto, Akio, and Sakai, Mitsuru, 4,839,208, Cl. 428-64.000.

Itoh, Tetsuo: *See—*
Mawatari, Masaaki; Itoh, Tetsuo; Tsuchikawa, Syuji; and Kimura, Shinichi, 4,839,425, Cl. 525-92.000.

Itoh, Yuji, to Canon Kabushiki Kaisha. Particle analyzing apparatus using an afocal light beam. 4,839,528, Cl. 250-574.000.

Itoi, Goro: *See—*
Tajima, Kyousuke; Itoi, Goro; and Sorimachi, Mitsuo, 4,838,815, Cl. 439-841.000.

Itou, Takaaki: *See—*
Uranishi, Kouji; and Itou, Takaaki, 4,838,229, Cl. 123-440.000.

Ivanova, Irina A.: *See—*
Granik, Vladimir G.; Stezhko, Tatyana V.; Glushkov, Robert G.; Mashkovsky, Mikhail D.; Roschina, Lidia F.; Polezhaeva, Antonina I.; Parimbetova, Roza B.; Bobkov, Jury G.; Losev, Alexandr S.; and Ivanova, Irina A., 4,839,380, Cl. 517-424.000.

Iwabuchi, Hidetoshi: *See—*
Abe, Yoshiaki; and Iwabuchi, Hidetoshi, 4,839,168, Cl. 424-74.000.

Iwaksaki, Masahiko, to Mitsubishi Denki Kabushiki Kaishi. Interface circuit for single-chip microprocessor. 4,839,795, Cl. 364-200.000.

Iwakura, Ken: *See—*
Ikeda, Kensuke; Yanagihara, Naoto; and Iwakura, Ken, 4,839,332, Cl. 503-212.000.

Iwanishi, Masazumi: *See—*
Imagawa, Osamu; Iwanishi, Masazumi; and Yokoyama, Seiichiro, 4,839,701, Cl. 357-2.000.

Iwasaki, Akira: *See—*
Hamasaki, Yoshito; Iwasaki, Akira; and Sue, Hiroaki, 4,838,576, Cl. 280-777.000.

Iwasaki, Chisato: *See—*
Okabe, Kazuya; Kasama, Yasuhiko; Seki, Hitoshi; and Iwasaki, Chisato, 4,839,510, Cl. 250-211.00J.

Iwata, Michiaki: *See—*
Koyama, Masao; Iwata, Michiaki; Kurihara, Kunihiko; and Sezaki, Masaji, 4,839,378, Cl. 514-417.000.

Iwatani, Shiro: *See—*
Kaneyuki, Kazutoshi; and Iwatani, Shiro, 4,839,576, Cl. 322-25.000.

Izaki, Shozo: *See—*
Sakami, Yasuo; Okina, Shigetaka; Tsubouchi, Junichi; Izaki, Shozo; Fukushima, Toshitaka; Watanabe, Hiroyuki; and Ishizaki, Masao, 4,839,854, Cl. 364-900.000.

Izumi, Fumiaki: *See—*
Hamano, Yukio; Tomomatsu, Hideo; Izumi, Fumiaki; and Taga, Yutaka, 4,838,125, Cl. 74-866.000.

Izumi, Mitsuhiko: *See—*
Yoshino, Kenji; Wakui, Tadahiro; Kumazawa, Yumiko; Izumi, Mitsuhiko; and Yamagishi, Touru, 4,839,128, Cl. 264-328.100

Izumi, Tsugio: *See—*
Sagi, Nobuo; Izumi, Tsugio; Kida, Haruyasu; and Maeda, Hirokazu, 4,839,192, Cl. 426-607.000.

J. Cinnamon Limited: *See—*
Cross, Michael G., 4,838,612, Cl. 297-338.000.

J. M. Voith GmbH: *See—*
Hafner, Paul; and Schiel, Christian, 4,838,156, Cl. 100-47.000.

J. R. Richards, Inc.: *See—*
Richards, Charles; and Kobayashi, Kazuhiro, 4,838,673, Cl. 351-44.000.

Jabarin, Saleh A.: *See—*
Ajmera, Prakash R.; and Jabarin, Saleh A., 4,839,127, Cl. 264-526.000.

Jackson, Eric A., to Anderson Strathclyde plc. Apparatus for manipulating a tool. 4,838,362, Cl. 173-36.000.

Jackson, John F., to Westinghouse Electric Corp. Serrated magnetic random memory cell and means for connecting a pair of adjacent cells. 4,839,858, Cl. 365-87.000.

Jackson, Winston J., Jr.: *See—*
Darnell, W. Ronald; and Jackson, Winston J., Jr., 4,839,459, Cl. 528-220.000.

Jacob, Kapakkamannil C.: *See*—
Cherukuri, Subraman R.; Mansukhani, Gul; and Jacob, Kapakkamannil C., 4,839,184, Cl. 426-307.00.

Jacobs, Harry E.: *See*—
Brown, Stanley M.; Byrne, John W.; and Jacobs, Harry E., 4,839,026, Cl. 208-120.000.

Jacobs, Jochen: *See*—
Kruse, Hans; Jacobs, Jochen; Altenschoepfer, Theodor; and Jeschke, Peter, 4,839,078, Cl. 252-99.000.

Jacobs Manufacturing Company, The: *See*—
Meistrick, Zdenek S.; and Quenneville, Raymond N., 4,838,516, Cl. 251-77.000.

Jaffe, Kenneth: *See*—
Sheridan, Michael; and Jaffe, Kenneth, 4,838,095, Cl. 73-864.630.

Jager, Horst, to Bayer Aktiengesellschaft. Reactive disazo dyestuffs having a fluorocontaining reactive group and a sulphatoethylsulphone substituent. 4,839,469, Cl. 534-637.000.

Jagotec AG: *See*—
Colombo, Paolo; La Manna, Aldo; and Conte, Ubaldo, 4,839,177, Cl. 424-482.000.

Jaguar Cars Limited: *See*—
Parsons, Bryan N. V., 4,838,220, Cl. 123-190.00D.

Jain, Surendra, to Reynolds Company, The. Fiberglass insulation coated with a heat collapsible foam composition. 4,839,222, Cl. 428-290.000.

Jakobs, Willy, to Klockner-Humboldt-Deutz Aktiengesellschaft. Roller mill, particularly roll press or roll jaw crusher. 4,838,494, Cl. 241-226.000.

Jamiolkowski, Dennis D.; Shalaby, Shalaby W.; Bezwada, Rao S.; and Newman, Hugh D., Jr., to Ethicon, Inc. Glycolide/p-dioxanone block copolymers. 4,838,267, Cl. 128-335.500.

Jangaard, Erling S., to Ruvo Automation Corporation. Method of applying a door hinge. 4,837,916, Cl. 29-4 4.000.

Janin, Claude: *See*—
Villaine, Philippe; and Janin, Claude, 4,839,113, Cl. 264-28.000.

Janko, Michael; and McAllister, Matthew, to Alliko Unlimited, Corp. Illuminated article. 4,839,777, Cl. 362-108.000.

Jannotta, Anthony S. Lower back therapy device. 4,838,249, Cl. 128-25.00R.

Jannson, Joanna L.: *See*—
Jannson, Tomasz P.; Jannson, Joanna L.; and Yeung, Peter C., 4,838,630, Cl. 350-3.700.

Jannson, Tomasz P.; Jannson, Joanna L.; and Yeung, Peter C., to Physical Optics Corporation. Holographic planar optical interconnect. 4,838,630, Cl. 350-3.700.

Jansch, Manfred. Method and apparatus for detecting leaks. 4,838,073, Cl. 73-40.700.

Jansen, Georg, to Akzo N.V. Process for lubricating and cleaning of bottle conveyor belts in the beverage industry. 4,839,067, Cl. 252-11.000.

Janssen, Peter J. M., to U. S. Philips Corporation. Record carrier with an optically readable trackwise-arranged information structure. 4,839,882, Cl. 369-275.000.

Janssen Pharmaceutica, N.V.: *See*—
Janssens, Frans E.; Kennis, Ludo E. J.; Lens, Jozef F.; Torremans, Joseph L. G.; and Diels, Gaston S. M., 4,839,374, Cl. 514-394.000.

Janssens, Frans E.; Kennis, Ludo E. J.; Lens, Jozef F.; Torremans, Joseph L. G.; and Diels, Gaston S. M., to Janssen Pharmaceutica, N.V. 4-((Bicyclic heterocyclyl)-methyl and -hetero)-piperidines. 4,839,374, Cl. 514-394.000.

Jantsch, Wolfgang; and Ferenczi, Gyorgy, to Magyar Tudomanyos Akademia Muszaki Fizikai Kutato Intezet. Method for the examination of electrically active impurities of semiconductor materials or structures and measuring arrangement for carrying out the method. 4,839,588, Cl. 324-158.00D.

Japan Atomic Energy Research Institute: *See*—
Kaetsu, Isao; Kumakura, Minoru; Suyama, Hidenari; Kameda, Nobuo; and Koyama, Hideo, 4,839,109, Cl. 264-1.400.

Japan Steel Works, Ltd., The: *See*—
Yoshino, Yuichi, 4,838,960, Cl. 148-135.000.

Japan Synthetic Rubber Co., Ltd.: *See*—
Atomori, Seiichi; Inagaki, Teruo; Furuyama, Tateki; and Kamiya, Akira, 4,839,410, Cl. 524-281.000.
Mawatari, Masaaki; Itoh, Tetsuo; Tsuchikawa, Syuji; and Kimura, Shinichi, 4,839,425, Cl. 525-92.000.

Jarnott, Frank T.; and Norwood, Leslie S., to Scott Bader Company Limited. Sectional storage tanks. 4,838,44?, Cl. 220-5.00A.

Jarvis, Patrick T. Steerable roller skate. 4,838,564, Cl. 280-11.280.

Jayne, William. All surface image forming system. 4,839,666, Cl. 346-75.000.

Jean Walterscheid GmbH: *See*—
Flanhardt, Michael; and Coenen, Karl, 4,838,108, Cl. 74-417.000.

Jellinek, Karl; Meier, Bert; and Zehrfeld, Jurgen, to Rutgerswerke AG. Composite materials of multilayer duroplastic prepregs. 4,839,229, Cl. 428-413.000.

Jencks, Davis C., to New England Overseas Corporation, Inc. Circular warp knit composite cord. 4,838,043, Cl. 66-170.000.

Jeneric/Pentron, Inc.: *See*—
Waknine, Samuel, 4,839,401, Cl. 522-14.000.

Jenkins, Robert L., to Wattigny, C. "Jerry", a part interest. Down hole oil field clean-out method. 4,838,354, Cl. 166-311.000.

Jennings, Alfred R., Jr.; and Stowe, Lawrence R., to Mobil Oil Corp. Proppant for use in viscous oil recovery. 4,838,351, Cl. 166-280.000.

Jensvold, John A.: *See*—
Sanders, Edgar S., Jr.; Clark, Daniel C.; and Jensvold, John A., 4,838,904, Cl. 55-158.000.

Jermyn, Chester S. Pumping device. 4,838,770, Cl. 417-343.000.

Jeruzal, Thomas M., to Chrysler Motors Corporation. Storage pack comprising at least two stacked and nested trays each loaded with a plurality of semi-circular split ring bearing halves. 4,838,417, Cl. 206-318.000.

Jeschke, Peter: *See*—
Kruse, Hans; Jacobs, Jochen; Altenschoepfer, Theodor; and Jeschke, Peter, 4,839,078, Cl. 252-99.000.
Wisotzki, Klaus-Dieter; Guirr, Ortburg; Jeschke, Peter; Schumann, Klaus; Schmid, Karl-Heinz; and Biermann, Manfred, 4,839,098, Cl. 252-557.000.

Jeschke, Willi; and Weber, Werner, to Heidelberger Druckmaschinen AG. Drive system with drive means for axial reciprocation of distributor rollers of an inking unit. 4,838,163, Cl. 101-349.000.

Jewish Hospital, The: *See*—
Weil, Gary J., 4,839,275, Cl. 435-7.000.

Jezic, Zdravko; and Young, Gene P., to Dow Chemical Company, The. Biconstituent polypropylene/polyethylene fibers. 4,839,228, Cl. 428-401.000.

JF-Fabriken - J. Freudendahl A/S: *See*—
Freudendahl, Jan, 4,838,358, Cl. 172-125.000.

Jiang, Bai-Chuan: *See*—
Bronskill, Michael J.; and Jiang, Bai-Chuan, 4,838,677, Cl. 351-203.000.

Jidosha Denki Kogyo Kabushiki: *See*—
Sasaki, Michiaki; and Yamamoto, Kiyokazu, 4,838,307, Cl. 137-574.000.

Jidosha Kiki Co., Ltd.: *See*—
Ohe, Takeshi; and Ohsaki, Hiroshi, 4,838,767, Cl. 417-299.000.

Jih, Chentung R.: *See*—
Chew, David W.; Hagenlocher, Willi A.; Jih, Chentung R.; and Nassimbene, Ernie G., 4,839,756, Cl. 360-105.000.

Jin, Sungho: *See*—
Dentini, Mark S.; Fulton, Joe A.; Jin, Sungho; Mottine, John J., Jr.; Shepherd, Lloyd; and Sherwood, Richard C., 4,838,347, Cl. 165-185.000.

Jitumori, Aiko: *See*—
Ito, Masaaki; Odagiri, Shiro; Maeda, Kouji; Uekubo, Yasuhiro; Jitumori, Aiko; and Usami, Teruo, 4,839,654, Cl. 342-22.000.

Jobmann, Ingo: *See*—
Bruhnke, Ulrich; Korber, Jurgen; and Jobmann, Ingo, 4,838,599, Cl. 296-37.900.

Jobs S.p.a.: *See*—
Corsi, Armando, 4,838,531, Cl. 269-21.000.

Johannes Zimmer Gesellschaft M.B.H.: *See*—
Bohm, Walter, 4,838,159, Cl. 101-119.000.

Johansson, Anders: *See*—
DeMario, Edmund E.; Johansson, Anders; and Nylund, Olov, 4,839,136, Cl. 376-462.000.

Johansson, Ronald C.: *See*—
Fox, Albert H., and Johansson, Ronald C., 4,839,473, Cl. 174-138.00F.

John Zink Company: *See*—
Young, John D.; and Fischer, Ernest A., 4,838,184, Cl. 110-346.000.

Johnan Seisakusho Co., Ltd.: *See*—
Sakai, Masanori, 4,839,544, Cl. 310-12.000.

Johnson, Alan T. Hoist and accumulator arm apparatus. 4,838,748, Cl. 414-796.700.

Johnson, Brian: *See*—
Geen, John A.; and Johnson, Brian, 4,839,650, Cl. 341-118.000.

Johnson, Darrell R.: *See*—
Marshall, Steven F.; Haden, Richard E., Jr.; and Johnson, Darrell R., 4,838,158, Cl. 101-105.000.

Johnson, Gordon E. Combined cover and attaching means for concealing a deadbolt lock. 4,838,059, Cl. 70-209.000.

Johnson, Gregg E.: *See*—
Escamilla, Robert M.; Escamilla, Elias, III; Escamilla, Elias, Jr.; Johnson, Gregg E.; Arnold, Robert M.; and Tatner, Thomas, 4,838,153, Cl. 99-349.000.

Johnson, Herbert C.: *See*—
Shifflet, Glenn; Johnson, Herbert C.; and Revenaugh, Paul W., 4,838,077, Cl. 73-118.100.

Johnson & Johnson: *See*—
Brassington, Nigel J.; and Gilbert, John A., 4,838,253, Cl. 128-156.000.

Johnson, Steven H.; and Williams, Lary L., to Deere & Company. Automatic engine control for an excavator. 4,838,755, Cl. 414-699.000.

Johnson, Steven H.; and Williams, Lary L., to Deere & Company. Hydraulic system for an industrial machine. 4,838,756, Cl. 414-699.000.

Johnson, Tedd P.: *See*—
Nurczyk, Mark E.; and Johnson, Tedd P., 4,838,483, Cl. 236-49.500.

Jokel, Isidore. Window instrusion barrier. 4,837,974, Cl. 49-55.000.

Jondrow, Timothy J., to Hewlett-Packard Company. Handle-latch mechanism. 4,838,585, Cl. 292-8.000.

Jones, A. Raymond. Drill bit. 4,838,366, Cl. 175-410.000.

Jones, Francis: *See*—
Van Ewyk, Robert L.; O'Connor, Ingrid M.; Mosley, Alan; Jones, Francis; Blackburn, Christopher; and Griffiths, John, 4,838,659, Cl. 350-337.000.

Jones, Howard: *See*—
Youssefyeh, Raymond D.; and Jones, Howard, 4,839,367, Cl. 514-312.000.

Jones, John I.: *See*—
Jucha, Rhett B.; Davis, Cecil J.; and Jones, John I., 4,838,990, Cl. 156-643.000.

Jones, Marshall G.: *See*—
Chande, Tushar S.; Jones, Marshall G.; Ortiz, Angel L., Jr.; and August, John L., Jr., 4,838,631, Cl. 350-6.600.

Jones, Steven D.; and Blomgren, George E., to Eveready Battery Company, Inc. Low temperature molten composition comprised of ternary alkyl sulfonium salts. 4,839,249, Cl. 429-194.000.

Josso, Frank: *See*—
Kertesz, Claude; Koehly, Gerard; Josso, Frank; and Bernard, Andre , 4,839,102, Cl. 252-628.000.

Jour, Jean-Paul; Orban, Jacques; and Salvaire, Andre , to Etudes et Fabrication. Cement mixing process. 4,838,699, Cl. 366-2.000.

Jucha, Rhett B.; Davis, Cecil J.; and Jones, John I., to Texas Instruments Incorporated. Method for plasma etching tungsten. 4,838,990, Cl. 156-643.000.

Jucha, Rhett B.: *See*—
Luttmer, Joseph D.; Davis, Cecil J.; Smith, Patricia B.; York, Rudy L.; Loewenstein, Lee M.; and Jucha, Rhett B., 4,838,984, Cl. 156-643.000.

Judas, Didier: *See*—
Cuzin, Daniel; and Judas, Didier, 4,839,441, Cl. 528-328.000.

Judson, Edward G. Balopod (hybrid flying machine). 4,838,501, Cl. 244-29.000.

Julius & August Erbsloh GmbH & Co.: *See*—
Grosch, Karl, 4,838,006, Cl. 52-790.000.

Jung, Werner; and Sievers, Axel, to BASF Lacke & Farben Akt. Soluble acrylate copolymer containing carboxyl groups, processes for its preparation and coating agents based on the acrylate copolymer. 4,839,448, Cl. 526-262.000.

Jungermann, Eric; and Scott, Richard A., to Neutrogena Corporation. Antibacterial iodophor soap base composition and method of making same. 4,839,080, Cl. 252-107.000.

Juridical Foundation The Chemo-Sero-Therapeutic Research Institute: *See*—
Sugahara, Keishin; Imamura, Takayuki; Hamada, Fukusaburo; Ohtomo, Nobuya; Fujita, Haruo; and Yagami, Kazuhide, 4,839,277, Cl. 435-7.000.
Taniguchi, Isao; Yasukouchi, Kazuo; Tsuji, Ichiroh; and Fujiyasu, Takeshi, 4,839,017, Cl. 204-403.000.

Justice, Gerald F.: *See*—
Connor, Richard J.; and Justice, Gerald F., 4,838,009, Cl. 53-477.000.

Justus, Paul E.; and Zaman, Mahammad F., to Essex Group, Inc. Heated supply sheaves for wire coating apparatus. 4,839,205, Cl. 428-34.100.

K. B. Electronics Inc.: *See*—
Saganovsky, Abraham, 4,839,570, Cl. 388-815.000.

K. W. Thompson Tool Company, Inc.: *See*—
French, Kendrick L., 4,838,339, Cl. 164-340.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Katsumoto, Kenichi; Isoda, Shigeo; Yuuki, Takahiro; Koike, Shiro; Yamamoto, Yutaka; Motonishi, Suguru; Kawaguchi, Tadashi; Gotoh, Tetsuya; and Horiguchi, Shiro, 4,839,005, Cl. 204-129.460.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Baba, Kiyokazu, 4,838,538, Cl. 271-238.000.
Nagai, Takao, 4,838,375, Cl. 180-142.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Ozawa, Masaki; Hosaka, Toshiyuki; and Yoshizawa, Masayuki, 4,838,707, Cl. 374-171.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Kano, Yukio; Yoshikawa, Kuniyuki; Kishida, Hideaki; Ito, Hiroshi; and Maeda, Mitsutoshi, 4,839,525, Cl. 250-560.000.

Kabushiki Kaisha Tokyo Kikai Seisakusho: *See*—
Miyoshi, Masahiko; and Sato, Masayoshi, 4,838,164, Cl. 101-365.000.

Kabushiki Kaisha Toritsu Industry: *See*—
Tajima, Masao, 4,839,429, Cl. 525-232.000.

Kabushiki Kaisha Toshiba: *See*—
Akagi, Junko, 4,839,612, Cl. 330-302.000.
Azuma, Yoshiyuki, 4,838,050, Cl. 68-12.00R.
Hara, Hiroyuki; and Sugimoto, Yasuhiro, 4,839,609, Cl. 330-253.000.
Iijima, Yasuo, 4,839,792, Cl. 364-200.000.
Ikegawa, Sumio; Komatsu, Shuichi; Arai, Shinji; Ashida, Sumio; and Yasuda, Nobuaki, 4,839,861, Cl. 365-113.000.
Ishida, Katsuyuki; Torita, Fumio; and Kohsaka, Yoshio, 4,837,883, Cl. 8-159.000.
Ito, Yasuyuki, 4,839,561, Cl. 315-4.000.
Kinoshita, Tsuneo; and Sato, Kazuyuki, 4,839,820, Cl. 364-491.000.
Matsumoto, Yoshihiro, 4,839,823, Cl. 364-513.000.
Morishita, Mimpei; and Azukizawa, Teruo, 4,838,172, Cl. 104-281.000.
Murakami, Syogo; and Shimmyo, Takashi, 4,839,732, Cl. 358-304.000.
Murakata, Masami, 4,839,821, Cl. 364-491.000.
Sekine, Makoto; Okano, Haruo; Arikado, Tsunetoshi; and Horiike, Yasuhiro, 4,838,978, Cl. 156-345.000.
Sugiura, Satoshi, 4,839,596, Cl. 324-322.000.
Tagawa, Hajime; and Yukinaga, Koji, 4,839,691, Cl. 355-260.000.
Takemura, Yasuo, 4,839,734, Cl. 358-213.220.
Tanaka, Koichi, 4,839,856, Cl. 364-900.000.
Tokumaru, Takeji; and Nagata, Miyuki, 4,839,839, Cl. 364-715.080.
Tokumaru, Takeji, 4,839,840, Cl. 364-715.080.
Uchida, Norio; Ishibashi, Yoriyuki; Hirano, Ryoichi; Masuyama, Masayuki; and Shimozono, Hiroaki, 4,838,693, Cl. 356-356.000.
Ueno, Masaji, 4,839,537, Cl. 307-446.000.
Ueno, Masaji, 4,839,540, Cl. 307-473.000.
Urushibata, Yukio, 4,839,826, Cl. 364-518.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Kimura, Kazuya; Nakamoto, Akira; and Hasegawa, Jun, 4,838,766, Cl. 417-222.000.
Watanabe, Yasushi; Kawaguchi, Masahiro; Suzuki, Shinichi; and Nakai, Tatsuya, 4,838,740, Cl. 417-295.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Kano, Hiroyuki; Yagi, Yuji; and Sakaki, Hiroyuki, 4,839,708, Cl. 357-26.000.
Kano, Yukio; Yoshikawa, Kuniyuki; Kishida, Hideaki; Ito, Hiroshi; and Maeda, Mitsutoshi, 4,839,525, Cl. 250-560.000.

Kabushiki Kaisya Advance Kaihatsu Kenkyujo: *See*—
Imai, Hideki; and Sasaki, Minoru, 4,839,649, Cl. 341-65.000.

Kadokura, Kenji: *See*—
Kida, Shuji; Kaneko, Yutaka; Kadokura, Kenji; Yoshimoto, Shinji, and Masuda, Kosaku, 4,839,264, Cl. 430-505.000.

Kaepa, Inc.: *See*—
Skaja, Joseph J., 4,837,960, Cl. 40-636.000.

Kaetsu, Isao; Kumakura, Minoru; Suyama, Hidenari; Kameda, Nobuo; and Koyama, Hideo, to Japan Atomic Energy Research Institute; and Tokyo Contact Lens Research Institute. Process for producing a contact lens. 4,839,109, Cl. 264-1.400.

Kaganov, Alan L.: *See*—
Dumican, Barry L.; Kaganov, Alan L.; and Ritter, Thomas A., 4,838,884, Cl. 604-364.000.

Kagawa, Junichi: *See*—
Sato, Yasushi; Nagasaki, Shigeru; Taniguchi, Masato; Kagawa, Junichi; and Kawamura, Mitsuyoshi, 4,838,218, Cl. 123-188.0AA.

Kai, Toru: *See*—
Yokoi, Satoru; and Kai, Toru, 4,838,171, Cl. 104-166.000.

Kaieda, Takeji; Yamada, Kimimasa; and Yamawaki, Naokuni, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing cytotoxic T-cells and compositions produced by said process. 4,839,290, Cl. 435-240.230.

Kaiser, Wolfgang: *See*—
Held-Elbert, Gabriele; Kaiser, Wolfgang; Koch, Wilhelm; and Schmutzler, Werner, 4,839,920, Cl. 379-377.000.

Kajiwara, Makoto: *See*—
Miyoshi, Masanobu; Kajiwara, Makoto; Onodera, Kaoru; and Sakamoto, Eiichi, 4,839,263, Cl. 430-384.000.

Kaku, Shinkyo; and Yu, Chung-Li, to Advanced Micro Devices, Inc. Apparatus for decoding facsimile coded data to image data with coding and reference line windowing and color change detection. 4,839,738, Cl. 358-261.200.

Kakugo, Masahiro; and Ima, Seiichiro, to Sumitomo Chemical Company, Limited. Polypropylene film. 4,839,234, Cl. 428-349.000.

Kakumu, Ichizo: *See*—
Ishida, Takao; Hagiwara, Hiroshi; and Kakumu, Ichizo, 4,837,979, Cl. 51-131.400.

Kallmes, Otto J., to M/K Systems Inc. Hydrofoil blade for producing turbulence. 4,838,996, Cl. 162-352.000.

Kalsi, Hardyal S.: *See*—
Markland, Eric; Tofield, Graham M.; Lucas, Gary P.; and Kalsi, Hardyal S., 4,838,091, Cl. 73-861.190.

Kalt, Glenda G.; Straub, Dale K.; and Piwonka, Peter, to Kalt, Glenda G. Universal clamp. 4,838,867, Cl. 604-180.000.

Kalt, Glenda G.; Straub, Dale K.; and Piwonka, Peter, to Kalt, Glenda G. Universal clamp. 4,838,878, Cl. 604-180.000.

KAM Scientific Inc.: *See*—
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Kamal, Nabil. Fabric picker and separator. 4,838,536, Cl. 271-18.300.

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Kameyama, Shuichi; Komeda, Tadao; Kobushi, Kazuhiro; and Sakai, Hiroyuki, to Matsushita Electric Industrial Co., Ltd. Method for fabricating bipolar semiconductor device. 4,839,302, Cl. 437-31.000.

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Kamitamari, Manabu; and Hayama, Hiroyoshi, to Minolta Camera Kabushiki Kaisha. Image forming apparatus. 4,839,697, Cl. 355-309.000.

Kamiya, Akira: *See*—
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Kamiya, Makoto: *See*—
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Kamiyama, Kozi; and Okazaki, Yoji, to Fuji Photo Film Co., Ltd. Optical wavelength conversion device. 4,839,638, Cl. 350-96.190.

Kan, Fumitaka; Arahara, Kohzoh; Tohyama, Noboru; Yuasa, Toshiya; and Fukumoto, Hiroshi, to Canon Kabushiki Kaisha. Image recording ink. 4,838,940, Cl. 106-22.000.

Kanamaru, Hitoshi, to Pioneer Electronic Corporation. Information reproduction method for complex and CD disks. 4,839,746, Cl. 358-342.000.

Kanasugi, Mikiko: *See*—
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Kanda, Shigeru; Shibata, Manabu; Ono, Masayoshi; and Okano, Michikazu, to Nihon Tokushu Toryo Co., Ltd.; and Hirotani Co., Ltd. Composition particularly adapted to damping sheets for vehicles. 4,838,939, Cl. 106-281.100.

Kanegae, Hidetoshi; Tomikashi, Minoru; and Hino, Akira, to Nissan Motor Company Limited. Automotive vehicle trouble checking apparatus. 4,839,811, Cl. 364-424.030.

Kanegafuchi Chemical Industry Co., Ltd.: *See*—
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Kaneko, Setsuo: *See*—
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Kano, Yukio; Yoshikawa, Kuniyuki; Kishida, Hideaki; Ito, Hiroshi; and Maeda, Mitsutoshi, to Kabushiki Kaisha Tokai Rika Denki Seisakusho; and Kabushiki Kaisha Toyota Chuo Kenkyusho. Method of and apparatus for measuring coordinates of edges of tape. 4,839,525, Cl. 250-560.000.

Kanzaki Kokyukoki Mfg. Co., Ltd.: *See*—
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Kaplan, Donald S.; Hermes, Matthew E.; Muth, Ross R.; and Kennedy, John J., to United States Surgical Corporation. Process of making an absorbable surgical device. 4,839,130, Cl. 264-235.000.

Karagiannis, Constantinos. Apparatus for coating and laminating sheet materials. 4,838,985, Cl. 156-522.000.

Karakawa, Kazuo, to Yamato Kogyo Kabushiki Kaisha. Elbow cover for an elbow in pipework. 4,838,318, Cl. 138-166.000.

Karamon, John J.; and Gravereaux, Daniel W. Method and system for synchronization of an auxiliary sound source to motion picture film, video tape, or other picture source containing a sound track. 4,839,733, Cl. 358-341.000.

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Koski, Richard D.; Kosco, William C.; and Dumais, Arthur, to Magnetek Controls. Piezoelectric actuator for magnetostrictive linear displacement measuring device. 4,839,590, Cl. 324-208.000.
Kosler, Manfred; and Hubski, Peter, to Create Gesellschaft fur Elektrotechnik mgH. Programmable circuit for controlling a liquid crystal display. 4,839,638, Cl. 340-784.000.
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Kotecki, Mariusz B.; and Thommes, James M., to Cyclomatic Industries, Inc. System for supplying power to different cutting torches. 4,839,499, Cl. 219-121.390.
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Kotting, Fritz; and Barwasser, Gunter, to Vernicke & Co. GmbH. Machine for grinding the edges of lenses. 4,837,978, Cl. 51-101.0LG.
Kottman, Rickie A.; Terrill, Robert E.; and Wise, Ann E., to Texas Instruments Incorporated. Apparatus and method for edge cleaning. 4,838,289, Cl. 134-153.000.
Kotz, Rudiger; Schuler, Claus; and Stucki, Samuel, to BBC Brown Boveri AG. Method for purifying industrial waste water by direct oxidation of the organic pollutants. 4,839,00[illegible], Cl. 204-149.000.
Kotzin, Michael D., to Motorola, Inc. Method and apparatus for time companding an analog signal. 4,839,923, Cl. 381-31.000.
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Koyama, Noritoshi; Ikeuchi, Takayuki; Araki, Seiichi; Kitoh, Kyosuke; and Ida, Katsumi, to Eisai Co., Ltd. Polyvinyl alcohol-containing injections. 4,839,389, Cl. 514-724.000.
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LeBlanc, Joseph A., to Gast Manufacturing Corporation. Cartridge rotary vane pump. 4,838,772, Cl. 418-13.000.

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Mastronardo, Patrick, 4,838,421, Cl. 206-387.000.

Lederman, Frederick E., to General Motors Corporation. Metal roller clutch cage. 4,838,398, Cl. 192-45.000.

Lee, Alexander Y., Jr. Anti-bruxism device. 4,838,283, Cl. 128-777.000.

Lee, Arnold St. J. Home medical surveillance system. 4,838,275, Cl. 128-670.000.

Lee, Dong K.: *See—*
Ihm, Sun K.; and Lee, Dong K., 4,839,329, Cl. 502-339.000.

Lee, Ruojia R., to Micron Technology, Inc. Blanket CMOS channel stop implant employing a combination of n-channel and p-channel punch-through implants. 4,839,301, Cl. 437-29.000.

Leep, James L.: *See—*
Beeman, John A.; Solt, Floyd R.; Leep, James L.; Marvin, Wayne S.; and Smith, Troy F., 4,838,430, Cl. 206-624.000.

Legon, Jack. Accessory support bracket. 4,838,508, Cl. 248-346.000.

Leighton, Stephen B.; and Tenney, John A. Magnetic personal turning monitor. 4,839,809, Cl. 364-413.020.

Leismer, Dwayne D.; and Blizzard, William A., Jr., to Camco, Incorporated. Dual hydraulic safety valve. 4,838,355, Cl. 166-375.000.

LeisureTech Sports Corp.: *See—*
Hauff, Brian L., 4,838,558, Cl. 273-395.000.

Leitch, Alan. Optical-fibre smoke detection/analysis system. 4,839,527, Cl. 250-573.000.

Lemme, Charles D.; and Furrer, Fredrick J. Adjustable shock absorber and system. 4,838,394, Cl. 188-299.000.

Leno, Theodore, Jr.: *See—*
Chriske, Eugene; Leno, Theodore, Jr.; and Fudge, Alva L., 4,838,178, Cl. 108-55.100.

Lenoir, Francois: *See—*
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Lenser Verwaltungs-GmbH: *See—*
Wildner, Gerhard, 4,839,045, Cl. 210-228.000.

Lentz, Gerd: *See—*
Heier, Christoph; Lentz, Gerd; and Ritter, Rainer, 4,838,488, Cl. 239-284.100.

Lenzi, Mauro. Continuous paper band folding apparatus to form piles. 4,838,848, Cl. 493-414.000.

Leonard, Mercedes B.: *See—*
Michelson, Randi J.; and Leonard, Mercedes B., 4,839,684, Cl. 354-327.000.

Leonard, Rex D.; and Short, Noel E., to International Cryogenics, Inc. Compressed-gas power source for portable gas-driven tools. 4,838,034, Cl. 62-50.200.

Leopold, Hans; and Stabinger, Hans. Density measuring instrument. 4,838,084, Cl. 73-32.00A.

Lerner, Harry. Orthodontic bracket and lock pin. 4,838,787, Cl. 433-14.000.

Lerner, Irwin S.; and Babbitt, Thomas J., to Manufacturers Hanover Trust Company. Container for thin glass plates. 4,838,423, Cl. 206-454.000.

Lesher, George Y., to Sterling Drug Inc. Tricyclic-pyridinylquinoline compounds, their preparation and use. 4,839,355, Cl. 514-224.500.

Leslie Ford Brown: *See—*
Arkell, Nigel J.; Sartor, Brian G.; and Prevost, David L., 4,838,451, Cl. 220-401.000.

Lesse, Hakan, to AB Tetra Pak. Reel for registry of a material web provided with crease lines. 4,838,468, Cl. 226-76.000.

Letemps, Bernard: *See—*
Blasquez-Gonzales, Ignacio; Blanchard, Rene; Letemps, Bernard, Mathivat, Denis; and Boutier, Philippe, 4,838,920, Cl. 65-104.000.

Leupold, Herbert A., to United States of America, Army. Clad magic ring wigglers. 4,839,059, Cl. 210-335.000.

Levander, Kai, to Oy Wartsila Ab. Passenger ship. 4,838,190, Cl. 114-56.000.

Levasseur, Joseph L., to Coin Acceptors, Inc. Coin diverting assembly. 4,838,406, Cl. 194-346.000.

Leveque, James H.; Williams, Frederick A.; and Eldon, John, to AMAF Industries, Inc.; and TRW, Inc. Processor based linked compressor-expander telecommunications system. 4,839,906, Cl. 375-37.000.

Levine, Jeffrey A.: *See—*
Anderson, Robert K.; Foster, Ruth E.; and Levine, Jeffrey A., 4,838,206, Cl. 119-130.000.

Levy, Alexander H.; VanDine, Leslie L.; and Trocciola, John C., to International Fuel Cells Corporation. Static regenerative fuel cell system for use in space. 4,839,247, Cl. 429-21.000.

Levy, Jacques S. Combined above and below grade dwelling with marine habitat. 4,837,989, Cl. 52-27.000.

Levy, Marvin H.; and Steinfort, Robert S. Spun-woven absorbent pad containing corn cob granules for application in removal of cooking oils from vessel. 4,838,947, Cl. 134-7.000.

Levy, Reuven. Rock 'N walker. 4,837,876, Cl. 5-107.000.

Lewis, Allen R.: *See—*
Bradt, L. Jack; Brown, Robert L.; Fogt, G. Stephen; Laroy, Ron; Lewis, Allen R.; and Love, James S., 4,839,505, Cl. 235-381.000.

Lewis, John E.: *See—*
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Lewis, William E.: *See—*
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Lewtas, Kenneth: *See—*
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Lexalite International Corporation: *See—*
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Leybold AG: *See—*
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Leybold-Heraeus GmbH: *See—*
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Lobsiger, Werner; and Lotz, Hans-Georg, 4,838,628, Cl. 350-1.600.

Lhuisset, Francois: *See—*
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Li, Wu-Shyong: *See—*
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Libbey-Owens-Ford Co.: *See—*
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Licentia Patent-Verwaltungs GmbH: *See—*
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Lieb, M. Jeremy: *See—*
Friedle, Dennis J.; Kolb, Richard P.; and Lieb, M. Jeremy, 4,838,822, Cl. 440-86.000.

Lieber, Richard L., to University of California, The Regents of the. Method and apparatus for adaptive closed loop electrical stimulation of muscles. 4,838,272, Cl. 128-421.000.

Liebl, Rainer; Frey, Michael; Mildenberger, Hilmar; Bauer, Klaus; and Bieringer, Hermann, to Hoechst Aktiengesellschaft. 1,2-disubstituted piperidines, processes for their preparation and their use in plant protection. 4,838,931, Cl. 71-94.000.

Lieske, Edgar: *See—*
Rose, David; Maak, Norbert; and Lieske, Edgar, 4,838,893, Cl. 8-405.000.

Life Systems, Inc.: *See—*
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Lill, Thomas M. Weather data transmitting system. 4,839,645, Cl. 340-870.170.

Lillington, David R.: *See—*
Dill, Hans G.; and Lillington, David R., 4,838,952, Cl. 136-256.000.

Lim, Jae S.: *See—*
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Limitorque Corporation: *See—*
Wilkinson, Ivan E.; and Auxier, Robert W., 4,839,475, Cl. 200-5.00R.

Lin, Chia-Cheng; and Rukavina, Thomas G., to PPG Industries, Inc. Titanate/organosilane compositions. 4,839,454, Cl. 528-32.000.

Lin, Kuo-Yang. Self detachable sinker assembly for fishing. 4,837,968, Cl. 43-43.120.

Lin, Ling-Yung, to New Fei Lien Enterprise Co., Ltd. Candle-like lighting device. 4,839,784, Cl. 362-393.000.

Lin, Tsong-Chi. Spring biased arm snap-toggle hinge. 4,837,894, Cl. 16-288.000.

Lindbauer, Ralf; and Glasner, Alfred, to Waagner-Biro Aktiengesellschaft. Method of purifying combustion product gases contaminated with dust and noxious gases. 4,839,147, Cl. 423-235.000.

Lindmayer, Joseph, to Quantex Corporation. Photoluminescent materials for outputting orange light. 4,839,092, Cl. 252-301.40S.

Lion Corporation: *See—*
Masamizu, Koji; Hirokawa, Shinya; and Fujita, Sanae, 4,839,395, Cl. 521-56.000.

Liposome Technology, Inc.: *See—*
Guo, Luke S. S.; Redemann, Carl T.; Radhakrishnan, Ramachandran; and Yau-Young, Annie, 4,839,175, Cl. 424-450.000.

Lippert, Irving S.; Sturgis, John I.; and Whiteside, George D., to Polaroid Corporation. Film cassette-liquid spread roller assembly interface. 4,839,676, Cl. 354-86.000.

Liquipak International, Inc.: *See—*
Corniea, Donald G., 4,838,462, Cl. 222-377.000.

Lisak, Stephen P.; and McGuire, James T., to Ryder International and Textron, Inc. Jack hold down device. 4,838,512, Cl. 248-503.000.

Liu, Chain T.: *See—*
Cathcart, John V.; and Liu, Chain T., 4,839,140, Cl. 420-445.000.

Livingston, Michael F. Impact head rest device for vehicle window. 4,838,575, Cl. 280-748.000.

Ljungkvist, Stig-Ake. Arrangement for improved ventilation and method of using the arrangement. 4,838,000, Cl. 52-376.000.

Lo, Hou-On, to Conair Corporation. Cushioned handle structure for personal care appliances. 4,837,892, Cl. 16-116.00R.

Lobsiger, Werner; and Lotz, Hans-Georg, to Leybold Heraeus GmbH. Process and apparatus for production of an optical element. 4,838,628, Cl. 350-1.600.

Lochbaum, Karen E.: *See—*
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Locher, Johannes: *See—*
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Lockard, Thomas A., to Koch Supplies, Inc. Control linkage for sausage stuffing mechanism on sausage stuffing machine. 4,837,896, Cl. 17-35.000.

Lockett, Michael J.: *See—*
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Lockhart, James L., to United States of America, Energy. Underwater measuring gage. 4,837,936, Cl. 33-783.000.

Lockwood, Hanford N., Jr., to NEA Technologies, Inc. Pulse combustion energy system. 4,838,784, Cl. 432-58.000.

Loewenstein, Lee M.: *See—*
Luttmer, Joseph D.; Davis, Cecil J.; Smith, Patricia B.; York, Rudy L.; Loewenstein, Lee M.; and Jucha, Rhett B., 4,838,984, Cl. 156-643.000.

Logan, Margaret E., to Eastman Kodak Company. Novel polymethine dyes and UV absorbers and imaging materials for their use. 4,839,260, Cl. 430-281.000.

Logan, Margaret E., to Eastman Kodak Company. Novel polymethine dyes and UV absorbers containing a triarylborylisocyano group and imaging compositions containing these dyes. 4,839,274, Cl. 430-281.000.

Lohmar, Ernst; and Burak, Gerhard, to Dr. Alois Stankiewicz GmbH. Polyurethane soft foam with sound insulating and vibration damping properties. 4,839,397, Cl. 521-159.000.

Lohrberg, Karl; and Kohl, Peter, to Metallgesellschaft Aktiengesellschaft. Electrode assembly for gas-forming electrolyzers. 4,839,013, Cl. 204-258.000.

Lohrberg, Karl: *See—*
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Lomax, Christopher P. J., to Boeing Company, The. System and method for self-cleaning barrier-type air filter. 4,838,902, Cl. 55-96.000.

Lonati, Francesco, to Lonati S.P.A. Device for selecting the needles in a knitting machine, particularly for stockings. 4,838,049, Cl. 66-222.000.

Lonati S.P.A.: *See—*
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Longmire, Daniel Q.: *See—*
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Lonis, Carolus J. M.; and Nieuwenhuis, Klaas, to Akzo N.V. Method of applying a road marking composition. 4,839,198, Cl. 427-137.000.

Loosen, Peter: *See—*
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Lord Corporation: *See—*
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Lord, Richard E.: *See—*
Cattrall, Thomas J.; and Lord, Richard E., 4,839,816, Cl. 364-474.090.

Lordo, Robert E.; and Rudisch, Walter E., to Wertec Corporation. Motor frame and motor with increased cooling capacity. 4,839,547, Cl. 310-60.00A.

L'Oreal: *See—*
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Losev, Alexandr S.: *See—*
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Lotz, Hans-Georg: *See—*
Lobsiger, Werner; and Lotz, Hans-Georg, 4,838,628, Cl. 350-1.600.

Louet Feisser, Arnold; Koorn, Maarten; and Sikkema, Sape, to C. van der Lely, N.V. Mowing machine. 4,838,013, Cl. 56-13.600.

Louison, Bernard *See—*
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Louvenrs Interna ional: *See—*
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Love, James S.: *See—*
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Love, Mahlon L.: *See—*
Bramstedt, Gerd; Love, Mahlon L.; and Hennen, John J., 4,838,011, Cl. 56-11.700.

Lowe, Terry B. Bung opening locator and method. 4,838,096, Cl. 73-865.800.

Lowe, Terry J. Remote control holder. 4,838,505, Cl. 248-176.000.

Lozeau, Robert V.: *See—*
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Lubrizol Corporation, The: *See—*
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Lucas, Gary P.: *See—*
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Lucas Huerta, Antonio, to Simes-Senco, S.A. Process and devices for tying crossing elements. 4,838,726, Cl. 403-397.000.

Lucas Industries Public Limited Company: *See—*
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Luckstead, Jon D. Pill dispenser. 4,838,453, Cl. 221-2.000.

Luddy, Francis E.; and Longhi, Sergio, to Nestec S.A. Fat fractions and mixtures thereof. 4,839,191, Cl. 426-607.000.

Ludwig Boschert GmbH & Co. KG: *See—*
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Luebbe, Robert W.: *See—*
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Lumisys Inc.: *See—*
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Lumitter Industry Co., Ltd.: *See—*
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Lummila, Markku: *See—*
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Lustour Corporation: *See—*
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Luther, Ronald B. Needle guard, and assembly. 4,838,871, Cl. 604-192.000.

Luttmer, Joseph D.; Davis, Cecil J.; Smith, Patricia B.; York, Rudy L.; Loewenstein, Lee M.; and Jucha, Rhett B. to Texas Instruments Incorporated. Method for etching films of mercury-cadmium-telluride and zinc sulfid. 4,838,984, Cl. 156-643.000.

Lutz, Robert G.: *See—*
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Gergen, William P.; and Lutz, Robert G., 4,839,437, Cl. 525-426.000.

Luyk, Harley E., to L.H.L. Incorporated. Table leg coupling assembly. 4,838,181, Cl. 108-156.000.

Lynch, Thomas M., to GTE Products Corporation. High density interconnect system. 4,838,800, Cl. 439-78.000.

Lynn, Lawrence A. Blood aspiration assembly and method. 4,838,855, Cl. 604-49.000.

Lyons Eye Institute of Western Australian Incorporated *See—*
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M/K Systems Inc.: *See—*
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Maag, Henry H. Four-bar variable resistance leg extension machine. 4,838,548, Cl. 272-134.000.

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Mabuchi, Sadao: *See—*
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MacFarlane, Alistair A., to Marathon Electric Manufacturing Corporation. Alternator regulator having output monitoring and limiting controls. 4,839,575, Cl. 322-25.000.

MacGregor Golf Company: *See—*
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Machida, Satoshi: *See—*
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Machler, Meinrad; Bittner, Reinhold; Sachse, Richard; and Schlemmer, Harry, to Carl-Zeiss-Stiftung. Reflection diffraction grating. 4,838,645, Cl. 350-162.230.

Macias, Jorge, to Russ Bassett Company. Drawer mounting means. 4,838,627, Cl. 312-341.00R.

MacMurray, Thomas A.; McComis, William T.; Boiarski, Anthony A.; Proffitt, James R.; and Green, Glen R., to H. J. Heinz Company. Method of removing outer protective layer from edible materials using laser energy. 4,839,181, Cl. 426-237.000.

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MacOnochie, Ewen R. A., to Quarry Engineering Developments Pty. Ltd. Rock-breaking apparatus. 4,838,363, Cl. 173-139.000.

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Madic, Charles; and de Sanoit, Jacques, to Commissariat a l'Energie Atomique. Ammonium plutonate uranate, its preparation process and its use for producing the mixed oxide $(U,Pu)O_2$. 4,839,149, Cl. 423-251.000.

Maeda, Hirokazu: *See—*
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Maeda, Katsuya: *See—*
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Maeshima, Katsuyoshi: *See—*
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Maestrone, Gianpaolo; Schildknecht, Eugene G.; and Untawale, Govind G., to Hoffmann-La Roche Inc. Anticoccidial compositions. 4,839,382, Cl. 514-453.000.

Magic American Corporation: *See—*
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Magnetek Controls: *See—*
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Magnetic Analysis Corporation: *See—*
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Magnussen, Haakon T., Jr.; Moeller, Roy P.; Palmer, Phillip S.; and Smith, Gary L., to Rainin Instrument Co., Inc. System and method for depassivating a passivated lithium battery in a battery powered microprocessor controlled device. 4,839,248, Cl. 429-49.000.

Magyar Tudomanyos Akademia Muszaki Fizikai Kutato Intezet: *See—*
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Mahan, Michael K. Grader blade height control. 4,837,940, Cl. 33-624.000.

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MAHO Aktiengesellschaft: *See—*
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Mai, Jimhin; Chambers, Laura J.; and McDonald, Richard E., to Nestec SA. Antioxidant compositions. 4,839,187, Cl. 426-542.000.

Maidhof, John T.: *See—*
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Maier, Peter; and Simen, Rolf. Jig saw. 4,837,935, Cl. 30-392.000.

Maier, Siegfried. Suction nozzle for a vacuum cleaning device 4,837,888, Cl. 15-387.000.

Maier, Ulrich: *See—*
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Maitland, Arthur; Strudwick, Ian A.; and Weatherup, Clifford R., to English Electric Valve Company Limited. Apparatus for forming an electron beam sheet. 4,839,554, Cl. 313-446.000.

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Maki, Gary K., to Idaho Research Foundation, Inc. Programmable data path device. 4,839,851, Cl. 364-900.000.

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Yoshino, Syuji; Makino, Satoshi; Fujita, Mitsuo; and Shimizu, Yukio, 4,839,204, Cl. 428-358.000.

Makishima, Shinichi; and Mochizuki, Keizo, to Meiji Seika Kaisha, Ltd Process for the production of fried potato strips. 4,839,182, Cl. 426-242.000.

Makita, Akihisa, to NEC Corporation. Early failure detection system for multiprocessor system. 4,839,895, Cl. 371-16.000.

Malcor, Jean-Georges: *See—*
Gragnolati, Claude; Thollon, Didier; and Malcor, Jean-Georges, 4,839,872, Cl. 367-180.000.

Malluche, Gisela: *See—*
Malluche, Hartmut H.; and Malluche, Gisela, 4,839,194, Cl. 427-2.000.

Malluche, Hartmut H.; and Malluche, Gisela, to Bone Diagnostic Center. Methods of preparing tissue samples. 4,839,194, Cl. 427-2.000.

Mamery, Gaby. Protective device for drum-brake operating shaft. 4,838,389, Cl. 188-78.000.

Mamiya Camera Co., Ltd.: *See—*
Amada, Mitsumasa; Sibasaki, Hitosi; and Nagasaka, Masami, 4,839,680, Cl. 354-233.000.

Mamiya, Satoru: *See—*
Hanaya, Morimasa; Miura, Tsunemoto; Mamiya, Satoru; Isozaki, Hiroshi; and Miyajima, Kiyoshi, 4,838,751, Cl. 414-412.000.

Mamodaly, Narquise; and Bert, Alain, to Thomson-CSF. Compact combiner for semiconductor devices operating in the ultra-high frequency range. 4,839,712, Cl. 357-51.000.

Manabe, Mitsufusa: *See—*
Suzuki, Yoshinobu; and Manabe, Mitsufusa, 4,838,150, Cl. 98-31.500.

Manan Manufacturing Co., Inc.: *See—*
Strasser, Robert K.; and Netsch, Robert L., 4,838,282, Cl. 128-754.000.

Manchak III, Frank: *See—*
Manchak Jr., Frank; and Manchak III, Frank, 4,839,061, Cl. 210-743.000.

Manchak Jr., Frank; and Manchak III, Frank. Method and apparatus for treatment of hazardous material spills. 4,839,061, Cl. 210-743.000.

Manchester R & D Partnership: *See—*
Fergason, James L., 4,838,660, Cl. 350-339.00F.

Mange, Christian; and Allard, Georges-Aloin, to Clextral. Process for preparing almond paste. 4,839,193, Cl. 426-633.000.

Manian, Bala S., to Lumisys Inc. Two-dimensional beam scanner. 4,838,632, Cl. 350-6.910.

Manion, Michael C.; Walensky, Loren J.; and Walker, Francis J., to Honeywell, Inc. Ultraviolet cured gas seal for discarding sabot projectile. 4,838,168, Cl. 102-522.000.

Mannesmann Rexroth GmbH, Jahnstrasse: *See—*
Wusthof, Peter; Eisenbacher, Egon; Lotter, Manfred; and Stolzer, Rainer, 4,838,765, Cl. 417-203.000.

Mannion, Joel: *See—*
Nicely, Mark C.; Leavitt, Ronald; Mannion, Joel; Schreiber, Rob; Lang, Gary R.; Papenberg, Robert L.; and Straub, Joseph E., 4,839,801, Cl. 364-200.000.

Mannschke, Lothar, to U.S. Philips Corp. Optical star coupler. 4,838,636, Cl. 350-96.160.

Mansfield Scientific, Inc.: *See—*
Peterson, Carl W., 4,838,864, Cl. 604-100.000.

Mansukhani, Gul: *See—*
Cherukuri, Subraman R.; Mansukhani, Gul; and Jacob, Kapakkamannil C., 4,839,184, Cl. 426-307.000.

Mansuripur, Masud; Ruane, Michael; and Rosenvold, Robert, to Boston University. Apparatus for measuring reflectivity. 4,838,695, Cl. 356-369.000.

Mantegani, Sergio: *See—*
Brambilla, Enzo; Mantegani, Sergio; Pegrassi, Lorenzo; Rossi, Alessandro; and Temperilli, Aldemio, 4,839,363, Cl. 514-288.000.

Mantovani, John C., to Conklin Instrument Corporation. Multirate automatic equalizer. 4,839,905, Cl. 375-12.000.

Manufacturers Hanover Trust Company: *See—*
Lerner, Irwin S.; and Babbitt, Thomas J., 4,838,423, Cl. 206-454.000.
Reher, James F.; and Farzin-Nia, Farrokh, 4,838,786, Cl. 433-9.000.

Marathon Electric Manufacturing Corporation: *See—*
MacFarlane, Alistair A., 4,839,575, Cl. 322-25.000.

Marbrow, Richard A., to Imperial Chemical Industries PLC. Receiver sheet. 4,839,338, Cl. 503-227.000.

Marcon, Charles; and Poullain, Jean, to Escofier Technologie, S.A. Process and a device for the production of grooves on a wall of revolution. 4,838,066, Cl. 72-95.000.

Marconi Instruments Limited: *See—*
Bradley, Liam P., 4,838,070, Cl. 73-1.0DV.

Maree, Johannes P., to Council for Scientific and Industrial Research. Biological treatment of water. 4,839,052, Cl. 210-603.000.

Markland, Eric; Tofield, Graham M.; Lucas, Gary P.; and Kalsi, Hardyal S., to Thorn EMI Flow Measurement Limited. Fludic oscillator flowmeters. 4,838,091, Cl. 73-861.190.

Marks, Tobin J.: *See—*
Wynne, Kenneth J.; Marks, Tobin J.; and Inabe, Tamotsu, 4,839,112, Cl. 264-22.000.

Maroldo, Stephen G.; Betz, William R.; and Borenstein, Noah, to Rohm and Haas Company. Carbonaceous adsorbents from pyrolyzed polysulfonated polymers. 4,839,331, Cl. 502-416.000.

Marsh, John F.; and Cleverley, John A., to Exxon Chemical Patents Inc. Overbased alkali metal additives. 4,839,094, Cl. 252-42.700.

Marshall, Simon L.: *See—*
Vandegrift, George F.; Vissers, Donald R.; Marshall, Simon L.; and Varma, Ravi, 4,839,133, Cl. 376-202.000.

Marshall, Steven F.; Haden, Richard E., Jr.; and Johnson, Darrell R., to United Health, Inc. Self-inking article marking device. 4,838,158, Cl. 101-105.000.

Marshall, William M., Sr. Liquid pump air release system. 4,838,866, Cl. 604-152.000.

Martell, Dennis J.: *See—*
Batz, James E.; Martell, Dennis J.; and Overmyer, Steven A., 4,839,642, Cl. 340-825.540.

Martin, August, to Pfaff Industriemaschinen GmbH. Sewing group with a feed device. 4,838,188, Cl. 112-121.120.

Martin, David A.; Ries, Edward L.; Vanderlinde, William; and Young, Marvin J., to Monsanto Company. Particulate polyacetal carboxylate and methods for preparation thereof. 4,839,407, Cl. 524-389.000.

Martin, John, to S. C. Johnson & Son, Inc. Support device for combustible package containing a heat-dispersible material and a combustible material. 4,839,144, Cl. 422-305.000.

Martin, Raymond G.: *See—*
Gehman, Roland P.; and Martin, Raymond G., 4,838,753, Cl. 414-563.000.

Martinez, Dennis M.; and Lim, Jae S., to Massachusetts Institute of Technology. Methods and apparatus for motion estimation in motion picture processing. 4,838,685, Cl. 352-85.000.

Martinolich, James J.: *See—*
Balopole, Harvey L.; Martinolich, James J.; Roberts, Arthur; and Sadowski, Henry W., 4,839,726, Cl. 358-166.000.

Martor-Argentax E.H. Beermann KG: *See—*
Beermann, Ewald H., 4,837,931, Cl. 30-92.000.

Maruman Golf Co., Ltd.: *See—*
Kobayashi, Masashi, 4,838,555, Cl. 273-167.00A.

Maruyama, Tatsuo; and Matsushita, Nobuo, to Toshiba Electric Equipment Corporation. Reflector. 4,838,629, Cl. 350-1.600.

Maruyama, Yutaka: *See—*
Ohta, Jiro; Tozawa, Sadamu; Matsushita, Koichi; and Maruyama, Yutaka, 4,838,710, Cl. 384-100.000.

Marvin Lumber and Cedar Company: *See—*
Battles, Laurence, 4,838,001, Cl. 52-456.000.

Marvin, Wayne S.: *See—*
Beeman, John A.; Solt, Floyd R.; Leep, James L.; Marvin, Wayne S.; and Smith, Troy F., 4,838,430, Cl. 206-624.000.

Masamizu, Koji; Hirokawa, Shinya; and Fujita, Sanae, to Lion Corporation. Absorbing article. 4,839,395, Cl. 521-56.000.

Maschinenfabrik Heid Aktiengesellschaft: *See—*
Holy, Franz; and Nader, Hans, 4,837,918, Cl. 29-568.000.

Masco Corporation: *See—*
Knapp, Alfons, 4,838,304, Cl. 137-454.600.

Mashkovsky, Mikhail D.: *See—*
Granik, Vladimir G.; Stezhko, Tatyana V.; Glushkov, Robert G.; Mashkovsky, Mikhail D.; Roschina, Lidia F.; Polezhaeva, Antonina I.; Parimbetova, Roza B.; Bobkov, Jury G.; Losev, Alexandr S.; and Ivanova, Irina A., 4,839,380, Cl. 517-424.000.

Maslaney, Michael J.; Andreasen, Dinal S.; and Brown, Clifford D., to General Signal Corporation. Optical signal power measurement method and apparatus. 4,838,032, Cl. 62-3.100.

Masoero, Marco; and Garrone, Angelo, to Fiat Auto S.p.A. Device for preventing the rear light units of motor vehicles from becoming dirty. 4,838,603, Cl. 296-180.100.

Mason, Anthony: *See—*
Brenner, Robert A.; and Mason, Anthony, 4,837,882, Cl. 8-159.000.

Massachusetts Institute of Technology: *See—*
Gale, Ronald P.; and Fan, John C. C., 4,839,145, Cl. 422-245.000.
Hollis, Mark A.; Goodhue, William D.; Nichols, Kirby B.; and Bergeron, Normand J., Jr., 4,839,310, Cl. 437-41.000.
Martinez, Dennis M.; and Lim, Jae S., 4,838,685, Cl. 352-85.000.

Massau, Bruce A. Polymeric hypodermic device. 4,838,877, Cl. 604-272.000.

Massey, Auldin J. Underwater communication device. 4,839,871, Cl. 367-132.000.

Massey, Eddie H.; and Sheliga, Theodore A., to Eli Lilly and Company. Stabilized insulin formulations. 4,839,341, Cl. 514-4.000.

Master, Barry S.; and Aralis, Frank M., to Beckman Instruments, Inc. Method and apparatus for determining calibration accuracy of a scientific instrument. 4,838,691, Cl. 356-319.000.

Mastronardo, Patrick, to Lebo Peerless, Inc. Multiple use cassette carrying case. 4,838,421, Cl. 206-387.000.

Masuda, Isao: *See—*
Saito, Yasuo; Ozaki, Tadashi; and Masuda, Isao, 4,838,116, Cl. 74-595.000.

Masuda, Kosaku: *See—*
Kida, Shuji; Kaneko, Yutaka; Kadokura, Kenji; Yoshimoto, Shinji; and Masuda, Kosaku, 4,839,264, Cl. 430-505.000.

Masuda, Masahiko: *See—*
Takahama, Teizo; Masuda, Masahiko; Sugimoto, Keisuke; and Sugiyama, Yuji, 4,839,019, Cl. 204-425.000.

Masuyama, Masayuki: *See—*
Uchida, Norio; Ishibashi, Yoriyuki; Hirano, Ryoichi; Masuyama, Masayuki; and Shimozono, Hiroaki, 4,838,693, Cl. 356-356.000.

Mathivat, Denis: *See—*
Blasquez-Gonzales, Ignacio; Blanchard, Rene; Letemps, Bernard; Mathivat, Denis; and Boutier, Philippe, 4,838,920, Cl. 65-104.000.

Matoba, Hideyasu. Mounting of a planetary gear assembly on a casing. 4,838,123, Cl. 74-801.000.

Matsi, Inc.: *See—*
Merry, Glenn W., 4,838,442, Cl. 215-228.000.

Matsuda, Hideo; and Hiraoka, Shinitiro, to Sharp Kabushiki Kaisha. Automatic sheet winding and discharging device. 4,838,537, Cl. 271-277.000.

Matsuda, Hiromu: *See—*
Imai, Akihiro; Matsuda, Hiromu; Yubakami, Keiichi; and Taguchi, Nobuyoshi, 4,839,337, Cl. 503-227.000.

Matsuda, Toshihiko: *See—*
Omae, Tsutomu; Matsuda, Toshihiko; Miyahara, Youjirou; and Kamiyama, Kenzo, 4,839,834, Cl. 364-565.000.

Matsuda, Yoshio; and Ishihara, Mitsutoshi, to Yoshida Kogyo K. K. Warp-knit tape for hook-and-loop fasteners. 4,838,044, Cl. 66-190.000.

Matsufuji, Akihiro; and Komine, Shigeo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,839,225, Cl. 428-336.000.

Matsui, Hitoshi; and Suzuki, Hiroshi, to Toyota Jidosha Kabushiki Kaisha. Method and device for electromagnetic removal of spatter on nozzle of arc welding torch. 4,838,287, Cl. 134-1.000.

Matsui, Sadayoshi: *See—*
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, 4,839,900, Cl. 372-46.000.

Matsumoto, Haruo, to Matsumoto Metal Mfg. Co., Ltd. Card lock. 4,838,058, Cl. 70-355.000.

Matsumoto, Hidekazu: *See—*
Hirose, Kenji; Bandoh, Tadaaki; Matsumoto, Hidekazu; Yamaguchi, Shinichiro; Hirayama, Hirokazu; and Nakanishi, Hiroaki, 4,839,846, Cl. 364-748.000.

Matsumoto, Masafumi: *See—*
Shirakoshi, Hiroshi; Kotani, Matahira; Matsumoto, Masafumi; and Morimoto, Hiroshi, 4,839,730, Cl. 358-294.000.

Matsumoto Metal Mfg. Co., Ltd.: *See—*
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Matsumoto, Takahiro: *See—*
Mikoshiba, Shigeo; Shinada, Shinichi; and Matsumoto, Takahiro, 4,839,637, Cl. 340-775.000.

Matsumoto, Yasuji: *See—*
Kurita, Atsushi; Matsumoto, Yasuji; and Huy, Sam, 4,839,452, Cl. 528-15.000.

Matsumoto, Yoshihiro, to Kabushiki Kaisha Toshiba. Automatic trouble analysis apparatus and method thereof. 4,839,823, Cl. 364-513.000.

Matsumura, Hiroyoshi: *See—*
Katsuyama, Toshio; and Matsumura, Hiroyoshi, 4,838,633, Cl. 350-96.110.

Matsunaga, Kuniyoshi: *See—*
Kosaka, Akira; Murao, Sawao; Hirano, Kenichi; Tanaka, Noriaki; and Matsunaga, Kuniyoshi, 4,839,279, Cl. 435-25.000.

Matsunaga, Osamu: *See—*
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Matsunaga, Satoru: *See—*
Mizuno, Toshiya; Yasumi, Hideyuki; and Matsunaga, Satoru. 4,839,129, Cl. 264-235.000.

Matsuno, Akira: *See—*
Koga, Shinichiro; Matsuno, Akira; Sakata, Katsuyuki; Ohtani, Yoshiaki; and Akihara, Isao. 4,839,458, Cl. 528-196.000.

Matsuo, Isaya: *See—*
Yasuda, Makoto; Ura, Syousabu; Nishimura, Shuichi; Matsuo, Isaya; Kato, Masami; and Sagata, Munehiro. 4,838,215, Cl. 123-52.0MB.

Matsuo, Mamoru: *See—*
Komatsubara, Toshio; Muramatsu, Toshiki; and Matsuo, Mamoru. 4,838,958, Cl. 148-11.50A.

Matsuo, Tatsuki: *See—*
Miura, Teiji; Yamazaki, Hideo; Abe, Nobumasa; Okamura, Toshihide; Morozumi, Hideki; and Matsuo, Tatsuki. 4,838,657, Cl. 350-336.000.

Matsuoka, Hiroki, to Toyota Jidosha Kabushiki Kaisha. Fuel injection control system for internal combustion engine when starting. 4,838,230, Cl. 123-491.000.

Matsuoka, Hiroshi: *See—*
Kawamura, Hideo; and Matsuoka, Hiroshi. 4,838,235, Cl. 123-668.000.

Matsusaka, Yoshihide; Aoyama, Kohji; and Noguchi, Masaro, to AMP Incorporated. Electrical terminal having a receptacle contact section of low insertion force. 4,838,816, Cl. 439-86[illegible].000.

Matsushima, Seiya; Yanagisawa, Takeshi; Miura, Nobuo; and Arakawa, Kuniaki, to Honda Giken Kogyo Kabushiki Kaisha. Throttle actuator for a vehicle. 4,838,113, Cl. 74-551.800.

Matsushima, Yoshihisa: *See—*
Ichikawa, Shinichi; Yoshida, Unkichi; Matsushima, Yoshihisa; and Hashimoto, Hisatake. 4,839,029, Cl. 208-251.00R.

Matsushita Electric Ind. Co., Ltd.: *See—*
Nagata, Kenichi; and Yamada, Noboru. 4,839,883, Cl. 369-286.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Imai, Akihiro; Matsuda, Hiromu; Yubakami, Keiichi; and Taguchi, Nobuyoshi. 4,839,337, Cl. 503-227.000.

Kameyama, Shuichi; Komeda, Tadao; Kobushi, Kazuhiro; and Sakai, Hiroyuki. 4,839,302, Cl. 437-31.000.

Kojima, Makoto; Misaki, Hirozumi; and Okada, Yasuyuki. 4,839,787, Cl. 363-60.000.

Noi, Keiichi; Takami, Akihiro; Ebine, Kazuhide; and Kumazawa, Kimiko. 4,839,097, Cl. 252-520.000.

Sasakawa, Kazumasa; Nishimura, Hisao; and Fujiwaka, Kensuke. 4,838,544, Cl. 272-73.000.

Sasaki, Seishi; Awamoto, Shigeru; Bannai, Tatsushi; Yokoyama, Katsuya; and Shibaya, Hiromichi. 4,839,744, Cl. 358-320.000.

Matsushita Electric Works, Ltd.: *See—*
Tanahashi, Masao; and Yada, Shiro. 4,837,929, Cl. 30-43.920.

Matsushita Graphic Communication Systems, Inc.: *See—*
Sawada, Kaname; Suzuki, Kazuo; Hasumuma, Shinji; Katayama, Eizo; Ohno, Motoyasu; Kanazawa, Tsukasa; and Ueki, Keiji. 4,839,879, Cl. 369-54.000.

Matsushita, Hajime: *See—*
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Matsushita, Koichi: *See—*
Ohta, Jiro; Tozawa, Sadamu; Matsushita, Koichi; and Maruyama, Yutaka. 4,838,710, Cl. 384-100.000.

Matsushita, Nobuo: *See—*
Maruyama, Tatsuo; and Matsushita, Nobuo. 4,838,629, Cl. 350-1.600.

Matsushita, Yoshifumi: *See—*
Yoshioka, Takeo; Minagawa, Tadao; Suzuki, Toshihiro; Yamasaki, Ichiro; and Matsushita, Yoshifumi. 4,839,767, Cl. 361-42.000.

Matsuura, Iwao, to Nissho Corporation. Urine-collecting device. 4,838,883, Cl. 604-349.000.

Matsuzaki, Katsuhiko: *See—*
Ohta, Hironori; Kawaguchi, Toshiyasu; Mukaiyama, Takashi; Matsuzaki, Katsuhiko; Ebisawa, Junichi; Taneda, Naoki; Arai, Daikichi; Yoshihara, Noriyuki; Yamada, Yoshikazu; and Kunii, Koushiro. 4,838,914, Cl. 65-2.000.

Matsuzaki, Shuichi: *See—*
Nakamura, Masaru; and Matsuzaki, Shuichi. 4,838,811, Cl. 439-607.000.

Matsuzawa, Soichiro, to NGK Insulators, Ltd. Composite magnetic head core. 4,839,763, Cl. 360-126.000.

Matsuzawa, Toshio; Minagawa, Kazuji; Muramatsu, Akira; Abe, Tomoaki; Kiyono, Masashi; Kamio, Shigeru; Maeda, Katsuya; and Takao, Mitsunori, to Nippondenso Co., Ltd. Apparatus for controlling intake air flow rate in internal combustion engine. 4,838,226, Cl. 123-399.000.

Matthews, Donald P.; Whitten, Jeffrey P.; and McCarthy, James R., to Merrell Dow Pharmaceuticals Inc. (Aryl or heteroaromatic methyl)-2,2'-bi-1H-imidazoles and their use as anti-hypertensive agents. 4,839,375, Cl. 514-397.000.

Matula, Joseph P.: *See—*
Mayer, Francis X.; Lewis, William E.; Matula, Joseph P.; and Staubs, David W. 4,839,023, Cl. 208-5[illegible].000.

Maullem, Shmuel; Sachs, George; and Wheeler, Larry, to University of California, The Regents of the; and Allergan, Inc. Use of manoalide and its derivatives for modifying calcium homeostasis. 4,839,385, Cl. 514-473.000.

Maurer, Reprecht; and Timtner, Karlheinz, to Ringspann Albrecht Maurer KG. Automatic overload clutch reset arrangement. 4,838,829, Cl. 464-38.000.

Maurice, Etienne: *See—*
Buget, Bernard; and Maurice, Etienne. 4,838,676, Cl. 351-202.000.

Mauro, Gerald D. Wood clad windows. 4,837,977, Cl. 49-501.000.

Mauz, Otto, to Hoechst Aktiengesellschaft. Preparation of polymer based on polyvinylene carbonate and/or polyhydroxymethylene. 4,839,439, Cl. 526-203.000.

Mavilor Systemes S. A.: *See—*
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Mawatari, Masaaki; Itoh, Tetsuo; Tsuchikawa, Syuji; and Kimura, Shinichi, to Japan Synthetic Rubber Co., Ltd. Thermoplastic resin composition comprising a polyphenylene ether and a polyamide. 4,839,425, Cl. 525-92.000.

Maxwell Electronics Limited: *See—*
Bittner, Wilfried A. A., 4,838,117, Cl. 74-665.00C.

Maxwell Laboratories, Inc.: *See—*
Dunn, Joseph E.; and Pearlman, Jay S., 4,838,154, Cl. 99-451.000.

Maxwell, Peter W., to Geosource, Inc. Geophone implanting and positioning apparatus. 4,838,379, Cl. 181-122.000.

May, Lance, to May, Lance. Method and arrangement for validating coupons. 4,839,507, Cl. 235-381.000.

Mayama, Tatsushige, to Nippon Tenshashi Kabushiki. Revolving grinding tool. 4,837,985, Cl. 51-364.000.

Mayer, Andreas, to BBC Brown Boveri AG. Free-running pressure wave supercharger. 4,838,234, Cl. 123-559.200.

Mayer, Francis X.; Lewis, William E.; Matula, Joseph P.; and Staubs, David W., to Exxon Research and Engineering Company. Once-through coking with hydrotreating and fluid catalytic cracking. 4,839,023, Cl. 208-50.000.

Mayo, Steven A.: *See—*
Weinerman, Lee S.; Mayo, Steven A.; McLinden, Thomas V.; and Wentzell, Timothy H., 4,838,056, Cl. 70-208.000.

Mazda Motor Corporation: *See—*
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Mizuma, Takashi; and Nakao, Koji, 4,838,607, Cl. 296-219.000.
Satou, Kazuo; and Okazaki, Ken, 4,838,956, Cl. 148-3.000.
Suemori, Tadao, 4,838,221, Cl. 123-195.00H.

Maze, Jack E.: *See—*
Haber, Terry M.; Maze, Jack E.; and Crouse, Roger R., 4,838,870, Cl. 604-187.000.

Mazeau, Jean P.: *See—*
Boudot, Jean E.; and Mazeau, Jean P., 4,839,314, Cl. 501-78.000.

Mazzucco, Michelangelo; Poletto, Vanni; and Sartori, Mario, to Cselt-Centro Studi E Laboratori Telecomunicazioni S.p.A. System for automatically controlling the gain-bandwidth product of operational amplifiers. 4,839,610, Cl. 330-278.000.

McAllister, Matthew: *See—*
Janko, Michael; and McAllister, Matthew, 4,839,777, Cl. 362-108.000.

McBride, Roger W.: *See—*
Safinya, Kambiz A.; and McBride, Roger W., 4,839,644, Cl. 340-854.000.

McBurney, Kevin B.; and Aleman, Javier. Method and apparatus for cleaning cooling tower basins. 4,839,064, Cl. 210-806.000.

McCague, Raymond, to National Research Development Corporation. Iodotamoxifen derivatives and use for estrogen receptor-positive breast cancer detection and therapy. 4,839,155, Cl. 424-1.100.

McCann, John J.: *See—*
Abdulwahab, Munib; Burkhardt, James L.; and McCann, John J., 4,839,721, Cl. 358-80.000.

McCarthy, James B.; and Furcht, Leo T., to University of Minnesota, Regents of the. Polypeptides with fibronectin activity. 4,839,464, Cl. 530-326.000.

McCarthy, James R.: *See—*
Matthews, Donald P.; Whitten, Jeffrey P.; and McCarthy, James R., 4,839,375, Cl. 514-397.000.

McClinden, Thomas V.: *See—*
Weinerman, Lee S.; Albris, Frank R.; McClinden, Thomas V.; and Wentzell, Timothy H., 4,838,054, Cl. 70-208.000.

McComis, William T.: *See—*
MacMurray, Thomas A.; McComis, William T.; Boiarski, Anthony A.; Proffitt, James R.; and Green, Glen R., 4,839,181, Cl. 426-237.000.

McCoy, Blane K.; and Garrison, James R., to Chrysler Motors Corporation. Fuel gauge damper circuit. 4,838,082, Cl. 73-313.000.

McCoy, Kevin P.; and Kokolis, George P., to Texaco Inc.; and Texaco Canada Resources. Gravity stable surfactant flooding in gas depleted reservoirs. 4,838,350, Cl. 166-274.000.

McCracken, Shaun D.: *See—*
Holcomb, Bruce A.; McCracken, Shaun D.; and McGinnis, Bryan J., 4,838,708, Cl. 383-5.000.

McCredie, Donald B. Swimming flipper. 4,838,824, Cl. 441-64.000.

McDermott International Inc.: *See—*
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Illakowicz, Jan, 4,838,170, Cl. 104-138.200.

McDonald, Henry: *See—*
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McDonald, Richard E.: *See—*
Mai, Jimbin; Chambers, Laura J.; and McDonald, Richard E., 4,839,187, Cl. 426-542.000.

McElrath, Kenneth O.; Robertson, Martha L.; and Chow, Wai Y., to Exxon Chemical Patents Inc. Ternary adhesive compositions. 4,839,422, Cl. 525-74.000.

McGinnis, Bryan J.: *See—*
Holcomb, Bruce A.; McCracken, Shaun D.; and McGinnis, Bryan J., 4,838,708, Cl. 383-5.000.

McGrane, Kathleen M.: *See—*
Badesha, Santokh S.; Stolka, Milan; McGrane, Kathleen M.; and Weagley, Ronald J., 4,839,451, Cl. 528-10.000.

McGuire, Dennis P.: *See—*
Miller, Lane R.; Nobles, Charles M., Jr.; and McGuire, Dennis P., 4,838,392, Cl. 188-277.000.

McGuire, James T.: *See—*
Lisak, Stephen P.; and McGuire, James T., 4,838,512, Cl. 248-503.000.

McHale, William D.: *See—*
Absil, Robert P.; Huss, Albin, Jr.; McHale, William D.; and Partridge, Randall D., 4,839,027, Cl. 208-138.000.

McKee, John M.; and Burger, Marilyn S., to Motorola, Inc. Liquid crystal light emitting display system. 4,838,661, Cl. 350-345.000.

McKee, William E.: *See—*
Trevison, Robert L.; McKee, William E.; and Hunnel, Larry B., 4,837,928, Cl. 29-840.000.

McKeever, Michael J. Kit of hand-held tools for making a patterned impression in a cementitious material. 4,838,728, Cl. 404-89.000.

McKeown, Patrick D.; and Neiger, Jack W., to Cyclops Corporation. Noise barrier. 4,838,524, Cl. 256-24.000.

McLain, Thomas N., II, to Schlumberger Industries, Inc. Fluid strainer and flow corrector for fluid measurement device. 4,839,038, Cl. 210-137.000.

McLaughlin, Thomas L. Power cleaning apparatus. 4,837,887, Cl. 15-104.330.

McLean, Joseph B.: *See—*
Comolli, Alfred G.; and McLean, Joseph B., 4,839,030, Cl. 208-403.000.

McLeod, Paul S.: *See—*
Fraas, Lewis M.; McLeod, Paul S.; and Cape, John A., 4,838,201, Cl. 118-719.000.

McLinden, Thomas V.: *See—*
Weinerman, Lee S.; Mayo, Steven A.; McLinden, Thomas V.; and Wentzell, Timothy H., 4,838,056, Cl. 70-208.000.

McMaster, Galen M.; and Sunderman, Donald W., to G & D Whirlwind Inc. Injection impeller for agricultural chemicals. 4,838,703, Cl. 366-169.000.

McNeal, William T.: *See—*
Giles, William O., Sr.; and McNeal, William T., 4,838,244, Cl. 126-391.000.

McRoberts, Richard C. Method and apparatus for determining mileage. 4,838,579, Cl. 283-48.100.

Mead Corporation, The: *See—*
Beeman, John A.; Solt, Floyd R.; Leep, James L.; Marvin, Wayne S.; and Smith, Troy F., 4,838,430, Cl. 206-624.000.
Spence, Meredith, Jr., 4,838,724, Cl. 402-79.000.
Wood, Prentice J., 4,838,479, Cl. 229-52.00B.

Means, Rodney J.: *See—*
Kulakowski, John E.; and Means, Rodney J., 4,839,877, Cl. 369-48.000.

Med Bed Technologies, Inc.: *See—*
DiMatteo, Paul; and Chubb, Charles F., 4,837,873, Cl. 5-81.00R.

Meek, Nigel W.: *See—*
Frogbrook, Kenneth H. L.; and Meek, Nigel W., 4,838,016, Cl. 56-341.000.

Mehdizadeh, Mehrdad: *See—*
Misic, George J.; Holland, G. Neil; Mehdizadeh, Mehrdad; and Patrick, John L., 4,839,594, Cl. 324-318.000.

Mehta, Umesh J.: *See—*
Church, John A.; and Mehta, Umesh J., 4,839,081, Cl. 252-108.000.

Mei-King Ng, Shirley; and DiTomasso, Denise-Marie, to Colgate-Palmolive Company. Stable hydrogen peroxide dental gel containing fumed silicas. 4,839,157, Cl. 424-53.000.

Meier, Arnold: *See—*
Ackermann, Ulrich; Faller, Kurt; Guzek, Krzysztof; and Meier, Arnold, 4,839,482, Cl. 200-148.00B.

Meier, Bert: *See—*
Jellinek, Karl; Meier, Bert; and Zehrfeld, Jurgen, 4,839,229, Cl. 428-413.000.

Meiji Seika Kabushiki Kaisha: *See—*
Koyama, Masao; Iwata, Michiaki; Kurihara, Kunihiko; and Sezaki, Masaji, 4,839,378, Cl. 514-417.000.

Meiji Seika Kaisha, Ltd.: *See—*
Atsumi, Kunio; Sakagami, Kenji; Yamamoto, Yuichi; Yoshida, Takashi; Nishihata, Ken; Kondo, Shinichi; and Fukatsu, Shunzo, 4,839,350, Cl. 514-202.000.
Makishima, Shinichi; and Mochizuki, Keizo, 4,839,182, Cl. 426-242.000.

Meissner, Henry. Violin. 4,838,140, Cl. 84-275.000.

Meistrick, Zdenek S.; and Quenneville, Raymond N., to Jacobs Manufacturing Company, The. Compression release retarder with valve motion modifier. 4,838,516, Cl. 251-77.000.

Meka, Masahiko: *See—*
Kitera, Takuya; Urushibata, Shoichi; Sato, Masatoshi; Nagashima, Tadashi; Hamada, Shoichi; Shirasu, Isao; Nakura, Yasumi; Sakamoto, Michito; Ishide, Takashi; Sakamoto, Naruo; Meka, Masahiko; and Tomeoka, Masaru. 4,839,495, Cl. 219-121.630.

Mekelburg, William F.: *See—*
Weits, Ferdinand; Mekelburg, William F.; and Latour, Marc R., 4,838,419, Cl. 206-386.000.

Mello Manufacturing, Inc.: *See—*
Perry, Timothy J., 4,838,907, Cl. 55-381.000.

Mellor, Charles E., to GTE Products Corporation. Reflector lamp having complementary dichroic filters on the reflector and lens for emitting colored light. 4,839,553, Cl. 313-111.000.

Menchetti, Robert J.; and Weir, Richard P., to National Gypsum Company. Universal secondary stud. 4,837,988, Cl. 52-36.000.

Mentzer, Charles C.; Cox, Howard W.; and Short, William T., to General Motors Corporation. Method of applying painted carrier films to automobile body parts. 4,838,973, Cl. 156-212.000.

Merck & Co., Inc.: *See—*
Barash, Louis; Christensen, Burton G.; Hannah, John; Leanza, William J.; and Shih, David H., 4,839,352, Cl. 514-210.000.
Patchett, Arthur A.; Greenlee, William J.; Parsons, William H.; and Chakravarty, Prasun K., 4,839,357, Cl. 514-235.800.

Merk, Werner, to Atlas-Danmark A/S. Deodorization process for triglyceride oil. 4,838,997, Cl. 203-92.000.

Merkovsky, Daniel, to Westinghouse Electric Corp. Anti-vibration flux thimble. 4,839,135, Cl. 376-254.000.

Merrell Dow Pharmaceuticals Inc.: *See—*
Matthews, Donald P.; Whitten, Jeffrey P.; and McCarthy, James R., 4,839,375, Cl. 514-397.000.

Merry, Glenn W., to Matsi, Inc. Product preserving stopper. 4,838,442, Cl. 215-228.000.

Mersiovsky, Lynda K.; and Sprott, Charles N., to International Business Machines Corporation. System for facilitating the control of audio information within a word processing document with audio input. 4,839,857, Cl. 369-25.000.

Messer. Griesheim GmbH: *See—*
Donnerhack, Andreas; Thoma, Klemens; Volker, Wolfgang; Gallmeister, Rolf-Dieter; Stratz, Thomas; and Lammers, Ludwig, 4,838,270, Cl. 128-371.000.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Hahn, Andreas; Wondrazek, Fritz; and Frank, Frank, 4,838,246, Cl. 128-6.000.
Spies, Hans; and Weigel, Ulrich, 4,838,166, Cl. 102-481.000.

Metal Box plc: *See—*
Hardy, Peter D., 4,838,008, Cl. 53-407.000.

Metallgesellschaft Aktiengesellschaft: *See—*
Dworak, Rainer; and Lohrberg, Karl, 4,839,003, Cl. 204-98.000.
Elsenheimer, Gerd; and Schnabel, Wolfram, 4,838,934, Cl. 75-36.000.
Lohrberg, Karl; and Kohl, Peter, 4,839,013, Cl. 204-258.000.

Metallpraecis Berchem + Schaberg Gesellschaft Fur Metallformgebung m.b.H.: *See—*
Berchem, Rutger; and Proksch, Georg. 4,838,312, Cl. 137-625.480.

Metcal, Inc.: *See—*
Cowell, Mark J., 4,839,501, Cl. 219-237.000.

Metz, Josef: *See—*
Bierwirth, Adolf-Peter; Sauerwald, Walter; Hulsewis, Hans; and Metz, Josef, 4,838,144, Cl. 89-46.000.

Metzger, Lynn. Guide bar for a hose which is physically manipulated by workers to deliver a high density material to a predeterminated site. 4,838,465, Cl. 222-526.000.

Meyer, Michael C.: *See—*
Pankhania, Mahendra G.; and Meyer, Michael C., 4,839,176, Cl. 424-465.000.

MGS, Inc.: *See—*
Gehman, Roland P.; and Martin, Raymond G., 4,838,753, Cl. 414-563.000.

Miba Sintermetall Aktiengesellschaft: *See—*
Filz, Friedrich, 4,839,138, Cl. 419-6.000.

Michaels, Edwin B., to E. B. Michaels Research Associates Inc. Process and composition for oral hygiene. 4,839,158, Cl. 424-54.000.

Michanczyk, Gary F. Running board. 4,838,567, Cl. 280-163.000.

Michaud, Paul; Berard, Jean T.; and Poudrier, Bertrand, to Posi-Plus Technologies Inc. Articulated boom jib assembly. 4,838,381, Cl. 182-2.000.

Michel, Peter: *See—*
Holzapfel, Heinz P.; and Michel, Peter, 4,839,710, Cl. 357-45.000.

Michelin Recherche et Technique S.A.: *See—*
Villaine, Philippe; and Janin, Claude, 4,839,113, Cl. 264-28.000.

Michelson, Randi J.; and Leonard, Mercedes B. Photographic tray agitator. 4,839,684, Cl. 354-327.000.

Michibayashi, Yasuo: *See—*
Sato, Hirokazu; Goto, Yasuhiro; Horiuchi, Kazufumi; Michibayashi, Yasuo; Nobutsugu, Hideo; and Kawamura, Takumi, 4,838,368, Cl. 177-25.180.

Michl, Terry L.: *See—*
Byers, Charles H., Jr.; Michl, Terry L.; and Acord, Dennis E., 4,838,705, Cl. 374-14.000.

Microfast Controls Corp.: *See—*
Kumar, Shalabh; and Edgar, Duane, 4,839,789, Cl. 364-142.000.

Micron Technology, Inc.: *See—*
Lee, Ruojia R., 4,839,301, Cl. 437-29.000.

Micropolis Corporation: *See—*
Gami, Bipin V.; and Dunstan, Ericson, 4,839,754, Cl. 360-73.010.

Midgley, John E.: *See—*
Charlton, John C.; Midgley, John E.; and Wilkins, Terence A., 4,839,299, Cl. 436-500.000.

Midwinter, Elizabeth A.: *See—*
Harris, Lee M.; Evans, Dix L.; and Midwinter, Elizabeth A., 4,839,635, Cl. 340-752.000.

Mierzwinski, Eugene P., to Hamilton Standard Controls, Inc. Integrated DC electroluminescent display system. 4,839,558, Cl. 313-510.000.

Mifflin, Thomas R.; and Dewitz, Thomas S., to Shell Oil Company. Method of removal and disposal of fly ash from a high-temperature, high-pressure synthesis gas stream. 4,838,898, Cl. 48-210.000.

Mihara, Yuji: *See—*
Ohno, Shigeru; Mihara, Yuji; and Adachi, Keiichi, 4,839,265, Cl. 430-522.000.
Miki, Nobuaki; Suzuki, Akira; and Kobayashi, Kouji, to Aisin Aw Co., Ltd. Pressure control valve. 4,838,517, Cl. 251-129.160.
Miki, Nobuaki: *See—*
Kobayashi, Kouji; Miki, Nobuaki; and Suzuki, Akira, 4,838,313, Cl. 137-625.650.
Kobayashi, Kouji; Suzuki, Akira; and Miki, Nobuaki, 4,838,518, Cl. 251-129.160.
Mikoshiba, Shigeo; Shinada, Shinichi; and Matsumoto, Takahiro, to Hitachi, Ltd. Method of driving gas-discharge panel. 4,839,637, Cl. 340-775.000.
Mildenberger, Hilmar: *See—*
Liebl, Rainer; Frey, Michael; Mildenberger, Hilmar; Bauer, Klaus; and Bieringer, Hermann, 4,838,931, Cl. 71-94.000.
Miller, Ira, to Motorola, Inc. MOS bandgap voltage reference circuit 4,839,535, Cl. 307-296.700.
Miller, Irvin M.: *See—*
Hess, Robert V.; Upchurch, Billy T.; Brown, Kenneth G.; Miller, Irvin M.; Schryer, David R.; Sidney, Barry D.; Wood, George M.; and Hoyt, Ronald F., 4,839,330, Cl. 502-53.000.
Miller, Jan D.; and Yi, Ye, to University of Utah. Air sparged hydrocyclone flotation apparatus and methods for separating particles from a particulate suspension. 4,838,434, Cl. 209-16.000.
Miller, John B. Dual flush system for toilets. 4,837,867, Cl. 4-324.000.
Miller, John D.: *See—*
Reed, Clayton L.; and Miller, John D., 4,839,048, Cl. 210-450.000.
Miller, Kenneth E.: *See—*
Smith, David H.; and Miller, Kenneth E., 4,838,295, Cl. 137-9.000.
Miller, Lane R.; Nobles, Charles M., Jr.; and McGuire, Dennis P., to Lord Corporation. Semi-active damper for vehicles and the like. 4,838,392, Cl. 188-277.000.
Miller, Robert A. Emergency signal device. 4,839,630, Cl. 340-574.000.
Miller, Robert L.: *See—*
Bader, Mark S.; and Miller, Robert L., 4,838,908, Cl. 55-385.100.
Miller, William A., II: *See—*
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Milligan, Patrick E.: *See—*
Westfall, Norman R.; and Milligan, Patrick E., 4,837,976, Cl. 49-430.000.
Milliken Research Corporation: *See—*
Dischler, Louis, 4,837,902, Cl. 26-1.000.
Milsco Manufacturing Company: *See—*
Hill, Kevin E., 4,838,514, Cl. 248-577.000.
Milton, R. M.; and Barnes, Daniel C. Illuminated aerial marker. 4,839,567, Cl. 315-344.000.
Miltz, Arthur I. Method and apparatus for air transfer between scuba divers. 4,838,256, Cl. 128-202.270.
Mimasu Oil Chemical Co., Ltd.: *See—*
Shimizu, Kazuo, 4,839,089, Cl. 252-183.110.
Mimeur, Jacques: *See—*
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Mims, Jimmie E.: *See—*
Brar, Amarjit S.; Mims, Jimmie E.; and Sharma, Jagdish P., 4,837,923, Cl. 29-603.000.
Minagawa, Kazuji: *See—*
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Minagawa, Tadao: *See—*
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Minard, Barbara J.: *See—*
Cawley, Leo P.; Bryant, Steven A.; and Minard, Barbara J., 4,839,058, Cl. 210-670.000.
Mind Over Matter Games, Inc.: *See—*
Volpert, Thomas R., 4,838,551, Cl. 273-157.00R.
Mine, Kazunori; Murakami, Keisuke; Tago, Mamoru; and Urata, Hiromasa, to Tokyo Electric Co., Ltd. Optical reader with shading correcting means. 4,839,514, Cl. 250-237.001.
Mine Safety Appliances Company: *See—*
Katz, Richard, 4,838,262, Cl. 128-205.240.
Mineart, Michael V., to FMC Corporation. Connector with spring retention device. 4,838,623, Cl. 305-58.0PC.
Minicam Research Corporation: *See—*
Ohosuga, Ichirho, 4,839,786, Cl. 363-52.000.
Ministry of International Trade: *See—*
Haruta, Masatake; and Kobayashi, Terushiko, 4,839,327, Cl. 502-243.000.
Ministry of International Trade and Industry: *See—*
Kawase, Kaoru; Sakami, Hiroshi; and Ida, Shozo, 4,839,318, Cl. 502-62.000.
Obuchi, Kiyoyuki; and Shimizu, Kenichi, 4,838,329, Cl. 152-210.000.
Minnesota Mining and Manufacturing Company: *See—*
Chou, Hsin-hsin; and Li, Wu-Shyong, 4,839,224, Cl. 428-323.000.
Fong, James J., 4,839,455, Cl. 528-28.000.
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Holcomb, Bruce A.; McCracken, Shaun D.; and McGinnis, Bryan J., 4,838,708, Cl. 383-5.000.
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Minoda, Minoru: *See—*
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Minolta Camera Kabushiki Kaisha: *See—*
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Hosomizu, Hiroshi; Ichikawa, Tsutomu; Kamiya, Makoto; Yoneyama, Masatoshi; and Tuzi, Kenzi, 4,839,686, Cl. 354-416.000.
Kamitamari, Manabu; and Hayama, Hiroyoshi, 4,839,697, Cl. 355-309.000.
Kawaguchi, Toshikazu, 4,839,693, Cl. 355-234.000.
Sakai, Masaaki; Ishihara, Sadao; and Shimoyama, Touma, 4,838,720, Cl. 400-642.000.
Taniguchi, Nobuyuki; Nakai, Masaaki; Omaki, Takanobu; Hosomizu, Hiroshi; Niwa, Masatake; Inoue, Toru; and Sekida, Minoru, 4,839,687, Cl. 354-416.000.
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Misaki, Hirozumi: *See—*
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Misenheimer, Laura P.: *See—*
Bulson, Laura G.; Misenheimer, Laura P.; and Sebrosky, Robert A., 4,839,621, Cl. 335-277.000.
Misic, George J.; Holland, G. Neil; Mehdizadeh, Mehrdad; and Patrick, John L., to Picker International, Inc. Faraday shield localized coil for magnetic resonance imaging. 4,839,594, Cl. 324-318.000.
Misumi, Masao; and Atsumi, Koji, to Oval Engineering Co., Ltd. Vortex flow meter. 4,838,092, Cl. 73-861.220.
Mita Industrial Co., Ltd.: *See—*
Yamamoto, Haruo; and Ogawa, Shusaku, 4,839,695, Cl. 355-218.000.
Mitchell, Allan T.: *See—*
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Mitchell, Paul H.: *See—*
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Mitsubishi Agricultural Machinery Co., Ltd.: *See—*
Adachi, Hitoyuki; and Ozoe, Masahiro, 4,838,357, Cl. 172-43.000.
Mitsubishi Chemical Industries Ltd.: *See—*
Koga, Shinichiro; Matsuno, Akira; Sakata, Katsuyuki; Ohtani, Yoshiaki; and Akihara, Isao, 4,839,458, Cl. 528-196.000.
Sibasaki, Masakatsu; Sodeoka, Mikiko; Iseki, Katsuhiko; Shinoda, Masaki; Aoki, Chiyoko; Hayasi, Yosio; and Kanayama, Toshiji, 4,839,388, Cl. 514-530.000.
Yoshitomi, Toshihiko; Kobayashi, Yoshimitsu; Kisaka, Yoshiyuki; Yoshida, Hidemi; Horie, Michikazu; Tamura, Takanori; and Ohgaki, Mitsuaki, 4,839,207, Cl. 428-64.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Banjo, Toshinobu; Ueda, Tetsuya; Onoda, Shigeo; and Kasatani, Yasushi, 4,838,804, Cl. 439-325.000.
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Fujishima, Kazuyasu, 4,839,864, Cl. 365-200.000.
Fujitsuka, Masashi, 4,838,020, Cl. 60-39.070.
Ito, Haruhiko; Shibata, Yoshio; Banzai, Masato; and Yatomi, Takeshi, 4,839,487, Cl. 219-69.120.
Ito, Masaaki; Odagiri, Shiro; Maeda, Kouji; Uekubo, Yasuhiro; Jitumori, Aiko; and Usami, Teruo, 4,839,654, Cl. 342-22.000.
Itoh, Hiromi, 4,839,196, Cl. 427-53.100.
Kaneyuki, Kazutoshi; and Iwatani, Shiro, 4,839,576, Cl. 322-25.000.
Morishita, Mitsuharu; Kohge, Shinichi; Hara, Tadayuki; Hata, Yasuaki; and Umemaru, Hisato, 4,838,074, Cl. 73-118.100.
Murakami, Sadatoshi; Yamasaki, Satoru; Tanaka, Masayuki; Hirata, Sayoko; Morimoto, Hiromi; Nomura, Kenji; Oka, Kenichiro; and Ohnishi, Masaru, 4,839,667, Cl. 346-76.0PH.
Okuno, Michiharu, 4,839,476, Cl. 200-17.00R.
Okura, Makoto, 4,839,794, Cl. 364-200.000.
Shinada, Mikio, 4,838,716, Cl. 400-208.000.
Tanaka, Toshinori, 4,838,100, Cl. 74-7.00A.
Teraoka, Yasuhiro; Ueda, Tetsuya; Yagoura, Hideya; Shimamoto, Haruo; Nango, Shigeyuki; Banjo, Toshinobu; and Seki, Hiroshi, 4,839,713, Cl. 357-70.000.
Toriu, Jirou; Ohno, Katsuhiro; and Miyajima, Jun, 4,837,922, Cl. 29-603.000.
Tsuji, Shintaro, 4,839,631, Cl. 340-541.000.
Tsutsumi, Kazumichi, 4,838,078, Cl. 73-118.200.
Une, Ryuzo, 4,838,719, Cl. 400-618.000.
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Yamamoto, Yuuichi; Nakamura, Tadaaki; Murai, Takashi; and Hijikata, Akemi, 4,838,033, Cl. 62-45.100.
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Mitsubishi Denki Kabushiki Kaishi: *See—*
Iwaksaki, Masahiko, 4,839,795, Cl. 364-200.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Kitera, Takuya; Urushibata, Shoichi; Sato, Masatoshi; Nagashima, Tadashi; Hamada, Shoichi; Shirasu, Isao; Nakura, Yasumi; Sakamoto, Michito; Ishide, Takashi; Sakamoto, Naruo; Meka, Masahiko; and Tomeoka, Masaru, 4,839,495, Cl. 219-121.630.
Mitsubishi Kasei Vinyl Company: *See—*
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Mitsubishi Mining and Cement Co., Ltd.: *See—*
Omizono, Hitoshi; Sasaki, Hiroshi; Fukatsu, Yasuo; Ota, Saburo; and Ueda, Yoshio, 4,837,995, Cl. 52-223.00L.
Mitsubishi Petrochemical Co., Ltd.: *See—*
Hayama, Kazuhide; and Saitoh, Yukio, 4,839,457, Cl. 528-86.000.

Mitsubishi Rayon Co., Ltd.: *See—*
Ida, Kozo, 4,839,125, Cl. 264-216.000.
Nakao, Fujio; and Uno, Hirofumi, 4,839,006, Cl. 204-130.000.
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Mitsuboshi Belting, Ltd.: *See—*
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Mitsui Petrochemical Industries, Ltd.: *See—*
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Mitsui Toatsu Chemicals, Incorporated: *See—*
Morita, Moritsugu; Miyazaki, Kazuo; Yamaguchi, Akihiro; Ohta, Masahiro; Tamai, Shoji; and Nishihara, Kunio, 4,839,232, Cl. 428-473.500.
Sugihara, Eiichi; Amemiya, Hideo; and Hayafune, Koji, 4,839,736, Cl. 358-253.000.
Yamashita, Hiroyuki; Odate, Makoto; Iizuka, Hajime; Kawazura, Hiroshi; Shiga, Yoshio; and Namekawa, Hiroshi, 4,839,376, Cl. 514-406.000.
Mitsumori, Sadamichi: *See—*
Kawashima, Kazuhiro; Komoda, Norihisa; Harada, Shunichi; Mitsumori, Sadamichi; and Taniguchi, Kouichi, 4,839,803, Cl. 364-403.000.
Miura, Nobuo: *See—*
Matsushima, Seiya; Yanagisawa, Takeshi; Miura, Nobuo; and Arakawa, Kuniaki, 4,838,113, Cl. 74-551.800.
Miura, Teiji; Yamazaki, Hideo; Abe, Nobumasa; Okamura, Toshihide; Morozumi, Hideki; and Matsuo, Tatsuki, to Seiko Epson Corporation. Liquid crystal shutter. 4,838,657, Cl. 350-336.000.
Miura, Tomoko: *See—*
Hirata, Keiiti; Morimoto, Yoshinari; Ban, Tomohiro; Furushima, Tokihito; Miura, Tomoko; and Ikeda, Yoshie, 4,839,827, Cl. 364-518.000.
Miura, Tsunemoto: *See—*
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Miya, Tetsuo: *See—*
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Miyahara, Youjirou: *See—*
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Miyaishi, Yoshinori: *See—*
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Miyajima, Jun: *See—*
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Miyajima, Kiyoshi: *See—*
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Miyakawa, Hideaki: *See—*
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Miyake, Akio: *See—*
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Miyamoto, Satoshi; and Nagatani, Masamichi, to Amchem Products, Inc. Phosphate coatings for metal surfaces. 4,838,957, Cl. 148-260.000.
Miyao, Manabu: *See—*
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Miyata, Hirofumi, to Bando Chemical Industries, Ltd. Speed-shifting device. 4,838,834, Cl. 474-11.000.
Miyazaki, Kazuo: *See—*
Morita, Moritsugu; Miyazaki, Kazuo; Yamaguchi, Akihiro; Ohta, Masahiro; Tamai, Shoji; and Nishihara, Kunio, 4,839,232, Cl. 428-473.500.
Miyazako, Takushi: *See—*
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Miyazawa, Osamu: *See—*
Yamada, Noboru; Abe, Tomohiko; and Miyazawa, Osamu, 4,839,760, Cl. 360-97.010.
Miyoshi, Masahiko; and Sato, Masayoshi, to Kabushiki Kaisha Tokyo Kikai Seisakusho. Ink-furnishing apparatus. 4,838,164, Cl. 101-365.000.
Miyoshi, Masanobu; Kajiwara, Makoto; Onodera, Kaoru; and Sakamoto, Eiichi, to Konishiroku Photo Industry Co., Ltd. Method of forming dye image having superior rapid processing performance. 4,839,263, Cl. 430-384.000.
Mizuhara, Howard, to GTE Products Corporation. Gold-palladium-nickel-copper-manganese filler metal for joining superalloy parts. 4,839,141, Cl. 420-587.000.
Mizuma, Takashi; and Nakao, Koji, to Mazda Motor Corporation. Arrangements for forming roof structures of vehicle bodies. 4,838,607, Cl. 296-219.000.
Mizumura, Shunzi: *See—*
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Mizuno, Seiichiro: *See—*
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Mizuno, Takeshi; and Higuchi, Toshiro, to Seiko Seiki Kabushiki Kaisha. Controlled type magnetic bearing device. 4,839,550, Cl. 310-90.500.
Mizuno, Toshiya; Yasumi, Hideyuki; and Matsunaga, Satoru, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing biaxially stretched polyparaphenylene sulfide film. 4,839,129, Cl. 264-235.000.
Mizushima, Yukio: *See—*
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Mizutani, Isao, to NGK Insulators, Ltd. Dielectric drying process for honeycomb structures. 4,837,943, Cl. 34-1.000.
Mlenek, Patrick L. Swinging screen door for sliding glass doors. 4,838,332, Cl. 160-90.000.
Mo, Bang H.: *See—*
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Duncan, Gary L., 4,839,123, Cl. 264-22.000.
Jennings, Alfred R., Jr.; and Stowe, Lawrence R., 4,838,351, Cl. 166-280.000.
Ramage, Michael P.; and Wong, Donald C., 4,839,024, Cl. 208-64.000.
Silvey, Frank C., 4,839,108, Cl. 261-97.000.
Mochida, Ei; Uemura, Akio; Kato, Kazuo; Tokunaga, Hiroki; and Haga, Akinori, to Mochida Pharmaceutical Co., Ltd.; and Hodogaya Chemical Co., Ltd. 1-acyl-2,3-dihydro-4(1H)-quinolinone-4-oxime derivatives. 4,839,368, Cl. 514-313.000.
Mochida Pharmaceutical Co., Ltd.: *See—*
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Modernfold, Inc.: *See—*
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Moehling, Charles, to AMSTED Industries Incorporated. Railway truck bolster with improved brake attachment. 4,838,174, Cl. 105-226.000.
Moeller, Roy P.: *See—*
Magnussen, Haakon T., Jr.; Moeller, Roy P.; Palmer, Phillip S.; and Smith, Gary L., 4,839,248, Cl. 429-49.000.
Mohajer, Yousef; Lazarus, Stanley D.; and Cooke, Robert S., to Allied-Signal Inc. Reduction of carboxyl end groups in polyester fibers with lactim ethers. 4,839,124, Cl. 264-211.000.
Mohammadi, Farrokh; and Shyu, Chin-Miin, to National Semiconductor Corporation. Application of deep-junction non-self-aligned transistors for suppressing hot carriers. 4,839,704, Cl. 357-23.300.
Mohebban, Manoochehr, to Raychem Corporation. Liquid crystal display with particular relationship of the capacitances. 4,838,653, Cl. 350-332.000.
Mohr, Georg: *See—*
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Moisan, Gerald L. Apparatus for manipulating manhole covers. 4,838,521, Cl. 254-131.000.
Molex Incorporated: *See—*
Igarashi, Masazumi, 4,838,806, Cl. 439-341.000.
Molinoff, Henry C. Mouth moisturizing pad. 4,838,882, Cl. 604-286.000.
Molnlycke AB: *See—*
Forgar, Monica; and Bjornson-Ljungblom, Kerstin, 4,838,868, Cl. 604-180.000.
Molzahn, David C., to Dow Chemical Company, The. Novel polymers from aminated polyethers and formaldehyde. 4,839,460, Cl. 528-230.000.
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Monarch Marking Systems, Inc.: *See—*
Strausburg, Larry D., 4,838,469, Cl. 227-67.000.
Monbaliu, Marcel J.; and Van Meerbeeck, Paul L., to AGFA-Gevaert, N.V. Colour photographic motion picture element. 4,839,267, Cl. 430-546.000.
Mondet, Jean: *See—*
Grollier, Jean F.; Dubief, Claude; and Mondet, Jean, 4,839,166, Cl. 424-71.000.
Monestere, Martin, to Allergan, Inc. Contact lens disinfection case with locking mechanism. 4,838,413, Cl. 206-5.100.
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Blyth, Randolph C.; and Ucci, Pompelio A., 4,839,212, Cl. 428-96.000.
Hardiman, Christopher J., 4,839,325, Cl. 502-170.000.
Martin, David A.; Ries, Edward L.; Vanderlinde, William; and Young, Marvin J., 4,839,407, Cl. 524-389.000.
Mormile, Patrick J., 4,839,427, Cl. 525-162.000.
Vandersall, Howard L., 4,839,065, Cl. 252-603.000.
Wilkie, Arnold E.; and Talley, Arthur, Jr., 4,839,211, Cl. 428-89.000.
Monson, Donald B.: *See—*
Orosz, Miklos J.; Tringali, Dominick; Monson, Donald B.; and Kuiper, Gerald J., 4,839,477, Cl. 200-50.0AA.

Montagnier, Luc; Guetard, Denise; Brun-Vezinet, Francoise; and Clavel, Francois, to Institut Pasteur. Retrovirus capable of causing AIDS, antigens obtained from this retrovirus and corresponding antibodies and their application for diagnostic purposes. 4,839,288, Cl. 435-235.000.

Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; Schreck, Lisa; and Sands, Keith P., to International Flavors & Fragrances Inc. Schiff base reaction products of mixtures of aldehydes including helional and alkyl anthranilates; derivatives thereof; and organoleptic uses thereof. 4,839,083, Cl. 252-174.110.

Moopenn, Alexander W.; Thakoor, Anilkumar P.; Daud, Taher; and Lambe, John J., to California Institute of Technology, The. High density associative memory. 4,839,859, Cl. 365-100.000.

Moore, Alan F., to Dunlop Limited a British Company. Resilient bush. 4,838,736, Cl. 405-224.000.

Moore Business Forms, Inc.: *See*—
Kegelman, Thomas D.; and Raymond, Michael W., 4,839,673, Cl. 346-160.100.
Steidel, Leonard R., 4,839,814, Cl. 364-400.000.

Moore, Clifford G.; Silverman, Herbert P.; and Bredow, James R. Plated sensor for monitoring corrosion or electroplating. 4,839,580, Cl. 324-65.00R.

Moore, David G.; and Foster, Donald D., to Calmar Corporation. Product dispenser having actuator locking collar and shroud. 4,838,460, Cl. 222-153.000.

Moore, Edgar F., III. Embroidery frame press plunger head. 4,837,913, Cl. 29-238.000.

Moore, Richard C.: *See*—
Covey, Rupert A.; and Moore, Richard C., 4,839,349, Cl. 514-92.000.

Moores, Gregory E.: *See*—
Kubicko, Robert E.; Moores, Gregory E.; and Younger, William H., 4,838,152, Cl. 99-280.000.

Morankar, Sudhakar D.; Esguerra, Hermando; Kerevel, Patrice; and Hilgart, Michael J., to Dukane Corporation. Method and apparatus for orienting a fiber optic member. 4,838,659, Cl. 350-96.200.

More, Edward S.; and Aiken, John C. Electro optic slate for input/output of hand-entered textual and graphic information. 4,839,634, Cl. 340-712.000.

Morgan, Barry A.: *See*—
Singh, Jasbir; and Morgan, Barry A., 4,839,465, Cl. 530-330.000.

Mori, Kei. Visible light ray radiation device for use in medical treatment. 4,838,271, Cl. 128-398.000.

Mori, Takaaki; Higuchi, Kinichi; Oyauchi, Tsukasa; Nitanda, Masao; Hosoi, Kohei; Imai, Isao; Kato, Heiji; and Ichikawa, Mitsuhiko, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Rolling roll with variable profile and of the tapered piston type. 4,837,906, Cl. 29-112.000.

Mori, Toshihiro; and Ohyagi, Takashi, to NEC Corporation. Pager receiver capable of controlling an internal state by a call signal. 4,839,641, Cl. 340-825.470.

Mori, Yuji: *See*—
Hunahata, Katuyuki; Nagae, Yoshiharu; Takasaka, Masahiro; Mori, Yuji; Hoshino, Minoru; Kozima, Yasuyuki; Saito, Youhei; Fukuda, Kyohei; Kozai, Hayao; Hasimoto, Tadahiko; and Tsuchihashi, Yoshiaki, 4,838,655, Cl. 350-345.000.

Morikawa, Hiroshi, to NEC Corporation. Method of making a field effect transistor with overlay gate structure. 4,839,304, Cl. 437-39.000.

Morimoto, Akio: *See*—
Nakagawa, Katsuji; Itoh, Masaki; Morimoto, Akio; and Sakai, Mitsuru, 4,839,208, Cl. 428-64.000.

Morimoto, Hiromi: *See*—
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Morimoto, Hiroshi: *See*—
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Morimoto, Yoshinari: *See*—
Hirata, Keiiti; Morimoto, Yoshinari; Bar Tomohiro; Furushima, Tokihito; Miura, Tomoko; and Ikeda Yoshie, 4,839,827, Cl. 364-518.000.

Morimoto, Yoshitaka; and Tabe, Hideya, to NEC Corporation. Optical fiber connector. 4,838,641, Cl. 350-96.210.

Morishige, Fukumi, to Nissan Chemical Industries, Ltd. Composition of accelerating recovery of function of hematopoietic organs. 4,839,172, Cl. 424-105.000.

Morishita, Mimpei; and Azukizawa, Teruo, to Kabushiki Kaisha Toshiba. Transporting system of floated carrier type. 4,838,172, Cl. 104-281.000.

Morishita, Mitsuharu; Kohge, Shinichi; Hara, Tadayuki; Hata, Yasuaki; and Umemaru, Hisato, to Mitsubishi Denki Kabushiki Kaisha. Steering torque detecting device. 4,838,074, Cl. 73-118.100.

Morisod, Jean-Bernard, to Bobst SA. Device for transporting and forming batches of flat pieces with decreasing thickness. 4,838,747, Cl. 414-790.300.

Morita, Moritsugu; Miyazaki, Kazuo; Yanaguchi, Akihiro; Ohta, Masahiro; Tamai, Shoji; and Nishihara, Tunio, to Mitsui Toatsu Chemicals, Incorporated. Flexible laminate printed-circuit board and methods of making same. 4,839,232, Cl. 428-473.500.

Morita, Toshiki: *See*—
Yokoi, Takeshi; and Morita, Toshiki, 4,838,535, Cl. 271-22.000.

Moriya, Yasuo; Suzuki, Nobuyoshi; and Goto, Hiroshi, to Nippon Oil & Fats Co., Ltd. Method for production of graft resin composition. 4,839,423, Cl. 525-80.000.

Moriya, Yasuo; Suzuki, Nobuyoshi; and Goto, Hiroshi, to Nippon Oil and Fats Co., Ltd. Method of manufacturing a grafted resin composition. 4,839,432, Cl. 525-303.000.

Mormile, Patrick J., to Monsanto Company. Resin systems cured with blocked acid catalysts. 4,839,427, Cl. 525-162.000.

Morozumi, Hideki: *See*—
Miura, Teiji; Yamazaki, Hideo; Abe, Nobumasa; Okamura, Toshihide; Morozumi, Hideki; and Matsuo, Tatsuki, 4,838,657, Cl. 350-336.000.

Morris, Gregory J. E.: *See*—
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Morrise, Matthew C. P., to North American Philips Corporation, Signetics Division. Counter with glitchless terminal count indication. 4,839,910, Cl. 377-28.000.

Morse Boulger, Inc.: *See*—
Gaskin, Matthew J., 4,838,212, Cl. 122-392.000.
Tsaveras, Thomas; Gaskin, Matthew J.; and Maidhof, John T., 4,838,183, Cl. 110-190.000.

Mortimore, David B.: *See*—
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Morton Thiokol, Inc.: *See*—
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Mosley, Alan: *See*—
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Motev, Phil: *See*—
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Motonishi, Suguru: *See*—
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Motorola, Inc.: *See*—
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Kotzin, Michael D., 4,839,923, Cl. 381-31.000.
McKee, John M.; and Burger, Marilyn S., 4,838,661, Cl. 350-345.000.
Miller, Ira, 4,839,535, Cl. 307-296.700.
Mullins, Aaron B.; and Bartlett, Michael H., 4,838,475, Cl. 228-179.000.
Scott, George R.; Gray, John C.; and Scott, Eric M., 4,838,310, Cl. 137-624.140.
Soo, David H.; and Dunn, William C., 4,839,769, Cl. 361-84.000.

Mottine, John J., Jr.: *See*—
Dentini, Mark S.; Fulton, Joe A.; Jin, Sungho; Mottine, John J., Jr.; Shepherd, Lloyd; and Sherwood, Richard C., 4,838,347, Cl. 165-185.000.

Mottura, Sergio, to Mottura S.p.A. Roller blind with a centrifugal-mass brake located outside the roller and an end support containing the brake. 4,838,333, Cl. 160-305.000.

Mottura S.p.A.: *See*—
Mottura, Sergio, 4,838,333, Cl. 160-305.000.

Mouissie, Bob, to Du Pont de Nemours, E. I., and Company. Power connector. 4,838,809, Cl. 439-155.000.

Mouret, Patrick; and Galant, Jean-Claude, to Rivierre Casalis. Farm product pickup baler. 4,838,015, Cl. 56-15.700.

Mourray, Jack W.; and Nagy, James P., to Ford Motor Company. Hydro-mechanical stop having a restrictive passage. 4,838,393, Cl. 188-284.000.

Mower, Vaughn L.; Deneris, Evan A.; and Cox, John B., to Unisys Corporation. Multiple-loop microwave frequency synthesizer using two phase lockloops. 4,839,603, Cl. 328-14.000.

Mozer, Albrecht; and Losch, Kurt, to Alcatel N.V. Semiconductor laser with constant differential quantum efficiency or constant optical power output. 4,839,901, Cl. 372-49.000.

MTU-Motoren-und Turbinen-Union Muenchen GmbH: *See*—
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Muhlestein, Mark: *See*—
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Mukai, Hirokatsu: *See*—
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Mukainakano, Hiroshi: *See*—
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Mukaiyama, Takashi: *See*—
Ohta, Hironori; Kawaguchi, Toshiyasu; Mukaiyama, Takashi; Matsuzaki, Katsuhiko; Ebisawa, Junichi; Taneda, Naoki; Arai, Daikichi; Yoshihara, Noriyuki; Yamada, Yoshikazu; and Kunii, Koushiro, 4,838,914, Cl. 65-2.000.

Muller, Bernhard: *See*—
Armier, Karl-Heinz; and Muller, Bernhard, 4,839,496, Cl. 219-121.630.

Muller, Gerhard; and Engelfried, Werner, to Terrot Strickmaschinen GmbH. Knitting machine. 4,838,048, Cl. 66-220.000.

Muller, Werner H., to Hoechst Aktiengesellschaft. Perfluoroalkyl group-containing 1,2-napthoquinone daizide compounds and reproduction materials produced therefrom. 4,839,256, Cl. 430-192.000.

Mullins, Aaron B.; and Bartlett, Michael H., to Motorola, Inc. Method and apparatus for EMI/RFI shielding an infrared energy reflow soldered device. 4,838,475, Cl. 228-179.000.

Mullins, Dennis R., to Dana Corporation. Preset tool gauge. 4,837,941, Cl. 33-626.000.

Mulreany, Patrick A.; Kinney, Alan C.; and Presley, Donald C., to Truckee Meadows Research & Development. Fluid infusion flow control system. 4,838,856, Cl. 604-65.000.

Multinorm B.V.: *See*—
van Steijn, Aloijsius C. M., 4,838,489, Cl. 239-310.000.

Munakata, Megumi: *See*—
Sato, Yasufumi; Munakata, Megumi; and Noguchi, Hiromichi, 4,839,399, Cl. 522-14.000.
Sato, Yasufumi; Munakata, Megumi; and Noguchi, Hiromichi, 4,839,400, Cl. 522-14.000.
Sato, Yasufumi; Munakata, Megumi; and Noguchi, Hiromichi, 4,839,668, Cl. 346-140.00R.
Sato, Yasufumi; Munakata, Megumi; and Noguchi, Hiromichi, 4,839,669, Cl. 346-140.00R.

Mundus, Friedhelm: *See*—
Ebmeyer, Wilfried; Achelpohl, Fritz; and Mundus, Friedhelm, 4,838,977, Cl. 156-252.000.

Munkel, Uwe, to Kuehnle, Kopp & Kausch. Bearing for an exhaust-gas turbocharger. 4,838,711, Cl. 384-215.000.

Murabayashi, Katuyoshi, to Daicel Chemical Industries, Ltd. Resin composition of polyphenylene ether and polyamide block copolymer. 4,839,424, Cl. 525-92.000.

Murai, Atsushi; Terano, Minoru; Kimura, Kohei; and Inoue, Masuo, to Toho Titanium Co., Ltd. Solid catalyst component for olefin polymerization catalysts. 4,839,321, Cl. 502-127.000.

Murai, Takashi: *See*—
Yamamoto, Yuuichi; Nakamura, Tadaaki; Murai, Takashi; and Hijikata, Akemi, 4,838,033, Cl. 62-45.100.

Murakami, Kanji. Atmosphere control apparatus for theaters. 4,838,344, Cl. 165-48.100.

Murakami, Keisuke: *See*—
Mine, Kazunori; Murakami, Keisuke; Tago, Mamoru; and Urata, Hiromasa, 4,839,514, Cl. 250-237.00R.

Murakami, Koichi, to Nissan Motor Co., Ltd. Pressure transducer and method for fabricating same. 4,838,088, Cl. 73-724.000.

Murakami, Sadatoshi; Yamasaki, Satoru; Tanaka, Masayuki; Hirata, Sayoko; Morimoto, Hiromi; Nomura, Kenji; Oka, Kenichiro; and Ohnishi, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Platen for use in thermal printer. 4,839,667, Cl. 346-76.0PH.

Murakami, Syogo; and Shimmyo, Takashi, to Kabushiki Kaisha Toshiba. Apparatus and method for transporting and cutting a recording medium. 4,839,732, Cl. 358-304.000.

Murakata, Masami, to Kabushiki Kaisha Toshiba. Automatic cell-layout arranging method and apparatus for polycell logic LSI. 4,839,821, Cl. 364-491.000.

Muramatsu, Akira: *See*—
Matsuzawa, Toshio; Minagawa, Kazuji; Muramatsu, Akira; Abe, Tomoaki; Kiyono, Masashi; Kamio, Shigeru; Maeda, Katsuya; and Takao, Mitsunori, 4,838,226, Cl. 123-399.000.

Muramatsu, Keiji: *See*—
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Muramatsu, Tadao: *See*—
Tabata, Kanzo; Inoue, Hiroshi; Muramatsu, Tadao; and Narahara, Yasuji, 4,839,217, Cl. 428-156.000.

Muramatsu, Toshiki: *See*—
Komatsubara, Toshio; Muramatsu, Toshiki; and Matsuo, Mamoru, 4,838,958, Cl. 148-11.50A.

Murao, Sawao: *See*—
Kosaka, Akira; Murao, Sawao; Hirano, Kenichi; Tanaka, Noriaki; and Matsunaga, Kuniyoshi, 4,839,279, Cl. 435-25.000.

Murasaki, Ryuichi, to Yoshida Kogyo K.K. Apparatus for starting rotation of tape-supply spool. 4,838,495, Cl. 242-55.000.

Murata Kikai Kabushiki Kaisha: *See*—
Ueda, Yutaka, 4,838,019, Cl. 57-264.000.

Murata, Makoto: *See*—
Okada, Tadashi; Furukawa, Yuuji; and Murata, Makoto, 4,838,120, Cl. 74-711.000.

Murata Manufacturing Co., Ltd.: *See*—
Ishikawa, Youhei; Tsunoda, Kikuo; Hiratsuka, Toshiro; and Abe, Hirotsugu, 4,839,773, Cl. 361-321.000.

Murata, Tadaichi; Isomura, Tsuneo; Fujimori, Kenichi; Tsuruta, Fuminori; Dohi, Kazuhito; Horigome, Masahiro; Nakayama, Yoshitarou; and Oomori, Sachio, to Shindengen Electric Manufacturing Co., Ltd; and Yamanashi Electronics Co. Ltd. Electrophotographic photoreceptor. 4,839,252, Cl. 430-59.000.

Murayama, Junichiro; and Komizo, Yuichi, to Sumitomo Metal Industries, Ltd. Titanium-clad steel and a method for the manufacture thereof. 4,839,242, Cl. 428-660.000.

Murota, Kazuya, to Nissan Motor Co., Ltd. Oil pump for transaxle. 4,838,764, Cl. 418-170.000.

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Buckland, Eric L.; and Nishimura, Masayuki, 4,838,690, Cl. 356-73.100.

Nishimura, Minoru: *See*—
Hattori, Torao; Nishimura, Minoru; and Goto, Masaki, 4,838,845, Cl. 474-242.000.

Nishimura, Shuichi: *See*—
Yasuda, Makoto; Ura, Syousabu; Nishimura, Shuichi; Matsuo, Isaya; Kato, Masami; and Sagata, Munehiro, 4,838,215, Cl. 123-52.0MB.

Nishimura, Tatsuo; Yoshimura, Yoshinobu; Miyake, Akio; and Hashimoto, Naoto, to Takeda Chemical Industries, Ltd. Antibacterial compounds, and use. 4,839,351, Cl. 514-206.000.

Nishio, Ken-ichi: *See*—
Nakatani, Mitsuhisa; and Nishio, Ken-ichi, 4,839,238, Cl. 428-614.000.

Nishioka, Ryo: *See*—
Hosoi, Masaaki; Nishioka, Ryo; Hioki, Yoshio; Iida, Yoshiaki; Takeshita, Hiroshi; Niiyama, Kenji; and Hidaka, Yusuke, 4,839,353, Cl. 514-212.000.

Nishiyama, Michiaki: *See*—
Takai, Nobuei; Sakamoto, Haruo; Uekido, Kouzou; and Nishiyama, Michiaki, 4,838,814, Cl. 439-620.000.

Nishiyama, Randall T.; and Bedard, Alfred J., Jr., to United States of America, Commerce; and Univ. of Colo. Found., Inc. Quad disk static pressure probe. 4,838,087, Cl. 73-700.000.

Nishiyama, Sinichi; Abe, Hajime; Seki, Kuniaki; and Hagiwara, Noboru, to Hitachi Cable, Ltd. Method for manufacturing metallic tube members. 4,838,063, Cl. 72-47.000.

Nissan Chemical Industries, Ltd.: *See*—
Morishige, Fukumi, 4,839,172, Cl. 424-105.000.
Seto, Kiyotomo; Tanaka, Sakuya; and Sakoda, Ryozo, 4,839,361, Cl. 514-252.000.

Nissan Motor Co., Ltd.: *See*—
Abe, Kazuyoshi; and Yazaki, Kazuhiko, 4,837,904, Cl. 29-34.00R.
Furubayashi, Tadashi; Yamada, Kazuo; and Fujitani, Hitoshi, 4,838,606, Cl. 296-188.000.
Imajo, Minoru; and Kawakita, Tsunehiro, 4,839,831, Cl. 364-550.000.
Ishido, Takao; Sasaki, Shougo; and Takahashi, Takao, 4,838,321, Cl. 139-20.000.
Kanegae, Hidetoshi; Tomikashi, Minoru; and Hino, Akira, 4,839,811, Cl. 364-424.030.
Kokuryo, Yoshiki; Kataoka, Sachiro; Inaba, Tomokazu; Terunuma, Kazuyoshi; and Asano, Toshiharu, 4,839,532, Cl. 307-10.300.
Kondo, Nobuaki; and Yamazaki, Shinichi, 4,837,881, Cl. 5-464.000.
Konishi, Junkichi; Tsukada, Kenichi; Sekiguchi, Tomoyoshi; Kouda, Masanori; and Suzuki, Minoru, 4,838,563, Cl. 280-840.000.
Murakami, Koichi, 4,838,088, Cl. 73-724.000.
Murota, Kazuya, 4,838,764, Cl. 418-170.000.
Okada, Tadashi; Furukawa, Yuuji; and Murata, Makoto, 4,838,120, Cl. 74-711.000.
Sasaki, Michiaki; and Yamamoto, Kiyokazu, 4,838,307, Cl. 137-574.000.
Yasuda, Makoto; Ura, Syousabu; Nishimura, Shuichi; Matsuo, Isaya; Kato, Masami; and Sagata, Munehiro, 4,838,215, Cl. 123-52.0MB.
Yoneyama, Shuuichi, 4,838,228, Cl. 123-425.000.

Nissels, Robert, to Berthoud S.A. Rotatable nozzle assembly for sprayers. 4,838,490, Cl. 239-333.000.

Nissho Corporation: *See*—
Matsuura, Iwao, 4,838,883, Cl. 604-349.000.

Nitanda, Masao: *See*—
Mori, Takaaki; Higuchi, Kinichi; Oyauchi, Tsukasa; Nitanda, Masao; Hosoi, Kohei; Imai, Isao; Kato, Heiji; and Ichikawa, Mitsuhiko, 4,837,906, Cl. 29-112.000.

Nitta, Tomio, to Tokai Corporation. Aerosol structure. 4,838,459, Cl. 222-136.000.

Nitto Kohki Co., Ltd.: *See*—
Kikuchi, Katsuji, 4,838,771, Cl. 417-417.000.

Niwa, Hitoshi: *See*—
Hayashi, Satoshi; Tomita, Masahiro; Niwa, Hitoshi; and Mukai, Hirokatsu, 4,838,233, Cl. 123-506.000.

Niwa, Masatake: *See*—
Taniguchi, Nobuyuki; Nakai, Masaaki; Omaki, Takanobu; Hosomizu, Hiroshi; Niwa, Masatake; Inoue, Toru; and Sekida, Minoru, 4,839,687, Cl. 354-416.000.
Nixodorg Computer AG: *See*—
Beck, Herbert; Anton, Karl-Heinz; and Hohner, Harald, 4,838,714, Cl. 400-124.000.
Noack, Manfred G.: *See*—
Vella, Philip A.; and Noack, Manfred G., 4,839,152, Cl. 423-478.000.
Noaki, Yasuhide: *See*—
Wakamatsu, Hisashi; and Noaki, Yasuhide, 4,839,015, Cl. 204-290.00R.
Nobile, Gilberto: *See*—
Tumiatti, Wander; Nobile, Gilberto; and Tundo, Pietro, 4,839,042, Cl. 210-194.000.
Noble, William L., Sr., to Chrysler Motors Corportion. Method of assembling and transporting vehicle wheel assemblies in a sequential order. 4,837,911, Cl. 29-159.100.
Nobles, Charles M., Jr.: *See*—
Miller, Lane R.; Nobles, Charles M., Jr.; and McGuire, Dennis P., 4,838,392, Cl. 188-277.000.
Noboru, Yoshinori, to Sanyo Electric Co., Ltd. Scroll compressor with balance weight movably attached to swing link. 4,838,773, Cl. 418-55.000.
Nobutsugu, Hideo: *See*—
Sato, Hirokazu; Goto, Yasuhiro; Horiuchi, Kazufumi; Michibayashi, Yasuo; Nobutsugu, Hideo; and Kawamura, Takumi, 4,838,368, Cl. 177-25.180.
Noguchi, Hiromichi: *See*—
Sato, Yasufumi; Munakata, Megumi; and Noguchi, Hiromichi, 4,839,399, Cl. 522-14.000.
Sato, Yasufumi; Munakata, Megumi; and Noguchi, Hiromichi, 4,839,400, Cl. 522-14.000.
Sato, Yasufumi; Munakata, Megumi; and Noguchi, Hiromichi, 4,839,668, Cl. 346-140.00R.
Sato, Yasufumi; Munakata, Megumi; and Noguchi, Hiromichi, 4,839,669, Cl. 346-140.00R.
Noguchi, Masaro: *See*—
Matsusaka, Yoshihide; Aoyama, Kohji; and Noguchi, Masaro, 4,838,816, Cl. 439-861.000.
Noguchi, Noboru: *See*—
, Furuta, Youichi; Ando, Masamoto; Takeuchi, Hiroaki; Noguchi, Noboru; and Nakanishi, Nobuyasu, 4,838,621, Cl. 303-115.000.
Noguchi, Takeshi: *See*—
Orikawa, Michihiro; and Noguchi, Takeshi, 4,838,529, Cl. 267-140.100.
Noi, Keiichi; Takami, Akihiro; Ebine, Kazuhide; and Kumazawa, Kimiko, to Matsushita Electric Industrial Co., Ltd. Voltage-dependent non-linear resistance ceramic composition. 4,839,097, Cl. 252-520.000.
Nokia Graetz GmbH: *See*—
Pottharst, Jurgen; and Tischer, Kurt M., 4,838,651, Cl. 350-331.00R.
Zondler, Rolf, 4,838,658, Cl. 350-339.00R
Noll, Tobias; and Ulbrich, Walter, to Siemens Aktiengesellschaft. Apparatus for bit-parallel addition of binary numbers. 4,839,850, Cl. 364-787.000.
Nomix Corporation: *See*—
Babcock, H. Nash; and Holub, Edward P., 4,839,115, Cl. 264-42.000.
Nomura, Hironori; Taiji, Shimakawa; Shinohara, Junji; Kobayashi, Shigetoyo; and Yamamoto, Hiroki, to Uni-Charm Corporation. Method for applying an elastic band onto a moving web. 4,838,969, Cl. 156-160.000.
Nomura, Kenji: *See*—
Murakami, Sadatoshi; Yamasaki, Satoru; Tanaka, Masayuki; Hirata, Sayoko; Morimoto, Hiromi; Nomura, Kenji; Oka, Kenichiro; and Ohnishi, Masaru, 4,839,667, Cl. 346-76.0PH.
Nomura, Shinnya; Toyoda, Toshiro; and Ikenoya, Kazuhisa, to Kayaba Kogyo Kabushiki-Kaisha. Magnetic stroke sensor for detecting the stroke of a fluid-power cylinder. 4,839,591, Cl. 324-208.000.
Nomura, Sumihiro: *See*—
Sato, Yasuhiko; Yamada, Koichiro; Nomura, Sumihiro; Ishida, Ryuichi; and Yamamura, Michio, 4,839,360, Cl. 514-252.000.
Nomura, Yasuhiro: *See*—
Ito, Yosuke; Nomura, Yasuhiro; and Katayama, Sakae, 4,839,373, Cl. 514-367.000.
Noonan, John P.: *See*—
Stemmons, Duane G.; and Noonan, John P., 4,839,531, Cl. 307-17.000.
Nordischer Maschinenbau Rud. Baader GmbH+CO KG: *See*—
Hartmann, Franz; and Wulff, Dieter, 4,837,898, Cl. 17-58.000.
Norrie, Lyle W., to Knud Simonsen Industries Limited. Carcass conveyor for chilling chamber. 4,838,036, Cl. 62-63.000.
North American Philips Corporation, Signetics Division: *See*—
Morrise, Matthew C. P., 4,839,910, Cl. 377-28.000.
North States Industries, Inc.: *See*—
Larson, Donald A., 4,838,205, Cl. 119-52.10R.
Northern Illinois Gas Company: *See*—
Batz, James E.; Martell, Dennis J.; and Overmyer, Steven A., 4,839,642, Cl. 340-825.540.
Northern Telecom Limited: *See*—
Abraham, Thomas, 4,838,992, Cl. 156-643.000.
Clark, Gordon P.; Karwowski, Zbigniew T.; and Tebinka, Henry, 4,839,471, Cl. 174-92.000.
Northrop Corporation: *See*—
Tully, John W.; O'Brien, Benedict B.; Hant, William; and Hu, King L., 4,839,303, Cl. 437-31.000.
Northwestern University: *See*—
Wynne, Kenneth J.; Marks, Tobin J.; and Inabe, Tamotsu, 4,839,112, Cl. 264-22.000.
Norton Company: *See*—
Waldenberger, Dean H., 4,839,206, Cl. 428-40.000.
Norviel, Vern A.: *See*—
Ruebush, Ann M.; Davis, Samuel L., Jr.; and Norviel, Vern A., 4,839,054, Cl. 210-639.000.
Norwood, Leslie S.: *See*—
Jarnott, Frank T.; and Norwood, Leslie S., 4,838,449, Cl. 220-5.00A.
Noujaim, Sharbel E.: *See*—
O'Donnell, Matthew; Engeler, William E.; Vogelsong, Thomas L.; Karr, Steven G.; and Noujaim, Sharbel E., 4,839,652, Cl. 341-122.000.
Nova-Link Limited: *See*—
Vander Park, Antonius A., 4,838,177, Cl. 108-155.000.
Nova Technologies, Inc.: *See*—
DiMatteo, Paul; and Segnini, Robert, 4,837,872, Cl. 5-60.000.
Novak, Joel S.: *See*—
Parsons, Natan E.; and Novak, Joel S., 4,839,039, Cl. 210-143.000.
Novak, Terry. Tepee tent. 4,838,293, Cl. 135-100.000.
Nover, Michael P. J.: *See*—
Schnitker, Wolfgang E.; Nover, Michael P. J.; and Appel, Kay, 4,839,775, Cl. 361-402.000.
Nozawa, Kenji, to Komori Printing Machinery Co., Ltd. Sheet-fed rotary printing press. 4,838,160, Cl. 101-183.000.
Ntronix, Inc.: *See*—
Vulpe, Alexei, 4,839,494, Cl. 219-10.55A.
Nudeshima, Masahiro: *See*—
Tanabe, Susumu; and Nudeshima, Masahiro, 4,838,879, Cl. 604-280.000.
Nuesslein, Hans: *See*—
Puchta, Rolf; Nuesslein, Hans; and Casper, Hannelore, 4,839,075, Cl. 252-8.700.
Nukem GmbH: *See*—
Bender, Rudolf; and Quittkat, Jorg, 4,838,086, Cl. 73-597.000.
Nunokawa, Kazuo, to Tokyo Kogaku Kikai Kabushiki Kaisha. Optical system for retinal camera. 4,838,680, Cl. 351-206.000.
Nurczyk, Mark E.; and Johnson, Tedd P., to American Standard Inc. Vav valve control with transducer tolerance compensation. 4,838,483, Cl. 236-49.500.
Nurse, Nigel P. M.: *See*—
Newbery, Percy G.; and Nurse, Nigel P. M., 4,839,625, Cl. 337-166.000.
Nusbaum, Arthur. Building safety net. 4,838,382, Cl. 182-138.000.
Nussbaumer, Manfred: *See*—
Glaser, Eberhard; Beitinger, Eberhard; and Nussbaumer, Manfred, 4,838,980, Cl. 156-497.000.
Nusser, Claus-Dieter; and Locher, Johannes, to Robert Bosch GmbH. Method and system for testing internal combustion engine computerized control units. 4,839,812, Cl. 364-424.040.
Nyilas, Charles P.: *See*—
Guardiani, Richard F.; and Nyilas, Charles P., 4,838,559, Cl. 277-3.000.
Nylund, Olov: *See*—
DeMario, Edmund E.; Johansson, Anders; and Nylund, Olov, 4,839,136, Cl. 376-462.000.
Nyssen, Roger: *See*—
Wagner, Wolfram; Nyssen, Roger; Berkenhaus, Dirk; and van Pey, Hans-Theo, 4,838,917, Cl. 65-5.000.
Obata, Takeo: *See*—
Takata, Akira; and Obata, Takeo, 4,839,539, Cl. 307-465.000.
Oberste-Padtberg, Rudiger; Perthuis, Herve ; Parcevaux, Philippe; and Peulet, Sylvie, to Dowell Schlumberger Incorporated. Process for plugging subterranean formations. 4,838,352, Cl. 166-291.000.
Oblon, Ronald P. Device for changing temperature of material therein. 4,838,242, Cl. 126-263.000.
O'Brien, Benedict B.: *See*—
Tully, John W.; O'Brien, Benedict B.; Hant, William; and Hu, King L., 4,839,303, Cl. 437-31.000.
O'Brien, Denise M.; and Croce, Carlo P., to Warner-Lambert Company. Tamper indicator for a blister package. 4,838,425, Cl. 206-531.000.
Occidental Chemical Corporation: *See*—
Delphin, Rene; and Regnaut, Bernard, 4,839,114, Cl. 264-40.400.
Oce-Nederland B.V.: *See*—
Reinten, Hans, 4,839,672, Cl. 346-160.000.
Ochoa, Ellen; Schils, George F.; and Sweeney, Donald W., to United States of America, Energy. Position, rotation, and intensity invariant recognizing method. 4,838,644, Cl. 350-162.130.
O'Connor, Ingrid M.: *See*—
Hilsum, Cyril; Van Ewyk, Robert L.; and O'Connor, Ingrid M., 4,838,662, Cl. 350-350.00F.
Van Ewyk, Robert L.; O'Connor, Ingrid M.; Mosley, Alan; Jones, Francis; Blackburn, Christopher; and Griffiths, John, 4,838,659, Cl. 350-337.000.
Ocvirk, Norbert, to Alfred Teves GmbH. Hydraulic brake system for automotive vehicles. 4,838,619, Cl. 303-114.000.
Oda, Isao; and Kato, Kiminari, to NGK Insulators, Ltd. Ceramic rotors for pressure wave superchargers and production thereof. 4,839,214, Cl. 428-116.000.

Oda, Noriyuki; Takehara, Tetsuo; Higashi, Katsumi; and Muramatsu, Keiji, to Asahi Glass Company Ltd. Joint structure for a tube support plate and a tube. 4,838,581, Cl. 285-47.000.
Odagiri, Shiro: *See*—
Ito, Masaaki; Odagiri, Shiro; Maeda, Kouji; Uekubo, Yasuhiro; Jitumori, Aiko; and Usami, Teruo, 4,839,654, Cl. 342-22.000.
Odate, Makoto: *See*—
Yamashita, Hiroyuki; Odate, Makoto; Iizuka, Hajime; Kawazura, Hiroshi; Shiga, Yoshio; and Namekawa, Hiroshi, 4,839,376, Cl. 514-406.000.
O'Donnell, Matthew; Engeler, William E.; Vogelsong, Thomas L.; Karr, Steven G.; and Noujaim, Sharbel E., to General Electric Company. Method and apparatus for high speed digital phased array coherent imaging system. 4,839,652, Cl. 341-122.000.
Oertel, Wolfgang: *See*—
Focke, Heinz; and Oertel, Wolfgang, 4,838,846, Cl. 493-132.000.
Oestreich, Ulrich, to Siemens Aktiengesellschaft. Metal-free, self-supporting optical cable. 4,838,635, Cl. 350-96.230.
Office Plus: *See*—
Tuhkanen, Tapio, 4,838,580, Cl. 283-56.000.
Ogata, Masahiro: *See*—
Shinoda, Takashi; Sakai, Kikuo; Ogata, Masahiro; Kawamoto, Hiroshi; Onishi, Yoshiaki, deceased; and Onishi, Junko, administratrix, 4,839,860, Cl. 365-104.000.
Ogata, Yasuzi; and Ohi, Takao, to Olympus Optical Co., Ltd. Compact zoom lens system. 4,838,669, Cl. 350-427.000.
Ogawa, Masaki: *See*—
Ohata, Keiichi; Hida, Hikaru; and Ogawa, Masaki, 4,839,703, Cl. 357-22.000.
Ogawa, Shusaku: *See*—
Yamamoto, Haruo; and Ogawa, Shusaku, 4,839,695, Cl. 355-218.000.
Ogawa, Takashi: *See*—
Katoh, Yoshihisa; Ogawa, Takashi; and Hasegawa, Mitsumasa, 4,839,488, Cl. 219-69.180.
Ogawa, Tetsuya: *See*—
Goto, Yasuyuki; and Ogawa, Tetsuya, 4,839,091, Cl. 252-299.630.
Ogletree, Martin L., to E. R. Squibb & Sons, Inc. Method of inhibiting onset of or treating migraine headache using a thromboxane A2 receptor antagonist. 4,839,384, Cl. 514-277.000.
Ogura, Wataru, to Chinon Kabushiki Kaisha. Serial dot matrix printer. 4,838,717, Cl. 400-322.000.
Ohashi, Osamu; and Sasabe, Ken, to National Research Institute for Metals. Method of diffusion bonding of aluminum or alumina ceramics. 4,838,474, Cl. 228-121.000.
Ohata, Keiichi; Hida, Hikaru; and Ogawa, Masaki, to NEC Corporation. High speed and power transistor. 4,839,703, Cl. 357-22.000.
Ohe, Takeshi; and Ohsaki, Hiroshi, to Jidosha Kiki Co., Ltd. Balanced vane type oil pumps. 4,838,767, Cl. 417-299.000.
Ohgaki, Mitsuaki: *See*—
Yoshitomi, Toshihiko; Kobayashi, Yoshimitsu; Kisaka, Yoshiyuki; Yoshida, Hidemi; Horie, Michikazu; Tamura, Takanori; and Ohgaki, Mitsuaki, 4,839,207, Cl. 428-64.000.
Ohi Seisakusho Co., Ltd.: *See*—
Hayakawa, Hatsuo; and Honma, Mikio, 4,838,588, Cl. 292-216.000.
Ohi, Takao: *See*—
Ogata, Yasuzi; and Ohi, Takao, 4,838,669, Cl. 350-427.000.
Ohishi, Kazutami, to Koito Seisakusho Co. Ltd. Headlight mounting device. 4,839,785, Cl. 362-418.000.
Ohkata, Ichizo; and Takahashi, Hiroshi, to Kato Hatsujyo Co., Ltd. Pulley in which ceramic particles are exposed on the surface. 4,838,842, Cl. 474-192.000.
Ohmatsu, Hideki; and Hirai, Hiroyuki, to Fuji Photo Film Co., Ltd. Heat-developable photosensitive material. 4,839,272, Cl. 430-617.000.
Ohnishi, Masaru: *See*—
Murakami, Sadatoshi; Yamasaki, Satoru; Tanaka, Masayuki; Hirata, Sayoko; Morimoto, Hiromi; Nomura, Kenji; Oka, Kenichiro; and Ohnishi, Masaru, 4,839,667, Cl. 346-76.0PH.
Ohno, Katsuhiro: *See*—
Toriu, Jirou; Ohno, Katsuhiro; and Miyajima, Jun, 4,837,922, Cl. 29-603.000.
Ohno, Motoyasu: *See*—
Sawada, Kaname; Suzuki, Kazuo; Hasunuma, Shinji; Katayama, Eizo; Ohno, Motoyasu; Kanazawa, Tsukasa; and Ueki, Keiji, 4,839,879, Cl. 369-54.000.
Ohno, Shigeru; Mihara, Yuji; and Adachi, Keiichi, to Fuji Photo Film Co., Ltd. Silver halide photosensitive material containing an infrared absorption dye. 4,839,265, Cl. 430-522.000.
Ohnuma, Nobuyoshi; and Ueda, Akio, to Toybox Corporation. Endless rail for running toy. 4,838,828, Cl. 446-446.000.
Ohosuga, Ichirho, to Minicam Research Corporation. DC-DC converter. 4,839,786, Cl. 363-52.000.
Ohsaki, Hiroshi: *See*—
Ohe, Takeshi; and Ohsaki, Hiroshi, 4,838,767, Cl. 417-299.000.
Ohsawa, Tuneyuki: *See*—
Echigo, Yoshiaki; Sugawara, Kenichi; Yamao, Mutsunori; Suematu, Yoshiyuki; Asami, Keiichi; and Ohsawa, Tuneyuki, 4,839,445, Cl. 525-503.000.
Ohta, Hironori; Kawaguchi, Toshiyasu; Mukaiyama, Takashi; Matsuzaki, Katsuhiko; Ebisawa, Junichi; Taneda, Naoki; Arai, Daikichi; Yoshihara, Noriyuki; Yamada, Yoshikazu; and Kunii, Koushiro, to Asahi Glass Company Ltd. Process for producing silica glass fibers. 4,838,914, Cl. 65-2.000.
Ohta, Jiro; Tozawa, Sadamu; Matsushita, Koichi; and Maruyama, Yutaka, to Canon Kabushiki Kaisha. Static pressure gas bearing assembly. 4,838,710, Cl. 384-100.000.
Ohta, Kenji; Takahashi, Akira; Inui, Tetsuya; Hirokane, Junji; and Katayama, Hiroyuki, to Sharp Kabushiki Kaisha. Photo-mask for use in manufacturing an optical memory disc, a method for making the photo-mask and a method for manufacturing the optical memory disc 4,839,251, Cl. 430-5.000.
Ohta, Masahiro: *See*—
Morita, Moritsugu; Miyazaki, Kazuo; Yamaguchi, Akihiro; Ohta, Masahiro; Tamai, Shoji; and Nishihara, Kunio, 4,839,232, Cl. 428-473.500.
Ohtake, Nobumasa: *See*—
Akutsu, Yoshinori; Nakano, Takaharu, Saho, Takahiro; Ohtake, Nobumasa; Yasuda, Hirofumi; and Kimura, Tamio, 4,839,443, Cl. 525-474.000.
Ohtani, Kazuo, to Canon Kabushiki Kaisha. Image recording apparatus for recording a selected portion of an original image. 4,839,696, Cl. 355-218.000.
Ohtani, Yoshiaki: *See*—
Koga, Shinichiro; Matsuno, Akira; Sakata, Katsuyuki; Ohtani, Yoshiaki; and Akihara, Isao, 4,839,458, Cl. 528-196.000.
Ohtomo, Nobuya: *See*—
Sugahara, Keishin; Imamura, Takayuki; Hamada, Fukusaburo; Ohtomo, Nobuya; Fujita, Haruo; and Yagami, Kazuhide, 4,839,277, Cl. 435-7.000.
Ohtsuki, Kazuhiko: *See*—
Yano, Kazuhiko; Ohtsuki, Kazuhiko; and Yoshii, Gen, 4,838,105, Cl. 74-377.000.
Ohuchi, Kiyoyuki; and Shimizu, Ken'ichi, to Agency of Industrial Science and Technology; and Ministry of International Trade and Industry. Nonskid device. 4,838,329, Cl. 152-210.000.
Ohya, Tsutomu: *See*—
Fujimoto, Tatsuo; and Ohya, Tsutomu, 4,839,790, Cl. 364-184.000.
Ohyagi, Takashi: *See*—
Mori, Toshihiro; and Ohyagi, Takashi, 4,839,641, Cl. 340-825.470.
Ohyauchi, Hideo: *See*—
Amano, Yoshiaki; Yokoyama, Eiji; and Ohyauchi, Hideo, 4,838,897, Cl. 48-196.00A.
Oikawa, Hideaki, to Pentel Kabusiki Kaisha. Automatic lead advance for mechanical pencils. 4,838,721, Cl. 401-53.000.
Ojima, Juji: *See*—
Mutoh, Naoto; and Ojima, Juji, 4,838,840, Cl. 474-138.000.
Oka, Kenichiro: *See*—
Murakami, Sadatoshi; Yamasaki, Satoru; Tanaka, Masayuki, Hirata, Sayoko; Morimoto, Hiromi; Nomura, Kenji; Oka, Kenichiro; and Ohnishi, Masaru, 4,839,667, Cl. 346-76.0PH.
Okabe, Kazuya; Kasama, Yasuhiko; Seki, Hitoshi; and Iwasaki, Chisato, to Alps Electric Co., Ltd. Optical sensor including shortcircuit protection having notched electrode regions. 4,839,510, Cl. 250-211.00J.
Okada, Akio: *See*—
Hamada, Takeaki; Okada, Akio; Abe, Kiyoshi; Udagawa, Katsuhiro; Okazaki, Fumitoshi; and Fujino, Kouji, 4,837,877, Cl. 5-10.00B.
Okada, Hiroshi; Kato, Yukihiro; Ina, Osamu; and Ikeda, Kazuhisa, to Nippondenso Co., Ltd. Semiconductor pressure sensor. 4,838,089, Cl 73-727.000.
Okada, Tadashi; Furukawa, Yuuji; and Murata, Makoto, to Nissan Motor Company, Limited. Centrifugally actuate clutch for a limited slip differential. 4,838,120, Cl. 74-711.000.
Okada, Yasuyuki: *See*—
Kojima, Makoto; Misaki, Hirozumi; and Okada, Yasuyuki, 4,839,787, Cl. 363-60.000.
Okajima, Takahiro: *See*—
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Peyman, Gholam A.: *See—*
Koziol, Jeffrey E.; and Peyman, Gholam A., 4,838,266, Cl. 128-303.100.

Pfaff Industriemaschinen GmbH: *See—*
Martin, August, 4,838,188, Cl. 112-121.100.

Pfeifer, Hans-Joachim, to Institut Franco-Allemand De Recherches De Saint-Louis. Method for the simultaneous measurement of three velocity components by means of laser doppler anemometry. 4,838,687, Cl. 356-28.500.

Pfizer, Inc.: *See—*
Quallich, George J.; and Williams, Michael T., 4,839,104, Cl. 260-396.00R.

Pharmetrix Corp.: *See—*
Baker, Richard; Helm, Verne; and Shrock, Paul, 4,838,862, Cl. 604-892.100.
Baker, Richard W.; Kochinke, Frank; and Huang, Carl, 4,839,174, Cl. 424-447.000.

Phelpstead, James W. P., to British-American Tobacco Company Limited. Smoking articles. 4,838,286, Cl. 131-360.000.

Philip Morris Incorporated: *See—*
Pletcher, Charles D., 4,839,602, Cl. 324-57.00Q.

Phillips, Danny: *See—*
Cleavelin, Cloves R.; and Phillips, Danny, 4,839,010, Cl. 204-192.280.

Phillips, James L., to Essex Group, Inc. Magnet wire oven control apparatus. 4,839,818, Cl. 364-477.000.

Phillips Petroleum Company: *See—*
Bailey, Fay W., 4,838,948, Cl. 134-8.000
Hoover, Kenneth C.; Sherk, Fred T.; and Figard, Joseph E., 4,839,411, Cl. 524-424.000.

Phillips, Roger W.; and Coombs, Paul G., to Optical Coating Laboratory, Inc. Thin film structure having magnetic and color shifting properties. 4,838,648, Cl. 350-166.000.

Phy, William S.; Early, James M.; and Negus, Kevien J., to Fairchild Semiconductor Corporation. Ceramic package for high frequency semiconductor devices. 4,839,717, Cl. 357-74.000.

Physical Optics Corporation: *See—*
Jannson, Tomasz P.; Jannson, Joanna ..; and Yeung, Peter C., 4,838,630, Cl. 350-3.700.

Piano, Anthony P., to Warner-Lambert Company. Tamper indicator lid. 4,838,448, Cl. 220-257.000.

Pichler, Klaus, to Siemens Aktiengesellschaft. Closure system for a longitudinally divided cable sleeve. 4,839,772, Cl. 174-92.000.

Pickelman, Dale M.: *See—*
Davis, Thomas E.; Schmidt, Donald J.; Kau, Jee J.; Wessling, Ritchie A.; Whipple, Sharon S.; Fibiger, Richard F.; and Pickelman, Dale M., 4,839,203, Cl. 427-244.000.

Picker International, Inc.: *See—*
Misic, George J.; Holland, G. Neil; Mehdizadeh, Mehrdad; and Patrick, John L., 4,839,594, Cl. 324-318.000.

Pierce Chemical Company: *See—*
Smith, Paul K., 4,839,295, Cl. 436-86.000.

Pierrat, Frank A.: *See—*
Shutske, Gregory M.; and Pierrat, Frank A., 4,839,364, Cl. 514-290.000.

Pileeki, Victor T.: *See—*
Sankar, Nott G.; Pileeki, Victor T.; and Zahaykevich, George A., 4,839,497, Cl. 219-121.710.

Pilot Man-Nen Hitsu Kabushiki Kaisha: *See —*
Ishikawa, Hiromichi, 4,838,715, Cl. 400-196.100.

Pine, Lloyd A.: *See—*
Schuette, William L.; and Pine, Lloyd A., 4,839,319, Cl. 502-64.000.

Pinson, George T., to Boeing Company, The. Resiliently deployable fairing for sealing an airframe cavity. 4,838,502, Cl. 244-49.000.

Pinto, Joseph F.: *See—*
Pollock, Clifford R.; Pinto, Joseph F.; and Georgiou, Efstratios, 4,839,009, Cl. 204-157.480.

Pinto, Shlomo. Method and device for forming a fluid permeation control layer of the ground. 4,838,734, Cl. 405-176.000.

Pioneer Electronic Corporation: *See—*
Hasegawa, Shinichi; and Yoshioka, Takayuki, 4,838,665, Cl. 350-418.000.
Ikedo, Yuji; Okajima, Takahiro; and Tashiro, Yasuyuki, 4,839,764, Cl. 360-98.080.
Imasaki, Kenji; Ichihashi, Toshiaki; and Sasaki, Masafumi, 4,839,922, Cl. 380-15.000.
Ishii, Tsuneo, 4,839,748, Cl. 360-10.100.
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Pioneer Electronics Corporation: *See—*
Fukuda, Nobutoshi; Tanabe, Masashi; Furuta, Yoshiki; Nagao, Tatsuro; Arifuku, Naoto; and Yamamisaka, Shinichi, 4,839,584, Cl. 324-103.00P.

Pioneering Technologies, Inc.: *See—*
Wright, Diana R.; and Schlerf, David W., 4,838,288, Cl. 134-110.000.

Pitney Bowes Inc.: *See—*
Hills, Karen F.; and Mitchell, Paul H., 4,839,813, Cl. 364-464.030.
Hubbard, David W., 4,838,370, Cl. 177-210.0FP.

Piwonka, Peter: *See—*
Kalt, Glenda G.; Straub, Dale K.; and Piwonka, Peter, 4,838,867, Cl. 604-180.000.
Kalt, Glenda G.; Straub, Dale K.; and Piwonka, Peter, 4,838,878, Cl. 604-180.000.

Placzek, Wieslaw: *See—*
Friedrich, Pawel; Placzek, Wieslaw; Mynarz, Leszek; Karpinski, Krzysztof; Gaszewski, Jerzy; and Tarasiuk, Tadeusz, 4,838,075, Cl. 73-49.800.

Plainer, Hermann: *See—*
Kraemer, Dieter; Plainer, Hermann; Sproessier, Bruno; Uhlig, Helmut; and Schnee, Reiner, 4,839,419, Cl. 525-54.100.

Plant Genetic Systems N.V.: *See—*
Vandekerckhove, Joel S., 4,839,231, Cl. 428-441.000.

Plantefeve, Jean-Claude; and Rene, Michel, to Societe de Conseils de Recherches et d'Applications Scientifiques. Modified clays, preparation thereof and therapeutical compositions containing the same. 4,839,173, Cl. 424-683.000.

Plasticolors, Inc.: *See—*
Speelman, David J.; and Virant, Allen J., 4,839,405, Cl. 524-99.000.

Plemmons, Harold F.: *See—*
Kolmes, Nathaniel H.; and Plemmons, Harold F., 4,838,017, Cl. 57-210.000.

Plessey Company plc, The: *See—*
Bennion, Ian; Trundle, Clive; Brettle, Jack; Goodwin, Martin J.; and Glenn, Robert, 4,838,634, Cl. 350-96.120.

Pletcher, Charles D., to Philip Morris Incorporated. Means for detecting metal in a stream of particulate matter. 4,839,602, Cl. 324-57.00Q.

Pneumo Abex Corporation: *See—*
Riley, Thomas N., 4,838,104, Cl. 74-99.00R.

Poehnitzsch, Guenter, to Siemens Aktiengesellschaft. Method for refreshing data in a dynamic random access memory unit and control unit for the implementation of the method. 4,839,867, Cl. 365-222.000.

Pohl, Harald: *See—*
Becker, Rudolf; Neubauer, Wilhelm; Beyer, Hans; and Pohl, Harald, 4,838,778, Cl. 425-133.100.

Polaroid Corporation: *See—*
Abdulwahab, Munib; Burkhardt, James L.; and McCann, John J., 4,839,721, Cl. 358-80.000.
Brennan, Kevin F., 4,839,706, Cl. 357-30.000.
Ellis, Ernest W., 4,839,335, Cl. 503-224.000.
Lippert, Irving S.; Sturgis, John I.; and Whiteside, George D., 4,839,676, Cl. 354-86.000.

Polaroid Corporation, Patent Department: *See—*
Cowan, James J., 4,839,250, Cl. 430-1.000.

Poletto, Vanni: *See—*
Mazzucco, Michelangelo; Poletto, Vanni; and Sartori, Mario, 4,839,610, Cl. 330-278.000.

Polezhaeva, Antonina I.: *See—*
Granik, Vladimir G.; Stezhko, Tatyana V.; Glushkov, Robert G., Mashkovsky, Mikhail D.; Roschina, Lidia F.; Polezhaeva, Antonina I.; Parimbetova, Roza B.; Bobkov, Jury G.; Losev, Alexandr S.; and Ivanova, Irina A., 4,839,380, Cl. 517-424.000.

Poli Industria Chimica S.P.A.: *See—*
Poli, Stefano, 4,839,387, Cl. 514-19.000.

Poli, Stefano, to Poli Industria Chimica S.P.A. Derivative of thiazolidine-4-carboxylic acid, its preparation and pharmaceutical compositions containing it. 4,839,387, Cl. 514-19.000.

Pollock, Clifford R.; Pinto, Joseph F.; and Georgiou, Efstratios, to Cornell Research Foundation, Inc. NaCl: on color center laser. 4,839,009, Cl. 204-157.480.

Pollock, Ira G.: *See—*
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Polomski, Ronald J.: *See—*
Wilfinger, Erich L.; Polomski, Ronald J.; and Firth, Darren L., 4,838,126, Cl. 74-869.000.

Pond, Jacob: *See—*
Thomsen, Karl V.; Darcy, John J.; Griswold, Augustus W.; Haritonoff, Boris W.; and Pond, Jacob, 4,838,964, Cl. 156-73.100.

Poole, Eddie D.: *See—*
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Poprawe, Reinhart: *See—*
Herziger, Gerd; Beyer, Eckhard; Loosen, Peter; and Poprawe, Reinhart, 4,839,493, Cl. 219-121.690.

Porterfield, Richard: *See—*
Hamilton, Daniel A.; Spowart, James R.; and Porterfield, Richard, 4,838,452, Cl. 221-1.000.

Portnoy, Vladimir, to Allergan, Inc. Ocular topology system. 4,838,682, Cl. 351-212.000.

Posi-Plus Technologies Inc.: *See—*
Michaud, Paul; Bedard, Jean T.; and Poudrier, Bertrand, 4,838,381, Cl. 182-2.000.

Potocjnak, Tomislav, to Tepora Transportsysteme Entwicklungs-GmbH. Storage assembly. 4,838,749, Cl. 414-277.000.

Pottharst, Jurgen; and Tischer, Kurt M., to Nokia Graetz GmbH. Projection tube having an insulating layer of magnesium oxide and a high transmission metal grating. 4,838,651, Cl. 350-331.00R.

Poudrier, Bertrand: *See—*
Michaud, Paul; Bedard, Jean T.; and Poudrier, Bertrand, 4,838,381, Cl. 182-2.000.

Poullain, Jean: *See—*
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Pow, Edwin C.: *See—*
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Power Components, Inc.: *See—*
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PPG Industries, Inc.: *See—*
Kunkle, Gerald E.; and Pecoraro, George A., 4,838,919, Cl. 65-18.100.
Lin, Chia-Cheng; and Rukavina, Thomas G., 4,839,454, Cl. 528-32.000.

Prahauser, Georg; Huber, Paul, deceased; and Schiessl, Alois, legal representative, to Buck KG, Firma. Method and device for protection of targets against approaching projectiles, which projectiles are provided with infrared-sensitive target finders. 4,838,167, Cl. 102-334.000.

Prange, Charles J., to Sewer Rodding Equipment Co. Sewer cleaning equipment. 4,838,302, Cl. 137-355.120.

Precor Incorporated: *See—*
Armstrong, Timothy O.; and Bull, John W., 4,838,543, Cl. 272-70.000.

Prenn, Otto E., to Stelco Inc. Process for upset forging of long stands of metal bar stock. 4,838,062, Cl. 72-41.000.

Prentice, Thomas C., to Teledyne, Inc. Article positioner and method. 4,838,515, Cl. 248-661.000.

Presley, Donald C.: *See—*
Mulreany, Patrick A.; Kinney, Alan C.; and Presley, Donald C., 4,838,856, Cl. 604-65.000.

Prevost, David L.: *See—*
Arkell, Nigel J.; Sartor, Brian G.; and Prevost, David L., 4,838,451, Cl. 220-401.000.

Price, Robert J.; Gee, James E.; Tonsor, Andrew J.; Satzler, Ronald L.; and Stevens, Samuel B., to Caterpillar Inc. Suspension structure for a tracked vehicle. 4,838,373, Cl. 180-9.460.

Priem, Barry L., to General Motors Corporation. Mold cavity gas removal system with gas flow indicator. 4,838,338, Cl. 164-113.000.

Prill, Fredric W.: *See—*
Farnham, Robert E.; and Prill, Fredric W., 4,839,571, Cl. 340-606.000.

Primaxis Corporation: *See—*
Dumoulin, Jacques, 4,838,741, Cl. 409-131.000.

Pro-Line, Inc.: *See—*
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Procter & Gamble Company, The: *See—*
Curro, John J.; Trusty, Alan J.; and Vernon, George M., 4,839,216, Cl. 428-134.000.
Willman, Kenneth W.; Brennock, June T.; O'Neill, David C.; and Szkutak, Joan B., 4,839,076, Cl. 252-90.000.

Proffitt, James R.: *See—*
MacMurray, Thomas A.; McComis, William T.; Boiarski, Anthony A.; Proffitt, James R.; and Green, Glen R., 4,839,181, Cl. 426-237.000.

Prokscha, Georg: *See—*
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Provost, Fellows and Scholars of the College of the Holy and Undivided Trinity of Queen Elizabeth Near Dublin, The: *See—*
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Pryor, Timothy R., to Diffracto Ltd. Pulsed robotic inspection. 4,838,696, Cl. 356-375.000.

Pryor, Timothy R., to Diffracto Ltd. Coordinate measuring method and device. 4,839,526, Cl. 250-561.000.

Puchinger, Frans; and Wydra, Gerhard, to MTU-Motoren-und Turbinen-Union Muenchen GmbH. Dispersion for protective coatings and method for applying such coatings. 4,838,942, Cl. 106-286.100.

Puchta, Rolf; Nuesslein, Hans; and Casper, Hannelore, to Henkel Kommanditgesellschaft auf Aktien. Fabric-softening detergent. 4,839,075, Cl. 252-8.700.

Puckett, Troy L.; and Cadorniga, Lauro C., to MacGregor Golf Company. Method of molding a foamed core short distance golf ball. 4,839,116, Cl. 264-45.300.

Pullen, Adrian C. Template for marking or cutting a shaped corner on a workpiece. 4,837,939, Cl. 33-562.000.

Pump Controller Corporation: *See—*
Groshong, Leroy E.; Groshong, Judson C.; and Brawn, R. James, deceased, 4,838,860, Cl. 604-152.000.

Pyi, Hwa-Sheng; and Asghar, Saf, to Advanced Micro Devices. Digital tone detection and generation. 4,839,842, Cl. 364-721.000.

Pyles, Donald, to Pyles, Donald. Adjustable wrench. 4,838,132, Cl. 81-111.000.

Quadro, Giuseppe, to Chiesi Farmaceutici S.p.A. Methylthioquinolyl guanidine derivative, process of preparation thereof and pharmaceutical compositions therefrom. 4,839,366, Cl. 514-312.000.

Quallich, George J.; and Williams, Michael T., to Pfizer, Inc. Process for preparing sertraline intermediates. 4,839,104, Cl. 260-396.00R.

Quantex Corporation: *See—*
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Quarry Engineering Developments Pty. Ltd.: *See—*
MacOnochie, Ewen R. A., 4,838,363, Cl. 173-139.000.

Quenneville, Raymond N.: *See—*
Meistrick, Zdenek S.; and Quenneville, Raymond N., 4,838,516, Cl. 251-77.000.

Quermann, Thomas R., to Unisys Corporation. Gyrocompass. 4,838,099, Cl. 74-5.470.

Quimby, Harold L. Pier for supporting a load such as a foundation wall. 4,838,737, Cl. 405-230.000.

Quintech Corporation: *See—*
Kasboske, George C., 4,839,779, Cl. 362-214.000.

Quittkat, Jorg: *See—*
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R. B. Industries, Inc.: *See—*
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Radhakrishnan, Ramachandran: *See—*
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Radovich, JoAnn K. Inflatable indoor/outdoor display figure. 4,837,958, Cl. 40-538.000.

Raffurty, Robert: *See—*
Rice, Verle; Curtis, William; Keener, Richard; and Raffurty, Robert, 4,838,138, Cl. 83-698.000.

Ragland, Frank R., Jr., to RCA Licensing Corporation. Cathode-ray tube having an improved shadow mask contour. 4,839,556, Cl. 313-408.000.

Rahim, Omar M.: *See—*
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Rahn, Armin, to Fluocon Technologies Inc. Vapour phase treatment process and apparatus. 4,838,476, Cl. 228-180.100.

Rahn, William H.: *See—*
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Raible, Ludwig: *See—*
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Rainey, Frank W.; and Clement, Harvey R., to Excel Corporation. Lift and carry accumulating conveyor. 4,838,411, Cl. 198-774.000.

Rainin Instrument Co., Inc.: *See—*
Magnussen, Haakon T., Jr.; Moeller, Roy P.; Palmer, Phillip S.; and Smith, Gary L., 4,839,248, Cl. 429-49.000.

Ramage, Michael P.; and Wong, Donald C., to Mobil Oil Corporation. Split-feed naphtha reforming process. 4,839,024, Cl. 208-64.000.

Ramalingam, Subbiah; and Chang, Rongfeng, to University of Minnesota, Regents of the. Arc coating of refractory metal compounds. 4,839,011, Cl. 204-192.380.

Ramaprasad, Kackadasam R., to Chronar Corp. Stabilization of intraconnections and interfaces. 4,838,950, Cl. 136-244.000.

Ramesham, Rajeshuni; Thakoor, Sarita; Daud, Taher; and Thakoor, Aniklumar P., to California Institute of Technology. Solid-state non-volatile electronically programmable reversible variable resistance device. 4,839,700, Cl. 357-2.000.

Range, Jochen; Hohlein, Bernd; Niessen, Hans; Vau, Volker; Schiebahn, H. J. R.; Hoffmann, Horst; and Vorwerk, Manfred, to Kernforschungsanlage Julich GmbH; and Rheinische Braunkohlenwerke AG. Method and reactor for catalytic methanization of a gas containing CO, CO_2 and H_2. 4,839,391, Cl. 518-712.000.

Ranke, Horst: *See—*
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Rankin, Peggy J.: *See—*
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Ranpak Corp.: *See—*
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Ransone, Philip O.: *See—*
Camarda, Charles J.; and Ransone, Philip O., 4,838,346, Cl. 165-104.140.

Rantanen, Rauno; and Lummila, Markku, to Valmet Paper Machinery Inc. Method and apparatus for applying coating liquid to a moving base. 4,839,201, Cl. 427-355.000.

Rappen, Albert, to VSR Engineering GmbH Fordertechnik. Scraper device for conveyor belts. 4,838,409, Cl. 198-497.000.

Rausing, Hans, to AB PROFOR. Opening arrangement on packing containers. 4,838,428, Cl. 206-603.000.

Rawlins, David. Pool cleaning device. 4,837,886, Cl. 15-1.700.

Raychem Corporation: *See—*
Mohebban, Manoochehr, 4,838,653, Cl. 350-332.000.

Raymond Engineering Inc.: *See—*
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Raymond, Michael W.: *See—*
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Raytheon Company: *See—*
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RCA Licensing Corporation: *See—*
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Reategui, Julio A.: *See—*
Vora, Kishore N.; Campbell, Donald N.; Davis, Robert C., Jr.; Spangler, Glenn E.; and Reategui, Julio A., 4,839,143, Cl. 422-98.000.

Rebecq, Jean M., to Societe Civile Pour la Realisation D'Inventions Techniques—S.C.R.I.T. Foldable temporary roadmarkers and containers for storing and/or transporting same. 4,838,415, Cl. 206-216.000.

Recherche Carbovac Inc.: *See—*
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Rector, James L.; and Zide, Robert M., to Pro-Line, Inc. Shock attenuation tension mounting for face guard. 4,837,866, Cl. 2-424.000.

Recurrent Solutions Limited Partnership: *See—*
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Red Eye Arms, Inc.: *See—*
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Redemann, Carl T.: *See—*
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Reed, Clayton L.; and Miller, John D., to Pall Corporation. Container for pressurized fluid. 4,839,048, Cl. 210-450.000.

Reed, Edward W. Straight-hanging tapered plant pot. 4,837,972, Cl. 47-67.000.

Reed Tool Company: *See—*
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REFAC International, Limited: *See—*
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Regnaut, Bernard: *See—*
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Rehart, Michael A.: *See—*
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Reher, James F.; and Farzin-Nia, Farrokh, to Manufacturers Hanover Trust Company. Orthodontic bracket. 4,838,786, Cl. 433-9.000.

Reifenhauser GmbH & Co Maschinenfabrik: *See—*
Balk, Hermann, 4,838,774, Cl. 425-66.000.

Reilly Tar & Chemical Corporation: *See—*
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Reimartz, Hans-Dieter; Steffes, Helmut; and Czarnetzki, Edwin, to Alfred Teves GmbH. Pressure differential valve. 4,838,305, Cl. 137-505.130.

Reinten, Hans, to Oce-Nederland B.V. Exposure device and printer with an led array. 4,839,672, Cl. 346-160.000.

Rench, Michael J.: *See—*
Blunden, Donald J.; and Rench, Michael J., 4,838,743, Cl. 410-9.000.

Rene, Michel: *See—*
Plantefeve, Jean-Claude; and Rene, Michel, 4,839,173, Cl. 424-683.000.

Renk Tacke GmbH: *See—*
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Rensing, Hans: *See—*
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Research Development Corporation of Japan: *See—*
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Resta Commerciale S.r.l.: *See—*
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Resta, Mario: *See—*
Resta, Rodolfo; Resta, Mario; and Resta, Roberto, 4,838,186, Cl. 112-2.100.

Resta, Roberto: *See—*
Resta, Rodolfo; Resta, Mario; and Resta, Roberto, 4,838,186, Cl. 112-2.100.

Resta, Rodolfo; Resta, Mario; and Resta, Roberto, to Resta Commerciale S.r.l. Automatic apparatus for the manufacture of mattress-sacks. 4,838,186, Cl. 112-2.100.

Revels, William R., to Unisys Corporation. Track-following servo for disk drive with multiple reference windows and time dependent logic circuitry. 4,839,751, Cl. 360-60.000.

Revenaugh, Paul W.: *See—*
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Rey, Pierre: *See—*
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Rheinische Braunkohlenwerke AG: *See—*
Range, Jochen; Hohlein, Bernd; Nessen, Hans; Vau, Volker; Schiebahn, H. J. R.; Hoffmann, Horst; and Vorwerk, Manfred, 4,839,391, Cl. 518-712.000.

Rheinische Braunkohlenwerke A.G.: *See—*
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Rheinmetall GmbH: *See—*
Bierwirth, Adolf-Peter; Sauerwald, Walter; Hulsewis, Hans; and Metz, Josef, 4,838,144, Cl. 89-46.000.

Rhoades, Clark J. Nut starter. 4,838,131, Cl. 81-57.430.

Rhoades, James J.; and Kopriva, Steven D. Tool for applying body side molding strip. 4,838,986, Cl. 156-574.000.

Rhoads, Robert. High sensitivity chromatography detector. 4,838,688, Cl. 356-72.000.

Rhodes, Carl: *See—*
Brown, Robert J.; Brown, Roberta; and Rhodes, Carl, 4,838,826, Cl. 446-141.000.

Rhodes, Michael L. P.: *See—*
Donnison, Geoffrey M.; Wordsworth, Robert A.; and Rhodes, Michael L. P., 4,838,149, Cl. 92-222.000.

Rhone-Poulenc Chimie: *See—*
Barthelemy, Pascal, 4,839,440, Cl. 526-262.000.

Rice, Verle; Curtis, William; Keener, Richard; and Raffurty, Robert, to R. B. Industries, Inc. Scroll saw blade holder and blade aligning device. 4,838,138, Cl. 83-698.000.

Richards, Charles; and Kobayashi, Kazuhiro, to J. R. Richards, Inc. Polarized lens and method of making the same. 4,838,673, Cl. 351-44.000.

Richner, Michel: *See—*
Schreiber, Peter; and Richner, Michel, 4,838,473, Cl. 228-45.000.

Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Kreidl, Janos; Visky, Gyorgy; Czibula, Laszlo; Stefko, Bela; Farkas nee Kirjak, Maria; Szombathelyi, Zsolt; Karpati, Egon; Kiss, Bela; Csomor, Katalin; Szporny, Laszlo; Forgacs, Lilla; Kuthi, Csaba; and Gere, Aniko, 4,839,362, Cl. 514-283.000.

Ricoh Company, Ltd.: *See—*
Saito, Yuichi, 4,839,737, Cl. 358-257.000.
Saka, Yasuhiko, 4,839,731, Cl. 358-296.000.
Sawada, Yasuo; and Machida, Hajime, 4,839,226, Cl. 428-336.000.
Takata, Akira; and Obata, Takeo, 4,839,539, Cl. 307-465.000.
Yano, Takashi, 4,839,887, Cl. 370-60.000.

Rieger, Heinz H. Fireplace gas burner assembly. 4,838,240, Cl. 126-92.00R.

Rieger, Heinz H. Fireplace natural gas and propane burner assembly. 4,838,241, Cl. 126-92.00R.

Riemenschneider, Bert R.: *See—*
Tigelaar, Howard L.; Mitchell, Allan T.; Riemenschneider, Bert R.; and Paterson, James L., 4,839,705, Cl. 357-23.500.

Riermeier, Manfred; and Schuber, Viktor, to Siemens Aktiengesellschaft. Solar module mounting arrangement using angle brackets. 4,838,951, Cl. 136-251.000.

Ries, Edward L.: *See—*
Martin, David A.; Ries, Edward L.; Vanderlinde, William; and Young, Marvin J., 4,839,407, Cl. 524-389.000.

Rieter Scragg Limited: *See—*
Eaton, David C.; and Lawrence, Christopher J., 4,839,815, Cl. 364-470.000.

Righi, Nardino, to Eurafrica S.r.l. Safety razor. 4,837,930, Cl. 30-47.000.

Riley, Paul E.; Kulkarni, Vivek D.; and Castel, Egil D., to National Semiconductor Corporation. Etch back detection. 4,839,311, Cl. 437-228.000.

Riley, Thomas N., to Pneumo Abex Corporation. Center mounted and center drive helical spline actuator. 4,838,104, Cl. 74-99.00R.

Ringspann Albrecht Maurer KG: *See—*
Maurer, Reprecht; and Timtner, Karlheinz, 4,838,829, Cl. 464-38.000.

Rinkewich, Isaac. Water distribution device and system including same. 4,838,485, Cl. 239-70.000.

Ritter, Gunter; Asmuth, Peter; and Raible, Ludwig, to Rheinische Braunkohlenwerke A.G. Method of removing SO_x and NO_x from effluent gas. 4,839,148, Cl. 423-239.000.

Ritter, Rainer: *See—*
Heier, Christoph; Lentz, Gerd; and Ritter, Rainer, 4,838,488, Cl. 239-284.100.

Ritter, Thomas A.: *See—*
Dumican, Barry L.; Kaganov, Alan L.; and Ritter, Thomas A., 4,838,884, Cl. 604-364.000.

Rivas, Mario A.: *See—*
Davis, Walter L.; Rivas, Mario A.; Burch, Kenneth R.; and Deems, Vincent B., 4,839,628, Cl. 340-311.100.

Rivierre Casalis: *See—*
Mouret, Patrick; and Galant, Jean-Claude, 4,838,015, Cl. 56-15.700.

Roach, Max J.; and Taylor, Jack C., to Du Pont Canada Inc. Method of welding flanged pipe sections and apparatus therefor. 4,838,477, Cl. 228-222.000.

Robert Bosch GmbH: *See—*
Affeldt, Karl-Heinz; and Hantel, Ulrich, 4,838,277, Cl. 128-691.000.
Heier, Christoph; Lentz, Gerd; and Ritter, Rainer, 4,838,488, Cl. 239-284.100.
Nusser, Claus-Dieter; and Locher, Johannes, 4,839,812, Cl. 364-424.040.

Roberts, Arthur: *See—*
Balopole, Harvey L.; Martinolich, James J.; Roberts, Arthur; and Sadowski, Henry W., 4,839,726, Cl. 358-166.000.

Roberts, Gerald E.; Staples, A. Gordon; and Toliver, Samuel, to General Electric Company. Monolithic crystal filter with wide bandwidth and method of making same. 4,839,618, Cl. 333-191.000.

Roberts, Marvin: *See—*
Sutter, James J.; and Roberts, Marvin, 4,838,554, Cl. 273-143.00R.

Roberts, Melvin F., to Bloomfield Industries, Inc. Decanter with molded interlocking handle. 4,838,463, Cl. 222-465.100.

Roberts, Peter A.; and Finnerty, John D., to College Savings Bank. Method and apparatus for insuring the funding of a future liability of uncertain cost. 4,839,804, Cl. 364-408.000.

Roberts, Thomas J.; and Roberts, Timothy J. Protective garment. 4,837,860, Cl. 2-51.000.

Roberts, Timothy J.: *See—*
Roberts, Thomas J.; and Roberts, Timothy J., 4,837,860, Cl. 2-51.000.

Robertson, Martha L.: *See—*
McElrath, Kenneth O.; Robertson, Martha L.; and Chow, Wai Y., 4,839,422, Cl. 525-74.000.

Robertson, William M.; Burke, Edward J.; and Clark, Randy L. Video tape storage cabinet. 4,838,911, Cl. 62-3.300.

Robinson, David B.; and Penny, William H., to SciMed Life Systems, Inc. Manifold for angioplasty balloon catheter. 4,838,269, Cl. 128-344.000.

Robinson, Jeffrey A.: *See—*
Cote, William J.; Kenney, Donald M.; Kerbaugh, Michael L.; Leach, Michael A.; Robinson, Jeffrey A.; and Sweetser, Robert W., 4,838,991, Cl. 156-643.000.

Robinson, Jeffrey I., to General DataComm Industries, Inc. Active transconductance filter device. 4,839,542, Cl. 307-520.000.

Robinson, Tibor: *See—*
Kissling, Bruno; and Robinson, Tibor, 4,838,896, Cl. 8-554.000.

Rock-Tenn Company: *See—*
Wischusen, Henry, III, 4,838,600, Cl. 296-97.800.

Rockefeller University, The: *See—*
Saltiel, Alan R., 4,839,466, Cl. 530-395.000.

Rockley, Mark G.: *See—*
Freeman, David L.; Rockley, Mark G.; and Harville, Donald G., 4,839,516, Cl. 250-255.000.

Rockwell International Corporation: *See—*
Dunn, Charlton; and Subbaraman, Maria R., 4,838,759, Cl. 415-143.000.
Hallock, David B., 4,839,606, Cl. 329-107.000.
Huth, Michael, 4,838,498, Cl. 242-75.510.
Schroeder, Paul K.; and Sampson, Gary W., 4,838,173, Cl. 105-35.000.

Roerig, Arnold J.; and Hergert, Richard R., to Beloit Corporation. Self-loading controlled deflection roll. 4,837,907, Cl. 29-115.000.

Roet, Simon J.: *See—*
Stijntjes, Johan; and Roet, Simon J., 4,839,220, Cl. 428-258.000.

Rofin-Sinar Laser GmbH: *See—*
Armier, Karl-Heinz; and Muller, Bernhard, 4,839,496, Cl. 219-121.630.

Rogers, Clarence L., Jr., to Uniroyal Goodrich Tire Company, The. Method and apparatus for tire uniformity correction. 4,837,980, Cl. 51-165.00R.

Rogers Manufacturing Company, The: *See—*
Bitel, Vincent J., 4,838,444, Cl. 220-4.00E.

Rogers, W. Leslie: *See—*
Koral, Kenneth F.; Rogers, W. Leslie; and Clinthorne, Neal H., 4,839,808, Cl. 364-413.240.

Rogers, Wayne W.; and Wang, Carl C. T., to Alcon Laboratories, Inc. Linear suction control system. 4,838,281, Cl. 128-752.000.

Rohm GmbH: *See—*
Kraemer, Dieter; Plainer, Hermann; Sproessier, Bruno; Uhlig, Helmut; and Schnee, Reiner, 4,839,419, Cl. 525-54.100.
Suetterlin, Norbert; Blitz, Hans-Dieter; and Trabitzsch, Hans, 4,839,417, Cl. 524-833.000.

Rohm and Haas Company: *See—*
Davies, Philip D. T.; and Kirch, Lawrence S., 4,838,998, Cl. 203-96.000.
Maroldo, Stephen G.; Betz, William R.; and Borenstein, Noah, 4,839,331, Cl. 502-416.000.

Rollet, Georges: *See—*
Alexandre, Bernard; Cornillon, Jean-Paul; and Rollet, Georges, 4,838,435, Cl. 209-555.000.

Roos, Mark D., to EIP Microwave, Inc. Method for removing phase instabilities caused by flexure of cables in microwave network analyzer measurements. 4,839,578, Cl. 324-58.00B.

Rorden, Randall J.; Arthur, Ronald B.; and Muhlestein, Mark, to Icon International, Inc. Static frame digital memory. 4,839,796, Cl. 364-200.000.

Rorer Pharmaceutical Corporation: *See—*
Youssefyeh, Raymond; Chakraborty, Utpal; Magnien, Ernest; and Desai, Rohit, 4,839,369, Cl. 514-314.000.
Youssefyeh, Raymond D.; and Jones, Howard, 4,839,367, Cl. 514-312.000.

Rosado, Serafin M.; and Vallejo, Luiz E. D., to Carnot, S.A. Power cycle having a working fluid comprising a mixture of substances. 4,838,027, Cl. 60-671.000.

Roschina, Lidia F.: *See—*
Granik, Vladimir G.; Stezhko, Tatyana V.; Glushkov, Robert G.; Mashkovsky, Mikhail D.; Roschina, Lidia F.; Polezhaeva, Antonina I.; Parimbetova, Roza B.; Bobkov, Jury G.; Losev, Alexandr S.; and Ivanova, Irina A., 4,839,380, Cl. 517-424.000.

Rose, David; Maak, Norbert; and Lieske, Edgar, to Henkel Kommanditgesellschaft auf Aktien. Oxidation hair dyes comprising substituted dihydroxypyridines as coupling components. 4,838,893, Cl. 8-405.000.

Rosengart, Henning. Electromedical treatment apparatus. 4,838,850, Cl. 600-14.000.

Rosenvold, Robert: *See—*
Mansuripur, Masud; Ruane, Michael; and Rosenvold, Robert, 4,838,695, Cl. 356-369.000.

Rosette, King H.; and Packer, Herbert, to Harshaw/Filtrol. Extrusion of macrocrystal scientillation phosphors. 4,839,090, Cl. 252-301.40H.

Ross, Robert J.: *See—*
Pellerin, Roy F.; and Ross, Robert J., 4,838,085, Cl. 73-597.000.

Ross, Stephen T.: *See—*
Kruse, Lawrence I.; and Ross, Stephen T., 4,839,371, Cl. 514-345.000.

Rossi, Albert; Tack, Robert; Lewtas, Kenneth; and Alves, Jose, to Exxon Chemical Patents Inc. Specified C_{14}-carboxylate/vinyl ester polymer-containing compositions for lubricating oil flow improvement. 4,839,074, Cl. 252-56.00D.

Rossi, Alessandro: *See—*
Brambilla, Enzo; Mantegani, Sergio; Pegrassi, Lorenzo; Rossi, Alessandro; and Temperilli, Aldemio, 4,839,363, Cl. 514-288.000.

Rossi, Marie L.: *See—*
Ouhadi, Trazollah; Dehan, Louis; and Rossi, Marie L., 4,839,084, Cl. 252-174.210.

Roth, Arlen L. Sun visor formed from a food and beverage carrier. 4,837,865, Cl. 2-196.000.

Roth, Ernst, to Siegenia-Frank KG. Stabilizer corner connection. 4,837,998, Cl. 52-288.000.

Rothe, Anselm: *See—*
Freitag, Helmut; Steinbiss, Joachim; and Rothe, Anselm, 4,839,297, Cl. 436-170.000.

Roussel Uclaf: *See—*
Vevert, Jean-Paul; Delevallee, Francoise; Gasc, Jean-Claude; and Petit, Francis, 4,839,358, Cl. 514-237.800.

Rowland, Robert O., to Hudson Oxygen Therapy Sales Company. Battery condition monitoring system. 4,839,597, Cl. 324-433.000.

Roy, Christian, to Recherche Carbovac Inc. Treatment of petroleum derived organic sludges and oil residues. 4,839,021, Cl. 208-13.000.

Royal Melbourne Institute of Technology Limited: *See—*
Tyson, Graham R., 4,839,646, Cl. 340-870.300.

Ruane, Michael: *See—*
Mansuripur, Masud; Ruane, Michael; and Rosenvold, Robert, 4,838,695, Cl. 356-369.000.

Rubertone, Joseph A.: *See—*
Schweighardt, Frank K.; and Rubertone, Joseph A., 4,838,274, Cl. 128-654.000.

Rudick, Arthur G.; Credle, William S., Jr.; Heenan, Richard H.; and Paisley, Gary V., to Coca-Cola Company, The. Microgravity carbonator system. 4,839,107, Cl. 261-82.000.

Rudisch, Walter E.: *See—*
Lordo, Robert E.; and Rudisch, Walter E., 4,839,547, Cl. 310-60.00A.

Rudish, Ronald M.; and Hall, Scott F., to Eaton Corporation. Contiguous channel multiplexer/demultiplexer. 4,839,894, Cl. 370-123.000.

Ruebush, Ann M.; Davis, Samuel L., Jr.; and Norviel, Vern A., to Chevron Research Company. Process for removing water-soluble organics from produced water. 4,839,054, Cl. 210-639.000.

Ruf, Max; and Korostenski, Erwin, to Audi AG. Cast iron camshaft for internal combustion engines. 4,838,217, Cl. 123-90.600.

Rukavina, Thomas G.: *See—*
Lin, Chia-Cheng; and Rukavina, Thomas G., 4,839,454, Cl. 528-32.000.

Ruland, Fred F., to Ruland Manufacturing Company, Inc. Torque wrench. 4,838,134, Cl. 81-467.000.

Ruland Manufacturing Company, Inc.: *See—*
Ruland, Fred F., 4,838,134, Cl. 81-467.000.

Rumberger, William E., to Boeing Company, The. Coupling for connecting two shafts. 4,838,831, Cl. 464-88.000.

Rupieper, Paul: *See—*
Bederke, Klaus; Brock, Thomas; Kerber, Hermann; and Rupieper, Paul, 4,839,414, Cl. 524-507.000.

Rupprecht, Georg; and Patashnick, Harvey, to Rupprecht & Patashnick Co., Inc. Constrained linear motion inertial balance. 4,838,371, Cl. 177-210.0FP.

Rupprecht & Patashnick Co., Inc.: *See—*
Rupprecht, Georg; and Patashnick, Harvey, 4,838,371, Cl. 177-210.0FP.

Russ Bassett Company: *See—*
Macias, Jorge, 4,838,627, Cl. 312-341.00R.

Rusterholz, John T.; and Schomburg, John R., to Unisys Corporation. Method and apparatus for performing a vector reduction. 4,839,845, Cl. 364-736.000.

Ruta, Joseph W., to S&C Electric Company. Control circuit with validity-determining arrangement. 4,839,770, Cl. 361-93.000.

Rutgerswerke AG: *See—*
Jellinek, Karl; Meier, Bert; and Zehrfeld, Jurgen, 4,839,229, Cl. 428-413.000.

Ruvo Automation Corporation: *See—*
Jangaard, Erling S., 4,837,916, Cl. 29-434.000.

Ryan, Dominic H.: *See—*
Coey, John M. D.; and Ryan, Dominic H., 4,838,706, Cl. 374-54.000.

Ryder International and Textron, Inc.: *See—*
Lisak, Stephen P.; and McGuire, James T., 4,838,512, Cl. 248-503.000.

Ryobi Limited: *See—*
Hashii, Toshimitu, 4,837,981, Cl. 51-170.0MT.

Ryoko Co., Ltd.: *See—*
Higa, Teruo, 4,839,051, Cl. 210-602.000.

S.A.R.L. S.T. Lagerwall: *See—*
Lagerwall, Sven T.; Andersson, Gunnar; Dahl, Ingolf; Kuczynski, Wojciech; Sharp, Kent; and Stebler, Bengt, 4,838,663, Cl. 350-350.00S.

S&C Electric Company: *See—*
Ruta, Joseph W., 4,839,770, Cl. 361-93.000.

S. C. Johnson & Son, Inc.: *See—*
Demarest, Scott W., 4,837,969, Cl. 43-131.000.
Kiehlbauch, Richard A.; and Tsaur, Sheng-Liang, 4,839,413, Cl. 524-460.000.
Martin, John, 4,839,144, Cl. 422-305.000.

Sabnis, Jayant S.: *See—*
Gluck, Eric H.; McDonald, Henry; Sabnis, Jayant S.; and Weinberg, Bernard C., 4,838,259, Cl. 128-2 H.210.
Sachs, George: *See—*
Maullem, Shmuel; Sachs, George; and Wheeler, Larry, 4,839,385, Cl. 514-473.000.
Sachse, Richard: *See—*
Machler, Meinrad; Bittner, Reinhold; Sachse, Richard; and Schlemmer, Harry, 4,838,645, Cl. 350 162.230.
Sadowski, Henry W.: *See—*
Balopole, Harvey L.; Martinolich, James J.; Roberts, Arthur; and Sadowski, Henry W., 4,839,726, Cl. 338-166.000.
Safinya, Kambiz A.; and McBride, Roger W., to Schlumberger Technology Corp. System and method for communicating signals in a cased borehole having tubing. 4,839,644, Cl. 340-854.000.
Sagami Chemical Research Center: *See—*
Sibasaki, Masakatsu; Sodeoka, Mikiko; Tseki, Katsuhiko; Shinoda, Masaki; Aoki, Chiyoko; Hayasi, Yosi ; and Kanayama, Toshiji, 4,839,388, Cl. 514-530.000.
Saganovsky, Abraham, to K. B. Electronics Inc. Current limiting control circuit for d.c. motors. 4,839,570, Cl. 388-815.000.
Sagata, Munehiro: *See—*
Yasuda, Makoto; Ura, Syousabu; Nishimura, Shuichi; Matsuo, Isaya; Kato, Masami; and Sagata, Munehiro, 4,838,215, Cl. 123-52.0MB.
Sagi, Nobuo; Izumi, Tsugio; Kida, Haruyasu; and Maeda, Hirokazu, to Fuji Oil Company, Limited. Hard butter composition containing triglycerides, and process for production thereof. 4,839,192, Cl. 426-607.000.
Saho, Takahiro: *See—*
Akutsu, Yoshinori; Nakano, Takaharu; Saho, Takahiro; Ohtake, Nobumasa; Yasuda, Hirofumi; and Kimura, Tamio, 4,839,443, Cl. 525-474.000.
Saijo, Yoshihiro: *See—*
Kume, Tadaaki; Saijo, Yoshihiro; and Fujikawa, Yasuji, 4,838,847, Cl. 493-133.000.
Saint-Gobain Vitrage: *See—*
Blasquez-Gonzales, Ignacio; Blanchard, Rene; Letemps, Bernard; Mathivat, Denis; and Boutier, Philippe, 4,838,920, Cl. 65-104.000.
Saito, Akira: *See—*
Ichikawa, Atsushi; Ito, Masamichi; and Saito, Akira, 4,838,649, Cl. 350-247.000.
Saito, Kiyoshi; Yamamoto, Yoshiro; and Sakuragi, Takeo, to Tokyo Electrical Co., Ltd. Apparatus for checking out purchases. 4,838,383, Cl. 186-59.000.
Saito, Naoki: *See—*
Harada, Toru; Saito, Naoki; and Sato, Kozo, 4,839,333, Cl. 503-218.000.
Saito, Takashi: *See—*
Hosaka, Masao; and Saito, Takashi, 4,839,699, Cl. 355-55.000.
Saito, Yasuo; Ozaki, Tadashi; and Masuda, Isao, to Kioritz Corporation. Crank. 4,838,116, Cl. 74-595.000.
Saito, Youhei: *See—*
Hunahata, Katuyuki; Nagae, Yoshiharu; Takasaka, Masahiro; Mori, Yuji; Hoshino, Minoru; Kozima, Masuyuki; Saito, Youhei; Fukuda, Kyohei; Kozai, Hayao; Hashimoto, Tadahiko; and Tsuchihashi, Yoshiaki, 4,838,655, Cl. 350 335.000.
Saito, Yuichi, to Ricoh Company, Ltd. Facsimile machine with a recording paper information memory. 4,839,737, Cl. 358-257.000.
Saitoh, Yukio: *See—*
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Saitou, Chikara: *See—*
Eguchi, Hiroyoshi; Yamada, Norio; Kuroyama, Itaru; and Saitou, Chikara, 4,839,798, Cl. 364-200.000.
Saka, Yasuhiko, to Ricoh Company, Ltd. Color overhead projector. 4,839,731, Cl. 358-296.000.
Sakagami, Kenji: *See—*
Atsumi, Kunio; Sakagami, Kenji; Yamamoto, Yuichi; Yoshida, Takashi; Nishihata, Ken; Kondo, Shinichi; and Fukatsu, Shunzo, 4,839,350, Cl. 514-202.000.
Sakaguchi, Masaaki: *See—*
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Sakai, Hiroyuki: *See—*
Kameyama, Shuichi; Komeda, Tadao; Kobushi, Kazuhiro; and Sakai, Hiroyuki, 4,839,302, Cl. 437-31.000.
Sakai, Kikuo: *See—*
Shinoda, Takashi; Sakai, Kikuo; Ogata, Masahiro; Kawamoto, Hiroshi; Onishi, Yoshiaki, deceased; and Onishi, Junko, administratrix, 4,839,860, Cl. 365-104.000.
Sakai, Masaaki; Ishihara, Sadao; and Shimoyama, Touma, to Minolta Camera Kabushiki Kaisha. Paper guide of printer for word-processor. 4,838,720, Cl. 400-642.000.
Sakai, Masanori, to Johnan Seisakusho Co., Ltd. Apparatus for driving a curtain. 4,839,544, Cl. 310-12.000.
Sakai, Mitsuru: *See—*
Nakagawa, Katsuji; Itoh, Masaki; Morimoto, Akio; and Sakai, Mitsuru, 4,839,208, Cl. 428-64.000.
Sakai, Takashi: *See—*
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Sakai, Yasuhito; and Iijima, Yoichi, to Fuji Jukogyo Kabushiki Kaisha. Control valve for a continuously variable transmission. 4,838,836, Cl. 474-28.000.
Sakaki, Hiroyuki: *See—*
Kano, Hiroyuki; Yagi, Yuji; and Sakaki, Hiroyuki, 4,839,708, Cl. 357-26.000.
Sakakibara, Shiro; Miyaishi, Yoshinori; and Furuya, Takashi, to Aisin-Warner Kabushiki Kaisha. Endless transmission belt. 4,838,844, Cl. 474-240.000.
Sakami, Hiroshi: *See—*
Kawase, Kaoru; Sakami, Hiroshi; and Iida, Shozo, 4,839,318, Cl. 502-62.000.
Sakami, Yasuo; Okina, Shigetaka; Tsubouchi, Junichi; Izaki, Shozo; Fukushima, Toshitaka; Watanabe, Hiroyuki; and Ishizaki, Masao, to Seiko Instruments & Electronics Ltd. Data collection system having stationary unit with electromagnetic induction circuitry for bidirectionally relaying data. 4,839,854, Cl. 364-900.000.
Sakamoto, Eiichi: *See—*
Miyoshi, Masanobu; Kajiwara, Makoto; Onodera, Kaoru; and Sakamoto, Eiichi, 4,839,263, Cl. 430-384.000.
Sakamoto, Haruo: *See—*
Takai, Nobuei; Sakamoto, Haruo; Uekido, Kouzou; and Nishiyama, Michiaki, 4,838,814, Cl. 439-620.000.
Sakamoto, Michito: *See—*
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Sakamoto, Naruo: *See—*
Kitera, Takuya; Urushibata, Shoichi; Sato, Masatoshi; Nagashima, Tadashi; Hamada, Shoichi; Shirasu, Isao; Nakura, Yasumi; Sakamoto, Michito; Ishide, Takashi; Sakamoto, Naruo; Meka, Masahiko; and Tomeoka, Masaru, 4,839,495, Cl. 219-121.630.
Sakata, Katsuyuki: *See—*
Koga, Shinichiro; Matsuno, Akira; Sakata, Katsuyuki; Ohtani, Yoshiaki; and Akihara, Isao, 4,839,458, Cl. 528-196.000.
Saken Co., Ltd.: *See—*
Higa, Teruo, 4,839,051, Cl. 210-602.000.
Sakoda, Ryozo: *See—*
Seto, Kiyotomo; Tanaka, Sakuya; and Sakoda, Ryozo, 4,839,361, Cl. 514-252.000.
Sakuragi, Takeo: *See—*
Saito, Kiyoshi; Yamamoto, Yoshiro; and Sakuragi, Takeo, 4,838,383, Cl. 186-59.000.
Sakurai, Keita: *See—*
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Sakurai, Noriyuki: *See—*
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Salomon S. A.: *See—*
Dufour, Pierre, 4,837,949, Cl. 36-127.000.
Salomon S.A.: *See—*
Diard, Jean-Luc; and Pascal, Roger, 4,838,572, Cl. 280-609.000.
Salplex Limited: *See—*
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Salter, James A.; Schmidt, Thomas R.; DeWitz, Thomas S.; Arbore, Charles M.; Duysings, Frederick M. H. J.; Van Der Meer, Johannes W.; Brown, David; and Venselaar, Henricus C. J., to Shell Oil Company. Pressure compensated weigh system. 4,838,738, Cl. 406-14.000.
Saltiel, Alan R., to Rockefeller University, The. Insulin activity messengers. 4,839,466, Cl. 530-395.000.
Salvaire, Andre : *See—*
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Sanders, Bruce C., to Sanders Brine Shrimp Company. Method of harvesting and harvesting device for brine shrimp eggs. 4,839,062, Cl. 210-776.000.
Sanders, Carl H.: *See—*
Beliles, Homer J.; Cantrell, M. Dale; and Sanders, Carl H., 4,838,754, Cl. 414-607.000.
Sanders, Edgar S., Jr.; Clark, Daniel O.; and Jensvold, John A., to Dow Chemical Company, The. Semi-permeable membranes with an internal discriminating region. 4,838,904, Cl. 55-158.000.
Sandoz Ltd.: *See—*
Bitterli, Peter; Geisel, Manfred; Goldmann, Jurgen; and Kaul, Bansi L., 4,838,943, Cl. 106-400.000.
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Sandrock, Gary D.; and Woodward, Winfred L., III, to Ergenics, Inc. Method of manufacturing tough and porous getters by means of hydrogen pulverization and getters produced thereby. 4,839,085, Cl. 252-181.600.
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Saneski, Steven P., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Clock skew correction arrangement. 4,839,907, Cl. 375-113.000.
Sankar, Nott G.; Pileeki, Victor T.; and Zahaykevich, George A., to Digital Equipment Corporation; and Advanced Laser Systems, Inc. Drilling apparatus and method. 4,839,497, Cl. 219-121.710.

Sano, Shigeru; and Yashima, Saburo, to Ichinoseki National College of Technology. Apparatus for separating spherical from non-spherical particles. 4,839,033, Cl. 209-4.000.
Santerelli, James E., to Owens-Illinois Closure Inc. Dispensing package for a viscous product. 4,838,461, Cl. 222-259.000.
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Sasaki, Seishi; Awamoto, Shigeru; Bannai, Tatsushi; Yokoyama, Katsuya; and Shibaya, Hiromichi, to Nippon Hoso Kyokai; and Matsushita Electric Industrial Co., Ltd. Video signal recording method and associated recording/reproducing apparatus. 4,839,744, Cl. 358-320.000.
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Sasaki, Yukio, to Nippon Tensaiseito Kabushiki Kaisha. Method of selecting live sugar beet seeds from a mixture of live and dead seeds. 4,837,970, Cl. 47-14.000.
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Sasaoka, Senzo; Inoue, Nobuaki; and Okutsu, Eiichi, to Fuji Photo Film Co., Ltd. Silver halide photographic material and method for forming an image using the same. 4,839,259, Cl. 430-264.000.
Sato, Hirokazu; Goto, Yasuhiro; Horiuchi, Kazufumi; Michibayashi, Yasuo; Nobutsugu, Hideo; and Kawamura, Takumi, to Ishida Scales Mfg. Co., Ltd. Manual combinatorial weighing apparatus. 4,838,368, Cl. 177-25.180.
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Sato, Katsuyuki; Kawamoto, Hiroshi; and Yanagisawa, Kazumasa, to Hitachi, Ltd. Selective application of voltages for testing storage cells in semiconductor memory arrangements. 4,839,865, Cl. 365-201.000.
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Sato, Kimiaki; and Khono, Tool, to Fujitsu Limited. Semiconductor memory device having sense amplifiers with delayed and stopped drive times. 4,839,868, Cl. 365-230.060.
Sato, Kozo: *See—*
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Sato, Yasufumi; Munakata, Megumi; and Noguchi, Hiromichi, to Canon Kabushiki Kaisha. Active energy beam-curable type resin composition. 4,839,399, Cl. 522-14.000.
Sato, Yasufumi; Munakata, Megumi; and Noguchi, Hiromichi, to Canon Kabushiki Kaisha. Active energy ray-curable resin composition. 4,839,400, Cl. 522-14.000.
Sato, Yasufumi; Munakata, Megumi; and Noguchi, Hiromichi, to Canon Kabushiki Kaisha. Liquid jet recording head. 4,839,668, Cl. 346-140.00R.
Sato, Yasufumi; Munakata, Megumi; and Noguchi, Hiromichi, to Canon Kabushiki Kaisha. Liquid jet recording head. 4,839,669, Cl. 346-140.00R.
Sato, Yasuhiko; Yamada, Koichiro; Nomura, Sumihiro; Ishida, Ryuichi; and Yamamura, Michio, to Tanabe Seiyaku Co., Ltd. Lactam derivatives. 4,839,360, Cl. 514-252.000.
Sato, Yasushi; Nagasaki, Shigeru; Taniguchi, Masato; Kagawa, Junichi; and Kawamura, Mitsuyoshi, to NGK Spark Plug Co., Ltd. Ceramic valve supporting structure in use for internal combustion engine. 4,838,218, Cl. 123-188.0AA.
Sato, Yoshihiko: *See—*
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Sawada, Kaname; Suzuki, Kazuo; Hasunuma, Shinji, Katayama, Eizo; Ohno, Motoyasu; Kanazawa, Tsukasa; and Ueki, Keiji, to Matsushita Graphic Communication Systems, Inc. Method for recording data on non-defective sectors of an optical disk. 4,839,879, Cl. 369-54.000.
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Schurter, Rolf; and Diel, Peter J., to Ciba-Geigy Corporation. 3-fuoropyridyl-2-oxy-phenoxy derivatives having herbicidal activity. 4,838,930, Cl. 71-94.000.
Schwaben, Hans-Dieter; Echte, Adolf; Bueschl, Rainer; Schlichtmann, Rainer; Klaerner, Peter; and Kindler, Hubert, to BASF Aktiengesellschaft. Thermoplastic molding materials and their preparation. 4,839,418, Cl. 525-53.000.
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Seagate Technology, Inc.: *See—*
Gatzen, Hans-Heinrich O. P., 4,839,761, Cl. 360-103.000.
Searl, Stephen, to General Electric Company. Ice piece ejection mechanism for icemaker. 4,838,026, Cl. 62-137.000.
Seaton, James C.: *See—*
Forrest, Ian S.; Seaton, James C.; and Moir, Michael, 4,839,189, Cl. 426-600.000.
SEB S.A.: *See—*
Hennuy, Jean; and Louison, Bernard, 4,837,952, Cl. 38-77.700.
Sebrosky, Robert A.: *See—*
Bulson, Laura G.; Misenheimer, Laura P.; and Sebrosky, Robert A., 4,839,621, Cl. 335-277.000.
Segnini, Robert: *See—*
DiMatteo, Paul; and Segnini, Robert, 4,837,872, Cl. 5-60.000.
Segwill Corp.: *See—*
Williams, John P.; Huang, Chin-Jung; and Shyu, Wen-Chyi, 4,838,052, Cl. 70-63.000.
Seiko Epson Corporation: *See—*
Miura, Teiji; Yamazaki, Hideo; Abe, Nobumasa; Okamura, Toshihide; Morozumi, Hideki; and Matsuo, Tatsuki, 4,838,657, Cl. 350-336.000.
Yamada, Noboru; Abe, Tomohiko; and Miyazawa, Osamu, 4,839,760, Cl. 360-97.010.
Seiko Instruments & Electronics Ltd.: *See—*
Kawahara, Yukito; Mukainakano, Hiroshi; and Machida, Satoshi, 4,839,300, Cl. 437-002.000.
Sakami, Yasuo; Okina, Shigetaka; Tsubouchi, Junichi; Izaki, Shozo; Fukushima, Toshitaka; Watanabe, Hiroyuki; and Ishizaki, Masao, 4,839,854, Cl. 364-900.000.
Seiko Instruments Inc.: *See—*
Aoki, Kenji; and Shimbo, Masafumi, 4,838,993, Cl. 156-643.000.
Namisato, Tooru, 4,839,874, Cl. 368-76.000.
Seiko Seiki Kabushiki Kaisha: *See—*
Mizuno, Takeshi; and Higuchi, Toshiro, 4,839,550, Cl. 310-90.500.
Seki, Hiroshi: *See—*
Terasoka, Yasuhiro; Ueda, Tetsuya; Yagoura, Hideya; Shimamoto, Haruo; Nango, Shigeyuki; Banjo, Toshinobu; and Seki, Hiroshi, 4,839,713, Cl. 357-70.000.
Seki, Hitoshi: *See—*
Okabe, Kazuya; Kasama, Yasuhiko; Seki, Hitoshi; and Iwasaki, Chisato, 4,839,510, Cl. 250-211.00J.
Seki, Kuniaki: *See—*
Nishiyama, Sinichi; Abe, Hajime; Seki, Kuniaki; and Hagiwara, Noboru, 4,838,063, Cl. 72-47.000.
Sekida, Minoru: *See—*
Taniguchi, Nobuyuki; Nakai, Masaaki; Omaki, Takanobu; Hosomizu, Hiroshi; Niwa, Masatake; Inoue, Toru; and Sekida, Minoru, 4,839,687, Cl. 354-416.000.
Sekiguchi, Tomoyoshi: *See—*
Konishi, Junkichi; Tsukada, Kenichi; Sekiguchi, Tomoyoshi; Kouda, Masanori; and Suzuki, Minoru, 4,838,563, Cl. 280-840.000.
Sekine, Makoto; Okano, Haruo; Arikado, Tsunetoshi; and Horiike, Yasuhiro, to Kabushiki Kaisha Toshiba. Dry etching apparatus. 4,838,978, Cl. 156-345.000.
Sekmakas, Kazys, to DeSoto, Inc. Cross-linked emulsion copolymers in thermosetting aqueous coatings. 4,839,403, Cl. 523-412.000.
Semerau, Jon M.; and Sonnek, Christopher D., to NCR Corporation. Data bit synchronizer. 4,839,890, Cl. 370-84.000.
Senba, Ayumi, to Hario Kabushiki Kaisha. Gruel cooker for microwave ranges. 4,839,484, Cl. 219-10.55E.
Seneau, Bernard, to General Foods Corporation. Method for producing a pre-proofed, frozen and unbaked dough having an improved shelf life. 4,839,178, Cl. 426-19.000.
Sensor Technologies, Inc.: *See—*
Fiori, David, Jr., 4,838,139, Cl. 84-1.100.
Sensui, Hideyuki: *See—*
Abe, Toshiyuki; Kikkawa, Katsumasa; Gonda, Michihiro; Sensui, Hideyuki; and Kanasugi, Mikiko, 4,839,334, Cl. 503-221.000.
Serio, Andre L.: *See—*
Ducos, Maurice P.; and Serio, Andre L., 4,839,239, Cl. 428-623.000.
Sethi, Amar J.: *See—*
Yong, Raymond N.; and Sethi, Amar J., 4,839,060, Cl. 210-731.000.
Seto, Kiyotomo; Tanaka, Sakuya; and Sakoda, Ryozo, to Nissan Chemical Industries Ltd. Dihydropyridine-5-phosphonic acid cyclic propylene ester. 4,839,361, Cl. 514-252.000.
Seto, Kunio: *See—*
Yamada, Minoru; Toyoda, Takashi; and Seto, Kunio, 4,839,273, Cl. 430-634.000.
Sevington, David. Skis. 4,838,571, Cl. 280-608.000.
Sewer Rodding Equipment Co.: *See—*
Prange, Charles J., 4,838,302, Cl. 137-355.120.
Sezaki, Masaji: *See—*
Koyama, Masao; Iwata, Michiaki; Kurihara, Kunihiko; and Sezaki, Masaji, 4,839,378, Cl. 514-417.000.
SGS Microelettronica S.p.A.: *See—*
Daniele, Vincenzo; and Benedetti, Mirella, 4,839,768, Cl. 361-56.000.
Shabo, Alan L. Applicator and package therefor. 4,838,851, Cl. 604-1.000.
Shah, Gautam P., to W. R. Grace & Co. Oxygen barrier film. 4,839,235, Cl. 128-516.000.
Shalaby, Shalaby W.: *See—*
Jamiolkowski, Dennis D.; Shalahy, Shalaby W.; Bezwada, Rao S.; and Newman, Hugh D., Jr., 4,838,267, Cl. 128-335.500.
Shamie, Louis: *See—*
Shamie, Sam; and Shamie, Louis, 4,837,875, Cl. 5-99.00C.
Shamie, Sam; and Shamie, Louis. Folding playpen with attached fabric enclosure. 4,837,875, Cl. 5-99.00C.
Shapovalov, Jury P.: *See—*
Shishkin, Viktor V.; Kryazhevskikh, Nikolai F.; and Shapovalov, Jury P., 4,839,047, Cl. 210-356.000.
Sharma, Jagdish P.: *See—*
Brar, Amarjit S.; Mims, Jimmie E.; and Sharma, Jagdish P., 4,837,923, Cl. 29-603.000.
Sharp, David E. Blood preservation by ultrahemodilution. 4,838,861, Cl. 604-6.000.
Sharp Kabushiki Kaisha: *See—*
Matsuda, Hideo; and Hiraoka, Shinitiro, 4,838,537, Cl. 271-277.000.
Ohta, Kenji; Takahashi, Akira; Inui, Tetsuya; Hirokane, Junji; and Katayama, Hiroyuki, 4,839,251, Cl. 430-5.000.
Shirakoshi, Hiroshi; Kotani, Matahira; Matsumoto, Masafumi; and Morimoto, Hiroshi, 4,839,730, Cl. 358-294.000.
Tanigawa, Masanobu, 4,839,486, Cl. 219-10.55R.
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, 4,839,900, Cl. 372-46.000.
Sharp, Kent: *See—*
Lagerwall, Sven T.; Andersson, Gunnar; Dahl, Ingolf; Kuczynski, Wojciech; Sharp, Kent; and Stebler, Bengt, 4,838,663, Cl. 350-350.00S.
Shaw, Jack R. Channel means for use in conjunction with building footing. 4,837,991, Cl. 52-98.000.
Shaya, Mousa N.: *See—*
Wang, Jyh-Yun; and Shaya, Mousa N., 4,838,278, Cl. 128-697.000.
Sheesley, Wilmer L.: *See—*
Peuza, William V.; and Sheesley, Wilmer L., 4,838,813, Cl. 439-620.000.
Shelanski, Morris V. Method of using a dermatome. 4,838,284, Cl. 128-898.000.
Sheliga, Theodore A.: *See—*
Massey, Eddie H.; and Sheliga, Theodore A., 4,839,341, Cl. 514-4.000.
Shell Internationale Research Maatschappij B.V.: *See—*
Coombs, Mandy E., 4,839,356, Cl. 514-227.200.
Shell Oil Company: *See—*
Broekhuis, Antonius A., 4,839,431, Cl. 525-298.000.
Corcoran, Chris T., 4,839,869, Cl. 367-53.000.
Gergen, William P.; and Lutz, Robert G., 4,839,435, Cl. 525-391.000.
Gergen, William P.; and Lutz, Robert G., 4,839,437, Cl. 525-426.000.
Kemp, Richard A., 4,839,028, Cl. 208-216.0PP.
Mifflin, Thomas R.; and Dewitz, Thomas S., 4,838,898, Cl. 48-210.000.
Salter, James A.; Schmidt, Thomas R.; DeWitz, Thomas S.; Arbore, Charles M.; Duysings, Frederick M. H. J.; Van Der Meer, Johannes W.; Brown, David; and Venselaar, Henricus C. J., 4,838,738, Cl. 406-14.000.
Watts, Andrew J., 4,838,323, Cl. 141-1.000.
Shen, Richard. Heavy-duty panic proof lock unit. 4,838,053, Cl. 70-92.000.
Shepherd, Lloyd: *See—*
Dentini, Mark S.; Fulton, Joe A.; Jin, Sungho; Mottine, John J., Jr.; Shepherd, Lloyd; and Sherwood, Richard C., 4,838,347, Cl. 165-185.000.
Sheppard, Alan R. Methods and apparatus for preventing or retarding fruit and vegetable freezing. 4,838,761, Cl. 416-170.00R.
Sheridan, Michael; and Jaffe, Kenneth, to Ethylene Corp. Sight glass construction. 4,838,095, Cl. 73-864.630.
Sherk, Fred T.: *See—*
Hoover, Kenneth C.; Sherk, Fred T.; and Figard, Joseph E., 4,839,411, Cl. 524-424.000.
Sherlock, Paul, to Sherwood Medical Company. Blood collection device. 4,838,872, Cl. 604-319.000.
Sherwood Medical Co.: *See—*
Haber, Terry M.; Maze, Jack E.; and Crouse, Roger R., 4,838,870, Cl. 604-187.000.
Sherlock, Paul, 4,838,872, Cl. 604-319.000.
Sherwood, Richard C.: *See—*
Dentini, Mark S.; Fulton, Joe A.; Jin, Sungho; Mottine, John J., Jr.; Shepherd, Lloyd; and Sherwood, Richard C., 4,838,347, Cl. 165-185.000.

Sheth, Ketankumar K., to Baker Hughes Incorporated. Reduced diameter downthrust pad for a centrifugal pump. 4,838,758, Cl. 415-140.000.
Shiba, Hiroshi; and Eguchi, Shoji, to NEC Corporation. Static random access memory having Bi-CMOS construction. 4,839,862, Cl. 365-154.000.
Shiba, Keisuke: *See*—
Nakamura, Shigeru; Minoda, Minoru; and Shiba, Keisuke, 4,839,257, Cl. 430-207.000.
Shibata, Atsushi: *See*—
Taya, Shunroku; Abe, Katsunobu; and Shibata, Atsushi, 4,839,523, Cl. 250-492.200.
Shibata, Manabu: *See*—
Kanda, Shigeru; Shibata, Manabu; Ono, Masayoshi; and Okano, Michikazu, 4,838,939, Cl. 106-281.100.
Shibata, Yoshio: *See*—
Ito, Haruhiko; Shibata, Yoshio; Banzai, Masato; and Yatomi, Takeshi, 4,839,487, Cl. 219-69.120.
Shibaya, Hiromichi: *See*—
Sasaki, Seishi; Awamoto, Shigeru; Bannai, Tatsushi; Yokoyama, Katsuya; and Shibaya, Hiromichi, 4,839,744, Cl. 358-320.000.
Shields, Steven E., to Hughes Aircraft Company. LCMOS displays fabricated with implant treated silicon wafers. 4,839,707, Cl. 357-23.700.
Shifflet, Glenn; Johnson, Herbert C.; and Revenaugh, Paul W., to Dana Corporation. Apparatus and method for monitoring the operation of a vehicle drive shaft. 4,838,077, Cl. 73-118.100.
Shiga, Yoshio: *See*—
Yamashita, Hiroyuki; Odate, Makoto; Iizuka, Hajime; Kawazura, Hiroshi; Shiga, Yoshio; and Namekawa, Hiroshi, 4,839,376, Cl. 514-406.000.
Shigei, Masahiro; Suto, Shugo; and Tatsukami, Masahiro, to Oki Electric Industry Co., Ltd. Manual head loading mechanism for flexible disk drive. 4,839,757, Cl. 360-99.050.
Shigetomi, Kazuo: *See*—
Takahara, Ichiro; Azumi, Masaaki; Shigetomi, Kazuo; Kamimura, Takaya; and Ishida, Hideki, 4,839,881, Cl. 369-75.200.
Shih, David H.: *See*—
Barash, Louis; Christensen, Burton G.; Hannah, John; Leanza, William J.; and Shih, David H., 4,839,352, Cl. 514-210.000.
Shikoku Kakoki Co., Ltd.: *See*—
Kume, Tadaaki; Saijo, Yoshihiro; and Fujikawa, Yasuji, 4,838,847, Cl. 493-133.000.
Shiley Infusaid Inc.: *See*—
Idriss, Samir F., 4,838,887, Cl. 604-891.100.
Shim-A-Line, Inc.: *See*—
Specktor, John; and Specktor, Gerald A., 4,838,573, Cl. 280-661.000.
Shinai, Hideo, to Yoshida Kogyo K. K. Detecting apparatus for detecting reinforcing strip on slide fastener chain. 4,838,097, Cl. 73-865.900.
Shimamoto, Haruo: *See*—
Teraoka, Yasuhiro; Ueda, Tetsuya; Yagoura, Hideya; Shimamoto, Haruo; Nango, Shigeyuki; Banjo, Toshinobu; and Seki, Hiroshi, 4,839,713, Cl. 357-70.000.
Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,838,115, Cl. 74-594.400.
Nagano, Masashi, 4,838,401, Cl. 192-64.000.
Shimbo, Masafumi: *See*—
Aoki, Kenji; and Shimbo, Masafumi, 4,838,993, Cl. 156-643.000.
Shimizu Construction Co., Ltd.: *See*—
Suzuki, Yoshinobu; and Manabe, Mitsufusa, 4,838,150, Cl. 98-31.500.
Shimizu, Etsuo; Kotera, Noboru; Onogi, Shinichi; and Hitomi, Teiichi, to Kasei Optonix, Ltd. Radiographic intensifying screen. 4,839,243, Cl. 428-690.000.
Shimizu, Isamu; and Yamaguchi, Minori, to Kanegafuchi Chemical Industry Co., Ltd. Multilayer photoconductive material. 4,839,240, Cl. 428-635.000.
Shimizu, Kazuo, to Mimasu Oil Chemical Co., Ltd. Substance for converting waste cooking oil into liquid soap. 4,839,089, Cl. 252-183.110.
Shimizu, Ken'ichi: *See*—
Ohuchi, Kiyoyuki; and Shimizu, Ken'ichi, 4,838,329, Cl. 152-210.000.
Shimizu, Yukio: *See*—
Yoshino, Syuji; Makino, Satoshi; Fujita, Mitsuo; and Shimizu, Yukio, 4,839,204, Cl. 428-358.000.
Shimmyo, Takashi: *See*—
Murakami, Syogo; and Shimmyo, Takashi, 4,839,732, Cl. 358-304.000.
Shimomura, Takeshi: *See*—
Yamaguchi, Shuichiro; Daikuhara, Norio; and Shimomura, Takeshi, 4,839,020, Cl. 204-431.000.
Shimoyama, Touma: *See*—
Sakai, Masaaki; Ishihara, Sadao; and Shimoyama, Touma, 4,838,720, Cl. 400-642.000.
Shimozono, Hiroaki: *See*—
Uchida, Norio; Ishibashi, Yoriyuki; Hirano, Ryoichi; Masuyama, Masayuki; and Shimozono, Hiroaki, 4,838,693, Cl. 356-356.000.
Shimura, Zenji: *See*—
Asaumi, Hiroshi; Shimura, Zenji; Yoshioka, Takehiro; Tadakuma, Kenji; Suzuki, Shinzaburo; Takada, Norio; Nakamura, Kenichi; and Hirai, Takene, 4,839,221, Cl. 428-213.000.
Shin-Chin, Shao, to Holmes Products Corp. Combination window and floor fan. 4,838,151, Cl. 98-94.100.
Shin-Etsu Chemical Co., Ltd.: *See*—
Kitamura, Hajime; and Iida, Tamaki, 4,839,195, Cl. 427-38.000.
Shin-Etsu Handotai Co., Ltd.: *See*—
Yamaguchi, Hisayoshi; Yanagisawa, Tamotsu; and Kobayashi, Minoru, 4,838,946, Cl. 134-7.000.
Shinada, Mikio, to Mitsubishi Denki Kabushiki Kaisha. Ribbon cartridge for a printer. 4,838,716, Cl. 400-208.000.
Shinada, Shinichi: *See*—
Mikoshiba, Shigeo; Shinada, Shinichi; and Matsumoto, Takahiro, 4,839,637, Cl. 340-775.000.
Shinano Tokki Corporation: *See*—
Kitahara, Haruo, 4,839,546, Cl. 310-51.000.
Shindengen Electric Manufacturing Co., Ltd: *See*—
Murata, Tadaichi; Isomura, Tsuneo; Fujimori, Kenichi; Tsuruta, Fuminori; Dohi, Kazuhito; Horigome, Masahiro; Nakayama, Yoshitarou; and Oomori, Sachio, 4,839,252, Cl. 430-59.000.
Shinoda, Masaki: *See*—
Sibasaki, Masakatsu; Sodeoka, Mikiko; Iseki, Katsuhiko; Shinoda, Masaki; Aoki, Chiyoko; Hayasi, Yosio; and Kanayama, Toshiji, 4,839,388, Cl. 514-530.000.
Shinoda, Takashi; Sakai, Kikuo; Ogata, Masahiro; Kawamoto, Hiroshi; Onishi, Yoshiaki, deceased; and by Onishi, Junko, administratrix, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering Ltd. Semiconductor device having head only memory with differential amplifier. 4,839,860, Cl. 365-104.000.
Shinogi & Co., Ltd.: *See*—
Hirai, Kentaro; Mizushima, Yukio; and Doteuchi, Masami, 4,839,365, Cl. 514-301.000.
Shinohara, Junji: *See*—
Nomura, Hironori; Taiji, Shimakawa; Shinohara, Junji; Kobayashi, Shigetoyo; and Yamamoto, Hiroki, 4,838,969, Cl. 156-160.000.
Shiohara, Yukimitsu: *See*—
Abe, Masaki; Shiohara, Yukimitsu; Adaniya, Takeshi; and Naemura, Hiroshi, 4,839,241, Cl. 428-659.000.
Shiojiri Kogyo Kabushiki Kaisha: *See*—
Ozawa, Masaki; Hosaka, Toshiyuki; and Yoshizawa, Masayuki, 4,838,707, Cl. 374-171.000.
Shiraishi, Akihiko, to Canon Kabushiki Kaisha. Wide angle zoom lens of long back focal distance. 4,838,666, Cl. 350-427.000.
Shirakoshi, Hiroshi; Kotani, Matahira; Matsumoto, Masafumi; and Morimoto, Hiroshi, to Sharp Kabushiki Kaisha. Image reading apparatus. 4,839,730, Cl. 358-294.000.
Shirasu, Isao: *See*—
Kitera, Takuya; Urushibata, Shoichi; Sato, Masatoshi; Nagashima, Tadashi; Hamada, Shoichi; Shirasu, Isao; Nakura, Yasumi; Sakamoto, Michito; Ishide, Takashi; Sakamoto, Naruo; Meka, Masahiko; and Tomeoka, Masaru, 4,839,495, Cl. 219-121.630.
Shishkin, Viktor V.; Kryazhevskikh, Nikolai F.; and Shapovalov, Jury P. Intermittent-action apparatus for filtering liquid. 4,839,047, Cl. 210-356.000.
Shoemaker, Larry N. Minimum tillage implement. 4,838,360, Cl. 172-176.000.
Shoji, Hisashi; Haneda, Satoshi; and Hiratsuka, Seiichiro, to Konishiroku Photo Industry Co., Ltd. Apparatus for reproducing multicolor image. 4,839,692, Cl. 355-211.000.
Shop-Vac Corporation: *See*—
Berfield, Robert C., 4,838,838, Cl. 474-113.000.
Short, Noel E.: *See*—
Leonard, Rex D.; and Short, Noel E., 4,838,034, Cl. 62-50.200.
Short, William T.: *See*—
Mentzer, Charles C.; Cox, Howard W.; and Short, William T., 4,838,973, Cl. 156-212.000.
Shrock, Paul: *See*—
Baker, Richard; Helm, Verne; and Shrock, Paul, 4,838,862, Cl. 604-892.100.
Shultz, Julius, to Dax Manufacturers Inc. Transparent picture frame construction. 4,837,954, Cl. 40-152.000.
Shutske, Gregory M.; and Pierrat, Frank A., to Hoechst-Roussel Pharmaceuticals, Inc. 9-Amino-3,4-dihydroacridines and related compounds useful for enhancing memory. 4,839,364, Cl. 514-290.000.
Shyu, Chin-Miin: *See*—
Mohammadi, Farrokh; and Shyu, Chin-Miin, 4,839,704, Cl. 357-23.300.
Shyu, Wen-Chyi: *See*—
Williams, John P.; Huang, Chin-Jung; and Shyu, Wen-Chyi, 4,838,052, Cl. 70-63.000.
Sibasaki, Hitosi: *See*—
Amada, Mitsumasa; Sibasaki, Hitosi; and Nagasaka, Masami, 4,839,680, Cl. 354-233.000.
Sibasaki, Masakatsu; Sodeoka, Mikiko; Iseki, Katsuhiko; Shinoda, Masaki; Aoki, Chiyoko; Hayasi, Yosio; and Kanayama, Toshiji, to Mitsubishi Chemical Industries Limited; and Sagami Chemical Research Center. Prostacyclins and pharmaceuticals containing the same. 4,839,388, Cl. 514-530.000.
Sidney, Barry D.: *See*—
Hess, Robert V.; Upchurch, Billy T.; Brown, Kenneth G.; Miller, Irvin M.; Schryer, David R.; Sidney, Barry D.; Wood, George M.; and Hoyt, Ronald F., 4,839,330, Cl. 502-53.000.
Siegel, Carole E.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,839,354, Cl. 514-226.500.
Siegenia-Frank KG: *See*—
Roth, Ernst, 4,837,998, Cl. 52-288.000.
Schmidt, Karl H., 4,838,111, Cl. 74-526.000.
Siemens Aktiengesellschaft: *See*—
Amey, Walter; and Schneeberger, Reinhold, 4,839,830, Cl. 364-551.010.

Awakowicz, Erwin; Schiller, Kurt; and Grassl, Erwin, 4,839,921, Cl. 379-428.000.
Clasen, Peter-Michael, 4,839,534, Cl. 307-269.000.
Grasser, Franz, 4,838,248, Cl. 128-24.00A.
Gulde, Peter; and Scholz, Christian, 4,838,994, Cl. 156-643.000.
Heinle, Georg, 4,839,589, Cl. 324-166.000.
Held-Elbert, Gabriele; Kaiser, Wolfgang; Koch, Wilhelm; and Schmutzler, Werner, 4,839,920, Cl. 379-377.000.
Holzapfel, Heinz P.; and Michel, Peter, 4,839,710, Cl. 357-45.000.
Knauer, Karl, 4,839,849, Cl. 364-784.000.
Koenig, Wilhelm; Lang, Thomas; and Trumpp, Gerhard, 4,839,643, Cl. 340-825.910.
Noll, Tobias; and Ulbrich, Walter, 4,839,850, Cl. 364-787.000.
Oestreich, Ulrich, 4,838,635, Cl. 350-96.230.
Pichler, Klaus, 4,839,472, Cl. 174-92.000.
Poehnitzsch, Guenter, 4,839,867, Cl. 365-222.000.
Riermeier, Manfred; and Schuber, Viktor, 4,838,951, Cl. 136-251.000.
Schink, Helmut, 4,839,607, Cl. 330-5.500.
Siemers, Paul A., to General Electric Company. Method of fabricating titanium alloys in foil form. 4,838,337, Cl. 164-46.000.
Sievers, Axel: *See*—
Jung, Werner; and Sievers, Axel, 4,839,448, Cl. 526-262.000.
Sigma Enterprises, Incorporated: *See*—
Hagiwara, Takashi, 4,838,552, Cl. 273-138.00A.
Signore, James R. D., II, to NCR Corporation. Digital printhead energy control system. 4,838,157, Cl. 101-93.030.
Sikkema, Sape: *See*—
Louet Feisser, Arnold; Koorn, Maarten; and Sikkema, Sape, 4,838,013, Cl. 56-13.600.
Sikora, Thomas R., to Tomar Electronics, Inc. Weatherproof lighting fixture with hermetically sealed base plate. 4,839,782, Cl. 362-363.000.
Silvano, Casalatina: *See*—
DeSchutter, Andre ; and Silvano, Casalatina, 4,838,322, Cl. 140-112.000.
Silverman, Herbert P.: *See*—
Moore, Clifford G.; Silverman, Herbert P.; and Bredow, James R., 4,839,580, Cl. 324-65.00R.
Silvey, Frank C., to Mobil Oil Corp. Liquid distribution device and pan. 4,839,108, Cl. 261-97.000.
Simen, Rolf: *See*—
Maier, Peter; and Simen, Rolf, 4,837,935, Cl. 30-392.000.
Simes-Senco, S.A.: *See*—
Lucas Huerta, Antonio, 4,838,726, Cl. 403-397.000.
Simmon, Todd R. Chair for use in swimming pools. 4,837,869, Cl. 4-496.000.
Simms, Graham J.; and Guppy, David J., to British Aerospace Public Limited Company. Ring laser gyroscopes. 4,839,903, Cl. 372-94.000.
Simon, Gehard; Hahnel, Peter; and Hoffmann, Erhard-Gunther, to Bayer Aktiengesellschaft. Sheet-shaped, corrosion resistant parts of apparatus. 4,839,209, Cl. 428-68.000.
Simon-Hartley: *See*—
Tharp, Charles E., 4,839,053, Cl. 210-616.000.
Simpson, Harold, to Ashland Products Company. Externally mounted latch for slidable sash window. 4,837,975, Cl. 49-175.000.
Sims, Roger D.: *See*—
Bakka, Charles M.; Sims, Roger D.; and Stevenson, James T., 4,838,744, Cl. 410-53.000.
Singh, Jasbir; and Morgan, Barry A., to Sterling Drug Inc. Di-(D-tryptophyl and/or tetrahydropyridoindolylcarbonyl)-containing peptide amides and process for preparation thereof. 4,839,465, Cl. 530-330.000.
Sintobrator, Ltd.: *See*—
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Stevenson, William H., IV; Stevenson, William H., III; and Bates, Aulby B., III. Marine sails with battens and furling systems therefor. 4,838,192, Cl. 114-105.000.
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Styer, Fred W.: *See—*
Cochrane, Douglas A., Jr.; and Styer, Fred W., 4,839,873, Cl. 367-133.000.
Subbaraman, Maria R.: *See—*
Dunn, Charlton; and Subbaraman, Maria R., 4,838,759, Cl. 415-143.000.
Sue, Hiroaki: *See—*
Hamasaki, Yoshito; Iwasaki, Akira; and Sue, Hiroaki, 4,838,576, Cl. 280-777.000.
Sue, Jiinjen A.; and Troue, Harden H., to Union Carbide Corporation. Zirconium nitride coated article and method for making same. 4,839,245, Cl. 428-698.000.
Suematu, Yoshiyuki: *See—*
Echigo, Yoshiaki; Sugawara, Kenichi; Yamao, Mutsunori; Suematu, Yoshiyuki; Asami, Keiichi; and Ohsawa, Tuneyuki, 4,839,445, Cl. 525-503.000.
Suemori, Tadao, to Mazda Motor Corporation. Automotive engine construction. 4,838,221, Cl. 123-195.00H.
Suetterlin, Norbert; Blitz, Hans-Dieter; and Trabitzsch, Hans, to Rohm GmbH. Method for making odorless aqueous solutions of water soluble polymers or copolymers. 4,839,417, Cl. 524-833.000.
Sugahara, Keishin; Imamura, Takayuki; Hamada, Fukusaburo; Ohtomo, Nobuya; Fujita, Haruo; and Yagami, Kazuhide, to Juridical Foundation The Chemo-Sero-Therapeutic Research Institute. Method for purification of HBc antigen and method for measurement of HBc antibody by using said purified HBc antigen. 4,839,277, Cl. 435-7.000.
Sugawara, Kenichi: *See—*
Echigo, Yoshiaki; Sugawara, Kenichi; Yamao, Mutsunori; Suematu, Yoshiyuki; Asami, Keiichi; and Ohsawa, Tuneyuki, 4,839,445, Cl. 525-503.000.
Sugihara, Eiichi; Amemiya, Hideo; and Hayafune, Koji, to Mitsui Toatsu Chemicals, Inc. Filter for CRT screen. 4,839,736, Cl. 358-253.000.
Sugimoto, Keisuke: *See—*
Takahama, Teizo; Masuda, Masahiko; Sugimoto, Keisuke; and Sugiyama, Yuji, 4,839,019, Cl. 204-425.000.
Sugimoto, Yasuhiro: *See—*
Hara, Hiroyuki; and Sugimoto, Yasuhiro, 4,839,609, Cl. 330-253.000.
Sugimura, Nobuyuki. Accumulator provided with an insert. 4,838,316, Cl. 138-30.000.
Sugino, Satoru, to Mitsubishi Kasei Vinyl Company. Composite polyester sheet and process for its production. 4,839,218, Cl. 428-212.000.
Sugita, Yutaka: *See—*
Takayama, Shinji; Kirino, Fumiyoshi; and Sugita, Yutaka, 4,838,962, Cl. 148-304.000.
Sugiura, Satoshi, to Kabushiki Kaisha Toshiba. Transmitting/receiving system for magnetic resonance imaging system. 4,839,596, Cl. 324-322.000.
Sugiyama, Yuji: *See—*
Takahama, Teizo; Masuda, Masahiko; Sugimoto, Keisuke; and Sugiyama, Yuji, 4,839,019, Cl. 204-425.000.
Sullivan, Daniel P.; Scherman, Terrel L.; and Drew, Elmer H., to General Motors Corporation. Method and apparatus of seat assembly. 4,837,905, Cl. 29-91.500.
Sullivan, Michael J., to Spalding & Evenflo Companies, Inc. Golf ball core by addition of dispersing agents. 4,838,556, Cl. 273-220.000.
Sulprizio, Lucelio. Ingot form. 4,839,236, Cl. 428-576.000.

Sumitomo Chemical Company, Limited: *See*—
Fukui, Yoshiharu; Kuroda, Kazuhisa; Ishii, Tamaki; and Sasaki, Manji, 4,839,408, Cl. 524-100.000.
Kakugo, Masahiro; and Ima, Seiichiro, 4,839,234, Cl. 428-349.000.
Nakatani, Mitsuhisa; and Nishio, Ken-ichi, 4,839,238, Cl. 428-614.000.

Sumitomo Electric Fiber Optics Corporation: *See*—
Buckland, Eric L.; and Nishimura, Masayuki, 4,838,690, Cl. 356-73.100.

Sumitomo Electric Industries, Ltd.: *See*—
Akechi, Kiyoaki, 4,838,936, Cl. 75-249.000.

Sumitomo Metal Industries, Ltd.: *See*—
Murayama, Junichiro; and Komizo, Yuichi, 4,839,242, Cl. 428-660.000.

Sumiya, Koji: *See*—
Ito, Wataru; Kubota, Tomoki; Sumiya, Koji; and Yokoyama, Shoji, 4,839,579, Cl. 324-63.000.

Sun, Alvin C. P.: *See*—
Theodoulou, Sotos M.; Thomson, Christopher W.; Vannerson, Eric; Baker, Wm. Keith; Sun, Alvin C. P.; and Hurley, Ken, 4,839,671, Cl. 346-159.000.

Suncom Co., Ltd.: *See*—
Ando, Shigeru, 4,839,824, Cl. 364-516.000.

Suncor, Inc.: *See*—
Yong, Raymond N.; and Sethi, Amar J., 4,839,060, Cl. 210-731.000.

Sunderman, Donald W.: *See*—
McMaster, Galen M.; and Sunderman, Donald W., 4,838,703, Cl. 366-169.000.

Sundstrand Corp: *See*—
Layer, John C., 4,838,403, Cl. 192-141.000.

Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., to Analgesic Associates. Cough/cold mixtures comprising non-steroidal anti-inflammatory drugs. 4,839,354, Cl. 514-226.500.

Survival Technology, Inc.: *See*—
Sarnoff, Stanley; and Sobel, Burton E., 4,839,170, Cl. 424-94.640.

Susumu Mitsuhashi: *See*—
Atsumi, Kunio; Sakagami, Kenji; Yamamoto, Yuichi; Yoshida, Takashi; Nishihata, Ken; Kondo, Shinichi; and Fukatsu, Shunzo, 4,839,350, Cl. 514-202.000.

Sutera, Richard: *See*—
Archer, Timothy H. V.; and Sutera, Richard, 4,839,664, Cl. 346-1.100.

Suto, Shugo: *See*—
Shigei, Masahiro; Suto, Shugo; and Tatsukami, Masahiro, 4,839,757, Cl. 360-99.050.

Sutter, James J.; and Roberts, Marvin. Toys. 4,838,554, Cl. 273-143.00R.

Suwa, Mituru, to Tsudakoma Kogyo Kabushiki Kaisha. Apparatus and method for starting a jet loom. 4,838,319, Cl. 139-116.00R.

Suya, Hajime. Articulator for mastering denture correcting technics. 4,838,788, Cl. 433-32.000.

Suyama, Hidenari: *See*—
Kaetsu, Isao; Kumakura, Minoru; Suyama, Hidenari; Kameda, Nobuo; and Koyama, Hideo, 4,839,107, Cl. 264-1.400.

Suzuki, Akira: *See*—
Kobayashi, Kouji; Miki, Nobuaki; and Suzuki, Akira, 4,838,313, Cl. 137-625.650.
Kobayashi, Kouji; Suzuki, Akira; and Miki, Nobuaki, 4,838,518, Cl. 251-129.160.
Miki, Nobuaki; Suzuki, Akira; and Kobayashi, Kouji, 4,838,517, Cl. 251-129.160.

Suzuki, Churyo; Ando, Kozo; and Enomoto, Tooru, to Aubex Corporation. Flexible pen nib for writing purposes. 4,838,723, Cl. 401-199.000.

Suzuki, Hiroshi: *See*—
Matsui, Hitoshi; and Suzuki, Hiroshi, 4,818,287, Cl. 134-1.000.

Suzuki, Junichiro; and Kinukawa, Tatsuji, to NGK Spark Plug Co., Ltd. Process for the production of ceramic materials having heat and wear resistance. 4,839,315, Cl. 501-87.000.

Suzuki, Kazuo: *See*—
Sawada, Kaname; Suzuki, Kazuo; Hasegawa, Shinji; Katayama, Eizo; Ohno, Motoyasu; Kanazawa, Tsukasa; and Ueki, Keiji, 4,839,879, Cl. 369-54.000.

Suzuki, Minoru: *See*—
Konishi, Junkichi; Tsukada, Kenichi; Sekiguchi, Tomoyoshi; Kouda, Masanori; and Suzuki, Minoru, 4,838,563, Cl. 280-840.000.

Suzuki, Nobuyoshi: *See*—
Moriya, Yasuo; Suzuki, Nobuyoshi, and Goto, Hiroshi, 4,839,423, Cl. 525-80.000.
Moriya, Yasuo; Suzuki, Nobuyoshi; and Goto, Hiroshi, 4,839,432, Cl. 525-303.000.

Suzuki, Shinichi: *See*—
Watanabe, Yasushi; Kawaguchi, Masahiro; Suzuki, Shinichi; and Nakai, Tatsuya, 4,838,740, Cl. 417-295.000.

Suzuki, Shinzaburo: *See*—
Asaumi, Hiroshi; Shimura, Zenji; Yoshida, Takehiro; Tadakuma, Kenji; Suzuki, Shinzaburo; Takada, Norio; Nakamura, Kenichi; and Hirai, Takene, 4,839,221, Cl. 428-283.000.

Suzuki, Toshihiro: *See*—
Yoshioka, Takeo; Minagawa, Tadao; Suzuki, Toshihiro; Yamasaki, Ichiro; and Matsushita, Yoshifumi, 4,839,767, Cl. 361-42.000.

Suzuki, Toshiyuki: *See*—
Komori, Takashi; Asahi, Masahiko; and Suzuki, Toshiyuki, 4,839,162, Cl. 424-63.000.

Suzuki, Yoshinobu; and Manabe, Mitsufusa, to Shimizu Construction Co., Ltd. Clean room. 4,838,150, Cl. 98-31.500.

Swahl, Debra A.: *See*—
Swahl, James C.; and Swahl, Debra A., 4,838,457, Cl. 222-48.000.

Swahl, James C.; and Swahl, Debra A. Lotion blending and dispensing unit. 4,838,457, Cl. 222-48.000.

Swanson, David L.; and Trick, Gilbert. Cooking apparatus. 4,839,502, Cl. 219-401.000.

Swarts, Donald E., to Du Pont de Nemours, E. I., and Company. Composition for polymerization with improved activator system. 4,839,324, Cl. 502-160.000.

Sweeney, Donald W.: *See*—
Ochoa, Ellen; Schils, George F.; and Sweeney, Donald W., 4,838,644, Cl. 350-162.130.

Sweet, David B.; and Hindel, James T., to BFGoodrich Company, The. Slip ring assembly and method of manufacture. 4,837,920, Cl. 29-597.000.

Sweetser, Robert W.: *See*—
Cote, William J.; Kenney, Donald M.; Kerbaugh, Michael L.; Leach, Michael A.; Robinson, Jeffrey A.; and Sweetser, Robert W., 4,838,991, Cl. 156-643.000.

Swenson, Harold W.; and Tuttle, Ken E., to Davidson Textron Inc. Method and apparatus for forming a composite foam shell and insert article. 4,839,117, Cl. 264-46.400.

Swiger, Roger T.: *See*—
Chung, Rack H.; Swiger, Roger T.; and Beers, Melvin D., 4,839,453, Cl. 528-18.000.

Syak, Charles W.: *See*—
Humble, Walter P.; Durkos, John C.; DiMargio, Nick A.; Cortell, Dominick J.; and Syak, Charles W., 4,838,523, Cl. 256-13.100.

Synthes: *See*—
Klaue, Kaj, 4,838,252, Cl. 128-92.0YP.

Sypniewski, James M., to Allied-Signal Inc. Traction system utilizing pump back based ABS system. 4,838,620, Cl. 303-116.000.

Syro Steel Company: *See*—
Humble, Walter P.; Durkos, John C.; DiMargio, Nick A.; Cortell, Dominick J.; and Syak, Charles W., 4,838,523, Cl. 256-13.100.

Szabo-Aczel, Stefan: *See*—
Winter, Susan C.; and Szabo-Aczel, Stefan, 4,839,159, Cl. 424-59.000.

Szkutak, Joan B.: *See*—
Willman, Kenneth W.; Brennock, June T.; O'Neill, David C.; and Szkutak, Joan B., 4,839,076, Cl. 252-90.000.

Szombathelyi, Zsolt: *See*—
Kreidl, Janos; Visky, Gyorgy; Czibula, Laszlo ; Stefko, Bela; Farkas nee Kirjak, Maria; Szombathelyi, Zsolt; Karpati, Egon; Kiss, Bela; Csomor, Katalin; Szporny, Laszlo ; Forgacs, Lilla; Kuthi, Csaba; and Gere, Aniko , 4,839,362, Cl. 514-283.000.

Szporny, Laszlo : *See*—
Kreidl, Janos; Visky, Gyorgy; Czibula, Laszlo ; Stefko, Bela; Farkas nee Kirjak, Maria; Szombathelyi, Zsolt; Karpati, Egon; Kiss, Bela; Csomor, Katalin; Szporny, Laszlo ; Forgacs, Lilla; Kuthi, Csaba; and Gere, Aniko , 4,839,362, Cl. 514-283.000.

T.Y. Lin International: *See*—
Yang, Y. C., 4,837,885, Cl. 14-21.000.

Ta Yu Electric Co., Ltd.: *See*—
Chuan, Chuang T.; and Cheng, Der C., 4,839,780, Cl. 362-265.000.

Tabata, Kanzo; Inoue, Hiroshi; Muramatsu, Tadao; and Narahara, Yasuji, to Ube Industries, Ltd. Aromatic polyimide film. 4,839,217, Cl. 428-156.000.

Tabe, Hideya: *See*—
Morimoto, Yoshitaka; and Tabe, Hideya, 4,838,641, Cl. 350-96.210.

Tachi, Katsuichi: *See*—
Kato, Tetsuro; and Tachi, Katsuichi, 4,839,750, Cl. 360-48.000.

Tachiuchi, Tsuguji; Konuma, Satoshi; and Tsuchiya, Nobuo, to Hitachi, Ltd.; and Hitachi Video Engineering, Inc. Image signal binary circuit with a variable-frequency clock signal generator for driving an image sensor. 4,839,739, Cl. 358-282.000.

Tack, Robert: *See*—
Rossi, Albert; Tack, Robert; Lewtas, Kenneth; and Alves, Jose, 4,839,074, Cl. 252-56.00D.

Tactilitics, Inc.: *See*—
Speck, Richard P., 4,839,512, Cl. 250-231.00P.

Tadakuma, Kenji: *See*—
Asaumi, Hiroshi; Shimura, Zenji; Yoshida, Takehiro; Tadakuma, Kenji; Suzuki, Shinzaburo; Takada, Norio; Nakamura, Kenichi; and Hirai, Takene, 4,839,221, Cl. 428-283.000.

Taga, Yutaka: *See*—
Hamano, Yukio; Tomomatsu, Hideo; Izumi, Fumiaki; and Taga, Yutaka, 4,838,125, Cl. 74-866.000.

Tagawa, Hajime; and Yukinaga, Koji, to Kabushiki Kaisha Toshiba. Image forming apparatus. 4,839,691, Cl. 355-260.000.

Tago, Mamoru: *See*—
Mine, Kazunori; Murakami, Keisuke; Tago, Mamoru; and Urata, Hiromasa, 4,839,514, Cl. 250-237.00R.

Taguchi, Nobuyoshi: *See*—
Imai, Akihiro; Matsuda, Hiromu; Yubakami, Keiichi; and Taguchi, Nobuyoshi, 4,839,337, Cl. 503-227.000.

Tai-Seng, Taw. Lock set proof against prize up. 4,838,061, Cl. 70-493.000.

Taiji, Shimakawa: *See*—
Nomura, Hironori; Taiji, Shimakawa; Shinohara, Junji; Kobayashi, Shigetoyo; and Yamamoto, Hiroki, 4,838,969, Cl. 156-160.000.

Tajima, Hatsuo: *See*—
Hosoi, Atsushi; and Tajima, Hatsuo, 4,838,200, Cl. 118-658.000.

Tajima, Kyousuke; Itoi, Goro; and Sorimachi, Mitsuo, to Hosiden Electronics Co., Ltd. Connector assembly. 4,838,815, Cl. 439-841.000.

Tajima, Masao, to Kabushiki Kaisha Toritsu Industry. Sanitary rubber composition or article. 4,839,429, Cl. 525-232.000.

Takaba, Yosuke, to Tamagawa Seiki Kabushiki Kaisha. Brushless DC motor. 4,839,552, Cl. 310-268.000.

Takabayashi, Yasuhiro, to Fuji Electric Co., Ltd. Generator system utilizing a fuel cell. 4,839,246, Cl. 429-12.000.

Takabayashi, Yasuhiro, to Fuji Electric Co., Ltd. Generator system utilizing a fuel cell. 4,839,574, Cl. 320-3.000.

Takada, Norio: *See*—
Asaumi, Hiroshi; Shimura, Zenji; Yoshida, Takehiro; Tadakuma, Kenji; Suzuki, Shinzaburo; Takada, Norio; Nakamura, Kenichi; and Hirai, Takene, 4,839,221, Cl. 428-283.000.

Takahama, Teizo; Masuda, Masahiko; Sugimoto, Keisuke; and Sugiyama, Yuji, to Fuji Electric Co., Ltd. Oxygen sensor. 4,839,019, Cl. 204-425.000.

Takahara, Ichiro; Azumi, Masaaki; Shigetomi, Kazuo; Kamimura, Takaya; and Ishida, Hideki, to Sanyo Electric Co., Ltd. Pickup transport device for optical disc apparatus. 4,839,881, Cl. 369-75.200.

Takahashi, Akira: *See*—
Ohta, Kenji; Takahashi, Akira; Inui, Tetsuya; Hirokane, Junji; and Katayama, Hiroyuki, 4,839,251, Cl. 430-5.000.

Takahashi, Hiroshi: *See*—
Ohkata, Ichizo; and Takahashi, Hiroshi, 4,838,842, Cl. 474-192.000.

Takahashi, Katsuya: *See*—
Takematsu, Tetsuo; Fukuoka, Daisuke; Takahashi, Katsuya; and Hashimoto, Isao, 4,838,924, Cl. 71-88.000.

Takahashi, Kiyotaka; and Arimoto, Kathuhiko, to Omron Tateisi Electronics Co. Device for accomodating cash enclosing envelopes. 4,838,480, Cl. 232-43.300.

Takahashi, Masami; Tatsukawa, Eiji; Torii, Shunichi; and Kojima, Keiji, to Hitachi, Ltd.; and Hitachi Computer Consultant, Ltd. Buffer control method for quickly determining whether a required data block is in the buffer. 4,839,799, Cl. 364-200.000.

Takahashi, Minoru: *See*—
Ishiguro, Minoru; and Takahashi, Minoru, 4,839,685, Cl. 354-403.000.

Takahashi, Takao: *See*—
Ishido, Takao; Sasaki, Shougo; and Takahashi, Takao, 4,838,321, Cl. 139-20.000.

Takahashi, Yoshitaka: *See*—
Ide, Jun; Iizumi, Tomoo; Takahashi, Yoshitaka; Yoshida, Hiroshi; Kaneko, Tooru; and Hishi, Yuichi, 4,839,753, Cl. 360-48.000.

Takai, Nobuei; Sakamoto, Haruo; Uekido, Kouzou; and Nishiyama, Michiaki, to Du Pont de Nemours, E. I., and Company. Connector apparatus for connecting a signal line with an external circuit. 4,838,814, Cl. 439-620.000.

Takami, Akihiro: *See*—
Noi, Keiichi; Takami, Akihiro; Ebine, Kazuhide; and Kumazawa, Kimiko, 4,839,097, Cl. 252-520.000.

Takamiya, Kikuzo; Mabuchi, Sadao; and Inoue, Kazuhiro, to Bridgestone Cycle Co., Ltd. Speed change device for bicycle. 4,838,122, Cl. 74-781.00B.

Takano, Hiroshi; and Hashimato, Yasuhiro, to Mitsuboshi Belting, Ltd. Variable speed pulley. 4,838,835, Cl. 474-13.000.

Takano, Mitsuyoshi; and Fukaya, Seiryo, to Anritsu Corporation. Signal analyzer apparatus with analog partial sweep function. 4,839,583, Cl. 324-77.00B.

Takano, Mitsuyoshi: *See*—
Fukaya, Seiryo; Takano, Mitsuyoshi; and Amamoto, Narushi, 4,839,582, Cl. 324-77.00B.

Takao, Mitsunori: *See*—
Matsuzawa, Toshio; Minagawa, Kazuji; Muramatsu, Akira; Abe, Tomoaki; Kiyono, Masashi; Kamio, Shigeru; Maeda, Katsuya; and Takao, Mitsunori, 4,838,226, Cl. 123-399.000.

Takasaka, Masahiro: *See*—
Hunahata, Katuyuki; Nagae, Yoshiharu; Takasaka, Masahiro; Mori, Yuji; Hoshino, Minoru; Kozima, Yasuyuki; Saito, Youhei; Fukuda, Kyohei; Kozai, Hayao; Hasimoto, Tadahiko; and Tsuchihashi, Yoshiaki, 4,838,655, Cl. 350-335.000.

Takata, Akira; and Obata, Takeo, to Ricoh Company, Ltd. Partially enabled programmable logic device. 4,839,539, Cl. 307-465.000.

Takayama, Haruyoshi, to Canon Kabushiki Kaisha. Transmission control apparatus. 4,839,908, Cl. 375-104.000.

Takayama, Masahiro, to Bridgestone Corporation. Pneumatic tire. 4,838,330, Cl. 152-537.000.

Takayama, Shinji; Kirino, Fumiyoshi; and Sugita, Yutaka, to Hitachi, Ltd. Magneto-optical recording medium. 4,838,962, Cl. 148-304.000.

Takeda Chemical Industries, Ltd.: *See*—
Asahi, Satoru; Tsunemi, Yutaka; and Doi, Muneharu, 4,839,285, Cl. 435-87.000.
Nishimura, Tatsuo; Yoshimura, Yoshinobu; Miyake, Akio; and Hashimoto, Naoto, 4,839,351, Cl. 514-206.000.

Takeda, Yukimasa: *See*—
Torimitsu, Hiroshi; Takeda, Yukimasa; and Tsuchikawa, Koji, 4,838,702, Cl. 366-149.000.

Takehara, Tetsuo: *See*—
Oda, Noriyuki; Takehara, Tetsuo; Higashi, Katsumi; and Muramatsu, Keiji, 4,838,581, Cl. 285-47.000.

Takemae, Shigeru; and Kodama, Mitsuhiro, to Mitsubishi Rayon Company Ltd. Method and apparatus for producing slub yarn. 4,837,903, Cl. 28-254.000.

Takematsu, Tetsuo; Fukuoka, Daisuke; Takahashi, Katsuya; and Hashimoto, Isao, to Mitsui Petrochemical Industries, Ltd. Aromatic urea derivatives and their use as neroicide. 4,838,924, Cl. 71-88.000.

Takemura, Yasuo, to Kabushiki Kaisha Toshiba. Solid-state imaging device having high-speed shutter function. 4,839,734, Cl. 358-213.220.

Takenaka, Noriaki: *See*—
Takinori, Sasaki; Takenaka, Noriaki; Kawaguchi, Akira; and Tayama, Yukiharu, 4,838,807, Cl. 439-347.000.

Takeshita, Hiroshi: *See*—
Hosoi, Masaaki; Nishioka, Ryo; Hioki, Yoshio; Iida, Yoshiaki, Takeshita, Hiroshi; Niiyama, Kenji; and Hidaka, Yusuke, 4,839,353, Cl. 514-212.000.

Takeshita, Keiji; Hamano, Hideo; and Ida, Shuchiro, to Toyota Jidosha Kabushiki Kaisha. Manually operated change-speed mechanism in power transfer device. 4,838,121, Cl. 74-785.000.

Takeuchi, Hiroaki: *See*—
Furuta, Youichi; Ando, Masamoto; Takeuchi, Hiroaki, Noguchi, Noboru; and Nakanishi, Nobuyasu, 4,838,621, Cl. 303-115.000

Takeuchi, Teruo: *See*—
Kuriyama, Zenkichi; Aoha, Masaho; and Takeuchi, Teruo, 4,839,875, Cl. 369-14.000.

Takiguchi, Haruhisa: *See*—
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, 4,839,900, Cl. 372-46.000.

Takinori, Sasaki; Takenaka, Noriaki; Kawaguchi, Akira; and Tayama, Yukiharu, to AMP Incorporated. Electrical connector latching mechanism. 4,838,807, Cl. 439-347.000.

Takizuka, Norikazu: *See*—
Nagura, Osamu; Inoue, Osamu; Kamikuri, Yoshimasa; and Takizuka, Norikazu, 4,839,406, Cl. 524-196.000.

Talaugon, Margie C. Car seat pillow. 4,838,611, Cl. 297-391.000.

Talley, Arthur, Jr.: *See*—
Wilkie, Arnold E.; and Talley, Arthur, Jr., 4,839,211, Cl. 428-89.000.

Tamagawa Seiki Kabushiki Kaisha: *See*—
Takaba, Yosuke, 4,839,552, Cl. 310-268.000.

Tamai, Shoji: *See*—
Morita, Moritsugu; Miyazaki, Kazuo; Yamaguchi, Akihiro; Ohta, Masahiro; Tamai, Shoji; and Nishihara, Kunio, 4,839,232, Cl. 428-473.500.

Tamura, Takanori: *See*—
Yoshitomi, Toshihiko; Kobayashi, Yoshimitsu; Kisaka, Yoshiyuki; Yoshida, Hidemi; Horie, Michikazu; Tamura, Takanori; and Ohgaki, Mitsuaki, 4,839,207, Cl. 428-64.000.

Tamura, Yasuyuki: *See*—
Inaba, Yutaka; and Tamura, Yasuyuki, 4,838,652, Cl. 350-331.00R

Tanabe, Masashi: *See*—
Fukuda, Nobutoshi; Tanabe, Masashi; Furuta, Yoshiki; Nagao, Tatsuro; Arifuku, Naoto; and Yamamisaka, Shinichi, 4,839,584, Cl. 324-103.00P.

Tanabe Seiyaku Co., Ltd.: *See*—
Sato, Yasuhiko; Yamada, Koichiro; Nomura, Sumihiro; Ishida, Ryuichi; and Yamamura, Michio, 4,839,360, Cl. 514-252.000.

Tanabe, Susumu; and Nudeshima, Masahiro, to Terumo Kabushiki Kaisha. Catheter. 4,838,879, Cl. 604-280.000.

Tanabe, Yoshiyuki; and Kashiwaya, Mineo, to Hitachi, Ltd. Fuel supply control apparatus for internal combustion engines. 4,838,223, Cl. 123-339.000.

Tanahashi, Masao; and Yada, Shiro, to Matsushita Electric Works, Ltd. Dry shaver with a readily replaceable outer shearing foil. 4,837,929, Cl. 30-43.920.

Tanahashi, Toshio, to NEC Corporation. Integrated circuit with clock distribution means for supplying clock signals. 4,839,604, Cl 328-62.000.

Tanaka, Hisatoshi; and Abiru, Masao, to G-C Dental Industrial Corp. Material packs for preparing plate dentures. 4,838,789, Cl 433-171.000.

Tanaka, Hitoshi: *See*—
Kyomasu, Mikio; Tanaka, Hitoshi; and Mizuno, Seiichiro, 4,839,735, Cl. 358-213.310.

Tanaka, Katsuhiko: *See*—
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Takahashi, Masami; Tatsukawa, Eiji; Torii, Shunichi; and Kojima, Keiji, 4,839,799, Cl. 364-200.000.
Tormitsu, Hiroshi; Takeda, Yukimasa; and Tsuchikawa, Koji, to Hoshizaki Denki Kabushiki Kaisha. Electric control apparatus for ice-cream-making machine. 4,838,702, Cl. 366-149.000.
Torita, Fumio: *See*—
Ishida, Katsuyuki; Torita, Fumio; and Kobsaka, Yoshio, 4,837,883, Cl. 8-159.000.
Toriu, Jirou; Ohno, Katsuhiro; and Miyajima, Jun, to Mitsubishi Denki Kabushiki Kaisha. Process for manufacturing a composite magnetic head structure. 4,837,922, Cl. 29-603.000.
Torok, Ernest J.; Krawczak, John A.; Fritz, Bernard S.; and Harvey, William A., to Unisys Corporation. Integrated solid state non-volatile fiber optic switchboard. 4,838,637, Cl. 350-96.180.
Torremans, Joseph L. G.: *See*—
Janssens, Frans E.; Kennis, Ludo E. J.; Mens, Jozef F.; Torremans, Joseph L. G.; and Diels, Gaston S. M., 4,839,374, Cl. 514-394.000.
Toshiba Ceramics Co., Ltd.: *See*—
Katoh, Yoshihisa; Ogawa, Takashi; and Hasegawa, Mitsumasa, 4,839,488, Cl. 219-69.180.
Toshiba Electric Equipment Corporation: *See*—
Ide, Katsuyuki; Kobayashi, Hisao; and Aoike, Nanjou, 4,839,564, Cl. 315-169.400.
Maruyama, Tatsuo; and Matsushita, Nobuo, 4,838,629, Cl. 350-1.600.
Toshiba Silicone Co., Ltd.: *See*—
Kurita, Atsushi; Matsumoto, Yasuji; and Huy, Sam, 4,839,452, Cl. 528-15.000.
TOTAL Compagnie Francaise des Petroles: *See*—
Ducos, Maurice P.; and Serio, Andre L., 4,839,239, Cl. 428-623.000.
Totta, Paul A.: *See*—
Gajda, Joseph J.; Srikrishnan, Kris V.; Totta, Paul A.; and Trudeau, Francis G., 4,839,715, Cl. 357-71.000.
Tourtellotte, Frederick: *See*—
Pernick, Jeffrey R.; and Tourtellotte, Frederick, 4,839,002, Cl. 204-58.000.
Tower, Stephen N.; Christenson, James A.; and Braun, Howard E., to Westinghouse Electric Corp. Nuclear steam supply system and method of installation. 4,839,137, Cl. 376-260.000.
Toybox Corporation: *See*—
Ohnuma, Nobuyoshi; and Ueda, Akio, 4,838,828, Cl. 446-446.000.
Toyo Boseki Kabushiki Kaisha: *See*—
Imagawa, Osamu; Iwanishi, Masazumi; and Yokoyama, Seiichiro, 4,839,701, Cl. 357-2.000.
Toyo Tire & Rubber Co., Ltd.: *See*—
Kondo, Nobuaki; and Yamazaki, Shinichi, 4,837,881, Cl. 5-464.000.
Toyoda Gosei Co., Ltd.: *See*—
Sato, Kenji, 4,838,976, Cl. 156-245.000.
Toyoda, Takashi: *See*—
Yamada, Minoru; Toyoda, Takashi; and Seto, Kunio, 4,839,273, Cl. 430-634.000.
Toyoda, Toshiro: *See*—
Nomura, Shinnya; Toyoda, Toshiro; and Ikenoya, Kazuhisa, 4,839,591, Cl. 324-208.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Furuta, Youichi; Ando, Masamoto; Tateuchi, Hiroaki; Noguchi, Noboru; and Nakanishi, Nobuyasu, 4,838,621, Cl. 303-115.000.
Hamano, Yukio; Kashihara, Yuji; Sakurai, Keita; Yasue, Hideki; and Fukumura, Kagenori, 4,838,124, Cl. 74-866.000.
Hamano, Yukio; Tomomatsu, Hideo; Izumi, Fumiaki; and Taga, Yutaka, 4,838,125, Cl. 74-866.000.
Inui, Masaki, 4,838,399, Cl. 192-53.00F
Kuwayama, Yoshinari; Yokoyama, Fumitomo; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,839,041, Cl. 210-168.000.
Matsui, Hitoshi; and Suzuki, Hiroshi, 4,838,287, Cl. 134-1.000.
Matsuoka, Hiroki, 4,838,230, Cl. 123-41.000.
Takeshita, Keiji; Hamano, Hideo; and Iida, Shuichiro, 4,838,121, Cl. 74-785.000.
Uranishi, Kouji; and Itou, Takaaki, 4,838,229, Cl. 123-440.000.
Tozawa, Sadamu: *See*—
Ohta, Jiro; Tozawa, Sadamu; Matsushita, Koichi; and Maruyama, Yutaka, 4,838,710, Cl. 384-100.000.
Trabitzsch, Hans: *See*—
Suetterlin, Norbert; Blitz, Hans-Dieter; and Trabitzsch, Hans, 4,839,417, Cl. 524-833.000.
Tracy, Michael J.: *See*—
Kramer, William E.; Forward, John E.; and Tracy, Michael J., 4,838,497, Cl. 242-67.200.
Traex Corporation: *See*—
Salzmann, Ferdinand F.; and Wenkman, Gregory J., 4,838,454, Cl. 221-57.000.
Trahan, Albert J., to Emhart Industries, Inc. Plunger assembly for a glassware forming machine. 4,838,921, Cl. 65-229.000.
Trailer P. H. Corporation: *See*—
Bakka, Charles M.; Sims, Roger D.; and Stevenson, James T., 4,838,744, Cl. 410-53.000.
Travis, Steed. Trolling motor having pivotal foot element. 4,838,817, Cl. 440-6.000.
Trenkle, Robert W.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; Schreck, Lisa; and Sands, Keith P., 4,839,083, Cl. 252-174.110.
Trett, John; and Bradbeer, Peter F., to Formula Systems Limited. Signal compensation circuits. 4,839,605, Cl. 328-146.000.
Trevison, Robert L.; McKee, William E.; and Hunnel, Larry B., to Cominco Ltd. Method of producing a jumper chip for semiconductor devices. 4,837,928, Cl. 29-840.000.
Trick, Gilbert: *See*—
Swanson, David L.; and Trick, Gilbert, 4,839,502, Cl. 219-401.000.
Trilogy Systems Corporation: *See*—
Beakley, Bruce E.; and Flanders, Thomas E., 4,839,543, Cl. 310-12.000.
Tringali, Dominick: *See*—
Orosz, Miklos J.; Tringali, Dominick; Monson, Donald B.; and Kuiper, Gerald J., 4,839,477, Cl. 200-50.0AA.
Tripodi, Daniel J.: *See*—
Edelson, Richard L.; and Tripodi, Daniel J., 4,838,852, Cl. 604-4.000.
Trocciola, John C.: *See*—
Levy, Alexander H.; VanDine, Leslie L.; and Trocciola, John C., 4,839,247, Cl. 429-21.000.
Trott, Gary R.: *See*—
Doehler, Gottfried H.; Scott, Caroline J.; Trott, Gary R.; and Boatman, Betty, 4,839,714, Cl. 357-71.000.
Troue, Harden H.: *See*—
Sue, Jiinjen A.; and Troue, Harden H., 4,839,245, Cl. 428-698.000.
Trowbridge, Theodore D.; and Fung, Shun C., to Exxon Research & Engineering Co. Method for treating and stabilizing zeolite catalysts. 4,839,320, Cl. 502-66.000.
Trubilin, Vladimir N.: *See*—
Fedorov, Svyatoslav N.; Egorova, Eleonora V.; Strusova, Natalya A.; Glazko, Viktor I.; and Trubilin, Vladimir N., 4,838,890, Cl. 623-6.000.
Truckee Meadows Research & Development: *See*—
Mulreany, Patrick A.; Kinney, Alan C.; and Presley, Donald C., 4,838,856, Cl. 604-65.000.
Trudeau, Francis G.: *See*—
Gajda, Joseph J.; Srikrishnan, Kris V.; Totta, Paul A.; and Trudeau, Francis G., 4,839,715, Cl. 357-71.000.
True, Donovan B. Ice fishing tip-up. 4,837,965, Cl. 43-17.000.
Trumpp, Gerhard: *See*—
Koenig, Wilhelm; Lang, Thomas; and Trumpp, Gerhard, 4,839,643, Cl. 340-825.910.
Trundle, Clive: *See*—
Bennion, Ian; Trundle, Clive; Brettle, Jack; Goodwin, Martin J.; and Glenn, Robert, 4,838,634, Cl. 350-96.120.
Trusty, Alan J.: *See*—
Curro, John J.; Trusty, Alan J.; and Vernon, George M., 4,839,216, Cl. 428-134.000.
TRW Cam Gears Limited: *See*—
Adams, Frederick J., 4,838,106, Cl. 74-388.0PS.
TRW, Inc.: *See*—
Leveque, James H.; Williams, Frederick A.; and Eldon, John, 4,839,906, Cl. 375-37.000.
TRW (Repa) GmbH: *See*—
Fohl, Artur, 4,838,499, Cl. 242-107.000.
Tsai, Tai A. Price indicating means for a weighing scale. 4,838,367, Cl. 177-25.150.
Tsaur, Sheng-Liang: *See*—
Kiehlbauch, Richard A.; and Tsaur, Sheng-Liang, 4,839,413, Cl. 524-460.000.
Tsaveras, Thomas; Gaskin, Matthew J.; and Maidhof, John T., to Morse Boulger, Inc. Apparatus and method for incinerating heterogeneous materials. 4,838,183, Cl. 110-190.000.
Tschudin-Mahrer, Rolf, to Irbit Research & Consulting AG. Fire-protective sealing element. 4,839,223, Cl. 428-317.100.
Tseng, Chi-Ping, to Du Pont de Nemours, E. I., and Company. Heterocyclic acyl sulfonamides. 4,838,925, Cl. 71-90.000.
Tsubakimoto Chain Co.: *See*—
Yokoi, Satoru; and Kai, Toru, 4,838,171, Cl. 104-166.000.
Tsubouchi, Junichi: *See*—
Sakami, Yasuo; Okina, Shigetaka; Tsubouchi, Junichi; Izaki, Shozo; Fukushima, Toshitaka; Watanabe, Hiroyuki; and Ishizaki, Masao, 4,839,854, Cl. 364-900.000.
Tsuchihashi, Yoshiaki: *See*—
Hunahata, Katuyuki; Nagae, Yoshiharu; Takasaka, Masahiro; Mori, Yuji; Hoshino, Minoru; Kozima, Yasuyuki; Saito, Youhei; Fukuda, Kyohei; Kozai, Hayao; Hasimoto, Tadahiko; and Tsuchihashi, Yoshiaki, 4,838,655, Cl. 350-335.000.
Tsuchikawa, Koji: *See*—
Torimitsu, Hiroshi; Takeda, Yukimasa; and Tsuchikawa, Koji, 4,838,702, Cl. 366-149.000.

Tsuchikawa, Syuji: *See*—
Mawatari, Masaaki; Itoh, Tetsuo; Tsuchikawa, Syuji; and Kimura, Shinichi, 4,839,425, Cl. 525-92.000.
Tsuchiya, Nobuo: *See*—
Tachiuchi, Tsuguji; Konuma, Satoshi; and Tsuchiya, Nobuo, 4,839,739, Cl. 358-282.000.
Tsudakoma Kogyo Kabushiki Kaisha: *See*—
Suwa, Mituru, 4,838,319, Cl. 139-116.00R.
Tsuji, Ichiroh: *See*—
Taniguchi, Isao; Yasukouchi, Kazuo; Tsuji, Ichiroh; and Fujiyasu, Takeshi, 4,839,017, Cl. 204-403.000.
Tsuji, Shintaro, to Mitsubishi Denki Kabushiki Kaisha. Monitor control apparatus. 4,839,631, Cl. 340-541.000.
Tsukada, Kenichi: *See*—
Konishi, Junkichi; Tsukada, Kenichi; Sekiguchi, Tomoyoshi; Kouda, Masanori; and Suzuki, Minoru, 4,838,563, Cl. 280-840.000.
Tsukamoto, Yuji, to NEC Corporation. Magnetic recording medium with protective layer using graphite fluoride and method of producing same. 4,839,244, Cl. 428-694.000.
Tsunemi, Yutaka: *See*—
Asahi, Satoru; Tsunemi, Yutaka; and Doi, Muneharu, 4,839,285, Cl. 435-87.000.
Tsunoda, Kikuo: *See*—
Ishikawa, Youhei; Tsunoda, Kikuo; Hiratsuka, Toshiro; and Abe, Hirotsugu, 4,839,773, Cl. 361-321.000.
Tsuruta, Fuminori: *See*—
Murata, Tadaichi; Isomura, Tsuneo; Fujimori, Kenichi; Tsuruta, Fuminori; Dohi, Kazuhito; Horigome, Masahiro; Nakayama, Yoshitarou; and Oomori, Sachio, 4,839,252, Cl. 430-59.000.
Tsutsumi, Kazumichi, to Mitsubishi Denki Kabushiki Kaisha. Suction air amount measuring device for an engine. 4,838,078, Cl. 73-118.200.
Tucker, Terry L.: *See*—
Hemsky, Robert L.; and Tucker, Terry L., 4,839,718, Cl. 358-22.000.
Tufts, Timothy A., to Ashland Oil, Inc. Storage stable blend comprising a long chain polyol, a short chain diol and a urethane. 4,839,087, Cl. 252-182.270.
Tuhkanen, Tapio, to Office Plus. Combined visiting card and brochure. 4,838,580, Cl. 283-56.000.
Tullsen, Thomas R., to Dionex Corporation. Bipolar voltage to frequency converter. 4,839,788, Cl. 363-63.000.
Tully, Clay E.; and Perry, Seth D., to Yale Security Inc. Door closer having arm/slide track connection. 4,837,890, Cl. 16-71.000.
Tully, John W.; O'Brien, Benedict B.; Hant, William; and Hu, King L., to Northrop Corporation. Planar bipolar transistors including heterojunction transistors and method. 4,839,303, Cl. 437-31.000.
Tulsa Power Products, Inc.: *See*—
Spillar, Robert J., 4,838,595, Cl. 294-90.000.
Tumiatti, Wander; Nobile, Gilberto; and Tundo, Pietro, to Sea Marconi Technologies S.p.A. Immobilized reagent for the decontamination of halogenated organic compounds. 4,839,042, Cl. 210-194.000.
Tundo, Pietro: *See*—
Tumiatti, Wander; Nobile, Gilberto; and Tundo, Pietro, 4,839,042, Cl. 210-194.000.
Tusim, Martin H., to Dow Chemical Company, The. Expandable and expanded alkenyl aromatic polymer particles and methods of making the same. 4,839,396, Cl. 521-88.000.
Tuttle, Ken E.: *See*—
Swenson, Harold W.; and Tuttle, Ken E., 4,839,117, Cl. 264-46.400.
Tuzi, Kenzi: *See*—
Hosomizu, Hiroshi; Ichikawa, Tsutomu; Kamiya, Makoto; Yoneyama, Masatoshi; and Tuzi, Kenzi, 4,839,686, Cl. 354-416.000.
TVA Holding S.p.A.: *See*—
Baranzelli, Cesare; Frulla, Claudio; and Gattolin, Dario, 4,838,561, Cl. 279-1.0DA.
Tyson, Graham R., to Royal Melbourne Institute of Technology Limited. Movement parameter sensor. 4,839,646, Cl. 340-870.300.
U-Haul International: *See*—
Abromavage, John C., 4,838,605, Cl. 296-182.000.
Ube Industries, Ltd.: *See*—
Tabata, Kanzo; Inoue, Hiroshi; Muramatsu, Tadao; and Narahara, Yasuji, 4,839,217, Cl. 428-156.000.
Ucci, Pompelio A.: *See*—
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Uchida, Norio; Ishibashi, Yoriyuki; Hirano, Ryoichi; Masuyama, Masayuki; and Shimozono, Hiroaki, to Kabushiki Kaisha Toshiba; and Tokyo Kogaku Kikai Kabushiki Kaisha. Method and apparatus for setting a gap between first and second objects to a predetermined distance. 4,838,693, Cl. 356-356.000.
Uchida, Yoshihiko; Kuroda, Kotaro; Kusano, Akihiko; and Fukunaga, Shinichi, to Kurosaki Refractories Co., Ltd.; and Nippon Steel Corporation. Lightweight heat-insulating tundish coating material. 4,839,317, Cl. 501-108.000.
Udagawa, Katsuhiro: *See*—
Hamada, Takeaki; Okada, Akio; Abe, Kiyoshi; Udagawa, Katsuhiro; Okazaki, Fumitoshi; and Fujino, Kouji, 4,837,877, Cl. 5-10.00B.
Uecker, Dale A.; and Boltz, Keith R. Temperature insulating apparatus for improving the efficiency of an evaporative cooling unit. 4,838,038, Cl. 62-304.000.
Ueda, Akio: *See*—
Ohnuma, Nobuyoshi; and Ueda, Akio, 4,838,828, Cl. 446-446.000.
Ueda, Kazuhiko, to Victor Company of Japan, Ltd. Contour compensating circuit. 4,839,725, Cl. 358-160.000.
Ueda, Kiichirou; and Arai, Norikazu, to Konishiroku Photo Industry Co., Ltd. Projection lens for a projector. 4,838,670, Cl. 350-432.000.
Ueda, Tetsuya: *See*—
Banjo, Toshinobu; Ueda, Tetsuya; Onoda, Shigeo; and Kasatani, Yasushi, 4,838,804, Cl. 439-325.000.
Teraoka, Yasuhiro; Ueda, Tetsuya; Yagoura, Hideya; Shimamoto, Haruo; Nango, Shigeyuki; Banjo, Toshinobu; and Seki, Hiroshi, 4,839,713, Cl. 357-70.000.
Ueda, Toshihiko, to Minolta Camera Kabushiki Kaisha. Zoom lens system for use in microfilm projection apparatus. 4,838,667, Cl. 350-427.000.
Ueda, Yoshio: *See*—
Omizono, Hitoshi; Sasaki, Hiroshi; Fukatsu, Yasuo; Ota, Saburo; and Ueda, Yoshio, 4,837,995, Cl. 52-223.00L.
Ueda, Yutaka, to Murata Kikai Kabushiki Kaisha. Spinning frame control system. 4,838,019, Cl. 57-264.000.
Ueki, Keiji: *See*—
Sawada, Kaname; Suzuki, Kazuo; Hasunuma, Shinji; Katayama, Eizo; Ohno, Motoyasu; Kanazawa, Tsukasa; and Ueki, Keiji, 4,839,879, Cl. 369-54.000.
Uekido, Kouzou: *See*—
Takai, Nobuei; Sakamoto, Haruo; Uekido, Kouzou; and Nishiyama, Michiaki, 4,838,814, Cl. 439-620.000.
Uekita, Masakazu; and Awaji, Hiroshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Thin film and device having the same. 4,839,219, Cl. 428-220.000.
Uekubo, Yasuhiro: *See*—
Ito, Masaaki; Odagiri, Shiro; Maeda, Kouji; Uekubo, Yasuhiro; Jitumori, Aiko; and Usami, Teruo, 4,839,654, Cl. 342-22.000.
Uemura, Akio: *See*—
Mochida, Ei; Uemura, Akio; Kato, Kazuo; Tokunaga, Hiroki; and Haga, Akinori, 4,839,368, Cl. 514-313.000.
Uemura, Hideki: *See*—
Kaneko, Kazuo; Hatakeyama, Takanobu; Hino, Hirofumi; Uemura, Hideki; and Yamamoto, Kazuo, 4,839,915, Cl. 378-105.000.
Ueno, Masaji, to Kabushiki Kaisha Toshiba. BicMO logic circuit. 4,839,537, Cl. 307-446.000.
Ueno, Masaji, to Kabushiki Kaisha Toshiba. Tri-state output circuit. 4,839,540, Cl. 307-473.000.
Ueno, Shoji: *See*—
Yamada, Yasuhiro; Ueno, Shoji; and Yoshida, Shiro, 4,839,755, Cl. 371-38.000.
Uhlig, Helmut: *See*—
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Uittenbogaard, Marinus: *See*—
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Ukrainsky-Nauchno-Issledovatelsky Institut Prirodnykh Gazov "Ukrniigaz": *See*—
Kiselev, Viktor M., 4,838,906, Cl. 55-238.000.
Ulbrich, Walter: *See*—
Noll, Tobias; and Ulbrich, Walter, 4,839,850, Cl. 364-787.000.
Umehara, Kiyoshi; Yamamoto, Hisaomi; Kobayashi, Nobuo; and Imai, Tsutomu, to Dainippon Ink and Chemicals, Inc. Fire-retardant for woody materials. 4,839,099, Cl. 252-607.000.
Umemaru, Hisato: *See*—
Morishita, Mitsuharu; Kohge, Shinichi; Hara, Tadayuki; Hata, Yasuaki; and Umemaru, Hisato, 4,838,074, Cl. 73-118.100.
Une, Ryuzo, to Mitsubishi Denki Kabushiki Kaisha. Sheet tensioning printer rollers. 4,838,719, Cl. 400-618.000.
Uni-Cardan Aktiengesellschaft: *See*—
Herrmann, Gert, 4,838,107, Cl. 74-411.000.
Uni-Charm Corporation: *See*—
Nomura, Hironori; Taiji, Shimakawa; Shinohara, Junji; Kobayashi, Shigetoyo; and Yamamoto, Hiroki, 4,838,969, Cl. 156-160.000.
Unilever Patent Holdings B.V.: *See*—
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Union Carbide Corporation: *See*—
Sue, Jiinjen A.; and Troue, Harden H., 4,839,245, Cl. 428-698.000.
Victor, Richard A.; and Lockett, Michael J., 4,838,913, Cl. 62-22.000.
Union Oil Company of California: *See*—
Coyle, Roy T.; and Ho, Phillman N., 4,839,150, Cl. 423-345.000.
Ward, John W., 4,839,025, Cl. 208-111.000.
Young, Donald C., 4,839,088, Cl. 252-183.130.
Union Sils, Van de Loo & Co.: *See*—
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Uniroyal Chemical Company, Inc.: *See*—
Covey, Rupert A.; and Moore, Richard C., 4,839,349, Cl. 514-92.000.
Wheeler, Edward L.; and Franko, Robert J., 4,839,188, Cl. 426-545.000.
Uniroyal Goodrich Tire Company, The: *See*—
Rogers, Clarence L., Jr., 4,837,980, Cl. 51-165.00R.
Unisys Corporation: *See*—
Gal, Laszlo V.; Arraut, Fernando W.; and Khosravi, Christopher H., 4,839,541, Cl. 307-481.000.
Mower, Vaughn L.; Deneris, Evan A.; and Cox, John B., 4,839,603, Cl. 328-14.000.
Peterson, LuVerne R.; and Rehart, Michael A., 4,839,848, Cl. 364-757.000.
Quermann, Thomas R., 4,838,099, Cl. 74-5.470.
Revels, William R., 4,839,751, Cl. 360-60.000.

Rusterholz, John T.; and Schomburg, John R., 4,839,845, Cl. 364-736.000.
Torok, Ernest J.; Krawczak, John A.; Fritz, Bernard S.; and Harvey, William A., 4,838,637, Cl. 350-96.180.
United Health, Inc.: *See—*
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Agriculture: *See—*
Fanta, George F.; and Otey, Felix H., 4,839,450, Cl. 527-313.000.
Air Force: *See—*
Dierksmeier, Douglas D., 4,838,584, Cl. 285-419.000.
Gleason, Clifford C., deceased; and Ekstedt, Edward E., 4,838,029, Cl. 60-732.000.
Army: *See—*
Birk, Aviezer, 4,838,142, Cl. 89-7.000
Gilbert, Everett E., 4,839,420, Cl. 525-61.000.
Graham, Gregory S., 4,838,500, Cl. 252-158.00R.
Leupold, Herbert A., 4,839,059, Cl. 2[illegible]0-335.000.
Stern, Richard A.; and Babbitt, Richard W., 4,839,659, Cl. 343-700.0MS.
Commerce: *See—*
Nishiyama, Randall T.; and Bedard, Alfred J., Jr., 4,838,087, Cl. 73-700.000.
Slocum, Alexander H.; and Peris, James P., 4,838,145, Cl. 91-536.000.
Energy: *See—*
Ashby, Carol I. H.; Brannon, Paul J.; and Gerardo, James B., 4,838,989, Cl. 156-628.000.
Barney, David M., 4,838,098, Cl. 73-19.000.
Bunker, Bruce C.; Lamppa, Diana L.; and Voigt, James A., 4,839,339, Cl. 505-1.000.
Carlson, Larry W.; and Herman, Harold, 4,838,035, Cl. 62-55.500.
Cathcart, John V.; and Liu, Chain T., 4,839,140, Cl. 420-445.000.
Lockhart, James L., 4,837,936, Cl. 33[illegible]783.000.
Ochoa, Ellen; Schils, George F.; and Sweeney, Donald W., 4,838,644, Cl. 350-162.130.
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Vandegrift, George F.; Vissers, Donald R.; Marshall, Simon L.; and Varma, Ravi, 4,839,133, Cl. 37[illegible]-202.000.
National Aeronautics and Space Administration: *See—*
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Chandler, Joseph A., 4,839,046, Cl. 2[illegible]0-355.000.
Collins, Earl R., Jr., 4,839,121, Cl. 26[illegible]-114.000.
Dyer, Gerald E., 4,839,489, Cl. 219-7[illegible].000.
Hess, Robert V.; Upchurch, Billy T.; Brown, Kenneth G.; Miller, Irvin M.; Schryer, David R.; Sidney, Barry D.; Wood, George M.; and Hoyt, Ronald F., 4,839,330, Cl. 502-53.000.
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Lasher, Mark E.; Bocker, Richard [illegible].; Drake, Barry L.; and Henderson, Thomas B., 4,838,646, Cl. 350-169.000.
U.S. Philips Corporation: *See—*
Bednarz, Jurgen, 4,839,912, Cl. 377-119[illegible]000.
Boskamp, Eddy B., 4,839,595, Cl. 324-3[illegible]8.000.
De Jong, Augustinus C. G.; and Schreuderhof, Antonie, 4,838,642, Cl. 350-96.270.
Dobson, Peter J., 4,838,987, Cl. 156-62[illegible]000.
Fonsalas, Frederic, 4,839,836, Cl. 364-5[illegible]2.000.
Ganser, Hans G.; Schafer, Ralf; and Stromberg, Hans P., 4,839,560, Cl. 313-628.000.
Janssen, Peter J. M., 4,839,882, Cl. 369-[illegible]75.000.
Krause, Matthias R., 4,838,372, Cl. 177-211.000.
Mannschke, Lothar, 4,838,636, Cl. 350-[illegible]6.160.
Neumann, Ernst-Georg H., 4,838,689, Cl. 356-73.100.
Schnitker, Wolfgang E.; Nover, Michael P. J.; and Appel, Kay, 4,839,775, Cl. 361-402.000.
Speake, John D., 4,839,617, Cl. 333-174[illegible]000.
Van Driel, Carel-Jan L., 4,839,855, Cl. [illegible]64-900.000.
Veldhuis, Raymond N. J., 4,839,843, Cl. 364-724.110.
Wijtsma, Jorrit, 4,839,513, Cl. 250-504.0[illegible]R.
U.S. Product Development Company: *See—*
Adell, Robert, 4,838,004, Cl. 52-718.10[illegible]
United States Surgical Corporation: *See—*
Kaplan, Donald S.; Hermes, Matthew E.; Muth, Ross R.; and Kennedy, John J., 4,839,130, Cl. 264-[illegible]235.000.
United Technologies Corporation: *See—*
Kromrey, Robert V., 4,839,392, Cl. 521[illegible]45.000.
Walker, Rayond M.; and MacNitt, Donald G., 4,838,069, Cl. 72-342.000.
Unitika, Ltd.: *See—*
Echigo, Yoshiaki; Sugawara, Kenichi; Yamao, Mutsunori; Suematu, Yoshiyuki; Asami, Keiichi; and Ohsawa, Tuneyuki, 4,839,445, Cl. 525-503.000.
Univ. of Colo. Found., Inc.: *See—*
Nishiyama, Randall T.; and Bedard, Alfred J., Jr., 4,838,087, Cl. 73-700.000.
Universal Instruments Corporation: *See—*
Hamilton, Daniel A.; Spowart, James F.; and Porterfield, Richard, 4,838,452, Cl. 221-1.000.
University of California, The Regents of the: *See—*
Lieber, Richard L., 4,838,272, Cl. 128-[illegible]21.000.
Maullem, Shmuel; Sachs, George; and Wheeler, Larry, 4,839,385, Cl. 514-473.000.
University of Chicago: *See—*
Doi, Kunio; and Katsuragawa, Shigehiko, 4,839,807, Cl. 364-413.130.
University of Cincinnati: *See—*
Deutsch, Edward A., 4,839,467, Cl. 534-10.000.
University of Georgia Research Foundation, Inc.: *See—*
Kaswan, Renee, 4,839,342, Cl. 514-11.000.
University of Michigan, The: *See—*
Koral, Kenneth F.; Rogers, W. Leslie; and Clinthorne, Neal H., 4,839,808, Cl. 364-413.240.
University of Minnesota, Regents of the: *See—*
Anderson, Robert K.; Foster, Ruth E.; and Levine, Jeffrey A., 4,838,206, Cl. 119-130.000.
Etter, Margaret C.; Frankenbach, Gayle M.; and Panunto, Thomas W., 4,839,536, Cl. 307-425.000.
McCarthy, James B.; and Furcht, Leo T., 4,839,464, Cl. 530-326.000.
Ramalingam, Subbiah; and Chang, Rongfeng, 4,839,011, Cl. 204-192.380.
Warwick, Warren J.; and Hansen, Leland G., 4,838,263, Cl. 128-30.200.
University of Tennessee Research Corporation, The: *See—*
Huang, Leaf, 4,839,111, Cl. 264-4.600.
University of Texas System, The Board of Regents of the: *See—*
Smith, R. Graham, 4,839,289, Cl. 435-240.270.
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Miller, Jan D.; and Yi, Ye, 4,838,434, Cl. 209-164.000.
University of Utah Research Foundation: *See—*
Kolff, Willem J., 4,838,[illegible] Cl. 623-3.000.
Uno, Hirofumi: *See—*
Nakao, Fujio; and Uno, Hirofumi, 4,839,006, Cl. 204-130.000.
Untawale, Govind G.: *See—*
Maestrone, Gianpaolo; Schildknecht, Eugene G.; and Untawale, Govind G., 4,839,382, Cl. 514-453.000.
Upadek, Horst: *See—*
von Rybinski, Wolfgang; Upadek, Horst; and Wichelhaus, Winfried, 4,839,066, Cl. 252-8.750.
Upchurch, Billy T.: *See—*
Hess, Robert V.; Upchurch, Billy T.; Brown, Kenneth G.; Miller, Irvin M.; Schryer, David R.; Sidney, Barry D.; Wood, George M.; and Hoyt, Ronald F., 4,839,330, Cl. 502-53.000.
Ura, Syousabu: *See—*
Yasuda, Makoto; Ura, Syousabu; Nishimura, Shuichi; Matsuo, Isaya; Kato, Masami; and Sagata, Munehiro, 4,838,215, Cl. 123-52.0MB.
Uranishi, Kouji; and Itou, Takaaki, to Toyota Jidosha Kabushiki Kaisha. Air-fuel ratio control device of an internal combustion engine. 4,838,229, Cl. 123-440.000.
Urata, Hiromasa: *See—*
Mine, Kazunori; Murakami, Keisuke; Tago, Mamoru; and Urata, Hiromasa, 4,839,514, Cl. 250-237.00R.
Urban, John A., to Lucas Industries Public Limited Company. Automatic adjuster for a vehicle shoe-drum brake. 4,838,390, Cl. 188-79.550.
Urushibata, Shoichi: *See—*
Kitera, Takuya; Urushibata, Shoichi; Sato, Masatoshi; Nagashima, Tadashi; Hamada, Shoichi; Shirasu, Isao; Nakura, Yasumi; Sakamoto, Michito; Ishide, Takashi; Sakamoto, Naruo; Meka, Masahiko; and Tomeoka, Masaru, 4,839,495, Cl. 219-121.630.
Urushibata, Yukio, to Kabushiki Kaisha Toshiba. Affine conversion apparatus using a raster generator to reduce cycle time. 4,839,826, Cl. 364-518.000.
Usami, Teruo: *See—*
Ito, Masaaki; Odagiri, Shiro; Maeda, Kouji; Uekubo, Yasuhiro; Jitumori, Aiko; and Usami, Teruo, 4,839,654, Cl. 342-22.000.
Utah Scientific Advanced Development Center, Inc.: *See—*
Hemsky, Robert L.; and Tucker, Terry L., 4,839,718, Cl. 358-22.000.
Vago, Otto Z., to State Industries, Inc. Water heater construction and method of heating water. 4,838,211, Cl. 122-159.000.
Valeo: *See—*
Chasseguet, Gustave; Naudin, Jacky; and Casse, Pierre, 4,838,395, Cl. 188-378.000.
Vallejo, Luiz E. D.: *See—*
Rosado, Serafin M.; and Vallejo, Luiz E. D., 4,838,027, Cl. 60-671.000.
Valmet Paper Machinery Inc.: *See—*
Rantanen, Rauno; and Lummila, Markku, 4,839,201, Cl. 427-355.000.
Van Aarsen Machinefabriek, B.V.: *See—*
Vries, Hendrikus H., 4,838,779, Cl. 425-331.000.
Van Dorn Company: *See—*
Gallagher, Thomas A., 4,839,491, Cl. 219-117.100.
Van Bekkum, Aart J.: *See—*
Herremans, Pieter; Hoogendijk, Christiaan J.; Boer, Adriaan H.; and Van Bekkum, Aart J., 4,838,127, Cl. 73-861.280.
van Blerk, Victor B., to Verbatim Corporation. Temperature/humidity floppy disk cassette defeat mechanism. 4,839,752, Cl. 360-69.000.
Vandegrift, George F.; Vissers, Donald R.; Marshall, Simon L.; and Varma, Ravi, to United States of America, Energy. Target and method for the production of fission product molybdenum-99. 4,839,133, Cl. 376-202.000.
Vandekerckhove, Joel S., to Plant Genetic Systems N.V. Agents and procedures for the transfer of proteins and/or nucleic acids onto a supported receptor surface. 4,839,231, Cl. 428-441.000.

van den Berg, Karel: *See—*
Bom, Cornelis J. G.; and van den Berg, Karel, 4,838,207, Cl. 119-14.020.
Vanderlinde, William: *See—*
Martin, David A.; Ries, Edward L.; Vanderlinde, William; and Young, Marvin J., 4,839,407, Cl. 524-389.000.
Van Der Meer, Johannes W.: *See—*
Salter, James A.; Schmidt, Thomas R.; DeWitz, Thomas S.; Arbore, Charles M.; Duysings, Frederick M. H. J.; Van Der Meer, Johannes W.; Brown, David; and Venselaar, Henricus C. J., 4,838,738, Cl. 406-14.000.
Vander Park, Antonius A., to Nova-Link Limited. Beam-type work station system. 4,838,177, Cl. 108-155.000.
Vandersall, Howard L., to Monsanto Company. Fire retardant concentrates and methods for preparation thereof. 4,839,065, Cl. 252-603.000.
van der Tak, Josephus A. M. Scrubbing machine. 4,838,193, Cl. 114-222.000.
VanDine, Leslie L.: *See—*
Levy, Alexander H.; VanDine, Leslie L.; and Trocciola, John C., 4,839,247, Cl. 429-21.000.
Van Driel, Carel-Jan L., to U.S. Philips Corporation. Multiple redundant clock circuit. 4,839,855, Cl. 364-900.000.
Van Ewyk, Robert L.; O'Connor, Ingrid M.; Mosley, Alan; Jones, Francis; Blackburn, Christopher; and Griffiths, John, to General Electric Company, p.l.c., The. Liquid crystal displays and fluorescent dyes for use therein. 4,838,659, Cl. 350-337.000.
Van Ewyk, Robert L.: *See—*
Hilsum, Cyril; Van Ewyk, Robert L.; and O'Connor, Ingrid M., 4,838,662, Cl. 350-350.00F.
Van Meerbeeck, Paul L.: *See—*
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Vannerson, Eric: *See—*
Theodoulou, Sotos M.; Thomson, Christopher W.; Vannerson, Eric; Baker, Wm. Keith; Sun, Alvin C. P.; and Hurley, Ken, 4,839,671, Cl. 346-159.000.
van Pey, Hans-Theo: *See—*
Wagner, Wolfram; Nyssen, Roger; Berkenhaus, Dirk; and van Pey, Hans-Theo, 4,838,917, Cl. 65-5.000.
Van Scoy-Mosher, Cheryle. Hospital gown. 4,837,863, Cl. 2-114.000.
van Steijn, Aloijsius C. M., to Multinorm B.V. Coupling device. 4,838,489, Cl. 239-310.000.
Varma, Ravi: *See—*
Vandegrift, George F.; Vissers, Donald R.; Marshall, Simon L.; and Varma, Ravi, 4,839,133, Cl. 376-202.000.
Varo, Inc.: *See—*
Dallin, William M., II, 4,839,569, Cl. 315-383.000.
Vau, Volker: *See—*
Range, Jochen; Hohlein, Bernd; Niessen, Hans; Vau, Volker; Schiebahn, H. J. R.; Hoffmann, Horst, and Vorwerk, Manfred, 4,839,391, Cl. 518-712.000.
Vaughan, A. Dahlgren; and Biswas, Dipak R., to Alcatel NA. Inert atmosphere cooler for optical fibers. 4,838,918, Cl. 65-12.000.
VDO Adolf Schindling AG: *See—*
Zeiss, Manfred, 4,839,636, Cl. 340-752.000.
Veldhuis, Raymond N. J., to U.S. Philips Corporation. Method and apparatus for correcting a sequence of invalid samples of an equidistantly sampled signal. 4,839,843, Cl. 364-724.110.
Vella, Philip A.; and Noack, Manfred G., to Olin Corporation. Process for producing an aqueous solution containing chlorine dioxide and chlorine. 4,839,152, Cl. 423-478.000.
Venselaar, Henricus C. J.: *See—*
Salter, James A.; Schmidt, Thomas R.; DeWitz, Thomas S.; Arbore, Charles M.; Duysings, Frederick M. H. J.; Van Der Meer, Johannes W.; Brown, David; and Venselaar, Henricus C. J., 4,838,738, Cl. 406-14.000.
Ventura, Robert M. Underwater (submersible) joint or splice. 4,839,470, Cl. 174-84.00R.
Vera, Jean C., to ECIA - Equipements et Composants Pour L'Industrie Automobile. Method and appliance for evaluating the sound emission property of hollow components. 4,838,072, Cl. 73-37.000.
Verbatim Corporation: *See—*
van Blerk, Victor B., 4,839,752, Cl. 360-69.000.
Vernon, George M.: *See—*
Curro, John J.; Trusty, Alan J.; and Vernon, George M., 4,839,216, Cl. 428-134.000.
Verseef, Jan H., to Frink America, Inc. Reversible moldboard assembly. 4,837,951, Cl. 37-197.000.
Vesper, Herbert J. End loading motor scraper. 4,837,950, Cl. 37-4.000.
Vetter, Kurt, to Behr Industrieanlagen GmbH & Co. Control system for a programmed spraying device. 4,838,311, Cl. 137-624.200.
Vevert, Jean-Paul; Delevallee, Francoise; Gasc, Jean-Claude; and Petit, Francis, to Roussel Uclaf. Alpha-mercaptomethyl-benzene propanamides, pharmaceutical compositions and use. 4,839,358, Cl. 514-237.800.
Vickers Systems Limited: *See—*
Cleasby, Kenneth G., 4,838,298, Cl. 137-110.000.
Victaulic Company of Japan, Ltd., The: *See—*
Hatakeyama, Ryoichi; and Ikeda, Shintaro, 4,838,582, Cl. 285-110.000.
Victor Company of Japan, Ltd.: *See—*
Ueda, Kazuhiko, 4,839,725, Cl. 358-160.000.
Yamada, Yasuhiro; Ueno, Shoji; and Yoshida, Shiro, 4,839,755, Cl. 371-38.000.
Victor, Richard A.; and Lockett, Michael J., to Union Carbide Corporation. Double column air separation process with hybrid upper column. 4,838,913, Cl. 62-22.000.
Victorinox AG: *See—*
Elsener, Carl, 4,837,932, Cl. 30-161.000.
Videocolor: *See—*
Dumesnil, Alain; and Perreaut, Jean-Marc, 4,839,568, Cl. 315-368.000.
Videomat Associates: *See—*
Bradt, L. Jack; Brown, Robert L.; Fogt, G. Stephen; Laroy, Ron; Lewis, Allen R.; and Love, James S., 4,839,505, Cl. 235-381.000.
Villaine, Philippe; and Janin, Claude, to Michelin Recherche et Technique S.A. Anistropic compositions of cellulose esters; processes for obtaining such compositions; fibers of cellulose esters or cellulose. 4,839,113, Cl. 264-28.000.
Virant, Allen J.: *See—*
Speelman, David J.; and Virant, Allen J., 4,839,405, Cl. 524-99.000.
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Lamartino, Salvatore P., 4,837,897, Cl. 17-35.000.
Visky, Gyorgy: *See—*
Kreidl, Janos; Visky, Gyorgy; Czibula, Laszlo; Stefko, Bela; Farkas nee Kirjak, Maria; Szombathelyi, Zsolt; Karpati, Egon; Kiss, Bela; Csomor, Katalin; Szporny, Laszlo; Forgacs, Lilla; Kuthi, Csaba; and Gere, Aniko, 4,839,362, Cl. 514-283.000.
Visser, Anthony, to 501 Visser 'S-Gravendeel Holding B.V. Apparatus or greenhouse for growing of plants. 4,837,971, Cl. 47-17.000.
Vissers, Donald R.: *See—*
Vandegrift, George F.; Vissers, Donald R., Marshall, Simon L.; and Varma, Ravi, 4,839,133, Cl. 376-202.000.
Vite, Jean Pierre, to Celamerck GmbH & Co. Compositions for combatting bark beetles. 4,839,383, Cl. 514-456.000.
Vitulli, Joseph L., Jr., to Magnetic Analysis Corporation. Operator input responsive system and method for selectively identifying verified object flaws. 4,839,592, Cl. 324-227.000.
Voegele, Gerald G.: *See—*
Keith, Peter T.; and Voegele, Gerald G., 4,838,268, Cl. 128-344.000.
Vogelsong, Thomas L.: *See—*
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Vogelzang, John H., to Honeywell Limited. Air conditioning system with periodic fan operation. 4,838,482, Cl. 236-11.000.
Voigt, James A.: *See—*
Bunker, Bruce C.; Lamppa, Diana L., and Voigt, James A., 4,839,339, Cl. 505-1.000.
Voler, Franja F.: *See—*
Koch, Earl E., deceased; Voler, Franja F.; and Howell, Edmund O., 4,838,014, Cl. 56-13.600.
Volker, Wolfgang: *See—*
Donnerhack, Andreas; Thoma, Klemens; Volker, Wolfgang; Gallmeister, Rolf-Dieter; Stratz, Thomas; and Lammers, Ludwig, 4,838,270, Cl. 128-371.000.
Volpert, Thomas R., to Mind Over Matter Games, Inc. Card game puzzle playing method. 4,838,551, Cl. 273-157.00R.
von dem Hagen, Tronje, to Dragerwerk Aktiengesellschaft. Gas metering arrangement. 4,838,261, Cl. 128-205.240.
von Gruenberg, Hubertus: *See—*
Kircher, Dieter; von Gruenberg, Hubertus; and Blum, Klaus-Dieter, 4,838,622, Cl. 303-115.000.
von Rybinski, Wolfgang; Upadek, Horst; and Wichelhaus, Winfried, to Henkel Kommanditgesellschaft auf Aktien. Fabric-softening detergent. 4,839,066, Cl. 252-8.750.
Vora, Kishore N.; Campbell, Donald N.; Davis, Robert C., Jr.; Spangler, Glenn E.; and Reategui, Julio A., to Allied-Signal Inc. Selective ionization of gas constituents using electrolytic reactions. 4,839,143, Cl. 422-98.000.
Vorwerk, Manfred: *See—*
Range, Jochen; Hohlein, Bernd; Niessen, Hans; Vau, Volker; Schiebahn, H. J. R.; Hoffmann, Horst; and Vorwerk, Manfred, 4,839,391, Cl. 518-712.000.
Vries, Hendrikus H., to Van Aarsen Machinefabriek, B.V. Apparatus for a pelletizer having hydraulically adjustable pressing rolls. 4,838,779, Cl. 425-331.000.
Vsesojuzny Nauchno-Issledovatelsky I Proektny Institut Mekhanicheskoi: *See—*
Slesarenko, Vladimir F., 4,839,036, Cl. 209-315.000.
VSR Engineering GmbH Fordertechnik: *See—*
Rappen, Albert, 4,838,409, Cl. 198-497.000.
Vulpe, Alexei, to Ntronix, Inc. Electromagnetic container sealing apparatus. 4,839,494, Cl. 219-10.55A.
W. L. Gore & Associates, Inc.: *See—*
Gilbert, Gary, 4,838,141, Cl. 84-380.00B.
W. R. Carpenter & Co. Ltd.: *See—*
Newby, Philip W., 4,838,437, Cl. 212-71.000.
W. R. Grace & Co.: *See—*
Shah, Gautam P., 4,839,235, Cl. 128-516.000.
W. R. Grace & Co.-Conn.: *See—*
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Waagner-Biro Aktiengesellschaft: *See—*
Lindbauer, Ralf; and Glasner, Alfred, 4,839,147, Cl. 423-235.000
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Schmidhammer, Ludwig; Dummer, Gerhard; Hirschmann, Peter; Strasser, Rudolf; and Haunberger, Franz, 4,839,153, Cl. 423-488.000.

Waddoups, Malcolm: *See—*
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Waeber, Bernard; and Brunner, Hans R., to Debiopharm, S.A. Preparation containing hexatriacontapeptides and methods of use. 4,839,343, Cl. 514-12.000.

Wafford, Terrell F.: *See—*
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Wagner, Herbert J.: *See—*
Wyler, Adolf; and Wagner, Herbert J., 4,838,892, Cl. 8-94.10R.

Wagner, Wilfried R.: *See—*
Schumaker, Norman E.; Stall, Richard A.; Nelson, Craig R.; and Wagner, Wilfried R., 4,838,983, Cl. 156-613.000.

Wagner, Wolfram; Nyssen, Roger; Berkenhaus, Dirk; and van Pey, Hans-Theo, to Bayer Aktiengesellschaft. Process and apparatus for the production of very fine mineral fibers, in particular glass fibers. 4,838,917, Cl. 65-5.000.

Wainberg, Mark A.; and Wong, Chiu-Ming, to KAM Scientific Inc. Hypochlorite: tertiary alcohol disinfectants with reduced offensive odor. 4,839,079, Cl. 252-104.000.

Wakamatsu, Hidetoshi, to Oki Electric Industry Co., Ltd. Method of manufacturing a trench filled with an insulating material in a semiconductor substrate. 4,839,306, Cl. 437-67.000.

Wakamatsu, Hisashi; and Noaki, Yasuhide, to Asahi Kasei Kogyo Kabushiki Kaisha. Hydrogen-evolution electrode and a method of producing the same. 4,839,015, Cl. 204-290.00R.

Waknine, Samuel, to Jeneric/Pentron, Inc. Light curable dental pit and fissure sealant. 4,839,401, Cl. 522-14.000.

Wakui, Tadahiro: *See—*
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Waldenberger, Dean H., to Norton Company. Double sided adhesive tape. 4,839,206, Cl. 428-40.000.

Walensky, Loren J.: *See—*
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Walker, Charles: *See—*
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Walker, Francis J.: *See—*
Manion, Michael C.; Walensky, Loren J.; and Walker, Francis J., 4,838,168, Cl. 102-522.000.

Walker, Howard; and Walker, Charles. Pneumatic ball amusement game. 4,838,550, Cl. 273-86.00R.

Walker, Rayond M.; and MacNitt, Donald G., to United Technologies Corporation. Apparatus for fabricating integrally bladed rotors. 4,838,069, Cl. 72-342.000.

Walker, William J.: *See—*
Albracht, Karl L.; and Walker, William J., 4,838,447, Cl. 220-89.00A.

Walkup, William B.: *See—*
Bertoglio, Guido; Boyle, Michael C; Cooney, James S.; and Walkup, William B., 4,838,801, Cl. 4 9-83.000.

Wall, Alfred J., Jr., to Louvenrs International. Louver system. 4,839,778, Cl. 362-150.000.

Walla, Gregg W., to Timerline Supply. Furniture anti-tip and lock mechanism. 4,838,624, Cl. 312-221.000.

Wallis, Bernard J. Corrugated fin forming apparatus. 4,838,065, Cl. 72-185.000.

Walter, Hans-Michael: *See—*
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Walton, Erlen B., to Eaton Corporation. Speed responsive rear wheel steering. 4,838,374, Cl. 180-140.000.

Wamac AB: *See—*
Backman, Ralf, 4,838,412, Cl. 198-838.00.

Wang, Carl C. T.: *See—*
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Wang, Jyh-Yun; and Shaya, Mousa N., to Hewlett-Packard Company. Paced QRS complex classifier. 4,838,278 Cl. 128-697.000.

Wang, Teh-Chuan, to Du Pont de Nemours, E. I., and Company. Process for the preparation of large diameter oriented monofilaments. 4,839,132, Cl. 264-134.000.

Ward, John W., to Union Oil Company of California. Mild hydrocracking with a catalyst containing non-hydrolyzable halogen. 4,839,025, Cl. 208-111.000.

Ward, Morris D.; and Williams, Kenneth L., to Texas Instruments Incorporated. Cascadable first-in, first-out memory. 4,839,866, Cl. 365-221.000.

Warner, Bert J. Stable floating pier. 4,838,735, Cl. 405-220.000.

Warner, David J., to Hughes Microelectronics Limited. Register access decade counting technique. 4,839,909, Cl. 377-24.100.

Warner-Lambert Company: *See—*
Cherukuri, Subraman R.; Mansukhani, Gul; and Jacob, Kapakkamannil C., 4,839,184, Cl. 426-307.00.
O'Brien, Denise M.; and Croce, Carlo P., 4,838,425, Cl. 206-531.000.
Piano, Anthony P., 4,838,448, Cl. 220-.57.000.

Warwick, Warren J.; and Hansen, Leland G., to University of Minnesota, Regents of the. Chest compression apparatus. 4,838,263, Cl. 128-30.200.

Washington State University Research Foundation, Inc.: *See—*
Pellerin, Roy F.; and Ross, Robert J., 4,838,085, Cl. 73-597.000.

Watanabe, Hiroyuki: *See—*
Sakami, Yasuo; Okina, Shigetaka; Tsubouchi, Junichi; Izaki, Shozo; Fukushima, Toshitaka; Watanabe, Hiroyuki; and Ishizaki, Masao, 4,839,854, Cl. 364-900.000.

Watanabe, Tohru: *See—*
Homma, Satoshi; and Watanabe, Tohru, 4,839,506, Cl. 235-379.000.

Watanabe, Toshiki; and Honda, Toshiharu, to Nippon Seiko Kabushiki Kaisha. Multi-disk fluid viscosity type auto-tensioner. 4,838,839, Cl. 474-135.000.

Watanabe, Yasushi; Kawaguchi, Masahiro; Suzuki, Shinichi; and Nakai, Tatsuya, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Variable displacement vane compressor. 4,838,740, Cl. 417-295.000.

Watari, Masao, to NEC Corporation. Orthogonal transformer and apparatus operational thereby. 4,839,844, Cl. 364-727.000.

Watercolour Bath Products, Inc.: *See—*
Champion, Clive A., 4,839,394, Cl. 521-55.000.

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Holtkamp, Reinhold, Sr. African violet plant named Improved Florida. 6,845, 6-13-89, Cl. 69.000.
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Holtkamp, Reinhold, Sr. African violet plant named Harlequin. 6,847, 6-13-89, Cl. 69.000.
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Hrebeniuk, Alexander. Distinct variety of Poinsettia named H420C. 6,853, 6-13-89, Cl. 86.000.
Van Wingerden, Rene, to California Plant Company. Chrysanthemum named California Moneymaker. 6,851, 6-13-89, Cl. 74.000.
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691 4,838,277
697 4,838,278
721 4,838,279
751 4,838,280
752 4,838,281
754 4,838,282
777 4,838,283
898 4,838,284

CLASS 131

259 4,838,285
360 4,838,286

CLASS 134

1 4,838,287
7 4,838,945
4,838,946
4,838,947
8 4,838,948
32 4,838,949
110 4,838,288
153 4,838,289

CLASS 135

25 R 4,838,290
68 4,838,291
100 4,838,292
4,838,293
102 4,838,294

CLASS 136

244 4,838,950
251 4,838,951
256 4,838,952

CLASS 137

9 4,838,295
78.3 4,838,296
99 4,838,297
110 4,838,298
203 4,838,299
224 4,838,300
240 4,838,301
355.12 4,838,302
423 4,838,303
454.6 4,838,304
505.13 4,838,305
522 4,838,306
554 4,838,309
574 4,838,307
596.16 4,838,308
624 14 4,838,310
624.2 4,838,311
625.24 4,838,314
625.3 4,838,953
625.48 4,838,312
625.65 4,838,313
4,838,954
899.3 4,838,315

CLASS 138

30 4,838,316
135 4,838,317
166 4,838,318

CLASS 139

20 4,838,321
116 R 4,838,319
351 4,838,320

CLASS 140

112 4,838,322

CLASS 141

1 4,838,323
64 4,838,324
90 4,838,325
114 4,838,327
147 4,838,326

CLASS 144

336 4,838,328

CLASS 148

2 4,838,955
3 4,838,956
11.5 A 4,838,958
11.5 C 4,838,959
12.4 4,838,961
135 4,838,960
260 4,838,957
304 4,838,962
328 4,838,963

CLASS 152

210 4,838,329
537 4,838,330

CLASS 156

64 4,838,968
73.1 4,838,964
83 4,838,965
117 4,838,966
145 4,838,967
160 4,838,969
169 4,838,970
173 4,838,971
175 4,838,972
212 4,838,973
222 4,838,974
245 4,838,976
252 4,838,977
345 4,838,978
4,838,979
497 4,838,980
515 4,838,981
520 4,838,982
522 4,838,985
564 4,838,975
574 4,838,986
613 4,838,983
624 4,838,988
626 4,838,987
628 4,838,989
643 4,838,984
4,838,990
4,838,991
4,838,992
4,838,993
4,838,994

CLASS 160

36 4,838,331
84.1 4,838,335
90 4,838,332
305 4,838,333
370.2 4,838,334

CLASS 162

18 4,838,995
352 4,838,996

CLASS 164

4.1 4,838,336
46 4,838,337
113 4,838,338
340 4,838,339
455 4,838,340
463 4,838,341

CLASS 165

10 4,838,342
47 4,838,343
48.1 4,838,344
4,838,345
104 14 4,838,346
185 4,838,347

CLASS 166

136 4,838,348
187 4,838,349
274 4,838,350
280 4,838,351
291 4,838,352
311 4,838,354
369 4,838,353
375 4,838,355

CLASS 169

66 4,838,356

CLASS 172

43 4,838,357
123 4,838,359
125 4,838,358
176 4,838,360

CLASS 173

12 4,838,361
36 4,838,362
139 4,838,363
170 4,838,364

CLASS 174

84 R 4,839,470
92 4,839,471
4,839,472
138 F 4,839,473

CLASS 175

371 4,838,365
410 4,838,366

CLASS 177

25.15 4,838,367
25.18 4,838,368
210 FP 4,838,369
4,838,370
4,838,371
211 4,838,372

CLASS 180

9.46 4,838,373
140 4,838,374
142 4,838,375
4,838,376
287 4,838,377

CLASS 181

122 4,838,379
291 4,838,380

CLASS 182

2 4,838,381
138 4,838,382

CLASS 186

59 4,838,383

CLASS 187

101 4,838,385
125 4,838,384

CLASS 188

24.12 4,838,386
24.21 4,838,387
65.1 4,838,388
78 4,838,389
79.55 4,838,390
171 4,838,391
277 4,838,392
284 4,838,393
299 4,838,394
378 4,838,395

CLASS 190

18 A 4,838,396

CLASS 192

0.044 4,838,397
45 4,838,398
53 F 4,838,399
56 R 4,838,400
64 4,838,401
98 4,838,402
141 4,838,403

CLASS 194

212 4,838,404
318 4,838,405
346 4,838,406

CLASS 198

406 4,838,407
434 4,838,408
497 4,838,409
706 4,838,410
774 4,838,411
838 4,838,412

CLASS 200

5 A 4,839,474
5 R 4,839,475
17 R 4,839,476
50 AA 4,839,477
52 R 4,839,478
61.45 R 4,839,479
86 A 4,839,480
144 B 4,839,481
148 B 4,839,482
302.1 4,839,483

CLASS 203

92 4,838,997
96 4,838,998

CLASS 204

1 T 4,838,999
4,839,000
11 4,839,001
58 4,839,002
98 4,839,003
128 4,839,004
129.46 4,839,005
130 4,839,006
149 4,839,007
157.15 4,839,008
157.48 4,839,009
192.28 4,839,010
192.38 4,839,011
255 4,839,012
258 4,839,013
265 4,839,014
290 R 4,839,015
299 R 4,839,016
403 4,839,017
425 4,839,018
4,839,019
431 4,839,020

CLASS 206

5.1 4,838,413
175 4,838,414
216 4,838,415
315.2 4,838,416
318 4,838,417
386 4,838,418
4,838,419
387 4,838,420
4,838,421
444 4,838,422
454 4,838,423
459 4,838,424
531 4,838,425
574 4,838,426
586 4,838,427
603 4,838,428
605 4,838,429
624 4,838,430
631 4,838,431
632 4,838,432

CLASS 208

13 4,839,021
4,839,022
4,839,023
64 4,839,024
111 4,839,025
120 4,839,026
138 4,839,027
216 PP 4,839,028
251 R 4,839,029
403 4,839,030

CLASS 209

2 4,839,031
3 4,838,433
4,839,032
4 4,839,033
44 4,839,034
164 4,838,434
300 4,839,035
315 4,839,036
555 4,838,435

CLASS 210

97 4,839,037
137 4,839,038
143 4,839,039
167 4,839,040
168 4,839,041
194 4,839,042
195.1 4,839,043
222 4,839,044
228 4,839,045
335 4,839,059
355 4,839,046
356 4,839,047
450 4,839,048
510.1 4,839,049
540 4,839,050
602 4,839,051
603 4,839,052
616 4,839,053
639 4,839,054
641 4,839,055
643 4,839,056
667 4,839,057
670 4,839,058
731 4,839,060
743 4,839,061
776 4,839,062
780 4,839,063
806 4,839,064

CLASS 211

51 4,838,436

CLASS 212

71 4,838,437
159 4,838,438
254 4,838,439

CLASS 215

216 4,838,441
228 4,838,442

CLASS 219

10.55 A 4,839,485
4,839,494
10.55 E 4,839,484
10.55 R 4,839,486
69.12 4,839,487
69.18 4,839,488
74 4,839,489
4,839,490
117.1 4,839,491
121.39 4,839,499
121.48 4,839,492
121.63 4,839,495
4,839,496
121.69 4,839,493
121.71 4,839,497
213 4,839,500
237 4,839,501
311 4,839,498
401 4,839,502
497 4,839,503

CLASS 220

1 B 4,838,443
4 E 4,838,444
5 A 4,838,449
22.3 4,838,445
85 R 4,838,446
89 A 4,838,447
257 4,838,448
270 4,838,450
401 4,838,451

CLASS 221

1 4,838,452
2 4,838,453
57 4,838,454
82 4,838,455

CLASS 222

1 4,838,456
48 4,838,457
135 4,838,458
136 4,838,459
153 4,838,460
259 4,838,461
377 4,838,462
465.1 4,838,463
478 4,838,464
526 4,838,465

CLASS 224

250 4,838,466
326 4,838,467

CLASS 226

76 4,838,468

CLASS 227

67 4,838,469
120 4,838,470
142 4,838,471

CLASS 228

4.5 4,838,472
45 4,838,473
121 4,838,474
179 4,838,475
180.1 4,838,476
222 4,838,477
223 4,838,478

CLASS 229

52 B 4,838,479

CLASS 232

43.3 4,838,480

CLASS 235

379 4,839,504
4,839,506
381 4,839,505
4,839,507
477 4,839,508
482 4,839,509

CLASS 236

1 G 4,838,481
11 4,838,482
49.3 4,838,484
49.5 4,838,483

CLASS 239

70 4,838,485
117 4,838,486
223 4,838,487
284 1 4,838,488
310 4,838,489
333 4,838,490
690 4,838,491
752 4,838,492

CLASS 241

101.7 4,838,493
226 4,838,494

CLASS 242

55 4,838,495
67.1 R 4,838,496
67.2 4,838,497
75.51 4,838,498
107 4,838,499
158 R 4,838,500

CLASS 244

29 4,838,501
49 4,838,502
214 4,838,503

CLASS 248

100 4,838,504
176 4,838,505
188 4,838,440
200 4,838,506
230 4,838,507
346 4,838,508
393 4,838,509
397 4,838,510
429 4,838,511
503 4,838,512
503.1 4,838,513
577 4,838,514
661 4,838,515

CLASS 250

211 J 4,839,510
211 R 4,839,511
227 4,839,515
231 P 4,839,512
237 R 4,839,514
255 4,839,516
325 4,839,517
337 4,839,518
390.01 4,839,519
396 R 4,839,520
453.1 4,839,521
455.1 4,839,522
492.2 4,839,523
504 R 4,839,513
505.1 4,839,524
560 4,839,525
561 4,839,526
573 4,839,527
574 4,839,528
4,839,529

CLASS 251

77 4,838,516
129.16 4,838,517
4,838,518
129.21 4,838,519
204 4,838,520

CLASS 252

8.514 4,839,095
8.515 4,839,096
8.7 4,839,075
8.75 4,839,066
11 4,839,067
33.6 4,839,068
42.7 4,839,094
45 4,839,069
51.5 A 4,839,070
4,839,071
4,839,072
4,839,073
56 D 4,839,074
90 4,839,076
98 4,839,077
99 4,839,078
104 4,839,079
107 4,839,080
108 4,839,081
174.11 4,839,083
174.12 4,839,082
174.21 4,839,084
181.6 4,839,085
182.27 4,839,087
182.3 4,839,086
183.11 4,839,089
183.13 4,839,088
299.63 4,839,091
301.4 H 4,839,090
301.4 S 4,839,092
314 4,839,093
520 4,839,097
557 4,839,098
603 4,839,065
607 4,839,099
626 4,839,100
627 4,839,101
628 4,839,102

643 4,839,103

CLASS 254

131 4,838,521
337 4,838,522

CLASS 256

13.1 4,838,523
24 4,838,524
26 4,838,525

CLASS 260

396 R 4,839,104
502.4 R 4,839,105

CLASS 261

28 4,839,106
82 4,839,107
97 4,839,108

CLASS 264

1.4 4,839,109
2.2 4,839,110
4.6 4,839,111
22 4,839,112
4,839,123
28 4,839,113
40.4 4,839,114
42 4,839,115
45.3 4,839,116
46.4 4,839,117
46.5 4,839,118
66 4,839,119
102 4,839,120
114 4,839,121
129 4,839,122
134 4,839,132
171 4,839,133
211 4,839,124
216 4,839,125
235 4,839,129
4,839,130
328.1 4,839,128
339 4,839,126
526 4,839,127

CLASS 266

80 4,838,526

CLASS 267

64.28 4,838,527
103 4,838,528
140.1 4,838,529

CLASS 269

15 4,838,530
21 4,838,531
23 4,838,532
310 4,838,533

CLASS 271

10 4,838,534
18.3 4,838,536
22 4,838,535
238 4,838,538
277 4,838,537
305 4,838,539

CLASS 272

1 B 4,838,540
27 N 4,838,541
67 4,838,542
70 4,838,543
73 4,838,544
117 4,838,545
119 4,838,546
134 4,838,547
4,838,548

CLASS 273

1 GG 4,838,553
1.5 A 4,838,549
86 R 4,838,550
138 A 4,838,552
143 R 4,838,554
157 R 4,838,551
167 A 4,838,555
220 4,838,556
237 4,838,557
395 4,838,558

CLASS 277

3 4,838,559
42 4,838,560

CLASS 279

1 DA 4,838,561
106 4,838,562

CLASS 280

1.5 4,838,565
11.28 4,838,564
149.2 4,838,566
4,838,578
163 4,838,567
234 4,838,568
275 4,838,569
507 4,838,570
608 4,838,571
609 4,838,572
661 4,838,573
707 4,838,574
748 4,838,575
777 4,838,576
804 4,838,577
808 4,838,378
840 4,838,563

CLASS 283

48.1 4,838,579
56 4,838,580

CLASS 285

47 4,838,581
110 4,838,582
354 4,838,583
419 4,838,584

CLASS 292

8 4,838,585
113 4,838,586
216 4,838,587
4,838,588
258 4,838,589
336.3 4,838,590
341.16 4,838,591

CLASS 293

109 4,838,592
126 4,838,593

CLASS 294

51 Re.32,948
86.18 4,838,594
90 4,838,595
137 4,838,596

CLASS 296

36 4,838,597
37.9 4,838,599
50 4,838,598
97.8 4,838,600
100 4,838,602
128 4,838,601
180.1 4,838,603
180.5 4,838,604
182 4,838,605
188 4,838,606
219 4,838,607

CLASS 297

27 4,838,608
225 4,838,610
277 4,838,609
338 4,838,612
391 4,838,611
452 4,838,613

CLASS 299

15 4,838,614
73 4,838,615

CLASS 301

10 R 4,838,616

CLASS 303

6.1 4,838,617
66 4,838,618
114 4,838,619
115 4,838,621
4,838,622
116 4,838,620

CLASS 305

58 PC 4,838,623

CLASS 307

10.1 4,839,530
10.3 4,839,532
17 4,839,531
140 4,839,533
269 4,839,534
296.7 4,839,535
425 4,839,536
446 4,839,537
456 4,839,538
465 4,839,539
473 4,839,540
481 4,839,541
520 4,839,542

CLASS 310

12 4,839,543
4,839,544
4,839,545
4,839,546
60 A 4,839,547
67 A 4,839,548
68 E 4,839,549
90 4,839,551
90.5 4,839,550
268 4,839,552

CLASS 312

221 4,828,624
252 4,838,625
333 4,838,626
341 R 4,838,627

CLASS 313

111 4,839,553
408 4,839,556
446 4,839,554
493 4,839,555
509 4,839,557
510 4,839,558
579 4,839,559
628 4,839,560

CLASS 315

4 4,839,561
149 4,839,562
169.3 4,839,563
169.4 4,839,564
209 R 4,839,565
224 Re.32,953
344 4,839,567
368 4,839,568
383 4,839,569

CLASS 318

603 4,839,572
615 4,839,573

CLASS 320

3 4,839,574

CLASS 322

25 4,839,575
4,839,576

CLASS 323

316 4,839,577

CLASS 324

57 Q 4,839,602
58 B 4,839,578
63 4,839,579
65 R 4,839,580
72 4,839,581
77 B 4,839,582
4,839,583
103 P 4,839,584
127 4,839,600
158 D 4,839,588
158 F 4,839,586
4,839,587
158 MG 4,839,585
166 4,839,589
208 4,839,590
4,839,591
227 4,839,592
240 4,839,593
318 4,839,594
4,839,595
322 4,839,596
433 4,839,597
539 4,839,598
542 4,839,599
559 4,839,601

CLASS 328

14 4,839,603
62 4,839,604
146 4,839,605

CLASS 329

107 4,839,606

CLASS 330

5.5 4,839,607
149 4,839,608
253 4,839,609
278 4,839,610
284 4,839,611
302 4,839,612

CLASS 331

69 4,839,613

CLASS 332

7.51 4,839,614
18 4,839,615

CLASS 333

32 4,839,616
174 4,839,617
191 4,839,618

CLASS 335

125 4,839,619
219 4,839,620
277 4,839,621

CLASS 336

92 4,839,622
213 4,839,623
4,839,624

CLASS 337

166 4,839,625
377 4,839,626

CLASS 338

174 4,839,627

CLASS 340

311.1 4,839,628
468 4,839,629
541 4,839,631
550 4,839,632
574 4,839,630
606 4,839,571
661 4,839,633
712 4,839,634
752 4,839,635
4,839,636
775 4,839,637
784 4,839,638
825.31 4,839,640
825.44 4,839,639
825.47 4,839,641
825.54 4,839,642
825.91 4,839,643
854 4,839,644
870.17 4,839,645
870.30 4,839,646
907 4,839,647
933 4,839,648

CLASS 341

65 4,839,649
118 4,839,650
120 4,839,651
122 4,839,652
157 4,839,653

CLASS 342

22 4,839,654
93 4,839,655
190 4,839,657
357 4,839,656
455 4,839,658

CLASS 343

700 MS 4,839,659
715 4,839,660
719 4,839,661
771 4,839,662
4,839,663

CLASS 346

1.1 4,839,664
4,839,665
75 4,839,666
76 PH 4,839,667
136 4,839,674
140 R 4,839,668
4,839,669
153.1 4,839,670
159 4,839,671
160 4,839,672
160.1 4,839,673

CLASS 350

1.6 4,838,628
4,838,629
3.7 4,838,630
6.6 4,838,631
6.91 4,838,632
96.11 4,838,633
96.12 4,838,634
96.16 4,838,636
96.18 4,838,637
96.19 4,838,638
96.20 4,838,639
4,838,640
4,838,641
96.21 4,838,635
96.23 4,838,642
96.27 4,838,643
96.33 4,838,644
162.13 4,838,645
162.23 4,838,648
166 4,838,646
169 4,838,647
174 4,838,649
247 4,838,650
280 4,838,651
331 R 4,838,652
4,838,653
332 4,838,654
333 4,838,655
335 4,838,656
336 4,838,657
4,838,659
337 4,838,660
339 F 4,838,658
339 R 4,838,661
345 4,838,662
350 F 4,838,663
350 S 4,838,664
351 4,838,665
418 4,838,666
427 4,838,667
4,838,668
4,838,669
432 4,838,670
516 4,838,671
537 4,838,672

CLASS 351

44 4,838,673
169 4,838,674
4,838,675
202 4,838,676
203 4,838,677
205 4,838,678
4,838,679
206 4,838,680
210 4,838,681
212 4,838,682
221 4,838,683
239 4,838,684

CLASS 352

85 4,838,685

CLASS 353

98 4,838,686

CLASS 354

76 4,839,675
86 4,839,676
195.1 4,839,677
217 4,839,678
233 4,839,680
234.1 4,839,679
286 4,839,681
312 4,839,682
322 4,839,683
327 4,839,684
403 4,839,685
416 4,839,686
4,839,687

CLASS 355

55 4,839,699
202 4,839,689
208 4,839,694
211 4,839,690
4,839,692
218 4,839,695
4,839,696
234 4,839,693
243 4,839,698
253 4,839,688
260 4,839,691
309 4,839,697

CLASS 356

28.5 4,838,687
72 4,838,688
73.1 4,838,689
4,838,690
319 4,838,691
343 4,838,692
356 4,838,693
357 4,838,694
369 4,838,695
375 4,838,696
406 4,838,697
437 4,838,698

CLASS 357

2 4,839,700
4,839,701
16 4,839,702
22 4,839,703
23.3 4,839,704
23.5 4,839,705
23.7 4,839,707
26 4,839,708
30 4,839,706
4,839,709
45 4,839,710
51 4,839,711
4,839,712
70 4,839,713
71 4,839,714
4,839,715
74 4,839,716
4,839,717

CLASS 358

12 4,839,720
22 4,839,718
80 4,839,721
4,839,722
98 4,839,723
138 4,839,724
160 4,839,725
166 4,839,726
167 4,839,727
183 4,839,728
213.16 4,839,729
213.22 4,839,734
213.31 4,839,735
253 4,839,736
254 B1 4,647,980
257 4,839,737
261.2 4,839,738
282 4,839,739
288 4,839,740
293 4,839,741
294 4,839,730
296 4,839,731
4,839,742
4,839,732
304 4,839,733
310 4,839,743
320 4,839,744
336 4,839,745
341 4,839,733
342 4,839,746
4,839,747

CLASS 360

10.1 4,839,748
12 4,839,749
48 4,839,750
4,839,753
60 4,839,751
69 4,839,752
73.01 4,839,754
96.3 4,839,759
97.01 4,839,760
98.08 4,839,764
99.05 4,839,757
99.06 4,839,758
103 4,839,761
105 4,839,756
107 4,839,762
126 4,839,763
133 4,839,765
4,839,766

CLASS 361

42 4,839,767
56 4,839,768
84 4,839,769
93 4,839,770
218 4,839,771
256 4,839,772
321 4,839,773
383 4,839,774
402 4,839,775

CLASS 362

31 4,839,776
108 4,839,777
150 4,839,778
214 4,839,779
265 4,839,780
299 4,839,781
363 4,839,782
374 4,839,783
393 4,839,784
418 4,839,785

CLASS 363

52 4,839,786
60 4,839,787
63 4,839,788

CLASS 364

142 4,839,789
184 4,839,790
200 4,839,791
4,839,792
4,839,793
4,839,794
4,839,795
4,839,796
4,839,797
4,839,798
4,839,799
4,839,800
4,839,801
4,839,802
403 4,839,803
408 4,839,804
413.02 4,839,806
4,839,809
413.13 4,839,807
413.14 4,839,805
413.24 4,839,808
419 4,839,810
424.03 4,839,811
424.04 4,839,812
464.03 4,839,813
469 4,839,814
470 4,839,815
474.09 4,839,816
474.32 4,839,817
477 4,839,818
483 4,839,819
491 4,839,820
4,839,821
513 4,839,822
4,839,823
516 4,839,824
518 4,839,825
4,839,826
4,839,827
4,839,828
519 4,839,829
550 4,839,831
551.01 4,839,830
552 4,839,832
562 4,839,833
565 4,839,834
567 4,839,835
582 4,839,836
708 4,839,837
709.11 4,839,838
715.08 4,839,839

4,839,840
717 4,839,841
721 4,839,842
724.11 4,839,843
727 4,839,844
736 4,839,845
748 4,839,846
754 4,839,847
757 4,839,848
784 4,839,849
787 4,839,850
900 4,839,851
4,839,852
4,839,853
4,839,854
4,839,855
4,839,856

CLASS 365

87 4,839,858
100 4,839,859
104 4,839,860
113 4,839,861
154 4,839,862
4,839,863
200 4,839,864
201 4,839,865
221 4,839,866
222 4,839,867
230.06 4,839,868

CLASS 366

2 4,838,699
89 4,838,700
136 4,838,701
149 4,838,702
169 4,838,703
307 4,838,704

CLASS 367

53 4,839,869
83 4,839,870
132 4,839,871
133 4,839,873
180 4,839,872

CLASS 368

76 4,839,874

CLASS 369

14 4,839,875
25 4,839,857
32 4,839,876
48 4,839,877
54 4,839,878
4,839,879
75.2 4,839,880
4,839,881
275 4,839,882
286 4,839,883

CLASS 370

3 4,839,884
4 4,839,885
4,839,886
60 4,839,887
68.1 4,839,888
70 4,839,889
84 4,839,890
94 4,839,891
95 4,839,892
100 4,839,893
123 4,839,894

CLASS 371

16 4,839,895
37 4,839,896
38 4,839,755
68 4,839,897

CLASS 372

6 4,839,898
45 4,839,899
46 4,839,900
49 4,839,901
70 4,839,902
94 4,839,903

CLASS 373

10 4,839,904

CLASS 374

14 4,838,705
54 4,838,706
171 4,838,707

CLASS 375

12 4,839,905
37 4,839,906
104 4,839,908
113 4,839,907

CLASS 376

202 4,839,133
216 4,839,134
254 4,839,135
260 4,839,137
462 4,839,136

CLASS 377

24.1 4,839,909
28 4,839,910
57 4,839,911
119 4,839,912

CLASS 378

44 4,839,913
61 4,839,914
105 4,839,915

CLASS 379

13 4,839,916
45 4,839,917
61 4,839,918
96 4,839,919
377 4,839,920
428 4,839,921

CLASS 380

15 4,839,922

CLASS 381

31 4,839,923

CLASS 383

5 4,838,708
18 4,838,709

CLASS 384

100 4,838,710
215 4,838,711
523 4,838,712

CLASS 388

815 4,839,570

CLASS 400

120 4,838,713
124 4,838,714
196.1 4,838,715
206 4,838,716
234 4,838,718
322 4,838,717
618 4,838,719
642 4,838,720

CLASS 401

53 4,838,721
101 4,838,722
199 4,838,723

CLASS 402

79 4,838,724

CLASS 403

322 4,838,725
397 4,838,726

CLASS 404

2 4,838,727
89 4,838,728
90 4,838,729
114 4,838,730

CLASS 405

40 4,838,731
52 4,838,732
129 4,838,733
176 4,838,734
220 4,838,735
224 4,838,736
230 4,838,737

CLASS 406

14 4,838,738

CLASS 407

42 4,838,739

CLASS 409

131 4,838,741
4,838,742

CLASS 410

9 4,838,743
53 4,838,744
121 4,838,745

CLASS 411

504 4,838,746

CLASS 414

277 4,838,749
300 4,838,750
412 4,838,751
421 4,838,752
563 4,838,753
607 4,838,754
699 4,838,755
4,838,756
790.3 4,838,747
796.7 4,838,748

CLASS 415

4.4 4,838,757
140 4,838,758
143 4,838,759

CLASS 416

93 R 4,838,760
170 R 4,838,761
187 4,838,762

CLASS 417

63 4,838,763
203 4,838,765
222 4,838,766
295 4,838,740
299 4,838,767
308 4,838,768
312 4,838,769
343 4,838,770
417 4,838,771

CLASS 418

13 4,838,772
55 4,838,773
170 4,838,764

CLASS 419

6 4,839,138
35 4,839,139

CLASS 420

445 4,839,140
587 4,839,141

CLASS 422

21 4,839,142
98 4,839,143
245 4,839,145
305 4,839,144

CLASS 423

213.5 4,839,146
235 4,839,147
239 4,839,148
251 4,839,149
345 4,839,150
449 4,839,151
478 4,839,152
488 4,839,153
544 4,839,154

CLASS 424

1.1 4,839,155
53 4,839,156
4,839,157
54 4,839,158
59 4,839,159
4,839,160
4,839,161
63 4,839,162
4,839,163
64 4,839,164
70 4,839,165
71 4,839,166
4,839,167
74 4,839,168
94.3 4,839,169
94.64 4,839,170
101 4,839,171
105 4,839,172
447 4,839,174
450 4,839,175
465 4,839,176
482 4,839,177
663 4,839,173

CLASS 425

66 4,838,774
67 4,838,775
112 4,838,776
114 4,838,777
133.1 4,838,778
330 Re.32,949
331 4,838,779

CLASS 426

19 4,839,178
98 4,839,179
115 4,839,180
237 4,839,181
242 4,839,182
274 4,839,183
307 4,839,184
512 4,839,185
523 4,839,186
542 4,839,187
545 4,839,188
600 4,839,189
603 4,839,190
607 4,839,191
4,839,192
633 4,839,193

CLASS 427

2 4,839,194
38 4,839,195
53.1 4,839,196
116 4,839,197
137 4,839,198
185 4,839,199
244 4,839,203
265 4,839,200
355 4,839,201
424 4,839,202

CLASS 428

34.1 4,839,205
40 4,839,206
64 4,839,207
4,839,208
68 4,839,209
77 4,839,210
89 4,839,211
96 4,839,212
114 4,839,213
116 4,839,214
131 4,839,215
134 4,839,216
156 4,839,217
212 4,839,218
220 4,839,219
4,839,233
258 4,839,220
283 4,839,221
290 4,839,222
317.1 4,839,223
323 4,839,224
336 4,839,225
4,839,226
343 4,839,227
349 4,839,234
358 4,839,204
401 4,839,228
413 4,839,229
423.1 4,839,230
441 4,839,231
473.5 4,839,232
576 4,839,236
610 4,839,237
614 4,839,238
623 4,839,239
635 4,839,240
659 4,839,241
660 4,839,242
690 4,839,243
694 4,839,244
698 4,839,245

CLASS 429

12 4,839,246
21 4,839,247
49 4,839,248
194 4,839,249

CLASS 430

1 4,839,250
5 4,839,251
59 4,839,252
137 4,839,255
175 4,839,254
190 4,839,253
192 4,839,256
207 4,839,257
264 4,839,258
4,839,259
281 4,839,260
4,839,274
313 4,839,261
379 4,839,262
384 4,839,263
505 4,839,264
522 4,839,265
524 4,839,266
546 4,839,267
567 4,839,268
570 4,839,269
583 4,839,270
596 4,839,271
617 4,839,272
634 4,839,273

CLASS 431

125 4,838,781
129 4,839,308
166 4,838,782
284 4,838,783

CLASS 432

58 4,838,784
121 4,838,785

CLASS 433

9 4,838,786
14 4,838,787
32 4,838,788
171 4,838,789
219 4,838,790

CLASS 434

116 4,838,791
126 Re.32,950
163 4,838,792
168 4,838,793
187 4,838,794
224 4,838,796
274 4,838,795

CLASS 435

7 4,839,275
4,839,276
21 4,839,277
4,839,278
25 4,839,279
34 4,839,281
61 4,839,282
68 4,839,283
4,839,284
87 4,839,285
108 4,839,286
135 4,839,287
235 4,839,288
240.23 4,839,290
240.27 4,839,289
285 4,839,280
296 4,839,291
313 4,839,292
320 4,839,293

CLASS 436

71 4,839,294
86 4,839,295
170 4,839,296
4,839,297
175 4,839,298
500 4,839,299

CLASS 437

29 4,839,301
31 4,839,302
4,839,303
39 4,839,304
41 4,839,305
4,839,310
67 4,839,306
002 4,839,300
129 4,839,307
160 4,839,309
228 4,839,311
233 4,839,312

CLASS 439

38 4,838,797
61 4,838,798
70 4,838,799
78 4,838,800
83 4,838,801
98 4,838,802
155 4,838,809
164 4,838,803
321 4,838,805
325 4,838,804
341 4,838,806
347 4,838,807
357 4,838,808
358 4,838,810
607 4,838,811
610 4,838,812
620 4,838,813
4,838,814
841 4,838,815
861 4,838,816

CLASS 440

6 4,838,817
4,838,818
40 4,838,821
47 4,838,819
86 4,838,822
87 4,838,820

CLASS 441

3 4,838,823
64 4,838,824

CLASS 446

136 4,838,825
141 4,838,826
327 4,838,827
446 4,838,828

CLASS 464

38 4,838,829
69 4,838,830
88 4,838,831
162 4,838,832
181 4,838,833

CLASS 474

11 4,838,834
13 4,838,835
28 4,838,836
80 4,838,837
113 4,838,838
135 4,838,839
138 4,838,840
190 4,838,841
192 4,838,842
205 4,838,843
240 4,838,844
242 4,838,845

CLASS 493

132 4,838,846
133 4,838,847
414 4,838,848

CLASS 494

85 4,838,849

CLASS 501

14 4,839,313
78 4,839,314
87 4,839,315
89 4,839,316
108 4,839,317

CLASS 502

53 4,839,330
62 4,839,318
64 4,839,319
66 4,839,320
127 4,839,321
159 4,839,322
4,839,323
160 4,839,324
170 4,839,325
220 4,839,326
243 4,839,327
334 4,839,328
339 4,839,329
416 4,839,331

CLASS 503

212 4,839,332
218 4,839,333
221 4,839,334
224 4,839,335
227 4,839,336
4,839,337
4,839,338

CLASS 505

1 4,839,339

CLASS 512

9 4,839,340

CLASS 514

4 4,839,341
11 4,839,342
12 4,839,343
16 4,839,344
19 4,839,387
21 4,839,345
34 4,839,346
53 4,839,347
89 4,839,348
92 4,839,349
202 4,839,350
206 4,839,351
210 4,839,352
212 4,839,353
224.5 4,839,355
226.5 4,839,354
227.2 4,839,356
235.8 4,839,357
237.8 4,839,358
241 4,839,359
252 4,839,360
4,839,361
277 4,839,384
283 4,839,362
288 4,839,363
290 4,839,364
301 4,839,365
312 4,839,366
4,839,367
313 4,839,368
314 4,839,369
328 4,839,370
345 4,839,371
352 4,839,372
367 4,839,373
394 4,839,374
397 4,839,375
406 4,839,376
415 4,839,377
417 4,839,378
421 4,839,379
444 4,839,381
453 4,839,382
456 4,839,383
473 4,839,385
492 4,839,386
530 4,839,388
724 4,839,389
746 4,839,390

CLASS 517

424 4,839,380

CLASS 518

712 4,839,391

CLASS 521

45 4,839,392
53 4,839,393
55 4,839,394
56 4,839,395
88 4,839,396
159 4,839,397
183 4,839,398

CLASS 522

14 4,839,399
4,839,400
4,839,401

CLASS 523

200 4,839,402
412 4,839,403

CLASS 524

69 4,839,404
99 4,839,405
100 4,839,408
179 4,839,409
196 4,839,406
281 4,839,410
389 4,839,407
424 4,839,411
436 4,839,412
460 4,839,413
507 4,839,414
549 4,839,415
558 4,839,416
833 4,839,417

CLASS 525

53 4,839,418
54.1 4,839,419
61 4,839,420
67 4,839,421
74 4,839,422
80 4,839,423
92 4,839,424
4,839,425
146 4,839,426
162 4,839,427
215 4,839,428
232 4,839,429
280 4,839,430
298 4,839,431
303 4,839,432
329.3 4,839,433
350 4,839,434
391 4,839,435
397 4,839,436
426 4,839,437
440 4,839,438
474 4,839,443
481 4,839,444
503 4,839,445
504 4,839,446

CLASS 526

203 4,839,439
225 4,839,447
238.2 4,839,449
262 4,839,440
4,839,448

CLASS 527

313 4,839,450

CLASS 528

10 4,839,451
15 4,839,452
18 4,839,453
28 4,839,455
32 4,839,454
33 4,839,456
86 4,839,457
89 Re.32,951
196 4,839,458
220 4,839,459
230 4,839,460
328 4,839,441
363 4,839,461
370 4,839,462
422 4,839,442
499 4,839,463

CLASS 530

326 4,839,464
330 4,839,465
395 4,839,466

CLASS 534

10 4,839,467
604 4,839,468
637 4,839,469

CLASS 562

450 Re.32,952

CLASS 600

14 4,838,850

CLASS 604

1 4,838,851
4 4,838,852
6 4,838,861
22 4,838,853
49 4,838,854
4,838,855
65 4,838,856
67 4,838,857
83 4,838,858
95 4,838,859
100 4,838,864
110 4,838,863
118 4,838,865
152 4,838,860
4,838,866
180 4,838,867
4,838,868
4,838,878
187 4,838,870
192 4,838,871
195 4,838,869
262 4,838,874
4,838,875
265 4,838,876
272 4,838,877
280 4,838,879
4,838,880
4,838,881
283 4,838,873
286 4,838,882
319 4,838,872
349 4,838,883
364 4,838,884
385.1 4,838,885
392 4,838,886
891.1 4,838,887
892.1 4,838,862

CLASS 623

2 4,838,888
3 4,838,889
6 4,838,890
20 4,838,891

CLASSIFICATION OF DESIGNS

D2—	24	301,518		331	301,541		86	301,564			301,587		344	301,610		63	301,633
	190	301,519		347	301,542		152	301,565	D18—	4	301,588	D24—	1.1	301,611			301,634
	608	301,520		359	301,543		218	301,566			301,589		3	301,612		98	301,635
	609	301,521		382	301,544		220	301,567	D19—	77	301,590		17	301,613		113	301,636
D6—	315	301,522			301,545	D12—	11	301,568	D21—	11	301,591		30	301,614	D28—	2	301,637
	323	301,523	D9—	341	301,546		147	301,569		45	301,592		31	301,615		14	301,638
	324	301,524		415	301,547		148	301,570		54	301,593		35	301,616		60	301,639
	410	301,525		434	301,548		149	301,571		81	301,594		41	301,617		62	301,640
	433	301,526		435	301,549		196	301,572		84	301,595		62	301,618		79	301,641
		301,527		453	301,550		310	301,573		157	301,596		64	301,619		83	301,642
	446	301,528	D10—	6	301,551	D13—	1	301,574		195	301,597	D25—	50	301,620		85	301,643
	583	301,529		22	301,552		11	301,575		224	301,598			301,621	D29—	18	301,644
	585	301,530		69	301,553		30	301,576	D22—	112	301,599			301,622	D32—		301,645
D7—	5	301,531		82	301,554	D14—	53	301,577		135	301,600		119	301,623			301,646
	45	301,532		97	301,555		118	301,581		142	301,601		123	301,624		21	301,647
	104	301,533			301,556		143	301,582		199	301,602		124	301,625		22	301,648
	408	301,534		126	301,557		157	301,579	D23—	215	301,603			301,626			301,649
D8—	1	301,535			301,558		171	301,580		252	301,604	D26—	24	301,627	D34—	16	301,650
		301,536	D11—	2	301,559		248	301,578		255	301,605		28	301,628		20	301,651
	4	301,537		32	301,560	D15—	7	301,583		271	301,606			301,629		21	301,652
		301,538		45	301,561		12	301,584		282	301,607			301,630		24	301,653
	41	301,539		57	301,562		138	301,585		332	301,608		42	301,631		26	301,654
	98	301,540		84	301,563	D16—	131	301,586		543	301,609		61	301,632		31	301,655

CLASSIFICATION OF PLANTS

P.—	7	6,843		6,846		6,849	86	6,852		6,855		6,857
		6,844		6,847		6,850		6,853				
	69	6,845		6,848	74	6,851	88	6,854		6,856		6,858

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

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PATENTS

4,838,082 4,838,244 4,838,500 4,838,502 4,838,512 4,839,038
4,838,308 4,838,317 4,838,418 4,838,436 4,838,442 4,838,457
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01 :	301,548		301,63[illegible]		301,652	27	301,616		301,583	47 :	301,634
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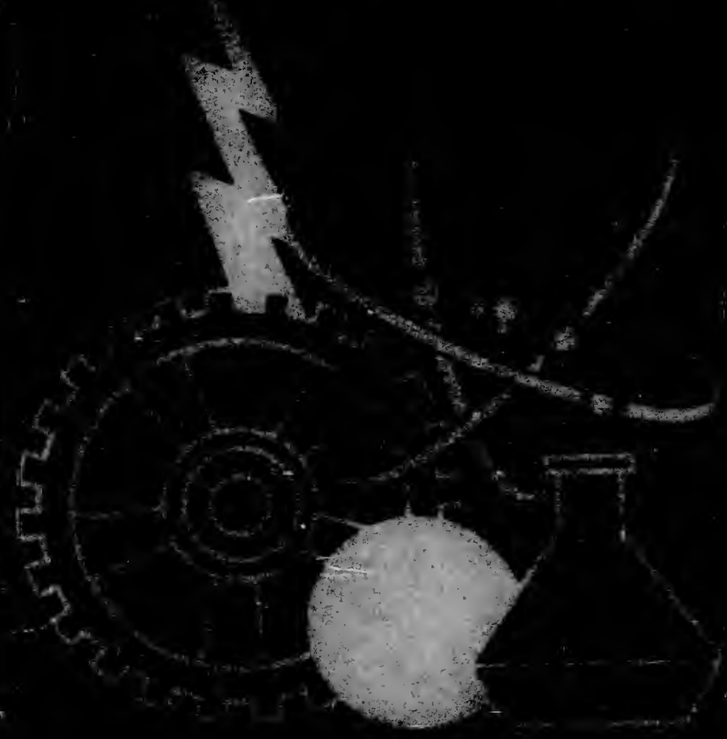

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Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1101 O.G. 56 on Apr. 25, 1989.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notices appearing in the Official Gazette at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

International PCT fees were changed on July 1, 1987 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 80 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

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—Corresponding prior U.S. national application filed:	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
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—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39.1	30.00	30.00

May 3, 1989. DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on June 17, 1986, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,594,734 through 4,596,052
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on June 15, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,334,325 through 4,335,470
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$ 245.00
By other than a small entity.....$ 490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small entity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED APRIL 2 ,1989
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,507,802	06/491077	04/02/85
4,507,804	06/555598	04/02/85
4,507,805	06/562034	04/02/85
4,507,813	06/525441	04/02/85
4,507,814	06/504898	04/02/85
4,507,818	06/402508	04/02/85
4,507,820	06/511523	04/02/85
4,507,830	06/506329	04/02/85
4,507,840	06/486524	04/02/85
4,507,864	06/403294	04/02/85
4,507,874	06/512355	04/02/85
4,507,879	06/467289	04/02/85
4,507,881	06/514934	04/02/85
4,507,884	06/576933	04/02/85
4,507,886	06/586854	04/02/85
4,507,888	06/493970	04/02/85
4,507,893	06/375000	04/02/85
4,507,896	06/445689	04/02/85
4,507,910	06/553840	04/02/85
4,507,911	06/417610	04/02/85
4,507,915	06/573542	04/02/85
4,507,919	06/379068	04/02/85
4,507,925	06/261650	04/02/85
4,507,931	06/625993	04/02/85
4,507,937	06/512664	04/02/85
4,507,947	06/518137	04/02/85
4,507,952	06/418058	04/02/85
4,507,965	06/422749	04/02/85
4,507,967	06/467136	04/02/85
4,507,968	06/481816	04/02/85
4,507,982	06/348115	04/02/85
4,507,983	06/462165	04/02/85
4,507,986	06/351266	04/02/85
4,507,987	06/501064	04/02/85
4,507,988	06/442729	04/02/85
4,507,989	06/438966	04/02/85
4,507,990	06/571196	04/02/85
4,507,994	06/492770	04/02/85
4,508,004	06/574430	04/02/85
4,508,008	06/375256	04/02/85
4,508,010	06/499235	04/02/85
4,508,016	06/530977	04/02/85
4,508,017	06/398237	04/02/85
4,508,019	06/362816	04/02/85
4,508,021	06/503722	04/02/85
4,508,022	06/444166	04/02/85
4,508,027	06/563081	04/02/85
4,508,038	06/506507	04/02/85
4,508,046	06/578170	04/02/85
4,508,051	06/429979	04/02/85
4,508,053	06/455828	04/02/85
4,508,054	06/550938	04/02/85
4,508,056	06/504875	04/02/85
4,508,060	06/570240	04/02/85
4,508,061	06/551938	04/02/85
4,508,080	06/531641	04/02/85
4,508,095	06/495507	04/02/85
4,508,098	06/452025	04/02/85
4,508,099	06/351018	04/02/85
4,508,115	06/479567	04/02/85
4,508,117	06/417478	04/02/85
4,508,129	06/425616	04/02/85
4,508,133	06/575633	04/02/85
4,508,134	06/618709	04/02/85
4,508,136	06/426375	04/02/85
4,508,144	06/555853	04/02/85
4,508,154	06/557328	04/02/85
4,508,164	06/533144	04/02/85
4,508,178	06/424302	04/02/85
4,508,184	06/498868	04/02/85
4,508,188	06/383104	04/02/85
4,508,192	06/479143	04/02/85
4,508,198	06/490199	04/02/85
4,508,199	06/436196	04/02/85
4,508,213	06/519034	04/02/85
4,508,215	06/485358	04/02/85
4,508,217	06/322968	04/02/85
4,508,221	06/303887	04/02/85
4,508,222	06/586338	04/02/85
4,508,224	06/306391	04/02/85

Patent Number	Serial Number	Issue Date
4,508,231	06/240515	04/02/85
4,508,233	06/479866	04/02/85
4,508,237	06/570762	04/02/85
4,508,238	06/398098	04/02/85
4,508,239	06/471052	04/02/85
4,508,248	06/402894	04/02/85
4,508,250	06/483763	04/02/85
4,508,252	06/304214	04/02/85
4,508,272	06/425503	04/02/85
4,508,274	06/551890	04/02/85
4,508,278	06/523065	04/02/85
4,508,281	06/523649	04/02/85
4,508,307	06/623249	04/02/85
4,508,308	06/374794	04/02/85
4,508,316	06/488099	04/02/85
4,508,319	06/553588	04/02/85
4,508,332	06/440290	04/02/85
4,508,333	06/426521	04/02/85
4,508,347	06/525918	04/02/85
4,508,348	06/587688	04/02/85
4,508,351	06/503543	04/02/85
4,508,353	06/452390	04/02/85
4,508,361	06/441148	04/02/85
4,508,372	06/270700	04/02/85
4,508,373	06/436580	04/02/85
4,508,378	06/473637	04/02/85
4,508,380	06/409938	04/02/85
4,508,384	06/424402	04/02/85
4,508,385	06/366451	04/02/85
4,508,391	06/435315	04/02/85
4,508,403	06/553853	04/02/85
4,508,406	06/431971	04/02/85
4,508,410	06/442335	04/02/85
4,508,412	06/355907	04/02/85
4,508,427	06/519466	04/02/85
4,508,430	06/420926	04/02/85
4,508,432	06/420928	04/02/85
4,508,436	06/306438	04/02/85
4,508,472	06/438782	04/02/85
4,508,476	06/369855	04/02/85
4,508,479	06/299731	04/02/85
4,508,480	06/355186	04/02/85
4,508,484	06/387844	04/02/85
4,508,488	06/568098	04/02/85
4,508,493	06/476024	04/02/85
4,508,497	06/543875	04/02/85
4,508,503	06/546107	04/02/85
4,508,509	06/464083	04/02/85
4,508,511	06/608123	04/02/85
4,508,512	06/436719	04/02/85
4,508,517	06/462753	04/02/85
4,508,518	06/336508	04/02/85
4,508,519	06/455469	04/02/85
4,508,545	06/549139	04/02/85
4,508,557	06/510865	04/06/85
4,508,560	06/439456	04/02/85
4,508,562	06/498990	04/02/85
4,508,580	06/555708	04/02/85
4,508,604	06/476522	04/02/85
4,508,621	06/536451	04/02/85
4,508,639	06/497234	04/02/85
4,508,643	06/464953	04/02/85
4,508,645	06/500773	04/02/85
4,506,647	06/608736	04/02/85
4,508,651	06/477059	04/02/85
4,508,663	06/514403	04/02/85
4,508,666	06/478893	04/02/85
4,508,671	06/525498	04/02/85
4,508,687	06/505928	04/02/85
4,508,694	06/492173	04/02/85
4,508,707	06/439216	04/02/85
4,508,708	06/384386	04/02/85
4,508,717	06/522359	04/02/85
4,508,723	06/385139	04/02/85
4,508,732	06/459928	04/02/85
4,508,734	06/278667	04/02/85
4,508,748	06/579550	04/02/85
4,508,787	06/217482	04/02/85
4,508,791	06/559067	04/02/85
4,508,809	06/497087	04/02/85
4,508,820	06/582862	04/02/85
4,508,903	06/488090	04/02/85
4,508,906	06/581859	04/02/85
4,508,914	06/375060	04/02/85
4,508,917	06/479937	04/02/85
4,508,921	06/625761	04/02/85
4,508,929	06/455362	04/02/85
4,508,933	06/471110	04/02/85
4,508,935	06/500357	04/02/85
4,508,938	06/495758	04/02/85
4,508,942	06/555819	04/02/85
4,508,945	06/533735	04/02/85
4,508,949	06/429099	04/02/85
4,508,950	06/474745	04/02/85
4,508,951	06/409663	04/02/85
4,508,956	06/412994	04/02/85
4,508,958	06/450169	04/02/85
4,508,969	06/277348	04/02/85
4,508,972	06/572285	04/02/85
4,508,973	06/613808	04/02/85
4,508,990	06/419176	04/02/85
4,508,994	06/480346	04/02/85
4,508,995	06/359669	04/02/85
4,509,000	06/480800	04/02/85
4,509,004	06/395331	04/02/85
4,509,010	06/452885	04/02/85
4,509,012	06/454690	04/02/85
4,509,051	06/420209	04/02/85
4,509,054	06/446735	04/02/85
4,509,074	06/463485	04/02/85
4,509,085	06/405744	04/02/85
4,509,102	06/473256	04/02/85
4,509,105	06/586307	04/02/85
4,509,107	06/546011	04/02/85
4,509,135	06/429379	04/02/85
4,509,139	06/341230	04/02/85
4,509,152	06/406001	04/02/85
4,509,155	06/383258	04/02/85
4,509,160	06/558320	04/02/85
4,509,161	06/378570	04/02/85
4,509,163	06/506616	04/02/85
4,509,178	06/487119	04/02/85
4,509,179	06/536313	04/02/85
4,509,180	06/439328	04/02/85
4,509,185	06/512136	04/02/85
4,509,192	06/482848	04/02/85
4,509,202	06/500979	04/02/85

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,263,551, Re. S. N. 314,303, Filed Feb. 23, 1989, Cl. 324, METHOD AND APPARATUS FOR IDENTIFIYING A CONDUCTIVE OBJECT BY MONITORING THE IMPEDANCE CHANGE IN A COIL SYSTEM CASED BY INTRODUCING THE OBJECT INTO THE COIL SYSTEM, William D. Gregory, et al., Owner of Record: *The Presiedent and Directors of Georgetown University, Washington, D. C.*, Attorney or Agent: Robert C. Miller, Ex. Gp.: 267

4,354,425, Re. S. N. 326,394, Filed Mar. 20, 1989, Cl. 092, FIRE-SAFE VALVE ACTUATOR, Billy R. Bruton, et al., Owner of Record: *Axelson, Inc., Longview, Tx.*, Attorney or Agent: Jonathan E. Jobe, Jr., Ex. Gp.: 341

4,416,145, Re. S. N. 347,584, Filed May 9, 1989, Cl. 73/40.5A, UNTRASONIC LEAK DETECTING METHOD AND APPARATUS, Mork Goodman, et al., Owner of Record: *UE System, Inc., New York, N. Y.*, Attorney or Agent: Ira Lee Zebrak, Ex. Gp.: 265

4,557,877, Re. S. N. 325,099, Filed Mar. 16, 1989, Cl. 261, LIQUID DISTRIBUTION FOR AN EXCHANGE COLUMN, Josef Hofstetter, et al., Owner of Record: *Sulzer Brothers, Ltd., Winterthur, Switzerland*, Attorney or Agent: Francis C. Hard Ex. Gp.: 135

4,664,266, Re. S. N. 350,714 Filed May 11,1989, Cl. 211/87, STORAGE HAMMOCK, Kirk A. Fausett, et al., Owner of Record: *Inventor(s)*, Attorney or Agent: Harvey B. Jacobson Jr., Ex. Gp.: 355

4,685,309, Re. S. N. 241,323, Filed Sept. 6, 1989, Cl. 62/212, PULSE CONTROLLED EXPANSION VALVE FOR MULTIPLE EVAPORATORS AND METHOD OF CONTROLLING SAME, Joseph L. Behr, Owner of Record: *Emerson Electric Co., Saint Louis , Mo.*, Attorney or Agent: William B. Cunningham Jr., Ex. Gp.: 344

4,685,495, Re. S. N. 351,596, Filed May 15, 1989, Cl. 144/3K, PORTABLE WOOD PROCESSING MACHINE, Floyd Freeman, Owner of Record: *Inventor*, Attorney or Agent: John V. Moriarity, Ex. Gp.: 321

4,700,806, Re. S. N. 350,136, Filed May 10, 1989, Cl. 181/283, STAMP FORMED MUFFLER, Jon Harwood, Owner of Record: *AP Parts Manufacturing Co., New York, N. Y.*, Attorney or Agent: Gerald E. Hespos, Ex. Gp.: 211

4,725,325, Re. S. N. 351,656, Filed May 15, 1989, Cl. 156/254, METHOD OF PRODUCING LAMINATED PLATE, Hidenori Hasegawa, Owner of Record: *Meinan Machinery Works, Inc., Aichi, Japan*, Attorney or Agent: William C. Geary III, Ex. Gp.: 131

4,765,712, Re. S. N. 347,113, Filed May 2, 1989, Cl. 350/96.23, OPTICAL FIBER CABLE, William D. Bohannon, Jr., Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N. J.*, Attorney or Agent: E. W. Somers, Ex. Gp.; 251

4,769,894, Re. S. N. 349,525, Filed May 9, 1989, Cl. 29/437, IRONING BOARD, Danny Simpson, Owner of Record: *Lear Siegler Seymour Corp., Seymour, Ind.*, Attorney or Agent: Kenneth I. Kohn, Ex. Gp.: 326

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,756,328, Reexam. No. 90/001,771, Requested May 15, 1989, Cl. 173/9, PNEMATICALLY OPERATED IMPACT-ACTION SELF-PROPELLED MECHANISM, Boris V. Sudnishnikov, et al., Owner of Record: *Institut Garnogo Dela Sibirskogo, Odessa, U. S. S. R.* Attorney or Agent: John C. Holman, Ex. Gp.: 320, Requester: Barry L. Grossman, Washington, D. C.

3,993,429, Reexam. No. 90/001,770, Requested May 11, 1989, Cl. 431/5, GAS CONDITIONING MEANS, William E. Archer, Owner of Record: *Wahlco International, Inc., Samta Ana, Calif.*, Attorney or Agent: Unknown, Ex. Gp.: 340, Requester: Martin P. Hoffman, Arlinton, Va.

4,568,420, Reexam. No. 90/001,772, Requested May 15, 1989, Cl. 162/65, MULTI-STAGE BLEACHING PROCESS INCLUDING AN ENHANCED OXIDATIVE EXTRACTION STAGE, Arthur J. Nonni, Owner of Record: *International Paper Co., New York, N. Y.*, Attorney or Agent: Unknown, Ex. Gp.: 130, Requester: Pennie & Edmonds, New York, N. Y.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceedings sent by certified mail to registrant at the last known address having been returned by the Postal Service as undliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Frank J. B. Bagley, Hollywood, Calif., Reg. No. 1,365,968, for the mark "MISS AMERICA PRINCESS PAGEANTS and design", Canc. No. 17,809.

ERMA S. BROWN
Administrator ,
Trademark Trial and Appeal Board
For JEFFERY M. SAMUELS
Assistant Commissioner for Trademarks

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by registered mail to the registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will be proceeded with as in the case of default.

Softalk Publishing, Inc., North Hollywood, Calif., Reg. No. 1,350,574, for the mark "SOFTALK" and design, Canc. No. 17,098.

ERMA S. BROWN
Administrator,
Trademark Trail and Appeal Board
For JEFFERY M. SAMUELS
Assistant Commissioner for Trademarks

Erratum

"All reference to Patent No. 4,825,749 to Joachim Neumann of Germany for `CIRCUIT ARRANGEMENT FOR POSITION AND FEE CONTROL OF A HYDRAULIC CYLINDER' appearing in the *Official Gazette* of May 2, 1989 should be deleted since no patent was granted."

PATENT AND TRADEMARK OFFICE

OFFICE OF THE ASSISTANT SECRETARY AND COMMISSIONER OF PATENTS AND TRADEMARKS

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Administrative Secretary Norma M. Rose rm 906 PK2..... 557-3071
Executive Assistant to the Commissioner
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Program Analyst (Vacant) rm 906 PK2..... 557-3071
Deputy Assistant Secretary and Deputy Commissioner
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Secretary (Vacant) rm 904 PK2..... 557-3961
Special Advisor to the Deputy Assistant Secretary
and Deputy Commissioner Joseph F. Nakamura rm 902 PK2..... 557-4047
Assistant Commissioner for Patents
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Secretary Helen White rm 1004 PK2..... 557-9093

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Secretary Olga M. Suarez rm 5C15 CP2..... 557-4035
Deputy Solicitor Charles E. Van Horn 5C15 CP2..... 557-2317
Secretary Cheryl P. Gibson rm 5C15 CP2..... 557-2317
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John W. Dewhirst rm 5C15 CP2..... 557-4035
Albin F. Drost rm 5C15 CP2..... 557-4035
Robert D. Edmonds rm 5C15 CP2..... 557-4035
John C. Martin rm 5C15 CP2..... 557-4035
Harris A. Pitlick rm 5C15 CP2..... 557-4035
John H. Raubitschek rm 5C15 CP2..... 557-4035
Richard E. Schafer rm 5C15 CP2..... 557-4035
Nancy C. Slutter rm 5C15 CP2..... 557-4035

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Maryann B. Volkmar rm 5C15 CP2..... 557-4022
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Director Cameron Weiffenbach rm 810 PK1..... 557-2012
Secretary Betty Kaminsky rm 810 PK1..... 557-2012
Harry I. Moatz rm 810 PK1..... 557-2012
Patricia M. Jordan rm 810 PK1..... 557-2012
Steve Morrison rm 810 PK1..... 557-2012
Roster Information rm 810 PK1..... 557-1728

BOARD OF PATENT APPEALS AND INTERFERENCES

Chairman Saul I. Serota rm 12C12 CG2..... 557-4072
Secretary Helen C. Gross rm 12C12 CG2..... 557-4072
Vice Chairman Ian A. Calvert rm 10D10 CG2..... 557-4000
Secretary Wanda G. Banks rm 10D10 CG2..... 557-4000
General Information:
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129 Herbicides, heterocyclic and nitrogen chemistry
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132 Food or edible material, processes, compositions and products
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133 Paper making and fiber liberation; glass manufacture; concentrating evaporators, separatory and thermolytic distillation processes and apparatus; separating and assorting solids-froth floatation; and compositions, method and apparatus for etching in chemical manufacture gas, heating and illumination apparatus and process and mineral oils apparatus
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182 Clinical chemistry, microbiology, immunology and enzymology, purification and chemical engineering
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183 Carbohydrate chemistry, drug, bioaffecting and body treating compositions containing carbohydrates, animal or plant extracts of undetermined constitution and chemical engineering
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184 Multicellular organisms (animal/plant), molecular genetics, cell culture, immunology, hybridoma, molecular biology, microbiology, fermentation metabolism and chemical engineering
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185 Molecular genetics, catalysis, enzymology, microbiology and chemical engineering
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SAC Verlene Day rm 3C17 CP4.................................. 557-3128
341 Expansible chamber motors, fluid power systems, turbines, combustion
Robert E. Garrett rm 3B22 CP4.................................. 557-3464
342 Internal combustion engines including charge forming and ignition systems
Charles J. Myhre rm 2D01 CP4.................................. 557-5690
343 Combustion power plants, jet engines, pumps rotary expansible chamber devices, turbocharges, superchargers, rotary internal combustion engines
Carlton R. Croyle rm 3B02 CP4.................................. 557-0398
344 Environmental control including; heating, air conditioning, refrigeration and ventilation; lubrication
Albert J. Makay rm 3D01 CP4.................................. 557-0397
346 Heating the environment and extracting heat from sun, poppet valve operation and exhaust gas treatment for internal combustion engines, and powerplant of the type using natural heat
Ira S. Lazarus rm 2B02 CP4.................................. 557-5679
347 Fluid handling which includes valves, pressure regulators and flow controllers for liquids and gases, heat exchange, and devices and methods for transferring heat from one material to another
Martin P. Schwadron rm 2B42 CP4.............................. 557-6777

350 General Construction, Petroleum and Mining Engineering rm 3C17 CP3.. 557-6200
Director Al Lawrence Smith rm 3D19 CP3.......................... 557-3414
Secretary Carol M. Sinclair rm 3D19 CP3.................... 557-3414
General Information/Receptionist rm 3C17 CP3................ 557-6200
SAC Joyce G. Hill rm 3D13 CP3.............................. 557-6200
351 Joints and connections, pipe couplings, fences, earth & hydraulic engineering, excavating, mechanical guns and projectors
Randolph A. Reese rm 4D01 CP3.................................. 557-6200
352 Gearing, power transmissions, clutches, machine elements
Leslie A. Braun rm 2B36 CP3.................................. 557-6200
354 Building structures and components David A. Scherbel rm 2D35 CP3.. 557-6200
355 Supports, racks, fire escapes, ladders, scaffolds, flexible partitions
Ramon S. Britts rm 4B02 CP3.................................. 557-6200
356 Petroleum, mining, highway and bridge engineering, well drilling, and endless belts
Jerome W. Massie rm 4D35 CP3.................................. 557-6200
357 Tables, chairs, cabinets, windows, doors, buckles, buttons, clasps
Kenneth J. Dorner rm 4A01 CP3.................................. 557-6200
358 Fasteners, safes, locks, closure fasteners, beds, control levers and linkages
Gary L. Smith rm 4D17 CP3.................................. 557-6200

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CM2	Crystal Mall 2, 1921 Jefferson Davis Highway
CP1	Crystal Plaza 1, 2001 Jefferson Davis Highway
CP2	Crystal Plaza 2, 2011 Jefferson Davis Highway
CP3	Crystal Plaza 3, 2021 Jefferson Davis Highway
CP4	Crystal Plaza 4, 2201 Jefferson Davis Highway
CP6	Crystal Plaza 6, 2221 Jefferson Davis Highway
CP34	Crystal Plaza 34, 2021 Jefferson Davis Highway
CS5	Crystal Square 5, 1755 Jefferson Davis Highway
CG2	Crystal Gateway 2, 1225 Jefferson Davis Highway
PK1	Crystal Park 1, 2011 Crystal Drive
PK2	Crystal Park 2, 2121 Crystal Drive
EADS	1232 South Eads Street
FERN	1411 South Fern Street
HCHB	Herbert C. Hoover Building, 14th & Constitution Avenue, N.W.
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Certificates of Correction for Week of June 20, 1989

PP 06 541	4,768,971	4,785,172	4,794,557
4,355 223	4,769,285	4,785,173	4,795,012
4,409 212	4,769,666	4,785,199	4,795,204
4,446 231	4,769,810	4,785,638	4,795,714
4,547 347	4,769,898	4,786,017	4,796,712
4,624 180	4,769,956	4,786,148	4,797,134
4,633 447	4,770,667	4,786,176	4,798,150
4,647 161	4,771,312	4,786,530	4,798,654
4,650 200	4,772,332	4,786,944	4,798,656
4,666 927	4,772,501	4,787,349	4,799,032
4,670 615	4,772,605	4,787,549	4,799,140
4,692 184	4,772,924	4,787,558	4,799,342
4,697 353	4,774,017	4,787,661	4,799,493
4,705 871	4,775,111	4,787,723	4,800,116
4,706 161	4,775,117	4,787,870	4,800,426
4,706 764	4,775,597	4,788,021	4,801,329
4,710 165	4,776,173	4,788,330	4,802,298
4,711 327	4,776,241	4,788,634	4,802,440
4,715 897	4,776,840	4,789,160	4,802,565
4,727 189	4,777,247	4,789,758	4,802,829
4,735 909	4,778,412	4,790,037	4,803,122
4,735 985	4,778,881	4,791,623	4,803,259
4,737 873	4,778,896	4,791,722	4,803,299
4,740 150	4,778,907	4,791,924	4,803,497
4,740 263	4,780,380	4,792,146	4,803,770
4,743 511	4,780,410	4,792,281	4,804,572
4,746 431	4,780,849	4,792,354	4,804,632
4,749 128	4,781,243	4,792,645	4,804,944
4,749 596	4,781,685	4,792,753	4,805,240
4,749 874	4,781,881	4,792,774	4,807,614
4,752 908	4,782,077	4,792,822	4,811,931
4,756 851	4,782,633	4,792,946	4,812,030
4,756 991	4,783,198	4,793,009	4,812,594
4,757 455	4,783,689	4,793,411	4,813,084
4,758 528	4,783,696	4,793,671	4,814,566
4,758 660	4,784,173	4,793,737	4,817,781
4,758 773	4,784,711	4,793,878	4,825,087
4,759 820	4,784,739	4,794,042	
4,765 763	4,784,922	4,794,060	
4,767 348	4,785,113	4,794,544	

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF May 20, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director.	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. HUTTLE, Director	3-31-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	5-4-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-31-86
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—G. SHAW, Acting Director	5-12-87
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	5-27-88
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	8-17-87
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	2-19-87
DESIGN, GROUP 290—K. L. CAGE, Director	2-6-86
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	1-12-88
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—D. G. KELLY, Director	1-13-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	1-20-87
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	11-12-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-1-88

Expiration of patents: The patents within the range of numbers indicated below expire during May 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

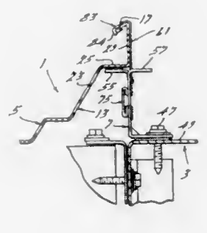
Patents ..... Numbers 3,659,294 to 3,667,068, inclusive
Plant Patents ..... 3,143 to 3,204 inclusive

REEXAMINATIONS

JUNE 20, 1989

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,193,247 (1079th)
PANEL MOUNTING CLIP
Robert E. Heckelsberg, Germantown, Tenn., assignor to AMCA International Corporation, Hanover, N.H.
Reexamination Request No. 90/000,346, Mar. 22, 1983.
Reexamination Certificate for Patent No. 4,193,247, issued Mar. 18, 1980, Ser. No. 875,533, Feb. 6, 1978.
Int. Cl.[4] E04D *1/34*
U.S. Cl. 52—713

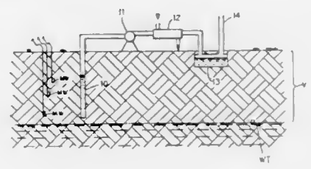


AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-3 is confirmed.

1. A panel mounting clip assembly for interengagement with overengaged longitudinal edges of a pair of adjacent panel members and for attaching them to a panel support member, comprising a base member having a bottom flange adapted to be fastened to said support member and a web extending transversely to said bottom flange, said web having a slot therein extending substantially parallel to said bottom flange and to the length of a panel connected to the clip, a flexible tab having a holding portion formed therein and extending through said slot, said tab having a web on one side of said base member web and said holding portion having flange means on the other side of said base member web, said flange means and tab web resiliently gripping said base member web, said tab having a width substantially less than the length of said slot and being slidable along the length of the slot, said tab having an arm projecting as cantilever above said base member and adapted to interfit with and be crimped to said panel edges, said base member having shelf flange means extending laterally from and substantially perpendicularly to said first mentioned web at a position spaced from said bottom flange and interengageable with coacting rim portions on the panels to support the panels at positions spaced above said support member, said holding portion substantially filling the narrower dimension of the slot and being resilient in the direction of said narrower dimension.

B1 4,593,760 (1080th)
REMOVAL OF VOLATILE CONTAMINANTS FROM THE VADOSE ZONE OF CONTAMINATED GROUND
Melvin J. Visser, Portage, Mich., and James J. Malot, Dorado, assignors to The Upjohn Company
Reexamination Request No. 90/001,521, Jun. 3, 1988.
Reexamination Certificate for Patent No. 4,593,760, issued Jun. 10, 1986, Ser. No. 567,972, Jan. 4, 1984.
Int. Cl.[4] E21B *43/00*
U.S. Cl. 166—267



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-3 is confirmed.

1. A process for removing a not-naturally-occurring, volatile liquid contaminant from a contaminated area of the earth, wherein the contaminated area of the earth has a subsurface water table and a subsurface vadose zone above the water table, the contaminant being present in the vadose zone, which comprises the steps of:

establishing a borehole extending downwardly from the surface of the ground within the contaminated area;

placing a first conduit within said borehole so that a ring-shaped zone is formed between the wall of said borehole and said conduit, said conduit having a perforate lower portion located in the vadose zone and spaced vertically above the water table so that fluids can flow from the vadose zone into the interior of said conduit, said perforate lower portion having an upper end and a lower end, said conduit having an imperforate upper portion above the upper end of said perforate lower portion,

filling fluid-permeable first fill material into a lower portion of said ring-shaped zone around said perforate lower portion of said conduit and which extends to the upper end of said perforate lower portion so that said first fill material will permit fluid readily to flow into said perforate lower portion of said conduit;

filling a second fill material of low fluid permeability into an upper portion of said ring-shaped zone around said imperforate upper portion of said conduit, said second fill material being effective to impede flow of air from the surface of the ground to the lower portion of the borehole;

applying a vacuum to the upper end of said conduit effective to induce flow of air and a gas containing vapor of said contaminant present in said vadose zone into the lower portion of said conduit and thence to the upper end of said conduit, the vacuum being effective to cause vaporization of a substantial quantity of said contaminant within the vadose zone around the borehole so that said contaminant is removed from the ground in vapor form, and

accumulating liquid in the lower end of said conduit and pumping said liquid to the upper end of said conduit separately from said gas.

2. A process for removing a not-naturally-occurring, volatile liquid contaminant from a contaminated area of the earth, wherein the contaminated area of the earth has a subsurface water table and a subsurface vadose zone above the water table, the contaminant being present in the vadose zone, which comprises the steps of:

establishing a borehole extending downwardly from the surface of the ground within the contaminated area;

placing a first conduit within said borehole so that a ring-shaped zone is formed between the wall of said borehole and said conduit, said conduit having a perforate lower portion located in the vadose zone and spaced vertically above the water table so that fluids can flow from the vadose zone into the interior of said conduit, said perforate lower portion having an upper end and a lower end, said conduit having an imperforate upper portion above the upper end of said perforate lower portion,

filling fluid-permeable first fill material into a lowerportion of said ring-shaped zone around said perforated lower portion of said conduit and which extends to the upper end of said perforate lower portion so that said first fill material will permit fluid readily to flow into said perforate lower portion of said conduit,

filling a second fill material of low fluid permeability into an upper portion of said ring-shaped zone around said imperforate upper portion of said conduit, said second fill material being effective to impede flow of air from the surface of the ground to the lower portion of the borehole;

applying a vacuum to the upper end of said conduit effective to induce flow of air and a gas containing vapor of said contaminant present in said vadose zone into the lower portion of said conduit and thence to the upper end of said conduit, the vacuum being effective to cause vaporization of a substantial quantity of said contaminant within the vadose zone around the borehole so that said contaminant is removed from the ground in vapor form,

forming a passageway extending downwardly from the surface of the ground to the vicinity of, but laterally spaced from, said perforate lower portion of said conduit, and

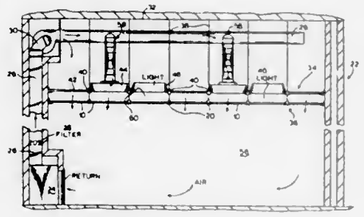
flowing air through said passageway into the vadose zone to increase lateral air flow through the vadose zone into said perforate lower portion of said conduit.

B1 4,603,618 (1081st)

AIR FILTERING AND DISTRIBUTION FOR LAMINAR FLOW CLEAN ROOM

Charles W. Soltis, P.O. Box 7328, Houston, Tex. 77248

Reexamination Request No. 90/001,504, May 4, 1988.
Reexamination Certificate for Patent No. 4,603,618, issued Aug. 5, 1986, Ser. No. 735,550, May 20, 1985.
Int. Cl.[4] F24F *7/00*
U.S. Cl. 98—31.5



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **14** and **15** is confirmed.

Claim **3** is cancelled.

Claims **1**, **4** and **6** are determined to be patentable as amended.

Claims **2**, **5** and **7–13**, dependent on an amended claim, are determined to be patentable.

1. An air filtering and distribution structure for use in an environmentally controlled enclosure, said structure comprising:

a first planar section spaced a predetermined distance from one surface of said enclosure *and defining a first plenum*, means for diffusing air through the first planar section such that the air is filtered thereby; and

a second planar section spaced a predetermined distance from and generally parallel to said first section *and defining therewith a second plenum at a relatively higher pressure that will cause any leakage of air through the first section to be away from the controlled enclosure*, the second planar section comprising a plurality of *translucent* membrane diffusion panels, each membrane diffusion panel comprising a frame having an open area, and a porous membrane sheet having a predetermined porosity mounted onto and extending over the frame and the open area therein with the porosity providing a predetermined resistance to flow of the air whereby during operation a slight pressure is developed between the first planar section and second planar section causing any leakage of air through the first section to be away from the controlled enclosure so that the membrane diffusion panels cooperate to provide uniform air flow through the second planar section such that the environmentally controlled enclosure achieves higher cleanliness levels for a given filtered air exchange rate than would be obtained without the membrane diffusion panels.

REISSUES

JUNE 20, 1989

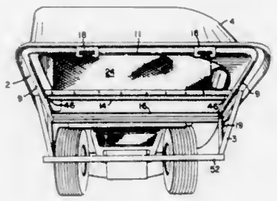
Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,954

LAWN MOWER GRASS COLLECTOR BAG SUPPORT

Gary R. Lamusga, Prior Lake, Minn., assignor to The Toro Company, Minneapolis, Minn.

Original No. 4,637,202, dated Jan. 20, 1987, Ser. No. 605,329, Apr. 30, 1984. Application for reissue Jan. 21, 1988, Ser. No. 146,505
Int. Cl.[4] A01D *34/70*
U.S. Cl. 56—202 **17 Claims**



1. A bag support for a vertically disposed grass collector bag on a lawn mower, comprising:

(a) a support framework consisting of two sides and a front and rear end, said front end adapted for mounting to the mower;

(b) a resilient frame having four sides, three sides being continuous and co-planar, the fourth side having a central open space defined between two segments of said fourth side adjacent said space, *said two segments* being inclined at an acute angle to the plane of said three co-planar sides, said space bounded by a pair of handles extending perpendicularly outward from said segments;

(c) said bag attached to said frame, said frame defining an open end of said bag;

(d) a frame retaining bracket mounted on said front end of said framework for removably receiving a portion of said resilient frame opposite said [handle;] *handles* and

(e) a handle retaining bracket attached to said rear end of said framework for removably receiving said handles, said bracket located so that said angled segments must be biased into planar alignment with said three co-planar sides of said frame to insert said handles into said bracket, whereby said frame bracket and handle bracket cooperate with the resilience of said frame and the bias of said frame segments to retain said bag in a substantially sealed grass receiving posture against said framework.

Re. 32,955

ELECTRONIC OVERSPEED SWITCH

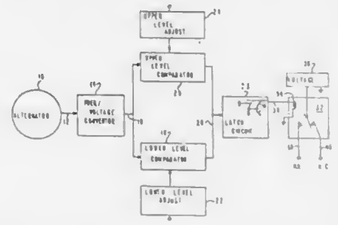
Lawrence E. Macy, deceased, late of Daleville, Ind. (by Amelita J. Macy, executor), assignor to Muncie Power Products, Inc., Muncie, Ind.

Original No. 4,510,899, dated Apr. 16, 1985, Ser. No. 605,842, May 1, 1984. Continuation of Ser. No. 823,514, Jan. 28, 1986, which is a continuation of Ser. No. 75,778, Sep. 17, 1979, abandoned. Application for reissue Mar. 9, 1987, Ser. No. 23,973
Int. Cl.[4] F22B *5/02*
U.S. Cl. 123—198 D **15 Claims**

1. An electrical speed control system for selectively connecting an accessory to an engine having a rotating electric signal producing device and a rotating shaft, said speed control system comprising:

means connected to receive a signal from said signal producing device for producing a speed signal indicative of the rotational speed of said shaft;

signal level sensing means connected to receive said speed signal for determining if said speed signal is indicative of a speed below a preselected first level and if said speed signal is indicative of a speed above a preselected second level, and for producing an energization signal whenever said speed signal is below said first preselected threshold level, for interrupting said energizing signal when said speed signal is above said second level for maintaining said interruption of said energization signal until said speed signal falls below said first preselected level and for reestablishing said energizing signal when said speed signal again falls below said first preselected level; and



switch means connected to said accessory means, and a source of electrical power, said energization signal actuating said switch whenever said energization signal is present.

14. The system of claim 1 in which said engine is capable of running independently of said accessory,

said accessory being characterized in that it is unsafe to connect it to said rotating shaft when said speed signal is above said preselected first level,

said engine running continuously while the speed signal falls from above said second level to below said first level.

Re. 32,956

CARTON AND BLANK THEREFOR

Richard L. Schuster, West Monroe, La., assignor to Manville Service Corporation, Ken-Caryl, Colo.

Original No. 4,582,199, dated Apr. 15, 1986, Ser. No. 675,805, Nov. 28, 1984. Continuation-in-part of Ser. No. 557,682, Dec. 2, 1983, abandoned. Application for reissue Nov. 4, 1987, Ser. No. 117,192
Int. Cl.[4] B65D *5/54, 65/12, 75/14*
U.S. Cl. 206—428 **13 Claims**

1. A paperboard carton for packaging a multiple of articles comprising:

a bottom panel;

first and second side panels hingedly joined at their lower edges to opposite side edges of the bottom panel along bottom score lines; outer and inner top panels hingedly joined to upper edges of the first and second side panels along top score lines with the outer top panel overlying and being adhesively secured to the inner top panel;

first and second partial end panels hingedly joined to opposite ends of the bottom panel along side score lines;

tuck flap means for holding said first and second end panels in an upright position such that said end panels are bowed inwardly, said tuck flap means joined to said end panels by end score lines offset from said bottom score lines such that the distance between the end score lines is less than

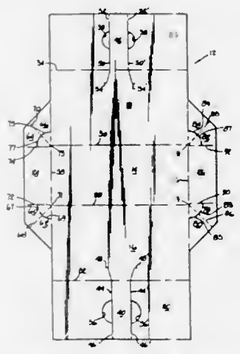
the distance between the bottom score lines, said tuck flap means including a tuck score line intersecting said side score lines and said end score lines such that the angle between said tuck score line and said end score line is [more than 45°]*less than 45°* while the angle between said tuck score line and said side score line is [less than 45°]*greater than 45°*; and

handle means on said inner and outer top panels comprising a pair of spaced substantially semi-circular cutouts in each of the top panels, the pair of cutouts in the inner top panel registering with the pair of cutouts in the outer top panel and a strap on each of the top panels located intermediate the cutouts, said straps extending substantially the entire width of the respective top panel, being defined by a pair of spaced apart cut lines and registering with the other strap whereby a double thickness handle is formed with access finger cutouts.

6. A paperboard blank for a carton for packaging a multiple of articles comprising:

a bottom panel;

first and second side panels hingedly joined at their lower edges to opposite side edges of the bottom panel along bottom score lines;



outer and inner top panels hingedly joined to upper edges of the first and second side panels along top score lines;

first and second partial end panels hingedly joined to opposite ends of the bottom panel along side score lines;

tuck flaps joining each partial end panel to the first and second side panels, said tuck flaps including a pair of generally triangular shaped flaps hingedly joined together along a tuck score line and joined to the side panel along side score lines and the end panel along end score lines, *said end score lines being parallel to one another and* said tuck score lines intersecting said side score lines and said end score lines such that the angle formed by the intersection of said tuck score line and said end score line is greater than 45° and the angle formed by the intersection of said tuck score line and said side score line is less than 45°; and

handle means on said inner and outer top panels comprising a pair of spaced substantially semi-circular cutouts in each of the top panels adapted to register when the carton is formed and a strap on each of the top panels located intermediate the cutouts, each strap extending substantially the entire width of the respective top panels, being defined by a pair of cut lines, and adapted to register when the carton is formed.

8. A paperboard carton for packaging a multiple of articles comprising:

a bottom panel;

first and second side panels hingedly joined at their lower edges to opposite side edges of the bottom panel along bottom score lines; outer and inner top panels hingedly joined to upper edges of the first and second side panels along top score lines with the outer top panel overlying and being adhesively secured to the inner top panel;

first and second partial end panels hingedly joined to opposite ends of the bottom panel along side score lines, each partial end panel being held in an upright position by a pair of tuck flap means which are adhesively secured to the side panels; and

tuck flap means for holding said first and second end panels in an upright position such that said end panels are bowed inwardly, said tuck flap means joined to said end panels by end score lines offset from said bottom score lines such that the distance between the end score lines is less than the distance between the bottom score lines, said tuck flap means including a tuck score line intersecting said side score lines and said end score lines such that the angle between said tuck score line and said end score line is [more than 45°]*less than 45°* while the angle between said tuck score line and said side score line is [less than 45°]*more than 45°* ; and

tear strip means on at least one of the side panels, said tear strip means extending the entire length of the side panel, being defined by a pair of perforated lines and being located at substantially the same height as the tops of the partial end panels.

10. A paperboard blank for a carton for packaging a multiple of articles comprising:

a bottom panel;

first and second side panels hingedly joined at their lower edges to opposite side edges of the bottom panel along bottom score lines;

outer and inner top panels hingedly joined to upper edges of the first and second side panels along top score lines;

first and second partial end panels hingedly joined to opposite ends of the bottom panel along side score lines, each partial end panel being hingedly joined to the first and second side panels by tuck flaps; and

tuck flap means for holding said first and second end panels in an upright position such that said end panels are bowed inwardly, said tuck flap means joined to said end panels by end score lines offset from said bottom score lines such that the distance between the end score lines is less than the distance between the bottom score lines, said tuck flap means including a tuck score line intersecting said side score lines and said end score lines such that the angle between said tuck score line and said end score line is [more than 45°]*less than 45°* while the angle between said tuck score line and said side score line is [less than 45°]*greater than 45°*; and

tear strip means on at least one of the side panels, said tear strip means extending the entire length of the side panel, being defined by a pair of perforated lines and being located a distance from the lower edge of the side panel substantially equal to the heights of the partial end panels.

13. A paperboard carton for packaging a multiple of articles comprising:

a bottom panel;

first and second side panels hingedly joined at their lower edges to opposite side edges of the bottom panel along bottom score lines;

outer and inner top panels hingedly joined to upper edges of the first and second side panels along top score lines with the outer top panel overlaying and being adhesively secured to the inner top panel;

first and second partial end panels hingedly joined to opposite ends of the bottom panel along side score lines;

tuck flap means for holding said first and second end panels in an upright position such that said end panels are bowed inwardly, said tuck flap means joined to said end panels by end score lines offset from said bottom score lines such that the distance between the end score lines is less than the distance between the bottom score lines, said tuck flap means including a tuck score line intersecting said side score lines and said end score lines such that the angle between said tuck score line and said end score line is less than 45° while the angle between said tuck score line and said side score line is more than 45°.

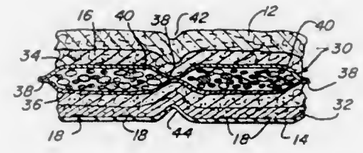
Re. 32,957
ABSORBENT ARTICLE

Robert T. Elias, deceased, late of Downers Grove, and Donald R. Elias, executor, Westmont, both of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.

Original No. 4,381,783, dated May 3, 1983, Ser. No. 274,931, Jun. 18, 1981. Continuation of Ser. No. 954,152, Oct. 24, 1978, abandoned. Application for reissue May 2, 1985, Ser. No. 729,678

Int. Cl.⁴ A61F *13/16*

U.S. Cl. 604—368 40 Claims



23. An absorbent panel structure for an absorbent article, comprising:

an absorbent layer comprising loosely compacted cellulosic fibrous material; and

pocket means provided within said absorbent layer medially of upper and lower portions of said loosely compacted cellulosic fibrous material of said absorbent layer, said pocket means comprising discrete individual pockets of superabsorbent hydrocolloid material,

said upper and lower portions of said absorbent layer being embossed toward each other throughout the thickness of each of said upper and lower portions, at embossed areas,

said pockets of hydrocolloid material being spaced and physically separated from each other by said embossed area between adjacent ones of said pockets.

Re. 32,958
THERMOSETTING EPOXY RESIN COMPOSITIONS

Taro Koshii, Chiba; Yoshitsugu Morita; Hideo Shinmi, both of Ichihara, all of Japan, and Tsuneo Hanada, Midland, Mich., assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Original No. 4,604,435, dated Aug. 5, 1986, Ser. No. 672,052, Nov. 16, 1984. Application for reissue Sep. 14, 1987, Ser. No. 95,970

Claims priority, application Japan, Nov. 28, 1983, 58-223855

Int. Cl.⁴ C08L *63/00;* C08G *59/40;* C09J *3/16;* H01B *3/40*

U.S. Cl. 525—476 7 Claims

1. A thermosetting epoxy resin composition comprising a mixture of

(a) 100 parts by weight of epoxy resin;

(b) 1 to 100 parts by weight of a curing agent for the he epoxy resin composition;

(c) 1 to 100 parts by weight of an organopolysiloxane composition which is a block copolymer containing at least one linear polysiloxane block and at least one resinous polysiloxane block wherein there is present in the block copolymer (i) 10 to 90 weight percent of linear organopolysiloxane blocks having the unit formula $—R_2SiO—_n$ and (ii) 90 to 10 weight percent of resinous organopolysiloxane blocks, the weight percents being based on the total weight of (i) and (ii) in the block copolymer, wherein R is independently selected from substituted and unsubstituted monovalent hydrocarbon groups having from 1 to 8 carbon atoms; n is an integer with a value of about 10 to [100] *1000;* the solvent solution viscosity of the block copolymer being at least 30 centipoise at 25° C. for a 40 weight percent solution [:]; the parts of (b) and (c) being based on 100 parts of (a).

Re. 32,959
AUTOMATIC FOCUSING APPARATUS

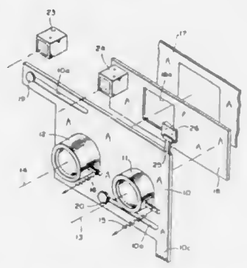
Hiroshi Ohmura; Takashi Maemori, and Toshio Ishii, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Original No. 4,582,411, dated Apr. 15, 1986, Ser. No. 736,318, May 21, 1985. Application for reissue Aug. 6, 1986, Ser. No. 893,685

Claims priority, application Japan, May 21, 1984, 59-100419

Int. Cl.⁴ G03B *3/00*

U.S. Cl. 354—403 14 Claims



8. An automatic focusing apparatus comprising:

means for finding that in which distance range an object to be photographed stands between a close range and a far range into which object distance is divided in front and in rear of a boundary;

means for varying the focal length of said objective means in at least two steps;

means for shifting the position of said boundary in cooperation with the operation of said focal length varying means; and

means for displacing said objective means to particular positions in accordance with said distance range found.

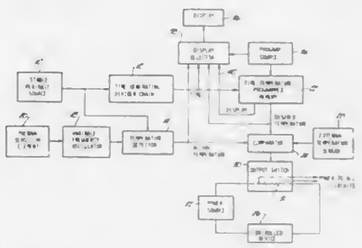
Re. 32,960
ELECTRONIC THERMOSTAT

Michael R. Levine, Ann Arbor, Mich., assignor to Honeywell Inc., Minneapolis, Minn.

Original No. 4,206,872, dated Jun. 10, 1980, Ser. No. 778,376, Mar. 17, 1977. Application for reissue Sep. 26, 1985, Ser. No. 780,412

Int. Cl.⁴ G05D *23/30;* F23N *5/20;* H05B *1/02*

U.S. Cl. 364—557 6 Claims



18. A thermostat for controlling the application of electrical power to a specified electrically controlled temperature modifying device comprising:

a source of a periodically alternating electrical signal whose

PLANT PATENTS

frequency is constant at ambient temperatures over the range of the thermostat;

a source of a periodically alternating electrical signal whose frequency varies as a function of the ambient temperature on the thermostat;

circuit means, responsive to the respective frequencies of said time-base electrical signal and said temperature-sensitive electrical signal, for generating a digital electrical signal representing the ambient temperature on the thermostat;

a clock utilizing an output from said source of a constant frequency electrical signal to generate digital electrical signals having values representative of real time;

a programmable, digital memory;

means for loading said memory with a plurality of separate programs for alternative use in controlling the specified temperature modifying device, each said program comprising digital signals representing desired temperatures at particular times over a twenty-four hour period;

means for selecting one of said plurality of said programs;

circuitry for applying the output of the clock to the memory to generate a digital electric signal representative of the desired temperature at a particular time as stored in said selected program; and

means for receiving the electrical signal and the output of the memory and for generating a control signal for said specified temperature modifying device as a function of the difference between the ambient temperature and the desired temperature;

whereby, through the use of said means for selecting one of said programs the ambient temperature at the thermostat may be controlled in accordance with different days of the week.

Re. 32,961

DEVICE FOR MEASURING LOCAL RADIATION ABSORPTION IN A BODY

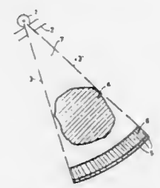
Wolfgang Wagner, Norderstedt, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Original No. 4,057,725, dated Nov. 8, 1977, Ser. No. 610,616, Sep. 5, 1975. Application for reissue Feb. 6, 1978, Ser. No. 875,432

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1974, 2442809

Int. Cl.[4] G01N *23/00*

U.S. Cl. 378—4 **9 Claims**



4. An apparatus for examining a body by means of penetrating radiation including a source means arranged to irradate the body with a planar spread of said radiation, detector means arranged to detect the radiation to provide output signals, relating to absorption of the radiation by the body, for processing to provide a representation of the distribution of absorption in a substantially planar section of the body and means adapted to scan the planar spread of radiation in relation to the body so as to irradate said section along a plurality of beam paths passing through the body from a plurality of direction, wherein said detector means comprises a plurality of detector devices of which a predetermined number are irradiated by said spread at any time and wherein the scanning means is arranged to traverse the spread of X-rays along the detector device so as to change the irradiated device progressively.

PLANT PATENTS

GRANTED JUNE 20, 1989

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,859

ROSE PLANT NAMED 'LAVJUNE'

Keith Laver, Caledon East, Canada, assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Feb. 22, 1988, Ser. No. 159,042

Int. Cl.[4] **A01H** *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class and all parts thereof, substantially as shown and described, characterized particularly by unusual attractive bright orange yellow colored flowers of excellent exhibition form which are long lasting on the plant and as cut flowers.

6,860

ROSE PLANT NAMED POULLOW YELLOW HIT

Pernille Olesen, and Mogens N. Olesen, both of Hillerodvej 49, DK 3480 Fredensborg, Denmark

Filed Mar. 15, 1988, Ser. No. 168,431

Int. Cl.[4] **A01H** *5/00*

U.S. Cl. Plt.—8 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by bright yellow flowers which hold color well borne singly, one to a stem, attractively displayed against dark green foliage.

6,861

HYBRID TEA ROSE PLANT CV. AROGREWOD

Jack E. Christensen, Ontario, Calif., assignor to Armstrong Garden Centers, Inc., Monrovia, Calif.

Filed Dec. 14, 1987, Ser. No. 132,576

Int. Cl.[4] **A01H** *5/00*

U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of hybrid tea rose plant cv. Arogrewod and the parts thereof, being particularly characterized by its vigorous growing plants of average height having a moderate number of strong stems; its classically shaped flowers; its flower color comprising a light lavender color on the inside surface of the petals and a creamy white on the outside petal surface; and its moderate fruity fragrance, substantially as described and illustrated herein.

6,862

ROSE PLANT NAMED 'BACARDI'

O. L. Weeks, 12610 Central Ave., Suite 76, Chino, Calif. 91710

Filed Feb. 9, 1988, Ser. No. 159,530

Int. Cl.[4] **A01H** *5/00*

U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the grandiflora rose class and all parts thereof, substantially as shown and described, characterized particularly by coral pink flowers which open well and are long lasting on the plant.

6,863

ROSE PLANT NAMED 'BURWORLD'

Anthony Perry, Hemet, Calif., assignor to Co-Operative Rose Growers, Inc., Tyler, Tex.

Filed Mar. 15, 1988, Ser. No. 168,499

Int. Cl.[4] **A01H** *5/00*

U.S. Cl. Plt.—12 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as shown and described, characterized particularly by high centered, exhibition form bicolored blooms of attractive red and yellow coloring borne primarily singly to a stem.

6,864

NECTARINE TREE, "KAM RED"

Steven G. Minami, 8790 S. Buttonwillow, and Gary R. Kitahara, P.O. Box 107, both of, Reedley, Calif. 93654

Filed May 16, 1988, Ser. No. 194,229

Int. Cl.[4] **A01H** *5/00*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree substantially as illustrated and described which is characterized as to novelty by bearing a freestone fruit having a firm flesh and by its general resemblance to the Flamekist nectarine tree (unpatented) from which it was derived as a bud sport but from which it is distinguished therefrom by its bearing fruit which matures for harvesting approximately August 7 through August 14, this date of maturity being approximately five to six days earlier than that of the Flamekist nectarine tree and by producing fruit which have a skin which is more deeply colored than that exhibited by the fruit of the Flamekist nectarine tree.

6,865

ALSTROEMERIA NAMED STAROVER

Jacob van Andel, Aalsmeer, Netherlands, assignor to Van Staaveren, B.V., Aalsmeer, Netherlands

Filed Sep. 4, 1987, Ser. No. 93,875

Int. Cl.[4] **A01H** *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinct Alstroemeria variety and the parts thereof, substantially as herein shown and described, characterized by the large size and the light purple and yellow coloration of the flowers, which are borne singly on strong stems of an umbel formation carried by a strong, tall stem.

6,866

ALSTROEMERIA NAMED ZELPADO

Gerard J. van Zelderen, Achterweg 34-36, 1424 PR De Kwakel, Netherlands

Filed Sep. 24, 1987, Ser. No. 100,717

Int. Cl.[4] **A01H** *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinct variety of Alstroemeria plant and parts thereof, substantially as herein shown and described, characterized by the distinctive red-purple coloration of its medium sized flowers, the upper ones of the inner petals having a white middle portion of its body, and by its continuous year around blooming habit.

6,867

CHRYSANTHEMUM PLANT NAMED APRICOT IMPALA

Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Fides Bebeer B.V., De Lier, Netherlands

Filed Nov. 23, 1987, Ser. No. 124,543

Int. Cl.[4] **A01H** *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct Chrysanthemum plant named Apricot Impala, as described and illustrated, and parts thereof.

6,868
CHRYSANTHEMUM PLANT NAMED PINK MONEYMAKER
Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands
Filed Nov. 23, 1987, Ser. No. 124,548
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—74 1 Claim
1. A new and distinct cultivar of Chrysanthemum plant named Pink Moneymaker, as described and illustrated, and parts thereof.

6,869
CHRYSANTHEMUM PLANT NAMED WALL STREET
Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Fides Beheer, De Lier, Netherlands
Filed Nov. 23, 1987, Ser. No. 124,549
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—74 1 Claim
1. A new and distinct cultivar of Chrysanthemum plant named Wall Street, as described and illustrated, and parts thereof.

6,870
CHRYSANTHEMUM PLANT NAMED LILAC MONEYMAKER
Jacques C. M. Van der Knaap, De Lier, Netherlands, assignor to Fides Beheer B.V., De Lier, Netherlands
Filed Nov. 23, 1987, Ser. No. 124,550
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—74 1 Claim
1. A new and distinct cultivar of Chrysanthemum plant named Lilac Moneymaker, as described and illustrated, and parts thereof.

6,871
DIEFFENBACHIA HYBRIDA HULA
Edwin J. Frazer, Brisbane, Australia, assignor to Hartman Plant Laboratories, Inc., Santa Paula, Calif.
Filed Mar. 9, 1987, Ser. No. 23,608
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—88 1 Claim
1. A new and distinct cultivar of Dieffenbachia as described and illustrated.

6,872
DIEFFENBACHIA HYBRIDA BALI HAI
Edwin J. Frazer, P.O. Box 200, Kenmore, Queensland 4069, Brisbane, Australia
Filed Mar. 9, 1987, Ser. No. 23,609
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—88 1 Claim
1. A new and distinct cultivar of Dieffenbachia as described and illustrated.

6,873
DIEFFENBACHIA HYBRIDA ALOHA
Edwin J. Frazer, P.O. Box 200, Kenmore, Queensland 4069, Brisbane, Australia
Filed Aug. 28, 1987, Ser. No. 23,610
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—88 1 Claim
1. A new and distinct cultivar of Dieffenbachia as described and illustrated.

6,874
SPATHIPHYLLUM NAMED — PHOENIX
Christopher J. London, 25 North Thompson Rd., Apopka, Fla. 32703
Filed Aug. 28, 1987, Ser. No. 91,552
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—88 1 Claim
1. A new and distinct cultivar of Spathiphyllum as described and illustrated.

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GRANTED JUN. 20, 1989

ERRATA

For CLASS	See PATENT NO.
350-096	4,839,970
440-078	4,840,136
138-155	4,840,194
224-274	4,840,332
277-222	4,840,379
464-111	4,840,600
464-157	4,840,601
436-111	4,840,919
503-201	4,840,927
525-327	4,841,017
546-270	4,841,035
350-006	4,841,135
388-828	4,841,206
388-811	4,841,207
346-001	4,841,306
346-001	4,841,307
346-157	4,841,337
337-248	4,841,356
368-120	4,841,500

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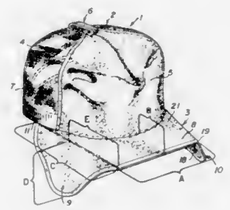
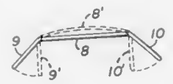
GRANTED JUNE 20, 1989

GENERAL AND MECHANICAL

4,839,924
SHOOTER'S HAT HAVING FLEXIBLE SIDE BLINDER ATTACHMENTS
Harold A. Laurence, Skokie, Ill., assignor to Laurence & Laurence, Inc., Skokie, Ill.
Filed May 27, 1988, Ser. No. 199,533
Int. Cl.[4] A42B *1/06*
U.S. Cl. 2—10 **20 Claims**



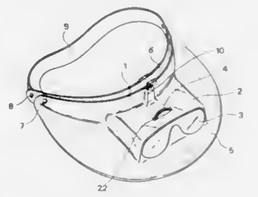


1. In a shooter's hat having in combination:
(A) a generally hemispherical crown having a peak and a generally circular margin defined by a band to generally encircle the head;
(B) a bill attached to said crown adjacent a forward portion of said margin;
(C) depending side flaps attached to said bill for restricting vision;
the improvement wherein:
(a) said bill comprises a generally planar member having a first marginal edge that extends along an arc and generally conforms to the shape of a wearer's head;
(i) said bill being attached to said crown along said arcuate first marginal edge to define a forward portion on said hat;
(ii) said bill having a generally straight second marginal edge spaced from said first edge, parallel to a chord of said arc and defining a front edge of said bill;
(iii) said second front marginal edge being shorther than a chord which extends along the diameter of the crown margin;
(iv) said bill having a pair of spaced apart, generally straight, opposed third and fourth marginal edges intersecting said first and second marginal edges;
(b) a first and a second vision-restrictive rigid side blinder attached to and depending from said third and fourth marginal edges, respectively, of said bill;
(i) said depending side blinders and said bill defining in cross-section a generally truncated A-shaped structure in its relaxed storage form;
(ii) said depending side blinders and said bill defining in cross-section a generally inverted U-shaped shaped structure in its operative stressed position upon a wearer's head providing defined horizontal and increased vertical fields of view bounded at a top and sides;
(iii) said depending side blinders flex into said U-shaped structure and said bill bows into a concave down configuration when said hat is placed operatively upon the wearer's head;
(iv) said bill and side blinders being flexibly rigid such that said side blinders are bendably positionable along their juncture with said bill yet retain their shape once operatively positioned.

4,839,925
STRETCHABLE NECKTIE
George S. Panton, Jr., 400 Coral Ave., Melbourne Beach, Fla. 32951
Continuation of Ser. No. 74,965, Jul. 17, 1987, abandoned. This application Nov. 4, 1988, Ser. No. 267,654
Int. Cl.[4] A41D *25/06*
U.S. Cl. 2—146 **7 Claims**

1. A stretchable necktie comprising:
an elongated outer casing formed of an unstretched stretchable nylon-spandex material, and
an elongated inner lining secured within said, casing extending generally the length of said casing and formed of an unstretched stretchable nylon-spandex material, whereby a necktie formed generally entirely of stretchable material is formed.

4,839,926
CAP WITH BINOCULARS
Hae Y. Choi, Seoul, Rep. of Korea, assignor to Un Shik Shin, Rep. of Korea
Filed Jun. 15, 1988, Ser. No. 206,822
Int. Cl.[4] A42B *1/24*
U.S. Cl. 2—199 **13 Claims**



1. A cap with binoculars comprising:
a head band adapted to be worn on the head of a user;
a visor portion connected to said head band, said visor portion including a visor member and a binoculars receiving portion mounted on said visor member, said binoculars

receiving portion having an upper surface with an opening therein;

binoculars mounted within said binoculars receiving portion and adjustable therein according to distance for the eyes of the user wearing said head band, said binoculars having an adjusting knob adjustable by the user through said opening;

a pin connecting means for connecting said visor portion to said head band such that said visor portion is movable between first and second positions relative to said head band when worn by the user, said visor portion when in the first position being positioned so that the user can see underneath said visor member, said visor portion when in the second position being positioned so that the user can look through said binoculars mounted in said binoculars receiving portion; and

a latching means for releasably latching said visor portion relative to said head band in the first position when raised thereto.

4,839,927

DRAINAGE SYSTEM IN MULTI-STORY BUILDING

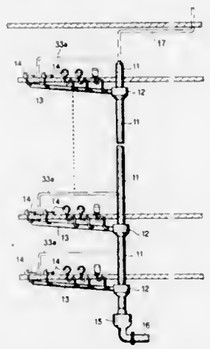
Takashi Watanabe, Tokyo, Japan, assignor to Nishihara Engineering Company, Ltd., Tokyo, Japan

Filed Aug. 6, 1987, Ser. No. 82,317

Claims priority, application Japan, Nov. 14, 1986, 61-269946; Nov. 21, 1986, 61-276820

Int. Cl.[4] E03D 9/01

U.S. Cl. 4—211 **16 Claims**



1. A drainage system including:

a stack which comprises an upper end and a lower end and a plurality of segments, including a top segment, aligned approximately vertically through the floor of each story of a multi-story building, the upper end of the top stack segment being open to the atmosphere;

a plurality of connectors each disposed between adjacent said segments;

each of said plurality of branch pipes connected to one or more fixtures which discharge waste water, each of said plurality of branch pipes being further connected at one end thereof to the stack through one of said plurality of connectors to conduct said waste water from said fixtures to the interior of said stack; and

a lower end connector for connecting the lower end of said stack to a horizontal pipe,

characterized in that each of said plurality of stack segments is provided with a cylindrical outer member and a cylindrical inner member which is inserted into said outer member coaxially to form an axially extending space annular in cross section between the outer surface of said inner member and the inner surface of said outer member, the inside space of said inner member serving as a passage for said waste water or a drainage passage and said space annular in cross section formed between said inner and said outer member serving as a passage for air or a vent passage, and that each of said plurality of connectors is provided with a generally cylindrical outer member connected to said adjacent stack segments, an upper stack segment of said adjacent stack segments being positioned just above each of said plurality of connectors and a lower stack segment of said adjacent stack segments being positioned just below each of said plurality of connectors, each of said plurality of said connectors being provided with a generally cylindrical inner member inserted into said outer member coaxially, with a space annular in cross section being formed between said outer member and said inner member of each of said plurality of connectors, which space serve as a vent passage for communication between a vent passage of the upper stack segment and that of the lower stack segment, the space formed inside said connector inner member serving as a drainage passage for communication between said drainage passage of said upper stack segment and that of said lower stack segment, each of said plurality of connectors being further provided with at least one inlet pipe which is disposed so as to extend through said connector outer member in a direction approximately coincident with a tangent to a circle formed by the inner peripheral surface of said connector inner member and which is connected at one end thereof to a corresponding branch pipe and is open at the opposite end thereof to said inner peripheral surface of said connector inner member.

4,839,928

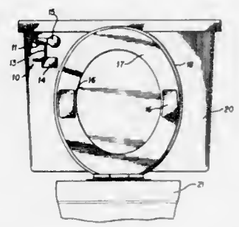
DEVICE FOR LOWERING TOILET SEATS

Timothy C. Probasco, 5716 Plainfield Ave., Apt. 4-A, Baltimore, Md. 21206

Filed Jul. 15, 1988, Ser. No. 220,009

Int. Cl.[4] A47K 17/02

U.S. Cl. 4—251 **5 Claims**



1. A toilet seat lowering device for use with a toilet having a seat, lid, and bowl rim, comprising, a structure having sleeve means adapted to be mounted over member the handle of a toilet, a wedge shaped member which is movably engageable between the toilet lid and toilet seat of a toilet when in their raised position, and a flexible means connecting said sleeve means, with respect to said wedge shaped member such that when said handle is rotated, said wedge shaped member is moved between said toilet lid and seat to therby cause said seat to fall onto said toilet rim.

4,839,929

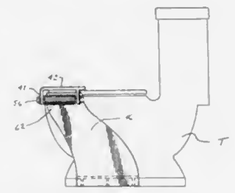
AUXILIARY TOILET SEAT

M. Jane Mai, 10704 W. 108th Ter., Overland Park, Kans. 66210, and Maxine Hargrave, 802 N. State St., Jerseyville, Ill. 62052

Filed Mar. 18, 1988, Ser. No. 170,007

Int. Cl.[4] A47K 13/00

U.S. Cl. 4—254 **3 Claims**



1. An auxiliary toilet seat, adapted to be mounted to a toilet secured in a public rest room by floor mounting bolts, said auxiliary toilet seat comprising:

a pair of spaced vertical legs;

each of said legs having a top portion and a bottom portion;

a bench seat having a generally flat top surface and a transverse front wall;

said bench seat having a first end and a second opposite end;

hinge means pivotally connecting said first end of said bench seat to said top portion of one of said legs;

handle means adjacent said second opposite end of said bench seat, whereby said bench seat may be moved between vertical and horizontal positions;

a horizontal mounting flange adjacent said bottom portion of each of said legs;

said mounting flanges extending inwardly, toward said bench seat;

a pair of generally triangular support ribs extending along each of said legs and connected with said mounting flanges;

said vertical legs each having an arcuate forward curvature providing a cantilever support for said bench seat; and

a plurality of spaced apertures in each of said mounting flanges for mounting said bench seat with said toilet floor mounting bolts.

4,839,930

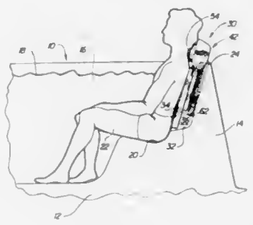
DRY HYDRO-MASSAGE UNIT FOR A SPA TANK

Jonathan Watkins, Vista, Calif., assignor to Watkins Manufacturing Corporation, Carlsbad, Calif.

Filed May 27, 1988, Ser. No. 199,971

Int. Cl.[4] A61H 37/00

U.S. Cl. 4—546 **22 Claims**



1. A dry hydro-massaging unit for mounting in a peripheral wall of a spa tub having a top rim, said dry hydro-massaging unit comprising:

a hydro-massage jet assembly having a discharge jet and means for movably mounting, said hydro-massage jet assembly within the peripheral wall of the spa tub;

means connected to said hydro-massage jet assembly for supplying a massaging fluid to said discharge jet; and

a diaphragm sealingly covering said discharge jet whereby said massaging fluid from said discharge jet massagingly flexes said diaphragm;

said means for mounting said hydro-massage jet assembly allows said assembly to be movable within the peripheral wall of the spa tub such that said diaphragm covered discharge jet is selectively movable between a first position below the top rim of the spa tub and second position above the top rim of the spa tub.

4,839,931

COUNTER TOP WASTE DISPOSAL UNIT

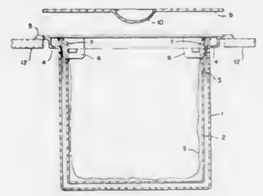
James A. Pontbriand, P.O. Box 550, Cardinal, Ontario, K0E 1E0, Canada

Filed Aug. 10, 1987, Ser. No. 83,172

Claims priority, application Canada, Jun. 9, 1987, 539245

Int. Cl.[4] E03C 1/00

U.S. Cl. 4—629 **1 Claim**



1. A receptacle for waste disposal which is adapted to be recessed in a counter-top, comprising:

an outer, rectangular, one-piece container, said outer container having a bottom, two long sides and two short sides defining a sealed shell with an open top and an upper edge shaped to form a lower outwardly directed flange portion, a small vertical step portion formed on the outer peripheral edge of said flange portion, and an upper outwardly directed flange portion formed at the top of said step portion and extending around the open top of the outer container, forming a flat, horizontal rim, said upper flange portion for resting on a counter top in substantially the same plane as the counter-top to support the receptacle;

an inner container nested in and supported by said outer container, said inner container having a bottom, two long sides and two short sides defining a sealed shell with an open top and an upper edge portion having a horizontal outwardly directed flange along each of said long sides and an upwardly and outwardly curved flange along each of said short sides, said flanges along said long sides of said inner container adapted to rest on and be supported by said lower flange portions of said long sides of said outer container, whereby waste material can be placed into the container or swept into the container across each long side, said short side flanges forming handles having upper edges having a height slightly less than said vertical step portion of said outer container, whereby said inner container is supported in and is removable through the open top of, said outer container; and

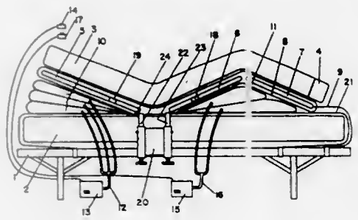
a clamping mechanism attached to the walls of the outer container to clamp and secure said outer container to a counter-top.

4,839,932

ADJUSTABLE BED SYSTEM

Robert M. Williamson, 1708 Matthews Rd., Austin, Tex. 78745

Filed May 26, 1987, Ser. No. 54,203
Int. Cl.[4] A47G 7/06; A47C 20/08
U.S. Cl. 5—68 8 Claims



1. An adjustable bed system comprising:
A. a three section hinged mattress support frame;
B. fastening means (20) to hold said three section mattress support frame to a bed (1) above a box springs (2) and below a mattress (3);
C. a spongy resilient material (26) up to 3" thick contained within the perimeter of said three section hinged mattress support frame with a cloth covering (8) to contain said three section hinged mattress support frame and said spongy resilient material (26); said cloth covering (8) having suitable openings to allow connection of said three section hinged mattress support frame to said fastening means (20);
D. tie down straps (9) to loosely anchor the leg end of said three section hinged mattress support frame to bed (1);
E. a first inflatable means (10) below a head end of said three section hinged mattress support frame to raise and lower said head end and a second inflatable means (11) below a leg end of said three section hinged mattress support frame to raise and lower said leg end;
F. a first means comprising a first motor-blower unit (13) with suitable valves and switches to inflate and deflate said first inflatable means (10) and a second means comprising a second motor-blower unit (15) with suitable valves and switches to inflate and deflate said second inflatable means (11).

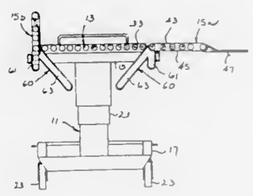
4,839,933

PATIENT TRANSFER AND CONVEYING VEHICLE

William B. Plewright; Kenneth O. Weir, and Richard J. Patterson, all of C/-85 Napier Street, Cottesloe, Australia

PCT No. PCT/AU86/00240, § 371 Date Apr. 13, 1987, § 102(e) Date Apr. 13, 1987, PCT Pub. No. WO87/01030, PCT Pub. Date Feb. 26, 1987
PCT Filed Aug. 13, 1986, Ser. No. 56,480
Claims priority, application Australia, Aug. 13, 1985, PH1921
Int. Cl.[4] A61G 7/08; A47C 21/08
U.S. Cl. 5—81 R 11 Claims

1. A handling device for aiding patient transfer between two support surfaces when such surfaces are positioned adjacent one another, said handling device comprising a body having a transfer surface, attaching means interconnecting said body to an apparatus providing one of the support surfaces, said attaching means providing for pivotal and sliding movement of said body relative to said apparatus between first second and third positions, in the first position said transfer surface bridges said support surfaces, in the second position the body extends upwardly of said apparatus to provide a safety barrier therefor and in the third position said transfer surface extends in a



downwardly inclined direction from a side of said apparatus to underlie its support surface.

4,839,934

MULTIPLE COMPONENT COMFORTER QUILT

Robert R. Rojas, 300 E. 33rd St., Box 268, New York, N.Y. 10016

Continuation-in-part of Ser. No. 864,823, May 19, 1986, abandoned. This application Oct. 13, 1987, Ser. No. 108,106
Int. Cl.[4] A47G 9/02
U.S. Cl. 5—502 18 Claims

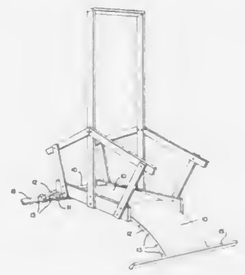
1. System of bed coverings adapted to cover beds of different standard sizes, said set comprising:
(a) a plurality of cover units of different sizes, each cover unit having a plurality of individual compartments of substantially the same size;
(b) a plurality of heat insulator units each having substantially the same size, at least one for each of said individual compartments, wherein
said individual compartments are arranged to receive and retain said heat insulator units,
said heat insulator units are arranged to be insertable and removable from said compartments of said cover units, and
said heat insulator units are arranged to be of a predetermined size and shape such that a first predetermined number of said heat insulator units in a cover unit having a first predetermined number of individual compartments will comprise a bed covering for a first standard sized bed, while a second predetermined number of said heat insulator units in a cover unit having a second predetermined number of individual compartments will comprise a bed covering for a second standard size bed whereby a plurality of the substantially uniformly sized heat insulator units may be used with different cover units of the system of bed coverings.

4,839,935

MINI ARCHED BRIDGE

Robert A. Calcagni, Poland, and Alexander Sheppa, Hubbard, both of Ohio, assignors to Commercial Shearing, Inc., Youngstown, Ohio

Filed Jul. 13, 1987, Ser. No. 73,074
Int. Cl.[4] E01D 15/12
U.S. Cl. 14—24 14 Claims



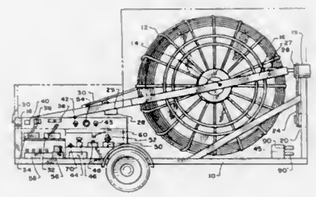
1. A mini arched bridge comprising at least two rigid hollow pans having integral downwardly depending ends and sides forming a unitary structure, each of said pans having an arcuate upper surface arching upwardly in use to support downward loads thereon, said at least two arched pans forming the entire upper surface of said bridge, said ends and sides of each pan extending completely around the perimeter of the pan to provide increased strength and rigidity to the pan and each side and end having comparable holes, a plurality of fasteners passing through the holes in the adjacent ends of each of said at least two pans, and, the ends remote from the connection adapted for placement into the earth on opposite sides of an area to be bridged, whereby said pans become a single arched member.

4,839,936

AUTOMATED SEWER CLEANING RODDING MACHINE

Charles J. Prange, Cridersville, Ohio, assignor to Sewer Rodding Equipment Company, Lima, Ohio

Continuation-in-part of Ser. No. 128,460, Dec. 3, 1987. This application May 10, 1988, Ser. No. 191,583
Int. Cl.[4] B08B 9/02
U.S. Cl. 15—104.33 12 Claims



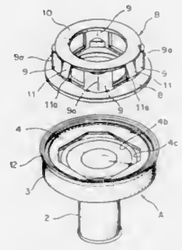
1. A sewer rodding cleaning machine comprising:
a chassis frame;
a rotatable carriage mounted on said frame;
a rod storage reel rotatably mounted on said rotatable carriage;
carriage drive means for rotating said carriage;
said carriage drive means including rotation selection control means;
rod feed drive means for feeding rod into a sewer line:
said rod feed drive means including rod feed direction selecting control means for selectively feeding said rod out or back;
sensing means sensing resistance to movement of said rod:
rod travel reversing means for reversing rod travel;
said sensing means activating said rod travel reversing means;
said rod travel reversing means reversing the direction of travel of said rod for a predetermined distance;
rod feed restoring means for restoring rod travel to the original direction after said rod has traveled said predetermined distance;
rod direction selection control means for reversing the normal operation of said rod feed drive means from feeding rod out and reversing to feed rod back to feeding rod back to reversing to feed rod out;
whereby said rod may be cyclically moved into and out of a sewer line blockage until said blockage is cleared.

4,839,937

GROMMET STRUCTURE

Ryuetsu Oikawa, and Akihiko Fujita, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jul. 11, 1988, Ser. No. 217,029
Claims priority, application Japan, Jul. 15, 1987, 62-107512[U]
Int. Cl.[4] F16L 5/02
U.S. Cl. 16—2 5 Claims



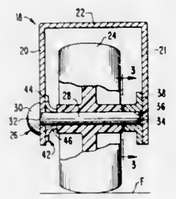
1. A grommet for insertion in a hole in a panel comprising:
a soft grommet body, including a supporting portion, arranged such that an electric wire insertion hole is formed in an inner peripheral portion of a hollow disc-like base at one end of said soft grommet body, a peripheral wall crookedly formed along an outer periphery of said hollow disc-like base, and a tip portion of said peripheral wall being further bent inwards to provide said supporting portion;
a hard resinous lock member comprising an angular pillar, including a bottom wall, having a substrate fitted in annular recess defined by said base, said peripheral wall and said supporting portion; said angular pillar also having a plurality of angular portions each adapted for fitting in said hole of said panel; stop members attached to the outer periphery of said bottom wall of said angular pillar for providing a locking force in said hole,
wherein an inner periphery of said supporting portion of said soft grommet body assumes an angular configuration having a plurality of corners contiguous to said plurality of angular portions of said angular pillar.

4,839,938

FURNITURE HAVING WHEEL AXLES CONCEALED ON ONE SIDE

J. Thayer Coggin, High Point, and Robert R. Hilton, Thomasville, both of N.C., assignors to Thayer Coggin Incorporated, High Point, N.C.

Filed Apr. 10, 1987, Ser. No. 36,745
Int. Cl.[4] A47B *91/00*; B60B *33/00*
U.S. Cl. 16—45 21 Claims



1. In an article of furniture having a furniture body and at least one wheel for rollably supporting at least part of the body on the floor, wheel supporting and concealing structure comprising:

an inverted U-shaped channel member having parallel depending flanges interconnected by an upper bight portion, said channel member being secured to the lower part of the furniture body adjacent the floor and dimensioned to receive the wheel between said flanges and conceal the majority of the height of the wheel behind said flanges;

a headed axle having a cylindrical shank and an enlarged head at one end thereof, for rotatably supporting the wheel between said flanges;

an axle-receiving aperture in only one of said flanges for supporting the headed end of said axle with said shank projecting into and substantially across said channel and said head abutting the outer surface of said one flange;

axle supporting means in said channel on the other of said flanges and aligned with said aperture for supporting the distal end of said axle shank, said other flange being imperforate in the region of said axle supporting means to conceal said axle and said axle supporting means from external view; and

axle retaining means in said channel, concealed from external view, for engaging said axle and retaining it in position in said channel, whereby only said head of said axle and the minor portion of the wheel projecting below said flanges are exposed to view.

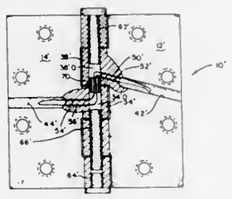
4,839,939

SECURITY HINGE WITH IMPROVED STRUCTURAL INTEGRITY WITH THE ELECTRICAL WIRES LOCATED ALONG THE PIVOT AXIS OF THE KNUCKLES

James A. O'Brien, II, 1331 W. Outer 21 Rd.-Lower Level, P.O. Box 405, Arnold, Mo. 63010-0405

Filed Mar. 24, 1988, Ser. No. 172,390
Int. Cl.[4] E05D *3/06*
U.S. Cl. 16—223 12 Claims

1. A security hinge having electrical control wires passing axially in a completely uncoiled manner-- has been inserted; there through comprising a pair of cooperating leaves having fastener openings adapted to enable the attachment of the respective leaves to a fixed member and a movable member; each of said leaves including knuckle means adapted to align and co-engage to receive pin means to hold the knuckle means in vertical alignment; said knuckle means comprising at least two knuckles; each of the knuckle means including an aligned vertical axis and having aligned pin openings extending along said axis receiving the uncoiled electrical wires and the pin means to retain the assembly in place; each of said leaves including slot means extending generally transversely through the leaf and being spaced from said openings sufficiently to avoid reducing the structural integrity of the body of said leaves; each of said slots being in fluid communication with at least one opening extending from the end of the slot into an axial opening located within one of said knuckle means, the control wires extend through the slots in each of the leaves and



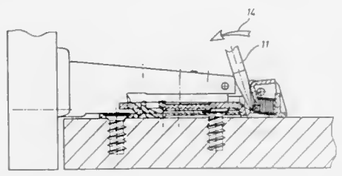
through the openings in each of leaves and through the aligned openings along said vertical axis in the knuckles within said hinge, and said wires pass uncoiled through no more than two said knuckles; and the pin means including upper and lower pin members including a first upper pin member extending through the uppermost knuckles and a second lower pin member extending through the bottomost knuckles.

4,839,940

RAPIDCY MOUNTABLE FURNITURE HINGE WITH SNAP CLOSURE

Alfred Grass, Höchst, Austria, assignor to Alfred Grass Ges.m.b.H. Metallwarenfabrik, A-6973 Hoechst/Vlbg., Austria

Filed Nov. 16, 1987, Ser. No. 120,907
Claims priority, application Fed. Rep. of Germany, Nov. 17, 1986, 3639276
Int. Cl.[4] E05D *7/12*
U.S. Cl. 16—258 6 Claims



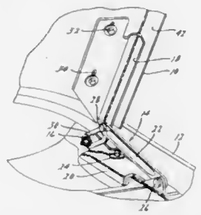
1. A rapidly mountable furniture hinge associated with a housing carried by a door and fastenable to a furniture part, said hinge comprising: a mounting plate secured to the furniture part having a fitting connection formed therein; a hinge arm moveably connected to the housing; a mounting plate top section adjustably securd to said hinge arm having a tang at one end directly downwardly at an angle away from the door for engagement with said mounting plate fitting connection and a plurality of tangs at the other end directed downwardly at angles away from the door; and a rotary slider moveably affixed to said mounting plate proximate the furniture part having a spring contiguous thereto and a forward inclined locking edge inclined in a direction opposite to the direction of inclination of the plurality of tangs engageable with said plurality of tangs to secure said mounting plate to said mounting plate top section as said spring urges to locking edge and said plurality of tangs in a locking relationship, said mounting plate top section tang and said mounting plate fitting connection releasably engaging each other when said slider locking edge engages said plurality of tangs to form a hinge snap closure.

4,839,941

ELEVATING AND TRAVERSING HOOD HINGE

James A. Orlando, Troy, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 28, 1987, Ser. No. 138,106
Int. Cl.[4] E05D *15/22*
U.S. Cl. 16—361 1 Claim



1. A hinge assembly for controlling movement of a hood between closed and opened position with respect to an automotive vehicle body comprising:

a first plate having a first end and a second end and being secured to the body;

a pivot bolt secured to the first plate at the first end thereof;

a second plate having a first end and a second end and being secured to the hood;

means defining an elongated slot in the second plate for receiving the pivot bolt for permitting simultaneous pivotal and translation movement with respect thereto while simultaneously permitting upward and forward movement of the hood with respect to the body; and

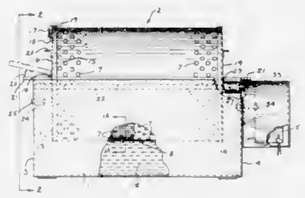
an elongated stabilizing rod pivotally connected at one end to the first plate at the second end of the first plate and pivotally connected at its other end to the second plate at the first end of the second plate, the other end pivotal connection being located at one end of the slot while also being inbetween the slot and an edge of the hood, said elongated slot being located at the first end of the second plate while also being spaced outwardly from and at an angle to the edge of the hood.

4,839,942

FISH SCALING APPARATUS

James B. Damp, P.O. Box 167, Abrams, Wis. 54101

Filed Jan. 15, 1988, Ser. No. 144,235
Int. Cl.[4] A22C *25/02*
U.S. Cl. 17—64 18 Claims



1. A fish scaling apparatus for removal of scales from a fish without brusing the edible body portion comprising,

a trough-shaped tank having a bottom and sidewall portions and first and second end walls secured to said bottom and sidewall portions,

a substantially closed cylindrical scaling drum having a cylindrical wall and end closure walls, said cylindrical wall being formed of metal and having a plurality of openings including inwardly projecting sidewalls having smooth inner scaling edges for scaling of fish during rotation of the drum,

a drive shaft means on said end closure walls,

first and second bearing means secured to the end walls of said trough-shaped tank and said end closure walls of said cylindrical drum, each of said first and second bearing means includes a first bearing member secured to said trough-shaped tank and a second bearing member secured to said cylindrical tank, said first and second bearing members being releasably coupled to form a rotating bearing support of said cylindrical tank and permitting manual removal of said tank without removing components from said bearing members, and

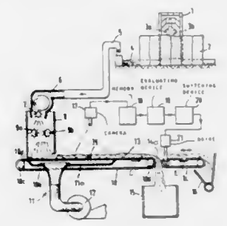
a motor means secured to one end wall of said trough-shaped tank and having an output shaft, and a releasable coupling direct connected to said output shaft and to said drive shaft means.

4,839,943

APPARATUS FOR DETECTING FOREIGN BODIES IN A FIBER TUFT MASS

Ferdinand Leifeld, Kempen, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

Filed Dec. 18, 1987, Ser. No. 134,869
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644535
Int. Cl.[4] D01B *1/00*
U.S. Cl. 19—80 R 17 Claims



1. An arrangement for ascertaining the presence of foreign bodies in, and their removal from a mass of fiber tufts, comprising

(a) a conveyor having a fiber tuft supporting surface;

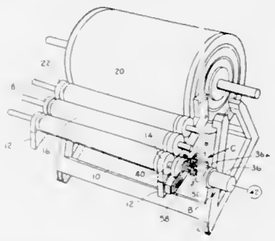
(b) means for forming a loose fiber tuft layer on said surface;

(c) driving means for advancing the conveyor for moving the loose fiber layer in a conveying direction;

(d) a foreign body detecting apparatus arranged for scanning the fiber tuft layer for ascertaining a presence of a foreign body at a first location and including signal generating means for generating a signal upon ascertaining said presence; and

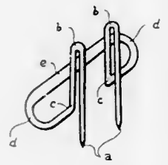
(e) a foreign body removing means operatively connected to said signal generating means for removing the foreign body at a second location upon receipt of said signal; said second location being downstream of said first location as viewed in said conveying direction.

4,839,944
FEED ROLL SENSOR FOR A TEXTILE CARDING MACHINE
John D. Hollingsworth, Greenville, and Gary H. Rookstool, Simpsonville, both of S.C., assignors to John D. Hollingsworth On Wheels, Inc., Greenville, S.C., a part interest
Filed Oct. 13, 1987, Ser. No. 107,666
Int. Cl.[4] D01G *23/06*; D01H *5/38*
U.S. Cl. 19—105 16 Claims



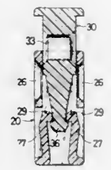
1. Apparatus sfor use in a textile machine control system for regulating the amount of textile fiber fed to said machine comprising:
(a) a fixed feed roll rotatable carried by a frame of said machine;
(b) a fixed nipping surface fixedly carried adjacent said feed roll to define a fixed nip between said feed roll and nipping surface through which said fibrous mass is fed;
(c) rotational motor drive means for rotating said feed roll;
(d) sensor means for directly and mechanically sensing a reaction of said rotational motor drive means to the torque of the feed roll produced during rotation of said feed roll and feeding said fibrous means through said nip;
(e) said sensor means generating an electrical control signal representing a quantitative condition of said fibrous mass for use in regulating said rotational drive means in a manner that a prescribed quantity of said fiber mass is fed to said machine.

4,839,945
INVISIBLE TIE TAIL HOLDER
Zane A. Price, 6248 Gentle La., Alexandria, Va. 22310, and Douglas P. Bentley, 8528 Cyrus Pl., Alexandria, Va. 22308
Continuation of Ser. No. 141,005, Jan. 5 1988, abandoned. This application Oct. 4, 1988, Ser. No. 253,958
Int. Cl.[4] A41D *25/10*
U.S. Cl. 24—49 R 4 Claims



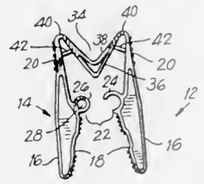
1. An invisible tie tail holder comprising:
a "c"-shaped holder having a c-body portion and including two curved outer end portions and two inner-end portions, said "c"-shaped holder being oriented for installation in a horizontal plane about a tie tail;
a pair of pin members oriented for vertical installation in the back of the front of a tie, said pin members each having a first end, a second end, and an intermediate portion; each first end being pin-shaped for pin-engagement with the front of the back of said tie, said intermediate portions being bent into an inverted "J"-shaped member having upper and lower ends wherein each said pin-shaped first end of said pin member is located at said lower end of said inverted "J"-shaped member and each said upper end of said inverted "J"-shaped member extends to and connects with said second end of said pin members which is affixed to a different one of said two inner-end portions of said "c"-shaped holder; and,
wherein said curved outer end portions of said "c"-shaped member extend horizontally beyond said pair of vertical pin members.

4,839,946
CORD LOCK
Ryukichi Murai, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan
Filed Apr. 29, 1988, Ser. No. 188,484
Claims priority, application Japan, May 1, 1987, 62-66288[U]
Int. Cl.[4] F16G *11/04*
U.S. Cl. 24—115 G 14 Claims



1. A cord lock comprising:
(a) a one-piece socket molded of synthetic resin and having a pair of aligned lateral apertures for receiving a cord and at least one resilient flap disposed in an axial hole in said socket below said apertures; and
(b) a one-piece plug molded on synthetic resin and axially movable in said socket, said plug having a transverse through-hole alignable with said lateral apertures for movement of the cord therethrough, and a wedge-shaped end portion engageable with said resilient flap and coacting with the latter for urging said plug to move axially upwardly under the resiliency of said resilient flap.

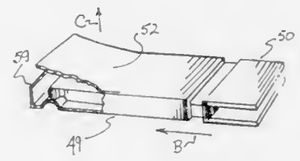
4,839,947
CLAMP MECHANISM
Robert Cohen, 310 E. 46th St., New York, N.Y. 10017, and Betty J. Charak, 343 E. 30th St., New York, N.Y. 10016
Filed Jul. 14, 1988, Ser. No. 219,962
Int. Cl.[4] A41F *1/00*; A44B *21/00*
U.S. Cl. 24—499 5 Claims



1. A clamp formed of a unitary piece of resilient material comprising first and second arms, each of said arms having a jaw portion terminating at a first arm end joined to a finger-grip portion terminating at a second arm end, said jaw portions each including an inwardly-directed face adapted to jointly

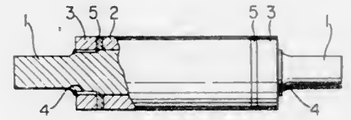
engage an object sought to be gripped between said jaw portions, an integral hinge member located on said arms between said finger-grip and jaw portions and comprising a first hinge member element on said first arm and a second hinge member element on said second arm, said first and second elements being engageable together to form a pivot point about which said arms rotate, and an integral biasing member extending between said finger-grip portion and affixed to said arms at the second ends thereof and having a pair of spacer members located between said biasing member and said finger-grip portion inwardly of said affixation points, whereby the biasing action is confined to the portion of said biasing member between said spacer members, the jaw ends of said arms being biased together about said hinge member by said biasing member.

4,839,948
CONVERTIBLE FOOTWEAR
Leslie A. Boros, 7074 E. Aster Dr., Scottsdale, Ariz. 85254
Continuation-in-part of Ser. No. 866,777, May 23, 1986, abandoned, which is a continuation of Ser. No. 681,844, Dec. 14, 1984, abandoned. This application Oct. 6, 1987, Ser. No. 105,715
Int. Cl.[4] A41F *1/00*
U.S. Cl. 24—662 3 Claims



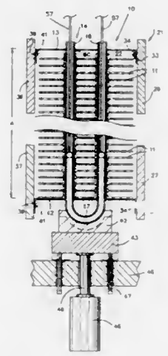
1. A clasp for detachably securing a first member to a second member, said clasp comprising:
(a) a female element couplable to said first member and including
(i) an open end,
(ii) a closed end spaced from the open end,
(iii) a pair of spaced apart edgewalls,
(iv) a first sidewall integral with said pair of edgewalls, and
(v) a second sidewall having
a first portion integral with said pair of edgewalls along a length thereof adjacent said open end, and
a second portion integrally extending from said first portion toward said closed end and independent said pair of edgewalls, said second portion being biased in a direction toward said first sidewall;
(b) a male element including
(i) a first end couplable to said second member, and
(ii) a second end spaced from said first end and receivable through the open end of said female element; and
(c) detent means for selectively and detachably retaining said male element within said female element, said detent means including
(i) a first engagement element of an engagement pair carried by one of said sidewalls at a location closer to said closed end than to said open end of said female element, and
(ii) a second engagement element of said engagement pair being complemental to said first engagement element and carried by said male element at a location closer to the second end thereof and to the first end thereof.

4,839,949
ROLLERS FOR ROLLING MILLS
Masahisa Sobue, Mito; Sensuke Okada; Kimihiko Akahori, both of Katsuta; Keiichi Kuniya, Hitachi; Toshimi Sasaki, Mito; Toshiyuki Kajiwara, Hitachi; Tomoaki Kimura, Hitachi, and Mitsuo Nihei, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 601,358, Apr. 18, 1984, abandoned. This application May 12, 1987, Ser. No. 48,907
Claims priority, application Japan, Apr. 22, 1983, 58-69918
Int. Cl.[4] B21B *27/00*
U.S. Cl. 29—132 19 Claims



1. A roll for strip sheet rolling mills, the roll being mounted as a work roll in a rolling mill and being a solid cylindrical bar having an axial length larger than a diameter thereof, said roll is an entirely non-metallic sintered body comprising a principal component of at least one material selected from the group consisting of silicon carbide, silicon nitride, sialon, alumina and zirconia and has a density of at least 96% of the sintered body theoretical density, said roll having an initial crown in a range of -300 μm to $+300$ μm.

4,839,950
METHOD FOR MAKING A TUBE AND FIN HEAT EXCHANGER
Steven L. Stroup, Bluffton, Ind., assignor to Crown Unlimited Machine, Incorporated, Bluffton, Ind.
Division of Ser. No. 52,689, May 28, 1987, Pat. No. 4,780,955. This application Feb. 29, 1988, Ser. No. 162,013
Int. Cl.[4] B21D *53/08*
U.S. Cl. 29—157.3 C 4 Claims



1. A method of producing heat exchangers having end sheets with fins stacked therebetween and tubes extending through said end sheets and fins expanded into tight engagement therewith, comprising loosely assembling said tubes through said end sheets and fins and thereafter progressively expanding said tubes from one end thereof causing tubes to expand into tight engagement with the end sheet adjacent to said one end of said tubes and thereafter progressively into tight engagement with said fins and the end sheet remote from said one end of said

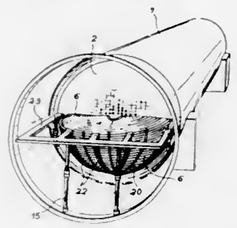
tubes, said progressive expansion of said tubes progressively causing shortening thereof, and supporting said end sheets a predetermined fixed distance apart during said progressive expansion of said tubes so that the spacing between the end sheets is unaffected by said expansion and shortening of said tubes and said end sheets are spaced apart said predetermined distance after said tubes are expanded.

4,839,951

PROCESS FOR THE INSTALLATION OF TUBES IN A STEAM GENERATOR

Gérard Boula, Fleursault, and Alain Georges, Verdun, both of France, assignors to Framatome, Courbevoie, France

Filed Aug. 27, 1987, Ser. No. 90,059
Claims priority, application France, Aug. 27, 1986, 86 12126
Int. Cl.⁴ B21D *53/00*
U.S. Cl. 29—157.4 **5 Claims**



1. A process for the installation of tubes in the form of planar layers, separated by in particular intermediate antivibratory bars, in a steam generator, said process comprising the repetition of the following steps

(a) installing a layer of tubes;

(b) positioning intermediate bars above said layer;

(c) loading said intermediate bars by forces along said intermediate bars and perpendicular to a plane of said layer of tubes;

(d) checking a clearance between said intermediate bars and each of the tubes of said layer; and

(e) removing and replacing those of said tubes whose clearance is outside the tolerances by correct tubes.

4,839,952

PROCESS FOR MANUFACTURING TOOTHED PARTS

Michihiro Yokoyama, Anjyo, Japan, assignor to Kabushiki Kaisha Yokoyama Seisakusho, Anjo, Japan

Filed Jun. 30, 1987, Ser. No. 68,152
Claims priority, application Japan, Jul. 3, 1986, 61-156758
Int. Cl.⁴ B21D *53/28*
U.S. Cl. 29—159.2 **1 Claim**

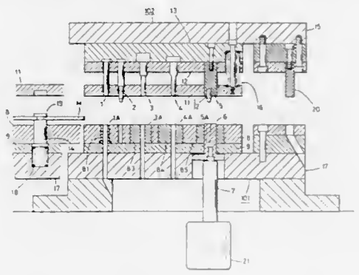
1. A process for manufacturing toothed parts having an exterior periphery defining a final tooth profile that is comprised of a finished smooth profile portion and a finished tooth profile portion and said process for manufacturing including the use of a press machine having top and bottom die sets with stock interposed therebetween at uniform intervals in sequence, said process including the steps of:

stamping a reference hole in said stock;

stamping a window hole defined by a front profile line and a back profile line substantially similar to the toothed parts in said stock while using said reference hole as a reference;

rough-forming on the back profile line of said window hole a tooth profile having a tooth width greater and a tooth height lower than the final tooth profile, the rough-formed tooth profile on one side of said window hole having a shape substantially similar to the finished tooth profile portion, and the front profile line of said window hole having a shape substantially similar to the finished smooth profile portion;

stamping a partially fabricated part through a die bushing in a female die with a finish punch that has a shape similar to that of the toothed parts, the die bushing through which said partially fabricated parts is passed having a 40°–100° chamfer around substantially an entire circumference of an upper inlet and a 90°–150° chamfer at a lower inlet of the die bushing; and



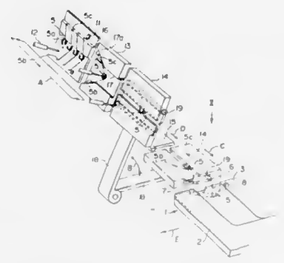
ironing said partially fabricated part with a finishing counter and thereby notching the tooth profile in a substantially identical shape to the tooth profile formed by said finish punch.

4,839,953

MAGNETIC DISK CARTRIDGE ASSEMBLY SYSTEM

Akira Mizuta, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 31, 1987, Ser. No. 140,270
Claims priority, application Japan, Jan. 9, 1987, 62-2899
Int. Cl.⁴ B23P *19/04;* **B65H** *3/00;* **G11B** *5/82;* **B65B** *69/00*
U.S. Cl. 29—225 **8 Claims**



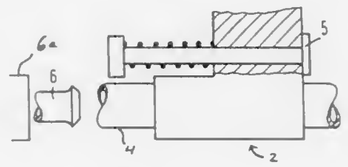
1. A magnetic disk cartridge assembly system for assembling a magnetic disk cartridge having a casing for accommodating therein a magnetic disk, a shutter which is slidably mounted on the outer surface of the casing, and a substantially V-shaped shutter spring which urges the shutter toward a predetermined direction and is inserted into the casing through a spring insertion opening to abut against an engaging portion on the casing at one end and against an engaging portion on the shutter at the other end under its own resiliency, comprising a guide member which has a guide groove for holding the shutter spring in a compressed state and is adapted to bring a first end of the guide groove in close opposition to the spring insertion opening of the casing, the width of the guide groove being not larger than that of the spring insertion opening at least at the first end, and a movable insertion means which is adapted to move the spring along the guide groove and to insert it into the spring insertion opening through the first end of the guide groove.

4,839,954

MANIPULATION DEVICE FOR HOSE MOUNTING

Gunter Hartmann; Ralf Swoboda, both of Munich, and Robert Lang, Syrgenstein, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 28, 1987, Ser. No. 43,315
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1986, 3614362
Int. Cl.⁴ B23P *19/02*
U.S. Cl. 29—235 **16 Claims**



1. A manipulation device for use with an industrial robot for automatically mounting hoses having different diameters onto corresponding fittings, comprising:

turret base member;

at least three double-jaw grippers arranged on said turret base member, each of said grippers corresponding to a different predetermined hose diameter;

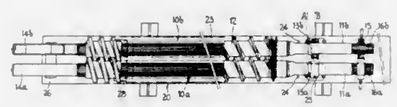
means for actuating each of said grippers; and each of said gripper being attached to said turret base member at an angle thereto, thereby allowing said gripper to grip a hose being held by a means for holding the hose in a defined position and to cause a predetermined length of hose to be obtained from a hose supply.

4,839,955

METHOD FOR MOUNTING AND REMOVING SCREWS OF AN EXTRUSION MACHINE

Jean Vannier, Mesvres Etang Sur Arroux, France, assignor to Clextral, Courbevoie, France

Filed Dec. 2, 1987, Ser. No. 127,998
Claims priority, application France, Dec. 2, 1986, 86 16817
Int. Cl.⁴ B23P *7/00*
U.S. Cl. 29—402.08 **2 Claims**



1. Method for selectively removing and mounting screws of an extrusion machine which comprises first and second screws driven in rotation and guided at opposite ends thereof by a bearing forming with the screws a screw-bearing assembly, each of said screws comprising a central driving shaft having splines, a plurality of hollow screw sections mounted on the driving shaft and having an inner wall defining grooves which are in engagement with the splines of the central shaft, and extrusion treating means on the periphery of the screw sections, said method comprising the steps of

(a) preparing a work table for simultaneously receiving the two screws, the table being provided with adjustable support means for the screws, extracting with the aid of hoisting means the screw-bearing assembly of the extrusion machine, and placing said assembly on the work table;

(b) removing the bearings and placing in position on one end of each of the two shafts a jig for locating an initial position of the splines and for maintaining the distance between the axes of the screws, and placing a protective sleeve on another end of each of the shafts;

(c) checking the dimensions of the flights of the screw sections for determining the defective sections to be repaired or replaced;

(d) removing the screws from the work table and preparing said work table for placing in position one of the screws;

(e) placing said first screw on the work table, and successively extracting the sections by means of suitable tooling and a single section-hoisting device;

(f) placing said second screw on the work table, and successively extracting the sections by means of said tooling and single-section hoisting device;

(g) after withdrawing the second splined shaft from the work table, preparing said table for placing the two splined shafts in position;

(h) placing the two splined shafts on the work table, and placing the jig back in position on one of the ends of the shafts for positioning said splined shafts and resuming said initial position of the splines;

(i) simultaneously sliding, by means of a double section-hoisting device, a new section on each splined shaft, and repeating the operation for each pair of new sections;

(j) removing the protective sleeve and the jig from each shaft;

(k) putting the bearing corresponding to each end of the shafts back in position; and

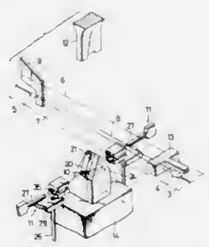
(l) remounting the screw-bearing assembly in the extrusion machine.

4,839,956

METHOD OF AND APPARATUS FOR ATTACHING TOP STOPS TO SLIDE FASTENER CHAIN

Tatsuo Osaki, Uozu, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Apr. 22, 1988, Ser. No. 184,897
Claims priority, application Japan, Apr. 25, 1987, 62-102811
Int. Cl.⁴ B21D *53/50*
U.S. Cl. 29—408 **6 Claims**



1. An apparatus for automatically attaching a pair of horizontal U-shaped top stops of synthetic resin to a continuous slide fastener chain including a pair of tapes and a pair of coupled rows of fastener elements mounted on and along respective inner longitudinal edges of the opposed tapes, there being a plurality of element-free spaces spaced at equal distances along the slide fastener chain, said apparatus comprising:

(a) means for supporting the slide fastener chain in tension along a horizontal path;

(b) an anvil and an upper jaw for defining a pair of pockets to clamp the top stops each on its upper and lower sur-

faces, said upper jaw being movable with respect to said anvil so as to release the upper surface of each said top stops, said anvil and said jaw being normally disposed below the path of the slide fastener chain and upwardly movable until said pockets are horizontally aligned with the opposed inner tape edges, said upper jaw having a substantially triangular head for insertion into a space between the opposed inner tape edges in response to the upward movement of said anvil and said upper jaw; and

(c) a thrusting member normally disposed below the path of the slide fastener chain and upwardly movable upon completion of attaching of the top stops said thrusting member having a substantially triangular upper end for insertion between the opposed inner tape edges in response to the upward movement of said thrusting member to remove the top stops out of said pockets.

4,839,957

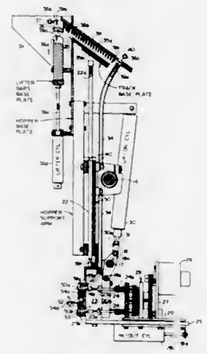
METHOD OF APPLYING A DOOR HINGE

Erling S. Jangaard, Maderia Beach, Fla., assignor to Ruvo Automatioo Corporation, Largo, Fla.

Division of Ser. No. 932,265, Nov. 19, 1986, Pat. No. 4,782,588. This application Apr. 6, 1988, Ser. No. 178,310

Int. Cl.[4] B23P *11/0*

U.S. Cl. 29—434 5 Claims



1. A method of securing with screw members the opposing flaps of a hinge member to a door and a door jamb at the same time, comprising the steps of:

positioning a door and a door jamb at a remote location;

periodically delivering to said remote location as many screw members as required to secure the flaps of a hinge member to said door and door jamb;

accomplishing said periodic delivery by moving a screw member-carrying element between a first position where it receives a charge of screw members and a second position adjacent said remote location;

delivering screw members to said element when said element is in its upward and outward position by means of a plurality of elongate conduit means which do not move during the performance of any step of the method;

positioning respective charging ends of said non-moving conduit means in communication with associated queues of said screw members;

transferring the lead screw member from each queue of screw members by an escapement means and delivering said screw members to charging ends of associated conduit means;

adding screw members to said queues by lifting them from a pile of randomly oriented screw members positioned within a hopper means;

accomplishing said lifting by reciprocating between an uppermost and a lowermost position an upstanding lifting means positioned within said hopper means;

forming a slot means in the uppermost end of said lifting means so that the shank portion of a screw member may enter said slot means at the same time its head portion is abuttingly engaged by the uppermost end of said lifting means adjacent said slot means so that said screw member is lifted from said pile attendant upward reciprocation of said lifting means;

propelling screw members lifted out of said pile by said lifting means to a storage area in the form of a queue so that said lifting means is empty and thus capable of lifting another screw member when it makes a subsequent reciprocation through said pile of screw members;

and propelling said screw members from said lifting means to said storage area under the influence of air under pressure.

4,839,958

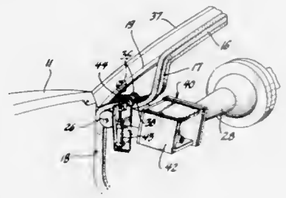
METHOD OF USING A ROBOT FOR INSTALLING WEATHER STRIPPING IN A DOOR OR LIKE OPENING

Stephen St. Angelo, Jr., Rochester Hills, Mich.; George C. Carver, Albany; David W. Patterson, Duluth, both of Ga., and Owen K. Fremont, Rochester, Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 944,649, Dec. 22, 1986, Pat. No. 4,760,636, which is a continuation-in-part of Ser. No. 888,238, Jul. 18, 1986, Pat. No. 4,715,110. This application Feb. 29, 1988, Ser. No. 161,500

Int. Cl.[4] B23P *11/02*

U.S. Cl. 29—450 10 Claims



1. A method for utilizing a robot with an arm and a variable rotational velocity pressure roller to install fixed lengths of weather stripping, stored in a loading station, into a body opening including generally straight sections and corner sections, said method in combination comprising:

loading said robot arm with one of said fixed lengths;

transferring said fixed length from said loading station to said body opening;

interacting and tracing said pressure roller along a straight section at a first linear speed and at a first rotational speed and interacting and tracing said pressure roller along a corner section at a second linear speed differing from said first linear speed and at a second rotational speed differing from said first rotational speed whereby said fixed length is guided and affixed with said sections as said fixed length is installed into said body opening.

6. A method for utilizing a robot with an arm and a variable rotational velocity pressure roller thereon to install a fixed length of weather stripping into a body opening including generally straight sections and corner sections, said method in combination comprising:

interacting and tracing said pressure roller along a straight section at a first linear speed and at a first rotational speed and interacting and tracing said pressure roller along a corner section at a second linear speed differing from said first linear speed and at a second rotational speed differing from said first rotational speed whereby said fixed length is guided and affixed with said sections as said fixed length is installed by said robot into said body opening.

4,839,959

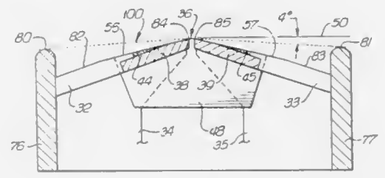
METHOD OF FORMING A MAGNETIC HEAD

Roger L. Mersing, Mission Viejo, Calif., assignor to Odetics, Inc., Anaheim, Calif.

Filed Oct. 22, 1987, Ser. No. 111,998

Int. Cl.[4] G11B *5/42*

U.S. Cl. 29—603 10 Claims



1. A method of forming a magnetic head comprising the steps of:

providing a head having a body with a tape facing surface;

coupling at least one guide member to the body of magnetic head wherein an edge of the guide member extends beyond the tape facing surface of the magnetic head and the guide member edge has a predetermined positioned relationship with respect to the tape facing surface; and

simultaneously lapping the edge of the guide member and a portion of the tape facing surface of the magnetic head to form a predetermined beveled contour on the tape facing surface determined by said positional relationship.

4,839,960

METHOD OF MANUFACTURING CIRCUIT COMPONENT SUCH AS STATOR FOR VARIABLE RESISTOR

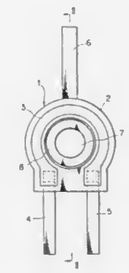
Tsutomu Yokoi; Hiroji Tani; Tohru Kasanami; Norio Fukui, and Keizou Yamamoto, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed May 25, 1988, Ser. No. 198,326

Claims priority, application Japan, May 29, 1987, 62-136087; May 29, 1987, 62-136088; Oct. 23, 1987, 62-268749

Int. Cl.[4] H01C *17/06*

U.S. Cl. 29—620 13 Claims



1. A method of manufacturing a circuit component comprising a substrate of resin and a film electrical element provided on the surface of said substrate, said method comprising:

a step of preparing a heat resistant film;

a step of providing a desired film electrical element on said heat resistant film;

a step of preparing a forming die having a cavity for forming a substrate;

a step of locating said heat resistant film provided with said film electrical element in said forming die to expose at least a part of said film electrical element in said cavity; and

a step of introducing resin into said cavity to form by said resin a substrate joined with said at least a part of said film electrical element.

4,839,961

GRIPPING DEVICE

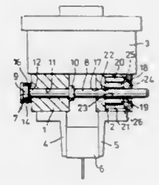
Adrianus J. P. M. Vermeer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 158,523, Feb. 22, 1988, abandoned. This application Sep. 19, 1988, Ser. No. 248,245

Claims priority, application United Kingdom, Mar. 11, 1987, 8705716

Int. Cl.[4] H05K *3/30*

U.S. Cl. 29—740 8 Claims



1. A gripping device for an apparatus for placing components on a substrate, the device comprising a pair of grippers, each of which comprises a gripper jaw and at least one of which is movable relative to the other to close and open the jaws for gripping and releasing a component, characterised by a stroke-limiting device which is arranged for abutment with a first gripper of said pair of grippers after an initial relative movement between the grippers in the direction to open the jaws so as to limit said initial relative movement between the grippers in this direction, the stroke-limiting device comprising an abutment member which is capable of limited movement relative to said first gripper in the directions of relative movement between the grippers and which has an abutment surface for cooperation with an abutment surface on the first gripper to limit said relative movement of the abutment member in one direction, means being provided for urging the abutment member in the opposite direction to a position in which the abutment surfaces are spaced from one another, and means being provided for locking the abutment member to the second gripper of said pair of grippers against movement relative thereto at least in one direction such that initial relative movement between the grippers in the direction to open the jaws brings the abutment surfaces into engagement with one another to prevent further relative movement between the grippers in that direction, the locking means being releasable to free the abutment member so as to permit further relative movement between the grippers in said direction.

4,839,962

HARNESS-MAKING MACHINE HAVING IMPROVED CABLE GUIDE

Alden O. Long, Jr., Carlisle, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 7, 1988, Ser. No. 268,113

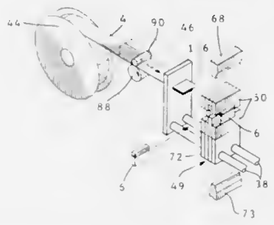
Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—749 13 Claims

1. A machine for installing a connector on a ribbon cable, the machine comprising a connector installing station having in-

stalling means therein for installing the connector on the ribbon cable, a connector positioning means adjacent the installing station for locating the connector relative to the installing means, and a cable dispensing unit proximate to the installing station for dispensing cable from a cable source to the installing station, the machine being characterized in that:

a cable guide is provided on the dispensing unit, the cable guide extending cantilever fashion from the dispensing unit towards the installing station, the guide having a free end which is spaced from the dispensing unit,



means for moving the cable guide between a retracted position and a forward position, the free end of the cable guide extending substantially through the connector positioning means and being adjacent to the installing station when the cable guide is in its forward position, the cable guide being retracted from the installing station when the cable guide is in its retracted position whereby,

a connector can be placed in the connector positioning means when the dispensing unit is in its retracted position, and upon movement of the cable guide to its forward position.

4,839,963

SLIDER HANDLING APPARATUS

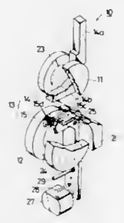
Hideki Akiyama, and Toyoo Morita, both of Toyama, Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 3, 1988, Ser. No. 227,636

Claims priority, application Japan, Aug. 7, 1987, 62-121275[U]

Int. Cl.[4] **A41H** *37/06*; **B21D** *53/54*

U.S. Cl. 29—766 **3 Claims**



1. A slider handling apparatus which comprises:

(i) a pressure roller having a peripheral groove and vertically movable toward and away from a path of travel of a slide fastener chain carrying sliders thereon;

(ii) a drive roller having a peripheral groove and engageable with said pressure roller across the fastener chain; and

(iii) a slider arresting means comprising

(iii-1) an upper stopper received in the peripheral groove in said pressure roller and vertically movable with said pressure roller; and

(iii-2) a lower stopper received in the peripheral groove said driver roller and pivotally connected to a bracket member to move into and out of the path of the fastener chain; said upper and lower stoppers cooperating in arresting sliders one at a time at a position in advance of a nip of said pressure and drive rollers.

4,839,964

FIXING STRUCTURE OF BLADE FORCE UP SPRING FOR CLOTHES SHAVER AND ELECTRIC SHAVER

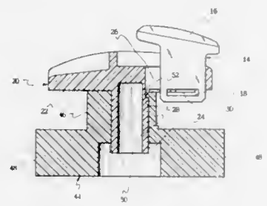
Hiromi Uchiyama, and Tsuyoshi Nakano, both of Matsumoto, Japan, assignors to Izumi Seimitsu Kogyo Kabushiki Kaisha, Matsumoto, Japan

Filed Sep. 15, 1987, Ser. No. 96,878

Claims priority, application Japan, Jun. 27, 1987, 62-099105[U]

Int. Cl.[4] **B26B** *19/14*

U.S. Cl. 30—43.6 **5 Claims**



1. A rotary electric shaver for whiskers or clothing pills, comprising an outer blade in the form of a mesh, inner blades each having a cutting section at an extremity thereof, a base for supporting the inner blades with the cutting sections thereof adjacent the outer blade, the base having an upper face facing the interior of the outer blade and a lower face, the base including a shaft projecting from the lower face thereof, a spring positioned on the lower face of the base for holding the inner blades upright in an orientation substantially vertical to the lower face with the cutting sections thereof adjacent the outer blade and for biasing the inner blades toward the outer blade, the spring having a central opening through which the base shaft projects, and a fan comprising a hollow shaft and blades projecting radially therefrom, the fan shaft being received on the base shaft with an axial extremity of the fan shaft pressing portions of the spring bordering the opening in the spring against the lower face of the base.

4,839,965

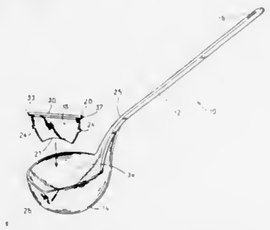
SKIMMER/SEPARATION LADLE

Mark W. Levie, New York, N.Y., assignor to LK Mfg., West Babylon, N.Y.

Continuation of Ser. No. 914,866, Oct. 3, 1986, abandoned. This application Apr. 4, 1988, Ser. No. 176,858

Int. Cl.[4] **A47J** *43/28*

U.S. Cl. 30—324 **10 Claims**



1. In a skimmer/separator ladle comprising:

a handle;

a bowl having a spout section at one end thereof and a container section at the other end thereof, the improvement consisting of:

a separator gate removably mounted in said bowl between said spout and said container section and coupling means for removably mounting said gate on said bowl, said gate defining a passage with the bottom of said bowl for liquids from the container section to said spout section, said bowl having at least one track and said gate is received therein, each track being semicircular, the gate including semicircular sides that mate with each of the semicircular tracks.

4,839,966

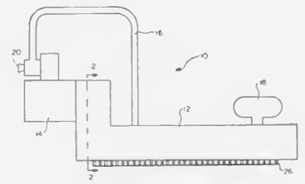
HAND-CARRIED TOOL FOR CUTTING PLASTER-LIKE MATERIAL

Benjamin Krouzkevitch, 70 Shelford Ave., San Carlos, Calif. 94070, and Alexander Litvinenko, 1974 Middle Two Rock Rd., Petaluma, Calif. 94952

Continuation of Ser. No. 934,006, Nov. 24, 1986, abandoned. This application Jan. 11, 1988, Ser. No. 144,603

Int. Cl.[4] **B27C** *1/10*

U.S. Cl. 30—475 **9 Claims**



1. A hand-carried tool for cutting plasterlike material to produce a smoothed surface, comprising

a casing,

one or more elongated cutting cylinders each attached to said casing rotatably around an axis,

a compressed air operable motor, and

power communicating means serving to communicate motion of said motor to said elongated cutting cylinders,

each of said cutting cylinders having cutting sections and grooves alternately formed sequentially and longitudinally therealong, mutually adjacent ones of said cutting sections being separated by one of said grooves, said grooves being formed completely around said cylinders circumferentially, each cutting section having two or more edge pieces protruding radially and spaced evenly around said axis, each edge piece having a cutting edge parallel to said axis, the distance between one of said cutting edges and the opposite one of said edge pieces to said one of said cutting edges being at least 0.7 cm.

4,839,967

SURVEYING METHOD ALLOWING GREATER FREEDOM IN POSITIONING THE SURVEYING INSTRUMENTS

Chen Huei-Chin, 3Fl., No. 10-2, Lane 433, Chilin Rd., Taipei, Taiwan

Filed Dec. 28, 1987, Ser. No. 137,925

Int. Cl.[4] **G01B** *11/27*

U.S. Cl. 33—228 **1 Claim**

1. A method for surveying a straight line between a first point and a second point comprising the steps of:

locating a surveying instrument having a telescope at the second point;

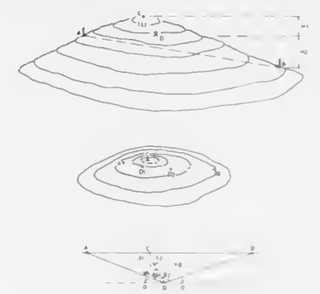
locating a compass at a third point separated by a measured distance (L) from said second point;

determining the bearing angle from said third point to said first point by said compass;

aligning the longitudinal axis of said telescope at said bearing angle;

measuring the angle (V) between the longitudinal axis of said telescope and a straight line between said second point and said third point;

measuring the angle (θ_1) between a straight line between said second point and said first point and a straight line between said second point and said third point;



defining a rotated reference line by rotating the longitudinal axis of said telescope 90° in a direction toward said first point, whereby said rotated reference line and said straight line between said second point and said third point form an angle θ_3 equal to $90° - V$; and

calculating the distance (S) between said first point and said second point using said values for L, θ_1 and θ_3.

4,839,968

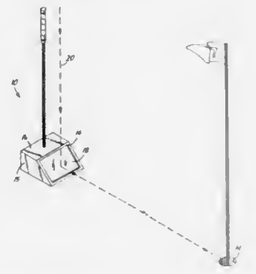
GOLF GREEN VIEWING APPARATUS

Hubert E. Logsdon, 501 E. Market St., Salem, Ind. 47167

Filed Jan. 19, 1988, Ser. No. 145,267

Int. Cl.[4] **G01B** *9/00*

U.S. Cl. 33—286 **1 Claim**



1. A golf green reading apparatus for enabling visual observation of golf green slope and obstruction between a position on said green remote from objective hole and said hole comprising,

a housing means for support of a reflective observing surface, said housing means including a bottom support surface, a forward surface, and a top surface; and

a handle means orthogonally secured to said housing means for transport of said housing means; and

wherein an included angle between said bottom support surface and said forward surface is an acute angle of forty-five degrees; and

wherein said housing means includes sides; said sides being of trapezoidal configuration; and

wherein said forward surface has a recess formed therein

wherein said recess and said reflective observing surface are of complementary shape; and
wherein said forward surface forms a rectangular framework about said observing surface; and
wherein said handle includes an elongate shaft with a handle core secured in an upward terminal end thereof with a non-slip handle surface secured about said core; and
wherein said support surface is planar for positioning on said green and of greater surface area than said top surface to impart stability to said apparatus

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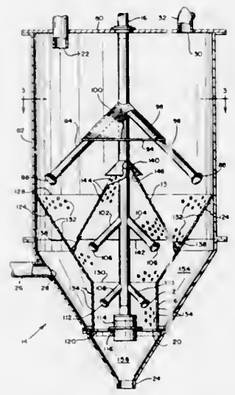
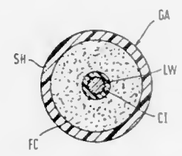
4,839,969
DRYING METHOD AND APPARATUS
Granville J. Hahn, Big Spring, Tex., assignor to Permian Research Corporation, Big Spring, Tex.
Filed Feb. 26, 1988, Ser. No. 160,521
Int. Cl.[4] F26B *17/12*
U.S. Cl. 34—169 **10 Claims**



1. A drier for particulate matter, said drier comprising:
An enclosed vessel having an upper section with a vertically oriented, substantially cylindrical sidewall, and a coaxially aligned lower section with a downwardly and inwardly tapered frustoconical sidewall, the bottom edge of said upper section being substantially coextensive with the top edge of said lower section;
A rotatable shaft coaxially disposed within said vessel and extending substantially the entire interior length of said vessel;
Means for rotating said shaft within said vessel;
A plurality of axially spaced arrays of circumferentially spaced, radially extending, downwardly inclined stirring arms connected to said shaft in fixed relation to said shaft and in substantially fixed relation to each other;
Inlet means near the top of said vessel for introducing particulate matter to be dried into said vessel;
Outlet means at the bottom of said vessel for discharging dried particulate matter from said vessel;
Means for introducing a heated gas into the lower section of said vessel; and
At least two perforated substantially frustoconical separator means coaxially disposed within said vessel in fixed relation to each other and to the sidewalls of said vessel: said first separator means tapering inwardly in the downward direction and having a top edge substantially coextensive with the sidewall of said vessel and a bottom edge terminating near the bottom of said vessel, said first separator means comprising a first inwardly and upwardly facing surface and a second downwardly and outwardly facing surface, said second surface further cooperating with the sidewall of said vessel to define an annular plenum within the lower section of said vessel, said plenum being adapted to receive said heated gas introduced into the lower section of said vessel and to distribute said heated gas upwardly through said vessel, the perforations in said first separator means being adapted to permit the passage of heated gas upwardly therethrough and not being substantially larger than the average particle size of said particulate matter; said second separator means being inverted relative to said first separator means and having a top edge closely adjacent to but spaced apart from said shaft, and a bottom edge disposed inwardly of and below the top edge of said first separator means but spaced sufficiently above the interiorly facing surface of said first separator means to permit the passage of particulate matter therebetween, at least some of the perforations in said second separator means being sufficiently large to permit the passage of particulate matter therethrough.

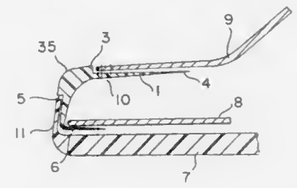
4,839,970
FILLING COMPOUND FOR LIGHT WAVEGUIDE LEADS AND/OR LIGHT WAVEGUIDE CABLES
Werner Goetze, Berlin; Ernst Mayr, Starnberg; Ulrich Oestreich, and Helmut Saller, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Continuation of Ser. No. 881,695, Jul. 3, 1986, abandoned. This application Sep. 4, 1987, Ser. No. 94,093
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1985, 3524181
Int. Cl.[4] G02B *6/44*; H02G *15/00*
U.S. Cl. 350—96.23 **20 Claims**



1. A light waveguide cable containing waveguide leads with a cable core filling compound between the outside surfaces of said waveguide leads and the inside surface of a casing for the cable, said core filling compound consisting essentially of:
92 to about 50 weight percent of polypropylene glycol; and
8 to about 50 weight percent of a finely distributed fumed silica, the agglomerates of the fumed silica having a size of less than 10 microns.

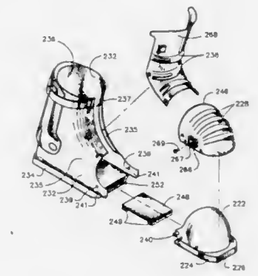
4,839,971
FRONT PIECE FOR SHOES
Werner Reber, Hauensteiner Strasse 22, D-6783, Dahn, Fed. Rep. of Germany
Filed Feb. 17, 1988, Ser. No. 156,804
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1987, 8703425[U]
Int. Cl.[4] A43C *13/14*
U.S. Cl. 36—77 R **9 Claims**

1. A reinforced toe-piece for a shoe comprising:
a front piece comprised of a resilient synthetic material generally having the shape of a shoe tip, including a top portion , a flank portion and a reinforced intermediate portion formed to interconnect said top portion and said flank portion, said reinforced portion having an increased thickness relative to the top and flank portions;
said top portion and said reinforced portion having a first step forming a first recess on a surface of said top portion for receiving a shoe upper and said top portion tapering in thickness from front to back; and



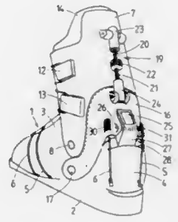
said flank portion and said reinforced portion having a second step forming a second recess on a surface of said flank portion for receiving a surrounding piece.

4,839,972
FOOTWEAR WITH PIVOTAL TOE
Roger N. Pack, Box 841, Edwards, Colo. 81632, and Eddress Ahmad, Box 725, Avon, Colo. 81620
Continuation-in-part of Ser. No. 835,038, Feb. 28, 1986, Pat. No. 4,667,769. This application Jul. 7, 1987, Ser. No. 70,708
The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.
Int. Cl.[4] A43B *5/04*
U.S. Cl. 36—117 **8 Claims**



1. An article of footwear adapted to receive the human foot and operative to prevent torsional rotation of the foot while permitting bending movement about the ball of the foot, comprising:
a toe portion having a first sole portion and a first relatively rigid upper shell, said first sole portion and said upper shell configured to extend around and enclose a forward part of the human foot from a forward tip receiving the toes rearwardly to a location just behind the ball of the foot, said shell having a rear edge extending over the ball of the foot;
a heel portion having a second sole portion and a second relatively rigid upper shell, said second upper shell having an access opening to permit insertion and removal of foot, said second upper shell extending around the rear of the foot and forwardly to a location proximate the ball of the foot and having a forward edge extending over the foot, said second upper shell and said second sole portion enclosing a rearward part of the foot;
hinge means interconnecting said toe portion and said heel portion for relative rotational motion about a fixed rotational axis in an axis plane substantially parallel to the plane of the first sole portion between a flat position wherein the respective first and second planes of said first and second sole portion are substantially parallel and a flexed position wherein said first and second planes are at an angle with respect to one another, said hinge means fixedly interconnecting said toe portion and said heel portion in a manner substantially prohibiting torsional movement therebetween; and
downward stop means for preventing relative angular rotational movement of said toe portion and said heel portion from said second position past said flat position in order to provide a hyperextension limit stop operative to prevent hyperextension of the foot.

4,839,973
SKI BOOT
David J. Dodge, Shelburne, Vt., assignor to Lange International S.A., Switzerland
Filed Apr. 9, 1987, Ser. No. 36,268
Int. Cl.[4] A43B *5/04*
U.S. Cl. 36—121 **12 Claims**



1. A ski boot comprising a lower part (1), comprising the sole and the vamp and surrounding the heel, a one-or two-part upper (7) articulated on the lower part at two opposite points (8, 9) which coincide at least approximately with the joint of the user's foot, wherein a rear part of the upper has a rounded cutaway portion (15) between its points of articulation of sufficient depth to permit an ample backward tilting of this part, and means for releasably locking the upper in a forward upright position for skiing and for permitting the upper to be tilted backwards when released from the locked position.

4,839,974
CLOSED DECORATION FRAME
Eckhard Walter, Braunschweig, Fed. Rep. of Germany, assignor to Rahmen mit System GmbH, Braunschweig, Fed. Rep. of Germany
PCT No. PCT/EP86/00172, § 371 Date Dec. 1, 1986, § 102(e) Date Dec. 1, 1986, PCT Pub. No. WO86/05668, PCT Pub. Date Oct. 9, 1986
PCT Filed Mar. 22, 1986, Ser. No. 2,629
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 8509511[U]
Int. Cl.[4] G09F *1/12*
U.S. Cl. 40—152 **22 Claims**

1. A frame for retaining a generally planar member such as a picture, a mirror or the like, comprising:
a polygonal frame comprised of a plurality of sectional pieces, each sectional piece comprising:
an outer wall extending along a longitudinal axis and having an inner and outer surface,
a wall piece connected to the inner surface of the outer wall and projecting inwardly,
an inner wall spaced inwardly from the outer wall and connected to the wall piece,
an end face connected to the outer wall and projecting inwardly with respect to the outer wall, the end face being adapted to contact the member when the member is inserted against the sectional piece,

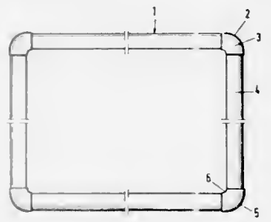
the outer wall, the wall piece, the inner wall and the end face defining a chamber; and

a plurality of corner parts for connecting the sectional pieces together, each corner part comprising:

an outer wall,

a pair of inwardly projecting stop faces connected to the outer wall and oriented so as to be substantially perpendicular to one another.

a pair of lugs, each lug extending from a respective stop face and being dimensioned so as to be receivable in the cham-



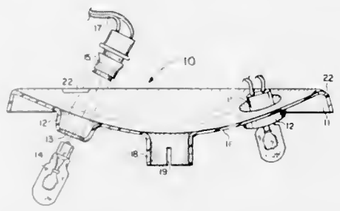
ber of a sectional piece, whereby the sectional piece can be selectively secured to the corner part, the lugs being positioned with respect to the stop faces so that a pair of sectional pieces inserted over the lugs will be oriented substantially perpendicular to one another, each corner part further comprising a pair of inner edges disposed inwardly from the outer wall and spaced apart from one another in a lateral direction perpendicular to the longitudinal axis, the outer wall, the stop faces and the inner edges defining a free receiving space for receiving a portion of the generally planar member retained by the frame.

4,839,975

LIGHTING SYSTEM FOR CAR TOP SIGN

William A. Elmer, 917 N. Pennsylvania Ave., Winter Park, Fla. 32789

Filed Jun. 1, 1987, Ser. No. 55,993
Int. Cl.[4] G09F *21/04*
U.S. Cl. 40—592 **3 Claims**



1. A lighting fixture for a car top sign, said sign formed as a triangular truncated pyramid having three faces of a translucent material for bearing a message and a triangular top surface, comprising:

a circular reflector having a convex surface thereof for efficient reflection of light, said reflector symmetrically attached to an interior surface of said triangular top surface;

three electric lamps in which each lamp depends from said convex surface opposite each respective apex of said triangular truncated pyramid and positioned to illuminate each of the adjacent faces of said truncated pyramid;

electrical connection leads from said lamp for connection to a source of electrical power; and

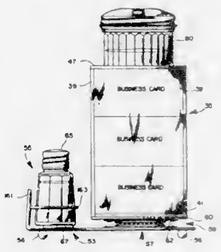
each of said faces thereby receiving overlapping reflected and direct illumination from two of said lamps, the curvature of said convex surface selected to concentrate light from said lamps on said panels.

4,839,976

DISPLAY AND DISPENSING APPARATUS

Arlene Kyler, 3445 Park Ave., Oceanside, N.Y. 11572

Continuation of Ser. No. 829,829, Feb. 14, 1986, Pat. No. 4,727,666. This application Nov. 25, 1987, Ser. No. 125,376
The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.
Int. Cl.[4] G09F *3/18*
U.S. Cl. 40—42 **16 Claims**



1. Apparatus for displaying advertising items, such as business cards, and also for containing articles, such ar food products, available for selective removal therefrom, comprising:

a substantially upright enclosure with substantially upright, substantially transparent side walls, and a top having a opening therein;

a side wall surface of said enclosure adapted to retain and exhibit said advertising items;

a receptacle accommodated in the top portion of said enclosure and extending downwardly from said opening, for holding said articles in a manner suitable for convenient removal of said articles therefrom; and

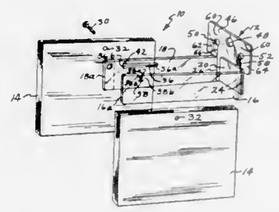
a space defined between inner surfaces of said side walls and said receptacle, said advertising items being at least partly received in said space and supported by both said receptacle and an inner surface of said side walls.

4,839,977

MOUNTING CLIP FOR DISPENSING SHEET-LIKE ITEMS

Richard G. Krautsack, Arlington Heights, Ill., assignor to Comark Merchandising, Inc., Elk Grove, Ill.

Filed Feb. 24, 1988, Ser. No. 159,828
Int. Cl.[4] G09F *3/20*
U.S. Cl. 40—658 **11 Claims**



1. Apparatus including a clip for displaying and dispensing a

plurality of sheet-like materials, one at a time, and at least one stack of sheet-like materials, comprising:

a plurality of sheet-like materials arranged in a stack;

a clip which includes a unitary strip of flexible material defining a pair of opposed arms and a base section intermediate the arms and having a rear surface;

fastener means for connecting the stack of sheet-like materials to both said arms so as to allow one said arm to slide relative to the other so that said base section is selectively movable from a position generally parallel to said stack of sheet-like materials to a position wherein the rear surface of said base section faces generally away from said stack of sheet-like materials; and

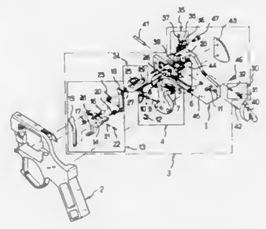
said clip further includes mounting means for mounting said base section to an external support means whereby said stack of sheet-like materials is supported a individual sheet-like components of the stack are separated therefrom.

4,839,978

SUPPORT DEVICE FOR THE MECHANISM OF A REVOLVER

Alain Lechelle; Thierry Guidat, both of Mulhouse, and Serge Bruckert, Cernay, all of France, assignors to Matra Manurhin Defense, France

Filed Mar. 22, 1988, Ser. No. 171,716
Claims priority, application France, Mar. 23, 1987, 87 03978
Int. Cl.[4] F41C *1/00*
U.S. Cl. 42—65 **18 Claims**



1. A device for supporting a mechanism of a revolver in association with a frame of said revolver, the device being essentially constituted by a mechanism carrier plate, said plate:

firstly directly receiving various subassemblies of the mechanism, including a first subassembly associated with a hammer, a second subassembly associated with a trigger, and a third subassembly associated with a cylinder latch; and

secondly being capable of being directly mounted together with the subassemblies supported thereby on the frame of the revolver.

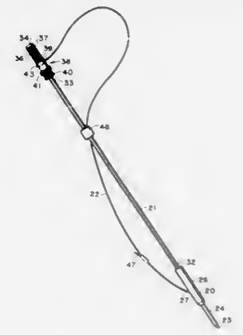
4,839,979

SPEAR GUN TIP ASSEMBLY AND METHOD OF USE THEREOF

William H. Rogers, Jacksonville, Fla., assignor to Sea Search, Inc., Jacksonville, Fla.

Continuation-in-part of Ser. No. 072,297, Jul. 13, 1987. This application Mar. 21, 1988, Ser. No. 171,018
Int. Cl.[4] A01K *81/00*
U.S. Cl. 43—6 **20 Claims**

1. A spear tip assembly for an underwater spear gun comprising an elongated shaft member having a long axis, a forward end portion, and a rearward end portion; an elongated tip member slideably and removably attachable to said forward end portion of said shaft member; and an elongated flexible cable member with a forward end attached to said tip member and a rearward end readily affixed and removable with respect to said shaft member, a stop on and adjacent said rearward end of said cable; mounting means on said rearward end portion of said shaft member for attachment to a forward end of a spear; manually releasable clamping means on said rearward end portion of said shaft member for readily detachably securing thereto said rearward end of said flexible cable, said clamping means including a passageway through which said stop and cable may readily move, said clamping means including means



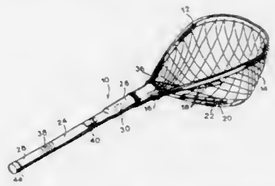
to selectively restrict the size of said passageway to prevent disconnecting movement of said stop therefrom; mounting means on said forward end portion of said shaft member for slideably and removably attaching said tip member thereto, said tip member having a forward sharpened free end and a rearward end including mating means adapted to be slideably detachable to said forward end of said shaft member.

4,839,980

ELECTRIC FISH LANDING NET

Dana A. Hersom, Rte. 4, Emmet Still Rd., Loganville, Ga. 30249

Filed Jun. 6, 1988, Ser. No. 202,384
Int. Cl.[4] A01K *79/02, 75/02, 77/00*
U.S. Cl. 43—11 **7 Claims**



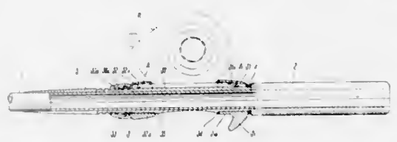
1. A hand-held landing net, capable of temporarily disabling a fish or other animal, comprising:

(a) a collecting net having electrodes located in said landing net;

(b) a frame and handle to which said collecting net and said electrodes are attached; and

(c) means for applying an electrical potential, located in said handle, to said electrodes for applying an electrical shock to an animal that comes into simultaneous physical contact with said electrodes.

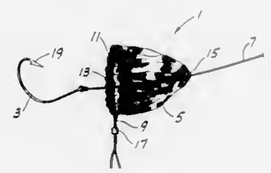
4,839,981
FISHING ROD
Toshihiko Yasui, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan
Filed Jun. 24, 1988, Ser. No. 210,977
Claims priority, application Japan, May 21, 1988, 63-67251[U]
Int. Cl.[4] A01K *87/00, 87/06*
U.S. Cl. 43—18.1 3 Claims



1. A fishing rod comprising:
a gently tapered conical rod body including a tail end portion and a tip end portion respectively located at opposite ends of said rod body;
a rear grip provided on said tail end portion;
a fishing reel fixture mounted on said rod body at a position in front of said grip, said reel fixture comprising (i) a cylindrical base having an inner diameter adapted to receive said rod body therein and comprising a screw thread at an outer periphery of a lengthwise front portion thereof, (ii) a fixed holder fixed to a lengthwise rear portion of said cylindrical base, (iii) a movable pusher supported on said cylindrical base to be movable axially thereof, and (iv) a threaded ring threadably engaged with said screw thread;
a bend-correcting means comprising a cylindrical member integral with said rod body and positioned in front of said reel fixture, for shifting in a direction toward said tip end portion, the position at which said rod body bends when subjected to a load from a hooked fish, said cylindrical member having an outer peripheral surface comprising means for facilitating holding thereof by an angler's hand; and
a front grip mounted on said rod body between said reel fixture and said cylindrical member, said front grip being formed of a softer material than that forming said reel fixture and said cylindrical member,
wherein said cylindrical member and said rod body are formed of prepreg comprising high strength fiber impregnated with synthetic resin, opposite surfaces of said cylindrical member and said front grip being in contact with each other, opposite surfaces of said front grip and said reel fixture being in contact with each other, an outer diameter of said cylindrical member at a rear end thereof being substantially equal to an outer diameter of said front grip at a front end thereof, an outer diameter of said front grip at a rear end thereof being substantially equal to an outer diameter of said cylindrical base of said reel fixture.

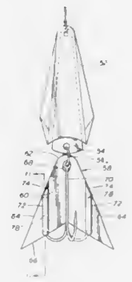
4,839,982
FISHING LURE
Robert G. Wood, 384 Palermo Dr., Ballwin, Mo. 63011
Filed May 13, 1988, Ser. No. 193,821
Int. Cl.[4] A01K *85/00, 97/04*
U.S. Cl. 43—41 5 Claims

1. A fishing lure comprising a fishhook with a pointed end, a bag having sidewalls formed of open-mesh material closed at one end and open at the other end and having means for drawing the open end closed thereby enclosing the fishhook within the bag, and a leader attached to the fishhook and extending through a sidewall of the bag, such that the bag is slideably mounted solely on the leader, whereby bait may be placed on the fishhook in the bag or in the bag without being placed on the fishhook and the bag then closed by said means, the bait being readily visually and/or olfactorily attractive to fish by reason of the open-mesh characteristic of the bag, and the



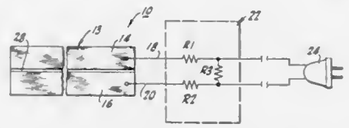
pointed end of the fishhook readily penetrating the bag by reason of its open-mesh characteristics for hooking a fish.

4,839,983
FISHING LURE APPARATUS WITH FISH ATTRACTANT
Aaron J. Pippert, Houston, Tex., assignor to Utex Industries, Inc., Houston, Tex.
Filed Sep. 28, 1987, Ser. No. 101,600
Int. Cl.[4] A01K *85/01*
U.S. Cl. 43—42.06 25 Claims



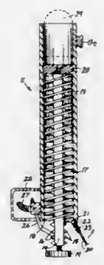
1. A fishing lure member comprising:
a web-like body member having a pair of opposite broad surfaces bounded by relatively thin peripheral edges, a leading end adapted for attachment to a linking ring or the like, and a trailing end distal the leading end;
means on said body member defining two pockets extending along at least one of said broad surfaces and each having an opening;
said pockets are elongated in the leading-trailing direction, each of said openings being disposed at one end of the respective pocket;
respective fish attractants removably disposed in said pockets;
said lure member is at least partially translucent in an area adjacent one of said pockets;
one of said fish attractants comprising a self-contained chemiluminescent cartridge light source disposed adjacent said translucent area;
said chemiluminescent cartridge light source is flexible and defines two inner chambers, separated by wall means frangible upon flexure of said light source, each of said chambers containing a respective substance, said two substances being capable of producing light when brought into contact with each other; and
an olfactory fish attractant removably disposed in the other of said pockets.

4,839,984
INSECT GUARD SYSTEM AND METHOD OF USE
Anne L. Saunders, and John G. Fields, both of 3169 Murietta's Roost, Dorrington, Calif. 95223
Filed Nov. 12, 1987, Ser. No. 119,787
Int. Cl.[4] A01M *1/22*
U.S. Cl. 43—112 14 Claims



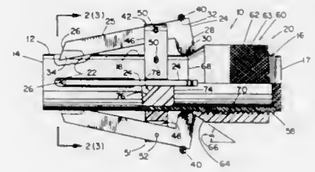
1. A system for training and repelling crawling insects, comprising: an elongated, flexible, electrically insulating substrate; a pair of elongated spaced conductors mounted on said substrate, said conductors being highly reflective and slippery; and power assembly means connected to said conductors for establishing a voltage differential providing a short-circuit current of about fifty microamps to about one microamp across said conductors, whereby crawling insects are repelled from crossing the spaced conductors by a combination of reflected images, slipperiness, and shock caused by bridging the voltage differential.

4,839,985
NEST EXTERMINATION KIT
Irwin M. Barry, Exchange Lots, Couva, Trinidad and Tobago
Filed Mar. 18, 1988, Ser. No. 170,009
Int. Cl.[4] A01M *1/20*
U.S. Cl. 43—132.1 3 Claims



1. A new and improved nest exterminating kit comprising,
a nest exterminating gun including a tubular barred formed with an open first end of a first diameter and a second end defining a smaller second opening, and
a ram means reciprocatably mounted within said tubular barrel and formed with a forward second portion and a remote first portion extending outwardly through said second end of said tubular barrel through said second opening, and
said ram means formed with a ram grasping and shock dampening means at the first portion and a piston at the remote second portions, and
a spring means captured between said piston and said second end of the tubular barrel for providing motive power to said pistion, and
said barred accommodating a liquid containing projectile whereupon compressing said spring means aganist the second end and releasing it, said projectile will be forcibly directed from said tubular barred, and
wherein said barrel is formed with a forward sighting means, and
wherein said barrel is formed with a trigger means operative with a release link to cooperate with a series of lower ratchet teeth integrally formed on said ram means to maintain said ram means in an extended position compressing said spring means, said trigger means operative to disengage said relase link from said lower ratchet teeth to release said ram means and direct said projectile from said barrel, and
wherein the means for compressing said spring includes an "L" shaped pawl pivotally mounted adjacent to said second end and cooperating with a series of upper ratchet teeth formed on an upper surface of said ram means opposed from the surface supporting said lower ratchet teeth to retract said ram means upon pivotal engagement of said pawl with said upper ratchet teeth.

4,839,986
GRAFTING APPARATUS
Debs E. Grantham, 4603 County Rd. 63, Rosharon, Tex. 77583
Filed Mar. 18, 1988, Ser. No. 169,626
Int. Cl.[4] A01G *1/00*
U.S. Cl. 47—6 26 Claims



1. A hand-held tool for making grafting-flap cuts in the bark of a limb of a selected woody plant, comprising
body means having axially aligned tubular ends including a first open end for accommodating coaxial insertion of the limb therein, and including a handle portion adjacent the end opposite said first open end, the tubular portion adjacent said first open end including a plurality of elongated slots longitudinally disposed therein and circumferentially equally spaced in parallel relation therearound, one end of said slots terminating adjacent said open end,
stop means cooperating with said body means for engaging the end of the inserted limb and limiting the depth of insertion thereof to a preselected depth,
a plurality of elongated knife members having first and second ends interconnected by an elongated central section, said first end having a sharp knife edge disposed on a lower longitudinal edge thereof and communicating with said first end, said longitudinal axis of each of said plurality of knife members registering with the longitudinal axis of one of said plurality of circumferentially spaced slots in said tubular body member for orienting said first end and said knife edge and a portion of said knife central section in registration with each of said parallel slots,
support means cooperating with said body means for supporting each of said knife members in a radially spaced relation to said body means in longitudinal axial registration with one of said plurality of slots, said support means mounting each of said knife members about a pivot point transversely disposed in said central section for permitting limited rotational movement of said knife member thereabout,
biasing means cooperating with said second ends of said plurality of knife members for biasing said second ends radially inwardly toward said body means and retracting said sharp knife edges upwardly into said slots, and
force exerting means cooperating with said handle end of said body means and selectively movable longitudinally in

relation thereto for engaging said second ends of said plurality of knife members and applying forces thereagainst opposing said bias means for pivoting each of said knife members upwardly about said pivot point for rotating said first end and said sharp knife edges thereof downwardly through said elongated slots in said tubular body means for engaging the limb inserted coaxially into said body means in a predetermined circumferentially spaced relationship, said force exerting means being further adjustable to apply sufficient forces on said knife member second ends for forcing said sharp knife edges into the limb to a pre-selected depth,

wherein when said body means handle end is manipulated for coaxially withdrawing said body means from the end of the limb, said plurality of sharp knife edges will cut a plurality of parallel grafting-flap cuts in said limb.

4,839,987

PROP SUPPORT FOR PLANTS GROWN IN BOXES

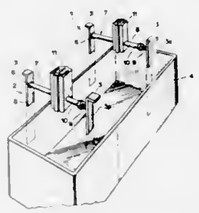
Paul-André Cosandier, 10, ch. de Tolochenaz 1110 Morges, Vaud, Switzerland

Filed Aug. 25, 1987, Ser. No. 89,090

Claims priority, application Switzerland, Aug. 29, 1986, 3465/86

Int. Cl.[4] A01G 9/12

U.S. Cl. 47—70 **7 Claims**



1. A plant support comprising more than one assembly supporting a propping means within a container for growing and supporting plants comprising two assemblies for supporting said propping means, each assembly comprising two clamping elements. each of which is provided with a contact surface which engages a corresponding surface of an inner wall of the container, an extensible bar having a pair of ends, the extensible bar being mounted between said two clamping elements and at least one connection piece slidingly disposed on said extensible bar and provided with means for attaching at least one part of said propping means, each of said two clamping elements further including on a side facing the other clamping element a socket for receiving one end of said extensible bar, each of said ends being freely located in said sockets, said sockets being bounded by a circular rib of triangular cross-section and having conical inside walls.

4,839,988

PANIC EXIT DEVICE

John E. Betts, Garden Grove, and George Toledo, San Diego, both of Calif., assignors to Thomas Industries Inc., Louisville, Ky.

Filed Apr. 6, 1988, Ser. No. 172,642

Int. Cl.[4] E05B 65/10

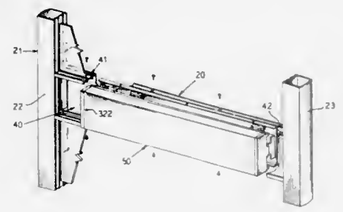
U.S. Cl. 49—141 **17 Claims**

1. In combination, a door with a panic actuator apparatus for unlatching said door mounted in and normally maintained in latched engagement with a door frame, said door including a pair of separate stiles along opposite edges and latch actuating means movable for retracting latch means which is normally providing said latched engagement between the door and the door frame, said apparatus comprising:

housing means for said panic actuator comprising a rail of said door extending between and connected to said stiles at opposite ends between opposite faces of said door, said housing including an enlarged opening on one face of said door;

a panic bar mounted in said enlarged opening for relative movement on said door in response to external pressure applied at any point against an outer face of said bar;

means supporting said bar from said housing for linear movement normal to said one face of said door including a pair of pivotal control arms mounted at a first end for rotation about a vertical axis fixed relative to said housing



and slidingly engageable with said panic bar at an opposite end;

means interconnecting said bar and said latch actuating means for unlatching said latch means in response to said movement of said bar on said door; and

said interconnecting means including a first lever pivotally mounted about a vertical axis and engageable by one of said control arms and a second lever pivotally mounted about a horizontal axis and engageable by said first lever, said second lever having an end slidingly engageable with said latch actuating means for unlatching said latch means.

4,839,989

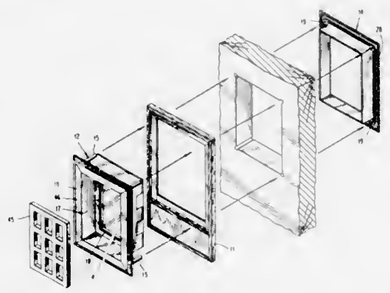
DOOR LIGHT

Dale K. McConnell, 370 Howard Ave., Holland, Mich. 49424

Filed Mar. 31, 1988, Ser. No. 175,944

Int. Cl.[4] E06B 7/28

U.S. Cl. 49—171 **20 Claims**



1. A prefabricated door light unit for use in an opening formed in a door, said door light unit comprising:

(a) ringlike frame means adapted to be fixedly mounted in said door opening and defining therein a window opening;

(b) door means mounted on said frame means for covering said window opening;

(c) said frame means including inner and outer ringlike frame units which mount in said door opening from respective inner and outer sides of the door opening;

(d) said inner and outer frame units having a slidable telescopic connection therebetween when mounted within said door opening;

(e) said outer frame unit comprising an integral, one-piece, ringlike, performed outer frame having a ringlike peripheral flange wall adapted for engagement with the outer surface of the door in surrounding relationship to the door opening;

(f) said outer frame also including a tubular support wall structure integrally fixed to said peripheral flange wall and projecting substantially transversely therefrom into said door opening;

(g) said outer frame tubular wall structure defining an outer peripheral support surface thereon and defining said window opening therein;

(h) said outer frame having a substantially S-shaped cross section including inner and outer approximately parallel walls which are integral with and project in opposite directions from the opposite ends of an intermediate wall;

(i) said outer wall defining said peripheral flange wall and said intermediate wall defining said tubular support wall structure;

(j) said intermediate wall defining said outer support surface on the outer periphery thereof with said latter surface extending substantially perpendicular to a vertical plane of the door opening;

(k) said intermediate wall defining thereon an inner peripheral surface which, at least along the bottom of said outer frame, slopes downwardly as it projects from the inner wall to said outer wall to permit drainage of water therefrom exteriorly of the door;

(l) said inner frame unit comprising a rectangular ringlike frame having a peripheral flange wall which is positionable adjacent and engageable with the inner surface of the door in surrounding relationship to the door opening;

(m) said inner frame unit also defining transverse suppour walls which are fixed to and project transversely from said peripheral flange wall into said door opening;

(n) said transverse walls of the inner frame unit defining thereon an inner support surface whereby said transverse walls project into said door opening into the region between the edge of said door opening and said tubular wall structure so that the inner and outer frame units can be slidably moved toward one another until the respective peripheral flange walls thereof respectively engage the inner and outer faces of the door;

(o) said frame means including fastener means extending between said inner and outer frame units for fixedly connecting same together;

(p) said outer frame tubular support wall structure including a peripheral extension section extending away from said S-shaped cross section in a direction toward the inner frame unit;

(q) said peripheral extension section of the outer frame tubular support wall structure defining said window opening;

(r) said door means being hingedly connected to swing between open and closed positions with respect to said window opening adjacent one side of the peripheral extension section; and

(s) fastening means for securing the door means in a closed position across said window opening;

(t) said peripheral extension section being disposed within the interior frame when the door light unit is mounted in said door opening.

4,839,990

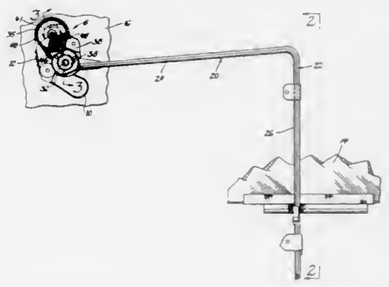
APPARATUS AND METHOD OF A POWER SPRING COUNTERBALANCE FOR TAPE DRIVE WINDOW REGULATORS

Michael K. Lam, Southfield; Bohdan Kazewych, Union Lake, and Edmond R. Gionet, Royal Oak, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 21, 1986, Ser. No. 933,202

Int. Cl.[4] E05F 11/48

U.S. Cl. 49—352 **9 Claims**



1. A vehicle tape drive window regulator, said regulator comprising in combination:

a drive tape connected with said window;

guide means providing a fixed path for said tape;

a winder gear drivably engaged with said tape for moving said tape in first and second directions; and

a counterbalance gear drivably engaged with said tape, and said counterbalance gear being in mesh with said winder gear whereby energy is stored from said tape when said tape is moving in said first direction and energy is released to said tape when said tape is moving in said second direction.

4,839,991

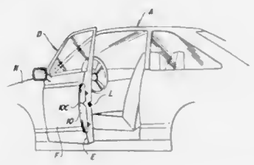
RETRACTABLE GUARD FOR MOTOR VEHICLE DOOR

Peter M. Rathgeb, 5721 SW. 162nd Ave., Fort Lauderdale, Fla. 33331

Filed May 4, 1988, Ser. No. 190,140

Int. Cl.[4] B60J 5/00

U.S. Cl. 49—462 **16 Claims**



1. A retractable guard mechanism for a motor vehicle door having a front hinge, a rear edge, and a latch, said mechanism comprising:

a. means for projecting from the front hinge of the door;

b. first means for clamping to the projecting means;

c. a cable attached at one end to the first clamping means;

d. second means for clamping to an opposite end of the cable;

e. an arm attached at one end to the second clamping means;

f. a rod fixed to an opposite end of the arm;

g. lever means, mounted at one end to both ends of the rod,

for turning with the rod as the rod is rotated about its longitudinal axis;

h. first spring means, coiled around both ends of the rod, for forcing the lever means to an extended position;

i. plate means, mounted as its rear side to an opposite end of the lever means, for pivoting around said opposite end of the lever means beyond the rear edge of the door;

j. an elastic bumper guard secured to a front side of the pivoting plate means; and

k. second spring means, attached to the rear side of the pivoting plate means, for rotating the pivoting plate means with the elastic bumper guard secured thereto to an extended position.

4,839,992

POLISHING DEVICE

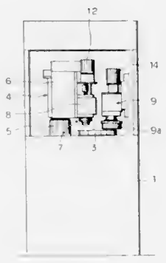
Takeo Ishida, Aichi; Hiroshi Hagiwara, and Ichizo Kakumu, both of Nagoya, all of Japan, assignors to Sintobrator, Ltd., Nagoya, Japan

Filed Apr. 4, 1988, Ser. No. 177,268

Claims priority, application Japan, Dec. 22, 1987, 62-324816; Dec. 22, 1987, 62-324817; Dec. 22, 1987, 62-194346[U]

Int. Cl.[4] B24B *7/00*

U.S. Cl. 51—5 D **4 Claims**



1. A polishing device comprising:

a frame;

a first rotary grindstone rotatably mounted on said frame, the upper surface of said rotary grindstone being a first grinding side;

a workpiece holding means for holding and bringing a workpiece into abutment with said first grinding side of said first rotary grindstone;

a pressure adjusting means incorporated in said workpiece holding means for adjusting the grinding pressure upon said workpiece; and

a truing dressing means for dressing said first grinding side of said first rotary grindstone, said truing dressing means having a second rotary grindstone and an angle adjust means for adjusting and fixing the angle of said second rotary grindstone with respect to said upper surface of said first rotary grindstone.

4,839,993

POLISHING MACHINE FOR FERRULE OF OPTICAL FIBER CONNECTOR

Takayuki Masuko, Tokyo; Norio Suzuki, Yokohama, and Kaoru Moriya, Yokohama, all of Japan, assignors to Fujisu Limited, Kawasaki, Japan

Filed Jan. 16, 1987, Ser. No. 3,803

Claims priority, application Japan, Jan. 28, 1986, 61-016310; Mar. 14, 1986, 61-038033; May 30, 1986, 61-081948[U]; Jul. 30, 1986, 61-179357

Int. Cl.[4] B24B *5/00*

U.S. Cl. 51—129 **4 Claims**

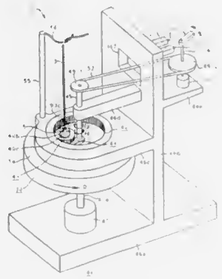
1. A polishing machine for polishing the end faces of elongated ferrules supporting coaxially aligned optical fibers to be connected in an optical fiber connector, said polishing machine comprising:

a rotating disk having a flat face:

a rubber plate on said rotating disk, said rubber plate being capable of elastic deformation under the influence of compression applied on its surface;

a thin copper polishing disk on said rubber plate, said polishing disk being capable of elastic deformation under the influence of compression applied on its surface;

means for pressing the end face of a said ferrule against the surface of said polishing disk with the longitudinal axis of the ferrule disposed generally perpendicularly to the surface of said rotating disk;



means for rotating said ferrule alternately in opposite directions within a predetermined angle around its longitudinal axis;

means for revolving said ferrule around an axis parallel to and spaced laterally from its longitudinal axis alternately in opposite directions within a predetermined angle on the surface of said polishing disk;

means for detecting that said ferrule has been rotated through a predetermined angle and outputting a detection signal; and

means for switching the rotational and revolving directions of said ferrule in response to said detection signal.

4,839,994

BELT GRINDING MACHINE

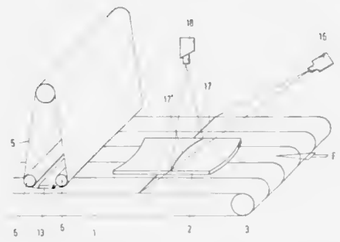
Juergen Heesemann, Bad Oeynhausen, Fed. Rep. of Germany, assignor to Karl Heesemann Maschinenfabrik GmbH & Co. KG, Bad Oeynhausen, Fed. Rep. of Germany

Filed Nov. 17, 1987, Ser. No. 121,852

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1986, 3639329

Int. Cl.[4] B24B *21/00*

U.S. Cl. 51—165.72 **18 Claims**



1. A belt grinding machine comprising a pressure bar which has a plurality of pressure shoes arranged next to one another transversely relative to the conveying direction of a workpiece to be machined, and in which each pressure shoe has assigned to it its own pressing-on device actuable as a function of workpiece parameters, a signal-processing unit means for controlling the pressing-on force of the pressing-on device based on the workpiece parameters, including the surface contour and thickness of the workpiece, and local and time data of the workpiece transport operation, a light source [for detecting workpiece parameters] that illuminates the surface of the workpiece linearly transversely relative to the conveying direction, wherein the light source is arranged in front of or behind a light incidence point in the conveying direction, and a light sensor which senses a surface region comprising a portion of the transverse direction and a portion in the conveying direction and outputs a signal to the signal-processing unit means that is used by the signal-processing unit means to determine the surface contour and thickness of the workpiece in the surface region.

4,839,995

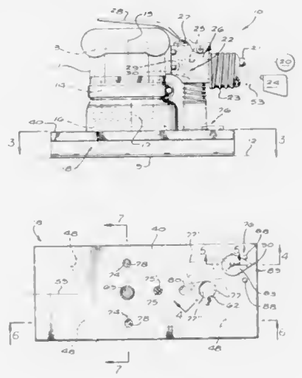
ABRADING TOOL

Alma A. Hutchins, Pasadena, Calif., assignor to Hutchins Manufacturing Company, Pasadena, Calif.

Filed May 2, 1988, Ser. No. 188,961

Int. Cl.[4] B24B *23/04, 55/06*

U.S. Cl. 51—170 MT **26 Claims**



1. An abrading tool comprising:

a body to be held by a user;

a unit mounted to said body for movement relative thereto and adapted to carry a work abrading element;

a motor carried by said body and operable to move said unit relative to the body to abrade a work surface;

said unit containing a passage or passages through which a flow of air and entrained particles abraded from the work surface are drawn by suction; and

a flow control valve carried by said unit and movable with said unit and a carried abrading element relative to said body by said motor;

said valve being operable to vary the effective size of an opening through which said air and entrained particles are drawn by suction, to thereby variably restrict the flow of air and particles through said opening and through said passage or passages in said unit.

4,839,996

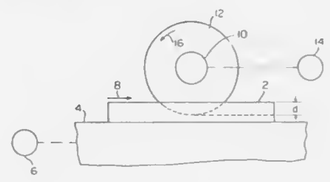
METHOD AND APPARATUS FOR MACHINING HARD, BRITTLE AND DIFFICULTLY-MACHINABLE WORKPIECES

Shinji Sekiya, Tokyo, Japan, assignor to Disco Abrasive Systems, Ltd., Tokyo, Japan

Filed Nov. 9, 1987, Ser. No. 118,133

Int. Cl.[4] B24B *1/00*

U.S. Cl. 51—281 R **1 Claim**



1. A method of machining a ferrite workpiece including the steps of

providing a rotating grinding wheel made of diamond abrasive grains,

rotating the grinding wheel at a peripheral velocity of 2,000 to 5,000 m/min., and

providing relative movement between the grinding wheel and the ferrite workpiece in a machining direction, said relative movement being at a feed speed of at least 50 mm/sec.

4,839,997

BRUSH SEAL MANUFACTURE

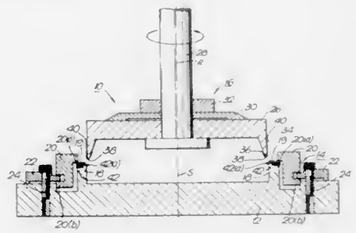
Robert B. Pritchard, Bristol, England, assignor to Rolls-Royce plc, England

Filed Oct. 16, 1987, Ser. No. 109,046

Claims priority, application United Kingdom, Oct. 24, 1986, 8625548

Int. Cl.[4] B24B *5/06*

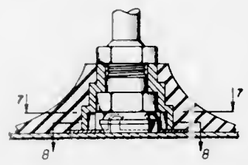
U.S. Cl. 51—290 **3 Claims**



1. A method of machining a brush seal of the type which comprises a pair of annular sideplates having a plurality of bristle elements which are sandwiched therebetween and extend generally radially therefrom and which is provided with an axis of rotation, the method comprising holding a brush seal in a first member and removing unwanted material from the bristle elemetns of said seal with a machining device having an outer portion having a diameter equal to a finished bore diameter of said brush seal, an inner portion, and an edge, in which the machining device is rotated about an axis which is coaxial with the axis of rotation of the brush seal and is traversed in a direction along said axis such that the edge acts on an entire circumference of the bristle elements simultaneously in order to cut and remove unwanted bristle material therefrom and in

which the outer portion acts on an entire inner circumference of said cut bristles simultaneously to machine them to a predetermined size.

4,839,998
ABRASIVE APPARATUS
Aleck Block, 800 Warner Ave., Los Angeles, Calif. 90024
Continuation of Ser. No. 819,546, Jan. 16 1986, abandoned. This application Jun. 3, 1987, Ser. No. 57,627
Int. Cl.[4] B24D *17/00*
U.S. Cl. 51—376 22 Claims



1. In combination for use with a drive member to polish a workpiece where the drive member has a socket, detent portions raised integrally from the socket in fixed relathionship to the socket at spaced positions around the periphery of the socket and extending in a linear direction having radial and tangential components and a centrally disposed shank with a recessed portion on the periphery of the shank,

a disc including:

an abrasive sheet having first and second spaced surfaces and having abrasive particles on one surface of the sheet, and

a fastener having a flange attached to the second surface of the sheet and having a plurality of coupling portions the coupling portions being planar and extending transversely from the flange in a linear direction having tangential and radial components for engaging the detent portions on the drive member to limit the rotary movement of the fastener when the disc engages the workpiece, the fastener having legs disposed on the coupling portions in the linear direction at an angle radially inwardly from the coupling portion the angle being greater than 90° and less than 180° relative to the associated coupling portion to extend into the recess in the shank and engage the shank at the recess in the shank, the legs being positioned relative to one another to define, with extended projections of such legs, portions of a polygon and the coupling portions being disposed relative to one another to define, within extended projections of such legs, portions of a polygon, the coupling portions and the legs being constructed to be retained by the drive member without any resilient springing of the coupling portions or the legs.

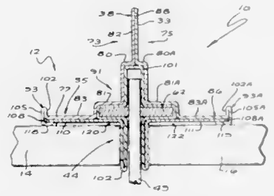
4,839,999
WALL STUD ASSEMBLY WITH FLANGE RETAINING SECTIONS
Forrest E. Clemens, Sherman Oaks, and Jack Doke, Walnut, both of Calif., assignors to Clemco Roll Forming, Inc., City of Industry, Calif.
Filed Dec. 18, 1987, Ser. No. 134,687
Int. Cl.[4] E04C *3/12*
U.S. Cl. 52—36 2 Claims

1. A stud for use with a bracket support in forming a wall unit, comprising:

(a) a pair of unitary elongated channels arranged back-to-back to form a common flat web, each one of said channels being a mirror image of the other channel;

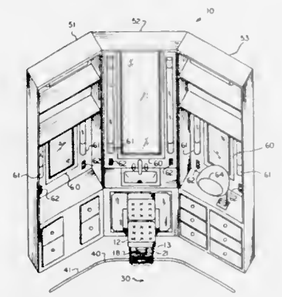
(b) said web extending integrally with and interconnecting two generally similar elongated shoulder portions;

(c) each one of said shoulder portions defining a stepped section for receiving and retaining the bracket support, each one of said flange retaining sections including a relatively short orthogonal interior edge which is reversely bent into a generally L-shaped elbow that defines a narrow elongated passageway with said stepped section; and



(d) said stepped section extending integrally into and interconnecting two generally similar flange retaining sections for rigidifying said shoulder portion and for further securing the bracket support into frictional engagement with the stud.

4,840,000
MODULAR SALON STATION
Tyrone C. Grines, 3735 Kensington St., Kansas City, Mo. 64128
Filed Jun. 10, 1988, Ser. No. 205,332
Int. Cl.[4] A47C *1/04*
U.S. Cl. 52—36 5 Claims



1. An apparatus for handling a salon patron, comprising;

a floor having an upper surface and a lower surface;

roller means retractably mounted to said lower surface of said floor;

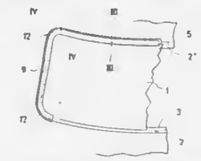
means for defining a predetermined path along said upper surface of said floor;

a chair for handling said salon patron, said mobile chair being movable along said predetermined path;

means for coupling said mobile chair to said predetermined path, for guiding said chair along said path;

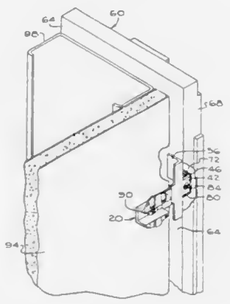
a plurality of cabinet modules attached to the upper surface of said floor; said cabinet modules disposed substantially parallel to said means for defining a predetermined path.

4,840,001
DEVICE FOR MOUNTING WINDOW PANE
Toshihide Kimisawa, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan
Filed Jan. 18, 1989, Ser. No. 298,011
Claims priority, application Japan, Jan. 30, 1988, 63-10460[U]
Int. Cl.[4] B60J *1/00*; E06B *3/58*
U.S. Cl. 52—208 2 Claims



1. A device for mounting a window panel in a depression formed in a vehicle panel and enclosing an area slightly larger than the area of said window pane, comprising a plastic fastener set along the inner side surface of said depression and a counter-fastener supported by said fastener to hold the edge of said window pane, said fastener being provided with an auxiliary member provided at a position corresponding to the corner of said depression for supporting said counter-fastener.

4,840,002
SYSTEM FOR INSTALLING WOOD DOOR JAMBS AND HARDWOOD DOOR TRIM
Einar Lovgren, 3011 Linton Blvd., #203-D, Delray Beach, Fla. 33445
Filed May 14, 1987, Ser. No. 50,304
Int. Cl.[4] E06B *1/04*
U.S. Cl. 52—213 17 Claims



1. A system for installing wood door jambs and wood trim comprising, in combination:

a clip having a base portion adapted to abut a wall surface, the base portion having an aperture adapted to receive fastening structure therethrough for engaging said clip to wall structure, structure for engaging a piece of hardwood trim comprising tongue structure, said tongue structure comprising at least one tongue flange, the tongue flange being substantially parallel to the base portion and being raised from and fixed to said base portion by leg flange means, and structure for engaging a door jamb; and,

at least one piece of trim, the trim having a front face and a back face, the back face of the trim having engagement structure comprising undercut structure adapted to engage the tongue flange on said clip, whereby the trim is firmly fixed to the clip and to the wall structure without the need to drill holes through the visible front face of the trim, and the door jamb is fixed to said clips and to said wall structure.

4,840,003
CONSTRUCTION LOG AND ASSOCIATED CORNER CONSTRUCTION
Gordon H. Lucas, and Randy K. Giles, both of Jefferson County, Tenn., assignors to Hearthstone Builders, Inc., Dandridge, Tenn.
Filed Nov. 9, 1987, Ser. No. 118,554
Int. Cl.[4] E04B *1/10*
U.S. Cl. 52—233 15 Claims

1. An improved log for interlocking with other similar logs for the construction of a log structure, said improved log comprising an elongated body defining a longitudinal axis and having an upper portion and a lower portion, and first and second exterior surfaces, said body including at least a first end portion for interlocking with said other similar logs, said first end portion defining a distal end and being provided with:

an upper notch provided in said upper portion of said body for engaging said similar log, said upper notch having a first engaging surface and a second substantially vertical engaging surface, said first engaging surface defining a planar surface which is laterally inclined from a point proximate said first exterior surface of said body to a point proximate said second exterior surface of said body, said second engaging surface provided with a first dovetail tenon;

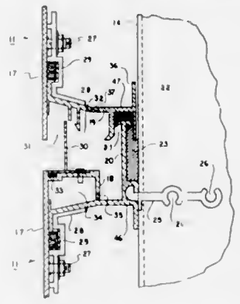
a lower notch provided in said lower portion of said body for engaging said similar log, said lower notch having a third engaging surface for engaging a first engaging surface of said similar log and a fourth substantially vertically disposed engaging surface provided with a second dovetail tenon, said third engaging surface defining a further planar surface which is longitudinally inclined from a point proximate said distal end of said body to a point displaced a selected distance from said distal end so as to closely receive said first engaging surface of said similar log; and

a substantially vertically disposed dovetail mortise defined in said second exterior surface of said body for receiving said first and second tenons of said first end portion of said similar logs.

4,840,004
EXTERNALLY DRAINED WALL JOINT DESIGN
Raymond M. L. Ting, 318 Holiday Dr., Pittsburgh, Pa. 15237
Filed Jul. 21, 1988, Ser. No. 222,551
Int. Cl.[4] E04H *1/00*
U.S. Cl. 52—235 9 Claims

1. In an exterior building panel wall assembly formed from individual wall panels secured to spaced apart wall supporting members, each said wall panel having essentially parallel top and bottom horizontal edges and two essentially parallel vertical side edges, said wall panels being joined along said horizontal edges to form horizontal wall joints and along said vertical

edges to form vertical wall joints, each said wall panel comprising an essentially flat exterior facing member and four interior perimeter extrusions including one top perimeter extrusion, one bottom perimeter extrusion, and two side perimeter extrusions, said perimeter extrusions being connected to said facing member by structural connecting means and sealed in between, a horizontal wall cavity being formed at each said horizontal wall joint between said top perimeter extrusion and said bottom perimeter extrusion across said horizontal wall joint, a vertical wall cavity being formed at each said vertical wall joint between said side perimeter extrusions across said vertical wall joint; the improvement comprising a horizontal rain screen member installed within said horizontal wall cavity separating said horizontal wall cavity into an outer horizontal cavity and an inner horizontal cavity, an upstanding male joint spline behind said inner horizontal cavity in said top perimeter



extrusion, a horizontal female joint in said bottom perimeter extrusion to cause engagement with said male joint spline, a vertical rain screen member installed within said vertical wall cavity separating said vertical wall cavity into an outer vertical cavity and an inner vertical cavity, said outer horizontal cavity and said outer vertical cavity being interconnected to form an outer cavity, said inner horizontal cavity and said inner vertical cavity being inter-connected to form an inner cavity, at least one drainage hole being provided near the bottom of said inner horizontal cavity allowing water drainage from said inner cavity to said outer cavity, a horizontal seal being provided in said horizontal female joint, a vertical seal being provided between said side perimeter extrusion and said wall supporting member, marriage seal being provided between said horizontal seal and said vertical seal, corner seals being provided at the intersecting corners of said perimeter extrusions.

4,840,005

PURLIN BRIDGING

Ronald Cochrane, Queensland, Australia, assignor to Australian Building Industries Pty. Ltd., Queensland, Australia

Filed Aug. 4, 1988, Ser. No. 228,032

Claims priority, application Australia, Jun. 1, 1988, 16953/88

Int. Cl.[4] E04C *2/42, 1/02*

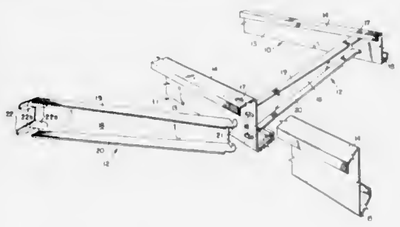
U.S. Cl. 52—667 **5 Claims**

1. Purlin bridging of the type comprising a series of bridging members each at its ends engaging in holes in a sheet metal purlin, wherein each bridging member includes:

a channel, with a web between a pair of flanges,

lugs extending from and substantially perpendicular to the web for engagement in the purlin holes,

hooks projecting from the flanges of the channel for engagement in the purlin holes, locking the lugs of the next



succeeding bridging member against disengagement from the purlin holes.

4,840,006

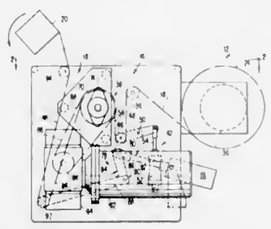
STRETCH WRAPPING MACHINE

John R. Humphrey, Naples, Fla., assignor to International Packaging Machines, Inc., Naples, Fla.

Division of Ser. No. 813,074, Dec. 24, 1985, Pat. No. 4,693,049, which is a continuation-in-part of Ser. No. 374,741, May 4, 1982, Pat. No. 4,590,746, which is a continuation-in-part of Ser. No. 307,283, Sep. 30, 1981, abandoned. This application Jun. 15, 1987, Ser. No. 62,466

Int. Cl.[4] B65B *11/04*

U.S. Cl. 53—64 **27 Claims**



1. A wrapping machine for wrapping with substantially constant tension a load placed on a rotatable turntable with a stretchable wrapping material comprising:

a prestretcher for stretching the wrapping material prior to wrapping around the load;

rotatable holding means for holding a roll of stretchable wrapping material which supplies the wrapping material to be wrapped around the load;

braking means coupled to the rotatable holding means for applying a braking force to the holding means in accordance with a brake control signal applied thereto to cause the film disposed on the roll to be restrained;

a single driven roller disposed between the roll of stretchable wrapping material and the turntable which contacts the stretchable wrapping material for applying a force to the stretchable wrapping material to cause prestretching and for changing the velocity of the stretchable wrapping material being delivered to the load to maintain substantially constant wrapping tension;

a variable speed electric motor for rotating the single driven roller to cause prestretching of the stretchable wrapping material disposed between the roll of stretchable wrapping material and the driven roller;

means for generating the brake control signal, the brake control signal being applied to the braking means to control the prestretching of the stretchable wrapping material, the brake control signal being a function of the supply of film from the roll of stretchable wrapping material;

means for maintaining substantially constant tension on the stretchable wrapping material being wrapped around the load disposed between the driven roller and the turntable which controls the speed of the variable speed electric motor as a function of velocity sensed during wrapping of the stretchable wrapping material located between the driven roller and the turntable by a velocity sensing means; and

means for selecting the amount of prestretching.

4,840,007

PACKAGING MACHINE WITH A DRYING TURRET

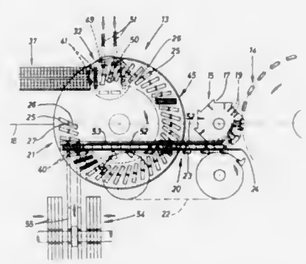
Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GMBH & Co.), Verden, Fed. Rep. of Germany

Filed Dec. 31, 1987, Ser. No. 140,188

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1987, 3701768

Int. Cl.[4] B65B *11/28, 51/06, 19/22*

U.S. Cl. 53—137 **8 Claims**



1. Packaging machine for cuboid packs having glue bonds, comprising:

a folding turret (**14**) and a following drying turret (**13**) for temporarily receiving the ready-folded packs (**10**) into drying pockets (**25, 26**);

a feed conveyor (**20**) for the drying turret (**13**);

arranged between said feed conveyor (**20**) and said drying turret (**13**), a first mouthpiece disk (**42**) with first mouthpiece orifices (**43, 44**) through which the packs (**10**) are moved when pushed into the drying pockets (**25, 26**);

means for feeding a transversely directed closing stamp (**40**) across an end wall (**28**) of the pack (**10**) on the entry side of each of the first mouthpiece orifices (**43, 44**);

arranged between the drying turret (**13**) and a discharge conveyor (**36**), a rotatable second mouthpiece disk (**48**) with several second mouthpiece orifices (**49, 50**) through which the packs (**10**) are moved when they are pushed out of the drying pockets (**25, 26**); and

means for feeding revenue stamps (**41**) in front of each of the second mouthpiece orifices (**49, 50**) and bondable to the packs (**10**) when laid against the end wall (**28**) in a U-shaped manner.

4,840,008

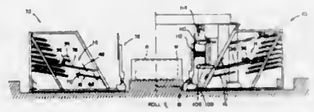
ROLL WRAPPING HEAD TRANSFER AND PLACEMENT APPARATUS

Stephen K. Hood, Hoquiam; Joseph Norkoski, Cosmopolis, and Halan P. Arnold, Aberdeen, all of Wash., assignors to Enterprises International, Inc., Hoquiam, Wash.

Division of Ser. No. 898,530, Aug. 21, 1986, Pat. No. 4,744,198. This application Mar. 11, 1988, Ser. No. 166,682

Int. Cl.[4] B65B *7/28*

U.S. Cl. 53—137 **3 Claims**



1. A vacuum positioning apparatus for moving a flat circular head from a transfer position on a transfer mechanism to a placement position against the end of a paper roll at a crimper station, comprising a frame for receiving the head from said transfer mechanism and having at least a first vacuum cup and at least a second movable vacuum cup spaced from said first cup for adjusting the distance between the first and second cups to accommodate different diameter heads, and said frame being movable toward and away from said paper roll along the longitudinal axis of the roll to place a head against the paper roll.

4,840,009

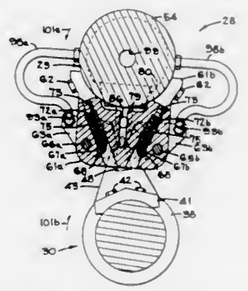
ROTARY FILM SEALING AND SEVERING HEAD FOR THERMOPLASTICS

Alan L. Reutmeester, Green Bay, and John M. Pamperin, Oneida, both of Wis., assignors to FMC Corporation, Chicago, Ill.

Filed Jul. 22, 1988, Ser. No. 222,865

Int. Cl.[4] B65B *51/26, 51/30, 51/16*

U.S. Cl. 53—373 **5 Claims**



1. A heat sealing and severing device for packing articles in tubular thermoplastic, said device comprising:

an anvil assembly rotatable about a first rotational axis and having a resilient anvil surface spaced from said first rotational axis;

a film cutting assembly rotatable about a second rotational axis parallel with said first rotational axis;

a pair of hollow V-shaped clamping bars mounted on said cutting assembly with said bars being spaced apart with each of said bars being parallel with said second rotational axis and each of said bars having a narrow edge portion directed away from said first rotational axis;

a heatable knife mounted on said cutting assembly with said knife mounted between said clamping bars with said knife

parallel to said clamping bars and spaced apart from said clamping bars, said knife having a knife edge which is directed away from said second rotational axis;

means for synchronously rotating said film cutting assembly and said anvil assembly to cause said clamping bars and said knife edge to contact said resilient anvil surface as said anvil assembly and said film cutting assembly rotate into a predetermined position about said first and second second axes;

spring means for biasing said clamping bars away from said second rotational axis causing said narrow edge portion of each of said V-shaped clamping bars to contact said anvil surface before said knife edge contacts said anvil surface as said anvil surface is rotated into a position nearest to said film cutting assembly, and causing said narrow edge portion of each of said V-shaped clamping bars to remain in contact with said anvil surface after said knife edge has rotated away from said anvil surface; and

means for providing a cooling liquid to each of said hollow clamping bars.

4,840,010

DEVICE FOR ACTUATION OF SEALING JAWS OF A PACKAGING MACHINE

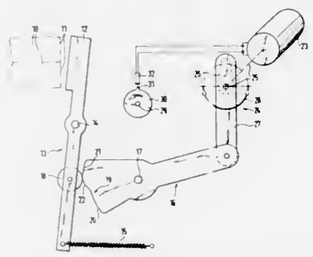
Heinz Focke, Verden, and Hans Jürgen Bretthauer, Bremen, both of Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Oct. 23, 1987, Ser. No. 111,534

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1987, 3636241

Int. Cl.⁴ B65B *51/14*

U.S. Cl. 53—375 **6 Claims**



1. Device for control of a pressing period and for actuation of sealing jaws in conjunction with a packaging machine, particularly for sealing of folding flaps of a package, said device comprising: rotatably driven actuating means for the sealing jaws; driving means having a uniform driving period and operable to drive said actuating means; and follower means for transferring the movement of said actuating means to the sealing jaws; wherein said actuating means comprises a driven cam rocker (**16**), movable to and fro while engaging the follower means; and wherein said driving means (**23**) comprises a rotatable crank mechanism (**24**), coupled to said cam rocker (**16**), for moving said cam rocker through one oscillation, to and from, during a whole revolution of the crank mechanism (**24**), thereby temporarily to move the sealing jaws (**12**) into a sealing position once or several times during each working cycle of the packaging machine; and wherein said follwer means has a follower element (**18**) on the sealing jaws, and wherein said cam rocker (**16**) has an irregular cam track (**19**) which acts on said follower element (18) to actuate the sealing jaws (**12**) and thereby determine the pressing period of the sealing jaws (**12**).

4,840,011

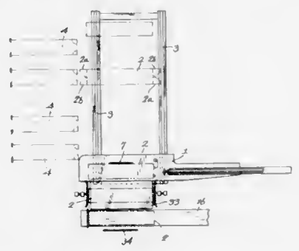
DEVICE FOR LATERALLY CUTTING CARTON CASE IN CARTON AUTOMATIC FEEDING DEVICE FOR A LIQUID FILLING MACHINE

Mitsuru Muramatsu, and Ryuichiro Tominaga, both of Tokyo, Japan, assignors to Jujo Paper Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1987, Ser. No. 101,521

Int. Cl.⁴ B65B *7/00;* **B26D** *7/06*

U.S. Cl. 53—381 R **4 Claims**



1. A device for laterally cutting upper and lower end face edges of elongate cases comprising:

a first support having an elongate base,

a guide plate at each end of said elongate base,

a second support adjacent said first support,

an upper and a lower cutting blade located above and below each of said guide plates,

means supporting each of said cutting blades at an angle inclined relative to an adjacent guide plate,

means for selectively extending and retracting each of said cutting blades between a first position on one side of an adjacent one of said guide plates and a position on another side of that guide plate, and

means for pushing said elongate cases laterally across said first support to said second support,

whereby said end faces of said cases are moved across said guide plates and said means for extending said cutting blades may be actuated to move said cutting blades to said first position and selectively cut portions of said upper and lower end face edges of said cases.

4,840,012

ZIPPERED FILM FEED

Hugo Boeckmann, Arlington Heights, Ill., assignor to Zip-Pak Incorporated, Northbrook, Ill.

Filed Dec. 10, 1987, Ser. No. 130,955

Int. Cl.⁴ B65B *9/20, 61/00, 61/18, 41/12*

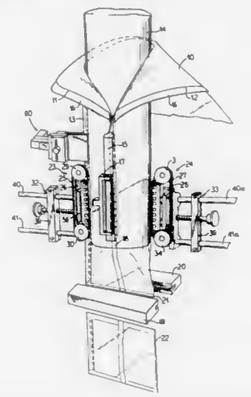
U.S. Cl. 53—410 **8 Claims**

1. A method of forming and shaping a permanent assembly of a sheet of plastic film with a longitudinally extending separable fastener strip thereon into a vertically upwardly opening tubular form adapted for gravitationally receiving bag filling contents in a vertical form filling and sealing packaging operation, the steps including:

effecting cyclical dwell and intermittent downward advancing of the tube by frictionally engaging the surface of the film and pushing the film downwardly in successive cyclical increments;

cross-sealing and filling the tube above the cross-seal and filling the tube between such increments;

frictionally engaging the outer surface of the film at the location of the fastener strip and at a location diametrically opposed therefrom;



and joining the edges of the film to form a tube at a location intermediate the locations of frictional engagement.

4,840,013

MACHINE AND PROCESS FOR SINUOUSLY FOLDING A BATT OF NON-WOVEN FIBROUS MATERIAL

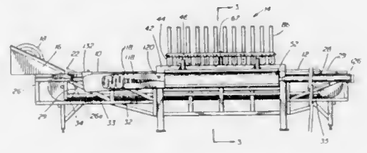
Guido Perrella, West Mount, Canada, assignor to Graham Fiber Glass Limited, Erin, Canada

Filed Apr. 15, 1988, Ser. No. 181,679

Claims priority, application Canada, Feb. 29, 1988, 560127

Int. Cl.⁴ B65B *63/02;* **B65H** *45/00*

U.S. Cl. 53—429 **11 Claims**



1. A machine for sinuously folding a batt of bulky non-woven fibrous material and inserting the folded material into a container, comprising:

a series of stationary, parallel, curved folding surfaces arranged as a straight row;

a series of movable curved folding surfaces each carried by a movable mounting which allows movement of each of the latter surfaces from an initial position in which the two series of facing folding surfaces have a gap therebetween, to a final position in which each of the movable folding surfaces has passed between stationary folding surfaces so that the two types of folding surfaces are overlapped;

means for moving the movable mountings in sequence such that a batt can be pulled between the two rows of folding surfaces when the movable surfaces are in their initial position, and can be sinuously folded by sequenced movement of the movable folding surfaces from the initial to the final position;

a compaction chamber alongside the two series of folding surfaces; and

a plate provided for pushing the folded batt from the folded surfaces into the compaction chamber;

the compaction chamber having a spout at one end and a movable wall at the other end to compact the batt longitudinally and push the sinuously folded and compacted batt through the spout and into a container held against the spout.

4,840,014

PROCESS FOR PRODUCING BOTTLED BEVERAGES

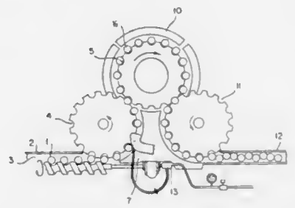
Tsutomu Takehana, Sagamihara; Tetsuo Kouzai, Kouriyama; Masaaki Sagara, Kouriyama; Tamio Yaginuma, Kouriyama, and Teruji Sasaki, Kouriyama, all of Japan, assignors to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 935,855, Nov. 28, 1986, abandoned. This application Jul. 6, 1988, Ser. No. 215,773

Claims priority, application Japan, Nov. 28, 1985, 60-266238

Int. Cl.⁴ B65B *31/06*

U.S. Cl. 53—432 **3 Claims**



1. A process for producing bottled beverages comprising the following steps:

charging a liquid product for drinking into a plurality of bottles, each with an externally threaded mouth;

purging air in the head space of each bottle charged with the liquid product for drinking with a non-oxidizing gas, said non-oxidizing gas being fed as a pulsed jet in an amount of 1.5 to 10 times the volume of the head space toward the mouth through a cylindrical tube having an inside diameter corresponding to approximately 10 to 100% of the inside diameter of the mouth, the top surface of the opening of said cylindrical tube being positioned at a distance of 0.1 to 10 mm from the top surface of the mouth and being substantially parallel to the top surface of the mouth, wherein the direction of ejection of the pulsed jet of non-oxidizing gas is at an angle of 20° to 90° with respect to the top surface of the mouth; and

applying a cap onto the threaded mouth of the bottle within 0.01 to 0.05 seconds after purging.

4,840,015

METHOD OF CONTINUOUSLY PROCESSING AND PACKING ELONGATED ARTICLES SUCH AS COHERENT PAIRS OF CHOPSTICKS AND AN APPARATUS FOR CARRYING OUT THE METHOD

Gert Schultz, Hillerod, Denmark, assignor to Stormax International A/S, Herley, Denmark

PCT No. PCT/DK87/00058, § 371 Date Mar. 24, 1988, § 102(e) Date Mar. 24, 1988, PCT Pub. No. WO87/07204, PCT Pub. Date Dec. 3, 1987

PCT Filed May 21, 1987, Ser. No. 150,415

Claims priority, application Denmark, May 30, 1986, 2564/86

Int. Cl.⁴ A01C *15/04;* **B27C** *9/00;* **A47J** *49/02*

U.S. Cl. 53—435 **12 Claims**

1. A method of continuously processing and packing elongated articles such as coherent pairs of chopsticks the outer shape of which being defined by two mutually parallel surfaces and two opposing surfaces inclining towards one another by the same inclination relative to a common plane of symmetry, the method comprising the steps of:

continuously advancing the articles along a track in the longitudinal direction of the articles;

centrally aligning the articles in the track during further

advancement while the articles pass by at least one processing implement by means of uniform centering rolls operating from the respective sides of said plane of symmetry of the articles, said centering rolls being biased towards the track by a uniform spring tension effected by spring means;

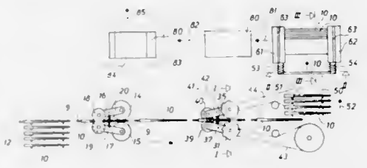
subsequently advancing the articles continuously in the transverse direction;

situating the articles in layers in a bundle of articles; and

subsequently wrapping said bundle in a sheet material.

4. An apparatus for continuously processing and packing elongated articles such as coherent pairs of chopsticks the outer shape of which being defined by two mutually parallel surfaces and two opposing surfaces inclining toward each other by the same inclination relative to a common plane of symmetry, the apparatus comprising:

a longitudinal, substantially horizontal track guiding the



articles during their continuous passage through the apparatus, the plane of symmetry of said articles being situated along the vertical central plane of the track;

conveyor means advancing the articles through the track;

implements processing the articles during their passage along the track;

uniform centering rolls operating from respective sides of the track and towards the center thereof, said centering rolls being biased towards the tracks by a uniform spring tension effected by spring means for engaging the articles into alignment during the processing procedure by means of the implements;

stopping means stopping the advancement of the articles and transferring the same to transverse conveyor means;

transferring means transferring the articles from the transverse conveyor means to a bundling device;

further conveyor means carrying bundles or articles to a wrapping device wrapping said bundles in sheet material.

4,840,016

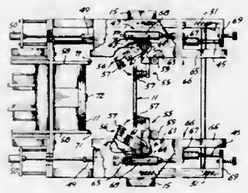
PAPER BAG FEEDER FOR BAG-FILLING OPERATIONS AND PROCESS

John E. Muller, Jr., Yakima, Wash., assignor to Pomona Service & Supply Co., Inc., Yakima, Wash.

Continuation of Ser. No. 58,593, May 20, 1987, abandoned, which is a continuation of Ser. No. 729,506, May 2, 1985, abandoned. This application Mar. 17, 1988, Ser. No. 171,202

Int. Cl.[4] B65B *43/30, 41/18, 39/10*

U.S. Cl. 53—459 **5 Claims**



1. Supply mechanism for feeding bags from a bag pack comprising means for supporting the bag pack with the bags upright and in face-to-face contact, two front suction cup means for gripping the front face of the leading bag at horizontally spaced locations, means for moving said front suction cup means away from the bag pack while said front suction cup means are applying suction to the front face of the leading bag for separating the leading bag from the bag pack and moving such bag along a linear bag path, two rear suction cup means for gripping the rear face of the leading bag at horizontally spaced locations, means supporting said rear suction cup means, respectively, for swinging about upright axes at opposite sides of the bag path toward each other from positions at opposite sides of the bag path into horizontally spaced locations in the bag path behind the leading bag separated from the bag pack by said front suction cup means for engagement with the rear face of the leading bag, means for applying suction to said front suction cup means and to said rear suction cup means for gripping the front face and the rear face, respectively, of the leading bag separated from the bag pack, means for moving said front suction cup means and said rear suction cup means relatively apart for opening such leading bag, means mounting said two front suction cup means for swinging about upright axes at opposite sides of the bag path, respectively, and thereby withdrawing said front suction cup means away from the front face of the leading bag out of the bag path, means for gripping the opened upper end of the leading bag and moving such opened bag farther away from the bag pack past said outwardly swung front suction cup means, means for swinging said two front suction cup means about their axes toward each other into the bag path, and means for swinging said two rear suction cup means about their axes away from each other out of the bag path.

4,840,017

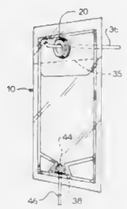
METHOD FOR FILLING COLLAPSIBLE CONTAINERS

Robert A. Miller, Crystal Lake, and Albert L. Stone, Buffalo Grove, both of Ill., assignors to Baxter Healthcare Corporation, Deerfield, Ill.

Filed Aug. 3, 1987, Ser. No. 80,853

Int. Cl.[4] B65B *3/04, 7/14, 51/10*

U.S. Cl. 53—468 **6 Claims**



1. The method of filling with fluid a flexible, collapsible container which comprises a pair of flexible plastic walls peripherally joined together, which method comprises:

connecting a fluid conduit to a tubular port which communicates through one of said walls to the container interior, and rupturing a sealing diaphragm that closes the bore of said tubular port; passing fluid through said conduit to fill said container;

sealing at least one of said tubular port and one plastic wall to the other plastic wall with a closed-loop seal line that completely surrounds said bore, to block flow communication between said bore and most of the container interior, whereby the contents of said container remain sealed on disengagement of said fluid conduit from the tubular port; and

cutting away at least portions of said other plastic wall situated in registry with said closed-loop seal line,

whereby the resulting open port extending through said tubular port and container can serve as a hanger port.

4,840,018

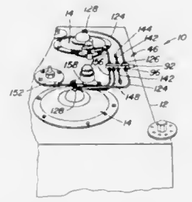
LUBRICATION DISTRIBUTION SYSTEM FOR A COTTON HARVESTER

Timothy A. Deutsch, Newton, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 28, 1988, Ser. No. 174,070

Int. Cl.[4] A01D *46/18*

U.S. Cl. 56—12.3 **12 Claims**



1. In a cotton harvester, the harvester having a plurality of cotton harvesting row units, each row unit including upright picker drum means for removing cotton from cotton plants and transmission means for driving and controlling the picker drum means, said picker drum means including first grease receiving areas adapted for receiving first preselected volumes of grease and said transmission means including cam means and gear means defining second grease receiving areas for receiving second preselected volumes of grease said first volumes being substantially greater than said second volumes, a lubrication system for automatically and simultaneously supplying grease to the first and second grease receiving areas comprising:

a source of grease on the harvester;

selectively activatable pump connected to the source of grease;

supply line means connected between the pump and the row units for supplying grease from the pump to the individual row units at approximately equal rates when the pump is activated; and

manifold means associated with each of the row units and including an input connected to the supply line means for receiving the grease from the supply line means, a first chamber in communication with the input, a plurality of first outputs opening from the first chamber, and means connecting the first outputs with the first grease receiving areas for providing a first proportion of the received grease to the first grease receiving areas, said manifold further comprising a second chamber, means for connecting the second chamber and the second grease receiving areas, and restrictor means connected between the first chamber and the second chamber for providing a second proportion of the received grease from the supply line means to the second grease receiving areas, said second proportion being substantially less than said first proportion.

4,840,019

DISC MOWER

Larry J. Pingry, Celina, Ohio, assignor to Allied Products Corporation, Chicago, Ill.

Filed Oct. 2, 1987, Ser. No. 104,821

Int. Cl.[4] A01D *34/66, 67/00*

U.S. Cl. 56—13.6 **14 Claims**

1. A rotary mowing device having a plurality of rotary cutter units mounted in substantial in-line relationship with each other, said rotary mowing device comprising:

a frame assembly having means for supporting a longitudinal cutter bar assembly in foliage-cutting relationship with respect to the ground, said cutter bar assembly having opposing end portions and an interior portion therebetween;

a mounting assembly having means for securing said frame assembly to a source of rotational power;

drive means for transmitting the rotational power to said cutter bar assembly;

said cutter bar assembly including a plurality of rotary cutter units mounted in a generally alternating manner with a plurality of spacer units, a drive shaft passing through said rotary cutter units and said spacer units, said drive shaft being in driving engagement with each of said rotary cutter units;

said cutter bar assembly having a leading edge portion defined by successive leading edge portions of said rotary cutter units and of said spacer units;

said cutter bar assembly having a trailing edge portion defined by successive trailing edge portions of said rotary cutter units and of said spacer units;

a plurality of leading edge securement means for joining the leading edge portion of each rotary cutter unit to the leading edge portion of each spacer unit adjacent thereto;

a plurality of trailing edge securement means for joining the trailing edge portion of each rotary cutter unit to the trailing edge portion of each spacer unit adjacent thereto;

each said leading edge securement means and each said trailing edge securement means of said interior portion of the cutter bar assembly secures a rotary cutter unit sandwiched between two of said spacer units, wherein said leading edge securement means joins an ear portion of one of said spacer units and an ear portion of the other of said two spacer units to opposite transverse ends of a leading edge portion of said sandwiched rotary cutter unit, whereby said leading edge securement means is located within said leading edge portion of the sandwiched rotary cutter unit.

4,840,020

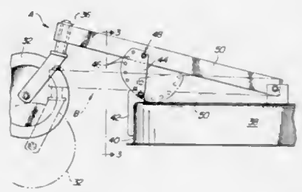
MOWER HEIGHT ADJUSTMENT MECHANISM

Ken K. Oka, St. Catharines, Canada, assignor to Deere & Company, Moline, Ill.

Filed Jun. 20, 1988, Ser. No. 208,697

Int. Cl.[4] A01D *34/74*

U.S. Cl. 56—15.2 **4 Claims**



1. Means for adjustably supporting a mower housing above the ground;

said housing including a generally horizontal deck with at least one generally horizontal deck reinforcing member;

means at the forward end of the housing connectable to a mobile vehicle, for supporting the front portion of said housing;

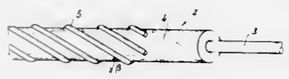
ground engaging means for adjustably supporting the rear portion of the housing including:
a tail wheel;
a generally fore-and-aft extending tail wheel support tube carried above the deck and projecting beyond the rear portion of said deck, the front portion of the tube attached to the deck for swinging movement about a generally horizontal pivot;
and means between the tube and deck for adjustably positioning the tube relative to the deck including:
first and second bracket means mounted on the deck and tube respectively; and
a cam-shaped adjustment member extending between the brackets:
said member having a plurality of adjustments selectively connectable with the first and second brackets.

4,840,021

CONTINUOUS MULTIFILAMENT SEWING THREAD AND PROCESS FOR MAKING SAME

Jean Guevel, Viriat; Marc Francois, Ecully, and Guy Bontemps, Tenay, all of France, assignors to Sa Schappe, Saint Rambert en Bugey, France

Filed Feb. 22, 1988, Ser. No. 158,456
Claims priority, application France, Feb. 20, 1987, 87 02869
Int. Cl.[4] D02G *3/28, 3/04*
U.S. Cl. 57—210 4 Claims



1. Multifilament core sewing thread, comprising:
a fixed high-tenacity multifilament core;
a cover sheathing said core, made of staple fibers; and
a multifilament yarn wrapping said core and said cover, wherein said multifilament yarn wrapping said core and said cover has the same rate of torsion as said core and said cover.

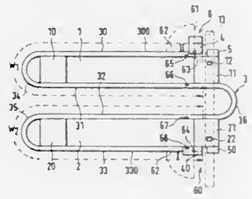
4,840,022

PROCESS AND DEVICE FOR THE SERVICING OF WORK STATIONS OF SPINNING OR DOUBLING MACHINES BY MEANS OF A PLURALITY OF SERVICE UNITS CAPABLE OF TRAVELLING ALONGSIDE THE WORK STATIONS

Rupert Karl, and Rudolf Becker, both of Ingolstadt, Fed. Rep. of Germany, assignors to Schubert & Salzer Maschinenfabrik, Ingolstadt, Fed. Rep. of Germany

PCT No. PCT/DE86/00505, § 371 Date Nov. 9, 1987, § 102(e) Date Nov. 9, 1987, PCT Pub. No. WO87/04734, PCT Pub. Date Aug. 13, 1987
PCT Filed Dec. 9, 1986, Ser. No. 130,452
Claims priority, application Fed. Rep of Germany, Jan. 31, 1986, 3602961
Int. Cl.[4] D01H *15/00, 9/10;* B65H *57/00;* B61J *3/00*
U.S. Cl. 57—263 28 Claims

1. A process for servicing textile machinery having a plurality of work stations, including:
providing a rail system which provides access for service units travelling thereover to all of the work stations, such rail system including at least one first movable rail segment comprising a service station, which first segment may be selectively moved between an operative position in alignment with the rail system, and an inspection position displaced therefrom with said first segment temporarily replaced with a second movable rail segment, so that there are no gaps in the rail system as it existed prior to such displacement of the first movable segment; and
providing at least two independently operable service units for travelling over the rail system to service the work stations; wherein
during normal functioning of the service units for servicing the work stations, said service station is placed in its operative position, and the service units are assigned non-overlapping service areas of the rail system for efficient servicing of the work stations; and
during servicing or adjustment of one of the service units, such one service unit is moved onto the service station which is then placed in its inspection position, and the other service unit is assigned an enlarged service area for also covering the formerly assigned rail system service area of such one service unit, whereby access is obtained to such one service unit for servicing of same, while the rail system is cleared for continued servicing of all work stations by the other service unit, without having to remove such one service unit from its support on the first movable rail segment.



7. Device for servicing work stations of spinning or doubling machines having at least two service units which can travel on running rails alongside a plurality of work stations of the machine arranged next to each other, comprising curved connecting sections of rail for connecting said running rails to each other at one end of the machine so that the service units can travel from one longitudinal side of the machine to the other longitudinal side thereof; a first movable segment of running rail which can be moved crosswise to the longitudinal direction of the machine running rail with a given service unit supported thereon for bringing such service unit into an inspection position thereof; a second movable segment of running rail for replacing said first segment thereof whenever same is moved; and control means for causing the remaining service units to take over the servicing of work stations which would otherwise be serviced by said given service unit whenever such service unit is situated in its inspection position.

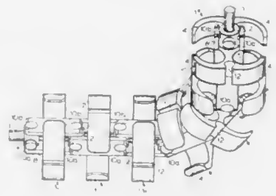
4,840,023

FLEXIBLE CABLE GUIDE WITH TWO-DIRECTIONAL JOINTS

Paolo Borsani, Milan, Italy, assignor to Tecno S.p.A. Mobili e Forniture per Arredamento, Milan, Italy

Filed Sep. 15, 1987, Ser. No. 97,483
Claims priority, application Italy, Sep. 15, 1986, 23021/86[U]
Int. Cl.[4] F16L *3/14*
U.S. Cl. 59—78.1 5 Claims

1. A flexible cable guide for a plurality of electrical conductors, comprising:
a plurality of generally I-shaped elements each formed with a central web provided with a throughgoing bore adapted to receive a stiffening cable, curved flanges defining laterally open generally cylindrical spaces adapted to receive respective electrical conductors, and respective pairs of mutually parallel spaced-apart lugs projecting axially from opposite sides of said central web; and
annular articulation bodies interconnecting said elements in contiguous end-to-end articulated relationship, said articulation bodies each having two mutually perpendicular pairs of pins projecting radially, said lugs being provided with formations pivotally engageable with said pins, one of the pairs of pins of each articulation body being pivotally engaged with a pair of lugs of a respective one of said elements and the other pair of pins of each articulation body being pivotally engaged with a pair of lugs of a respective other of said elements angularly offset from



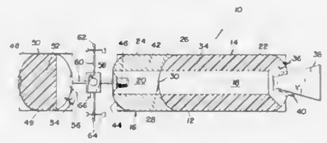
said one of said elements through 90°, whereby each of said articulation bodies and the pairs of lugs pivotally connected thereto form a Cardan-type bidirectional joint, said joints spacing the flanges of successive ones of said elements apart so that conductors can pass into an out of said guide between said elements.

4,840,024

MULTIPLE PROPELLANT SOLID ROCKET MOTOR

Allan J. McDonald, Pleasant View, Utah, assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Aug. 20, 1984, Ser. No. 642,469
Int. Cl.[4] F02C *3/20*
U.S. Cl. 60—39.461 22 Claims



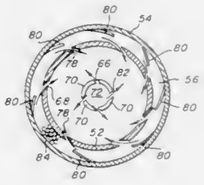
1. A multiple propellant solid rocket motor comprising:
a first enclosure having a fist chamber containing a solid propellant and means for exhausting propellant combustion gases from the first enclosure to provide rocket motor thrust;
first ignition means for igniting the solid propellant;
a second enclosure associated with but insulated from the first enclosure having a second chamber containing an extinguishable solid propellant;
a third enclosure having a third chamber containing a gas generating propellant capable of generating a gas that is capable of igniting the extinguishable propellant;
second ignition means for igniting the gas generating propellant;
means for releasing generated gas within the second enclosure so as to contact, ignite, and combustibly react with the extinguishable solid propellant therein;
pressure control means intermediate the first and second enclosures for maintaining choked extinguishable propellant combustion gas flow from the second enclosure to the first enclosure during extinguishable solid propellant combustion;
removable, insulative, plug means associated with the pressure control means to seal the pressure control means until extinguishable solid propellant combustion;
means for removing the plug means in association with extinguishable solid propellant combustion;
transfer means intermediate the second and third enclosures for channeling gas generated in the third enclosure to the releasing means within the second enclosure;
gas pressure control means associated with the transfer means and intermediate the second and third enclosures for maintaining choked flow of gas from the third enclosure to the second enclosure during gas generation; and
an insulating bulkhead intermediate said first and second enclosures, said pressure control means comprises an opening in the insulated bulkhead between the first and second enclosures, the opening having an operative area maintaining choked extinguishable propellant combustion gas flow from the second enclosure to the first enclosure during extinguishable solid propellant combustion, and
the plug means comprises an insulated diaphragm plugging the insulating bulkhead opening.

4,840,025

MULTIPLE-PROPELLANT AIR VEHICLE AND PROPULSION SYSTEM

George A. Coffinberry, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 918,214, Oct. 14, 1986, abandoned.
This application Apr. 15, 1988, Ser. No. 183,471
Int. Cl.[4] C06D *6/60*
U.S. Cl. 60—217 13 Claims



1. In a propulsion system having a rocket casing containing a combustor, propellant injectors, nozzle throat and nozzle; a fuel passageway wherein fuel is endothermically pyrolyzed, the fuel passageway being adjacent to and surrounding the combustor and nozzle throat; and means for providing fuel flow in the fuel passageway, the improvement comprising a woven silicon carbide fiber inner wall forming a combustor liner and a nozzle throat liner and a woven silicon carbide fiber outer wall spaced from the inner wall to form said fuel passageway, whereby the silicon carbide fibers are woven to conduct heat from the combustor and nozzle throat to the fuel passageway, thereby providing heat for the endothermic pyrolysis of the fuel.

4,840,026

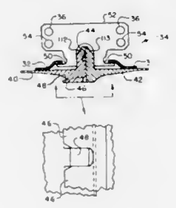
BAND CLAMP APPARATUS

Dudley O. Nash, Cincinnati; Glenn L. Knight, Jr., Mason, and James H. Bertke, Cincinnati, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 24, 1988, Ser. No. 159,868
Int. Cl.[4] F02K *1/00*
U.S. Cl. 60—271 6 Claims

1. A band clamp apparatus for an engine/exhaust system comprising in combination:
a first band clamp segment formed in a semi-circular shape, said first band clamp segment having a first flange at one end of said first band clamp segment and a second flange at the other end of said first band clamp segment, said first flange having a first and second bolt hole therein arranged on opposite sides of said first band clamp segment, said first flange having a pair of jackscrew holes therein arranged on opposite sides of said first band clamp segment, aligned with and spaced-above said first and second bolt

holes respectively, said second flange having a third and fourth bolt hole therein arranged on opposite sides of said first band clamp segment, said first band clamp segment including a longitudinal groove in its inner surface extending the entire length thereof, said longitudinal groove forming a pair of substantially parallel wall surfaces, and, a second band clamp segment formed in a semi-circular shape, said second band clamp segment having a third flange at one end of said second band clamp segment and a fourth flange at the other end of said second band clamp segment, said third flange having a first and second bolt hole therein arranged on opposite sides of said second band clamp segment, said third flange having a pair of jackscrew holes therein arranged on opposite sides of said second band clamp segment, aligned with and spaced-above said first and second bolt holes respectively, said fourth flange having a third and fourth bolt hole therein arranged on opposite sides of said second band clamp



segment, said second band clamp segment including a longitudinal groove in its inner surface extending the entire length thereof, said longitudinal groove forming a pair of substantially parallel wall surfaces, said engine/exhaust system providing a circumferentially mated jointed flange at their connecting point, said first and second band clamp segments positioned around said engine/exhaust system and operatively engaging said circumferentially-mounted flange, said first flange of said first band clamp segment operatively mating with said fourth flange of said second band clamp segment at the horizontal centerline of said engine/exhaust system, said first and fourth flanges being secured together by a pair of bolts, said second flange of said first band clamp segment operatively mating with said third flange of said second band clamp segment at the horizontal centerline of said engine/exhaust system, said second and third flanges being secured together by a pair of bolts.

4,840,027

DOUBLE AIR-FUEL RATIO SENSOR SYSTEM HAVING IMPROVED EXHAUST EMISSION CHARACTERISTICS

Atsuo Okumura, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Oct. 8, 1987, Ser. No. 105,696

Claims priority, application Japan, Oct. 13, 1986, 61-241486; Jul. 7, 1987, 62-167819

Int. Cl.⁴ F01N *3/20;* **F02D** *41/14*

U.S. Cl. 60—274 **22 Claims**

1. A method for controlling an air-fuel ratio in an internal combustion engine having a catalyst converter for removing pollutants in the exhaust gas thereof, and upstream-side and downstream-side air-fuel ratio sensors disposed upstream and downstream, respectively, of said catalyst converter, for detecting a concentration of a specific component in the exhaust gas, said method comprising the steps of:

calculating an air-fuel ratio correction amount in accordance with the outputs of said upstream-side and downstream-side air-fuel ratio sensors;

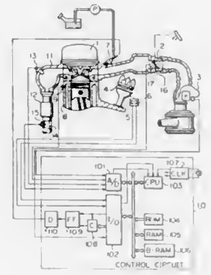
skipping a speed of changing said air-fuel ratio correction amount in accordance with the output of the downstream-side air-fuel ratio sensor by a speed skip amount immediately after the output of said downstream-side air-side ratio sensor is switched between the rich side and the lean side;

gradually decreasing the speed of changing said air-fuel ratio correction amount in accordance with the output of said downstream-side air-fuel ratio sensor ate decreasing speed after the speed of changing said air-fuel ratio correction amount is skipped; and

adjusting an actual air-fuel ratio is accordance with said air-fuel ratio correction amount;

wherein said air-fuel ratio correction amount calculating step comprises the steps of:

calculating an air-fuel ratio feedback control parameter in



accordance with the output of said downstream-side air-fuel ratio sensor; and

calculating said air-fuel ratio correction amount in accordance with the output of said upstream-side air-fuel ratio sensor and said air-fuel ratio feedback control parameter;

said skipping step skipping a speed of changing said air-fuel ratio feedback control parameter when the output of said downstream-side air-fuel ratio sensor is switched between the rich side and the lean side;

said gradually decreasing step gradually decreasing the speed of changing said air-fuel ratio feedback control parameter when the output of said downstream-side air-fuel ratio sensor indicates a lean state or a rich state.

4,840,028

PURIFIER OF DIESEL PARTICULATES IN EXHAUST GAS

Takao Kusuda, Ashiya; Masaaki Yonemura, Nara; Hisanori Shimoda, Suita; Masuo Takigawa, Ikoma, and Toshihiro Mihara, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 15, 1988, Ser. No. 170,437

Claims priority, application Japan, Mar. 20, 1987, 62-66410; Mar. 20, 1987, 62-66411; Aug. 20, 1987, 62-206702

Int. Cl.⁴ F01N *3/02*

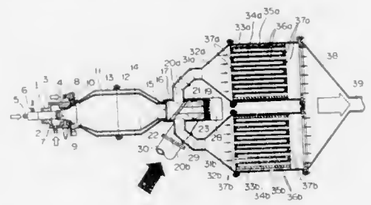
U.S. Cl. 60—303 **7 Claims**

1. An exhaust gas purifier system for connection to an exhaust pipe of a diesel engine for filtering off diesel particulates contained in exhaust gas and incinerating said particulates by means of an oil burner, comprising:

a four-way valve having a cylindrically shaped body with two gas inlets and two gas outlets, one of said inlets being connectable to the exhaust pipe of the diesel engine and the other of said inlets being connectable to a combustion chamber of the oil burner, said valve including a movable shaft disposed therein having an elliptical vane, attached to said shaft, in sliding contact with a portion of the inner surface of said body between said gas inlets, each of said gas outlets being located between said gas inlets and in

said portion of the inner surface with which said elliptical vane is in sliding contact;

two parallel filter elements made of ceramic; and



means for connecting each of said filter elements to a corresponding one of said gas outlets.

4,840,029

EXHAUST GAS CONTROL MEANS FOR ENGINE

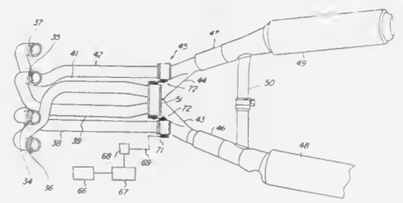
Tadashi Sakurai, and Wataru Fuchigami, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 6, 1987, Ser. No. 22,434

Claims priority, application Japan, Mar. 7, 1986, 61-48490; Mar. 7, 1986, 61-48491; Mar. 7, 1986, 61-48492

Int. Cl.⁴ F02B *27/02*

U.S. Cl. 60—313 **13 Claims**



1. In an exhaust system for a vehicle powered by an internal combustion engine having a first exhaust pipe, a second exhaust pipe juxtaposed to said first exhaust pipe, a first reflective means rotatably supported upon a first shaft in said first exhaust pipe, the rotatable position of said first reflective means being effective to vary the reflective area thereof, second reflective means rotatably supported on a second shaft in said second exhaust pipe, the rotatable position of said second reflective means being effective to vary its reflective area, said shafts being positioned at different longitudinal positions along the length of said vehicle, and motion transmitting means for rotatably coupling said first and said second shafts.

4,840,030

TAIL PIPE STRUCTURE OF CONTROL TYPE MUFFLER

Tsunemi Ikeda, and Motoki Ota, both of Tokyo, Japan, assignors to Calsonic Corporation, Tokyo, Japan

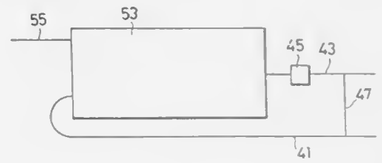
Filed Jan. 21, 1988, Ser. No. 146,422

Claims priority, application Japan, Jan. 28, 1987, 62-10975[U]

Int. Cl.⁴ F01N *7/00*

U.S. Cl. 60—324 **5 Claims**

1. An internal combustion engine tail pipe structure for use with a control type muffler having first and second outlet pipes each having an upstream side for receiving exhaust gases from the muffler and a downstream side for discharge of engine exhaust gases, the second outlet pipe having a control valve inserted therein, characterized by conduit means downstream of the control valve for establishing communication between said first and second outlet pipes at a point of connection



between the upstream and downstream ends of said first outlet pipe.

4,840,031

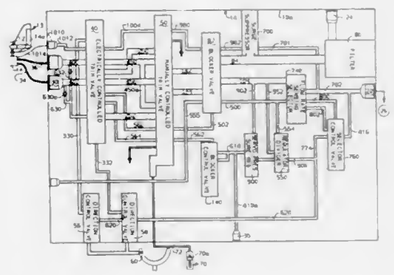
CONTROL SYSTEM FOR FLUID PRESSURE OPERATED ACTUATOR

Frank Hribar, Kirtland, Ohio, assignor to Fluid Regulators Corp., Painesville, Ohio

Filed May 5, 1987, Ser. No. 47,032

Int. Cl.⁴ F16D *33/00*

U.S. Cl. 60—338 **21 Claims**



1. For a fluid pressure operated actuator having at least two pressure input ports, the application of pressure to said ports determining the direction of motion, a control system comprising:

(a) a source of pressurized fluid having a source pressure;

(b) pressure controlling means for providing a controlled fluid pressure at a pressure level that is a predetermined level below said source pressure;

(c) direction control means operative to selectively communicate said source of pressurized fluid to one of said actuator input ports while communicating the other of said ports with a return pressure line;

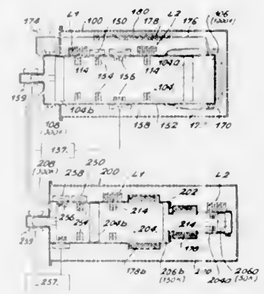
(d) blocking means operative to interrupt communication of said source with said direction control means and being further operative to communicate said controlled pressure to both of said actuator input ports concurrently during actuator idle periods.

4,840,032

REFRIGERATOR, MORE PARTICULARLY WITH VUILLEUMIER CYCLE, COMPRISING PISTONS SUSPENDED BY GAS BEARINGS

Gérard Claudet, La Tronche; Bernard Devanckel; Alain Ravex, both of Meylan, and Serge Reale, Grenoble, all of France, assignors to Commissariat a l'Energie Atomique and Air Liquid, both of Paris, France

Filed Feb. 1, 1988, Ser. No. 150,971
Claims priority, application France, Feb. 16, 1987, 87 01926
Int. Cl.[4] F25B 9/00
U.S. Cl. 62—6 **15 Claims**



1. A refrigerator operating in a Vuilleumier cycle, characterized in that it uses at least one gas bearing (**104***a*, **104***b*, **201***a*, **204***b*) for the suspension of at least one piston (**4**, **104**, **201**), and comprising:

a first cylinder (**102**) having a hot end and an intermediate temperature end, and displacement piston (**104**) sliding in the first cylinder between a first and a second position to compress and expand a quantity of gas contained in the first cylinder (**102**), a conduit which includes a thermal regenerator connecting the high temperature end and the intermediate temperature end of the first cylinder;

a second cylinder (**202**) having an intermediate temperature end and a cold end, a second displacement piston (**204**) sliding in the second cylinder (**202**) between a first and a second position to compress and expand a quantity of gas contained in the second cylinder;

a duct connecting the intermediate temperature end of the first cylinder and the intermediate temperature end of the second cylinder;

means for displacing the first cylinder (**102**) and the second cylinder (**202**) in phase relation,

characterized in that it comprises:

a gas bearing (**104***a*) at the hot end of the first piston (**104**) and a gas bearing (**104***b*) at the intermediate temperature end of the first piston;

a gas bearing (**204***b*) at the intermediate temperature end of the second piston (**204**) and a gas bearing (**204***a*) at the cold end of the second piston.

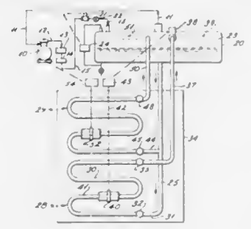
4,840,033

ICE BUILDER AND CONTROL SYSTEM THEREFOR

Milton W. Garland, Waynesboro, Pa., assignor to Frick Company, Waynesboro, Pa.

Filed Jun. 20, 1988, Ser. No. 208,677
Int. Cl.[4] F25D 3/00
U.S. Cl. 62—59 **15 Claims**

1. An ice builder having evaporator means in at least two sections disposed at upper and lower levels of height for disposition in a tank of water, each having an inlet and an outlet, a refrigerant accumulator for separating liquid refrigerant from vapor, means connecting said evaporator means to said accumulator below its level of liquid refrigerant, means connecting each section outlet to said accumulator above its level of liquid refrigerant, valve means in the lower level section outlet, means sensing the thickness of ice on said lower level section, means for closing said valve means in response to a predetermined ice thickness, means sensing the thickness of ice on said



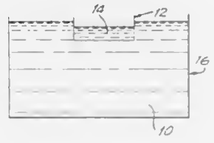
upper level section, means for supplying liquid refrigerant to said accumulator and withdrawing vapor therefrom, and means for discontinuing the withdrawal of refrigerant vapor from said accumulator in response to a predetermined ice thickness on said upper level coil section.

4,840,034

METHOD OF FREEZING VITAL BODY FLUIDS

Barnet L. Liberman, 421 Hudson St., New York, N.Y. 10014, assignor to Barnet L. Liberman; Winthrop D. Chamberlain, both of New York; Joseph Fedele and Brian Fedele, both of Queens, all of, N.Y., a part interest

Filed Jul. 14, 1988, Ser. No. 219,339
Int. Cl.[4] F25D 17/02
U.S. Cl. 62—64 **20 Claims**



1. A method of freezing vital body fluids comprising:

preparing a brine including at least 0.1% by weight of cruciferous oil;

cooling the brine to a temperature between about −22° and −43.6° F.;

providing a heat transfer container including a vital body fluid therein; and

bringing the heat transfer container into a heat transfer relationship with the cooled brine for a period of time sufficient to transmit cold from the cooled brine to the vital body fluid in the heat transfer container and freeze the vital body fluid.

4,840,035

METHOD OF FREEZING TISSUE

Barnet L. Liberman, 421 Hudson St., New York, N.Y. 10014, assignor to Barnet L. Liberman; Winthrop D. Chamberlain, both of New York; Joseph Fedele and Brian Fedele, both of Queens, all of, N.Y., a part interest

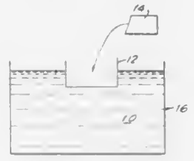
Filed Jul. 14, 1988, Ser. No. 219,330
Int. Cl.[4] F25D 17/02
U.S. Cl. 62—64 **20 Claims**

1. A method of freezing a tissue specimen comprising:

preparing a brine including at least about 0.1% by weight of a cruciferous oil;

cooling the brine to a temperature between about −22° and −43.6° F.;

providing a tissue specimen; and



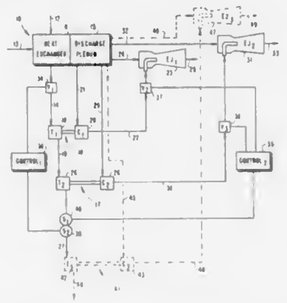
subjecting the tissue specimen to a heat transfer relationship with the cooled brine for a period of time sufficient to freeze the tissue specimen.

4,840,036

AIR CYCLE REFRIGERATION SYSTEM

Wilbur A. Spraker, Jr., Indianapolis, Ind., assignor to Household Manufacturing, Inc., Prospect Heights, Ill.

Filed Jun. 5, 1987, Ser. No. 58,927
Int. Cl.[4] F25D 9/00
U.S. Cl. 62—172 **9 Claims**



1. An air cycle refrigeration system which comprises:

an air-to-air heat exchanger including a system air inlet and outlet and a coolant air inlet and outlet, the coolant air outlet of said heat exchanger comprising a discharge plenum;

first coupling means for coupling the system air inlet of said heat exchanger to a source of high-pressure, high temperature system air;

second coupling means for coupling the coolant air inlet of said heat exchanger to a source of coolant air;

a turbocharger including a turbine drivingly coupled to a compressor, the turbine having an inlet and an outlet, the inlet of the turbine being connected with the system air outlet of said heat exchanger, the compressor having an inlet and an outlet, the inlet of the compressor being connected with the coolant air outlet of said heat exchanger;

an ejector pump means having a first inlet connected with the compressor outlet and a second inlet connected with the coolant air outlet of said heat exchanger, said ejector pump means further including an outlet, said ejector pump means being for receiving air from the compressor outlet into the first inlet in a manner to draw additional inlet air from the coolant air outlet and through the second inlet of said ejector pump means and exhausting the air,

the outlet system air from the outlet of the heat exchanger driving the turbine and being exhausted therefrom at a reduced temperature, the turbine in turn driving the compressor which draws air from the plenum of said heat exchanger, the compressor exhausting high pressure air from the compressor outlet, the high pressure air from the outlet of the compressor being directed to said ejector pump means and operating to draw additional coolant air from the plenum;

compressor outlet control means for controlling the flow of air from the outlet of the compressor to said ejector pump means, and

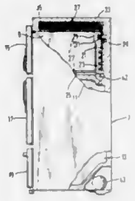
sensor means for sensing the temperature of the air discharged through the outlet of the turbine, said compressor outlet control means being for controlling the flow of air from the outlet of the compressor to said ejector pump means in response to the sensed temperature of the air discharged through the outlet of the turbine.

4,840,037

REFRIGERATOR WITH COLD ACCUMULATION SYSTEM

Koji Yamada, and Noriaki Sakamoto, both of Ibaraki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 8, 1988, Ser. No. 153,712
Claims priority, application Japan, Feb. 27, 1987, 62-029077[U]
Int. Cl.[4] F25B 5/00
U.S. Cl. 62—199 **14 Claims**



1. A refrigerator having a compartment, comprising:

a cold accumulation material;

a refrigerating cycle for cooling said compartment and the cold-accumulation material;

means for cooling said compartment by heat transfer between said compartment and said cold-accumulation material;

load detecting means for measuring an amount of a load to be cooled;

clock counting means for generating time data; and

control means for causing said refrigerator to operate in accordance with first, second and third modes of operation wherein in said first mode said refrigerator compartment is cooled by the refrigerating cycle, wherein in said second mode said compartment is cooled by the cold-accumulation material, and wherein in said third mode the cold-accumulation material is cooled by the refrigerating cycle, said modes being carried out in accordance with said time data, the second mode operation having a time duration that is a function of load as determined by the load detecting means.

4,840,038

CONTROL DEVICE FOR USE IN A REFRIGERATION CIRCUIT

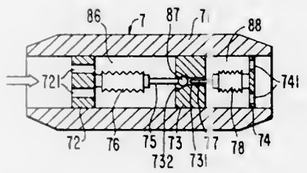
Motoharu Sato, Honjo, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Dec. 7, 1987, Ser. No. 129,669
Claims priority, application Japan, Dec. 6, 1986, 61-87389[U]
Int. Cl.[4] F25B 41/04
U.S. Cl. 62—210 **8 Claims**

1. In a refrigeration circuit comprising a compressor, a condenser, a control device, an evaporator and an accumulator serially arranged to form a closed refrigerant circulation path,

the improvement comprising said control device including: a tubular casing; a first, second and third wall disposed on an interior surface of said tubular casing; said first wall having a plurality of holes therethrough, said second wall spaced from said first wall and having a longitudinal bore therethrough, and said third wall spaced from said second wall and having at least one hole therethrough;

a first bellows disposed in a region between said first wall and said second wall and having a valve element at one end thereof for controlling a flow of refrigerant through



said longitudinal bore in said second wall; and a second bellows disposed in a region between said second wall and said third wall and having a valve control element at one end extending through said longitudinal bore of said second wall, said valve control element contacting said valve element when said valve element has closed fluid flow through said longitudinal bore, said valve control element moving said valve element when the level of refrigerant fluid in said circuit is reduced below a predetermined level to allow fluid flow through said longitudinal bore.

4,840,039

AUTOMATIC EXPANSION VALVE FOR A REFRIGERATION CIRCUIT

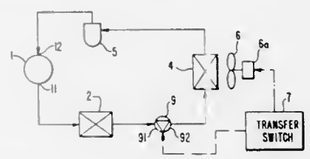
Takai Kazuhiko, Gunma, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Mar. 21, 1988, Ser. No. 171,392

Claims priority, application Japan, Mar. 20, 1987, 87-41584[U]

Int. Cl.[4] B60H *1/32*

U.S. Cl. 62—244 **10 Claims**



8. An automotive air conditioning system having a refrigeration circuit including a compressor, a condenser, an expansion valve, an evaporator, and an accumulator connected in series, a fan associated with said evaporator, and a transfer switch for regulating the speed of said fan to thereby control air flow volume across said evaporator, the improvement comprising:

said expansion valve comprises two orifices and an actuator, a first orifice providing continuous communication through said expansion valve and a second orifice providing controllable communication through said expansion valve;

said actuator comprises an electromagnetic valve, said electromagnetic valve comprises an electromagnet and a valve element, and said valve element opens and closes said second orifice in accordance with the operation of said electromagnet as controlled by said transfer switch;

wherein the said second orifice is open when the air flow volume of said fan is a maximum and said second orifice is closed when the air flow volume of said fan is a minimum.

4,840,040

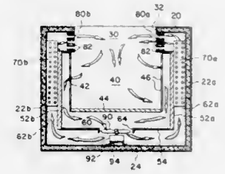
ISLAND TYPE REFRIGERATION DISPLAY CABINET

Kwok K. Fung, Niles, Mich., assignor to American Standard Inc., New York, N.Y.

Filed Sep. 22, 1988, Ser. No. 247,543

Int. Cl.[4] A47F *3/04*

U.S. Cl. 62—255 **14 Claims**



1. An island-type refrigeration display cabinet comprised of:

a cabinet having an interior display space therein and a top wall with an access opening therethrough;

means for forceably discharging at least two oppositely directed co-planar convergent air streams into said access opening, said air streams generating a multisectional single air curtain across said access opening, said forceable discharge means further comprises of a bifurcated conduit disposed in said cabinet, said bifurcated conduit including two discharge louvers in parallel spaced relationship, each said louver disposed at a respective side of said access opening for discharging one of said oppositely directed co-planar convergent air streams;

a motor driven fan element disposed in said bifurcated conduit; and

means for providing return air to said conduit from said interior display space, said return air means including a plurality of interior walls defining said interior display space, said interior walls having a plurality of return air apertures therethrough, and said return air means further including a return air conduit in said cabinet in flow communication with said return air apertures, said return air conduit having an aperture for flow communication with said bifurcated conduit.

4,840,041

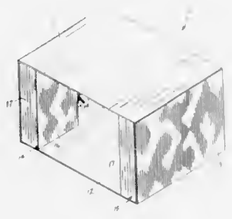
AIR CONDITIONER WALL SLEEVE

Eugene E. Nervina, 100 Manhattan Ave. 910, Union City, N.J. 07087

Filed Apr. 26, 1988, Ser. No. 186,233

Int. Cl.[4] F25D *23/12*

U.S. Cl. 62—263 **6 Claims**



1. An air conditioning wall sleeve for use in combination with a window unit air conditioner including a top face, bottom face, side faces, a forward face, and a rear face therein defining outward surfaces of said air conditioner wherein said rear face includes a rear discharge vent for exhausting heated air from said air conditioner and side vents secured to rear portions of each side face of said air conditioner oriented adjacent said rear discharge vent on said side faces, said sleeve comprising,

a cabinet including a top wall,

a bottom wall,

a first side wall, and

a second side wall defining a rectangular parallel piped, and

a plurality of generally "U" shaped adapter means secured to an interior surface of each side wall wherein said adapter means is defined by a height substantially equal to a distance between said top wall and bottom wall and of a depth less than that of either side wall wherein said adapter means extends along the interior surface of each side wall a distance substantially less than that of the side wall, and

each of said plurality of adapter means spaced a distance apart between each other to substantially equal the distance between the side faces of the air conditioner, and

said cabinet including a plurality of rear louvers to define a rear wall of said cabinet of a length greater than the that of the rear face of the air conditioner, and

wherein said cabinet defines a space means between said adapter means and said rear wall and between the side vents of the air conditioner and the interior surfaces of each side wall opposed to said side vents for enabling intake air to be directed through said louvers and said space means and ultimately directed to said side vents.

4,840,042

HEAT PUMP SYSTEM

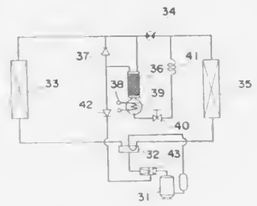
Mitsuhiro Ikoma, Nara; Kazuo Nakatani, Osaka; Yuji Yoshida, Hyogo; Takeshi Tomizawa, Nara, and Koji Arita, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jul. 29, 1988, Ser. No. 226,084

Claims priority, application Japan, Jul. 31, 1987, 62-192949; Oct. 26, 1987, 62-269631; Oct. 26, 1987, 62-269632

Int. Cl.[4] F25B *13/00*

U.S. Cl. 62—324.1 **10 Claims**



1. A heat pump system which comprises:

a main heat pump circuit filled with non-azeotropic mixed coolant and including a compressor, a utility-side heat exchanger, a throttling device, a source-side heat exchanger, etc.;

a fractionating separator having an upper end fluid-connected with an exit side of the utility-side heat exchanger;

a reservoir disposed beneath the fractionating separator and having a bottom fluid-connected through a shut-off valve with a low pressure piping on an inlet side of either the source-side heat exchanger or the utility-side heat exchanger; and

a coolant ejector disposed between the compressor and the utility-side heat exchanger, wherein a gaseous medium generated from the fractionating separator when the reservoir is heated is guided to a suction port of the coolant ejector to flow into the main heat pump circuit.

4,840,043

CRYOGENIC REFRIGERATOR

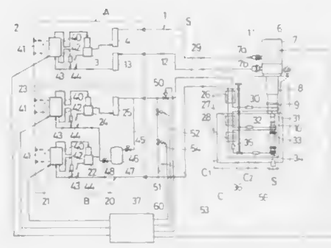
Katsumi Sakitani; Yoon M. Kang; Shinichiro Shinozaki; Shoichi Taneya; Kazuo Miura; Tadashi Ogura, and Satoshi Noguchi, all of c/o Kanaoka Factory, Sakai Plant, Daikin Industries, Ltd., 1304 Kanaoka-cho, Sakai-shi, Osaka 591, Japan

Filed May 18, 1987, Ser. No. 50,475

Claims priority, application Japan, May 16, 1986, 61-113332; May 16, 1986, 61-113333

Int. Cl.[4] F25B *19/00*

U.S. Cl. 62—51.2 **11 Claims**



1. A cryogenic refrigerator for maintaining a low temperature working apparatus at a cryogenic level, said cryogenic refrigerator comprising:

a precooling refrigerating circuit including a compressor for compressing refrigerant gas, and an expander operatively connected to said compressor for expanding the gas compressed by said compressor thereby lowering the temperature of the refrigerant gas,

said expander including heat stations which are maintained at respective lowered temperatures of the refrigerant gas;

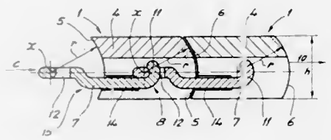
a J-T circuit including a precooler in a heat exchange relationship with the heat stations of said expander for undergoing heat exchange therewith to precool refrigerant gas in the J-T circuit, a J-T valve operatively connected to said precooler for Joule-Thomson expanding the precooled refrigerant gas into a gas/liquid state, and a cooler operatively connected to and downstream of said J-T valve;

a cryostat in which the heat stations of said expander, said J-T valve and said cooler are disposed, said cryostat including a cryogenic maintaining part in which said cooler is disposed for supporting the low temperature working apparatus within said cryostat adjacent said cooler to maintain the low temperature working apparatus at a cryogenic level resulting from evaporation of the liquid of the refrigerant gas existing in a gas/liquid state after the expansion thereof by said J-T valve disposed upstream of said cooler;

a precooling refrigerating circuit stop means operatively connected to said precooling refrigerating circuit and said J-T circuit for stopping the operation of said precooling refrigerating circuit; and

a control means operatively connected to said precooling refrigerating circuit stop means for activating said precooling refrigerating circuit stop means to stop the operation of said precooling refrigerating circuit while causing said J-T circuit to operate while the low temperature working apparatus is to be operated.

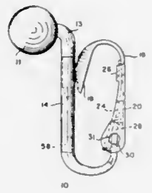
4,840,044
ARTICULATED WRISTLET
Werner Scholpp, Oberriexingen, Fed. Rep. of Germany, assignor to Montres Rado S.A., Lengnau, Switzerland
Filed Feb. 3, 1988, Ser. No. 151,681
Claims priority, application France, Feb. 5, 1987, 87 01512
Int. Cl.[4] A44C 5/02
U.S. Cl. 63—4 7 Claims



3. An articulated wristlet having a plurality of decorative elements, said elements being arranged side by side along a longitudinal axis,
a flexible inner core,
assembly means fixing said decorative elements to said inner core,
said assembly means having a plurality of sliding type slide fittings, whereby the decorative elements are mounted on the slide fittings in a manner such that movement of the decorative elements is only permitted in a direction longitudinal to said wristlet,
each decorative element having a lateral face which covers at least partially the lateral face of an adjacent element in order to lock said elements between them when the wristlet is worn normally,
said lateral faces being shaped in such a manner that they uncover one another when the wristlet is folded beyond a predetermined angle, thus permitting the releasing and the removal of any one decorative element located anywhere along the wristlet by sliding said one decorative element along the sliding type fitting on which it is mounted;
said flexible inner core having a plurality of linking elements, said linking elements being present in the same number as the number of decorative elements, said linking elements being further articulated to one another in series by means of hinges, said hinges being capable of being unhooked, said decorative elements and said linking elements being provided with said assembly means, said releasing permitting the removal of a decorative elements from the wristlet by sliding said decorative element along the corresponding assembly means, followed by the unhooking of said linking element.

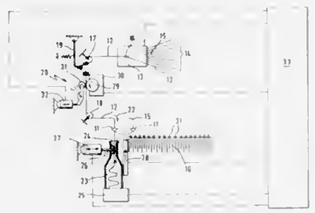
4,840,045
JEWELRY MOUNTING CONSTRUCTION
Leonardo Moody, Downers Groove, Ill., assignor to Luc-Co., Inc., Chicago, Ill.
Continuation-in-part of Ser. No. 930,271, Nov. 14, 1986, abandoned, which is a continuation of Ser. No. 832,843, Feb. 4, 1986, Pat. No. 4,655,055, which is a continuation of Ser. No. 728,444, Apr. 30, 1985, Pat. No. 4,574,595, which is a continuation of Ser. No. 460,284, Jan. 24, 1983, abandoned. This application Mar. 4, 1987, Ser. No. 21,804
Int. Cl.[4] A44C 7/00
U.S. Cl. 63—12 3 Claims

1. A construction for adapting a standard pierced-ear earring for attachment to non-pierced ears when the pierced-ear earring is of the kind having a linear post for insertion through an ear lobe, the construction comprising, in combination:
a receptacle for the post, the receptacle being configured as a linear tube having a central linear bore and being adapted at one end to receive the earring post, the receptacle's bore containing an elastic material that compresses upon insertion of the post into the receptacle and retains the post within the receptacle by a friction fit; and
means for clamping the receptacle to an ear lobe the means



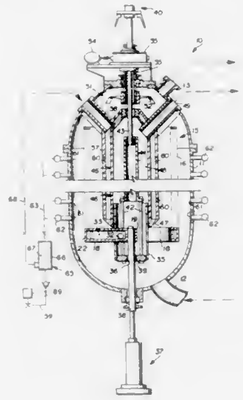
being configured as a spring clip that positions the receptacle parallel to the ear lobe, whereby the earring is attached to an ear without insertion of the post into the ear lobe.

4,840,046
PROCEDURE AND DEVICE FOR ENSURING A PRECISELY POSITIONED INTRODUCTION OF A SUBSTITUTE YARN IN A KNITTING MACHINE
Ernst Goller, Reutlingen, and Fritz Walker, Kusterdingen, both of Fed. Rep. of Germany, assignors to H. Stoll GmbH & Co., Fed. Rep. of Germany
Filed Mar. 31, 1988, Ser. No. 176,198
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1987, 3712264
Int. Cl.[4] D04B 15/54
U.S. Cl. 66—144 16 Claims



4. An apparatus for ensuring a precisely positioned introduction of a substitute yarn on a knitting machine having at least one yarn feeder in the region of the yarn working position, to which the yarn is guided selectively from several yarn storage bobbins through a yarn changing device, characterized in that there is provided on the yarn path between the yarn changing device and the yarn working position a yarn take-up device, means for driving the yarn take-up device independently of the knitting machine drive, and including a yarn collection container between the yarn feeder and the yarn working position, a yarn clamp for clamping the yarn in the yarn collection container and a yarn cutting device for cutting a drawn out length of yarn, and including a control device for controlling operation of the yarn take-up device the yarn collection container, the yarn clamp and the yarn cutting device.

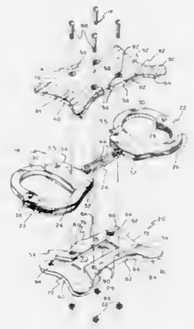
4,840,047
MULTISCREEN PRESSURE DIFFUSER
Johan C. F. C. Richter, Oslo, Norway, and Ole J. Richter, Karlstad, Sweden, assignors to Kamyr AB, Karlstad, Sweden
Continuation-in-part of Ser. No. 125,710, Nov. 27, 1987. This application May 18, 1988, Ser. No. 195,670
Int. Cl.[4] D21C 9/00
U.S. Cl. 68—181 R 19 Claims



1. A pressure diffuser comprising:
(a) a generally vertical pressurizable liquid tight vessel having a slurry inlet adjacent the bottom and a slurry outlet adjacent the top;
(b) at least one ring shaped screen element, providing first and second concentric screen surfaces, mounted generally vertically within said vessel;
(c) a plurality of radially extending header arms mounting said screen element for movement in said vessel, and in fluid communication therewith;
(d) first linear actuator means mounted in vertical alignment with said vessel and operatively connected to said arms for effecting reciprocation thereof;
(e) a cylinder, open at both ends, affixed to said arms and extending above and below them to define a generally vertical pathway;
(f) a piston disposed within said cylinder generally below said arms for reciprocation therewithin;
(g) second linear actuator means disposed in vertical alignment with said vessel;
(h) means for operatively connecting said piston to said second actuator to effect reciprocation of said piston in said cylinder;
(i) a guiding conduit surrounding an open end of said cylinder generally above said arms, for guiding reciprocation of said cylinder with said arms and for transporting liquid from said arms; and
(j) an effluent outlet connected to said guiding conduit for carrying effluent liquid from said guiding conduit to a location remote from said vessel.

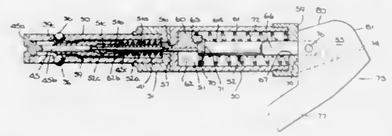
4,840,048
HANDCUFF RESTRAINING APPARATUS AND METHOD OF USE
Dennis C. Elam, 2606 Pawnee No. 8, Garden City, Kans. 67846
Continuation of Ser. No. 898,660, Aug. 21, 1986, abandoned. This application Sep. 9, 1987, Ser. No. 96,270
Int. Cl.[4] E05B 75/00
U.S. Cl. 70—16 15 Claims

1. A handcuff restraining assembly adapted to be used by a law enforcement officer or the like to restrain a suspect, comprising:
(a) a handcuff assembly having a pair of handcuff bracelet members interconnected by a connector member;
(b) said handcuff bracelet members having a clasp pivotally connected to a base member operable to restrain and selectively anchor a suspect's wrist area therein;
(c) a restraining assembly connected about a portion of said



handcuff bracelets and enclose said connector member to provide a rigid, non-moving interconnection between said handcuff bracelet members and said restraining assembly; and
(d) said restraining assembly having a main handle assembly the size and configuration operable to receive the restraining officer's hand thereabout and to provide firm gripping thereof so as to move said handcuff bracelet members in an inclined and twisting manner as required.

4,840,049
PLUNGER LOCK AND KEY
Onofrio N. Russo, Middle Village, N.Y., assignor to Gas Energy, Inc., Brooklyn, N.Y.
Filed Sep. 26, 1986, Ser. No. 911,767
Int. Cl.[4] E05B 67/36
U.S. Cl. 70—34 16 Claims



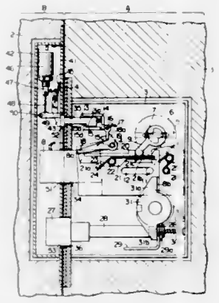
1. An improved plunger lock, comprising:
a housing open at both ends;
a lock operating plunger axially moveable in said housing and biased in a first axial direction therein to locking position, said plunger having an axial bore extending there through said plunger further including tool-engagable means; and
security means fixedly mounted against movement relative to said housing and extending through said bore in said plunger in a second axial direction toward an end of said housing.

4,840,050

LOCK DEVICE WITH TRIGGER BOLT

Motobiro Gotanda, 1802-10, Nakabiyo, Abiko-shi, Chiba-ken, Japan

Filed Apr. 10, 1987, Ser. No. 36,615
Claims priority, application Japan, Apr. 14, 1986, 61-84350
Int. Cl.[4] E05B *63/14*
U.S. Cl. 70—107 17 Claims



1. A locking device for locking a door in a door frame comprising a locking portion on said door and a fixing portion on said door frame, said locking portion comprising a rotation lever means rotatably mounted on said door, a dead bolt moveable in said door between a locked and an unlocked position, said rotation lever means being engageable with said dead bolt to move said dead bolt from its locked to its unlocked position, a rotating plate means rotatably mounted on said door and rotatable in one direction to engage and move said dead bolt from its locked to its unlocked position, a latch means moveably mounted on said door between a latched and an unlatched position, said rotating plate means being engageable with said latch means to move said latch means from said latched to said unlatched position, a trigger bolt means mounted on said door for movement between a trigger-locked and a trigger-released position, said trigger bolt means in said trigger-locked position locking said dead bolt in its locked position, said trigger bolt means in said trigger-release position releasing said dead bolt so that said dead bolt is moveable from its locked to its unlocked position, said fixing portion comprising a pressing-operable means mounted on said door frame and moveable between an engaged position and a released position, said pressing-operable means when in said engaged position and with the door closed being engageable with said trigger bolt means to maintain said trigger bolt means in said trigger-locked position, said pressing-operable means when in said released position and with the door closed being operable to release said trigger bolt means to its trigger-release position so that the door can be opened.

4,840,051

STEEL ROLLING USING OPTIMIZED ROLLING SCHEDULE

Francisco Boratto, Westmount; Stephen Yue, Montreal, and John J. Jonas, Westmount, all of Canada, assignors to Ipsco Inc., Canada

Filed Jun. 1, 1987, Ser. No. 55,945
Int. Cl.[4] B21B *1/0*
U.S. Cl. 72—11 14 Claims

1. In the rolling of steel of a known alloy composition in a rolling mill whose operating conditions are known or measurable by a selected number of sequential reduction passes at steadily declining steel temperatures between rolls separated by sequentially diminishing gaps,

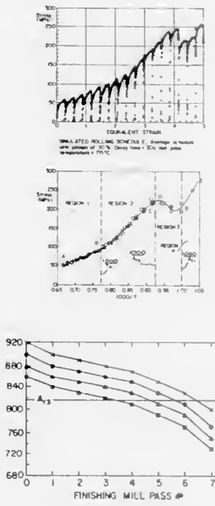
the improvement comprising rolling the steel in accordance with a rolling schedule determined in accordance with the following procedure:

(a) applying to a specimen of the steel a series of thermo-mechanical workings at selected strain levels imparted during selected steel temperatures, and separated by selected rest time intervals, all selected to simulate the sequence of reduction passes of the steel under the conditions encountered in the rolling mill;

(b) comparing stress values obtained from the series of workings with the inverse of the temperatures of the steel at which the respective values were obtained thereby to determine the upper limit of the austenite-ferrite cooling transformation temperature range;

(c) repeating step (a) for a series of specimens of the steel at selected varying starting and terminating temperatures thereby to obtain a series of possible rolling schedule simulations having a varying number of reduction passes in the sequence thereof occurring at steel temperatures below said upper limit;

(d) measuring the value of a selected property at ambient temperature of specimens of the steel each of which has



undergone a discrete one of the rolling schedule simulations; and

(e) selecting from the rolling mill analogue of possible rolling schedule simulations at least one predetermined rolling schedule which will predictably impart to the steel a value of said selected property falling within a predetermined range.

10. In the rolling of microalloyed steel of a known alloy composition in a rolling mill whose operating conditions are known or measurable by a selected number of sequential reduction passes at steadily declining steel temperatures between rolls separated by sequentially diminishing gaps, and wherein the upper limit of the austensite-ferrite cooling transformation temperature range is sufficiently accurately known or estimated,

the improvement comprising rolling the steel in accordance with a rolling schedule determined in accordance with the following procedure:

(a) applying multiple linear regression analysis to rolling mill data obtained from the measurement of selected parameters including at least steel temperature at the final reduction pass, time elapsed and total strain between the reaching of the said upper limit and the final pass, carbon content of the steel, thereby to derive a linear relationship therebetween and a selected property of the steel; and

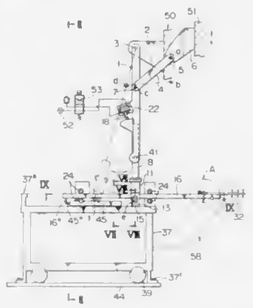
(b) selecting a set of values for controllable parameters in said linear relationship to derive at least one predetermined rolling schedule which will predictably impart to the steel a value of said selected property falling within a predetermined range.

4,840,052

MOBILE NOZZLE DEVICE FOR DIE LUBRICATING

Yasuhira Takata, Niihama, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Dec. 21, 1988, Ser. No. 287,961
Claims priority, application Japan, Dec. 30, 1987, 62-200823[U]
Int. Cl.[4] B21C *9/00*
U.S. Cl. 72—45 6 Claims



1. A mobile nozzle device for spraying a lubricant onto surfaces of dies in a forging press when said press is in an open position and said dies are separated, comprising: lever means pivotally connected at an upper end thereof to a frame of said forging press through a pivot shaft, said lever means being connected at an intermediate portion thereof to a press slider of said forging press such as to swing about said pivot shaft in response to the vertical movement of said slider; a guide member secured to a lower end of said lever means and having a guide portion extending in the longitudinal direction of said lever means; a horizontal bar member horizontally movably carried by a truck and carrying a roller positioned for engagement with said guide portion of said guide member; and a mobile nozzle mounted on an end of said horizontal bar member; whereby said horizontal bar member is moved horizontally to position said mobile nozzle into and out of a space between the seperated dies of said forging press by the engagement of said roller with said guide portion of said guide member, in response to vertical movement of said press slider.

4,840,053

METHOD FOR MANUFACTURING A PIPE WITH PROJECTIONS

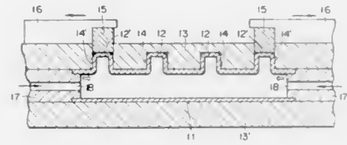
Masanobu Nakamura, Kamakura, Japan, assignor to Mitsui & Co., Ltd., Tokyo and Kokan Kako Co., Ltd., Yokohama, both of, Japan

Filed Dec. 30, 1987, Ser. No. 139,811
Claims priority, application Japan, Jul. 29, 1987, 62-189384; Aug. 17, 1987, 62-203841
Int. Cl.[4] B21D *26/02*
U.S. Cl. 72—58 11 Claims

1. A method for manufacturing a pipe with projections using an apparatus which includes a bulge mold having at least one fixed space at an axially middle position and having variable spaces at the sides of the at least one fixed space, detachable members detachably mounted in the variable spaces to fully occupy the variable spaces, and holding members which press a pipe member inside the bulge mold from both ends, said method comprising the steps of:

housing the pipe member in the bulge mold, with the detachable members being mounted in the variable spaces;

holding tightly the pipe member with the bulge mode;



introducing pressurized fluid into the pipe member and using the holding members to apply pressure on the pipe member toward the center thereof to bulge an intermediate portion thereof to form at least one projection;

removing the detachable members from the variable spaces after the at least one projection is formed; and

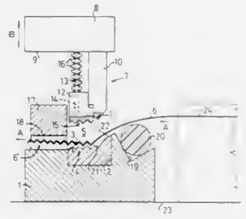
introducing pressurized fluid into the pipe member and using the holding members to apply pressure on the pipe member toward center thereof to form bulged portions at positions closer to the ends of the pipe member.

4,840,054

ARRANGEMENT FOR PROFILING FORWARDLY INDEXED MATERIAL WEBS

Börje Sjögren, Huddinge, Sweden, assignor to Nordisk Kartro AB, Farsta, Sweden

PCT No. PCT/SE87/00491, § 371 Date Jun. 8, 1988, § 102(e) Date Jun. 8, 1988, PCT Pub. No. WO88/03067, PCT Pub. Date May 5, 1988
PCT Filed Oct. 23, 1987, Ser. No. 205,397
Claims priority, application Sweden, Oct. 24, 1986, 8604557
Int. Cl.[4] B21D *13/02*
U.S. Cl. 72—382 6 Claims



1. An arrangement for profiling a forwardly indexed material web (6), and more specifically for forming mutually parallel, transverse undulations in a sheet-metal web, which is preferably of uniform width and which is indexed forwardly through a forming space (5) provided in the arrangement, characterized in that the forming space (5) is located between a lower bed (1), which carries thereon a die (3) having an upwardly turned forming surface (4,21) comprising a forming location (21), and a holding device (8) located above the forming space and which carries a punch mechanism (7) driven reciprocatingly towards and away from the die (3) and which is arranged to be brought into forming or shaping impact with the web (6) and the forming surface (421) of the die; an inclined ramp surface (22) arranged adjacent said forming location to

guide the material web obliquely downwards towards the forming location (21) on the forming surface of the die; and a resiliently yieldable web-support body (20) mounted in the proximity of the ramp surface for yielding resiliently in a direction transversely to the plane of the ramp surface when the web is stretched over the body as a result of forces exerted by the punch mechanism (7) on the web (6) during a profiling operation.

4,840,055

DRAWING APPARATUS IN A PRESS

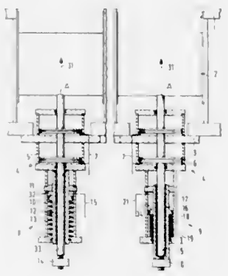
Wolfgang Michael, Goeppingen, and Martin Kaletka, Boll, both of Fed. Rep. of Germany, assignors to L. Schuler GmbH, Goeppingen, Fed. Rep. of Germany

Filed Jan. 25, 1988, Ser. No. 147,893

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1987, 3702069

Int. Cl.[4] B21D *45/04, 22/20*

U.S. Cl. 72—345 **8 Claims**



1. A drawing apparatus in a press, comprising pressure plate means, which is raised and lowered by draw cushion means driven by an operating pressure media, for the counter-holding of a sheet metal draw part during the drawing operation in an active direction and for the ejection of the sheet metal draw part, at least one blocking means for delaying the upward movement of the pressure plate means to the upward movement of a press ram including pressure cylinder means and pressure piston means with an active surface coordinated with a pressure space and adapted to be acted upon by a hydraulic liquid from a pressure line in a direction opposite the active direction of the counter-holding during the drawing operation, piston rod pivotably connected with the pressure plate means, the pressure piston means being displaceably supported on the piston rod, the piston rod, protruding out of the side opposite the active surface of the pressure piston means and including thereat an abutment, and the side of the pressure piston means opposite the active surface being continuously acted upon by pressure so that the pressure piston means will move away from the abutment when the active surface of the pressure piston means is not acted upon with a pressure and the pressure piston means is placed against the abutment when the active surface of the pressure piston means is acted upon with the pressure of a hydraulic liquid from the pressure line.

4,840,056

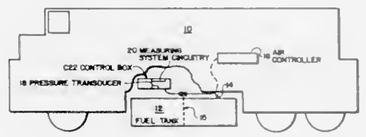
FUEL MEASURING SYSTEM

Emilio A. Fernandez, Fairfax County, Va.; Angel P. Bezos, Montgomery County, and Charles H. Kimball, Carroll County, both of Md., assignors to Pulse Electronics, Inc., Rockville, Md.

Filed Dec. 11, 1987, Ser. No. 131,639

Int. Cl.[4] G01F *23/18, 23/14, 25/00*

U.S. Cl. 73—1 H **12 Claims**



1. A fuel measuring system of the bubble type comprising:

at least first and second bubbling tank tubes mounted at predetermined locations in a tank containing a liquid;

means for passing a predetermined constant volume of air through each of said bubbling tank tubes;

means for periodically measuring the pressure of the air supplied to each of said bubbling tank tubes and generating pressure data corresponding to the measured pressures for each of said bubbling tank tubes;

microprocessor means receiving said pressure data and programmed to compute a normalized pressure value for each of said bubbling tank tubes, averaging said normalized pressure values and then, using the averaged normalized pressure value, deriving the instantaneous volume of fuel in the tank; and

display means responsive to said microprocessor means for displaying the amount of fuel in the tank.

4,840,057

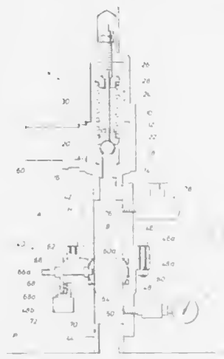
METHOD AND APPARATUS FOR TESTING RELIEF VALVE

George H. Bingham, P.O. Box 10706, Bakersfield, Calif. 93309

Filed Feb. 19, 1988, Ser. No. 157,593

Int. Cl.[4] G01M *19/00*

U.S. Cl. 73—4 R **5 Claims**



1. Apparatus adapted for testing of a pressure safety valve while enabling the pressure safety valve to remain operational, including;

a housing having an internal flow passage formed therethrough;

means for connecting said housing with a contained source of operating fluid under pressure to communicate said operating fluid into said internal flow passage;

means for connecting said housing with the pressure safety valve to communicate the operating fluid to the inlet of the pressure safety valve;

valve means mounted with said housing for controlling communication through said flow passage, said valve means movable between an open position providing substantially unrestricted communication through said flow passage and a closed position for substantially blocking communication through said flow passage;

actuator means mounted with said housing for manually moving said valve means to and from the open and closed position from exteriorly of said housing;

said actuator means having means for enabling locking of said actuator means with said housing to prevent undesired movement of said valve means from the open position.

4,840,058

METHOD OF LEAK TESTING A CAVITY

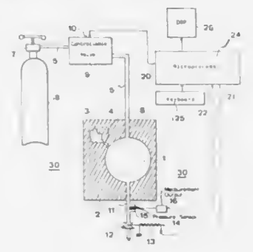
Elie Cohen, Paris, France, assignor to Societe De Traitement Automatique - Control et Etancheite, Fresnes, France

Filed Apr. 1, 1988, Ser. No. 176,548

Claims priority, application France, Apr. 2, 1987, 87 04608

Int. Cl.[4] G01M *3/26*

U.S. Cl. 73—40 **5 Claims**



1. A method of leak testing at least one "main" cavity formed in a body, the method consisting in filling said main cavity with a test gas at a determined pressure, in measuring the leakage pressure variation in said main cavity while reducing the pressure inside said main cavity in steps (dp_n) by means of a controllable valve, and in comparing the various values of leakage pressure variation, with equal values being representative of a part that may be leaky, and with values that becomne smaller from one measurement to another being representative of the presence of at least one secondary cavity communicating with said main cavity via a seepage path having high head loss, said two cavities taken together being possibly non-leaky.

4,840,059

METHOD FOR ADJUSTING FUEL INJECTION QUANTITY OF ELECTROMAGNETIC FUEL INJECTOR

Tatsuo Okada, Okazaki; Sadao Sumiya, Takahama, and Masakimi Nakano, Nishio, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 20, 1988, Ser. No. 222,083

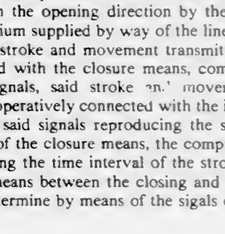
Claims priority, application Japan, Jul. 21, 1987, 62-180062

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—119 A **5 Claims**

1. A method for adjusting the fuel injection quantity of an electromagnetic fuel injector composed of a needle valve reciprocally accommodated in a valve body for opening and closing a nozzle hole, and an electromagnetic actuator for reciprocally moving said needle valve, said electromagnetic actuator having a movable core which moves with said needle valve, and a fixed iron core for attracting said movable core to move said needle valve to its open position, an adjust pipe being provided within a through hole formed in said fixed iron core, and a spring being interposed between a tip end portion of said adjust pipe and said movable core for continuously biasing said needle valve to its closed position, comprising the steps of:

inserting said adjust pipe into said through hole of said fixed iron core by a predetermined length and temporarily fixing said adjust pipe to said fixed iron core so as not to be



moved by a force received from said spring when said needle valve is operated and so as to start moving when a force larger than said force of said spring is applied;

reciprocating said needle valve with said adjust pipe temporarily fixed to said fixed iron core for a predetermined period of time for running in said electromagnetic fuel injector;

finely adjusting the position of said adjust pipe while checking actual fuel injection quantity; and

unmovably fixing said adjust pipe to said through hole of said fixed iron core by caulking an outer peripheral portion of said fixed iron core at such a position that said injector injects a desired fuel injection quantity.

4,840,060

ARRANGEMENT FOR THE DETERMINATION OF THE INJECTION PROGRESS IN AN INTERNAL COMBUSTION ENGINE

Wolfgang Notz, Puchheim; Volker Schwarz, Weinstadt, and Ulrich Augustin, Kernen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 11, 1988, Ser. No. 167,111

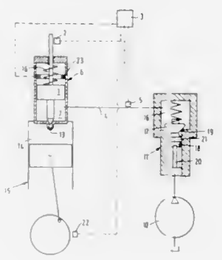
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1987, 3707927

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—119 A **26 Claims**

1. An arrangement for determining the injection course in an internal combustion engine, comprising injection pump means, injection valve means connected with the injection pump means by way of a line means, the injection valve means including an injection nozzle means operable to be closed by a closure means which is displaceably arranged in the manner of a piston in an antespace connected with the line means and is acted upon in the opening direction by the pressure of the injection medium supplied by way of the line means against a return force, stroke and movement transmitter means operatively coupled with the closure means, computer means for processing signals, said stroke and movement transmitter means being operatively connected with the input of the computer means, said signals reproducing the stroke movement and position of the closure means, the computer means being operable during the time interval of the stroke movement of the closure means between the closing and opening position thereof to determine by means of the sigals of the stroke and

movement transmitter means the velocity and acceleration of the closure means and therefrom the pressure in the antechamber as well as the volumetric flow leaving the nozzle means, respectively, the discharge quantity according to the following equations:



$$p_D \cdot A = m \cdot d^2h/dt^2 + R \cdot dh/dt + K \cdot h + F_1 + F_2 \quad (I)$$

$$dQ/dt = f(h,X)\sqrt{(p_D - p_G)\,2/\rho} \quad (II)$$

$$Q = \int dQ/dt \quad (III)$$

whereby

p_D=pressure in the nozzle antechamber,

p_G=pressure in the combustion space, respectively, on the outlet side of the nozzle,

A=cross section of the closure element acted upon by the pressure p_D in the opening direction,

m=mass of the closure element,

h=stroke of the closure element,

t=time,

R=damping, respectively, friction coefficient of the stroke movement of the closure element,

K=spring constant of the return force,

F_1=prestress of the return force,

F_2=friction coefficient,

Q=quantity of the injection medium leaving the nozzle,

ρ=density of the injection medium,

f(h,X)=a predetermined function, dependent on the stroke (h) of the closure element and on the pressure factor X, and

$X=(p_D-p_G)/p_G$=dimensionless pressure factor.

4,840,061

METHOD OF DETECTING A FLUID INFLUX WHICH COULD LEAD TO A BLOW-OUT DURING THE DRILLING OF A BOREHOLE

Bertrand Peltier, Cambridge, Great Britain, assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Jul. 8, 1988, Ser. No. 216,579

Claims priority, application France, Jul. 15, 1987, 87 09963

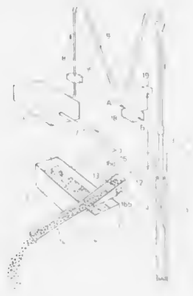
Int. Cl.[4] E21B 47/00

U.S. Cl. 73—155 **7 Claims**

1. A method of detecting a fluid influx in a well being drilled, such as an oil well, said fluid influx possibly resulting in a blow-out, the detection being based on the difference between the inlet (A) and outlet (B) flowrates of the drilling mud injected into the well, said method comprising the steps of measuring the inlet rate A and the outlet rate B of the drilling mud and forming the quantity:

$$C = a.B - A$$

where a is a scale factor the value of which may be altered in order to produce a recalibration of the outlet flow rate measurement; effecting this recalibration whenever the average value of quantity C, in relation to the period of time involved, identifies a significant difference between the inlet and outlet flowrates; and setting off an alarm when, over a fixed period of



time, a certain predetermined number of consecutive recalibrations corresponding to an outlet flowrate which exceeds the inlet flowrate takes place, each of them corresponding to an increase in the average value of quantity C.

4,840,062

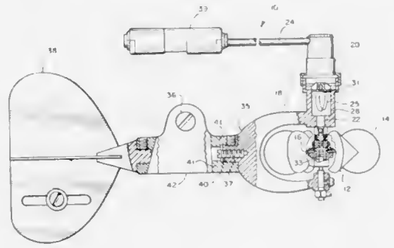
FIBER OPTIC CURRENT METER WITH PLASTIC BUCKET WHEEL

James C. Futrell, II, Picayune, Miss., assignor to The United States of America as represented by the Secretary of Interior, Washington, D.C.

Filed Sep. 10, 1987, Ser. No. 94,975

Int. Cl.[4] G01D 21/00

U.S. Cl. 73—170 A **7 Claims**



1. A current meter for measuring velocity of a moving fluid, said current meter comprising:

a one-piece plastic bucket wheel assembly comprising a plurality of cups connected to and formed integrally with a central ring mounted for rotation on a rotatable shaft, said cups being disposed in spaced relation around the periphery of the ring and said bucket wheel assembly being capable of rotating in response to fluid movement;

means for suspending said bucket wheel assembly in a moving fluid so that said bucket wheel assembly rotates in response to fluid movement; and

a signal generating means, including a fiber optic cable means connected to said rotatable shaft upon which said bucket wheel assembly is mounted and disposed so as to create a light path which is broken during the rotational movement of said bucket wheel assembly, for generating a signal proportional to the velocity of the moving fluid.

4,840,063

FAIL SAFE VALVE FOR AN AIR INLEAKAGE MONITORING SYSTEM IN A STEAM TURBINE

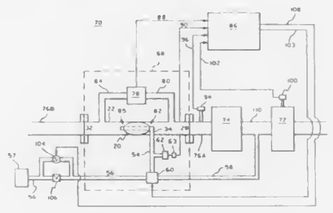
Michael Twerdochlib, Oviedo, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 49,493, May 14, 1987, Pat. No. 4,787,408.

This application Aug. 17, 1988, Ser. No. 232,983

Int. Cl.[4] G01F 5/00

U.S. Cl. 73—203 **9 Claims**



1. A fail-safe bypass monitor for measuring the volumetric flow rate of normally low pressure air inleakage evacuated from a steam turbine condenser and exhausted through a segment of vent pipe, comprising:

(a) bypass flowmeter means, positioned between the condenser and the vent pipe segment to receive air from the condenser and to exhaust air through the vent pipe segment, for providing a first signal indicative of volumetric air flow rate from the condenser;

(b) a tube having a first end for receiving air flow from the condenser and a second end connected to the vent pipe segment;

(c) an inflatable bladder positioned within said tube for sealing off relatively low pressure air flow through the vent pipe segment to divert the air flow to said flowmeter means and for permitting relatively high pressure air flow through the vent pipe segment when air pressure between the condenser and said inflatable bladder exceeds a preselected value;

(d) means for providing a second signal when air pressure between the condenser and said inflatable bladder exceeds the preselected value;

(e) mechanical means for inflating and deflating said bladder; and

(f) control means responsive to the first and second signals for controlling said mechanical means.

4,840,064

LIQUID VOLUME MONITORING APPARATUS AND METHOD

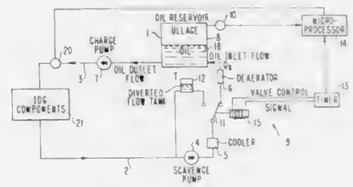
Efrem V. Fudim, Milwaukee, Wis., assignor to Sundstrand Corp., Rockford, Ill.

Filed Mar. 15, 1988, Ser. No. 168,477

Int. Cl.[4] G01F 23/14

U.S. Cl. 73—290 B **20 Claims**

1. An apparatus for determining the volume of liquid in a container which is being provided with an in flow of liquid and an out flow of liquid such that there normally remains an ullage volume in the container which is filled with gas comprising means for interrupting one of the flows of liquid, means for detecting the pressure of the gas in the ullage volume of the container during an interruption of said one of the flows of liquid, and means for calculating the volume of liquid in said container from a change in the pressure of the gas in the ullage



volume of said container during an interruption of said one of the flows of liquid.

4,840,065

DRIED LOAD DETECTOR FOR DRY-CLEANING MACHINES

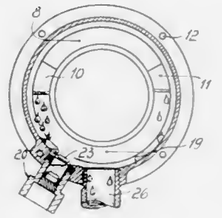
Tommaso Arbizzani, Pontecchio Marconi, Italy, assignor to Sodibo S.p.A., Bologna, Italy

Filed Sep. 21, 1987, Ser. No. 99,357

Claims priority, application Italy, Sep. 30, 1986, 3529 A/86

Int. Cl.[4] G01F 23/24

U.S. Cl. 73—295 **6 Claims**



1. Dried load detector for dry-cleaning machines comprising a case arranged on a duct connecting a vapor condensing assembly to a separator, said vapor being essentially composed of water and a solvent, said case comprising an inlet conduit and an outlet conduit and defining at least one inlet chamber and one outlet chamber separated by a partition, said partition comprising a solvent aperture and a water aperture located at different heights and connecting said inlet chamber to said outlet conduit, a solvent level detector being provided between said solvent aperture and said outlet conduit whereby a load dryness is detected as a function of the solvent level.

4,840,066

ULTRASONIC THICKNESS GAUGE HAVING AUTOMATIC TRANSDUCER RECOGNITION AND PARAMETER OPTIMIZATION AND METHOD THEREOF

Ronald J. Botsco, Huntingtoo Beach; Robert L. Jones, Anaheim, and David E. Methe, Lake Forest, all of Calif., assignors to NDT Instruments, Inc., Huntington Beach, Calif.

Filed Jun. 27, 1988, Ser. No. 211,791

Int. Cl.[4] G01N 29/00

U.S. Cl. 73—597 **3 Claims**

1. In an ultrasonic thickness gauge of the type having a transducer to contact a workpiece, a pulser to transmit an ultrasonic pulse into the workpiece through the transducer, a receiver for receiving an echo of the transmitted pulse, a logic circuit for calculating the time elapsed between the transmitted

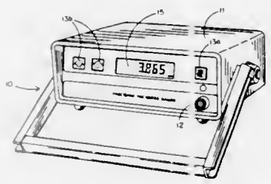
and received pulses for measuring the thickness of the workpiece and a display for displaying measured thicknesses; the improvement comprising:

means in said transducer for identifying the type of transducer;

means in said gauge for automatically recognizing said transducer type identifying means;

means in said gauge, responsive to said recognizing means, for automatically setting gauge parameters in accordance with the recognized transducer type;

wherein said transducer type identifying means comprises an electrical component in the electrical circuit of said transducer:



wherein said recognizing means comprises a current source for applying electrical current to said component and means for measuring the voltage differential across said component induced by said current;

wherein said measuring means comprises an analog-to-digital converter;

wherein said setting means comprises a memory device having stored therein a plurality of parameter sets, each such set corresponding to an output of said analog-to-digital converter, said setting means further comprising means for controlling said gauge in accordance with said parameter sets; and

wherein at least one parameter in said parameter sets comprises the position of a decimal point in said display.

4,840,067

SEMICONDUCTOR PRESSURE SENSOR WITH METHOD DIAPHRAGM

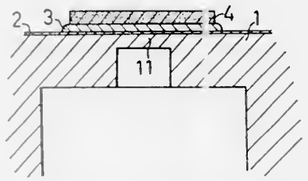
Minoru Nishida, Okazaki; Naohito Mizuno, Nishio; Tadashi Hattori, Okazaki; Seizi Huzino, Anjo, and Yoshiyasu Ando, Nishio, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 15, 1987, Ser. No. 50,031

Claims priority, application Japan, Jun. 13, 1986, 61-138731

Int. Cl.[4] G01L 9/04

U.S. Cl. 73—726 8 Claims



1. A semiconductor pressure sensor comprising:

a metal diaphragm having a surface roughness of 0.5 μm to 3 μm and which deforms in proportion to a change in an applied pressure;

a metal oxide layer formed in a surface of said metal diaphragm;

a glass layer formed on said metal oxide layer; and

a semiconductor chip having a strain gauge which produces output signals responsive to the deformation of said metal diaphragm, said semiconductor chip being bonded to said glass layers.

5. A semiconductor pressure sensor comprising:

a metal diaphragm which deforms in proportion to a change in an applied pressure;

a metal oxide layer formed in a surface of said metal diaphragm;

a glass layer formed on said metal oxide layer, said glass layer being made of a low melting point glass having a thickness of about 40 μm to 60 μm, and a filler of said glass layer having an average particle diameter of about 2.0 μm and a maximum particle diameter of about 20 μm; and

a semiconductor chip having a strain gauge which produces output signals responsive to the deformation of said metal diaphragm, said semiconductor chip being bonded to said glass layer.

4,840,068

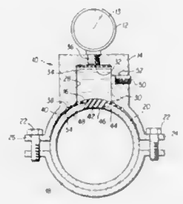
PIPE PRESSURE SENSOR

John D. Mayhew, Jr., 6831 Campbell Dr., Salem, Va. 24153

Filed Mar. 14, 1988, Ser. No. 168,077

Int. Cl.[4] G01L 7/08

U.S. Cl. 73—730 4 Claims



1. A pressure sensor to be mounted on a pipe having a hole therein for measuring the pressure of fluid in the pipe comprising:

a chamber holder for defining a hollow chamber having a pressure inlet opening and a pressure outlet opening;

a pressure gauge attached to said chamber holder and communicating with said hollow chamber through said pressure outlet for measuring the pressure of a fluid in said hollow chamber;

a fluid in said chamber;

a mounting means for engaging a pipe and said chamber holder and mounting said chamber holder on said pipe by urging the pressure-inlet opening of said chamber holder toward said pipe;

a diaphragm comprising a wide flat flange means and a narrower, round, sensing protrusion with a sensing tip on the outer end thereof extending outwardly from one side of the diaphragm, said flange means having the function of being positioned between said chamber holder and an outer surface of said pipe to form a sealed interface between a portion of said chamber holder surrounding said pressure-inlet opening and said pipe, said protrusion extending through said hole in said pipe so as to communicate pressure of fluid in the pipe to the fluid in the chamber via the diaphragm, said sensing protrusion having a length such that when the pressure sensor is mounted on said pipe the sensing tip of said sensing protrusion is positioned approximately at an inner surface of said pipe and a diameter which is approximately the same as the diameter of said hole;

whereby a hole can be bored in said pipe having a diameter of approximately the diameter of said round sensing protrusion, said pressure sensor can be mounted at said hole with said sensing protrusion extending therethrough so that pressure of fluid in said pipe is transmitted to said pressure gauge via said sensing protrusion.

4,840,069

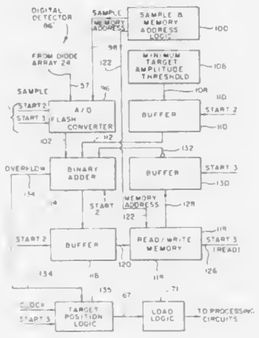
ELECTRO-OPTIC SPACE POSITIONER WITH BACKGROUND COMPENSATOR

Herbert R. Hampton, Hauppauge; Robert Fodale, Massapequa, and Charles R. Conkling, Jr., Shoreham, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation of Ser. No. 903,366, Sep. 3, 1986, abandoned. This application Apr. 18, 1988, Ser. No. 183,421

Int. Cl.[4] G01M 5/00

U.S. Cl. 73—802 2 Claims



1. An apparatus for analyzing aircraft wing movement under load, the apparatus comprising:

a plurality of light sources located on an aircraft wing which moves relative to a fuselage;

a diode array mounted on the aircraft fuselage for sensing light from the sources as well as background, and converting sensed light to analog signals corresponding to wing displacement;

analog/digital converting means connected to the diode array output for converting the analog signals to corresponding digital signals after elimination of residual charge in the diode array;

means for storing the digital signals derived from background light alone;

means connected to the output of the storing means for subtracting the digital signals during the two time periods -

(a) non-energization of the light sources when only background light is present,

(b) energization of the light sources when the background light is also present;

whereby the effects of background light are eliminated thereby correlating an output from the diode array solely to the light sources on the wing;

an overflow output of the subtracting means for carrying data representing the location of a sensed light source exceeding a threshold and located relative to a reference point; and

means having an input connected to the overflow output for gating overflow data with a system clock, the latter clock providing system timing for the light sources and the light-sensing array.

4,840,070

LAMINATE COMPRESSION TESTER

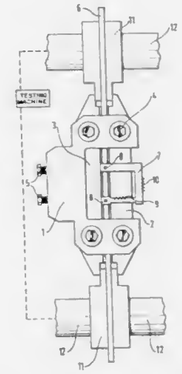
Colin A. Ralfs, and Anthony Murdock, both of Preston, United Kingdom, assignors to British Aerospace Public Limited Company, Preston, England

Filed Oct. 20, 1987, Ser. No. 110,310

Claims priority, application United Kingdom, Oct. 21, 1986, 8625204

Int. Cl.[4] G01N 3/08

U.S. Cl. 73—818 6 Claims



1. A stabiliser assembly for preventing premature failing of an elongate compression test specimen by buckling including:

a support body defining a passage region through which a test specimen is inserted, said support body comprising two generally parallel spaced U-shaped bracket members, the arms of one bracket member being rigidly interconnected by spacer means to the arms of the other bracket member with the bases of said members lying adjacent each other; and

two generally parallel spaced pairs of stabiliser members carried between the arms of said bracket members, said stabiliser members of each pair being mounted in use one to each side of the inserted specimen, each stabiliser member having a longitudinal edge region which lies adjacent a length of the inserted specimen so that, if initial buckling of the inserted specimen occurs, the edge region is contacted by the inserted specimen and further buckling prevented, each stabiliser member being of a cross-sectional shape such that any buckling loads are resisted, at least one of said stabiliser members being adjustable with reference to the other so that test specimens of different thicknesses can be accommodated.

4,840,071

CONVECTIVE ATTENUATION FLOWMETER

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 71,777, Jul. 10, 1987, and a continuation-in-part of Ser. No. 78,206, Jul. 27, 1987, and a continuation-in-part of Ser. No. 88,571, Aug. 24, 1987. This application Mar. 3, 1988, Ser. No. 163,855

Int. Cl.[4] G01F 1/84

U.S. Cl. 73—861.38 9 Claims

1. An apparatus for measuring mass flow rate comprising in combination:

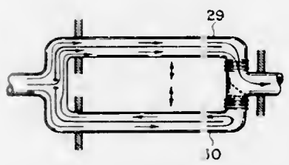
(a) at least one elongated member including at least one flow passage with one extremity secured to a support to restrain lateral movement thereof and the other extremity disposed in a laterally flexible arrangement;

(b) another elongated member including at least two flow passages with one extremity secured to the support to

restrain lateral movement thereof and the other extremity disposed in a laterally flexible arrangement, wherein said two flow passages are connected to one another alowing media to circulate therethrough under zero net flow condition;

(c) means for imposing flexural vibrations on said one and another elongated members;

(d) first means for determining time rate of loss of momentum associated with the flexural vibration of said one elongated member from said one elongated member; and



(e) second means for determining time rate of loss of momentum associated with the flexural vibration of said another elongated member from said another elongated member;

wherein mass flow rate of media moving through said one elongated member is determined from the difference in the time rates of loss of momentum respectively determined by said first and second means for determining the time rate of loss of momentum.

4,840,072

VARIABLE ORIFICE FLOW METER

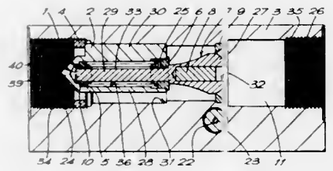
Roy M. Cuthbert, c/o Webtec Products, Ltd., Edison Road, St. Ives, Cambridgeshire, PE17 4LZ, England

Filed Aug. 5, 1987, Ser. No. 81,823

Claims priority, application United Kingdom, Oct. 28, 1986, 8625705

Int. Cl.[4] G01F *1/26*

U.S. Cl. 73—861.58 9 Claims



1. A variable orifice flow meter comprising a body, an inlet in the body, an outlet in the body, a bore in the body extending between the inlet and the outlet and defining a straight flow passage for liquid, a sharp edged orifice in the bore, a piston having a head capable of blocking the orifice. support means for the piston mounted in the bore, the support means having a blind bore in which the piston is slidably mounted and resilient means in the support means and arranged to urge the piston to block the orifice.

4,840,073

TORQUE DETECTING DEVICE

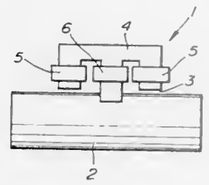
Hiroyuki Aoki, Yokohama; Shinichiro Yahagi, Obbu, and Takanobu Saito, Tohkai, all of Japan, assignors to Nissan Motor Company Ltd. and Daido Tokushuko Kabushiki Kaisha, both of, Japan

Filed Sep. 25, 1987, Ser. No. 101,213

Claims priority, application Japan, Sep. 26, 1986, 61-226062; Dec. 27, 1986, 61-310685

Int. Cl.[4] G01L *3/10*

U.S. Cl. 73—862.36 16 Claims



1. A torque detecting device having a measuring shaft, means for forming a magnetic circuit wherein said measuring shaft is a part of said magnetic circuit, and means for detecting a magnetostrictive force passing through said measuring shaft, wherein said measuring shaft is made from a steel comprised by weight percentage of 0.1-0.5% of C, not more than 1.0% of Si, not more than 2.0% of Mn, and one or both of not more than 5.0% of Ni and not more than 5.0% of Cr, with the remainder being iron and impurities.

4,840,074

MULTI-STREAM FLUID SAMPLING VALVE

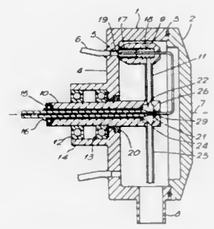
Paul A. Jessop, Northwich, England, assignor to VG Instruments Group Limited, Crawley, England

Filed Mar. 31, 1988, Ser. No. 175,847

Claims priority, application United Kingdom, Apr. 2, 1987, 8707874

Int. Cl.[4] G01N *1/00*

U.S. Cl. 73—864.81 20 Claims



1. A valve for providing a sample from any of a plurality of streams of fluid (,) comprising:

a) movable selecting means for selecting one of said plurality of streams while allowing the unselected ones of said streams to discharge;

b) sample dividing means for dividing the selected one of said streams into a sample flow portion and a purging flow portion;

c) a stationary output member;

d) a transfer member movable with said selecting means and adapted to convey said sample flow portion from said selecting means to said stationary output member;

e) sealing means for connecting said transfer member to said output member and adapted to confine substantially all of said sample flow portion to its interior;

f) a movable seal housing in which said sealing means is disposed and in which is formed a purging chamber adjacent to at least a part of the exterior of said sealing means, and

g) means for passing said purging flow portion through said purging chamber.

4,840,075

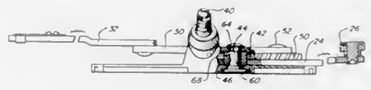
WINDOW OPERATOR

Daniel G. Tucker, Elysian, Minn., assignor to Truth Incorporated, Owatonna, Minn.

Filed May 20, 1988, Ser. No. 196,378

Int. Cl.[4] F16H *29/20*

U.S. Cl. 74—89.14 4 Claims



1. A window operator comprising a base, a pivot pin upstanding from said base, a bushing mounted on said pivot pin, a first member pivotally mounted on said bushing, a second member pivotally mounted on said bushing, said members being superimposed one on the other with the bushing having an end extending thereabove, a metal washer positioned against said bushing end and extending radially therebeyond to have an annular part thereof overlie part of the uppermost member, and said annular part of the washer being deformed downwardly from the plane of the washer a predetermined amount to provide a controlled clearance for the members.

4,840,076

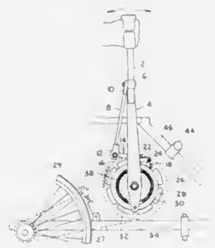
LEVER DRIVE APPARATUS

Clifford E. Brubaker, and Colin A. McLaurin, both of Charlottesville, Va., assignors to The University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Continuation of Ser. No. 877,502, Jun. 23, 1986, abandoned. This application Feb. 22, 1988, Ser. No. 161,384

Int. Cl.[4] F16H *37/02*

U.S. Cl. 74—143 14 Claims



1. Apparatus for propelling a wheeled vehicle, comprising:

a hand-manipulated lever having an upper portion pivotally connected to a lower portion,

a clutch assembly comprising drum means rotatably connected to the vehicle, brake band means pivotally connected at a lower end to the lower portion of the lever and overlying a circumferential edge of the drum, the brake band means and drum comprising a clutch operable by frictional engagement between the brake band means and the drum,

linkage means connected to an upper end of the brake band means, and

actuator means, connected at one end to the upper portion of the lever and at other end to the linkage means, for actuating the clutch through the linkage means.

4,840,077

BALL SCREW APPARATUS

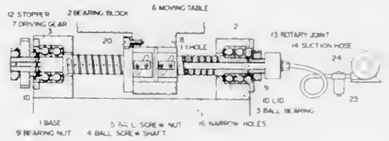
Masayuki Katahira, Maebashi, Japan, assignor to Nippon Seiko Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1988, Ser. No. 172,226

Claims priority, application Japan, Mar. 25, 1987, 62-43782[U]

Int. Cl.[4] F16H *25/22, 25/24*

U.S. Cl. 74—424.8 NA 7 Claims



1. A ball screw apparatus including a ball screw shaft having a spiral groove on the outer surface thereof, a ball screw nut having a spiral groove on the inner surface thereof opposing the spiral groove of said shaft, and a plurality of balls which are engaged within the spiral grooves of said ball screw nut and of said ball screw shaft wherein said ball screw shaft has an axial hollow portion, and a plurality of smaller holes open on the outer periphery of said screw shaft, said smaller holes being communicated with said axial hollow portion, and air sucking means comprising a suction port connected to the axial hollow portion of said shaft so as to apply a negative pressure to the inside of the axial hollow portion.

4,840,078

STEERING DEVICE FOR VEHICLES

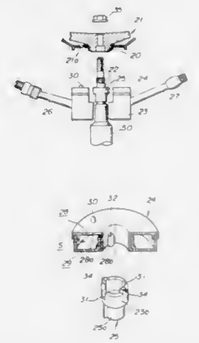
Kazuaki Shitanoki, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1987, Ser. No. 35,350

Claims priority, application Japan, Apr. 7, 1986, 61-51677

Int. Cl.[4] G05G *11/00*

U.S. Cl. 74—484 R 9 Claims



1. A steering device for a vehicle, comprising:

steering column members fixed to a body of the vehicle;

a steering shaft rotatably mounted on the steering column members;

a steering wheel fixedly connected to an upper end of said steering shaft, said steering wheel having a cylindrical boss member provided with first and second engaged means;

a receiving case member disposed coaxially with said steering shaft, said receiving case member being provided with first and third engaging means, and said receiving case member being rotatable together with said steering wheel by an engagement of said first engaging means and said first engaged means of said steering wheel; and

a cancelling cam member disposed coaxially with respect to said steering shaft, said cancelling cam member being provided with a second engaging means that is engageable with said second engaged means formed in said boss member of said steering wheel and with a third engaged means that is engageable with said third engaging means formed in said receiving case member whereby said cancelling cam member is rotatable together with said steering wheel by the engagement between said second engaged means and said second engaging means and the engagement between said third engaged means and said third engaging means.

4,840,079

PUSH-PULL CONTROL, E.G., A HAND THROTTLE OR STOP CONTROL FOR INTERNAL COMBUSTION ENGINES

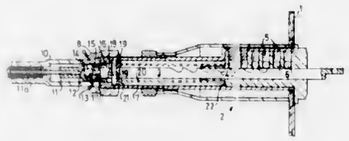
Ingmar Nilsson, Askim, Sweden, assignor to TX Controls AB, Vastra Frolunda, Sweden

Filed Nov. 16, 1987, Ser. No. 121,142

Claims priority, application Sweden, Nov. 18, 1986, 8604929

Int. Cl.⁴ F16C *1/10*

U.S. Cl. 74—500.5 **4 Claims**



1. Control device comprising a housing, a push-pull rod displaceably mounted in the housing and having a longitudinal axis, and a connector element for connecting an operating element to the push-pull rod, the connector element and the push-pull rod having profiled interfitting end portions which can be coupled together by an engagement movement perpendicular to said longitudinal axis, characterized in that the push-pull rod is surrounded by a sleeve element, which is limitedly displaceable relative to the push-pull rod and is springloaded towards an end position, in which the sleeve element engages the connector element and prevents the connector element from moving relative to the push-pull rod in a direction perpendicular to said longitudinal axis.

4,840,080

DRIVING DEVICE EMPLOYED IN A WINDOW REGULATOR

Tetuo Kobayashi, Ikeda, and Shoichi Hirai, Nishinomiya, both of Japan, assignors to Nippon Cable System, Inc., Takarazuka, Japan

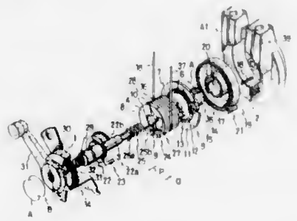
Continuation of Ser. No. 906,360, Sep. 10, 1986, abandoned, which is a continuation of Ser. No. 669,493, Nov. 8, 1984, Pat. No. 4,628,759. This application Apr. 7, 1988, Ser. No. 180,646

Claims priority, application Japan, Feb. 21, 1984, 59-24043; Feb. 21, 1984, 59-32024

The portion of the term of this patent subsequent to Dec. 16, 2003, has been disclaimed.

Int. Cl.⁴ F16C *1/10*

U.S. Cl. 74—501.5 R **6 Claims**



1. A driving device employed in a window regulator comprising:

(a) housing;

(b) a driving member including a shaft provided for rotational movement within said housing and an associating member being fixed to said shaft, said associating member extending from said shaft in the radial direction and having at least one notch portion along a peripheral edge of said associating member;

(c) a drum being provided within said housing, being adjacent to said associating member, being coaxial with said shaft, being rotatable around said shaft, being axially movable along said shaft and having an associating projection, said associating projection being mounted on a first side surface of said drum facing to said associating member, and being capable of associating said notch portion with some play in the rotational direction;

(d) an elastic means for urging said associating member in the rotational direction and for biasing said drum away from said associating member, by engagement of one end of said elastic means with said drum and by engagement of the other end of said elastic means with said associating member; and

(e) a brake spring set between an outer peripheral surface of said associating member and an inner peripheral surface of said housing having ends inserted into gaps between said notch portion and said associating projection.

4,840,081

SPEED-CHANGE OPERATING LEVER FOR A BICYCLE

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Feb. 11, 1988, Ser. No. 155,155

Claims priority, application Japan, Feb. 18, 1987, 62-23314[U]

Int. Cl.⁴ F16C *1/10*; G05G *11/00*

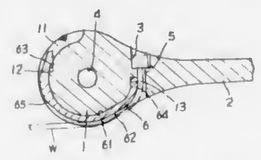
U.S. Cl. 74—502.2 **6 Claims**

1. A speed-change operating lever for a bicycle for operating a derailleur through a control wire interconnecting the derailleur and the operating lever to change the bicycle speed, said lever comprising:

a boss provided with a winding portion for receiving said control wire,

an operating portion in continuation of said boss and extending radially outwardly of said boss, and

a wire retaining portion for retaining an end of said control wire, said winding portion being provided with a winding amount changing means for adjusting an outer diameter of said winding portion with respect to a center of said boss



to change an amount by which said wire is wound at said winding portion, said winding amount changing means comprising a winding adjuster having a substantially circular arc shape and being detachably mounted on said winding portion and having a winding part on its outer side surface on which said wire is wound.

4,840,082

LEVER SYSTEM FOR VEHICLES

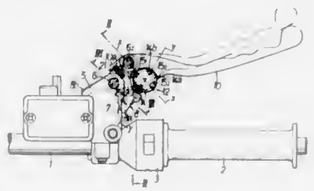
Hideyuki Terashima, and Yasuhiko Tsuchiya, both of Ueda, Japan, assignors to Nissin Kogyo Kabushiki Kaisha, Ueda, Japan

Filed Jun. 2, 1988, Ser. No. 201,239

Claims priority, application Japan, Jun. 5, 1987, 140780; Jun. 5, 1987, 87422[U]

Int. Cl.⁴ G05G *1/04*

U.S. Cl. 74—523 **5 Claims**



1. A lever system for vehicles, comprising an operating element for operating a master cylinder, an operating lever for actuating said operating element, said operating element and said operating lever being mounted on a lever holder attached to a steering handle, and an adjusting means interposed between said operating element and said operating lever for adjusting the distance between said operating lever and said steering handle, wherein said operating element is pivotally supported on said lever holder through a first support shaft, and said operating lever is pivotally supported on said operating element through a second support shaft; wherein said adjusting means comprises an adjusting element rotatably mounted in said operating lever and having a plurality of recesses of different depths made therein, a pin hole made in said operating element, and an urging pin having its one end fitted in said pin hole and having the other end adapted to be selectively engaged in one of said plurality of recesses.

4,840,083

DEVICE FOR DAMPENING ROTARY MOTION

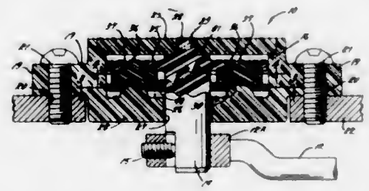
Robert A. Hagan, Roscoe, and Ernest W. Reinwall, McHenry, both of Ill., assignors to Elco Industries, Inc., Rockford, Ill.

Filed Mar. 14, 1988, Ser. No. 167,700

The portion of the term of this patent subsequent to May 30, 2006, has been disclaimed.

Int. Cl.⁴ F16F *15/10*

U.S. Cl. 74—574 **11 Claims**



1. Apparatus for dampening rotation of a first member relative to a second member, said second member comprising a chamber having an axially facing wall, angularly spaced protrusions projecting from said wall and extending axially into said chamber, said first member comprising a rotatable shaft and further comprising a disc joined rigidly to and projecting radially from said shaft and rotatable in said chamber, an elastomeric ring coupled to and rotatable with said disc, said ring being located on one face of said disc and being disposed between said disc and said protrusions, and means pressing said ring toward said protrusions with sufficient force to cause said ring to be resiliently compressed by said protrusions, the compression of said ring creating a force against said protrusions as said ring rotates relative to said protrusions whereby such force dampens rotation of said first member relative to said second member.

4,840,084

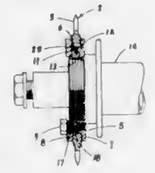
FREEWHEEL MECHANISM FOR BICYCLES

Roger O. Durham, 1370 Thompson Ave., Glendale, Calif. 91201

Filed Dec. 17, 1987, Ser. No. 134,502

Int. Cl.⁴ G05G *1/14*

U.S. Cl. 74—594.1 **5 Claims**



1. In combination with a bicycle having a roller chain and having a rotatable rear wheel including a hub having an externally-threaded shoulder, a freewheel mechanism comprising:

(a) a freewheel body having internal threads for engagement with said threaded shoulder of said hub, said freewheel body including a cylindrical shoulder and a head portion;

(b) a removable side plate secured to said freewheel body;

(c) a sprocket rotatably supported on said cylindrical shoulder of said freewheel body, said sprocket having sprocket teeth for engagement with said roller chain, said sprocket nested for guidance between said head portion of said freewheel body and said removable side plate;

(d) a pawl means and pawl spring means disposed between said sprocket and said freewheel body, said pawl means and said pawl spring means coacting with said sprocket

and said freewheel body, so as to allow said sprocket to turn in only one direction in relation to said freewheel body.

4,840,085

PEDAL FOR A BICYCLE

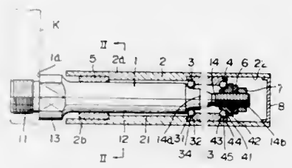
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Continuation of Ser. No. 3,412, Jan. 15, 1987, abandoned. This application Jun. 13, 1988, Ser. No. 206,947

Claims priority, application Japan, Jan. 23, 1986, 61-8290[U]

Int. Cl.⁴ G05G 1/14

U.S. Cl. 74—594.4 **4 Claims**



1. A bicycle pedal to be supported to a crank arm of a bicycle, comprising:

(a) a pedal shaft including a base adapted to be mounted on said crank arm, an utmost end portion, and an intermediate shaft portion between said base and said utmost end portion, said utmost end portion having a smaller diameter than a diameter of said base,

(b) a pedal body suported rotatably relative to said pedal shaft, said pedal body having a first foot bearing surface on one side thereof and a second foot bearing surface at another side thereof which are positioned radially outwardly of said intermediate shaft portion and said outmost end portion,

(c) a ball bearing means for supporting said pedal body rotatably relative to said pedal shaft and comprising a first ball bearing means and a second ball bearing means provided between said pedal body and said utmost end portion at a position located at said utmost end portion spaced from an axial center position of a portion of said pedal shaft which includes said intermediate shaft portion and said utmost end portion, said first ball bearing means and said second ball bearing means being axially spaced apart and located at a position adjacent a longitudinal utmost end portion of said pedal body; and

(d) a bush formed of light metal or synthetic resin and provided between a longitudinal root end portion of said pedal body and said intermediate shaft portion at a side of said intermediate shaft portion adjacent said base, said bush comprising means for enabling said pedal body at a side thereof adjacent said base to be supported through said bush which in turn is supported by said pedal shaft when said pedal body bends radially of said pedal shaft, wherein a gap is defined between said pedal body and said intermediate shaft portion, said gap enabling said pedal body to rotate freely relative to said pedal shaft during use without contacting said pedal shaft when said pedal body bends radially of said pedal shaft responsive to a treading force applied to one of said first foot bearing surface and said second foot bearing surface, said bush having a length such that it does not extend into said gap.

4,840,086

DEVICE FOR FASTENING A SHOE ON A BICYCLE PEDAL

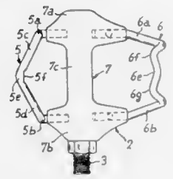
René M. R. Bidal, Labalme Sur Cerdon, France, assignor to Ste Look, Nevers, France

Filed May 13, 1988, Ser. No. 193,722

Claims priority, application France, Jun. 22, 1987, 87 08730

Int. Cl.⁴ G05G 1/14

U.S. Cl. 74—594.6 **8 Claims**



1. A device for fastening a shoe to a bicycle pedal, which comprises in combination:

at least one retaining member attached to the underface of the sole of the shoe, said retaining member being provided with a rear retaining recess which opens rearwardly and with a front retaining recess which opens forwardly,

a bicycle pedal comprising a pedal body having a spindle and carrying a rear anchoring member and a front anchoring member, said anchoring members being adapted for respectively being engaged inside said rear and front retaining recesses of said retaining member attached to the underface of said sole of the shoe,

each of said anchoring members being formed of a length of resilient metal wire,

said metal wire forming the rear anchoring member comprising two horizontal arms joined to one another so as to define between said arms an obtuse angle which faces said pedal,

said metal wire forming said front anchoring member comprising a horizontal transverse arm spaced from and attached to said pedal by two rearwardly extending portions of said metal wire, a slight kink being formed between said rearwardly extending portions in a central portion of said transverse arm,

said kink capable of engaging said front retaining recess of said retaining member atached to the sole of said shoe, while the apex of said obtuse angle of said rear anchoring member is engaged inside said rear retaining recess of said retaining member.

4,840,087

DIFFERENTIAL GEAR ASSEMBLY INCLUDING AT LEAST ONE INTEGRATED CONSTANT VELOCITY UNIVERSAL JOINT

Hans-Heinrich Welschof, Rodenbach, and Rudolf Beier, Offenbach am Main, both of Fed. Rep. of Germany, assignors to Löhr & Bromkamp GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Oct. 7, 1986, Ser. No. 916,304

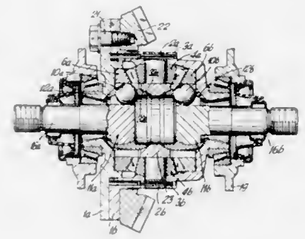
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1985, 3536289

Int. Cl.⁴ F16H 1/40

U.S. Cl. 74—713 **18 Claims**

1. A differential gear assembly comprising: a differential gear housing; differential gear means; at least one constant velocity universal joint integrated within said gear housing, said universal joint including an inner joint member, an outer joint member, ball means joining said inner and outer joint members in torque transmitting engagement and shaft journal means engaging said inner joint member; and means for engaging said outer joint member with said differential gear means; wherein said inner joint member, said ball means and said shaft

journal means of said universal joint positioned inside said housing are provided with at least one sliding face, said one sliding face being supported by one of an inwardly directed support and an outwardly directed support, said inwardly directed support being located axially inwardly in said housing relative to said joint and said outwardly directed support being



on a counter face designed independently of said outer joint member; wherein one of said inner joint member and said shaft journal means is supported in the direction of a center of said differential gear assembly axially on sliding faces of a ring member which is held in a differential carrier and which is independent of said outer joint member.

4,840,088

MECHANICAL TRANSMISSION, PARTICULARLY FOR CABLEWAY WINCHES

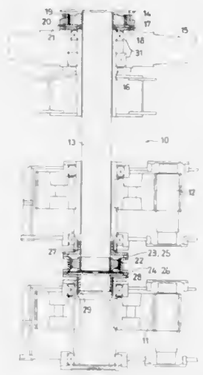
Otto Pabst, Meransen, Italy, assignor to Leitner, S.p.A., Bolzano, Italy

Continuation-in-part of Ser. No. 24,008, Mar. 10, 1987, abandoned. This application Aug. 4, 1988, Ser. No. 229,723

Claims priority, application Italy, Mar. 11, 1986, 21190/86[U]

Int. Cl.⁴ F16H 37/06

U.S. Cl. 74—661 **1 Claim**



1. A mechanical transmission comprising:

(a) a shaft having a first end and a second end;

(b) a first flange mounted on the first end of said shaft;

(c) a first articulated coupling mounted on said shaft adjacent to said first flange, said first coupling having frontal teeth facing away from said first flange;

(d) first means for releasably coupling said first articulated coupling to said first flange;

(e) a pulley mounted on said shaft adjacent to said first articulated coupling, said pulley being mounted for free rotation relative to said shaft;

(f) a second flange mounted on said shaft between said pulley and said first articulated coupling, said second flange having frontal teeth facing said first articulated coupling and sized, shaped, and positioned to engage said teeth on said first articulated coupling;

(g) second means for releasably coupling said second flange to said pulley;

(h) a first speed reduction gear assembly mounted on said shaft adjacent said pulley;

(i) a second speed reduction gear assembly mounted on the second end of said shaft, said second speed reduction gear assembly having a longitudinal seat facing said first speed reduction gear assembly, said longitudinal seat having internal longitudinal splines;

(j) a first sleeve mounted on said shaft and connected to said first speed reduction gear assembly on the side facing said second speed reduction gear assembly, said first sleeve having frontal teeth facing away from said first speed reduction gear assembly;

(k) a second sleeve slidably mounted on said shaft and releasably connected to said second speed reduction gear assembly on the side facing said first speed reduction gear assembly, said second sleeve having frontal teeth facing away from said second speed reduction gear assembly and having external longitudinal splines sized, shaped, and positioned to engage said internal longitudinal splines in said seat;

(l) a second articulated coupling mounted on said shaft between said first and second sleeves, said second articulated coupling having frontal teeth facing said first sleeve and sized, shaped, and positioned to engage said teeth on said first sleeve and frontal teeth facing said second sleeve and sized, shaped, and positioned to engage said teeth on said second sleeve;

(m) third means for releasably connecting said first sleeve to said second articulated coupling;

(n) fourth means for releasably connecting said second sleeve to said second articulated coupling; and

(o) said second sleeve being sized and shaped so that, when it is released from said second articulated coupling, it can slide into said longitudinal seat and out of engagement with said second articulated coupling.

4,840,089

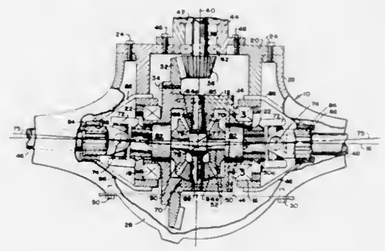
AXLE-CONTROLLED, POSITIVE DIFFERENTIAL

Archie O. Williamson, Edina, Minn., assignor to Williamson Patent Holding Company, Edina, Minn.

Filed May 16, 1988, Ser. No. 194,446

Int. Cl.⁴ F16H 1/44

U.S. Cl. 74—690 **29 Claims**



25. A positive differential, comprising:

a case supported for rotation about a transverse axis;

drive means for effecting rotation of said case;

a pair of rotatable bevels positioned within said case;

control means for supporting said bevels in spaced-apart,

opposing predetermined angled relation in said case for separate rotation about offset axes extending through points positioned predetermined equal distances laterally outward along the transverse axis toward the respective output shafts and through a common focal point positioned a predetermined distance off the transverse axis, as well as for common rotation about the transverse axis, but while constraining said bevels against uncontrolled revolution about the transverse axis relative to said case, so that spacing between said bevels varies between a predetermined minimum and a predetermined maximum in accordance with circumferential position;

a universal joint coupled between each bevel and a corresponding output shaft;

means for rotatably supporting each universal joint in fixed position relative to said case; and

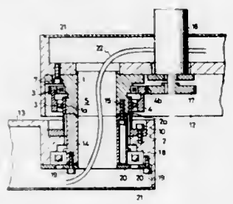
a first pinion rotatably supported on said case and engaged between said bevels at the maximum spacing therebetween so that said pinion permits relative rotation of said bevels for differential drive.

4,840,090

HARMONIC SPEED CHANGER

Masanari Iwata, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Aichi, Japan

Filed Jan. 19, 1988, Ser. No. 145,088
Claims priority, application Japan, Jan. 19, 1987, 62-9256
Int. Cl.[4] F16H *37/00*
U.S. Cl. 74—804 **7 Claims**



1. A harmonic speed changing mechanism arranged in an articulation between a first arm and a second arm of an industrial robot such that the second arm is supported through said harmonic speed changing mechanism swingably by the articulation, said mechanism comprising:

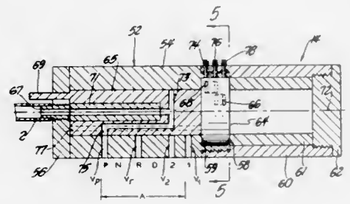
a circular spline fixed to said first arm of said articulation and having a cylindrical outer surface formed with a gear, a flexible spline fixed to said second arm of said articulation and having a cylindrical inner surface formed with a gear, the number of teeth of said gear of said flexible spline being larger than that of said gear of said circular spline, said flexible spline being arranged outside of said circular spline so that said gear of said circular spline can mesh with said gear of said flexible spline, and a wave generator having an inner surface defining an ellipsoidal cross section, said gear of said flexible spline being deformed to an ellipse by said inner surface of said wave generator so that said gear of said flexible spline meshes with said gear of said circular spline partially to thereby rotate said flexible spline and said second arm of said articulation at a predetermined reduction rate when said wave generator is rotated, wherein a through-hole is formed along an axis of said harmonic reduction gear mechanism and wiring and/or piping necessary for said industrial robot is provided in said through-hole.

4,840,091

TRANSMISSION SHIFT MECHANISM

Roger R. Smith, 7261 Lyons Rd., Imlay City, Mich. 48444

Filed Oct. 11, 1988, Ser. No. 255,800
Int. Cl.[4] F16H *5/52;* **B60K** *41/22*
U.S. Cl. 74—867 **17 Claims**



1. A mechanism for selecting the gear of an automatic transmission in a vehicle, comprising:

a pressure source;

a gear selection valve having an inlet means for receiving fluid from the pressure source, first outlet ports, and second outlet ports;

a manual override means for opening and blocking communication between the pressure source and the first ports and for simultaneously opening and blocking communication between the pressure source and the second outlet ports;

a port selector means within the valve for controlling flow through the second ports, the port selector means being movable to a plurality of positions, each position permitting a selected second outlet port to open;

a selector control means for moving the port selector means from one position to another, the selector control means including a planetary gear set connected by an input shaft to the transmission and connected to a vehicle load by an output shaft, the planetary gear set having a ring gear whose angular position is a function of reaction torque imposed by the load on the output shaft, the selector control means further including an arm assembly connected between the ring gear and the port selector means so that the position of the port selector means is a function of the reaction torque on the output shaft.

4,840,092

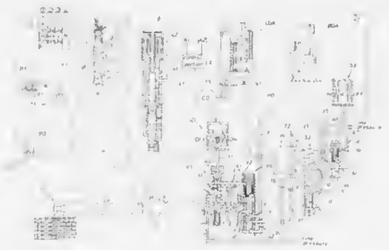
HYDRAULIC CONTROL DEVICE FOR AUTOMATIC TRANSMISSIONS

Yoshikazu Sakaguchi, Anjo; Yutaka Taga, Aichi, and Yuji Kashihara, Toyota, all of Japan, assignors to Aisin-Warner Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Filed Jun. 25, 1987, Ser. No. 67,764
Claims priority, application Japan, Jun. 30, 1986, 61-154834; Jun. 30, 1986, 61-154835
Int. Cl.[4] B60K *41/06*
U.S. Cl. 74—869 **15 Claims**

1. A hydraulic control device for an automatic transmission, including a control unit, a shift gear mechanism, clutches and brakes for controlling the shift gear mechanism, hydraulic servos for actuating the clutches and brakes to control the shift gear mechanism and having hydraulic servo for a forward clutch, and an electronically operated regulating valve for regulating pressure according to signals from the control unit, comprising:

a selecting valve switched by signals indicating stopping and running condition of a vehicle, said selecting valve being connected to the hydraulic servo for the forward clutch for engaging and transmitting torque during the forward running condition, said selecting valve selectively receiving a line pressure and a control pressure from said regulating valve so that hydraulic pressure just below engaging pressure regulated by said regulating valve is applied



to said hydraulic servo for the forward clutch during stopping, and a line pressure is applied to said hydraulic servo for the forward clutch during running.

4,840,093

LID LOOSENER AND TIGHTENER

Leman Goldman, Jr., 2644 Rockafellow Ave., Pennsauken, N.J. 08109

Filed Dec. 16, 1987, Ser. No. 133,651
Int. Cl.[4] B67B *7/18*
U.S. Cl. 81—3.43 **6 Claims**

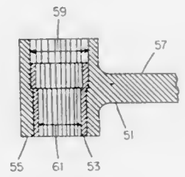
1. A device for loosening and tightening the lids of jars or containers, said device comprising a handle, a flexible strap, a means for attaching said strap to said handle, a means for forming a loop in said strap sized to be placed around said lid, a means for securing said strap to said handle after said strap has been wrapped around said lid, said handle comprising a top and a bottom, said strap comprising a wide section and a narrow section, said means for attaching said strap to said handle comprising tacks wich attach said wide section to said bottom of said handle, said means for forming said loop comprising a brace attached to said handle and a slot positioned in said wide section, and said strap further comprising an unattached end so that said loop may be formed by placing said unattached end through said brace and inserting said unattached end through said slot.

4,840,094

MULTIPLE SOCKET AND MULTIPLE SOCKET WRENCH

Richard J. Macor, 13H Franklin Greens, Somerset, N.J. 08873

Continuation-in-part of Ser. No. 468,779, Feb. 22, 1983, abandoned. This application Dec. 10, 1984, Ser. No. 680,321
Int. Cl.[4] B25B *13/58*
U.S. Cl. 81—185 **30 Claims**



1. A multiple socket device having four different conventional socket sizes about a single axis, comprising:

(a) a first member being an outer member and having a generally hollow, cylindrical configuration about said single axis, said first member having an upper portion and a lower portion, the upper portion having a first inside diameter corresponding to the largest of said four different conventional socket sizes, and the lower portion having a second inside diameter corresponding to the second largest of said four different conventional socket sizes, each of said upper portion and said lower portion having an array of angular longitudinal grooves spaced around its inside surface and extending for the entire length thereof;

(b) a second member being an inner member and having a generally hollow, cylindrical configuration, about said single axis, said second member having an upper portion and a lower portion, the upper portion having an outside diameter substantially equal to the inner diameter of the upper portion of said first member and having an array of angular longitudinal grooves spaced around its outside surface corresponding to those on the inside surface of said upper portion of said first member, said upper portion further having a third inside diameter corresponding to the second smallest of said four different conventional socket sizes and having an array of angular longitudinal grooves spaced around its inside surface and extending for the entire length thereof, the lower portion having an outside diameter substantially equal to the inner diameter of the lower portion of said first member and having an array of angular longitudinal grooves spaced around its outside surface corresponding to those of the inside surface of said lower portion of said first member, said lower portion further having a fourth inside diameter corresponding to the smallest of said four different conventional socket sizes and having an array of angular longitudinal grooves spaced around its inner surface and extending for the entire length thereof, said second member being slidably mounted within said first member along said single axis and being releasably fixed so as to move axially within said first member between two fixed positions without protruding from said first member.

4,840,095

TURNING MACHINE

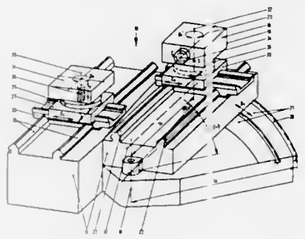
Walter Nussbaumer, and Karl-Heinz Beyrer, both of Ravenburg, Fed. Rep. of Germany, assignors to Maschinenfabrik Ravensburg AG, Ravensburg, Fed. Rep. of Germany

Filed Jun. 9, 1987, Ser. No. 60,076

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1986, 3618938

Int. Cl.[4] B23B *3/00*

U.S. Cl. 82—117 13 Claims



1. A universal turning machine comprising:

a multi-track bed having first tracks and second tracks disposed substantially side-by-side with said first tracks, said multi-track bed comprising a spindle head machine bed having said first tracks thereon, said first tracks extending in a longitudinal direction in a bed plane;

a spindle head having means for mounting a workpiece thereon, including a headstock means and a receiver means, rotatively mounted to said headstock means, for rotatively supporting a workpiece for rotation about a receiver axis, and having a center axis perpendicular to said bed plane, said spindle head being mounted on said first tracks for movement thereon in said longitudinal direction;

indexing control means for controlling the angle of said receiver means about said receiver axis;

an auxiliary machine bed having said second tracks thereon;

a rest for mounting thereon working means which work the workpiece on said spindle head during rotation of the workpiece by said receiver means, said rest being mounted on said second tracks for movement therealong in opposite first directions, said spindle head machine bed and said spindle head therewith being pivotable in said bed plane about at least a swivel axis for adjusting the relative positions of the working means and the workpiece prior to working the workpiece with the working means, said swivel axis being perpendicular to said bed plane and parallel to and spaced from said center axis, said spindle head on said first tracks and said rest on said second tracks being movable past each other respectively in said longitudinal and first directions; and

means for supporting said rest on said second tracks such that said rest is movable in second directions transverse to said first directions, said first and second directions being parallel to said bed plane;

said spindle head being moveable on said first tracks and in pivotal movement with said spindle head machine bed in said bed plane about said swivel axis and said rest being movable in said first and second directions, all during rotation of the workpiece by said receiver means with the working means engaging the workpiece so as to work the workpiece, said spindle head being movable on said first tracks to a position where said swivel axis is spaced from said center axis a distance between approximately 100 cm and approximately 300 cm.

4,840,096

DEVICE FOR MACHINING CHAMFERS ON A FREE OF A PIPE

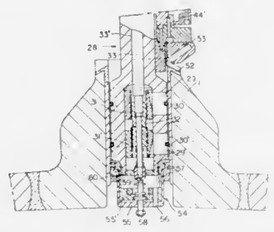
Alain Martin, Lyons, and Philippe Maillard, Marcy l'Etoile, both of France, assignors to Framatome & Cie., Courbevoie, France

Division of Ser. No. 709,270, Mar. 7, 1985. This application Apr. 16, 1987, Ser. No. 39,201

Claims priority, application France, Mar. 8, 1984, 8403581

Int. Cl.[4] B23B *5/16*

U.S. Cl. 82—113 2 Claims



1. Device for machining chamfers on a free end of a pipe having a longitudinal axis of symmetry, said device comprising

(a) a frame having means for centering and fixing it in the interior of said pipe coaxially with said pipe, comprising a stem extending along the axis of symmetry when the frame is fixed in the said pipe and having an end exterior to the pipe;

(b) a support for a chamfering tool mounted concentrically around said frame and movable with respect to said frame along an axis of said frame in translation and about said axis of said frame in rotation;

(c) powered drive means mounted on said frame and engaging said support for causing the translation of said support along said axis of said frame;

(d) powered drive means mounted on said frame and engaging said support for turning said support about said axis of said frame;

(e) means for detecting the position and fixing a convenient position of said frame along an axis of said pipe before a chamfering operation, said means comprising a displacement detector cooperating with the extension endn part of the stem of the frame; and

(f) a displacement detector cooperating with a part of the support of the chamfering tool for detecting the position of said support along said axis of said frame and controlling said drive means for causing the translation of said support and said tool along said axis of said frame.

4,840,097

PORTABLE MITER GUIDE DEVICE FOR PORTABLE POWER SAWS

Erwin D. Campbell, 10 Capewood Dr., #180, Simpsonville, S.C. 29681

Filed Aug. 17, 1987, Ser. No. 85,936

Int. Cl.[4] B26D *1/18*

U.S. Cl. 83—829 20 Claims

1. A portable miter guide device for a portable power saw, comprising:

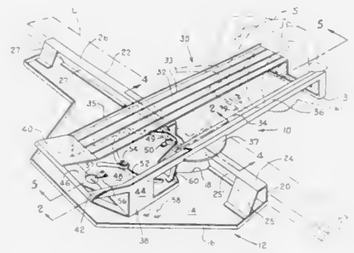
(a) a saw support and guide comprising:

(1) two spaced horizontal elongated members on which a base of said saw is directly supported and guided during saw operation; said horizontal elongated members adapted to extend over the upper surface of lumber to be cut and to guide the blade of said power saw in a straight line between said elongated members;

(2) vertical means for connecting the ends of said horizontal elongated members to maintain the spacing therebetween constant;

(3) a saw support and guide housing having a horizontal support surface spaced from said horizontal elongated members and connected thereto by a plurality of walls extending at an angle from said horizontal elongated members and said horizontal support surface; and

(4) at least one saw lift surface at one end of said horizontal elongated members which extends upwardly from said horizontal elongated members at an angle of less than 90 degrees by which said saw base is directly engaged to lift and guide said power saw out of contact with said support and guide housing during movement of said power saw onto said elongated members for saw operation;



(b) a support base having a horizontal surface for supporting said saw support and guide having spaced vertical surfaces extending at a substantially right angle to the horizontal surface of said base for contact with said lumber;

(c) means for pivotally connecting said saw support and guide housing horizontal support surface to said base horizontal support surfaces for pivotal movement relative thereto; and

(d) means for temporarily locking said horizontal support surfaces in a plurality of angular positions, whereby said elongated members may guide said power saw acros said lumber in one of a plurality of straight line positions at an angle to the side of said lumber.

4,840,098

CUTTING KNIFE FOR ROTARY CUTTING APPARATUS FOR PAPER

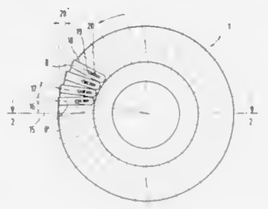
Gunter Gämmerler, Ichoring 44, D-8021 Icking, Fed. Rep. of Germany

Filed May 23, 1988, Ser. No. 197,213

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1987, 3719721

Int. Cl.[4] B26D *1/143*

U.S. Cl. 83—841 8 Claims



1. A cutting knife for a rotary cutting apparatus for paper products, comprising a circular-periphery base body having a cutting plane surface on one side and a truncated cone surface on the opposite side; a plurality of blades respectively mounted on said truncated cone surface, each of said blades being adjustably positionalbe to extend beyond said circular periphery and having a blade face in alignment with said base body cutting plane surface.

4,840,099

ELECTRONIC MUSICAL INSTRUMENT

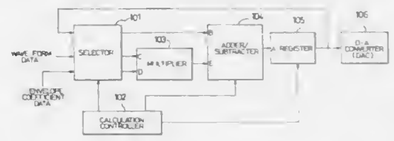
Hiroshi Kitagawa, Shizuoka, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusbo, Japan

Filed Sep. 29, 1987, Ser. No. 102,408

Claims priority, application Japan, Oct. 4, 1986, 61-236862

Int. Cl.[4] G10H *1/00, 1/02, 1/06*

U.S. Cl. 84—1.01 4 Claims



1. An electronic musical instrument comprising:

multiplying means for multipling input data C and input data D to obtain output data E;

adding means for adding the output data E and input data B, or substracting them one from the other, to obtain output data A;

memory means for temporarily storing the output data A to be read out later;

selector means which receives the output data A, waveform data and envelope coefficient data and selectively outputs the input data B, C and D;

calculation control means whereby, for a calculation $A=B+(C\times D)$, an envelope calculation represented by

(1) $X=Env-Env\times Step$,

(2) $Env=X+Step\times Speed$,

wherein X represents a buffer for calculation, Step represents envelope level coefficient data, Speed represents envelope speed coefficient data and Env represent envelope data, and an envelope-appended musical waveform calculation represented by

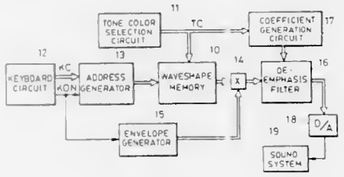
(3) $S=S+Wave\times Env$,

wherein S represents a composite waveform in each channel and wave represents waveform data, are switched between the envelope calculation and the envelope appended musical waveform calculation them on a time-shared basis for each step of each calculation cycle; and

D/A converting means whereby digital musical waveform data obtained by the calculations is converted to analog form for acoustic output;

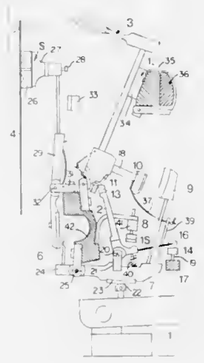
wherein the calculation $A=B\pm C\times D$, is performed on a time-shared basis and the input data is controlled, by which calculations of different functions such as calculations of an envelope waveform and a musical waveform, are performed by the same calculation means, obtaining a musical waveform.

4,840,100
TONE SIGNAL GENERATION DEVICE FOR AN ELECTRIC MUSICAL INSTRUMENT
Takeshi Adachi, and Kazuo Masaki, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan
Filed Jun. 11, 1987, Ser. No. 61,707
Claims priority, application Japan, Jun. 13, 1986, 61-136313
Int. Cl.[4] G01H *1/02, 1/00*
U.S. Cl. 84—1.19 9 Claims



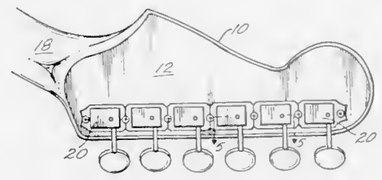
1. A tone signal generation device for an electronic musical instrument comprising:
memory means for storing waveshape data representing a tone waveshape having plural periods, the tone waveshape having the level of frequency components constituting said tone waveshape being previously elevated in a predetermined high frequency region corresponding to a frequency region to which quantization noise components of said tone waveshape belong;
reading means for reading out said waveshape data from said memory means; and
filter means for receiving said tone waveshape and for restraining the level of the components in said predetermined high frequency region, thereby said quantization noise being reduced without impairing the level of the signal component.

4,840,101
ESCAPEMENT MECHANISM FOR UPRIGHT PIANO
Fernand Kummer, Route de Delemont 24, 2802 Develier, Switzerland
Filed Sep. 26, 1988, Ser. No. 248,719
Int. Cl.[4] G10C *3/18*
U.S. Cl. 84—247 5 Claims



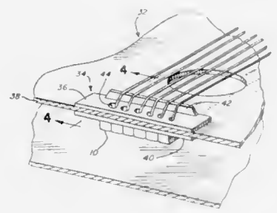
1. An escapement mechanism for an upright piano of the type including a jack pivotally mounted on a movable wippen and provided with a tip at its upper end and a prolongation at its lower end, and a hammer including a butt, the improvement comprising at least one repetition lever carried by the prolongation to define an L-shaped assembly with the jack and prolongation, at least one repetition button disposed below the repetition lever for engagement thereby when the wippen moves outwardly during escapement, thereby causing tilting of the jack so that the tip thereof may be disposed in an original position below the butt.

4,840,102
HIGH DENSITY HEADPLATE FOR A STRINGED INSTRUMENT
R. Aspen Pittman, 13994 Simshaw, Sylmar, Calif. 91342
Filed Mar. 27, 1987, Ser. No. 31,289
Int. Cl.[4] G10D *1/12*
U.S. Cl. 84—293 9 Claims



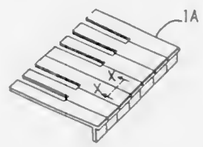
1. In a stringed instrument having a body portion supporting a bridge and a neck terminated with a headstock having a tuning machine including a tuning gear support plate portion affixed thereto, with at least one string stretched between said bridge and said tuning machine: a separate metal headplate having a thickness between 1/64 inch and 1/16 inch and formed of brass and fastened between said headstock and said tuning gear support plate portion of said tuning machine.

4,840,103
STRING LOCK FOR ACOUSTICAL INSTRUMENTS
Todd Mayer, 309 B. Woodcreek Rd., Apt. 215, Bollingbrook, Ill. 60439
Filed Jun. 8, 1987, Ser. No. 59,588
Int. Cl.[4] G10D *3/12*
U.S. Cl. 84—297 R 7 Claims



1. A string retention system for a hollow bodied musical instrument having a soundboard, the improvement comprising:
a bridge including a string support member fixed to the exterior surface of said soundboard;
a reinforcing means fixed to the interior surface of said soundboard beneath said bridge;
a plurality of strings, each string having an appropriate diameter throughout its length and having a restraining means at one end, the diameter of said restraining means being substantially greater than said string length diameter;
a plurality of bores, the number of which equals the number of said plurality of strings, each of said bores being keyhole shaped and extending linearly through said bridge, said soundboard, and said reinforcing means, the circular portion of said keyhole shape being sufficiently large such that said restraining means can pass therethrough and the notched portion of said keyhole shape having a width larger than said string length diameter and smaller than said restraining means diameter; and
a plurality of string locks, one for each string, each of said string locks consisting of a block having a top surface, a generally parallel bottom surface, and side walls extending between said top and botom surfaces, a bore extending through said block from said top surface to said bottom surface, said bore having a keyhole shape of substantially the same size and shape of each of said plurality of bores, a depression formed in the bottom surface of said string lock approximately over the midpoint of the notch of said string lock keyhole;
each string lock being positioned interiorly of said hollow body with its bore aligned with an associated one of said plurality of bores, an associated one of said plurality of strings having its restraining means passed through the aligned circular portions of said bores and seated in said string lock depression, thereby extending the adjacent portion of said string length through the notched portion of said aligned bores and over said string support member, whereby the tension of the string provides a compressive force on the combination of elements consisting of said string lock, said reinforcing means, said soundboard, and said bridge which fixes the string in place.

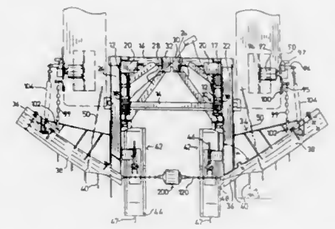
4,840,104
KEYBOARD
Muoeo Ishida; Mithuo Yamashita, both of Hamamatsu; Masanari Onishi, Himeji, and Masahiro Tanaka, Hyogo, all of Japan, assignors to Kawai Musical Instrument Manufacturing Co., Ltd., Hamamatsu, Japan
Filed Feb. 5, 1988, Ser. No. 152,532
Claims priority, application Japan, Mar. 3, 1987, 52-47998
Int. Cl.[4] G10C *3/12*
U.S. Cl. 84—437 7 Claims



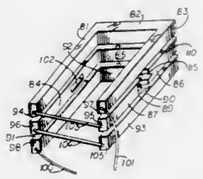
1. A keyboard composed of a resin composition, having a durometer hardness of 82 or larger, which comprises a cellulose derivative resin and a silica having 3.0 or less silanol groups in the area of 100 square angstrom and a BET specific surface area of 10 to 210 m^2/g.

4,840,105
MINE FIELD CLEARING APPARATUS
Uri Ladan, Petach Tikva; Boaz Karton, Meitar, and Aron Klipper, Beersheva, all of Israel, assignors to Israel Aircraft Industries Ltd., Lod, Israel
Continuation of Ser. No. 26,387, Mar. 16, 1987, abandoned. This application Aug. 9, 1988, Ser. No. 230,662
Int. Cl.[4] B63G *7/06;* H07F *7/02;* F41H *11/12*
U.S. Cl. 89—1.13 12 Claims

1. Apparatus for exploding magnetic mines comprising:
a permanent magnet disposed at a distance in front of a vehicle to be protected from mines and means for producing rotation of the permanent magnet thereby to cause premature detonation of mines in the vicinity thereof and without causing unacceptable damage to the vehicle or occupants of the vehicle.



4,840,106
ELECTROMAGNETIC INJECTOR/RAILGUN
Louis J. Jasper, Jr., Ocean, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Continuation of Ser. No. 910,915, Sep. 22, 1986, abandoned. This application Dec. 28, 1987, Ser. No. 141,365
Int. Cl.[4] F41F *1/02*
U.S. Cl. 89—8 6 Claims

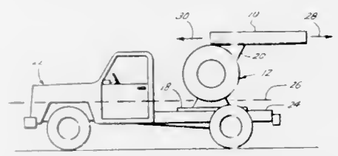


1. A device for accelerating a projectile comprising:
first and second rails, parallel spaced a predetermined distance apart;
a rigid conductor connecting said first and second rails;
the first said rail having a gap therethrough dimensioned to closely receive said projectile, said gap severing said first rail; and
the second said rail having a hole for admitting said projectile, and
means for applying a voltage across said first and second rails so that presence of said projectile in said gap produces acceleration of said projectile from said gap away from said rails.

4,840,107
METHOD AND APPARATUS FOR MANAGING RECOIL OF ELECTROMAGNETIC GUNS
William F. Weldon, Austin, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.
Filed Apr. 16, 1987, Ser. No. 39,655
Int. Cl.[4] F41F *1/02*
U.S. Cl. 89—8 7 Claims

1. A method of distributing recoil force of a railgun, comprising:
establishing a power supply for said railgun, which power supply exhibits a reaction force vector acting on said power supply in a component at the time of power discharge;

coupling said railgun to said power supply such that a railgun recoil force arising as a result of firing of said railgun



will oppose the reaction force vector of the power supply component along the axis of the railgun.

4,840,108

APPARATUS FOR THE INFEED OF AMMUNITION FROM AN AMMUNITION CONTAINER TO AN AUTOMATIC FIRING WEAPON

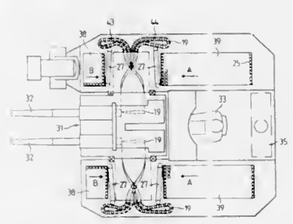
Ernst Hürlemann; Kurt Müller, and Bruno Ruppen, all of Zurich, Switzerland, assignors to Werkzeugmaschinenfabrick Oerlikon-Bührle AG, Zurich, Switzerland

Filed Apr. 21, 1988, Ser. No. 184,608

Claims priority, application Switzerland, May 8, 1987, 01768/87

Int. Cl.[4] F41F 9/02

U.S. Cl. 89—33.14 **6 Claims**



1. An apparatus for the infeed of ammunition from an ammunition container to an automatic firing weapon, comprising:

an ammunition container;

a plurality of loading clips for ammunition provided for the ammunition container;

each loading clip containing a predetermine number of cartridges;

means mounting said ammunition container for rotation in conjunction with the automatic firing weapon about a predetermine azimuth axis;

a device for displacing the loaded loading clips out of the ammunition container;

an extraction device for stripping the cartridges out of the loading clips;

said extraction device comprising an endless conveyor band which is arranged at an inclination in relation to the loading clips; and

a flexible endless chain which can be twisted through an angle of at least 90° for the transport of the cartridges from the endless conveyor band which have been stripped out of the loading clips to the firing weapon.

4,840,109

APPARATUS FOR DELIVERING AMMUNITION FROM A CONTAINER STRUCTURE TO A FIRING WEAPON

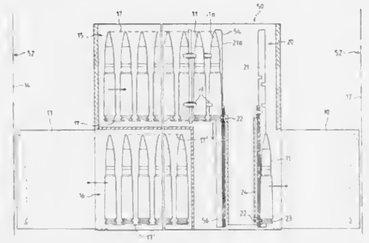
Kurt Müller, Zürich, and Erwin Bohler, Dübendorf, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Jan. 25, 1988, Ser. No. 147,876

Claims priority, application Switzerland, Feb. 2, 1987, 362/87

Int. Cl.[4] F41D 10/22

U.S. Cl. 89—33.14 **4 Claims**



1. An apparatus for delivering ammunition from a container structure to a firing weapon having two spaced weapon barrels, wherein the cartridges in the container structure are arranged side by side as well as one behind the other, comprising:

an ammunition container structure mounted between the two spaced weapon barrels of the firing weapon;

said ammunition container structure comprising a first front ammunition container and a second rear ammunition container viewed in the direction of firing of the two spaced weapon barrels;

said first front ammunition container being operatively associated with one of said two spaced weapon barrels;

said second rear ammunition container being operatively associated with the other one of said two spaced weapon barrels;

a first endless storage chain arranged in said first front ammunition container;

a second endless storage chain arranged in said second rear ammunition container;

said first front ammunition container comprising:

a device for axially displacing cartridges within said first front ammunition container;

a first endless conveyor chain; and

ammunition from said first front ammunition container being delivered by said device for axially displacing cartridges and by said first endless conveyor chain to the associated one of said two spaced weapon barrels;

said second rear ammunition container comprising:

a second endless conveyor chain; and

ammunition from said second rear ammunition container being delivered by said second endless conveyor chain directly to the other associated one of said spaced two weapon barrels.

4,840,110

DEVICE FOR STORING AND LOADING AMMUNITION IN A TURRET

Helmut Fischer, Dusseldorf, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jan. 28, 1988, Ser. No. 149,329

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1987, 3702426

Int. Cl.[4] F41F 9/06

U.S. Cl. 89—46 **5 Claims**

1. A weapon device, comprising:

a holding member for holding ammunition prior to launch through an end thereof, said holding member having first and second opposite sides;

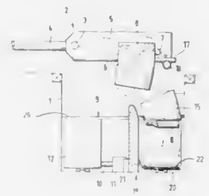
first and second shaft magazines respectively mounted to said opposite sides of said holding member, each of said first and second shaft magazines having at least one shaft;

a turret having a turret basket;

a ring magazine rotatively mounted in said turret basket for rotation about a vertical axis, said ring magazine having a plurality of vertical radially oriented ring shafts for receiving ammunition;

drive means for rotating said ring magazine about said vertical axis;

an auxiliary shaft device having auxiliary shafts and being fixed to said turret above said ring magazine so that respective ones of said ring shafts are alignable with said auxiliary shafts upon rotation of said ring magazine by said drive means, said auxiliary shaft device being fitted to said turret below said first and second shaft magazines, said



holding member being moveable into and away from an indexed position in which the shafts of said first and second shaft magazines are aligned with said auxiliary shafts therebelow; and

a lifting device having means for lifting ammunition stored in said ring magazine into said first and second shafts via said auxiliary shafts;

wherein said holding member is a tubular weapon pivotable about a horizontal axis relative to said turret, and wherein said first and second shaft magazines are pivotally mounted to said tubular weapon for pivotal movement about an axis parallel to said horizontal axis between a first position in which said first and second shaft magazines are spaced from said auxiliary shaft device and a second position in which said first and second shaft magazines are aligned with said auxiliary shaft device when said tubular weapon is in said indexed position, said indexed position defining a predetermined pivotal position of said tubular weapon about said horizontal axis.

4,840,111

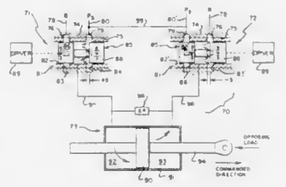
ENERGY-CONSERVING REGENERATIVE-FLOW VALVES FOR HYDRAULIC SERVOMOTORS

Kenneth D. Garnjost, Buffalo, N.Y., assignor to Moog Inc., East Aurora, N.Y.

Filed Jan. 31, 1986, Ser. No. 825,136

Int. Cl.[4] F15B 11/02, 11/20

U.S. Cl. 91—436 **89 Claims**



1. In a servomechanism associated with a source of pressurized fluid at a supply pressure, the improvement which comprises:

a first valve and a second valve, each of said valves having one member movable relative to another member, each of said other members having a supply opening communicating with said source, having a return opening, and having a control opening, each of said one members being movable within a first positional range relative to the associated other member to increase the pressure at the associated control opening and being movable within a second positional range to decrease the pressure at the associated control opening;

a first conduit communicating one of said first valve supply and return openings with the like one of said second valve supply and return openings;

a first driver operatively arranged to move said first valve one member to a desired position relative to said first valve other member;

a second driver operatively arranged to move said second valve one member to a desired position relative to said second valve other member;

a sensor for determining a pressure differential at said first and second valve control openings; and

a controller operatively associated with said sensor and with said drivers for causing said first valve one member to move to an appropriate position within one of its positional ranges and for causing said second valve one member to move to an appropriate position within the other of its positional ranges when the pressure at one of said control openings is greater than the pressure at the other of said control openings, and for causing both of said first and second valve one members to move to appropriate positions within like ones of said positional ranges when the pressure at said one control opening is less than the pressure at said other control opening.

4,840,112

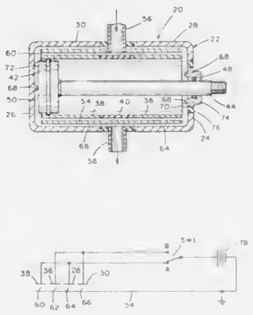
COMBINED VALVE/CYLINDER USING ELECTRO-RHEOLOGICAL FLUID

Dilip K. Bhadra; Richard L. Creedon, both of San Diego, and C. Ross Harder, Rancho Sante Fe, all of Calif., assignors to GA Technologies Inc., San Diego, Calif.

Filed Jan. 12, 1988, Ser. No. 142,995

Int. Cl.[4] F15B 13/044

U.S. Cl. 91—459 **7 Claims**



1. Electrically controlled combined valve/cylinder apparatus, said apparatus comprising:

a housing including a substantially cylindrical body, and spaced first and second end walls closing said body, said first end wall having an aperture;

a cylinder disposed inside said body, said cylinder and said body being substantially concentric;

a piston disposed in said cylinder;

a control ram connected to said piston and extending through said aperture in said first end wall, said piston being movable between a first position adjacent said first end wall in which said ram is extended and a second position wherein said piston is disposed adjacent said second end wall so that said ram is retracted;

a substantially cylindrical control sleeve disposed between and spaced from both said body and said cylinder;

inlet means for supplying an electro-rheological fluid inside said housing;

outlet means for discharging said fluid from said housing;

said control sleeve, said body and said cylinder each being at least partially electrically conductive and together forming four electrostatically controlled valves, actuation of the first and third valves causing the ram to retract, actuation of the second and fourth valves causing said ram to extend,

one of said inlet means and outlet means comprising a first port tube extending through said body and said sleeve, and the other of said inlet means and outlet means comprising a second port tube extending through said body but not said sleeve.

4,840,113

LOUVER VENT FOR THE VENTILATION OF A MOTOR VEHICLE PASSENGER COMPARTMENT

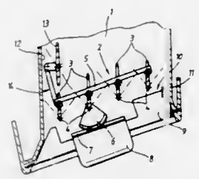
Elmar Freitag, Weil der Stadt; Karl-Heinz Weller, Gerlingen, and Hans-Wilhelm Trube, Herrenberg, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jun. 13, 1988, Ser. No. 205,836

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719835

Int. Cl.[4] F24F *13/15*

U.S. Cl. 98—2 **8 Claims**



3. Louver vent arrangement for controlling air flow into a vehicle passenger space or the like, comprising:

a first row of movable air deflection slats arranged substantialy parallel to one another,

a second row of movable air deflection slats arranged substantially parallel to one another and disposed downstream of said first row of slats,

a joint operating handle for jointly moving the first and second row of slats,

and at least one housing air deflection slat means dispsoed adjacent a housing wall means of louver housing at a location upstream of said at least one of the first and second rows of slats, said housing air deflection slat means being movable operable by the joint operating handle from a position wherein it is in parallel with the wall means and deflects no air, into a position at an angle with said wall means for directing air flow away from the housing wall means toward a respective oppositely directed slat of one of the first slats has been moved past a central position of said first row of slats.

4,840,114

AIR OUTLET DEVICE

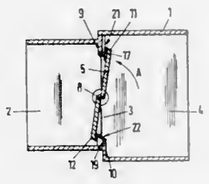
Karl-Heinz Bauer, and Gerold Eckert, both of Bad Neustadt, Fed. Rep. of Germany, assignors to Preh, Elektrofeinmechanische Werke, Jakob Preh, Nachf. GmbH & Co., Fed. Rep. of Germany

Filed Apr. 13, 1988, Ser. No. 180,951

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1987, 3713591

Int. Cl.[4] B60H *1/26*

U.S. Cl. 98—2 **10 Claims**



1. An air outlet device, comprising:

a housing body having an air passage opening, said air passage opening defining a closing plane and two seat edges;

an elastically distortable closure flap which is mounted pivotably around a swivelling axis and located near the air passage opening, said closure flap defining two sealing edges, each sealing edge corresponding to one of the seat edges of the air passage opening, the swivelling axis being situated essentially parallel to and between the sealing edges;

an actuating part located adjacent to one end of the closure flap, said actuating part being operable so as to pivot the closure flap between an open position, a closed position, and a closing position located between the open position and the closed position;

wherein when the closure flap is in the closing position, a longitudinal gap is formed between each sealing edge and its corresponding seat edge, said longitudinal gap narrowing from a first end of the closure flap adjacent to the actuating part toward a second end of the closure flap remote from the actuating part so that when the closure flap is moved from the closing position to the closed position, the seat edges progressively contact the sealing edges along the closure flap from the second end to the first end of the closure flap.

4,840,115

AIR OUTLET ARRANGEMENT OF A HEATING AND/OR AIR-CONDITIONING INSTALLATION, ESPECIALLY FOR THE REAR SPACE OF A PASSENGER MOTOR VEHICLE

Paul Johnson, Munich, and Karl W. Karnebogen, Kottgeisering, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

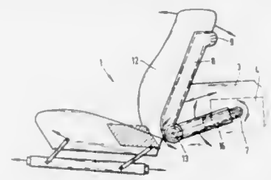
Filed Sep. 2, 1988, Ser. No. 188,915

Claims priority, application Fed. Rep. of Germany, May 4, 1987, 3714820

Int. Cl.[4] B60H *1/34*

U.S. Cl. 98—2.03 **8 Claims**

1. An air outlet arrangement of a heating and/or air-conditioning system especially for the rear space of a passenger motor vehicle, wherein the motor vehicle has two front seats with a center tunnel therebetween, the outlet arrangement comprising pivotal outlet channel means which at least in one pivot position is spatially integrated in or at other interior equipment components arranged in the passenger motor vehicle rear space so as to provide a substantially smooth contour therewith, and wherein said pivotal outlet channel has a pivot



means which is connected at an air outlet located between the front seats on said center tunnel.

4,840,116

CONTROLLING METHOD FOR OPERATION OF PAINTING BOOTH

Akihiro Murakami; Mitsunobu Matsunaga, and Yasunari Tanemura, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 21, 1987, Ser. No. 135,381

Claims priority, application Japan, Jan. 10, 1987, 62-3693

Int. Cl.[4] B05C *15/00*

U.S. Cl. 98—115.2 **7 Claims**

7. A method of controlling the operation of a painting booth having fore and rear painting zones with opposing air inlet and air exhaust chambers, comprising the steps of:

generating a vertical air current between the air inlet and exhaust chambers of the fore and rear zones at times when an object is to be painted in said corresponding zone;

detecting the speed of horizontal air currents in the rear zone;

detecting the quantity of air exhausting from the fore zone;

decreasing the quantity of air exhausting from the fore zone at times when an object to be painted is in the rear zone;

controlling the quantity of air entering the fore zone from the corresponding inlet chamber in accordance with the detected speed of the horizontal air currents in the rear zone;

maintaining the quantity of the inlet air and constant to the fore zone at times when the decreasing quantity of air exhausting from the fore zone reaches zero for terminating the air current in the fore zone.

4,840,117

MACHINE FOR THE PRODUCTION OF PUFFED CEREALS

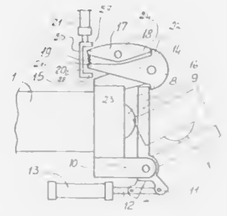
Alfredo R. Fonticoli, Via Milano, 23, 20090 - Cesano Boscone (Milano), Italy

Filed Apr. 10, 1987, Ser. No. 37,221

Claims priority, application Italy, Dec. 9, 1986, 22615 A/86

Int. Cl.[4] A23L *1/00, 1/18*

U.S. Cl. 99—323.4 **2 Claims**



1. A machine for the production of puffed cereals comprising:

at least one pair of rotatable drums disposed alongside one another, each drum having a closed end an an open end, said open end being closable by a sealing door hingedly mounted at said open end of each said drum, said sealing door being movable between an open position and a closed position,

said rotatable drums being mounted on a box like frame rigid with a platform turnable about a transverse axis,

fluid pressure actuating means associated with each said sealing door of each said drum, said fluid pressure actuating means being provided for automatically opening and closing the associated said sealing door,

a latch mechanism associated with each said sealing door and operable automatically to lock each said door in the closure position and to release each said door at the end of a cereal treatment operation,

said platform being pivoted a the end thereof adjacent said closed ends of said drums and being engaged at a point remote from said pivoted end by at least one double-acting fluid pressure actuator which is extendable to tilt said platform to bring said open ends of said drums into register with respective cereal supply ducts,

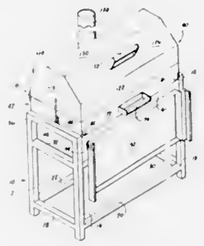
each said sealing door being fixedly connected to a respective plate having a lower part pivoted to a projecting portion of an associated drum of said drums, said plate being provided with at least one projecting arm laying at an angle to the plane of said plate, said machine further comprising

a fluid pressure actuator, having an actuating rod connected to said projecting arm whereby extension and retraction of said fluid pressure actuator causes rotation of said plate and closure and opening of said door,

said latch mechanism cooperating with said plate to hold said door in the closure position thereof, said latch mechanism comprising

a latch body pivotally connected to a second projecting portion of each said drum, said latch body having the shape of an isoscele triangle of small angle, an arcuate projecting portion of said latch body at the base thereof, respective upper and lower nose projections of said projecting base portion, said lower nose projection being engageable with said plate and said upper nose projection being engageable with one end of a locking rocker member pivoted in the vicinity of the mid point thereof.

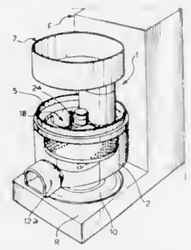
4,840,118
OUTDOOR GRILL WITH EXTRACTABLE FOOD SUPPORTING RACK
Homer L. Rinehart, 1603 NW. 4th St., Lindsay, Okla. 73052
Filed Aug. 7, 1987, Ser. No. 82,684
Int. Cl.[4] A47J *27/00*
U.S. Cl. 99—446 21 Claims



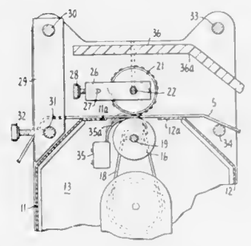
1. An outdoor grill comprising:
a vertically extending standard;
a housing mounted at the top of said standard and including:
a fuel-containing base portion; and
a hood having a lower edge and being hingedly connected to said base portion for pivotation about a horizontal pivotal axis from a first, closed position to an open position;
a fuel-supporting grate vertically removably positioned in the lower portion of said housing on said base portion for supporting a combustible fuel;
a foraminous food-supporting rack assembly horizontally reciprocably mounted in said base portion of said housing above said fuel-supporting grate;
an opening in one side of the base portion of said housing through which said food-supporting rack assembly can be pulled directly outwardly in horizontal reciprocation for purposes of removing the food on the food-supporting rack assembly from the interior of the housing; and
a drip pan assembly pivotally secured to a side of the base portion of said housing for pivotation about a horizontal axis located adjacent the opening into the base portion of said housing, said drip pan assembly including:
a pan having confining flanges extending around the outer perimeter thereof; and
track means secured to said flanges for movably supporting said food-supporting rack assembly when said food-supporting rack assembly is extricated from said housing by movement horizontally through said opening in the base portion of said housing from the interior of the housing to the exterior thereof to a position over said drip pan assembly and at rest upon said track means.

4,840,119
DEVICE FOR SQUEEZING TOMATOES
Carlo Caldi, Novara, Italy, assignor to Girmi S.P.A. Corso Matteoth, Milan, Italy
Filed Jul. 27, 1988, Ser. No. 224,757
Claims priority, application Italy, Aug. 26, 1987, 67741 A/87
Int. Cl.[4] A23N *1/00*
U.S. Cl. 99—512 16 Claims

1. A tomato-squeezing device which separates the juice from the waste, wherein it comprises:
a bowl-shaped container for collecting the juice,
a basket which can be mounted for rotation within the bowl-shaped container, the basket having a generally cylindrical shape with a base wall, a perforated peripheral wall, and tomato entrainment formations facing towards the inside of the basket, and
a shaped cover which can be inserted into the basket and has a system of walls which define, within the bounds of the cover, an inner waste-collection chamber and, together with the basket, a squeezing duct which tapers generally from an entry region where tomatoes enter the duct to a terminal region, the cover also defining a duct for supplying the tomatoes to the entry region and at least one aperture located at the terminal region of the squeezing duct which puts the terminal region of the squeezing duct into communication with the waste-collection chamber located at the cover.

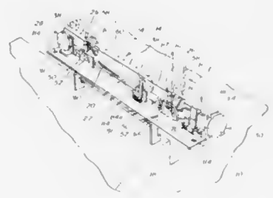


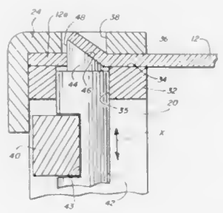
4,840,120
PRINTER FOR A STRIP OF TICKETS
Matthew J. Swiech, Antioch; Gary D. Munyon, and Kenneth J. Dias, both of Concord, all of Calif., assignors to G & B Rubber Stamp Co., Inc., Concord, Calif.
Filed May 18, 1987, Ser. No. 51,298
Int. Cl.[4] B41F *5/04*
U.S. Cl. 101—228 5 Claims



1. An imprinter for use in applying numbers, names or other indicia upon tickets, comprising:
a rectangular housing and support frame including front, rear and side plates, each side plate having an elongate slot formed therein;
a drive motor and an elongate roller mounted within said rectangular housing and support frame; said roller being mounted between said side plates on a first horizontal axis and operatively connected to said motor;
a non-rotating floating axle of support mounted between said side plates on a second horizontal axis parallel to and above said first horizontal axis, the ends of said floating axle being engaged with the elongate slots, respectively;
means for engaging the ends of said floating axle for vertically positioning said axle relative to said first horizontal axis;
a friction roller rotatably mounted and supported upon said floating axle, the peripheral surface of said friction roller being in close proximity or in contact with the upper periphery of said elongate roller;
an imprint roller rotatably mounted and supported upon said floating axle, the peripheral surface of said imprint roller being in close proximity or in contact with the upper periphery of said elongate roller;
an inking wheel and mounting arm, said arm being secured to said floating axle, said wheel being rotatably mounted from said arm and peripherally engaged with said imprint roller; and
guide means for aligning and directing a strip of tickets between said drive roller and said friction and imprint rollers.

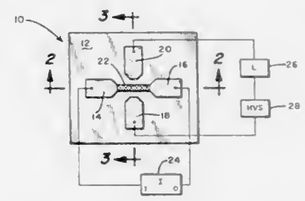
4,840,121
MASTER HOLDING MECHANISM FOR DUPLICATING MACHINES
Stanley J. Szczesniak, Lindenhurst, Ill., assignor to AM International, Inc., Chicago, Ill.
Filed Nov. 26, 1986, Ser. No. 935,367
Int. Cl.[4] B41F *27/12, 13/54*
U.S. Cl. 101—415.1 16 Claims





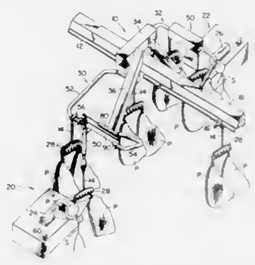
15. A mechanism for holding a master, printing plate or the like on a cylinder of a duplicating, printing or like machine, comprising:
an elongated housing mounted on the cylinder and extending transversely across the periphery of the cylinder;
an elongated die plate extending along the housing and having a series of holes spaced therealong;
a pin bar extending along the housing in juxtaposition to the die plate and having pins in line with the holes in the die plate, the pins having sharpened ends for piercing masters that are not provided with pre-punched perforations; and
actuator means operatively associated between the die plate and the pin bar for effecting relative movement therebetween for moving the pins through a master and into the holes in the die plate to hold the master, including means for moving said pins only partially through the master to hold the master but to prevent formation of residue pieces which might fall into the machine.

4,840,122
INTEGRATED SILICON PLASMA SWITCH
Eldon Nerheim, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Apr. 18, 1988, Ser. No. 182,378
Int. Cl.[4] F42C *19/12;* F42B *3/12*
U.S. Cl. 102—202.5 12 Claims



1. An integrated circuit device for switching high currents, comprising:
(a) a silicon chip substrate having first and second pairs of conductive contacts deposited on at least one surface of said substrate, said contacts being spaced apart along two mutually perpendicular axes;
(b) a strip of material which, when vaporized, creates a plasma cloud, disposed on said silicon chip substrate joining said first pair of contacts to one another, said strip of material extending between but out of physical contact with said second pair of contacts.

4,840,123
CONVEYORIZED APPARATUS WITH MOVEABLE RAIL SECTION
Harold L. Osthus, West Willington; John F. de Raismes, Simsbury; Lawrence S. Wolfson, West Hartford, and Robert M. Vaida, Ellington, all of Conn., assignors to Gerber Garment Technology, Inc., Tolland, Conn.
Continuation-in-part of Ser. No. 937,927, Dec. 4, 1986, abandoned. This application Oct. 29, 1987, Ser. No. 117,433
Int. Cl.[4] E01B *25/24*
U.S. Cl. 104—100 16 Claims



12. A conveyorized transport apparatus for moving articles supported by a trolley along a rail system to and from a work station comprising:
an incoming rail section on which trolleys and supported articles approach the work station;
an outgoing rail section on which trolleys and supported articles depart from the work station;
a moveable rail section pivotally connected at one end with one of the other rail sections for movement between a conveying position for transferring the trolley and load between the incoming and outgoing rail sections, and a

diverted position for locating the trolley and supported load closer to the work station than in the conveying position; and

actuating means for pivoting the moveable rail section between the conveying and diverted positions,

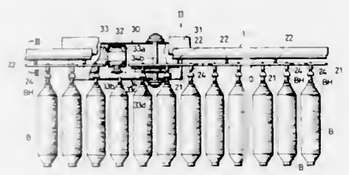
said moveable rail section being pivotable about two generally orthogonal axes relative to said one of the other rail sections.

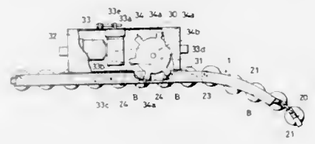
4,840,124

ROVE BOBBIN TRANSPORTING SYSTEM

Fumio Tadashima, Kanazawa, Japan, assignor to Murao Boki Kabushiki Kaisha, Kanazawa, Japan

Filed May 20, 1988, Ser. No. 196,425
Claims priority, application Japan, May 27, 1987, 62-131005
Int. Cl.[4] B61B *13/12*
U.S. Cl. 104—163 8 Claims





1. In a rove bobbin transporting system which includes a transport rail and an elongated carrier mounted for movement along said transport rail and having a plurality of bobbin hangers provided in a juxtaposed relationship thereon for removably hanging rove bobbins thereon, wherein the improvement comprises a plurality of driving devices for moving said carrier which are disposed in a spaced relationship by a distance smaller than the overall length of said carrier along said transport rail and each include a drive motor and a rotary sprocket wheel having a plurality of teeth, and a plurality of engaging members for engaging with said teeth of said rotary sprocket wheel, respectively, said engaging members being along the longitudinal dimension of said carrier and wherein said engaging members comprise brackets for mounting said bobbins to said carrier.

4,840,125

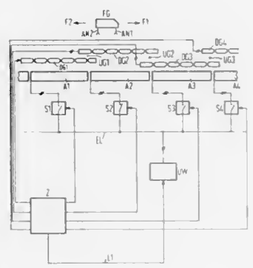
APPARATUS FOR RAIL OPERATION COMPRISING A LONG-STATOR LINEAR MOTOR

Wilbrand Lueers, Braunschweig, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 9, 1988, Ser. No. 204,227
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1987, 3722295
Int. Cl.[4] B60L *13/10*
U.S. Cl. 104—292 1 Claim

1. In an apparatus for rail operation of the type which comprises a long-stator linear motor, in which a propulsion traveling wave winding is supplied by a distributing sub-station parallel thereto, a double line which is crossed at regular intervals and is connected to a stationary central station are positioned along the path of travel, and in which a vehicle carries at least one antenna arranged in a vehicle-symmetrical manner and is inductively coupled to the double line for data exchange with the central station, the improvement wherein:

said propulsion traveling wave winding is divided into individual sections, each of said sections being separately supplied with propulsion energy, said double line is similarly divided into sections of corresponding lengths that overlap with a predetermined length at the section boundaries;



a vehicle traveling said railway includes means for generating signals which are transmitted by said at least one antenna in a section; and

a control means for receiving said signals and producing control signals for the section; and

switch means connected to said control means and to said sections and responsive to said control signals for controlling the energization of said sections.

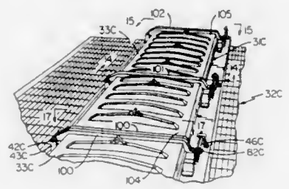
4,840,126

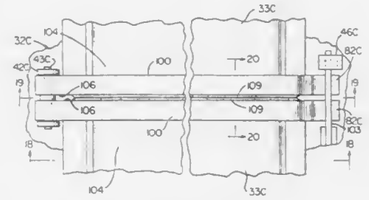
RAILROAD HATCH COVER HAVING AN INTEGRAL HOLDDOWN BAR THEREFOR

Donald L. Kleykamp, 6014 Gothic Pl., Dayton, Ohio 45459

Continuation of Ser. No. 856,899, Apr. 28, 1986, abandoned, which is a division of Ser. No. 459,069, Jan. 19, 1983, Pat. No. 4,602,569. This application Aug. 26, 1987, Ser. No. 89,464
The portion of the term of this patent subsequent to Jul. 29, 2003, has been disclaimed.
Int. Cl.[4] B61D *39/00*
U.S. Cl. 105—377 7 Claims

1. In a combination of a hatch cover for a railroad car and a holddown bar for said hatch cover, said hatch cover having opposed ends, said holddown bar having opposed ends one of which is adapted to be pivotally mounted to said car and the other of which is adapted to be releasably latched to said car while a medial portion thereof intermediate said opposed ends extends transversely across said hatch cover, the improvement wherein said holddown bar and said hatch cover comprise a one-piece homogeneous member formed of polymeric material, said holddown bar being disposed at one of said opposed ends of said hatch cover and having a flat end face that is disposed substantially transverse to said hatch cover, said end face carrying a gasket for sealing to an adjacent hatch cover





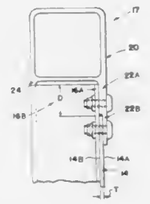
and holddown bar combination when the two combinations are in the closed condition thereof.

4,840,127

TOP CHORD FOR OPEN TOP HOPPER CARS

Jan Z. Tomaka, Quebec, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed Dec. 4, 1987, Ser. No. 128,930
Int. Cl.[4] B61D *17/08*
U.S. Cl. 105—406.1 19 Claims



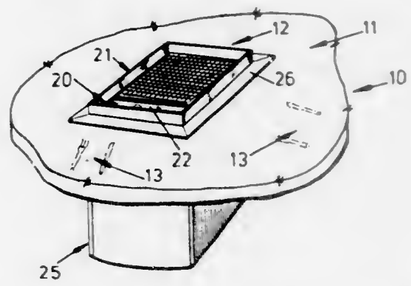
1. A chord for attachment to a pair of structural members, one being a planar member and the other being a reinforcing member, said chord comprising a stem for attachment to the structural members, and a chord section integral with the stem and extending transverse thereto, said stem comprising a relatively thick proximal portion connected with the chord section and a thinner distal portion cooperating with the thick portion to define a step of a predetermined width on one side of said stem, the other side of said stem being substantially planar, the thick portion of the stem comprising means for resisting bending moments action on the stem and transferring said force from the stem to the reinforcing member, said thick portion of stem further being adapted for direct engagement with the reinforcing member and the thinner distal portion adapted to sandwich the planar structural member between the thinner portion of the stem and the reinforcing member, said chord section extending transversely to said stem in a predetermined direction, said chord section having a lip member integral with the chord section and extending away from the chord section at a location spaced from the stem and in a direction generally parallel thereto, the lip being adapted for bearing on a portion of the reinforcing member.

4,840,128

EATING TABLE WITH INSET BARBECUE

Robert McFarlane, and Stewart M. Walker, both of Glasgow, Scotland, assignors to Trading Post Restaurants Limited, Glasgow, Scotland

Filed Mar. 1, 1988, Ser. No. 162,421
Int. Cl.[4] F24C *3/00*
U.S. Cl. 108—50 3 Claims



1. An eating table having a table top with a centrally disposed aperture which is surrounded by an eating zone capable of accommodating a plurality of eating stations from which seated persons may consume food,

a charcoal gas-fired grill barbecue set into said aperture and having a body which is located beneath the table top and which is surrounded by a housing which forms part of the table and which supports the table top,

the barbecue comprising a charcoal bed filled with charcoal lava pieces located beneath a substantially horizontal griddle which is level with the table top and on which food may be barbecued, and between the griddle and the charcoal bed there is a plurality of dished slats for collecting grease emanating from food being grilled on the barbecue, the slats being inclined at an angle to the horizontal for delivering their collected grease into a grease tray,

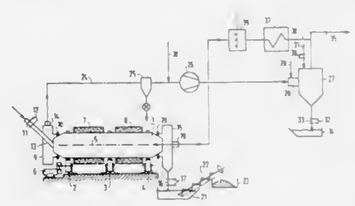
the arrangement being such that persons seated around the perimeter of the table can both grill food and eat food at the table.

4,840,129

PYROLYSIS SYSTEM

Horst Jelinek, Offenbach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 30, 1987, Ser. No. 103,410
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1986, 3633212
Int. Cl.[4] F23G *5/12*
U.S. Cl. 110—229 9 Claims



1. A pyrolysis system for trash and refuse utilization having a heated low temperature carbonization drum with a device for

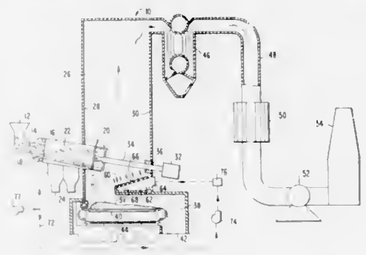
feeding material to be carbonized located at one end face of the drum, a residue discharge device at the other end face of the drum, a low temperature carbonization gas exhaust, and a gas converter connected to the low temperature carbonization gas exhaust for converting the low temperature carbonization gas into cracked gas, comprising means for supplying to the low temperature carbonization drum part of a quantity of cracked gas flowing out of the gas converter as a heat carrier.

4,840,130

WASTE DISPOSAL SYSTEM

John M. Quiel, Long Beach, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 21, 1988, Ser. No. 222,586
Int. Cl.[4] F23B *7/00*
U.S. Cl. 110—234 16 Claims



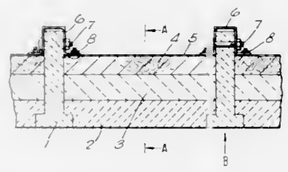
1. A waste disposal system for the combustion of waste materials comprising:
a combustor having an inlet end and an outlet end;
a furnace enclosing the outlet end of said combustor, said furnace having a front wall through which said outlet end extends and a back wall; and
a step extending out from said back wall spaced from and below said outlet end, said step being hollow on the inside thereof to form a plenum chamber to receive air and having an upper surface which defines a plurality of openings into said furnace whereby air injected through said openings deflects airborne ash and combustible solids from the outlet end of said combustor up into said furnace.

4,840,131

INSULATING LININGS FOR FURNACES AND KILNS

Henry R. Meumann, Lichfield, United Kingdom, and Johannes Stark, Mechernich, Fed. Rep. of Germany, assignors to Foseco International Limited, Nechells, Great Britain

Filed Sep. 8, 1987, Ser. No. 93,942
Claims priority, application United Kingdom, Sep. 13, 1986, 8622114; Aug. 3, 1987, 8718286
Int. Cl.[4] F23M *5/00*
U.S. Cl. 110—336 8 Claims



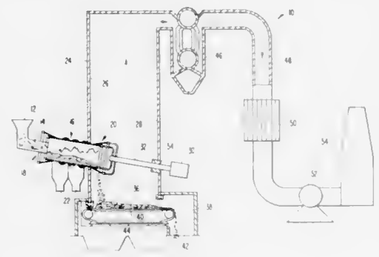
1. A furnace or kiln for the heat treatment of materials or articles, said furnace or kiln having an inner lining comprising boards of refractory, heat-insulating material where said boards are restrained from inward movement by rails of a ceramic fiber-based refractory heat-insulating material having shoulders at their inward side against the back of which shoulders edge portions of said boards rest, the thermal conductivity of said rails being not greater than 0.1 $w.M^{-1}.°K^{-1}$ at ambient temperature, the rails having a density within the range of 0.2 to 0.75 $g.cm^{-3}$.

4,840,132

ROTARY COMBUSTOR

Vince A. Jose, Brea, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 21, 1988, Ser. No. 222,592
Int. Cl.[4] A47J *36/00*
U.S. Cl. 110—246 6 Claims



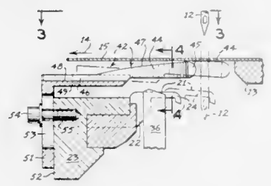
1. A rotary combustor comprising:
a plurality of water cooled tubes secured directly to each other in abutting relationship to form a cylindrical barrel defining a combustion chamber therein, said barrel having a charge end and a discharge end;
means interconnecting said tubes for circulating water therethrough; and
wherein at least certain of said tubes are bent outwardly from the center of said barrel at spaced locations along their lengths to form a plurality fo openings in said barrel to allow combustion air into said combution chamber.

4,840,133

NEEDLE PLATE FOR HOOK BAR OF CUT PILE TIFTING MACHINE

Charles W. Watkins, Ooltewah, Tenn., assignor to Tuftco Corporation, Chattanooga, Tenn.

Filed Sep. 19, 1988, Ser. No. 245,529
Int. Cl.[4] D05C *15/08*
U.S. Cl. 112—80.3 11 Claims



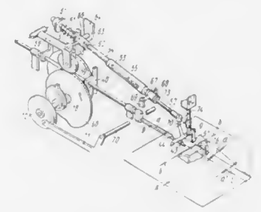
1. In a cut-pile tufting machine having a plurality of needles for introducing yarns through a base fabric movable front-to-rear in a longitudinal path through the machine to form transversely spaced, longitudinal rows of loops, a transversely extending hook bar supporting a plurality of cut pile hooks having bills projecting forward, knives for cooperating with said hooks to cut said loops, means for reciprocably moving said hook bar longitudinally below said longitudinal path between a forward operative position cooperating with a corresponding needle to form a loop and a rearward position cooperating with a corresponding knife for cutting said loop to form a cut pile tuft, means supporting said base fabric comprising:
(a) a plurality of elongated needle plate fingers having front and rear end portions,
(b) support means mounting the rear end portions of said needle plate fingers on said hook bar to cause said front end portions to project forward above said hooks,
(c) said front end portions projecting forward far enough to extend between corresponding needles when said hooks are in said forward operative positions, and
(d) said needle plate fingers having top surfaces supporting said base fabric as said base fabric moves longitudinally through said machine.

4,840,134

MACHINE FOR PRODUCING A TRIPLE-THREAD CHAIN STITCH FOR SEWING WEBS OVER AN EDGE

Nikolai N. Raikov, Kerch, U.S.S.R., assignor to Tsentralnoe Proektno-Konstruktorskoe Bjuro Vsesojuznogo Rybopromyshlennogo Obiedinenia Azovo-Chernomorskogo Basseina, Sevastopol, U.S.S.R.

PCT No. PCT/SU85/00066, § 371 Date Mar. 25, 1987, § 102(e) Date Mar. 25, 1987, PCT Pub. No. WO87/00873, PCT Pub. Date Feb. 12, 1987
PCT Filed Jul. 30, 1985, Ser. No. 35,732
Int. Cl.[4] D05B *1/20, 57/06*
U.S. Cl. 112—162 5 Claims



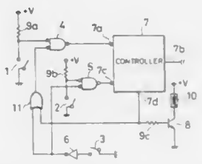
1. A triple-thread stitching machine for sewing webs over their edges, comprising a framework (**13**) having mounted thereon means (**14**) for guiding the webs into a sewing zone; retaining means (**16**) for retaining the sewn up edges of the webs; a device (**17**) for advancing the webs and a main shaft (**18**) operatively connected with mechanisms (**19**, **20**, **21**), respectively, for driving a sewing needle (**8**) mounted on a needle bar (**39**), a looper needle (**9**) mounted on an associated rod (**45**) and a looper hook (**10**) mounted in a canti-lever fashion on a telescopic rotatable bar, the looper hook (**10**) being mounted for moving about the needle (**8**) at the side of the device (**17**) for advancing the webs, the telescopic rotatable bar being offset from the needle bar (**39**) towards the device (**17**) for advancing the webs and inclined with respect to an imaginary plane including the axis of the needle (**8**) and the line of stitching through the edges of the webs, the needle (**8**) having an eye (**43**) and being so mounted in the needle bar (**39**) that its eye (**43**) faces the device (**17**) for advancing the webs, and the needle (**8**) having a groove (**44**) made therein at the same side thereof, behind the eye (**43**).

4,840,135

SEWING MACHINE CONTROLLER INHIBITING SEWING IN UNSAFE CONDITIONS

Satomi Yamauchi, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 937,281, Dec. 3, 1986, abandoned. This application Dec. 29, 1987, Ser. No. 165,824
Claims priority, application Japan, Dec. 3, 1985, 60-272005; Dec. 3, 1985, 60-272006
Int. Cl.[4] D05B *69/36*
U.S. Cl. 112—277 3 Claims



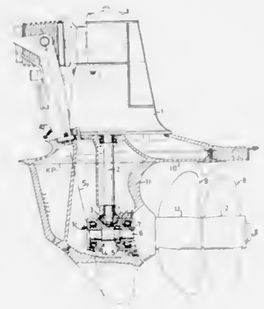
1. A sewing machine controller having an automatic lifting mechanism for a cloth presser, comprising:
a first switch for controlling the rotation of a sewing machine motor shaft via a rotation command signal;
means for detecting conditions dangerous to an operator of said sewing machine;
means for inhibiting said rotation command signal responsive to an ouptut of said detecting means;
means for raising said cloth presser of said sewing machine; said detecting means detecting a raising of said cloth presser;
a treadle switch; and
means for inhibiting said cloth presser raising means upon closure of said treadle switch.

4,840,136

PROPELLER DRIVE FOR BOATS

Lennart H. Brandt, Fjärås, Sweden, assignor to AB Volvo Penta, Gothenburg, Sweden

Continuation of Ser. No. 778,310, Sep. 20, 1985, Pat. No. 4,698,036, which is a continuation of Ser. No. 531,613, Sep. 12, 1983, abandoned. This application Sep. 11, 1987, Ser. No. 95,112
Claims priority, application Sweden, Sep. 13, 1982, 8205215
The portion of the term of this patent subsequent to Oct. 6, 2004, has been disclaimed.
Int. Cl.[4] B63H *21/24*
U.S. Cl. 440—78 4 Claims



1. In a propeller drive unit for boats having steering means to steer same and a pair of concentric counter-rotationally drive propeller shafts in a drive housing, each of said shafts carrying

at least one propeller having a hub, said drive housing having a substantially vertical output drive shaft extending generally the length of said housing and having its lower end coupled to said pair of shafts, and a steering axis for steering said drive housing thereabout, and an anti-cavitation plate located above said propellers, the improvement wherein said drive housing comprises a forward projected surface located beneath a first plane generally horizontally defined by said anti-cavitation plate and forwardly of a second plane passing generally laterally through said first plane and through and along said steering axis, said forward projected surface being at least half but at most twice as large as a rearward projected surface of a portion of said drive housing located beneath said first plane and behind said second plane and a rearward projected surface of said hubs of said propellers thereby reducing the resultant steering torque exerted by the water flow force on said drive unit counteracting against transverse forces of said propellers whereby steering forces to be applied to said steering means is reduced.

4,840,137

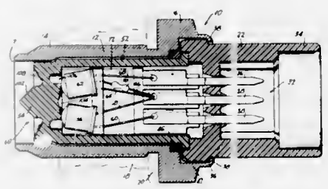
LIQUID LEVEL GAUGING APPARATUS

Thomas Beauvais, Hamden; Vincent G. Kienke, Fairfield; Peter J. Lupoli, Hamden, and Donald J. Mattis, Norwalk, all of Conn., assignors to Casco Products Corporation, Bridgeport, Conn.

Continuation of Ser. No. 68,575, Jul. 1, 1987, abandoned. This application Nov. 3, 1988, Ser. No. 266,577

Int. Cl.⁴ G01F *23/01*

U.S. Cl. 116—227 **19 Claims**



1. An indicator for displaying when the height of a liquid in a vessel reaches a preselected height, said vessel having a wall and said indicator comprising in combination:

(a) a cup-like enclosure having a bottom wall comprising prism means having exterior and interior surfaces, the exterior surface of said prism means being conical and being located for immersion in the liquid to be monitored when said liquid reaches said preselected height,

(b) a light source,

(c) a light-responsive means, and

(d) means for mounting said light source and light-responsive means in close juxtaposition adjacent said prism means and in said cup-like enclosure,

(e) the interior surface of said prism means having a light-admitting substantially conically-shaped recess which is substantially coaxial with the conical exterior surface of the prism means, said prism means enabling light rays from said light source to pass into the surface of its conically-shaped recess and to be bent, by refraction, to strike the conical exterior surface of the prism means and said prism means enabling reflected rays from said conical exterior surface of the prism means to pass through the surface of said conically-shaped recess and to be thereby bent, by refraction, to strike the said light-responsive means so as to indicate the presence or absence of liquid at the conical exterior surface of said prism means.

4,840,138

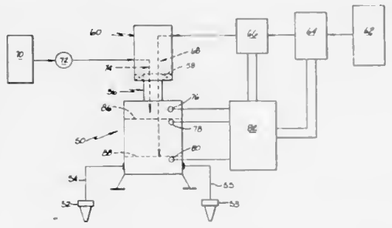
FLUID DISPENSING SYSTEM

James S. Stirbis, Littleton, Colo., assignor to Preferred Machining Corporation, Englewood, Colo.

Filed Dec. 23, 1986, Ser. No. 945,515

Int. Cl.⁴ B05C *5/02*

U.S. Cl. 118—694 **12 Claims**



1. A sealant supply system for a sealant applying machine having a plurality of rotatable sealant applying head devices rotatable about a central axis of rotation and comprising:

support means for supporting said system on the machine;

a rotatable sealant supply chamber means mounted on said support means for holding a supply of sealant material and having a bottom wall portion, a side wall portion, and an upper wall portion;

coupling passage means in a lower portion of said chamber means for connection to the sealant applying head devices to supply sealant thereto;

a spindle means mounted on said upper wall portion of said chamber means for enabling rotation of said chamber means;

a first central passage means in said spindle means enabling supply of air and sealant to said chamber means;

bearing journal means and bearing means on an outer wall portion of said spindle means for rotatably supporting said spindle means;

a non-rotatable housing means for receiving and rotatably supporting said bearing means and said spindle means;

a second central passage means in said non-rotatable housing means for connection to said first central passage means for enabling supply of air and sealant to said chamber means;

passage sealing means between said spindle means and said housing means for sealing said first central passage means relative to said second central passage means;

a sealant delivery tube means mounted in said first central passage means and said second central passage means and having a discharge opening located in said chamber means for supplying sealant to said chamber means; and

air passage means circumjacent said tube means and defined by said tube mean and said first central passage means and said second central passage means for supplying pressurized air to said chamber means.

4,840,139

APPARATUS FOR THE FORMATION OF A FUNCTIONAL DEPOSITED FILM USING MICROWAVE PLASMA CHEMICAL VAPOR DEPOSITION PROCESS

Tetsuya Takei, Ueno, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

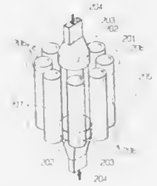
Filed Sep. 28, 1987, Ser. No. 102,010

Claims priority, application Japan, Oct. 1, 1986, 61-231304

Int. Cl.⁴ C23C *16/00*

U.S. Cl. 118—723 **4 Claims**

1. In an apparatus for the formation of a functional deposited film on a plurality of cylindrical substrates by means of microwave plasma chemical vapor deposition, said apparatus having a cylindrical deposition chamber comprising a circumferential wall having an end portion thereof provided with a microwave introducing window to which a waveguide extending from a microwave power source is connected, said cylindrical deposition chamber having a plasma generation space circumscribed by a plurality of rotatable cylindrical substrate holders, each said substrate holder having one of said cylindrical substrates thereon, said rotatable cylindrical substrate holders being concentrically arranged in said cylindrical deposition chamber, said cylindrical deposition chamber being provided with means for supplying a film-forming raw material gas into said plasma generation space and means for evacuating said cylindrical deposition chamber, the improvement which comprises: (a) a removable opening and shutting member provided with



said microwave introducing window in order to permit removal or insertion of said cylindrical substrates in said cylindrical deposition chamber; (b) an electromagnetic wave shielding means and (c) a vacuum sealing means being arranged in that order from the side of the plasma generation space on the top of the circumferential wall of said deposition chamber to substantially enclose the inside of said deposition chamber, said electromagnetic wave shielding means comprising a spring structure of a metal selected from the group consisting of iron, copper, nickel, chromium, aluminum, tin, zinc and alloys containing at least one of said metals, which said spring structure exhibits sufficient elasticity to follow the changes in the clearance between said opening and shutting member and said circumferential wall of said deposition chamber.

4,840,140

SECURING MEANS FOR ODORLESS ANIMAL LITTER UNIT

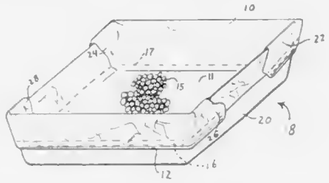
Patrick Yananton, 1518 Little Hill Rd., Point Pleasant, and Janice P. Parker, 365 St. Nicholas Ave., Haworth, both of N.J. 08742

Continuation-in-part of Ser. No. 573,958, Jan. 26, 1984, which is a continuation-in-part of Ser. No. 315,307, Oct. 27, 1981, Pat. No. 4,469,046, which is a continuation-in-part of Ser. No. 909,256, May 24, 1978, abandoned. This application Dec. 31, 1986, Ser. No. 948,209

The portion of the term of this patent subsequent to Feb. 3, 2004, has been disclaimed.

Int. Cl.⁴ A01K *67/00*

U.S. Cl. 119—1 **27 Claims**



1. In the combination of a litter box and a litter device for use with cats,

said litter box having a base and four walls,

said litter device being a sorbent pad laminate means for the collection of animal urine and comprising:

(a) a bottom sheet layer of moisture impermeable material, and sheet layer being in contact with the base and walls of said litter device;

(b) an intermediate sorbent layer of material having high urine dispersion and sorbency capacity;

(c) a top claw resistant screen means, said screen means being a urine permeable, urine inert, flexible member formed of strands having sufficient tear strength to withstand the clawing action of a cat and sufficiently small hole size to protect said sorbent layer and said sheet layer of moisture impermeable material from being torn by animal claws,

said bottom sheet layer and said top screen means being secured to each other along at least a substantial portion of their periphery;

the improvement comprising: securing means, said securing means removably affixing said sheet layer to said base of said litter device and preventing relative movement between said litter box and said litter device which can be caused by the clawing action of an animal.

4,840,141

AUTOMATIC MILKING APPARATUS

Barry R. Marshall, Ramsden, England, assignor to Ambic Equipment Limited, Withey, England

Filed May 7, 1987, Ser. No. 46,692

Claims priority, application United Kingdom, May 10, 1986, 8611471

Int. Cl.⁴ A01J *5/04*

U.S. Cl. 119—14.47 **2 Claims**

1. An automatic milking apparatus including a clawpiece, a cluster of teat cups, each with a teat cup shell housing, a teat cup liner, and short milk tubes connecting each liner with the clawpiece;

said clawpiece including, for each short milk tube connected thereto, a non-return valve for permitting milk flow in the teat cup in a direction towards the clawpiece, away from the teats, and for preventing milk-flow in the opposite direction;

each teat cup liner and short milk tube connected thereto forming an airtight passageway precluding air admission into the apparatus upstream of the respective clawpiece valve during a milking operation; and

each teat cup liner including an air admission passage extending from the interior of the liner to an exterior liner part within the corresponding teat cup shell, and an air admission tube extending from the air admission passage to an air admission control means which is operative, at will, to prevent air admission during a milking operation

and to permit air admission upon completion of a milking operation.

4,840,142

APPARATUS FOR RAISING SMALL ANIMALS

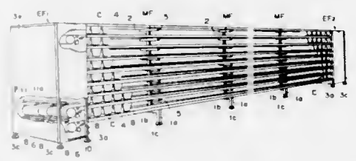
Tetsushi Ishikawa, Okayama; Masato Okabe, Narita, and Hiroyasu Kato, Tokyo, all of Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama and Kabushiki Kaisha Itoki, Osaka, both of, Japan

Filed Oct. 20, 1987, Ser. No. 110,409

Claims priority, application Japan, Oct. 20, 1986, 61-247472

Int. Cl.[4] A01K *31/00*

U.S. Cl. 119—17 **20 Claims**



1. An apparatus for raising small animals, comprising:

end frame housing disposed at longitudinally opposite ends of said apparatus;

a plurality of stands disposed at longitudinally spaced intermediate positions between said end frame housings;

a post mounted upon each one of said plurality of said stands at a central portion thereof with respect to the lateral direction of said apparatus;

a plurality of vertically spaced brackets secured to each one of said plurality of said posts at vertically spaced positions thereof so as to project in laterally opposite directions with respect to said each one of said plurality of said posts and thereby define a plurality of longitudinally extending, vertically spaced rows of brackets;

rack members longitudinally disposed between said end frame housings and secured to said plurality of vertically spaced brackets so as to form a plurality of vertically spaced racks;

cages, for housing said small animals mounted upon said vertically spaced racks so as to form a plurality of longitudinally extending, vertically spaced rows of said cages;

a plurality of vertically spaced conveyor belts respectively provided below each one of said longitudinally extending, vertically spaced rows of said cages for receiving bodily discharge and food remains from said small animals;

a plurality of vertically spaced means disposed within one of said end frame housings for respectively driving each one of said conveyer belts;

a plurality of vertically spaced means disposed within said one of said end frame housings for respectively cleaning each one of said conveyor belts with respect to said bodily discharge and food remains received thereon; and

trough collection means defined within a bottom portion of said one of said end frame housing and disposed below the lowermost one of said plurality of vertically spaced conveyor belts for collecting said bodily discharge and food remains removed from said plurality of conveyor belts by said cleaning means.

4,840,143

PET FOOD DISPENSER

Allen Simon, E. Northport, N.Y., assignor to Four Paws Products, Ltd., Hauppauge, N.Y.

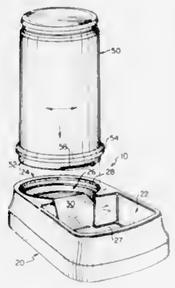
Filed Nov. 20, 1987, Ser. No. 123,129

Int. Cl.[4] A01K *39/00*

U.S. Cl. 119—52 R **12 Claims**

1. A storage and dispensing apparatus of the type including a tray adapted to rest securely on a flat surface and a generally cylindrical storage container extending axially above said tray, comprising:

an annular, inwardly projecting flange formed on a surface of said tray, said flange being interrupted over a predefined circumferential distance thereof; a downwardly and outwardly flaring skirt portion formed near the bottom of said container, the outside diameter of said skirt portion at the point of largest diameter being larger than the inside diameter of said flange;



a plurality of radially outwardly projecting lug members formed on said skirt so as to project radially outwardly beyond said skirt, at least one of said lug members having a circumferential extent which does not exceed the circumferential extent of the interruption in said flange; and

means on said container defining an annular, downwardly facing seat above and proximate to said skirt for engaging said tray from above.

4,840,144

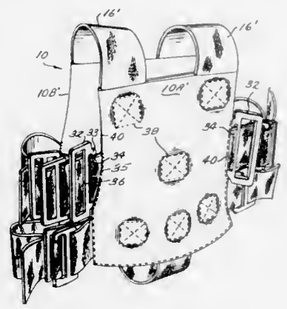
CHILD HARNESS

John L. Voorhees, Kensington, Md., and James Kemp, Henderson, Ky., assignors to Productive Products Limited, Henderson, Ky.

Continuation-in-part of Ser. No. 802,467, Nov. 27, 1985, Pat. No. 4,699,090. This application Oct. 9, 1987, Ser. No. 106,369

Int. Cl.[4] A62B *35/00*

U.S. Cl. 119—96 **4 Claims**



1. A harness for restraining a person positioned in the lap of a person wearing a conventional seat belt, said harness comprising front and rear panels, each said panel including a top edge, spaced side edges extending generally from said top edge to a bottom edge extending between said respective side edges, said top edges of said panels being connected adjacent said respective side edges by first and second strap means, each said panel having an inner and outer face with said inner faces of said panels facing each other, said bottom edges of said panels being connected by a third releasable and adjustable strap means extending between approximately the midpoint of said respective bottom edges, said side edges of said front and rear panels having each a pair of releasable and adjustable strap means for connecting said side edges, one of said strap means of said pair being located adjacent said respective bottom edges of said panels and the other of said pair of strap means being located approximately at the midpoint of each said side edge, said other of said pair of strap means including seat belt attachment means with said attachment means comprising a pair of belt loops, one being disposed adjacent one side edge of said rear panel and the other belt loop being disposed adjacent the other side edge of said rear panel.

4,840,145

PROCESS AND A DEVICE FOR CLEANING INNER OR OUTER WALLS OF VERTICALLY EXTENDING OR INVERTED TUBES OF HEAT EXCHANGERS

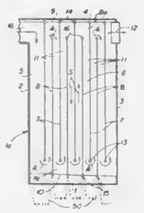
Frohmut Vollhardt, Oberhausen, and Hans Krämer, Dinslaken, both of Fed. Rep. of Germany, assignors to Man Gutehoffnungshuette GmbH, Fed. Rep. of Germany

Filed May 17, 1988, Ser. No. 195,117

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1986, 3621850; Sep. 29, 1986, 3632982

Int. Cl.[4] F22B *37/18, 37/48*

U.S. Cl. 122—379 **7 Claims**



1. A process for cleaning the inner and outer walls of vertical and inverted tubes of heat exchangers, particularly of the tubes of trash incinerators waste heat boiler, comprising imparting a kinetic energy to the tubes in a longitudinal direction and then stopping the tubes abruptly, said tube walls including a horizontally extending header and wherein the header is engaged and lifted upwardly and then permitted to fall downwardly.

4,840,146

MULTIPLE THROTTLE MECHANISM FOR INTERNAL COMBUSTION ENGINES

Shozo Yanagisawa, Toukai; Sigeo Tamaki, and Isamu Ishizawa, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 5, 1988, Ser. No. 190,659

Claims priority, application Japan, May 11, 1987, 62-112316

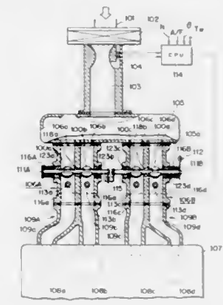
Int. Cl.[4] F02B *75/18*

U.S. Cl. 123—52 MB **6 Claims**

1. A multiple throttle mechanism for internal combustion engines comprising a main air intake passage, a plurality of intake manifold passages connected to the downstream side of main air intake passage and communicating with engine cylinders, respectively, a plurality of throttle valves provided in said intake manifold passages, respectively, and fuel injectors having fuel injection holes opened to said intake manifold passages downstream of said throttle valves, respectively, characterized by

a pair of intake manifold blocks separated from each other and each having at least two parallel passages formed therethrough and a wall portion separating thereby said adjacent parallel passages, said parallel passages each being a part of said intake manifold passage and having said injection hole;

a pair of throttle shafts arranged in an axial direction, said throttle shafts each crossing said parallel passages, passing through a through hole formed in said wall portion of said intake manifold block and supported on said intake manifold block, said throttle valves being mounted on said throttle shafts so that said throttle valves are operated



simultaneously to control the cross sectional area of each said parallel passage; and

means, including air gap defined between said through hole and said throttle shaft, for fluidly interconnecting said parallel passages in each of said intake manifold blocks and passing air from said main air intake passage into said parallel passages downstream of said throttle valves by by-passing said throttle valves, thereby providing desired fuel air ratio for each said engine cylinder during idling of the engine.

4,840,147

COMBUSTION CHAMBER OF A TWO-STROKE ENGINE

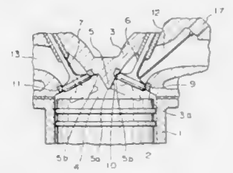
Toshio Tanahashi, Susono; Norihiko Nakamura, Mishima; Hiroshi Noguchi, Gotenba; Kenichi Nomura, Susooo; Toyokazu Baika, Susono; Masanobu Kanamaru, Susono; Tatsuo Kobayashi, Susono; Hideo Nagaosa, Susono; Kazuhiro Ito, Susono; Toshio Ito, Susono, and Kouichi Nakae, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jul. 5, 1988, Ser. No. 215,420

Claims priority, application Japan, Jul. 9, 1987, 62-169684; Nov. 17, 1987, 62-288390; Apr. 27, 1988, 63-102659

Int. Cl.[4] F02B *75/02*

U.S. Cl. 123—65 VD **22 Claims**



1. A two-stroke engine comprising:

an engine body including a cylinder head having an inner wall;

a piston reciprocally movable in said engine body, the inner wall of said cylinder head and a top face of said piston defining a combustion chamber therebetween;

at least one intake valve arranged on the inner wall of said cylinder head;

at least one exhaust valve arranged on the inner wall of said cylinder head;

masking means arranged between said intake valve and said exhaust valve to mask a valve opening formed between a valve seat and a peripheral portion of said intake valve, which is located on said exhaust valve side, for the entire time for which said intake valves is open.

4,840,148

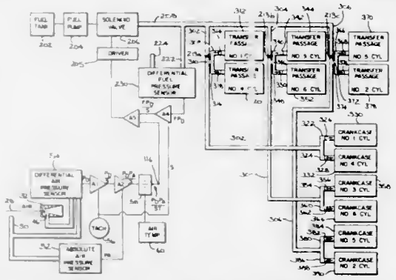
TWO CYCLE ENGINE WITH LOW PRESSURE CRANKCASE FUEL INJECTION

Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Continuation-in-part of Ser. No. 95,356, Sep. 10, 1987, Pat. No. 4,750,464, which is a continuation-in-part of Ser. No. 25,270, Mar. 12, 1987, Pat. No. 4,763,626. This application Apr. 6, 1988, Ser. No. 178,383

Int. Cl.[4] F02B *33/14*

U.S. Cl. 123—73 A **14 Claims**



1. A two cycle internal combustion engine comprising:

a piston reciprocal in a cylinger between a crankcase and a combustion chamber;

air intake means supplying combustion air to said crankcase;

fuelll supply means including a fuel pump supplying fuel to said crankcase through a fuel line, without a carburetor, without a high pressure fuel pump, without high pressure fuel injectors, and without a constant fuel pressure regulator;

means sensing the amount of combustion air supplied to said crankcase;

means sensing the flow velocity of fuel through said fuel line comprising a restriction orifice in said fuel line producing a fuel pressure drop indicating fuel flow velocity;

a conduit connected between said crankcase and said fuel line downstream of said restriction orifice and passing pressurized air-fuel mixture from said crankcase to said fuel line to improve fuel atomization;

means in said fuel line upstream of said restriction orifice and responsive to said means sensing the amount of combustion air and said means sensing flow velocity of fuel, to control the amount of fuel supplied through said fuel line according to said amount of combustion air and said fuel flow velocity.

4,840,149

CAMSHAFT APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Hiroya Fujita, Anjo, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jul. 1, 1988, Ser. No. 214,730

Claims priority, application Japan, Jul. 7, 1987, 62-103297[U]

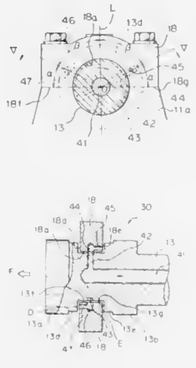
Int. Cl.[4] F01L *1/04*; F01M *1/06*

U.S. Cl. 123—90.31 **5 Claims**

1. A camshaft apparatus provided for an internal combustion engine having two cylinder heads disposed in parallel to each other in such a manner that a front portion of one of said cylinder heads is disposed near a rear portion of one of the other of said cylinder heads, said two cylinder heads being provided with at least one support portion projecting therefrom and at least one bearing cap fixed on said support portion to define a cylindrical supporting hole therebetween, said camshaft apparatus comprising:

first camshafts disposed on each of said two cylinder heads, respectively, each of said first camshafts being driven by said engine to rotate in the same direction;

second camshafts disposed on each of said two cylinder heads, respectively, each of said second camshafts being rotatably supported by said cylindrical supporting hole, and formed with at least two large diameter portions having diameters larger than said supporting hole, one of said at least two large diameter portions being located on one side of said bearing cap and the other of said at least



two large diameter portions being located on the other side of said bearing cap to define first and second lubricating gaps between said large diameter portions and said bearing cap;

helical gears mounted on said first and second camshafts, respectively, said helical gears mating with each other to transmit a rotation of said first camshafts to said second camshafts; and

means for supplying lubricating oil to said first and second lubricating gaps, said oil supply means supplying different amounts of oil to said first and second lubricating gaps, respectively, to produce a pressure differential between said first and second lubricating gaps and thereby urge said camshaft in a predetermined direction.

4,840,150

VALVE-ACTUATING LEVER FOR INTERNAL COMBUSTION ENGINES

Werner Kotzab, Schweinfurt, and Horst Zielke, Winnenden, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

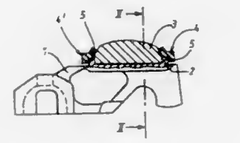
Filed May 12, 1988, Ser. No. 193,671

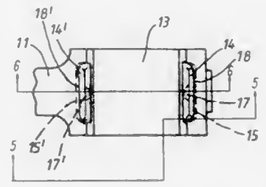
Claims priority, application Fed. Rep. of Germany, May 12, 1987, 3715758

Int. Cl.[4] F01L *1/18*

U.S. Cl. 123—90.39 **5 Claims**

1. A valve-actuated lever, comprising slide means disposed in a rectangular groove of a lever means, the slide means being form-lockingly retained in the lever means by at least two strip means within the area of forward and rear edges of the slide means, the forward and rear edges being formed relative to the central axis of a cam shaft, the lever means being provided with projections within the area of the rectangular groove, the slide means having a pair of recesses, the respective recesses being formed in the forward and rear edges of the slide means and adjacent to forward and rear edges of the groove, wherein the strip means are at least equal in length to the respective recesses, and project into cavities formed in the lever means beneath the respective forward and rear edges of the groove,





and the strip means include at least one of a fiber-reinforced plastic material, ceramic-powder containing plastic material and glass microballs containing material, each with a temperature resistance of at least 150° and form-lockingly filling the pair of recesses and respective cavities.

4,840,151

SEALED-TYPE LASH ADJUSTER

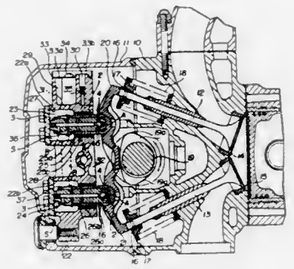
Masayasu Sakata, Niiza, Japan, assignor to Hooda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 11, 1987, Ser. No. 61,867

Claims priority, application Japan, Jun. 14, 1986, 61-138711

Int. Cl.[4] F01L *1/24*

U.S. Cl. 123—90.43 **1 Claim**



1. A sealed-type lash adjuster comprising:

cylindrical body means having

a bottom;

plunger means

slidably received in said body means and

forming a high pressure chamber for sealing hydraulic oil between an inner surface of said bottom portion of said body means and said plunger means;

diaphragm means

mounted between an open end of said body means and said plunger means and forming a reservoir chamber for the hydraulic oil to be supplied to said high pressure chamber,

said diaphragm means being formed of flexible material, with at least part of the thickness thereof being formed of a fluorine-bonded layer extending over the entirety of said diaphragm means;

holder means including

bushing means, including an interior surface having an annular channel therein, for slideably receiving said cylindrical body means with said bottom portion of said body means generally facing toward a combustion chamber means and engageable with valve rocker means, and said diaphragm means and said open end of said body means generally facing away from said combustion chamber means;

fluid reservoir means for storing fluid lubricant; and conduit means in fluid communication with said fluid reservoir means and said annular channel in said bushing means, for conducting fluid lubricant from said fluid reservoir means to said annular channel in said bushing means; and

mounting means operable to secure said holder means with said cylindrical body means being interposed between said combustion chamber means and said diaphragm means.

4,840,152

V-TYPE VERTICAL ENGINE

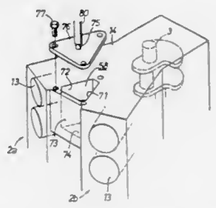
Yoshimi Watanabe; Shinichi Miyakoshi, and Kenichi Goto, all of Wako, Japan, assignors to Honda Giken Gokyo Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1987, Ser. No. 49,305

Claims priority, application Japan, May 16, 1986, 61-112123; May 16, 1986, 61-073655[U]; May 16, 1986, 61-073656[U]

Int. Cl.[4] F02B *75/22*

U.S. Cl. 123—52 MV **7 Claims**



1. A V-type vertical engine having a crank shaft extending vertically and a pair of cylinder banks forming a certain angle therebetween, comprising:

intake ports which are located adjacent to the internal sides of the cylinder banks and communicated with combustion chambers of the engine by way of intake valves;

intake tubes which are connected to the intake ports and, at least in part thereof, extend along a central line between the two cylinder banks away from the crank shaft of the engine;

exhaust ports which are located adjacent to the external sides of the cylinder banks and communicated with the combustion chambers of the engine by way of exhaust valves;

exhaust passages which, at least in part thereof, extend along a cylinder axial line towards the crank case;

a cooling water passage consisting of a central conduit extending in a central plane located between the two cylinder banks in parallel with the crank shaft of the engine; and

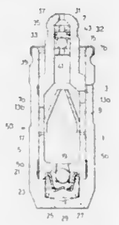
wherein a thermostat valve is accommodated in a thermostat valve chamber defined by a chamber member which is supported by a pair of transfer conduits extending from upper surfaces of the two cylinder banks, the thermostat

valve chamber being communicated with water jackets in the cylinder banks by way of the transfer conduits as well as with the central conduit.

4,840,153
HYDRAULIC LASH ADJUSTER

Akira Aida, and Toshihiro Ikeda, both of Takasaki, Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1988, Ser. No. 145,121
Claims priority, application Japan, Oct. 23, 1987, 62-266538
Int. Cl.[4] F01L *1/24*
U.S. Cl. 123—90.55 17 Claims



1. A hydraulic lash adjuster for adjusting the valve clearance of an engine valve and for supplying oil to lubricate a surface, comprising:

a cup-shaped body having an oil introducing port and an inner chamber;

a plunger assembly axially movably fitted in said inner chamber and including a partition wall which divides said inner chamber transversely to the chamber axis into first and second compartments and which has a hole providing fluid communication between said first and second compartments, an oil outlet port at the top of said assembly, and an oil supply inlet provided in a peripheral wall of said assembly to communicate with said oil introducing port;

a high pressure chamber defined in said first compartment of said inner chamber and having first valve means for seating on said hole of said partition wall;

a reservoir chamber defined in said second compartment and being fluid communication with said high pressure chamber by way of said hole of said partition wall;

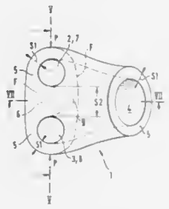
a separator provided in said plunger assembly and dividing said reservoir chamber into two spaces, an outer surface of said separator and a substantially opposed inner surface of said plunger assembly together defining a space which converges in the direction of said oil outlet port; and

second valve means provided in said plunger assembly in fluid communication with said reservoir chamber and said oil outlet port for allowing oil introduced through said oil introducing port and said oil supply inlet to flow therethrough to be ejected from said oil outlet port but preventing outside air from being drawn into said reservoir chamber through said oil outlet port when the pressure of the outside air exceeds the pressure of the introduced oil.

4,840,154
TUBULAR CERAMIC BODY FOR GAS PASSAGES IN CYLINDER HEAD OF INTERNAL COMBUSTION ENGINE

Dieter Fingerle, Hochdorf, and Wolf-Dieter Gundel, Pliezhausen-Ruebgarten, both of Fed. Rep. of Germany, assignors to Feldmühle Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 8, 1988, Ser. No. 153,132
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1987, 3706208
Int. Cl.[4] F01N *7/14, 7/16, 7/18*
U.S. Cl. 123—193 H 7 Claims

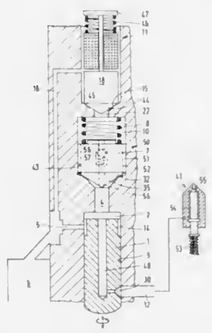


1. A tubular ceramic body for gas passages in a cylinder head of an internal combustion engine, comprising a tubular piece having an opening; two separate tubular portions each having an end side and provided with an opening at said end side, said tubular portions merging into said tubular piece in a transition region; and a connection provided between said tubular portions at least in said transition region of said tubular portions into said tubular piece, said ceramic body being formed as a one-piece member produced in a single sintering process from a single material, and said connection of said tubular portions being formed by a common wall.

4,840,155
FUEL INJECTION PUMP

Anton Karle, Leonberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 27, 1988, Ser. No. 187,082
Claims priority, application Fed. Rep. of Germany, May 11, 1987, 3715614
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—300 11 Claims



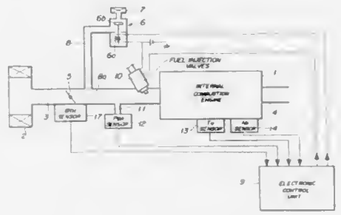
1. In a fuel injection pump for internal combustion engines, comprising housing means defining a pump working chamber; at least one pump piston movably guided in said working chamber; a fuel injection valve; means to connect said chamber

to said fuel injection valve during an advancement stroke of said pump piston to open or close said fuel injection valve, said housing means including a first unloading passage connected to said chamber, said housing means further including an unloading chamber connectable to said first unloading passage, and a second unloading passage connected to said unloading chamber to unload the latter; a controlling member controlling said first unloading passage to close or open the latter; a restoring spring positioned in said unloading chamber and biasing said controlling member in a direction of closing, the improvement comprising said first unloading passage having a valve seat with which said controlling member cooperates as a valve closing member, said controlling member being formed so that an opening pressure thereof is higher than the opening pressure of said fuel injection valve, said valve seat and said second unloading passage being connected with one another in an unthrottled manner; and a further valve operating so that in a first operating range said second unloading passage is open at the beginning of the advancement stroke of said pump piston by said further valve enabling a pre-injection of fuel, closed after opening of said controlling member for starting a main fuel injection and again opened for ending at the beginning of the advancement stroke of said pump piston for starting a fuel injection without preinjection and finally opened again for ending the fuel injection.

4,840,156
INTAKE AIR QUALITY CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES AT TERMINATION OF FUEL CUT OPERATION

Akihiro Yamato, Shiki, and Makoto Hashiguchi, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 615,050, May 29, 1984, abandoned. This application Dec. 24, 1987, Ser. No. 139,068
Claims priority, application Japan, Jun. 16, 1983, 58-108239
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—339 3 Claims

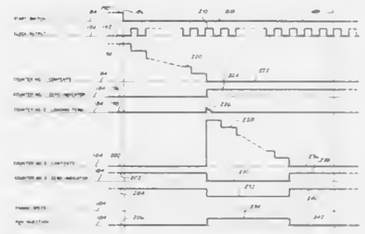


1. A method of controlling the quantity of intake air being supplied to an internal combustion engine, said engine having an intake passage, a throttle valve arranged in said intake passage, and means for increasing the quantity of intake air being supplied to said engine by a required amount in response to operating conditions of said engine, said method comprising the steps of: (a) interrupting the fuel supply to said engine at deceleration of said engine with said throttle valve fully closed; (b) determining whether or not a predetermined condition that the engine rotational speed is lower than a predetermined low value that is higher than a normal idle speed of the engine is satisfied for terminating the interruption of the fuel supply to said engine, which is carried out at deceleration of said engine with said throttle valve fully closed; (c) detecting a rate of decrease in the rotational speed of said engine; (d) comparing the detected rate with a predetermined value; and (e) increasing the quantity of fuel being supplied to said engine for a limited period of time, and at the same time actuating said intake air quantity increasing means for said limited period of time to supply a supplementary quantity of intake air, immediately after it is determined that said predetermined condition is satisfied, while at the same time the detected rate of decrease is larger than said predetermined value.

4,840,157
ENGINE SPEED CONTROL CIRCUIT FOR DRAG RACING

Robert E. Furrow, P.O. Box 338, Hinton, Okla. 73047

Filed May 20, 1988, Ser. No. 196,744
Int. Cl.[4] F02D *31/00*
U.S. Cl. 123—352 16 Claims



1. A circuit for temporarily reducing the engine speed of a racing car during a drag race, comprising:

a clock for providing a sequence of timed electrical pulses during the drag race;

a first down counter electrically connected to the clock for counting down from a first preselected number entered into the first down counter in response to pulses provided by the clock;

a second down counter electrically connected to the clock for counting down from a second preselected number entered into the second down counter in response to pulses provided by the clock wherein the second down counter is characterized as having a zero count indicator terminal providing the alternative voltage states corresponding to a counting and non-counting condition of the second down counter;

starting means for initiating a countdown of the first down counter from the first preselected number simultaneously with the start of a drag race;

means electrically connecting the down counters for loading the second preselected number into the second down counter at such time that the count in the first down counter reaches zero;

speed adjustment means for adjusting the speed of the racing car engine in response to a speed control signal; and

means, connected between the speed adjustment means and the zero count indicator terminal of the second down counter, for providing the speed control signal in response to a selected voltage state at said zero count indicator terminal.

4,840,158
IGNITION TIMING CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Satosi Komurasaki, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1988, Ser. No. 187,463
Claims priority, application Japan, Apr. 30, 1987, 62-109329
Int. Cl.[4] F02P *5/14*
U.S. Cl. 123—419 4 Claims

1. An ignition timing control apparatus for an internal combustion engine which comprises:

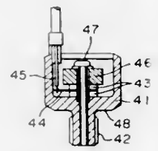
a non-resonance type acceleration sensor which has a piezoelectric element as a vibration detecting element for said engine and a metric screw portion to be engaged with the same;

a frequency filter having its central frequency in a range of from 10 KHz to 20 KHz and its band width of 1 KHz or higher, which selectively detects a knocking signal component contained in an output from said sensor;

a gate means for interrupting a noise which disturbs detection of the knocking signal contained in an output signal from said frequency filter;

a noise level detector for detecting, from an output from said gate means, the level of a mechanical vibration noise of the engine other than the knocking signal;

a comparing and integrating means for integrating a pulse signal obtained by comparing an output voltage from said noise level detector with an output voltage from said gate means;



a rotation signal generator for generating an ignition signal in response to a predetermined ignition advance angle characteristic;

a waveform-shaping circuit for shaping the waveform of the output of said rotation signal generator and for controlling the closing angle of an ignition coil;

a phase shifter for shifting with delay of time the output signal of said waveform-shaping circuit in response to the output of said comparing and integrating means so that a switching circuit for turning-on and off said ignition coil is actuated; and

a gate timing controller triggered by the output of said phase shifter so as to interrupt the ignition noise by closing the gate of said gate means for a predetermined time from the time of ignition.

4,840,159

APPARATUS FROM CONTROLLING AMOUNT OF INTAKE AIR TO ENGINE

Osamu Matsumoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 161,051

Claims priority, application Japan, Feb. 26, 1987, 62-29303; Feb. 26, 1987, 62-29304

Int. Cl.[4] F02M *23/00*

U.S. Cl. 123—585 **4 Claims**

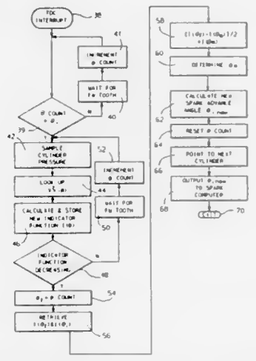
1. An apparatus for controlling the amount of intake air to an engine, comprising:

a throttle body forming a part of an air intake passage for said engine, said throttle body being oriented so that the inside of said throttle body defines a horizontal passage;

a throttle valve disposed in said throttle body;

a second valve coupled to the bottom of said throttle body and acting to control the amount of auxiliary air flowing through a bypass passage which bypasses said throttle valve; and

at least one guide passage formed in said throttle body and connected with said bypass passage, said guide passage



having an open end in said horizontal passage disposed above the center line of said horizontal passage.

4,840,160

VALVE CONTROL DEVICE

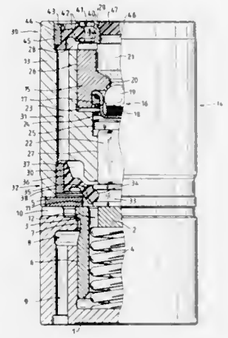
Michael Zipprath, Herzogenaurach, and Dieter Schmidt, Nuremberg, both of Fed. Rep. of Germany, assignors to INA Walzlager Schaeffler KG, Fed. Rep. of Germany

Filed Feb. 11, 1988, Ser. No. 154,802

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1987, 3704743

Int. Cl.[4] F02M *38/00*

U.S. Cl. 123—467 **8 Claims**



1. A control device for a valve arranged in a fuel injection line of an internal combustion engine and closable to build up an injection pressure at an injection nozzle wherein a play adjusting element is arranged between a valve body of the valve and a drive element, characterized in that the adjusting element **(14)** is provided with two pistons **(15,22)** guided in a housing **(13)**, the first piston **(15)** is acted upon by the drive element and the second piston **(22)** acts upon the valve body, and the housing **(13)** accommodates between the pistons **(15,22)** an oil-containing pressure chamber **(23)** which is fluidly isolated in relation to the valve **(1,2)** and accommodates a pressure spring **(24)** acting upon pistons **(15,22)**.

4,840,161

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

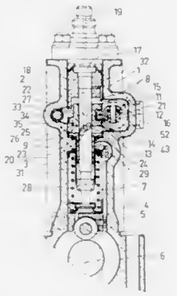
Wolfgang Eckell, Leonberg; Josef Guentert, Gerlingen; Walter Haefele, Fellbach; Manfred Kraemer, Schwieberdingen; Uwe Kuhn, Riederich, and Johann Warga, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 29, 1988, Ser. No. 213,044

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724662

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—500 **20 Claims**



1. A control device for axial displacement of at least one control slide relative to a pump piston in a fuel injection pump for internal combustion engines in which said control device comprises:

a rotatable shaft,

a connecting element secured to said rotatable shaft,

an adjusting means disposed on said connecting element secured to said rotatable shaft, said adjusting means including a radially projecting cylindrical stud,

a slide shoe secured on said cylindrical stud of said adjusting means free of any axial displacement, said slide shoe engages a cross groove disposed on said control slide in order to convert a rotational motion of said rotating shaft into a reciprocating motion of said control slide,

said cylindrical stud including a free end that forms an enlarged head **(44, 144, 244)** which engages one face end of said slide shoe **(43, 143, 243)** from behind to provide very little axial play by which said slide shoe is secured in its working position.

4,840,162

FUEL INJECTION PUMP

Andre Brunel, St Genis Laval, France, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

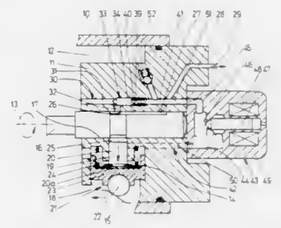
Filed May 10, 1988, Ser. No. 197,072

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719831

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—506 **20 Claims**

1. A fuel injection pump for internal combustion engines having a pump interior, at least one pump piston defining a pump work chamber, said pump piston adapted to be driven reciprocatingly to execute an intake stroke and a supply stroke, wherein upon said intake stroke said pump work chamber is filled with fuel via an inflow line from a fuel supply chamber in said pump interior, and upon the supply stroke the fuel is pumped out of the pump work chamber to an adjoining injection nozzle, an electric switching valve which controls a duration of pumping, said electric switching valve being disposed in a relief line leading from said pump work chamber to a relief chamber in said pump interior, and said switching valve on closing defines the supply onset and by opening defines the end of supply, a non-return valve **(33; 133; 233)** having an opening direction toward said pump work chamber **(25)** being disposed in an inflow line **(30)** between said fuel supply chamber **(12)** and said pump work chamber **(25)**, said non-return valve including a valve element, a valve closing spring **(40)** for urging said valve element **(37)** in a closing direction and a fuel-fillable



control chamber **(39)** adapted, when filled with fuel, to lock said valve element **(37)** in its closing position, said control chamber **(39)** communicating with a section **(52)** of a relief line **(42)** located between said switching valve **(43)** and the relief chamber in the pump interior, and said relief line **(42)** is closed off toward the relief chamber **(12)** by a check valve **(52)** so oriented that its opening direction is toward the relief chamber.

4,840,163

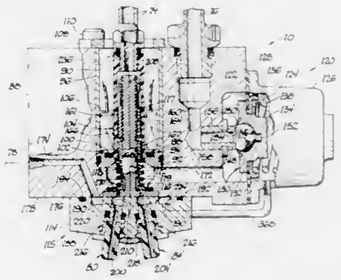
ELECTROMAGNET, VALVE ASSEMBLY AND FUEL METERING APPARATUS

Daniel E. Alsobrooks, Flat Rock; Hansueli Bart, Mt. Clemens; Richard Chauvin, Clawson; Thomas A. Horn, East Detroit; John H. Merte, Sterling Heights, all of Mich.; Gerhard Mesenich, Bochum, Fed. Rep. of Germany, and Donna M. Mitts, Canton Township, Wayne County, Mich., assignors to Colt Industries Inc., New York, N.Y.

Filed Jan. 8, 1987, Ser. No. 1,420

Int. Cl.[4] F02M *39/00*; **F16K** *11/14*

U.S. Cl. 123—533 **59 Claims**



1. An improvement in a fuel supply system of an internal combustion engine, having a single fuel metering valve assembly supplying fuel to a plurality of cylinders of said engine, each of said cylinders having intake port means at one end of an individual fuel line connected for the flow of fuel thereinto, the opposite end of each fuel line being operatively connected to the fuel metering valve assembly, the fuel metering valve assembly having a number of fuel discharge passages corresponding in number to the number of fuel lines, air chamber means continguous to said discharge passages for receiving superatmospheric air therein, and means connecting respective ones of said fuel lines to respective ones of said discharge passages across said air chamber means and said superatmos-

pheric air therein, the fuel discharged from said fuel discharge passages and said superatmospheric air combining to form a fuel-air mixture of atomized fuel and air, whereby said fuel-air mixture flows through the fuel lines for an equal distribution to each cylinder, wherein said improvement comprises said fuel metering valve assembly comprising electromagnetic motor means, wherein said electromagnetic motor means comprises stationary magnetic body means at least in part comprised of magnetic material, said magnetic body means being formed as to have an axis of revolution and further comprising transverse wall means, pole piece means situated as to be centrally of and stationary with respect to said magnetic body means, electrical coil means effective upon energization thereof to create a magnetic flux loop, armature means, said transverse wall means extending generally transversely of said axis of revolution and effective to at least in part receive said armature means, said armature means being moved into contact with said pole piece means upon energization of said coil means, said magnetic body means and said pole piece means functioning to provide a path for said flux loop about said electrical coil means upon energization thereof, wherein said path of said flux loop is comprised of a non-moving portion of said electromagnetic motor means and of a moving portion of said electromagnetic motor means, wherein said moving portion of said electromagnetic motor means comprises said armature means, wherein said non-moving portion of said electromagnetic motor means comprises said pole piece means and said stationary magnetic body means, and additional means forming a magnetic interruption in said non-moving portion of said electromagnetic motor means for enhancing flux leakage thereby reducing the flux decay time in said flux loop, wherein said armature means comprises a valving member for alternatingly permitting and terminating the flow of said fuel through said fuel discharge passages, and wherein said additional means forming said magnetic interruption comprises gap-forming means of non-magnetic material in said non-moving portion, and wherein said gap-forming means of non-magnetic material is at most only partly in said transverse wall means.

4,840,164

METHOD AND APPARATUS FOR SUPERCHARGING INTERNAL COMBUSTION ENGINES

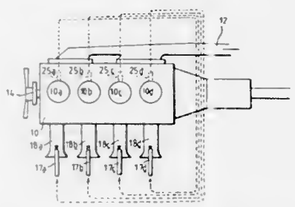
Bryan N. V. Parsons, Stoney Stanton, England, assignor to Jaguar Cars Limited, England

Filed Jan. 19, 1988, Ser. No. 145,059

Claims priority, application United Kingdom, Jan. 24, 1987, 8701578

Int. Cl.[4] F02B *29/02, 47/08*

U.S. Cl. 123—559.1 11 Claims



1. A method of supercharging a multi-cylinder internal combustion engine comprising, tapping exhaust gases from each of the cylinders of the engine towards the end of its expansion stroke to provide a high velocity pulsed jet of gas, injecting the high velocity pulse jet of gas from one cylinder into a mixing chamber connected to an inlet port of another cylinder, said mixing chamber containing air so that the momentum exchanged between the jet of gas and the air will accelerate the air to provide a pulsed induction charge of the air, said pulsed induction charge being delivered to said other cylinder towards the end of the induction stroke of said other cylinder.

4,840,165

CONTINUOUS SPARK ELECTRONIC IGNITER

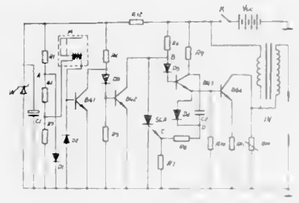
Wang Hua, Chengdu, China, assignor to Chengdu Aircraft Corporation, Chengdu, China

Filed Nov. 16, 1987, Ser. No. 121,213

Claims priority, application China, Nov. 26, 1986, 86107987

Int. Cl.[4] F02P *3/04, 7/067*

U.S. Cl. 123—606 6 Claims



1. A continuous spark electronic ignition, comprising:

a. magnetic pulse generator means for providing an electric pulse signal in accordance with the rotational position of an engine crank,

b. signal amplifying circuit means having an input connected to an output of said magnetic pulse generator means for amplifying said electric pulse signal,

c. voltage stabilizing circuit means having an input connected to a power supply and an output connected to said magnetic pulse generator means and said signal amplifying circuit means for providing stabilized input voltages to said magnetic pulse generator means and said signal amplifying circuit means, and

d. continuous pulse generating circuit means having an oscillation control input connected to an output of said signal amplifying circuit means for generating a corresponding continuously pulsed output voltage signal in response to each pulse input from said signal amplifying circuit means,

said magnetic pulse generator means including a permanent magnet, a first magnetic flux conductor and a second magnetic flux conductor connected respectively to opposite poles of said permanent magnet and defining a normally closed first magnetic circuit and a normally open second magnetic circuit, said first magnetic circuit being closed through a magnetic flux attracting gap of from about 0.1 mm to about 5 mm defined between the closest parts of said first and second magnetic flux conductors, said second magnetic circuit having a magnetic detecting surface spaced from said first magnetic circuit, and a coupling coil wound about a portion of one of said first and second magnetic flux conductors in said second magnetic circuit and between said first magnetic circuit and said magnetic detecting surface,

said continuous pulse generating circuit means including directly coupled two-stage transistor switching circuit means having an output connected to an ignition coil and a resistance connecting the emitter of a second stage transistor of said switching circuit means to ground, oscillation maintaining and control circuit means including a three-terminal semiconductor switching device having a controlled-current input connected to a first stage transistor bias circuit of said switching circuit means for causing said switching circuit means to oscillate between enabled and disabled states, trigger signal circuit means having an input connected to the emitter of one of said first and second stage transistors of said switching circuit means and an output connected to a control input of said three-terminal semiconductor switching device for causing said three-terminal semiconductor switching device to conduct and disable said switching circuit means and to stop conducting after said switching circuit means is disabled, and trigger signal continuous current circuit means having an input connected to the collector of said first stage transistor of said switching circuit means and an output connected to an input of said trigger signal circuit means for causing said three-terminal semiconductor switching device to remain conductive for a period of time after said switching circuit means is disabled.

4,840,166

SHOCK WAVE SOURCE WITH INCREASED DEGREE OF EFFECTIVENESS

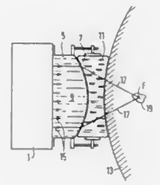
Georg Naser, Zirndorf; Helmut Reichenberger, Eckental, and Hubert Schwark, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 26, 1987, Ser. No. 31,334

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1986, 3610837

Int. Cl.[4] A61B *17/22*

U.S. Cl. 128—24 A 3 Claims



1. A shock wave source, particularly useful for a lithotriptor, comprising:

a pressure source for the generation of a pressure wave pulse having a direction of propagation;

a coupling body having an output adapted to be coupled to a body of a patient, said coupling body comprising material having an acoustic impedance value matched to that of the body of the patient;

a seal diaphragm for acoustically coupling said pressure wave pulse into said coupling body;

said seal diaphragm having a front wall disposed at a distance, in the direction of propagation of the pressure wave pulse, from the pressure source and in contact with said coupling body;

said seal diaghragm and said pressure source enclosing a space containing a substance having a B/A nonlinearity parameter value higher than that of water and an acoustic impedance value which is less than or equal to that of water;

said substance being acoustically coupled to both the pressure source and the seal diaphragm; and

said front wall of said seal diaphragm being shaped so as to cause focusing of the pressure wave pulse generated by the pressure source.

4,840,167

RESPIRATOR AND A METHOD OF UTILIZING THE RESPIRATOR TO PROMOTE BLOOD CIRCULATION

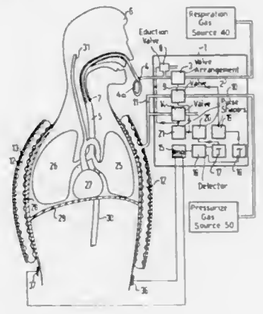
Sven G. Olsson, Soedra Sandby, and Björn Jonson, Lund, both of Sweden, assignors to Siemens Elema AB, Sweden

Division of Ser. No. 908,949, Sep. 16, 1986, Pat. No. 4,676,232, Continuation of Ser. No. 552,776, Nov. 17, 1983, abandoned. This application Apr. 15, 1987, Ser. No. 38,494

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1982, 3242814

Int. Cl.[4] A61H *31/00*

U.S. Cl. 128—28 14 Claims



1. A respirator connectable to the lungs of a patient comprising:

means for applying a respiratory gas to the lungs of said patient;

means for restricting expansion of a substantial portion of the chest and abdomen of the patient by applying a continuous uniform non-deforming, volume limiting force to the chest and abdomen opposing expansion of the chest and abdomen; and

control means for synchronizing the operation of said means for applying a respiratory gas and said means for restricting expansion so that the respiratory gas is applied at a point in the heart cycle of the patient such that the uniform force creates a pressure rise around the heart coinciding with the contraction phase of the heart.

4,840,168

COMBINATION ARM SPLINT AND FINGER SUPPORT MEANS

Robert Lonardo, 680 Capri Blvd., Treasure Island, Fla. 33706

Filed Aug. 11, 1988, Ser. No. 231,223

The portion of the term of this patent subsequent to Nov. 8, 2005, has been disclaimed.

Int. Cl.[4] A61F *5/10*

U.S. Cl. 128—77 8 Claims

1. In combination,

a finger support,

a forearm and wrist splint, comprising

an elongated base strip having a longitudinal axis adapted to conform to the underside of a patient's forearm, said base strip having first and second layers, each having forward and rearward ends; said base strip being folded at its upper forward end and extending rearwardly with said second layer dwelling coextensively with said first layer,

a hand support portion formed at said forward end of said first layer,

connecting means detachably connecting the rearward ends of said first and second layers,

a slot means formed between said first and second layers adjacent said forward ends, said slot means extending transversely with respect to the longitudinal axis of said base strip and being adapted to transversely slidably receive said finger support, and

means for detachably securing said finger support within said slot means.

4,840,169

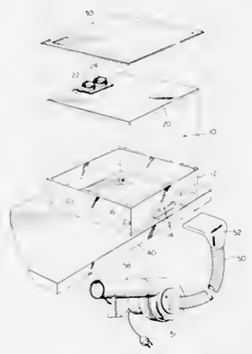
VENTILATION SYSTEM FOR ARTISTS

Fred Folsom, 908 Hudson Ave., Takoma Park, Md. 20912

Continuation of Ser. No. 929,836, Nov. 13, 1986, abandoned. This application Dec. 22, 1987, Ser. No. 136,521

Int. Cl.[4] A61B *19/00*

U.S. Cl. 128—863 **6 Claims**



1. A paint ventilation enclosure for an artist when working with paints and solvents, said paint ventilation enclosure comprising:

a transparent housing having a base and sidewalls, said housing being transparent to aid in viewing paint located in said housing through said sidewalls, said housing being normally open at its top to communicate freely with the atmosphere and to gain access to paints located in said housing,

a transparent palette located in said housing for holding paints, said palette being continuously flat between said sidewalls of said housing,

means for supporting said palette above said base of said housing and below the top of said housing,

peripheral edges of said palette being spaced inwardly from said sidewalls of said housing to allow free passage of air from above said palette to below said palette in a space defined between said peripheral edges and said sidewalls,

vent means located in a sidewall of said housing above said base and below said palette for drawing vapors and fresh atmosphere downwardly from above said palette and evacuating the vapors and atmosphere out of said housing, and

lid means removably mounted on top of said housing for allowing free communication of atmosphere with the interior of said housing when access to the interior of said housing is required in a first position of said lid and for sealing the interior of said housing when said lid is in a second position to prevent escape of vapors from said housing.

4,840,170

SELF-RESCUER APPARATUS

Klaus-Dieter Dahrendorf; Volker Huennebeck, and Wilfried Hoffman, all of Berlin, Fed. Rep. of Germany, assignors to Auergesellschaft GmbH, Berlin, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 824,775, Jan. 30, 1987, abandoned. This application Jul. 13, 1987, Ser. No. 72,526

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1985, 3503628

Int. Cl.[4] A62B *7/08*

U.S. Cl. 128—202.26 **4 Claims**

1. In a self contained personal breathing apparatus for emergency use having a breathing bag with an external surface, the apparatus including a canister, a supply of oxygen-evolving chemical in the canister which is adapted to react with carbon dioxide and water vapor in exhaled breath to generate oxygen and heat as a byproduct, the breathing bag being composed of a flexible material, wherein the a canister is partially disposed therein, said canister including a first port exterior of said bag and a second port in fluid communication with said bag such that the generated oxygen collects therein, a mouthpiece, a breathing tube operably connected between the mouthpiece and the first port, such that exhaled breath is provided to the canister through the breathing tube and oxygen generated in the canister is provided for inhaled breath back through the tube, and carrying strap means to permit portability of the apparatus by a user, the improvement comprising:

a pair of spaced part loops that are aligned and affixed on the external surface of the breathing bag;

an essentially flat first plate having a substantially rectangular configuration with a first and second edge, said first and second edge being essentially parallel and opposite each other on the plate;

a first flanged protrusion affixed to the first edge, and a second flange protrusion affixed to the second edge and oppositely affixed to the first flanged protrusion, said first and second flanged protrusions being sized to removably engage with the loops on the breathing bag so the first plate is held by the loops and rests against the external surface of the breathing bag;

a second essentially flat plate also having a substantially rectangular configuration with a first and second edge;

a separation means disposed normal to and interposed transversely between said first and second plates to maintain a passage therebetween so air can flow therethrough and provide thermal insulation due to convection between the first plate and the second plate so the amount of heat byproduct is minimized from reaching the second plate and thus a user is protected therefrom, the second plate positioned by the separation means so it is parallel to the first plate with the first edge of the first plate essentially aligned and parallel to the first edge of the second plate; and

a first wall and a second wall being substantially parallel to each other, said first wall joining the first edge of the first plate to the first edge of the second plate, said second wall joining the second edge of the first plate with the second edge of the second plate to define a substantially rectangular configuration for the passage within the separation means, each wall hingeably connected along their respective edges to the respective plates.

4,840,171

OXYGEN SUPPLY UNIT HAVING AN OXYGEN GENERATOR

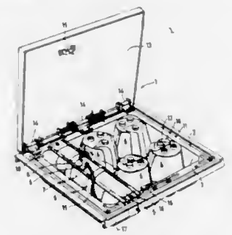
Holmer Röhling, Reinfeld; Frank Schulz, Lübeck, and Siegfried Preininger, Stockelsdorf, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Jun. 10, 1988, Ser. No. 204,873

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1987, 3719427

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—204.18 **5 Claims**



1. An oxygen supply unit comprising:

an openable housing having a rectangular reinforcing frame having four interconnected side walls;

a strut defining a longitudinal axis and having first and second ends;

releasable attachment means for releasably attaching said first and second ends of said strut to respective ones of two of said side walls of said reinforcing frame;

at least one oxygen mask disposed in said housing;

an elongated oxygen generator for supplying oxygen to said oxygen mask when said oxygen supply unit is in use;

said oxygen generator defining a longitudinal axis; and,

holding means for holding said generator only to said strut so as to cause said axes to extend in the same direction and so as to prevent vibration from being transmitted directly from said generator to said housing.

4,840,172

DEVICE FOR POSITIONING AN ENDOTRACHEAL TUBE

Scott D. Augustine, 4761 Olive St., San Diego, Calif. 92105, and Douglas J. Augustine, Box 37, Sandstone, Minn. 55072

Continuation of Ser. No. 904,011, Sep. 4, 1986, abandoned. This application Nov. 6, 1987, Ser. No. 119,300

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—207.14 **9 Claims**

1. A device for positioning an endotracheal tube in a trachea of a patient to be intubated, comprising:

an elongate flexible positioning member with an axis, a closed distal end and a proximal end;

three elongated flexible extensions attached to said distal end and forming a tripodal structure with a vertex attached to and opening away from said distal end, said tripodal structure having a base which describes a circle having a predetermined diameter which is at least equal to the trachea diameter of the trachea of a patient to be intubated; and

bias means in each of said extensions and acting solely between said extension and said distal end for moving said extension from a closed position along said axis, through

an angle of less than 90°, to a respective leg position in said tripodal structure and for spring-biasing said extension to said leg position.

4,840,173

ENDOTRACHEAL TUBE COMBINATION

John W. Porter, III, 6224 NE. Davis St., Portland, Oreg. 97213

Filed Feb. 22, 1988, Ser. No. 158,634

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—207.15 **3 Claims**

1. An endotracheal tube for ventilating the lungs of a patient comprising; a ventilation tube adapted to extend from a gas source into and through the mouth of the patient, past the epiglottis into the trachea and past the vocal chords to end at a position above the carina, an inflatable cuff surrounding the tube inwardly of the extended end and when in position in the trachea, located between the carina and vocal cords, air injection means connected to the cuff for injecting air into the cuff to expand the cuff against the trachea wall for sealing off passage of air around the cuff, and a suction tube defining a suction passage, said suction tube independent of the ventilation tube at its exterior end and merging with the ventilation tube to form a near-circular configuration having independent dual passages and adaptable for passage through the epiglottis and vocal cords in the trachea, said suction passage being noncommunicative with the ventilation passage, said suction tube terminating at an interior end juxtaposed to the inflated cuff to provide an open passage to the space immediately above the cuff, said suction tube end having multiple openings in communication with fluids that pool around the cuff so as not to be blocked by the cuff, said cuff has a section that is immediately adjacent to the suction tube end that is less flexible than the remainder of the inflatable cuff, said interior end of said suction tube having an end opening positioned

adjacent said cuff and juxtaposed the inflated portion of said cuff whereby suction from the suction passage acting against said cuff section is inhibited from closing the openings thereof, and said suction tube having an opposite exterior end for projection out of the patient's mouth and separated from the ventilation tube, and connection means for connecting the suction tube to a source of negative air pressure.

4,840,174

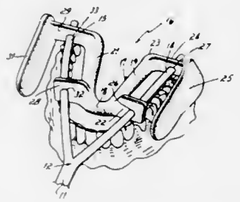
METHOD OF LASER TREATMENT OF CANCERIZATION OF THE ORAL CAVITY

Jack L. Gluckman, Cincinnati, Ohio, assignor to University of Cincinnati, Cincinnati, Ohio

Division of Ser. No. 879,401, Jun. 27, 1986, Pat. No. 4,736,745. This application Dec. 22, 1987, Ser. No. 136,556

Int. Cl.[4] A61B *17/36*

U.S. Cl. 128—303.1 **11 Claims**



1. A method of treating field cancerization of the oral cavity comprising sensitizing premalignant and malignant tissue to a destructive light;

non-selectively irradiating substantially all of the oral cavity with said destructive light by emitting said destructive light through at least one optical diffuser positioned within said oral cavity said destructive light being of an intensity and duration effective to damage said premalignant and malignant tissue.

4,840,175

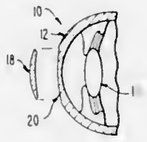
METHOD FOR MODIFYING CORNEAL CURVATURE

Gholam A. Peyman, 535 N. Michigan Ave., Chicago, Ill. 60611

Continuation of Ser. No. 946,633, Dec. 24, 1986, abandoned, which is a continuation of Ser. No. 760,080, Jul. 29, 1985, abandoned. This application Jan. 22, 1988, Ser. No. 148,170

Int. Cl.[4] A61N *5/06*

U.S. Cl. 128—303.1 **5 Claims**



1. A method of modifying the curvature of a patient's live cornea comprising the steps of

removing a thin layer from the front of the live cornea and thereby exposing an internal surface thereof,

directing a laser beam onto the exposed internal surface in a predetermined pattern to ablate, and therefrom remove, a three-dimensional portion thereof, and

replacing the originally removed thin corneal layer back onto the ablated internal surface of the live cornea from which the thin corneal layer was removed,

the removing, directing and replacing steps taking place without freezing the internal surface or the thin layer.

4,840,176

TREATING INSTRUMENT FOR USE WITH AN ENDOSCOPE

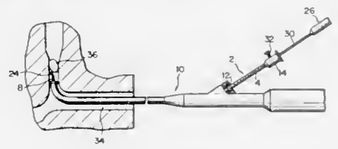
Kunio Ohno, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1987, Ser. No. 116,448

Claims priority, application Japan, Nov. 6, 1986, 61-264410

Int. Cl.[4] A61B *17/36*

U.S. Cl. 128—303.14 **17 Claims**



1. A treating instrument for use with an endoscope, comprising;

a flexible sheath having a distal end portion and a proximal end portion, said sheath having an opening formed at the distal end portion;

a treating element having a distal end portion and a proximal end portion and accommodated slidably in said sheath, said treating element having directionality and being capable of extending through the opening of said sheath and being used from specific directions to reach the treated part;

an elongated member connected at its one end portion to the proximal end portion of said treating element and inserted slidably in said sheath;

operating means attached to the other end portion of said elongated member, arranged at the rear of the proximal end portion of said sheath and used to move forward and backward and rotate said treating element; and

stopping means for limiting the rotating angle of said treating element when said treating element is rotated by said operating means.

4,840,177

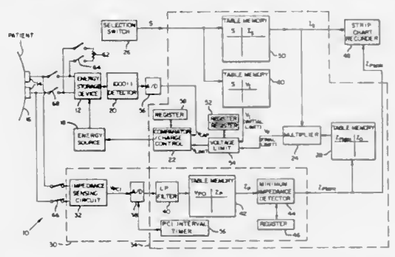
CURRENT-BASED DEFIBRILLATOR

Francis M. Charbonnier, McMinnville; Martin G. Rockwell, Sherwood, and Carl E. Benvegar, Corvallis, all of Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 3, 1987, Ser. No. 117,125

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—419 D **9 Claims**



1. A defibrillator system for delivering an electrical shock to a patient to restore normal cardiac rhythm comprising;

a capacitor for accumulating an electrical charge;

first and second electrodes for applying an electrical shock from the capacitor to the patient;

charging means for charging the capacitor;

detector means for detecting the charge accumulated by the capacitor;

impedance measuring means for determining a transthoracic impedance of the patient, said impedance measuring means including means for sampling the patient's transthoracic impedance periodically;

current establishing means for establishing a fixed magnitude of current which is desired to be delivered to the patient irrespective of the patient's transthoracic impedance; and

circuit means cooperating with the charging means, detector means, impedance measuring means and current establishing means for discontinuing the charging of the capacitor when the accumulated charge is sufficient to deliver the selected current to a patient having the measured transthoracic impedance, said circuit means including processing means for determining the charge accumulation required to deliver the desired current to a patient having a transthoracic impedance equal to the lowest value of transthoracic impedance sampled.

4,840,178

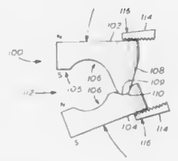
MAGNET FOR INSTALLATION IN THE MIDDLE EAR

Jorgen Heide, Cordoba; Timothy D. Gooch, Memphis; Anthony D. Prescott, Arlington, all of Tenn., and Dennis Bojrab, Bloomfield Hills, Mich., assignors to Richards Metal Company, Memphis, Tenn.

Continuation-in-part of Ser. No. 837,708, Mar. 7, 1986. This application May 15, 1987, Ser. No. 50,940

Int. Cl.[4] H04R *25/00*

U.S. Cl. 128—419 R **7 Claims**



1. A magnet assembly for coupling with the magnetic coil of a hearing said, comprising:

a first separate section sized and shaped to partially surround at least a portion of a bone in the ossicular chain;

a second separate section sized and shaped to cooperate with the first section and clamp onto said portion of a bone in the ossicular chain,

at least one of the first and second sections comprising a magnet and the other section formed of material that is magnetically attracted to the magnet.

4,840,179

COMBINED SENSOR FOR THE TRANSCUTANEOUS MEASUREMENT OF OXYGEN AND CARBON DIOXIDE IN THE BLOOD

Georg J. Ullrich, Freiburg im Breisgau, Fed. Rep. of Germany, assignor to Hellige GmbH, Freiburg, Fed. Rep. of Germany

Filed Nov. 17, 1987, Ser. No. 121,713

Claims priority, application European Pat. Off., Nov. 17, 1986, 86115941.6

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—633 **5 Claims**

1. A sensor element for simultaneous, continuous, transcutaneous measurement of the partial pressure of carbon dioxide and of the oxygen saturation in the blood of a living body, said sensor element comprising:

a housing having a planar measuring surface;

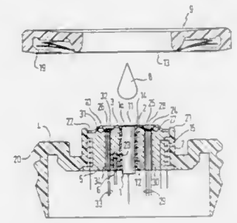
a membrane, permeable to carbon dioxide, sealably disposed about the measuring surface, said membrane having inner and outer surfaces;

a reference electrode and a measuring electrode embedded in the measuring surface and electrically insulated each from the other;

two light emitting diodes embedded in the measuring surface each emitting light of different wave length and so positioned that the emitted light beams do not mutually interfere;

photoelectric receptor means embedded in the measuring surface; and

a thin layer of electrolyte disposed between the measuring surface and the inner surface of the membrane;



whereby when the outer surface of the membrane is brought in contact with the skin, carbon dioxide diffuses through the membrane changing the pH of the electrolyte solution which change in pH is sensed by the reference electrode and the measuring electrode which change in pH is related to the partial pressure of carbon dioxide and whereby the light emitted from the diodes after diffusion through the skin is detected by the photoelectric receptor means and the oxygen saturation of the blood is determined by the principle of pulse oximetry.

4,840,180

ULTRASONIC DIAGNOSIS APPARATUS FOR MEASUREMENT OF SPEED OF MOVING MEDIUM IN A LIVING BODY

Yukio Ito; Yutaka Sato; Shinji Kishimoto, and Satoshi Tamano, all of Kashiwa, Japan, assignors to Hitachi Medical Corp., Tokyo, Japan

Continuation of Ser. No. 804,608, Dec. 4, 1985, abandoned. This application Feb. 26, 1988, Ser. No. 160,754

Claims priority, application Japan, Dec. 4, 1984, 59-255919

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—661.08 **4 Claims**

1. An ultrasonic diagnosis apparatus comprising:

an ultrasonic probe for transmitting an ultrasonic pulse beam toward a moving medium in a living body at a predetermined time interval Δt defining a constant recurrence

frequency and for receiving the reflected wave as a high frequency signal from a portion of the moving medium at any given depth in the living body;

converting means for mixing the received high-frequency signal with a set of complex reference signals having a frequency n times (n: an integer) as high as the recurrence frequency of the transmitted ultrasonic pulse beam and having a complex relation therebetween, thereby converting the received high-frequency signal into complex signals including a sine component signal and a cosine component signal;

operating means including a speed operating circuit for computing a moving speed of the moving medium at said given depth in the living body on the basis of said complex signals, said speed operating circuit including means for obtaining values a and b of said sine component signal at time t and time $(t+\Delta t)$, respectively, and values c and d of said cosine component signal at said times t and $(t+\Delta t)$, respectively, to compute intensities I_t and $I_{(t+\Delta t)}$ of the received signal represented by equations

$$I_t=(a^2+c^2)^{\frac{1}{2}}$$

and

$$I_{(t+\Delta t)}=(b^2+d^2)^{\frac{1}{2}},$$

for using the computed values of intensities I_t and $I_{(t+\Delta t)}$ to compute angular displacements θ and δ, respectively, by equations

$$\theta = \sin^{-1}\frac{a}{(I_t)}$$

and

$$\delta = \sin^{-1}\frac{b}{(I(t+\Delta t))}$$

and for using the computed values of angular displacements θ and δ and the value of said predetermined time interval Δt to compute a Doppler shift frequency f_d represented by

$$f_d=2\pi\cdot(\delta-\theta)/\Delta t,$$

the moving speed of the moving medium at said given depth in the living body being determined from the computed Doppler shift frequency f_d; and

display means for displaying in real time the moving speed computed by said speed operating circuit.

4,840,181

SPHYGMOMANOMETER ADOPTING RECOGNITION OF KOROTKOFF SOUNDS

Keiji Yamaguchi, Shimizu, Japan, assignor to Terumo Corporation, Tokyo, Japan

Filed Apr. 1, 1987, Ser. No. 32,555
Claims priority, application Japan, Apr. 3, 1986, 61-75452
Int. Cl.⁴ A61B 5/02
U.S. Cl. 128—680 **8 Claims**

1. A sphygmomanometer, comprising:

pressurizing means for applying variable pressure to a blood vessel;

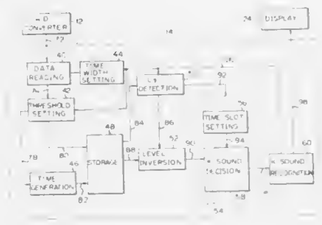
oscillation detecting means for detecting oscillation produced from the blood vessel while pressurized by said pressurizing means;

pressure sensing means for sensing pressure being applied to the blood vessel;

Korotkoff sound recognizing means for recognizing Korotkoff sounds out of the oscillation detected by said oscillation detecting means;

blood pressure computing means for computing blood pressure from the pressure applied to the blood vessel as detected by said pressure detecting means when said Korotkoff sound recognizing means has recognized one of the Korotkoff sounds; and

time width setting means for setting a delay period of time based on the amplitude of a most recent one of the Korotkoff sounds recognized by said Korotkoff sound recognizing means and for inhibiting an output from said oscillation detecting means to said Korotkoff sound recognizing means during the delay period, thereby said Korotkoff sound recognizing means being unable to recognize any of the Korotkoff sounds until the delay period of time set by said time width setting means expires.

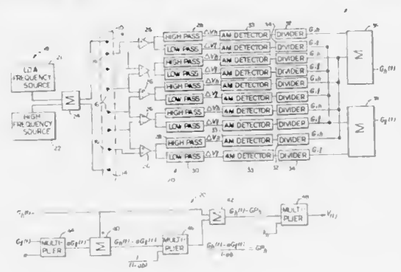


4,840,182

CONDUCTANCE CATHETER

Drew E. Carlson, Providence, R.I., assignor to Rhode Island Hospital, Providence, R.I.

Filed Apr. 4, 1988, Ser. No. 176,924
Int. Cl.⁴ A61B 5/02
U.S. Cl. 128—694 **20 Claims**



1. Conductance catheter-apparatus for measuring the volume of a biological chamber having a wall, said apparatus comprising

a catheter employing a plurality of electrodes along its length, said plurality including outer drive electrodes and intermediate potential sensing electrodes between said outer electrodes,

an alternating current source connected to provide alternating currents at high and low frequencies to said outer drive electrodes, and

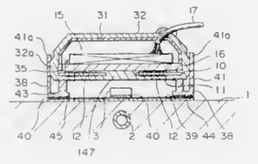
processing means connected to said intermediate potential sensing electrodes for processing potential signals to obtain a high-frequency conductance signal and a low-frequency conductance signal and for using said conductance signals to determine volume in a manner that excludes parallel conductance through the wall of said chamber and surrounding tissue.

4,840,183

ELECTROCARDIOGRAPH

Minoru Takahashi, Funabashi, and Tsutomu Kotani, Kamagaya, both of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jul. 28, 1988, Ser. No. 225,224
Claims priority, application Japan, Aug. 13, 1987, 62-124044[U]; Aug. 13, 1987, 62-124047[U]; Aug. 13, 1987, 62-124049[U]
Int. Cl.⁴ A61B 7/04
U.S. Cl. 128—715 **7 Claims**



1. An electrocardiograph comprising:

a sensor body having a substrate (**16**), a plurality of saturable inductors connected alternately in series mounted on one surface of said substrate radially with a predetermined angular period, each of said saturable inductors having a saturable magnetic core and a coil wound on the core, a process circuit means (**15**) for processing an output of said saturable inductors and mounted on the other surface of said substrate, a lead wire coupled with said process circuit for supplying power to said process circuit and obtaining an output of the process circuit, a shield case (**31**) surrounding said process circuit, and a housing (**32**) for securing the above members having a projection (**32***b*) on an external wall of the housing,

a magnet assembly having a bottom ring (**38***a*) with a plurality of upright wall chips (**41**) positioned perpendicularly at a periphery of said bottom ring, a film (**39**) having a permanent magnet (**3**) at a center of said film attached to said bottom ring, each of said wall chips having an extreme end and jaws at the extreme end so that each said jaw engages detachably with said projection (**32***b*) of the housing (**32**), and a plurality of posts (**43**) fixed to said bottom ring (**38**) so that it touches with said sensor body when it is engaged with the magnet assembly, and said magnet is positioned close to said saturable inductors,

wherein the improvements comprise in that at least one of said jaws (**141***a*) on the wall chips (**41**) and said projection (**32***b*) on said housing (**32**) has a slanted surface which engages with said projection (**32***b*) or said jaw (**141***a*).

4,840,184

SECOND METHOD FOR USING CANNULA INCLUDING A VALVE STRUCTURE AND ASSOCIATED INSTRUMENT ELEMENTS

Rakesh K. Garg, R.R. #1, Box 3032, Lafayette, N.J. 07848

Continuation-in-part of Ser. No. 97,098, Sep. 16, 1987. This application Jul. 6, 1988, Ser. No. 215,830
Int. Cl.⁴ A61B 10/00
U.S. Cl. 128—753 **1 Claim**

1. A method for penetrating external body tissue and for taking a sample of internal body tissue being located below such external body tissue, said method comprising the steps of:

a. penetrating such external body tissue with a cannula-stylet combination, said combination comprising an outer hollow cannula and an inner solid stylet; said cannula including a valve structure, a proximal end portion, and a distal end portion; said cannula distal end portion being longer than said cannula proximal end portion and said valve structure combined; said cannula distal end portion further including a symmetrically tapered circular sharp edge; said stylet including a proximal end portion and a distal end portion; said stylet distal end portion further including a location surface marker and a symmetrically tapered pointed edge; said valve structure being in the open position and said stylet distal end portion being located just distal to said cannula distal end portion;

b. withdrawing said stylet from said cannula while maintaining said cannula distal end portion located within such internal tissue until said stylet distal end portion location surface marker is located just proximal to said cannula proximal end portion whereby said stylet distal end portion is located just proximal to said valve structure;

c. placing said valve structure in the closed position;

d. fully withdrawing said stylet from said cannula;

e. inserting an inner hollow needle-syringe combination into said cannula; said needle including a proximal end portion and a distal end portion; said needle proximal end portion further including a location surface marker; said needle distal end portion further including a location surface marker, sharp lateral edge cutting means, and a circular annular surface; said syringe being attached to said needle proximal end portion; wherein said needle distal end portion location surface marker is located just proximal to said cannula proximal end portion whereby said needle distal end portion is located just proximal to said valve structure and within said cannula proximal end portion;

f. placing said valve structure in the open position;

g. inserting said needle until said proximal end portion location surface marker is located immediately adjacent to the cannula proximal end, whereby said needle distal end portion protrudes beyond said cannula distal end;

h. aspirating any fluid being located just proximal to such internal tissue using said syringe being attached to said needle proximal end portion;

i. obtaining a piece of such internal tissue using said needle distal end portion sharp lateral edge cutting means while further aspirating such fluid using said syringe being attached to said needle proximal end portion;

j. advancing said cannula distally relative to said needle such that said needle distal end portion is covered by said cannula distal end portion;

k. withdrawing said needle from said cannula until said needle proximal end location surface marker is located just proximal to said cannula proximal end portion whereby said needle distal end portion is just proximal to said valve structure;

l. placing said valve structure in the closed position; and

m. fully withdrawing said needle including such piece of attached internal tissue from said cannula having said valve structure in the closed position.

4,840,185

BLOOD SAMPLING DEVICE WITH SHIELD

Manuel Hernandez, 1030 NW., 181 St., Miami, Fla. 33169

Filed Feb. 17, 1988, Ser. No. 157,274
Int. Cl.⁴ A61B 5/00
U.S. Cl. 128—763 **12 Claims**

1. A medical device comprising barrel means including an elongated cylindrical portion having a first and second end portion at opposite ends thereof; needle assembly means projecting from said second end portion of said elongated cylindrical portion; groove means provided in the outer surface of said elongated cylindrical portion and protective shield means including locking button means operatively connected to said groove means, said groove means including a plurality of rearwardly extending grooves and a plurality of circumferential locking grooves, said locking grooves located adjacent said

first and second end portions of said elongated cylindrical portion, said circumferential locking grooves being intersected by said rearwardly extending grooves with said locking groove being of lesser depth at said point of intersection,

whereby said protective shield means is telescopically positioned over said elongated barrel means and is movable between a first and second position to alternatively prevent accidental contact with said needle assembly or permit use of said medical device for its intended purpose.

4,840,186

IMPLANTABLE MULTI-POLE COAXIAL LEAD

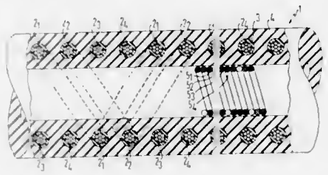
Anders Lekholm, Bromma; Ulf Fahlstreem, Stockholm, both of Sweden, and Hermann Groothoff, Friesoythe/Altenoythe, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 27, 1988, Ser. No. 199,920

Claims priority, application European Pat. Off., Jun. 1, 1987, 87107895.2

Int. Cl.[4] A61N *1/00*

U.S. Cl. 128—784 17 Claims



1. A multi-pole coaxial lead for an electrode for stimulating body tissue comprising:

a plurality of conductors wound in a helix; first insulating material individually surrounding each conductor in said plurality of conductors;

a tube consisting of a second insulating material said tube having a wall in which said plurality of conductors are embedded and axially separated from each other surrounded by said second insulating material, and said tube having a central opening therein; and

a helically wound stylet guide coil disposed in said central opening of said tube of second insulating material.

4,840,187

SHEATH APPLICATOR

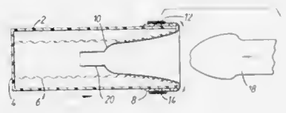
Gary B. Brazier, Harwich, England, assignor to Bard Limited, Sunderland, England

Filed Aug. 28, 1987, Ser. No. 90,375

Claims priority, application United Kingdom, Sep. 11, 1986, 86 21884

Int. Cl.[4] A61F *5/43*

U.S. Cl. 128—844 18 Claims



1. A sheath applicator assembly for locating a sheath on a patient's penis, comprising:

a generally tubular applicator casing dimensioned to contain a sheath and having a first open end and a second end;

a generally tubular flexible liner casing located in the applicator casing and having an open end positioned at the first end of said applicator casing, and folded back thereover, said liner casing being fixedly secured to said applicator casing at a region remote from the first end of said applicator casing; and

a sheath located within said liner casing and having an open end at the open end of the liner casing and folded back over the open end of the liner casing and the applicator casing;

the coefficient of friction between the liner casing and the applicator casing being less than the coefficient of friction between the liner casing and the sheath.

4,840,188

DESENSITIZING CONDOM

Herbert J. Heidenfelder, 1270 NE. 95th St., Miami Shores, Fla. 33138

Filed Jan. 11, 1988, Ser. No. 142,647

Int. Cl.[4] A61F *5/44*

U.S. Cl. 128—844 1 Claim

1. A condom for use by a male human during sexual intercourse comprising a phallic-shaped elastic sheath having a closed end and an open end, a local coating on the inside surface of said closed end, said local coating consisting essentially of a topical anesthetic for delaying ejaculation by said male human during said sexual intercourse and a water-soluble base therefor, and a small colored bump on said sheath solely adjacent to said open end, said mark being visually distinct from the color of said sheath and visually indicating said inside surface on which said local coating is located.

4,840,189

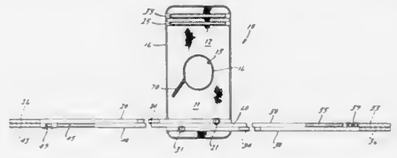
RESTRAINING VEST

Roberta S. Wachtel, 10469 Puttygut Rd., Richmond, Mich. 48062

Filed Jan. 29, 1988, Ser. No. 150,151

Int. Cl.[4] A61F *13/00*

U.S. Cl. 128—869 10 Claims



1. A vest for restraining a patient in a supporting structure, said supporting structure having a frame, comprising:

a main body including a front panel portion, a back panel portion and a centrally located opening for receiving a patient's head and neck;

a pair of straps extending laterally in opposite directions beyond the lateral side edges of said front panel portion, said pair of straps being of sufficient length to extend around the back of said patient;

a first means for releasably fastening said pair of straps to said back panel portion;

a pair of means for guiding each strap of said pair of straps after said first straps are extended around said patient's back and fastened to said back panel portion, said guide means attached to said front panel portion;

a third strap extending laterally in opposite directions beyond both lateral side edges of said front panel portion, said third strap for routing around said frame of said supporting structure;

a second means for fastening said pair of straps to said third strap whereby a patient wearing said vest may be restrained in said supporting structure.

4,840,190

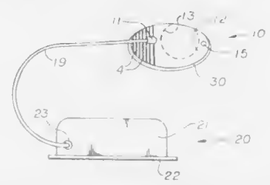
LOZENGE-SHAPED LOW PROFILE INJECTION RESERVOIR

Gordon H. Sasaki, Pasadena, Calif., assignor to Dow Corning Wright, Arlington, Tenn.

Continuation of Ser. No. 907,203, Sep. 12, 1986, abandoned. This application Apr. 14, 1988, Ser. No. 183,460

Int. Cl.[4] 161B *19/00*

U.S. Cl. 128—897 1 Claim



1. An improved injection reservoir for subcutaneously pressurizing an inflatable implantable prosthesis of the type wherein said reservoir comprises a body of a biocompatible, implantable material having a lower base surface which is intended to be placed against bodily structures and a curved upper wall which is sealingly attached to the base surface to form a hollow interior chamber, said upper wall being of a substantially non-expansible elastic material of which at least a portion is self-sealing to penetration by a hypodermic needle to permit the hollow interior chamber to be filled by a hypodermic needle, said hollow interior chamber being sealingly connected to a fluid conduit means to permit fluid injected within said hollow interior chamber to be passed into the interior of said inflatable prosthesis, wherein the improvement comprises the body of the injection reservoir having a front end, a rear end, and two sides when viewed from above said upper wall wherein said front and rear ends are each substantially shaped as an acute angle and said sides are each substantially shaped as an obtuse angle and wherein said lower base surface being generally flat and said upper wall continuously tapers in a relatively flat curve from its highest point to its edge in a smooth fashion which facilitates insertion and removal to and from the desired site in the patient and wherein said fluid conduit means is connected to said hollow interior chamber at said rear end of the injection reservoir and said rear end has an upper surface which includes a plurality of raised ridges thereon wherein each of said ridges extends substantially parallel with the width of said injection reservoir.

4,840,191

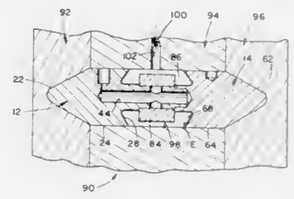
INFLATABLE VALVE

Theodore J. Gausman, Mentor, and Gary W. Scheffel, Streetsboro, both of Ohio, assignors to Nupro Company, Willoughby, Ohio

Filed Apr. 5, 1988, Ser. No. 178,065

Int. Cl.[4] F16K *7/10, 43/00*

U.S. Cl. 137—15 17 Claims



12. A method of assembling a valve member comprising the steps of:

connecting a plurality of valve body members for defining a fluid supply line therein extending between an inlet and outlet;

placing an annular filter over the outlet, filter receiving at least one of said body members therein and interconnecting said other body member thereto;

bonding an elastomeric material to the valve body members and encompassing the outlet and filter; and,

curing said elastomeric material on the valve body members.

4,840,192

HYDRAULIC HAMMER REDUCTION SYSTEM FOR RAILROAD TANK CARS

Sylvester E. Yandle, II, c/o Industrial Pump Sales, Inc., 2814 Engineers Rd., Belle Chasse, La. 70037

Filed May 5, 1986, Ser. No. 859,791

Int. Cl.[4] F16K *17/40*

U.S. Cl. 137—681 12 Claims

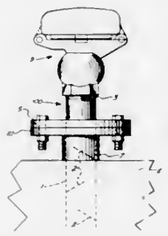
7. In a moving tank carrying a liquid load, such as for example a railroad tank car:

a rupture disk assembly for allowing some of the liquid load to escape from the tank before the tank is fractured from the hydraulic hammer action;

a mechanical energy dissipation system for dissipating hydraulic hammer action in the moving tank car, comprising

a mechanical device of a relatively small size in comparison to the size of the tank, said device extending down into the interior of the tank and being located in the line of flow of the liquid between the rupture disk of the rupture disk

assembly and the liquid load in the tank, said device presenting a series of diverging, energy dissipating impact surfaces to the liquid flow from the tank to the rupture



disk, significantly dissipating the hydraulic hammer action of the liquid from the impact of the liquid against the impact surfaces as it flows through said device.

4,840,193

ELECTROMAGNETICALLY ACTUATABLE THREE-WAY/TWO-POSITION DIRECTIONAL CONTROL VALVE

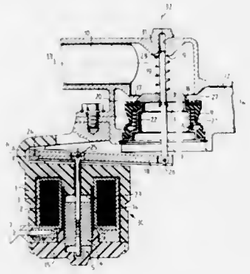
Lothar Schiel, Hofheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 27, 1988, Ser. No. 211,634

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1987, 3722009

Int. Cl.[4] F15B *13/044*

U.S. Cl. 137—627.5 **6 Claims**



1. An electromagnetically actuatable three-way/two-position directional control valve for alternatively connecting an outlet port to a first and to a second inlet port, comprising a valve chamber with which the outlet port is in direct communication, the inlet ports respectively communicate with said valve chamber through two sealing seats adapted to be alternatively closed or opened by means of a movable valve closure member, at least one electromagnet comprising a housing accommodating a magnet coil and a slidably disposed armature, said armature operatively connected to said electromagnet and valve closure member by a valve-actuating tappet such that when the electromagnet is excited, said armature actuates the valve closure member, a connection being established between the second inlet port and the outlet port in an inactive position of the valve closure member, wherein the valve closure member includes an elastic valve member having a sealing surface biased by a compression spring in a direction of the first sealing seat in the inactive position, said valve closure member being movable relative to a valve plate which cooperates with said sealing surface of said elastic valve member, said valve plate biased downwardly against said sealing surface by resilient resetting means in the inactive position of the closure member, and during actuation of said electromagnet, an intermediate position of the valve member is provided for in which intermediate position the two sealing seats are simultaneously closed.

4,840,194

EXPLOSION PROOF ELECTRICAL CONDUIT SEALING FITTING

Richard C. Berry, Camillus, N.Y., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Jan. 14, 1988, Ser. No. 143,871

Int. Cl.[4] F16L *9/22*

U.S. Cl. 138—155 **1 Claim**

1. An explosion-proof electrical conduit sealing fitting for threadedly engaging at least two threaded conduits and surrounding at least one conductor running through said at least two threaded conduits, said fitting comprising:

a first sub-element having a portion threadedly engaging a portion of at least one of said at least two threaded conduits;

a second sub-element having a portion threadedly engaging at least a portion of one of said at least two threaded conduits;

means for connecting said first sub-element to said second sub-element;

a third sub-element having a portion threadingly engaging a portion of at least one of said at least two threaded conduits;

a fourth sub-element having a portion threadingly engaging a portion of at least one of said at least two threaded conduits;

means for connecting said third sub-element to said fourth sub-element;

said first, second, third and fourth sub-elements being substantially identical;

means for connecting said first sub-element to said third sub-element; and

means for connecting said second sub-element to said fourth sub-element;

whereby said connected first, second, third and fourth sub-elements completely surround said at least one conductor and threadedly engage all of said at least two threaded conduits.

4,840,195

PISTON-BACKED GAS PRESSURE REGULATOR

John S. Zabrenski, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Nov. 19, 1987, Ser. No. 122,959

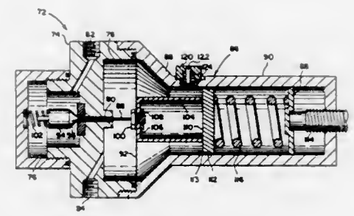
Int. Cl.[4] G05D *16/06*

U.S. Cl. 137—312 **9 Claims**

1. In a gas pressure regulator which includes a housing having a high pressure chamber, a low pressure chamber, an orifice extending between the high pressure chamber and the low pressure chamber, a bonnet mounted across an end of the

low pressure chamber, a valve plug in the high pressure chamber adapted to move toward and away from the orifice to open and close the regulator, and means across the low pressure chamber and connected to said valve plug for moving the valve plug toward and away from the orifice, the improvement comprising:

the means for moving said valve plug includes a flexible diaphragm secured across the low pressure chamber to



separate the low pressure chamber from the bonnet, a rigid piston sealingly mounted across the bonnet spaced from the flexible diaphragm and forming a chamber therebetween, means connecting the rigid piston to said flexible diaphragm so that they move together, and means in the chamber between the diaphragm and piston for indicating any leakage across said flexible diaphragm without allowing the leakage to escape from the chamber to the atmosphere.

4,840,196

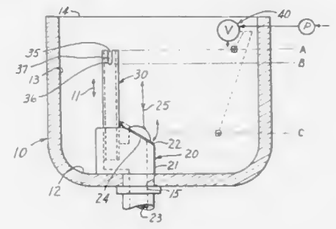
BI-STABLE, THREE CONDITION FLUSH TANK SYSTEM

Bruce A. Antunez, 1143 Indian Springs Dr., Glendora, Calif. 91740

Filed Jun. 10, 1988, Ser. No. 205,267

Int. Cl.[4] F16K *31/18, 33/00*

U.S. Cl. 137—410 **12 Claims**



1. A flush tank system comprising:

a water storage tank having an outlet;

a flush valve in said outlet adapted to close to hold stored water in said tank, and to open to discharge said water through said outlet, said flush valve including a standpipe rising in said tank and discharging into said outlet, said standpipe having a peripheral wall with an upper end establishing an uppermost water level in said tank, and drain means in said peripheral wall at a repose level, said drain means draining water from said tank down to said repose level;

a tank valve mounted to said tank for receiving water to be supplied to said tank, and; having an open condition for supplying water to said tank and a closed condition preventing said supply; said tank valve including water level-responsive control means selected to establish said condition, said control means being bi-stable, and retaining the most recent condition pertaining to either a level higher than said repose level or a lower level respective to drainage of stored water from said tank to a predetermined lower level;

whereby with the flush valve closed and the tank valve open, water is continuously supplied to a preselected level above the repose level, at which event the water level responsive control means changes the tank valve to a closed condition and water drains through said drain means through said standpipe to said discharge outlet of said flush valve until the repose level has been reached, and the system remains in repose with both valves closed, with the tank valve remaining closed and opening only after the water level has lowered to a desired predetermined level, and said flush valve closing at a desired closure level.

4,840,197

POWER STEERING VALVE

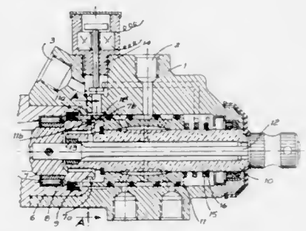
Arthur E. Bishop, and John Baxter, both of P. O. Box 217, Gladesville, 2111, Wales

Filed Jun. 14, 1988, Ser. No. 206,290

Claims priority, application Australia, Jun. 15, 1987, P 12477

Int. Cl.[4] F15B *13/14*

U.S. Cl. 137—625.21 **2 Claims**



1. A rotary hydraulic valve to control the hydraulic pressure in power steering gears for automotive vehicles, comprising:

an input-shaft;

a coaxially arranged driven member;

a torsion bar drivingly connecting said input-shaft and said driven member, interengaging means connecting said input-shaft and said driven member arranged for limited lost motion between said input-shaft and driven member;

an axially movable sleeve surrounding said input-shaft;

an intermediate member carried between said sleeve and said driven member to provide a slack-free driving connection between said sleeve and said driven member;

the said intermediate member being in the form of a thin arcuately shaped member having arms extending partially around and embracing the driven member and outwardly and inwardly extending lugs respectively engaging and fitting closely within slots formed in the sleeve and the driven member, the lug fitting within the slot in the sleeve being constructed and arranged to permit axial movement of the sleeve.

4,840,198

CONTROL VALVE

Helmut Ott, Stuttgart, Fed. Rep. of Germany, assignor to Herion-Werke KG, Fellbach, Fed. Rep. of Germany

Filed Jan. 14, 1988, Ser. No. 143,969

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1987, 3700899

Int. Cl.[4] F16K *11/04*

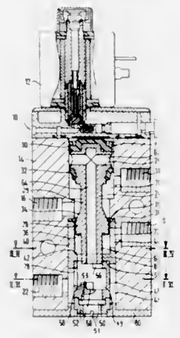
U.S. Cl. 137—625.64 **12 Claims**

1. A directional control valve unit; comprising:

a housing having fluid inlet means, fluid outlet means includ-

ing two working ports, and vent means with one working port directly connectable to said vent means;

valve means including a control valve via which said other working port is connectable with said vent means, said control valve being accommodated in said housing and having one section in form of a seat-type valve in the area



of said one working port and another section in form of a sliding-type valve in the area of said other working port; and

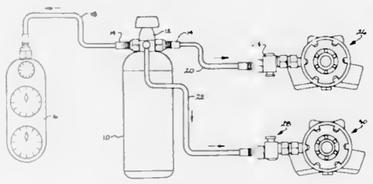
throttle means for controlling ventilation of said fluid outlet means and including a throttle bush rotatably arranged in said housing and cooperating with said valve means.

4,840,199

REGULATOR SAFETY VALVE

Charles D. Brunt, Jr., 322 Country Breeze La., Duson, La. 70529-9562

Filed Nov. 3, 1987, Ser. No. 116,250
Int. Cl.[4] A62B 7/00
U.S. Cl. 137—883 8 Claims



1. A self-contained underwater scuba apparatus comprising:

an air cylinder for receiving and containing pressurized air;

a first stage regulator mounted to an outlet of said air cylinder and defining a plurality of nozzles;

a first second stage regulator;

a second second stage regulator;

a first control valve mounted intermediate said first stage regulator and said first second stage regulator, said first control valve including a valve housing having a first connector comprising an externally threaded female connector element connectable to a source of breathable gas and a second connector comprising a male connector element having a lock nut element mounted circumferentially thereabout and connected to the first second stage regulator of the underwater breathing apparatus, an intermediate valve stem receiving passage; and an intermediate valve stem mounted within said stem receiving passage so as to be slidable along a longitudinal axis thereof; said valve stem including means defining a flowthrough passage between a bore of said first connector and a bore of said second connector such that the valve stem is slidable from a first position wherein communication between said first and second connector bores is cut off to a second position wherein flow therebetween is possible via said flowthrough passage; and

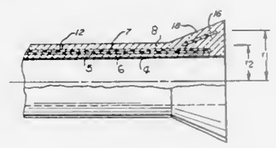
a second control valve mounted intermediate said first stage regulator and said second second stage regulator.

4,840,200

PRESTRESSED TUBE

Richard L. Creedon, San Diego, Calif., assignor to General Atomics, San Diego, Calif.

Division of Ser. No. 818,203, Jan. 13, 1986, Pat. No. 4,774,872, which is a continuation-in-part of Ser. No. 506,430, Jun. 21, 1983, Pat. No. 4,624,173. This application Oct. 19, 1987, Ser. No. 110,211
Int. Cl.[4] F16L 9/04
U.S. Cl. 138—172 12 Claims



1. A prestressed tube comprising:

inner and outer concentric, generally cylindrical walls substantially homogeneous so as to be free of internal stress-imparting members and having opposed cylindrical surfaces;

a nonadhering lamina between said inner and said outer walls; and

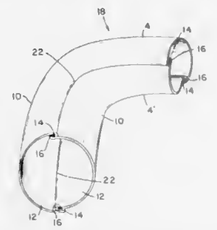
a pressure medium beween said nonadhering lamina and at least one of said inner and said outer walls, pressing against the opposed cylindrical surfaces so as to bias said inner and said outer walls away from each other with a prestress force.

4,840,201

TWO PIECE PIPE FITTING COVER

Chris J. Botsolas, St. Petersburg, Fla., assignor to Carol M. Botsolas, St. Petersburg, Fla.

Filed Apr. 22, 1988, Ser. No. 185,078
Int. Cl.[4] F16L 57/00
U.S. Cl. 138—178 12 Claims



1. A cover adapted to be placed about an insulated or uninsulated pipe fitting comprising:

two half sections each comprising a body having an interior surface and an exterior surface and two edges;

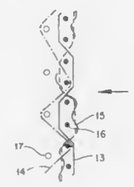
a pair of opposed side seams extending along each edge of each said half section, said side seams comprising a groove and a lip extending from said groove, the groove of one half section being located between the lip and the interior surface of said half section and the groove of the other half section being located along each edge between the lip and the exterior surface, each said lip being substantially parallel to a surface of said body, and wherein said lip of each side seam of one half section is adapted to be transversely insertable into and interlock with the corresponding groove of the other half section, when the half sections are secured about a pipefitting to create a lock seam between said half sections.

4,840,202

ELECTRICALLY CONDUCTIVE TWO COMPONENT TWISTED YARN AND FABRICS FOR TEXTILE FLAT GOODS FOR CLEAN ROOMS AND CLEAN ROOM WEARING APPAREL

Mattias Feustel, Triebes; Guenter Frotscher, Greiz-Gommla; Wieland Nitschke, Greiz; Dieter Obensuf, Greiz; Juergen Saupe, Dresden, and Manfred Weidelt, Gera-Lusan, all of German Democratic Rep., assignors to VEB Forschung und Entwicklung, Greiz, German Democratic Rep.

Division of Ser. No. 926,596, Nov. 3, 1986. This application Oct. 30, 1987, Ser. No. 115,679
Claims priority, application German Democratic Rep., Nov. 8, 1985, 2826362; Jun. 2, 1986, 2907933; Jun. 9, 1986, 2911013
Int. Cl.[4] D03D 15/02
U.S. Cl. 139—425 R 2 Claims



1. Fabric for the production of textile flat goods and wearing apparel for clean rooms comprising electrically conductive combination yarns and electrically nonconductive synthetic yarns, the fabric having an upper ply of electrically nonconductive combination yarns and a lower ply stabilizing the upper ply and interwoven with the electrically nonconductive yarns of the upper ply, wherein the lower ply includes electrically nonconductive lower ply warp yarns interwoven with electrically nonconductive lower ply filling yarns into a 1/1 plain weave, 4 electrically nonconductive lower ply warp yarns within a pattern repeat additionally interwoven with 4 electrically nonconductive filling yarns in the upper ply in a plain weave, and 2 electrically conductive combination warp yarns within a pattern repeat interwoven with all electrically nonconductive filling yarns in the upper ply in a pattern repeat in a 2/2 twill weave opposite 2/2 twill woven upper ply warp yarns.

4,840,203

PROCESS FOR CLAMPING, FASTENING AND PRESENTATION OF WEFT THREADS IN GRIPPER WEAVING LOOMS AND DEVICE USED TO THIS END

Denis Moeneclaey, Roeselare; Remi Lagache, Zillebeke-Ieper; Johnny Victoor, Langemark, and Lucien Coopman, Zonnebeke, all of Belgium, assignors to Picanol N.V., Ieper, Belgium

Filed Apr. 3, 1987, Ser. No. 33,739
Claims priority, application Netherlands, Apr. 3, 1986, 8600857
Int. Cl.[4] D03D 47/34
U.S. Cl. 139—453 9 Claims

1. Apparatus for clamping, holding and presenting weft threads in gripper weaving looms having at least two weft threads, a gripper for inserting the weft threads into successive sheds and a reed for beating-up the inserted weft thread, comprising:

a) a plurality of movable clamps each clamp holding an end of a weft thread;

b) thread guiding means for deviating the path travelled by the weft threads from a weft thread supply point to a corresponding movable clamp;

c) driving and control mechanism for moving each movable clamp between three positions, wherein: in the first position the weft thread extending between the guiding means and the clamp is out of the path of travel of the gripper; in the second position the weft thread is in the path of travel of the gripper; and, in the third position the clamp is located on the insertion side of the cloth edge in the proximity of and above the fell;

d) auxiliary means attached to the reed for bringing the inserted weft thread back into the respective clamp on the insertion side during the bearing movement of the reed; and

e) cutting-off means for cutting off the inserted weft thread mounted along the insertion side near the cloth edge.

4,840,204

AXIAL COMPONENT LEAD CUTTER AND FORMER

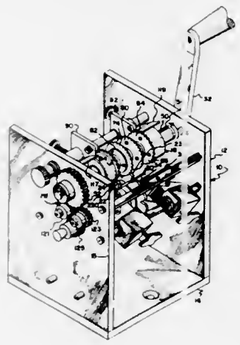
Avraham Shiloh, 127 Thunder Cir., Bensalem, Pa. 19020; Adam Shiloh, 3517 Glen Way, Huntingdon Valley, Pa. 19006, and Peretz J. Shiloh, 534 A Knights Bridge, Bensalem, Pa. 19020

Filed Feb. 25, 1988, Ser. No. 160,145
Int. Cl.[4] B21F 45/00
U.S. Cl. 140—105 14 Claims

1. An apparatus for forming leads axially protruding from a component, comprising:

a component carrier having a pair of spaced apart component support walls, at least a pair of opposing generally V-shaped cutouts in said walls adapted to retain said component therein such that said axial leads extend outboard thereof, a lagging outboard edge of each cutout defining a partial conical surface having a conical radius of curvature that is a predetermined function of a coinci-

dental span between opposing cutout defining surfaces; and



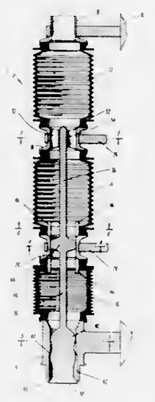
means for bending the axially protruding leads of the component retained in said cutout, said means for bending disposed on either side of said pair of support walls outboard of said component.

4,840,205

METHOD AND APPARATUS FOR DISPENSING LIQUIDS

Gunnar Drevfors, Mendota Heights; Donald G. Corniea, Inver Grove Heights, and Norman J. Paulson, Maple Grove, all of Minn., assignors to Tetra Pak Finance & Trading S.A., Pully, Switzerland

Filed Jul. 8, 1988, Ser. No. 216,335
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—2 **14 Claims**



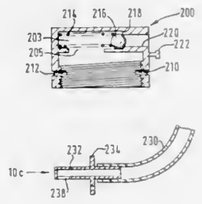
1. Apparatus for dispensing liquids comprising
a discharge nozzle having an internal bore, said bore having a central axis,
a movable discharge valve element cooperating with said bore to control liquid flow out of said nozzle,
a valve stem extending from said discharge valve element and along said central axis,
a pair of sleeves arranged coaxial with said valve stem, a first one of said sleeves being spaced from said discharge element a greater distance than the second one of said sleeves,
a first bellows between said nozzle and said second sleeve, and a second bellows between said first sleeve and said second sleeve,
a third bellows connected with said first sleeve and arranged coaxial with said valve stem, liquid supply means for introducing liquid into said third bellows,
said first sleeve being connected with said valve stem for imparting reciprocating motion to said valve stem upon axial movement of said first sleeve,
said valve stem having a control valve element in position to cooperate with said second sleeve to selectively open and close liquid flow between said first and second bellows, and
said second sleeve being mounted for axial reciprocating motion relative to said discharge nozzle.

4,840,206

HYDRAULIC FLUID CONTAINERS AND RESERVOIRS

Adrian C. Hill, Winsford, and Derek Jepson, Marton, both of England, assignors to Rolls-Royce Motors Limited, Crewe and Castrol Limited, Swindon, both of, United Kingdom

Continuation of Ser. No. 790,761, Oct. 23, 1985, abandoned, and a continuation of Ser. No. 543,897, Oct. 20, 1983, abandoned.
This application Apr. 8, 1987, Ser. No. 36,207
Claims priority, application United Kingdom, Oct. 22, 1982, 8230159; Dec. 10, 1982, 8235325
Int. Cl.[4] B65B *3/00;* **B67C** *3/00;* **B67D** *5/06*
U.S. Cl. 141—349 **4 Claims**



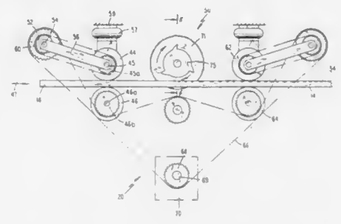
1. An arrangement of a motor vehicle hydraulic fluid system reservoir and a container for fluid to be transferred to the reservoir comprising:
an opening in the reservoir;
a cap having a substantially restricted orifice removably positioned on said opening;
a discharge opening in the container adapted to mate in substantially fluid-tight male/female relationship with said orifice of said cap when on the reservoir for the transference of fluid from the container into the reservoir, said orifice in said cap having a valve means normally closed but being openable when said opening in said container is mated therewith, said discharge opening in said container mating with said orifice in said cap only when the cross-sectional shapes thereof are the same;
a locking member for interlocking said cap and said discharge opening in said container to one another; and
wherein said cap further comprises an opening therein for permitting air to escape from said reservoir while it is being filled via said restricted orifices in said container and reservoir.

4,840,207

APPARATUS FOR MAKING WOODEN I-BEAMS

Jerry L. Lines, Wilmington, N.C., assignor to MiTek Industries, Inc., St. Louis, Mo.

Division of Ser. No. 843,228, Mar. 24, 1986, Pat. No. 4,720,318, which is a continuation-in-part of Ser. No. 764,180, Aug. 9, 1985.
This application Jul. 1, 1987, Ser. No. 69,535
Int. Cl.[4] B27C *9/00*
U.S. Cl. 144—41 **13 Claims**



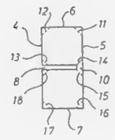
1. Apparatus for manufacturing a pair of elongate wooden chord members each including a longitudinal groove in one surface thereof, from elongate rectangular wooden stock material, comprising:
(a) a splitter blade and a pair of router tips respectively mounted on opposite sides of the blade;
(b) means for rotating said splitter blade and router tips;
(c) means for supporting a length of said stock material during cutting engagement with said splitter blade and router tips; and
(d) means for providing relative movement between said stock material and splitter blade and router tips substantially along the longitudinal axis of said stock material to split said stock material into substantially identical chord members while forming said longitudinal grooves; said means comprising at least one pair of drive rolls comprising top and bottom rolls extending transversely with respect to the direction of travel of the stock material for driving the stock material between them.

4,840,208

METHOD OF MANUFACTURING OBLONG WOODEN ARTICLES TO BE USED FOR THE MANUFACTURE OF COUPLED-TOGETHER PAIRS OF CHOPSTICKS

Gert Schultz, Hillerod, Denmark, assignor to Stormax International A/S, Herlev, Denmark

Filed Mar. 9, 1988, Ser. No. 166,080
Int. Cl.[4] B27M *1/08;* **B27L** *5/02*
U.S. Cl. 144—367 **2 Claims**



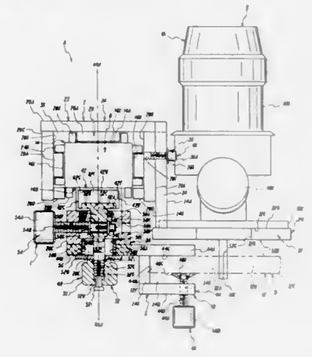
1. A method of manufacturing oblong wooden articles to be used for the manufacture of coherent pairs of chopsticks, comprising the steps of:
punching and cutting the oblong articles out of veneer sheets along outer straight lines resulting in outer surfaces of the oblong articles being formed, said outer surfaces inclining slightly towards one another and extending over the entire length of the articles; and
providing each article with a cut along the plane of symmetry between said outer surfaces and leaving a short uncut portion at the thickest end of the article, the cut along the plane of symmetry extending only partially through the article in the transverse direction thereof.

4,840,209

ROUTER GUIDE ASSEMBLY AND METHOD OF USING SAME

Raymond P. Reneau, 5844 Sampley Way, Houston, Tex. 77092

Filed Mar. 10, 1988, Ser. No. 166,260
Int. Cl.[4] B27M *1/00;* **B27C** *5/10*
U.S. Cl. 144—371 **28 Claims**



2. A router guide assembly for guiding a router over a workpiece for making a precise cut on the workpiece, comprising:
an elongate rail member;
a router trolley mounted for movement along the length of said rail member, said router trolley supporting the router for cutting operations on the workpiece, said router trolley including
a trolley member for aligned movement along said rail member;
a router support secured with said trolley member for receiving the router for mounting therewith and,
securing member affixed to said rail member for securing said rail member with the workpiece.

4,840,210

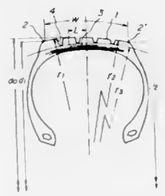
HEAVY DUTY PNEUMATIC RADIAL TIRES

Takashi Kukimoto, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Aug. 5, 1987, Ser. No. 81,788
Claims priority, application Japan, Aug. 6, 1986, 61-183454
Int. Cl.[4] B60C *3/06*
U.S. Cl. 152—209 A **7 Claims**

1. A pneumatic radial tire comprising; a tread with an asymmetrical profile, wherein the tread maximum outer diameter is located spaced from the tire equatorial plane outwardly opposite to a side on which the tire is to be mounted to a vehicle by a distance L equal to a range from 0.05 to 0.30 times as long as the width W of the tread, and a ratio of d_2/d_1 is set at a range from 0.98 to 1.00 in which d_1 and d_2 are diameters of tread shoulders of the tread on a side of the tread maximum outer diameter and on the opposite side of the tread respectively,
wherein when a contour of the tread positioned on opposite sides of the maximum outer diameter circumferential location in a cross section including a rotational axis of the tire is approximated by two arcs, a radius of curvature, r_1

of the tread contour on an outer side of the tire when being mounted onto the vehicle is smaller than a radius of



curvature, r_2, of the tread contour on an inner side of the mounted tire, and the maximum outer diameter of the tire is greater than the diameters d_1 and d_2.

4,840,211

PNEUMATIC TIRE HAVING ASYMMETRICAL GROOVE CROSS SECTION

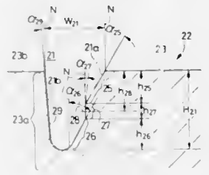
Shigeo Makino, Saitama, Japan, assignor to Bridgestone Corporation, Japan

Filed Jun. 19, 1987, Ser. No. 63,894

Claims priority, application Japan, Jun. 20, 1986, 61-144058

Int. Cl.[4] B60C *11/06*

U.S. Cl. 152—209 R **12 Claims**



1. A pneumatic tire comprising; a tread having at least one circumferential main wide groove, said groove in cross-section having opposite side walls, one of said opposite side walls consisting of a straight outer wall region located at a radially outer portion of said one side wall, a straight inner wall region located at a radially inner portion of said one side wall, a straight intermediate wall region located between said inner and outer wall regions, groove wall angles α_{25}, α_{26} formed between a line perpendicular to an outer surface of said tread and respective straight surface portions of said one side wall in said outer and inner regions selected to be larger than a groove wall angle α_{27} formed between said line and a surface portion of said one side wall in said intermediate region, and the other of said opposite side walls having a substantially linear face along the entire wall.

4,840,212

AUTOMATIC AIR PUMP FOR WHEEL TIRES

Yung-Kuan Wei, No. 1, Lane 970, Sec 2, Pen Tien St., Tainan, Taiwan

Filed Jan. 13, 1987, Ser. No. 2,919

Int. Cl.[4] B60C *23/10*, *23/12*

U.S. Cl. 152—419 **5 Claims**

1. Apparatus for automatically maintaining and indicating a desired pressure in a pneumatic tire which is mounted on a wheel of a vehicle, comprising:

a piston;

cylinder means adpated to be fixed to the wheel and defining a space in which said piston is mounted to reciprocate;

contact means attached to said piston and adapted to engage an interior portion of the pneumatic tire when the tire is inflated beneath the desired pressure and thereby displace said piston to compress air within said space;

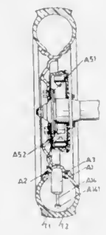
means for biasing said piston relative to said cylinder means so that said contact means is urged toward the interior portion of the tire and said piston is urged toward an end wall of said cylinder;

exhaling valve means for allowing air to pass from said space to the area bounded by the interior of the tire when said piston compresses the air within said space;

inhaling valve means for allowing air to enter from an external atmosphere to said space when said piston depressurizes said space by displacement toward said end wall, whereby an alternate pressurization and depressurization of the space by the piston as the wheel rotates causes air to be supplied to the are bounded by the interior of the tire;

switching means positionally located within said space defined by said cylinder means for opening an electrical path responsive to displacement of said piston from said end wall of said cylinder means; and

means responsive to said switching means for indicating the displacement of said piston from said end wall and thereby indicate to an operator of said vehicle a tire inflation beneath said desired pressure.



4,840,213

HEAVY DUTY LOW PROFILE PNEUMATIC RADIAL TIRES

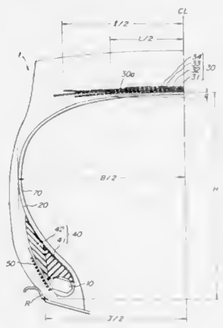
Hiroyuki Koseki, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Mar. 28, 1988, Ser. No. 174,268

Claims priority, application Japan, Apr. 3, 1987, 62-82463

Int. Cl.[4] B60C *03/04*, *09/28*

U.S. Cl. 152—454 **2 Claims**



1. A tubeless type heavy duty low profile pneumatic radial tire comprising a radial carcass layer toroidally extending from one of beads to the other, and a belt comprising at least two

plies successively closely plied on a crown portion of the carcass layer, said at least two plies having non-extensible cords arranged at a shallow angle with respect to an equatorial plane of the tire but intersecting between the plies through the tire equatorial plane, said tire using a 15° rim as a design rim thereof, wherein when the tire is assembled into the design rim and inflated at a normal internal pressure, a shape of the carcass line in a tire radial section meets the following inequalities (1) through (4):

$$0.45 \leqq H/B \leqq 0.75 \quad (1)$$

$$(0.12\ H/B) + 0.79 \leqq 1/B \leqq (-0.12\ H/B) + 0.85 \quad (2)$$

$$(0.1\ H/B) + 1.11 \leqq B/J \leqq (0.1\ H/B) + 1.15 \quad (3)$$

$$0 < a/H \leqq 0.017 \quad (4)$$

in which H, B, a, J and are the maximum sectional height of the carcass line measured radially from the bead heel, the maximum axial width of the carcass line, a maximum distance between a straight line which is in parallel with a rotary axis o the tire in the radial section and intersects with the carcass line at two points which are separated from each other by a distance: $L = 0.96B - 0.77H$, width of the tire as measured from one bead heel to the other bead heel and the greatest axial width of a zone where the cords between the belt plies still intersect with one another, respectively.

4,840,214

TIRE BELT REINFORCING STRIP AND METHOD OF MAKING OF SAME

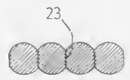
Luc Bourgois, Desselgem, Belgium, assignor to N. V. Bekaert S. A., Zwevegem, Belgium

Filed Sep. 10, 1987, Ser. No. 95,022

Claims priority, application European Pat. Off., Oct. 10, 1986, 86870146.7; Mar. 9, 1987, 87200427.0

Int. Cl.[4] D02G *03/48*

U.S. Cl. 152—527 **8 Claims**



1. A tire belt reinforcing strip having a significantly higher bending stiffness in the plane of the strip than in the longitudinal plane perpendicular thereto, wherein said strip is in the form of a bundle of steel wires having flattened sides, extending side by side in one plane when the bundle is in free straight position, adjacent wires being in contact with each other along said flattened sides and bound to each other to such extent that the strip presents, in the plane of the strip, a significant excess of bending stiffness above the sum of the bending stiffnesses of the individual wires in the same plane, the steel cross section being between 0.05 mm^2 and 2 mm^2 with a tensile strength above 2200 N/mm^2 and an elongation at break above 1.5%.

4,840,215

TIRE CHANGER SAFETY POST

Tumkur R. Vijay, and Bryce L. Mannen, both of Conway, Ark., assignors to FMC Corporation, Chicago, Ill.

Continuation of Ser. No. 10,029, Feb. 2, 1987, abandoned. This application Jul. 22, 1988, Ser. No. 224,204

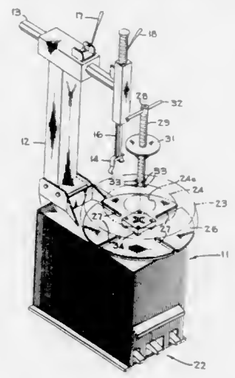
Int. Cl.[4] B60L *25/00*

U.S. Cl. 157—1.0 **14 Claims**

9. Safety apparatus for a tire changing machine comprising a support table for receiving rim/tire assemblies and a tire inflation system connected to said tire changing machine,

rim restraint means for firmly fixing the rim/tire assembly axially with respect to the support table,

means for releasably connecting said rim restraint means to the support table prior to tire inflation, and



pneumatic valve means attached to said tire inflation system having inflation air enabling and disabling positions, said rim restraint means having means to contact and urge said pneumatic valve means to said enabling position by connecting said rim restraint means to the support table.

4,840,216

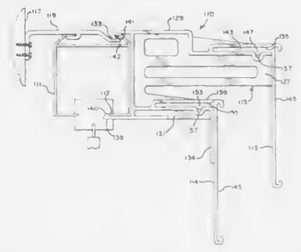
VALANCE BRACKET FOR A VERTICAL BLIND

Julius F. John, Redondo Beach, Calif., assignor to Home Fashions, Inc., Santa Monica, Calif.

Filed May 19, 1988, Ser. No. 196,134

Int. Cl.[4] E06B *9/38*

U.S. Cl. 160—178.1 **23 Claims**



1. A valance assembly, including a head rail, a support means, a valance mounting means, and a valance;

said support means being mountable to a wall surface;

said head rail being secured to said support means for the support of a blind assembly;

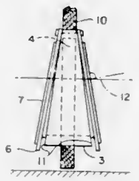
said valance mounting means being mounted to said head rail and having a vertical central web between a lower horizontal arm and an upper horizontal arm, and said upper horizontal arm containing an outwardly opening and inwardly extended longitudinal horizontal recess;

said recess having a horizontal wall and a detent on said wall;

said valance comprising a display face and a support flange mounted thereon for achieving a substantially vertical position of said display face when said support flange is secured in said recess of said valance mounting means; and

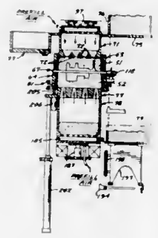
said support flange being mounted in said recess and having a detent element engaged with said recess detent, whereby said valance is supported by said valance mounting means on said support means.

4,840,217
PET PORTAL
Richard Evans, III, Box 23-C Bay Rd., Bowdoinham, Me. 04008
Filed May 9, 1988, Ser. No. 191,432
Int. Cl.[4] E05D 7/00
U.S. Cl. 160—368.1 3 Claims



1. For use with an enclosed structure, a device for providing to selected pet animals easy, independent ingress to and from said structure while deterring passage to non-selected animals, comprising:
a frame which establishes a passageway between the exterior and interior of said enclosed structure,
a plurality of doors depending from said frame and so arranged that all elements of said plurality of doors must be ajar concurrently in order for communication of air between the exterior and interior of said enclosed structure to occur, said plurality of doors comprising only two doors, one located on each of the exterior and the interior sides of said frame, that only open outwardly with respect to said passageway and which only move in opposing directions with respect to one another,
a closing means utilizing gravity and the air pressure gradient along the length of said passageway in order to establish a weathertight seal between said frame and the distal and proximal elements of said plurality of doors, respectively.

4,840,218
AUTOMATIC MATCHPLATE MOLDING SYSTEM
William A. Hunter, Inverness, Ill., assignor to Hunter Automated Machinery Corporation, Schaumburg, Ill.
Filed Apr. 1, 1987, Ser. No. 33,177
The portion of the term of this patent subsequent to Oct. 13, 2004, has been disclaimed.
Int. Cl.[4] B22C 15/22, 15/28
U.S. Cl. 164—169 8 Claims

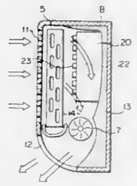


1. A matchplate molding machine comprising a molding flask for making a mold from sand, a sand magazine spaced vertically from said flask, said magazine being movable laterally relative to said flask between a receiving position in which the magazine is spaced laterally from the flask and a delivery position in which the magazine is alined vertically with the flask, said magazine being loaded with sand when in said receiving position and being conditioned to discharge such sand into said flask when in said delivery position, an air plenum spaced vertically from and alined vertically with said flask, said magazine being located between said air plenum and said flask when said magazine is in said delivery position, means for supplying pressurized air to said plenum when said magazine is in said delivery position, vertically opening ports in said plenum for directing pressurized air into said magazine thereby to blow sand from the magazine and into said flask, means mounting said plenum for vertical movement between active and retracted positions, said plenum sealing against said magazine when in said active position thereby to enable the pressurized air to blow the sand from said magazine, said plenum being spaced vertically from said magazine when in said retracted position thereby to enable the magazine to move laterally between said receiving and delivery positions, and means for selectively shifting said plenum vertically between said active and retracted positions.

4,840,219
MIXTURE AND METHOD FOR PREPARING CASTING CORES AND CORES PREPARED THEREBY
Robert W. Foreman, 4353 Covered Bridge Rd., Bloomfield Hills, Mich. 48013
Filed Mar. 28, 1988, Ser. No. 174,394
Int. Cl.[4] B22C 1/18, 9/10
U.S. Cl. 164—369 15 Claims

11. A water disintegratable casting core comprised of:
50–90% of a salt chosen from the group consisting essentially of:
halides, carbonates, sulfates, sulfites, nitrates and nitrites of Group Ia and Group IIa metals, and mixtures thereof; and,
10–50% of a particulate material dispersed in the salt, said particulate material substantially non-reactive with the salt and comprised of a first, material having a mesh size of at least 60–20 and a second material having a mesh size of at least 280.

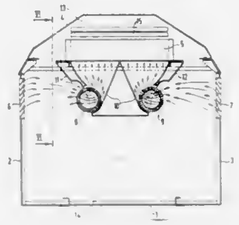
4,840,220
HEAT PUMP WITH ELECTRICALLY HEATED HEAT ACCUMULATOR
Kenji Umezu, Shizuoka, and Tetsuo Sano, Fujinomiya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Oct. 19, 1987, Ser. No. 109,310
Claims priority, application Japan, Oct. 23, 1986, 61-252290
Int. Cl.[4] F25B 29/00
U.S. Cl. 165—1 11 Claims



11. A method for controlling an air conditioner, comprising the steps of:
determining an operation start time of the air conditioner;
determining a preheating time for an electric heater for selectively supplying heat to a heat accumulator arranged in an air duct in an indoor unit;

preheating the electric heater a predetermined time before the operation start time;
driving a heat pump type refrigeration cycle constituted by said indoor unit and an outdoor unit when the operation start time for the heating operation is reached; and
controlling a drive state of the heat pump refrigeration cycle for the heating operation on the basis of temperature preset data and indoor temperature detection data.

4,840,221
DEVICE FOR VENTILATING RHEOSTATS AND/OR FLUID RADIATORS IN A LOCOMOTIVE
Jean-Claude Dumas, Soisy Sous Montmorency; Maurice Thoraval, Argenteuil, and Gérard Genuit, Bezons, all of France, assignors to Alsthom, Paris Cedex, France
Continuation of Ser. No. 11,815, Feb. 6, 1987, abandoned. This application Oct. 31, 1988, Ser. No. 267,630
Claims priority, application France, Feb. 11, 1986, 86 01847; Jan. 27, 1987, 87 00939
Int. Cl.[4] F28F 13/12; B61C 5/00
U.S. Cl. 165—41 4 Claims



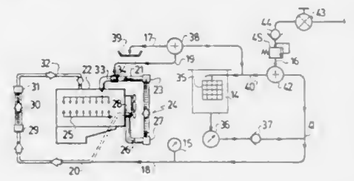
1. A device for ventilating at least one of a fluid radiator unit and a starting and braking rheostat unit in a locomotive having side walls and a roof, which locomotive is powered electrically, by means of an internal combustion engine or by a combination thereof, said at least one unit requiring ventilation being disposed below and in proximity of the locomotive roof, said device comprising two tangential fans having a horizontal axis of rotation placed longitudinally relative to the locomotive, a triangular shaped volute between said tangential fans and slide baffles above said tangential fans defining separate access chambers from the outlet of said tangential fans to the underside of said one unit, the sum of the cross sections of said access chambers at the underside of said one unit being substantially equal to the area of said at least one unit requiring ventilation, and an air intake opening being placed in each side wall of the locomotive.

4,840,222
HEAT SINK AND MOUNTING ARRANGEMENT THEREFOR
Bryan L. Lakin, and William P. W. McDaniel, both of Springfield, Mo., assignors to Fasco Industries, Inc., Boca Raton, Fla.
Filed Dec. 6, 1985, Ser. No. 805,965
Int. Cl.[4] F28F 7/00; H02K 11/00, 5/18, 9/00
U.S. Cl. 165—47 14 Claims

1. In a dynamoelectric machine having a generally cylindrical shell surrounding the exterior thereof, and an electronic circuit associated therewith, the improvement comprising a generally arcuate shaped heat sink for mounting at least a portion of the electronic circuit, said heat sink having means to releasably grip the inner surface of the shell to mount the heat sink therein and be in substantially close thermal contact therewith, the releasable gripping means comprising sufficient resiliency and an outer radius of curvature sufficiently different from the curvature of the shell so that when compressed,

inserted therein and released, the heat sink expands against the shell.

4,840,223
POWER BACK SCRUBBING AND FLUSHING SYSTEM FOR COOLING SYSTEMS
Edward Lee, Winnipeg, Canada, assignor to Solv-X Inventions Ltd., Manitoba, Canada
Filed Oct. 30, 1987, Ser. No. 115,434
Int. Cl.[4] F28G 9/00
U.S. Cl. 165—95 14 Claims



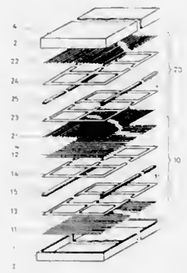
1. Apparatus for flushing and scrubbing the coolant system of an automobile engine which includes a heater core having an inlet and an outlet, an engine block having coolant passages therein and having inlets and outlets therefore, a coolant pump and an engine radiator core all operatively connected together, said apparatus comprising in combination a fluid pump, a liquid holding reservoir connected to said fluid pump, a first conduit extending from said fluid pump and being operatively connected to the outlet of the heater radiator core, a second conduit connected between the outlets of said coolant passages and said reservoir and a third conduit extending between said reservoir and said first conduit, and first valve means in said second conduit controlling the routing of fluid therethrough.

4,840,224
DEVICE FOR TRANSFERRING HEAT ENERGY BY CAPILLARY FORCES
Claudius R. Dietzsch, Stein am Rhein, Switzerland, assignor to Sig Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland
Filed Apr. 28, 1988, Ser. No. 187,311
Claims priority, application Switzerland, Apr. 28, 1987, 1631/87
Int. Cl.[4] F28D 15/02
U.S. Cl. 165—104.26 10 Claims

1. A heat energy transfer device for heating or cooling a surface, comprising
(a) wall means defining a closed cavity; said wall means having an outer face constituting said surface;
(b) a heat transfer medium contained in said cavity and having a liquid phase;
(c) a first capillary means disposed in said cavity for advanc-

ing said heat transfer medium in said liquid phase in a first direction parallel to said surface; said first capillary means including two superposed first arrays of parallel-arranged, spaced wires extending generally two-dimensionally in respective planes oriented parallel to said surface; said first arrays having respective sides oriented towards one another; and first supporting spacer means positioned between said first arrays for maintaining the first arrays in position and for providing a space therebetween; and

(d) a second capillary means disposed in said cavity for



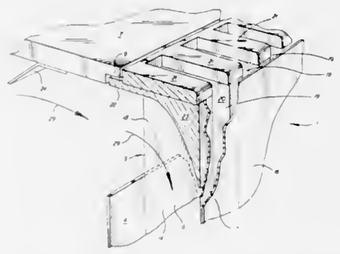
advancing said heat transfer medium in said liquid phase in a second direction parallel to said surface; said first and second directions being non-parallel to one another; said second capillary means including two superposed second arrays of parallel-arranged, spaced wires extending generally two-dimensionally in respective planes oriented parallel to said surface; said second arrays having respective sides oriented towards one another, and second supporting spacer means positioned between said second arrays for maintaining the second arrays in position and for providing a space therebetween.

4,840,225

HEAT EXCHANGE ELEMENT AND ENCLOSURE INCORPORATING SAME

John M. Foley, Grafton; Ronald L. Piuze, Shrewsbury; Ralph I. Larson, Jr., Bolton, and George Doumani, North Andover, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 10, 1987, Ser. No. 37,046
Int. Cl.[4] F28D *15/00*; H01L *23/46*
U.S. Cl. 165—104.33 **12 Claims**



1. An enclosure for heat generating assembly comprising:

a rack in which heat generating assemblies may be mounted, the rack being mounted in a cavity defined by side walls, a rear wall, a front wall, a top and a base which together separate the cavity from the surrounding environment of the enclosure;

at least one of said walls having a heat exchange element sandwiched between an outer panel and an inner panel and being rigidly attached thereto;

said heat exchange element having a heat receiving side facing said cavity and a heat dissipating side facing the surrounding environment and comprising a serpentine metallic member defining a first plurality of parallel vertically extending elongate grooves, having elongate openings all in the heat receiving side, and a second plurality of parallel elongate grooves, having elongate openings all in the dissipating side, the grooves of the first plurality being interdigitated with the grooves of the second plurality, the groove ends all terminating in open ends, and closure means closing all of the open ends of only the first plurality of grooves, said closure means being molded and cured in situ in the groove ends they close;

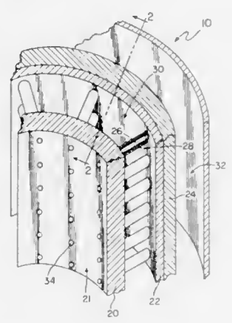
a blower means for circulating air past a said assembly, when in the rack, to cool said assembly and subsequently through the heat receiving grooves of the heat exchange element past the inner panel for recirculation past the assembly.

4,840,226

CORROSIVE RESISTANT HEAT EXCHANGER

Scott L. Richlen, Annandale, Va., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 10, 1987, Ser. No. 83,340
Int. Cl.[4] F28F *19/00*
U.S. Cl. 165—134.1 **16 Claims**



1. A corrosive resistant heat exchanger for recovering heat from a hot gas comprising:

a first conduit for conveying said hot gas, said first conduit having ducts through the wall thereof, said ducts being spaced at predetermined intervals in the longitudinal and horizontal directions;

a second conduit surrounding said first conduit and having an outer wall spaced outwardly from the wall of said first conduit to form a plenum therebetween, said second conduit having ducts through the wall thereof;

tubes connecting the ducts in said first conduit to the ducts in the wall of said second conduit;

an innocuous gas;

means for conveying said innocuous gas through said ducts in said second conduit wall and into said first conduit, such that a boundary layer of said innocuous gas is formed between the inner surface of said first conduit and said hot gas; and

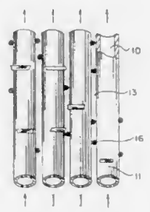
means for pumping a heat recovery medium through said plenum.

4,840,227

PROCESS FOR PRODUCING A HOLLOW FIBER MASS TRANSFER MODULE AND MODULE PRODUCED BY THIS PROCESS

Wolf-Dieter Schmidt, Lübeck, Fed. Rep. of Germany, assignor to Draegerwerk AG, Fed. Rep. of Germany

Division of Ser. No. 112,667, Oct. 22, 1987, Pat. No. 4,769,146.
This application Mar. 14, 1988, Ser. No. 166,876
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, 3636583
Int. Cl.[4] F28D *7/00*
U.S. Cl. 165—162 **5 Claims**



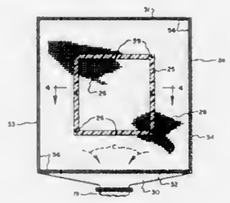
1. A mass heat exchanger comprising a cylindrical housing having an opening at each end, a cap closing each opening having axially aligned tubular connector portions for respective inlet and outlet fluid flow, a plurality of axially extending tubular fibers positioned in said housing and defining a second flow space in their interior volumes, a grout material in said housing adjacent each of the ends of said tubular fibers separating said fibers and securing them in axially aligned positions relative to said housing and defining a first flow space between the grout material of the ends of said fibers, a multiplicity of dispersed separating particles disposed in said first flow space and attached along the lengths of said fibers, providing a separate tubular fiber orientation, and an inlet and outlet connected into a side of said cylindrical housing communicating with said first flow space.

4,840,228

HEAT EXCHANGER HAVING METAL WIRE SCREENS, AND METHOD OF MAKING STACK OF SCREENS THEREFOR

Richard L. Shaner, 10186 Pine Ledge Dr. South, Clarence, N.Y. 14031

Filed Aug. 12, 1985, Ser. No. 764,777
Int. Cl.[4] F28D *7/02*
U.S. Cl. 165—165 **2 Claims**



1. A heat exchanger comprising:

means providing a chamber,

a stack of metal wire screens transversely filling said chamber,

sealant means arranged between adjacent screens in the same endless pattern and located inwardly of the edges of said screens to provide a barrier enclosing an inner region of said stack surrounded by an outer region of said stack,

means clamping said stack of screens to compress said barrier, including bars arranged over said barrier at opposite ends of said stack, tie rods passing through holes in the bars at least at one end of said stack, penetrating the various screens and also said barrier, and at such one end of said stack having threaded ends on which nuts are screwed to bear against such bars,

means for conducting the flow of a first fluid through said inner region from end to end, and

means for conducting the flow of a second fluid through said outer region from end to end,

a layer of gasket material wrapped around said stack to prevent fluid bypassing the screens at the extremities of their said edges,

whereby heat is exchanged between said fluids by way of conduction through the metal wires of said screens.

4,840,229

MULTIPLE POSITION SERVICE SEAL UNIT WITH POSITIVE POSITION INDICATING MEANS

Lewis D. Proctor, Kincardineshire, Scotland; Colby M. Ross, Carrollton, Tex.; Brian P. Manzi, Montrose, Scotland, and Frank Giusti, Jr., Lewisville, Tex., assignors to Otis Engineering Corporation, Carrollton, Tex.

Division of Ser. No. 846,290, Mar. 31, 1986, Pat. No. 4,722,392.
This application Sep. 18, 1987, Ser. No. 98,410
Int. Cl.[4] E21B *23/00*
U.S. Cl. 166—381 **4 Claims**

1. A method for restricting longitudinal movement of a service tool suspended by a work string within a production tubing comprising the steps:

obstructing the annulus between the production tubing and the work string with an annular locator ring mounted on said production tubing string;

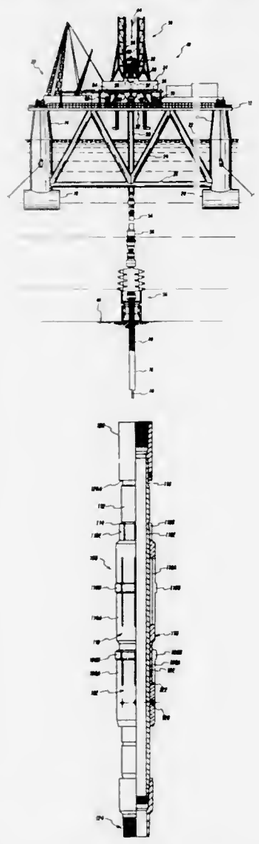
longitudinally reciprocating a latch assembly having a fixed collet attached to said work string and a movable collet slidably mounted on said work string;

engaging the annular locator ring with the movable collet and moving said movable collet longitudinally to a separated position on said work string relative to the fixed collet;

lowering said latch assembly below said locator ring;

retracting the work stsring and inserting the movable collet

into a pocket formed between the work string and fixed collet for preveing deflection of said fixed collet; and,



engaging the locator ring with the fixed collet while the movable collet is inserted within said pocket.

4,840,230

RETRIEVABLE WEDGING SYSTEM FOR COUPLING DOWNHOLE DEVICES INTO CASED BORE HOLES

T. Leslie Youd, Orem, Utah, and Garrett O. Jackson, Valencia, Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Sep. 14, 1987, Ser. No. 96,860
Int. Cl.[4] E21B *23/00, 33/129* B25B *1/00*
U.S. Cl. 166—382 **16 Claims**

1. A retrievable wedging system for coupling a device to the interior of a cylindrical pipe comprising:

a pair of arcuate top wedges for insertion between the device and the pipe;

a first O-ring for disposition about the top wedges to couple the top wedges to said device;

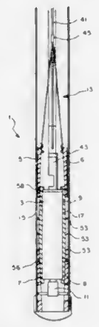
a pair of arcuate bottom wedges for insertion between the device and the pipe, said bottom wedges opposing said top wedges, whereby said top and bottom wedges cooperate to lock the device to said pipe when they are pressed together;

coupling means for slideably coupling the bottom wedges to the device;

retrieving means for disengaging the device from the cylindrical pipe and removing the top and bottom wedges and the device from the pipe, said retrieving means being arranged such that when said device is removed from the pipe, the retrieving means initially disengages said top wedges from said device and moves said device only after said top wedges have been disengaged but before said bottom wedges are moved.

15. A method of releasably coupling a device to a bore hole casing and subsequently retrieving the device comprising the steps of:

coupling a pair of bottom wedges to the bottom of the deice and a pair of top wedges to the top of the device;



inserting the device together with the top and bottom wedges into the bore hole and lowering the device until the bottom wedges contact the bottom of the borehole;

setting the device by pushing the top wedges towards the bottom wedges to lock the device in place against the casing; and

retrieving the device by pulling on a retrieving cable that is connected to both of the top wedges and to the device whereby when tension is applied to the retrieving cable, a first one of the top wedges is disengaged before any tension is applied to move the second top wedge or the device, and then the second top wedge is disengaged before any tension is applied to lift the device itself.

4,840,231

METHOD AND APPARATUS FOR SETTING AN INFLATABLE PACKER

Vel Berzin, and Luis E. Mendez, both of Houston, Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

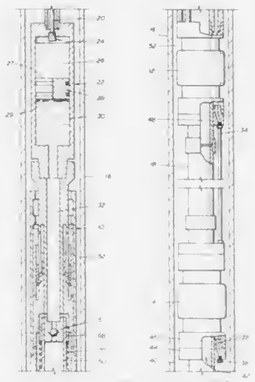
Filed Apr. 22, 1988, Ser. No. 184,832
Int. Cl.[4] E21B *23/06*
U.S. Cl. 166—387 **15 Claims**

1. Apparatus for setting inflatable elastomeric packer sealing elements selectively positionable in a subterranean well bore by a wireline and radially movable for sealing engagement within the well bore in response to fluid pressure, the apparatus comprising:

pressure generating means suspended in said well bore by said wireline for pressurizing a liquid within a liquid chamber of said generating means;

pressure transmitting means having a fluid passageway in fluid communication with said liquid chamber for transmitting liquid pressure from said liquid chamber to said elastomeric packer sealing elements for moving the element into sealing engagement with said well bore

check valve means for automatically closing said passageway in response to a decline in liquid pressure in said passageway; and



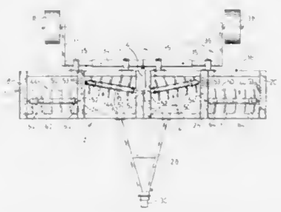
pressure relief means in fluid communication with said passageway for relieving liquid pressure to said elastomeric packer sealing elements in excess of a selected level.

4,840,232

SOIL AERATING EQUIPMENT

Matthew E. Mayer, Woodstock, Canada, assignor to Holland Equipment Limited, Woodstock, Canada

Filed Feb. 23, 1988, Ser. No. 159,158
Int. Cl.[4] A01B *45/02*
U.S. Cl. 172—21 **4 Claims**



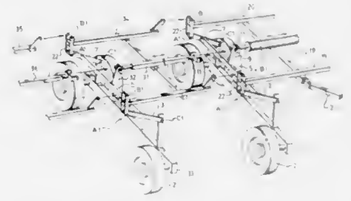
1. Soil aerating equipment comprising a frame moveable in an intended direction of travel, at least a pair of shafts freely rotatably mounted on the frame for rotation about the shaft longitudinal axes, said shafts extending in rearwardly inclined opposite directions on opposite sides of a centre line of said frame extending in the direction of travel, means for adjusting the rearward inclination of the shafts to desired angles in the range of from about 90° to about 120° to the direction of travel, each shaft carrying a series of soil-engaging substantially planar tines extending therefrom in vertical planes and positioned to sequentially engage and penetrate the soil with consequent rotation of the shafts when the frame is moved in the direction of travel, each tine having a central longitudinal axis which extends behind the shaft rotational axis at a distance therefrom in the range from about 0.25 to about 1.75 inches and each tine being twisted about the tine central longitudinal axis at an angle to a vertical plane parallel to the direction of travel in the range of from about 1° to about 30°.

4,840,233

AGRICULTURAL IMPLEMENT HAVING ROCK SHAFT ACTUATED TRANSPORT WHEEL FRAMES

Terrance Friggstad, and David R. Hundeby, both of Saskatoon, Canada, assignors to Flexi-Coil Limited, Saskatoon, Canada

Filed Feb. 12, 1988, Ser. No. 155,516
Claims priority, applicatioo Canada, Feb. 3, 1987, 528908
Int. Cl.[4] A01B *63/22, 73/04*
U.S. Cl. 172—311 **22 Claims**



1. A height adjusting mechanism for a framework that supports a multiplicity of ground working tools of an agricultural implement whereby the tools can be variably positioned for variable ground penetration, comprising:

(a) a set of at least four wheels mounted on two horizontally and longitudinally disposed wheel frames, each wheel frame being supported by at least two of said wheels, disposed proximate the respective ends of said frames,

(b) two rigid, longitudinally disposed, rock shafts, each pivotally attached to, at two points proximate the two ends of, a respective one of said wheel frames, said rock shafts being adapted to pivot relative to their respective wheel frames on longitudinal axes passing through the pivotal attachments on their respective wheel frames, at variable elevations above their respective wheel frames,

(c) two longitudinally spaced, transversely disposed, rigid, horizontal, tool mount bars, each pivotally attached, adjacent its two ends, to the two said rock shafts, said tool mount bars being disposed above said rock shafts and adapted to support two ranks of ground working tools,

(d) at least two longitudinally disposed, rigid, frame bars, transversely spaced along said tool mount bars and fastened thereto to maintain the latter in spaced parallel relationship, and

(e) power means to pivot said rock shafts in opposite directions, simultaneously and through equal angles, around their respective pivotal axes.

4,840,234

PNEUMATIC RAM BORING MACHINE

Paul Schmidt, Winterberger Strasse, 5940 Lennestadt 1, Fed. Rep. of Germany

Filed Oct. 5, 1987, Ser. No. 105,104
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1986, 3634579
Int. Cl.[4] B25D *17/12*
U.S. Cl. 173—90 **8 Claims**

1. A ram boring machine for use in an underground body of soil and having an external diameter, said machine including an axially reciprocating piston driven by compressed air and imparting impact energy to the boring machine for producing a tunnel in the underground body of soil with the tunnel having

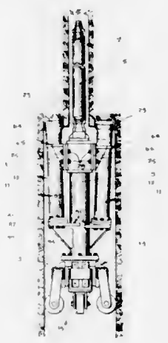
a diameter corresponding to the external diameter of the boring machine and with the boring machine discharging exhaust air in the axial direction into the tunnel wherein the improvement comprises an axially extending hollow cylinder housing having a first end and a second end spaced apart in the axial direction and located in the flow of exhaust air in the tunnel from said boring machine, means forming an axially extending cylindrical passage for conveying compressed air therethrough located within and spaced inwardly from said housing and extending axially between the first and second ends thereof, an annular passageway located between the housing and said means and extending axially between the first and second ends, an end face plate at each of said first and second ends of the annular passageway, exhaust air inlet holes in said end face plate at the first end and exhaust air outlet holes in said end face plate at the second end in general axial alignment for conveying the exhaust air axially through said annular passageway about said cylindrical passage, and at least one of a sound absorbing filter material and an oil separating filter material filling the annular passageway between the first and second ends.

4,840,235

IMPACT HAMMER ASSEMBLY FOR DRILLING ROCK

Roger Masse, 131 Roussin, Thetford Mines, Quebec, Canada G6G 1N6

Filed Apr. 14, 1988, Ser. No. 181,497
Int. Cl.[4] B23B *15/16*
U.S. Cl. 173—104 **11 Claims**



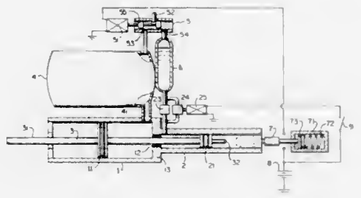
1. An impact hammer assembly for use on a drill head intended for drilling hard material such as rock, said impact hammer assembly comprising:
an elongated case having a longitudinal axis and comprising an inner housing opening at one end of said case;
a drill bit having a forward impact head extending out of said inner housing and a rearward stem extending within said inner housing, said stem being free to rotate and free to slide in said housing about and along said longitudinal axis;
impact motor means mounted in said inner housing, said impact motor means including a linearly reciprocable impact piston mounted behind the drill bit, and means for imparting a reciprocating motion to said impact piston to cause the same to repeatedly hit the stem of the drill bit for said bit head to impact said hard material, and
means for retaining the drill bit in said housing, said retaining means including a pair of pins extending transversally across the elongated case, said pins passing through said inner housing on either side of the stem of the drill bit and acting as stop means inside said housing to limit the slidable displacement of said stem without infering with the free rotation of the same.

4,840,236

HYDRAULIC-PNEUMATIC ACTUATOR FOR IMPACT CUTTER

Glora Goldman, 15 Hakibuzim Street, Kiriat Halim, Israel

Filed Apr. 28, 1987, Ser. No. 43,361
Claims priority, application Israel, May 6, 1986, 78698
Int. Cl.[4] B23B *45/16*
U.S. Cl. 173—134 **4 Claims**



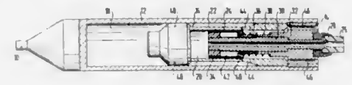
1. An impact implement for cutting through an object with great force, said implement having a front end and a rear end, and further comprising:
a single-acting impact actuator comprising a large-diameter cylinder (**1**) positioned at said front end and a large diameter piston (**11**) contained in said large-diameter cylinder (**1**);
a single-acting control actuator comprising a small-diameter cylinder (**2**) positioned at said rear end and a small diameter piston (**22**) contained in said small-diameter cylinder (**2**);
said large and small diameter cylinders being coaxially and rigidly connected together and separated by a common partition (**13**) between said cylinders, and said large and small diameter pistons being connected together by a common piston rod (**3**) sealingly passing through said partition (**13**) between said cylinders;
a cutting tool attached to a front end of an extension of said piston rod (**3**) which is rigidly connected to said piston (**11**) of said impact actuator and which protrudes out of a front end of said large-diameter impact actuator cylinder;
a large-size air pressure vessel (**4**) communicating with a rear end of said large-diameter impact actuator cylinder (**1**) by means of a large-diameter pipe (**41**);
a liquid-filled pressure vessel (**6**) communicating with a front end of said small-diameter control actuator cylinder (**2**) through a check valve (**23**) and a stop valve (**24**) in parallel alignment;
valve means for alternatively connecting said air pressure vessel (**4**) and said liquid-filled pressure vessel (**6**) to the atmosphere and to a supply of compressed air;
said control actuator retaining said tool in a retracted position, against the pressure on said large diameter piston (**11**) of said impact actuator by compressed air contained in said cylinder (**1**) of said impact actuator and in said air pressure vessel (**4**), and releasing said large diameter piston (**11**) and said tool upon opening of said stop valve (**24**), thereby connecting said control actuator to the atmosphere, whereby compressed air contained in said impact actuator cylinder (**1**) and in said pressure vessel (**4**) drives said large diameter piston (**11**) and said tool forward at substantially constant air pressure.

4,840,237

RAM BORING IMPLEMENT

Helmuth Roemer, Attendorner Strasse 135, D-5950 Finnentrop-Haggen, Fed. Rep. of Germany

Filed Jan. 4, 1988, Ser. No. 151,421
Claims priority, application Fed. Rep. of Germany, Jan. 2, 1987, 8700076[U]
Int. Cl.[4] E21B *4/14*
U.S. Cl. 175—19 **12 Claims**



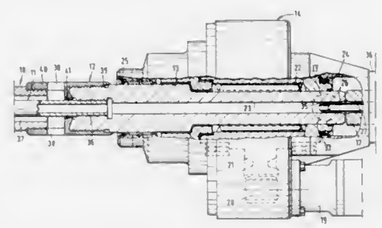
1. A ram boring implement, comprising:
a generally cylindrical housing;
a pneumatically driven percussion piston axially movable in a reciprocating manner in the housing and defining a first pressure chamber in front of it and a second pressure chamber behind it;
a core member mounted axially within said housing;
said core member having an end portion coaxially projecting into the interior of said housing;
a compressed air supply, comprising a compressed air supply hose connected to the housing; and
a control sleeve which is axially adjustable for reversing the direction of motion of the ram boring implement, said control sleeve being arranged on an outer circumferential surface of said end portion and including an annular effective area that is acted upon by the pressure in the second pressure chamber;
said core member including a spindle drive rotatably mounted in said housing for adjusting the axial position of the control sleeve in response to turning of the compressed air supply hose;
said spindle drive having a first end connected to said compressed air hose for rotation therewith and a second end threadedly connected to said control sleeve to adjust the axial position of the control sleeve relative to the spindle drive while the ram boring implement is in operation.

4,840,238

SUPERPOSED DRILLING DEVICE

Günter Klemm, Olpe, Fed. Rep. of Germany, assignor to Ing. Günter Klemm Spezialunternehmen für Bohrtechnik, Fed. Rep. of Germany

Filed Aug. 9, 1988, Ser. No. 230,230
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1987, 3728269
Int. Cl.[4] E21B *4/14*
U.S. Cl. 175—92 **8 Claims**



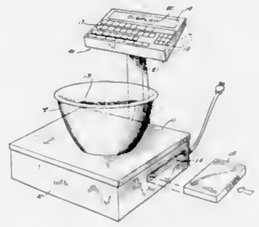
1. Superposed drilling device comprising
a rotary drive (**14**) rotatingly driving a shank (13),
a hammer drill (**15**) provided downstream of the rotary drive (**14**) and whose piston (**17**) strikes on the shank (**13**),
a scavenging pipe (**26**) extending through a bore (**27**) of the piston (**17**) and projecting into a scavenging bore (**23**) of the shank (**13**),
a seal (**34**) being disposed between a wall of said bore (**23**) and the scavenging pipe (**26**),
characterized in that between said scavenging pipe (**26**) and said scavenging bore (**23**), there is an annular chamber (**32**), and that the scavenging pipe (**26**) comprises a radially projecting thicker head (**33**) than said scavenging pipe (**26**) in which the seal (**34**) is accommodated.

4,840,239

VOLUMETRIC-TO-GRAVIMETRIC-TO-VOLUMETRIC CONVERTER SCALE

James E. Slagg, 510 Sycamore Ave., South Milwaukee, Wis. 53172

Filed Nov. 22, 1988, Ser. No. 274,857
Int. Cl.[4] G01G *19/40, 19/22*
U.S. Cl. 177—25.14 **25 Claims**



1. A converter scale comprising:
transducer means for producing an electric signal (W) corresponding to the weight of a material placed on the scale,
means for converting said signal (W) corresponding to weight to a signal (V) corresponding to the volume of said material, and
display means responding to said signal (V) corresponding to volume by displaying information indicative of said volume.

4,840,240

WEIGHING AND PACKING DEVICE

Yoshiharu Toyoda, Akashi; Yoshitaka Mikata, Himeji, and Shoji Yamano, Akashi, all of Japan, assignors to Yamato Scale Company, Limited, Japan

Filed Jan. 25, 1988, Ser. No. 147,785
Claims priority, application Japan, Jan. 26, 1987, 62-17096
Int. Cl.[4] G01G *13/00*
U.S. Cl. 177—25.18 **18 Claims**

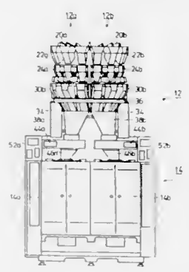
1. A weighing and packing device comprising:
first and second combination weighers, each adapted to deliver batches of product, each batch having a total weight substantially equal to a target weight preset as an operating condition of each said weigher;
first and second packers adapted to pack said batches of product delivered from said first and second combination weighers, respectively;
control means for controlling operation of said first and

second combination weighers and said first and second packers;

at least one operation display means coupled to said control means for supplying operating conditions of said first and second combination weighers and said first and second packers and displaying operation data of said first and second combination weighers and said first and second packers;

said control means adapted to operate said first and second combination weighers in a first mode in which said weighers operate synchronously to deliver said batches of product to their respective packers in first and second cycles, respectively, one cycle being a function of the other, and in a second mode in which said weighers operate nonsynchronously to deliver said batches of product to their respective packers in first and second cycles, respectively, which are independent of each other; and

said control means includes means for selecting one of said first and second modes of operation in accordance with said operating conditions supplied from said operation display means.

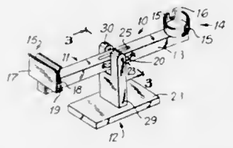


4,840,241

LETTER SCALE WITH COIN COUNTER-BALANCE

Takeshi Ishikawa, 420 E. 80th St., Suite 8L, New York, N.Y. 10021

Filed Oct. 3, 1988, Ser. No. 252,635
Int. Cl.[4] G01G *23/14, 1/18*
U.S. Cl. 177—172 **9 Claims**



1. A coin scale for measuring weight of a mailing material, comprising:

a scale section including an elongated arm, a coin receiving member formed at one end of the arm for supporting a plurality of coins thereon, a mail receiving member formed at the other end of the arm for supporting a mailing material to be weighed thereon, and a first supporting device formed in the arm between the coin receiving member and the mail receiving member, said first supporting device having a plurality of supporting points, said scale section being supported by one of the supporting points, and

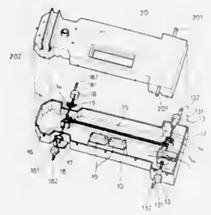
a base section situated under the scale section, said base section having a stand and a second supporting device formed on the stand, said second supporting device rotatably engaging one of the supporting points of the first supporting device and supporting the elongated arm as a fulcrum of a balance so that in at least one supporting point, weight at the mail receiving member which corresponds to the particular weight zone of a mailing material increases step by step as one coin is added in the coin receiving member.

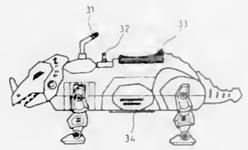
4,840,242

CONVERTIBLE ANIMAL TOY

Liu P. Chih, No. 29, Lane 426, Wor Long Street, Taipei City, and Chi Y. Hwang, No. 21, Lane 20, Chung Chen N. Rd., Sun Chong City, Taipei Shien, both of Taiwan

Filed Mar. 3, 1988, Ser. No. 163,645
Int. Cl.[4] B62D *57/02;* A63H *11/20*
U.S. Cl. 180—8.1 **5 Claims**





5. A convertible animal toy, comprising:

a toy body;

a front shaft having opposite ends and a rear shaft having opposite ends, said front and rear shafts being spaced from each other and mounted for rotation to said toy body;

a universal joint connected to each end of said front shaft and on opposite sides of said toy body;

a first pair of eccentric projections connected respectively to said universal joints, said first pair of eccentric projections being in phase opposition to each other;

a second pair of eccentric projections connected respectively to said opposite ends of said rear shaft on opposite sides of said toy body, said second pair of eccentric projections being in phase opposition to each other, eccentric projections from said first and second pair of eccentric projections on each side of said toy body being in phase opposition to each other;

reduction gear drive means mounted to said toy body and operatively connected to said rear shaft for rotating said rear shaft;

a bevel gear connected to each of said front and rear shafts;

a bevel gear shaft having bevel gears engaged with said bevel gears of said front and rear shafts for transferring rotation of said rear shaft to said front shaft over said bevel gear shaft;

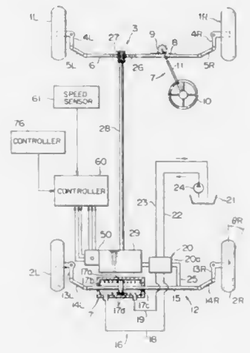
a set of moving media for connection to each of said eccentric projections for movement by rotation of said front and rear shafts to move said toy body, said sets including one set of four leg-like pieces each for engagement with one of said eccentric projections for executing walking movement with rotation of said eccentric projection, and a second set of four wheels each for connection to one of said eccentric projections for rotation, with rotation of said eccentric rotations; a turning support mounted for pivotal movement to each side of said toy body adjacent said front shaft, each of said first pair of eccentric projections being engaged for rotation in one of said turning supports for steering of said first pair of eccentric projections with pivoting of said turning supports sliding means mounted for sliding movement to said toy body; and connecting means connected between said sliding means and each turning support for pivoting each turning support.

4,840,243

FOUR-WHEEL STEERING VEHICLE

Shigefumi Hirabayashi, Hiroshima, and Toshio Nakajima, Hatsukaichi, both of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 30, 1988, Ser. No. 238,195
Claims priority, application Japan, Aug. 31, 1987, 62-217296
Int. Cl.[4] B62D *5/04;* B60T *8/00*
U.S. Cl. 180—140 **12 Claims**



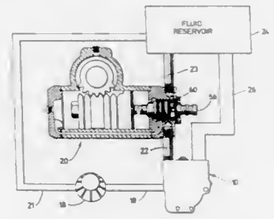
1. A four-wheel steering vehicle including a four-wheel steering mechanism for controlling a steering of front and rear wheels based on a predetermined steering ratio property in accordance with an operation of a steering wheel, and an anti-lock braking system for controlling a braking force acted on each of the front and rear wheels to prevent the wheels from locking during a braking operation, the improvement comprising steering ratio changing means for controlling a steering ratio of a steering amount of the rear wheels to a steering amount of the front wheels in accordance with a vehicle speed based on said steering ratio property, fail detecting means for detecting an abnormal condition of the anti-lock braking system, compensating means for receiving signals from the fail detecting means and compensating the steering ratio property so that the rear wheels are steered in a direction and amount to improve a driving stability of the vehicle during a braking operation.

4,840,244

AUTOMATIC REGULATOR VALVE ASSEMBLY FOR VEHICLE POWER STEERING

Robert H. Broucksou, Hanover, Pa., assignor to R.H. Sheppard Co., Hanover, Pa.

Filed Dec. 28, 1987, Ser. No. 138,046
Int. Cl.[4] B62D *5/08*
U.S. Cl. 180—143 **23 Claims**



3. A vehicle power steering system providing variable power assist characteristics comprising:

steering gear means;

hydraulic pump means to provide pressurized hydraulic fluid to said steering means;

a fluid reservoir to receive low pressure fluid from said steering gear means;

a regulator valve assembly to divide the flow of hydraulic fluid between said steering gear means and said fluid reservoir, said regulator valve assembly including means for varying the flow of hydraulic flow to said steering gear substantially in response to inlet fluid pressure of said steering gear means; and

means for bypassing fluid from said flow varying means around said steering gear; said flow varying means including a flow control valve;

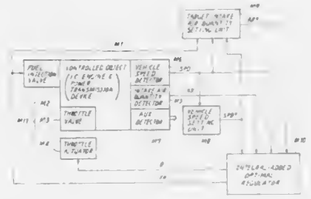
said flow control valve including a reciprocating piston having first and second ends received within a cylinder, the first end of said piston being in fluid communication with said inlet fluid pressure, at least one flow orifice extending transversely across said cylinder, said piston being operative to open and close said orifice to regulate the flow to said steering gear.

4,840,245

APPARATUS FOR CONTROLLING VEHICLE SPEED

Eiichi Kamei, Nagoya, and Hideaki Namba, Oobu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 830,139, Feb. 18, 1989, abandoned.
This application Apr. 13, 1988, Ser. No. 183,378
Claims priority, application Japan, Feb. 18, 1985, 60-31906
Int. Cl.[4] B60K *31/04*
U.S. Cl. 180—179 **3 Claims**



1. Apparatus for controlling a speed of a vehicle having an

internal combustion engine and a power transmission mechanism as a controlled object, comprising:

(a) intake air flow rate detecting means for producing an intake air flow signal indicative of intake air flow to said internal combustion engine;

(b) vehicle speed detecting means for producing a vehicle speed signal indicative of a traveling speed of said vehicle;

(c) cruising speed setting means for setting a constant cruising speed in accordance with said vehicle speed signal when a cruising mode is designated;

(d) target intake air flow setting means for setting said intake air flow to a value corresponding to a minimum fuel amount capable of maintaining said cruising speed on the basis of a pattern of correlation between fuel amount and intake air flow, predetermined in correspondence with said cruising speed; and

(e) an integral-added optimal regulator for determining, in receipt of said target intake air flow, said cruising speed, and control input and output values of said controlled object, feedback amounts of controlled variables of said air-fuel mixture supply means on the basis of operating equations used for estimating internal state of said controlled object predetermined in accordance with a dynamic model of the system relating to said controlled object, and also on the basis of an optimal feedback gain, said integral-added optimal regulator then outputting one or more control signals based on said determined feedback amount, said integral-added optimal regulator having:

(i) a first integrator for integrating a difference between said vehicle speed obtained by said vehicle speed detecting means and a target vehicle speed;

(ii) a second integrator for integrating the difference between said intake air flow obtained by said intake air flow rate detecting means and the target intake air flow set by said target intake air flow setting means;

(iii) an observer for estimating an internal state of said internal combustion engine determined on the basis of dynamic models of said internal combustion engine, using information related to throttle valve opening degree, said fuel amount, said vehicle speed and said intake air flow; and

(iv) feedback amount determining means for determining the rate of air flow and fuel amount fed to said internal combustion engine by computing one of matrix products or vector products of the difference outputs from said first and second integrators, said internal state estimated by said observer, and a predetermined feedback gain, said rate of air flow and fuel amount determined by said feedback amount determining means being fed to said observer;

(f) air-fuel mixture supply means for supplying air and fuel to said engine in accordance with said rate of air flow and said fuel amount determined by said feedback amount determining means so as to control the speed of said engine, said air-fuel mixture supply means having at least one fuel injection valve and an actuator for adjusting the opening degree of a throttle valve disposed in an intake pipe of said engine so that said rate of air flow and fuel amount are used to control said fuel injection valve and said actuator, respectively.

4,840,246

POWER TRANSMISSION CONTROL SYSTEM FOR A FOUR-WHEEL DRIVE VEHICLE

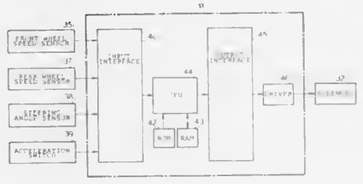
Toru Yamakawa; Fujio Makita, both of Hachioji; Mitsuo Umezawa, and Ryuzo Sakikiyama, both of Tokyo, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,546

Claims priority, application Japan, Sep. 19, 1983, 58-172665

Int. Cl.⁴ B60K *17/34*

U.S. Cl. 180—247 **9 Claims**



1. In a power transmission control system for a four-wheel drive vehicle powered by an engine having a transmission for transmitting power of said engine to main driving wheels of said four-wheel drive vehicle, a clutch for further transmitting said power simultaneously to auxiliary driving wheels of the vehicle, and circuit means for engaging said clutch in accordance with driving conditions, the improvement wherein the circuit means comprises:

first sensors for detecting speeds of shafts for said main and auxiliary driving wheels for producing respective shaft speed signals;

a second sensor for detecting steering angle for producing a steering angle signal;

first means for producing a vehicle speed signal when the speed of the vehicle is below a predetermined speed;

comparing means responsive to the steering angle signal for producing a steering angle decision signal when the steering angle is larger than a predetermined value;

second means responsive to the shaft speed signals for producing a speed difference signal when the difference between the speeds of the shafts for the main and auxiliary wheels is smaller than a predetermined value;

decision means responsive to the vehicle speed signal, steering angle decision signal, and speed difference signal for disengaging the clutch for providing two-wheel driving.

4,840,247

DEVICE FOR CONTROLLING 4WD VEHICLE CENTRAL DIFFERENTIAL RESTRICTION DEVICE ACCORDING TO FRONT AND REAR WHEELS ROTATIONAL SPEED DIFFERENCE, AND METHOD OF OPERATION THEREOF

Yuji Kashihara; Yutaka Tage; Yasunari Nakamura; Hiroshi Ito, and Tokuyuki Takahashi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Apr. 30, 1987, Ser. No. 44,309

Claims priority, application Japan, May 6, 1986, 61-105473; May 6, 1986, 61-105475; Jun. 9, 1986, 61-133065; Jun. 30, 1986, 61-153172; Sep. 29, 1986, 61-230543

Int. Cl.⁴ B60K *17/34*

U.S. Cl. 180—249 **12 Claims**

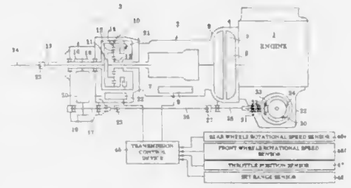
1. In a four wheel drive vehicle with an engine, a front wheel propeller shaft, a rear wheel propeller shaft, a central differential device for differentially transsmitting rotational power from said engine to said front wheel propeller shaft and said rear wheel propeller shaft, a front wheels rotational speed sensor for detecting a rotational speed of a combination of front wheels of the vehicle, a rear wheels rotational speed sensor for detecting a rotational speed of a combination of rear wheels of the vehicle, and a central differential operation resticting device for selectively restricting the differential operation of said central differential device at variable degrees:

a method for controlling said central differential operation restricting device, comprising the steps of:

(a) detecting the rotational speed of the front wheels and the rotational speed of the rear wheels of the vehicle by said front wheels rotational speed sensor and said rear wheels rotational speed sensor, respectively, to produce a first variable value and a second variable value corresponding to the rotational speed of said front wheels and said rear wheels respectively;

(b) comparing said first variable value with said second variable value to produce a third variable value which is the absolute value of the difference between said first and second variable values;

(c) comparing said third variable value with a reference value to detect a first condition that said third variable value is larger than said reference value and a second condition that said third variable is smaller than said refrence value;



(d) increasing the degree of the differential operation restricting operation of said central differential operation restricting device for an increment thereof when said first condition is detected; and

(e) decreasing the degree of the differential operation restricting operation of said central differential operation restricting device when said second condition is detected;

(f) comparing said first variable value with said second variable value to detect a first sub-condition that said first variable value is larger than said second variable value and a second sub-condition that said first variable value is not larger than said second variable value, wherein said reference value is modified according to said second variable value when said first sub-condition is being detected, while said reference value is modified according to said first variable value when said second sub-condition is being detected;

wherein said steps (a), (b), (c) and (d) are repetitively performed in said sequence as long as said first conditon is being detected and said steps (a), (b), (c) and (e) are performed when said second condition is detected.

4,840,248

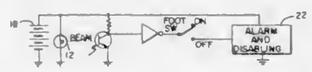
SAFETY SWITCH LIGHT FENCE

Edward J. Silverman, 301 S. Seventh Ave., Suite 325, West Reading, Pa. 19611

Filed Jun. 2, 1987, Ser. No. 57,095

Int. Cl.⁴ B60K *28/04*

U.S. Cl. 180—272 **20 Claims**



1. In a vehicle having multiple exit openings about an operator station from which an operator controllably operates various functions of the vehicle, the improvement comprising:

a photoelectric cell system disposed substantially across said multiple exit openings about the operator station, including at least one light source and a plurality of light sensors spaced from the light source, the light sensors producing respective signals responsive to obstruction of a respective beam adjacent the corresponding exit opening from the source to the respective sensor, and means responsive to the respective signal for operating at least one of an indicator and a device for disabling of the vehicles.

4,840,249

APPARATUS FOR SREWING A COVER ONTO A SCREW NECK OF A HEARING AID

Ulrich Birkholz, Bayreuth; Christof Haertl, Neunkirchen, and Peter Nassler, Eckental, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 1, 1987, Ser. No. 45,448

Claims priority, application Fed. Rep. of Germany, May 16, 1986, 3616637

Int. Cl.⁴ H04R *25/02*

U.S. Cl. 181—129 **8 Claims**

1. An apparatus for screwing a cover having a central axis onto a screw neck of a hearing aid, comprising a manually graspable rotary shaft having a first end which has at least two pins lying essentially diametrically opposite one another relative to a longitudinal axis of said rotary shaft, said pins mating with corresponding holes arranged in the cover lying essentially diametrically opposite one another with reference to the center axis of the cover.

4,840,250

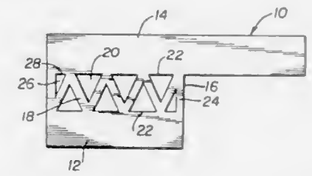
ACOUSTIC IMPEDANCE INDUCING DEVICE

Donald A. Novy, 1234 S. Quince Way, Denver, Colo. 80231

Filed Aug. 25, 1988, Ser. No. 236,669

Int. Cl.⁴ G10D *9/00*; **G10K** *11/00*

U.S. Cl. 181—175 **21 Claims**



1. An acoustical impedance inducing device for axial insertion into a longitudinal air column of a wind musical instrument, comprising:

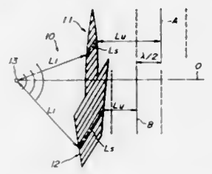
a first annular band of first predetermined thickness;

a second annular band of second predetermined thickness, wherein said second predetermined thickness is approximately twice said first predetermined thickness; and

a first web interconnecting said first and second bands and maintaining said bands at a predetermined axial spacing, wherein said web is formed of strips diagonally disposed between the first and second bands and defining a triangle

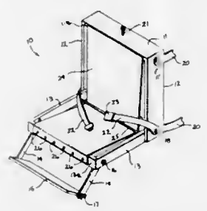
shaped aperture between adjacent bands, with a base of the triangle being colinear with an edge of one of said first and second bands.

4,840,251
NOISE REDUCING APPARATUS
Masanori Murase, Kodaira; Naotaka Tomita, Sayama, and Kazuyoshi Iida, Yokohama, all of Japan, assignors to Bridgestone Corporation, Japan
Filed Sep. 30, 1988, Ser. No. 251,290
Claims priority, application Japan, Sep. 30, 1987, 62-247349
Int. Cl.[4] F01N 1/06
U.S. Cl. 181—206 **3 Claims**



1. A noise reducing apparatus in a form of a hollow body comprising a first group of passages and a second group of passages, a length of each passage of the first group is determined as a sum of; a distance from a sound source to an inlet of a passage, the length of the passage and a distance from an outlet of the passage to an imaginary flat plane in front of the outlet of the passage to achieve a first constant length so that a resultant wave emitted from the outlet after passing through each passage of the first group of the passages becomes a plane wave, and a length of each passage of the second group is determined such that a second constant length is equal to said first constant length plus or minus a half wavelength of a frequency of a sound to be reduced so that the resultant plane wave emitted from the outlet of the passages of the first group and a resultant plane wave emitted from an outlet of the passages of the second group become a plane wave which is shifted from said imaginary flat plane by a half wavelength.

4,840,252
DEER STAND
Lacy K. Hucks, Jr., 229 S. Waccamaw Dr., Garden City, S.C. 29576
Filed Dec. 28, 1987, Ser. No. 138,806
Int. Cl.[4] E04G 3/00
U.S. Cl. 182—187 **4 Claims**

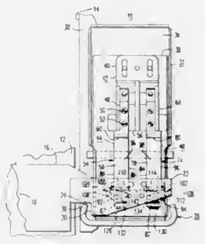


1. A deer stand apparatus for selective securement to trees and the like comprising:
a housing framework including a top frame member, a bottom frame member, and a plurality of side frame members, and
a seat framework including a plurality of arms pivotally secured to each of said side frame members with a forward seat link and a rearward seat link joining said arms together, and
a foot rest means pivotally secured to said plurality of arms, said seat framework means and said foot rest means foldable within the housing framework at a first position and unfoldably disposable orthogonally to said housing framework in a second position, and
wherein said seat framework means includes a seat fabric wherein said seat fabric is secured to a forward face of said top frame member at one terminal end and securable to said forward seat link at said other end, and
wherein said seat fabric is releasably securable to said forward seat link by means of hook and loop fastening strips and additionally the use of snap fasteners, and
wherein said other end of said fabric is securable to a rear face of said top frame member when said seat framework means and said foot rest means are foldably nested within the housing framework, and
wherein a plurality of tree straps are secured to said side frame members for securement about an associated tree, and
wherein a seat belt is secured to said side frame members, and
wherein at least one of said tree straps and said seat belts are secured to said side frame member about a common connection additionally securing said arms to said side frame members.

4,840,253
METHOD AND APPARATUS FOR SERVING AND DISPLAYING FOOD
Joseph T. DiMaggio, and Marina A. DeMaggio, both of 479 Valencia Dr., South San Francisco, Calif. 94080
Filed Nov. 18, 1986, Ser. No. 932,452
Int. Cl.[4] B65G 53/02
U.S. Cl. 186—49 **2 Claims**

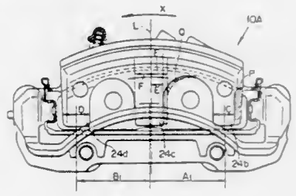
2. A method for serving and displaying food comprising:
providing a continuous watercourse pathway having a predetermined width and defined by an inner continuous, stationary vertical wall and an outer continuous, stationary vertical wall, said inner and outer vertical walls being spaced apart and substantially parallel to one another in an oblong configuration and with two rounded ends, said watercourse pathway confining water at a continuous horizontal level;
providing a plurality of food carriers floatable in water, each carrier having a circular outer periphery and an outer diameter which is less than the width of said pathway and greater than one-half the width of said pathway;
disposing said carriers sequentially within said pathway and adjacent to one another in a substantially staggered arrangement such that the outer peripheries of substantially every other carrier in said arrangement is in close proximity to said outer vertical wall and the outer peripheries of substantially all of the other of said carriers are in close proximity to said inner vertical wall, and such that the total accumulated spacing between said carriers around said watercourse pathway is less than the smallest carrier diameter; and
circulating water around said watercourse pathway for horizontally propelling said carriers along said pathway in a predetermined direction such that said carriers are in contact only with one another and with said inner and outer vertical walls, wherein during propelling of said carriers by circulating water substantially every carrier physically contacts its adjacent carriers at their respective outer peripheries and contacts one of said vertical walls whereby substantially all of said carriers rotate simultaneously about their respective vertical axes with adjacent carriers rotating in opposite directions.

4,840,254
ELEVATOR HOISTWAY DOOR INTERLOCK
David B. Pearson, Raritan, and Robert A. Wissell, Maywood, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Aug. 12, 1988, Ser. No. 231,407
Int. Cl.[4] B66B 13/00
U.S. Cl. 187—57 **5 Claims**



1. In an electro-mechanical elevator hoistway door interlock which mechanically latches an elevator hoistway door in a closed position and provides an electrical indication when the mechanical latch is made, including a first latch portion carried by a hoistway door, a bridging contact carried by the first latch portion, a second latch portion fixed to a hoistway door jamb which is cooperable with the first latch portion to prevent unauthorized opening of the hoistway door when it is closed, and an electrical switch associated with the second latch portion which is actuated by the bridging contact to provide the electrical indication when the hoistway door is closed and latched by the first and second latch portions, an improvement to the electrical switch comprising:
an insulative mounting block,
first and second elongated stationary electrical contacts,
each of said first and second stationary electrical contacts having an upper portion fixed to said insulative mounting block and a lower portion depending from said insulative mounting block,
the lower portion of each of said first and second electrical contacts having a substantially U-shaped configuration in side elevation, including a bight and upper and lower legs,
the bights of said first and second electrical contacts having inner edges in adjacent spaced relation, and outer non-adjacent edges,
the upper leg of each of said first and second electrical contacts being integrally joined to the upper portion of the associated stationary electrical contact,
the lower leg of each of said first and second electrical contacts having an upwardly facing spring seat,
the bights of said first and second electrical contacts each having an outwardly extending arm on said outer non-adjacent edges,
the arm of each of said first and second electrical contacts defining a slot,
a pivotable contact disposed in the slot of each of said first and second electrical contacts, with said pivotable contact having a downwardly facing spring seat,
and a spring disposed to extend between the spring seats of the lower leg and pivotable contact of each of said first and second electrical contacts,
said springs biasing said pivotable contacts to first positions, the pivotable contacts of said first and second electrical contacts being simultaneously pivotable in opposite rotational directions to second positions, against the bias of said springs, by a downward movement of the bridging contact, providing a wiping action between the pivotable contacts and the bridging contact.

4,840,255
DISC BRAKE
Hideto Murakami, Hatano, and Terukiyo Kitamura, Tokyo, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama City, Japan
Continuation of Ser. No. 833,141, Feb. 26, 1986, abandoned.
This application May 18, 1987, Ser. No. 51,187
Claims priority, application Japan, Feb. 28, 1985, 60-28599[U]
Int. Cl.[4] F16D 65/20
U.S. Cl. 188—73.35 **10 Claims**



1. A disc brake for reducing brake noise in an automobile, comprising:
(a) a disc rotor having first and second major surfaces and being adapted for attachment to a wheel of the automobile;
(b) a carrier for connecting to a fixed member of the automobile, said carrier including:
(i) two spaced arm portions each straddling a peripheral portion of said disc rotor, each of said arm portions including:
(1) a first and second end portion, and
(2) an inner side;
(ii) a base portion positioned at one side of said disc rotor and being connected to said first end portions of each of said arm portions; and
(iii) a bridge portion positioned at the other side of said disc rotor and being connected to said second end portions of each of said arm portions;
(c) a caliper slidably mounted to said carrier so that said caliper is slidable in a direction perpendicular to the major surfaces of said disc rotor, said caliper including a bridge portion straddling the periphery of the disc rotor, a base portion positioned at a first side of said disc rotor and a holder portion positioned at the a second side of said disc rotor, said holder portion comprising:
(i) first, second and third finger portions which are arranged in this order in the direction of rotation of said rotor when the automobile is moving in a forward direction, said finger portions being arranged on an imaginary plane which is parallel to the second side of said disc rotor, and
(ii) means for reducing braking noise, comprising at least any one of the finger portions being of a different size and configuration from the other of said finger portions and a pitch between said first and second finger portions which is different than the pitch between said second and third finger portions;
(d) two identical piston units which are mounted parallel to said base portion of said caliper;
(e) an inner brake shoe movably mounted between the first side of said disc rotor and each of said piston units so that

upon operation of said piston units said piston units press said inner brake shoe against one face of said disc rotor, said inner brake shoe including opposed ends which are slidably engaged with said inner side of each of said arm portions of said carrier respectively; and

(f) an outer brake shoe movably mounted between the second side of said disc rotor and said holder portion so that upon operation of said piston units, said piston units move said caliper and thus said holder portion and said outer brake shoe, said outer brake shoe making contact with the other face of said disc rotor, said outer brake shoe including opposed ends which are slidably engaged with said inner side of each of said arm portions of said carrier respectively;

whereby the three finger portions of said holder portion are positioned asymmetrically with respect to said outer brake shoe.

4,840,256

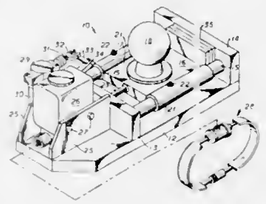
SURGE BRAKE APPARATUS FOR GOOSENECK TRAILERS

James E. Webb, 13809 Hershie St., Houston, Tex. 77015

Filed May 5, 1988, Ser. No. 190,656

Int. Cl.[4] B60T 7/20

U.S. Cl. 188—112 R **15 Claims**



1. A trailer hitch for actuating the hydraulic brakes of a wheeled trailer responsive to the relative movement between a two vehicle and the trailer being towed comprising:

a hitch member having a base plate adapted to be affixed to the tow vehicle and a second plate movably mounted thereon for longitudinal movement relative to the base plate and the tow vehicle and the second plate having trailer connecting means thereon which moves therewith and which is adapted to receive the tongue portion of the wheeled trailer,

said second plate slidably mounted and supported on a pair of elongate cylindrical rod members secured on said base plate in a parallel spaced relation above the top surface thereof and movable relative to said base plate upon relative movement between the towed trailer and the tow vehicle,

a master hydraulic cylinder removably mounted on said base plate stationary relative to said second plate and connected by conduit to the hydraulic brakes of the towed trailer and having a movable piston therein for creating a hydraulic fluid pressure to actuate the hydraulic trailer brakes,

actuating means carried on said second plate and operatively connected to said master cylinder piston whereby forward movement of said second plate relative to said master cylinder will cause said actuating means to pressurize the fluid therein to activate the wheel brakes of the trailer as the tow vehicle is slowed down, and

releasable lock means for selectively preventing relative movement between said movable trailer connecting means and said master cylinder whereby the trailer may be backed up by the tow vehicle without actuation of the trailer brakes.

4,840,257

BRAKE ADJUSTERS

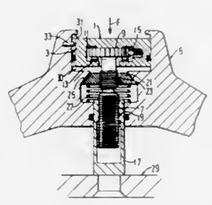
Anthony W. Harrison, Birmingham, England, assignor to Lucas Industries public limited company, Birmingham, England

Continuation of Ser. No. 936,440, Dec. 1, 1986, abandoned. This application Apr. 12, 1988, Ser. No. 183,361

Claims priority, application United Kingdom, Nov. 29, 1985, 8529473

Int. Cl.[4] F16D 65/56

U.S. Cl. 188—196 D **9 Claims**



1. An adjuster for use in spring applied brakes comprising a thrust block which is axially slidable in a cylinder bore, the thrust block being rotatably connected to one of two screw threaded adjuster members which are interconnected by a self-sustaining thread, said one adjuster member being provided with a spiral drive thread between the thrust block and said self-sustaining thread, and an axial portion of said one adjuster member being profiled, detent means engaging said profiled portion, the profile of said portion being constructed and arranged that said detent means at all times applies a force to said profiled portion to prevent accidental rotation of said one adjuster member in either direction while allowing rotation thereof when said force is exceeded, a drive ring having a complementary thread meshing with said spiral drive thread with a predetermined amount of axial thread clearance therebetween requiring an amount of relative axial movement between the drive ring and said one adjuster member in one of two axial directions before the meshed threads on the drive ring and on said one adjuster member interengage each other, the drive ring having a tapered outer peripheral surface which can engage a complementary surface on said cylinder bore to form a cone clutch, under the action of a spring, said surfaces interengaging on brake release to cause said one adjuster member to rotate under the action of said spiral thread when said meshed threads have interengaged, said drive ring being rotatable on said spiral drive thread on brake application after said meshed threads have interengaged and the cone clutch has been released.

4,840,258

BRIEF CASE WITH A PORTABLE WIRELESS TELEPHONE

Arifumi Tomikawa, and Nihiko Yasukawa, both of Norcross, Ga., assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 071,966, Jul. 10, 1987, Pat. No. 4,790,417. This application Jul. 15, 1988, Ser. No. 245,393

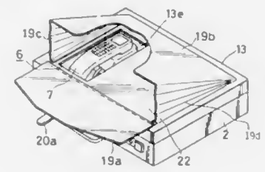
Int. Cl.[4] A45G 15/00

U.S. Cl. 190—102 **3 Claims**

1. A brief case for containing a portable wireless telephone set and other items, comprising:

a base having a first space for accommodating the telephone set and a second space for accommodating said other items, and

a lid assembly capable of being partially opened to permit access and use of the telephone set, said lid assembly including



a first lid substantially covering the entire base and having an opening over the space for the telephone set; and

a second lid covering at least the opening in said first lid.

4,840,259

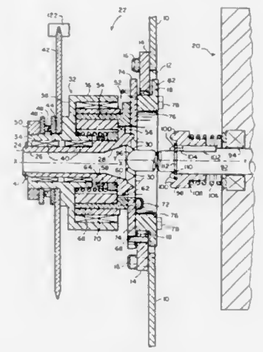
DRIVE MECHANISM FOR A REPRODUCTION APPARATUS

Vladimir S. Guslits, and Steven P. Bailey, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 3, 1987, Ser. No. 128,313

Int. Cl.[4] F16D 7/02, 11/00, 13/08, 21/08

U.S. Cl. 192—48.2 **2 Claims**



1. In a reproduction apparatus having a station with a shaft rotatable about an axis, a drive mechanism for rotating the shaft, a plate supporting the drive mechanism, and the station shaft being movable into and out of engagement with the drive mechanism, the drive mechanism comprising:

a coupling having an opening generally aligned with the axis of the shaft for receiving the shaft, the end of the opening facing the received shaft being of frusto-conical shape to accept a slightly misaligned shaft, the end of the coupling having gear teeth extending axially for connecting the coupling to the shaft for conjoint movement,

a rotor positioned around the coupling, means mounting the rotor on the coupling for rotation relative to the coupling,

means connected to the rotor for rotating the rotor relative to the coupling,

a clutch supported by the plate and positioned between the rotor and the coupling, the clutch being effective when energized to couple the rotor to the coupling for conjoint rotation, and the clutch being effective when deenergized to permit the rotor to rotate relative to the coupling,

means for mounting the rotor relative to the clutch so that the rotor can rotate freely when the clutch is deenergized, and

means for supporting the drive mechanism permitting radial movement thereof relative to the plate to compensate for receipt of a misaligned shaft in the opening in the coupling.

4,840,260

BICYCLE FREE-WHEEL STARWHEEL AND FREE WHEEL PROVIDED WITH SUCH A STARWHEEL

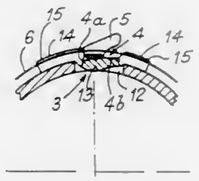
Bernard Josereau, Eu, France, assignor to Etablissements Maurice Maillard, Incheville, France

Filed Aug. 3, 1987, Ser. No. 81,061

Claims priority, application France, Aug. 5, 1986, 86 11325

Int. Cl.[4] F16D 41/30

U.S. Cl. 192—64 **16 Claims**



1. A bicycle free-wheel starwheel assembly, comprising:

(a) a starwheel (1) constituted by at least one thin, stamped member,

(b) a plurality of spaced, recessed receptacles (3,4) disposed around an outer periphery of the starwheel, and individually mounted thereon,

(c) a plurality of spring biased pawls (5) individually pivotally disposed in the receptacle recesses for interlocking the starwheel, in one direction of rotation, with an outer ring (21) of a sprocket wheel within which the starwheel is rotatably journaled.

4,840,261

AUTOMATIC TRANSMISSION HAVING CENTRIFUGALLY OPERABLE DRAIN VALVE IN HYDRAULICALLY OPERATED CLUTCH ACTUATOR

Toshikazu Oshidari, Yokosuka; Noboru Hattori, Miura, and Yoshiaki Kato, Fujisawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 1, 1987, Ser. No. 127,253

Claims priority, application Japan, Dec. 4, 1986, 61-287628

Int. Cl.[4] F16D 25/12

U.S. Cl. 192—106 F **7 Claims**

1. In an automatic transmission having a clutch drum, a planetary gear unit and a clutch mechanism which selectively engages said clutch drum and said planetary gear unit,

a hydraulic actuator for actuating said clutch mechanism by using a hydraulic pressure, which comprises:

a means defining a chamber defined said clutch drum;

a piston operatively disposed in said chamber to form a fluid work chamber, said piston actuating said clutch mechanism when said fluid work chamber is filled with a pressurized fluid;

a drain valve including a drain bore formed in the piston

having one end exposed to said fluid work chamber and a valve ball movably interposed in said drain bore in such a manner that when said fluid work chamber is filled with a pressurized fluid, said ball closes said drain bore; and

flow straightening means for straightening flow of the fluid toward said drain bore in order to suppress formation of vortex flow of the fluid in said fluid work chamber about a mouth of said drain bore, said flow straightening means being a structure which is exposed to said fluid work chamber near the mouth of said drain bore, said structure including vanes which are integrally formed on said piston in a manner to extend radially outwardly from said drain bore of said drain valve relative to an axis of said drain bore.

4,840,262

CLUTCH PLATE

Gert Herrmann, Solingen, Fed. Rep. of Germany, assignor to Uni-Cardan AG

Filed Oct. 26, 1987, Ser. No. 113,059

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637382

Int. Cl.[4] F16D *3/80*

U.S. Cl. 192—106.2 **3 Claims**

1. A clutch plate comprising a hub; side plates rotationally fast with the hub; a lining carrier element supported between the side plates for limited rotational movement relative thereto; spring means for resisting such rotational movement; and a viscous shear coupling comprising a housing with an inner part rotationally fast with the hub, an outer part rotatably supported on the inner part and rotationally fast with the lining carrier element, and containing a viscous liquid and a plurality of interleaved plates alternately fast with the inner and outer parts, said viscous shear coupling transmitting torque only up to an equilibrium position at which torque on said lining carrier element is balanced by the forces exerted by said spring means.

4,840,263

HYDRAULIC CONTROL DEVICE FOR 4WD TORQUE DISTRIBUTION CLUTCH PROVIDING STABILIZED PRESSURE CHARACTERISTICS

Nobuyuki Kato; Tokuyuki Takahashi and Hiroshi Itoh, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 14, 1987, Ser. No. 95,883

Claims priority, application Japan, Oct. 6, 1986, 61-237631; Oct. 23, 1986, 61-252229

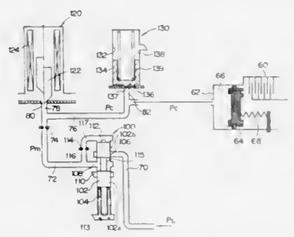
Int. Cl.[4] F16D *25/14;* **F16K** *17/34*

U.S. Cl. 192—109 F **10 Claims**

1. For a hydraulically actuated torque distribution clutch in a four wheel drive device in a power train of an automotive vehicle:

a hydraulic fluid pressure control device, comprising:

(a) a means for producing a control hydraulic fluid pressure for actuating said torque distribution clutch according to an oscillatory release of part of hydraulic fluid pressure supplied from a source of hydraulic fluid pressure;



(b) an output conduit for conducting said control hydraulic fluid pressure from said control hydraulic fluid pressure producing means toward said torque distribution clutch; and

(c) an accumulator type hydraulic fluid pressure damper connected to said output conduit for smoothing hydraulic pressure fluctuations caused in said output conduit by said oscillatory release of hydraulic fluid.

4,840,264

DEPOSIT SYSTEM INSTALLATION FOR TROLLEYS

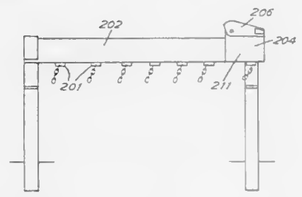
Claude Chappoux, Mornant; Bernard Rouesnel, Ecully, and Guy Gillet, Deols, all of France, assignors to Ronis S.A. and Super Market Systems, both of, France

Filed Jul. 30, 1987, Ser. No. 79,796

Claims priority, application France, Aug. 4, 1986, 86 11255; Feb. 17, 1987, 87 01992

Int. Cl.[4] G07F *7/00*

U.S. Cl. 194—212 **8 Claims**



1. Deposit system installation for transport trolleys, comprising, a locking line constituted by a substantially horizontal bar, deposit system apparatuses, each connected to a trolley, whereby there is cooperation of longitudinal sliding within the line, each deposit apparatus comprising a coin system arranged to permit separation of an apparatus from said locking system by the introduction of a deposit such as a coin into said apparatus, the liberation of the deposit being produced by the passage of said apparatus over a decoding station forming part of the locking line;

wherein the deposit system apparatus comprises a rotor fast with a control knob and with a locking cam, a plurality of pistons returned by springs locking the rotor in cooperation with counter-pistons sliding in a casing of the apparatus, opposite extremities of the counter-pistons being able to cooperate with a profile of the decoding station in order to unlock the rotor;

wherein the rotor comprises at least one longitudinal locking piston arranged to be brought into the unlocking position by the deposit against the action of a spring, the rotation of the unlocked rotor blocking the locking piston which retains the deposit;

wherein the deposit system apparatus slides on a profile bar and passes beneath a decoding head.

4,840,265

OBJECT DISTRIBUTING AND SUPPLYING METHOD AND APPARATUS

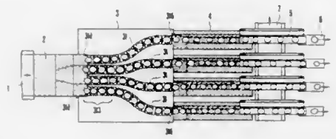
Yasuhiro Sato, and Kazuo Haraguchi, both of Shizuoka, Japan, assignors to Kabushiki Kaisha Maki Seisakusho, Shizuoka, Japan

Filed Aug. 18, 1987, Ser. No. 86,711

Claims priority, application Japan, Aug. 29, 1986, 61-202822; Sep. 5, 1986, 61-136492[U]; Sep. 16, 1986, 61-141554[U]

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—446 **3 Claims**



1. A method of distributing and conveying ball-like objects which are easy to roll and are soft and suspectible to damage, such as fruit and vegetables, in a generally horizontal running direction, to apparatus spaced downstream in the running direction from the preceding process line wherein the objects are received in a random manner from the preceding process line, comprising the steps of arranging a pluraility of conveyors curved in the generally horizontal running direction and extending in the running direction between the preceding process line and the apparatuses, providing each conveyor with a starting end and locating the starting ends for forming a wide receiving part common to each of the conveyors at the preceding process line, providing the conveyors with a plurality of conveying elements with an upper part and a front end and a rear end spaced apart in the running direction so that the conveying elements receive the objects, forming a carrying surface on the upper part of the conveying elements with the carrying surface having a plurality of fin-shaped flexible and elastic projections extending in the running direction and spaced approximately equidistantly apart in the direction extending transversely of the running direction, inclining the carrying surfaces inwardly transversely of the running direction to a flat central part of the carrying surface so that the objects roll on the inclined surfaces to the central part, providing notches in the thin-shaped projections for preventing the objects from rolling in the running direction, distributing the objects from the preceding process line to the wide receiving parts and then to the starting ends of the conveyors, moving the objects on the carrying surfaces of the conveying elements on the conveyors along curved conveying paths diverging from one another in the running direction from the preceding process line to the appraratuses for forming a separate row of the objects on each conveyor, and conveying each row of objects from a terminating end part of the conveyor to one of the apparatuses for movement from the terminating end in a streamline manner.

4,840,266

METHOD AND DEVICE FOR CONTROLLING THE VACUUM IN A SUCCESSION OF SUCTION CONVEYORS

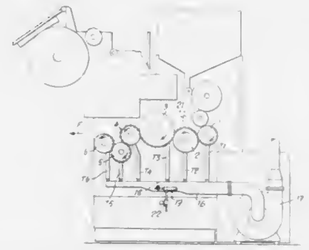
Gian L. Gherardi, Medicina, Italy, assignor to Sasib S.p.A., Bologna, Italy

Filed Mar. 28, 1988, Ser. No. 174,350

Claims priority, application Italy, May 15, 1987, 12488 A/87

Int. Cl.[4] A24C *5/00;* **B65G** *29/00*

U.S. Cl. 198—471.1 **5 Claims**



1. An apparatus for conveying articles comprising:

a succession of endless conveyors, the articles being individually held by suction on one said conveyor and then transferred to a succeeding said conveyor, each said conveyor including suction holes and a suction chamber to which said suction holes are successively connected for a predetermined fraction of a cyclic movement of said conveyor to hold the article to said conveyor during that fraction of movement; and

a vacuum generating means for generating a vacuum for each of said suction chambers and including a distributor means for distributing the vacuum to each said suction chamber and a control means for sensing a leading end of a flow of the articles upon a starting of the conveying of the articles and for connecting at least one said suction chamber through said distributor means to said vacuum generating means by a successive step and progressively just in advance of a receipt by the associated said at least one said conveyor of the leading end of the flow of the articles.

4,840,267

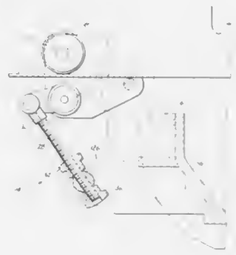
METHOD AND APPARATUS FOR CLEANING A CONVEYOR BELT

Bob G. Pine, Chagrin Falls, Ohio, assignor to Applied Techniques Inc., Chagrin Falls, Ohio

Filed Jan. 9, 1987, Ser. No. 1,913

Int. Cl.[4] B65G *45/00*

U.S. Cl. 198—498 **15 Claims**



1. Apparatus for the removal of material disposed on a

conveyor in the form of a flexible sheet-like, imperforate belt, comprising:

a rotatable cleaning roller disposed adjacent one side of the belt, the cleaning roller extending across the wodth of the belt and being maintained in a stationary position relative to the belt;

a biasing roller disposed on the opposite side of the belt from the cleaning roller, the biasing roller extending across the width of the belt and being movable relative to the belt and the cleaning roller for displacing the belt toward or away from the cleaning roller;

a stationary frame member to which the cleaning roller is secured;

end supports for the biasing roller, the end supports being mounted to the frame member for movement relative to the frame member;

a connecting bar extending between and connected to the end supports, the connecting bar being disposed on that side of the belt closest to the cleaning roller; and

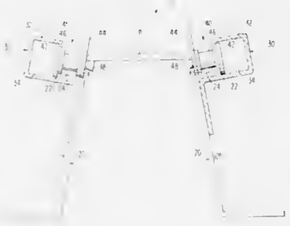
a threaded, rotatable shaft in threaded engagement with the connecting bar and the frame for adjusting the position of the connecting bar relative to the belt.

4,840,268

ADJUSTABLE WIDTH CHAIN CONVEYOR

Albert W. Zemek, Windsor, N.Y., assignor to Universal Instruments Corporation, Binghamton, N.Y.

Filed Aug. 23, 1988, Ser. No. 235,159
Int. Cl.[4] B65G *15/00*
U.S. Cl. 198—817 **6 Claims**



1. A self-adjusting chain conveyor device for accommodating conveyed items of varying effective widths and compensating for misalignment of the conveyor beyond the tolerances permitted by the item support surface area, said device comprising:

a chain having spaced chain portions for supporting the items;

support means for slidably supporting said chain portions thereon, said means including a pair of supports inclined toward each other and spaced a predetermined distance apart;

means for limiting the downward side of said chain portions on each of said support means; and

means for preventing said chain portions from tipping off of each of said support means.

4,840,269

APRON TYPE CONVEYOR

William B. Anderson, Oconomowoc, Wis., assignor to Rexnord Inc., Brookfield, Wis.

Filed Mar. 28, 1988, Ser. No. 174,009
Int. Cl.[4] B65G *17/10*
U.S. Cl. 198—822 **8 Claims**

1. An apron type belt conveyor comprising,

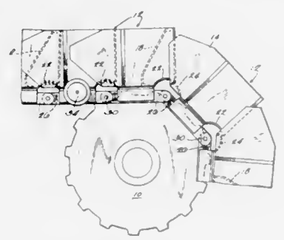
a plurality of pivotally interconnected chain links mounted for forward movement generally parallel to the length of the links,

sprockets engaging said links for driving said conveyor,

mutually overlapping pans each mounted on a chain link and having a pitch which equals the spacing between successive chain links,

said pans being movable in a forward direction with said conveyor,

the forward portion of each pan being elastic and formed to provide a large transverse arcuate bead and the trailing portion of each pan being elastic and formed to provide a small transverse arcuate bead,



said large and small beads having different centers and the forward edge of each large bead overlapping and being biased into contact with the small bead on the pan next ahead to flex the beads within their elastic limits at all times during operation and as the conveyor passes over said sprockets,

an end plate on each end of each said pan,

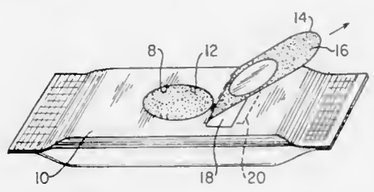
the front of each end plate and the rear of the next forward end plate being shaped to overlap and engage each other at all times during operation.

4,840,270

RE-SEALABLE LABEL FLAP

Garry L. Caputo, Rutherford, N.J.; Thomas A. Saldarelli, and William E. Dwan, both of Yorktown Heights, N.Y., assignors to Nice-Pak Products, Inc., Orangeburg, N.Y.

Filed Dec. 21, 1987, Ser. No. 135,940
Int. Cl.[4] B65D *81/24*
U.S. Cl. 206—205 **5 Claims**



1. A package having an opening and a resealable label flap for sealing the opening, said package comprising:

an enclosure portion for housing contents, said enclosure having a first sealing surface;

an opening in said enclosure for accessing said contents;

a label flap having a second sealing surface for selectively sealing said enclosure portion by covering said opening;

a roughened area located on said first or second sealing surface, said area formed by a corona discharge and providing a surface capable of bonding to a pressure sensitive, non-thermal adhesive more strongly than the area of said sealing surface not treated by corona discharge; and

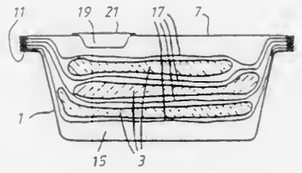
an adhesive applied between said label flap and said enclosure for adhering said first sealing surface to said second sealing surface such that said opening can be sealed by said label flap, said flap being secured to said enclosure by the stronger bond created within said roughened area of said sealing surface, said roughened area, with said adhesive, functioning as a label stop.

4,840,271

IMPROVED THERMOPLASTIC SKIN PACKING MEANS

Anthony J. M. Garwood, Bayswater, Australia, assignor to Garwood, Ltd., Victoria, Australia

PCT No. PCT/AU86/00339, § 371 Date Jun. 19, 1987, § 102(e) Date Jun. 19, 1987, PCT Pub. No. WO87/02965, PCT Pub. Date May 21, 1987
PCT Filed Nov. 7, 1986, Ser. No. 86,046
Claims priority, application Australia, Nov. 14, 1985, PH3406; Feb. 24, 1986, PH4760
Int. Cl.[4] B65D *81/20, 21/00*
U.S. Cl. 206—213.1 **27 Claims**



1. An improved package for perishable goods comprising:

a base over which said goods are placed;

a gas permeable flexible web covering and at least partially skin packing said goods and holding said goods relative to said base, said web being sealed to said base;

a lid positioned over the top of said base and sealed to said base over said flexible web;

a space above said goods formed between said flexible web and said lid; and

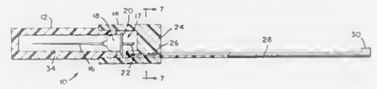
a gas retained in said space, said gas selected for enhancing preservation of the packaged goods by permeation of said gas through said gas permeable web.

4,840,272

CONTAINER FOR INJECTION NEEDLES WITH SAFETY APPARATUS

Michael C. Goldman, 7801 Connecticut Ave., Chevy Chase, Md. 20815

Filed Aug. 25, 1988, Ser. No. 236,606
Int. Cl.[4] A61M *5/32;* **B65D** *85/20*
U.S. Cl. 206—365 **4 Claims**



1. A cartridge for housing a syringe needle comprising,

a casing having a generally cylindrical side wall forming a chamber for receiving said needle and having an open end leading into said chamber,

a cap having a cylindrical surface and a channel formed in said surface,

an arm extending outwardly from said side wall and extending through said channel whereby said cap is slidably received on said extension,

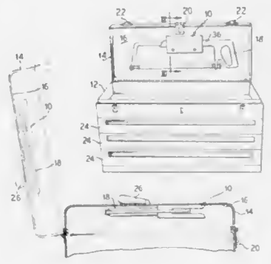
a section formed at the distal end of said extension for grasping same and having a cross-section dimension greater than said channel.

4,840,273

TOOL RETENTION DEVICE

Robert G. Zavacki, 4748 N. Kenneth, 2nd Flr., Chicago, Ill. 60630

Continuation of Ser. No. 72,732, Jul. 13, 1987, abandoned. This application Oct. 5, 1988, Ser. No. 253,885
Int. Cl.[4] B65D *85/28*
U.S. Cl. 206—372 **13 Claims**



5. A device for removably securing a hacksaw, having a frame, to a movable portion of a tool box comprising:

a single unitary fastening member secured to the movable portion, said fastening member having a base section and first and second upstanding arm sections having proximal and distal ends extending away from said base section and a predetermined distance on the same side of said base section at the respective ends of said base section, said first and second arm sections defining a channel having a width, depth, and length, the channel having a substantially U-shaped cross-section formed by said base section and said first and second upstanding arm sections, the distal ends of the first and second arm sections are beveled toward one another, the width of the channel corresponding to a width of the frame of the hacksaw to be mounted allowing the hacksaw to be removably received within the channel, the first and second arm sections are separated from each other by a distance corresponding to the widest part of a bow-shaped frame portion of the hacksaw, the depth of the channel being at least equal to a height of the frame of the hacksaw to be mounted, and the length of the channel being sufficient to allow the hacksaw to be received within the channel and supported therein; and

the width, depth, and height being so constructed and arranged that the hacksaw is secured within the channel during movement of the movable portion of the tool box merely by being received within the channel without the need for additional fastening means.

4,840,274

PROTECTIVE DEVICE FOR COILS OF METAL

Gary Young, 802 Martha Dr., Franklin, Ohio 45005

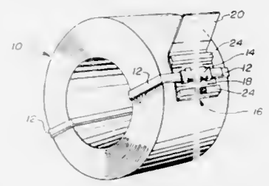
Continuation-in-part of Ser. No. 87,705, Aug. 21, 1987, abandoned. This application Mar. 23, 1988, Ser. No. 172,250
Int. Cl.[4] B65D *85/66*
U.S. Cl. 206—389 **7 Claims**

1. A protective device for a coil of metal including a plurality of sprially wrapped layers of sheet metal held together by at least one band which is retained by a clip, said protective device comprising:

a bottom panel having a portion thereof disposed between the outer layer of said coil of metal and said clip;

a top panel hingable connected to said bottom panel so that said top panel may be opened and closed;

a pair of cushions spaced apart to define a pocket therebetween for receiving said clip, one of said cushions being mounted on said bottom panel while the other one of said



cushions is mounted on said top panel in order to provide maximum space between said cushions when said top panel is opened, and

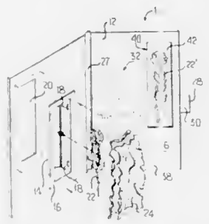
said top panel enclosing said clip in said pocket when said top panel is closed.

4,840,275

GREETING CARD AND PACKAGE

Michael S. Faiola, 18424 Wachs Ter., Olney, Md. 20832, and Richard J. Faiola, 335 N. Forty-Eighth St., Harrisburg, Pa. 17111

Filed Feb. 5, 1987, Ser. No. 10,982
Int. Cl.[4] B65D *85, 50*
U.S. Cl. 206—423 **13 Claims**



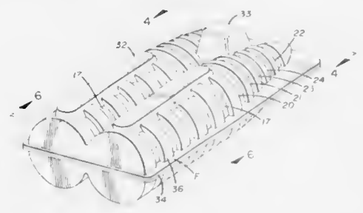
1 A greeting card comprising a sheet of material and a receptacle for receiving and enclosing a gift, means for retaining said gift within said receptacle, means for detachably securing said receptacle to said sheet of material so that said receptacle may be easily detached from said sheet of material without causing visible damage thereto; said receptacle comprising a bubble, an opening formed through said sheet of material, and said bubble being disposed in said opening and protruding from said sheet of material, said receptacle comprising a bubble formed of transparent material, said means for detachably securing said receptacle to said sheet of material being comprised of flange means on said bubble and nib means formed in said bubble, said flange means and said nib means being disposed to secure said sheet of material therebetween, said sheet of material including a front panel and a back panel, said opening being located in said front panel for exposing a portion of said back panel, said portion of said back panel being provided with decorative material which is aligned with said opening and visible through said opening whenever said receptacle is detached from said sheet of material.

4,840,276

CONE PACKAGE

Frederick A. George, Hermitage, Pa., assignor to George & Thomas Cone Company, Hermitage, Pa.

Filed May 25, 1988, Ser. No. 198,439
Int. Cl.[4] B65D *85/36*
U.S. Cl. 206—499 **6 Claims**



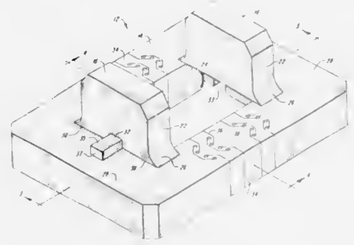
1. An ice cream cone package for holding a number of nested cones therein comprises a pair of identical generally rectangular panels made of a resilient plastic resin material, said panels joined together in hinged relationship at identical ends, a plurality of elongated pockets in each of said panels, said pockets facing one another when said panels are folded in face to face relationship, a plurality of longitudinally spaced arcuate ribs throughout each of said pockets separated by arcuate recesses having flat surfaces, an elongated recessed area formed in each of said pockets inwardly of said identical ends, substantially square recessed areas positioned between and intersecting portions of said, pockets adjacent said identical ends, each of said ribs having a transversely angularly disposed surface in relation to said flat surfaces of said arcuate recesses and an additional area of greater transverse angularly indentations in relation to said flat surfaces of said arcuate recesses, some of said arcuate recessed areas interconnecting to adjoining arcuate recessed areas of an adjacent pocket.

4,840,277

PACKING DEVICE HAVING SUPPORT TAB

Charles Waldner, Georgetown, Mass., assignor to United Foam Plastics Corporation, Georgetown, Mass.

Filed Jun. 14, 1988, Ser. No. 206,423
Int. Cl.[4] B65D *81/04*
U.S. Cl. 206—523 **6 Claims**



1. A foldable plastic packing device, comprising:

a collar, having longitudinal elements and lateral elements, that frames a central cavity,

at least one leg element hingedly connected to a lateral element and pivotable into said central cavity,

said leg element having widened portions to project over said collar and maintain said leg element in a position perpendicular to said collar,

a support tab, hingedly connected to said leg element, positionable between said leg element and said lateral element to assist in maintaining said leg element in a position perpendicular to said collar.

6. A plastic packing device comprising a block of plastic, die-cut to form:

a collar having outer longitudinal elements and outer lateral elements that surround an interior portion,

a leg element in said interior portion, hingedly connected by a first living hinge to one of said outer lateral elements, and pivotable out of said interior portion to a position perpendicular to said collar,

said leg element having widened

portions adjacent said living hinge to project over said collar and maintain said leg element in said position perpendicular to said collar,

a support tab, hingedly connected to said leg element by a second living hinge colinear with said first living hinge, and pivotable oppositely from said leg element out of said interior portion, to a position between said leg element and said one lateral element to assist in maintaining said leg element in said perpendicular position.

4,840,278

CEILING RACK

Yvon Gelinas, 31 Stéphane, P.O. Box 52, St. Philippe, Quebec, Canada J0L 2K0

Filed May 17, 1988, Ser. No. 195,309
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—18 **9 Claims**

1. A ceiling rack comprising:

a T-shaped attachment member comprising a horizontal bar attachable to the ceiling and a vertical stem projecting down from the bar, wherein said stem consists of a U-shaped channel member having a back side with an upper end and a pair of opposite sides that are parallel to each other and perpendicular to said back side, said opposite sides having upper ends that integrally extend away from the upper end of said back side and are horizontally angled to form together said horizontal bar;

a height adjusting member telescopically mounted to the stem portion, said height adjusting member consisting of a hollow tube that is cross-sectionally square and has a lower end closed by a plug;

securing means to retain the height adjusting member in one of a plurality of vertical settings provided onto the stem;

at least one elongated, horizontal support member on either side of said T-shaped attachment member, each support member having an upwardly open longitudinal channel; and

a frame consisting of a beam having longitudinal lipped edges extending from a valley,

first means to removably attach said beam at mid point thereof to the plug at the lower end of the height adjusting member; and

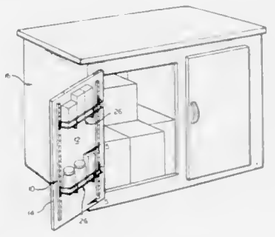
second means to removably attach each support member at mid point thereof to said frame at a given distance from said T-shaped attachment member.

4,840,279

CABINET STORAGE RACKS

Dean L. Cobb, Hoffman Estates, and Edward M. Bieser, Elgin, both of Ill., assignors to Grayline Housewares, Elgin, Ill.

Filed Jul. 19, 1988, Ser. No. 222,702
Int. Cl.[4] A47F *5/08*
U.S. Cl. 211—88 **5 Claims**



1. A storage rack for mounting to cabinet doors and the like comprising, in combination:

a pair of brackets of an extended length having a plurality of spaced apart holes therein along the length thereof for receiving therein shelf mounting means for securing shelves to said brackets, said brackets being mounted in spaced-apart parallel relationship and

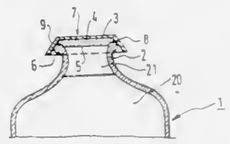
at least one shelf having a front wall, a bottom wall and a pair of adjustably positionable side walls which are free from said bottom wall, each of said pair of side walls being free-standing and the terminal ends thereof having fastening means affixed to them for removably securing said shelf to said brackets, said adjustably positionable permitting said side walls to be positioned to compensate for variations in the spacing between said pair of brackets, whereby said shelves can be more easily and quickly removably mounted to said brackets.

4,840,280

SEALING CAP FOR LIQUID FOOD OR BEVERAGE CONTAINERS

Pascal Schvester, Chicago, Ill., assignor to American Air Liquide, New York, N.Y.

Filed Jan. 28, 1988, Ser. No. 149,498
Int. Cl.[4] B65D *85/72*
U.S. Cl. 215—228 **8 Claims**



1. A sealing cap for liquid food or beverage containers having an enclosed gaseous atmosphere above said liquid food or beverage and adapted for reducing the amount of any gaseous oxygen present in said enclosed atmosphere, the sealing cap comprising

a sealing body with an outer surface adapted to be in contact with the external atmosphere and an inner surface facing the enclosed gaseous atmosphere above said liquid food or beverage,

packing means disposed within the sealing body comprising sealed bag means, said sealed bag means including a first

wall having an outer surface for contact with the enclosed gaseous atmosphere and a second wall having an outer surface for contact with the inner surface of said sealing body, and

absorbing means for gaseous oxygen disposed within the sealed bag means,

said first wall comprising a polymeric film permeable to gaseous oxygen and to water vapor and impermeable to liquids, said film having a permeability to gaseous oxygen of at least 10,000 $cc/m^2 \times bar \times hour$.

4,840,281

TAMPER EVIDENT OPTICAL DEVICE AND ARTICLE UTILIZING THE SAME

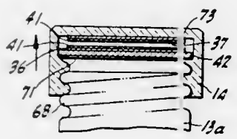
Roger W. Phillips; Vernon C. Spellman; Wayne L. Gossett; Marc A. Kamerling, and Paul G. Coombs, all of Santa Rosa, Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Continuation-in-part of Ser. No. 894,320, Aug. 7, 1986, Pat. No. 4,721,217. This application Jan. 25, 1988, Ser. No. 147,891

Claims priority, application Japan, Jul. 8, 1987, 62-198004; European Pat. Off., Jul. 31, 1987, 87306825.8

Int. Cl.[4] B65D *55/02*

U.S. Cl. 215—230 **27 Claims**



1. In a tamper evident optical device having at least first and second layers with a spacer layer therebetween providing a desired optical property and a release layer disposed between the first and second layers to permit the first and second layers to be separated from each other and thereby separate the optical device into two parts and so that the desired optical property is destroyed, said release layer having been formed so that it does not affect to a significant degree the optical properties of the tamper evident optical device.

4,840,282

PRESSURE-RESISTANT TANK

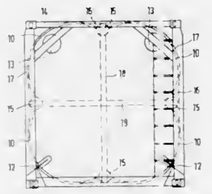
Helmut Gerhard, Weitefeld, Fed. Rep. of Germany, assignor to Westerwaelder Eisenwerk Gerhard GmbH, Weitefeld, Fed. Rep. of Germany

Filed Jun. 30, 1988, Ser. No. 213,824

Claims priority, application Fed. Rep. of Germany, Aug. 10, 1987, 8710906

Int. Cl.[4] B65D *88/06*

U.S. Cl. 220—1.5 **9 Claims**



1. A pressure-resistant tank the jacket of which includes

a plurality of longitudinal bars formed with tubular cross-sections and extending parallel to a longitudinal tank axis,

a plurality of part-cylindrical shell elements fitted between respective ones of said longitudinal bars, the axes of said shell elements extending parallel to said tank axis,

a pair of tank heads connected to the ends of said part cylindrical shell elements,

a number of individual tie rods traversing the interior of said tank and interconnecting opposite ones of said longitudinal bars, and

reinforcing pipe sections inserted into said tubular longitudinal bars in the areas in which said tie rods are connected to said longitudinal bars.

4,840,283

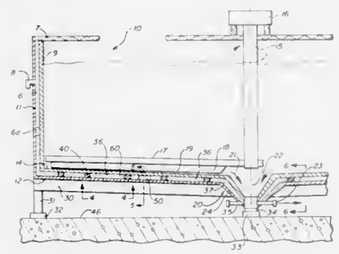
DOUBLE SHELL THICKENER

M. James Lillywhite, Salt Lake City, Utah, and Michael J. Horn, Owensboro, Ky., assignors to Baker Hughes, Houston, Tex.

Filed Nov. 23, 1987, Ser. No. 123,745

Int. Cl.[4] G01M *3/00*

U.S. Cl. 220—5 A **5 Claims**



1. A tank system comprising:

a series of support beams normally placed on a support;

a first series of steel sheet segments supported on and welded to said support beams, said segments forming an outer shell bottom of a tank;

a series of spaced spacer bars positioned on top surfaces of said outer shell bottom and having void spaces extending between said bars;

a load-carrying permeable material filling in said void spaces;

a second series of steel sheet segments supported on said permeable material and having edges mounted on said spaced spacer bars, said second series of segments forming an inner shell bottom spaced from said outer shell;

an upstanding tank wall attached to peripheral portions of said outer and inner bottom shell;

means accessing said void spaces and permeable material for detecting leaks of fluid, confined by said inner bottom shell and said tank wall, into said void spaces and through said permeable material;

a central sludge cone extending from an inner periphery of said first and second series of segments forming said outer shell bottom and said inner shell bottom, said sludge cone comprising spaced concentric inner and outer cone sections having a hollow interior in flow communication with said void spaces; and

wherein said means accessing said void spaces includes a drainage nozzle accessing said hollow interior of said sludge cone.

4,840,284

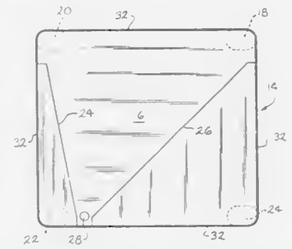
SLOPED BOTTOM TANK

Andrew W. Snyder, Beatrice, Nebr., assignor to Hoover Group, Inc., Roswell, Ga.

Filed Jan. 15, 1988, Ser. No. 144,376

Int. Cl.[4] B65D *87/00*

U.S. Cl. 220—5 A **1 Claim**



1. A portable tank for fluid storage and transport having generally vertical sides and a sloped bottom for complete drainage of fluid from the tank comprising:

a generally rectangular bottom plate having upwardly curved side portions that merge with upwardly extending wall portions that terminate in a substantially horizontal upper edge,

said bottom plate having an inner surface and an outer surface and having a discharge opening therethrough, said inner surface having a plurality of smooth contoured surfaces sloped toward said discharge opening and a plurality of creases between said sloped surfaces directed toward said discharge opening to thereby slope substantially all of said inner surface toward said discharge opening,

said side walls being mounted on and secured to said upper edge of said bottom plate,

said outer surface being contoured like said inner surface,

a plurality of feet attached to said outer surface of said plate and positioned at the corners of said plate, each of said feet having a sculptured upper edge conforming in shape to said bottom plate outer surface at the corner of said plate and being secured to said outer surface so that when said feet are resting on a horizontal surface said discharge opening is positioned at the lowest elevation of said bottom plate and said inner surface presents a smooth contoured surface sloping toward said discharge opening.

4,840,285

CABINET CONSTRUCTION FOR A DRYER

Keith E. Carr, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Oct. 2, 1986, Ser. No. 914,280

Int. Cl.[4] B65D *6/00*

U.S. Cl. 220—47 **15 Claims**

1. A cabinet construction for a dryer comprising:

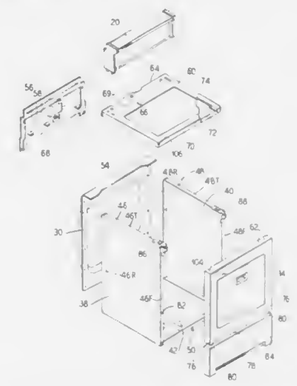
a pair of spaced apart and essentially parallel side panels having back edges, front edges and top edges;

a bottom panel having back edges and side edges permanently attached at either lateral side edge to said side panels;

a rear panel attached to said back edges of said side and bottom panels;

a front panel removably attachable to said front edges of said side panels;

a top panel removably attachable to said top edges of said side panels; and



a bracket attached to each side panel adjacent to a junction of said top edge and said side edge, said top panel and said front panel being removably attached to said brackets.

4,840,286

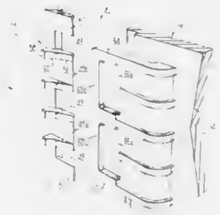
EQUIPMENT ENCLOSURE WITH INTERNAL FASTENERS

James R. Heberling, Lawrenceville; Mark Hicks, Norcross, and Nancy Watts, Marietta, all of Ga., assignors to Hayes Microcomputer Products, Inc., Norcross, Ga.

Filed Feb. 23, 1988, Ser. No. 159,069

Int. Cl.[4] H05K *7/20*

U.S. Cl. 220—306 **5 Claims**



1. An equipment enclosure, comprising:

a base having a bottom portion and an upturned peripheral portion connected to said bottom portion and defining a base cavity, said upturned peripheral portion, having a general L-shaped cross-sectioned configuration with a backside of the "L" adjacent said base cavity;

a cover having a top portion and a downturned peripheral portion connected to said top portion and defining a cover cavity, said base cavity and cover cavity forming an enclosure cavity; and

a fastener having a first tooth connected to one of said upturned peripheral portion and downturned peripheral portion, said first tooth having a general right triangular configuration with a longer side affixed to said "L" and having a segmented hypotenuse composed of first second, and third segments, said first segment forming an acute angle with said longer side, said second segment being positioned generally parallel to said longer side, said third segment being positioned between said first and second

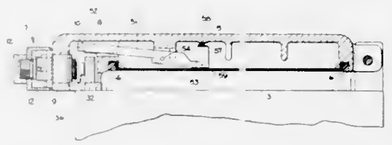
segments, said fastener also having a first detent connected to the other of said upturned peripheral portion and downturned peripheral portion and positioned for sliding engagement with said hypotenuse, said first detent engaging said first tooth in said enclosure cavity and releasably connecting said base and said cover.

4,840,287

LOCKING MECHANISM FOR A PRESSURE COOKER

Edward L. Brewer, and John M. Clark, both of Eatoo, Ohio, assignors to Henny Penny Corporation, Eaton, Ohio

Filed Apr. 29, 1988, Ser. No. 188,292
Int. Cl.[4] B65D *45/00*; F24D *1/00*
U.S. Cl. 220—316 **18 Claims**



1. In a pressure cooker having a receptacle with an open end, and a lid hingedly connected to the receptacle for movement from an open position to a closed position, the improvement comprising a locking mechanism adapted to be mounted on the lid and a locking bar adapted to be mounted on the receptacle at the open end thereof for engagement by said locking mechanism, said locking mechanism comprising an elongated locking arm rotatable from a fully open position to a fully closed position, a cam shaft operatively connected to said locking arm for rotation therewith, a locking cam mounted on one end of said cam shaft, and displacement means operative to displace said cam shaft axially from a retracted position to an extended position as said locking arm is rotated from its fully open position to an intermediate position, whereby to position said locking cam for engagement with said locking bar, continued rotation of said locking arm toward the fully locked position causing said locking cam to engage said locking bar, said locking cam being configured to cause the lid to be drawn into sealing engagement with the open end of the receptacle as the locking arm is moved from the intermediate position to the fully closed position.

13. A locking mechanism movable between a fully open position and a fully closed position, said locking means comprising:

a displacement member,

a bearing sleeve rotatably journaled in said displacement member,

a cam shaft slidably journaled in said bearing sleeve,

a locking cam on said cam shaft,

operating means interconnecting said cam shaft and said bearing sleeve for joint rotation, said operating means engaging said displacement member, said displacement means acting through said operating means to axially displace said cam shaft upon rotation of said bearing sleeve, and

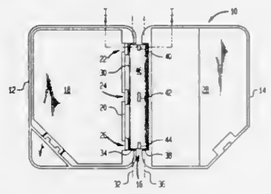
a locking arm connected to said bearing sleeve for rotating said sleeve, whereby said locking cam is moved from the fully open position to the fully closed position upon rotation of said locking arm.

4,840,288

COMPACT CASE WITH IRREVERSIBLE HINGE

William Lunderman, New York, and David Seidler, Forest Hills, both of N.Y., assignors to Revlon, Inc., New York, N.Y.

Filed Aug. 31, 1988, Ser. No. 239,167
Int. Cl.[4] B65D *85/68*
U.S. Cl. 220—334 **12 Claims**



1. A compact case, comprising a base; a lid; hinging means for hinging said lid to said base such that said lid is movable relative to said base between a first position in which said base and said lid are arranged generally back to back and a second position in which said base and said lid are arranged generally face to face, said hinging means including a hinge member pivotable relative to said base about a first pivot axis and pivotable relative to said lid about a second pivot axis, said first and second pivot axes being positioned relative to each other such that said hinge member is movable between an unlocked position, which said hinge member assumes when said lid is in said first position, and a locked position, which said hinge member assumes when said lid is in said second position; and locking means for automatically and non-releasably locking said hinge member in said locked position in response to the pivotal movement of said hinge member relative to said base as said hinge member is moved from said unlocked position to said locked position.

4,840,289

SPIN-BONDED ALL PLASTIC CAN AND METHOD OF FORMING SAME

Roger J. Fait, Ballwin, and Donald H. Ellerbrock, Florissant, both of Mo., assignors to Sonoco Products Company, Hartsville, S.C.

Filed Apr. 29, 1988, Ser. No. 188,445
Int. Cl.[4] B65D *41/00, 13/00*
U.S. Cl. 220—359 **7 Claims**

1. A thermoplastic synthetic all plastic can comprising

(a) a molded plastic can body including a cylindrical side wall portion, a closed bottom, and an open mouth portion extending upwardly from said cylindrical side wall portion and including an inwardly tapering exterior surface, said inwardly tapering exterior surface being inset inwardly from said cylindrical side wall.

(b) a molded plastic end closure member including a circular center panel portion closing the upper end of said can body, and an integrally formed rim portion extending downwardly from the peripheral portion of said circular center panel, said rim portion including a substantially cylindrical outer wall, and an outwardly tapering interior surface inclined to mate with said inset inwardly tapering exterior surface of said open mouth portion of said can body, said rim portion having a thickness corresponding with the distance said inwardly tapering exterior surface of said open mouth portion is inset from said cylindrical side wall, and

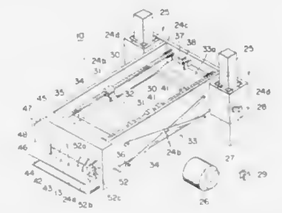
(c) spin-bond means securing and sealingly connecting said mating surfaces of said inwardly tapering exterior surface of said open mouth portion and said outwardly tapering interior surface of said rim portion to securely bond said molded plastic end closure member to said mold plastic can body, and with said cylindrical side wall portion of said can body and said cylindrical outer wall of said end closure member in substantial alignment to thereby provide a smooth continuous appearance along the juncture of said can body and said end closure member.

4,840,290

BULK LOADED COIN DISPENSING MACHINE

Shunichi Nakamura, Tokyo; Kouichi Iimura, Kawasaki; Kikuo Nakamura, Iruma, and Susumu Ozawa, Niiza, all of Japan, assignors to Kabushiki Kaisha Sigma, Tokyo, Japan

Filed Feb. 26, 1987, Ser. No. 19,547
Claims priority, application Japan, Mar. 1, 1986, 61-42828; Mar. 1, 1986, 61-42829; Mar. 31, 1986, 61-46158[U]; Apr. 3, 1986, 61-48907[U]
Int. Cl.[4] C07F *11/46, 7/04*
U.S. Cl. 221—10 **14 Claims**



1. A coin exchanging machine for exchanging money such as bank notes for coins as money or token coins for game machines, which comprises:

(a) case means;

(b) money inlet means through which money is inserted into the machine, disposed on a front face of the case means;

(c) coin tray means for discharging coin bundles one by one, disposed at a lower portion of a coin accommodating space for piling up vertically a plurality of coin bundles in a state wherein each bundle is laid horizontally;

(d) coin case means disposed detachably at the bottom of the case means for accommodating a plurality of coin bundles in a state wherein each bundle is laid horizontally with the axis of each bundle extending laterally;

(e) coin pushing means for pushing a row of coin bundles laterally at one time by pushing side ends of rows of coin bundles piled up in the coin case means; and

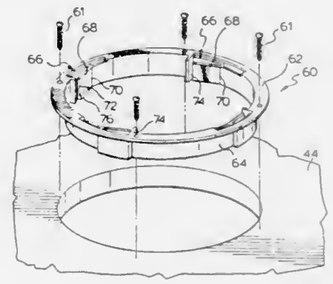
(f) coin transferring means having a conveyor and means to vertically move the conveyor for directly receiving a row of coin bundles pushed by the coin pushing means to transfer the coin bundles into the coin accommodating space located at a position higher than the coin case means, the conveyor being movable vertically in a state wherein the conveyor is horizontally extended in a direction perpendicular to the axis of each coin bundle in the coin case means, a row of coin bundles being received by the conveyor in a stationary state in a position where the conveyor is located along one side face of the coin case means, the means to vertically move the conveyor moving the conveyor, while holding the coin bundles thereon, to a position where the coin bundles on the conveyor are directly fed by the conveyor in the coin accommodating space, one by one, through a coin feeding window in response to consumption of the coin bundles when the conveyor is horiontally driven.

4,840,291

CONTAINER DISPENSING SYSTEM

Dennis Merlin, Thornhill, Canada, assignor to Hillwell Manufacturing Inc., Ajax, Canada

Continuation-in-part of Ser. No. 897,359, Aug. 18, 1986, abandoned. This application Jun. 27, 1988, Ser. No. 211,717
Int. Cl.[4] B65H *1/08*
U.S. Cl. 221—59 **8 Claims**



1. In a container dispensing system, a mounting insert for reception in a flat surface, said mounting insert comprising:

a seating flange having a downwardly extending tubular locating inset at the interior of the seating flange,

said tubular locating inset having a plurality of recesses spaced thereabout with spring fingers disposed therein and extending inwardly at a shallow angle past said tubular locating inset, each finger being connected to a generally vertical edge of one of said recesses with an opposite end of said finger being free and movable into the associated recess,

each recess including an inwardly extending vertical stop face adjacent said free end of said finger.

4,840,292

METHOD AND APPARATUS FOR DISPENSING OIL WELL PROPPANT ADDITIVE

Robert D. Harvey, Rte. 3, Box 177AA, Kilgore, Tex. 75662

Filed Mar. 24, 1988, Ser. No. 172,568
The portion of the term of this patent subsequent to Jul. 21, 2004, has been disclaimed.
Int. Cl.[4] G01F *11/24*
U.S. Cl. 222—1 **7 Claims**

6. In a method for delivering an additive to a pressurized fluidized proppant line during delivery of said pressurized, fluidized proppant to a well, the steps of:

sealing a first chamber from the atmosphere;

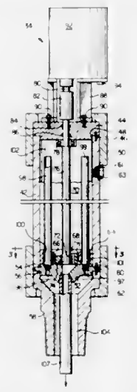
filling said first chamber with an additive through a removably coverable hole in said first chamber;

coupling a second chamber with a pressurized proppant transporting line;

metering additive contained within said first chamber to said second chamber;

equalizing fluid pressure in said second chamber with fluid pressure inside said first chamber using a plurality of conduits disposed within and extending form said first

chamber to said second chamber, such that undesirable turbulence of said additive is reduced; and



dropping said additive from said second chamber to the pressurized proppant transporting line for transportation into the well.

4,840,293

APPARATUS FOR DISCHARGING A BEAD OF PASTY MATERIAL FROM A FLEXIBLE BAG

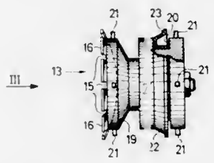
Wilhelm Segatz, Zell, Fed. Rep. of Germany, assignor to ARA - Werk Krämer GmbH & Co., Fed. Rep. of Germany

Filed Jul. 22, 1987, Ser. No. 76,496

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1986, 8620379; Apr. 4, 1987, 8705036

Int. Cl.[4] B65D *88/54*

U.S. Cl. 222—94 **22 Claims**



1. An apparatus for discharging a strand of pasty materials from a deformable tubular container, comprising:

a bag-loadable cylinder, having a front face pointing in a discharge direction of the apparatus, the cylinder having a central outlet aligned with a nozzle connection to the tubular container;

a substantially piston-like pressure member axially displaceable against the tubular container in the cylinder and a device for axial displacement of the pressure member; and,

a pressure relief spring supported on an inner wall of the cylinder and cooperating therewith, the pressure relief spring having radial spring tongues engaging on the inner wall of the cylinder and the pressure relief spring being made from a springy plastic.

4,840,294

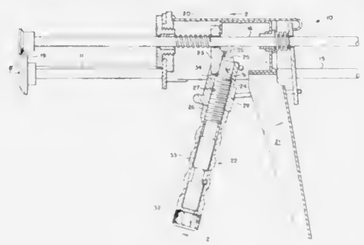
ADJUSTABLE DISPENSING TOOL

Richard J. Ernst, Palatine, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 12, 1988, Ser. No. 155,447

Int. Cl.[4] B65D *5/08*

U.S. Cl. 222—287 **7 Claims**



1. A tool for dispensing fluid, comprising a frame for carrying a cartridge containing a fluid, a pushing rod for reaching into said cartridge, a canted nut surrounding said rod for gripping said rod along its length, a manually operable lever for engaging said canted nut at a given distance from said rod, said lever being adjustable along its axis to vary said given distance, said lever comprising an elongated member at least partially threaded, a rotatable fulcrum threaded to mate with a portion of said member, whereby mechanical advantage provided by said lever may be changed to accommodate fluids of different viscosities.

4,840,295

ROTARY POURING NOZZLE FOR A VESSEL FOR HOLDING MOLTEN METAL

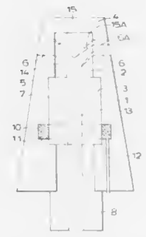
James F. M. Hartley, Cardiff, United Kingdom, assignor to Foseco International Limited, Birmingham, England

Filed Sep. 19, 1988, Ser. No. 246,313

Claims priority, application United Kingdom, Oct. 1, 1987, 8723059

Int. Cl.[4] B22D *37/00*

U.S. Cl. 222—598 **13 Claims**



1. A rotary pouring nozzle for a vessel for holding molten metal, comprising a stationary component and a rotatable component sealingly engaged rotatably in said stationary component for rotation relative to said stationary component about a rotational axis fixed with respect to said stationary component, said stationary and rotatable components having interlocking parts inside said stationary component which retain said components together in their working relationships, said stationary component having a flow aperture directed laterally of said rotational axis, and said rotatable component having a nozzle outlet movable into and out of communicating register with said flow aperture by rotation of said rotatable component relative to said stationary component.

4,840,296

CLAMPING AND FIXING APPARATUS FOR A REFRACTORY-MADE PLATE FOR A SLIDE GATE VALVE FOR CONTROLLING A MOLTEN STEEL FLOW

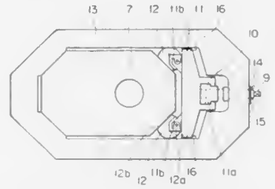
Takashi Otsuka; Masahiko Nose, both of Okayama; Kenji Yamamoto, Bizen; Tadao Taniguchi, Bizen; Yoshifumi Shigeta, Bizen, and Mototsugu Osada, Bizen, all of Japan, assignors to Shinagawa Refractories Co., Ltd., Japan

Filed Mar. 30, 1988, Ser. No. 175,281

Claims priority, application Japan, Aug. 26, 1987, 62-128492[U]; Nov. 12, 1987, 62-171993[U]

Int. Cl.[4] B22D *37/00, 11/00*

U.S. Cl. 222—600 **4 Claims**



1. A clamping and fixing apparatus for a refractory plate (7) located in a casing (13) of a slide gate valve which controls a molten steel flow comprising:

a guide piece (11) located in the casing (13) having a first side adjacent an end of the refractory place (7) and an opposite second side adjacent an end of the casing (13), said guide piece (11) also having opposite ends adjacent a respective opposite side of the casing (13);

a guide means for guiding said guide piece for movement toward and away from the refractory plate (7) between a clamped position and an unclamped position;

a respective plate-clamping fixture (12) located at a respective said end of said guide piece (11), each said fixture (12) including a peripheral surface which contacts the adjacent side of the casing (13) and said guide piece (11) when said guide piece (11) is moved to the clamped position, as well as a planar portion (12*b*) of said peripheral surface which engages a complementary angled planar surface at the end of the plate (7);

a mounting means (11*b*, 12*a*) for rotatably mounting a respective said fixture (12) to a respective said end of said guide piece (11) for rotation in a plane parallel to the plate (7); and

a moving means for moving said guide piece (11) between the clamped and unclamped positions.

4,840,297

APPARATUS FOR SHIELDING A MOLTEN METAL STREAM

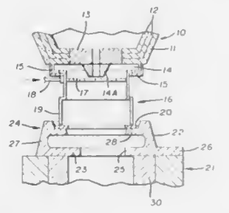
David L. Weekley, Newton Falls, and Ivan Parker, North Canton, both of Ohio, assignors to Vac Tec, Inc., Salem, Ohio

Filed Aug. 5, 1988, Ser. No. 228,737

Int. Cl.[4] B22D *37/00*

U.S. Cl. 222—607 **4 Claims**

1. A shroud apparatus for use in pouring molten metal from a metallurgical vessel having an outlet and a metal work assembly to a receptacle maintaining a neutral atmosphere around a molten metal stream comprising, a monolithic ceramic fiber composite body member having an apertured base portion and an integral metal ware registration portion, said registration portion comprising an integral registration ring portion, a continuous wall of a height extending upwardly from said base portion, an inturned self-facing continuous flange on said wall spaced in relation to the horizontal plane defined by the upper free end of said continuous wall, said continuous wall and said inturned self-facing continuous flange defining an aperture of a



dimension greater than that of said aperture in said base portion, an area defined within said self-facing inturned flange, and means for aligning said metallurgical vessel outlet with said shroud and said receptacle.

4,840,298

BICYCLE LUGGAGE CARRIER ATTACHMENT ARRANGEMENT

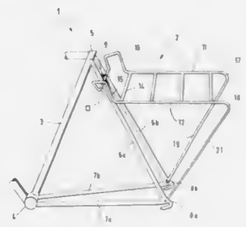
Heinrich Belka, Bielefeld, Fed. Rep. of Germany, assignor to Esge-Marby GmbH & Co., KG, Bielefeld, Fed. Rep. of Germany

Filed Jan. 9, 1987, Ser. No. 1,687

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1986, 3601387

Int. Cl.[4] B62J *7/00*

U.S. Cl. 224—39 **15 Claims**



1. The combination of

a bicycle frame (1) with

a bicycle luggage carrier (2) and with

an attachment arrangement to attach the bicycle luggage carrier (2) to the frame (1) of the bicycle,

wherein the bicycle frame has

a seat tube (3);

a pair of rear fork elements (6*a*, 6*b*) joined to the seat tube (3),

a cross brace (9, 69) connecting said rear fork elements; and

wherein the luggage carrier (2) has an extending end portion (11, 12, 15, 16,) positioned for attachment to the frame in the vicinity of the seat tube, said end portion including a cross element (13);

said attachment arrangement comprising

a clamping element (22,) located intermediate of the luggage carrier and the bicycle frame and joining the end portion of the luggage carrier (2) to the bicycle frame,

said clamping element being formed with at least one recess (35; 62; 74, 75) defining a recess axis,

the clamping element being shaped and dimensioned to receive at least part of the extending end portion (11, 12, 15, 16, 1;) of the luggage carrier,

the recess axis of the clamping element extending, when the clamping element is associated with a bicycle frame, essentially at right angles to the rear fork elements (6*a*, 6*b*) of the frame;

releasable clamping means (41, 42 55, 63, 64, 78) engaging in said clamping element and positioned on said clamping element, for clamping said at least part of the extending end portion of the luggage carrier in said at least one recess;

wherein the clamping element (22) comprises a blocklike structure formed with receiving holes (36, 37); and

said at least one recess (35) forming a slot extending transversely across with respect to said rear fork elements (6*a*, 6*b*), said slot having a root or bottom;

the slot and the cross element (13) of the luggage carrier (2) being dimensioned for reception of the cross element in the slot;

wherein said releasable clamping means comprise clamping elements (41, 42, 46, 47) engageable with the cross element and extending into the receiving holes (36, 37) formed in said block-like structure of the clamping element (22) and engageable with the cross element (13) of the luggage carrier (2); and

attachment means (28, 32;) for associating and attaching the clamping element to the cross brace (9, 69).

4,840,299

DISPENSER ADAPTER

Jack Burns, 11 N. John St., Pearl River, N.Y. 10965

Filed Apr. 14, 1988, Ser. No. 181,414
Int. Cl.[4] B26F *3/02*
U.S. Cl. 225—52 14 Claims

1. A dispensing aid for improving the dispensing of thin webs from rolls carried in elongated containers having a top formed of two substantially parallel surfaces, said dispensing aid comprising:

(a) a cover having an elongated top member affixed to front and back members, all joined by a pair of side members to form an open bottomed covering device for fitting over said container;

(b) at least one spring affixed to the underside of said top member;

(c) a pressure applying surface on said spring for applying a distributed array of forces to the top of said container responsive to externally applied force; and

(d) whereby the web being routed through said two parallel surfaces for removal from said roll may be controlled responsive to said distributed forces.

4,840,300

PAPER CONVEYING ROLLER FOR IMAGE FORMING APPARATUS

Masaru Tsuji, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 18, 1987, Ser. No. 27,428
Claims priority, application Japan, Mar. 18, 1986, 61-40211[U]
Int. Cl.[4] B65H *5/06, 9/00;* B41J *13/02, 13/03*
U.S. Cl. 226—187 4 Claims

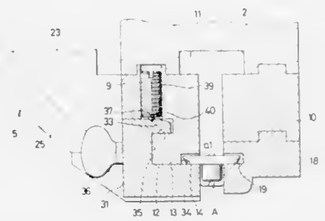
1. A paper conveying roller device for an image forming apparatus composed of an upper unit rotatably pivoted on a lower unit, having a paper conveying passage formed at the boundary juncture between said upper and lower units, including at least one pair of paper conveying rollers, one of said paper conveying rollers of said at least one pair of paper conveying rollers being disposed on said upper unit of said image forming apparatus and the other of said paper conveying rollers being disposed on said lower unit of said image forming apparatus, wherein at least one of said rollers of said at least one pair of paper conveying rollers is supported by a spring means wherein said spring means passes through the center of said at least one paper conveying roller, each end of said spring means being attached to said image forming apparatus.

4,840,301

FASTENER CONVEYING APPARATUS FOR FASTENER ASSEMBLING MACHINE

Fumio Seki, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Aug. 24, 1987, Ser. No. 88,309
Claims priority, application Japan, Aug. 26, 1986, 61-129901[U]
Int. Cl.[4] A41H *37/04*
U.S. Cl. 227—139 7 Claims



1. A fastener conveying apparatus for an automatic fastener assembling machine having an upper unit, said apparatus comprising:

(a) a base;

(b) a chute fixed to said base and defining a first passageway for guiding therethrough a plurality of fastener members in succession;

(c) a guide supported on said base and defining a second passageway extending between a lower end portion of said first passageway and the upper unit of the fastener assembling machine for receiving from said first passageway the fastener members one at a time and for guiding the individual fastener member through said second passageway;

(d) a pusher reciprocable in said guide for pushing the fastener member in said second passageway toward the upper unit of the fastener assembling machine; and

(e) said guide including

front and rear parallel guide blocks fixed to said base,

a rear guide part fixed to an underside of said rear guide block, and

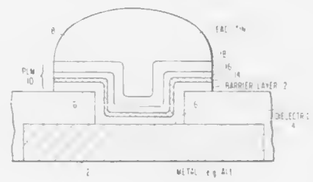
a front guide part detachably mounted on an underside of said front guide block, wherein said front guide part has in its top surface a longitudinal V-shaped groove into which balls of at least two ball plungers fixed to said front guide block normally resiliently project.

4,840,302

CHROMIUM-TITANIUM ALLOY

David A. Gardner; James G. Ryan, both of Essex Jct.; Joseph G. Schaefer, Berkshire, and Erick G. Walton, So. Burlington, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 15, 1988, Ser. No. 181,882
Int. Cl.[4] B23K *1/20;* H01L *23/48, 29/54*
U.S. Cl. 228—123 15 Claims



1. An alloy layer for contacting portions of a conductive layer exposed through an overlying organic insulator layer disposed on a substrate, consisting of chromium and titanium, wherein at least 50 atm % of the alloy content at a lower surface thereof is titanium.

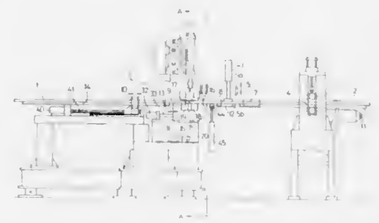
4,840,303

METHOD AND APPARATUS FOR CUTTING AND WELDING STEEL STRIPS

Mamoru Fujii, Kurashiki; Kazuo Noda, Kobe; Shoji Nagasaka, Kobe; Hiroshi Tajika, Kobe, and Koji Ono, Kobe, all of Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

PCT No. PCT/JP87/00123, § 371 Date Dec. 28, 1987, § 102(e) Date Dec. 28, 1987, PCT Pub. No. WO87/05244, PCT Pub. Date Sep. 11, 1987
PCT Filed Feb. 26, 1987, Ser. No. 92,913
Claims priority, application Japan, Feb. 28, 1986, 61-43189; Mar. 11, 1986, 61-54406; Dec. 25, 1986, 61-311111; Feb. 9, 1987, 62-29177
Int. Cl.[4] B23K *26/02, 26/10*
U.S. Cl. 228—164 15 Claims

1. In a continuous processing line, in which facing ends of preceding and succeeding steel strips are cut and the cut end surfaces are caused to abut as butt surfaces and are welded along the butt line formed by the abutting, a method of cutting and welding steel strips, in which, when cutting, abutting and welding facing ends of the steel strips, at the time of the cutting or abutting prior to the welding, either said preceding steel strip or said succeeding steel strip is attracted by an electromagnetic chuck in at least one work table in said continuous processing line, and said electromagnetic chuck is moved to pull said preceding or succeeding steel strip until it strikes a



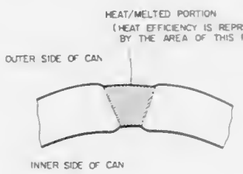
reference block disposed parallel to the center line of said continuous processing line to align one edge of said preceding or succeeding steel strip to be parallel to said center line.

4,840,304

BUTT-WELDED CANS AND PROCESS FOR MANUFACTURING THE SAME

Nobuyuki Sato, Yokohama; Hiroshi Matsubayashi, Kamakura; Seishichi Kobayashi, Yokohama; Minoru Mitsuhashi, Yokohama; Kenji Matsuno, Yokohama, and Kazuhisa Ishibashi, Tokyo, all of Japan, assignors to Toyo Seikan Kaisha Ltd., Japan

Division of Ser. No. 140,603, Dec. 28, 1987, Pat. No. 4,805,795.
This application Sep. 2, 1988, Ser. No. 239,662
Claims priority, application Japan, Dec. 27, 1986, 61-310194; Jan. 9, 1987, 62-3022; Jan. 20, 1987, 62-10959; Jan. 20, 1987, 62-10960; Jan. 20, 1987, 62-10961
Int. Cl.[4] B23K *26/00, 26/16*
U.S. Cl. 228—214 16 Claims



1. A process for manufacturing butt-welded cans which is characterized by comprising the steps of applying a 0.5 to 3.5 μm thick organic resin film for preventing the adhesion of melted metal particles to at least a 1-mm-wide region from the butt-weld portion edges of at least the inner surface of a steel plate can blank having a carbon concentration of 0.02 to 0.09% by weight; and butt-welding the edges of said can blank by the use of a laser.

4,840,305

METHOD FOR VAPOR PHASE SOLDERING

Michael J. Ankrom, Baltimore; Corey H. Bowcutt, Annapolis; John J. Buckley, Jr., Baltimore, and James A. Rew, Millersville, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 30, 1987, Ser. No. 32,426
Int. Cl.[4] B23K *31/02*
U.S. Cl. 228—232 20 Claims

1. A method for vapor phase soldering components onto a

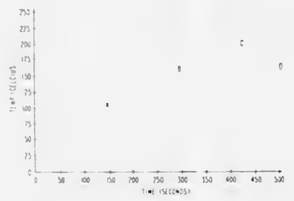
PWB onto which solder has been previously deposited comprising the steps of:

(a) applying a fluxing agent onto the PWB surface to be soldered;

(b) introducing the PWB into a vapor phase environment providing a temperature range between approximately ambient and the temperature of a saturated vapor of at least a first selected fluid in order to heat the PWB as follows:

(c) initially heating the PWB according to a first time-temperature gradient having a first slope value from ambient temperature to a predetermined first temperature selected to activate the flux and permit the flux to outgas before reflow and maintaining the PWB at said predetermined first temperature for a predetermined first period of time;

(d) heating the PWB according to a second time-temperature gradient having a second slope value from said first temperature to a predetermined second temperature se-



lected to preheat the PWB to a temperature which is slightly less than the melting point of the solder and maintaining the PWB at said predetermined second temperature for a predetermined second period of time;

(e) heating the PWB according to a third time-temperature gradient having a third slope value from said first temperature to a predetermined third temperature selected to preheat the PWB to a temperature which is at least equal to the melting point of the solder and maintaining the PWB at said predetermined third temperature for a predetermined third period of time;

(f) cooling the PWB according to a fourth time-temperature gradient having a fourth slope value, said fourth slope value having an absolute value greater than twice the value of any one of said first, second or third slope values, and by reducing the temperature below the third selected temperature so that the solder is in a solid state; and then

(g) withdrawing the PWB from the vapor phase environment.

4,840,306

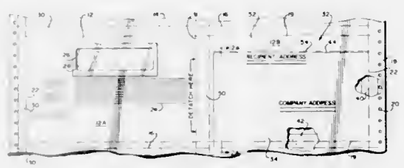
FOLD-OVER MAILER WITH SIDE-OPEN RETURN ENVELOPE WITH SLITTABLE EDGE

Leo Lombardo, Manchester, N.H., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Aug. 22, 1988, Ser. No. 234,579

Int. Cl.[4] B65D *27/06, 27/10, 27/34*

U.S. Cl. 229—73 **20 Claims**



1. A mailer having a return envelope, comprising first and second paper plies;

means about the margins of said plies for releasably securing said plies one to the other;

a third paper ply disposed between said first and second plies and having discrete margins;

means about the margins of said third ply for securing said third ply and one of said first and second plies one to the other whereby said intermediate ply and said one ply form a return envelope;

means defining an opening for said return envelope along a margin of said third ply;

one of the margins of said third ply being reversely folded along a foldline to form a flap disposed between said third ply and said one ply and a line of adhesive disposed between said flap and said one ply to secure said third ply and said one ply one to the other along said one margin whereby an edge portion of said return envelope and including said flap may be slit adjacent said foldline and along the adhesive line to open the return envelope.

4,840,307

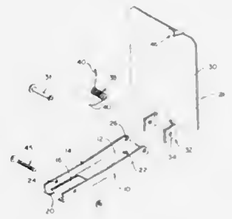
POSTBOX SIGNAL

Janet A. Hartman, 1157 Pugh Rd., Wayne, Pa. 19087

Filed May 3, 1988, Ser. No. 189,729

Int. Cl.[4] B65D *91/00*

U.S. Cl. 232—35 **3 Claims**



1. A postbox signal device comprising:

a support plate having integral therewith means for mounting onto a conventional rural type of postbox without the requirement of postbox mutilation, as for instance a postbox aperture to accommodate a fastener, or of additional materials to effect said mounting:

a signal plate pivotally secured at one end to the support plate and foldable thereon to form a compact relatively planar mass adapted for ease of handling;

a spring means biasing the signal plate to an open or unfolded position;

said integral means for mounting comprising horizontally extending opposed tab elements that are adapted to operatively associate with the horizontal section of a conventional postbox latch member for retaining the signal device in operative position on the postbox;

said support plate having an elongated, open-ended slot at the free end thereof, the tab elements being disposed at said open end in the plane of the support plate, and the plate thus configured to facilitate assembly of the device as said relatively planar mass;

said slotted configuration being adapted to receive therethrough a said horizontal section of a conventional postbox latch member whereby said signal device may be easily mounted on said postbox by inserting the latch member through the slot, lifting slightly on the latch member, sliding the tab elements between the latch member and the postbox to an operative position, and then releasing the latch member whereby the signal device is retained at said operative position; and

a tab member extending outwardly from the free end of the signal plate and adapted to operatively associate with the

postbox closure for retention in the folded position and whereby opening of said closure frees the signal plate for movement to an upright position to normally signal a delivery to the postbox.

4,840,308

AUTOMOTIVE AIR CONDITIONING SYSTEM DAMPER POSITION CONTROL

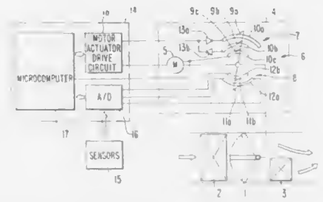
Hidemitsu Akabane, Takasaki; Toshimi Isobe, Isesaki, and Seiichi Hoshino, Nitta, all of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Jul. 18, 1988, Ser. No. 220,740

Claims priority, application Japan, Jul. 18, 1987, 62-109593[U]

Int. Cl.[4] G05D *23/12*

U.S. Cl. 236—13 **2 Claims**



1. In an automotive air conditioning system including an air mix damper which controls the temperature of the air blown into a compartment to be cooled by controlling the mixture of cool air and heated air and a damper position control device, said damper position control device including a motor actuator and a control circuit, said motor actuator including a motor driving the air mix damper and a rotation control switch provided with a regulator regulating upper and lower rotational limits of said motor and a position detector generating position signals corresponding to the rotational angle of the shaft of said motor, said control circuit controlling the operation of said motor actuator in accordance with a plurality of temperature signals, and the position signals, said control circuit initiating control of the operation of said motor actuator upon inputting one of the position signals corresponding to the upper and lower rotational limits of the shaft of said motor, the improvements comprising:

stop determination means in said control circuit for determining whether said motor stops within the upper and lower rotational limits;

regulator control means in said control circuit responsive to said stop determination means for using a position signal from said position detector corresponding to the position at which said motor stops as one of the upper and lower rotational limits of said regulator.

4,840,309

TRACTION MAT

Gaspare Teresi, 142 Fulton Ave., Fairview, N.J. 07022

Filed Feb. 29, 1988, Ser. No. 161,973

Int. Cl.[4] E01B *23/00*

U.S. Cl. 238—14 **5 Claims**

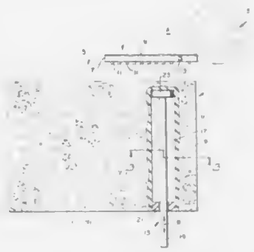
1. A traction mat for a vehicle wheel comprising:

(a) a planar shaped member including upper and lower surfaces;

(b) a plurality of spaced traction cleats extending from the lower surface of the member for engaging a slippery road surface;

(c) the member and cleats being integrally formed from a moldable material;

(d) an elongate recess molded within the member, the longitudinal axis of the recess being disposed transverse to a given direction of wheel travel when the mat is disposed in a position of use: and



(e) an elongate handle coaxially supported within the recess for free slidable movement and disposable in positions of retraction and extension with respect thereto.

4,840,310

FUEL INJECTION NOZZLE

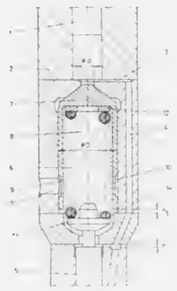
Gottfried Haider, Linz, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Oct. 26, 1987, Ser. No. 112,495

Claims priority, application Austria, Oct. 30, 1986, 2893/86

Int. Cl.[4] F02M *47/00*

U.S. Cl. 239—533.4 **5 Claims**



1. A fuel injection nozzle for an internal combustion engine, especially a diesel engine, comprising:

a housing means including a longitudinal passage which has an inlet end for connection with a pressurizable fuel chamber of a fuel injection pump, and an outlet end provided with fuel injection bore means;

said longitudinal passage being provided intermediate said inlet and outlet ends, with a longitudinally elongated valve needle spring chamber which is radially enlarged in relation to said longitudinal passage immediately upstream of a seat provided where said longitudinal passage emerges into said valve needle spring chamber;

a fuel delivery bore provided in said housing means, so as to intersect with said longitudinal passage at a first intersection upstream of, and at a second intersection downstream from, said valve needle spring chamber;

a valve needle longitudinally slidably received in said longitudinal passage and having a spring plate thereof disposed in said valve needle spring chamber;

a piston shoulder formed on said valve needle and exposed to said fuel delivery bore via said second intersection, whereby an increase in fuel pressure applied on said piston shoulder can slide said valve needle longitudinally in one

direction for moving a tip portion of said valve needle axially away from a closing relation in relation to said fuel injection bore means, and upon a decrease in fuel pressure applied on said piston shoulder can permit said valve needle to slide longitudinally in an opposite direction until said valve needle tip portion closes said fuel injection bore means;

a displacer piston longitudinally slidably received in said valve needle spring chamber, said displacer piston having an end wall capable of closing-off and opening said valve needle spring chamber at said seat;

said displacer piston further including a generally tubular sidewall which extends longitudinally from said end wall towards said spring plate;

a stop means provided for engagement by said sidewall upon longitudinal movement of said end wall away from said seat for limiting longitudinal movement of said end wall away from said seat and thereby limiting volume of a space created in said valve needle spring chamber upstream of said displacer piston;

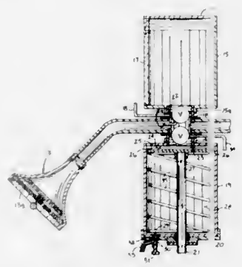
a compression coil spring received in said valve needle spring chamber, said spring having one end pressed against said displacer piston end wall for tending to maintain said end wall seated against said seat, and another end pressed against said spring plate of said valve needle for tending to maintain said tip portion of said valve needle disposed in closing relation to said fuel injection bore means, whereby said spring longitudinally overlaps with said sidewall of said displacer piston, and, in use, first increment of increased pressure on fuel in said longitudinal passage upstream of said valve needle spring chamber may axially slide said valve needle, against counterpressure provided by said spring, to open said fuel injection bore means for a pre-injection of fuel out of said fuel injection bore means, a second increment of increased pressure on said fuel may longitudinally displace said end wall of said displacer piston, against counterpressure provided by said spring, away from said seat, such movement being limited by said stop means, opening said space, thereby temporarily relieving pressure on said fuel and permitting said spring to temporarily reclose said valve needle against said fuel injection bore means, and a third increment of increased pressure on said fuel may axially slide said valve needle a second time, against counterpressure provided by said spring, to open said fuel injection bore means for injection of fuel out of said fuel injection bore means.

4,840,311

SHOWER DISPENSING HEAD

Judy A. Shamblin, 4222 Mohawk, Baytown, Tex. 77521

Filed Jul. 5, 1988, Ser. No. 215,267
Int. Cl.[4] B05B *7/30, 11/02*
U.S. Cl. 239—74 8 Claims



1. A shower dispensing head apparatus for selectively supplying bath toiletry fluid through a shower head in full communication with said dispensing head apparatus comprising,

an upper elongate container removable secured to an upper end of a union, and

a lower elongate container underlying said upper container and removably secured to a lower end of said union, and

said union secured to and in fluid communication with a water conduit directing water to said shower head, and

said upper container including a lid removably secured to said upper container for replenishment of a toiletry fluid in said upper container, and

a first valve positioned in fluid communication between said upper container and an outlet pipe wherein said outlet is positioned within said water conduit for supplying a predetermined quantity of said toiletry fluid within said water conduit, and

said lower elongate container including a lid removably secured to said lower elongate container remote from said union;

said lid including an outlet spigot in fluid communication with a manually manipulatable third valve and plunger extending outwardly of said lid for directing a toiletry fluid within said lower container through said spigot, and

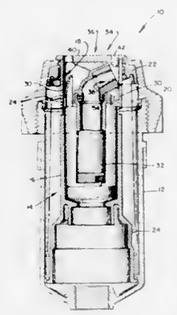
a second valve positioned between said water conduit and a piston within said lower container to pressurize said toiletry fluid within said lower container.

4,840,312

SPRINKLER NOZZLE MODULE

Stephen L. Tyler, Diamond Bar, Calif., assignor to The Toro Company, Minneapolis, Minn.

Filed Nov. 20, 1987, Ser. No. 123,420
Int. Cl.[4] B05B *15/10*
U.S. Cl. 239—205 1 Claim



1. A rotating pop-up sprinkler comprising:

(a) a tubular body suitable for connection to a water source;

(b) an elongate tubular riser assembly received within the body and in fluid communication therewith, comprising a lower non-rotating portion and an upper rotating portion rotatably coupled thereto, wherein the riser assembly has retracted and extended states relative to the body, and wherein the upper rotating portion of the riser assembly is cup-like and has a vertical cylindrical wall extending radially inward from which is a pair of diametrically opposed tabs each having a bottom surface;

(c) a ring-like cap threadedly attached to the top of the body having an annular upper rim;

(d) an annular wiper seal captured within the cap and in contact with and underside of the cap rim;

(e) a compression spring acting between on underside of the wiper seal and the non-rotating portion of the riser assembly for urging the riser assembly toward its retracted state; and

(f) a removable nozzle module comprising a nozzle holder and a nozzle received thereby and in fluid communication therewith, wherein:

(i) the nozzle holder comprises an upper lid and a body wherein the body and the lid are integral one to the other; the body forms a nozzle aperture to receive the nozzle; and extending radially from the body is a pair of diametrically-opposed wings each having a top surface, the top surfaces of the wings being suitable for engagement with the bottom surfaces of the riser assembly tabs, whereby partial rotation of the nozzle holder relative to the rotating portion of the riser assembly effects engagement or disengagement of the top and bottom surfaces of the corresponding wings and tabs, respectively, depending on the direction of rotation, thereby resulting in a bayonet connection between the nozzle module and the rotating portion of the riser assembly;

(ii) the upper lid of the nozzle holder is accessible when the riser assembly is in its retracted state and the lid forms one or more apertures for receiving means for applying torque to the nozzle holder, whereby the nozzle module can be twisted relative to the non-rotating portion of the riser assembly and removed without extending the riser assembly; and

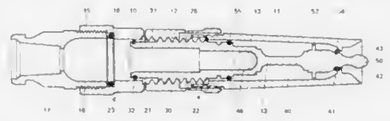
(iii) the nozzle aperture is below the rim of the cap and is therefore covered and protected when the riser assembly is in its retracted state.

4,840,313

WATER SPRAY FITTING

Albert F. Hansen, Whangarei, New Zealand, assignor to Hansen Development Limited, Whangarei, New Zealand

Filed Oct. 14, 1987, Ser. No. 108,495
Claims priority, application New Zealand, Oct. 16, 1986, 217969
Int. Cl.[4] B05B *1/32*
U.S. Cl. 239—456 6 Claims



1. A water spray fitting for controlling the flow of water from a pressure water supply, comprising:

a body of said fitting adapted to be connected to said water supply and comprising a hollow interior extending from a water inlet to said interior to a water outlet from said fitting;

an internally threaded control ring located in a transverse cut out part of said body and rotatable therein about its longitudinal axis by force applied manually to an exposed exterior part or parts of said control ring; and

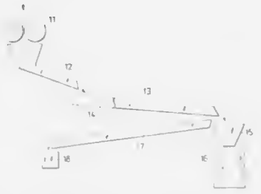
a valve member extending longitudinally within said hollow interior and through said control ring and externally threaded in the region of said control ring such that rotation of said control ring causes longitudinal movement of said valve member within said hollow interior, and comprising a distal end engaging said water outlet to control the flow of water therefrom on movement of said valve member by way of said control ring, and means sealing said valve member to the interior of the fitting on either side of said control ring, and a passage for water internally through said valve member from the water inlet side of said interior through a water outlet port of the member to the water outlet side of the body beyond said control ring, said valve member being formed such that the forces applied to said valve member in use of the fitting by rearwardly directed water pressure acting on said valve member beyond said control ring and forwardly directed water pressure acting on said valve member on said inlet side thereof are substantially balanced.

4,840,314

TREATMENT OF MERCURIAL WASTE

Hans Kulander, Saltvik, Sweden, assignor to MRT System Aktiebolag, Sweden

Filed Mar. 30, 1988, Ser. No. 175,256
Claims priority, application Sweden, Apr. 16, 1987, 8701613
Int. Cl.[4] B02C *19/14*
U.S. Cl. 241—24 12 Claims



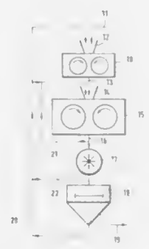
1. A method of separating mercurial waste from scrapped metal vapor discharge lamps of the type which are coated with luminescent powder on their inside glass surfaces, comprising the steps of crushing the lamps into particles, separating the crushed particles into a relatively coarse first fraction and a relatively fine second fraction, said relatively coarse first fraction having a particle size larger than a range of about 0.2 to 1.0 mm and being essentially free of the mercury in said scrapped lamps, said relatively fine second fraction having a particle size less than said range of about 0.2 to 1.0 mm and containing substantially all of the mercury in said scrapped lamps, said separation step being performed with the use of vibrating screen means, and both of said steps of crushing and separating being performed dry and on essentially said scrapped lamps only.

4,840,315

METHOD AND INSTALLATION FOR A CONTINUOUS PRESSURE COMMUNUTION OF BRITTLE GRINDING STOCK

Gerhard Rubin, Cologne, and Hugo Bleckmann, Bonn, both of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 9, 1988, Ser. No. 204,256
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1987, 3719251
Int. Cl.[4] B02C *4/00*
U.S. Cl. 241—24 17 Claims



1. A method for the continuous pressure comminution of brittle grinding stock such as cement clinker, ore, coal of the

like using a high-pressure roller in whose narrowest nip the grinding stock is subjected to a product bed comminution, the comminuted product is de-agglomerated, the fine finished product is classified out of the de-agglomerated product in a sifter, and the coarse fraction is recirculated for delivery into the roller press, characterized in that the agglomerates delivered from the roller press are pressed at least a second time in the nip of a further roller press before de-agglomeration so that the pressure pattern in the second roller nip becomes narrower in the circumferential direction but higher in amplitude.

4,840,316

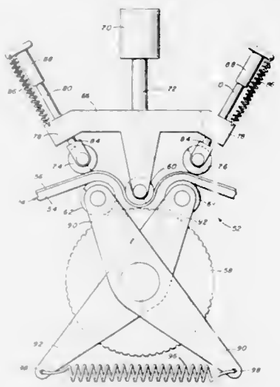
RUBBER CRUMB RECOVERY FROM VEHICLE TIRES

Randel L. Barclay, 5616 Carpenter Rd., Stockton, Calif. 95205

Filed Jul. 13, 1988, Ser. No. 218,687

Int. Cl.[4] B02C *18/22*

U.S. Cl. 241—279 **20 Claims**



1. An apparatus for removing rubber from a tire segment of the type having a threaded portion fixed to a belted underlayer, comprising,

a rasp having an axis of rotation,

means for rotating said rasp about said axis,

a capture roller having a tire engagement position wherein said capture roller is adjacent to said rasp to maintain a thread portion of a captive tire in frictional contact with the circumference of the rasp,

first and second tensioning rollers mounted on parallel shafts at opposed sides of said capture roller when said capture roller is in said engagement position said tensioning rollers each having an operating condition in which the tensioning roller is spaced apart from said capture roller by frictional contact with a captive tire placed therebetween, and

drive means for providing relative movement between said rotational axis of the rasp and said captive tire as the treaded portion of said captive tire is removed from a belted underlayer.

4,840,317

WOOD PULP GRINDER

Hans-Otto Henrich, Hiedenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Oct. 22, 1987, Ser. No. 112,252

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, 3636226

Int. Cl.[4] B02C *19/12*

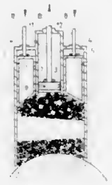
U.S. Cl. 241—282 **20 Claims**

1. A wood pulp grinder comprising a grinder housing having an open end facing toward a grindstone for delivering wood to be ground to the grindstone;

a main press chamber in the grinder housing spaced above the grindstone; a main press ram guided for movement toward and away from the grindstone through the main press chamber, and when the main press ram is moved away from the grindstone, wood may be loaded into the main press chamber;

an auxiliary press ram at a side of the main press chamber in the grinder housing, the auxiliary press ram having an active end for pressing upon wood in the grinder housing, the auxiliary press ram being movable separately from the main press ram over pressing stroke toward and away from the grindstone;

the main press ram having a first active lower surface for pressing upon wood in the grinder housing and the main press ram having a pressing stroke during which said first



active lower surface presses upon wood in the grinder housing and the pressing stroke of the main press ram having an end of motion at which the active surface of the main pressing ram is nearest the grindstone, the auxiliary press ram having a second active surface for pressing upon wood in the grinder housing and the auxiliary press ram having an active stroke during which said second active surface presses upon wood in the grinder housing, the second active surface being located, at least at the beginning of the active stroke of the auxiliary press ram, toward the grindstone, at a height generally near the height of the first active surface of the main press ram at the end of the active stroke of the main press ram where the first active surface is closest to the grindstone;

said auxiliary press ram maintaining pressure upon wood in the grinder housing while the main press ram is moved away from the grindstone to load wood into the main press chamber.

4,840,318

WELDED CONICAL GRINDING CUTTER

Helmer Gustafsson, Valkeakoski, Finland, assignor to Yhtyneet Paperitehtaat Oy Jylhavaara, Valkeakoski, Finland

Filed Jan. 7, 1985, Ser. No. 689,474

Int. Cl.[4] B02C *19/00*

U.S. Cl. 241—294 **6 Claims**

1. A conical grinding cutter for the grinding or refining of wood pulp, comprising

a plurality of separately cast cutter sectors formed of a first material providing a long service life, each having been cast into a curved rigid configuration with a plurality of integrally cast ridges in the surface thereof, and each said sector having along its longitudinally extensive edges at least one junction piece formed of a second material which is weldable, each said sector being cast about and partially embedding said at least one junction piece,

said cutter sectors being assembled adjacent one another along said longitudinally extensive edges to define a cone including a grinding portion constituted by a longitudinally extensive surface provided with said integrally cast ridges,

said cutter sectors being welded together along said weldable junction pieces to obtain a stiff and rigid conical grinding cutter.

4,840,319

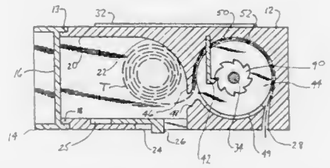
BAG TIE DISPENSER

Harold E. Heleen, and Lucille M. Heleen, both of P.O. Box 21, Thomasville, Ga. 31799-021

Filed Jan. 28, 1988, Ser. No. 149,359

Int. Cl.[4] B65H *19/00;* **G03B** *1/24*

U.S. Cl. 242—55.53 **3 Claims**



1. A new and improved bag tie dispenser, comprising:

a hollow generally rectangular housing;

a lid removably received on a top portion of said housing;

a loose tie storage receptacle on an upper surface of said lid;

said housing having a tie feed hopper with a straight back vertical interior wall;

a lower portion of said back vertical wall connected by a curved support surface to a generally horizontal radiused guide lip;

a cylindrical recess in said housing disposed beneath said horizontal radiused guide lip;

a feed gap communicating between said tie feed hopper and said cylindrical recess;

a cylindrical feed roller rotatably mounted in said cylindrical recess;

said feed roller having an outer peripheral surface provided with a plurality of axially extending evenly circumferentially spaced slots;

each of said slots having a width of about three thirty seconds of an inch and a depth of about three hundredths of an inch;

said feed roller having a maximum diameter dimensioned to form a slight spacing between said roller and a wall of said cylindrical recess;

a generally horizontal slot formed through a front wall of said housing;

said slot tangentially connected with said cylindrical recess;

an aperture formed through said front housing wall;

said aperture in communication with said tie feed hopper;

a slidable cover on said housing for selectively opening and closing said aperture;

means for manually rotating said feed roller; and

adhesive means on a back exterior wall of said housing for securing said dispenser to a vertical surface.

4,840,320

APPARATUS FOR AUTOMATICALLY THREADING THE LEADING EDGE OF A SPOOLED WEB INTO A CONVEYING PASSAGE

Toshio Shigeta, Chiba; Yoshiyuki Muto, and Tadao Etani, both of Tokyo, all of Japan, assignors to Japan Tobacco Inc. and Tokyo Automatic Machinery Works Ltd., both of Tokyo, Japan

Filed Dec. 14, 1987, Ser. No. 132,365

Claims priority, application Japan, Dec. 25, 1986, 61-312561

Int. Cl.[4] B65H *19/16, 19/18*

U.S. Cl. 242—58 **11 Claims**

1. Apparatus for automatically threading the leading end of a web spooled on a reel into one end of a conveying passage, said apparatus comprising:

(a) a draw-out lever having a web support surface and movable to a first position at which said support surface engages the web spooled on the reel;

(b) a nipping finger actuatable to trap the leading end of the web against said surface when the lever is in its first position;

(c) said lever being movable to a second position in which said support surface is spaced from the web spooled on the reel for unspooling the web from the reel;

(d) feed means made effective after said lever has moved to its second position and after said nipping finger is deactuated for engaging the unspooled web and feeding the leading end thereof into said conveying passage;

(e) said draw-out lever including a guide lever fixed to said draw-out lever and carrying a back-up roller on its free end positioned to engage the web unspooled from the reel when said lever is in its second position:

(f) said feed means including a feed roller movable into engagement with the web unspooled from the reel for trapping the unspooled web against the back-up roller; and

(g) means for rotating said feed roller.

4,840,321

APPARATUS FOR FEEDING PACKAGING-MATERIAL REELS TO A PACKAGING MACHINE

Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Fed. Rep. of Germany

Filed Sep. 11, 1987, Ser. No. 95,594

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1986, 3631205

Int. Cl.[4] B65H *19/12, 16/04*

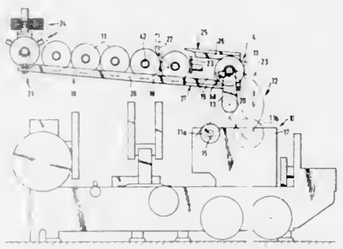
U.S. Cl. 242—58.6 **19 Claims**

1. Apparatus for transferring and feeding reels of packaging material to a reel-changing device of a packaging machine, the real-changing device having at least one supporting journal which projects from a reel supporting frame and which penetrates into a central orifice in the reel for the mounting of the latter; said apparatus comprising:

means for mounting said supporting journal (15, 16) on said reel supporting frame (17), so as to be axially displaceable,

and for pushing said journal (15, 16) from a retracted initial position into an extended position in a central orifice (42) in the reel (11) to receive the reel supplied in a working plane;

a pivotably mounted conveying arm (13) for feeding the reels (11) of the reel-changing device (12); and



a transversely projecting reel conveying journal (28) which is arranged on said conveying arm (13) and which is axially displaceable in order to receive a reel in a transfer station (14) and to deliver the reel to the reel-changing device (12).

4,840,322

WINDING OF FLEXIBLE ELONGATE MATERIAL

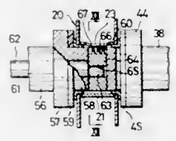
Yuichi Masuda, Namerikawa, and Kozo Shimizu, Kurobe, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Division of Ser. No. 859,490, May 5, 1986, Pat. No. 4,742,969. This application Feb. 24, 1988, Ser. No. 159,928

Claims priority, application Japan, May 17, 1985, 60-105576

Int. Cl.[4] B65H *18/10*

U.S. Cl. 242—67.1 R **7 Claims**



3. An apparatus for winding a flexible elongate material, comprising:

(a) a spool for winding thereon the flexible elongate material, including a hollow cylindrical body having an axial hole extending from end thereof and defined by an annular peripheral wall of said spool body, and a radial opening extending through said annular peripheral wall and communicating with said axial hole;

(b) a pair of oppositively disposed first and second drive shafts relatively movable toward and away from each other for releasably holding said spool, said first and second drive shafts being rotatable about their own axes to revolve said spool, said first drive shaft having at its one end an annular flange engageable with said one end of said spool body and an extension projection from said annular flange that is receivable in said axial hole in said spool body, said extension of said first drive shaft having a radial recess disposed in registry with said radial opening in said spool body; and

(c) holding means associated with said first drive shaft and cooperative with said radial opening with said spool body for holding a leading end of the flexible elongate material on said spool body, said holding means including an axial hole in said first drive shaft communicating at its one end with said radial recess, said holding means further comprising an auxiliary drive shaft rotatably received in said axial hole and said first drive shaft, at least one locking needle operatively connected with said auxiliary drive shaft and selectively projectable beyond an outer peripheral surface of said annular peripheral wall, through said radial recess in said extension and through said radial opening in said spool body, and a presser pad disposed in registry with said radial opening of said spool body and reciprocably movable toward said spool body to force the leading end of the elongate material into locking engagement with said locking needle when the latter projects beyond said outer peripheral surface of said annular wall.

4,840,323

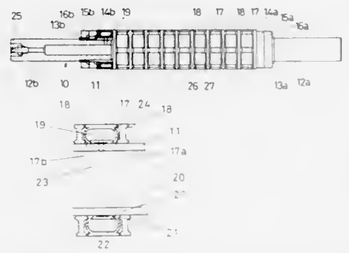
WEB WINDING AND/OR REWINDING SHAFT STRUCTURE

Kiyoji Nakajima, 6-1, Chuo-cho 3-chome, Higashi-Kurume, Tokyo, Japan

Filed Feb. 8, 1988, Ser. No. 153,425

Int. Cl.[4] B65H *75/24*

U.S. Cl. 242—72 B **2 Claims**



1. An expansible mandrel for supporting a winding roll comprising:

a center shaft having a longitudinal air passage therethrough;

a plurality of apertures in said center shaft communicating said air passage with the outer periphery of said center shaft;

an air valve means attached to said air passage for connecting to an air source for supplying air to said air passage and to said plurality of apertures;

a plurality of separate hollow expandable annular members mounted along said center shaft, each one of said plurality of expansible annular members having an air inlet for communicating with one of said plurality of apertures for receiving air supplied by said air passage for expanding each one of said plurality of separate hollow expansible members;

a plurality of spacer rings mounted along said center shaft, each one of said plurality of spacer rings being mounted directly adjacent to and separating adjacent ones of said plurality of expansible annular members, and each one of said plurality of spacer rings having means for fixedly attaching directly adjacent ones of said expansible annular members to said outer periphery of said center shaft;

a plurality of internal rings, each one of said plurality of internal rings being mounted inside one of said plurality of expansible annular members, and each one of said internal rings having clamping means for fixedly attaching each said one of said plurality of annular members to said outer periphery of said center shaft; and

wherein, when said plurality of separate hollow expansible annular members is not expanded a winding roll may be slipped over said plurality of annular members and over said plurality of spacer rings, and when said plurality of annular members is then expanded sufficiently for contacting the winding roll by an air source attached to said air passage supplying air thereto a winding roll is rigidly attached to said center shaft by the said plurality of expanded annular members.

4,840,324

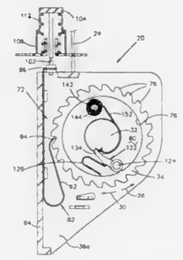
SEAT BELT RETRACTOR HAVING A COMFORT MECHANISM WITH FULL MEMORY AND SLACK SET

Wallace C. Higbee, Romeo, and Barney J. Bauer, Grosse Pointe Woods, both of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Dec. 28, 1987, Ser. No. 138,838

Int. Cl.[4] B60R *22/34*

U.S. Cl. 242—107.6 **20 Claims**



20. An apparatus for use in protecting an occupant of a vehicle and comprising:

a spindle having belt webbing wound thereon, said spindle being supported for rotation in belt retraction and belt withdrawal directions;

spring means for biasing said spindle to rotate in the belt retraction direction;

a manually movable member having a portion for engagement by the hand of the vehicle occupant and to which a force is applied by the occupant to move said manually movable member; and

means for rotating said spindle in the belt withdrawal direction to pay out a predetermined amount of belt webbing from said spindle in response to movement of said manually movable member by the vehicle occupant engaging said portion and applying a force thereto and for thereafter blocking rotation of said spindle in the belt retraction direction.

4,840,325

SEAT BELT TIGHTENING DEVICE

Kazuo Higuchi; Hiroshi Tabata; Hisakazu Okuhara; Hidetoshi Saruwatari, and Akihiko Akiyama, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1987, Ser. No. 30,630

Claims priority, application Japan, Apr. 2, 1986, 61-76043; Apr. 2, 1986, 61-49160[U]

Int. Cl.[4] B60R *22/42, 22/46*

U.S. Cl. 242—107.2 **10 Claims**

1. A seat belt tightening device for removing slack in a seat belt when the seat belt is required to positively restrain a passenger, comprising:

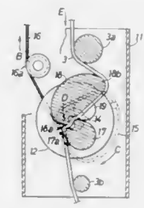
a drive source which is activated when the seat belt is required to restrain the passenger;

a rotary member which is adapted to be rotated about a first axis by said drive source;

a pair of clamp members accommodating a certain span of the seat belt therebetween without substantially obstructing lengthwise motion of the seat belt, means for fixing one of said clamp members with respect to said rotary member, means for rotatably supporting at least one of the clamp members for rotation with respect to said fixed clamp member about a second axis substantially parallel to an apart from said first axis; and

a pair of seat belt guides which are provided at either end of the given span of the seat belt for limiting the motion of the seat belt in a direction perpendicular to a major surface of the seat belt, said guides defining a direct path therebetween;

wherein the rotatable clamp member is provided with a



contact surface which pushes a major surface of the seat belt out of line from said direct path between the pair of seat belt guides in response to the rotary member being rotated by the drive source and said rotatable clamp member further includes a clamp surface which clamps the seat belt in cooperation with a corresponding clamp surface of said fixed clamp member as the contact surface pushes the seat belt and said rotatable clamp member is thereby rotatively driven with respect to said fixed clamp member by a reaction which the rotatable clamp member receives from the seat belt.

4,840,326

MAGNETIC TAPE CASSETTE

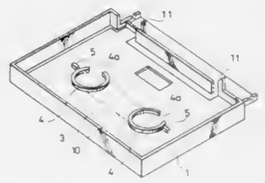
Shingo Katagiri; Keiji Mori, and Masahiko Asai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 13, 1988, Ser. No. 143,475

Claims priority, application Japan, Jan. 13, 1987, 62-2484[U]

Int. Cl.[4] G11B *23/04*

U.S. Cl. 242—199 **6 Claims**



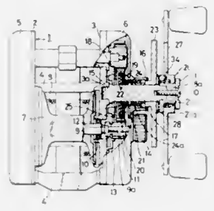
1. A magnetic tape cassette comprising: upper and lower half bodies connected together to define a cassette housing; a pair of flangeless hubs rotatably mounted between said upper and lower half bodies; an annular projection for each of said hubs provided on at least one of said upper and lower half bodies; and a rib for each of said hubs having a height substantially the same height as a corresponding annular projection and extending radially of said corresponding annular projection for only a distance corresponding to a first-wound portion of a tape wound on said corresponding hub.

4,840,327

APPARATUS FOR MEASURING DRAG-FORCE OF FISHING REEL

Kyoichi Kaneko, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Filed Sep. 15, 1987, Ser. No. 96,919
Claims priority, application Japan, Sep. 18, 1986, 61-220780
Int. Cl.[4] A01K *89/00*
U.S. Cl. 242—217 11 Claims



1. A fishing reel comprising a casing, a spool shaft, a spool carried on said spool shaft, a fishing line wound about said spool, means rotatably maintaining said spool shaft in said casing, a handle shaft having inner and outer portions, a bearing rotatably supporting the inner portion whereby the outer portion is located outwardly of said casing, a handle, means mounting said handle on said handle shaft on the outer portion for relative rotatable motion with respect thereto, a drag-force adjusting knob rotatable on said handle shaft, a drive gear disposed on said handle shaft, a drag device mounted on said handle shaft inwardly of said handle for preselected pressure-setting by rotation of said adjusting knob, said drag device frictionally connecting said drive gear to said handle shaft and interconnecting said drive gear and said adjusting knob and comprising an assembly of laminated washers interengaging said drive gear and said handle shaft and spring means disposed between said drag-force adjusting knob and said washers, whereby said washers are pressurized commensurate with the pressure applied on said spring means by operation of said adjusting knob for effecting the frictional connection of said drive gear to handle shaft, means operatively connecting said handle shaft and said spool shaft for transmitting torque from said handle shaft proportional to the pressure force on the washers to said spool shaft, said torque transmitting means comprising a pinion gear mounted on said spool shaft and engageable with said drive gear, a drag-force measuring mechanism fixed on said handle for applying on said handle a torque slightly greater than the torque applied by said drive gear on said handle shaft, and cooperative visual drag-force display means provided on said drag-force measuring mechanism and said handle.

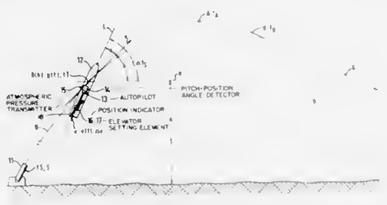
4,840,328

METHOD AND ARRANGEMENT FOR THE AUTONOMOUS DETERMINATION OF AN INERTIAL POSITIONAL REFERENCE ON BOARD A GUIDED PROJECTILE

Peter Sundermeyer, Lauf, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Feb. 19, 1988, Ser. No. 157,890
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1987, 3707159
Int. Cl.[4] F41G *7/00*
U.S. Cl. 244—3.15 6 Claims

1. A method for the autonomous determination of an inertial positional reference on board a guided projectile through the obtention and evaluation of pressure values in the surroundings of the projectile during the movement thereof along a ballistic trajectory; comprising measuring the dynamic atmospheric pressure of the medium of the surroundings onflowing against the projectile during an aerodynamically stable condition of flight of the projectile; and with the value of the atmospheric pressure measurement as a characteristics curve parameter for the momentarily given position of an elevator or stabilizer of the projectile, reading out the momentary absolute pitch position angle of the projectile from an area of characteristics



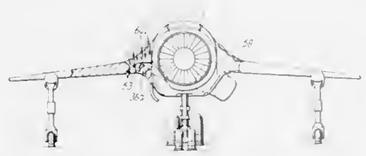
curves, which has as the content thereof the pitch position angle in dependence upon the position of the elevator in conformance with aerodynamic trim equations for the assumed condition of flight as determined from model observations or model investigations.

4,840,329

AIRCRAFT WITH STOWABLE VECTORABLE NOZZLE AND EJECTOR THRUST AUGMENTATION

Gary F. Szuminski, Cincinnati, Ohio, and Benjamin D. Ward, Marietta, Ga., assignors to Rolls-Royce Inc., Greenwich, Conn.

Continuation of Ser. No. 934,854, Nov. 25, 1986, abandoned, Continuation-in-part of Ser. No. 849,492, Apr. 8, 1986, Pat. No. 4,713,935. This application Dec. 14, 1987, Ser. No. 134,602
Int. Cl.[4] B64D *33/04*
U.S. Cl. 244—12.5 17 Claims



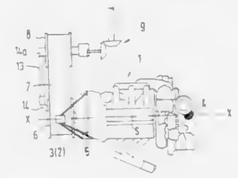
1. An aircraft comprising: structure including a fuselage and wings, a gas turbine engine located in the fuselage, a stowable exhaust nozzle mounted in a bearing and protruding from the bearing through a cut-out section of the fuselage for rotation from a first position in which exhaust gas issuing from the nozzle is directed generally downwards to a second position in which exhaust gas is directed generally rearward; the structure including means defining a stowage cavity situated adjacent the stowable nozzle bearing, the cavity having a generally downward facing outlet opening and being arranged in relation to a nozzle axis of rotation so that the nozzle may be stowed in the cavity in the first position and, in the second position, may be rotated out of the cavity, wherein the nozzle is provided with a cuff fairing attached to the nozzle for rotation therewith, the fairing extending out from the nozzle to blank off at least partially the cut-out section of the fuselage.

4,840,330

SUSPENSION SYSTEM FOR A DRIVE ASSEMBLY OF A HELICOPTER

Ulrich von Broock, Weissach, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 29, 1988, Ser. No. 162,122
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1987, 3706379
Int. Cl.[4] B64C *27/00*
U.S. Cl. 244—17.27 12 Claims



1. A suspension system having elastic bearings for a drive assembly of a helicopter having a belt drive that is arranged between an engine output shaft and a main rotor and comprises a first drum connected with the output shaft and a second drum connected with an angular drive, said drums being connected in a tensionable belt drive, wherein the suspension system has at least two bearing means in the area of the belt drums and another bearing means at the end of the drive assembly that faces away from the belt drums, and wherein said bearing means have a spring rigidity coordination in horizontal and vertical directions for providing limited swivel movements of the assembly around the longitudinal axes of the belt drums as well as parallel lifting movements in the vertical direction.

4,840,331

TRAILING EDGE FLAPS FOR AIRCRAFT WINGS

George H. Williams, Almondsbury, United Kingdom, assignor to British Aerospace PLC, London, United Kingdom

Filed Aug. 9, 1988, Ser. No. 230,018
Claims priority, application United Kingdom, Aug. 11, 1987, 8718977
Int. Cl.[4] B64C *3/50*
U.S. Cl. 244—212 4 Claims

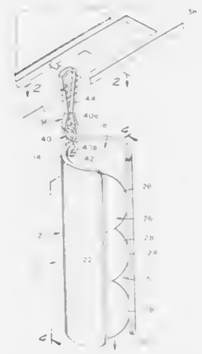
1. A trailing edge flap assembly for an aircraft wing, said wing including at its rearward end upper and lower surfaces terminating in a trailing edge portion, said trailing edge flap assembly comprising a flap member located in a stowed position during normal flight within said trailing edge portion, a mounting beam located to said wing lower surface and extending rearwardly thereof and below said flap member, substantially longitudinal guideway means on said mounting beam, carriage means in rolling engagement with said guideway means, and flap actuation means located at or about the rearward extremity of said mounting beam the improvement consisting in that said flap actuation means comprises actuator mounting means, a rotary actuator and at least one lever arm associated with said rotary actuator about a common substantially transverse axis of rotation, said at least one lever arm extending upwardly and terminating adjacent the undersurface of said flap member in a pivotal attachment to at least one forwardly extending actuator link pivotally interconnecting said at least one lever arm and said carriage means, said flap member being supported upon said flap assembly by means of first link means interconnecting said carriage means to a forward portion of said flap member and second link means interconnecting said at least one actuator link to a more rearward portion of said flap member.

4,840,332

GOLF BALL HOLDER

David D. Hoyt, 4170 Motor Ave., Culver City, Calif. 90230

Filed Aug. 26, 1987, Ser. No. 89,537
Int. Cl.[4] B60R *9/00*
U.S. Cl. 224—274 3 Claims



1. A device adapted to be oriented in a vertical position for holding three golf balls aligned in a row, comprising

a wall element made of a resilient plastic material,

said wall element having edges and being formed into a tubular member with the cross section of the wall being partially circular in configuration with said edges being opposed and parallel with each other and spaced apart a distance ranging between 0.500 and 1.000 inch to define an aperture, said distance being sufficient to allow a user to insert a finger into the aperture but sufficiently restrictive to prevent a golf ball from being inserted into the tubular member through said aperture, and the resiliency of the wall element being sufficient to grip a golf ball placed within the tubular member from an end thereof but insufficient to allow the wall element to expand so that the distance between said edges exceeds 1.000 inches.

said tubular member having opposed open ends having an inside diameter prior to inserting a golf ball ranging between 1.500 and 1.750 inch, said diameter being less than the diameter of the golf balls yet sufficiently great to allow a golf ball to be inserted into an open end, with the wall element expanding outwardly as the golf ball enters the tubular member, said wall element gripping the ball firmly upon insertion into the tubular member, and

a stop member adjacent one of said open ends and projecting from the wall element into the interior of the tubular member a sufficient distance to prevent a golf ball from moving through said open end unless the user intentionally applies pressure to the golf ball to force it past the stop member.

4,840,333

DEVICE FOR FASTENING BAR-LIKE OBJECTS

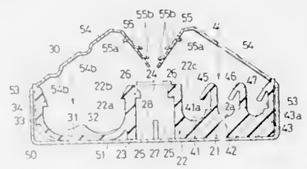
Hiromichi Nakayama, Toyota, Japan, assignor to Nifco, Inc., Yokohama, Japan

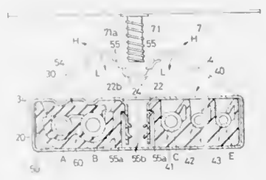
Filed Sep. 15, 1988, Ser. No. 244,764

Claims priority, application Japan, Sep. 21, 1987, 62-144703[U]

Int. Cl.[4] F16L *3/22*

U.S. Cl. 248—68.1 **20 Claims**





1. A device for fastening bar-like objects upon a mounting surface having a stud projecting from said mounting surface, comprising:

a body comprising a one-piece molding, having a holding section for holding a bar-like object and a stud insertion hole extending in a direction substantially perpendicular to the longitudinal direction of the bar-like object fastened thereto, and having a locking shoulder portion defined upon an inner wall surface of said stud insertion hole; and

a belt-like holding sheet disposed around said body and having at least one portion thereof capable of being inserted through said stud insertion hole along said inner wall surface thereof, said at least one end portion being provided with a first locking pawl extending toward said inner wall surface of said stud insertion hole and capable of being locked to said locking shoulder portion of said stud insertion hole, and a second locking pawl extending toward the center of said stud insertion hole for engagement with a threaded portion of said stud to be inserted within said stud insertion hole so as to prevent detachment of said device from said stud.

4,840,334

FASTENER FOR FASTENING ELONGATE OBJECT

Akio Kikuchi, Yokohama, Japan, assignor to Nifco, Inc., Yokohama, Japan

Filed Feb. 17, 1988, Ser. No. 156,630

Claims priority, application Japan, Feb. 17, 1987, 62-21741[U]

Int. Cl.[4] F16L *3/08*

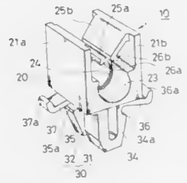
U.S. Cl. 248—73 **14 Claims**

1. A plastic one-piece molded fastener for mounting an elongated object upon a support panel having an aperture defined therein for reception of a portion of said fastener, comprising:

means for holding said elongated object, having a longitudinal axis defined therein, such that said longitudinal axis of said elongated object extends in a predetermined axial direction with respect to said holding means so as to define an axial plane within said fastener;

first, substantially U-shaped leg means having a first leg portion thereof having one end fixedly secured to an undersurface portion of said holding means which is disposed upon a first side of said axial plane of said fastener, and a second leg portion thereof, cantilevered from the other end of said first leg portion so as to be resiliently flexible with respect to said first leg portion thereof and thereby permit entrance of said first substantially U-shaped leg means into said aperture defined within said support panel, having means thereon for engaging undersurface and upper surface portions of said support panel when said first substantially U-shaped leg means of said fastener is disposed within said aperture defined within said support panel, said second leg portion of said first substantially U-shaped leg means being disposed upon a second opposite side of said axial plane of said fastener such that a hollow portion of said first substantially U-shaped leg means as defined between said first and second leg portions thereof is disposed substantially within said axial plane of said fastener; and

second, substantially U-shaped leg means having a first leg portion thereof having one end fixedly secured to an undersurface portion of said holding means which is disposed upon said second opposite side of said axial plane of said fastener, and a second leg portion thereof, elastically fixed to said first leg portion thereof so as to be resiliently flexible with respect to said first leg portion thereof and thereby permit entrance of said second substantially U-shaped leg means into said aperture defined within said support panel, having means thereon for engaging undersurface and upper surface portions of said support panel when said second substantially U-shaped leg means of said fastener is disposed within said aperture defined within said support panel, said second leg portion of said second subtantially U-shaped leg means being disposed upon said first side of said axial plane of said fastener such that a hollow portion of said second substantially U-shaped leg means as defined between said first and second leg portions thereof is disposed substantially within said axial plane of said fastener whereby said hollow portions of said first and second substantially U-shaped leg means, and said first and second substantially U-shaped leg means, are substantially co-axially disposed with respect to each other along said axial plane of said fastener.



4,840,335

HOLDING ARRANGEMENT FOR LOADING PLASTIC BAGS

Edward W. Forman, Jr., Palmyra; Alexander R. Provan, Canandaigua, and Ronald R. Schmieder, Fairport, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 19, 1985, Ser. No. 713,432

The portion of the term of this patent subsequent to Dec. 11, 2001, has been disclaimed.

Int. Cl.[4] B65B *67/04*

U.S. Cl. 248—97 **11 Claims**

1. A bag holding arrangement adapted to facilitate the loading of articles into a plastic bag selectively removable from stacks of differently sized bags, each said bag having an upwardly opening mouth and a pair of integral upwardly extending handle loops disposed on opposite sides of said mouth, said holding arrangement comprising:

a pair of spaced side members having a mirror-image configuration, each said side member being formed of wire bent to form a vertical rear portion, an arm portion extending forwardly from the upper end of said rear portion, and a base portion extending forwardly from the lower end of said rear portion;

said arm portion including a first upwardly extending horizontally elongated tab having a rearwardly projecting protrusion, a forwardly extending nose segment, and a downwardly and rearwardly extending wire portion having the forward end thereof connected to said nose segment and the rearward end thereof fastened to said vertical rear portion, a second downwardly depending elongated tab formed in said wire portion having a forwardly projecting protrusion and a bag-engaging surface at the rearward end of the tab;

holding means interconnecting said vertical rear portions proximate the upper ends thereof for supporting a stack of bags of a predetermined size therefrom; and

means interconnecting each of the forward extending base portions to provide a horizontal support surface,

whereby a user is adapted to selectively place the handle loops of the topmost bag from a stack of a predetermined bag size, which when the bag is of a larger size, on a respective one of the first upwardly tabs, or alternatively when the bag is of a smaller shorter size, place the handle loops of the bag on respectively one of the downwardly depending second tabs, such that the bottom of the bag is supportable on said horizontal support surface.

4,840,336

CANTILEVERED SUPPORT ARMS FOR PLASTIC BAG RACK

Alvin L. Stroh, Downey, and Terry C. Pilon, Claremont, both of Calif., assignors to McMillin Wire & Plating, Inc., Los Angeles and Challenge Bag California, Inc., Rancho Cucamonga, both of, Calif.

Filed Jun. 6, 1988, Ser. No. 202,329

Int. Cl.[4] B65B *67/04*

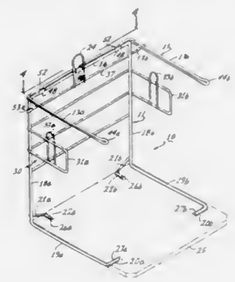
U.S. Cl. 248—97 **8 Claims**

8. Apparatus, formed of a single length of wire having a middle portion and end portions with terminal ends, for use in suspending plastic bags on a rack, said apparatus comprising:

a structure comprised of upper and lower wire portions provided by bending each end portion of said single length of wire beneath its middle portion;

said structure including a middle back portion and a support arm portion with a free end cantilevered forwardly from each end of said middle back portion; and

each said cantilevered support arm portion having a protuberance on the free end thereof provided by the bending of the end portion of the single length of wire beneath its middle portion and having its upper wire portion positioned adjacent its lower wire portion.



4,840,337

SUPPORT FORMED OF RIGID PLASTIC MATERIAL

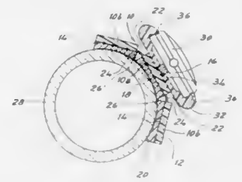
Hans Zaugg, Derendingen, Switzerland, assignor to ETA SA Fabriques d'Ebauches, Switzerland

Filed May 6, 1988, Ser. No. 190,845

Claims priority, application Switzerland, May 8, 1987, 01769/87

Int. Cl.[4] A47F *7/02*

U.S. Cl. 248—115 **20 Claims**



1. A support comprising:

a pellet of rigid plastic material having two opposed faces and comprising a rigid central portion and a pair of rigid outer portions, each of said rigid outer portions being connected to said rigid central portion by a flexible bridge formed by at least one elongated groove in said pellet;

a coupling means on one of said opposing faces; and,

a layer of adhesive material on the other of said opposing faces, a part of said adhesive layer being on each of said rigid outer portions, and said flexible bridge permitting each of said rigid outer portions to be adhered to a planar surface when said rigid outer portions are aligned with said rigid central portion and to be adhered to a non-planar surface when said rigid outer portions are folded back relative to said rigid central portion such that said coupling means can be fastened to a corresponding one of said surfaces.

4,840,338

LOCKING TRIPOD LEG

Chadwell O'Connor, 2024 Galaxy Dr., Newport Beach, Calif. 92660

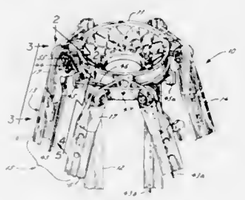
Filed Sep. 28, 1987, Ser. No. 101,504

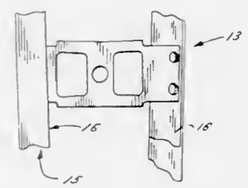
Int. Cl.[4] F16M *11/32*

U.S. Cl. 248—168 **6 Claims**

2. A tripod comprising, in combination, a tripod head, three elongated leg assemblies secured at their upper ends to said

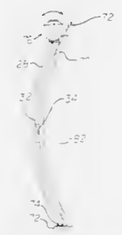
head, each of said leg assemblies having upper portions rigid in a plane, said planes forming a triangle at said head and being at approximately 120° angles from the adjacent planes, each leg assembly having a lower portion slidably mounted in the upper portion for selectively extending the length of the leg assemblies, means in each leg assembly for clamping the lower portion to the upper portion to prevent relative movement in the





plane of that leg assembly, means in each leg assembly for locking the lower portion against sliding movement in the upper portion, and means on said head for releasing both the clamping means and the locking means of each leg assembly, said means for releasing permitting operation of the locking and clamping means of each leg assembly either simultaneously or each leg assembly individually.

4,840,339
BISTABLE PANEL ATTACHMENT SYSTEM
Larry N. Grogan, Manchester, N.H., assignor to Velcro Industries B.V., Amsterdam, Netherlands
Filed Jan. 27, 1988, Ser. No. 148,932
Int. Cl.[4] A47G *29/00*
U.S. Cl. 248—205.2 **16 Claims**



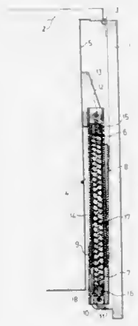
1. A fastener system for mounting a structure to a support by means of a fastener having a first part, associated with said structure, carrying a large plurality of projecting elements capable of engaging cooperating elements carried by a second part of the fastener, associated with said support, to fasten the structure and support together, comprising:

(a) a resilient member having one of the first and second parts of the fastener attached to a surface thereof at least adjacent a center portion thereof;

(b) restraining means, connected to said support, defining the length of a chord of a curvature of said member to form a curved resilient spring able to move from a first stable arched position to a second stable inverted arched position, the elements of said first part, when engaging with the elements of said second part, resiliently fastening said structure and support together by means of a force provided by the engagement of the elements of the fastener parts and the resilience of the resilient members; and

(c) adjustable means associated with said restraining means for adjusting the chord length of said curved resilient spring, when desired, to facilitate movement from one to the other of the two stable positions.

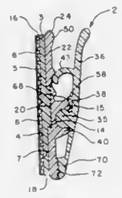
4,840,340
TELESCOPIC BRACE ASSEMBLY
Hans Gustafsson, Västerås, and Thomas Hallberg, Köping, both of Sweden, assignors to GH Trading AB, Västerås, Sweden
Filed Apr. 1, 1988, Ser. No. 176,509
Int. Cl.[4] A47B *1/04*
U.S. Cl. 248—240.4 **7 Claims**



1. A telescopic brace assembly (4) for use with two objects (1, 2) which are capable of being folded relative to one another and particularly intended for supporting a work surface (1) which can be folded relative to a frame structure (5), said brace assembly including two tubes (6, 7) which are capable of being telescopically displaced one within the other and the mutually opposite free ends of which are intended to be pivotally connected (10, 12) to a respective one of said objects, a spring (14) arranged in the telescopic tubes for biasing the tubes together; and locking means (8) for releasably locking the telescopic tubes relative to one another in an active supporting position of the brace assembly, said spring comprising a compression spring disposed such that when the telescopic tubes are withdrawn one from the other the spring is compressed to attendantly store energy therein; the extent to which the telescopic tubes can be withdrawn one from the other being determined

by a maximum degree of compression of the spring, wherein one end of the spring co-acts with a stop means (15) which is stationary in relation to one of said telescopic tubes; the spring is adapted to be compressed against said stop means with the aid of a pull rod (17) which accompanies movements of the other telescopic tube and which is connected (16) to the other end of the spring, wherein the spring is arranged in an inner one (7) of said two telescopic tubes and is compressible against said stop means located at a free end of said inner tube, said pull rod extending through the stop means, one end thereof being located in and firmly held (12) relative to an outer one of said telescopic tubes and another opposite end thereof being connected (16) to an end of the spring distal from the stop means.

4,840,341
CLIP AND HOLDER
Gary K. Hasegawa, 1457 W. Hutchinson Ave., Chicago, Ill. 60613
Filed May 9, 1988, Ser. No. 191,345
Int. Cl.[4] A47F *5/00*
U.S. Cl. 248—316.5 **16 Claims**



1. A flexible plastic clip assembly comprising:

an elongated support bar,

first and second pivotally interconnected clip members pivotal between closed and open positions for respectively grasping articles and releasing the same,

means interlocking said first slip member to said bar for adjustable movement along the bar lengthwise thereof,

and spring means interposed between said members for biasing said second member to closed position with said first member,

said first member having a flexible portion in the region of said interlocking means and said spring means engaging and operative to deflect said portion of said first member into tight interlocking relation with said bar to hold the clip assembly from moving along the bar.

4,840,342
PICTURE FRAME STANDOFF
Henry D. Sweeny, Kitchener, and Antonio D. Sabbadin, Waterloo, both of Canada, assignors to Swenco Limited, Waterloo, Canada
Filed Jan. 20, 1988, Ser. No. 146,028
Int. Cl.[4] A47G *1/16*
U.S. Cl. 248—475.1 **3 Claims**

1. A standoff for use with a picture frame member presenting a generally C-shaped channel profile toward the rear thereof with a pair of coplanar flanges spaced apart by a narrow gap therebetween, said standoff comprising:

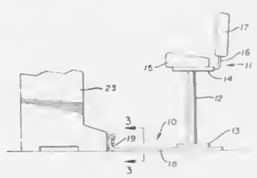
a central, wall-engaging portion which includes a transversely arcuate outer surface, first and second sides and first and second ends, a generally rectangular peripheral skirt therebelow having side and end skirt portions connected to said sides and ends of said central portion, and a central transverse rib extending between and connecting said side skirt portions;

a pair of flexible leg portions each extending away from the wall-engaging portion and connected thereto by a living hinge extending along the adjacent side of the wall-engaging portion at the junction of the outer surface and the adjacent side skirt portion; and

a groove formed in an enlarged section at the free end of each leg portion and extending parallel to the side skirts of the wall-engaging portion; whereby in use the leg portions may be rotated about the living hinges thereof to bring the free ends together with the grooves facing away from

each other such that the free ends may be inserted into the gap between the flanges of the frame member, release of the leg portions allowing them to spring apart so that each groove thereof may engage the adjacent flange to hold the standoff in position, extending rearwardly of the frame member so that said arcuate surface may contact a wall or other surface.

4,840,343
QUICK RELEASE SEAT SUPPORT
George E. Gasser, 4136 Loganway, Youngstown, Ohio 44505
Filed Mar. 3, 1988, Ser. No. 163,744
Int. Cl.[4] A47B *97/00*
U.S. Cl. 248—500 **3 Claims**



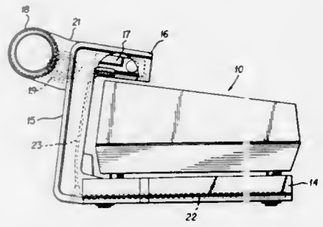
1. A quick release seat support comprising in combination an elongated flat body member, a seat configuration secured to said elongated flat body member, a quick release fitting on said elongated body member comprising a curved portion of said elongated body member having a forshortened free upstanding end thereon at right angles to the plane of said elongated body member, said free upstanding end having parallel planar surfaces, an inverted fixed elongated channel member having an angularly inclined descending portion aligned for compound angular registration of said curved portion of said body member engaging and resiliently displacing the angularly inclined descending portion within, said elongated channel member secured to a machine base.

4,840,344

TERMINAL PROVIDED WITH A PRINTER

Tomomi Moroe, Ohtsu, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jun. 8, 1987, Ser. No. 59,783
Claims priority, application Japan, Jun. 9, 1986, 61-87741[U]
Int. Cl.[4] F16M *1/00*
U.S. Cl. 248—676 7 Claims



1. A terminal support including an integral printer unit comprising:
- a printer unit support comprising a base member for receiving a terminal mounted thereon, and a supporting member connected to and extending upwardly from said base member;
- a printer unit supported by said supporting member at a location which overlies at least a portion of a terminal mounted on said base member; and
- a control circuit board mounted within said printer unit support for controlling said printer unit.

4,840,345

CLIPS WITH OVERLAPPING ENGAGEMENT MEMBERS

Gary A. Neil, Amersham, and Edward H. F. Ferguson, Aylesbury, both of England, assignors to TRW United-Carr Ltd., Buckinghamshire, United Kingdom

Filed Jan. 29, 1988, Ser. No. 149,696
Claims priority, application United Kingdom, Jan. 30, 1987, 8702148
Int. Cl.[4] F16L *3/08*
U.S. Cl. 248—74.2 11 Claims

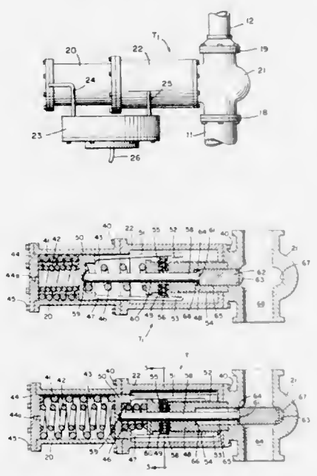
1. A clip comprising a gapped annular body having two end portions defining a gap therebetween, said end portions being adapted to interengage in overlapped relationship to close the body, one of said end portions being bifurcated to provide a forked configuration defining first and second radially spaced and axially offset fork portions and the other end comprising first and second axially adjacent parts, said fork portions being arranged such that, when said end portions are interengaged, said first fork portion radially overlaps substantially only said first part and said second fork portion is radially overlapped by substantially only said second part; and abutment means extending radially from between said axially adjacent parts to engage axially between said first and second fork portions.

4,840,346

APPARATUS FOR SEALING A WELL BLOWOUT

Dewa N. Adnyana, Stamford, and Neil E. Rogen, Westport, both of Conn., assignors to Memory Metals, Inc., Norwalk, Conn.

Filed Apr. 11, 1985, Ser. No. 721,957
The portion of the term of this patent subsequent to Oct. 28, 2003, has been disclaimed.
Int. Cl.[4] E21B *33/06*
U.S. Cl. 251—1.3 24 Claims



1. Apparatus for sealing a well tubing bore comprising:
- a housing including channel means for communicating with said tubing bore and a chamber connected to said channel means;
- sealing means slidably mounted within said housing and disposable in a retracted open condition in said chamber to enable fluid flow through said channel means; and
- actuator means disposed in said chamber and including a shape memory alloy material responsive to the temperature thereof rising to a predetermined level corresponding to the transition temperature of said shape memory alloy for transforming in shape to extend said sealing means into a sealing contact within said channel means thereby blocking fluid flow therethrough; said channel means including a concave portion and said sealing means including a distal end having a complementary convex surface for conformably fitting said concave portion when said sealing means are extended.

2. Apparatus for sealing a well tubing bore comprising:
- a housing including channel means for communicating with said tubing bore and a chamber connected to said channel means;
- sealing means slidably mounted within said housing and disposable in a retracted open condition in said chamber to enable fluid flow through said channel means;
- actuator means disposed in said chamber and including a shape memory alloy material responsive to the temperature thereof rising to a predetermined level corresponding to the transition temperature of said shape memory alloy for transforming in shape to extend said sealing means into a sealing contact within said channel means thereby block-

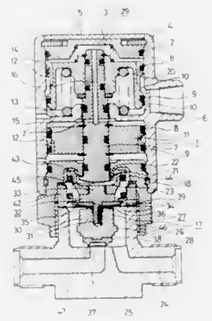
ing fluid flow therethrough; and means for locking including first ratchet means disposed axially in said chamber, complementary second ratchet means opposing said first ratchet means, radially resilient means connecting said second ratchet means to said first side of said slidable connector and urging said second ratchet means to slide over said first ratchet means as said sealing means is extended and lock with said first ratchet means when said actuator means is cooled to resume an untransformed shape.

4,840,347

PNEUMATICALLY-OPERATED VALVE

Ryozo Ariizumi; Masakuni Kainuma; Toshikazu Aoki; Shoji Suda; Mitsunori Hoshi, all of Saitama, and Takashi Ejiri, Tokyo, all of Japan, assignors to Fujikura Rubber, Ltd., Tokyo, Japan

Filed Mar. 14, 1988, Ser. No. 168,092
Int. Cl.[4] F16K *31/122*
U.S. Cl. 251—63.4 11 Claims



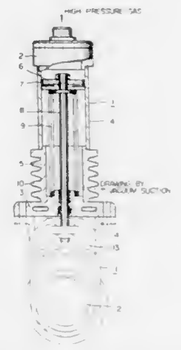
1. A pneumatically-operated valve for controlling the flow of fluid through a fluid passageway by movement of said valve between a normally open position and a closed position with respect to a valve seat defined upon said fluid passageway, comprising:
- valve means, disposed within the vicinity of said fluid passageway and spring-biased to said normally open position, for controlling said flow of fluid through said fluid passageway;
- a cylinder having a longitudinal axis defined therein;
- a transversely extending annular partition plate disposed within said cylinder for dividing said cylinder into first and second piston chambers;
- an axially disposed piston rod movable within said cylinder between first inoperative and second operative positions, and extending through said annular partition plate so as to have opposite end portions thereof disposed within said first and second piston chambers;
- first piston means fixedly secured upon one end of said piston rod and disposed within said first piston chamber;
- second piston means fixedly secured upon an axially central portion of said piston rod and disposed within said second piston chamber, a second end portion of said piston rod being disposed within the vicinity of said valve means for engaging said valve means and moving said valve means from said normally open position to said closed position when said piston rod is moved from said first inoperative position to said second operative position;
- spring biasing means, disposed within said first piston chamber and interposed between said annular partition plate and said first piston means, for normally biasing said piston rod to said first inoperative position;
- inlet port means defined within a sidewall portion of said cylinder for introducing pressurized fluid into said first piston chamber in order to move said piston rod from said first inoperative position to said second operative position;
- axially extending fluid passageway means defined within an external surface portion of said first piston means for fluidically connecting said inlet port means to said first piston chamber;
- axially extending fluid passageway means defined within said piston rod from said one end of said piston rod to said axially central portion of said piston rod for providing fluidic communication from said first piston chamber toward said second piston chamber; and
- transversely extending fluid passageway means defined within said axially central portion of said piston rod for providing fluidic communication between said axially extending fluid passageway means of said piston rod and said second piston chamber.

4,840,348

VALVE ACTUATOR FOR SLIDE EXHAUST BRAKE SYSTEMS

Kazunori Takigawa, Numazu, and Roichi Suzuki, Mishima, both of Japan, assignors to Usui Kokusai Sangyo Kabushiki Kaisha, Nagasawa, Japan

Continuation of Ser. No. 867,486, May 27, 1986, Pat. No. 4,733,687. This application Nov. 18, 1987, Ser. No. 122,128
Claims priority, application Japan, Jun. 6, 1985, 60-85410
The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.
Int. Cl.[4] F16K *31/122, 49/00*
U.S. Cl. 251—63.6 8 Claims



1. A valve actuator for use with a slide exhaust brake system having an exhaust gas passage for carrying hot exhaust gases, said valve actuator comprising: a sealed cylinder casing having a head wall fixed to the upper thereof and a bottom wall fixed to the lower end thereof; a piston member fitted in said cylinder casing and having its piston rod projecting at its end portion to the outside through said bottom wall; a packing member mounted to and surrounding said piston member; and a plate valve member carried on the end portion of said piston rod for opening or closing the exhaust gas passage of said exhaust brake system which is to be fastened to the bottom wall of said cylinder casing, and a coil spring surrounding said piston rod and disposed intermediate said piston member and said bottom wall for urging said plate valve member toward the open position,

wherein the improvement resides: in that said cylinder casing includes a cylinder body formed from a first metal material having a first thermal conductivity, said cylinder body having one end fixed to said head wall and having a length substantially equal to the sliding distance of said piston member fitted therein, and a cylindrical wall

formed from a second metal having a second thermal conductivity which is different from the first thermal conductivity, said cylindrical wall surrounding and being spaced radially from said piston rod and said coil spring and having one end fixed on the inner side of the bottom wall of said cylinder casing and having its opposed end fixed to the end of the cylinder body opposite the head wall, said cylindrical wall having a length substantially equal to the length of the coil spring in a compressed condition corresponding to the closed position of the plate valve, whereby the cylindrical wall substantially spaces said cylinder body, said packing member and said piston member from the hot exhaust gases in the exhaust gas passage and provides said cylinder body with a substantially minimal length, and whereby the different thermal conductivities provide a thermal impulse which reduces heat transfer to said cylinder body for reducing thermal influence on the packing member.

4,840,349

DEVICE FOR ACTUATING A THROTTLE VALVE

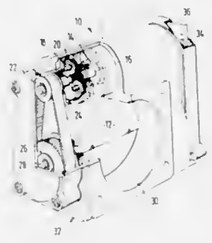
Cornelius Peter, Otterswelher; Uwe Schuper, Buehl-Vimbuch, and Lothar Schmidt, Buehl-Altschweier, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 15, 1988, Ser. No. 271,458

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1987, 8715467[U]

Int. Cl.[4] F16K *31/04*

U.S. Cl. 251—129.11 **3 Claims**



1. A device for actuating a throttle valve, comprising an electric drive motor, a step down gear driven by said electric drive motor, said step-down gear that drives an output shaft, said output shaft is provided with a first gear wheel (**22**) which is operatively connected to a throttle valve shaft (**28**), said step-down gear is embodied as a planetary gear (**18**), said throttle valve shaft (**28**) is provided with a second gear wheel (**26**) that is disposed on one end of said throttle valve shaft (**28**), and said first and second gear wheels (**22, 26**) are operatively joined to one another by a toothed belt (**24**).

4,840,350

ELECTRICALLY ACTUATED EGR VALVE

John E. Cook, Chatham, Canada, assignor to Bendix Electronics Limited, Chatham, Canada

Filed Jul. 31, 1987, Ser. No. 80,041

Int. Cl.[4] F16K *31/04*, *31/52*

U.S. Cl. 251—129.11 **9 Claims**

1. A valve comprising:

a valve seat, positioned about a passage;

a rigid valve stem that is movable in a substantially axial manner relative to the valve seat from a first position corresponding to valve seat closure, to a second position corresponding to non-closure of the valve seat;

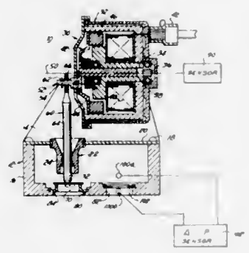
closure means carried by the valve stem for seating upon the valve seat and for opening and closing the passage;

an eccentric that can execute arcuate motion about an axis and comprises, in spaced relation to said axis, a pivotal connection to said stem;

a valve stem guide that is spaced from said valve seat and from the pivotal connection of said eccentric to said stem;

said valve stem guide comprising a convex wall defining a valve stem passage through which said valve stem extends and which is substantially coaxial with said first-mentioned passage, said convex wall providing a constraint on said valve stem passage as the stem is being axially displaced through the valve stem passage;

said eccentric and said convex wall being organized and arranged in relation to said stem such that in response to



arcuate motion of said eccentric about said axis from a first angular orientation, corresponding to said first position, to a second angular orientation, corresponding to said second position, the shaft is displaced substantially axially while pivoting with respect to both the eccentric and the valve stem passage, and for a given amount of motion of said eccentric about said axis from said first angular orientation, the closure means is moved relative to the valve seat a smaller distance than the closure means is moved relative to the valve seat for the same given amount of motion of said eccentric about said axis from said second angular orientation.

4,840,351

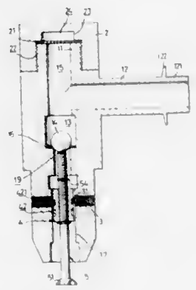
FAUCET STRUCTURE

Jong T. Lii, No. 2, Alley 203, Lane 51, Yung Ta Road, Yung Kang Hsiang, Tainan Hsien, Taiwan

Filed Apr. 18, 1988, Ser. No. 182,523

Int. Cl.[4] F16K *31/44*

U.S. Cl. 251—230 **2 Claims**



1. A faucet structure comprising:

(a) a hollow housing (**1**) having a protruding end (**11**) on a top portion thereof, a tubular means (**12**) integrally and horizontally formed on an upper lateral surface thereof to threadedly engage with a water pipe, a steel ball (**14**) to control a volume of water being encased in an enlarged bore (**13**) of said housing (**1**), a pad (**16**) disposed beneath said steel ball (**14**) to prevent damage to said steel ball (**14**) and provide a sealing effect therebetween, a plurality of strips (**17**) formed in an interior of said housing (**1**) below said enlarged bore (**13**), and a threaded hole (**18**) laterally formed through said housing (**1**) on a pair of said strips (**17**) wherein said two strips (**17**) are oriented opposite to each other;

(b) a cap (**2**) threadedly provided on said housing (**1**) with a circular gasket (**21**) disposed therebetween;

(c) a plurality of plugs (**3**) which are threadedly received in respective threaded holes (**18**), said plugs (**30**) each having a tongue (**31**) horizontally formed on a distal end thereof to protrude from a surface of said strip (**17**);

(d) a valve body (**4**) having a threaded hole (**41**) axially extending through a central part thereof, and two mortises (**42**) which are respectively disposed on opposite exterior sides thereof for receiving said tongues (**31**); and,

(e) a stem (**5**) with a threaded surface on an upper part thereof being threaded through said valve body (**4**), a retaining ring (**52**) and C-ring (**54**) being provided on an exterior of said stem (**5**) to cooperatively define a range that said valve body (**4**) is threadedly urgeable on said stem (**5**) by turning an irregularly-formed end (**51**) which is mounted on a bottom end of said stem (**5**).

4,840,352

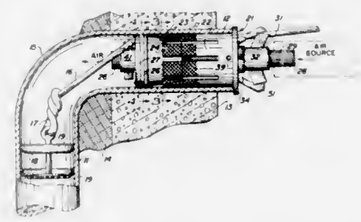
BLOW PLUG

Roy J. Ellis, 430 E. Cascada Rd., Litchfield Park, Ariz. 85340

Filed Feb. 1, 1988, Ser. No. 150,780

Int. Cl.[4] B65H *59/00*

U.S. Cl. 254—134.4 **10 Claims**



1. A conduit plug comprising a cylindrical split sleeve, a wedge having a narrow end and a wide end, said wedge being adapted to be moved into said sleeve to expand the sleeve into contact with the inner surface of the conduit, a resilient sealing member positioned at the wide end of said wedge and having a cylindrical periphery, a compression member overlying said sealing member, means for applying a force to said compression member to move said wedge into said sleeve and to compress the sealing member to cause the periphery of said sealing member to expand into sealing engagement with the inner surface of the conduit, means providing an air passage through the conduit plug and means providing a lead line passage through the conduit plug.

4,840,353

APPARATUS FOR STUDYING QUENCHING FLUIDS AND QUENCHABILITY OF MATERIALS

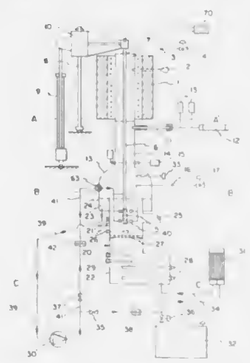
Patrice Schwegler, Bavans; Jean-Jacques Debrie, Merous-Moval; Bernard Clement, Evette Slabert; Francois Moreaux, Nancy, and Jacques Olivier, Jouars-Pontchartrain, all of France, assignors to Servimetal, Paris, France

Filed Sep. 9, 1987, Ser. No. 94,426

Claims priority, application France, Sep. 11, 1986, 86 12895

Int. Cl.[4] C21D *11/00*

U.S. Cl. 266—80 **19 Claims**



1. Apparatus for studying quenching fluids and the stirring thereof and quenchability of materials in the form of testpieces (**5**), comprising in combination: a furnace (**1**) for heating said testpieces, means for introducing each testpiece into the quenching liquid and extracting the quenched testpiece, a quenching tank (**20**) containing the quenching fluid, and means for circulating the quenching fluid by a pump and associated conduits, wherein the quenching tank (**20**) comprises an upper tank (**21**) and a lower tank (**22**) which are connected by means (**27**) for organising the circulation and distribution of the fluid and establishing the speed thereof, the upper tank being provided with an immersed injector (**40**) formed by at least one circular array comprising a plurality of radial nozzles (**62**) directed towards the axis of the tank and connected to a pressurised fluid source (**30**), the upper portion of the upper tank comprising a conduit (**39**) for the return of fluid to the pressurisation means (**30**), the lower tank (**22**) comprising a separate pressurised fluid intake, means for monitoring and regulating the temperature of the fluid, and means for measuring the speed of circulation of the fluid.

4,840,354

STIRRING BRICK WITH SHAPED GAS VOLUME CONTROL OPENINGS

Micheal D. LaBate, 115 Hazen Ave., Ellwood City, Pa. 16117

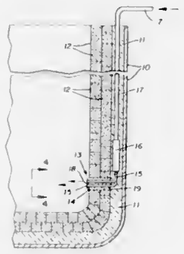
Filed Jun. 22, 1988, Ser. No. 209,834

Int. Cl.[4] C21C *5/48*

U.S. Cl. 266—218 **8 Claims**

1. An improvement in apparatus for introducing gas into molten metal in a metallurgical vessel having a plurality of rectangular refractory bricks forming a protective refractory working lining on the bottom and side walls thereof, said improvement comprising a stirring block consisting of a refractory body member having horizontally disposed upper and lower surfaces and vertically disposed front, back, and end surfaces positioned in a side wall of said protective refractory working lining with said upper, lower, and end surfaces thereof in face to face engagement with said rectangular refractory bricks so as to form an unbroken continuation of the

refractory working lining, a plurality of transverse passageways in said stirring block communicating with said front surface thereof and means establishing communication with said passageways and a source of stirring gas.

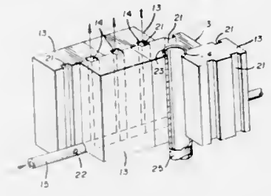


4,840,355

SLAG CONTROLLING DEVICE FOR BASIC OXYGEN FURNACES

Micheal D. LaBate, 116 Hazen Ave., Ellwood City, Pa. 16117

Filed Jul. 13, 1988, Ser. No. 218,305
Int. Cl.[4] B22D *41/08*
U.S. Cl. 266—220 6 Claims



1. An improvement in a metallurgical vessel having a refractory lining and a tap hole, the improvement comprising: a plurality of refractory bodies having planar upper and lower and side surfaces, channels in said side surfaces of some of said refractory bodies positioned for registry with channels in the side surfaces of others of said refractory bodies when said refractory bodies are positioned around said tap hole so as to form a portion of said refractory lining, some of said registering channels defining gas passageways and others of said registering channels defining an opening communicating with said tap hole and means communicating with a source of gas and said channels defining said gas passageways for delivering and controlling the gas delivered to said gas passageways.

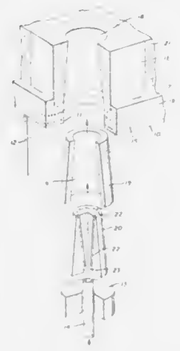
4,840,356

EXTERNALLY REPLACEABLE STIRRING PLUG FOR MOLTEN METAL VESSELS

Michael D. Labate, 115 Hazen Ave., Ellwood City, Pa. 16117

Filed Jun. 13, 1988, Ser. No. 205,821
Int. Cl.[4] C21C *5/43*
U.S. Cl. 266—265 7 Claims

1. In a device for introducing gas into a mass of molten metal in a vessel having a refractory lining and an apertured block of a known height having horizontally disposed upper and lower surfaces and vertically disposed side surfaces positioned in said lining with said aperture in registry with an opening in said vessel, the improvement comprising a refractory core of the same height as said apertured block registable with said aperture in said block, passageways formed in and extending through said refractory core, said refractory core and said opening in said vessel being of substantially the same size so that said refractory core may be moved through said opening in said vessel into said aperture in said block, means for delivering gas to said passageways in said core and means for supporting said core in said block , said means for supporting said core in said block consisting of a spacer and a support plate therefor, said support plate being removably attached to said vessel.

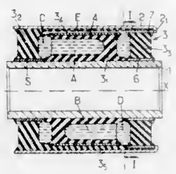


4,840,357

HYDRAULIC ANTIVIBRATORY SUPPORT SLEEVES

Pierre Jouade, Chateaudun, France, assignor to Hutchinson, France

Filed Jun. 16, 1988, Ser. No. 207,517
Claims priority, application France, Jun. 19, 1987, 87 08615
Int. Cl.[4] F16F *5/00*
U.S. Cl. 267—140.1 5 Claims



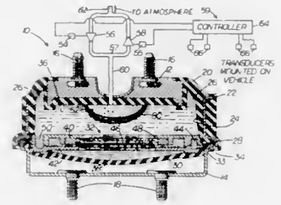
1. A hydraulic antivibratory support sleeve comprising two rigid tubular frames (1,2) one surrounding the other and joined together by an elastomer body (3) adhered thereto and shaped so as to form therewith at least two diametrically opposite sealed pockets (A,B), communicating together through a narrow channel (E), the assembly formed by said pockets and said narrow channel being filled with a damping liquid (L), the pockets being in the form of cavities formed axially in at least one solid annulus forming the elastomer body, which cavities have a relatively small radial thickness so as to be substantially closed by radial crushing, characterized in that the pockets (A,B) open respectively into two separate at least semi-annular chambers (C,D) formed in the elastomer body and in that these two chambers are joined together exclusively by the above narrow channel (E), said channel being oriented in a direction having at least an axial component.

4,840,358

HYDRAULIC ENGINE MOUNT WITH AIR BLADDER TUNING

John F. Hoying, Bellbrook, Ohio, and Bernard Lange, Russelsheim, Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 28, 1988, Ser. No. 173,848
Int. Cl.[4] F16F *9/50*
U.S. Cl. 267—140.1 3 Claims



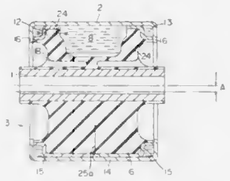
1. A hydraulic mount assembly, comprising:
a pair of mounting members;
a hollow body connected to said mounting members;
a resilient diaphragm closing said hollow body and forming therewith a closed cavity that is filled with hydraulic fluid;
means for partitioning said cavity into a primary chamber and a secondary chamber enclosed by said diaphragm;
an expandable pneumatic bladder mounted within said primary chamber;
communication means for communicating said bladder solely with the atmosphere, and;
check valve means mounted within said communication means to control the flow of air between said bladder and the atmosphere;
whereby the bladder is passively inflated and deflated by operation of the mount assembly itself and the damping and dynamic rate characteristics of the hydraulic mount may be controlled by said check valve means to provide optimum vehicle operating characteristics.

4,840,359

ENCAPSULATED RUBBER CUSHION

Arno Hamaekers, Gorxheimertal, and Axel Rudolph, Darmstadt, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Apr. 14, 1988, Ser. No. 181,558
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1987, 3724432
Int. Cl.[4] F16F *13/00*
U.S. Cl. 267—140.1 15 Claims



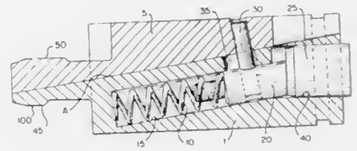
1. An encapsulated rubber cushion having a longitudinal axis and adapted to be stressed chiefly perpendicular to its axis, comprising:
two sleeves one around the other in an axially parallel relationship and a resilient body of rubber disposed between them which contacts the outer of the sleeves with at least two webs projecting substantially in the radial direction, the webs being associated with an imaginary perpendicular plane erected in the axis of the sleeves and together with terminal end walls and the outer of the sleeves defining at least partially liquid-filled chambers which are connected at least partially by connecting openings, the webs being compressed together resiliently between the two sleeves to a breadth that is smaller than the breadth in which they were manufactured, and the webs being compressed in the axial direction to a length that is shorter than the length in which they were manufactured, and the webs being produced in the form of pairs of partial webs which have an axial distance from one another which increases radially outwardly, and the distance being substantially eliminated in the assembled encapsulated rubber cushion by a pressing against one another of the pairs of partial webs.

4,840,360

EXPANDING MANDREL

Donald L. Bartley, Willoughby, Ohio, assignor to Kennametal Inc., Latrobe, Pa.

Filed Apr. 20, 1988, Ser. No. 183,943
Int. Cl.[4] B21D *41/02*
U.S. Cl. 269—48.1 18 Claims



1. An expanding mandrel for operation within a cylindrical sleeve comprising:
(a) a body member having a concave inner surface and having a working end which engages an inner diameter of a workpiece at a single point;
(b) resilient means mounted within the body member;
(c) a single wedge member slidably engaging the body member concave inner surface having a working end which engages the inner diameter of the workpiece at two points, the wedge engaging and being biased by the resilient means in a direction opposite the working end of the body member;
(d) shaft means for compressing the resilient means and sliding the wedge towards the working end of the body member;
wherein the wedge and body member are forced against the inner diameter of the workpiece by the resilient means, forming a three point contact, and are released by the application of external pressure on the shaft means.

4,840,361

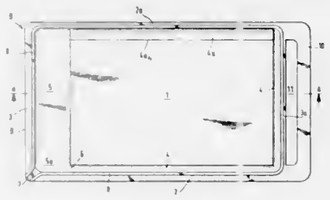
HOUSEHOLD BOARD

Hans-Jürgen Richter, Bad Soden-Salmünster, Fed. Rep. of Germany, assignor to Allstar Vergrauchsguter GmbH, Rodgau-Niederroden, Fed. Rep. of Germany

Filed Feb. 18, 1988, Ser. No. 157,003
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1987, 3705132
Int. Cl.[4] B23Q *3/00*
U.S. Cl. 269—289 R 5 Claims

1. A household board comprising a cutting surface, a working surface opposing said cutting surface, two opposing long sides and two opposing short sides, wherein said cutting surface is slightly sloped from one of the long sides to the other of the long sides and comprises a juice channel located at the periphery of the cutting surface and extending along the two

sides and one of the short sides, a juice collecting chamber communicating with the juice channel and located at the periphery of the cutting surface and extending along the other of the short sides, one end of said juice collecting chamber being



deeper than an opposing end thereof, and a pouring spout located at said one end of the juice collecting chamber, and wherein the working surface comprises a plurality of ribs which divide the working surface into a plurality of chambers.

4,840,362

APPARATUS FOR POSITIONING AND SUPPORTING A PATIENT FOR SPINAL SURGERY

Ross L. Bremer, 1502 Beach Ave., Atlantic Beach, Fla. 32233, and Howard P. Hogshead, Jacksonville, Fla., assignors to Ross L. Bremer, Atlantic Beach, Fla.

Filed Feb. 4, 1988, Ser. No. 152,225

Int. Cl.[4] A61G *13/00*

U.S. Cl. 269—328 **30 Claims**

1. An assemblage for positioning and supporting a surgical patient, comprising:

a generally rectangular base block formed of resilient material having length, width and depth dimensions and a central opening;

a generally elongated U-shaped block formed of resilient material having a base and a pair of leg portions extending from said base defining a central opening and having length, width and depth dimensions

means for releasably securing said U-shaped block and said base block one to the other with said U-shaped block superposed on said base block and said openings in registration one with the other;

a face and chest block formed of resilient material superposed at least in part on said base block adjacent the end of said U-shaped block remote from said base thereof for receiving the face and chest of the patient;

a pair of elongated blocks formed of resilient material superposed on the legs of said U-shaped blocks to define a space laterally therebetween in registry with the openings in said U-shaped block and said base block whereby the abdomen and diaphragm of the patient may depend freely in a direction toward said space and openings; and

means for releasably securing said pair of blocks and said U-shaped block one to the other.

4,840,363

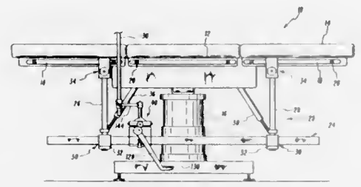
TELESCOPING, STERILE UPRIGHT SUPPORT ASSEMBLY

Bernard E. McConnell, Rte. 2, Box 87, Greenville, Tex. 75401

Continuation of Ser. No. 794,388, Nov. 4, 1985, Pat. No. 4,702,465, which is a continuation-in-part of Ser. No. 598,579, Apr. 10, 1984, Pat. No. 4,579,324, which is a continuation of Ser. No. 267,523, May 27, 1981, abandoned. This application Oct. 26, 1987, Ser. No. 113,676

Int. Cl.[4] A61G *13/00*

U.S. Cl. 269—328 **9 Claims**



1. Apparatus for positioning a patient's limb within a sterile field defined above a patient support surface of an operating table, said positioning apparatus comprising, in combination:

a support rail adapted for suspension from said operating table in a horizontal orientation below said patient support surface;

an adjustable clamp assembly slidably mounted on said support rail for bidirectional displacement, said clamp assembly including universal positioning means movably mounted onto said clamp assembly for variable angular orientation relative to said patient support surface;

a tubular receiver attached to said universal positioning means;

an extendable support arm movably coupled to said tubular receiver; and,

coupling means mounted onto said tubular receiver and releasably engagable with said support arm for securing said support arm in an extended position relative to said tubular receiver.

4,840,364

COMBINATION FOLDING AND CUT PRODUCT ATTACHMENT APPARATUS

Eckhard Schneider, Stadtbergen, Fed. Rep. of Germany, assignor to Man - Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Oct. 20, 1987, Ser. No. 111,042

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, 3636244

Int. Cl.[4] B41L *43/04*

U.S. Cl. 270—38 **6 Claims**

1. Combination folding and cut product or sheet attachment apparatus, particularly for association with a material handling system, for example from a printing machine, delivering printed products in cut sheet form, comprising

a first folding blade cylinder (**5**) having pick-up needles (**6**) located on the cylinder;

a first folding flap cylinder (**8**) having folding flaps (**9**) cooperating with said first folding blade cylinder for receiving the products and forming a first cross fold therein;

a second folding blade cylinder (**10**) having folding blades (**12**);

a second folding flap cylinder (**14**) having folding flaps (**16**) cooperating with said second folding blade cylinder (**10**) for receiving the products and forming a second cross fold therein, and wherein

said first folding flap cylinder (**8**) essentially includes only said folding flaps (**9**);

and said second folding blade cylinder (**10**) is formed with grippers (**11**) for receiving and gripping said products from said first folding flap cylinder (**8**) and, upon folding operation of the folding blades (**12**) on the second folding blade cylinder, forming a second cross fold by pushing the products into the folding flaps (**16**) of the second folding flap cylinder (**14**), and

wherein, further, a stapling cylinder (**18**) is provided, having a stapling mechanism thereon,

and each of said blade cylinders (**5, 10**) has a staple closing means (**13**) located thereon,

said stapling cylinder (**18**) being selectively engageable with a selected one of said folding blade cylinders (**5, 10**) and,

upon engagement therewith, for stapling the products, said staple closing means (**13**) on the selected folding blade cylinder closing the staples applied thereto.

4,840,365

APPARATUS FOR RECEIVING AND TRANSPORTING FOLDED SHEETS OR SHEET PACKAGES

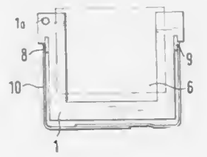
Ingo Kobler, Anhausen, and Godber Petersen, Augsburg, all of Fed. Rep. of Germany, assignors to MAN ROLAND Druckmashinen AG, Offenbach am Main, Fed. Rep. of Germany

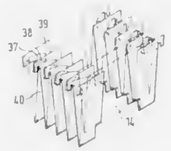
Filed May 29, 1987, Ser. No. 56,786

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1986, 3621832

Int. Cl.[4] B65H *39/02*

U.S. Cl. 270—54 **29 Claims**





1. Apparatus for receiving and transporting folded sheets having a fold line or spine and two essentially parallel sheet elements, which can be spread apart,

comprising

a plurality of carrier segments (**1, 33, 34**) defining upper and lower regions and connected alternately at the upper and lower regions to form a segment array or assembly of zig-zag or accordion or bellows pleat form, said segments being connected in such a way that, upon application of a force to a segment longitudinally of the segment array or assembly, subsequent connected segments will be pulled, or pushed elastically to expand or compress accordion-like so that said segments will be, selectively, drawn or spread apart or expanded and compressed towards each other; and

a support means (**8, 9; 47, 50**) supporting said segments for movement between said compressed and expanded positions, said segment array or assembly forming in a direction longitudinally of the array or assembly an elastically expansible or compressible sheet holding structure to receive folded sheets and support said folded sheets for, respectively, expanding or spreading apart and compressing said supported sheets upon expansion and compression, respectively, of the segments.

4,840,366

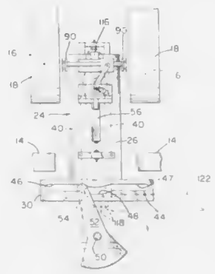
IN-MOLD LABELING APPARATUS AND METHOD

Brian J. Johnston, York, and Paul W. Klinedinst, Windsor, both of Pa., assignors to Graham Engineering Corporation, York, Pa.

Filed Aug. 27, 1987, Ser. No. 90,237

Int. Cl.[4] B29C *49/24*

U.S. Cl. 271—9 **25 Claims**



1. An in-mold labeling apparatus comprising

(a) a label transport assembly movable along a first path extending between a label pick up position and a labeling position, the assembly having

i. a label transfer head,

ii. a label pick up means on the head, and

iii. a follower member;

(b) a power drive for the label transport assembly, the power drive having

i. a drive member, and

ii. a power drive means for continuously moving the drive member repetitively around an endless second

(c) connection means joining the drive member directly to the follower moving the label transport assembly back and forth the first path only as the drive member is moved around the second and

(d) label transfer head drive means for extending and retracting the label transfer head at the label pick up position and at labeling position

(e) whereby during each cycle of movement of the drive member around the second path the label transfer assembly is moved back and forth between the label pick up and labeling positions and the label transfer head is extended and retracted to pick up a label at the pick up position,

carry the label to the labeling position and place the label in a mold half and return to the pick up position.

4,840,367

CASSETTE WITH A TAPE BOX FOR TAPE DISPENSERS OF MAIL PROCESSING MACHINES

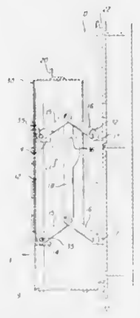
Oswald Geyer, Altenstadt; Helmut Lemmens, Wiesbaden-Nauroth, and Helmut Stoyhe, Obertshausen, all of Fed. Rep. of Germany, assignors to Francotyp-Postalia GmbH, Berlin, Fed. Rep. of Germany

Filed Nov. 16, 1987, Ser. No. 120,875

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1986, 8630748[U]

Int. Cl.[4] B65H *1/12*

U.S. Cl. 271—160 9 Claims



1. Cassette for tape dispensers of mail processing machines, comprising a housing having a dispenser opening formed therein, stop beads formed on said housing at said dispenser opening, a tape box disposed in said housing for receiving tapes, a bearing plate disposed in said tape box, a magazine spring pressing said bearing plate against tapes in said tape box and pressing the tapes against said stop beads, and a parallel guidance device guiding said bearing plate parallel to said dispenser opening, said parallel guidance device including upper pivotally connected scissors members and lower pivotally connected scissors members, and a connecting rod connected between said upper scissors members and said lower scissors members.

4,840,368

BILL CONTAINING BOX APPARATUS OF BILL RECEIVING AND DISPENSING MACHINE

Kazuhiro Uehara, Tokyo, Japan, assignor to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1987, Ser. No. 111,277

Claims priority, application Japan, Oct. 31, 1986, 61-167583[U]

Int. Cl.[4] B65H *1/00*

U.S. Cl. 271—162 5 Claims

1. A bill receiving and dispensing machine for receiving and dispensing bills, said machine comprising:

a machine body,

a front door forming a part of said machine body,

a bill containing box of a substantially rectangular configuration normally carried obliquely in said machine body adjacent to said front door and said box being swingable in said machine body and removable from said machine body and bills stacked in said box are normally inclined,

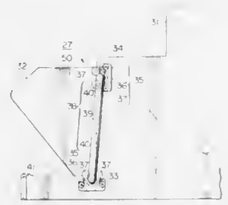
a pair of frame members disposed at opposite sides of said bill containing box,

a pair of lower notches formed in said frame members and facing upward,

a pair of upper notches formed in said frame members and facing the front of said machine body,

an upper opening formed on said bill containing box and oriented upwardly for receiving and removing bills therefrom,

a bottom opening formed on a bottom end of said bill containing box and normally oriented obliquely downwardly for communicating with a dispensation bill feed-out apparatus which feeds bills out of said bill containing box, and



a pair of engaging members mounted on opposite sides of said bill containing box, said pair of engaging members including upper engaging portions extending horizontally for engaging with said upper notches, handle portions extending from said upper engaging portions for carrying said bill containing box and through which said bill containing box can be removed from said machine body, and lower engaging portions extending horizontally from said handle portions for engaging with said lower notches.

4,840,369

APPARATUS FOR CONVEYING SHEET MEMBER

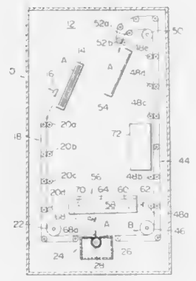
Motoaki Takahashi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 14, 1987, Ser. No. 38,112

Claims priority, application Japan, Apr. 14, 1986, 61-85251; Apr. 15, 1986, 61-86497; Apr. 15, 1986, 61-86498; Apr. 15, 1986, 61-86499

Int. Cl.[4] B65H *5/22*

U.S. Cl. 271—276 2 Claims



1. An apparatus (**24**) for conveying a sheet member (A) by a conveyor roller having an axis perpendicular to the direction of conveyance of said sheet member, comprising:

at least one suction roller (**28**) constituting said conveyor roller and having a hollow cylindrical body and a multiplicity of suction holes (**40**) formed in a smooth and unobstructed outer wall of said cylindrical body;

a chamber (**26**) surrounding and rotatably mounting said suction roller and having a planar wall (**36**, **38**) provided therein with at least one elongated slit (**30**) through which said suction holes are exposed in a region parallel to the axis of said suction roller, said suction roller being mounted in said chamber such that an uppermost surface of the roller, disposed in said slit, lies flush with said planar wall; and

means for applying a vacuum to said exposed suction holes via said chamber, unexposed suction holes lying within the chamber, and an unobstructed interior of said hollow cylindrical body such that, upon rotation of said roller, said sheet member is conveyed over said chamber wall in a direction perpendicular to said slit and roller axis.

4,840,370

HAND AND DIGIT EXERCISER

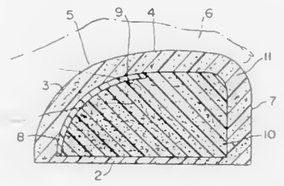
Thomas W. Biddlecombe, 3 Burne Court, Kew, Victoria, Australia 3101

Filed Jul. 22, 1981, Ser. No. 285,325

Claims priority, application Australia, Jul. 29, 1980, PE4742

Int. Cl.[4] A63B *21/30*

U.S. Cl. 272—68 10 Claims



1. A hand and digit exerciser comprising a block of resilient material having a cross-section incorporating a flat base, a convex leading edge extending upwardly and forwardly from said base merging into an upper surface sized and shaped such that the base may be placed upon a flat surface with the forearm of the user extending along that surface, the palm of the hand placed over the rounded leading edge and the fingers extending along the upper surface, said block incorporating a reinforcing member positioned therewithin near the rounded leading edge and arranged to substantially retain the shape of the rounded leading edge when the remainder of the block is deformed by the fingers of the user.

4,840,371

NOVELTY GOLF CLUB WITH PROGRAMMED SOUND PLAYING DEVICE

John C. Harris, 310 Sound Beach Ave., Old Greenwich, Conn. 06870

Filed Nov. 24, 1987, Ser. No. 124,245

Int. Cl.[4] A63J *5/04, 23/00*; A63B *69/36*

U.S. Cl. 272—8 N 6 Claims

1. A novelty device made to resemble a golf club comprising:

(a) a club head, an elongated shaft connected to said club head and a handle connected to an end of said elongated shaft remote from said club head;

(b) a hollow chamber formed in said club head and having mounted therein a sound producing device programmed to play a novelty program;

(c) said sound producing device being battery powered;

(d) said handle being hollow and having contained therein a battery chamber adapted to contain battery means for powering said sound producing device, said battery chamber opening at an end of said handle and further including a cap removably placeable over said opening; and

(e) electrical conductors extending within said elongated shaft between said battery chamber and said hollow chamber for electrically interconnecting said battery means with said sound producing device.

4,840,372

DIAGNOSTIC TESTING SYSTEM FOR AN EXERCIE MACHINE

Gary Oglesby, Lombard, and Bryan Andrus, Chicago, both of Ill., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Filed Oct. 21, 1986, Ser. No. 921,696

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—72 15 Claims

1. In an exercise machine having a plurality of components including means for providing a force to oppose exercising movements of a user, a diagnostic system to allow various of said components to be checked for maintenance comprising:

input means actuable by authorized personnel for initiating diagnostic testing of one or more of said components; and

processing means for controlling in a test mode the operation of a plurality of said components including said opposition force providing means, said processing means being responsive to said input means for controlling said opposition force means to operate in said test mode.

4,840,373

FOUR-BAR RIGID-DRIVE VARIABLE RESISTANCE PECTORAL FLY MACHINE

Henry H. Maag, 5332 Clark Cir., Westminster, Calif. 92683

Filed Mar. 24, 1988, Ser. No. 172,550

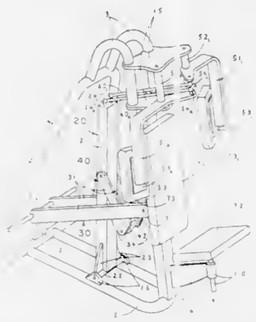
Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—134 1 Claim

1. An exercise machine for exercising the shoulder-joint horizontal-flexion muscles of an operator, comprising:

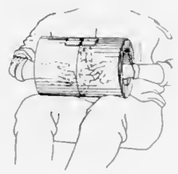
—a rigid frame including a base portion and an upstanding

portion having a front, rear, top and bottom, wherein the bottom is rigidly secured to the base portion;
—an operator back constraint pad attached to the front side of said upstanding portion;
—an operator seat support pad attached to the front side of said upstanding portion in a position where it will engage the operator's seat while said operator is in a seated position of operation with his back engaging said back constraint pad;
—a pair of rigid counter-rotating assemblies mounted at the top of the front side of said upstanding portion so as to rotate about respective first and second substantially vertical axes, wherein said first substantially vertical axis is positioned to be coaxial with the vertical axis of rotation of said operator's right shoulder joint while said operator is in the operating position and said second substantially vertical axis is positioned to be coaxial with the vertical axis of rotation of said operator's left shoulder joint while said operator is in the operating position;
—said pair of rigid counter-rotating assemblies are comprised of respective cranks with offset arms which include respective contact surfaces for engaging the operator's respective right and left exercising upper arms while in said operating position;
—a rigid rotating effort arm assembly which is journaled to said frame to rotate about a first horizontal axis which is perpendicular with said first and second substantially vertical axes;



—a pair of rigid connecting links comprising slider linkages pivotally joining from the distal end of said rotating effort arm to respective pivotal points of connection on said respective counter-rotating assemblies in such a way that the respective counter-rotating assemblies rotate in opposite directions, thereby when said rotating effort arm assembly rotates toward said counter-rotating assemblies said pair of respective connecting links will cause said respective counter-rotating assemblies to rotate in opposite directions;
—a rigid rotating weight arm assembly which is journaled to said frame to rotate about a second horizontal axis which is both parallel with and separated by a specific distance from said first horizontal axis;
—said rotating weight arm assembly includes means for loading weights onto at a point offset from said second horizontal axis;
—said rotating effort arm assembly and said rotating weight arm assembly are mechanically linked to each other at third and fourth horizontal axes which are both parallel with and offset by specific distances from said first and second horizontal axes respectively, by a rigid connecting link which has a specific length between its centers of connection;
—said rotating effort arm assembly, said rotating weight arm assembly, said connecting link mechanically joining said rotating effort arm assembly to said rotating weight arm assembly, and said frame of said exercise machine join together to form a four-bar linkage system, which functions in conjunction with the rotating weight arm assembly and the crank and slider linkages constituted by the counter-rotating assemblies and their connecting links, to provide a variably resistive force at said upper arm engaging contact surfaces, which force varies as a function of the positions of said counter-rotating assemblies.

4,840,374
GAME UTILIZING THE SENSE OF TOUCH
Robert M. Skinner, 15300 S. Irving, Dolton, Ill. 60419
Filed Jul. 2, 1987, Ser. No. 69,280
Int. Cl.[4] A63F *9/06*
U.S. Cl. 273—1 G **7 Claims**



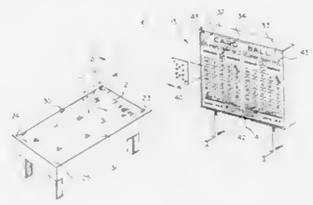
1. A game or training device comprising a hollow container having two sections with open ends and with an aperture plate having a plurality of apertures of different sizes interposed between said two sections, the two sections being separable for removal of the aperture plate with suitable means for holding said sections together in an assembled relation.

4,840,375
PINBALL MACHINE
Patrick M. Lawlor, 24308 Tomlin Rd., Marengo, Ill. 60152, and Lawrence E. DeMar, 1660 North LaSalle St., Chicago, Ill. 60614
Filed Jun. 17, 1987, Ser. No. 63,126
Int. Cl.[4] A63D *3/02;* **A63F** *7/22*
U.S. Cl. 273—121 A **29 Claims**

1. A pinball machine comprising:
a first generally horizontal playfield which includes targets and at least one means operable by a player for propelling a ball that has been put in play on the first playfield, and

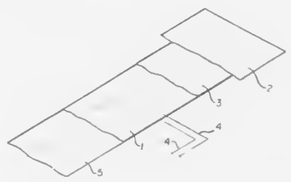
a second generally vertical non-pachinko playfield which includes targets and at least one means operable by a player for repeatedly propelling a ball that has been put in play on the second playfield in a manner in which said ball can be indefinitely kept in play on said second playfield.

4,840,376
POKER AND POOL APPARATUS
Michael J. Garret, Delta, Canada, assignor to Cardball International Limited, Delta, Canada
Filed Nov. 23, 1987, Ser. No. 123,867
Claims priority, application Canada, Nov. 21, 1986, 523605
Int. Cl.[4] A63D *15/00, 15/20*
U.S. Cl. 273—14 **11 Claims**



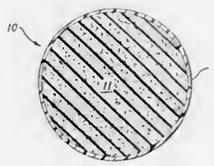
5. A poker type pool game comprising a plurality of balls, each of said balls being marked to indicate a separate and particular card of a deck, a scoreboard operable to be mounted separate from a pool table, said scoreboard indicating each of said cards corresponding with the card marking on a respective ball, and a plurality of switches on said scoreboard one for each of said cards and mounted adjacent thereto, each of said switches being manually operable to indicate which of said cards corresponds to a ball operable to enter a pool table pocket.

4,840,377
ELECTRICAL TAPE BOUNDARY SENSOR APPARATUS
C. Frederick Bowser, 121 E. Church St., Homer City, Pa. 15748, and John L. Kurtz, Indiana, Pa., assignors to C. Frederick Bowser, Homer City, Pa.
Filed Dec. 14, 1987, Ser. No. 132,586
Int. Cl.[4] A63B *61/00*
U.S. Cl. 273—31 **5 Claims**



1. A tape boundary sensor apparatus comprising:
(a) elongated sensor means adapted to be positioned along various boundary lines;
(b) conditioning circuit means electrically connected to the sensor means for filtering out unwanted signals and fluctuations from an output waveform of the sensor means;
(c) multiplexer means electrically connected to the conditioning circuit means for scanning the output of the sensor means for identifying a particular sensor of the sensor means which has been impacted by an object;
(d) analog to digital converter means for converting the analog output waveform of the sensor means to a proportional digital word;
(e) processor and memory means electrically connected to the converter means and to the multiplexer means for comparing the output waveform to known pre-set thresholds of:
(i) slope of the initial section of a known output waveform of the sensor for determination of the surface area of impact;
(ii) peak voltage of a known output waveform of the sensor for determination of the force of impact;
(iii) a known duration of impact; wherein the slope, peak voltage, and duration are compared to the pre-set thresholds to determine and confirm what kind of object impacted the sensor; and
(g) indicator means connected to the processor and memory means;
wherein an impact on a sensor causes a voltage output therefrom and the processor makes a determination whether a ball has caused the impact, and directs the results of the analysis to the indicator means.

4,840,378
SOFTBALL
Robert P. Molitor, Niles, Mich., assignor to Spalding & Evenflo Companies, Inc., Tampa, Fla.
Continuation of Ser. No. 876,505, Jun. 20, 1986, Pat. No. 4,725,058. This application Nov. 30, 1987, Ser. No. 126,320
The portion of the term of this patent subsequent to Feb. 16, 2005, has been disclaimed.
Int. Cl.[4] B29C *27/08*
U.S. Cl. 273—60 B **7 Claims**



1. A softball having a substantially solid core and cover wherein the ball has a circumference of substantially 12 inches, a weight of 175 to 198 grams, a coefficient of restitution of substantially 0.478 and a compression from 0.010 to 0.014 inches wherein said core has a density from 15.5 to 16.5 pounds per cubic foot, a hardness from 72 to 78 on the Shore A scale, said core being formed from a cellular polymeric material, wherein said cover has a specific gravity of substantially 1.2, and a thickness from 0.035 inches to 0.060 inches, and a Shore A hardness from 70 to 90, said cover being formed from a vinyl resin of the homopolymer or copolymer dispersion type, a liquid plasticizer for a vinyl resin, stabilizers and a white pigment dispersion such as a titanium dioxide dispersion.

4,840,379
SPLIT SEALING RING HAVING A BIAS CUT
Richard A. Thoman, Jr., Kulpsville, Pa., assignor to Greene, Tweed & Co., Kulpsville, Pa.
Filed Jun. 29, 1988, Ser. No. 213,024
Int. Cl.[4] F16J *9/14*
U.S. Cl. 277—222 **7 Claims**

1. An improved, generally annular split sealing ring having generally curved radially inner and radially outer surfaces and opposed first and second axial surfaces extending between the radially inner and outer surfaces, the sealing ring having an axially extending, radially centered axis and a cut extending therethrough from the inner radial surface to the outer radial

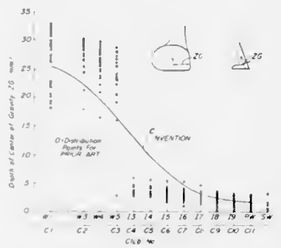
surface to create a gap for facilitating installation and removal of the sealing ring, wherein the improvement comprises:

the cut extending through the sealing ring along a single continuous cut plane, the orientation of the cut plane being determined by establishing a first reference plane extending radially through the sealing ring and generally parallel to and through the axis, a second reference plane extending generally perpendicular to the first reference plane and generally midway between the first and second axial surfaces to establish a first generally radially extending reference line, and a third reference plane extending generally perpendicular to the first and the second reference planes and midway between the inner and outer radial surfaces to establish a second generally axially extending reference line and a third reference line, the cut plane being oriented at a first predetermined angle with respect to the second reference plane and the first reference line, and at a second predetermined angle with respect to the third reference plane and the third reference line.

4,840,380
SET OF GOLD CLUBS

Ryota Kajita, Matsudo; Hiroshi Esaki, Yokohama, and Hirato Shimazaki, Tokyo, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation of Ser. No. 813,454, Dec. 26, 1985, abandoned. This application Jun. 22, 1988, Ser. No. 211,152
Claims priority, application Japan, Dec. 25, 1984, 59-277156; May 31, 1985, 66-118391
Int. Cl.[4] A63B *53/04*
U.S. Cl. 273—77 A **5 Claims**



1. A continuous golf club set comprising:

at least one club having its center of gravity located along a line perpendicular to the club striking face thereof at an inward distance of at least 15 mm therefrom, at least one club having its center of gravity located along a line perpendicular to the club striking face thereof at an inward distance therefrom of between 10 mm and less than 15 mm, and at least one club having its center of gravity located along a line perpendicular to the club striking face thereof at an inward distance of less than 10 mm therefrom, said continuous set having clubs ordered from a longer to a shorter driving distance with increasing loft and lie angles, said clubs having:

(a) a club length for each club decreased within a range of 15–30 mm in said club order;

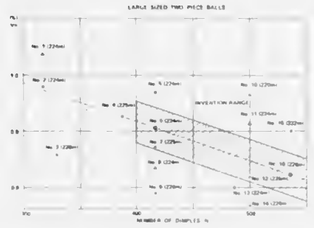
(b) for each clubhead, a club loft and lie are increased within a loft angle range of 3°–5° and a lie angle of not more than 2°, in said club order; and

(c) for each clubhead a sole width is decreased not more than 15 mm in said club order.

4,840,381
GOLF BALL

Keisuke Ihara, Tokyo; Yasuhide Alaki, Saitama, and Jun Nomura, Yokohama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 28,590, Mar. 20, 1987, abandoned. This application Jun. 10, 1988, Ser. No. 204,899
Claims priority, application Japan, Mar. 20, 1986, 61-63668
Int. Cl.[4] A63B *37/14*
U.S. Cl. 273—232 **4 Claims**



1. A golf ball having a plurality of recessed dimples on the surface thereof, wherein the golf ball is a large sized two-piece ball consisting of a core and a cover; the maximum diameter of the dimples is 2 to 4 mm; the maximum depth of the dimples is 0.1 to 0.4 mm; the number of dimples is 400 to 600; at least 90% of the dimples have a value of Vo in the range defined by the following equation:

$$0.35 \leqq Vo \leqq 0.47$$

wherein Vo is the volume of each dimple confined below a plane defined by the dimple edge divided by the volume of a cylinder whose bottom is defined by said plane and whose height is defined by the maximum dimple depth from the bottom; and the total volume ratio Vr of the dimples is defined by the following equation:

$$Vr = Vs/(4\pi R^3/3) \times 100$$

wherein Vs is the sum of the dimple volumes as defined above, and R is the radius of the ball in the range defined by the following equation:

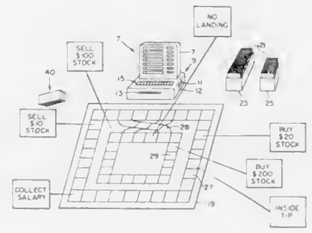
$$V_{RL} - N/1500 \leqq Vr \leqq V_{RU} - N/1500$$

wherein V_{RL} is not less than 1.14 inclusive, V_{RU} is not more than 1.22 inclusive, and N is the number of the dimples and ranges from 400 to 600 both inclusive.

4,840,382
ELECTRONIC CARD READER AND FINANCIAL ASSET GAMES

Kenneth L. Rubin, 24 June St., Westwood, Mass. 02090

Filed Jan. 20, 1988, Ser. No. 146,220
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—237 **28 Claims**



1. Game apparatus for a competitive game to be played by two or more players comprising:

a display for indicating a current state of the game;

a plurality of cards encoded with different information affecting the current state of the game;

processor means for receiving signals and processing signals to determine the state of the game;

a card reader logically connected to the processor means for reading at least one card at a time and generating signals indicative of the encoded information read from the card; and

player input means for allowing players to communicate to the processor means, a player communicating decisional information to the processor means through the player input means, and the player input means generating player decision signals indicative of the decisional information from the player;

the processor means being responsive to both the signals generated by the card reader and the player decision signals by causing a change from the current state of the game to a new state of the game with respect to the encoded information read from the card, the decisional information communicated by the player and any previous information, and by causing the display to provide an indication of the new state of the game, the state of the game being effectively controlled by the player communicated decisional information and the encoded information read from the card.

4,840,383
ILLUMINATED DART

James W. Lombardo, 829 Delphi Rd., Olympia, Wash. 98502

Filed Oct. 29, 1987, Ser. No. 114,053
Int. Cl.[4] A63B *65/02*
U.S. Cl. 273—420 **7 Claims**

5. An illuminated dart, comprising:

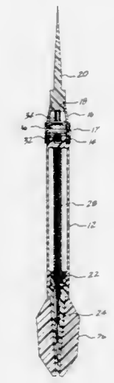
tip means;

hollow shaft means connected to said tip means;

electrical illumination means in said shaft means;

means for energizing said illumination means;

tail fin means connected to said shaft means; and

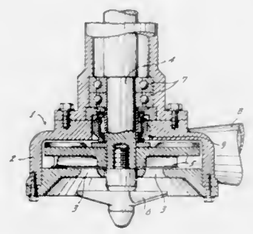


means for transmitting light from said illumination means to said tail fin means.

4,840,384
FACE-TYPE SHAFT SEAL WITH SHROUD

Glenn R. Dorsch, Aberdeen, Wash., assignor to Vaughan Co., Inc., Montesano, Wash.

Filed Sep. 4, 1987, Ser. No. 93,464
Int. Cl.[4] F16J *15/36*
U.S. Cl. 277—12 **7 Claims**



1. In a liquid pump having a casing, a rotary pumping member mounted for rotation in such casing, a rotary drive shaft extending into the casing for rotating the rotary pumping member, bearing means mounting the shaft and sealing means for preventing access to the bearing means of the liquid being pumped from the casing including a first seal component encircling the drive shaft and mounted stationarily relative to the casing, a second seal component encircling and mounted for rotation with the drive shaft and a generally cylindrical liquid tight axially resilient member encircling the drive shaft, extending lengthwise therealong, having one end portion bearing on the second seal component and biasing such second seal component toward the first seal component to an abutting sealing condition, the improvement comprising a shroud attachment including a collar encircling and fitted on the shaft adjacent to the end of the resilient member remote from the sealing means, a shroud portion extending from said collar lengthwise of the drive shaft into overlapping relationship with the second seal component and enclosing the resilient member to shield the exterior of the resilient member, and a third seal

component carried by said shroud in slidable relationship axially of the shaft to the second seal component.

4,840,385

DEVICE FOR SEALING SHAFT BEARINGS OR SHAFT BEARING HOUSINGS

Helmut Senft, and Peter Hasenrath, both of Graz, Austria, assignors to Maschinenfabrik Andritz Actiengesellschaft, Graz, Austria

Filed Sep. 21, 1987, Ser. No. 99,456
Claims priority, application Austria, Sep. 24, 1986, 2551/86
Int. Cl.⁴ F02F *11/00*
U.S. Cl. 277—53 **27 Claims**

1. A sealing bearing assembly for a shaft, comprising,

a bearing housing which has, at one end thereof, an annular groove with a bottom surface,

a first sleeve which surrounds and is immediately mounted on the shaft with a sealed clearance between the first sleeve and the shaft, said first sleeve being inserted in said bearing housing, said first sleeve having an outer circumferential surface provided with an annular projection which is fitted into the groove of the bearing housing, said projection being spaced from the bottom of the groove to provide a space, an annular seal in the space between the projection and the bottom of the groove, said first sleeve having at least one end with an inner circumferential surface provided with an annular recess, and a radial lip seal in said annular recess of the first sleeve, said first sleeve having at least one end portion that has a greater diameter than the portion that is beside the annular projection whereby, progressing in an axial direction, the first sleeve forms a step from its center toward its end, said shaft having an end area provided with an annular recess for forming a labyrinth seal, said first sleeve having an end which extends into the annular recess of the shaft and is formed to define a labyrinth gap between the first sleeve and shaft.

4,840,386

SOUND DEADENING DUAL SLEEVE SEALING ARRANGEMENT

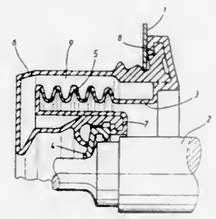
Karl Peitsmeier, Neuhausen, and Helmut Patzelt, Kernen-Stetten, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 21, 1988, Ser. No. 171,442
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1987, 3709027
Int. Cl.⁴ F16J *3/04, 15/52*
U.S. Cl. 277—212 FB **5 Claims**

1. A sealing sleeve arrangement for masking the aperture between a positionally stable wall and a shaft penetrating a bore in the wall, comprising:

a first sealing sleeve which abuts the wall and the shaft with respective end regions in a fixedly tight manner, and which forms a bellows which compensates an offset of the shaft within the bore dictated by tolerances, and

a second sleeve fixedly connectable to the first sealing sleeve such that when the second sleeve is connected to the first sealing sleeve the first and second sleeves form conjointly with their walls, in the region of the bellows, a closed sound insulating air chamber which chamber is closed by



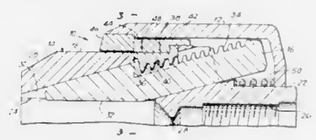
connection points when the sleeves are connected to one another.

4,840,387

SELF-ACTUATING KEYLESS CHUCK

Donald J. McCarthy, Wethersfield, Conn., assignor to The Jacobs Manufacturing Company, Bloomfield, Conn.

Filed Jan. 20, 1988, Ser. No. 146,279
Int. Cl.⁴ B23B *5/22, 5/34*
U.S. Cl. 279—1 K **17 Claims**



1. A chuck for use with a powered driver having a drive shaft comprising generally cylindrical body means including a body member having a nose section and a tail section and a circumferential groove formed therein intermediate said nose and tail sections, said tail section having an axial bore formed therein to mate with said drive shaft of said powered driver and said nose section having an axial bore formed therein and a plurality of angularly disposed passageways formed therethrough and intersecting said axial bore and said circumferential groove, a plurality of jaw pieces slidably positioned in each of said angularly disposed passageways, each of said jaw pieces having a jaw face formed on one side thereof and threads formed on the opposite side thereof, split nut means rotatable mounted in said circumferential groove and in engagement with said threads of said jaw pieces, said split nut means including a split nut, a collar surrounding and securing said split nut, and at least one first impact dog, sleeve means rotatably mounted on said body member, said sleeve means including an impact ring and at least one second impact dog and spring means interposed between said body means and said sleeve means and adapted to bias said second impact dog into juxtaposition with said first impact dog.

4,840,388

GROCERY CART

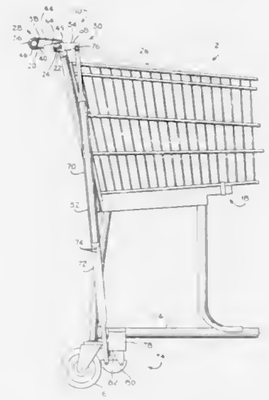
Robert E. Doughty, 940 South 134th, Bonner Springs, Kans. 66012

Filed Nov. 27, 1987, Ser. No. 126,187
Int. Cl.⁴ B62B *5/04*
U.S. Cl. 280—33.994 **11 Claims**

10. An automatic braking apparatus in combination with a user-propelled grocery cart, luggage cart or the like having support wheels and a transverse handle rearwardly spaced from the body of the cart, said braking apparatus comprising:

a braking mechanism for shiftably coupling with the cart and for shifting between braked and released positions, said mechanism including braking means for braking at least one support wheel when in said braked position and for releasing said wheel for unbraked rotation thereof when in said released position;

pivot structure for pivotally coupled with the cart about a fixed pivot point adjacent one end of the cart handle for pivotal shifting between braked and released positions, said pivot structure presenting first and second, opposed, connection portions;



connecting means connecting said first connection portion with said braking means for mutual, corresponding, shifting of said pivot structure and braking means between said braked and released positions; and

handle means for pivotally coupling with the cart handle for pivotal shifting between braked and released positions and including means for coupling with said second connection portion for mutual, corresponding, shifting of said handle means and pivot structure, and thereby said braking means, between said braked and released positions,

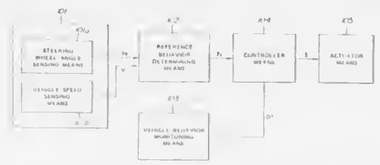
said handle means and pivot structure being shiftable in opposed rotational directions during mutual corresponding shifting between said braked and released positions.

4,840,389

VEHICLE STEER ANGLE CONTROL SYSTEM BASED ON MATHEMATICAL MODEL

Taketoshi Kawabe, Tokyo, and Ken Ito, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Oct. 9, 1987, Ser. No. 106,444
Claims priority, application Japan, Oct. 13, 1986, 61-241430
Int. Cl.⁴ B62D *6/02*
U.S. Cl. 280—91 **16 Claims**



1. A steer angle control system for a controlled vehicle having at least one steerable first wheel, comprising:

sensor means for sensing conditions of said controlled vehicle, said sensor means comprising means for sensing a steering wheel angle of said controlled vehicle and providing a sensed steering wheel angle, and means for sensing a vehicle speed of said controlled vehicle and providing a sensed vehicle speed,

reference behavior determining means, connected with said steering wheel angle sensing means and said vehicle speed sensing means, for determining a value of a reference output motion variable of a predetermined reference mathematical model, corresponding to said sensed steering wheel angle and said sensed vehicle speed by solving said reference model,

vehicle behavior monitoring means for determining a value of a plant output motion variable which is a linear combination of a yawing motion variable of said controlled vehicle and a side motion variable of said controlled vehicle,

controller means, connected with said reference behavior determining means and said vehicle behavior monitoring means, for producing a control signal representing a target first wheel steer angle so as to reduce a deviation of said plant output motion variable from said reference output motion variable, and

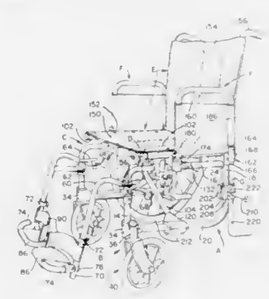
actuator means for varying an actual first wheel steer angle of said controlled vehicle in accordance with said control signal.

4,840,390

SYMMETRICALLY MODULAR WHEELCHAIR

Walter G. Lockard; Allen J. Boris, both of Elyria, and Wieslaw Kosc, North Royalton, all of Ohio, assignors to Invacare Corporation, Elyria, Ohio

Filed Sep. 30, 1986, Ser. No. 913,501
Int. Cl.⁴ A61G *5/02*
U.S. Cl. 280—250.1 **16 Claims**



1. A wheelchair comprising:

left and right side frames, each side frame including upper and lower generally horizontal legs and generally vertical forward and rearward legs connected with the general horizontal legs;

a pair of rear wheels mounted to the side frames;

a pair of front wheel assemblies mounted to the side frames;

a seat portion operatively connected with the side frames;

a pair of seat side supports which are connected with side portions of the seat;

a pair of cross members, each cross member fixedly connected at an upper end to one of the side supports;

a pair of fittings, each fitting being fixedly connected with a lower end of one of the cross members and defining a side frame tubing section receiving aperture therein, each of the fittings receiving the generally horizontally disposed lower leg of one of the side frames therein for rotating movement thereon; and,

a projection and circumferentially extending guide slot arrangement interconnected with at least one of the fittings

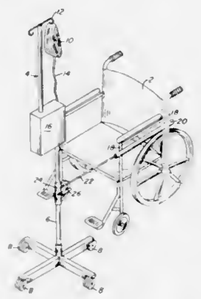
and the horizontal leg received therein for maintaining the fitting and the side frame in alignment.

4,840,391

TRANSPORTATION OF HOSPITAL PATIENTS

Karl D. Schneider, 608 Hickory Cir., Canonsburg, Pa. 15317

Continuation-in-part of Ser. No. 40,969, Apr. 20, 1987, abandoned. This application Jul. 12, 1988, Ser. No. 223,266
Int. Cl.[4] A47C *7/62*
U.S. Cl. 280—304.1 7 Claims



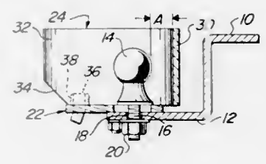
1. Attachment apparatus for joining a patient carrying wheeled vehicle to an intravenous pole assigned having an upstanding elongated IV pole mounted upon a wheeled base, said attachment apparatus comprising an elongated arm including two tubes telescopically received one within the other;
an elongated tubular housing formed by two arcuate segments connected by a hinge, one of said acruate segment being fixedly connected to an end of one of said tubes;
latch means releasably connecting said two arcuate segments into said tubular housing; and
stop means located within said tubes for limiting the extent of extension of said tubes, said tubes means including a positioning means anchored to one of said tubes and a flexible member having terminal end portions secured to the other one of said tubes.

4,840,392

TRAILER HITCH GUIDE

Theodore N. Baskett, 9514 Portland Ave., Tacoma, Wash. 98445

Filed Apr. 11, 1988, Ser. No. 179,687
Int. Cl.[4] B60D *1/0*
U.S. Cl. 280—477 1 Claim



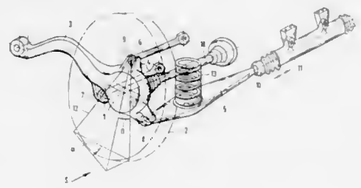
1. A trailer hitch guide for guiding a hitch socket component on a trailer tongue into registry with a cooperating hitch ball component on a towing vehicle, the guide comprising:
(a) a flat mounting plate member arranged for attachment to a towing vehicle with a hitch ball projecting upwardly therefrom,
(b) a v-shaped guide fence member mounted removably on the mounting plate member and forming a vertically extending wall, the apex of the wall being configured to be positioned forwardly, with reference to the towing vehicle, of a hitch ball on the mounting plate member and the diverging wings of the wall being configured to diverge rearwardly, with reference to the towing vehicle, of the hitch ball on the mounting plate member for sliding contact by the socketed front end of a trailer tongue for guiding a hitch socket into registry with the hitch ball, and
(c) securing means interengaging the mounting plate member and guide fence member for releasably securing said members together, whereby the guide fence member is removable from the mounting plate member after the ball and socket components of the trailer hitch are hitched together,
(d) the securing means comprising a pair of studs secured to and projecting downwardly from the bottom edge of the fence member adjacent the diverging ends thereof, and stud-receiving openings in the mounting plate for removably receiving said studs,
(e) the portion of the studs projecting downwardly from the fence member extending angularly in the rearward direction, with reference to the towing vehicle, of said diverging ends, and
(f) the bottom corners of said ends of the diverging wings adjacent the studs being removed to form edges that extend angularly upwardly and rearwardly from the studs, whereby to facilitate removal of the guide fence member from the mounting plate member by rocking the fence member upwardly from the mounting plate member at the apex of the fence member.

4,840,393

WHEEL SUSPENSION FOR STEERABLE REAR WHEEL ON MOTOR VEHICLES EQUIPPED WITH FRONT WHEEL STEERING ESPECIALLY PASSENGER VEHICLE

Rudolf Mueller, Dachau, and Ludwig Strasser, Ebersberg, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 3, 1988, Ser. No. 151,944
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1987, 3703196
Int. Cl.[4] B62D *9/00*
U.S. Cl. 280—661 23 Claims



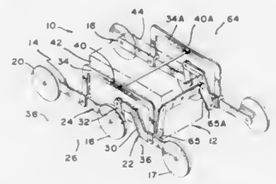
1. A wheel suspension for steerable rear wheels of motor vehicles equipped with front wheel steering, comprising: wheel carrier means for each rear wheel; each wheel carrier means having a longitudinal guide means connected thereto and extending at least approximately in the vehicle longitudinal direction and pivotally connected to a fixed vehicle part; plural cross guide means extending at least approximately in the vehicle transverse direction and pivotally connected to a fixed vehicle part; additional cross guide means displaceable in the vehicle transverse direction by an adjusting means for providing a steering motion to the rear wheels; and plural joint means each operatively connecting the cross guide means and the additional cross guide means with the wheel carrier means respectively; said plural joint means of the plural cross guide means defining the steering axis of rotation which is arranged in a plane extending substantially in the vehicle longitudinal direction and inclined with respect to a vertical vehicle transverse plane in such a manner that it rises rearwardly.

4,840,394

ARTICULATED SUSPENSION SYSTEM

Donald B. Bickler, Temple City, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 21, 1988, Ser. No. 184,236
Int. Cl.[4] B62D *21/00*
U.S. Cl. 280—677 4 Claims



1. A vehicle moveable along the ground comprising:
a body having a width extending in a predetermined transverse direction;
a pair of side suspensions lying at either side of said body;
each side suspension including a pair of end wheels rotatable about transverse axes including a front wheel and a rear wheel, a middle wheel rotatable about a transverse axis, a rear linkage extending between said rear and middle wheels, a front linkage extending between said front wheel and said rear linkage, and a body link having front and rear ends pivotally connected respectively to said front and rear linkages;
one of said linkages of each side suspension including a first bogie link having opposite ends coupled to said middle wheel and one of said end wheels, and the other of said linkages including a second bogie link having a first end coupled to the other one of said end wheels and a second end and also including means coupling the second end of the second bogie link to the first bogie link which allows the second end of the second bogie link to pivot about a transverse axis and move forward and rearward; and
a transverse suspension for coupling said side suspensions to said body including an intermediate cross link having a middle pivotally coupled to said body about a longitudinal axis extending in a direction substantially perpendicular to said transverse axes and having a pair of ends, and a pair of end cross links each having an inner end pivotally connected to an end of said intermediate cross link and an outer end pivotally connected to an end of said body link.

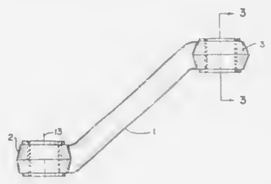
4,840,395

BUSHING FOR VEHICLE SUSPENSION

George Sturmon, P.O. Box 1241, St. Charles, Mo. 63302

Filed Aug. 21, 1986, Ser. No. 898,959
Int. Cl.[4] B60G *11/58*
U.S. Cl. 280—688 14 Claims

1. An interface rod connecting the frame, chassis and the body of a motor vehicle with respect to the axle, in conjunction with the spring and shock absorber system in the vehicle suspension system;
said interface rod comprising an extended rod having an opening at each of the opposite ends thereof, each of which openings is adapted to be mounted to a corresponding member at a fixed predetermined location in the vehicle suspension system such that a connection between the center point of the openings at the opposite ends of the rod and the corresponding points of the vehicle suspension system is achieved, wherein the improvement comprises:
an uninterrupted round cylindrical bushing ring forming the opening which is adapted to be interference fit with the corresponding member at the predetermined location in the vehicle suspension system;
said bushing ring being freely rotating with respect to said extended rod and concentrically mounted within a case polymer interface that is formed within an intrinsic larger hold in the rod;
said case polymer interface having a nominal hardness in the range of from 71 Type A Durometer to 53 Type D Durometer, said hardness being chosen to allow said polymer to be compressed to absorb shock loads and to permit temporary misalignment of said rod and said corresponding members under stress, said case polymer interface being further secured in the intrinsic larger hole formed at the end of the rod;
whereby said cast polymer interface is fixed with respect to the intrinsic larger hole in the rod and rotatable with respect to said bushing ring.



4,840,396

REAR SUSPENSION SYSTEM FOR AUTOMOBILES

Kanji Kubo, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1987, Ser. No. 123,870
Claims priority, application Japan, Dec. 9, 1986, 61-292985
Int. Cl.[4] B60G *3/00*
U.S. Cl. 280—690 7 Claims

1. A rear suspension system for automobiles comprising:
a trailing arm which extends substantially along a fore-and-aft direction of an automobile body and is pivoted to the automobile body at its front end;
a wheel support member connected to a rear end of the trailing arm in a laterally moveable manner relative thereto;
a first lateral link extending laterally between an upper portion of the wheel support member and the automobile body substantially along a horizontal direction;
a second lateral link extending laterally between a lower portion of the wheel support member and the automobile body substantially along a horizontal direction; and
a third lateral link extending laterally between an intermediate position of the wheel support member, located between the upper portion and the lower portion of the

wheel support member and behind a central axial line of a wheel axle of the wheel support member, and the automobile body substantially along a horizontal direction;

the second lateral link having a substantially same length as the third lateral link wherein the trailing arm extends substantially horizontally and the rear end of the trailing arm is pivoted to the wheel support member by way of a pivot pin which is slightly forwardly inclined from a vertical direction.

4,840,397

IMPACT PROTECTION DEVICE FOR THE OCCUPANTS OF MOTOR VEHICLES WITH A FILTER TO CLEAN THE DRIVING GAS

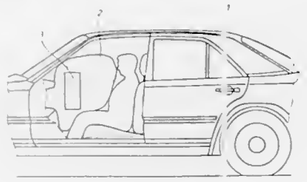
Egon Katz, Nagold; Alban Bossenmaier, Stuttgart, and Luigi Barmbilla, Böblingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 15, 1987, Ser. No. 133,075

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644554

Int. Cl.[4] B60R *21/02*

U.S. Cl. 280—739 6 Claims



1. An impact protection device for an occupant of a motor vehicle, having a cushion which can be blown up in the event of a collision by means of a driving gas generated by combustion of solid gas-generating materials, a part of a wall of said cushion having a multiplicity of openings which are outlet flow openings from said cushion for said driving gas, and having a filter for cleaning solid combustion residues from said driving gas, wherein:

said outlet openings simultaneously form said filter and said filter comprises a fabric that does not stretch upon being blown up by the driving gas and which has a filter weave with a tearing force to DIN 53 354 of at least 1500N/5 cm, a further tearing force to DIN 53 516 with test body B of at least 150N, a heat resistance of at least 1 second at 300° C. without substantial reduction in strength, an unstressed pore size by means of which at least 50% of particles with a size of more than 0.1 μm are retained and an air permeability L in $L.cm^{-2}.min^{-1}$, which lies in the region enclosed by curves $L=0.05+0.075.p$ and $L=1.2+0.6.p$, and which has an area of 500 to 10,000 cm^2.

4,840,398

DRIVE ARRANGEMENT FOR A ROLL BAR OF MOTOR VEHICLES

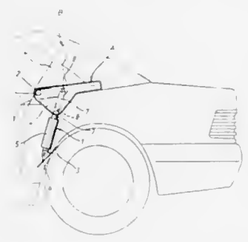
Klaus Matthias, Sindelfingen; Karl-Heinz Baumann, Bondorf; Gerald Schick, Garching; Arno Disson, Grafenau; Hermann Möller, Gärtringen; Holger Seel, Aidlingen; Claus Töpfer, Sindelfingen; Uwe Nerger, Sindelfingen; Peter Thiele, Sindelfingen, and Eugen Fleisch, Rottenburg, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 26, 1988, Ser. No. 249,182

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1987, 3732562

Int. Cl.[4] B60R *21/00*

U.S. Cl. 280—756 23 Claims



1. A drive arrangement for a motor vehicle roll bar, comprising:

at least one piston-cylinder means including a support piston, guide cylinder and ejection spring for extending a roll bar, in response to a control pulse triggered by a crash situation, from a lowered rest position to an erected supporting position;

a controlled release locking means for releasing the support piston so that it can be extended out of said guide cylinder by an ejection spring and relocking said support piston in an extended end position;

drive means, connected to said at least one piston-cylinder means, for controlling the direction of movement and the speed of the spring-loaded support piston;

and cancelling means for cancelling the influence of the drive means on the spring-loaded support piston in response to a crash signal.

4,840,399

ANTI-SKID DEVICES FOR MOTOR VEHICLES

Hansjörg W. Rieger, Aalen, and Wolfgang Biehler, Aalen-Unterkochen, both of Fed. Rep. of Germany, assignors to Rud-Kettenfabrik Rieger & Dietz GmbH u.Co., Aalen, Fed. Rep. of Germany

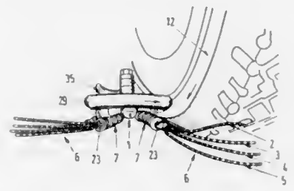
Filed Jul. 18, 1986, Ser. No. 887,869

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1985, 3526360

Int. Cl.[4] B60C *27/00*

U.S. Cl. 280—757 31 Claims

1. Anti-skid device for motor vehicles with a plurality of chain strands (**2, 3, 4, 5**) retained by a support (**1**) which can be set into a revolving motion and connected to the latter by intermediate pieces (**7**) forming resilient spreading arms, of which the ends remote from the support (**1**) are thrown away from the support (**1**) by the effect of centrifugal force when the support (**1**) revolves in the service position, and at least parts of which pass through the region of the ground contact surface of the tyre (**12**) when the vehicle tyre (**12**) rotates, characterized in that chain strand groups, each of which groups comprises at least two chain strands, engage the outer ends of at least some of the intermediate pieces forming the resilient spreading arms, each of said intermediate pieces forming the resilient spreading arms supporting at least one of said plurality of chain strands at the outer end of said intermediate piece, and at least some of said intermediate pieces forming said resilient spreading arms supporting one of said chain strand groups comprising at least



two of said plurality of chain strands at the outer end of said intermediate pieces, the number of said plurality of chain strands being greater than the number of said intermediate pieces.

4,840,400

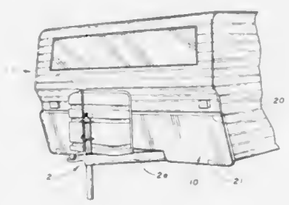
GRAVEL SHIELD FOR HITCH TRAVEL TRAILER

Eugene F. Greenleaf, 117 W. Wright Pl., Marquette, Mich. 49855

Filed Sep. 3, 1987, Ser. No. 92,534

Int. Cl.[4] B60R *19/00*

U.S. Cl. 280—770 11 Claims



1. A gravel shield for hitch trailers, comprising:

a protective plate member having a solid unitary structure with a fixed form adapted to be firmly fixed in place;

said protective plate member having a width dimension approximately equal to the width dimension of a front portion of a hitch trailer to be shielded;

said protective plate member including a lower portion thereof which comprises means for cooperating with a tongue frame portion of said trailer; and

means for fastening said protective plate member fixedly in place adjacent said front portion of said hitch trailer to be shielded;

said fastening means comprising:

a U-shaped channel member adapted to be secured to and extend laterally across essentially the entire front portion of said hitch trailer, said channel member being adapted to securely receive an upper edge portion of said protective plate member therein; and

at least one pair of spaced clip members, each adapted to be secured adjacent a lower edge of said front portion of said hitch trailer to support a lower edge portion of said protective plate member.

4,840,401

GUIDE RAIL COVER

Tatsuo Yamashita, and Kazuyoshi Ishiguro, both of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakuso, Niwa, Japan

Filed Jul. 19, 1988, Ser. No. 221,617

Claims priority, application Japan, Jul. 21, 1987, 62-111620[U]; Aug. 21, 1987, 62-127143[U]

Int. Cl.[4] B60R *21/02*

U.S. Cl. 280—804 19 Claims

1. A guide rail cover disposed along a guide rail having a guide groove for guiding a slider retained an end of a webbing for fastening an occupant of a vehicle in forward and backward directions of said vehicle, comprising:

a base made of a rigid synthetic resin and disposed to the guide rail; and

a filler made from a nonrigid synthetic resin and extending from said base in a direction for closing said guide groove.

4,840,402

AUTOMATIC LOCKING AND RELEASING ARRANGEMENT FOR VEHICULAR SEAT BELT

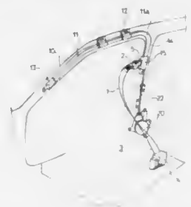
Kazuo Yamamoto, Sagamihara; Katsuyasu Ono, Yokohama, and Shinichi Yamamuro, Toyoake, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha and Chuo Hatsujo Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 2, 1988, Ser. No. 201,436

Claims priority, application Japan, Jan. 29, 1988, 63-17337

Int. Cl.[4] B60R *22/06*

U.S. Cl. 280—804 8 Claims



1. An automatic locking and releasing arrangement for vehicular seat belt including:

a guide rail mounted along an opening portion of a vehicular door on the inside surface of the door pivotably disposed within said opening portion;

a cable adapted to slide through a first guide passage formed in the guide rail;

a drive means for driving the cable;

a connector and a cam both fixed to the cable at a predetermined spacing from each other;

a slider fitted slidably in a second guide passage formed in the guide rail in communication with the first guide passage, and adapted to engage the connector and the cam and slide through the second guide passage of the guide rail;

a seat belt attached to the slider;

an anchor means for retaining the slider in a locking position of the seat belt; and

a ring-like slide member fixed to a core of the cable portion positioned at least between said connector and said cam, said ring-like slide member comprising a plurality of slide portions arranged at slight intervals in the longitudinal direction of the cable through a flexible portion formed between adjacent said slide portions, the section of each said slide portion in a plane perpendicular to the core of the cable having a smaller diameter than the section of said first guide passage, and the cable being slid through the first guide passage of the guide rail by said slide portions of said ring-like slide member

4,840,403

DEVICE FOR ADJUSTING THE POSITION OF A STRAP RETURN ELEMENT, IN PARTICULAR OF A SAFETY BELT FOR AN AUTOMOBILE VEHICLE

Gerard Escaravage, Valentigney, France, assignor to Ecia Equipements et Composants pour L'Industrie Automobile, Audincourt, France

Filed May 18, 1988, Ser. No. 195,339
Claims priority, application France, May 27, 1987, 87 07509
Int. Cl.[4] B60R 22/20
U.S. Cl. 280—808 7 Claims

1. A device for adjusting the position of a strap-return element of a safety belt between two end positions, said device adapted to be mounted in particular on a post of an automobile vehicle, and said device comprising:

a guide rail adapted to be fixed to said post and having a front side and a rear side, which is adapted to face said post, said guide rail being provided with a rack-shaped locking means;

the strap return element comprising a first substantially planar portion and a second portion which is angularly offset relative to said first portion in a direction away from said front side of said guide rail; said first portion having two lateral wings extending toward said guide rail and located on each side of the latter, said first portion also comprising a blocking plate located between said wings and extending oppositely to said guide rail rear side and downwardly inclined toward the latter to cooperate with said rack-shaped locking means for locking said strap-return element in position; and

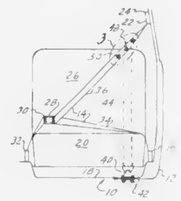
elastic means, located between said blocking plate and said rail rear side and facing said first planar portion, for biasing said strap-return element so that, normally, said first planar portion bears against said rail front side and said blocking plate rests in contact, and in engagement, with said rack-shaped locking means, whereby, when said second portion is pushed in the direction of said rail front side against said elastic means bias, the strap-return element tilts about a junction of said first and second portion so that said first planar portion rotates away from said rail front side and so that said blocking plate is pivotally released from said rack-shaped locking means, thereby allowing shifting of said strap-return element along said guide rail.

4,840,404

SEAT BELT SYSTEM HAVING SHOULDER HEIGHT SUPPORT

Wesley E. Falterman, 40565½ E. Stetson Ave., Hemet, Calif. 92344

Filed Jul. 28, 1988, Ser. No. 225,163
Int. Cl.[4] B60R 21/10
U.S. Cl. 280—808 17 Claims



1. A seat belt apparatus for a vehicle having lower anchor means at first and second sides of a seat of the vehicle, and an upper anchor means at the first side of the seat above and behind a back of the seat, the apparatus comprising:

(a) a first belt anchored to the anchor means at the first side of the seat and retractably anchored to the upper anchor means;

(b) coupling means connected to the lower anchor means at the second side of the seat;

(c) buckle means on the first belt, the buckle means being adapted for releasable engagement with the latch means;

(d) rear anchor means below and behind the seat;

(e) a second belt anchored to the rear anchor means and having a free end; and

(f) means for releasably connecting the free end of the second belt to the first belt between the buckle means and the upper anchor means with the second belt in supportive contact with the top of the seat back.

4,840,405

MECHANISM FOR MAINTAINING A STRAP OF A SAFETY BELT IN AN ADJUSTABLE POSITION

Girard Escaravage, Valentigney, France, assignor to Eica-Equipements et Composants Pour L'Industrie Automobile, Audincourt, France

Filed May 25, 1988, Ser. No. 198,349
Claims priority, application France, May 27, 1987, 87 07506
Int. Cl.[4] B60R 22/20
U.S. Cl. 280—808 12 Claims

1. A mechanism for maintaining a strap of a safety belt in an adjustable position for fixing to a structure, and comprising a case, a lock and a strap holder; wherein

said case comprises: a periphery with an anchoring base; and a front wall which is provided with a longitudinal slot having at least one closed end and with a guide located on the longitudinal axis of said slot in the vicinity of said closed end thereof; and

said lock comprises: a push-member having a first end, accessible from the exterior of said case, and a second end located inside the latter and mounted in said guide to be movable in a direction substantially perpendicular to said front wall; a keeper located in said case and articulated to the latter to be tiltable relative to said front wall between a first retaining position, where it is close to said front wall, and a second releasing position where it is away from said front wall and cooperating with said second end

of said push-member; a catch slidingly engaged in said slot and having an outer end, associated with said strap holder, and an inner end located in said case for cooperation with said keeper; and a spring located in said case and acting on said keeper for biasing the latter in its first position in a

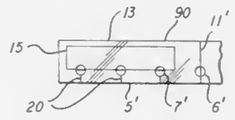
direction toward said second end of said push-member and the front wall of the case; whereby, when said first end of said push member is pushed, said keeper is pivoted from its first position to its second position so that it is allowed to release said inner end of said catch.

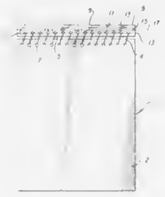
4,840,406

METHOD OF MOUNTING INDEX TABS UPON STENOGRAPHIC NOTEBOOKS

Warren R. Pitts, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed May 29, 1987, Ser. No. 55,406
Int. Cl.[4] B42D 13/00, 1/00
U.S. Cl. 281—1 20 Claims





1. Method of mounting index tabs to coiled wire stenographic notebooks, comprising the steps of:

(a) providing a stenographic notebook having a coiled wire binding means;

(b) providing one or more elongated transparent plastic index tab containing envelopes having a longitudinal axis along the length thereof, and a plurality of aligned apertures therethrough extending along first envelope portions parallel to said longitudinal axis and adjacent a lower envelope edge, at least some of said apertures surrounding turns of said coiled wire, said envelopes also having two open side portions transverse to said longitudinal axis, and upper closed envelope edge portions parallel to said longitudinal axis; and

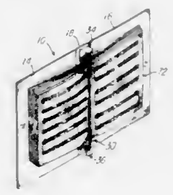
(c) inserting index tabs through said open side portions of said envelopes until said tabs are contained within said envelopes.

4,840,407

SHEET MUSIC BINDER

Karl S. Schroeder, 6822 Salem Ave., Clayton, Ohio 45315

Filed Mar. 31, 1988, Ser. No. 175,930
Int. Cl.[4] B47D 17/00; B42F 1/00; A47B 19/10, 23/06
U.S. Cl. 281—48 13 Claims



1. A binder for sheet music comprising:

a folder of the type having hinged front and rear panels and a centerline extending from the top to the bottom thereof;

a center post assembly;

means mounting said center post assembly for rotation relative to said folder about an axis parallel to said centerline and spaced inwardly of said panels; and

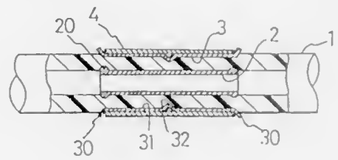
means for holding sheet music on said center post assembly.

4,840,408

HOSE INTERMEDIATE RETAINER

Hiroyuki Nishiki, Nagoya, and Yuji Kokuryu, Ichinomiya, both of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Oct. 13, 1987, Ser. No. 107,429
Claims priority, application Japan, Oct. 15, 1986, 61-157837[U]
Int. Cl.[4] F16L 5/00
U.S. Cl. 285—62 3 Claims



1. A hose intermediate retainer comprising:

a hose;

an intermediate retainer having: an inner cylinder placed in said hose; and an outer cylinder covering said hose at a location corresponding to the location of said inner cylinder and being pressed in the radial direction inwardly for holding said hose between itself and said inner cylinder; and

a clamp secured to the outside of said outer cylinder;

wherein said outer cylinder comprises: a first pressed portion having a smooth surface pressed circularly in the radial direction inwardly except both ends of said outer cylinder; and at least one second pressed portion formed

on the portion of said first pressed portion for depressing the outer surface of said hose;

said inner cylinder has a ring shaped projection at both ends having an outside diameter larger than the outside diameter of the central portion thereof; and

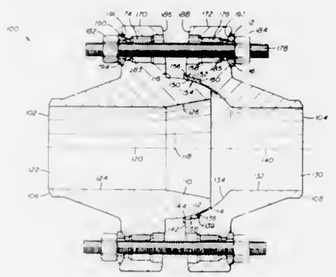
said clamp is secured around said first pressed portion of said outer cylinder and the axial movement of said clamp is restricted by said both ends of said outer cylinder.

4,840,409

SWIVEL FLOW LINE CONNECTOR

Joseph J. Welkey, Houston, Tex., assignor to Taper-Lok Corporation, Houston, Tex.

Filed May 5, 1988, Ser. No. 192,330
Int. Cl.[4] F16L *27/04*
U.S. Cl. 285—167 **41 Claims**



1. Apparatus for making a swiveled flow line connection, comprising:

a male member having an annular end portion with a convex curved exterior sealing surface, a maximum outside diameter and a terminus adjacent a minimum outside diameter of said surface;

a female member generally matingly pivotable with said male member and having an annular end portion with an outwardly tapered frustoconical interior surface with a slope with respect to a longitudinal axis of said female member less than that of said male member end portion exterior surface, said frustoconical interior surface terminating at a maximum inside diameter thereof and extending axially to a radially inwardly projecting shoulder at a minimum inside diameter;

a seal ring having a frustoconical outer surface with a slope substantially equal to that of said female member interior surface for sealing engagement therewith, an inner concave annular surface with a curvature substantially equal to that of said male member exterior surface for sealing engagement therewith, a lip extending radially outwardly from said seal ring outer surface adjacent a maximum outside diameter thereof, said seal ring outer surface maximum outside diameter being greater than said female member end portion interior surface maximum inside diameter, and a maximum inside diameter of said seal ring inner surface less than said male member end portion exterior surface maximum outside diameter, said seal ring having an annular face extending radially outwardly from said seal ring inner surface minimum inside diameter to said seal ring outer surface minimum outside diameter, said seal ring annular face having a radial dimension at least as large as that of said radially inwardly projecting female member end portion shoulder; and

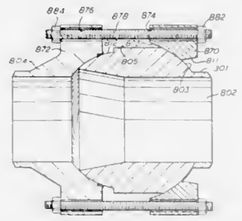
means for urging said male and female members toward each other in pivoted alignment to compress said seal ring between said respective male and female end portion surfaces to form a fluid seal therebetween.

4,840,410

APPARATUS FOR MAKING A SWIVELED FLOW LINE CONNECTION

Joseph J. Welkey, P.O. Box 40082, Houston, Tex. 77240

Continuation-in-part of Ser. No. 192,330, May 5, 1988. This application May 24, 1988, Ser. No. 198,126
Int. Cl.[4] F16L *27/04*
U.S. Cl. 285—261 **27 Claims**



1. Apparatus for making a swiveled flow line connection, comprising:

a male member having an annular end portion with a convex curved exterior sealing surface with a maximum outside diameter, a terminus adjacent a minimum outside diameter of said surface, and a rearward external convex shoulder;

a female member generally matingly pivotable with said male member and having an annular end portion with an outwardly tapered frustoconical interior surface with a slope with respect to a longitudinal axis of said female member less than that of said male member end portion exterior surface, said frustoconical interior surface terminating at a maximum inside diameter thereof and extending axially to a radially inwardly projecting shoulder at a minimum inside diameter;

a seal ring having a frustoconical outer surface with a slope substantially equal to that of said female member interior surface for sealing engagement therewith, an inner concave annular surface with a curvature substantially equal to that of said male member exterior surface for sealing engagement therewith, a lip extending radially outwardly from said seal ring outer surface adjacent a maximum outside diameter thereof, said seal ring outer surface maximum outside diameter being greater than said female member end portion interior surface maximum inside diameter, and a maximum inside diameter of said seal ring inner surface less than said male member end portion exterior surface maximum outside diameter, said seal ring having an annular face extending radially outwardly from said seal ring inner surface minimum inside diameter to said seal ring outer surface minimum outside diameter, said seal ring annular face having a radial dimension at least as large as that of said radially inwardly projecting female member end portion shoulder; and

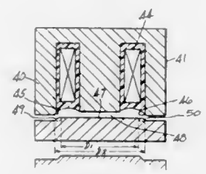
means for urging said male and female members toward each other in pivoted alignment to compress said seal ring between said respective male and female end portion surfaces to form a fluid seal therebetween, said urging means including opposed annular flanges operatively associated with said respective male and female members, said male member flange having a concave surface for engaging said convex rearward external shoulder and pivoting said male member with respect to said male member flange.

4,840,411

ELECTROMAGNETIC SHEAR LOCK

Alan C. Sowersby, Wallingford, Conn., assignor to Harrow Products, Inc., Wallingford, Conn.

Filed Feb. 13, 1987, Ser. No. 14,831
Int. Cl.[4] E05C *17/16*
U.S. Cl. 292—251.5 **7 Claims**



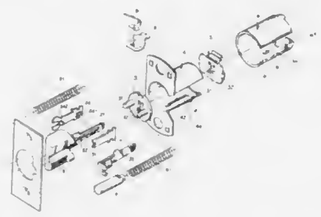
1. A magnetic shear lock of the type comprising one of an electromagnet and an armature for locking a door to a door opening where the door opening is defined by a frame and the door is vertically hinged to said frame for horizontal swinging motion, an electromagnet mounted in the door opening, said electromagnet comprising an E-shaped core having two outer legs and an intermediate leg, all of said legs extending vertically from a common base, an energizing coil wound about said intermediate leg between said outer legs, an armature member adapted to be mounted in the door for vertical movement toward said electromagnet when said coil is energized, said armature having a central elongated longitudinal projection on its surface facing said electromagnet and integral with said armature, the edges of said projection being inwardly beveled ten to thirty-five degrees, the outer legs of said electromagnet having surfaces arranged to make surface contact with said armature on either side of said projection when said coil is energized, said outer legs of said electromagnet having outwardly beveled edges on the inner sides thereof of ten to thirty-five degrees arranged to make contact with the beveled edges of said armature projection, said intermediate leg of said electromagnet being of lesser dimension than said outer legs to define a recess between said outer legs for said armature projection, said projection of said armature being received between said outer legs of said electromagnet when said coil is energized and providing a mechanical resistance to shearing movement between said electromagnet and said armature when said coil is energized.

4,840,412

EASILY ADJUSTABLE LATCH

Richard Shen, No. 233, Sec. 2, Hai Tien Road, Tainan, Taiwan

Filed Aug. 11, 1987, Ser. No. 83,823
Int. Cl.[4] E05C *1/16*
U.S. Cl. 292—337 **1 Claim**



1. An easily adjustable variable backset latch comprising:

(A) a substantially cylindrical inner housing (**4**) with a U-shaped guide slot (**42**) and a protuberance (**41**) thereon; said protuberance (**41**) projecting radially outwards from a central point of a cut out section (**44**) formed by said guide slot (**42**); said inner housing (**4**) also having a plate portion on a foremost end thereof which is fixed to a faceplate (**1**);

(B) a main bolt (**2**) having a slide extension (**21**) projecting rearwardly from a rear end thereof; said slide extension (**21**) having an extension slot (**22**) set horizontally along a center axis thereof; a link (**24**) being on a first side of said extension slot (**22**) and being slidably secured thereto by means of a punchout (**241**) and a stop (**242**); a slide bar (**7**) being on a second side of said extension slot (**22**), said slide bar (**7**) being slidably retained in said extension slot (**22**) by a catch (**71**), and said catch (**71**) being slidable between said stop (**242**) and said punchout (**241**), said slide bar (**7**) being urgeable by a spindle of a doorknob handle to retract said slide extension (**21**) and said main bolt (**2**) when said variable backset latch is in maximum backset position;

(C) an auxiliary bolt (**9**) which is secured to and urgeable by an L-shaped actuating plate (**23**);

(D) a retainer plate (**3**) with two retainer posts (**31**) thereon; said retainer plate (**3**) being retained by a circular retention wall (**43**) of said inner housing (**4**); said two retainer posts (**31**) respectively receiving springs (**91**, **91'**) thereon for providing a restoring force for the main bolt (**2**) and the auxiliary bolt (**9**), respectively; a bent O-shaped stabilizer (**8**) having two recesses at one end thereof to engage with and secure the retainer plate (**3**) and having a protrusion on another end thereof, said stabilizer (**8**) preventing said auxiliary bolt (**9**) from being forced open; a flat spring (**81**) with a hole on a first end thereof for receiving said protrusion on said stabilizer (**8**) so as to vertically secure said stabilizer (**8**), with a second end of said stabilizer (**8**) contacting an inner wall of said inner housing (**4**); and

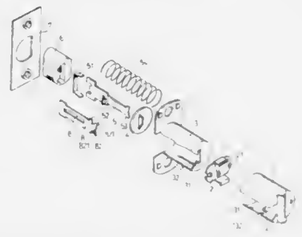
(E) a substantially cylindrical outer housing (**6**) having a guide piece (**62**) for engaging with said guide slot (**42**); said outer housing (**6**) also having a minimum backset hole (**61**) and a maximum backset hole (**61'**); said protuberance (**41**) being engageable with either of said backset holes (**61** or **61'**).

4,840,413

LENGTH-ADJUSTABLE LATCH

Richard Shen, No. 233, Sec. 2, Hai Tien Road, Tainan, Taiwan

Filed Aug. 14, 1987, Ser. No. 85,620
Int. Cl.[4] E05C *1/16*
U.S. Cl. 292—337 **1 Claim**



1. A length-adjustable latch comprising:

an outer housing (**1**) having an inwardly-extending protuberance (**12**) and having two longitudinally spaced holes (**131**,**132**) thereon;

an inner housing (**3**) having a longitudinal slot (**31**) to engage with said protuberance (**12**) and having an extension block (**32**) engageable with said positioned holes (**131**, **132**), a circular slidable plate (**4**) being inserted thereinto;

an installation seat (**2**) being secured to said outer housing (**1**) by engaging two blocks (**21**) thereof with respective corresponding holes (**11**) disposed at said outer housing (**1**);

a drive linkage (**5**) having an extension element (**52**) extend-

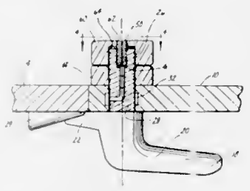
ing from middle portion thereof; said drive linkage (5) being stepped at one end thereof to form a larger end and a smaller end; said larger end being connected to a U-shaped clip (51) and together inserted into a bolt (6); said smaller end being formed with an extension (53);
a backset plate (8) having a longitudinal sliding space (81) to slidably receive said extension element (52) of said drive linkage (5); said extension element (52) having a front end with a width slightly larger a width of said sliding space (81) to prevent said extension element (52) from sliding out of said sliding space (81); said backset plate (8) having a trail end (82) and a laterally protruding portion (821) on a rear end thereof;
a spring (54) encompassing said drive linkage (5) and said backset plate (8) being utilized to facilitate the operation of said bolt (6);
characterized in that:
said outer housing (1) is longitudinally slidable and adjustable relative to said inner housing (3) by positioning said longitudinally-spaced holes (131, 132) with said extension block (32);
said outer housing (1), said installation seat (21), said inner housing (3) and said slidable plate (4) each have respective openings provided on corresponding positions thereof respectively; said extension (53) of said drive linkage (5) extends through said openings provided respectively on the slidable plate (4), the inner housing (3) and the installation seat (2), the protruding portion (821) of the backset plate (8) is blocked out of the outer housing (1) by the installation seat (2);
said trail end (82) and said laterally protruding portion (821) of the backset plate (8) extend out of the installation seat (2), only said backset plate (8) is usable for drawing back said bolt (6) when said outer housing (1) is in a 70 mm backset position; said drive linkage (5) is utilized for drawing back said bolt (6) when said outer housing (1) is in a 60 mm backset position.

4,840,414

GREASE FITTING FOR DOG

Keith L. Ford, 4327 Woodward, Wayne, Mich. 48189

Filed Feb. 29. 1988, Ser. No 161,953
Int. Cl.[4] E05B *15/0*
U.S. Cl. 292—356 5 Claims



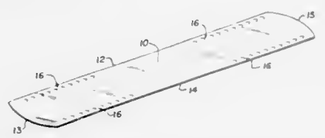
1. A dog useful for latching a ship's door to a bulkhead, having an opening communicating with a lubricant-receiving cavity comprising:
a handle having a spindle received through said opening such that a first handle portion is slideably disposed in said opening, the spindle having external threaded means and a lubricant passage with an inlet opening in an extreme end of the spindle, and an outlet opening adjacent the lubricant-receiving cavity;
the inlet opening of the lubricant passage having internal threaded means;
an elongated plug threadably received in the inlet opening, and abutment means in the spindle engageable with the plug such that when fully seated in the spindle inlet opening, the outer end of the plug extends beyond the spindle a sufficient distance for a tool to clampingly engage the plug;
a first nut mounted on the external, threaded means of the spindle so as to abut the bulkhead on the side opposite the handle; and
a cap nut mounted on the spindle adjacent the first nut to substantially enclose the end of the spindle, the cap nut having an opening for generally enclosing the outer end of the plug.

4,840,415

APPARATUS TO MOVE NEGATIVES

Ralph E. Baker, Vancouver, and Gordon G. Landherr, Surrey, both of Canada, assignors to Ampro Photo Workshops Limited, Vancouver, Canada

Filed Feb. 29, 1988, Ser. No. 161,729
Int. Cl.[4] B25B *27/00*
U.S. Cl. 294—1.1 4 Claims



1. An apparatus for moving a longitudinal film strip carrying positive or negative images having spaced perforations along parallel longitudinal edges of the strip in a longitudinal pocket comprising:
a longitudinal planar member having first and second parallel longitudinal edges and a plurality of spaced, flexible gripping means extending out of the plane of the longitudinal member for engagement in the spaced perforations along parallel edges of a film strip when said planar member is positioned adjacent a film strip in an overlying manner within a longitudinal pocket holding said film strip.

4,840,416

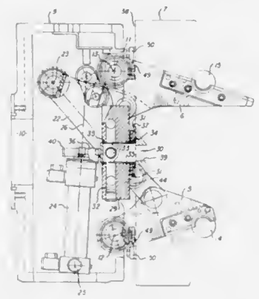
SYSTEM COMPRISING A POWER-ACTUATED GRIPPER AND A NUMBER OF GRIPPING OBJECTS, ESPECIALLY FOR USE IN AN AUTOMATED FOUNDRY PLANT, WITH FLUID COMMUNICATION BETWEEN SAID GRIPPER AND A GRIPPING OBJECT BEING GRIPPED BY IT

Ole A. Jacobsen, Tisvildeleje, Denmark, assignor to Dansk Industri Syndikat A/S, Herley, Denmark

Filed Oct. 14, 1987, Ser. No. 108,392
Claims priority, application Denmark, Oct. 14, 1986, 4898/86
Int. Cl.[4] B25J *15/06, 9/14*
U.S. Cl. 294—2 6 Claims

1. A system comprising
(a) a gripper (3) adapted to be moved between various stations and comprising
(a1) gripping means (5,6,49) adapted when in a gripping position (FIG. 2) to engage cooperating engagement means (14,15,50) on a gripping object (7) and when in a non-gripping position (FIG. 3) to be out of engagement with such cooperating means, and
(a2) fluid-communication coupling means (30,31) adapted when in said gripping position to engage cooperating fluid-transfer means (37,39,48) of said gripping object (7) and when in said non-gripping position to be out of engagement with such cooperating fluid-transfer means, and
(b) a number of gripping objects (7) adapted to be moved between various stations by said gripper (3) and each comprising

(b1) engagement means (14,15,50) adapted to be engaged by said gripping means (5,6,49) on said gripper (3), and
(b2) fluid-transfer means (37,39,48) adapted to be engaged by said fluid-communication coupling means (30,31) on said gripper (3),
characterized in
(c) that said fluid-communication coupling means (30,31) on said gripper (3) for providing fluid-communication between said gripper means and said gripping objects are constituted by tubular members with at least one open



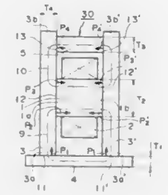
end, said open ends being adapted to be brought into fluid-tight contact with a substantially plane surface (37) on said gripping object (7) by movement of said gripping means from the non-gripping position to the gripping position, said substantially plane surface (37) comprising fluid-transfer openings (39,48) adapted such that when said gripping object is in said gripping position said fluid transfer openings are situated within the limits of the positions of said open ends of said fluid-communication coupling means defined only by engagement of said gripping object by said gripping means.

4,840,417

MOVABLE YOKE-TYPE LIFTING MAGNET DEVICE

Akira Izumi; Tomomi Kishi, both of Toyota, and Hideo Niwa, Toyoake, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Sanmei Denki Kabushiki Kaisha, Nagoya, both of, Japan

Filed Nov. 27, 1987, Ser. No. 126,006
Claims priority, application Japan, Nov. 27, 1986, 61-280669
Int. Cl.[4] B66C *1/06;* H01F *7/20*
U.S. Cl. 294—65.5 19 Claims



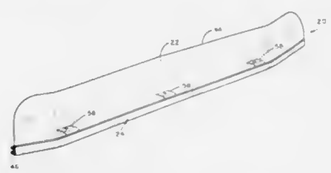
1. A yoke-type lifting magnet device comprising:
a main core constructed of magnetic material and having first and second ends;
a coil wound around said main core;
at least one yoke magnetically coupled to each of said first and second ends of said main core, respectively, each said yoke having a first end adapted to magnetically couple with a workpiece to be lifted and a second end opposite said first end of said yoke with respect to said main core, said main core, said yoke provided at said first end of said main core, said workpiece, and said yoke provided at said second end defining a first magnetic flux path when said main core is magnetically excited; and
an auxiliary core magnetically coupled between said second end of each said yoke, said main core, said yoke provided at said first end of said main core, said auxiliary core, and said yoke provided at said second end of said main core defining a second magnetic flux path when said main core is magnetically excited, wherein said first and second magnetic flux paths are parallel to each other, thereby forming a magnetic flux path circuit.

4,840,418

PROTECTIVE SHIELD AND METHOD OF FASTENING PROTECTIVE SHIELD TO A FRAME

Charles A. Bockenheuser, Tulsa, Okla., assignor to Pardners Unlimited, Inc., Tulsa, Okla.

Continuation of Ser. No. 9,816, Feb. 2, 1987, abandoned. This application Mar. 24, 1988, Ser. No. 177,826
Int. Cl.[4] B60J *1/20*
U.S. Cl. 296—91 24 Claims



1. A protective shield assembly, comprising:
a shield having at least one edge;
a frame, the frame including a front wall, a rear wall spaced apart from the front wall, and a bottom; the bottom securely connecting the front wall to the rear wall; the front wall having an inside facing the rear wall and an outside; the rear wall having an inside facing the front wall and an outside; the front wall, rear wall, and bottom forming a channel; and
mechanical fastening means, extending partially across the channel from at least one of the front wall and the rear wall, for adhesive-independently fastening the edge of the shield into the channel, the fastening means mechanically connecting to the surface of the shield in order to prevent extraction of the shield from the channel.

4,840,419

TENSIONING ARRANGEMENT FOR THE TOP COVER OF A MOTOR VEHICLE

Eugen Kolb, Stuttgart, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

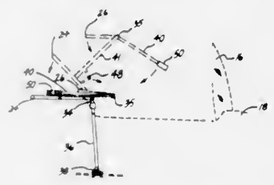
Filed May 25, 1988, Ser. No. 198,445
Claims priority, application Fed. Rep. of Germany, May 29, 1987, 3718093
Int. Cl.[4] B60J *7/12*
U.S. Cl. 296—108 20 Claims

1. A tensioning arrangement for a foldable top cover of a motor vehicle, comprising draw means extending through loop-shaped longitudinal edges of the foldable top cover, said draw means being operatively connected with a forward transversely extending frame means of the foldable top cover by a draw spring and with a rear pivotal support means of the foldable top cover at its other end by a spring-loaded foldable pivot lever means, whereby in a closing position of the foldable top, a pressure bolt means arranged at the pivot lever means is

supported at a free end of a laterally positioned longitudinal extending girder of the foldable top and tensions the draw

spring means by way of the draw means to tension the foldable top cover means of the motor vehicle.

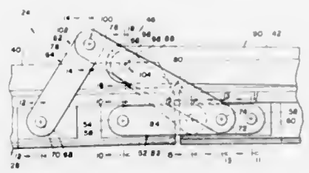
4,840,420
CONVERTIBLE TOP
Darrell A. Weber, 712 9 St, N.E., Minot, N. Dak. 58701
Filed Nov. 6, 1987, Ser. No. 117,327
Int. Cl.[4] B60J *7/12*; B62K *27/16*
U.S. Cl. 296—116 2 Claims



2. A convertible top for motorcycle sidecars, comprising:
a collapsible frame;
said collapsible frame having a pair of spaced vertical supports;
means for mounting said vertical supports on the floor of a sidecar;
a first U-shaped bow pivotally mounted to each of said vertical supports;
a pair of side support rails pivotally mounted on opposite sides of said first U-shaped bow;
a second U-shaped bow pivotally mounted to each of said side support rails;
a pair of front support bars pivotally mounted to said side support rails;
windshield clamp means on each of said front support bars;
a pair of pivotal support braces, each of said support braces having an intermediate pivotal connection, and each of said support braces having one end pivotally mounted on said first U-shaped support bow and having an opposite end pivotally mounted on one of said side support rails; and
foldable cover means over said collapsible frame.

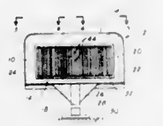
4,840,421
VEHICLE CONVERTIBLE TOP FRAME SIDE RAIL LINKAGE ASSEMBLY
Robert E. Hennessy, Allen Park, Mich., assignor to Cars & Concepts, Inc., Brighton, Mich.
Filed Mar. 7, 1988, Ser. No. 164,532
Int. Cl.[4] B60J *7/08*
U.S. Cl. 296—122 13 Claims

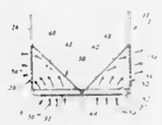
1. In a vehicle convertible top including a frame movable between a raised use position and a folded storage position and having a pair of side rails each of which includes front and intermediate rail members, a linkage assembly associated with each side rail and comprising:
a hinge link having opposite ends respectively pivoted to the front and intermediate rail members;
an operating linkage including first and second operating links having first ends respectively pivoted to the front and intermediate rail members and having second ends including a pivotal connection that pivotally connects these second ends directly to each other;



a connecting link that interconnects the hinge link and the operating linkage to coordinate the movements of the hinge link and the operating linkage to move the front and intermediate rail members between an unfolded use position and a folded storage position; and
an actuating member connected to the side rail and to the operating linkage to actuate folding and unfolding movement of the front and intermediate rail members as the convertible top frame is moved between the use and storage positions.

4,840,422
TRAILER AIR GRILL
Thomas H. Engel, 45 Terry Ct., Hollister, Calif. 93502
Filed Jan. 4, 1988, Ser. No. 140,475
Int. Cl.[4] B62D *37/02*
U.S. Cl. 296—180.4 9 Claims



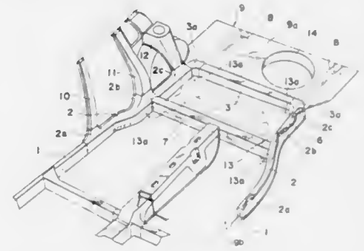


1. A trailer air grill adapted for mounting in a front wall, a side wall and an opposite side wall of a trailer, the trailer air grill comprising:
a front wall intake air grill mounted in the front wall, the front wall intake air grill having stationary louvers mounted therein for directing airflow at an angle when air impacting the front wall intake air grill is received therethrough;
a first side wall discharge air grill mounted in the side wall;
a second side wall discharge air grill mounted in the opposite side wall, the stationary louvers in the front wall intake air grill directing substantially half of the airflow toward the first side wall discharge air grill and the other half of the airflow toward the second side wall discharge air grill; and
an interior V-shaped deflector barrier centered at the back of the front wall intake air grill to deflect the airflow to the first and second side wall discharge air grills.

4,840,423
FRONT BODY STRUCTURE OF A MOTORCAR
Yoshihiro Maekawa, Higashihiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan
Filed Mar. 29, 1988, Ser. No. 174,884
Claims priority, application Japan, Mar. 31, 1987, 62-80605
Int. Cl.[4] B62D *21/02*
U.S. Cl. 296—194 30 Claims

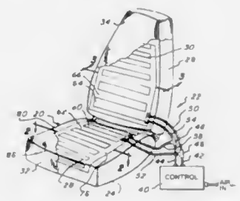
1. In a cab-over type motor vehicle in which a front seat is mounted on a floor at a position above an engine, a front body structure thereof comprising:
a front cross member extending in the transverse direction of the vehicle body at the fore end thereof;
a pair of side sills extending in the longitudinal direction of the vehicle body along respective sides of said floor;
a pair of front side frames extending substantially horizontally in the longitudinal direction of the vehicle body along respective side portions of said floor, each said front side frame having a front portion extending beyond the front end of the respective said side sill, said front portion being offset inwardly of the remaining portion of said front side frame, and the fore end of said front side frame being connected to said front cross member at a position spaced substantially inwardly from the respective end thereof;
a pair of front pillars extending in the vertical direction of the vehicle body at respective front side portions thereof, the lower portion of each said front pillar being bifurcated in the longitudinal direction of the vehicle body into a fore branch and a rear branch, said fore branch being connected at the lower end thereof to the respective said end of said front cross member, and each said rear branch being connected at the lower end thereof to the respective said side sill; and
a pair of front tires, each said tire being disposed between said fore and rear branches of a respective said front pillar lower portion.

4,840,424
AUTOMOTIVE REAR UNDERBODY STRUCTURE
Seiichi Asoh, Higashihiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan
Filed Mar. 31, 1988, Ser. No. 176,179
Claims priority, application Japan, Mar. 31, 1987, 62-80604; Mar. 31, 1987, 62-49307[U]; Apr. 7, 1987, 62-85087
Int. Cl.[4] B60J *1/00*
U.S. Cl. 296—204 17 Claims



1. An underbody structure of an automotive vehicle, which comprises:
a pair of side sills each having a generally closed cross section and extending longitudinally of the automotive vehicle, said side sills spaced apart from each other in a direction extending widthwise of the automotive vehicle;
a respective rear frame member connected to and butting end-to-end against each one of said side sills and extending rearwardly of the automotive vehicle;
a first cross member connected at its opposite ends to the rear frame members, respectively, so as to extend widthwise of the automotive vehicle in the same plane in which the rear frame members lie; and
a second cross member connected at its opposite ends to the rear frame members, respectively, so as to extend widthwise of the automotive vehicle in said plane, said second cross member being disposed rearwardly of the first cross member with respect to the automotive vehicle.

4,840,425
VARYING SUPPORT CUSHIONED SEATING ASSEMBLY AND METHOD
Roger H. Noble, Fairfax, Okla., assignor to Tush Cush, Inc., Liberal, Kans.
Filed Apr. 21, 1987, Ser. No. 40,634
Int. Cl.[4] A47C *7/46*, *27/10*
U.S. Cl. 297—284 7 Claims



1. In a seating device having a seat unit and a back unit, an assembly for providing varying cushioned support to the body of a user seated on said device, said assembly comprising:
first and second sections, said first section having front and rear portions and being positionable adjacent to said seat

unit of said seating device, and said second section having upper and lower portions and being positionable adjacent to said back unit of said seating device, each of said portions of said first and second sections including a plurality of adjacently positioned support members each of which has a support surface with said support surfaces being positionable to support different areas of the body of a user when seated on said seating device, and at least selected ones of said plurality of support members of said portions of said first and second sections including movement establishing means for causing movement of said support surfaces of said selected ones of said plurality of support members relative to adjacent support surfaces of the others of said pluralty of said support members with movement of at least some of said support surfaces of said selected ones of said plurality of support members in said rear portion of said first section and said lower portion of said second section occurring prior to movement of said support surfaces of said selected ones of said plurality of support members in said front portion of said first section and said upper portion of said second section and with at least one of said selected ones of said plurality of support members adjacent to said lower portion of said second section being configured so that said support surface of said at least one of said selected ones of said plurality of support members adjacent to said lower portion of said second section is movable a greater distance toward a user seated in said seating device than said support surfaces of others of said plurality of support members whereby support is provided to the lumbar region of the spine of a user seated on said device, and each of said first and second sections including input means and transmitting means connected between said movement establishing means and said input means, with said input means of said first section being positioned in said rear portion of said first section and said input means of said second section being positioned in said lower portion of said second section; and

control means connected with said input means of both of said first and second sections for periodically causing movement of said movement establishing means to thereby vary the areas of support provided to the body of a user when seated on said seating device and to cause massaging action by said support surface of said at least one of said selected ones of said plurality of support members adjacent to said lower portion of said second section to thereby relieve discomfort at said lumbar region of the spine of a user seated on said device.

4,840,426
OFFICE CHAIR
Burkhard Vogtherr, Kandern-Holzen, and Manfred Elzenbeck, Steinheim/Murr, both of Fed. Rep. of Germany, assignors to Davis Furniture Industries, Inc., High Point, N.C.
Filed Sep. 30, 1987, Ser. No. 102,724
Int. Cl.[4] A47C *3/10*
U.S. Cl. 297—300 **12 Claims**

1. An office chair comprising:

(a) a seat member and a backrest member having a lumbar region, said seat member and backrest member hingedly articulated together about a first horizontal axis extending along the rear of said seat member and the lower edge of said backrest member, said backrest member being curved from top to bottom about a second horizontal axis extending through said lumbar region;

(b) a support system including:

(i) a vertical column extending upwardly from a base and a support frame having a transverse support arm;

(ii) said transverse support arm mounted on the upper end of and extending perpendicularly from said vertical column, said transverse support arm extending beneath said seat member along a third horizontal axis;

(iii) said support frame further including a front member and a longitudinal member extending forwardly from said transverse support arm;

(c) a pair of side arms, each side arm affixed to an opposite end of said transverse support arm and extending upwardly then rearwardly therefrom, the upper end of each side arm pivotally supporting opposite side edges of said backrest member at a point substantially aligned with said second horizontal axis;

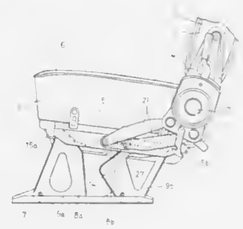
(d) spaced slotted housing secured to the undersurface of said seat member adjacent the front portion thereof;

(e) connecting means slidably joining and selectively locking said front member of said support frame within said spaced slotted housings;

(f) the second horizontal axis extending through said lumbar region lying rearwardly of said transverse support arm, said first horizontal axis being movable responsive to tilting of said backrest member between a first upright position in which said first horizontal axis is positioned substantially rearwardly of said second horizontal axis and a second tilted position in which said first horizontal axis is positioned substantially beneath said second horizontal axis;

(g) whereby as said back member is tilted rearwardly said seat member realizes a slight lowering and the horizontal distance between the center of gravity of the occupied chair and said transverse support arm is minimized.

4,840,427
SEAT FOR AN AUTOMOBILE
Bahk Hong, Seoul, Rep. of Korea, assignor to Kia Motors Corporation, Rep. of Korea
Filed Aug. 13, 1987, Ser. No. 85,990
The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.
Int. Cl.[4] B60N *1/02*
U.S. Cl. 297—346 **12 Claims**



1. An adjustable seat for a vehicle comprising:

a seat back;

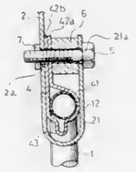
a seat bottom;

the seat back being coupled to a device for adjusting the forward or backward position of the adjustable seat;

means for adjusting the angle of the seat back to the seat bottom, the means for adjusting being coupled to the seat back; and

the seat bottom including means for moving the seat bottom forwards and backwards and adjusting the angle of the seat bottom with respect to a floor of the vehicle, the means for moving the seat bottom forward and backward including a pair of side brackets secured to a bottom of the seat bottom, a pair of seat support brackets secured to a floor of the vehicle, and two sets of legs, each set of legs including a pair of legs that are pivotally connected to a separate side bracket and support bracket, the legs being pivotal from a first position to a second position, at least one pair of lgs including a pin on each of the legs, the seat bottom further including means for removably securing the legs in the first or second position, the means for removably securing including at least one handle secured to a connecting member, the connecting member being secured to a locking member for receiving a pin on the legs, the locking member being coupled to a spring so as to be biased against the pin, the handle cooperating with the connecting member to cause the locking member to release the pin.

4,840,428
HEAD REST ADJUSTING DEVICE
Hideo Kobayashi, and Yoshio Arai, both of Akishima, Japan, assignors to Tachi-S Co., Ltd., Tokyo, Japan
Filed Jun. 24, 1988, Ser. No. 211,222
Int. Cl.[4] A47C *7/36*
U.S. Cl. 297—408 **11 Claims**



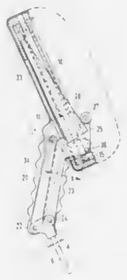
1. A head rest adjusting device in which the head rest is adjustably inclined forwardly and backwardly relative to a head rest stay, comprising:

a head rest frame;

a friction mechansim including at least one substantially U-shaped leaf spring made of metallic material, said leaf spring being wound about the head rest stay and comprising a securing section, a stay receiving section adapted for receiving therein of said head rest stay, and a protruding resilient section integrally formed on said stay receiving section, said protruding resilient section being adapted to provide a resiliency to said stay receiving section; and

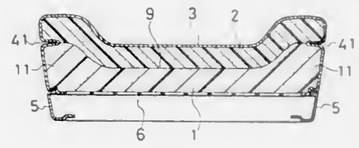
means for securing said friction mechanism to said head rest frame.

4,840,429
MOTOR-ADJUSTABLE HEAD SUPPORT FOR A DENTAL TREATMENT CHAIR
Klaus Stöckl, Bensheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jul. 21, 1988, Ser. No. 222,516
Claims priority, application Fed. Rep. of Germany, Aug. 14, 1987, 3727204
Int. Cl.[4] A47C *7/38*
U.S. Cl. 297—409 **17 Claims**



1. A reclining chair having a back rest, a head support with a housing and adjustment means for positioning the head support relative to the back rest, said adjustment means having a guideway rigidly mounted in the housing, a straight-line moving mechanism having a fixed part receiving a movable part, said mechanism being disposed in said housing, drive means being positioned in the housing for moving the movable part along said fixed part, two supporting arms each having a first pivotable connection at one end to a second part on said back rest and at the other end having a second pivotable connection to the movable part, said second pivotable connections on the movable part being spaced apart by a distance greater than a distance between the first pivotable connections to form a quadrilateral linkage and one of the two arms having a roller engaging said guideway so that when the movable part is shifted on the fixed part, a point on the head support moves in a predetermined curve having a center offset from the pivotable connections and said back rest.

4,840,430
AUTOMOTIVE SEAT AND METHOD OF FORMING SAME
Makoto Shimada, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan
Filed Jan. 4, 1988, Ser. No. 143,222
Int. Cl.[4] A47C *7/02*
U.S. Cl. 297—452 **8 Claims**



1. An automotive seat comprising:

a foam main pad which is so foamed in a mold that a central portion of its upper surface is recessed;

a sub pad bonded to said main pad such that said sub pad conforms in shape to said upper surface of said main pad,

wherein said sub pad is also bonded to a covering member; and

a decorative recessed groove provided between said main pad and said sub pad such that it is defined laterally of said main and sub pads;

wherein said sub pad is formed into a uneven shape, so that the size of said sub pad is conformed to that of said main pad, the free end part of said covering member being inserted into a boundary between said sub pad and said main pad.

4,840,431

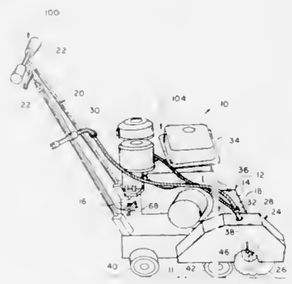
PORTABLE ROTARY POWER SAW

Andrew L. Jedick, Sheffield, Ohio, assignor to Diamond Products, Inc., Elyria, Ohio

Filed Jul. 26, 1988, Ser. No. 224,452

Int. Cl.[4] E21C *47/00*

U.S. Cl. 299—39 **13 Claims**



1. A portable rotary power saw for cutting a groove into concrete, asphalt or similar surfaces comprising a housing having a fore end and an aft end, said housing at its aft end having one or more rear wheels supporting said aft end upon such surface and a handlebar assembly extending vertically upward therefrom, said housing at its fore end supporting a rotary cutting blade, a vertically adjustable axle in the proximity of said fore end including one or more front wheels, a stationary axle mounted on said housing between said aft end and said fore end, said adjustable axle being supported by said stationary axle, and adjustment means for adjusting the position of said adjustable axle relative to said housing and in turn the vertical height of said fore end of said housing and thus the cutting depth of said blade, said adjustment means comprising a segment, a latch, and actuation means for operating said latch, said segment having a first leg supported by said stationary axle and a second leg having a plurality of notches spaced along its length and extending through the top of said housing, said latch being located immediately adjacent said notched second leg and being capable of pivoting in and out of engagement with said notches, said segment being connected to said adjustable axle and being biased by a biasing means such that when a user activates said actuation means and exerts a vertically downward force upon said handlebar assembly causing said housing to pivot upon said rear wheels said adjustable axle extends vertically downward relative to said housing and when said user discontinues activating said actuation means said latch engages one of said notches of said second leg of said segment thereby locking said segment and said adjustable axle into a predetermined position.

4,840,432

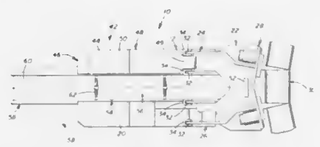
CONTINUOUS MINER WITH DUCT ASSEMBLY

Maurice K. LeBegue, and Henry E. Wilson, both of Fairmont, W. Va., assignors to Baker International Corporation, Orange, Calif.

Filed Jul. 21, 1987, Ser. No. 76,155

Int. Cl.[4] E21C *35/22*

U.S. Cl. 299—64 **13 Claims**



1. A continuous miner comprising

a mobile frame assembly having a front end portion and a rear end portion,

a boom assembly extending from said mobile frame assembly,

said boom assembly having a first end portion pivotally connected to said mobile frame assembly by a plurality of connecting means and a second end portion spaced from said first end portion,

dislodging means connected to said boom assembly second end portion,

conveying means connected to said mobile frame assembly for receiving material from said dislodging means,

four individual retaining means secured to said mobile frame assembly front end portion, each said retaining means secured to said mobile frame assembly at a predetermined location along an axis transverse to a longitudinal axis of said mobile frame assembly, and

four individual engaging means extending longitudinally from said boom assembly first end portion, each said engaging means pivotally connected by a pivot pin to one of said retaining means to allow said boom assembly to pivot in an upward and downward direction relative to said mobile frame assembly.

4,840,433

PRESSURE CONTROL DEVICE, IN PARTICULAR FOR PRESSURE-FLUID-OPERABLE BRAKE SYSTEMS OF AUTOMOTIVE VEHICLES

Juergen Schonlau, Walluf; Alfred Birkenbach, Hattersheim, and Ralf Harth, Oberursel, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

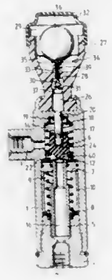
Filed Mar. 17, 1988, Ser. No. 169,562

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1987, 3709991

Int. Cl.[4] B60T *8/24, 8/26, 8/28;* G05D *16/10*

U.S. Cl. 303—9.68 **5 Claims**

1. A pressure control device for pressure-fluid-operable brake systems of automotive vehicles, comprising a housing having a longitudinal axis extending in a vertical direction and said housing incorporating a pressure control valve adapted to control pressure fluid flow between a pressure-fluid inlet and a pressure-fluid outlet of said housing, a deceleration-responsively movable inertia member in said housing, a control piston arranged in the housing, said control piston being slidable in dependence upon the pressure of the pressure fluid and the position of the inertia member, said control piston operatively connected to the pressure control valve, wherein the inertia member is provided in a chamber in the housing, said chamber being substantially free from pressure fluid, a guide element in said chamber for guiding said inertia member in a horizontal movement direction in response to deceleration forces on said inertia member the inertia member adapted to control a second valve which is mounted and operative to isolate a compartment, confined by the housing and a face of the control piston, from the chamber, said second valve connecting said chamber and said compartment wherein the record valve closes the



connection between said chamber and said compartment when said inertia member is moved into said horizontal direction thereby to constrain said control piston to a fixed position relative to said compartment.

4,840,434

VEHICLE BRAKE SYSTEM HAVING AN ANTI-SKID APPARATUS

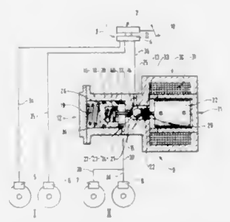
Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 1, 1985, Ser. No. 750,453

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1984, 3431326

Int. Cl.[4] B60T *8/26*

U.S. Cl. 303—113 **5 Claims**



1. A vehicle brake system comprising a brake fluid pressure means for applying a brake pressure in said brake system, front wheel brakes, rear wheel brakes, and an antiskid apparatus between said brake fluid pressure means which controls fluid flow from master cylinder to said rear wheel brakes, a brake pressure regulating valve and one brake pressure maintenance valve disposed between said brake fluid pressure means and the rear wheel brakes, said brake pressure regulating valve and said brake pressure maintenance valve are united into a valve combination and have a hydraulically self-controlling rear wheel brake pressure limiter, a first valve seat and a first movable valve element, said first movable valve element is actuatable on one end by an adjusting piston and on the other end by an electromagnet of said brake pressure maintenance valve.

4,840,435

HYDRAULIC BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES WITH ANTI-SKID CONTROL SYSTEM

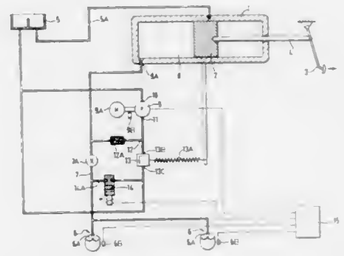
Helmut Steffes, Hattersheim, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 30, 1988, Ser. No. 252,288

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1987, 3734603

Int. Cl.[4] B60T *8/40*

U.S. Cl. 303—116 **3 Claims**



1. A hydraulic brake system for automotive vehicles with an anti-skid control system, having a master brake cylinder with a master piston and a working chamber disposed therein, a first conduit, a wheel brake cylinder connected to said master brake cylinder through said first conduit, a pressure medium storage reservoir connected to said first conduit, control valves connected between said first conduit and said reservoir, a hydraulic pump, operable through a motor, actuable via an electronic booster-and-control unit, the outlet of which is coupled via a non-return valve to said first conduit and the inlet of which is coupled to said reservoir, wherein the improvement comprises:

said first conduit being open between said master brake cylinder and said wheel brake cylinder;

a pressure control valve actuable in response to the volume of said working chamber;

the inlet of said non-return valve communicating with the outlet of said hydraulic pump and the inlet of said pressure control valve;

means communicating the outlet of said pressure control valve with said pressure medium storage reservoir;

a valve in communication with said first conduit between said master brake cylinder and said wheel brake cylinder and controlled via said electronic booster-and-control unit to open and close to bring said first conduit into communication with said pressure medium storage reservoir; and

a section of reduced cross-sectional area in said first conduit between said valve and said working chamber, said cross section being smaller than the cross section of said first conduit between said valve and said wheel brake cylinder.

4,840,436

ANTI-LOCK BRAKE SYSTEM WITH TRACTION SLIP CONTROL

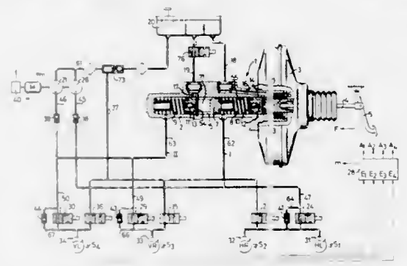
Jochen Burgdorf, Rumpenheim; Hans-Dieter Reinartz, Frankfurt am Main; Lutz Weise, Pfungstadt; Norbert Ocvirk, Offenbach; Horst P. Becker, Frankfurt am Main, and Otto Determann, Darmstadt, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 22, 1987, Ser. No. 112,310

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1986, 3635846

Int. Cl.[4] B60T *8/32*; B60K *28/16*

U.S. Cl. 303—119 9 Claims



9. An anti-lock brake system with traction slip control of the type including a pedal-actuated, auxiliary-force-assisted braking pressure generator having a master cylinder to which two break circuits each including a pair of wheel brakes are connected by two main brake lines, at least one auxiliary-pressure hydraulic pump, wheel sensor means and electronic circuit means for determining rotational behavior of the wheels and for generating electric braking-pressure control signals which, for the purpose of slip control, control an electromagnetically actuatable pressure-fluid inlet valve and outlet valve provided in the pressure-fluid lines, pistons of the master cylinder being provided with central control valves which, in a brake release position, open pressure-fluid connections between a pressure-fluid supply reservoir and pressure chambers of the master cylinder and which, in a braking position, close said pressure-fluid connections, said at leaslt one hydraulic pump connected to the supply reservoir and to the main brake lines, and comprising at least one valve provided in a pressure-fluid conduit leading from the pressure-fluid supply reservoir to the master cylinder, said at least one valve adapted to shut off pressure-fluid flow in said conduit in the event of traction control, whereby auxiliary pressure develops in said two brake circuits, including a throttling valve in one of the main brake lines which is connected to one of said pressure chambers of the master cylinder which includes a floating piston, said throttling valve adapted to preclude displacement of said floating piston in an actuating direction during traction control.

4,840,437

DYNAMIC TRACK TENSIONING SYSTEM FOR TRACKED VEHICLES

Samuel B. Henry, Royal Oak, and James J. Kuhns, Romeo, both of Mich., assignors to Cadillac Gage Textron Inc., Warren, Mich.

Filed Mar. 15, 1988, Ser. No. 168,382

Int. Cl.[4] B62D *55/30*

U.S. Cl. 305—10 11 Claims

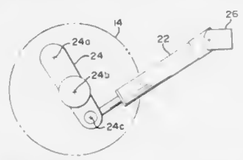
1. In tracked vehicle having tracks subject to variable tension, a dynamic track tension system comprising:

a source of hydraulic pressure;

condition detecting means for detecting vehicle conditions for and producing control signals in accordance with the vehicle conditions;

hydraulic control means including pilot valve means selectively operable to allow bidirectional flow or unidirectional flow with respect to said source, said hydraulic control means producing a control pressure; and

a pressurizable hydraulic track adjuster means for controlling the tension in each track, said pressurizable hydraulic track adjuster means coupled to the hydraulic pressure source by said hydraulic control means and having pressure therein established by said hydraulic control means in response to said control signals for conditioning said hydraulic control means to vary the pressure in said hydraulic track adjuster means for applying a variable tension to each track according to the detected vehicle conditions.



4,840,438

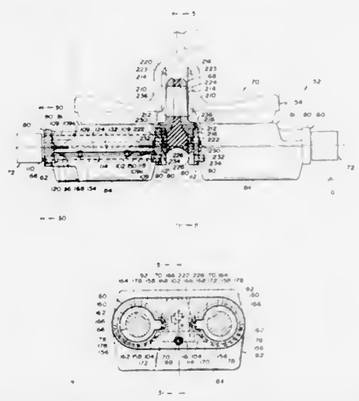
PIN AND BUSHING ASSEMBLY FOR SHOE ASSEMBLY OF TRACK LAYING VEHICLE

Robert M. Cory, Roseville, Mich., assignor to General Dynamics Land Systems, Inc., Warren, Mich.

Division of Ser. No. 752,186, Jul. 3, 1985, Pat. No. 4,700,992. This application Apr. 7, 1987, Ser. No. 35,442

Int. Cl.[4] B62D *55/21*

U.S. Cl. 305—36 6 Claims



1. In an endless track for a track laying vehicle, said endless track being of the type including a plurality of shoe assemblies and connectors that extends between the shoe assemblies, and each shoe assembly including a pair of pin assemblies, each pin assembly comprising: a sleeve received within the associated shoe assembly; said sleeve including a pair of sheet metal sleeve members formed to define a generally round opening through the sleeve; a metal pin received within the opening in the sleeve and having opposite ends projecting outwardly from the sleeve to permit connection of adjacent shoe assemblies by connectors at the opposite ends of the pins thereof; a resilient bushing molded in situ of resilient material between the sleeve and the pin and bonded to both the sleeve and the pin; and the sleeve including a positioning flange that projects transverse to the pin and is cooperatively defined by the sleeve members and the resilient bushing material between the sleeve and the pin.

4,840,439

DISPLAY CABINET

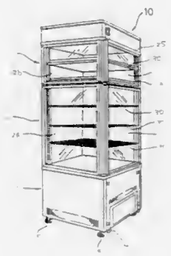
Kenichi Nara, and Ryoichi Takahashi, both of Maebashi, Japan, assignors to Sanden Corporation, Gunma, Japan

Continuation of Ser. No. 20,088, Feb. 27, 1987, abandoned. This application May 24, 1988, Ser. No. 201,323

Claims priority, application Japan, Mar. 3, 1986, 61-30215[U]; Mar. 3, 1986, 61-30216[U]

Int. Cl.[4] E05B *65/46*

U.S. Cl. 312—116 21 Claims



1. A display cabinet comprising:

at least one structural member defining a compartment for displaying and storing merchandise, said structural member including a door movable between open and closed positions, said door when in the open position providing access to merchandise stored in said compartment;

a shelf disposed in said compartment to provide a support surface for merchandise stored in said compartment, said shelf having a shelf back portion, a shelf front portion, a shelf first side portion, and a shelf second side portion opposite to said shelf first side portion;

a slideable rod rectangular frame element positioned a discrete distance above and parallel to said shelf to position the merchandise supported on said support susrface of said shelf by sliding towards said shelf front portion and pushing merchandise therewith, the discrete distance being sufficient to prevent merchandise from tipping over when engaged and pushed relative to said shelf by said slidable rod rectangular frame element;

first and second spaced elongated sleeves through which said slideable rod rectangular frame element is slidably received;

a first support element fixing said first spaced elongated sleeve at said shelf first side portion;

a second support element fixing said second spaced elongated sleeve at said shelf second side portion, said first and second support elements positioning said first and second spaced elongated sleeves, respectively, so that said slideable rod rectangular frame element is positioned at the discrete distance relative to said shelf for sliding movement relative to said shelf; and

a stopper element at said shelf back portion which holds, together with said first and second spaced elongated sleeves, said slideable rod rectangular frame element at the discrete distance when said slideable rod rectangular frame element is fully inserted in a stationary position in said compartment.

4,840,440

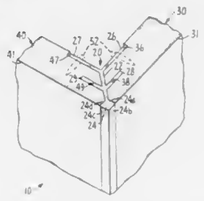
CORNER CONSTRUCTION APPARATUS AND METHOD

Monrow Dieter, P.O. Box 2008, Paso Robles, Calif. 93447

Continuation-in-part of Ser. No. 800,468, Nov. 21, 1985, abandoned. This application Nov. 3, 1986, Ser. No. 926,449

Int. Cl.[4] A47F *3/00*

U.S. Cl. 312—140 21 Claims



1. A cabinet corner constructed extrusion for mating with and joining a pair of side panels comprising a plurality of surface sections defined in cross-section by:

an elongate rigid rib section,

an external corner section positioned at one end of said rib section with a diagonal of said corner section aligned with the length of said rib section and having a pair of remote exposed faces and a pair of side faces,

a pair of rigid external leg sections normal to one another and positioned at the other end of said rib section with the angle between said external leg sections bisected by the length of said rib section, and

a pair of rigid internal leg sections normal to one another, each of said internal leg sections being parallel to one of said external leg sections and located along said rib section substantially mid-way between the remote corner of said corner section and said external leg sections, the lengths of said internal leg sections being such that a normal projection of each internal leg section onto the adjacent external leg section ends substantially halfway along the length of such external leg section.

4,840,441

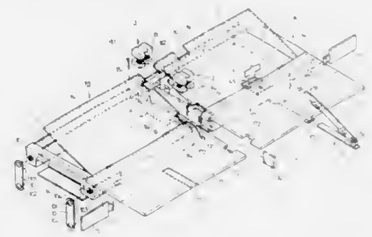
MULTI-FUNCTION SATCHEL

Hwa-Yang Tsay, 109, Cheng Shin Road, Kaohsiung, Taiwan

Filed Feb. 12, 1988, Ser. No. 155,497

Int. Cl.[4] A47R *27/00*

U.S. Cl. 312—231 14 Claims



1. A multi-function satchel comprising:

a pair of rectangular, generally flat cases which are separate from each other, each case comprising (a) a large rectangular side, an opposed large rectangular side, four peripheral walls separating said large side and opposed large side by a a short distance such that the sides and peripheral walls define a flat case volume, and an interior wall be-

tween the sides which separate the case volume into a large space and at least one smaller space, (b) a pivotally moveable board mounted to the case to cover the large side of the case, and (c) a moveable lid pivotally mounted to the case to lie over the board on the large side of the case, the movable lid being pivotable through 180° about its pivot axis to form a generally planar surface with the board when the board closes the large side of the case,

first connecting means for connecting the cases together side by side with a peripheral wall of one case abutting a peripheral wall of the other case such that the respective two boards and the two lids, when turned through 180°, together form an enlarged, generally planar writing surface,

a second connecting means for connecting the two cases closed upon each other with their respective boards and lids closed onto their respective large sides of the case and the two large sides facing each other, whereby the two large spaces store large objects such as books or the like, and

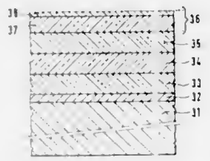
wherein a peripheral wall of each said case includes an opening therein for access to its large space.

4,840,442

MULTIDIELECTRIC MIRROR FOR CARBON DIOXIDE LASER PROVIDING THE MID INFRARED, IN HIGH REFLECTANCE WITH GOOD PROTECTION AGAINST MECHANICAL ATTACK

Jacques Mouchart, L'Hay les Roses; Gérard Villela, Marcoussis; Franck Dutois, Antony, and Bernard Pointu, Ballancourt sur Essonne, all of France, assignors to Compagnie Generale D'Electricite, Paris, France

Filed Oct. 26, 1987, Ser. No. 112,159
Claims priority, application France, Oct. 28, 1986, 86 14971
Int. Cl.[4] G02B *1/10, 5/00; B32B 33/00*
U.S. Cl. 350—1.6 **4 Claims**



1. A multidielectric mirror for reflecting light in the mid infrared from a carbon dioxide laser, said mirror comprising:

a substrate;

a reflector on said substrate, said reflector being made up from a stack of quarter-wavelength layers which succeed one another from the substrate, said layers being essentially constituted by low absorption dielectric materials having low absorption for said light to be reflected and alternating between having low and high refractive indeces and terminating with a high index last layer, each of said layers having an optical thickness close to a quarter-wavelength of said light so as to confer high reflectance to said mirror;

said mirror including a protective surface layer constituted by a protective dielectric material having greater hardness than said high index dielectric material;

said mirror including the improvement whereby at least the last of said high index quarter wavelength layers is a composite layer comprising:

a base layer whose optical thickness is a major fraction of the optically thickness of said composite layer and which is constituted by one of said dielectric materials having low absorption and high refractive index; and

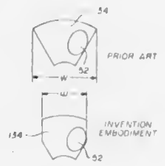
said protective surface layer, the optical thickness of said protective layer constituting a minor fraction of the optical thickness of the composite layer, and said protective material having a higher refractive index than said high index and low absorption dielectric material so as to simultaneously obtain good mechanical protection for the stack together with increased reflectance even if the absorption of said protective material for said light is somewhat greater than the absorption of said low absorption dielectric materials.

4,840,443

HOLOGRAPHIC SCANNER SPINNER

John R. Debesis, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 31, 1988, Ser. No. 200,289
Int. Cl.[4] G02B *5/32, 26/10*
U.S. Cl. 350—3.71 **3 Claims**



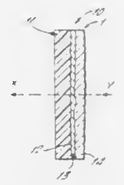
1. A holographic scanner spinner including a disc having an axis and a plurality of sector-shaped facets bounded by radial lines extending radially from said axis, each facet having a diffraction grating pattern, each pattern extending to the two radial lines bounding its facet in regions between a first, and a second, greater radial distance from said axis and being radially spaced from said two radial lines in regions radially outwardly from said second radial distance.

4,840,444

COMPOSITE HOLOGRAPHIC ELEMENTS

Brian Hewitt, The Street, 2 Croft Cottages, Wattisfield, Suffolk, England IP22 1NS

PCT No. PCT/GB87/00579, § 371 Date Apr. 13, 1988, § 102(e) Date Apr. 13, 1988, PCT Pub. No. WO88/01403, PCT Pub. Date Feb. 25, 1988
PCT Filed Aug. 17, 1987, Ser. No. 190,686
Claims priority, application United Kingdom, Aug. 15, 1986, 8619922
Int. Cl.[4] G03H *1/22*
U.S. Cl. 350—3.85 **4 Claims**



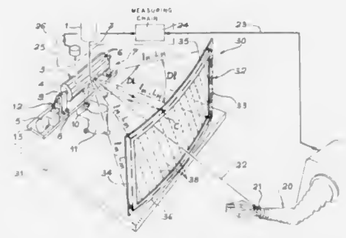
1. A composite optical element comprising a substrate having on one surface a surface relief pattern capable of providing a holographic image when viewed in reflection, a partially reflective layer facing the said surface of the substrate, and at least one thin optically absorbent layer adjacent the substrate to provide absorption of light incident on the substrate.

4,840,445

SYSTEM FOR LOCATING AN OBJECT IN SPACE

Bernard Lerat, Thones, France, assignor to Commisariat A L'Energie Atomique, Paris, France

Filed Jun. 9, 1988, Ser. No. 204,674
Claims priority, application France, Jun. 10, 1987, 87 08060
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.8 **9 Claims**



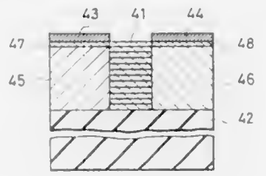
1. A system for locating an object, comprising a light emitting means emitting a light beam, a device that communicates, to the emitted light beam, a deflection that is variable as a function of time, making it perform scans along two directions, i.e. latitude and longitude, of a space in which the object is placed, a device enabling the measurement of this deflection, a first sensor which is fixed to the object and is sensitive to a first portion of the deflected light beam as well as a means to determine the direction of a second portion of the deflected light beam at the instant when the first portion of the deflected light beam sensitizes the first sensor.

4,840,446

PHOTO SEMICONDUCTOR DEVICE HAVING A MULTI-QUANTUM WELL STRUCTURE

Hitoshi Nakamura, Kanagawa; Shinji Sakano, Hachiouji; Hiroaki Inoue; Toshio Katsuyama, both of Hachiouji, and Hiroyoshi Matsumura, Saitama, all of Japan, assignors to Hitachi Cable, Ltd. and Hitachi, Ltd., both of Tokyo, Japan

Filed Sep. 9, 1987, Ser. No. 94,601
Claims priority, application Japan, Sep. 16, 1986, 61-215806
Int. Cl.[4] G02F *1/15*
U.S. Cl. 350—96.13 **10 Claims**



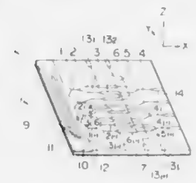
1. In a semiconductor device which has a multi-quantum well structure formed by laminating thin semiconductor layers on a semiconductor substrate and which operates in accordance with changes in refractive index caused by variations in the number of carriers in the region of said multi-quantum well structure, a photo semiconductor device which comprises means for injecting said carriers into said multi-quantum well structure region in a direction parallel to the surface of the laminated thin semiconductor layers constituting said multi-quantum well structure, wherein at least a portion of an optical waveguide provided on said semiconductor substrate has said multi-quantum well structure, and said means for injecting said carriers are provided on both sides, respectively, of that portion of said optical waveguide, so that said portion and said means for injecting said carriers from an optical modulating region.

4,840,447

LIGHT MODULATING DEVICE ARRAY

Keiji Kataoka, Kawagoe, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 10, 1987, Ser. No. 95,616
Claims priority, application Japan, Sep. 10, 1986, 61-211563
Int. Cl.[4] G02B *6/10; G02F 1/00*
U.S. Cl. 350—96.14 **10 Claims**



6. A light modulating device array formed in a surface of a crystal plate with an electrooptic effect, comprising:

an optical input coupling waveguide receiving a laser beam from a laser source;

an array of tapered waveguides arranged in parallel, each for passing a light beam from the optical input coupling waveguide towards a narrow end thereof;

a plurality of light modulators juxtaposed in a predetermined direction and receiving light beams from the tapered waveguide array,

each light modulator including an input waveguide coupled to said narrow end of the tapered waveguide, a pair of waveguides formed by bifurcating the input waveguide, and electrodes disposed on said pair of waveguides, for applying a control field thereto; and

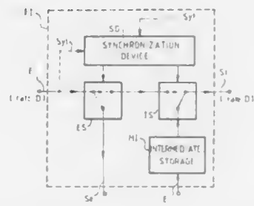
means connected to said electrodes, for applying the same potential to opposite ones of pairs of electrodes of adjacent light modulators and for enabling a different potential to be applied to others of said electrodes.

4,840,448

OPTICAL FIBER TRANSMISSION APPARATUS, IN PARTICULAR FOR SUBMARINE USE

Jean Thiennot, Gif-Sur-Yvette, France, assignor to Etat Francais Represente Par Le Ministre des Postes et Telecommunications-Centre National D'Etudes des Telecommunications, Issy Les Moulineaux, France

Filed Apr. 7, 1988, Ser. No. 178,986
Claims priority, application France, Apr. 14, 1987, 87 05306
Int. Cl.[4] G02B *6/28*
U.S. Cl. 350—96.16 **35 Claims**



1. An optical fiber cable transmission apparatus for distributing an underwater multiplexing function by enabling traffic

reconfiguration comprising a plurality of repeater-interchanger modules, each said repeater interchanger module enclosed in a housing and interchanging frame segments between at least two selected fibers of said cable, each said repeater-interchanger module comprising

means for receiving frame segments from groups of signal streams on fibers in said optical fiber cable;

means for converting said received frame segments to electrical signals for processing;

means for converting processed electrical signals to optical frame segments;

means for transmitting said optical frame segments to fibers in said cable;

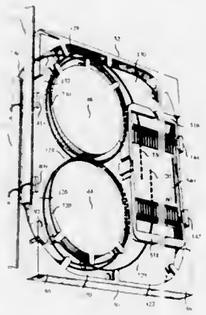
at least one interchange module associated with a synchronization means, said interchange module having electrical means for transferring data between said selected fibers by extracting segments from a first group of signal streams of a useful signal and for replacing said extracted segments with segments from a second group of signal streams.

4,840,449

OPTICAL FIBER SPLICE ORGANIZER

Shahryar Ghandeharizadeh, Hopatcong, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 27, 1988, Ser. No. 149,036
Int. Cl.[4] G02B 6/35
U.S. Cl. 350—96.20 8 Claims



1. A device for organizing optical fibers separated from at least one optical fiber cable comprising:

a rectangular base plate of prescribed width and length divided along its width into first and second rectangular sections;

sidewalls on the opposite edges along the width of the rectangular base plate; and

an optical fiber splice tray having a pair of opposite entrance sides for optical fiber ends;

the first rectangular section of the base plate comprising first and second cylinders extending outward a predetermined distance from the base plate, each cylinder having a diameter greater than twice the minimum bend radius of the separated optical fiber and being spaced from the other cylinder, from the sidewall adjacent thereto and from the edge of the rectangular base plate along the length of the first rectangular sections;

the second rectangular section of the base plate comprising means for mounting the optical fiber splice tray a predetermined distance from the base plate to form a channel for separated optical fibers between said base plate and the splice tray;

the at least one optical fiber cable running substantially parallel to the edge of the first section of the rectangular base plate along its length;

the space between the first cylinder and the sidewall adjacent thereto in the first rectangular section forming a first channel having an entrance at the edge of the rectangular base plate along its length for receiving a plurality of optical fibers separated from the at least one optical fiber cable running substantially parallel to the edge of the first rectangular section along its length,

a first passageway for directing at least one optical fiber separated from the at least one optical fiber cable running parallel to the length of the first rectangular section from the entrance of the first channel to one entrance side of the optical fiber splice tray, said first passageway guiding the at least one optical fiber at least around the first cylinder in a first direction through the first channel, the channel formed by the space between the first and second cylinders and the channel between the base plate and the splice tray in variable length loops each exceeding the minimum bend radius of the separated optical fiber, and

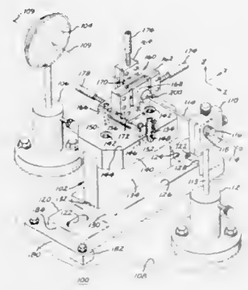
a second passageway for directing at least one other optical fiber separated from the at least one optical fiber cable running parallel to the length of the first rectangular section from the entrance of the first channel to the other entrance side of the optical fiber splice tray, said second passageway guiding the at least one other optical fiber at least around the first cylinder in a first direction and around the second cylinder in a second direction opposite the first direction through the first channel, the channel formed by the space between the first and second cylinders, the channel formed by the space between the second cylinder and the sidewall adjacent thereto and the channel between the base plate and the splice tray in variable length loops each exceeding the minimum bend radius of the optical fiber.

4,840,450

APPARATUS AND METHOD FOR OPTICAL FIBER END POSITIONING FOR LASER INJECTION

Marshall G. Jones; Angel L. Ortiz, Jr., both of Scotia; Tushar S. Chande, and John L. August, Jr., both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 3, 1988, Ser. No. 151,844
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.20 18 Claims



1. Apparatus for positioning an end of an optical fiber at a predetermined location for injection with a laser beam, said fiber end predetermined location being uniquely defined relative to a laser beam axis and a reference surface, the fiber being mounted in fiber holding means for adjustably moving said fiber end in x, y and z mutually orthogonal coordinate directions to achieve said predetermined location, both the beam axis and a longitudinal axis of a fiber end portion adjoining the fiber end being parallel to said z-direction, said apparatus comprising:

positioning means for adjustably positioning an object affixed thereto in three mutually orthogonal coordinate directions;

a mechanical seat affixed to said positioning means and including a planar seating surface for seating the fiber end, a predetermined position on said seating surface allocated for seating the fiber end when positioned at said predetermined location; and

means for supporting said positioning means in a unique predetermined relation to said reference surface so that the three orthogonal adjusting directions thereof are parallel to said x-, y-, and z-directions and said planar seating surface is both perpendicular to said z-direction and positioned to confront the fiber end positioned at said predetermined location, said supporting means further supporting said positioning means so that said seating surface can be adjusted in said x-, y- and z-directions until reaching first x, y and z positions effective to position the fiber end to substantially abut said seating surface predetermined position, said positioning means enabling restoration of said first x, y and z positions following positioning means readjustment along at least one of said x-, y- or z-directions to introduce sufficient clearance between said mechanical seat and the fiber end to allow removal of said positioning means and said mechanical seat;

so that for an initial installation of a first optical fiber with its fiber end positioned at said fiber end predetermined location, said positioning means can be adjustably positioned to said first x, y and z positions with the first fiber end substantially abutting said seating surface predetermined position and then said positioning means can be removed following readjustment in at least one of said x-, y- or z-directions and further so that in order to subsequently determine if the first fiber end is still positioned at said predetermined location or to install a second fiber in place of the first fiber, said positioning means is first reinstalled and adjusted so that said seating surface is positioned at said first x, y and z positions and then the fiber to be positioned is moved until the end thereof substantially abuts said seating surface predetermined position.

10. A method for positioning an end of an optical fiber at a predetermined location for injection with a laser beam, said fiber end predetermined location being uniquely defined relative to a beam axis and a reference surface, an end portion of the fiber proximate the fiber end being mounted in fiber holding means for adjustably moving said fiber end in x, y, and z mutually orthogonal coordinate directions to achieve said predetermined location, both the beam axis and a longitudinal axis of the fiber end portion being parallel to said z-direction, said method comprising the steps of:

(a) mounting a planar seating surface of a mechanical seat to confront the end of a first optical fiber where that fiber end is positioned at said predetermined location, said seating surface including a predetermined position allocated for seating the fiber end when positioned at said predetermined location, said seating surface being perpendicular to said z-direction;

(b) adjusting the position of said mechanical seat in said x-, y- and z-directions until reaching first x, y and z positions effective to position said first fiber end to substantially abut said seating surface predetermined position;

(c) readjusting the position of said mechanical seat in at least one of said x-, y- or z-directions by a distance sufficient to effect a clearance between said mechanical seat and the first fiber end to allow removal of said mechanical seat;

(d) removing said mechanical seat to enable injection of the laser beam into the first fiber end;

upon replacement of the first fiber with a second fiber, the second fiber being mounted in the fiber holding means, positioning the second fiber end at the fiber predetermined location by performing the steps of:

(e) remounting the mechanical seat to a position identical to that which it held in step(b) relative to said x-, y- and z-directions including adjustment to restore said first x, y and z positions;

(f) moving the second fiber in said x-, y- and z-directions until the end thereof substantially abuts said seating surface predetermined position;

(g) repeating step(c); and

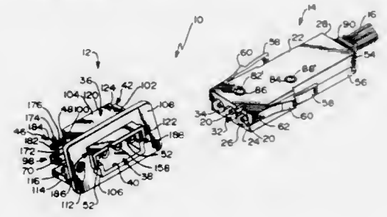
(h) removing said mechanical seat to enable injection of the laser beam into the second fiber end.

4,840,451

SHIELDED FIBER OPTIC CONNECTOR ASSEMBLY

Stephen A. Sampson, Downers Grove; Philip J. Dambach, and David L. Brunker, both of Naperville, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Dec. 8, 1987, Ser. No. 130,145
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.20 22 Claims



1. A fiber optic receptacle connector for connecting at least one optical-electronic device of the type including a body with a major face and having a lens projecting from said face to at least one end of an optical fiber secured in a plug connector, said receptacle connector comprising;

a plug-receiving socket with a front opening and a rear wall, said rear wall including a corresponding number of spaced interface apertures, each interface aperture being aligned with and dimensioned to closely coaxially receive the projecting lens of one said optical-electronic device, said rear wall further including a corresponding number of tubular projections coaxially aligned with and surrounding each aperture extending forwardly into the plug-receiving socket,

whereby, as a plug connector is inserted into the socket, each said optical fiber end is received and guided by a said tubular projection into abutting coaxial alignment with the aperture and lens, respectively.

4,840,452

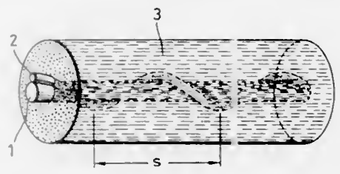
LIGHT WAVE CONDUCTOR-SENSOR FOR TENSION

Helmut Federmann, Bergisch Gladbach; Friedrich K. Levacher, Brauweiler, and Georg Noack, Bergisch, all of Fed. Rep. of Germany, assignors to Felten & Guilleaume Energietechnik GmbH, Cologne, Fed. Rep. of Germany

Filed Nov. 14, 1985, Ser. No. 798,014
Claims priority, application Fed. Rep. of Germany, Nov. 14, 1984, 8433322; Jul. 27, 1985, 3526966
Int. Cl.[4] G02B 6/44; H01J 5/16
U.S. Cl. 350—96.23 23 Claims

1. A light wave conductor-sensor for tension, comprising a primary coated light wave conducting element; at least one coil wound on said primary coated light wave conducting element and forming together with the latter a sensor core; and a compound including longitudinally extending tension-proof fibers embedded in a synthetic plastic matrix, said compound forming a casing for said sensor core, said primary coated light

wave conducting element having a predetermined diameter, said coil having a length of twist which is greater than 2.2 times the diameter of said primary coated light wave conducting element.



4,840,453

COMPOSITE OVERHEAD STRANDED CONDUCTOR

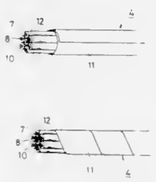
Yoshinobu Kitayama, Kanagawa, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 15, 1986, Ser. No. 852,464

Claims priority, application Japan Apr. 17, 1985, 60-57908[U]; Dec. 4, 1985, 60-187003[U]

Int. Cl.⁴ G02B *6/44*

U.S. Cl. 350—96.23 **8 Claims**



1. In a composite overhead stranded conductor having an optical fiber comprising a protective tube disposed around a spacer having a plurality of spiral grooves formed in its periphery for accommodating optical fibers, the improvement wherein the optical fibers accommodated within each spiral groove comprises a plurality of glass fibers, each having a primary coating layer bonded thereto said glass fibers being stranded together with a thin heat-resistant tape applied to and over the stranded fibers, contacting the stranded fibers continuously over an axial direction of said tube and holding them in a bundle such that the outer diameter of said bundle is approximately the same as the outer diameter of said stranded fibers.

4,840,454

OPTICAL CABLE AND METHOD OF MANUFACTURING

Ernst Mayr, Starnberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschat, Berlin and Munich, Fed. Rep. of Germany

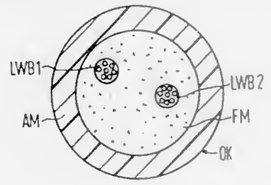
Filed Aug. 17, 1987, Ser. No. 86,273

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1986, 3629827

Int. Cl.⁴ G02B *6/44*

U.S. Cl. 350—96.23 **12 Claims**

1. In an optical cable having an outer cladding containing at least one light waveguide bundle containing a plurality of light waveguides and a filling compound providing longitudinal tightness of the bundle in the cable, the improvements comprising each light waveguide bundle being saturated with an adhering, first filling compound which has a viscosity and still holds together the light waveguides of each light waveguide bundle and wherein the remaining space within the outer cladding being filled with a second filling compound having a viscosity that is lower than the viscosity of the first filling compound.



4,840,455

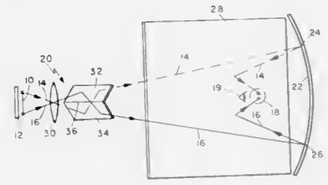
3-DIMENSIONAL OPTICAL VIEWING SYSTEM

Paul S. Kempf, Solana Beach, Calif., assignor to Paul Stuart Kempf and Pilar Moreno Family Trust, Encinitas, Calif.

Filed Mar. 20, 1985, Ser. No. 714,102

Int. Cl.⁴ G02B *27/22*

U.S. Cl. 350—137 **11 Claims**



1. An optical system for providing a 3-dimensional view of an object, comprising:

means for holding an object to be viewed;

image forming and separating means for forming and projecting two different images of the same object from different angles along diffrent optical paths through the system, the image forming and separating means comprising a projection lens and a pair of angled mirrors positioned to shutter opposite halves of the lens from each other to project separate images from opposite halves of the lens; and

means for directing the images separately into the retina of at least one eye of an observer.

4,840,456

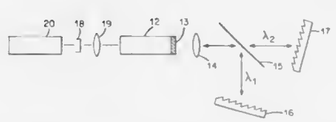
METHODS OF AND APPARATUS FOR GENERATION OF RADIO FREQUENCY SIGNALS

Donald M. Fye, Wayland, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 28, 1987, Ser. No. 138,233

Int. Cl.⁴ G02B *27/44*; H01S *3/082*

U.S. Cl. 350—162.17 **22 Claims**



1. An extremely high frequency electrical generator comprising;

means for generating a collimated coherent light beam along a first path;

beam splitting means oriented along said first path for splitting said light beam into two components, one of said components being directed along a second path, and the other of said components being directed along a third path, said second and third paths being non-coincident;

a first frequency selective element means oriented along said second path for receiving said one component and reflecting back, along said second path, toward said beam splitting means, light at the wavelength λ_1;

a second frequency selective element means oriented along said third path for receiving said other component and reflecting back, along said third path, toward said beam splitting means, light at the wavelength λ_2;

whereby said beam splitting means combines said light at said wavelengths λ_1 and λ_2 along a fourth path; and

a photodetecting means oriented along said fourth path for receiving light at said wavelengths λ_1 and λ_2 and for providing electrical signals at the wavelength, $|\lambda_1-\lambda_2|$.

4,840,457

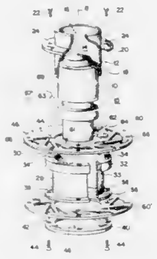
ANGLED STRUT DIAPHRAGM SPRING

James N. Remer, Cherry Hill, N.J., assignor to General Electric Company, Camden, N.J.

Filed Dec. 17, 1987, Ser. No. 134,121

Int. Cl.⁴ G02B *7/02*

U.S. Cl. 350—255 **10 Claims**



1. An arrangement supporting a lens relative to a frame for providing motion normal to a flat surface of a disc storage medium, comprising:

a lens arrangement adapted for motion in a direction along a lens axis and normal to said flat surface of said disc;

at least one thin, flat support means, said support means including a first circular support region fixed to the periphery of said lens arrangement, said first circular support region having a diameter, said support means further including a second circular support region mechanically affixed to said frame, said second circular support region having a diameter greater than said diameter of said first circular support region and being coaxial therewith, said support means further comprising a plurality of elongated arms extending between and interconnecting said first and second circular support regions of said support means, each of said elongated arms having substantially straight, parallel first and second elongated sides, one end of said first elongated side of each arm joining said first circular support region at a respective reference radial from said axis, and a second end of said first elongated side joining said second circular support region at a respective second radial angularly displaced from said reference radial in one angular direction, one end of said second elongated side of each arm joining said first circular support region at a respective third radial displaced from said reference radial in an angular direction opposite to said one angular direction, the other end of said second elongated side extending to join said second circular support region at a point within the arc subtended by said reference and second radials.

4,840,458

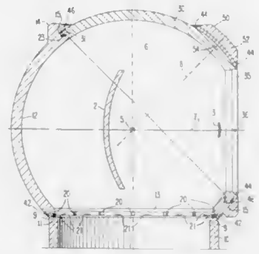
FIXED SHUTTER CONSTRUCTION FOR A SPLIT-SPHERE OBSERVATORY DOME

Ethan W. Cliffton, 3435 Army St., Suite 332, San Francisco, Calif. 94110

Filed Dec. 8, 1987, Ser. No. 130,125

Int. Cl.⁴ G02B *27/00*

U.S. Cl. 350—319 **7 Claims**



1. In a split-sphere observatory dome of the type comprising:

a cylindrical base having a circular peripheral edge.

an antrum shell having a first circular peripheral edge rotatably supported on the circular peripheral edge of the cylindrical base and a second circular peripheral edge disposed at an acute angle with respect to said first circular peripheral edge,

a rotor shell having a first circular peripheral edge rotatably supported on the second circular peripheral edge of the antrum shell and a second circular peripheral edge disposed at an angle with respect to said first circular peripheral edge of said rotor shell and tangential thereto at a point, said second circular peripheral edge of said rotor shell defining the periphery of a planar oculus;

wherein upon rotation of the rotor shell said oculus revolves about an axis of rotation along a path wherein the orientation of the plane of the oculus varies between a vertical orientation and a horizontal orientation;

the improvement comprising:

a shutter lid fixed to said antrum shell proximate said second circular peripheral edge of said antrum shell, said shutter lid covering a portion of said rotor shell and exposing a portion of said rotor shell, said oculus being revolvable between a position wherein said lid completely covers said oculus and a position wherein said oculus is completely exposed.

4,840,459

MATRIX ADDRESSED FLAT PANEL LIQUID CRYSTAL DISPLAY DEVICE WITH DUAL ENDED AUXILIARY REPAIR LINES FOR ADDRESS LINE REPAIR

Michael F. Strong, Patersonville, N.Y., assignor to General Electric Co., Schenectady, N.Y.

Filed Nov. 3, 1987, Ser. No. 116,199

Int. Cl.⁴ G02F *1/13*; G09G *3/36*

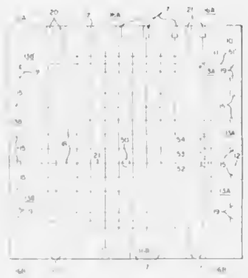
U.S. Cl. 350—333 **7 Claims**

1. An information display device comprising:

(a) a plurality of optical display elements arranged in an X-Y matrix format;

(b) a plurality of main X address lines of electrically conductive material;

(c) a plurality of main Y address lines of electrically conductive material, said X and Y address lines being transversely oriented to each other;
(d) each of said optical display elements being connected to a single main X address line and to a single main Y address line through an individual switching device whereby each of said elements has a unique X-Y address in the said matrix; and main X and Y address lines being adapted to supply energizing and switching signals to said optical display elements to provide an optical output;
(e) a plurality of auxiliary address lines of electrically conducting material crossing over each of said main X and main Y address lines at a plurality of crossover points said auxiliary address lines being electrically insulated from the crossover points each of said auxiliary address lines



adapted to be connected to one of said main address lines at a crossover point to repair any open circuited main address line to allow said repaired main address line to be driven from said auxiliary line, the number of auxiliary lines associated with said main X and Y address lines being less in number than the main address lines;
(f) each of said auxiliary lines having signal input pads at each end so that said auxiliary line may be driven from both ends; whereby severance of an auxiliary line beyond the crossover point at which said auxiliary line is connected to a main line converts an auxiliary line into two repair line portions, said portion beyond the initial point of repair being adapted to be connected to any one of the main address lines beyond said initial point of repair for further repair.

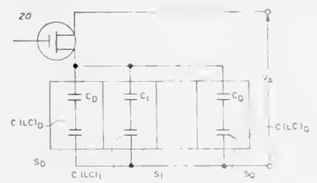
4,840,460

APPARATUS AND METHOD FOR PROVIDING A GRAY SCALE CAPABILITY IN A LIQUID CRYSTAL DISPLAY UNIT

Anthony J. Bernot, Gilbert, and Michael J. Johnson, Phoenix, both of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 13, 1987, Ser. No. 120,456
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—333 **20 Claims**

8. The method of implementing a gray scale for a pixel in a liquid crystal display, said method comprising the steps of:
dividing said pixel into an plurality of subpixels;
enclosing each subpixel between a first and a second conducting surface;
dividing each subpixel into a first and a second volume, said first volume proximate said first conducting surface, said second volume proximate said second conducting surface, said first and said second volume sharing a common boundary;
placing a liquid crystal material in said first volume;
fabricating said second volume with a dielectric material; and
applying a voltage to between said first and said second conducting surface, said voltage causing an elelctric field to be applied to said liquid crystal material, said electric



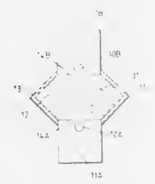
field being determined by subpixel parameters, said subpixel parameters adjusted to provide optical activity saturation of each subpixel for a preselected voltage.

4,840,461

OPTICAL SWITCHING DEVICES HAVING LIQUID CRYSTAL WITH SPLAYED MOLECULAR ORIENTATION

Christopher S. Winter, and Raman Kashyap, both of Ipswich, England, assignors to British Telecommunications public limited company, United Kingdom

Filed Oct. 2, 1987, Ser. No. 103,734
Claims priority, application United Kingdom, Oct. 7, 1986, 8624071; Jan. 20, 1987, 8701174
Int. Cl.[4] G02F *1/13*; G02B *6/42*; H01P *1/10*
U.S. Cl. 350—346 **17 Claims**



1. An optical switch which comprises:
a confining region associated with and between at least two optical path regions;
said confining region including a liquid crystal control region which is switchable between two refractive index states for switchably coupling optical signals between said two path regions and having a splayed molecular orientation in at least one of said states so as to reduce switch sensitivity to the polarization of optical signals in said path regions.

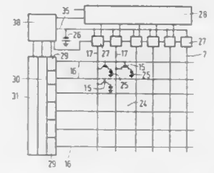
4,840,462

METHOD OF DRIVING A FERROELECTRIC LIQUID CRYSTAL DISPLAY DEVICE AND ASSOCIATED DISPLAY DEVICE TO ACHIEVE GRAY SCALE

Wilbert J. A. M. Hartmann, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 25, 1988, Ser. No. 160,424
Claims priority, application Netherlands, Mar. 17, 1987, 8700627
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—350 S **9 Claims**

1. A method of driving a display device for displaying grey scales, comprising a ferro-electric liquid crystal between two supporting plates and a system of pixels arranged in rows and columns, each pixel being constituted by picture electrodes provided on the facing surfaces of the supporting plates, and a system of row and column electrodes, at least one row of pixels being selected via a row electrode during a line selection period, data signals being presented via the column electrodes, and the row of pixels, prior to selection, being brought to an extreme state by means of an auxiliary signal, characterized in that during at least a part of the line selection period the pixels are connected via active switching elements to the column electrodes in order to present data signals to the pixels, in that the auxiliary signal is presented to the pixels via the same switching elements, the auxiliary signal being presented at an instant before the commencement of the line selection over at



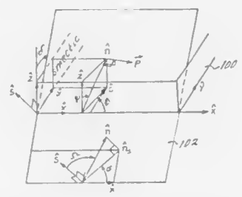
least a period which is equal to the switching period of the ferro-electric medium and which has such a duration and amplitude that the extreme transmission state is reached, in that after the line selection period the pixels assume a transmission state which is substantially exclusively determined by the data presented, and characterized in that the grey scale is determined by the duration and the amplitude of the data signal presented during the period when the row of pixels is selected for data display.

4,840,463

SURFACE STABILIZED FERROELECTRIC LIQUID CRYSTAL DEVICES

Noel A. Clark, 3106 Kittrell Ct., Boulder, Colo. 80303, and Sven T. Lagerwall, 30 Snackvagen, Goteborg, Sweden

Division of Ser. No. 88,482, Aug. 19, 1987, Pat. No. 4,813,767, which is a continuation of Ser. No. 797,021, Nov. 12, 1985, abandoned, which is a division of Ser. No. 571,733, Jul. 7, 1983, Pat. No. 4,563,059, which is a continuation-in-part of Ser. No. 456,844, Apr. 10, 1983, abandoned, which is a continuation of Ser. No. 110,451, Jan. 8, 1980, Pat. No. 4,367,924. This application Jul. 28, 1988, Ser. No. 225,464
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—350 S **19 Claims**



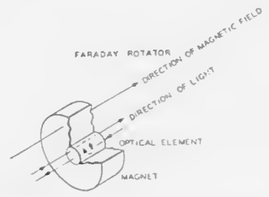
1. A process of making a liquid crystal device including a ferroelectric liquid crystal, molecules, having long axes, in a bulk of said liquid crystal forming helices and first and second means for containing said liquid crystal, said process comprising the steps of:
forming layers of said molecules at an angle different from 90° to said first and second means;
aligning the molecules of said liquid crystal adjacent to at least said first means at an angle $\Omega(\alpha)$ from the normal to said first means, said angle $\Omega(\alpha)$ being a predetermined function of an angle α, said angle α being an angle between a reference vector in a plane parallel to said first means and a projection of said long axes of said molecules onto said plane, said aligning step allowing said molecules to move between at least two particular orientations; and
suppressing the formation of said helices.

4,840,464

OPTICAL ISOLATOR EMPLOYING A GERMANIUM-ARSENIC-SELENIUM COMPOSITION

Donald K. Wilson, 102 Hillside Ave., West Caldwell, N.J. 07006

Filed Mar. 28, 1988, Ser. No. 172,779
Int. Cl.[4] G02F *1/09*
U.S. Cl. 350—355 **13 Claims**



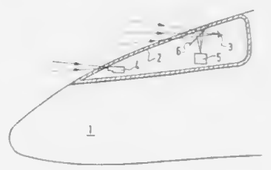
1. A Faraday rotor comprising an optical element in which is rotated a plane of polarization of polarized light along an optical axis, said optical element comprising a rod comprising an optically transmitting composition comprising from about 15 wt. % to about 50 wt. % germanium, from about 5 wt. % to about 20 wt. % arsenic, and from about 30 wt. % to about 80 wt. % selenium; and means for generating a magnetic field along the optical axis of said optical element, thereby rotating said plane of polarization of polarized light in said optical element.

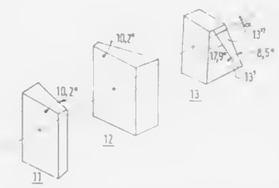
4,840,465

DEVICE FOR CORRECTING DISTORTION

Fernand R. Loy, Sceaux; Jean-Claude Perrin, Macon, and Joël Rollin, Vanves, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 19, 1987, Ser. No. 123,034
Claims priority, application France, Nov. 21, 1986, 86 16234
Int. Cl.[4] G02B *13/10, 27/14*
U.S. Cl. 350—421 **6 Claims**





1. A device correcting the differential distortion resulting

from superimposing the images received by first and second receivers sensitive in a given spectral band, said images resulting from simultaneous observation of a field of view at two distinct locations through a shield transparent in said given spectral band, said shield having a shape generating distortion without rotational symmetry, said device comprising an optical correction system having a modular structure using parallel beams and being arranged between said shield and said second receiver, said system introducing a distortion having a curvature and variation of length of lines opposite those of said differential distortion.

4,840,466

CHANGEABLE MAGNIFICATION OPTICAL SYSTEM

Yasuyuki Yamada, Tokyo, and Isao Nakazawa, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1986, Ser. No. 872,138

Claims priority, application Japan, Jun. 10, 1985, 60-125798

Int. Cl.[4] G02B *15/02, 17/00; G03B 15/00, 1/18*

U.S. Cl. 350—422 **25 Claims**

1. A changeable magnification optical system comprising:
a plurality of optical paths, each of which conducts light from an object to an image receiving surface;
optical path selecting means for selecting one of said plurality of optical paths;
switch optical means switchable between said plurality of optical paths for causing the magnification to change in cooperation with selection of the optical path by said optical path selecting means; and
second optical means arranged in at least one of said plurality of optical paths to receive light transmitted through the first optical means when said first optical means is in one of said optical paths.

4,840,467

COMPACT ZOOM LENS SYSTEM WITH A HIGH ZOOMING RATIO

Katsuhiro Takada, and Takanori Yamanashi, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

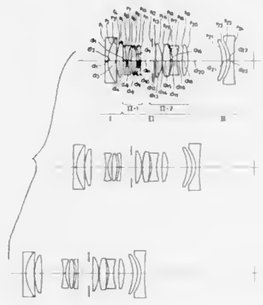
Filed Dec. 24, 1987, Ser. No. 137,678

Claims priority, application Japan, Dec. 25, 1986, 61-307797

Int. Cl.[4] G02B *15/14*

U.S. Cl. 350—427 **10 Claims**

1. A compact zoom lens system with a high zooming ratio comprising, in order from the object side, a first lens group having a positive refracting power, a second lens group having a positive refracting power and a third lens group having a negative refracting power, and being arranged to be zoomed by varying the space between said first lens group and said second lens group and the space between said second lens group and said third lens group, in which at least one graded refractive index lens having the distribution of the refractive



index thereof in the direction of the optical axis is arranged in at least one lens group.

4,840,468

FOCUSING METHOD FOR ZOOM LENS

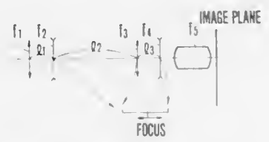
Tsunefumi Tanaka, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 158,053, Feb. 12, 1988, abandoned, which is a continuation of Ser. No. 933,261, Nov. 19, 1986, abandoned, which is a continuation of Ser. No. 722,990, Apr. 15, 1985, abandoned, which is a continuation of Ser. No. 460,364, Jan. 24, 1983, abandoned. This application Nov. 14, 1988, Ser. No. 273,172

Claims priority, application Japan, Feb. 8, 1982, 57-18410

Int. Cl.[4] G02B *15/18*

U.S. Cl. 350—427 **15 Claims**



1. A zoom lens comprising:
a first lens component, stationary during focusing;
a second lens component;
a third lens component; and
a fourth lens component, said third and fourth lens components moving as a unit when focusing is made, and moving in such a manner that their overall refractive power varies when zooming is made, said second lens component being movable simultaneously with said third lens component and said fourth lens component during zooming and being stationary during focusing, wherein the movement of said third and fourth lens components relative to a given object distant is substantially linear over the whole range of variation in focal length and substantially linear relative to all object distances focusable by the movement of the third and fourth lens components.

4,840,469

TELEPHOTO ZOOM LENS

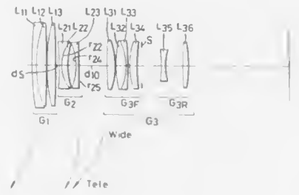
Keiji Moriyama, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Oct. 30, 1987, Ser. No. 114,581

Claims priority, application Japan, Nov. 6, 1986, 61-264315; Nov. 6, 1986, 61-264316

Int. Cl.[4] G02B *15/16, 9/64*

U.S. Cl. 350—427 **13 Claims**



1. A telephoto zoom lens comprising, in succession from the object side, a first lens group having a positive refractive power, a second lens group having a negative refractive power, and a third lens group having a positive refractive power, said lens group being moved independently of each other during zooming and satisfying the following conditions:

$$1.3 < f_1/f_w < 1.6$$

$$0.25 < |f_2/f_W| < 0.45$$

$$0.44 < f_3/f_W < 0.52$$

$$1.3 < \left|\frac{1}{\beta_{2W}} - \frac{1}{\beta_{2T}}\right| < 1.55$$

$$0.5 < \beta_{2W}/\beta_{2T} < 0.6$$

$$0.1 < \left|\frac{1}{\beta_{3W}} - \frac{1}{\beta_{3T}}\right| < 0.3$$

$$0.55 < \beta_{3W}/\beta_{3T} < 0.75$$

where
f_W: the focal length of the entire system at the wide end
f_1: the focal length of the first lens group
f_2: the focal length of the second lens group
f_3: the focal length of the third lens group
β_{2W}: the imaging magnification at the wide end of the second lens group
β_{2T}: the imaging magnification at the telephoto end of the second lens group
β_{3W}: the imaging magnification at the wide end of the third lens group
β_{3T}: the imaging magnification at the telephoto end of the third lens group.

4,840,470

DRIVE CONTROL OF ZOOM LENS IN ZOOMING SYSTEM

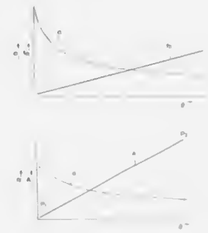
Yoshichi Ohtake, Kamakura, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Dec. 28, 1987, Ser. No. 137,921

Claims priority, application Japan, Dec. 27, 1986, 61-313004; Dec. 27, 1986, 61-313005

Int. Cl.[4] G02B *15/00*

U.S. Cl. 350—429 **6 Claims**



1. An optical zooming system comprising:
zoom lens means for varying the focal length of said zooming system by its own movement in directions of the optical axis thereof, said zoom lens means having engaging means at its peripheral surface;
cylindrical cam means arranged to encase said zoom lens means and having a cam groove at its inner circumferential surface, said engaging means of said zoom lens means being engaged with said cam groove to be movable along said cam groove; and
drive means coupled to said cylindrical cam means to rotate said cylindrical cam means so that said zoom lens means is moved in the optical axis directions in response to the rotation of said cylindrical cam means, the movement of said zoom lens means resulting from the engagement between said engaging means of said zoom lens means and said cam groove of said cylindrical cam means;
wherein said cam groove has a configuration formed so that the focal length of said zooming system is varied in substantially linear relationship to the angle of rotation of said cylindrical cam means.

4,840,471

X-RAY SHIELDED PROJECTION LENS

Katsuaki Mitani, Ibaraki, and Hideki Ishinaga, Takatsuki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 10, 1987, Ser. No. 83,337

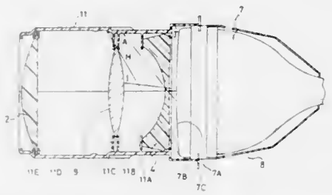
Claims priority, application Japan, Aug. 11, 1986, 61-188133; Feb. 20, 1987, 62-38404

Int. Cl.[4] G02B *27/00*

U.S. Cl. 350—438 **10 Claims**

1. An X-ray shielded projection lens mounted in front of a cathode ray tube apparatus, said projection lens comprising:
at least one lens element which is made of glass for absorbing X-rays irradiated from said cathode ray tube apparatus; and
a body tube made of a plastic material containing X-ray shielding material, and having a cover portion for encasing the entire front portion of said cathode ray tube apparatus so as to cover a gap defined between said cathode ray tube apparatus and said at least one lens element and

thereby to prevent leakage of X-rays through said gap, and lens element positioning means for positioning each



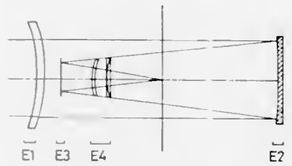
said at least one lens element at a predetermined position relative to the front of said cathode ray tube apparatus.

4,840,472

REFLECTING/REFRACTIVE OPTICAL SYSTEM

Yasunori Arai, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1988, Ser. No. 177,736
Claims priority, application Japan, Apr. 9, 1987, 62-88167
Int. Cl.[4] G02B *17/08*
U.S. Cl. 350—442 **5 Claims**



1. A reflecting/refractive optical system having four optical units arranged along the optical path, comprising, in order from the object side: a first optical unit comprising a meniscus lens having a weak negative power, a second optical unit comprising a reflecting surface having a positive power, a third optical unit for deflecting light reflected from the second optical unit, and a fourth optical unit comprising at least one negative lens element, said system satisfying the following conditions:

(1) $-0.15<f/f_I<0$
(2) $0.55<|R_{I,1}|/f<0.90$
(3) $0.60<f/f_{II}<0.90$
(4) $0.40<l_{II,III}/f_{II}<0.8$

where

f : focal length of the overall system.
f_I : focal length of the first optical unit
$R_{I,1}$: radius of curvature of the first surface of the first optical unit
$l_{II,III}$: the aerial distance from the second optical unit to the third optical unit.

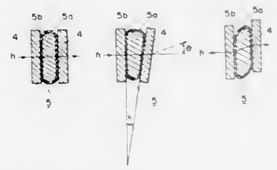
4,840,473

OPTICAL DEVICE

Nobuo Kusbibiki, Ebina; Noriyuki Nose, Sagamihara; Toshiyuki Nakajima, Atsugi; Takeshi Baba, Atsugi; Masakazu Matsugu, Atsugi, and Yukichi Niwa, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1986, Ser. No. 908,725
Claims priority, application Japan, Sep. 27, 1985, 60-215493
Int. Cl.[4] G02B *27/40*
U.S. Cl. 350—484 **9 Claims**

1. An optical device, comprising a plurality of sandwiching members and deformable member sandwiched by the plurality of sandwiching members, the shear modulus of the deformable member decreasing toward the inside thereof; said deformable member comprising an elastomeric core and an elastomeric



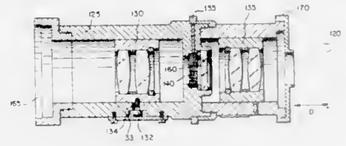
coating covering the core; said elastomeric core having a shear modulus in the range 1×10^2 dyne/cm^2 to 5×10^5 dyne/cm^2; said elastomeric coating having a shear modulus in the range of 1×10^4 dyne/cm^2 to 1×10^9 dyne/cm^2.

4,840,474

FURNACE VIEWING SYSTEM

Dallas E. Heft, 130 Chippewa Dr., Lancaster, Ohio 43130, and Donald A. Carignan, P.O. Box 381, Westfield, Mass. 01086

Filed Jul. 2, 1987, Ser. No. 69,343
Int. Cl.[4] G02B *15/10*
U.S. Cl. 350—572 **3 Claims**



1. In a furnace viewing system, an adapter device for installation between a conventional lens tube and a conventional television camera comprising

iris control means for controlling the amount of light passing through the lens tube,

lens means for inverting the image passing through the lens tube, and

focus control means for adjusting the spacing between the camera and said lens means.

4,840,475

EXTERNAL MIRROR FOR VEHICLES

Siegfried Herzog, Steinenbronn; Dieter Eckert, Magstadt, and Max Bausch, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

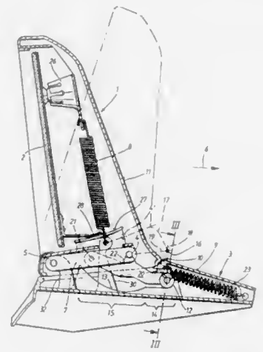
Filed Apr. 14, 1987, Ser. No. 38,137
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1986, 3613878
Int. Cl.[4] B60R *1/06*; G02B *5/08, 7/18*
U.S. Cl. 350—604 **20 Claims**

1. External mirror for vehicles having a mirror casing, which is stationary in the operating position and in which a mirror glass is held so as to be adjustable, and having a mirror base holding the mirror casing and immovably located relative to the vehicle, also having two hinge pins located at a distance apart one behind the other in the direction of travel and approximately parallel to the external surface of the vehicle, these hinge pins being provided for the mirror casing so that the latter can, in the case of collision, move either to the front or to the rear, one of which hinge pins is located immovably with respect to the mirror base and the other relatively immovably with respect to the mirror casing, the two hinge pins being

rigidly connected together by means of a coupling link, also having at least one spring acting, in its effective direction, transverse to the hinge pins and clamping the mirror casing in the operating position defined by stops on the mirror casing and/or mirror base, characterized by the combination of the following features:

the mirror base is provided with a rigid streamlined fairing which—in the operating position of the mirror casing - merges flush with a gap in a streamline fairing of the mirror casing;

the hinge pin with fixed location relative to the mirror base is located to the rear with respect to the direction of vehicle travel and the other hinge pin, arranged to be relatively immobile with respect to the mirror casing is located at the front with respect to the direction of travel vehicle;



a pivotably or rotatably held guide part is provided on the mirror casing at a distance from the front hinge pin and in the direction towards the mirror base and/or offset relative to it towards the front, which guide part interacts with guide track located in the mirror base, the guide surface of which guide track points in the direction of the mirror casing and is in contact with the guide part at least in the operating position of the mirror casing; and

the guide track has—seen in the plane of pivoting of the mirror casing—at least in a front part, a shape such that when the mirror casing pivots out of the operating position in the forward direction, the instantaneous center of the pivoting motion represented by the current intersection point of the connecting line between the two hinge pins of the mirror casing with the guide track normal at the kinematically effective contact point of the guide part, is always located outside the fairing parts but in the vicinity of the gap.

4,840,476

COMPACT EYEGLASS CONSTRUCTION

Craig E. Rooney, Prairie Village, Kans., assignor to John Gareis, Kansas City, Mo.

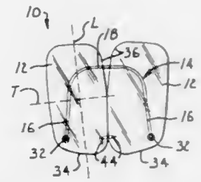
Filed Dec. 31, 1987, Ser. No. 140,300
Int. Cl.[4] G02C *5/08*
U.S. Cl. 351—63 **13 Claims**

1. An eyeglass construction comprising:

a pair of lenses each having a longitudinal axis and a shorter transverse axis;

an arched nose bridge having a pair of spaced apart lower ends; and

means for mounting said lenses on the respective lower ends of said nose bridge in a manner permitting the lenses to pivot about substantially parallel pivot axes between a wearing position wherein the transverse axes of the lenses are generally parallel and a compact storage position wherein the longitudinal axes of the lenses are generally parallel, said mounting means comprising a passage formed through each lens, a bushing fitted in each passage, and a pivot pin on each of said lower ends of the nose bridge, said pivot pins being fitted in the respective bushings and being rotatable therein to mount the lenses on the nose bridge.

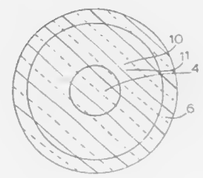


4,840,477

DYED COLOR CHANGE CONTACT LENS

Charles W. Neefe, Big Spring, Tex., assignor to Sunsoft Corp., Albuquerque, N. Mex.

Continuation-in-part of Ser. No. 147,148, Jan. 22, 1988, which is a continuation-in-part of Ser. No. 869,583, Jun. 2, 1986, Pat. No. 4,738,520, which is a continuation-in-part of Ser. No. 832,381, Feb. 24, 1986, abandoned. This application Jun. 24, 1988, Ser. No. 211,335
Int. Cl.[4] G02C *7/04*
U.S. Cl. 351—162 **17 Claims**



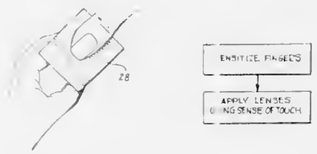
1. A molded contact lens that changes the apparent color of the eye having a dyed or molded transparent colored iris area on the convex lens surface and a light reflecting iris area precipitated on the concave lens surface and when the lens is placed on the cornea of an eye, persons viewing the eye will perceive an apparent eye color change because the concave light reflecting iris area is seen through the convex transparent colored iris area.

4,840,478

METHOD AND ARTICLE OF MANUFACTURE FOR INSERTING CONTACT LENS

Sidney F. Young, 355 N. Wilmot Rd., Tucson, Ariz. 85711

Division of Ser. No. 853,651, Apr. 18, 1986, Pat. No. 4,757,571.
This application Feb. 16, 1988, Ser. No. 156,341
Int. Cl.[4] G02C 7/04
U.S. Cl. 351—177 6 Claims



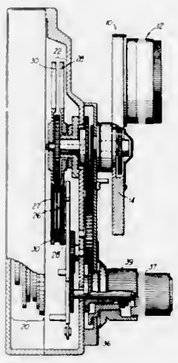
1. In a method of inserting a contact lens in a human eye by hand, the steps comprising:
   a. sensitizing the fingers; and
   b. applying the lens by sense of touch with the sensitized fingers.

4,840,479

CROSSED CYLINDER LENSES REFRACTOR WITH THREE-LENS VARIABLE CROSSED CYLINDER ASSEMBLY AND METHOD OF USE

Clinton N. Sims, 3432 W. Riverside Dr., Ft. Myers, Fla. 33901

Continuation-in-part of Ser. No. 23,980, Mar. 16, 1987, which is a continuation of Ser. No. 670,398, Nov. 9, 1984, abandoned.
This application Nov. 2, 1987, Ser. No. 116,322
Int. Cl.[4] A61B 3/02
U.S. Cl. 351—235 21 Claims



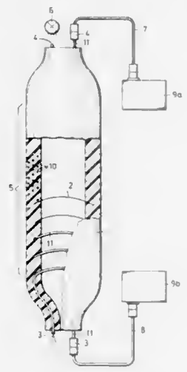
1. A refractor, comprising a pair of batteries, each battery comprising a viewing tube, selectable sphere lenses, and a variable, three-lens crossed cylinder lens assembly comprising a stationary cylinder lens and two identical cylinder lenses concurrently alignable with the viewing tube, each identical cylinder lens of power equal to one-half the stationary lens power and of opposite sign, mounted in a means for rotating them in opposite directions at the same rate relative to a combined lens axis.

4,840,480

LIGHT CONDUIT ARRANGEMENT FOR MONITORING A PHYSICAL CONDITION OF A STRUCTURAL PART

J. Peter Starke, Odenthal; Friedrich K. Levacher, Brauweiler, and Helmut Federmann, Berg. Gladbach, all of Fed. Rep. of Germany, assignors to Philips Kommunikations Industrie A, Hamburg, Fed. Rep. of Germany

Filed Aug. 4, 1982, Ser. No. 405,095
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1981, 3131870
Int. Cl.[4] G01B 11/16
U.S. Cl. 356—32 4 Claims



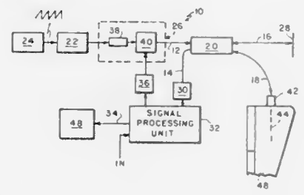
1. A light conduit arrangement for monitoring physical conditions, such as breakage or deformation, of a structural part, comprising at least one light conduit whose breaking elongation is greater than that of the structural part, the light conduit having its terminal portions connectable respectively to a light source and a light receiver, an intermediate portion of the light conduit being secured to the structural part under an initial mechanical stress relative to the structural part, and the initial mechanical stress being selected such that the resulting breaking elongation of the prestressed intermediate portion is less than that of the structural part.

4,840,481

POLARIMETRIC OPTICAL FREQUENCY DOMAIN DISTRIBUTED STRAIN SENSOR AND METHOD

William B. Spillman, Jr., Charlotte, Vt., assignor to Simmonds Precision, Tarrytown, N.Y.

Filed Dec. 10, 1987, Ser. No. 131,069
Int. Cl.[4] G01B 11/16
U.S. Cl. 356—32 12 Claims



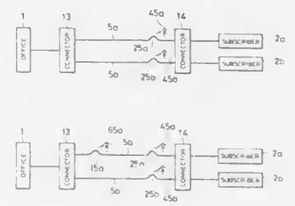
1. An apparatus for sensing distributed strain along an optical fiber, comprising:
   means for launching frequency varying optical energy having a selectively controlled polarization state into an optical fiber subject to strain and for providing a reference signal representative of the modulated optical energy, the polarization state of the optical energy controlled in response to a control signal;
   means for mixing a portion of the optical energy backscattered from said fiber with a portion of the reference signal to produce a beat signal, the frequency of which is representative of a strain location along the fiber; and
   means for sensing the polarization state of the backscattered optical energy and for controlling the polarization state of the optical energy launched by said first-mentioned means in response to the beat signal provided by said second-mentioned means.

4,840,482

METHOD OF COATED FIBER IDENTIFICATION IN OPTICAL TRANSMISSION NETWORK

Masayuki Shigematsu, and Shuzo Suzuki, both of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 15, 1988, Ser. No. 182,022
Claims priority, application Japan, Apr. 17, 1987, 62-95892
Int. Cl.[4] G01N 21/84
U.S. Cl. 356—73.1 6 Claims



1. A method for identifying an aimed coated fiber from a plurality of coated fibers in an optical transmission network at the upstream and downstream ends thereof during transmission of an optical signal comprising the steps of:
   bending said coated fibers at downstream end sides thereof far from an optical signal source to produce radiated light from the bent portions thereof;
   measuring the first levels of radiated light produced at the downstream end sides;
   bending either the coated fiber to be identified or all remaining coated fibers at the upstream end side of the optical transmission network;
   measuring the second levels of radiated light produced in the respective fibers at the downstream end side with the plurality of said fibers remaining bent at their downstream end side; and
   comparing the second levels of radiated light with the first levels of radiated light to detect variation in the level of radiated light, the aimed coated fiber being identified according to the detected variation.

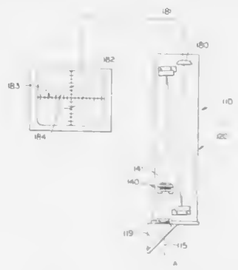
4,840,483

ALIGNMENT TOOL FOR LASER BEAM DELIVERY SYSTEMS AND METHOD OF ALIGNMENT

James L. Haffner, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Dec. 18, 1987, Ser. No. 134,695
Int. Cl.[4] G01B 11/00
U.S. Cl. 356—153 26 Claims

1. An improved tool for use in aligning both angular and translational position of a laser beam at a rotating joint of a laser beam delivery system having one or more rotatable laser optics, said tool comprising:
   (a) a tool chassis having means for receiving a laser beam, said laser beam being directed along a laser beam axis to said rotating joint of said delivery system and to said receiving means;
   (b) means for mounting said tool chassis on the rotatable part of a rotating joint of the laser beam delivery system to be aligned, said mounting means allowing attachment of said chassis on such rotatable part such that said chassis can be rotated about said joint;
   (c) means mounted on said chassis for monitoring the position of a laser beam received relative to a two dimensional coordinate system during rotation of said tool; and
   (d) a laser beam focusing lens mounted on said chassis for focusing at least a portion of a laser beam received such that translational deviations of said received laser beam are eliminated from that focused beam, whereby in conjunction with said monitoring means angular orientation



of said received laser beam can be isolated and monitored when passed through said focusing lens, the focused beam tracing a rounded pattern on said monitoring means as said tool chassis is rotated about said joint, wherein angular deviations of said beam at the rotating joint can be corrected by adjusting one or more of the laser optics to center said beam within said rounded tracing pattern, and whereby translational position of said received laser beam can be monitored when not focused by said focusing lens, the unfocused beam similarly tracing a rounded pattern on said monitoring means as said tool chassis is rotated about said joint, wherein translational deviations of said beam can be corrected by centering the unfocused beam within the rounded tracing pattern on said monitoring means, such that both translational and angular errors in said laser beam can be determined and corrected.

4,840,484

ATOMIC ABSORPTION SPECTROPHOTOMETER WITH FURNACE AT PRESSURE EQUAL OR NEAR LIGHT SOURCE PRESSURE

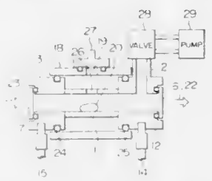
Konosuke Oishi, Mito; Toyoharu Okumoto, Katsuta; Hayato Tobe, Mito, and Masamichi Tsukada, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 30, 1988, Ser. No. 175,320
Claims priority, application Japan, Mar. 30, 1987, 62-76562
Int. Cl.[4] G01N 21/74
U.S. Cl. 356—312 7 Claims

1. An atomic absorption spectrophotometer including:
   an electric furnace for drying and ashing a liquid sample to be analyzed and then atomizing the sample to generate atomic vapor;
   a low-pressure lamp for emitting light having a spectrum of an element to be analyzed onto the atomic vapor atomized in said electric furnace;
   a monochromator for splitting the transmitted light from said electric furnace and selecting a wavelength of an

atomic absorption line absorbed by said element to be analyzed; and

a signal processing unit for detecting light having the selected wavelength supplied from said monochromator and for analyzing the element to be analyzed,



wherein said electric furnace comprises: a sealing mechanism for maintaining the inside of said electric furnace airtight; and

an evacuation unit for evacuating the inside of said electric furnace to a pressure equal or near to the pressure of the inside of said lamp.

4,840,485

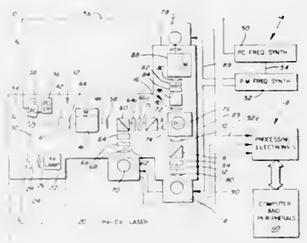
FREQUENCY DOMAIN CROSS-CORRELATION FLUOROMETRY WITH PHASE-LOCKED LOOP FREQUENCY SYNTHESIZERS

Enrico Gratton, Urbana, Ill., assignor to I.S.S. (U.S.A.) Inc., Champaign, Ill.

Continuation of Ser. No. 943,253, Dec. 17, 1986, abandoned. This application Jul. 27, 1988, Ser. No. 225,595

Int. Cl.[4] G01N *21/64*

U.S. Cl. 356—317 **9 Claims**



1. Apparatus for cross-correlation frequency domain fluorometry, which comprises:

a source of electromagnetic radiation;

means for amplitude modulating the electromagnetic radiation at a first frequency;

means for directing the amplitude-modulated electromagnetic radiation at a sample;

means for detecting the luminescence of the sample;

means for providing a signal coherent with amplitude modulated signals produced by said amplitude modulating means, at a second frequency, to said detecting means;

means for modulating the gain of said detecting means by said signal;

said amplitude modulating means and means for providing a signal at a second frequency each comprising a separate phase-locked loop frequency synthesizer;

said second frequency being different from said first frequency by at least 100 hertz; and means for deriving a resultant signal from said electromagnetic radiation and said detecting means at a frequency of the difference between said first and second frequencies, to detect phase shift and modulation changes of said luminescence from that of said electromagnetic radiation.

4,840,486

APPARATUS FOR MEASURING FLOW VECTORS IN GAS CURRENTS

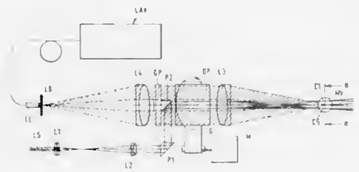
Richard Schodl, Troisdorf-Eschmar, Fed. Rep. of Germany, assignor to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Bonn, Fed. Rep. of Germany

Filed Aug. 12, 1987, Ser. No. 84,578

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1986, 3631901

Int. Cl.[4] G01N *21/53*

U.S. Cl. 356—338 **25 Claims**



9. An apparatus for measuring the flow vector of a particle contained in gas currents flowing through a plurality of at least three light beams focused onto at least three juxtaposed locations within a measuring volume, comprising:

receiving means for receiving reflections of said at least three light beams, reflected from said particle flowing through said at least three juxtaposed locations;

selecting means for selecting a first and a second light beam from said plurality of at least three light beams;

first signalling means for producing a first signal upon receipt of a reflection of said first light beam; and

second signalling means for producing a second signal upon receipt of a reflection of said light beam.

4,840,487

MEASURING APPARATUS FOR ETCHING PITS

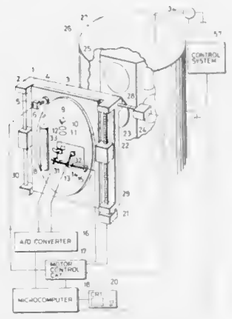
Minori Noguchi, Yokohama; Toru Otsubo, Fujisawa, and Susumu Aiuchi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 19, 1986, Ser. No. 875,980

Claims priority, application Japan, Jun. 19, 1985, 60-131761

Int. Cl.[4] G01B *11/22*

U.S. Cl. 356—355 **10 Claims**



1. An apparatus for measuring a depth of a fine pit or a fine groove on a substrate, comprising:

working means for forming a fine pit or a fine groove on a semiconductor substrate;

laser source means for generating a laser beam having a wavelength less than a predetermined wavelength so as to be a short wavelength;

optical means for radiating the short wavelength laser beam generated by the laser source means to a surface portion of the semiconductor substrate including at least one pit or groove formed by the working means and in a direction substantially perpendicular to a surface of the semiconductor substrate;

detection means for detecting an intensity of an interference light between light which is reflected by a bottom of the at least one pit or groove and diffracted by an orifice of the at least one pit or groove and light which is reflected and diffracted by the surface portion of the semiconductor substrate other than the at least one pit or groove, the detection means including a detector for converting the detected interference light to an electric signal; and

computing means for calculating a depth of the at least one pit or groove formed by the working means in accordance with a time interval between peaks of the electric signal.

4,840,488

PHOTOELECTRIC TYPE DISPLACEMENT DETECTING INSTRUMENT

Yoshihiko Kabaya, Sagamihara; Naofumi Yasuda, Ichikawa, and Toshihiro Omi, Kawasaki, all of Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

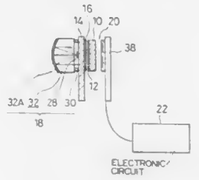
PCT No. PCT/JP87/00154, § 371 Date Jul. 24, 1987, § 102(e) Date Jul. 24, 1987, PCT Pub. No. WO87/05693, PCT Pub. Date Sep. 24, 1987

PCT Filed Mar. 12, 1987, Ser. No. 86,627

Claims priority, application Japan, Mar. 14, 1986, 61-56534; Mar. 14, 1986, 61-56535; Jun. 25, 1986, 61-149073; Mar. 6, 1987, 62-51517; Mar. 6, 1987, 62-51518

Int. Cl.[4] G01D *5/36*

U.S. Cl. 356—374 **14 Claims**



1. A photoelectric type displacement detecting instrument comprising:

a main optical lattice (12) formed on a first member (10) made of a light transmitting material;

an auxiliary optical lattice (16) formed on a second member (14) made of a light transmitting material and movable relative to said first member (10) in a manner to be parallel and adjacent to said main optical lattice (12);

a light emitter (18) for emitting detecting light to both optical lattices (12 and 16) from the outer side of said second member (14) to said first member (10);

a light receiver (20) opposed to said light emitter (18), interposing therebetween both optical lattices (12 and 16), for receiving said detecting light transmitted through the both optical lattices (12 and 16), transducing changes in the value of said received light through the repeat of overlappings due to relative movements between both optical lattices (12 and 16) into electric signals, and outputting same; and

an electronic circuit (22) for processing said electric signals from said light receiver (20) and calculating a relative moving distance between said main optical lattice (12) and said auxiliary optical lattice (16) on the basis of the number of changes in the value of said received light; wherein:

said second member (14) has a phase dividing frame (24) for dividing said auxiliary optical lattice (16);

said light emitter (18) is integrally formed with a light emitting element (28) disposed at the outer side of either one of said first member (10) and said second member (14), a ring-shaped member (30) surrounding said light emitting element (28) and having a height larger in value than the thickness of said light emitting element (28) and a lens member (32) being in contact with the outer surface of said ring-shaped member (30) and having a reflector (32A) for making parallel the light diffused from said light emitting element (28) and reflecting same toward said phase dividing frame (24); and

said light receiver (20) is opposed to said light emitting element (28), interposing therebetween said phase dividing frame (24), and integrally formed therein with photoelectric transducing elements (34A–34D) provided corresponding in number to the number of division of said phase dividing frame (24).

4,840,489

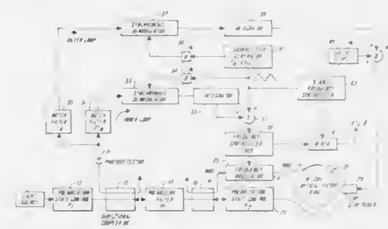
INTERFEROMETER GYROSCOPE HAVING TWO FEEDBACK LOOPS

Joseph D. Coccoli, Sudbury, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Aug. 22, 1986, Ser. No. 899,540

Int. Cl.[4] G01B *9/02*

U.S. Cl. 356—350 **7 Claims**



1. An interferometer gyroscope for measuring inertial rotation comprising,

an open-ended optical fiber loop, said optical-fiber loop including optical-path length control means for controlling the optical path length of said optical fiber loop in response to an applied optical path length control signal;

a generator for generating a laser beam characterized by a predetermined optical frequency;

coupling means for coupling said laser beam to the opposite terminal ends of said optical-fiber loop such that electromagnetic energy from said beam is propagated through said optical-fiber loop from one end of said optical-fiber loop to the other end of said optical fiber loop in a first direction, and from said other end to said one end in a second direction, said second direction being opposite to said first direction;

a first signal generator for generating a periodic signal at a frequency f_m;

modulating means for modulating the frequency of the said beam transmitted into said one end of said optical-fiber loop in a first direction and for modulating the frequency of the said beam transmitted from said one end of said optical-fiber loop in said second direction;

a modulator control including a means for detecting said counter-propagating electromagnetic energy from the ends of said optical-fiber loop coupled in series with a first demodulator and an integrator establishing a first feedback path between said ends of said optical fiber loop and

said modulator to generate a first control signal for controlling said modulating means to maintain the phase difference between said electromagnetic energy propagated in said optical-fiber loop in opposite directions to be substantially ninety degrees out of phase at said means for detecting;

said first control signal being representative of the sum of said periodic signal and the signal resulting from the demodulation of said detected electromagnetic energy from the ends of said optical-fiber loop at a frequency $2f_m$;

an optical path length control signal generator including means for detecting said counter-propagating electromagnetic energy from the ends of said optical-fiber loop coupled in series with a second demodulator and an integrator establishing a second feedback path between said ends of said optical-fiber loop and said path length control means, said generator providing means for generating said optical path length control signal and for applying said path length control signal to said path length control means whereby the optical path length of such loop is held constant against external disturbance such that said integrated signal is maintained at a predetermined value resulting in stabilization of the scale factor of said gyroscope apparatus;

said path length control signal being representative of the integrated signal resulting from the demodulation of said detected electromagnetic energy from the ends of said loop at a frequency f_m;

the magnitude of said first control signal being indicative of the inertial rotation rate of said loop.

4,840,490

LASER POSITION MEASUREMENT AND ALIGNMENT

David Gabriel, Kingston; David Audus, Marlow, and Norman Strange, Chichester, all of England, assignors to Lasercheck Limited, Burnham, United Kingdom

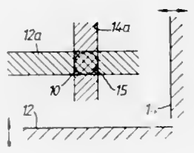
PCT No. PCT/GB85/00565, § 371 Date Sep. 30, 1986, § 102(e) Date Sep. 30, 1986, PCT Pub. No. WO86/03581, PCT Pub. Date Jun. 19, 1986

PCT Filed Dec. 10, 1985, Ser. No. 902,370

Claims priority, application United Kingdom, Dec. 10, 1984, 8431148; Apr. 22, 1985, 8510218

Int. Cl.⁴ G01B *11/26*

U.S. Cl. 356—375 **33 Claims**



1. A target apparatus for detecting the position of a laser beam, comprising:

(a) a body mounted for rotation about an axis, said body having first and second edges lying in plane normal to said axis and extending in angularly spaced-apart relationship with respect to said axis to define therebetween an aperture allowing transmission of a laser beam therethrough, said edges being shaped such that as a function of radial distance from said axis the angular spacing between said edges is a monotonic function of the radial distance,

(b) means for determining a reference position of the body that allows transmission of the laser beam through said aperture,

(c) drive means coupled to said body for reciprocating said body about said axis with respect to said reference position such that the body is turned in a first direction to cause said first edge to intersect the beam and in a second, opposite direction to cause said second edge to intersect the beam, and

(d) means for determining the respective angular positions of said body at said first and second intersections such that the spatial position of the laser beam relative to the target apparatus is determinable from a knowledge of the reference position and of the respective angular positions at said first and second intersections.

4,840,491

RUBBER KNEADING METHOD

Yoshiaki Hagiwara, Tokyo; Hiromi Ishida, and Takeyoshi Takahashi, both of Tochigi, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Aug. 27, 1987, Ser. No. 89,803

Claims priority, application Japan, Aug. 27, 1986, 62-200770

Int. Cl.⁴ B29B *1/08*

U.S. Cl. 366—69 **7 Claims**

1. A method of kneading rubber comprising the steps of:

kneading rubber with a kneading mixer;

discharging said rubber thus kneaded from said kneading mixer;

passing said rubber thus discharged through first roll means to form a first rubber sheet having a predetermined thickness;

passing rubber of said first rubber sheet through second roll means to form a second rubber sheet whose thickness is 2 mm or less; and

passing rubber of said second rubber sheet through third roll means to form a third rubber sheet having a desired final thickness;

wherein said predetermined thickness is thicker than 3 mm.

4,840,492

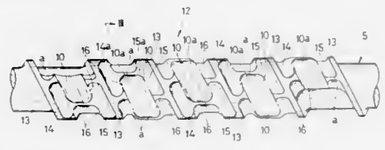
ROTATIONAL SCREW FOR MIXING

Kensaku Nakamura, 272-1 Bessho-cho, Matsubara-shi, Osaka, Japan

Filed Apr. 25, 1988, Ser. No. 185,493

Int. Cl.⁴ B01F *7/08;* **B29B** *7/42*

U.S. Cl. 366—81 **3 Claims**



1. A rotary mixing screw comprising

a circular cylindrical solid rod having on the outer periphery there of

a pair of first recesses arranged substantially parallel to each other and substantially helically about an axis of the rod, said first recesses each forming a triangle having three tips and three rounded sides, each first recess being disposed to have its successive tips spaced at 120° a angle from each other said triangles being formed when considered from a helical cross section;

said outer periphery of said rod having remaining portions adjacent said pair of first recesses; and

a second recess formed between said pair of first recesses and arranged helically about said axis, said second recess forming a triangle with three tips and three rounded sides, with a tip being disposed at 60° angle from the closest tips of said pair of first recesses, said triangle being formed when considered from a helical cross section, said second recess having a wider dimension axially than said pair of first recesses; and

wherein the areas adjacent to the pair of first recesses and said second recess, each have an opening to form a plurality of flow paths.

4,840,493

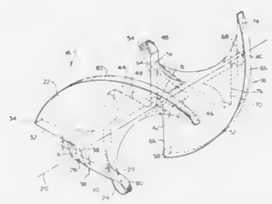
MOTIONLESS MIXERS AND BAFFLES

Terry A. Horner, 143 S. Main, Allenstown, N.J. 08514

Filed Nov. 18, 1987, Ser. No. 121,935

Int. Cl.⁴ B01F *5/06*

U.S. Cl. 366—339 **20 Claims**



1. A motionless mixer baffle member having opposed major surfaces and first and second ends, said baffle member being helically twisted symmetrically about a longitudinal axis and being defined by said opposed major surfaces extending along said axis from said first end to said second end of said baffle, said major surfaces being connected together at said first end by a substantially planar surface extending substantially transversely of said axis and lying in a plane substantially parallel to said axis.

4,840,494

CALIBRATED TEMPERATURE SENSOR AND METHOD OF CALIBRATING SAME

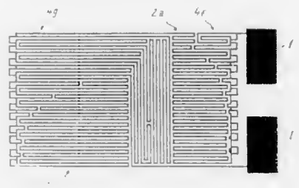
Petr Horn, Oberhasli, Switzerland, assignor to Albert Koch, Einsiedeln, Switzerland

Continuation-in-part of Ser. No. 786,955, Oct. 1, 1985, abandoned. This application Oct. 13, 1987, Ser. No. 106,678

Claims priority, application Switzerland, Feb. 1, 1984, 462/84; Jan. 8, 1985, 54/85

Int. Cl.⁴ G01K *15/00, 7/16*

U.S. Cl. 374—1 **4 Claims**



1. A process for calibrating temperature sensors having trimming paths for calibrating purposes comprising the steps of forming a substrate having a plurality of temperature sensors thereon;

stabilizing the temperature of the substrate and sensors at a preselected equilibrium temperature with variations of less than 0.1° C.;

concurrently measuring with a measuring device the temperature-dependent total resistance R_o of all sensors on the substrate;

calculating and selecting a first combination of interruptions of trimming paths based on said measured total resistance R_o for each sensor wherein the calculated theoretical resistance increase expected to result from the selected interruptions approaches the difference between a desired resistance value R_f and the measured initial value R_o;

subsequently interrupting the selected paths in an adjusting device separate from the measuring device;

again stabilizing the temperature of the substrate and sensors at the preselected equilibrium temperature with variations of less than 0.1° C.;

again measuring the resistance R_o of all sensors;

calculating and selecting a second combination of interruptions of trimming paths based on the last measured total resistance R_o for each sensor wherein the calculated theoretical resistance increase is expected to increase the total resistance to the desired resistance value R_f; and

subsequently interrupting the second combination of selected paths in the separate adjusting device, and wherein each said sensor includes a first partial structure having a first plurality of trimming paths having different values for the first interrupting step and a second partial structure having a second plurality of trimming paths having different values for the second interrupting step, the sensor being formed so that interruption of all trimming paths of the first partial structure increases the total resistance R_o by at least 20%, the calculation and selection of the first combination of trimming paths being made such that the total resistance measured after the first interruption of selected paths is less than the final desired resistance value R_f by half the amount of the total possible resistance increase achievable by interrupting all paths in the second partial structure.

4,840,495

METHOD AND APPARATUS FOR MEASURING THE THERMAL RESISTANCE OF AN ELEMENT SUCH AS LARGE SCALE INTEGRATED CIRCUIT ASSEMBLIES

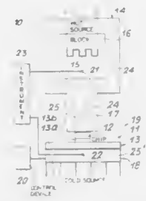
Jean Bonnefoy, Crespieres, France, assignor to Bull S.A., Paris, France

Filed Dec. 29, 1986, Ser. No. 947,265

Claims priority, application France, Dec. 27, 1985, 85 19342

Int. Cl.⁴ G01N *27/18;* **G01R** *31/26*

U.S. Cl. 374—43 **11 Claims**



1. In a method for determining the thermal resistance (R3) of an element (11), wherein a temperature (T1) of a hot source and a temperature (T2, T'2) of a cold source are measured, a thermal flux (Q) flowing from the hot source to the cold source is determined, and a thermal resistance (R1, R2) is calculated by applying the formula $R=(T-T2)/Q$, the improvement comprising:

connecting the element (**11**) to the hot source (**14**) via a serially connected solid bar (**17**) having a cross-section at least approximately equal to a facing cross-section of the element, said solid bar being a good thermal conductor;
measuring hot source temperature (T1) and cold source temperature (T2);
determining thermal flux (Q);
calculating a thermal resistance (R1) representative of the bar and the element by applying the formula $R1=(T1-T2)/Q$;
removing the element (**11**);
moving bar (**17**) into contact with cold source (**18**) via an interface (**25**);
measuring hot source temperature (T'1) and cold source temperature (T'2);
determining thermal flux (Q);
calculating a thermal resistance (R2) representative of the bar by applying the formula $R2=(T1-T'2)/Q$; and
calculating a thermal resistance (R3) of the element (**11**) by subtracting R2 from R1.

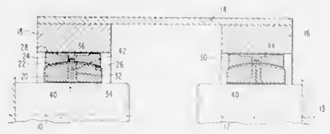
4,840,496
NONCONTACT TEMPERATURE PATTERN MEASURING DEVICE
Daniel D. Elleman, San Marino; James L. Allen, La Crescenta, both of Calif., and Mark C. Lee, Rockville, Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Feb. 23, 1988, Ser. No. 159,613
Int. Cl.[4] G01J *5/00, 5/30*
U.S. Cl. 374—124 **7 Claims**

1. A noncontact temperature pattern measuring device for providing the true temperature distribution for a remotely located surface area, said measuring device comprising:
a laser pyrometer means including a high resolution photodetector positioned to receive thermal radiation from said remotely located surface area, a high resolution laser for eradiating a portion of said remotely located surface, and means for detecting at least a portion of the laser signal reflected from said remotely located surface for determining the emissivity of the surface region reflecting the laser signal and compensating the value of thermal radiance for said emissivity;
means for focusing the laser signal, the response of the photodetector to thermal radiation and the response of the laser signal detecting means on a small precise point on the remotely located surface area; and
means for scanning the focused condition created by said focusing means across the entire remotely located surface area, thereby producing a true temperature measurement at each point of focus.

4,840,497
SUNSHADES STORAGE CASE
Sue E. Harber, and James L. Harber, both of 345 Clifton Rd., South Charleston, Ohio 45368
Filed Mar. 11, 1988, Ser. No. 167,102
Int. Cl.[4] B65D *30/10, 33/17*
U.S. Cl. 383—4 **4 Claims**

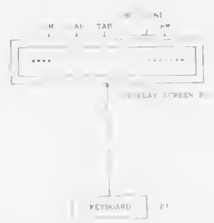
1. A new and improved sunshades storage case for use with an accordion-fold cardboard automobile sunshade, said storage case comprising:
a pair of generally rectangular front and back panels formed from a flexible plastic material;
emergency highway signal markings printed on said front and back panels;
a pair of generally triangular side panels formed from a flexible plastic material;
said side panels secured in opposed parallel relation between said front and back panels;
a cylindrical loop formed at a bottom end of each of said front and back panels;
a U-shaped bar extending through each of said loops;
a pair of hinges pivotally connecting ends of said U-shaped bars adjacent a bottom end of each of said side panels, said U-shaped bars mounting bottom ends of said front and back panels for movement between opened and closed positions;
a generally rectangular top bracket extending transversely across a top end of said front and back panels, said top bracket secured to said front, back, and side panels;
a cylindrical recessed socket centrally formed in a top surface of said top bracket; and
said storage case having a vertical trapezoidal configuration when in said opened position.

4,840,498
SELF-ALIGNING JOURNAL BEARING
Gerhardt E. Lichtfuss, Rockford, Ill., assignor to Sundstrand Corp., Rockford, Ill.
Filed Jun. 28, 1988, Ser. No. 212,574
Int. Cl.[4] F16C *25/04*
U.S. Cl. 384—213 **12 Claims**



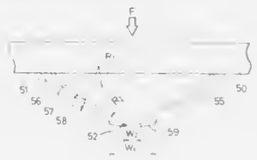
1. A self-aligning journal fluid film lubricated bearing having a bushing mounted about a cylindrical surface of a race member for relative rotational movement therebetween about a rotational axis comprising:
a ball member having an inner surface and an outer spherical surface portion with a plurality of spaced radial holes positioned in a plane perpendicular to said rotational axis;
a race member having an outer cylindrical surface and an inner spherical surface that is adapted to mate with the spherical surface portion of said ball member, said race member having a plurality of spaced holes extending radially through the race member from the inner to the outer surface, each hole being located in a slot having a major axis lying in a radial plane which passes through said rotational axis and a depth effective to provide a distribution of a lubricating fluid in the form of a film for supporting the rotating load on the bearing during operation;
means for providing a fluid film between an inner surface of said bushing and the outer cylindrical surface of said race member to support the rotating load on the bearing during operation, said means including an orifice associated with said spaced radial holes which meters the required amount of lubricant flow both to the contacting spherical surfaces and to the bushing and race member contacting surfaces; and
at least one anti-rotation pin tightly fitted in a hole of said ball member and extending into a corresponding hole in said race member to provide a connection allowing small articulating motion but no full rotation between the ball member and the race member.

4,840,499
DISPLAY CONTROL DEVICE FOR A TYPEWRITER WHICH DISPLAYS BOTH INPUT CHARACTERS AND FORMAT INFORMATION
Ryoichi Sasaki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Dec. 8, 1987, Ser. No. 130,169
Claims priority, application Japan, Dec. 9, 1986, 61-293007
Int. Cl.[4] B41J *3/46*
U.S. Cl. 400—83 **5 Claims**



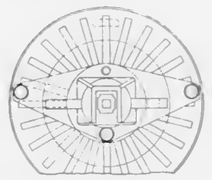
1. A display control device for a typewriter comprising:
input means for inputting character data and format setting data;
format memory means for storing the format setting data;
a display unit having a plurality of display positions, each of said display positions being able to display a character corresponding to the character data inputted by the input means; and control means for displaying individual forms, according to the format setting data stored in the format memory means, within each of the display positions before the character data is inputted, and for displaying the character in place of the individual form when the character data is inputted.

4,840,500
THERMAL TRANSFER PRINTER HAVING AN IMPROVED THERMAL HEAD TO IMPROVE INK TRANSFER EVENESS
Akira Sasaki; Yoshihito Takahashi; Akiyoshi Hakoyama, all of Hitachi; Katsumasa Mikami, Ibaraki; Masafumi Suzaki; Takeo Honma, both of Hitachi; Tsuyoshi Yasutomi; Ryoichi Shiraishi, both of Kokubu, and Yasuo Nishiguchi, Kyoto, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 23, 1987, Ser. No. 76,849
Claims priority, application Japan, Jul. 30, 1986, 61-177540
Int. Cl.[4] B41J *3/20*
U.S. Cl. 400—120 **6 Claims**



1. For use with a thermal transfer printer having a thermal head, a platen facing said thermal head, and a transfer recording paper for insertion between said thermal head and said platen so that printing is performed; said thermal head including a head substrate member, a graze portion formed projectingly on said head substrate member, and a heating resistor element formed on a crown portion of said graze portion wherein
a temperature distribution curve of a surface of said heating resistor element of said thermal head when said thermal head is not pressed against a platen side and a face pressure distribution curve of the surface of said heating resistor element of said thermal head when said thermal head is pressed against the platen side have substantially analogous shapes within a range coextensive with said heating resistor element.

4,840,501
THREE POLE PRINTHEAD ACTUATOR
Kam C. Wong, Canoga Park; Bernard Rubinshtein, Agoura, and Aram Arzoumanian, Woodland Hills, all of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.
Continuation of Ser. No. 857,736, Apr. 29, 1986, abandoned.
This application Mar. 14, 1988, Ser. No. 171,160
Int. Cl.[4] B41J *3/12*
U.S. Cl. 400—124 **10 Claims**



1. In a printhead having a series of magnetic actuators arranged in a circular array, an individual magnetic actuator comprising:
a three-pole magnetic actuator having
a single coil wound around a center magnetic pole,
an "E"-shaped core having a length oriented to extend radially in the circular array and defining the three magnetic poles along that length, said three magnetic poles each having a rectangular cross section, and said "E"-shaped core being substantially thin in the circumferential

direction of said circular array of magnetic actuators compared to the length of the core such that said core has a substantially greater dimension in the radial direction of the circular array than in the circumferential direction thereof for enabling twenty-four such individual magnetic actuators to be disposed in a circular array having a diameter of less than 6 centimeters and

an armature striding over all three magnetic poles.

4,840,502

THERMAL TRANSFER RIBBON CASSETTE

Michael O. Grey, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed May 9, 1986, Ser. No. 861,216
Int. Cl.[4] B41J *32/02*
U.S. Cl. 400—196 **3 Claims**

1. A ribbon cassette for use in a printer and containing an endless ribbon to be unwound from a coil of said endless ribbon, driven past a printing station and then rewound onto the coil of said endless ribbon, said ribbon cassette comprising a

housing portion and a cover portion,

rotatable plate member supported in the housing portion and comprising a solid bottom flange member and having a plurality of radially extending ribs for supporting the coil of endless ribbon at one elevation in edge-wise manner on said ribs.

means for driving said endless ribbon at an angle past the printing station,

spool means around which the coil of endless ribbon is positioned in an arrangement wherein the endless ribbon is unwound from the inside of said coil of endless ribbon and is rewound on the outside of said coil of endless ribbon, said spool means including a concave-shaped wall portion defining a substantially concave surface on the exterior thereof for containing said coil of endless ribbon thereabout, said solid bottom flange member extending from said concave-shaped wall portion and said radially extending ribs being disposed on the upper surface of said flange member to raise said endless ribbon above the upper surface of said flange member, and

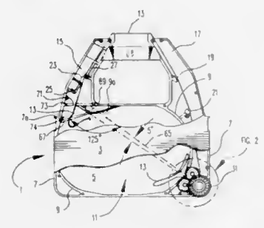
guide means comprising a plurality of plate members integral with said cover portion and positioned around and spaced from the spool means and extending in radial manner from the center of the coil of endless ribbon and spaced upwardly from the ribs of the rotatable plate member for guiding said endless ribbon from the concave surface of the spool means in unwinding of the endless ribbon therefrom and for holding the endless ribbon in a configuration substantially corresponding with the contour of the concave surface in rewinding of the endless ribbon around the coil thereof.

4,840,503

STUFFED CHAMBER RIBBON CARTRIDGE

Sheldon D. Roberts, Versailles; Louann B. Samuels, Scott County, and David T. Shadwick, Lexington, all of Ky., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed Mar. 31, 1988, Ser. No. 175,893
Int. Cl.[4] B41J *35/28*
U.S. Cl. 400—208 **5 Claims**



1. A ribbon cartridge comprising two pinch rollers, a printer ribbon stuffed in said cartridge by said two pinch rollers, a first chamber into which said ribbon is stuffed, said first chamber having an obstruction wall opposite the direction of stuffing force of said two pinch rollers, a third roller in said cartridge located out of said first chamber linked to one of said pinch rollers to drive said pinch roller to which it is linked by driving movement of said third roller, at least part of said one pinch roller being located between said third roller and said first chamber, a second chamber having an exit slot, and an opening in said first chamber immediately contiguous to said wall opposite said stuffing force, said opening having a dam constricting said ribbon which permits said ribbon to exit said first chamber to be loosely contained in said second chamber and to exit said second chamber in a single strand through said exit slot, said exit slot being on the side of said second chamber near said obstruction wall such that said obstruction wall is substantially straight on a line at an obtuse angle to said direction of stuffing force and said dam is located on a line which is substantially an extension of said line of said wall.

4,840,504

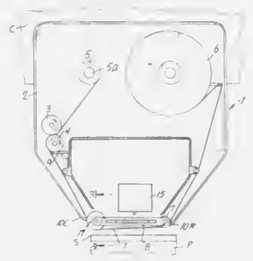
PRINTER RIBBON CARTRIDGE WITH MEANS FOR TRANSVERSELY DISPLACING RIBBON DURING ADVANCE

Mosi Chu, Setauket; Anthony Graziano, Bay Shore, and Kenneth Kress, Huntington, all of N.Y., assignors to Primages, Inc., Del.

Continuation-in-part of Ser. No. 871,369, Jun. 6, 1986, abandoned, Continuation-in-part of Ser. No. 609,784, May 14, 1984, Pat. No. 4,623,271. This application May 11, 1987, Ser. No. 48,237
Int. Cl.[4] B41J *33/56*
U.S. Cl. 400—213 **5 Claims**

1. An ink ribbon cartridge comprising a case, a storage reel for an ink ribbon, a take-up reel for the ink ribbon, means for longitudinally advancing the ink ribbon from the storage reel to the take-up reel, and means supported by the cartridge for transversely displacing the ribbon during its longitudinal advance including a freely rotatable and axially movable first shaft means supported by said case, a first roller fixed to said first shaft means, freely rotatable and axially movable second shaft means supported by said case, a second roller fixed to said second shaft means, coupling means coupling said first and second shaft means for causing said second shaft means to follow the longitudinal movement of said first shaft means, said ribbon passing on said first roller to rotate said first roller during longitudinal advance of the ribbon, said first roller having an end cam surface, the case having a corresponding

cam surface facing and engaging the cam surface on the first roller, said cam surfaces respectively including a plurality of



peaks and an inclined surface between successive peaks to produce a saw-tooth path of travel of the ribbons as the ribbon advances.

4,840,505

ELECTRONIC TYPEWRITER RIBBON LIFT-UP APPARATUS

Yasuyoshi Kurokawa, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 18, 1986, Ser. No. 875,532
Claims priority, application Japan, Jun. 21, 1985, 60-136339
Int. Cl.[4] B41J *29/36*
U.S. Cl. 400—697.1 **4 Claims**

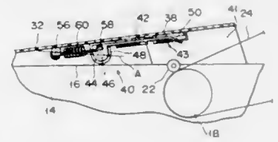
1. An electronic typewriter ribbon lift-up apparatus in which a ribbon cartridge holder vertically mounting a printer ribbon and a correction ribbon is pivotable by a lever mechanism and is engaged with a cam follower pin of a ribbon-lifting disc cam, said disc cam being provided with a printing cam groove and a correction cam groove and being rotatable about a rotation axis from an original position by operation of control means for selective pivoting of the ribbon cartridge holder to one of a printing position and a correcting position, wherein said disc cam has a circular first cam groove for continuous printing operation, a second cam groove for single type printing operation starting from a home position and communicating with the first cam groove, and an arc third cam groove for correcting operation starting from the home position and crossing the first cam groove, said first cam groove having a specified radius with the rotation axis of the disc cam being a center thereof, said third cam groove having a smaller radius than said specified radius of the first cam groove, and wherein a cam auxiliary plate rotatably and coaxially provided on the disc cam comprises a guide portion for the intersection between said first and third cam grooves, and a projection extending at least to the home position to ensure the return of the disc cam to the original position.

4,840,506

PRINTER

Kazuhiko Kashiwagi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 21, 1987, Ser. No. 99,291
Claims priority, application Japan, Sep. 22, 1986, 61-144101[U]
Int. Cl.[4] B41J *11/70, 29/00*
U.S. Cl. 400—621 **12 Claims**



1. A printer comprising:

a main body having an upper opening;

a platen arranged in the main body so as to face the upper opening;

a printing head located in the main body so as to face the platen;

sheet feeding means, arranged in the main body, for supplying continuous paper around the platen;

a cover mounted on the main body to be rotatable between two positions, including a closing position for covering the opening except for a portion above the platen, and an opening position for exposing the opening; and

a cutting mechanism for cutting continuous paper at a predetermined position, said cutting mechanism including: a cutter supported by the cover to oppose the main body, said cutter having a proximal end portion rotatably supported by the cover, and a blade extending from the proximal end portion, said cutter being rotatable between three positions, including a stand-by position where the blade is located above the platen, a cutting position where the blade abuts against the peripheral surface of the platen, and a housing position where the blade is rotated to a position adjacent a side of the cover opposing the platen at times when the cover is in the opening position; and biasing means for biasing the cutter toward the stand-by position when the cutter is located at a predetermined position adjacent the cutting position and for biasing the cutter toward the housing position when said cutter is located at a predetermined position adjacent the housing position.

4,840,507

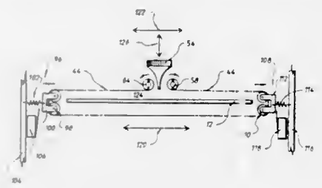
PRINTER WITH PRINTING SHIELD

Gerard Chenest, Saint Paer, France, assignor to Unisys Corporation, Blue Bell, Pa.

Filed Mar. 8, 1988, Ser. No. 165,311
Claims priority, application United Kingdom, Nov. 14, 1987, 8726732
Int. Cl.[4] B41J *11/62*
U.S. Cl. 400—713 **23 Claims**

1. A printer operative to move a printhead along a printing path to leave a readable record on a surface of a presented document maintained on a printing support surface and advanced in the course of presentation and printing; said printing being transverse to the direction of advancement of the document; said printer comprising; a moveable band, supported to pass at a predetermined distance from and parallel to said printing support surface and to pass beneath said printing support surface, said band being operative to accept a document between said band and said printing support surface and to prohibit any portion of the document to exceed said predetermined distance from said printing support surface; said band being coupled to move with said printhead as said printhead

moves along said path; said band permitting said printhead to protrude there-through to print upon the document; and said



printer comprising automatic tensioning means operative to maintain tension in said band.

4,840,508

MECHANICAL PENCIL CAPABLE OF AUTOMATICALLY PROPELLING SUCCESSIVE LENGTHS OF LEAD

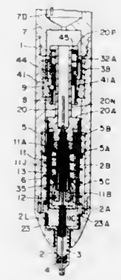
Hiroyuki Watanabe, Hiratsuka, Japan, assignor to Pilot Precision Kabushiki Kaisha, Kanagawa, Japan

Filed Aug. 21, 1987, Ser. No. 87,863

Claims priority, application Japan, Jan. 29, 1987, 62-17363; Feb. 23, 1987, 62-25196[U]; Mar. 4, 1987, 62-31557[U]

Int. Cl.[4] B43K *21/22*

U.S. Cl. 401—65 **6 Claims**



1. A mechanical pencil capable of automatically propelling successive lengths of lead, comprising:

(a) substantially tubular body means having a lead storage chamber formed therein for accommodating spare lengths of lead, for use one after another, the body means having a writing end;

(b) a tubular lead guide receiving a length of lead therein and coaxially mounted with the body means so as to partly protrude outwardly thereof from the writing end thereof and engaged by said return spring, the lead guide being resiliently urged to a preassigned normal position with respect to the body means and being retractable relative to the body means from the preassigned normal position in a direction away from the writing end of the body means against the urging force of said return spring with the wear of the lead;

(c) a friction member mounted on the lead guide for engaging the lead so as to normally cause the lead to travel with the lead guide in the axial direction of the body means;

(d) a socket mounted within the body means and having an annular internal taper surface concentric with the body means, the taper surface decreasing in diameter as it extends away from the writing end of the body means;

(e) a chuck disposed intermediate the lead storage chamber and the lead guide and coacting with the socket for releasably gripping the lead, the chuck being displaceable axially of the body means relative to the socket between an open position, closer to the writing end of the body means, for permitting the free passage of the successive lengths of lead therethrough from the lead storage chamber into the lead guide, and a closed position, away from the writing end of the body means, for tightly gripping the lead against axial displacement in a direction away from the writing end of the body means, said chuck being resiliently biased from the open toward the closed position;

(f) chuck opening means disposed within the body means and coupled to the lead guide for joint displacement therewith axially of the body means, the chuck opening means actuating the chuck from the closed to the open position upon displacement of the lead guide from a retracted to the preassigned normal position;

(g) whereby the chuck is held open when the lead guide is in the normal position, permitting a new length of lead to fall therethrough from the lead storage chamber into the lead guide when the lead that has been received in the lead guide wears short;

(h) one-way locking means for permitting the lead guide to retract into the body means with the wear of the lead during writing or marking and for locking the lead guide against displacement toward the writing end of the body means when the mechanical pencil is moved out of contact with a writing or marking surface; and

(i) unlocking means for causing the one-way locking means to permit the lead guide, together with the lead being engaged by the friction member, to travel back to the normal position when the lead is worn to a prescribed degree.

4,840,509

SYNTHETIC RESIN PEN UNIT

Akio Ito, and Hiroshi Kato, both of Aichi, Japan, assignors to Pilot Ink Co., Ltd., Japan

Division of Ser. No. 9,542, Feb. 2, 1987, Pat. No. 4,721,404, which is a continuation of Ser. No. 878,396, Jun. 19, 1986, abandoned, which is a continuation of Ser. No. 202,815, Oct. 31, 1980, abandoned. This application Oct. 15, 1987, Ser. No. 108,675

Int. Cl.[4] B43K *1/12, 1/06, 1/06*

U.S. Cl. 401—198 **3 Claims**

1. A pen unit comprising, in cross-section, a number of synthetic resin elements fused in the axial direction to form a capillary pen nib, said nib having an outer annular cylindrical member and is hollow at its circumferential center, a plurality of curved bent members extending inwardly from said cylindrical member toward said hollow center, said plurality of curved bent members uniformly circumferentially spaced thereon, said nib devoid of any inwardly extending straight members, said curved bent members comprise alternate long and short bent members and said long bent members comprise a base portion bent in a first direction and a top portion which is bent in a second direction and extending toward the central axis of the pen.

4,840,510

CONTAINER WITH BRUSH AND FLUID METERING UNIT FOR FLUID TYPE COSMETICS

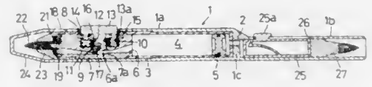
Shigeru Yaita, Saitama, Japan, assignor to Kabushiki Kaisha Yaita Seisakusho, Saitama, Japan

Filed Oct. 27, 1987, Ser. No. 113,116

Claims priority, application Japan, Oct. 29, 1986, 61-165961[U]

Int. Cl.[4] A46B *11/02*

U.S. Cl. 401—149 **5 Claims**



1. A fluid dispenser for fluid cosmetics comprising:

a housing;

a cosmetics reservoir in said housing for containing fluid cosmetics;

a brush attached to said housing for receiving and distributing fluid cosmetics;

a fluid passage in said housing for fluidly communicating said brush and said reservoir, said fluid passage having an intermediate passage portion having first and second ends, and said fluid passage having a stepped portion; and

a fluid metering means attached to said housing for metering fluid from said cosmetics reservoir through said fluid passage to said brush, said fluid metering means including a pushing unit movably received within said housing, said pushing unit having a first portion extending out of said housing and a second portion for extending into said stepped portion of said fluid passage, said second portion being substantially L-shaped, said fluid metering means further including a movable substantially L-shaped shut-off unit adjacent said second portion and freely movable in the direction for entering said fluid passage for pushing out fluid from said fluid passage toward said brush and for blocking off fluid communication between said brush and said reservoir, said fluid metering means further including a biasing means for urging said first portion of said pushing unit outwardly of said housing, said second portion blocking off fluid communication between said brush and said reservoir when said first portion of said pushing unit is moved inwardly into said fluid passage, said pushing unit then contacting said shut-off unit for moving said shut-off unit into said fluid passage while moving said second portion into said stepped portion of said passage for forcing fluid cosmetics out of said stepped portion toward said brush when said first portion of said pushing unit is moved further inwardly into said fluid passage, said second portion then further moving said shut-off unit into said fluid passage for blocking off fluid communication between said brush and said reservoir, said biasing means then moving said second portion in a return direction out of said stepped portion of said fluid passage when moving said pushing unit outwardly of said housing and said second portion maintaining said fluid passage blocked for developing negative pressure in said stepped portion for drawing fluid cosmetics therein, said biasing means then further moving said second portion in the return direction for unblocking said fluid passage for drawing in fluid cosmetics from said reservoir, and said second portion contacting said shut-off unit for moving said shut-off unit out of said fluid passage for unblocking fluid communication between said brush and said reservoir.

4,840,511

ELONGATED ROLL-ON APPLICATOR PACKAGE WITH RESILIENT LINER

Joseph E. Fattori, Mendham, and Siegbert O. Wagner, Basking Ridge, both of N.J., assignors to The Mennen Company, Morristown, N.J.

Filed Aug. 10, 1987, Ser. No. 84,403

Int. Cl.[4] A45D *34/04*

U.S. Cl. 401—213 **7 Claims**

1. A roll-on applicator package comprising, in combination, a hollow container for storing a fluid to be dispensed, an integral neck area as part of said container having internal opposing notches and an upwardly and inwardly formed wiping lip, a generally cylindrical roller with hemispherical ends and stub axles protruding along the longitudinal axis of the roller, the roller being larger in cross-sectional area than the cross-sectional area defined by the top edge of the wiping lip, the roller being suspended by the stub axles which engage the notches, a removable cap having attached therein, to the underside of the top portion of the cap, a resilient liner, the cap having a downwardly protruding, integral peripheral rib aligned generally with the top edge of the wiping lip, the resilient liner positioned such that when the cap is in place atop the container, a sealing liner portion of the resilient liner is compressed by the peripheral rib causing the resilient liner to bridge the space between the wiping lip and the roller to form a seal, the cap having slots and the container having detent means for fixing the cap atop the container, the detent means and the slots being dimensionally positioned such that the resilient liner must be compressed before the slots can engage the detent means, the resilient liner comprising a synthetic elastomeric material having a Durometer measurement of 20–35 Shore A.

4,840,512

FITTING FOR FASTENING THE RAIL MEMBER OF A DRAWER

Erich Röck, Höchst, and Helmut Hollenstein, Lustenau, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Dec. 15, 1987, Ser. No. 134,304

Claims priority, application Austria, Jan. 8, 1987, 20/87

Int. Cl.[4] B25G *3/00*

U.S. Cl. 403—22 **5 Claims**

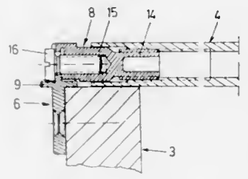
1. A fitting for fastening a rail member of a drawer to a rear wall or a side wall of the drawer, said fitting comprising:

a supporting member to be fastened to the rear wall or side wall of the drawer, said supporting member having therein an open-ended slot;

a fastening member having means for threadably, rotatably

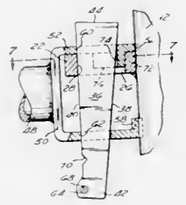
connecting said fastening member to a rear end of the rail member for adjustment relative thereto;

a clamping screw extending through said slot in said supporting member and threaded into said fastening member; and



means on said fastening member for, upon turning of said clamping screw to clamp said supporting member between said clamping screw and said fastening member, preventing turning of said fastening member relative to said supporting member.

4,840,513
SCAFFOLDING CONNECTOR APPARATUS
Steven B. Hackett, 17822 Arbor La., Irvine, Calif. 92705
Filed Nov. 5, 1986, Ser. No. 927,661
Int. Cl.[4] F16B 7/00; E04G 7/00
U.S. Cl. 403—49 31 Claims



1. An apparatus for removably connecting a vertically upright first member and a second member, said apparatus comprising:

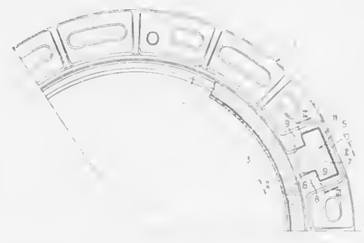
a plate surrounding said first member at least one aperture extending through said plate, said aperture being tapered in a first direction and having a narrow end and a wide end along said first direction;

a first leg extending from said second member and adapted to rest on top of said plate;

a tooth depending from said first leg said tooth extending into said aperture and being tapered in said first direction to conform in size and shape to said narrow end of said aperture; and

means for forcing said tooth into said aperture narrow end along said first direction so as to prevent rotation of said second member in a horizontal plane about said first member.

4,840,514
MANHOLE ASSEMBLY WITH T-SHAPED HINGE
Andre Defrance, Pont A Mousson, and Jean-Claude Hauer, Saulxures les Nancy, both of France, assignors to Pont-A-Mousson S.A., Nancy, France
Filed Apr. 7, 1988, Ser. No. 178,932
Claims priority, application France, Apr. 7, 1987, 87 04885; Dec. 16, 1987, 87 17571
Int. Cl.[4] E02D 29/14; E05D 7/10
U.S. Cl. 404—25 12 Claims



1. A manhole assembly, comprising:

(a) a generally circular frame (1, 1'),

(b) a generally circular cover (4) seated within the frame and removably hinged thereto by pivot means comprising:

(c) a T-shaped hinge lug (16) extending radially outwardly from a peripheral edge of the cover and defined by a radial neck (17) and a cylindrical pivot shaft (18) transverse to the neck and having a flattened upper surface (19), and

(d) a T-shaped receptacle (5, 5') recessed in an upper edge of the frame, configured to receivingly accommodate the hinge lug, and defined by a radial neck (6) extending outwardly from an inner edge of the frame, a transverse trough (7, 7') having a greater depth than the receptacle neck, and a pair of retaining lips (9) individually overhanging opposite ends of a radially innermost region (8) of the trough such that said lips are disposed at opposite sides of said radial neck, wherein:

(e) said innermost region of the trough has an inwardly facing concave shape of greater diameter than a maximum diameter of the pivot shaft taken parallel to the flattened upper surface thereof,

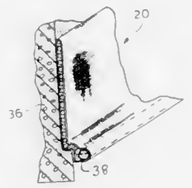
(f) inner edges of the lips define openings in cooperation with an external wall (11) of the frame above opposite ends of the trough and above a radially outermost region (10) thereof.

(g) a maximum diameter of the pivot shaft taken perpendicular to the flattened upper surface thereof is less than the width of said openings to enable the removal of the cover from the frame when the cover is raised to a vertical position, and

(h) the hinge lug lies out of engagement with surfaces of the receptacle when the cover is closed to avoid metallic rocking and clanking noises upon the passage of a vehicle.

4,840,515
SUBTERRANEAN DRAIN
James S. Freese, Charlotte, N.C., assignor to Mirafi, Inc., Charlotte, N.C.
Filed Dec. 5, 1986, Ser. No. 938,507
Int. Cl.[4] E02B 11/00
U.S. Cl. 405—45 9 Claims

1. A subterranean drainage unit for protecting a structure by intercepting subsurface fluid flows, comprising a sheet base member having parallel first and second planar surfaces, regularly spaced discrete frusto-conical members projecting from said first planar surface members intersecting channels to allow for lateral and vertical uninterrupted flow of fluid, said second planar surface being constructed and arranged to cohesively adhere to the surface of said structure being protected and a filter media supported by said projections to maintain a substantially rigid surface which is non-interfering with the flow of fluid within said intersecting channels.



4,840,516
ARTIFICIAL REEF
Thomas A. Rambo, 155 Lake Ave., Riverhead, N.Y. 11901
Filed Oct. 7, 1988, Ser. No. 254,814
Int. Cl.[4] E02B 3/06
U.S. Cl. 405—33 19 Claims

1. An artificial reef, comprising:

a plurality of aligned adjacent blocks;

each of said blocks including a base having front and back walls connected by sidewalls, an upper surface and a bottom surface;

a plurality of generally vertical columns spaced along said upper surface of said base;

said columns being sequentially stepped in height from said front and back walls to a maximum height adjacent a mid-portion of said base;

and

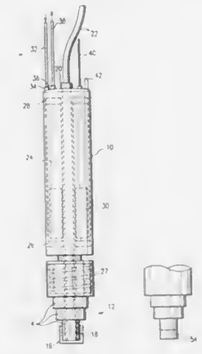
columns of each pair of adjacent blocks having complementary aligned surfaces forming a plurality of intersecting passages extending in first and second perpendicular directions, each of said passages having a corrugated internal surface.

4,840,517
SOIL DISPLACEMENT TOOLS
Roger A. Bullivant, Burton-on-Trent, England, assignor to Roger Bullivant of Texas, Inc., Grand Prairie, Tex.
Filed Feb. 27, 1987, Ser. No. 19,883
Claims priority, application United Kingdom, Feb. 28, 1986, 8605009
Int. Cl.[4] E02D 5/36
U.S. Cl. 405—241 12 Claims

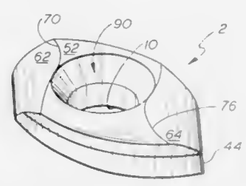
1. A soil displacement tool comprising:

an elongate body having a cylinder formed therein,

a piston moveable in the cylinder, fluid supply and exhaust lines in the cylinder and valve means for causing the piston to selectively impact one or other end of the cylinder to move the tool, the piston and cylinder being annular with the piston having a longitudinal bore therethrough along its longitudinal axis with a central longitudinal passage formed through the piston and through the tool.



4,840,518
CUTTING INSERT
Lawrence Plutschuck, and James E. Ochenski, both of Warren, Mich., assignors to GTE Valenite Corporation, Troy, Mich.
Filed Dec. 27, 1988, Ser. No. 290,599
Int. Cl.[4] B23C 5/02
U.S. Cl. 407—113 13 Claims



1. A cutting insert having a longitudinal axis, a vertical axis and a horizontal axis, comprising:

a planar bottom surface;

a first side surface extending vertically from said planar bottom surface to a first juncture and lying in a first plane which forms a first regular concave curve relative to said vertical axis;

a second side surface opposite said first side surface and extending vertically from said planar bottom surface to a second juncture and lying in a second plane which forms a second regular concave curve relative to said vertical axis;

a first cutting edge face extending at a first angle away from said vertical axis, said first cutting edge face extending from said first juncture to a first cutting edge;

a second cutting edge face extending at a second angle opposite to said first angle and away from said vertical axis, said second cutting edge face extending from said second juncture to a second cutting edge;

a third side surface extending at a third angle away from said vertical axis, said third side surface extending from said planar bottom surface;

a fourth side surface extending at a fourth angle opposite to said third angle and from said vertical axis, said fourth side surface extending from said planar bottom surface;

a top surface extending from said first cutting edge to said

second cutting edge and lying in a third plane which forms a third regular concave curve relative to said planar bottom surface;

a first upper corner area generally extending angularly upward relative to said planar bottom surface in a first longitudinal direction from said first cutting edge towards said second cutting edge, and in a first horizontal direction from said top surface to said fourth side surface, said first upper corner area lying in a fourth plane which is concave relative to said planar bottom surface and which is generally tangent to said top surface;

a diagonally opposite second upper corner area generally extending upward relative to said bottom surface in a second longitudinal direction opposite said first longitudinal direction from said second cutting edge towards said first cutting edge, and in a second horizontal direction from said top surface to said third side surface, said second upper corner area lying in a fifth plane which is concave relative to said planar bottom surface and which is generally tangent to said top surface;

said top surface, said first upper corner area and said first cutting edge face intersecting to form said first cutting edge as a first irregular curve concave relative to said vertical axis, and said top surface, said second upper corner area, and said second cutting edge face intersecting to form said second cutting edge as a second irregular curve concave relative to said vertical axis.

4,840,519

DRILL BIT FOR HAND DRILLS

Werner Kleine, Achim, Fed. Rep. of Germany, assignor to Gebruder Heller GmbH. Werkzeugfabrik, Achim-Upbusen, Fed. Rep. of Germany

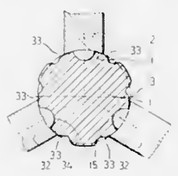
Continuation of Ser. No. 684,031, Dec. 20, 1984, abandoned. This application Jun. 24, 1987, Ser. No. 65,944

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1983, 8337365[U]; Apr. 10, 1984, 3413232

The portion of the term of this patent subsequent to Oct. 27, 2004, has been disclaimed.

Int. Cl.[4] B23B *31/04, 51/02*

U.S. Cl. 408—226 13 Claims



1. A set of drill bits of different thickness, wherein each drill bit has a drill shank and a clamping shank which has a longitudinal axis and a circumferential surface, and wherein the circumferential surface of one drill bit is larger than the circumferential surface of another drill bit, the circumferential surface of each drill bit being interrupted by at least two angularly spaced and generally longitudinally extending grooves, each of said circumferential surfaces having at least one formation which adjoins each of said grooves, each said formation being a surface other than concentric about the longitudinal axis of the involved drill bit, and the sectional profile of each groove and its associated formation surface being identical for all drill bits of said set.

4,840,520

MOUNTING DEVICE HAVING A CONICAL SHANK

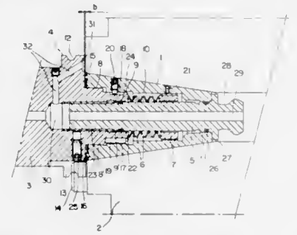
Emile Pfalzgraf, 7, rue de Neuwiller, 67330 Bouxwiller, France

Filed May 19, 1988, Ser. No. 197,123

Claims priority, application France, Nov. 23, 1987, 87 16604; European Pat. Off., Dec. 21, 1987, 87440086.4

Int. Cl.[4] B23C *9/00;* B23B *31/00*

U.S. Cl. 409—232 14 Claims



1. Mounting device having a conical shank, with conical and butt contact for attachments, tool holders and tools, comprising a cone (1) for introduction into a spindle (2), a forward part (3) separate from and centered in a bore in the cone (1) and provided with a collar (4) for application against the face of the spindle (2), a pull rod (5) for interconnecting the cone (1) and the forward part (3), a resilient assembly (6) for pressing the cone (1) into the spindle (2) in locking position, mounted in compression between the cone (1) and the forward part (3), and means (7) for adjusting said pressing assembly (6).

4,840,521

ELEMENT FOR FILTERING STRESS VARIATIONS IN A BOLTED ASSEMBLY

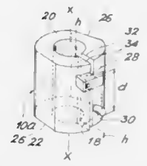
Bernard Bonnet, Eaubonne, France, assignor to Framatome, Courbevoie, France

Continuation of Ser. No. 830,794, Feb. 19, 1986, abandoned. This application Oct. 16, 1987, Ser. No. 110,628

Claims priority, application France, Feb. 19, 1985, 8502360

Int. Cl.[4] F16B *31/12;* G01L *1/04*

U.S. Cl. 411—14 6 Claims



1. A filtering element for filtering stress variations in a bolted assembly, the assembly having first and second members, each having at least one facing hole, a threaded member passing through said holes and a nut screwed onto a screw, wherein the filtering element constituted by a generally elongated tube whose height H is at least 0.8 times its diameter, which surrounds the screw and has a bearing surface on one face of one of the first and second members and bearing surface on one face of the nut, said two bearings surfaces being interrupted by a slot which completely transverses the tube in accordance with a generally longitudinal directional section thereof, a displacement h being provided on each of the bearing surfaces located respectively on either side of said slot, these two displacements being in opposite directions in accordance with the longitudinal direction of the element, the tube having two flats formed symmetrically with respect to a plane passing through the axis of the tube and through the longitudinal slot.

4,840,522

SYNTHETIC RESIN RIVET

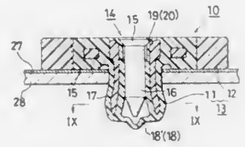
Kazumasa Kurihara, Yokohama, Japan, assignor to Nifco, Inc., Yokohama, Japan

Filed Oct. 27, 1987, Ser. No. 112,977

Claims priority, application Japan, Oct. 29, 1986, 61-164947

Int. Cl.[4] F16B *13/06*

U.S. Cl. 411—44 5 Claims



1. A synthetic resin rivet for disposition within an aperture defined within a panel, comprising:

a rivet body having a hollow cylindrical portion and an integral flange portion extending radially outwardly from the upper end of said cylindrical portion for engaging a surface of said panel when said rivet is disposed within said panel aperture; and

a pin for spreading hollow cylindrical portion of said rivet body when inserted thereinto,

said rivet body having a double-layer structure constituted by hard and soft synthetic resins, with at least an outer layer of said hollow cylindrical portion of said rivet body comprising said soft synthetic resin and an inner layer of said hollow cylindrical portion of said rivet body comprising said hard synthetic resin for uniformly radially expanding said outer soft synthetic resin into sealing engagement with sidewall portions of said aperture defined within said panel when said pin is inserted into said hollow cylindrical portion of said rivet body; and an expansible, plastically deformable, substantially U-shaped cap member integrally formed upon the lower end of said hollow cylindrical portion of said rivet body for closing the lower end opening of said hollow cylindrical portion of said rivet body and being constituted of said soft synthetic resin for counteracting contractual tendencies of said soft synthetic resin outer layer of said hollow cylindrical portion of said rivet body away from said sidewall portions of said aperture defined within said panel in order to maintain said sealing engagement thereof by substantially flattening out from said U-shaped configuration when said hollow cylindrical portion of said rivet body is radially expanded as a result of said insertion of said pin into said hollow cylindrical portion of said rivet body.

4,840,523

SECURING DEVICE

Tsutomu Oshida, Kamagaya, Japan, assignor to Nifco, Inc., Yokohama, Japan

Filed Jun. 30, 1988, Ser. No. 213,851

Claims priority, application Japan, Jul. 16, 1987, 62-109351

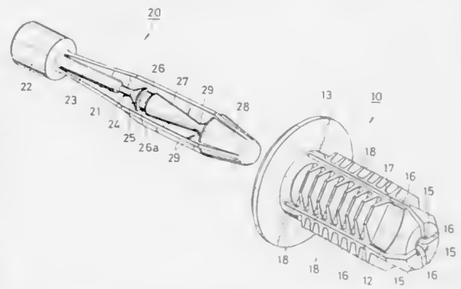
Int. Cl.[4] F16B *13/06*

U.S. Cl. 411—48 4 Claims

1. A securing device to be inserted within holes defined within at least two plates to be secured together, comprising:

an outer cylinder having a hollow cylindrical portion with a flange provided at one end, an inwardly projecting portion provided at the other end, a plurality of slits open at said other end and extending axially toward said flanged end so as to divide said hollow cylindrical portion into four quadrants with the outer surface of each quadrant comprising a flat surface disposed substantially perpendicular to the outer surface of each adjacent quadrant, and a plurality of axially spaced engagement ribs, each having the configuration of a trapezoid, projecting outwardly from each of said flat outer surfaces of said quadrants of said cylindrical portion such that the outermost edge surfaces of said trapezoidal ribs are disposed parallel to said flat surfaces of said quadrants of said cylindrical portion whereby each one of said outermost edge surfaces of said trapezoidal ribs are disposed substantially perpendicular with respect to adjacent outermost edge surfaces of said trapezoidal ribs so as to provide the ribbed portion of said outer cylinder with a first substantially square-shaped configuration; and

an insertion member having a rod-like portion to be inserted into and movable within said outer cylinder, said rod-like portion having a head portion provided at one end, an intermediate large diameter portion having an outer diameter which is greater than the inner diameter of said inwardly projecting portion of said outer cylinder so as to



be engaged by said inwardly projecting portion of said outer cylinder in order to radially expand said quadrant portions of said outer cylinder so as to cause said ribs to engage an inner peripheral surface of at least one of said holes of at least one of said plates to be secured together when said insertion member is disposed at a first axial position with respect to said outer cylinder, and a small diameter portion interposed between said large diameter portion and said head portion and having an outer diameter which is smaller than the inner diameter of said inwardly projecting portion of said outer cylinder so as to permit said securing device to achieve a released state with respect to said plates to be secured together when said insertion member is disposed at a second axial position with respect to said outer cylinder.

4,840,524

ANCHOR MEMBER WITH ELECTRICAL INSULATION JACKET

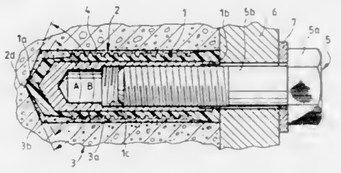
Heinz Bisping; Erich Leibhard, both of Munich, and Peter Mauthe, Kelinberghofen, all of Fed. Rep. of Germany, assignors to Hilti Aktiengesellschaft

Filed May 18, 1988, Ser. No. 195,209

Claims priority, application Fed. Rep. of Germany, May 19, 1987, 3716703

Int. Cl.[4] F16B *39/02;* E21D *20/02*

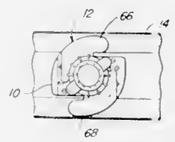
U.S. Cl. 411—82 13 Claims



1. Anchor member securable in a hardenable mass in an axially extending borehole in a receiving material, comprising an axially extending metal core member having a leading end in the direction said anchor member is inserted into the borehole and a trailing end, said core member having an axially

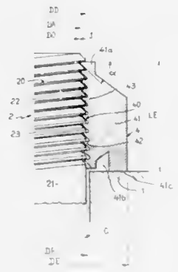
extending connecting thread, a jacket enclosing said core member in the axial direction thereof from the leading end at least for an axially extending section toward the trailing end, said jacket is formed of an electrically non-conductive plastics material at least in an axially extending section of said jacket to be located within the receiving material, wherein the improvement comprises a stop centered at the leading end of said jacket on an extension of the axis of said core member and said stop arranged to abut at the base of the borehole approximately along the axis of the borehole, said stop is a conically-shaped tip on the leading end of said jacket with the apex of said tip located approximately on the projection of the axis of said core member.

4,840,525
FASTENER RESTRAINER FOR FRAMING SYSTEM
Hugo E. Rebentisch, Garden City, Mich., assignor to Unistrut International Corp., Ann Arbor, Mich.
Filed Dec. 9, 1987, Ser. No. 130,807
Int. Cl.[4] F16B *37/04*
U.S. Cl. 411—85 **7 Claims**



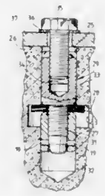
1. A fastener for use in joining the members comprising a nut having an opening adapted to engage a mating member, said fastener being adapted to be engaged with a channel-shaped member having a pair of parallel lip-like portions defining a slot;
said fastener including a retainer, said retainer being attached to said nut;
said nut having a major axis and a minor axis and having a groove extending transversely adjacent each of the opposite ends of said nut along said major axis adapted to frictionally engage lip-like portions of said channel member;
said retainer being formed of a resilient deformable mateial and comprising a base secured to said nut along a horizontal plane of said base and having an opening aligned with said opening in said nut;
said retainer having a pair of wing members extending outwardly from said base and upwardly at an angle with respect to the horizontal plane of said base, each wing member including a first section attached to and projecting downwardly from said base transversely of the major axis of said nut a substantial distance beyond a side of said nut;
said wing members each including a second section extending outwardly at said base and transversely of said major axis of said nut a shorter distance than said first sections and parallel to one of said grooves
said second sections each terminating at a vertical plane containing one of said grooves;
said wing members extending outwardly from opposite sides of said base and being spaced from each other.

4,840,526
GRIPPING DEVICE FOR TENSIONING SCREWING ELEMENTS
Jean-Claude Bourdonné, Le Breuil, France, assignor to Framatome, Courbevoie, France
Filed Apr. 16, 1987, Ser. No. 39,125
Claims priority, application France, Apr. 17, 1986, 86 05552
Int. Cl.[4] F16B *39/28, 39/30*
U.S. Cl. 411—263 **4 Claims**



1. Gripping device for tensioning a screwing element (2,3) having a free end, said free end having an outer profile (20,30) complementary to an inner profile (40, 50) of an engaging member (4, 5), said outer profile comprising teeth of constant pitch whose mean diameter is generated by a truncated cone and a generatrix of whose outer diameter is parallel to the axis of said screwing element (2, 3), said inner profile (40, 50) comprising teeth of constant cross-section and of a constant pitch slightly larger than that of said screwing element (2, 3) and generated on a conical bore of the same conicity as said mean diameter of said outer profile (20, 30) of said screwing element, said engaging member being provided with a bearing zone (41c, 51c) which supports and transmits forces and which is located on a peripheral portion of said engaging member.

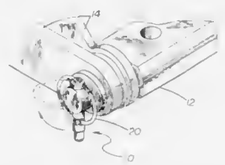
4,840,527
EXPANSION DOWEL ASSEMBLY
Hans Gschwend, Mauren; Hans Hachtel, Schaanwald, and Werner Wanger, Mauren, all of Liechtenstein, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein
Filed Dec. 22, 1987, Ser. No. 136,551
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643911
Int. Cl.[4] F16B *21/00*
U.S. Cl. 411—344 **12 Claims**



1. An expansion dowel assembly for insertion into a bore hole formed in a hard receiving material, with the assembly having a leading end inserted first into the bore hole and a trailing end with an insertion direction extending from the trailing end to the leading end direction and comprising expansion members displaceable radially outwardly by elastic force,

an axially extending sleeve-like support bearing having a leading end and a trailing end relative to the insertion into the bore hole, load engagement means in said support bearing, said support bearing located closer to the leading end of said expansion dowel assembly relative to said expansion members, a detachable tension member retaining said expansion members on said support bearing in a radially inwardly displaced position, wherein the improvement comprises said expansion members are radially slotted annular disks formed of a spring plate material positioned in the radially inwardly displaced position between said support bearing and said tension member and being releasable into a radially outwardly displaced position by the removal of said tension member, said tension member comprises a shaft elongated in the trailing end-leading end direction and a sleeve fitted on said shaft and secured by noses on said shaft at the trailing end thereof, and said sleeve having conically-shaped outside surfaces supporting said annular disks in the radially inwardly displaced position with said annular disks located between said conically-shaped supports and the trailing end of said bearing support with the trailing end of said bearing support forming a conically-shaped surface supporting the leading ends of said annular disks.

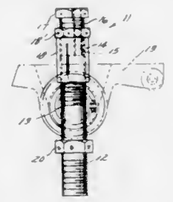
4,840,528
LOCKING HITCH PIN ASSEMBLY
Harvey A. Doom, Rte. 2, Box 168A, Smithland, Ky. 42801
Filed Feb. 16, 1988, Ser. No. 155,735
Int. Cl.[4] F16B *21/02*
U.S. Cl. 411—351 **7 Claims**



1. A locking hitch pin assembly comprising:
a locking pin having first and second ends;
a head being provided at said first end;
a pull ring rotatably retained by said head to allow swinging movement toward and away from said second end of said locking pin; and
means for retaining said pull ring in said pin adjacent said second end, said retaining means being retractable within said locking pin and including a keeper notch for capturing said pull ring;
whereby when said pull ring is pivoted to come into engagement with said pin, said ring being positively retained and held therein.

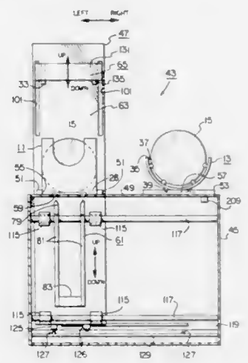
4,840,529
ADJUSTMENT LOCK
Donald A. Phillips, 2909 S. Logan, Lansing, Mich. 48910
Filed Aug. 17, 1987, Ser. No. 85,758
Int. Cl.[4] F16B *23/00, 35/00*
U.S. Cl. 411—397 **2 Claims**

1. A jam lock security structure for rocker arms in adjustment of valve lash clearance, the combination comprising:
a threaded stud;
a threaded sleeve threadably moveable and locatable on the axis of said stud;
a threaded jam element threadably insertable and removable from said threaded sleeve and axially engageable against the end of said stud at a position established by the position of said sleeve and said jam element defining a threaded opening offset from the and parallel to the axis of said jam element; and
a threaded set screw selectively positionable in said opening offset from said axis of said jam element and engageable with said stud upon final positioning of said sleeve element



by said jam element and stress locking said jam elements in selected position.

4,840,530
TRANSFER APPARATUS FOR SEMICONDUCTOR WAFERS
Loc H. Nguyen, 1617 Whittenburg, Fort Worth, Tex. 76134
Filed May 23, 1988, Ser. No. 197,682
Int. Cl.[4] B65G *65/30*
U.S. Cl. 414—404 **4 Claims**



1. An apparatus for automatically transferring wafers between first wafer container means and second wafer container means, said wafers being used in the manufacture of integrated circuits, each of said wafers having a center of gravity and an edge surface, said first container means having two opposite sides with a plurality of parallel slots for receiving said wafers by their edge surfaces and having an open bottom and an open top, said second container means having longitudinal support means with a plurality of parallel slots for receiving said wafers by their edge surfaces and having a closed bottom and an open top, comprising:
(a) first transfer means for transferring said wafers to and from said first container means, said first transfer means entering said first container means through said open bottom of said first container means, said first transfer means having a plurality of parallel slots for receiving said wafers by their edge surfaces and contacting said wafers at points below their centers of gravity;
(b) second transfer means for transferring said wafers to and from said second container means and for transferring said wafers to and from said first transfer means, comprising retainer means and movement means;
(c) said retainer means for retaining said wafers in the same relative orientation with respect to one another when said

wafers are removed from a container means, said retainer means having first and second retainer wall means for supporting said wafers, each of said first and second retainer wall means each having a lower edge and an inside surface, said first and second retainer wall means oriented relative to one another such that said inside surfaces face each other, each of said first and second retainer wall means inside surfaces having a plurality of parallel slots for receiving said wafers by their edge surfaces;

(d) said first and second retainer wall means pivotable relative to one another between open and closed positions, said closed position being where said first and second retainer wall means contact said wafer edge surfaces at points located below the centers of gravity of said wafers, said open position being where said first and second retainer wall means are out of contact with said wafer edge surfaces and said retainer wall means can be inserted or removed from said second container means, said first and second retainer wall means pivotable between open and closed positions when said lower edges of said retainer wall means are inside of said second container means.

4,840,531

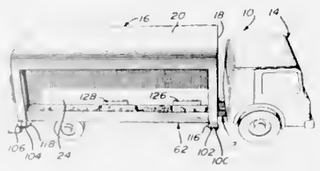
VEHICLE FOR CURBSIDE COLLECTION OF SOURCE SEPARATED RECYCLABLE MATERIALS

Maurice J. Dinneen, Scarborough, Canada, assignor to The Corporation of the City of Toronto, Toronto, Canada

Filed Jun. 10, 1988, Ser. No. 205,179

Int. Cl.[4] B65F *3/04*

U.S. Cl. 414—409 **5 Claims**



1. A vehicle for curbside collection of source separated recyclable materials comprising:

a wheel-supported understructure having front and rear sections;

a driver compartment mounted to said front section of said understructure;

a dumping unit mounted to said rear section of said understructure; said unit including a box-like frame having a front wall, a rear wall, spaced side walls, and a top wall, and displaying therein a plurality of longitudinally spaced dividing walls defining a first series of compartments;

a vertically movable trough extending longitudinally of said frame along one side wall thereof; said trough displaying therein a plurality of longitudinally spaced dividing walls defining a second series of compartments to receive source separated recyclable materials;

means on said unit for vertically guiding said trough along said one side wall; said guiding means allowing said trough to move to an upper discharging position over said side wall whereby recycling materials collected in each compartment of said trough are dumped into a corresponding compartment of said box-like frame;

actuatable means mounted between said frame and said understructure for moving said frame relative to said understructure;

hinge points on said frame and said understructure, located at the lower portion of each said side wall;

removable retaining means receivable in each said hinge point and cooperating with said actuatable means to tilt said frame about those hinge points from which said retaining means are not removed;

latchable door means at the bottom of each compartment of said frame allowing said materials to be discharged therefrom when said frame is tilted; and

said top wall extends over said series of compartments and is disposed a distance above said one side wall to allow said trough to move to said upper discharge position.

4,840,532

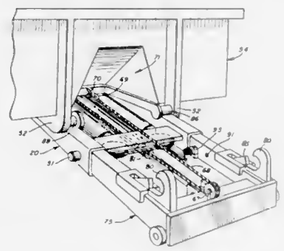
ROLL-OFF HOIST FOR VARIABLE POSITIONING OF CONTAINERS

Donald E. Galbreath, Winamac, Ind., assignor to Galbreath Incorporated, Winamac, Ind.

Continuation-in-part of Ser. No. 835,186, Mar. 3, 1986, abandoned. This application Aug. 14, 1986, Ser. No. 896,759

Int. Cl.[4] B60P *1/04*

U.S. Cl. 414—479 **19 Claims**



1. A vehicle mounted roll-off hoist for loading, transporting and unloading containers of various sizes, each container having stop means and cable hitch means at its forward end, said hoist comprising, in combination:

a roll-off hoist frame comprising a pair of laterally spaced beams secured together by spaced apart cross members;

hinge means adjacent the rearward end of said hoist frame adapting said hoist to pivot on the vehicle between a horizontal position and a rearwardly inclined position;

a container stop carriage telescopically connected with the forward end portion of said hoist frame;

stop means on said carriage engageable with coacting stop means on a container;

fluid actuator means interposed between said stop carriage and said hoist frame adapted to locate said stop carriage at predetermined distances from said hoist frame to place each container in the most favorable position on the vehicle for transport while said hoist frame is in the horizontal position; and

a hydraulic interlock valve mounted between the vehicle and said hoist and operable to preclude operation of said fluid actuator means unless said hoist is in the horizontal position relative to the vehicle.

4,840,533

APPARATUS FOR TRANSPORTING LOADS

Karl-Heinz Althoff, Bad Oeynhausen, Fed. Rep. of Germany, assignor to O & K Orenstein & Koppel AG, Dortmund, Fed. Rep. of Germany

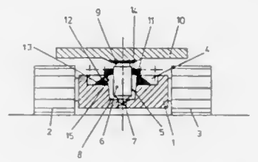
PCT No. PCT/EP86/00641, § 371 Date Aug. 24, 1987, § 102(e) Date Aug. 24, 1987, PCT Pub. No. WO87/03863, PCT Pub. Date Jul. 2, 1987

PCT Filed Nov. 7, 1986, Ser. No. 112,510

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1985, 3546106

Int. Cl.[4] B65G *41/00*

U.S. Cl. 414—495 **9 Claims**



1. An apparatus for transporting load units comprising:

a drive system carrier for lifting the load unit;

a single essentially vertically extending lifting element operatively associated with said drive system carrier;

a lifting platform supported by said lifting element;

at least two variable length supporting elements provided between said drive system carrier and said lifting element so as to displace said lifting platform transverse to the lifting direction; and

an element having a tapered inner diameter and being attached to said drive system carrier, said tapered inner diameter being tapered toward said drive system carrier thereby forming an inner wall which acts as an abutment surface for said lifting element upon lateral displacement of said lifting platform.

4,840,534

AUTOMOBILE LIFT AND TOW HOIST

Jerry Totty, Rte. 2, Box 54, Chaffee, Mo. 63740

Filed Nov. 24, 1987, Ser. No. 124,598

Int. Cl.[4] B60P *3/12*

U.S. Cl. 414—563 **16 Claims**

1. A hoist for lifting and towing an automobile using a tow truck or similar towing vehicle, said hoist comprising:

a frame work including a base adapted to be mounted on a vehicle bed and laterally spaced upstanding frame members mounted to the base and projecting upwardly therefrom;

a Z-shaped support structure including: a generally vertical standard; a generally horizontal upper leg having a front end hinged to said frame members by an upper, front transverse, horizontal-axis hinge member, and a rear end secured to said generally vertical standard, which is adapted to be disposed adjacent but to the rear of the vehicle bed on which the framework is mounted in use, at an upper site on said standard; and a lower leg having a front end mounted to said standard at a lower site which is arranged to be located, in use, adjacent but above a ground surface on which the towing vehicle may run, said upper site being disposed to be located, in use, above said vehicle bed, and said lower site being disposed to be located, in use, below said vehicle bed; said lower leg being joined at said front end thereof to said standard at said lower site by a lower, rear transverse, horizontal-axis hinge member; and said lower leg being provided at a rear end thereof with left and right, upwardly arcuate cradle means disposed for supporting left and right wheels of an end of a vehicle which is to be towed; and

means for separately power-articulating said upper, front and lower, rear hinge means respectively for raising and lowering said standard and for moving said cradles between a lowered position of use, in which said lower leg is approximately horizontal and projects rearwardly, and a stowed position, in which said lower leg is approximately vertical and projects upwardly from said lower site on said standard;

said upper, front transverse, horizontal-axis hinge member comprising a pipe hinge made of coaxial inner and outer steel pipes restrained against axial movement, the inner pipe thereof being secured to said frame members, and the outer pipe thereof having the front end of said upper leg secured thereof;

said upper leg comprising a pair of laterally spaced adjacent beams each separately secured to said outer pipe of said front transverse, horizontal-axis hinge member and to said standard;

said lower, rear transverse, horizontal-axis hinge member comprising a pipe hinge made of coaxial inner and outer steel pipes restrained against axial movement, one of the pipes thereof being secured to said standard and the other of the pipes thereof being secured to said lower leg.

4,840,535

VERTICAL SUBMERSIBLE PUMP ASSEMBLY

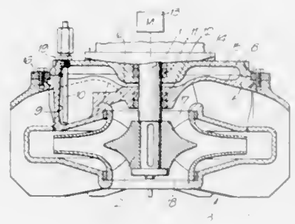
Torgeir Skarstad, Spikkestad, Norway, assignor to Kvaerner-Eureka A/S, Tranby, Norway

Filed Jan. 20, 1988, Ser. No. 146,129

Claims priority, application Norway, Oct. 26, 1987, 874457

Int. Cl.[4] F01D *25/32*

U.S. Cl. 415—168.2 **2 Claims**



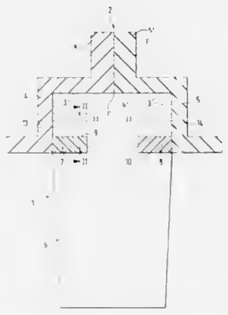
1. A vertical submersible pump assembly, comprising a centrifugal pump assembly with a rotor, and a pump casing, and a drive motor connected with pump rotor by a drive shaft, with a drain chamber surrounding the drive shaft and being sealed off in the direction of the pump rotor, and the drive motor with respective shaft seal means, wherein the centrifugal pump has upper and lower inlets, the pump casing forms the bottom of the drain chamber and contains the seal means against the pump rotor, and the drain chamber is shaped as a downwardly closed pocket extending down into the upper pump inlet, and means extending down into said pocket to remove liquid from said pocket.

4,840,536

AXIAL GUIDE BLADE ASSEMBLY FOR A COMPRESSOR STATOR

Siegfried Sikorski, Munich, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 24, 1988, Ser. No. 173,233
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1987, 3711764
Int. Cl.[4] F01D 9/01
U.S. Cl. 415—190 11 Claims



1. An axial guide blade assembly, especially for a compressor stator, comprising compressor housing means having a longitudinal housing axis, said housing means including housing sections divided in a plane (P) extending perpendicularly to said longitudinal housing axis, said housing sections forming an inner circumferential groove in said housing means, a plurality of guide blades each having a longitudinal blade axis extending substantially radially to said longitudinal housing axis, each of said guide blades having a root an a guide section, two fiber rings for mounting said guide blades in said inner circumferential groove, each guide blade having two recesses in and near its root, one of said recesses being arranged at a front edge of said guide blade near said root and the other of said recesses being arranged at a rear edge of each guide blade near said root, thereby forming a front edge group of recesses and a rear edge group of recesses, each group of recesses receiving one of said fiber rings, each of said fiber rings (7, 8) having a plurality of locating gaps (11), one guide blade being received in each locating gap, so that each of said guide blades is suspended by said rings in said recesses, wherein said fiber rings having a radially directed thermal expansion coefficient, relative to said longitudinal housing axis, which expansion coefficient is greater than a corresponding thermal expansion coefficient of said compressor housing means, whereby said guide blades and said fiber rings are clamped together in said inner circumferential groove of said housing means due to said different thermal expansion coefficients.

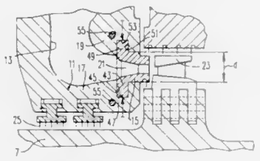
4,840,537

AXIAL FLOW STEAM TURBINE

George J. Silvestri, Jr., Winter Park, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 14, 1988, Ser. No. 257,909
Int. Cl.[4] F01D 1/02
U.S. Cl. 415—202 9 Claims

1. An axial flow steam turbine comprising:
a rotor;
a casing;
an inlet nozzle ring disposed circumferentially about said rotor within said casing, said inlet nozzle ring including radially spaced inner and outer sections, said sections having confronting channels across said space, and a plurality of nozzle chambers communicating with said space; and
a plurality of nozzle blocks having radially inwardly and



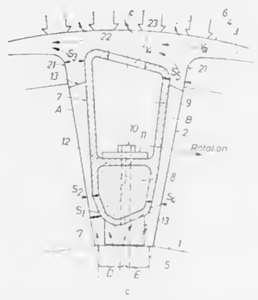
outwardly extending flanges, said flanges positioned in said confronting channels of said inlet nozzle ring and contained therein under compressive forces exerted by said nozzle ring sections.

4,840,538

INTERPOLAR BODY FOR COOLING SALIENT-TYPE ROTOR BY VENTILATION

Kalman N. Lehoczky, 5228 18th Ave. East, Bradenton, Fla. 34208

Filed Aug. 18, 1987, Ser. No. 86,501
Int. Cl.[4] F01D 5/18
U.S. Cl. 416—96 A 11 Claims



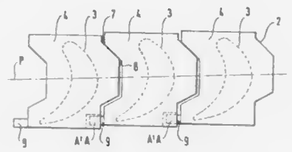
1. A device for cooling salient-type rotor poles of an electrical machine, comprising:
a rim which serves as a yoke of the rotor and which has radially extending ventilation ducts for carrying cooling air therethrough;
a plurality of spaced salient poles being mounted on the perphery of rim such that interpolar spaces are defined between adjacent ones,
and creating a radial airgap between the salient poles and the internal surface of the stator;
a plurality of interpolar bodies placed in the interpolar spaces providing radially extending ventilation gaps on both sides of the interpolar body and relative to the adjacent salient poles, and
the interpolar bodies having a circumferentially extending top surface close to the internal surface of the stator creating a circumferential channel between the interpolar body and the internal surface of stator, and the top surface providing openings between the interpolar body and the tip of salient poles and corresponding to the radially extending ventilation gaps wherein internal parallel to the rotational axis, wherein at least some of the internal channels extending parallel to the rotational axis are filled with materials different from those constituent in the outer wall of the interpolar bodies.

4,840,539

MOVING BLADING FOR STEAM TURBINES

Pierre Bourcier, and Gilbert Riollet, both of Paris, France, assignors to Alsthom, Paris, France

Filed Mar. 8, 1988, Ser. No. 165,320
Claims priority, application France, Mar. 12, 1987, 87 03390
Int. Cl.[4] F01D 5/22
U.S. Cl. 416—191 12 Claims



1. Moving blading for a steam turbine, the blading comprising a plurality of blades having respective generally radial bodies provided with transverse members with the transverse members on adjacent blades in contact, at least during rotation of the blading over plane surfaces which are substantially parallel to radial axes Z'Z of the blades, said contact causing the blade bodies to twist, the improvement wherein, in addition to said contact between adjacent transverse members, said blading includes links provided by means of additional contacts which are free to slide rectilinearly in planes corresponding to the plane of each transverse member along respective axes which are substantially perpendicular to the axis of rotation 00' of the blading, said additional contacts being situated at a relatively large distance from said contact that gives rise to twisting.

4,840,540

PROPELLER WHOSE BLADES ARE PROVIDED WITH SLATS

Michael Kallergis, Brunswick, Fed. Rep. of Germany, assignor to Deutsche Forchungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

Filed Jun. 22, 1988, Ser. No. 210,115
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1987, 3721295
Int. Cl.[4] B64C 11/16
U.S. Cl. 416—223 A 2 Claims

1. Propeller, each of whose blades is provided with a slat which is rigidly connected to the propeller blade, and of which the outer radius is smaller than the blade radius, wherein the slat tips lie on a diameter given by the equation

$$D_i = \sqrt{[(LTLP)^2 \cdot a_o^2 - v_\infty^2]}\ /\pi \cdot n$$

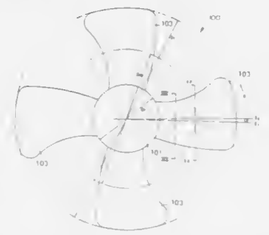
where
LTLP = lower transonic limit of the particular blade configuration including slat
a_o = velocity of sound in air
v_∞ = flight speed
n = propeller rotational speed.

4,840,541

FAN APPARATUS

Takaaki Sakane, Nagoya, and Kazuhiro Takeuchi, Chita, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 11, 1988, Ser. No. 167,309
Claims priority, application Japan, Mar. 13, 1987, 62-59194; Feb. 24, 1988, 63-41435
Int. Cl.[4] F04D 29/38
U.S. Cl. 416—223 R 5 Claims



1. A fan apparatus having a boss portion which is driven to be rotated and a plurality of blades connected to said boss portion in such a manner that said boss portion positions at a center position of said a plurality of blades, wherein;
a setting angle of said blade at a first area from a bottom portion of said blade to an inter mediate portion is maintained substantially the same,
the setting angle of the said blade at a second area from said intermediate portion to a top portion of said blade is gradually increased,
a chord length of said blades is gradually increased from the bottom portion to the top portion of said blade,
a first wing axis which represents a center portion of the chord length at the first area from the bottom portion to the intermediate portion of the blade is inclined to a second wing axis which represents the center portion of the chord length at the second area from the intermediate portion to the top portion in such a manner that the second wing axis inclined toward a rotating direction of said boss from the first wing axis; and
a profile of said blade is so formed that the profile at the first area is perpendicular to the first wing axis and the profile at the second area is perpendicular to the second wing axis.

4,840,542

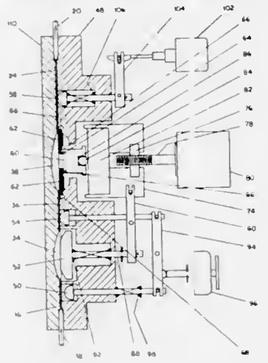
INFUSION PUMP WITH DIRECT PRESSURE SENSING

Martyn S. Abbott, Richardson, Tex., assignor to Quest Medical, Inc., Carrollton, Tex.

Continuation-in-part of Ser. No. 717,131, Mar. 27, 1985, Pat. No. 4,657,490. This application Apr. 10, 1987, Ser. No. 37,019
Int. Cl.[4] F04B 43/08; A61M 1/00
U.S. Cl. 417—9 2 Claims

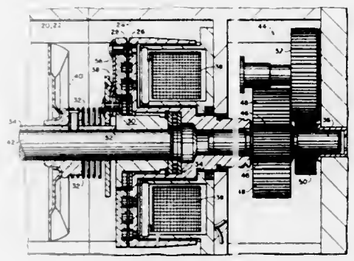
1. A pump for parenteral administration of fluid to a patient from an elevated I.V. container comprising:
tubing extending from the I.V. container to the patient;
a disposable pump chamber in line with the tubing;
a pump including means operating in discrete cycles for pressurizing the pump chamber and means for measuring the pressure during pumping cycles;

an outlet valve downstream from the pumping chamber;
means for measuring the gravity head pressure at the pump when the outlet valve is closed prior to the beginning of a pumping cycle, and establishing an operational occlusion pressure based on the measured head; and



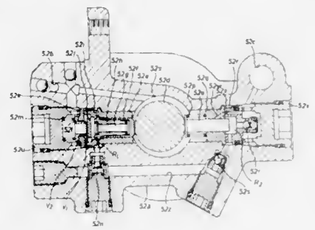
means for stopping the pump if the measured pumping pressure exceeds the occlusion pressure during a pumping cycle.

4,840,543
CLUTCH APPARATUS FOR RAPID POWER SOURCE CONVERSION
John D. Geberth, Jr., 10 Goose Cove La., Ramsey, N.J. 07446
Filed Aug. 10, 1988, Ser. No. 230,594
Int. Cl.[4] F04B *17/00*; F16D *27/06*
U.S. Cl. 417—223 11 Claims



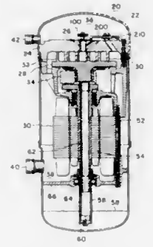
1. Apparatus for use in combination with a motor driven mechanism, such as an airless spray paint pump, which permits the power source thereof to be converted between an electric motor and an internal combustion engine, wherein the respective output shafts of said electric motor and internal combustion engine are identical and when mounted to said motor driven mechanism are aligned with the input shaft thereof so as to directly drive the input shaft of the motor driven mechanism, said apparatus comprising:
(a) a driven clutch plate fixedly connected to the input shaft of said motor driven mechanism;
(b) a drive clutch plate;
(c) a clutch hub axially displaceable and non-rotatably mounted on the output shaft of the electric motor or internal combustion engine;
(d) means for mounting said driven clutch plate to said clutch hub so that said driven clutch plate is normally biased to a fixed axial position on said clutch hub and axially resiliently moveable relative to said clutch hub toward said driven clutch plate;
(e) biasing means axially biasing said clutch hub on said output shaft toward the input shaft;
(f) a thrust bearing arranged so as to permit a slight clearance between the faces of said drive and driven clutch plates when said clutch hub is biased toward the input shaft; and
(g) activation means for causing said driven clutch plate to move axially relative to said clutch hub to close the clearance between said drive and driven clutch plates and non-rotatably engage said driven clutch plate.

4,840,544
HYDRAULIC PUMP ASSEMBLY ASSOCIATED WITH ACCUMULATOR
Hiromu Kuromitsu, Kariya; Nobuyasu Nakanishi, Toyota; Akira Shirai, Toyota, and Noboru Noguchi, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan
Continuation of Ser. No. 826,617, Feb. 6, 1986, abandoned. This application Jul. 5, 1988, Ser. No. 214,830
Claims priority, application Japan, Feb. 6, 1985, 60-15426; Mar. 26, 1985, 60-44663; Mar. 26, 1985, 60-44664; Mar. 26, 1985, 60-44665
Int. Cl.[4] F04B *1/02*
U.S. Cl. 417—254 6 Claims



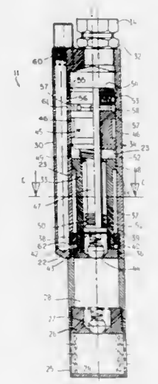
1. A hydraulic pump assembly for us in combination with an accumulator for supplying hydraulic fluid under pressure into the accumulator through an inlet check valve associated thereto, comprising:
a pump housing provided with an inlet port for connection to a fluid reservoir and an outlet port for connection to said accumulator through said inlet check valve;
a single cam shaft rotatably mounted within said pump housing to be driven by a power source;
a first pump assembly of large displacement capacity including a first cylinder provided within said pump housing perpendicularly to said cam shaft, a first plunger axially movably disposed within said first cylinder for reciprocation by engagement with said cam shaft, a first suction check valve arranged to cooperate with said first plunger for permitting therethrough flow of hydraulic fluid from said inlet port toward said first plunger, a relief valve associated with said first suction check valve to release excessive hydraulic pressure from a pump chamber between said first suction check valve and said first plunger into a chamber in communication with said inlet port, and a first exhaust check valve arranged to cooperate with said first plunger for discharging therethrough the hydraulic fluid pressurized by said first plunger; and
a second plunger pump assembly of small displacement capacity including a second cylinder provided within said pump housing perpendicularly to said cam shaft, a second plunger axially slidably disposed within said second cylinder for reciprocation by engagement with said cam shaft, a second suction check valve arranged in communication with said first exhaust check valve to cooperate with said second plunger for permitting therethrough the flow of pressurized hydraulic fluid from said first exhaust check valve toward said second plunger, and a second exhaust check valve arranged to cooperate with said second plunger for discharging therethrough the hydraulic fluid pressurized by said second plunger toward said outlet port;
wherein said first suction check valve comprises a cylindrical retainer fixedly coupled with said first cylinder, an axially movable valve plate disposed within said cylindrical retainer movable in response to reciprocation of said first plunger, an annular valve seat fixedly coupled with said cylindrical retainer, a cylindrical valve body axially slidably coupled with said annular valve seat, and resilient means for biasing said valve body toward said valve plate, said cylindrical valve body having an annular seat portion cooperable with a flat surface of said valve plate, wherein said relief valve comprises an annular flange of said valve body cooperable with said valve seat, and wherein the flat surface of said valve plate is adapted to be brought into engagement with the annular seat portion of said valve body only by the hydraulic fluid pressurized by said first plunger.

4,840,545
SCROLL COMPRESSOR RELIEF VALVE
John R. Moilanen, La Crescent, Minn., assignor to American Standard Inc., New York, N.Y.
Filed May 16, 1988, Ser. No. 194,271
Int. Cl.[4] F04B *49/02*
U.S. Cl. 417—301 20 Claims



1. A scroll compressor reverse-rotation relief valve for a hermetic compressor operating to compress a refrigerant, said relief valve comprised of:
a scroll compressor element disposed in said hermetic compressor to divide said scroll compressor into a suction pressure portion and a discharge pressure portion, said scroll compressor element having a discharge port defined therethrough to discharge refrigerant into said discharge pressure portion, said scroll compressor element further including a relief passage interconnecting a source of suction pressure refrigerant to said discharge port;
means for preventing a backflow of refrigerant from said discharge pressure portion into said discharge port;
means for closing said relief passage in a flow preventing manner disposed in said relief passage, said relief passage closing means being refrigerant pressure responsive to seleictively prevent a flow of refrigerant through said refief passage whereby said relief passage is closed by said relief passage closing means when the scroll compressor is operated with the correct rotation to produce refrigerant discharge pressure exceeding refrigerant suction pressure, and said relief passage is open to permit passage of suction pressure refrigerant to said discharge port when the scroll compressor is operated in reverse rotation to produce refrigerant discharge pressure less than refrigerant suction pressure.

4,840,546
PUMP FOR LIQUIDS AND GASES
Ludvig Nass, Liljeveien 4b, S-7400 Oppdal, Norway
Continuation of Ser. No. 542,172, Oct. 14, 1983, abandoned.
This application Mar. 6, 1986, Ser. No. 838,396
Int. Cl.[4] F04B *47/08*
U.S. Cl. 417—403 6 Claims



1. A pump immersible in a well hole or the like for pumping liquids and gases therefrom using a supply of pressurized working medium, the pump comprising
an elongated pump housing having an inner wall formed to define a longitudinal bore,
a partition mounted on the inner wall to divide the housing bore into an upper housing chamber and a lower housing chamber, the partition formed to include an aperture for the reception of a piston, the inner wall of the upper housing chamber being formed to include first, second, and third ports,
a double acting piston in the bore, the double acting piston including an upper flange, a lower flange, and a hollow shaft extending therebetween, the hollow shaft being mounted for sliding movement in the partition aperture to position the upper flange in the upper housing chamber and to position the lower flange in the lower housing chamber,
the hollow shaft, the partition, and the inner wall of the pump housing cooperating with the upper flange to define an upper working chamber for the reception of pressurized working medium and with the lower flange to define a lower working chamber for the reception of pressurized working medium,
first conduit means for conducting pressurized working medium to the first port of the upper housing chamber,
second conduit means for conducting pressurized working medium between the second port of the upper housing chamber and the upper working chamber,
third conduit means for conducting pressurized working medium between the third port of the upper housing chamber and the lower working chamber, and
control valve means for controlling the direction of movement of the double acting piston within the housing bore, the control valve means being mounted for sliding movement in the upper housing chamber between a lower and an upper operating position, the control valve means including first means for interconnecting the first and second conduit means to deliver pressurized working medium from the supply of pressurized working medium to the upper working chamber when the control valve means is in its lower position to move the double acting piston in an upward direction within the housing bore and

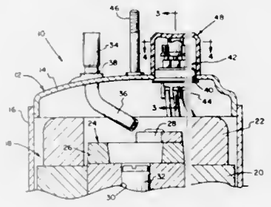
second means for interconnecting the first and third conduit means to deliver pressurized working medium from the supply of pressurized working medium to the lower working chamber when the control valve means is in its upper position to move the double acting piston in a downward direction within the housing bore.

4,840,547

COMPRESSOR INCLUDING PROTECTIVE CAP FOR HERMETIC TERMINAL

Emanuel D. Fry, Tecumseh, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Aug. 10, 1988, Ser. No. 230,578
Int. Cl.[4] F04B *35/04*; H01R *13/44*
U.S. Cl. 417—422 **20 Claims**



8. In combination with a hermetic compressor having a sealed housing and a hermetic terminal including a base portion and at least three circularly arranged conductor pins extending upwardly, parallel to one another, from the base portion on the exterior of the housing, a protective cap on said hermetic terminal for temporarily covering the hermetic terminal when it is not otherwise connected to an external source of power, such as during manufacturing, shipping, and storage of the compressor, said protective cap comprising:

a cup-shaped body member, including an open end, a closed end, and a generally cylindrical sidewall therebetween, said open end being disposed circumjacent the hermetic terminal base portion; and

a generally cylindrical stud portion having an attached end and an opposite unattached end, said attached end being attached to said body member closed end, said stud portion being disposed substantially coaxially within said body member in spaced relationship with said sidewall, said unattached end being disposed radially inwardly of the circularly arranged conductor pins in contacting engagement therewith.

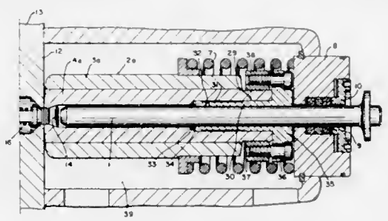
4,840,548

HIGH PRESSURE PLUNGER PUMP

Paul Hammelmann, Zum Sundern 17, 4740 Oelde, Fed. Rep. of Germany

Filed Mar. 24, 1988, Ser. No. 173,153
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1987, 3709611
Int. Cl.[4] F04B *19/03*, *21/02*
U.S. Cl. 417—469 **7 Claims**

1. A high pressure plunger pump, comprising a centrally arranged pressure valve; an oscillatingly movable plunger having an axis; a sleeve guided on said plunger and limiting a working chamber; a suction chamber which surrounds said sleeve and accommodates an aspirated fluid, said sleeve having a ring chamber which opens toward said plunger; and a bush which is arranged in said ring chamber and supported against said plunger, said bush abutting against the plunger, said bush being formed as a one-piece sealing bush composed of metal, said bush being provided with an opening extending towards said plunger and limiting with said sleeve an additional ring chamber which is filled with a leakage fluid and loaded with a pressure which acts in the region of said opening, said first-mentioned ring chamber having a front end and a front end surface; and further comprising a ring-shaped soft packing



arranged at said front end of said first-mentioned ring chamber, said soft packing overlapping said front end surface and extending axially at both sides of said front end surface.

4,840,549

SCROLL COMPRESSOR WITH CONTROL OF DISTANCE BETWEEN DRIVING AND DRIVEN SCROLL AXES

Etsuo Morishita; Masayuki Kakuda, both of Amagasaki; Masahiro Sugihara, Wakayama; Tsutomu Inaba, Wakayama; Toshiyuki Nakamura, Wakayama, and Tadashi Kimura, Wakayama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 12,375, Feb. 9, 1987, Pat. No. 4,753,582. This application Jun. 9, 1988, Ser. No. 204,253
Claims priority, application Japan, Feb. 12, 1986, 61-28427
Int. Cl.[4] F04C *18/04*, *27/00*
U.S. Cl. 418—55 **2 Claims**

1. A scroll compressor which comprises:

a sealing container,

a driving scroll with a wrap plate,

a driven scroll with a wrap plate, which is combined with said driving scroll to form a compression chamber therebetween,

an Oldham's coupling for transmitting a driving force of said driving scroll to said driven scroll,

a partition plate fixed to said container and having a supporting pin provided at a position near the inner wall of said container,

a movable bearing support which supports said driven scroll, said movable bearing support being placed below said partition plate and having a bearing engaged with said supporting pin, the engagement between said supporting pin and said bearing comprising means for supporting said movable bearing support for swingable motion around said supporting pin, and

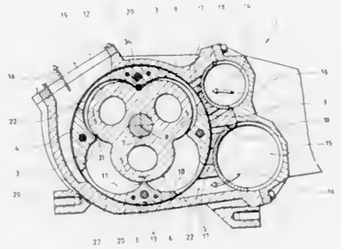
a rotation controlling means which causes a swinging movement of said movable bearing support around said supporting pin along with said driven scroll whereby the distance between the axial centers of said driving and driven scrolls is changed, wherein said rotation controlling means has a center around which said movable bearing support is swung, the center of the controlling means being determined in such a position that it is opposite a vector of the compressing force acting on said driven scroll and at an angle deviated from the imaginary line on the vector in the direction of rotation of said driven scroll.

4,840,550

INTERNAL AXIS ROTARY PISTON ENGINE WITH PROTRUSIONS HAVING TWO SEALING CORNERS

Hans Baumgartner, Viersen; Manfred Brandstädter, Düsseldorf, and Ulrich Henke, Übach Palenberg, all of Fed. Rep. of Germany, assignors to Pierburg GmbH, Fed. Rep. of Germany

Filed Jan. 20, 1988, Ser. No. 145,836
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1987, 3702558
Int. Cl.[4] F01C *1/10*, *19/00*
U.S. Cl. 418—150 **7 Claims**



1. A rotary piston engine, comprising:

a housing;

an outer rotor and an inner rotor provided so as to rotate around different axes of rotation, the outer rotor having engagement parts defining working spaces therebetween and the inner rotor having pistons; and

strip-like protrusions having two sealing corners provided so as to extend in a spaced manner next to each other in the rotational direction of the outer rotor, said protrusions being provided at the engagement parts of the outer rotor so as to project radially inward and form a contour of the pistons of the inner rotor, the working spaces each having a volume exclusively sealed by sealing edges formed by the sealing corners so as to extend across the entire length of the inner rotor, these sealing corners being arranged so that only sealing corners of two adjacent engagements parts of the outer rotor contact a piston of the inner rotor as the piston enters a working space of the outer rotor.

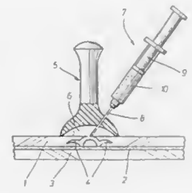
4,840,551

ARRANGEMENT FOR REPAIRING STONE IMPACT DAMAGES AT WINDSHIELDS MADE OF MULTI-LAYER SAFETY GLASS

Kurt Lay, Rottenburg, and Erwin Sailer, Altdorf, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 6, 1987, Ser. No. 23,000
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1986, 3607738
Int. Cl.[4] B29B *9/00*
U.S. Cl. 425—12 **4 Claims**

1. An arrangement for repairing stone impact damages at windshields, comprising a transparent plastic cup means adapted to be sealingly placed on the windshield over the damage, and having flexible resilient material means for causing a vacuum-tight intermediate space between the plastic cup means and the windshield, substantially the entire plastic cup means consisting of said flexible material means which is able to be pierced anywhere throughout its entirety by means of a hollow needle means, and wherein said flexible material means forms a vacuum-tight sealed passage, a hollow needle extending through the sealed passage into said intermediate space while allowing said hollow needle means to be freely moved in



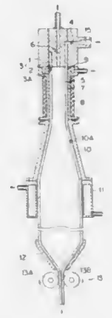
said vacuum-tight intermediate space by virtue of the vacuum-tight sealed passage in said flexible material.

4,840,552

APPARATUS FOR CONTINUOUSLY PRODUCING HEAT-SHRINKABLE CROSSLINKED RESIN TUBE

Akihumi Onishi; Masakasu Hasegawa; Michio Takaoka; Tsuneaki Motai; Motoyuki Ono, and Shotaro Yoshida, all of Tokyo, Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed Jul. 7, 1987, Ser. No. 70,784
Int. Cl.[4] B29C *47/88*
U.S. Cl. 425—72.1 **11 Claims**



1. An apparatus for continuously producing a heat-shrinkable crosslinked resin tube, comprising

an extruder head including a die and a mandrel combined therewith for extruding a crosslinkable resin composition into a hollow tube,

means associated with said extruder head for introducing a fluid under pressure into the interior of the tube being extruded by said extruder head,

a crosslinking cylinder disposed downstream of said extruder head for causing the tubular resin composition to cross-link by continuously heating said tube,

an unheated expanding die disposed immediately downstream of said crosslinking cylinder for conducting the tube therethrough without further application of heat and having an interior surface having a continuously increasing diameter in a downstream direction,

a cooling cylinder disposed immediately downstream of said expanding die for cooling the tube,

guide means disposed downstream of said cooling cylinder for deforming the tube into a flattened form, and

means disposed downstream of said guide means for drawing the tube away from said extruder head,

wherein a smooth non-perforated interior surface free of a

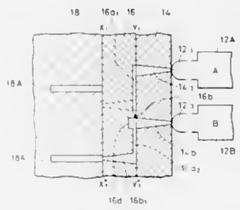
substantial gap or step extends continuously from said crosslinking cylinder to said cooling cylinder.

4,840,553

METAL MOLD STRUCTURE FOR MOLDING MULTI-LAYER RESIN

Takashi Arai, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 24,711, Mar. 11, 1987, abandoned. This application Sep. 20, 1988, Ser. No. 246,613
Claims priority, application Japan, Mar. 20, 1986, 61-063453; Mar. 27, 1986, 61-069424; Jun. 26, 1986, 61-098586
Int. Cl.[4] B29C *45/13, 45/16*
U.S. Cl. 425—129.1 **2 Claims**



1 A metal mold for a multi-layer resin molded article for effecting, in injection-molding a cylindrically-shaped part, sandwich molding in which core layer resin is used for the center of the cylinder portion of the cylindrically-shaped part and skin layer resin is used for the portion around said center of the cylinder portion, characterized in that a mold member provided with a cavity for molding said cylindrically-shaped part has attached thereto a runner plate provided with a plurality of runners for passing said resins therethrough into said cavity, said runner plate has attached thereto a fixed plate provided with a sprue connected to an injection cylinder unit for the core layer resin and an injection cylinder unit for the skin layer resin, the start point of said plurality of runners and the injection port of said injection cylinder unit for the core layer resin are arranged on a straight line, a resin reservoir is provided at a position on said straight line, a runner for the skin layer resin is provided between said injection cylinder unit for the skin layer resin and said start point of said runners, and a gate having a reduced resin flow-cross-section is provided at a location in said runner for the skin layer resin near said resin reservoir.

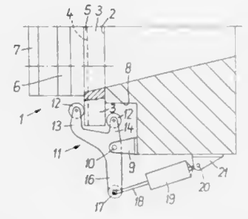
4,840,554

EXTRUSION HEAD EQUIPPED WITH A CLAMPING DEVICE FOR THE TOOL COMPONENTS

Ingo Hirschkorn, Neu Wulmstorf, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Apr. 11, 1988, Ser. No. 179,941
Claims priority, application Fed. Rep. of Germany, Apr. 11, 1987, 3712343.2
Int. Cl.[4] B29C *47/00*
U.S. Cl. 425—190 **11 Claims**

1. In an extrusion tool including
an end plate,
a plate holder cassette including means for seating said end plate, and having opposite first and second faces;
an extrusion head including means for seating said cassette; said first face of said cassette being oriented towards said extrusion head and said second face of said cassette being oriented away from said extrusion head;
first clamping means having an operative position for pressing said cassette and said end plate as a unit against said extrusion head by engaging an outer face of said end plate; said first clamping means having a withdrawn position in which said first clamping means permits a removal of said end plate from said cassette and a removal of said cassette from said extrusion head;
the improvement comprising a second clamping means for pressing, in a clamping position thereof, said cassette



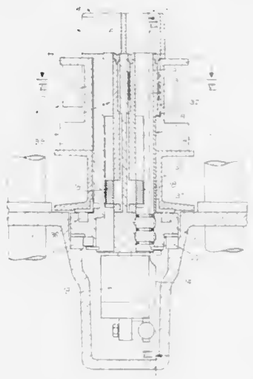
against said extrusion head by engaging said second face of said cassette externally of said end plate, whereby said end plate is, in said withdrawn position of said first clamping means, removable from said cassette while said cassette remains pressed against said extrusion head by said second clamping means.

4,840,555

INSTALLATION FOR THE SIMULTANEOUS THERMOFORMING OF AT LEAST ONE ROW OF CONTAINERS IN THERMOPLASTIC MATERIAL, EACH CONTAINER BEING PROVIDED WITH A DECORATIVE BANDEROLE

Jean-Claude Hautemont, Gif-sur-Yvette, France, assignor to Societe a Responsabilite Limitee, Les Ulis Cedex, France

Filed Dec. 9, 1988, Ser. No. 281,789
Claims priority, application France, Dec. 11, 1987, 87 17355
Int. Cl.[4] B29C *51/02*
U.S. Cl. 425—500 **18 Claims**



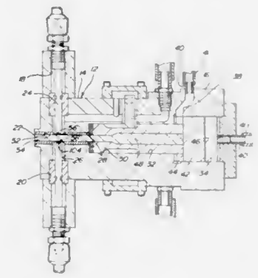
1. Installation for the simultaneous thermoforming of at least one row of containers in thermoplastic material, in which each one of the containers are provided with a decorative banderole, installation of the type comprising:
a thermoforming station through which is fed step-by-step a thermoforming band pre-heated to its forming temperature, and which comprises, under the path of said thermoplastic band, a molding unit equipped with a plurality of vertical cylindrical forming chambers disposed in at least one row transversal with respect to the horizontal step-by-step feeding direction of the thermoplastic band, said chambers being open at their top part and having at their lower end, an opening adapted to be closed off by a bottom element movable with respect to the molding unit, so as to be capped by the corresponding molding unit which rests on a press table, vertically movable between a high or thermoforming position and a low or container-stripping position, and
a device for cutting, preforming and transferring the banderoles in the forming chambers of the molding unit, said device comprising, from upstream to downstream, in the moving direction of the banderoles:
a roller supporting a reel of master band, said roller being mounted on bearings on either side of the reel,
a cutting unit for longitudinally cutting the master-band into individual bands, said cutting unit being mounted on a supporting frame laterally spaced from the molding unit,
a pre-winding unit for pre-winding the decorative banderoles, said pre-winding unit presenting, inside a supporting unit which is placed under the molding unit:
(a) a plurality of vertical cylindrical pre-winding chambers, each one in alignment with one of the forming chambers so that the vertical wall of each pre-winding chamber defines a contour which is homothetic to that of the forming chamber, yet slightly smaller than the contour of the latter, thus constituting by its upper edge, an annular holding shoulder which also defines the bottom opening of the forming chamber,
(b) a shaping member having a rod which traverses the pre-winding chamber and forms with the vertical wall thereof a narrow annular pre-winding and guiding chamber, and of which the upper part, on the one hand, constitutes at least part of the bottom plate and has a cross-section of similar yet smaller shape than that of the vertical wall of the forming chamber, so that the distance between the vertical wall of said forming chamber and the peripheral face of the upper end of the shaping member is at least equal to the thickness of a banderole, and on the other hand, is adapted to penetrate into the forming chamber and to apply said banderole and keep it applied against the vertical side wall of said forming chamber,
(c) a plurality of vertical access slots, each slot being provided in a lateral wall defining part of the pre-winding chambers and issuing obliquely in one of said pre-winding chambers provided in said supporting unit, and
(d) a transfer member provided in the pre-winding and guiding annular chamber and fast with the lower part of the rod of the shaping member, said transfer member being adapted to support the banderole until the latter has been transferred to the forming chamber by a relative movement between said transfer member and said forming chamber, and
a banderole introduction and transverse cutting unit comprising:
(a) a plurality of knives, each one of which is adapted to cooperate with a counter-blade for transversely cutting the back end of the banderole introduced at least partly into the corresponding pre-winding chamber,
(b) a plurality of pairs of introduction rollers having axes parallel to the vertical introduction slots, each pair being placed upstream of a knife and of an introductin slot and adapted to drive the individual band gripped between its two rollers at a pace equal to the length of a banderole,
(c) control means for turning the introduction rollers and sequentially actuating the transverse cutting knives, and
(d) a supporting carriage, moveable horizontally parallel to the plane containing the axes of the chambers of one row of forming chambers, and perpendicular to the thermoplastic band feeding direction, at a right angle with the forming station, said carriage carrying the transverse cutting knives, the pairs of introduction rollers and their control means, wherein:
the molding unit rests on the press table via the supporting unit and is fixed thereon in normally unremovable fashion;
the movable carriage comprises two partial carriages placed one behind the other following the direction of a row of pre-winding chambers;
the first partial carriage rests, in operative position, entirely on at least one lower horizontal slide rail of the supporting unit and is removably fixed on the latter and presents a vertical wall which is equipped with slots giving access to the pre-winding chambers, defines a lateral part of said chambers, and comprises, upstream of each slot, one of the pairs of introduction rollers, and downstream of said slot, a transverse cutting knife which cooperates with an edge of said slot, and means for controlling said transverse cutting knives as well as a transmission mechansim cooperating with said pairs of introduction rollers;
the second partial carriage, on the one hand, is guided on the surface on which rests the thermoforming installation in parallel to the guide rail of the first partial carriage, and, is adapted to be coupled to one of the lateral ends of the first partial carriage, and, on the other hand, comprises a driving motor ensuring displacement of said second partial carriage with respect to the frame of the thermoforming installation, and rotation control means whose output is connected to the input of the transmission mechanism, and
the supporting unit is removably mounted on the press table, is adapted to move on said press table in a horizontal direction parallel to the moving direction of the two partial carriages, and is equipped with means controlling the upward and downward movement of the shaping member.

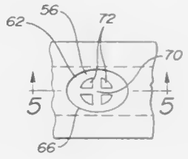
4,840,556

MIXING PLATE FOR INJECTION MOLDING MACHINE

Bernard J. Reilly, Troy, and Roger Michels, Utica, both of Mich., assignors to Extrusion Punch & Tool Co., Troy, Mich.

Filed Jul. 16, 1987, Ser. No. 74,066
Int. Cl.[4] B29C *45/02*
U.S. Cl. 425—543 **4 Claims**

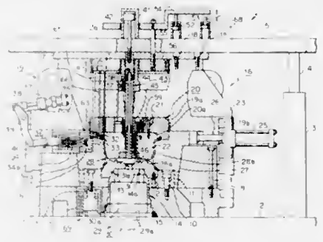




1. An injection molding mixing head for producing a chemically reactive mixture of at least two fluid streams comprising:

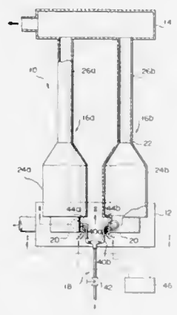
a body having a plurality of inlets and an outlet;
a first through bore formed in the body;
a hollow sleeve mounted within the first through bore and defining a mixing chamber therein, the mixing chamber being disposed in communication with the outlet of the body;
a plurality of orifices formed in the sleeve and communicating through the sleeve with the mixing chamber, each orifice comprising:
(a) a first portion disposed in fluid communication with the mixing chamber, the first portion being a cylindrical channel; and
(b) a second portion contiguously connected to the first portion, the second portion having continuously outwardly tapered side walls;
a plurality of reactant passageways, each passageway extending through the body and connecting an associated orifice and an associated inlet in fluid flow communication for the flow of the fluid stream into the mixing chamber;
a mixing plate positioned circumferentially across each orifice at the junction of the first and second portions thereof, each mixing plate having a plurality of apertures positioned thereon;
piston means reciprocally mounted within a fluid chamber formed within the body, the piston means having a pair of opposed faces;
a rod slidably disposed within the mixing chamber, the rod having the same cross-section as the mixing chamber, the rod having a first end and a second end, the first end attached to the piston means;
pressurized fluid inlet and outlet means formed within the body in fluid flow communication with the fluid chamber for sequentially admitting and exhausting pressurized fluid from opposed faces of the piston means to cause reciprocal movement of the piston means and rod attached thereto from a first position within the mixing chamber thereby opening the first and second orifices to the mixing chamber for fluid stream flow from the first and second passageways into the mixing chamber to a second position in which the piston rod closes off the first and second passageways from the mixing chamber to stop the flow of fluid streams into the mixing chamber and, concurrently, ejects the chemically reactive mixture of the first and second fluid streams in the mixing chamber through the outlet in the body.

4,840,557
VERTICAL INJECTION APPARATUS
Kenji Ishimoto, and Kouji Kawabata, both of Ube, Japan, assignors to UBE Industries, Ltd., Ube, Japan
Filed Nov. 25, 1987, Ser. No. 125,549
Claims priority, application Japan, Dec. 1, 1986, 61-284155; Jan. 8, 1987, 62-1055
Int. Cl.[4] B29C 45/31
U.S. Cl. 425—555 **10 Claims**



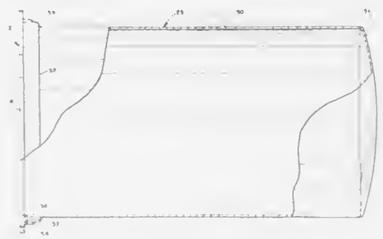
1. A vertical injection apparatus incorporated with a parting mold composed of mold elements comprising:
an upper mold half and a lower mold half having an outer side;
a mold pin having a lower free end portion and having an outer side, said mold pin being vertically movable between an upper position and a lower position, said mold pin at said upper position defining with said upper mold half and said lower mold half an initial cavity for receiving an injected melt, said mold pin at said lower position defining with said upper mold half and said lower mold half a final cavity forming a contour of a molded product;
a vertical sleeve hole at the outer side of said lower mold half;
a vertical melt passage hole communicating between the initial cavity and the sleeve hole, at least an upper part of the melt passage hole adjacent the initial cavity having a diameter smaller than a diameter of the sleeve hole but larger than a diameter of said mold pin for forming circumferential gap between said mold pin at the lower position thereof and the melt passage hole;
a vertically extending pin hole in said upper mold half coaxial with the melt passage hole and open to the initial cavity, said mold pin being provided to vertically move through the pin hole;
an injection sleeve having a plunger slidable therein for injecting melt into said initial cavity;
means for actuating the injection sleeve to cause the injection sleeve to move toward and be received in the sleeve hole;
means for actuating the plunger to cause the plunger to carry out an injection; and
means for actuating a movement of said mold pin between the upper and lower positions wherein after the melt in the sleeve is injected by the plunger into the initial cavity through the melt passage hole, said mold pin is forced to move from the upper position to the lower position so that a lower free end portion of said mold pin is inserted into at least the upper part of the melt passage hole through the initial cavity, thus urging the melt supplied in both the initial cavity and the melt passage hole against the surface of the initial cavity, and changing the melt in the initial cavity into the molded product in the final cavity.

4,840,558
PULSATING COMBUSTION SYSTEM
Kazuo Saito, Fujisawa; Toshihiko Saito, and Ken Kishimoto, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 24, 1987, Ser. No. 137,666
Claims priority, application Japan, Jun. 26, 1987, 62-159041
Int. Cl.[4] F23C 11/04
U.S. Cl. 431—1 **4 Claims**



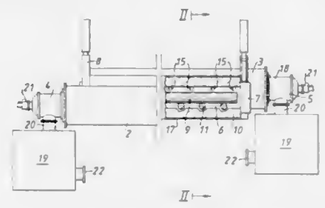
1. A pulsating combustion system comprising:
at least two combustion chambers, each having a circumferential wall and an exhaust port and said chambers each having the same arrangement;
air intake ports respectively formed in and terminating at said circumferential walls of said combustion chambers;
tail pipes connected to said exhaust ports in said combustion chambers;
air intake pipe means, one end of each of which is connected to a corresponding one of said air intake ports, for supplying air required for combustion into said combustion chambers at said circumferential wall in a way such that a turbulent flow is caused along the inner surfaces thereof;
a common air intake chamber to which the other ends of each of said air intake pipe means are commonly connected;
an exhaust chamber to which said tail pipes are commonly connected;
valve means, one of which is arranged in each said air intake pipe means, for aerodynamically maintaining a forward flow coefficient higher than a reverse flow coefficient;
means for injecting fuel into each of said air intake pipe means at a location between said valve means and each of said air intake ports;
ignitors respectively arranged in said combustion chambers;
an air supply fan arranged in said common air intake chamber; and
means for starting said air supply fan and said ignitors at an operation start time.

4,840,559
SEAL ARRANGEMENT FOR HIGH TEMPERATURE FURNACE APPLICATIONS
Klaus H. Hemsath, Toledo, Ohio, assignor to Gas Research Institute, Chicago, Ill.
Division of Ser. No. 130,098, Dec. 2, 1987, Pat. No. 4,787,844.
This application Sep. 14, 1988, Ser. No. 244,307
Int. Cl.[4] F27D 1/16
U.S. Cl. 432—3 **4 Claims**



1. A method for maintaining a door in sealing engagement with a heat treat furnace having an imperforate, cylindrical shell member into which work is placed, said shell member having a flanged opening sealed by an elastomer element between said flange and said door, said method comprising the steps of:
(a) insulating the exterior wall of said shell member by providing yielding insulation extending axially along said shell member from said flange for a predetermined distance;
(b) insulating the interior wall of said shell member from radiant heat by providing an insulation barrier spaced a radial distance away from the interior wall of said shell member and generally adjacent said outside insulation;
(c) heating said shell member about its outside surface up to said insulation whereby the diameter of said shell thermally expand;
(d) cooling the shell by a coolant within a water jacket adjacent the flange whereby the shell wall adjacent said insulation is cooled principally by conduction in a progressive manner from a hot temperature at a position on said shell member adjacent the end of said yieldable insulation furthestremoved from said flanged end to a low temperature adjacent said flanged end to avoid thermal destruction of said elastomer seal.

4,840,560
HEATING STOCK IN A HEATING CHAMBER
John D. Waddington, Solihull, United Kingdom, assignor to British Gas PLC, London, England
Filed Nov. 25, 1987, Ser. No. 125,333
Claims priority, application United Kingdom, Jan. 3, 1987, 8700219
Int. Cl.[4] F27B 9/28
U.S. Cl. 432—59 **1 Claim**

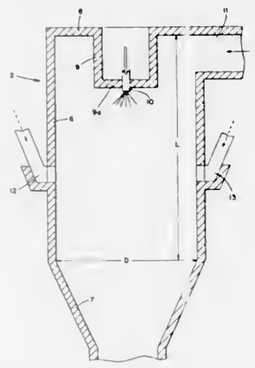


1. Apparatus for heating stock comprising a heating chamber for receiving stock for heating with a heating gas, a first elongated plenum chamber extending along one side of said heating chamber and having an opening at one end thereof, a second elongated plenum chamber extending adjacent the opposite side of said heating chamber and having an opening at one end thereof, a first plurality of ports communicating said first plenum with said heating chamber, a second plurality of ports communicating said second plenum with said heating chamber, a fist regenerative type burner communicating with the opening at the end of said first plenum, a second regenerative type burner communicating with the opening at the end of said second plenum, each burner being adapted on its firing cycle to supply heating gas to its plenum chamber in a direction parallel to the side of the heating chamber for subsequent distribution to the heating chamber for heating the stock and on its flueing cycle to receive from its plenum chamber waste gas discharged from the heating chamber, the arrangement being that, in use, while one burner is firing the other is flueing.

4,840,561
APPARATUS FOR THE HEAT TREATMENT OF FINE-GRAINED MATERIAL
Georg Unland, Ennigerloh, and Günter Driemeier, Lienen, both of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Fed. Rep. of Germany
Filed Jan. 19, 1988, Ser. No. 145,384
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3701964
Int. Cl.[4] F27B 7/02
U.S. Cl. 432—106 **10 Claims**

1. In apparatus for heat treating fine-grained material, such as cement raw material, including
(a) a multi-stage preheater for preheating the material,
(b) an upright combustion chamber in communication with said preheater for precalcining the preheated material,
(c) a rotary drum furnace for receiving and burning the precalcined material and having an exhaust pipe in communication with the preheater, and
(d) a cooler in communication with said furnace for receiving and cooling the burnt material,
(e) said combustion chamber being cylindrical at its upper region and forming a hopper at its lower region; said combustion chamber having at its upper region a cover, a

fuel supply, and a tangential inlet communicating with a conduit for receiving combustion air from said cooler; said combustion chamber having at least one material supply for receiving preheated material from said preheater; said lower region of said combustion chamber having an open-



ing therein for the delivery of precalcined material and gases of combustion to said exhaust pipe,

the improvement wherein:

(f) said cover has a downwardly extending recess therein at the level of the combustion air inlet, said recess having a base on which said fuel supply is mounted.

4,840,562

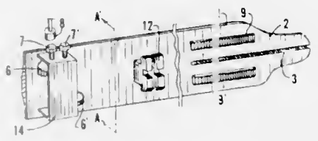
ADJUSTABLE ORTHODONTIC BAND

Mark Wilson, 30131 Town Center Dr. #160, Laguna Niguel, Calif. 92677, and Joseph Burrell, 2254 Warmside Ave., Torrance, Calif. 90505

Filed Nov. 13, 1987, Ser. No. 120,129

Int. Cl.[4] A61C 7/00

U.S. Cl. 433—23 **2 Claims**



1. An adjustable orthodontic band comprising:

a. a flat, soft-metal strip which is relatively thick in the center and thinning towards its edges and narrowing at one end to form a tang, said tang being split along its length into two joined halves;

b. a pair of horizontal, gear-cut racks, one attached on the upper half and one on the lower half of the tang, the attachment being made by a suitable process such as welding;

c. a frame attached to the other end of the strip;

d. a pair of pinion-bearing shafts mounted to and vertically rotatable in said frame, the pinions being of a size to mesh with the gear-cut racks and capable of creating upper and lower tightening and stretching forces in the flat, soft-metal strip;

e. locking means cooperating between the pinion-bearing shafts and said frame to inhibit rotation of the shafts when desired;

f. a slotted bracket attached to the strip in the area between the frame and the gear-cut racks, said bracket being capable of holding archwires in an orthodontic process;

whereby the flat, soft-metal strip is first formed into a cylindrical shape by introducing the tang into said frame so that each pinion is engaged with its corresponding rack, the cylinder thus formed then being placed over a tooth to be banded, the two pinion bearing shafts unlocked and individually turned until the desired band shape and tightness are achieved and the shafts again locked, the conformance of the band to tooth shape being the result of the double stretching forces provided by the racks and pinions acting on the two halves of the soft-metal, varying thickness tang and on the non-slitted portion of the strip.

4,840,563

DENTAL EQUIPMENT HAVING MEANS FOR DELIVERING RF AND LF ENERGY TO A DENTAL HANDPIECE

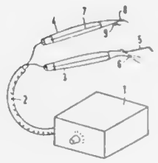
Hans-Walter Altendorf, Worms, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 11, 1988, Ser. No. 155,115

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1987, 3706265; Nov. 17, 1987, 3739009

Int. Cl.[4] A61C 3/00

U.S. Cl. 433—29 **26 Claims**



1. Dental equipment having means for providing energy from a supply part to a first dental handpiece containing a tool that can be placed into ultrasound oscillations by a resonator located in said first handpiece and to a second dental handpiece containing a surgical tool operable with radio-frequency current (RF energy), by use of a transmission cable connectable, first, to said supply part and, second, to said first and second handpieces, said transmission cable containing at least an inner conductor and a shielded line arranged coaxially thereabout comprising:

said equipment containing an additional supply source for generating a lamp voltage having a frequency in the range of zero (DC voltage) to a significantly lower-frequency in comparison to the frequency of the RF energy for the operation of first and second lamps located in said first and second handpieces respectively; and

said transmission cable provided for the transmission of, first, the RF energy and, second, the energy for the lamp, having a third conductor for the transmission of the lamp voltage for feeding the lamp, said third conductor being arranged relative to said shielded line such that a highly capacitive coupling exists between said shielded line and said third conductor.

4,840,564

DENTAL MEASURING APPARATUS

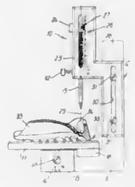
Alan J. Segal, 13 Park Avenue, Hale, Cheshire, WA15 9DL, United Kingdom

Filed Nov. 16, 1987, Ser. No. 120,844

Claims priority, application United Kingdom, Nov. 20, 1986, 8627776

Int. Cl.[4] A61C 19/04

U.S. Cl. 433—72 **10 Claims**



1. A hand held operable dental measuring apparatus for taking measurements relative to a reference point on a denture, said apparatus comprising

a base plate providing a support surface for said denture,

a datum point on said surface,

a first scale for indicating distances from said datum point along a path in the plane of said surface,

a support means fixed to said plate and projecting upwardly therefrom to one side of said support surface clear of said datum point and said path,

a probe having an axis and having a tip thereto, said probe being mounted on said support surface clear of said datum point and said path,

a probe having an axis and having a tip thereto, said probe being mounted on said support means above said support surface with said tip aligned with said datum point, said probe being manually movable axially of itself to move said tip towards and away from said datum point,

means for restraining movement of said probe transversely to the said axis thereof;

a second scale for indicating the height of said tip above said datum point,

whereby by locating the denture on said support surface on top of said datum point and said path and manually moving the probe tip into contact with the said reference point on the denture, the height of the denture at said reference point on the denture, and the spacing of said reference point from a periphery of said denture can be determined respectively from the two scales.

4,840,565

TOOTH-DIE DOWEL-PIN AND LOCKING ASSEMBLY AND METHOD OF MAKING A DENTAL MODEL INCORPORATING SAID ASSEMBLY

Melvin D. Poveromo, 14135 N. Miami Ave., North Miami, Fla. 33161

Filed Dec. 11, 1987, Ser. No. 131,787

Int. Cl.[4] A61C 19/00

U.S. Cl. 433—74 **13 Claims**

1. A tooth-die dowel-pin and locking assembly for locking only an individual tooth-die in a dental model against movement in all directions, comprising:

an elongated dowel-pin means adapted to be secured to the base of only an individual tooth die, said dowel-pin means having a free end and a fastening end;

said dowel-pin means having first hole means which extends transversely therethrough between opposite ends thereof and which has spaced apart hole portions; and

locking pin means, having a free end and a grasping end, adapted to be transversely inserted through said first hole means and through corresponding mating second hole means in the base of a dental model, for locking said individual tooth die in the dental model against movement in all directions when said locking pin means is inserted

through said first and second hole means, said first and second hole means being transversely aligned with each other when the tooth die is inserted in the dental model.

4,840,566

DEVICE FOR MAINTAINING A BORING TOOL IN A VIBRATORY DENTAL INSTRUMENT

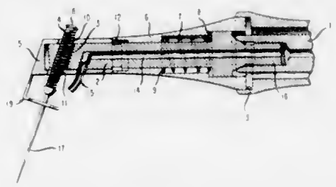
Henri Leonard, Besancon, France, assignor to Micro-Mega, Besancon, France

Continuation-in-part of Ser. No. 531,445, Sep. 12, 1983, Pat. No. 4,634,378. This application Jun. 2, 1987, Ser. No. 56,703

Claims priority, application France, Jun. 2, 1986, 86 08151

Int. Cl.[4] A61C 1/14

U.S. Cl. 433—127 **19 Claims**



1. A tool holder for fastening a dentistry-type tool to be subjected to vibrations comprising a core to be attached to a generator of vibrations and having a housing;

a locking assembly cap is fitted onto a forward area of the core and having a rear end;

a tool to be subjected to vibrations supported in the forward area of the core and locked in position by the locking assembly cap;

a circlip attached to the core of a position following the locking assembly cap;

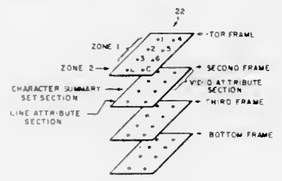
a locking assembly sliding component placed over a rear area of the core for contacting with a front end the rear end of the locking assembly cap and said circlip providing a stop to the locking assembly sliding component; and

a compressive spring component engaging the core and the locking assembly sliding component for pushing the locking assembly sliding component in a forward direction whereby the forward displacement of the locking assembly sliding component under the pressure of the compressive spring is limited based on the presence of the circlip.

4,840,567
BRAILLE ENCODING METHOD AND DISPLAY SYSTEM

Timothe Litt, Waltham, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 16, 1987, Ser. No. 26,108
Int. Cl.[4] G09B 21/00
U.S. Cl. 434—114 14 Claims



1. A system for displaying text in Braille code, said text having characters with video attributes and being formatted for a visual presentation in which the characters have a predetermined relative spatial relationship with each other, said system comprising:

A. a digital data processor for storing and processing said text;

B. A Braille display terminal having an electro-mechanical Braille display cell for displaying Braille code;

C. cursor control means for selectively identifying a position in said text and the character located at said position, including attributes of said character;

D. first control means for hierarchically ordering a description of the identified character into a plurality of frames of information, said plurality of frames including a top frame and a bottom frame, wherein said top frame appears on the Braille display cell when said character is caused to be displayed on said display cell; and

E. frame selection means for causing a successive frame of said plurality of frames to be displayed on said Braille display cell whereby said successive frame replaces the frame previously displayed on said display cell,

whereby a substantially complete description of any character of text and its associated attributes can be displayed on a said Braille display cell by using said cursor control means to identify the position in text and then using said frame selection means to individually display the plurality of levels of information and whereby the formatting and relative spatial relationship of the characters in the displayed text are substantially preserved.

4,840,568
JACK ASSEMBLY

Dennis M. Burroughs, Savage, and Thomas W. Cruise, Coon Rapids, both of Minn., assignors to ADC Telecommunications, Inc., Minneapolis, Minn.

Continuation of Ser. No. 32,880, Mar. 31, 1987, abandoned. This application Sep. 8, 1988, Ser. No. 243,180
Int. Cl.[4] H05K 7/00
U.S. Cl. 439—49 14 Claims

1. A jack assembly comprising:

a mount having a plurality of exposed electrical contact members disposed in a predetermined array;

a plurality of jacks having predetermined forward walls;

attaching means for releasably attaching each of said plurality of jacks to said mount with said jacks in side-by-side relation and with said forward walls exposed to an operator opposing said assembly, said attaching means accommodating individual removal of said jacks by said operator when opposing said forward walls and with said jacks removably insertable onto said mount by an operator placing a jack in an inserted position;

each of said jacks including a jack body formed of dielectric material, said bodies having an interior chamber and a plurality of bores extending through said forward walls in communication with said chamber, said bores sized to receive a plug of predetermined dimensions and having a tip contact and a ring contact;

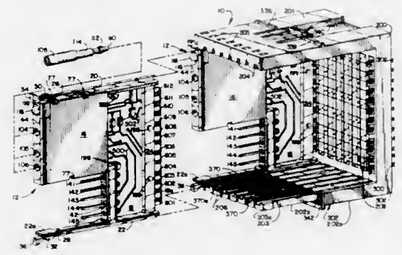
a plurality of electrically conductive spring contacts disposed within said chamber;

securing means for securing first ends of said spring contacts to said body with said first ends presenting electrical contact points disposed in a predetermined array;

said plurality of spring contacts including tip spring contacts disposed to make electrical contact with tip contacts of plugs inserted within said bores, said plurality further including ring spring contacts disposed to make electrical contact with ring contacts of said plugs, each of said jacks having a set of ring spring contacts and tip spring contacts;

connecting means for connecting a circuit board to said body;

said circuit board including circuitry having a first plurality and a second plurality of circuit contact points, said first plurality of circuit contact points disposed on said circuit



board to make electrical contact with said electrical contact points of said spring contact first ends when said circuit board is connected to said body, said second plurality of circuit contact points disposed for said second plurality to make electrical contact with predetermined ones of said plurality of exposed electrical contact members when said jack is attached to said mount in said inserted position;

a plurality of wire termination members secured to said body and having wire termination ends exposed outside said body to an operator facing said forward wall;

said plurality of wire termination members each having termination member contacts disposed in a predetermined array;

said circuitry including a third plurality of circuit contact points disposed on said circuit board to make electrical contact with said termination member contacts when said circuit board is connected to said body and means for electrically connecting said third plurality of circuit contact points to at least a portion of said plurality of spring contacts.

4,840,569
HIGH DENSITY ROTARY CONNECTOR

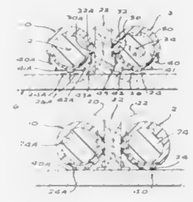
Michael K. Cabourne, Hacienda Heights, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Jun. 27, 1988, Ser. No. 211,783
Int. Cl.[4] H01R 9/09
U.S. Cl. 439—65 12 Claims

1. Apparatus for connecting together each of a plurality of conductive pads lying in a row on a first base, to a corresponding one of a plurality of pads lying in a second row on a second base, comprising:

an elongated bobbin having a pivot axis extending along its length;

an electrically conductive wire extending in multiple turns about said bobbin, with said turns spaced from one another along the length of the bobbin, and with said wire having at least one gap therein in each turn, each turn of the wire being attached to said bobbin along part of its length but having spaced contact portions forming



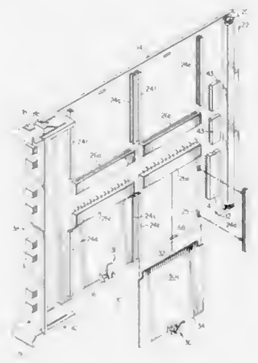
contacts that are free of attachment to said bobbin so each contact portion can deflect by bending of the contact portion, said contacts lying further from said pivot axis than adjacent portions of said wire turn;

means for supporting said first and second bases and for supporting said bobbin in pivoting about said pivot axis at a distance from said rows to bring said contacts against and away from said pads as said bobbin pivots about said axis between first and second rotational positions.

4,840,570
PLUG-IN CARD MODULE

James A. Mann, Jr., Richardson, and E. Fletcher Haselton, Irving, both of Tex., assignors to Teknekron Infoswitch Corporation, Fort Worth, Tex.

Filed Jun. 27, 1988, Ser. No. 211,589
Int. Cl.[4] H01R 23/72
U.S. Cl. 439—74 16 Claims



1. A plug in card module for use in a rack module having means for supporting a plurality of plug in card modules in an abutting side by side relation, comprising:

a printed circuit board having first and second sides, a leading edge and a rear edge;

at least two pairs of card receiving and guiding rails transversely disposed on the printed circuit board, each of the pairs comprising first and second oppositely-disposed elongate rails secured to the printed circuit board;

first and second electrical connectors longitudinally disposed on the printed circuit board, each said electrical connector disposed adjacent an associated pair of said elongate rails; and

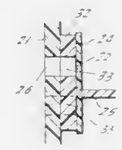
an electrical circuit board slidably supported in each pair of elongate guide rails, the electrical circuit board having a leading edge received in the associated electrical connector, and a rear edge; and

means which engages said printed circuit board and is supported on the rear edge of each electrical circuit board for locking a electrical circuit board, in the pair of said elongate rails and its associated said electrical connector.

4,840,571
HOUSING STRUCTURE FOR DECREASING A RADIO UNIT'S SUSCEPTIBILITY TO STATIC ELECTRICITY

Shigeki Minata, and Toshihiro Mori, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Division of Ser. No. 773,329, Sep. 6, 1985, abandoned. This application Dec. 11, 1987, Ser. No. 132,706
Claims priority, application Japan, Sep. 10, 1984, 59-189139
Int. Cl.[4] H01R 9/09, 13/53
U.S. Cl. 439—76 3 Claims



1. Apparatus comprising:

a housing;

a circuit board located in said housing and having an electronic component thereon, said electronic component being sensitive to static electricity;

an inner terminal plate including an inner terminal, said inner terminal being coupled to said circuit board and being electrically connected to said electronic component in such manner that static electricity applied to said inner terminal will be transferred to said electronic component, said inner terminal plate being fixed to said circuit board;

a housing opening formed in said housing in alignment with said inner terminals to permit an external pin of an external unit to pass through said housing and to contact said inner terminal, said inner terminal being spaced from and out of contact with said housing; and

a relatively airtight spacer, having resistivity to static electricity, which is interposed between the housing and said inner terminal plate surrounding said housing opening, and having an aperture communicating between said housing opening and said inner terminal.

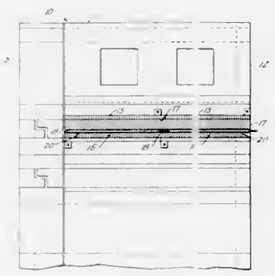
4,840,572
TELEPHONE CONNECTOR BLOCK HAVING SERIALLY INTERCONNECTIBLE GROUNDING STRIP

Paul V. De Luca, Plandome Manor, and Helmuth Neuwirth, Garden City, both of N.Y., assignors to Porta Systems Corp., Syosset, N.Y.

Filed May 26, 1988, Ser. No. 199,057
Int. Cl.[4] H01R 9/24, 13/28
U.S. Cl. 439—92 2 Claims

1. Telephone connector block construction comprising in combination: a plurality of connector blocks in abutted relation, each of said blocks having an exposed surface forming an elongated channel extending between first and second ends of said block, said channels communicating in end to end relation; an elongated ground strip element carried in each of said channels, and extending the length thereof, each of said ground

strip elements including first and second side walls, and an axially oriented bent interconnecting portion, one end of said side walls having flared extensions forming an entrance to a planar chanell formed between said side walls, a second end of each of said side walls having an offset portion leading to a



planar segment in abutted relation with respect to a corresponding planar segment on the other of said side walls to form a planar contact; whereby the placing of said connector blocks in abutted relation serves to engage said planar contact of one of said ground strip elements into engagement with a planar channel in an adjacent said ground strip element.

4,840,573

MECHANISM FOR CONNECTING SHIELDING CAPS OF MULTI-POLE PLUGS TO THE GROUND POTENTIAL LAYERS OF A MOTHER BOARD

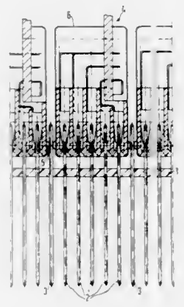
Peter Seidel, Groebenzell; Leo Pelzl, Holzkirchen, and Karl Zell, Niederpoecking, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 165,420, Feb. 29, 1988, abandoned, which is a continuation of Ser. No. 829,620, Feb. 14, 1986, abandoned. This application Dec. 12, 1988, Ser. No. 284,788

Claims priority, application Fed. Rep. of Germany, May 31, 1985, 35195961

Int. Cl.[4] H01R *4/66*

U.S. Cl. 439—92 **9 Claims**



1. Apparatus for shielding a multi-pole printed circuit card plug to a ground potential layer, comprising:

a mother board including the ground potential layer thereon;

a plurality of first contact elements perpendicularly extending to and through said mother board;

a plurality of second contact elements perpendicularly extending through and to said mother board and electrically connected to the ground potential layer;

a multi-pole connector plug including a plurality of third contact elements for respectively engaging said first contact elements when said multi-pole connector plug is plugged into said first and second contact elements; and

a conductive shielding cap mounted on said multi-pole connector plug and including spring elements for resiliently engaging said second contact elements when said multi-pole connector plug is plugged onto said first and second contact elements, said conductive shielding cap and said spring elements being of unitary formation, said shielding cap having shaped edges forming said spring elements.

4,840,574

MULTICONNECTOR

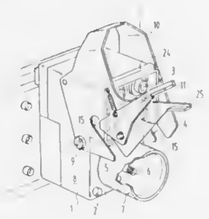
Simon F. Mills, Princes Risborough, United Kingdom, assignor to European Atomic Energy Community (Euratom), Luxembourg, Luxembourg

Filed Oct. 25, 1988, Ser. No. 261,872

Claims priority, application Luxembourg, Nov. 10, 1987, 87043; Feb. 2, 1988, 87125

Int. Cl.[4] H01R *4/60*

U.S. Cl. 439—191 **5 Claims**



1. A multiconnector composed of a stationary socket unit and of a free plug unit, the system comprising means for aligning both units prior to any operative engagement of the individual connectors, wherein the means for aligning both units include, as an integral part of one of said units, a tube (**18**), having an outer shape which has a spherical front portion (**19**) followed by a conical portion (**20**) which extends up to a diameter equal to that of the sphere, the tube having an axis parallel to the alignment direction, and as an integral part of the second unit, a cylindrical chamber (**7**) positioned in coaxial alignment with said tube (**18**) and having a diameter corresponding with slight clearance to the sphere diameter, wherein at least one claw (**16**) is pivotably mounted on the plug unit, said socket unit including a shoulder, said claw latching behind said shoulder (**24**) of the socket unit (FIG. 1*a*) as soon as the conical portion (**20**) of the tube (**18**) penetrates into the chamber (**7**) during the mutual approach of the units, wherein an engagement lever (**10**) is mounted to the other unit, two cam followers (**14**) are mounted on opposite side surfaces of one of the units (FIG. 1*b*) and engage cam slots (**15**) in said engagement lever (**10**) mounted on the other unit such that if the units are aligned and the lever is then operated, the cam followers (**14**) penetrate into the cam slots (**15**) and move the two units up to a final position with connections (**3**, **4**, **5**, **6**) operatively engaged.

4,840,575

CARD CONNECTOR

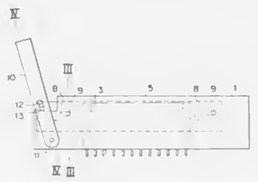
Noriyuki Matsuoka, Tokyo, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed May 24, 1988, Ser. No. 198,931

Claims priority, application Japan, May 30, 1987, 62-136400

Int. Cl.[4] H01R *11/22, 13/62*

U.S. Cl. 439—267 **3 Claims**



1. A card connector comprising:

a main body having a card insertion slit for receiving a card therein;

at least one resilient contacting piece attached to said main body and adjacent to said insertion slit, and each said at least one contacting piece having a contact surface means for contacting a card when a card is received in said insertion slit and for rubbing a card when a card is received in said insertion slit and is moved relative to said contact surface means when said at least one contacting piece is in a closed position against a card;

a single cam block reciprocably slidably received in said main body and adjacent to said insertion slit for reciprocating diagonally upwardly and downwardly;

force applying means attached to said single cam block for applying a substantially horizontal force for sliding said single cam block forwardly and rearwardly relative to said main body;

a guide means on said single cam block for causing said single cam block to move diagonally upwardly when said single cam block slides forwardly relative to said main body and for causing said single cam block to move diagonally downwardly when said single cam block slides rearwardly relative to said main body;

a card supporting surface on said single cam block for supporting a card received in said card insertion slit in said main body on said single cam block; and

a plain cam surface on said single cam block adjacent to said at least one resilient contacting piece for engaging said contacting piece for keeping said contacting piece and said contact surface means in a normally open position for receiving a card in said insertion slit and on said card supporting surface of said single cam block without contacting said contact surface means, and said plain cam surface causing said contacting piece and said contact surface means to move to the closed position against a card received in said card insertion slit on said card supporting surface when said single cam block moves forwardly and diagonally upwardly relative to said main body by said guide means from an initial position to an intermediate position, and said plain cam surface on said single cam block allowing said contacting piece and said contact surface means to remain in the closed position against a card received in said card insertion slit for rubbing a card against said contact surface means of said at least one contacting piece when said single cam block moves further diagonally upwardly by said guide means from the intermediate position to a final position when a substantially horizontal forward force is applied to said single cam block through said force applying means.

4,840,576

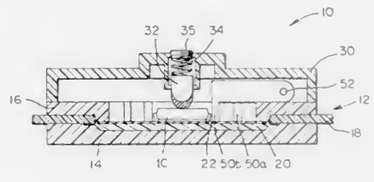
ZERO INSERTION FORCE SOCKET FOR SURFACE-MOUNTED INTEGRATED CIRCUITS

David Nierescher, Renton, and Douglas Yip, Bellevue, both of Wash., assignors to Data I/O Corporation, Redmond, Wash.

Filed Oct. 14, 1987, Ser. No. 108,775

Int. Cl.[4] H01R *13/62*

U.S. Cl. 439—331 **30 Claims**



1. A zero insertion force socket for integrated circuits, comprising:

a base

a resilient circuit having a predetermined contact pattern on its upper surface, said resilient circuit being mounted on said base;

a rigid lid pivotally mounted on said base; and

a plunger slidably mounted in and projecting downwardly from said lid at a position located so that the lower end of said plunger contacts the upper surface of said integrated circuit when said lid is in its closed position, said plunger being resiliently biased downwardly away from said lid so that it resiliently biases said integrated circuit downwardly and facilitates the use of said socket with integrated circuits having cases of varying thickness.

4,840,577

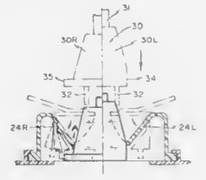
PLUG LOCKING COVER

David Prouty, 72 Thomas Street, Exeter, Ontario, Canada N0M 1S0

Filed Sep. 28, 1987, Ser. No. 101,956

Int. Cl.[4] H01R *13/62*

U.S. Cl. 439—373 **8 Claims**



1. In combination with a wall mounted power box carrying a female power receptacle, a cover plate adapted for releasingly engaging the marginal profile of a male electrical plug adapted to be inserted into, thereupon to cause electrical engagement therewith, or to be removed from the female power receptacle whereby the plug is constrainingly engaged into the receptacle by the cover plate, the cover plate comprising:

(a) an outer housing defining an upper essentially flat surface which itself defines a recess in the form of an "H" and hence the upper surface includes fingers, which lie in the plane of the surface, and which project toward each other so that their distal and lateral margins or edges define with the upper flat surface the "H" recess, while proximate ends of each finger merge integrally with and are part of the upper surface;

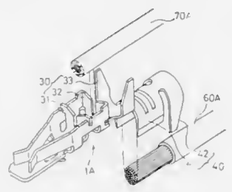
(b) means on the sides of the housing for fixedly engaging the housing onto the receptacle.

4,840,578

ELECTRICAL CONTACT

Kensaku Sato, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1987, Ser. No. 111,601
Claims priority, application Japan, Oct. 30, 1986, 61-165797[U]; Dec. 25, 1986, 61-307691
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—395 8 Claims



1. An electrical contact having a generally U-shaped cross section, with a pair of side walls extending upright from a base plate, which comprises:

a contacting section provided at a front end of said contact for contact with a mating contact;

a connecting section provided behind said contacting section for connection to at least one conductor;

said connecting section having at least three piercing walls lying in spaced parallel planes each perpendicular to a longitudinal axis of said conductor;

said piercing walls each having a piercing slit which is made wider progressively toward a rear end of said contact; and

a pair of engaging means provided at opposite upper side edges of each said piercing wall for engagement with said side walls, whereby each said piercing wall is held firmly in place.

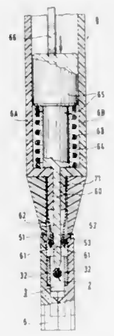
4,840,579

SLOTTED CONNECTION ARRANGEMENT FOR AN ELECTRIC WIRE, AND A CORRESPONDING CONNECTION TOOL

Jean-Paul Heng, Lyon; Ariel Ruiz, Villeurbanne, and Alain Boissonnet, Ampuis, all of France, assignors to CGEE Althom, France

PCT No. PCT/FR87/00387, § 371 Date Jun. 1, 1988, § 102(e) Date Jun. 1, 1988, PCT Pub. No. WO88/02935, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 8, 1987, Ser. No. 214,713
Claims priority, application France, Oct. 10, 1986, 86 14133
Int. Cl.[4] H01R *4/24*
U.S. Cl. 439—395 7 Claims

1. In a slotted connection arrangement for an electric wire (2), in particular for use in an electric junction block, wherein at least one connection part (3) is held in an insulating housing (5) provided with at least one opening extending over a slot (30) for the stripping and retaining the core of the wire and for providing electrical connection and which is located along a wall of said connection part, said opening enabling a wire to be connected to be inserted transversely over a wire-stripping opening (34) to the slot and also enabling the insulating sheath (21) of the wire to be subsequently held fast, the improvement wherein the housing is provide with at least one insertion orifice (51) for a rigid moving insertion blade belonging to an external tool, said blade being extended to slide along the slot while a wire is being inserted and said housing being provided with a device for positioning the tool via the insertion orifice, said device comprising a projection (52) having said insertion orifice (51) provided in the middle thereof and suitable for being received by translation in the end of the tool which includes said insertion blade, the inside of the insertion orifice being provided with latching rims (53) for moving fixing elements (61, 62) carried by the end of the tool and suitable for penetrating into the insertion orifice prior to the insertion blade



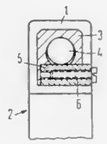
in order to latch onto the rims and thereby fix the tool relative to the insulating housing while the tool insertion blade is being actuated.

4,840,580

CONNECTOR ARRANGEMENT FOR A LEAD FOR AN IMPLANTABLE STIMULATION DEVICE

Goesta Saell, Norsberg, and Jakub Hirschberg, Taeby, both of Sweden, assignors to Siemens AG, Berlin and Munich, Fed. Rep. of Germany

Filed May 27, 1988, Ser. No. 199,919
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1987, 3718913
Int. Cl.[4] H01R *4/44, 4/50*
U.S. Cl. 439—431 9 Claims



1. In an implantable stimulation device having an electrode lead with a proximal end and a terminal portion of said device having a socket in which said proximal end of said lead is received, the improvement being a connector arrangement comprising:

means for fixing said proximal end of said lead in said socket to make a rigid mechanical and electrical connection, said means for fixing having a longitudinal axis; and

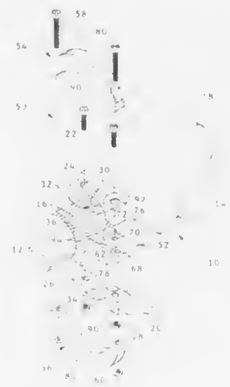
means in said terminal portion of said device for receiving said means for fixing such that the longitudinal axis thereof is tangential relative to said proximal end of said lead and substantially normal to the direction of insertion of said lead into said socket.

4,840,581

CABLE JACKET STRAIN RELIEF ADAPTER ASSEMBLY

Walter P. Leufert, Harrisburg, and David L. Miller, Landisville, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 22, 1988, Ser. No. 288,747
Int. Cl.[4] H01R *13/595*
U.S. Cl. 439—472 7 Claims



1. An adapter assembly for being secured to a preexisting electrical connector assembly having first and second cover members securable together at a cable exit to define the cable exit for a multiconductor cable, the adapter assembly for providing improved cable strain relief when the electrical connector assembly including the adapter assembly is secured to the multiconductor cable, the adapter assembly comprising:

a mounting member and a pair of clamping members securable to said mounting member by securing means, said mounting member adapted to be mounted between facing portions of first and second cover members of the electrical connector assembly at a cable exit thereof, and said clamping members upon being secured to said mounting member and thereby secured to said electrical connector assembly engage and firmly clamp outer surface portions of an outer jacket of a multiconductor cable having conductors terminated to respective terminals within a housing of said electrical connector assembly.

4,840,582

MODULAR PLUG IDENTIFICATION TAG

Albert U. Marson, Riverview, Mich., assignor to Michigan Bell Telephone Company, Mich.

Filed Jun. 22, 1988, Ser. No. 210,318
Int. Cl.[4] H01R *13/50*
U.S. Cl. 439—491 8 Claims

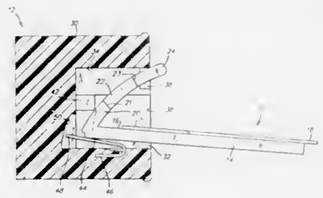
1. An identification tag for cooperating with a modular jack having a housing forming a cavity therein, said tag comprising:

a body portion to allow indicia to be placed thereon;

a tab portion connected to one end of said body portion; and

means for allowing pivotal movement between said tab portion and said body portion relative to each other;

whereby the tab portion is pivotally moved toward the body portion and both portions are partially inserted into the



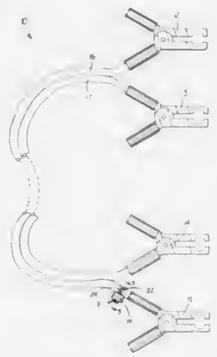
cavity and the tab portion is released to removably lock the tab within the cavity of the modular jack.

4,840,583

AUTOMATIC JUMPER CABLES

Donald M. Moore, Rte. 3, Box 109, Warrenton, Va. 22186

Filed Mar. 10, 1988, Ser. No. 166,404
Int. Cl.[4] H01R *11/00*
U.S. Cl. 439—504 8 Claims



1. An automotive jumper cable apparatus for use with direct current batteries comprising,

a first electrical conductive cable formed with first and second ends, and a second electrical conductive cable formed with third and fourth ends, and

first and fourth battery connector clamps are secured to said first and second ends respectively and second and third connector clamps are electrically secured to said third and fourth ends respectively;

said first second battery connector clamps comprise a first clamp couple means for attachment to respective terminals with a first direct current battery and said third and fourth battery connector clamps comprise a second couple means for attachment to a second direct current battery, and

a polarity indicator means electrically associated with said fourth battery connector clamp for testing polarity connection of said first and second battery clamp couples, and

said polarity indicator means including a LED element means electrically associated with a conductive probe means including an electrical insulator between said probe means and said fourth battery connector clamp;

said probe means positioned for temporary contact with a remaining battery terminal of said second battery when said first and second battery connector clamps are secured

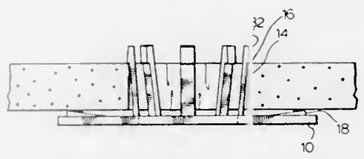
to said first battery and said third battery connector clamp is secured to a single terminal of said second battery, and wherein said polarity indicator means includes a torquing strap for securement about said first electrical conductive cable including a spike for penetration into said cable for providing electrical communication between said cable and said LED elements.

4,840,584

MOUNTING PLATE FOR ATTACHMENT OF ELECTRICAL CONTROLS AND ACCESSORIES TO WALLS AND THE LIKE

Michael Cox, 340 Kennedy St., Aurora, Ontario, Canada L4G 2L7

Filed Feb. 5, 1988, Ser. No. 152,819
Int. Cl.[4] H01R *13/71*
U.S. Cl. 439—538 18 Claims



14. A wall mounting plate adapted to allow an electrical device to be mounted thereto, comprising:

a generally planar base, having spaced from one side thereof a plurality of wall engaging surfaces facing said base;

said base interior to said wall engaging surface including an electrical wire receiving port;

a plurality of wall engaging contact areas spaced from said one side of said base exterior to said wall engaging surfaces and moveable against a bias towards said base, the spacing between said wall engaging contact areas and said wall engaging surfaces being variable by movement against said bias of said contact areas towards said one side of said base;

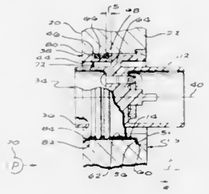
said plurality of wall engaging surfaces being associated with said plate to cooperate as a group during securement of said plate to a wall by passing through and aligning said port with a common opening in the wall.

4,840,585

BARRIER WALL CONNECTOR

Steven Z. Muzslay, Huntington Beach, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Sep. 6, 1988, Ser. No 240,340
Int. Cl.[4] H01R *13/74*
U.S. Cl. 439—556 10 Claims



1. A connector for installation in a hole in a barrier wall wherein the barrier wall forms a connector-engaging wall surface at said hole and wherein a pressure differential can exist at opposite sides of the barrier wall with the pressure higher at a rear side of the wall than at a front side of the wall, comprising:

a connector frame with front and rear ends which can mount in said hole in said barrier wall, said frame having a frame axis and said frame including a radially inner portion and a skirt extending around said inner portion, said skirt having radially inner and outer sides;

an elastomeric seal mounted on said outer side of said skirt to bear against said wall surface at said hole;

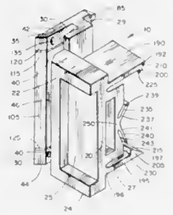
said frame having a connecting portion extending between said frame inner portion and said skirt at a location on said skirt spaced forward of said elastomeric seal, with said inner side of said skirt open to said higher pressure at said rear side of said barrier wall, whereby pressure at said inner side of said skirt tends to deflect the skirt to press the seal against the wall surface.

4,840,586

KEYING APPARATUS FOR CONNECTING A PRINTED WIRING ASSEMBLY TO A BACKPLANE STRUCTURE

Sherman G. Thomas, Earlysville, Va., assignor to General Electric Company, Charlottesville, Va.

Filed Dec. 21, 1987, Ser. No. 135,799
Int. Cl.[4] H01R *13/639*
U.S. Cl. 439—680 8 Claims



1. A keying arrangement for preventing insertion and connection of an incorrect circuit board connector in a multiboard card rack comprising:

a circuit board including an edge surface and a key portion having at least one unique recess situated along said edge surface;

a key mating member having at least one protrusion for precisely mating with said key portion;

key support means adapted to receive said key mating member and for positioning said key mating member for mating with said key portion; and

mechanical attachment means, situated on said key support means, for attaching said key support member to said card rack.

4,840,587

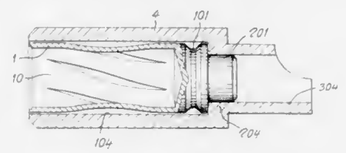
COMPOSITE FEMALE CONTACT

Attilio Lancella, Genova-Sestri, Italy, assignor to CONNEI S.p.A., Italy

Filed Mar. 7, 1988, Ser. No. 164,892
Claims priority, application Italy, Mar. 25, 1987, 12446 A/87
Int. Cl.[4] H01R *13/54*
U.S. Cl. 439—851 4 Claims

1. A composite female contact adapted to a receive a male contact of the pin type, in which, when the pin contact in not ionserted, the areas which establish electrical contact with the pin contact, upon insertion of same, are arranged at least approximately according to a family of straight generatrices of a hyperboloid of revolution of one branch, comprising:

an elastic contact element substantially in the form of a cylindrical sleeve made of a first suitable metal or metal alloy, said element having through slots arranged along its cylindrical surface and inclined with respect to the longitudinal axis of the said sleeve, said sleeve being permanently deformed by having been twisted a predetermined angle directed in the sense of inclination of the slots,



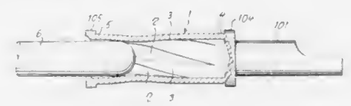
a housing body, made of a second suitable metal or metal alloy having different physical properties than the said first metal or metal alloy, and presenting a cavity adapted to house said contact element in a stable manner for its electric connection with any type of circuit.

4,840,588

SOCKET CONTACT FOR CONTACT DEVICES OF THE PIN AND SOCKET TYPE

Attilio Lancella, Genova-Sestri, Italy, assignor to Connei S.p.A., Italy

Filed Mar. 7, 1988, Ser. No. 164,906
Claims priority, application Italy, Mar. 25, 1987, 12447 A/87
Int. Cl.[4] H01R *13/54*
U.S. Cl. 439—851 6 Claims



1. A socekt contact for contact devices of the socket and pin type, in which, when the pin contact is not inserted, the areas of the socket contact which establish contact with the pin contact, upon insertion of same, are arranged at least approximately according to a family of straight generatrices of a hyperboloid of revolution of one branch, said socket contact having been formed by means of deformation by twisting through a predetermined angle of a hollow cylindrical sleeve of suitable metal, provided with through slots arranged along its cylindrical surface and inclined with respect to the longitudinal axis of said sleeve, said twisting being directed in the sense of inclination of the slots, wherein:

each slot is so shaped that prior to twisting deformation, it has a lance-head or lanceolate shape, the base of the slot being near the zone of maximum width of the slot and the apex of the slot terminating at the zone of the least width of the slot, the bases of the slots being arranged in proximity to the annular inlet zone of the sleeve.

4,840,589

UNDERWATER EXHAUST SYSTEM FOR BOATS OF STEPPED-HULL CONSTRUCTION AND INCLUDING EXHAUST COOLING

Vance V. Breaux, P.O. Box 146, Loreauville, La. 70552

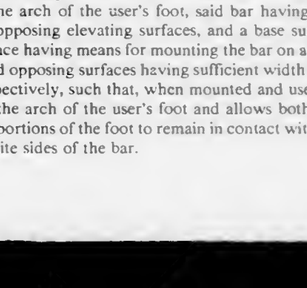
Continuation of Ser. No. 907,189, Sep. 12, 1986, abandoned. This application Jul. 11, 1988, Ser. No. 220,366
Int. Cl.[4] B63B *1/34*
U.S. Cl. 440—89 18 Claims

1. An underwater exhaust system for use with the bottom of the hull of a boat oriented in its position of intended use and having an engine giving off exhaust gas, the bottom of the hull extending from the bow to the stern of the boat and being defined between port and starboard chines and being divided by a longitudinally extending centerline, said system comprising:

an exhaust box mounted in the interior of said hull, said exhaust box defining a hollow interior and having a top opening and bottom opening;

first pipe means for conveying the exhaust gas from said engine into the top opening of said exhaust box;

a step extending from the port chine to the centerline and then to the starboard chine transversely across the entire bottom of the port and the starboard portions of said hull, said step defining within said hull on each of said port and



starboard portions a generally planar recessed bottom aft of said step, said recessed bottom occupying a plane spaced from and being positioned inward relative to an imaginary generally planar surface defined by the aftward extension of the portion of said hull positioned forward of said step; and

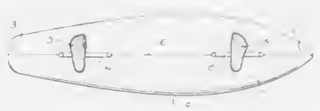
diffuser mean connected to said exhaust box and being positioned along the portion of said recessed bottom aft of said transverse step, said diffuser means for controlling the passage of the exhaust gas from said exhaust box along the exterior of said planar recessed bottom portion in an aftward direction.

4,840,590

SURFBOARD TRACTION BAR

Thomas J. Kelley, 919 Calle Amanecer St., Suite N, San Clemente, Calif. 92672

Filed Aug. 6, 1987, Ser. No. 83,115
Int. Cl.[4] B63B *35/72*
U.S. Cl. 441—74 8 Claims



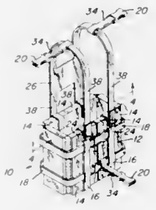
1. A surfboard traction bar formed of an elastomeric material, for mounting on the deck of a surfboard to comfortably engage the arch of the user's foot, said bar having an upper surface, opposing elevating surfaces, and a base surface, said base surface having means for mounting the bar on a deck, said upper and opposing surfaces having sufficient width and thickness, respectively, such that, when mounted and used, the bar engages the arch of the user's foot and allows both the front and rear portions of the foot to remain in contact with the deck on opposite sides of the bar.

4,840,591

BUOYANT SUPPORT APPARATUS AND SYSTEM FOR USE IN EXERCISING

Thomas G. Dulin, Trenton, N.J.; Eric Bass, and Richard M. Babyak, both of Doylestown, Pa., assignors to Therapeutic Systems, Inc., Doylestown, Pa.

Filed Nov. 6, 1987, Ser. No. 118,386
Int. Cl.[4] A63B *23/00*
U.S. Cl. 441—106 24 Claims



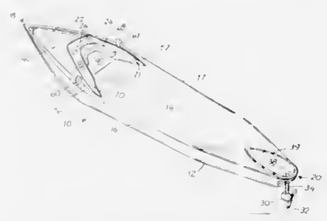
1. A buoyant device for exercising in water by an individual comprising a jacket to be worn closely about the trunk of the individual entirely below said individual's arm pits and about said individual's trunk, said jacket comprising a plurality of segments of buoyant material, covering means for encasing said segments of buoyant material in said jacket and for forming flexible joints interposed between said segments with the spacing between said segments being adjustable, and holding means for wrapping said jacket around the trunk of said individual so that said segments completely encircle said trunk, said holding means comprising at least one adjustable belt encircling said segments and interposed joints to adjust the spacing of said segments with respect to one another when said jacket is in place, whereupon said jacket is held in place by the frictional engagement of said covering means with the trunk.

4,840,592

POWER DRIVEN UNDERWATER VIEWING PLATFORM

Allen B. Anderson, P.O. Box 847, Big Fork, Mont. 59911

Filed Feb. 13, 1987, Ser. No. 14,590
Int. Cl.[4] B63C *11/00*
U.S. Cl. 441—135 16 Claims



1. An underwater viewing sled comprising:
an elongated flotation platform means for completely supporting a person above an upper surface of a body of water having a bow and stern and a deck portion and hull portion and comprising a rigid material;
viewing means extending through said platform from said deck potion to said hull portion and having a leading portion located a first predetermined distance aft of said bow and a trailing portion located a second, larger, distance aft of said bow;
propulsion means operably coupled to said platform means for propelling said viewing sled, said propulsion means mounted substantially at said stern of said platform means;
power source means operable coupled with said propulsion means for supplying power thereto;
cowling means attached to said deck portion and extending above part of said deck portion and said viewing means from said bow toward said stern, wherein a first portion of said cowling extends toward said stern a third distance exceeding said first distance but less than said second distance;
actuating means comprising an actuating control having a first variable position switch for propulsion speed control and regulation of said propulsion means, said actuating means being located in a first lateral position adjacent said cowling means and substantially at one side of said platform; and
directional control means for directing the course of said sled and having a steering handle located in a second lateral position adjacent said cowling means opposite said first lateral position, said cowling means extendiang aftward of said actuating control and said steering handle.

4,840,593

LOW PRESSURE MERCURY VAPOR DISCHARGE LAMP AND PREPARATION THEREOF

Takao Takeda, Chigasaki; Hitoshi Yamazaki, Yokohama; Yoshiteru Taniguchi, Kamakura; Norihiko Tanaka, Kawasaki; Hiroshi Ito, Tokyo; Minoru Uchida, Yokosuka, and Jun Imai, Hiratsuka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 920,451, Oct. 20, 1986, abandoned, Division of Ser. No. 861,724, May 12, 1986, Pat. No. 4,725,298, Division of Ser. No. 723,967, Apr. 12, 1985, abandoned. This application May 12, 1988, Ser. No. 195,380
Claims priority, application Japan, Aug. 12, 1983, 58-147618; Aug. 12, 1983, 58-147619; Sep. 6, 1983, 58-163611; Feb. 15, 1984, 59-26486; Feb. 15, 1984, 59-26487; Feb. 15, 1984, 59-26646
Int. Cl.[4] H01J *9/00*
U.S. Cl. 445—26 5 Claims

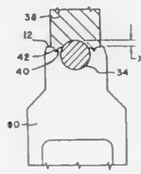
1. A process for preparing a low pressure mercury vapor discharge lamp comprising a bulb and an end plate firmly connected to the bottom of said bulb with an adhesive so as to close said bottom, which comprises a step of forming a groove in the surface of said end plate, a step of applying said adhesive in said groove where said bulb and a stem are to be bonded at a given position, a step of drying said adhesive applied to remove a solvent contained therein, a step of inserting into an insertion hole formed in said end plate a exhaust tube having an enlarged diameter portion of a diameter larger than that of said insertion hole for exhaust tube, said enlarged portion being on the same side of said end plate as said surface where said bulb and stem are to be bonded and said enlarged portion being formed on said exhaust tube at a position near the end of said bulb in said discharge lamp, while applying said adhesive at the upper part of said enlarged diameter portion followed by drying, and a step of putting said bulb and said stem on a given position of said adhesive applied to the surface of said end plate followed by melting and solidifying said adhesive.

4,840,594

METHOD FOR MANUFACTURING ELECTRODES FOR A SPARK PLUG

David J. Moore, Fostoria, Ohio, assignor to Allied-Signal Inc., Morristown, N.J.

Filed Jun. 6, 1988, Ser. No. 202,285
Int. Cl.[4] H01T *21/02*
U.S. Cl. 445—7 7 Claims



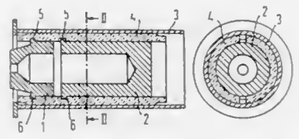
1. A method of manufacturing electrodes for a spark plug comprising the steps of:
cutting a piece of inconel wire from a source to define a cylindrical blank having a first end and a second end;
placing said cylindrical blank in a first die, said first die forming an extruded tip on said first end;
placing said cylindrical blank in a second die, said second die forming an extruded cup in said cylindrical blank that extend from said second end toward said first end;
inserting a copper core in said cup;
placing said cylindrical blank and copper core in a third die to extrude to a predetermined length between said first end and said second end for a resulting center wire;
carrying said center wire to a bath where at least said first end is cleaned to remove oil or grease that may have been accumulated thereon as a result of the extrusion of said cylindrical blank;
transporting said center wire in a station where a cylindrical hole is placed in said first end;
inserting a platinum sphere in said hole; and
striking said first end with a punch to produce an annular lip on said first end which engages and mechanically retains said platinum sphere in said hole.

4,840,595

ELECTRON BEAM CATCHER FOR VELOCITY MODULATED ELECTRON TUBES

Wilhelm Bibracher, Otterloh, and Josef Hauser, Bad Wiessee, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 23, 1987, Ser. No. 76,914
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629461
Int. Cl.[4] H01J *25/34*
U.S. Cl. 445—28 5 Claims



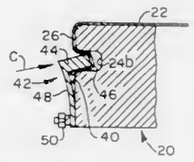
1. An electron beam catcher for velocity modulated electron tubes, particularly a multi-stage collector for traveling-wave tubes, comprising, a plurality of copper catcher electrodes which are mounted to surround the electron beam and follow one another in the direction of the axis of the electron beam, said plurality of catcher electrodes electrically insulated from each other, a copper outer envelope surrounding said plurality of catcher electrodes, a plurality of oblong insulator members (4, 4') extending in the axial direction and mounted between said plurality of catcher electrodes (1, 2) and said copper outer vacuum envelope (3) and said oblong insulator members are formed as half shells; and said copper outer vacuum envelope (3) shrunk onto said plurality of oblong insulator members (4, 4') such that said plurality of oblong insulator members (4, 4') are pressed between said plurality of catcher electrodes (1, 2) and said copper outer vacuum envelope (3).

4,840,596

FACTORY FIXTURE FRAME WITH MEANS FOR TEMPORARILY AND REMOVABLY SUPPORTING AN IN-PROCESS TENSION MASK FOR A COLOR CATHODE RAY TUBE

Lawrence W. Dougherty, Sleepy Hollow, and James L. Kraner, Barrington, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 31, 1987, Ser. No. 139,997
Int. Cl.[4] H01J *9/00*
U.S. Cl. 445—30 23 Claims



1. For use in the manufacture of a color cathode ray tube having a flat faceplate and a tensed foil shadow mask, a factory fixture frame for mounting an in-process shadow mask, the frame including peripheral elongate recess means for receiving an edge of the shadow mask, and mechanical mask-retaining means including elongate means positionable in said recess means for temporarily and removably supporting an in-process shadow mask in tension, and spring means being operatively associated between the frame and the elongate means for biasing the elongate means in clamping engagement with the edge of the shadow mask in the recess means.

4,840,597

DOLL WITH MEANS FOR PRODUCING SOAP BUBBLES AND HAVING AN ANTI-SPILL CONTAINER

Jose L. J. Perez, Biar Alicante, Spain, assignor to Jesmar S.A., Biar, Spain

Filed Jun. 17, 1987, Ser. No. 63,423
Claims priority, application Spain, Jun. 17, 1986, 294,821
Int. Cl.[4] A63H *33/28, 13/00;* A47G *19/22*
U.S. Cl. 446—16 9 Claims

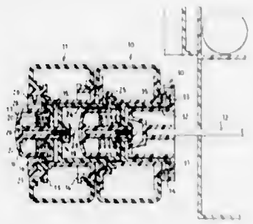
6. A bubble blowing doll, said doll comprising:

(a) a trunk;
(b) a receptacle for holding bubble making liquid, said receptacle having a first portion for containing said liquid when said receptacle is in an upright position and a second upper inner portion having a concavity within which said liquid remains contained in case said receptacle is moved from the upright position;
(c) an extremity pivotally mounted on said trunk;
(d) a bubble-making liquid, pick-up tool attached to the extremity;
(e) a head portion connected to said trunk, said head portion having an opening;
(f) an air impeller functionally connected to the opening in the head portion for impelling air through the opening;
(g) a battery-operated electrical circuit energizable to operate the air impeller; and
(h) a switching element connected to the electrical circuit for closing and opening the circuit and having a switching member located on said pivotally mounted extremity,
wherein, after the tool is placed in the receptacle and a film of liquid is formed thereon and when the extremity is then pivoted such that the tool is moved in an arc from in the receptacle to adjacent to the opening, the switching member on the extremity closes the electrical circuit and the air impeller is activated to cause bubbles to be produced from the film on the tool.

4,840,598
AMUSEMENT PROJECTILE DEVICE
Robert W. Schuetz, Rt. 2, Box 125-J, Berkley, W. Va. 25801
Filed Nov. 16, 1987, Ser. No. 120,955
Int. Cl.[4] A63H *33/20*
U.S. Cl. 446—52 4 Claims

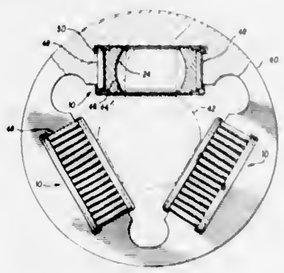
1. An amusement projectile device, comprising
(a) a longitudinal hollow body having a generally rectangular transverse cross sectional configuration, said body comprising a pair of longitudinal sections defining a cavity and hinged together at one end for movement between a closed position wherein said sections are adjacent one another and an open position wherein said sections are spaced from one another, the other ends of said body sections defining a tapered tail portion;
(b) a head portion connected with said hollow body adjacent the hinged connection of said body sections, said body having a convex top surface and containing a recess in one side surface thereof defining a projection portion for propelling the devices into the air;
(c) elastic biasing means connected between said head portion and said body sections to assist movement of said sections from the closed to the open position when the device is propelled into the air;
(d) first and second fins conneced with said body sections, respectively, adjacent said tail portion to assist in the flight of the device; and
(e) a plurality of streamer means arranged within said hollow body cavity, whereby with said body sections in the closed position, said body is propeled into the air and when said body reaches the apex of its flight path, said biasing means move said body sections to the open position to release said streamer means from said body cavity, said streamer means and said body falling randomly to the ground.

4,840,599
WHEEL FOR A TOY VEHICLE AND A TOY VEHICLE HAVING SUCH A WHEEL
Alex L. K. Ming, New Territories, Hong Kong, assignor to Unimax Distribution Limited, Kowloon, Hong Kong
Filed Jan. 29, 1987, Ser. No. 11,432
Claims priority, application United Kingdom, Jan. 30, 1986, 8602291
Int. Cl.[4] A63H *17/00*
U.S. Cl. 446—465 16 Claims



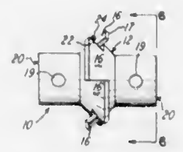
1. A wheel for a toy vehicle, comprising a coupling device for releasably and coaxially attaching the wheel to a hub mounted on an axle of a toy vehicle or to another wheel, the coupling device being supported relative to a rim of the wheel so as to be coaxial therewith and angularly movable relative thereto, the coupling device having a part on an outer side of the wheel for enabling the coupling device to be turned angularly, and a first part of a bayonet coupling on the inner side of the wheel for co-operating with a second part of a bayonet coupling on said hub or said another wheel, the wheel having a said second part of a bayonet coupling on the outer side of the wheel for co-operating with a said first part of a bayonet coupling on a like wheel.

4,840,600
LINEAR NEEDLE ROLLER BEARING
Craig E. White, Pineville, and Bobby L. Hodge, Matthews, both of N.C., assignors to INA Bearing Company, Inc., Fort Mill, S.C.
Filed May 8, 1987, Ser. No. 47,134
Int. Cl.[4] F16D *3/30*
U.S. Cl. 464—111 13 Claims



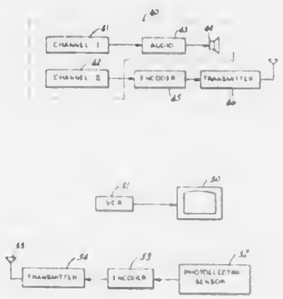
1. A linear needle roller bearing comprising:
a generally rectangularly shaped linear needle bearing block having two opposed ends and an outer peripheral bearing surface extending between said ends, the corners of said bearing block being rounded, said outer peripheral bearing surface extending perpendicularly to said ends and forming a plurality of linear bearing surfaces;
an axial bore extending through the center of said linear needle bearing block;
a plurality of needle rollers disposed on the outer peripheral bearing surface, each of said needle rollers having two ends, a cylindrical rolling surface, a longitudinal axis and a predetermined length; and
a pair of retaining members, each of said retaining members being fixed to a respective one of the ends of said block, each of said retaining members having a substantially C-shaped lip extending over one of said two ends of each of the plurality of needle rollers and a mounting portion, the mounting portion of each of said retaining members conforming generally to the shape of one of the opposed ends of said bearing block and being fixed thereto, said lip being formed so as to extend outwardly beyond the cylindrical rolling surfaces of said needle rollers and in a direction substantially parallel to the longitudinal axes of said needle rollers such that said lip is engageable and in retaining relationship with the cylindrical rolling surfaces of said needle rollers thereby retaining said needle rollers on said block.

4,840,601
SELF BALANCING UNIVERSAL JOINT
Stephen A. Denman, Centerville, Ohio, assignor to Jerome P. Bloom, Englewood, Ohio, a part interest
Filed Sep. 4, 1986, Ser. No. 903,662
Int. Cl.[4] F16D *3/18*
U.S. Cl. 464—157 18 Claims



1. A universal joint comprising a pair of coupling devices each including a hub and means defining an extension of said hub, said means including a plurality of circumferentially spaced divergent projections which are longitudinally and laterally extended, have lateral extremities which are outwardly and symmetrically divergent and define the shape of a segment of a cone, said projections having their successively adjacent side surfaces formed to define therebetween spaces the bounding sides of which are similarly divergent and have a divergency similar to that of said projections, said extensions of said hubs being configured to interfit and being interfit with the projections of each thereof relatively rotatively displaced and projected in and through the spaces defined between the bounding sides of the projections of the other of said extensions, adjacent interfitting projections defining means to maintain a relatively controlled, sliding bearing engagement thereof, one to the other, regardless of the angle of displacement, roll and slide thereof in use.

4,840,602
TALKING DOLL RESPONSIVE TO EXTERNAL SIGNAL
William J. Rose, West Hartford, Conn., assignor to Coleco Industries, Inc., West Hartford, Conn.
Continuation-in-part of Ser. No. 11,600, Feb. 6, 1987. This application Dec. 2, 1987, Ser. No. 127,903
Int. Cl.[4] A63H *30/00, 3/28*; G11B *31/00*
U.S. Cl. 446—175 8 Claims

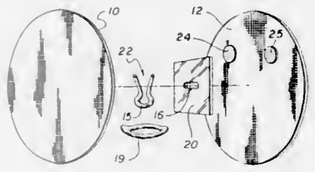


1. In combination, a talking toy and an external signal generating means, said talking toy including
(a) a central processing unit;
(b) a speech synthesizer including a digital to analog converter;
(c) a memory for storing speech data in digital form;
(d) a speaker coupled to said digital to analog converter to produce synthesized human speech, said central processing unit being arranged to access said memory to select speech data therefrom and supply said accessed data to said synthesizer, said speech data being stored in said memory in addresses which may be accessed to produce phrases of human speech; and
(e) a radio frequency receiver coupled to said central processing unit to receive a binary encoded signal indicative of speech data to be elicited from said memory; said external signal generating means including
(i) means for transmitting a radio frequency signal to said toy, said signal having binary encoded instructions for eliciting speech data from the memory of said toy; and
(ii) means for narrating a story to which speech comments from the toy are elicited.

4,840,603
DOLL AND METHOD FOR PRODUCING A DOLL
Mary J. Cahill, 387 Cypress Ave., Sunnyvale, Calif. 94086
Continuation-in-part of Ser. No. 828,329, Jan. 17, 1986, which is a continuation-in-part of Ser. No. 662,839, Oct. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 610,959, May 16, 1984, Pat. No. 4,629,441. This application May 1, 1987, Ser. No. 45,609
Int. Cl.[4] A63H *3/02, 3/36*
U.S. Cl. 446—372 24 Claims

1. A method of forming features in a fabric doll face comprising:
(a) outlining a feature on a front piece of fabric, the front piece of fabric being formed of stretchable material, the feature being in a form of a perimeter;
(b) attaching a middle cover of material that does not stretch to the front piece of fabric over the feature and forming a cavity therebetween and within the perimeter, the middle cover of material being smaller than the front piece of fabric;
(c) inserting filling material between the front piece of fabric and the middle cover inside the cavity; and

(d) attaching a rear piece of fabric to the front piece of fabric over the middle cover, the rear piece of fabric being



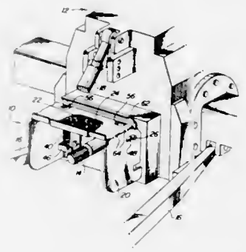
approximately the same size as the front piece and extending substantially beyond the feature.

4,840,604

MASTER SAFETY SHIELD WITH DI FLECTING DOOR

David B. Nusbaum, Shell Rock, and Robert L. Mayfield, Waterloo, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 26, 1988, Ser. No 198,885
Int. Cl.[4] F16D *3/84*
U.S. Cl. 464—176 **17 Claims**



I. A master safety shield for a power take-off shaft, comprising:

a U-shaped main body disposed above and around the power take-off shaft and having an opening in the central portion of the top thereof;

a pivotally mounted door for closing said opening and having a first position closing said opening and a second position spaced away therefrom; and

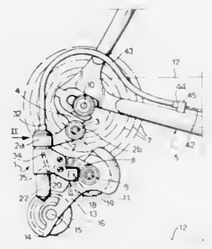
biasing means extending between said main body and said door for biasing said door into said first position.

4,840,605

REAR DERAILER FOR BICYCLE GEARS

Sandro Testa, Perarolo, Italy, assignor to Campagnolo S.p.A., Vicanza, Italy

Filed Jul. 5, 1988, Ser. No. 215,155
Claims priority, application Italy, Jul. 2, 1987, 67569 A/87
Int. Cl.[4] F16H *11/08*
U.S. Cl. 474—80 **12 Claims**



1. A rear derailleur for bicycle gears, comprising:

an upper body which can be fixed to the bicycle frame,

a lower body carrying transmission means for the bicycle chain and connected to the upper body so as to be movable relative thereto to bring the chain into selective engagement with a series of sprockets carried by the hub of the rear wheel of the bicycle, and

flexible cable means for causing movement of the lower body,

wherein it further includes a cylindrical guide element fixed to the upper body, a control lever which carries the lower body and is supported for rotation and axial sliding on the cylindrical guide element, and transmission means interposed between the flexible cable means and the control lever for simulaneously imparting rotation and axial sliding to the control lever relative to the cylindrical guide element as a result of operation of the flexible cable means, means also being provided for keeping the orientation of the lower body unchanged as the position of the control lever varies.

4,840,606

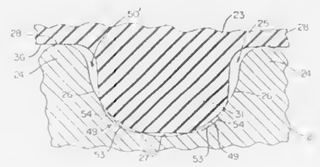
SYNCHRONOUS DRIVE SYSTEM AND METHOD OF MAKING THE SAME

Robert E. Wetzel, Springfield, Mo., assignor to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 927,205, Nov. 5, 1986, Pat. No. 4,722,721, which is a division of Ser. No. 883,257, Jul. 8, 1986, Pat. No. 4,679,999, which is a continuation of Ser. No. 671,392, Nov. 15, 1984, abandoned. This application Jan. 25, 1988, Ser. No. 147,392
The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.
Int. Cl.[4] F16G *1/28;* **F16H** *7/02*
U.S. Cl. 474—153 **30 Claims**

1. In the combination of a toothed pulley and a toothed belt that has teeth thereof serially mesh with cavities of said pulley that are respectively disposed between adjacent teeth thereof and that respectively have bottoms, each belt tooth having a longitudinal crosssectional configuration that defines a pair of space side face means that respectively have free end portions thereof that are remote from adjacent root means thereof and that are spaced apart from each other by a bottom face means of said tooth, each bottom face means having a center that defines a radial length of that respective belt tooth that is at least as long as any other radial length of the respective belt tooth, said belt having land areas on each side of each belt

tooth, the improvement wherein said teeth of said pulley and said belt are so constructed and arranged that each belt tooth would have said pair of free end portions thereof compressed radially outwardly and inwardly toward each other by the respective adjacent pulley teeth while said bottom face means thereof has said center thereof spaced from said bottom of the



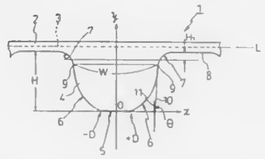
cavity between those respective adjacent pulley teeth when that belt tooth is fully received in the cavity between those respective adjacent pulley teeth and those respective adjacent pulley teeth are just making contact with the land areas of the belt on each side of that belt tooth while being spaced from the respective root means of that belt tooth.

4,840,608

TOOTHED BELT

Junichi Araki; Nobuhiro Saito; Hidenori Tezuka, and Masuhiro Saito, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1987, Ser. No. 78,789
Claims priority, application Japan, Jul. 28, 1986, 61-175720
Int. Cl.[4] F16G *1/28*
U.S. Cl. 474—205 **38 Claims**



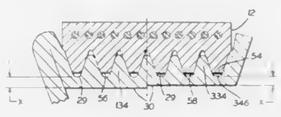
1. A toothed belt for use in a power transmission system, said belt having elastic, longitudinally spaced teeth including a tooth tip with intermediate bottom lands for meshing with cooperating teeth of a toothed pulley, each said belt tooth having a longitudinal sectional shape comprising a cycloidal convex curve extending from the tooth tip and an arc smoothly connecting said cycloidal convex curve and said bottom land.

4,840,607

PULLEY FOR POLY-V BELT

Gary L. Hitchcock, Rochester, Mich.; Henry W. Thomey, Windsor, Canada; Yahya Hodjat, Utica, Mich.; Marc R. Cadarette, and Dawson M. Collins, both of Windsor, Canada, assignors to Dyneer Corporation, Scotsdale, Ariz.

Filed Jun. 26, 1987, Ser. No. 67,621
Int. Cl.[4] F16H *7/02*
U.S. Cl. 474—167 **14 Claims**



1. A pulley for transmitting power to or from an adjacent "K" type poly-v belt, said belt having alternatively raised and indented areas running in parallel longitudinally on said belt, comprising:

(a) a body including an outer cylindrical surface;

(b) a plurality of raised ribs extending from said outer surface, said ribs running circumferentially about said surface and corresponding with the indented areas of said belt;

(c) a plurality of trough areas between said ribs in correspondence with the raised areas of said belt;

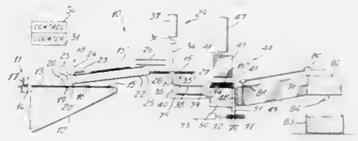
(d) said ribs extending radially traverse of the axis of rotation of said pulley, each of said ribs in cross section bounded by a pair of planar side walls at relative angles of 40°±0.5° and terminating in a 140° arc having a radius of 0.50 mm, an outermost point of said arc 0.96 mm below a point of intersection of projections of said side walls, and said side walls extending at least 3.44 mm in the traverse direction inward of said point of intersection.

4,840,609

BAG FOLDING MACHINE

Elwyn D. Jones, Kingston; Robert Lauzon, Montreal, and Bruno Wetter, St-Eustache, all of Canada, assignors to Glopak Inc., Montreal, Canada

Filed Aug. 25, 1987, Ser. No. 89,155
Int. Cl.[4] B65H *33/02, 33/08, 37/06, 45/30*
U.S. Cl. 493—28 **43 Claims**



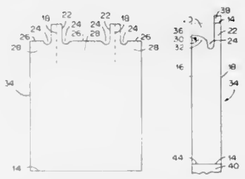
1. A bag folding machine comprising first conveying means for positioning a flat bag over a first support surface, holding means to hold said flat bag stationary over said first support surface in predetermined alignment with a first folding means, said first folding means effecting a first fold to said flat bag, second conveying means for positioning said folded bag on a second stationary support surface, second folding means for effecting a second fold to said folded bag, and third conveying means for positioning said twice folded bag onto a third stationary support surface, third folding means for imparting a third fold to said twice folded bag and including a bag support frame having spaced apart upper and lower bag engaging members for retaining an upper and a lower edge portion of said bag after being folded a third time and with said bag oriented substantially vertically, drive coupling means to move said bag support frame to a discharge position, and discharge means to push said bag out of engagement by said bag engaging members to transfer same to a collector means.

4,840,610

THERMOPLASTIC BAG, BAG PACK AND METHOD OF MAKING THE SAME

Timothy W. Pistner, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 675,109, Nov. 26, 1984, Pat. No. 4,790,437.
This application Sep. 14, 1988, Ser. No. 243,968
Int. Cl.[4] B31B *1/04*
U.S. Cl. 493—194 8 Claims



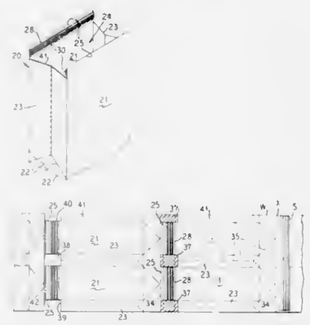
1. A method for forming thermoplastic film handled bags comprising:
(a) forming a continuous collapsed thermoplastic tube;
(b) forming heat seal lines across the width of said tube, transverse to the tube sides, at bag length intervals, said heat seal lines being sufficient to seal the films of said collapsed tube together and prewe ken said line for subsequent bag separation;
(c) longitudinally folding opposite sides of the heat sealed tube equally toward each other until they at least substantially meet at a common center line;
(d) folding this structure once again in the same direction along said center line;
(e) removing eight film layers in one of the corner regions defined by a transverse heat seal line and the spine of fold (d), the film removal being such as to yield, on unfolding, a bag having a bag mouth opening and a pair of single film loop handles near opposite ends of said bag mouth opening but spaced from the sides; and
(f) collecting while still folded, the interconnected structures of (e) in a volumetrically efficient pack of bags.

4,840,611

GUSSETED BAGS WITH RECLOSURE FEATURES

Donald L. Van Erden, Wildwood, Ill., and Steven Ausnit, New York, N.Y., assignors to Minigrip, Inc., Orangeburg, N.Y.

Division of Ser. No. 799,790, Nov. 20, 1985, Pat. No. 4,736,450.
This application Dec. 31, 1987, Ser. No. 139,969
Int. Cl.[4] B31B *1/04*
U.S. Cl. 493—213 3 Claims



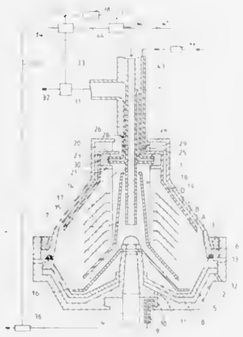
1. A method of making bags having opposite face wall panels connected by a closed bottom, opposite side expanding gussets, and a top opening providing a bag mouth, comprising:
providing a web of a length from which a plurality of bags can be produced by separating the web across its length into bag length sections;
securing across the web on axes extending between opposite longitudinal sides of the web and at bag mouth ends of said bag length sections fastener strips comprising extruded reclosable plastic profiles;
and punching out portions of the web and the secured fastener strips aligned with areas of the web to be formed into said expanding gussets;
and leaving lengths of the fastener strips on portions of the web which will form free end bag mouth portions of face wall panels of the bag length sections and which face wall panels are foldable onto one another along a line which extends across said fastener strip axes.

4,840,612

CENTRIFUGAL SEPARATOR AND METHOD OF OPERATING SAME

Anders Pallmar, Huddinge, Sweden, assignor to Alfa-Laval Marine and Power Engineering AB, Tumba, Sweden

Filed Jun. 17, 1988, Ser. No. 208,105
Claims priority, application Sweden, Jun. 24, 1987, 8702612
Int. Cl.[4] B04B *11/00*
U.S. Cl. 494—2 9 Claims



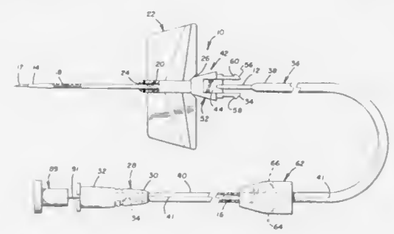
1. In the operation of a centrifugal separator having a rotor, a separation chamber in said rotor, said chamber having an inlet for liquid feed mixture, a central outlet for separated liquid and a peripheral outlet for separated solids, opening means for opening and closing the peripheral outlet during operation of the rotor, means for supplying a predetermined amount of a displacement liquid heavier than said separated liquid to the separation chamber and control means for activating said supply means to supply displacement liquid to said separation chamber immediately prior to the opening of said peripheral outlet, the improvement which comprises:
a. supplying a first quantity of displacement liquid to said separation chamber at a first flow rate and then supplying a second quantity at a substantially lower rate;
b. detecting the possible existence of displacement liquid in the separated liquid leaving the rotor through the central outlet; and
c. opening the peripheral outlet in response to the detection of displacement liquid in the separated liquid.

4,840,613

PROTECTIVE SHEATH FOR CATHETER ASSEMBLY

Daniel J. Balbierz, Sunnyvale, Calif., assignor to Menlo Care, Inc., Palo Alto, Calif.

Filed Apr. 27, 1988, Ser. No. 186,560
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—51 18 Claims



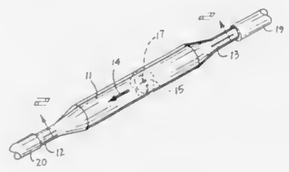
1. In a catheter assembly having a cannula having cannula distal and proximal end portions and a longitudinal duct therethrough from the cannula distal end portion to the cannula proximal end portion, an inserter having inserter distal and proximal end portions and a guide channel therethrough from the inserter distal end portion to the inserter proximal end portion, the cannula slidably fitting in the guide channel, and a hub structure having hub distal and proximal end portions and a passageway therethrough from the hub distal end portion to the hub proximal end portion, the cannula proximal end portion being attached to the hub structure with the duct in flow communication with the passageway, an improvement comprising:
a sheath having sheath distal and proximal end portions and a longitudinal slit or weakened portion extending therealong from said sheath distal end portion to said sheath proximal end portion, said sheath being about said cannula between said inserter and said hub structure;
sheath stripping means carried by said inserter for stripping said sheath, starting from said sheath distal end portion, from about said cannula as said cannula is slid distally through said guide channel;
a first lock member carried by said inserter; and
a second lock member about said cannula between said inserter and said hub structure, said first and second lock members being interlockable with on another.

4,840,614

GASTRIC TUBE POSITIONING METHOD

Bassam Maaz, 637 Avant La., N., Memphis, Tenn. 38105

Filed Jan. 4, 1988, Ser. No. 140,612
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—53 1 Claim



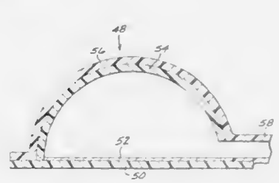
1. A method for proper positioning of a gastric feed tube within a patient comprising,
securing a first gastric tube portion onto a forward end of a valve means, and
securing a second gastric tube portion onto a rearward end of said valve means, and
directing said second gastric tube portion through a patient's esophagus, and
temporarily positioning a terminal end portion of said first gastric tube portion within a liquid and observing the liquid for presence of bubbling emanating from said terminal end within said liquid to ascertain the positioning of the second gastric tube portion either within a patient's stomach wherein no bubbling occurs, or within the patient's gastric tube portion by the presence of bubbling within said liquid, and
further forming said valve means with an internal flexible membrane normally seated over a defined opening within said valve means enabling fluid flow from said rearward end of said valve means to a said forward end of said valve means only, and
forming said flexible membrane of a memory retentent material and of a force to normally seat said membrane against a frame portion defining said opening wherein said normal forces of seating is less than that of exhalation pressure of an individual during a normal respiratory process.

4,840,615

SELF-SEALING INJECTION RESERVOIR

John C. Hancock; William R. Dubrul, both of Santa Barbara, and Charles J. Heyler, III, Thousand Oaks, all of Calif., assignors to McGhan Medical Corporation, Santa Barbara, Calif.

Division of Ser. No. 781,965, Sep. 30, 1985, Pat. No. 4,738,657.
This application Mar. 14, 1988, Ser. No. 167,409
Int. Cl.[4] A61M *25/00*; A61B *19/00*
U.S. Cl. 604—93 9 Claims



1. A self-sealing injection reservoir adapted to be punctured by a hypodermic needle, the reservoir comprising:
a body defining a chamber for holding liquid, said body including a base;
a substantially dome-shaped member made of elastic material and having a concave interior side which is under compression as a result of having been manufactured into a substantially dome-shaped configuration and thereafter inverted, the dome shaped member comprising at least an interior wall of the chamber and being disposed in a location of the chamber which is adapted to be punctured by the hypodermic needle;
duct means for conducting liquid out of the chamber, and
guard means incorporated in the chamber for preventing accidental puncture of the base with the hypodermic needle.

4,840,616

SYRINGE HYPODERMIC NEEDLE

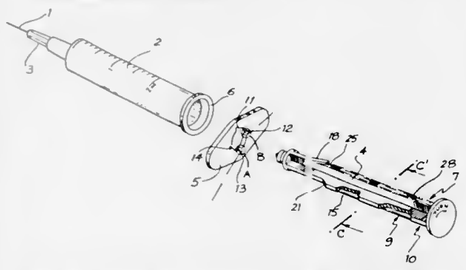
Gilbert H. Banks, Rainbow Flats, Australia, assignor to Bev-Cap Plastics Pty. Ltd., New South Wales, Australia

Filed Feb. 29, 1988, Ser. No. 161,574
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—110 9 Claims

1. A single use disposable medical syringe comprising a syringe body adapted at one end to receive a hypodermic

needle, a plunger located within said syringe body and passing through an end plate attached to other end of said syringe body and characterised in that:

said plunger includes a plunger head forming at any time a seal with an interior surface of said syringe body, and a plunger shaft including at least a first and second longitudinally extending spline, said first spline including teeth adapted to co-act with a first pawl and said second spline including teeth adapted to co-act with a second pawl, said splines further including circumjacent and corresponding first and second recesses;



said end plate having an aperture to locate said plunger shaft, said aperture having three or more channels each adapted to receive one or other said splines and two of said channels being provided respectively with said first and second pawls;

said recesses allowing free rotation of said plunger within said end plate aperture such that when said first pawl allows withdrawal only of said plunger whereupon predetermined free rotation of said plunger engages said second pawl which allows insertion only of said plunger.

4,840,617

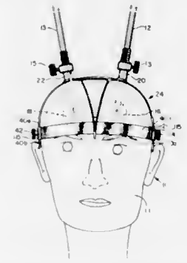
CEREBRAL AND LUMBAR PERFUSION CATHETERIZATION APPARATUS FOR USE IN TREATING HYPOXIC/ISCHEMIC NEUROLOGIC TISSUE

Jewell L. Osterholm, Radnor, Pa., assignor to Thomas Jefferson University, Philadelphia, Pa.

Continuation of Ser. No. 755,427, Jul. 16, 1985, abandoned, which is a continuation-in-part of Ser. No. 428,900, Sep. 30, 1982, Pat. No. 4,758,431, and a continuation-in-part of Ser. No. 582,961, Feb. 23, 1984, Pat. No. 4,686,085 which is a division of Ser. No. 428,850, Sep. 30, 1982, Pat. No. 4,445,500, said Ser. No. 428,900, and Ser. No. 428,850, each is a division of Ser. No. 354,346, Mar. 3, 1982, Pat. No. 4,445,886, which is a continuation-in-part of Ser. No. 139,886, Apr. 14, 1980, Pat. No. 4,378,797. This application Aug. 24, 1988, Ser. No. 238,982

Int. Cl.[4] A61M *25/02, 5/00, 1/00*; A61B *19/00*

U.S. Cl. 604—174 21 Claims



1. A cerebral catheterization apparatus for delivering oxygenated nutrient to or from the cerebro-spinal fluid pathway of a patient suspected of suffering from ischemic central nervous system tissue comprising:

(a) catheter means for providing a delivery pathway for said oxygenated nutrient to the lateral ventricle of the brain of said patient, said delivery pathway comprising an inlet and outlet;

(b) guide means, mating with said catheter means, for directing said catheter means toward said lateral ventricle; and

(c) a harness, positionable with respect to the head of the patient, said guide means being mounted thereon, for positioning said guide means with respect to the head such that said catheter means may be reliably inserted into said lateral ventricle, said harness comprising:

(i) a horizontal strap for encircling the head of the patient, the ventrex of the skull being above said horizontal strap; and

(ii) a transverse strap coupled to said horizontal strap, said transverse strap generally lying above the coronal suture of said patient and lying in a generally vertical plane which intersects with the lateral ventricles, to thereby position said guide means at a predetermined location with respect to said ventricles, said guide means being mounted on said transverse strap.

4,840,618

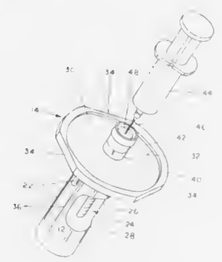
MEDICAL SAFETY DEVICE

Ray D. Marvel, 3206 Highway 92, Hotchkiss, Colo. 81419

Filed Apr. 25, 1988, Ser. No. 185,855

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—187 14 Claims



1. Apparatus for providing a safety shield to an operator in the process of transferring body fluids from a syringe to a test container which comprises:

a handle for holding the safety shield in the hand of an operator, said handle having the form of an elongated, substantially cylindrical member with a longitudinal dimension which is sufficient to extend transversely across the palm of the operator's hand and having formed therein a longitudinal cavity within the substantially cylindrical member that is long enough to receive the greater part of a test container lengthwise, said cavity being sized for securely holding the test container and

a shield extending radially outwardly from the upper end of the handle to a distance such that when the handle is grasped within the operator's palm to form a clenched fist about the handle, the bottom surface of the shield substantially covers the upper side of the clenched fist.

4,840,619

SYRINGE

Elaine L. Hughes, 3009 Castle Dr., Blue Springs, Mo. 64015

Filed May 26, 1988, Ser. No. 199,323

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—187 10 Claims

1. A syringe for administering injections comprising:

(a) a barrel having an interior chamber for holding fluid;

(b) a plunger reciprocably located in said chamber and manipulative by an administer of an injection;

(c) a needle having an end point in flow communication with one end of said chamber;

(d) said needle including a projection extending radially outward therefrom; and

(e) a sleeve slidably mounted on said barrel and including means for engaging said needle projection subsequent to administration of said injection such that an administrator may engage said needle projection with said means by sliding said sleeve along said barrel and subsequently disconnect said needle from said barrel by rotation of said sleeve.

4,840,620

PORTABLE PUMP FOR INFUSING MEDICINE INTO A LIVING BODY

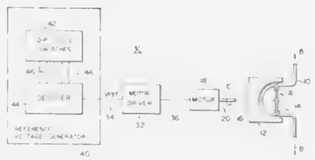
Susumu Kobayashi, and Kazumasa Satoh, both of Fujinomiya, Japan, assignors to Terumo Corporation, Tokyo, Japan

Filed Apr. 3, 1987, Ser. No. 33,772

Claims priority, application Japan, Apr. 7, 1986, 61-78288

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—246 5 Claims



1. An infusion rate control apparatus for controlling an infusion pump powered by a motor, comprising:

driving means for driving the motor of the infusion pump in response to a control signal;

speed setting means, including a dual in-line package code switch having a control knob that is manually operated to set in said speed setting means a decimal value corresponding to a desired speed of the motor, for producing a binary-coded signal in dependence upon the decimal value set therein, the dual in-line package code switch and the control knob together providing a visual indication representative of a flow rate at which the liquid is to be transported;

control signal producing means, interconnected with said speed setting means, for producing the control signal in dependence upon the binary coded signal and supplying the control signal to said driving means.

4,840,621

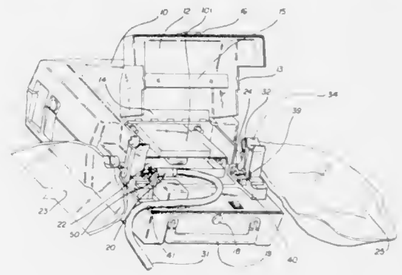
PIERCING PIN TRANSFER DEVICE

Mark E. Larkin, Lindenhurst, and John E. Ogden, Libertyville, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Jan. 19, 1988, Ser. No. 145,008

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—29 27 Claims



1. A piercing pin transfer device comprising, in combination a piercing pin;

means to support said pin;

means for holding a first port adapted to connect to said pin;

means for holding a second port adapted to connect to said pin, said second port holding means being in opposing relationship with said first port holding means;

means for connecting said pin to said first port, disconnecting said pin from said port, and connecting said pin to said second port and

means for inverting said piercing pin intermediate of said first port holding means and said second port holding means.

4,840,622

KINK RESISTANT CATHETER

Dwayne E. Hardy, San Mateo, Calif., assignor to Menlo Care, Inc., Palo Alto, Calif.

Filed Oct. 6, 1987, Ser. No. 105,552

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—264 46 Claims

1. In a cannula having a proximal end portion adapted to be connected to a hub, a distal end portion and a longitudinal duct therethrough from the distal end portion to the proximal end portion, the cannula being of a material selected such that an

inner cross-section of the duct increases to form an enlarged duct cross-section when at least a part of the distal end portion is inserted through the skin and into a blood vessel of a living subject and maintained therein and/or when the duct is contacted by an aqueous liquid for a period of time sufficient for the enlarged duct cross-section to form, an improvement comprising:

where in the cannula has a larger outer cross-section and the duct has a larger inner cross-section starting from the proximal end portion and continuing to a position along the cannula than have the cannula and the duct starting at the distal end portion and continuing to the position, the position being located such that when the distal end portion is inserted in the blood vessel the position is located beneath the skin short of the blood vessel; and further including:

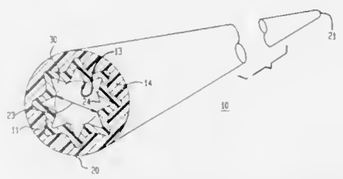
a reinforcing tube having an outer surface matingly held within the duct and having an inner passageway, the tube extending from the proximal end portion to adjacent the position.

4,840,623

MEDICAL CATHETER WITH SPLINED INTERNAL WALL

John Quackenbush, Hoover, Ala., assignor to FBK International Corporation, Birmingham, Ala.

Filed Feb. 1, 1988, Ser. No. 151,061
Int. Cl.[4] A61M 25/00
U.S. Cl. 604—280 **5 Claims**



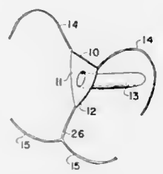
1. A catheter adapted for insertion into the human body, said catheter including a flexible tube having an internal and an external wall, said internal, wall having a splined configuration, and having an outer shell, said outer shell having an internal wall and an external wall, said internal wall of said outer shell having a geometry to match the geometry of the external wall of said inner tube and being integral herewith.

4,840,624

FEMALE CONDOM DEVICE

Henry J. Lee, 2521 Harriman Cir., Tallahassee, Fla. 32312

Filed Sep. 24, 1982, Ser. No. 100,426
Int. Cl.[4] A61F 5/44
U.S. Cl. 604—349 **3 Claims**



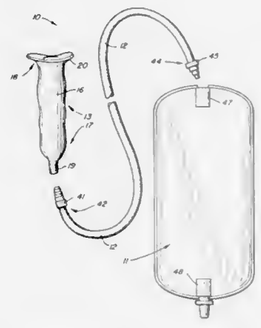
1. A female condom device comprising a triangular pubic area cover pad having a front side and a back side, a thin elastomeric tubular condom portion affixed to said pad with the opening of said condom portion generally in the center of said front side and the closed end of said condom extending outwardly from said back side, and two hip engaging elongated loops of tape extending outwardly from the three corners of said pad; said condom portion having an expandible constricting encirclement spaced rearwardly from and adjacent to said cover pad.

4,840,625

EXTERNAL CATHETER URINE COLLECTION SYSTEM

Ramona R. Bell, 3708 Magee Ave., Oakland, Calif. 94619

Filed May 27, 1988, Ser. No. 199,622
Int. Cl.[4] A61F 5/44
U.S. Cl. 604—352 **2 Claims**



1. An external catheter urine collection system for males, comprising:

a lightweight urine collection reservoir made of flexible material and having a urine collection inlet,

a lightweight urine collection tube made of flexible material, having a reservoir connecting end for connecting to the inlet of the urine collection reservoir, and a catheter connecting end means, and

an external catheter having a distal end and a proximal end, the proximal end having a diameter and length sufficient to fit over a male patient's penis and be positioned at the base of the penis, the distal end including connector means for connecting the catheter to the catheter connecting end of the urine collection tube, so that urine may flow from the catheter into the urine collection tube, and the proximal end including adhesively sealing rim means for sealing the proximal end of the catheter only to the body skin adjacent to and around the base of the patient's penis, thereby adhesively securing the catheter to the patient and preventing leakage of urine from around the proximal end of the catheter,

the external catheter including a generally annular sheet of material sealed to and extending around the proximal end of the external catheter, said sheet having an adhesive coated proximal side in position to contact and sealingly adhere to the patient's skin adjacent to the base of the penis,

the annular sheet being radially asymmetrical around the proximal end of the external catheter so that when the catheter is properly attached to the patient, no portion of the annular sheet rest substantially on the patient's scrotum.

4,840,626

HEPARIN-CONTAINING ADHESION PREVENTION BARRIER AND PROCESS

Gary Linsky, East Brunswick; Timothy Cunningham, Flemington, and Eli Pines, Watchung, all of N.J., assignors to Johnson & Johnson Patient Care, Inc., New Brunswick, N.J.

Filed Sep. 29, 1986, Ser. No. 912,450
Int. Cl.[4] A01F 13/16
U.S. Cl. 604—364 **18 Claims**

1. An improved adhesion-preventative barrier fabric comprising an oxidized regenerated cellulose fabric which is drapable, conformable, adherent to body organs, and substantially absorbable within thirty (30) days in the body, which fabric has heparin absorbed thereon, said heparin being present in a non-toxic, adhesion-preventative effective amount and potency.

4,840,627

ARTIFICIAL EYE LENS AND METHOD OF TRANSPLANTING SAME

Michael Blumenthal, c/o Abrams, 1136 Fifth Ave., New York, N.Y. 10028

Continuation of Ser. No. 849,325, Apr. 8, 1986, abandoned. This application May 13, 1987, Ser. No. 51,159
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 **14 Claims**

1. An intraocular lens comprising a hydrogel material and defining:

a central optical portion; and,

only two oppositely disposed equidistant elongate, fixation elements integrally formed with and extending axially from said optical portion said fixation elements and optical portion defining a straight line, said fixation elements tapering gradually and symmetrically to a minimum along a smooth curve over its length to its outer end, said tapering being normal to the plane of said optical portion thereby substantially eliminating weak points at the interface between the optical portion and the fixation elements.

4,840,628

NON-ENVELOPED GEL PROSTHESIS

Joseph F. Cavon, 1125 E. 17th St., Santa Ana, Calif. 92701

Continuation-in-part of Ser. No. 781,305, Sep. 27, 1985, Pat. No. 4,740,208, which is a continuation of Ser. No. 613,894, May 24, 1984, abandoned, which is a continuation of Ser. No. 209,021, Nov. 21, 1980, Pat. No. 4,470,160. This application Jan. 27, 1988, Ser. No. 148,864
The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.
Int. Cl.[4] A61F 2/12
U.S. Cl. 623—8 **2 Claims**

1. An unconstrained cohesive gel prosthesis for implantation in a human body cavity normally substantially occupied by soft tissue consisting essentially of:

an unconstrained molded pressure-dispersing cohesive homogeneous gel elastomer formed to fit the shape and size of a body cavity normally substantially occupied by soft tissue in the human body,

the cohesion of said gel being such that it can be stretched substantially more than 21% of its length without the appearance of stress cracks in the gel, the gel being sufficiently cross linked so that the gel has a non-flowing characteristic.

4,840,629

MAMMARY PROSTHESIS

Ricardo A. Bustos, Sao Paulo, Brazil, assignor to Silimed Silicone E Instrumental Medico-Cirurgico e Hospitalar Ltda., Rio de Janeiro, Brazil

Filed Oct. 11, 1988, Ser. No. 255,278
Claims priority, application Brazil, Oct. 14, 1987, PI8705600
Int. Cl.[4] A61F 2/12
U.S. Cl. 623—8 **8 Claims**

1. MAMMARY PROSTHESIS, to be inserted in the breast of a patient by an incision, characterized by comprising a perforated lamina (**10**) made of an inert and flexible material, having a thickness not exceeding 1.0 mm and showing, when flattened, the approximate shape of an annular sector, with an extension of about 180 to about 220 , the inner diameter and the flexibility of the lamina in the annular sector being sized in order to allow the lamina (**10**) to assume a substantially frustoconical shape having a slightly convex side surface and the inner peripheral edge surrounding the mammary areola at a certain distance, on inserting the prosthesis between the mammary gland and the detached skin, the ends of the inner peripheral edge of the lamina (**10**) being close to each other in such a way to occupy one of the positions adjoining and overlapping one another and the extreme edges of the lamina remaining angularly spaced apart.

4,840,630

ARTIFICIAL HIP JOINT

Yasuhiro Kitamura, Kyoto, Japan, assignor to Kyocera Corporation, Kyoto, Japan

Continuation of Ser. No. 873,288, Jun. 5, 1986, abandoned, which is a continuation of Ser. No. 592,605, Mar. 22, 1984, abandoned. This application Feb. 4, 1988, Ser. No. 154,504
Int. Cl.[4] A01F 2/34
U.S. Cl. 623—22 **3 Claims**

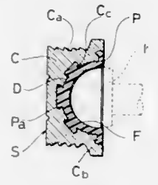
1. An artificial hip joint comprising:

a socket member having a ceramic external frame member to be secured in a hipbone and a cup-shaped, high-density molded polyethylene socket plug held and secured in said external frame member; and

a stem member having a condyle portion at a first end thereof and a second, opposite end thereof designed to be embedded and secured in a thigh bone,

wherein said socket plug rotatably supports a spherical section of said condyle portion, and has a plurality of undercut protrusions,

wherein said external frame member has a generally concave section having a plurality of sockets defined therein, the protrusions of said socket plug being disposed in said sockets, thereby securely joining the socket plug to the external ceramic frame member so as to preclude movement of the socket plug relative to the ceramic frame, the undercut protrusions serving to compensate for the thermal expansion coefficient difference between the socket plug and the external frame member;



said ceramic frame member consisting essentially of a ceramic selected from the group consisting of alumina ceramics, zirconia ceramics and apatite ceramics; and

said condyle portion consisting essentially of monocrystalline alumina ceramics or polycrystalline zirconia ceramics.

4,840,631

ARTIFICIAL HIP JOINT SOCKET WITH HYDRAULIC HEAD SUPPORT

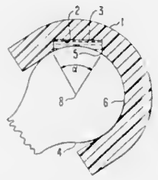
Robert Mathys, Bettlach, Switzerland, assignor to Robert Mathys Co., Bettlach, Switzerland

Continuation-in-part of Ser. No. 864,727, Apr. 23, 1986, abandoned. This application Feb. 29, 1988, Ser. No. 162,249

Claims priority, application Switzerland, Aug. 28, 1984, 04121/84

Int. Cl.[4] A61F *2/32*

U.S. Cl. 623—22 **11 Claims**



11. An artificial hip joint socket for receiving and cooperating with a ball head of a femoral prosthetic shaft comprising

a hollow body having a wall and a spherical inner surface for receiving the ball head of the prosthetic shaft such that said ball head and said spherical surface have a common center, said body further including means defining a recess extending into said wall from said inner surface forming a liquid chamber, said recess being positioned at the stress zone of the femoral head support,

said means defining said recess including a circular edge at the line of junction with said spherical inner surface defining the sole opening into said liquid chamber, said edge forming a permanent latitudinal seal with said ball head when said joint is under load so that an increase of pressure of said ball against said spherical surface allows an increase in hydrostatic pressure in said liquid chamber.

4,840,632

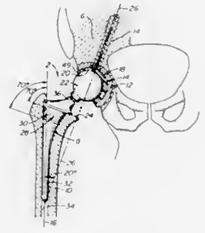
HIP PROSTHESIS

Stanley L. Kampner, 2320 Sutter, San Francisco, Calif. 94115

Continuation of Ser. No. 590,258, Mar. 16, 1984, abandoned. This application May 21, 1986, Ser. No. 870,289

Int. Cl.[4] A61F *2/34, 2/32*

U.S. Cl. 623—22 **40 Claims**



I. An acetabular implant for implantation in an acetabular cavity of a patient comprising a generally semi-spherical acetabular cup including a fixation hole positioned at a location spaced from an edge of the cup so that the hole can be substantially aligned with the pectineal line of the patient when the cup is implanted in the cavity, a portion of an exterior surface of the cup and at least partially spaced from the edge of the cup being porous to promote bone ingrowth upon implantation of the cup, the portion of the exterior cup surface extending over at least a part of the hole, a remainder of the exterior cup surface spaced from the hole and contiguous with at least a portion of the edge of the cup being substantially smooth to inhibit bone ingrowth, and an elongated anchor insertable into the pelvis for mechanically fixing the cup to the pelvis, the anchor including means for engaging the cup and applying a force to the cup in the direction of the anchor to thereby firmly seat the cup in the cavity.

4,840,633

CEMENTLESS ENDOPROSTHESIS

Manfred Kallabis, Falkenweg 24, and Guido Gombert, Schillerstr. 18, both of D-8960 Kempton, Fed. Rep. of Germany

Filed Dec. 23, 1987, Ser. No. 137,257

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1987, 3700102; Jul. 31, 1987, 3725387

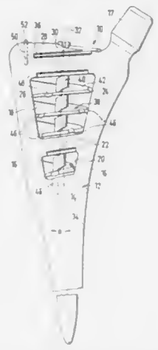
Int. Cl.[4] A61F *2/32, 2/30*

U.S. Cl. 623—23 **12 Claims**

1. A cementless endoprosthesis primarily for hip joints comprising:

a longitudinal stem to be non-rotably inserted into a medullary canal, the stem at a proximal end thereof having a conical neck integral therewith, said neck having a central axis angularly arranged with respect to a central longitudinal axis of the stem, said stem having a pair of broad side faces and a pair of small end faces, the stem including means for guiding and supporting a screw spindle; and

said screw spindle having a broad flange helical flank to engage cancellous bone of the canal, whereby upon being screwed into the stem in a substantially longitudinal direction, the flange helical flank is extended beyond both side faces of the stem to form a plurality of lateral extending support ribs cutting into cancellous bone of the canal.



4,840,634

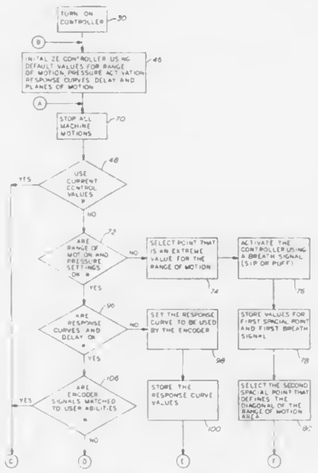
CALIBRATION CONTROLLER FOR CONTROLLING ELECTRICALLY OPERATED MACHINES

Walter Muller, Binningen, Switzerland, and Thomas A. Krouskop, Stafford, Tex., assignors to Clayton Foundation for Research, Houston, Tex.

Filed Jun. 10, 1987, Ser. No. 60,563

Int. Cl.[4] B62D *11/04*

U.S. Cl. 623—24 **8 Claims**



1. A controller for enabling a person with limited physical abilities to control one or more electrically operated machines comprising,

a movable mouthpiece adapted to conduct an air flow therethrough in response to a person blowing and/or sipping air therethrough,

a pressure transducer connected to the mouthpiece and actuated by air flow through the mouthpiece, said transducer providing a signal in response to air flow,

a plurality of position transducers connected to and measuring the position of the mouthpiece in a plurality of planes, each transmitter emitting a signal characteristic of the position of the mouthpiece,

a controller connected to and receiving the outputs of the pressure transducer and the position transducers and connected to and controlling one or more machines by control signals,

said controller including calibration means responsive to the outputs of the Pressure transducers and the position transducers selecting one or more planes of motion to be used for control in response to the person and selecting the range of motion in response to the person in each selected plane to be used for control, said calibration means arranging the control signals to fit within the selected planes and range of motion.

4,840,635

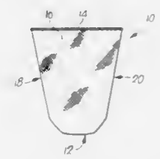
FULL-FASHION STUMP SHRINKER FOR THE RESIDUAL LIMB OF A HUMAN AMPUTEE

William B. Smith; Martha M. Field, both of Leawood, Kans.; Lawrence Pierce, Jr., Raytown, Mo., and Jeffrey C. Dalbey, Olathe, Kans., assignors to Knit-Rite, Inc., Kansas City, Mo.

Filed Aug. 8, 1986, Ser. No. 894,651

Int. Cl.[4] A61F *2/80*

U.S. Cl. 623—36 **8 Claims**



1. A stump shrinker for applying comfortable therapeutic compression of at least 10 to 30 millimeters of mercury at 50% stretch of the shrinker to the residual limb of a human amputee comprising:

an elongated, one-piece, soft, pliable fabric receptacle having a pair of flaccid sidewalls initially collapsed flatly against one another prior to donning of the shrinker by the amputee,

said sidewalls being integrally interconnected along their opposite, longitudinal extremities so as to define an internal, stump-receiving socket which changes from a flattened condition before use to a condition conforming to the shape of the stump when the shrinker is worn by the amputee,

said receptacle further having a normally open upper end through which the stump is inserted into the socket when the shrinker is donned by the amputee and a closed, seamless, normally lower toe disposed to engage and bear against the distal end of the stump when the shrinker is in place on the stump,

said receptacle tapering toward a minimum transverse dimension as said toe is approached and being of full-fashion, knit construction whereby to provide said tapered configuration without seams along the longitudinal extremities of the sidewalls,

said fabric being formed by resilient yarn of constant density throughout the shrinker and having such resilience that the shrinker exerts compression of at least 10 to 30 milimeters of mercury at 50% stretch of the fabric,

said yarn being knitted in connected loops of substantially uniform pattern and number per square inch throughout the receptacle, whereby the shrinker exhibits generally uniform compression against the residual limb of the wearer over a wide range of stretch as the limb changes in diameter due to swelling and contraction.

4,840,636

MODIFYING THE SURFACE OF THE INTERIOR PORE WALLS OF OBJECTS SUCH AS MEMBRANES WITH GAS ACTIVATED BY PARTIAL BRUSH DISCHARGE

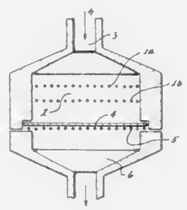
Herbert Bauser; Bernd Schindler, both of Stuttgart, and Horst Chmiel, Leonberg, all of Fed. Rep. of Germany, assignors to Fraunhofer Geselschaft E.V., Munich, Fed. Rep. of Germany

Filed Oct. 9, 1984, Ser. No. 658,762

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1983, 3337763

Int. Cl.[4] B01D *13/04, 39/14;* C08J *9/30*

U.S. Cl. 8—115.52 14 Claims



1. A method for modifying the surface of the pore walls of a mebrane made of an organic compound material and to be used for separating materials and/or phases of matter comprising the steps of:

providing a flow of gas and forcing said gas through said membrane, said gas comprising or including at least one particular reaction medium, for electro-chemically activating the membrane; and

providing partial electrical brush discharge through said gas, at a point in time prior to the gas having passed through said membrane, for electrically activating said particular reaction medium so that said then activated reaction medium in turn modifies and chemically activates the surface of said pore walls.

4,840,637

SYNTHETIC EBONY AND METHOD OF PRODUCING THE SAME (I)

Philip C. Rolffs, 629 South Shore Dr., P.O. Box 175, Portage, Mich. 49081

Continuation of Ser. No. 933,478, Nov. 21, 1986, abandoned. This application Jun. 10, 1988, Ser. No. 206,190

The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.

Int. Cl.[4] D06P *3/60*

U.S. Cl. 8—402 16 Claims

1. A method of treating wood of the genus Juglans to change its color completely and throughout the entire structure and substance thereof essentially to jet black, with bronze highlights, consisting essentially of the following steps:

placing the starting wood into a vacuum/pressure vessel

drawing a vacuum in the vessel to below about 50 mm of mercury,

allowing the vessel to stand for a period between about and 24 hours at a temperature between about 100° and 150° F. until essentially all the extractable water and air is extracted from the wood,

introducing an aqueous solution of n iron salt having a concentration between about six (6) and not greater than about eighteen (18) percent by weight into the vessel, while maintaining the vacuum therein,

thereafter applying an elevated pressure inside of the vessel between about 200 and about 800 pounds per square inch,

allowing the vessel to stand for a period between about 3 and about 48 hours at a temperature between about 100° and 250° F. until essentially the maximum possible amount of iron salt solution is absorbed by said wood,

releasing the pressure in the vessel,

draining fluid from the vessel,

removing the wood from the vessel,

washing the wood with water, and

drying the thus-treated wood to produce a jet black synthetic ebony product having bronze highlights.

15. Wood of the genus Juglans characterized by being jet black throughout its entire structure and substance except for bronze highlights, thereby constituting a high-lighted jet-black ebony substitute.

4,840,638

SYNTHETIC EBONY AND METHOD OF PRODUCING THE SAME (II)

Philip C. Rolffs, 629 S. Shore Dr., P.O. Box 175, Portage, Mich. 49081

Continuation of Ser. No. 933,486, Nov. 21, 1986, abandoned. This application Jun. 13, 1988, Ser. No. 206,374

Int. Cl.[4] D06P *3/60*

U.S. Cl. 8—408 19 Claims

1. A method of treating wood of the genus Juglans to change its color completely and throughout the entire structure and substance thereof essentially to jet black, consisting essentially of the following stages the steps:

Stage I:

placing the starting wood into a vacuum/pressure vessel,

drawing a vacuum in the vessel to below about 50 mm of mercury,

allowing the vessel to stand for between about 3 and 24 hours at a temperature between about 100° and 150° F. until essentially all the extractable water and air is extracted from the wood,

introducing an aqueous solution of an iron salt having a concentration greater than about twelve (12) percent by weight into the vessel, while maintaining the vacuum therein,

thereafter applying an elevated pressure between about 200 and 800 pounds per square inch inside of the vessel,

allowing the vessel to stand at a temperature between about 100° to about 250° F. for between about 3 and about 48 hours until essentially the maximum possible amount of iron salt solution is absorbed by said wood,

releasing the pressure in the vessel,

draining fluid from the vessel,

removing the wood from the vessel,

washing the wood with water,

drying the thus-treated wood intermediate product having bronze highlights or white iron salt deposits therein, depending upon the amount of tannin naturally present in the wood and the concentration of the iron salt solution employed, and

Stage II:

placing the thus-treated wood intermediate product into a vacuum/pressure vessel,

drawing a vacuum in the vessel to below about 50 mm of mercury,

allowing the vessel to stand for between about 3 and 24 hours at a temperature between about 100° and 150° F. until essentially all the extractable water and air is extracted from the wood,

introducing an aqueous solution of tannic acid having a concentration of at least about four (4) percent by weight into the vessel while maintaining the vacuum therein,

thereafter applying an elevated pressure between about 200 and 800 pounds per square inch inside of the vessel,

allowing the vessel to stand at a temperature between about 100° to about 250° F. for between about 3 and about 48 hours until essentially the maximum possible amount of tannic acid solution is absorbed by said wood,

releasing the pressure in the vessel,

draining fluid from the vessel,

removing the wood from the vesse ,
washing the wood with water,
and drying the thus-treated wood to produce a jet black synthetic ebony product essentially free of bronze highlights.

16. The method of treating wood of the genus Juglans to change its color completely and throughout the entire structure and substance thereof essentially to jet black, consisting essentially of the steps of placing the starting Juglans wood into a vacuum/pressure vessel, drawing a vacuum in the vessel and allowing the vessel to stand at an elevated temperature until essentially all of the extractable water and air is extracted from the wood, and impregnating the wood with an aqueous solution of an iron salt at an elevated temperature and pressure to cause blackening of the wood essentially throughout, subjecting the wood to a vacuum at an elevated temperature, until essentially all the extractable water and air is extracted from the wood, and impregnating the wood with an aqueous solution of tannic acid at an elevated temperature and pressure to cause reaction with the iron salt remaining in the thus-treated wood and to complete the blacking process, and drying the thus-treated wood to produce a jet black product.

4,840,639

AGENT FOR DYEING HAIR

Hans Husemeyer, Darmstadt, Fed. Rep. of Germany; Herbert Mager, Fribourg, Switzerland, and Eugen Konrad, Darmstadt, Fed. Rep. of Germany, assignors to Vella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 901,994, Aug. 28, 1986, abandoned, which is a continuation of Ser. No. 669,634, Nov. 7, 1984, abandoned, which is a continuation of Ser. No. 433,728, Oct. 12, 1982, abandoned, which is a continuation of Ser. No. 253,636, Mar. 20, 1980, abandoned. This application Jun. 7, 1988, Ser. No. 204,993

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1978, 2831847

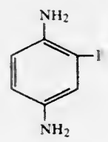
Int. Cl.[4] A61K 7/13

U.S. Cl. 8—410 **9 Claims**

1. A composition for use in the oxidative dyeing of human hair comprising 0.1 to 5.0 weight percent of a combination of

(A) at least one coupler conventionally used in hair coloring selected from the group consisting of 2-napthol, 3,4-diamino-benzoic acid, resorcinol, 4-chlororesorcinol, m-aminophenol, m-phenylene diamine, n-toluylene diamine, 2,4-diamino anisol, 2,4-diamino benzyl alcohol and 3-amino-6-methylphenol; and

(B) 0.01 to 3.0 weight percent of an 1-hydroxy-alkyl-2,5-diamino-benzene of the formula



where R is a hydroxyalkyl having 1 to 2 carbon atoms as developer.

4,840,640

POLARIZING FILM: POLYMER FILM BASE CONTAINING SUBSTITUTED ANTHRAQUINONE DICHROIC DYE

Konoe Miura, Yokohama; Tetsuo Ozawa, Hadano; Seigo Okumura, Machida, and Hidetoshi Urashima, Kitakyushu, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Japan

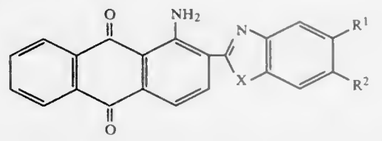
Filed Jun. 16, 1987, Ser. No. 62,881

Claims priority, application Japan, Jun. 17, 1986, 61-140956

Int. Cl.[4] C09B 1/22; G02B 1/08, 5/30

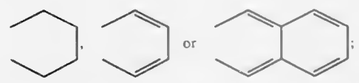
U.S. Cl. 8—506 **6 Claims**

1. A polarizing film which comprises a film base having thereon an anthraquinone dye of general formula (I):



(I)

wherein R^1 and R^2 each represents a hydrogen atom, an alkyl group, an alkoxy group, an aralkyloxy group, an aryl group, a cyclohexyl group, a 4-alkylcyclohexyl group, a carboxylic acid ester group, a carboxylic acid amide group, a halogen atom,



X represents an oxygen atom, a sulfur atom or an amino group.

4,840,641

CATIONIC DIAZACYANINE DYESTUFFS FOR DYEING POLYACRYLONITRILE-WOOL BLENDS

Alfred Brack, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

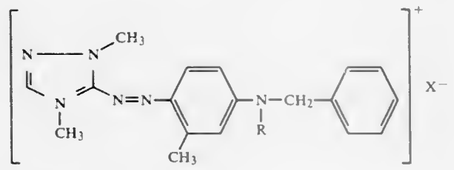
Filed Apr. 4, 1988, Ser. No. 176,904

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1987, 3712822; Jul. 7, 1987, 3722322

Int. Cl.[4] C09B 44/18, 67/22

U.S. Cl. 8—534 **5 Claims**

1. A dyestuff of the formula



wherein

R represents methyl or ehtyl and

X^- represents a colorless anion.

4,840,642

MONOAZO COMPOUNDS HAVING A 6-(5'-CHLORO-2',4'-DIFLUOROPYRIMID-6'-YLAMINO)-1-HYDROXY-3-SULFONAPHTHALENE GROUP AND THEIR USE AS DYES

Günther Auerbach, Basel, and Helmut A. Moser, Oberwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

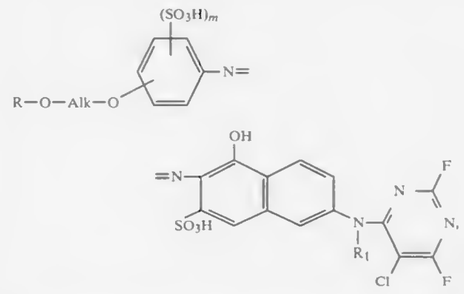
Filed Sep. 4, 1987, Ser. No. 93,335

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1986, 3630615

Int. Cl.[4] C09B 29/16, 62/24; D06P 3/32; C07D 239/42

U.S. Cl. 8—549 **20 Claims**

1. A compound of the formula



or a water-soluble salt thereof each cation of which is independently a non-chromophoric cation, wherein Alk is linear or branched C_{2-3}alkylene,

R is hydrogen, sulfo, C_{1-4}alkyl or C_{2-4}hydroxyalkyl,

R_1 is hydrogen, methyl or ethyl, and

m is 0 or 1,

or a mixture of such compounds or salts.

4,840,643

TRICHROMATIC COMBINATION OF DYES FOR NYLON

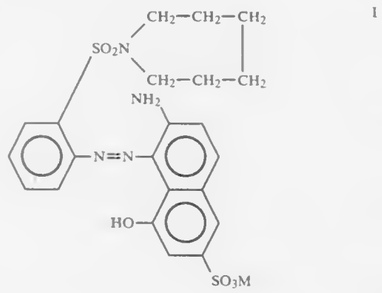
Jay E. Rowe, Douglasville, Pa., assignor to Crompton & Knowles Corporation, Stamford, Conn.

Filed Mar. 16, 1988, Ser. No. 168,657

Int. Cl.[4] C09B 1/00, 29/00, 45/00

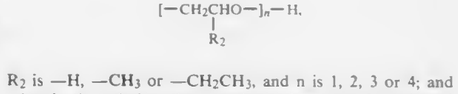
U.S. Cl. 8—641 **23 Claims**

1. A process for dyeing natural and synthetic polyamide textile fibers by contacting said fibers with an aqueous solution containing a plurality of dyes, in which one of the dyes in said solution is a red acid dye having the structure:



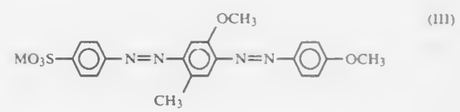
(I)

Wherein M is —Na, —K, —Li, or —N $(R_1)_4$, R_1 is —H or

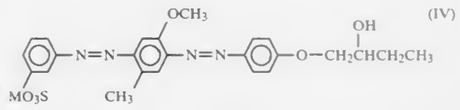


(II)

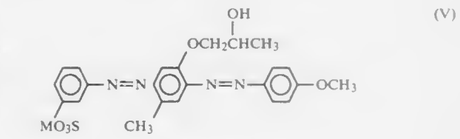
Wherein R_3 is —H or —CH_3 and M has the same meaning as above; and said yellow dye being at least one of the acid yellow dyes having the following structure:



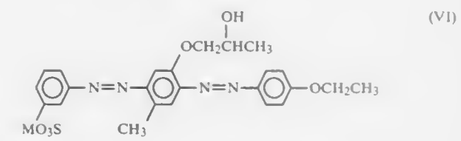
(III)



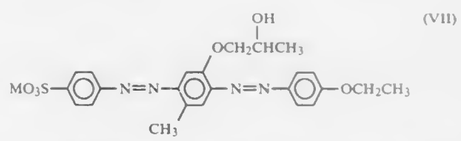
(IV)



(V)



(VI)



(VII)

Wherein M in each of said yellow dye structures has the same meaning as above in Structure I.

4,840,644

CELL CORROSION REDUCTION

Purush Chalilpoyil, Lincoln; Frank L. Parsen, Weston, and Chih-Chung Wang, Lexington, all of Mass., assignors to Duracell Inc., Bethel, Conn.

Continuation of Ser. No. 919,412, Nov. 24, 1987, abandoned, Division of Ser. No. 700,836, Feb. 12, 1986, abandoned. This application Jan. 26, 1988, Ser. No. 148,182
Int. Cl.[4] H01M *10/52*
U.S. Cl. 29—623.1 1 Claim

1. A method for reducing the gassing of an anode subject to gassing, said method comprising the steps of making single crystal particles of the metal utilized as the active anode of said cell; forming said single crystal particles into an anode for said cell wherein said anode comprises mercury amalgamated single crystal particles and wherein said mercury is present in said anode in an amount less than about 1.5% by weight thereof; and adding a surface active heteropolar material having a polar affinity to said anode to said cell, wherein said heteropolar material comprises an organic phosphate ester having the formula:

$$[RO(EtO)_n]_x-P(=O)(OM)_y$$

where $x+y=3$

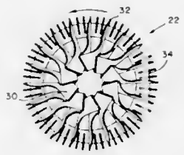
M=H, ammonia, amino, or an alkali or alkaline earth metal and R=phenyl or alkyl or alkylaryl of 6–28 carbon atoms.

4,840,645

ROTARY SEPARATOR WITH A POROUS SHROUD

Lee R. Woodworth, Calabasas, and Beb H. Rowlett, Palos Verdes, both of Calif., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 15, 1983, Ser. No. 485,156
Int. Cl.[4] B01D *45/12*
U.S. Cl. 55—1 8 Claims



1. A particle separator for removing particles from an airstream, comprising:

a cylindrical housing having an interior surface, and inlet and an outlet;

a rotor rotatably mounted about an axis within said housing, said rotor having a cylindrical body portion upon which a plurality of rotor blades extending axially along said cylindrical body portion are mounted, said rotor blades extending radially outwardly closely adjacent said interior surface of said housing, said rotor further including an inducer portion near said inlet imparting a dynamic pressure to said airstream as it enters said inlet, said inducer portion also directing said airstream into said rotor blades;

an exducer portion near said outlet, said exducer portion removing a portion of said dynamic pressure from said airstream as it exits said outlet, said interior surface of said housing and said cylindrical body portion defining an annular area through which said airstream is flowed;

means for driving said rotor, the rotation of said rotor causing said airstream within said annular area to swirl around said axis and said particles to migrate radially outward adjacent said interior surface of said housing;

porous shroud means for minimizing secondary flow swirl between said rotor blades, said porous shroud means being mounted onto and rotating with said rotor blades within said housing; and

means for removing said particles adjacent said interior surface of said housing to a location outside said housing.

4,840,646

TETRABROMO BISPHENOL BASED POLYESTERCARBONATE MEMBRANES AND METHOD OF USING

Joginder N. Anand, Clayton, Calif.; Stephen E. Bales, Midland, Mich.; Darrell C. Feay, Orinda, and Thomas O. Jeanes, Antioch, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 856,878, Apr. 28, 1986, abandoned. This application Jul. 19, 1988, Ser. No. 221,483
Int. Cl.[4] B01D *53/22*
U.S. Cl. 55—16 36 Claims

1. A method of separating oxygen from a mixture of gases comprising nitrogen and oxygen wherein the method comprises

a. contacting the gas mixture with a membrane comprising a thin, discriminating layer of polyestercarbonate, wherein the diphenolic residue in the backbone of the polyestercarbonate is a tetrabromo diphenolic residue, under conditions such that the oxygen selectively permeates through the membrane to the other side of the membrane; and

b. removing the permeated gas from the other side of the membrane;

wherein the separation factor for oxygen and nitrogen is 6.5 or greater at about 24° C. and a reduced flux of 1.25×10^{-8} cc/cm^2-sec cmHg or greater oxygen.

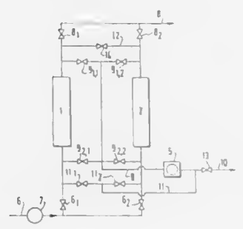
19. A membrane comprising a dense skin of a polyestercarbonate, wherein the diphenolic residue in the backbone of the polyestercarbonate is a tetrabromo diphenolic residue, wherein the membrane has a separation factor for oxygen and nitrogen of 6.5 or greater at about 24° C. and a reduced flux of 1.25×10^{-8} cc/cm^2-sec cmHg or greater for oxygen.

4,840,647

PROCESS FOR TREATING A GASEOUS MIXTURE BY ADSORPTION

Léon Hay, Paris, France, assignor to L'air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Continuation of Ser. No. 22,450, Jan. 29, 1987, abandoned. This application Oct. 21, 1988, Ser. No. 267,636
Claims priority, application France, Jul. 4, 1986, 8510405
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—26 26 Claims



1. A process for recovering by adsorption at least one preferentially adsorbable constituent of a gaseous feed mixture, said process employing only two adsorbers and comprising the following cycle of operations for each adsorber:

(a) an adsorption stage in which the feed mixture is admitted into a first adsorber through an inlet end thereof and comprising an isobaric adsorption sub-stage at a high pressure of the cycle for adsorption of said preferentially adsorbable constituent, the mixture, at least during said isobaric sub-stage, circulating through the first adsorber and being withdrawn therefrom through an outlet end thereof, the direction of circulation of the mixture being termed cocurrent, said isobaric sub-stage being conducted until an adsorption front has reached said outlet end;

(b) a first stage for cocurrent decompression of the first absorber to a medium pressure of the cycle;

(c) a second stage for countercurrent decompression of the first adsorber to a low pressure of the cycle, the gas withdrawn in the course of this second stage being the production gas containing the desired content of said adsorbable constituent, at least a portion of the gaseous mixture extracted from the first absorber in the course of stage (b) being richer in said adsorbable constituent than said gaseous feed mixture and being recycled to the inlet end of the second adsorber and admixed with said feed mixture during at least a portion of stage (a) of said second adsorber; and

(d) a recompression stage to raise the pressure in said first adsorber from said low pressure to an initial pressure of said stage (a) by introduction of gas cocurrently withdrawn from the second adsorber.

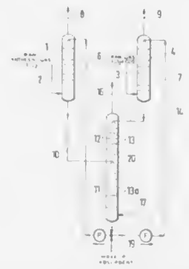
pressure relief zone, and said gaseous mixture is withdrawn from the top of said second pressure relief zone; said first pressure relief zone is the lower part of an upright regeneration column and said second pressure relief zone is the upper part of said regeneration column, said second pressure relief zone is disposed directly above the first pressure relief zone and communicates directly therewith, and said second absorbent solution is passed downwardly into and through said first pressure relief zone from said second pressure relief zone, regenerated absorbent solution is withdrawn from the bottom of said regeneration column and two partial streams of said regenerated solution are fed into said two scrubbing zones.

4,840,648

PROCESS FOR REGENERATING ABSORBENTS CONTAINING CO_2 AND COS

Gerhard Grünewald, Mainz-Gonsenheim, and Manfred Kriebel, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main and Linde Aktiengesellschaft, Hollriegelskreuth, both of, Fed. Rep. of Germany

Filed Mar. 14, 1988, Ser. No. 167,565
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1987, 3709364
Int. Cl.[4] B01D *47/00*
U.S. Cl. 55—44 4 Claims



1. A process for regenerating two absorbent solution streams laden with physically dissolved carbon dioxide and carbon oxysulfide, said two absorbent streams coming from two scrubbing zones for scrubbing gases, comprising the steps of:

(a) pressure-relieving a first absorbent solution having carbon dioxide physically dissolved therein, into a first pressure relief zone to effect a pressure reduction of at least two bars and liberate a CO_2-containing gas;

(b) pressure-relieving a second absorbent solution having carbon dioxide and a concentration of carbon oxysulfide at least three times that of the first absorbent solution in a second pressure relief zone containing material-exchange-promoting elements;

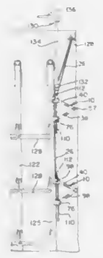
(c) passing said CO_2-containing gas liberated in said first pressure relief zone upwards through said second pressure relief zone in counterflow to the second absorbent solution in said second pressure relief zone, whereby a gaseous mixture containing CO_2 and COS is formed in said second

4,840,649

ADJUSTABLE BUTTRESS FOR USE IN AN ELECTROSTATIC PRECIPITATOR

John A. Jonelis, Crystal Lake, and John I. Bata, Algonquin, both of Ill., assignors to Midwest Power Corporation, Rolling Meadows, Ill.

Filed Jul. 19, 1988, Ser. No. 221,345
Int. Cl.[4] B03C *3/04*
U.S. Cl. 55—140 24 Claims



1. An adjustable buttress positioned between a portion of an electrostatic precipitator housing and an end plate being on one end of a plurality of plates for spacing the end plate from that portion of the housing comprising, in combination, an axle, a pair of buttress contacts pivotally connected to the axle, said buttress contacts defining a contact plane being substantially parallel to the end plate, each of said buttress contacts being spaced from the axle, and a positioning device connected to the buttress contacts for selectively moving the buttress contacts relative to each other to determine selectively the distance between the axle and the contact plane and thereby determine minimum spacing between the end plate and the portion of the housing.

4,840,650

CEILING FAN FILTER

Elmer L. Matherne, 129 Matherne St., Bourg, La. 70343

Filed Jun. 24, 1988, Ser. No. 211,453
Int. Cl.[4] B01D *46/54*; B63H *1/00*
U.S. Cl. 55—385.1 13 Claims

1. A ceiling fan filter comprising:

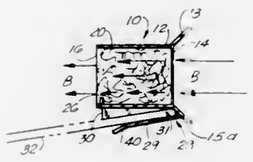
(a) a generally rectangular housing having an air entrance and an air exit;

(b) stop means secured to a perimeter portion of said air entrance and extending across said air entrance;

(c) a filter medium configured to fir within said housing against said stop and intermediate said air entrance and said air exit;

(d) attachment means secured to said housing and adapted to be secured to the leading edge portion of a fan blade for attaching said ceiling fan filter to said fan blade of a ceiling fan, said attachment means comprising portions config-

ured to frictionally fit onto said fan blade, said attachment means portions providing a gap for accepting said leading edge of said fan blade, said gap having generally the same angle as said fan blade has with horizontal plane; and,



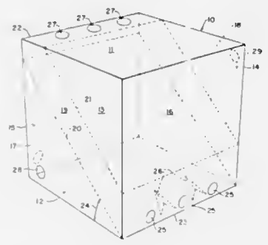
(e) elongated channel means secured adjacent said air entrance for channeling air into said air entrance.

4,840,651

GAS/SOLIDS CONTACTING DEVICE

Donald D. Tiggelbeck, Pittsburgh, Pa., assignor to TIGG Corporation, Pittsburgh, Pa.

Filed Jan. 11, 1988, Ser. No. 142,569
Int. Cl.[4] B01D *45/00*
U.S. Cl. 55—479 **5 Claims**



1. A container for contacting gases with particulate solids comprising a generally rectangular box having a top wall a bottom wall, two side walls and a first end wall and a second end wall opposite the said first end wall, said container including therein a solids-containing chamber formed between a pair of generally parallel foraminous surfaces which are generally perpendicular to said side walls; an upper one of said foraminous surfaces extending from the said top wall adjacent to the intersection of the said top wall with said first end wall to the said second end wall adjacent to the intersection of said bottom wall with said second end wall; a lower one of said foraminous surface extending from said first end wall adjacent to the intersection of said top wall with said first end wall to the region of the intersection of said bottom wall with said second end wall;

at least one solids charging opening communicating with said chamber in the said top wall or said first end wall or either side wall for introducing particulate solids into said solids-containing chamber; at least one solids discharge opening in the said second end wall or bottom wall, said opening communicating with said solids-containing chamber for discharging particulate solids from said solids-containing chamber; at least one gas flow port in said container beneath the said solids-containing chamber to admit gas into or to discharge gas from said container; at least one gas flow port in the said container above the said solids-containing chamber to discharge gas from or to admit gas into said container; said solids-containing chamber containing particulate solids between the said foraminous surfaces and being adapted to permit the flow of gas from a first said gas flow port, through a first of said foraminous surfaces, through the contained particulate solids and through the second of said foraminous surfaces, and through a second said gas flow port; said foraminous surfaces being inclined at an angle greater than the angle of repose of said particulate solids;

said container including a gas distribution means comprising multiple baffles defining multiple gas passageways between said first gas flow port and the said first of said foraminous surfaces, said baffles preventing unidirectional flow of gas from the said first gas flow port to said first of said foraminous surfaces.

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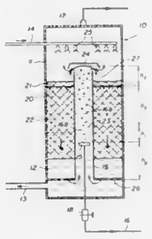
METHOD OF GENERATING AND USING COLD, AND DEVICE FOR IMPLEMENTING SUCH METHOD

Laszlo Simon, Satigny, and Jean Pfau, Collonge-Bellerive, both of Switzerland, assignors to Coldeco S.A., Carouge, Switzerland

PCT No. PCT/CH87/00008, § 371 Date Sep. 17, 1987, § 102(e) Date Sep. 17, 1987, PCT Pub. No. WO87/04510, PCT Pub. Date Jul. 30, 1987
PCT Filed Jan. 16, 1987, Ser. No. 110,723
Claims priority, application Switzerland, Jan. 18, 1986, 00178/86; Jan. 18, 1986, 00179/86; Jan. 18, 1986, 00181/86
Int. Cl.[4] B01D *9/04; C02F 1/22*
U.S. Cl. 62—534 **25 Claims**



1. In a method of generating cold and using it either directly or indirectly after transient storage and restitution, wherein cooling and/or partial freezing of a cold-accumulating and cooling liquid partially filling a cooling cell is effected by injecting a refrigerant at least partly in the liquid state into a mass of said cold accumulating and cooling liquid in said cooling cell, vaporizing said refrigerant directly in said liquid, by collecting the refrigerant in the gaseous state at the upper part of said cooling cell, above a free surface of the cold-accumulating and cooling liquid, wherein the cold-accumulating and cooling liquid is withdrawn from said cell, and is conveyed in a cold-utilization circuit and/or at least one cold-storage cell, then is reintroduced into said cooling cell, the improvement wherein a stream of liquid in closed hydraulic circuit is generated in said cooling cell during injection of said refrigerant, said stream including at least one ascending stream of cold-accumulating and cooling liquid, located substantially above a zone of injection of said refrigerant at least partly in the liquid state, said zone of injection being located on a portion of a horizontal section of said cell, said stream further including at least one descending stream formed essentially of cold-accumulating and cooling liquid free of said gaseous refrigerant, wherein said stream in closed hydraulic circuit is produced by a siphon effect induced by reduction of the mean density of the mixture of liquid and bubbles of vaporized refrigerant above said injection zone, and wherein the rate of injection of said refrigerant is adjusted in such manner that vaporization thereof generates a gel or a fluid and homogeneous suspension of crystals of cold-accumulating and cooling liquid frozen in the bulk of said liquid in movement.

4,840,653

FABRICATION OF HIGH-SILICA GLASS ARTICLE

Eliezer M. Rabinovich, Berkeley Heights, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Continuation-in-part of Ser. No. 17,905, Feb. 24, 1987, abandoned, which is a continuation-in-part of Ser. No. 774,666, Sep. 11, 1985, abandoned, which is a continuation of Ser. No. 743,268, Jun. 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 564,181, Dec. 22, 1983, abandoned. This application Sep. 19, 1988, Ser. No. 246,954
Int. Cl.[4] C03B *37/016*
U.S. Cl. 65—3.12 **6 Claims**

1. A method for fabricating an article comprising silica-containing glass, the method comprising the steps of:

dispersing silica-containing material in a polar liquid to form a sol;

gelling said sol to form a gel body;

treating said gel body with heat to form a silica-containing glass body; and

completing the fabrication of said article, Characterized In That

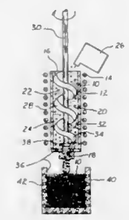
said silica-containing material includes at least a first portion containing chemically bound fluorine and a second portion which is essentially free of chemically bound fluorine, the duration of said gelling step ranging from about 5 minutes to about 24 hours.

4,840,654

METHOD FOR MAKING MULTI-LAYER AND PIN GRID ARRAYS

Michael J. Pryor, Woodbridge, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 811,906, Dec. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 707,636, Mar. 4, 1985, abandoned. This application Jan. 22, 1988, Ser. No. 147,596
Int. Cl.[4] C03B *19/09*
U.S. Cl. 65—18.1 **21 Claims**



1. The process of forming a structure from a ceramic and glass composite, said process comprising the steps of:

providing particles of ceramic material;

providing particles of glass material;

mixing said particles of glass and ceramic together to form a mixture of ceramic and glass particles;

heating said mixture to a temperature from about 500° to about 700° C. to form a slurry of solid ceramic particles in a matrix of molten glass;

pressing said slurry at a pressure of less than about 15 psi into a mold having the shape of said desired structure;

forming the slurry into said structure; and

cooling said structure to solidify the molten glass.

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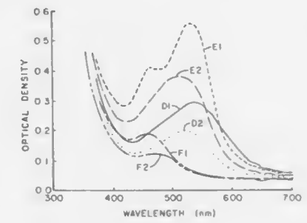
METHOD FOR MAKING COLORED PHOTOCHROMIC GLASSES

Nicholas F. Borrelli, Elmira, and Brent M. Wedding, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 26, 1988, Ser. No. 161,093
Int. Cl.[4] C03C *4/06*
U.S. Cl. 65—30.11 **3 Claims**



1. A method for optically bleaching a surface-colored photochromic glass article which comprises the steps of:

selecting for treatment a surface-colored silver halide-containing photochromic glass;

heating the surface colored photochromic glass to an elevated temperature of at least about 200° C.; and

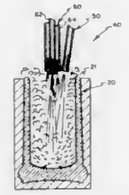
exposing the surface colored photochromic glass to short wavelength light of an energy of at least about 3 electron volts while at the elevated temperature; said exposure being for a time at least sufficient to irreversibly bleach the undarkened color of the surface-colored photochromic glass.

4,840,656

METHODS AND APPARATUS FOR FORMING GLASS ARTICLES

Michael J. Ziegler, Parma; Barry Millward, Chagrin Falls, and Kenneth P. Robb, Jr., Stow, all of Ohio, assignors to AGA A.B., Lidingö, Sweden

Continuation of Ser. No. 70,403, Jul. 7, 1987, abandoned, which is a continuation-in-part of Ser. No. 945,285, Dec. 22, 1986, abandoned, which is a continuation-in-part of Ser. No. 798,614, Nov. 15, 1985, Pat. No. 4,652,292, which is a continuation-in-part of Ser. No. 600,410, Apr. 16, 1984, Pat. No. 4,553,999. This application Oct. 17, 1988, Ser. No. 259,465
Int. Cl.[4] C03B *9/36*
U.S. Cl. 65—85 **15 Claims**



1. In a method of making a hollow glass article by shaping a quantity of molten glass in a mold cavity, the improvement comprising the steps of:

(a) placing a gob of molten glass in a mold cavity that defines features of the shape of the article that is to be formed;

(b) pressure forming a glass article by pressing a mold core within the mold cavity against the molten glass gob and

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pressure forcing the molten glass to flow in a space between the mold core and mold cavity into a desired shape;
(c) removing the mold core from a hollow of the newly formed glass article;
(d) providing a source of pressurized cryogen which has a temperature substantially below that of ambient air;
(e) providing a source of pressurized air; and,
(f) introducing cryogen and air from the pressurized sources thereof through injector means for introducing flows of these flows into the hollow interior of the newly formed glass article to cool the newly formed glass article and to give the article shape stability so the newly formed glass article can be removed from the mold cavity.

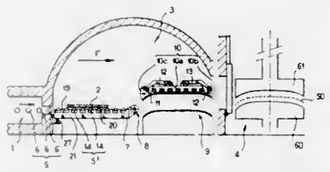
15. In a hollow glass article manufacturing machine including a mold having a cavity into which a quantity of molten glass is introduced to be conformed to a desired shape as defined by the mold cavity, and having gas inlet means for admitting a flow of cooling gas to the mold cavity interiorally with respect to the hollow glass article being formed in the cavity to directly cool interior surface portions of the molten glass therein for at least assisting in conforming a quantity of molten glass to a desired configuration defined by the mold cavity, the improvement of means for providing separate flows of cold cryogen vapor and air into the hollow glass article wherein the flows are mixed to provide a cooling gas that has a temperature that is substantially below the temperature of ambient air, and wherein the gas inlet means includes:
(a) tube-within-a-tube cryogen injector means for separately discharging relatively low and relatively high velocity flows of cryogen vapor in directions generally toward the hollow interior of a newly formed pressed glass article;
(b) auxiliary injector means for discharging a flow of ambient air in a direction toward the hollow interior of a newly formed pressed glass article; and,
(c) the cryogen and air injector means being arranged to direct flows of cryogen vapor and air into the hollow interior of a newly formed pressed glass article for mixing in the hollow interior to provide said cooling gas.

4,840,657

PROCESS AND APPARATUS FOR BENDING GLASS PLATES

Roger Orain, Garches, France, assignor to Saint-Gobain Vitrage, Courbevoie, France

Filed Jul. 8, 1988, Ser. No. 216,389
Claims priority, application France, Jul. 15, 1987, 87 09916
Int. Cl.[4] C03B 23/025
U.S. Cl. 65—107 **33 Claims**



1. A process for bending glass plates brought to high temperature and arriving flat on a conveyor, said process comprising the steps of:
(a) grasping each glass plate by its lower face; then
(b) turning each plate over to bring its lower face into upper position; and then
(c) depositing each plate on a bending form the profile of which it assumes.

20. Apparatus for bending glass plates brought to high temperature and arriving flat on a conveyor, said apparatus comprising:
(a) a bending cell;
(b) a plate located in said bending cell and able to receive the glass plates from the conveyor that brings them, said plate being equipped with means for holding the glass plates by a partial vacuum and being able to pivot to turn over the held glass plates to bring the initially lower faces of these plates into the upper position; and
(c) a bending form located under said plate after it has pivoted so that, when said plate releases each glass plate, the glass plate is deposited on said bending form.

4,840,658

ALGICIDAL COMPOSITION

Hiroshi Kakisawa; Takenori Kusumi, both of Ibaraki, and Nobuo Ohno, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 13, 1987, Ser. No. 25,694
Claims priority, application Japan, Mar. 14, 1986, 61-57925
Int. Cl.[4] A01N 37/06
U.S. Cl. 71—67 **6 Claims**

1. An algicidal composition which comprises as an active ingredient an algicidally effective amount of a higher fatty acid containing 16 to 22 carbon atoms having 4-5 carbon-carbon unsaturated bonds in molecule or its environmentally acceptable salt, and an inert carrier.

4. A method of controlling algae which comprises applying an algicidally effective amount of a higher fatty acid or its salt as claimed in claim 1 to algae selected from the group consisting of *Chattonella antiqua, Chattonella marina, Olisthodiscus luteus, Heterosigma akashiwo, Gymnodinium nagasakiense, Gymnodinium sanguineum* and *Gymnodinium breve.*

4,840,659

N-PHOSPHONOMETHYLGLYCINE PHYTOTOXICANT COMPOSITIONS

John E. Franz, Crestwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 511,695, Jul. 7, 1983, abandoned, which is a division of Ser. No. 361,219, Mar. 24, 1982, Pat. No. 4,495,363, which is a continuation of Ser. No. 630,392, Nov. 10, 1975, abandoned, which is a continuation of Ser. No. 362,712, May 22, 1973, abandoned, which is a division of Ser. No. 170,385, Aug. 9, 1971, Pat. No. 3,799,758, which is a continuation-in-part of Ser. No. 123,057, Mar. 10, 1971, abandoned. This application Mar. 16, 1988, Ser. No. 168,797
The portion of the term of this patent subsequent to Mar. 26, 1991, has been disclaimed.
Int. Cl.[4] A01N 57/04
U.S. Cl. 71—86 **4 Claims**

1. A phytotoxicant composition adapted for use as a herbicide comprising a herbicidally effective amount of N-phosphonomethylglycine, a diluent, and a surface active agent.

4,840,650

PLANT GROWTH REGULATOR DISPERSIONS

William J. Kowite, and Stephen L. Oestreicher, both of Raleigh, N.C., assignors to Rhone Poulenc Nederlands B.V., Amstelveen, Netherlands

Continuation of Ser. No. 814,898, Dec. 30, 1985, abandoned. This application Nov. 19, 1987, Ser. No. 122,626
Int. Cl.[4] A01N 57/12
U.S. Cl. 71—86 **16 Claims**

1. A stable plant growth regulating composition which comprises a dispersion, having a Brookfield viscosity of less than 800 cps, said dispersion being a microemulsion, and containing micelles no larger than 300 nm in diameter, of:
a. from about ten percent (10%) to about fifty percent (50%) by weight of 2-chloroethylphosphonic acid; and
b. from about twenty percent (20%) to about sixty percent (60%) by weight of a hydrocarbon oil which is:
i. substantially immiscible with water;
ii. stable at the pH of said regulator compound, said pH being as low as 0.5 pH; and

iii. said hydrocarbon oil forming a continuous phase of said microemulsion; and
c. from about five percent (5%) to about twenty-five percent (25%) by weight water; and
d. from about ten percent (10%) to about forty percent (40%) by weight of hydrophobic surfactant selected from the group consisting of phosphate acid, phosphate esters, or one or more anionic or nonionic polyethoxylated alcohol or phenol compounds containing from about eight to about twenty carbon atoms in the alkyl chain and less than twenty moles of ethylene oxide per mole of alcohol or phenol, said surfactant having an HLB less than about8, or surfactant mixture which is stable at said pH of said regulator compound.

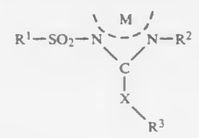
4,840,661

SULPHONYLISO(THIO)UREA DERIVATIVES AND HERBICIDAL USE THEREOF

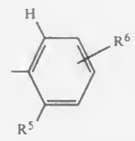
Hans-Joachim Diehr; Christa Fest, both of Wuppertal; Rolf Kristen, Monheim; Joachim Kluth, Langenfeld; Klaus-Helmut Müller, Duesseldorf; Theodor Pfister, Monheim; Uwe Priesnitz, Solingen; Hans-Jochem Riebel, Wuppertal; Wolfgang Roy, Langenfeld; Hans-Joachim Santel, Cologne; Robert R. Schmidt, Bergisch Gladbach, and Ludwig Eue, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 23, 1985, Ser. No. 769,272
Claims priority, application Fed. Rep. of Germany, Aug. 30, 1984, 3431921; May 17, 1985, 3517844
Int. Cl.[4] A01N 43/02, 43/48; C07D 401/00, 403/00
U.S. Cl. 71—90 **8 Claims**

1. A sulphonyliso(thio)urea derivative of the formula



in which
R^1 represents the radical



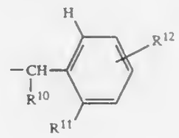
wherein
R^5 and R^6 are identical or different and represent hydrogen, halogen, cyano, nitro, C_1–C_6-alkyl (which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1–C_4-alkoxycarbonyl, C_1–C_4-alkylaminocarbonyl, di-(C_1–C_4-alkyl)-amino-carbonyl, hydroxyl, C_1–C_4-alkoxy, formyloxy, C_1–C_4-alkyl-carbonyloxy, C_1–C_4-alkoxy-carbonyloxy, C_1–C_4-alkylamino-carbonyloxy, C_1–C_4-alkylsulphinyl, C_1–C_4-alkylsulphonyl, di-(C_1–C_4-alkyl)-aminosulphonyl, C_3–C_6-cycloalkyl or phenyl), or represent C_2–C_6-alkenyl (which is optionally substituted by fluorine, chlorine, bromine, cyano, C_1–C_4-alkoxy-carbonyl, carboxyl or phenyl), or represent C_2–C_6-alkinyl (which is optionally substituted by fluorine, chlorine bromine, cyano, C_1–C_4-alkoxy-carbonyl, carboxyl or phenyl), or represent C_1–C_4-alkoxy (which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1–C_4-alkoxy-carbonyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–Ch_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl), or represent C_1–C_4-alkylthio (which is optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1–C_4-alkoxy-carbonyl, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl), or represent C_3–C_6-alkenyloxy (which is optionally substituted by fluorine, chlorine, bromine, cyano or C_1–C_4-alkoxy-carbonyl), or represent C_2–C_6-alkenylthio (which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_3-alkylthio or C_1–C_4-alkoxy-carbonyl), C_3–C_6-alkinyloxy, C_3–C_6-alkinylthio, or represent the radical $—S(O)_p—R^7$

wherein
p represents the numbers 1 or 2 and
R^7 represents C_1–C_4-alkyl (which is optionally substituted by fluorine, chlorine, bromine, cyano or C_1–C_4-alkoxy-carbonyl), C_3–C_6-alkenyl, C_3–C_6-alkinyl, C_1–C_4-alkoxy, C_1–C_4-alkoxyamino, C_1–C_4-alkoxy-C_1–C_4-alkyl-amino, C_1–C_4-alkylamino or di-(C_1–C_4-alkyl)-amino, or
R^5 and R^6 furthermore represent phenyl or phenoxy, or represent C_1–C_4-alkylcarbonylamino. C_1–C_4-alkoxy-carbonylamino, C_1–C_4-alkylamino-carbonylamino or di-(C_1–C_4-alkyl)-amino-carboxylamino, or represent the radical $—CO—R^8$,

wherein
R^8 represents C_1–C_6-alkyl, C_1–C_6-alkoxy, C_3–C_6-cycloalkoxy, C_3–C_6-alkenyloxy, C_1–C_4-alkylthio, C_1–C_4-alkylamino, C_1–C_4-alkoxyamino, C_1–C_4-alkoxy-C_1–C_4-alkyl-amino or di-(C_1–C_4-alkyl)-amino (which are optionally substituted by fluorine and/or chlorine), or R^5 and R^6 furthermore represent C_1–C_4-alkylsulphonyloxy, di-(C_1–C_4-alkyl)aminosulphonylamino or the radical $—CH=N—R^9$,

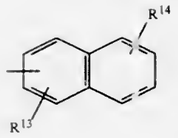
wherein
R^9 represents C_1–C_6-alkyl which is optionally substituted by fluorine, chlorine, cyano, carboxyl, C_1–C_4-alkoxy, carbonyl, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl, or represents benzyl which is optionally substituted by fluorine or chlorine, or represents C_3–C_6-alkenyl or C_3–C_6-alkinyl, optionally substituted by fluorine or chlorine, or represents phenyl which is optionally substituted by fluorine, chlorine, bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy, trifluoromethyl, trifluoromethoxy or trifluoromethylthio, or represents C_1–C_6-alkoxy, C_3–C_6-alkenoxy, C_3–C_6-alkinoxy or benzyloxy, optionally substituted by fluorine and/or chlorine, or represents amino, C_1–C_4-alkylamino, di-(C_1–C_4-alkyl)amino, phenylamino, C_1–C_4-alkyl-carbonyl-amino, C_1–C_4-alkoxy-carbonylamino or C_1–C_4-alkylsulphonylamino, or represents phenylsulphonylamino which is optionally substituted by fluorine, chlorine, bromine or methyl;

or wherein, furthermore,
R^1 represents the radical

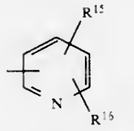


wherein
R^{10} represents hydrogen or C_1–C_4-alkyl and
R^{11} and R^{12} are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), carboxyl, C_1–C_4-alkoxy-carbonyl, C_1–C_4-alkylsulphonyl or di-(C_1–C_4-alkyl)-aminosulphonyl;

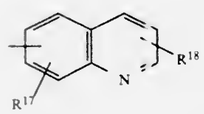
or wherein, furthermore,
R^1 represents the radical



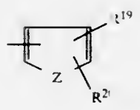
wherein
R^{13} and R^{14} are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine) or C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine);
or wherein, furthermore,
R^1 represents the radical



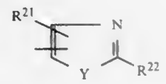
wherein
R^{15} and R^{16} are identical or different and represent hydrogen, fluorine, chlorine, bromine, nitro, cyano, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine) or C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), or represent C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl (which are optionally substituted by fluorine and/or chlorine), or represent di-(C_1–C_4-alkyl)-aminosulphonyl or C_1–C_4-alkoxycarbonyl;
or wherein, furthermore,
R^1 represents the radical



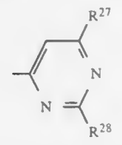
wherein
R^{17} and R^{18} are identical or different and represent hydrogen, fluorine, chlorine, bromine, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or bromine) or C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), or represent C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl (which are optionally substituted by fluorine and/or chlorine), or represent di-(C_1–C_4-alkyl)-aminosulphonyl;
or wherein, furthermore,
R^1 represents the radical



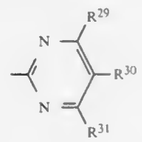
wherein
R^{19} and R^{20} are identical or different and represent hydrogen, fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl (which is optionally substituted by fluorine and/or chlorine), di-(C_1–C_4-alkyl)-amino-sulphonyl or C_1–C_4-alkoxy-carbonyl and
Z represents oxygen, sulphur or the grouping N—Z^1,
wherein
Z^1 represents hydrogen, C_1–C_4-alkyl (which is optionally substituted by fluorine, chlorine, bromine or cyano), C_3–C_6-cycloalkyl, benzyl, phenyl (which is optionally substituted by fluorine, chlorine, bromine or nitro), C_1–C_4-alkyl-carbonyl, C_1–C_4-alkoxy-carbonyl or di-(C_1–C_4-alkyl)-aminocarbonyl;
or wherein, furthermore,
R^1 represents the radical



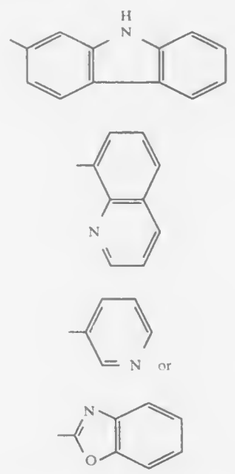
wherein
R^{21} represents hydrogen, C_1–C_5-alkyl or halogen
R^{22} represents hydrogen or C_1–C_5-alkyl and
Y represents sulphur or the grouping N—R^{23}
wherein
R^{23} represents hydrogen or C_1–C_5-alkyl;
and wherein, furthermore,
R^2 represents the radical



wherein
R^{27} and R^{28} are identical or different and represent hydrogen, fluorine, chlorine, bromine, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), C_1–C_4-alkyl-amino or di-(C_1–C_4-alkyl)-amino, with the proviso that at least one of the radicals R^{27} and R^{28} is other than hydrogen;
or wherein, furthermore,
R^2 represents the radical



wherein
R^{29} represents hydrogen, fluorine, chlorine, bromine, hydroxyl, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine) or C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine),
R^{30} represents hydrogen, fluorine, chlorine, bromine, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), cyano, formyl, C_1–C_4-alkyl-carbonyl or C_1–C_4-alkoxycarbonyl and
R^{31} represents hydrogen, fluorine, chlorine, bromine, hydroxyl, C_1–C_4-alkyl (which is optionally substituted by fluorine and/or chlorine), C_1–C_4-alkoxy (which is optionally substituted by fluorine and/or chlorine), amino, C_1–C_4-alkyl-amino or di-(C_1–C_4-alkyl)-amino, or
R^{30} and R^{31} together represent C_3–C_4-alkanediyl;
or wherein, furthermore,
R^3 represents a phenyl radical, which is optionally substituted by one or more of the radicals from the series comprising halogen, cyano, nitro, hydroxyl, carboxyl, C_1–C_6-alkyl (which is optionally substituted by fluorine, chlorine, bromine, nitro, cyano, hydroxyl, carboxyl, C_1–C_4-alkoxy-carbonyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio or phenyl), C_3–C_6-cycloalkyl C_1–C_4-alkoxy (which is optionally substituted by flourine, chlorine, bromine, cyano, carboxyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio or C_1–C_4-alkoxy-carbonyl), C_1–C_4-alkylthio (which is optionally substituted by fluorine, chlorine, bromine, byano, carboxyl or C_1–C_4-alkoxy-carbonyl), amino, C_1–C_4-alkyl-amino and di-(C_1–C_4-alkyl)-amino (which are optionally substituted by fluorine, chlorine, bromine, cyano, carboxyl, C_1–C_4-alkoxy or C_1–C_4-alkoxycarbonyl), C_1–C_4-alkyl-carbonyl-amino, C_1–C_4-alkoxy-carbonyl-amino, (di)-C_1–C_4-alkylaminocarbonyl-amino, formyl, C_1–C_4-alkyl-carbonyl, benzoyl, C_1–C_4-alkoxy-carbonyl, phenoxy-carbonyl, benzyloxycarbonyl, phenyl (which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, hydroxyl or methyl), phenoxy, phenylthio, phenylsulphonyl, phenylamino and phenylazo (which are optionally substituted by fluorine, chlorine, bromine, cyano, nitro, methyl and/or trifluoromethyl), pyridoxy and pyrimidoxy (which are optionally substituted by fluorine, chlorine, bromine, cyano, nitro, methyl and/or trifluoromethyl), C_1–C_4-alkyl-carbonyloxy, C_1–C_4-alkoxycarbonyloxy, C_1–C_4-alkyl-amino-carbonyloxy and di-(C_1–C_4-alkyl)-amino-carbonyloxy, or which is optionally fused with an alkylene chain (which is optionally branched and/or interrupted by one or more oxygen atoms) or a benzo radical (which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, methyl and/or trifluoromethyl);
or wherein, furthermore,
R^3 represents a



which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_3-alkyl or C_1–C_3-alkoxy (the latter optionally being substituted by fluorine and/or chlorine);
and wherein, furthermore,
X represents oxygen or sulphur and
M represents hydrogen or one equivalent of sodium, potassium, magnesium, calcium, aluminium, manganese, iron, cobalt or nickel,
or an adduct thereof with a strong acid.

5. A method of combating unwanted vegetation which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation a herbicidally effective amount of a compound or adduct thereof according to claim 1.

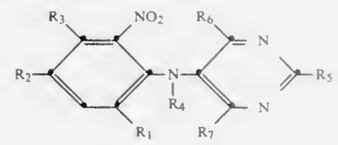
4,840,662

N-(2-NITROPHENYL)-5-AMINOPYRIMIDINE DERIVATIVES AND USEFUL FOR CONTROLLING HARMFUL MICRO-ORGANISMS

Helmut Zondler, Bottmingen; Adolf Hubele, Magden, and Robert Nyfeler, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 16, 1984, Ser. No. 631,272
Claims priority, application Switzerland, Jul. 25, 1983, 4047/83
Int. Cl.[4] A01N *25/32*; **C07D** *239/34, 407/04*
U.S. Cl. 71—92 **11 Claims**

1. A compound of the formula



wherein
R_1 and R_2 are each independently NO_2 or CF_3, or one of R_1 and R_2 is hydrogen,
R_3 is hydrogen or halogen,
R_4 is hydrogen or the —C(O)R′ group, in which R′ is C_1–C_4alkyl which is unsubstituted or substituted by one halogen, C_1–C_3alkoxy or C_1–C_3alkylthio,
R_5, R_6 and R_7 are each independently hydrogen, halogen, nitro, cyano, thiocyano, mercapto, C_1–C_6alkyl, C_1–C_6haloalkyl, C_1–C_6alkoxy, C_1–C_6alkoxy which is substituted by one halogen, nitro, cyano, C_1–C_3alkoxy, C_1–C_3alkylthio and/or $N(C_1$–C_4alkyl$)_2$; or are C_3–C_6cycloalkoxy, C_3–C_6alkenyloxy, C_3–C_6alkynyloxy, C_1–C_6alkylthio, C_3–C_6alkenylthio, C_1–C_6alkylsulfonyl, C_1–C_6alkylsulfoxyl, C_3–C_6alkenyl, C_3–C_6haloalkenyl, C_3–C_6alkynyl, C_3–C_6haloalkynyl or the $N(C_1$–C_4alkyl$)_2$ group, and R_5 may additionally be a phenyl or benzyl group which are both unsubstituted or substituted by one to three identical or different members selected from halogen, nitro, cyano, C_1–C_4alkyl, C_1–C_3haloalkyl, N-$(C_1$–C_3alkyl$)_2$, and/or C_1–C_3alkoxy.

11. A method of controlling phytopathogenic pests or of preventing cultivated plants from being attacked by such pests, which comprises applying to said plants or to the locus thereof an effective amount of a compound of claim 1.

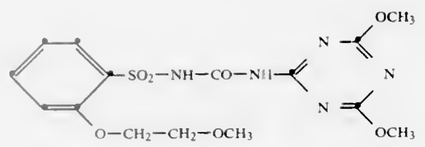
4,840,663

SYNERGISTIC COMPOSITION AND METHOD FOR SELECTIVE WEED CONTROL IN RICE

Marco Quadranti, Brugg; Wilheim Schmidli, Münchwilen, and Andreas Zoschke, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

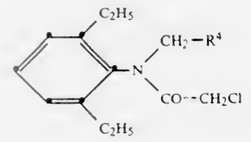
Filed Oct. 13, 1987, Ser. No. 107,202
Claims priority, application Switzerland, Oct. 22, 1986, 4216/86
Int. Cl.[4] A01N *43/66*
U.S. Cl. 71—93 **8 Claims**

1. A synergistic composition for selective weed control in rice, characterized in that, in addition to carriers and/or other adjuvants, it contains, in admixture with one another, as active component, on the one hand
N-[2-(2-methoxyethoxy)-phenylsulphonyl]-N′ (4,6-dimethoxy-1,3,5-triazin-2-yl)-urea of the formula I



(I)

and an active ingredient of formula



(V)

in which R^4 represents C_4-C_6 alkoxy or C_1-C_4 alkoxymethyl.

4,840,664

HERBICIDAL PYRIDINI DERIVATIVES

David Cartwright, Reading, England, assignor to Imperial Chemical Industries PLC, London England

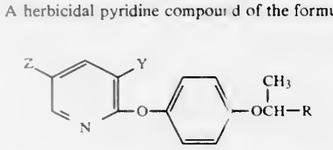
Filed Feb. 22, 1979, Ser. No. 14,252

Claims priority, application United Kingdom, Mar. 1, 1978, 8127

Int. Cl.[4] A01N *43/40;* **C07D** *213/64*

U.S. Cl. 71—94 **10 Claims**

1. A herbicidal pyridine compound of the formula (II)



(II)

wherein Z is a trifluoromethyl, difluoromethyl, or chlorodifluoromethyl radical or hydrogen; Y is hydrogen, chlorine or a trifluoromethyl radical, provided that at least one of Z and Y is a halogenomethyl radical; and R is a carboxyl group; a lower alkoxycarbonyl group wherein the alkoxy group may be straight or branched, and which is unsubstituted or substituted with one or more hydroxy, alkoxy, or halogen substituents; or, in the case of compounds wherein R is a carboxyl group, a salt thereof; and wherein more than 50% by weight of the compound is in the form of the D optical isomer.

10. A method of controlling unwanted graminaceous weeds which comprises applying to said weeds a herbicidally effective amount of a compound according to claim 1 wherein more than 50% by weight of the compound is in the form of the D optical isomer.

4,840,665

WEAR-RESISTANT SINTERED IRON-BASED ALLOY AND PROCESS FOR PRODUCING THE SAME

Satoshi Fujii, Hyogo, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 14, 1987, Ser. No. 3,342

Claims priority, application Japan, Jan. 14, 1986, 61-6934

Int. Cl.[4] C22C *29/02*

U.S. Cl. 75—241 **2 Claims**

1. A wear-resistant sintered iron based alloy consisting essentially of

a first phase having a martensite composition which comprises from 0.5 to 3.0 wt % of Cr, from 0.4 to 1.0 wt % of Mn, from 0.1 to 0.4 wt % of Mo, and the balance of Fe, based on the total amount of said first phase;

a second phase having a martensite and Cr carbide composition which comprises from 10 to 20 wt % of Cr and the balance of Fe, based on the total amount of said second phase; and

from 1.0 to 2.5 wt % of C, based on the total amount of said alloy;

wherein said first phase and said second phase are present as a mixture containing from 10 to 80% by volume of said second phase, based on the total volume of said alloy; and

said alloy is substantially free from any residual austenite.

4,840,666

LACQUER, AND PROCESS FOR PRODUCING ANTI-CORROSION COATINGS

Helmut Schmidt, Höchberg; Helmut Patzelt, Kist; Gerhard Tünker, and Horst Scholze, both of Würzburg, all of Fed. Rep. of Germany, assignors to Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V., Munich, Fed. Rep. of Germany

Continuation of Ser. No. 792,840, Oct. 30, 1985. This application Apr. 18, 1988, Ser. No. 185,268

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1984, 3439880

Int. Cl.[4] C04B *9/02*

U.S. Cl. 106—14.05 **13 Claims**

1. An anti-corrosion lacquer containing:

(1) a silicic acid heteropolycondensate prepared by hydrolyzing and polycondensing:

(a) at least one organosilane of the formula I:

(I)

wherein R is alkyl, alkenyl, aryl, aralkyl, alkylaryl, arylalkenyl or alkenylaryl, X is hydrogen, halogen, hydroxyl, alkoxyl, acyloxy or the group $-NR'_2$, wherein R' is hydrogen or alkyl, with each being the same or different, and m is 1, 2 or 3, and at least one of the following components (b), (c) and (d):

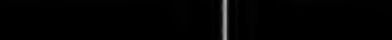
(b) one or more silicon-functional silanes of the formula II:

(II)

wherein X has the above meaning, with the proviso that not all of the radicals X are hydrogen,

(c) one or more oxides, which have low volatility and are soluble in the reaction medium, of an element of main groups Ia to Va or of subgroups IIb to Vb of the periodic table or one or more compounds, which form such an oxide of low volatility, of these elements, and

(d) one or more organo-functional silanes of the formula III:



(III)

wherein R and X have the above meaning, R'' is alkylene, arylene, alkylenearylene, alkenylene or alkylenearylene, wherein said R'' radicals are uninterrupted or interrupted by oxygen or sulfur atoms or —NH— groups, Y is halogen or an amino, amide, aldehyde, alkylcarbonyl, carboxyl, hydroxyl, mercapto, cyano, alkoxy, alkoxycarbonyl, sulfonic acid, phosphoric acid, acryloxy, methacryloxy, glycidyloxy, epoxy or vinyl group, n is 0, 1 or 2 and p is 1, 2 or 3, with n+p being 1, 2 or 3, wherein the total proportion of components (b), (c) or (d) or (b), (c) and (d) is at least 5 mole percent,

(2) a filler in flake or lamellar form, and

(3) an organic solvent capable of dissolving said silicic acid heteropolycondensate.

4,840,667

METAL-CHELATING DIPHENOLAMINE OLIGOMERS FOR CORROSION INHIBITION OF METAL SUBSTRATES

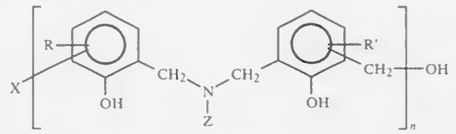
Walter O. Siegl, Dearborn, and Mohinder S. Chattha, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 20, 1987, Ser. No. 5,182

Int. Cl.[4] C04B *9/02;* **C23C** *22/48*

U.S. Cl. 106—14.15 **11 Claims**

1. An aqueous composition useful to deposit a corrosion inhibiting coating on a corrodible metal substrate said composition (1) having a pH of between about 2 and about 10 and (2) comprising at least about 0.01 weight percent of a water-soluble or water-dispersible diphenolamine oligomeric metal-chelating compound selected from compounds having the general chemical formula:



wherein each R and R' is independently selected from alkyl, alkoxy, aryl and halogen, X is hydrogen, CH_2OH or a methylene bridging group, Z is alkyl, aryl or hydroxy alkyl, X and R are each attached at the ortho or para position on its phenol ring and R' and said methylene bridging group are each attached at the ortho or para position on its phenol ring, and n is between about 2 and about 150.

4,840,668

CORROSION-INHIBITING PIGMENTS, THEIR PRODUCTION AND USE

Manfred Gawol, Clausthal-Zellerfeld, and Gerhard Adrian, Goslar, both of Fed. Rep. of Germany, assignors to Dr. Hans Heubach GmbH & Co. KG, Langelsheim, Fed. Rep. of Germany

PCT No. PCT/EP87/00071, § 371 Date Sep. 30, 1987, § 102(e) Date Sep. 30, 1987, PCT Pub. No. WO87/05040, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 13, 1987, Ser. No. 116,723

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1986, 3605526

Int. Cl.[4] C09D *5/08;* **C04B** *14/34;* **C09C** *1/00*

U.S. Cl. 106—14.21 **11 Claims**

1. A corrosion inhibiting pigment for paints and varnishes compatible with galvanized steel substrates, nongalvanized steel substrates as well as aluminum substrates, said pigment consisting essentially of:

a first component selected from the group consisting of metallic oxides, metallic phosphates, metallic molybdates and mixtures thereof, wherein the metal is at least one member selected from the group consisting of zinc, aluminum, iron, barium, strontium, calcium, magnesium and titanium; and

soluble chromate in an amount equivalent to 0.03–0.6 weight percent sodium dichromate based on the total weight of the pigment, said soluble chromate being in the form of a compound selected from the group consisting of sodium dichromate, potassium dichromate, ammonium dichromate, sodium chromate, potassium chromate, ammonium chromate, potassium chromate, chromic acid and mixtures thereof, said pigment being compatible with galvanized steel substrates, non-galvanized steel substrates as well as aluminum substrates.

4,840,669

WATER SOLUBLE COLORING COMPOSITIONS CONTAINING SPARKLE COMPONENTS

Cleveland L. Hughes, Grand Terrace; Timothy N. Williams, Canoga Park, and Paul M. Mandel, Jr., Orange, all of Calif., assignors to Color Quest Inc., Anaheim, Calif.

Filed Mar. 16, 1987, Ser. No. 25,853

Int. Cl.[4] C09D *13/00*

U.S. Cl. 106—19 **6 Claims**

1. A water soluble crayon composition, consisting of: a polymeric thickener to maintain solid components in a uniform and permanent suspension in the composition; water soluble micro-crystalline wax to thicken the composition; color and glitter, the composition being porable at about 95° F.–130° F., and formulated in the temperature range of about 90° F.–130° F.

4,840,670

WATER SOLUBLE COLORING COMPOSITIONS CONTAINING SPARKLE COMPONENTS

Cleveland L. Hughes, Grand Terrace; Timothy N. Williams, Canoga Park, and Paul M. Mandel, Jr., Orange, all of Calif., assignors to Color Quest Inc., Anaheim, Calif.

Filed Mar. 16, 1987, Ser. No. 25,854

Int. Cl.[4] C09D *11/00*

U.S. Cl. 106—19 **3 Claims**

1. A water soluble paint composition including poster paints, color brushes, and roller balls consisting of: water; a polymeric thickener to maintain solid components in a uniform and permanent suspension in the composition, selected from the group consisting of a polyacrylic acid, nitrile latexes, styrene-butadiene latexes, polyisobutylene, acrylic latexes, rosin gum, flours, starches, fumed silica, hydroxypropyl methyl cellulose, hydroxy butyl methyl cellulose; glycerin, or alcohols selected from the group consisting of sorbitol, cetyl, and mixtures thereof in liquid form to enable the mixture to flow at about 85° F.–130° F.; a water soluble microcrystalline wax to thicken the composition; and, glitter and coloring agents.

4,840,671

PROCESS FOR CHEMICAL STABILIZATION OF HEAVY METAL BEARING DUSTS AND SLUDGES AS EAF DUST

John D. Lynn, Center Valley; Charles E. Jablonski, and Walter D. Egan, both of Bethlehem, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Continuation of Ser. No. 63,605, Jun. 18, 1987, abandoned. This application Jul. 29, 1988, Ser. No. 227,438

Int. Cl.[4] C04B *13/34, 7/147, 7/00*

U.S. Cl. 106—85 **10 Claims**

1. A method of chemically stabilizing waste material selected from the group consisting of electric arc furnace dust, lime kiln dust and fly ash, where such material contains heavy metals and may be classified as hazardous waste, comprising the steps of

(1) mixing said waste material with an effective amount of lime, waste pickle liquor and water to yield a flowable blend,

(2) allowing said blend to set to produce a relatively impermeable concrete-like solid waste in which said heavy metals are physically entrapped or adsorbed therein.

4,840,672

LIGHTWEIGHT INSULATING BOARDS AND PROCESS FOR MANUFACTURING SAME

Emile Baes, Kapelle-op-den-Bos, Belgium, assignor to Redco N.V., Belgium

Filed Mar. 12, 1987, Ser. No. 25,195

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1986, 3608544

Int. Cl.[4] C08K *3/34, 3/10*

U.S. Cl. 106—86 **11 Claims**

1. Lightweight insulating board comprising:

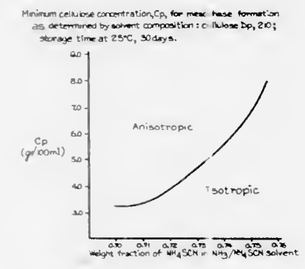
(a) 50–70% by weight of cement,
(b) 0–5% by weight of cellulose fibers,
(c) 0.5–4% by weight of non-cellulose, alkali-resistant fiber material,
(d) 5–20% by weight of mica,
(e) 5–20% by weight of light filler and
(f) 8–25% by weight of hydrated lime.

4,840,673

ANISOTROPIC CELLULOSE ARTICLES, FIBERS, AND FILMS AND METHOD OF PRODUCING SAME

John A. Cuculo; Michael H. Theil; Kup S. Yang, and Yue S. Chen, all of Raleigh, N.C., assignors to North Carolina State University, Raleigh, N.C.

Division of Ser. No. 937,034, Dec. 2, 1988, Pat. No. 4,750,939.
This application Mar. 9, 1988, Ser. No. 166,041
Int. Cl.[4] C08L *1/00*; D01F *2/00*
U.S. Cl. 106—198 22 Claims



1. A cellulose fiber formed from a lyotropic mesophase solution of cellulose in an ammonia/ammonium thiocyanate solvent.

4,840,674

INK COMPOSITIONS

William M. Schwarz, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 1, 1987, Ser. No. 56,202
Int. Cl.[4] C09D *11/02*
U.S. Cl. 106—22 18 Claims

1. An ink composition comprised of a major amount of water; an organic solvent consisting essentially of a solvent selected from the group consisting of tetramethylene sulfone; 1,1,3,3-tetramethyl urea; and 3-methyl sulfolane; which solvent has permanently dissolved therein spirit soluble dyes selected from the group consisting of black, yellow, cyan, magenta, brown, and mixtures thereof, which dyes are substantially insoluble in aqueous media.

4,840,675

MOLD RELEASE COMPOSITION

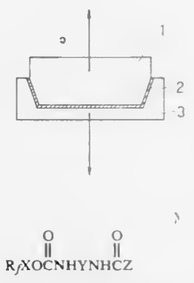
Shosin Fukui, Toyonaka; Masayoshi Shinjo, Settsu, and Hirokazu Aoyama, Osaka, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 936,940, Dec. 1, 1986, abandoned, which is a continuation of Ser. No. 785,646, Oct. 9, 1985, abandoned, which is a division of Ser. No. 627,577, Jul. 3, 1984, abandoned. This application Sep. 26, 1988, Ser. No. 249,191
Int. Cl.[4] B28B *7/36*
U.S. Cl. 106—38.22 7 Claims

1. A process for imparting releasing property against one of synthetic resin, natural resin, rubber and formed product thereof to a mold which comprises applying to the mold a composition comprising:

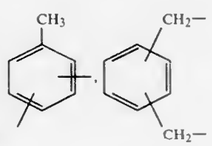
(A) at least one of

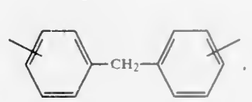
(1) a fluorine-containing urethane compound represented by the formula

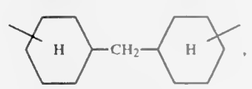


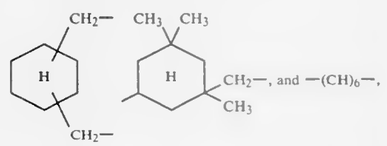
$$R_fXOCNHYNHCZ \quad (I)$$

wherein R_f represents a perfluoroalkyl group having 4 to 20 carbon atoms, X represents a methylene group, $—CH_2C-H(A)C_mH_{2m}—$ or $—SO_2N(R)C_tH_{2t}—$, A represents a hydrogen atom or hydroxyl group m is an integer of 0 to 4; and R represents a methyl or ethyl group, t is an integer of 1 to 4, Y represents a divalent group selected from the group consisting of;

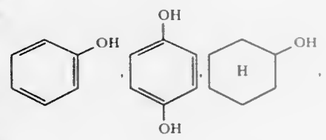


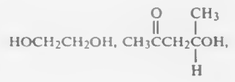


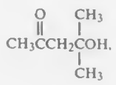




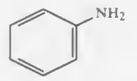
and Z represents a monohydric organic group which is a residue obtained by removing one hydrogen atom from a compound of the group consisting of;



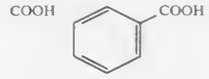




$C_nH_{2n+1}OH$ wherein n is an integer of 1 to 7, $C_nH_{2n+1}O(CH_2)_{n'}OH$ wherein n is an integer of 1 to 4 and n' is an integer of 2 to 4,



$C_nH_{n+1}NH_2$ wherein n is an integer of 1 to 3,



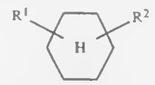
and $C_nH_{2n+1}COOH$ wherein n is an integer of 1 to 3,

(2) a fluorine-containing urethane compound represented by the formula

$$R_fXOCNHYNHCWCNHYNHCOXR_f \quad (II)$$

wherein R_f, X and Y are as defined above and W represents a divalent organic group which is a residue obtained by removing two hydrogen atoms from a compound selected from the group consisting of; $HO(CH_2)_kOH$ wherein k is an integer of 2 to 6, $HO(CH_2)_kNH_2$ wherein k is an integer of 2 to 6, $H_2N(CH_2)kNH_2$ wherein k in an integer of 2 to 6,

wherein R^1 and R^2 are the same or different and are each a hydroxyl group or amino group and



wherein R^1 and R^2 are as defined above, and

(3) a fluorine-containing urethane compound represented by the formula

$$R_fXOCNHYNHCNHYNHCOXR_f \quad (III)$$

wherein R_f, X and Y are as defined above, and

(B) at least one of members selected from the class consisting of silicone oil, a methyl silicone varnish, wax, and a highly fluorinated organic alkyl compound or amine compound.

4,840,676

INSOLUBLE PIGMENTS AND PREPARATION THEREOF

Howard W. Clark, and Tracy E. Chapman, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 748,273, Jun. 24, 1985, abandoned. This application Jun. 20, 1986, Ser. No. 876,566
The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.
Int. Cl.[4] C09D *17/00*
U.S. Cl. 106—462 44 Claims

1. A water-insoluble pigment comprising a complex of a water insoluble inorganic anion exchange material with a layered structure and a water-soluble dye, said anion exchange material represented by the general formula

$$[M^{+2}Q^{+3}(OH)_{5-x}](A^{-1})_d(A^{-1})_e(A^{-3})_f(A^{-4})_g \cdot nH_2O$$

where M is a metal element or elements each with a positive valence of 2; Q is a metal element or elements each with a positive valence of 3; A^{-1}, A^{-2}, A^{-3}, and A^{-4} are each one or more exchangeable anions each having a negative valence of 1, 2, 3, and 4, respectively; and n, x, d, e, f and g are real numbers greater than or equal to zero and satisfy the following:

$$0 < x \leqq 1$$

$$d+2e+3f+4g=x$$

$$0 \leqq n \leqq 10.$$

4,840,677

PLATELETLIKE TWO-PHASE PIGMENT

Werner Ostertag, Gruenstadt, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 2, 1988, Ser. No. 201,207
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1987, 3718446; Jun. 13, 1987, 3719804
Int. Cl.[4] C09C *1/22*
U.S. Cl. 106—456 14 Claims

1. A plateletlike two-phase pigment based on aluminum-containing iron oxides, which has a core with a hematite structure of the composition

$$Al_xFe_{2-x}O_3$$

where x is from 0.02 to 0.5, and an outer layer with a spinel structure of the composition

$$Al_yFe_{3-y}O_{4+z}$$

where y is from 0.03 to 0.75 and z is from 0 to 0.5.

4,840,678

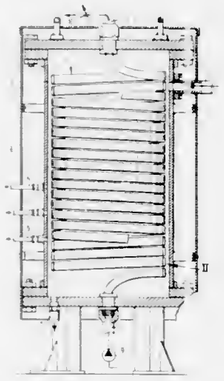
PIPE COIL COOKER

Herman J. van der Schaaf, Wilnis, Netherlands, assignor to B. V. Gerbs. ter Braak, Netherlands

Filed Mar. 25, 1985, Ser. No. 715,639
Claims priority, application Netherlands, Mar. 26, 1984, 8400950
Int. Cl.[4] B01J *3/00*; C13F *1/00*; B01D *1/00*
U.S. Cl. 127—2 8 Claims

1. Apparatus for cooking sugar comprising a tubular coil wound about a longitudinal axis which is substantially vertically disposed, said coil including an inlet at the lower portion thereof and an outlet at the upper portion thereof, means in communication with said inlet for forcing a mixture of sugar, water and additives upwardly through said coil, a heating jacket disposed in surrounding relationship to said coil, means in communication with said heating jacket for providing a heating medium within said jacket to heat the mixture passing

through said coil to a high temperature at which sugar crystals dissolve so as to provide a clear sugar solution at said outlet, and means in communication with said outlet for controlling



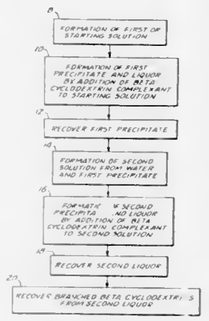
the operational pressure within said coil, said coil being of rounded-off rectangular cross-section to ensure optimum heat transfer by improving the heat transfer per unit weight of the mixture of sugar, water and additives forced through the coil.

4,840,679

PURIFICATION AND SEPARATION OF BRANCHED BETA-CYCLODEXTRINS

Robert N. Ammeraal, Worth, Ill.; Allan R. Hedges, Crown Point, and David J. Gottneid, Griffith, both of Ind., assignors to American Maize-Products Company, Stamford, Conn.

Filed Jul. 8, 1987, Ser. No. 71,097
Int. Cl.[4] C13K *1/08*
U.S. Cl. 127—40 15 Claims



1. A method for purifying and separating branched beta-cyclodextrins comprising the steps of:
(a) forming a first precipitate and a first liquor by adding a beta-cyclodextrin complexant to a first solution, said first solution having a solids concentration of about 24 to about 40% by weight;
(b) recovering said first precipitate;
(c) washing said first precipitate with water to remove a portion of acyclic dextrins from said first precipitate;
(d) forming a second solution by mixing water with the washed first precipitate;
(e) forming a second precipitate and a second liquor by adding a beta-cyclodextrin complexant to the second solution;
(f) recovering said second liquor; and
(g) recovering a purified branched beta-cyclodextrin from said second liquor.

4,840,680

METHOD FOR DEGREASING A COLD ROLLED METALLIC BAND

Robert Wang, Wissous, France, assignor to Societe Stein Heurtey, Z.A.I., Ris Orangis, France

Continuation-in-part of Ser. No. 720,600, Apr. 5, 1985, abandoned. This application May 8, 1987, Ser. No. 48,468
Claims priority, application France, Sep. 28, 1984, 84 14950; Apr. 5, 1985, 84 05366
Int. Cl.[4] B08B *5/00*; C23G *5/00*
U.S. Cl. 134—40 7 Claims

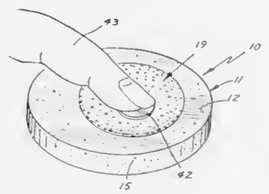
1. A method of continuously removing grease from a cold rolled metallic band by the chemical effects of an atmosphere of a specific composition, which consists essentially of heating the grease-containing cold rolled metallic band at a temperature of between 350° C. and 700° C. in an enclosure provided with means for heating the grease-containing cold rolled metallic band and vaporizing the grease from the metallic band, and contacting the grease vapors with a gaseous atmosphere introduced into the enclosure, which gaseous atmosphere chemically decomposes the grease by a reaction between the gaseous atmosphere and the vaporized grease, said gaseous atmosphere consisting essentially of a mixture of nitrogen and hydrogen enriched with water in the form of steam, said hydrogen being present in an amount of 2 to 30 percent and the steam being present in an amount of 5 to 30 percent based on the complete gaseous mixture.

4,840,681

CONTACT LENS CLEANING DEVICE AND METHOD

Larry W. Pompe, 115-½E. Litchfield Ave., Willmar, Minn.

Division of Ser. No. 22,813, Mar. 9, 1987, Pat. No. 4,779,300. This application Aug. 10, 1988, Ser. No. 230,438
Int. Cl.[4] B08B *1/00*
U.S. Cl. 134—42 10 Claims



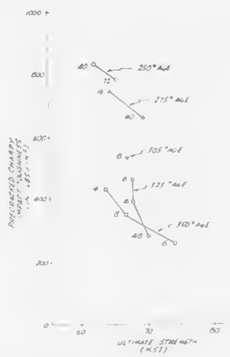
1. A method of cleaning a contact lens comprising:
providing an annular member with outer uninterrupted side walls and an inner side walls defining a central opening covered with a cleaning pad spanning the central opening and having edges overlapping the outer side walls;
providing a base having inner side walls defining a mounting opening with a shape and dimension corresponding to the outer side walls of the annular member, with the annular member fitted into the mounting opening with the cleaning pad edges engaged between the inner walls defining the mounting opening and the outer side walls of the annular member;
applying a lens cleaning solution to the portion of the cleaning pad spanning the opening of the annular member;
applying a contact lens in reciprocal motion to the side of the cleaning pad having the cleaning solution to clean the contact lens.

4,840,682

LOW TEMPERATURE UNDERAGING PROCESS FOR LITHIUM BEARING ALLOYS

R. Eugene Curtis, Issaquah; G. Hari Narayanan, Seattle, and William E. Quist, Redmond, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 21, 1985, Ser. No. 800,503
Int. Cl.[4] C22F *1/04*
U.S. Cl. 148—12.7 A 7 Claims



1. A process for improving the fracture toughness of an aluminum-lithium alloy without detracting from the strength of said alloy, said alloy consisting essentially of:

Element	Amount (wt. %)
Li	1.0 to 3.2
Mg	0 to 5.5
Cu	0 to 4.5
Zr	0.08 to 0.15
Mn	0 to 1.2
Fe	0.3 max
Si	0.5 max
Zn	0.25 max
Ti	0.15 max
Other trace elements	
each	0.05 max
total	0.25 max
Al	Balance,

said alloy first being formed into an article, solution heat treated and quenched, said process comprising the step of aging said alloy article to a predetermined underaged strength level at from about 200° F. to less than 300° F.

4,840,683

AL-CU-LI-MG ALLOYS WITH VERY HIGH SPECIFIC MECHANICAL STRENGTH

Bruno Dubost, St. Egreve, France, assignor to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France

Continuation of Ser. No. 710,699, Mar. 11, 1985, abandoned. This application Feb. 16, 1988, Ser. No. 158,048
Claims priority, application France, Mar. 15, 1984, 84 04483
Int. Cl.[4] C22F *1/04*
U.S. Cl. 148—12.7 A 18 Claims

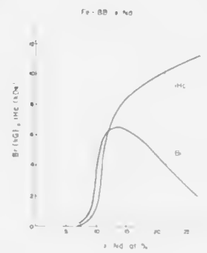
1. A heat treated and aged aluminium based alloy of very high specific mechanical strength, consisting essentially of (as % by weight):
Cu from 2.4 to 3.5%
Li from 1.9 to 2.7%
Mg from about 0.26 to 0.8%
Fe≦0.20%
Si≦0.10%
Mn from 0 to 1%
Cr from 0 to 0.30%
Zr from 0 to 0.20%
Ti from 0 to 0.10%
Be from 0 to 0.02%
Other substances (impurities)
each<0.05%
total<0.15%
remainder Al.

4,840,684

ISOTROPIC PERMANENT MAGNETS AND PROCESS FOR PRODUCING SAME

Setsuo Fujimura, Kyoto; Masato Sagawa, Nagaokakyo, and Yutaka Matsuura, Ibaraki, all of Japan, assignors to Sumitomo Special Metals Co, Ltd., Osaka, Japan

Filed Dec. 30, 1983, Ser. No. 567,640
Claims priority, application Japan, May 6, 1983, 58-79096; May 6, 1983, 58-79098; May 31, 1983, 58-94876
The portion of the term of this patent subsequent to Jul. 22, 2003, has been disclaimed.
Int. Cl.[4] H01F *1/04*
U.S. Cl. 148—302 13 Claims



1. A powder metallurgically sintered, isotropic permanent magnet having a mean crystal grain size of 1–80 microns and consisting essentially of, by atomic percent, 12–20 percent R wherein R is at least one element selected from the group consisting of Nd, Pr, La, Ce, Tb, Dy, Ho, Er, Eu, Sm, Gd, Pm, Tm, Yb, Lu and Y and wherein at least 50% of R consists of Nd and/or Pr, 5–18 percent B and at least 62 percent Fe, in which at least 50 vol % of the entire magnet is occupied by a ferromagnetic compound having an Fe-B-R type tetragonal crystal structure, said magnet having a maximum energy product of at least 4 MGOe and an intrinsic coercivity of at least 1 kOe.

2. A powder metallurgically sintered, isotropic permanent magnet having a mean crystal grain size of 1–80 microns and consisting essentially of, by atomic percent, 12–20 percent R wherein R is at least one element selected from the group consisting of Nd, Pr, La, Ce, Tb, Dy, Ho, Er, Eu, Sm, Gd, Pm, Tm, Yb, Lu and Y and wherein at least 50% of R consists of Nd and/or Pr, 5–18 percent B, at least one additional element M selected from the group given below in the amounts not exceeding the atomic percentages specified below, wherein the sum of M does not exceed the maximum value of any one of the values specified below for M actually added and at least 62 percent Fe:
7.8% Al, 3.8% Ti, 7.8% V, 6.9% Cr, 6.9% Mn, 4.8% Zr, 4.5% Hf, 10.0% Nb, 8.8% Ta, 7.6% Mo, 5.0% Ge, 2.0% Sb, 2.7% Sn, 4.2% Bi, 3.8% Ni, and 7.9% W,
in which a ferromagnetic compound having an Fe-B-R type tetragonal crystal structure occupies at least 50 vol % of the entire magnet, said permanent magnet having a maximum energy product of at least 4 MGOe and an intrinsic coercivity of at least 1 kOe.

4,840,685

ALUMINUM ALLOY FOR THE SUBSTRATE OF MAGNETIC DISK

Motohiro Nabae, Nikko, Japan, assignor to Furukawa Aluminum Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 864,313, May 19, 1986, abandoned.
This application Apr. 13, 1988, Ser. No. 183,441
Claims priority, application Japan, May 21, 1985, 60-108800
Int. Cl.[4] C22C *21/00*
U.S. Cl. 148—439 10 Claims

1. An aluminum alloy, suitable as a substrate for a magnetic disk, consisting essentially of 2 to 6 wt.% of Mg, and 0.12 to 2.0 wt.% of Cu; or 2 to 6 wt.% of Mg, and 0.28 to 7.0 wt.% of Zn; or 2 to 6 wt.% of Mg, 0.12 to 2.0 wt.% of Cu and 0.28 to 7.0 wt.% of Zn, wherein each aluminum alloy contains not more than 0.06 wt.% of Fe, and from an effective amount of two or more of Cr, Zr, Ti and B to not more than a total of 0.5 wt.% thereof, to render minute crystal particles in said alloy, thereby rendering the surface of said alloy smooth after plating, with the proviso that the total content of Cr and Zr is not more than 0.3 wt.%, and the total content of Ti and B is not more than 0.05 wt.%.

4,840,686

BAINITIC CORE GRINDING ROD

Charles R. Arnett, Kansas City, Mo., and James P. Bruner, Middletown, Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Apr. 6, 1988, Ser. No. 178,404
Int. Cl.[4] C22C *38/22*
U.S. Cl. 148—334 14 Claims

14. A grinding rod for use in a rotating grinding mill, comprising:

a heat treated carbon or alloy steel grinding rod having a surface and a core,

said rod including at least 0.40 weight % chromium, at least 0.30 weight % molybdenum, and less than 0.7 weight % manganese,

said surface having a microstructure that is substantially martensite having a hardness of at least about HRC 60,

said core having a microstructure that is at least about 50% bainite having a hardness of at least about HRC 40 wherein said rod has improved wear resistance and improved breaking resistance.

4,840,687

EXPLOSIVE COMPOSITIONS

John W. Forsberg, Mentor-on-the-Lake, Ohio; John J. Mullay, Hazleton, and Joseph A. Sohara, Whitehall, both of Pa., assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed Nov. 14, 1986, Ser. No. 931,377
Int. Cl.[4] C06B *45/00*
U.S. Cl. 149—2 44 Claims

1. An explosive composition comprising a discontinuous oxidizer phase comprising at least one oxygen-supplying component, a continuous organic phase comprising at least one water-immiscible organic liquid, and an emulsifying amount of at least one nitrogen-containing emulsifier derived from

(A) at least one carboxylic acylating agent,

(B) at least one polyamine, and

(C) at least one acid or acid producing compound said acid or acid-producing compound (C) being bonded to said polyamine (B) through at least one salt linkage,

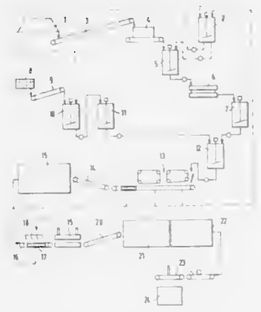
said acid or acid-producing compound (C) being: at least one polycarboxylic acid or acid-producing compound; at least one fatty acid or acid-producing compound containing at least about 12 carbon atoms; at least one hydrocarbyl-substituted carboxylic acid or acid-producing compound, the hydrocarbyl substituent of said acid or acid-producing compound having an average of at least about 10 aliphatic carbon atoms; at least one anhydride, ester or halide of a phosphorus acid; at least one phosphinyl or phosphonous acid or acid-producing compound; at least one oxyphosphorus, thiophosphorus, or oxythiophosphorus acid or acid-producing compound; nitric acid; nitrous acid; sulfurous acid; hydrochloric acid; silicic acid; boric acid; perchloric acid; chloric acid; chlorous acid; hypochlorous acid; permanganic acid; chromic acid; dichromic acid; hydrofluoric acid; hydrobromic acid; hydriodic acid; hydrosulfuric acid; or a mixture of two or more thereof.

4,840,688

METHOD FOR THE PRODUCTION OF FIBROUS PLASTER BOARDS

Winold Vogt, Rothenburg, Fed. Rep. of Germany, assignor to Pfleiderer Industrie GmbH & Co., KG, Neumarkt, Fed. Rep. of Germany

Filed Sep. 1, 1988, Ser. No. 239,883
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730585; European Pat. Off., Aug. 13, 1988, 88113212.0
Int. Cl.[4] B32B *13/02*
U.S. Cl. 156—39 8 Claims



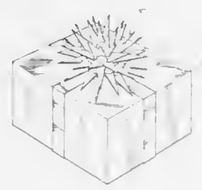
1. A method for the production of fibrous plaster boards comprising preparing a suspension from wet-digested fiber material and calcium sulfate dihydrate, dewatering the suspension to a residual moisture content of 30 to 40% while simultaneously forming the suspension into boards, recrystallizing the dihydrate by heating the boards in air and without pressure to convert the dihydrate to a beta form of a hemihydrate, and setting the boards by aspirating water through the boards by suction.

4,840,689

ORNAMENT PRODUCTION

Olaf B. Raiskums, Brampton, and James D. Mancel, Aurora, both of Canada, assignors to Raiman Design, Inc., Wilmington, Del.

Filed Jun. 16, 1988, Ser. No. 207,578
Int. Cl.[4] B31F *1/00*
U.S. Cl. 156—217 26 Claims



1. A method of producing a hemispherically-shaped ornament having a plurality of radiating conical points, the method comprising the steps of:

providing a strip of flexible material;

cutting out of said strip a strip of longitudinally spaced-apart blanks, each blank having transversely opposed petals and a central portion therebetween;

forming said petals into cones to produce elements with opposed cones;

separating said elements;

stacking a plurality of said elements in a circular arrangement; and

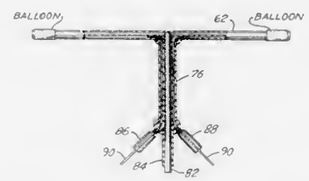
compressing and connecting said central portions together.

4,840,690

METHOD OF CONSTRUCTING A BLOOD FLOW CONDUIT

Lev A. Melnyshyn, Mt. Prospect; Jeffrey M. Stupar, Chicago, and Edward M. Goldberg, Glencoe, all of Ill., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Division of Ser. No. 899,624, Aug. 25, 1986, Pat. No. 4,731,055.
This application Mar. 10, 1988, Ser. No. 166,140
Int. Cl.[4] B29C *65/54;* A61M *29/02*
U.S. Cl. 156—242 5 Claims



1. A method of constructing a blood flow conduit from a first resilient tube having a central lumen and a first inflation lumen along its inner surface, and a second resilient tube having a central lumen and two second inflation lumens along its inner surface, comprising:

forming first balloon inflation openings in the wall of said first resilient tube adjacent to its ends and in communication with said first inflation lumen;

positioning balloon collars adjacent to the ends of said first tube over said first balloon inflation openings and sealing the edges of said collars to said first tube;

forming a receiving opening passing through the wall of said first tube and, on either side of said receiving opening forming second balloon inflation openings in the wall of said first resilient tube in communication with said first inflation lumen;

positioning said second tube opposite said receiving opening with said second inflation lumens opposite said second balloon inflation openings;

forming third balloon inflation openings in the wall of said second resilient tube in communication with each of its second inflation lumens and positioning inflation means for facilitating connection with an external source of pressured fluid for expanding said balloon collars when said blood flow conduit is being used in a surgical procedure adjacent to each of said third balloon inflation openings;

passing a first thread through one of said inflation means and its corresponding third balloon inflation opening, second inflation lumen, second balloon inflation opening and into the corresponding section of said first inflation lumen;

passing a second thread through the other of said inflation means and its corresponding third balloon inflation opening, second inflation lumen, second balloon inflation opening and into the corresponding section of said first inflation lumen;

sealing said inflation means to the second tube and the intersection of the second tube to the first tube with a sealing medium; and

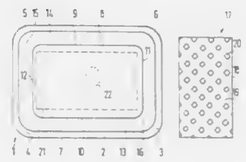
permitting said sealing medium to cure and then removing said first thread and said second thread.

4,840,691

PROCESS FOR PRODUCING FORMED AND LABELLED THREE DIMENSIONAL PLASTIC ARTICLES

Michael Knape, Mari, Fed. Rep. of Germany, assignor to Sendvac M. Knape GmbH & Co. Maschinen und Anlagen KG, Recklinghausen, Fed. Rep. of Germany

Filed Dec. 29, 1986, Ser. No. 924,622
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1985, 3538528; European Pat. Off., Jun. 27, 1986, 86108804.5
Int. Cl.[4] B32B *31/04*
U.S. Cl. 156—245 12 Claims



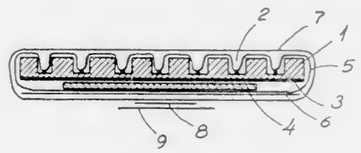
1. A process for producing formed labelled three dimensional plastic articles from a sheet of heated plastic film including the steps of providing at a first station a first sheet of the heated plastic film, shaping said sheet into a plurality of interconnected three dimensional articles, cooling the so formed sheet, at a second station providing an adhesive applicator and a label applicator, moving both of said applicators simultaneously, alternately aligning said applicators with said sheet and while said adhesive applicator is aligned with the sheet simultaneously applying adhesive to all of the shaped articles and simultaneously causing the label applicator to obtain a plurality of labels equal in number that of the articles, moving both of said applicators to align the label bearing applicator with the articles to which the adhesive has been applied and aligning the adhesive applicator with a source of adhesive, moving said label and adhesive applicators simultaneously to apply the labels and receive a new charge of adhesive.

4,840,692

METHOD FOR PRODUCING AN ABSORPTION BODY, NOTABLY FOR USE IN CASES OF URINARY INCONTINENCE IN WOMEN

Jorgen Kamstrup-Larsen, Allerod, Denmark, assignor to Coloplast A/S, Denmark

Continuation of Ser. No. 855,640, Apr. 16, 1986, abandoned.
This application Nov. 18, 1987, Ser. No. 122,215
Claims priority, application Denmark, Aug. 21, 1984, 3988; PCT Int'l Appl., Aug. 21, 1985, PCT/DK85/00081
Int. Cl.[4] B32B *31/18*
U.S. Cl. 156—252 14 Claims



1. A method for producing an absorption body for use in cases of female urinary incontinence and containing a core in the form of one flat absorbent pad provided with channels, comprising the steps of:

(a) subjecting the sheet material with the deposited layer of

the mixture to a heat treatment at a temperature just sufficient to soften the thermoplastic surface of the said fibers and within the range of 90° to 175° C. so as to cause the fibers of which at least the surface is thermoplastic to adhere to each other at the spots of contact and to the sheet material, thereby forming a three-dimensional network in which the particles of the pulverulent material are evenly distributed, and

(c) cutting or milling the body to remove a substantial proportion of core material so as to form a plurality of channels in the surface of the thus-formed pad opposite the sheet material, the channels having a depth of 65–95% of the thickness of the pad, a width of each at least 4 mm and leaving at least 4 mm of core material between each two neighboring channels.

4,840,693

ORGANOPOLYSILOXANE HOT-MELT ADHESIVE

Toshio Suzuki, and Tadashi Okawa, both of Chiba, Japan, assignors to Toray Silicone Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1988, Ser. No. 221,694
Claims priority, application Japan, Jul. 23, 1987, 62-183944
Int. Cl.⁴ C09J *3/02*
U.S. Cl. 156—329 **6 Claims**

I. A method of adhering a first substrate surface to a second substrate surface comprising the steps of:

(a) heating to at least 40° C. a material which comprises predominantly an organopolysiloxane which converts to an isotropic liquid at temperatures of at least 40° C. and which contains the R^1R^2SiO unit or $R^1R^2{}_2SiO_{1/2}$ unit, wherein R^1 is the $—R^3—CN$ group in which R^3 is a divalent organic group having at least one aromatic ring, and R^2 is an alkyl group having from to 4 carbon atoms,

(b) coating said heated material onto said first substrate surface,

(c) contacting said second substrate surface with said coated heated material, and

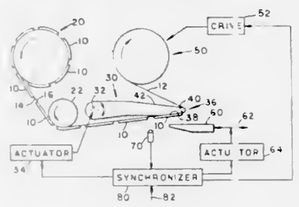
(d) then allowing said coated material to cool until said material is in a nonfluid state.

4,840,694

METHODS AND APPARATUS FOR HANDLING DOUBLE-SIDED ADHESIVE TABS

Donald L. Brookman; David E. Merrill, both of Richmond, and Everett C. Grollimund, Midlothian, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Jul. 18, 1988, Ser. No. 220,665
Int. Cl.⁴ B32B *31/18*
U.S. Cl. 156—344 **5 Claims**



5. The method of removing double-sided adhesive tabs from the surface of a carrier tape to which said tabs are initially releasably adhesively secured, said method comprising the steps of:

feeding said carrier tape around a convex nose structure so that the tabs are on the side of said carrier tape which becomes convex as said carrier tape passes said nose structure in order to peel the carrier tape from a tab adjacent said nose structure;

contacting said tab adjacent said nose structure with a member, said member contacting the surface of said tab remote from said carrier tape in order to adhesively secure said tab to said member; and

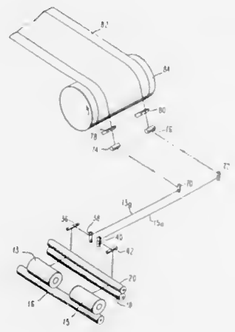
moving said member in synchronization with said tab adjacent said nose structure in order to support said tab after said carrier tape has been completely peeled away from said tab.

4,840,695

METHOD FOR UNWINDING ELASTIC TAPE

Thomas E. Benim, Kinston, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 27, 1988, Ser. No. 149,156
Int. Cl.⁴ B32B *31/14*
U.S. Cl. 156—344 **2 Claims**



I. A method of unwinding from the surface of a package an elastic strip material wound on the package, said strip having a peel resistance of from about 5 to about 25 grams/mm, said method comprising: rotating the package at a substantially constant peripheral rate of speed; pulling said strip material from said package at a location on said surface; and heating the surface of said package from a temperature of about 25° to about 50° C. to reduce the peel resistance by about 50 to 75%.

4,840,696

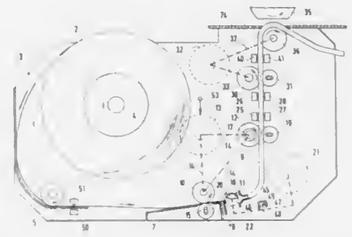
LABEL DISPENSER AND A FRANKING MACHINE EQUIPPED WITH SAID DISPENSER

Marek Krasuski, Fontenay Aux Roses; Jean-Pierre Grégoire, Bagneux, and Claude Gerbaud, Massy, all of France, assignors to SMH Alcatel, Paris, France

Continuation of Ser. No. 855,258, Apr. 24, 1986, Pat. No. 4,652,330. This application Oct. 5, 1987, Ser. No. 105,479
Claims priority, application France, Apr. 24, 1985, 85 06266
The portion of the term of this patent subsequent to Mar. 24, 2004, has been disclaimed.
Int. Cl.⁴ B65H *26/00*
U.S. Cl. 156—353 **14 Claims**

1. In a label dispenser for selectively dispensing labels of different lengths from a continuous tape, the dispenser comprising a cutter and intermittent drive means for intermittently driving the tape, said intermittent drive means and cutter being mounted on a tape guide path, said dispenser further including control means for controlling said intermittent drive means and said cutter, the improvement wherein said intermittent drive means includes first drive means upstream of said cutter and second drive means downstream of said cutter for ensuring that said tape is held stationary or driven at the same given tape advance speed from points located both upstream and downstream from said cutter, said dispenser further including a first photoelectric cell for detecting the leading end of the tape on its guide path at an initial position which is located at a distance

downstream from said cutter which is no greater than the length of the shortest selectable label, and a second photoelectric cell for detecting the advance of the tape from its initial position, said first and second cells being mounted downstream from said cutter at respective distances equal to different label lengths and being connected to said control means, said dispenser further including independent ejector means for ejecting each cutoff label at an ejection speed greater than said tape advance speed, said ejector means being mounted downstream from at least said first cell and being separated from said second drive means by a distance which is less than the length of the shortest label whereby said intermittent drive means operates to advance the leading end of said continuous tape for severance of labels of different lengths independently of said ejector means and vice versa, and whereby, irrespective of the lengths of the labels cut from said tape, said ejector means operating at an ejection speed greater than said tape advance speed to separate a severed label from the tape to allow said first and second photoelectric cells to detect advance of the tape after passage through the second drive means for controlled severance of a succeeding label of either length.

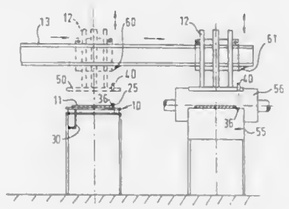


4,840,697

APPARATUS FOR HANDLING SHEET MATERIAL

Anthony G. Goodfellow, Maghull, and Anthony R. Wright, Southport, both of England, assignors to W&A Bates Limited, United Kingdom

Division of Ser. No. 697,243, Feb. 1, 1985, Pat. No. 4,714,505. This application Oct. 2, 1987, Ser. No. 103,665
Claims priority, application United Kingdom, Feb. 10, 1984, 8403494
Int. Cl.⁴ B29D *30/30*
U.S. Cl. 156—405.1 **9 Claims**



1. A tire building server feeding a ply of tire building fabric to a tire building former and comprising:

a table having a surface thereon on which said ply of the tire building fabric can be laid,

means for tilting the table and means for supplying air to the surface of the table to enable the tire building fabric thereon to be aligned with one longitudinal edge of said fabric in alignment with a first abutment arranged on a first datum line,

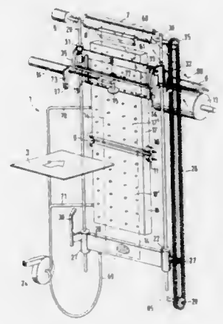
a gripping device for picking up said ply of tire building fabric in a flat condition, said gripping device being flat and of similar area to that of the table, and being arranged to be transversely movable and hold said ply of tire building fabric in an alignment preserving manner automatically to align said longitudinal edge with a second datum line substantially parallel with the first datum line so as to enable said ply of tire building fabric to be fed in appropriate alignment to a tire building former.

4,840,698

APPARATUS FOR LAMINATING A FILM UNDER PRESSURE AND HEAT

Hans-Guenter E. Kuehnert, Erzhausen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main and ELTI Apparatebau und Elektronik GmbH, Erzhausen, both of, Fed. Rep. of Germany

Filed Jun. 3, 1985, Ser. No. 740,831
Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420429
Int. Cl.⁴ B65C *1/00*; B44C *1/00*; B65H *5/12*
U.S. Cl. 156—485 **35 Claims**



1. An apparatus for laminating a film under pressure and heat onto opposite sides of a carrier, said opposite sides each being heated before the laminating starts, comprising:

a single supply roll of a photoresist film to be laminated simultaneously to opposite sides of said carrier, said supply roll being mounted in a pivoting frame which is horizontally pivotable about a vertical axis, said pivoting frame being located behind an upper vacuum table of a laminating station in the direction of transport of the carrier;

a magazine for releasably suspending each of a plurality of carriers to be laminated, said carriers being vertically upstanding;

a heating station for heating the carriers, said heating station having two horizontally revolving endless conveyor belts, each of which is in contact with an electric heating element, said heating station being located in front of a laminating station in the direction of transport of the carrier;

said laminating station, comprising (i) a pair of laminating rollers forming a nip and (ii) a plurality of vertically aligned vacuum tables, each vacuum table of said plurality having a suction plate for vertically fixing the photoresist film;

a cutting device for cutting the photoresist film over the width of said film, wherein the cutting device is movable along vertical guide rods which extend vertically on both sides of the vacuum tables;

a knife carrier with a rack mounted pivotally on guides connected to one another by a cross-member and which can be displaced vertically and retained along the guide rods by a clamping piece or an electric positioning device;

roller conveyor means for moving the carrier horizontally

along a path through said heating station, a lateral aligning device and a board gripper, there being a stop that is pivotable into and out of the path of the roller conveyor means such that when said stop is pivoted into said path, a front edge of the carrier abuts the stop;

said vacuum tables located vertically above and below the pair of laminating rollers;

a gripper bar which is a vacuum bar and is adapted to grasp a strip-shaped portion of the photoresist film, said gripper bar having two guides;

means for moving the gripper bar vertically downward along vertical guide rods parallel to one another out of an adjustable position above the laminating station, beyond the laminating station, and into a position in the region of the lower vacuum table; and

a chain connection fastened to one of said two guides of the gripper bar, said chain connection being connected frictionally to an endless revolving drive chain which is guided around two chain wheels, wherein said gripper bar is movable, together with the two guides, along the vertical guide rods by said endless revolving drive chain.

4,840,699

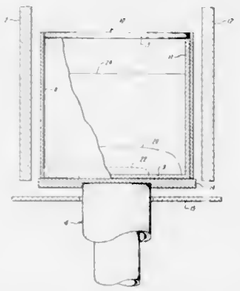
GALLIUM ARSENIDE CRYSTAL GROWTH

Chandra P. Khattak, Danvers; Vernon E. White, Needham; Frederick Schmid, Marblehead, and John H. Wohlgemuth, Acton, all of Mass., assignors to Ghemical Technologies, Salem, Mass.

Continuation of Ser. No. 65,163, Jun. 12, 1987, abandoned, which is a continuation of Ser. No. 779,817, Sep. 25, 1985, abandoned. This application Dec. 28, 1987, Ser. No. 142,310

Int. Cl.[4] C30B *11/00*

U.S. Cl. 156—616.41 **12 Claims**



1. A process for growing semi-insulating gallium arsenide ingots in a sealed silica crucible comprising the steps of:

providing a silica crucible,

placing gallium arsenide meltstock in said crucible,

raising the temperature of said crucible to a temperature above the melt point of said meltstock and maintaining said temperature above said melt point for a length of time sufficient to melt said meltstock, and

thereafter directionally solidifying said meltstock by withdrawing heat from the center bottom portion of said crucible while simultaneously applying heat to the side walls of said crucible,

the temperature of the center bottom of said crucible being maintained below the melt point and the temperature of the upper portion of the side walls of said crucible being maintained above said melt point until substantially all of said meltstock has been solidified, wherein:

no encapsulant is placed within said crucible;

said crucible is sealed with a silica cover plate after said gallium arsenide is placed therein; and,

said withdrawing and said applying are independently controlled such that the interface between solidified gallium arsenide and liquid gallium arsenide is convex to the liquid and advances outwardly and upwardly from said center bottom portion, and the temperature gradients within the liquid portion of said gallium arsenide are maintained sufficiently low such that said solidified meltstock forms an ingot that, except adjacent the sides thereof, is crack-free.

4,840,700

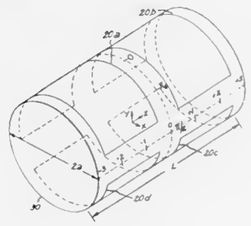
CURRENT STREAMLINE METHOD FOR COIL CONSTRUCTION

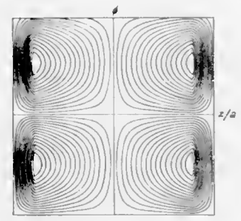
William A. Edelstein, and Frederick Schenck, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 795,024, Nov. 4, 1985, abandoned, which is a continuation of Ser. No. 548,041, Nov. 2, 1983, abandoned. This application Jul. 13, 1987, Ser. No. 73,552

Int. Cl.[4] B44C *1/22;* **H01F** *7/06*

U.S. Cl. 156—634 **10 Claims**





1. A method for producing an electrical coil for generating magnetic fields said method comprising the steps of:

calculating a pattern of current paths on a curved three dimensional surface at least partially enclosing a volume, said current paths corresponding to a specified continuous current distribution which is capable of generating a desired magnetic field within said volume, said pattern of current paths being a sequence of arcs on said curved surface;

providing a continuous conductive layer mounted on an insulative substrate which is conformable to said curved surface;

removing a thin line of conductive material from said conductive layer on said insulative substrate, said conductive material being removed along said pattern of current paths, the thinness of said line of removed material being measured relative to said remaining conductive material in which conductive current paths in said conductive layer are thereby formed; and

disposing said conductive layer so as to conform to said curved surface.

4,840,701

ETCHING APPARATUS AND METHOD

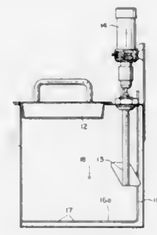
Ronald C. Stern, Hoddesdon, Great Britain, assignor to STC PLC, London, England

Filed Jun. 23, 1988, Ser. No. 210,333

Claims priority, application United Kingdom, Aug. 14, 1987, 8719306

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—637 **8 Claims**



4. A method of etching a single crystal semiconductor substrate, the method including exposing a selected region of the substrate to a liquid etch, agitating the etchant adjacent the substrate, and injecting oxygen, an inert gas or mixtures thereof into the etchant adjacent the substrate thereby achieving uniform etching of the substrate.

4,840,702

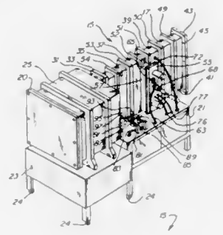
APPARATUS AND METHOD FOR PLASMA TREATING OF CIRCUIT BOARDS

John E. Schumacher, III, Boulder, Colo., assignor to Action Technologies, Inc., Boulder, Colo.

Filed Dec. 29, 1987, Ser. No. 138,962

Int. Cl.[4] B44C *1/22;* **C03C** *15/00, 25/06;* **C23F** *1/02*

U.S. Cl. 156—643 **22 Claims**



1. A method for treating objects using a gas excited within an electrical field, said method comprising:

establishing an excited gas zone having the gas excited within the electrical field thereat;

establishing a gas zone having gas therein not exposed to the electrical field so that the gas thereat remains substantially unexcited; and

exposing said objects alternately to said unexcited gas and said excited gas for preselected periods of time.

4,840,703

METHOD FOR CONTROLLING AN OXYGEN BLEACHING

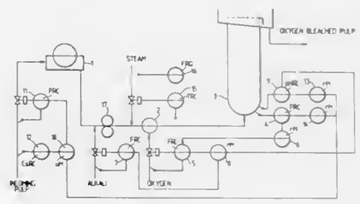
Erkki Malmsten, Rauma, Finland, assignor to Rauma-Repola Oy, Pori, Finland

Continuation of Ser. No. 948,459, Dec. 31, 1986, abandoned, which is a continuation of Ser. No. 744,985, Jun. 17, 1985, abandoned. This application Jun. 28, 1988, Ser. No. 213,516

Claims priority, application Finland, Nov. 8, 1984, 844390

Int. Cl.[4] D21C *7/12, 9/147*

U.S. Cl. 162—49 **4 Claims**



1. Method for controlling an oxygen-bleaching process of lignocellulose pulp stock to a desired degree of delignification comprising adding alkali oxygen at a desired ratio to the pulp stock, passing the pulp at a desired substantially constant temperature into and out of the bleaching reactor wherein the pulp has a substantially constant level at its outlet measuring the hydrostatic pressure at the bottom of the reactor and adjusting the quantity of feed of oxygen in response to the measured hydrostatic pressure, to a value to reach the desired degree of delignification; and adjusting the amount of alkali added in response to the adjusted amount of oxygen to maintain the alkali and oxygen ratio at the desired ratio.

4,840,704

CONTROLLING CHARACTERISTICS OF A PULP MAT ON A PULP WASHING SURFACE

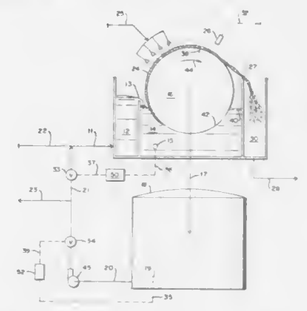
George W. Seymour, 2841 Parkwood Dr., Brunswick, Ga. 31520

Filed Mar. 21, 1988, Ser. No. 170,299

The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.

Int. Cl.[4] D21C *9/00*

U.S. Cl. 162—49 **10 Claims**



1. In a pulp washing process wherein a cellulosic pulp slurry stream and a dilution liquid stream are continuously introduced to form a level of admixture of these streams comprising pulp and water in a container wherefrom a mat comprising pulp and water continuously forms on a washing surface which is moved at a surface speed and wherein wash water is directed at said mat on said washing surface and vacuum filtering is

carried out to produce a product stream of washed pulp and water at a downstream location on said surface and a filtrate which is divided so that part of it is recirculated to provide said dilution liquid stream, the improvement comprising the steps of:

(a) determining the total mass of said product stream in weight per unit area on said surface and adjusting said surface speed in response to said determination to reach a selected value for said total mass,

(b) adjusting the rate of said dilution liquid stream introduction in response to a level sensor in said container to reach a selected level of said admixture in said container.

4,840,705

PAPERMAKING METHOD

Hisao Ikeda; Fumio Suzuki; Yoshitane Watanabe; Mitsunobu Matsumura; Yasuhiro Takahashi; Hiroshi Murakami, and Koichi Maeda, all of Funabashi, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

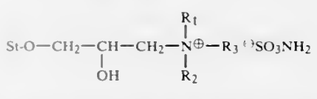
Filed Jan. 25, 1988, Ser. No. 147,851

Claims priority, application Japan, Feb. 2, 1987, 62-22092

Int. Cl.[4] D21H *3/28*

U.S. Cl. 162—175 **8 Claims**

1. A papermaking method comprising the steps of sheet-formation of an aqueous papermaking stock which contains a cellulose fiber or the said fiber and an inorganic filler, dewatering and drying, characterized by the addition of a starch ether derivative of a general formula (I):



(I)

where St-O represents a starch molecule residue, R_1, R_2 and R_3 independently represent an alkyl group having from 1 to 18 carbon atoms or a benzyl group, provided that two or more of these R_1, R_2 and R_3 must not be a benzyl group or an alkyl group having from 5 to 18 carbon atoms at the same time, and any two of these R_1, R_2 and R_3 may be bonded to form a cyclic structure, the said derivative containing the ether bond in a degree of substitution of from 0.01 to 0.1, to the said papermaking stock in an amount of from 0.05 to 5.0% by weight of the cellulose fiber or the total of the said fiber and the inorganic filler in the said stock.

4,840,706

METHOD AND APPARATUS FOR MEASURING WATER CONTENT

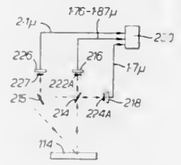
Neil F. Campbell, Canterbury, England, assignor to The Wiggins Teape Group Limited, Basingstoke, England

Continuation of Ser. No. 654,684, Sep. 26, 1984, abandoned. This application Feb. 17, 1987, Ser. No. 15,592

Claims priority, application United Kingdom, Sep. 26, 1983, 8325691

Int. Cl.[4] D21F *7/06;* **G01N** *21/17*

U.S. Cl. 162—198 **18 Claims**



1. Apparatus for measuring the water content of a material over a predetermined range and having a source of infra-red radiation for directing at the material, detector means for such radiation and at least first and second filters for selecting radiation for detection at a first wavelength band at which the detected radiation is affected by water content and a second wavelength band at which the detected radiation is substantially unaffected by water content respectively, wherein first and second signals are produced in dependence upon the radiation detected at said first and second wavelength bands respectively, and means responsive to said first and second signals to derive a signal having a value representing the water content, the improvement wherein the first wavelength band at which said first filter responds has a center wavelength of approximately 1.83 microns, wherein said second filter wavelength band is removed from said first wavelength band to provide a response that is substantially independent of water content over the predetermined range and has a center wavelength of approximately 1.7 microns, and wherein the moisture ratio of the material lies in the range of 1 to 6.

4,840,707

SEPARATION OF 3-METHYL-2-BUTANONE FROM FORMIC ACID BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, and Richard R. Rall, Bozeman, Mont., assignors to Lloyd Berg, Bozeman, Mont.

Filed Dec. 30, 1988, Ser. No. 291,961

Int. Cl.[4] B01D *3/40;* **C07C** *45/83, 53/02*

U.S. Cl. 203—51 **4 Claims**

1. A method for recovering 3-methyl-2-butanone from mixtures of 3-methyl-2-butanone and formic acid which comprises distilling a mixture of 3-methyl-2-butanone and formic acid in a rectification column in the presence of about one part of an extractive agent per part of the 3-methyl-2-butanone—formic acid mixture, recovering 3-methyl-2-butanone as overhead product and obtaining the extractive agent and the formic acid from the stillpot, wherein said extractive agent comprises a dimethyl amide containing three or four carbon atoms.

4,840,708

PROCESS FOR THE PRECISE DETERMINATION OF THE SURFACE AREA OF AN ELECTRICALLY CONDUCTING SHAPED BODY

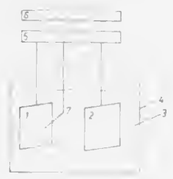
Jean-Claude Puippe, Grabenstrasse 7, 8304 Wallisellen, Switzerland

Continuation-in-part of Ser. No. 587,192, Mar. 7, 1984, abandoned. This application Mar. 21, 1986, Ser. No. 844,216

Claims priority, application Switzerland, Mar. 11, 1983, 1353/83

Int. Cl.[4] G01N *27/26;* **C25D** *21/12*

U.S. Cl. 204—1 T **22 Claims**



1. A process for obtaining an absolute measurement of the surface area of an electrically conducting shaped body comprising:

selecting an electrolyte suitable for producing a diffusion controlled limiting current plateau in the polarization curve;

immersing the shaped body in the electrolyte;

applying a first electrical signal to the shaped body to cause a diffusion process in the electrolyte near the shaped body which diffusion process is characterized by being diffusion rate limited; and

measuring a second electrical signal associated with the diffusion process and proportionally varying in relation thereto during the period of about the first 3 seconds after the application of the first electrical signal to obtain a measurement of the diffusion process from which the surface area of the shaped body may be determined.

4,840,709

SINGLE-STAGE ELECTROCHEMICAL IMAGE-FORMING PROCESS FOR REPRODUCTION LAYERS

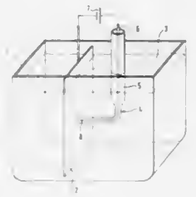
Engelbert Pliefke, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 25, 1988, Ser. No. 198,308

Claims priority, application Fed. Rep. of Germany, May 26, 1987, 3717652

Int. Cl.[4] C25D *9/02*

U.S. Cl. 204—2 **22 Claims**



1. A process for the electrochemical image formation on an electrically conductive substrate by the action of electric current, comprising the steps of:

contacting the substrate with an electrically conductive solution of an organic substance;

applying a direct voltage between the substrate and at least one electrode;

depositing said organic substance onto the substrate by current impulses, at a current density from about 0.01 to 100 A/dm^2.

4,840,710

METHOD OF STRIPPING ELECTROLYTICALLY DEPOSITED COPPER FROM A CATHODE

Bruce Middlin, Roxby Downs; Norman Locke, and Alan W. Kennedy, both of Townsville, all of Australia, assignors to M.I.M. Technology Marketing Limited, United Kingdom

Filed Oct. 27, 1987, Ser. No. 113,074

Claims priority, application Australia, Nov. 4, 1986, PH8801

Int. Cl.[4] C25D *1/20*

U.S. Cl. 204—12 **8 Claims**

1. A method of stripping electrolytically deposited copper from a cathode comprising:

maintaining said cathode in a generally vertical upright position by supporting the cathode along its lower edge not its upper edge;

flexing said cathode by an amount exceeding the strength of the adhesion bond between the deposited copper and the cathode but not exceeding the elastic limit of the cathode, thereby causing at least part of the deposited copper to separate from the cathode and

then wedge-stripping or gas-blasting the deposited copper from the cathode.

4,840,711

PROCESS FOR THE FUSION OF ONE ELEMENT INTO A SECOND ELEMENT

Ady Joseph, Ontario, Canada, assignor to Metafuse Limited, Ontario, Canada

Continuation of Ser. No. 888,272, Jul. 22, 1986, abandoned, Continuation of Ser. No. 768,189, Aug. 23, 1985, abandoned, which is a continuation of Ser. No. 684,157, Dec. 20, 1984, abandoned, which is a continuation of Ser. No. 604,392, Apr. 26, 1984, abandoned, which is a continuation of Ser. No. 319,672, Nov. 9, 1981, abandoned, which is a continuation-in-part of Ser. No. 224,762, Jan. 13, 1981, abandoned. This application Apr. 8, 1987, Ser. No. 36,202

Int. Cl.[4] C25D *32/00*

U.S. Cl. 204—15 **6 Claims**

1. A process for the fusion of at least one second conductive chemical element, in a dissociable form as part of a solution, into a matrix of a first conductive chemical element comprising the steps of:

placing the solution in contact with a selected area of the adjacent surface of said first conductive chemical element; and

applying an interrupted half-wave electrical pulsing signal within a frequency in the range of 400 Hz to 35 MHz to said solution and said first conductive chemical element, said signal having an amplitude of 3 amps per 0.3 square mm, whereby said second conductive chemical element is fused with said first conductive chemical element in said selected area without substantial generation of heat.

4,840,712

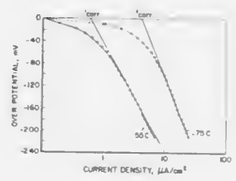
PROCESS FOR IMPROVING WEAR ON CONDUCTOR ROLLS IN ELECTROPLATING OF STEEL SURFACES

Richard N. Steinbicker, Allentown; Herbert E. Townsend, Center Valley, and Yung-Herng Yau, Allentown, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Oct. 13, 1988, Ser. No. 256,977

Int. Cl.[4] C25D *5/04*

U.S. Cl. 204—28 **19 Claims**



1. In a process for electrodepositing a protective coating of zinc or a zinc alloy on iron or steel substrates in which said process utilizes a metal conductor roll or conductor roll with metal sleeves and contains a rinsing bath with a mineral acid solution associated with said roll, the improvement which comprises said mineral acid bath having at least 50 ppm of hydrogen peroxide or a peroxydisulfate compound.

4,840,713

PROCESS FOR THE ELECTRO CHEMICAL ROUGHENING OF ALUMINUM FOR USE IN PRINTING PLATE SUPPORTS

Engelbert Pliefke, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 25, 1988, Ser. No 198,307
Claims priority, application Fed. Rep. of Germany, May 26, 1987, 3717654
Int. Cl.[4] C25F *3/04*
U.S. Cl. 204—129.75 11 Claims

1. A process for electrochemical roughening of supports of aluminum and aluminum alloys for use in printing plates, comprising the steps of:

immersing the support in an electrolytic, acidic, unsaturated solution of aluminum chloride comprising from 5 to 100 g/l sulfate ions and from 1 to 100 g/l chloride ions; and

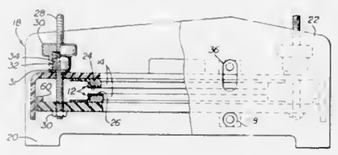
applying an alternating current to electrochemically roughen the support.

4,840,714

ELECTROBLOTTING TECHNIQUE FOR TRANSFERRING SPECIMENS FROM A POLYACRYLAMIDE ELECTROPHORESIS OR LIKE GEL ONTO A MEMBRANE

William J. Littlehales, Point Richmond, Calif., assignor to American Bionetics, Inc., Hayward, Calif.

Filed May 13, 1987, Ser. No 49,739
Int. Cl.[4] G01N *27/28, 27/26*
U.S. Cl. 204—180.1 32 Claims



17. A method of transferring a particular specimen from a polyacrylamide electrophoresis or like gel onto a transfer sheet by means of electroblotting, said method comprising the steps of:

(a) providing a pair of plate-shaped electrode assemblies having facing layers of electrically conductive material in a confronting relationship to one another;

(b) placing said gel and transfer sheet between said electrode assemblies such that the gel and transfer sheet are in a confronting relationship with one another;

(c) adjustably decreasing the spacing between said electrode assemblies at a plurality of different points on one of the assemblies so that the assemblies squeeze the gel and support sheet together while remaining substantially parallel at their adjusted position; and

(d) connecting said electrode assemblies to a source of power for producing an electric field across said gel and support sheet in order to transfer said specimen from the gel to the sheet by means of electroblotting.

4,840,715

ELECTRODEPOSITION COATING METHOD

Masayuki Misawa, Hiratsuka; Toshio Ogasawara, Kamakura; Masahiko Sagane, Fujisawa; Yasuyuki Hirata, Hatano, and Masafumi Kume, Hiratsuka, all of Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 938,983, Dec. 3, 1986, abandoned. This application Aug. 8, 1988, Ser. No. 229,754
Claims priority, application Japan, Dec. 4, 1985, 60-272817
Int. Cl.[4] C25D *13/06*
U.S. Cl. 204—181.1 10 Claims

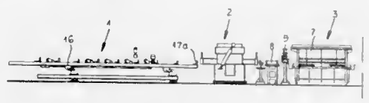
1. A method of electrodeposition coating, which comprises performing a first electrodeposition coating on an article as a cathode using (I) a cationic electroposition paint comprising (A) a polyamine resin and (B) at least one pigment, said pigment (B) containing at least 5% by weight of a pigment having an oil absorption of at least 100 and being incorporated so that the total oil absorption of the pigment (B) is in the range of 1,000 to 10,000 per 100 g of the resin (A), then while the resulting coated film is in the uncured state, performing a second electrodeposition coating on it using (II) an emulsion-type cationic electrodeposition coating paint comprising a resin (C) and a pigment (D) and having a minimum electrodeposition current density of not more than 0.7 mA/cm^2 and a degree of emulsification of at least 80% by weight, said pigment (D) having a lower total oil absorption than the total oil absorption of the pigment (B) in the cationic electrodeposition paint (I), and thereafter curing the applied films under heat to form a composite cured coated film.

4,840,716

AUTOMATIC PLANT FOR CONTINUOUS ELECTROPLATING TREATMENT OF METAL BARS

Sergio Angelini, Residenza del Cantone 061, Segrate (Milan), Italy

Filed Jun. 22, 1988, Ser. No. 209,996
Claims priority, application Italy, Jun. 22, 1987, 20990 A/87
Int. Cl.[4] C25D *19/00*
U.S. Cl. 204—207 15 Claims



1. Automatic plant for continuous electroplating treatment of metal bars, characterized by the fact that it comprises, successively, an automatic introduction unit for bars to be treated, a degreasing and cleaning unit for the bars, an electrolytic treatment unit having one or more consecutive cells and associated devices for electrical contact with the bars in movement, a handling device for the bars, a final burnishing or polishing unit for the bars and an extraction and storage unit for the treated bars, in which the automatic introduction unit for the bars possesses means for the mutual electrical and mechanical connecting together in alignment of the bars successively introduced, and the extraction unit possesses means for separating the successive bars and for storing them side by side, the handling device for the bars carrying out their entrainment in the axial direction and simultaneous rotation of the bars about themselves.

4,840,717

SILVER RECOVERY CELL

Milton A. Dzodin, 29733 Red Leaf Dr., Southfield, Mich. 48076

Filed Aug. 24, 1988, Ser. No. 235,676
Int. Cl.[4] C25C *1/20, 7/06*
U.S. Cl. 204—237 21 Claims

21. A silver recovery system, said silver recovery system being used for recovering silver from a silver laden solution, said silver recovery system comprising:

at least one silver recovery cell, each said silver recovery cell comprising:

a clear canister, said clear canister having a closed bottom and an open end;

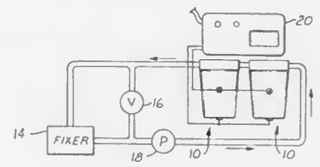
an anode rod attached to said bottom of said clear canister, said anode rod projecting upwardly into said clear canister;

an anode terminal electrically connected to said anode rod;

a cathode cylinder in said clear canister, said cathode cylinder encircling said anode rod, said cathode cylinder having a longitudinal slot; a cathode terminal electrically connected to said cathode cylinder;

a top releasably attached to said clear canister at said open end;

inlet means for introducing said silver laden solution into said clear canister;



outlet means for exiting said silver laden solution from said clear canister;

means for fluidically sealing said top with respect to said clear canister; and

an inlet port in fluidic communication with said inlet means, said inlet port being located in axial alignment with said anode rod, said inlet port causing flow of said silver laden solution to be sped up upon passage therethrough;

electrical means for selectively supplying electricity to said anode terminal and said cathode terminal;

piping means for selectively piping said silver laden solution from a first location to said recovery cell and back to said first location; and

pump means connected with said piping means for selectively pumping said silver laden solution from said first locatin to said inlet means of said recovery cell.

4,840,718

INERT COMPOSITE ELECTRODE, IN PARTICULAR AN ANODE FOR MOLTEN SALT ELECTROLYSIS

Christine Zöllner, and Herbert Hahn, both of Nuremberg, Fed. Rep. of Germany, assignors to C. Conradty Nürnberg GmbH & Co. KG, Rötbenbach, Fed. Rep. of Germany

Filed Oct. 21, 1986, Ser. No. 921,677
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1985, 3537575
Int. Cl.[4] C25B *11/00;* C25C *7/02;* C25D *17/10*
U.S. Cl. 204—286 17 Claims

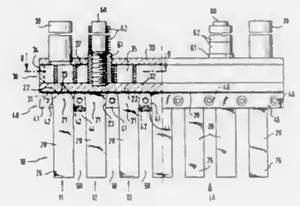
1. In an inert composite electrode for molten salt electrolysis consisting of

an active part in the form of a plurality of bar-shaped active elements (20) having end surfaces (22) and which are arranged in one or more mutually aligned groups and with their longitudinal axes mutually parallel,

an electrode holder which comprises a current feed plate (30), having one main surface (31) in firm contact with the active elements at their end surfaces, and

a connecting arrangement which connects the active elements together in groups and holds the active elements in contact with the plate, the improvement comprising:

the active elements (20) each have a respective head section (21) adjacent to the current feed plate (30), which section is widened in the direction of the end surface (22) adjacent to the plate substantially in a wedge shape with two oppositely-lying wedging surfaces (23), wherein the plane of said wedge-shape lies perpendicular to a line of alignment (25) along which the respective group of elements is aligned, and



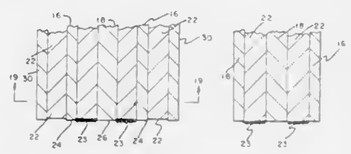
at least one clamping element (41) having at least one wedging surface (42) is brought into contact with each of the two oppositely-lying wedging surfaces (23) of the head section (21) of the respective active element (20), wherein the wedging angle of the clamping element substantially corresponds to that of the respective wedging surface of the head section.

4,840,719

CORROSION PROBE AND METHOD FOR MEASURING CORROSION RATES

Raymond J. Jasinski, Tulsa, Okla., assignor to Cities Service Oil and Gas Corporation, Tulsa, Okla.

Division of Ser. No. 151,002, Feb. 1, 1988, Pat. No. 4,784,729, which is a division of Ser. No. 903,036, Aug. 29, 1986, Pat. No. 4,752,360, which is a continuation-in-part of Ser. No. 740,497, Jun. 3, 1985, abandoned, which is a continuation-in-part of Ser. No. 646,236, Aug. 31, 1984, abandoned. This application Sep. 6, 1988, Ser. No. 242,143
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—404 20 Claims



1. A method for preparing a dielectric surface of a corrosion probe means to become ionically conductive when the corrosion probe means is inserted into a corrosive liquid environment containing a disperse phase having an ionically conductive solution, comprising the steps of:

(a) contacting a dielectric surface of a corrosion probe means with a surfactant for a sufficient period of time to render the dielectric surface ionically conductive when the corrosion probe means is inserted into a corrosive liquid environment containing a disperse phase having an ionically conductive solution.

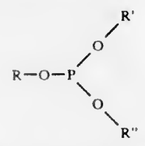
4,840,720

PROCESS FOR MINIMIZING FOULING OF PROCESSING EQUIPMENT

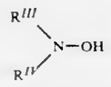
Dwight K. Reid, Houston, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Sep. 2, 1988, Ser. No. 240,775
Int. Cl.[4] C10G 9/16
U.S. Cl. 208—48 AA 21 Claims

1. A process for inhibiting the degradation, particulate and gum formation of distillate fuel oils prior to or during processing which comprises adding to the distillate fuel oil an effective inhibiting amount of a mixture of (a) a phosphite compound having the formula



wherein R, R' and R" are the same or different and are alkyl, aryl, alkaryl or aralkyl groups, and (b) an effective amount of hydroxylamine having the formula



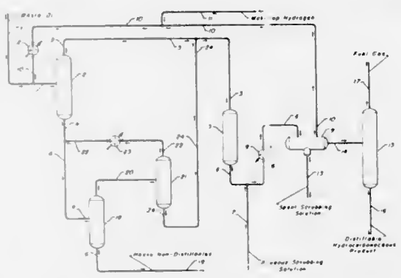
wherein R^{III} and R^{VI} are the same or different and are hydrogen, alkyl, alkaryl or arlkyl groups, wherein the weight ratio of (a):(b) is from about 1:10 to about 10:1.

4,840,721

PROCESS FOR TREATING A TEMPERATURE-SENSITIVE HYDROCARBONACEOUS STREAM CONTAINING A NON-DISTILLABLE COMPONENT TO PRODUCE A HYDROGENATED DISTILLABLE HYDROCARBONACEOUS PRODUCT

Tom N. Kaines, La Grange, and Robert B. James, Jr., Northbrook, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Mar. 16, 1988, Ser. No. 169,242
Int. Cl.[4] C10G 9/16, 34/00
U.S. Cl. 208—57 41 Claims



1. A process for treating a hydrocarbonaceous stream containing a non-distillable component to produce a hydrogenated distillable hydrocarbonaceous product and a heavy product comprising said non-distillable component while minimizing thermal degradation of said hydrocarbonaceous stream which process comprises the steps of:

(a) contacting said hydrocarbonaceous stream with a hot first hydrogen-rich gaseous stream having a temperature greater than said hydrocarbonaceous stream in a first flash zone at flash conditions including a first pressure thereby increasing the temperature of said hydrocarbonaceous stream and vaporizing at least a portion thereof to provide a first hydrocarbonaceous vapor stream comprising hydrogen and a first heavy product stream comprising said non-distillable component;

(b) contacting said first heavy product stream comprising said non-distillable component with a hot second hydrogen-rich gaseous stream in a second flash zone at flash conditions including a second pressure which is less than said first pressure of step (a) thereby vaporizing at least a portion thereof to provide a second hydrocarbonaceous vapor stream comprising hydrogen and a second heavy product stream comprising said non-distillable component;

(c) condensing at least a portion of said second hydrocarbonaceous vapor stream to provide a first liquid stream comprising distillable hydrocarbonaceous compounds;

(d) contacting said first hydrocarbonaceous vapor stream comprising hydrogen from step (a) and said first liquid stream comprising distillable hydrocarbonaceous compounds from step (c) with a hydrogenation catalyst in a hydrogenation reaction zone at hydrogenation conditions to increase the hydrogen content of the hydrocarbonaceous compounds introduced into said hydrogenation reaction zone;

(e) condensing at least a portion of the resulting effluent from said hydrogenation reaction zone to provide a third hydrogen-rich gaseous stream and a liquid stream comprising hydrogenated distillable hydrocarbonaceous compounds; and

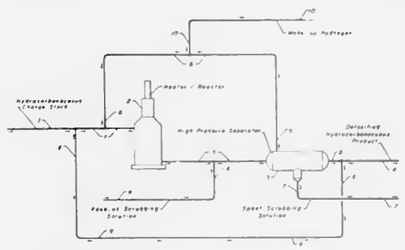
(f) recovering a hydrogenated distillable hydrocarbonaceous product from said liquid stream comprising hydrogenated distillable hydrocarbonaceous compounds.

4,840,722

NON-CATALYTIC PROCESS FOR THE CONVERSION OF A HYDROCARBONACEOUS STREAM CONTAINING HALOGENATED ORGANIC COMPOUNDS

Russell W. Johnson, Elmhurst, and Lee Hilfman, Mount Prospect, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Apr. 1, 1988, Ser. No. 176,504
Int. Cl.[4] C10G 45/02, 67/10
U.S. Cl. 208—95 10 Claims



5. A non-catalytic process for the conversion of a hydrocarbonaceous stream containing less than about 5 weight percent halogenated organic compounds which process consists essentially of

(a) reacting said hydrocarbonaceous stream in the presence of hydrogen in a reaction zone at reaction conditions including an elevated temperature selected to hydrogenate at least a portion of said halogenated organic compounds;

(b) contacting the reaction zone effluent with an aqueous scrubbing solution; and

(c) introducing a resulting admixture of said reaction zone effluent and said aqueous scrubbing solution into a separation zone to provide a hydrocarbonaceous product stream containing lower halogen content and a spent aqueous stream.

4,840,723

HYDROCARBONS PYROLYSIS

Frederick D. Austin; John L. Barclay, both of Surrey, and James O. Hunter, Sunbury-on-Thames, all of England, assignors to The British Petroleum Company p.l.c., London, England

Continuation of Ser. No. 946,575, Nov. 13, 1986, abandoned. This application Sep. 15, 1988, Ser. No. 246,036
Claims priority, application United Kingdom, Mar. 28, 1985, 8508103
Int. Cl.[4] C01G 9/38
U.S. Cl. 208—106 9 Claims

1. A process for the pyrolysis of a liquid hydrocarbon feed boiling at a temperature above 350° C. which comprises introducing the hydrocarbon feed in the form of finely divided droplets into a hot gas which gas is at a pressure of not more than 1 MPa and which contains at least 65% volume of methane and not more than 10% volume hydrogen, the temperature of the reaction mixture into which the droplets are fed being in the range 600° C. to 1400° C. followed by reduction of the temperature of the reaction mixture to below 300° C. in less than 30 milliseconds, the proportion of steam in the hot gas being not more than 12% by volume.

4,840,724

PROCESS FOR CRACKING HYDROCARBON FEEDS

Cornelis J. Groenenboom, Driehuis, and Peter A. Wieringa, Naarden, both of Netherlands, assignors to Akzo NV, Arnhem, Netherlands

Continuation of Ser. No. 920,434, Oct. 20, 1986, abandoned. This application Jan. 12, 1989, Ser. No. 296,893
Claims priority, application Netherlands, Oct. 18, 1985, 8502851
Int. Cl.[4] C10G 11/05
U.S. Cl. 208—120 8 Claims

1. A cracking process comprising cracking a metal-free hydrocarbon feed in the presence of a fluidizable cracking catalyst composition containing a sepiolite, an ultrastable Y-zeolite, a clay selected from the group consisting of kaolin, bentonite, a layered clay and a montmorillonite clay, and a matrix material.

4,840,725

CONVERSION OF HIGH BOILING LIQUID ORGANIC MATERIALS TO LOWER BOILING MATERIALS

Stephen C. Paspek, North Royalton, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Jun. 19, 1987, Ser. No. 64,919
Int. Cl.[4] C10G 29/02, 35/02
U.S. Cl. 208—130 19 Claims

1. A process for converting high boiling hydrocarbons to lower boiling materials characterized by an increase in aromatic content and a lower pour point which comprises contacting said high boiling hydrocarbons with water at a temperature of from about 600° F. to about 875° F. at a pressure of at least about 2000 psi in the absence of any externally supplied catalysts, and wherein the weight ratio of water to high boiling hydrocarbons is from about 0.5:1 to about 0.7:1, and the water and high boiling hydrocarbon form a substantially single phase system under the elevated temperature and pressure conditions utilized.

4,840,726

METHOD FOR DETERMINING AND CONTROLLING THE AMOUNT OF FINELY DIVIDED PARTICULATE SOLIDS ADDED TO A STREAM OF FLUID

John J. Wakefield, Jr., Kingwood, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 932,852, Nov. 20, 1986, abandoned. This application Apr. 15, 1988, Ser. No. 181,803
Int. Cl.[4] C10G 9/32
U.S. Cl. 208—152 12 Claims

1. A method for adding controlled quantities of finely divided particulate catalyst to a fluid catalyst cracking process, said method consisting essentially of:

(a) flowing a fluid through a transfer line to transfer said particulate catalyst to said process;

(b) adding said particulate catalyst to said transfer line at a selected rate and at a temperature different than the temperature of said fluid to produce a mixture of said particulate catalyst and said fluid in said transfer line;

(c) determining the temperature of said particulate catalyst prior to addition of said particulate catalyst to said transfer line;

(d) determining the temperature of said fluid flowing through said transfer line prior to addition of said particulate catalyst to said transfer line;

(e) determining the quantity of said fluid flowing through said transfer line;

(f) determining the heat capacity of said particulate catalyst and said fluid;

(g) determining the temperature of said mixture in said transfer line;

(h) calculating the amount of particulate catalyst in said mixture by the equation:

$$W_c=(W_a\times C_{pa}\times(T_a-T_{ac})/C_{pc}\times(T_{ac}-T_c))$$

where:

W_c equals the amount of particulate catalyst in said mixture,

W_a equals the amount of fluid flowing through said transfer line,

T_a equals the temperature of the fluid flowing through said transfer line prior to addition of said particulate catalyst to said transfer line,

T_c equals the temperature of the particulate catalyst added to said transfer line prior to addition of said particulate catalyst to said transfer line,

T_{ac} equals the temperature of the mixture flowing in said transfer line,

C_{pa} equals the heat capacity of the fluid flowing through said transfer line,

C_{pc} equals the heat capacity of the particulate catalyst added to said transfer line.

(i) controlling the rate of addition of said particulate catalyst to said transfer line to maintain a selected quantity of said particulate catalyst in said transfer line based upon said calculation.

4,840,727

DOUBLE BANK GRAIN CLEANER AND ASPIRATOR THEREFOR

Cecil T. Humphrey, 3744 Linwood St., Burnaby, Canada

Filed Dec. 20, 1982, Ser. No. 451,302
Claims priority, application Canada, Dec. 30, 1981, 393429
Int. Cl.[4] B07B 9/02, 7/01
U.S. Cl. 209—32 3 Claims

1. A double bank cleaning device for granular and like material comprising:

an outer, open frame of rectangular configuration having spaced end frames interconnected by upper and lower cross beams;

an inner frame suspended from said outer frame by universal joints thereby to allow said inner frame to move in a horizontal plane relative to said outer frame;

two spaced banks of cleaning decks mounted in and secured to said inner frame, said decks having infeed ends and outlet ends extending beyond the confines of the outer frame and adapted to convey granular material throughout their length; and

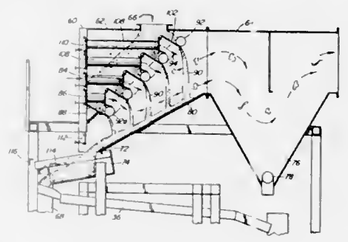
drive means mounted on said inner frame between said spaced banks of cleaning decks, said drive means comprising a box enclosure secured to the inner frame, a dead shaft vertically mounted in said box enclosure, an eccentric weight mounted for rotation in a horizontal plane on said dead shaft and motor means for rotating said weight thereby to impart a flat, rotary motion to said suspended inner frame and the double bank of cleaning decks secured therein; and including

a multi-feed aspirator for feeding granular material into said cleaning device, said aspirator comprising a housing mounted above said outer frame;

a plurality of horizontally disposed feed rolls mounted in said housing, one above and forward of the other, each roll feeding a curtain of granular material, by gravity, down through the housing and into said infeed ends of said decks, and a plurality of ducts directing air generally horizontally against said curtains of granular material to carry lighter-than-grain pieces into a drop out section.

2. An aspirator for mounting on top of a grain cleaning machine comprising:

a housing having an intake section and an exhaust section, said housing being adapted for connection to fan means for passing air through said housing from the intake to the exhaust sections;



said intake section having an inlet in its upper end for receiving granular material therein, and an outlet in its lower end for dropping granular material into cleaning decks of said cleaning machine;

baffle means dividing said intake section between its granular inlet and outlet and extending generally diagonally across said intake section;

means in said baffle means for metering granular material therethrough in a plurality of downwardly flowing curtains extending across said intake section; and

means for directing the air passing through the housing to impinge upon said downwardly flowing curtains thereby to carry material lighter than said granular material out of said intake section and into said exhaust section;

said baffle means comprising a stepped panel extending generally diagonally from one end wall of the intake section to the top wall thereof, said stepped panel having a series of vertical sections separated by horizontal sections, said metering means being located in the horizontal sections and the air directing means being located in the vertical sections;

said metering means comprises a plurality of feed rolls extending across said baffle means, each feed roll being located adjacent to and below said vertical and horizontal sections, and gate members in the horizontal sections in contact with the feed rolls for passing granular material through the baffle means, and drive means for rotating said feed rolls.

4,840,728

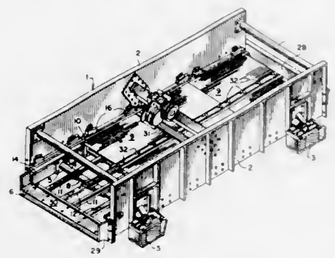
VIBRATING SCREENING APPARATUS

James D. Connolly, and Darrel Huff, both of Princeton, W. Va., assignors to Conn-Weld Industries, Inc., Princeton, W. Va.

Filed Mar. 14, 1988, Ser. No. 167,636

Int. Cl.[4] B07B *1/46*

U.S. Cl. 209—405 **11 Claims**



1. In vibrating screening apparatus having vibrating and screening means, the improvement comprising a frame having laterally spaced side plates, a plurality of cross-members extending transversely between said side plates, each cross-member having end plates welded to opposite ends thereof and being boltable through said end plates to said side plates, and a rigid spacer plate inserted between an end plate of each cross-member and an adjoining side plate and boltable with said end plate to said side plate.

4,840,729

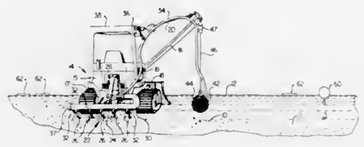
OIL SPILL RECOVERY APPARATUS

Robert A. Levine, Westminster, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 5, Jan. 2, 1987, Pat. No. 4,758,355. This application Feb. 12, 1988, Ser. No. 155,406

Int. Cl.[4] E02B *15/04*

U.S. Cl. 210—170 **2 Claims**



1. Apparatus for removing oleaginous substances such as crude oil or refined petroleum products from entrapment in coarse bottom sediments such as submerged sand beds covered by bodies of water or forming the bottom of a holding pond characterized by:

tractor means for traversing said sand bed in a pattern which will substantially cover the area in which said substances are entrapped, said tractor means including a movable boom for supporting pump means for withdrawing water from said body of water;

motor driven pump means supported by said boom spaced from said tractor means for intake of water from said body of water;

means mounted on said tractor means for mechanically plowing said sand bed to a depth sufficient to overturn said sand bed which has been saturated with said substances; and

hydraulic jet nozzle means in communication with said pump means for discharging a high velocity flow stream of water adjacent to said means for plowing to agitate said overturned said to free said substances from the grains of sediment for flotation of said substances to the surface of said body of water.

4,840,730

CHROMATOGRAPHY SYSTEM USING HORIZONTAL FLOW COLUMNS

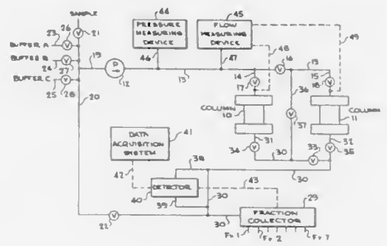
Vinit Saxena, Pinole, Calif., assignor to Sepragen Corporation, San Leandro, Calif.

Continuation of Ser. No. 889,335, Jul. 25, 1986, abandoned. This application Jun. 9, 1988, Ser. No. 207,896

The portion of the term of this patent subsequent to Dec. 9, 2003, has been disclaimed.

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—198.2 **22 Claims**



1. A low pressure chromatography system using at least one horizontal column, said system comprising:

at least one chromatographic column having a bed of separation medium located intermediate an inlet channel and an outlet channel said inlet and outlet channels being coaxially positioned with respect to each other, said column being constructed such that sample fluid passes through said bed in a horizontal direction from said inlet channel to said outlet channel,

means for directing sample fluid to said column including pump means having an outlet connected via a first fluid line to an inlet of said column, said inlet being in fluid communication with said inlet channel, and valve means mounted in said first fluid line for controlling passage of fluid therethrough,

detection means connected to said column for detecting sample fluid fractions discharged from said outlet channel of said column, and

means for controlling at least sample fluid directed into said inlet of said column and sample fluid fractions discharged from said outlet channel of said column.

4,840,731

APPARAUS FOR REDUCTION OF COD IN WATER

Morris Sheikh, 803 Canterberry Crescent, Bloomfield Hills, Mich. 48013

Division of Ser. No. 746,041, Jun. 18, 1985, Pat. No. 4,683,065. This application Jul. 22, 1987, Ser. No. 76,312

Int. Cl.[4] C02F *1/74;* **B01J** *8/04*

U.S. Cl. 210—200 **21 Claims**

1. An apparatus for reducing chemical oxygen demand (COD) levels in water comprising:

a waste water holding tank;

a plurlaity of independent, individually isolatable reactors;

catalyst contained in a fixed bed within each reactor, the catalyst, selected from the group consisting of activated alumina, Group VIIIB metals, Group IIB metals, and mixtures thereof;

means for conveying the water from the waste water hodling tank to the respective reactor;

means for conveying at least one oxygen source to the water;

means for discharging water away from each reactor;

means for discharging water from the apparatus; and

means for regenerating the spent catalyst while the catalyst remains contained within each respective reactor, the regenerating means associated with each respective reactor.

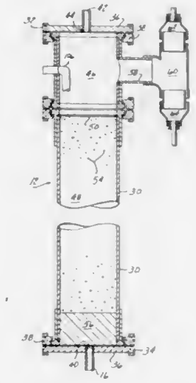
18. An apparatus for reducing levels of chemical contaminants in aqueous media comprising:

a holding tank for the aqueous media;

a plurality of independent, individually isolatable reactors capable of being in fluid communication with one another;

catalyst fixedly contained within each reactor, the catalyst selected from the group consisting of activated alumina, Group VIIIB metals, Group IIB metals and mixtures thereof;

means for conveying the aqueous media from the hodling tank to the reactor, the conveying means comprising:



(a) a main water pipe; and

(b) a plurality of main water pipe branch lines connected at a first end to the main water pipe and at a second end to the base of the associated reactor;

means for conveying at least one oxygen source to the aqueous media;

means for discharging the aqueous media from the reactor, the discharge means comprising:

(a) an exit pipe, having a first end affixed to and extending outward from the associated reactor;

(b) a divider ventricle in communication with a second end of the exit pipe, the divider ventricle having a gaseous collector dome above the junction with the exit pipe with a gaseous escape vent located therein and a liquid phase collector portion; and

(c) a return line connected to the liquid phase collector portion at a first end and connected to the main water pipe at a second end; and

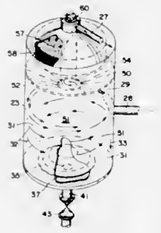
means for discharging the aqueous media from the apparatus.

4,840,732

FUEL TANK CLEANING SYSTEM

P. J. Thomas Rawlins, 216 Sena Dr., Metairie, La. 70005

Division of Ser. No. 899,071, Aug. 21, 1986, Pat. No. 4,772,401.
This application Aug. 25, 1988, Ser. No. 236,558
Int. Cl.[4] B01D *36/04*
U.S. Cl. 210—306 2 Claims



1. A vessel for separating solid contaminants and free water from contaminated fuel, the vessel comprising:

a. an annular wall portion, and top and bottom portions, together defining a vessel chamber therewithin;

b. an upper horizontal baffle member having a fluid flow bore therethrough, contained within the vessel chamber for separating the vessel chamber into a lower separator zone and an upper filtration zone;

c. inlet means for introducing contaminated fuel within the lower separator zone so that the fuel is circulated within the lower separator zone to cause larger contaminants and free water to move downward along the annular wall of the vessel chamber into a lower portion of the separator zone;

d. lower baffle means within the lower portion of the separator zone of the vessel chamber for preventing free water and contaminants that have settled within the lower portion of the separator zone from returning into an upper portion of the separator zone;

e. means within the lower portion of the separator zone of the vessel chamber for discharging the contaminants and free water that have settled therewithin;

f. a discharge line in the upper filtration zone for discharging fluid introduced into the vessel chamber;

g. a primary filter medium contained within the upper filtration zone of the vessel chamber above the upper baffle for filtering fluid being discharged from the discharge line of the vessel chamber; and

h. means within the tank portion for receiving discharged fuel from into the tank under such a velocity so as to create a turbulence of fuel, free water and contaminants within the tank.

4,840,733

FINE POROUS MEMBRANE AND PROCESS FOR PRODUCING THE SAME

Jun Sasaki; Atsushi Adachi; Kyoichi Maruo; Yukio Shinagawa, and Sumio Ohtani, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 2, 1987, Ser. No. 127,304
Claims priority, application Japan, Dec. 2, 1986, 61-285996; Dec. 2, 1986, 61-285997
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—500.41 6 Claims

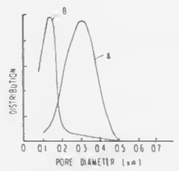
1. A fine porous membrane, comprising:

a polymer film having a top and a bottom surface defining an interior;

a plurality of pores distributed in said film in a thickness direction; and

a dense layer comprising a plurality of pores of minimum pore size located within said interior space,

means providing a ratio of the maximum pore size of the pores in the dense layer to the average pore size of the pores in the dense layer, of not more than 1.8,



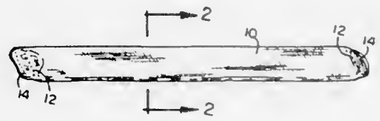
and means providing a pore size of the pores located at the bottom surface of the film of 10 to 1,000 times greater than the pore size of the pores located at the top surface of the film.

4,840,734

PROCESS FOR ABSORBING LIQUID LEAKS AND SPILLS

Edward R. Johnson, 306 Burk Ave., Ridley Park, Pa. 19078

Filed Nov. 25, 1987, Ser. No. 125,117
Int. Cl.[4] B01D *15/00*
U.S. Cl. 210—660 1 Claim



1. A method for absorbing acidic liquid leaks and spills, comprising:

contacting said acidic liquids with a product having at least one closed cell formed from an elongated tube having walls of an acid resistant fibrous material which is permeable to the acidic liquid, said tube having vermiculite in said tube as an absorbent in an amount sufficient to fill said tube to substantially restrict movement of individual vermiculite particles while permitting positioning of said tube, and end seams at both ends of said tube having inside end seams and outside end seams at both of said ends to contain said vermiculite therein;

and removing said product after a quantity of acidic liquid has been absorbed.

4,840,735

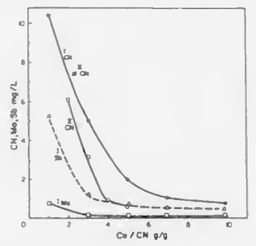
PROCESS FOR THE REMOVAL OF CYANIDE AND OTHER IMPURITIES FROM SOLUTION

Ernest Goodwin, Manitouwadge, Canada, assignor to Hemlo Gold Mines Inc., Toronto, Canada

Filed May 3, 1988, Ser. No. 189,806
Claims priority, application Canada, Jun. 23, 1987, 540430
Int. Cl.[4] C02F *1/52*
U.S. Cl. 210—721 11 Claims

1. A process for the removal of cyanide, molybdenum and antimony impurities from an aqueous solution comprising adding copper ion and ferrous ion as reagents to said solution while maintaining a pH of about 4 to 8 in said solution using lime, with a ratio of copper to cyanide in the range of 3:1 to

10:1 by weight in said solution and with a ratio of iron to copper of at least 0.3:1 by weight in said solution, forming a



precipitate including said impurities, and separating said precipitate from said aqueous solution.

4,840,736

PROCESS FOR PRODUCING COMBUSTIBLE SEWAGE SLUDGE FILTER CAKES IN FILTER PRESSES

Bruno Sander, Ludwigshafen; Herbert Lauer, Mutterstadt, and Manfred Neuwirth, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 320,681, Nov. 12, 1981, abandoned.
This application Sep. 22, 1983, Ser. No. 534,681
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1980, 3045120
Int. Cl.[4] C02F *11/14, 1/52*
U.S. Cl. 210—727 6 Claims

1. A process for producing combustible filter cakes from sewage sludges of which the sewage sludge solids contain less than 70% by weight of organic matter which comprises: concentrating the sewage sludges in the absence of lime by gravity sedimentation by adding a synthetic organic flocculant in amounts of from 0.5–2.0 kg/metric ton of sewage sludge solids from 0.5–5.0% by weight of sewage sludge solids to 6–14% by weight of sewage sludge solids; mixing the sewage sludges with finely divided coal or ash or mixtures thereof, in an amount of from 0.5 to 1.5 parts by weight per part by weight of sewage sludge solids;

treating the sewage sludges by mixing before, during or after adding finely divided coal or ash or mixtures thereof with a further amount of organic flocculants 2–8 kg/metric ton of sewage sludge solids to form flocs having high mechanical stability wherein said organic flocculants employed are mixtures, in a weight ratio of from 1:3 to 3:1 of a flocculant which is 30 to 40% by weight cationically modified and a flocculant which is 70–90% by weight cationically modified;

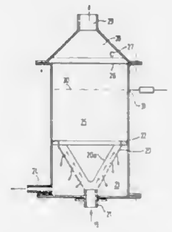
and thereafter dewatering the sewage sludges in a filter press to form sewage sludge - filter cakes which release satisfactorily for automatic ejection, have solids contents of 50–65% by weight, and which can be burnt without the addition of auxiliary fuel.

4,840,737

PROCESS FOR SEPARATING SOLID PARTICLES AND/OR LIQUID FROM A SUSPENSION AND WASH COLUMN

Percy C. Henriquez, Holten, Netherlands, assignor to Douwe Egberts Koninklijke Tabaks-fabriek-Koffiebranderijen-Theehandel N.V., Utrecht, Netherlands

Filed Feb. 24, 1987, Ser. No. 17,873
Claims priority, application Netherlands, Feb. 24, 1986, 8600461
Int. Cl.[4] B01D *23/24, 11/02*
U.S. Cl. 210—772 6 Claims



1. Process for separating solid particles from a liquid suspension and purifying or leaching solid particles in a column containing a compacted bed, which comprises the following steps:

supplying a liquid suspension to said column, while withdrawing liquid phase therefrom through a filter construction thus washing the compacted bed, the leading portion of said liquid phase forming a wash front, disintegrating the washed compacted bed and removing the product of this disintegration, the washfront in the compacted bed being moved between two extreme limits in the compacted bed, wherein introducing said liquid suspension in the column and adjusting the pressure below a maximum permissible pressure in the column, extracting an amount of liquid therefrom through said filter construction leaving a pseudo-liquid residue of solid particles, said residue accumulates and by so accumulating adopts a translatory movement in the axial direction of the column, and thereby passes through disintegration means in the column.

4,840,738

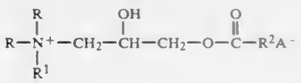
STABLE BIODEGRADABLE FABRIC SOFTENING COMPOSITIONS CONTAINING 2-HYDROXYPROPYL MONOESTER QUATERNIZED AMMONIUM SALTS

Frederick E. Hardy, Ponteland, United Kingdom, and Darlene R. Walley, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 25, 1988, Ser. No. 160,380
Int. Cl.[4] D06M *00/00*; C11D *7/08*
U.S. Cl. 252—8.6 16 Claims

1. A liquid fabric softening and antistatic composition comprising:

(a) from about 1% to about 20% by weight of submicron-sized particles of a quaternized ester-ammonium softening compound having the formula



and mixtures thereof, wherein each R substituent is independently selected from C_1–C_6 alkyl or hydropxyalkyl groups, R^1 is a C_{14}–C_{22} hydrocarbyl group, R^2 is a

C_{13}–C_{21} hydroxycarbyl group, and A— is a softener compatible anion; and

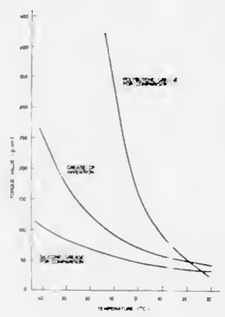
(b) from about 60% to about 98% of a liquid carrier having said softening compound particles dispersed therein; said compositions being maintained at a pH ranging from about 2.0 to about 5.0 and further being substantially free of unprotonated amines.

4,840,739

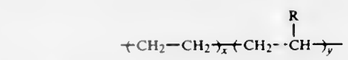
ADHESIVE GREASE COMPOSITION COMPRISING A RANDOM COPOLYMER OF ETHYLENE AND AN ALPHA-OLEFIN

Shigeru Mori, Annaka, and Takayuki Takahashi, Gunma, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan

Filed Mar. 16, 1988, Ser. No. 169,038
Claims priority, application Japan, Mar. 17, 1987, 62-60070
Int. Cl.[4] C10M *107/22*
U.S. Cl. 252—17 **11 Claims**



1. An adhesive grease composition which comprises: 100 parts by weight of a random copolymer of ethylene and an alpha-olefin having the following general formula



in which R represents an alkyl group having from 1 to 3 carbon atoms, and x and y are independently a positive integer provided that x/y=0.5 to 2.0 and x+y= 50 to 150; and

from 5 to 100 parts by weight of a thickening agent for the grease composition.

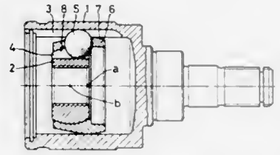
4,840,740

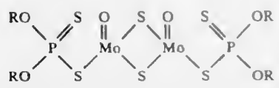
GREASE FOR HOMOKINETIC JOINT

Tasuku Sato; Kiyoshi Nakanishi; Yoshikazu Fukumura, and Keizo Nagasawa, all of Iwata, Japan, assignors to NTN Toyo Bearing Co., Ltd., Osaka, Japan

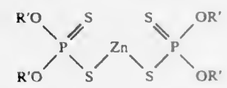
Continuation of Ser. No. 3,172, Jan. 14, 1987, abandoned. This application Aug. 17, 1988, Ser. No. 233,862
Claims priority, application Japan, Jan. 16, 1986, 61-8432; Apr. 25, 1986, 61-97615; Oct. 20, 1986, 61-250417
Int. Cl.[4] C10M *137/10, 115/08*
U.S. Cl. 252—32.7 E **8 Claims**

1. A grease for a homokinetic joint comprising a base oil, a thickening agent which is a urea compound and an organic molybdenum compound, in an amount of up to 10% by weight, selected from at least one compound from the group consisting of molybdenum dialkyl dithiocarbamate, molybdenum dialkyl dithiophosphate and molybdenum diaryl dithiophosphate of the formula:





wherein R represents a primary or secondary alkyl group or aryl group and an organic zinc compound selected from the group consisting of zinc dialkyl dithiophosphate, and zinc diaryl dithiophosphate of the formula:



wherein R' represents a primary or secondary alkyl or aryl group, in an amount of up to 15% by weight.

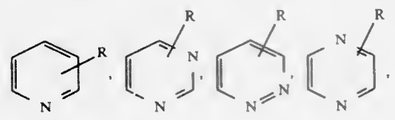
4,840,741

ASHLESS ANTI-WEAR ADDITIVES

Morton Beltzer, Westfield, N.J., and Said Jahanmir, Germantown, Md., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 851,961, Apr. 14, 1986, abandoned. This application Aug. 17, 1987, Ser. No. 85,799
Int. Cl.[4] C10M *133/40*
U.S. Cl. 252—47 **8 Claims**

1. A method for producing a lubricating oil having improved anti-wear properties, said method comprising admixing with a major amount of a basestock of lubricating viscosity from about 0.25 to about 2.0 weight percent of a compound selected from the group consisting of:



fused ring derivatives thereof and mixtures thereof, wherein R is one or more substituents selected from the group consisting of halogens, methyl cyano, cyano, isocyano, cyanato, isocyanato, thiocyanato, isothiocyanato, nitro, nitroso, formyl, acetyl, methoxy, methyl thio, thiol, disulfide, chloromethyl, dichloromethyl, trichloromethyl, chlorobromomethyl, nitromethyl, cyanomethyl and mixtures thereof.

4,840,742

SILICONE CONTAINING EMULSIONS AS BLADDER LUBRICANTS

Michael J. Hoffman, Clinton, Mich., assignor to Wacker Silicones Corporation, Adrian, Mich.

Continuation-in-part of Ser. No. 14,735, Feb. 13, 1987, abandoned. This application Nov. 6, 1987, Ser. No. 119,259
The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.
Int. Cl.[4] C10M *173/00, 155/02*
U.S. Cl. 252—49.5 **14 Claims**

1. An aqueous organopolysiloxane emulsion comprising (1) from 1 to 70 percent by weight of a hydroxyl-containing organopolysiloxane gum having a plasticity value of from 50 to 100 based on the weight of the organopolysiloxane emulsion; (2) from 0.1 to 25 percent by weight of an organohydrogenpolysiloxane fluid having a viscosity of from 5 to 100 mPa.s at 25° C., and an average of at least 2 Si-bonded hydrogen atoms per molecule, based on the weight of the organopolysiloxane emulsion; (3) from 0.05 to 40 percent by weight of a lubricant having a melting point of from 25 to 80° C., based on the organopolysiloxane emulsion; (4) from 0.1 to 20 percent by weight of mica, based on the weight of the organopolysiloxane emulsion; (5) from 2 to 12 percent by weight of a thickening agent, based on the weight of the organopolysiloxane emulsion; (6) from 1 to 10 percent by weight of a surfactant, based on the weight of the organopolysiloxane emulsion; and(7) from 10 to 90 percent by weight of water, based on the weight of the organopolysiloxane emulsion.

4,840,743

LIQUID ORGANOPOLYSILOXANE COMPOSITIONS

William Gardiner, Penarth, Wales, assignor to Dow Corning, Ltd., Barry, Wales

Filed Apr. 7, 1988, Ser. No. 179,463
Claims priority, application United Kingdom, Apr. 24, 1987, 8709745
Int. Cl.[4] C10M *105/76*
U.S. Cl. 252—49.6 **6 Claims**

1. An organopolysiloxane composition consisting essentially of (1) 100 parts by weight of a liquid polydiorganosiloxane wherein at least 70 percent of the total organic substituents are methyl groups, any remaining organic substituents being selected from the group consisting of alkyl groups having from 2 to 14 inclusive carbon atoms and phenyl groups, (2) from 0.01 to 7.5 parts by weight of an organosiloxane having at least one silicon-bonded group selected from the group consisting of anilinophenoxy and naphthylaminophenoxy groups and (3) a metal compound which is selected from the group consisting of (i) siloxy metal compounds having in the molecule at least one metal atom selected from the group consisting of titanium, zirconium and hafnium atoms attached to silicon via a TiOSi, ZrOSi or HfOSi linkage, and (ii) zirconium salts of monocarboxylic acids, there being sufficient of the metal compound present to provide from 0.001 to 0.25 part by weight of metal.

6. In an automobile fan clutch containing a viscous coupling fluid, the improvement comprising using as said coupling fluid a composition consisting essentially of (1) 100 parts by weight of a liquid polydiorganosiloxane wherein at least 70 percent of the total organic substituents are methyl groups, any remaining organic substituents being selected from the group consisting of alkyl groups having from 2 to 14 inclusive carbon atoms and phenyl groups, (2) from 0.01 to 7.5 parts by weight of an organosiloxane having at least one silicon-bonded group selected from the group consisting of anilinophenoxy and naphthylaminophenoxy groups and (3) a metal compound which is selected from the group consisting of (i) siloxy metal compounds having in the molecule at least one metal atom selected from the group consisting of titanium, zirconium and hafnium atoms attached to silicon via a TiOSi, ZrOSi or HfOSi linkage, and (ii) zirconium salts of monocarboxylic acids, there being sufficient of the metal compound present to provide from 0.001 to 0.25 part by weight of metal.

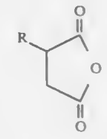
4,840,744

MODIFIED SUCCINIMIDES AND LUBRICATING OIL COMPOSITIONS CONTAINING THE SAME

Robert H. Wollenberg, San Rafael; Frank Plavac, Novato, and Timothy R. Erdman, San Rafael, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 90,187, Aug. 27, 1987, Pat. No. 4,746,446, which is a division of Ser. No. 864,166, May 16, 1986, which is a division of Ser. No. 722,939, Apr. 12, 1985, Pat. No. 4,612,132, which is a continuation-in-part of Ser. No. 632,777, Jul. 20, 1984, abandoned. This application Apr. 26, 1988, Ser. No. 186,512
Int. Cl.[4] C10M *133/44*
U.S. Cl. 252—51.5 A **43 Claims**

1. A product prepared by the process which comprises reacting (a) a polyamino alkenyl or alkyl succinimide wherein one or more of the nitrogens of the polyamino moiety is substituted with a hydroxyhydrocarbyl oxycarbonyl wherein the hydroxyhydrocarbyl group of said hydroxyhydrocarbyl oxycarbonyl contains from 2 to 20 carbon atoms and 1 to 6 hydroxy groups with the proviso that there is no hydroxy substitution on the hydrocarbyl carbon atom attaching the hydroxyhydrocarbyl group to the oxy atom of the oxycarbonyl group and with the further proviso that when more than one hydroxy group is contained in the hydroxyhydrocarbyl group, no more than one hydroxy group is attached to the same carbon atom and the number of carbon atoms in the hydroxyhydrocarbyl group is minimally one greater than the number of hydroxy groups, with (b) an alkenyl or alkyl succinic anhydride of the formula:



wherein R is alkenyl or alkyl of from 10 to 300 carbon atoms and wherein the process employs from about 0.1 to 1.5 equivalents of the alkenyl or alkyl succinic anhydride per equivalent of the modified polyamino alkenyl or alkyl succinimide of (a) above.

4,840,745

FLUID COMPOSITION

Toshiyuki Tsubouchi; Kazuaki Abe, and Hitoshi Hata, all of Sodegaura, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Nov. 20, 1987, Ser. No. 123,412
Claims priority, application Japan, Nov. 21, 1986, 61-278307
Int. Cl.[4] C10M *105/04*
U.S. Cl. 252—73 **6 Claims**

1. In a traction drive containing a tractant, the improvement which comprises using as the tractant a fluid composition which contains a cis-o-tercyclohexyl compound and a trans-o-tercyclohexyl compound at a weight ratio within the range of 25:75 to 65:35.

4,840,746

LIQUID CLEANSER COMPOSITION CONTAINING AN ABRASIVE CRYSTALLINE ALUMINOSILICATE ZEOLITE AGGREGATE

Ryozi Shiozaki, Matsudo; Atsuhiko Kaji, Ichikai; Hiroyuki Saijo, and Katsuhiko Deguchi, both of Utsunomiya, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Aug. 17, 1987, Ser. No. 86,365
Claims priority, application Japan, Sep. 3, 1986, 61-207139; Sep. 3, 1986, 61-207140
Int. Cl.[4] C09G *1/02*; C11D *3/14, 9/20, 17/08*
U.S. Cl. 252—174.25 **13 Claims**

1. A liquid cleanser composition comprising from 1 to 20

percent by weight of a synthetic, organic surfactant, from 3 to 70 percent by weight of water-insoluble, synthetic, crystalline aluminosilicate zeolite abrasive particles each composed of an aggregate of at least 30 cubic aluminosilicate zeolite crystals penetrating into each other so that each particle has many corners, said crystalline aluminosilicate zeolite abrasive particles having an average particle size of 2 to 12 microns, said particles being dispersed in a liquid carrier.

4,840,747

METHOD FOR PRODUCING A TERBIUM ACTIVATED CERIUM MAGNESIUM ALUMINATE PHOSPHOR

Albert K. Fan; Douglas R. Ginter; Joseph J. Lenox, and Thomas L. Henson, all of Towanda, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Nov. 23, 1988, Ser. No. 275,485

Int. Cl.[4] C09K *11/80*

U.S. Cl. 252—301.4 R **1 Claim**

1. A method for producing a terbium activated cerium magnesium aluminate phosphor, said method comprising:

(a) forming a uniform powder blend consisting essentially of in percent by weight from about 71 to about 74 aluminum oxide, wherein said aluminum oxide is selected from the group consisting of alpha aluminum oxide, gamma aluminum oxide, and combinations thereof, from about 12 to about 14 cerium oxide, a source of magnesium in an amount of from about 2 to about 3 magnesium, a source of fluoride in an amount of from about 0.3 to about 0.7 fluoride, and a source of terbium in an amount of from about 6 to about 9 terbium;

(b) firing said blend in a non-oxidizing atmosphere at a temperature of from about 1500° C. to about 1800° C. for a sufficient time to produce the phosphor wherein the particle size is no greater than about 5 micrometers in diameter;

(c) cooling said phosphor; and

(d) deaggmomerating the resulting cooled phosphor.

4,840,748

POLYALKANOLAMINES

Thomas J. Bellos, Kirkwood, and Eva C. Lovett, St. Louis, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 676,693, Nov. 20, 1984, Pat. No. 4,731,481, which is a division of Ser. No. 264,506, May 18, 1981, Pat. No. 4,505,839. This application Jun. 15, 1987, Ser. No. 62,290

Int. Cl.[4] B01D *17/00 1/00*

U.S. Cl. 252—344 **7 Claims**

1. A process of demulsifying an oil-in-water emulsion which comprises adding to said emulsion from about one to about 200 parts per million, based on the volume of the emulsion of a composition comprisinig polyalkanolamines which polyalkanolamines have an osmometer molecular weight of from about 325 to 525, a viscosity of about 65 to 150 SUS at 50% aqueous solution by weight at 100° F. and which do not exhibit a peak at 46.6 ppm on ^{13}C nmr spectrum in D_2O and allowing the oil and water phases to separate.

5. In a process of beneficiating solids using a froth floatation system, the improvement which comprises adding to said system from about 0.5 to about 60 parts per million of a composition comprising polyalkanolamines and salts and quaternaries thereof, which polyalkanolamines have an osmometer molecular weight of from about 325 to 525, a viscosity of about 65 to 150 SUS at 50% aqueous solution by weight at 100° F. and which do not exhibit a peak at 46.6 ppm on ^{13}C NMR spectrum in D_2O.

4,840,749

PROCESS FOR PRODUCTION OF 1-AMINOANTHRAQUINONE

Noriaki Ikeda; Noboru Sugishima; Yasushi Fujii; Shinji Ikuta; Yoshiyuki Nakanishi, all of Himeji, and Akira Inoue, Hirakata, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Jun. 16, 1987, Ser. No. 62,638

Claims priority, application Japan, Jun. 17, 1986, 61-139311; Aug. 25, 1986, 61-197083; Jan. 6, 1987, 62-110; Jan. 6, 1987, 62-111

Int. Cl.[4] C07C *97/12*

U.S. Cl. 260—378 **10 Claims**

1. A process for producing 1-aminoanthraquinone, which comprises

(a) a step of oxidizing 1-nitronaphthalene in the liquid phase with an acidic aqueous solution containing a ceric ion, except aqueous sulfuric acid solution containing ceric sulfate, as an oxidizing agent and separating crystals containing 5-nitro-1,4-naphthoquinone and the acidic aqueous solution containing a cerium ion from the resulting reaction mixture,

(b) a step of subjecting the 5-nitro-1,4-naphthoquinone obtained in step (a) to Diels-Alder reaction with 1,3-butadiene in a solvent, precipitating crystals containing the resulting 5-nitro-1,4,4a,9a-tetrahydroanthraquinone, separating them by filtration, separating and recovering the unreacted 1-nitronaphthale and the solvent in the filtrate in a separation tower, and recycling 1-nitronaphthalene to step (a) for use as the starting material and re-using the recovered solvent for the Diels-Alder reaction,

(c) a step of reducing 5-nitro-1,4,4a,9a-tetrahydroanthraquinone obtained in step (b), separating crystals containing 1-aminoanthraquinone and purifying them, and

(d) a step of electrolytically oxidizing the acidic aqueous solution containing a cerium ion separated in step (a) to convert the cerous ion in the acidic aqueous solution to a ceric ion and recycling the resulting acidic aqueous solution containing a ceric ion to step (a) for re-use as the oxidizing agent.

4,840,750

CATALYTIC PROCESS FOR THE MANUFACTURE OF ACID FLUORIDE

Serge Delavarenne, Saint Germain En Laye; Michel Fauconet, St. Avold; Michel Simon, Harnes, and Jean Sommer, Strasbourg, all of France, assignors to Societe Chimique des Charbonnages S.A., Tour Aurore, France

Filed Nov. 16, 1987, Ser. No. 121,642

Claims priority, application France, Nov. 20, 1986, 86 16143; Feb. 19, 1987, 87 02140; Jul. 24, 1987, 87 10567

Int. Cl.[4] C07C *51/58*

U.S. Cl. 260—544 A **12 Claims**

1. A catalytic process for the manufacture of acid fluoride from carbon monoxide, hydrogen fluoride, and an aliphatic hydrocarbon stream consisting essentially of at least one alkane containing 3 to 4 carbon atoms, comprising the following sequential steps:

(a) introducing at least one fluid selected from the group consisting of carbon monoxide and said hydrocarbon stream into a reactor in the presence of a superacidic catalyst system consisting essentially of hydrogen fluoride and antimony pentafluoride,

(b) if it has not already been introduced during step (a), introducing into the reactor a fluid selected from the group consisting of carbon monoxide and said hydrocarbon stream, the reactor being at a temperature not above 60° C. permitting the formation, principally, of a complex consisting of the alkyloxocarbonium cation and the anion SbF_6^-

(c) converting said complex into acid fluoride,

(d) separating said acid fluoride, and

(e) recovering said superacidic catalyst system.

4,840,751

PROCESS FOR CONTACTING GASES WITH LIQUIDS

István Kenyeres, and Lehel Koch, both of Budapest, Hungary, assignors to Innofinance Általános Innovációs Pénzintézet, Budapest, Hungary

Filed Nov. 20, 1987, Ser. No. 123,228

Claims priority, application Hungary, Nov. 28, 1986, 4943/86

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—36.1 **4 Claims**

1. A process for contacting a gas with a liquid, comprising ejecting through a nozzle the liquid to be contacted in the form of a jet, through a space containing the gas to be contacted, and through the surface of the liquid to be contacted, and blowing at least a part of the gas, or at least a part of the liquid to be contacted, or both, onto the surface of the ejected liquid as streams of gas, or of liquid, or of both, through a partially enclosed annular space having a slot or a plurality of orifices substantially surrounding and facing the jet.

4,840,752

CARBURETTOR

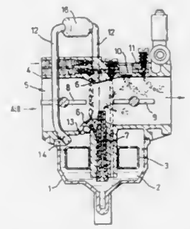
Robert D. Glen, Forest Hill, Great Britain, assignor to E.P. Barrus Limited, Oxfordshire, United Kingdom

Filed Oct. 21, 1988, Ser. No. 260,736

Claims priority, application United Kingdom, Oct. 21, 1987, 8724612

Int. Cl.[4] F02M *5/02*

U.S. Cl. 261—72.1 **5 Claims**



1. A carburettor, especially suitable for marine motors, of the type in which a supply of liquid fuel is held in a generally closed lower portion of a carburettor body, the lower portion being provided with inlets for air and outlets for fuel whereby fuel held therein is displaced in disseminated or vaporous form, into a main engine air supply passing through the upper part of the carburettor: in which an elongate duct means of capacity generally equivalent to said supply of liquid fuel is provided to communicate at each end with the said lower portion so that when the carburettor is inverted the said supply of liquid fuel drains into duct means under gravity, for re-use after like gravity drainage back into the lower portion when the carburettor is restored to its original orientation.

4,840,753

DEVICE FOR AERATING FLUIDS, IN PARTICULAR DURING FLOTATION

Andreas Jungmann, Essen, and Ulrich Reilard, Dorsten, both of Fed. Rep. of Germany, assignors to Allmineral Aufbereitungstechnik GmbH & Co. KG, Duisburg, Fed. Rep. of Germany

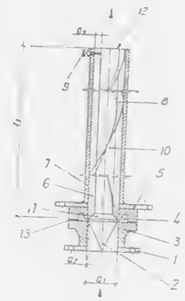
PCT No. PCT/EP87/00665, § 371 Date Jul. 21, 1988, § 102(e) Date Jul. 21, 1988, PCT Pub. No. WO88/03838, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 4, 1987, Ser. No. 238,352

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1986, 3640315

Int. Cl.[4] B01F *3/04*

U.S. Cl. 261—76 **13 Claims**



1. A device for aerating fluids and embodied as a ring injector comprising:

a housing through which said fluid, in the form of a slurry, flows, with said housing having an inlet end, an outlet end, and air discharge opening means; and

a middle piece disposed in said housing in such a way that an annular channel is formed between said middle piece and said housing, with said middle piece having an end that is remote from said outlet end of said housing and that is embodied in such a way that at this location, where said annular channel communicates with said air discharge opening means of said housing, said annular channel increased suddenly, in the direction of flow of said slurry, from its narrowest gap width, which leads to a minimum slurry speed of 2.0 m/s, to a uniform cross-sectional area having a wide gap width that remains constant to said outlet end of said housing and that provides a mixing and dispersing section, the length of which is more than twenty times said constant wider gap width.

4,840,754

METHOD OF MOLDING ARTICLES

Harry C. Morgan, Pittsburgh, Pa., assignor to Ocutech, Pittsburgh, Pa.

Filed Nov. 9, 1987, Ser. No. 118,736

Int. Cl.[4] B29D *11/00*

U.S. Cl. 264—2.2 **11 Claims**

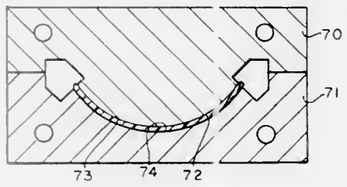
1. A method for molding an article, the method including the steps of:

providing a mold having separable molding surfaces;

loading a predetermined quantity of moldable material on at least one molding surface of the mold;

positioning the molding surfaces of the mold into a spaced apart relation to establish a meniscus of moldable material in the gap about the periphery of the moldable material;

causing said meniscus to attain a convex curvature extending outwardly of the gap between the molding surfaces; and



finalizing the molding of the moldable material to form the article while maintaining said meniscus with a convex curvature.

4,840,755

METHOD OF AND APPARATUS FOR PRODUCING COMPACTED CHOPPED STRANDS

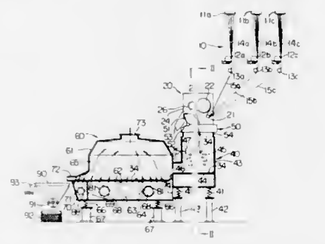
Kogi Nakazawa, and Toshihito Fujita, both of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Continuation of Ser. No. 895,587, Aug. 13, 1986, abandoned, which is a continuation of Ser. No. 647,855, Sep. 4, 1984, abandoned, which is a continuation of Ser. No. 426,199, Sep. 28, 1982, abandoned. This application Sep. 14, 1988, Ser. No. 245,932

Claims priority, application Japan, Nov. 27, 1981, 56-190162; Feb. 12, 1982, 57-20711; Mar. 19, 1982, 57-43900

Int. Cl.[4] C03B *37/01*

U.S. Cl. 264—15 **16 Claims**



1. A method of producing compacted chopped strands having a high density comprising: cutting wetted strands with a cutting blade to prepare flattened chopped strands; subjecting said flattened chopped strands in a wetted state to a spheroidizing action until the flattened chopped strands are changed into compacted rod-shaped chopped strands having substantially circular cross-section; supplying said compacted chopped strands to one end of a vibrating carrier plate provided with a multiplicity of small perforations; conveying said chopped strands in the form of flowing bed thereof toward another end of said carrier plate while vibrating said chopped strands; applying heated gas to said flowing bed of chopped strands from the lower side of said carrier plate so that said heated gas flows through said flowing bed, thereby drying said chopped strands and removing fine filaments contained in said flowing bed; recirculating said heated gas which has passed through said flowing bed to the lower side of said carrier plate; and separating fine filaments from said heated gas being recirculated.

10. An apparatus for producing compacted chopped strands having a high density comprising:

means for cutting wetted strands with a cutting blade so as to form flattened chopped strands

a rolling apparatus having an inlet for receiving wetted, flattened chopped strands; a spheroidizing means for imparting spheroidizing action to said wetted chopped strands until the flattened chopped strands are changed into compacted rod-shaped chopped strands having substantially circular cross-section; and an outlet for discharging the treated chopped strands;

drying means adapted to receive and dry said chopped strands coming from said rolling means having a casing provided at one end with an inlet for said chopped strands and at the other end an outlet for said chopped strands; a flow settling plate disposed in said casing substantially horizontally between said one end and said other end and provided with a multiplicity of small perforations, said flow settling plate dividing the space in said casing into at least one gas supplying chamber below and a gas discharging chamber above; and a vibrating means for vibrating said flow settling plate such that said chopped strands supplied through said inlet are moved toward said outlet;

means for supplying a heated gas into said gas supplying chamber so that said heated gas flows upwardly through the perforations in said perforated flow settling plate and then through said flowing bed of said chopped strands;

a gas discharging means for discharging gas from said gas discharging chamber;

a gas recirculating means for recirculating heated gas discharged from said gas discharging chamber to said gas supplying chamber; and

means provided in said gas recirculating means for separating fine filaments from said heated gas being recirculated.

4,840,756

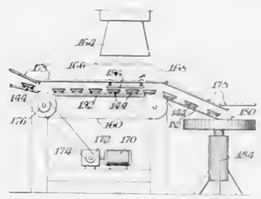
RADIATION PROCESS FOR PREPARATION OF ELECTROPHORESIS GEL MATERIAL

Richard C. Ebersole, Wilmington, and Robert P. Foss, Hockessin, both of Del., assignors to E. I. Du Pont Nemours and Company, Wilmington, Del.

Division of Ser. No. 604,586, Apr. 27, 1984, Pat. No. 4,704,198. This application Nov. 7, 1986, Ser. No. 928,154

Int. Cl.[4] C08F *2/54, 20/56;* **B29C** *35/08, 39/06*

U.S. Cl. 264—22 **13 Claims**



1. A process for preparing a thin porous gel product having a volume with length and width dimensions useful for electrophoretic separation by the steps of:

forming a water solution of a mixture of from about 3% weight/volume to about 30% weight/volume of acrylamide and/or other water soluble monomers which can undergo radical initiated polymerization and a cross-linking agent, the cross-linking agent comprising about 0.1% weight/weight to about 10% weight/weight of the total monomer.

adding a buffer to maintain pH and detergent, solutes, ampholytes or other materials to the solution which may be needed to maintain uniform electrophoretic migration.

forming the solution into the shape of the desired gel product having a uniform atomic composition throughout the volume.

subjecting the formed solution to ionizing radiation to polymerize and cross-link the monomer solutions, and

regulating the dose of ionizing radiation applied to the monomer solution to vary porosity of the resulting gel product as a function of the length and width of the gel.

4,840,757

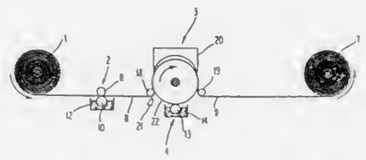
REPLICATING PROCESS FOR INTERFERENCE PATTERNS

Gary P. Blenkhorn, Cape Elizabeth, Me., assignor to S. D. Warren Company, Westbrook, Me.

Filed May 19, 1987, Ser. No. 51,891

Int. Cl.[4] B29D *17/00*

U.S. Cl. 264—22 **1 Claim**



1. In a method of forming a plastic film or sheet on or against a release sheet with a pattern, setting the film or sheet, and stripping the set film or sheet from the release sheet to leave the pattern replicated in the film or sheet, the improvement wherein the release sheet comprises a substrate having on at least one side thereof a coating of a radiation curable composition or material which has been cured by radiation, the outer surface of the coating having a light wave interfernce pattern having a peak to valley definition of or less than 7,000 angstroms formed by curing the coating in intimate contact with a replicating surface having the interference pattern.

4,840,758

METHODS OF PREPARING MOLDED THERMOPLASTIC ARTICLES WHEREIN RADIO FREQUENCY ENERGY IS UTILIZED TO HEAT THE THERMOPLASTIC MATERIAL

Agmund K. Thorsrud, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 9, 1988, Ser. No. 242,550

Int. Cl.[4] B29C *35/12, 43/00, 67/22*

U.S. Cl. 264—26 **25 Claims**

1. A method of preparing a molded thermoplastic article comprising the steps of:

(a) admixing a radio frequency energy sensitizing agent comprised of N-ethyl toluenesulfonamide with a thermoplastic polymer;

(b) applying radio frequency energy to the mixture formed in step (a) for a time sufficient to produce a moldable consistency in said mixture; and

(c) compression molding said mixture to produce a molded article therefrom.

4,840,759

ISOPENTANE AS BLOWING AGENT TO IMPROVE COFFEE RETENTION IN FOAM CUPS MOLDED FROM EXPANDABLE POLYSTYRENE

Paul E. Arch, Wayne, and Edwin H. Niemann, Downington, both of Pa., assignors to Arco Chemical Technology, Inc., Wilmington, Del.

Division of Ser. No. 184,926, Apr. 25, 1988. This application Oct. 11, 1988, Ser. No. 255,679

Int. Cl.[4] C08J *9/16, 9/18*

U.S. Cl. 264—53 **3 Claims**

1. A method for enhancing the coffee retention of molded foam cups made from vinyl aromatic polymer particles which have been impregnated with a blowing agent which method consists of adding an effective amount of isopentane as a portion of the blowing agent into the polymer particles and thereafter forming and molding said particles in the shape of a cup.

4,840,760

MANUFACTURING METHOD FOR MAGNETIC TAPE CASSETTE

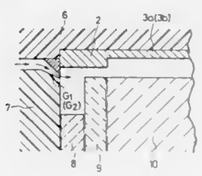
Kengo Oishi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 28, 1988, Ser. No. 149,321

Claims priority, application Japan, Jan. 28, 1987, 62-16202

Int. Cl.[4] B29C *45/04, 45/16*

U.S. Cl. 264—245 **3 Claims**



1. A method of manufacturing a magnetic tape cassette, by using a molding die comprising a fixed part and a second part including a submarine gate and a plurality of movable cores, said method comprising the steps of;

defining an initial cavity in said molding die between said fixed part and said moveable cores, said cavity having a specific size for forming a body of said cassette,

filling a molten plastic for molding said body of said cassette into said initial cavity in said molding die;

selectively moving said coles to define new cavities for at least two windows, said windows being separated by an intermediate portion of said cassette body and formed in the longitudinal direction thereof, said cavities being connected to said submarine gate; and

injecting a molten opticaliy-transmissive plastic into said new cavities in the molding die through the submarine gate in a longitudinal direction along said intermediate portion already molded from the other plastic whereby pressure of said optically-transmissive plastic is lower than flow pressure of said other plastic; and

flow of said optically-transmissive plastic is in said longitudinal direction, so that deformation of said intermediate portion due to stress is prevented during said filling of said new cavities.

4,840,761

PROCESS FOR MAKING ENCAPSULATED ANCHOR RUNG

Heinrich Zenhausern, Birmensdorferstrasse 134A CH-8902, Urdorf/Zurich, Switzerland, and Robert Weber, Oakville, Canada, assignors to Heinrich Zenhausern, Urdorf/Zurich, Switzerland

Filed Feb. 20, 1987, Ser. No. 16,870

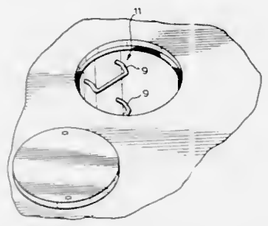
Claims priority, application Canada, Apr. 8, 1986, 506119

Int. Cl.[4] B29C *45/14*

U.S. Cl. 264—254 **5 Claims**

1. An improved method of manufacturing a climbing rung in a mould body having an ejection half and an injection half, the climbing rung having a generally U-shaped core of two parallel legs spaced apart by a central tread encapsulated in a protective coating comprising the combination in a sealing interface of a pair of pre-formed protective sleves and an injection moulded protective coating, the method comprising the steps of (a) sheathing the end of each leg in a pre-formed protective sleeve open at one end to receive the leg; (b) gripping the preformed protective sleeves with means for gripping the climbing rung only proximate the end of each leg; (c) position-

ing with the gripping means the tread and legs of the climbing rung extending only to proximate the receptive end of each pre-formed protective sleeve centrally in a disjointed injection mould cavity; (d) closing the ejection half and the injection half of the mould body so as to form the mould cavity enclosing the tread and legs of the climbing rung extending only to proximate the receptive end of each pre-formed protective sleeve, the mould body forming an annular seal at the outside



circumference of each pre-formed protective sleeve proximate the receptive end; (e) injecting a molten thermoplastic material into the mould cavity whereby the material flows into the entire mould cavity evenly coating the core of the climbing rung and weeping into the interface at the receptive end of each pre-formed sleeve and each leg, whereby the injected thermoplastic material melts with the pre-formed protective sleeves to form a sealing interface.

4,840,762

PROCESS FOR PREPARATION OF HIGH-PERFORMANCE GRADE CARBON FIBERS

Toru Sawaki; Hideharu Sasaki, both of Iwakuni; Tsutomu Nakamura, Kuga, and Jiro Sadanobu, Iwakuni, all of Japan, assignors to Teijin Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 691,624, Jan. 11, 1985, abandoned. This application Oct. 22, 1985, Ser. No. 790,102

Claims priority, application Japan, Jan. 24, 1984, 59-9454; Jul. 31, 1985, 60-167466; Jul. 31, 1985 60-167467

Int. Cl.[4] D01F *9/14*

U.S. Cl. 264—29.2 **8 Claims**

1. A process for the preparation of high-performance grade carbon fibers, which process comprises attaching a fine powder of at least one member selected from the group consisting of oxides and carbides of silicon, aluminum, titanium, and boron to a precursor fiber bundle of as-spun pitch fibers, subjecting the fiber bundle to an infusibilization treatment, and subjecting the fiber bundle to a carbonization treatment, wherein the fine powder is attached to the precursor fiber bundle in an amount of 0.1 to 3% by weight based on the weight of the fibers, such that fusion bonding of the fibers in the bundle during infusibilization is substantially prevented without degrading the strength and elongation characteristics of the resulting carbon fibers.

4,840,763

METHOD FOR THE PRODUCTION OF REINFORCED COMPOSITES

Douglas W. Freitag, Arlington, Tex., assignor to LTV Aerospace and Defense Company, Dallas, Tex.

Filed Aug. 6, 1987, Ser. No. 82,433

Int. Cl.[4] C04B *33/28*

U.S. Cl. 264—65 **41 Claims**

1. In a method for producing a whisker reinforced refractory composite, the steps comprising:

(a) forming a suspension in a carrier liquid of a mixture of particulate materials comprising a colloidal refractory matrix powder, a colloidal sintering aid and refractory reinforcing whiskers;

(b) conforming said suspension to a desired configuration and into contact with a semi-permeable membrane;

(c) retaining said suspension in said configuration while imposing a pressure on said suspension to expel liquid from said suspension through said membrane to arrive at a green composite shaped in said desired configuration and

having a density equal to at least 40% of the theoretical density of said composite;

(d) drying said green composite; and

(e) thereafter sintering said shaped dried composite under an nonoxidative atmosphere at a temperature sufficient to form an intergranular liquid phase in said composite.

4,840,764

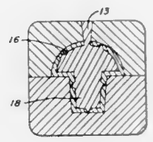
CONTROLLED WALL CASTING PROCESS

Richard F. Cummins, 941 Alabama, Lawrence, Kans. 66044

Filed Oct. 12, 1988, Ser. No. 256,633

Int. Cl.[4] B29C *39/18*

U.S. Cl. 264—102 **20 Claims**



1. A method for forming a cast replica of an article, comprising the steps of:

forming an outer mold around said article with a first molding material, said outer mold having an inner surface substantially conforming to the outer surface of said article;

separating said article from said outer mold;

applying to said outer mold on its inner surface a predetermined thickness of a second molding material which is separable from said outer mold, said second molding material defining a hollow space at the interior thereof;

filling the hollow space with a third molding material separable from said second molding material;

allowing said third molding material to cure to form an inner mold;

separating said second molding material from said outer mold and said inner mold;

locating said inner mold or a reproduction thereof within said outer mold with a space between said outer mold and said inner mold or reproduction representing said predetermined thickness;

filling the space between said inner mold or reproduction and said outer mold with a fourth molding material;

allowing said fourth molding material to cure, forming said cast replica, and separating said cast replica from said outer mold.

4,840,765

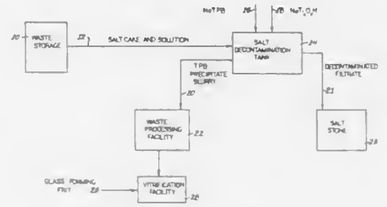
PRECIPITATE HYDROLYSIS PROCESS FOR THE REMOVAL OF ORGANIC COMPOUNDS FROM NUCLEAR WASTE SLURRIES

Joseph P. Doherty, Elkton, Md., and James C. Marek, Augusta, Ga., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 25, 1987, Ser. No. 18,389

Int. Cl.[4] G21F *9/14*

U.S. Cl. 376—310 **26 Claims**



1. A process for removing organic compounds from a radioactive waste precipitate slurry, comprising hydrolyzing said slurry with an acid in the presence of a catalytically effective amount of a copper catalyst comprising copper (II) cations and separating the resulting hydrolyzed organic compounds.

4,840,766

METHOD OF AND APPARATUS FOR CONTROLLING STEAM VENT VOLUME OF MOISTURE SEPARATOR REHEATERS

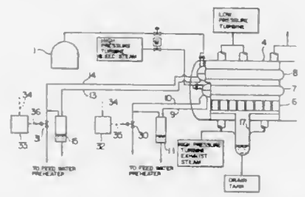
Shozo Nakamura, Hitachiota; Tokunori Mathusima, Ibaraki, and Kunio Tsuji, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 25, 1983, Ser. No. 545,242

Claims priority, application Japan, Oct. 26, 1982, 57-186871

Int. Cl.[4] G21D *3/00*

U.S. Cl. 376—378 **4 Claims**



1. A method of controlling the flow rate of steam of moisture separator reheaters of a nuclear power plant, comprising the steps of:

mounting a control valve in a steam vent line of a moisture separator reheater to effect control of the flow rate of the vent steam in conformity with the loud applied to the plant, storing information in a function generator on the functional relationship between loads applied to the plant and openings of the control valve, providing a signal to the function generator corresponding to a load applied to the plant, and providing a command signal to the control valve for adjusting the control valve opening, to thereby avoid the occurrence of an instable flow phenomenon in the entire range of loads applied to the plant.

3. In a nuclear power plant, an apparatus for controlling the flow rate of vent steam moisture separator reheaters having a drain water discharging line and a vent steam discharging line comprising:

a control valve mounted in a vent steam line of a moisture separator reheater to effect control of the flow rate of the vent steam in conformity with the load applied to the plant, and a function generator means for storing information on the functional relation between the loads applied to the plant and openings of the control valve, said function generator means producing an output signal to control the control valve.

4,840,767

METHOD OF MAKING A CATHODE FROM TUNGSTEN AND IRIDIUM POWDERS USING A BARIUM IRIDIATE FORMED FROM BARIUM PEROXIDE AND IRIDIUM OXIDE AS THE IMPREGNANT

Louis E. Branovich, Howell Township, Monmouth County; Gerard L. Freeman, Freehold Township, Monmouth County; Bernard Smith, Ocean, and Donald W. Eckart, Wall Township, Monmouth County, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 3, 1988, Ser. No. 252,945

Int. Cl.[4] G22F *3/26*

U.S. Cl. 419—27 **8 Claims**

1. Method of making a cathode for operation in microwave devices from tungsten and iridium powders using a barium iridiate formed from barium peroxide and iridium oxide as the impregnant, said method including the steps of:

(A) mixing the tungsten and iridium powders,

(B) adding about 2 percent by weight of an activator to the mixture,

(C) ball milling the mixture for about 8 hours,

(D) pressing the ball milled mixture into a billet at about 48,000 psi in a die,

(E) sintering the billet at about 1800° C. for about thirty minutes in dry hydrogen of less than −100 dewpoint,

(F) backfilling the billet with copper in dry hydrogen at about 1500° C.,

(G) machining the billet to the desired geometry,

(H) removing the copper by etching in nitric acid,

(I) thoroughly rinsing in deionized water, methanol and then drying,

(J) firing the billet in dry hydrogen at about 1400° C. for about 15 minutes,

(K) impregnating the billet with a barium iridiate formed in situ from reacting barium peroxide (BaO_2) with iridium oxide (IrO_2) by firing the billet in a dry hydrogen furnace at a temperature at which the impregnant melts for about two minutes,

(L) removing the billet from the furnace after the furnace is cooled, and

(M) removing any loose pieces of impregnant from the billet.

4,840,768

AUSTENITIC FE-CR-NI ALLOY DESIGNED FOR OIL COUNTRY TUBULAR PRODUCTS

Henry A. Domian; Dale F. LaCount, both of Alliance; Alex S. Miller, Poland, all of Ohio, and Kenneth D. Seibert, Hemet, Calif., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Nov. 14, 1988, Ser. No. 270,142

Int. Cl.[4] C22C *30/02*

U.S. Cl. 420—582 **3 Claims**

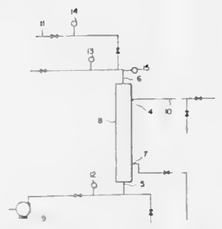
1. An austenitic alloy having high strength galling resistance, and corrosion resistance under stress consisting essentially of, in weight percent; 27–32 Ni; 24–28 Cr; 1.25–3.0 Cu; 1.0–3.0 Mo; 1.5–2.75 Si; 1.0–2.0 Mn; with no more than 0.015 N, 0.10 each of B, V and C, 0.30 Al, 0.03 P and 0.02 S; the balance being Fe and incidental impurities.

4,840,769

PROCESS FOR STERILIZING A FILTRATION DEVICE

Tatuo Nejigaki, and Yoshimi Kakutani, both of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 11, 1986, Ser. No. 850,610
Claims priority, application Japan, Apr. 18, 1985, 60-81347; Apr. 18, 1985, 60-81348; May 21, 1985, 60-107063
Int. Cl.[4] A61C 2/06
U.S. Cl. 422—26 5 Claims



1. A process for sterilizing a filtration device containing residual raw water and filtrate and having a raw water side and a filtrate side and which employs therein a hollow, fiber type filtration module comprising hollow fibers disposed in a module case, said hollow fibers having end portions which are fixed in said module case by a sealing material, said hollow fibers being made of a heat resistant polymer with a heat distortion temperature of 70° C. or higher under a load of 18.6 kg/cm^2 and containing a pore diameter of less than 0.45 μm and the sealing material having a diference in the average linear expansion coefficient between it and the material of the module case of 7×10^{-5}/°C. or lower, at a temperature of 20°–121° C., which comprises

(i) discontinuing filtration,

(ii) passing sterilizing steam from the raw water side of the module to the filtrate side thereof, after pushing out the raw water from the raw water inlet of the module and filtrate from the module, with said sterilizing steam and

(iii) preventing the filtrate side of the filtration device from developing a negative pressure by introducing a fluid selected from the group consisting of water and a sterilized gas into the filtration device from a raw water side during the natural cooling which takes place after the steam sterilization has been completed.

4,840,770

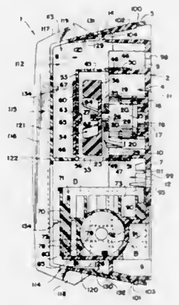
ODOR CONTROL PRODUCT DISPENSER

David K. Walz, Stone Mountain; Robert D. Howerton, Decatur, both of Ga.; Andrew W. Allen, East Jordan, Mich.; Thera C. Moss, and William H. Kenney, both of Cleveland, Tenn., assignors to SECO Industries, Inc., Cleveland, Tenn.

Filed Feb. 24, 1987, Ser. No. 17,542
Int. Cl.[4] A61L 9/12
U.S. Cl. 422—49 45 Claims

1. Odor control product dispenser apparatus comprising a cabinet including a first compartment containing a centrifugal fan and motor, a second compartment juxtaposed to said first compartment and containing a disposable container means, first and second vent means for respectively venting said first and second compartments to the atmosphere, a shroud surrounding said fan, said shroud having axial inlet openings through which air is drawn by said fan through said first vent means and radial discharge opening means through which air is forced radially outwardly by said fan into said second compartment for flow past the disposable container means in said second compartment and discharged through said second vent means, said disposable container means having a well in one end containing odor control product means, said well having an open top exposing said odor control product means to the air flowing through said second compartment, and support means within said second compartment for supporting said container means with said open top of said well facing said radial discharge opening means and in substantial axial alignment therewith, whereby substantially all of the air entering said second compartment through said radial discharge opening means flows past said odor control product means prior to being discharged through said second vent means.

12. Odor control product dispenser apparatus comprising a cabinet including a back wall having a partition extending forwardly therefrom intermediate the length of said back wall dividing said cabinet into first and second compartments, said first compartment containing a centrifugal fan and motor assembly, first and second vent means for respectively venting said first and second compartments to the atmosphere, a



shroud surrounding said fan, said shroud having axial inlet openings through which air is drawn by said fan through said first vent means and radial discharge opening means for directing substantially all of the air that is forced radially outwardly by said fan into said second compartment, support means within said second compartment for supporting odor control product means for exposure to the air flowing through said second compartment prior to discharge through said second vent means, said cabinet including an open front, and a front cover extending over said open front said first and second vent means comprising a grill on said front cover for venting said first and second compartments to the atmosphere through said grill said grill being removable from said front cover, and means on said grill and front cover providing a snap connection between said grill and front cover to permit attachment and removal of said grill without the use of any tools.

4,840,771

INCUBATOR FOR REAGENTS

Edward Williamson, Dover, and Stanley Pfeiffer, Mendham, both of N.J., assignors to Becton Dickinson & Company, Franklin Lakes, N.J.

Filed Sep. 22, 1986, Ser. No. 910,125
Int. Cl.[4] B01L 7/00, 9/00, 11/00
U.S. Cl. 422—104 13 Claims

1. An apparatus for heating at least one container, said apparatus comprising:

a housing;

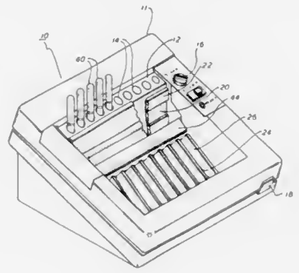
a block including a plurality of openings for holding containers;

means for pivotably securing the block to said housing, whereby the block is pivotable between an upright position in which containers are supported in the block and a downwardly inclined position in which containers spill out of the block;

drive means drivingly connected to said block to pivotably move the block from an upright position to a downwardly inclined position and back to an upright position;

heating means for heating containers in the block; and

control means for automatically actuating said drive means after a pre-set time to pivot said block to said downwardly



inclined position, whereby containers automatically spill out of the block and heating of containers is stopped without shutting down of the heating means.

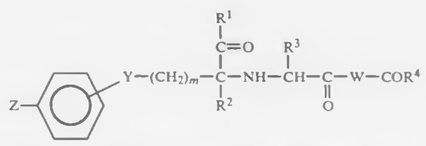
4,840,772

ANTIGLAUCOMA COMPOSITIONS AND METHODS

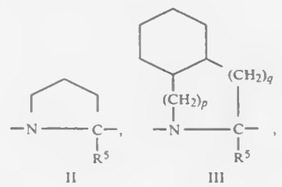
Robert Watkins, Great Meadows; Ronald J. Doll, Maplewood; Bernard R. Neustadt, West Orange; Elizabeth M. Smith; Charles V. Magatti, both of Verona, and Elijah H. Gold, West Orange, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 849,072, Apr. 4, 1986, Pat. No. 4,783,444, which is a continuation of Ser. No. 651,378, Sep. 17, 1984, Pat. No. 4,584,285, which is a continuation of Ser. No. 500,494, Jun. 2, 1983, abandoned. This application Aug. 3, 1988, Ser. No. 227,954
Int. Cl.[4] G01N 31/22
U.S. Cl. 422—61 8 Claims

4. A kit comprising in separate containers in a single package pharmaceutical compositions for use in combination to reduce intraocular pressure, which comprises in one container a pharmaceutical composition comprising an intraocular pressure reducing amount of a compound of formula I or a pharmaceutically and ophthalmologically acceptable salt thereof



in combination with an ophthalmologically acceptable carrier for topical use, wherein W is



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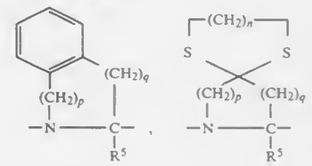


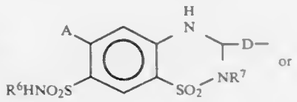
IV V

n is 0 or 1; m is 0 to 2;

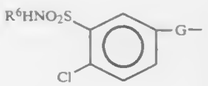
p and q are each 0, 1 or 2, provided that the sum of p and q is 1 or 2, and that in formula V, p is not 0;

Y is —CH_2—, —CH_2O—, or —CH_2S—, attached at the 2 or 4 position of phenyl group;

Z is



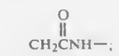
VI



VII

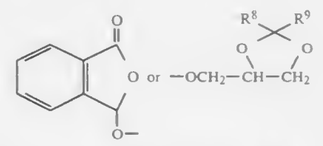
wherein A is Cl or CF_3;

D is —$(CH_2)_u$—, wherein u is 1 or 2, —CH_2O—, —CH_2S—,



G is —$CONR^7(CH_2)_r$—, or —$SO_2NR^7(CH_2)_r$—; t is 0 or 1;

R^1 and R^4 are independently hydroxy, alkoxy having from 1 to 8 carbon atoms, K—X_r—$(CH_2)_s$—O—, wherein K is phenyl, substituted phenyl, 1- or 2-naphthyl, X is oxygen or sulfur, r is 0 or 1 and s is 0 to 4, provided that when s is 0, r is 0 and wherein the substituents on the phenyl are chosen from group M, wherein M is halogen, hydroxy, trifluoromethyl, alkoxy having 1 to 6 carbon atoms, 2- and 3-furanyl, 2- and 3-thienyl, phenyl, phenyl substituted with halogen, hydroxy, trifluoromethyl, alkoxy having from 1 to 6 carbon atoms or alkyl having from 1 to 6 carbon atoms, —OCH_2OCO—alkyl wherein the alkyl has from 3 to 8 carbon atoms, —OCH_2CO—phenyl, wherein the phenyl is phenyl or phenyl substituted with group M, 1-glyceryl,



R^2, R^5, R^6 and R^9 are hydrogen or lower alkyl;

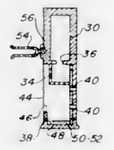
R^3 is hydrogen, lower alkyl or amino lower alkyl;

R^7 is hydrogen, lower alkyl or phenyl(lower)alkyl; and

R^8 is hydrogen, lower alkyl, phenyl, or phenyl substituted by group M; and

in a second container, a pharmaceutical composition comprising an intraocular pressure reducing amount of a beta adrenergic blocking agent in a topical ophthamologically acceptable carrier.

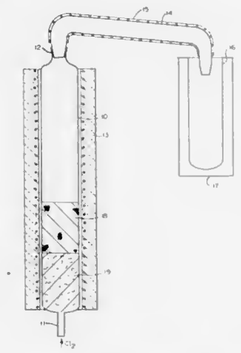
4,840,773
DEODORANT DISPENSER
Leonard Wade, 11215 Cornish St., Lynwood, Calif. 90262
Filed Aug. 5, 1988, Ser. No. 229,002
Int. Cl.[4] B60H 3/00
U.S. Cl. 422—124 12 Claims



1. A liquid scent deodorant dispenser for utilization within a forced airstream comprising:
(a) a structural body having a front, rear, sides, top, and bottom, formed of non-porous material, with sufficient integrity to confine a liquid;
(b) said body having a fill cavity with a closure therein positioned on the front;
(c) said body having a fill chamber therein in communication with said fill cavity, also an air vent emerging from said body to atmosphere, the chamber receiving liquid scent from said fill cavity allowing sufficient quantity of liquid scent to be received within the dispenser;
(d) a dispensing reservoir having an open side disposed beneath said fill chamber in the body, further having a passageway to the fill chamber such that liquid scent deodorant flows freely therebetween;
(e) an air chamber integrally formed within the body under said reservoir having a plurality of apertures through the body front and an opening in the body back allowing air to pass from the opening through the apertures;
(f) a liquid absorbing wick media, lining the air chamber and the open side of said reservoir absorbing the liquid deodorant to a point of saturation and transferring the aroma of the liquid scent to the airstream through the process of vaporization; and,
(g) mounting means connected onto said body for fastening the dispenser to convenient appurtainances in the airstream.

4,840,774
PROCESS FOR THE PRODUCTION OF ZIRCONIUM TETRACHLORIDE FROM DISSOCIATED ZIRCON
John S. Campbell, Gerrards Cross; Brian N. Baker, Pinner, and Anil Katyal, London, all of England, assignors to Tam Ceramics Inc., Niagara Falls, N.Y.
Continuation of Ser. No. 759,113, Jul. 25, 1985, abandoned. This application Jun. 26, 1987, Ser. No. 68,803
Claims priority, application United Kingdom, Aug. 1, 1984, 8419596
Int. Cl.[4] C01G 25/04
U.S. Cl. 423—79 11 Claims

1. A process for the production of zirconium tetrachloride from dissociated zircon produced by melting zircon in a furnace to form a matrix of vitreous silica containing encapsulated zirconia, which process consists essentially of passing gaseous chlorine through pellets consisting of ground dissociated zircon, carbon and a binder at a temperature in the range of from 450° to 800° C. to produce a gaseous reaction mixture containing zirconium tetrachloride which contains less than about



0.22% by weight, calculated as SiO_2, of silicon tetrachloride, and recovering the zirconium tetrachloride therefrom.

4,840,775
METHOD FOR REMOVING SODIUM AND CHLORIDE FROM COBALTIC HYDROXIDE
Eric F. Husted, Ulster, and Judith A. Ladd, Sayre, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.
Filed Oct. 13, 1987, Ser. No. 107,079
Int. Cl.[4] C01G 51/00; C22B 23/00
U.S. Cl. 423—150 5 Claims

1. A method for removing sodium and chloride from impure cobaltic hydroxide, said method comprising:
(a) firing said impure cobaltic hydroxide containing water, and the impurities of sodium and chloride at a temperature of from about 189° C. to about 850° C. to produce a dried cobaltic hydroxide;
(b) slurrying said dried cobaltic hydroxide in deionized water which contains an ionic compound wherein the concentration of said ionic compound is greater than about 0.05 molar to produce a purified cobaltic hydroxide; and
(c) removing said purified cobaltic hydroxide from the resulting liquor.

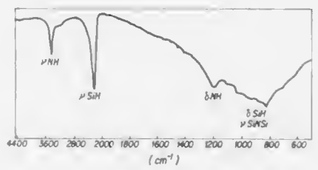
4,840,776
METHOD FOR REMOVING SODIUM AND AMMONIA FROM COBALT
Eric F. Husted, Ulster, Pa., assignor to GTE Products Corporation, Stamford, Conn.
Filed Oct. 13, 1987, Ser. No. 107,078
Int. Cl.[4] C01G 51/00; C22B 23/00
U.S. Cl. 423—150 2 Claims

1. A method for removing sodium and ammonia from cobalt, said method comprising:
(a) heating a solution of hexammine cobalt (III) chloride at a temperature of at least about 80° C.;
(b) adding sodium hydroxide to the resulting heated hexammine cobalt (III) chloride solution at a rate of addition not exceeding about 0.22 moles of sodium hydroxide per mole of cobalt per minute with the total amount of sodium hydroxide not exceeding about 1.4 times the stoichiometric amount required to form cobaltic hydroxide and allowing cobaltic hydroxide to precipitate;
(c) separating the resulting cobaltic hydroxide precipitate from the resulting mother liquor;
(d) washing said cobaltic hydroxide with hot deionized water to remove sodium so that the level of sodium in said cobaltic hydroxide is equal to or less than about 60 weight parts per million on a cobalt basis; and
(e) firing the resulting washing cobaltic hydroxide at a temperature of from about 180° C. to about 850° C. to remove any water and ammonia which may be present therefrom.

4,840,777
PROCESS FOR INHIBITING MONO AND DIETHANOLAMINE DEGRADATION
Joseph A. Faucher, Carlsbad, Calif., assignor to UOP, Des Plaines, Ill.
Continuation-in-part of Ser. No. 144,654, Jan. 12, 1988, abandoned, which is a continuation-in-part of Ser. No. 921,458, Oct. 22, 1986, abandoned. This application Oct. 4, 1988, Ser. No. 252,989
Int. Cl.[4] B01D 53/34
U.S. Cl. 423—229 2 Claims

1. A process for the purification of a gas stream containing one or more of the following impurities: H_2S, COS, CO_2 and mercaptans, comprising; (i) contacting the gas stream with an aqueous solvent solution of stabilized monoethanolamine or diethanolamine in such a manner that the impurities are absorbed into the monoethanolamine solution or diethanolamine solution to form a rich solution; (ii) regenerating the monoethanolamine or diethanolamine solvent from the rich solution so as to remove the impurities and (iii) recycling the monoethanolamine or diethanolamine solvent into the aqueous solution and feeding it back into contact with the gas stream in a closed loop and (iv) introducing methyldiethanolamine into the recirculating aqueous solvent solution in an amount from about 4 to about 25 percent by weight based on the total weight of the solution so as to inhibit degradation of the monoethanolamine or diethanolamine in solution.

4,840,778
INORGANIC POLYSILAZANE AND METHOD OF PRODUCING THE SAME
Mikiro Arai, Iruma; Takeshi Isoda, Niiza, and Takuji Itoh, Sayama, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 26, 1985, Ser. No. 801,884
Int. Cl.[4] C01B 33/00, 21/063, 33/06
U.S. Cl. 423—324 24 Claims



1. Method for producing an inorganic polysilazane having at least a skeletal structure of the formula $(-SiH_2NH-)_n$ wherein n represents a numeral of at least 15 and a molecular weight of at least 690 comprising reacting a halosilane with a base other than ammonia to form a halosilane adduct and reacting the adduct with ammonia in an unreactive solvent, said base being selected from the group consisting of tertiary amines, sterically hindering-group containing secondary amines, phosphine, stibine, arsine, trimethylphosphine, dimethylphosphine, methyldiethylphosphine, triethylphosphine, trimethylarsine, trimethylstibene, trimethylamine, triethylamine, thiophene, furan, dioxane, selenophene and 1-methylphosphole.

4,840,779
CRYSTALLINE ZEOLITE LZ-202 AND PROCESS FOR PREPARING SAME
Thomas R. Cannan, Valley Cottage, N.Y., assignor to UOP, Des Plains, Ill.
Filed Jul. 8, 1985, Ser. No. 752,555
Int. Cl.[4] C01B 33/28; C01G 23/047
U.S. Cl. 423—328 50 Claims

1. A crystalline omega-type synthetic zeolite molecular sieve, denominated LZ-202,
(a) whose stoichiometric composition expressed in moles of oxide is

$$1.0 \pm 0.5 M_{2/n}O : Al_2O_3 : xSiO_2 : yH_2O$$

wherein M represents at least one hydrogen, ammonium, alkali metal, alkaline earth, transition metal or rare earth lanthanide metal cation in oxidation state n, x has a value of from about 3 to about 20, and y has a value of from zero to about 20;
(b) having an X-ray diffraction pattern characteristic of an omega-type zeolite;
(c) whose fluorosilicate substitution product is more crystalline than that prepared from a calcined or oxidized omega-type zeolite synthesized using an organic template cation.

4,840,780
ZSM-51, METHOD OF PREPARING SAME AND CATALYTIC CONVERSION THEREWITH
Ernest W. Valyocsik, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.
Division of Ser. No. 479,522, Mar. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 438,817, Nov. 3, 1982, abandoned. This application Aug. 7, 1984, Ser. No. 638,610
Int. Cl.[4] C01B 33/28
U.S. Cl. 423—329 7 Claims

1. A method of making a synthetic zeolite having an x-ray powder diffraction pattern containing the interplanar spacing set forth in Table 1 of the specification which comprises reacting a mixture containing a source of silica, an organic template R, an alkali metal oxide, water, and alumina, said mixture having a composition, in terms of mole ratios, of oxides falling within the following ranges:

SiO_2/Al_2O_3:	15–25,000
OH^-/SiO_2:	0.005–1.0
M^+/SiO_2:	0.001–5.0
H_2O/SiO_2:	10–200
R/SiO_2:	0.01–3

wherein R is at least one organic cation selected from the group consisting of dimethylpiperidinium, trimethylene bis trimethylammonium and tetramethyl piperazinium and M is an alkali metal and maintaining said reaction mixture from about 80° C. to about 180° C. for about 2 to 10 days until said zeolite is formed.

4,840,781
PROCESS FOR PRODUCING A SILICON CARBIDE
Kaneo Noake, Minamata, Japan, assignor to Chisso Corporation, Japan
Filed Oct. 5, 1987, Ser. No. 104,156
Claims priority, application Japan, Oct. 7, 1986, 61-238829
Int. Cl.[4] C01B 31/36
U.S. Cl. 423—345 4 Claims

1. A process for producing silicon carbide which comprises subjecting an organosilicon compound expressed by the formula:

$$R^1SiR^2_3$$

wherein R^1 represents a radical selected from the group consisting of saturated aliphatic hydrocarbon radicals, unsaturated aliphatic hydrocarbon radicals and aromatic hydrocarbon radicals, each having a carbon number of 3 to 10, and R^2

represents a chlorine atom or OR^3 group wherein R^3 represents an alkyl group of 1 to 4 carbon atoms to hydrolysis to obtain a liquid hydrolyzate of said organosilicon compound having a viscosity of 50 to 5×10^5 cP at 25° C., followed by calcining said hydrolyzate in an inert gas atmosphere.

4,840,782

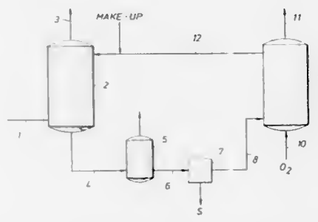
GAS TREATING PROCESS AND COMPOSITION

Dallas L. Byers, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 937,446, Dec 5, 1986, abandoned, which is a continuation of Ser. No. 790,763, Oct. 23, 1985, abandoned, which is a continuation of Ser. No. 614,363, May 29, 1984, abandoned. This application Dec. 21, 1987, Ser. No. 139,140

Int. Cl.⁴ C01B *17/05*

U.S. Cl. 423—576.6 **42 Claims**



1. A process for the removal of H_2S from a sour gaseous stream comprising

(a) contacting the sour gaseous stream in a contacting zone with an aqueous reaction solution at a temperature not greater than about 160° C., the reaction solution comprising an effective amount of vanadium V-containing ions to oxidize H_2S to elemental sulfur and being substantially free of anthraquinone disulfonate, and producing a sweet gas stream and an aqueous solution having a pH of 8–11 and containing sulfur and vanadium IV-containing ions, said reaction solution further comprising an amount of phosphate ions sufficient to provide a molar ratio of phosphate ions to vanadium IV-containing ions produced in solution of at least 0.1;

(b) removing sulfur from the aqueous solution, producing an aqueous solution having reduced sulfur content;

(c) regenerating aqueous solution having reduced sulfur content in a regenerating zone and producing regenerated reactant in said solution; and

(d) returning regenerated solution from step (c) to the contacting zone for use as aqueous reaction solution therein.

4,840,783

PROCESS FOR THE PRODUCTION OF HYDROGEN BY CATALYTIC REFORMING OF METHANOL WITH WATER VAPOR

Dang Vu Quang, Neuilly; Michel Davidson, Le Vesinet; Daniel Durand, Rueil-Malmaison, and Philippe Courty, Houilles, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

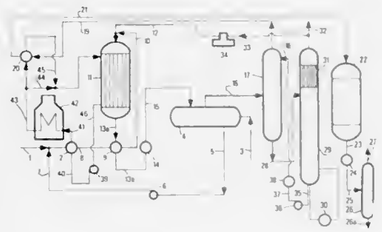
Filed Dec. 16, 1987, Ser. No. 133,843

Claims priority, application France, Dec. 16, 1986, 86 17712

Int. Cl.⁴ C01B *1/05*

U.S. Cl. 423—648.1 **19 Claims**

1. A process for the production of hydrogen by catalytic reforming of methanol with steam, said process comprising admixing methanol, H_2O and carbon dioxide to form a feed mixture and delivering said feed mixture into contact with a catalyst containing copper, in a fixed bed, in a catalytic zone, at a temperature comprised between 150° to 400° C., wherein the molar ratio of the carbon dioxide to the methanol, at the input



of the catalytic zone, is comprised between 0.01–0.14 and the water/methanol ratio is 1.1–10 moles per mole.

4,840,784

USE OF PYRYLIUM AND THIAPYRYLIUM COMPOUNDS AS BIOLOGICAL STAINS

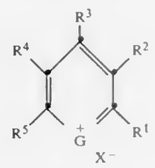
David S. Frank, Rochester, and Robert T. Belly, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 452,260, Dec. 22, 1982, Pat. No. 4,555,396. This application Aug. 9, 1985, Ser. No. 764,151

Int. Cl.⁴ G01N *1/30*; C12Q *1/04*

U.S. Cl. 424—3 **9 Claims**

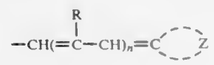
1. In a method for distinguishing cells in a biological sample by staining cells with a fluorescent dye, wherein the improvement comprises employing as the fluorescent dye a compound of the formula



wherein

G is O or S;

R^1, R^3, and R^5 are independently selected from the group consisting of hydrogen, alkyl, aryl, aralkyl, amino, styryl, bis(diaryl)vinylene, and



wherein

R is hydrogen or alkyl;

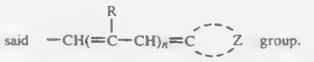
Z represents the carbon, nitrogen, oxygen, sulfur or selenium atoms necessary to complete a basic heterocyclic ring system used in cyanine dyes;

n is 0 or 1;

R^2 is hydrogen or, taken together with either R^1 or R^3, represents the elements needed to complete an aromatic or a carbocyclic ring system;

R^4 is hydrogen or, taken together with either R^3 or R^5 represent the elements needed to complete an aromatic or a carbocyclic ring system; and

X^- is an anion, provided that when both R^2 and R^4 are hydrogen, at least one of R^1, R^3 and R^5 is



said $-CH(=C-CH)_n=C$(Z) group.

4,840,785

MAMMAL INTESTINAL HORMONE PRECURSOR AND ITS USE

Guro Gafvelin, Stockholm; Mats Carlquist, Sundbyberg, and Viktor Mutt, Solna, all of Sweden, assignors to Kabigen AB, Stockholm, Sweden

PCT No. PCT/SE86/00100, § 371 Date Nov. 10, 1986, § 102(e) Date Nov. 10, 1986, PCT Pub. No. WO86/05495, PCT Pub. Date Sep. 25, 1986

PCT Filed Mar. 7, 1986, Ser. No. 934,449

Claims priority, application Sweden, Mar. 11, 1985, 8501203

Int. Cl.⁴ A61K *49/00, 37/24*; C07K *7/32*

U.S. Cl. 424—9 **15 Claims**

1. A mammal intestinal hormone precursor having the following peptide structure: His-Ser-Asp-Gly-Thr-Phe-Thr-Ser-Glu-Leu-Ser-Arg-Leu-Arg-L-M-Ala-Arg-Leu-Gln-Arg-Leu-Leu-Gln-Gly-Leu-Val-Gly-N-O, wherein L is Glu or Asp, M is Gly or Ser, and N and O are selected from Lys and Arg.

4,840,786

AEROSOL ANTIPERSPIRANT COMPOSITIONS

Philip S. Johnson, and Theresa A. Bakken, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 22, 1988, Ser. No. 171,618

Int. Cl.⁴ A01N *25/02*

U.S. Cl. 424—43 **9 Claims**

1. An aerosol antiperspirant composition comprising:

(a) from about 2% to about 10% of a hydrophobic liquid selected from the group consisting of fatty acid and fatty alcohol esters, water-insoluble ethers and alcohols, polyorganosilicones, and mixtures thereof;

(b) from about 20% to about 95% of the propellant;

(c) from about 2% to about 30% of an enhanced efficacy metallic antiperspirant material, containing at least about 30% of a high efficacy metallic species (by weight of all metallic species in said antiperspirant material);

(d) from about 0.1% to about 3.0% of a hydrophobically-treated hectorite clay;

(e) from about 0.1% to about 3.0% of a hydrophobically-treated bentonite clay; and

(f) from about 0.01% to about 0.2% of an activator selected from the group consisting of propylene carbonate, ethanol, and mixtures thereof;

wherein the level of said activator is less than

$$0.03 + 0.165 \times \frac{(d)}{(d) + (e)} .$$

4,840,787

DENTIFRICE CONTAINING A POLY(HYDROXYPROPYL ETHER) NON-IONIC SURFACTANT AND A SPECIFIED CATIONIC POLYMER

Jean F. Grollier, Paris, France, assignor to L'Oreal, Paris, France

Filed Jul. 14, 1987, Ser. No. 95,591

Claims priority, application Luxembourg, Sep. 15, 1986, 86586

Int. Cl.⁴ A61K *7/16, 7/18, 7/22*

U.S. Cl. 424—52 **11 Claims**

1. Dentifrice comprising:

(A) a poly(hydroxypropyl ether) nonionic surfactant, and

(B) a cationic polymer chosen from the group consisting of:

(i) a vinylpyrrolidone/di(C_{1-4})alkylamino(C_{2-18})-alkyl acrylate or methacrylate copolymer or a vinyl-pyrrolidone/di(C_1-C_4)alkylamino-2-hydroxypropyl acrylate or methacrylate copolymer, quaternized or non-quaternized, and

(ii) a cationic polysaccharide which is hydroxypropylated and quaternized guar gum resulting from the reaction of 2,3-epoxypropyltrimethylammonium chloride with guar gum;

wherein the poly(hydroxypropyl ether) surfactant is present in an amount of 0.1 to 4% by weight based on the total weight of the dentifrice; and

wherein the cationic polymer is present in an amount of 0.1 to 0.4% by weight based on the total weight of the dentifrice.

4,840,788

NONALCOHOLIC SUNSCREEN GEL

Vicki T. Beachell, Claymont, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Jul. 15, 1986, Ser. No. 219,589

Int. Cl.⁴ A61K *7/40, 7/42, 7/44*

U.S. Cl. 424—59 **6 Claims**

1. An ethanol free clear oil-in-water transparent gel sunscreen composition comprising an oil phase comprising an oil and an emulsifier and a water phase having dissolved therein an emollient, said oil phase having dissolved therein an effective amount of ultraviolet radiation and absorbing ingredients comprising at least one p-amino-benzoic acid compound and at least one benzophenone compound.

4,840,789

ANTIPERSPIRANT CREAMS

Thomas V. Orr, and Gerard B. Meyer, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 16, 1987, Ser. No. 109,790

Int. Cl.⁴ A61K *7/32, 7/34, 7/36, 7/38*

U.S. Cl. 424—66 **22 Claims**

1. An antiperspirant cream composition comprising:

(a) from about 30% to about 50% of a volatile silicone oil;

(b) from about 10% to about 30% of a non-volatile liquid C_{12}–C_{25} saturated or unsaturated hydrocarbon emollient having a viscosity of at least about 2 cs at 25° C. selected from the group consisting of saturated and unsaturated dodecane, saturated and unsaturated tridecane, saturated and unsaturated tetradecane, saturated and unsaturated pentadecane, saturated and unsaturated hexadecane, saturated and unsaturated heptadecane, saturated and unsaturated octadecane, saturated and unsaturated nonadecane, saturated and unsaturated eicosane, saturated and unsaturated heneicosane, saturated and unsaturated docosane, saturated and unsaturated tricosane, saturated and unsaturated tetracosane, saturated and unsaturated pentacosane, isomers of these compounds, and mixtures thereof;

(c) from about 2% to about 10% of a particulate thickening material; and

(d) from about 15% to about 45% of a particulate antiperspirant active material,

wherein said composition has a penetration force value of from about 150g to about 800g at 25° C. and at 50% relative humidity, and a total level of particulate material of from about 32% to about 40%.

4,840,790

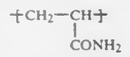
COSMETIC COMPOSITION FOR THE TREATMENT OF THE HAIR AND SCALP CONTAINING IN COMBINATION A POLY-BETA-ALANINE AND NICOTINIC ACID OR AN ESTER THEREOF

Jean-Francois Grollier, and Chantal Fourcadier, both of Paris, France, assignors to L'Oreal, Paris, France

Filed May 21, 1986, Ser. No. 865,441
Claims priority, application France, May 22, 1985, 85 07703
The portion of the term of this patent subsequent to Apr. 5, 2005, has been disclaimed.
Int. Cl.[4] A61K 7/06
U.S. Cl. 424—70 12 Claims

1. A cosmetic composition for the hair to retard the appearance of an oily aspect of the hair comprising in a cosmetically acceptable vehicle

(i) a water soluble polymer comprising 50 to 100% of units of the formula $-[CH_2-CH_2-CO-NH]-$ and from 0 to 50% of units of the formula



and

(ii) at least one nicotinic derivative selected from nicotinic acid or an ester thereof.

4,840,791

HAIR-WAVING PROCESS

Roger A. Mathews, Newbury Park; Edward R. Moore, Canoga Park, and David W. Cannell, Los Angeles, all of Calif., assignors to Redken Laboratories, Inc., Canoga Park, Calif.

Continuation of Ser. No. 577,169, Feb. 6, 1984, abandoned. This application Aug. 20, 1985, Ser. No. 767,500
Int. Cl.[4] A61K 7/09
U.S. Cl. 424—71 2 Claims

1. In a process for the permanent waving of hair in which, washed hair wound on a mandrel is subjected to the action of a reactive waving solution applied to the mandrel-wound hair, the waving solution having a pH of from 6.8 to 7.0 containing, for cleavage of the cystine bonds, glycerol monothioglycolate and the step of applying peroxide oxidizing agent to the mandrel-wound hair, after rinsing of the hair, to reform the cystine bonds, the improvement which comprises:

(a) blotting the hair after cleavage of the cystine bonds to remove reactive waving solution from the hair leaving a remainder to maintain the level of cleaved cystine bonds;

(b) applying to the blotted mandrel-wound hair a protein-flow solution and allowing the protein-flow solution to remain in contact with the hair for a period of time of from about 5 to about 10 minutes to induce protein flow in the hair to achieve a desired curl configuration, said protein-flow solution being an aqueous protein-flow solution having a pH from about 2 to about 10 and said protein-flow solution being an aqueous solution of magnesium sulfate present in concentration of about 1 to 10 percent by weight of solution of, and a water-soluble hydroxyorganic compound containing up to about 4 carbon atoms and at least one hydroxyl group present in a concentration of from 2 percent by weight up to 5 percent by weight of solution, and 0.5 to 6 percent by weight nonionic surfactant and thereafter;

(c) rinsing the protein-flow solution from the mandrel-wound hair; and

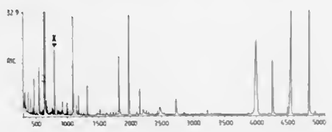
(d) applying the oxidizing agent to the mandrel-wound hair to reestablish the cystine bonds to fix the curl.

4,840,792

AGENT NEUTRALIZING BAD SMELLS FROM EXCRETIONS AND EXCREMENTS OF ANIMALS

Daniel Joulain, Grasse; Philippe Racine, Chateauneuf de Grasse, and Francoise Maire, Neuilly sur Seine, all of France, assignors to Robertet S.A., Grasse, France

PCT No. PCT/FR87/00185, § 371 Date Jan. 27, 1988, § 102(e) Date Jan. 27, 1988, PCT Pub. No. WO87/07152, PCT Pub. Date Dec. 3, 1987
PCT Filed May 27, 1987, Ser. No. 159,595
Claims priority, application France, May 29, 1986, 86 07856
Int. Cl.[4] A61L 9/01
U.S. Cl. 424—76.1 5 Claims



1. A method for neutralizing disagreeable odours from animal excretions and excrement, comprising the steps of applying to a surface having a significant odour from animal excretions or excrement an agent including a compound selected from the group consisting of C_{10} to C_{12} aliphatic alcohols, C_{10} to C_{13} aldehydes, C_{13} to C_{18} aliphatic ketones, aromatic ketones having a musk odour and up to 18 carbon atoms, C_8 to C_{15} aliphatic esters, methyl anthranilate, methyl N-methylanthranilate, p-cresyl phenylacetate, amyl salicylate, coumarin, dihydrocoumarin, gammadecalactone, dodecalactone, undecalactone, eugenol, isoeugenol, diphenyl oxide, the methyl and ethyl ethers of naphthol, galaxolide, indole and its reaction products with hydroxycitronella, tridecene-2-nitrile, and 2-(2'-methyl-pent-2'-enyl)-5-methyl pyridine, in an amount effective to neutralize disagreeable odors from said excretions or excrement, said agent having a vapour tension of less than or equal to 4 Pa at 25° C.

4,840,793

METHOD OF REDUCING TISSUE DAMAGE AT AN INFLAMMATORY SITE USING A MONOCLONAL ANTIBODY

Robert F. Todd, III; Benedict R. Lucchesi; Paul J. Simpson, all of Ann Arbor, Mich.; James D. Griffin, Sherborn, and Stuart F. Schlossman, Newton Centre, both of Mass., assignors to Dana-Farber Cancer Institute, Boston, Mass. and The University of Michigan, Ann Arbor, Mich.

Filed Jun. 11, 1987, Ser. No. 61,336
Int. Cl.[4] A61K 39/395
U.S. Cl. 424—85.8 11 Claims

1. A method of treating a human or animal host with the intent of reducing tissue damage occurring at an inflammatory site in any part of the body of the host experiencing a phagocyte-mediated inflammatory condition, said method comprising:

administering in vivo a monoclonal antibody having the binding specificity of the MY904 murine monoclonal antibody produced by the cell line A.T.C.C. No. HB 9510 which will bind specifically to an epitope expressed on the CD11b part of the CD11/CD18 glycoprotein of the Mol antigen expressed on the surface of granulocytes and other phagocytic cells and will inhibit the CD11/CD18 adhesion dependent cellular interactions of such cells reflecting their immunological inflammatory response function which contributes to such damage and yet, not interfere with the binding of iC3b.

4,840,794

MASTITIS VACCINE CONTAINING ANTIGENS FROM *S. AUREUS*

Dennis L. Watson, Armidale, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Australia

PCT No. PCT/AU86/00134, § 371 Date Jan. 12, 1987, § 102(e) Date Jan. 12, 1987, PCT Pub. No. WO86/06634, PCT Pub. Date Nov. 20, 1986
PCT Filed May 13, 1986, Ser. No. 12,060
Claims priority, application Australia, May 13, 1985, 528/85
Int. Cl.[4] A61K 37/085
U.S. Cl. 424—92 14 Claims

1. A killed vaccine effective in the immunization of ruminants against intramammary challenge by *S. aureus* and other species of the genes Staphylococcus, which comprises the antiphagocytic in vivo antigen(s) produced by the in vitro culture of a pseudocapsule—producing strain of *S. aureus* in a nutrient growth medium which is enhanced by the addition of milk or a milk component thereto.

4,840,795

PREPARATION AND METHOD FOR EFFECTING FAT AND LIPID ADSORPTION

Shmuel Ben-Sasson, Jerusalem, Israel, assignor to Rafa Laboratories, Israel

Division of Ser. No. 787,315, Oct. 15, 1985, Pat. No. 4,780,307.
This application Nov. 20, 1987, Ser. No. 123,300
Claims priority, application Israel, Oct. 23, 1984, 73921
Int. Cl.[4] A61K 33/08
U.S. Cl. 424—690 15 Claims

1. Pharmaceutical preparation for fat and lipid adsorption upon administration thereof, said preparation being in a form for oral administration and providing a fat and lipid adsorption effective amount of aluminium hydroxide having a specific surface area of at least 400 m^2 per g and having a high degree of adsorption of dietary lipids and fats while having negligible antacid activity,

said aluminium hydroxide being capable of adsorbing at least 1 g of fat per g of said aluminium hydroxide, and

said preparation being in the form of an aqueous suspension, whereby ingestion of said preparation causes excretion of dietary lipids.

9. Method of effecting fat and lipid adsorption, which comprises administering a fat and lipid adsorption effective amount of aluminium hydroxide having a specific surface area of at least 400 m^2 per g and having a high degree of adsorption of dietary lipids and fats while having negligible antacid activity, said aluminium hydroxide being capable of adsorbing at least one g of fat per g of aluminium hydroxide.

whereby said administration causes excretion of dietary lipids.

4,840,796

BLOCK COPOLYMER MATRIX FOR TRANSDERMAL DRUG RELEASE

Randall P. Sweet; Chi-long Lee, and Gerald A. Gornowicz, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 22, 1988, Ser. No. 184,748
Int. Cl.[4] A61F 13/02
U.S. Cl. 424—448 15 Claims

1. In a transdermal drug delivery system, comprising in combination:

(a) an impermeable backing member;

(b) a matrix containing a medicinally active ingredient; and,

(c) means to attach said system to the skin of a patient;

the improvement which comprises:

said matrix comprising a substantially linear thermoplastic block copolymer which is a reaction product of a polydiorganosiloxane which forms soft segments in said reaction product and a diisocyanate which forms hard segments, said copolymer having a glass transition temperature between about 45° C. and 160° C. said soft segments forming from about 80 to 99 percent by weight, based on the weight of said copolymer, said hard segments forming about 1 to 20 weight per cent, based on the weight of said copolymer, the average molecular weight of said copolymer being between about 15,000 and 500,000.

4,840,797

CONFECTIONERY OR PHARMACEUTICAL PRODUCT WITH A SUGARLESS COATING OBTAINED BY HARD COATING AND METHOD FOR ITS PREPARATION

Bernard Boursier, Violaines, France, assignor to Roquette Freres, Lestrem, France

Filed Apr. 21, 1986, Ser. No. 854,135
Claims priority, application France, Apr. 30, 1985, 85 06579
Int. Cl.[4] A23G 3/30, 7/00; A01N 25/00
U.S. Cl. 424—475 8 Claims

1. Confectionery or pharmaceutical product provided with a hard sugarless coating obtained by hard coating using a maltitol syrup having a dry matter content from 50 to 70% by weight, the said coating being essentially crystalline and comprising at least 90% by weight of maltitol.

4,840,798

ASTRINGENT GEL COMPOSITION AND METHOD FOR USE

Dennis A. Skaliotis, New Bedford, Mass., assignor to Theon, Inc., New Bedford, Mass.

Filed Jul. 27, 1988, Ser. No. 224,809
Int. Cl.[4] A61K 9/14, 9/16, 31/28
U.S. Cl. 424—488 14 Claims

1. An astringent gel composition for treating inflammatory skin conditions, erythema, chapping and skin irritations comprising a uniform mixture of:

(a) an aqueous solution of aluminum acetate containing from about 2.0 to about 7.0% by weight of aluminum, acetate,

(b) a gelling agent present at a level of from about 0.5 to about 4.0% by weight,

(c) a lower polyalkylene glycol present at a level of from about 0.5 to about 2.0% by weight,

(d) a C_2 to C_4 alkylene glycol present at a level of from about 5 to about 25% by weight, and

(e) a saturated aqueous solution of calcium sulfate,

said aluminum acetate being present in therapeutically effective amounts and said calcium sulfate being present in an amount sufficient to enhance the storage stability of the composition.

4,840,799

PROCESS FOR PREPARING RAPIDLY DISINTEGRATING GRANULATES

Curt H. Appelgren, Kungsbacka; Eva C. Eskilsson, Mölnlycke, and Jonas P. Uvdal, Gothenburg, all of Sweden, assignors to Lejus Medical Aktiebolag, Molndal, Sweden

Filed Feb. 17, 1987, Ser. No. 15,011
Claims priority, application Sweden, Feb. 14, 1986, 8600657
Int. Cl.[4] A61K 9/50
U.S. Cl. 424—493 20 Claims

1. A process for the preparation of a rapidly disintegrating core comprising a pharmaceutically active compound, said process comprising adding an emulsifier/tenside having a HLB-value corresponding to the solubility characteristics of the pharmaceutically active compound in a solution or a suspension of the pharmaceutically active compound in a water-:alcohol mixture having a weight ratio of 40–80:60–20 to form a pumpable composition, subjecting the pumpable composition to an intense treatment in an apparatus selected from the group of homogenizer, colloid mill, pearl mill, and pebble mill wherein the composition is distributed over a bed of at least one solid material having a large effective surface area and having nonbinding properties to the said pharmaceutically active compound so as to form an agglomerate, and drying the

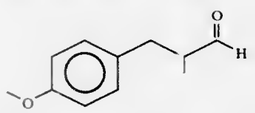
agglomerate to form a granulate having irregular or spherical form.

4,840,800
SOYBEAN FIBER IN INSECT REARING MEDIA
Robert L. Harris, 2704 Broadmoor, Bryan, Tex. 77802
Filed Nov. 16, 1987, Ser. No. 121,161
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—2 4 Claims

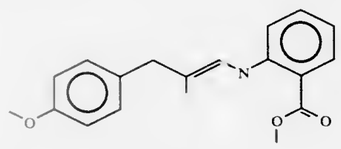
4. In an improved method of making an insect larval media manufactured by blending nutritionally balanced amounts of dry ingredients selected from group consisting of carbonaceous and/or proteinaceous ingredients, vitamin supplements, preservatives and mixtures thereof, and tableting the ingredients before adding cold water: the improvement comprising:
adding to the ingredients, prior to tableting about 65% soybean fiber by weight of the dry mixture;
whereby the media is solidified when cold water is added.

4,840,801
USE OF SCHIFF BASE REACTION PRODUCT OF METHYL ANTHRANILATE AND CANTHOXAL IN AUGMENTING OR ENHANCING AROMA OR TASTE OF FOODSTUFF OR CHEWING GUM
Braja D. Mookherjee, Holmdel; Robert W. Trenkle, Point Pleasant, both of N.J.; Nicholas Calderone, Laurel Hollow, N.Y.; Keith P. Sands, Marlboro, N.J., and Myrna L. Hagedorn, Edison, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.
Division of Ser. No. 114,247, Oct. 19, 1987, Pat. No. 4,775,720.
This application Jun. 3, 1988, Ser. No. 202,046
Int. Cl.[4] A23L *1/235*
U.S. Cl. 426—3 1 Claim

1. A process for augmenting or enhancing the aroma or taste of a foodstuff or chewing gum comprising the step of intimately admixing with said foodstuff or chewing gum from 0.02 parts per million up to about 50 parts per million by weight based on said foodstuff or chewing gum of a Schiff base reaction product produced according to the process of reacting methyl anthranilate with canthoxal having the structure:



whereby a composition of matter containing the compound having the structure:



is produced.

4,840,802
PROCESS FOR BREWING BEER WHILE ENHANCING YEAST GROWTH
Chris E. Lindberg, Milwaukee; Edward J. Kot, Delafield, and Etzer Chicoye, Milwaukee, all of Wis., assignors to Miller Brewing Company, Milwaukee, Wis.
Filed Nov. 6, 1985, Ser. No. 795,629
Int. Cl.[4] C12C *11/04, 3/00;* C12N *1/38, 1/18*
U.S. Cl. 426—16 2 Claims

1. In the method of brewing which includes fermenting a wort and adding an effective amount of zinc ions to the wort to enhance yeast growth, the improvement which comprises adding the zinc ions to the wort as ashed trub which has been prepared by heating trub to destroy the organic combustibles.

4,840,803
PROCESS AND DOUGH COMPOSITION FOR PRODUCING MULTI-TEXTURED COOKIES CONTAINING HARD FATS
Robert A. Polizzano, Teaneck, N.J., assignor to Nabisco Brands, Inc., Parsippany, N.J.
Filed Oct. 10, 1985, Ser. No. 786,088
Int. Cl.[4] A21D *13/00*
U.S. Cl. 426—94 23 Claims

1. A process for preparing a multi-textured cookie which process comprises:
mixing flour, a humectant and fat or shortening to produce a first cookie dough;
mixing flour, a sugar and fat or shortening, to produce a second cookie dough, at least about 12 percent by weight of the fat or shortening in the second cookie dough being a hard vegetable fat having a solid fat index of at least about 40 percent at 70° F., the remaining fat or shortening used in the second cookie dough having a solid fat index in the range of from about 15 to about 25 percent at 70° F.;
enrobing a portion of the first cookie dough within a portion of the second cookie dough to produce a composite dough piece; and
baking the composite dough piece to form a multi-textured cookie with a center having a soft and moist texture and a firm outer layer.

4,840,804
METHOD OF DEHYDRATING FOODS IN MELTED ERYTHRITOL
Tsutomu Kondou, Sagamihara, Japan, assignor to Mitsubishi Chemical Industries Limited and Nikken Chemicals Company, Limited, both of, Japan
Filed Apr. 12, 1988, Ser. No. 180,479
Claims priority, application Japan, Apr. 14, 1987, 62-91600
Int. Cl.[4] A23B *7/02;* A23L *1/09*
U.S. Cl. 426—103 7 Claims

1. A dehydrated food having a surface which has been at least partially immersed in erythritol at elevated temperature.

4,840,805
PROCESS FOR PREPARING STERILIZED PACKAGED FISH AND PRODUCT THEREOF
Ko Sugisawa; Yasushi Matsumura, both of Nara; Hidefumi Okamoto, Osaka, and Kumiko Abe, Nara, all of Japan, assignors to House Food Industrial Co., Ltd., Higashiosaka, Japan
Filed Apr. 7, 1987, Ser. No. 35,190
Claims priority, application Japan, Apr. 16, 1986, 61-87697
Int. Cl.[4] A23L *1/325, 3/00*
U.S. Cl. 426—129 12 Claims

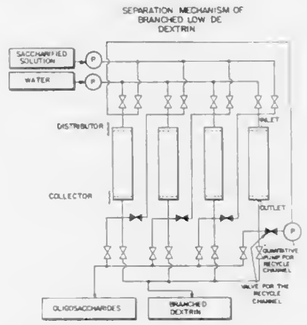
1. A packaged fish product prepared by a process comprising:
drying a fish selected from the group consisting of sardine, horse mackerel, pacific saury, mackerel, salmon, yellowtail, spanish mackerel, herring, eel, conger eel, flatfish, sea bream and pollack to a water content of 35 to 82 wt.%;

broiling the dried fish until it has a hardness ranging from 105 to 1250 g;
hermetically packaging said broiled fish; and heat sterilizing the packaged fish.

4,840,806
STORAGE STABLE TOMATO - BASED SAUCE
Roy Hyldon, Bloomington, and Usha Bhatia, St. Paul, both of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.
Continuation of Ser. No. 36,632, Apr. 10, 1987, abandoned. This application May 27, 1988, Ser. No. 201,302
Int. Cl.[4] A23L *1/272, 1/39*
U.S. Cl. 426—270 15 Claims

1. A method of preventing loss of color and flavor of a tomato-based sauce said method comprising:
(a) forming a sauce having tomato solids, on a dry basis, in an amount in excess of about 6% by weight of sauce, total water in an amount in excess of about 30% by weight of sauce and edible acid in an amount sufficient to provide a sauce pH of about 4.2 or lower.
(b) after forming said sauce, storing said sauce under frozen storage conditions.

4,840,807
BRANCHED DEXTRIN PRODUCTION AND COMPOSITIONS CONTAINING SAME
Tsukasa Yoshida; Yoshio Ishige, both of Yotsukaido; Masaki Matsudaira, and Tadashi Takahashi, both of Chiba, all of Japan, assignors to Sanmatsu Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 24, 1987, Ser. No. 88,281
Int. Cl.[4] A23L *1/00*
U.S. Cl. 426—48 6 Claims



1. A process for producing branched dextrin which process comprises the steps of:
(a) reacting alpha-amylase with starch to produce a saccharified solution composed mainly of branched dextrin containing alpha-1,6-linkages and linear oligosaccharides containing alpha-1,4-linkages, and
(b) contacting the thus obtained saccharified solution with a gel-type filtering agent thereby selectively fractionating and separating said branched dextrin substantially free of said linear oligosaccharices, said branched dextrin having a mean molecular weight of from about 800 to about 16,000.

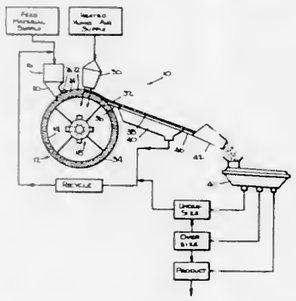
4,840,808
METHOD OF PRESERVING COLOR OF VEGETABLE PASTA PRODUCTS
Yanien Lee, Manlius; Carleton G. Merritt, Phoenix, and Nancy E. Dermody, Camillus, all of N.Y., assignors to Borden, Inc., Columbus, Ohio
Filed Sep. 23, 1987, Ser. No. 99,923
Int. Cl.[4] A23L *1/16*
U.S. Cl. 426—270 21 Claims

1. A method of preserving the color and texture of fresh green vegetable pasta comprising:
(a) subjecting fresh green vegetable matter to an aqueous alkaline solution for a period of time and at a temperature sufficient to hydrolyze or partially hydrolyze the methyl and phytyl ester groups of the chlorophyll contained in the green vegetable matter, whereby the methyl and phytyl ester groups of the chlorophyll are converted to the respective alkali salts, wherein the pH of the alkaline solution is maintained between 9.0 and 11.0 by addition of sufficient buffer and wherein the buffer comprises a cation selected from the group consisting of calcuim, sodium, potassium, magnesium. zinc, copper and aluminum;
(b) preparing a puree of the hydrolyzed vegetable matter of step (a) wherein the pH is maintained between 9.0 and 11.0;
(c) blending a mixture comprised of glutinous flour, the puree of hydrolyzed vegetable matter of step (b), and water, to form a green alimentary vegetable paste, wherein the pH of said alimentary vegetable paste is above 7.0 and below 9.0;
(d) extruding by internal pressure said green alimentary vegetable paste through holes in an extruder die having a plurality of holes, or by sheeting said green alimentary vegetable paste by pressing it between rollers; and
(e) drying extruded or sheeted green alimentary vegetable paste to produce vegetable paste which retains the green color of the vegetable matter.

4,840,809
AGGLOMERATION PROCESS
Sheng H. Hsu, Marysville, Ohio, assignor to Nestec S.A., Vevey, Switzerland
Filed Apr. 11, 1988, Ser. No. 180,226
Int. Cl.[4] A23F *5/12*
U.S. Cl. 426—285 12 Claims

1. A process for agglomerating particles of water-soluble particulate materials comprising conveying a layer of particles of water-soluble particulate material on a porous surface, directing a laminar flow of heated humid air towards the layer of particles being conveyed and applying a reduced pressure from beneath the porous surface for drawing the heated humid air to the layer of the material for contacting the heated humid air with particles of the conveyed particulate material layer for a

time sufficient for fusing particles of the layer at points of contact between the surfaces of the particles while substantially avoiding condensation of moisture in voids between the surfaces of the particles.

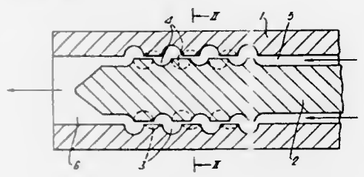


4,840,810

PROCESS FOR THE PREPARATION OF AN EDIBLE FAT-CONTAINING PRODUCT

Janos Bodor, Rijswijk; Jan van Heteren, Vlaardingen; Henricus W. Willemse, Schiedam, and Leo F. Vermaas, Lijsterlaan, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 24, 1986, Ser. No. 843,338
Claims priority, application United Kingdom, Mar. 27, 1985, 8508012; Netherlands, May 24, 1985, 8501486
Int. Cl.[4] A23D 3/00
U.S. Cl. 426—312 25 Claims



1. Process for the preparation of an edible plastified fat-containing product comprising heatexchanging a composition comprising at least 10 wt. % fat wherein the balance of the composition comprises material selected from the group consisting of water, gas, protein, additional fat, and mixtures thereof by passing the composition through a heat-exchanger comprising two closely spaced mutually displaceable surfaces, each having a pattern of cavities which overlap during movement of one surface with respect to the other, between which surfaces the composition passes, at least one of which surfaces is provided with means to control the temperature thereof, thereby substantially, simultaneously and homogeneously shearing and heating or shearing and cooling said composition to control the change in crystal structure thereof to produce said product.

4,840,811

PROCESS FOR PRODUCING COLORLESS, ODORLESS AND TASTELESS CASSIA ENDOSPERM FLOUR

Friedrich Bayerlein, Krailling; Nikolaos Keramaris, Eichenau; Nikolaus Kottmair, Gauting; Manfred Kuhn, Munich, all of Fed. Rep. of Germany, and Michel M. Maton, Vaucresson, France, assignors to Diamalt Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 25, 1987, Ser. No. 100,820
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1986, 3634645
Int. Cl.[4] A23L 1/04
U.S. Cl. 426—430 20 Claims

1. A process for producing a cassia endosperm flour which is practically colorless, odorless and tasteless and which has a high synergistic gelling property when combined with carrageenan, xanthan, polyacrylates or mixtures thereof, which comprises

(a) extracting the endosperm flour of cassia tora having characteristic color, odor and taste with an extraction liquid comprising a mixture of about 5% by weight to about 90% by weight water and an agent selected from the group consisting of alkanol, acetone and mixtures thereof, the extraction proceeding at a temperature of about 25° C. for a sufficient time to provide a flour lacking said characteristic color, odor and taste, and

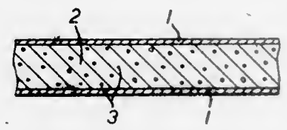
(b) drying the resulting cassia endosperm flour.

4,840,812

METHOD OF ADJUSTING THE QUALTITY OF LIQUORS

Yasunori Tominaga, Tokyo, Japan, assignor to Live International Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1987, Ser. No. 109,512
Claims priority, application Japan, Oct. 29, 1986, 61-257897
The portion of the term of this patent subsequent to Aug. 23, 2005, has been disclaimed.
Int. Cl.[4] C12G 3/08
U.S. Cl. 426—488 14 Claims



1. A method of adjusting the quality of an alcoholic liquor which comprises the step of absorbing and removing part of the odor-emitting substances and water contained therein by means of osmosis by bringing the liquor into contact with a highly osmotic substance contained between semipermeable membranes.

4,840,813

LOW AND NON-FAT FROZEN DAIRY DESSERTS AND METHOD OF PREPARATION

Norman A. Greenberg, New Hope; Ramesh C. Chandan, New Brighton; William D. Deeslie, Maple Grove, all of Minn., and Daniel D. Conolly, Berkeley, Calif., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Aug. 24, 1987, Ser. No. 88,744
Int. Cl.[4] A23G 9/02, 9/04
U.S. Cl. 426—565 31 Claims

1. A method for preparing a liquid mix useful for making an aerated milk based frozen desert of reduced fat content having the organoleptic properties of high fat ice creams, comprising the steps, in sequence of:

A. providing a sweetened milk blend mixture comprising,

(1) about 0.1% to about 9% butterfat by weight of the mixture,

(2) about 4% to about 7% by weight of the blend of casein,

(3) about 1.5% to about 4% by weight of the mixture of whey protein,

(4) about 13% to about 17% by weight of the mixture of sucrose,

(5) about 0.5% to about 2% dry weight of the mixture is ash, wherein the lactose concentration of the mixture is less than 10%, wherein the whey protein to casein ratio ranges from about 1:0.5 to 3, wherein at least a portion of the whey protein is undenatured;

B. heating the mixture at temperatures and times sufficient to provide the mixture with a whey protein denaturation ranging from about 50% to 100%;

C. cooling the mixture to a temperature ranging from 40° F. to 70° F. to form a cooled liquid dessert composition.

4,840,814

PROCESS FOR MAKING A CALCIUM ENRICHED MILK

Hidetoshi Harada, Sanitama; Satoshi Chihara, Tokyo; Yutaka Suginaka, Saitama; Shigeko Suido, Tachikawa, and Toshitaka Kobayashi, Saitama, all of Japan, assignors to Meiji Milk Products Company Limited, Tokyo, Japan

Continuation of Ser. No. 746,784, Jun. 20, 1985, abandoned. This application Jun. 20, 1987, Ser. No. 78,016
Claims priority, application Japan, Jul. 3, 1984, 59-136495
Int. Cl.[4] A23C 3/00
U.S. Cl. 426—580 6 Claims

1. A process for producing a calcium enriched milk or toned milk which does not coagulate upon boiling, comprising the steps of upwardly adjusting the pH of said milk or toned milk to above 6.7, adding calcium to said milk or toned milk in the form of a water-soluble calcium salt of an organic acid, and then lowering the pH of said milk or toned milk, wherein:

all upward adjustment of said pH is accomplished exclusively by adding an alkali metal hydroxide, carbonate or bicarbonate to said milk or toned milk;

all lowering of said pH of said milk or toned milk is accomplished exclusively by said addition of said calcium salt after said upward adjustment;

said calcium salt is added in an amount of 30–90 mg% and lowers said pH of said milk or toned milk to a value above that of said milk or toned milk prior to said upward adjustment and within a range of 6.6–7.9; and

said milk or toned milk is sterilized and cooled prior to the upwardly adjustment of the pH; and

wherein the amount of said alkali metal hydroxide carbonate or bicarbonate is such that the calcium enriched milk or toned milk does not coagulate upon a one minute boiling.

4,840,815

LOW CALORIC ALKYL GLYCOSIDE FATTY ACID POLYESTER FAT SUBSTITUTES

Richard S. Meyer; Jeffrey M. Root, both of Tacoma; Michael L. Campbell, Kent, and Daryl B. Winter, Seattle, all of Wash., assignors to Curtice-Burns, Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 49,625, May 13, 1987, abandoned. This application Nov. 18, 1987, Ser. No. 122,188
Int. Cl.[4] A23D 5/00
U.S. Cl. 426—611 7 Claims

1. A low calorie food composition comprising:

nonfat ingredients, and

fat ingredients, wherein from about 5.0% to about 95% of the fat ingredients comprises an alkyl glycoside fatty acid polyester having at least four fatty acid ester groups,

wherein the fatty acid ester groups comprise both saturated and unsaturated fatty acid ester groups, each fatty acid having from 4 to 24 carbon atoms, and

wherein the alkyl glycoside moiety comprises a saccharide portion and an alkyl portion, the alkyl portion having from 1 to 24 carbon atoms.

4,840,816

METHOD OF FABRICATING OPTICAL WAVEGUIDES BY ION IMPLANTATION DOPING

Bill R. Appleton, Oak Ridge, Tenn.; Paul R. Ashley, Toney, Ala., and Christopher J. Buchal, Juelich, Fed. Rep. of Germany, assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 24, 1987, Ser. No. 29,570
Int. Cl.[4] B05D 3/06; C23C 14/00
U.S. Cl. 427—38 8 Claims

1. A method for fabricating an optical waveguide in an oxide crystalline substrate, comprising the steps of:

providing said crystalline substrate in the form of an optical quality crystalline oxide body;

implanting a dopant into said crystalline oxide body over a selected waveguiding region by directing a beam of ions of a selected heavy metal dopant onto a patterned region defining said selected region of said crystalline oxide body at a selectec concentration and energy for a period sufficient to alter the refractive index of said crystalline oxide body to provide optical waveguiding through said patterned region while maintaining said oxide body at a low temperature sufficient to substantially prevent thermal diffusion of said copant and disloged crystal atoms within said crystalline oxide body; and

annealing said crystalline oxide body in a water saturated oxygen atmosphere at a selected temperature and period of time sufficient to induce epitaxial regrowth of the ion implanted region of said crystalline structure of said crystalline oxide body to restore crystal structure and incorporate said copant into the crystalline lattice of said oxide body.

4,840,817

METHOD FOR TREATMENT OF FIBROUS MATERIALS

Shuichi Murakami, and Yasunao Shimano, both of Ishikawa, Japan, assignors to Komatsu Seiren Co., Ltd., Ishikawa, Japan

Filed Feb. 23, 1988, Ser. No. 159,094
Int. Cl.[4] B05D 3/02
U.S. Cl. 427—45.1 9 Claims

1. A method for the treatment of fibrous materials, which comprises (A) impregnating a fibrous material with a treating agent comprising (1) a tetrakishydroxymethyl phosphonium compound or an ammonium condensate of tetrakishydroxymethyl phosphonium compound, in a concentration in the range of 20 to 80%, (2) methylolmelamine in a concentration of 2 to 30% and (3) urea, thiourea or a guanidine salt, in a concentration of 2 to 30%, (B) heating the fibrous material with high-pressure steam under a pressure in the range of 0.1 to 3 kg/cm^2 or subjecting the fibrous material to a microwave heat treatment in the presence of water vapor, and (C) drying the fibrous material.

4,840,818

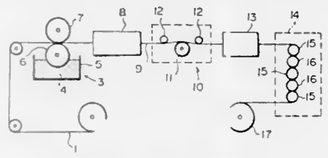
METHOD OF MAKING MAGNETIC RECORDING MEDIUM

Hiroshi Chikamasa; Masaaki Utsui, and Yasutami Nojiri, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Apr. 6, 1987, Ser. No. 34,975
Claims priority, application Japan, Apr. 4, 1986, 61-77596
Int. Cl.[4] B05D 5/12
U.S. Cl. 427—130 6 Claims

1. A method of making a magnetic recording medium by forming a recording layer composed of a ferromagnetic material on a strip-like substrate, the method of making a magnetic recording medium comprising:

(i) a first step of applying said ferromagnetic material onto the surface of said substrate,
(ii) a second step of drying said ferromagnetic material applied on the surface of said substrate,
(iii) a third step of grinding the surface of the dried recording layer on said substrate, to remove portions of said record-



ing layer protruding from said surface and create loose process grains on said surface,
(iv) a fourth step of removing the loose process grains clinging to the ground surface of said recording layer, and
(v) a fifth step of calendering the surface of said recording layer from which the loose process grains have been removed.

4,840,819

METHOD FOR PREPARING COMPOSITE MEMBRANES FOR ENHANCED GAS SEPARATION

Samuel C. Williams, Canton; Benjamin Bikson, Brookline; Joyce K. Nelson, Lexington, and Robert D. Burchesky, Norwood, all of Mass., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Apr. 8, 1987, Ser. No. 35,781
Int. Cl.[4] B05D *5/00, 7/00*
U.S. Cl. 427—245 **18 Claims**

1. In the process of preparing a composite membrane capable of selectively permeating a more readily permeable component of a gas mixture in gas separation operations and having a separation layer that determines the separation characteristics of the membrane and a porous support layer, the improvement comprising:
(a) coating the porous support layer with a wet separation layer of membrane material, said support layer containing a controlled amount of liquid in the range of from about 10% to about 90% by weight of the liquid present in said support layer in fully wet form, said liquid being a solvent or non-solvent for the material of the separation layer; and
(b) drying said separation layer on the porous support layer, the presence of said liquid in the porous support layer precluding any appreciable penetration of the membrane material into the pores of said porous support layer, the separation layer thereby being of a non-occlusive nature with enhanced permeation characteristics, and having thickness of about 0.4 microns or less,
whereby the composite membrane exhibits essentially the separation characteristics of the very thin, non-occlusive membrane layer while achieving enhanced permeation and an advantageous combination of selectivity and permeability for the desired gas separation operations.

4,840,820

ELECTROLESS NICKEL PLATING OF ALUMINUM

Paul B. Schultz, Farmington, and Eugene F. Yarkosky, Milford, both of Conn., assignors to Enthone, Incorporated, West Haven, Conn.

Continuation of Ser. No. 663,826, Oct. 23, 1984, Pat. No. 4,567,066, which is a continuation of Ser. No. 525,358, Aug. 23, 1983, abandoned. This application Oct. 15, 1985, Ser. No. 786,988
Int. Cl.[4] C23C *3/02*
U.S. Cl. 427—305 **5 Claims**

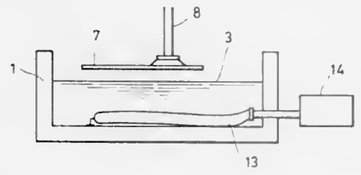
1. In a process for plating zinc or tin coated aluminum substrates with an adherent, non-blistered electroless metal coating by metal plating from a first electroless plating bath to the desired thickness, the bath being replenished as needed to maintain the desired metal concentration, and with the bath being used until the electroless metal coatings produced on the substrates are non-adherent and blistered after which the bath is discarded, the improvement whereby the lift of the bath is increased comprising:
plating a thin coating of the metal on the substrates from a second electroless metal plating bath prior to plating to the desired thickness with the first bath, both electroless metal plating baths containing a source of metal ions and a reducing agent to reduce the metal ions.

4,840,821

METHOD OF AND APPARATUS FOR FORMING FILM

Toshihiko Miyazaki; Kunihiro Sakai, both of Tokyo; Yoshinori Tomida, Yokohama; Hiroyuki Sugata, Kawasaki; Hiroshi Matsuda, Yokohama, and Yukuo Nishimura, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 864,536, May 19, 1986, abandoned. This application Feb. 11, 1988, Ser. No. 157,146
Claims priority, application Japan, May 27, 1985, 60-112066; May 27, 1985, 60-112067; May 27, 1985, 60-112069
Int. Cl.[4] B25D *1/20*
U.S. Cl. 427—430.1 **2 Claims**



1. A method of forming a Langmuir-Blodgett film on a substrate which comprises:
positioning a surface of said substrate such that it faces the surface of a first liquid on which a group of molecules is spread, said liquid contained in a reservoir; and
supplying and discharging a second liquid to said reservoir which can be distinctly separated from said first liquid so as to increase and decrease the total volume of liquid in the reservoir thereby moving up and down the surface of said first liquid over which said group of molecules is spread, wherein said liquids are in contact and immiscible with one another with each having a different viscosity and specific gravity from the other such that said liquids do not mix and such that said second liquid which is supplied to and discharged from said reservoir remains in the lower portion of said reservoir.

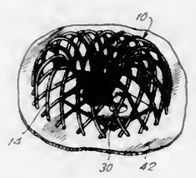
4,840,822

DECORATIVE NETTING BOW AND METHOD OF MAKING SAME

Peter S. C. Cheng, 5 Ross Street, Toronto, Ontario, Canada M5T 1Z8

Filed Jun. 2, 1988, Ser. No. 201,781
Int. Cl.[4] D04D *7/10*
U.S. Cl. 428—4 **23 Claims**

1. A bow-forming decoration, comprising:
a tubular netting having pliable, elongated strands of synthetic plastic material intersecting one another and forming an open-work pattern having open spaces, said strands being joined at their points of intersection,
said tubular netting extending longitudinally along an axis from one axial end region of the netting to an opposite axial end region thereof, said netting having a circumferentially-complete tubular central region intermediate said end regions and extending circumferentially completely about said axis,
said strands having stationary end portions at said one axial end region that are gathered in a common bunch, and



said strands having movable end portions at said opposite axial end region that are movable toward said common bunch and form a decorative bow.

4,840,823

PLASTIC FILM PACKAGING MATERIAL

Makoto Chigami; Sumio Ogihara, both of Kanagawa; Hiroshi Hoaki, Tokyo; Tomonobu Kondo, Chiba, and Masao Okamura, Kanagawa, all of Japan, assignors to Kabushiki Kaisha Frontier; Nippon Unicar Kabushiki Kaisha and Nittetsu Kougyo Kabushiki Kaisha, Japan

Filed Oct. 9, 1987, Ser. No. 106,268
Int. Cl.[4] B65D *81/24;* **B32B** *7/02;* **C08L** *23/04*
U.S. Cl. 428—35.5 **8 Claims**

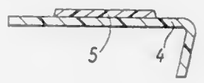
1. A plastic film packaging material comprising 100 weight parts of a polyethylene resin and, 5 to 100 weight parts of an additive comprising a silica containing naturally porous material which is hydrophillic and which has a pore diameter of 15-200 A, a specific surface area of 110 to 130 m^2/g, voids of 40 to 50% and a specific gravity of about 1.2.

4,840,824

STAIRTREAD FACINGS AND A CO-EXTRUSION METHOD FOR THEIR MANUFACTURE

Robert J. Davis, Stockport, United Kingdom, assignor to Ferodo, Inc., Manchester, England

Filed Oct. 13, 1987, Ser. No. 111,583
Claims priority, application United Kingdom, Oct. 14, 1986, 8624653
Int. Cl.[4] B32B *3/10, 5/20;* **B29C** *67/22, 47/06*
U.S. Cl. 428—67 **11 Claims**



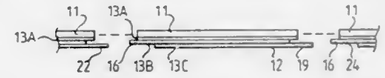
1. A stairtread facing coxtruded to provide a locating member and one or more integral strips of non-slip friction material, wherein said locating member is shaped to locate said one or more strips on a stairtread, and wherein said locating member and said one or more strips have different properties.

4,840,825

STONE TILES

Emilios Aristodimou, Colchester Mill Hotel, East Street, Colchester, Essex, CO1 2VA, England

Filed May 19, 1987, Ser. No. 51,930
Claims priority, application United Kingdom, May 21, 1986, 8612355
Int. Cl.[4] B32B *3/06*
U.S. Cl. 428—77 **6 Claims**



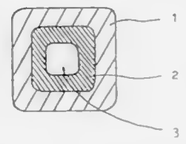
1. A tile comprising in combination:
a layer of a natural stone material and a substrate layer of essentially the same shape as said natural stone layer;
said substrate layer being adhered to a face of said stone layer and being relatively non-brittle as compared to the stone material;
first and second projecting tongues being defined by said substrate layer;
said first and second tongues projecting along two adjacent edges of the tile in a plane generally parallel to the major surface of the stone layer;
first and second grooves having complementary forms to said first and second tongues respectively and being defined by said substrate layer along respective opposed edges of the tile to receive the respective tongues of other tiles during the fixing thereof; and
a tab which projects from the substrate layer beyond the adjacent edge of said stone layer which said tab projects in the plane of the exposed substrate major surface, a corresponding groove being formed in the substrate along the opposed edge of the tile.

4,840,826

FIBER REINFORCED PLASTIC SOLID OR HOLLOW MOLDED ARTICLE

Yoshikazu Shirasaki, and Kenichi Inuzuka, both of Ohtsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed Sep. 22, 1987, Ser. No. 99,726
Claims priority, application Japan, Sep. 22, 1986, 61-224195
Int. Cl.[4] F16L *11/00*
U.S. Cl. 428—36.91 **6 Claims**



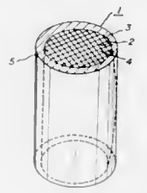
1. A fiber reinforced plastic solid or hollow molded article which comprises,
a plastic core part reinforced with inorganic fibers (A); and
a plastic sheath part reinforced with polyenthylene filaments having high tenacity (B), wherein
the volume of the fibers (A)/filaments (B) is 75/25 to 95/5 and wherein the high tenacity polyethylene filaments have a tensile strenght of at least 20 g/denier and a tinsel modulus of at least 500 g/denier.

4,840,827

CERAMIC HONEYCOMB STRUCTURAL BODIES AND METHOD OF PRODUCING THE SAME

Isao Mizutani; Toshihiko Hijikata, and Takashi Harada, all of Nagoya, Japan, assignors to NGK Insulators, Ltd., Japan

Filed Mar. 8, 1988, Ser. No. 165,464
Claims priority, application Japan, Mar. 16, 1987, 62-37125[U]
Int. Cl.[4] B32B *3/12*
U.S. Cl. 428—116 16 Claims



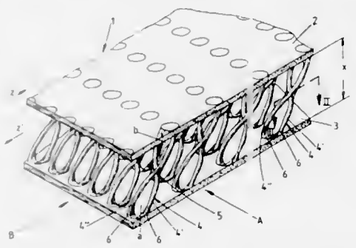
1. A ceramic honeycomb structural body having a plurality of longitudinal channels formed therein by a plurality of intersecting longitudinal partition walls, comprising an extrusion molded main ceramic honeycomb structural body having an outer diameter smaller than a predetermined dimension, and a coating layer formed on an outer periphery of said main body, so as to provide said main body with an outer diameter having a dimension within a predetermined dimensional tolerance of said predetermined dimension.

4,840,828

STRUCTURAL ELEMENT FORMED OF A RESIN-HARDENED VELOUR FABRIC AND FABRICATION METHOD

Wolfgang Böttger, Ködnitz; Kurt Biedermann, and Werner Pensel, both of Kulmbach, all of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Jul. 15, 1988, Ser. No. 219,398
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723681
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—120 11 Claims



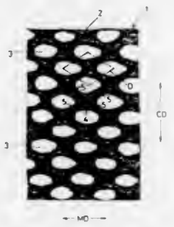
1. Structural element comprising a velour fabric formed of two generally parallel layers and intermediate ribs connected between and separating said layers, said intermediate ribs being formed of threads, said velour fabric being made of aramid fibers, carbon fibers, ceramic fibers or glass fibers, and a hardened resin impregnated within said velour fabric.

4,840,829

NONWOVEN FABRIC PATTERNED WITH APERTURES

Migaku Suzuki, Kawanoe; Satoshi Nozaki, Ehime; Shigeo Imai, Kawanoe; Makoto Ishigami, Kawanoe, and Toshio Kobayashi, Kawanoe, all of Japan, assignors to Uni-Charm Corporation, Ehime, Japan

Filed Dec. 29, 1987, Ser. No. 138,945
Claims priority, application Japan, Dec. 31, 1986, 61-312896
Int. Cl.[4] B32B *3/10*
U.S. Cl. 428—131 5 Claims



1. A nonwoven fabric that includes
a plurality of spaced apart apertures arranged in a pattern in said fabric, and
nonwoven fiber areas composed of individual fibers that are entangled together around said apertures, the improvement comprising that
(1) said apertures:
(a) being circular or elliptical in shape,
(b) each having a periphery that is definitely contoured and free of fluff,
(c) being spaced at least 1 mm from one another, and
(d) being formed solely by the action of a water jet against a web of non-woven fibers travelling over a patterned array of upstanding projections that are surrounded by water drainage openings, and
(2) said nonwoven fiber areas:
(a) having substantially no difference in thickness throughout its area,
(b) having a high fiber density and degree of entangling directly contouring each of the apertures so as to give improved strength and shape-stability,
(c) being substantially free of any fluff extending into said apertures, and
(d) having a strength requiring no addition of a binder.

4,840,830

POLYESTER FILM FOR MAGNETIC RECORDING TAPE

Seiji Sakamoto, Machida, and Kiyoshi Yasumura, Yokohama, both of Japan, assignors to Diafoil Company, Limited, Tokyo, Japan

Continuation of Ser. No. 931,871, Nov. 17, 1986, abandoned, which is a continuation of Ser. No. 821,881, Jan. 27, 1986, abandoned, which is a continuation of Ser. No. 599,332, Apr. 12, 1984, abandoned. This application Oct. 6, 1987, Ser. No. 105,977
Claims priority, application Japan, May 2, 1983, 58-77927
Int. Cl.[4] B32B *27/36*
U.S. Cl. 428—141 5 Claims

1. A polyester film, comprising 0.05–1% by weight of particles consisting essentially of calcium and phosphorus, formed by the reaction of a calcium compound, a trivalent phosphorus compound and a pentavalent phosphorus compound during polymerization, and in which the number, H_2, of the secondary interference fringes (number/mm^2) and the average center-line roughness, R_a, (μm) satisfy the following relationships:

$$H_2 < 25 \quad (1)$$

$$0.001 \leqq R_a \leqq 0.025 \quad (2)$$

$$R_a > 2 \times 10^{-4} H_2 + 0.01 \quad (3)$$

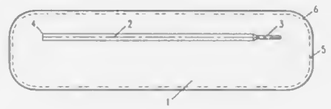
and wherein the total amount of the calcium compound is 0.3–1 mol % based on the total amount of the acid components in the polyester film, the molar ration of the phosphorus compound to the calcium compound of 0.7–3, the amount of calcium and phosphorus per particle is about 1–15% by weight, and the molar ratio of the pentavalent to the trivalent phosphorus compound is 1–20, and wherein the trivalent phosphorus compound is selected from the group consisting of phosphorus acid, trialkylesters of phosphorus acid, and partial alkylester of phosphorus acid, and the pentavalent phosphorus compound consists of a mixture of phosphoric acid and a trialkylester of phosphoric acid and a partial alkylester of phosphoric acid.

4,840,831

PACKING MATERIAL FOR RELATIVELY RIGID OBJECTS AND METHOD FOR PACKING ELECTRODES

Petrus E. G. Schraven, Wijchen, and Jan A. M. H. Jacobs, DB Druten, both of Netherlands, assignors to Smitweld B.V., Netherlands

Filed Apr. 21, 1987, Ser. No. 40,958
Claims priority, application Netherlands, Apr. 29, 1986, 8601090
Int. Cl.[4] B32B *15/08, 15/12, 29/00*
U.S. Cl. 428—152 4 Claims



1. Packaging material for relatively rigid objects, the packaging material comprising:
a creped basic layer of paper or plastic having a stretch capability of substantially 20–80 percent;
a first sheet of metal foil positioned adjacent to one face of the creped basic layer;
a first polyethylene-based adhesive layer positioned between and contiguous to the creped basic layer and the first sheet of metal foil;
a second sheet of metal foil positioned adjacent to a second face of the creped basic layer;
a second polyethylene-based adhesive layer positioned between and contiguous to the creped basic layer and the second metal foil;
a first layer of polyethylene plastic material positioned contiguous to the first metal foil sheet so that the first metal foil sheet lies between the first layer of plastic material and the first adhesive layer; and
a second layer of polyethylene plastic material positioned contiguous to the second metal foil sheet so that the second metal foil sheet lies between the second layer of plastic material and the second adhesive layer.

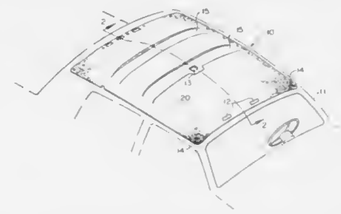
4,840,832

MOLDED AUTOMOBILE HEADLINER

Paul L. Weinle, Charlotte; Vernon C. Smith, Huntersville; Christopher H. Gardner, Charlotte; Clarence A. Peoples, Jr., Rockwell, all of N.C., and Matthew R. Pierce, Troy, Mich., assignors to Collins & Aikman Corporation, New York, N.Y.

Filed Jun. 23, 1987, Ser. No. 65,898
Int. Cl.[4] B32B *3/00, 3/26*
U.S. Cl. 428—156 25 Claims

15. A vehicle headliner adapted to be mounted adjacent a vehicle roof so as to underlie the roof and shield the same from view, and characterized by being of a highly deformable, resilient construction to facilitate installation in the vehicle and by providing excellent sound absorption properties, said headliner comprising a panel formed of a batt of polymeric fibers compressed and molded into a predetermined contoured concave shape of varying thickness, and having an elastic memory of the molded shape, the polymeric fibers of said batt comprising a blend of relatively high melting thermoplastic polymer fibers and relatively low melting potentially adhesive thermo-



plastic binder fibers forming a multiplicity of fiber-to-fiber bonds at the fiber intersections to impart to the panel self-supporting molded rigidity to allow the headliner to retain its shape in the installed condition in the vehicle yet rendering the panel highly deformable and resilient to allow it to be flexed or bent during installation and to thereafter resiliently recover to its original molded shape.

4,840,833

INK COMPOSITION AND A PRESSURE SENSITIVE REPRODUCING

Zenshiro Iijima, Abiko, Japan, assignor to Adger Kogyo Co., Ltd., Soka City, Japan

Filed Feb. 18, 1988, Ser. No. 157,253
Claims priority, application Japan, Feb. 19, 1987, 62-36406; Feb. 19, 1987, 62-36407
Int. Cl.[4] B32B *3/00*
U.S. Cl. 428—207 4 Claims

1. An ink composition comprising a fine powder of white colored water soluble alkali salt of aliphatic sulfate selected from the group consisting of lauryl sulfate, myristil sulfate, cetyl sulfate and stearil sulfate dispersed in a monohydric alcohol as a coloring matter, wherein the ratio of the monohydric alcohol to the alkali salt of aliphatic sulfate of 50–2000 parts by weight of the monohydric alcohol per 100 parts by weight of the alkali salt of aliphatic sulfate.

4,840,834

ELECTROSTATIC RECORDING MATERIAL

Yasuharu Onogi; Akinori Oka; Masakatsu Nagatomo; Takumi Kondo, and Kouji Mizumoto, all of Miyazaki, Japan, assignors to Oji Paper Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1987, Ser. No. 27,818
Claims priority, application Japan, Mar. 19, 1986, 61-61177
Int. Cl.[4] B32B *9/00*
U.S. Cl. 428—211 3 Claims

1. An electrostatic recording material which comprises a support coated in sequence with a conductive layer and a recording layer composed of a dielectric resin and a pigment, wherein the ratio of dielectric resin to pigment is in the range of from 5:5 to 8L2, and wherein at least 2 percent of the pigment component in said recording layer is made of an aluminum hydroxide powder having an average particle size of 1–20 μm.

4,840,835

HEAT-SENSITIVE TRANSFERRING RECORDING MEDIUM

Seiji Ueyama, Hirakata, and Hiroyasu Onoe, Ikoma, both of Japan, assignors to General Company Limited, Japan

Filed Jul. 29, 1985, Ser. No. 759,859
Claims priority, application Japan, Mar. 12, 1985, 60-47441
Int. Cl.[4] B41M 5/26
U.S. Cl. 428—212 6 Claims

1. A heat-sensitive transferring recording medium which comprises a substrate, a heat-sensitive releasing layer overlying the substrate, and a heat-sensitive transferring ink layer overlying the heat-sensitive releasing layer, wherein the heatsensitive releasing layer is easily melted when heated and the heat-sensitive transferring ink layer becomes cohesive when heated and has a melt viscosity that is higher than that of the heat-sensitive releasing layer.

4,840,836

STRETCHED, COMPOSITE POLYESTER FILMS USABLE PARTICULARLY FOR GRAPHIC ARTS

Marcel Eyraud, Lyons, France, assignor to Rhone-Poulenc Films, Courbevoie, France

Continuation of Ser. No. 6,544, Feb. 24, 1987, abandoned. This application Oct. 17, 1988, Ser. No. 262,172
Claims priority, application France, Apr. 15, 1985, 85 05841
Int. Cl.[4] B32B 7/02, 27/08, 27/36
U.S. Cl. 428—213 6 Claims

1. A thick, composite graphic polyester arts film with a thickness of between 40 and 300 microns, drawn, crystalline or semi-crystalline, comprising a drawn layer (A) of thickness e_1, layer (A) being essentially unfilled and being covered on at least one of its faces with a thin drawn layer (B), drawn layer (B), of thickness e_2, having an overall roughness greater than 0.3 micron and being filled with inert particles, the volume median diameter of the filler being at least equal to the thickness of the layer, wherein:

(i) the ratio of the thicknesses of the layers (B) and (A) denoted by e_2/e_1 is lower than 5%; and

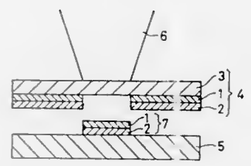
(ii) the percentage of scattered light transmitted from the composite film is lower than 7.

4,840,837

HEAT TRANSFER MEDIUM

Noriatsu Tanaka; Masami Tokunaga; Tsuyoshi Tanaka; Satoshi Koyama, and Keiichi Kikuchi, all of Kanagawa, Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1988, Ser. No. 214,067
Claims priority, application Japan, Jul. 2, 1987, 62-166180
Int. Cl.[4] B41M 5/26
U.S. Cl. 428—216 15 Claims



1. A heat transfer medium comprising a base material having thereon in order outwardly from said base material:

(a) a colorless or light color heat-fusible transfer layer (A) comprisigg from about 55 to 95 wt% of a wax an from about 5 to 45 wt% of a thermoplastic resin compatible with said wax, based on the whole amount of layer; and

(b) a heat-softenable ink layer (B) comprising from about 50 to 90 wt% of a thermoplastic resin incompatible with said wax in layer (A) and having adhesion upon heating, from about 3 to 30 wt% of a heat-fusible lubricant selected from the group consisting of a natural wax, a petroleum wax, a synthetic wax, a fatty acid, a fatty acid amide, a fatty acid ester, a fatty acid ketone, an aliphatic alcohol, a partial ester of a fatty acid and a polyhydric alcohol, a nonionic ester series active agent, a block polymer of ethylene oxide and propylene oxide, and a mixture thereof, and a coloring agent, based on the whole amount of layer (B);

the viscosity of layer (A) being from about 100 c.p. to 1,000 c.p. at a temperatrue 20° C. higher than the melting point of layer (A) shown by a differential scanning calorimeter.

4,840,838

HIGH TEMPERATURE FILTER FELT

Kurt H. Wyss, Meyrin, Switzerland, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 8, 1988, Ser. No. 270,783
Int. Cl.[4] B01D 39/08, 39/16; B32B 5/06; D04B 1/16
U.S. Cl. 428—234 4 Claims

1. A filter felt suitable for long term use at temperatures up to 300° C., comprising a supporting scrim and a batt of staple fibers entangled into the scrim,

said filter felt having a weight per square meter in the range from 400 g to 900 g; an air permeability in the range from 30 to 400 liters per square decimeter per minute at 20 mm water differential pressure; a tensile strength in the machine and cross-direction of greater than 100 Newtons per 25 mm width when measured at 25° C.; and tensile strengths of greater than 50 Newtons per 25 mm width in the machine direction and 100 Newtons per 25 mm width in the cross-direction when measure at 200° C.; an initial modulus in the machine direction greater than 125 Newtons per 25 mm width at 200° C., and an elongation of less than 20% when stressed at 50 Newtons per 25 mm width at 200° C.; an abrasion weight loss of less than 13 percent by the Martindale abrasion test after 10,000 cycles.

said supporting scrim having a weight range from 100 to 550 g per square meter, said supporting scrim comprising an intermeshed continuous filament bulked (machine direction) yarn having a linear density in the range from 1,000 to 5,000 dtex, containing from 40 to 75% by weight of glass fibers having a linear density in the range from 0.2 to 2 dtex/filament and 25 to 60% by weight of poly(tetrafluoroethylene) fibers having a linear density in the range from 3 to 10 dtex/filament, and a cross-machine direction continuous filament yarn having a linear density in the range of 150 to 5,000 dtex and selected from the class consisting of glass, aramid, poly(tetrafluoroethylene), polyacrylate, polyphenylene sulfide or blends of these fibers or the bulked yarn previously described as the machine direction yarn,

said batt of staple fibers having the weight range from about 300 to 800 g per square meter, the staple fibers of said batt having a linear density from 0.2 to 20 dtex/filament, and being selected from the class consisting of aramids, poly(-tetrafluoroethylene), polyphenylene sulfide, polyacrylates, polyketones, polyoxyketones, glass, and blends of the above.

4,840,839

THERMOPLASTIC MASS PASSED BETWEEN ROLLERS

Francisco C. Codina, Sant Just Desvern, Spain, assignor to Texsa, S.A., Barcelona, Spain

Filed Apr. 27, 1987, Ser. No. 86,291
Claims priority, application Spain, May 5, 1986, 554644
Int. Cl.[4] C08K 5/01, 3/34, 3/36; B32B 5/16
U.S. Cl. 428—240 15 Claims

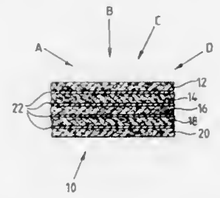
1. A thermoplastic mass comprising from about 8 to 60 percent of a highly aromatic oil having a saturate content of below 15 percent by weight, from 1 to 50 percent by weight of chlorinated polyethylene having a chlorine content lying between 20 and 95 percent by weight, and from about 20 to 90 percent by weight of a finely divided powder filler.

4,840,840

COMPOSITE MATERIAL

Nigel Flynn, and Nigel Clark, both of Bolton, England, assignors to Lantor (UK) Limited, Bolton, England

Filed Dec. 4, 1987, Ser. No. 128,901
Claims priority, application United Kingdom, Dec. 10, 1986, 8629566
Int. Cl.[4] B32B 5/16
U.S. Cl. 428—283 10 Claims



1. A composite microwave absorbent material comprising a plurality of layers of fabric, adjacent layers of said fabric being joined together, each said layer containing a comminuted conductive material, the amount of conductive material being different in successive fabric layers.

4,840,841

DISPOSABLE ONE-PIECE SEAT LINER

John J. Madsen, 138 S. 35th St., Belleville, Ill. 62223

Filed Mar. 15, 1988, Ser. No. 168,488
Int. Cl.[4] B32B 27/00; A61F 13/16
U.S. Cl. 428—286 14 Claims

1. A one-piece disposable seat liner for seats having a bottom, back, sidewalls and arms formed from a uniform layer of absorbent cellulosic fibers possessing sufficient integrity that it does not abrade during normal use bonded to a flexible moisture repellant backing sheet, said seat liner comprising a pocket formed from an upper and a lower section with the upper section sized to cover the back of the seat with the side edges folding forward along the sidewalls of the seat and the lower section sized to cover the bottom of the seat with the side edges folding upward along the arms of the seat joined by a fold line at the junction between the upper and lower sections.

4,840,842

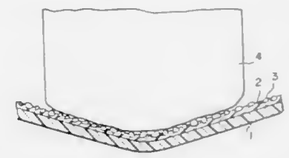
ABRASIVE TAPE

Nobutaka Yamaguchi; Masaaki Fujiyama; Masami Suzuki, and Yasuyuki Yamada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 25, 1987, Ser. No. 100,857
Claims priority, application Japan, Sep. 25, 1986, 61-226459
Int. Cl.[4] G11B 5/702
U.S. Cl. 428—323 21 Claims

1. An abrasive tape comprising a flexible substrate, and an abrasive layer overlaid on said flexible substrate by applying an abrasive coating composition containing abrasive grains and a binder onto said flexible substrate and drying the applied abrasive coating composition, wherein said binder contains a vinyl chloride resin have a $-SO_3M$ group and a number average molecular weight within the range of 15,000 to 60,000, where M represents Li, Na or K, and an epoxy group;

wherein the ratio of said epoxy group to said vinyl chloride resin is within the range of 0.1 to 10 wt % and the amount



of said vinyl chloride resin used is within the range of 15 to 50 parts to 100 parts of said abrasive grains.

4,840,843

MAGNETIC RECORDING MEDIUM

Kunihiko Sano; Makoto Nagao; Akira Nahara; Yasuo Nishikawa, and Hiroyuki Iwasaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 19, 1987, Ser. No. 109,377
Claims priority, application Japan, Oct. 17, 1986, 61-247109; Jan. 19, 1987, 62-9540; Jan. 20, 1987, 62-10179; Mar. 6, 1987, 62-51659
Int. Cl.[4] G11B 5/64
U.S. Cl. 428—336 12 Claims

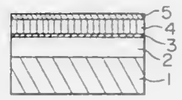
1. A magnetic recording medium comprising a non-magnetic support having provided thereon a thin magnetic metal film and a protective layer mainly comprising carbon having a graphite structure containing at least one element selected from the group consisting of Mn, Mo, Nb, Ta, Ti, V, Cr and W, wherein said at least one element is present in an amount of from 0.5 to 10 wt. % and wherein the thickness of said protective layer is from 10 to 1,000 Å.

4,840,844

MAGNETIC RECORDING MEDIUM

Masaaki Futamoto, Kanagawa; Yukio Honda, Fuchu; Shinichiro Saito, Tokyo; Takashi Nishimura, Kokubunji; Kazuetsu Yoshida, Kodaira; Toyoji Okuwaki, Tokyo; Hitoshi Iwata, Kumagaya; Hiroyuki Suzuki, Kokubunji; Kazushige Imagawa, Koganei; Hideo Daimon; Osamu Kitakami, both of Toride, and Hideo Fujiwara, Ibaraki, all of Japan, assignors to Hitachi, Ltd. and Hitachi Maxell Ltd., both of Tokyo, Japan

Filed Jun. 2, 1987, Ser. No. 56,661
Claims priority, application Japan, Jun. 2, 1986, 61-125777; Mar. 30, 1987, 62-77857
Int. Cl.[4] G11B 5/64
U.S. Cl. 428—336 18 Claims



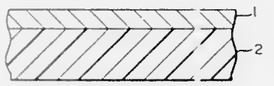
1. A magnetic recording medium which comprises a non-magnetic substrate, a magnetic film formed on the substrate and a protective film having a thickness of 50 to 2,000 Å provided on the magnetic film, the protective film containing at least one selected element selected from the group consisting of B and C as a constituent element, and the concentration of the selected element increasing throughout the protective film from the interface side with the magnetic film toward the opposite face side in a continuous manner.

4,840,845

MAGNETIC RECORDING MEDIUM HAVING PERPENDICULAR MAGNETIC ANISOTROPY

Hideki Tamai, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 4, 1987, Ser. No. 58,040
Claims priority, application Japan, Jun. 6, 1986, 61-132551
Int. Cl.[4] G11B 5/64
U.S. Cl. 428—336 15 Claims



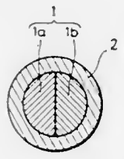
1. A magnetic recording medium having at least a first recording layer which is a source of perpendicular magnetic anisotropy and which comprises a magnetic film of an Fe-Ti or Fe-Ti-Cr alloy fabricated on a substrate, said alloy comprising:
(a) 15-21 atomic percent of Ti and the balance of Fe, or
(b) 5-21 atomic percent of Ti, 5-15 atomic percent of Cr and the balance of Fe,
to have a structure of mixed phase comprising an amorphous phase and isolated crystalline grains with bcc phase surrounded by said amorphous phase.

4,840,846

HEAT-ADHESIVE COMPOSITE FIBERS AND METHOD FOR MAKING THE SAME

Sbozo Ejima, Moriyama; Taizo Sugihara, Omihachiman, and Morio Abe, Shiga, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Sep. 10, 1987, Ser. No. 94,891
Claims priority, application Japan, Sep. 12, 1986, 61-214145
Int. Cl.[4] D02G 3/00
U.S. Cl. 428—373 7 Claims



1. A heat-adhesive composite fiber comprising a core portion and a sheath portion,
(A) said core portion being of the side-by-side type composite structure comprising two core components made of different polypropylele base polymers present in a composite ratio of 1:2 to 2:1, one of said core components having a Q value, expressed in terms of weight-average molecular weight/number-average mollecular weight, equal to or higher than 6, and the other core component having a Q value equal to or lower than 5, and
(B) said sheath portion satisfying at least the following requirements (i) and (ii);
(i) said sheath portion comprising a sheath component of a polyethylene base polymer having a melting point lower by at least 20° C. than the lower of the two melting points of said two core components;
(ii) said sheath portion covering said core portion in a proportion of 25 to 55% by weight based on the total weight of said sheath portion and said core portion.

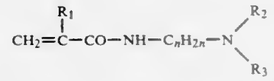
4,840,847

CONJUGATE FIBERS AND NONWOVEN MOLDING THEREOF

Tadayuki Ohmae; Tadashi Sakurai, and Kouichiro Asao, all of Chiba, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 2, 1988, Ser. No. 189,439
Claims priority, application Japan, Feb. 4, 1988, 63-25466
Int. Cl.[4] D02G 3/00
U.S. Cl. 428—373 3 Claims

1. A conjugate fiber obtained by melt spinning (A) a crystalline poly-α-olefin and (B) an ethylene copolymer containing from 40 to 95% by weight of an ethylene unit and from 5 to 60% by weight of at least one dialkylaminoalkylacrylamide comonomer unit represented by formula (I):



(I)

wherein R_1 represents a hydrogen atom or a methyl group; R_2 and R_3 each represents an alkyl group having from 1 to 4 carbon atoms; and n represents an integer of from 2 to 5, said ethylene copolymer having a melt index of from 10 to 1000 g/10 min as measured according to JIS K-6760, either by aligning the components (A) and (B) in parallel or by aligning the component (A) as a core and the component (B) as a sheath.

4,840,848

THERMAL TRANSFER RECORDING MEDIUM

Kunihiro Koshizuka, and Takao Abe, both of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jan. 20, 1988, Ser. No. 146,243
Claims priority, application Japan, Jan. 27, 1987, 62-16870
Int. Cl.[4] B41M 5/00
U.S. Cl. 428—413 15 Claims

1. A thermal transfer recording medium having a thermal transfer colorant layer provided on a support, and wherein said thermal transfer colorant layer contains a colorant, a polyoxyethylene type compound having a moiety represented by the following formula in the molecule:

$$-(CH_2CH_2O)_n-$$

wherein n is an integer of at least 2; and
at least one modified silicon compound selected from the group consisting of an alkyl-modified silicon compound, a polyether-modified silicone compound, an amino-modified silicon compound, an alcohol modified silicone compound, a mercapto-modified silicone compound, a carboxyl-modified silicone compound and an epoxy-modified silicone compound.

4,840,849

LAMINATED ARTICLE FROM MOLDING COMPOSITIONS OF A CHLOROSULFONATED POLYOLEFIN AND A FLUORINE-CONTAINING ELASTOMER

Yukihiko Harada; Tatsushi Nakagawa; Junichiro Kaneseka, and Yousuke Kaneshige, all of Yamaguchi, Japan, assignors to Tosoh Corporation, Japan

Filed Aug. 20, 1987, Ser. No. 87,189
Claims priority, application Japan, Aug. 20, 1986, 61-192787
Int. Cl.[4] B32B 27/06, 27/00; C08L 23/16
U.S. Cl. 428—419 4 Claims

1. A laminated article obtained by molding a chlorosulfonated polyolefin composition and a fluorine-containing elastomer composition, wherein said chlorosulfonated polyolefin composition contains (a) a lead compound present in an amount of from 2 to 100 parts by weight based on 100 parts by weight of the chlorosulfonated polyolefin composition, and (b) a peroxide present in an amount of from 0.5 to 20 parts by weight based on 100 parts by weight of the chlorosulfonated polyolefin composition, and wherein said chlorosulfonated polyolefin contains from 10 to 60 wt % of chlorine and from 0.3 to 3.0 wt % of sulfur.

4,840,850

EMISSIVE COATING FOR X-RAY TARGET

Clarence O. Clark, Brown Deer, Wis., and Jauwhei Hong, Elk Grove, Ill., assignors to General Electric Company, N.Y.

Filed May 9, 1986, Ser. No. 861,523
Int. Cl.[4] B05D 5/06; B32B 15/04
U.S. Cl. 428—471 9 Claims

1. A process for producing an emissive coating on a substrate of an X-ray target comprising:
mechanically mixing from about 70 mole percent to about 90 mole percent titanium dioxide with from about 30 mole percent to about 10 mole percent calcium oxide to produce a mixture;
sintering said mixture at a temperature below a melting temperature thereof to produce a ceramic mass;
grinding and screening said ceramic mass to produce a ceramic powder;
applying said ceramic powder to said substrate;
baking said substrate and ceramic powder at a temperature and for a time effective to fuse said ceramic powder to said substrate and said temperature being below a temperature which permits emission from the substrate which reacts with said coating.

4,840,851

SURFACE COATED ARTICLE, PROCESS AND MEANS FOR THE PREPARATION THEREOF AND USE THEREOF

Carl G. Gölander, Stockholm; Erik S. Jönsson, Nässjö, and Todorka G. Vladkova, Sofia, all of Sweden, assignors to Ytkemiska Institutet, Stockholm, Sweden

PCT No. PCT/SE85/00376, § 371 Date May 9, 1986, § 102(e) Date May 9, 1986, PCT Pub. No. WO86/02087, PCT Pub. Date Apr. 10, 1986
PCT Filed Sep. 27, 1985, Ser. No. 862,504
Claims priority, application Sweden, Sep. 28, 1984, 84048669
Int. Cl.[4] B32B 27/32
U.S. Cl. 428—523 29 Claims

1. A surface coated article comprising (i) a substrate with (ii) a cured polyethylene oxidebased coating thereupon consisting essentially of polyethylene oxide chains, each of which has one end that is unmodifed, free and pendant from said substrate and another that has been crosslinked, via one or more radiation curable, ethylenically unsaturated group(s) as part of said polyethylene oxide chain, to other chains by a cross-linking agent with two or more radiation curable, ethylenically unsaturated groups reactive with the ethylenically unsaturated groups of the polyethylene oxide chains, the surface coated article being produced by the process of (i) cross-linking by means of radiation, and (ii) swelling the substrate prior to said cross-linking operation,
the proportions between polyethylene oxide and crosslinking agent being such that an adherent, cured coating is obtained.

4,840,852

ALUMINUM ALLOY VEHICULAR MEMBER

M. Elise Hyland, Forest Hills, and Warren H. Hunt, Jr., Monroeville, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 794,467, Nov. 4, 1985, abandoned, and Ser. No. 66,953, Jun. 29, 1987. This application Jun. 30, 1988, Ser. No. 213,830
Int. Cl.[4] B32B 15/20
U.S. Cl. 428—654 42 Claims

40. A plural panel vehicular structural member having spaced general parallel inner and outer panels connected along peripheral portions thereof, said panels comprised of an alloy consisting essentially of, by weight percent, 0.5 to 0.85% Si, 0.25 to 0.48 Mg, 0.05 to 0.40% Fe, 0.7 to 1.1% Cu, less than 0.08% Mn, the balance essentially aluminum and incidental elements and impurities and said inner panel being deep drawn product and formed in mild steel forming dies to produce said deep drawn product having a shape substantially identical to mild steel formed in said dies.

4,840,853

SURFACE STRUCTURE OF ALN SUBSTRATE AND A PROCESS FOR PRODUCING THE SAME

Satoshi Iio, and Akiyasu Okuno, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Mar. 9, 1987, Ser. No. 30,253
Claims priority, application Japan, Mar. 8, 1986, 61-51213
Int. Cl.[4] B32B 15/04
U.S. Cl. 428—698 10 Claims

1. A surface structure for a AlN substrate comprising:
an AlN substrate,
an intermediate layer disposed on the AlN substrate, and
a metallized layer disposed on said intermediate layer, said intermediate layer comprising at least aluminum, nitrogen and oxygen.

4,840,854

REINFORCED PLATE-LIKE SINTERED BODIES

Takao Kojima, and Tetsusyo Yamada, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 749,457, Jun. 27, 1985, abandoned. This application Sep. 11, 1987, Ser. No. 97,343
Claims priority, application Japan, Jun. 27, 1984, 59-130938
Int. Cl.[4] B32B 3/00
U.S. Cl. 428—698 6 Claims

1. A reinforced plate-like laminated sintered body produced by the steps:
(a) providing a green laminate comprising an Al_2O_3-based surface layer comprising ZrO_2 at least partly over one surface of a base material layer, the thickness ratio of said surface layer with respect to said base material layer being in the range of 1/100 to 20/100 and the laminate having a ratio of shrinkage moduli

$$\frac{l_0/l_1}{l_0'/l_1'}$$

where l_0/l_1 is the shrinkage modulus of the base material layer when sintered alone; l_0'/l_1' is the shrinkage modulus of the surface layer when sintered alone; l_0 is a green length before sintering of the base material layer, l_1 is a length after sintering of the base material layer; l_0' is a green length before sintering of the surface layer; and l_1' is a length after sintering of the surface layer, and
(b) simultaneously sintering said laminate.

4,840,855

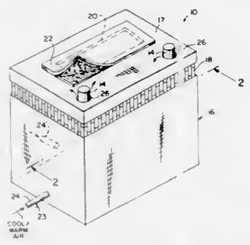
BATTERY LIFE EXTENDER

Michael Foti, 1919 Lenox Ave., East Meadow, N.Y. 11554, and James Embry, 1930 S. Westwood #14, Mesa, Ariz. 85202

Filed Mar. 28, 1988, Ser. No. 174,184
Int. Cl.[4] H01M 10/50
U.S. Cl. 429—120 10 Claims

1. A battery life extender which comprises:
(a) a housing disposed around the battery with terminals of the battery extending through top of said housing so that battery clamps can be attached thereto, said housing having an access opening in the top thereof;
(b) means for stabilizing temperature of the battery within

said housing during hot and cold weather conditions so as to extend operating life of the battery; and



(c) a removable cover sized to fit over said access opening in the top of said housing so that the battery can be serviced without having to remove said housing or any part thereof.

4,840,856

ALLYL GROUP-CONTAINING OLIGOETHYLENEOXYPOLYPHOSPHAZENES, PROCESS FOR THEIR PREPARATION, AND THEIR USE

Yoshifumi Nakacho; Yuji Tada, and Sinichi Yamada, all of Tokushima, Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

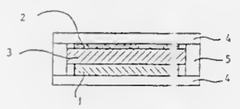
PCT No. PCT/JP87/01028, § 371 Date Aug. 24, 1988, § 102(e) Date Aug. 24, 1988, PCT Pub. No. WO88/05064, PCT Pub. Date Jul. 14, 1988

PCT Filed Dec. 24, 1987, Ser. No. 245,440

Claims priority, application Japan, Dec. 26, 1986, 61-310739

Int. Cl.[4] H01M *6/18*

U.S. Cl. 429—192 3 Claims



1. An alkali metal secondary battery comprising a positive electrode in the form of a layer of V_2O_5, a negative electrode made of a substance capable of occluding and releasing an alkali metal ion, and an electrolyte comprising a complex of the polyphosphazene with an alkali metal salt.

4,840,857

GALVANIC PRIMARY ELEMENT WITH NEGATIVE LITHIUM ELECTRODE

Subash-Chander Nijhawan, Kronberg; Horst Daniel, Hofheim, and Welf Dennstedt, Kelkheim, all of Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Apr. 28, 1988, Ser. No. 187,284

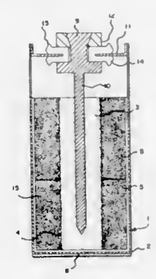
Claims priority, application Fed. Rep. of Germany, May 2, 1987, 3714655

Int. Cl.[4] H01M *6/16*

U.S. Cl. 429—197 10 Claims

1. In a galvanic primary element having a negative lithium electrode and a positive metal oxide electrode comprising CrO_x wherein $2 \leqq x \leqq 2.9$ and a non aqueous electrolyte the improvement comprising:

interposing, as the sole barrier between said electrodes, an electronically non-conductive but lithium ion permeable



layer comprising the reaction product of lithium and CrO_x.

4,840,858

SECONDARY CELL

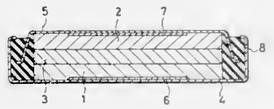
Nobuhiro Furukawa; Koji Nishio, and Noriyuki Yoshinaga, all of Hirakata, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jun. 13, 1988, Ser. No. 206,056

Claims priority, application Japan, Jun. 12, 1987, 62-147496; Dec. 18, 1987, 62-322266

Int. Cl.[4] H01M *4/60, 6/16*

U.S. Cl. 429—197 15 Claims



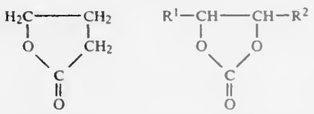
1. A rechargeable secondary cell comprising;

a positive electrode formed of a conductive polymer;

a negative electrode;

a separator disposed between the positive electrode and the negative electrode; and

an electrolyte including a mixed solvent of γ-butyrolactone and a cyclic carbonic ester compound expressed by the following chemical formulas.



γ-butyrolactone cyclic carbonic ester compound

(where R^1 is a lower alkyl group having 1–3 carbon atoms and R^2 is a hydrogen atom or a methyl group, R^2 being a hydrogen atom, and R^1 being a group other than the methyl group.)

4,840,859

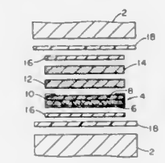
THERMAL BATTERY

Mark T. Williams, Owings Mills; Clinton S. Winchester, Beltsville, and Joseph D. Jolson, Baltimore, all of Md., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jun. 16, 1986, Ser. No. 874,415

Int. Cl.[4] H01M *4/60*

U.S. Cl. 429—212 13 Claims



1. A thermal battery comprising at least one electrochemical cell comprising an anode of alkali metal, alkaline earth metal or alloys thereof, a fusible salt electrolyte, a fluorocarbon polymer or fluorochlorocarbon polymer depolarizer, and means for heating the cell to melt the electrolyte.

4,840,860

MULTIACTIVE ELECTROPHOTOGRAPHIC ELEMENT

William J. Staudenmayer, Pittsford; David S. Weiss, Rochester, and Joseph A. Pavlisko, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 16, 1988, Ser. No. 168,822

Int. Cl.[4] G03G *5/05*

U.S. Cl. 430—59 4 Claims

1. In an electrophotographic element comprising: an electrically conductive support; a charge-generation layer comprising a photoconductive material sensitive to visible or infrared radiation; and a charge-transport layer containing a triarylamine charge-transport material,

the improvement wherein the charge-transport layer comprises a mixture of a polycarbonate comprising poly[2,2-bis(4-hydroxyphenyl)propane carbonate] and a polyester formed from 4,4'-(2-norbornylidene)diphenol and terephthalic and azelaic acids, and the weight ratio of the polycarbonate to the polyester is in the range of 9:1 to 3:7.

4,840,861

MULTIACTIVE ELECTROPHOTOGRAPHIC ELEMENT

William J. Staudenmayer, Pittsford; David S. Weiss, Rochester, and Joseph A. Pavlisko, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 16, 1988, Ser. No. 168,835

Int. Cl.[4] G03G *5/05*

U.S. Cl. 430—59 3 Claims

1. In an electrophotographic element comprising: an electrically conductive support; a charge-generation layer comprising a photoconductive material sensitive to visible or infrared radiaton; and a charge-transport layer containing a triarylamine charge-transport material,

the improvement wherein the charge-transport layer comprises a mixture of a polycarbonate comprising poly[2,2-bis(4-hydroxyphenyl)propane carbonate] and a polyester formed from 2,2-bis(4-hydroxyphenyl)propane and terephthalic and isophthalic acids, and the weight ratio of the polycarbonate to the polyester is in the range of 9:1 to 3:7.

4,840,862

PHOTOCONDUCTIVE COMPOSITION HAVING AN AZAAZULENIUM SALT

Naonori Makino; Takanori Hioki; Yoshio Inagaki, and Seiji Horie, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

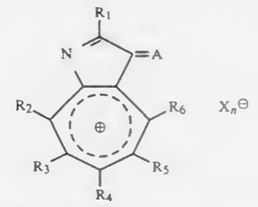
Filed Aug. 7, 1987, Ser. No. 82,462

Claims priority, application Japan, Aug. 7, 1986, 61-184325

Int. Cl.[4] G03G *5/09, 5/14*

U.S. Cl. 430—75 19 Claims

1. A photoconductive composition comprising at least one azaazulenium salt represented by the following formula (I):



(I)

wherein R_1, R_2, R_3, R_4, R_5 and R_6, which may be the same or different, each represents a hydrogen atom, a halogen atom, a hydroxyl group, a nitro group, a carboxyl group, a sulfonic acid group, a mercapto group, or a monovalent organic group; A represents a divalent organic group bonded by the double bond; $X\ominus$ represents an anionic group; n is the number of $X\ominus$ groups required to balance the positive charge; provided that each $X\ominus$ group may be bonded to any of R_1, R_2, R_3, R_4, R_5, R_6 or A to form an inner salt; and any two of R_2, R_3, R_4, R_5 and R_6 bonded to adjacent carbon atoms may be linked to form a substituted or unsubstituted aromatic carbocyclic or aromatic heterocyclic ring.

4,840,863

POSITIVELY CHARGEABLE TONER FOR USE IN DRY ELECTROPHOTOGRAPHY

Akira Otsu, and Hiroshi Nagase, both of Tokyo, Japan, assignors to Fujikura Kasei Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1987, Ser. No. 38,822

Claims priority, application Japan, Apr. 17, 1986, 61-87075

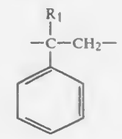
Int. Cl.[4] G03G *9/08*

U.S. Cl. 430—110 15 Claims

1. A positively chargeable toner for use in dry electrophotography, said toner comprising

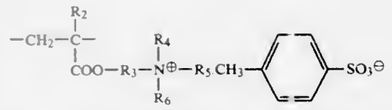
(A) a resinous binder composed of at least one resin selected from copolymers of styrene and/or alphamethylstyrene with alkyl (meth)acrylates, polyester resins and epoxy resins,

(B) 1 to 10 parts by weight, per 100 parts by weight of the resinous binder, of a copolymer containing a quaternary ammonium salt group, said copolymer having a weight average molecular weight of from 2,000 to 10,000 and composed of 65 to 97% by weight of recurring units represented by the formula



(I)

wherein R_1 represents a hydrogen atom or a methyl group, and 35 to 3% by weight of recurring units represented by the formula



(II)

wherein R_2 represents a hydrogen atom or a methyl group, R_3 represents an alkylene group, and each of R_4, R_5 and R_6 represents an alkyl group, and

(C) a coloring agent.

4,840,864

NEW ELECTROSTATOGRAPHIC TONERS AND DEVELOPERS CONTAINING NEW CHARGE-CONTROL AGENTS

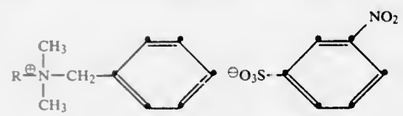
Douglas E. Bugner; Peter S. Alexandrovich; Lawrence P. DeMejo; Robert A. Guistina, and James H. Anderson, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 17, 1987, Ser. No. 134,344

Int. Cl.[4] G03G 9/10

U.S. Cl. 430—110 **4 Claims**

1. A dry, particulate, electrostatographic toner composition comprising a polymeric binder and a charge-control agent comprising a quaternary ammonium salt having the structure



wherein R is alkyl having 12 to 18 carbon atoms.

4,840,865

LIQUID DEVELOPER FOR ELECTROSTATIC PHOTOGRAPHY

Eiichi Kato; Shigeyuki Dan; Hiroshi Ishiguro; Kazuo Ishii, and Hidefuji Sera, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

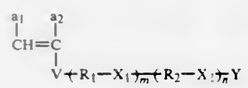
Filed Dec. 29, 1986, Ser. No. 946,728

Claims priority, application Japan, Dec. 26, 1985, 60-294550

Int. Cl.[4] G03G 9/12

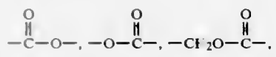
U.S. Cl. 430—114 **13 Claims**

1. A liquid developer for electrostatic photography comprising a non-aqueous solvent having electrical resistivity of not less than $10^9\Omega$-cm and a dielectric constant of not more than 3.5 having dispersed therein at least one resin, wherein said resin is a copolymer resin obtained by subjecting a solution containing (A) at least one of monofunctional monomer which is soluble in said solvent but insolubilized upon polymerization and (B) at least one of monomers having at least two polar groups and/or polar linking groups represented by formula (I):

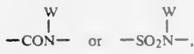


(I)

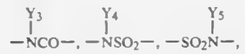
wherein V represents —O—,



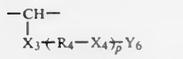
—SO_2—, —CONH—, —SO_2NH—,



wherein W represents a hydrocarbon residue or $-(R_1-X_1)_m-(R_2-X_2)_n-Y$; Y represents a hydrogen atom, a hydrocarbon residue having from 1 to 18 carbon atoms, or a hydrocarbon residue having from 1 to 18 carbon atoms which is substituted with a halogen atom, —OH, —CN, —NH_2, —COOH, —SO_3H or PO_3H; X_1 and X_2 each represents —O—, —S—, —CO—, —CO_2—,



—$NHCO_2$—or —NHCONH—, wherein Y_1, Y_2, Y_3, Y_4 and Y_5 each has the same meaning as Y; R_1 and R_2 each represents a substituted or unsubstituted hydrocarbon residue having from 1 to 18 carbon atoms which may contain a moiety of



in its main chain, wherein X_3 and X_4 each has the same meaning as X_1 and X_2; R_4 represents a substituted or unsubstituted hydrocarbon residue having from 1 to 18 carbon atoms; and Y_6 has the same meaning as Y; a_1 and a_2 each represents a hydrogen atom, a hydrocarbon residue, —COOZ or —COOZ having a hydrocarbon residue attached at the carbonyl, wherein Z represents a hydrogen atom or a substituted or unsubstituted hydrocarbon residue; and m, n and p each represents O or an integer of from 1 to 4, to a polymerization reaction in the presence of a resin which is soluble in said solvent and contains no graft group polymerizable with said monomers, and wherein said at least one of monofunctional monomer which is soluble in said solvent but insolubilized upon polymerization and said at least one monomer having at least two polar groups and/or polar linking groups from particles and said particles have absorbed to the surface thereof as an outer particle resin said resin which contains no graft group polymerizable with said monomers.

4,840,866

MICROCAPSULE IMAGING SYSTEM HAVING IMPROVED DYNAMIC RANGE

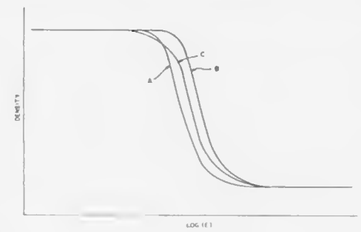
Kerry Kovacs; William Simpson, both of Centerville; Amy L. Burkholder, Kettering; Russell K. Messer, Franklin, and Teresa M. Thomas, Springfield, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Mar. 24, 1988, Ser. No. 172,624

Int. Cl.[4] G03C 1/46, 1/72, 5/00, 1/495

U.S. Cl. 430—138 **17 Claims**

1. A photographic material comprising a support having a layer of microcapsules thereon and an image-forming agent being associated with said microcapsules, said microcapsules including a mixture of a first subset of microcapsules and a second subset of microcapsules, said first and second subsets of microcapsules being associated with an image-forming agent for the same color, and said first subset of microcapsules providing a higher film speed than said second subset of microcapsules when said first and second subsets of microcapsules are



exposed to a broad band white light source and developed under identical conditions.

4,840,868

PHOTOSENSITIVE COMPOSITION BASED ON A DIAZONIUM SALT POLYCONDENSATION PRODUCT WITH AN ESTER POLYMER BINDER HAVING URETHANE GROUP

Georg Pawlowski; Guenter Hultsch, both of Wiesbaden, and Gerhard Mack, Walluf, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

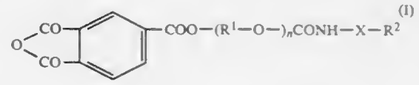
Filed Dec. 21, 1987, Ser. No. 135,448

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644163

Int. Cl.[4] G03C 1/60, 1/94

U.S. Cl. 430—155 **13 Claims**

1. A photosensitive composition comprising (i) a photosensitive diazonium salt polycondensation product in an amount sufficient to render said composition photosensitive and (ii) a non-photosensitive polymeric binder with carboxyl side groups which is soluble or swellable in aqueous-alkaline solutions and which is present in an amount sufficient to impart layer-forming capability to a coating solution of said composition, said polymeric binder comprising the reaction product of a monofunctional intramolecular anhydride of an organic polycarboxylic acid with a polymer containing hydroxyl groups as the only functional groups capable of reaction with acid anhydrides, wherein the acid anhydride is a compound of the general formula (I)



(I)

wherein

R^1 is an alkylene group having from 2 to 6 carbon atoms,

R^2 is a hydrogen atom, a substituted or unsubstituted alkyl, cycloalkyl, aryl or heteroyl group,

X is a single bond or one of the groups CH_2, SO_2 and $O=P-R^3$,

R^3 is an alkyl, alkenyl or aryl group, and

n is a number from 1 to 6.

4,840,869

LIGHT-SENSITIVE COMPOSITION

Noriyasu Kita, Musashimurayama, and Kiyoshi Goto, Hachioji, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 867,628, May 27, 1986, abandoned, which is a continuation of Ser. No. 578,500, Feb. 9, 1984, abandoned. This application Aug. 10, 1987, Ser. No. 83,879

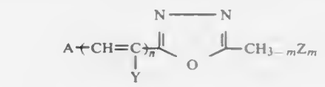
Claims priority, application Japan, Feb. 10, 1983, 58-19689

Int. Cl.[4] G03C 1/60, 1/68, 1/49, 1/727

U.S. Cl. 430—191 **28 Claims**

1. A light-sensitive composition comprising

(a) a 2-halomethyl-1,3,4-oxadiazole compound of Formula I



wherein, Z is a fluorine atom, a chlorine atom or a bromine atom; Y is a hydrogen atom, a halogen atom, an alkyl group or an aryl group, wherein A is a substituted or unsubstituted benzofuryl-radical, m is an integer of from 1 to 3, and n is an integer of 0 or 1,

(b) a coloring agent, and

(c) a light sensitive resist forming compound,

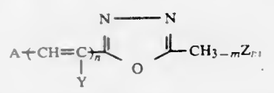
each of said 2-halomethyl-1,3,4-oxidiazole compound, said coloring agent and said light sensitive resist forming com-

pound being present in an amount effective to provide a photosensitive resist forming composition capable of providing print-out images.

12. A light sensitive composition comprising:

(a) a free radical producing agent, said free radical producing agent being a 2-halomethyl-1,3,4-oxadiazole compound of the following Formula:

Formula I



wherein, Z is a fluorine atom, a chlorine atom or a bromine atom; Y is a hydrogen atom, a halogen atom, an alkyl group or an aryl group, A is a heterocyclic radical containing at least one element selected from the group consisting of oxygen, nitrogen, sulphur and silenium, m is an interger of from 1 to 3, and n is an integer of 0 or 1,

(b) a coloring agent, and

(c) a light sensitive resist forming compound,

each of said 2-halomethyl-1,3,4-oxidiazole compound, said coloring agent and said light sensitive resist forming compound being present in an amount effective to provide a photosensitive resist forming composition capable of providing print-out images.

4,840,870

HEAT-TRANSFER IMAGE-RECEIVING ELEMENT

Masaru Iwagaki, Hino; Toyoaki Masukawa, Hinode; Tawara Komamura, Hachioji; Wataru Ishikawa, Hachioji, and Kimie Hoshino, Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 930,019, Nov. 7, 1986, abandoned, which is a continuation of Ser. No. 679,912, Dec. 10, 1984, abandoned. This application Mar. 14, 1988, Ser. No. 170,063

Claims priority, application Japan, Dec. 19, 1983, 58-237965

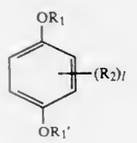
Int. Cl.[4] G03C *5/54*

U.S. Cl. 430—201 **11 Claims**

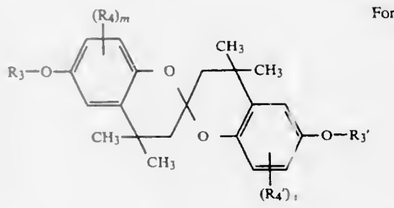
1. A heat transfer image forming method which comprises heating a heat-transfer image-receiving element in a superposed relation with a heat-transfer element containing a heat-transferable dye donator wherein dye is imagewise transferred by heat,

said heat-transfer image-receiving element comprising (a) at least one compound having the following general Formula (I), (II) or (III) and (b) at least one compound having the following general Formula (IV

Formula (I)

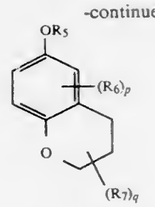


Formula (II)

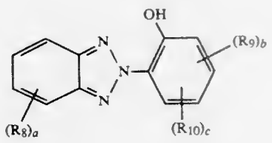


-continued

Formula (III)



Formula (IV)



wherein

R_1, R_1', R_3, R_3' and R_5 each is a hydrogen atom, alkyl, alkenyl, cycloalkyl, phenyl, naphthyl, heterocyclic, acyl, alkylsulfonyl, arylsulfonyl or aralkylsulfonyl group;

R_2, R_4, R_4', R_6 and R_7 each is a hydrogen atom, a halogen atom, or a monovalent organic group, l is an integer of from 1 to 4, q is an integer of from 1 to 6, and m, n and p each is an integer of from 1 to 3, provided if the l, m, n, p and q each is an integer of not less that 2, R_2, R_4, R_4', R_6 and R_7 are the same as or different from one another;

R_8, R_9 and R_{10} each is a hydrogen atom, a halogen atom, alkyl, alkenyl, cycloalkyl, phenyl, naphthyl, heterocyclic, acyl, amino, alkylsulfonyl, arylsulfonyl or aralkylsulfonyl group, and a, b and c each is an integer of from 1 to 4, R_8, R_9 and R_{10} are the same as or different from one another and c is an integer of from 1 to 4, R_8, R_9 and R_{10} are allowed to be either the same as or different from one another.

4,840,871

COLOR PHOTOGRAPHIC HEAT DEVELOPMENT PROCESS

Manfred Peters, Leverkusen; Hans Öhlschläger, Bergisch-Gladbach; Thomas Kaluschke, Leichlingen; Kaspar Wingender, Leverkusen; Günther Schenk, Cologne, and Immo Boie, Leichlingen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengessellschaft, Leverkusen, Fed. Rep. of Germany

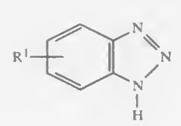
Filed Jun. 3, 1988, Ser. No. 201,840

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719880

Int. Cl.[4] G03C *5/54, 1/34*

U.S. Cl. 430—203 **4 Claims**

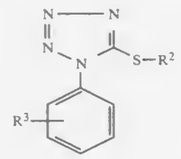
1. Process for the production of colour images by the photographic dye diffusion process in which a first light-sensitive sheet material is imagewise exposed, at least one of said first light-sensitive sheet material and a second light-insensitive sheet material is moistened with an aqueous liquid and the two sheet materials are together heated to 50°–100° C. with their coated surfaces in contact and then separated, said first sheet material containing, on a layer support, at least one light-sensitive silver halide emulsion layer and at least one non-diffusible colour providing compound which is capable of being decomposed imagewise in the process of development to release a diffusible dye and said second sheet material containing a salt of a strong organic base and a weak acid, wherein said first sheet material contains a combination of compounds corresponding to the following formulae I and II:



(I)

wherein

R^1 denotes hydrogen, alkyl with up to 6 carbon atoms, halogen, hydroxy, alkoxy or substituents which together form a condensed benzene ring, and



(II)

wherein

R^2 denotes a group which can be split off in the process of development of the material and

R^3 denotes hydrogen, halogen, alkyl with up to 4 carbon atoms, alkoxy, carboxy, carbalkoxy, carbonamido or sulphonamido.

4,840,873

PRODUCTION OF OPTICAL RECORDING MEDIUM

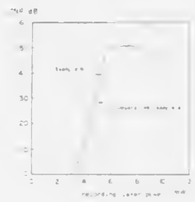
Hideki Kobayashi; Minoru Ikeda, both of Kurashiki; Koichi Saito, Okayama; Shiro Nagata, and Koichi Horino, both of Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki and Kuraray Plasmon Data Systems Co., Ltd., Osaka, both of, Japan

Filed Jul. 10, 1987, Ser. No. 72,139

Claims priority, application Japan, Jul. 11, 1986, 61-164276

Int. Cl.[4] G03C *1/72, 1/94*

U.S. Cl. 430—273 **18 Claims**



1. A process for producing an optical recording medium, which comprises:

laminating a thin metal film ranging in thickness from 5 to 200 nm onto the minutely toughened surface of a plastic substrate; and

heat-treating said laminated structure at a temperature which is greater than 40° C. and which at the same time is a temperature within the range of a temperature 80° C. lower than the glass transition temperature of the plastic substrate to a temperature 60° C. higher than the glass transition temperature of the plastic substrate; said optical recording medium upon exposure to laser light of a specific wavelength region, being deformed by the formation of bubbles on the thin metal layer of the recording medium which provide for the recording of information.

4,840,872

PATTERN FORMING METHOD BY USE OF X-RAY EXPOSURE

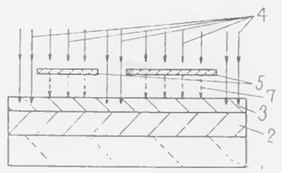
Masayuki Endo, Izumi; Masaru Sasago, and Kazufumi Ogawa, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 15, 1987, Ser. No. 108,698

Claims priority, application Japan, Oct. 16, 1986, 61-245705

Int. Cl.[4] G03C *1/495, 5/00*

U.S. Cl. 430—273 **9 Claims**



1. A pattern forming method comprising the steps of:

forming a resist layer on a semiconductor substrate;

forming a water-soluble organic film on said resist layer, said water-soluble organic film containing materials of high absorbing efficiency to soft X-rays or electrons,

selectively exposing said water-soluble organic film on said resist layer to X-rays,

removing said water-soluble organic film and

selectively developing said resist layer to form a resist pattern.

4,840,874

METHOD OF FORMING RESIST PATTERN

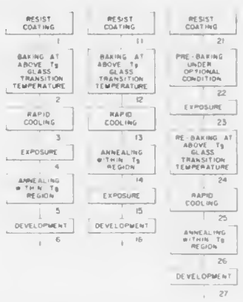
Fumiaki Shigemitsu; Kinya Usuda, and Tatsuo Nomaki, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 22, 1987, Ser. No. 99,895

Claims priority, application Japan, Sep. 25, 1986, 61-226901

Int. Cl.[4] G03C *5/16*

U.S. Cl. 430—296 **11 Claims**



1. A method of forming a resist pattern comprising the steps of: coating a resist on a substrate,

baking the coated resist at a temperature in its glass transition temperature region or higher,

rapidly cooling the baked resist to maintain the enthalpy of the resist in a high state so that the sensitivity of the resist is high,

exposing the resist to electromagnetic waves or corpuscular rays, and

developing the exposed resist, wherein said method further comprises the step of annealing said resist at a temperature within said glass transition temperature region after said cooling step and before said developing step for a period of time sufficient to relax the enthalpy of the resist and decrease its sensitivity to a desired value.

4,840,875

DESENSITIZING GUM FOR LITHOGRAPHIC PRINTING PLATE COMPRISING A POLYBASIC AND MONOESTER OF POLYSACCHARIDE

Kenji Kunichika; Hiroshi Matsumoto, both of Shizuoka, and Akira Shingu, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa and Oji-National Co., Ltd., Tokyo, both of, Japan

Filed Feb. 3, 1988, Ser. No. 151,989

Claims priority, application Japan, Feb. 4, 1987, 62-24355

Int. Cl.[4] G03C *5/24, 5/34*

U.S. Cl. 430—309 **19 Claims**

1. In a gumming-up process which comprises applying to a lithographic printing plate comprising an oleophilic image area and a hydrophilic non-image area, a desensitizing gum comprising a least one polybasic acid monoester of polysaccharide, said polybasic acid being selected from the group consisting of itaconic acid, maleic acid, phthalic acid, trimellitic acid, pyromellitic acid, endomethylene tetrahydrophthalic acid, chlorendic acid, methyl endomethylene tetrahydroxy phthalic acid, tetrahydroxy phthalic acid, diphenic acid, citraconic acid, glutaconic acid, glutaric acid, succinic acid, hexaisobutenyl succinic acid, nonyl succinic acid, n-octyl succinic acid, 2-ethyl-2-methylsuccinic acid, dimethylbenzyl succinic acid, octenyl succinic acid, hexenyl succinic acid, decenyl glutaric acid and dodecenyl succinic acid.

4,840,876

METHOD OF TREATING PHOTORESISTS

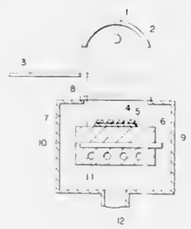
Tetsuji Arai, Yokohama, Japan, assignor to Ushio Denki, Tokyo, Japan

Filed Jan. 26, 1988, Ser. No. 147,419

Claims priority, application Japan, Mar. 24, 1987, 62-67889

Int. Cl.[4] G03C *5/36*

U.S. Cl. 430—328 **12 Claims**



1. A method of treating a photoresist image developed on a semiconductor, comprising the steps of:

placing the semiconductor with the developed photoresist image thereon under a reduced pressure atmosphere;

exposing the photoresist image to ultraviolet radiation;

increasing the temperature of the photoresist image in proportion to an increasing flow temperature of the photoresist image while continually exposing said photoresist image to said ultraviolet radiation; and

controlling the increasing temperature of the photoresist image so that the photoresist image is maintained at a temperature greater than the increasing flow temperature of the photoresist image, during at least a portion of said continued exposure, and so as to prevent a substantial dimensional and shape change of the photoresist image.

4,840,877

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL AND METHOD FOR PROCESSING THE SAME

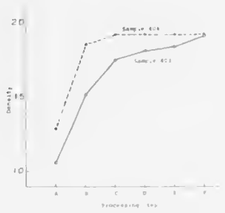
Akira Abe; Keiji Mihayashi; Hidetoshi Kobayashi, and Hirobiko Kato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 9, 1987, Ser. No. 94,638

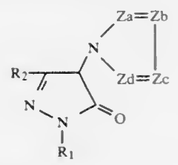
Claims priority, application Japan, Sep. 9, 1986, 61-212394; Sep. 30, 1986, 61-231496; Sep. 30, 1986, 61-231497

Int. Cl.[4] G03C *7/30, 7/38*

U.S. Cl. 430—350 **29 Claims**



13. A method for processing an imagewise exposed silver halide color photographic material comprising a color developing step and a drying step, said silver halide color photographic material comprising a support having thereon at least one silver halide emulsion layer, at least one layer of said silver halide color photographic material containing the combination of a magenta dye forming coupler represented by general formula (I) and a compound which is not a coupler represented by general formula (II)



(I)

wherein R_1 represents an aromatic group, an aliphatic group or a heterocyclic group; R_2 represents a substituent; and Za, Zb, Zc and Zd, which may be the same or different, each represents an unsubstituted methine group, a substituted methine group or —N═,

$$(R'—COO^-)_nM^{n+} \quad \text{(II)}$$

wherein R′ represents a substituent which imparts a diffusion-resistant proerty to the compound represented by the general formula (II) and wherein R′ contains a total of from 8 to 40 carbon atoms, and represents a straight chain or branched chain alkyl group, an alkenyl group, an alkynyl group, a cyclic alkyl group, an aralkyl group, a cyclic alkenyl group, an aryl group, or a heterocyclic group; M^{n+} represents a hydrogen ion, a metal ion or an ammonium ion; and n represents an integer from 1 to 4, wherein the period of time from the beginning of said color developing step to the end of said drying step is at most about 15 minutes.

4,840,878

METHOD OF COLOR IMAGE FORMATION USING A HIGH CHLORIDE EMULSION AND A DEVELOPER FREE OF BENZYL ALCOHOL

Takeshi Hirose; Nobuo Furutachi; Kozo Aoki; Kiyoshi Nakazyo, and Genichi Furusawa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

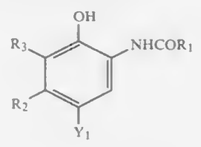
Continuation of Ser. No. 6,511, Jan. 23, 1987, abandoned. This application Sep. 30, 1988, Ser. No. 251,932

Claims priority, application Japan, Jan. 23, 1986, 61-13416; Mar. 19, 1986, 61-61211; Jul. 25, 1986, 61-175233

Int. Cl.[4] G03C *5/24, 5/38, 7/30, 7/32*

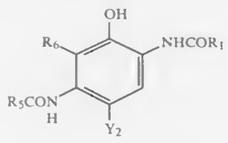
U.S. Cl. 430—380 **22 Claims**

1. A method for forming a color image, which comprises imagewise exposing a multi-layer silver halide color photographic material comprising a reflective support having provided thereon at least three silver halide emulsion layers different in color sensitivity, each of which separately contains at least one of couplers represented by formula (I)



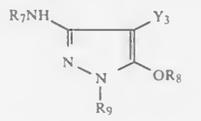
(I)

wherein R_1 represents an aliphatic group, an aromatic group, a heterocyclic group, an aromatic amino group, or a heterocyclic amino group; R_2 represents an aliphatic group; R_3 represents a hydrogen atom, a halogen atom, an aliphatic group, an aliphatic oxy group, or an acylamino group; or R_2 and R_3 are taken together to form a 5- or 7-membered ring; Y_1 represents a halogen atom, or a group capable of being split off upon coupling with an oxidation product of a developing agent; and R_1, R_2, or Y_1 may form a polymer including a dimer, and couplers represented by formula (II)



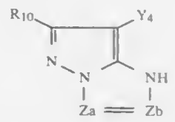
(II)

wherein R_4 and R_5 each represents an aliphatic group, an aromatic group, a heterocyclic group, an aromatic amino group, or a heterocyclic amino group; R_6 represents a hydrogen atom, a halogen atom, an aliphatic group, an aliphatic oxy group, or an acylamino group; or R_5 and R_6 are taken together to form a 5- or 7-membered ring; Y_2 represents a halogen atom, or a group capable of being split off upon coupling with an oxidation product of a developing agent; and R_4, R_5, R_6, or Y_2 may form a polymer including a dimer; at least one of couplers represented by formula (III)



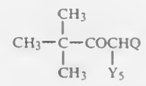
(III)

wherein R_7 and R_9 each represents a substituted or unsubstituted phenyl group; R_8 represents a hydrogen atom, an aliphatic or aromatic acyl group, or an aliphatic or aromatic sulfonyl group; Y_3 represents a hydrogen atom, or a group capable of being split off upon coupling with an oxidation product of a developing agent; and R_7, R_8, R_9, or Y_3 may form a polymer including a dimer, and couplers represented by formula (IV)



(IV)

wherein R_{10} represents a hydrogen atom or a substituent; Y_4 represents a halogen atom, or a group capable of being split off upon coupling with an oxidation product of a developing agent; Za and Zb each represents a methine group, a substituted methine group, or =N—; or R_{10}, Za, Zb, or Y_4 may form a polymer including a dimer; and at least one of couplers represented by formula (V)



(V)

wherein Y_5 represents a group capable of being split off upon coupling with an oxidation product of a developing agent; and Q represents a substituted or unsubstituted N-phenyl-carbamoyl group; or Y_5 or Q may form a polymer including a dimer, and processing the exposed material with a color developing solution [containing substantially no benzyl alcohol] for a period of not more than 2 minutes, wherein said silver halide emulsions each contains silver chlorobromide having a silver chloride content of 90 mol% or more and the color developing solution is free from benzyl alcohol.

4,840,879

DIRECT POSITIVE IMAGE-FORMING PROCESS

Atushi Kamitakahara, and Keiji Ogi, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 846,845, Apr. 1, 1986, abandoned, which is a continuation of Ser. No. 693,794, Jan. 23, 1985, abandoned, which is a continuation of Ser. No. 457,490, Jan. 12, 1983, abandoned. This application Jan. 29, 1988, Ser. No. 153,519

Claims priority, application Japan, Jan. 12, 1982, 57-22507

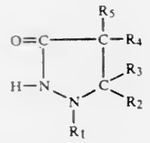
Int. Cl.[4] G03C *5/24, 7/16*

U.S. Cl. 430—406 **7 Claims**

1. A process for forming a direct positive color image comprising

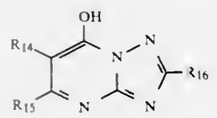
(a) imagewise exposing a direct positive photosensitive silver halide color photographic material to light to yield an imagewise exposed material, said photographic material having a support and at least one silver halide emulsion layer thereon, said emulsion layer containing a coupler and internal latent image type silver halide crystals whose surfaces have not been fogged prior to said imagewise exposure, and

(b) uniformly exposing to light the entire surface of said imagewise exposed photographic material before or during a development step and in the presence of a substance of Formula IV, a compound of Formula I and a color-developing agent consisting of aromatic primary amino compounds selected from the group consisting of N-methyl-aminophenol, 4-amino-3-methyl-N-ethyl-N-(β-methanesulfonamidoethyl) aniline,4-amino-3-methyl-N-ethyl-N-(β-hydroxyethyl) aniline,4-amino-3-methyl-N,N-diethyl-p-phenylenediamine, and 4-amino-3-methyl-N-ethyl-N-β-methoxyethyl-p-phenylenediamine; wherein the oxidized products thereof form a coupling reaction with said couplers to produce dyes,



I

wherein R_1 is selected from hydrogen, alkyls of 1 to 4 carbon atoms which are substituted or unsubstituted, and aryls which are substituted or unsubstituted; R_2–R_5 are individually selected from the same group as R_1 and hydroxyl;



IV

wherein R_{14} and R_{15} are individually selected from hydrogen, alkyls having 1 to 4 carbon atoms which may be substituted or unsubstituted, aryl groups which may be substituted or unsubstituted and non-metal atoms necessary for linking R_{14} and R_{15} in such a manner as to create 5 or 6 membered ring, and R_{16} is selected from hydrogen, alkyls having 1 to 4 carbon atoms which may be substituted or unsubstituted, and aryl groups which may be substituted, and wherein said exposed photographic material is processed in a prebath or a color developer containing 10 mg/l to 10 g/l of said formula compound.

4,840,880

COLOR PHOTOGRAPHIC RECORDING MATERIAL CONTAINING A YELLOW DIR COUPLER

Hans Öhlschläger; Günter Renner, both of Bergisch Gladbach; Friedrich-Wilhelm Kunitz; Heinrich Odenwälder, both of Leverkusen, and Dirk Hübner, Cologne, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

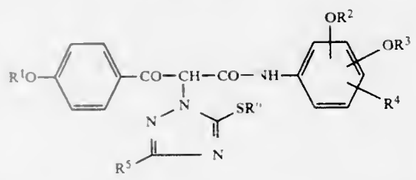
Filed Jul. 20, 1987, Ser. No. 75,574

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1986, 3626219

Int. Cl.[4] G03C *7/36*

U.S. Cl. 430—505 **2 Claims**

1. Colour photographic recording material having at least one predominantly blue sensitive silver halide emulsion layer unit associated with at least one yellow coupler, a predominantly green sensitive silver halide emulsion layer unit associated with at least one magenta coupler and a predominantly red sensitive silver halide emulsion layer unit associated with at least one cyan coupler, each of said silver halide emulsion layer units comprising two or more silver halide partial layers, characterised in that at least one partial layer of the predominantly green sensitive silver halide emulsion layer unit or of the predominantly red sensitive silver halide emulsion layer unit contains a compound corresponding to the following formula:



wherein

R^1 denotes a straight chained or branched alkyl group with up to 18 carbon atoms;

R^2, R^3 denote identical or different alkyl groups with up to 18 carbon atoms;

R^4 denotes Cl;

R^5 denotes H or alkyl with up to 9 carbon atoms;

R^6 denotes a saturated or unsaturated aliphatic group with up to 10 carbon atoms

and the total number of carbon atoms in R^5 and R^6 is not less than 5 and not greater than 10.

4,840,881

PROCESS FOR THE PRODUCTION OF LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Yoshikazu Watanabe, Hino, and Motoaki Tanaka, Hachioji, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 894,475, Aug. 4, 1986, abandoned, which is a continuation of Ser. No. 682,481, Dec. 17, 1984, abandoned, which is a continuation of Ser. No. 548,421, Nov. 3, 1983, abandoned, which is a continuation of Ser. No. 471,602, Mar. 4, 1983, abandoned, which is a continuation of Ser. No. 297,119, Aug. 28, 1981, abandoned, which is a continuation of Ser. No. 875,875, Feb. 7, 1978, abandoned. This application Jul. 21, 1988, Ser. No. 223,713

Claims priority, application Japan, Feb. 10, 1977, 13601

Int. Cl.[4] G03C *7/32*

U.S. Cl. 430—512 **27 Claims**

1. A process for the preparation of a light-sensitive silver halide photographic material comprising a support, a silver halide emulsion layer, and a non-light-sensitive hydrophilic colloid layer consisting essentially of two layer elements, said process comprising incorporating an oil particle-forming substance into at least one of said elements, the density of the oil particles of the outermost layer element being not more than 0.3 cc/cc, the oil particle density of the second of said layer elements being greater than the oil particle density of said outermost layer element, the difference in oil particle density between the outermost layer element and the second of said layer elements being sufficient to reduce at least one of turbidity, adhesion, or static, and wherein said non-light-sensitive hydrophilic colloid layer and said silver halide emulsion are applied to said support at substantially the same time.

4,840,882

HEAT DEVELOPABLE COLOR LIGHT-SENSITIVE MATERIAL

Masaru Iwagaki; Takashi Sasaki; Tawara Kumamura; Fumio Ishii, and Kunihiro Koshizuka, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 898,849, Aug. 19, 1986, abandoned, which is a continuation of Ser. No. 674,569, Nov. 26, 1984, abandoned. This application Aug. 31, 1988, Ser. No. 240,361

Claims priority, application Japan, Dec. 2, 1983, 58-226759

Int. Cl.[4] G03C *5/54, 1/46*

U.S. Cl. 430—505 **18 Claims**

1. In a heat-developable color light-sensitive material comprising a support having thereon at least two light-sensitive layers each comprising a light-sensitive silver halide, organic silver salt, dye-donating material capable of releasing or forming a diffusible dye by heat development, reducing agent, and hydrophilic binder, said at least two light-sensitive layers differing from each other in the color sensitivity of said light-sensitive silver halide and in the hue of said diffusible dye,

said heat-developable color light-sensitive material, wherein at least one of said light-sensitive layer(s) containing said dye-donating materials is homogeneously hardened with a hardening agent for said hydrophilic binder.

4,840,883

LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING NOVEL CYAN COUPLER

Toyoaki Masukawa; Hidetaka Ninomiya, and Hiroyuki Iizuka, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

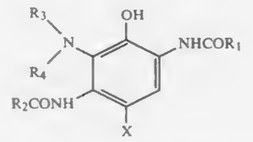
Filed Jun. 14, 1988, Ser. No. 206,580

Claims priority, application Japan, Jun. 26, 1987, 62-160324

Int. Cl.[4] G03C *7/34*

U.S. Cl. 430—553 **22 Claims**

1. A light-sensitive silver halide color photographic material having at least one silver halide emulsion layer on a support, characterized in that at least one layer of said silver halide emulsion layer contains at least one cyan coupler represented by the formula (I) shown below:



(I)

wherein R_1 and R_2 each represent an alkyl group, an aryl group, a heterocyclic group, a dialkylamino group, an anilino group, an alkoxy group or an aryloxy group; R_3 represents a hydrogen atom or an alkyl group; R_4 represents a hydrogen atom, an alkyl group, an aryl group, a R_5CO— group or a R_5SO_2— group; provided that R_3 and R_4 cannot be hydrogen atoms at the same time; R_5 represents a hydrogen atom, an alkyl group, an aryl group, a dialkylamino group, an anilino group, an alkoxy group or an aryloxy group; and X represents a hydrogen atom or an eliminatable group through the reaction with the oxidized product of a color developing agent.

4,840,884

PHOTOGRAPHIC ELEMENT AND PROCESS COMPRISING A DYE RELEASING GROUP

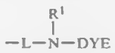
Jared B. Mooberry, and Stephen P. Singer, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 19, 1987, Ser. No. 109,371

Int. Cl.[4] G03C *7/18, 7/32, 7/36*

U.S. Cl. 430—557 **10 Claims**

1. A photographic element comprising a support bearing a silver halide photographic emulsion and a coupler having a coupling-off group bonded to the coupler at the coupling position wherein the coupling-off group is represented by the formula:

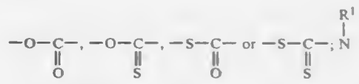


wherein

L is a linking group cleavable from

after coupling-off and contains —B— bonded to

wherein —B— is



is a substituted nitrogen atom bonded to DYE that together with the substituted nitrogen atom is a releasable dye comprising an electrically neutral chromophore; wherein the linking group enables a spectral shift in absorption of DYE.

4,840,885

COLOR PHOTOGRAPHIC RECORDING MATERIAL FOR THE DYE DIFFUSION TRANSFER PROCESS

Manfred Peters, Leverkusen; Günter Helling, Odenthal, and Helmut Reiff, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 1, 1988, Ser. No. 162,618

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1987, 3708307

Int. Cl.[4] G03C *5/54, 7/26*

U.S. Cl. 430—559 **7 Claims**

1. A photographic recording material having at least one supported layer of binder containing a light sensitive silver halide and at least one non-diffusible color providing compound capable of releasing a diffusible dye upon development,

said color providing compound being contained in the binder layer in the form of a dispersion of particles of an ionically modified polymer which is charged or loaded with the color providing compound wherein the ionically modified polymer is an ionomeric polyaddition or polycondensation product containing from 4 to 180 milliequivalents of ionic groups per 100 g and is selected from the group consisting of polyurethanes, polyesters, polyamides, polyureas, polycarbonates, polyacetals, polyethers and ionomeric products belonging to two or more types thereof.

4,840,886

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL CONTAINING A 1H-PYRAZOLE (3,2-C)-S-TRIAZOLE DERIVED MAGENTA COUPLER

Toshifumi Iijima; Kenji Kumashiro; Hiroshi Kashiwagi; Koichi Hatta; Yuji Hotta; Hiroko Ohya; Noritaka Nakayama; Satoshi Kawakatsu; Katsunori Katoh, and Kaoru Shinozaki, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Continuation of Ser. No. 086,188, Aug. 14, 1987, abandoned, which is a continuation of Ser. No. 775,685, Sep. 13, 1985, abandoned. This application Feb. 26, 1988, Ser. No. 161,321

Claims priority, application Japan, Sep. 14, 1984, 59-193609; Sep. 17, 1984, 59-195234; Nov. 15, 1984, 59-243012; Nov. 15, 1984, 59-243015; Apr. 3, 1985, 60-70198

Int. Cl.[4] G03C *1/08, 7/26, 7/32, 1/46*

U.S. Cl. 430—558 **11 Claims**

1. A silver halide color photographic material having at least one silver halide emulsion layer on a support, said silver halide emulsion layer containing at least one of the 1H-pyrazolo[3,2-c]-S-triazole derived magenta couplers that have a substituent of the following formula at 3-position:

$$—R_1—S(O)_n—R_2$$

wherein

R_1 is an alkylene group;

R_2 is an alkyl, cycloalkyl or aryl group; and

n is 1 or 2.

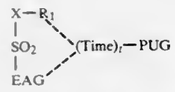
4,840,887

SILVER HALIDE PHOTOGRAPHIC MATERIALS

Koki Nakamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Apr. 29, 1988, Ser. No. 188,779
Claims priority, application Japan, Apr. 30, 1987, 62-106885
Int. Cl.[4] G03C *1/02, 1/46, 1/08, 1/06*
U.S. Cl. 430—564 **10 Claims**

1. A silver halide photographic material comprising a support having formed thereon at least one silver halide emulsion layer, wherein the silver halide photographic material contains, in the silver halide emulsion layer, other hydrophilic colloid layer(s), or both, a compound represented by formula (I)



(I)

wherein EAG represents an electron accepting group, $—SO_2—$ represents a sulfonylene group; X represents an oxygen atom (—O—), a sulfur atom (—S—) or an atomic group ($—N(R_2)—$) containing a nitrogen atom; the single bond between $—SO_2$ and X being cleaved after EAG receives an electron, wherein R_1 and R_2 each represents a simple bond or a group other than a hydrogen atom; said R_1, R_2, EAG may be combined with each other to form a ring; (Time) represents a group capable of releasing a photographically useful group (PUG) upon the cleavage of the SO_2—X bond; t represents 0 or 1; when said t is 0, (Time) represents a simple bond and X may be a part of PUG; the solid line represents a bond; the dotted lines show that at least one of them is bonded.

4,840,888

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Mikio Kawasaki; Hiroaki Shiozawa; Kikujulo Fukuouji, and Kouji Ono, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 5,489, Jan. 20, 1987, abandoned. This application Oct. 27, 1988, Ser. No. 266,211
Claims priority, application Japan, Jan. 22, 1986, 61-11427; Mar. 18, 1986, 61-61190
Int. Cl.[4] G03C *5/26, 1/10*
U.S. Cl. 430—567 **12 Claims**

1. In a light-sensitive silver halide photographic material having at least one silver halide emulsion layer on a support, the improvement wherein said light-sensitive photographic material contains light-sensitive silver halide grains, metal salt grains having internal fog and a polyhydric alcohol having at least two hydroxyl groups having a melting point of 40° C. or higher.

4,840,889

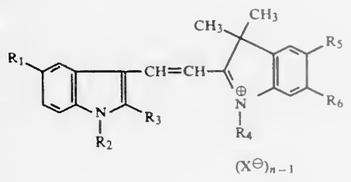
HIGH WHITENESS SILVER HALIDE PHOTOGRAPHIC PAPER FOR DIRECT POSITIVES

Yutaka Uesawa, and Isamu Morimoto, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

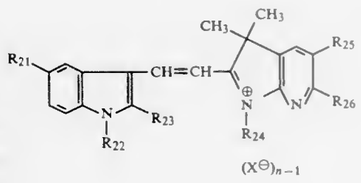
Filed Sep. 8, 1987, Ser. No. 93,821
Claims priority, application Japan, Sep. 11, 1986, 61-214658; May 1, 1987, 62-108138
Int. Cl.[4] G03C *1/36, 1/92*
U.S. Cl. 430—597 **12 Claims**

1. A silver halide photographic paper for direct positives, comprising a support and a silver halide emulsion layer for direct positives, provided on the support and containing silver halide grains having been fogged in the presence of a reduction fogging agent and a water-soluble gold compound, wherein a photographic layer on the side on which said silver halide emulsion layer for direct positives is provided contains an emulsion dispersion or latex dispersion of an oil-soluble brightening agent, and simultaneously contains at least one of organic desensitizers represented by formula (I), (II), (III), (IV) or (V):

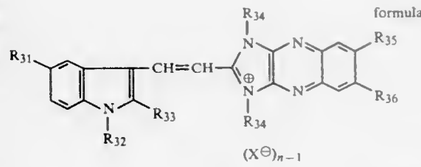
formula (I)



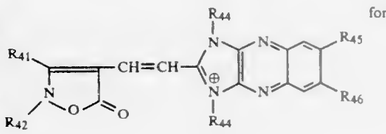
formula (II)



formula (III)

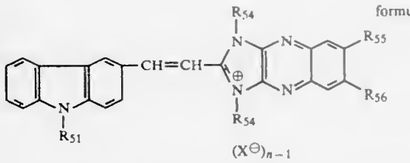


formula (IV)

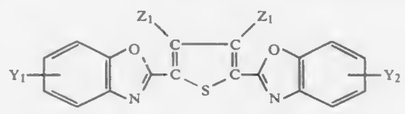


or

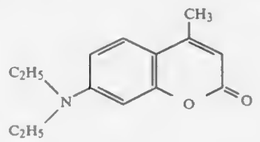
formula (V)



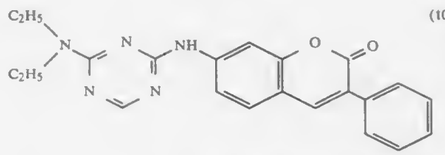
wherein R^1, R^{21} and R^{31} each represent a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, aryloxy group or a nitro group, R^2, R^3, R^4, R^{22}, R^{23}, R^{24}, R^{32}, R^{33}, R^{34}, R^{44} and R^{54} each represent an alkyl group, an alkenyl group, an aryl group or an aralkyl group, which may be unsubstituted or substituted, R^5, R^6, R^{25}, R^{26}, R^{35}, R^{36}, R^{45}, R^{46}, R^{55} and R^{56} each represent a hydrogen atom, a halogen atom, an alkyl group, an aryl group, a thienyl group, an alkoxy group, a hydoxy group, a cyano group, an alkylsulfonyl group, an alkoxycarbonyl group, a phenylsulfonyl group, a trifluoromethyl group, a trifluoromethylsulfonyl group or a nitro group, R^{41} represents an aryl group, R^{42} represents an alkyl group, R^{51} represents an alkyl group which may be unsubstituted or substituted, $X^{\ominus}$ represents an anion and n represents 1 or 2 with proviso that in case where the compound forms an internal salt, n is 1 and said oil-soluble brightening agent being selected from the group consisting of:



(4)



and



(10)

wherein Y^1 and Y^2 each represent an alkyl group, Z^1 a hydrogen atom or an alkyl group.

4,840,890

HARDENED PROTEINIC BINDER LAYER

Hans Öhlschläger, Bergisch Gladbach; Karl-Wilhelm Schranz, Odenthal-Hahnenberg, and Johannes Sobel, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 875,607, Jun. 18, 1986, abandoned. This application Jan. 19, 1988, Ser. No. 147,032
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1985, 3523360
Int. Cl.[4] G03C *1/30*
U.S. Cl. 430—622 **4 Claims**

3. Light-sensitive photographic recording material comprising at least one gelatin-containing binder layer which has been hardened with a heteroaromatic vinylsulphone compound corresponding to the following formula:

$$Z(—SO_2—CH=CH_2)_2$$

wherein Z denotes a triazole, thiadiazole, pyridine or triazine which may be substituted further.

4,840,891

ENCAPSULATION OF SPERM FOR ARTIFICIAL INSEMINATION

Jonathan van Blerkom, Denver, Colo., assignor to Genetic Engineering, Inc., New City, N.Y.

Filed Sep. 3, 1986, Ser. No. 903,120
Int. Cl.[4] A01N *1/02;* **C12N** *11/04*
U.S. Cl. 435—2 **15 Claims**

1. A method of encapsulating viable mammalian sperm for storage or transfer, and subsequent insemination of a female mammal, which comprises encapsulating the sperm with a nontoxic hydrophilic polymer, said polymer being essentially freely flowable at the temperature of the uterus of such mammal, but not freely flowable at the temperature of storage or transfer, the polymer at the latter temperature being permeable to molecules of a predetermined size but not to the sperm whereby the sperm may receive nutrients and excrete waste products through the microcapsule without escaping; the sperm escaping from the microcapsule at said uterine temperature when the polymer becomes freely flowable.

4,840,892

POLYNUCLEOTIDE HYBRIDIZATION PROBES

Craig W. Adams, King of Prussia, Pa.; Jeffry J. Leary, Brea, Calif., and Martin Rosenberg, Malvern, Pa., assignors to Smithkline Beckman Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 610,363, May 15, 1984, abandoned. This application Apr. 15, 1985, Ser. No. 723,388
Int. Cl.[4] C12Q *1/70, 1/68;* **C12P** *19/34*
U.S. Cl. 435—5 **17 Claims**

1. A method for preparing a polynucleotide hybridization probe which comprises selectively protecting a probe region within a single stranded polynucleotide having a probe region and a non-probe region both 5' and 3' to the probe region by hybridizing the probe region to a complementary sequence and then chemically modifying the non-probe region of the remaining single-stranded portion of the polynucleotide.

4,840,893

ELECTROCHEMICAL ASSAY FOR NUCLEIC ACIDS AND NUCLEIC ACID PROBES

Hugh A. O. Hill, and Susan I. Libor, both of Oxford, England, assignors to Medisense, Inc., Cambridge, Mass.

PCT No. PCT/GB84/00432, § 371 Date Oct. 15, 1985, § 102(e) Date Oct. 15, 1985, PCT Pub. No. WO85/02627, PCT Pub. Date Jun. 20, 1985
PCT Filed Dec. 14, 1984, Ser. No. 769,629
Claims priority, application United Kingdom, Dec. 16, 1983, 8333650; Dec. 16, 1983, 8333651; Jan. 19, 1984, 8401399
Int. Cl.[4] C12P *1/68;* **G01N** *33/53, 33/566;* **C07H** *19/06*
U.S. Cl. 435—6 **47 Claims**

1. An assay for determining a target nucleic acid sequence which comprises the steps of:

(a) providing a probe material comprising,
  (i) a sequence of nucleic acids complementary to a given target sequence and,
  (ii) a first ligand chemically linked thereto and capable of a specific binding reaction with an antiligand;
(b) contacting the said probe material with an assay system comprising,
  (i) a mediator, enzyme, substrate system capable of transferring charge to an electrode surface when the enzyme is catalytically active, and
  (ii) a second ligand chemically linked to one of said mediator, enzyme or substrate, wherein the second ligand is capable of competing with the first ligand for binding with the antiligand, and (iii) said antiligand;
  whereby said first ligand competes with said second ligand in a specific binding reaction with the antiligand, the extent of binding of said second ligand to said antiligand being reflected in the charge which said system transfers to said electrode surface;
(c) contacting the above system with a solution suspected of containing the said target sequence whereby the binding of any of the said target sequence present in the solution to the probe affects the availability of the first ligand to compete with said second ligand to bind said antiligand and therefore alters the rate of charge transfer to the electrode and
(d) measuring said charge transfer and relating said measurement to the determination of said target nucleic acid sequence.

4,840,894

METHOD FOR DETECTING A MARKER FOR ESSENTIAL HYPERTENSION AND DIAGNOSTIC USE THEREOF

David Schachter; Szloma Kowarski, both of Bronx; Lisa A. Cowen, New York, all of N.Y., and Richard E. Abbott, Englewood, N.J., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Mar. 4, 1986, Ser. No. 835,898

Int. Cl.[4] G01N *33/53, 33/543, 33/555, 33/577*

U.S. Cl. 435—7 34 Claims

1. A diagnostic method for identifying an individual predisposed to essential hypertension which comprises determining the amount of an integral membrane, calcium-binding protein present in a sample of a tissue from the individual, the integral-membrane, calcium-binding protein having a molecular weight of about 200,000 daltons in non-denaturing detergents and of about 20,500 daltons in sodium dodecyl sulfate polyacrylamide gels, a blocked amino terminus, an isoelectric point of about 4.5 and an affinity constant for the complexation of calcium of about 2.4 micromolar, and comparing the amount so determined with the amount of such protein present in a sample of the same tissue from a normal individual, a reduced amount being indicative of predisposition to essential hypertension.

4,840,895

MONOCLONAL ANTIBODIES REACTIVE WITH IMMUNE COMPLEXES

Colin H. Self, Loadon, England, assignor to Cambridge Patent Development Limited, United Kingdon

PCT No. PCT/GB85/00120, § 371 Date Nov. 18, 1985, § 102(e) Date Nov. 18, 1985, PCT Pub. No. WO85/04422, PCT Pub. Date Oct. 10, 1985

PCT Filed Mar. 29, 1985, Ser. No. 803,137

Claims priority, application United Kingdom, Mar. 30, 1984, 8408193

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.[4] G01N *33/53*

U.S. Cl. 435—7 78 Claims

1. A secondary monoclonal antibody against a complex of a molecule of molecular weight less than 5000 and a binding protein against said molecule which secondary monoclonal antibody is not an antibody against molecule or against its binding protein.

4,840,896

HETEROPOLYMERIC PROTEIN

Vemuri B. Reddy, Framingham; Nancy Hsiung, Wellesley; Antoo K. Beck, Chestnut Hill, and Edward G. Bernstine, Boston, all of Mass., assignors to Integrated Genetics, Inc., Framingham, Mass.

Filed Nov. 2, 1983, Ser. No. 548,228

Int. Cl.[4] C12P *19/00, 5/00, 15/00*

U.S. Cl. 435—68 18 Claims

1. A mammalian cell comprising a first expression vector, said cell being capable of producing a biologically active heterodimeric human fertility hormone comprised of an alpha subunit and a beta subunit, each said subunit being encoded in nature by a distinct mRNA, said hormone being selected from the group consisting of hCG, and LH, the alpha subunit of said hormone being encoded by said first expression vector and the beta subunit being encoded by said first expression vector or a second expression vector.

4,840,897

MODIFIED HUMAN INSULIN AND ITS USE AS STARTING MATERIAL FOR THE PREPARATION OF HUMAN INSULIN

Gijsbert W. K. Van Dedem, and Francois E. A. Van Houdenhoven, both of Heesch, Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

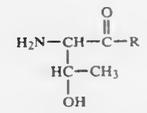
Continuation-in-part of Ser. No. 485,592, Apr. 18, 1983, abandoned. This application Aug. 20, 1985, Ser. No. 767,481

Claims priority, applicatioo Netherlands, Apr. 21, 1982, 8201650

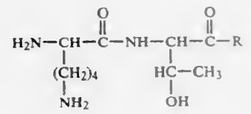
Int. Cl.[4] C12P *21/06, 21/02, 21/04;* C07K *7/40*

U.S. Cl. 435—69 6 Claims

3. Method for the semi-synthetic preparation of human insulin comprising (a) enzymatically bonding des-B30-insulin to a peptide comprising 2 to 4 amino acids or the amide or ester thereof, wherein the N-terminal amino acid is threonine, of the formula:



or enzymatically bonding desB29, B30-insulin to a peptide comprising 3 to 5 amino acids or the amide or ester thereof, wherein the N-terminal dipeptide is lysine-threonine, of the formula:



wherein R is selected from the group consisting of a hydrophobic amino acid, a charged amino acid, a dipeptide or a tripeptide wherein at least one of the amino acids is a hydrophobic or charged amino acid, an amide of said amino acid, dipeptide or tripeptide and an ester of said amino acid, dipeptide or tripeptide, to form the modified human insulin of claim 1, (b) isolating the modified human insulin (c) enzymatically removing R from the isolated modified human insulin and (d) thereafter isolating the resulting human insulin, wherein selection of enzymes in step (a) and step (c) is dictated by the peptide and by R, respectively, and wherein isolation of the modified human insulin in step (b) is conducted under hydrophobic conditions if the amino acids in the peptide are hydrophobic and under polar or ionizing conditions if the amino acids in the peptide are charged.

4,840,898

HIGH TEMPERATURE METHOD FOR THE PRODUCTION OF RIBAVIRIN

Jefferson C. Lievense, Rochester, N.Y.; Joanna D. Sawyer, Littleton, Colo., and Anthony J. Terpolilli, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 17, 1987, Ser. No. 97,762

Int. Cl.[4] C12P *19/38, 19/28;* C12R *1/13*

U.S. Cl. 435—87 5 Claims

1. In a method for the production of a 1,2,4-triazole nucleoside comprising the step of reacting a ribose donor with a triazole compound in the presence of an enzyme preparation derived from *Brevibacterium acetylicum*, the improvement wherein the ribose donor is guanosine or a guanosine derivative and the temperature during at least a part of the reaction is at or above 65° C. so that the precent conversion of starting materials to the 1,2,4-triazole nucleoside is greater than about 58 percent.

4,840,899

METHOD FOR THE PRODUCTION OF RIBAVIRIN USING HIGH ROBOSE DONOR CONCENTRATIONS

James M. Pochodylo, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 17, 1987, Ser. No. 97,767

Int. Cl.[4] C12P *19/35, 19/28;* C12R *1/13*

U.S. Cl. 435—87 6 Claims

1. In a method for the production of a 1,2,4-triazole nucleoside comprising the step of reacting a ribose donor with a triazole compound in the presence of an enzyme preparation derived from Brevibacterium acetylicum, the improvement wherein the ribose donor is guanosine or a guanosine derivative; the concentration of the donor is above about 100 mM; said triazole compound is present in the amount of at least 100 mM; and the enzyme preparation is added.

4,840,900

CONTINUOUS PROCESS FOR THE PREPARATION OF IMMOBILIZED GLUCOAMYLASE

John M. Wasileski, Brookfield, Wis., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Apr. 13, 1987, Ser. No. 37,652

Int. Cl.[4] C12P *19/20;* C12N *11/02, 11/08, 9/34*

U.S. Cl. 435—96 16 Claims

1. A process for preparing a biocatalyst comprising glucoamylase enzyme immobilized on porous, particulate, macroreticular anionic exchange resin,

said glucoamylase being a water soluble fungal derived enzyme, and

said resin being in free base form and having a particle size of about 0.50±0.20 mm and said particles having pore sizes therein of about 900 to 2000 Angstrom units,

which comprises depositing said enzyme on said resin in a continuous deposition mode of operation, said depositing being carried out in a period of about 1 to 2 hours at a temperature not to exceed 50° C. with 10±5 volumes of enzyme solution per volume of said resin, said enzyme solution having a concentration of about 100 to 200 IU of said enzyme per ml of said solution and said solution being buffered with acetate buffer at a pH of 4.0±0.3, and said depositing thereby providing a loading of about 1000 to 1500 IU of said enzyme per gram of said resin in dry form, and stabilizing the resultant deposited enzyme by treating the deposited enzyme with an aqueous solution of carbohydrate selected from the group consisting of starch, glucose and oligosaccharides in such an amount and for such a period of time as to render said enzyme substantially non-leachable from said resin when the resin is an expanded or non-expanded ionic form.

4,840,901

RESTRICTION ENDONUCLEASE DRA II

Rüdiger Grosskopf, Haar, and Christoph Kessler, Munich, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 738,036, May 24, 1985, abandoned. This application May 20, 1988, Ser. No. 198,621

Claims priority, application Fed. Rep. of Germany, May 30, 1984, 3420298

Int. Cl.[4] C12P *19/34;* C12N *9/22*

U.S. Cl. 435—91 5 Claims

1. Restriction endonuclease which recognizes palindromic sequence

5'Pu G G N C C Py 3'
3'Py C C N G G Pu 5'

and cleaves said palindromic sequence at a point between the second and third base from the 5' end.

4,840,902

CONTINUOUS PROCESS FOR ETHANOL PRODUCTION BY BACTERIAL FERMENTATION USING PH CONTROL

Hugh G. Lawford, Mississauga, Canada, assignor to George Weston Limited, Toronto, Canada

Continuation-in-part of Ser. No. 772,492, Apr. 12, 1985. This application May 4, 1987, Ser. No. 45,409

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[4] C12P *7/06;* C12N *1/38, 1/00*

U.S. Cl. 435—161 11 Claims

1. A continuous process for the production of ethanol, which comprises

feeding an aqueous substrate solution substantially continuously to a reactor containing a fermentation medium and a submerged culture of an organism of the genus Zymomonas;

cultivating said organism to produce ethanol under substantially steady state anaerobic conditions in an aqueous nutrient medium containing assimilable carbon, nitrogen and phosphorus;

controlling pH in the fermentation medium between a pH of about 3.8 and a pH less than 4.5 so that ethanol production is substantially uncoupled from cell growth and wherein the biomass expresses values for both the specific rate of substrate uptake (q_s) and the specific rate of ethanol formation (q_p) which are greater than the values would be for a similar process conducted at a higher pH; and

removing an effluent containing ethanol from the reactor.

4,840,903

PROCESS FOR PRODUCING ETHANOL FROM PLANT BIOMASS USING THE FUNGUS PAECILOMYCES SP.

Jung Fu Wu, Lakewood, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 8, 1985, Ser. No. 763,585

Int. Cl.[4] C12P *7/10;* C12R *1/79*

U.S. Cl. 435—165 27 Claims

1. A process for producing ethanol from plant biomass comprising:

forming a substrate from said biomass, said substrate including hydrolysates of cellulose and hemicellulose;

selecting and isolating a species of the fungus *Paecilomyces sp.* NF1 which species has the ability to ferment both cellobiose and xylose to ethanol;

inoculating said substrate with said selected fungus;

fermenting said inoculated substrate under conditions favorable for cell viability and conversion of hydrolysates to ethanol; and

recovering the ethanol from said substrate.

4,840,904

RECOVERY AND REUSE OF CELLULASE CATALYST IN AN EXZYMATIC CELLULOSE HYDROLYSIS PROCESS

Jonathan Woodward, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 18, 1987, Ser. No. 98,242

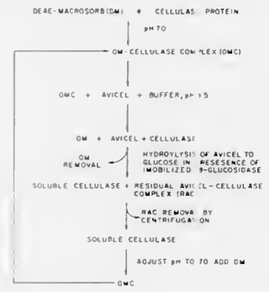
Int. Cl.[4] C12P *7/10, 19/02*

U.S. Cl. 435—165 4 Claims

1. A process for recovering cellulase subsequent to cellulose hydrolysis comprising:

at a basic pH contacting a solution of reactant products from the hydrolysis of cellulose, including cellulase, with Kie-

selguhi granules adsorbent, thereby resulting in the adsorption of said cellulase on said adsorbent; contacting



said cellulase and a solution having an acidic pH to separate said cellulase from said adsorbent.

4,840,905

PROCESS FOR CULTURING BIOLOGICAL MATERIAL

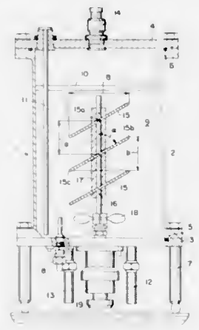
Michael J. Kearns, Salisbury, England, and Michael J. Comer, Bernried, Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Oct. 7, 1987, Ser. No. 106,115

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1986, 3634203

Int. Cl.[4] C12N *5/02*

U.S. Cl. 435—240.25 **13 Claims**



1. A process for culturing biological material capable of multiplication, which comprises the steps of:

homogeneously suspending the biological material in a culture medium;

placing said culture medium in a bioreactor comprising a vessel having a top wall and a bottom wall, means for controlling environmental conditions in the culture medium, and stirring means for the homogeneous distribution of the biological material in the culture medium, the stirring means having a rotation axle defining an axial direction and attached to a rotary drive means for driving the stirring means, said stirring means extending into and rotating in the interior of the vessel and comprising a plurality of stirrer blades in the form of plates affixed at adjacent points along the rotation axle with an angle of inclination toward said rotation axle, each stirrer blade having at its edge two extreme points displaced in the axial direction from the point at which the plate is fixed to the rotation axle, these extreme points having a predetermined distance in axial direction from each other, and wherein said points at which said stirrer blades are affixed to said rotation axle are separated from each other by a distance in the range of at least about half as great as said predetermined distance between said extreme points; and

causing said stirrer blades to rotate, thereby keeping said biological material in homogeneous suspension while the biological material is multiplying.

4,840,906

PLANT GENERATION METHOD

Clifford P. Hunter, Sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

Filed May 14, 1987, Ser. No. 49,360

Claims priority, application United Kingdom, May 15, 1986, 8611818

Int. Cl.[4] C12N *5/00*

U.S. Cl. 435—240.49 **8 Claims**

1. A method of generating barley plants comprising culturing barley microspores on a sugar-containing medium and harvesting green plantlets from the medium characterized in that the sugar in the sugar-containing medium is selected from the group consisting of (a) glucose having a concentration in the medium of not greater than 0.03 mol/1; (b) oligosaccharides, containing 2 to 10 monosaccharide residues, at least two of which are glucose residues, having a concentration in the medium of 0.05 to 0.35 mol/1; or (c) polysaccharides, containing more than 10 monosaccharide residues, at least two of which are glucose residues, having a concentration in the medium of 2 to 12 percentage w/v (grams per 100 ml).

4,840,907

PROCESS FOR PRODUCING OPTICALLY ACTIVE DICHLOROPROPANOL USING MICROORGANISM

Naoya Kasai, Kishiwada; Hisaharu Shima, Amagasaki, and Kazuya Tsujimura, Sakai, all of Japan, assignors to Osaka Soda Co., Ltd., Osaka, Japan

Filed Jun. 2, 1986, Ser. No. 869,711

Claims priority, application Japan, Jul. 3, 1985, 60-147065

Int. Cl.[4] C12R *1/38;* **C12P** *41/00, 7/04*

U.S. Cl. 435—253.3 **7 Claims**

1. A process for producing optically active dichloropropanol, which comprises cultivating the R-(+)-2,3-dichloro-1-propanol-assimilating strain Pseudomonas OS-K-29 as deposited with the Fermentation Research Institute, Agency of Industrial Science and Technology, Japan, under Deposit No. FERM BP-994 in a culture medium containing racemate 2,3-dichloro-1-propanol and recovering optical isomer S-(−)-2,3-dichloro-1-propanol from the culture broth.

4,840,908

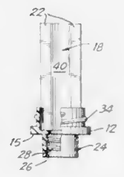
CULTURE BOTTLE ASSEMBLY

James A. Burns, Elizabeth, N.J., assignor to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jun. 29, 1988, Ser. No. 217,481

Int. Cl.[4] C12M *1/24*

U.S. Cl. 435—296 **10 Claims**



1. A device for culturing microorganisms wherein the sample of interest is to be exposed separately to both a solid and a liquid culture medium; characterized by

(a) a generally flat base;

(b) said base having an upper surface and a lower surface;

(c) an extension extending integrally from said bottom surface of said base;

(d) a bore positioned substantially centrally in said base;

(e) said bore extending from said top surface through said extension;

(f) internal threads in said bore in the area thereof extending through said extension;

(g) an upright solid medium support extending upwardly from said upper surface of said base;

(h) a transparent elongated cap for covering said upright solid medium;

(i) said cap having an open end and a closed end;

(j) said cap, at the open end thereof, and said base having cooperating connecting means for holding said cap on said base; and

(k) whereby upon connecting of said internal threads to a liquid culture body, said bore provides connection of the liquid contents of a liquid culture bottle to said solid medium on said upright solid medium support.

10. An assembly for culturing microorganisms wherein the solid medium is contained separately to the liquid medium after exposure, characterized by

(a) a liquid culture medium bottle;

(b) said bottle having a closed end and an open end;

(c) a neck on said bottle adjacent the open end;

(d) external threads on said neck; and

(e) a device for connection to said external threads, said device comprising

(1) a generally flat base;

(2) said base having an upper surface and a lower surface;

(3) an extension extending integrally from said bottom surface of said base;

(4) a bore positioned substantially centrally in said base;

(5) said bore extending from said top surface through said extension;

(6) internal threads in said bore in the area thereof extending through said extension for cooperating with said external threads on said neck allowing momentary contact of said solid medium with said liquid medium with subsequent segregation;

(7) an upright solid medium support extending upwardly from said upper surface of said base;

(8) a transparent elongated cap for covering said upright solid medium during culturing;

(9) said cap having an open end and a closed end; and

(10) said cap, at the open end thereof, and said base having cooperating connecting means for holding said cap on said base and for exposing said solid medium to examination.

4,840,909

METHOD OF PREPARING A SULFONAMIDE-FOOD COLOR ADDITIVE FOR DETECTION OF SULFONAMIDES IN ANIMAL FEEDS AND PHARMACEUTICALS PREPARATIONS

Irving S. Rossoff, 515 Springfield Rd., P.O. Box 333, Taylorville, Ill. 62568

Continuation of Ser. No. 846,360, Mar. 31, 1986. This application Aug. 26, 1987, Ser. No. 89,511

Int. Cl.[4] G01N *33/02*

U.S. Cl. 436—20 **5 Claims**

1. A method for preparing a sulfonamide-food color additive product for incorporation into an animal feed which product, upon being wetted, produces a visually detectable color indicative of the presence of said sulfonamide, which method consists essentially of admixing a minor amount of an approved food color additive with a sulfonamide in the presence of water, and drying the resulting mixture so as to incorporate said food color additive into said sulfonamide thereby producing a sulfonamide-food color additive product which, upon being wetted, produces a visually detectable color indicative of the presence of said sulfonamide.

4,840,910

CONTROLLING SULFIDE SCAVENGER CONTENT OF DRILLING FLUID

Stephen D. Matza, Stafford; William E. Ellington, and Henry C. Fleming, III, both of Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 784,422, Oct. 4, 1985, Pat. No. 4,658,914, which is a continuation-in-part of Ser. No. 609,611, May 14, 1984, abandoned. This application Apr. 20, 1987, Ser. No. 40,414

The portion of the term of this patent subsequent to Apr. 21, 2004, has been disclaimed.

Int. Cl.[4] G01N *31/02, 33/24*

U.S. Cl. 436—30 **7 Claims**

1. A process for determining the amount of unspent zinc-containing sulfide scavenger in an aqueous drilling fluid, comprising:

mixing one part by volume of said drilling fluid with about 4 to 10 parts by volume of a selective solvent for zinc ions, such that the solvent provides a pH of about 4 to 6 and is capable of dissolving substantially all of the zinc present in the drilling fluid which has not been combined into molecules of zinc sulfide;

separating the resulting solution from undissolved solids;

determining the amount of dissolved zinc present in the solution; and

determining the amount of unspent zinc-containing sulfide scavenger in the aqueous drilling fluid.

4,840,911

USE OF SULFOXIDES FOR TESTING IONIZATION DETECTOR SYSTEM

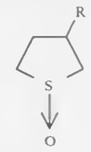
Joseph Epstein, Baltimore; John A. Parsons, Abingdon, and Frank Block, Edgewood, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 28, 1987, Ser. No. 55,811

Int. Cl.[4] G01N *31/00*

U.S. Cl. 436—8 **3 Claims**

1. A method of simulating a positive response of organophosphorus esters to an ionization detector system which comprises forwarding to the ionization detector system a gaseous stream comprising water vapor and a sulfoxide selected from the group consisting of a di (lower alkyl) sulfoxide or a cyclic sulfoxide the latter represented by the formula I:



I

4,840,912

PROCESS FOR DRUG DETECTION

Baruch Glattstein, Jerusalem, Israel, assignor to Erez Forensic Technology, Ltd., Israel

Division of Ser. No. 12,028, Feb. 9, 1987. This application Oct. 11, 1988, Ser. No. 255,989

Claims priority, application Israel, Feb. 12, 1986, 77871; Dec. 3, 1986, 80860

Int. Cl.[4] G01N *33/00, 33/15*

U.S. Cl. 436—92 **10 Claims**

1. A process for the screening of suspect samples for the presence of illicit cocaine and street heroin sufficient to insti-

tute confiscation of such samples, based upon the presumptive indication of their presence which comprises the steps of applying to samples suspected of containing illicit materials selected from the group consisting of cocaine, cocaine-free-base, or street heroin, a reagent which upon contact with such materials gives a characteristic color reaction to the trace amounts of organic bases or acetic acid commonly present and emitted by said materials, said color reaction providing sufficient indication of the presence of said illicit material for confiscation of said suspect samples prior to positive identification of the individual materials by further tests required for proper prosecution.

4,840,913

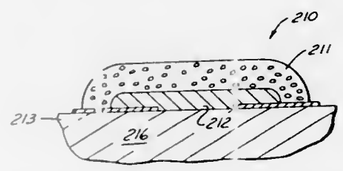
OXIDES OF NITROGEN DETECTOR

Eleftherios M. Logothetis, Birmingham, and Richard E. Soltis, Redford, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 927,637, Nov. 6, 1986, abandoned. This application May 19, 1988, Ser. No. 196,813

Int. Cl.[4] G01N *25/22, 27/50*

U.S. Cl. 436—116 **8 Claims**



1. A method of sensing oxides of nitrogen in an ambient gas including other reducing gases including the steps of:

exposing an oxidation catalyst to ambient gas;

passing the ambient gas through the oxidation catalyst which oxidizes the reducing species without affecting any NO_2 present;

positioning the oxidation catalyst between the ambient gas and an oxides of nitrogen semiconductor sensor;

isolating the oxides of nitrogen semiconductor sensor from the ambient gas; and

passing the gaseous output from the oxidation catalyst to the oxides of nitrogen semiconductor sensor to detect the amount of oxides of nitrogen by sensing the change in resistance of the oxides of nitrogen sensor.

4,840,914

GENDER-INDICATING COLORIMETRIC TEST ON PREGNANCY URINE AND TEST KIT THEREFOR

Kenneth Weisberg, 606 St. Andrews Rd., Hollywood, Fla. 33021

Filed Sep. 26, 1988, Ser. No. 248,909

Int. Cl.[4] G01N *33/52*

U.S. Cl. 436—183 **9 Claims**

1. A method for the determination of the gender of the unborn child which comprises the steps of:

(a) contacting a sample of the urine from a woman pregnant with the unborn child with a gender-indicating composition;

(b) initiating a chemical reaction between said urine and said composition;

(c) comparing the color developed in the reaction solution as a result of said reaction with standards indicating the gender of said unborn child;

said urine sample being obtained from said pregnant woman during or after the 20th week of the pregnancy; and

said gender-indicating composition comprising an alkali hydroxide and metallic aluminum in 10:1 to 2:1 proportion by weight;

said contacting proportions of said composition to urine being from about 1:1 to about 1:6, weight to volume; said initiation of reaction being caused by the exothermic nature of the reaction;

said color standards for gender determination comprising shades of tan which indicate a female child and shades of brown indicating a male child.

9. A kit for the determination of the gender of an unborn child by reacting with the urine of a pregnant woman, pregnant with said child, which comprises:

(a) kit means enclosing:

(b) a reaction vessel

(c) a portion of a gender-indicating composition

(d) a color standard for comparison;

said reaction vessel having a sufficient capacity to accept a sample of the urine from a pregnant woman and to confine the liquid reactants during the reaction of the urine with the gender-indicating composition; said gender-indicating composition comprising an alkali hydroxide and metallic aluminum, both in particulate form, and said composition portion being an amount sufficient for reacting with the urine and forming a tan or brown solution; said color standard in chart or sample form for use as a comparison standard with said colored solution and having tan standards for female indication and brown standards for male indication.

4,840,915

METHOD FOR DIAGNOSING MALIGNANT TUMORS

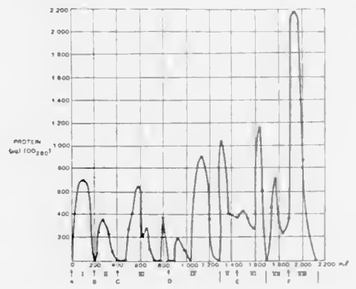
Samuel Bogoch, St. George, Bermuda, assignor to Brain Research, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 281,883, Jul. 9, 1981, and a continuation-in-part of Ser. No. 271,645, Jul. 8, 1981, Pat. No. 4,486,538, each is a continuation-in-part of Ser. No. 922,799, Jul. 7, 1978, Pat. No. 4,298,590, which is a continuation of Ser. No. 19,078, Mar. 9, 1978, abandoned, which is a continuation-in-part of Ser. No. 941,940, Sep. 13, 1980, abandoned, which is a division of Ser. No. 852,200, Nov. 17, 1977, Pat. No. 4,196,186, which is a continuation of Ser. No. 621,112, Oct. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 553,075, Feb. 25, 1975, abandoned, and a continuation-in-part of Ser. No. 550,432, Feb. 18, 1975, abandoned, and a continuation-in-part of Ser. No. 450,404, Mar. 12, 1974, abandoned, and a continuation-in-part of Ser. No. 385,451, Aug. 3, 1973, abandoned, and a continuation-in-part of Ser. No. 286,172, Jul. 23, 1981, which is a continuation of Ser. No. 101,127, Dec. 7, 1979, abandoned, which is a continuation of Ser. No. 852,200, Nov. 17, 1977, Pat. No. 4,196,186. This application Oct. 3, 1983, Ser. No. 538,492

The portion of the term of this patent subsequent to Apr. 1, 1997, has been disclaimed.

Int. Cl.[4] G01N *33/544, 33/531*

U.S. Cl. 436—530 **8 Claims**



1. A method for diagnosing malignant tumors which comprises:

(a) dividing a sample of body fluid into a first and second aliquot;

(b) contacting said first aliquot with a complex of Malignin and an inert carrier for about two hours to allow protein to bind to said complex;

(c) separating from said first aliquot said complex and the protein bound to it;

(d) cleaving the bound protein from said complex;

(e) quantitatively determining the amount of protein cleaved from said complex;

(f) contacting said second aliquot with a complex of Malignin and an inert carrier for about 10 minutes to allow protein to bind to said complex;

(g) separating from said second aliquot said complex and the protein bound to it;

(h) cleaving the bound protein from said complex;

(i) quantitatively determining the amount of protein cleaved from said complex;

(j) comparing the amount of protein determined in step e, above, with that determined in step i, above; and correlating the difference between the two amounts with a predetermined standard value indicative of the tumor, wherein said Malignin is a product, derived from brain tumor cells, which forms a single line precipitate with its specific antibody in quantitative precipitin tests and in Ouchterlony gel diffusion tests, is soluble in water and aqueous solutions having an acid or neutral pH, and insoluble at an alkaline pH, has a spectrophotometric absorption peak wave length of 280 mu, a molecular weight of about 10,000 and an amino acid composition approximately as follows:

	Approximate No. of Residues
Aspartic Acid	9
Threonine	5
Serine	5
Glutamic Acid	13
Proline	4
Glycine	6
Alanine	7
Valine	6
½ Cystine	1
Methionine	2
Isoleucine	4
Leucine	8
Tryosine	3
Phenylalanine	3
Lysine	6
Histidine	2
Argine	5
Approximate Total	89

ammonia and the amino acids cysteic, hydroxyproline, norleucine, isodesmosine, hydroxylysine, lysinonorleucine and gamaaminobutyric acid being absent in detectable amounts.

4,840,916

PROCESS FOR FABRICATING AN AVALANCHE PHOTODIODE

Kazuhito Yasuda, Tokyo, and Yutaka Kishi, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 738,723, May 29, 1985, abandoned. This application Aug. 21, 1987, Ser. No. 90,432

Claims priority, application Japan, May 31, 1984, 59-109434

Int. Cl.[4] H01L *31/18*

U.S. Cl. 437—3 **6 Claims**

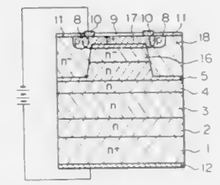
1. A process for fabricating an avalanche photodiode, comprising the steps of:

carrying out a first crystal growth for forming a first semiconductor layer of a first conductivity type on a semiconductor body comprising a light absorption layer;

selectively etching a periphery of said first semiconductor layer to leave the first semiconductor layer in the form of a mesa;

melting-back the exposed surface of the first semiconductor layer in the form of a mesa;

carrying out a second crystal growth for forming a second semiconductor layer on said mesa-etched and melted-back first semiconductor layer; and



forming an impurity doped region of a second conductivity type extending from the top surface of said second semiconductor layer into the inside of said first semiconductor layer, whereby a p-n junction is defined in said inside of said first semiconductor layer and the remaining portion of said first semiconductor layer where said impurity doped region is not formed defines a multiplication layer.

4,840,917

METHOD OF INTERFACE STATE REDUCTION IN MNOS CAPACITORS

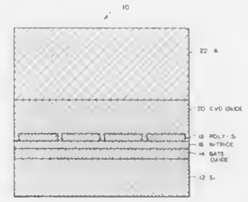
Yea-Dean Sheu, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 13, 1988, Ser. No. 218,004

The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.

Int. Cl.[4] H01L *21/00, 21/02, 21/477, 29/00*

U.S. Cl. 437—10 **4 Claims**



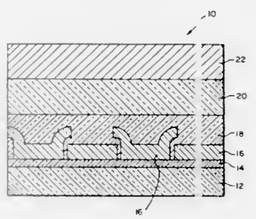
1. A method of reducing the interface state density between Si and SiO_2 in an MNOS (conductor-nitride-oxide silicon) structure, comprising the steps of:

(a) forming an oxide layer over the metal;

(b) forming an unpatterned Al layer over the oxide layer having trace water;

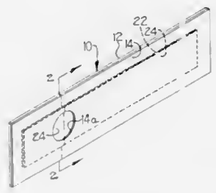
(c) sintering the unpatterned Al layer to generate sufficient hydrogen atoms from trace water in the oxide layer to reduce the interface state between Si and SiO_2.

4,840,918
METHOD OF NOISE REDUCTION IN CCD SOLID STATE IMAGERS
Yea-Dean Sheu, Rochester, and Gilbert Hawkins, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed May 9, 1988, Ser. No. 191,526
The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.
Int. Cl.[4] H01L *21/00, 21/02, 21/477, 31/00*
U.S. Cl. 437—53 3 Claims



1. A method of passivating the surface states of an active layer in a solid state device comprising the steps of:
(a) forming an unpatterned Al layer over an oxide layer of the device having trace water;
(b) sintering the unpatterned Al layer to generate sufficient hydrogen atoms from trace water in the oxide layer to passivate surface states on the gate oxide/silicon interface in the device active areas.

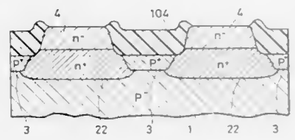
4,840,919
GAS DOSIMETER FOR COLORIMETRICALLY INDICATING THE PRESENCE OF AMIDES
Amir J. Attar, Raleigh, N.C., assignor to Perfect View, Inc., Raleigh, N.C.
Filed Mar. 3, 1987, Ser. No. 21,247
Int. Cl.[4] G01N *2/78*
U.S. Cl. 436—111 5 Claims



1. A method for colorimetrically indicating the presence of aromatic amines which comprises exposing the aromatic amines to a chromophoric reagent comprising 1,2 naphthoquinone-4-sulfonic acid or a derivative of 1,2 naphthoquinone-4-sulfonic acid and an effective concentration of a buffering agent to maintain the pH of said reagent less than 4.5, and observing the change in color of said reagent.

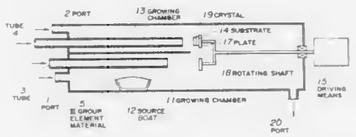
2. In a gas dosimeter which includes a chromophoric reagent which changes color in response to exposure to specific vapors or gases, the improvement wherein the chromophoric reagent comprises 1,2 naphthoquinone-4-sulfonic acid or a derivative of 1,2 naphthoquinone-4-sulfonic acid and a buffering agent which maintains the chromophoric reagent at a pH less than 4.5.

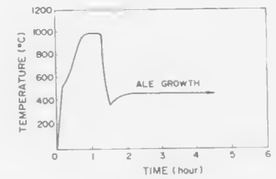
4,840,920
METHOD OF ISOLATING A SEMICONDUCTOR DEVICE USING LOCAL OXIDATION
Kakutaro Suda, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 25, 1987, Ser. No. 100,947
Claims priority, application Japan, Jul. 2, 1987, 62-167182
Int. Cl.[4] H01L *29/78, 21/265*
U.S. Cl. 437—69 6 Claims



1. A method of manufacturing a semiconductor device having adjacent ones of element regions isolated by isolation regions, said method comprising:
a first step of successively stacking a first oxide film and a first nitride film on a first conductivity type semiconductor substrate of low impurity concentration;
a second step of removing a plurality of portions of a two-layer film formed by said first oxide film and said first nitride film through etching to form first regions in which two-layer films are left and second regions surrounded by said first regions;
a third step of introducing second conductivity type impurity into said second regions of said semiconductor substrate by utilizing said two-layer films of said first regions as masks;
a fourth step of performing side etching of side walls of said first oxide films by utilizing said first nitride films as masks to retract edges of said first oxide films to prescribe positions in said first regions;
a fifth step of performing selective oxidation by utilizing said first nitride films as masks to form second oxide films being larger in thickness than said first oxide films on said second regions of said semiconductor substrate and on regions exposed in said fourth step within said first regions of said semiconductor substrate;
a sixth step of diffusing said second conductivity type impurity introduced into said second regions of said semiconductor substrate in said third step by heat treatment to form second conductivity type buried layers of high impurity concentration;
a seventh step of introducing, after removing said first nitride films, first conductivity type impurity into only regions having surfaces covred by said first oxide films within said first regions of said semiconductor substrate through said first oxide films by utilizing said second oxide films as masks and further performing heat treatment to form first conductivity type buried layers of high impurity concentration in regions between adjacent ones of said second conductivity type buried layers; and
an eighth step of removing said first oxide films and said second oxide films and forming a second conductivity type epitaxial layer on said semiconductor substrate.

4,840,921
PROCESS FOR THE GROWTH OF III-V GROUP COMPOUND SEMICONDUCTOR CRYSTAL ON A SI SUBSTRATE
Takashi Matsumoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Jun. 30, 1988, Ser. No. 213,940
Claims priority, application Japan, Jul. 1, 1987, 62-165694; Jul. 1, 1987, 62-165695; Jul. 13, 1987, 62-175105; Jul. 14, 1987, 62-176374
Int. Cl.[4] H01L *21/205*
U.S. Cl. 437—89 5 Claims

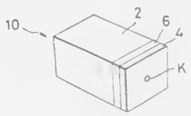




1. A process for the growth of III-V group compound semiconductor crystal on a Si substrate comprising,
placing a Si substrate on a mount positioned in a growing chamber,
heating said Si substrate at a predetermined temperature,
supplying first gas seed including one selected from In and Ga of III group elements, and second gas seed including one of V group elements alternately into said growing chamber, and
growing III-V group compound semiconductor crystal on said Si substrate,
wherein said one selected from In and Ga is a chloride thereof.

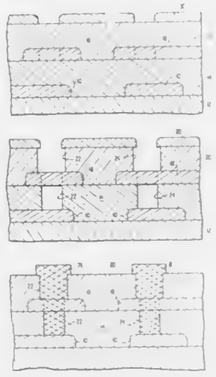
4,840,922
METHOD OF MANUFACTURING MASKED SEMICONDUCTOR LASER
Hiroshi Kobayashi, 3-15 Hanakoganei, Kodaira-shi, Tokyo; Haruhiko Machida, 10-7 Nakaochiai 4-chome, Shinjuku-ku, Tokyo; Hideaki Ema, Shizuoka; Jun Akedo, Tokyo; Makoto Harigaya, Yokohama, and Yasushi Ide, Tokyo, all of Japan, assignors to Ricoh Company, Ltd.; Hiroshi Kobayashi and Haruhiko Machida, all of Tokyo, Japan
Filed Oct. 13, 1987, Ser. No. 80,389
Claims priority, application Japan, Jul. 29, 1986, 61-178140; Mar. 12, 1987, 62-057784; Jul. 3, 1987, 62-166617
Int. Cl.[4] H01S *3/19*
U.S. Cl. 437—129 36 Claims

1. A method of manufacturing a masked semiconductor laser, comprising the steps of:
forming a masking layer capable of cutting off light emitted from a semiconductor laser body on a light-emitting surface of the semiconductor laser body; and
thereafter, removing or making optically transparent a localized portion of said masking layer with light emitted from the semiconductor laser body for thereby defining a light-emitting hole in said masking layer for passage of said light therethrough, wherein said intensity of the light emitted from said semiconductor laser body is adjusted such that the energy of the light is higher than a threshold at which said masking layer is removed or made optically transparent is collected in an area of said light-emitting surface



within the diameter of said light-emitting hole, and wherein said semiconductor laser body is energized in an evacuated vacuum chamber to emit light for forming said light-emitting hole.

4,840,923
SIMULTANEOUS MULTIPLE LEVEL INTERCONNECTION PROCESS
Donis G. Flagello, Ridgefield, Conn.; Janusz S. Wilczynski, Ossining, and David F. Witman, Pleasantville, both of N.Y., assignors to International Business Machine Corporation, Armonk, N.Y.
Continuation of Ser. No. 857,275, Apr. 30, 1986, abandoned.
This application Oct. 19, 1988, Ser. No. 262,208
Int. Cl.[4] H01L *21/312*
U.S. Cl. 437—189 11 Claims



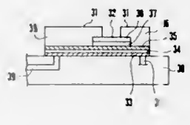
1. A method of establishing a conductive via path between spaced interlevel conductors comprising the steps of:
defining a first level having a pattern of a conductive material and applying a first dielectric layer over said first level of conductive material:
applying a second level having a pattern of a conductive material with via openings over said first dielectric layer;
applying a second dielectric layer over said second level of conductive material;
creating a via path by opening said dielectric layers through said via openings in said conductive level and terminating said opening at the first conductive level; and
filling said opening with a conductive material.

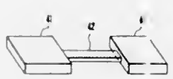
4,840,924

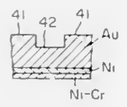
METHOD OF FABRICATING A MULTICHIP PACKAGE

Kouji Kinbara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 753,231, Jul. 9, 1985, abandoned. This application Oct. 29, 1987, Ser. No. 115,565
Claims priority, application Japan, Jul. 11, 1984, 59-143581; Jul. 16, 1984, 59-146035
Int. Cl.[4] H01L *21/23*
U.S. Cl. 437—189 2 Claims







1. A method of fabricating a multichip package having an array of contact pads, each pad including a connection conductor portion and a separable conductive portion, particularly for fabricating said contact pad having the ability to make wiring changes, comprising the steps of forming a multilayer thin film conductive layer comprising chromium, palladium and copper layers on an insulating layer, coating a photoresist on said multilayer thin film conductive layer; implementing exposure and development processes to said photoresist to form a first pattern including said separable conductive portion; implementing a multilayer plating process to form a first wiring layer constituted by nickel and gold plating layers and including said separable conductive portion, thereafter stripping off said photoresist; coating a photoresist on said multilayer thin film conductive layer and said first wiring layer for a second time; implementing exposure and development processes to said photoresist to form a second pattern including said connection conductor portion; implementing a plating process to form a second wiring layer including said connection conductor portion, thereafter stripping off said photoresist; removing the thin film conductive layer except for said first and second wiring layers, thereby completing a conductive portion for soldering; and thereafter forming a solder dam made of a photosensitive polyimide varnish on said insulating layer on which said conductive portion for soldering is formed.

4,840,925

COMPOSITIONS OF TRANSITION METAL MANGANITES IN THE FORM OF PARTICLES OR CERAMICS, THEIR PREPARATION AND THEIR USE IN THE PRODUCTION OF THERMISTORS

Abel C. Rousset, Ramonville St Agne; Guy Boissier, Toulouse; El Hadj Jabry, Benslimane, and Jean-Pierre Caffin, Castres, all of France, assignors to Universite Paul Sabatier (Toulouse III), Toulouse, France

Filed Jun. 4, 1986, Ser. No. 870,355
Claims priority, application France, Jun. 4, 1985, 85 08401
Int. Cl.[4] C04B *35/00*; C01G *45/12*
U.S. Cl. 501—1 14 Claims

1. A composition of a derivative of the manganite type having the formula

$$Mn_{3-x-y-z}Ni_xCo_yM_zO_4 \quad (I)$$

wherein

M represents at least one divalent metal selected from copper, zinc and cadmium,

x, y and z are numbers ranging from 0 to 1, with the sum (x+y+z) being lower than 2,

with the provisos that the numbers x, y and z cannot simultaneously all be equal to zero, that x can range from 0.6 to 1 when y=z=0 and that y can range from 0.6 to 1 when x=z=0;

said composition being in the form

(a) of a particulate composition wherein at least 90 percent of the particles have the following characteristics:

(i) morphology—essentially isotropic form,

(ii) granulometry—a size lower than or equal to 5 micrometers,

(iii) structure—spinel type and

(iv) specific area—greater than 3 m^2/g, or

(b) of a ceramic having a density at least equal to 94 percent of its theoretical density.

4,840,926

HIGH FREQUENCY WAVE ABSORBING CERAMICS

Toshiki Saburi, Anjo; Nobuyuki Ohya, Nagoya; Toru Yamazaki, Kariya, and Taisei Katoh, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 27,071, Mar. 17, 1987, abandoned, which is a continuation of Ser. No. 813,780, Dec. 27, 1985, abandoned. This application Nov. 25, 1987, Ser. No. 125,712
Claims priority, application Japan, Dec. 28, 1984, 59-280712
Int. Cl.[4] C04B *35/00*
U.S. Cl. 501—134 7 Claims

1. A high frequency wave absorbing ceramics of a ternary composition comprising lead iron niobate $Pb(Fe_{\frac{2}{3}}Nb_{\frac{2}{3}})O_3$, lead iron tungstate $Pb(Fe_{\frac{2}{3}}W_{\frac{1}{3}})O_3$ and lead nickel tantalate $Pb(Ni_{\frac{1}{3}}Ta_{\frac{2}{3}})O_3$,

the composition ratio in the ternary composition lying in the inside (including the boundary) of a quadrangle A—B—C—D in the ternary phase diagram shown in FIG. 1, and the high frequency wave absorbing ceramics having a dielectric constant of 13,000 or more at a frequency of 1 MHz.

4,840,927

DESENSITIZER COMPOSITION

Shojiro Sano, and Keiso Saeki, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 9, 1986, Ser. No. 905,206
Claims priority, application Japan, Sep. 9, 1985, 60-198746
The portion of the term of this patent subsequent to Feb. 16, 2005, has been disclaimed.
Int. Cl.[4] B41M *5/16*
U.S. Cl. 503—201 11 Claims

1. A color developer sheet for development of substantially colorless organic color formers comprising a substrate having provided thereon an electron-accepting color developer compound containing layer, said color developer compound containing layer having provided thereon a desensitizer composition consisting essentially of a 2,2,6,6-tetramethylpiperidine compound as a desensitizer and additives comprising a natural or synthetic high-molecular weight compound and a pigment.

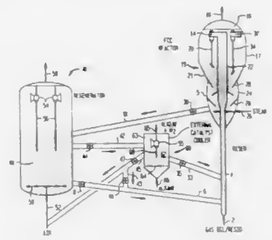
9. A process for forming an image comprising either (i) superposing a color former sheet containing a color former on a color developer sheet and applying pressure to the sheets so as to imagewise effect color formation and development or (ii) imagewise applying ink containing the color former to the color developer sheet so as to effect color formation and development, wherein the color developer sheet comprises a color developer and the desensitizing composition of claim 2.

4,840,928

CONVERSION OF ALKANES TO ALKYLENES IN AN EXTERNAL CATALYST COOLER FOR THE REGENERATOR OF A FCC UNIT

Mohsen N. Harandi, Lawrenceville, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 19, 1988, Ser. No. 144,990
Int. Cl.[4] B01J *38/30*; C10G *11/18*; C07C *5/333*
U.S. Cl. 502—41 12 Claims



1. In a process for regenerating a coke-contaminated fluid cracking catalyst in a regeneration zone at a pressure in the range from above 20 psig to about 50 psig and a temperature in the range from about 1200° F. to about 1500° F. (650° C. to 815° C.) while injecting enough oxygen-containing regeneration gas into said regeneration zone to maintain a dense fluid bed of regeneration catalyst, and regenerate the catalyst before returning it to a fluid cracker, the improvement comprising,

(a) withdrawing a controlled stream of said regenerator catalyst and introducing it into a dehydrogenation zone at a temperature below those prevailing in said regeneration zone, said dehydrogenation zone being located in a catalyst cooler, externally relative to said cracker and regenerator, the amount of said stream being sufficient to supply the endothermic heat of reaction for dehydrogenation of alkanes in said dehydrogenation zone,

(b) introducing a feedstream of said alkanes into said dehydrogenation zone in an amount sufficient to maintain hot withdrawn catalyst in a state of fluidization in said catalyst cooler, said state of fluidization existing in a sub-transport regime operating at a weight hourly space velocity WHSV of said lower alkanes not to exceed 5 hr^{-1} while maintained at a temperature high enough to convert at least 50% of said alkanes, and concurrently to cool said catalyst,

(c) transporting cooled catalyst directly from said dehydrogenation zone, said catalyst now at a temperature in the range from about 1100°–1350° F. (649°–731° C.), to said regeneration zone, and mixing hot catalyst therein with said cooled catalyst, and,

(d) withdrawing products of dehydrogenation in an effluent stream from said catalyst cooler.

4,840,929

ZEOLITE BETA WITH IMPROVED REGENERATION CHARACTERISTICS

Nai Y. Chen, Titusville, N.J., and Sharon B. McCullen, Newtown, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 70,607, Jul. 2, 1987, abandoned, which is a continuation of Ser. No. 835,690, Mar. 3, 1986, abandoned. This application Jul. 11, 1988, Ser. No. 218,438
Int. Cl.[4] B01J *29/32*
U.S. Cl. 502—74 8 Claims

7. A process for preparing a highly dispersed platinum-containing binder-free Zeolite Beta having a silica-to-alumina mole ratio between 100 and 500, said process comprising:

(a) contacting an as-synthesized Zeolite Beta with an inert gas at a temperature of about 1000° F. at about atmospheric pressure for approximately two hours;

(b) calcining the product of step (a) in an oxygen environment at a temperature of about 1000° F. for approximately two hours;

(c) removing the framework alumina from said Zeolite Beta in the absence of a binder by treatment with acid to the required silica-to-alumina mole ratio;

(d) incorporating said platinum onto the product of step (c);

(e) ammonium-exchanging the product of step (d); and

(f) calcining the product of step (e).

4,840,930

METHOD FOR PREPARING ACID STABLE ZEOLITES AND HIGH SILICA ZEOLITES PREPARED BY IT

Rene B. LaPierre, Medford; Randall D. Partridge, Ewing; Paul T. Reischman, Lambertville, and George T. Kerr, Lawrenceville, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 603,388, Apr. 24, 1984, abandoned, which is a continuation-in-part of Ser. No. 379,424, May 18, 1982, abandoned. This application Jun. 12, 1986, Ser. No. 874,819
Int. Cl.[4] B01J *29/08*
U.S. Cl. 502—79 6 Claims

1. A process for making an acid stabilized zeolite having the structure of a faujasite which comprises calcining a zeolite having the structure of a faujasite in a steam-containing atmosphere comprising at least 10 weight percent steam at increasing temperatures extending over the temperature range of 200° C. to 650° C. wherein the zeolite is heated at a rate greater than 2.0° C. $min.^{-1}$ and less than 4.0° C. $min.^{-1}$ within the range of 200° C. to 500° C. and 0.2° C. to 0.5° C. $min.^{-1}$ within the range of 500° C. to 650° C.; cooling the calcined zeolite; and contacting the cooled calcined zeolite with an acid to remove structural aluminum from the zeolite, to raise the silica:alumina ratio of the zeolite.

4,840,931

METHOD OF INDUCING SURFACE ENSEMBLES ON A METAL CATALYST

Steven S. Miller, Morgantown, W. Va., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 2, 1987, Ser. No. 103,866
Int. Cl.[4] B01J *31/24, 31/20, 31/18;* C07C *1/04*
U.S. Cl. 502—162 11 Claims

1. A method of inducing surface ensembles on metal catalysts for use in controlling product distribution in the metal-catalyzed conversion of carbon monoxide and hydrogen into hydrocarbons comprising confining a metal catalyst in an evacuated volume at about room temperature, contacting the metal catalyst with a mixture of a gaseous Lewis base and carbon monoxide having a carbon monoxide to Lewis base ratio in the range of about 10 to 120:1 to adsorb the mixture on the surface of the metal catalyst to create reactive ensembles of carbon monoxide on the surface of said catalyst provided by a substantial number of carbon monoxide species being adsorbed on said surface in the vicinity of adsorbed gaseous Lewis base species which tightly bind the carbon monoxide species to the surface of the metal catalyst.

4,840,932

CATALYST FOR PRODUCING 1,4-NAPHTHOQUINONE

Ryo Matsuura, Yamato; Shigeyuki Yoshimura, Tokyo; Yasuo Asanuma, Kamakura; Katsuaki Nasu, Yokohama; Haruo Yoshizumi, Tokyo; Kazumi Tsujimoto, Hatano, and Toshiyuki Kimura, Yokohama, all of Japan, assignors to Kawasaki Kasei Chemicals Ltd., Tokyo, Japan

Continuation of Ser. No. 748,714, Jun. 26, 1985, abandoned, which is a continuation of Ser. No. 175,683, Aug. 8, 1980, abandoned. This application Mar. 16, 1988, Ser. No. 170,057
Claims priority, application Japan, Sep. 5, 1979, 54-112797
Int. Cl.[4] B01J *23/04, 23/22, 35/02*
U.S. Cl. 502—202 8 Claims

1. A molded catalyst having a cylindrical shape, the outer diameter of the circle being from 3 to 5 mm, the inner diameter of the circle being from 1.0 to 2.5 mm, the thickness of the wall being 1.0 to 1.5 mm and the height being from 4 to 6 mm containing a catalytically effective component useful for oxidizing naphthalene to 1,4-naphthoquinone.

4,840,933

HEAT SENSITIVE RECORDING MATERIAL

Toshimasa Usami; Seiji Hatakeyama, and Akihiro Shimomura, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 26, 1987, Ser. No. 53,788
Claims priority, application Japan, May 26, 1986, 61-121875; Dec. 8, 1986, 61-292160; Apr. 9, 1987, 62-88197
Int. Cl.[4] B41M *5/18*
U.S. Cl. 503—213 8 Claims

1. A heat sensitive recording material which comprises a support having thereon a transparent heat sensitive layer containing at least color former-containing microcapsules and a color developer, said heat sensitive layer being formed using a colorless or light colored precursor of a basic dye as said color former, and according to a process which comprises preparing a coating composition by mixing said microcapsules with an emulsified dispersion prepared by dissolving at least the color developer into an organic solvent slightly soluble or insoluble in water to form an organic phase and then dispersing said organic phase in an aqueous phase containing a protective colloid to form an emulsified composition, coating the resulting composition on the support, and then drying the coat.

4,840,934

THERAPEUTIC METHOD USING T CELL GROWTH FACTOR

David W. Anderson, Littleton, Colo., assignor to Eleanor Roosevelt Institute for Cancer Research, Inc., Denver, Colo.

Division of Ser. No. 460,727, Jan. 25, 1983, Pat. No. 4,623,622.
This application Oct. 31, 1986, Ser. No. 925,207
Int. Cl.[4] A61K *37/02, 35/26;* C07J *15/06*
U.S. Cl. 514—2 4 Claims

1. A method of treating a warm blooded mammal for the modification of the mammal's immune system comprising injecting into said mammal an effective amount of the T cell growth factor produced by a process comprising:

(a) cloning and selecting a human ALL cell line from the cell culture identified as HSB-2-ER1CR;

(b) culturing the cell line with a tissue culture medium;

(c) contacting the cells so obtained with an inducer which activates or stimulates the production of T cell growth factor; and

(d) recovering the supernatant therefrom containing the T cell growth factor.

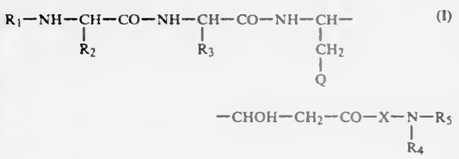
4,840,935

PEPTIDE AMINO-ALCOHOL DERIVATIVES CONTAINING A TETRASUBSTITUTED CARBON ATOM, INHIBITING RENIN AND ACID PROTEASES, PROCESS FOR OBTENTION AND THERAPEUTICAL USE

Jean Wagnon, Montpellier; Remy Guegan, Castelnau-le-Lez; Colette LaCour, Montpellier, and Dino Nisato, Saint-Georges d'Orques, all of France, assignors to Sanofi and Institut National de la Sante et de la Recherche Medicale, both of, France

Filed Jul. 16, 1986, Ser. No. 886,070
Claims priority, application France, Jul. 31, 1985, 8511728
Int. Cl.[4] A61K *37/43;* C07K *5/08*
U.S. Cl. 514—18 13 Claims

1. A peptide amino-alcohol derivative of the formula:



(I)

in which:

R_1 represents an acyl group chosen from the following groups: alkylcarbonyl, alkoxycarbonyl, arylcarbonyl, arylalkylcarbonyl, arylalkoxycarbonyl, heterocyclylcarbonyl, heterocyclylalkylcarbonyl, in which the alkyl group is optionally substituted by a hydroxyl group, heterocyclylcarbonylalkylcarbonyl, heterocyclylalkenylcarbonyl and cycloalkylcarbonyl, or represents a (lower alkyl)sulfonyl group which is unsubstituted or substituted on the alkyl by a free amino group or an amino group carrying a protecting group, or by a phenyl, or represents a phenylsulfonyl group which is unsubstituted or substituted on the phenyl nucleus by a lower alkyl;

R_2 represents a lower alkyl group which is unsubstituted or substituted by a phenyl, naphthyl, cyclohexyl or pyridyl, or R_2 represents a phenyl, naphthyl, cyclohexyl or pyridyl radical;

R_3 represents hydrogen, a lower alkenyl, a phenyl, a naphthyl, a cycloalkyl containing 3 to 6 carbon atoms, a 5-membered or 6-membered monocyclic heterocyclic group which is unsubstituted or substituted with a lower alkyl or trifluoromethyl, or alternatively a lower alkyl which is unsubstituted or substituted by a free amino group or an amino group carrying a protecting group, by a di(lower alkyl)amino group, by a free carboxyl or a carboxyl esterified with a lower alkyl or a benzyl, by a free carbamoyl or a carbamoyl substituted with one or two lower alkyls or with a phenyl, by a hydroxyl, lower alkoxy or benzyloxy group, by a pyridylmethoxy group, by a (lower alkyl)thio, (lower alkyl)sulfinyl or (lower alkyl)sulfonyl group, by a phenyl which is unsubstituted or substituted with a hydroxyl, by a naphthyl, by a cycloalkyl containing from 3 to 6 carbon atoms, by a 5-membered or 6-membered monocyclic heterocyclic group which is unsubstituted or substituted with a lower alkyl or a trifluoromethyl, or by a bicyclic heterocyclic group which is unsubstituted or substituted with a lower alkyl or a trifluoromethyl;

R_4 represents hydrogen or a lower alkyl which is unsubstituted or substituted by an indolyl, pyridyl, imidazolyl or phenyl radical;

R_5 represents an aliphatic or cyclic hydrocarbon group of 3 to 20 carbon atoms which is unsubstituted or substituted by a phenyl, hydroxyphenyl or amino group, the said hydrocarbon group containing at least one hydroxyl group and at least one carbon atom not having a C—H bond;

Q represents isopropyl, phenyl or cyclohexyl, respectively forming with the radical:

the residue of the amino acid Sta, AHPPA or ACHPA; and

X is either a direct bond or the residue of an amino acid such as Ala, Nva, Val, Leu, Nle, Ile, Phg, Abu or Cpg;

and also any pharmaceutically acceptable salts of the said peptide amino alcohol with mineral or organic acids or with alkali metals or alkaline earth metals.

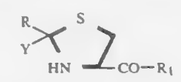
4,840,936

PHARMACEUTICALLY USEFUL DERIVATIVES OF THIAZOLIDINE-4-CARBOXYLIC ACID

Davide Della Bella, Milan; Angelo Carenzi, Busto Arsizio; Dario Chiarino, Monza, and Franco Pellacini, Sesto S. Giovanni, all of Italy, assignors to Zambon S.p.A., Milan, Italy

Filed Jul. 13, 1987, Ser. No. 72,569
Claims priority, application Italy, Jul. 14, 1986, 21112 A/86
Int. Cl.[4] C07D *277/06, 417/06;* A61K *31/425*
U.S. Cl. 514—18 17 Claims

1. A compound of formula



(I)

in which

Y is hydrogen, or methyl;

R is a radical selected from

(6-methoxy)-2-napthyl)-methyl,

1-(4-isobutylphenyl)-ethyl,

1-(6-methoxy-2-napthyl)-ethyl,

5-(2,4-difluorophenyl)-2-hydroxyphenyl,

2-(3-trifluoromethyl-phenylamino)-phenyl,

(Z)-5-fluoro-2-methyl-1-(4-methylsulfinylbenzylidene)-1H-inden-3-yl-methyl,

1-(4-chlorobenzoyl)-5-methoxy-2-methyl-1H-indol-3-yl-methyl,

1-(3-benzoyl-phenyl)-ethyl,

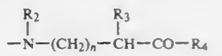
2-(2,6-dichlorophenylamino)-benzyl,

1-[4-(2-thienyl-carbonyl)-phenyl]-ethyl,

when Y is hydrogen

and is 2-(6-methoxy-2-napthyl)-ethyl when Y is methyl;

R_1 is hydroxy, C_1-C_6 alkoxy, amino, mono- or dialkylamino, in which the alkyl has from 1 to 4 carbon atoms, or an aminoacid radical of the formula

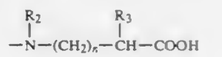


in which

R_2 is hydrogen; R_3 is hydrogen, C_1-C_4 alkyl optionally substituted by SH, SCH_3 or by a phenyl optionally substituted by 1 or 2 hydroxy groups;

n is an integer chosen between 0,1 and 2; when n is 0, R_2 and R_3 together may form a $—(CH_2)_3—$or a $—CH_2—S—CH_2—$group;

R_4 is hydroxy, C_1-C_6 alkoxy or a radical of an amino-acid of formula:



in which R_2, R_3 and n have the above-stated meanings; and their salts with pharmaceutically acceptable acids or bases.

4,840,937

SURFACTANT COMPOSED OF ACYLATED COLLAGEN OR ACYLATED GELATINE AND A PRODUCTION PROCESS THEREOF

Tetsuro Namiki, Ome; Masayasu Furuse, Sagamihara; Yoshimitsu Kuroyanagi, Hachiogi; Teruo Miyata, Tokyo, and Takashi Suzuki, Yokohama, all of Japan, assignors to Koken Co., Ltd. and Shiseido Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 845,442, Mar. 28, 1986, abandoned.
This application Sep. 16, 1987, Ser. No. 97,400
Claims priority, application Japan, Apr. 6, 1985, 60-71896
Int. Cl.[4] C08H *1/06;* C08L *89/04, 89/06*
U.S. Cl. 514—21 4 Claims

1. A non-irritating cosmetic composition for application to the human body comprising an emulsion of water, a cosmetically acceptable oily material, and as an emulsifier, a surfactant comprising an acylated atelocollagen which is the reaction product between atelocollagen and an aliphatic acid having from 2 to 26 carbon atoms or an anhydride thereof reacted at a temperature of about 25° C. or lower and at a pH in the range of from 8 to 14.

4,840,938

PHARMACEUTICAL COMPOSITIONS CONTAINING ANTHRACYCLINE GLYCOSIDES

Gaetano Gatti, Sesto San Giovanni; Diego Oldani, Robecco sul Naviglio; Carlo Confalonieri, Cusano Milanino, and Luciano Gambini, Cornaredo, all of Italy, assignors to Farmitalia Carlo Erba s.r.l., Milan, Italy

Division of Ser. No. 788,158, Oct. 16, 1985, Pat. No. 4,675,311.
This application Aug. 6, 1986, Ser. No. 893,613
Claims priority, application United Kingdom, Oct. 22, 1984, 8426672
The portion of the term of this patent subsequent to Jun. 23, 2004, has been disclaimed.
Int. Cl.[4] A61K *31/70*
U.S. Cl. 514—34 11 Claims

10. A method of improving the solubility of a lyophilised preparation containing an anthracycline glycoside selected from the group consisting of 4'-epi-doxorubicin, 4'-desoxy-doxorubicin, daunorubicin, 4-demethoxy-daunorubicin, and their pharmaceutically acceptable salts, in an aqueous medium, said method comprising combining the said anthracycline glycoside or a salt thereof with a cosolubilizing agent selected from the group consisting essentially of a hydroxy-, mercapto-, or amino-substituted benzoic acid, an alkali metal salt thereof, a C_1-C_4 alkyl ester thereof, a ring-halogenated methyl-sub-

stituted phenol, an amino acid, and mixtures thereof, and freeze drying the resulting combination, with said anthracycline glycoside or salt thereof remaining in the presence of said cosolubilizing agent.

4,840,939

TREATMENT OF CANCER WITH PHLORIZIN AND ITS DERIVATIVES

Harry H. Leveen, 321 Confederate Cir., Charleston, S.C. 29407; Robert F. Leveen, 312 Lombard St., Philadelphia, Pa. 19147, and Eric G. Leveen, 141 S. Battery, Charleston, S.C. 29401

Continuation-in-part of Ser. No. 640,170, Aug. 13, 1984, Pat. No. 4,684,627, which is a continuation-in-part of Ser. No. 300,136, Sep. 8, 1981, abandoned. This application Mar. 18, 1987, Ser. No. 27,413

The portion of the term of this patent subsequent to Aug. 4, 2004, has been disclaimed.

Int. Cl.[4] A61K *37/02;* **C07H** *1/00*

U.S. Cl. 514—25 **26 Claims**

1. A method for inhibiting glucose transport into malignant neoplastic cells which comprises administering an effective amount of a compound or compounds selected from the group consisting of phlorizin, phloretin, phlorizin glucoronide, 4-deoxyphloretin-2-D-glucose, and cytochalasin-B to a human being.

4,840,940

METHOD FOR REDUCING THE OCCURRENCE OF DISTAL ANASTOMOTIC INTIMAL HYPERPLASIA USING FRACTIONATED HEPARIN

Vikrom S. Sottiurai, 5812 Virginia Pl., Metairie, La. 70003

Filed Oct. 21, 1987, Ser. No. 110,730

Int. Cl.[4] A61K *31/70*

U.S. Cl. 514—56 **9 Claims**

1. A method for reducing the occurrence of intimal hyperplasia in grafts of substitute veins and arteries having end-to-side distal anastomosis, the method including administering a region of fractionated heparin to a subject into which said graft has been implanted, wherein said fractionated heparin is selected from the class consisting of fractionated heparin having O-sulfated, N-desulfated and N-acetylated endings.

4,840,941

METHOD FOR INHIBITING INFECTION OF HUMAN T-CELLS

Ryuzo Ueno, Nishinomiya; Ryuji Ueno, Kyoto; Sachiko Kuno, Ibaraki, and Akihiko Tabata, Nishinomiya, all of Japan, assignors to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo, Japan

Division of Ser. No. 19,180, Feb. 26, 1987. This application Jan. 15, 1988, Ser. No. 144,131

Claims priority, application Japan, Apr. 4, 1986, 61-078470; Apr. 4, 1986, 61-078471; Apr. 21, 1986, 61-093019

Int. Cl.[4] A61K *31/70, 31/72, 31/725;* **C08B** *37/02*

U.S. Cl. 514—59 **11 Claims**

1. A method for inhibiting infection of human T-cells by a human retrovirus which comprises providing in the presence of human T-cells susceptible to infection by said human retrovirus an infection inhibiting effective amount of dextran sulfate having a sulfur content of between 13 and 20%.

4,840,942

EMULSIFYING DISPERSANT AND BIOCIDAL COMPOSITION CONTAINING SAME

Tetsuji Iwasaki, and Yoshio Fukui, both of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Oct. 2, 1984, Ser. No. 656,835

Claims priority, application Japan, Oct. 14, 1983, 58-192168

Int. Cl.[4] A01N *57/00*

U.S. Cl. 514—120 **15 Claims**

1. An agricultural biocidal composition which is emulsifiable in water, consisting essentially of: from 10 to 90% by weight of a water-insoluble agricultural biocide selected from the group consisting of pesticides and herbicides, from 15 to 50% by weight of a water-insoluble organic solvent in which said biocide is dissolved and from 1 to 50% by weight of an emulsifier comprising a nonionic surfactant of the formula:

$$R^1—Y^1—(R^3O)_n—Y^2—R^2$$

wherein R^1 and R^2 are each a saturated or ethylenically unsaturated hydrocarbon group, with the proviso that at least one of R^1 and R^2 has at least 8 carbon atoms, Y^1 is -COO- or —O—, Y^2 is —OC— or represents a direct valence bond between $(R^3O)_n$ and R^2, R^3 is C_2–C_4 alkylene, and n is an integer of from 1 to 100.

4,840,943

ANDROST-4-ENE-3,17-DIONES AND PROCESS FOR THEIR PREPARATION

Franco Buzzetti, Monza; Enrico di Salle, and Paolo Lombardi, both of Milan, all of Italy, assignors to Farmitalia Carlo Ebra S.r.l., Milan, Italy

Filed Jun. 15, 1987, Ser. No. 61,663

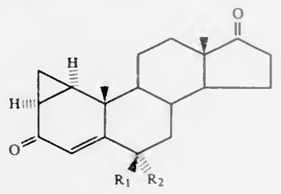
Claims priority, application United Kingdom, Jun. 20, 1986, 8615092

Int. Cl.[4] C07J *53/00, 75/00;* **C07D** *31/705, 31/565*

U.S. Cl. 514—177 **5 Claims**

1. A compound having the formula (I)

(I)



wherein

one of R_1 and R_2 is hydrogen and the other is amino or azido, or R_1 and R_2, taken together, form a $=CH_2$ or $=O$ group, and, when one of R_1 and R_2 is amino, the pharmaceutically acceptable salts thereof.

5. A pharmaceutical composition for inhibiting the biotransformation of androgens into estrogens which comprises an amount of a compound according to claim 1 effective to inhibit the biotransformation of an androgen into an estrogen, or a pharmaceutically acceptable salt thereof, together with a pharmaceutically acceptable carrier or diluent.

4,840,944

ANTIBACTERIAL BETA-LACTAMS, PHARMACEUTICALS THEREOF AND METHODS OF USING THEM

Wagn O. Godtfredsen, Vejrose, and Welf von Daehne, Rungsted Kysi, both of Denmark, assignors to Leo Pharmaceutical Products Ltd., Ballerup, Denmark

Filed Jan. 24, 1980, Ser. No. 118,063

Claims priority, application United Kingdom, Feb. 13, 1979, 7905020; Jun. 19, 1979, 7921341; Aug. 9, 1979, 7927761; Nov. 14, 1979, 7939473

Int. Cl.[4] A61K *31/43;* **C07D** *499/32*

U.S. Cl. 514—195 **8 Claims**

1. 1,1-Dioxopenicillanoyloxymethyl 6-[D-α-amino-α-(p-hydroxyphenyl)acetamido]penicillanate, and salts thereof with pharmaceutically acceptable, non-toxic acids.

5. An antibacterial pharmaceutical composition in dosage unit form for enteral, parenteral or topical treatment of patients which comprises as the active component an antibacterially effective amount of the compound 1,1-dioxopenicillanoyloxymethyl 6-[D-α-amino-α-(p-hydroxyphenyl)acetamido]-penicillanate or a salt thereof with a pharmaceutically acceptable, non-toxic acid, together with an atoxic pharmaceutically acceptable carrier.

4,840,945

CEPHALOSPORIN DERIVATIVES

Haruo Ohnishi, Funabashi; Hiroshi Kosuzume, Mishima; Masahiro Mizota, Gotenba; Yasuo Suzuki, Kawaguchi, and Ei Mochida, Toshima, all of Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Mar. 10, 1986, Ser. No. 838,309

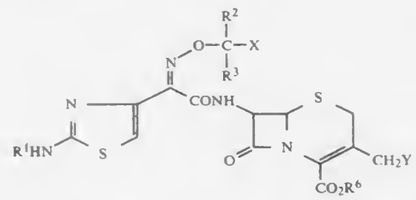
Claims priority, application Japan, Apr. 1, 1985, 60-68866; May 17, 1985, 60-105704; Jul. 4, 1985, 60-147359; Jul. 27, 1985, 60-166259

Int. Cl.[4] C07D *501/36;* **A61K** *31/545*

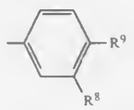
U.S. Cl. 514—206 **12 Claims**

1. A cephalosporin derivative represented by the formula (XIV):

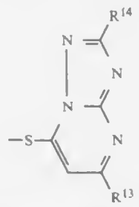
(XIV)



or pharmacuetically or veterinarily acceptable non-toxic salts or solvates or non-toxic salts of solvates thereof: wherein R^1 represents a hydrogen atom or an amino-protecting group, no represents a hydrogen atom, a methyl group, a carboxyl group, or protected carboxyl group, R^3 represents a hydrogen atom or a ethyl group, R^6 represents a hydrogen atom or a carboxy protecting group, X represents a group:



wherein R^8 and R^9 are the same or different and represent hydroxy groups or acetoxy groups, and Y represents a group:



wherein R^{13} represents a methyl group and R^{14} represents a carboxyl group or a protected carboxyl group.

4,840,946

BENZAZOLYTHIO-CARBAPENEM ANTIBIOTICS

Dieter Häbich; Wolfgang Hartwig; Karl G. Metzger, all of Wuppertal, and Hans-Joachim Zeiler, Velbert, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

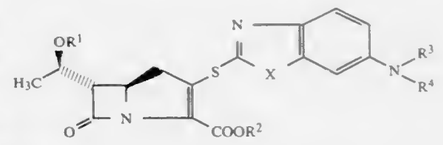
Filed Nov. 12, 1987, Ser. No. 119,752

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1986, 3640715

Int. Cl.[4] A61K *31/40;* **C07D** *487/04*

U.S. Cl. 514—210 **10 Claims**

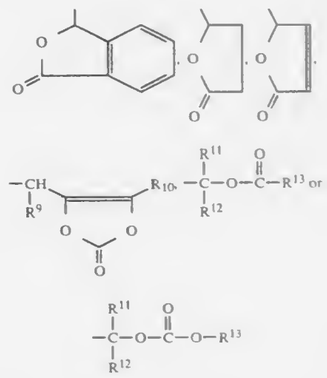
1. A benzazolylthiocarbapenem of the formula



in which

R^1 represents hydrogen, trimethylsilyl, triethylsilyl, triisopropylsilyl, tert.butyl-dimethylsilyl, triphenylsilyl, trimethylsilylethoxy-carbonyl, benzyl, benzyloxycarbonyl, 2-nitrobenzyl, 4-nitrobenzyl, 2-nitrobenzyloxycarbonyl, 4-nitrobenzyloxycarbonyl, tert.butyloxycarbonyl, allyloxycarbonyl, 4-methoxybenzyl, 4-methoxybenzyloxycarbonyl, formyl, acetyl, trichloroacetyl, 2,2,2-trichloroethoxycarbonyl, 2,4-dimethoxybenzyl, 2,4-dimethoxybenzyloxycarbonyl, methoxymethyl, methylthiomethyl, methoxyethoxymethyl, [2-(trimethylsilyl)ethoxy]methyl, 2-(methylthiomethoxy)ethoxycarbonyl, tetrahydropyranyl or benzoyl,

R^2 represents hydrogen, methyl, ethyl, tert.butyl, 2-chloroethyl, 2,2,2-trichloroethyl, cyanoethyl, diphenylmethyl, triphenylmethyl, acetoxymethyl, allyl, benzyl, 4-methoxybenzyl, 2,4-dimethoxybenzyl, 1-phenoxyethyl, 2-methyl-2-propenyl, 4-nitrobenzyl, 2-nitrobenzyl, trimethylsilylethyl or tert.butyldimethylsilylethyl; or a radical from the group consisting of



in which

R^9 and R^{10} are identical or different and represent hydrogen, phenyl or C_1–C_4-alkyl,

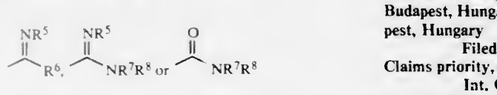
R^{11} and R^{12} are identical or different and represent hydrogen or C_1–C_4-alkyl and

R^{13} represents C_1–C_6-alkyl,

R^3 represents hydrogen or C_1–C_{10}-alkyl, C_6–C_{12}-aryl or C_7–C_{14}-aralkyl,

R^4 represents hydrogen or represents C_1–C_{10}-alkyl, C_6–C_{12}-

aryl or C_7–C_{14} aralkyl, or represents C_1–C_{10}-alkylsulphonyl, C_6–C_{12}-arylsulphonyl or C_7–C_{14}-aralkylsulphonyl, or represents vinyl, allyl, tert.butoxycarbonyl, benzyl, benzyloxycarbonyl, 2-nitrobenzyl, 4-nitrobenzyl, 2-nitrobenzyloxycarbonyl, 4-nitrobenzyloxycarbonyl, 4-methoxybenzyloxycarbonyl, formyl, benzoyl, acetyl, ethylcarbonyl, chloroacetyl, trichloroacetyl, trifluoroacetyl, methyloxycarbonyl, allyloxycarbonyl, trimethylsilyl, triethylsilyl, triphenylsilyl, tert.butyldimethylsilyl, methyldiphenylsilyl, 2,4-dimethoxybenzyl, 2,4-dimethoxybenzyloxycarbonyl, 4-methoxybenzyl, 2-(methoxymethyloxy)phenyl, bis-(4-methoxyphenyl)-methyl, tert.butoxycarbonylmethyl, allyloxycarbonylmethyl, methoxymethyl, methylthiomethyl, methoxyethoxymethyl, [2-(trimethylsilyl)ethoxy]methyl or 2-(methylthiomethoxy)ethoxycarbonyl; or represents a group of the formula



in which

R^5, R^6 and R^8 are identical or different and denote hydrogen, C_1–C_{10}-alkyl, C_6–C_{12}-aryl or C_7–C_{14}-aralkyl,

and

X represents O, S, NH or NCH_3,

or a salt thereof.

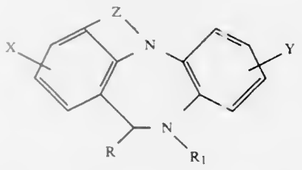
4,840,947

ANTIINFLAMMATORY AND ANALGESIC PIPERIDIN-4-YL-TETRACYCLIC BENZODIAZEPINES AND USE THEREAS

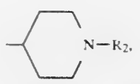
Edward J. Glamkowski, Warren; Yulin Chiang, Convent Station, both of N.J., and Frederick J. Ehrgott, Jr., Norwich, Conn., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Filed Oct. 14, 1986, Ser. No. 918,242
Int. Cl.[4] C07D *487/04;* A61K *31/55*
U.S. Cl. 514—219 **20 Claims**

1. A compound having the formula



where X is hydrogen, loweralkyl, trifluoromethyl or halogen; Y is hydrogen, loweralkyl, trifluoromethyl or halogen; Z is $—CH_2CH_2—$, $—CH=CH—$ or $—CH_2CH_2CH_2—$; R is



R_2 being hydrogen, loweralkyl, ethoxycarbonyl, 2,2,2-trichloroethoxycarbonyl or phenoxycarbonyl; and R_1 is hydrogen, loweralkanoyl, loweralkyl, ethoxycarbony, 2,2,2-trichloroethoxycarbonyl or phenoxycarbonyl; or a pharmaceutically acceptable acid addition salt thereof.

19. A method of treating a patient in need of relief from inflammation which comprises administering to the patient an effective inflammation-alleviating amount of a compound as defined in claim 1.

20. A method of treating a patient in need of relief from pain which comprises administering to the patient an effective pain alleviating amount of a compound as defined in claim 1.

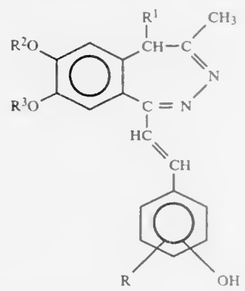
4,840,948

1-(HYDROXYSTYRL)-5H-2,3-BENZODIAZEPINE DERIVATIVES, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

Tibor Láng; Jeno Korosi; György Rabloczky; Tamás Hámori; Mária Kuhár née Kürthy; István Polgári; István Elekes; Gábor Zólyomi; Krisztina Heltai; Judit Sárossy née Kincsesy; Zsuzsanna Láng née Rihmer, and Imre Moravcsik, all of Budapest, Hungary, assignors to EGIS Gyogyszergyar, Budapest, Hungary

Filed May 20, 1987, Ser. No. 51,777
Claims priority, application Hungary, May 21, 1986, 2140/86
Int. Cl.[4] C07D *243/10;* A61K *31/55*
U.S. Cl. 514—221 **8 Claims**

1. 1-(Hydroxystyryl)-5H-2,3-benzodiazepine derivatives represented by the formula (I),



(I)

wherein

R stands for a hydrogen or halogen atom, or a C_{1-4} alkoxy group,

R^1 represents a hydrogen atom or a C_{1-4} alkyl group,

R^2 and R^3 are identical and denote a C_{1-4} alkyl group, or combined they denote a methylene group.

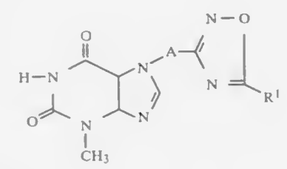
4,840,949

OXADIAZOLE-ALKYL-PURINE DERIVATIVES USEFUL AS ANTITUSSIVE AGENTS

Dezso Korbonits, Budapest; Emil Minker, Szeged; Zoltán Vargai, Budapest; Gergely Héja, Budapest; Gábor Kovács, Budapest; Ágnes Gottsegen, Budapest; Sándor Aotus, Budapest; Sándor Virág, Budapest; Andrea Bolehovszky, Budapest; Jeno Marton, Budapest; Katalin Mármarosi née Kellner, Biatorbágy; Lóránd Debreczeni, Budapest; László Tardos, Budapest; Péter Körmöczy, Budapest; Vera Gergely, Budapest, and Gábor Horváth, Budapest, all of Hungary, assignors to Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Oct. 9, 1987, Ser. No. 107,693
Claims priority, application Hungary, Oct. 9, 1986, 4230/86
Int. Cl.[4] A61K *31/52;* C07D *473/06*
U.S. Cl. 514—234.2 **9 Claims**

1. A compound of the Formula I



wherein

A stands for C_{1-4} alkylene and

R^1 represents C_{1-6} alkyl, hydroxyalkyl, halogenoalkyl, carboxyalkyl, C_{5-6} cycloalkyl or aminoalkyl of the general Formula $—(CH_2)_n—NR^2R^3$ in which group n is an integer from 1–3;

R^2 and R^3 each stand for hydrogen or C_{1-4} alkyl or together with the adjacent nitrogen atom they are attached to form a 5- or 6-membered nitrogen containing heterocyclic ring which can optionally contain an oxygen atom or a second nitrogen atom; or

R^1 stands for phenyl, hydroxyphenyl, carboxyphenyl, benzyl or dimethoxybenzyl;

or a physiologically acceptable acid addition salts or salt formed with inorganic bases thereof.

8. An antitussive composition comprising as active ingredient an antitussively effective amount of a compound of the Formula I as defined in claim 1 or a pharmaceutically acceptable salt thereof in admixture with a suitable inert carrier.

9. An antitussive method of treatment which comprises the step of administering to a susceptible animal subject an antitussively effective amount of a compound as defined in claim 1.

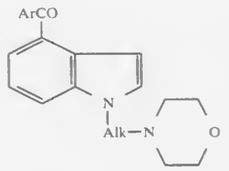
4,840,950

4-ARYLCARBONYL-1-[(4-MORPHOLINYL)-LOWER-ALKYL]-1H-INDOLES

Thomas E. D'Ambra, North Greenbush, and Malcolm R. Bell, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Feb. 11, 1987, Ser. No. 13,313
Int. Cl.[4] C07D *413/00;* A61K *31/40*
U.S. Cl. 514—235.2 **7 Claims**

1. A member of the group consisting of (A) compounds having the formula:



where Ar is lower-alkoxyphenyl or 1-naphthyl, and Alk is lower-alkylene containing from one to four carbon atoms; and (B) pharmaceutically acceptable acid-addition salts thereof.

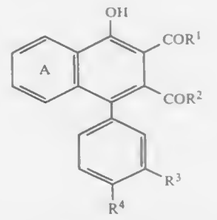
4,840,951

NOVEL NAPHTHALENE DERIVATIVE

Tameo Iwasaki, Nishinomiya, and Kohki Takashima, Tokyo, both of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaku, Japan

Filed Jun. 17, 1987, Ser. No. 64,293
Claims priority, application Japan, Jul. 1, 1986, 61-155416
Int. Cl.[4] C07C *265/30;* A61K *31/235, 31/535*
U.S. Cl. 514—239.5 **24 Claims**

1. A naphthalene derivative of the formula:



wherein Ring A is an unsubstituted benzene ring, a benzene ring having 1–3 substituent(s) selected from an alkoxy group and a halogen atom, or a benzene ring substituted with a lower alkylenedioxy group; each of R^1 and R^2 is a group of the formula: $—OR^5$, $—NHR^5$ or

or either one of R^1 and R^2 is a lower alkoxy group and the other one is a group of the formula: $—OR^5$, $—NHR^5$ or

each of R^3 and R^4 is a lower alkoxy group, alkoxy group, or one of R^3 and R^4 is a lower alkoxy group and the other is a hydrogen atom; R^5 is selected from the group consisting of

(i) an alkyl group having at least one substituent selected from the group consisting of a heterocyclic group containing a nitrogen atom, an oxygen atom and/or a sulfur atom, an aryl group, a cycloalkyl group, an alkylthio group, a lower alkoxy group, a lower alkoxycarbonyl group, a lower alkoxy-lower alkoxy group, a mono- or di-lower alkylamino group, an amino group, a thiol group, a hydroxy group, a carboxy group and a halogen atom,

(ii) a heterocyclic group containing a nitrogen atom, an oxygen atom and/or a sulfur atom,

(iii) a cycloalkyl group,

(iv) an alkyl group of at least 5 carbon atoms, and

(v) an alkenyl group; and each of R^6 and R^7 is a hydrogen atom or a lower alkyl group, or a salt thereof.

4,840,952

METHOD FOR TREATMENT OF MALE IMPOTENCE

Donald E. Gamble; Harry L. Hunter, and Gordon R. McKinney, all of Evansville, Ind., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 793,821, Nov. 1, 1985, Pat. No. 4,687,771. This application Jul. 8, 1987, Ser. No. 70,851
Int. Cl.[4] A61K *31/50, 31/495*
U.S. Cl. 514—253 **5 Claims**

1. A method for treating male sexual impotence which comprises administering directly to the penis a non-toxic therapeutically effective dose of trazodone or a pharmaceutically acceptable acid addition salt thereof to a patient in need of such treatment.

4,840,953

9-(SUBSTITUTED THIO)-4H-PYRIDO[1,2,-A]PYRIMIDIN-4-ONE DERIVATIVES

Shigeru Matsutani; Yukio Mizushima; Masami Doteuchi, and Yasunobu Ishihara, all of Osaka, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

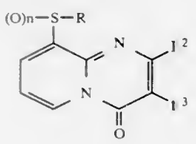
Continuation of Ser. No. 911,359, Sep. 25, 1986, abandoned. This application Jun. 15, 1988, Ser. No. 206,665

Claims priority, application Japan, Sep. 25, 1985, 60-213181; Jan. 21, 1986, 61-11591; Jul. 30, 1986, 61-181159

Int. Cl.[4] C07D *471/04*; A61K *31/505*

U.S. Cl. 514—258 **6 Claims**

1. A compound of the formula:



(I)

wherein

n is 0 or 1,

R is —COR[1],

R[1] is isoxazolyl, oxazolyl or thiazolyl and

R[2] and R[3] are each hydrogen, C_1–C_5 alkyl, carboxy, C_2–C_5 alkoxycarbonyl or benzyloxycarbonyl, optionally substituted by one or two members selected from the group consisting of C_1–C_3 alkyl, C_1–C_3 alkoxy and halogen.

4,840,954

6,7-DISUBSTITUTED 1-CYCLOPROPLY-1,4-DIHYDRO-4-OXO-1,8-NAPHTHYRIDINE-3-CARBOXYLIC ACIDS

Uwe Petersen, Leverkusen; Klaus Grohe, Odenthal; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

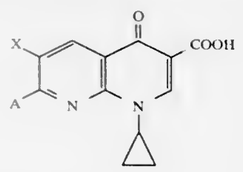
Filed Dec. 31, 1985, Ser. No. 815,440

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1985, 3500562; Mar. 13, 1985, 3508816

Int. Cl.[4] A61K *31/41, 31/436*; C07D *471/04*

U.S. Cl. 514—254 **12 Claims**

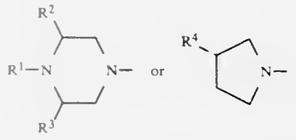
1. A 1-cyclopropyl-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid of the formula



in which

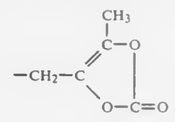
X represents halogen and

A represents



wherein

R[1] represents a branched or straight-chain alkyl group with 1 to 4 carbon atoms, which is substituted by a hydroxyl or methoxy group, a phenacyl radical which is optionally substituted by hydroxyl, methoxy, chlorine or fluorine, 2-oxopropyl, 3-oxobutyl or represents the radical

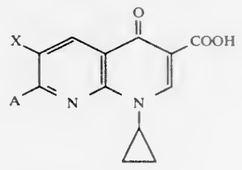


R[2] represents hydrogen or methyl, or phenyl or thienyl which is optionally substituted by chlorine, fluorine, methyl, hydroxyl, or methoxy,

R[3] represents hydrogen or methyl

R[4] represents hydroxymethyl and a pharmaceutically usable hydrate, acid addition salt and alkali metal, alkaline earth metal, silver and guanidinium salt thereof, and the methyl, ethyl, pivaloyloxymethyl, pivaloyloxyethyl or (5-methyl-2-oxo-1,3-dioxol-4-yl-methyl) esters thereof.

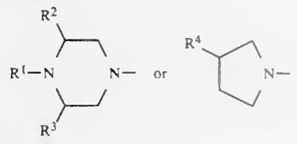
8. A 1-cyclopropyl-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acid of the formula



in which

X represents nitro and

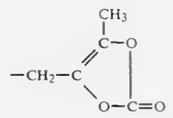
A represents



or halogen,

wherein

R[1] represents hydrogen, a branched or straight-chain alkyl group with 1 to 4 carbon atoms, which can optionally be substituted by a hydroxyl or methoxy group, a phenacyl radical which is optionally substituted by hydroxyl, methoxy, chlorine or fluorine, 2-oxopropyl, 3-oxobutyl, 4-aminobenzyl, formyl or acetyl, or represents the radical



R[2] represents hydrogen or methyl, or phenyl or thienyl which is optionally substituted by chlorine, fluorine, methyl, hydroxyl or methoxy,

R[3] represents hydrogen or methyl and

R[4] represents hydrogen, hydroxyl, amino, alkyl- or dialkylamino with 1 or 2 carbon atoms in the alkyl group, hydroxymethyl, aminomethyl or alkyl- or dialkyl-aminomethyl with 1 or 2 carbon atoms in the alkyl group, and a pharmaceutically usable hydrate, acid addition salt and alkali metal, alkaline earth metal, silver and guanidinium salt thereof, and the methyl, ethyl, pivaloyloxymethyl, pivaloyloxyethyl or (5-methyl-2-oxo-1,3-dioxol-4-yl-methyl) esters thereof.

4,840,955

6-SUBSTITUTED-2(1H)-QUINOLINONES AND RELATED COMPOUNDS HAVING USE AS CARDIOTONIC, ANTIHYPERTENSIVE, AND ANTITHROMBOTIC AGENTS

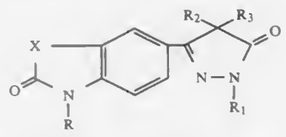
Ila Sircar, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 846,410, Mar. 31, 1986, abandoned, which is a continuation of Ser. No. 685,639, Dec. 24, 1984, abandoned. This application Aug. 20, 1987, Ser. No. 87,570

Int. Cl.[4] C07D *401/04, 403/04*; A61K *31/47, 31/415*

U.S. Cl. 514—278 **8 Claims**

1. A compound having the formula



I

wherein X is $(CH_2)_n$ wherein n is 1 or 2, or $CR_4{=}CR_5$ wherein R_4 and R_5 are independently hydrogen or lower alkyl; R and R_1 are independently hydrogen or lower alkyl; R_2 and R_3 are independently lower alkyl or R_2 and R_3 are taken together with the carbon to which each is attached to form a ring having three to six carbons, inclusive.

4,840,956

NOVEL DISUBSTITUTED-7-PYRROLIDINOQUINOLINE ANTIBACTERIAL AGENTS

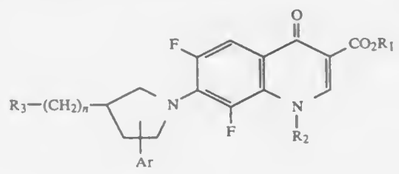
John M. Domagala, Canton; Susan E. Hagen, Ypsilanti; Joseph P. Sanchez, Canton, all of Mich., and Marjorie S. Solomon, Bellevue, Wash., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 831,232, Feb. 18, 1986, abandoned. This application Jan. 14, 1988, Ser. No. 144,301

Int. Cl.[4] A61K *31/47*; C07D *401/04*

U.S. Cl. 514—312 **5 Claims**

1. A compound having the formula



wherein R_1 is hydrogen or alkyl of one to six carbon atoms; R_2 is cyclopropyl; n is zero R_3 is OR_4, in which R_4 is hydrogen or alkyl of one to six carbon atoms; Ar is phenyl, or a pharmaceutically acceptable acid addition or base salt thereof.

4,840,957

PYRAN DERIVATIVES

Hisashi Takao; Norio Osaki, and Norio Yasudomi, all of Tokushima, Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

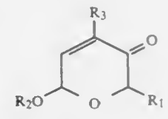
Division of Ser. No. 920,937, Oct. 20, 1986, Pat. No. 4,742,078, which is a continuation of Ser. No. 614,165, May 5, 1984, abandoned. This application Jan. 21, 1988, Ser. No. 146,671

The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.

Int. Cl.[4] A01N *43/40*; C07D *405/06*

U.S. Cl. 514—326 **3 Claims**

1. A pyran derivative represented by the formula



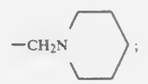
and an acid salt thereof, wherein:

R_1 is lower alkyl, cycloalkyl or phenyl,

R_2 is alkyl having 12 to 20 carbon atoms, and

R_3 is:

(1) the structure of formula (1)

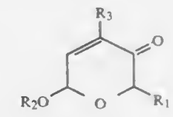


(1)

and

(2) the structure of the above formula (1) wherein at least one hydrogen is substituted by a substituent selected from the group consisting of lower alkyl, lower alkoxy and halogen.

3. A method for controlling mites, consisting essentially of the step of applying to a mite-infested area a miticidal composition which comprises a miticidally effective amount of a pyran derivative represented by the formula



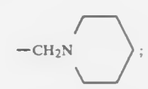
or an acid salt thereof, wherein:

R_1 is lower alkyl, cycloalkyl or phenyl,

R_2 is alkyl having 12 to 20 carbon atoms, and

R_3 is:

(1) the structure of formula (1)



(1)

and

(2) the structure of the above formula (1) wherein at least one hydrogen is substituted by a substituent selected from the group consisting of lower alkyl, lower alkoxy and halogen.

4,840,958

NOVEL 3-HYDROXYPYRID-2-ONES AND 3-HYDROXYPRID-4-ONES USEFUL IN TREATING PATIENTS HAVING A TOXIC CONCENTRATION OF IRON

Robert C. Hider, Essex; George Kontoghiorghes, and Jack Silver, both of London, all of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 478,493, Mar. 24, 1983, abandoned. This application Nov. 20, 1986, Ser. No. 933,338

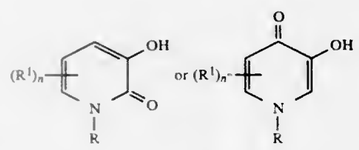
Claims priority, application United Kingdom, Mar. 24, 1982, 8208608

Int. Cl.[4] A61K *31/44;* **C07D** *211/86*

U.S. Cl. 514—348 **17 Claims**

1. A method for the treatment of a patient having a toxic concentration of iron in the body, comprising:

administering to said patient by mouth, by the bowel or by parenterally an amount effective to reduce said toxic concentration of a 3-hydroxypyrid-2-one or 3-hydroxypyrid-4-one compound, said compounds having the formula:



wherein

R is an unsubstituted C_1–C_3 hydrocarbon group;

R^1 is an unsubstituted C_1–C_3 hydrocarbon group; and

n is 0, 1 or 2;

or a physiologically acceptable salt thereof.

4,840,959

PYRIDINECARBOXAMIDE DERIVATIVES AND THEIR USE AS FUNGICIDE

Masatsugu Oda, Yokohama; Naoko Sasaki, Tokyo; Toshiro Sakaki, Yokohama; Hirofumi Tomita, Tokyo, and Nobuyuki Nonaka, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

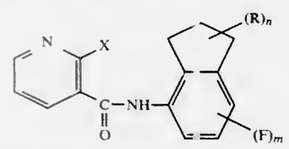
Filed Aug. 12, 1987, Ser. No. 84,173

Claims priority, application Japan, Aug. 12, 1986, 61-188936; Oct. 21, 1986, 61-250472; Apr. 13, 1987, 62-90371

Int. Cl.[4] C07D *213/46;* **A61K** *31/455*

U.S. Cl. 514—355 **10 Claims**

1. A pyridinecarboxamide derivative having the formula:



wherein X represents a halogen atom, methyl group or trifluoromethyl group, R represents a lower alkyl group or halogen atom, n represents an integer of 1 to 6, and m represents 0 or 1.

4,840,960

TREATMENT OF GLOMERULONEPHRITIS

R. Bernd Sterzel, and Alexander Scharabine, both of Guilford, Conn., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Aug. 25, 1987, Ser. No. 89,094

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—356 **6 Claims**

1. A method of treating a patient suffering from glomerulonephritis, the method comprising administering to said patient a therapeutically effective amount of nitrendipine, either alone or in admixture with a pharmaceutically acceptable diluent.

4,840,961

HETEROCYCLIC AMIDE DERIVATIVES

Graham Holmwood, Wuppertal; Joachim Weissmüller, Monheim; Wilhelm Brandes, Leichlingen, and Paul Reinecke, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

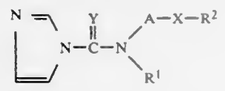
Filed Apr. 11, 1986, Ser. No. 851,057

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1985, 3513259

Int. Cl.[4] C07D *233/90;* **A61K** *31/415*

U.S. Cl. 514—399 **12 Claims**

1. A heterocyclic amide derivative of the formula



(I)

in which

R^1 is alkyl with 1 to 12 carbon atoms, alkenyl with 3 to 12 carbon atoms, halogeno-substituted alkenyl with 3 to 12 carbon atoms, alkinyl with 3 to 12 carbon atoms, halogeno-substituted alkinyl with 3 to 12 carbon atoms, alkoxyalkyl with 1 to 6 carbon atoms in the alkoxy part and 2 to 6 carbon atoms in the alkyl part or alkylthioalkyl with 1 to 6 carbon atoms in the alkyl part;

R^2 is naphthyl, naphthyl substituted by a substituent selected from the group consisting of alkyl with 1 to 4 carbon atoms, halogen and halogenoalkoxy with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, tetrahydronaphthyl, tetrahydrononaphthyl substituted by a substituent selected from the group consisting of alkyl with 1 to 4 carbon atoms, halogen and halogenoalkoxy with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, indanyl or indanyl substituted by a substituent selected from the group consisting of alkyl with 1 to 4 carbon atoms, halogen and halogenoalkoxy with 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms;

A is an alkylene bridge with 1 to 8 carbon atoms or, if X denotes a direct bond, is also an alkenylene bridge with 1 to 8 carbon atoms;

X is oxygen, sulphur or a direct bond; and

Y is oxygen or sulphur;

or an acid addition salt or a metal salt complex thereof.

10. A method of combating fungi which comprises administering to such fungi or to a fungus habitat a fungicidally effective amount of a compound or addition product according to claim 1.

4,840,962

COUGH/COLD MIXTURES COMPRISING NON-STEROIDAL ANTI-INFLAMMATORY DRUGS

Abraham Sunshine, New York; Eugene M. Laska, Larchmont, and Carole E. Siegel, Mamaroneck, all of N.Y., assignors to Analgesic Associates, Larchmont, N.Y.

Continuation of Ser. No. 16,398, Feb. 19, 1987, abandoned, which is a division of Ser. No. 887,205, Jul. 21, 1986, Pat. No. 4,738,966, which is a division of Ser. No. 752,546, Jul. 8, 1985, Pat. No. 4,619,934, which is a division of Ser. No. 598,502, Apr. 9, 1984, Pat. No. 4,552,899. This application Mar. 22, 1988, Ser. No. 172,973

Int. Cl.[4] A61K *31/34, 31/40, 31/415*

U.S. Cl. 514—406 **15 Claims**

1. A pharmaceutical composition of matter for use in the treatment of cough, cold, cold-like and/or flu symptoms in a mammalian organism, and adapted for unit dosage oral administration, said composition comprising (i) an analgesically and anti-inflammatorily effective amount of a non-narcotic analgesic constituent consisting essentially of at least one of the acetic acid NSAIDs, tolmetin, zomepirac, sulindac, or pharmaceutically acceptable salt thereof, in combinatory immixture with (ii) an antihistaminically effective amount of at least one of the antihistamines, chlorpheniramine, brompheniramine, dexchlorpheniramine, dexbromphreniramine, triprolidine, doxylamine, tripelennamine, cyproheptadine, carbinoxamine, bromodiphenhydramine, phenindamine, pyrilamine, azatadine, or pharmaceutically acceptable salt thereof.

4,840,963

2-SULFAMOYL-1H-INDOLE DERIVATIVES FOR THE TREATMENT OF ELEVATED INTRAOCULAR PRESSURE

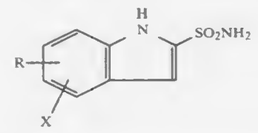
Kenneth L. Shepard, North Wales, and Samuel L. Graham, Harleysville, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 589,385, Mar. 14, 1984, abandoned. This application Dec. 7, 1984, Ser. No. 679,431

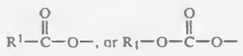
Int. Cl.[4] A61K *31/40;* **C07D** *209/10*

U.S. Cl. 514—418 **2 Claims**

1. A method of treating glaucoma and elevated intraocular pressure which comprises topical ocular application to a patient in need of such treatment of an effective intraocular pressure lowering amount of a compound with structural formula:



or an ophthalmologically acceptable salt thereof, wherein X is hydrogen, R is HO—,



wherein R^1 is C_{1-5}alkyl.

4,840,964

TAURINE DERIVATIVE, ITS PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING IT

Michele G. Di Schiena, and Vittoria Orru, both of Cisliano, Italy, assignors to Ricerche di Schiena S.n.c. del Dr. Michele G. di Schiena & C., Milan, Italy

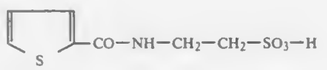
Filed Aug. 22, 1988, Ser. No. 234,181

Claims priority, application Italy, Sep. 18, 1987, 21958 A/87

Int. Cl.[4] A61K *31/38;* **C07D** *333/02*

U.S. Cl. 514—448 **2 Claims**

1. A compound of the formula



and its salts with pharmaceutically acceptable organic or inorganic bases.

4,840,965

NAPHTHALENE ANTI-PSORIATIC AGENTS

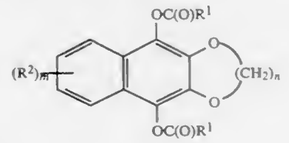
Gordon H. Jones, Cupertino; Michael C. Venuti, San Francisco, and John M. Young, Redwood City, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 7, 1987, Ser. No. 70,456

Int. Cl.[4] A01N *43/24, 43/26;* **C07D** *321/10, 319/00*

U.S. Cl. 514—450 **28 Claims**

1. A compound of the formula



(I)

wherein:

m is 1 or 2;

n is 1, 2 or 3;

R^1 is alkyl of one to seven carbon atoms or an optionally substituted phenyl; and

R^2 is hydrogen, lower alkyl of one to six carbon atoms, lower alkoxy of one to six carbon atoms, optionally substituted phenyl, optionally substituted phenyl-lower-alkyyl, optionally substituted phenyl-lower-alkoxy, amino, lower alkylamino, lower dialkylamino, halo, cyano, hydroxy, or lower alkylthio.

4,840,966

METHOD OF TREATING HYPERTENSION

Yukihiko Hara, Shizuoka, and Tateo Suzuki, Sendai, both of Japan, assignors to Mitsui Norin Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1988, Ser. No. 160,026

Claims priority, application Japan, Mar. 3, 1987, 62-48387

Int. Cl.[4] A61K *31/35*

U.S. Cl. 514—456 **10 Claims**

1. A method of treating hypertension to reduce blood pressure or to maintain blood pressure at a desired level comprising administering to a patient in need thereof, an effective amount of at least one tea polyphenol selected from the group consisting of (−)-epigallocatechin gallate, free theaflavin, theaflavin monogallate A, theaflavin monogallate B and theaflavin digallate to maintain or lower blood pressure.

4,840,967

CARBAMATE OR UREA DERIVATIVES, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS COMPRISING THEM

Nigel Beeley, Combs la Ville, and Gérard Cremer, Morangis, both of France, assignors to Synthelabo, Paris, France

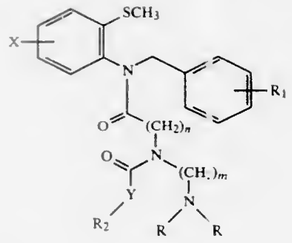
Filed Jul. 7, 1987, Ser. No. 70,580

Claims priority, application France, Jul. 8, 1986, 86 09887

Int. Cl.[4] C07C *149/437;* **A61K** *31/17, 31/27*

U.S. Cl. 514—466 **4 Claims**

1. A compound which is a carbamate or urea derivative of general formula (I)



(I)

wherein
X is hydrogen, halogen or methylthio,
Y is oxygen or

R is C_1–C_4 alkyl,
R_1 is hydrogen, one or two halogen atoms or trifluoromethyl groups, a methyl group, a methoxy group, a cyano group, a nitro group, a methoxycarbonyl group, a methylenedioxy group linked to two adjacent carbon atoms of the benzene ring to which it is attached, or a fused benzo group forming an α-naphthyl or β-naphthyl group with the benzene ring to which it is attached,
R_2 is a linear or branched C_1–C_8 alkyl or alkenyl group optionally substituted with halogen atoms or a methoxy group, a cyclopropylmethyl group, or a phenyl group optionally substituted with one or two halogen atoms or methyl groups,
n is 1 or 2, and
m is 2 or 3, or an addition salt thereof with a pharmacologically acceptable acid.

4,840,968

PREPARATION AND USES OF NEW PROSTAGLANDIN DERIVATIVES WHICH PROTECT CELL MEMBRANES AGAINST ISCHEMIC, PHYSICAL, CHEMICAL, AND BIOLOGICAL INJURIES

Tsuyoshi Ohnishi, 502 King of Prussia Rd., Radnor, Pa. 19087

Continuation-in-part of Ser. No. 104,713, Oct. 2, 1987, abandoned. This application Jan. 25 1988, Ser. No. 147,839
Int. Cl.[4] C07C *177/00;* **A61K** *31/557*
U.S. Cl. 514—530 **6 Claims**

1. A method for preparing hydrophobic esters selected from the group consisting of acetoxymethyl and acetoxyethyl esters, said method comprising using oligomers, which are prepared from starting materials, selected from the group consisting of prostaglandin A_1 and prostaglandin E_1 modified by the addition of an alkaline hydroxide material; said method further comprising combining 50 mg of one of the starting materials with 0.5 ml of ethyldiisopropylamine 0.1 ml chloroform and 2 ml of iso-alcohol; adding 0.2 ml of acetoxymethyl bromide or acetoxyethyl bromide to the mixture and stirring in a stoppered flask for 20 hours evaporating said stirred materials in vacuo, taking up the residue in benzene, and filtering to remove unnecessary byproduct (ethyldiisopropylammonium bromide); reevaporating the benzene solution; extracting the residue with diethyl ether; and evaporating the extract in vacuo overnight.

2. A method of protecting vital organs, such as the brain, spinal cord, heart, lung, liver, kidney stomach, duodenum and blood vessels against damage caused by (a) ischemic, and (b) spinal cord injuries by administering the ester-compounds of claim 1

(a) orally at a dosage of 10 mg/kg body weight/ day or
(b) subcutaneously or intramuscularly at a dosage of 6 mg/kg body weight/day or
(c) intravenously at a dosage of 2 mg/kg body weight/day.

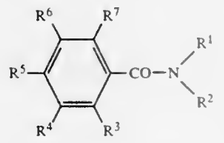
4,840,969

N-SUBSTITUTED BENZAMIDES

Horst Tarnow, Langenfeld, and Bernhard Homeyer, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 19, 1987, Ser. No. 27,706
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1986, 3611193
Int. Cl.[4] A01N *37/40, 37/18, 37/26*
U.S. Cl. 514—617 **6 Claims**

1. A method of combating insects and nematodes comprising applying to said insects or nematodes or to a habitat thereof, an insecticidal or nematicidal effective amount of an N-substituted benzamide of the formula (I)



(I)

in which
R^1 represents hydrogen or alkyl,
R^2 represents halogenoalkyl with more than one carbon atoms, or represents cycloalkyl which is substituted by halogen or halogenoalkyl and R^3, R^4, R^5, R^6 and R^7 are identical or different and represent hydrogen, halogen, nitro, alkyl, halogenalkyl, halogenoalkoxy or halogenoalkylthio, or represent the radical $-CONR^1R^2$.

4,840,970

AQUEOUS SOLUTION CONTAINING LIPID-SOLUBLE PHARMACEUTICAL SUBSTANCE

Hiroyuki Ohasi; Toru Takami, both of Kanagawa; Noritoshi Koyama, Saitama; Yoshio Kogure, Saitama; Katsumi Ida, Saitama; Kazumi Iijima, Gumma, and Tomohiro Kobori, Saitama, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 634,113, Jul. 24, 1984, abandoned. This application Jun. 1, 1987, Ser. No. 56,302
Claims priority, application Japan, Jul. 25, 1983, 58-134260
Int. Cl.[4] A61K *31/12, 31/07, 31/335, 31/225*
U.S. Cl. 514—690 **9 Claims**

1. In an aqueous solution containing a lipid-soluble source of one or more of vitamins A, E, K or ubiquinone and hydrogenated lecithin in an amount of 0.1 to 15 parts by weight of said lipid-soluble source of said vitamins or ubiquinone, the improvement wherein the solution further comprises a neutral amino acid selected from the group consisting of glycine, alanine, β-alanine, serine, threonine, valine, isoleucine, leucine, phenylalanine, methionine, histidine and taurine incorporated therein in an amount of 0.05 to 6 wt./vol. % of the aqueous solution to adjust the pH of the solution to a range of from 5.5 to 8.

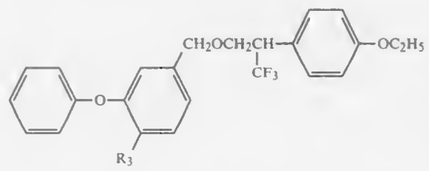
4,840,971

NOVEL ETHER COMPOUND, A PROCESS FOR MANUFACTURING THE SAME, A COMPOSITION CONTAINING THE SAME AND A USE THEREOF

Kazunori Tsushima, Nishinomiya, Japan; Noritada Matsuo, Rochester, N.Y.; Yoo Tanabe, Toyonaka, Japan; Toshihiko Yano, Ikoma, Japan, and Masachika Hirano, Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 2, 1987, Ser. No. 33,245
Claims priority, application Japan, Apr. 7, 1986, 61-79664; Aug. 16, 1986, 61-191833; Feb. 10, 1987, 61-28575
Int. Cl.[4] A61K *31/085*
U.S. Cl. 514—721 **6 Claims**

1. An ether compound and its optical isomer represented by the formula



wherein R_3 represents a hydrogen or flourine atom.

6. A method for controlling an insect and/or an acarid, which comprises applying an insecticidally and/or acaricidally effective amount of the ether compound according to claim 1 to the insect and the acarid.

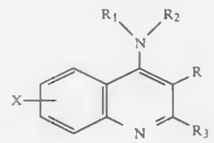
4,840,972

RELIEF FROM MEMORY DYSFUNCTION WITH α-ALKYL-4-AMINO-3-QUINOLINEMETHANOLS AND 1-(4-ARALKYLAMINO-3-QUINOLINYL)ALKANONES AND RELATED COMPOUNDS

Richard C. Effland, and Joseph T. Effland, both of Bridgewater, N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 899,584, Aug. 25, 1986, Pat. No. 4,789,678. This application Nov. 14, 1988, Ser. No. 270,172
Int. Cl.[4] A61K *31/47*
U.S. Cl. 514—313 **1 Claim**

1. A method of treating a patient in need of relief from memory dysfunction characterized by decreased cholinergic function, which comprises administering to the patient an effective amount of a compound having the formula



where X is hydrogen, halogen, loweralkyl, loweralkoxy or trifluoromethyl; R is

R_4 being loweralkyl; R_1 is hydrogen, loweralkyl or arylloweralkyl; R_2 is hydrogen, loweralkyl or arylloweralkyl; and R_3 is loweralkyl, with the proviso that when R is acetyl, R_3 is methyl and X is hydrogen, R_1 and R_2 are not both hydrogen, or a pharmaceutically acceptable acid addition salt thereof.

4,840,973

POLYPROPYLENE RESIN PREFOAMED PARTICLES

Hideki Kuwabara, Hadano, and Shohei Yoshimura, Tomioka, both of Japan, assignors to Japan Styrene Paper Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 858,868, May 1, 1986, abandoned, which is a continuation of Ser. No. 764,979, Aug. 13, 1985, abandoned, which is a continuation of Ser. No. 592,559, Mar. 23, 1984, abandoned. This application Aug. 7, 1987, Ser. No. 82,560
Claims priority, application Japan, Mar. 25, 1983, 58-50048; Apr. 19, 1983, 58-68999
Int. Cl.[4] C08J *9/22, 9/24*
U.S. Cl. 521—58 **3 Claims**

1. Prefoamed particles consisting essentially of an ethylene/propylene random copolymer, wherein said prefoamed particles are obtained by foaming particles of an ethylene/propylene random copolymer containing 1 to 4% by weight of random-copolymerized ethylene at a temperature in the range of from Tm - 15° C. to Tm - 5° C. (in which Tm is a temperature at which to terminate melting of the copolymer) and within the range of 141° to 151° C., and wherein said prefoamed particles have a crystal structure characterized in that in a DSC curve obtained by heating 1 to 3 mg of the copolymer prefoamed particles to 220° C. at a heating rate of 10° C./min. with a differential scanning calorimeter, there appear a peak (characteristic peak) characteristic of the copolymer and another peak (high temperature peak) at a higher temperature than a temperature at which the characteristic peak appears.

4,840,974

METHOD FOR REDUCING SILICONE FOAM DENSITY AND SILICONE FOAM COMPOSITIONS

David C. Gross, Schenectady; Larry N. Lewis, Scotia, both of N.Y., and Connie L. Haig, Evansville, Ind., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 226,919, Aug. 1, 1988. This application Dec. 5, 1988, Ser. No. 280,081
Int. Cl.[4] C08G *77/00;* **C08J** *9/02*
U.S. Cl. 521—85 **5 Claims**

1. A foamable composition comprising by weight,
(A) 100 parts of a vinyl-terminated polydiorganosiloxane,
(B) 0.5 to 50 parts of a hydride polysiloxane,
(C) 0.2 to 10 parts of a hydroxylated material, and
(D) an effective amount of a platinum catalyst comprising
(i) platinum vinyl siloxane complex, and
(ii) a member selected from a platinum triarylphosphine and a triarylphosphine,
where there is present in the platinum catalyst, per part by weight of platinum of the platinum vinyl siloxane complex, from 0.2 to 4 parts of platinum of the platinum triarylphosphine or 0.2 to 3 parts of the triarylphosphine.

4,840,975

SPHERICAL GRAINS OF POLYAMINO ACID AND PRODUCTION METHOD THEREOF

Chuichi Hirayama, No. 373-12, Shimonabe-machi, Kumamoto-shi, Kumamoto-ken; Yoshiaki Motozato, No. 1174-5, Hotakubohonmachi, Kumamoto-shi, Kumamoto-ken, and Hirotaka Ihara, No. 854-2, Shimizu-machi, Takahira, Kumamoto-shi, Kumamoto-ken, all of Japan, assignors to Chuichi Hirayama; Yoshiaki Motozato; Hirotaka Ihara; Juridical Foundation The Chemo-Sero-Therapeutic Research Institute, all of Kumamoto and Mitsui Toatus Chemical, Inc., Tokyo, all of, Japan

Continuation-in-part of Ser. No. 878,683, Jun. 26, 1986, abandoned. This application Nov. 3, 1987, Ser. No. 117,925
Claims priority, application Japan, Jun. 27, 1985, 60-141677
Int. Cl.[4] C08V *9/16*
U.S. Cl. 521—183 **10 Claims**

1. A method for producing porous spherical grains of poly-(α-amino acid), which comprises the steps of preparing a solu-

tion of hydrophobic poly(α-amino acid) dissolved in an organic solvent containing an additive, adding the solution to an aqueous medium and agitating the medium so as to obtain a dispersion of the porous spherical grains of the poly (α-amino acid) dispersed in the aqueous medium while evaporating the organic solvent; and taking out the spherical grains of poly(α-amino acid) from dispersion, wherein the additive is noncompatible with the poly(α-amino acid), compatible with the organic solvent in which the poly (α-amino acid) is dissolved, and which has a higher boiling point than those of the organic solvent and the aqueous medium.

4,840,976

PRODUCTION OF CLOSED-CELLED FOAMS OF HIGH COMPRESSIVE STRENGTH

Reinhold Weber, Mutterstadt; Ludwig Zuern, Bad Durkheim, and Manfred Weilbacher, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 8, 1988, Ser. No. 216,348

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1987, 3723301

Int. Cl.[4] C08J *9/08, 9/14*

U.S. Cl. 521—79 **1 Claim**

1. A process for producing a closed-celled foam of high compressive strength by extruding a mixture of a styrene polymer and from 8 to 16% by weight, based on the styrene polymer, of a blowing agent and also, optionally, customary additives, which comprises using as the blowing agent a mixture containing

(a) from 2 to 20% by weight of ethyl chloride,

(b) from 2 to 20% by weight of carbon dioxide,

(c) from 20 to 80% by weight of dichlorodifluoromethane and

(d) from 10 to 60% by weight of monochlorodifluoromethane.

4,840,977

POLYMERIC IODONIUM SALTS, METHOD FOR MAKING, AND HEAT CURABLE COMPOSITIONS

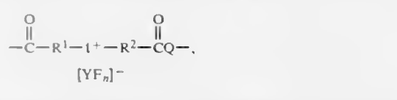
James V. Crivello, Clifton Park, and Julia L. Lee, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 1, 1987, Ser. No. 103,156

Int. Cl.[4] C08G *79/14;* **C08L** *85/00*

U.S. Cl. 522—25 **15 Claims**

10. Heat curable compositions comprising a cationically polymerizable organic material, a polymeric iodonium salt comprising chemically combined units of the formula



$$-C(=O)-R^1-I^+-R^2-C(=O)Q-,$$

$$[YF_n]^-$$

and an effective amount of a copper compound, where R^1 and R^2 are selected from $C_{(6-14)}$ divalent aryl radicals and $C_{(6-14)}$ divalent aryl radicals and $C_{(6-14)}$ divalent aryl radicals substituted with 1–4 monovalent radicals inert during interfacial polymerization, Q is a member selected from

$$-NR^4-R^3-N- \text{ and } -OR^6O-,$$

and Y is a metal or metaloid selected from P, As, Sb, B, and R^6 is a divalent $C_{(2-30)}$ organo radical.

4,840,978

BLENDS, OF CYCLIC VINYL ETHER CONTAINING COMPOUNDS AND EPOXIDES

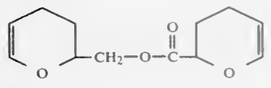
Joseph V. Koleske, Charleston, W. Va., and George T. Kwiatkowski, Green Brook, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 480,473, Mar. 29, 1983, Pat. No. 4,645,781. This application Dec. 22, 1986, Ser. No. 944,871

Int. Cl.[4] C08G *59/26, 59/42, 65/26, 65/14*

U.S. Cl. 522—169 **3 Claims**

1. A photopolymerizable composition comprising 2-(3,4-epoxycyclohexyl-5,5-spiro-3,4-epoxy)-cyclohexane-meta-dioxane, a cyclic ether of the formula:



and a photoinitator.

4,840,979

PROCESS FOR PREPARING CATIONIC COATING COMPOSITIONS USING AMMONIA ADDUCTS OF EPOXY RESINS WHICH ARE FURTHER REACTED WITH A CYCLIC ANHYDRIDE

Roeland Van Iperen; Johannes M. Van Der Mark, and Petrus G. Kooijmans, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 90,277, Aug. 28, 1987, abandoned. This application Jun. 10, 1988, Ser. No. 204,912

Claims priority, application United Kingdom, Sep. 5, 1986, 8621491

Int. Cl.[4] C08K *5/16;* **C08L** *63/00*

U.S. Cl. 523—404 **19 Claims**

1. A process for preparing a coating composition comprising blending:

(1) from about 5 to about 35 weight percent of a crosslinking compound, and

(2) from about 65 to about 95 weight percent of a carboxylated amide group-containing amino binder which is the reaction product of an amino group-containing resin binder and not more than about 0.1 mol of a cyclic anhydride per amino group equivalent of said amino group containing resin binder, which amino group-containing binder comprises the reaction product of

(a) ammonia, and

(b) a blend of

(b_1) a polyglycidyl ether having n epoxy groups per molecule, wherein $1<n<1.9$, said polyglycidyl ether being the reaction product of a multifunctional polyglycidyl ether having x epoxy groups per molecule, wherein $x>2$, and (x-n) mol of a monofunctional phenol per mol of the multifunctional polyglycidyl ether, and

(b_2) a diglycidyl ether, having an EGC in the range of from 1000 to 5500 mmol/kg,

the average molar epoxy functionality of the glycidyl ethers present in the blend of polyglycidyl ether and diglycidyl ether being less than about 1.75.

4,840,980

METHOD OF STABILIZING EPOXY-POLYAMIDE COATINGS

Alan J. Pekarik, Parma, Ohio, assignor to The Glidden Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 4,624, Jan. 15, 1987, Pat. No. 4,771,088. This application Feb. 29, 1988, Ser. No. 161,963

The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.

Int. Cl.[4] C08K *5/19;* **C08L** *63/00, 77/08*

U.S. Cl. 523—456 **4 Claims**

1. In a method of stabilizing thermosetting epoxy/polyamide coating composition, the improvement comprising:

providing a polymeric mixture of an amino-functional polyamide resin and an epoxy resin adapted to coreact to form a thermoset polymer where the polymeric mixture contains at least 0.1% by weight of a rheology stabilizing additive consisting of an ethoxylated quaternary ammonium salt based on the weight of the polymeric mixture;

wherein said stabilizing additive provides stabilized viscosity and sag resistance of the polymeric mixture during the catalyzed pot life of the polymeric mixture.

4,840,981

POLYETHYLENE TEREPHTHALATE RESIN COMPOSITION

Masayoshi Hasuo, Yokohama; Seiichi Mukai, Kunitachi; Ryo Saito, and Isao Ikuhara, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

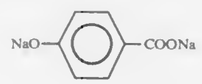
Filed Apr. 1, 1988, Ser. No. 177,477

Claims priority, application Japan, Apr. 3, 1987, 62-82477; Apr. 3, 1987, 62-82479

Int. Cl.[4] C08K *5/13, 5/09*

U.S. Cl. 524—114 **3 Claims**

1. A polyethylene terephthalate resin composition comprising a polyethylene terephthalate resin and from 0.1 to 3% by weight, based on the polyethylene terephthalate resin, of an aromatic compound of the formula:



(I)

4,840,982

POLYMER BLENDS CONTAINING IONOMERIC ELASTOMERS

John R. Campbell, Clifton Park; Robert E. Williams, Jr., Scotia; Sterling B. Brown, Schenectady, all of N.Y.; Paul M. Conroy, and Robert A. Florence, both of Pittsfield, Mass., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 791,881, Oct. 28, 1985, abandoned, which is a continuation-in-part of Ser. No. 619,433, Jun. 11, 1984, abandoned, which is a continuation-in-part of Ser. No. 528,188, Aug. 31, 1983, abandoned, which is a continuation-in-part of Ser. No. 528,189, Aug. 31, 1983, abandoned. This application Aug. 10, 1987, Ser. No. 82,907

Int. Cl.[4] C08K *5/51*

U.S. Cl. 524—151 **20 Claims**

1. A polymer composition comprising:

(A) a major proportion of at least one polyphenylene ether, or a mixture thereof with a styrene homopolymer;

(B) a minor proportion, effective to increase impact resistance, of at least one elastomer substantially free from aromatic moieties, having a carbon atom polymer chain and containing sulfonic or carboxylic acid substituents or salts thereof;

(C) a minor proportion, effective to maintain component B as a substantially stable disperse phase in component A, of at least one substituted aromatic polymer, the substituents thereof being sulfonic or carboxylic acid groups or salts thereof as defined for component B; and

(D) at least one plasticizer, said plasticizer being a polar material melting at least 50° C. below the processing temperature of the resinous components of the composition.

4,840,983

ANTI-TREEING ADDITIVES

Gary A. Vincent, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed May 23, 1986, Ser. No. 866,413

Int. Cl.[4] C08K *5/04, 5/54*

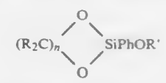
U.S. Cl. 524—265 **7 Claims**

1. An improved electrical cable insulation material comprised of

(a) polyolefin

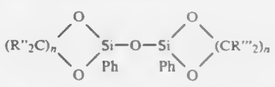
(b) an anti-treeing additive chosen from the group consisting of

(i) a compound represented by the general formula



where each R independently denotes a hydrogen atom, or a saturated hydrocarbon radical; n has a value from 2 to 5; Ph represents an aryl radical; and R′ represents an alkyl radical with 1 to 6 carbon atoms; and

(ii) a compound represented by the general formula



where R″ denotes a hydrogen atom or a saturated hydrocarbon radical, Ph denoted an aryl radical, n has a value from 2 to 5, and at least R″ and one R‴ radical on the oxygen bonded carbon atoms of said general formula denotes an alkyl radical with between 1 and 6 carbon atoms; wherein the polyolefin (a) and the anti-treeing additive (b) are intermixed, and the anti-treeing additive comprises between 0.1 and 5 weight percent of the improved cable insulation material.

4,840,984

POLYETHYLENE TEREPHTHALATE RESIN COMPOSITION

Akiyoshi Somemiya, Kobe, and Kazushi Hirobe, Osaka, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 58,053, Jun. 4, 1987, Pat. No. 4,742,130. This application Feb. 22, 1988, Ser. No. 158,490

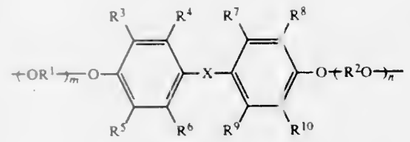
Claims priority, application Japan, Jun. 5, 1986, 61-130578

The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.

Int. Cl.[4] C08L *67/02*

U.S. Cl. 524—394 **23 Claims**

1. A polyethylene terephthalate resin composition suitable for use in moldings which comprises: (A) 5 to 93 parts of a polyethylene terephthalate resin, (B) 95 to 7 parts of a polyethylene terephthalate block copolymer having 10 to 55% by weight of units represented by the formula (I):



(I)

wherein R^1 and R^2 are the same or different and each is a bivalent hydrocarbon group having 2 to 4 carbon atoms, R^3 to R^{10} are the same or different and each is hydrogen atom, a monovalent hydrocarbon group or a halogen atom, X is a bivalent group or single bond, and each of m and n is an integer of 5 to 20, said parts of said components (A) and (B) being parts by weight based on the total amount of said components (A) and (B), and (C) a glass fiber.

4,840,985

GRINDING AGENT BASED AND/OR COPOLYMERS FOR AQUEOUS SUSPENSION OF COARSE MINERAL MATERIALS FOR PIGMENT APPLICATIONS

Olivier Gonnet, St. Andrêde Corcy; Georges Ravet, Craponne, and Jacky Rousset, Chatillon sur Chalaronne, all of France, assignors to Coatex, S. A., Caluire, France

Continuation of Ser. No. 881,490, Jul. 1, 1986, abandoned, which is a continuation of Ser. No. 731,752, May 7, 1985, abandoned, which is a continuation of Ser. No. 518,635, Jul. 29, 1983, abandoned. This application Sep. 23, 1987, Ser. No. 102,775

Claims priority, application France, Aug. 6, 1982, 82 14030

Int. Cl.[4] C08J *3/12*

U.S. Cl. 524—425 **15 Claims**

1. A process for the preparation of a stable aqueous mineral suspension, comprising the steps of:

(i) combining (a) water, (b) $CaCO_3$, (c) a grinding agent which is at least one member selected from the group consisting of acrylic acid homopolymers and copolymers which are predominantly acrylic acid and contain at least one monomer selected from the group consisting of methacrylic acid, itaconic acid, crotonic acid, fumaric acid, maleic acid, isocrotonic acid, aconitic acid, mesaconic acid, sinapinic acid, undecylenic acid, angelic acid, hydroxyacrylic acid, acrolein, acrylamide, acrylonitrile, esters of acrylic acid, esters of methacrylic acid, dimethylaminoethyl methacrylate, imidazoles, vinylpyrrolidone, vinylcaprolactam, ethylene, propylene, isobutylene, diisobutylene, vinyl acetate, styrene, alphamethylstyrene and methylvinylketone, wherein from 40 to 80% of the acid groups of said homopolymers and copolymers have been neutralized with neutralizing agents, at least one of which is characterized by a monovalent function, and (d) a grinding material to give a mixture; and

(ii) grinding said mixture to give said stable aqueous mineral suspension such that 95% of the particles are smaller than 2 microns and 75% of the particles are smaller than 1 micron.

4,840,986

PROCESS FOR PRODUCING A POLYARYLENE SULFIDE

Hiroshi Inoue; Toshikazu Kato; Satoshi Tomagou, and Noriaki Emura, all of Mie, Japan, assignors to Tosoh Corporation and Toso Susteel Co., Ltd., Japan

Filed Mar. 7, 1988, Ser. No. 165,062

Claims priority, application Japan, Mar. 6, 1987, 62-49913

Int. Cl.[4] C08G *7/14*

U.S. Cl. 524—436 **5 Claims**

1. A process for producing a polyarylene sulfide through a polymerization reaction between a dihalogenated aromatic compound and an alkali metal sulfide in an aprotic polar solvent at a temperature of from about 200° to about 270° C. for about 0.5 to about 30 hours with stirring, said process comprising adding from about 0.05 to about 5 miles of calcium chloride per mole of the dihalogenated aromatic compound after the conversion of the dihalogenated aromatic compound has reached about 60 to about 98 mol % and allowing the reaction to proceed.

4,840,987

FLAME RETARDANT HEAT-SHRINKABLE TUBE

Yoshito Sakamoto, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Japan

Filed Mar. 18, 1988, Ser. No. 169,692

Int. Cl.[4] C08K *3/22*

U.S. Cl. 524—436 **6 Claims**

1. A flame retardant heat-shrinkable tube comprising a cross-linked flame retardant resin composition which consisting essentially of:

(a) 100 parts by weight of an ethylene/vinyl acetate copolymer having a vinyl acetate content of 20 wt % or more based on the total amount of the copolymer or 100 parts by weight of a resin mixture containing a polyolefin resin and an ethylene/vinyl acetate copolymer said resin mixture having a vinyl acetate content of 20 to 40 wt % based on the total amount of said resin mixture, and

(b) from 150 to 250 parts by weight of magnesium hydroxide.

4,840,988

RUBBER COMPOSITION FOR TIRE TREAD

Rinichi Nakayama, Osaka; Yasunori Yoshida, Hyogo, and Satoshi Iwama, Osaka, all of Japan, assignors to Toyo Tire & Rubber Co., Ltd., Osaka, Japan

Filed Feb. 16, 1988, Ser. No. 157,036

Claims priority, application Japan, Feb. 17, 1987, 62-35304

Int. Cl.[4] C08K *3/04, 5/01; C08L 9/00*

U.S. Cl. 524—476 **7 Claims**

1. A rubber composition for a tire tread for icy and snow covered roads comprising:

diene system rubber in the amount of 100 parts by weight (pbw);

carbon black in the amount of x pbw; and

a softening agent in the amount of y pbw, with the relationship between x and y given by the inequality $(5/8)x - 20 \leqq y \leqq x$, said softening agent being selected from the group consisting of z parts by weight of liquid polymer alone and z parts by weight of liquid polymer in combination with naphthene oil, said z parts by weight being selected in compliance with the inequality $(y/5) + 5 \leqq z$ with a flow point of said liquid polymer being 20° C. or below and said liquid polymer being selected from the group consisting of one or more of liquid polybutadiene, liquid polybutene, liquid polyisoprene, liquid polyisobutylene and liquid polyisopreneisobutylene.

4,840,989

COPOLYMER MADE FROM N-VINYLAMIDES AND PERFLUOROALKYL GROUP-CONTAINING, ETHYLENICALLY UNSATURATED COMPOUNDS, A PROCESS FOR THEIR PREPARATION, AND THEIR USE

Holger Ohst, Aachen; Wolfgang Podszun, Cologne; Carlhans Süling, Odenthal; John Goossens, and Günther Penners, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 141,880, Jan. 6, 1988, abandoned. This application Sep. 26, 1988, Ser. No. 249,132

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1987, 3701408

Int. Cl.[4] C08L *27/12; C08F 12/30*

U.S. Cl. 524—544 **10 Claims**

1. Stabilized aqueous dispersions of inorganic oxides comprising, as a stabilizer, copolymers containing 0.01 to 35 mol-%, relative to the total monomer composition, of one or more polymerized perfluoroalkyl group-containing monomer units, 55 to 99.99 mole-% of one or more polymerized N-vinylamide monomer units, and 0 to 10 mole-% of one or more further comonomers.

4,840,990

AQUEOUS BINDER DISPERSIONS FOR THE PREPARATION OF PAINTS & FINISHES

Erich Gullbins, Heidelberg; Graham E. McKee, Weinheim, and Gregor Ley, Wattenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 90,450, Aug. 18, 1987. This application Sep. 26, 1988, Ser. No. 249,298

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1986, 3629581

Int. Cl.[4] C08L *51/00*

U.S. Cl. 524—504 **4 Claims**

1. A process for preparing an aqueous binder dispersion, said binder consisting essentially of the following components:

(A) from 0.5 to 50% by weight, based on the binder, of a phenolic resin precondensate;

(B) from 20 to 70% by weight, based on the binder, of a copolymer containing

(b_1) at least one comonomer selected from the group consisting of alkyl acrylates and alkyl methacrylates as the predominant copolymerized unit(s), and

(b_2) at least one comonomer selected from the group consisting of vinylesters of C_2–C_4-carboxylic acids, C_1–C_4-dialkylmaleates and fumarates, vinylaromatics, acrylonitrile, methacrylonitrile, acrylamide, methacrylamide, vinyl ethers of 3 to 10 carbon atoms, vinyl halides, and polyolefinically unsaturated compounds, as the additional copolymerized unit(s) said copolymer (B) containing from 0.1 to 50%, based on (B), of one or more functional groups selected from the group consisting of the glycidyl, carbonyl, N-methylol, N-alkoxymethyl, amino and hydrazo groups; and

(C) from 10 to 70% by weight, based on the binder, of a graft elastomer consisting of dicne polymer latex particles grafted with a copolymer containing at least one comonomer selected from the groups consisting of styrene, acrylonitrile, C_1–C_6-alkylacrylates, and C_1–C_6-alkyl methacrylates, as the predominent copolymerized unit(s); comprising the steps of

(i) preparing a primary aqueous dispersion of said graft elastomer (C),

(ii) mixing the said aqueous graft elastomer (C) dispersion with the phenolic component(s) of the said phenolic resin precondensate (A), and thereafter

(iii) condensing the resulting mixture with the aldehyde component(s) of the phenolic resin precondensate (A).

4,840,991

AQUEOUS DISPERSIONS OF PARTIALLY CROSS-LINKED EMULSION COPOLYMERS

Kazys Sekmakas, St. Petersburg Beach, Fla., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Nov. 28, 1986, Ser. No. 935,722

Int. Cl.[4] C08K *43/00*

U.S. Cl. 524—812 **11 Claims**

1. An aqueous dispersion of partially cross-linked copolymer particles produced by copolymerizing in aqueous emulsion a mixture of: (A) from 1% to 30% of a dimaleate or difumarate of a trihydric alcohol; (B) from 3% to 30% of hydroxy-functional alkyl acrylate or methacrylate; (C) from 0.5% to 10% of a salt-forming monoethylenically unsaturated monomer selected from monoethylenic carboxylic acid monomer and monoethylenic amine monomer selected from alkylamine acrylates, methacrylates, acrylamides, and methacrylamides; and (D) the balance of the copolymer consisting essentially of at least about 25% of nonreactive copolymerizable monoethylenically unsaturated monomer, said monomers in the absence of the cross-linking provided by said component (A) providing a rubbery copolymer, the copolymer particle-containing suspension produced by said emulsion copolymerization being coagulated with water immiscible organic solvent which is a poor solvent for the copolymer to provide a liquid phase containing the coagulating solvent and the water and surfactants used in said emulsion copolymerization and a coagulum of the copolymer particles therein, said coagulum, after removal of said liquid phase, being dispersed in water with the aid of a salt-forming volatile acid or a volatile base and a water-miscible organic solvent, said last-named solvent being present in said aqueous dispersion in an amount insufficient by itself to dissolve said coagulum in the absence of said salt-forming acid or base.

4,840,992

COPOLYMERS OF POLY(VINYL TRIFLUOROACETATE) OR POLY(VINYL ALCOHOL)

Ronald F. Ofstead, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 891,852, Sep. 3, 1986, Pat. No. 4,693,939, which is a division of Ser. No. 731,915, May 8, 1985, Pat. No. 4,618,649, which is a continuation-in-part of Ser. No. 500,785, Jun. 3, 1983, Pat. No. 4,528,325. This application Jun. 17, 1987, Ser. No. 65,890

Int. Cl.[4] C06F *16/06*

U.S. Cl. 525—61 **17 Claims**

1. A non-crosslinked poly(vinyl alcohol) polymer hydrogel which is the reaction product of:

a. a non-crosslinked poly(vinyl trifluoroacetate) polymer which is the reaction product of:

1. vinyl trifluoroacetate monomer, and

2. up to 5 weight percent of a comonomer selected from vinyl esters, vinyl ethers, and co-polymerizable disubstituted ethylenes; and

b. a mild base in a non-aqueous diluent selected so that the poly(vinyl trifluoroacetate) polymer and its poly(vinyl alcohol) polymer solvolysis product are insoluble therein, said poly(vinyl alcohol) polymer being hydrated to provide said hydrogel.

4,840,993

IMPACT-RESISTANT POLYAMIDE MOLDING COMPOUNDS

Wilfried Bartz, Marl, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Apr. 21, 1987, Ser. No. 40,917

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1986, 3613528

The portion of the term of this patent subsequent to Jul. 5, 2005, has been disclaimed.

Int. Cl.[4] C08L *45/00, 77/00*

U.S. Cl. 525—66 **20 Claims**

1. An impact-resistant polyamide molding compound comprising an intimate mixture of

A. from about 60 to about 98% by weight of a polyamide having an Eta_{rel} value in the range of from about 1.2 to about 2.4

B. from about 2 to about 40% by weight of a polyalkenamer having a viscosity number in the range of from about 50 to about 250 ml/g,

said mixture having been combined with from about 0.05 to about 5% by weight relative to the sum of components A and B, of an organic free radical former at a temperature sufficient to cause said radical former to decompose into free radicals.

7. A molding composition of claim 1 wherein said polyalkenamer is grafted by 0.2 to 5% by weight of an unsaturated monomer containing carboxyl or carboxylic acid anhydride groups.

4,840,994

COMPOSITIONS BASED ON FLUOROELASTOMERS AND ON MODIFIED OLEFIN C POLYMERS

Giovanni Moggi, Milan; Gianna Citillo, Genova; Mauro Aglietto, and Enzo Benedetti, both of Pisa, all of Italy, assignors to Ausimont S.p.A., Milan, Italy

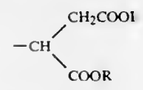
Continuation of Ser. No. 205,175, Jun. 1[illegible], 1988. This application Jun. 17, 1988, Ser. No. 208,038

Claims priority, application Italy, Jun. 19, 1987, 20956 A/87

Int. Cl.[4] C08L *51/06, 27/16, 27/18, 27/22*

U.S. Cl. 525—72 5 Claims

1. Fluoroelastomer compositions vulcanizable with peroxide and/or ionic vulcanization, comprising from 0.5 to 5 parts by weight, per 100 parts by weight of fluoroelastomer, of an ethylene homopolymer or of an ethylene/propylene or ethylene/butene-1 copolymer of the amorphous type and containing ester groups —COOR, R = an alkyl with 1 to 8 C, along the polymeric chain, in amounts equal to 0.5%–10% by weight referred to the olefin polymer, said ester groups being bound to carbon atoms of the polymer chain either directly or through a $—CH_2—$ radical or in the form



where R is a C_1–C_8 alkyl group.

4,840,995

AROMATIC POLYESTER/AROMATIC POLYCARBONATE/ALPHA-OLEFIN UNSATURATED CARBOXYLIC ACID REACTION PRODUCT COMPOSITIONS

Mitsuhiko Tamura; Masaaki Miyamoto, and Kazuo Miyamoto, all of Kitakyushu, Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed May 17, 1988, Ser. No. 194,893

Claims priority, application Japan, May 20, 1987, 62-122859

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—133 8 Claims

1. A resin composition comprising
(a) an aromatic polyester,
(b) an aromatic polycarbonate consisting essentially of carbonate units and
(c) a reaction product of an α-olefin having a molecular weight of 40 to 2,000 and an unsaturated carboxylic acid or a derivative thereof, the content of said unsaturated carboxylic acid or said derivative thereof in said reaction product being 5 to 70 wt %.

4,840,996

POLYMERIC COMPOSITION

Leslie Wild, Wyoming, and Chun D. Lee, Cincinnati, both of Ohio, assignors to Quantum Chemical Corporation, New York, N.Y.

Filed Nov. 30, 1987, Ser. No. 126,435

Int. Cl.[4] C08L *23/26, 23/04*

U.S. Cl. 525—193 8 Claims

1. A composition comprising:
a first ethylene polymer having a density in the range of between about 0.94 and about 0.96 and a melt index in the range of between about 0.05 and about 1.0, said first ethylene polymer present in a concentration of between about 90% and about 97% by weight, based on the total weight of said composition;
a second ethylene polymer having a melt index of at least about 20, said second ethylene polymer present in a concentration of between about 3% and about 10% by weight, based on the total weight of said composition; and
an organic peroxide present in a free radical generating effective amount.

4,840,997

COMPOSITION AND PROCESS FOR MAKING GOLD COLORED OLEFIN POLYMERS

James B. Snell, and Marjorie B. Skinner, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 24, 1987, Ser. No. 124,804

Int. Cl.[4] C08L *23/02*

U.S. Cl. 525—210 15 Claims

1. A metallic gold colored composition comprising:
(a) from about 95 to about 98 weight percent olefin polymer, wherein said polymer has a density of greater than or equal to about 0.94 g/cc;
(b) from about 0.5 to about 4 weight percent mica-based gold pigment;
(c) from about 0.01 to about 0.4 weight percent of mica-based bronze pigment; and
(d) from about 0.001 to about 0.006 weight percent carbon black.

4,840,998

MODIFIED POLYTETRAFLUOROETHYLENE FINE POWDER AND PRODUCTION OF THE SAME

Tetsuo Shimizu, Ibaraki, and Kazutaka Hosokawa, Settsu, both of Japan, assignors to Daikin Industries Ltd., Osaka, Japan

Filed Aug. 27, 1987, Ser. No. 89,766

Claims priority, application Japan, Aug. 27, 1986, 61-200506

Int. Cl.[4] C08F *259/08*

U.S. Cl. 525—276 9 Claims

1. Modified polytetrafluoroethylene fine powder, which comprises primary particles having a core-shell structure and having an average particle size of 0.1 to 0.6 μm, wherein the core comprises a copolymer consisting essentially of tetrafluoroethylene and 0.01 to 0.15% by weight, based on the total weight of the particles, of at least one olefinically unsaturated compound selected from the group consisting of a fluoroalkyl vinyl ether of the formula:

$$X(CF_2)_nOCF=CF_2$$

wherein X is a hydrogen atom, a fluorine atom or a chlorine atom and n is an integer of 1, 2, 4, 5 or 6 and a fluoroalkyl vinyl ether of the formula:

$$C_3F_7(OCF_2CF_2CF_2)_m[OCF(CF_3)CF_2]_lOCF=CF_2$$

wherein m is an integer of 0 to 2 and l is an integer of 0 to 2 and the shell comprises a copolymer consisting essentially of tetrafluoroethylene and 0.04 to 0.25% by weight, based on the total weight of the particles, of chlorotrifluoroethylene.

4,840,999

DEHYDROGENATED POLYSPIROHEPTADIENE

Bernd Tieke, Marly, and Sheik A. Zahir, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

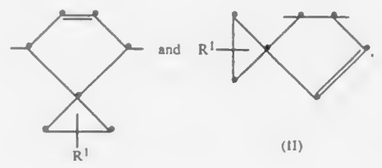
Filed Sep. 11, 1987, Ser. No. 95,075

Claims priority, application Switzerland, Sep. 19, 1986, 3756/86-7

Int. Cl.[4] C08F *8/42*

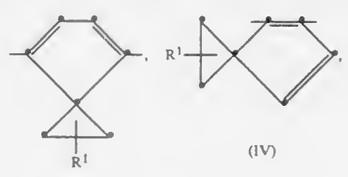
U.S. Cl. 525—332.1 6 Claims

1. A dehydrogenated poly(spiro[2,4]hepta-4,6-diene) which is insoluble in organic solvents having an electrical conductivity of at least 10^{-1} $Sxcm^{-1}$, and containing, relative to the total number of recurring structural units in the polymer, 0–90 mol % of the recurring structural units of the formulae I and II

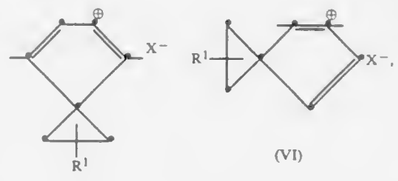


(I) and (II)

in which R^1 is in each case a hydrogen atom or an alkyl group having 1 to 4 C atoms, and 10–100 mol % of at least one of the recurring structural units of the formulae III to VI



(III) and (IV)



(V) and (VI)

in which R^1 is as defined in formula I or II and X^- is a bromide or iodide ion or an anion of a Lewis or protonic acid.

4,841,000

PROCESS FOR THE PREPARATION OF AROMATIC POLYESTERS

Peter Tacke, Krefeld; Ulrich Grogp, Kempen, and Karsten-Josef Idel, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Oct. 17, 1988, Ser. No. 258,803

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1987, 3736650

Int. Cl.[4] C07D *203/18*

U.S. Cl. 525—437 7 Claims

1. Process for the preparation of aromatic polyesters based on aromatic diphenols and iso- and terephthalic acid by solvent-free trans-esterification of esters of the diphenols with the aromatic dicarboxylic acids, characterised in that the esters of the diphenols are first reacted with the terephthalic acid alone, and the isophthalic acid is added to the solvent-free reaction mixture after at least 70% of the terephthalic acid put into the process has undergone reaction.

4,841,001

FUNCTIONALIZED THERMOPLASTIC POLYMER HAVING DICYCLOPENTADIENYL GROUPS IN POLYMER CHAIN

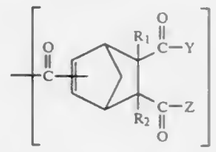
Christopher M. Hawkins, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 16, 1987, Ser. No. 133,861

Int. Cl.[4] C08G *63/62, 63/46*

U.S. Cl. 525—468 14 Claims

1. A thermoplastic polymer having recurring aromatic units in the main chain and end groups of the formula



wherein R^1 and R^2 are individually selected from the group consisting of hydrogen, phenyl, an alkyl radical having 1 to 6 carbon atoms, an alkyl substituted phenyl radical having 1 to 14 carbon atoms, chlorine, bromine, an alkoxy radical having 1 to 6 carbon atoms, and cyano; and wherein Y and Z are individually selected from the group consisting of hydroxy, alkoxy, phenoxy and arylamine, and when taken together are an oxygen.

4,841,002

LIQUID AROMATIC BISOXAZOLINE AND DISOXAZINE MONOMER MIXTURES CURED WITH POLYPHENOLIC COMPOUNDS

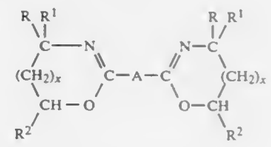
Billy M. Culbertson, Worthington, and Omar Tiba, Dublin, both of Ohio, assignors to Ashland Oil, Inc, Ashland, Ky.

Continuation-in-part of Ser. No. 144,142, Jan. 15, 1988, Pat. No. 4,806,267. This application Nov. 8, 1988, Ser. No. 266,403

Int. Cl.[4] C08G *65/40, 69/44, 69/40*

U.S. Cl. 525—504 2 Claims

1. The process for preparing a cured resin comprising reacting a polyphenolic compound with a composition having a melting point below 100° C., said composition consisting of more than two compounds having the formula



wherein
A represents a cyclic or acyclic aliphatic or substituted cyclic or acyclic aliphatic moiety having from 1 to 20 carbon atoms, or an aromatic mono-, or multi-nuclear or aliphatic substituted aryl residue having from 6 to 20 carbon atoms,
R independently represents H, CH_3, CH_2CH_3 or C_6H_5,
R^1 independently represents H or CH_3,
R^2 independently represents H or CH_3, and
x represents an integer of from 0 to 2.

4,841,003

PROCESS FOR PRODUCING OLEFIN POLYMERS

Norio Kashiwa; Akinori Toyota, both of Iwakuni, and Mamoru Kioka, Ohtake, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Division of Ser. No. 783,816, Oct. 7, 1985, Pat. No. 4,725,656, Continuation of Ser. No. 563,824, Dec. 21, 1983, abandoned. This application Sep. 22, 1987, Ser. No. 99,797
Claims priority, application Japan, Dec. 24, 1982, 57-225999
Int. Cl.[4] C08F *4/52, 10/06*
U.S. Cl. 526—125 11 Claims

1. A process for producing a polymer or copolymer of an olefin which comprises polymerizing or copolymerizing at least one olefin with or without a diolefin in the presence of a catalyst composed of (A) a magnesium-containing solid titanium catalyst component containing magnesium, titanium, a halogen and an electron donor as essential ingredients and (B) an organoaluminum compound catalyst component; characterized in that

(1) said catalyst further comprises as an outside electron donor (C) an organic silicon compound catalyst component having an Si—O—C or Si—N—C bond, and

(2) said electron donor in the catalyst component (A) is selected from the group consisting of (a) and (d) below,

(a) a mono- or poly-ester of an unsaturated non-aromatic cyclic polycarboxylic acid in which R^1 of the ester moiety —$COOR^1$ is a linear hydrocarbon group, and the non-aromatic ring is a non heterocyclic ring composed of at least one pair of two adjacent carbon atoms forming a double bond and another carbon atom with at least two carboxyl groups being directly or indirectly bonded to the carbon atoms forming the double bond, and

(d) a mono- or poly-ester of an unsaturated non-aromatic cyclic polycarboxylic acid in which R^4 of the ester moiety —$COOR^4$ is a hydrocarbon group, the non-aromatic ring may contain at least one hetero atom selected from oxygen, nitrogen and sulfur atoms in addition to at least two carbon atoms, and at least two carboxyl groups are bonded directly or indirectly to the non-aromatic ring, provided that when at least one pair of two adjacent carbon atoms forming a double bond exists in the non-aromatic ring at least one of the carboxyl groups is bonded directly or indirectly to a carbon atom other than the above two adjacent carbon atoms.

4,841,004

PROCESS FOR THE PREPARATION OF A 1-OLEFIN STEREOBLOCK POLYMER

Walter Kaminsky, Pinneberg, and Maria Buschermöhle, Hamburg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Nov. 25, 1987, Ser. No. 125,342
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1986, 3640948
Int. Cl.[4] C08F *4/64 10/06*
U.S. Cl. 526—160 2 Claims

1. A process for the preparation of a 1-olefin stereoblock polymer through polymerization of a 1-olefin of the formula $R—CH=CH_2$ in which R is an alkyl group having 1 to 28 carbon atoms, at a temperature of −50° to 100° C., at a pressure of 0.5 to 60 bar, in solution, in suspension or in the gas phase, in the presence of a catalyst which comprises a transition metal compound and an alumoxane, wherein the polymerization is carried out in the presence of a catalyst whose transition metal compound is bis-neomenthylcyclopentadienyl zirconium dichloride, and where the alumoxane is one of the formula II

$$Al_2OR_4^5[Al(R^5)-O]_n \quad (II)$$

for the linear type and/or one of the formula III

$$[Al(R^5)-O]_{n+2} \quad (III)$$

for the cyclic type, where, in the formulae II and III, R^5 denotes methyl, ethyl or isobutyl, and n is an integer from 4 to 20.

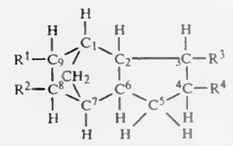
4,841,005

TRICYCLODECANE DERIVATIVE

Sinji Tamaru, and Motonobu Kubo, both of Osaka, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Filed Feb. 12, 1988, Ser. No. 155,608
Claims priority, application Japan, Feb. 12, 1987, 62-30255
Int. Cl.[4] C08F *18/20, 120/22*
U.S. Cl. 526—245 9 Claims

1. A tricyclodecane derivative represented by formula (I):



(I)

wherein

R^1 represents a group $X^1O—$ or a hydrogen atom;

R^2 represents a hydrogen atom when R^1 represents a group $X^1O—$, or R^2 represents a group $X^1O—$ when R^1 represents a hydrogen atom;

wherein X^1 represents a group

$$CH_2=CX^2C(=O)-$$

or a hydrogen atom, wherein X^2 represents a hydrogen atom, a methyl group, or a trifluoromethyl group;

R^3 represents a fluoroalkyl group containing from 1 to 21 carbon atoms, an iodine atom, or a hydrogen atom; and

R^4 represents an iodine atom or a hydrogen atom when R^3 represents a fluoroalkyl group containing from 1 to 21 carbon atoms, or R^4 represents a fluoroalkyl group containing from 1 to 21 carbon atoms when R^3 represents an iodine atom or a hydrogen atom.

4. A tricyclodecane derivative as claimed in claim 1, wherein

R^1 represents a group

$$CH_2=CX^2CO-$$

or a hydrogen atom;

R^2 represents a group

$$CH_2=CX^2CO-$$

when R^1 represents a hydrogen atom, or R^2 represents a hydrogen atom when R^1 represents a group

$$CH_2=CX^2CO-;$$

R^3 represents a fluoroalkyl group containing from 1 to 21 carbon atoms or a hydrogen atom; and

R^4 represents a hydrogen atom when R^3 represents a fluoroalkyl group containing from 1 to 21 carbon atoms, or

R^4 represents a fluoroalkyl group containing from 1 to 21 carbon atoms when R^3 represents a hydrogen atom.

9. A polymer comprising monomeric units derived from said tricyclodecane derivative as claimed in claim 4.

4,841,006

RELEASE COATING-FORMING COMPOSITION

Keiji Kobayashi, and Takashi Urabe, both of Gumna, Japan, assignors to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1988, Ser. No. 228,080
Claims priority, application Japan, Aug. 4, 1987, 62-194771
Int. Cl.[4] C08G *77/06*
U.S. Cl. 528—15 3 Claims

1. A composition for forming a release coating, comprising:

(A) 100 parts by weight of a polyorganoborosiloxane having an average composition represented by formula I:

$$R_aSiO_{(4-a)/2}(BO_{1.5})_b \quad (I)$$

wherein R is a substituted or unsubstituted monovalent hydrocarbon group bonded to a silicon atom, a is a number between 1.8 and 2.2, both inclusive, and b is a positive number, and containing at least 30 ppm by weight, based on the formula (I), of boron atoms in the form of ≡Si—O—B≡ linkages, each molecule thereof containing at least two alkenyl groups bonded to a silicon atom;

(B) a polyorganohydrogensiloxane containing in each molecule at least three hydrogen atoms bonded to silicon atoms in an amount of 0.5 to 10 hydrogen atoms for each of said alkenyl groups in the component (A); and

(C) a catalytic amount of a curing catalyst selected from the group consisting of platinum and platinum compounds.

4,841,007

FLUORINATED POLYETHERURETHANES AND MEDICAL DEVICES THEREFROM

Richard J. Zdrahala, Dayton, and Marc A. Strand, Centerville, both of Ohio, assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Mar. 28, 1988, Ser. No. 173,892
Int. Cl.[4] C08G *18/38*
U.S. Cl. 528—28 11 Claims

1. A thermoplastic polyetherurethane consisting substantially of a product from the reaction of a diisocyanate, a fluorinated polyol, a nonfluorinated polyol selected from the group consisting of a polyalkyleneoxide polyol and a polyester polyol and a chain extender of 2 to 12 carbon atoms selected from the group consisting of a diol, diamine and amino alcohol.

4,841,008

COATING COMPOSITIONS

Takashi Tsukamoto, Suita; Toyoji Hatta, Ikeda, and Ichiro Minato, Kobe, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Aug. 4, 1988, Ser. No. 228,317
Claims priority, application Japan, Aug. 11, 1987, 62-201407; Aug. 11, 1987, 62-201408
Int. Cl.[4] C08G *18/80*
U.S. Cl. 528—45 8 Claims

1. A polyurethane coating composition which comprises:

(a) a polyisocyanate blocked with an oxime or a lactam; or a polyurethane prepolymer having terminal isocyanate groups blocked with an oxime or a lactam;

(b) a polyaminepolyetherpolyester which is a condensate of a polyaminepolyether and an organic carboxylic acid, the polyaminepolyether being an adduct of an oxirane compound to a polyamine compound, a polyamidepolyaminepolyether which is an adduct of an oxirane compound to a polyamidepolyamine, the polyamidepolyamine being a condensate of a polyamine and an organic carboxylic acid; or a mixture of the polyaminepolyetherpolyester and the polyamidepolyaminepolyether.

4,841,009

SUBSTANTIALLY LINEAR MONOMERIC COMPOSITION AND LIQUID CRYSTAL POLYMERIC COMPOSITIONS DERIVED THEREFROM

Donald R. Kelsey, Hillsborough, N.J., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 454,179, Dec. 28, 1982, abandoned. This application Jul. 5, 1985, Ser. No. 752,010
Int. Cl.[4] C07C *69/017, 39/21, 103/133, 87/80;* C07D *209/56, 277/70;* C08G *73/16, 73/08, 65/40, 63/62*
U.S. Cl. 528—75 46 Claims

46. A substantially linear polymeric composition having repeating units of the formula:

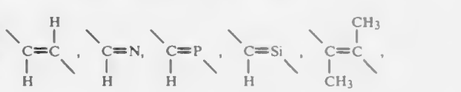
$$+Z—R^1—R_m^2—R_n^3—R^4—Z+Q+$$

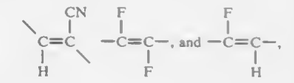
wherein

R^1 and R^4 are individually a substituted or unsubstituted aromatic or heteroaromatic group having from 5 to about 20 carbon atoms,

R^2 is a substituted or unsubstituted aromatic, heteroaromatic or cycloaliphatic group having from 5 to about 20 carbon atoms,

R^3 is selected from the group consisting of:





Z is oxygen or nitrogen, and

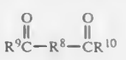
wherein

m has a value of at least 2 and n has a value of at least 1 such that the aspect ratio of the composition is from about 3.5 to about 7.0 and, when m and/or n are values of 2 or greater,

R^2 and R^3 individually can be the same or different groups, and

the R^2 and R^3 group(s) can be arranged in any order provided two or more R^3 groups are not directly connected to each other with a chemical bond; and Q is the residuum of a difunctional monomer selected from the following:

(1) a difunctional monomer having the formula:



wherein

R^8 is a substituted or unsubstituted alkyl group having from 1 to abouto 20 carbon atoms or a substituted or unsubstituted aromatic, heteroaromatic or cycloaliphatic group having from 5 to about 20 carbon atoms and

R^9 and R^{10} are individually halogen or —OR^{11} wherein R^{11} is hydrogen or a substituted or unsubstituted alkyl, aryl or arylalkyl group having from 1 to about 20 carbon atoms, with the proviso that when R^9 and/or R^{10} are halogen or when R^9 and/or R^{10} are —OR^{11} wherein R^{11} is not hydrogen, then E^1 and/or E^2 in the substantially linear monomeric composition are a hydroxyl radical or an amino radical;

(2) a difunctional monomer having the formula

wherein R^{12} and R^{13} are individually halogen or — OR^{14} in which R^{14} is a substituted or unsubstituted alkyl, aryl or arylalkyl group having from 1 to about 20 carbon atoms;

(3) a difunctional monomer having the formula

$$R^{13}—Ar—R^{16}$$

wherein Ar is the residuum of a benzenoid compound having at least one electron withdrawing group in one or more of the positions ortho or para to R^{15} and R^{16} and wherein R^{15} and R^{16} are individually halogen, $—NO_2$, $—OSOR^{17}$ or $—O-SO_2R^{18}$ in which R^{17} and R^{18} are a substituted or unsubstituted hydrocarobon group; and

(4) a difunctional monomer having the formula

$$O=C=N—R^{19}—N=C=O$$

wherein R^{19} is a substituted or unsubstituted alkyl, aryl or arylalkyl having from 1 to about 20 carbon atoms.

4,841,010

TRIGLYCIDYL ETHER/TETRAGLYCIDYL ETHER/ALKADIENE RUBBER/POLYALKYLENE POLYAMINE FORMULATION

Hanna Dodiuk, Haifa, Israel, assignor to State of Israel, Ministry of Defence, Armament Development Authority, Rafel, Haifa, Israel

Filed Sep. 2, 1987, Ser. No. 92,380

Int. Cl.[4] C08G *59/56, 59/58*

U.S. Cl. 528—99 **18 Claims**

1. A twin-pack system for producing epoxy resins which retain mechanical and adhesive properties at elevated temperatures, up to about 120° C., and which can be cured at ambient or slightly elevated temperatures,

wherein pack (1) comprises in combination:

a. a tetraglycidyl diamino-diaromatic alkane, and

b. a triglycidyl ether of an amino aromatic compound; and

wherein pack (2) comprises in combination: a curing system consisting of:

a. a polyalkylene-polyamine; and

b. an aminoterminated or carboxyterminated alkadiene rubber compound.

4,841,011

PREPARATION OF ARYLENE OLIGOMERS

Ian D. H. Towle, Cirencester, England, assignor to Raychem Limited, London, United Kingdom

Filed Sep. 11, 1987, Ser. No. 96,414

Claims priority, application United Kingdom, Sep. 30, 1986, 8623511

The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.

Int. Cl.[4] C08G *8/02, 11/00*

U.S. Cl. 528—125 **22 Claims**

1. A method of preparing an arylene oligomer having the repeat unit:

-Ar-O-Ar-B-

where

each B independently is a carbonyl (—CO—) or sulphonyl (—SO_2—) group, and each Ar is independently a substituted or unsubstituted phenylene moiety or a substituted or unsubstituted polynuclear moiety, aromatic carbon atoms of which are bonded directly to the —O— or —CO— or SO_2 groups,

which comprises oligomerising a monomer system comprising (I) phosgene or an aromatic or aliphatic carboxylic or sulphonic diacid dihalide monomer and a polynuclear aromatic comonomer having two activated hydrogens or (II) a self-oligomerising polynuclear aromatic monomer containing both a carboxylic or sulphonic acid halide group and an active hydrogen atom, in a reaction medium comprising:

(A) a Lewis acid;

(B) a controlling agent comprising:

(i) $R(OX)_a$ or added water which must be present in the reaction medium together with the Lewis acid before any monomer containing acid halide groups is added,

(ii) $R(COOX)_a$,

(iii) $R(SO_3X)_a$, or

(iv) $(RO)_bY$, which, if the Y-O linkage(s) are reactive to acid halide groups, must be present in the reaction medium together with the Lewis acid before any monomer containing acid halide groups is added,

where R is a monovalent or polyvalent organic group compatible with the monomer(s) and the other components of the reaction medium,

each X independently is a hydrogen atom or a monovalent metal atom,

each a independently is 1 or 2,

Y is a multivalent metal atom, and

b is an integer equal to the valency of Y; and

(C) optionally a non-protic diluent;

the various components being present in such proportions and the oligomerisation being conducted under such reaction conditions that a substantially linear arylene oligomer substantially free of pendant groups resulting from ortho substitution of para-linked aromatic rings in the oligomer back-bone is obtained either in a dispersed state, in which case the group R of the controlling agent (B) preferably has fewer than 8 aliphatic carbon atoms directly bonded to one another, or in a solution or gel state.

4,841,012

POLYESTERS WITH IMPROVED GAS BARRIER PROPERTIES

Robert B. Barbee, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

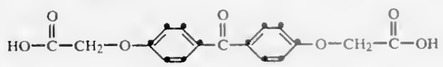
Filed Aug. 25, 1988, Ser. No. 236,382

Int. Cl.[4] C08G *63/66*

U.S. Cl. 528—125 **4 Claims**

1. A polyester having an inherent viscosity of at least 0.5 measured at 25° C. in a 60/40 by weight mixture of phenol/tetrachloroethane at a concentration of 0.5 g/100 mL comprising the polyester reaction product of:

(A) a dicarboxylic acid corresponding to the structure



and

(B) a diol selected from the group consisting of ethylene glycol, 1,4-butane diol and 1,4-cyclohexanedimethanol.

4,841,013

PREPARATION OF POLY(ARYLENE ETHER KETONES)

Ian D. H. Towle, Cirencester, England, assignor to Raychem Limited, London, England

Filed Sep. 11, 1987, Ser. No. 96,415

Claims priority, application United Kingdom, Sep. 18, 1986, 8622475; Oct. 8, 1986, 8624172

The portion of the term of this patent subsequent to Jun. 20, 2006, has been disclaimed.

Int. Cl.[4] C08G *8/02, 14/00*

U.S. Cl. 528—125 **22 Claims**

1. A method of preparing a poly(arylene ether ketone) having the repeat unit:

—Ar—O—Ar—CO—

where each Ar is independently a substituted or unsubstituted phenylene moiety or a substituted or unsubstituted polynuclear moiety, aromatic carbon atoms of which are bonded directly to the —O— or —CO— groups, which comprises polymerising a monomer system comprising (I) phosgene or an aromatic or aliphatic diacid dihalide monomer and a polynuclear aromatic comonomer having two activated hydrogens or (II) a self-polymerising polynuclear aromatic monomer containing both an acid halide group and an active hydrogen atom, in a reaction medium comprising:

(A) a Lewis acid;

(B) a controlling agent comprising:

(i) $R(OX)_a$ or added water which must be present in the reaction medium together with the Lewis acid before any monomer containing acid halide groups is added,

(ii) $R(COOX)hd\ a$,

(iii) $R(SO_3X)_a$, or

(iv) $(RO)_bY$, which, if the Y—O linkage(s) are reactive to acid halide groups, must be present in the reaction medium together with the Lewis Acid before any monomer containing acid halide groups is added,

where

R is a monovalent or polyvalent organic group compatible with the monomer(s) and the other components of the reaction medium,

each X independently is a hydrogen atom or a monovalent metal atom,

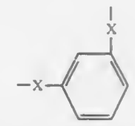
each a independently is 1 or 2,

Y is a multivalent metal atom, and

b is an integer equal to the valency of Y; and

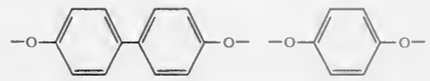
(C) optionally a non-protic diluent;

the various components being present in such proportions and the polymerisation being conducted under such reaction conditions that a thermally stable, substantially linear poly(arylene ether ketone) substantially free of pendant groups resulting from ortho substitution of para-linked aromatic rings in the polymer backbone is obtained *either* in a dispersed state, in which case the group R of the controlling agent (B) has fewer than 8 aliphatic carbon atoms directly bonded to one another, *or* in a solution or gel state.



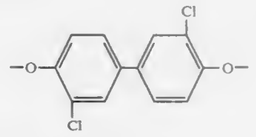
wherein X=C=O or —O—, in proportions of 0 to 15 mole percent,

(d) units of at least one of formulas



in proportions of 0 to 33 mole percent, and

(e) units of the formula



in proportions of 2 to 40 mole percent.

4,841,014

MELT-PROCESSABLE, THERMOTROPIC, FULLY AROMATIC POLYESTERS

Walter Brodowski, Amorbach, Fed. Rep. of Germany, assignor to Akzo N.V., Arnhem, Netherlands

Filed Jun. 23, 1988, Ser. No. 210,428

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1987, 3721256

Int. Cl.[4] G08G *63/18, 63/68*

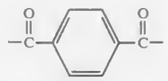
U.S. Cl. 528—191 **13 Claims**

1. A melt-processable, thermotropic, fully aromatic polyesters, consisting essentially of

(a) repeating units of the formula

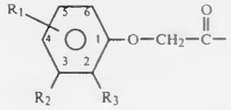
in proportions of 20 to 70 mole percent,

(b) units of the formula



in proportions of 10 to 40 mole percent,

(c) one or both, units of the formula



wherein R_1, R_2, and R_3 are each independently selected from the group consisting of hydrogen, halogen, hydrocarbyl having from 1 to 12 carbon atoms, inclusive and halogen substituted hydrocarbyl of 1 to 12 carbon atoms, inclusive: R_1 is attached to a carbon atom at one of the ring positions 4, 5 or 6; and R_2, and R_3 when taken together represent the divalent moiety of the formula:

$$—CH=CH—CH=CH—$$

which effectively creates an additional fused aromatic ring structure.

4,841,015

LOW PLATE-OUT POLYCARBONATE END CAPPED WITH PHENOXY ACETIC ACID

Daniel W. Fox, Pittsfield; Edward N. Peters, Lenox, and Paul D. Sybert, Pittsfield, all of Mass., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 22, 1987, Ser. No. 136,664

Int. Cl.[4] C08G *63/62*

U.S. Cl. 528—198 **8 Claims**

1. An aromatic polycarbonate resin having a polymer chain terminated with a monovalent group of the formula:

wherein R_1, R_2, and R_3 are each independently selected from the group consisting of hydrogen, halogen, hydrocarbyl having from 1 to 12 carbon atoms, inclusive and halogen substituted hydrocarbyl of 1 to 12 carbon atoms, inclusive: R_1 is attached to a carbon atom at one of the ring positions 4, 5 or 6; and R_2, and R_3 when taken together represent the divalent moiety of the formula:

$$—CH=CH—CH=CH—$$

which effectively creates an additional fused aromatic ring structure.

4,841,016

POLYESTER RESIN COMPOSITIONS

Bill R. Edwards, 1733 N. Parkdale, Wichita, Kans. 67212

Filed Mar. 16, 1988, Ser. No. 168,895
Int. Cl.[4] C08G *63/02*
U.S. Cl. 528—272 12 Claims

1. An additive composition for enhancing the curing and color clarity properties of a polyester resin at ambient temperatures in the presence of an oxidizing agent wherein the polyester resin is substantially free of amine and metal constituents, the additive composition comprising:

from about 50 to about 75 parts by weight of a mercaptan; and

from about 50 to about 25 parts by weight of a quarternary ammonium salt.

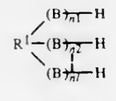
4,841,017

POLYETHER COMPOUNDS, EPOXY RESINS AND PROCESSES FOR PRODUCTION THEREOF

Takaaki Murai, and Katsuhisa Sakai, both of Hiroshima, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

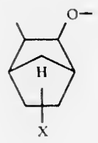
Filed Mar. 11, 1988, Ser. No. 167,680
Claims priority, application Japan, Aug. 17, 1987, 62-203919; Aug. 18, 1987, 62-204868; Aug. 25, 1987, 62-212139; Aug. 31, 1987, 62-215526
Int. Cl.[4] C08G *59/02*; C07D *303/12*
U.S. Cl. 525—327.3 7 Claims

1. An epoxy resin represented by formula (II)

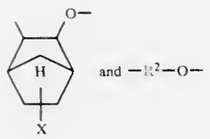


(II)

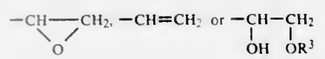
wherein R^1 represents a residue group of an organic compound having l active hydrogen atoms, nl through nl each represents 0 or an integer of from 1 to 100, the sum of integers represented by nl through nl is from 1 to 100, and l represents an integer of from 1 to 100, and B represents an oxynorbornane unit having a substituent



or a mixture of

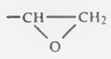


wherein R^2 represents a residue group of a mono epoxy compound, X represents a



group,

wherein R^3 represents a hydrogen atom, an alkyl group, an alkylcarbonyl group or an arylcarbonyl group, provided that the epoxy resin represented by formula (II) contains at least one



group.

4,841,018

CATALYTIC PREPARATION OF POLY(ARYLENE SULFIDE) FROM HALOTHIOPHENOL

Roger G. Gaughan, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 664,734, Oct. 25, 1984, abandoned.
This application Sep. 8, 1987, Ser. No. 96,220
Int. Cl.[4] C08G *75/02*
U.S. Cl. 528—374 33 Claims

1. A process for the preparation of a poly(arylene) sulfide comprising:

contacting, in an alkaline reaction medium, a halothiophenol and a catalyst comprising a compound selected from the group consisting of palladium complex compounds in which the palladium has a valence state of zero, nickel complex compounds in which the nickel has a valence state of zero or two, and nickel halides in which the nickel has a valence state of two, in an alcohol solvent under polymerization conditions effective for producing the poly(arylene sulfide); and,

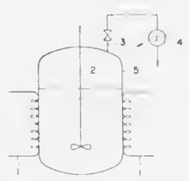
recovering the poly(arylene sulfide).

4,841,019

APPARATUS FOR PRODUCING POLYARYLENESULFIDES

Takao Iwasaki, and Katsumi Horikosi, both of Iwaki, Japan, assignors to Kureha Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 751,843, Jul. 5, 1985, abandoned. This application Mar. 16, 1987, Ser. No. 23,966
Claims priority, application Japan, Jul. 11, 1984, 59-143828
Int. Cl.[4] B01J *19/02*
U.S. Cl. 528—388 6 Claims



1. In a process for producing a polyarylenesulfide by reacting a hydrous alkali metal sulfide with a dihaloaromatic compound in an aprotic polar organic solvent in a corrosion-resistant apparatus, the improvement wherein the process is carried out in an apparatus comprising at least one process vessel wherein at least the liquid-contacting parts of said apparatus are constructed of titanium thereby to produce a polyarylenesulfide having a molecular weight larger than polyarylenesulfide which is produced in an apparatus made of stainless steel.

4,841,020

CATALYTIC POLYMERIZATION OF CARBON MONOXIDE WITH FUNCTIONAL SUBSTITUTED ETHYLENICALLY UNSATURATED MONOMER

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 21, 1987, Ser. No. 98,652
Claims priority, application Netherlands, Nov. 27, 1986, 8603015
Int. Cl.[4] C08G *67/02*
U.S. Cl. 528—392 13 Claims

1. The process of producing linear alternating polymers of carbon monoxide and a functionally substituted ethylenically unsaturated compounds wherein the functional substituent is separated from the ethylenic unsaturation by at least one $-CH_2-$ bridging group, by contacting carbon monoxide and the functionally substituted ethylenically unsaturated compound under polymerization conditions in the presence of a catalyst composition formed from a palladium compound, the anion of a non-hydrohalogenic acid having a pKa less than about 6 and a bidentate ligand selected from bidentate phosphorus ligand and bidentate nitrogen ligand.

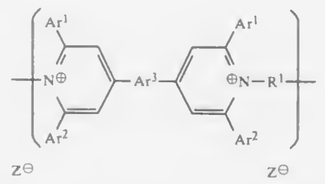
4,841,021

POLYPYRIDINIUM

Alan R. Katritzky, Gainesville, Fla.; Larry R. Krepski, White Bear Lake, Minn.; Jerald K. Rasmussen, Stillwater, Minn.; Steven M. Heilmann, Afton, Minn., and Richard D. Tarr, Toledo, Ohio, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 30, 1987, Ser. No. 126,590
Int. Cl.[4] C08G *33/02*
U.S. Cl. 528—407 10 Claims

1. A polymer comprising dipyridinium units having the formula:



wherein Ar^1, Ar^2, and Ar^3 are the same or different aromatic or heteroaromatic group each of which contains one ring or two fused or catenated rings having 5 to 12 ring carbon or heteroatoms, R^1 is any divalent organic bridging group, and $Z^\ominus$ is a counterion.

4,841,022

METHOD FOR REMOVING IMPURITIES FROM POLYPHENYLENE SULFIDE RESIN

Yoshiaki Nakamura, Chiba; Kiichi Marukawa, Yokohama, and Kazuyoshi Nagaki, Chiba, all of Japan, assignors to Tohpren, Co., Ltd., Japan

PCT No. PCT/JP87/00179, § 371 Date Nov. 13, 1987, § 102(e) Date Nov. 13, 1987, PCT Pub. No. WO87/05915, PCT Pub. Date Oct. 8, 1987
PCT Filed Mar. 24, 1987, Ser. No. 131,047
Int. Cl.[4] C08G *75/02*
U.S. Cl. 528—487 6 Claims

1. A method for removing impurities from a polyphenylene sulfide resin, which comprises heat-mixing a powdery polyphenylene sulfide resin with a solvent selected from the group consisting of:

(I) at least one solvent selected from the group consisting of dimethylsulfoxide, sulfolane, glycerol, and a combination of ethylene glycol or diethylene glycol with dimethylsulfoxide, sulfolane or glycerol,

(II) a mixed solvent of a solvent selected from the group consisting of dimethylsulfoxide, sulfolane, glyceral, thylene glycol and diethylene glycol with an α-halogenated aphthalene or biphenyl,

(III) a mixed solvent of the mixed solvent (II) or at least one solvent selected from the group consisting of benzyl alcohol, sulfolane and glyceral with N-methyl-2-pyrrolidone and

(IV) a mixed solvent of the solvent (I) or N-methyl-2-pyrrolidone with water

to bring the powder and the solvent sufficiently in contact with each other in the partially dissolved state, cooling and filtering the mixture, and washing the filter cake with a solvent incapable of dissolving the polyphenylenesulfide resin therein.

4,841,023

INACTIVATION OF VIRUSES IN LABILE PROTEIN-CONTAINING COMPOSITIONS USING FATTY ACIDS

Bernard Horowitz, New Rochelle, N.Y., assignor to New York Blood Center, Inc., New York, N.Y.

Filed Jun. 25, 1986, Ser. No. 878,446
The portion of the term of this patent subsequent to Sep. 23, 2003, has been disclaimed.
Int. Cl.[4] A61K *39/18, 39/29*
U.S. Cl. 530—351 28 Claims

1. A process for rendering a labile protein-containing composition substantially free of lipid-containing viruses without incurring substantial protein denaturation comprising contacting said composition with an effective amount of fatty acid having at least 16 carbon atoms or a salt or a monoglyceride thereof for a sufficient period of time and at a temperature of 0° C. to 37° C.

4,841,024

PURIFICATION OF ANTIBODIES

Gene R. Nathans, Columbia, and Robert W. Rosenstein, Ellicott City, both of Md., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 15, 1986, Ser. No. 907,404
Int. Cl.[4] C07R *3/12*
U.S. Cl. 530—387 8 Claims

1. A process for purifying I(g)G3 antibody, comprising:

contacting a liquid containing I(g)G3 antibody with an affinity matrix for I(g)G3 antibody which is maintained at a pH of at least 9.0 and no greater than 9.6 to adsorb I(g)G3 antibody; releasing adsorbed I(g)G3 antibody from the affinity matrix; and collecting released I(g)G3 antibody in an eluate which is at a pH of at least 9.0 and no greater than 9.6.

4,841,025

ANTIBODY PREPARATIONS

Stephen P. Cobbold, and Herman Waldmann, both of Cambridge, England, assignors to National Research Development Corporation, London, United Kingdom

Continuation of Ser. No. 624,205, Jun. 25, 1984, abandoned.
This application Mar. 21, 1988, Ser. No. 171,164
Claims priority, application United Kingdom, Jul. 8, 1983, 8318575
Int. Cl.[4] A61K *39/395*; C07K *3/12*
U.S. Cl. 530—387 15 Claims

1. A monoclonal antibody preparation, comprising intact IgG antibody molecules having a single binding activity, which activity is in respect of a cell surface antigen of a target cell, and having only one of the two light chains which will bind to the antigen, the other non-binding light chain being characteristic of a cell not specifically to the antigen from which the source hybridoma derives, the proportion of such antibody molecules relative to IgG antibody molecules having

two light chains which will bind to the antigen being about 10:1 or more to thereby produce an enhancement of the binding activity of the mixture of the antibody molecules as originally secreted.

4,841,026

VIRALLY INACTIVATED, NON TOXIC, HUMAN TRANSFERRIN PREPARATION

Shirley M. Van Beveren, and Albert R. Pappenhagen, both of Concord, Calif., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jan. 27, 1987, Ser. No. 7,150
Int. Cl.[4] C07K *15/14, 3/24*
U.S. Cl. 530—394 **10 Claims**

1. A method of preparing a sterile, virally inactivated, human, non-toxic, stable transferrin preparation, comprising of steps of

(a) fractionating human plasma to obtain partially purified transferrin solution;

(b) adding a soluble iron salt to the solution of Step (a) in the proportion of at least 1.3 milligrams of iron per gram of transferrin;

(c) reacting said iron salt with said transferrin to form a saturated transferrin -iron complex and removing the non-complexed iron from the solution;

(d) separating non-transferrin proteins from the solution of step (c); and

(e) heating the iron-containing transferrin obtained in step (d) in order to inactivate viruses.

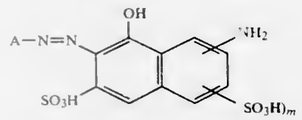
4,841,027

PROCESS FOR PREPARING PHENYL- AND NAPHTHYLAZO-AMINONAPHTHOL SULPHONIC ACIDS

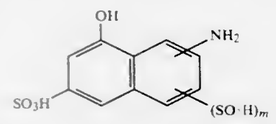
Yutaka Kayane, Moriguchi; Takashi Omura, Ashiya; Yasuo Tezuka, Nara, and Hideharu Sone, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 377,054, May 11, 1982, abandoned. This application Feb. 11, 1985, Ser. No. 700,063
Claims priority, application Japan, May 14, 1981, 56-73191
Int. Cl.[4] C09B *41/00, 41/136, 62/028, 62/51*
U.S. Cl. 534—599 **4 Claims**

1. A process for producing an arylazo-aminonaphtholsulfonic acid represented by a free acid of the formula,



wherein A is a phenyl or naphthyl group unsubstituted or substituted by one to four members selected from alkyl, alkoxy, phenoxy, sulfonic acid, carboxylic acid, arylamino, amino, nitro and hydroxyl groups and halogen atoms, and m is 0 or 1. which comprises reacting an aminonaphtholsulfonic acid represented by a free acid of the formula,



wherein m is as defined above, with a dibasic acid anhydride selected from the group consisting of maleic anhydride and succinic anhydride to obtain an acylaminonaphtholsulfonic acid, coupling a diazonium compound of amine of the formula,

$$A'—NH_2$$

wherein A' is a phenyl or naphthyl group unsubstituted or substituted by one to four members selected from alkyl, alkoxy, phenoxy, sulfonic acid, carboxylic acid, arylamino, maleinylamino, nitro and hydroxyl groups and halogen atoms, with the acylaminonaphtholsulfonic acid, and then subjecting the resulting coupling product to hydrolysis in the presence of an acid or an alkali.

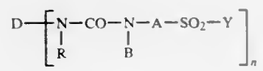
4,841,028

REACTIVE DYES COMPRISING A REACTIVE RADICAL BONDED TO THE CHROMOPHOR BY A UREA BRIDGE MEMBER

Peter Aeschlimann, Sandweg 16, 4123 Allschwil, and Hansrudolf Schwander, Unterm Schellenberg 189, 4125 Riehen, both of Switzerland

Continuation of Ser. No. 913,557, Sep. 29, 1986, abandoned, which is a continuation of Ser. No. 771,128, Aug. 30, 1985, abandoned. This application Aug. 10, 1987, Ser. No. 86,173
Claims priority, application Switzerland, Aug. 30, 1984, 4155/84
Int. Cl.[4] C09B *62/527, 52/525, 62/535, 62/537*
U.S. Cl. 534—629 **18 Claims**

1. A reactive dye of the formula



(1)

in which D is the radical of a monoazo, polyazo, metal complex azo, anthraquinone phthalocyanine, formazan, azomethine, dioxazine, phenazine, stilbene, triphenylmethane, xanthene, thioxanthone, nitroaryl, naphthoquinone, pyrenequinone or perylenetetracarbimide dye, R is hydrogen or C_1-C_4-alkyl which is unsubstituted or is substituted by halogen, hydroxyl, cyano, C_1-C_4-alkoxy, carboxyl or sulfo, A is straight-chain or branched C_2-C_6-alkylene which is unsubstituted or is substituted by chlorine, bromine, fluorine, hydroxyl, sulfato, C_1-C_4-alkanoyloxy, cyano, carboxyl, alkoxycarbonyl having 1 to 5 C-atoms or carbamoyl, or is alkyleneoxyalkylene having 1 to 6 C-atoms in each alkylene member, independently of each other; Y is $—CH=CH_2$ or $—CH_2—CH_2—Z$, Z is $—OSO_3H$, $—SSO_3H$, $—OCOCH_3$, $—OPO_3H_2$ or Cl, B is (a) hydrogen (b) C_1-C_6-alkyl which is unsubstituted or is substituted by halogen hydroxyl, cyano, C_1-C_4-alkoxy, carboxyl or sulfo, (c) C_7-C_{20}-alkyl, (d) cyclohexyl, (e) phenyl which is unsubstituted or is substituted by mtehyl, ethyl, methoxy, ethoxy, chlorine, bromine, carboxyl, sulfo or sulfomethyl or (f) a radical of the formula

$$—A—SO_2—Y$$

wherein A and Y are as defined above and n is 1 or 2.

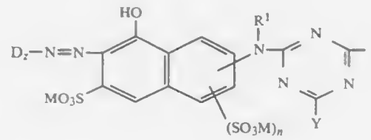
4,841,029

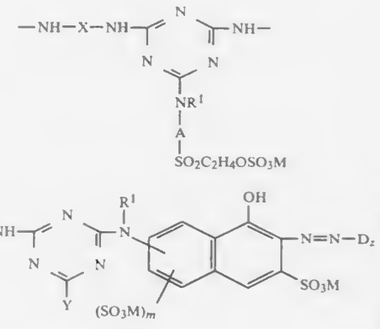
DIAZO COLORS AND DYEING METHOD USING THE SAME

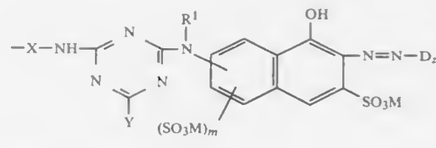
Yoshiaki Kato, Mitaka, and Toshio Hihara, Kitakyushu, both of Japan, assignors to Mitsubishi Chemical Industries Limited, Japan

Continuation of Ser. No. 866,135, May 21, 1986, abandoned. This application Apr. 19, 1988, Ser. No. 186,656
Claims priority, application Japan, May 28, 1985, 60-113198
Int. Cl.[4] C09B *62/09, 65/513;* **D06P** *1/382, 1/384*
U.S. Cl. 534—634 **3 Claims**

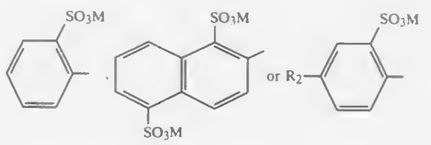
1. A disazo dyestuff represented by the formula:







wherein D_z represents



M represents hydrogen or alkali metal; R^1 represents hydrogen or lower alkyl; R^2 represents lower alkyl or lower alkoxy; A represents phenylene; X represents phenylene or phenylene substituted with methyl, methoxy, carboxy, sulfonic, or chlorine; Y represents halogen; and m represents 0 or 1.

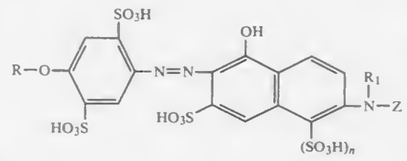
4,841,030

AZO REACTIVE DYESTUFFS

Horst Jäger, Koeln-Buchheim, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 166,436, Jul. 7, 1980, abandoned, which is a continuation of Ser. No. 6,023, Jan. 24, 1979, which is a continuation of Ser. No. 299,659, Oct. 24, 1979, abandoned, which is a continuation of Ser. No. 881,925, Dec. 3, 1969, abandoned. This application Dec. 4, 1981, Ser. No. 327,337
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1968, 1813438
Int. Cl.[4] C09B *62/085, 62/09, 62/245, 62/405*
U.S. Cl. 534—638 **3 Claims**

1. A reactive dyestuff of the formula



wherein

R is alkyl of 1-5 carbon atoms or cyclohexyl;

R_1 is hydrogen;

Z is monochlorotriazinyl further substituted by amino C_1-C_3-alkylamino, hydroxyethylamine, di-hydroxethylamino, morpholine, piperidino, cyclohexylamino, phenylamino, carboxy- or sulpho-phenylamino, methoxy, ethoxy, phenylsulphonyl-methoxy, phenoxy, sulphophenyloxy, methyl- or methoxy-phenyloxy, hydroxyethylmercapto, phenylmercapto, methyl-phenylmercapto, dinitrophenylmercapto, methyl or phenyl; and

n is 0 to 1.

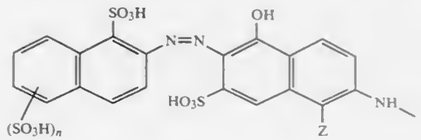
4,841,031

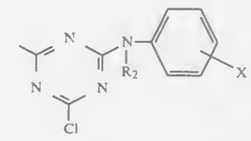
REACTIVE DYE HAVING BOTH MONOCHLOROTRIAZINYL AND VINYLSULFONE TYPE REACTIVE GROUPS

Yutaka Kayane, Sakai; Katsumasa Otake, Nara, and Yasuo Tezuka, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 7, 1984, Ser. No. 648,349
Claims priority, application Japan, May 6, 1981, 56-68727; May 6, 1981, 56-68728
Int. Cl.[4] C09B *62/085, 62/45, 62/53;* **D06P** *1/38*
U.S. Cl. 534—638 **6 Claims**

1. A compound represented by a free acid of the formula,





wherein R_2 is alkyl having 1 to 4 carbons and is unsubstituted; Z is hydrogen or sulfonic acid; n is 0 or 1; and X is $—SO_2CH=CH_2$ or $—SO_2CH_2CH_2Y$ in which Y is a group that is splittable by alkalis.

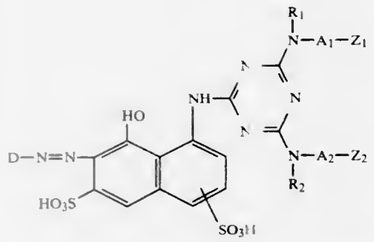
4,841,032

FIBER REACTIVE MONOAZO COMPOUNDS HAVING TWO VINYLSULFONE TYPE FIBER REACTIVE GROUPS IN THE MOLECULE

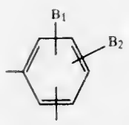
Toshihiko Morimitsu; Sadanobu Kikkawa, both of Minoo; Naoki Harada, Suita, and Takashi Omura, Ashiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 28, 1987, Ser. No. 90,508
Claims priority, application Japan, Sep. 19, 1986, 61-223453; Nov. 18, 1986, 61-274868
Int. Cl.[4] C09B *62/51;* **D06P** *1/384, 3/66*
U.S. Cl. 534—642 **8 Claims**

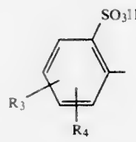
1. A compound represented by the following formula in a free acid form,



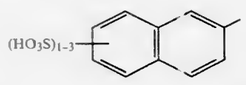
wherein A_1 and A_2 independently of one another are a phenylene group represented by the following formula,



wherein B_1 and B_2 independently of one another are hydrogen, methyl, ethyl, methoxy, ethoxy, halogeno or sulfo, or a naphthylene group unsubstituted or substituted with one sulfo, Z_1 and Z_2 independently of one another are $-SO_2CH=CH_2$ or $-SO_2CH_2CH_2Y$ in which Y is a group capable of being split by the action of an alkali, R_1 and R_2 independently of one another are hydrogen or alkyl having 1 to 4 carbon atoms, which is unsubstituted or substituted with hydroxy, cyano, alkoxy, halogeno, carboxy, carbamoyl, alkoxycarbonyl, alkylcarbonyloxy, sulfo, or sulfamoyl, and D is a sulfophenyl of the formula



in which R_3 and R_4 independently of one another are hydrogen, methyl, ethyl, methoxy, ethoxy, chloro, bromo, acetylamino, propionylamino, nitro, sulfo or carboxy, or a sulfonaphthyl of the formula,



provided that $-A_1-Z_1$ and $-A_2-Z_2$ are different from each other when D is the sulfophenyl and both R_1 and R_2 are hydrogen.

4,841,033

REACTIVE RED MONOAZO DYE COMPOUND HAVING TWO VINYLSULFONE TYPE FIBER REACTIVE GROUPS

Toshihiko Morimitsu; Sadanobu Kikkawa, both of Minoo; Naoki Harada, Suita, and Takashi Omura, Ashiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

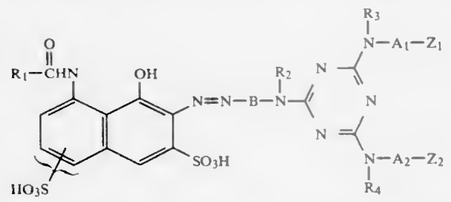
Filed Sep. 29, 1987, Ser. No. 102,355

Claims priority, application Japan, Oct. 29, 1986, 61-257841; Dec. 9, 1986, 61-294513

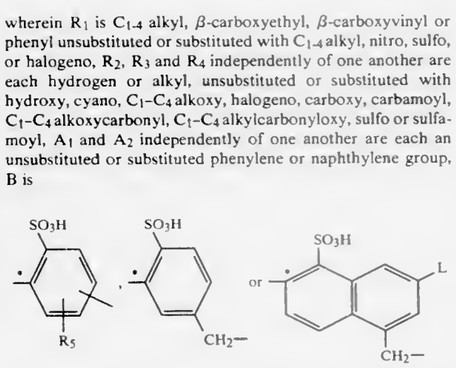
Int. Cl.[4] C09B *62/51;* **D06P** *1/384, 3/66*

U.S. Cl. 534—642 **7 Claims**

1. A monoazo compound represented by the following formula in a free acid form,



wherein R_1 is C_{1-4} alkyl, β-carboxyethyl, β-carboxyvinyl or phenyl unsubstituted or substituted with C_{1-4} alkyl, nitro, sulfo, or halogeno, R_2, R_3 and R_4 independently of one another are each hydrogen or alkyl, unsubstituted or substituted with hydroxy, cyano, C_1-C_4 alkoxy, halogeno, carboxy, carbamoyl, C_1-C_4 alkoxycarbonyl, C_1-C_4 alkylcarbonyloxy, sulfo or sulfamoyl, A_1 and A_2 independently of one another are each an unsubstituted or substituted phenylene or naphthylene group, B is



in which R_5 is hydrogen, methyl or sulfo, L is hydrogen or sulfo, and the asterisked linkage is bonded to the azo group, and Z_1 and Z_2 independently of one another are each $-SO_2CH=CH_2$ or $-SO_2CH_2CH_2Y$ in which Y is a group splittable by the action of an alkali.

4,841,034

WATER-SOLUBLE AZO COMPOUNDS HAVING A TRIAZINE MOIETY AND DYEING METHOD THEREWITH

Satoshi Ototake, Ohmiya; Ryozo Matsunaga, and Masao Furusawa, both of Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

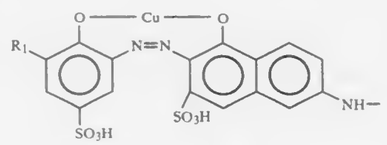
Continuation of Ser. No. 443,674, Nov. 22, 1982, abandoned. This application Nov. 15, 1984, Ser. No. 671,036

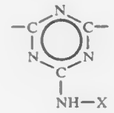
Claims priority, application Japan, Dec. 3, 1981, 56-193629

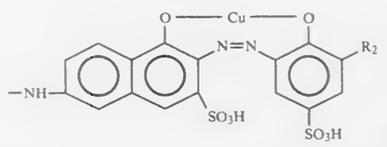
Int. Cl.[4] C09B *45/08, 45/28, 45/01;* **D06P** *1/10*

U.S. Cl. 534—701 **6 Claims**

1. A water-soluble azo compound which, in the free acid form, is represented by the following formula:







wherein R_1 and R_2 stand independently for chlorine or nitro, and X stands for phenyl which may be substituted with chlorine, methyl, lower-alkoxy or carboxyl.

6. A method for dyeing cellulose fibers which comprises dyeing said fibers with the water-soluble azo compound of claim 1.

4,841,035

CERTAIN-2-PYRIDYLOXY-PHENOXY-PROPIONIC ACID-S-THIAZOLIN-2-YL AND BENZOTHIAZOL-2-YL ESTER DERIVATIVES

Shinzo Someya, Tokorozawa; Seigo Koura, Tokyo; Mikio Ito, Tokuyama; Akira Nakanishi, Yokohama, and Yuji Nonaka, Tokuyama, all of Japan, assignors to Toyo Soda Mfg. Co. and Agro-Kanesho Co., Ltd., both of Tokyo, Japan

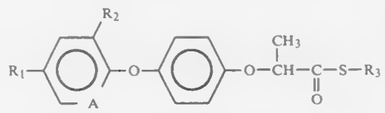
Division of Ser. No. 48,956, May 12, 1987, Pat. No. 4,741,756. This application Nov. 2, 1987, Ser. No. 116,241

Claims priority, application Japan, May 16, 1986, 61-111929

Int. Cl.[4] C07D *401/12, 277/70*

U.S. Cl. 546—270 **1 Claim**

1. A propionic acid thiol ester derivative having the formula:



wherein

R_1 is a cyano group, a trifluoromethyl group, a halogen atom or a nitro group, R_2 is a hydrogen atom, a halogen atom or a cyano group, R_3 is a thiazolin-2-yl group or a benzothiazol-2-yl group, and A is a nitrogen atom.

4,841,036

PHENYL ACOTHIENYLTHIAZOANILINE DIS-AZO DYE FOR POLYESTER FIBERS

Seiichi Imahori; Kiyoshi Himeno, and Junji Yoshihara, all of Kanagawa, Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

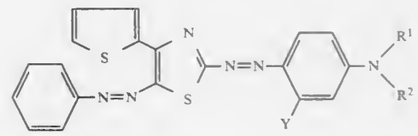
Continuation of Ser. No. 372,264, Apr. 26, 1982, abandoned. This application Dec. 18, 1984, Ser. No. 683,323

Claims priority, application Japan, Apr. 24, 1981, 56-62070

Int. Cl.[4] C09B *31/043, 29/36, 33/02, 35/02*

U.S. Cl. 534—761 **1 Claim**

1. A dis-azo dye for polyester fibers represented by the formula



wherein Y is hydrogen or acetylamino, and R^1 and R^2 are each C_1-C_4 alkyl, cyanoethyl, acetoxyethyl or C_1-C_4 alkoxyethyl.

4,841,037

AMINO SULFONAPHTHOLTRISAZO COMPOUNDS AND RECORDING LIQUIDS CONTAINING THE SAME

Tokuya Ohta; Masatsune Kobayashi; Yuko Suga; Konoe Miura; Hiroshi Takimoto, all of Yokohama, and Tomio Yoneyama, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha and Mitsubishi Chemical Industries Limited, both of Tokyo, Japan

Filed Jun. 10, 1986, Ser. No. 872,605

Claims priority, application Japan, Jun. 11, 1985, 61-126987; Jun. 11, 1985, 61-126988; Jun. 11, 1985, 61-126990; Jun. 11, 1985, 61-126991

Int. Cl.[4] C09B *31/27, 33/22;* **C09D** *11/16*

U.S. Cl. 534—815 **17 Claims**

1. A naphthalene trisazo compound represented by the formula (II):

(II)

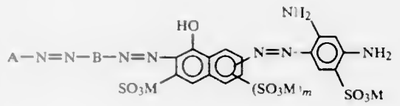
wherein X represents hydrogen, lower alkyl, phenyl, or phenyl substituted with $-SO_3M$;

m is zero or 1;

M represents alkali metal, ammonium or H.Am (wherein Am represents amine); and

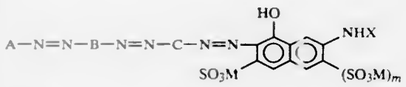
A represents an unsubstituted or substituted benzene or naphthalene ring, B and C each represent an unsubstituted or substituted 1,4-phenylene or 1,4-naphthalene provided that B and C do not represent a naphthalene ring at the same time; that the substituents for each of A, B and C in formula (II) are one or more substituents selected from the group consisting of $-SO_3M$, lower alkyl, lower alkoxy, lower alkyl carbonylamino, —COOM, and halogen; and that none of A, B and C contain a hydroxy or an unsubstituted amino group.

8. A recording liquid comprising a recording agent as a recording-image forming component and a liquid medium for dissolving or dispersing said recording agent, wherein said recording agent comprises at least one napthalene trisazo compound selected from the group consisting of compounds represented by the formula (I) or (II):



(I)

or



(II)

wherein

X represents hydrogen, lower alkyl, phenyl or phenyl substituted with $—SO_3M$;

m is zero or 1;

M represents an alkali metal, ammonium or H.Am (wherein Am represents amine); and

wherein in formula (I), A is a $—SO_3M$ substituted naphthyl group, and B is phenyl substituted by at least one substituent selected from the group consisting of lower alkyl and lower alkoxy, and in formula (II), A represents an unsubstituted or substituted benzene or naphthalene ring; B and C each represent an unsubstituted or substituted 1,4-phenylene or 1,4-naphthalene provided that B and C do not represent a naphthalene ring at the same time; that the substituents for each of A, B and C in formula (II) are one or more substituents selected from the group consisting of $—SO_3M$, lower alkyl, lower alkoxy, lower alkyl carbonylamino, —COOM, and halogen, and that none of A, B and C contain a hydroxy or an unsubstituted amino group.

4,841,038

METHOD FOR PREPARING COENZYME A ESTERS OF ALL-TRANS- AND 13-CIS RETINOIC ACIDS

Hector F. DeLuca, Madison, Wis.; Andrzej Kutner, Warsaw, Poland, and Heinrich K. Schnoes, Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 869,791, Jun. 2, 1986, Pat. No. 4,757,140. This application May 5, 1988, Ser. No. 190,443

Int. Cl.[4] C07H *19/20*

U.S. Cl. 536—27 **1 Claim**

1. A method for preparing all-trans and 13-cis-retinoyl CoA which comprises treating, respectively, all-trans or 13-cis-retinoic acid with N-hydroxysuccinimide, separating formed dicyclohexylurea from the reaction mixture, recovering the respective N-succinimidyl esters of all-trans or 13-cis-retinoic acid, reacting said respective esters with a solution of Coenzyme A and recovering all-trans-retinoyl CoA or 13-cis-retinoyl CoA.

4,841,039

2',3'-DIDEOXY-5-SUBSTITUTED URIDINES AND RELATED COMPOUNDS AS ANTIVIRAL AGENTS

Chung K. Chu, Athens, and Raymond F. Schinazi, Tucker, both of Ga., assignors to Emory University, Atlanta and University of Georgia Research Foundation, Inc., Athens, both of, Ga.

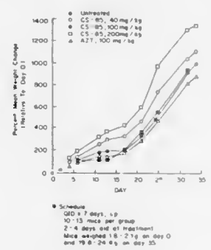
Continuation of Ser. No. 857,947, May 1, 1986, Pat. No. 4,681,933. This application Feb. 18, 1987, Ser. No. 16,136

The portion of the term of this patent subsequent to Jul. 21, 2004, has been disclaimed.

Int. Cl.[4] C07H *19/073, 19/10*

U.S. Cl. 536—29 **2 Claims**

1. A compound which exhibits antiviral activity having the formula:



wherein R^4 is O; R^5 is ethyl; $R^{3'}$ is N_3; $R^{5'}$ is OH, N_3, NH_2, phosphate, or a C_{1-4} acyl group; and R^6 is H.

4,841,040

PHOSPHATED, OXIDIZED STARCH AND USE OF SAME AS DISPERSANT IN AQUEOUS SOLUTIONS AND COATING FOR LITHOGRAPHY

Ernst K. Just, and Robert G. Nickol, both of Wilmington, Del., assignors to Aqualon Company, Wilmington, Del.

Filed Dec. 9, 1987, Ser. No. 131,053

Int. Cl.[4] C08B *31/06*

U.S. Cl. 536—105 **10 Claims**

1. A phosphated, oxidized starch having a molecular weight of about 1,500 to about 40,000 Daltons, a carboxyl degree of substitution of 0.30 to 0.96, and a phosphate degree of substitution of about 0.002 to about 0.005.

4,841,041

PENTASACCHARIDES AND TETRASACCHARIDES HAVING ANTI-THROMBOTIC ACTIVITY

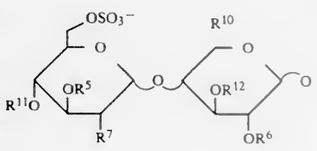
Constant A. A. van Boeckel, Mercuriusstraat; Tom Beetz, Lith, both of Netherlands, and Maurice Petitou, Paris, France, assignors to Akzo N.V., Arnhem, Netherlands and Sanofi S.A., Paris, France

Filed Jul. 12, 1988, Ser. No. 217,997

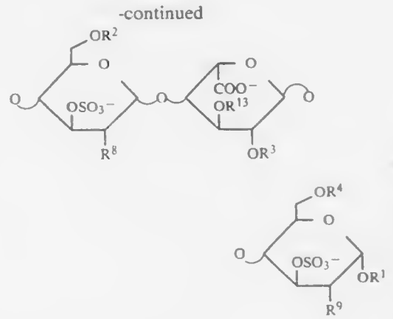
Int. Cl.[4] C08B *37/00; A61K 31/715*

U.S. Cl. 536—118 **10 Claims**

1. A pentasaccharide of the formula:



-continued



wherein:

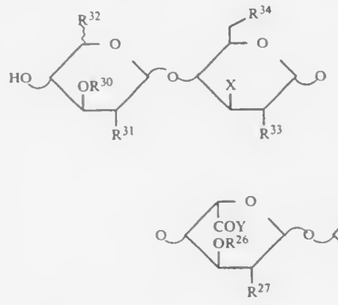
R^1 is hydrogen or alkyl (1–20 C),

R^2, R^3, R^4, R^5, R^6, R^{11}, R^{12} and R^{13} represent hydrogen or the moiety SO_3^-,

R^7, R^8, R^9 represent OH, OSO_3^-, $NHSO_3^-$ or NH-acyl,

R^{10} represents the moiety COO^-, CH_2OH or $CH_2OSO_3^-$ and the charge of the various charged moieties is compensated by suitable pharmaceutically acceptable counter-ions.

10. A tetrasaccharide of the formula:



or a salt thereof, wherein

R^1 is H or a 1–2 C alkyl;

R^{26}, R^{27}, R^{29}, R^{30}, R^{31} and R^{34} represent a moiety selected from X and OBzl;

X represents an O-acyl moiety wherein the acyl can be removed by hydrolysis;

Bzl represents a protecting group that can be removed by hydrogenolysis;

R^{28} and R^{33} represent a moiety selected from X, OBzl, N_3, NH-acyl and NHBzl;

R^{32} represents a moiety selected from —COY, CH_2X and CH_2OBzl; and

Y represents an OALK, wherein ALK is a hydrocarbon radical.

4,841,042

PROCESS FOR THE PREPARATION OF CARBAPENEM INTERMEDIATES

Dieter Häbich, and Wolfgang Hartwig, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

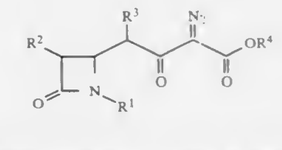
Filed Mar. 10, 1986, Ser. No. 838,237

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1985, 3509769

Int. Cl.[4] C07D *205/08, 401/06; C07F 7/18; C07B 37/04*

U.S. Cl. 540—200 **4 Claims**

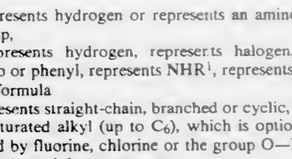
1. A compound of the formula



in which

R^1 represents hydrogen or represents an amino protective group,

R^2 represents hydrogen, represents halogen, represents azido or phenyl, represents NHR^1, represents a radical of the formula

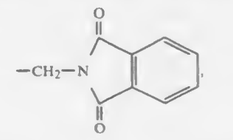


represents straight-chain, branched or cyclic, saturated or unsaturated alkyl (up to C_6), which is optionally substituted by fluorine, chlorine or the group $O—R^8$,

X denoting sulphur or oxygen,

R^8 representing hydrogen, representing trimethylsilyl, triethylsilyl, triisopropylsilyl, tert.butyldimethylsilyl, triphenylsilyl, trimethylsilylethoxycarbonyl, representing benzyl, benzyloxycarbonyl, 2- or 4-nitrobenzyl, 2- or 4-nitrobenzyloxycarbonyl, tert.-butyloxycarbonyl, allyloxycarbonyl, 4l-methoxybenzyl, 4-methoxybenzyloxycarbonyl, or representing formyl, acetyl, trichloroacetyl, trichloroethoxycarbonyl, 2,4-dimethoxybenzyloxycarbonyl, methoxymethyl, methylthiomethyl, methoxyethoxymethyl, [20(trimethylsilyl)ethoxy]methyl, 2-methylthiomethoxy)ethoxycarbonyl, tetrahydropyranyl or benzoyl,

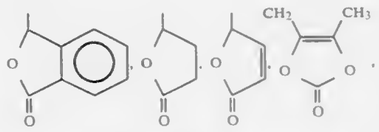
R^3 represents 3,4-dimethoxyphenyl, represents chlorine, bromine, cyano, cyanato, azido, CF_3, represents $-COR^{18}$, $-CONR^{19}R^{18}$, allyloxycarbonyl, 4-nitrobenzyloxycarbonyl, $—NHR^{18}$, ureido, guanidino, amidino, $—NH-SO_2R^{20}$, $—OSO_2R^{20}$, $—OPO(OR^{19})\ OR^{18}$, $—S—R^{18}$, $—SCOR^{18}$, $—SO_2OR^{18}$, $—SO_2NHR^{18}$, —SCN, $—SO_2R^{20}$, $—SCONH_2$ -S-pyridyl, -S-pyrimidyl, -S-methyltetrazolyl, -S-thiadiazolyl, 2-aminothiadiazolyl or



R^{18} and R^{19} being identical or different and representing hydrogen, representing straight-chain or branched alkyl (up to C_6), representing phenyl, 4-methylphenyl or benzyl, or representing a protective group for hydroxyl, mercapto or amino, and

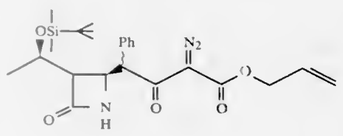
R^{20} having the same meaning as R^{19} and R^{18} but not representing hydrogen or a protective group, and

R^4 represents hydrogen or represents methyl, ethyl, tert.-butyl, decyl, 2-chloroethyl, 2,2,2-trichloroethyl, cyanoethyl, diphenylmethyl or triphenylmethyl, acetonyl, allyl, benzyl, 4-methoxybenzyl, 2,4-dimethoxybenzyl, tert.-butyldimethylsilyl, 1-phenoxyethyl or 2-methyl-2-propenyl, 4-nitrobenzyl, 2-nitrobenzyl, trimethylsilylethyl or dimethyl-tert.-butylsilylethyl or represents a radical of the formula



$—CH_2—OCO—C(CH_3)_3$, $—CH(CH_3)OCOOC_2H_5$ or $—CH_2OCOCH_3$.

3. The compound 3-(tert.butyldimethylsilyloxyethyl)-4-(3-allyloxycarbonyl-)-3-diazo-2-oxo-1-phenylpropyl)-azetidin-2-one of the formula



4,841,043

STEREOSELECTIVE SYNTHESIS OF 1-β-ALKYL CARBAPENEM ANTIBIOTIC INTERMEDIATES

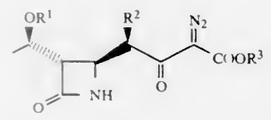
Robert Deziel, St. Lambert, and Masaki Endo, Candiac, both of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 812,570, Dec. 23, 1985, abandoned. This application Aug. 3, 1987, Ser. No. 81,054

Int. Cl.[4] C07D *205/08;* C07B *37/04;* C07F *7/22, 7/18*

U.S. Cl. 540—200 34 Claims

1. A process for producing diazo intermediates of the formula



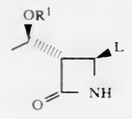
wherein

R^1 is hydrogen or a conventional hydroxy-protecting group;

R^2 is a lower alkyl having from 1-6 carbon atoms, and

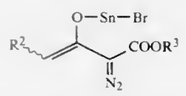
R^3 represents a conventional carboxyl-protecting group, which process comprises

reacting a compound, in the presence of tin, a silver salt, iodine, or an iodide salt as catalysit and a polar solvent, said compound having the formula

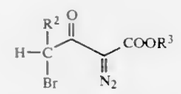


wherein R^1 is as defined above, and

L is a leaving group capable of being displaced by a tin enolate of the formula



wherein R^2 and R^3 are as defined above with a compound of the formula



wherein R^2 and R^3 are as defined above.

4,841,044

CEPHALOSPORIN DERIVATIVES

Yoshiaki Watanabe, Kodaira; Chihiro Yokoo, Gyoda; Masami Goi, Kisai; Akira Onodera, Kuki; Mitsuo Murata, Washimiya; Hiroshi Fukushima, Miyashiro; Minoru Taguchi, Ohmiya, and Kaoru Sota, Shimotomi, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Japan

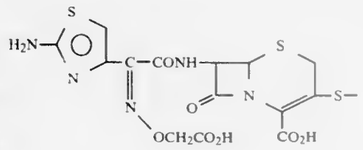
Filed Dec. 18, 1986, Ser. No. 943,037

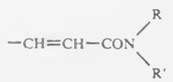
Claims priority, application Japan, Dec. 23, 1985, 60-289589; Mar. 15, 1986, 61-56084; Jun. 25, 1986, 61-148668

Int. Cl.[4] C07D *501/36;* A61K *31/545*

U.S. Cl. 540—227 5 Claims

1. A cephalosporin derivatives represented by the formula





wherein R is a hydrogen atom or a lower alkyl group having 1 to 4 carbon atoms, R′ is a hydrogen atom, a lower alkyl group having 1 to 4 carbon atoms, a cycloalkyl group having 5 or 6 carbon atoms or a benzyl group, or R and R′ together with the nitrogen atom to which they are attached form a tetrahydropyridinyl group, a morpholinyl group or pyrroridinyl group, and the non-toxic salts thereof.

4,841,045

SYNTHESIS OF VINBLASTINE AND VINCRISTINE TYPE COMPOUNDS

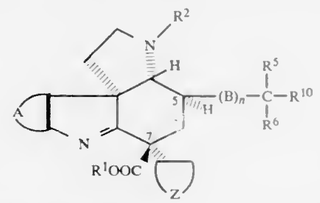
Martin Kuehne, Burlington, Vt., assignor to University of Vermont & State Agricultural College, Burlington, Vt.

Continuation-in-part of Ser. No. 810,112, Dec. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 710,792, Mar. 12, 1985, abandoned. This application May 18, 1987, Ser. No. 50,807

Int. Cl.[4] C07D *519/04, 461/00, 487/04*

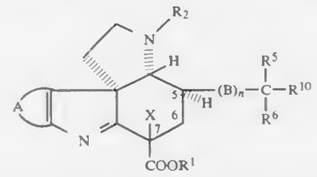
U.S. Cl. 540—478 48 Claims

1. A process for producing a compound of the formula:



wherein n is an integer from 0 to 1; Z is the remaining portion of a ring selected from the group consisting of vindoline, 16-lower alkoxy vindoline, des(N-methyl)-N-formyl vindoline, des(N-methyl)-N-formyl-16-lower alkoxy vindoline and 16-methoxy-2,3-dihydro N^a methyl-tabersonine; R^1 is lower alkyl; R^2 is an amino protecting group; R^{10} is $—CH_2Y$, formyl or formyl protected through the formation of an acetal; A is the remaining portion of a benzene ring; B is an alkylene chain of 1 to 4 carbon atoms; Y is individually a leaving group or a hydrolyzable ether group, R^5 is hydrogen or lower alkyl, R^6 is individually hydrogen, lower alkyl, or taken together with Y forms a lower alkylidenedioxy or oxo

or mixtures thereof with the corresponding 7R-diastereomer having the configuration at C-5 opposite to that shown above, comprising condensing a compound of the formula



wherein n, R^1, R^2, R^5, R^6, A, R^{10} and B are as above and X is halogen with the proviso that when R^6 is a hydrolyzable ether group, R^{10} is $—CH_2Y$, Y is a leaving group;

with vindoline, 16-lower alkoxy vindoline, des(N-methyl)-N-formyl vindoline, des(N-methyl)-N-formyl-16-lower alkoxy vindoline or 16-methoxy-2,3-dihydro N^a methyl-tabersonine or a salt thereof.

4,841,045

PROCESS FOR THE PREPARATION OF PYRIDOBENZODIAZEPINONE

Roberto P. Giani, Locate Triulzi; Ettore Parini, Cologno Monzese; Giancarlo Tonon, Milan, and Massimiliano Borsa, Vimodrone, all of Italy, assignors to Dompe' Farmaceutici S.p.A., Milan, Italy

Filed Oct. 26, 1988, Ser. No. 262,787

Claims priority, application Italy, Oct. 30, 1987, 48557 A/87

Int. Cl.[4] C07D *471/04*

U.S. Cl. 540—495 2 Claims

1. A process for the preparation of 6,11-dihydro-5H-pyrido [2,3-b][1,5]benzodiazepin-5-one by the condensation of 2-chloronicotinic acid and o-phenylenediamine, characterized in that the reaction of condensation is carried out at reflux in a solvent selected from the group consisting of cyclopentanol and cyclohexanol.

4,841,047

4-BENZYL-1-(2H)-PHTHALAZINONE-DERIVATES

Jürgen Engel, Alzenau, and Gerhard Scheffler, Hanau, both of Fed. Rep. of Germany, assignors to Aasta Pharma AG, Frankfurt, Fed. Rep. of Germany

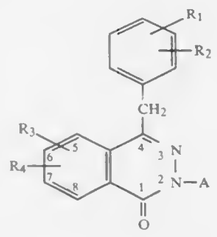
Filed Nov. 10, 1986, Ser. No. 928,458

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1985, 3539873

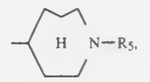
Int. Cl.[4] A61K *31/50, 31/55;* C07D *403/04, 401/04*

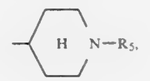
U.S. Cl. 540—599 8 Claims

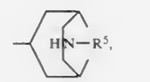
1. A 4-benzyl-1-(2H)-phthalazinone derivative of the formula

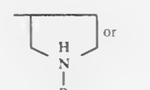


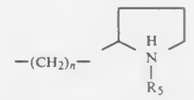
wherein R_1 represents fluorine, chlorine, bromine, trifluoromethyl, C_1–C_6-alkyl, hydroxy, C_1–C_6-alkoxy, C_2–C_6-alkanoyloxy, amino, C_1–C_6-alkylamino, di-C_1–C_6-alkylamino, C_2–C_6-alkanoylamino, C_2–C_6alkanoyl-C_1–C_6-alkylamino or a nitro group, R_2 represents hydrogen or has one of the meanings given above for R_1, and R_1 and R_2 may be the same or different, R_3 and R_4 may be the same or different and represent hydrogen, halogen, C_1–C_6-alkyl, hydroxy, C_1–C_6-alkoxy, benzyloxy or C_2–C_6-alkanolyloxy and A represents one of the radicals











wherein n=1 or 2 and R_5 represents a C_1–C_6-alkyl group substituted by the following radicals:

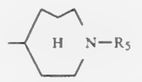
(a) a phenyl radical or a phenyl carbonyl radical each of which may contain one, two or three substituents, which may be the same or different, whereby the substituents are halogen atoms, trifluoromethyl, C_1–C_6-alkoxy groups, or

(b) a C_1–C_6-alkoxy radical, a mono or dihydroxy-C_1–C_6-alkyl radical or a hydroxy-C_1–C_6 alkoxy radical or

(c) a mono-C_1–C_6-alkylamino or di-C_1–C_6-alkylamino radical whereby the latter may also be closed to form a 5–7 membered, nitrogen-containing ring, which may optionally contain a further oxygen atom, or

(d) a C_3–C_8-cycloalkyl radical or a C_3–C_8-cycloalkylcarbonyl radical

or wherein R_5 is a monounsaturated C_3–C_6alkyl group, a monounsaturated C_3–C_6-alkyl group with a phenyl radical, a monounsaturated C_3–C_6-alkylcarbonyl group or a monounsaturated C_3–C_6alkylcarbonyl group with a phenyl radical and physiologically acceptable addition salts thereof, with the exception of compounds wherein A represents the radical



and R_5 represents allyl, benzyl, phenylethyl or methoxyethyl, R_1 represents chlorine in the 4-position and R_2, R_3 and R_4 represent hydrogen.

4,841,048

DIOXAZINE COMPOUND HAVING VINYLSULFONE TYPE FIBER REACTIVE GROUP

Hirokazu Sawamoto, Minoo; Takashi Omura, Ashiya, and Naoki Harada, Suita, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

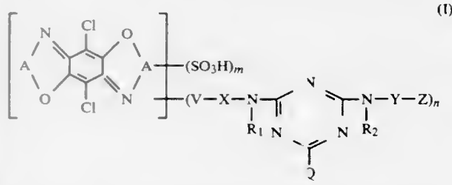
Continuation of Ser. No. 12,177, Feb. 9, 1987, abandoned. This application Nov. 19, 1987, Ser. No. 125,745

Claims priority, application Japan, Feb 17, 1986, 61-32645

Int. Cl.[4] C07D *265/34*

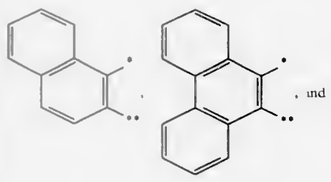
U.S. Cl. 544—74 **6 Claims**

1. A dioxazine compound represented by the following formula (I) in a free acid form,

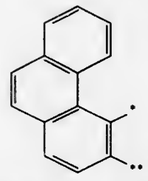


(I)

wherein A is an aromatic ring residue selected from the group consisting of:



, and



in which * and ** denote linkages to the adjacent nitrogen and oxygen atoms, respectively, V is direct linkage, $—SO_2NR_5—$ or $—NR_6—$ in which R_5 and R_6 are independently hydrogen, alkyl unsubstituted or substituted by hydroxyl, cyano, alkoxy, halogen, carboxy, carbamoyl, alkoxycarbonyl, alkylcarbonyloxy, sulfo, or sulfamoyl, X is direct linkage or aliphatic, alicyclic, araliphatic or aromatic divalent group, Y is phenylene unsubstituted or substituted once or twice by methyl, ethyl, methoxy, chloro, bromo, or sulfo, or naphthylene unsubstituted or substituted once by sulfo, Z is $—SO_2CH=CH_2$ or $—SO_2CH_2CH_2Z_1$ in which Z_1 is a group splittable by the action of an alkali, Q is sulfo, hydroxy, halogeno, lower alkoxy, phenoxy unsubstituted or substituted once or twice by methyl, ethyl, methoxy, chloro, bromo, sulfo or carboxy, or amino, alkylamino, cycloalkylamino, aralkylamino, arylamino, N,N-dialkylamino, N-alkyl-N-cycloalkylamino, N-alkyl-N-arylamino, heterocylic ring-containing amino or N-heterocylic ring-containing amino, R_1 is hydrogen, alkyl unsubstituted or substituted by hydroxyl, cyano, alkoxy, halogen, carboxy, carbamoyl, alkoxycarbonyl, alkylcarbonyloxy, sulfo, or sulfamoyl, or, when X is direct linkage and V is the $—SO_2NR_5—$, R_1 and R_5 may form a ring taken together with each adjacent nitrogen, R_2 is hydrogen, alkyl unsubstituted or substituted by hydroxyl, cyano, alkoxy, halogen, carboxy, carbamoyl, alkoxycarbonyl, alkylcarbonyloxy, sulfo, or sulfamoyl, and m and n satisfy the following formula,

$$O<m+n\leqq 6$$

provided that m and n each is defined as follows,

$$O\leqq m\leqq 5 \text{ and } O<n\leqq 4.$$

4,841,049

REACTIVE DYES OF THE DIOXAZINE SERIES

Karl Seitz, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

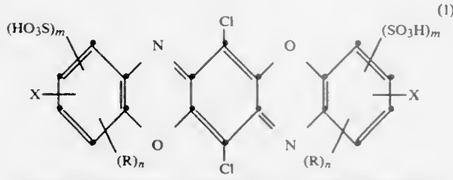
Filed Sep. 3, 1987, Ser. No. 92,798

Claims priority, application Switzerland, Sep. 12, 1986, 3666/86

Int. Cl.[4] C07D *265/38*; C09B *19/02*

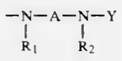
U.S. Cl. 544—76 **15 Claims**

1. A reactive dye of the formula



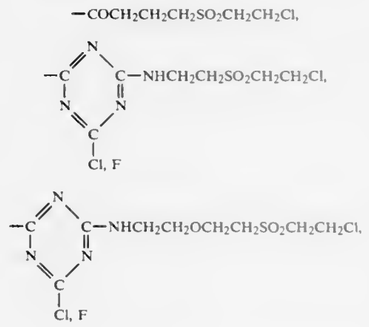
(1)

in which $(R)_n$ stands for n substituents R which, independently each other, are C_{1-4}-alkyl, C_{1-4}-alkoxy, halogen, carboxyl, carbamoyl, N-C_{1-4}-alkylcarbamoyl, N,N-di-C_{1-4}-alkylcarbamoyl, C_{1-4}-alkylsulfonyl, sulfamoyl, N-C_{1-4}-alkylsulfamoyl or N,N-di-C_{1-4}-alkylsulfamoyl, n is 0 to 2, m is 1 to 2, one X is an H_2N group and the other X is a radical of the formula



(2)

in which R_1 and R_2 are independently of each other hydrogen or C_{1-4}-alkyl which is unsubstituted or substituted by halogen, hydroxyl, cyano, sulfo or sulfato, A is C_{2-4}-alkylene which is unsubstituted or substituted by halogen, hydroxyl, carboxyl, sulfo, phenyl, sulfophenyl or C_{1-4}-alkoxycarbonyl, or is cyclohexylene which unsubstituted or substituted by C_{1-4}alkyl, or in which the group $—N(R_1)—A—N(R_2)—$ is 1,4-piperazinediyl, and Y is a radical of the formula



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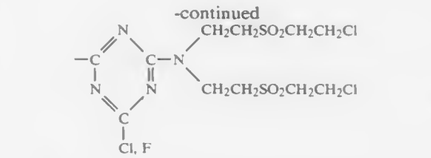

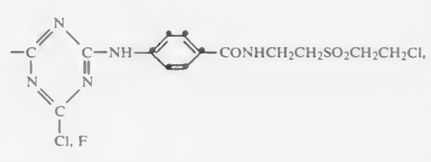

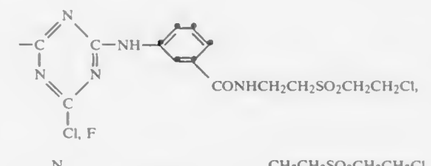

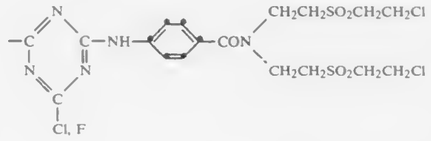

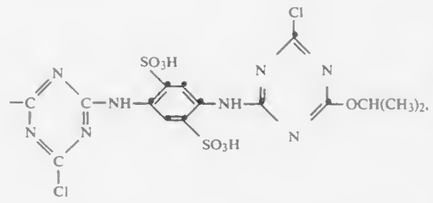

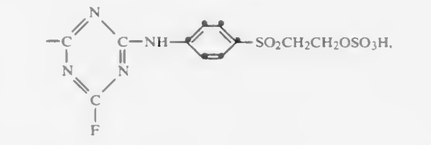

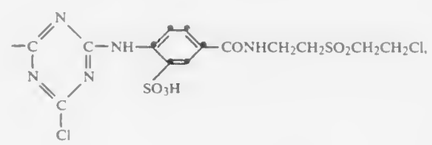

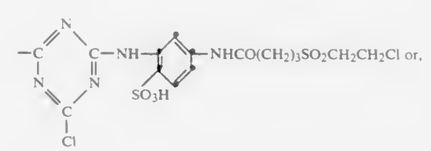

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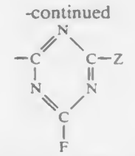


wherein Z is methoxy, isopropoxy, $—NH_2$, and N-C_1–C_6-alkylamino, N,N-di-C_1–C_6-alkylamino, cyclohexylamino, benzylamino, phenethylamino, phenylamino, naphthylamino, N-C_1–C_6-alkyl-N-cyclohexylamino, N-C_1–C_6-alkyl-N-phenylamino, furanylamino. thiophenylamino, pyrazolylamino, pyridylamino, pyrimidinylamino, quinonylamino, benzimidazolylamino, benxthiazolylamino or benzoxazolylamino radical or the radical of a 6-membered N-heterocyclic compound which can contain nitrogen, oxygen and sulfur as further heteroatoms, all of which radicals mentioned above are unsubstituted or substituted by halogen, nitro, cyano, trifluoromethyl. sulfamoyl, carbamoyl, C_1–C_4-alkyl, C_1–C_4-alkoxy, acetylamino, ureido, hydroxyl, carboxyl, sulfomethyl or sulfo, or Y is a chlorotriazine radical which is substituted by $—NH_2$, β-sulfatoethylamino, β-hydroxyethylamino, N,N,di-β-hydroxyethylamino, phenylamino, N-ethyl-N-phenylamino, m-sulfophenylamino, p-sulfophenylamino, 2,5-disulfophenylamino, morpholino, methoxy or isopropoxy, or is a 2,4-difluoropyrimid-6-yl or 2,4-difluoro-5-chloro-pyrimid-6-yl radical.

4,841,050

CARBAZOLE CONTAINING BENZOPYRANS

Andreas Guentner; Udo Mayer, both of Frankenthal, and Andreas Oberlinner, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

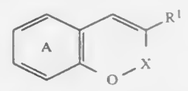
Filed Mar. 12, 1987, Ser. No. 25,063

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1986, 3608215

Int. Cl.[4] C07D *405/06, 413/14*

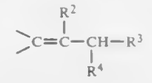
U.S. Cl. 544—150 **1 Claim**

1. A benzopyran of the formula I



(I)

where R^1 is unsubstituted C_1–C_8-alkyl, unsubstituted or substituted phenyl, C_1–C_5-alkoxy or halogen, X is a radical



R^2 is hydrogen or, together with R^1, is $C_2—R^3$ is carbazol-3-yl or 1,2,3,4,4a,9a-hexahydrocarbazol-6-yl, each of which may be substituted on the nitrogen atom by C_1–C_5-alkyl or benzyl, and the ring A may be fused to a benzo ring, may be substituted by C_1–C_4-alkyl, chlorine or bromine, or may be substituted in ring position 7 by C_1–C_5-mono- or dialkylamino (each of which in turn may be substituted by chlorine or phenyl), pyrrolidino, piperidino, morpholino, hydroxyl or C_1–C_4-alkoxy.

4,841,051

PHENYLPIPERAZINE DERIVATIVES

Akira Shiozawa, Saitama; Yuh-Ichiro Ichikawa, Tokyo, and Takashi Takahira, Saitama, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

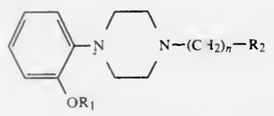
Filed Dec. 1, 1986, Ser. No. 936,270

Claims priority, application Japan, Dec. 10, 1985, 60-277412

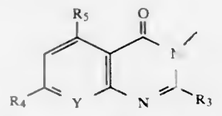
Int. Cl.⁴ C07D *403/06*

U.S. Cl. 544—287 **3 Claims**

1. A phenylpiperazine derivative represented by the formula:



wherein R_1 stands for an ethyl group; R_2 stands for a group represented by the formula:



(wherein R_3, R_4 and R_5 each stand for a hydrogen atom or a methyl group and Y stands for CH); and n stands for an integer of 2 or 4, and pharmaceutically acceptable acid solution salts thereof.

4,841,052

NAPHTHALIC ACID IMIDES ELECTROPHOTOGRAPHIC TONERS

Horst Harnisch, Much, and Roderich Raue, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

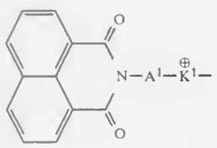
Division of Ser. No. 10,364, Feb. 3, 1987. This application Jul. 28, 1988, Ser. No. 225,329

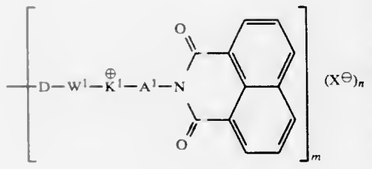
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1986, 3604827

Int. Cl.⁴ C07D *471/06*

U.S. Cl. 544—361 **1 Claim**

1. A naphthalic acid imide of the formula

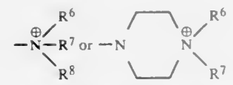




in which

A^1 represents C_2–C_5-alkylene,

$\oplus K^1$ represents

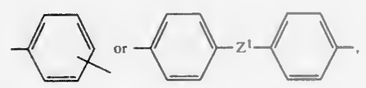


R^6 represents C_1–C_{16}-alkyl, carbamoylmethyl or benzyl,

R^7 represents methyl or ethyl or a single bond linked to D,

R^8 represents methyl or ethyl,

W^1 represents



Z^1 represents $—CH_2—$,

—O— or $—SO_2—$ and

$X^\ominus$ represents an unsubstituted benzosulphonate or a benzenesulphonate substituted by chlorinr or C_1–C_{12}-alkyl, a C_5–C_{18}-alkylsulphonate or a salt of a C_5–C_{18}-alkylcarboxylic acid or a salt of a condensation product of formaldehyde and arylsulphonic acids and/or optionally sulphonated 4,4'-dihydroxy-diphenylsulphone, wherein D represents $—CH_2—$, $—CH_2—CO—$, $—CH_2—CO—NH—$or $—CH_2—CO—NH—CH_2—$

m represent 0 or 1.

4,841,053

PROCESS FOR DESENSITIZING A 1-(ALKYLAMINO)ALKYL-POLYSUBSTITUTED PIPERAZINONE DURING RECOVERY

Pyong-Nae Son, Akron; Charles P. Jacobs, Elyria; Ronald M. Kovach, Avon Lake, and John T. Lai, Broadview Heights, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 848,555, Apr. 7, 1986, abandoned. This application Jan. 21, 1988, Ser. No. 146,532

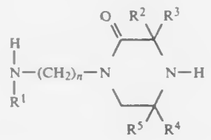
Int. Cl.⁴ C07D *241/08*

U.S. Cl. 544—384 **5 Claims**

1. In a process for preparing a polysubstituted piperazinone reaction product from a triamine which is an acyclic or cyclic N-substituted-1,2-diamine or 1,3-diamine, comprising, contacting said triamine with a saturated acyclic or cyclic monoketone present in an amount from about 2 to about 25 times greater than the molar amount required to react with said triamine, in the absence of a phase transfer catalyst and a primary alcohol solvent, and in the presence of an alkali metal hydroxide and sufficient haloform to produce said reaction product at a reaction temperature in the rnage from above the freezing point of the reaction mass, up to about the reflux temperature thereof, and recovering said polysubstituted piperzinone, the improvement consisting essentially of

(i) adding a large excess of solid alkali metal hydroxide, at least five moles for each mole of said triamine,

(ii) producing a substantially completely monoketonesoluble water-sensitive polysubstituted piperazin-2-one represented by the structure



wherein, n represents 2 or 3, being the number of methylene groups linking the terminal amino group to the N^1 atom of the piperazinone,

R^1 represents C_1–C_{12} alkyl, C_5–C_{12} cycloalkyl, phenyl, naphthyl, alkylphenyl and alkyl-napahthyl each alkyl substituent being C_1–C_{12}, and,

R^2, R^3, R^4, and R^5 each represent C_1–C_{12} alkyl, C_1–C_8 hydroxylaklyl, C_1–C_8 aminoalkyl, C_1–C_8 alkoxylakyl, and, C_5–C_{12} cycloalkyl, and in combination, R^2 with R^3, and R^4 with R^5, represent C_5–C_{14} cycloalkyl having at least four of the C atoms cyclized;

(iii) separating an essentially anhydrous solution of said polysubstituted piperazinone in said monoketone substantially free of a salt of said alkali metal, without contacting said solution with water; and,

(iv) distilling unwanted low-boiling byproducts and said ketone from said solution to purify said polysubstituted piperazinone without degrading it.

4,841,054

2,6-DIMETHYL-3,5-DIMETHOXYCARBONYL-4-(5'-TRIMETHYLSILYL-2'-FURYL)-1,4-DIHYDROPYRIDINE

Edmund Y. Lukevits, ulitsa Ierikju,43,kv.10; Valeria V. Kastron, ulitsa Avotu,33,kv.2; Rasma O. Vitolin, ulitsa Suvorova,117,kv.13; Nikolai P. Erchak, ulitsa Dzirnavu,161,kv.13; Indulis P. Skrastinsh, ulitsa Lienes,9,kv.26; Gunar Y. Dubur, ulitsa Ierikju,43,kv.2, and Agris A. Kimenis, ulitsa Staitseles,15,kv.208, all of Riga, U.S.S.R.

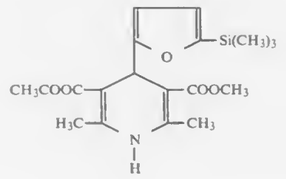
PCT No. PCT/SU86/00104, § 371 Date May 26, 1988, § 102(e) Date May 26, 1988, PCT Pub. No. WO88/03143, PCT Pub. Date May 5, 1988

PCT Filed Oct. 21, 1986, Ser. No. 239,953

Int. Cl.⁴ C07F *7/10*

U.S. Cl. 546—14 **1 Claim**

1. 2,6-dimethyl-3,5-dimethoxycarbonyl-4-(5'-trimethylsilyl-2'-furyl)-1,4-dihydropyridine of the formula:



4,841,055

DESMOSINE DERIVATIVES AND REAGENT FOR PREPARING ARTIFICIAL ANTIGENS

Takashi Matsumoto, Stockholm, Sweden; Takashi Okada, and Sigenobu Mizusaki, both of Tokyo, Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

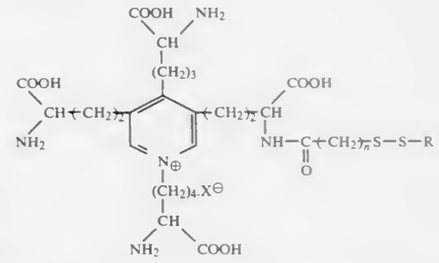
Division of Ser. No. 839,576, Mar. 14, 1986, Pat. No. 4,723,012. This application Jul. 30, 1987, Ser. No. 79,512

Claims priority, application Japan, Mar. 25, 1985, 57-58182

Int. Cl.⁴ C07D *213/62, 213/32*

U.S. Cl. 546—261 **5 Claims**

1. A method for preparing a desmosine artificial antigen comprising the step of reacting a desmosine derivative having a formula:



where R is an electron-attracting organic group selected from the group consisting of pyridyl, azidophenyl and pheoyl, X^- is an anion, and n is an integer of 1 to 6, with a carrier polymer having a thiol group derived from a material selected from the group consisting of bovine serum albumin, mouse gamma globulin, mouse serum albumin and keyhole limpet hemocyanin with a molar ratio of the desmosine derivative to carrier polymer being from about 10:1 to about 20:1 at a temperature and for a period of time sufficient for bonding said desmosine derivative to said carrier polymer through a disulfide bond, with the elimination of R-SH, to produce a desmosine artificial antigen.

4,841,056

SUBSTITUTED HEXAHYDRO-4H-INDOLO[6,5,4-CD]INDOLES

William H. Hunter, Amersham, England, assignor to Lilly Industries Limited, London, United Kingdom

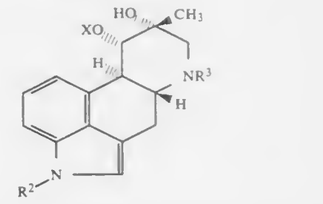
Filed Jan. 27, 1988, Ser. No. 148,807

Claims priority, application United Kingdom, Jul. 27, 1984, 8419278

Int. Cl.⁴ C07D *457/14*

U.S. Cl. 546—68 **1 Claim**

1. A compound of formula:



in which R^2 is hydrogen, C_{1-4} alkyl or a protecting group, R^3 is C_{1-4} alkyl or a protecting group, and X is hydrogen or —OX is a leaving group.

4,841,057

CYCLIC IMIDO ANTHRAQUINONE COMPOUNDS

Konoe Miura, Yokobama; Tetsuo Ozawa, Hadano; Seigo Okumura, Machida, and Shinji Kubo, Kitakyushu, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Japan

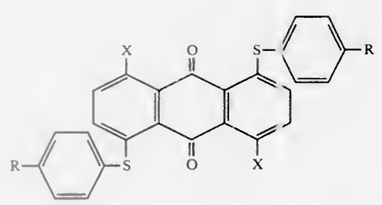
Filed Jan. 12, 1988, Ser. No. 143,366

Claims priority, application Japan, Jan. 13, 1987, 62-5569; Feb. 10, 1987, 62-28696

Int. Cl.⁴ C07D *221/02, 209/56, 209/02, 209/36*

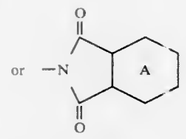
U.S. Cl. 546—183 **2 Claims**

1. An anthraquinone compound represented by formula:



(I)

wherein two R, which may be the same or different, each represents a hydrogen atom,



ring A represents a substituted or unsubstituted aromatic or aliphatic ring; and two X, which may be the same or different, each represents a hydrogen atom or an amino group, provided that X and R are not simultaneously a hydrogen atom.

4,841,058

VIOLOGEN DERIVATIVE

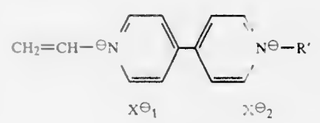
Takeshi Endo; Yoko Nambu, and Kazutoshi Yamamoto, all of Yokohama, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 837,080, Mar. 6, 1986, abandoned. This application Mar. 7, 1988, Ser. No. 168,626

Int. Cl.[4] C07D *401/04*

U.S. Cl. 546—257 8 Claims

1. A vinyl viologen derivative represented by the formula:



(I)

wherein

R' is a hydrogen atom tolyl; benzyl a C_1-C_6 alkyl; a C_2-C_6 alkenyl; a C_3-C_6 cycloalkyl; a C_6-C_{10} unsubstituted aromatic group; substituted C_1-C_6 alkyl, substituted C_2-C_6 alkenyl or substituted C_6-C_{10} aromatic, wherein the substituent is —OH; and

X_1 and X_2 are anions which may be same or different.

4,841,059

PYRIDINE-ENAMINES

Michael Schriewer; Klaus Grohe, both of Odenthal; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

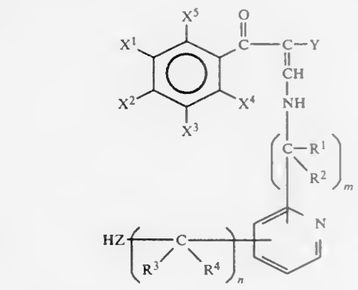
Division of Ser. No. 1,318, Jan. 8, 1987, Pat. No. 4,725,595. This application Oct. 15, 1987, Ser. No. 108,839

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1986, 3600891

Int. Cl.[4] C07D *213/40, 213/03, 213/75*

U.S. Cl. 546—312 2 Claims

1. An enamine of the formula



(I)

in which

X^1 represents hydrogen, nitro, alkyl with 1-3 carbon atoms or halogen,

X^2 denotes halogen, alkyl with 1-3 carbon atoms, an alkylsulphonyl group with up to 3 C atoms in the alkyl radical or a phenylsulphonyl group,

R^5 can be hydrogen, halogen or methyl,

R^1, R^2, R^3 and R^4 each independently represents hydrogen, an alkyl group with 1-3 carbon atoms, phenyl, or a phenyl radical which is substituted by halogen, nitro, or alkyl with up to 3 carbon atoms,

Y represents a carboxyl group, a nitrile group, an ester group —$COOR^5$ or an acid amide group —$CONR^6R^7$,

Z represents oxygen or an amine radical NR^8,

m and n each denote 0 or 1,

X^3 represents halogen or the nitro group and

X^4 denotes halogen, a nitro group, an alkoxy, alkylmercapto or alkylsulphonyl group with in each case 1-3 carbon atoms or an arylsulphonyl group.

4,841,060

VAPOR-PHASE INTRAMOLECULAR DEHYDRATION REACTION OF ALKANOLAMINES

Youichi Hino, Sakai; Yuuji Shimasaki, Takatsuki, and Michio Ueshima, Takarazuka, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

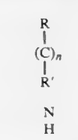
Division of Ser. No. 942,299, Dec. 16, 1986, abandoned. This application Apr. 15, 1988, Ser. No. 183,474

Claims priority, application Japan, Dec. 23, 1985, 60-287924; Dec. 27, 1985, 60-292540

Int. Cl.[4] C07D *203/02, 295/02;* B01J *23/04, 23/02*

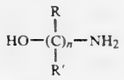
U.S. Cl. 546—184 6 Claims

1. A process for forming a cyclic amine represented by the general formula:



(II)

wherein each of R and R' is hydrogen, a methyl group or an ethyl group, and n is an integer of 2 to 5, which comprises subjecting an alkanolamine represented by the general formula:



(I)

wherein R, R' and n are as defined above, to vapor phase intramolecular dehydration reaction in the presence of a catalytic oxide composition represented by the following formula:

$$Si_aX_xY_yO_b$$

wherein Si is silicon, X is at last one element selected from alkali metals and alkaline earth metals, Y is at least one element selected from B, Al, Ti, Zr, Sn, Zn and Ce, and O is oxygen; and the suffixes a, x, y and b represent the atomic ratios of the elements Si, X, Y and O respectively, and when a=1, x=0.005—1 and y=0—1, and b is a value determined by a, x and y.

4,841,061

PROCESS FOR PRODUCING CYCLIC AMINES

Yuuji Shimasaki, Takatsuki; Michio Ueshima, Takarazuka; Hideaki Tuneki, and Kimio Ariyoshi, both of Suita, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

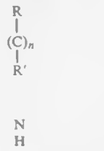
Continuation-in-part of Ser. No. 943,086, Dec. 18, 1986, abandoned. This application Nov. 30, 1987, Ser. No. 126,351

Claims priority, application Japan, Dec. 27, 1985, 60-292541; Nov. 17, 1986, 61-271965; Nov. 17, 1986, 61-271966; Nov. 17, 1986, 61-271967; Nov. 17, 1986, 61-271968; Nov. 17, 1986, 61-271969; Nov. 17, 1986, 61-271970

Int. Cl.[4] C07D *203/02, 295/02;* B01J *27/18*

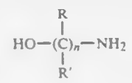
U.S. Cl. 546—184 13 Claims

1. A process for producing a cyclic amine represented by the general formula



(II)

wherein each of R and R' is selected from hydrogen, a methyl group and an ethyl group, and n is an integer of 2 to 5, which comprises vapor-phase intramolecular dehydration reaction of an alkanolamine represented by the general formula



(I)

wherein R, R' and n are as defined above, said reaction being carried out in the presence of, as a catalyst, an oxide composition represented by the following formula

$$X_aP_bY_cO_d$$

wherein X is at least one element selected from transition metal elements of Groups I through VIII, lanthanide elements, actinide elements and elements of Group IIIA in the periodic table, Si, Ge, Sn, Pb, Sb and Bi, P is phosphorus, Y is at least one element selected from alkali metal elements and alkaline earth metal elements, O is oxygen, the suffixes a, b, c and d are the atomic ratios of the elements X, P, Y and O, respectively, and when a=1, b=0.01—6, and c=0—3, and d is a value determined by a, b and c and the state of bonding of the constituent elements.

4,841,062

NEW CEPHEM AND CEPHAM COMPOUNDS AND PROCESSES FOR PREPARATION THEREOF

Takao Takaya, Kawanishi; Hisashi Takasugi; Kiyoshi Tsuji, both of Osaka, and Toshiyuki Chiba, Nara, all of Japan, assignors to Fujisawa Pharmaceutical Company, Limited, Osaka, Japan

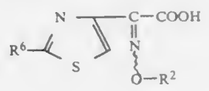
Division of Ser. No. 830,973, Feb. 19, 1986, which is a division of Ser. No. 543,247, Oct. 19, 1983, Pat. No. 4,604,456, which is a division of Ser. No. 886,340, Mar. 19, 1978, Pat. No. 4,425,341. This application Feb. 11, 1988, Ser. No. 155,132

Claims priority, application United Kingdom, Mar. 14, 1977, 10699/77; Jul. 12, 1977, 29245/77; Oct. 11, 1977, 42315/77; Jan. 3, 1978, 7875

Int. Cl.[4] C07D *277/42, 277/46*

U.S. Cl. 548—194 14 Claims

1. A compound of the formula:



wherein

R^2 is cyclo(lower)alkyl or lower alkynyl having 2 to 6 carbon atoms, and

R^6 is amino or protected amino, or its reactive derivative at the carboxy group effective for transforming the carboxy group into a reactive N-acylating group.

4,841,063

2-ALKYL-3-HALOISOTHIAZOL-3-THIONE

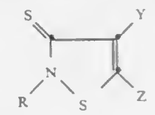
Joseph A. Virgilio; Milton Manowitz, both of Wayne, and Emanuel Heilweil, Fairfield, all of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Continuation of Ser. No. 325,467, Nov. 27, 1981, abandoned, which is a division of Ser. No. 190,779, Sep. 25, 1980, Pat. No. 4,328,347, which is a division of Ser. No. 952,038, Oct. 16, 1978, Pat. No. 4,281,136, which is a continuation-in-part of Ser. No. 852,456, Nov. 25, 1977, abandoned. This application Jan. 31, 1984, Ser. No. 575,423

Int. Cl.[4] C07D *275/02*

U.S. Cl. 548—213 7 Claims

1. A 4-isothiazolin-3-thione of the formula:



wherein:

R is selected from the group of alkyl radicals having one to eight carbon atoms or is an allyl group;

Y and Z are selected from the group consisting of hydrogen, and chlorine, but if Y is the same as Z, both are chlorine.

4,841,064

BACTERICIDAL (3,5-SUBSTITUTED POLYOXYMETHYLENE OXAZOLIDINES

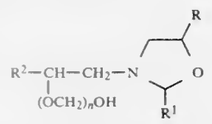
Kamlesh Gaglani, Passaic, and Albert Erlender, Montville, both of N.J., assignors to Cosan Chemical Corporation, Carlstadt, N.J.

Continuation of Ser. No. 942,041, Dec. 16, 1986, abandoned, which is a continuation of Ser. No. 675,901, Nov. 30, 1984, abandoned, which is a continuation of Ser. No. 418,256, Sep. 15, 1982, abandoned, which is a division of Ser. No. 304,809, Sep. 23, 1981, abandoned. This application Dec. 2 1987, Ser. No. 127,552

Int. Cl.[4] C07D *263/06*

U.S. Cl. 548—215 7 Claims

1. A class of polyoxymethyleneoxazolidines having the structural formula:



wherein R is an alkyl group of 1 to 6 carbon atoms, a cycloalkyl group of 3 to 8 carbon atoms or an aryl group of 6 to 10 carbon atoms; R^1 represents a hydrogen, an alkyl group of 1 to 6 carbon atoms, a cycloalkyl group of 3 to 8 carbon atoms, an aryl group of 6 to 10 carbon atoms, a substituted aryl group of 6 to 10 carbon atoms containing alkyl, halogen, alkoxy, or nitro substituents, R^2 represents an alkyl group of 1 to 6 carbon atoms, a cycloalkyl group of 3 to 8 carbon atoms, or an aryl group of 6 to 10 carbon atoms; and n represents an integer in the range of 1 to 8.

4,841,065

ISOXAZOLE DERIVATIVES WITH ANTIVIRAL ACTIVITIES AND PHARMACEUTICAL PRODUCTS CONTAINING THESE

Dieter Binder, Vienna; Franz Rovenszky, Bruck an der Leitha, and Hubert P. Ferber, Ansfelden, all of Austria, assignors to CL Pharma Aktiengesellschaft, Linz, Austria

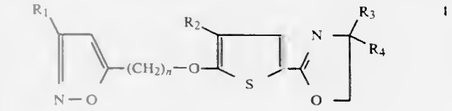
Filed Jan. 11, 1988, Ser. No. 142,677

Claims priority, application Austria, Jan. 28, 1987, 164/87

Int. Cl.[4] C07D *413/14;* A61K *31/42*

U.S. Cl. 548—238 5 Claims

1. A compound of the formula



in which

R_1 denotes C_1-C_4 alkyl,

R_2 denotes hydrogen, C_1-C_4 alkyl, chlorine or bromine,

R_3 and R_4, which are the same or different are hydrogen or C_1-C_4 alkyl, but not both hydrogen and n denotes the integer 6, 7 or 8.

4,841,066

PREPARATION OF 3-METHYL-1-VINYLIMIDAZOLIUM CHLORIDES

Hans-Helmut Goertz, Freinsheim; Ferdinand Straub, Hockenheim; Axel Sanner, Frankenthal; Albrecht Kolb, Weisenheim; Hans-Juergen Raubenheimer, Ketsch, and Friedrich Vogel, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

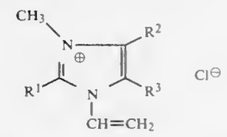
Filed May 13, 1987, Ser. No. 49,314

Claims priority, application Fed. Rep. of Germany, May 21, 1986, 3617069

Int. Cl.[4] C07D *233/58*

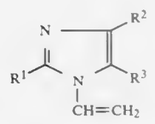
U.S. Cl. 548—335 4 Claims

1. A process for the preparation of a 3-methyl-1-vinylimidazolium chloride of the formula I



I

where R^1, R^2 and R^3 are each H or methyl, wherein a 10–70% strength by weight aqueous solution of an N-vinylimidazole of the formula II



II

where R^1, R^2 and R^3 are each H or methyl, is reacted with methyl chloride in an amount of from 90 to 110 mol %, based on the N-vinylimidazole of the formula II, at from 40° to 100° C. in a closed system.

4,841,067

NOVEL AMINO ACID DERIVATIVES

Kinji Iizuka; Tetsuhide Kamijo; Tetsuhiro Kubota, all of Nagano; Kenji Akahane, Tokyo; Hideaki Umeyama, Chiba, and Yoshiaki Kiso, Osaka, all of Japan, assignors to Kissei Pharmaceutical Co., Ltd., Nagano, Japan

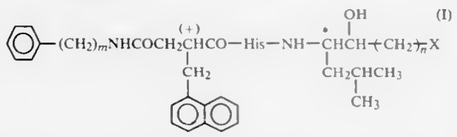
Continuation of Ser. No. 824,341, Jan. 31, 1986, abandoned. This application Aug. 19, 1988, Ser. No. 233,962

Claims priority, application Japan, Jan. 31, 1985, 60-17563; Feb. 14, 1985, 60-27972; Mar. 1, 1985, 60-41614

Int. Cl.[4] C07D *233/64*

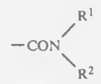
U.S. Cl. 548—344 21 Claims

1. An amino acid derivative represented by formula (I):



(I)

wherein X represents a straight or branched chain alkoxycarbonyl group having 2 to 10 carbon atoms, or aralkoxycarbonyl group having 8 to 10 carbon atoms, a hydroxymethyl group, or



wherein R^1 represents a hydrogen atom an alkyl group having 1 to 6 carbon atoms, or an aralkyl group having 7 to 10 carbon atoms and R^2 represents an alkyl group having 1 to 6 carbon atoms, or X represents —CH_2—Y—R wherein Y represents —O— or —NH— and R represents a straight or branched chain alkyl group having 1 to 6 carbon atoms or an aralkyl group having 7 to 10 carbon atoms, $C^{(+)}$ represents (+) form, His represents as L-histidyl group and $C^{\bullet}$ represents a carbon atom in the L-configuration, m represents an integer of from 1 to 3, and n represents 0 or 1; or a pharmaceutically acceptable salt thereof.

4,841,068

3-HYDROXY PYRAZOLE DERIVATIVES

Yoshihiro Fujikawa, Chiba; Masazumi Wakamatsu, Yamaguchi; Mariko Fukui, Tokyo, and Tadashi Miyasaka, Kanagawa, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

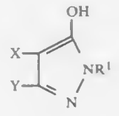
Filed Feb. 19, 1987, Ser. No. 16,618

Claims priority, application Japan, Feb. 19, 1986, 61-34320

Int. Cl.[4] C07D *231/46*

U.S. Cl. 548—365 13 Claims

1. A pyrazole compound represented by the general formula (I):



(I)

wherein:

R^1 is a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, a phenyl group or a substituted phenyl group substituted with an alkyl group having 1 to 4 carbon atoms or an alkyloxy group having 1 to 4 carbon atoms;

X is a nitroso group, an amino group or $(R^2)_2NCH{=}N{-}$(- wherein R^2 is an alkyl group having 1 to 3 carbon atoms); and

Y is —$C(O)NH_2$ when R^1 is an alkyl group having 1 to 4 carbon atoms, a phenyl group or a substituted phenyl group and X is a nitroso group, or —$C(O)NH_2$ when R^1 is, an alkyl group having 1 to 4 carbon atoms, a phenyl group or a substituted phenyl group and X is an amino group, or CN or —$C(S)NH_2$ when R^1 is a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, a phenyl group or a substituted phenyl group and X is $(R^2)_2NCH{=}N{-}$(- wherein R^2 is the same as defined above).

4,841,069

AMMONOLYSIS-ALKYLATION REACTIONS USING AMMONIA AND AN ALCOHOL TO PREPARE N-ALKYL MALEIMIDES AND N-ALKYL SUCCINIMIDES

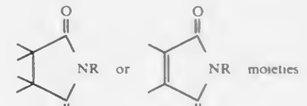
Robert J. Olsen, Lisle, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Mar. 30, 1987, Ser. No. 31,545

Int. Cl.[4] C07D *207/408, 207/452*

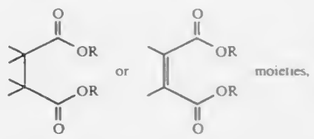
U.S. Cl. 548—545 13 Claims

1. A process comprising forming a first compound containing the



moieties

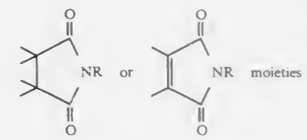
from a second compound containing the



moieties,

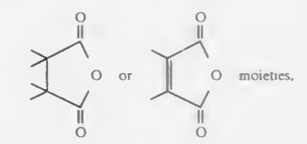
wherein R is H or a C_1 to C_8 alkyl radical, by contacting under reaction conditions said second compound with ammonia and the corresponding C_1 to C_8 alkanol.

8. A process comprising forming a first compound containing the



moieties

from a second compound containing the



moieties,

wherein R is a C_1 to C_8 alkyl radical, by contacting under reaction conditions said second compound with ammonia and the corresponding C_1 to C_8 alkanol.

4,841,070

SULFINYL-ASCORBIC ACID USEFUL AS AN ANTI-OXIDANT

Horst Pauling, Bottmingen, and Christof Wehrli, Witterswil, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jun. 24, 1988, Ser. No. 211,514

Claims priority, application Switzerland, Jul. 9, 1987, 2616/87; Apr. 25, 1988, 1536/88

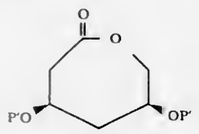
Int. Cl.[4] C07D *411/04*

U.S. Cl. 549—34 5 Claims

1. A compound selected from the group consisting of 5,6-sulfinyl-L-ascorbic acid and its stereoisomers.

4,841,071
6-SUBSTITUTED-4-HYDROXY-TETRAHYDROPYRAN-2-ONES
Prasad K. Kapa, Parsippany, N.J., assignor to Sandoz Pharm. Corp., E. Hanover, N.J.
Division of Ser. No. 512,163, Jul. 8, 1983, Pat. No. 4,571,428. This application Sep. 3, 1985, Ser. No. 771,809
Int. Cl.[4] C07D *313/00, 313/04*
U.S. Cl. 549—214 **6 Claims**

1. A compound of the formula:



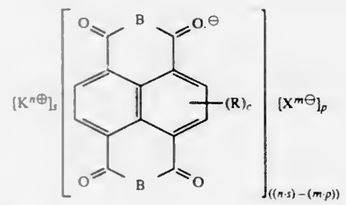
wherein each P' is an hydroxy group-protecting group selected from the group consisting of tri-substituted silyl, benzyl, and substituted benzyl.

4,841,072
PREPARATION OF ALKYLENE CARBONATES
Robert J. Harvey, Teaneck, N.J., assignor to Scientific Design Company, Inc., Little Ferry, N.J.
Continuation of Ser. No. 326,447, Dec. 2, 1981, abandoned. This application Jun. 7, 1983, Ser. No. 502,024
Int. Cl.[4] C07D *317/12*
U.S. Cl. 549—230 **14 Claims**

1. A process for preparing alkylene carbonates by the reaction of an alkylene oxide with carbon dioxide in the presence of water comprising carrying out said reaction at a temperature in the range of about 20°-90° C. and in the presence of an effective amount of an organic quaternary phosphonium halide.

4,841,073
RADICAL ANION SALTS OF DERIVATIVES OF 1,4,5,8-NAPHTHALENETETRACARBOXYLIC ACID AND THEIR USE
Tillmann Hassel, Cologne; Jürgen Hocker, Bergisch Gladbach; Gerhard Heywang, Bergisch Gladbach; Hans-Klaus Müller, Bergisch Gladbach, and Hans G. Fitzky, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed Nov. 12, 1986, Ser. No. 928,942
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1985, 3542485; Aug. 14, 1986, 3627667
Int. Cl.[4] C07D *493/16*
U.S. Cl. 549—232 **8 Claims**

1. A crystalline, stable radical anion salt of the formula

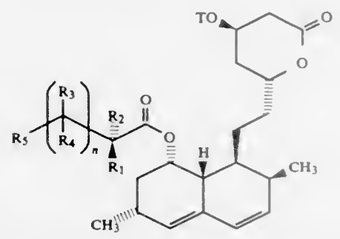


(I)

in which
K is an n-valent cation,
n is a whole number >0,
s is a whole number from 1 to 5,
X is an m-valent anion,
m is a whole number >0,
p is 0, 1 or a whole number >1, with the proviso that (m·p) may at most take the value ((n·s)−1);
B is oxygen,
R is halogen, nitro, hydroxyl, cyano, C_1–C_4-alkyl, cyclohexyl, phenyl, or a carboxylic acid ester and c is 0 or a whole number from 1 to 4.

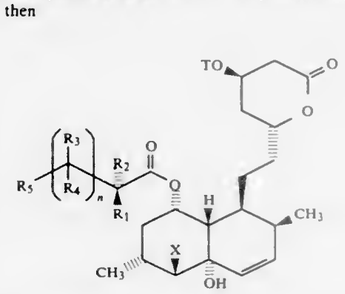
4,841,074
INTERMEDIATES AND PROCESSES FOR 6-CARBOXY HMG-COA REDUCTASE INHIBITORS
Ta J. Lee, and William F. Hoffman, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.
Filed Dec. 11, 1987, Ser. No. 131,695
Int. Cl.[4] C07D *309/30*
U.S. Cl. 549—292 **24 Claims**

21. A process of claim 19 which further comprises:
(a) contacting a compound (2);



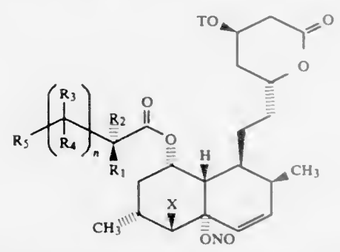
(2)

with phenylselenyl chloride or phenylselenyl bromide (X=Cl or Br) at about −80° C. in methylene chloride followed by treatment with 30% hydrogen peroxide in tetrahydrofuran at about 25° C. to yield a compound (3); then



(3)

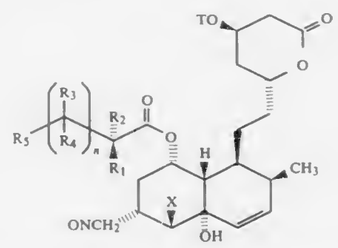
(b) reacting the compound (3) with nitrosyl chloride in pyridine to yield a compound (4);



(4)

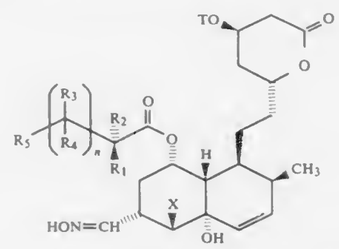
(c) irradiating the compound (4) with light of wavelength

greater than 320 Å in benzene-pyridine to yield a compound (5);



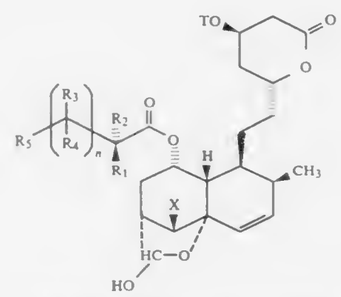
(5)

(d) heating the compound (5) in isopropanol at about 80° C. to afford compound (6); then



(6)

(e) treating compound (6) with an aqueous paraformaldehyde solution in the presence of an acid catalyst to yield a compound (7);



(7)

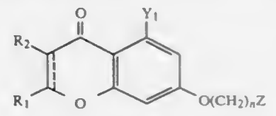
(f) contacting a compound (7) with pyridinium chlorochromate in methylene chloride to yield a compound (8).

4,841,075
METHOD OF PREPARING ACETAL OR KETAL
Hajime Matsushita, Yokohama; Makoto Shibagaki, Kawasaki; Kyoko Takahashi, Tokyo, and Hideyuki Kuno, Yokohama, all of Japan, assignors to Japan Tobacco, Inc., Tokyo, Japan
Filed Dec. 7, 1987, Ser. No. 129,702
Claims priority, application Japan, Dec. 11, 1986, 61-293470
Int. Cl.[4] C07D *317/00, 317/22*
U.S. Cl. 549—341 **5 Claims**

1. A method of preparing an acetal or ketal, which comprises causing an aldehyde or ketone to react with an alcohol by using a hydrous oxide of an element of Group IV of the Periodic Table as a catalyst, whereby the acetal or ketal corresponding to the aldehyde or ketone is obtained.

4,841,076
BENZOPYRAN DERIVATIVES
Masayuki Kitagawa, and Makoto Tanaka, both of Tokyo, Japan, assignors to Dalichi Seiyaku Co., Ltd., Japan
Filed Jun. 4, 1987, Ser. No. 58,105
Claims priority, application Japan, Jun. 4, 1986, 61-129420
Int. Cl.[4] C07D *311/22*
U.S. Cl. 549—401 **6 Claims**

1. A benzopyran derivative represented by the formula

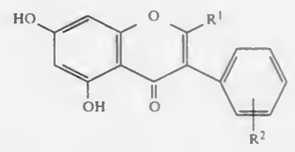


(I)

wherein;
R_1 represents a hydrogen atom or a lower alkyl group;
R_2 represents a lower alkyl group, a cycloalkyl group, a phenyl group which may have one or more substituents selected from the group consisting of halogen atom, lower alkyl group, lower alkoxy group and hydroxyl group, or a phenylalkyl group;
Y_1 represents a halogen atom or a trihalomethyl group;
Z represents a carboxyl group, a lower alkoxycarbonyl group;
n represents an integer of from 1 to 6; and the
bond ⎓ between the 2- and 3-positions represents a single bond or a double bond; and pharmaceutically acceptable salts thereof.

4,841,077
ISOFLAVONE DERIVATIVES, AND SALTS THEREOF, AND CANCEROCIDAL AND IMMUNOSUPPRESSIVE AGENTS CONTAINING THE SAME
Noriki Ito, Saitama; Hiroshi Ogawara, Tokyo, and Shunichi Watanabe, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan
PCT No. PCT/JP86/00586, § 371 Date Jul. 16, 1987, § 102(e) Date Jul. 16, 1987, PCT Pub. No. WO87/02982, PCT Pub. Date May 21, 1987
PCT Filed Nov. 17, 1986, Ser. No. 93,025
Claims priority, application Japan, Nov. 18, 1985, 60-259603
Int. Cl.[4] C07D *311/24*
U.S. Cl. 549—402 **2 Claims**

1. Isoflavone derivative represented by the general formula (1) or salt thereof;



(I)

wherein R^1 is —COOR[7]; R^7 is a lower alkyl which may be substituted by one or two hydroxyl or lower alkoxy groups and R^2 is oxalyloxy or lower alkoxyoxalyloxy.

4,841,078

BENZOPYRANS

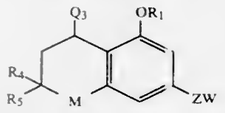
James F. Eggler, Stonington; Michael E. Johnson, Gales Ferry, and Lawrence Sherman, Ledyard, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 457,171, Jan. 13, 1983, Pat. No. 4,486,428, which is a continuation-in-part of Ser. No. 358,751, Mar. 16, 1982, abandoned. This application Aug. 9, 1984, Ser. No. 639,038

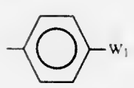
Int. Cl.[4] C07D *311/58, 405/12*

U.S. Cl. 549—402 **7 Claims**

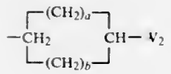
1. A compound of the formula



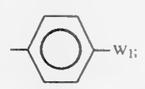
and pharmaceutically acceptable cationic and acid addition salts thereof;
wherein
Q_3 is $COOR_7$, CONHOH, $CONHCONH_2$, $CONR_{12}R_{13}$, $CONHCOR_{19}$, $CONHSO_2R_{17}$, $CH_2CONHCOR_{19}$ or $COCH_2Q_4$, where
Q_4 is CN or $COOR_5$;
M is O;
R_1 is a member selected from the group consisting of hydrogen, benzyl, benzoyl, alkanoyl having from one to five carbon atoms and $—CO—(CH_2)_p—NR_{15}R_{16}$ wherein p is 0 or an integer from 1 to 4; each of R_{15} and R_{16} when taken individually is selected from the group consisting of hydrogen and alkyl having from one to four carbon atoms; R_{15} and R_{16} when taken together with the nitrogen atom to which they are attached from a 5- or 6-membered heterocyclic ring selected from the group consisting of piperidino, pyrrolo, and pyrrolidino;
R_4 is hydrogen, alkyl having from 1 to 6 carbon atoms or $—(CH_2)_z—C_6H_5$ wherein z is an integer from 1 to 4;
R_5 is hydrogen, methyl or ethyl;
R_7 is hydrogen, alkyl having from one to four carbon atoms or benzyl;
R_{12} and R_{13} are each hydrogen, alkyl having from one to six carbon atoms, phenyl or benzyl;
R_{17} is alkyl having from one to six carbon atoms, benzyl or $R_{18}C_6H_4$,
where R_{18} is H, NH_2, F, Cl, Br, CH_3, or OCH_3; R_{19} is R_7, phenyl or phenethyl; and
Z is selected from the group consisting of
(a) alkylene having from one to nine carbon atoms; and
(b) $—(alk_1)_m—X—(alk_2)_n—$ wherein each of (alk_1) and (alk_2) is alkylene having from one to nine carbon atoms, with the proviso that the summation of carbon atoms in (alk_1) plus (alk_2) is not greater than nine; each of m and n is 0 or 1; X is selected from the group consisting of O, S, SO and SO_2; and W is selected from the group consisting of hydrogen, methyl,



wherein W_1 is selected from the group consisting of hydrogen, fluoro and chloro; and



wherein W_2 is selected from the group consisting of hydrogen and



a is an integer from 1 to 5 and b is 0 or an integer from 1 to 5; with the proviso that the sum of a and b is not greater than 5.

4,841,079

PROCESS FOR THE PRODUCTION OF ASYMMETRIC HYDANTOINS

Frank J. Urban, Waterford, Conn., assignor to Pfizer, Inc., New York, N.Y.

Filed Aug. 7, 1987, Ser. No. 82,765

Int. Cl.[4] C07D *311/68*

U.S. Cl. 549—404 **8 Claims**

4. 4-Amino-6-fluoro-(2R)-methylchroman-4-carboxylic acid.

5. 6-Fluoro-(2R)-methyl-4-ureidochroman-4carboxylic acid.

4,841,080

PROCESS FOR THE OXIDATION OF ETHYLENE TO ETHYLENE OXIDE

William D. Armstrong, Ramsey, N.J., assignor to Scientific Design Company, Inc., Little Ferry, N.J.

Division of Ser. No. 361,304, Mar. 24, 1982, Pat. No. 4,760,042. This application Feb. 16, 1988, Ser. No. 156,212

Int. Cl.[4] C07D *301/3*

U.S. Cl. 549—536 **12 Claims**

1. A process for the oxidation of ethylene with molecular oxygen to ethylene oxide under oxidizing conditions employing an alkali metal-promoted supported silver catalyst suitable for the oxidation of ethylene to ethylene oxide prepared by the steps comprising:
(a) impregnating a support with a solution of an organic silver salt; said support comprising alumina, silica, silica-alumina or combinations thereof having a surface area of about 0.1 to 1.0 m^2 and characterized by the ability to selectively adsorb an alkali metal in an amount greater than is calculalted from the amount in a solution thereof which has been adsorbed;
(b) separating the impregnated support of (a) from said solution and activating in the presence of molecular oxygen at a maximum temperature not exceeding 500° for a period of time sufficient to produce an active fresh silver catalyst having an average silver particle size of about 0.2-1.0 microns;
(c) post-impregnating the active catalyst of (b) with a solution of a compound of at least one alkali metal selected from the group consisting of Cs, K, and Rb in an amount determined by the amount of alkali compound in solution or an excess of such amount, followed by washing off said excess with 1-3 carbon alkanol, and producing a finished catalyst containing 25-500 wt ppm of said alkali metal, whereby a substantial fraction of said alkali metal post-impregnated is selectively adsosrbed.

4,841,081

METHOD OF OPTICALLY RESOLVING A RACEMATE OR A DIASTEREOMERIC MIXTURE OF GLYCIDYL COMPOUND

Fumio Toda, Ehime; Koichi Tanaka, Matsuyama, and Tetsuya Nakata, Ibaraki, all of Japan, assignors to Osaka Soda Co., Ltd., Osaka, Japan

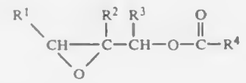
Filed Oct. 14, 1986, Ser. No. 918,724

Claims priority, application Japan, Oct. 16, 1985, 60-230686; Nov. 8, 1985, 60-251597; Dec. 13, 1985, 60-281567

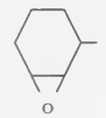
Int. Cl.[4] C07D *301/32, 303/04;* **C07C** *69/76, 69/74*

U.S. Cl. 549—541 **18 Claims**

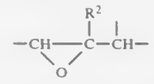
1. A method of optically resolving a racemate or a diastereomeric mixture of a compound selected from the group consisting of glycidyl ester compounds represented by the formula:


(II)-1

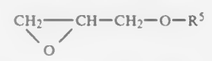
wherein R^1, R^2 and R^3, independently from each other, represent H or CH_3, R^4 represents a C_1-C_6 alkyl, C_6-C_{10} aryl, C_6-C_{10} aryl-C_1-C_2-alkyl, C_6-C_{10} aryl-C_2-C_4-alkenyl or C_2-C_4 alkenyl group, and when R^4 represents an alkyl group, R^1 and R^3 together may represent the moiety



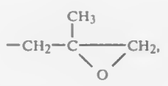
together with the group



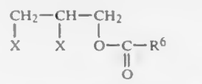
in the formula,
glycidyl ether compounds represented by the formula:


(II)-2

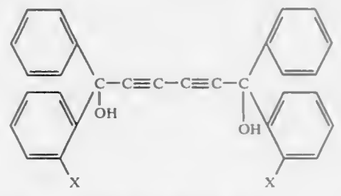
wherein R^5 represents a C_1-C_6 alkyl, C_6-C_{10} aryl, C_2-C_4 alkenyl or



and compounds represented by the formula:


(II)-3

wherein X represents a halogen atom, and R^6 represents a C_1-C_6 alkyl, C_6-C_{10} aryl, C_6-C_{10} aryl-C_1-C_2-alkyl, C_6-C_{10} aryl-C_2-C_4-alkenyl or C_2-C_4 alkenyl group which comprises contacting said racemate or diastereomeric mixture with an optically active form of a compound having the following formula (I):


(I)

wherein X represents a halogen atom,
to form an inclusion complex compound having the optically active compound of formula (I) as a host, and separating the resulting complex compound from the mixture.

4,841,082

PREPARATION OF DIMETHYLZINC

Scott H. Eidt; Dennis L. Deavenport, both of Seabrook, and Nam H. Tran, Houston, all of Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Filed Aug. 19, 1988, Ser. No. 233,774

Int. Cl.[4] C07F *3/06*

U.S. Cl. 556—129 **5 Claims**

1. A process for the preparation of dimethylzinc which comprises heating a dimethylaluminum halide and a dialkylzinc under an inert atmosphere to achieve a redistribution reaction between the dimethylaluminum halide and dialkylzinc with distillative removal of the lower boiling dimethylzinc from the resulting reaction mixture wherein the alkyl groups are lower alkyl and the dialkylzinc is not dimethylzinc.

4,841,083

LADDER POLYSILANES

Yoichiro Nagai, Yamato, and Hideyuki Matsumoto, Kiryu, both of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

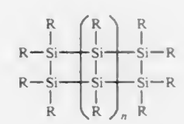
Filed May 27, 1988, Ser. No. 199,805

Claims priority, application Japan, Jun. 3, 1987, 62-138287

Int. Cl.[4] C07F *7/08, 7/10, 7/18*

U.S. Cl. 556—430 **3 Claims**

1. A ladder polysilane represented by the general formula (I):


(I)

where n is a positive integer, and R is a halogen atom, a hydrogen atom, a hydroxyl group, an alkyl group, an alkenyl group, an aryl group or an alkoxy group having 20 or less carbon atoms, and said alkyl, alkenyl, aryl or alkoxy group may contain a functional group selected from the group consisting of —COOH, $—SO_3H$, $—NH_2$, $—NO_2$, —NCO, —F, —Cl, —Br, —I or —OH.

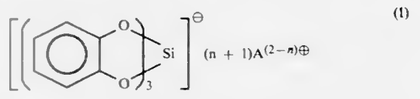
4,841,084

NEW HEXACOORDINATE SILICON COMPLEXES, THE PROCESS FOR THEIR PREPARATION AND THEIR APPLICATION

Robert J. Corriu; Geneviève E. Cerveau, both of Montpellier; Claude G. Chuit, Palavas les Flots, and Catherine Reye, Montpellier, all of France, assignors to Centre National de la Recherche Scientifique, Paris, France

Filed Dec. 24, 1985, Ser. No. 813,128
Claims priority, application France, Dec. 27, 1984, 84 19886
Int. Cl.[4] C07F 7/08, 7/18
U.S. Cl. 556—464 20 Claims

1. A hexacoordinate silicon complex which corresponds to the general formula I:



(I)

in which:

A represents an alkali metal or alkaline earth metal except for magnesium, and

n=0 or 1.

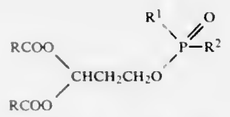
4,841,085

ALDOPHOSPHAMIDES

David Farquhar, and Yuqiang Wang, both of Houston, Tex., assignors to Board of Regents, University of Texas System, Austin, Tex.

Filed Jun. 30, 1986, Ser. No. 879,910
Int. Cl.[4] C07F 9/40
U.S. Cl. 538—180 9 Claims

1. A compound having the structure:



wherein R is CH_3 or C_2H_5; R^1 is NH_2, $NHCH_3$, NHC_2H_5, NHC_2H_4Cl, $N(CH_3)_2$, $N(C_2H_5)_2$, $N(C_2H_4Cl)_2$, OCH_3, OC_2H_5, CH_3, or C_2H_5, and R^2 is $N(C_2H_4Cl)_2$ or NHC_2H_4Cl.

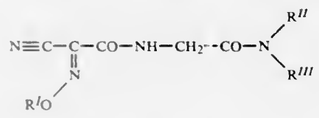
4,841,086

PROCESS FOR THE PREPARATION OF 2-CYANO-2-OXIMINO-ACETAMIDE DERIVATIVES

Herbert Gayer, Monheim, and Klaus Jelich, Wuppertal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 20, 1988, Ser. No. 146,051
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1987, 3702283
Int. Cl.[4] C07C 121/66, 121/84; C07D 295/16
U.S. Cl. 558—301 2 Claims

1. A process for the preparation of a 2-cyano-2-oximino-acetamide derivative of the formula



in which

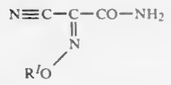
R^I represents straight-chain or branched alkyl having 1 to 4 carbon atoms, allyl, propargyl, cyanomethyl, cyanoethyl, phenylalkyl, having 1 or 2 carbon atoms in the alkyl part, which is optionally monosubstituted or independently disubstituted in the phenyl part by fluorine, chlorine, cyano, nitro, hydroxyl, methyl, methoxy, methylthio, methylsulphinyl, methylsulphonyl and phenyl which is optionally monosubstituted or disubstituted by fluorine or chlorine, the substituents being identical or different; or cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl or cycloheptyl which is in each case optionally monosubstituted or disubstituted by fluorine, chlorine or methyl, the substituents being identical or different;

R^{II} represent hydrogen, methyl or ethyl;

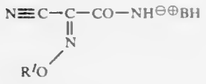
R^{III} represents hydrogen, methyl, ethyl, n-propyl, i-propyl, n-butyl, i-butyl, sec.-butyl, tert.-butyl, allyl, propargyl, halogenoalkyl having 1 or 2 carbon atoms and 1 to 3 identical or different halogen atoms, alkoxyalkyl having 1 or 2 carbon atoms in each of the alkoxy part and the alkyl part, dialkylaminoalkyl having 1 or 2 carbon atoms in the individual alkyl parts, alkoxycarbonylalkyl, hydroxycarbonylalkyl, aminocarbonylalkyl, alkylaminocarbonylalkyl with dialkylaminocarbonylalkyl in each case having 1 or 2 carbon atoms in each alkyl part, cyanoalkyl having 1 to 4 carbon atoms in the alkyl part; phenylalkyl, having 1 or 2 carbon atoms in the alkyl part, which is optionally monosubstituted or independently disubstituted in the phenyl part, or phenyl which is monosubstituted independently disubstituted, possible substituents in each case being the phenyl substituents which have already been mentioned in the case of R^I; represents cyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl or cycloheptyl which is in each case optionally monosubstituted or disubstituted by fluorine, chlorine or methyl, the substituents being identical or different, alkylcarbonylamino or alkoxycarbonylamino in each case having 1 or 2 carbon atoms in the alkyl part and in the alkoxy part respectively, aminocarbonylamino, methylaminocarbonylamino, ethylaminocarbonylamino, dimethylaminocarbonylamino, diethylaminocarbonylamino, methylethylaminocarbonylamino, or formylamino or the —N=CH—R^{IV} group, where

R^{IV} represents methyl, ethyl, or phenyl which is optionally monosubstituted or independently disubstituted, possible substituents being the phenyl substituents which have already been mentioned in the case of R^I;

comprising reacting a 2-cyano-2-oximino-acetamide of the formula

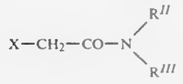


with a base B at a temperature between 0° C. and 100° C., to produce a salt of the formula



in which

B represents one equivalent of an organic or inorganic base, and reacting such salt directly or if appropriate, after intermediate isolation, with an alkylating agent of the formula



in which

X is halogen, methane- or p-toluenesulphonate or methyl sulphate, at a temperature between 0° C. and 150° C.

4,841,087

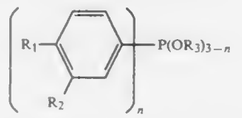
ACRYLONITRILE DIMERIZATION PROCESS

Marion J. Mathews III, and P. Robert Peoples, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 39,247, Apr. 17, 1987, abandoned. This application Mar. 14, 1988, Ser. No. 169,069
Int. Cl.[4] C07C 121/20
U.S. Cl. 558—363 5 Claims

1. In a process for dimerizing acrylonitrile to obtain 1,4-dicyanobutenes, said process comprising dissolving acrylonitrile in an organic solvent capable of donating protons but substantially unreactive with respect to acrylonitrile and organic phosphorus (III) compounds; contacting the acrylonitrile with an organic phosphorus (III) catalyst compound at a temperature from 0° to 120° C. under substantially anhydrous conditions; the improvement characterized in that:

(a) the catalyst is represented by the formula:



wherein n is 1 or 2; R_1 and R_2 are each hydrogen, alkyl, aryl, cycloalkyl or heteroatom containing substituents; R_3 is alkyl, cycloalky or aryl; and aryl moieties constitute at least 25% by weight of the catalyst

(b) the catalyst constitutes 16% to 90% by weight of the reaction mixture and at least 28% of the volume of any co-solvent present, and

(c) the rate constant is higher than obtained with an otherwise identical reaction mixture containing less than 16% by weight catalyst under identical conditions.

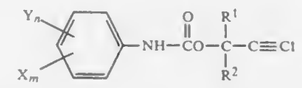
4,841,088

IODOPROPARGYL CARBAMATE DERIVATIVE, A METHOD FOR ITS PRODUCTION AND FUNGICIDAL COMPOSITIONS CONTAINING IT AS AN ACTIVE INGREDIENT

Tomoyuki Kusaba, Toyonaka; Junya Takahashi, Hyogo; Masayo Sugano, Osaka; Tamon Uematsu, Kobe; Yukio Oguri, Toyonaka, and Tomohiro Teramae, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 13, 1987, Ser. No. 84,885
Claims priority, application Japan, Aug. 26, 1986, 61-200274; Aug. 26, 1986, 61-200276; Dec. 22, 1986, 61-307390; Dec. 23, 1986, 61-315812
Int. Cl.[4] C07C 121/52
U.S. Cl. 558—417 6 Claims

1. A compound represented by the general formula,



wherein X, which may be the same or different, represents a cyano, nitro, halogenated lower alkyl, C_1–C_{12} alkoxy, lower alkoxy-substituted lower alkyl, lower alkenyloxy, lower alkynyloxy, halogenated lower alkoxy, lower alkoxycarbonyl or lower alkylthio group, R^1 and R^2, which may be the same or different, represent a hydrogen atom or a methyl group, Y represents a chlorine atom, m represents an integer of from 1 to 5, and n represents an integer of from 0 to 4, the sum of m and n being less than 6.

4,841,089

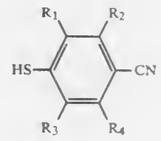
PROCESS FOR THE PREPARATION OF 4-MERCAPTOBENZONITRILES, AND 4-MERCAPTOBENZONITRILES

Hermann Hagemann, Leverkusen, and Klaus Sasse, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 4, 1986, Ser. No. 937,935
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1985, 3543036
Int. Cl.[4] C07C 121/52
U.S. Cl. 558—412 4 Claims

1. A 4-mercaptobenzonitrile selected from the group consisting of 4-mercapto-5-fluorobenzonitrile, 4-mercapto-5-chlorobenzonitrile, 4-mercapto-5-bromobenzonitrile, 4-mercapto-5-methylbenzonitrile, 4-mercapto-5-trifluoromethylbenzonitrile, 2-chloro-4-mercaptobenzonitrile, 2-methyl-4-mercaptobenzonitrile, 2-trifluoromethyl-4-mercaptobenzonitrile and 2-cyano-4-mercaptobenzonitrile.

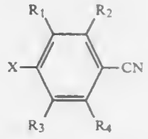
2. A process for the preparation of a 4-mercaptobenzonitrile of the formula



in which

R_1, R_2, R_3 and R_4, each independently represents hydrogen, unsubstituted or substituted lower alkyl or unsubstituted or substituted lower alkoxy,

wherein a 4-halogenobenzonitrile of the formula



in which

R_1, R_2, R_3 and R_4 have the abovementioned meanings and X represents a halogen atom, is reacted at a temperature of 80 to 180° C. with 0.8 to 1.2 moles of sodium sulfide per mole of 4-halogenobenzonitrile or 2 to 4 moles of sodium hydrogen sulfide per mol of 4-halogenobenzonitrile in the presence of an inert organic solvent, and the reaction mixture is subsequently acidified at a temperature of −10° to 50° C. until a pH of less than 3 is reached.

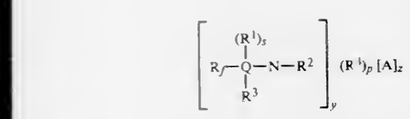
4,841,090

TREATMENT OF FIBROUS SUBSTRATES, SUCH AS CARPET, WITH FLUOROCHEMICAL

Kalyanji U. Patel, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 805,589, Dec. 9, 1985, abandoned, which is a continuation of Ser. No. 387,444, Jun. 11, 1982, abandoned. This application Sep. 29, 1987, Ser. No. 102,259
Int. Cl.[4] C07C 121/66, 121/75
U.S. Cl. 558—437 6 Claims

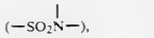
1. Compounds of the formula



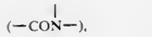
where

R_f is a fluorinated, saturated, monovalent, aliphatic, stable, non-polar, inert, oleophobic, hydrophobic radical having 3 to 20 carbon atoms and 40 to 78 weight percent fluorine and terminating in at least three fully fluorinated carbon atoms;

Q is an organic linking group which is one or a combination of polyvalent aliphatic groups polyvalent aromatic groups, oxy (—O—), thio (—S—), carbonyl (—CO—), sulfonamido



carbonamido



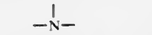
hydroxymethylene (—CH(OH)—), carbamato (—NHCOO—) and urylene (—NHCONH) organic linking moieties, with the proviso that the moiety of Q which is bonded to the nitrogen atom of the amine salt group is not an electrophilic moiety and that Q is bonded to the nitrogen atom of the amine salt group by a methylene moiety;

N is a tertiary amino nitrogen atom or quaternary amino nitrogen atom;

R^1 is a hydrogen or an alkyl group;

R^2 is R_fQ—, alkyl groups, alkyl groups containing an —O— hetero atom, alkyl groups containing an —S— hetero atom, alkyl groups containing an

hetero atom, aryl groups, aryl groups containing an —O— hetero atom, aryl groups containing an —S— hetero atom, aryl groups containing an



hetero atom, combinations of such groups, alkylene groups, arylene groups or combinations of arylene and alkylene groups;

R^3 is a cyanoalkyl moiety;

R^4 is an alkylene or arylene group;

A is an anion derived from a protonic acid or an alkylating agent;

s is 1;

y is 1 to 4;

p is 0 to 1;

z is 1 to 4;

with the provisos that

(1) when y is 1, then p is 0 and z is 1, and (2) when y is 2, then R^2 is said alkylene or arylene group or combination thereof, and said compounds contain at least about 20 weight-percent carbon-bonded fluorine the locus of which is in said R_f radical.

4,841,091

PROCESS FOR PRODUCING 16-SUBSTITUTED PROSTAGLANDIN ES.

Toshio Tanaka; Atsuo Hazato; Seizi Kurozumi, all of Tokyo, and Masahiro Koga, Yamaguchi, all of Japan, assignors to Teijin Limited, Osaka, Japan

PCT No. PCT/JP86/00034, § 371 Date Sep. 29, 1986, § 102(e) Date Sep. 29, 1986, PCT Pub. No. WO86/04330, PCT Pub. Date Jul. 31, 1986

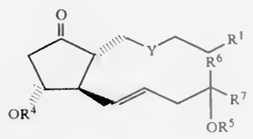
PCT Filed Jan. 28, 1986, Ser. No. 913,889

Claims priority, application Japan, Jan. 29, 1985, 60-13527; Oct. 29, 1985, 60-240439

Int. Cl.[4] C07C *177/00*

U.S. Cl. 558—441 **1 Claim**

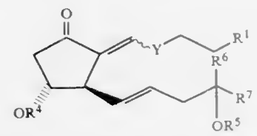
1. A process for producing 16-substituted prostaglandin Es, which include compounds expressed by the following formula (I), or their enantiomers, or their mixtures of arbitrary mixing ratio,



(I)

wherein R^1 indicates $COOR^2$, CH_2OR^3, in which R^2 indicates a hydrogen atom, a substituted or unsubstituted C_1–C_{10} alkyl group, a substituted or unsubstituted C_3–C_{10} cycloalkyl group, or a substituted or unsubstituted phenyl group, and R^3 indicates a hydrogen atom, a tri(C_1–C_7) hydrocarbon silyl group, a group which forms an acetal bond together with the oxygen atom of a hydroxyl group, or a C_2–C_7 aryl group: R^4 and R^5 are identical or different, each representing a hydrogen atom, a tri(C_1–C_7) hydrocarbon silyl group, or a group which forms an acetal bond together with the oxygen atom of a hydroxyl group; R^6 indicates a hydrogen atom, a C_1–C_4 alkyl group, or vinyl group; R^7 indicates a linear or branched C_3–C_8 alkyl group, an alkenyl group, or an alkynyl group, which may contain an oxygen atom; a phenyl group, a phenoxy group, or a C_3–C_{10} cycloalkyl group, which may be substituted; or a linear or branched C_1–C_5 alkyl group which is substituted by a C_1–C_6 alkoxy group, a phenyl group, a phenoxy group, or a C_3–C_{10} cycloalkyl group, which may be substituted; and Y indicates CH_2X or XCH_2, in which X represents an ethylene group, a cis- or trans-vinylene group, or an ethynylene group,

which process comprises selectively reducing using an organic tin hydride compound and a zerovalent palladium catalyst the double bonds at the 7- and 8-positions of 16-substituted Δ^7-prostaglandin Es, which include compounds expressed by the following formula (II), their enantiomers, or their mixtures of arbitrary mixing ratio, further followed by the deprotecting reaction and/or the hydrolytic reaction, if necessary,



(II)

wherein R^1, R^4, R^5, R^6, R^7, and Y are as defined hereinabove.

4,841,092

PREPARATION OF TRIS(2-CYANOETHYL)AMINE

Robert A. Smiley, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed May 23, 1988, Ser. No. 197,152

Int. Cl.[4] C07C *121/43*

U.S. Cl. 558—455 **3 Claims**

1. A process for the production of tris(2-cyanoethyl)amine which comprises (a) reacting at a temperature of 70° C. to 105° C. a mixture consisting essentially of acrylonitrile, water, an ammonium salt of aliphatic acid having 1 to 6 carbon atoms or hydroxy acetic acid or sulfoacetic acid, and a sufficient amount of an aliphatic acid having 1 to 6 carbon atoms or hydroxyacetic acid or sulfoacetic acid to give the mixture an initial pH of less than 7, and then (b) adding sufficient alkali metal hydroxide to raise the pH to 11 or higher, to precipitate tris(2-cyanoethyl)amine.

4,841,093

AROMATIC DICARBOXYLIC ACID DIALLYL ESTER DERIVATIVE, PREPOLYMER DERIVED FROM THE DERIVATIVE AND CURABLE RESIN COMPOSITION CONTAINING THE DERIVATIVE

Sinji Tamaru, Suita, and Motonobu Kubo, Toyonaka, both of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

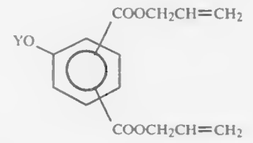
Filed Oct. 19, 1987, Ser. No. 109,413

Claims priority, application Japan, Oct. 22, 1986, 61-252439; Dec. 23, 1986, 61-314653; Dec. 24, 1986, 61-314517; Dec. 24, 1986, 61-314518

Int. Cl.[4] C07C *69/76*

U.S. Cl. 560—65 **1 Claim**

1. A diallyl aromatic dicarboxylate derivative of the formula



(1)

wherein Y is a perfluoroalkenyl group having 6 to 14 carbon atoms.

4,841,094

PREPARATION OF MONOMERS

Ian D. H. Towle, Cirencester, England, assignor to Raychem Limited, London, England

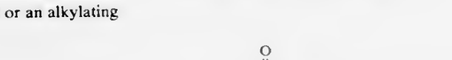
Division of Ser. No. 877,658, Jun. 3, 1986, Pat. No. 4,777,282. This application Jul. 29, 1988, Ser. No. 204,650

Claims priority, application United Kingdom, Aug. 27, 1985, 8521324

Int. Cl.[4] C07C *69/76*

U.S. Cl. 560—73 **6 Claims**

1. A method for the preparation of an organic compound comprising reacting a first compound of the formula:



where

each R is independently a substituted or unsubstituted alkyl or aryl group;

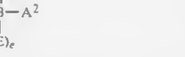
each r is independently an integer from 1 to 4 inclusive depending upon the element M used;

each M is independently an element selected from gallium, indium thallium, arsenic, antimony, or bismuth;

each Y is independently an oxygen atom, a sulphur atom, a substituted nitrogen atom other than —NH—, or a substituted phosphorus atom other than —PH—, —P(H)$_3$—, or —P(OH)—; and

A^1 is an aromatic, aliphatic, aromatic/aliphatic, heterocyclic, alicyclic, siloxyl or silane group,

with a second compound of the formula:



where

X is a halogen atom or a group capable of reacting with the first compound to eliminate a compound containing M and X;

B is an atom selected from carbon, phosphorus, sulphur or silicon;

D is an oxygen or sulphur atom or an amine group;

d is 1 if B is carbon, zero or 1 if B is phosphorus, zero, 1 or 2 if B is sulphur or zero if B is silicon;

E is selected from an aromatic group, aliphatic group, OR′ or NR′$_2$ if B is phosphorus, or from an aromatic group, aliphatic group or OR′ if B is silicon, where R′ is a substituted or unsubstituted alkyl or aryl group;

e is zero if B is carbon or sulphur, 1 if B is phosphorus or 2 if B is silicon; and

A^2 is an aromatic, aliphatic, aromatic/aliphatic, heterocyclic, alicyclic, siloxyl or silane group,

to eliminate the compound $(R)_rMX$ and produce a compound of the formula:

where G is either the group —M—$(R)_r$ or the group

4,841,095

MODIFIED POLYISOCYANATES WITH BIURET STRUCTURE AND PROCESS FOR THEIR PREPARATION

Eugenio Bianchin, Treviso; Giovanni Longo, Spinea, and Gian F. Lunardon, Paduva, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 23,952, Mar. 11, 1987, abandoned, which is a continuation of Ser. No. 784,572, Oct. 4, 1985, abandoned. This application Dec. 16, 1987, Ser. No. 134,595

Claims priority, application Italy, Oct. 5, 1984, 23003 A/84

Int. Cl.[4] C07C *125/06*

U.S. Cl. 560—115 **15 Claims**

1. A process for the preparation of modified polyisocyanates having a biuret structure as set forth below:

wherein R_1 is a radical selected from the group consisting of unsubstituted aliphatic, cycloaliphatic and aliphaticcycloaliphatic radicals, said radicals having one or more hydrogen atoms substituted by halogen, NO_2, a non reactive hydroxy, an alkyl radical or an alkoxy radical; and R_2 is the radical

$R_3(OC_nH_{2n})_x$ — wherein R_3 is an alkyl or acetyl radical having a maximum of 18 carbon atoms, n is a whole number selected from 2, 3 and 4 and X is a whole number selected from 1 to 50, the process consisting of reacting water or a compound containing water of crystallization which splits off water, with an organic diisocyanate, in a diisocyanate/water molar ratio lower than 10:1, in the presence of an agent which forms a homogeneous phase with water and the diisocyanate under the reaction conditions and throughout the reaction period, and which has a hydrogen atom which reacts with the isocyanate group as determined by the Zerewitinoff method.

4,841,096

CYCLOHEXANE-2,5-DIONE-1,4-YLENE-BIS (-3-PROPIONIC ACID) DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Masahiko Miyashita, Osaka, Japan, assignor to Nippon Gosei Kaagaku Kogyo, Japan

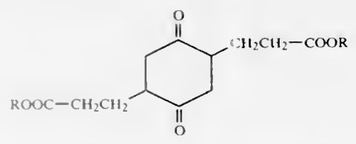
Continuation-in-part of Ser. No. 835,531, Mar. 3, 1986, abandoned, and a continuation-in-part of Ser. No. 878,199, Jun. 25, 1986, Pat. No. 4,772,432. This application Dec. 8, 1987, Ser. No. 129,982

Claims priority, application Japan, Mar. 5, 1985, 60-43019; Jul. 27, 1985, 60-166081

Int. Cl.⁴ C07C *69/75*

U.S. Cl. 560—126 **5 Claims**

1. A cyclohexane-2,5-dione-1,4-ylene-bis(-3-propionic acid) derivative represented by the formul



wherein R is hydrogen or alkyl having 1 to 10 carbon atoms.

4,841,097

DIALKANOYLOXYBENZYLIDENE DIALKANOATE

Hitoshi Takita; Fumihiko Kimura; Sakuo Noda, all of Tokyo; Yutaka Mukaida, Moroyama; Toyohiko Nitta, and Hidetoshi Kobayashi, both of Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

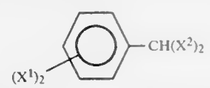
Division of Ser. No. 681,289, Dec. 13, 1984, abandoned. This application Apr. 13, 1988, Ser. No. 181,177

Claims priority, application Japan, Dec. 26, 1983, 58-251692; Jun. 22, 1984, 59-128789

Int. Cl.⁴ C07C *69/035, 67/08;* **C09F** *5/08*

U.S. Cl. 560—144 **4 Claims**

1. A process for producing a dialkanoyloxy-benzylidene dialkanoate of the formula (I):

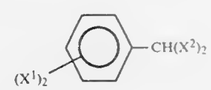


(I)

wherein X^1 and X^2 are an alkanoyloxy group having from 1 to 18 carbon atoms, which comprises the step:

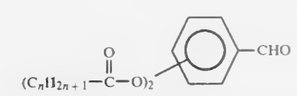
(i) reacting a dihydroxybenzaldehyde with an alkanoic acid anhydride of the formula $(C_mH_{2m+1}—CO)_2O$, wherein m is an integer of 1 to 18 in the presence of base with heating or in the presence of strong acid.

2. A process for producing a dialkanoyloxy-benzylidene dialkanoate of the formula (I):



(I)

wherein X^1 and X^2 are, independently, an alkanoyloxy group having from 1 to 18 carbon atoms, which comprises the steps: (i) reacting a dihydroxybenzaldehyde with an alkanoic acid anhydride of the formula $(C_nH_{2n+1}—CO)_2O$, wherein n is an integer of 1 to 18, to obtain a dialkanoyloxybenzaldehyde of the formula (II):



(II)

(ii) reacting said dialkanoyloxybenzaldehyde with an alkanoic acid anhydride of the formula $(C_mH_{2m+1}—CO)_2O$, wherein m is an integer of 1 to 18, in the presence of base with heating or in the presence of strong acid.

4,841,098

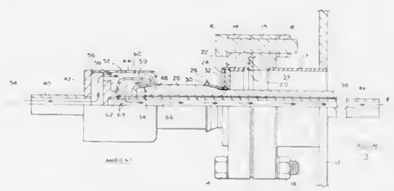
HIGH POWER RADIO FREQUENCY ENERGY FEEDTHROUGH FOR HIGH VACUUM VESSEL

Arthur R. Dunton, Englewood, Fla., assignor to Insulator Seal, Inc., Englewood, Fla.

Filed Jun. 9, 1988, Ser. No. 204,393

Int. Cl.⁴ H01B *17/30, 17/54*

U.S. Cl. 174—15.3 **9 Claims**



1. A fluid coolable feedthrough for conducting electrical energy at high power levels through a wall of a pressure or vacuum vessel, the feedthrough comprising:

mounting flange means for mounting the feedthrough to flange mating means formed at the wall of the vessel, the mounting flange means including sealing means for sealing the flange means to the flange mating means in a pressure or vacuum sealing arrangement,

insulator tube means secured to said mounting flange means in a pressure or vacuum sealing arrangement,

conductor tube means secured to said insulator tube means at a bonding region at an outer end thereof for conducting said electrical energy at high power levels and for carrying cooling fluid therethrough, said conductor tube means defining at least one interior cooling fluid flow passage directly adjacent to said bonding region for conducting away the heat generated at said region incident to the passage of said electrical energy at high power levels, said insulator tube means being for insulating said conductor tube means for said mounting flange means and from said wall.

4,841,099

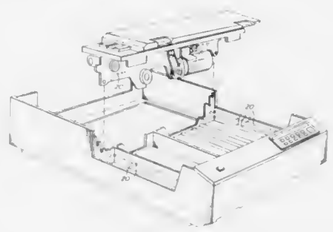
ELECTRICALLY INSULATING POLYMER MATRIX WITH CONDUCTIVE PATH FORMED IN SITU

Arthur J. Epstein, Bexley, Ohio; Joan R. Ewing, Fairport, and Joseph A. Swift, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 2, 1988, Ser. No. 188,984

Int. Cl.⁴ H05K *1/00;* **B23K** *31/00*

U.S. Cl. 174—68.5 **44 Claims**



1. An electrical component comprising an electrically insulating polymer matrix filled with an electrically insulating fibrous filler capable of heat conversion to an electrically conducting fibrous filler, said electrically insulating polymer matrix including at least one continuous electrically conductive path formed by the in situ heat conversion of said electrically insulating fibrous filler.

15. A method of forming at least one electrically conductive path in a polymer matrix comprising providing an electrically insulating structural polymer matrix filled with electrically insulating fibrous filler capable of heat conversion to an electrically conducting fibrous filler, heating the portion of said polymer matrix corresponding to a desired conductive path to a temperature sufficient to convert said electrically insulating fibrous filler to an electrically conductive fibrous filler thereby providing said at least one electrically conductive path.

31. A machine including a plurality of electrical components each requiring the supply of electrical current for proper functioning, said machine including at least one support member comprising an electrically insulating structural polymer matrix filled with an electrically insulating fibrous filler capable of heat conversion to an electrically conducting fibrous filler said electrically insulating structural polymer matrix including at least one continuous electrically conductive path between electrical components formed by the in situ head conversion of said electrically insulating fibrous filler.

4,841,100

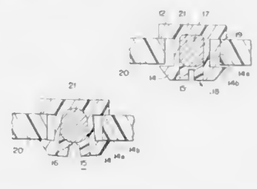
EXPANDING SURFACE MOUNT COMPATIBLE RETAINER POST

Martin C. Ignasiak, Mentor, Ohio, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 2, 1987, Ser. No. 92,063

Int. Cl.⁴ H05K *1/18*

U.S. Cl. 174—138 G **19 Claims**



1. A retainer post for insertion in a hole in a printed circuit board in order to mount a device to such board, comprising:

a resilient body including a neck section insertable in a printed circuit board, a shoulder section means adjoining said neck station for engaging the surface of a printed circuit board to prevent said body from passing completely through such a hole, said neck section being diametrically expandable in response to internal bursting pressure applied to said neck section, a bursting means for expanding in response to an increase in temperature to expand said neck section to cause the retainer post to engage a printed circuit board in which it is inserted, and reservoir means for retaining said bursting means, said reservoir means being disposed within said neck section.

4,841,101

HERMETICALLY SEALED FEEDTHROUGHS AND METHODS OF MAKING SAME

John A. Pollock, c/o Product Engineering Associates Inc., P.O. Box 269, Wilton, N.H. 03086

Filed Dec. 21, 1987, Ser. No. 135,602

Int. Cl.⁴ H01B *17/30;* **B23K** *3/02*

U.S. Cl. 174—152 GM **12 Claims**

1. The method of making a hermetically sealed electrical feedthrough connection into an enclosure bulkhead of a high expansion metal, said method comprising:

bonding a connector pin into a tubular ferrule using a glass-like insulating material, said ferrule being constructed of a metal having a coefficient of expansion which approximates that of said insulating material, said ferrule being of

substantially uniform outer diameter over most of its length but having, at its inner end, a shallow rim having a height which is substantially equal to the thickness of a maximally compliant solder joint;

boring a feedthrough port into an enclosure bulkhead of a high expansion metal, said port having a diameter over most of its length which will accept said rim with minimal clearance;

inserting said ferrule into said port rim end first with said rim centering the remaining length of the ferrule within the bore with essential uniform clearance; and

introducing molten solder into said uniform clearance space thereby to provide a seal having radial compliance to accommodate differential expansion between said ferrule and said high expansion metal.

5. The method of making a hermetically sealed electrical feedthrough connection into an enclosure bulkhead of a high expansion metal, said method comprising:

bonding a connector pin into a tubular ferrule using a glass-like insulating material, said ferrule being constructed of a metal having a coefficient of expansion which approximates that of said insulating material, said ferrule being of substantially uniform outer diameter over its length;

boring a feedthrough port into an enclosure bulkhead of a high expansion metal, said port having a diameter over most of its length which will accept said ferrule with clearance which is substantially equal to the thickness of a maximally compliant solder joint and having, at the inner end of said port, a portion of reduced diameter which will receive one end of said ferrule with minimal clearance;

inserting said ferrule into said port with said portion of reduced diameter centering the remaining length of the ferrule within the bore with essential uniform clearance; and

introducing molten solder into said uniform clearance space thereby to provide a seal having radial compliance to accommodate differential expansion between said ferrule and said high expansion metal.

9. In an enclosure bulkhead of a high expansion metal, a hermetically sealed electrical feedthrough connection comprising:

a tubular ferrule constructed of a metal having a coefficient of expansion which approximates that of glass, said ferrule being of substantially uniform outer diameter over most of its length but having, at its inner end, a shallow rim having a height which is substantially equal to the thickness of a maximally compliant solder joint

a connector pin concentric within said ferrule;

a glass-like insulator bonded between said pin and said ferrule;

a feedthrough port in said enclosure bulkhead, said port having a diameter over most of its length which will accept said rim with minimal clearance, said ferrule being inserted into said port rim end first with said rim centering the remaining length of the ferrule within the bore with essential uniform clearance; and

solder filling said uniform clearance space thereby to provide a seal having radial compliance to accommodate differential expansion between said ferrule and said high expansion metal.

11. In an enclosure bulkhead of a high expansion metal, a hermetically sealed electrical feedthrough connection comprising:

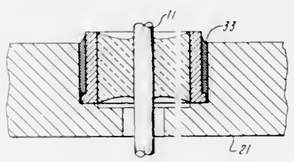
a tubular ferrule constructed of a metal having a coefficient of expansion which approximates that of glass, said ferrule being of substantially uniform outer diameter over its length;

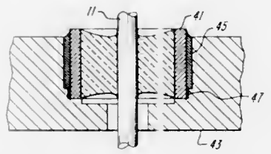
a connector pin concentric within said ferrule;

a glass-like insulator bonded between said pin and said ferrule;

a feedthrough port in said enclosure bulkhead, said port having a diameter over most of its length which will accept said ferrule with clearance which is substantially equal to the thickness of a maximally compliant solder joint and having, at the inner end of said port, a portion of reduced diameter which will receive said ferrule with minimal clearance, said ferrule being inserted into said port with said portion of reduced diameter centering the remaining length of the ferrule within the bore with essential uniform clearance; and

solder filling said uniform clearance space thereby to provide a seal having radial compliance to accommodate differential expansion between said ferrule and said high expansion metal.





4,841,102

ELECTROMAGNETIC SHIELDING ARRANGEMENT

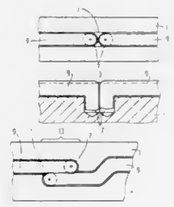
Hans F. K. Elsner, Bremen; Peter W. Prendel, Weyhe; Wilfried H. K. Kandler, Achim, and Jürgen Sandkuhl, Weyhe-Leeste, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 3, 1988, Ser. No. 151,771

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1987, 3703787

Int. Cl.[4] H05K *9/00;* G12B *17/02;* F16J *15/12;* B65D *53/00*

U.S. Cl. 174—35 GC 4 Claims



1. A shielding arrangement comprising a stranded elastic shielding body having a substantially constant cross-section, which body is arranged between two housing parts in a groove provided in the surface of one of the housing parts, characterized in that the two ends of the shielding body are each inserted into a blind hole directed perpendicularly to the surface of the one housing part and located in the groove.

4,841,103

ARRANGEMENT FOR THE CONNECTION OF AN INTERMEDIATE REPEATER FOR SUBMARINE CABLES

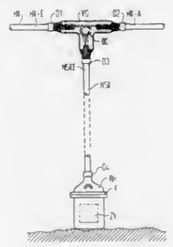
Ulrich Oestreich, Munich, and Wolfgang Giebel, Traubing, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 1, 1988, Ser. No. 226,881

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1987, 3726358

Int. Cl.[4] H04B *3/44;* H02G *15/14, 9/02;* H01B *11/16*

U.S. Cl. 174—70 S 13 Claims



13. In a submarine intermediate repeater station comprising a repeater and a main cable, an arrangement for the connection of said repeater to said main cable comprising:

a connector element in said main cable; and,

an umbilical cable connected between said connector element and said repeater and carrying signal lines and supply lines between said main cable and said repeater and being of sufficient length so as to allow said repeater to be brought to the surface of the body of water under which said repeater is submersed without thereby disturbing said main cable.

4,841,104

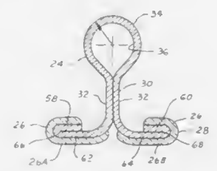
ELECTRIC TOY TRAIN TRACK

Robert Adell, 200 Adell Blvd., Sunnyvale, Tex. 75182

Filed Mar. 21, 1988, Ser. No. 170,536

Int. Cl.[4] B60M *1/30*

U.S. Cl. 191—29 R 1 Claim



1. An electric toy train track power rail comprising a length of a formed conductive metal strip to which electrical insulation has been selectively applied continuously along the length thereof such that in transverse view the power rail comprises a horizontal base having a bottom, sides, and a top, and an upright centrally supported on the base to provide electrical continuity to an electric toy train that runs on a track that contains the power rail, said electrical insulation being disposed in covering relation to the bottom and sides of the base and in covering relation to at least a portion of the top of the base immediately contiguous each side, in which the base is defined by longitudinal margins of the metal strip and said insulation is disposed as two separate and discrete zones, one zone for one margin, the other zone for the other margin, said zones being separated at the bottom of said base by a gap that is disposed directly below said upright.

4,841,105

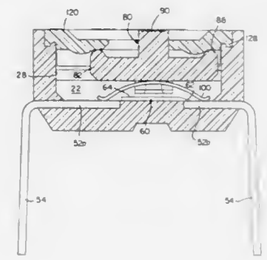
SLIDE SWITCH CONFIGURED AS AN INTEGRATED CIRCUIT PACKAGE

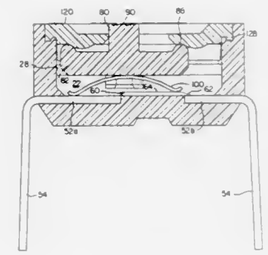
Joseph R. Goodman, Walkertown, and Roger L. Thrush, Clemmons, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 11, 1988, Ser. No. 179,603

Int. Cl.[4] H01H *15/00*

U.S. Cl. 200—16 D 10 Claims





1. A switch configured as an integrated circuit package including a housing body comprised of an insulating material with a plurality of leads extending from the body, the leads being arranged in first and second opposed rows with fixed ends of the leads being in a spaced apart and facing relation and disposed in a generally horizontal plane on a floor of the housing body, each pair of opposed fixed ends being in alignment with an associated slide switch element, where each slide switch element comprises a bow shaped element with first and second contact portions at ends of the bow adjacent to respective first and second fixed ends of the leads, each of the slide switch elements being moveable between a first position where two opposed fixed ends are commoned by the first and second contact portions of the respective slide switch element bridging between the first and second fixed ends, to a second position where the contact portions only contact the second said fixed end, thereby breaking the continuity between the first and second fixed ends, the switch being characterized in that:

the housing body includes two ramp elements which extend at least partially between, and flank the widths of, the first and second fixed ends of the leads, and in that each slide switch element includes two integral tabs adjacent to the first contact portion which engage the two ramp elements, which, upon movement of each of the slide switch elements, cause the tabs to slide up the ramp elements,

thereby lifting the first contact portions of the slide switch elements vertically away from the floor of the body.

4,841,106

SYMMETRIC PERCUSSION SWITCHING DEVICE USING A HEAD POINT OVER-RUN DEVICE

Bruno Jacquet, Rueil Malmaison; Frédéric Noirot, Asnieres Sur Seine, and Jean-Pierre Tellier, Jouy Le Moutier, all of France, assignors to La Telemecanique Electrique, France

Filed Aug. 13, 1987, Ser. No. 84,730

Claims priority, application France, Aug. 14, 1986, 86 11737

Int. Cl.[4] H01H *21/12*

U.S. Cl. 200—462 **7 Claims**

1. A double percussion snap-acting switching device comprising:

(i) a bistable dead center over-run device including: a toggle arm mounted about a fixed axis for rocking between first and second positions and having a striker part; at least first and second stops respectively defining said first and second positions, a control means whose displacement causes rocking of the toggle arm from one to the other of said positions after passing through a dead center and a spring connected between said control means and said toggle arm;

(ii) first and second switches each comprising a fixed switch contact and a rigid switch arm carrying a movable switch contact and a surface portion on the switch arm disposed for engagement by said striker part after said toggle arm passes the dead center;

(iii) first and second further spring means respectively biasing the rigid switch arms of the respective switches towards the respective fixed switch contact with an antagonistic force lower than that produced by the toggle arm, said toggle arm exerting on each rigid switch arm a force which is a linear function of the displacement of said toggle arm having a first predetermined slope, whereas each rigid switch arm exerts on said toggle arm a resistance force which is a linear function of said displacement having a second predetermined slope, said first slope being substantially larger than said second slope.

4,841,107

DEVICE FOR INDICATING THE FILLING LEVEL IN A FLUID RESERVOIR

Peter Tandler, Kronberg/Ts., and Rudolf Cezanne, Hofheim/Ts., both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

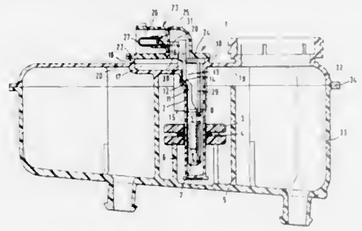
Filed May 3, 1988, Ser. No. 189,857

Claims priority, application Fed. Rep. of Germany, May 14, 1987, 3716135

Int. Cl.[4] H01H *35/18*

U.S. Cl. 200—84 C **5 Claims**

1. A device for indicating the filling level in a fluid reservoir in a vehicular hydraulic brake system, comprising a guide tube extending into the fluid reservoir, alongside of which guide tube a float is displaceably arranged, said float including at least one magnet by means of which at least one reed switch arranged inside the guide tube is actuatable when the float reaches a predetermined position, said reed switch being connected by at least one electric wire extending from the interior of the guide tube to at least one plug-and-socket connector contact arranged in a cap, wherein the magnet is arranged in a first radial recess in the float, said first radial recess forming



side walls, said side walls including retaining means for securing the magnet in an installed position on said float, wherein the retaining means are shaped in the form of elastically deformable snap-in projections formed at the side walls of the first radial recess.

4,841,108

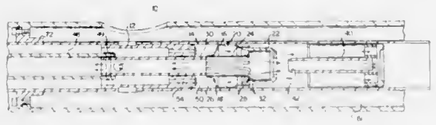
RECLOSER PLENUM PUFFER INTERRUPTER

Sidney R. Hamm, Muskego, Wis., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Nov. 6, 1987, Ser. No. 117,604

Int. Cl.[4] H01H *33/88*

U.S. Cl. 200—148 A **17 Claims**



1. A distribution class interrupter, comprising:

an outer housing adapted to contain an arc extinguishing fluid therein;

an interrupter tube mounted within said housing;

a first elongated electrical current carrying member carried within said tube;

a second elongated current carrying member which is disposed end-to-end with said first member and which is movable within said tube between a closed position where it is in electrical contact with said first member and an opened position where it is spaced from said first member, said first member and said second member defining a gap when said second member is in its opened position such that an electrical arc is formed across said gap as said first member is separated from said second member, at least one of said first and second current-carrying members defining an internal passageway in fluid communication with said gap and the interior of said housing for directing ionized fluid thereformed, said second member being adapted to be operated by a prime mover to stroke said second member between its opened position and its closed position;

piston means, carried by said second member, for supplying pressurized fluid into said gap as said second member is moved into its opened position, said piston means moving between an open position and a closed position in response to said prime mover;

base means, carried by said interrupter tube for supporting said second elongated current-carrying member and said piston means, said base means and said piston means defining a variable volume chamber whose interior is pressurized when said prime mover strokes said second member from its closed position to its opened position;

insulated plenum means, carried by said piston means and disposed around the contacting ends of said first member and said second member, for confining the fluid supplied by said piston means from said variable volume chamber in the vicinity of said gap until said arc is extinguished, said plenum means having a length at least equal to the length of the arc formed between said first and second members, whereby the interior of said outer enclosure adjacent said gap is shielded from the ionized fluid thereformed;

an arcing tip carried on said first elongated current-carrying member;

a second arcing tip carried on said second elongated current-carrying member; and,

wherein said first and second elongated current-carrying members carry both arcing current and steady state current.

4,841,109

SLIDE SWITCH

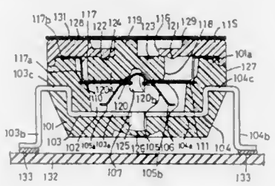
Takahiro Sakakino, Nagaokakyo; Koji Ohmori, Takatsuki; Takashi Yoshimura, Mishima; Shoji Kazusaka, and Yoshitaka Sunagawa, both of Takatsuki, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Aug. 27, 1987, Ser. No. 89,814

Claims priority, application Japan, Aug. 28, 1986, 61-132233; Dec. 24, 1986, 61-314084

Int. Cl.[4] H01H *15/02*

U.S. Cl. 200—302.1 **10 Claims**



1. A slide switch comprising:

a base member forming a housing;

an electrically insulating flexible film member housed within said base member;

a striking member mounted on one side of said film member and supported in said housing for sliding movement; and,

a switching contact mechanism housed within said base member on the other side of said film member and capable of being actuated by sliding movement of said striking member, said switch contact mechanism comprising:

a pair of spaced stationary contacts provided at a lower portion of said housing;

a movable contact blade having a mountain shape and a pair of contact portions at opposite ends of said blade for respectively engaging with said pair of spaced stationary contacts;

a spring plate member for supporting said movable contact blade within said housing at a position where said contact portions of said movable blade are both spaced from said pair of stationary contacts, said spring plate having a projection associated therewith for engaging with said striking member, said striking member having a profile which engages with said projection through said film upon sliding movement of said striking member to cause a deflection of said spring plate and the movement of the contact portions of said movable blade into respective engagement with said stationary contacts.

4,841,110

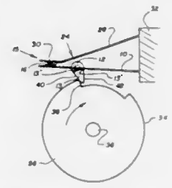
TIMING MECHANISM WITH CAM AND SWITCH ARRANGEMENT

Daniel K. Amonett, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Continuation of Ser. No. 896,733, Aug. 15, 1986, abandoned. This application Aug. 27, 1987, Ser. No. 91,368

Int. Cl.[4] H01H *19/62*

U.S. Cl. 200—574 **6 Claims**



1. A timing mechanism comprising:

cam means rotatably mounted for providing a caming function, said cam means having at least one cam step;

switch means for providing a switching function, said switch means including a cam follower and means for providing a ramping function when said cam follower is raised over said step and for providing a quick break switching function, which is substantially quicker than that which would be provided by said ramping function, when said cam follower drops over said step, regardless of the direction of rotation of said cam means;

said means for providing a ramping function and a quick break switching function comprises:

a pivot means for pivoting said cam follower about a pivot axis; and means for limiting the amount of pivot of said cam follower;

said means for limiting the amount of pivot of said cam follower includes a ledge carried by said cam follower;

said switch means further comprises an electrical switch blade and said pivot means comprises a socket on said blade and a pin extending from said cam follower and engaging said socket;

wherein said ledge and said electrical switch blade contact each other to limit the pivot of said cam follower.

4,841,111

MICROWAVE OVEN WITH IMPROVED DEFROSTING MODE

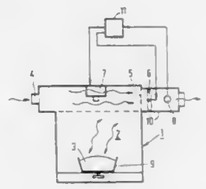
Franciscus Kokkeler, Mainate; Mario Fioroli, Brezzo di Bedero Varese, both of Italy; Per O. G. Risman, Herryda, Sweden; Liliana Vigano, Arese, Italy, and Mats G. Idebro, Norrköping, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1987, Ser. No. 119,605

Claims priority, application Sweden, Nov. 13, 1986, 8604868; Italy, Feb. 5, 1987, 19263 A/87

Int. Cl.[4] H05B *6/68*

U.S. Cl. 219—10.55 B **8 Claims**



1. A microwave oven capable of operating in a defrosting

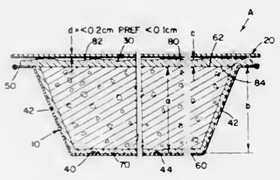
mode for defrosting a frozen article comprising an oven cavity in which a frozen article to be defrosted is placed, a microwave generator for radiating microwave energy into said cavity for heating said article, humidity sensor means for sensing a change in the humidity of the air in said cavity, fan means for producing an air flow across said article to said humidity sensor means, control means for controlling the duration of the generation of microwave energy into said cavity radiated from said microwave generator in accordance with the humidity sensed by said humidity sensor means, characterized in that, when said oven is in said defrosting mode, said control means determining the duration of the generation of energy from said microwave generator into said cavity and therefore the duration of the defrosting mode solely in accordance with the change in humidity sensed by said humidity sensor means, said change in humidity corresponding to a humidity gradient and interruption of the defrosting mode is effected when the humidity sensor means detects a predetermined positive humidity gradient.

4,841,112

METHOD AND APPLIANCE FOR COOKING A FROZEN POT PIE WITH MICROWAVE ENERGY

Yigal Peleg, Solon, Ohio, assignor to The Stouffer Corporation, Solon, Ohio

Filed Feb. 1, 1988, Ser. No. 151,199
Int. Cl.[4] H05B *6/80*
U.S. Cl. 219—10.55 E **6 Claims**



1. A combined frozen pie and appliance for reconstituting the frozen pie in a microwave oven by direct exposure to microwave energy with said frozen pie being free of any transporting carton, said pie including a precooked, lossy material filler food having a preselected depth and covered by a layer of uncooked dough surrounding said filler food and having a top portion with a preselected nominal thickness between an upper undulating surface and a generally flat lower surface and said appliance comprising:

(a) as a first component, a dish shaped receptacle formed of a continuous sheet of metal foil material with a pie receiving cavity between a lower wall upon which said dough is supported and an upper peripheral rim with a preselected shape and spaced from said lower wall a distance slightly greater than said preselected depth and slightly less than the sum of said preselected depth and said preselected thickness whereby said filler food of said pie is within said cavity, but below said rim, and is shielded from direct microwave exposure by said metal foil, except for microwave energy passing through the top portion of said dough layer, whereby said undulating upper surface of said top portion is above said rim; and,

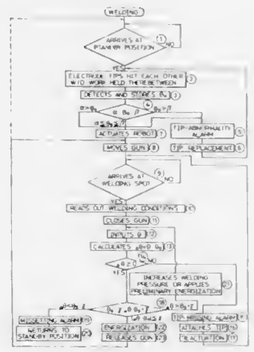
(b) as a second component, a self-sustaining generally rigid microwave susceptor sheet with an outer shape generally matching said preselected shape of said rim, said susceptor sheet supported directly on said upper surface of the top portion of said dough layer and in parallel, heat conduction relationship with said upper undulating surface but spaced from said rim by said top portion of said dough layer, said susceptor sheet including a thin metallized layer on a plastic film laminated to a paper board with a thickness less than 0.2 cm. with said layer having a thickness allowing microwave heating of said thin metal layer to brown said top surface into a browned, crisp crust by conduction to a temperature over 200° F. as said filler food is heated by only that microwave energy passing through said susceptor sheet and said top portion of said dough layer.

4,841,113

WELDING CONTROL APPARATUS AND METHOD

Akio Hamada; Gen Tsujii; Genzo Fuse, and Masahide Kondo, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1988, Ser. No. 259,828
Claims priority, application Japan, Oct. 20, 1987, 62-262623; Oct. 20, 1987, 62-262625; Jan. 26, 1988, 63-13699
Int. Cl.[4] B23K *11/24*
U.S. Cl. 219—110 **6 Claims**



1. A welding control method for automatic welding machines wherein a welding gun is successively moved by a robot to a plurality of welding spots on a work object whereby the welding gun is closed to firmly clamp the work object while applying pressure thereto and energized to perform welding, said welding control method comprising the steps of:

closing the welding gun absent a work object clamped between the electrode tips prior to performing welding at a first welding spot on the work object for taking as a reference opening degree the then observed opening degree of the gun arms;

storing said reference opening degree;

presetting each welding spot at a specific opening degree of the gun arms which corresponds to the thickness of the work object at said welding spot;

detecting the opening degree of the gun arms when the welding gun is closed at each welding spot on the work object;

determining a difference between a detected opening degree and the reference opening degree; and thereafter

comparing said opening difference with said preset opening degree for checking of any abnormal conditions.

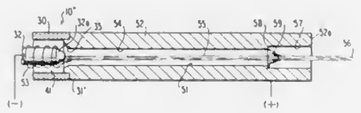
4. The welding control method as in claim 1, wherein the step of comparing said opening difference with said preset opening degree comprises the step of determining whether the opening difference is in the range above the preset opening degree in which case a preliminary energization using a smaller current than the welding current specified for each welding spot is applied until the opening difference is leveled off to the preset opening degree at which time the specified welding current is applied for regular welding.

4,841,114

HIGH-VELOCITY CONTROLLED-TEMPERATURE PLASMA SPRAY METHOD AND APPARATUS

James A. Browning, P.O. Box 6, Hanover, N.H. 03755

Continuation-in-part of Ser. No. 24,485, Mar. 11, 1987, Pat. No. 4,788,402. This application May 13, 1988, Ser. No. 193,702
Int. Cl.[4] B23K *9/00, 9/04*
U.S. Cl. 219—121.47 **11 Claims**



1. In a plasma-arc torch comprising a cylindrical casing forming a chamber and having a first, electrically conductive end wall including an extended length nozzle bore defining an anode nozzle passage extending axially therethrough and forming an anode electrode and a second, opposite end wall, a cathode electrode mounted coaxially within the opposite end wall of the cylindrical casing and being electrically insulated from said first end wall and terminating short thereof, said anode nozzle passage at its end facing said cathode electrode flaring outwardly and being conically enlarged, means for introducing a plasma producing gas under pressure into the chamber defined by said cylindrical casing, said cathode electrode and said end walls, and means for creating an electrical potential difference between said cathode electrode and said first end wall constituting said anode nozzle to create a plasma arc flame normally exiting from said anode nozzle passage, and with an anode foot normally constituted by a circumferential metal ring surrounding the nozzle exit orifice, the improvement comprising:

a surface discontinuity at a point along the nozzle bore, sufficiently upstream of said nozzle exit orifice and of sufficient size to cause the arc to pass to the anode nozzle passage wall in the vicinity of the discontinuity, thereby establishing an arc column which, with a downstream ionized region is maintained wholly within the extended length nozzle bore, thereby extending the life of the circumferential anode region, in the vicinity of the exit of the nozzle of the plasma torch while yielding full control over arc-length characteristics, wherein said means for introducing said plasma producing gas under pressure into said chamber comprises means for feeding said gas tangentially into the end of the chamber remote from said anode nozzle passage to establish a vortex flow of gas exhibiting a low pressure core extending through the anode nozzle passage and with said core establishing a small diameter arc column extending partially through said nozzle passage such that the boundary layer of the vortex flow of gas along the anode nozzle passage wall provides a path for the arc to pass directly to the anode nozzle passage wall at, or just downstream of the disturbance zone provided by the nozzle passage wall surface discontinuity, and further comprising means for introducing a material to be sprayed into a high-velocity, essentially ion-free hot gas stream downstream of the arc column and its downstream ionized region, at significantly lower temperature that of said arc column and its downstream ionized region, thereby eliminating excessive heating of the particles sprayed by the torch.

4,841,115

ORBITAL WELDHEAD

Joel C. Severin, Anaheim; Mark W. Scaglione, Huntington Beach; William S. Hinds, Costa Mesa, and Vytautas J. Jusionis, Westminister, all of Calif., assignors to ST International, Santa Ana, Calif.

Filed Feb. 25, 1988, Ser. No. 160,666
Int. Cl.[4] B23K *9/225*
U.S. Cl. 219—60 A **10 Claims**

1. An apparatus for welding a joint in tubing comprising:

a weldhead;

a cartridge selectively attachable to said weldhead having collet means for gripping the tubing on either side of the joint to be welded;

a circular rotor disposed within said weldhead having a notch in the perimeter thereof to admit the tubing when said cartridge is attached to said weldhead;

an electrode disposed on an inner circumference of said circular rotor and extending radially therefrom;

drive means for rotating said rotor so that said electrode orbits the joint;

current supply means coupled to said electrode and the tubing for establishing a welding arc therebetween; and

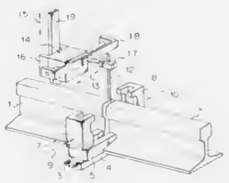
pair of ceramic alumina inserts disposed in said weldhead, one on each side of the joint to be welded, for focusing the welding arc to the joint.

4,841,116

PROCESS FOR AUTOMATIC FUSION WELDING OF RAILS

Akira Kimura; Hiroshi Kashiwabara, and Hirohisa Fujiyama, all of Sagamihara, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Feb. 23, 1988, Ser. No. 159,254
Claims priority, application Japan, Feb. 24, 1987, 62-40779
Int. Cl.[4] B23K *25/00*
U.S. Cl. 219—73.1 **1 Claim**



1. A process for automatic fusion welding of rails by a com-

bination of submerged arc welding and electroslag welding, said rails having a base, a web, and a head, said process comprising:

performing an initial root weld run on the rail base using submerged arc welding and thereafter, without interruption of welding, performing subsequent weld runs on the rail base, followed by the rail web, and then the rail head using electroslag welding until completion of welding;

during all of said welding runs, preventing outflow of molten slag and molten metal by providing a metal mold mounted on an upper surface of the rail base and a metal shoe mounted on the metal mold

performing all of said welding runs by using a DC welding power source providing a DC current and having constant potential characteristics, by using a filler wire having a diameter of form 1.2 to 2.0 mm, and by using a fused type flux comprising, as a main component, at least 15 to 45% of CaF_2 and 15 to 35% of TiO_2, wherein the total amount of CaF_2 and TiO_2 is at least 50%

4,841,117

METHOD FOR LENGTHENING THE BLADING AEROFOIL OF TURBO MACHINERY BLADES

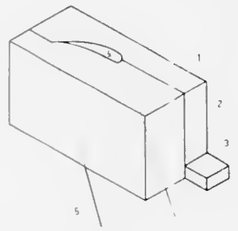
Tibor Koromzay, Wettingen, Switzerland, assignor to BBC Brown Boveri AG, Baden, Switzerland

Filed Dec. 3, 1987, Ser. No. 128,170

Claims priority, application Switzerland, Dec. 12, 1986, 4952/86

Int. Cl.[4] B23K *9/04*

U.S. Cl. 219—76.1 **7 Claims**



1. A method for lengthening the blade aerofoil of turbo machine blades by building up weld metal thereon, the blade aerofoil having any given profile and the method being carried out on assembled blades, the method comprising the steps of:

encasing the portion of the blade aerofoil to be welded in a metal mold matched to the profile of the blade aerofoil and which metal mold extends beyond the end surface of the blade aerofoil thus forming a depression defined by the end surface of the blade aerofoil and the inside surfaces of the mold, the recess providing screening against air flowing into the mold, the end surface of the blade aerofoil being freely accessible; and

applying at least one layer of weld material to the end surface of the blade aerofoil.

4,841,118

ORBITAL WELD HEAD TOOL

Mark A. Overbay, East Ridge, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 28,907, Mar. 23, 1987, and a continuation-in-part of Ser. No. 55,240, May 28, 1987. This application Jun. 9, 1988, Ser. No. 205,399

Int. Cl.[4] B23K *9/225*

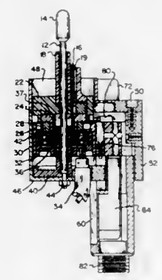
U.S. Cl. 219—124.03 **13 Claims**

1. An improved orbital weld head tool comprising in combination:

means for fixedly engaging the inside of a hollow workpiece and aligning and maintaining fixed positioning of said tool relative to the workpiece and the center of a desired substantially circular weld path thereon;

a tungsten weld tip supported on a carriage which moves longitudinally along said means for engaging, aligning and maintaining fixed positioning of said tool;

means rotating said carriage and thereby orbiting said tungsten weld tip in substantially said desired circular weld path about an axis through said center;



means to sense the changing voltage of said welding arc during orbiting of said weld tip; and

means for moving said means for oribting and said tungsten weld tip in a path parallel to said axis and toward and away from the workpiece in response to the magnitude of the voltage of said welding arc;

whereby variations in the workpiece weld path are accommodated to make a substantially uniform weld.

4,841,119

WELDING WIRE

Daniël Chambaere, Wevelgem, Belgium, assignor to N.V. Bekaert S.A., Zwevegem, Belgium

Filed Nov. 24, 1987, Ser. No. 124,571

Claims priority, application Belgium, Dec. 19, 1986, 1/011594

Int. Cl.[4] B23K *35/22*

U.S. Cl. 219—146.1 **12 Claims**

1. Welding electrode for arc welding, comprising a steel substrate having a thin, ferrous oxide containing covering layer, wherein said covering layer has a thickness of less than 500 Å and has the structure of a ferric-oxide gel comprising trivalent Fe-cations that are surrounded by oxygen-containing anions, which anion-surrounded cations are amorphously bound in an aqueous gel-like network.

4,841,120

THERMAL HEAD

Masamori Yagino; Masato Taniguchi; Yoshitomo Ito; Toshimitsu Takano; Wataru Ishikawa; Sadatoshi Kikuchi, and Tetsuo Endo, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 11, 1987, Ser. No. 95,269

Claims priority, application Japan, Sep. 12, 1986, 61-214078; Dec. 26, 1986, 61-316154; Feb. 28, 1987, 62-29143[U]

Int. Cl.[4] B41J *3/20*

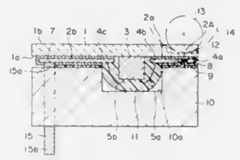
U.S. Cl. 219—216 **22 Claims**

1. A thermal head for recording on a recording medium comprising;

a substrate having a thick portion and a thin portion, said thin portion having a first flat surface and a second surface formed on an opposite side of said substrate from said first flat surface, said second surface being adapted to contact said recording medium,

a plurality of heat resistor elements formed on said first flat surface of said thin portion of said substrate,

wiring circuit means for said heat resistor elements formed on said first flat surface of said substrate and driving means



for driving said heat resistor elements formed by said first flat surface of said substrate,

said thin portion being made by grinding said second surface of said substrate.

4,841,121

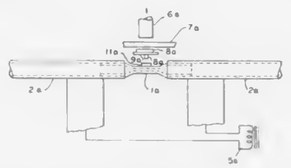
HOT HEADING PLASTIC RIVETS BY RESISTANCE HEATING

Edward A. Green, and Clayton S. Stambaugh, both of Warren, Ohio, assignors to The Taylor-Winfield Corporation, Warren, Ohio

Filed Jun. 18, 1987, Ser. No. 63,395

Int. Cl.[4] H05B *1/00*

U.S. Cl. 249—243 **4 Claims**



1. Resistance welding apparatus including at tube of high electrical resistance material brazed between two electrically conductive tubes connected to the secondary of a resistance welding transformer, a plastic element having a head projecting through a hole of a metallic element, and means for initiating forcible contact between said tube of high electrical resistance material and the head of said plastic element whereby the head of said plastic element is heated, softens and becomes upset to form an interlock, of the same material as said head, with said metallic element.

4,841,122

HUMIDIFIER HAVING A HEATING CHAMBER WITH A CONTINUOUSLY OPEN DRAIN AND FLUSHING OUTLET

Lewis Marton, Randwick, Australia, assignor to Atlas Air (Australia) Pty, Limited, New South Wales, Australia

Continuation of Ser. No. 706,265, Feb. 27, 1985, abandoned. This application Dec. 30, 1986, Ser. No. 948,408

Claims priority, application Australia, Mar. 2, 1984, PG 3893

Int. Cl.[4] H05B *1/02, 3/60;* **F22B** *1/30*

U.S. Cl. 219—273 **7 Claims**

1. A humidifier comprising:

(a) a heating chamber having side walls, a lid and a bottom defining a closed heating chamber, the bottom extending downwardly from the side walls and defining a single, continuously open drain and flushing outlet located at a lowermost extremity of the bottom so as to allow continuous flushing of impurities from the heating chamber;

(b) a water inlet in fluid communication with the heat chamber;

(c) a steam outlet located near the top of the heating chamber to allow steam to pass outwardly from the heating chamber;

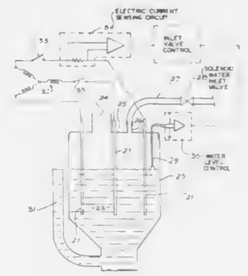
(d) port means defined by the heating chamber;

(e) electric water heating means located in the heating chamber and extending through the port means;

(f) electrical power supply means connected to the water heating means to supply electrical power thereto;

(g) an unobstructed open ended drain pipe having one open end in continuous open fluid communication with the drain and flushing outlet, the drain pipe extending up the outside of the heating chamber a predetermined height so that the other open end of the drain pipe defines a predetermined static water level inside the heating chamber;

(h) a water inlet valve adapted to control the flow of water passing through the water inlet into the heating chamber;



(i) means for detecting the water level in the heating chamber;

(j) inlet valve control means operatively connected to the water level detecting means and to the water inlet valve to open and close the valve to maintain the level of water within the heating chamber approximately equal to the height of the drain pipe; and,

(k) flushing control means comprising:

(i) means for detecting the impurity level of the water in the heating chamber; and,

(ii) means operatively connecting the inlet valve control means and said impurity level detecting means such that when the impurity level reaches a predetermined level the inlet valve control means opens the water inlet valve for a predetermined period of time to flush accumulated impurities out of the heating chamber through the drain and flushing outlet and the drain pipe.

4,841,123

AUTOMATIC WELDING DEVICE

Frank Novak, Chamblee, and Hartmut W. Fleiss, Marietta, both of Ga., assignors to Welding Services, Inc., Atlanta, Ga.

Filed Jun. 17, 1987, Ser. No. 63,270

Int. Cl.[4] B23K *11/32*

U.S. Cl. 219—125.12 **9 Claims**

1. An apparatus for positioning a welding torch to apply a weld overlay to a pre-existing along a substantially saddle-shaped juncture between a cylindrical workpiece and a substantially perpendicular intersecting pipe, comprising:

a carriage adapted to receive a welding torch for mounting to said carriage in fixed angular relation thereto;

a track selectively mountable to a workpiece for receiving said carriage for movement thereon, said track defining a pre-determined path substantially parallel to an imaginary surface defined by lines projecting radially outwardly along a path defined by a pre-existing weld, said track

further having a flat face formed longitudinally thereon, said face being in constant angular orientation with respect to said imaginary surface projecting radially said pre-existing weld and having a varying angular orientation with respect to horizontal, and said track further having a gear rack longitudinally mounted thereon;

a cylindrical roller mounted for rotation on said carriage in fixed angular relation thereto and disposed to engage said flat face of said track such that said roller engaging said flat face maintains said carriage in constant angular relation to said imaginary surface projecting normally from said pre-existing weld;

a gear mounted on said carriage for driven rotation such that said driven gear engages said gear rack to move said carriage along said track; and

means associated with said carriage for mounting said welding torch for movement toward and away from said workpiece in a direction normal to said workpiece and for translational movement across the width of said pre-existing weld.

4,841,124

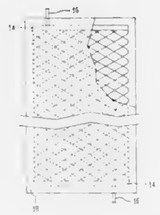
STRAIN-RESISTANT HEATED HELICOPTER ROTOR BLADE

Duncan B. Cox deceased, late of Pittsburgh, Pa. (Basil M. Cox, executor), and Martin Schuyler, Hastings-on-Hudson, N.Y., assignors to Cox & Company, Inc., New York, N.Y.

Continuation of Ser. No. 361,805, Mar. 25, 1982, abandoned, which is a continuation-in-part of Ser. No. 174,597, Aug. 1, 1980, abandoned. This application Apr. 27, 1987, Ser. No. 42,859

Int. Cl.[4] H05B *3/16*

U.S. Cl. 219—201 **4 Claims**



1. A strain-resistant heated helicopter rotor blade, comprising:

an elongated blade body having a longitudinal axis along which cyclic stress is applied during use;

an elongated electrical heater mounted to the body parallel to said axis and comprising a plurality of like, elongated and electrically resistive wires which are placed together to form a component with two opposed ends, two parallel sides and a central axis, each of said plurality of wires being oriented to substantially lie along directions of minimum strain in the blade body when the body is stressed along said longitudinal axis, said directions of minimum strain being determined by the Poisson's ratio of the blade body at the location of the heater and selected in accordance therewith; and

electrical terminals connected to said ends.

4,841,125

CONTROL UNIT FOR A HEATING SYSTEM WITH MEMORY MEANS

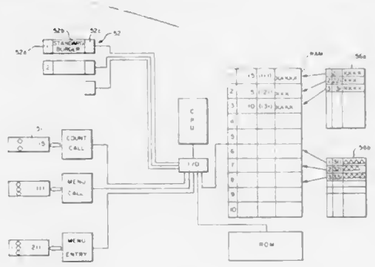
Kaoru Edamura, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 80,221, Jul. 31, 1987, abandoned, which is a continuation of Ser. No. 875,588, Jun. 18, 1986, abandoned. This application Jun. 23, 1988, Ser. No. 212,040

Claims priority, application Japan, Jul. 18, 1985, 60-110056[U]; Aug. 12, 1985, 60-124262[U]; Oct. 15, 1985, 60-1588441[U]; Dec. 12, 1985, 60-191706[U]

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—506 **18 Claims**



1. A control unit for a heating system comprising

a memory means having memory areas for storing data and cooking programs to be inputted thereto and outputted therefrom,

display means including a current program display window and a plurality of individual program display windows,

external memory means with memory modules for storing data to be loaded in said memory means,

control means serving to cause data stored in said memory means to be displayed by said display means,

program indicating means individually associated with said individual program display windows for specifying a program displayed in one of said individual program display windows,

menu entry means for causing said control means to store selected one or more of programs stored on said external memory,

means to be stored at specified one or more of said memory areas of said memory means,

menu call means for causing data associated with a program stored in said memory means and specified by said program indicating means to be displayed in said current program display window, and

starting means for causing said control means to start executing a program stored in said memory means and specified by said program indicating means and to display in said current program display window data associated with said program.

4,841,126

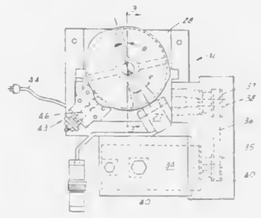
ROTARY TABLE WIRE EDM MACHINE

Richard N. Graeber, Farmington Hills, Mich., assignor to McWilliams Machinery Sales, Division of Bridgeport Machines Inc., Farmington Hills, Mich.

Filed Dec. 28, 1987, Ser. No. 138,390

Int. Cl.[4] B23H *1/00, 11/00*

U.S. Cl. 219—69.2 **17 Claims**



10. In an EDM machine in which relative movement between at least one electrode of the EDM machine and a workpiece describe a path for producing a desired contour of a workpiece, the combination comprising:

translation means for providing a distance between the at least one electrode and an axis of rotation, the distance corresponding to the distance between a point on the path and the axis of rotation;

rotation means including a rotary table on which the workpiece is mountable for rotating the workpiece about the axis of rotation to an orientation in which the electrode is coincidental with the workpiece at a point on the path, said rotation means having a contact ring associated therewith; and

polarity means including a d.c. brush assembly for supplying polarity to the workpiece via said contact ring when the workpiece is mounted on the rotary table.

4,841,127

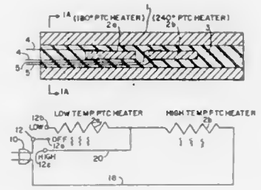
DUAL TEMPERATURE HAIR CURLER UTILIZING A PAIR OF PTC HEATERS

Lee A. Prager, Raymond, and Douglas C. Carbone, Standish, both of Me., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 6, 1987, Ser. No. 34,516

Int. Cl.[4] H05B *1/02, 3/24;* **H01C** *7/02;* **A45D** *1/04*

U.S. Cl. 219—225 **7 Claims**



1. A heater device adapted to attain predetermined temperatures in high and low settings, said heater device comprising:

an elongated hollow body of heat transmitting material;

at least two PTC heaters having different anomoly temperatures disposed in said body, one of said PTC heaters having a higher anomoly temperature than the balance of said PTC heaters and means to conduct current to opposite sides of each of said PTC heaters;

said current conducing means, including means electrically connecting said PTC heater in series with each other;

switch means including said PTC heaters connected to a power source through said current conducting means, said switch means cooperating with said current conducting means and said PTC heaters to produce a low temperature and a high temperature in said heater device by either (1) energizing the higher anomoly temperature heater in series with a lower anomoly temperature heater or (2) effectively energizing the higher anomoly temperature heater alone, said PTC heaters being arranged relative to each other and said current conducting means so that when a lower anomoly temperature PTC heater is energized, the higher anomoly temperature PTC heater in series therewith is simultaneously energized whereby the higher anomoly temperature PTC heater is limited in the temperature that it can attain by said lower anomoly temperature PTC heater.

4,841,128

CIRCUIT UNIT

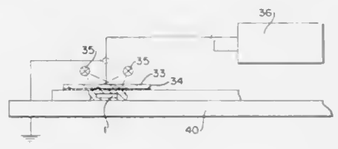
Helmut Gröttrup, and Thomas Maurer, both of Munich, Fed. Rep. of Germany, assignors to Gesellschaft fur Automation u. Organization mbH, Munich, Fed. Rep. of Germany

PCT No. PCT/DE81/00008, § 371 Date Sep. 8, 1982, § 102(e) Date Sep. 8, 1982, PCT Pub. No. WO82/02444, PCT Pub. Date Jul. 22, 1982

PCT Filed Jan. 8, 1981, Ser. No. 422,909

Int. Cl.[4] G06K *19/06*

U.S. Cl. 235—491 **33 Claims**



1. An apparatus comprising:

(a) an identification card

(b) a semiconductor substrate on said card

(c) an integrated circuit integrated on said substrate and adapted to process electronic signals; and

(d) a plurality of coupling elements coupled to said integrated integrated circuit, wherein said plurality of coupling elements comprises:

(i) opto-electronic means for transferring energy to said integrated circuit;

(ii) opto-electronic means means for transferring output data from said integrated circuit; and

(iii) opto-electronic means for transferring input data to said integrated circuit, wherein all of said coupling elements are integrated and disposed on said semiconductor substrate which bears said integrated circuit.

4,841,129

PATTERN RECOGNITION DEVICE

Takao Tawara, Kawaguchi; Jun Akedo, and Yoshiyuki Iwashita, both of Tokyo, all of Japan, assignors to Opticon Inc., Orangeburg, N.Y.

Filed Dec. 19, 1986, Ser. No. 944,375

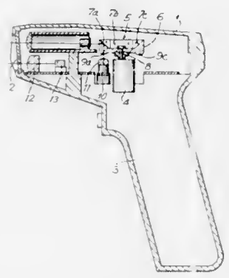
Claims priority, application Japan, Dec. 21, 1985, 60-288859

Int. Cl.[4] G06K *7/10*

U.S. Cl. 235—472 **10 Claims**

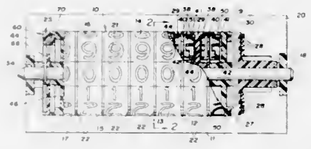
5. A bar-code scanning device including a rotor rotatable about a fixed axis, and at least two mirrors carried by said rotor and positioned to provide sequential reflected scanning sweeps of a light beam directed towards said mirrors;

the improvement comprising each said mirror being formed integrally as a surface of an optical block rotatable about said fixed axis by a drive motor; and



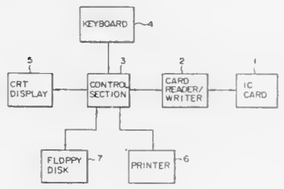
a lens associated with at least one of said mirrors and rotatable in unison therewith for modifying the focal point and depth of field of said light beam when reflected by the associated said mirror.

4,841,130
ODOMETER
Dale C. Maschino, Burton, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jul. 18, 1988, Ser. No. 220,288
Int. Cl.[4] G01C *22/00*
U.S. Cl. 235—96 **3 Claims**



1. In an odometer assembly comprising a drive shaft, a plurality of digit wheels rotatably supported on said shaft, a plurality of carriers arranged between the respective wheels and coaxially mounted therewith on said shaft, means preventing said carriers from rotating, means drivingly connecting said drive shaft to a first one of said wheels, pinion gears rotatably supported on the respective carriers, said wheels having on one of two sides an internal ring and a pair of internal transfer teeth separated by a notch in said ring, said wheels having on the other side an internal ring gear, said pinion gears operable to transmit drive between adjacent ones of the wheels, said pinion gears having transfer teeth and locking teeth on one of two ends thereof that cooperate with said internal ring and said pair of teeth and said notch in the adjacent wheel to the right thereof and having drive teeth on the other end thereof that cooperate with said ring gear in the adjacent wheel to the left of said one wheel thereby to effect a ten to one reduction drive between each wheel and the immediate wheel to the left thereof and wherein the leftmost wheel is the highest indicating wheel, the improvement comprising an end disk mounted adjacent said leftmost wheel on said shaft, means preventing said end disk from rotating, and spring supported pawl means on said end disk for operatively engaging said pair of internal transfer teeth on said leftmost wheel as the latter said wheel is rotated in a forward direction to a zero indicating position to remove gear backlash initially and thereafter prevent backward rotation thereof.

4,841,131
PORTABLE ELECTRONIC DEVICE WITH MEANS FOR CHECKING DATA VALIDITY DURING READ-OUT
Yasuo Iijima, Yokohama, Japan, assignor to Kabushiki Kaisha Tosbiba, Kawasaki, Japan
Filed Jan. 7, 1987, Ser. No. 1,252
Claims priority, application Japan, Feb. 18, 1986, 61-33345
Int. Cl.[4] G06K *5/00*
U.S. Cl. 235—380 **7 Claims**



1. A data processing system including a portable electronic device and a host system detachably connected to said portable electronic device so as to transmit transaction data to the portable electronic device, said portable electronic device comprising:

means for receiving transaction data from said host system;

means for producing error detection information for said received transaction data;

mean for adding said produced error detection information to said transaction data; and

memory means for storing the transaction data to which the error detection information is added.

4,841,132
PROGRAM RECORDING SCHEDULING APPARATUS USING AN OPTICAL READER
Masahiko Kajitani, Neyagawa; Kiyoshi Takeda, Katano; Koji Isono, Neyagawa; Masumi Hirose, Kyoto; Kouji Matsubara, Moriguchi, and Etsuji Shuda, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan
Filed Jul. 16, 1987, Ser. No. 74,552
Claims priority, application Japan, Jul. 21, 1986, 61-171266; Aug. 19, 1986, 61-194457; Aug. 19, 1986, 61-194458; Aug. 22, 1986, 61-197521; Aug. 26, 1986, 61-199643
Int. Cl.[4] G06K *7/10;* **G06F** *3/06*
U.S. Cl. 235—472 **11 Claims**

1. A program recording scheduling apparatus comprising:

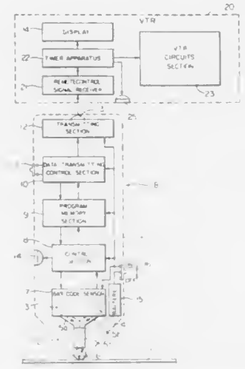
a bar code reading means for photoelectrically reading bar codes from a program member, said bar codes representing different kinds of program information for a particular program event including program date, channel number, start time and end time, said bar code reading means generating program scheduling signals which are a replica of photoelectrically detected bar codes corresponding to said different kinds of program information;

means for receiving said program scheduling signals from said bar code reading means and converting them into respective storable program signals corresponding to said different kinds of program information for a particular program event, said respective storable program signal omitting preselected information which is contained in corresponding program scheduling signals;

program memory means containing a plurality of storage areas, said plurality of storage areas respectively storing the storable program signals corresponding to said different kinds of program information for a particular program event in response to signals from a control means;

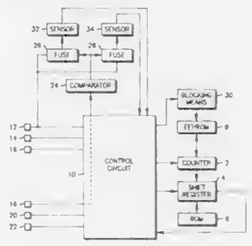
transmitting means for converting the storable program signals stored in said memory means into a transmitted infrared remote control signal; and

data transmitting control means responsive to an applied actuating signal for collectively transmitting said storable program signals corresponding to said different kinds of



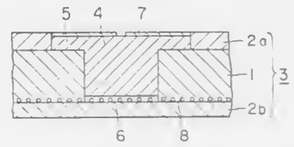
program information for a particular program event from said program memory means to said transmitting means for conversion into said transmitted infrared control signal.

4,841,133
DATA CARD CIRCUITS
Anil Gercekci, Geneva; Michel Bron, Lausanne, both of Switzerland, and Peter D. Hudson, Camberley, United Kingdom, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 30, 1988, Ser. No. 175,390
Claims priority, application United Kingdom, Jun. 30, 1987, 8715268
Int. Cl.[4] G06K *19/06*
U.S. Cl. 235—492 **19 Claims**



1. A data card of the type comprising an integrated circuit on a semiconductor chip embedded in a plastic card, the circuit including a non-volatile memory having a transport code preprogrmamed therein, control circuitry for controlling the circuit, a comparator having a first input coupled to an input node of the circuit for receiving an externally-applied code and a second input coupled to said memory for comparing said externally-applied and transport codes, and a first irreversible switch coupled to an output of the comparator such that said first irreversible switch is actuated if the externally-applied and transport codes match.

4,841,134
IC CARD
Yoshiaki Hida; Satoshi Ishihara; Seiji Take; Masao Gogami, and Toshiyuki Suzuki, all of Tokyo, Japan, assignors to Dai Nippon Insatsu Kabushika Kaisha, Tokyo, Japan
Filed Jul. 25, 1986, Ser. No. 889,277
Claims priority, application Japan, Jul. 27, 1985, 60-166450; Sep. 5, 1985, 60-196168; Nov. 8, 1985, 60-250152; Feb. 21, 1986, 61-036719; Mar. 4, 1986, 61-047023
Int. Cl.[4] G06K *19/02*
U.S. Cl. 235—488 **22 Claims**



1. An IC card comprising an IC module embedded in an IC module substrate built in a card substrate, said IC module comprising an IC chip, a circuit substrate and a reinforcing member, said reinforcing member comprising at least a part of the side portion of said IC module substrate extended in the outer circumferential direction, wherein said reinforcing member is formed in a shape so that it has a greater area toward the portion of the IC card with a greater flex coefficient.

4,841,135
ROTARY LIGHT BEAM DEFLECTOR WITH REVOLUTION SURFACE MIRROR
Chiaki Goto, and Kazuo Horikawa, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Division of Ser. No. 938,298, Dec. 5, 1986. This application Aug. 23, 1988, Ser. No. 235,131
Claims priority, application Japan, Dec. 5, 1985, 60-272399; Feb. 7, 1986, 61-23950; Feb. 10, 1986, 61-25938
Int. Cl.[4] G01J *3/50*
U.S. Cl. 350—6.8 **1 Claim**

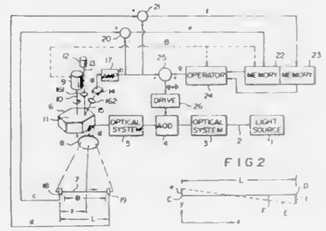
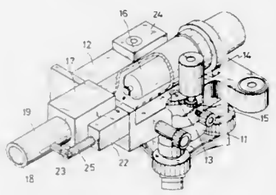


FIG 2

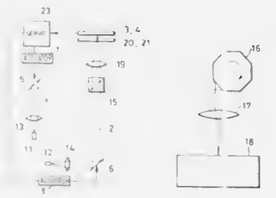
1. A light beam deflector comprising a deflecting surface which rotates about a rotational shaft to deflect a scanning light beam and a revolution surface mirror having a reflecting surface which is a surface of revolution coaxial with the rotational shaft, the revolution surface mirror being formed integrally with the rotational shaft.

4,841,136
SIGHTING APPARATUS WITH AUTOMATIC CORRECTION MECHANISM
Yasuyuki Nakayama, and Tomoya Sada, both of Chofu, Japan, assignors to Mizoguchi Manufacturing Company Limited, Aichi, Japan
Filed Dec. 15, 1987, Ser. No. 133,275
Claims priority, application Japan, Dec. 18, 1986, 61-195120[U]
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 R **3 Claims**



1. A sighting apparatus comprising a table provided rotatably on a base, and a laser oscillator an optical system including an automatic correction mechanism being mounted on the table, the table being rotated by remote control, characterized by a circular air bubble tube provided on the table such that an air bubble is positioning at the center of the tube when the table is in a horizontal state, a photosensor disposed on the table for sensing the position of the air bubble in the tube, and an interruption circuit provided on the table for interrupting a power source for the laser oscillator in accordance with a signal from the photosensor which is generated when the table is tilted beyond an angle range in which the automatic correction mechanism operates effectively.

4,841,137
BEAM POSITION CONTROL DEVICE
Takeshi Mochizuki, Ibaragi; Akira Arimoto, and Susumu Saito, both of Tokyo, all of Japan, assignors to Hitachi Koki Company, Limited and Hitachi, Ltd., both of, Japan
Filed Jul. 2, 1987, Ser. No. 69,122
Claims priority, application Japan, Jul. 4, 1986, 61-156079
Int. Cl.[4] H01J *3/14;* **H04N** *1/10*
U.S. Cl. 250—236 **12 Claims**

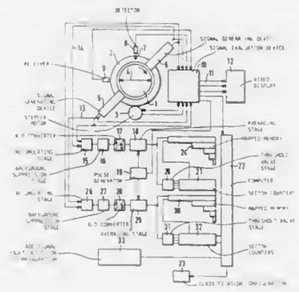


1. A beam deflecting device, comprising:
two light sources for providing first and second light beam;
a deflector;
a recording medium;
a beam splitter for splitting said first and second light beams into a first and a second scanning light beam respectively incident upon said deflector for scanning said recording medium, and a first and a second reference light beam respectively;
a light detector having a first and a second beam position detector which are contained in the same plane; and
separating means positioned between said beam splitter and said first and second beam position detectors for separating said first and second reference light beams to fall respectively upon said first and second beam position detectors.

4,841,138
PHOTOSENSITIVE POSITION SENSOR WITH LOGARITHMIC CONVERSION
Hideo Muro, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Aug. 28, 1987, Ser. No. 90,603
Claims priority, application Japan, Aug. 28, 1986, 61-200200; Aug. 28, 1986, 61-200201
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—209 **17 Claims**

1. A position sensor comprising;
a photosensitive element comprising a first semiconductor layer of a first conductivity type which forms a photosensitive pn junction with a second semiconductor layer of a second conductivity type, and first and second electrodes connected to first and second separate positions of said first layer, respectively, for delivering first and second photocurrents which vary in dependence on a position of a spot illuminated by a beam of light between said first and second positions,
current converting means for receiving said first and second photocurrents from said photosensitive element, and producing a first detection current corresponding to said first photocurrent, a second detection current corresponding to said second photocurrent, a first sum current which is a sum of said first detection current and twice said second detection current, and a second sum current which is a sum of said second detection current and twice said first detection current,
logarithmic converting means for producing a first logarithmic voltage which is in a logarithmic relationship with said first detection current, a second logarithmic voltage which is in a logarithmic relationship with said first sum current, a third logarithmic voltage which is in a logarithmic relationship with said second sum current, and a fourth logarithmic voltage which is in a logarithmic relationship with said second detection current,
a first differential pair circuit for amplifying a difference between said first and second logarithmic voltages, and producing first and second differential output currents,
a second differential pair circuit for amplifying a difference between said third and fourth logarithmic voltages, and producing third and fourth differential output currents, and
operating means for producing a position signal representing the position of the illuminated spot from said first, second, third and fourth differential output currents.

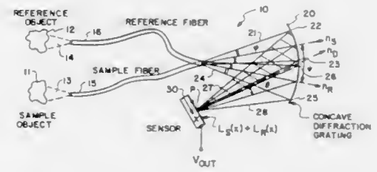
4,841,139
METHOD FOR TESTING COMPONENTS OF TRANSPARENT MATERIAL FOR SURFACE IRREGULARITIES AND OCCLUSIONS
Harald Schmalfuss, Rodgau; Hubert Kurpiella, Eschborn, and Bernhard Schneider, Hofheim, all of Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany
Filed Jun. 15, 1987, Ser. No. 62,181
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1986, 3620146
Int. Cl.[4] G01N *9/04*
U.S. Cl. 250—223 R **10 Claims**



1. A method for testing components of transparent material for surface irregularities and occlusions, comprising the steps of:
dot-scanning the component by moving a light ray which produces a light section in the component as the light ray passes completely therethrough;
detecting the light which respresents surface irregularities and occlusions of at least the front and back surfaces of the component by receivers located on one side of the component;
generating fault signals based on the light detected in said detecting step;
digitizing the fault signals which are generated in said generating step;
feeding the digitized signal to a mapped memory; and analyzing the signal by:
(a) feeding the digitized signal through a preselectable number of thresholds to a number of sector counters;
(b) evaluating the sector counters on-line according to preselected criterion regarding the number, location and gray tone distribution of the digitized fault signals; and
(c) evaluating the signals in the mapped memory in a computer if the fulfillment of the criterion for evaluation of the sector counters cannot be sufficiently assured.

4,841,140
REAL-TIME COLOR COMPARATOR
Charles T. Sullivan, and J. David Zook, both of Burnsville, Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Nov. 9, 1987, Ser. No. 118,587
Int. Cl.[4] G01J *3/50*
U.S. Cl. 250—226 **9 Claims**

1. Input mechanism to a color comparator apparatus comprising:
first optical path means having an input end and an output end, said input end being adapted to collect and transmit the color of a reference object to said output end;
second optical path means having an input end and an output end, said input end being adapted to collect and transmit the color of a sample object to said output end;
spectral dispersive element means in the form of a single concave diffraction grating, said grating including a reference area and a sample area which are spatially separated one from the other on said concave diffraction grating;
means positioning said first optical path means output end to direct reference light emanating therefrom to the reference area on said concave diffraction grating;
means positioning said second optical path means output end to direct sample light emanating therefrom to the sample area on said concave diffraction grating;



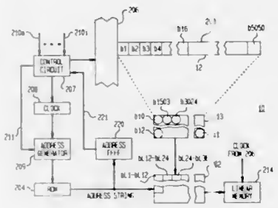
a photodetector array, said photodetector array having a reference linear array of photodetectors and adjacent thereto a sample linear array of photodetectors;
means directing diffracted light from said reference area onto said reference linear array of photodetectors from a first solid angle and directing diffracted light from said sample area onto said sample linear array of photodetectors from a different solid angle, said reference array and sample array of photodetectors producing a plurality of light intensity signals representative of the spectral distribution of the reference object color and the sample object color.

4,841,141
OPTICAL COORDINATES INPUTTING APPARATUS HAVING SWITCHING MEANS TO OPERATE Y-AXIS LIGHT EMITTERS WHEN OPERATION OF THE X-AXIS EMITTERS OUTPUTS A COORDINATES SIGNAL
Junichi Ouchi, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Japan
Filed Jun. 13, 1988, Ser. No. 206,455
Claims priority, application Japan, Sep. 7, 1987, 62-223769
Int. Cl.[4] G01V *9/04;* **G06M** *7/00;* **H01J** *40/14*
U.S. Cl. 250—221 **2 Claims**

1. An optical coordinates inputting apparatus comprising a light emitting element array and a photodetector array opposed to the light emitting element array, arranged in X- and Y-axis directions, X-axis and Y-axis multiplexer means sequentially driven as a pair of light emitting element and photodetector of the X- and Y-axis directions, X- and Y-axis signal detecting means for outputting a coordinates signal when a light

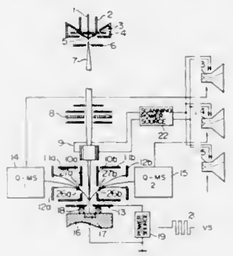
signal outputted from the driven light emitting element is not photodetected by the opposed photodetector, and switching means for operating either the X-axis or Y-axis multiplexer means, whereby, when the coordinates signal is outputted, the switching means operates the other X- or Y-axis multiplexer means.

4,841,142
DOCUMENT SCANNER WITH RESOLUTION SELECTION CONTROL
Paul Waszkiewicz, Agoura Hills, Calif. assignor to Photon Devices, Ltd., Newport Beach, Calif.
Filed Nov. 3, 1987, Ser. No. 116,517
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227 **8 Claims**



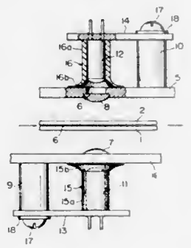
1. A scanner including a plurality of radiation conduits configured to define an entrance field and an exit field having first and second geometries, respectively, an array of discrete sensors energy-coupled to said plurality of conduits at said exit field, and circuit means connected to said sensor array, said circuit means being adapted to store those outputs from said sensor array which are located at addresses in one of a plurality of address strings which is a subset of the totality of addresses in said array, said circuit means including means for selecting one of said plurality of address strings.

4,841,143
CHARGED PARTICLE BEAM APPARATUS
Hifumi Tamura, Hachioji; Hiroyasu Shichi, and Kaoru Umemura, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 25, 1988, Ser. No. 160,408
Claims priority, application Japan, Feb. 27, 1987, 62-42551
Int. Cl.[4] H01J *37/25*
U.S. Cl. 250—288 **8 Claims**



1. A charged particle beam apparatus comprising:
hybrid charged particle beam source means for emitting a charged particle beam formed of both ions and electrons;
focusing means for focusing and for enabling irradiation of said charged particle beam emitted by said charged particle beam source means on a sample;
deflecting means for deflecting said charged particle beam so as to scan said sample;
secondary ion separating means disposed approximately symmetrically with respect to the axis of said charged particle beam proximate to said sample for separating positive and negative secondary ions generated by the irradiation of said sample into positive and negative ions;
two mass analyzers for analyzing the mass of said separated positive and negative secondary ions, respectively;
magnetic field generating means for extracting secondary electrons in a direction perpendicular to the direction, along which said secondary ions are extracted; and
a secondary electron detector for detecting secondary electrons thus extracted.

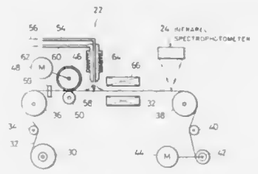
4,841,144
DUST-PROOF TUBE HAVING A CYLINDRICAL PORTION THAT SEALS PHOTOSENSOR AND INTEGRALLY FORMED FRUSTRUM PORTION
Kouichi Goi, Kawasaki; Hiroshi Emori, Koshigaya, and Daiki Sato, Tokyo, all of Japan, assignors to Laurel Bank Machines Co., Ltd., Tokyo, Japan
Filed Feb. 26, 1988, Ser. No. 160,769
Claims priority, application Japan, Feb. 27, 1987, 62-29813[U]
Int. Cl.[4] H01J *5/02*
U.S. Cl. 250—239 **13 Claims**



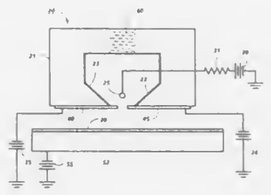
1. A dust-proof tube for a photosensor comprising a cylindrical portion, the inner diameter of said cylindrical portion being substantially equal to the outer diameter of said photosensor so that said cylindrical portion can sealingly receive said photosensor, and a frustum portion integrally formed with said cylindrical portion and extending from an end of said cylindrical portion, said cylindrical portion and said frustum portion being made of elastic material.

4,841,145
APPARATUS FOR PREPARING SAMPLE SOLUTION FOR INFRARED SPECTROPHOTOMETER AND METHOD OF ANALYZING SAMPLE SOLUTION
Akio Wada, Hachioji; Fumiko Nakeuchi, Kokubunji, and Seiji Nishizawa, Tokyo, all of Japan, assignors to Nihon Bunko Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 18, 1987, Ser. No. 63,908
Claims priority, application Japan, Jun. 24, 1986, 61-147393
Int. Cl.[4] G01J *3/42;* **G01N** *21/35*
U.S. Cl. 250—304 **14 Claims**

1. An apparatus for measuring the infrared spectrum of a component separated by a liquid chromatograph, comprising:
sample retaining means having a surface made of a substance which reflects infrared radiation, a recessed portion being formed on said surface;
a dropping tube, having an end portion disposed above said sample retaining means, for receiving effluent from a column of a liquid chromatograph, and through which said effluent flows as a sample solution and from which said sample solution is allowed to drip into said recessed portion of said sample retaining means;
driving means for driving said sample retaining means continuously or intermittently;
solvent removing means for depositing a solute of said sample solution dripped in said recessed portion of said sample retaining means by evaporating a solvent of said sample solution; and
an infrared spectrophotometer which emits infrared radiation onto the deposited solute and measures the intensity of the infrared radiation which is absorbed by said solute and reflected back through said deposited solute by a bottom surface of said recessed portion.

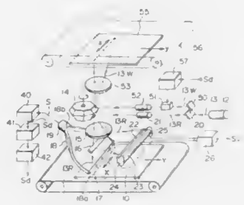


4,841,146
SELF-CLEANING SCOROTRON WITH FOCUSED ION BEAM
Robert W. Gundlach, Victor, and Richard F. Bergen, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Aug. 3, 1987, Ser. No. 81,068
Int. Cl.[4] H01T *19/04*
U.S. Cl. 250—324 **7 Claims**



1. A self-cleaning scorotron charging apparatus adapted to uniformly charge a surface of a charge receptor substrate with either negative or positive ions, said charging apparatus being characterized by including:
a substantially enclosed insulating housing including top, side and bottom, surfaces;
electrode means positioned on said bottom surface of said insulating housing and adapted to form a slit therein, and
coronode means within said insulating housing adapted to emit ions through said slit onto said charge receptor, said insulating housing having wedge shaped interior portions that are slanted toward said slit so as to focus additional ions from said coronode means to the center of said slit and thereby increase the efficiency of said charging apparatus.

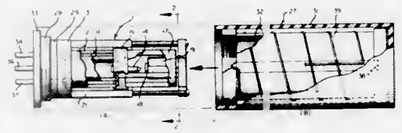
4,841,147
IMAGE READ-OUT AND RECORDING APPARATUS
Shigeru Saotome, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Jun. 30, 1987, Ser. No. 67,854
Claims priority, application Japan, Jun. 30, 1986, 61-153566
Int. Cl.[4] G01N *23/04;* **H04N** *1/04*
U.S. Cl. 250—327.2 **4 Claims**



1. An image read-out and recording apparatus comprising:
(i) a light source for emitting a light beam,
(ii) a light beam splitting means for splitting said light beam into a read-out beam and a recording beam,
(iii) a common light deflector for deflecting said read-out beam and said recording beam to produce a deflected read-out beam and a deflected recording beam, respectively,
(iv) a read-out sub-scanning means for moving an image original, which is disposed at a position at which the deflected read-out beam impinges, with respect to said light deflector in a direction at an angle with respect to a direction of main scanning effected by said deflected read-out beam,
(v) a light detection means for photoelectrically detecting light reflected by said image original, light passing through said image original, or light emitted by said image original when said image original is exposed to said read-out beam, and generating image signals representing an image recorded on said image original,
(vi) a modulation means for modulating said recording beam on the basis of said image signals, and
(vii) a recording sub-scanning means for moving a photosensitive material, which is disposed at a position at which the deflected recording beam impinges, with respect to said light deflector in a direction at an angle with respect to the direction of main scanning effected by said deflected read-out beam,
wherein said apparatus further comprises means for forming an additional beam from said deflected read-out beam by splitting said deflected read-out beam, and a means for detecting the amount of said additional beam for generating a synchronizing signal representing a scanning position of said deflected read-out beam on said image original with respect to said main scanning direction.

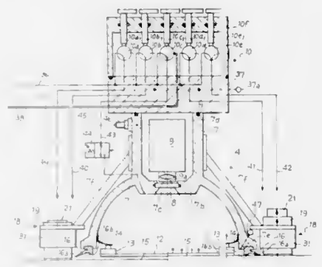
2. An apparatus as defined in claim 1 wherein said image original is a stimulable phosphor sheet carrying a radiation image stored thereon, and said light detection means detects light emitted by said stimulable phosphor sheet in proportion to the stored radiation energy upon exposure to stimulating rays as said read-out beam.

4,841,148
VARIABLE TEMPERATURE SCANNING TUNNELING MICROSCOPE
Joseph W. Lyding, Champaign, Ill., assignor to The Board of Trustees of The University of Illinois, Urbana, Ill.
Filed Mar. 21, 1988, Ser. No. 170,732
Int. Cl.[4] G01N *23/00*
U.S. Cl. 250—306 **6 Claims**



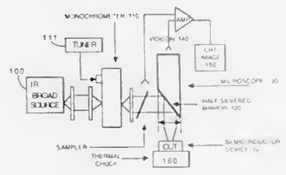
1. A scanning, tunneling microscope comprising:
a base;
an inner and an outer piezoelectric tube concentrically connected to said base, said tubes having substantially the same length and the same composition;
a tunneling probe having a tip, said probe being coaxially connected to an end of said inner piezoelectric tube opposite said base;
a temperature compensating annular collar coaxially connected to an end of said outer piezoelectric tube opposite said base, said collar having a length and composition to compensate for thermal changes in the length of said probe;
a sample holder tube axially connected to said collar;
a pair of spaced rails extending longitudinally within said holder tube and attached thereto;
a holder for holding a sample to be examined, said holder resting on and movable along the length of said rails;
conductor means for applying selected voltages to said outer piezoelectric tube to cause inertial movement of said sample along said rails to a distance within tunneling range from said tip of said probe; and
conductor means for applying selected voltages to said inner piezoelectric tube to cause said probe to scan a portion of a surface of said sample.

4,841,149
DEVICE FOR DETECTING MICRO-LEAKS OF GAS BY INFRARED RADIATIONS
André Martin, Toulon, and Minh P. Luong, Montgeron, both of France, assignors to Technologies Speciales Ingenierie-T.S.I., Toulon, France
Filed Mar. 1, 1988, Ser. No. 162,816
Claims priority, application France, Mar. 6, 1987, 87 03212
Int. Cl.[4] G01M *3/38*
U.S. Cl. 250—330 **12 Claims**



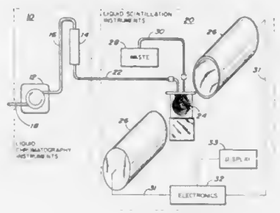
1. Device for detecting micro-leaks of gas by infrared radiations on a wall, of the type comprising an enclosure provided with an infrared camera and further provided with an opening equipped with sealing means designed to be placed in contact with the wall, means for sealingly applying said enclosure against said wall and means for creating a partial vacuum inside said enclosure, device wherein said infrared camera is placed inside a sealed tank separated from the enclosure by a partition wall, and has its objective situated in front of a lens permeable to infrared radiations and fixed in said partition wall, and has its comprising an insulating screen placed in the center of the opening of the enclosure and applied against said wall for filtering the gas leaks drawn by the effect of the vacuum, as so to obtain a thermal gradient detectable by thermovision.

4,841,150
REFLECTION TECHNIQUE FOR THERMAL MAPPING OF SEMICONDUCTORS
Martin J. Walter, Lee, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Dec. 28, 1987, Ser. No. 138,238
Int. Cl.[4] G01K *11/18, 13/00*
U.S. Cl. 250—339 **2 Claims**



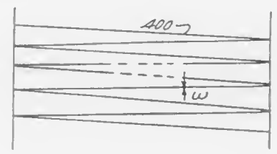
2. A device for determining a semiconductor's actual temperature comprising:
an infrared source which emits a broad spectrum of light;
a tunable monochrometer which receives said broad spectrum of light from said infrared source and produces therefrom an illuminating monochromatic radiation at tunable wavelengths, said illuminating monochromatic radiation being reflected off of said semiconductor, said tunable monochrometer also indicating to users a value of the illuminating monochromatic radiation's wavelength actually being emitted;
a microscope which receives light reflected off of said semiconductor from said illuminating source to produce an image of said semiconductor;
a detector which receives and converts said image of said semiconductor from said microscope and converts said image into electrical signals; and
a display means which receives said electrical signals from said detector and displays said semiconductor image as said tunable monochrometer is incrementally tuned, said display means indicating a decrease of light reflected off of said semiconductor at a transition point where said illuminating monochromatic radiation is transmitted through the semiconductor rather than reflected off of it, said transition point occuring at a specific wavelength which corresponds to the semiconductor's actual band gap energy and actual temperature, said specific wavelength being the value of the monochromatic radiation's wavelength actually emitted by the tunable monochrometer at the transition point.

4,841,151
VARIABLE VOLUME FLOW CELL
William H. Shope, Santa Ana, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.
Filed Feb. 13, 1987, Ser. No. 14,738
Int. Cl.[4] G01T *1/20*; G01N *23/12*
U.S. Cl. 250—364 **10 Claims**



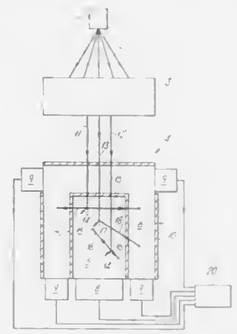
8. A variable volume flow cell for a continuous flow liquid scintillation instrument comprising a rotatable spool wound with a selectable length of transparent open-bored flexible tubing, the number of windings of the tubing being variable according to the desired volume of flow in proximity to a light detector, the wound open-bored tubing being rotatably held within a frame and enclosed within a cover, said flow cell being positioned within a liquid scintillation instrument in proximity to the light detector for transmitting light energy from a sample solution with scintillation material through said tubing to said light detector.

4,841,152
CONTINUOUS-RESISTANCE FIELD SHAPING ELEMENT FOR A KINESTATIC CHARGE DETECTOR
Frank A. DiBianca, Chapel Hill, N.C., assignor to University of North Carolina at Chapel Hill, Chapel Hill, N.C.
Filed May 13, 1988, Ser. No. 193,526
Int. Cl.[4] G01T *1/185*
U.S. Cl. 250—374 **8 Claims**



1. An apparatus for detecting the spatial distribution and intensity of radiation, comprising:
a first means for conducting electrical current;
a second means for conducting electrical current;
means for fixing the position of said second conducting means with respect to said first conducting means to define a gap therebetween, said fixing means comprises an enclosure including first and second opposing walls and a third wall attached to said first and second walls, said first conducting means disposed on said first wall, said second conducting means disposed on said second wall;
radiation source means for directing ionizing radiation into said gap;
medium means, disposed within said gap, for ionizing in response to said radiation to produce charge carriers;
charge carrier displacing means, electrically connected to said first and second conducting means, for inducing the charge carriers within said gap to drift at a velocity v_{drift} in a first direction, said charge carrier displacing means including means for producing a uniform constant electric field between said first and second conducting means;
moving means, coupled to at least one of said source means and said medium means, for moving said medium means relative to said source means in a second direction opposite to said first direction at a velocity v_{scan} having a magnitude substantially equal to the magnitude of the velocity v_{drift} of said drifting charge carriers;
detecting means for detecting charge carriers in said gap; and
correcting means disposed on a first surface of said third wall within said enclosure, for correcting distortions in said electric field in proximity to said third wall first surface, said correcting means comprising a resistive wire zig-zagged across said third wall first surface and electrically connected between said first and second conducting means.

4,841,153
COAL ANALYSIS
Malcolm R. Wormald, Abingdon, England, assignor to Cogent Limited, London, England
Continuation of Ser. No. 908,720, Sep. 18, 1986, abandoned. This application Jul. 27, 1988, Ser. No. 225,623
Claims priority, application United Kingdom, Sep. 18, 1985, 8523060
Int. Cl.[4] G01T *3/06*; G01N *23/222*
U.S. Cl. 250—390.04 **9 Claims**



1. A gamma ray detector system comprising:
a plurality of scintillators for detecting gamma rays as detection events and generating outputs corresponding to said detection events, said scintillators being arranged adjacent each other in an array; means for detecting one of said outputs from any of said scintillators, and for selecting the scintillator corresponding to that output as a primary scintillator;
means for selecting two other scintillators of said plurality of scintillators on opposite sides of said primary scintillator; and
means for detecting outputs from said two other scintillators which are coincident with said one of said outputs from said primary scintillator.
7. A method of analyzing a material which generates gamma rays when subjected to neutrons, said method comprising:
subjecting said material at a site to first neutrons from a first neutron source of first properties:
detecting first gamma rays generated from said material, when said material is subjected to said first neutrons, by prompt neutron activation substantially at the site at which said material is subjected to said first neutrons, so as to generate first gamma ray detection events correspond-

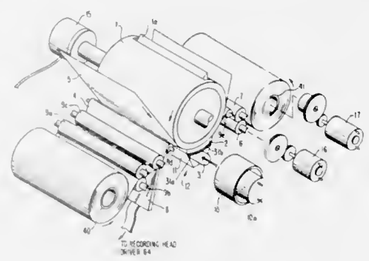
ing to said first gamma rays detected, and generating first outputs corresponding to said first gamma ray detection events;
determining from said first outputs energies of the first gamma rays corresponding to said first outputs;
generating a first energy spectrum of the energies of the first gamma rays corresponding to said first outputs;
subjecting the material at a site to a second neutrons from a second neutron source of second properties;
detecting second gamma rays generated from said material when said material is subjected to said second neutrons, by prompt neutron activation substantially at the site at which said material is subjected to said second neutrons, so as to generate second gamma ray detection events corresponding to said second gamma rays detected, and generating second outputs corresponding to said second gamma ray detection events;
determining from said second outputs energies of the second gamma rays corresponding to the second outputs;
generating a second energy spectrum of the second gamma rays corresponding to said second outputs; and
comparing said first and second energy spectra so as to determine the composition of said material.

4,841,154

THERMAL COPYING APPARATUS

Masanori Yoshikawa, Mino, and Shuichi Watanabe, Yahata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 10, 1987, Ser. No. 60,358
Claims priority, application Japan, Jul. 18, 1986, 61-170054; Nov. 10, 1986, 61-266890; Nov. 10, 1986, 51-266924
Int. Cl.[4] G03C *5/16*
U.S. Cl. 250—317.1 **15 Claims**



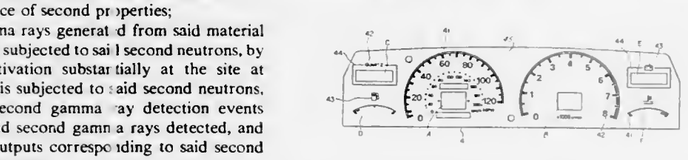
1. A thermal copying apparatus comprising:
a holding member and a transparent member for holding therebetween an original having thereon an image pattern corresponding to which heat is accumulated when said original is irradiated by a light and a recording sheet so that said original and said recording sheet are in intimate contact with each other at a predetermined area;
a conveying means for conveying said original and said recording sheet;
a light source for producing a light for irradiating said original through said transparent member each time when said original and said recording sheet are conveyed by a predetermined distance to effect a copying operation in which said original accumulates heat in a pattern corresponding to said image pattern so that said image pattern is thermosensitively copied on said recording sheet; and
a temperature control means for making a surface temperature of said transparent member uniform during the copying operation by at least one of heating and cooling.

4,841,155

INDICATOR ARRANGEMENT FOR MOTOR VEHICLES

Masahiko Ushida, and Hitoshi Shibata, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 28, 1987, Ser. No. 55,132
Claims priority, application Japan, May 30, 1986, 61-126548
Int. Cl.[4] G09F *13/20*
U.S. Cl. 250—463.1 **5 Claims**



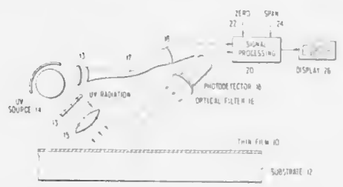
1. An indication device of a gauging apparatus, comprising:
an indication panel having with a background portion and indication marks including patterns and characters; and
a black light source for illuminating the surface of said indicator panel, said black light source being capable of exciting a fluorescent material, said black light source being positioned so as to direclty illuminate the surface of said panel,
wherein said background portion of said indicator panel surface is printed with a fluorescent-material-containing paint which has a first color when exposed to light from said black light source and a second color when exposed to ordinary light unable to excite the fluorescent material.

4,841,156

MEASUREMENT OF THE THICKNESS OF THIN FILMS

Joe T. May, and Edward A. Casacia, both of Leesburg, Va., assignors to Electronic Instrumentation and Technology, Inc., Sterling, Va.

Filed May 15, 1987, Ser. No. 49,833
Int. Cl.[4] G01N *21/64*
U.S. Cl. 250—461.1 **8 Claims**



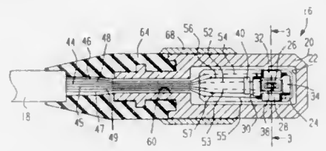
1. A method of selectively measuring the thickness of a film or a film on a substrate comprising the steps of:
exciting the film with ultraviolet radiation of first wavelengths selected based on the florescence characteristics of the material of the film to cause the film to fluoresce by emitting light of a longer ultraviolet wavelength than the exciting radiation;
detecting the ultraviolet radiation of said first selected wavelengths to produce a first electrical signal proportional to an instantaneous intensity of said ultraviolet radiation of said first selected wavelengths;
filtering and detecting the emitted light from the film to produce a second electrical signal proportional to second selected wavelengths of the emitted light;
dividing said second electrical signal by said first electrical signal to produce an instantaneous quotient output calibrated to the intensity of the exciting radiation and which is a direct measurement of the thickness of the film; and
displaying the calibrated output.

4,841,157

OPTICAL BACKSCATTER TURBIDIMETER SENSOR

John P. Downing, Jr., 2428 39th Street, N.W., Washington, D.C. 20007

Filed Jan. 6, 1988, Ser. No. 141,268
Int. Cl.[4] G01N *15/07, 21/49*
U.S. Cl. 250—574 **13 Claims**



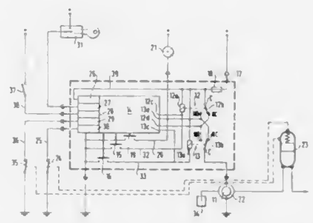
1. An apparatus for measuring particle concentration in fluids comprising
a housing having a cavity defining an opening for facing a fluid,
a printed circuit board adjacent the cavity,
a radiation emitting diode mounted on the printed circuit board for projecting radiation from the opening into the fluid;
a plurality of radiation detectors mounted on the printed circuit board adjacent the diode and on at least two different sides of the radiation emitting diode for receiving radiation passing from the fluild into the opening;
means for preventing radiation emitted by the diode from impinging directly on the detectors such that the detectors respond to radiation reflected by particles in the fluid;
a potting matereial which is transparent to the radiation emitted by the diode, filling the cavity and encasing the printed circuit board, the diode and the detectors; and
wire means connected to the printed circuit board and extending from the housing for connecting the diode and the detectors to a particle sensor operating and indicating circuit.

4,841,158

SAFETY RELAY CIRCUIT FOR SWITCHING ON ELECTRIC SYSTEMS OF AUTOMOTIVE VEHICLES

Franz Latka, Niddatal, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 8, 1988, Ser. No. 165,328
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1987, 3709059
Int. Cl.[4] B60T *17/18*
U.S. Cl. 307—10.1 **15 Claims**



1. A safety relay circuit for the ignition switch controlled electrical system of an automotive vehicle, said safety circuit comprising a pair of change-over relays, each having a contact arm shiftable between a normal open contact and a normal closed contact and being engaged with the normal closed contact when the relay is in its normal deenergized. state, the open contact of each relay being connected to the closed contact of the other, one of said closed contacts being connected to an electrical power source and the other of said closed contacts being connected to said electrical system, control circuit means connected to said ignition switch and to a pair of normally open relay control switches respectively connected to said relays to energize the relay when the relay switch connected thereto is closed, said control circuit including means for maintaining both of said control switches in their respective normal open positions when said ignition switch is off and for closing one of said control switches only upon a first actuation of said ignition switch and for closing the other of said control switches only upon the next subsequent actuation of said ignition switch, and auxiliary switch actuating means connected to said control circuit for energizing or deenergizing said relays independently of said control switches.

4,841,159

SWITCHING AND TESTING SYSTEM

Vernon C. Evans, New Athens, and George H. Heidinger, Sparta, both of Ill., assignors to Peabody Coal Company, St. Louis, Mo.

Filed Aug. 29, 1986, Ser. No. 902,217
Int. Cl.[4] H02J *3/14;* **G08B** *19/00*
U.S. Cl. 307—38 **16 Claims**

1. A switching system for powering first and second electrical loads from a voltage supply, the electrical loads being operable from controls and connected to the voltage supply by the switching system, the switching system comprising:
electronic switch means having a control element which is responsive to a control voltage difference to cause said switch means to become conductive, said switch means having a switch terminal connected to a first supply line and another switch terminal connected to the first electrical load;
means responsive to the controls for generating the control voltage difference when the voltage supply is connected to the first supply line thereby powering the first electrical load from the first supply line;
means responsive to the controls for generating first and second control signals;
a first contactor, responsive to the first control signal, for connecting the voltage supply to a first supply line , the first electrical load connected to the first supply line; and
a second contactor, responsive to the second control signal, for connecting the second supply line to the first supply line thereby connecting the voltage supply to the second supply line, and causing said means for generating the control voltage difference to interrupt power through the electronic switch means thereby discontinuing the supply of power to the first electrical load.

4,841,160

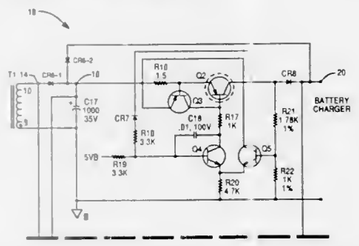
POWER SUPPLY SWITCHING CIRCUIT

Steven A. Yon, Altamonte Springs, and Luis A. Diaz, Apopka, both of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 1, 1988, Ser. No. 278,636
Int. Cl.[4] H02J *7/00*
U.S. Cl. 307—66 **38 Claims**

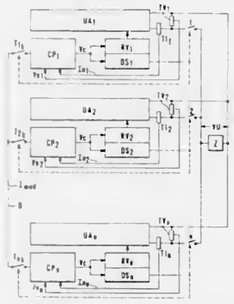
1. A power supply comprising:
an input for receiving a power signal;
a DC storage device connected to said input;

a voltage regulator connected to said DC storage device and having a primary output connectable to a battery;
a first diode connecting said primary output to said DC storage device;
a DC to DC converter for converting the voltage at said DC storage device to an auxiliary DC voltage, said converter having a supply voltage input; and
a switching circuit including:



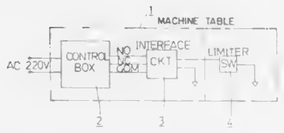
a first switch responsive to said power signal for providing said DC storage device voltage to said converter supply voltage input;
a second switch responsive to the voltage on said battery for providing said DC storage device voltage to said converter supply voltage input, and
a third switch responsive to an auxiliary voltage on/off signal for overriding said second switch.

4,841,161
MONITORING CIRCUIT FOR CONTROL MEANS AND SELECTIVE BREAKAWAY MEANS IN MODULAR SUPPLY SYSTEMS
Salvatore Lentini, and Giuseppe Patti, both of Palermo, Italy, assignors to Italtel Societa Italiana Telecomunicazioni s.p.a, Milan, Italy
PCT No. PCT/EP86/00415, § 371 Date Feb. 2, 1987, § 102(e) Date Feb. 2, 1987, PCT Pub. No. WO87/00655, PCT Pub. Date Jan. 29, 1987
PCT Filed Jul. 15, 1986, Ser. No. 10,281
Claims priority, **application Italy, Jul. 16, 1985, 21584 A/85**
Int. Cl.[4] **H02J** *1/0*
U.S. Cl. 307—85 **3 Claims**



1. A modular supply system for controlling power supplied to a load, comprising:
a plurality of power units connected in parallel, each of said plurality of power units including,
power supply means for supplying a voltage signal and a current signal to the load,
first monitoring means for developing an error signal corresponding to the difference between said current signal and a source current signal,
second monitoring means for developing a voltage error signal corresponding to the summation of said voltage and said error signal,
control means for regulating said voltage and current signals supplied from said power supply means within a predetermined tolerance limit in response to said voltage error signal, and
selective breakaway means for disconnecting said power supply means in response to said voltage error signal being detected outside of said predetermined tolerance limit;
each of said plurality of power units that has said power supply means connected providing an equal distribution of power to the load.

4,841,162
LIMITER SWITCHING APPARATUS
Bor-Cherng Lay, No. 156, Ta-Tun 1st St., and Shoei-Sheng Jou, No. 12, Alley 5, Lane 500, Wu-Chyuan Rd., both of Taichung, Taiwan
Filed Jul. 14, 1988, Ser. No. 219,002
Int. Cl.[4] **H03K** *19/12*
U.S. Cl. 307—112 **4 Claims**

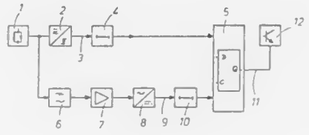


1. A limiter switching apparatus comprising:
a control box made of non-conductive material and adapted for being installed on a metal surface of a machine table;
a plurality of spacing members evenly formed on a top surface of said control box;
a plurality of electrical terminals respectively provided at each area defined by said spacing members for making internal and external electrical connections therewith;
an interface circuit means designed for being operated with minimal current and voltage to prevent electrical leakage and electrically disposed in said control box with electrical connection points respectively connected to each one of said electrical terminals of the control box for effecting electrical connections and disconnections therewith; and
a limiter switch installed at a proper place on the machine table and electrically connected to said interface circuit means through a single electrical line and a common contact of the machine table for being caused to close and open so as to activate and deactivate said interface circuit means; thereby, switching operations of said interface circuit device can be effectively performed within said control box in any conditions without incurring electrical leakage.

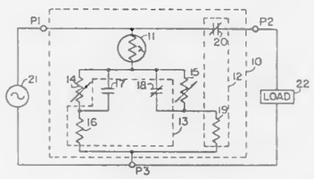
4,841,163
PROXIMITY SWITCH IMMUNE TO INTERFERENCE FIELDS
Jens Mueller, Radevormwald, Fed. Rep. of Germany, assignor to Werner Turck GmbH Co., KG., Halver, Fed. Rep. of Germany
Filed Feb. 16, 1988, Ser. No. 155,770
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1987, 3704893
Int. Cl.[4] **H01H** *35/00;* **G08B** *13/00*
U.S. Cl. 307—116 **3 Claims**

1. A proximity switch immune to interference fields comprising:

an oscillator circuit (1) including a coil (13) having an amorphous metal core, said oscillator circuit being controllable by a permanent magnet and being damped in its basic condition by the core of the coil and being undampable by the approach of a permanent magnet,
a first signal evaluating circuit (2) connected to the oscillator circuit output (17) and providing an output signal corresponding to the undamped condition of the oscillator circuit (1),
a blockable holding circuit (5) in the form of a D flip-flop with a switching signal input (D) having the output (3) of the first signal evaluating circuit (2) connected thereto, and with a blocking signal input (C),
a filter (6) tuned to the frequency of the interfering alternating magnetic field to be considered,
a second signal evaluating circuit (8) including a multivibrator stage, the second signal evaluating circuit being connected via the filter to the oscillator circuit output (17), for transmitting via the multivibrator stage a blocking signal, continuous over the duration of the interference, to the blocking signal input (C) of the blockable holding circuit (5) only upon the occurrence of an oscillator circuit output signal of the frequency of the interfering alternating magnetic field, the holding circuit being responsive to the blocking signal by retaining the output (11) of the holding circuit at the last-assumed value thereof so that the output of the holding circuit (5) can no longer be influenced by the approach or distancing of the permanent magnet,
a final stage (12) connected to the holding circuit output (11) and including an electronic switch for the circuit to be switched and a firing device for the electronic switch, and
a supply circuit for the oscillator circuit (1) and the two signal evaluating circuits (2 and 8).



4,841,164
LIGHT-SENSITIVE SWITCH STRUCTURE AND METHOD WITH INVERSE OFF/ON RATIO
Egidio Basso, 9145 Dallas, Grosse Ile, Mich. 48138
Continuation-in-part of Ser. No. 828,370, Feb. 11, 1986, Pat. No. 4,771,186. This application Jul. 18, 1988, Ser. No. 219,743
Int. Cl.[4] **H01H** *35/00, 47/24*
U.S. Cl. 307—117 **20 Claims**



1. Condition responsive primarily electronic switch means responsive to at least one of light, temperature, pressure and sound conditions for use in conjunction with a source of electrical energy and an electrical load for automatically connecting and disconnecting the electrical load from the source of electric energy, which primarily electronic switch means is responsive to a specific sequence of the condition levels to achieve an inverse off/on ratio whereby the electric load is disconnected from the source of electrical energy at a lower condition level to which said primarily electronic switch means is responsive than the condition level at which the electrical load is connected to the source of electrical energy.

4,841,165
D. C. POWER CONTROLLER
Gary L. Bowles, Long Beach, Calif., assignor to Wesley H. Heinmiller, Wilmington, Calif.
Filed Feb. 12, 1988, Ser. No. 155,594
Int. Cl.[4] **H02J** *1/02*
U.S. Cl. 307—132 R **11 Claims**

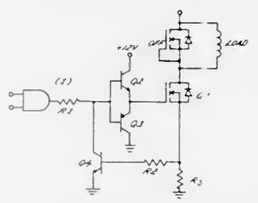
1. Apparatus for controlling the rate at which electric power is furnished to a load from a source of direct current, the apparatus comprising:
a signal generator operative to provide a periodic signal having a first value during a first portion of each period and a second value during a second portion of the period, the signal generator comprising a timing capacitor and circuit means operative to alternately charge the capacitor at a first rate and discharge the capacitor at a second rate, the duration of the first portion of each period being determined by the first and the duration of the second portion of each period being determined by the second rate,
switch means responsive to the signal to enable direct current from the source to flow through the load during the time the signal has one of said values and to prevent the current from flowing during the time the signal has the other value; and
control means manually operable to vary the relative durations of the first and second portions of each period and thereby control the rate at which electric power is furnished to the load.

4,841,166
LIMITING SHOOT-THROUGH CURRENT IN A POWER MOSFET HALF-BRIDGE DURING INTRINSIC DIODE RECOVERY
James A. Harnden, San Jose, Calif., assignor to Siliconix Incorporated, Santa Clara, Calif.
Filed Jul. 17, 1987, Ser. No. 74,903
Int. Cl.[4] **H03K** *19/094;* **G05F** *1/46*
U.S. Cl. 307—246 **14 Claims**

7. A circuit for switching current to an inductive load comprising:
a low-side MOSFET with an intrinsic body-drain diode to clamp inductive flyback energy, said low-side MOSFET having a drain connected to a supply return, a source, and a gate connected to a source of bias potential;
a high-side P-channel MOSFET having a source connected to a supply voltage, a drain connected to said source of said low-side MOSFET and through an inductive load to said supply return, and a gate;
means for sensing the current between said source and drain of said high-side MOSFET;

a control input terminal for receiving a control signal indicating when said high-side MOSFET is to turn on; and

means responsive to said control signal for supplying a bias signal to said gate of said high-side MOSFET in order to cause said high-side MOSFET to turn on, said means



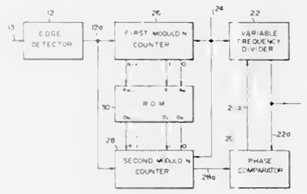
responsive reducing said bias signal when said means for sensing determines that said current flow between said source and drain of said high-side MOSFET exceeds a predetermined magnitude during the recovery time (Trr) of said intrinsic body-drain diode of said low-side MOSFET.

4,841,167

CLOCK RECOVERING DEVICE

Noboru Saegusa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 27, 1987, Ser. No. 89,794
Int. Cl.[4] H03K *5/13, 1/17*
U.S. Cl. 307—269 **7 Claims**



1. A clock recovering device comprising:

an edge detector means for producing a pulse when received data changes;

a first counter means for counting a high-speed clock which is an integral multiple times higher than a transmission rate of the received data, and reset by the pulse output of said edge detector means;

a logic means for processing an output of said first counter means;

a second counter means for receiving an output of said logic means and reset by the pulse output for counting the high-speed clock;

a phase comparator means for deciding a phase of recovered clock by comparing the recovered clock with a carry which is output by said second counter means; and

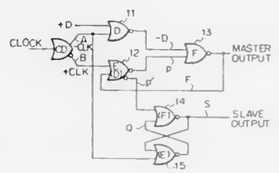
a variable frequency divider means controlled in frequency division number by an output of said phase comparator means for producing the recovered clock from the high-speed clock.

4,841,168

MASTER SLAVE LATCH CIRCUIT WITH RACE PREVENTION

Katuhisa Kubota, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 13, 1986, Ser. No. 929,795
Claims priority, application Japan, Nov. 26, 1985, 60-266462; Mar. 20, 1986, 61-062914
Int. Cl.[4] H03K *3/284, 17/16, 19/02*
U.S. Cl. 307—272.2 **3 Claims**



1. A master slave latch circuit, comprising:

clock means for outputting clock pulses each having first and second edges;

a master latch circuit, having a latch gate, outputting a master output signal in synchronization with the first edge of each clock pulse; and

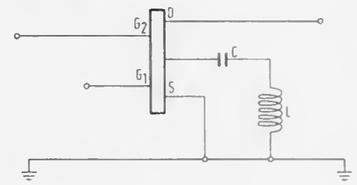
a slave latch circuit outputting a slave output signal in synchronization with the second edge of each clock pulse, said latch gate of said master latch circuit operating as a data gate for said slave latch circuit.

4,841,169

DUAL-GATE FET AMPLIFIER-MIXER WITH INTERMEDIATE OHMIC ISLAND FOR REJECTING A FREQUENCY BAND

Christos Tsironis, Montgeron, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 469,593, Feb. 24, 1983, abandoned.
This application Feb. 24, 1986, Ser. No. 833,571
Claims priority, application France, Mar. 3, 1982, 82 03510
Int. Cl.[4] H03K *3/26, 3/353*
U.S. Cl. 307—303 **2 Claims**



1. An amplifier-filter-mixer device comprising a single dual-gate field effect transistor including a semiconductor substate on which are disposed:

(a) a source electrode spaced apart from a drain electrode;

(b) spaced-apart first and second gate electrodes located between the source and drain electrodes;

(c) an ohmic island located between the first and second gate electrodes; and

(d) a band rejection filter comprising a resonant circuit including an inductor and a capacitor electrically connected in series, said resonant circuit having first and second ends, the first end being electrically connected to the ohmic island;

said device being operable such that when predetermined bias voltages are applied thereto:

(1) a first part of the field effect transistor electrically coupled to the first gate electrode and extending from the source electrode to the ohmic island effects amplification of an input signal applied to the first gate electrode;

(2) a second part of the field effect transistor electrically coupled to the second gate electrode and extending from the ohmic island to the drain electrode effects mixing of the amplified input signal with a local oscillator signal applied to the second gate electrode; and

(3) said resonant circuit rejects noise signals received at the first gate electrode and parasitic signals produced during mixing of the input signal and the local oscillator signal;

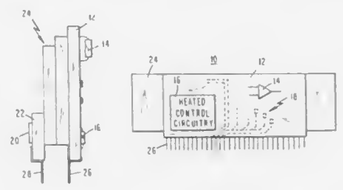
said predetermined bias voltages including a common reference voltage applied to the source electrode and the second end of the resonant circuit, and voltages applied to the drain electrode and the first and second gate electrodes which effect saturated operation of the first part of the field effect transistor and non-saturated operation of the second part of the field effect transistor.

4,841,170

TEMPERATURE CONTROLLED HYBRID ASSEMBLY

Larry E. Eccleston, Edmonds, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Dec. 8, 1986, Ser. No. 939,522
Int. Cl.[4] H01L *27/00*
U.S. Cl. 307—310 **22 Claims**



1. A hybrid electronic circuit arrangement comprising:

a substrate;

an electrical circuit formed on said substrate;

a temperature control means formed on said substrate; and

heat generating circuit means formed on said substrate for heating said electrical circuit to operate at predetermined temperature conditions,

said heat generating circuit means connected to and responsive to said temperature control means,

said heat generating circuit means in close thermal conductivity with said electrical circuit for eliminating requirement of heat enclosure therefor,

at least one element of said electrical circuit, said temperature control means, and said heat generating circuit means comprising an integrated circuit and at least another element of said electrical circuit, said temperature control means, and said heat generating circuit means comprising a film resistor.

4,841,171

HIGH SPEED COMPARATOR CIRCUIT WITH SINGLE SUPPLY VOLTAGE

Song Dong-Il, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 30, 1987, Ser. No. 139,734
Int. Cl.[4] H03K *5/24*
U.S. Cl. 307—355 **21 Claims**

1. A high speed comparator circuit, comprising:

first and second resistances, said first resistance being connectable to a reference potential;

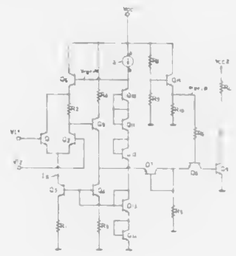
first and second semiconductor devices each having emitter electrodes connectable in common to a reference potential via said first resistance, each having a base electrode providing a discrete respective first and second input terminal, said second resistance being coupled to form a first node between a collector electrode of said first semiconductor device and a second node with a collector terminal of said second semiconductor device;

third and fourth transistors each having a common collector-base junction coupled in common with an emitter electrode of said third transistor coupled to a third node;

a fifth transistor having a base electrode coupled to said second node, a collector electrode connectable to a common voltage source, and an emitter electrode connectable to said reference potential;

a sixth transistor having a collector electrode connectable to a common voltage source, an emitter electrode coupled to said first node, a base electrode coupled to said third node, and exhibiting a forward voltage V_{BE} between the base and the emitter electrode of the sixth transistor matched with forward voltage V_{BE} of the fourth transistor;

a seventh transistor having a collector-base junction connectable to said reference potential, and an emitter electrode coupled to said emitter electrode of said fifth transistor;



an eighth transistor having a common collector-base junction connected to an emitter electrode of said fourth transistor, the forward voltage V_{BE} of the eighth transistor; and

a ninth transistor having a common collector-base junction connected to an emitter of said eighth transistor and between said commonly connected emitter electrodes of said first and second transistors and said first resistance and said emitter electrode of said fifth transistor;

the backward voltage V_{EC} between the emitter and the collector of the seventh transistor being matched with the backward voltage V_{EC} of the third transistor;

wherein, when both inputs of the first and second input terminals are equal to each other, if the value of said first resistance is equal to one-half of the value of said second resistance, then voltage drop across the second resistance is equal to V_{BE} and this voltage is matched with voltage between the base and the emitter of the ninth transistor,

whereby well balanced square waves are produced by operation of said first and second transistors by a single current source.

4,841,172

BIPOLAR-MOS LOGIC CIRCUIT WITH HIGH SPEED OPERATION

Masaji Ueno, and Hideaki Masuoka, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jul. 28, 1988, Ser. No. 225,495
Claims priority, application Japan, Aug. 5, 1987, 62-194527
Int. Cl.[4] H03K *17/04, 19/013, 17/62*
U.S. Cl. 307—443 **7 Claims**

1. A logic circuit for supplying an output signal having a prescribed waveform and one of two levels in response to a

prescribed input signal and a power source voltage, comprising:

output circuit means for generating the output signal, including first and second output transistor means for alternately providing a first level output signal and a second level output signal;

resistive means responsive to the power source voltage for supplying a current to the first output transistor means;

current control means connected in parallel with the resistive means for controlling the current supplied to the first output transistor means, including first and second MOS transistor means for controlling the waveform of the first level output signal in accordance with the ratio of the channel length to the width of the first and second MOS transistor means; and

output control means for controlling the first and second output transistor means in response to the input signal for supplying one of the first level output signal and the second level output signal.

4,841,173

BIPOLAR LOGIC CIRCUIT

Tsunehiro Koyama, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 4, 1987, Ser. No. 81,227

Claims priority, application Japan, Aug. 7, 1986, 61-186649

Int. Cl.[4] H03K *19/088, 5/08, 17/687*

U.S. Cl. 307—456 **2 Claims**

1. A bipolar logic circuit comprising:

an output Darlington transistor and a first transistor which are connected in series between a high potential source and a low potential source, the first transistor conducting transient current,

a second transistor whose collector is connected to a base of the output Darlington transistor and is connected to the high potential source through a resistor, whose emitter is connected to a base of the first transistor, and whose base is connected to the high potential source through a resistor,

a third transistor whose emitter is connected to the low potential source and whose base is supplied with a signal corresponding to an input signal,

a first diode whose anode is connected to the base of the second transistor and whose cathode is connected to a collector of the third transistor; and

a second diode whose anode is connected to said emitter of said second transistor and whose cathode is connected to said collector of said third transistor to lessen the transient current of the first transistor and turn off the first and second transistors simultaneously.

4,841,174

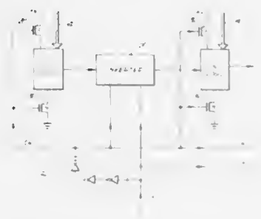
CMOS CIRCUIT WITH RACEFREE SINGLE CLOCK DYNAMIC LOGIC

Randall M. Chung, Laguna Niguel, and Bradley S. Masters, Chino, both of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Continuation-in-part of Ser. No. 789,383, Oct. 21, 1985, Pat. No. 4,740,721. This application Feb. 12, 1987, Ser. No. 13,694

Int. Cl.[4] H03K *19/094; G06F 7/38*

U.S. Cl. 307—469 **10 Claims**



1. A CMOS circuit employing dynamic logic, comprising:

clock means for supplying a clock signal;

complement clock means for supplying a complement clock signal having delayed transitions with respect to said clock signal;

first logic means, coupled to said complement clock means and comprising one or more logic gates of transistors of a first conductivity type, for receiving one or more externally provided input logic signals and performing first predetermined logic operations thereon and for providing first logic output signals corresponding to said logic operations performed on said input logic signals, wherein the timing of said first logic operations are controlled by said complement clock signal;

latch means, comprising transistors of said first conductivity type and a second conductivity type, for receiving said first logic output signals from said first logic means and latching said first logic output signals during a predetermined phase of said clock signal and the corresponding complement phase of said complement clock signal;

second logic means, coupled to said clock means and comprising one or more logic gates of transistors of said second conductivity type, for receiving one or more of said latched first logic output signals and performing second predetermined logic operations thereon and for providing the result of said second logic operations as second logic output signals, wherein said second predetermined logic operations are synchronized by said complement clock signal; and

each of said first logic means and said second logic means further comprising at least one precharge transistor and one evaluate transistor, said precharge transistors having switching characteristics slightly slower than the transistors employed in said logic gates and said latch means.

4,841,175

ECL-COMPATIBLE INPUT/OUTPUT CIRCUITS IN CMOS TECHNOLOGY

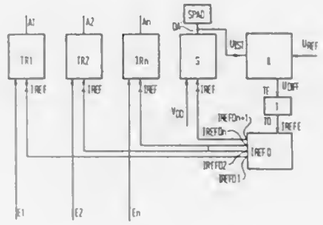
Erik De Man, and Stefan Meier, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

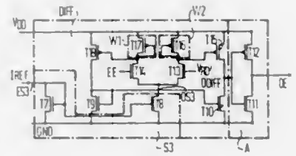
Filed Oct. 21, 1987, Ser. No. 110,886

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3701986

Int. Cl.[4] H03K *19/092, 19/086;* **H03F** *3/45*

U.S. Cl. 307—475 **15 Claims**





1. An ECL-compatible input/output circuit in CMOS technology, comprising a plurality of driver stages, a sensor stage, a comparator, a low-pass filter and a reference current source; the sensor stage, the comparator, the low-pass filter and the reference current source forming a control circuit; the comparator having two inputs and an output; the output of the comparator connected to the reference current source via the low-pass filter; the reference current source having n+1, where n is a whole number, outputs and having a respective output connected to a corresponding driver stage and to the sensor stage; an output of the sensor stage being connected to a first input of the two inputs of the comparator; a second input of the two inputs of the comparator being connected to an external reference voltage; the driver stages and the sensor stage each containing an external terminal; the sensor stage containing an input connected to a positive voltage; and the driver stages containing inputs for input signals of the ECL-compatible input/output circuit.

4,841,176

OUTPUT DISABLE CONTROL CIRCUIT FOR ECL PROGRAMMABLE ARRAY LOGIC DEVICE

Michael S. Millhollan, Saratoga, and Chiakang Sung, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 868,641, May 29, 1986. This application Apr. 3, 1987, Ser. No. 34,400

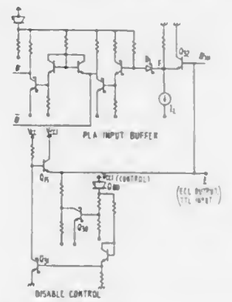
Int. Cl.[4] H03K *19/092, 17/16, 19/088*

U.S. Cl. 307—475 **5 Claims**

1. Disable circuitry for disabling an output node of an ECL programmable array logic circuit so that the output node can serve as an input for TTL signals, the disable circuitry comprising:

means for generating a control signal; and

disable control means operatively connected to the output node and responsive to the control signal for disabling the output node such that TTL signals can be applied to the



output node as inputs to the ECL programmable array logic circuit in a first mode.

4,841,177

COMPARATOR CIRCUIT OPERABLE FOR A WIDE RANGE OF INPUT SIGNAL

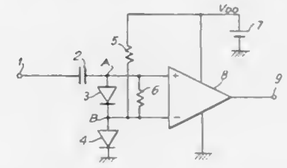
Takahiro Sugiyama, and Mitsutoshi Sugawara, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jan. 6, 1988, Ser. No. 141,873

Claims priority, application Japan, Jan. 7, 1987, 62-2213

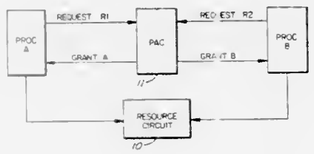
Int. Cl.[4] G06G *7/12;* **H03K** *5/00, 5/22, 5/153*

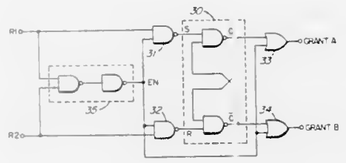
U.S. Cl. 307—494 **9 Claims**



1. A comparator circuit comprising a signal input terminal receiving an input signal, a signal output terminal, first and second voltage terminals, a differential amplifier having first and second input nodes and an output node, said output node having no ohmic electrical connection with said first and second input nodes, a capacitor coupled between said signal input terminal and said first input node, a first diode coupled between said second input node and said second voltage terminal in a forward direction thereof from said second input node to said second voltage terminal, first means coupled only between said second input node and said first voltage terminal without connection to said output node for biasing said first diode to make said first diode conductive in a forward-biased state, a second diode coupled between said first and second input nodes to clamp a voltage difference between said first and second input nodes to a predetermined value, second means coupled to at least said first input node for gradually equalizing the potential at first input node to the potential at said second input node with a predetermined time constant irrespective of a level of said output node, said time constant being greater than an interval period between two succeeding occurrences of said input signal, and a lead means for coupling said output node to said signal output terminal, whereby a voltage difference is provided between said first input node and said second input node during said interval period.

4,841,178
ASYNCHRONOUS PROCESSOR ARBITRATION CIRCUIT
Joël Bisson, Vancouver, Canada, assignor to Northern Telecom Limited, Montreal, Canada
Filed Feb. 23, 1988, Ser. No. 159,332
Int. Cl.[4] G01R *19/145*; G06F *1/00*
U.S. Cl. 307—518 6 Claims





3. An asynchronous processor arbitration circuit comprising, a pair of input terminals each one for connection to a respective source of request signals, a latch circuit having set and reset terminals and corresponding output terminals, a pair of gates each having their respective output terminals connected to the set and reset input terminals and each having a first input terminal connected to a respective one of the pair of input terminals and each gate also having a second input terminal connected to an enable terminal, and a delay circuit responsive to a request signal on either of said input terminals for generating an enabling signal on said enable terminal, the enabling signal being effective for disabling said pair of gates after a predetermined period of time subsequent to the occurrence of said request signal, the predetermined period of time being larger than the time required to stabilize the latch circuit and

a pair of OR gating means connected between the output terminals of the latch circuit and circuit output terminals, the pair of OR gating means being responsive to the enabling signal for allowing the output from the latch circuit to be available on the circuit output terminal only after said predetermined period of time.

4,841,179
PHASE EQUALIZING ACTIVE FILTER
Hideyuki Hagino, Fukaya, and Takashiro Kusano, Kumagaya, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 23, 1987, Ser. No. 136,968
Claims priority, application Japan, Dec. 26, 1986, 61-315355
Int. Cl.[4] H03B *1/00*; H03K *5/00*
U.S. Cl. 307—520 8 Claims

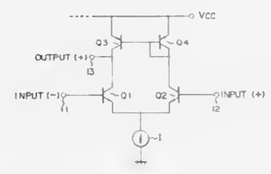
1. An active filter comprising:

a signal input terminal coupled for reception with an input signal;

a first operational amplifier with positive and negative input terminals and a positive output terminal, said positive input terminal being connected to said signal input terminal, and said positive output terminal being grounded through a first capacitor;

a second operational amplifier with positive and negative input terminals and a positive output terminal, said positive input terminal being connected to the positive output terminal of said first operational amplifier, and said positive output terminal being connected to the positive input terminal of said first operational amplifier, through a second capacitor;

a buffer with input and output terminals, said input terminal being connected to the positive output terminal of said second operational amplifier, and said output terminal being connected to the negative input terminal of said first operational amplifier;

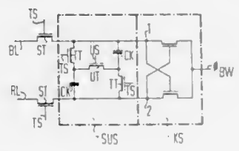


a first resistor connected at the first end to the positive input terminal of said first operational amplifier and connected at the second end to the negative input terminal of said second operational amplifier;

a second resistor connected at the first end to the second end of said first resistor, and at the second end to the output terminal of said buffer; and

a signal output terminal connected to the output terminal of said buffer.

4,841,180
INTEGRABLE EVALUATING CIRCUIT
Rainer Kraus, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jul. 17, 1987, Ser. No. 74,764
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1986, 3625020
Int. Cl.[4] G01R *19/00*; H03K *17/687, 17/16, 19/017*
U.S. Cl. 307—530 11 Claims



1. Integrable evaluating circuit, comprising:

a trigger circuit,

a first and second circuit node, both of which serve both as inputs and as mutually-complementary outputs for said trigger circuit,

a pair of signal lines exhibiting the same potential in a rest state,

switching transistors each being connected between a respective one of said two circuit nodes and a respective signal line of said pair of signal lines,

wherein each switching transistor has a first current-carrying connection connected with a respective one of said circuit nodes, has a second current-carrying connection connected with a respective one of said signal lines, and has a control connection connected with an isolation signal having a signal elevation of a given amount,

a signal-enhancement circuit connected between said trigger circuit and said pair of signal lines,

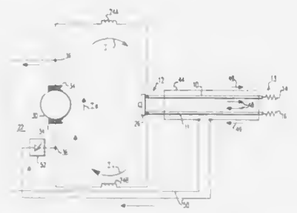
said switching transistors initially connecting a signal occurring on a given one of said two signal lines with its signal elevation to said circuit node connected to said given signal line,

wherein said switching transistor connected to said given one of said two signal lines operates to switch the signal from said circuit node connected to said given signal line,

wherein said signal-enhancement circuit operates to increase the potential of said circuit node connected to said given signal line by a given amount while simultaneously reducing the potential at the other one of said two circuit nodes as a result of a potential shift, and

wherein said signal-enhancement circuit operates to reduce the potential of said circuit node connected to said given signal line and to increase the potential of the other one of said two circuit nodes if the signal has a negative signal elevation.

4,841,181
ELECTROMAGNETIC LAUNCHER WITH POST-FIRING ENERGY RECOVERY FOR SLOW OR RAPID FIRE OPERATION
George A. Kemeny, Wilkins Township, Allegheny County, and Daniel W. Deis, Churchill Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Nov. 16, 1987, Ser. No. 121,011
Int. Cl.[4] H02K *41/00*
U.S. Cl. 310—12 13 Claims



1. Electromagnetic projectile launcher apparatus comprising:

(a) a source of high current including energy storing inductance and a generator in series with said inductance and including a rotor and rotor terminals;

(b) a rail system including first and second generally parallel, conducting rails having a breech end and a muzzle end;

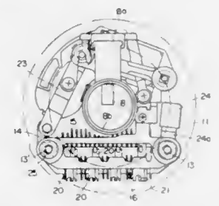
(c) an armature for conducting current between said rails and for accelerating a projectile along said rails;

(d) switch means connected to said breech end to initiate injection of said high current into said rails and armature whereby said projectile is launched out said muzzle end;

(e) means for recovering inductive energy remaining in said rail system after a launch; and

(f) means for transferring said recovered energy back to said generator to increase the kinetic energy of said rotor to a level above that which it would have without said recovery of energy.

4,841,182
RECTIFIER IN ALTERNATING GENERATORS FOR AUTOMOTIVE VEHICLES
Kyoshi Tsuchiya, Kiryu; Hideyuki Ioka, Maebashi, and Hideyuki Takahashi, Ashikaga, all of Japan, assignors to Mitsuba Electric Mfg., Co., Ltd., Japan
Filed Aug. 27, 1987, Ser. No. 89,967
Claims priority, application Japan, Aug. 28, 1986, 61-131811[U]; Sep. 1, 1986, 61-132717[U]; Sep. 1, 1986, 61-132718[U]; Jun. 6, 1987, 62-141712
Int. Cl.[4] H02K *11/00*
U.S. Cl. 310—68 D 16 Claims



1. An alternating current generator for automotive vehicles comprising:

a pair of opposed case brackets,

a core shaft rotatably supported between the case brackets,

a rotor core fitted to the core shaft,

a rotor coil wound over the rotor core to form a rotor disposed between the case brackets, the rotor being rotatable about the axis of the core shaft,

stator means, surrounding the rotor, for having an alternating current induced therein by the rotational movement of the rotor,

rectifier means for rectifying alternating current induced in the stator, the rectifier means being secured to one of the case brackets so as to be disposed between the rotor and said one of the case brackets, and

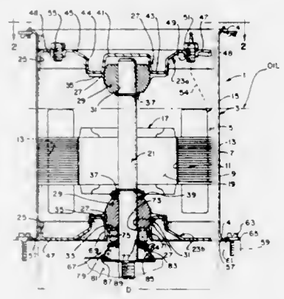
a cooling fan provided on the rotor core, the cooling fan generating, in the generator, an air flow in a direction substantially along the axis of the core shaft so as to cool the rectifier means when the rotor is rotated,

said rectifier means comprising a pair of substantially elongated opposed conductive radiators for positive and negative sides respectively, each having embedded therein diode chips arranged in a juxtaposed fashion, said radiators extending in a direction substantially perpendicular to the axis of the core shaft, and being radially spaced from each other to form an air pathway therebetween into which the air flow is introduced, whereby substantial surface area for heat transfer is ensured on mutually opposing surfaces of the radiators.

4,841,183
DYNAMOELECTRIC MACHINE CONSTRUCTION AND METHOD
L. Ranney Dohogne, and Raymond D. Heilman, both of St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Oct. 27, 1986, Ser. No. 923,480
Int. Cl.[4] H02K *5/16*
U.S. Cl. 310—90 2 Claims

1. A dynamoelectric machine comprising a cylindrical housing, a stator core having an outer periphery, said stator core having a central bore therethrough and a plurality of slots extending radially outwardly from said central bore, windings inserted in said slots, said stator core being sized relative to said housing so as to be positively secured within said housing when said stator core is foreceably inserted into said housing, a rotor rotatably received within said stator core bore, a rotor shaft extending outwardly from said dynamoelectric machine,

a bearing support at each end of said housing, a bearing carried by each of said bearing supports for receiving and journaling said rotor shaft, wherein one of said bearing supports has a central opening through which said rotor shaft extends for connection to an application member, the inner portion of said central opening constituting a bearing race, said rotor shaft being journaled by a bearing received in said bearing race, said bearing having an outer end face perpendicular to said rotor shaft, the outer portion of said central opening being generally cylindrical and constituting a seal bore, said application member being carried by and being rotatable with said rotor shaft, a seal between said seal bore and said application member for slidably sealing said shaft and application member with respect to said bearing, said seal having a first seal portion sealed with respect to said seal bore, a central seal opening for receiving



said rotor shaft, an outer cylindrical wall for sealing said seal with respect to said seal bore of said bearing support and an inner face substantially perpendicular to said central opening of said bearing support for being in face-to-face abutting relation with said outer end of said bearing thereby to at least in part align said seal with respect to said bearing and to said shaft, and a second seal portion sealed with respect to said application member, said first seal portion being stationary with said seal bore, said second seal portion being rotary with said application member and rotor shaft, a stationary sealing surface carried by said first seal portion, and a rotary seal member having a rotary sealing surface, said rotary seal member being carried by a said second seal portion with said rotary sealing surface being in face-to-face sliding, sealing engagement with said stationary sealing surface of said first seal portion.

4,841,184

VELOCITY AND IMBALANCE OBSERVER CONTROL CIRCUIT FOR ACTIVE MAGNETIC BEARING OR DAMPER

Hsiang M. Chen, Latham; Martin W. Eusepi, Rexford, and Robert E. Johnson, Ballson Spa, all of N.Y., assignors to Mechanical Technology Incorporated, Latham, N.Y.

Filed Jun. 23, 1987, Ser. No. 65,574

Int. Cl.[4] F16C *39/06*

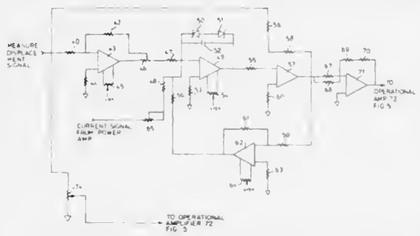
U.S. Cl. 310—90.5 **4 Claims**

1. A system for stabilizing a journal in the magnetic field of an attractive type active magnetic bearing including coil means comprising:

means for sensing a displacement of said journal;

means for measuring control current

a velocity observer circuit connected to said sensing means comprising integrators and functioning to feedback control signals based on said journal displacement and said control current; and driver circuitry connected to said



velocity observer circuit and functioning to apply said feedback control signals to said coil means.

4,841,185

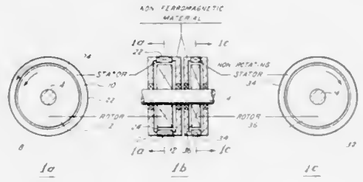
RISING FREQUENCY GENERATOR

William F. Weldon, Austin, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Filed Apr. 9, 1987, Ser. No. 36,541

Int. Cl.[4] H02K *23/60*

U.S. Cl. 310—115 **1 Claim**



1. An alternating current generator whose power output increases in voltage and frequency as power is delivered to an external load, the generator comprising:

a shaft;

a stator having windings, the stator positioned for rotating about the shaft;

a rotor having windings, the rotor being rigidly connected to the shaft and positioned for rotating with the shaft, the moment of inertia of the rotor being at least eight times less than the moment of inertia of the stator;

an output port conductively coupled to the windings of the stator; and

means for breaking the shaft including alternator means for providing excitation current for the generator, said alternator means having a rotor rigidly secured to the shaft.

4,841,186

ELECTRONICALLY COMMUTATED, COLLECTORLESS DIRECTED-CURRENT MOTOR

Josef Feigel, Landshut, and Klaus Pfendler, Bonndorf, both of Fed. Rep. of Germany, assignors to Standard Elektrik Lorenz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 30, 1988, Ser. No. 175,498

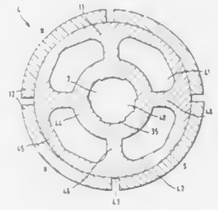
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710658

Int. Cl.[4] H02K *21/12*

U.S. Cl. 310—156 **3 Claims**

2. Electronically commutated, collectorless direct-current motor comprising a rotor having a multipolar body of permanent-magnet material, a shaft, an internal magnetic yoke, and a multipolar stator coil surrounding the rotor and being surrounded by a magnetic yoke, the internal magnetic yoke having axial apertures and being disposed between the shaft and the body of permanent-magnet material, said internal magnetic

yoke having an inner and an outer ring, said body of permanent-magnet material having diametrically arranged magnetic pieces, said two rings being interconnected by several bridge



portions whose number is equal to the number of magnetic pieces, the outer ring varying in thickness at different points, the thickness being the smallest at the center between two bridge portions and the largest at said bridge portions.

4,841,187

ELECTRIC MOTOR WITH ATTACHED TACHOGENERATOR

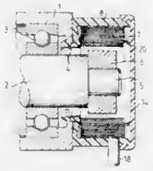
Dieter Hauke, Hatten, and Edgar Zelle, Rastede, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 23, 1988, Ser. No. 197,183

Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717180

Int. Cl.[4] H02K *5/10, 5/124;* G01P *1/04;* H02H *7/093*

U.S. Cl. 310—171 **16 Claims**



1. In an electric motor with an attached tachogenerator wherein said electric motor has a rotatably mounted motor shaft having an end portion which extends outside of a shaft bearing plate of the motor housing through a bore in the bearing plate, and wherein said tachogenerator includes an annular permanent magnet which rotates with said motor shaft and a stationary detector means, including an annular coil positioned adjacent and surrounding said magnet, for providing an output corresponding to the rpm of the motor shaft; the improvement wherein said magnet is mounted on said end portion of said motor shaft, and further comprising: a closeable housing including a hollow cylindrical member surrounding said magnet and said annular coil and having an annular bottom at its end facing said motor housing, with said annular bottom having a center passage opening for said motor shaft, and means for fastening said cylindrical member to said motor housing disposed at said end of said cylindrical member facing said motor housing; and a cap closing the other end of said cylindrical member.

4,841,188

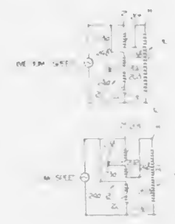
SPEED CHANGING DEVICE FOR ELECTRIC FANS

Chung-Hsing Hao, No. 22-2, Sec. 2, Chang An Rd., Hsi Tun District, Taichung City, Taiwan

Filed Nov. 25, 1987, Ser. No. 125,491

Int. Cl.[4] H02K *17/08*

U.S. Cl. 310—200 **1 Claim**



1. A speed changing device for electric ceiling fans, comprising:

a run coil means for being electrically connected to a stator of a ceiling fan;

a starting and speed changing coil means comprising a set of medium-speed taps and a set of low-speed taps arranged so that three speed-changing coils are formed for being variably coupled with said run coil means and parallel-connected to a power source of the ceiling fan for being switched into a plurality of speed-changing coils without incurring direction change of electrical current flowing therein;

wherein a pre-determined number of said speed-changing coils is arranged to be in series-connection with said run coil means while the rest of said speed-changing coils having a capacitor means connected in series at one end thereof, are made to be in parallel-connection with said run coil means after said capacitor means is actuated when the motor revolution is changed into a low speed.

4,841,189

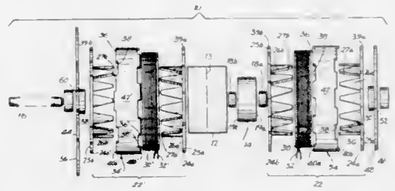
STEPPER MOTOR AND METHOD OF MAKING THE SAME

Roy Cooper, Waterbury, and Charles Hansen, Wolcott, both of Conn., assignors to Tri-tech, Inc., Waterbury, Conn.

Filed Dec. 30, 1987, Ser. No. 121,170

Int. Cl.[4] H02K *37/00*

U.S. Cl. 310—257 **9 Claims**



1. An electric rotating machine comprising, in combination:

an annular permanent magnet rotor having rotor poles of alternating polarity around its circumference, said rotor having an external diameter that is at least 55 percent of the diameter of the machine;

at least two stator phase assemblies each including a pair of pole pieces of annular configuration in opposed relationship with each other to form an annular space therebe-

tween, said pair of pole pieces being disposed concentrically around the outer periphery of said rotor, each said pole piece including along its inner periphery spaced-apart salient stator poles in magnetic flux relationship with the rotor poles, with the stator poles of the pole pieces of each stator phase assembly being interleaved with one another, each said stator phase assembly including annular energizing means surrounding the outer periphery of the rotor and disposed substantially entirely within the annular space between the pair of stator pole pieces for producing a magnetic field in the salient stator poles of said pair;

a multi-part housing for said machine comprising a field ring corresponding to each stator phase assembly, each field ring having first and second side edges each including a plurality of grooves and protrusions and additional parts of said housing having grooves mating with said protrusions, the protrusions on one side edge of the field ring being insertably received by the grooves in one of the additional housing parts and the protrusions on the other side edge of the field ring being insertably received by the grooves in another of the additional housing parts, said grooves and protrusions of each field ring are matingly engageable with the grooves and protrusions of adjacent field rings such that each of the stator poles are at an angular displacement of about a 90 electrical degree index spacing from the stator poles of the adjacent stator phase assembly; and

means for applying current to the energizing means in each of said stator phase assemblies to produce the corresponding magnetic field with the fields of the stator phase assemblies in different phase relationship with each other.

4,841,190

RESIN-FILLED PERMANENT-MAGNET STEPPING MOTOR

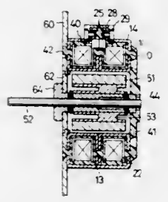
Kunitake Matsushita; Hiroshi Sakuma; Takayuki Yamawaki; Takashi Yoshikura; Hiroshi Sano; Yuzuru Suzuki; Michihiro Torii, and Tohru Ohnuki, all of Iwata, Japan, assignors to Minebea Co., Ltd., Nagano, Japan

Filed Apr. 27, 1988, Ser. No. 186,820

Claims priority, application Japan, May 1, 1987, 62-108143; Jun. 19, 1987, 62-94431[U]

Int. Cl.[4] H02K *37/16*

U.S. Cl. 310—257 **6 Claims**



1. A stepping motor comprising:

two stator units, which comprise a pair of stator yokes, each of said stator yokes having a number of magnetic pole teeth which protrude parallel to an axial direction, and form an annular space between one of said stator yokes and the magnetic pole teeth engaged with each other, and an annular coil comprising a bobbin with magnet wire wrapped therearound disposed in said annular space, said bobbin comprising an annular core having flanges on opposite sides thereof, said two stator units being disposed in a back-to-back relation;

a rotor consisting of a cylindrical magnet and a rotor shaft inserted in said cylindrical magnet, both ends thereof being extended from both ends of the magnet;

a plurality of pins mounted radially in said flanges and connected to at least one magnet wire;

a resin structure filled in the annular spaces and connecting integrally the stator yoke, the annular coil and the pins;

an end plate formed on a first side of the stator and molded integrally with the stator;

a plurality of resinous protrusions formed integrally with the resin structure on a second side of the stator yoke;

a flange plate provided with retaining holes, said protrusions passing through said retaining holes and being deformed to hold said flange plate on said second side of the stator yoke; and

two bearings mounted co-axially, one on the end plate and the other on the flange plate, said bearings rotatably supporting the rotor shaft.

4,841,191

PIEZOELECTRIC ACTUATOR CONTROL APPARATUS

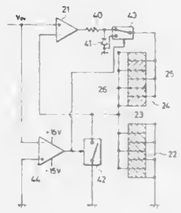
Keiji Takada, Tokorozawa; Masahide Okumura, Sagamihara; Satoru Fukuhara, Kokubunji; Toshiyuki Morimura, Hachioji; Sumio Hosaka, Nishitama, and Shigeyuki Hosoki, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1988, Ser. No. 153,006

Claims priority, application Japan, Feb. 20, 1987, 62-35509; Feb. 20, 1987, 62-35510

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—317 **9 Claims**



1. A piezoelectric actuator control apparatus comprising:

a stack type piezoelectric actuator which has a material that develops strain upon application of an electric field and which further has electrodes for applying an electric field to said material;

a capacitor connected in series with said piezoelectric actuator, said capacitor being comprised of a stack type ceramic capacitor having a structure substantially the same as that of said piezoelectric actuator to thereby cause the leakage currents flowing in the capacitor and in said piezoelectric actuator to be substantially equal to each other;and

control means which controls a voltage applied to said piezoelectric actuator so that a voltage of said capacitor will reach a predetermined value.

4,841,192

PIEZOELECTRIC HYDROPHONE

Per J. Tetlie, Horteo; Hans N. Brudal, Tonsberg, and Alf E. Meisingset, Horten, all of Norway, assignors to Getech A/S, Horten, Norway

Filed Sep. 25, 1987, Ser. No. 100,833

Claims priority, application Norway, Sep. 26, 1986, 863841

Int. Cl.[4] H01L *41/08*

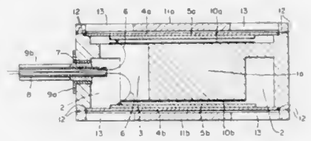
U.S. Cl. 310—337 **6 Claims**

1. A piezoelectric hydrophone comprising:

a hydrophone assembly having side, front and rear edges and an integral center section recessed inwardly from said front and rear edges, the center section being provided with a first aperture therethrough, the hydrophone assembly being provided with a radially extending second aperture in said side edge communicating with said first aperture;

pressure sensitive front and rear diaphragms respectively closing the front and rear edges of the hydrophone assembly, the front and read diaphragms being integrally joined by laser welding to said hydrophone assembly at said front and rear edges thereof respectively, said front and rear diaphragms each having a piezoelectric element attached thereto;

a lead-in tube sealingly fused in said second aperture in said hydrophone assembly by a glass body, said lead-in tube carrying therethrough lead wires connected to the piezoelectric elements, the lead wires extending from the lead-in tube through said first aperture in said center section, the lead-in tube being sealed closed for sealing the interior of the hydrophone;



external overload protection means mounted respectively over each of said front and rear diaphragms at a distance therefrom for protecting said front and rear diaphragms and said piezoelectric elements from destructive deformation due to an internal overpressure condition, said external overload protector means allowing substantially unattenuated propagation of acoustic pressure waves therethrough; and

a gas under pressure sealingly contained in said hydrophone for internally pressurizing the front and rear diaphragms;

and wherein the center section of said hydrophone assembly is integrally formed as one piece with the hydrophone assembly and serves as an internal overload protector means for protecting said front and rear diaphragms and said piezoelectric elements against destructive deformation due to an external overpressure condition.

4,841,193

FLUORESCENT LAMP DEVICE WITH INCANDESCENT BULB TYPE BASE CAP

Naoyuki Nakamura, Bizen, and Masashi Sangen, Kobe, both of Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Filed Feb. 8, 1988, Ser. No. 153,363

Claims priority, application Japan, Feb. 10, 1987, 62-29087

Int. Cl.[4] H01J *61/30*

U.S. Cl. 313—318 **5 Claims**

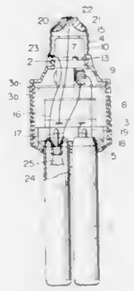
1. A fluorescent lamp device comprising:

a luminous tube unit including four glass tubes, each having a longitudinal axis, arranged so that the intersections of said axes with a plane perpendicular thereto form a rectangle in said plane, each of said tubes having a fluorescent coating on an inner surface thereof and being charged with mercury and rare gases, each of two of said four glass tubes being further provided at one end with an electrode projecting from the inside of said tube to the exterior thereof;

a case having one end secured to said luminous tube unit for the support thereof, the other end of said case being provided with an outwardly projecting portion having an engagement groove in its outer peripheral surface, the outwardly projecting portion of said case further including a stopper portion extending in the direction of said longitudinal axes away from said luminous tube unit;

a ballast located within said case; and

a base cap including a main body having an outer peripheral surface at one end provided with a spiral groove and a base outer cover fitted on to said groove, said main body further having an inner peripheral surface at the other end thereof provided with an engagement portion, a guide groove and a rotation limiting groove in that order starting from said other end of said main body, said base cap being rotatably secured to said case with the engagement portion of said main body fitting within the engagement



groove of said case, the outwardly projecting portion of said case fitting within the guide groove of said main body and the stopper portion of said case fitting within the rotation limiting groove of said main body, whereby said luminous tube unit is rotatable with respect to said base cap, excessive rotation thereof being prevented by engagement of the stopper portion of said case with an end of the rotation limiting groove of said base cap.

4,841,194

FLUORESCENT DISPLAY DEVICE

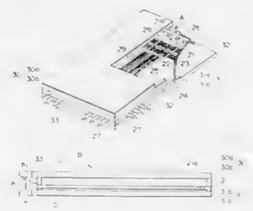
Takao Kishino, and Tadashi Mizohata, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Continuation of Ser. No. 827,265, Feb. 7, 1986, abandoned. This application Oct. 19, 1988, Ser. No. 262,194

Claims priority, application Japan, Feb. 19, 1985, 60-30898

Int. Cl.[4] H01J *63/06*

U.S. Cl. 313—496 **9 Claims**



1. A fluorescent display device comprising:

a casing containing an evacuated chamber;

a substrate disposed in said evacuated chamber, said substrate being formed of a thin layer of sheet glass;

at least one display section formed on said substrate, said display section having a plurality of segments each comprising anode conductors having a phosphor layer deposited on the surface thereof; and

a cathode stretched above said substrate for emitting electrons to be impinged upon said phosphor layer;

wherein said casing comprises a front member for permitting external view of said segments and a rear member for forming a rear surface of said casing, said front member and said rear member being formed of a thin layer of

limited-heat-treated reinforced glass having a strength of about 3.5 times that of sheet glass after formation of said casing, heat treatment of said glass being limited to that required at least for coating of an external electric field shielding film on said front member and assembling said front and rear members together to form said casing;

and wherein said substrate is disposed in said evacuated chamber maintaining spaces between said front member and said substrate and between said substrate and said rear member said spaces allowing deformation of the front member and rear member without touching said substrate so that said substrate is not subject to external forces, said substrate being thinner than said front member.

4,841,195

DISCHARGE LAMP HAVING A YTTRIUM ALUMINUM GARNET DISCHARGE ENVELOPE

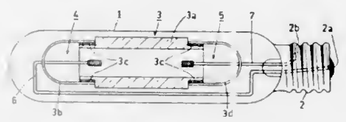
Gijsbertus De With, and Hendricus J. A. Van Dijk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 11, 1984, Ser. No. 598,959

Claims priority, application Netherlands, Apr. 29, 1983, 8301514

Int. Cl.⁴ H01J *17/16, 61/30*

U.S. Cl. 313—636 **17 Claims**



1. In a high-pressure discharge lamp having a discharge envelope which accommodates an ionizable filling and two main electrodes between which a discharge path extends, said discharge envelope having a wall of ceramic translucent material consisting essentially of densely sintered polycrystalline yttrium aluminium garnet and at least one of the substances MgO and SiO_2 in a total quantity of at least 50 ppm by weight, the absolute value of the difference between the SiO_2 and MgO contents being at least 50 ppm by weight, and an excess of MgO being at most 1000 ppm by weight.

4,841,196

TWO-FILAMENT LAMP AND OPERATING CIRCUIT AND METHOD FOR DESIGNING SAME

John F. Waymouth, Marblehead, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Dec. 9, 1987, Ser. No. 130,835

Int. Cl.⁴ H05B *39/10*

U.S. Cl. 315—65 **17 Claims**

1. An incandescent lamp and operating circuit comprising:

(a) an incandescent lamp including:

(i) a light-transmissive envelope hermetically enclosing an interior;

(ii) first and second electrically conductive lead-in wires running through said envelope and protruding into said interior;

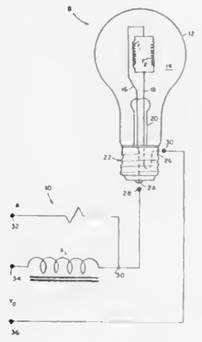
(iii) first and second lamp filaments mounted within said interior, said filaments being electrically coupled with said lead-in wires such that said first filament is electrically in parallel with said second filament between said lead-in wires, said first filament being designed to operate at a first rated voltage, said second filament being designed to operate at a second rated voltage, said second rated voltage being higher than said first rated voltage; and

(b) an operating circuit outside of said envelope including:

(i) an inductive reactance electrically coupled with said first lead-in wire;

(ii) voltage-detection means for measuring the operating voltage across said lead-in wires of said lamp; and

(iii) means for coupling with an external source of electrical power;



(c) whereby a measurement by said voltage-detection means which returns a value equal to said first rated voltage indicates that both of said filaments are operating and a measurement by said voltage-detection means which returns a value equal to said second rated voltage indicates that said first filament has failed and only said second filament is operating.

4,841,197

DOUBLE-CHAMBER ION SOURCE

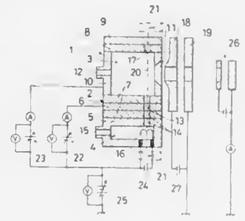
Kazuo Takayama, Machida; Eiji Yabe, Shimizu; Kenichi Takagi, Chigasaki; Ryota Fukui, Hatano, and Riichi Kikuchi, Chigasaki, all of Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Chigasaki, Japan

Filed May 27, 1987, Ser. No. 55,804

Claims priority, application Japan, May 28, 1986, 61-121283; May 28, 1986, 61-121284; May 28, 1986, 61-121285; May 30, 1986, 61-123652; May 30, 1986, 61-123653; Jul. 19, 1986, 61-169047

Int. Cl.⁴ G01T *1/20;* **H01J** *27/00*

U.S. Cl. 315—111.81 **10 Claims**



1. An ion source for producing ions by means of a plasma comprising:

an electric discharge chamber body,

a partition wall dividing an interior space of said body into a main discharge chamber and a subsidiary discharge chamber,

a filament mounted in said subsidiary discharge chamber,

an anode electrode provided in said partition wall, said partition wall and said anode electrode each having at least one small opening therethrough which are aligned and communicate said subsidiary discharge chamber with said main discharge chamber and are sized for jetting of a plasma into said main discharge chamber,

and subsidiary discharge chamber having a rare, inert gas introducing opening therein,

said main discharge chamber having an electric discharge gas introducing opening therein and an ion outlet opening therein, the gas pressure in said subsidiary discharge chamber being kept higher than the gas pressure in said main discharge chamber, and

magnet means provided adjacent an outside surface of said body for creating a magnetic field extending nearly along an axis of said at least one small opening of said anode electrode enhancing the jetting of the plasma into said main discharge chamber.

4,841,198

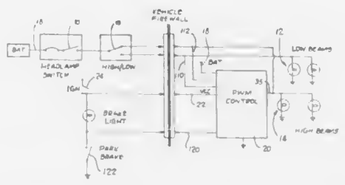
HEAD LAMP CONTROL METHOD AND APPARATUS, WITH PWM OUTPUT REGULATION

Daniel D. Wilhelm, Reed City, Mich., assignor to Nartron Corporation, Reed City, Mich.

Filed Oct. 19, 1987, Ser. No. 109,917

Int. Cl.⁴ B60Q *1/02*

U.S. Cl. 315—82 **9 Claims**



1. Apparatus for energizing a motor vehicle lamp at a designated power level comprising:

(a) a battery for energizing said motor vehicle lamp with a battery output signal;

(b) modulating means powered by said battery through a vehicle ignition switch for modulating the battery output signal and energizing the head lamp at the designated power level during operation of the motor vehicle; and

(c) monitoring means for sensing a modulated energization signal coupled to the head lamp and adjusting modulation of the energization voltage to maintain the designated power level of lamp energization as the battery output signal changes during motor vehicle operation.

4,841,199

ELECTRICAL SYSTEM FOR VEHICLE DAYTIME RUNNING LIGHTS

Tsutomu Irie, Hamilton, Canada, assignor to See-Me Lights Corp., Hamilton, Canada

Filed Feb. 3, 1988, Ser. No. 151,979

Int. Cl.⁴ H05B *37/00;* **B60Q** *1/02*

U.S. Cl. 315—83 **6 Claims**

4. A headlight circuit for a vehicle, said vehicle having an engine and right and left side headlights including low and high beam filaments having first and second contact points between which an electrical potential may be applied to induce said filaments to emit light, and comprising in combination:

means for electrically connecting first contact points of each of said low beam filaments;

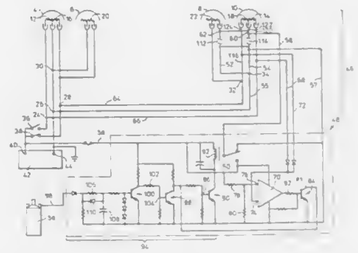
means for electrically connecting first contact points of each of said high beam filaments;

means for selectively connecting said first contact points of said low beam filaments to a power source;

means for selectively connecting said first contact points of said high beam filaments to a power source;

means for connecting second contacts of the low and high beam filaments on a first side of the vehicle to a point of common potential;

means for connecting second contacts of the low and high beam filaments on a second side of the vehicle to switching means;



said switching means being adapted to assume a first state establishing an electrical connection to said point of common potential or a second state establishing an electrical connection to said power source;

means for establishing said second state only when the engine is running and the first contacts of neither the low or high beam filaments are connected to said power source.

4,841,200

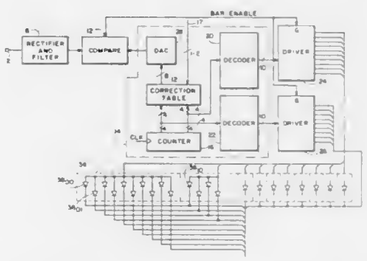
CIRCUIT FOR DRIVING A MULTIPLE-ELEMENT DISPLAY

Edward J. Cleary, Jr.; Mike R. Coleman, both of Beaverton, Oreg., and Michael R. Jones, Brea, Calif., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 850,198, Apr. 10, 1986, abandoned. This application Oct. 5, 1987, Ser. No. 106,995

Int. Cl.⁴ H05B *37/00*

U.S. Cl. 315—363 **9 Claims**



1. A circuit for driving a display device having n display elements, where n is a positive integer greater than 1, comprising:

a device for providing a repetitive digital signal having a predetermined sequence of n digital values,

conversion means for converting the digital signal to analog form in accordance with a predetermined transfer function,

comparison means for comparing the magnitude of the analog signal with the magnitude of a second signal and providing a display enable signal in the event that the magnitude of the analog signal bears a predetermined relationship to the magnitude of the second signal, and

decoder means having a plurality of output terminals at

which n distinct output signals, corresponding respectively to said n digital values, are provided, said decoder means being responsive to the display enable signal for providing one of the n output signals to the corresponding one of the n display elements when the decoder means receives the corresponding one of the n digital values.

4,841,201

DISPLAY DEVICE INCLUDING FLYBACK TRANSFORMER CONSTRUCTED TO CONTROL LEAKAGE CURRENTS

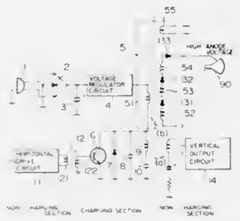
Kazuyoshi Takizawa, Hiratsuka, and Kiyoshi Watanuki, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

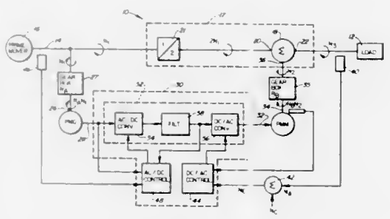
Filed Nov. 4, 1987, Ser. No. 116,343

Claims priority, application Japan, Nov. 14, 1986, 61-173941

Int. Cl.⁴ H04N 3/95

U.S. Cl. 315—411 **8 Claims**





1. A display device comprising:

a cathode ray tube;

a flyback transformer including a primary winding which is dc-wise connected to a commercial power source and a secondary winding which is dc-wise insulated from said primary winding and which generates a high voltage for an anode of said cathode ray tube;

a charging section which includes a horizontal deflection coil dc-wise connected to said primary winding, but does not include said primary winding and

a non-charging section which includes a vertical deflection coil dc-wise insulated from said primary winding, but not said secondary winding;

wherein said secondary winding includes a first layer winding and a second layer winding wound concentrically on said first layer winding, the winding start position of said first layer winding being shifted from the winding start position of said second layer winding toward the winding end side thereof by an amount such that a difference between a current leaking from said charging section into a said non-charging section and a current leaking from said secondary winding into said primary winding is not larger than 1 mA RMS, and the winding end position of said first layer winding extending at least to the winding end position of said second layer winding.

4,841,202

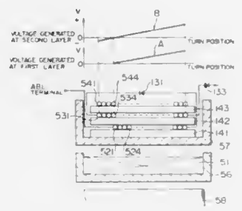
SPEED-LIMITED ELECTRICALLY COMPENSATED CONSTANT SPEED DRIVE

Bryan W. Dishner, Roscoe; Vijay K. Maddali, Rockford, and P. John Dhyanchand, Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 28, 1987, Ser. No. 138,344

Int. Cl.⁴ H02P 9/00

U.S. Cl. 318—14 **8 Claims**



1. An electrically compensated constant speed drive (ECCSD) for developing constant-speed motive power at a drive output shaft from variable-speed motive power provided by a prime mover at an ECCSD input shaft wherein the speed of the input shaft is limited so that such speed is equal to or less than the speed required to maintain the drive output shaft at a desired speed, comprising:

a differential having a first input coupled to the input shaft, a second input and an output coupled to the output shaft;

a permanent magnet generator (PMG) having a motive power shaft coupled to the input shaft and electrical power windings which develop AC power;

a permanent magnet motor (PMM) having a motive power shaft coupled to the second differential input and electrical power windings;

an AC/DC converter coupled to the electrical power windings of the PMG for developing a DC voltage on a DC link from the AC power developed by the PMG;

a DC/AC converter coupled between the AC/DC converter and the electrical power windings of the PMM for developing AC power from the DC power developed by the AC/DC converter to operate the PMM;

a first control means for controlling the AC/DC converter responsive to an operating parameter of the PMG; and

a second control means operationally independent of the first control means for controlling the DC/AC converter whereby the PMM develops compensating motive power at a speed sufficient to maintain the drive output shaft at the desired speed.

4,841,203

ELECTRIC TROLLING MOTOR STEERING SYSTEM

David A. Gilbert, 76542 Meadow Way, Oak Ridge, Oreg. 97463

Filed May 31, 1988, Ser. No. 200,728

Int. Cl.⁴ B63H 21/26

U.S. Cl. 318—53 **6 Claims**

1. A steering system for electric trolling motors, which comprises:

a steering shaft, axially rotating within a steering shaft housing having boat attachment means, the steering shaft having a first end extending above the steering shaft housing and a second end extending below the steering shaft housing and attached to an electric motor with propeller;

a base member mounted on top of the steering shaft housing;

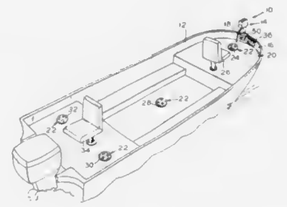
a direct current electrical power source;

an electric gearhead motor mounted on the base member, and having an output shaft extending therefrom;

a spline gear formed on the first end of the steering shaft;

an output gear attached to said output shaft from the gearhead motor, and interconnected to said spline gear;

a plurality of remote steering station members, each steering station member comprising a base plate and three electric push switches installed thereon; wherein a first push switch is electrically connected to and energizes said electric motor with propeller; a second push switch is electrically connected to and energizes the gearhead motor thereby rotating, through said gearing, the steering shaft and thus the electric motor with propeller in a first



direction; and a third push switch which energizes the gearhead motor similar to the second push switch but with polarity reversed, so as to rotate the steering shaft and the electric motor with propeller in a second and opposite direction;

said three switches being installed on said base plate in a spaced triangular relationship so that placement of a user's foot will energize said first push switch; and tilting of the foot to the right will also energize the second push switch, or tilting of the foot to the left will also energize said third push switch.

4,841,204

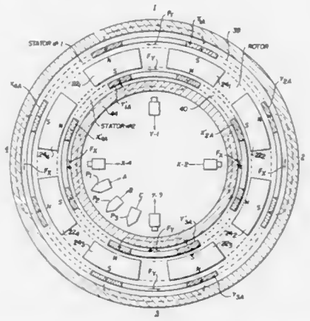
COMBINATION ELECTRIC MOTOR AND MAGNETIC BEARING

Philip A. Studer, 10313 Ridgemoore Dr., Silver Spring, Md. 20901

Filed Oct. 7, 1987, Ser. No. 105,256

Int. Cl.⁴ F16C 39/06; H02K 7/09

U.S. Cl. 318—254 **7 Claims**



1. A combined electric motor and magnetic bearing, therefor, comprising:

an annular rotor including a plurality of alternately poled permanent magnets arranged in a ring of equally spaced pairs;

an armature including two annular segmented stator coil assemblies, one of said stator coil assemblies being located interiorally of said rotor for producing radial forces and the other of said stator coil assemblies being located exteriorally of said rotor for producing torque couples on the rotor, each of said stator coil assemblies further comprising a plurality of mutually opposing pairs of stator coils located in relatively close proximity to the rotor, said stator coils having separated core portions providing current conduction in mutually opposite directions which interacts with a flux from a respective pair of adjacent alternately poled magnets of said plurality of alternately poled magnets to produce forces on said rotor in a predetermined direction;

means for energizing said other stator coil assembly to produce torque couples in the same direction on the rotor to produce rotation thereof;

means for sensing displacement of said rotor along two mutually orthogonal axes coincident with a central rotational axis of said rotor; and

means responsive to said sensing means for energizing said one coil assembly to produce pairs of like directed radial forces along said axes which produce a resultant radial force to center and support said rotor about said rotational axis.

4,841,205

CONTROL DEVICE FOR A MOVABLE PART, DESIGNED FOR OPENING AND CLOSING AN OPENING, ESPECIALLY A SLIDING/TILTING ROOF FOR A VEHICLE

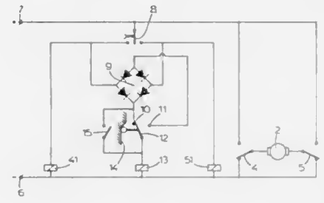
Jeen Bekkema, Venlo, Netherlands, assignor to Vermeulen-Hollandia Octrooien II B.V., Netherlands

Filed Jan. 20, 1988, Ser. No. 146,253

Claims priority, application Netherlands, Jan. 23, 1987, 8700159

Int. Cl.⁴ H02P 5/00

U.S. Cl. 318—282 **2 Claims**



1. A control device for a movable part designed for opening and closing an opening, especially a sliding/tilting roof of a vehicle, comprising:

a motor for driving the movable part and having terminals for connection to different poles of a power source;

a pole reversing switch for selectively connecting the terminals of the motor to said different poles of the power source;

a control member driven by the motor;

a first switch actuated by said control member for interrupting the connection of the terminals of the motor with the poles of the power source when the movable part reaches a closed position;

a second manually operable switch with a normally assumed non-connected rest position and first and second connected positions;

first and second relays, associated with the pole reversing switch;

said pole reversing switch including a separate make-and-break contact connected to each terminal of the motor and controlled by one of the relays, respectively, which make-and-break contacts each connect the corresponding terminal of the motor with one pole of the power source when the corresponding relay is not excited and with the other pole of the power source when the corresponding relay is

excited, first ends of the excitation windings of both relays being connected with the one pole of the power source and second ends of the excitation windings being alternately connectable with the other pole of the power source through the respective connected positions of said second manually operable switch; and

a switching circuit, in which the first switch is connected, and which first switch, when the movable part reaches the closed position upon actuation of the manually operable switch to a connected position for one relay, connects the excitation winding of the other relay with the other pole of the power source for connection of both poles of the motor to the other pole of the power source.

4,841,206

SPEED CONTROL DEVICE FOR AN ELECTRONIC SEWING MACHINE

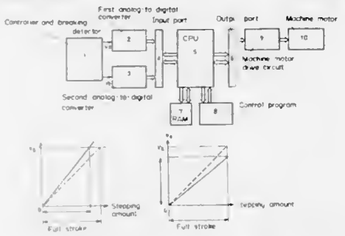
Akira Orii, and Takeshi Kongo, both of Tokyo, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1988, Ser. No. 166,640

Claims priority, application Japan, Mar. 24, 1987, 62-67870

Int. Cl.[4] D05B *69/36*

U.S. Cl. 388—828 **12 Claims**



1. A speed control device for a sewing machine, comprising:

a controller/break circuit including a variable resistor for speed control and a break detection resistor for break detection, said variable resistor having a plurality of terminals, both of said resistors being electrically connected to each other, said controller/break circuit also including comparing means for comparing values indicative of a variable potential of said variable resistor and of a break detection potential of said break detection resistor with a predetermined set value of a corresponding potential so as to thereby detect a break of at least one of any of the terminals and consequently slow a rotation speed of the sewing machine instantly down to zero.

9. A method for controlling speed of a sewing machine that has a motor, comprising the steps of:

ascertaining values indicative of a variable potential of a variable resistor and a break detection potential of a break detection resistor;

detecting a break of at least one of any of a plurality of terminals of said variable resistor by comparing the ascertained values with a predetermined set value of a corresponding potential; and

slowing a rotation speed of the sewing machine motor instantly down to zero in response to the detected break.

4,841,207

PULSE WIDTH MODULATED CONTROL METHOD AND MEANS

Neil G. Cheyne, St. Helens, New Zealand, assignor to Fisher & Paykel, Auckland, New Zealand

Continuation of Ser. No. 709,043, Mar. 7, 1985, abandoned. This application Aug. 24, 1987, Ser. No. 88,657

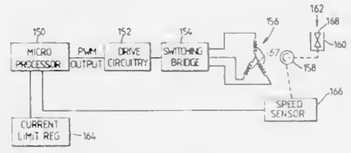
Claims priority, application New Zealand, Mar. 8, 1984, 207431; Mar. 8, 1984, 207430

Int. Cl.[4] H02P *5/16*

U.S. Cl. 388—811 **31 Claims**

1. A pulse width modulated method, using at least one power switch having "on" and "off" states for providing, respectively, low and high impedance paths between an inductive load and a source of power, thereby controlling the current flow through the inductive load during a sequence of regular reoccurring time periods, and wherein the at least one power switch is switched to the "on" state during a plurality of the time periods causing a current flow, the method comprising the combination of steps, operative during any one of a plurality of the time periods, of:

switching the at least one power switch from the "on" state to the "off" state when a predetermined level of current



flow has been reached flowing in one of, the inductive load and the at least one power switch; and

switching the at least one power switch back to the "on" state after the "off" state in the same time period as the "off" state occurred, independent of the occurrence of the beginning of a time period and, if the off state exists at the end of the time period, then at the beginning of the next time period.

4,841,208

POSITION CONTROL SYSTEM INCLUDING A QUICK RESPONSE CONTROL

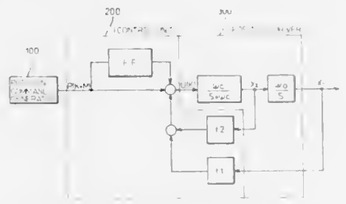
Hiroshi Itoh, Numazu, Japan, assignor to Toshiba Kikai Kabushi Kaisha, Tokyo, Japan

Filed Sep. 11, 1987, Ser. No. 95,110

Claims priority, application Japan, Sep. 11, 1986, 61-214741; Apr. 7, 1987, 62-86649

Int. Cl.[4] G05B *13/02*; B29C *47/92*

U.S. Cl. 318—561 **4 Claims**



1. A position control system comprising:

position command generating means for generating a position command at a prescribed sampling time k for a time k+M which is at least one sampling cycle M ahead of the prescribed sampling time;

a controlled object including a speed control loop, and control means for generating a control input value determined by determining a weight coefficient of each of position commands at sampling times k+l, (l=1, 2, . . . , M) and a weight coefficient for the position and speed which are outputs of the controlled object in order to minimize the value of an evaluation function so that the position command at said prescribed sampling time k and the position of the controlled object will be equalized, while the position commands produced by said position command generating means at the sampling times k+l (l=1, 2, . . . M), the position and speed of the controlled object, and a control input to be applied to said controlled object are being used as variables, wherein the state equation of said controlled object in a discrete-time system is expressed by:

$$X_{(k+1)}=\Phi\cdot X_{(k)}+G\cdot U_{(k)},$$

and a control input vector for minimizing the evaluation function:

$$J_{c(k)}=[R_{O(k+M)}-X_{(k+M)}]^T\cdot F_M\cdot[R_{O(k+M)}-X_{(k+M)}]+\sum_{j=k}^{K+M}\{[R_{O(j)}-X_{(j)}]^T\cdot Q[R_{O(j)}-X_{(j)}]+U_{(j-1)}^T\cdot H_{(j-i-k)}\cdot U_{(j-i)}\}$$

which evaluates the difference between a status variable vector $X_{(k)}$ of said controlled object and a position command vector $R_{O(k)}$ is generated at the prescribed sampling time k, while the position command vectors $R_{O(k+1)}$, $R_{O(k+2)}$, . . . , $R_{O(k+M)}$ generated by said position command generating means from a sampling time k+1 to a sampling time k+M which is M steps ahead of the sampling time k+1 are being used as variables,

where

$X_{(k)}$: the status variable vector (n×1) of the system,

Φ: the coefficient matrix (n×n) of the controlled object,

G: the input matrix (n×m),

$U_{(k)}$: the control input vector (m×i),

$R_{O(k)}$: the enlarged position command signal (n×1), F_M: the final matrix (n×n),

Q: the positive semi-definite symmetric matrix (n×n),

$H_{(i)}$: the positive definite symmetric matrix (m×m),

i=1, . . . , M (M is a predictive period, i.e., the number of sampling times).

4,841,209

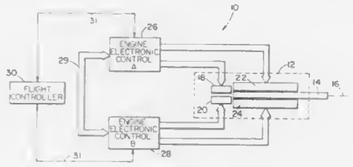
ACTUATOR CONTROL SYSTEM WITH DISPLACEMENT SENSOR FAULT DETECTION

Demetrius J. Poumakis, West Paulm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 25, 1987, Ser. No. 125,364

Int. Cl.[4] G05B *9/03*

U.S. Cl. 318—564 **4 Claims**



1. A detection system for use in determining failure of a linear variable phase transducer (LVPT) displacement sensor that includes a plurality of primary electrical windings receiving excitation signals for producing magnetic fluxes at different phases in a displaceable core, and a secondary electrical winding providing signals indicative of the summed magnetic flux in the core, said system comprising:

means for sensing said primary winding excitation signals;

means for sensing voltage and phase of the secondary winding signals;

detector means for receiving said sensed signals including;

means for determining a magnitude of the relative phase between said primary excitation signals and said secondary winding signals;

means for computing a displacement signal value in dependence on said relative phase magnitude; and

means having associated therewith a plurality of predetermined ranges of signal values corresponding to each of said displacement signal values for comparing the secondary winding signal voltage value with the corresponding one of said predetermined ranges of signal values, said comparing means capable of formulating each of said value ranges with different magnitudes, and further for providing fault signals if said secondary winding signal voltage value is not within said value range.

4,841,210

INDUSTRIAL ROBOT CONTROL DEVICE

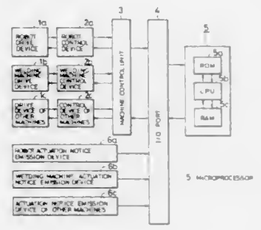
Hisao Kato, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 16, 1988, Ser. No. 156,130

Claims priority, application Japan, Feb. 16, 1987, 52-32698

Int. Cl.[4] G05B *19/42*

U.S. Cl. 318—568.24 **6 Claims**



1. A control device for controlling a plurality of machines including industrial robots, which are provided in a single production line comprising:

means for producing a prior notice of actuation for each of said machines a predetermined period of time before the actuation of each of said machines;

means for calculating a total amount of voltage drops caused by the actuations of said machines to which the prior notices of actuation have been issued;

means for detecting whether the total amount of voltage drops is lower than a predetermined allowable value;

means for determining drive order and drive timing of said machines according to priorities which have been given to said machines, respectively, when it is detected by said determining means that the total amount of voltage drops exceeds the predetermined allowable value; and

means for driving said machines according to outputs of said determining means.

4,841,211

METERING METHOD OF INJECTION MOLDING MACHINE

Noriaki Neko, Hachioji, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP86/00604, § 371 Date Jul. 9, 1987, § 102(e) Date Jul. 9, 1987, PCT Pub. No. WO87/03245, PCT Pub. Date Jun. 4, 1987

PCT Filed Nov. 26, 1986, Ser. No. 81,458

Claims priority, application Japan, Nov. 27, 1985, 60-265125

Int. Cl.[4] G05B *19/18*

U.S. Cl. 318—569 **5 Claims**

1. A method for metering resin in an injection molding machine, comprising the steps of:

(a) controlling the injection molding machine by means of a numerical controller;

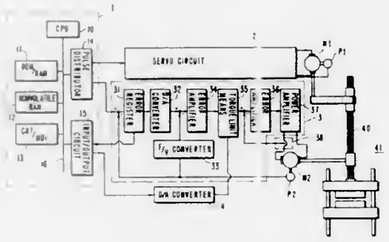
(b) using a servo motor as a drive source for driving a screw in an axial direction;

(c) performing injection of the resin via the screw;

(d) during metering, applying a torque limit corresponding to the back pressure to said servo motor, to control an output of said servo motor to a torque of the back pressure;

(e) during metering, reading via said numerical controller a

value of an error register in a servo circuit which drives said servo motor, and adding the readout value to said error register after a sign of the readout value is inverted, to thereby perform follow-up so as to set the value of said error register to 0;



(f) during metering, detecting an axial position of said screw from the value read out from said error register, thereby detecting the metering point; and

(g) after the screw position has reached the metering point, canceling the torque limit and driving said servo motor so that the screw is positioned and held at the metering point.

4,841,212

ELECTROMAGNETIC BEARING CONTROL APPARATUS

Osami Matsushita, Taira; Michiyuki Takagi, Ushiku; Mitsuho Yoneyama, Tiyoda; Toyomi Sugaya, Shimoinayoshi, and Ikuhiro Saito, Simoinayoshi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

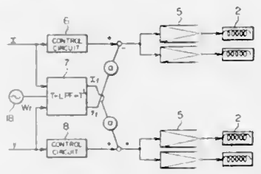
PCT No. PCT/JP87/00342, § 371 Date Aug. 12, 1987, § 102(e) Date Aug. 12, 1987, PCT Pub. No. WO88/02073, PCT Pub. Date Mar. 24, 1988

PCT Filed May 28, 1987, Ser. No. 102,561

Claims priority, application Japan, Sep. 12, 1986, 61-213903

Int. Cl.[4] G05B *1/01*

U.S. Cl. 318—607 **7 Claims**



1. An electromagnetic bearing control apparatus having means for detecting orthogonal x and y-component signals of radial displacement of a rotor, and servo-circuit means for controlling currents being supplied to electromagnetic coils in accordance with the displacement x and y-component signals from said detecting means such that said rotor is held in a predetermined radial position, said servo-circuit means comprising:

an x-component control circuit for processing said displacement x-component signal;

a y-component control circuit for processing said displacement y-component signal;

selective extraction means for extracting a frequency component to be controlled from said displacement x and y-component signals; and

means for supplying said displacement x and y-component signals to said selective extraction means, for adding one component of x and y-component signals of said frequency component delivered out of said selective extraction means to the other component of the processed displacement x and y-component signals delivered out of the other of said x and y-component control circuits, and for subtracting the other component of x and y-component signals of said frequency component delivered out of said selective extraction means from one component of said processed displacement x and y-component signals delivered out of one of said x and y-component control circuits;

wherein said selective extraction means comprises a band-pass filter which coincide with a frequency of a self-excited vibration generated as said rotor rotates.

4,841,213

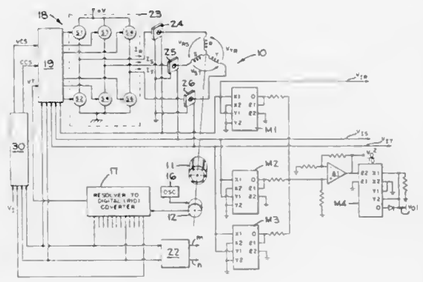
CURRENT AND TORQUE FEEDBACK SYSTEM AND CIRCUITRY FOR SINE-WAVE CONTROLLED BRUSHLESS SERVO DRIVE SYSTEMS

Jaroslav Tomasek, Plymouth, Minn., assignor to FMC Corporation, Chicago, Ill.

Filed Apr. 1, 1988, Ser. No. 176,536

Int. Cl.[4] G05B *1/06*

U.S. Cl. 318—661 **8 Claims**



1. A current and torque feedback system for use with a sine-wave controlled brushless servo motor having a plurality of stator windings, a permanent magnet rotor and a rotor position sensor for developing sensor signals which indicate the rotary position of said motor rotor, said motor being connected to a servo amplifier for synthesizing and delivering sinusoidal electrical currents to said stator windings, said system comprising:

current sensing means for sensing instantaneous values of curents in each of said stator windings;

means responsive to said current sensing means for computing peak values of said currents in said stator windings;

means responsive to said current sensing means for sensing simultaneously and independently the electrical polarity of the current in each of said stator windings;

means using said sensor signals for dividing the electrical revolution of said brushless motor into a number of regions equal to the number of phases of said brushless motor with each of said regions centered at a corresponding one of the positions of peak values of said currents; and

means using said sensor signals, said peak values of said currents and said current polarities for generating an output signal having a value proportional to said peak values of said currents and having a polarity indicative of the direction of the torque generated by said brushless motor.

4,841,214

CONTROL DEVICE FOR A STEPPING MOTOR

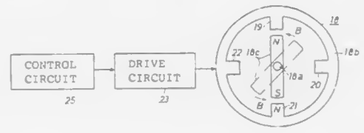
Michio Ueda, Gamagori, and Satoshi Shibata, Chita, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Dec. 29, 1987, Ser. No. 139,205

Claims priority, application Japan, Dec. 30, 1986, 61-199093[U]

Int. Cl.[4] H02P *8/00*

U.S. Cl. 318—696 **7 Claims**



1. A control device for a stepping motor comprising:

drive means connected to and driven by the stepping motor and including a resilient member which is restored in a direction opposite to its previous driven direction due to its resiliency when the driving force of a rotor of the stepping motor is interrupted, a restraining force for holding the rotor of the stopped stepping motor being smaller than a resilient force applied to the rotor of the stepping motor due to the resiliency of the resilient member; and

stop control means for controlling the stepping motor by outputting a reverse control signal which rotates the stepping motor at least a minimum step in a direction opposite to a previous direction of rotation so as to offset the resiliency of the member when the previous rotation stops, thereby avoiding stepout of the stepping motor.

4,841,215

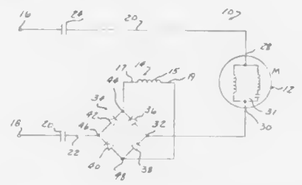
D.C. SOLENOID CONTROL CIRCUIT

Stephen P. Verbos, Spring Lake, Mich., assignor to Lift Tech International Inc., Muskegon, Mich.

Filed Jun. 22, 1987, Ser. No. 65,333

Int. Cl.[4] H02P *3/18*

U.S. Cl. 318—757 **5 Claims**



1. A control apparatus comprising: an A.C. motor with first and second input leads;

a D.C. solenoid having a winding, the solenoid operating a device;

a source of A.C. electrical power;

means, responsive exclusively to the flow of A.C. current through the motor, for converting the A.C. current to a D.C. current, the converting means providing an A.C. current path and a D.C. current path;

means for exclusively supplying A.C. electrical power to the A.C. motor, the A.C. power supplying means including:

the A.C. electrical power source connected to first and second terminals;

a first conductor connected to the first terminal and one of the A.C. motor leads;

a second conductor connected to the second terminal;

the other lead of the A.C. motor being connected solely through the A.C. current path provided by the converting means and the second conductor to the second terminal;

the D.C. current being supplied exclusively to the winding of the D.C. solenoid;

the D.C. solenoid being connected in series with the D.C. current path of the converting means.

4,841,216

ENGINE START TYPE VSCF GENERATING SYSTEM

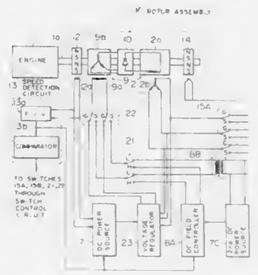
Yoshimi Okada; Masao Kimura, and Kazuo Okubo, all of Ise, Japan, assignors to Shinko Electric Co., Ltd., Tokyo, Japan

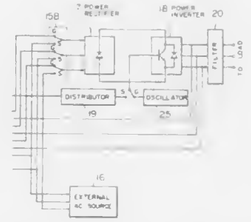
Filed May 20, 1988, Ser. No. 196,518

Claims priority, application Japan, Jul. 24, 1987, 62-183489

Int. Cl.[4] F02N *11/04, 11/08*

U.S. Cl. 322—10 **6 Claims**





1. An engine start type VSCF generating system for converting a varible speed shaft output of an engine to AC power of a constant voltage at a constant frequency, comprising:

an AC exciter having a rotor winding and a field winding;

a rotary rectifier for rectifying an output of said AC exciter to a direct current:

a main generator constituted by an AC generator having a rotary field winding and an armature winding, said rotary field winding being excited by the direct current from said rotary rectifier;

said rotor winding of said AC exciter, said rotary rectifier, and said rotary field winding of said main generator being mounted on a common shaft of said engine;

a power rectifier for converting an AC output of said main generator to DC power;

a power inverter connected to said power rectifier for converting a DC output of said power rectifier to an AC power;

position sensor means mounted on the common shaft of said engine for detecting a rotational position of said rotary field winding of said main generator;

a filter connected to said power inverter for removing noise in the AC output power thereof;

switching means for connecting an input of said power

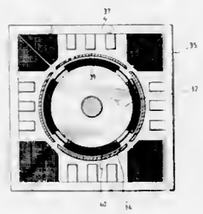
rectifier to an external AC power source, and for connecting an output of said power inverter to said armature winding of said main generator by disconnecting said filter thereby to drive said main generator as a no-commutator motor at the time of starting of said engine; and a distributor connected to said position sensor means and said power inverter for controlling commutation of said power inverter based on a position detection signal from said position sensor means.

4,841,217

PULSED GENERATOR INCORPORATING OUTPUT WAVEFORM FLEXIBILITY AND A PULSED TRANSFORMER

William F. Weldon; Siddharth B. Pratap and Mircea D. Driga, all of Austin, Tex., assignors to The University of Texas System, Austin, Tex.

Filed Dec. 14, 1987, Ser. No. 132,596
Int. Cl.[4] H02K 39/00
U.S. Cl. 322—8 **18 Claims**



1. A pulsed alternator for sequentially supplying short duration pulses of electrical power to a load circuit, where said alternator includes a stator or rotor each having an inner or outer periphery, said alternator comprising:
- an armature coil mounted on the inner or outer periphery of the stator or rotor, said load circuit being connected to said armature coil;
- a field coil mounted on the rotor when the armature coil is on the stator and on the stator when the armature coil is on the rotor;
- a compensating coil mounted about the inner or outer periphery of said stator or rotor, said compensating coil coupled to said armature coil solely by mutual inductance or magnetic coupling, and;
- an external trigger switch coupled between said armature coil and said load circuit, said switch adapted to be periodically and sequentially opened and closed to provide said pulses to said load circuit.

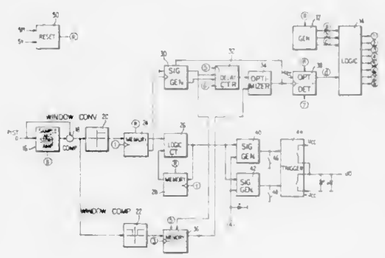
4,841,218

ELECTRONIC CONTROLLER AND A SYSTEM AND METHOD FOR OPTIMIZING GENERATION OF ELECTRICAL POWER UTILIZING THE SAME

Meir Rosinnes, Ra'Anana, Israel; Hugo Stadler, Ruhstorf/Rott, and Siegfried Strunz, Pocking, both of Fed. Rep. of Germany, assignors to Amin Engineers Ltd., Israel and Loher Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 29, 1988, Ser. No. 150,377
Claims priority, application Israel, Jan. 30, 1987, 81437
Int. Cl.[4] H02P 9/00
U.S. Cl. 322—24 **8 Claims**

1. In a system comprising an asynchronous generator rotatable at variable speeds, and a main electrical network carrying power at a substantially constant voltage and frequency, the improvement comprising:
- a synchronizer having an electronic optimization controller, said synchronizer being connected in a circuit between said generator and said network for receiving electrical power at variable voltages and frequencies from said generator and for controllably and continuously injecting



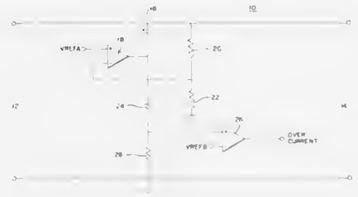
said power into said network at substantially constant voltage and frequency.

4,841,219

LOSSLESS OVERCURRENT SENSING CIRCUIT FOR VOLTAGE REGULATOR

Kevin J. Lonergan, Palmer Lake, Colo., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed May 10, 1988, Ser. No. 192,686
Int. Cl.[4] G05F 1/44
U.S. Cl. 323—274 **5 Claims**



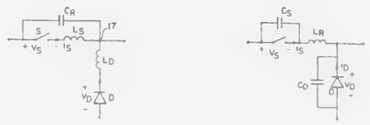
1. An overcurrent sensing circuit for voltage regulators comprising:
- at least a first voltage regulator circuit including:
- (a) an input;
- (b) an output;
- (c) a field effect transistor having a source, a drain, and a gate, and being disposed between said input and said output so that current can flow from said input through the drain and the source to said output; and,
- (d) voltage feedback means connected between said output and a first input of an amplifier circuit, said amplifier circuit generating as an output, a control voltage that is fed to the gate of the field effect transistor, said control voltage being responsive to the circuit output voltage; and,
- means to sense when the magnitude of said control voltage exceeds a set point at which said field effect transistor is driven into saturation thereby, said point being indicative of an overcurrent condition between said input and said output.

4,841,220

DC-TO-DC CONVERTERS USING MULTI-RESONANT SWITCHES

Wojciech A. Tabisz, 6700 H. Terrace View, and Fred C. Lee, 2909 Stradford Ln., both of Blacksburg, Va. 24060

Filed Sep. 23, 1987, Ser. No. 99,965
Int. Cl.[4] G05F 1/56; H02M 3/335
U.S. Cl. 323—282 **11 Claims**



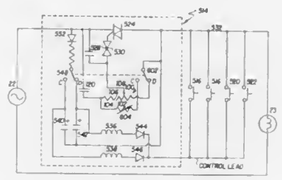
1. A multi-resonant converter for converting a DC input signal from a supply to a DC output signal to be imposed across a load, said device comprising:
- an input stage for receiving the DC input signal;
- an output stage for imposing said DC output signal across the load;
- an active switch and a passive switch interposed between said input and output stages; and
- reactive means for causing said active and passive switches to act together as a multi-resonant switch.

4,841,221

POSITION-SENSING CIRCUIT

Jonathan A. Barney, Whitehall, and Arjuna R. Karunaratne, Allentown, both of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Apr. 27, 1988, Ser. No. 186,517
Int. Cl.[4] G05F 5/02; G01R 27/02
U.S. Cl. 323—320 **15 Claims**



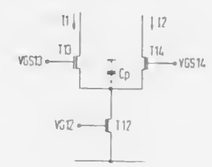
1. A bistable position-sensing circuit comprising:
- (a) an elongated first electrically-conductive element having first and second segments,
- (b) a second electrically-conductive element, movable along the length of said first element, while maintaining electrical contact with said first segment, said second segment, or both segments,
- (c) a first energy-storage element electrically connected to said second element, and
- (d) a second energy-storage element electrically connected to said first segment and to said first energy-storage element,
- whereby a time constant of said circuit undergoes a stepwise change when said second element is positioned to contact both segments of said first element.

4,841,222

SWITCHED CURRENT SOURCE

Rudolf Koch, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jan. 30, 1987, Ser. No. 9,251
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1986, 3603241
Int. Cl.[4] G05F 3/26
U.S. Cl. 323—311 **6 Claims**



1. Switched current source, comprising at least two branches, at least one MOS current source transistor connected in common to each of said at least two branches, and at least two MOS switching transistors each being connected in a respective one of said branches and simultaneously forming an additional current source transistor, said at least one current source transistor being connected as a respective cascode with each of said at least two switching transistors.

4,841,223

METHOD AND APPARATUS FOR MEASURING FIBER ORIENTATION ANISOTROPY

Gary A. Baum, and Charles C. Habeger, Jr., both of Appleton, Wis., assignors to The Institute of Paper Chemistry, Appleton, Wis.

Filed Jun. 17, 1987, Ser. No. 63,580
Int. Cl.[4] G01R 27/04; G01B 5/16
U.S. Cl. 324—58.5 A **16 Claims**

1. Apparatus for measuring fiber orientation anisotropy in a web of fibrous material that has a machine direction and a cross direction, the apparatus comprising:
- a waveguide having a first end and a second end and gripping means between said ends for insertion of a specimen of the web in a plane normal to the waveguide axis and alternately with its machine direction aligned in each of two orientations,
- a microwave signal generator for generating a test signal at a single, constant frequency,
- conduit means for conducting a generated microwave test signal from signal generator to said first end of said waveguide so as to propagate the microwave test signal from said first end to said second end with an electric field established in one of the perpendicular directions,
- detector means at said second end having a narrow band sensitivity for receiving a preferentially filtered constant frequency test signal propagated through said waveguide (1) with the waveguide empty of said specimen, (2) with the microwave signal attentuated by said specimen oriented in the first of said orientations and (3) with the specimen oriented in the second of said orientations, said detector means rectifying said received microwave signal

to produce an electrical signal proportional to the intensity of the microwave signal received thereby.

waveguide attenuator means disposed in said waveguide between said gripping means and said detector for preferentially filtering reflected waves from the propagated microwave test signal, and

metering means for receiving the electrical signal from said detector means and evaluating the intensity thereof.

4,841,224

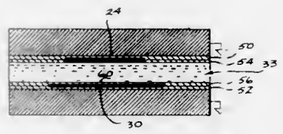
GAP WIDTH PROBE AND METHOD

James D. Chalupnik; Joseph L. Garbini, and Jens E. Jorgensen, all of Seattle, Wash., assignors to Washington Technology Center, Seattle, Wash.

Filed Nov. 10, 1987, Ser. No. 119,748

Int. Cl.[4] G01R *27/26*

U.S. Cl. 324—61 P **12 Claims**



1. A probe for use with detection circuitry for measuring the distance between two surfaces, comprising:

an inflatable bladder having means for forming an interior cavity, said means including first and second bladder sides that may be substantially adjacent and parallel to one another when said bladder is uninflated such that the probe thickness is minimized, said bladder being suitable for insertion between the surfaces;

means for inflating said cavity such that said first and second sides move away from one another, whereby said bladder can be inserted between the surfaces and inflated such that said sides are in contact with the surfaces; and

distance measuring means for measuring the distance between said sides when said cavity is inflated, to thereby determine the distance between the surfaces.

4,841,225

CAPACITIVE SENSOR FOR MEASURING A DISPLACEMENT

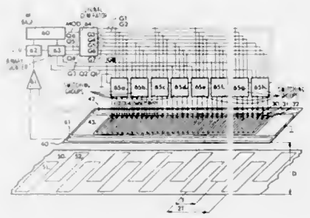
Hans U. Meyer, 42, rue de Lausanne, 1110 Morges, Switzerland

Filed Sep. 28, 1987, Ser. No. 102,042

Claims priority, application Switzerland, Nov. 13, 1986, 4535/86-7

Int. Cl.[4] G01R *27/26*

U.S. Cl. 324—61 R **2 Claims**



1. Capacitive sensor for measuring a displacement between a scale and a slide movable relative to one another and facing each other, the scale comprising a series of receiving electrodes having a pitch T along the direction of displacement, the slide comprising a series of emitting electrodes having a pitch T/N in the direction of displacement, characterized in that the series of emitting electrodes is electrically divided in M groups of N adjacent electrodes, signal generator means having, said outputs having ZN signal configurations, 2N outputs for generating on each group one of two signal distributions each having the same spatial period, the first signal distribution being that obtained by connecting N of the outputs of said signal generator means directly to said emitting electrodes, the other signal distribution being derived from the first signal distribution by switching groups connected between each group of electrodes and the outputs of said generator means, said switching groups shifting the first signal distribution along the direction of displacement, and a control circuit being provided for weighting each group and for switching each group from one signal distribution to the other, whereby when a signal distribution overlaps into an adjacent group following shifting, the distribution is governed by the weighting provided by said control circuit, thus providing preference between overlapped signal distributions.

4,841,226

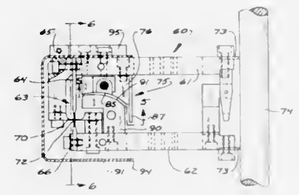
CAPACITIVE EXTENSOMETER WITH CURVED TARGET SURFACE

Harry R. Meline, Minnetonka, and Eric L. Paulsen, Wayzata, both of Minn., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Continuation-in-part of Ser. No. 893,799, Aug. 6, 1986. This application Oct. 1, 1987, Ser. No. 103,538

Int. Cl.[4] G01R *27/26;* **G01L** *1/00;* **G01B** *5/00*

U.S. Cl. 324—61 R **6 Claims**



1. A capacitive extensometer assembly comprising;

a first mounting arm member, and a second mounting arm member;

means for pivotally connecting said first and second mounting arm members together to form an extensometer assembly for permitting relative movement between first ends of the mounting arm members;

means at said first ends of the mounting arm members for engaging a specimen to be tested; and

a sensor mounted on the first and second mounting arm members to sense movement between the first and second mounting arm members, said sensor including two portions comprising a proximity detector member having an end surface for sensing proximity to an adjacent surface mounted on the first mounting member, and a target member mounted on the second mounting arm member, said proximity detector and target member having surfaces that face each other and which are spaced apart to form a gap when the first and second mounting arm members are in a reference position and wherein the spacing of the proximity detector and target increases as the first ends of the mounting arm members move apart, the surface of the proximity detector facing the target member surface being formed to be at least partially curved about an axis, which axis is offset from the pivot axis of relative pivotal movement of the first and second arm members so changes in the relative position between the first and second portions of the sensor change as the first mounting arm member and second mounting arm member move.

4,841,227

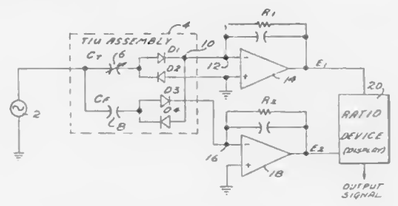
APPARATUS FOR THE RATIOMETRIC MEASUREMENT OF A QUANTITY OF LIQUID IN A TANK

Lawrence C. Maier, Middlebury, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Jun. 1, 1987, Ser. No. 55,846

Int. Cl.[4] G01R *27/26;* **G01F** *23/00*

U.S. Cl. 324—61 R **20 Claims**



1. Apparatus for measuring a quantity of a liquid in a tank, comprising:

first and second capacitive transducer means disposed in a tank and responsive to an AC signal for providing first and second measurement signals, said first measurement signal corresponding to said quantity of liquid in said tank, said second measurement signal corresponding to an empty tank;

first and second rectifier means coupled, respectively, to said first and second transducer means, for respectively receiving said first and second measurement signals and providing first and second current signals;

first current-to-voltage converter means having a first input coupled to said first and second rectifier means, for receiving said first current signal and a portion of said second current signal, and for providing a first voltage signal corresponding to said first and second measurement signals;

second current-to-voltage converter means, coupled to said second rectifier means, for receiving another portion of said second current signal, and for providing a second voltage signal corresponding to said second measurement signal; and

means for forming a ratio of said first and second voltage signals to provide an output signal indicative of said quantity of liquid in said tank.

4,841,228

APPARATUS FOR INDICATING THE RESISTIVE CHARACTERISTIC OF A CAPACITOR

Hitoshi Noguchi, and Hideki Wakamatsu, both of Tokyo, Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 10, 1987, Ser. No. 72,070

Claims priority, application Japan, Jul. 11, 1986, 61-163444

Int. Cl.[4] G01R *27/26*

U.S. Cl. 324—62 **5 Claims**

1. An apparatus for providing an indication of the resistive component of the impedance of a capacitor comprising:

a terminal to which a source of alternating current voltage is to be applied,

means for coupling a capacitor to be tested to said terminal so as to produce a first signal having resistive and capacitive components corresponding to the resistive and capacitive components of current flowing through the capacitor,

means coupled to said terminal for producing a second signal that is out of phase with the capacitive component of said first signal,

a first controllable signal dividing means for supplying at its output a selectable fraction of a signal applied to its input,

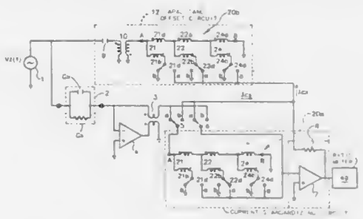
a second controllable signal dividing means for supplying at its output a selectable fraction of a signal applied to its input, said second controllable signal dividing means having its input coupled to receive said second signal,

an operational amplifier having an inverting input, a non inverting input and an output,

means for coupling said non inverting input of said amplifier to a point of reference potential,

a resistor having one end connected to the output of said amplifier and the other end connected to the output of said second signal dividing means,

switching means for coupling said first signal to said inverting input of said amplifier via said first signal dividing means, said output of said second controllable signal dividing means to said first inverting input of said amplifier and the other end said resistor to said inverting input of said amplifier when in a first position and for coupling said first signal to said inverting input of said amplifier, said first signal dividing means between the other end of said resistor and said inverting input of said amplifier and the output of said second signal dividing means to the junction of said resistor and said first signal dividing means when in a second position,



said first and second controllable signal dividing means being controlled so that said first and second signals are withint the same amplitude range, and

a phase detector coupled to said source of alternating current voltage and the output of said operational amplifier.

4,841,229

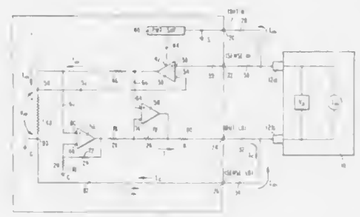
METHOD OF AND CIRCUIT FOR OHMMETER CALIBRATION

Larry E. Eccleston, Edmonds, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Dec. 2, 1987, Ser. No. 127,704

Int. Cl.[4] G01R *27/02*

U.S. Cl. 324—63 **9 Claims**



1. For an ohmmeter having an output consisting of first and second terminals, and first and second leads extending from said terminals to be connected to a load, current generator means for causing an ohmmeter current having a predetermined magnitude to flow in said leads and means for measuring

a voltage difference between said leads as a result of said current flowing therethrough to obtain a reading of the electrical resistance of said load:

a calibration circuit for calibrating said ohmmeter, comprising

input terminals to be connected to said first and second leads;

reference resistance means having a known value of resistance;

means for applying said ohmmeter current to said reference resistance means to provide to said ohmmeter a calibration reading corresponding to the resistance of said reference resistance means, wherein a voltage drop within said ohmmeter leads as a result of resistance distributed therein imparts an error to said calibration reading; and

means for compensating said calibration circuit for said voltage drop to eliminate said calibration reading error, comprising circuit means for conducting said current between said ohmmeter terminals and said reference resistance means, and not through said ohmmeter leads, electrically bypassing said ohmmeter leads.

4,841,230

DEVICE FOR MEASURING MOISTURE CONTENT IN GRAINS

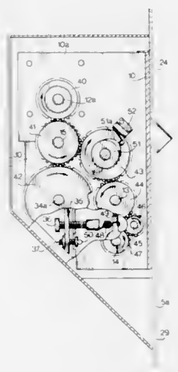
Naoto Sugimoto, Fukuroi, Japan, assignor to Shizuoka Seiki Co., Ltd., Fukuroi, Japan

Filed Sep. 2, 1988, Ser. No 239,911

Claims priority, application Japan, Sep 4, 1987, 62-135977[U]

Int. Cl.[4] G01N *27/04*

U.S. Cl. 324—65 R **2 Claims**



1. A device for measuring moisture content in grains, comprising:

a base supporting plate secured to a wall of the device;

a movable supporting plate pivotally mounted on the base supporting plate;

a first roller electrode rotatably mounted on the base supporting plate;

a second roller electrode rotatably mounted on the movable supporting plate adjacent the first roller electrode;

a spring provided between the base and movable supporting plates so as to press the second roller electrode against the first roller electrode;

a motor mounted on the base supporting plate;

a gear train operatively connected between the motor and the first and second electrodes, for driving the electrodes.

4,841,231

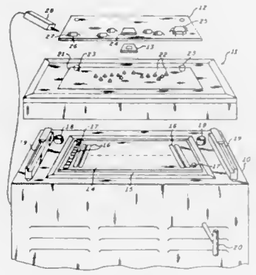
TEST PROBE ACCESSIBILITY METHOD AND TOOL

Ernest A. Angelucci, Kennett Square, Pa., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Oct. 30, 1987, Ser. No. 114,918

Int. Cl.[4] G01R *1/04, 31/02*

U.S. Cl. 324—73 R **7 Claims**



1. A method for verifying continuity between the pins of a potentially faulty component on a circuit card and the associated probes of an automatic test system where said pins are not accessible from the component side of the card and said probes are electrically isolated with respect to each other, each said probe providing a distinct electrical path to said automatic test system, comprising the steps of:

shorting said pins of said component with respect to each other by shorting means,

probing a point of said card on said component side thereof with a continuity probe of said system, where said point is in electrical contact through other than said shorting means with at least one of said pins of said component, and

performing a separate respective continuity test with respect to each of said associated probes using said continuity probe and said automatic test system, said continuity probe being in contact with said point for each said test.

4,841,232

METHOD AND APPARATUS FOR TESTING THREE STATE DRIVERS

Patricia K. Graham, and Robert R. Williams, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1988, Ser. No. 187,703

Int. Cl.[4] G01R *31/28*

U.S. Cl. 324—73 R **28 Claims**

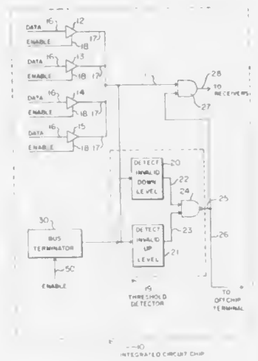
1. In a circuit having a data bus, the improvement comprising,

data driver means having a data input, a data output and an enable input,

means connecting the data output of said data driver means to said data bus, to thereby drive said data bus with a binary signal when said data driver means is enabled, or to present a high impedance to said data bus when said data driver means is disabled,

receiver means connected to said data bus, and

test means connected to said data bus operable to provide an output signal of one state that is indicative of a valid binary signal on said bus when said data driver means is enabled, and an output signal of an opposite state that is indicative of an invalid binary signal on said bus when said data driver means is disabled.



4,841,233

SEMICONDUCTOR INTEGRATED CIRCUIT ADAPTED TO CARRY OUT OPERATION TEST

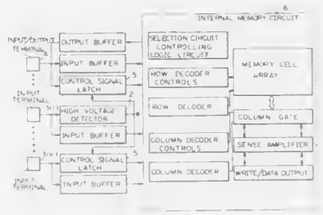
Masanobu Yoshida, Kawaguchi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 876,456, Jun. 20, 1986, abandoned. This application Mar. 24, 1988, Ser. No. 175,667

Claims priority, application Japan, Jun. 20, 1985, 60-134649

Int. Cl.[4] G01R *31/00;* **G11C** *7/00, 29/00*

U.S. Cl. 324—73 R **6 Claims**



1. A semiconductor integrated circuit device adapted to carry out a test operation, comprising:

an internal memory circuit operating under one of a normal mode and test mode, including:

a memory cell array;

a row decoder circuit coupled to said memory cell array;

a column gate circuit coupled to said memory cell array; and

a column decoder circuit coupled to said column gate circuit;

a plurality of input and output terminals connected to said internal memory circuit;

a high voltage detector circuit, connected to one of said input and output terminals, for outputting a control signal only when a predetermined voltage higher than a power source voltage is applied to one of said input and output terminals;

latch means, connected to said row and column decoders, to said internal memory circuit and to one of said input and output terminals not connected to said high voltage detector circuit, for latching an input signal in response to said control signal from said high voltage detector circuit;

buffer means, connected to said latch means and said internal memory circuit, for receiving input and output signals; and

selection means, coupled to said buffer means, for selecting one of the normal mode and test mode of said internal memory circuit in accordance with the input signal latched by said latch means.

4,841,234

VOLTAGE DETECTOR UTILIZING AN OPTICAL PROBE OF ELECTRO-OPTIC MATERIAL

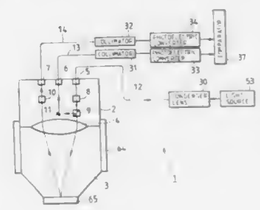
Shinichiro Aoshima, and Yutaka Tsuchiya, both of Shizuoka, Japan, assignors to Hamamatsu Photonics Kabushiki Kaisha, Shizuoka, Japan

Filed May 31, 1988, Ser. No. 200,563

Claims priority, application Japan, May 31, 1987, 62-137056

Int. Cl.[4] G01R *19/00, 31/00;* **G02F** *1/09*

U.S. Cl. 324—96 **12 Claims**



1. A voltage detector for detecting a voltage developing in a selected area of an object to be measured, comprising:

a light source for emitting a light beam;

a voltage-sensing part including first reflection means for reflecting an input light beam, and an electro-optic material whose refractive index changes according to said voltage developing in said selected area of said object;

splitting and extracting means for extracting a light beam with a first predetermined polarized component from a light beam introduced from said light source which is launched into said electro-optic material as said input light beam, and extracting an output light beam with a second predetermined polarized component from an output light beam emerging from said electro-optic material after reflecting from said first reflection means;

an optical means disposed between said voltage sensing part and said splitting and extracting means, for making light paths of said input light and said output light different from each other; and

detection means for determining said voltage developing in said selected area of said object on the basis of intensity of said output light beam with said second predetermined polarized component.

4,841,235

MRS CURRENT SENSOR

Jerome K. Hastings, Sussex; Bruce C. Beihoff, Glendale; Michael S. Baran, Wauwatosa; Mark A. Juds, New Berlin, and James E. Hansen, Oka Creek, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 11, 1987, Ser. No. 61,351

Int. Cl.[4] G01R *19/00, 33/02*

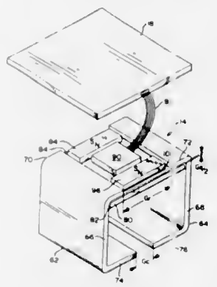
U.S. Cl. 324—117 R **28 Claims**

1. A current sensor for measuring current flow in an electrical conductor, said sensor comprising:

a magnetic flux concentrator comprising a magnetic pole structure substantially encircling the cross-sectional shape of said conductor and including two magnetic pole por-

tions spaced to provide a magnetic sensing region therebetween whereby electrical current flowing in said conductor will induce a magnetic field within said region;

means disposed to measure a component of magnetic field intensity along a principal axis within said sensing region and operative to generate an output signal as a function thereof; and



means operative to generate a component of magnetic field intensity within said region along an axis offset from said principal axis, said offset component having a characteristic magnitude substantially unaffected by flow of current in said conductor.

4,841,236

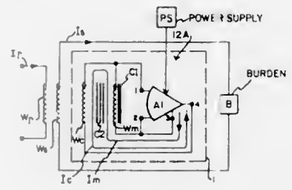
CURRENT RATIO DEVICE

Petar N. Miljanic, Gloucester, and William J. M. Moore, Ottawa, both of Canada, assignors to Canadian Patents and Development Limited-Societe Canadienne Des Brevets Et D'Exploitation Limitee, Ottawa, Canada

Filed Mar. 22, 1988, Ser. No. 171,765

Int. Cl.[4] G01R *1/20*

U.S. Cl. 324—127 **21 Claims**



1. A device for use in constructing an alternating current, current transformer, said device comprising

(a) a first magnetic core,

(b) a second magnetic core,

(c) a measuring winding having Nm turns electromagnetically coupled with the first core but not with the second core,

(d) a compensating winding having Nc turns electromagnetically coupled with both cores,

(e) an amplifier having an input and an output,

(f) said input being connected to receive the waveform across the measuring winding,

(g) said output being connected to the compensating winding to provide a compensating current Ic through the conpensating winding equal to a magnetizing current Iμ required to magnetize the second core, and

(h) said output being connected to the measuring winding to provide a measuring current Im through the measuring winding in a direction opposite to that of the compensating current and equal to

$$\frac{IcNc}{Nm},$$

whereby, when primary and secondary windings are electromagnetically coupled with the cores to form an alternating current, current transformer and the secondary winding is connected to a burden, the magnetizing current Iμ for such transformer is provided by the device.

4,841,237

CURRENT-MEASURING DEVICE

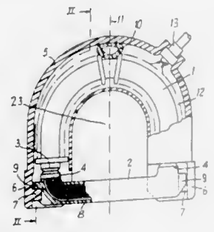
Bernard Landre, Paris, France, assignor to Universal Technic, Paris, France

Filed Aug. 7, 1987, Ser. No. 82,543

Claims priority, application France, Aug. 11, 1986, 86 11586

Int. Cl.[4] G01R *19/00, 1/04*

U.S. Cl. 324—127 **4 Claims**



1. A current-measuring device comprising an annular magnetic circuit having separate first and second magnetic circuit portions with ends suitable for coming face-to-face to form a closed magnetic circuit, a housing surrounding at least the first portion of the magnetic circuit, magnetic flux detection means for detecting a magnetic flux in the magnetic circuit, and locking means for locking the two magnetic circuit portions against each other, wherein said locking means include fastening portions of the housing extending beyond the ends of the first magnetic circuit portion on respective outer sides thereof, and wherein said second magnetic circuit portion is mounted to pivot about pivot means relative to the fastening portions between a first position in which the ends of the second magnetic circuit portion are not face-to-face with the ends of the first magnetic circuit portion and where the second magnetic circuit portion is laterally displaceable for the purpose of disengaging from the pivot means, and a second position where the second magnetic circuit portion has its ends pressed against the ends of the first magnetic circuit portion and where the second magnetic circuit portion is immobilized, the device further including means to enable the ends of the first magnetic circuit portion to move relative to the pivot means.

4,841,238

GAUGE DRIVING SYSTEM

Barry Birch, Abbeyfeale, Ireland, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Dec. 15, 1987, Ser. No. 133,078

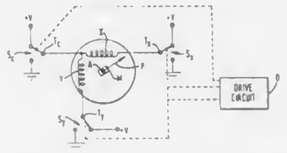
Claims priority, application United Kingdom, Dec. 17, 1986, 8630086

Int. Cl.[4] G01R *1/20*

U.S. Cl. 324—144 **11 Claims**

1. In an air-core gauge comprising first and second magnetic field-generating coils each with first and second ends, a first connection point connected to the first end of the first coil and to the first end of the second coil, second and third connection

points at the second ends of the respective coils, and a rotatably-mounted pointer means within the magnetic fields generated by the two coils having a reference position: a driving system comprising means providing two signal levels, switching means for selectively connecting each of said connection points to either of said two signal levels, and driving means for controlling said switching means so that one of said connection



points is connected alternately to said two signal levels with variable duty cycle to turn said pointer means through a corresponding angle from said reference position, wherein said switching means and driving means serve, for any given angle of said pointer means relative to said reference position, to connect only one of said connection points alternately to said two signal levels whilst at the same time maintaining each of the other connection points at either of the two signal levels.

4,841,239

METHOD AND MEASURING INSTRUMENT FOR IDENTIFYING THE DIFFUSION LENGTH OF THE MINORITY CHARGE CARRIERS FOR NON-DESTRUCTIVE DETECTION OF FLAWS AND IMPURITIES IN SEMICONDUCTOR CRYSTAL BODIES

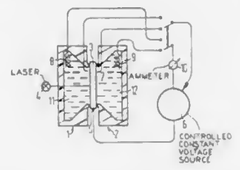
Helmut Foell, and Volker Lehmann, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 20, 1988, Ser. No. 197,603

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1987, 3719921

Int. Cl.[4] G01R *31/26*

U.S. Cl. 324—158 R **12 Claims**



1. A method for identifying the diffusion length (L) of minority charge carriers and their topical fluctuations and for non-destructive detection of flaws and impurities in a semiconductor crystal body, comprising the steps of:

(a) placing the semiconductor crystal body between two electrolyte-filled measuring chamber halves so that a front side and a backside of the semiconductor crystal body are each in contact with electrolyte contained in both measuring chamber halves;

(b) connecting the semiconductor crystal body to a voltage source via an ohmic contact and applying a voltage between the backside of the semiconductor crystal body and an electrode of the measuring chamber half connected to the backside of the semiconductor crystal body so that a blocking space charge zone is formed at the backside of the semiconductor crystal body;

(c) irridating with light the front side of the semiconductor crystal body;

(d) measuring the photocurrent I_G of the minority charge carriers occurring at the backside during the irradiation,

(e) applying a voltage between the front side of the semiconductor crystal body and an electrode of the measuring chamber half connected to the front side of the semiconductor crystal body so that a blocking space charge zone is formed at the front side of the semiconductor crystal body;

(f) measuring the photocurrent I_0 of substantially generated minority charge carriers occurring at the front side of the semiconductor crystal body upon irradiation;

(g) calculating the diffusion length (L) from the mathematical equation:

$$I_G/I_0 = \frac{\alpha^2 \cdot L^2}{1 - \alpha^2 L^2} \cdot \frac{-2}{\exp(-D/L) + \exp(+D/L)}$$

where α is the absorption coefficient and D is the specimen thickness.

4,841,240

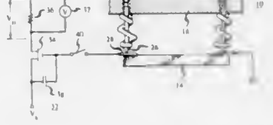
METHOD AND APPARATUS FOR VERIFYING THE CONTINUITY BETWEEN A CIRCUIT BOARD AND A TEST FIXTURE

Ching-Wen Hsue, and Wha-Joon Lee, both of Lawrenceville, N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 29, 1988, Ser. No. 149,829

Int. Cl.[4] G01R *1/04, 31/02*

U.S. Cl. 324—158 P **8 Claims**



5. A circuit for indicating whether each of a pair of conductive members is in electrical contact with each of a pair of interconnected nodes on a body, even when the nodes are connected by a high-impedance circuit path, characterized in that said circuit comprises:

a field effect transistor having a drain, gate and source;

a capacitor coupled between the gate and source of the field effect transistor;

means for selectively coupling the gate of the FET to one of the pair of conductive members while the other of the pair of members is coupled to a first potential; and

a resistor coupled in series with the drain-to-source portion of the field effect transistor between circuit ground and a voltage source of a potential less than said first potential, the resistor carrying a voltage thereacross whose magnitude changes when the FET becomes conductive which occurs when each of the conductive members is in contact with a separate one of the interconnected nodes, notwithstanding the impedance of the circuit path connecting the nodes.

4,841,241

TESTING DEVICE FOR BOTH-SIDED CONTACTING OF COMPONENT-EQUIPPED PRINTED CIRCUIT BOARDS

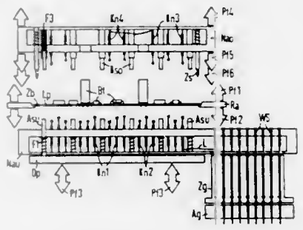
Wolfgang Hilz, Munich; Rudolf Schuster, Heimstetten, and Hans Schauflinger, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 21, 1987, Ser. No. 75,994

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1986, 3626693

Int. Cl.[4] G01R *1/04, 1/073*

U.S. Cl. 324—158 F **20 Claims**



17. A testing device for component equipped printed circuit boards having an underside and an upperside, comprising:

a stationary lower needle adapter carrying a plurality of lower pressure rams and carrying resilient lower contact needles arranged test-specimen-associated for contacting the underside of the printed circuit board;

a plurality of resilient upper pressure rams arranged test-specimen-associated for engaging the upperside of the printed circuit boards;

a vertically adjustable, relative to said lower needle adapter, upper needle adapter carrying said upper pressure rams, and carrying resilient upper contact needles arranged test-specimen-associated for contacting the upperside of the printed circuit board; and

said plurality of non-resilient lower pressure rams arranged test-specimen-associated for engaging the underside of the printed circuit board.

4,841,242

METHOD FOR TESTING CONDUCTOR NETWORKS

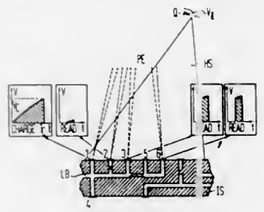
Matthias Brunner, Kirchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 29, 1988, Ser. No. 161,758

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1987, 3712176

Int. Cl.[4] G01R *31/00, 31/02*

U.S. Cl. 324—158 R **8 Claims**



1. A method for testing conductor networks comprising the steps of, changing the charge condition of a first point (1) of the conductor network by irridating with a first particle beam (PE), irridating with the first or a second particle beam (PE) a second point (2) of the conductor network, detecting the charge condition of the second point (2) by detecting the secondary particles triggered at said second point, and irridating said first and second points (1, 2) of the conductor network with a third particle beam (HS) which has a particle energy (E_{HS}) so as to compensate for losses occurring in the conductor network.

4,841,243

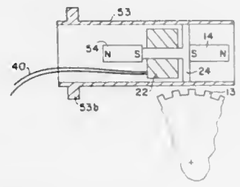
SIDE-LOOKING SPEED SENSOR

Eugene R. Bishop, Fort Lauderdale; Matthew L. Schneider, Margate, both of Fla., and Hermann Rosshirt, Bristol, Conn., assignors to North American Philips Corp., New York, N.Y.

Continuation-in-part of Ser. No. 718,307, Apr. 1, 1985, abandoned. This application Jul. 7, 1986, Ser. No. 882,801

Int. Cl.[4] G01P *3/48;* **H02K** *17/42*

U.S. Cl. 324—174 **18 Claims**



12. An arrangement for detecting the speed of a gear or the like, said arrangement comprising

a gear or the like having a plurality of magnetizable elements about the circumference thereof, said gear having an axis of rotation located centrally of said elements,

a speed sensor comprising an elongated pole piece of soft magnetic material defining an axis therethrough between opposed ends thereof, a coil surrounding said elongated pole piece substantially coaxially therewith, a disc-like pole piece extending radially from said elongated pole piece coaxially therewith and having a larger diameter than said coil, and an axially magnetized permanent magnet substantially coaxial with and abutting one of said pole pieces, said device being oriented adjacent the periphery of said gear and transversely thereof so that said disc-like pole piece is proximate to the periphery of said gear and said elements move substantially perpendicular to the plane of said disc-like pole piece when said gear and said disc-like pole piece are most proximate, a tubular housing of non-magnetic material and sized to closely receive said disc-like pole piece therein, said housing receiving said pole pieces coaxially therein.

4,841,244

METHOD AND APPARATUS FOR ON-SINE MONITORING OF WEAR IN MACHINERY

Keith W. Chambers, Pinawa, Canada, assignor to Her Majesty the Queen in Right of Canada as Represented by the Minister of National Defence, Canada

Filed Sep. 18, 1986, Ser. No. 908,731

Claims priority, application Canada, Oct. 11, 1985, 492,775

The portion of the term of this patent subsequent to Mar. 17, 2004, has been disclaimed.

Int. Cl.[4] G01N *27/74;* **G01R** *33/12;* **G01F** *1/708;* **G01P** *5/18*

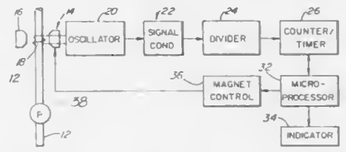
U.S. Cl. 324—204 **32 Claims**

1. A device for producing an electrical signal which is proportional to the concentration of ferromagnetic particulate material in a fluid stream, said device comprising, in combination:

a sensing coil arranged to form the inductance voil of and connected to a radio frequency oscillator arranged to produce an electrical signal at a base frequency;

magnetic trap means for producing a magnetic field; and

support means for supporting said sensing coil and said magnetic trap means in juxtaposition to one another such that, when said coil is disposed within or proximate said fluid stream and electricaly connected said radio frequency oscillator, energization of said magnetic trap means causes ferromagnetic particulate material proximate said coil to be attracted toward said coil resulting in a deviation of the frequency of said signal from said base frequency proportional to the concentration of ferromagnetic particulate material in said fluid stream.



4,841,245

DISPLACEMENT SENSOR HAVING MULTIPLEXED DUAL TANK CIRCUITS

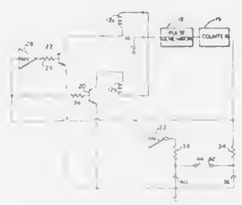
David Fiori, Jr., Yardley, Pa., assignor to Sensor Technologies, Inc., Pennsauken, N.J.

Continuation of Ser. No. 821,982, Jan. 29, 1986, which is a continuation-in-part of Ser. No. 700,081, Feb. 11, 1985, abandoned. This application Jan. 29, 1987, Ser. No. 8,639

The portion of the term of this patent subsequent to May 5, 2004, has been disclaimed.

Int. Cl.[4] G01B *7/14*

U.S. Cl. 324—208 **11 Claims**



1. Sensor apparatus comprising:

a sensor having first and second tank circuits and a movable metal member;

means for moving said movable metal member, relative to a portion of each of said first and second tank circuits, in accordance with changes in a parameter being monitored, to change the relative resonant frequencies of said first and second tank circuits; and

circuit means, responsive to changes in the relative resonant frequencies of said first and second tank circuits, for developing indications of changes in said parameter being monitored, said circuit means including;

(a) a pulse generator for producing a first series of pulses having a repetition rate related to the resonant frequency of said first tank circuit and a second series of pulses having a repetition rate related to the resonant frequency of said second tank circuit;

(b) a counter, responsive to said first and said second series of pulses, for counting a prescribed number of pulses of said first series and a prescribed number of pulses of said second series and for developing a first counter output pulse having a duration related to the time required to count said first series prescribed number of pulses and a second counter output pulse having a duration related to the time required to count said second series prescribed number of pulses;

(c) tank circuit switching means, responsive to said counter output pulses, for connecting said first tank circuit to said pulse generator for the duration of said first counter output pulse and for connecting said second tank circuit to said pulse generator for the duration of said second counter output pulse; and

(d) means, responsive to said counter output pulses, for developing an output indication of the relative time durations required for counting said prescribed number of pulses of said first series of pulses and said prescribed number of pulses of said second series of pulses.

4,841,246

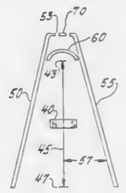
MULTITURN SHAFT POSITION SENSOR HAVING MAGNET MOVABLE WITH NONROTATING LINEAR MOVING NUT

Mark A. Juds, New Berlin, and Bruce C. Beihoff, Glendale, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 29, 1987, Ser. No. 139,218

Int. Cl.[4] G01B *7/30*

U.S. Cl. 324—208 **15 Claims**



1. A multiturn shaft position sensor for detecting the position of a multiturn shaft comprising:

a multiturn screw disposed to turn with the multiturn shaft;

a nonrotating nut mounted on said multiturn screw for linear movement dependent upon the turning of said multiturn screw;

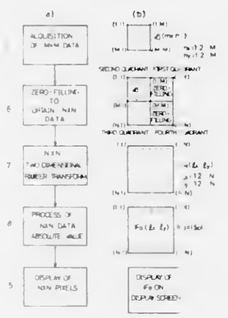
a magnet disposed upon said nonrotating nut for linear movement along a predetermined movement path from a first end to a second end with said linear movement of said nonrotating nut;

a pair of flux plates formed of a material of high magnetic permeability disposed on opposite sides of said movement path of said magnet having a narrow gap therebetween proximate to said first end of said movement path;

a magneto resistive structure disposed in said narrow gap between said pair of flux plates having an electrical resistance dependent upon the magnetic flux therethrough; and

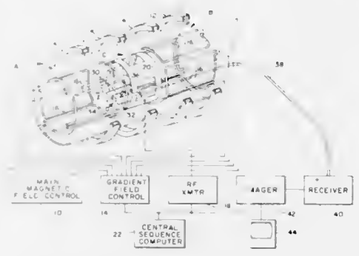
an electrical circuit connected to said magneto resistive structure for measuring said electrical resistance of said magneto resistive structure and generating a position signal indicative of the position of the multiturn shaft proportional to said electrical resistance of said magneto resistive structure.

4,841,247
METHOD FOR INTERPOLATIVE EXTENSION OF NUCLEAR MAGNETIC RESONANCE IMAGE
Hidenobu Itagaki, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 912,750, Sep. 26, 1986. This application May 31, 1988, Ser. No. 203,552
Claims priority, application Japan, Oct. 15, 1985, 60-229051
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 **11 Claims**



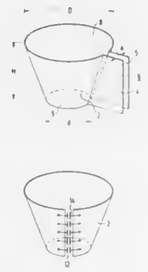
1. A method for extending a two-dimensional nuclear magnetic image array filled with sampling data obtained by the step of two-dimensionally sampling a nuclear magnetic resonance signal representative of a predetermined characteristic of specific atomic nuclei in a test piece, comprising the steps of: creating a two-dimensional extension array which is larger than said image array and which has a portion equal in size to and containing said sampling data from said image array; zero filling all of said extension array other than said portion thereof; and thereafter two-dimensionally Fourier-transforming said extension array.

4,841,248
TRANSVERSE FIELD LIMITED LOCALIZED COIL FOR MAGNETIC RESONANCE IMAGING
Mehrdad Mehdizadeh, University Hts.; John L. Patrick, Solon, and George J. Misic, Novelty, all of Ohio, assignors to Picker International, Inc., Highland Hts., Ohio
Continuation-in-part of Ser. No. 931,726, Nov. 17, 1986, Pat. No. 4,753,738, which is a continuation-in-part of Ser. No. 765,708, Aug. 14, 1985, Pat. No. 4,793,356. This application Aug. 17, 1987, Ser. No. 85,277
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—318 **20 Claims**



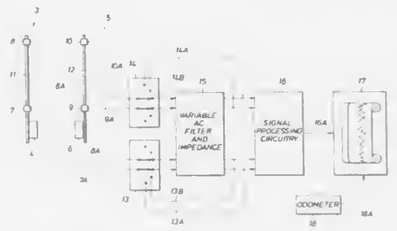
1. A magnetic resonance apparatus comprising:
a main magnetic field generating means for generating a main magnetic field along a main field axis through an examination region;
a magnetic resonance excitation means for exciting magnetic resonance of nuclei of a subject in the examination region;
a localized coil assembly for receiving radio frequency signals from the resonating nuclei, the coil assembly including:
an inner conductor defining a first current path along the main field axis and closely adjacent a surface of the subject,
an outer conductor defining a current path along the main magnetic field axis, generally parallel to a surface of the subject and displaced further from the subject than the inner conductor,
a connecting means for electrically connecting adjacent first ends of the inner and outer conductors; and,
a coupling means connected adjacent second ends of the inner and outer conductors for interconnecting the conductors with a cable extending to a receiver.

4,841,249
TRUNCATED CONE SHAPED SURFACE RESONATOR FOR NUCLEAR MAGNETIC RESONANCE TOMOGRAPHY
Wilhelm Duerr, Erlangen; Hartwig Ingwersen, Uttenreuth; Norbert Krause, Heroldsbach, and Ralph Oppelt, Uttenreuth, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Oct. 6, 1987, Ser. No. 105,003
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, 3636660
Int. Cl.[4] H01P *7/00*
U.S. Cl. 324—318 **3 Claims**



3. A surface resonator for nuclear magnetic resonance tomography comprising:
a ribbon-shaped electrical conductor having upper and lower edges arranged in a loop having spaced ends forming a gap in said loop, said conductor having a shape conforming substantially to the surface of a truncated cone with said upper edge of said conductor surrounding a first area and said lower edge of said conductor surrounding a second area different in size from said first area to permit differently sized areas of a patient to be examined using said surface resonator; and
capacitive means electrically connected to said spaced ends of said conductor and having a capacitance for defining the resonant frequency of said resonator.

4,841,250
PASSIVE GEOPHYSICAL SURVEY APPARATUS BASED UPON THE DETECTION OF THE DC COMPONENT OF THE VERTICAL ELECTRICAL POTENTIAL OF NATURAL EARTH CURRENTS
John R. Jackson, Englewood, Colo., assignor to J. R. Jackson and A. M. (Andy) Arismendi, Jr., Gaithersburg, Md.
Filed Jan. 24, 1986, Ser. No. 821,967
Int. Cl.[4] G01V *3/165, 3/08*
U.S. Cl. 324—349 **3 Claims**

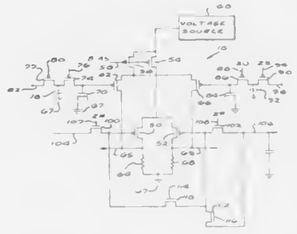


1. An apparatus for performing passive geophysical measurements as a function of the natural Earth currents, said apparatus comprising:
(a) at least one pair of vertically spaced non-polarized electrodes wherein each of said at least one pair of electrodes consist essentially of
(1) a lower non-polarized electrode spaced above the Earth and within the lower atmosphere adjacent thereto and
(2) an upper non-polarized electrode arranged within said lower atmosphere and vertically positioned above said lower electrode,
(b) circuit means electrically connected to said at least one pair of electrodes for sensing an electrical potential occurring between each pair of said at least one pair of electrodes as a function of said natural Earth currents adjacent said at least one pair of electrodes and for generating an electrical signal proportional thereto, and
(c) AC filtering means electrically connected to said circuit means for receiving said electrical signal, said AC filtering means filtering out the AC component of said electrical signal leaving the DC component thereof and out-putting a DC signal, and
(d) measuring means electrically connected to said AC filtering means for receiving, measuring and indicating said DC signal, said DC signal providing an indication of the lithological character of adjacent Earth materials as a function of the DC component of said electrical potential.

4,841,251
METHOD OF GENERATING A VOLTAGE WITH A TRIANGULAR SHAPE FROM A SAWTOOTH WAVEFORM
Uwe Hartmann, and Fritz Ohnemus, both of Villingen-Schwenningen, Fed. Rep. of Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen, Fed. Rep. of Germany
Filed Jan. 7, 1988, Ser. No. 142,560
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3701927
Int. Cl.[4] H03K *5/08, 4/10*
U.S. Cl. 328—36 **11 Claims**

1. A method for generating a voltage waveform having a triangular shape, comprising the steps: supplying a first voltage waveform having a sawtooth shape; supplying a second voltage waveform having a sawtooth shape opposite in phase to the sawtooth shape of said first voltage waveform, forming horizontal components on said second voltage waveform during predetermined intervals of said second voltage waveform, said first voltage waveform and said second voltage waveform having equal peaks; and adding said first voltage waveform to said second voltage waveform with said horizontal components thereon for generating said voltage waveform with triangular shape.

4,841,252
SYSTEM FOR COMPENSATING FOR OFFSET VOLTAGES IN COMPARATORS
Perry W. Lou, Carlsbad, Calif., assignor to Brooktree Corporation, San Diego, Calif.
Filed Aug. 5, 1987, Ser. No. 81,910
Int. Cl.[4] H03F *1/02*
U.S. Cl. 330—9 **30 Claims**



1. In combination for providing a correction in a comparator to compensate for an offset voltage produced in the comparator,
an amplifier having a first input for a reference voltage and a second input for a variable voltage and having an output and having characteristics to produce the offset voltage,
means for introducing the reference voltage to the first input,
means for introducing the variable voltage to the second input to obtain the production in the amplifier of the offset voltage and a voltage representative of the difference between the variable and reference voltages,
means for periodically shorting the first and second inputs to provide for the introduction of the reference voltage to both inputs,
means for determining the offset voltage from the amplifier when the first and second inputs are shorted, and
means for introducing the offset voltage to the output of the amplifier when the reference voltage is introduced to the first input and the variable voltage is introduced to the second input, the offset voltage being introduced to the output of the amplifier in a polarity for compensating for the offset voltage produced in the comparator.

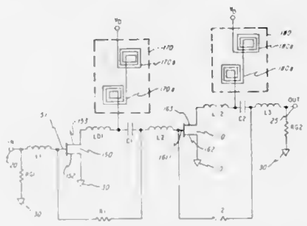
VOL 1103 ISS 3 JE 20 1989 UMI

4,841,253

MULTIPLE SPIRAL INDUCTORS FOR DC BIASING OF AN AMPLIFIER

Carl A. Crabill, Richardson, Tex., assignor to Harris Corporation, Melbourne, Fla.

Filed Apr. 15, 1987, Ser. No. 38,377
Int. Cl.[4] H03F *3/60*
U.S. Cl. 330—277 **6 Claims**



1. An amplifying means having an input circuit adapted for receiving electromagnetic wave signals and an output circuit, said amplifying means comprising:

a plurality of amplifying stages cascadingly connected between said input circuit and output circuit of said amplifying means wherein said plurality of amplifying stages provides a signal path between said input circuit and output circuit, wherein each of said amplifying stages includes an input portion and an output portion; and

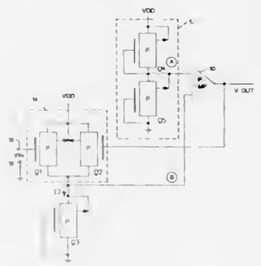
inductive means connected outside said signal path and between each output portion of said amplifying stages and a DC bias, said inductive means including at least two spiral inductors connected in series wherein each of said spiral inductors includes a predetermined inductance for providing a cumulative impedance between the respective output portions of said amplifying stages and said DC bias for isolating said electromagnetic wave signals from said DC bias in a frequency band of 1.5 GHz and 3.0 GHz.

4,841,254

CMOS PRECISION GAIN AMPLIFIER

Eugene R. Bukowski, Cary, and Charles R. Hoffman, Raleigh, both of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 29, 1987, Ser. No. 55,651
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—253 **15 Claims**



1. An improved amplifier circuit arrangement for integrating with other components on a semiconductor chip said amplifier circuit arrangement comprising:

a power supply having a single voltage supply rail;

an amplifier circuit means having an inverting input terminal, a non-inverting input terminal and an output terminal;

a voltage divider network for generating a reference biasing voltage coupled to the inverting input;

a gain settng network including only active circuit devices for setting the gain of said amplifier; said gain setting network having a first node coupled to the single voltage supply rail, a second node coupled to the non-inverting input terminal, a first control terminal coupled to an input signal source and a second control terminal coupled to the output terminal; and

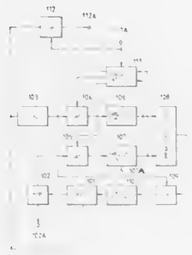
a first FET device having a source and a substrate terminal coupled to the second node and a control terminal and drain terminal coupled to a reference potential.

4,841,255

FREQUENCY SYNTHESIZER

Motoi Ohba, and Mitsuo Makimoto, both of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 23, 1988, Ser. No. 210,456
Claims priority, application Japan, Jun. 24, 1987, 62-156814
Int. Cl.[4] H03L *7/18*
U.S. Cl. 331—14 **10 Claims**



1. A frequency synthesizer comprising:

(a) a first oscillator outputting a signal having a reference frequency;

(b) a first frequency divider dividing the frequency of the output signal from the first oscillator;

(c) a second oscillator outputting a signal having a target frequency;

(d) a second frequency divider dividing the frequency of the output signal from the second oscillator;

(e) a phase comparator comparing phases of output signals from the first and second frequency dividers;

(f) an integrator integrating an output signal from the phase comparator and controlling the second oscillator in accordance with the integration of the output signal from the phase comparator;

(g) a first gate connected between the first oscillator and the first frequency divider;

(h) a second gate connected between the second oscillator and the second frequency divider;

(i) a third gate connected between the phase comparator and the integrator; and

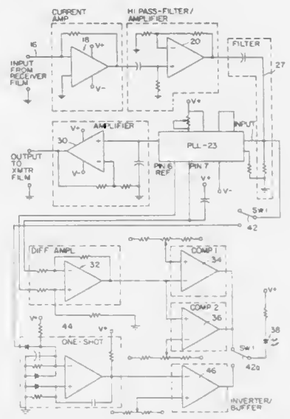
(j) means for controlling the first gate, the second gate, and the third gate in accordance with the output signals from the first and second frequency dividers and with an external synthesizer control signal.

4,841,256

PIEZOELECTRIC PHASE LOCKED LOOP CIRCUIT

Raymond F. Gastgeb, Doylestown, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 20, 1987, Ser. No. 110,260
Int. Cl.[4] G01F *23/22*; G01L *1/16*; H03L *7/08*
U.S. Cl. 331—25 **8 Claims**



1. A piezoelectric phase-lock loop circuit comprising:

(a) a structural member having a piezoelectric transmitter film and a piezoelectric receiver film adhered thereto, said transmitter film producing electro-mechanical vibrations in said structural member upon activation by an alternating current input signal, said receiver film producing alternating output signals in response to vibration of said structural member;

(b) voltage controlled oscillator means for generating said alternating input signal;

(c) phase comparator means for comparing the phase angle of the signal produced by said receiver film with the phase angle of said alternating input signal and for outputting a signal corresponding to the differential in phase angle;

(d) low pass filter means connected to the output of said phase comparator means for inputting a dc error signal corresponding to said phase differential to said voltage controlled oscillator means, said dc error signal forcing the frequency of said voltage controlled oscillator means to track said output signal whereby a predetermined phase relationship is maintained between said output and input signals.

4,841,257

HIGH-SPEED SAMPLING PHASE DETECTOR FOR CLOCK AND DATA RECOVERY SYSTEM

Larry R. Morrison, and Vaughn J. Jenkins, both of Bountiful, Utah, assignors to Unisys Corporation, Blue Bell, Pa.

Filed Mar. 28, 1988, Ser. No. 173,799
Int. Cl.[4] H03D *13/00*; H03L *7/08*
U.S. Cl. 331—26 **13 Claims**

1. A high-speed sampling phase detector for clock and data recovery systems, comprising:

differentiating means for receiving coded input data signals and for generating sampling pulses,

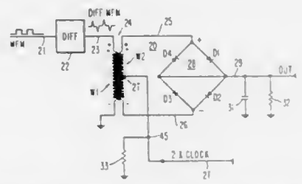
high-speed transformer means having a primary winding coupled to the sampling pulse output of said differentiating means,

high-speed fullwave diode bridge rectifying means,

a secondary winding of said transformer means being coupled to the input of said diode bridge rectifying means,

clock means having clock signals whose rates is at twice the data rate,

said clock means being connected as an input to a center tap of said secondary winding of said transformer means,



error signal means coupled to the output of said bridge rectifying means,

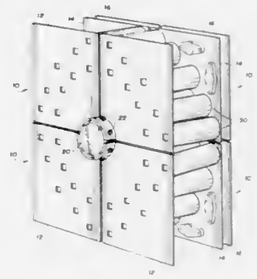
said sampling pulses being employed to sample portions of said clock signals to provide a D.C. error signal at the output of said bridge rectifying means.

4,841,258

METHOD FOR PACKAGING A MICROWAVE TUBE MODULATOR

Dan Ehrenhalt, Buffalo, and George R. Giles, Getzville, both of N.Y., assignors to LTV Aerospace & Defense Co., Dallas, Tex.

Filed Feb. 16, 1988, Ser. No. 156,175
Int. Cl.[4] H03K *7/00*
U.S. Cl. 332—9 R **38 Claims**



1. A method for packaging into an effective module components, particularly power transistors, in the primary circuit of a microwave tube modulator output transformer to minimize electrical resistance and inductance in the primary circuit, the process comprising the steps of:

connecting a first plate to a first end of the microwave tube modulator output transformer primary, and connecting said first plate to a source of positive voltage;

mounting a second plate in spaced apposition to said first plate, and connecting said second plate to ground;

mounting a third plate in progressively spaced apposition to said first plate and said second plate, and connecting said third plate to a second end of the output transformer primary; and

mounting a plurality of primary circuit power transistors on said third plate at minimum practical distances from the second end of the output transformer primary such that the common element of each of said power transistors is connected to said third plate and therefore effectively connected to the second end of the output transformer primary, said first plate providing a low-resistance path for current flowing between the output transformer primary and the source of positive voltage and said third

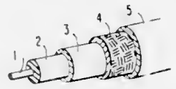
plate providing a low-resistance path for current flowing between the respective drain elements of said power transistors and the output transformer primary, said first and said third plates also minimizing inductance in the output transformer primary circuit.

4,841,259

WAVE PROPAGATION STRUCTURES FOR ELIMINATING VOLTAGE SURGES AND ABSORBING TRANSIENTS

Ferdy Mayer, 92-98 boulevard Victor Hugo, 92115 Clichy, France

Filed Sep. 16, 1987, Ser. No. 97,014
Claims priority, application France, Sep. 13, 1986, 86 13093
Int. Cl.⁴ H01P *1/22, 3/06, 3/08*
U.S. Cl. 333—17.2 **22 Claims**



1. Structure adapted to propagate an electromagnetic wave, comprising: at least one conductive member, and an adjacent dielectric material distributed in a wave propagation direction, through which said wave passes, said dielectric material exhibiting non-linear conductivity such that it is substantially non-conductive at a rated applied voltage of the structure, and substantially conductive at any abnormally high applied voltage, said distributed dielectric material comprising a granular, conductive polycrystaline material having thin interstitial, substantially insulating layers disposed between grains of said polycrystaline material.

4,841,260

HALF WAVE PLATE

William F. Call, Bellingham, Mass., assignor to Epsco, Incorporated, Hopkinton, Mass.

Filed Jan. 14, 1987, Ser. No. 3,207
Int. Cl.⁴ H01P *1/165*
U.S. Cl. 333—21 A **2 Claims**

1. A microwve device comprising a member defining an axial circular waveguide wall, said member also defining a pair of cavities positioned on opposite longitudinal sides of said waveguide wall a plurality of slots in the wall between said circular waveguide and each of said cavities, said cavities having two side broad walls, two narrow end walls and a top wall opposite said slots in width than the width of said side walls, and means for supporting said member for rotation.

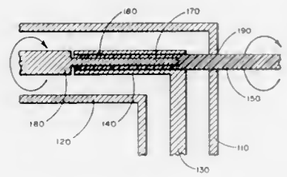
4,841,261

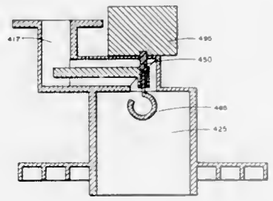
MICROWAVE ROTARY JUNCTION WITH EXTERNAL ROTARY ENERGY COUPLING

Eugene P. Augustin, 2713 Lemon Tree La., Orlando, Fla. 03209

Filed Sep. 1, 1987, Ser. No. 91,710
Int. Cl.⁴ H01P *1/06*
U.S. Cl. 333—21 A **8 Claims**

1. A microwave rotary junction with mechanical energy coupling means comprised of a first, stationary, TEM type transmission line and a second TEM type transmission line having a rotatable center conductor, said rotatable center conductor having a first end and a second end and said rotatable center conductor being choke coupled to a stationary conductor of said first TEM transmission line so that said first end extends beyond said stationary conductor of said first transmission line and said second end is an open circuit on said second coaxial TEM line and wherein said rotatable center





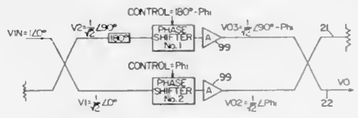
conductor is connected by a dielectric rod extending from said second end of said rotatable center conductor to the outside of said first transmission line to form a drive for performing at least one of the following energy coupling means: a- driving said rotatable transmission line conductor by external means; and b- driving an external device by said rotatable transmission line conductor.

4,841,262

RADIO FREQUENCY POWER MODIFICATION WITHOUT PHASE SHIFT

Michael Lomangino, Dix Hills, N.Y., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jul. 24, 1986, Ser. No. 888,676
Int. Cl.⁴ H01P *1/22, 5/12*
U.S. Cl. 333—81 R **2 Claims**



1. A microwave circuit for controlling the level of radio frequency power without a phase shift comprising:

input and output hybrid elements for coupling power into and out of said circuit and into and out of first and second channels for conduction equal amounts of power between said input and output hybrid elements;

first and second adjustable phase shift element, in corresponding ones of said first and second channels, for shifting the phase of power travelling therethrough by equal and opposite amounts, whereby the amplitude of power coupled out of said hybrid element may be varied by adjustment of the phase shift, characterized in that:

each of said first and second channels consists of a single conductive path for microwave power between said input and output hybrid element

wherein each of said first and second paths exclude hybrid elements for splitting power;

one of said conductive paths includes a phase shifter set to shift the phase of power passing therethrough by a quantity phi; and

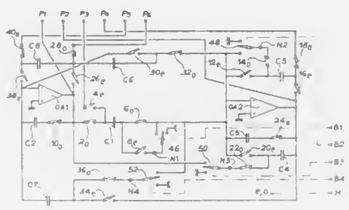
the other of said conductive paths includes a fixed phase shifter for shifting the phase of power passing therethrough by one hundred eighty degress and a phase shift element set to shift said phase by an amount equal to one hundred eighty degrees minus phi.

4,841,263

BIQUAD BLOCK WITH SWITCHED CAPACITORS WITHOUT CONTINUOUS FEEDBACK LOOP AND WITH NO SENSITIVITY COMPARED WITH THE GAIN OF OPERATIONAL AMPLIFIERS AND THE RATIO OF THE CAPACITANCES

Jan Mulawka, ul. Bernardyn ka 3-M41 02904, Warszawa, Poland; Agnieszka Konczykowska, L'Haye les Roses, and Michel Bon, Verrieres Le Buisson, both of France, assignors to Etat Francais représentéO par le Ministre Délégué des Postes et Télécommunications (CNET), Moulineaux, France and Jan Mulawka, Warsaw, Poland

Filed Aug. 19, 1988, Ser. No. 234,277
Claims priority, application France, Aug. 28, 1987, 87 12028
Int. Cl.⁴ H03H *19/00*
U.S. Cl. 333—173 **10 Claims**



1. Switched capacitor biquad block filter incorporating six input-output connections P1, P2, . . . , P6 and a clock input H for receiving a clock signal for controlling the closing and opening of a group of switches, said switches comprising a first family of switches controlled in the open state during a first half-cycle of each cycle of the clock signal and which are controlled in the closed state during a second half-cycle of each cycle of the clock signal and a second family of switches controlled in the closed state during said first half-cycle of each cycle of the clock signal and in the closed state during said second half-cycle of each cycle of the clock signal, said biquad block comprising:

a first operational amplifier 0A1 provided with a noninverting input connected to earth, an inverting input E1 and an inverting output S1 connected to the first connection P1 of the filter,

a second operational amplifier 0A2 provided with a noninverting input connected to earth, an inverting input E2 and an output S2 connected to the second connection P2 of the filter,

a first capacitor C1 and switches for connecting said capacitor between the output S1 of the first operational amplifier and the input E2 of the second operational amplifier during said first hald-cycles of the clock signal and for connecting said capacitor to the connection P3 and to a node N1 during said second half-cycles of the clock signal,

a second capacitor C2 and switches for connecting said capacitor between the input E1 and the output S1 of the first operational amplifier during said first half-cycles of the clock signal and for connecting said capacitor solely to the input E1 of the first operational amplifier during said second half-cycles of the clock signal,

a third capacitor C3 and switches for connecting said capacitor between a node N2 and connection P4 during said first half-cycles of the clock signal and for connecting said capacitor between the input E2 and the output S2 of the second operational amplifier during said second half-cycles of the clock signal,

a fourth capacitor C4 and switches for connecting said capacitor between a node N3 and the output S2 of the second operational amplifier during said first half-cycles of the clock signal and for connecting said capacitor between the input E2 and the output S2 of the second operational amplifier during said second half-cycles of the clock signal,

a fifth capacitor C5 and switches for connecting said capacitor between input E2 and output S2 of the second operational amplifier during said first half-cycles of the clock signal and for connecting said capacitor solely to the input E2 of the second operational amplifier during said second half-cycles of the clock signal,

a sixth capacitor C6 and switches for connecting said capacitor between connection P6 and input E2 of the second operational amplifier during said first half-cycles of the clock signal and for connecting said capacitor between output S1 and input E1 of the first operational amplifier during said second half-cycles of the clock signal,

a seventh capacitor C7 and switches for connecting said capacitor between input E1 of the first operational amplifier and a node N4 during said first half-cycles of the clock signal and for connecting said capacitor between input E1 of the first operational amplifier and output S2 of the second operational amplifier during said second half-cycles of the clock signal,

an eighth capacitor C3 and switches for connecting said capacitor between connections P5 and P6 during said first half-cycles of the clock signal and for connecting said capacitor between input E1 and output S1 of the first operational amplifier during said second half-cycles of the clock signal, and

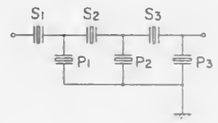
four two-position switches controlled by signals applied to terminals B1, B2, B3, B4 of the biquad block, the first switch connecting node N1 to input E2 of the second operational amplifier or to earth, the second switch connecting node N2 to input E2 of the second operational amplifier or to earth, the third switch connecting node N3 to output S1 of the first operational amplifier or to earth and the fourth switch for connecting node N4 to input E2 of the second operational amplifier or to earth.

4,841,264

LADDER-TYPE CERAMIC FILTER

Michitaka Oshikawa, Tsurugashima, Japan, assignor to Toko Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1988, Ser. No. 224,499
Int. Cl.⁴ H03H *9/58*
U.S. Cl. 333—189 **2 Claims**



1. A ladder type piezoelectric ceramic filter comprising an input terminal, an output terminal and a plurality of resonator sections connected between said input terminal and said output terminal, each section comprising a series resonance element

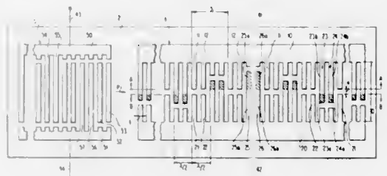
and a parallel resonance element, the resonance frequency of a series resonance element provided in a section located closest to said input terminal being lower than the resonance frequency of series resonance elements provided in other sections, the antiresonance frequency of the series resonance element provided in said section located closest to said input terminal being higher than that of said series resonance elements provided in other sections, the resonance frequency of a parallel resonance element provided in a section located closest to said output terminal being lower than that of parallel resonance elements provided in other sections, and the antiresonance frequency of said parallel resonance element provided in said section located closest to said output terminal being higher than that of parallel resonance elements provided in other sections.

4,841,265

SURFACE ACOUSTIC WAVE FILTER

Takaya Watanabe, and Shigeo Fushimi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo Japan

Filed Sep. 26, 1988, Ser. No. 249,024
Int. Cl.[4] H03H *9/145, 9/64*
U.S. Cl. 333—194 **14 Claims**



1. A surface acoustic wave (SAW) filter having a piezoelectric substrate and a conductive transducer formed over said piezoelectric substrate, wherein:

said transducer has first and second bus bars arranged in parallel at a prescribed interval from each other;

a plurality of pairs of first electrode fingers having the same lengths, vertically extending from said first bus bar and arranged at prescribed intervals in the lengthwise direction of said first bus bar;

a plurality of pairs of second electrode fingers having the same lengths, vertically extending from said second bus bar, arranged at said prescribed intervals in the lengthwise direction of said second bus bar, the tips of these paired second electrode fingers being positioned opposite to those of said paired first electrode fingers;

a plurality of first weighted electrode pairs positioned between two adjacent pairs of said first electrode fingers, each pair of said first weighted electrodes comprising a pair of first electrode sections whose lengths of overlap with said paired second electrode fingers are determined by the negative tap coefficients of an FIR filter having a desired lowpass characteristic and a pair of second electrode sections positioned on the elongations of these first electrode sections, one end of each such second electrode section being connected to the first bus bar; and

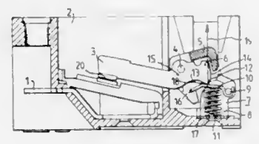
a plurality of second weighted electrode pairs positioned between two adjacent pairs of said second electrode fingers, each pair comprising a pair of third electrode sections positioned between two opposite ones of said first electrode pairs, whose lengths of overlap with said paired first electrodes are determined by the positive tap coefficients of said FIR filter, and a pair of fourth electrode sections positioned on the elongations of said electrode sections, one end of each such fourth electrode section being connected to the second bus bar.

4,841,266

CIRCUIT BREAKER HAVING AN ELECTRODYNAMICALLY OPENING CONTACT SYSTEM

Hans-Jürgen Wulff, Hohenwestedt, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 18, 1988, Ser. No. 172,932
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1987, 3708807
Int. Cl.[4] H01H *75/00*
U.S. Cl. 335—16 **6 Claims**



1. A circuit breaker comprising

(a) a housing;

(b) a stationary contact mounted in the housing;

(c) an operating shaft disposed in the housing and rotatable about a first axis of rotation;

(d) a movable contact including a contact arm pivotally held in said operating shaft for rotation about a second axis of rotation relative to said operating shaft from an on position in which said stationary and movable contacts are in engagement, into a tripped position in which said contacts are separated; said contact arm being movable, by rotation of said operating shaft about said first axis of rotation, into and out of said on position and an off position other than said tripped position; said contact arm further having a terminus including a rounded corner and an adjoining rounded engagement face;

(e) a structural unit stationarily supported in said housing and comprising a spring having a stationarily supported first end and a second end and a transfer lever having an end pivotally supported for rotation about a third axis of rotation; said lever being disposed between said second end of said spring and said terminus of said contact arm and engaging said rounded corner or said rounded engagement face of said terminus dependent on the position of said contact arm for transmitting a torque from said spring to said contact arm about said second rotary axis said transfer lever having a first engagement portion adjoining said third rotary axis and a second engagement portion bent from said first engagement portion in a direction towards said spring.

4,841,267

DEFLECTION APPARATUS FOR CATHODE RAY TUBE

Seiji Watabe; Isao Yokoyama; Tsutomu Maeda; Koichi Shibuya, and Sumio Takahashi, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

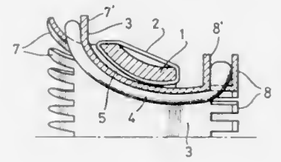
Filed Aug. 26, 1988, Ser. No. 240,145
Int. Cl.[4] H01F *7/00*
U.S. Cl. 335—210 **3 Claims**

1. A deflection apparatus for cathode ray tube characterized by comprising:

(a) a trumpet-shaped deflection yoke having plural guide grooves on the inner surface extending generally in the direction of axis of cathode ray tube for retaining scanning windings therein,

(b) one of the horizontal and vertical scanning windings retained in said guide grooves,

(c) a trumpet-shaped insulator which is arranged on the inner surface of said deflection yoke and



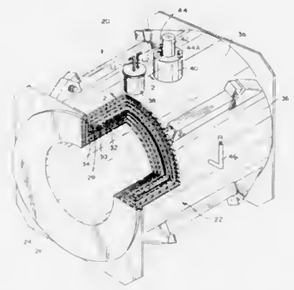
(d) the other scanning windings arranged on the inner surface of said insulator.

4,841,268

MRI MAGNET SYSTEM WITH PERMANENTLY INSTALLED POWER LEADS

Sibley C. Burnett, Cardiff; John R. Purcell, San Diego; Bruce C. Breneman, San Diego, and Raymond E. Sarwinski, San Diego, all of Calif., assignors to General Atomics, San Diego, Calif.

Filed Sep. 28, 1987, Ser. No. 101,517
Int. Cl.[4] H01F *7/22*
U.S. Cl. 335—216 **11 Claims**



1. A magnet system for providing a magnetic field comprising:

a vacuum vessel;

a cryogenic containment vessel supported within said vacuum vessel and containing a main coil having a first end and a second end and formed of superconductive wire for providing said magnetic field, along with a quantity of liquid helium to maintain said wire below its critical temperature, the pressure inside said containment vessel being greater than atmospheric pressure;

a pair of power leads for supplying energy to said coil from a power supply outside said vacuum vessel and for taking energy from said coil to power dissipative means disposed outside said vacuum vessel, each of said leads connected to one of said coil ends, extending outside said vacuum vessel and comprising an elongate metallic tube; and

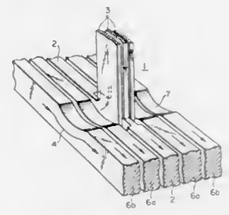
means responsive to the passage of electrical current through the tubes of said leads to cause helium gas resulting from the boiling of liquid helium in said containment vessel to be vented to atmosphere through said tubes thereby cooling said tubes.

4,841,269

COIL DEVICE

Kazuo Kuno, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 1, 1988, Ser. No. 278,450
Int. Cl.[4] H01F *5/00*
U.S. Cl. 335—299 **5 Claims**



1. A coil device comprising:

feeders connectable to a power source and adapted to supply electric current;

a coil conductor section connected at both ends to said feeders and wound into a coil in a position adjacent to said feeders; and

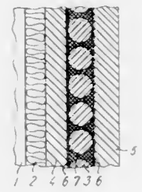
deformed sections provided in at least one of the coil conductors of said coil conductor section at positions in the vicinity of said feeders in such a manner as to generate current loops which cancel an error magnetic field generated by a current loop which flows in said feeders.

4,841,270

HEAT-DISTRIBUTING WINDING

Ove Hansen, Bogense, Denmark, assignor to Transpower A/S, Denmark

Filed Jan. 15, 1988, Ser. No. 144,005
Claims priority, application Denmark, Jan. 19, 1987, 267/87
Int. Cl.[4] H01F *27/22*
U.S. Cl. 336—61 **3 Claims**



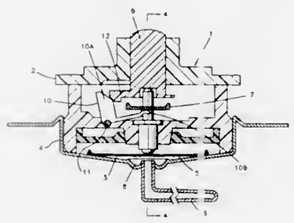
1. An annular core transformer comprising; a cylindrical core with external and internal cylindrical surfaces and end surfaces connecting said cylindrical surfaces, a toroidal electrical winding wound on said core with parts of the winding extending along the cylindrical surfaces of the core, and parts of the winding extending along the end surfaces of the core the turns of the winding mainly following the generatrix direction along the cylindrical surfaces, at least one heat heat distributing winding concentric with the core and made from juxtaposed turns of wire-shaped heat conducting material substantially perpendicular to and in heat-conductive contact with, but electricaly insulated from the electrical winding parts extending along the cylindrical external surface of the core and mainly in the generatrix direction of said core , and wherein a heat distributing winding is applied both at an inner surface and an outer surface of the electrical winding parts extending along the cylindrical external surface of the core.

4,841,271

TRIP-FREE RESETTING MECHANISM FOR AN ON-OFF UNIT

Robert F. Purssell, Plymouth, England, assignor to Ranco Incorporated of Delaware, Dublin, Ohio

Filed Jan. 12, 1987, Ser. No. 2,161
Claims priority, application United Kingdom, Jan. 17, 1986, 8601115
Int. Cl.[4] H01H *37/38*
U.S. Cl. 337—320 5 Claims



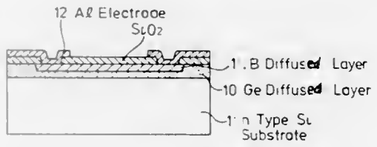
1. A trip-free mechanism for resetting an on-off circuit breaking switch unit breakable by the tripping of an actuator element from a first condition to a second condition, the mechanism comprising a resetting member engageable and movable to apply a resetting force to the actuator element to reset the latter from its second condition to its first condition, and restraining means acted upon by the resetting member when said resetting member applies the resetting force to the actuator element, said restraining means having at least a portion moved in response to resetting movement of the resetting member to maintain the unit in its broken condition until the resetting member is disengaged upon resetting of the actuator element.

4,841,272

SEMICONDUCTOR DIFFUSION STRAIN GAGE

Hideaki Yamagishi, and Mayumi Nonaiyama, both of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Aug. 26, 1987, Ser. No. 89,504
Claims priority, application Japan, Sep. 25, 1986, 61-226632
Int. Cl.[4] G01L *1/22*
U.S. Cl. 338—2 3 Claims



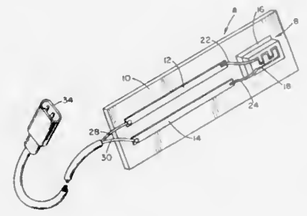
1. A semiconductor strain gage comprising a silicon substrate, wherein impurity atoms of the IV group forming neither donors nor acceptors are doped in said silicon substrate, and wherein a diffused resistance region is formed in the impurity doped region.

4,841,273

HIGH TEMPERATURE SENSING APPARATUS

Paul J. Hortoo, Moorpark, Calif., assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Dec. 18, 1987, Ser. No. 134,881
Int. Cl.[4] G01K *01/14*; H01C *01/012*
U.S. Cl. 338—28 8 Claims



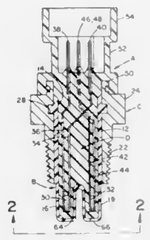
1. A temperature sensing device for high temperatures comprising:
- an elongated ceramic member having a substantially flat surface along the length thereof;
- a pair of elongated spaced-apart electrically conductive strips extending along said substantially flat surface and being fused along the entire length thereof to said ceramic member;
- variable resistance means having a resistance that varies with temperature and being mounted on said ceramic member;
- said variable resistance means being in the form of a resistance thermometer-type of sensing device through which a variable excitation current flows that is proportional to the temperature thereof and which is heated by a heat source whose temperature is to be sensed and that is completely separate from said temperature sensing device; and
- connecting means for connecting said conductive strips in electrically conductive relationship with said resistance means, said connecting means comprising precious metal wires welded to said conductive strips and to said variable resistance means.

4,841,274

TEMPERATURE RESPONSIVE PROBE APPARATUS

Charles Yagher, Jr., Lexington, and Kenneth C. Day, Mansfield, both of Ohio, assignors to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Dec. 21, 1987, Ser. No. 135,247
Int. Cl.[4] G01K *1/14, 7/16*
U.S. Cl. 338—28 7 Claims



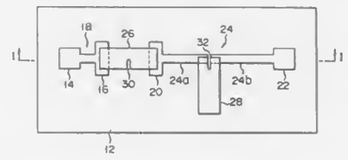
1. Temperature responsive apparatus comprising an elongated hollow plastic shell having an open end and a closed end portion, a pair of spaced-apart probes on said closed end portion, and thermistor received in each said probe to sense fluid temperature, and plastic material filling said shell.

4,841,275

THICK-FILM INTEGRATED CIRCUIT DEVICE CAPABLE OF BEING MANUFACTURED BY MEANS OF EASY-TO-PERFORM TRIMMING OPERATION

Mitsuru Murata, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 1, 1987, Ser. No. 127,160
Claims priority, application Japan, Dec. 2, 1986, 61-287128
Int. Cl.[4] H01C *10/100*
U.S. Cl. 338—195 6 Claims



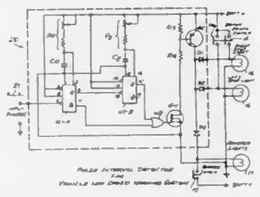
1. A thick-film integrated circuit device comprising:
- an insulating substrate;
- first and second conductors formed on said insulating substrate and spaced apart from each other, at least one of said conductors having a substantially elongated intermediate portion;
- trimming resistor formed on said insulating substrate and having two ends overlapping and electrically connected to said first and second conductors for coarsely adjusting the resistance of the integrated circuit device; and
- function-trimming resistor formed on said insulating substrate in the form of a strip having two ends, one function-trimming resistor end extending from and electrically contacting said substantially elongated intermediate portion, for finely adjusting the resistance of the integrated circuit device, said function-trimming resistor having a negligibly low pre-trimmed resistance which is at most equal to one-tenth of the resistance of said trimming resistor.

4,841,276

VEHICLE LOW SPEED WARNING SYSTEM

Roy P. Abel, 1315 N. Columbus #13, Glendale, Calif. 91202, and Warren W. Welcome, Tarzana, Calif., assignors to Roy P. Abel, Glendale, Calif.

Continuation-in-part of Ser. No. 745,194, Jun. 17, 1985, Continuation of Ser. No. 741,815, Jun. 6, 1985. This application Nov. 6, 1987, Ser. No. 119,298
Int. Cl.[4] B60Q *1/00*
U.S. Cl. 340—466 6 Claims



6. In a vehicle slow speed warning system having a means for generating a train of signal pulses at a rate proportional to the vehicle's speed, and having a vehicular brake light, the improvement comprising a pulse interval detector comprising:
- a microcomputer system including
- a microprocessor for comparing the sum of a number of signal pulses in a predetermined time interval with a constant number stored in the microprocessor.
- said microprocessor including means for generating a control signal,
- said control signal responsive to the result of the comparison made by said microprocessor to apply operating power to electronic output stages included in said system for said vehicular brake light.

4,841,277

OMNIBUS ALARM SIGNALING SYSTEM

John A. Wilson, Scotch Plains, N.J., assignor to The Hijack Light, Inc., Newark, N.J.

Filed Sep. 3, 1987, Ser. No. 92,677
Int. Cl.[4] B60R *25/10*
U.S. Cl. 340—426 5 Claims

1. An alarm signaling system for taxi cabs, buses and similar such motor vehicles carrying passengers for hire, comprising:
- illumination means mounted on said motor vehicle and capable of providing a visual alert to persons located outside said vehicle;
- first switch means available to an operator within said motor vehicle to activate said illumination means from within said vehicle; and
- second switch means available to deactivate said illumination means, but only available to deactivate said illumination means from without said motor vehicle;
- wherein said first and said second means are incorporated as part of an included control apparatus which also provides a cycling timing signal to periodically energize said illumination means once said first switch means is activated; and
- wherein said illumination means is mounted on said motor vehicle to provide a visual alert illuminating the roadway under said vehicle once energized by said first switch means.

4,841,278

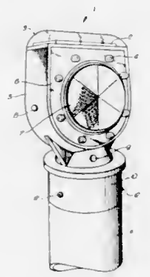
SELF-ILLUMINANT DELINEATOR AND DELINEATOR SYSTEM BY USE THEREOF

Hirofumi Tezuka; Kouji Nogami, and Toshihide Koyano, all of Shiga, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Continuation-in-part of Ser. No. 748,730, Jun. 25, 1985, abandoned. This application Mar. 23, 1987, Ser. No. 29,372
Claims priority, application Japan, Jun. 27, 1984, 59-97524[U]; Jul. 30, 1984, 59-118315[U]; Jan. 31, 1985, 59-19070
Int. Cl.[4] E01F *9/00*
U.S. Cl. 340—908.1 12 Claims

1. A self-illuminant delineator comprising a plurality of light-emitting diodes disposed on a sign surface of said delineator; power supply means for powering the light-emitting diodes including a solar cell module disposed on the top surface of said delineator and covered with a transparent cover and a rechargeable battery for storing power; control means for controlling the flickering of the light-emitting diodes; and communication means for periodically transmitting or receiving a reference signal to synchronize the control means for the flickering of said light emitting diodes; wherein the power supply means also supplies power to the communication

means, and the control means further includes timing means for controlling duration during which power is supplied to the communication means from the power supply; wherein said solar cell module is substantially horizontally disposed on the top surface of said delineator and said transparent cover for covering said solar cell module is substantially oval hemi-



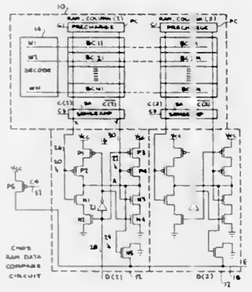
spheric or substantially hemispheric and is mounted and fixed on the top surface of said delineator so as to provide a convex external surface; and further wherein the solar cell module supplies power to said rechargeable battery and functions as an optical sensor for generating a signal when the incident light drops below a predetermined level.

4,841,279

CMOS RAM DATA COMPARE CIRCUIT

Donald M. Walters, Jr., Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 30, 1987, Ser. No. 115,130
Int. Cl.[4] G06F *7/0.*
U.S. Cl. 340—146.2 **11 Claims**



1. A data compare circuit for use with a complementary metal-oxide-semiconductor random-access-memory (CMOS RAM) to check the equality of a bit field in an accessed RAM word against data values, said circuit comprising:

an inverter (I1) having an input connected to receive a true data signal and an output to provide a complementary data signal;

a first group of series-connected transistors formed of a first P-channel transistor (P1), a second P-channel transistor (P2), a first N-channel transistor (N1) and a second N-channel transistor (N2);

said first P-channel transistor (P1) having its source connected to a supply potential (VCC), its gate connected to the output of the inverter (I1), and its drain connected to the source of said second P-channel transistor (P2);

said second P-channel transistor (P2) having its gate connected to a first sense node (X) and its drain connected to an intermediate node (A);

said first N-channel transistor (N1) having its drain connected to the intermediate node (A), its gate connected to the first sense node (X), and its source connected to the drain of said second N-channel transistor (N2);

said second N-channel transistor (N2) having its gate connected to the input of the inverter (I1) and its source connected to a ground potential;

a second group of series-connected transistors formed of a third P-channel transistor (P3), a fourth P-channel transistor (P4), a third N-channel transistor (N3), and a fourth N-channel transistor (N4);

said third P-channel transistor (P3) having its source connected to the supply potential (VCC), its gate connected to the input of said inverter (I1), and its drain connected to the source of said fourth P-channel transistor (P4);

said fourth P-channel transistor (P4) having its gate connected to a second sense node (Y) and its drain connected to the intermediate node (A);

said third N-channel transistor (N3) having its drain connected to the intermediate node (A), its gate connected to the second sense node (Y) and its source connected to the drain of said fourth N-channel transistor (N4);

said fourth N-channel transistor (N4) having its gate connected to the output of the inverter (I1) and its source connected to the ground potential; and

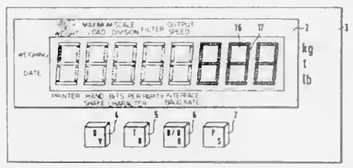
an N-channel switching transistor (N5) having its source connected to the ground potential, its gate connected to the intermediate node (A) and its drain connected to an output line (18) for generating an equal signal (E) which is discharged from a precharged high voltage level to a low logic level when the bit field in the accessed RAM word and the data values are different.

4,841,280

VISUAL DISPLAY APPARATUS FOR INFORMATION ITEMS

Bernhard Hermann, Schoemberg; Herbert Muerdter, Albstadt; Walter Ehresmann, Albstadt, and Manfred Kammerer, Albstadt, all of Fed. Rep. of Germany, assignors to August Sauter GmbH, Ebingen, Fed. Rep. of Germany

Filed Aug. 11, 1987, Ser. No. 84,016
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1986, 3627394
Int. Cl.[4] G09G *3/00*
U.S. Cl. 340—706 **22 Claims**



1. An apparatus for visual display of information items on a display field of a multisegment bar display, wherein the segment bars of said display are selectively actuatable for display depending on the particular information item which is to be displayed, comprising:

a display field;

a multisegment bar display of individual of individual segment bars arranged on said display field to form a plurality of alphanumeric characters linearly arrayed in a block within said display field; and

permanent markings on said display field, each permanent marking indicating a specific information item;

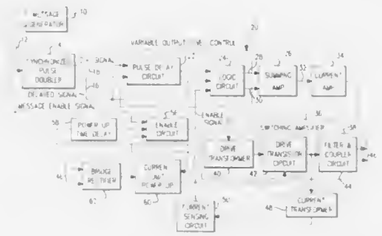
a plurality of said individual segment bars forming said alphanumeric characters also being operatively associated with corresponding ones of said permanent markings, so that actuation of an individual segment bar displays the respective information item of the corresponding permanent marking.

4,841,281

APPARATUS FOR CONTROLLING A SWITCHING AMPLIFIER

Waymon A. Melvin, Jr., Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 16, 1987, Ser. No. 64,148
Int. Cl.[4] H04M *11/04*
U.S. Cl. 340—310 A **16 Claims**



16. A switching amplifier and amplifier control apparatus for use on a power line communication system, comprising:

means for generating a message signal for transmission over said power line communication system, said message signal containing a plurality of information bits and having a preselected frequency and phase associated therewith, said message generating means further generating a message enabling signal in conjunction with said message signal;

means for amplifying said message signal;

means for driving said amplified message signal into said power line communication system;

logic means in electrical communication with said message signal and being effective upon reception of said message enabing signal, for conditioning said message signal such that under normal operating conditions, said message signal can be communicated to said amplifying means;

means for sensing an overcurrent condition at said driving means and generating a current limit signal in response thereto;

means for limiting current through said driving means until the expiration of a power up time delay value, such power up time delay value having a duration which is preselected to a value that allows for component settling;

means for measuring said power up time delay value and generating a power up time delay signal until said power up time delay value has expired; and

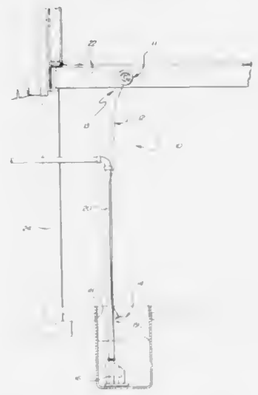
means for generating an enable signal and a disable signal, generating said enable signal upon sensing the absence of said current limit signal and the absence of said power up time delay signal, said enable and disable signal generating means further being effective such that, upon sensing at least one of said limit current signal and said power up time delay signal, said enable and disable signal generating means generates said disable signal such that said driving means is prevented from communicating said message signal to said power line communication system.

4,841,282

SMOKE AND LIQUID ALARM

Gustave A. Reis, 5270 Daniels, Troy, Mich. 48098

Filed Jul. 5, 1988, Ser. No. 215,419
Int. Cl.[4] G08B *19/00, 17/10*
U.S. Cl. 340—521 **9 Claims**



1. For use with a smoke alarm of the ionization type having an ionization chamber which acts in response to the pressure of a predetermined level of ionization therein to lower the impedance thereof and circuitry operatively associated therewith to cause an alarm signal to be sounded in response to said lowered impedance, a liquid level detector comprising:

a sensor head having two spaced apart electrodes, each in electrical communication with an electrically conductive lead, said leads being connected to either side of the ionization chamber so that the electrodes are in parallel therewith,

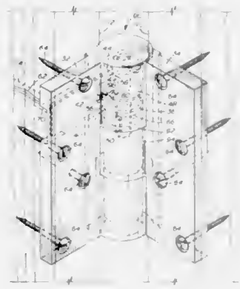
whereby liquid in contact with the electrodes establishes a conductive path therebetween, thereby completing the alarm circuit and causing sounding of the alarm signal.

4,841,283

SECURITY HINGE UTILIZING CONCEALED RADIATIVE SENSING TO DETECT HINGE POSITION

Leszek Bubliewicz, San Antonio, Tex., assignor to Southern Steel Company, San Antonio, Tex.

Filed Dec. 21, 1987, Ser. No. 136,091
Int. Cl.[4] G08B *13/08, 13/18*
U.S. Cl. 340—545 **12 Claims**



1. A hinge construction for mounting a door to a door frame

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or the like and providing for detection of changes in hinge leaf position, comprising:

(a) a hinge having a first and a second leaf, each leaf having a leaf body and at least one knuckle, said hinge knuckles being adjacent to each other and pivotally connected, thereby defining a hinge pivotal axis, each leaf being moveable relative to the other; said first leaf including a pocket formed in said leaf body and extending into said knuckle;

(b) a radiative sensing means, including a radiative emitter means and radiative detector means mounted and concealed within said pocket and knuckle of said first hinge leaf, said sensing means being adapted to provide a change-of-position signal in response to an actuating means and adapted for connection to external electrical circuits;

(c) an actuating means mounted and concealed within said second hinge leaf knuckle to rotate with the rotation of said second hinge leaf, said actuating means extending into said first hinge leaf knuckle, the rotation of said actuating means shielding said radiative detector means from said radiative emitter means when said hinge is opened, thereby causing said radiative sensing means to form a change-of-position signal indicative of an open-hinge position; and

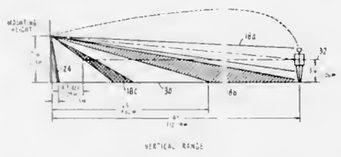
(d) a means for resetting said actuator means.

4,841,284

INFRARED INTRUSION DETECTION SYSTEM INCORPORATING A FRESNEL LENS AND A MIRROR

Jack L. Biersdorff, Los Altos, Calif., assignor to C & K Systems, Inc., San Jose, Calif.

Filed Oct. 19, 1987, Ser. No. 110,136
Int. Cl.[4] G08B *13/18*
U.S. Cl. 340—567 **5 Claims**



1. In an infrared intrusion detection system for mounting at a distance displaced from a detection plane, wherein said system having a first fresnel lens having a plurality of lines of focus and a focal point along said plurality of lines of focus for focusing infrared radiation, wherein the improvement comprising:

a detector in said detection system, located at said focal point; and

a curvilinearly-shaped mirror means spaced apart from said detector in the direction away from said detection plane for receiving infrared radiation from said detection plane closer to said detector than the infrared radiation focused through said fresnel lens, and for reflecting and focusing said detected infrared radiation directly onto said detector.

4,841,285

TILT-RESPONSIVE DISPLAY CASE ALARM

Jack R. Laut, P.O. Box 2555, Dunnellon, Fla. 32630

Filed May 3, 1988, Ser. No. 189,550
Int. Cl.[4] G08B *13/14*
U.S. Cl. 340—571 **6 Claims**

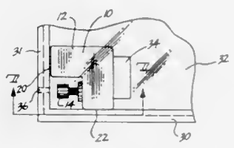
1. A new and improved display case alarm adapted to be mounted in an interior corner portion of a display case, comprising:

a generally L-shaped housing;

said housing having first and second legs each having rectangular interior and exterior side wall portions and a rectangular end face;

an enable/disable switch extending form said interior side wall portion of said first leg, said enable/disable switch located in an enclosed rectangular recess when said L-shaped housing is mounted in an interior corner portion of a display case;

an audible alarm in said housing, said audible alarm having a grill portion extending through said exterior side wall of said first leg;



a mercury switch in said housing, said mercury switch comprising a pool of mercury in a conical recess encapsulated in a block of plastic material, and first and second electrical conductors arranged to be contacted by said mercury pool upon tilting of said housing; and

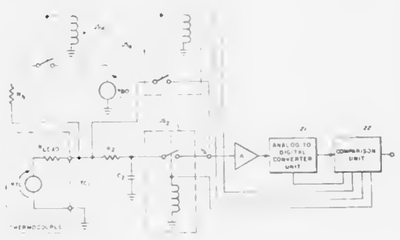
a battery in said housing, said enable/disable switch, said audible alarm, said mercury switch and said battery being connected in series.

4,841,286

APPARATUS AND METHOD FOR DETECTION OF AN OPEN THERMOCOUPLE IN A PROCESS CONTROL NETWORK

Karl T. Kummer, Doylestown, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 8, 1988, Ser. No. 153,753
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—653 **13 Claims**



1. Apparatus for verifying operation of a thermocouple, said apparatus comprising:

a voltage source having a known potential;

a resistor having a known resistance;

switch means for periodically inserting a voltage source and a resistor in series with said thermocouple;

voltage means for measuring a first and a second voltage level at preselected times during a switch means cycle, said first voltage being measured when said voltage source and said resistor are coupled to said thermocouple, said second voltage level measured when said voltage source and said resistor are not coupled to said thermocouple; and

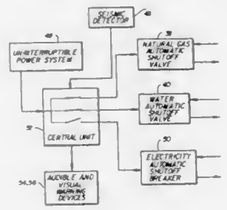
comparison means for comparing said first and said second voltage level.

4,841,287

EARTHQUAKE UTILITIES CUT-OFF CONTROL SYSTEM

Alan Y. Flig, 13127 Bassett St., North Hollywood, Calif. 91605, and Paul Regan, 5541 Willis Ave., Van Nuys, Calif. 91411

Filed Dec. 17, 1987, Ser. No. 134,052
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—690 **15 Claims**



I. A fail-safe control system for automatic cut-off of gas, electric and water utilities in a building in the event of an earthquake, comprising:

(a) an uninterruptible power supply for providing continuous power to said system;

(b) an electrical seismic detector means, being connected to said uninterruptible power supply, and having an output for triggering an electric current upon the occurrence of an earthquake;

(c) a control relay being connected to said seismic detector means and obtaining power from said output of said seismic detector means;

(d) electrically operated gas cut off means, being adapted to be positioned between the main gas supply and the building gas supply, and connected to said uninterruptible power supply, for interrupting the gas supply to the building upon an occurrence of an earthquake detected by said seismic detector means;

(e) electrically operated water cut-off means, being adapted to be positioned between the main water supply and the building water supply, and connected to said uninterruptible power supply, for interrupting the water supply to the building upon an occurrence of an earthquake detected by said seismic detector means;

(f) said gas and water cut off means being normally opened when energized and being closed when de-energized;

(g) first normally closed contact of said control relay being connected in series with said gas cut-off means, and said first contact being opened when said control relay is energized by said seismic detector means upon an occurrence of an earthquake detected by said seismic detector means, thereby de-energizing and closing said gas cut-off means;

(h) second normally closed contact of said control relay being connected in series with said water cut off means, and said contact being open when said control relay is energized by said seismic detector means upon an occurrence of an earthquake detected by said seismic detector means, thereby de-energizing and closing said water cut off means;

(i) electrically operated breaker trip means, being connected to said uninterruptible power supply, for tripping the main power supply breaker to the building when said breaker trip means is energized upon an occurrence of an earthquake detected by said seismic detector means;

(j) first normally open contact of said control relay being connected in series with said breaker trip means, and said normally open contact being closed when said control relay is energized by said seismic detector means upon an occurrence of an earthquake detected by said detector means, thereby energizing said breaker trip means and tripping the main power supply breaker to the building; and

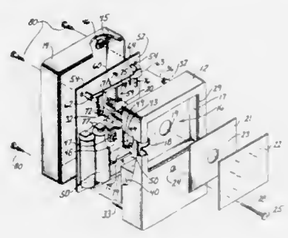
(k) said gas and water cut-off means and said breaker trip means being manually resetable after said seismic detector means has been activated in response to an earthquake.

4,841,288

EARTHQUAKE ILLUMINATING DEVICE

Lyle F. Addicks, 10246 S. Julius Ave., Downey, Calif. 90241

Filed Feb. 22, 1988, Ser. No. 158,635
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—690 **8 Claims**



1. An illuminating device for use as a precautionary measure in a home located in an area subject to earthquakes, said device comprising:

a battery power supply;

a control gate;

a socket connected across said battery power supply by said control gate;

a light bulb in said socket;

a latching circuit connected to said battery power supply, said latching circuit having a trigger input and an output which normally has a low output voltage level thereon;

a normally-open motion detection switch connecting said battery power supply to the trigger input of said latching circuit;

said latching circuit being actuated by a signal supplied on the trigger input thereof when said motion detection switch is initially closed by the shaking of an earthquake into a latched state to provide a high voltage level on the output thereof;

said control gate operable in response to the high voltage level on the output of said latching circuit to turn on said light bulb; and

a housing for enclosing said device, said housing having a front wall and a back wall;

a light compartment within said housing located opposite a window provided on the front wall thereof;

said light bulb held by said socket so as to extend into said light compartment; and

means for detachably fastening the back wall of said housing to the wall of a home;

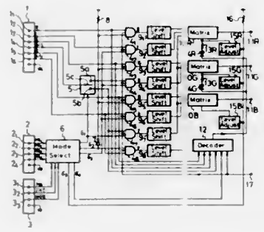
whereby when an earthquake occurs during the night hours that is severe enough to knock out the utility power for the home the housing enclosing the device can be readily removed from the wall of the home and used as a portable light source.

4,841,289

INTERFACE CIRCUIT FOR ADAPTING A MULTI-SCAN MONITOR TO RECEIVE COLOR DISPLAY DATA FROM VARIOUS TYPES OF COMPUTERS

Koji Kambayashi, Chiba; Nobuyuki Okamoto, Tokyo, and Kenichiro Kawanami, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 6, 1987, Ser. No. 47,679
Claims priority, application Japan, May 12, 1986, 61-107994
Int. Cl.[4] H04N 5/12
U.S. Cl. 340—703 4 Claims



1. A monitor interface circuit for connection between one of a plurality of different types of external sources of display data signals and a display monitor in order to adapt the monitor to any one of the external sources, the interface circuit selecting only one of the different types of external sources, wherein the interface circuit comprises:

(a) display data input circuit means which is capable of receiving various types of incoming display data signals from any of the external sources.

(b) mode signal input circuit means which is capable of receiving mode information signals from any of the external sources which are associated with said incoming display data signals;

(c) mode control signal generating means connected to said mode signal input circuit means for generating a plurality of mode control signals in response to each received mode information signal;

(d) signal mixing means for mixing said display data signals from said display data input circuit means in accordance with said mode control signals; and

(e) signal output circuit means connected to said signal mixing means for generating display signals for the monitor corresponding to three primary colors of red, green and blue.

4,841,290

DISPLAY UNIT

Masaaki Nakano; Syoyu Watanabe; Yusaku Saito, and Syuji Iwata, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1987, Ser. No. 101,032
Claims priority, application Japan, Sep. 25, 1986, 226767
Int. Cl.[4] G06K 9/16
U.S. Cl. 340—707 2 Claims

1. A display unit with position detecting capabilities, said display unit comprising:

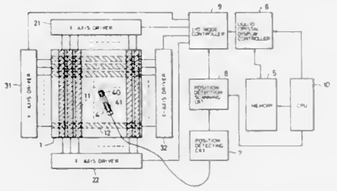
a flat-plate-shaped display panel having X-Y matrix electrodes consisting of two groups of electrodes which are arranged in a crossed-grid fashion to cover a major portion of said display panel;

display-signal applying means for applying display signals to said X-Y matrix electrodes;

current applying means for applying a current having a.c. components to at least one group of said X-Y matrix electrodes in such a manner that said current is sequentially applied to respective one of said electrodes in said at least one group, in a predetermined sequential order;

an input pen with magnetic flux detecting means for detecting magnetic flux associated with a current flowing in an electrode at a matrix location where said input pen is applied;

phase comparison means for comparing a phase of said



current applied to said electrodes with that of an output signal of said magnetic flux detecting means; and

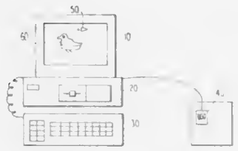
position detecting means for detecting the position of said input pen on said display panel according to an output signal of said phase comparison means.

4,841,291

INTERACTIVE ANIMATION OF GRAPHICS OBJECTS

Scott R. Swix, Atlanta, and Leroy A. Krueger, Marietta, both of Ga., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 21, 1987, Ser. No. 98,653
Int. Cl.[4] G09G 1/16
U.S. Cl. 340—725 9 Claims



1. A method of interactively creating an animated display on a computer graphics screen comprising the steps of:

selecting a graphics object from a display of graphics objects on said graphics screen or from a graphics object table stored in memory;

moving said graphics object on said graphics screen by means of a pointing device;

recording said movements of said graphics object on said graphics screen in memory;

selecting an operation to perform on said graphics object at a particular location on said graphics screen;

recording said operation on said graphics object and the location on the graphics screen where the operation is to be performed; and

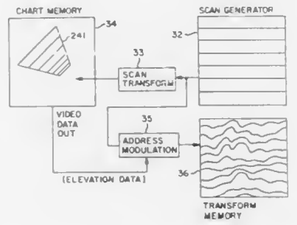
playing back said movement and said operation on said graphics object on said graphics screen at a later time.

4,841,292

THIRD DIMENSION POP UP GENERATION FROM A TWO-DIMENSIONAL TRANSFORMED IMAGE DISPLAY

John R. Zeno, New York, N.Y., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Aug. 11, 1986, Ser. No. 895,065
Int. Cl.[4] H04N 15/00
U.S. Cl. 340—736 4 Claims



1. Method of providing an image on an electronic display, characterized by:

(a) encoding the image as a series of data elements corresponding to coordinate locations;

(b) storing the data elements in a first memory;

(c) generating a first scan pattern;

(d) selecting a scan transformation;

(e) generating a secondary scan pattern by modulating the first scan pattern;

(f) obtaining the data elements corresponding to the secondary scan pattern from the first memory; and

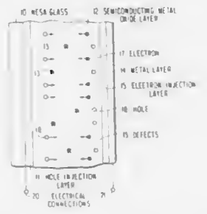
(g) displacing the secondary scan pattern to generate representations of third dimensional image features by modulating the secondary scan pattern with predeterminted bits of said data elements to thereby provide an image signal showing displacement from the secondary scan pattern for display on a display surface.

4,841,293

PROCESS FOR DISPLAYING INFORMATION

Masaaki Takimoto, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 3, 1987, Ser. No. 21,281
Claims priority, application Japan, Mar. 3, 1986, 61-45617
Int. Cl.[4] G09G 3/16
U.S. Cl. 340—763 26 Claims



1. A process for displaying information, comprising the steps of:

providing a layer of a semiconducting oxide disposed between an electron injection layer and a hole injection layer, said electron injection layer containing a metal oxide in a fine particulate form;

selectively applying a potential difference across the oxide layer with the electron injection layer being negatively biased relative to the hole injection layer to create an image by the dual injection of electrons and holes into the oxide layer, the image being formed by the trapping of electrons in color center promoting structural defects in the oxide layer; and

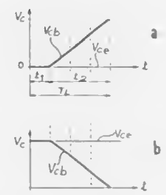
erasing the image by applying a potential difference of opposite polarity across the electron and hole injection layers.

4,841,294

ACTIVE MATRIX DISPLAY SCREEN PERMITTING THE DISPLAY OF GRAY LEVELS

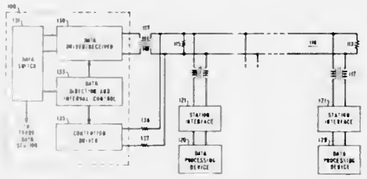
Jean-Frédéric Clerc, Saint-Egreve, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Feb. 17, 1987, Ser. No. 15,369
Claims priority, application France, Feb. 17, 1986, 86 02103
Int. Cl.[4] G09G 3/20
U.S. Cl. 340—793 3 Claims



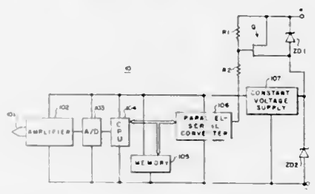
1. An active matrix display screen comprising a first wall on which are deposited a matrix of N by P electrodes forming the first plates of capacitors, N addressing columns and P addressing rows, NP control transistors each having a drain (D), a gate (G) and a source (S), the drain (D) of each transistor being connected to the plate of one of the capacitors, the source to one of the columns and the gate to one of the rows; a second wall on which is deposited a counterelectrode forming the second plate of the capacitors; a first control circuit able to successively apply to the N rows a voltage Ve able to make the transistors of each row on for a time T_L, the control of the N rows constituting a frame of duration $Tr=NT_L$; a second control circuit able to apply to the counterelectrode a voltage Vce successively assuming two values, namely a value 0 and and a value Vc, the voltage Vce passing from one to the other of these values either following each frame, or following each row; and a third control circuit able to apply to the P columns for the entire control time of a row, a set of P voltages, said screen being characterized in that the third control circuit comprises a circuit supplying a voltage Vcb having a pedestal of duration t_1 of value equal to the voltage Vce applied to the counterelectrode and for a duration t_2 a ramp-like voltage passing linearly from said voltage Vce to a voltage differing from Vce by a quantity Vc, the total duration t_1+t_2 of the voltage Vcb being equal to the control time T_L of a row; and secondary column control circuits connected between said third control circuit and each column and which transmit to each column said voltage Vcb for a time which can assume a series of discrete values between t_1, in which case a black display is obtained, and T_L in which case a white display is obtained, each intermediate discrete value between t_1 and T_L corresponding to a gray display.

4,841,295
LOCAL AREA NETWORK WITH BIASING ARRANGEMENT FOR FACILITATING ACCESS CONTENTION BETWEEN WORK STATIONS CONNECTED TO A COMMON BUS
Robert H. Delaney, Blairstown; Charles R. Kalmanek, Jr., Hoboken, and Robert C. Restrick, II, Hopatcong, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jul. 24, 1986, Ser. No. 890,260
Int. Cl.[4] H04Q *9/00*
U.S. Cl. 340—825.5 16 Claims



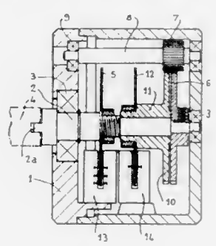
1. A local area data distribution bus accessing arrangement, comprising
a bus having a far end and a near end,
a first termination impedance connected at the far end of the bus,
at least a first and a second station interface connected to the bus intermediate the far end and the near end,
a data driver/receiver coupled through the second termination impedance connected to the near end of the bus and operative to transmit and receive data during intervals of non-contention,
a contention driver, an impedance network connecting the contention driver through the second termination impedance to the near end of the bus, the contention driver being operative during intervals of contention to drive the bus through the impedance network and the second termination impedance to a predetermined and controlled weak logic state level in alternative operation to logic states suppressed by the data driver and selected to enhance contention operation which weak logic state is at such a bias level that an entire length of the bus is at that logic state but wherein each station interface can override that logic state and force the bus to an opposite logic state.

4,841,296
TWO-WIRE TRANSMITTER
Norio Kadoya; Jun Kawachi, both of Yokohama, and Keiji Miyazawa, Kamakura, all of Japan, assignors to Yamatake-Honeywell Co. Ltd., Tokyo, Japan
Filed Jan. 16, 1987, Ser. No. 3,896
Claims priority, application Japan, Jan. 31, 1986, 61-19591
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—870.16 8 Claims



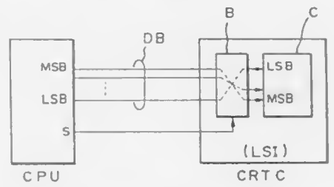
1. A two-wire transmitter comprising
a detecting section for detecting a physical variable to be measured to produce a detection output,
first constant voltage device means connected in series with a two-wire transmission path,
signal processing means energized by a voltage supplied by said first constant voltage device means for converting the detection output into representative serial pulse signals,
second constant voltage device means connected in series with said two-wire transmission path, and
switching means connected in parallel with said second constant voltage device means and turned on/off by the serial pulse signals for transmitting the serial pulse signals on said two-wire transmission path utilizing a current flowing in said two-wire transmission path.

4,841,297
DISPLACEMENT CODER
Pierre Bourgeaux, Lachat, and Alain Riand, Latbuille, both of France, assignors to S.A. Des Etablissements Staubli, Faverges, France
Filed Feb. 12, 1988, Ser. No. 155,588
Int. Cl.[4] H03M *1/24*
U.S. Cl. 341—11 1 Claim



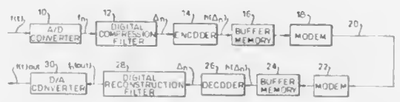
1. A displacement coder for determining the position of a movable component of a machine comprising a casing, a primary shaft rotatably supported within said casing, a first disk means fixedly mounted to said primary shaft, said first disk means having concentric scales, first pulse counting means for detecting said concentric scales of said first disk means, a hub means mounted to said primary shaft and being freely rotatable with respect thereto, a second disk means carried by said hub means, said second disk means having a scale, second pulse counting means for detecting said scale of said second disk means, a first wheel extending outwardly from said hub means and having a plurality of peripheral teeth, a second shaft means disposed within said casing generally parallel to said primary shaft means, a pinion means mounted on said secondary shaft means, said teeth of said first wheel means being drivingly meshed with said pinion means, a second wheel means fixedly mounted to said primary shaft and having a plurality of peripheral teeth, said teeth of said second wheel means being drivingly meshed with said pinion means, said first wheel means having at least one less tooth than said second wheel means so that said second disk means will be rotatably driven in a ratio with respect to said first disk means of less than but substantially equal to one to one, and means for drivingly connecting said principal shaft to the movable component.

4,841,298
BIT PATTERN CONVERSION SYSTEM
Joji Murakami, Kawasaki; Syogo Sibazaki, Yokohama, and Junya Tempaku, Yokosuka, all of Japan, assignors to Fujitsu Limited and Fujitsu Microcomputer Systems Limited, both of Kawasaki, Japan
Filed Dec. 14, 1987, Ser. No. 132,441
Claims priority, application Japan, Dec. 19, 1986, 61-301657
Int. Cl.[4] H03M *7/02*
U.S. Cl. 341—51 8 Claims



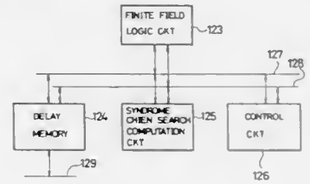
1. A bit pattern conversion system for converting a sequence of a bit pattern between a central processing unit and a peripheral circuit, comprising:
a data bus line connected between said central processing unit and said peripheral circuit, and
a conversion means provided in said peripheral circuit for converting said sequence of said bit pattern from a most significant bit to a least significant bit, and vice versa, in accordance with a conversion signal.

4,841,299
METHOD AND APPARATUS FOR DIGITAL ENCODING AND DECODING
Charles S. Weaver, Palo Alto, Calif., assignor to Digital Recording Research Limited Partnership, Menlo Park, Calif.
Filed Aug. 31, 1987, Ser. No. 91,544
Int. Cl.[4] H03M *7/40*
U.S. Cl. 341—65 21 Claims



1. In a digital decoder for decoding a stream of encoded digital data words which have been encoded using a variable word length code set in which code words comprise a single group of 0 bits and an adjacent single group of 1 bits, the combination comprising:
means responsive to a stream of encoded digital data words for counting the total number of zero bits in the encoded data words to obtain a count of the total number of zero bits in each data word and for temporarily storing the count total, and
means for counting the total number of 1 bits in said encoded data words to obtain a count of the total number of 1 bits in each data word,
the total number of zero bits counted together with the total number of one bits counted being indicative of the decoded signal.

4,841,300
ERROR CORRECTION ENCODER/DECODER
Hideo Yoshida; Tohru Inoue; Atsuhiro Yamagishi, all of Kamakura; Yoshiaki Oda; Minoru Ozaki, both of Amagasaki, and Toshihisa Nishijima, Kanagawa, all of Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan
Filed Jun. 17, 1987, Ser. No. 63,178
Claims priority, application Japan, Jun. 18, 1986, 61-141679; Jul. 17, 1986, 61-168402; Oct. 8, 1986, 61-240685
Int. Cl.[4] H03M *13/00*
U.S. Cl. 341—94 9 Claims

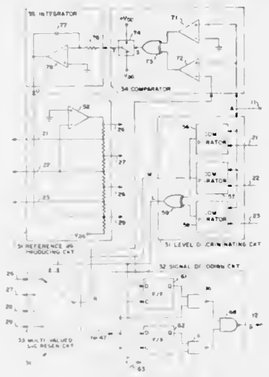


1. An error correction encoder/decoder system comprising:
a memory for storing a received coded word;
a finite field logic circuit for deriving an error locator polynomial and an error evaluator polynomial from said received word, said finite field logic circuit including;
arithmetic and logic means for determining degrees of both of said polynomials, said arithmetic and logic means having a memory for storing intermediate data in calculating both of said polynomials;
Galois logic means responsive to said degrees to solve both of said polynomials for making correction of an error; and
program means for controlling said Galois logic means and said arithmetic and logic means;
a syndrome/Chien search computation circuit for determining a syndrome and an error location from the results output from said finite field logic circuit; and
an address generation circuit arranged in a form of subtraction type counter circuit and responsive to said error location to generate an address in said memory so that the received word at said address may be fetched and corrected.

4,841,301
DEVICE OPERABLE LIKE AN AUTOMATIC LEVEL CONTROL CIRCUIT FOR DECODING A MULTIVALUED SIGNAL
Masaki Ichihara, Tokyo, Japan, assignor to NEC Corporation, Japan
Continuation of Ser. No. 716,581, Mar. 27, 1985, abandoned. This application Nov. 30, 1987, Ser. No. 126,864
Claims priority, application Japan, Mar. 30, 1984, 59-60842
Int. Cl.[4] H03M *1/18*
U.S. Cl. 341—126 5 Claims

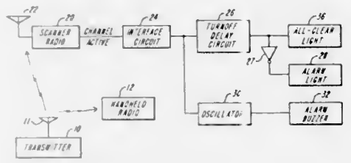
1. A device for use in decoding a received multivalued signal to produce a decoded signal and including a reference voltage producing circuit for producing a plurality of signal discriminating reference voltages and a plurality of signal regenerating reference voltages which are related to one another, a level discriminating circuit responsive to said signal discriminating reference voltages for discriminating said received multivalued signal to produce a local encoded signal, a signal decoding circuit for decoding said local encoded signal into said decoded signal and, a multivalued signal regenerating circuit responsive to said local encoded signal for selecting one of said signal regenerating references voltages to produce a selected regenerated multivalued signal, wherein the improvement comprises a comparator for comparing the voltages of said received and said selected regenerated multivalued signals to produce a result of comparison, an integrator for integrating

said result of comparison to produce a result of integration, and voltage regulating means responsive to said result of integra-



tion for simultaneously regulating said signal discriminating and regenerating reference voltages.

4,841,302
TRANSMITTER DETECTOR FOR USE IN A MOVING VEHICLE
Philip Henry, Las Vegas, Nev., assignor to Gray Electronics, Inc., Green Valley, Nev.
Filed Jan. 30, 1987, Ser. No. 9,947
Int. Cl.[4] H04B 17/00
U.S. Cl. 342—20 **22 Claims**



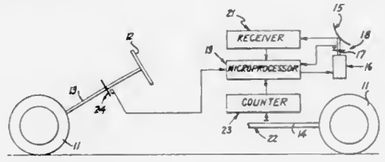
1. Apparatus for detecting the proximity of a radio transmitter of known frequency and power to a moving vehicle, comprising:

a radio frequency scanner having a selected channel set to said known frequency so that it provides a channel active signal during the time that a signal is received on said known frequency;

timing means responsive to said channel active signal for generating a timing delay signal having a duration representative of the maximum time for said moving vehicle to pass said transmitter based on an estimated speed of said vehicle and the range of said transmitter; and

alert means responsive to said channel active signal and said timing delay signal for generating an operator alert during said channel active signal and during said timing delay signal.

4,841,303
LOW COST METHOD AND SYSTEM FOR AUTOMATICALLY STEERING A MOBILE DIRECTIONAL ANTENNA
Roy E. Anderson, Scotia, N.Y., assignor to Mobile Satellite Corporation, Malvern, Pa.
Filed Jul. 1, 1987, Ser. No. 68,531
Int. Cl.[4] H01Q 3/00
U.S. Cl. 342—359 **21 Claims**



1. A automatic steering control system for a mobile mounted, rotatable, directional antenna for automatically causing the directional antenna to track a geostationary satellite during movement of a vehicle having the directional antenna rotatably mounted thereon, said antenna steering control system comprising:

(a) reversible servo drive motor means mountable on the vehicle for rotating the directional antenna in azimuth in either direction;

(b) antenna rotational position sensing and signal deriving means mountable on the vehicle for developing a first electric signal representative of an actual angular heading of the rotatable directional antenna measured with respect to an arbitrary starting position;

(c) vehicle turn sensing and signal deriving means mountable on the vehicle for developing a vehicle turn signal representative of the magnitude and direction of each turn made by the vehicle measured with respect to an arbitrary initial starting position;

(d) communication signal receiving means coupled to the directional antenna for receiving and processing communication signals detected by the antenna; and

(e) microprocessor means having at least a clock, a mathematical equation processing unit and a memory and a plurality of input terminals respectively coupled to the outputs from the communication signal receiving means, the vehicle turn sensing and signal deriving means and the antenna rotational position sensing and signal deriving means, and having its output connected to control operation of the reversible servo drive motor means;

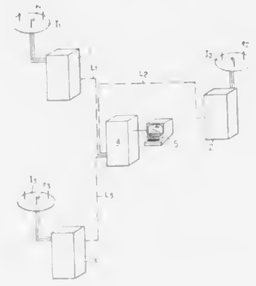
(f) said microprocessor means being programmed to initially rotate the directional antenna over substantially a full 360 degree scanning angle via the reversible servo drive motor means while intermittently sampline the signal strength of the carrier of a received communication signal with the communication signal receiving means at a sampling rate higher than any expected rate of communication signal variation, and recoring the results in memory in the microprocessor along with a respective directional antenna aheading derived from said antenna rotational position sensing said signal driving means for each sampled signal;

(g) said microprocessor means also being programmed to compare the received signal carrier magnitudes for each sampled heading of the directional antenna and specially recording in memory the respective antenna heading from which the maximum received carrier strength signal was derived, and controlling operation of the reversible servo drive motor means to cause it to rotate the directional antenna so that it bears on the respective heading from which the maximum received carrier strength signal was derived; and

(h) said microprocessor means also being further programmed to process an input signal from said vehicle turn sensor and signal deriving means to develop an antenna

azimuth heading correction for combining the the last known directional antenna azimuth setting for maximum received signal amplitude for use in maintaining the pointing direction of the antenna as the vehicle changes direction during periods when the received signal is degraded or interrupted.

4,841,304
INSTALLATION FOR THE DETECTION AND LOCATION BY INTERFEROMETRY, IN REAL TIME AND AT GREAT DISTANCE OF LIGHTENING STRIKES
Philippe Richard; André Soulage, both of Paris, and Jean Appel, Vanves, all of France, assignors to Office National d'Etudes et de Recherches Aerospatiales (ONERA), Chatillon S/Bagneux, France
Continuation of Ser. No. 71,311, Jul. 9, 1987, abandoned. This application Nov. 28, 1988, Ser. No. 277,434
Claims priority, application France, Jul. 10, 1986, 86 10091
Int. Cl.[4] G01J 3/02
U.S. Cl. 342—460 **12 Claims**



1. Installation for the spacial location by interferometric measurement, in real time and at a great distance, of the electrical component of electromagnetic radiation generated by lightning discharges, said installation comprising, in combination:

(i) at least two and at most three interferometric location stations for determining the angular location of a said lightning discharge and situated at a moderate distance from one another, each station comprising:

at least two fixed receiving antennas for receiving at least one electromagnetic radiation of predetermined wavelength in the UHF-VHF waveband generated by such lightning discharges,

interferometric processing means for measuring, the phase differences between signals produced by the antennas in response to the electromagnetic radiation received thereby and for processing the results of measuring said phase differences to provide information representative of the elevation and azimuth of said electromagnetic radiation,

threshold validation means, sensitive to the magnitude of at least one parameter of the electromagnetic radiation received, for producing an actuating signal when said magnitude is greater than a preestablished threshold,

data storing means, responsive to said threshold validation means, for selecting the information provided by the interferometric processing means only when said magnitude is greater than said preestablished threshold,

means for producing numerical data based on said information as selected by the sorting means, and on information representing the date of the lightning discharge,

processing means for processing said numerical data such that said numerical data is temporarily stored at each station and then transmitted periodically in blocks and at a frequency which is consistent with the discharge activity,

storage means for temporarily storing the numerical data for a time period which is a function of the possible transmission flow rate,

transmission means, in a transmission line, for transmitting the numerical data;

(ii) transmission lines for respectively connecting the location stations to an acquisition center for numerical data, said acquisition center comprising:

respective receiving means for receiving the numerical data transmitted from the location stations,

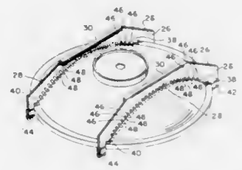
means for sorting and associating the information having, in a predetermined time span, the same date and transmitted respectively from different location stations, and

storage means, connected to said sorting and associating means, for temporarily storing the sorted and associated information for a time period which is a function of the calculating capacity of the acquisition center,

(iii) calculating means for determining, by triangulation, from the sorted and associated data relating to elevation and azimuth, the spacial position of the lightning discharge which occurred on said date; and

(iv) display means for displaying the results provided by said calculating means.

4,841,305
METHOD OF SECTIONING AN ANTENNAE REFLECTOR
Mark W. Rose, Fort Worth, Tex., assignor to Dalsat, Inc., Plano, Tex.
Filed Feb. 1, 1988, Ser. No. 151,000
Int. Cl.[4] H01Q 15/16
U.S. Cl. 343—912 **17 Claims**



1. A method of sectioning an antennae reflector, comprising the steps of:

providing a substantially rigid antennae reflector having a curved inner surface for reflecting and focusing electromagnetic energy and a curved outer surface opposite from said inner surface;

providing support means for journally supporting said reflector and positioning said reflector on said support means such that said support means is in contact with a portion of said reflector adjacent to the perimeter thereof and is not in contact with either the curved inner surface or the curved outer surface of the reflector, thereby supporting the reflector in a substantially relaxed state so that only its internal residual stresses determine its shape;

providing 2N number of elongated beams, each of which has relatively flat opposite major surfaces and a minor surface which is curved to conform to the curvature of said outer surface, where N is an integer corresponding to the N number of sections to be formed;

dividing said beams into N number of cooperating pairs and placing each pair in a predetermined position relative to the outer surface so that respective major surfaces of the beams are in facing relationship and the intersection of a plane lying between the facing major surfaces with the outer surface of the reflector defines a corresponding curve along which the reflector is to be sectioned;

identifying said corresponding curves;

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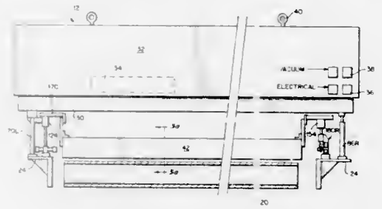
connecting the individual beams of each cooperating pair;
securing each beam pair to the outer surface of the reflector so that a spacing is maintained between the respective minor surfaces of the beams and the outer surface of the reflector; and
sectioning the reflector along each of the corresponding curves to form said N number of sections.

4,841,306
MULTI-COLOR FLUID JET PATTERN GENERATOR FOR TEXTILES
Timothy H. V. Archer, and Richard Sutera, both of Centerville, Ohio, assignors to Burlington Industries, Inc., Greensboro, N.C.
Filed Sep. 17, 1987, Ser. No. 97,677
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—1.1 **24 Claims**

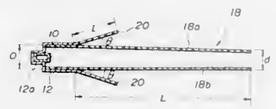


1. Fluid jet printing apparatus for printing on a substrate comprising:
a fluid jet printing head for disposition above a substrate;
a print bar carried by said head including an orifice plate for flowing fluid through the orifices of said plate for deposition on the substrate; and
means carried by said head mounting said print bar for linear movement relative to said head in directions toward and away from said substrate.

4,841,307
FLUID JET APPLICATOR APPARATUS
Louis A. Graham, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.
Filed Dec. 4, 1987, Ser. No. 128,907
Int. Cl.[4] G01D *15/18*; **B05C** *11/00*; **B11J** *15/24*
U.S. Cl. 346—1.1 **24 Claims**

1. A fluid jet printing apparatus comprising:
a frame;
an elongated fluid jet printhead carried by said frame for printing on a substrate;
a pair of laterally spaced substrate transport rollers carried by said frame substantially coextensive in length with said printhead for locating the substrate, in a first position of said rollers, in opposition to the printhead and with said rollers adjacent opposite sides of the printhead;
means carried by said frame mounting said rollers for movement from said first position into a second position spaced from said printhead with said rollers in said second position locating the substrate in a non-print position relative to said printhead; and
means carried by said frame for moving said rollers from said first position into said second position.

4,841,308
SLOTTED WAVEGUIDE ANTENNA ASSEMBLY
Takashige Terakawa, Yokohama; Mutsumi Takahashi, Kawasaki, and Noriyuki akaba, Tokyo, all of Japan, assignors to Tokyo Keiki Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 71,038, Jul. 8, 1987, abandoned, which is a continuation-in-part of Ser. No. 702,379, Feb. 15, 1985, abandoned. This application Aug. 8, 1988, Ser. No. 229,759
Claims priority, application Japan, Feb. 16, 1984, 59-27722; Feb. 21, 1984, 59-23379; Feb. 25, 1984, 59-34710; Mar. 10, 1984, 59-34689; Mar. 10, 1984, 59-46090
Int. Cl.[4] H01Q *13/10*
U.S. Cl. 343—771 **15 Claims**

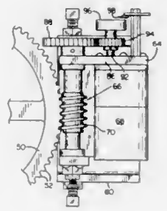


1. A slotted waveguide antenna assembly including a slotted waveguide which is fixed and held, at its back side, by a holder member, which assembly comprises:
a dielectric beam shaper formed of a pair of dielectric plate members, said dielectric plate members having base portions which are supported by said holder member and having forward end portions which extend to project forwardly of said slotted waveguide to define a space therebetween; and
a pair of reflectors provided at the base portions of the respective dielectric plate members and supported by said holder member for reflecting electromagnetic waves radiated through the base portions of the respective dielectric plate members;
said dielectric plate members having a thickness which produces a phase difference, between electromagnetic waves reflected by inner surfaces of the respective dielectric plate members and directed to the space between the dielectric plate members and electromagnetic waves reflected by interfaces at external surfaces of the respective dielectric plate members and directed to the space between the dielectric plate members, the phase difference causing the reflected electromagnetic waves directed to the space between the dielectric plate members to substantially cancel each other;
said pair of dielectric plate members being disposed apart a distance D at the base portions thereof, which differs from a distance d between the dielectric plate members at the forward portions thereof, such that the ratio d/D is given by the following relation $0.8 \leqq d/D < 1$.

4,841,309
ANTENNA WITH MOTORIZED POSITIONER
James D. Burr, Evergreen, Colo., assignor to Echosphere Corporation, Englewood, Colo.
Filed Feb. 19, 1988, Ser. No. 158,203
Int. Cl.[4] H01Q *3/08*
U.S. Cl. 343—766 **8 Claims**

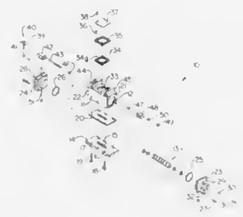
1. A motorized antenna positioner comprising:
a frame,
an adjuster shaft rotatably mounted on said frame and means operatively connected to the adjuster shaft which is shifted by turning of the adjuster shaft to position an antenna,
a worm wheel element with worm wheel teeth operatively connected to the adjuster shaft,

a worm gear element with a worm gear drive,
a mounting for the worm wheel element and worm gear element whereby the axis of the worm gear element is spaced from and extends transversely of the axis of the worm wheel element and the worm gear drive meshes with the worm wheel teeth,



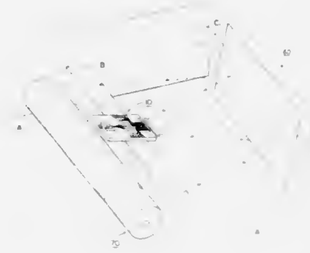
said mounting including biasing means yieldably biasing said elements in a direction urging the axis of the wheel element and the axis of the gear element toward each other,
a motor with output shaft and means drivingly connecting the output shaft of the motor and the worm gear element whereby operation of the motor produces rotation of the worm gear element.

4,841,310
HIGH PERFORMANCE INK JET PRINT HEAD FOR USE IN A HIGH SPEED PRINTER
Arthur R. Hoffman, Owego, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 31, 1988, Ser. No. 176,118
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **35 Claims**



1. An ink jet print head for use in a high speed printer mechanism for developing a plurality of ink jet streams in a predetermined array and for producing substantially uniformly timed break-off of said streams to form uniform printing droplets of ink, comprising:
means to define a cavity for enclosing an acoustic wave generator for producing dynamic pressure waves;
means to define an ink reservoir for enclosing a supply of ink under a predetermined static pressure and located so that said dynamic pressure waves from said acoustic wave generator are superimposed on said static pressure;
means to define a plurality of ink nozzles located so they are exposed to said supply of ink in said reservoir under said predetermined static pressure for producing a plurality of streams of ink; and
means to isolate said plurality of ink jet nozzles from said dynamic pressure waves transmitted through said means to define a cavity, while exposing said supply of ink in said reservoir under said predetermined static pressure to said dynamic pressure waves from said acoustic wave generator to produce substantially uniform break-off of said plurality of streams of ink to form droplets of ink for printing, including gasket means formed of a soft material with a durometer value in the order of 60.

4,841,311
LASER BEAM PRINTER WITH COMPACTLY ARRANGED PHOTOSENSITIVE ELEMENT, LASER BEAM EMITTING ELEMENT AND REFLECTIVE ELEMENT
Makoto Suzuki, Nagoya, and Satoshi Urukawa, Suzuka, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Aug. 21, 1987, Ser. No. 87,762
Claims priority, application Japan, Sep. 20, 1986, 61-222319
Int. Cl.[4] G01D *9/42*
U.S. Cl. 346—108 **6 Claims**

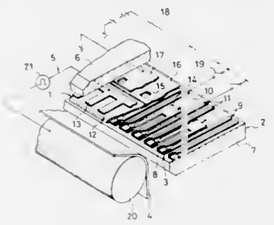


1. A laser printer comprising:
a laser beam emitting element for emitting a laser beam;
a deflective element, with a variable refractive index, fixed to the laser beam emitting element for deflecting the laser beam emitted from the laser beam emitting element;
a reflective element for reflecting the laser beam deflected by the deflective element; and
a photosensitive element located adjacent the laser beam emitting element and spaced apart from the reflective element for being exposed by the laser beam reflected by the reflective element.

4,841,312
THERMAL-ELECTROSTATIC INK JET RECORDING APPARATUS
Nanao Inoue; Koichi Saito; Ryoki Kato; Hiroshi Fujimagari; Yoshihiko Fujimura; Seiichi Kato; Koichi Naito, and Kiyoshi Horie, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Filed Nov. 27, 1987, Ser. No. 126,125
Claims priority, application Japan, Nov. 27, 1986, 61-280579
Int. Cl.[4] G01D *15/16*
U.S. Cl. 346—160 R **12 Claims**

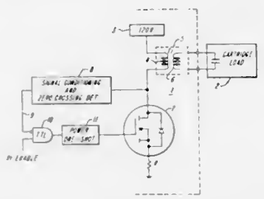
7. An ink jet recording apparatus comprising:
(a) a recording head formed of two spaced apart insulating plates, each having an inner face and providing a slit therebetween for containing an ink to be jetted from said head onto a recording sheet, said head having a discharge side toward the recording sheet from which the ink is to be jetted and a base side opposite said discharge side;
(b) electrostatic field forming electrode means for forming an electrostatic field between ink in said slit and the recording sheet, including a field forming electrode positioned in said slit; and
(c) thermal energy applying means for selectively heating unit areas of the ink in response to image signals to cause ink in said unit areas to be jetted under the influence of the

electrostatic field toward said recording sheet, said thermal energy applying means including a plurality of electric resistance heaters arranged adjacent one another on one of said inner faces adjacent said discharge side, each of said heaters having an independent electrode connectable to a switching circuit for selectively causing an electric current to flow through the heater in response to image signals, wherein said heaters are grouped into a plurality of pairs, each pair comprising two adjacent heaters, each of said heaters having an inner end and an outer end, said



apparatus further including a plurality of U-shaped common electrodes, each of said common electrodes being associated with a different one of said pairs of heaters, each said common electrode having first and second free ends, said first free end being connected to said inner end of one of said heaters in said associated pair and said second free end being connected to said inner end of the other of said heaters of said associated pair, and said independent electrode of each said heater being connected to the outer end of said heater.

4,841,313
RF DRIVER AND CONTROL
Nathan K. Weiner, Stoughton, Mass., assignor to Delphax Systems, Randolph, Mass.
Filed Jun. 16, 1987, Ser. No. 63,155
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—159 **21 Claims**



1. A drive network for driving a transformer-coupled resonant circuit at its resonant frequency F, said resonant circuit including a transformer having a primary winding and a secondary winding and including a load element coupled across said secondary winding, wherein the inductance of said secondary winding and the capacitance of said load element substantially define said resonant frequency, comprising:

A. current means coupled to said primary winding for establishing a controllable impedance current path from a first potential through said primary winding to a second potential and including means for controlling said impedance of said path in response to an applied trigger signal, and

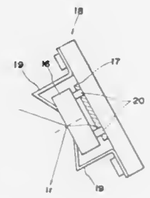
B. feedback means responsive to the voltage across said primary winding for generating said trigger signal and applying said trigger signal to said impedance control means whereby an oscillatory current is established in said current path at said resonant frequency, said feedback means including:

i. an AC signal means responsive to said voltage across said primary winding to generate an AC signal representative of the AC component of said voltage across said primary winding measured with respect to a reference potential,

ii. a trigger generator means responsive to said AC signal for generating a trigger signal having a succession of voltage pulses substantially in a predetermined phase relation to the oscillatory current and alternate ones of the crossings of said reference potential by said AC signal, and

iii. means for applying said trigger signal to said impedance control means.

4,841,314
ELECTROSTATIC LATENT IMAGE FORMING APPARATUS USING SEMICONDUCTOR LASER
Naoto Ohmori, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Aug. 9, 1988, Ser. No. 230,467
Claims priority, application Japan, Aug. 12, 1987, 62-201184
Int. Cl.[4] G01D *15/00*
U.S. Cl. 346—160 **12 Claims**



1. An electrostatic latent image forming apparatus comprising:

a semiconductor laser;

drive means for adding bias current to switching current modulated by an image signal and applying the current obtained by the addition to said semiconductor laser, thereby to excite the semiconductor laser to emit a laser beam;

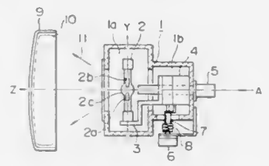
a photoreceptor having a surface on which an electrostatic latent image is to be formed by the laser beam;

a scanning optical system for scanning the surface of said photoreceptor by the laser beam emitted from said semiconductor laser and forming the electrostatic latent image by the laser beam on the surface of said photoreceptor;

a low reflectance mirror disposed in a path of transmission of the laser beam extending from said semiconductor laser to said photoreceptor for lowering intensity of said laser beam during reflecting the laser beam toward the photoreceptor, the low reflectance mirror having a function which reflects a part of the laser beam and transmits the remaining laser beam; and

light absorbing means disposed behind said low reflectance mirror for absorbing the laser beam passing through the low reflectance mirror.

4,841,315
EXPOSURE APPARATUS
Misao Kokabu; Hitoshi Nakamura; Takashi Fujimura, all of Mobara, and Nobuyasu Hayashi, Chiba, all of Japan, assignors to Hitachi Ltd. and Hitachi Device Engineering Co., Ltd., Tokyo, Japan
Filed Jul. 27, 1988, Ser. No. 224,768
Claims priority, application Japan, Sep. 18, 1987, 62-232256
Int. Cl.[4] G03B *41/00*
U.S. Cl. 354—1 **3 Claims**

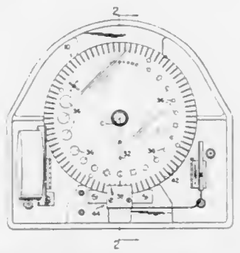


1. An exposure apparatus for use in forming a fluorescent screen on the inner surface of the panel of a color cathode ray tube, comprising:

a short-arc mercury-vapor lamp having an approximately spherical bulb charged with mercury vapor in an enclosed manner, an electron-emission electrode, and an opposing electrode disposed in opposition to said electron-emission electrode, said electrodes being spaced apart from each other along the center axis of said bulb by a predetermined distance so that an arc is produced between said electrodes; and

drive means for causing said short-arc mercury-vapor lamp to be displaced toward the center axis of said panel in correspondence with the variation of the arc center of said short-arc mercury-vapor lamp.

4,841,316
PHOTOHEAD SYSTEM FOR POSITIONING AN APERTURE WHEEL AND METHOD OF MAKING AN APERTURE DISC
Robert J. Pavone, South Windsor; Bruce L. Davidson, East Hartford, and Henry F. Berdat, Manchester, all of Conn., assignors to The Gerber Scientific Instrument Company, South Windsor, Conn.
Filed Feb. 17, 1988, Ser. No. 157,285
Int. Cl.[4] G03B *41/00*
U.S. Cl. 354—4 **13 Claims**



1. An apparatus for selectively exposing various images on a photosensitive surface, said apparatus comprising:

a frame having a beam axis;

radiant energy emitting means supported by said frame in registry with said beam axis to provide radiant energy for exposing images on a photosensitive surface;

beam imaging means located coincident with said beam axis for forming from said radiant energy emitted by said emitting means a light beam along said beam axis;

aperture means having a plurality of differently sized apertures spaced from one another along a first arcuate path concentric with an axis of rotation,

said aperture means having a plurality of indicators equidistantly spaced from one another in a second arcuate path concentric with said first path, each of said apertures being oriented in radial alignment with one of said indicators;

means supporting said aperture means for rotation relative to said frame about said axis of rotation and with said axis of rotation generally parallel to said beam axis with said arcuate first path intersecting said beam axis,

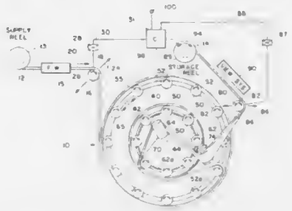
initializing means fixed relative to said indicators and cooperating with said frame for initializing one of said indicators to a reference position relative to said frame;

drive means supported by said frame and engaging said aperture means for selectively positioning one of said apertures in alignment with said beam axis;

a sensor fixed to said frame and located in alignment with said aperture means second path for generating an indicating signal each time one of said plurality of indicators moves past said sensor; and

control means connected with said sensor and said drive means for receiving said indicating signals from said sensor and establishing from said signals the present position of said aperture means relative to said reference position and for energizing said drive means to rotate said aperture means to position a selected one of said differently sized apertures in precise alignment with said beam axis.

4,841,317
WEB HANDLING DEVICE
William E. Westell, Weston, Mass., assignor to Honeywell Inc., Minneapolis, Minn.
Filed May 2, 1988, Ser. No. 189,084
Int. Cl.[4] G03B *37/02;* **H04N** *3/36;* **B65H** *16/00*
U.S. Cl. 354—65 **16 Claims**



1. Web handling apparatus for use with first and second web storage means, comprising:

a first plurality of rotatable members mounted proximate a first plane and arranged around a first axis, each rotatable member of the first plurality being rotatable about axes substantially perpendicular to the first plane;

a second plurality of rotatable members mounted proximate the first plane and arranged around the first axis and surrounding the first plurality, each rotatable member of the second plurality being rotatable about axes substantially perpendicular to the first plane;

canted means rotatable about an axis at an acute angle with the first plane, the web being wound around the first and second pluralities of rotatable members and the canted means between the first and second web storage means, the windings of web around the first and second pluralities being substantially parallel to the first plane, a predetermined one of the rotatable members of the first plurality operating to direct the web between the first and second pluralities and a predetermined one of the rotatable members of the second plurality operating to direct the web between the second plurality and the canted means so that the web is directed out of parallelity with the first plane between the second plurality and the second storage means; and

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control means operable to rotate the second plurality of rotatable members as a group around the first axis.

4,841,318

CAMERA SYSTEM WITH MODE SELECTING DEVICE

Kouji Yamamoto, Sakai; Shinji Tominaga, Osaka; Akira Yamanaka, Sakai; Hiroshi Ueda, Nara; Nobuyuki Taniguchi, Tondabayashi; Ikushi Nakamura, and Michihiro Iwata, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 797,510, Nov. 13, 1985, abandoned. This application Mar. 17, 1988, Ser. No. 169,586

Claims priority, application Japan, Nov. 14, 1984, 59-173261; Dec. 28, 1984, 59-197143; Feb. 27, 1985, 60-28848; Mar. 8, 1985, 60-33950; Mar. 12, 1985, 60-35962; Mar. 12, 1985, 60-35963; Mar. 27, 1985, 60-45490; Mar. 27, 1985, 60-45491; Mar. 28, 1985, 60-46676; Mar. 28, 1985, 60-46677; Mar. 28, 1985, 60-46678

Int. Cl.[4] G03B *1/00*

U.S. Cl. 354—173.1 **5 Claims**

1. A control device for use in a camera comprising:

means for winding up a film loaded in the camera by one frame;

means for generating a release signal to effect exposure on the film;

means for choosing first mode or second mode, during the first mode the camera operates to take pictures consecutively so long as the release signal is generated, and during the second mode the camera operates to take only one picture even if the generation of the release signal is continued;

means for preliminary winding up the film by predetermined length in response to a closure of a back lid of the camera, the film lying in the normal frame position when the preliminary winding is terminated; and

means for forcibly selecting the second mode before the preliminary winding is terminated.

4,841,319

APPARATUS FOR LOADING A FILM CASSETTE INTO A CAMERA

David E. Hansen, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

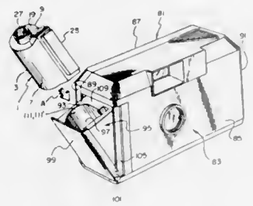
Filed May 9, 1988, Ser. No. 191,445

Int. Cl.[4] G03B *17/02, 1 1/26*

U.S. Cl. 354—275 **10 Claims**

1. An improved photographic camera wherein there is provided a film cassette receiving chamber, and wherein the improvement comprises:

said film cassette receiving chamber being configured to receive the type of film cassette that contains a non-protruding film leader, and including a loading opening having a continuous enclosed perimeter substantially commensurate in shape with an outline of the aforementioned film cassette to prevent the type of film cassette that has a protruding film leader from being inserted into said chamber.



4,841,320

DEVELOPING DEVICE FOR PHOTOSENSITIVE MATERIAL

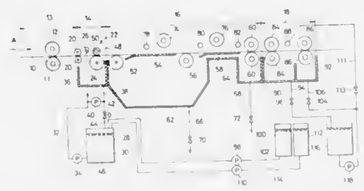
Tomoaki Takekoshi; Hisao Ohba, and Kenji Kunichika, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Dec. 23, 1987, Ser. No. 137,076

Claims priority, application Japan, Dec. 23, 1986, 61-307054

Int. Cl.[4] G03D *5/04*

U.S. Cl. 354—299 **9 Claims**



1. A device for developing a photosensitive material, comprising: warming means for raising the temperature of said photosensitive material; measuring means for applying only a minimum necessary amount of a developing solution for effecting development to an exposed surface of said photosensitive material; and a developing section for developing said photosensitive material with said developing solution applied by said measuring means and wherein the warmed photosensitive material heats the developing solution which is applied thereon sufficiently to enhance the development of the photosensitive material within said developing section.

4,841,321

CIRCULATING LIQUID FLOW DETECTING APPARATUS IN A MACHINE FOR AUTOMATICALLY PROCESSING LIGHT-SENSITIVE MATERIAL

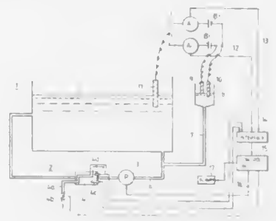
Junichi Kose, and Nobuyuki Seto, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 5, 1988, Ser. No. 190,430

Claims priority, application Japan, May 7, 1987, 62-109684; May 7, 1987, 62-109685; Sep. 17, 1987, 62-231111; Sep. 17, 1987, 62-231112

Int. Cl.[4] G03D *3/06*

U.S. Cl. 354—324 **10 Claims**



1. An apparatus for detecting circulating liquid flow in a machine for automatically processing a photographic light-sensitive element, comprising:

a processing tank for containing a processing liquid;

a processing liquid circulating means, provided outside said processing tank, for circulating a part of the processing liquid in said processing tank;

a branch pipe means having an opening portion at one end opened at a position higher than a liquid level of the processing liquid, said branch pipe means being vertically disposed and having the other end connected to a pipe which extends between a lower portion of said processing tank and a suction side of said processing liquid circulating means such that the liquid in said branch pipe means is directly responsive to operation of said circulating means;

a first liquid level detecting electrode provided in said opening portion so that a lower end of said first electrode is positioned on the same level as or a position a little lower than the liquid level of said processing tank;

a second liquid level detecting electrode provided so that a lower end of said second electrode is positioned on the same level as or a little lower than a position where the liquid level in said branch pipe is lowered when said circulating means is driven; and

a common electrode provided so as to be in contact with the processing liquid.

4,841,322

CAMERA HAVING INTERCHANGEABLE LENSES

Masahiro Kawasaki, and Osamu Sato, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 103,311, Oct. 1, 1987, abandoned. This application Nov. 1, 1988, Ser. No. 266,328

Claims priority, application Japan, Oct. 1, 1986, 61-234141; Nov. 10, 1986, 61-265738; Feb. 6, 1987, 62-15509[U]

Int. Cl.[4] G03B *3/10, 7/20*

U.S. Cl. 354—400 **23 Claims**

1. A camera capable of being used with a plurality of types of interchangeable photographing lens means, comprising:

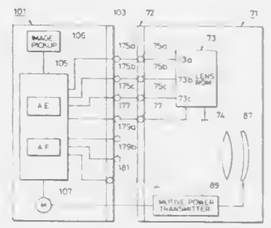
a camera body having a first mount for mounting photographing lens means to said body;

a first electrical contact;

means coupled to said first electrical contact for detecting whether a photographing lens means mounted on said mount has an automatic focusing capability;

a first group of electrical contacts for coupling signals between said photographing lens means and said camera body; and

means for transmitting via said first group of electrical contacts a single datum from said photographing lens means to said camera body in a parallel mode when said detecting means detects that said lens has no automatic focusing capability and transmitting and receiving a plurality of different data in a series mode when said detecting means detects that said photographing lens means has an automatic focusing capability.



4,841,323

AUTOMATIC FOCUSING METHOD AND CAMERA PROVIDED WITH AUTOMATIC FOCUSING APPARATUS

Minoru Yamada; Eiji Ito; Kenji Miyama, all of Hachioji; Masataka Sawamura, Hino; Yasushi Hoshino, Tokyo, and Masamori Makino, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 890,181, Jul. 14, 1986. This application Mar. 9, 1988, Ser. No. 169,102

Claims priority, application Japan, Dec. 4, 1984, 59-184450[U]; Dec. 4, 1984, 59-256870; Dec. 4, 1984, 59-256872; Dec. 5, 1984, 59-258114; Apr. 23, 1985, 60-88322; Apr. 30, 1985, 60-93394

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—400 **10 Claims**

1. An automatic focusing camera comprising:

a distance measuring means for producing a distance information of an object;

a photographic lens;

lens guide means attached to the lens for moving the lens along an optical axis;

a lens-driving means having a groove adapted to receive the lens guide means;

a lens-positioning means arranged adjacent the lens-driving means, said lens-positioning means having a stepped cam for setting the position of stoppage of the lens moved by the lens-driving means; and

means for controlling the rotation of the lens-driving means and the lens-positioning means in accordance with the distance information from the distance measuring means; wherein the lens-driving means and the lens positioning means are rotated relative to each other by the controlling means to focus the lens, whereby both the lens-driving means and the lens-positioning means are simultaneously

rotated then only the lens-driving means is rotated to move the guide means onto the stepped cam of the lens-positioning means along the groove for focusing and thereafter the lens-driving means is stopped at a position based on the distance information.

4,841,324

CAMERA HAVING AN AUTO-FOCUSING DEVICE

Akira Ogasawara, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

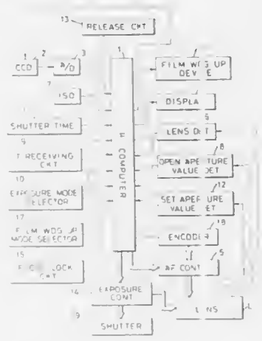
Continuation of Ser. No. 41,628, Apr. 22, 1987, Pat. No. 4,723,139, which is a continuation of Ser. No. 875,688, Jun. 18, 1986, abandoned. This application Dec. 16, 1987, Ser. No. 134,202

Claims priority, application Japan, Jun. 26, 1985, 60-139281; Aug. 23, 1985, 60-185547

The portion of the term of this patent subsequent to Feb. 2, 2005, has been disclaimed.

Int. Cl.[4] G03B *3/00, 17/40*

U.S. Cl. 354—402 **6 Claims**



1. a camera body on which a first photographing lens and a second photographing lens are exchangeably mounted, said first photographing lens having an optical system that is driven automatically in accordance with a defocus distance when said first photographing lens is mounted on said camera body, and said second photographing lens having an optical system that is not driven automatically when said second photographing lens is mounted on said camera body, comprising:

detection means for detecting a defocus distance of a photographing lens;

drive means for driving said first photographing lens on the basis of the detected defocus distance;

means for detecting mounting of said second photographing lens on said camera body to generate a lens detection signal; and

control means for controlling said drive means, said control means providing said drive means with an operating period for driving said first photographing lens between an exposure operation and a subsequent exposure operation, but deleting said operating period in response to said detection signal.

4,841,325

AUTOMATIC FOCUSING DEVICE FOR CAMERA

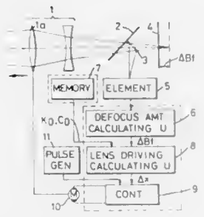
Kunihisa Hoshino, deceased, late of Tokyo (by Chie Hoshino, legal representative); Yoshinari Hamanishi, Tokyo, and Ken Utagawa, Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 5,241, Jan. 20, 1987, abandoned. This application Sep. 16, 1988, Ser. No. 245,967

Claims priority, application Japan, Jan. 22, 1986, 61-12391

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—402 **17 Claims**



1. A camera comprising:

(a) a photographing lens for forming an image of an object, said photographing lens having at least one lens component which is movable to form the image of the object;

(b) detecting means for detecting an amount of defocus of the image of the object formed by said photographing lens from a predetermined plane and for producing a defocus signal which indicates the detected amount of defocus;

(c) memory means in which a conversion coefficient and a correction coefficient are stored fixedly;

(d) motor means for moving said at least one lens component;

(e) calculating means for determining a corrected conversion coefficient on the basis of the conversion coefficient stored in said memory means and both said detected amount of defocus conforming to said defocus signal and said correction coefficient stored in said memory means, and also for conducting a calculation of a driving amount of said motor means on the basis of the corrected conversion coefficient and the detected amount of defocus, said calculating means producing a driving signal which indicates said driving amount of said motor means; and

(f) control means responsive to said driving signal for causing said motor means to drive by said driving amount indicated by said driving signal.

4,841,326

APPARATUS FOR DETECTING THE FOCUS ADJUSTED STATE OF AN OBJECTIVE OPTICAL SYSTEM

Takeshi Koyama, and Keiji Ohtaka, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 2, 1987, Ser. No. 115,905

Claims priority, application Japan, Nov. 5, 1986, 61-264355

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—406 **13 Claims**

1. An apparatus for detecting the focus adjusted state of an objective optical system, comprising:

a plurality of pattern forming optical means for forming energy patterns whose relative positional relation varies in conformity with the focus adjusted state by the use of energy passed through different areas of a pupil of the objective optical system;

sensing means having a plurality of portions and producing a signal regarding a relative positional relation between the energy patterns; and

optical means disposed between the objective optical system and said pattern forming optical means for asymmetrically varying optical paths passing through said areas of the pupil;

said pattern forming optical means being arranged in the direction passing through said areas on the pupil and forming an asymmetrical shape with respect to the optic axis of said objective optical system, a first pattern forming optical means having a different shape from a second pattern forming optical means.

4,841,327

CAMERA SYSTEM

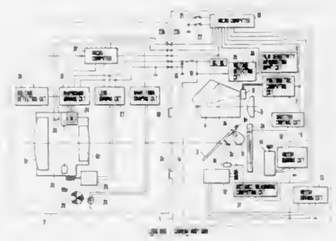
Hiroshi Yamamoto, and Nobuyuki Suzuki, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1988, Ser. No. 141,715

Claims priority, application Japan, Jan. 12, 1987, 62-4590; Jan. 12, 1987, 62-4591; Jan. 19, 1987, 62-9441

Int. Cl.[4] G03B *7/00*

U.S. Cl. 354—412 **28 Claims**



1. A camera system having a camera body and an interchangeable lens body which is detachably mountable on said camera body, comprising:

(a) said camera body including:

(a-1) a power source;

(a-2) a first motor arranged to be operated by a power supply from said power source;

(a-3) mirror driving means arranged to be driven by said first motor to move a mirror both upward and downward according to the operation of said first motor; and

(a-4) means for effecting a power supply to said interchangeable lens body;

(b) said interchangeable lens body including:

(b-1) a second motor arranged to be operated by a power supply from said power source;

(b-2) diaphragm driving means arranged to be driven by said second motor and to drive a diaphragm both in the directions of stopping down and opening the aperture thereof according to the operation of said second motor; and

(b-3) means for receiving said power supply from said camera body; and

(c) control means for controlling the operations of said first and second motors, said control means being arranged to actuate said first motor to cause said mirror driving means to move said mirror upward, to actuate said second motor to cause said diaphragm driving means to drive said diaphragm in the direction of stopping down the aperture thereof after the lapse of a given period of time from commencement of the upward movement of said mirror, to actuate said first motor to cause said mirror driving means to move said mirror downward and to actuate said second motor to cause said diaphragm driving means to drive said diaphragm in the direction of opening the aperture thereof after the lapse of a given period of time from the end of the downward movement of said mirror.

4,841,328

ELECTROSTATIC RECORDING APPARATUS

Masaru Takeuchi; Takeo Fukatsu, both of Kyoto; Shoichi Nakano, Osaka; Yukinori Kuwano, Osaka; Koji Minami, Osaka, and Masayuki Iwamoto, Hyogo, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Filed Aug. 4, 1986, Ser. No. 893,099

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—211 **33 Claims**

1. An electrostatic recording apparatus comprising:

a photosensitive member which includes a support and a bulk layer composed of an amorphorous material which is formed on the support, wherein a first layer region is formed at the support side in the bulk layer, a second layer region is formed at the surface side therein, said first layer region containing silicon atoms as base material and hydrogen of 0.01-40 atomic %, oxygen, carbon or nitrogen of 0.01-40 atomic % and an element in the group III or V of the periodic table of 5×10^{-6}-1.0 atomic %, and said second layer region containing silicon atoms as base material and hydrogen of 0.01-40 atomic % and not being doped virtually with an element in the group III or V of the periodic table,

charging means for uniformly charging said photosensitive member,

a first light source mounted for exposure to said photosensitive member to form an image after charging said photosensitive member by said charging means, and

a second light source mounted for discharging said photosensitive member to eliminate charges remaining on said photosensitive member immediately before charging said photosensitive member by said charging means,

the wavelengths of light from said first and second light sources being shorter than 650 nm, respectively.

4,841,329

DEVELOPING DEVICE ACCOMMODATING APPARATUS AND IMAGE FORMING APPARATUS AND DEVELOPING DEVICE

Toshirou Kasamura, Yokohama; Masafumi Takagi; Naoki Okuda, both of Kawasaki; Masashi Ohashi; Toshihiko Kusumoto, both of Tokyo; Nobukazu Sasaki, Yokohama; Yasunori Maeda, Inagi, and Masamichi Ikeda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1987, Ser. No. 116,957

Claims priority, application Japan, Nov. 7, 1986, 61-265096; Nov. 18, 1986, 61-274584; Dec. 26, 1986, 61-313178; Mar. 10, 1987, 62-52915; Mar. 10, 1987, 62-52927

Int. Cl.[4] G03G *15/06*

U.S. Cl. 355—245 **31 Claims**

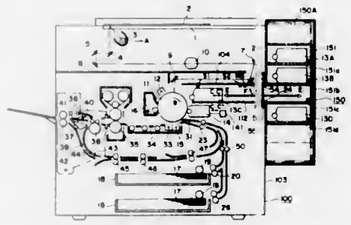
1. An image forming apparatus, comprising:

accommodating means for accomodating a plurality of developing devices on movable stages and having first moving means for moving the developing devices in a predetermined direction intersecting a direction of movement of the stages; and

an image formation assembly including a second moving means for receiving a said developing device moved out of said accommodating means and for further moving it in the predetermined direction, said image formation assembly including means for forming images using said developing device;

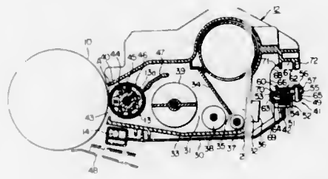
said accommodating means further including means for allowing a said developing device to be loaded into said

accommodating means, said allowing means allowing said accommodating means to be hinged to expose such side of



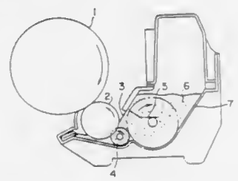
said accommodating means as is opposed to said moving means, thus allowing the loading of the developing device.

4,841,330
RECORDING APPARATUS
Susumu Owada; Masayuki Kamegamori, both of Hachioji, and Akira Kosugi, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Filed Mar. 5, 1987, Ser. No. 22,209
Claims priority, application Japan, Mar. 8, 1986, 61-50982; Mar. 8, 1986, 61-50984; Mar. 8, 1986, 61-33504[U]; Mar. 11, 1986, 61-51312
Int. Cl.[4] G03G *15/06*
U.S. Cl. 355—245 **12 Claims**



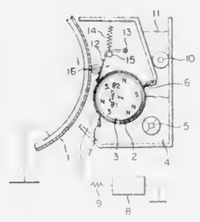
1. A recording apparatus comprising:
an image carrier having a movable image surface adapted for carrying a latent image to be developed, said image carrier including a drum extending in a longitudinal direction;
a developing unit having a developer surface for conveying a developer thereon,
guide means including a wall for slidably mounting said developing unit thereon,
means for releasably biasing said developing unit for slidably moving said developing unit in a biasing direction between at least a first position and a second position, said first position being an operating position where said developer surface faces said movable image surface with a development gap therebetween to transfer the developer onto the movable image surface and the second position is a detached position where said developer surface is spaced from said movable image surface with a gap larger than the development gap, said developing unit including an end wall part overlapping a portion of said image carrier when said developing unit is in said operating position to prevent movement of said developing unit in said longitudinal direction; and
said guide means further allowing said developing unit to slide on said wall in a mounting direction transverse to the biasing direction, said developing unit being slidable on said guide means in said mounting direction for mounting said developing unit in the recording apparatus and then movable in said biasing direction for positioning in said operating position.

4,841,331
TRIBOELECTRIC CHARGE APPLICATION MEMBER FOR TONER
Nobuhiro Nakayama, Susono; Yasuo Asahina, Numazu; Hiroyuki Fushimi, Numazu, and Yasuaki Iwamoto, Numazu, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Mar. 3, 1988, Ser. No. 163,694
Claims priority, application Japan, Mar. 5, 1987, 62-51011
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—245 **11 Claims**



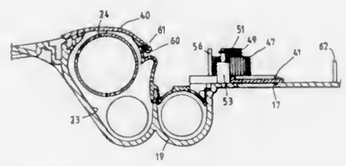
1. A development apparatus for developing latent electrostatic image by toner to visible toner images, comprising a triboelectric charge application member for triboelectrically charging a toner, which serves as a member for regulating the thickness of a toner layer formed on a rotatable developer feeding member, which triboelectric charge application member comprises a base substrate member and an overcoat layer formed on said base substrate, which overcoat layer comprises as the main component a polymer prepared from at least a fluoro-olefin compound and an unsaturated silicon compound as monomer compounds for said polymer.

4,841,332
TONER CONTROL FOR A DEVELOPER DEVICE
Satoshi Haneda; Hisashi Shoji, and Seiichiro Hiratsuka, all of Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 810,990, Dec. 19, 1985, abandoned, which is a continuation of Ser. No. 703,286, Feb. 20, 1985, abandoned. This application Jul. 23, 1986, Ser. No. 890,787
Claims priority, application Japan, Feb. 23, 1984, 59-31405
The portion of the term of this patent subsequent to Dec. 20, 2005, has been disclaimed.
Int. Cl.[4] G03G *15/08, 15/09*
U.S. Cl. 355—251 **26 Claims**



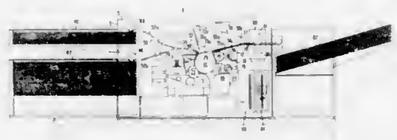
1. A developing means for developing, in an oscillatory electric field, a latent image formed on an image forming member comprising a two-component type developer wherein a mixture of toners and magnetic carriers is used, a developing sleeve having fixed magnetic poles therein, said developing sleeve being provided to face with said image forming member, said developer being arranged to move on said developing sleeve according to the rotation of said sleeve, said magnetic poles being arrangeed so as not to be in the nearest position to said image forming member, and said magnetic carriers having a resistivity of not less than 10^{13} Ωcm measured by reading an electric current value obtained in the manner that the carrier particles are put in a vessel having a sectional area of 0.5 cm^2 and tapped, and a load of 1 kg/cm^2 is applied onto the packed particles and a voltage is applied between the load and a bottom electrode so as to generate an electric field of 1000 V/cm.

4,841,333
PROCESS UNIT FOR AN IMAGING APPARATUS
Dhirendra Damji, Biggleswade, England, assignor to Xerox Corporation, Stamford, Conn.
Filed Jun. 10, 1988, Ser. No. 204,827
Claims priority, application United Kingdom, Aug. 19, 1987, 8719545
Int. Cl.[4] G03G *5/00, 15/08*
U.S. Cl. 355—211 **16 Claims**



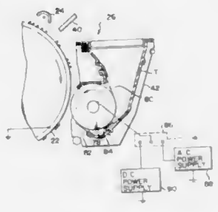
1. A process unit adapted to be removably mounted in a main assembly of an electrostatographic printing machine, comprising a housing , an imaging member inside the housing, which housing has a chamber for containing developer and an aperture through which the imaging member may be exposed to light, an opaque shutter adjacent the aperture, and a sealing shutter adjacent the developer chamber, wherein the opaque shutter and the sealing shutter are linked to form a unitary member which is slideably mounted within the housing and which is adapted to cooperate with actuating means provided on the main assembly of the printer whereby the opaque shutter and the sealing shutter are moved together to positions at which they respectively close the aperture and seal the developer chamber when the process unit is removed from the main assembly, and the opaque shutter and the sealing shutter are moved together to positions at which the aperture and the developer chamber respectively are open when the process unit is inserted in the main assembly of the copying machine.

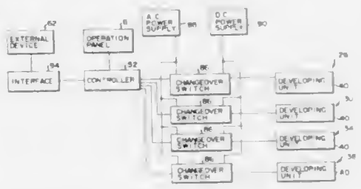
4,841,334
ELECTROGRAPHIC PRINTER WITH SMALL DIAMETER DRUM AND CHARGED TRANSFER BELT
Kensuke Fukae, Monsey, N.Y., and Shozo Kaieda, Nagano, Japan, assignors to Kentek Information Systems, Inc., Allendale, N.J.
Filed Jul. 28, 1987, Ser. No. 78,861
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—271 **41 Claims**



1. An electrographic printing apparatus for producing hard copies of information to be recorded on a sheep of paper or the like, comprising,
a housing,
a source of paper and an output receptacle for receiving said paper after it is imprinted,
a paper path along which said paper travels between said source and said output receptacle,
a photoconductive member for storing a latent electrostatic image of the information to be imprinted,
developer means for developing said latent electrostatic image on said photoconductive member,
combined transfer and transport means associated with said photoconductive member, said combined transfer and transport means being located above said paper path and transporting said paper from above, said combined transfer and transport means cooperating with said photoconductive member to define a transfer zone wherein said developed image is transferred to said paper, said combined transfer and transport means being operative to separate said paper from said photoconductive member and to transport said paper along said paper path away from said photoconductive member.

4,841,335
RECORDING APPARATUS AND METHOD
Mitsuaki Kohyama, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Dec. 4, 1986, Ser. No. 937,977
Claims priority, application Japan, Dec. 5, 1985, 60-272482
Int. Cl.[4] G03G *15/01*
U.S. Cl. 355—245 **16 Claims**

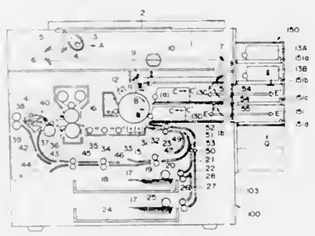




1. A recording apparatus for recording a color image or a monochromatic image of a color selected from a plurality of colors on a recording member with a plurality of developing agents, comprising:
selecting means for selecting color image recording mode or a monochromatic image recording mode and selecting the color at monochromatic image recording time;
an image carrier;
charging means for charging the carrier;
a plurality of latent image forming and developing means provided along a moving direction of said carrier, said plurality composed of a first latent image forming and developing means and subsequent latent image forming and developing means, for using the developing agents of

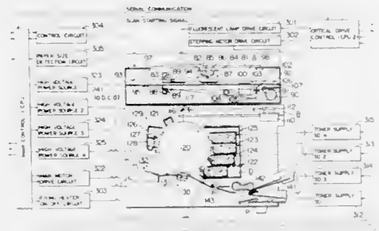
the plurality of colors, the latent image forming and developing means respectively having:
latent image forming means for forming a latent image on the carrier charged by the charging means,
developing means for developing the latent image formed by the latent image forming means with the developing agents,
said plurality of latent image forming and developing means alternately repeat the formation of the latent image on the carrier charged by the charging means and the development of the latent image at color image recording mode time to form a color developing agent image;
said latent image forming and developing means of the color selected by the selecting means form the latent image on the carrier charged by the charging means, and develops the latent image at monochromatic image recording mode time to form a monochromatic developing agent image,
said subsequent developing means developing the latent images without contact with the carrier,
transfer means for transferring the color developing agent image or monochromatic developing agent image formed by the latent image forming and developing means on the recording member, and
bias electric field applying means for applying a first bias electric field between the carrier and the subsequent developing means, said bias electric field applying means applying the bias electric field for moving the developing agent flown from the developing means by electrostatic force to move only in a direction toward the carrier at color image recording mode time and applying a second bias electric field having a sufficient intensity and frequency to cause the developing agent flown from the developing means to reciprocate at monochromatic image recording mode time.

4,841,336
IMAGE FORMING APPARATUS WITH DEVELOPING DEVICE ACCOMMODATING MEANS
Toshihiko Kusumoto, Tokyo; Toshirou Hasamura, Yokohama; Naoki Okuda, Kawasaki; Masashi Ohashi, Tokyo; Nobukazu Sasaki, Yokohama, and Minoru Nada, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 9, 1988, Ser. No. 165,934
Claims priority, application Japan, Mar. 10, 1987, 62-52901; Mar. 10, 1987, 62-52913; Mar. 10, 1987, 62-52924
Int. Cl.[4] G03G *15/01*
U.S. Cl. 355—245 **7 Claims**



1. A multi-color image forming apparatus, for forming a superimposed multi-color image on a transfer material, comprising:
a latent image bearing member;
means for forming a latent image on said image bearing member;
plural developing means containing different color developers for developing the latent image in different colors;
means for accommodating said plural developing means;
guiding means for guiding said developing means between a first position within said accommodating means and a second position adjacent said image bearing member;
driving means for moving said developing means between the first position and the second position for exchange of the developing means at the second position;
means for discriminating said plural developing means;
second developing means disposed adjacent said image bearing member at a different position;
wherein when plural colors are selected for development, a discrimination is made as to whether the developing means containing the developer of the selected color is at the second position or not, and if so, the developing means located at the second position is operated before the other of the plural developing means irrespective of the order of the selection.

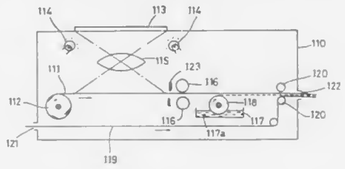
4,841,337
IMAGE FORMING APPARATUS
Seiichiro Hiratsuka; Kunihisa Yoshino; Satoshi Haneda, and Hisashi Shoji, all of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Apr. 19, 1988, Ser. No. 183,711
Claims priority, application Japan, Apr. 21, 1987, 62-99534
Int. Cl.[4] G03G *15/01*
U.S. Cl. 355—157 **10 Claims**



1. A color image forming apparatus comprising color separation means for obtaining a color-separated image of a specific color, changeover means for changing a color component to be separated by said color separating means, a single photoelectric converting means for converting said color-separated image into an electric signal, a single signal processing means for forming image data by processing an output signal of said photo-electric converting means, latent image forming for forming a latent image on an image retainer based on said image data, and a plurality of developing means having therein toners each different in color for developing said latent image, wherein a step for forming a toner image on said image retainer is repeated plural times by selecting one of said plural developing means corresponding to a specific color by said changeover means, so that a multi-color toner image is formed on said image retainer.

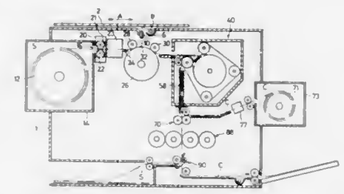
4,841,338
IMAGE RECORDING AND ADHERING APPARATUS
Keiko Suzuki, Okazaki, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan
Filed Mar. 25, 1988, Ser. No. 173,609
Claims priority, application Japan, Mar. 27, 1987, 62-75664; Sep. 22, 1987, 62-238453
Int. Cl.[4] G03B *27/32, 27/52;* **G03C** *1/72*
U.S. Cl. 355—27 **12 Claims**

1. An image recording and adhering apparatus including:
an exposing means for image-wise exposing a pressure-sensitive photosensitive medium according to source image information so as to form thereon latent images and a developing means for applying a pressure to the image-wise exposed photosensitive medium so as to cause a chemical reaction with a developer material to thereby develop said latent images into visible images on a recording medium, wherein the improvement comprises:



an adhering means for adhering a sheet of other medium on the reverse surface of said recording medium.

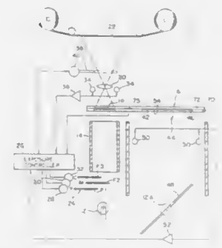
4,841,339
IMAGE FORMING METHOD
Isao Taniguchi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Mar. 11, 1988, Ser. No. 167,285
Claims priority, application Japan, Mar. 12, 1987, 62-55243; Mar. 12, 1987, 62-55244
Int. Cl.[4] G03B *27/32, 27/52;* **B65H** *20/24*
U.S. Cl. 355—27 **9 Claims**



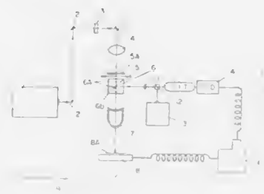
1. An image forming method in which an entrance-side nip roller and an exit-side nip roller, disposed in contact with exposed material supporting means on opposite sides of an exposure position, are employed to convey photosensitive and pressure-sensitive material from a supply position to said exposure position, the improvement comprising operating said entrance-side and exit-side nip rollers with a differential timing so as to remove any sag in said photosensitive and pressure-sensitive material.

4,841,340
METHOD OF AN APPARATUS FOR PRODUCING ADDITIONAL PRINT
Kanji Tokuda, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Dec. 31, 1987, Ser. No. 140,181
Claims priority, application Japan, Feb. 9, 1987, 62-27815; Feb. 9, 1987, 62-27816; Feb. 9, 1987, 62-27817
Int. Cl.[4] G03B *27/80*
U.S. Cl. 355—38 **20 Claims**

1. A method of producing an additional print from a negative film by a printer whose internal conditions are preset, wherein said additional print has the same color characteristics of an image on a first printed sheet, said method comprising the steps of:
(a) performing arithmetic operations upon the amount of exposure required for printing an image on photographic paper from said negative film of an original image on the basis of a first set of data of said original image on said negative film and a second set of data of said image on said first printed sheet of photographic paper printed from said negative film; and
(b) performing exposure control on the basis of the results of said arithmetic operations to finish the color characteristics of said image to be additionally printed on said photographic paper so that said color characteristics become substantially same as the color characteristics of said image printed on said first printed sheet,
wherein said step (a) includes the steps of (c) detecting said first set of data and (d) detecting said second set of data.



4,841,341
INTEGRATOR FOR AN EXPOSURE APPARATUS OR THE LIKE
Kazufumi Ogawa; Masaru Sasago, both of Hirakata; Masayuki Endo, Izumi, and Ken Ishihara, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 12, 1987, Ser. No. 61,266
Claims priority, application Japan, Jun. 13, 1986, 61-138555; Jun. 27, 1986, 61-152454
Int. Cl.[4] G03B *27/70, 27/72*
U.S. Cl. 355—43 **14 Claims**



1. An exposure apparatus comprising:
an excimer light source for emitting excimer laser light, the light travelling along an optical path;
a reduction-projection lens disposed in said optical path and through which the light passes;
a wafer stage for holding a wafer in the optical path so as to be exposed to the light travelling therealong;

a mask holder disposed between said light source and said wafer stage for holding a mask to mask the light to which a wafer held by said wafer stage is exposed; and

an integrator disposed in said optical path between said light source and said wafer stage for distributing the light emitted from said light source over a predetermined area with uniform illuminance,

said integrator including a transparent substrate having two opposing surfaces, at least one of said surfaces being a light distributing surface for distributing light passing therethrough,

the entire said light distributing surface consisting of a plurality of concentric recesses.

4,841,342

APPARATUS FOR TREATING PHOTORESISTS

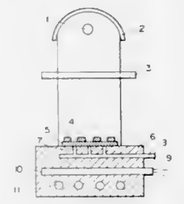
Shinji Suzuki, Kawasaki; Tetsuji Arai, Yokohama; Kuniharu Ohno, Miyashiro; Kazuyeshi Ueki, Kawasaki; Yoshiki Mimura; Kazuya Tanaka, both of Yokohama; Shinji Sugioka, Kakogawa, and Hiroko Suzuki, Kawasaki, all of Japan, assignors to Ushio Denki, Tokyo, Japan

Division of Ser. No. 923,553, Oct. 17, 1986. This application May 12, 1988, Ser. No. 192,994

Claims priority, application Japan, Mar. 13, 1986, 61-53626

Int. Cl.[4] G03B *27/72*

U.S. Cl. 355—71 **7 Claims**



1. Apparatus for treating a photoresist pattern on a semiconductor wafer to enhance thermal stability of said pattern comprising:

a support,

means for holding a semiconductor wafer on said support,

a discharge lamp for radiating energy of wavelengths in the ultraviolet range,

means for directing said radiant energy of ultraviolet wavelengths from said discharge lamp to a photoresist pattern formed on a semiconductor wafer supported on said support, and

means interposed between said discharge lamp and said photoresist pattern for selectively filtering wavelengths in the 300 nm to 500 nm spectral response region of said photoresist pattern from said radiant energy, such that treating of said photoresist pattern is accomplished only by ultraviolet radiation components other than wavelengths in said spectral response region.

4,841,343

DRY FILM DEVELOPMENT PROCESS FOR AN APERTURE CARD PRINTER

Michael H. Ranger, San Jose; Esther H. Lim, Fremont, and Robert J. Grady, Redwood City, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 25, 1988, Ser. No. 173,214

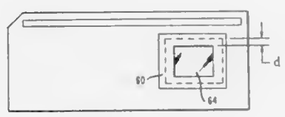
Int. Cl.[4] G03B *27/32*

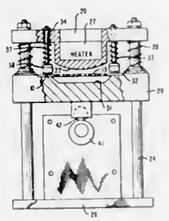
U.S. Cl. 355—77 **6 Claims**

1. In a process for exposing and developing a dry film and which includes:

the steps of exposing the film to a selected light pattern, then stretching the film across a curved heated surface for developing the resultant image using a standard development temperature,

the steps of applying a mask to the peripheral border of the film to decrease exposure of the border and, after exposure, developing the film at a selected development temperature, the selected development temperature being





sufficiently above the standard development temperature to provide a development time which is shorter than the development time associated with the standard development temperature, and

the decrease in development time being proportionately greater than the increase in development temperature, for substantially eliminating image smearing.

4,841,344

LIGHT-EMITTING-DIODE (LED) WITH SPHERICAL LENS

Jochen Heinen, Haar, Fed. Rep. of Germany, assignor to Siemens Atiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Division of Ser. No. 906,900, Sep. 15, 1986, Pat. No. 4,740,259. This application Dec. 7, 1987, Ser. No. 129,178

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1985, 3532821

Int. Cl.[4] H01L *33/0, 29/06*

U.S. Cl. 357—17 **6 Claims**

1. A light-emitting diode apparatus, comprising:

spherical lens means for radiation concentration secured to a light-emitting diode by means of adhesive;

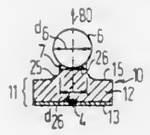
said light-emitting diode having a semiconductor body with a luminescent zone which has a shape of a spot;

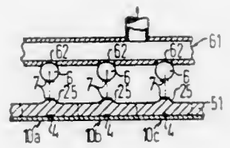
the luminescent zone being situated closer to one surface of said semiconductor body than an opposite surface thereof;

the opposite surface having a mesa with a circular mesa surface, the circular mesa surface being positioned in adjusted and centered fashion opposite the luminescent zone of the diode;

the spherical lens means being arranged on the circular mesa surface, and being aligned and retained in self-centered fashion on the mesa surface by the adhesive;

a diameter of the circular mesa surface being dimensioned of a comparable size to a diameter of such that the spherical lens is self-centered by a surface tension of the adhesive





when viscous in combination with the mesa surface diameter.

4,841,345

MODIFIED CONDUCTIVITY MODULATED MOSFET

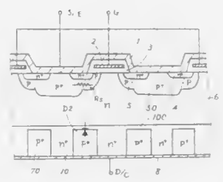
Gourab Majumdar, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Itami, Japan

Filed Aug. 26, 1986, Ser. No. 900,443

Claims priority, application Japan, Aug. 27, 1985, 60-190734; Aug. 27, 1985, 60-190735

Int. Cl.[4] H01L *29/78, 29/74, 27/02*

U.S. Cl. 357—23.4 **3 Claims**



1. A semiconductor device having improved speed and frequency switching characteristics, comprising:

a first drain/collector layer of a first semiconductor conductivity type having a high impurity concentration, said layer having upper and lower major surfaces;

a drift layer of the first semiconductor conductivity type formed on said upper major surface of said first semiconductor layer;

base region of a second semiconductor conductivity type formed in an island shape in predetermined regions on an upper surface of said drift layer;

a source/emitter island region of the first semiconductor conductivity type having a high impurity concentration and formed in an island shape in predetermined regions of an upper surface of said base regions; and

a control electrode formed through an insulating film in a predetermined region on said upper surface of said drift layer and on an upper surface of said base regions;

a second drain/collector region of the second semiconductor conductivity type having a high impurity concentration and formed in an island shape on said lower major surface of said first drain/collector semiconductor layer and in alignment with said source/emitter island region.

4,841,346

FIELD-EFFECT TRANSISTOR DEVICES

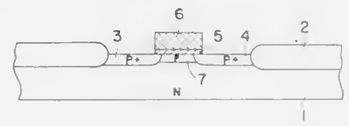
Tatsuo Noguchi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 20, 1987, Ser. No. 28,627

Claims priority, application Japan, Mar. 22, 1986, 61-64406

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.1 **2 Claims**



1. In an insulated gate semiconductor device comprising a semiconductor substrate having a first conductivity, a source electrode and a drain electrode having a second conductivity and formed on the substrate, a buried channel having said first conductivity and formed between the source electrode and the drain electrode, and a gate electrode formed above the channel through the intermediary of an insulation layer,

the improvement wherein said gate electrode is made of material having a Fermi level located between a conduction band and a valence band of the semiconductor, and

wherein the substrate has an impurity concentration of more than $1\times10^{17}\,cm^{-3}$.

4,841,347

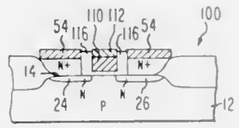
MOS VLSI DEVICE HAVING SHALLOW JUNCTIONS AND METHOD OF MAKING SAME

Sheng T. Hsu, West Windsor Township, Mercer County, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 30, 1985, Ser. No. 792,789

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.9 **9 Claims**



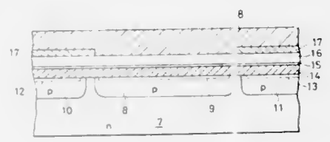
1. An MOS field effect transistor (FET) comprising a body with a surface, an insulated gate on said surface, source and drain regions in said body adjacent said gate extending downwardly from said surface to a predetermined depth and spaced to define a channel region therebetween, two spaced apart layers of doped single cryatalline silicon, one of which is on said surface of said source region in ohmic contact therewith and spaced from said gate and the other of which is on said surface of said drain region in ohmic contact therewith and spaced from said gate, and a layer of refractory metal silicide on said layer of single crystalline silicon, said two layers of doped single crystalline silicon being more highly doped than both of said source and drain regions.

4,841,348

SOLID STATE IMAGE PICKUP DEVICE

Makoto Shizukuishi, and Ryuji Kondo, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 9, 1987, Ser. No. 71,684
Claims priority, application Japan, Jul. 9, 1986, 61-159543
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 11 Claims



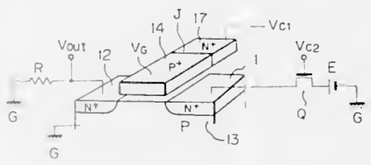
1. A solid state pickup device, comprising:
a semiconductor substrate of a first conductivity type;
a photosensitive section comprising:
a region of a second conductivity type formed in said semiconductor substrate, said region having semiconductive channels of the first conductivity type located at a surface of said region, and having a plurality of charge accumulation means corresponding to respective picture elements;
means for transferring signals accumulated in said charge accumulation means;
a logic circuit integrally formed with said region in said substrate and at a periphery of said region; and
a photoconductive film formed on, and contiguous with, said substrate including said region and said logic circuit, and means for electrically coupling said photoconductive film to each of said plurality of charge accumulation means, and for supplying thereto an electric signal produced in response to light incident on said photoconductive film.

4,841,349

SEMICONDUCTOR PHOTODETECTOR DEVICE WITH LIGHT RESPONSIVE PN JUNCTION GATE

Motoo Nakano, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 798,187, Nov. 14, 1985, abandoned. This application Oct. 28, 1987, Ser. No. 113,324
Claims priority, application Japan, Nov. 16, 1984, 59-241978
Int. Cl.[4] H01L *27/14, 31/10* H03K *3/42*
U.S. Cl. 357—30 12 Claims



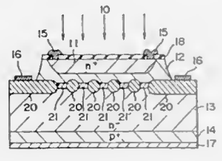
1. A semiconductor photodetector device for a solid state image sensing device, comprising:
an insulating gate field effect transistor having a channel region and source and drain regions of a first conductivity type, a gate electrode of a second conductivity type, opposite to the first conductivity type, and a gate extension portion of the first conductivity type, said gate electrode and said gate extension portion forming a PN junction outside the channel region of said transistor and inside a photodetector area for detecting light; and
means for applying a first voltage to said gate extension portion to reverse bias the PN junction and enable detection of light when the PN junction becomes temporarily conductive and supplies a voltage to said gate electrode, the voltage having a level determined by the intensity of the light of the photodetector area, and for applying a second voltage to said gate extension portion to forward bias the PN junction, reset said photodetector device and release carriers stored in said gate electrode.

4,841,350

STATIC INDUCTION PHOTOTHYRISTOR HAVING A NON-HOMOGENEOUSLY DOPED GATE

Jun-ichi Nishizawa, 6,16, Komegafukuro, 1-chome, Sendai-shi, Miyagi 980, Japan

Continuation of Ser. No. 910,268, Sep. 19, 1986, abandoned, which is a continuation of Ser. No. 610,299, Apr. 30, 1984, abandoned. This application Dec. 9, 1987, Ser. No. 131,347
Claims priority, application Japan, Aug. 30, 1982, 57-150300
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 14 Claims



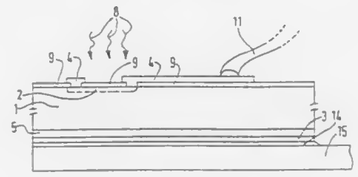
1. A static induction type photothyristor having a non-homogeneously impurity doped gate structure, which comprises a cathode region of one conductivity type, a gate region and an anode region formed in a high resistivity semi-conductor substrate, the cathode and gate regions being connected at a first junction and the anode and gate regions being connected at a second junction, characterised in that the distribution profile of the impurity in the gate region is non-homogeneous in a gate plane perpendicular to a current flow direction between the cathode region and anode region and includes high impurity concentration region portions, and, with respect to said high impurity concentration region portions, low impurity concentration region portions, the impurity concentrations of said low impurity concentration region portions are sufficiently low to be completely depleted by a built-in potential between said low and high impurity region portions, no neutral region being formed in the low impurity concentration region portions of the gate region, whereby optically excited minority carriers are stored in the high impurity concentration region portions and majority carriers are permitted to easily pass through the low impurity concentration region portions of the gate region, and in that the high and low impurity concentration regions of said gate region are constructed so that their potential voltages relative to said cathode region are capacitively-coupled together so that the potential voltage of the low impurity concentration region portions of the gate region capacitively vary with that of the high impurity concentration regions of the gate region, and said cathode region is formed on a first surface of said semi-conductor substrate and said anode region is formed on another surface reverse from said first surface of said semi-conductor substrate, a cathode electrode is formed on said anode region, and an optical window area is formed on said cathod electrode to permit the penetration of triggering light, a gate electrode being formed on peripheral high impurity concentration region portions of the gate region, and the conductivity type of said gate region portions is the same as that of said anode region and is reverse from that of said cathode region, concentrations of said high impurity concentration region portions of the gate region are at least one order of magnitude higher than that of said low impurity concentration region portions.

4,841,351

HGCDTE PHOTODIODE WITH HIGH SPEED RESPONSE

Royer Michel, Paris, France, assignor to S.A.T. (Société Anonyme de Télécommunications), France

Filed Apr. 13, 1988, Ser. No. 181,023
Claims priority, application France, Apr. 14, 1987, 87 05256
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 9 Claims



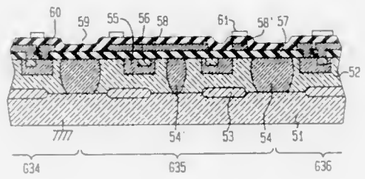
1. A phototdiode made from a P type HgCdTe semiconductor substrate in which an N type doped zone is formed on one face thus providing a PN junction, and with metallizations for access to the P and N zones, wherein the metallization giving access to the P zone is in contact with a degenerated Cu_2Te layer disposed on the P face of said HgCdTe semiconductor substrate opposite the PN junction.

4,841,352

SEMI-CUSTOM INTEGRATED CIRCUIT PROVIDED WITH STANDARDIZED CAPACITOR CELLS

Akira Aso, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 929,769, Nov. 13, 1986, abandoned. This application Jun. 14, 1988, Ser. No. 206,996
Claims priority, application Japan, Nov. 13, 1985, 60-255254
Int. Cl.[4] H01L *27/10, 27/02, 29/72*
U.S. Cl. 357—45 7 Claims



1. A semiconductor integrated circuit comprising:
a semiconductor substrate,
a plurality of circuit elements including bipolar transistors formed in said semiconductor substrate and aligned in a plural number of lines,
a first insulating film covering said semiconductor substrate at said lines and at portions between said lines, a plurality of contact holes being formed in said first insulating film for a selected group of bipolar transistors in said lines, said first insulating film having no contact holes on an unselected group of bipolar transistors ins aid lines, and
a first level of metallic layers disposed on said first insulating film, a first group of said metallic layers running between said lines as at least a part of wirings for interconnection, a second group of said metallic layers being formed on said selected group of bipolar transistors at said lines and being connected to said selected group of bipolar transistors through said contact holes, and a third group of said metallic layers having an enlarged area located on but isolated from said unselected group of bipolar transistors via said first insulating film to form a capacitor in which said enlarged area serves as an upper electrode and said semiconductor substrate with the unselected group of bipolar transistors formed therein serves as a lower electrode without having direct connection to said first level of metallic layers.

4,841,353

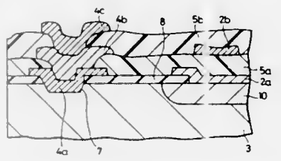
TRANSISTOR DEVICES FOR MICROWAVE OSCILLATOR ELEMENTS

Kenzo Wada, and Eiji Nagata, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 753,092, Jul. 9, 1985, abandoned. This application Nov. 24, 1987, Ser. No. 129,390
Claims priority, application Japan, Jul. 10, 1984, 59-141375
Int. Cl.[4] H01L *27/02*
U.S. Cl. 357—51 8 Claims

1. In a transistor device for use in oscillating an electric signal at a frequency comprising a transistor chip having three electrodes and a package having three terminals corresponding to the three electrodes, said transistor chip being encapsulated within said package, a control electrode of the three electrodes of said transistor chip being connected to a first of the three terminals by a bonding wire within said package, an output electrode of the three electrodes being coupled with a second of three terminals, the transistor device having an input impedance reviewed from the first terminal as an input terminal at said frequency, the improvement which comprises an insulator plate means fixedly mounted adjacent said transistor chip within said package, and a conductor element supported on said insulator plate means and having opposite ends which are connected to said output electrode and said second terminal of said package, respectively, to connect said output electrode and said second terminal, said conductor element having substantially higher inductance in comparison with that of the bonding wire connected between said control electrode and said first terminal so that said input impedance of said transistor device has a negative resistance characteristic with a reduced phase rotation at said frequency which has no relation to an external circuit connected to said second terminal of the package.

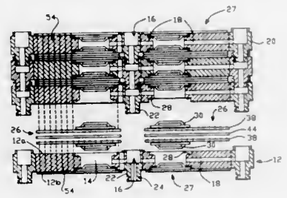
4,841,354
ELECTRONIC DEVICE WITH PERIPHERAL PROTECTIVE ELECTRODE
Tohru Inaba, Takasaki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Continuation of Ser. No. 921,525, Oct. 22, 1986, abandoned, which is a continuation of Ser. No. 535,234, Sep. 23, 1983, abandoned. This application Apr. 28, 1988, Ser. No. 188,080
Claims priority, application Japan, Sep. 24, 1982, 57-16439
Int. Cl.[4] H01L 23/48
U.S. Cl. 357—71 **15 Claims**



1. A semiconductor device encapsulated with a resin comprising:
a substrate;
a plurality of semiconductor regions formed in one major surface of said substrate for providing semiconductor elements;
a first film comprised of an inorganic insulating material extending over said substrate;
a first wiring layer formed over said first film and coupled to one of said semiconductor regions through an opening provided in said first film;
a second film comprised of an organic insulating material, said second film being provided over said first wiring layer in said first film; and
stress absorbing means for preventing deformation of said first wiring layer and said second film being formed adjacent to a peripheral portion of said substrate to absorb stress caused during curing of said resin, said stress absorbing means comprising a protective electrode which is made up of lower and upper metal wiring layers comprising aluminum, one superimposed above the other, and which penetrates said first and second films to connect said upper metal wiring layer to said lower metal wiring layer and said lower metal wiring layer to said substrate; said protective electrode being located outside of said semiconductor regions and away from said first wiring layer.

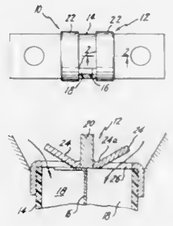
4,841,355
THREE-DIMENSIONAL MICROELECTRONIC PACKAGE FOR SEMICONDUCTOR CHIPS
Howard L. Parks, Los Gatos, Calif., assignor to Amdahl Corporation, Sunnyvale, Calif.
Filed Feb. 10, 1988, Ser. No. 154,852
Int. Cl.[4] H01L 23/46, 23/36
U.S. Cl. 357—82 **27 Claims**

1. A three-dimensional microelectronic package for semiconductor chips, comprising:
a plurality of cavity wafers, each cavity wafer having a plurality of cavities, tunnels for providing private coolant to said cavities, and conductive paths, said cavity wafers being arranged in a stack;
a plurality of interconnect means, attached to said cavity wafers at positions corresponding to the positions of the cavities, for housing the semiconductor chips, electrically interconnecting the semiconductor chips and said conductive paths of said cavity wafers, selectively electrically interconnecting said conductive paths of adjacent cavity wafers, and for providing a medium for exchanging heat



between the semiconductor chips and the coolant in the cavities.

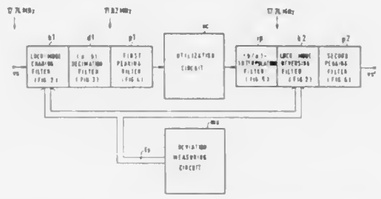
4,841,356
FUSES AND THEIR MANUFACTURE
Kenneth D. Howton, Palatine; Robert G. Stewart, Lake Villa, and Herman R. Zeitler, Mount Prospect, all of Ill., assignors to Brush Fuses, Inc., Des Plaines, Ill.
Filed Apr. 5, 1988, Ser. No. 177,637
Int. Cl.[4] H01H 85/14, 85/04
U.S. Cl. 337—248 **9 Claims**



4. A cartridge fuse including a tube of insulation, first and second terminals at the ends of said tube and a link interconnecting said terminals, at least one of said terminals comprising an end cap of sheet metal having at least one tab congruent to and aligned with a hole in the end cap, the tab and the area of the end cap in which the hole is formed being continuously interconnected portions of the sheet metal of the end cap.

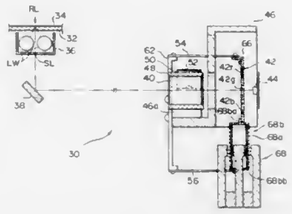
4,841,357
DATA COMPANDER FOR DIGITAL VIDEO SIGNALS
David Gillies, Strasbourg, France, assignor to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany
Filed Feb. 24, 1988, Ser. No. 166,529
Claims priority, application European Pat. Off., Mar. 7, 1987, 87103281.9
Int. Cl.[4] H04N 9/44
U.S. Cl. 358—17 **11 Claims**

1. A data compander for digital video signals having a sampling frequency and a chrominance-subcarrier frequency, wherein the sampling frequency is locked to the chrominance-subcarrier frequency, said data compander comprising:
a lock-mode-changing filter having an input and an output, said input receiving said digital video signals as input video signals, said lock-mode-changing filter changing the lock of said input video signals from said chrominance-subcarrier frequency to the line frequency;
an (a/b)-decimation filter, wherein a and b are integers with the integer a less than the integer b, said (a/b)-decimation filter having an input and an output, said input of said (a/b)-decimation filter connected to said output of said lock-mode-changing filter;
a first peaking filter having an input and an output, said input of said first peaking filter connected to said output of said (a/b)-decimation filter;
a utilization circuit for the line-locked signals, said utilization circuit having an input and an output, said input of said utilization circuit connected to said output of said first peaking filter;
a (b/a)-interpolation filter having an input and an output, said input of said (b/a)-utilization filter connected to said output of said utilization circuit;



a lock-mode-reversing filter having an input and an output, said input of said lock-mode-reversing filter connected to said output of said (b/a)-interpolation filter, said lock-mode-reversing filter changing the line lock of the signals into a lock with the chrominance-subcarrier frequency; and
a second peaking filter having an input and an output, said input connected to said output of said lock-mode-reversing filter, said output providing the companded video signals.

4,841,358
DEVICE FOR READING A COLOR IMAGE FROM AN ORIGINAL DOCUMENT WITH RECIPROCATING FILTER
Yoshiaki Kammoto, and Masanori Saito, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan
Filed Sep. 26, 1986, Ser. No. 911,876
Claims priority, application Japan, Sep. 30, 1985, 60-214491
Int. Cl.[4] H04N 9/07
U.S. Cl. 358—75 **6 Claims**



1. A device for reading a color image from a color original document, comprising:
a line image sensor for decomposing the color image which is incident to a light-sensitive surface of said line image sensor into pixels each having a predetermined configuration and photoelectrically converting said pixels;
an optical arrangement for conducting the color image located on the read line to said light sensitive surface of said line image sensor;
flat filter means having a plurality of color separation stripe filters each having a predetermined size and separating a predetermined color component, said filters being spaced at a predetermined distance from each other and extending along the lenth of said light-sensitive surface wherein said predetermined distance is such that a light beam directed toward said line image sensor is temporarily and completely intercepted;
filter drive means for driving said flat filter means in a reciprocal motion in a plane which is perpendicular to an optical axis so as to cause any one of said filters to move into alignment with said optical axis; and
filter support means for supporting said filter means in such a manner as to allow said filter means to move in the direction of reciprocation while restricting movement of said filter means in other directions;
wherein said filter support means comprises a plurality of leaf springs which are identical in dimensions and spring coefficient.

4,841,359
PHOTOGRAPHIC APPARATUS FOR MAKING SIMULTANEOUS EXPOSURES
Ross H. Hawkins, Woodridge; David Laing, Acacia Ridge, and Bryan C. Bedington, Kangaroo Point, all of Australia, assignors to Bryna Pty. Ltd., Queensland, Australia
PCT No. PCT/AU87/00076, § 371 Date Nov. 12, 1987, § 102(e) Date Nov. 12, 1987, PCT Pub. No. WO87/05716, PCT Pub. Date Sep. 24, 1987
PCT Filed Mar. 18, 1987, Ser. No. 157,480
Int. Cl.[4] H04N 1/46
U.S. Cl. 358—76 **18 Claims**

1. A system including a first camera for producing latent images of an object on film which may subsequently be processed; a second camera integral with or adjacent the first camera adapted to produce images substantially corresponding to the latent images of the first camera whereby respective images of the second camera correspond to respective latent images of the first camera; coding means including at least one light emitting display associated with the first camera for uniquely coding each said latent image, said coding means correspondingly coding the images produced by the second camera, said coding means further including a counter for providing in response to a release signal a code indicative of the number of latent images produced, an identification code matrix for producing a user code indicative of a particular user, a mixer for combining the latent image code and the user code, and drivers for driving said light emitting display; and, image display means for displaying or providing viewable images of the images produced by the second camera.

4,841,360

APPARATUS AND METHOD FOR THE REPRODUCTION OF COLORED ORIGINALS WITH GRAY BALANCE AND/OR CONTRAST ADJUSTMENT

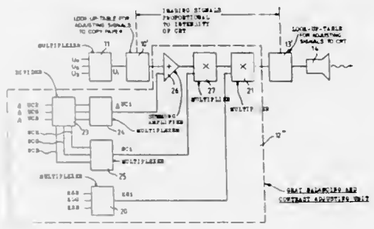
Klaus Birgmeir, Putzbrunn, Fed. Rep. of Germany, assignor to Agfa - Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 14, 1987, Ser. No. 85,943

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1986, 3629422

Int. Cl.[4] G03F *3/08*; H04N *1/40, 1/46, 9/64*

U.S. Cl. 358—80 **31 Claims**



1. A method of copying an original in which an imaging device makes an optical image of said original and said image is printed, comprising the steps of scanning said original; generating imaging signals based on the scanning step; adjusting at least one of a plurality of exposure parameters for the printing of said image in such a manner that each remaining exposure parameter of said plurality is substantially unaffected, the adjusting step including modifying said signals so that the latter are substantially proportional to a predetermined characteristic of said device or to the logarithm of said predetermined characteristic, and correcting said signals subsequent to modification, said correcting compromising multiplying said signals by a correction factor for said at least one exposure parameter or adding a correction factor for said at least one exposure parameter to said signals; and converting said signals into said image after the adjusting step by means of said imaging device.

4,841,361

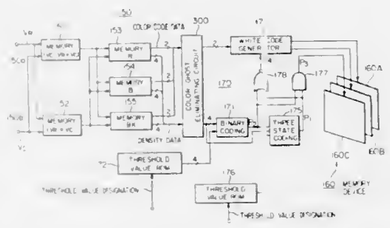
COLOR IMAGE PROCESSING APPARATUS

Masahiko Matsunawa, and Hiroyuki Yamamoto, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 3, 1987, Ser. No. 128,276

Int. Cl.[4] G03F *3/08*; H04N *1/46*

U.S. Cl. 358—80 **7 Claims**



1. Apparatus for processing a color original image which comprises

(1) means for reading a color original image to generate a plurality of color component signals for each pixel of said original image;

(2) means for processing said color component signals to generate a plurality of color image signals wherein each of said color image signals comprises color code data and density data;

(3) means for eliminating a color ghost from said color code data, said color ghost eliminating means storing corrected color code data whereby said color ghost eliminating means outputs corrected color code data in accordance with said color code data, and;

(4) means for correcting said density data in accordance with said corrected color code data.

4,841,362

APPARATUS FOR GENERATING POSITIVE OR NEGATIVE IMAGE OUTPUT SIGNALS FROM EITHER POSITIVE OR NEGATIVE ORIGINALS

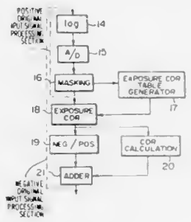
Hitoshi Urabe; Takao Shigaki, and Osamu Shimazaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

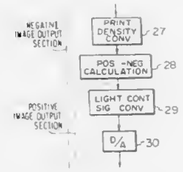
Continuation of Ser. No. 892,454, Aug. 4, 1986, Pat. No. 4,734,763, which is a continuation of Ser. No. 627,701, Jul. 3, 1984, abandoned. This application Mar. 4, 1988, Ser. No. 164,369

Claims priority, application Japan, Jul. 4, 1983, 58-121325; Mar. 12, 1984, 59-46897

Int. Cl.[4] G03F *3/08*; H04N *1/46*

U.S. Cl. 358—80 **4 Claims**





1. An apparatus for processing an image signal for positive-to-negative conversion in an image output system, which comprises means for converting a positive density signal representing a positive image to be printed with a desired density on an ultimate photosensitive printing material into a positive density printing signal for producing said positive image with said desired density, and means for converting said positive density printing signal into a negative density signal representing an intermediate negative image to be printed on an intermediate photosensitive printing material with a density such that when said negative image is used to print an image on said ultimate photosensitive printing material, said positive image with said desired density is obtained.

3. An apparatus for processing a negative original density signal, obtained by photoelectrically scanning a negative original and including three primary color signal components corresponding to respective primary color contents of said negative original, which apparatus comprises:

first converting means for converting said negative original density signal into a corrected negative density signal representing a negative image recorded with a normal exposure (neither underexposed nor overexposed), and

second converting means for converting said corrected negative density signal thus obtained into a positive density signal having three primary color signal components and representing a positive image recorded with a normal exposure, a weight ratio of said three primary color signal components of said positive density signal always being equal to a predetermined ratio when said negative original is a gray original.

4. An apparatus for processing a negative original density signal, obtained by photoelectrically scanning a negative original and including three primary color signal components corresponding to respective primary color contents of said negative original, which apparatus comprises:

first converting means for converting said negative original density signal into a corrected negative density signal representing a negative image recorded with a normal exposure (neither underexposed nor overexposed), and

second converting means for converting said corrected negative density signal thus obtained into a positive density signal having three primary color signal components and representing a positive image recorded with a normal exposure, a weight ratio of said three primary color signal components of said positive density signal always being equal to 1:1:1 when said negative original is a gray original.

4,841,363

ENDOSCOPIC VIDEO SYSTEM

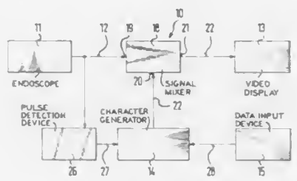
Felix Ams, Kämpfelbach, and Roland Schäfer, Bretten-Diedelsheim, both of Fed. Rep. of Germany, assignors to Richard Wolf GmbH, Fed. Rep. of Germany

Filed Jul. 14, 1988, Ser. No. 219,441

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1987, 3723228

Int. Cl.[4] A61B *1/04*

U.S. Cl. 358—98 **18 Claims**



1. An endoscopic television system, comprising:

(a) an endoscope adapted to generate an endoscopic image video signal representative of an endoscopic image, the endoscopic image video signal having synchronization signals therein;

(b) data input means for generating keying signals representative of characters;

(c) character generator means coupled to the data input means for generating character signals representative of characters in response to receipt of the keying signals, and for storing the character signals in a character store;

(d) synchronization means coupled to the endoscopic image video signal for generating a synchronization output signal representative of the synchronization pulses in the endoscopic image video signal;

(e) image control means associated with the character generator means and coupled to the synchronization output signal for reading the character signals stored in the character store as a function of the synchronization output signal, and for generating a character video signal;

(f) mixer means coupled to the endoscopic image video signal and the character video signal for mixing the signals together and to generate a composite endoscopic image/-character video signal;

(g) monitor means coupled to the composite endoscopic image/character video signal for displaying on a television screen the endoscopic image and characters represented by the composite signal; the endoscopic image being displayed on a portion of the screen, the characters being displayed on at least one image-free zone of the screen.

4,841,364

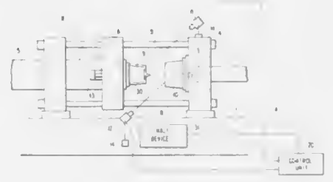
SYSTEM FOR CONFIRMING THE RELEASE OF A MOLDED ARTICLE IN AN INJECTION MOLDING APPARATUS AND FOR DETERMINING THE QUALITY OF THE ARTICLE

Norindo Kosaka, and Chikatoshi Yamaguchi, both of Shizuoka, Japan, assignors to Kawaguchi, Ltd., Shizuoka, Japan

Filed Apr. 15, 1988, Ser. No. 182,210

Int. Cl.[4] H04N *7/18*

U.S. Cl. 358—101 **11 Claims**



1. A system for detecting release of a molded article and determining the quality of the article in an injection molding machine having at least two mold members for forming a mold, said system comprising:

a first video camera for monitoring a first mold member and providing surface image data indicative thereof;

a second video camera for monitoring a surface of a second mold member which mates with the first mold member, and providing surface image data indicative thereof; and

control means including memory means for storing reference image data and the provided surface image data, means for comparing the reference image data and the provided surface image data, and means for determining the quality of a molded article and detecting release of the molded article from the mold members based upon comparison by said comparing means.

4,841,365

ARRANGEMENT FOR RECEIVING NUMERICAL DATA, COMPRISING A CIRCUIT FOR RECOGNIZING THE START OF PACKETS

André Guenot, Yerres, and Christian J. R. Cantou, Combs la Ville, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 18, 1987, Ser. No. 136,169

Claims priority, application France, Dec. 23, 1986, 86 18052

Int. Cl.[4] H04N *7/04*

U.S. Cl. 358—147 **7 Claims**

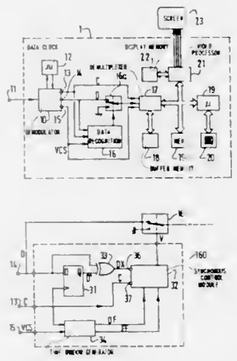
1. An apparatus for receiving digital data transmitted in the form of multiplexed packets in the video channel of a television transmission system, comprising:

a. a demodulator including:

i. means for generating data clock signals synchronized with reception of a bit synchronizing burst which is a sequence of n bits of alternating first and second logic levels at a start of each data packet after a line synchronizing signal, and

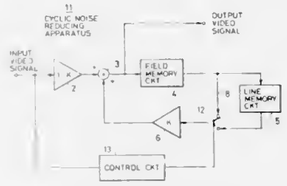
ii. means for supplying data signals,

b. a demultiplexer for receiving and demultiplexing the data signals and the data clock signals from the demodulator,
c. means for handing data to be viewed on a screen, and
d. a circuit for authorizing transfer of the data signals to the demultiplexer by supplying a recognition signal if the start of a data packet has been recognized, comprising:
i. a flip-flop having a data input coupled to receive the data signals from the demodulator and an output,
ii. means for effecting a modulo-2-sum, the effecting means having first and second inputs and an output, the first input being coupled to receive the data signals from



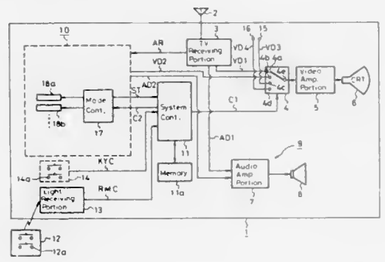
the demodulator, the second input being coupled with the output of the flip-flop,
iii. a time window generator for generating a time window which is open during an open period, and
iv. a synchronous control module having an input, coupled with the output of the effecting means, for storing a sequence of given states of its input during the open period of the time window and which synchronous control module has an has an output for supplying said recognition signal when the sequence of states is essentially a sequence of said first logic level.

4,841,366
CYCLIC NOISE REDUCING APPARATUS
Toshiyuki Katagiri, and Kazuhisa Marukado, both of Osaka, Japan, assignors to NEC Home Electronics Ltd., Osaka, Japan
Filed Mar. 31, 1987, Ser. No. 32,828
Claims priority, application Japan, Mar. 31, 1986, 61-73349; May 26, 1986, 61-120550
Int. Cl.[4] H04N *5/213*
U.S. Cl. 358—167 13 Claims



1. A noise reducing apparatus comprising:
means for delaying an input video signal by n lines for a first field and by n+1 lines for a second field to obtain a delayed video signal;
means for cyclically adding said delayed video signal for each field to a subsequent signal of said input video signal to obtain an output video signal having reduced noise; and
means for causing the delay of said first and second fields to be equal to a delay period of a frame delay to avoid half line shifting of said input video signal, said delay period corresponding to a delay of 2n+1 lines.

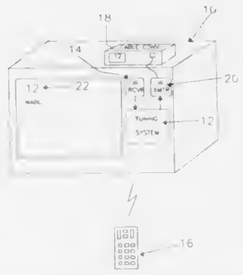
4,841,367
VIDEO SOURCE SELECTING SYSTEM
Norihito Ichikawa; Ikeo Someya; Osamu Oda, all of Tokyo, and Toshio Amano, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Jul. 29, 1987, Ser. No. 79,153
Claims priority, application Japan, Jul. 29, 1986, 61-178172
Int. Cl.[4] H04N *5/268*
U.S. Cl. 358—181 8 Claims



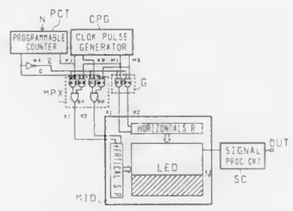
1. A video source selecting system comprising:
(a) a switching means for sequentially selecting, for display, a monitor television receiver, video signals present on a plurality of channels, such video signals including a video signal from a built-in video tape recorder and a video signal from at least one external video input terminal; and
(b) control means for controlling said switching means, said control means operative in response to said built-in video tape recorder placed in its playback mode, to cause said switching means to successively select each of said plurality of video signals sequentially, and operative in response to said built-in video tape recorder not placed in its playback mode, to omit the video signal from said video tape recorder from selection by said switching means.

4,841,368
TELEVISION CUSTOMER CONTROL FUNCTIONS RESTORER
Robin B. Rumbolt; William F. Guerinot, and Daniel J. Dargis, all of Knoxville, Tenn., assignors to North American Philips Corporation, New York, N.Y.
Filed Jan. 21, 1988, Ser. No. 146,528
Int. Cl.[4] H04N *5/44*
U.S. Cl. 358—194.1 7 Claims

1. In a television receiver having a channel-associated function which is automatically executed when a television tuning system in the television receiver is selectively tuned to a selected channel, a function restorer for restoring said channel-associated function which is suppressed when said television tuning system is fixedly tuned to an available channel different from said selected channel and tunning of said television receiver is controlled by external tuning means, said function restorer comprising:
means for generating an external tuner selection signal and a first selected channel signal signifying said selected channel;
means responsive to said external tuner selection signal and said first selected channel signal for tuning said television tuning system to said available channel and executing said channel-associated function; and
remote control transmitter means in said television receiver and connected to said television tuning system for generating, in dependence on said channel-associated function, a second selected channel signal corresponding to said first selected channel signal and transmitting said second selected channel signal to said external turning means for tuning said external tuning means to said selected channel.

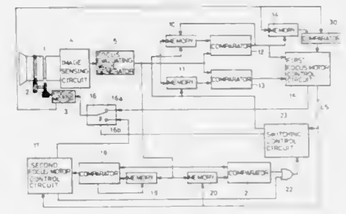


4,841,369
SOLID STATE IMAGING DEVICE WITH AN ARRANGEMENT FOR PROVIDING A HIGH SPEED SCAN OR OMITTING SCANNING IN AN UNNECESSARY PICK-UP RANGE
Shigeki Nishizawa, 3ku-27gou, 3550 Hayano, Mobara-shi, Chiba-ken; Iwao Takemoto, 1221-6 Hayano, Mobara-shi, Chiba-ken; Toshio Miyazawa, 853-27 Ariyoshicyou, Chiba-shi, Chiba-ken, and Tetsurou Izawa, 3550 Hayano, Mobara-shi, Chiba-ken, all of Japan
Filed Jul. 2, 1987, Ser. No. 69,178
Int. Cl.[4] H04N *5/335*
U.S. Cl. 358—213.26 4 Claims



1. A solid-state imaging system comprising:
a plurality of photo-electric converting elements arrayed in a plurality of rows and columns, a vertical scanning circuit for accessing predetermined ones of said elements in every one or more rows in a predetermined order, a horizontal scanning circuit for accessing predetermined ones of said elements in every column in a predetermined order, an output terminal, an output circuit for serially deriving the converted electrical signal to said output terminal in cooperation with said vertical and horizontal scanning circuits, and an exchanging circuit for making the scanning rate of said vertical scanning circuit normal in a first mode and equal to that of said horizontal scanning circuit in said second mode.

4,841,370
AUTOMATIC FOCUSING CIRCUIT FOR AUTOMATICALLY MATCHING FOCUS IN RESPONSE TO VIDEO SIGNAL
Hirotsugu Murashima, Yamatotakada; Satoru Maeda, Hirakata, and Shunji Hirano, Takatsuki, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Nov. 13, 1987, Ser. No. 120,583
Claims priority, application Japan, Nov. 17, 1986, 61-273212; Dec. 19, 1986, 61-304411; Feb. 18, 1987, 62-34763; Feb. 26, 1987, 62-43405; Feb. 26, 1987, 62-43406; Mar. 4, 1987, 62-49513
Int. Cl.[4] H04N *5/232*
U.S. Cl. 358—227 18 Claims



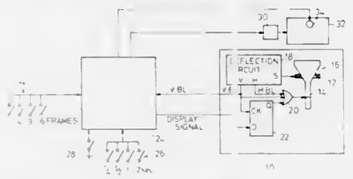
1. An automatic focusing system for automatically matching a focus in response to a video signal obtained from image sensing means having a focusing lens and an image sensor, comprising:
relative position changing means for changing the positional relationship of said focusing lens and said image sensor relative to each other in the direction of an optical axis of said focusing lens,
focus evaluating value detecting means for detecting a level of a high frequency component of the video signal obtained from said image sensing means every constant period, converting the level into either a focus evaluating value which takes the maximum value in the in-focus positional relationship or a focus evaluating value which takes the minimum value in the in-focus positional relationship,
first control means connected to said focus evaluating value detecting means for controlling said relative position changing means so that the positional relationship of said focusing lens and said image sensor is once fixed in the positional relationship where said focus evaluating value takes the maximum value or the minimum value,
second control means for changing, by a very small amount, the positional relationship of said focusing lens and said image sensor and detecting the change of said focus evaluating value corresponding to the very small change after the relationship of said focusing lens and said image sensor is once fixed by said first control means, so that the positional relationship of said focusing lens and said image sensor is corrected to the maximal point or the minimal point of said focus evaluating value, and
switching control means for resuming controlling the positional relationship of said focusing lens and said image sensor by said first control means when the correction amount of the positional relationship of said second focusing lens and said image sensor by said second control means exceeds a predetermined value.

4,841,371

APPARATUS FOR RECORDI NG CRT IMAGE

Mikio Nishiyama; Tatsuo Yoshino, ar d Taizo Akimoto, all of Kanagawa, Japan, assignors to Fuj Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 11, 1987, Ser. No. 95,502
Claims priority, application Japan, S ep. 11, 1986, 61-214915
Int. Cl.[4] H04N 5/04
U.S. Cl. 358—244 21 Claims



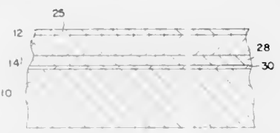
1. An apparatus for recording CR image by a recording device comprising:
- vertical synchronizing signal separ ting means for separating vertical synchronizing signals from a video signal;
- counter means for counting the number of said vertical synchronizing signals;
- raster erase means for obscuring the scanning lines of a CRT image; and
- control means for controlling the exposure time during which said CRT image is recorded by said recording device, said control means controlling said exposure time so that, if K and n are integers and if the number of said vertical synchronizing signals is represented by $2^k \times n$, said exposure time corresponds to $2^k \times n$.

4,841,372

CATHODE RAY TUBE CONTRAST ENHANCEMENT SYSTEMS

Sae D. Lee, Buffalo Grove, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 894,084, Aug. 8, 1986. This application Dec. 15, 1986, Ser. No. 941,458
The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.
Int. Cl.[4] H01J 29/87
U.S. Cl. 358—247 29 Claims



9. A cathode ray tube comprising a faceplate and an implosion panel bonded to said faceplate by UV-curable non-epoxy adhesive incorporating neutral density contrast-enhancing light-absorptive means.

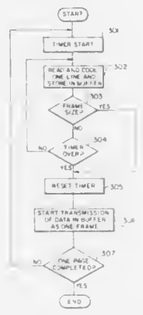
19. A method of manufacturing a cathode ray tube having a faceplate and an implosion panel thereover comprising the steps of:
- interposing an ultraviolet-curable non-epoxy adhesive material incorporating neutral density contrast-enhancing light-absorptive means between said implosion panel and said faceplate;
- and curing said adhesive material by exposure to ultraviolet radiation to bond said implosion panel to said faceplate.

4,841,373

FACSIMILE TRANSMISSION CONTROL METHOD IN WHICH A FRAME OF STORED IMAGE DATA IS TRANSMITTED WHEN EITHER A PREDETERMINED TIME HAS ELAPSED OR A PREDETERMINED AMOUNT OF IMAGE DATA HAS BEEN STORED

Kazuo Asami, Yokohama, and Fumihiro Ogasawara, Yamato, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 19, 1988, Ser. No. 145,236
Claims priority, application Japan, Jan. 19, 1987, 62-8305
Int. Cl.[4] H04N 1/32, 1/21, 1/40
U.S. Cl. 358—257 5 Claims



1. A facsimile transmission control method, comprising the steps of:
- establishing a transmission line between a transmitter and a receiver;
- implementing a predetermined transmission control procedure between said transmitter and said receiver to thereby establish parameters necessary for transmission of data between said transmitter and said receiver; and
- reading an original to produce image data and storing said image data for transmission while at the same time monitoring the amount of image data stored for transmission and also monitoring a timer, wherein, if said amount of image data stored for transmission has reached a predetermined amount before said timer has reached a predetermined time, said amount of image data stored for transmission is formed into a frame of data, which is then transmitted from said transmitter to said receiver, whereas, if said timer has reached said predetermined time before said amount of image data stored for transmission has reached said predetermined amount, then said amount of image data stored for transmission is formed into a frame of data, which is then transmitted from said transmitter to said receiver.

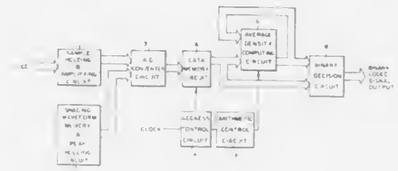
4,841,374

IMAGE PROCESSING METHOD

Matahira Kotani, Nara; Motohiko Hayashi, and Masafumi Yamanoue, both of Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 18, 1986, Ser. No. 931,843
Claims priority, application Japan, Nov. 18, 1985, 60-259473
Int. Cl.[4] H04M 1/40
U.S. Cl. 358—280 4 Claims

1. An image processing method for expressing a halftone-including original image obtained from an image reader having binary black-and-white pixels and for reproducing the halftone-including original image as a binary-coded output, wherein said image processing method comprises the steps of:
- scanning and sampling the halftone-including original image and developing a digital image signal, therefrom, corresponding to a specific pixel line;
- storing said digital image signal at a predetermined address in memory means;
- calculating a first average density value for a first specific pixel line corresponding to a present image line of said digital image signal centered about a subject pixel;
- calculating a second average density value for a second specific pixel line corresponding to a line preceding and adjacent to said present image line stored in said memory means and adjacent to said present image line;
- calculating an average density output by averaging said first and second average density values; and
- comparing the density value of said subject pixel with said average density output to develop a binary black-or-white pixel value for said subject pixel region, thereby producing the binary-coded output for correcting the halftone-including original image gradation.



4,841,375

IMAGE-RESOLUTION CONVERSION APPARATUS FOR CONVERTING A PIXEL-DENSITY OF IMAGE DATA

Shunichi Nakajima, and Koji Izawa, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 14, 1987, Ser. No. 38,362
Claims priority, application Japan, May 29, 1986, 61-124209; May 29, 1986, 61-124211; May 29, 1986, 61-124212
Int. Cl.[4] H04N 1/00
U.S. Cl. 353—280 24 Claims

TERMINAL NO	CONVERSION RATIO	
	MAIN SCANNING DIRECTION	SUB-SCANNING DIRECTION
PC 1	2	2
PC 2	2	2
G III	1 97	2 05
G IV	1	1

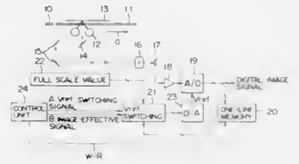
1. An image-resolution conversion apparatus for converting a pixel-density of an image data, comprising:
- input means for receiving image data which can be of various pixel densities;
- selection means, having a plurality of pixel-density conversion ratio data items, respectively representing ratios of pixel-density conversion for converting the pixel-density of the image data to an other predetermined pixel density stored therein for selecting one of the plurality of stored pixel-density conversion ratio data responsive to the pixel density of the image data received by said input means; and
- pixel-density converting means, receiving the image data received by said input means and the pixel density conversion ratio data corresponding to a ratio between a present pixel density and an input pixel density from said selection means, for performing a predetermined arithmetic operation on the basis of the pixel-density conversion ratio data from said selection means, to convert the pixel density of the image data to said present pixel density.

4,841,376

SHADING CORRECTING METHOD ENABLING PREVENTION OF EFFECT OF NOISE AND APPARATUS THEREFOR

Hiroyuki Yamamoto, and Masahiko Matsunawa, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1987, Ser. No. 80,872
Claims priority, application Japan, Aug. 15, 1986, 61-191207
Int. Cl.[4] H04N 1/40
U.S. Cl. 358—282 2 Claims



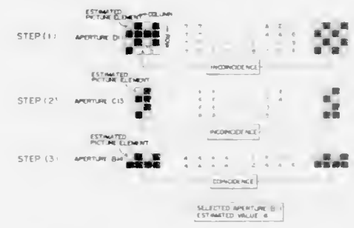
1. A shading correcting apparatus comprising an A/D converter which converts an image signal into a digital signal and a reference voltage switching circuit which switches over a shading correction signal set as a first reference voltage of said A/D converter and a reference signal being set as a second reference voltage and different from said correction signal and applies same on said A/D converter, wherein the aforesaid first reference Voltage is outputted during an effective period of an image signal by said reference voltage switching circuit while the aforesaid second reference voltage is outputted thereby out of the effective period.

4,841,377

CONTINUOUS IMAGE ESTIMATION METHOD

Seiichiro Hiratsuka, and Masahiko Matsunawa, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1987, Ser. No. 62,556
Claims priority, application Japan, Jun. 14, 1986, 61-138892; Jun. 14, 1986, 61-138893
Int. Cl.[4] H04N 1/40
U.S. Cl. 358—283 19 Claims



1. A continuous tone image estimation method of a binary image, comprising the steps of: setting a plurality of kinds of scanning aperatures and a plurality of scanning apertures to be in different positions from one another for each of said plurality of kinds in the binary image selecting only one of said scanning apertures satisfying a predetermined condition for each picture element of a continuous tone image to be estimated; and estimating said continuous tone image on the basis

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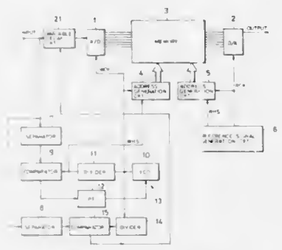
of the number of white or black picture elements in the selected scanning aperture.

4,841,378
VIDEO CAMERA ENABLEMENT SYSTEM UTILIZING A VIDEO CASSETTE CHARACTERISTIC
Harmon I. Cogert, Woodland Hills, Calif., assignor to Short Takes, Inc., Minneapolis, Minn.
Continuation-in-part of Ser. No. 914,307, Oct. 2, 1986, abandoned. This application Feb. 4, 1988, Ser. No. 152,335
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—335 **10 Claims**

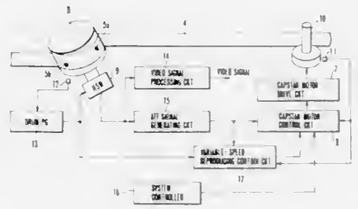
1. A video recording system comprising:
a camera producing a video picture signal when operated;
a video cassette recorder connected to the camera for recording the video picture signal on a video cassette; and
means for enabling operation of the camera if the cassette possesses a predetermined physical characteristic and for preventing operation of the camera if the cassette does not possess the predetermined physical characteristic.

4,841,379
TIME-BASE ERROR CORRECTION APPARATUS FOR VIDEO TAPE OR DISK PLAYER
Toru Akiyama, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan
Filed Sep. 17, 1987, Ser. No. 97,893
Claims priority, application Japan, Sep. 17, 1986, 61-218618
Int. Cl.[4] H04N *5/95*
U.S. Cl. 358—337 **3 Claims**



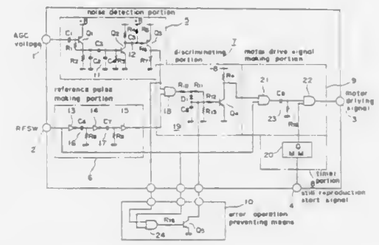
1. A time-base error correction apparatus comprising:
an A/D converter circuit for analog-to-digital conversion of an input video signal on the basis of a write clock;
a memory for storing an output of said A/D converter circuit;
a D/A converter circuit for digital-to-analog conversion of an output of said memory on the basis of a read clock;
a separator circuit for separating a synchronizing signal from said video signal;
a PLL circuit for generating said write clock in response to an output of said separator circuit;
a detector circuit for producing a residual time-base error signal representing an amount of time-base error between said video signal and said write clock; and
a variable delay circuit for delaying said video signal on the basis of said residual time-base error signal, a resulting delayed signal being applied to an input of said A/D converter circuit.

4,841,380
REPRODUCING APPARATUS FOR INTERMITTENTLY DRIVING RECORDING MEDIUM
Susumu Kozuki, and Keiji Satoh, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 2, 1986, Ser. No. 936,843
Claims priority, application Japan, Dec. 5, 1985, 60-272600
Int. Cl.[4] H04N *5/783;* **G11B** *15/52*
U.S. Cl. 360—10.2 **11 Claims**



1. An apparatus for reproducing recorded signals from a tape-shaped recording medium in which a plurality of oblique tracks are formed in parallel, comprising:
(a) a reproducing head;
(b) means for forming a tracking error signal indicating a tracking error of said reproducing head by utilizing an output therefrom;
(c) transporting means for intermittently transporting said recording medium in a longitudinal direction thereof;
(d) pulse generating means for generating timing pulses in response to a level of said tracking error signal;
(e) delay means for delaying a timing indicated by said timing pulses;
(f) means for determining a start timing and a stop timing at which the transportation of said recording medium by said transporting means is started and stopped, said means determining either said start timing or said stop timing, or both, corresponding to the timing delayed by said delay means;
(g) a plurality of adjusting means arranged to be able to manually adjust a delay time given by said delay means;
(h) producing means for producing information with respect to a track pitch of said tracks; and
(i) selection means for selectively using said plurality of adjusting means on the basis of information produced by said producing means.

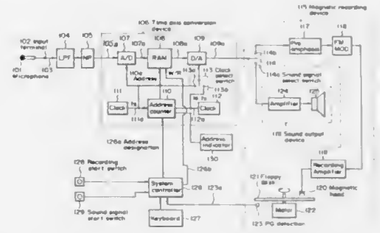
4,841,381
STILL REPRODUCTION CONTROLLING CIRCUIT
Akira Toguchi, Daito, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan
PCT No. PCT/JP86/00480, § 371 Date May 8, 1987, § 102(e) Date May 8, 1987, PCT Pub. No. WO87/01894, PCT Pub. Date Mar. 26, 1987
PCT Filed Sep. 16, 1986, Ser. No. 54,911
Claims priority, application Japan, Sep. 18, 1985, 60-142168[U]
Int. Cl.[4] H04N *5/782*
U.S. Cl. 360—10.3 **1 Claim**



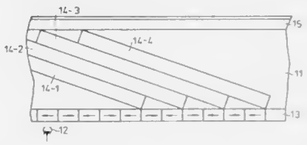
1. A still reproduction controlling circuit for controlling a motor driving a tape at a low speed, comprising:
noise detection means for detecting a state in which a reproduction output is falling in an FM brilliance signal;
reference pulse generating means for generating a reference pulse of a predetermined width corresponding to the vertical blanking period, in response to a head change over signal;
discriminating means, receiving outputs from said noise detection means and said reference pulse generating means, for outputting a stop motor control signal to stop the driving of said motor when the output of said noise detection signal coincides with said reference pulse, to drive said noise band into a vertical blanking period; and
an error operation preventing means, connected to said noise detection means and receiving said head change over signal, for outputting an error prevention signal to said discriminating means in response to the detection of noise coinciding in time with said reference pulse, such that said stop motor control signal from said discriminating means is inhibited.

4,841,382
AUDIO RECORDING DEVICE
Akihiko Sasaki, and Hiroaki Atsumi, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 20, 1987, Ser. No. 110,340
Claims priority, application Japan, Oct. 20, 1986, 61-247608; Oct. 20, 1986, 62-247610
Int. Cl.[4] G11B *5/00*
U.S. Cl. 360—32 **4 Claims**

1. An audio recording device comprising:
A/D converter means for converting an inputted analog sound signal to a digital sound signal;
memory means for storing said digital sound signal;
D/A converter means for converting said digital sound signal read out of said memory means to an analog sound signal;
an address counter for designating an address of said memory means to write or read signals therefrom;
a magnetic recording device for recording said analog sound signal on a rotary magnetic recording medium;
a sound output device for receiving said analog sound signal to output a sound;
a sound signal select switch for switching said analog sound signal to said magnetic recording device or said sound output device;
a system controller for writing said digital sound signal into said memory means sychronously with a low-frequency first clock signal for recording said analog sound signal on said recording medium by said magnetic recording device, by reading said digital sound signal from said memory means synchronously with a high-frequency second clock signal and transmitting a D/A converted analog sound signal select switch, and for outputting a sound from said sound output device by reading said digital sound signal from said memory means synchronously with said first clock signal and transmitting a D/A converted analog sound signal to said sound output device through said sound signal select switch;
an input device for setting a memory address to start writing and setting conditions for selecting said sound signal to be outputted as a sound or to be recorded by said magnetic recording device; and
an address indicator for indicating an address designated by said address counter.



4,841,383
CONTROL PULSE RECORDING CIRCUIT FOR MAGNETIC RECORDING AND REPRODUCING APPARATUS
Naomichi Nishimoto, Toyko; Takeshi Okauchi, Chigasaki, and Koichi Kido, Yokosuka, all of Japan, assignors to Victor Company of Japan, Ltd., Kanagawa, Japan
Continuation of Ser. No. 886,020, Jul. 16, 1986, abandoned. This application Jun. 9, 1988, Ser. No. 206,949
Claims priority, application Japan, Jul. 16, 1985, 60-156679; Jul. 17, 1985, 60-157905
Int. Cl.[4] H04N *5/78;* **G11B** *27/02*
U.S. Cl. 360—33.1 **6 Claims**



1. A control pulse recording circuit for a magnetic recording and reproducing apparatus, said control pulse recording circuit comprising:
a control head for reproducing at least leading edges of square wave control pulses from a control track of a pre-recorded magnetic tape which is pre-recorded with the control pulses with a constant period, and for recording a recording voltage which is to be recorded and is supplied thereto so as to re-write positions of trailing

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edges of said control pulses within an interval between two mutually adjacent leading edges of the pre-recorded control pulses on the pre-recorded magnetic tape so that a duty cycle of the control pulses becomes a value in accordance with a value of recording data to be recorded by a re-writing operation, said leading edges of the control pulses reproduced by said control head being used in a servo circuit within the magnetic recording and reproducing apparatus;

detecting means for detecting the leading edges of the control pulses reproduced by said control head and for producing a detection pulse signal;

recording voltage generating means supplied with the output detection pulse signal of said detecting means and said recording data for generating a recording voltage having three levels including a zero level, a polarity of said recording voltage changing across said zero level at a time in accordance with said recording data in an interval from a starting time when the re-writing operation is started between the two mutually adjacent leading edges of the pre-recorded control pulses to an ending time when the re-writing operation is ended; and

switching means for selectively supplying said recording voltage from said recording voltage generating means to said control head during said interval from the starting time to the ending time so as to switch a mode of said control head into a recording mode and for blocking the supply of said recording voltage to said control head at a time which is after a predetermined time from the ending time where said recording voltage becomes approximately said zero level, and is immediately before a next leading edge of the control pulses so as to switch the mode of said control head into a reproducing mode.

4,841,384

SERVO PROTECTION CIRCUIT FOR DISK DRIVE

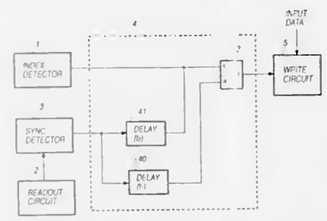
Yoichi Murakami, Tokyo, and Yoshihisa Okawa, Gunma, both of Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 18, 1988, Ser. No. 220,146

Claims priority, application Japan, Jul. 16, 1987, 62-178055

Int. Cl.[4] G11B *15/04, 21/10*

U.S. Cl. 360—60 **3 Claims**



1. A servo protection circuit for protecting a servocontrol signal prerecorded in a magnetic recording disk from being erased by write operation, comprising:

sync detector means for generating a sync pulse in response to a sync code prerecorded in said magnetic disk; and

servo protection means for generating a servo protect pulse in response to said sync pulse and disabling write operation of said disk during the presence of said servo protect pulse, said servo protect pulse having a duration variable with the interval between successive ones of said sync pulse.

4,841,385

DATA SIGNAL REPRODUCING APPARATUS

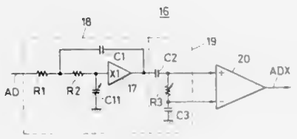
Kenji Nakano, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 8, 1987, Ser. No. 105,830

Claims priority, application Japan, Oct. 11, 1986, 61-241594

Int. Cl.[4] G11B *5/03, 5/09*

U.S. Cl. 360—65 **10 Claims**



1. A data reproducing apparatus for reproducing data recorded on a magnetic recording medium using a magnetic transducing head by modulating an encoded digital information signal as first and second frequency components in accordance with logic states "0" to "1, comprising in combination;

an equalizing circuit interposed between a reproducing magnetic transducing head and a decoder or demodulator for the encoded digital information signal, for compensating for signal degradation caused by the electromagnetic transducing characteristic between the magnetic recording medium and said recording and reproducing transducing head, characterized in that said equalizing circuit comprises:

(a) a low-pass filter for controlling at least the amplitude of the second frequency signal component;

(b) a high-pass filter for controlling at least the amplitude of the first frequency component; and

(c) switching means for switching at least the pass band of said low-pass filter or said high-pass filter in correspondence to characteristics of the output signal from said reproducing transducer head,

wherein an equalization characteristic corresponding to logic state "0" or "1" is achieved by maximizing an eyeopening ratio or aperture opening ratio of an eye-pattern thereof.

4,841,386

CASSETTE RECORDER WITH RECORDING PROGRAMMING

Rolf Schiering, Hemmingen, Fed. Rep. of Germany, assignor to Deutsche AG für Unterhaltungselectronic OHG, Villingen-Schwenningen, Fed. Rep. of Germany

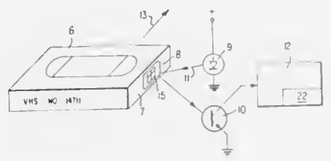
PCT No. PCT/EP87/00073, § 371 Date Sep. 11, 1987, § 102(e) Date Sep. 11, 1987, PCT Pub. No. WO87/05129, PCT Pub. Date Aug. 27, 1987

PCT Filed Feb. 13, 1987, Ser. No. 117,066

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1986, 3605563

Int. Cl.[4] G11B *15/07, 23/087*

U.S. Cl. 360—69 **13 Claims**



1. A receiver cassette recorder and, for use therewith, a cassette for selectively automatically recording programming based on parameters that have been selected by a user, said cassette comprising a cassette housing having thereon a dedicated area for a user to mark indicia representing parameters to be read by said recorder so that selected programs can be automatically recorded; and said cassette recorder comprising:

reading means for reading indicia on said cassette; and

control means connected to said reading means for receiving a signal indicative of the indicia read by said reading means, and said control means including a memory connected to said control means for storing the signals received by said control means.

4,841,387

ARRANGEMENT FOR RECORDING AND INDEXING INFORMATION

Diane J. Rindfuss, 395 Oak Creek Dr., Wheeling, Ill. 60090

Filed Dec. 15, 1987, Ser. No. 133,336

Int. Cl.[4] G11B *15/18*

U.S. Cl. 360—72.1 **34 Claims**

1. An arrangement for recording information relating to an event on a recording medium, and for indexing handwritten notations concerning the event to the recorded information, comprising:

a recording device for recording information onto a recording medium;

means for receiving handwritten notations on a writing surface;

means for sensing relative positions of the recorded information on the recording medium, and for sensing positions of corresponding handwritten notations on the writing surface;

means for correlating the respective positions of the recorded information to the positions of the handwritten notations; and

playback means for locating and reproducing portions of the recorded information in response to identification of corresponding portions of the handwritten notations.

4,841,388

RECORDING APPARATUS FOR RERECORDING BY REPOSITIONING RECORDING MEDIUM

Taizou Hori, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 23, 1987, Ser. No. 123,918

Int. Cl.[4] G11B *15/18*

U.S. Cl. 360—721 **8 Claims**

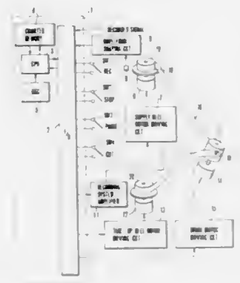
1. A recording apparatus for recording information signal on a recording medium, comprising:

(a) recording means for recording an information signal on said recording medium;

(b) moving means for moving said recording medium relative to said recording means;

(c) instruction means for giving instructions to commence a recording action on said information signal, to bring said recording action to a pause and to make preparation for a re-recording action on said information signal;

(d) position information holding means for holding position information on the position of said recording medium obtained relative to said recording means at the start of said signal recording action; and



(e) control means for controlling said moving means, on the basis of the position information held by said position information holding means, to bring said recording medium back to the relative position thereof obtained at the start of said recording action on said information signal in case that said instruction means gives an instruction to make preparation for re-recording said information signal after a previous instruction is given to bring said recording action to a pause.

4,841,389

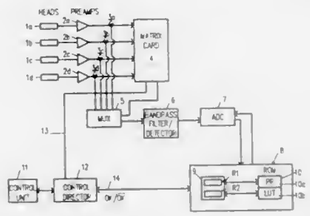
MAGNETIC TRANSDUCER CRASH ANTICIPATION AND RESPONSE METHOD AND APPARATUS

Roger F. Hoyt; Carl M. Jefferson, both of San Jose, and Steven E. Millman, Campbell, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 11, 1987, Ser. No. 60,578

Int. Cl.[4] G11B *5/60, 21/02*

U.S. Cl. 360—75 **18 Claims**



1. A method for denoting the likelihood of an impending crash of a magnetic transducer against a rotating magnetic recording medium due to deterioration in flying height of the transducer below a predetermined acceptable value comprising the steps, while the medium is being rotated at substantially constant velocity, of:

over a predetermined area of said recording medium, writing one signal at a predetermined amplitude and at a frequency f_l;

reading back said one signal at frequency f_l and storing its spectral amplitude;

overwriting said predetermined area with another signal at said predetermined amplitude but at a higher frequency f_h;

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then reading back the component of said one signal remaining after said overwriting and storing its spectral amplitude;

calculating the ratio of the spectral amplitudes of said one signal as read before said overwriting and said remaining component of said one signal as read after said overwriting; and

using said ratio to initiate a desired control operation when said ratio denotes that flying height is below said acceptable value.

4,841,390

DIGITAL SIGNAL REPRODUCING APPARATUS

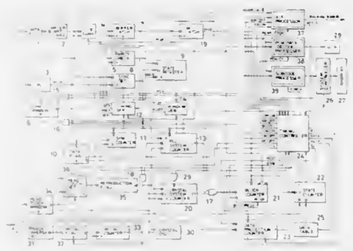
Seiichi Yokosawa, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 5, 1987, Ser. No. 104,019

Claims priority, application Japan, Oct. 3, 1986, 61-234480; Oct. 6, 1986, 61-236245; Oct. 7, 1986, 61-237247; Oct. 8, 1986, 61-238153; Nov. 7, 1986, 61-264039

Int. Cl.[4] G11B *21/10, 5/09*

U.S. Cl. 360—77.14 **11 Claims**



1. In a digital signal reproducing apparatus having at least two rotary heads for reproducing a plurality of signals on a recording medium, said plurality of signals containing a digital signal, a tracking pilot signal composed of a frequency signal with a small azimuth-effect, and a sync signal, said plurality of signals being recorded on each of a plurality of helical tracks in a predetermined format with the recording region in one track being independent of the recording region in another track in the longitudinal direction, the positions of the pilot signals recorded on three consecutive tracks differing from one track to another, with the sync signal being recorded on a position corresponding to one of the two adjacent tracks, each of said rotary heads having a width greater than the width of each track on which it scans, each of said rotary heads outputting, as a result of reproduction of each track, the pilot signal on the on-track and the crosstalks of the pilot signals on the two adjacent tracks, and a capstan servo system being controlled by the difference between the levels of crosstalk of the pilot signals on said two adjacent tracks so as to ensure that said rotary heads will correctly scan each track, the improvement comprising:

a head touch detector circuit that detects the output of an RF signal as a result of contact that is established between said recording medium and each of said rotary heads;

a reproduction flag generator circuit which, in response to the output of said head touch detector circuit, indicates that the system is in a replay mode;

an ATF sync window forming circuit which forms an ATF sync window that detects and protects a tracking ATF sync signal assuming the period during which said sync signal is reproduced in response to said reproduction flag; and

a data sync window forming circuit which forms a data sync window that detects and protects a data sync signal which serves as a reference for reading data, assuming the period over which said sync signal is reproduced in response to said reproduction flag;

both of said windows being opened at the time when said head touch detector circuit detects the output of an RF signal, and at the time when either one of said ATF and data sync signals is detected, the window for the other sync signal being turned off and only the window for said detected signal being controlled.

4,841,391

ROTARY HEAD TYPE RECORDING AND/OR REPRODUCING APPARATUS HAVING MODE SELECTING MECHANISM

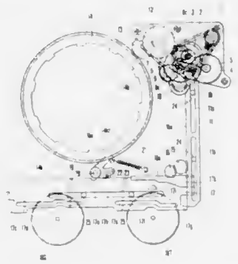
Akio Iwasaki, and Kenichi Nagasawa, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1987, Ser. No. 88,126

Claims priority, application Japan, Aug. 27, 1986, 61-200534; Aug. 27, 1986, 61-200540; Aug. 27, 1986, 61-200541; Aug. 28, 1986, 61-202009; Aug. 28, 1986, 61-202012; Aug. 28, 1986, 61-202024

Int. Cl.[4] G11B *15/665, 15/18*

U.S. Cl. 360—85 **14 Claims**



1. A rotary head type recording and/or reproducing apparatus comprising:

(a) a cylinder member having a rotary head;

(b) tape loading means for winding a tape-shaped recording medium stretched between a pair of reels onto said cylinder member, said loading means having a movable guide post for guiding said tape-shaped recording medium;

(c) transportation means for transporting said tape-shaped recording medium and having a plurality of modes;

(d) a motor;

(e) a mode lever having a plurality of cams and slidable between a plurality of stop positions;

(f) mode control means for changing a mode of said transportation means to one of said plurality of modes depending upon the stop position of said mode lever; and

(g) transmitting means for transmitting a driving force of said motor to said tape loading means and said mode lever, said transmitting means including a first rotary gear which is rotated by the driving force produced by said motor, a plurality of revolving gears which are in meshing engagement with said first rotary gear and are revolvable around said first rotary gear, while each of them is rotatable around its rotating axis, a second rotary gear which is rotatable coaxially with said first rotary gear and pivotally supports said plurality of revolving gears and a third rotary gear which is rotatable coaxially with said first rotary gear and is in meshing engagement with said plurality of revolving gears, wherein said driving force is transmitter through said second rotary gear to one of said guide post and said mode lever and through said third rotary gear to the other of said guide post and said mode lever.

4,841,392

TAPE LOADING APPARATUS HAVING AN ARRANGEMENT FOR CONTROLLING MOVEMENT OF A GUIDE ROLLER HOLDER ARM

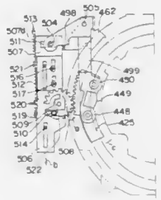
Hidenori Muramatsu; Kimichika Yamada; Katsuya Nozawa, and Yoshihiko Goto, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1986, Ser. No. 922,438

Claims priority, application Japan, Oct. 29, 1985, 60-241852

Int. Cl.[4] G11B *15/66*

U.S. Cl. 360—85 **5 Claims**



1. A tape loading mechanism comprising:

a rotating drum head;

a stationary guide rail supported adjacent said drum head and having therein a guide groove;

a rotatable drive gear;

a ring-shaped loading gear which extends around said drum head, which is rotatably supported, and which engages said drive gear and is rotated in response to rotation of said drive gear;

a loading block and a subblock supported in said guide groove of said guide rail for independent movement therealong and each having thereon a post which can engage a tape from a cassette, and means operatively coupling each of said loading block and said subblock to said loading gear for effecting movement of said loading block and said subblock along paths of travel from respective initial positions to respective advanced positions in response to movement of said loading gear, wherein as said loading block and said subblock move to their advanced positions said posts thereon pull the tape into a configuration disposed along a tape path extending partway around said drum head;

a movable rack member having a rack thereon and means for effecting movement of said rack member with said subblock;

a holder arm which has a tape guide roller rotatably supported at one end thereof and which is supported at a location spaced from said one end thereof for pivotal movement between advanced and retreated positions in which, when said loading block and said subblock are in their advanced positions, said guide roller is respectively at first and second locations in which it respectively engages and is spaced form a tape extending along said tape path, said first and second locations respectively being disposed along and spaced from said path of travel of said subblock;

a further gear which is rotatably supported and is engageable with said rack on said rack member, said further gear being rotated by said rack in response to movement of said rack after said subblock has passed said first location; and

holder arm operating means responsive to rotation of said further gear by said rack for effecting movement of said holder arm from said retreated position thereof to said advanced position thereof.

4,841,393

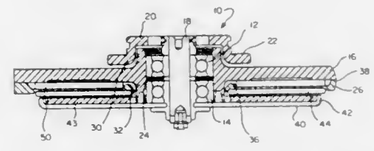
SPINDLE MOTOR FOR A DISC DRIVE

Donald J. MacLeod, Santa Cruz County; Miles L. Peterson, Santa Clara County, and Charles G. Nowark, Jr., Santa Cruz County, all of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Nov. 2, 1987, Ser. No. 116,044

Int. Cl.[4] G11B *15/00*

U.S. Cl. 360—98.07 **11 Claims**



1. A spindle motor for use in a disc drive including a base casting for the drive, the motor comprising a shaft extending through said base casting and carrying a hub supporting one or more discs for rotation, said shaft being supported for rotation in said casting by one or more bearings, rotation of the shaft being controlled by an axial air gap motor comprising a flat rotor connected to the shaft and extending axially parallel to the base casting of the housing, said rotor comprising a magnet supported by a rotor support plate carried on an end of said shaft, means comprising a single printed board supported to have first and second surfaces essentially out of contact with said base casting and said rotor support plate for supporting on one surface thereof a plurality of axially oriented coils in a toroidal path around said shaft and in a plane parallel to said magnet, and on the other of said surfaces a toroidal magnetic return path element mounted on the opposite side of said axially oriented coils from said rotor, said magnetic return path being formed of a wound coil of thinly sliced sheet steel, thereby forming a magnetic path comprising said magnet, said coils and said return path element, whereby a low profile spindle motor is achieved.

4,841,394

COVER MECHANISM FOR A RECORDING MEDIUM HOLDING DEVICE

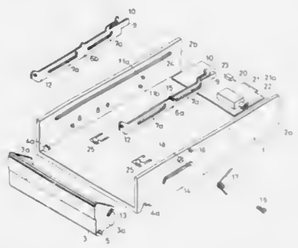
Youzi Tomizawa, Yokohama, and Masashi Mizutani, Kawasaki, both of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Aug. 28, 1987, Ser. No. 90,613

Claims priority, application Japan, Oct. 31, 1986, 61-167560[U]

Int. Cl.[4] G11B *17/04, 17/032, 17/03*

U.S. Cl. 360—99.06 **2 Claims**



1. A recording medium holding device comprising:

a casing having a front end, a rear end, and a pair of sidewalls each of said sidewalls defining a hole at the bottom

thereof adjacent to said front end, said sidewalls provided with a plurality of guide pins projecting inward;

cover pivotally provided at said front end of said casing and having a pair of sidewalls, each of said cover sidewalls having a laterally projecting pin movably received by said hole of one of said casing sidewalls, said cover sidewalls further defining an oblong hole;

a pair of transversely spaced parallel sliding levers slidably mounted to the inner side of said casing sidewalls said levers defining longitudinally extending guide slots for movably receiving said guide pins of said casing sidewalls, said sliding levers each having an upwardly bent and forwardly inclined front end provided with a laterally projecting pin movably received by said oblong hole of said cover sidewall, said levers each further having a sliding hook and a guide projection disposed at the rear end of said levers;

a resilient member for biasing one of said sliding levers toward said front end of said casing;

a solenoid having a lock claw selectively engaged with an engaging claw formed in a said guide projection of a said lever for holding said sliding lever against the biasing force of said resilient member;

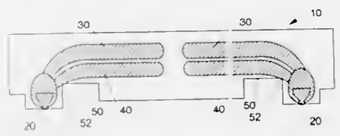
whereby, upon operation, said lock claw disengages said engaging claw of said guide projection and said resilient member biases said sliding levers toward said front end of said casing such that said sliding hook cooperates with a projection formed on a recording medium to move said recording medium toward said front end of said casing.

4,841,395

STATIC ELECTRICITY DISCHARGE DEVICE FOR A MAGNETIC HEAD

David C. Craft, Eden Prairie, Minn. assignor to Magnetic Peripherals Inc., Minnetonka, Minn.

Filed Mar. 21, 1988, Ser. No. 171,052
Int. Cl.[4] G11B *5/60, 5/147*
U.S. Cl. 360—103 4 Claims



1. In a magnetic head having a non magnetic dielectric material with an outer surface, a set of magnetic circuits, including at least one pole exposed at said outer surface, and a plurality of conductors extending from said magnetic circuits through said non magnetic dielectric material, said non magnetic dielectric material mounted on a conductive body, the improvement comprising:

a recess formed in said non magnetic dielectric material sufficiently deep to expose a portion of one of said conductors to provide a static electricity discharge path between said exposed portion of said one of said conductors and said conductive body along said outer surface of said non magnetic dielectric material.

4,841,396

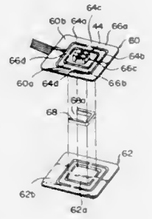
DOUBLE GIMBAL MAGNETIC HEAD SUPPORTING MECHANISM FOR A FLOPPY DISK DRIVE

Yushi Kawasaki, Higashimurayama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1987, Ser. No. 131,554
Claims priority, application Japan, Dec. 19, 1986, 61-303035
Int. Cl.[4] G11B *5/48, 21/16*
U.S. Cl. 360—104 4 Claims

1. A magnetic head supporting mechanism having a carriage which is movable in the radial direction of a floppy disk, an arm provided rockably relative to said carriage and magnetic heads which are mounted on said carriage and said arm, respectively, and are brought into close contact with opposite surfaces of said floppy disk for reading/writing operation, said magnetic head supporting mechanism, characterized in that:

one of said magnetic heads is supported by one of said carriage or arm through a gimbal pair assembly in the state of being movable only vertically and restrained from inclining,



said gimbal pair assembly including a pair of biaxial gimbal springs with the outer-peripheries thereof fixed on said one of said carriage or said arm, and a spacer for fixing central portions of said pair of gimbal springs with a space therebetween and said one of said magnetic heads being mounted on the central portion of said gimbal pair assembly in a fixed state;

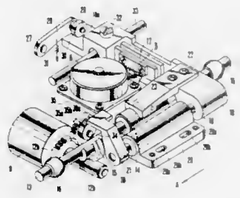
the other one of said magnetic heads is mounted on the other of said arm or said carriage through a biaxial gimbal spring.

4,841,397

HEAD SHIFTING DEVICE

Masaya Maeda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 847,202, Apr. 2, 1986, abandoned. This application Jan. 26, 1988, Ser. No. 148,131
Claims priority, application Japan, Apr. 4, 1985, 60-71732
Int. Cl.[4] G11B *5/54*
U.S. Cl. 360—105 29 Claims



1. A head shifting device in a recording or reproducing apparatus which changes a recording or reproducing position thereof from one position to another by shifting a recording or reproducing head in a radial direction of a disc-shaped flexible recording medium, said device comprising:

first means for shifting said head in the radial direction of said medium;

second means for repetitively moving said head toward and away from said recording medium as said head is shifted in said radial direction, said second means being arranged to shift said head to a position separated away from said recording medium when said head is shifted to change the recording or reproducing position from said one position to said another position; and

control means for controlling said first means so that said head is stopped at a position location between the adjacent recording or reproducing positions.

8. A head shifting device comprising:

first means for moving a head a predetermined distance in a predetermined direction along a surface of a recording medium;

second means for repetitively changing a distance between said head and the surface of said recording medium every predetermined distance said head is moved in the predetermined direction by said first means, said second means being arranged to separate said head away from the surface of said recording medium on the way of movement of said head when said head is moved by said first means in said predetermined direction by said predetermined distance; and

control means for controlling said first means so that the movement of said head in said predetermined direction stops at a position separated away from said recording medium when said second means moves said head to said position.

4,841,398

NON LINEAR MAGNETORESISTIVE SENSOR

Greg S. Mowry, Burnsville, Minn., assignor to Magnetic Peripherals Inc., Minnetonka, Minn.

Filed Feb. 17, 1987, Ser. No. 15,200
Int. Cl.[4] G11B *5/127, 5/33*
U.S. Cl. 360—113 1 Claim

1. Apparatus comprising:

a magnetoresistive sensor mounted in a recording head adjacent a magnetic recording medium comprising:

a sense region having a magnetization vector M aligned parallel to the easy axis in the absence of external magnetic fields from said recording medium;

means for providing a sense current in the sense region having a vector J substantially parallel with said easy axis magnetization vector M;

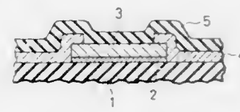
said magnetic recording medium mounted adjacent to said head such that relative motion between them can occur; the magnetic medium having a plurality of magnetization transitions recorded thereon providing magnetic flux pulses to the sense region as a transition passes the sensor, the peak flux amplitude of the pulse being sufficient to rotate the sense region magnetization vector M away from the sense current vector J so that the angle between them is in the range of 40 to 50 degrees, whereby the sensor operates in a non linear mode because of the initial alignment of sense current and magnetization vectors in absence of magnetic flux from the magnetic medium, and wherein the sensor's response in the region of the pulse peak from magnetic flux from the magnetic medium is approximately a linear function of magnetic flux of the transition.

4,841,399

MAGNETORESISTIVE MAGNETIC HEAD INCLUDING ZIRCONIUM SHEET FILM

Masahiro Kitada, Tokyo; Noboru Shimizu, Tokorozawa; Hideo Tanabe; Hitoshi Nakamura, both of Tokyo; Tetsuo Kobayashi, Kanagawa; Tooru Takeura, Odawara, and Kazuhiro Momata, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 1, 1986, Ser. No. 936,617
Claims priority, application Japan, Nov. 29, 1985, 60-267111
Int. Cl.[4] G11B *5/30*
U.S. Cl. 360—113 10 Claims



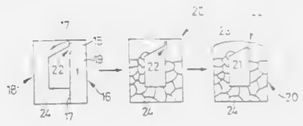
1. A magnetoresistive magnetic head comprising a two-layer film structure consisting of i) a magnetoresistive film comprised of a Ni-Fe alloy film containing 7 to 27 wt % of iron and substantially the balance of nickel and ii) a shunt film comprised of a zirconium film.

4,841,400

MAGNETIC HEAD CORE COMPRISING A MONOCRYSTALINE FERRITE

Soichiro Matsuzawa, Kuwana, Japan, assignor to NGK Insulators, Ltd., Tokyo, Japan

Division of Ser. No. 683,491, Dec. 19, 1984, Pat. No.
Claims priority, application Japan, Dec. 27, 1983, 58-246262
Int. Cl.[4] G11B *5/133, 5/127*
U.S. Cl. 360—125 6 Claims



1. A magnetic head core comprising:

a generally ring-shaped ferrite which forms a generally annular magnetic circuit, said core having a magnetic gap of a predetermined width formed transversely across the annulus of the magnetic circuit;

said magnetic circuit consisting of a plurality of respective core elements of ferrite butted together in contacting engagement into a generally ring-shaped assembly and bonded together at mutually abutting surfaces by means of a solid-solid reaction;

opposed end portions of said respective core elements define said magnetic gap therebetween and provide contacting surfaces with which a magnetic recording medium is slidably contacted and are formed from a single crystal of ferrite; and

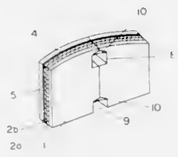
one of said plurality of core elements originally being a block of polycrystalline ferrite having a partially monocrystalline portion consisting of a ferrite single crystal with said respective opposed end portion including said monocrystalline portion, another of said plurality of core elements having said respective opposed end portion being originally polycrystalline and being monocrystallized as a result of growth of said ferrite single crystal of said monocrystalline portion of said one of said plurality of core elements toward the originally polycrystalline portion of the opposed end portion of said another of said plurality of core elements.

4,841,401

AMORPHOUS MAGNETIC HEAD

Mitsuo Satomi; Akio Kuroe, both of Katano; Eisuke Sawai, Hirakata; Masaru Higashionji, Katano; Hiroshi Sakakima, Hirakata, and Kenji Kondo, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd. Osaka, Japan

PCT No. PCT/JP84/00037, § 371 Date Oct. 9, 1984, § 102(e) Date Oct. 9, 1984, PCT Pub. No. WO84/03167, PCT Pub. Date Aug. 16, 1984
Continuation of Ser. No. 31,183, Mar. 30, 1987, abandoned, which is a continuation of Ser. No. 666,089, Oct. 9, 1984, abandoned. This PCT application Feb. 9, 1984, Ser. No. 224,215
Claims priority, application Japan, Feb. 10, 1983, 58-20623
Int. Cl.[4] G11B *5/127*
U.S. Cl. 360—125 9 Claims



1. In a magnetic head having a magnetic core comprising a first substrate of non-magnetic material, at least one layer of an amorphous magnetic alloy material directly formed on said first substrate, and a second substrate of non-magnetic material bonded to said layer of amorphous magnetic alloy material by a bonding glass layer formed of a glass material containing lead and having a low melting point, the improvement of means for preventing deterioration of said bonding glass layer and resultant weakening of adhesion of the bond between said second substrate of non-magnetic material and said layer of amorphous magnetic alloy material, said means comprising:

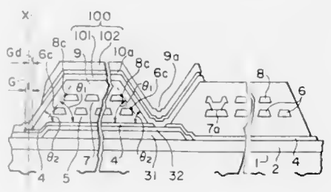
a layer of non-magnetic ceramic material, separate from said bonding glass layer, between said layer of amorphous magnetic alloy material and said bonding glass layer, said non-magnetic ceramic layer having a thickness δ defined by $2000\ \text{Å} < \delta \leqq 5000\ \text{Å}$.

4,841,402

THIN FILM MAGNETIC HEAD AND METHOD OF MANUFACTURE

Tadashi Imanaka; Masayuki Takagi; Eisei Togawa; Harunobu Saito; Sadanori Nagaike; Masaki Ohuna, all of Odawara; Saburo Suzuki, Minamiashigara; Tetsuo Kobayashi, Ashigarakami, and Shunichiro Kuwatsuka, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo Japan

Filed Jan. 20, 1987, Ser. No. 4,623
Claims priority, application Japan, Jan. 27, 1986, 61-13807
Int. Cl.[4] G11B *5/12, 5/20*
U.S. Cl. 360—126 9 Claims



1. A thin film magnetic head comprising:

a substrate (1) having a planar surface;

a first magnetic member (30) formed on said substrate;

a non-magnetic gap layer (4) formed on said first magnetic member;

a first insulator member (5) formed on said gap layer;

a layer of a first conductor member (6) of spiral windings of electrically conductive material formed on said first insulator member and having an outer surface edge;

a second insulator member (7) formed on said first conductor member;

a layer of a secondcconductor member (8) of spiral windings of electrically conductive material formed on said second insulator member and having an outer surface edge, said second conductor member being electrically connected with said first conductor member to constitute a two-layered conductor coil;

a third insulator member (9) formed on said second conductor member; and

a second magnetic member (101) formed on said third insulator member arranged to extend on edges of said first, second and third insulator members along a straight line having a slope and on a portion of said gap layer and being in contact with said first magnetic member to constitute a magnetic path; wherein

the relative arrangement of said first and second conductor members (6, 8) within a space defined by said gap layer (4) and said second magnetic layer (101) is such that an angle θ_1 formed between a reference plane substantially parallel with the substrate surface and a line connecting the surface edges (6c, 8c) of the cross-sections of said first and second conductor members (6, 8) taken on a plane perpendicular to the substrate surface is substantially equal to an angle θ_2 formed between said reference plane and a side slope of said second magnetic member (101), and

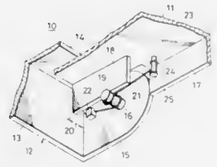
each of said angles is in a range of from about 30° to 45°.

4,841,403

LID SPRING LOCKING STRUCTURE IN A MAGNETIC TAPE CASSETTE

Masao Tsuruta; Seiji Kiuchi; Akira Honjyoh; Kengo Oishi, and Osamu Suzuki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 586,924, Mar. 7, 1984, abandoned. This application May 14, 1987, Ser. No. 51,220
Claims priority, application Japan, Mar. 7, 1983, 58-31509
Int. Cl.[4] G11B *23/02, 15/32*
U.S. Cl. 360—132 9 Claims



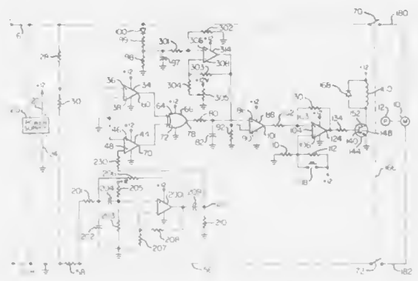
1. In a magnetic tape cassette in which an opening provided in the front part of a cassette body is covered by a guard panel (12), and in which supporting shafts (16) protrude from the inner surfaces of the side walls (15) of said guard panel near said opening, said guard panel being rotatable with respect to said cassette body to open and close said opening, and a coil spring (21) supported on each supporting shaft has a first end engaged with said guard panel urging said guard panel through a second end of said coil spring to rotate to close said opening, the improvement wherein the first end is engaged with a protrusion, integral with said guard panel, for detachably engaging the first end to said guard panel, and the second end of each coil spring is fixedly secured to looking means provided on an inner surface adjacent a side wall of an upper half of said cassette body so that said second end is stationary with respect to said locking means regardless of rotation of said guard panel.

4,841,404

PUMP AND ELECTRIC MOTOR PROTECTOR

William W. Marsball, Centerville, and Lamar D. Springer, Spring Valley, both of Ohio, assignors to Spring Valley Associates, Inc., Dayton, Ohio

Filed Oct. 7, 1987, Ser. No. 106,048
Int. Cl.[4] H02H *5/00*
U.S. Cl. 361—30 10 Claims



5. The method of protecting a liquid pump which is operated by an electric motor to which alternating current electrical energy having a fundamental frequency is applied through a plurality of electric conductor members, and a switch operable to connect and to disconnect the electric motor with respect to the electric conductor members comprising:

providing a first voltage signal, the first voltage signal being related to the current flow through the electric conductor members and through the electric motor,

attentuating harmonic frequencies which exist in the first voltage signal,

providing a second voltage signal, the second voltage signal being related to the voltage of the alternating current electrical energy which is applied to the electric conductor members,

sensing the phase angle between the first voltage signal and the second voltage signal and obtaining a phase angle voltage signal proportional to the phase angle,

generating a third voltage signal in accordance with the amplitude of the voltage of the alternating current electrical energy which is applied to the electric conductor members, modifying the third voltage signal to obtain a fourth voltage signal which compensates for changes in phase angle which occur as a result of variations in the amplitude of the voltage of the alternating current electrical energy which is applied to the electric conductor members, comparing the phase angle voltage signal to the fourth voltage signal, and operating the switch when the difference between the phase angle voltage signal and the fourth voltage signal exceeds a predetermined magnitude.

4,841,405

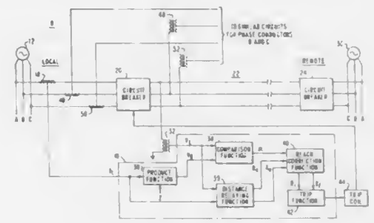
PROTECTIVE RELAYING APPARATUS FOR PROVIDING FAULT-RESISTANCE CORRECTION

Eric A. Udren, Monroeville Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 6, 1985, Ser. No. 709,235
Int. Cl.[4] H02H *3/34*
U.S. Cl. 361—80 9 Claims

1. Protective relay apparatus for use at a local end of a line segment of a transmission line in a power system network, said network including local and remote generating sources disposed at respective local and remote ends of said transmission line segment for rendering load flow conditions associated therewith, said relay apparatus operative in response to a fault along said transmission line to measure an apparent impedance corresponding to said fault in relation to the local end of said transmission line segment and to generate a signal representative thereof for use in determining the location of said fault along said transmission line, said apparent impedance measurement, at times, including an erroneous component caused by said load flow conditions of said transmission line segment interacting with a fault which contributes resistance substantially to the fault impedance of the transmission line, said erroneous component rendering the determination of an erroneous fault location, said protective relay apparatus comprising:

first means for generating a first signal indicative of the load flow conditions of said transmission line segment;



second means for generating a second signal representative of said erroneous component as a function of said first signal;

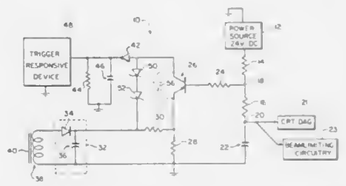
means for compensating said apparent fault impedance signal as a function of said second signal, a predetermined impedance characteristic of a transmission line segment, and an apparent fault impedance signal to generate a compensated fault impedance signal, thereby providing a fault impedance measurement for the determination of a better estimate of the fault location along the transmission line.

4,841,406

X-RADIATION PROTECTION CIRCUIT

Willy F. Stierberger, Knoxville, Tenn., assignor to North American Philips Consumer Electronics Corp., Knoxville, Tenn.

Filed Sep. 28, 1987, Ser. No. 101,878
Int. Cl.[4] H02H *3/20*
U.S Cl. 361—91 8 Claims



1. In a television having a cathode-ray tube producing an electron beam, a high voltage transformer for providing a high voltage potential, and an electron beam power source for providing an electron beam current to the tube, a protective circuit comprising:

first detector means interconnected with the electron beam power source for monitoring the electron beam current therefrom and for continuously producing a first voltage proportional in magnitude to the electron beam current;

second detector means interconnected with the high voltage transformer for monitoring the high voltage transformer therefrom and for continuously producing a second voltage proportional in magnitude to the high voltage potential; and

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a monitoring circuit constantly receiving the first and second voltages for constantly monitoring the additive sum of the first and second voltages and for producing a trigger signal when the additive sum of said first and second voltages exceeds a selected magnitude, whereby a trigger signal indicates an excessively high combination of electron beam current and high voltage potential.

4,841,407

MAGNETIC FIELD GENERATOR HAVING A PLURALITY OF COILS FOR GENERATING MAGNETIC FIELD IN SUBSTANTIALLY THE SAME SPACE AND METHOD OF DRIVING THE SAME

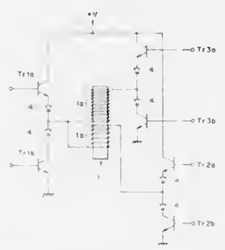
Hisatoshi Baba; Naoki Imokawa, and Makoto Shiho, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 10, 1987, Ser. No. 60,303

Claims priority, application Japan, Jun. 16, 1986, 61-138346; Dec. 24, 1986, 61-306221; Dec. 24, 1986, 61-306222

Int. Cl.[4] H01H *47/00, 47/26*

U.S. Cl. 361—146 11 Claims



1. A bias magnetic field generator for an optomagnetic information recording apparatus comprising:

a first coil group, including at least one coil, for generating a magnetic field upon energization;

a second coil group, including at least one coil, and arranged such that a magnetic field is generated in substantially the same space as that of the magnetic field generated by said first coil group, a self-inductance of said second coil group being smaller than that of said first coil group; and

driving means for selectively energizing said first and second coil groups, said driving means energizing said second coil group first, and when the magnetic field intensity of said second coil group reaches a predetermined value, energizing said first coil group, thereby keeping the magnetic field intensity at the predetermined value.

4,841,408

ELECTROCONDUCTIVE SLIDING APPARATUS

Shigeki Matsunaga, Tokyo; Yuichi Ishikawa, Yokohama, and Masachi Hosoya, Fujisawa, all of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1987, Ser. No. 111,674

Claims priority, application Japan, Oct. 31, 1986, 61-258550; Dec. 26, 1986, 61-308893; Jun. 15, 1987, 62-146862

Int. Cl.[4] H05F *3/0*

U.S. Cl. 361—220 28 Claims

1. An electroconductive sliding apparatus including:

(a) a first electroconductive member rotatively supported by at least one bearing;

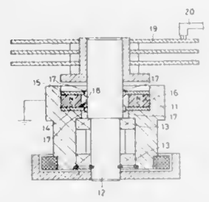
(b) a second electroconductive member supported by said bearing for relative movement with said first electroconductive member and defining a slidable point therebetween;

(c) an electroconductive slider at said slidable point for sliding upon said first member to provide for the grounding of static electricity from said first member to said second member in order to avoid static electricity spark between said members;

(d) means to apply a force to said electroconductive slider to push the same against said second member;

(e) a lubricating magnetic fluid interposed between said first and said second electroconductive members in order to lubricate said slidable point between said electroconductive slider and said second member;

(f) means to produce a magnetic force between said first



electroconductive member and said second electroconductive member to keep said magnetic fluid at said slidable point and to form a magnetic field around said slidable point;

whereby said slidable point is characterized by the existence of said magnetic fluid to be contactingly slided or to be floatingly slided at a distance capable of providing electroconductive grounding between said first electroconductive member and said second electroconductive member and being lubricated by said magnetic fluid.

4,841,409

METHOD OF MANUFACTURING A CORONA DISCHARGE ELECTRODE AND A CORONA DISCHARGE ELECTRODE PRODUCED BY THE METHOD

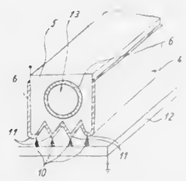
Klaus Kalwar, Alte Landwehr 10, 4803 Steinhagen, Fed. Rep. of Germany

Filed Nov. 30, 1987, Ser. No. 127,280

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1986, 3640966; Nov. 29, 1986, 8632118[U]

Int. Cl.[4] H01T *19/04;* F27B *9/04*

U.S. Cl. 361—230 13 Claims



1. A corona discharge electrode comprising a core of at least partially electrically graphite material, a dielectric layer of a ceramic material coating at least a corona discharge surface of said core, said ceramic material being substantially of an oxide free ceramic having a density of at least 95% of theoretically attainable density.

4,841,410

METHOD OF ACCOMMODATING AN OBJECT WHICH CARRIES CURRENT DURING OPERATION IN A SYNTHETIC RESIN HOUSING AND A COMBINATION OF AN OBJECT WHICH CARRIES CURRENT DURING OPERATION AND A SYNTHETIC RESIN HOUSING

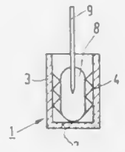
Andries C. Maijers; Johannus W. Weekamp; Antonius C. J. C. Van Den Ackerveken, and Jan Brink, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 3, 1987, Ser. No. 116,419

Claims priority, application Netherlands, Nov. 6, 1986, 8602805

Int. Cl.[4] H05K *1/04;* H05F *3/02*

U.S. Cl. 361—306 8 Claims



5. A combination of an open synthetic resin housing comprising a bottom wall portion and a continuous side wall portion extending upwardly from said bottom wall portion, said bottom wall portion and said wall position defining an open space for accommodating an electrical element provided with two leads extending outwardly from said housing in the same general direction from two opposing ends of said element and said element positioned in said space, the leads of said element projecting outwardly from said space away from said bottom wall portion and said space being filled by a cured synthetic resin characterized in that in the vicinity of each of the ends of said element from which said leads extend, a resilient, member which partially surrounds said element, contacts portions of said element between said ends and away from said leads and is provided between said side wall portion of said housing and walls of said element facing said side wall portion, said resilient member comprising two legs, each leg being situated between said element and portions of said side wall portion facing said element and each leg comprising angled portion comprising at least two vertices, at least one of which vertices engages against the element and at least one of which vertices engages against said side wall portion of said housing.

4,841,411

ELECTRICAL CAPACITORS HAVING LOW CAPACITANCE TOLERANCES AND METHOD FOR THE MANUFACTURE THEREOF

Hartmut Kessler, Regensburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 29, 1988, Ser. No. 187,962

Claims priority, application Fed. Rep. of Germany, May 12, 1987, 3715810

Int. Cl.[4] H01G *1/015, 13/00*

U.S. Cl. 361—323 23 Claims

1. An electrical capacitor, comprising:

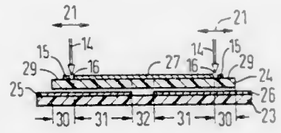
a stack of at least two dielectric plies of plastic;

regenerably thin metal coats on at least one side of said at least two dielectric plies;

metal-free insulating strips provided on said at least two dielectric plies in alternation from ply to ply in proximity to different edge sides and at a distance therefrom;

metal layers applied to said edge sides to contact said metal coats with opposite polarity from ply to ply;

overlap of said metal coats being modified from a rated overlap of said metal coats in accordance with an equation $C=\epsilon\epsilon_o nL\ (u+\Delta u)/(d+\Delta d)$ to compensate for fluctuations from a prescribed rated thickness of said dielectric plies, where C is the capacitance of the capacitor, ϵ is the dielectric constant of the dielectric material used, ϵ_o is the dielectric constant of a vacuum, n is the number of plies of



the film capacitor situated on top of one another, L is the length of the film capacitor defined by a parting cut, u is the lateral rated overlap, Δu is the modification of the lateral rated overlap, d is the rated dielectric thickness and Δd is the fluctuation of the rated dielectric thickness.

4,841,412

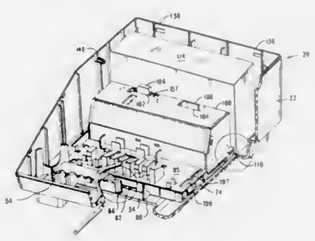
ELECTRONIC APPARATUS ASSEMBLY

George Heys, Jr.; Andrew E. Yandora, and Philip D. McDowell, all of Cambridge, Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Jun. 29, 1988, Ser. No. 212,839

Int. Cl.[4] G06F *1/00*

U.S. Cl. 361—393 21 Claims



1. An electronic terminal device comprising:

a combined base and wall structure for said terminal device, said wall structure including two side walls, a front wall and a rear wall, said side walls each having an inclined portion extending upwardly from said front wall to a point and a horizontal portion extending from said point to said rear wall;

a top member positioned on the horizontal portions of the side walls and on the rear wall;

a keyboard module positioned over the inclined portions of the side walls and over the front wall;

a power supply having a housing positioned on said base within said terminal adjacent said rear wall;

an electronics assembly positioned within said terminal adjacent said power supply and provided with a plurality of extensions which engage apertures in the housing of said power supply and retain said electronics assembly and said power supply in position and provide electrical connection between said power supply and said electronics assembly; and

resilient securing means releasably retaining said electronics assembly in position on said base within said terminal device.

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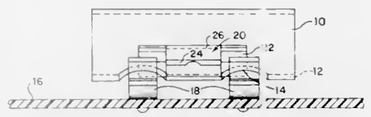
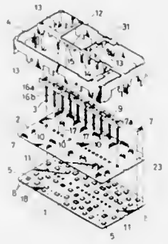
4,841,413
SNAP ON FUSE COVER
Dennis S. Mizerak, Brunswick, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.
Filed Sep. 11, 1987, Ser. No. 96,174
Int. Cl.[4] H05K 7/00
U.S. Cl. 361—400 5 Claims



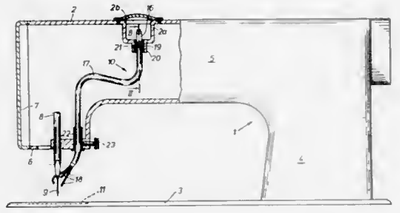
1. A fuse cover combination comprising a board, a pair of fuse engaging clips spaced apart from each other and connected to said board, a fuse mounted between said clips, and a fuse cover engaged over said fuse and fuse clips, said fuse cover comprising a transparent resilient tubular member having opposite open ends and an axial length which is greater than a length encompassing said fuse and fuse clips, said tubular member having an axially extending slot to permit said tubular member to engage on opposite sides of said fuse clips.

4,841,414
HIGH FREQUENCY APPARATUS CHASSIS AND CIRCUIT BOARD CONSTRUCTION
Eiichi Hibino; Kiyoshi Kawakita; Takami Yamamoto; Kazunori Kinoshita, and Shigeki Takase, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan
Continuation of Ser. No. 145,644, Jan. 13, 1988, abandoned, which is a continuation of Ser. No. 437,223, Dec. 31, 1986, abandoned. This application Nov. 3, 1988, Ser. No. 267,658
Claims priority, application Japan, Dec. 3, 1985, 60-186442[U]
Int. Cl.[4] H05K 5/04; H04M 1/08
U.S. Cl. 361—424 17 Claims



15. A high frequency apparatus construction comprising:
a printed circuit base plate having first and second main surfaces opposed to each other, and a plurality of first apertures extending therethrough at right angles to said first and second main surfaces; said base plate including circuit pattern on at least said second main surface;
a chassis which defines a top surface plane, said chassis receiving said base plate;
fixing means fixing said base plate in said chassis;
positioning means fixedly provided on said chassis and defining a predetermined spacing between said top surface plane of said chassis and the first main surface of said base plate;
a plurality of external connection lead terminals inserted in said plurality of first apertures to extend away from said top surface plane and below said base plate; and soldered to said circuit pattern; and
a terminal holder made of insulation material and fixedly retaining said plurality of external connection lead terminals, said terminal holder being positioned by being clamped between said first main surface of said base plate and said positioning means;
wherein said chassis is formed from a single metal plate which is punched and shaped in such a manner that it has four side walls depending at right angles to said top surface plane and said first and second main surfaces of said base plate and successively connected together, said chassis having a shield plate thereon and defining said top surface plane, and said positioning means is formed at least in part by a depending portion of said shield plate;
wherein said depending portion of said shield plate extends at right angles to said first main surface of said base plate and has a predetermined length, and said positioning means is formed by at least a portion of the depending portion of said shield plate opposed to said first main surface for spacing said base plate from said top surface plane at least by said predetermined length;
wherein said shield plate is formed with guide projections extending from said depending portion at positions where they do not interfere with said plurality of external connection lead terminals, and wherein said base plate is formed with second and third apertures receiving said guide projections, the latter being soldered to said circuit pattern on said second main surface of said base plate; and
wherein said plurality of external connection lead terminals, said depending portion of said shield plate, and said guide projections are positioned in substantially the same plane and engage respective portions of said terminal holder.

4,841,415
APPARATUS FOR LIGHTING A SEWING AREA OF A SEWING MACHINE
Reinhold Dobner, Kaiserslautern, Fed. Rep. of Germany, assignor to G. M. Pfaff, AG, Fed. Rep. of Germany
Filed Mar. 3, 1988, Ser. No. 163,769
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1987, 8703621
Int. Cl.[4] D05B 79/00
U.S. Cl. 362—90 10 Claims

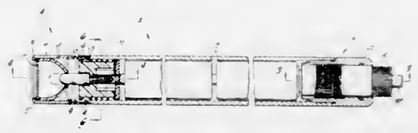


1. A lighting device for a sewing machine having a housing with a base, an upright portion mounted on the base and an arm portion carried by the upright portion overlying the base and with a needle carried by the arm portion for movement to effect sewing over the base portion, comprising a light source carried on said housing, a flexible sheath supported in the arm portion and extending outwardly of the arm portion in a vicinity of the needle, at least two light guides in said sheath having first ends exposed to said light source and opposite second ends extending out of said sheath in the vicinity of the needle, said sheath being bendable and each of said light guides being bendable independently so as to arrange said second ends, extending out of said sheath, to illuminate effective areas in the vicinity of said needle.

4,841,416
SOLAR CHARGING LAMP
Todd Doss, 1540 Alfred La. #D, Yuba City, Calif. 95991
Filed Mar. 2, 1988, Ser. No. 162,883
Int. Cl.[4] F21S 9/00
U.S. Cl. 362—183 1 Claim

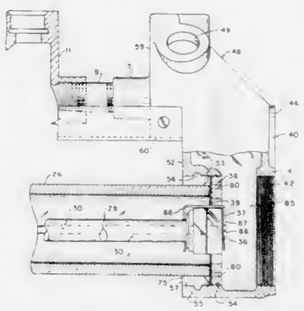
1. A solar charging lamp post comprising,
a vertical housing means including a transparent globe protectively containing an illumination bulb therein secured to an upper terminal end of said housing means, and
photo-voltaic cell means for collecting and converting solar energy to direct current electrical energy, and
a direct current storage battery secured within a battery housing means operatively associated with said photo-voltaic cell means for accepting and storing said electrical energy from said photo-voltaic cell means, and
further housing means secured to said vertical housing means for storage of a length of electrical cord formed with an adaptor at one end thereof operatively associated with said photo-voltaic cell means for selective electrical association with an automobile for providing electrical energy to a storage battery within said automobile, and
wherein said illumination bulb is a direct current bulb of a wattage range of ten to twenty watts, and
wherein said photo-voltaic cell means are secured to brackets on said vertical housing means wherein said vertical means is cylindrical and said bracket means include a plurality of brackets diametrically opposed proximate said upper terminal end of said vertical housing means, and
wherein said globe is of polyhedral configuration formed with an upper surface wherein said upper surface has positioned thereon said photo-voltaic cell, and
wherein said battery housing means is secured to a lower terminal end of said vertical housing means for providing stability to the solar charging lamp post, and
wherein a photo-cell is operatively associated with said bulb for enabling illumination of said bulb during periods of darkness, and
wherein infra-red movement sensor is operatively associated with said photo-electric cell further including switch means for disengaging said cell and providing switching of said bulb through said infra-red movement sensor for illuminating said bulb upon sensing movement proximate said sensor.

4,841,417
TAILCAP SWITCH-FOCUS FLASHLIGHT
Anthony Maglica, Ontario; Robert J. DeLong, Temple City, and Armis L. Lewis, Cucamonga, all of Calif., assignors to MAG Instrument, Inc., Ontario, Calif.
Filed Oct. 7, 1987, Ser. No. 106,064
Int. Cl.[4] F21L 7/00
U.S. Cl. 362—206 16 Claims
1. A flashlight comprising:
a barrel for retaining one or more dry cell batteries;
a head assembly positioned at one end of the barrel and containing a lens, a reflector and a lamp having a positive contact and a ground contact;
means for electrically coupling the positive contact of the lamp to a first battery electrode and the ground contact of the lamp to a second battery electrode;
means for switching the electrical circuit on or off which includes a tail cap, an outer housing rotatably positioned



within the tail cap, an inner housing positioned within the outer housing, an electrical contact, and means for making and breaking electric contact between the second electrode and the contact, said means being positioned at a second end of the barrel, and at said same second end means for moving the lamp relative to the reflector and thereby adjusting the focus of the light emitting through said lens of the flashlight.

4,841,418
EXPLOSION-PROOF FIXTURE AND METHOD
Dwayne Davis, Lee County, Miss., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Aug. 21, 1987, Ser. No. 87,760
Int. Cl.[4] F21Y 15/00
U.S. Cl. 362—223 14 Claims



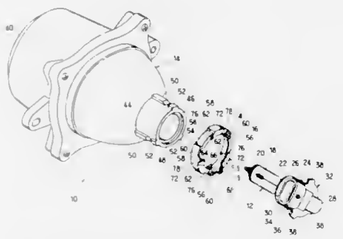
1. An explosion-proof fixture comprising an end housing, said end housing having inner and outer walls defining a chamber, openings in said inner and outer walls, a light transmitting sleeve having an open end mounted in said inner wall opening, said sleeve being slideable through said openings and mountable and demountable therethrough, a lamp mounted within said sleeve, said lamp having socket means on an end thereof, retaining means on said inner wall, and bracket assembly means, connected to and supported by said retaining means, for mounting said lamp within said sleeve.

4,841,419
LAMP ASSEMBLY HAVING A SNAP-ON CONNECTOR FOR READY MOUNTING AND DISMOUNTING OF A LIGHT BULB TO AND FROM A LAMP HOUSING
Kazutami Ohishi, Shizuoka, Japan, assignor to Koito Seisakusho Co., Ltd., Japan
Filed Jul. 18, 1988, Ser. No. 220,691
Claims priority, application Japan, Jul. 20, 1987, 62-180239
Int. Cl.[4] H01J 5/48
U.S. Cl. 362—226 6 Claims
1. An electric lamp assembly of the type having a light bulb

including a base with a flange formed thereon, the flange having a plurality of lugs extending radially outwardly therefrom, and a lamp housing for accomodating the light bulb, the lamp housing having a mounting tube extending therefrom to terminate in a bulb entrance end through which the light bulb is inserted in the lamp housing until the base of the light bulb becomes received in the mounting tube, the mounting tube having first engagement means formed thereon, wherein the improvement resides in a snap-on connector for permitting the light bulb to be readily mounted to and dismounted from the lamp housing after said snap-on connector has been mounted on said mounting tube by a rotational movement of said snap-on connector, the snap-on connector comprising:

(a) a substantially annular body;

(b) locking second engagement means formed adjacent one axial end of the annular body, the second engagement means being locklingly engageable with the first engagement means on the mounting tube of the lamp housing by rotation of said snap-on connector for lockingly mounting the annular body on the bulb entrance end of the mounting tube; and



(c) a plurality of retainer lips extending radially inwardly from the other axial end of the annular body and each defining a space for accommodating one lug on the flange of the light bulb between itself and the bulb entrance end of the mounting tube, each retainer lip having first and second opposite ends in the circumferential direction of the annular body, at least the first circumferential end of each retainer lip being open for insertion of one lug on the light bulb flange;

(d) whereby the light bulb can be mounted to the lamp housing via the snap-on connector by first inserting the light bulb in the bulb entrance end of the mounting tube, then by inserting the lugs on the light bulb flange in the open first circumferential ends of the retainer lips of the snap-on connector until the lugs become held against the bulb entrance end of the mounting tube, and then by turning the light bulb relative to the lamp housing and the snap-on connector until the lugs on the light bulb flange become received in the spaces between the retainer lips of the snap-on connector and the bulb entrance end of the mounting tube.

4,841,420

STRING LIGHTS FOR CONSTRUCTION SITES

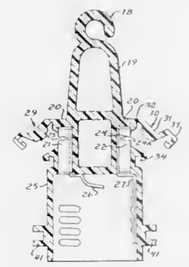
Horacio A. Baggio, Niles, and George R. Eckart, Evanston, both of Ill., assignors to Woodhead Industries, Inc., Northbrook, Ill.

Filed Jun. 20, 1988, Ser. No. 209,322

Int. Cl.[4] F21V *15/02*

U.S. Cl. 362—249 **7 Claims**

1. A plurality of string lights adapted to be hung on a common messenger wire at spaced intervals to provide light for an area, each of said string lights comprising: a lampholder defining mean for attaching to said messenger wire and a socket for receiving a lamp, said lamp holder further including first and second electrical connector means for attaching to electrical power feed lines to energize a lamp received in said socket; means defining a peripheral retainer flange on the exterior of said socket; and a lamp guard comprising first and second similar lamp protectors, each lamp protector including an upper collar defining a groove for coupling to a portion of said retainer flange on said socket and a hinging coupling member at one end of said collar and including a connecting element,



the other end of said collar extending laterally outwardly and defining a slot for receiving an associated connecting element of an adjacent lamp protector, said lamp protector further including a cage guard and a hinge extending from said collar to said cage guard to permit said cage guard to swing outwardly and upwardly relatively to said collar, and releasable snap coupling means for coupling to an associated cage guard at a location remote from said collar.

4,841,421

HOUSING FOR LONG-FIELD LAMPS HAVING INTERCHANGEABLE LOUVER INSERT

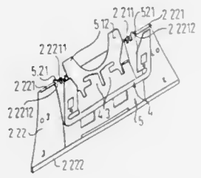
Gottfried Mueller, Traunwalchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 27, 1988, Ser. No. 263,190

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1988, 8800431[U]

Int. Cl.[4] F21V *17/02*

U.S. Cl. 362—279 **4 Claims**



1. A housing for long-field lamps having an interchangeable louver insert whereby at least one lock is provided for the mutual, releasable interlocking of the housing and louver insert, said lock having a U-shaped carrier with two free legs and a spring arm extending between said legs in the direction toward the free ends thereof, whereby said lock, further, has its free legs secured to at least one housing face wall at the inside and the spring arm, whose free end is shaped as a gripping surface having latch shoulders offset relative thereto at both sides, describes an acute angle with said legs, and whereby, upon insertion of said louver insert into said housing, the gripping surface of the spring arm slides across the upper edge of that end louver lamella of the louver insert that is proximate to said spring arm and the latch shoulders of the spring arm engage in locking fashion under bent-off upper edge parts of this end louver lamella that represent a counter-latch, comprising the louver insert being interchangeable with at least one other louver insert that has substantially high louver lamellae and, a plate-shaped lock adapter of resilient material being secured to that end louver lamella of this other louver insert that is proximate to the lock being secured thereto at that side facing toward the lock and between the upper and lower bent-off edges of said end louver lamella, the gripping surface of the lock being lengthened beyond the upper lamella edge by said lock adapter and said lock adapter representing the counter-latch for the lock.

4,841,422

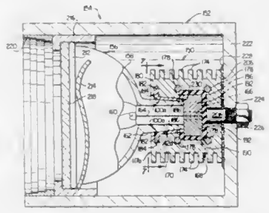
HEAT-DISSIPATING LIGHT FIXTURE FOR USE WITH TUNGSTEN-HALOGEN LAMPS

Allen R. Groh, Roanoke, Tex., assignor to Lighting Technology, Inc., Roakoke, Tex.

Division of Ser. No. 68,560, Jun. 30, 1987, Pat. No. 4,780,799, which is a continuation-in-part of Ser. No. 922,152, Oct. 23, 1986, abandoned. This application Jun. 8, 1988, Ser. No. 203,807

Int. Cl.[4] F21V *29/00*

U.S. Cl. 362—294 **7 Claims**



1. Heat dissipating electrical connector apparatus comprising:

a cooling body having first and second spaced sections formed from a thermally and electrically conductive material adapted to receive electrical power from a source thereof, said cooling body further having a socket opening extending inwardly through a front end portion thereof and having an interior side surface and an inner end, said socket opening being adapted to receive a lamp element base portion having connector pins thereon, said first and second sections of said cooling body each having a pin opening formed therein which extends rearwardly from said inner end of said socket opening and is adapted to receive one of said connector pins;

a thermally conductive, electrically resistive material encapsulating and separating said first and second spaced sections of said cooling body; and

heat conducting material disposed along said interior side surface of said socket opening and adapted to be compressed between said interior side surface and a lamp base portion inserted into said socket openings.

4,841,423

ADDITIONAL HEADLIGHT FOR USE ON A MOTOR VEHICLE IN CONJUNCTION WITH A DIPPED HEADLIGHT

Bernard Luciani, Paris, France, assignor to Cibie Projecteurs, Bobigny Cedex, France

Filed Jun. 15, 1987, Ser. No. 62,214

Claims priority, application France, Jun. 17, 1986, 86 08722

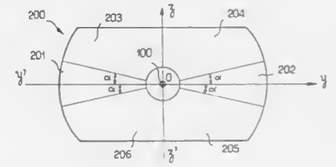
Int. Cl.[4] F21V *7/09*

U.S. Cl. 362—304 **6 Claims**

1. A motor vehicle headlight suitable for emitting a light beam which is essentially complementary to a dipped beam having a cutoff so that together the two beams constitute a main beam, the headlight comprising an axial filament lamp, a reflector and a closure glass, the headlight including the improvements whereby:

the filament of the lamp emits freely in all directions thereabout;

the reflector comprises two first sectors which are paraboloid in shape, which have a common focus situated approximately in the middle (in the axial direction) of the filament and a common axis of revolution which defines the axis of the headlight, said first sectors being delimited



by half-planes that are inclined on either side of substantially horizontal plane passing through the axis of the headlight in order to create a spot of light concentration in the vicinity of said headlight axis, and two other sectors which interconnect said first sectors with continuity and which are shaped such that the major part of each filament image produced thereby lies above a cutoff that substantially coincides with the cutoff of the dipped beam; and certain zones of the closure glass include means for distributing the beam horizontally.

4,841,424

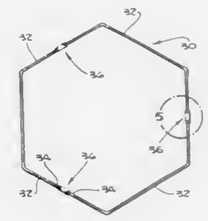
KNOCKDOWN RING FRAME FOR LAMP SHADE

Franz K. Weber, Belmont Shore, Calif., assignor to Modulite Corporation, Compton, Calif.

Filed May 31, 1988, Ser. No. 200,546

Int. Cl.[4] F21V *1/06*

U.S. Cl. 362—352 **12 Claims**



1. A knockdown ring frame for a lamp shade, comprising:

at least two rigid, elongated rods, each having opposite ends and formed to lie in a common plane and rigidly interconnect end-to-end to form a closed, planar ring, each said rod having a straight portion at each said end, each said portion having a transversely-extending tang formed thereon and spaced inwardly from a respective end; and

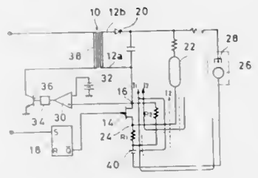
at least two connector sleeves, each having open, opposite ends and a straight segment at each said open end adapted to slidably receive an end of one of said rods coaxially therein, each said segment having a detent therein spaced inwardly from a respective end of said sleeve adapted to receive one of said tangs in locking, over-center engagement.

4,841,425

HIGH-VOLTAGE POWER SUPPLY APPARATUS

Yukio Maeba, and Kiyoteru Igashira, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed May 28, 1987, Ser. No. 55,188
Claims priority, application Japan, May 30, 1986, 61-83529[U]; May 30, 1986, 61-83530[U]
Int. Cl.[4] H02M 3/335
U.S. Cl. 363—21 9 Claims



1. A high-voltage power supply apparatus, comprising:
a transformer having an input winding and an output winding,
a series connection of a first resistor and a switching element, said series connection being connected between one end of said output winding and a reference potential,
a second resistor connected in parallel with said series connection,
a medium voltage circuit connected between the other end of said output winding and the reference potential,
a high voltage circuit connected in parallel with said medium voltage circuit,
control means for turning on said switching element and for controlling an input voltage of said input winding based on a current flowing through said first and second resistors, when said high voltage circuit is operated, and
for turning off said switching element and for controlling said input voltage of said input winding based on a current flowing through said second resistor, when said high voltage circuit is not operated.

4,841,426

METHOD FOR CONTROLLING THE SEMICONDUCTOR SWITCHES OF A RECTIFIER BRIDGE CONNECTED TO AN A.C. MAINS SUPPLY, AND A CONTROL UNIT DESIGNED FOR APPLYING THE METHOD

Harri Hakala, Hyvinkaa, Finland, assignor to Kone Elevator GmbH, Baar, Switzerland

Filed Dec. 18, 1987, Ser. No. 135,111
Claims priority, application Finland, Jan. 13, 1987, 870119
Int. Cl.[4] H02M 5/458
U.S. Cl. 363—37 6 Claims

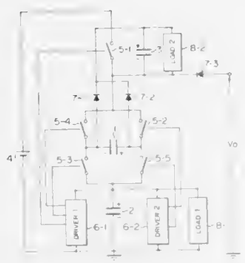
1. A method of controlling inverting semiconductor switches connected in parallel with rectifying components (D_7-D_{12}) of a rectifier bridge connected to an a.c. supply network, comprising the steps of:
forming a reference voltage (V_{REF}) comprised of a first voltage (V_N) proportional to a phase voltage having the highest absolute value and a second voltage (V_D) proportional to a rectified voltage from said rectifier bridge; and
controlling each of said semiconductor switches (Q_7-Q_{12}) by comparing a voltage (U_1-U_6) proportional to a phase voltage to said reference voltage (V_{REF}).

4,841,427

CAPACITIVE VOLTAGE LOWERING CIRCUIT WITH DUAL OUTPUTS

Hideki Miyazaki; Kenichi Onda, and Yasuo Matsuda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 29, 1988, Ser. No. 213,134
Claims priority, application Japan, Jul. 1, 1987, 62-162353; Nov. 24, 1987, 62-294148
Int. Cl.[4] H02M 3/06
U.S. Cl. 363—62 6 Claims



1. A power supply circuit comprising:
first charge storing means;
second and third charge storing means supplying their charged voltages so as to be used as sources of predetermined voltages applied to associated loads respectively;
switch means capable of selectively establishing at least a first mode and a second mode, so that, in said first mode, said first and second charge storing means are connected in series with a d.c. power source to be charged by a power supply voltage, while, in said second mode, said first charge storing means is electrically isolated from said d.c. power source and said second charge storing means, and said third charge storing means is connected to said first charge storing means in a closed circuit to be charged by the charges stored in said first charge storing means; and
a drive circuit driving said switch means so that said switch means repeats an operation cycle including at least said first mode and said second mode executed in that order.

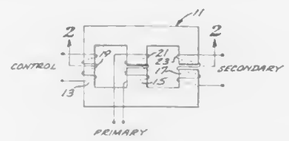
4,841,428

NON-SATURATING MAGNETIC AMPLIFIER CONTROLLER

Robert D. Washburn, Malibu, and Robert F. McClanahan, Valencia, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 18, 1988, Ser. No. 169,921
Int. Cl.[4] H02P 13/04
U.S. Cl. 363—75 14 Claims

1. A magnetic amplifier comprising:
a magnetic core having a primary leg, a secondary leg, and a control leg;
a primary winding disposed about said primary leg of said magnetic core for generating a magnetic AC flux in said magnetic core;
a secondary winding disposed about said secondary leg of said magnetic core; and
a control winding disposed about said control leg of said magnetic core for controlling the reluctance of said control leg relative to the reluctance of said secondary leg, said control being provided without driving said magnetic core into saturation.

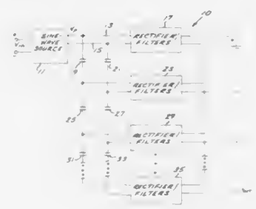


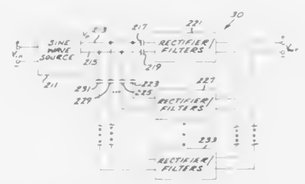
4,841,429

CAPACITIVE COUPLED POWER SUPPLIES

Robert F. McClanahan, Valencia; Robert D. Washburn, Malibu; Carlos H. Gonzalez, Norwalk; Jerry C. Sze, San Francisco, and David M. Lusher, Torrance, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 24, 1988, Ser. No. 173,223
Int. Cl.[4] H02M 7/06
U.S. Cl. 363—126 7 Claims





1. A power supply comprising:
means for providing AC power at a frequency greater than one megahertz;
non-resonant means responsive to said AC power for providing DC isolation and for providing capacitively coupled AC power without inductors or resistors; and
a plurality of rectifying means responsive to said capacitively coupled Ac power for providing respective DC outputs.

4,841,430

METHOD OF TEACHING A PATH TO A MOVING BODY

Toru Nakagawa; Hitoshi Kubota, and Yasuo Sakurai, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sep. 5, 1986, Ser. No. 904,844
Claims priority, application Japan, Sep. 5, 1985, 60-196267
Int. Cl.[4] G06F 15/46
U.S. Cl. 364—167.01 19 Claims

1. In a control system having a memory for controlling the movement of a moving part of a working apparatus so that said moving part is moved to trace a predetermined path, a method of successively obtaining tracing points on said path as path data for teaching said moving part to be moved substantially along said path by successive tracing of the tracing points, comprising the steps of:
(a) moving a position feeler along said path and monitoring the position of the feeler at first, second and third sampling points along said path;
(b) obtaining a difference between a path length and a straight distance between the first and second sampling points on said path in response to the monitored positions at the first and second sampling points;
(c) determining a curvature of said path on the basis of an angle formed by said first and second sampling points and said third sampling point on said path in response to the monitored positions at the first, second and third points; and
(d) selectively storing said first, second and third sampling points as said tracing points in said memory on the basis of the obtained difference and the determined curvature.

4,841,431

PROGRAMMABLE TRANSFER MACHINE

Masayoshi Takagi, Kariya; Yoshio Yoshioka, Anjo; Tetsuo Matsuzaki, Nishio; Shuhei Noro, Aichi; Syouji Ikawa, Okazaki, and Katutoshi Naruse, Toyota, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Jul. 10, 1987, Ser. No. 72,142
Claims priority, application Japan, Jul. 10, 1986, 61-162659
Int. Cl.[4] G06F 15/46
U.S. Cl. 364—187 5 Claims

1. A programmable transfer machine for processing plural workpieces, said workpieces moving through said transfer machine in only one direction, said machine comprising:
a plurality of machining stations;
a conveyor responsive to a transfer command signal applied thereto for simultaneously conveying workpieces to said machining stations successively only in said one direction

so that each of said workpieces is transferred from one of said machining stations to another machining station each time said conveyor is operated;

a plurality of numerically controlled machine tools respectively disposed at said machining stations, for respectively undertaking a series of machining operations which are to be performed on each of said workpieces, each of said machine tools being adapted to execute one or more machining programs assigned thereto, said machining operations undertaken by said machine tools;

means included in each of said machine tools for generating a trouble signal when the machine tool is in trouble;

program execution control means responsive to said trouble signal from each of said machine tools for causing a normal machine tool which is adjacent to said machine tool in trouble and at an upstream side of said conveyor, to execute one of said machining programs originally assigned to said machine tool in trouble in addition to another of said machining programs originally assigned to said normal machine tool;

detection means for issuing a completion signal when the executions of all of said machining problems by one or more remaining normal machine tools are completed; and

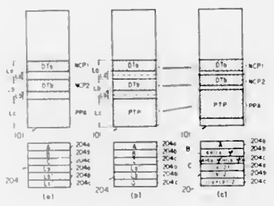
means for applying said transfer command signal to said conveyor so as to operate the same each time said completion signal is issued from said detection means.

4,841,432

METHOD OF RECONFIGURATION OF STORAGE AREAS IN AN APPARATUS FOR CHEATING NC TAPES

Hajimu Kishi, Hino; Takashi Takegahara, Hachioji, and Masashi Yukutomo, Sagamihara, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Continuation of Ser. No. 444,591, Nov. 17, 1982, abandoned.
This application Jan. 19, 1988, Ser. No. 145,739
Claims priority, application Japan, Mar. 30, 1981, 56-047047
Int. Cl.[4] G06F *15/16*
U.S. Cl. 364—191 **9 Claims**



1. In an apparatus for automatically creating NC tapes for controlling machine tools wherein a memory is subdivided into plural storage areas, wherein each of the subdivided storage areas has the capability of being divided into a blank portion and a data portion, and wherein predetermined data are written into respective ones of the subdivided storage areas, a method of reconfiguring the subdivided storage areas of the memory comprising the steps of:

(a) discriminating whether a blank portion exists in a predetermined one of the subdivided storage areas;

(b) reducing, when there is no blank portion, or substantially no blank portion, in the predetermined one of the subdivided storage areas, the size of the blank portions of the remaining ones of the subdivided storage areas; and

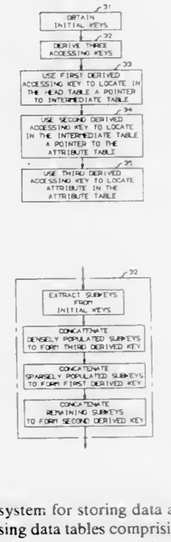
(c) enlarging the predetermined one of the subdivided storage areas by an amount equal to the amount of blank portion reduction effected in the remaining ones of the plural storage areas.

4,841,433

METHOD AND APPARATUS FOR ACCESSING DATA FROM DATA ATTRIBUTE TABLES

Shafik J. Hakim; Mark R. Locher, both of Naperville; Kenneth Y. Nieng, Lombard, and Barbara A. Vagnozzi, Naperville, all of Ill., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 26, 1986, Ser. No. 935,247
Int. Cl.[4] G06F *12/00*
U.S. Cl. 364—200 **12 Claims**



1. In a data base system for storing data attributes, said data base system comprising data tables comprising a head table and a plurality of tables of data attributes, each of said tables of data attributes comprising a plurality of slots, and wherein each of said data attributes is identified by a plurality of data accessing keys, a method of accessing data attributes in said plurality of tables of data attributes, comprising the steps of:

extracting at least two fixedly selected subkeys from different ones of said plurality of data accessing keys; and

deriving a first derived key for accessing one of said tables of said data base by combining data of said extracted subkeys;

wherein every slot of each of said tables of attributes corresponds to only one set of values of said plurality of data accessing keys.

4,841,434

CONTROL SEQUENCER WITH DUAL MICROPROGRAM COUNTERS FOR MICRODIAGNOSTICS

James K. Mathewes, Jr., Northborough; Jan S. Herman, Hollister; Stephen C. Johnson, Waltham; Richard B. Goud, Concord, and Jack J. Stiffler, Hopkinton, all of Mass., assignors to Raytheon Company, Lexington, Mass.

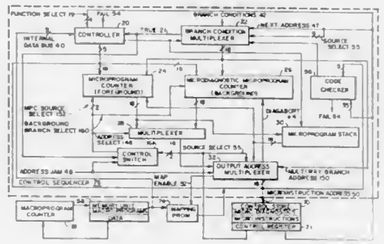
Continuation of Ser. No. 609,602, May 11, 1984, abandoned.
This application Apr. 27, 1987, Ser. No. 42,560
Int. Cl.[4] G06F *11/00, 9/22*
U.S. Cl. 364—200 **21 Claims**

1. A processing system for executing a stored primary program comprising:

memory means for storing a microinstruction secondary program and microinstructions for implementing macro-

instructions of said primary program, said secondary program being used for microdiagnostic testing;

control sequencer means coupled to said memory means and responsive to a macroinstruction of said primary program for enabling said processing system to execute said stored secondary program simultaneously with the execution of



said primary program without increasing said primary program execution time, said macroinstruction of said primary program being implemented by at least one of said microinstructions stored in said memory means; and

said control sequencer means comprises at least two microprogram counters for controlling the simultaneous operation of said primary program and said secondary program.

4,841,435

DATA ALIGNMENT SYSTEM FOR RANDOM AND BLOCK TRANSFERS OF EMBEDDED SUBARRAYS OF AN ARRAY ONTO A SYSTEM BUS

Robert L. Papenberg, San Jose, Calif., assignor to Saxpy Computer Corporation, Sunnyvale, Calif.

Filed Oct. 29, 1986, Ser. No. 924,912
Int. Cl.[4] G06F *12/00, 12/04, 12/06, 12/08*
U.S. Cl. 364—200 **7 Claims**

1. In a data transfer apparatus including a system memory (SMEM) having its storage elements organized into wide words (WW) having addresses A_{WW}, each WW consisting of W system words, with a location of each system word in a WW given by an offset (X), with each system word also identified by a system memory address, A_{SM}, and with the system memory having a data I/O port and a control port, said data transfer apparatus also including a buffer memory having a data I/O port and a control port, where the system memory has an array of storage elements defined as sequentially addressed system word storage elements and with a selected subarray of storage elements embedded in the array defined by a starting address, an increment between rows (IBR) of the elements of the selected subarray and an increment between columns (IBC) of the elements of the selected subarray and a number of columns (NC), an improved system for transferring data from said selected subarray to said buffer during an SMEM read operation and from said buffer to said selected subarray during an SMEM write operation comprising:

a system BUS (SBUS) including W word-segments, said system BUS coupled to the SMEM data I/O port so that the system words stored in the storage elements of a WW of said SMEM are transferred to corresponding word-segments of said SBUS during an SMEM read and so that the system words on said word-segments are transferred to corresponding storage elements in the WW during a SMEM write operation;

a packing MUX for controllably coupling a selected word-segment of said SBUS to the I/O port of said buffer memory;

a scattering DEMUX for controllably coupling the I/O port of said buffer memory to a selected word-segment of said SBUS;

read control means, coupled to said SMEM, said packing MUX, and said buffer memory, for controlling said SMEM to transfer a subarray WW, being a WW including subarray system words stored in storage elements of said selected subarray, to said SBUS, with said subarray WW being on the SBUS for one WW cycle, for controlling said packing MUX to sequentially couple only the word-segments of the SBUS having subarray system words thereon to the data I/O port of the buffer memory during said WW cycle, and for sequentially writing the subarray system words transferred by said packing MUX to the I/O port of said buffer memory into selected storage locations in said buffer during said WW cycle; and

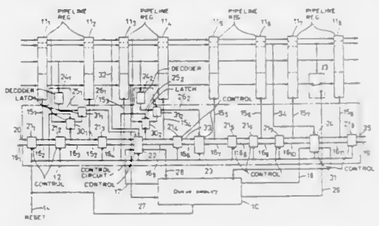
write control means coupled to said SMEM, said scattering DEMUX, and said buffer memory for sequentially reading system words to be stored in the subarray storage elements from selected storage elements in said buffer memory, for controlling said scattering DEMUX to sequentially couple the I/O port of said buffer memory to only the subarray word-segments of SBUS corresponding to the subarray storage locatins of a given WW in said SMEM, and for sequentially writing each system word, transferred from said buffer memory to said subarray word-segments, into subarray storage locations of said given WW in said SMEM.

4,841,436

TAG DATA PROCESSING APPARATUS FOR A DATA FLOW COMPUTER

Hajime Asano, Toyonaka; Hiroaki Terada, Suita; Katsuhiko Asada, Amagasaki; Hiroaki Nishikawa, Suita; Masahisa Shimizu, Kadoma; Hiroki Miura, Hirakata; Kenji Shima, Nishinomiya; Shinji Komori, Itami; Souichi Miyata, Shiki, and Satoshi Matsumoto, Uda, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma; Sanyo Electric Co., Ltd., Moriguchi; Mitsubishi Denki Kabushiki Kaisha, Tokyo and Sharp Corporation, Osaka, all of, Japan

Filed May 30, 1986, Ser. No. 868,701
Claims priority, application Japan, May 31, 1985, 60-119034
Int. Cl.[4] G06F *9/18*
U.S. Cl. 364—200 **2 Claims**



1. A tag data processing apparatus for a data flow computer wherein tag data, representing an identifier of the context of program execution, and operation instructions are carried on tokens moving in first in-first out queues, said tag data processing apparatus comprising:

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UMI

a plurality of serially connected pipeline registers for holding and transmitting tokens having tag data associated therewith, each pipeline register having an input end, an output end, and an enable lead, wherein said output end of a preceding pipeline register is connected to said input end of a succeeding pipeline register;

queue memory means for storing usable tag data to be added to tokens having a tag add instruction and for storing tag data from tokens having a restore instruction, said queue memory means having a data input end operatively connected with said output ends of said pipeline registers, a data output end operatively connected with said input ends of said pipeline registers and having an enable lead; and

control means, operatively connected to said pipeline registers, including:

means for detecting that a token in one of said pipeline registers is a tagged token, and has one of a tag restoring instruction or a tag adding instruction;

means for producing signals on said enable lead of said queue memory means for (a) writing the tag of a tagged token that is detected to have a tag restoring instruction to said queue memory means, and (b) writing a tag from said queue memory means to a tagged token which has a tag adding instruction,

means for erasing said added tag from said queue memory means; and

means for generating clock pulses for moving tokens through said pipeline registers;

said control means causing said queue memory means to store said tags from said tagged token having a tag restoring instruction only when said token is detected to be tagged with said tag restoring instruction and said queue memory means is ready for input;

said control means causing said tag to be erased from said queue memory means only when a particular condition is satisfied, and said control means causing said tag from the output of said queue memory means to be written to said token only when said token is determined to have a tag adding instruction and said queue memory means is ready to produce output.

4,841,437

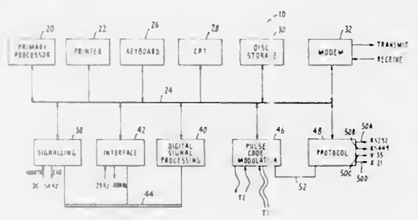
SYSTEM ARCHITECTURE FOR A TEST APPARATUS HAVING PRIMARY AND DEPENDENT PROCESSORS

Andre Lubarsky, Sunnyvale, and Richard E. Pospisil, Cupertino, both of Calif., assignors to LP COM, Mountain View, Calif.

Filed Sep. 18, 1985, Ser. No. 777,173

Int. Cl.⁴ G06F *13/40*

U.S. Cl. 364—200 **3 Claims**



1. An apparatus for analyzing communication lines, comprising:

a primary processor;

a digital information bus;

a dependent processor for digitally processing analog singals, said dependent processor being connected to said primary processor via said digital information bus;

an analog information bus; and

an interface module connected to said primary processor via said digital information bus and to said dependent processor via said analog information bus, said interface module having a means to connect said interface module to the communications lines to be analyzed so that the interface module may send analog signals to the communications lines and the interface module may receive analog signals from the communications lines, wherein the primary processor controls the signals passing between the interface module and the communications lines by sending digital instructions to both said dependent processor and said interface module via said digital information bus, and wherein said dependent processor and said interface module communicate using analog signals via said analog information bus.

4,841,438

SYSTEM FOR GENERATING MASK PATTERN FOR VECTOR DATA PROCESSOR

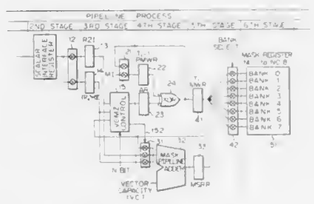
Akira Yoshida, and Yuuichi Sasaki, both of Kawasaki, Japan, assignors to Fujitsu Limited, Japan

Filed Sep. 19, 1986, Ser. No. 909,335

Claims priority, application Japan, Sep. 19, 1985, 60-207502

Int. Cl.⁴ G06F *15/16*

U.S. Cl. 364—200 **6 Claims**



1. A system for generating a mask pattern for a vector data processor having a mask register and a vector register in which, the value of the mask register is "1", a calculation is executed for the corresponding element of the vector register, and when the value of the mask register is "0", a calculation is not executed, in accordance with a calculational mask function, said system comprising:

designation means for designating sequential "i" elements of "0" or "1" from a beginning element of the mask register and subsequent sequential "j" elements of "1" or "0"; and

control means for rendering the "i" elements to be "0" or "1", the "j" elements to be "1" or "0", and the remaining elements to be all "0's" or all "1's", when "i" plus "j" is smaller than a vector length which is the object of the calculation of a vector data operand used in a vector instruction, a desired pattern of "0" or "1" being generted in the mask register.

4,841,439

METHOD FOR RESTARTING EXECUTION INTERRUPTED DUE TO PAGE FAULT IN A DATA PROCESSING SYSTEM

Atsuhiko Nishikawa, Mito; Yoshihiro Miyazaki, Hitachi; Masayuki Tanji, Hitachi; Soichi Takaya, Hitachi, and Shinichiro Yamaguchi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 14, 1986, Ser. No. 917,974

Claims priority, application Japan, Oct. 11, 1985, 60-224765

Int. Cl.⁴ G06F *12/00*

U.S. Cl. 364—200 **4 Claims**

1. A method for restarting execution of an instruction interrupted due to a page fault in a data processing system having a main memory, means for storing microprograms of microinstructions, a microprogram counter for holding a microprogram address, a program counter for holding a program address, and an external memory, said method comprising the steps of:

storing microinstructions, including a microinstruction for main memory access and a microinstruction for waiting for a reply to a main memory access for a fixed number N of operating steps after execution of said microinstruction for a main memory access;

executing said microinstruction for main memory access without saving a current microprogram address;

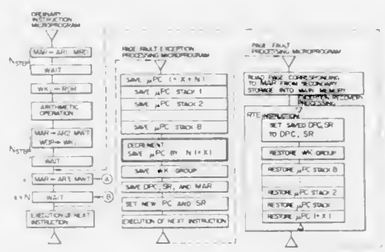
executing said microinstruction for waiting for a reply to a main memory access without incrementing said microprogram counter until a reply to the memory access is received;

branching from said microinstruction for waiting for a reply to a main memory access to an exception processing microprogram when a reply to a main memory access is received and a page fault is indicated;

executing said exception processing microprogram by saving a microprogram address which is obtained by substracting N from the address of said microinstruction for waiting for a reply to a main memory access and for setting a new program address in said program counter for executing a procedure for recovery of a page fault; and

executing said procedure for recovery of a page fault by loading a page for which said page fault has occurred into said main memory from said external memory and resetting the program counter and restoring the microprogram address which is saved by said exception processing microprogram;

thereby effecting the restart of the instruction execution.



4,841,440

CONTROL PROCESSOR FOR CONTROLLING A PERIPHERAL UNIT

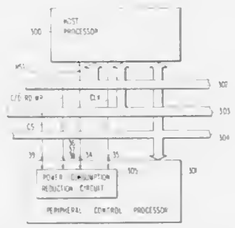
Kazuya Yonezu, and Keiji Matsumoto, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 26, 1984, Ser. No. 604,274

Claims priority, application Japan, Apr. 26, 1983, 58-73280

Int. Cl.⁴ G06F *1/00*

U.S. Cl. 364—200 **9 Claims**



1. A peripheral control processor for use with a host processor and a peripheral unit, said peripheral control processor receiving an external clock signal and an external reset signal, said peripheral control processor comprising:

a first terminal for receiving said external clock signal;

a second terminal for receiving said external reset signal to initialize said peripheral control processor;

a third terminal for receiving a chip select signal,

a fourth terminal for receiving a reading signal or a writing signal;

a data communication circuit, coupled to said first to fourth terminals, for transferring data between said host processor and said peripheral unit on the basis of timing control by said external clock signal, said data communication circuit being enabled by said chip select signal and initialized by said external reset signal, said data communication circuit transferring said data from said host processor to said peripheral unit in response to said writing signal and from said peripheral unit to said host processor in response to said reading signal; and

a control circuit coupled between said first terminal and said data communication unit and connected to said second, third and fourth terminals, said control circuit permitting said external clock signal to be supplied to said data communication circuit when both of said chip select signal and said reading signal or said writing signal are received, and inhibiting application of said external clock signal to said data communication circuit when said external reset signal is received, wherein said data communication circuit it initialized and power consumption of said data communication circuit is reduced in response to said external reset signal.

4,841,441

METHOD OF CREATING A COMPUTER SYSTEM

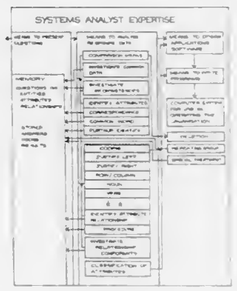
Rodger J. Nixon; Peter J. C. Roselli; David I. Armstrong; Martin K. Lindley, and Imogen E. de la Bere, all of Christchurch, New Zealand, assignors to Adata Software Limited, Christchurch, New Zealand

Filed Aug. 1, 1985, Ser. No. 761,748

Claims priority, application New Zealand, Aug. 1, 1984, 209070; Mar. 29, 1985, 211641

Int. Cl.⁴ G06F *15/40*

U.S. Cl. 364—401 **26 Claims**



1. A method of constructing a data model of an organizational structure and the operation thereof which comprises the stages of analysing data provided by the customer organization (analysis), designing application software (procedure design), writing programs which collectively enable control of the operating procedures of the organization (programming) and testing the individual programs characterized by performing the stage of analysis with a data processing machine, wherein the analysis stage comprises:

storing in memory of the machine a source series of questions which are presentable in conversational language concerning the entities in the organizational structure, the

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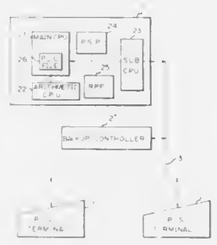
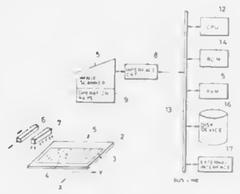
attributes of those entities, and the relationship between the entities; and
constructing a data model from the answers.

4,841,442
POS SYSTEM FOR UPDATING LOOK-UP TABLE
Osamu Hosoyama, Takasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Dec. 27, 1985, Ser. No. 813,951
Claims priority, application Japan, Dec. 27, 1984, 59-280629
Int. Cl.[4] G06F *15/20*
U.S. Cl. 364—405 **15 Claims**



1. A point of sales (POS) system comprising:
a central computer; and
a plurality of POS terminals connected to said central computer, said central computer including:
a main look-up table for storing article data;
first means for sending and receiving a text;
means for analyzing the text received by said first means;
means for searching the contents of said main look-up table based on the analysis by said analyzing means;
means for compiling a response text based on the findings of the search by said searching means; and
means for updating the article data stored in said main look-up table based on the analysis by said analyzing means, each of said POS terminals including:
second means for sending and receiving a text;
means for compiling an inquiry demand text which demands an inquiry into the article data in said main look-up table;
means for compiling an update demand text which demands an update of the content of said main look-up table; and
means for inputting replacement data to said main look-up table;
wherein said central computer, in response to receipt of an inquiry demand text sent from one of said POS terminals, causes said analyzing means to analyze the received text, causes said searching means to search the contents of said main look-up table according to the result of the analysis, causes said response text compiling means to compile a response text according to the findings of the search, and causes said first means for sending and receiving a text to send the response text to said one of said POS terminals, and
wherein said central computer, in response to the update demand text sent from said one of said POS terminals, causes said analyzing means to analyze the received text, and updates the data stored in said main look-up table with updated data input and sent from said one of said POS terminals by changing the data stored in said main look-up table to new data.

4,841,443
METHOD OF AND APPARATUS FOR AUTOMATICALLY READING 5 BAND ARRAYAL PATTERN
Shigeru Kakumoto, Kodaira; Tatsuo Sumi, and Tetsuo Kurisu, both of Yokohama, all of Japan, assignors to Hitachi, Ltd. and Hitachi Software Engineering Co., Ltd., both of Tokyo, Japan
Filed Oct. 30, 1986, Ser. No. 924,788
Claims priority, application Japan, Oct. 30, 1985, 60-241548; Oct. 30, 1985, 60-241549
Int. Cl.[4] G06K *9/00, 9/12*
U.S. Cl. 364—413.01 **15 Claims**



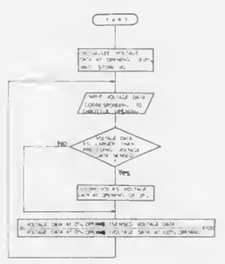
1. A method of automatically reading a band arrayal pattern having a plurality of bands in patterns arrayed substantially in a first direction and within a plurality of lanes extending substantially in a second direction perpendicular to the first direction, said method comprising the steps of:
photoelectrically scanning the pattern to generate density data items made up of pixels;
detecting histograms from the generated density data items, said histograms consisting of sums of the density data items of the pixels in a plurality of straight lines in said second direction;
detecting from said histograms representative points for respective lanes, the points representing positions of said respective lanes in said first direction;
detecting for said respective lanes density data trains of the pixels in straight lines in said second direction and passing the detected representative points; and
detecting positions of the plurality of bands within said respective lanes in said second direction from the detected density data trains.

4,841,444
METHOD FOR CONTINUOUS ESTIMATION BY NON-LINEAR SIGNAL MATCHING OF SEISMIC TRACES
Chittibabu Chittineni, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.
Continuation of Ser. No. 831,382, Feb. 20, 1986, abandoned. This application Sep. 30, 1988, Ser. No. 253,353
Int. Cl.[4] G01V *1/36;* G06K *9/48*
U.S. Cl. 364—421 **15 Claims**

1. A method for determining a continuous velocity for the propagation of acoustic seismic pulses through subsurface formations in a system where acoustic pluses are generated by a seismic source transmitted into the earth, reflected back by interfaces, detected by seismic pulse receivers and converted to electrical signals representing a series of sequentially detected acoustic pulses, said method including the steps of:
receiving signals representing detected acoustic pulses;
selecting signals representing acoustic pulses having a common reflection midpoint between a seismic source and a seismic pulse receiver;
determining a beginning point, intermediate points and an end point for each selected signal;
estimating non-linear signal match curves for said selected signals;
calculating derivatives of the inverse of the square of the root mean square velocity of the acoustic pulses represented by each said selected signal;
computing root mean square velocities of the acoustic pulses by integrating said derivatives;

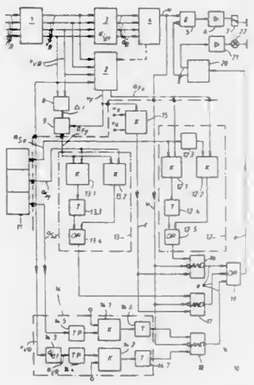
estimating interval velocities for the acoustic pulses between interfaces;
establishing a continuous velocity for the acoustic pulses; and
displaying said estimated interval velocities.

4,841,445
ELECTRONICALLY CONTROLLED AUTOMATIC TRANSMISSION
Masanari Yamamoto; Yasunobu Ito, and Shouji Yokoyama, all of Anjo, Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo, Japan
Filed Aug. 10, 1987, Ser. No. 83,392
Claims priority, application Japan, Aug. 11, 1986, 61-188197
Int. Cl.[4] G06F *15/50, 7/70*
U.S. Cl. 364—424.1 **1 Claim**



1. An electronically controlled automatic transmission having shift solenoids controlled by a microcomputer in dependence upon a vehicle velocity signal and a throttle opening signal, which comprises:
a throttle opening sensor for generating a voltage conforming to a throttle opening;
memory means for storing voltage data V_0 of a throttle opening of 0% and voltage data V_{100} of a throttle opening of 100%;
means for comparing at least one of a sensed voltage data V'_0 of a throttle opening of 0% and a sensed voltage data V'_{100} of a throttle opening of 100% respectively to V_0 and V_{100} in said memory means and for rewriting at least one of V_0 in said memory means with V'_0 when V_0 and V'_0 are different and V_{100} in the memory means with V'_{100} when V_{100} and V'_{100} are different; and
arithmetic means for calculating a throttle opening θ_a corresponding to a sensed voltage data V_a based on a ratio of a difference between said voltage data V'_0 corresponding to a throttle opening of 0% in said memory means and said sensed voltage data V_a to a difference between said voltage data V'_0 corresponding to a throttle opening of 0% and said voltage data V'_{100} corresponding to a throttle opening of 100% in said memory means.

4,841,446
METHOD FOR MONITORING THE OPERATIONS OF AN ELECTROMECHANICAL CONTROL SYSTEM THAT ENSURES THE ADHESION OF WHEELS OF A MOTOR VEHICLE
Heinz Leiber, Oberriexingen, and Hans-Joachim Ohnemüller, Reutlingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Filed Dec. 11, 1987, Ser. No. 131,504
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644139
Int. Cl.[4] B60T *8/00*
U.S. Cl. 364—426.02 **19 Claims**



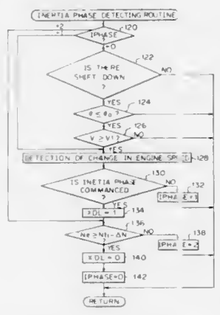
1. A safety switching arrangement for monitoring and controlling the operations of an electromechanical control system that ensures the adhesion of heels of a motor vehicle, such as an antilock system or an antislip control system by a control system control signal, that is equipped with wheel rotation speed signal generators and a reference circuit for the determination of the wheel speeds, vehicle speed and vehicle acceleration from wheel rotation speeds, said safety switching arrangement comprising:
first input means for receiving first set of vehicle acceleration signals derived from wheel speeds and vehicle speed, in said reference circuit;
second input means for receiving second set of vehicle acceleration signals from acceleration sensors fixed at the vehicle;
evaluation means for comparing said first and second set of acceleration signals to determine whether they match within a band width and generating an error signal to disable said control system and activate a warning indicator when the acceleration signals do not match within said band width; and
third input means for receiving a control system control signal as a blocking signal and suppressing said evaluation means from generating an error signal in response to said blocking signal.

4,841,447

SYSTEM FOR CONTROLLING IDLING SPEED IN INTERNAL COMBUSTION ENGINE FOR VEHICLE WITH AUTOMATIC TRANSMISSION

Kazuhiko Hayashi, Nagoya; Shigeru Kuriyanagi, Okazaki, and Kunihiro Iwatsuki, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 22, 1986, Ser. No. 866,333
Claims priority, application Japan, May 22, 1985, 60-109746
Int. Cl.[4] F02M *51/00*
U.S. Cl. 364—431.07 **5 Claims**



1. In a system for controlling engine idling speed for an internal combustion engine of a vehicle provided with an automatic transmission, the engine being provided with an intake line and a throttle valve arranged therein, said system comprising:

a by-pass passageway connected to the intake line so as to by-pass the throttle valve;

valve means arranged in the by-pass passageway for controlling the amount of air passing therethrough;

means for calculating the degree of opening of the valve means corresponding to a preset parameter corresponding to an intake air amount during a substantially fully closed condition of the throttle valve; and

means for producing a signal directed to the valve means for operating the same so that the actual opening of the valve means corresponds to the opening calculated by the calculating means, the improvement wherein the system further comprises apparatus for decreasing shock when the automatic transmission is downshifted, the apparatus comprising

means for detecting a shift down operation of the automatic transmission while the vehicle is in an engine braking condition wherein the net torque output of the engine is negative; and

means for modifying the calculated degree of opening of the throttle bypass valve means so that the amount of air is increased during the shift down operation, thereby reducing the engine pumping inertia.

4,841,448

WINDSHEAR FLIGHT RECOVERY COMMAND SYSTEM

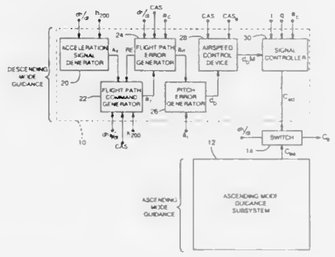
Douglas W. Ford, Hillsboro, Oreg., assignor to Flight Dynamics, Inc., Portland, Oreg.

Filed Sep. 1, 1987, Ser. No. 92,089
Int. Cl.[4] G06F *15/50*; G01D *1/08*
U.S. Cl. 364—433 **17 Claims**

17. A system for generating a guidance signal for directing a descending aircraft to recover from a windshear condition, the parameters characterizing the descent of said aircraft including airspeed, vertical velocity, and a first flight path, comprising:

means receiving signals corresponding to said vertical velocity, airspeed, and first flight path for generating a pitch error signal representing the difference between said first flight path signal and a flight path command signal, the flight path command signal being generated from said vertical velocity and airspeed signals and representing a second flight path by which said aircraft can arrest its descent by a predetermined altitude;

means for preventing said pitch error signal from assuming values that exceed a predetermined angle corresponding to a maximum safe angle of attack of said aircraft;



means for adjusting said pitch error signal in accordance with said airspeed signal, thereby to compensate said pitch error signal for any airspeed in excess of said aircraft's normal flight requirements; and

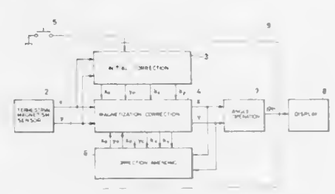
means for limiting said flight path command signal to values corresponding to descent angles greater than a predetermined level below horizontal.

4,841,449

DIRECTION FINDER

Mitiyo Suyama, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 8, 1987, Ser. No. 105,787
Claims priority, application Japan, Oct. 8, 1986, 61-240687
Int. Cl.[4] G01C *17/38*
U.S. Cl. 364—449 **1 Claim**



1. A direction finder for use on a movable body, comprising:

terrestrial magnetism sensor means mounted on a movable body and operable to detect a terrestrial magnetism as a pair of magnetic field components which are parallel to a terrestrial surface and provide an orthogonal pair of detection signals corresponding thereto, respectively;

initial correction means for obtaining, on a basis of maximum and minimum values of said pair of detection signals from said terrestrial magnetism sensor means obtained as said movable body is directed along a circular route, radii of a circular locus of said movable body on a perpendicular coordinate system including coordinates of said pair of detection signals and a pair of error correction amounts for use in cancelling components of detection signals which are due to a magnetization field of said movable body;

magnetization correction means for correcting a further detected pair of detection signals from said terrestrial magnetism sensor menas, on a basis of said error correction amounts and providing a pair of corrected detection signals; and

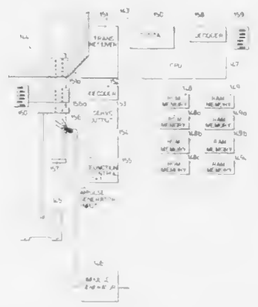
correction amount amending means for obtaining, from said pairs of detection signals, two circles having a common radius identical in length to that of a circle corresponding to said circular locus obtained by said initial correction means, said two circles passing through respective coordinate points corresponding to said pair of corrected detection signals from said magnetizing correction means before and after said movable body changes a moving direction, and for amending said error correction amounts on a basis of center coordinates and radii of said circles according to said pair of corrected detection signals obtained before and after said change of a moving direction of said movable body when a coordinate point corresponding to said corrected detection signal pair from said magnetizing correction means during a change of a moving direction of said movable body is within a predetermined distance from either of said two circles.

4,841,450

ARRANGEMENT COMPRISING A SYSTEM PROVIDING MOVEMENT, PROCESSING AND/OR PRODUCTION

Lars-Berno Fredriksson, Kinna, Sweden, assignor to Kvaser Consultant, AB, Kinna, Sweden

Continuation of Ser. No. 731,626, May 1, 1985, abandoned. This application Apr. 19, 1988, Ser. No. 183,126
Claims priority, application Sweden, Sep. 2, 1983, 8304743
Int. Cl.[4] G05B *19/18*
U.S. Cl. 364—468 **11 Claims**



1. A distributed control system for performing functions at a plurality of physically separated function points, conprising:

(a) at each function point:

(i) actuating means for carrying out a specific function; and

(ii) function control means for controlling said actuating means, said function control means including a programmable microprocessor having an associated memory and interface, said microprocessor being configurable to provide a selected control function for controlling one of a plurality of different types of actuating means;

(b) at least one of said function points comprising:

(i) a sensor connected to said actuating means and to an input of said function control means, and forming a continuous feedback loop;

(c) a common computer connected to the function control means of each function point through a first common connection loop, said computer comprising:

(i) means for transmitting, during a start up phase, a first set of digital signals for configuring the function control means of each function point to provide a selected control function; and

(ii) means for transmitting to the function control means of each function point, during an operating phase, a second set of digital signals comprising operating commands for the specific function to be carried out by the actuating means controlled by said function control means; and

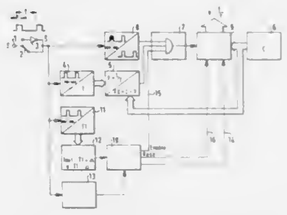
(d) means for supplying energy to said actuating means through a second common connection loop.

4,841,451

SYSTEM FOR MEASURING THE DURATION RATIO OF PULSES OF VARIABLE FREQUENCY

Bernd Rumpf, Friedrichsdorf, and Wolfgang Reisch, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 7, 1987, Ser. No. 35,556
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1986, 3611565
Int. Cl.[4] G01R *29/02*; H03K *5/26*
U.S. Cl. 364—484 **15 Claims**



1. A system for measuring the duration ratio of input pulses in a pulse train of variable pulse repetition frequency, particularly in electronically controlled fuel-injection systems for internal combustion engines, comprising

means for generating clock pulses at a variable frequency which is a predetermined multiple of the pulse repetition frequency of the input pulses; and

means responsive to the clock pulses for determining the duration ratio, said ratio determining means including means for counting the clock pulse during each input pulse.

4,841,452

Patent Not Issued For This Number

4,841,453

MULTIDIRECTIONAL SCAN AND PRINT CAPABILITY

David E. Finlay; Stephen D. Hanna, both of Boulder; David C. Stevenson, Longmont, and John T. Varga, Boulder, all of Colo., assignors to IBM Corporation, Armonk, N.Y.

Filed Nov. 10, 1986, Ser. No. 929,036
Int. Cl.[4] G06F *15/40*
U.S. Cl. 364—519 **15 Claims**

1. An apparatus for generating symbols to be image on an output device in successive rows of symbols, scanned in a raster fashion along successive scan lines in which said scan lines can be parallel to said rows of symbols and directed left to right, successive scan lines progressing from top to bottom or vice versa, or said scan lines can be perpendicular to said rows of symbols and directed top to bottom, successive scan lines progressing left to right or vice versa, said apparatus including:

a page buffer containing a representation of said symbols in a predetermined order, each such representation including an address escape pointer,

a column position escape memory specifying for each of said rows of symbols a page buffer pointer to a first symbol in said row and a height factor identifying a space allotted for presentation of said symbol row,

an address escape memory with a record for each different

symbol containing a font pointer and a representation of space allotted for said symbol in orthogonal directions,

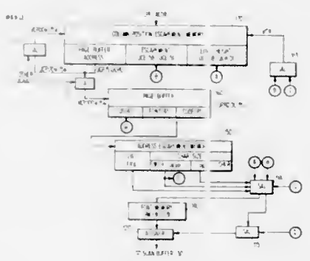
a font memory with a record for each symbol providing a graphic representation of said symbol in at least two orientations,

means for storing a print command specifying a specific relation between scan direction, scan progression and rows of symbols,

first means responsive to said print command for accessing said column position escape memory to identify said first symbol for a selected row of symbols by said page buffer pointer,

second means responsive to said first means for accessing a corresponding entry in said page buffer including said address escape pointer,

third means responsive to said second means for accessing said address escape memory to derive font addressing information,



addressing means responsive to said print command and to said second and third means and to said font memory for deriving output information.

said addressing means including means for successively deriving different font addresses for a given symbol until a quantity of data extracted from said font memory bears a specified relation to data extracted from said address escape memory,

said addressing means further including means for developing fill bits for insertion into said output information, said fill bits related to a difference between said data extracted from said address escape memory related to a dimension of said symbol and said line height data from said column escape memory whereby spacing of rows of symbols may be freely selected to be larger than a dimension of any symbol on said row.

4,841,454

DISPLAY CONTROLLER WITH A VARIABLE SCROLLING SPEED, AND METHOD FOR OPERATING SAME

Koichi Awazu, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 27, 1987, Ser. No. 43,022
Claims priority, application Japan, Apr. 30, 1986, 61-100753
Int. Cl.[4] G06F 3/14
U.S. Cl. 364—521 **7 Claims**

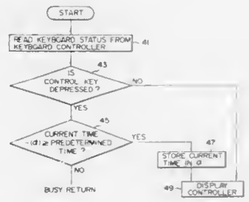
1. A data display-controlling device for use with a data processing apparatus, which includes a keyboard for entering data and a display unit for displaying the data, and which controls said keyboard unit and said display unit by executing an operating system program, said data display-controlling device comprising:

scroll display controller means for displaying display data on said display unit in a scrolling manner;

designating means, coupled to said display controller means, for designating said scroll display controller means to scroll-display the display data on said display unit at one of a high speed and a low speed;

timer means for measuring a current time; and

control means for outputting display data to said display unit, in response to said designating means designating the scroll-display at low speed, by: (1) determining, based on



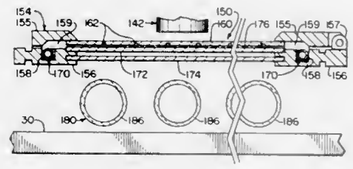
the current time from said timer means, whether a predetermined time has elapsed since a last output of display data, (2) executing the operating system program until the predetermined time elapses, and (3) outputting display data to said display unit when said predetermined time has elapsed.

4,841,455

RESEAU APPARATUS FOR PHOTOGRAMMETRY DEVICES

Franz W. Leberl; Sean Curry; Denis Henrot, all of Boulder; Milan Karspeck, Loveland, and Scott Lee, Boulder, all of Colo., assignors to Vexcel Corporation, Boulder, Colo.

Filed Aug. 3, 1987, Ser. No. 81,147
Int. Cl.[4] G02B 15/626
U.S. Cl. 364—525 **16 Claims**



1. Reseau grid apparatus for providing grid marks for an image on an object to be photographed or digitized by a camera, comprising:

an object mounting plate for supporting the object;

reseau means for holding the object on the mounting plate and for providing reseau grid marks correlated geometrically with the image, said reseau means including a thin transparent reseau plate adapted for positioning on the object mounting plate and having two opposite planar surfaces with edges around its perimeter, a plurality of grid marks in the form of grooves etched on one of the surfaces of the reseau plate, and grid illumination means positioned adjacent an edge of the reseau plate for illuminating the grid marks by directing light longitudinally through said reseau plate from the edge of the reseau plate to the grooves in the surface of the reseau plate;

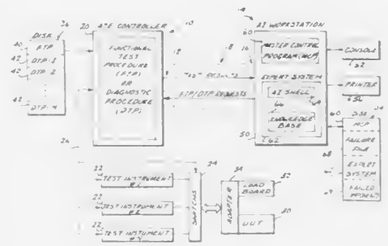
an object illumination means adjacent said object mounting plate for illuminating the image on an object positioned on the object mounting plate.

4,841,456

TEST SYSTEM AND METHOD USING ARTIFICIAL INTELLIGENCE CONTROL

Thomas J. Hogan, Jr., Enumclaw; Jon J. Kasprick, Federal Way; Donald R. Anderson, Auburn, and Douglas W. Kersh, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 9, 1986, Ser. No. 906,104
Int. Cl.[4] G01R 31/28
U.S. Cl. 364—550 **5 Claims**



1. An apparatus for testing an electronic unit under test (UUT), comprising:

(a) an automatic test system comprising an automatic test equipment (ATE) controller, at least one test instrument connectable to the ATE controller and to the UUT, and storage means for storing a functional test procedure (FTP) for the UUT, the ATE controller including an ATE port, and ATE data processing means for executing the FTP in response to a start FTP command and for providing an FTP data set at the ATE port, the FTP data set comprising data indicating the results obtained by executing the FTP;

(b) communication means connected to the ATE port; and

(c) an artificial intelligence (AI) system comprising an AI data processor having an AI port through which the AI data processor is connected to the communication means, means for receiving the FTP data set via the AI port, and expert system means for processing the FTP data set when the FTP data set indicates that a failure has occurred to identify, if possible, the defective UUT portion that may have caused the failure, and for producing output data that identifies the defective UUT portion.

5. A method of testing an electronic unit under test (UUT) comprising the steps of:

(a) connecting the UUT to a testing apparatus comprising an automatic test system connected via communication means to an artificial intelligence (AI) system, the automatic system comprising an automatic test equipment (ATE) controller, at least one test instrument connectable to the ATE controller and to the UUT, and storage means for storing a functional test procedure (FTP) for the UUT, the AI system comprising an AI data processor and expert system means;

(b) causing the ATE controller to execute the FTP, such that the ATE controller produces an FTP data set;

(c) transmitting the FTP dat set to the AI system via the communication means; and

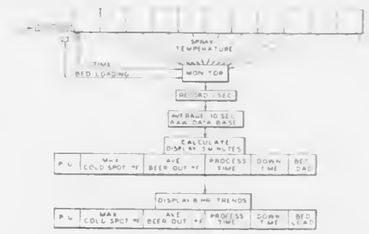
(d) causing the expert system to process the FTP data set when the FTP data set indicates that a failure has occurred to identify, if possible, the defective UUT portion that may have caused the failure.

4,841,457

PASTEURIZATION MONITORING PROCESS

Carl W. Clyne, St. Louis County; Gary L. Woolever, Madison County; James Teng, St. Louis County, and Hooshang Naji, St. Louis, all of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Jul. 8, 1987, Ser. No. 71,142
Int. Cl.[4] A61L 2/04; G01K 1/16
U.S. Cl. 364—557 **8 Claims**



1. A system for continuously and automatically monitoring a tunnel pasteurizer including

a tunnel pasteurizer having a finite length divided into a succession of zones and having a finite width and means for passing packages through the tunnel from one end to the other thereof,

water spray means for spraying water onto packages passing through the tunnel at a uniform spray density across the width of the tunnel and at progressively different temperatures to form a heating zone, a holding zone and a cooling zone from the one end to the other of the tunnel,

means for continuously measuring spray water temperatures in the zones along the length of the pasteurizer,

means for continuously measuring the time each package remains in each zone; and

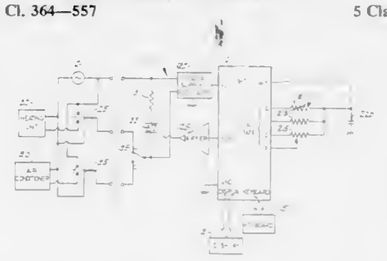
means responsive to the measured spray water temperatures and measured times each package remains in each zone for empirically determining the P.U. input to each package leaving the pasteurizer tunnel.

4,841,458

ANALOG TO DIGITAL CONVERSION BY MEASURING THE RATIO OF RC TIME CONSTANTS

Michael R. Levine; Victor Rigotti; James Russo, all of Ann Arbor, and Nicholas Skogler, Ypsilanti, all of Mich., assignors to Honeywell, Incorporated, Minneapolis, Minn.

Filed Jul. 7, 1987, Ser. No. 70,727
Int. Cl.[4] G01K 7/24; G01R 27/02
U.S. Cl. 364—557 **5 Claims**



1. An analog to digital conversion apparatus comprising:

an analog sensing device having a variable resistance dependent upon an environmental condition, having a first terminal and a second terminal;

a precision fixed resistor having a resistance value near the

nominal value of resistance of said analog sensing device, having a first terminal and a second terminal;
a capacitor having a first terminal connected to said second terminal of said analog sensing device and said second terminal of said precision fixed resistor and a second terminal connected to a reference voltage;
a discharge means connected to said capacitor for discharging said capacitor;
a first time constant measuring means connected to said analog sensing means, said capacitor and said discharge means for measuring the variable time constant of said analog sensing device by discharging said capacitor via said discharge means, charging said capacitor through said first terminal of said analog sensing device and counting the number of predetermined time intervals required for the voltage across said capacitor to reach a predetermined threshold voltage;
a second time constant measuring means connected to said precision fixed resistor, said capacitor and said discharge means for measuring the reference time constant of said precision fixed resistor and said capacitor by discharging said capacitor via said discharge means, charging said capacitor through said first terminal of said precision fixed resistor and counting the number of predetermined time intervals required for the voltage across said capacitor to reach said predetermined threshold voltage;
a measurement sequence means connected to said first time constant measurement means and said second time constant measurement means for producing a sequence of measurements by causing said second time constant measurement means to measure said reference time constant a first time thereby producing a first count, then causing said first time constant measurement means to measure said variable time constant, then causing said second time constant measurement means to measure said reference time constant a second time thereby producing a second count, and for comparing said first count and said second count and repeating said sequence of measurements if said first count and said second count differ by more than a predetermined amount; and
a ratio means connected to said first time constant measurement means, said second time constant measurement means and said measurement sequence means for computing the digital ratio of the count of predetermined time intervals of said variable time constant and the count of predetermined tim intervals of said reference time constant if said first count and said second count do not differ by more than a predetermined amount, said ratio being the digital representation of the environmental condition sensed by said analog sensing device.

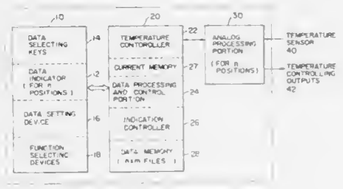
4,841,459

TEMPERATURE INDICATING CONTROL APPARATUS HAVING DATA STORING FUNCTION

Go Ikeda, Susono; Kiyoshi Sasaki, Mishima; Hiroshi Kumazaki; Shigeru Fujita, both of Numazu, and Hideo Banzai, Mishima, all of Japan, assignors to Toshiba Hikai Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 8, 1986, Ser. No. 849,424
Int. Cl.[4] G06F *19/46*; F27D *3/00*
U.S. Cl. 364—557 **5 Claims**

1. A temperature indicating control apparatus for indicating and controlling the temperatures of a plurality of positions of a device, comprising:
a setting device for setting set data required for controlling the temperatures of the plurality of positions;
a plurality of indicators for selectively indicating plural groups of the set data or detected values of the temperatures of the plurality of positions,
each of said plurality of indicators being of a plural digit type, and being accompanied by an increment switch and a decrement switch both operable as the setting device,
a calculating device for calculating control values for controlling temperatures of the plurality of positions based on the set data and the detected values;
an input and output device for receiving said detected values from outside sensors and delivering said control values to outside control elements;
a function selecting device for selecting a LOCAL operation and a REMOTE operation; and a data memory for storing said plural groups of set data required for controlling the temperatures of the plurality of positions;
a current memory for storing set data which is currently used for controlling temperatures of the plurality of positions; and
means for controlling the indication of said plurality of indicators and the transfer of the set data between said



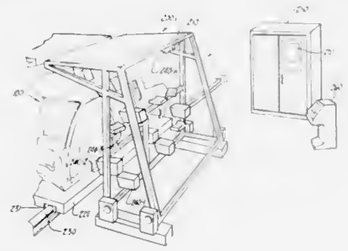
data memory and said current memory in accordance with the operating results of said function selecting means,
wherein said function selecting means comprises LOCAL, REMOTE, MONITOR, SET, STORE and LOAD operation selecting keys, said function selecting means comprises keys which designate a code number of functions of LOCAL, REMOTE, MONITOR, SET, STORE and LOAD, and said function selecting means are constructed such that when the REMOTE key is operated, the MONITOR, SET, STORE and LOAD keys are made inoperative and said current memory is controlled by an outside computer and the like, while when the LOCAL key is operated, any one of the aforementioned keys is made operable.

4,841,460

METHOD AND APPARATUS FOR CALIBRATING A NON-CONTACT GAUGING SENSOR WITH RESPECT TO AN EXTERNAL COORDINATE SYSTEM

Robert Dewar, Troy, and Dale R. Greer, Novi, both of Mich., assignors to Perceptron, Inc., Farmington Hills, Mich.

Filed Sep. 8, 1987, Ser. No. 94,329
Int. Cl.[4] G06G *7/48*; H04N *7/18*
U.S. Cl. 364—571.02 **38 Claims**



1. A method for calibrating an arbitrarily oriented non-contact measurement sensor that is pre-calibrated and includes a structural light source and optical sensing means, with respect to an external coordinate system, the method comprising:

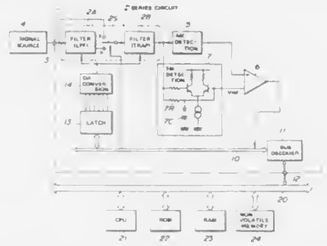
using the structured light from the sensor to create a target lying simultaneously within a measuring zone of the sensor and a measuring zone of measuring means external to the sensor;
using the sensor to determine first spatial coordinates of the target expressed in terms of the sensor's coordinate system;
using the external measuring means to determine second spatial coordinates of the target expressed in terms of the external coordinate system; and
transforming the first spatial coordinates into the coordinates expressed in terms of the external system using the first and second spatial coordinates of the target.

4,841,461

FILTER ADJUSTMENT APPARATUS AND METHOD

Yoshihiro Yamamoto, Tokyo; Tsutomu Kume, Ibaraki; Nobuo Yamazaki; Fumiharu Hashimoto, both of Tokyo, and Koichi Ohya, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 24, 1987, Ser. No. 137,719
Claims priority, application Japan, Dec. 27, 1986, 61-315055; Dec. 27, 1986, 61-315053
Int. Cl.[4] G06F *7/38*; H03F *1/34*
U.S. Cl. 364—572 **17 Claims**



1. A filter adjustment apparatus for adjusting frequency characteristics of a filter comprising:
a filter having characteristics which are adjusted by adjustment data;
means for supplying said adjustment data to said filter;
a signal processing circuit connected in series with said filter; and
means for setting said signal processing circuit to a state of not influencing said filter, said setting means including switch means for bypassing said signal processing circuit.

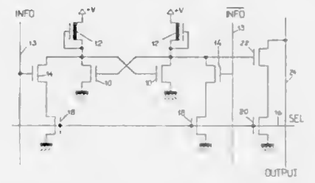
4,841,462

RANDOM ACCESS MEMORY AND LINEAR INTERPOLATION CIRCUIT COMPRISING APPLICATION THEREOF

Jean-Pierre Vigarié, Cesson Sevigne; Jean-Claude Carlach, and Pierre Penard, both of Rennes, all of France, assignors to Etat Francais, Administration des P.T.T. (Centre National d'Etudes des Telecommunications), Issy les Moulineaux and Etabilissement Public dit "Telediffusion de France", Montrouge, both of, France

Filed Nov. 21, 1985, Ser. No. 800,413
Claims priority, application France, Nov. 21, 1984, 84 17738
Int. Cl.[4] G06F *7/38*; G11C *7/00*; H01L *27/02*
U.S. Cl. 364—723 **8 Claims**

1. A fast read-write memory for integration on a semiconductor substrate, having a plurality of memory points wherein each memory point has
a set-reset flip-flop having two metal-oxide-semiconductor storage transistors, whose drains are grounded and whose sources are connected to a voltage source through respective load transistors,
a metal-oxide-semiconductor output transistor having a grid connected to the source of one of said storage transistors and having a source connected to a read-out output line,
two input data lines arranged to receive complementary binary data each connected to the grid of a respective one of a pair of MOS switch transistors whose source is connected to the source of a respective one of said storage transistors,
a pair of first control transistors each having a grounded drain and a source which is connected to the drain of a respective one of said switch transistors and a second control transistor having a grounded drain and a source which is connected to the drain of the output transistor,
and a selection line connected to the grids of all said control transistors.

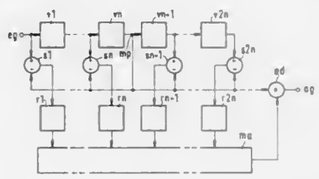


4,841,463

NONRECURSIVE DIGITAL FILTER

Soenke Mehrgardt, March, and Bernhard Ehret, Freiburg, both of Fed. Rep. of Germany, assignors to Deutsche ITT Industries GmbH, Freiburg, Fed. Rep. of Germany

Filed Jul. 15, 1987, Ser. No. 75,024
Claims priority, application European Pat. Off., Aug. 7, 1986, 86110932.0
Int. Cl.[4] G06F *15/31*
U.S. Cl. 364—724.16 **5 Claims**



1. A nonrecursive digital filter comprising:
a first group of delay elements and a second group of delay elements, all of said delay elements being connected in series and each of said delay elements providing a delay approximately equal to the period of a clock signal or a multiple of the period of said clock signal;
a center tap connected between said first and said second groups of said delay elements;
a first group of subtracters and a second group of said subtracters, each of said subtracters being associated with a respective one of said delay elements, the minuend input of each of said subtracters in said first group being connected to the input of a respective one of said delay elements in said first group, the minuend input of each of said subtracters in said second group being connected to the output of a respective one of said delay elements in said second group, and the subtrahend input of each of said subtracters being connected to said center tap;
a plurality of read-only memories, the address input of each of said read-only memories being connected to the output

of a respective one of said subtracters, each of said read-only memories containing the function e=bd, where d is the output signal of said respective one of said subtracters and b is a value responsive to the difference between the signal value at said center tap and the minuend input of said respective one of said subtracters;

a first adder having a plurality of inputs each of which is connected to a respective one of the outputs of said read-only memories; and

a second adder having a first input connected to said center tap and a second input connected to the output of said first adder.

4,841,464

CIRCUIT FOR THE FAST CALCULATION OF THE DIRECT OR INVERSE COSINE TRANSFORM OF A DISCRETE SIGNAL

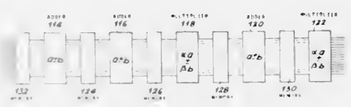
Jacques Guichard, 8 rue des Morillons, 75015 Paris, and Eric Cassimatis, 4 pl de Barcelone, 75016 Paris, both of France

Filed May 20, 1986, Ser. No. 865,108

Claims priority, application France, May 22, 1985, 85 07717

Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—725 **13 Claims**



10. A circuit for the fast calculation of the inverse cosine transform (x_i), $0 \leqq i \leqq N-1$ of a discretized signal defined by a sequence (X_i), $0 \leqq i \leqq N-1$, in which $N=2^n$ and n is a number equal to or greater than 4, wherein said circuit comprises a group of upper half-stages receiving a sequence (X_{2q}), $0 \leqq q \leqq (N/2)-1$ of even index components of the cosine transform and supplying a first sequence (y_j^0), $0 \leqq j \leqq (N/2)-1$, a group of lower half-stages receiving a sequence (X_{2q+1}), $0 \leqq q \leqq (N/2)-1$ of the odd index components of the cosine transform and supplying a second sequence (x_j^1), $0 \leqq j \leqq (N/2)-1$, and a final adder stage receiving the first sequence (x_j^0) and the second sequence (x_j^1) and supplying a sequence (x_j), $0 \leqq j \leqq N-1$, each upper half-stage, each lower half-stage and the final adder stage respectively performing the reverse cosine mathematical operation.

4,841,465

TRANSFORMATION CIRCUIT ARRANGEMENT

The A. Vuong, Stuttgart, Fed. Rep. of Germany, assignor to Telefunken Fernseh und Rundfunk GmbH, Hanover, Fed. Rep. of Germany

PCT No. PCT/EP86/00578, § 371 Date Jun. 16, 1987, § 102(e) Date Jun. 16, 1987, PCT Pub. No. WO87/02489, PCT Pub. Date Apr. 23, 1987

PCT Filed Oct. 9, 1986, Ser. No. 69,445

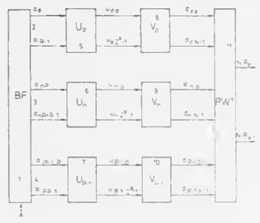
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1985, 3536773

Int. Cl.[4] G06F *15/332*

U.S. Cl. 364—725 **14 Claims**

1. Circuit arrangement for the transformation of a first unknown vector with the aid of a matrix comprising:

the matrix is constructed in such a manner that the rows of said matrix contain a second, known vector which is cyclically shifted by rows; both the first, unknown vector and said second, known vector have the same length; said first vector is divided into a plurality of partial vectors; each said partial vector is output to an addition circuit and to a logic linkage circuit connected to the output of the respective said addition circuit; and the output of each respective said linkage circuit is output to a calculating



unit which produces the transform of said first unknown vector as a result.

4,841,466

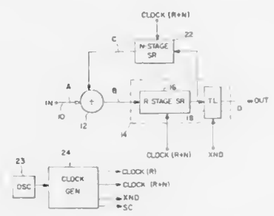
BIT-SERIAL INTEGRATOR CIRCUITRY

Todd J. Christopher, Indianapolis, Ind., assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Aug. 24, 1987, Ser. No. 88,340

Int. Cl.[4] G06F *7/50*

U.S. Cl. 364—733 **6 Claims**



1. A bit-serial integrator circuit for integrating a bit-serial signal comprising:

a signal input terminal for applying a bit-serial signal;

combining means for combining bit-serial signals, having a first input terminal coupled to said signal input terminal, a second input terminal and an output terminal;

a first serial shift register having R stages, R being an integer, an input terminal coupled to the output terminal of said combining means, an output terminal and a clock input terminal;

a second serial shift register having N stages, N being an integer, an input terminal coupled to the output terminal of said first serial shift register, an output terminal coupled to the second input terminal of said combining means, and a clock input terminal;

means for applying a burst of clock pulses to the clock input terminals of said first and second serial shift registers, the pulses in said burst being synchronous with occurring bits of said bit-serial signal, and the number of pulses in said burst being at least R+N per sample period; and

transparent latch means, having a signal input coupled to the output terminal of said first serial shift register for passing sample bits during a first predetermined portion of said burst and latching and outputting a predetermined sample bit for the duration of each sample period following said predetermined portion.

4,841,467

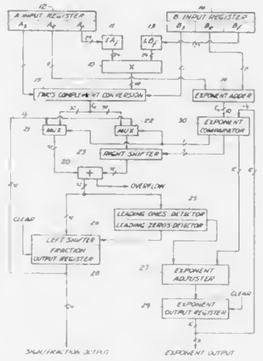
ARCHITECTURE TO IMPLEMENT FLOATING POINT MULTIPLY/ACCUMULATE OPERATIONS

Chung-Yih Ho, Schenectady; Karl J. Molnar, Clifton Park, and Daniel A. Staver, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 5, 1987, Ser. No. 104,453

Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—748 **11 Claims**



1. A system for multiplioation of successive pairs of floating point binary numbers and for accumulation of the products from such multipliction to generate a running result, each of said floating point numbers comprising a sign filed and a fraction field that express a signed magnitude and further comprising an exponent field, said system comprising:

means for temporarily storing the previous value of said running result, when such there is, including

means for temporarily storing a two's complement number descriptive of the sign field and fraction field of said previous value of said running result, and including

means for temporarily storing an exponent field of said previous value of said running result, which exponent field is associated with the temporarily stored two's complement number;

means responding to the fraction fields of each said successive pair of floating point binary numbers for generating a respective product of a respective pair of quantities, one of which respective quantities is integer one plus a fraction that is the fraction field of one of said successive pair of floating point binary numbers, and the other of which respective quantities is integer one plus a fraction that is the fraction field of the other of said successive pair of floating point binary numbers, said standard form being integer one plus a fraction;

means responding to the exponent fields of each successive pair of floating point binary words for determining an exponent field associated with the product generated from their fraction fields;

means responding to the sign fields of each said pair of floating point binary numbers for converting each said respective product to a two's complement number with which the exponent field associated with the product is also associated;

means for aligning the resulting two's complement number descriptive of the product and the temporarily stored two's complement number, by shifting the one of those two's complement numbers having a lower exponent field associated therewith than the other of those two's complement numbers;

means for adding the aligned two's complement numbers as received at respective ones of a first input port thereof and a second input port thereof, to generate a sum in two's complement form at an output port thereof;

means normalizing the sum for generating a replacement two's complement number used to replace the two's complement number descriptive of the sign field and fraction field of said previous value of said running result in said means for temporarily storing a two's complement number, said means normalizing the sum including

means for determining the number of sign bit repetitions in said sum and including

first data shifter means for shifting said sum by that number of bits towards increased significance to generate said replacement two's complement number; and

means for adding the number of sign bit repetitions to the larger of the exponent fields respectively associated with the product and associated with the previous value of the running result, thereby generating a replacement exponent field used to replace the exponent field of said previous value of said running result in said means for temporarily storing same.

4,841,468

HIGH-SPEED DIGITAL MULTIPLIER ARCHITECTURE

Bruce E. Miller, Aloha, Oreg., and Robert E. Owen, Saratoga, Calif., assignors to Bipolar Integrated Technology, Inc., Beaverton, Oreg.

Filed Mar. 20, 1987, Ser. No. 28,360

Int. Cl.[4] G06F *7/52*

U.S. Cl. 364—754 **35 Claims**

1. In an integrated circuit, a mulitiplier architecture comprising:

first data input means for inputting a binary X-operand comprising an array of M parallel bits wherein M is an integer greater than or equal to 1;

second data input means for inputting a binary Y-operand comprising an array of N parallel bits wherein N is an integer greater than or equal to 1;

binary multiplier means for multiplying the X-operand and the Y-operand to produce a binary product comprising an array of M+N parallel bits;

means for inputting a load instruction into the multiplier means;

load means in the multiplier means responsive to the load instruction for concatenating the X operand and Y operand without multiplying said operands to produce, as said product, a concatenated result in which the M most significant bits are the X operand and the N least significant bits are the Y operand;

and output means for outputting the product.

4,841,469

MATRIX TIMES MATRIX MULTIPLIER

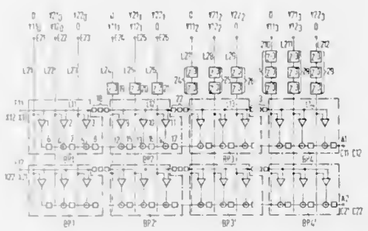
Ronald Kuenemund, Unterhaching, and Tobias Noll, Neufahrn, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 22, 1988, Ser. No. 222,937

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1987, 3729175

Int. Cl.[4] G06F *7/52*

U.S. Cl. 364—754 2 Claims



1. A circuit for the multiplication of the elements of a multiplicand matrix represented by digital signals by the elements of a multiplier matrix represented by digital signals, characterized in that a first multiplicand line comprises a plurality of sections (**L11** . . . **L14**), an input (**E11**) is supplied with the digital signals that represent the elements of the first row of the multiplicand matrix at a prescribed sampling rate; a first section (**L11**) of the said plurality of sections of said first multiplicand line is connected to a first bit-associated circuit (BP1) associated with the least-significant bits of the elements of the multiplier matrix, said first bit-associated circuit formed of a plurality of multiplier lines (**L21** . . . **L23**) which receive said bits, said plurality of multiplier lines corresponding to the number of elements of a matrix row of the multiplier matrix increased by the number of rows of the matrix diminished by 1, said first bit-associated circuit further including a plurality of partial product stages (**1, 2, 3**) individually connected to the multiplier lines (**L21** . . . **L23**), the first inputs of said partial product stages connected to the first section (**L11**) of the first multiplicand line and the second inputs thereof being respectivly connected to the multiplier lines (**L21** . . . **L23**), and said first bit-associated circuit including a first iterative circuit of adders (**4, 5**) and respectively alternately connected time delay elements (**6** . . . **8**), and the outputs of said partial product stages are connected to inputs of said adders (**4, 5**); and each further section (**L12**) of the first multiplicand line is connected to a further, similarly constructed, bit-associated circuit (**BP2**) which is respectively associated with a more-significant bit of the elements of the multiplier matrix, and every every further section (**L12**) of the first multiplicand line is connected through a delay chain (**18**) to the respectively preceding section (**L11**) which cause a delay which is established by the iterative circuit of the bit-associated circuit (**BP1**) connected to the preceding section (**L11**), and time-delay elements (**19** . . . **21**) connected in the multiplier lines (**L24** . . . **L26**) of every further bit-associated circuit (**BP2**), and the time delay of said delay elements equaling the sum of all delays (**18**) which are inserted into the allocated and all preceeding sections (**L12, L11**) of the first multiplicand line, and the further iterative circuit of adders (**12** . . . **14**) comprising respectively interposed time delay elements (**15** . . . **17**) of every further bit-associated circuit (**BP2**) is connected to the output of the corresponding iterative circuit of the immediately preceding, bit-associated circuit (**BP1**); first digital signals of the output that represent the elements of the first roll of the product matrix occuring at the output of the iterative circuit of the bit-associated circuit (**BP4**) for the most significant bits of the elements of the multiplier matrix, further multiplicand lines comprising a plurality of sections respectively allocated to the further rows of the multiplicand matrix and their inputs (**L12**) being supplied with digital signals which represent the elements of the further rows of the multiplicand matrix and supplied at the said sampling rate; the individual sections of every further multiplicand line connected to bit-associated circuits (BP1' . . . BP4') the same as the corresponding sections (**L11** . . . **L14**) of the first multiplicand line; further digital signals of the output of the elements of the further rolls of the product matrix occur at the outputs of the iterative circuits of the bit-associated circuits (BP4') for the most significant bits of the elements of the multiplier matrix, and such bit-associated circuits connected to the last sections of the further multiplicand lines and the time delay elements (**6, 7, 8, 15, 16, 17**) connected between the adders (**4, 5, 12, 13, 14**) of the individual iterative circuits each providee delays which correspond to a clock period of the digital signal supplied to the inputs (**E11, E12**) of the multiplicand lines.

4,841,470

SURFACE ACOUSTIC WAVE DEVICE FOR DIFFERENTIAL PHASE SHIFT KEYING CONVOLVING

Takeshi Okamoto; Teruo Niitsuma, and Shoichi Minagawa, all of Tokyo, Japan, assignors to Clarion, Co., Ltd., Tokyo, Japan

Filed Jun. 18, 1986, Ser. No. 875,855

Claims priority, application Japan, Jun. 25, 1985, 60-139968; Jun. 27, 1985, 60-139074; Jun. 27, 1985, 60-139075; Jun. 27, 1985, 60-139073

Int. Cl.[4] G06G *7/12;* H03H *9/00*

U.S. Cl. 364—821 21 Claims

1. A differential phase shift keying convolver comprising:

a piezoelectric substrate;

two input transducers provided at spaced locations on one surface of said substrate and opposed to each other, one of said transducers generating first and second surface acoustic waves which travel toward the other of said transducers along respective traveling paths and which have different phases; and

output gate means provided between said input transducers along each said traveling path of surface acoustic waves for producing output gate signals which are a convolution of input signals generated by said input transducers, said output gate means including a plurality of pairs of output gates in which said gates of each said pair are disposed along a respective said traveling path and have therebetween a space which is located approximately in the center of the path of travel.

4,841,471

SYSTEM FOR CONVERTING ANALOG SIGNALS TO A DISCRETE REPRESENTATION WITHOUT ALIASING

Edwin A. Sloane, Los Altos, Calif., assignor to Schlumberger Technologies, Inc., San Jose, Calif.

Filed Apr. 10, 1987, Ser. No. 36,763

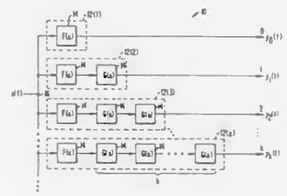
Int. Cl.[4] G06G *7/02*

U.S. Cl. 364—825 6 Claims

1. A method for calibrating a system for correcting transfer functions of a non-ideal series filter network comprising:

providing a filter network of non-ideal filter elements, having an input port for receiving a test signal and having J ordered output ports for generating J ordered output signals at respective output ports, with the ratio of amplitudes of successive output signals for a given frequency component being a first constant and with a difference of phases of successive output signals for a given frequency component being a second constant;

providing a correction network having J ordered input ports, K ordered output ports, K ordered summing elements coupled to respective output ports, and J×K correction elements, w_{jk}, each w_{jk} coupling a jth input port to the kth summing element and having an adjustable correction weight;



coupling each of said J ordered ports to a respective one of said J ordered input ports;

determining the value of an error matrix, E, defining an error between the transfer functions of the set non-ideal filter elements and the transfer functions of a set of ideal filter elements;

determining a value of the elements c_{ij}, of the matrix $(I+E)^{-1}$ where I is the identity matrix; and

setting the correction weight of each weighting element, w_{jk}, equal to c_{ij} for j=i and k=j.

4,841,472

WORD PROCESSOR CAPABLE OF AUTOMATIC TILTING OF DOCUMENTS

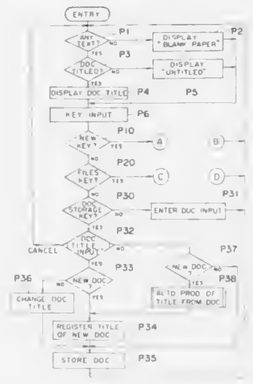
Koichi Izubara, Osaka, Japan; Jeffrey L. Caruso, Concord, Mass., and Theodore C. Johnson, Seattle, Wash., assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 729,309, May 1, 1985, abandoned. This application Apr. 14, 1987, Ser. No. 38,336

Claims priority, application Japan, Apr. 22, 1986, 61-94298; Jul. 31, 1986, 61-181432

Int. Cl.[4] G06F *15/40*

U.S. Cl. 364—900 16 Claims



1. A word processor comprising:

a screen display means for displaying characters or the like on a screen;

a key input means for inputting the characters or the like of documents in the form of data including a title for a document and various commands;

a print means for printing document data of documents;

a document producing means for producing documents from data inputted from said key input means including a recording medium for receiving the document data and for outputting said document data to said print means;

means for permitting an operator to input a title to said document, produced by said document producing means, by the key input means in response to a first command from said key input means, and

a document management means for inputting, in accordance with a second command received from said key input means, document management data to a document management data area located at a determined position of said recording medium, and for outputting document management data stored in said recording medium to said screen display means, said document management data stored in said recording medium including titles of said documents stored in said recording medium and access data for filed corresponding to said documents; said document management means includes a title producing means for automatically producing, in response to the second command received when an untitled document is under processing, a title of said untitled document from a character string of a predetermined number of characters occupying a portion of said untitled document.

4,841,473

COMPUTER ARCHITECTURE PROVIDING PROGRAMMABLE DEGREES OF AN ALMOST CONDITION

Albert D. DePaul, New York, N.Y., assignor to Robert S. Salzman, Millington, N.J.

Filed Dec. 19, 1986, Ser. No. 943,424

Int. Cl.[4] G06K *9/68;* G06F *7/22;* H04N *5/14*

U.S. Cl. 364—900 22 Claims

1. A computer system having improved throughout and speed, comprising:

a processor having a data input and an address/data output;

a first set of memories each having separate data inputs, but sharing common addressing, said first set of memories being operatively connected to said processor;

a second set of template memories containing programmable data;

clocked address counter logic operatively connected to said processor and said template memories for generating sequential addresses for said set of template memories and end-of-address-range signal for said processor;

a set of variable comparators operatively connected with said first and second sets of memories, said variable comparators processing data from said first and second sets of memories and in response thereto, providing a set of data signals including an "almost" match signal; and

decoding logic means operatively connected to said set of variable comparators and communicating with said processor and said address counter logic for receiving and decoding said set of data signals and in response thereto, providing comparison signals for said processor and said clocked address counter logic.

4,841,474

COMPUTER SYSTEM WITH WORK STATIONS AT REMOTE POSITIONS AND RESERVE BATTERY POWER SUPPLY

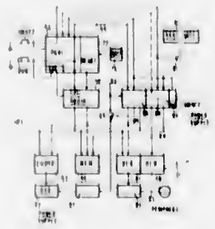
Frederik Zandveld, and Peter C. L. Van Der Vliet, both of Apeldoorn, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 10, 1985, Ser. No. 733,272

Claims priority, application Netherlands, May 18, 1984, 8401587

Int. Cl.[4] G06F 13/00, 11/30

U.S. Cl. 364—900 11 Claims



1. A computer system comprising:

a central machine for processing data, said machine being adapted to be connected to a mains supply, said central machine including a volatile memory;

a plurality of user work stations coupled to said central machine for remote users to exchange data with said central machine;

reserve battery supply means connected to said central machine for temporarily supplying power to said volatile memory in the event said mains supply is interrupted;

said central machine having four separate states: an active state, in which data exchange by said central machine with any of said work stations, including processing at said central machine can be carried out; a standby state, in which data exchange cannot be carried out between any of said workstations and said central machine but in which the volatile memory is powered by the mains supply for retaining information; a battery supply state in which the volatile memory is temporarily powered by the reserve battery supply means for retaining information; and a rest state, during which the central machine and volatile memory are deactivated and information stored in the volatile memory is lost,

independently powered heart memory means operative during all said states for storing predetermined beginning and ending times for the active state and including real time clock means and means for setting said central machine in said active state during an active time period beginning at said beginning time and ending at said ending time;

each said workstation including user control means for generating an activate state request signal requesting to change the state of said central machine from said standby state to said active state;

means for generating a battery-was-off signal in the event power from said reserve battery supply means was interrupted during said battery supply state;

means, including said heart memory means, for storing indications of the condition of said computer system including said battery-was-off signal and an indication of whether an activate state request signal has occurred; and

logic means responsive to the presence of power from said mains supply for selectively placing said central machine in said active state or said standby state based on inspection of said stored condition indications including means for initiating an initial program load if said mains supply power reappears during said active time period and said battery-was-off signal is present.

4,841,475

DATA TRANSFER SYSTEM AND METHOD FOR CHANNELS WITH SERIAL TRANSFER LINE

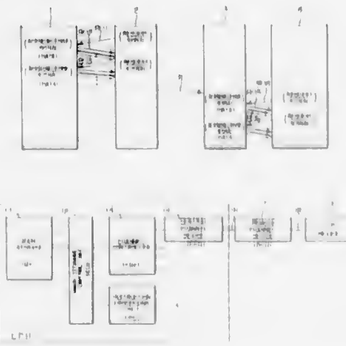
Takuo Ishizuka, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 26, 1986, Ser. No. 911,785

Claims priority, application Japan, Oct. 1, 1985, 60-218902

Int. Cl.[4] G06F 9/00

U.S. Cl. 364—900 8 Claims



1. A data input/output control system for controlling data chaining transfers comprising:

(a) a data processing unit for performing data processing and data transfer in accordance with instructions being executed by said data processing unit;

(b) a main storage connected to said data processing unit for storing data and said instructions including chaining instructions;

(c) a channel controlled connected to said main storage for controlling a plurality of input/output data channels using chaining instructions read from said main storage, said channel controller being operated in response to said chaining instructions read from said main storage, and said chaining instructions being outputted by said data processing unit to said main storage;

(d) at least one transfer line for serially transferring data from said main storage;

(e) at least one data input/output device connected to said at least one transfer line;

(f) each input/output data channel includes at least one central channel means connected between said at least one transfer line and said channel controller for sending a chaining instruction from said channel controller to said at least one transfer line, said channel controller being operated in response to said chaining instruction outputted by said data processing unit to said main storage operator, said data processing unit being operated in accordance with said instructions being executed in said data processing unit, and said chaining instruction being indicative of whether data in said main storage at a plurality of addresses is to be chained and transferred to said at least one input/output device; and

(g) remote channel means, connected between said at least one transfer line and said input/output device and responsive to said chaining instruction sent from said central channel means, for sending, after completion of a current data transfer, an instruction to said central channel means requesting a new data transfer command for a next data transfer.

4,841,476

EXTENDED FLOATING POINT OPERATIONS SUPPORTING EMULATION OF SOURCE INSTRUCTION EXECUTION

James A. Mitchell, and John F. Bechdel, both of Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 6, 1986, Ser. No. 915,423

Int. Cl.[4] G06F 9/00

U.S. Cl. 364—900 8 Claims

1. In a system for emulating the execution of source CPU instructions received from a computer external to said system, said system including a memory, a target instruction unit which processes and issues translated target instructions, target functional units for executing target instructions, and an instruction translating unit (translator) for receiving and translating said source instructions to translated target instructions, an improvement for accelerating said translating and issuing, said improvement comprising:

signal means in said translator for generating a floating point token signal in response to translation of a source floating point arithmetic instruction;

outcome means in said floating point unit for generating completion signals indicative of the outcome of the target floating point arithmetic instruction issued in response to said translation, said completion signals being generated in advance of completing the execution of said issued target floating point arithmetic instruction;

a multi-stage wait queue including a wait stage in said translator, said multi-stage wait queue connected to said signal and outcome means for receiving and moving said token signal to said wait stage in response to said translation and for removing said token signal from said wait stage in response to said completion signals; and

system means connected to said wait stage, said translator, and said target instruction unit for preventing the translation and issue of instructions until said token is removed from said wait stage.

4,841,477

RESPONSE/PROCESSING APPARATUS FOR EXTERNAL-ABNORMAL-STATE IN DATA PROCESSING SYSTEM

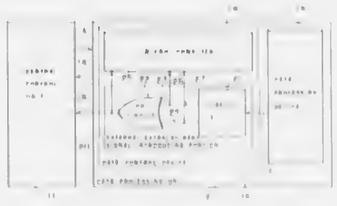
Masaharu Mizuta, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 917,824, Oct. 10, 1986, abandoned. This application Sep. 6, 1988, Ser. No. 240,470

Claims priority, application Japan, Dec. 27, 1985, 60-296042

Int. Cl.[4] G06F 13/14

U.S. Cl. 364—900 4 Claims



1. A data processing system comprising:

a data processing device installed in a data processing unit for processing prescribed data; and

a data control device installed in the data processing unit and having an external extraordinary signal introducing portion for introducing external abnormal signals outputted from the data processing device, and a microcomputer for performing transmission/receiving of a command signal and a response signal between the external extraordinary signal introducing portion and a central control unit based on the abnormal signals outputted from the external extraordinary signal introducing portion,

wherein said external extraordinary signal introducing portion is provided with a latch circuit for storing the external abnormal signals outputted from the data processing device and transmitting the external abnormal signals to the microcomputer, and an OR logic circuit for taking logical sum of the external abnormal signals latched by the latch circuit, said OR logic circuit having an output terminal connected both to the microcomputer and to the central control unit for outputting a control signal to the microcomputer and also for outputting an attention signal to the central control unit to inform the central control unit of an abnormal condition without interruption of processing by the microcomputer

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4,841,478

DOCUMENT PROCESSOR

Tsutomu Takahashi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1986, Ser. No. 923,089

Claims priority, application Japan, Oct. 31, 1985, 60-244978

Int. Cl.[4] G06F 3/00

U.S. Cl. 364—900 15 Claims

1. A document processor comprising

input means for inputting a document;

memory means for storing the document input by said input means;

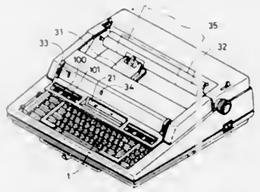
a first scale;

print means, having a scale indicator for indicating a printing position relative to said scale, for printing the document stored in said memory means onto a print medium in the direction of said first scale as indicated by said scale indicator;

display means for displaying a second scale corresponding to said first scale and for displaying characters to be printed; and

control means for controlling said print means such that the

document stored in said memory means is read out and printed, and for controlling said display means such that

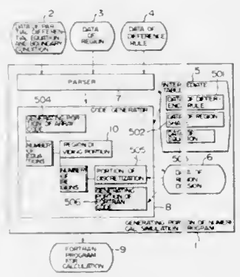


said second scale of said display means is displayed in correspondence with the characters to be printed.

4,841,479
METHOD FOR PREPARING A SIMULATION PROGRAM

Michiru Tsuji, Hino; Chisato Konno, Iragi, and Miyuki Saji, Funabashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 19, 1987, Ser. No. 16,406
Claims priority, application Japan, Mar. 14, 1986, 61-54762
Int. Cl.[4] G06F *3/02, 15/328*
U.S. Cl. 364—900 2 Claims



1. A method for automatically generating by use of a computer a simulation program for simulating a phenomenon in a region by discretizing automatically data of a partial differential equation inputted when the partial differential equation and boundary conditions governing the phenomenon and data representing the shape of a region, which is an object of calculation, are given, by using a discretization rule by the finite differential method, and for generating a program calculating numerical values representative of the phenomenon determined by said partial differential equation over the whole object region of calculation by the finite differential method on the basis of the equation after the discretization, said method comprising the steps of:

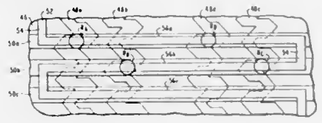
dividing said object region of calculation into a plurality of blocks, each of which has the same differential equation and the same discretization rule; and

generating a program which calculates, for each of said blocks numerical values representative of the phenomenon determined by the partial differential equation and the discretization rule both applied for each of the blocks by the finite differential method.

4,841,480
CROSS-TIE MEMORY SYSTEM

Donald R. Lampe, Ellicott City, Md.; Mark A. Mentzer, Lititz, Pa., and Eric H. Naviasky, Baltimore, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 795,284, Nov. 5, 1985, Pat. No. 4,722,073. This application Oct. 9, 1987, Ser. No. 107,122
Int. Cl.[4] G11C *19/08*
U.S. Cl. 365—87 **17 Claims**



1. A magnetoresistive random access cross-tie memory array comprising:

a. an insulating substrate;

b. a plurality of spaced columns of thin film magnetoresistive material disposed upon said substrate, said thin film columns being symmetrically patterned and shaped to provide only two stable magnetic domain states at spaced memory elements which form and X-Y array of spaced-apart memory elements magnetically addressable to one of two possible stable states;

c. row conductors aligned over row-aligned pairs of memory elements;

d. serpentine-shaped column conductors having column-extending portions interconnecting row-aligned extending portions, each said serpentine-shaped column conductor arranged so that adjacent row-aligned extending portions of said column conductor conduct current in opposed directions over row-adjacent memory elements;

e. a single binary digit being written and stored at four of said memory elements defined on four adjacent columns of magnetoresistive material, with one memory element of the four being located along each of said four columns of magnetoresistive material, with two of said four memory elements aligned under a first row conductor, and the other two memory elements aligned under a second row conductor;

f. said four memory elements being aligned under one of said serpentine column conductors, with two of said four memory elements aligned under said first row conductor being further aligned under a first row-aligned extending portion of said one serpentine column conductor, and the other two of said four memory elements aligned under said second row conductor being further aligned under a second row-aligned extending portion of said one serpentine column conductor; and

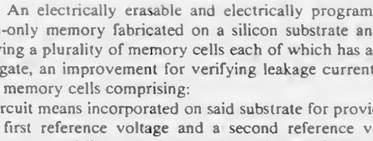
g. wherein signals passed through said first and second row-aligned extending portions of said one serpentine column conductor are complementary signals.

4,841,481
SEMICONDUCTOR MEMORY DEVICE

Shuji Ikeda, Koganei; Satoshi Meguro, Hinode; Kotaro Nishimura; Sho Yamamoto, both of Kodaira, and Nohuyoshi Tanimura, Musashino, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 899,404, Aug. 22, 1986, Pat. No. 4,774,203. This application Jul. 28, 1988, Ser. No. 225,467
Int. Cl.[4] G11C *11/00, 7/00;* **H03K** *3/284;* **H01L** *29/78*
U.S. Cl. 365—154 **6 Claims**

1. A semiconductor memory device having a memory cell including a flip-flop composed of first and second inverters, the output terminals of said first and second inverters being respectively connected to the input terminals of said second and first inverters, each of said first and second inverters being constituted by a MISFET and a load element which is connected in series to said MISFET and which is formed by a polysilicon film, said polysilicon film including a first region of a first conductivity type, a second region of a second conductivity type, and a third region having no impurities of said first and second conductivity types introduced therein and defining said

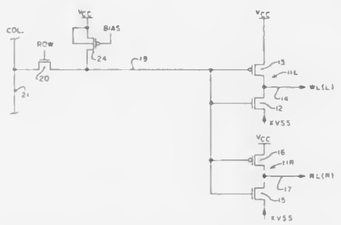


load element, said first region being formed on the side of said polysilicon film which is closer to the end thereof to which a power supply voltage is applied than at least said second and third regions, and said second region being formed on the side of said polysilicon film which is closer to said MISFET than at least said third region.

4,841,482
LEAKAGE VERIFICATION FOR FLASH EPROM

Jerry A. Kreifels, Citrus Heights, and George Hoekstra, Santa Clara, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Feb. 17, 1988, Ser. No. 157,364
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—185 6 Claims



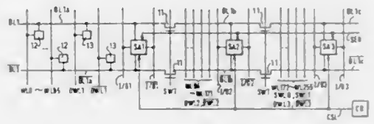
1. An electrically erasable and electrically programmable read-only memory fabricated on a silicon substrate and employing a plurality of memory cells each of which has a floating gate, an improvement for verifying leakage current from said memory cells comprising:

circuit means incorporated on said substrate for providing a first reference voltage and a second reference voltage onto word lines coupled to a control gate of each of said memory cells, wherein said first reference level is coupled to said word line under normal operation, but during a test verification mode, said circuit means provides said second reference level onto said word line such that a current measurement device coupled to drains of said memory cells measures leakage current from said cells, said leakage current being above a predetermined value if a given cell is leaky and susceptible to being overerased.

4,841,483
SEMICONDUCTOR MEMORY

Tobru Furuyama, Tokyo, Japan, assignor to Kabushiki Kaisha Tosbiba, Kanagawa, Japan

Filed Dec. 9, 1987, Ser. No. 130,568
Claims priority, application Japan, Dec. 15, 1986, 61-298398
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—189.07 **12 Claims**



1. A semiconductor memory having a plurality of memory cells and a bit line connected to the memory cells, comprising:

the bit line being formed of a plurality of sub-bit lines,

switch means for interconnecting and disconnecting the sub-bit lines, said switch means including respective switching elements which interconnect the sub-bit lines,

reference potential means for storing reference potentials, and

sense amplifier means for comparing the output of an addressed memory cell with the reference potentials, whereby the memory is capable of storing n-valued data using n different storage potentials.

4,841,484
TRI-STATE IIL GATE

Kazuo Watanabe, Takasaki; Makoto Furihata, Gunma, and Kouichi Yamazaki, Takasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 25, 1986, Ser. No. 832,694
Claims priority, application Japan, Feb. 25, 1985, 60-34341; Feb. 25, 1985, 60-34342; Apr. 24, 1985, 60-86373; Apr. 24, 1985, 60-86398
Int. Cl.[4] H03K *19/02, 19/092;* **G11C** *11/00*
U.S. Cl. 365—190 **25 Claims**

10. A semiconductor integrated circuit device comprising:

a power supply terminal for supplying an operating voltage to said semiconductor integrated circuit device;

a current source coupled to said power supply terminal;

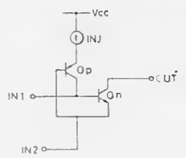
a plurality of tri-state gates being interconnected within said semiconductor integrated circuit deice, each tri-state gate having an input terminal, at least one output terminal and a control terminal, and each of said plurality of tri-state gates further including first and second bipolar transistors, said first bipolar transistor having a base coupled to said input terminal, an emitter coupled to said control terminal and at least one collector coupled to said at least one output terminal, said second bipolar transistor having an emitter coupled to said current source, a base coupled to said control terminal and a collector coupled to said input terminal;

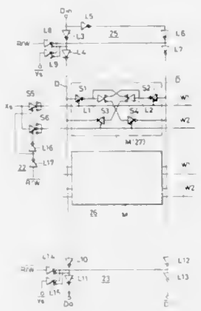
wherein said output terminal of each tri-state gate becomes a floating condition regardless of an input signal applied to said input terminal when a control signal applied to said control terminal have a first level so that said first and second bipolar transistors are turned off,

and wherein each tri-state gate provides a signal having a selected one of a high or low level in response to the input signal applied to said input terminal when the control signal applied to said control terminal have a second level so that said second bipolar transistor is turned on and said first bipolar transistor is in either an on or off state in response to the input signal;

wherein said plurality of tri-stat gates are collectively provided in an island region formed in a semiconductor substrate, wherein the control terminals of said plurality of

tri-state gates are constituted by said island region, and wherein said plurality of tri-state gates are commonly



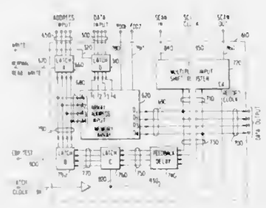


controlled by a potential level of said first island served as the control signal.

4,841,485
READ/WRITE MEMORY DEVICE WITH AN EMBEDDED READ-ONLY PATTERN AND METHOD FOR PROVIDING SAME

Ronald J. Prilik, South Burlington, and James R. Varner, Essex Junction, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y

Filed Nov. 5, 1987, Ser. No. 116,818
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—201 **21 Claims**

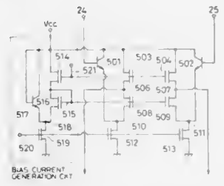


1. A memory array device with an embedded binary pattern, said memory array device comprising
a first voltage line and a second voltage line;
an array of bistable memory cell means, each of said bistable memory cell means being associated with a respective address value and being constructed with first and second sides that each are selectively connectable to said first voltage line or said second voltage line, each of said bistable memory cell means, when said first and second sides are selectively connected to opposite ones of said first and second voltage line, being for:
(a) functioning, during times when said first and second voltage lines are energized at a same time and voltage level, in a bistable mode; and
(b) functioning, during times when said first and second voltage lines are energized at at least one of different times and different voltage levels, in an embedded binary pattern mode wherein each of said bistable memory cell means being set to a logical value corresponding to a selected connection of said first and second sides of said bistable memory cell means to said first and second voltage lines.

4,841,486
SEMICONDUCTOR MEMORY DEVICE AND SENSE AMPLIFIER

Osamu Minato; Toshiaki Masuhara; Koichiro Ishibashi, all of Tokyo; Shoji Hanamura, Kokubunji; Shigeru Honjyo, Hachioji, and Nobuyuki Moriwaki, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 29, 1986, Ser. No. 946,776
Claims priority, application Japan, Dec. 27, 1985, 60-292899
Int. Cl.[4] G11C *7/00, 11/42*
U.S. Cl. 365—207 **19 Claims**



1. A semiconductor memory device having a memory plane defined by a plurality of memory cells, a decoder for accessing said memory cells, a data line on which a signal output from an accessed memory cell is transmitted, and a sense amplifier for amplifying the signal transmitted on said data line,
said sense amplifier comprising:
first and second common-collector bipolar transistors, wherein the collectors are supplied with a predetermined first operating potential and the bases of which are differentially driven by a differential input signal from said accessed memory cell;
first and second P-channel MOSFETs, wherein the sources are respectively coupled to the emitters of said first and second common-collector bipolar transistors and the gates of which are supplied with a predetermined bias voltage;
first and second N-channel MOSFETs, wherein the sources are supplied with a second operating potential, the drains of which are respectively coupled to the drains of said first and said second P-channel MOSFETs, the gates of which are coupled to each other, and wherein said first and second N-channel MOSFETs include a source-drain current path operating as an input current path and an output current path, respectively, of a current mirror circuit; and
a first sense output signal is provided at a first circuit node at the coupling of said drain of said second P-channel MOSFET and said drain of said second N-channel MOSFET.

4,841,487
SEMICONDUCTOR MEMORY DEVICE WITH ADDRESS GENERATOR

Shigeki Demura, and Toshio Oura, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 26, 1988, Ser. No. 160,983
Claims priority, application Japan, Feb. 27, 1987, 62-45742
Int. Cl.[4] G11C *13/00*
U.S. Cl. 365—230.01 **15 Claims**

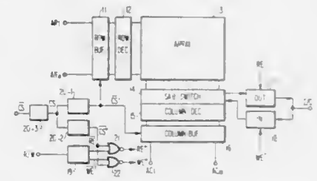
14. A microprogram control unit incorporated in a microcomputer fabricated on a semiconductor chip, said microprogram control unit performing a read-out operation, comprising:
(a) a memory cell array having a plurality of memory cells arranged in rows and columns, each of said memory cells having a metal-insulator-semiconductor structure fixedly storing a data bit depending upon a thickness of the insulator, said rows being grouped by four to form a plurality of memory cell groups;
(b) a first decoder circuit operative to produce a first activation signal for reading out said data bits each selected from each of said rows;
(c) a second decoder circuit operative to produce a second activation signal of a positive high voltage level;
(d) a first selector module having a plurality of first selector circuits equal in number to said memory cell groups, each of said first selector circuits being provided with four transfer gates coupled in parallel to said four rows of each memory cell group, each first selector circuit being responsive to said second activation signal so as to allow said one of said data bits selected from each memory cell group to pass therethrough, said first selector circuits being grouped by four to form a plurality of first selector groups;
(e) a third decoder circuit operative to produce a third activation signal of a positive high voltage level;

(f) a second selector module having a plurality of second selector circuits equal in number to said first selector groups, each of said second selector circuits being provided with four series combinations each consisting of a buffer circuit and a transfer gate, each second selector circuit being responsive to said third activation signal to allow one of said data bits selected from said first selector groups to pass therethrough;
(g) a plurality of buffer circuits each coupled to each of said second selector circuits;
(h) a plurality of clocked flip-flop circuits each coupled to said each of said buffer circuits and responsive to a clocked pulse so as to latch said data bit fed from said buffer circuit coupled to each second selector circuit, all of said data bits latched by said clocked flip-flop circuits being transferred to an instruction register, a part of said data bits latched by said clocked flip-flop circuits being transferred to said first and second decoder circuits for producing said first and second activation signals; and
(i) a microprogram sequencer operative to execute a predetermined function for producing an internal address signal on the basis of remaining data bits, said internal address signal being supplied to said third decoder circuit for producing said third activation signal.

4,841,488
SEMICONDUCTOR MEMORY CIRCUIT WITH IMPROVED TIMING AND DELAY CONTROL FOR DATA READ OUT

Kohji Sanada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 8, 1987, Ser. No. 36,765
Claims priority, application Japan, Apr. 8, 1986, 61-81711
Int. Cl.[4] G11C *7/00, 11/40*
U.S. Cl. 365—233 **5 Claims**



1. A memory circuit comprising:
an array of memory cells;
a selection circuit for operatively selecting at least one of the memory cells;
an output terminal;
an output circuit having an input end and an output end, said output end being coupled to said output terminal, said output circuit operatively generating, when enabled, and output signal at said output terminal in accordance with a level at the input end, and said output circuit setting, when disabled, said output terminal at a high impedance state;
first means, coupled to said selection circuit and said input end of said output circuit, for applying a data signal derived from the selected memory cell to said input end of said output circuit;
second means receiving an external control signal assuming one of active and inactive levels;
first and second control signal generators each coupled to said second means, said first and second control signal generators generating first and second active level control signals with first and second delay times, respectively, when said external control signal changes to an active level, and generating first and second inactive control signals with third and fourth delay times, respectively, when said external control signal changes to an inactive level, said first delay time being shorter than said second delay time, and said fourth delay time being shorter than said third delay time;
third means coupled to said first control signal generator and said selection circuit, said third means enabling said selection circuit in response to the active level of said first control signal, and disenabling said selection circuit in response to the inactive level of said first control signal; and
fourth means coupled to said second control signal generator and said output circuit, said fourth means enabling said output circuit in response to the active level of said second control signal, and disenabling said output circuit in response to the inactive level of said second control signal.
2. A memory circuit comprising:
an array of memory cells;
a selection circuit for operatively selecting at least one of the memory cells;
an output terminal;
an output circuit having an output end coupled to said output terminal, and an input end, said output circuit operatively producing at said output terminal, data corresponding to a signal at the input end thereof when said output circuit is enabled, and said output circuit setting said output terminal in a high impedance state when said output circuit is disabled;
means, coupled to said selection circuit and said output

circuit, for supplying the input end of said output circuit with a signal derived from the memory cell selected by said selection circuit;

first means for receiving an external control signal having one of an active and an inactive level;

a first series circuit having a first field effect transistor connected between a first voltage line supplied with a first voltage and a first node, and a second field effect transistor connected between said first and a second voltage line supplied with a second voltage, a conductance of said first transistor being smaller than that of said second transistor;

a second series circuit having a third field effect transistor connected between said voltage line and a second node, and a fourth field effect transistor connected between said second node and said second voltage line, a conductance of said third transistor being larger than that of said fourth transistor;

second means coupled to said first means, said first series circuit and said second series circuit, said second means simultaneously rendering said second and fourth transistors conductive in response to the active level of said external control signal so that said second voltage is produced at said first node and thereafter produced at said second node, said second means simultaneously rendering said first and third transistors conductive in response to the inactive level of said external control signal so that said first voltage is produced at said second node and thereafter produced at said first node;

third means, coupled to said first node and said selection circuit, for enabling said selection circuit when said first node is approximately at said second voltage and disabling said selection circuit when said first node is approximately at said first voltage; and

fourth means, coupled to said second node and said output circuit, for enabling said output circuit when said second node is approximately at said second voltage and disabling said output circuit when said second node is approximately at said first voltage.

4,841,489

METHOD OF IMAGING AN OBJECT BY ULTRASONIC OR ELECTROMAGNETIC WAVES

Yoshihiko Ozaki; Hiroaki Sumitani; Toshimasa Tomoda; Fumihide Sato, and Kenji Kusano, all of Anagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1986, Ser. No. 946,481

Claims priority, application Japan, Dec. 27, 1985, 60-292763; Dec. 27, 1985, 60-292764; Dec. 27, 1985, 60-292768; Mar. 14, 1986, 61-57481; Mar. 14, 1986, 61-57482; Mar. 14, 1986, 61-57483

Int. Cl.⁴ G03B *42/06*

U.S. Cl. 367—7 **15 Claims**

1. In a method of imaging an object wherein when a target object is imaged using ultrasonic or electromagnetic waves based on a synthetic aperture method to obtain an image of said target object by mechanically or electronically scanning an ultrasonic or electromagnetic wave transcieving system to transmit ultrasonic or electromagnetic waves which spread spacially in relation to said object, and to receive waves reflected from said target object, while obtaining an image of said target object by using a Time of Flight locus line along a direction of scanning prescribed by a phase delay in a received signal generated in a period from the transmission of waves to the reception of waves, wherein a method of imaging an object by ultrasonic or electromagnetic waves further comprises the steps of using a receive signal group from each of a plurality of scanning points within a range of a synthetic aperture to sequentially reproduce a line image of a central line of said synthetic aperture range, whereby an image of a target spatial area is sequentially produced while said ultrasonic or electromagnetic wave transceiver system is being scanned.

4,841,490

INVERSION OF A VERTICAL SEISMIC PROFILE BY MINIMIZATION OF AN ENTROPY LIKE FUNCTION

Didier Carron, Joinville, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Jun. 16, 1988, Ser. No. 208,183

Claims priority, application France, Jun. 19, 1987, 87 8592

Int. Cl.⁴ G01V *1/28*

U.S. Cl. 367—38 **11 Claims**

1. A method of identifying underground geological strata from a plurality of seismic traces Sk(t) recorded in a borehole at different levels k of depth Zk, wherein each trace Sk(t) includes n discrete sample values sampled as a function of time t at a constant time interval Δt, the method determining the series $R=\{r_i \text{ for } i=1,n\}$ representative of seismic reflection coefficients at the interfaces formed between successive geological strata, wherein i is an index relating to the sampling depth on a time scale at the constant interval Δt, said method including the steps of:

establishing the time-depth curve relating the depth Zk to the transit time Tk recorded on the trace Sk(t) for each level k;

extracting the upgoing wavefield Uk(t) and the downgoing wavefield Dk(t) from the traces Sk(t); and

calculating $U^{mean}(t)$, $U^{min}(t)$, and $U^{max}(t)$ representative of mean value, minimum value, and maximum value, respectively, of the upgoing wavefield Uk(t−Tk), and calculating $D^{mean}(t)$, representative of mean value of the downgoing wavefield Dk(t+Tk);

said method further including the steps of:

(a) determining a series $R^o=\{r^o_i\}$, representative of an approximation to the series R, by minimizing the function

$$H(R)=\Sigma f(r_i)$$

wherein $f(r_i)$ is an increasing function of $|r_i|$, which is symmetrical on the X axis, concave, and satisfies the constraint

$$R \bullet D^{mean}(t)=U^{mean}(t)$$

wherein the operator • represents a convolution product;

(b) determining a series $\Delta R=\{\delta r_i\}$ representative of a value for correcting the series R^o, and minimizing a function $J(\Delta R)$ which is linear in $|\delta r_i|$ under the constraints:

$$U^{min}(t)<[(R^o+\Delta R)\bullet D^{mean}(t)]<U^{max}(t) \text{ and}$$

$$|Zk-Zks(R^o+\Delta R)|<\epsilon k$$

wherein $Zks(R^o+\Delta R)$ is a linearized function in ΔR representative of the depth Zks calculated synthetically at level k from the initial solution R^o and the magnitude ϵk is

representative of the uncertainty in the magnitudes of Zk and Tk; and

(c) calculating the series $R=R^o+\Delta R\{R_i=r^o_i+\delta r_i\}$ representative of seismic reflection coefficients.

4,841,491

ULTRASONIC BEAM FORMER

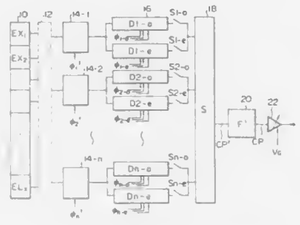
Shinichi Kondo, Kodaira; Kageyoshi Katakura; Toshio Ogawa, both of Tokyo; Shin'ichiro Umemura, and Hiroshi Ikeda, both of Hachioji, all of Japan, assignors to Hitachi Ltd. and Hitachi Medical Corp., both of Tokyo, Japan

Filed Aug. 4, 1986, Ser. No. 892,287

Claims priority, application Japan, Aug. 7, 1985, 60-173458; Dec. 11, 1985, 60-281423

Int. Cl.⁴ G01S *15/06*

U.S. Cl. 367—103 **11 Claims**



1. An ultrasonic beam former comprising:

a plurality of receiving amplifiers for independently amplifying received signals of respective elements of a transducer array, the amplification factor of each of said receiving amplifiers being changed stepwise so that the gain increases with the elapse of time after each wave transmission;

a plurality of channels each having a plurality of sampling delay means for delaying by a different amount the output of each of said plurality of receiving amplifiers during a single signal reception period following each transmitted signal;

addition means for adding together outputs of said plurality of sampling means having corresponding delays; and

a time gain control amplifier for amplifying the output of said addition means, the amplification factor of said time gain control amplifier changing in a sawtooth wave form.

4,841,492

APODIZATION OF ULTRASOUND TRANSMISSION

Robert H. Russell, Manhattan Beach, Calif., assignor to North American Philips Corporation, New York, N.Y.

Filed Aug. 5, 1987, Ser. No. 82,248

Int. Cl.⁴ G01S *9/68*

U.S. Cl. 367—105 **9 Claims**

1. An apodization attenuation circuit to control the amplitude of pulses transmitted from each ultrasound transducer element in an array of N transducer elements comprising:

an aperture of m transmitting elements within said array wherein $1 \leqq m \leqq N$ with an acoustic axis passing through the center of said aperture;

means to focus the transmission of ultrasound energy from said elements within said aperture; and

means to shape the distribution of electrical energy applied across said m transmitting transducer elements such that the excitation energy decreases as a function of distance from the center and the variation of peak pressure among said transmitting elements if a function of lateral distance of each element to the axis of the transmitted beam of ultrasound energy which means include:

a two wire power supply;

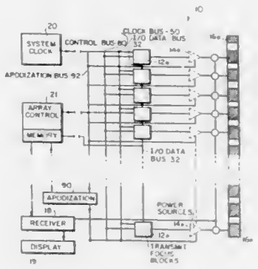
means to determine which of said transducer elements are within said aperture;

a string of N resistors, one for each of said transducer elements, said N resistors being connected in series with the last resistor in said string being connected to the first to form a closed loop;

N driver circuits, each driver circuit being connected to energize a corresponding transducer element as a function of a reference potential input;

each interresistor node of said resistor string being connected to the driver circuit of a corresponding one of said transducer elements and functioning as the reference potential input for said driver circuit;

means to connect at least one node of said resistor string on each side of said acoustic axis within said aperture to a first potential of said power supply and at least one node of said resistor string on each side of said acoustic axis outside said aperture to a common potential of said power supply such that the reference potential input from said resistor string to each of said driver circuits approximates a selected Gaussian function.



4,841,493

ELECTRONIC ACOUSTIC SIGNAL EMITTER

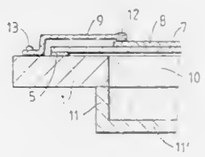
Alfred Meisner, Nuremberg; Erwin Potthof, Rothenbach, and Henry Fluhrer, Nuremberg, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Fed. Rep. of Germany

Filed Apr. 20, 1988, Ser. No. 184,016

Claims priority, application Fed. Rep. of Germany, May 27, 1987, 3718018

Int. Cl.⁴ H01L *41/08*

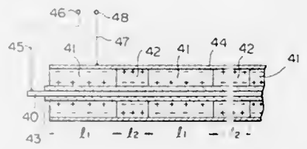
U.S. Cl. 367—140 **9 Claims**



1. An electronic acoustic signal emitter including a piezo-ceramic plate arranged on a metal membrane; and a circuit board supporting an actuating circuit comprising of electrical components, said electrical components of said actuating circuit connected by conductive paths on said circuit board, said electrical components of said actuating circuit electrically connected to a ring shaped conductive path on said circuit board of diameter generally equal to that of the metal membrane, said ring shaped conductive path forming a support for said metal membrane, the side of said metal membrane opposite said piezo-ceramic plate being electrically conductively fas-

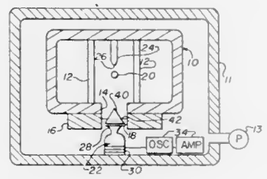
tened to said circuit board at said ring shaped conductive path and concentric thereto, said electrical components and said metal membrane located on one side of said circuit board, and said circuit board including a radiation opening located beneath said metal membrane.

4,841,494
UNDERWATER PIEZOELECTRIC ARRANGEMENT
Hisao Banno, Tohkai, Japan, assignor to NGK Spark Plug Co., Ltd., Aichi, Japan
Filed Jun. 28, 1988, Ser. No. 212,676
Claims priority, application Japan, Jul. 3, 1987, 62-167588; Jul. 3, 1987, 62-167589
The portion of the term of this patent subsequent to Sep. 22, 2004, has been disclaimed.
Int. Cl.[4] G01V *1/38*
U.S. Cl. 367—157 **9 Claims**



1. An underwater piezoelectric arrangement comprising at least one first and at least one second piezoelectric elements juxtaposed, said first piezoelectric element being made of a polarized ceramic-polymer composite having a first hydrophone constant and generating electrostatic charges of opposite polarities on the opposed surfaces thereof in response to stresses which act on said first piezoelectric element in a direction parallel to said surfaces thereof, said second piezoelectric element being made of a polarized ceramic-polymer composite having a second hydrophone constant smaller than said first hydrophone constant and generating electrostatic charges of opposite polarities on the opposed surfaces thereof in response to stresses which act on said second piezoelectric element in a direction parallel to said surfaces thereof, the levels of said charges generated on the surfaces of each of said piezoelectric elements in response to said stresses being substantially equal, electrode members provided on respective opposed surfaces of each of said first and second piezoelectric elements, said electrode member on the positive pole surface of said first piezoelectric element being electrically connected to said electrode member on the negative pole surface of said second piezoelectric element, said electrode member on the negative pole surface of said first piezoelectric element being electrically connected to said electrode member on the positive pole surface of said second piezoelectric element, and a pair of terminals connected to said electrode members on the positive pole surface of said first piezoelectric element and the negative pole surface of said second piezoelectric element and said electrode members on the negative pole surface of said first piezoelectric element and the positive pole surface of said second piezoelectric element for providing detection of an output signal produced in accordance with the difference between the respective hydrophone constants of said first and second piezoelectric elements only in response to acoustic waves being received by the arrangement and cancellation of noise signals produced in accordance with said charges on said first and second piezoelectric elements.

4,841,495
HORN LOADED TRANSDUCER FOR ACOUSTIC LEVITATION
Thomas J. Danley, Highland Park, and Charles A. Rey, Naperville, both of Ill., assignors to Intersonics Incorporated, Northbrook, Ill.
Filed Jun. 9, 1986, Ser. No. 871,924
Int. Cl.[4] G01K *15/00*
U.S. Cl. 367—191 **10 Claims**

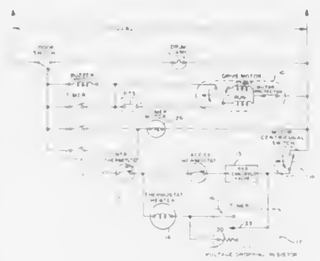


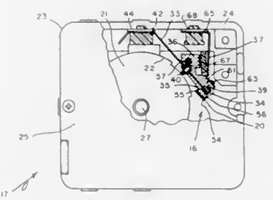
1. In an acoustic levitation device wherein an object is levitated by acoustic energy from a sound source and is heated while being levitated, the improvement wherein said sound source comprises a dish-shaped member and means for flexing said dish-shaped member to produce sound at the outer perimeter of said member, and means for horn loading and protecting said sound source from heat, said last mentioned means comprising a hollow tube, said dish-shaped member being located in one end of the tube, a insulating member disposed in the tupe and being spaced from the tube and the dish-shaped member, said insulating member having a base coextensive with the dish-shaped member except for the outer perimeter thereof to insulate said dish-shaped member, said insulating member tapering away from the base thereof to provide horn loading for said sound source means.

4,841,496
APPLIANCE TIMER
George W. Adams, Greenwood; Steven W. Smock, and Ross G. Helft, both of Indianapolis, all of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.
Filed Dec. 17, 1987, Ser. No. 134,166
Int. Cl.[4] G04F *8/00;* **H01H** *43/10*
U.S. Cl. 368—107 **14 Claims**

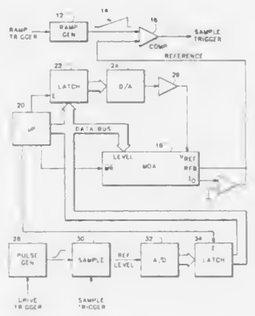
1. In an appliance timer having a housing, a motor driven cam programming means carried in said housing, a switch blade responsive to said cam programming means, and a plurality of electrical switch circuit means for providing a plurality of operating levels for a function of said appliance, each switch circuit means comprising one or more of the following switch circuit components: said switch blade, a first contact mounted on said switch blade, second contact means for cooperating with said first contact means, support means for supporting said second contact means, a terminal mounted exteriorly of said housing, a housing feed-through, and a terminal strap, the improvement comprising a leadless resistor or capacitor electrically and mechanically attached directly to at least one of

said switch circuit components, said resistor or capacitor having a predetermined resistance or capacitance whereby it provides differentiation between said plurality of circuits means to provide said plurality of operating levels.



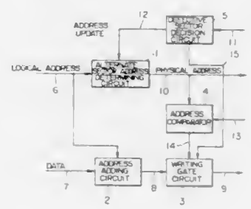


4,841,497
DIGITAL TIME BASE WITH CORRECTED ANALOG INTERPOLATION
Glenn Bateman, Redmond, Oreg., and Donald L. Brand, North Ridge, Calif., assignors to Tektronix, Inc., Beaverton, Oreg.
Filed Dec. 7, 1987, Ser. No. 129,619
Int. Cl.[4] H03K *13/20*
U.S. Cl. 368—113 **4 Claims**



3. A digital time base with analog interpolation comprising:
means for generating an analog ramp signal in response to a ramp trigger;
means for comparing the analog ramp signal with a signal level which varies between a zero value and a maximum value to establish an interval along the analog ramp signal; and
means for adjusting the maximum value so that the interval is a predetermined value.

4,841,498
INFORMATION RECORDING/REPRODUCING APPARATUS WITH MEANS FOR SUBSTITUTING PREDETERMINED GOOD SECTORS FOR DEFECTIVE ONES
Tatuo Sugimura, Yawata; Isao Satoh, Neyagawa; Yoshihiko Imai, Hirakata, and Makoto Ichinose, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 11, 1985, Ser. No. 710,216
Int. Cl.[4] G11B *17/22*
U.S. Cl. 369—32 **9 Claims**

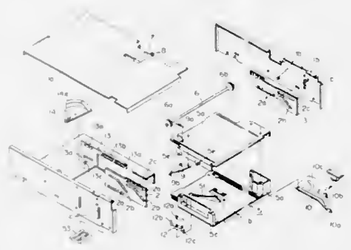


1. An information recording and reproducing apparatus comprising:
means for recording information on a recording medium and reproducing the same therefrom, said recording medium having a recording/reproducing structure in which an information recording/reproducing region is divided into a plurality of addressable sectors;
means for providing a logical address for a sector designated for recording;
means for receiving said logical address and for designating a first physical address of said sector designated for recording;
means for detecting whether said sector designated for recording is defective;
means responsive to detection that the sector designated for recording is defective for designating an alternate recording sector to be used in place of the defective sector, said means for designating the alternate recording sector controlling said means for designating the first physical address so that said means for designating designates a second physical address of an alternate recording sector each time a defective recording sector is detected;
means for adding said logical address to recordable data to form an address-added data signal having a logical address portion and a data portion; and
means for recording said address-added data signal at a sector having said first physical address when a defective sector is not detected, and at a sector having said second physical address when a defective sector is detected.

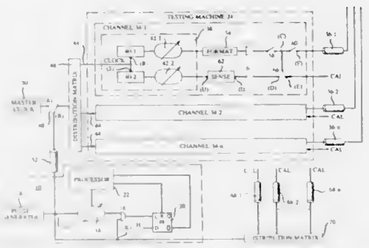
4,841,499
MULTI-DISC PLAYER
Akira Takahashi; Testuro Kamimura; Masahiko Kawamura; Kiyoshi Morikawa, and Sei Onishi, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan
Filed Feb. 24, 1988, Ser. No. 160,049
Claims priority, application Japan, Feb. 24, 1987, 62-39295; Feb. 24, 1987, 62-39299
Int. Cl.[4] G11B *17/28, 5/48, 25/04*
U.S. Cl. 369—38 **11 Claims**

1. A disc selection device in a multi-disc player, comprising:
a magazine adapted to accommodate a plurality of discs therein;

a holder for receiving said magazine in a magazine inserting direction and for holding said magazine;
slide plates provided at both sides of said holder, said slide plates being formed with cam surfaces for moving said holder in a vertical direction which direction is perpendicular to the magazine inserting direction, said slide plates being also formed with racks;
left and right gears engageable with said racks for driving said slide plates; and
a shaft for connecting together said left and right gears to drive said slide plates in a same direction.

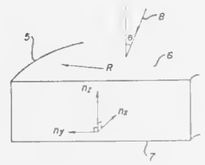


4,841,500
PRINTED CIRCUIT BOARD FABRICATION TECHNIQUE
Wha-Joon Lee, Lawrenceville, N.J., assignor to American Telephone and Telegraph Company, New York, N.Y.
Filed Mar. 17, 1988, Ser. No. 169,543
Int. Cl.[4] G04F *8/00, 10/00*
U.S. Cl. 368—120 5 Claims



1. A method for fabricating a printed circuit board comprising the steps of:
soldering at least one lead of at least one component to a metallized area on an insulative substrate; and
testing the circuit board by launching at least one test signal from a testing machine to the circuit board along a circuit path and then analyzing, at the testing machine, each response signal generated by the circuit board and communicated to the testing machine along the circuit path in response to the test signal, each signal incurring a propagation delay over at least a portion of the circuit path traveled thereby, characterized in that:
the step of testing further includes the step of compensating the testing machine in accordance with the magnitude of the propagation delays incurred by each signal as it travels along at least a portion of a circuit path, the propagation delays being measured by the steps of:
(a) launching a first pulse into a first end of the circuit path so that the first pulse propagates to a node of interest along said path;
(b) simultaneously launching a second pulse into one end of a programmable delay line which serves to delay the second pulse from reaching a second end of the delay line by an adjustable time period;
(c) checking whether the second pulse has reached the second end of the delay line at substantially the same time the first pulse has reached said node of interest, and, if not, adjusting the delay of the programmable delay line by a predetermined amount; and
(d) repeating steps (a)–(c) until the second pulse reaches the second end of the delay line at about the same instant as the first pulse reaches said node of interest.

4,841,501
PLASTIC SUBSTRATE FOR OPTICAL DISK AND PROCESS FOR PRODUCING THE SAME
Akihiro Izuka, Himeji; Yoshio Onizawa, Hyogo, and Mitsuru Yamashita, Himeji, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan
Filed Feb. 27, 1987, Ser. No. 19,720
Claims priority, application Japan, Mar. 3, 1986, 61-45900
Int. Cl.[4] G11B *11/12, 7/26*
U.S. Cl. 369—13 5 Claims

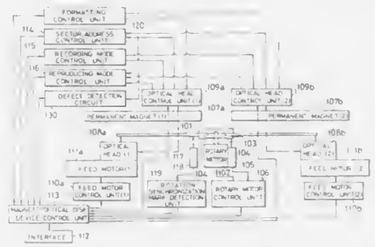


1. A recording medium for optical high-density data storage and retrieval systems designed to record and/or read data on a recording layer supported on a flat transparent plastic substrate by means of an incident laser beam passing through the flat transparent plastic substrate, characterized in that the absolute values of the difference between the refractive index (n_z) in the direction perpendicular to the flat surfaces of the transparent plastic substrate and the refractive indexes (n_x) and (n_y) in the direction parallel to the flat surfaces thereof, that is, $|n_z-n_x|$ and $|n_z-n_y|$ are smaller than 4×10^{-4}.

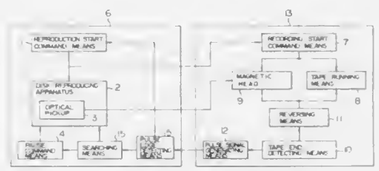
4,841,502
INFORMATION RECORDING SYSTEM AND REPRODUCING FOR RECORDING AND REPRODUCING INFORMATION ON A MAGNETO-OPTICAL DISK
Teruo Murakami, Yokohama, and Naobumi Seo, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 6, 1986, Ser. No. 871,558
Claims priority, application Japan, Jun. 14, 1985, 60-128265; Sep. 17, 1985, 60-203325; Oct. 7, 1985, 60-221771
Int. Cl.[4] G11B *13/04, 11/12*
U.S. Cl. 369—13 6 Claims

1. An information recording and reproducing system for recording and reproducing information on a magneto-optical disk, comprising:
a magneto-optical disk having a number of sectors each having at least one address portion and information recording portion;
a disk driving means for driving the magneto-optical disk placed on a turntable;
a first optical system having a first magnet means, a first optical head, and a first optical head control means for carrying out an erasing operation on the disk prior to a recording of information on the disk and for carrying out a sector address reproducing operation on the disk; and

a second optical system having a second magnet means, a second optical head, and a second optical head control means for carrying out an information recording operation on the disk and a sector address reproducing operation on the disk,
said first and second optical heads being arranged and controlled such that when the first optical head is positioned at an address portion of one sector, the second optical head is positioned at an information recording portion of another sector, wherein when the first optical head is reproducing the sector address of the address portion, the second optical head is recording information to the information recording portion, and when the second optical head is positioned at an address portion of one sector, the first optical head is positioned at an information recording portion of another sector, wherein when the second optical head is reproducing a sector address of the address portion, the first optical head is erasing information from the information recording portion.

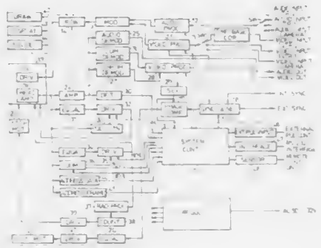


4,841,503
SYSTEM FOR RECORDING INFORMATION FROM ONE RECORDING MEDIUM ONTO A REVERSING CASSETTE TAPE RECORDING MEDIUM WITHOUT LOSS OF INFORMATION DURING A REVERSING OPERATION
Jiro Yamada, Neyagawa; Masahide Haseoka, Kadoma, and Isao Obata, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 12, 1987, Ser. No. 84,460
Claims priority, application Japan, Aug. 18, 1986, 61-192353
Int. Cl.[4] G11B *5/86, 13/04*
U.S. Cl. 369—14 3 Claims



1. An information reproducing and recording system comprising:
a disk reproducing apparatus for reproducing information from a plurality of information sections on a disk;
a recording apparatus for recording the information reproduced by the disk reproducing apparatus onto a recording medium, said recording medium having an end;
operation start command means for starting the operations of the disk reproducing apparatus and recording apparatus synchronously with each other;
detecting means for detecting that the recording medium of said recording apparatus has reached said end;
searching means, responsive to the detecting output of said detecting means, for interrupting the reproducing operation of said disk reproducing apparatus and searching for a header signal of an information section, the reproduction of which has been interrupted;
pause command means for temporarily stopping said disk reproducing apparatus in response to the completion of the header signal search of said searching means;
reversing means for receiving the output of said detecting means and reversing the driving direction of the recording medium; and,
means for releasing the temporary stop state of said reproducing apparatus after the reversing means reverses the driving direction of the recording medium.

4,841,504
METHOD AND APPARATUS FOR RECORDING AN INFORMATION SIGNAL ON A ROTARY RECORDING MEDIUM
Hirohisa Yamaguchi, Tokyo, and Akira Mashimo, Tokorozawa, both of Japan, assignors to Teac Corporation, Tokyo, Japan
Filed Jul. 14, 1987, Ser. No. 73,979
Claims priority, application Japan, Jul. 16, 1986, 61-167547
Int. Cl.[4] G11B *17/22*
U.S. Cl. 369—32 9 Claims



1. A method of recording an information signal on a rotary recording medium having a track comprising an unrecorded track not recorded with information signals and a pre-recorded track recorded with information signals and continuing to the unrecorded track by recording and reproducing means being selectively operated in a recording mode and a reproducing mode for recording information signals on and from the rotary recording medium in such a manner that an information signal is recorded on an unrecorded track turn which is a portion of the unrecorded track scanned by the recording and reproducing means during one revolution of the rotary recording medium continuously from a pre-recorded information signal recorded on a pre-recorded track turn, the pre-recorded track turn being a portion of the pre-recorded track scanned by the recording and reproducing means during one revolution of the rotary recording medium, the method comprising the steps of:
searching a pre-recorded track turn immediately preceding the unrecorded track by feeding the recording and reproducing means operated in the reproducing mode across the track responsive to a first command signal commanding a preparation mode for the recording;
repeatedly reproducing the information signal recorded on the searched pre-recorded track turn by moving the recording and reproducing means back to the beginning of the track turn by one track pitch at an end of the track turn;
scanning an unrecorded track turn immediately following the pre-recorded track turn by the recording and repro-

ducing means continuously from the pre-recorded track turn to the unrecorded track turn responsive to a second command signal commanding a start of the recording by prohibiting the movement of the recording and reproducing means moving back to the beginning of the searched pre-recorded track turn; and

switching the recording and reproducing means from the reproducing mode to the recording mode at a recording start location on the unrecorded track to cause the recording of the information signal.

4,841,505

PICKUP POSITION CONTROL METHOD ENABLING RESTART OF REPRODUCTION AFTER INTERRUPTION

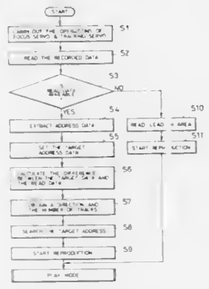
Yoshio Aoyagi, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 26,314, Mar. 16 1987, abandoned. This application Oct. 28, 1988, Ser. No. 268,671

Claims priority, application Japan, Mar. 14, 1986, 61-57277

Int. Cl.[4] G11B 7/00

U.S. Cl. 369—32 **5 Claims**



1. A pickup position control method for a disk reproducing device, comprising the steps of when the power supply is interrupted during reproduction:

holding a pickup for reading data recorded on a disk-shaped recording medium at the last reading position of said recording medium;

reading by said pickup data recorded on said disk-shaped recording medium on said last reading position when said power supply is resupplied to said disk reproducing device;

generating target address data according to read address data in said read recorded data, said target address data having a predetermined, non-identical relationship to said read address data;

moving said pickup according to an address difference between said target address data and said read address data to a position indicated by said target address data; and

beginning reproduction from said position indicated by said target address data.

4,841,506

RANDOM PLAYING METHOD FOR DISK PLAYER

Kazuhiro Kiyoura; Fumio Endo; Toshiyuki Kimura; Yoshio Aoyagi, and Kazunari Nakamura, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 1, 1987, Ser. No. 103,314

Claims priority, application Japan, Jan. 1, 1986, 61-233727; Oct. 1, 1986, 61-233724; Oct. 1, 1986, 61-233725; Oct. 1, 1986, 61-233726; Oct. 1, 1986, 61-233723; Oct. 1, 1986, 61-233728

Int. Cl.[4] G11B 17/06, 17/22, 27/19

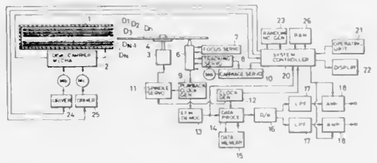
U.S. Cl. 369—32 **6 Claims**

1. A random playback method for a disk player, the disk player playing a disk having a plurality of information sections recorded thereon, and each information section being assigned a different number, the method comprising the steps of:

storing information which represents the last information section played back by the disk player;

determining the number of information sections recorded on the disk;

comparing the determined number of recorded information sections with a predetermined number of information sections;



randomly generating a number which corresponds to one of the numbers assigned to the information sections;

repeating said step of randomly generating a number only if the generated random number corresponds to the number assigned to the information section which was last played back by the disk player, and the determined number of recorded information sections is greater than the predetermined number of information sections; and

playing back the information section corresponding to the finally generated random number.

4,841,507

OPTICAL HEAD FOR AN OPTICAL RECORDING AND REPRODUCING APPARATUS

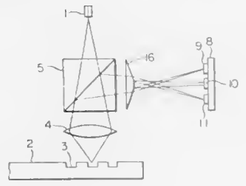
Hitoshi Imai; Ryuichiro Arai; Kimiyuki Koyanagi, and Michihiro Tadokoro, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 1, 1987, Ser. No. 127,049

Claims priority, application Japan, Dec. 5, 1986, 61-186833

Int. Cl.[4] G11B 7/00

U.S. Cl. 369—44 **17 Claims**



1. An optical head for an optical recording and reproducing system including an information carrier having a recording surface and a guide groove formed in the recording surface, said optical head comprising:

a light source adapted to generate a first light beam;

a first optical means for focusing said first light beam along a first light path and into the guide groove;

a second optical means for reflecting a reflected light beam, initially reflected from the guide groove along the first light path, away from the first light path and along a second light path;

an optical element disposed in the second light path and having a face including a cylindrical surface formed on a central portion of said face and slanted surfaces formed on said face on both sides of said central cylindrical surface, said optical element being adapted to divide the reflected light beam into three light beams; and

a light receiving element having at least three light receiving units receiving the respective light beams divided by said optical element.

$$\left.\begin{aligned}\left(X+\delta\cdot\frac{d}{F}-\frac{\lambda}{P}\cdot\frac{d}{F}\right)^2+Y^2\geqq\left(\frac{d}{2}\right)^2\\ \left(X-\delta\cdot\frac{d}{F}+\frac{\lambda}{P}\cdot\frac{d}{F}\right)^2+Y^2\geqq\left(\frac{d}{2}\right)^2\end{aligned}\right\}$$

where P is a pitch of pits or pregrooves of said recording medium, λ is a wavelength of said light beam, δ is a value which is from equal to or more than zero to equal to or less than a maximum moving distance of said object lens in a direction of a track error, d is a diameter of said light beam which is reflected, X is an axis which is parallel to a track error direction to intersect the light axis of said light beam which is reflected and Y is an axis which is orthogonal to said X to intersect said light axis, and

a track error being detected in accordance with said light beams of said first and second regions, and a focus error being detected in accordance with said light beam of said region.

4,841,508

METHOD AND APPARATUS FOR DETECTING A TRACK AND FOCUS ERRORS IN AN OPTICAL HEAD

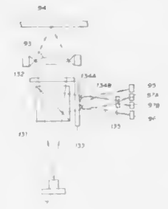
Yasuo Kimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 28, 1987, Ser. No. 138,484

Claims priority, application Japan, Dec. 25, 1986, 61-310311; Mar. 20, 1987, 62-66178; Apr. 8, 1987, 62-87658

Int. Cl.[4] G11B 7/125

U.S. Cl. 361—45 **8 Claims**



1. A method for detecting a track and fucus errors in an optical head comprising steps of,

radiating light beam to be directed to a recording medium, and

detecting light amount of light beam which is reflected through an object lens from said recording medium

wherein said light beam which is reflected is divided in its cross section into light beams of at least a first, second and third regions,

said first region being expressed in its cross sectional position by the equations,

$$\left.\begin{aligned}\left(X-\delta\cdot\frac{d}{F}\right)^2+Y^2\leqq\left(\frac{d}{2}\right)^2\\ \left(X+\delta\cdot\frac{d}{F}+\frac{\lambda}{P}\cdot\frac{d}{F}\right)^2+Y^2\leqq\left(\frac{d}{2}\right)^2\end{aligned}\right\}$$

said second region being expressed in its cross sectional position by the equations, and

$$\left.\begin{aligned}\left(X+\delta\cdot\frac{d}{F}\right)^2+Y^2\leqq\left(\frac{d}{2}\right)^2\\ \left(X-\delta\cdot\frac{d}{F}-\frac{\lambda}{P}\cdot\frac{d}{F}\right)^2+Y^2\leqq\left(\frac{d}{2}\right)^2\end{aligned}\right\}$$

said third region being excluded from said first and second regions and expressed in its cross sectional position by the equations,

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4,841,509

APPARATUS AND METHOD FOR DETECTING FOCUS ERROR SIGNAL AND TRACKING ERROR SIGNAL IN AN OPTICAL DISK SYSTEM

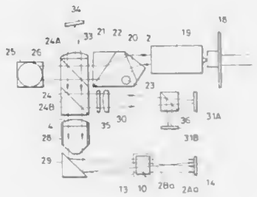
Toshimasa Kamisada, Hiratuka, and Akira Saito, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 3, 1986, Ser. No. 937,365

Claims priority, application Japan, Dec. 4, 1985, 271450/1985

Int. Cl.[4] G11B 7/13

U.S. Cl. 369—46 **3 Claims**



1. A system for detecting a signal representative of a focus error and tracking error by an optical disk reader comprising:

means for irradiating the disk to obtain reflected zero and first order diffraction rays;

a cylindrical lens for selectively converging the rays to an elliptical image having a major axis defined by nonconverged rays and a minor axis defined by converged rays, the image including first and second interference portions of the diffraction rays defined by the interference of the first order diffraction rays with the zero order diffraction rays;

a beam splitter disposed to split the rays into first and second photoreceptive images;

first and second photodetectors selectively spaced forward and behind a convergent point for reception of a converging image at the first photodetector and an expanding image at the second photodetector, and each having at least four photoreceptive portion, a selective two of the four being aligned with the major axis for detecting tracking errors and a selective other two being aligned with the minor axis for detecting focus error from reception of the photoreceptive images each photoreceptive portion being capable of producing an output representative of received image intensity; and,

said selected major axis photoreceptive portions being dis-

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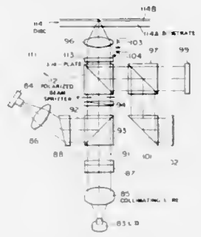
posed to identify a tracking error represented by a sum of the differences between outputs from the major axis photoreceptive portions of each photodetector and said minor axis photoreceptive portions being disposed to identify a focus error represented by a difference of the sums between outputs from the minor axis photoreceptive portions of each photodetector.

4,841,510
OPTICAL CHARACTERISTIC MEASURING APPARATUS FOR AN OPTICAL RECORDING MEDIUM SUBSTRATE

Akihiko Yoshizawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 9, 1987, Ser. No. 36,775
Claims priority, application Japan, Apr. 10, 1986, 61-82810
Int. Cl.[4] G11B *7/125*
U.S. Cl. 369—46 **10 Claims**



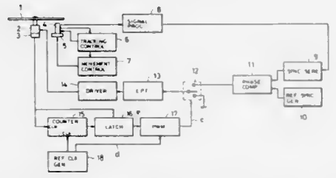
1. An optical characteristic measuring apparatus for measuring a carrier to noise ratio of an optical recording medium substrate comprising:
a linear polarized light producing means for producing a linear polarized parallel light beam,
a condenser lens system receiving said linear polarized parallel light beam, condensing said linear polarized parallel light beam and projecting a condensed light toward said optical recording medium substrate,
an analyzer arranged on one side of said optical recording medium substrate, said analyzer being in a crossed Nicol state for transmitting only a polarized light component, said polarized light component being polarized in an orthogonal direction to said linear polarized parallel light beam from said linear polarized light producing means; and
a light receiving means for receiving the polarized light component transmitted by said analyzer wherein a carrier to noise ratio of said optical recording medium substrate can be evaluated by determining an amount of polarized light component received by said light receiving means.

4,841,511
CONSTANT LINEAR VELOCITY DISK ROTATING APPARATUS

Motoyuki Suzuki; Yoshio Miura, and Akio Fukushima, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 19, 1987, Ser. No. 109,315
Claims priority, application Japan, Oct. 17, 1986, 61-245348
Int. Cl.[4] G11B *19/24*
U.S. Cl. 369—50 **9 Claims**

1. A constant linear velocity disk rotating apparatus for rotating a disk at a constant linear velocity, comprising:
signal detecting means which detects a signal provided by a disk in which data is recorded at a constant linear velocity at different radial positions relative to the disk;
phase comparing means which compares the phase of the detection signal of said signal detecting means with that of a reference signal, and provides a control signal on the basis of the result of comparison;
driving means which drives the disk for rotation according to the control signal;
disk rotation detecting means which detects the rotating frequency or period of the disk; and

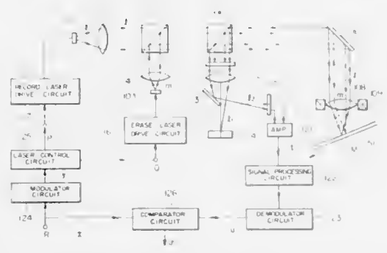


gain regulating means which regulates the gain of the control signal according to the output of said disk rotation detecting means in inverse proportion to the radial position r of said signal detecting means relative to the disk;
wherein the control signal provided by said phase comparing means is supplied to said driving means after the gain of the control signal is regulated by said gain regulating means.

4,841,512
OPTICAL DISK APPARATUS WITH AN ERASE CHECKING FUNCTION

Shinji Kubota; Kazutoyo Hirosawa, both of Hirakata, and Tomio Yoshida, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 17, 1986, Ser. No. 942,790
Claims priority, application Japan, May 16, 1986, 61-112902
Int. Cl.[4] G11B *27/36*
U.S. Cl. 369—54 **8 Claims**

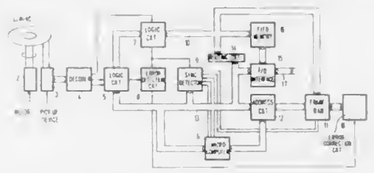


1. An optical disk apparatus with an erase checking function comprising:
recording means for recording data in a selected area of an optical disk by means of a very small spot produced from a light source;
reproducing means for reproducing the data recorded by said recording means;
erasing means for erasing data recorded by said recording means;
erase checking means, operative during a test mode, for checking that said erasing means is correctly operating, said erase checking means causing said erasing means to erase first data recorded in a first test region of said optical disk, thereafter causing said recording means to record second data in said first test region where the first data has been erased, and determining if the second data thus recorded is correctly reproduced by said reproducing means; and
power change means for changing the power level of said erasing means from a predetermined normal level when said erasing means erases said first data.

4,841,513
SEQUENTIAL BUFFER DEVICE

Hassan Farhangi, and Johan W. M. E. Konings, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 1, 1987, Ser. No. 57,883
Claims priority, application Netherlands, Jun. 4, 1986, 8601437
Int. Cl.[4] G11B *5/02*
U.S. Cl. 369—59 **7 Claims**



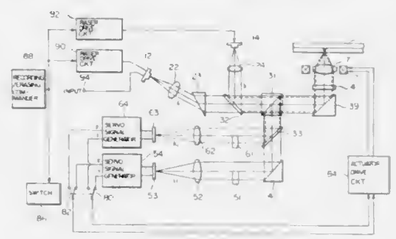
1. A sequential buffer device for connection to a player for an optically readable memory disc, which player includes error protection members for data originating from the disc was well as reconfiguration members for presenting data elements of successive data frames on a serial output at a predetermined, uniform speed, which sequential buffer deivce comprises: a serial input coupled to said serial output of said player to receive successive data frames which contain user data and possibly error detection data and error correction data in a predetermined pattern (format); a random access memory (RAM) connected to said serial input for storing the data of at least one frame received in a first byte-wise write operation under the control of a byte-wise incrementable address counter; a cylically operative error detection device also connected to said serial input to perform error detection on the basis of the error detection data in a received frame; an error correction device bidirectionally connected to the random access memory to localize and correct an error under the control of the error detection device and on the basis of the error correction data in the frame; and a first-in-first-out memory having a capacity most equal to the capacity of the random access memory and having a data input which is connected to a data output of the random access memory for executing a first read and a second write operation in synchronism with said first write operation in order to write data from the random access memory into the first-in-first-out memory, said first-in-first-out memory also having a data output for executing a user read operation asynchronously with respect to said first write operation in order to read-out data from said first-in-first-out memory.

4,841,514
OPTICAL RECORDING METHOD AND APPARATUS USING TWO FIGHT SPOTS

Nobuyoshi Tsuboi, Ibaraki; Atsumi Watanabe, Hitachi; Yoshio Sato, Hitachi; Satoshi Shimada, Hitachi, and Hiroshi Sasaki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 16, 1986, Ser. No. 919,421
Claims priority, application Japan, Oct. 16, 1985, 60-228775
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—100 **13 Claims**

1. An optical recording apparatus comprising:
an optical recording medium in which a portion thereof irradiated by a light spot to be heated to a temperature exceeding a first temperature higher than room temperature develops a first phase structure when the heated portion is cooled down thereafter and the portion irradiated by a light spot to be heated to a temperature between the first temperature and a second temperature exceeding the room temperature and not exceeding the first temperature develops a second phase structure when the heated portion is cooled down thereafter, whereby information is recorded by corresponding one of the first and second phase structures to a state that information has been recorded and by corresponding the other one thereof to a state that information has been erased;
optical means for focusing two light beams to form two light spots having different degrees of focus and for positioning the two light spots on said optical recording medium and along a recording track thereof to be radiated as a preceding spot and a succeeding spot located in the vicinity of the preceding spot;
information means for providing information for recording on said optical recording medium;
first adjust means for adjusting said optical means so that the degree of focus of the preceding spot is set to a level

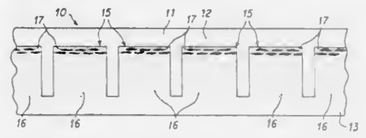


to preheat a portion of said optical recording medium irradiated with the preceding spot to a temperature not exceeding the first temperature and the degree of focus of the succeeding spot is set to a level to be higher than the degree of focus of the preceding spot to heat the preheated portion to a temperature exceeding the first temperature such that when said preheated portion is irradiated with said succeeding spot in accordance with said information from said information means, said information is recorded by setting said preheated portion to said first phase structure; and
second adjust means for adjusting said optical means so that the degree of focus of the preceding spot is set to a level to heat the portion of the optical recording medium to a temperature between the first temperature and the second temperature and the degree of focus of the succeeding spot is set to a level lower than the degree of focus of the preceding spot to hold the heated portion to a temperature between the first temperature and the second temperature so as to enable erasing of said optical recording medium.

4,841,515
READ-WRITE OPTICAL DISK

Wesley James, Brooklyn, N.Y., assignor to Micronic Interface Technologies, New York, N.Y.

Filed Jul. 1, 1987, Ser. No. 68,923
Int. Cl.[4] G11B *7/24*
U.S. Cl. 369—100 **19 Claims**



1. An optical disk, readable by a laser reading device, capable of undergoing multiple write cycles and comprising a

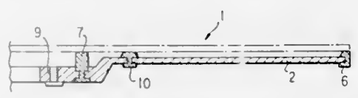
substrate member for first and second materials, having specific optical reflectivities substantially differing from each other, with said disk further comprising means for permitting a selective exposure, to the laser of said reading device, of either of said first or second materials at selected locations on said disk.

4,841,516
TURNTABLE FOR MOUNTING RECORDING MEDIUM IN DISK FORM

Michio Ohmori; Michiya Okamura, and Hiroshi Yui, all of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1987, Ser. No. 96,484
Claims priority, application Japan, Sep. 20, 1986, 61-223255; Sep. 25, 1986, 61-226516
Int. Cl.[4] G11B *3/00*
U.S. Cl. 369—264 **11 Claims**

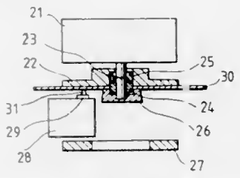
1. A turntable for mounting a recording medium in a disk form which comprises a substrate in a disk form and a receiving portion projecting from the top of said substrate, said substrate and said receiving portion being formed by injection-molding, said substrate being shaped from a thermoplastic composite resin, said resin comprising (a) a non-crystalline thermoplastic resin having a glass transition point of at least 100° C. and (b) reinforcing fibers in said thermoplastic resin in an amount from 19 to 70 vol. % relative to the sum of said resin and said fibers, wherein said resin has a dynamic shear modulus, G', of at least 1.5×10^{10} dyne/cm^2 as measured at a frequency of 11 Hz over the temperature range of −40° C. to 100° C., the ratio of dynamic shear modulus at −40° C., G_1' to dynamic shear modulus at 100° C., G_2' of up to 1.5, and a density of up to 2.0 g/cm^3, and said receiving portion being shaped from a thermoplastic elastomer having a hardness of 5 to 40.



4,841,517
DISK CLAMPING DEVICE

Toshihiko Kurihara, and Tadashi Funabashi, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Apr. 11, 1988, Ser. No. 179,824
Claims priority, application Japan, Apr. 16, 1987, 62-92031
Int. Cl.[4] G11B *25/04*
U.S. Cl. 369—270 **7 Claims**

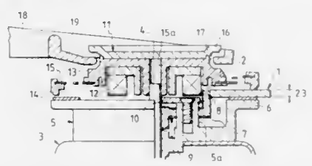


1. A disk clamping device, comprising:
a turntable mounted fixedly on a disk drive shaft of a motor;
a first hub for centering a disk having a small diameter hole, said first hub being mounted on said disk drive shaft;
a second hub for centering a disk having a large diameter hole, said second hub being separated from said first hub and movably mounted to engage said disk drive shaft and having a clamping surface which is brought into contact with a surface of said disk having a small diameter hole when engaged with said disk drive shaft; and
a separate clamper movably mounted so as to be brought into contact with a surface of said disk having said large diameter hole, wherein when said clamping surface of said second hub is brought into contact with said surface of said disk having a small diameter hole, said clamper is positioned away from said surface of said disk having a small diameter hole.

4,841,518
CLAMPING MECHANISM FOR INFORMATION RECORDING DISK

Shinsaku Nozu; Masao Kase, and Masakazu Yamashita, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 8, 1988, Ser. No. 203,831
Claims priority, application Japan, Aug. 27, 1987, 62-130799[U]
Int. Cl.[4] G11B *17/04*
U.S. Cl. 369—270 **5 Claims**

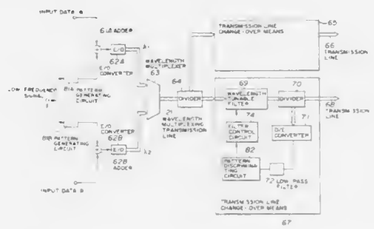


1. In a clamp mechanism for clamping an information recording disk having a clamper arranged to press and clamp an information recording disk against a turntable using a magnetic attractive force, the improvement wherein said clamper comprises: a retaining member vertically movable is attracted to said turntable by said magnetic attractive force, a ring-like pressing member having a diameter larger than that of said retaining member arranged to abut said information recording disk, and a plate spring member interconnecting said retaining member in such a manner that said retaining member and said pressing member are vertically movable relative to each other.

4,841,519
APPARATUS FOR DISCRIMINATING AN OPTICAL SIGNAL FROM OTHERS AND AN APPARATUS FOR TUNING AN OPTICAL WAVELENGTH FILTER USED IN THE SAME

Makoto Nishio, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 27, 1988, Ser. No. 212,384
Claims priority, application Japan, Jun. 26, 1987, 62-160624; Jan. 6, 1988, 63-1474
Int. Cl.[4] H04B *9/00*
U.S. Cl. 370—3 **6 Claims**



1. An apparatus for discriminating an optical signal from others comprising,

a plurality of adding means, each including an adder in which input data and a discriminating signal of a frequency lower than a signal band of said input data are added to produce an added signal,
a plurality of electric-optic converters, each converting one of said added signals into an optical signal of a predetermined wavelength different from others,
a wavelength multiplexer for multiplexing optical signals supplied from said plurality of electric-optic converters to produce an optical wavelengh division multiplexing signal which is propagated through a wavelength multiplexing transmission line,
a divider for dividing said optical wavelength division multiplexing signal into a plurality of optical wavelength division multiplexing signals, and
a plurality of transmission line change-over means, each supplying an optical signal of a predetermined wavelength to a corresponding transmission line and including a wavelength filter coupled to said divider for passing a optical signal of a wavelength selected from plural wavelengths therethrough, a circuit for detecting a discriminating signal included in said optical signal passed through said wavelength filter, and a circuit for controlling said wavelength filter in accordance with said discriminating signal detected in said circuit for detecting whereby a center wavelength of said wavelength filter is tuned to a predetermined tuning wavelength.

4,841,520
DATA TRANSMISSION SYSTEM WITH BUS FAILURE DETECTION SYSTEM

Lee W. Steely, Reinholds, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

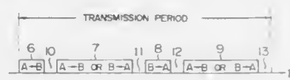
Continuation-in-part of Ser. No. 921,185, Oct. 21, 1986. This application Dec. 8, 1987, Ser. No. 130,247
Int. Cl.[4] H04J *3/14*
U.S. Cl. 370—13 **10 Claims**

1. In a multiplex system of the type comprising bus means; a central controller coupled to the bus means and comprising means for applying clock signals to the bus means, means for receiving data signals from the bus means, and means for applying data signals to the bus means; and a first remote station coupled to the bus means and comprising first means for maintaining a count of the clock signals and means for applying a first data signal to the bus means during a time period corresponding to a first selected count; and a second remote station coupled to the bus means and comprising second means for maintaining a count of the clock signals and means for receiving a second data signal from the bus means during a time period corresponding to a second selected count, the improvement comprising:
third means for detecting a failure of the bus means; and
fourth means, responsive to the third means, for preventing the clock signal from being carried at least to the second remote station during a detected failure of the bus means.

4,841,521
METHOD AND SYSTEM FOR BIDIRECTIONALLY TRANSMITTING DATA

Eiichi Amada, Kodaira; Hirotoshi Shirasu, Yokohama, both of Japan; Hiroshi Takatori, Ottawa, Canada; Tohru Kazawa, Kokubunji, Japan; Toshiro Suzuki, Tama, Japan; Takanori Miyamoto, Fuchu, Japan, and Tatsuya Kameyama, Hachioji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 28, 1987, Ser. No. 55,036
Claims priority, application Japan, May 28, 1986, 61-121009; Feb. 9, 1987, 62-26243
Int. Cl.[4] H04B *3/20, 1/56;* H04L *5/16*
U.S. Cl. 370—31 **14 Claims**

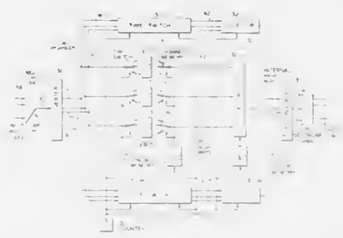


1. A method for bidirectionally transmitting data between two terminal stations through a transmission line by switching in time the direction of data transmission, comprising the steps of:
configuring a transmission signal frame with a first time section having a fixed transmission direction and a second time section having a variable transmission direction, wherein information data and transmission direction control data are transmitted during said first time section from one of the terminal stations to the other of the terminal stations;
detecting the transmission direction control data in said other of the terminal stations; and
determining the transmission direction for said second time section on the basis of the detected transmission direction control data.

4,841,522
TIME DIVISION CHANNEL SWITCHING CIRCUIT

Katsuyuki Yamazaki, Tanashi, Japan, assignor to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1988, Ser. No. 164,820
Claims priority, application Japan, Mar. 13, 1987, 62-56706
Int. Cl.[4] H04Q *11/04*
U.S. Cl. 370—64 **3 Claims**



1. In a time division channel switching circuit, in which a desired sub channel accommodated in a desired channel on an inputhighway, where n (an integer more than one) channels, each having m (an integer more than one) sub channels, have been time-division-multiplexed, is switched to a sub channel of a desired channel on a time-division-multiplexed output highway, the improvement comprising:
a serial-to-parallel converter whereby the input highway is converted into a plurality m of internal highways equal in number to paralleled sub channels;
time switches of the same number m as that of sub channels, each time switch having channel memories of the same

number as that of sub channels and each channel memory having a memory capacity separated into a plurality of blocks equal to the number n of channels;

selectors, each provided in correspondence to one of the time switches, for selecting a desired channel memory output of the corresponding time switch; and

a parallel-to-serial converter for time division multiplexing the output of each selector into the output highway;

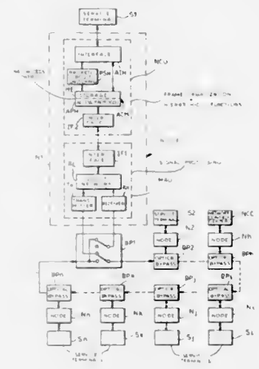
wherein the internal highways are supplied to all the time switches in parallel; the contents of the desired same address are read out of the respective channel memories in one of the time switches and a desired one of the channel memory outputs is selected by one of the selectors in correspondence to said one of the time switches.

4,841,523

METHOD OF ACCESSING LOCAL AREA NETWORKS WITH A UNIDIRECTIONAL RING TRANSMISSION LINE, AND LOCAL AREA NETWORK USING THIS METHOD

Daniele Roffinella, Moncalieri, and Maurizio Sposini, Turin, both of Italy, assignors to Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Dec. 23, 1987, Ser. No 137,801
Int. Cl.[4] H04J *3/26*
U.S. Cl. 370—89 24 Claims



1. A method of asynchronously accessing a high-speed local area network having a ring-transmission line along which a plurality of nodes are arranged with each node being capable of signal regeneration, said method comprising the steps of:

organizing information which is transmitted along said line into hybrid frames each having a circuit region in the form of a zone allotted to communications with information-continuity requirements and a packet region in the form of a zone allotted to communications which do not require continuity of information;

effecting asynchronous access of the individual nodes for circuit and packet transmission along said line in sequence to said line in a given order and maintaining said order in both the circuit region and the packet region of each of said frames; and

in the packet region of each frame, starting from an instant preceding by a predetermined time period the end of the frame, disabling the packet transmission of the node which has the right of transmission at that instant or of the nodes which would have the right of access from that instant to the end of the present frame, thereby avoiding overlapping between adjacent frames.

4,841,524

DIGITAL DATA MULTIPLE CONVERSION SYSTEM FOR CONVERTING DATA HAVING A FREQUENCY TO DATA HAVING ANOTHER FREQUENCY BY A DIGITAL STUFFING METHOD

Hirohisa Miyaou, Yokohama; Takahiro Furukawa, Oyama, and Toru Kosugi, Omiya, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 16, 1988, Ser. No. 169,217
Claims priority, application Japan, Mar. 16, 1987, 62-060424
Int. Cl.[4] H04J *3/04*
U.S. Cl. 370—112 6 Claims

1. A digital data multiplexing-demultiplexing system comprising:

a memory unit receiving and storing input data having a bit length of N, N being an integer;

a first frequency divider receiving an input clock having a first frequency and frequency-dividing the input clock by N to output a first frequency-divided signal;

a first pulse width expansion circuit connected to receive a plurality of frequency divided pulses which comprise at least start and end frequency divided pulses in a first predetermined frequency division period from the first frequency divider, receiving the input clock, and outputting a first pulse width expanded signal of the input clock, a pulse width thereof corresponding to a number of lost pulses of the input clock pulse plus one;

a circuit outputting a read clock having a second frequency near to the first frequency and stuffing the read clock;

a second frequency divider receiving the read clock and frequency-dividing the read clock by N to output a second frequency-divided signal;

a second pulse width expansion circuit connected to receive a plurality of frequency divided pulses which comprise at least start and end frequency divided pulses in a second predetermined frequency division period from the second frequency divider, receiving the read clock, and outputting a second pulse width expanded signal of the read clock, a pulse having a width corresponding to a number of lost pulses of the read clock pulses plus one;

a phase detector receiving the first and second pulse width expanded signals, and outputting a phase detection signal when phases of both pulse width expanded signals coincide; and

a stuffing request circuit receiving the phase detection signal, and outputting a stuffing request signal to the stuffing circuit,

the memory unit storing the input data in response to the first frequency-divided signal, and outputting the stored data to the stuffing circuit in response to the second frequency-divided signal, and

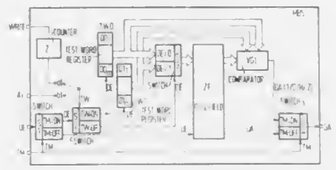
the stuffing circuit stuffing the read clock in response to the stuffing request signal.

4,841,525

METHOD AND ARRANGEMENT FOR TESTING MEGA-BIT MEMORY MODULES WITH ARBITRARY TEST PATTERNS IN A MULTI-BIT TEST MODE

Normen Lieske, Augsburg, and Werner Seichter, Unterföhring, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 5, 1987, Ser. No. 104,155
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1986, 3634352
Int. Cl.[4] G01R *31/28*
U.S. Cl. 371—21 6 Claims



1. A method for testing mega-bit memory modules in a multi-bit test mode with arbitrary test patterns, whereby at reading in a 1-bit datum the 1-bit datum is simultaneously mapped onto a cell group of m cells of the memory cell field described by the m-dimensional function

$$f(DE)=\{DE\}_{1,\ldots,m} \text{ with } DE\epsilon\{0,1\}$$

and whereby at reading out the cell contents of such a cell group the cell group is inversely mapped by the m-dimensional inverse function

$$f^{-1}(\{DA\}_{1,\ldots,m})=DA \text{ with } DA\epsilon\{0,1\}$$

to get the original datum,

reading in m data information (DE) bits individually into the mega-bit memory module (MBS) and combining such bits into an m-dimensional test word (TW0) in a test word register,

allocating the bit places of a test word (TW0) to the cells of an m-dimensional cell group, and

subsequently mapping the test word (TW0) or the negated test word (TW0) onto a cell group or onto a plurality of cell groups of the cell field (ZF).

4,841,526

DATA COMMUNICATIONS SYSTEM

Jon C. Wilson, 200 N. Maryland Ave., #301, Glendale, Calif. 91206-4236; David A. Shick, 27366 Compostela, Mission Viejo, Calif. 92692; Robert L. Haynie, 16181 Jasmine Way, Los Gatos, Calif. 95030; Donald R. Wilder, 525 Gabilan St. #8, Los Altos, Calif. 94022; Larry D. Zimmerman, 4504 Poinsettia, San Jose, Calif. 95136; Richard M. LeCour, 225 Massol Ave., Los Gatos, Calif. 95030, and D. James Guzy, 1340 Arbor Rd., Menlo Park, Calif. 94025

Continuation-in-part of Ser. No. 614,283, May 25, 1984, abandoned. This application Nov. 19, 1986, Ser. No. 932,926
Int. Cl.[4] G08C *25/02*
U.S. Cl. 371—32 10 Claims

1. A communication system comprising a first and a second station wherein data frames are transmitted from the first station to the second station through a first communication link, each data frame including data and an identification number, said data frames having a selected frame size, said identification numbers of the frames being in the sequential order of transmission to facilitate frame identification, said first station storing the data frames transmitted by the first station and said second station storing the data frames received by the second station, said second station transmitting through the first or a second communication link data groups including acknowledgement information relating to the identification members of data frames successfully received by the second station;

said first station storing the data frames in such manner that the identification numbers of the frames are within a variable range of identification numbers defining a first window having an upper and lower limit wherein the first station evaluates the acknowledgement information received from the second station to vary the upper and lower limits of the first window; and

said second station storing the data frames in such manner that the identification numbers of the frames are within a variable range defining a second window having an upper

and lower limit for a variable range of identification numbers of possible data frames from the first station acceptable to the second station, wherein said second station evaluates the data frames received from the first station to vary the upper and lower limits of the second window, the difference between the upper and lower limits of each window defining its size;

wherein at least one of the two stations is such that the size of the first or the second window is selectable according to the speed, length or error rate of the first or the first and second communication links or the frame size used in connection therewith to increase the efficiency in communication link utilization.

4,841,527

STABILIZATION OF RANDOM ACCESS PACKET CDMA NETWORKS

Dipankar Raychaudhuri, Kendall Park, and Kuriacose Joseph, Plainsboro, both of N.J., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 16, 1987, Ser. No. 121,423
Int. Cl.[4] G08C *25/02*; G06F *11/14*
U.S. Cl. 371—32 6 Claims

1. A method for transmitting information in a CDMA system, said method comprising:

initially transmitting information in a code division multiple access channel;

determining if said information has been correctly received;

retransmitting said information with a selected time delay if said information has not been correctly received; and

repeating said determining and retransmitting steps until said information is correctly received using different time

delays, said different time delays being random in duration, but together having an average duration selected in

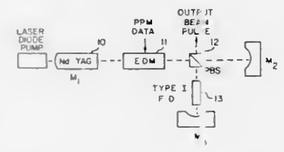
accordance with the occupancy of said channel to provide a single stability mode.

4,841,528

FREQUENCY DOUBLED, CAVITY DUMPED FEEDBACK LASER

Donald L. Sipes, Jr., Lisle, Ill., and Deborah L. Robinson, La Canada, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Sep. 6, 1988, Ser. No. 240,205
Int. Cl.[4] H01S *3/0*
U.S. Cl. 372—22 **10 Claims**



1. Apparatus for efficient frequency doubling while cavity dumping a pumped laser in a resonator cavity in order to produce modulated output light pulses comprising

a laser having a pumped gain medium in said resonator cavity for emitting light at a first frequency on a fixed axis between two mirrors,

modulating means placed between one of said two mirrors and said gain medium for deflecting light in said resonant cavity along a path at a fixed angle with respect to said fixed axis between said two mirrors in response to a cavity-dumping control signal,

a third mirror placed to receive resonant cavity light deflected by said modulating means and to redirect it back on the same path,

frequency doubling means placed in said deflected light path between said modulating means and said third mirror, and

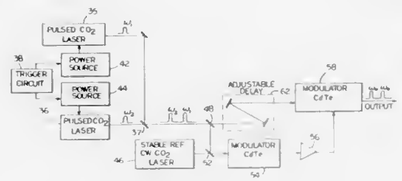
beamsplitting means placed between said frequency doubling means and said modulating means for separating out frequency doubled light as a modulated output pulse, and passing undoubled frequency light through said modulating means and said gain medium whereby light in said resonator cavity between said two mirrors experiences cavity dumping and frequency doubling while transmitting a modulated pulse of light reflected from said third mirror and redirection of undoubled frequency light into said resonator cavity while transmitting said modulated pulse of light for greater efficiency.

4,841,529

SYSTEM FOR GENERATING A STABLE OPTICAL FREQUENCY

Ali Javan, Cambridge, Mass., assignor to Laser Science, Inc., Cambridge, Mass.

Division of Ser. No. 915,652, Oct. 6, 1986, abandoned. This application Sep. 9, 1987, Ser. No. 94,423
Int. Cl.[4] H01S *3/13*
U.S. Cl. 372—32 **8 Claims**



1. In a system for generating stable optical pulses, the combination comprising

a first pulsed laser for generating a laser pulse subject to frequency variations,

a second pulsed laser for generating a laser pulse subject to frequency variations,

circuitry for causing the laser pulse generated by said second pulsed laser to occur a predetermined delay interval after the laser pulse generated by said first pulsed laser occurs,

a stable CW laser for producing a frequency stable reference output,

a beam-splitter for separating the laser pulses into first pulse portions and second pulse portions, the first pulse portions being spaced by said predetermined interval and the second pulse portions being spaced by said predetermined interval,

a mixer for combining said first pulse portions of the pulses from said first and second lasers with said frequency stable reference output to produce spaced beat frequency signals,

an amplifier for amplifying said spaced beat frequency signals,

a modulator, the amplified, spaced beat frequency signals being applied thereto, and

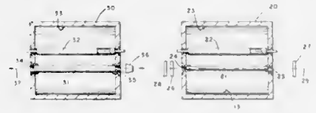
a path adapted to couple said second pulse portions of the pulses from said first and second lasers to said modulator, wherein said modulator produces output laser pulses that are coherent with respect to each other, are spaced by said predetermined interval, and have said frequency variations removed therefrom.

4,841,530

CR-DOPED SCANDIUM BORATE LASER

Bruce H. Chai, Bridgewater; Shui T. Lai, Florham Park, and Margaret N. Long, Landing, all of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Mar. 27, 1986, Ser. No. 845,215
Int. Cl.[4] H01S *3/16*
U.S. Cl. 372—41 **18 Claims**



1. A laser comprising:

a laser medium comprising a single crystal of $MBO_3:Cr^{3+}$,

where M is selected from the group consisting of scandium, indium and lutetium; and

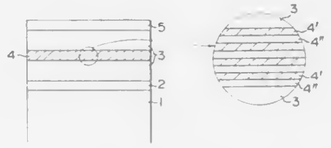
means for exciting the laser medium to emit coherent radiation.

4,841,531

SEMICONDUCTOR LASER DEVICE

Masahiko Kondow, Kokubunji; Shin Satoh, Iruma; Shigekazu Minagawa, Tokyo; Akio Ohishi, Tokyo, and Takashi Kajimura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 11, 1988, Ser. No. 155,058
Claims priority, application Japan, Feb. 12, 1987, 62-28207
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—43 **3 Claims**



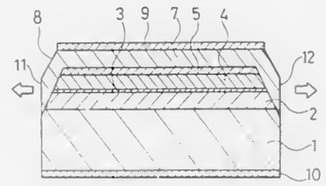
1. In a semiconductor laser device having a double hetero structure semiconductor laser, the improvement comprising said double hetero structure semiconductor laser comprising a cladding layer of $In_{1-x-y}Ga_xAl_yP_{1-z}As_z$ ($0 \leqq x \leqq 1$, $0 \leqq y \leqq 1$, $0 \leqq z \leqq 0.5$, $0.5 \leqq x+y \leqq 1$) and an active layer of a strained-layer superlattice of $In_{1-x-y}Ga_xAl_yP_{1-z}As_z$ ($0 \leqq x \leqq 1$, $0 \leqq y \leqq 1$, $0 \leqq z \leqq 1$, $0 \leqq x+y \leqq 1$) system.

4,841,532

SEMICONDUCTOR LASER

Hisao Kumabe, and Wataru Susaki, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Nov. 10, 1987, Ser. No. 119,340
Claims priority, application Japan, Nov. 13, 1986, 61-270695
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **10 Claims**



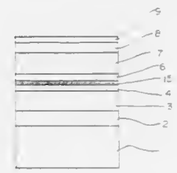
1. A semiconductor laser comprising sequentially disposed, on a first surface of a substrate, a first semiconductor cladding layer of a first conductivity type, an active semiconductor layer having a first band gap energy, a second semiconductor cladding layer of a second conductivity type opposite from said first conductivity type, and a semiconductor contacting layer of said second conductivity type, said first surface extending in generally perpendicular first and second directions, said second cladding layer, said active layer, and at least part of said first cladding layer having generally planar first and second ends, said ends lying in planes that are oblique to said first direction and generally parallel to said second direction, and a fifth semiconductor layer disposed at least on said ends, said fifth semiconductor layer being of said second conductivity type and having a second energy band gap larger than said first energy band gap, whereby a non-absorbing mirror structure is provided at each of said ends.

4,841,533

SEMICONDUCTOR LASER DEVICE HAVING A GRADED INDEX WAVEGUIDE

Toshiro Hayakawa, Nara; Takahiro Suyama, Tenri; Masafumi Kondo, Tenri; Kohsei Takahashi, Tenri, and Saburo Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 17, 1986, Ser. No. 920,585
Claims priority, application Japan, Oct. 24, 1985, 60-240162
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—45 **3 Claims**



1. In a semiconductor laser device containing a laser oscillation-operating area, the device wherein said laser oscillation-operating area comprises:

a superlatticed quantum well region which is composed of alternate layers consisting of GaAs layers and thin Al_x-$Ga_{1-x}As$ ($0 < x \leqq 1$) layers, each of said layers having a thickness of several molecular layers or less,

optical guiding layers consisting of $Al_yGa_{1-y}As$ ($x \leqq y \leqq 1$) and sandwiching said superlatticed quantum well region therebetween, the AlAs mole fraction (i.e., y) of each said optical guiding layers being continuously varied, and

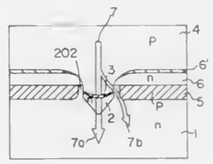
cladding layers superposed on said optical guiding layers, respectively.

4,841,534

BURIED TYPE SEMICONDUCTOR LASER DEVICE

Toshihiko Yoshida; Haruhisa Takiguchi, both of Tenri; Shinji Kaneiwa, Nara; Hiroaki Kudo, and Sadayoshi Matsui, both of Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 897,337, Aug. 15, 1986. This application Aug. 5, 1988, Ser. No. 229,212
Claims priority, application Japan, Aug. 21, 1985, 60-184650; Sep. 10, 1985, 60-201161; Sep. 11, 1985, 60-202463; Sep. 12, 1985, 60-203627; Sep. 19, 1985, 60-207869
Int. Cl.[4] H01S *3/19*; H01L *33/00*
U.S. Cl. 372—46 **3 Claims**



1. A buried type semiconductor laser device comprising:

a multi-layered epitaxial growth crystal including a striped laser-oscillation operating area on a semiconductor substrate, said laser operating area comprising a buffer layer having the same conductivity type as said substrate, an

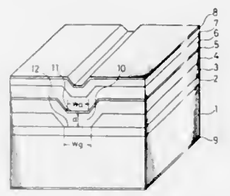
active layer, and a cladding layer having a conductivity type different from that of said substrate, wherein said laser-oscillation operating area is formed within a striped channel in the central area of said substrate and is sandwiched between one part of the burying layer and another part of the burying layer, which are formed by diffusing an impurity into the outside of the central area of said substrate, through the portion of said substrate positioned between said laser-oscillation operating area and each part of said burying layer, thereby electrically isolating said burying layer from said cladding layer.

4,841,535

SEMICONDUCTOR LASER DEVICE

Yutaka Mihashi; Yutaka Nagai, and Kenji Ikeda, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Aug. 11, 1988, Ser. No. 231,003
Claims priority, application Japan, Aug. 19, 1987, 62-205764
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—46 **6 Claims**



1. A semiconductor laser comprising a plurality of semiconductor layers serially disposed on a substrate of a first conductivity type including a first cladding layer of the first conductivity type, a current blocking layer of a second conductivity type opposite the first conductivity type and forming a rectifying junction with said first cladding layer, said current blocking layer including a longitudinal groove extending through said current blocking layer to said first cladding layer, the longitudinal groove having a transverse width along said first cladding layer, a second cladding layer of the first conductivity type disposed on said current blocking layer and in and having the configuration of the groove, a bent active layer disposed on said second cladding layer and having the configuration of the groove and spaced from said first cladding layer at said groove by the thickness of said second cladding layer, a third cladding layer of the second conductivity type, and a contacting layer of the second conductivity type, and first and second electrodes disposed on said substrate and said contacting layer, respectively, wherein a resonant cavity includes a portion of said bent active layer opposite the longitudinal groove, the width of the longitudinal groove at said first cladding layer is less than 2 microns, and the thickness of said second cladding layer at the longitudinal groove is greater than 0.6 micron.

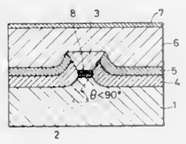
4,841,536

SEMICONDUCTOR LASER DEVICES

Aiko Ohishi, Kokubunji; Motohisa Hirano, Tokyo; Naoki Chinone; Shinji Tsuji, both of Hachioji; Hitoshi Nakamura, Kanagawa, and Hiroyoshi Matsumura, Saitama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 11, 1986, Ser. No. 850,685
Claims priority, application Japan, Apr. 12, 1985, 60-76745; Sep. 11, 1985, 60-199416; Feb. 28, 1986, 61-41773
Int. Cl.[4] H01S 3/19
U.S. Cl. 372—46 **6 Claims**

1. In a buried hetero structure semiconductor laser, a mesa stripe having an active layer and side surfaces disposed at an acute angle to a semiconductor substrate to form a trapezoidal-like shape on the semiconductor substrate of multi-layered structure, said active layer is buried to cover the sides and top of said trapezoidal-like mesa shape and at least one p-n junction



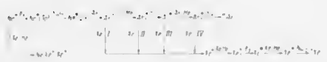
is disposed on both sides of said trapezoidal-like mesa stripe constituting a current blocking layer so that current flows only through said trapezoidal-like mesa stripe and at least one p-n junction interface is disposed between the narrowest part of said trapezoidal-like mesa shape and the upper end.

4,841,537

MEDIUM FOR GAS LASER EXCITED BY IONIZING PARTICLES

Andrei J. Alexandrov, ulitsa Volgina, 9, korpus 1, kv. 122; Viktor A. Dolgikh, ulitsa Dolgoprudnaya, 3, kv. 18; Oleg M. Kerimov, 2 Pugachevskaya ulitsa, 3,korpus 1, kv. 231; Alexei J. Samarin, ulitsa Ostrovityanova, 35a, kv. 147, all of Moscow; Igor G. Rudoi, ulitsa Sportivnaya, 7, kv.44, Moskovskaya oblast, Shatura, and Arkady M. Soroka, ulitsa Novatorov, 4, korpus 6, kv. 53, Moscow, all of U.S.S.R.

PCT No. PCT/SU88/00013, § 371 Date Sep. 27, 1988, § 102(e) Date Sep. 27, 1988, PCT Pub. No. WO88/05971, PCT Pub. Date Aug. 11, 1988
PCT Filed Jan. 15, 1988, Ser. No. 271,953
Claims priority, application U.S.S.R., Jan. 28, 1987, 4186717
Int. Cl.[4] H01S 3/22, 3/223
U.S. Cl. 372—55 **1 Claim**



1. A medium for a gas laser excited by ionizing particles, containing helium, neon, argon or krypton with a total concentration of more than 10^{19} cm^{-3}, with argon or krypton concentration ranging from $3 \cdot 10^{16}$ cm^{-3} to a value which amounts to 15% of the total concentration, and at least one more component selected from the group consisting of xenon, hydrogen, hydrogen isotope, or a mixture of these components in various combinations, the concentration of each of the components or of a mixture thereof being chosen from a range from 10^{15} cm^{-3} to a value which amounts to 20% of argon or krypton concentration.

4,841,538

CO_2 GAS LASER DEVICE

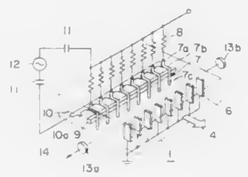
Satoru Yanabu, Machida; Hideomi Takahashi, Tokyo; Eiji Kaneko, and Koichi Yasuoka, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 21,850, Mar. 4, 1987. This application Nov. 10, 1988, Ser. No. 270,376
Claims priority, application Japan, Mar. 5, 1986, 61-31788[U]
Int. Cl.[4] H01S 3/22
U.S. Cl. 372—58 **5 Claims**

1. A CO_2 gas laser device for generating laser light through glow discharge of a gas containing CO_2 generated between anode and cathode electrodes disposed opposite to each other

in a resonant cavity for circulating laser gas flow, the glow discharge being coaxial with the gas flow comprising:

(a) a plurality of cathode electrodes disposed in a row extending across upstream of the gas flow, each of said cathode electrodes having a first portion extending transverse to the direction of the gas flow, a second portion extending transverse to the direction of the gas flow and offset transverse from said first portion of the cathode electrodes, said second portion being disposed downstream of said first portion with respect to said gas flow,



and third portion mutually connecting adjoining ends of said first and second portions,

(b) a turbulence generating member having a rectangular cross section and disposed upstream of the center portions of the second portion of the cathode electrodes at an appropriate distance and parallel to the cathode electrodes so as to cross the gas flow; and

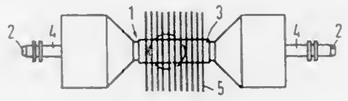
(c) a plurality of anode electrodes disposed transverse to the direction of the gas flow, parallel to the second portion of the cathode electrode, and downstream of and opposite to the cathode electrodes so as to cross the gas flow.

4,841,539

GAS LASER DISCHARGE TUBE WITH CERAMIC WAFERS AND COOLING WAFERS IN A STACK

Guenther Hahn, Hoehenkirchen; Hans Krueger; Herbert Lamprecht, both of Munich, and Werner Seiffarth, Bad Aibling, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 10, 1987, Ser. No. 37,202
Claims priority, application Fed. Rep. of Germany, May 2, 1986, 3614912
Int. Cl.[4] H01S 3/03
U.S. Cl. 372—63 **16 Claims**



1. In a gas laser, a discharge tube, comprising:

a stack of alternating ceramic wafers and cooling wafers, said stack including a discharge channel and at least one return channel,

said ceramic wafers lying radially closer to said discharge channel than said cooling wafers; and

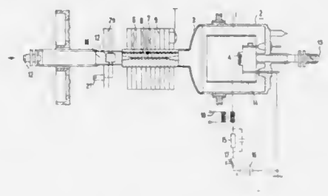
mirrors carried on said discharge tube aligned with said discharge channel for laser light resonance.

4,841,540

GAS LASER ARRANGEMENT

Hans Krueger, Munich; Herbert Lamprecht, deceased, late of Munich; by Thekla Lamprecht, heir; by Simon Lamprecht, heir, both of Landsberg/Lech, and Wilhelm Tiemann, Bubenreuth, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 28, 1988, Ser. No. 250,237
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1987, 3732637
Int. Cl.[4] H01S 3/097
U.S. Cl. 372—86 **6 Claims**



1. An improved gas laser arrangement having a discharge tube arranged between a cathode and anode, said discharge tube being provided with a discharge channel and at least one gas return channel, the improvement comprising:

an auxiliary electrode in a position relative to said cathode so that an ionization is possible therebetween, and

a resistor connecting said auxiliary electrode to an operating voltage source for generating an increased spatially extensive preionization discharge in a cathode space of said gas laser arrangement.

4,841,541

COUPLING OF RING LASERS

Edward A. Sziklas, Glastonbury, and John A. Benda, Amston, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 20, 1988, Ser. No. 221,857
Int. Cl.[4] H01S 3/083
U.S. Cl. 372—94 **12 Claims**

1. A laser system comprising:

a first ring laser resonator having a first gain medium means for establishing an inverted population state in a first gain medium;

a first set of mirrors in a ring configuration for resonating, in predetermined radially diverging forward and reverse modes and predetermined radially converging adjoint reverse and adjoint forward modes, radiation in a first ring path passing through said gain medium, said radiation in said forward and adjoint forward modes travelling in a predetermined forward direction about said ring path and said radiation in said reverse and adjoint reverse modes travelling about said first ring path in a reverse direction

opposite to said forward direction, said adjoint forward mode being adjoint to said forward mode and said adjoint reverse mode being adjoint to said reverse mode;

first outcoupling means for extracting radiation travelling in said forward mode in said first ring path from said first ring path;

internal coupling means for coupling a predetermined coupling fraction of said radiation in one of said forward and reverse modes into a first predetermined radially converging mode adjoint to the other of said forward and reverse modes and travelling about said first ring path in a direction opposite to that of said one of said forward and reverse modes, whereby said radiation in said first predetermined radially converging mode converges radially and couples into said other of said forward and reverse modes; and

means for coupling into said ring path a second predetermined amount of external coupling radiation into a predetermined radially converging mode adjoint to said one of said forward and reverse modes, whereby said external coupling radiation converges radially and couples in phase said one of said forward and reverse modes and said one of said forward and reverse modes phase couples through said internal coupling means said other of said forward and reverse modes, so that all of said predetermined modes of said ring laser resonator are coupled in phase to said external coupling radiation.

4,841,542

ELECTRIC FURNACE ARRANGEMENT

Ernst Zajicek, Ottensheim; Ernst Riegler, Enns, and Johann Mühlbauer, Leonding, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed May 12, 1988, Ser. No. 193,735
Claims priority, application Austria, May 15, 1987, 1233/87
Int. Cl.[4] H05B 7/02
U.S. Cl. 373—73 **14 Claims**

1. In an electric furnace arrangement, such as an electric arc furnace or a plasma furnace, of the type including

a furnace platform,

a furnace vessel arranged on said furnace platform,

a furnace lid covering said furnace vessel,

a lid supporting framework pivotably mounted lateral of said furnace vessel for lifting, lowering and pivoting said furnace lid and including at least one lid bracket, a lid lifting mechanism for lifting and lowering said furnace lid and a lid pivoting mechanism for pivoting said furnace lid from a position above said furnace vessel into a position lateral of said furnace vessel and back, the improvement comprising oscillating crank means including a first oscillating crank hinged to said lid supporting framework pivotably connecting said lid supporting framework to said furnace platform, and a second oscillating crank provided hinged to said lid supporting framework, said supporting framework constituting a coupler to said furnace platform, thereby forming a four-bar linkage, whereby said four-bar linkage enables the lid-supporting framework to undergo a pivoting and swing motion when removing and returning said furnace lid.

4,841,543

PROBE FOR MEASURING THE THERMAL CONDUCTIVITY OF MATERIALS

André Dittmar; Georges Delhomme; Bernard Roussel, and Joseph Chatonnet, all of Lyons, France, assignors to Centre National De La Recherche Scientifique (C.N.R.S.), Paris, France

Filed Oct. 17, 1986, Ser. No. 920,241
Claims priority, application France, Oct. 23, 1985, 8515932
Int. Cl.[4] G01N 25/18
U.S. Cl. 374—44 **12 Claims**

1. A probe for measuring the thermal conductivity of materials, comprising:

a support plate made of electrically and thermally insulating matter and having a surface defining a face of application thereby said support plate has on said surface defining said face of application a median conducting measurement zone (Z1) divided into a first plurality of heat conducting sections and at one reference measurement zone (Z2) divided into a second plurality of heat conducting sections, and whereby said median conmeasurement zone (Z1) is separated from said reference measurement zone (Z2) by at least one depression in said surface of said support plate defining said face of application so as to limit the thickness of said support plate in an area between said median conducting measurement zone (Z1) and said reference measurement zone (Z2) thereby reducing thermal conduction through the face of the probe;

a plurality of thermocouples comprised of interjunction connecting conductors and disposed on a portion of said support plate on said surface defining said face of application, each thermocouple having at least one hot junction and at least one cold junction, wherein said thermocouples connect said first plurality of sections of said median conducting measurement zone (Z1) and said second plurality of sections of said reference measurement zone (Z2) in series, and wherein said hot junctions are disposed on said first plurality of sections and said cold junctions are disposed on said second plurality of sections;

a heating element of planar shape disposed on said support plate at said median conducting measurement zone (Z1) and laterally offset from a plane corresponding to said face of application;

a coating of electrically insulating matter having heat conducting particles and disposed on said median conducting measurement zone (Z1) with said heating element and on said reference measurement zone (Z2);

a plurality of conductors disposed on said surface of said support plate opposite to said surface defining said face of application and connecting said heating element and said thermocouples to external driving circuitry; and

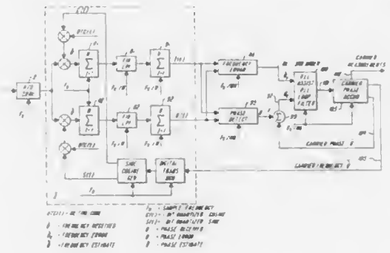
a covering of electrically and thermally insulating matter disposed on said surface of said support plate opposite to said surface defining said face of application and enclosing said plurality of thermocouples and said plurality df said conductors.

4,841,544

DIGITAL DIRECT SEQUENCE SPREAD SPECTRUM RECEIVER

Peter Nuytkens, Watertown, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed May 14, 1987, Ser. No. 50,224
Int. Cl.[4] H04K 1/00
U.S. Cl. 375—1 **12 Claims**



1. An improved direct sequence spread spectrum receiver for receiving and demodulating a transmitted RF carrier radio signal modulated in accordance with a transmitted code having a fundamental frequency, said radio signal being further characterized by a Doppler shift, wherein the receiver comprises

means for receiving said radio signal,

IF converter means for converting said received radio carrier signal to an IF converted signal centered about an intermediate frequency f_o corresponding to said code fundamental frequency offset by said Doppler shift,

N-bit analog to digital sampling means for sampling said IF converted signal at a sampling frequency f_s thereby forming a digitized IF converted signal including a succession of N-bit digital signals,

local IF means for developing digital local if signals, such means including

(i) means for generating digital sin (f_o) and cos(f_o) signals at said sampling frequency f_s

(ii) code generating means for generating a local code at said sampling frequency

(iii) means for multiplying the local code times each said sin(f_o) and cos(f_o) signal to obtain said local IF signals,

correlator means for correlating the digitized IF converted signal with the local IF signals so as to develop in phase and quadrature components signals, and

tracking means, responsive to the in phase and quadrature component signals for changing the sampling frequency to maintain it substantially equal to a multiple of the frequency of the digitized IF converted signal.

4,841,545

SYNCHRONOUS TRACKING DEVICE FOR DIRECT SPREAD SPECTRUM RECEIVER

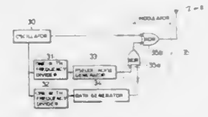
Akihiko Endo; Shigeki Takeda, and Hiroshi Takeda, all of Tokyo, Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Jul. 21, 1987, Ser. No. 76,185
Claims priority, application Japan, Aug. 6, 1986, 185819
Int. Cl.[4] H04B 15/00
U.S. Cl. 375—1 **24 Claims**

7. A receiver tracking circuit for a direct-spread spectrum system in which a received signal derives from a transmitter carrier modulated by a data signal and spread by a coherent pseudonoise (PN) signal, comprising:

initial tracking means for locking on the coherent PN signal in the received signal, including shared controlled oscillator means having first and second feedback inputs, for generating a local carrier, and a local PN generator synchronized to the local carrier for generating a local PN signal to be locked onto the coherent PN signal, and PN tracking error detector means for providing a first error signal coupled as a first correction signal to the first feedback input;

despreading means for applying the local PN signal to the received signal to produce a despread signal;



final tracking means for locking on the despread signal, including the shared controlled oscillator means, the local carrier of which is to be locked on the despread signal, and phase error detector means for providing a second correction signal to the second feedback input; and

control means for holding the first correction signal at its current value and starting the final tracking means when the initial tracking means has locked on the coherent PN signal.

4,841,546

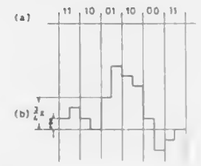
Patent Not Issued For This Number

4,841,547

DIGITAL COMMUNICATION SYSTEM

Fumio Ikegami, 5-7010 Yuniumi Manshion, 34-10 Kohatauchibata, Uji-shi, Kyoto-fu; Susumu Yoshida, Kyoto; Tsutomu Takeuchi, Kyoto, and Sirikiat Ariyavisitakul, Kyoto, all of Japan, assignors to Fumio Ikegami and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed May 8, 1987, Ser. No. 47,319
Claims priority, application Japan, May 13, 1986, 61-111673
Int. Cl.[4] H04L 27/18
U.S. Cl. 375—53 **3 Claims**



1. A digital communication system having an improved transmission bit error rate of multi-valued information symbols transmitted through a multipath environment having two transmission paths with different transmission propagation times, said multi-valued information symbols representing at least four states, said digital communication system comprising:

information symbol input means for receiving said multivalued information symbols;

carrier wave input means for receiving a carrier wave signal;

modulating means for shifting a phase of said carrier wave signal in response to said multi-valued information symbols input by said information symbol input means during a predetermined time interval, said phase shift of said carrier wave signal including two equal phase shifts occurring during respective first and second halves of said predetermined time interval, said two equal phase shifts being in the same direction and having a predetermined magnitude corresponding to respective ones of said multivalued information symbols, said modulating means out-

putting said shifted carrier wave signal as a modulated output signal;

transmitting means for transmitting said modulated output signal from said modulation means through both paths of said multipath environment;

receiving means for receiving said transmitted signal from both paths of said multipath environment, said receiving means including means for dividing said received signal into two received output signals ; and

demodulating means for delaying, by ½ of said predetermined time interval, one of two received output signals and multiplying the delayed signal by the other one of said two received output signals and integrating the result thereof so that the original binary information signal can be obtained.

4,841,548

METHOD AND APPARATUS FOR EXTRACTING AN AUXILIARY DATA CLOCK FROM THE CLOCK AND/OR THE CLOCK-PHASE OF A SYNCHRONOUS OR PLESIOCHRONIC DIGITAL SIGNAL

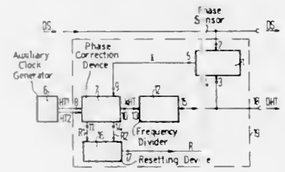
Wilhelm Volejnik, Sauerlach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 4, 1987, Ser. No. 116,663

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1986, 3640431

Int. Cl.⁴ H04L *7/02*

U.S. Cl. 375—110 **14 Claims**



4. Apparatus for extracting an auxiliary data clock (DHT) from the clock of a digital signal (DS), comprising:

a fixed frequency auxiliary clock generator for generating an auxiliary clock (HT) having a fixed frequency;

a phase sensor for receiving and sensing the phase difference between the digital signal (DS) and the auxiliary clock (DHT) and producing a correction signal (K);

a phase correction device connected to said auxiliary clock generator and to said phase sensor and operable to select a fixed frequency clock generated by the auxiliary clock generator to produce a corrected auxiliary clock (kHT) as the auxiliary data clock (DHT).

4,841,549

SIMPLE, HIGH PERFORMANCE DIGITAL DATA TRANSMISSION SYSTEM AND METHOD

Stephen L. Knapp, 1776 Oakdale St., Pasadena, Calif. 91106

Filed Mar. 21, 1988, Ser. No. 170,551

Int. Cl.⁴ H04L *7/04*

U.S. Cl. 375—111 **8 Claims**

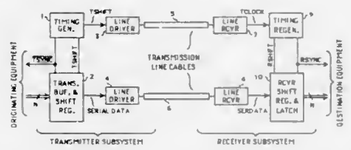
1. A communication system for transmitting data from a sending station to a receiving station comprising:

first channel means for carrying message timing information from the sending station to the receiving station;

at least one second channel means for carrying message data information from the sending station to the receiving station;

means for transmitting timing signals from the sending station to the receiving station over the first channel means at a frequency which may be varied over a predetermined range in accordance with at least one characteristic of the first and second channel means; and

means for transmitting data signals from the sending station to the receiving station over the second channel means at said frequency, the data signals representing data words;



the means for transmitting timing signals including means for interrupting the timing signals following each group of data signals to indicate the end of each corresponding word.

4,841,550

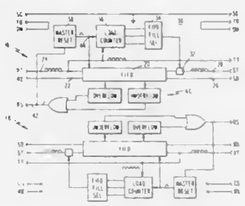
UNIVERSAL NULL DTE

Michael George; Lyndon G. Pierson, and Mark E. Wilkins, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 9, 1987, Ser. No. 118,075

Int. Cl.⁴ H04L *7/00*

U.S. Cl. 375—118 **17 Claims**



1. In a multi-segment communication network having at least two segments, each segment having a clock source for generating a data communication rate and data communication equipment (DCE) for communicating with another segment, the improvement comprising:

data terminal equipment means for interfacing between two segments of the communication network;

said terminal equipment means including: first input means for receiving receive clock signals from a first DCE in a first segment;

buffer means for receiving data from the first DCE, second input means for receiving send clock signals from a second DCE in a second segment;

transmitting means for transmitting data from said buffer means to the second DCE responsive to said send clock signals generated by said second DCE; and

preload means for loading said buffer means to a predetermined selectable level prior to activating said transmitting means to transmit said data to said second DCE;

said preload means including:

gating means for permitting said send clock signals from the second DCE to activate said buffer means to provide stored data to said transmitting means; and

enabling means operable for enabling said gating means to pass said send clock signals from the second DCE to said buffer means only after said buffer means has been filled to a selected level.

4,841,551

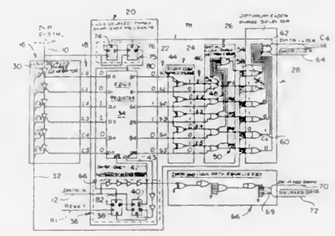
HIGH SPEED DATA-CLOCK SYNCHRONIZATION PROCESSOR

Napoleon G. Avaneas, Kings Park, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation of Ser. No. 7,504, Jan. 5, 1987, abandoned. This application Jun. 6, 1988, Ser. No. 205,582

Int. Cl.⁴ H04L *7/00;* **H03K** *5/00;* **H03D** *3/24*

U.S. Cl. 375—118 **7 Claims**



1. A synchronizing circuit for generating a data clock from a local clock, the circuit comprising:

multiple tap active delay line means connected to the local clock for generating delayed clock phases constituting a first signal set;

means connected at its input to the first set for sampling the clock phases during a preselected timing interval following receipt of data by the circuit to produce second signal set, the sampling means comprising:

(a) a register having inputs connected to respective clock phases;

(b) means enabled by a reset signal and triggered by initial incoming data for strobing the register to enable writing of the first set from the register and producing the sampled clock phases continuously regardless of subsequent input data;

means for selecting an optimum clock phase by detecting the occurrence of a preselected transition in a sampled clock phase; and

terminal means connected to an output of the selecting means for making available the optimum clock phase as a data clock during the time period when data is received, the selecting means including a plurality of gates, each gate having

(a) a first input connected to a corresponding delayed clock phase at the delay line means; and

(b) second and third inputs connected to sequentially adjacent signals of the second set for determining which delayed clock phase has undergone a desired transition during a sampling interval thereby representing an optimum phase;

the selecting means further including digital summing means connected at its input to the outputs from all the gates for producing the delayed optimum clock phase as a data clock.

4,841,552

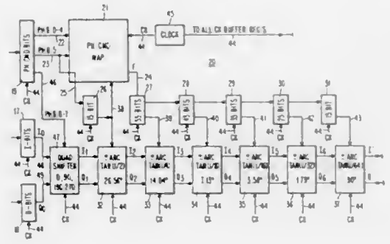
DIGITAL PHASE SHIFTER

Samuel C. Kingston, Salt Lake City, Utah, assignor to Unisys Corporation, Blue Bell, Pa.

Filed Apr. 4, 1988, Ser. No. 177,283

Int. Cl.⁴ H03K *5/153, 5/135*

U.S. Cl. 377—43 **8 Claims**



1. A digital phase shifter comprising:

a phase command register for receiving phase commands in the form of a digital number,

an inphase register and a quadrature register for receiving real and imaginary components of a complex number representative of base band data,

a quadrature shifter coupled to said inphase and quadrature registers and to said phase command register for shifting the phase of said real and imaginary components,

command map means coupled to said phase command register for receiving a phase command and for generating a plurality of plus and minus phase shift command bits,

a plurality of plus or minus phase shifters coupled to said plus or minus phase shift command bits and to the output of said quadrature shifter, and

said plurality of plus or minus phase shifters being connected in series to perform plus or minus phase shifts of predetermined angles that diminish by a factor of approximately one-half from the previous phase shift angle.

4,841,553

METHOD OF AND APPARATUS FOR CARRYING OUT TOMOGRAPHY

Hideo Nagai, Tokyo, Japan, assignor to Yokogawa Medical Systems, Limited, Tokyo, Japan

PCT No. PCT/JP86/00496, § 371 Date May 19, 1987, § 102(e) Date May 19, 1987, PCT Pub. No. WO87/02158, PCT Pub. Date Apr. 9, 1987

PCT Filed Sep. 27, 1986, Ser. No. 57,970

Claims priority, application Japan, Sep. 30, 1985, 60-216778

Int. Cl.⁴ G06F *15/42*

U.S. Cl. 378—19 **3 Claims**

1. A method of carrying out tomography, comprising the steps of

rotation a radiation source and a multichannel radiation detector about a subject to be examined, said radiation source being disposed so as to generate a fan beam of radiant rays, said multichannel radiation detector having an offset arrangement and being disposed in opposition to said radiation source with said subject being interposed therebetween;

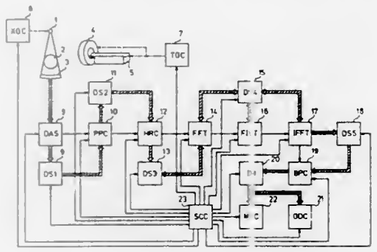
applying said fan beam of radiant rays in a direction parallel with a chosen section of said subject;

measuring said chosen section of said subject in a plurality of directions parallel therewith so as to obtain data representative of a distribution of intensity of transmitted radiant rays;

obtaining measurement data in the form of an array corresponding to said fan beam in respective directions; and

reconstructing a tomogram of said subject from said mea-

surement data, wherein a set of da a is obtained based on radiant ray beams advancing in an opposite direction along the same paths as those of adiant rays providing said measurement data, then the et of data is inserted



between an adjacent corresponding set of measurement data prior to convolution or filtering to thereby increase the amount of measurement data, and then reconstructing an image using the increased amount of measurement data.

4,841,554

X-RAY SCANNER FOR INSPECTING ARTICLES MOVING THERETHROUGH

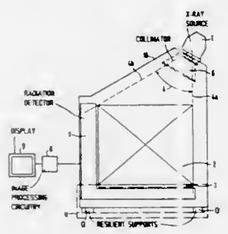
Gerhard Doenges, Heidenrod-Kemel; Rolf Dietrich, Hofheim; Helmut Thoma, Mainz, and Eckart-Alfred Von Unger, Munich, all of Fed. Rep. of Germany, assignors to Heimann GmbH, Wiesbaden, Fed. Rep. of Germany

Filed Feb. 29, 1988, Ser. No. 161,991

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1987, 8703674

Int. Cl.[4] G01N *23/04*

U.S. Cl. 378—57 **2 Claims**



1. An x-ray scanner comprising:

an x-ray source which generates an x-ray beam emanating from a focus;

a collimator disposed with respect to said x-ray source for collimating said x-ray beam to generate a fan-shaped x-ray beam;

means for conveying a series of articles to be inspected through said fan-shaped x-ray beam;

a radiation detector disposed for receiving radiation from said x-ray beam attenuated by said articles and generating electrical signals corresponding to the intensity of the received radiation;

means for generating a visual image of said articles based on said signals;

a rack on which at least said means for conveying is mounted;

a frame to which said x-ray source, said collimator and said radiation receiver are mounted, said frame being resistant to flexural and torsional stresses; and

resilient means disposed between said frame and said rack for mounting said frame to said rack to substantially insulate said frame and the components mounted thereon from mechanical stresses caused by the operation of said means for conveying.

4,841,555

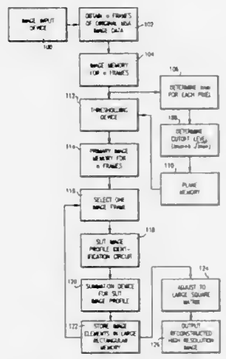
METHOD AND SYSTEM FOR REMOVING SCATTER AND VEILING GLATE AND OTHER ARTIFACTS IN DIGITAL RADIOGRAPHY

Kunio Doi, Willowbrook, and Yuichiro Kume, Clarendoo Hills, both of Ill., assignors to University of Chicago, Chicago, Ill.

Filed Aug. 3, 1987, Ser. No. 81,001

Int. Cl.[4] H05G *1/64*

U.S. Cl. 378—99 **18 Claims**



8. A system for reconstructing an image obtained from plural sequential exposures of an object by a radiation source comprising:

multiple slit beam scanning means positioned between the source and the object for exposing said object with radiation emanating from said source and passing through said scanning means;

means for performing plural successive image acquisition steps in which successive frames of original image data each in the form of plural pixels are acquired at said plural successive image data acquisition steps during relative movement of said source and said scanning means;

means for determining for each pixel a minimum value (I_{min}) of image data acquired during the successive image data acquisition steps;

means for comparing the image data of each pixel acquired for each frame with a comparison cutoff value which bears a predetermined relationship to the minimum pixel value for that frame;

means for summing for each pixel all of the values of original image data which exceed said cutoff value for all of said frames of original image data; and

means for outputting a reconstructed image data based at least in part on the sums produced by said summing means.

17. A system for reconstructing an image obtained from plural sequential exposures of an object by a radiation source, comprising:

multiple slit beam scanning means positioned between the source and the object for exposing the object with radiation emanating from said source and passing through said scanning means;

means for producing relative movement between the source and the scanning means;

means for performing plural successive image acquisition steps in which successive frames of original image data each in the form of a matrix of plural pixels are acquired at each of said plural image data acquisition steps upon relative movements of said source and said scanning means;

said scanning means having a slit beam width selected to be narrower than a pixel size of the pixel matrix at an image plane of said means for performing plural image acquisition steps;

means for producing based on said original image data a series of image data derived from radiation passing through a common slit of the scanning means in consecutive image acquisition steps;

means for forming an enlarged pixel matrix by assigning said series of image data to a respective series of adjacent pixels arranged in a direction perpendicular to the scanning beams of said scanning means in the enlarged pixel matrix; and

means for forming an image based at least in part on said series of image data assigned in said enlarged pixel matrix.

4,841,556

PLASMA X-RAY SOURCE

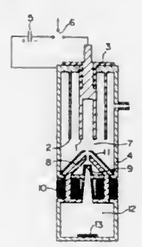
Yasuo Kato, Zama; Isao Ochiai, Hachioji; Yoshio Watanabe, Tokyo, and Seiichi Murayama, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 10, 1987, Ser. No. 12,992

Claims priority, application Japan, Mar. 7, 1986, 61-48258

Int. Cl.[4] H01J *35/00*

U.S. Cl. 378—119 **5 Claims**



1. A plasma X-ray source comprising:

an inner cylindrical electrode;

an outer cylindrical electrode disposed coaxially with the inner cylindrical electrode, with a desired gap therebetween;

an electrically insulating member provided between the inner cylindrical electrode and the outer cylindrical electrode so that breakdown occurs along a surface of said electrically insulating member when high voltage is applied between the electrodes;

a discharge vessel containing the inner and outer cylindrical electrodes therein and filled with a gas selected from a group consisting of neon, argon, kyrpton and xenon and mixtures thereof, said gas being convertible into a plasma; and

means for applying a pulse voltage between the inner and outer cylindrical electrodes so that the inner cylindrical electrode is at a negative potential with respect to the outer cylindrical electrode, to generate the plasma within the discharge vessel.

4,841,557

X-RADIATOR WITH CIRCULATING PUMP FOR HEAT DISSIPATION

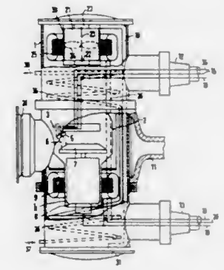
Klaus Haberrecker, Bubenreuth, and Rainer Roth, Dormitz, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 6, 1986, Ser. No. 915,704

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1985, 8531503[U]

Int. Cl.[4] H01J *35/10*

U.S. Cl. 378—141 **17 Claims**



1. An x-radiator having a housing containing heat-emitting components, an insulating fluid filling the interior of said housing surrounding said components, and a pump means mounted integrated with said housing in fluid communication with the interior of said housing for circulating said fluid for at least partially dissipating the heat from said components, said pump means including a fluid mover, a first port disposed at one end of said housing proximate said fluid mover, and a second port disposed at an opposite end of said housing, said fluid mover being connected to said second port by a conduit integrated with said housing to move said fluid over said components in one direction between said ports.

4,841,558

FRONT PLATE FOR X-RAY CASSETTES

Shoji Kaneko, Saitama, and Atsumi Nakamura, Chiba, both of Japan, assignors to Somar Corporation, Tokyo, Japan

Filed Sep. 10, 1987, Ser. No. 94,784

Claims priority, application Japan, Sep. 10, 1986, 61-138829[U]

Int. Cl.[4] B32B *5/12*; G03B *42/04*

U.S. Cl. 378—182 **9 Claims**

1. An x-ray film cassette comprising:

a front plate;

a frame extending from the periphery of said front plate; and

a rear plate coupled to said frame; said front plate comprising an intermediate layer made up of synthetic fiber reinforced resin layers, two outer layers made up of carbon fiber reinforced resin layers, said two outer layers being laid on the outer surfaces of said intermediate layer, respectively and two outermost layers made up of synthetic fiber reinforced resin layers, said two outermost layers

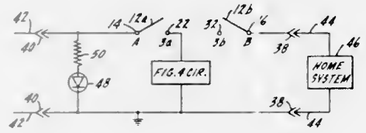
being laid on the outer surfaces of said outer layers, respectively, thus forming a multi-layer structure.

4,841,559

TELEPHONE NETWORK INTERFACE TESTER

Guy T. Curtis, Ashburnham, Mass., assignor to TriTech Laboratories, Inc., North Andover, Mass.

Filed Apr. 29, 1988, Ser. No. 187,959
Int. Cl.[4] H04M *1/24*
U.S. Cl. 379—27 **20 Claims**



1. A device for interposing in a multiple conductor telephone service line for testing the service line and a telephone network attached to the service line comprising:

a. connector means for connecting the device in circuit between the telephone service line and the telephone network,

b. first circuit means for testing said service line, including an amplifier for amplifying electrical signals on said service line and a transducer connected to said amplifier to produce an audible representation of said amplified electrical signals,

c. second circuit means for testing said telephone network, including indicator means for identifying a plurality of conditions of said telephone network, and

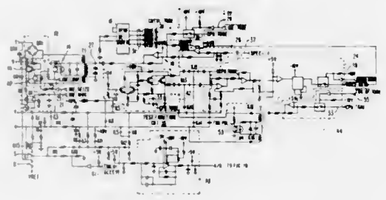
d. means for switching between said first and second circuit means.

4,841,560

DIRECT ACCESS TEST UNIT FOR CENTRAL OFFICE

Aaron Chan, Moorpark; Ben Pierce, Thousand Oaks, and Leslie Shafto, Camarillo, all of Calif., assignors to Harris Corp., Melbourne, Fla.

Filed Oct. 16, 1987, Ser. No. 109,164
Int. Cl.[4] H04B *3/46*
U.S. Cl. 379—29 **30 Claims**



1. A direct access test unit to be connected in a telephone office for testing subscriber lines in response to commands from a remote telephone facility comprising:

a first access port coupled to an access line circuit by way of which said remote telephone facility communicates with said telephone office in the course of testing subscriber lines;

a second access port, coupled to a test trunk circuit, by way of which a subscriber line is placed in a prescribed electrical test condition by said test unit in accordance with a prescribed test to be conducted on said subscriber line circuit; and

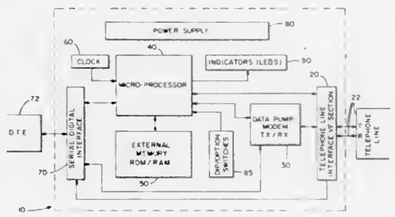
subscriber line test means, coupled to said first and second access ports, and responsive to a command supplied from said remote telephone facility via said access line circuit to said first access port, representative of a command to conduct a test of the subscriber line circuit to which said remote telephone facility is connected, for placing said subscriber line circuit in a prescribed electrical test condition via said second access port in accordance with a prescribed test of said subscriber line circuit.

4,841,561

OPERATING DEFAULT GROUP SELECTABLE DATA COMMUNICATION EQUIPMENT

Gregory P. Hill, Naugatuck, Conn., assignor to General DataComm, Inc., Middlebury, Conn.

Filed Dec. 8, 1987, Ser. No. 129,983
Int. Cl.[4] H04M *1/26, 11/00*
U.S. Cl. 379—97 **17 Claims**



1. A data communication apparatus for use in a plurality of countries having at least one different operating parameter, comprising:

(a) receiving means for receiving signals communicated over a communications channel;

(b) transmitting means for transmitting signals out over a communications channel;

(c) a memory means for storing the predetermined values of at least one operating parameter including at least one hardware related operating parameter for a plurality of countries;

(d) means for changing a hardware configuration of said data communication apparatus in accord with said at least one hardware related parameter value; and

(e) processing means connected to said receiving means, said data transmitting means, said means for changing the hardware configuration, and said memory means, said processing means being arranged

to process said received signals and send relevant information to a data terminal,

to obtain signals from a data terminal, process the obtained signals, and send relevant information to said data transmitting means, and

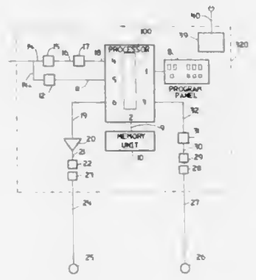
to obtain parameter values stored in said memory means, said parameter values permitting said processing means to cause said means for changing the hardware configuration to assume a proper configuration so as to permit said data communication apparatus to function in accord with the operating parameter requirements of the country in which said data communication apparatus is to be used.

4,841,562

TELEPHONE VCR CONTROL

Steven Lem, 3711 Brayton Ave., Long Beach, Calif. 90807

Filed Jul. 24, 1987, Ser. No. 77,439
Int. Cl.[4] H04M *11/00*; J04Q *9/00*
U.S. Cl. 379—104 **4 Claims**



1. A processor based controller for a video cassette recorder, comprising:

a transceiver means to electrically connect to a telephone line to transmit or receive signals,

a converter means to convert Touch Tone signals to digital words,

an amplifying means to increase said processor's signal to an infrared light emitting device.

an infrared light emitting device coupled to a first fiber optic assembly which transfers said diode's light output to the VCR's remote sensor,

a light detecting and quantifying means to receive light transferred by a second fiber optic assembly from the VCR's channel display, and to convert its intensity into a digital word, and a memory unit for storing programmed functions of the controller,

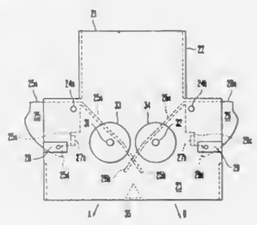
a data entry means for entering codes to modify the processor's operations to suit different types of VCR.

4,841,563

BUCKET TYPE COIN ACCUMULATION APPARATUS

Yoshii Sano; Hideo Totsu, and Toshiharu Morihisa, all of Tokyo, Japan, assignors to Tamura Electric Works, Ltd., Tokyo, Japan

Filed Dec. 18, 1987, Ser. No. 135,006
Claims priority, application Japan, Jan. 12, 1987, 62-3271
Int. Cl.[4] H04M *17/02*
U.S. Cl. 379—150 **9 Claims**



1. A bucket type coin accumulation apparatus comprising:

a collection plate and a return plate, both of which constitute a bottom portion of a coin accumulation bucket and cooperate to randomly accumulate coins in said coin accumulation bucket;

locking means for independently locking said collection plate and said return plate when a coin is inserted;

biasing means for independently urging said collection plate and said return plate in a counter-gravity direction by a biasing force smaller than a weight of one coin and for causing said collection and return plates to wait at home positions, respectively;

detecting means for detecting whether said collection plate and said return plate are located at the home positions of said collection plate and said return plate defined by biasing by said biasing means; and display means for displaying an out-of-order state when said detecting means detects in the initial state without any coin deposited that neither said collection plate nor said return plate is located at the home position;

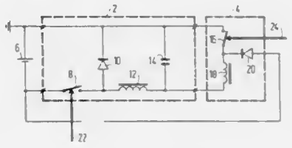
whereby one of said collection plate and said return plate is released by the weight of the accumulated coin upon selective unlocking of said locking means to selectively collect or return the accumulated coin, and the presence/absence of coin accumulation is discriminated by an output from said detecting means.

4,841,564

DC-SUPPLY ARRANGEMENT FOR A TELECOMMUNICATION LINE

Franciscus A. C. M. Schoofs, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 17, 1987, Ser. No. 63,341
Claims priority, application Netherlands, Jul. 8, 1986, 8601774
Int. Cl.[4] H04M *19/00*
U.S. Cl. 379—413 **4 Claims**



1. An improved switched-mode DC power supply circuit for a telecommunications line on which common mode currents may occur, such circuit being connectable to a DC source having a pair of terminals one of which is earthed and the other of which is a DC supply voltage terminal, such circuit having a pair of output terminals between which an output capacitor is connected, a terminal of said capacitor being directly connected to said earthed terminal of said DC source, said capacitor being charged from said supply voltage terminal by a first switched DC converter comprising a first switching element which is periodically switched by a first periodic control signal having a variable duty cycle so as to maintain the voltage across the output terminals of said circuit at a preselected level, said capacitor also being charged by said common mode currents;

such improvements being characterized in that said power supply circuit further comprises a second switched DC converter having a second switching element and inductor connected in series across said capacitor, said second converter further having a diode connecting the junction of said second switching element and said inductor to said supply voltage terminal, said second switching element being periodically switched by a second periodic control signal which becomes operative when the duty cycle of said first periodic control signal has been reduced substantially to zero;

said second converter transferring charge from said capacitor to said DC source so as to maintain the voltage across the output terminals of said circuit at said preselected level

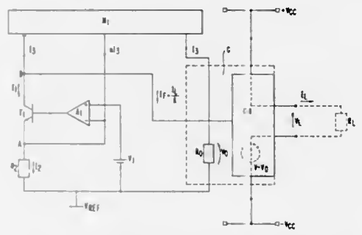
despite charging of said capacitor by said common mode currents.

4,841,565

MONOLITHICALLY INTEGRATABLE TELEPHONE CIRCUIT FOR FEEDING A SUBSCRIBER'S TELEPHONE LINE

Marco Siligoni, Vittuone; Vanni Savioli, Monza, and Emilio Lorena, Parona, all of Italy, assignors to SGS Microelectronica SpA, Milan, Italy

Filed Apr. 30, 1986, Ser. No. 857,487
Claims priority, application Italy, Apr. 30, 1985, 20549 A/85
Int. Cl.⁴ H04M *19/00*
U.S. Cl. 379—413 **1 Claim**



1. A monolithically integratable telephone circuit for feeding a subscriber's telephone line, comprising:

a current mirror circuit having an input and first and second outputs; a transistor having first, second and control terminals; an operational amplifier having an output terminal and first and second input terminal;

wherein said input of said current mirror circuit is connected to said second terminal of said transistor; said control terminal of said transistor is connected to said output terminal of said operational amplifier; said first terminal of said transistor is connected to said second input terminal of said operational amplifier and is connected to a voltage reference via a first resistance; said first input terminal of said operational amplifier is connected to said voltage reference via a voltage generator; said first output of said current mirror circuit is connected to said second input terminal of said operational amplifier and said second output of said current mirror circuit is connected to said voltage reference via a second resistance;

said circuit further comprising a circuit means for coupling said subscriber's telephone line to a supply voltage generator having first and second terminals, said circuit means having first and second terminals connected to said first and second terminals of said supply voltage generator and having third and fourth terminals connected to a first and second wire respectively of said subscriber's line; said circuit coupling means comprising at least one additional voltage generator for outputting a voltage in accordance with a resultant voltage across said second resistance, and a circuit current transducer means, inserted between at least one of the first and second terminals of said circuit means which is connected to said subscriber's telephone line and said input of said current mirror circuit.

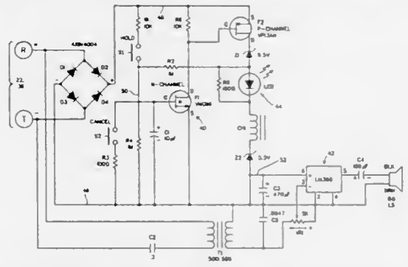
4,841,566

HOLD AND DIAL ACCESSORY FOR TELEPHONE INSTRUMENT

Thomas M. Lott, 55 W. Santa Inez, San Mateo, Calif. 94402

Filed Feb. 22, 1988, Ser. No. 158,867
Int. Cl.⁴ H04M *1/25*
U.S. Cl. 379—352 **8 Claims**

1. A hold and dial monitor accessory for use with a conventional telephone instrument connected across a subscriber service pair extending from a central office, the hold and dial monitor accessory being bridge connected across the telephone service pair and including manually actuable and releasable line seize circuit means for holding a communication loop through the central office and having an internally established time constant for automatic line release, and audio amplifier and loudspeaking circuit means for amplifying audio information present on the telephone service pair during the interval when the line seize circuit means is holding the communication loop, the line seize circuit means comprising an enhancement



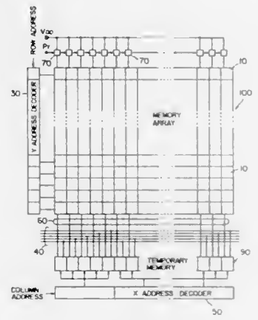
mode field effect transistor having source and drain elements in series connection across the tip and ring wires of said telephone service pair and a gate connection selectively connectable to one of the tip and ring wires in order to place a low impedance load across the tip and ring wires and thereafter selectively connectable to the other of the tip and ring wires in order to release the low impedance load, there being charge storage capacitor and discharge resistor means connected between the gate and the other of the tip and ring wires in order to establish said internally established time constant.

4,841,567

MEMORY DEVICE

Eiji Masuda, Kawasaki; Yasuhiko Fujita, Tokyo, and Terufumi Takasaki, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 893,906, Jul. 22, 1986, abandoned. This application Sep. 21, 1988, Ser. No. 246,965
Claims priority, application Japan, Jul. 22, 1985, 60-161626
Int. Cl.⁴ H04M *1/272*
U.S. Cl. 379—355 **9 Claims**



1. A memory device comprising:

a first memory array having a plurality of first RAM cells arranged as a matrix, each of said first RAM cells being accessed by a column address and a row address;

a second memory array having a plurality of second RAM cells arranged along a row, each of said second RAM cells being accessed by a column address so as to store and transfer data from or to said first memory array;

a plurality of bus lines connected to said second memory array so as to read out data from said first memory array or to write data into said first memory array through said second memory array;

a plurality of data lines connected between said first memory array and said second memory array so as to transfer data between said first memory array and second memory array;

an X address decoder which outputs a column address of said matrix to said first memory array through said second memory array; and

a Y address decoder which outputs a row address of said matrix to said first memory;

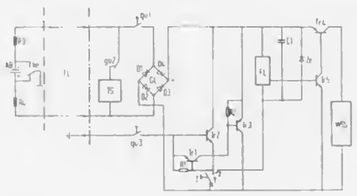
whereby, in a read-out operation, data stored in said first memory array is simultaneously transferred to said second memory array through said data lines and stored in said second memory array, and subsequently outputted at different times from said second memory array to the bus lines, and in a write-in operation, data from the bus lines is outputted to and stored in said second memory array at different times and subsequently simultaneously transferred from said second memory array to said first memory array along said data lines.

4,841,568

CIRCUIT ARRANGEMENT FOR A TELEPHONE STATION WITH EARTH CONNECTION TO THE CENTRAL SUPPLY DEVICE

Juergen Riesmeyer, Olching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 8, 1988, Ser. No. 153,319
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1987, 3709537
Int. Cl.⁴ H04M *1/00*
U.S. Cl. 379—380 **1 Claim**



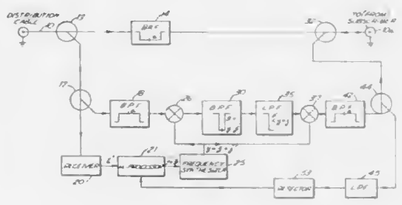
1. A circuit arrangement for a telephone station with earth connection to a central supply device for the purpose of post-dialing said telephone station having a dialing and speech circuit, a polarity reversal protection device and a flash circuit, comprising, in combination a key (T) with a double-make contact (y,z), a fixed contact side of which is connected to a negative terminal of the polarity reversal protection device (GL), a rest side of a first actuated make contact (y) being connected to the base of a first NPN-transistor (Tr1) and, via a resistor (R1) to the emitter of said NPN-transistor (Tr1) and to earth potential, and in the actuated state, interconnects output terminals of the polarity reversal protection device (GL) via the collector-emitter path of a second NPN-transistor (Tr2) which is connected by its base to earth potential, the collector of said first NPN-transistor (Tr1) is connected to the base of a PNP-transistor (Tr3) whose emitter-collector path is connected between said output terminals of the polarity reversal protection device (GL), and connected to a rest side of a second actuated make contact (z), which is selectively connected to the first make contact (y) and to a positive output of the polarity reversal protection device (GL) via a Zener Diode (Ze), which is arranged in parallel to the flash circuit and in parallel to a supply capacitor (C1).

4,841,569

SECURE VIDEO DISTRIBUTION SYSTEM

David E. Wachob, Elkins Park, Pa., assignor to General Instrument Corporation, New York, N.Y.

Filed Dec. 30, 1987, Ser. No. 139,459
Int. Cl.⁴ H04N *7/167*; H04K *3/00*
U.S. Cl. 380—7 **16 Claims**



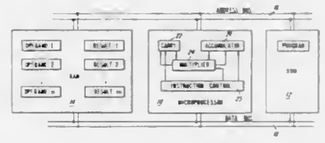
1. In combination in apparatus for electronically restoring a video program which includes an in-band jamming wave characterized by a time varying frequency, means for receiving the jammed video program, a band reject filter, heterodyning means having first and second inputs and an output connected to said band reject filter; said receiving means coupling the video program having the variable frequency jamming wave to said first input of said heterodyning means, and means for supplying to said second input of said heterodyning means a signal of time varying frequency appropriate to heterodyne the changing frequency of the jamming signal to that of the band reject filter.

4,841,570

ONE-WAY TRANSFORMATION OF INFORMATION

James A. Cooper, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 11, 1987, Ser. No. 48,433
Int. Cl.⁴ H04K *1/00*
U.S. Cl. 380—30 **22 Claims**



1. A method for one-way transformation of data to generate an encrypted form thereof by obtaining a modulo-k representation of a product of at least first and second numbers in an n-bit computer where $2^n \neq k$, said computer having a multiplying apparatus including an n-bit accumulator register and an n-bit carry register, comprising the steps of:

inputting a first number G from an input source to the computer,

obtaining a second number H,

using said multiplying apparatus to obtain a product $J = G*H$,

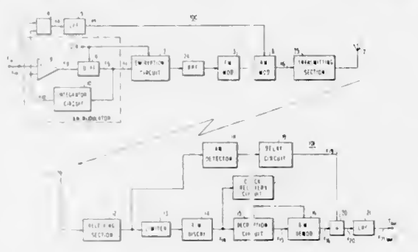
storing said product in said accumulator and carry registers,

transforming the product to obtain a unique one-way encrypted transform thereof,

said transforming step comprising the step of obtaining a

modulo-k representation, $J_k=(G^t H) \bmod k$, of the product by performing the further steps of:
comparing the contents of said accumulator and carry registers to determine a relation therebetween,
selecting a function dependent on the results of said comparing step,
applying the selected function to the contents of said carry register,
generating signals representative of the selected function of the contents of said carry register
transferring said generated signals to the accumulator register,
altering said accumulator register in response to said signals transferred thereto,
generating signals representative of the altered contents of said accumulator register and
outputting said signals representative of the altered contents of said accumulator register as the transformed representation J_k.

4,841,571
PRIVACY SIGNAL TRANSMISSION SYSTEM
Kouzou Kage, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Dec. 19, 1983, Ser. No. 562,567
Claims priority, application Japan, Dec. 22, 1982, 57-223892
Int. Cl.[4] H04K *1/10*
U.S. Cl. 380—31 **9 Claims**



1. A privacy signal transmission system comprising:
a transmitter including digital pulse modulator means for converting a first analog signal into a first digital signal said digital pulse modulator means including means for converting the first digital signal into a second analog signal, encryption means for converting the first digital signal into a first digital privacy signal, subtractor means for producing a first analog error signal representative of the difference between said second signal provided by analog conversion of the first digital signal and the first analog signal, and transmission means for transmitting a modulated signal in response to the first analog error signal and the first digital privacy signal; and
a receiver including means for receiving the modulated signal including the first analog error signal and the first digital privacy signal to generate a second analog error signal and a second digital privacy signal, decryption means for converting the second digital privacy signal into a second digital signal, digital pulse demodulator means for converting the second digital signal into a third analog signal, and reproduction means for reproducing the first analog signal by adding the second analog error signal to the third analog signal.

4,841,572
STEREO SYNTHESIZER
Arnold I. Klayman, Huntington Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Mar. 14, 1988, Ser. No. 167,615
Int. Cl.[4] H04S *1/00*
U.S. Cl. 381—17 **19 Claims**

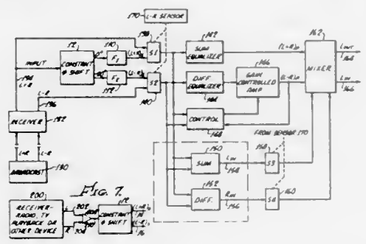
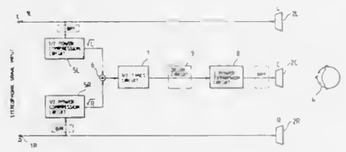


FIG. 7.

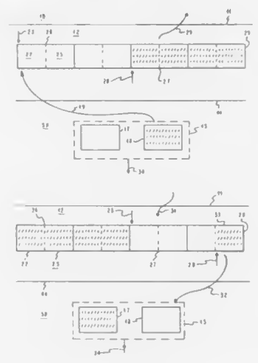
1. A system for generating stereo image enhanced output signals from a monaural input signal having a bandwidth, said system comprising:
first means responsive to the monaural input signal for generating a simulated sum signal which comprises different frequencies,
second means responsive to the input signal for generating a simulated difference signal that is delayed with respect to said simulated sum signal and which has components of said different frequencies, each such component in said second means having a different time delay with respect to a corresponding component in said first means, each said first and second means comprising phase shift means for providing each different delay time as a substantially fixed phase separation between corresponding bands of said simulated sum and said simulated difference signals over a portion of said bandwidth of frequencies.
stereo image enhancement means responsive to said simulated sum and difference signals for generating stereo enhanced left and right output signals.

4,841,573
STEREOPHONIC SIGNAL PROCESSING CIRCUIT
Shinichi Fujita, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan
Filed Aug. 29, 1988, Ser. No. 237,986
Claims priority, application Japan, Aug. 31, 1987, 62-217521
Int. Cl.[4] H04S *3/00*
U.S. Cl. 381—27 **3 Claims**



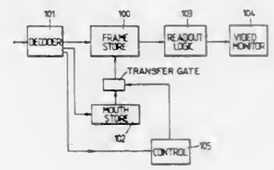
1. A stereophonic signal processing circuit, comprising;
a first channel signal input terminal;
a first level compression circuit connected to said first channel signal input terminal and compressing a peak level of a first channel signal inputted to said first channel signal input terminal, into $\frac{1}{2}$ power of the level;
a second channel signal input terminal;
a second level compression circuit connected to said second channel signal input terminal and compressing a peak level of a second channel signal inputted to said second channel signal input terminal, into $\frac{1}{2}$ power of the level;
an arithmetic mean circuit connected to individual output terminals of said first and second level compression circuits and determining an arithmetic mean between individual output signals emanating from said first and second level compression circuits; and
a level expansion circuit connected to an output terminal of said arithmetic mean circuit and expanding a peak level of an output signal emanating from said arithmetic mean circuit, into 2nd power of the level,
an output signal emanating from said level expansion circuit being produced as a third channel signal to be reproduced midway between individual reproducing positions of said first and second channel signals.

4,841,574
VOICE BUFFER MANAGEMENT
Xuan N. Pham, and John H. Wilson, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 11, 1985, Ser. No. 786,914
Int. Cl.[4] G01L *3/00*
U.S. Cl. 381—31 **7 Claims**



1. A voice buffering system, comprising:
means for receiving a substantially endless stream of digitized voice data representing an essentially continuous, intelligible speech message;
means for storing the received substantially endless stream of digitized voice data at a first rate;
means for controlling a transfer of the substantially endless stream of digitized voice data into and out of the storing means; and
means, response to the controlling means, for outputting, in real time, the stored substantially endless stream of digitized voice data, wherein said essentially continuous, intelligible speech message remains intact at a second rate.

4,841,575
IMAGE ENCODING AND SYNTHESIS
William J. Welsh, Ipswich; Brian A. Fenn, Woodbridge, and Paul Challener, Ipswich, all of England, assignors to British Telecommunications public limited company, Great Britain
Filed Nov. 14, 1986, Ser. No. 930,473
Claims priority, application United Kingdom, Nov. 14, 1985, 8528143
Int. Cl.[4] G10L *5/02*
U.S. Cl. 381—36 **17 Claims**



1. An apparatus for encoding a moving image including a human face comprising:
means for receiving video input data;
means for output of data representing one frame of the image;
identification means arranged in operation for each frame of the image to identify that part of the input data corresponding to the mouth of the face represented and
(a) in a first phase of operation to compare the mouth data parts of each frame with those of other frames to select a representative set of mouth data parts, to store the selected parts and to output the selected parts;
(b) in a second phase to compare the mouth data part of each frame with those of the stored set and to generate a codeword indicating which member of the set the mouth data part of that frame most closely resembles.

DESIGNS

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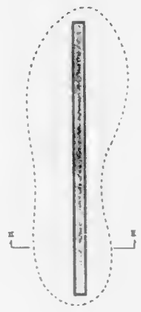
301,656
ELEMENT OF A SHOE SOLE
Juan A. Diaz, Weymouth, Mass., assignor to Reebok International Ltd., Canton, Mass.
Filed Jul. 16, 1987, Ser. No. 74,320
Term of patent 14 years
U.S. Cl. D2—314

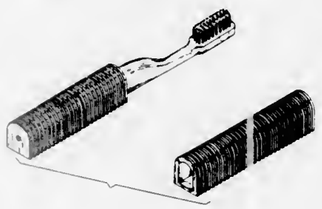


301,657
ELEMENT OF A SHOE UPPER
Paul D. Brown, Hingham, Mass., assignor to Reebok International Ltd., Canton, Mass.
Filed Sep. 8, 1987, Ser. No. 93,689
Term of patent 14 years
U.S. Cl. D2—314

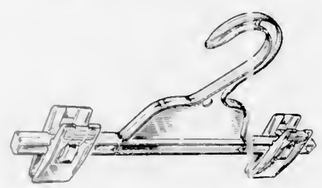
301,658
SHOE SOLE
Yoshiaki Hase, Akashi, Japan, assignor to Asics Corporation, Kobe, Japan
Filed Jun. 4, 1986, Ser. No. 870,693
Claims priority, application Japan, Dec. 27, 1985, 60-54422
Term of patent 14 years
U.S. Cl. D2—320

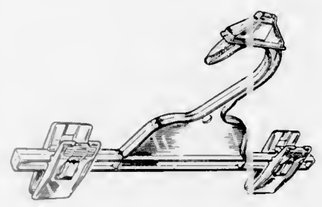
301,659
SHOE OUTSOLE
Tuan Le, New York, N.Y., assignor to Reebok International Ltd., Canton, Mass.
Filed Oct. 6, 1988, Ser. No. 254,124
Term of patent 14 years
U.S. Cl. D2—320

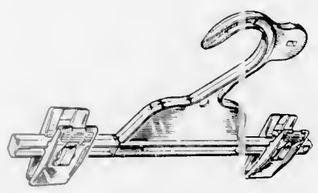
301,660
COMBINED TOOTHBRUSH AND CONTAINER THEREFOR
Emilio Ambasz, 295, Central Park West, New York, N.Y. 10024
Filed Dec. 30, 1987, Ser. No. 139,703
Term of patent 14 years
U.S. Cl. D4—108



301,661
GARMENT HANGER
Ronald M. Wilson, Black Rock, Australia, assignor to Spotless Plastics Pty. Ltd., Moorabbin, Australia
Filed May 27, 1987, Ser. No. 54,811
Term of patent 14 years
U.S. Cl. D6—326



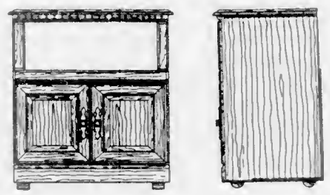




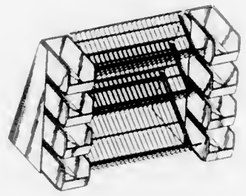
301,662
SWIVEL CHAIR
Robert Vonhausen, Giessen, Fed. Rep. of Germany, assignor to VOKO Franz Vogt & Co., Fed. Rep. of Germany
Filed Jun. 20, 1986, Ser. No. 877,541
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1985, 21MR585
Term of patent 14 years
U.S. Cl. D6—366

301,663
ARMCHAIR
Robert Vonhausen, Giessen, Fed. Rep. of Germany, assignor to VOKO Franz Vogt & Co., Fed. Rep. of Germany
Filed Jun. 20, 1986, Ser. No. 877,542
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1986, 21MR586
Term of patent 14 years
U.S. Cl. D6—372

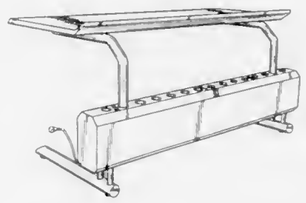
301,664
VIDEO STORAGE CART OR THE LIKE
Paul Bush, Lakewood, N.Y., and Bruce O. Anderson, Talbott, Tenn., assignors to Bush Industries, Inc., Jamestown, N.Y.
Filed May 2, 1988, Ser. No. 189,689
Term of patent 14 years
U.S. Cl. D6—436



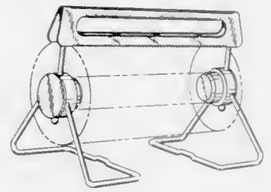
301,665
PASTRY RACK
J. Marshall Suttles, Elberton, Ga., assignor to Royston Corporation, Royston, Ga.
Filed Apr. 21, 1986, Ser. No. 856,135
Term of patent 14 years
U.S. Cl. D6—463



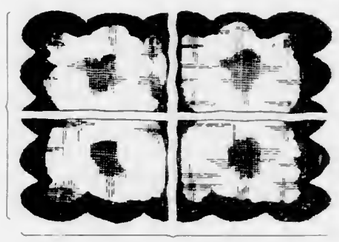
301,666
OFFICE TABLE
Urs Greutmann, and Carmen Bolzern, both of Zurich, Switzerland, assignors to Denz & Co., AG, Zurich, Switzerland
Filed Jan. 6, 1986, Ser. No. 816,191
Claims priority, application Switzerland, Jul. 5, 1985, 114.614
Term of patent 14 years
U.S. Cl. D6—480



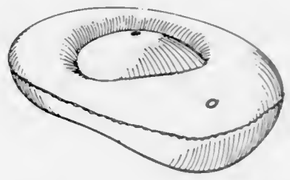
301,667
ROLLED MATERIAL DISPENSER
Amy W. Barrs, Atlanta; Kurtis L. Brown, Woodstock; James F. Dickson, Atlanta, and Stephen M. Englebert, Woodstock, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Dec. 2, 1987, Ser. No. 128,538
Term of patent 14 years
U.S. Cl. D6—518



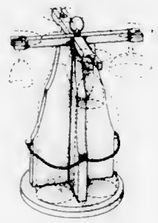
301,668
RUG OR SIMILAR ARTICLE
Park B. Smith, New York, N.Y., assignor to Park B. Smith, Inc., New York, N.Y.
Filed Oct. 27, 1988, Ser. No. 263,137
Term of patent 14 years
U.S. Cl. D6—592



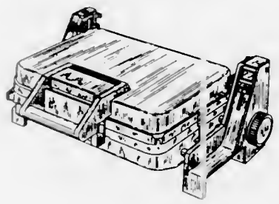
301,669
TWO-CHAMBER INFLATABLE AIR CUSHION
Vernon I. Dwelly, 6 Carmel Dr., Novato, Calif. 94947
Filed Apr. 7, 1986, Ser. No. 850,394
Term of patent 14 years
U.S. Cl. D6—601

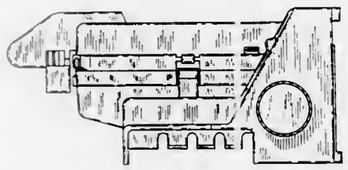


301,670
ROTATABLE WINE AND GLASS RACK
Charles B. Kennedy, 818 Banks Ave., Knoxville, Tenn. 37917
Filed Jan. 24, 1986, Ser. No. 821,960
Term of patent 14 years
U.S. Cl. D7—71

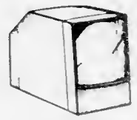


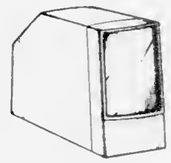
301,671
GRILL
Jan F. Van Asten, Leek, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 18, 1986, Ser. No. 944,796
Claims priority, application Benelux, Jun. 20, 1986, 61194-00
Term of patent 14 years
U.S. Cl. D7—352



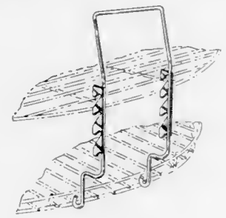


301,672
BEVERAGE DISPENSER VALVE
Alvin H. Schechter, New York, N.Y., and Carl R. Thompson, Stratford, Conn., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Mar. 5, 1986, Ser. No. 841,748
Term of patent 14 years
U.S. Cl. D7—398

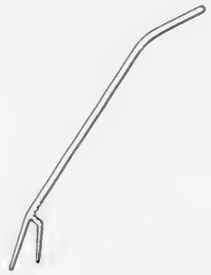




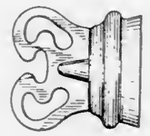
301,673
HEIGHT ADJUSTMENT HANDLE FOR SUSPENDING A GRID ON A BARBEQUE GRILL
Ralph Ogden, 1304 Fisher St., Munster, Ind. 46321
Filed Jul. 2, 1986, Ser. No. 881,461
Term of patent 14 years
U.S. Cl. D7—402



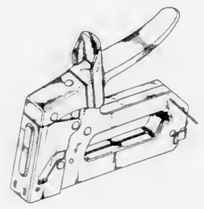
301,674
IMPLEMENT FOR PICKING UP PINE CONES OR THE LIKE
Tim S. Smith, and Zondra Smith, both of 806 Forrest Ave., Eastman, Ga. 31023
Filed Jul. 10, 1986, Ser. No. 884,266
Term of patent 14 years
U.S. Cl. D8—13



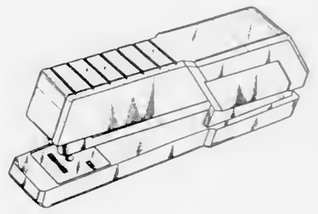
301,675
FUSE PULLER
James N. Pearse, Dix Hills, N.Y., and Wolfgang F. Bienwald, Inverness, Fla., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.
Continuation-in-part of Ser. No. 794,351, Nov. 1, 1985, abandoned. This application Sep. 17, 1986, Ser. No. 909,460
Term of patent 14 years
U.S. Cl. D8—14



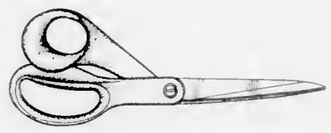
301,676
STAPLING GUN OR SIMILAR ARTICLE
Chi Hui-Neng, No. 32, Kuang Cheng Rd., Twu Cheng Ts'un, Ta Li Hsiang, Taichung Hsien, Taiwan
Filed Jun. 24, 1986, Ser. No. 877,980
Term of patent 14 years
U.S. Cl. D8—49



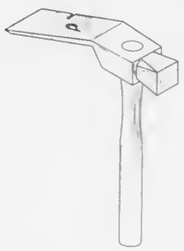
301,677
STAPLER
Lars-Göran Rosenblad, Huskvarna, Sweden, assignor to Isaberg AB, Hestra, Sweden
Filed May 20, 1986, Ser. No. 867,251
Claims priority, application Sweden, Nov. 26, 1985, 85-2862
Term of patent 14 years
U.S. Cl. D8—50



301,678
SCISSORS
Erkki O. Lindén, Björkkulla, Finland, assignor to Fiskars Oy Ab, Helsinki, Finland
Filed Dec. 22, 1986, Ser. No. 946,274
Claims priority, application Finland, Aug. 22, 1986, 818/86
Term of patent 14 years
U.S. Cl. D8—57



301,679
COMBINED HAMMER AND HATCHET
Nick Kokkinos, 423 N. Pinellas Ave., Tarpon Springs, Fla. 33589
Filed Nov. 18, 1985, Ser. No. 805,369
Term of patent 14 years
U.S. Cl. D8—75



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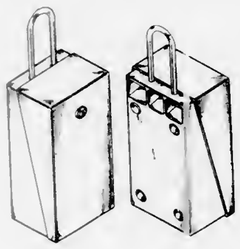
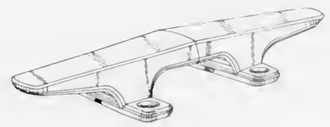
301,680
KNIFE FOR CUTTING PLASTIC CABLE INSULATION
William W. Glaze, 101 Glaze St., Vidalia, Ga. 30474
Filed Apr. 28, 1986, Ser. No. 857,817
Term of patent 14 years
U.S. Cl. D8—98

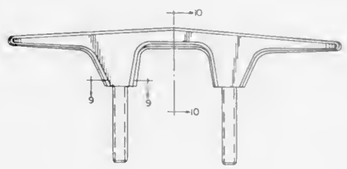
301,681
KNOB
Franz W. Jans, Offenbach am Main, Fed. Rep. of Germany, assignor to Armaturen & Presswerk GmbH, Roedermark, Fed. Rep. of Germany
Filed Jan. 14, 1987, Ser. No. 3,186
Term of patent 14 years
U.S. Cl. D8—312

301,682
LOCKBOX FOR VIDEOTAPES OR THE LIKE
Will H. Gardenswartz, 6255 Habitat Dr., #3022, Boulder, Colo. 80301
Filed Oct. 16, 1987, Ser. No. 109,695
Term of patent 14 years
U.S. Cl. D8—333

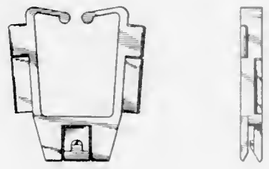


301,683
CLEAT FOR BOATS
Warwick M. Whitley, II, Lynn Haven, Fla., assignor to Attwood Corporation, Lowell, Mich.
Filed Apr. 21, 1986, Ser. No. 857,417
Term of patent 14 years
U.S. Cl. D8—356

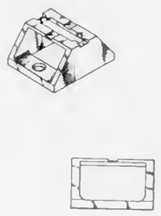




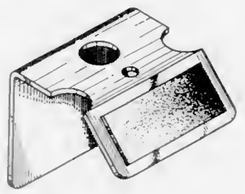
301,684
GROMMET FOR ELECTRICAL WIRES
Richard Herzog, Des Plaines, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Apr. 25, 1986, Ser. No. 857,779
Term of patent 14 years
U.S. Cl. D8—356



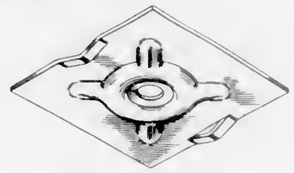
301,685
SECURITY ALARM BRACKET
Dennis L. Vories, Valley Center, Calif., assignor to F. B. Nutter Enterprises, Inc., San Bernardino, Calif.
Filed Mar. 25, 1986, Ser. No. 845,826
Term of patent 14 years
U.S. Cl. D8—373



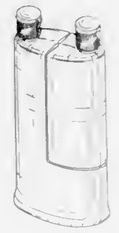
301,686
BRACKET FOR CLOCK, FIGURE TOY OR SIMILAR ARTICLE
Randy L. Long, 100 N. Ohio St., Appleton City, Mo. 64724
Filed Apr. 28, 1986, Ser. No. 857,828
Term of patent 14 years
U.S. Cl. D8—373



301,687
MINE ROOF SUPPORT PLATE
Bruce A. Cassidy, R.D. 1, Box 319, Richmond, Ohio 43944, and James O. Gray, R.D. 1, Rayland, Ohio 43943
Filed Nov. 13, 1985, Ser. No. 805,102
Term of patent 14 years
U.S. Cl. D8—399

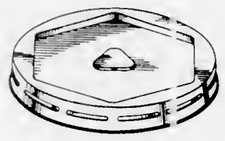


301,688
DUAL COMPARTMENT BOTTLE
Richard D. Green, 1150 18th St., Ste. 101, Santa Monica, Calif. 90403
Filed Mar. 21, 1986, Ser. No. 845,412
Term of patent 14 years
U.S. Cl. D9—341



301,689
GAS CONTAINER
Orval L. Fick, and Raymond B. Ferbrache, both of Winfield, Kans., assignors to Gott Corporation, Winfield, Kans.
Filed May 8, 1986, Ser. No. 862,444
Term of patent 14 years
U.S. Cl. D9—374

301,690
CONTAINER LID
Laura P. Mobberley, Kansas City, Mo., assignor to Sealright Co., Inc., Kansas City, Mo.
Filed May 15, 1986, Ser. No. 863,531
Term of patent 14 years
U.S. Cl. D9—452

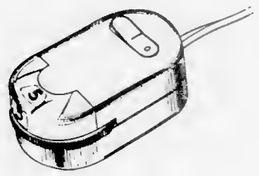


301,691
CONTAINER LID
Laura P. Mobberley, Kansas City, Mo., assignor to Sealright Co., Inc., Kansas City, Mo.
Filed May 15, 1986, Ser. No. 863,532
Term of patent 14 years
U.S. Cl. D9—453

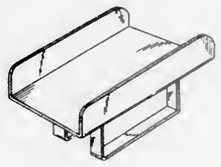
301,692
WRIST WATCH
Masamichi Wakamatsu, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Jul. 17, 1986, Ser. No. 887,114
Term of patent 14 years
U.S. Cl. D10—38

301,693
WRIST WATCH
Vittorio Canta, 1260 Rue University, Ste. 304, Montreal, Quebec H3B 3B9, Canada
Filed Apr. 14, 1986, Ser. No. 852,505
Term of patent 14 years
U.S. Cl. D10—39

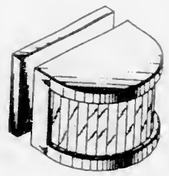
301,694
CONTROL HOUSING FOR AN ELECTRIC BLANKET
Ronald E. Ahlers, Bronxville, and Ronald Emmerling, New York, both of N.Y., assignors to J.C. Penney Co. Inc., Dallas, Tex.
Filed Feb. 25, 1986, Ser. No. 836,447
Term of patent 14 years
U.S. Cl. D10—50



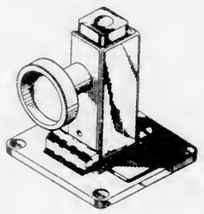
301,695
PATIENT WEIGHT BASKET
Fernando V. DeCastro, 6125 Clayton Ave., Ste. 130, St. Louis, Mo. 63139
Filed Feb. 10, 1986, Ser. No. 827,729
Term of patent 14 years
U.S. Cl. D10—94



301,696
INFRARED RADIATION DETECTOR
Hugh T. Greenlee, and Roy P. Hess, both of Cuyahoga County, Ohio, assignors to Burle Technologies, Inc., Lancaster, Pa.
Filed Apr. 4, 1986, Ser. No. 850,339
Term of patent 14 years
U.S. Cl. D10—106



301,697
ADJUSTABLE HOLDER FOR WATER SKIING SAFETY FLAG
Gary F. Morris, 2169 St. Mary's Dr., Salt Lake City, Utah 84108
Filed Jan. 5, 1987, Ser. No. 964
Term of patent 14 years
U.S. Cl. D10—121



301,698
ROPE CHAIN
Jacob Markovits, 1313 53rd St., Brooklyn, N.Y. 11219
Filed May 8, 1986, Ser. No. 862,399
Term of patent 14 years
U.S. Cl. D11—13

301,699
ROSE CHAIN
Jacob Markovits, 1313 53rd St., Brooklyn, N.Y. 11219
Filed May 21, 1986, Ser. No. 867,283
Term of patent 14 years
U.S. Cl. D11—13

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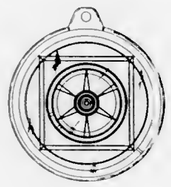
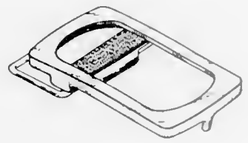
301,700
EARDROP HOLDER
Brenda D. Coleman, 6615 Calmos St., Peppermill Village, Md. 20743
Filed Jun. 11, 1986, Ser. No. 873,317
Term of patent 14 years
U.S. Cl. D11—86

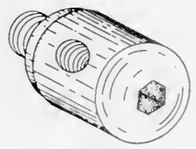
301,701
MEDALLION
Hubert Palm, Linzgaublick 2, 7750 Konstanz 19 - Wallhausen, Fed. Rep. of Germany
Filed Apr. 6, 1988, Ser. No. 178,286
Term of patent 14 years
U.S. Cl. D11—96



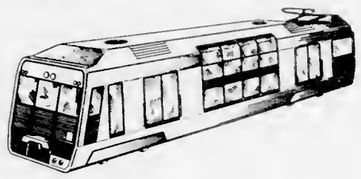
301,702
BELT BUCKLE
Donald G. Peterson, 0361 County Rd. 1040, Frisco, Colo. 81401
Filed Dec. 1, 1986, Ser. No. 937,131
Term of patent 14 years
U.S. Cl. D11—230



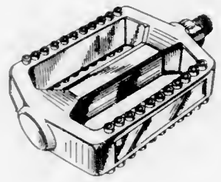
301,703
MOTORCYCLE OIL GAUGE FITTING
Michael Bernstein, 7950 Curtis Blvd., Falcon, Colo. 80831
Filed Sep. 28, 1987, Ser. No. 101,960
Term of patent 14 years
U.S. Cl. D12—114



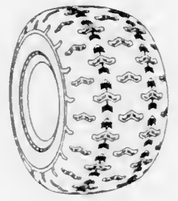
301,704
RAIL CAR
Michael Groves; Antbony Hume; Jonathan Sothcott, all of Warwick, England, and Martin Pemberton, Sydney, Australia, assignors to State Rail Authority of New South Wales, Australia
Filed Apr. 24, 1986, Ser. No. 857,604
Claims priority, application Australia, Oct. 25, 1985, 3067/85
Term of patent 14 years
U.S. Cl. D12—40



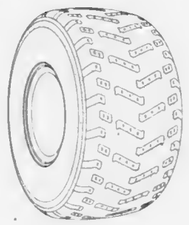
301,705
CYCLE PEDAL
William H. Ropp, Centerville, Ohio, assignor to Huffy Corporation, Miamisburg, Ohio
Filed Jan. 16, 1987, Ser. No. 5,530
Term of patent 14 years
U.S. Cl. D12—125



301,706
AUTOMOBILE TIRE
Yasuo Igarashi, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Aug. 15, 1986, Ser. No. 896,974
Claims priority, application Japan, May 28, 1986, 61-20745
Term of patent 14 years
U.S. Cl. D12—136



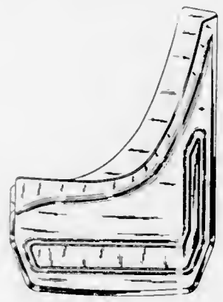
301,707
AUTOMOBILE TIRE
Yasuo Igarashi, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Jul. 1, 1986, Ser. No. 880,904
Claims priority, application Japan, Mar. 19, 1986, 61-10198
Term of patent 14 years
U.S. Cl. D12—147



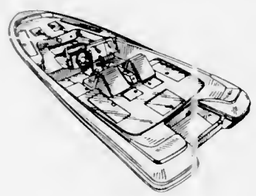
301,708
MOTORCYCLE TIRE
Shigehiko Suzuki, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Aug. 18, 1986, Ser. No. 897,206
Claims priority, application Japan, Jun. 19, 1986, 61-23563
Term of patent 14 years
U.S. Cl. D12—147

301,709
AUTOMOBILE TIRE
Tetsushi Fujiki, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Sep. 17, 1986, Ser. No. 908,525
Claims priority, application Japan, Jun. 6, 1986, 61-22031
Term of patent 14 years
U.S. Cl. D12—149

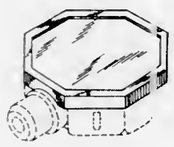
301,710
VEHICLE SPLASH GUARD
Douglas K. Ward, and Jerry N. Moscovitch, both of Toronto, Canada, assignors to Powerflow Products, Ltd., Toronto, Canada
Filed May 30, 1986, Ser. No. 869,029
Term of patent 14 years
U.S. Cl. D12—185



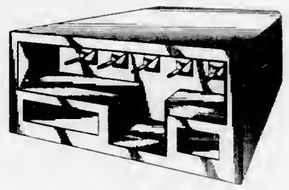
301,711
BOAT
Michael Allbritton, Longview, Tex., assignor to Skeeter Products, Inc., Kilgore, Tex.
Filed Aug. 8, 1988, Ser. No. 229,351
Term of patent 14 years
U.S. Cl. D12—314

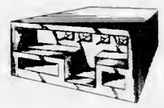


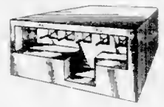
301,712
ELECTRICAL CONNECTOR FOR A MERCHANDISE SECURITY SYSTEM
Marcia Israel, 7710 Haskell Ave., Van Nuys, Calif. 91406
Filed Sep. 2, 1986, Ser. No. 903,067
Term of patent 14 years
U.S. Cl. D13—24

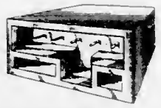


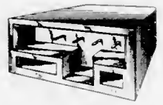
301,713
PORTABLE MEMORY MODULE
Michael L. Bolan; Francis A. Scherpenberg, and William F. Davies, Jr., all of Dallas, Tex., assignors to Dallas Semiconductor Corporation, Dallas, Tex.
Filed Oct. 30, 1985, Ser. No. 792,961
Term of patent 14 years
U.S. Cl. D14—114

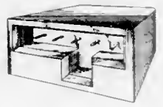




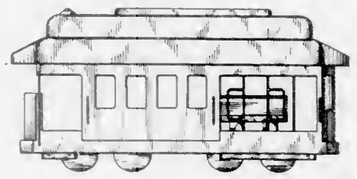


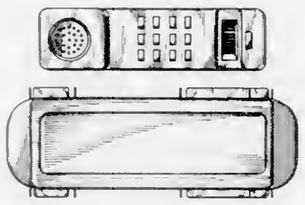






301,714
TELEPHONE SET
Kash Gobindram, Farmingdale, N.Y., assignor to Kash 'N' Gold Ltd., Ronkonkoma, N.Y.
Filed Apr. 9, 1987, Ser. No. 36,247
Term of patent 14 years
U.S. Cl. D14—143

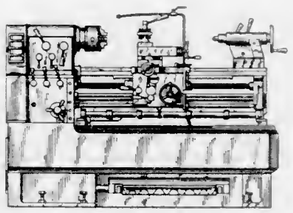


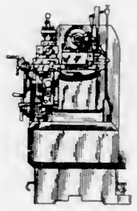


301,715
RADIO RECEIVER
Murray I. C. Camens, Den Bosch, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 9, 1986, Ser. No. 916,989
Claims priority, application United Kingdom, Apr. 16, 1986, 1033510
Term of patent 14 years
U.S. Cl. D14—192

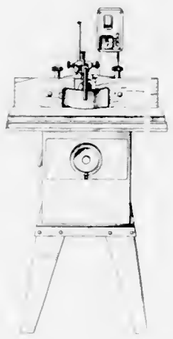
301,716
PORTABLE RADIO RECEIVER
Itsumi Ohzu, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Jun. 5, 1986, Ser. No. 871,578
Term of patent 14 years
U.S. Cl. D14—188

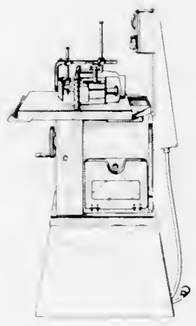
301,717
PRECISION LATHE
Cheng-Chwen Huang, Dah-Li, Taiwan, assignor to Shenjey Industrial Co., Ltd., Taichung, Taiwan
Filed Mar. 15, 1985, Ser. No. 712,083
Term of patent 14 years
U.S. Cl. D15—130



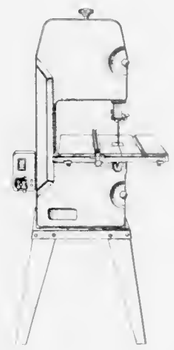


301,718
POWER-DRIVEN MILLING MACHINE
Marc Wodli, 6 rue Poincare, 67800 Bischheim, France
Filed Sep. 4, 1987, Ser. No. 93,892
Term of patent 14 years
U.S. Cl. D15—131



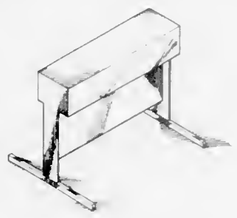


301,719
POWER-DRIVEN BAND SAW
Marc Wodli, 6 rue Poincare, 67800 Bischheim, France
Filed Sep. 4, 1987, Ser. No. 93,891
Term of patent 14 years
U.S. Cl. D15—134

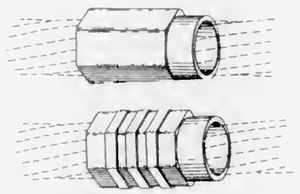


301,720
BOOKEND
Joseph V. Percoco, 6746 S. Bellaire Way, Littleton, Colo. 80122, and Richard Percoco, 6400 Ester Blvd. #503, Ft. Myer Beach, Fla. 33931
Filed Feb. 19, 1985, Ser. No. 702,785
Term of patent 14 years
U.S. Cl. D19—34.1

301,721
PORTABLE DISPLAY SIGN
Larry O. Myshyniuk, 950 SW. 15th Ave., Delray Beach, Fla. 33444
Filed Feb. 5, 1986, Ser. No. 826,213
Term of patent 14 years
U.S. Cl. D20—10



301,722
CABLE IDENTIFICATION SLEEVE
Isaac Sachs, 1240 Ridgewood Dr., Chomedey, Laval Que., Canada H7W 1L3
Filed Mar. 8, 1985, Ser. No. 709,726
Term of patent 14 years
U.S. Cl. D20—22

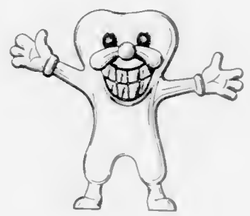


301,723
GAME BOARD
Anthony J. Nardello, Mantua, N.J., assignor to Anthony J. Nardello, Mantau, N.J. and Thomas D. Rabbittino, Philadelphia, Pa.
Filed Jan. 31, 1986, Ser. No. 825,047
Term of patent 14 years
U.S. Cl. D21—27

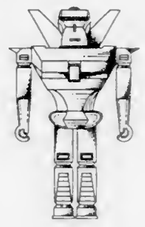
301,724
SIMULATIVE RIDING TOY
David B. Tohl, 10705 Hepburn Cir., Culver City, Calif.
Filed Aug. 4, 1987, Ser. No. 81,883
Term of patent 14 years
U.S. Cl. D21—74

301,725
TOY BADGER ANIMAL FIGURE
Ken Havelock, 1401 W. 14th St., Sault Ste. Marie, Mich. 49783
Filed May 27, 1986, Ser. No. 879,553
Term of patent 14 years
U.S. Cl. D21—148

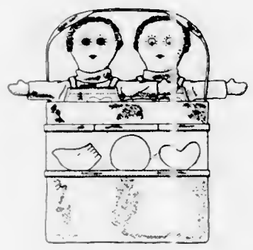
301,726
NOVELTY TOOTH FIGURE
John M. Williams, 6703 Saffron Hills, Spring, Tex. 77379
Filed Apr. 27, 1988, Ser. No. 197,899
Term of patent 14 years
U.S. Cl. D21—155



301,727
TOY ROBOT
David C. Brune, Rte. 1, Box 593B, Cedar Hill, Mo. 63016
Filed Feb. 18, 1986, Ser. No. 834,050
Term of patent 14 years
U.S. Cl. D21—166



301,728
COMBINED DOLLS AND CARRIER
Mary C. Garner, 3112 O St., NW., Washington, D.C. 20007
Filed Aug. 19, 1988, Ser. No. 234,281
Term of patent 14 years
U.S. Cl. D21—167

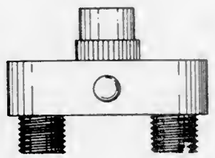


301,729
ERGOMETER
Jan Capjon, Fagerstrand, Norway, assignor to J. Oglaend, Inc., Mt. Kisco, N.Y.
Filed Dec. 19, 1986, Ser. No. 944,888
Term of patent 14 years
U.S. Cl. D21—194

301,730
WEIGHTED FISHING WORM
Donnie Morris, Rte. 10, Box 609, Fort Worth, Tex. 76135
Filed Mar. 3, 1987, Ser. No. 21,012
Term of patent 14 years
U.S. Cl. D22—127

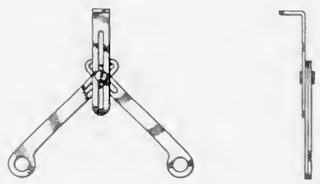
301,731
HYDRO-THERAPY FITTING
David W. Allen, Garden Grove, and David K. Kramer, Fullerton, both of Calif., assignors to Honiton Investments, N.V., Curacao, Netherlands Antilles
Filed Mar. 17, 1986, Ser. No. 845,017
Term of patent 14 years
U.S. Cl. D23—213

301,732
FLUID DISTRIBUTION MANIFOLD
Joanna Malagrida, 2189 Alpena Ave., Dayton, Ohio 45406
Filed Jan. 23, 1986, Ser. No. 821,780
Term of patent 14 years
U.S. Cl. D23—263

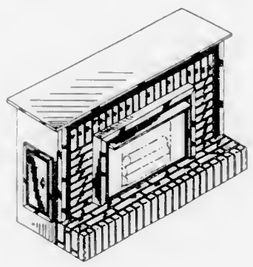


301,733
MICROWAVE-POWERED WATER HEATER
Bentley Mansfield, 1907 S. Fannin St., Amarillo, Tex. 79109
Filed Oct. 7, 1986, Ser. No. 916,461
Term of patent 14 years
U.S. Cl. D23—318

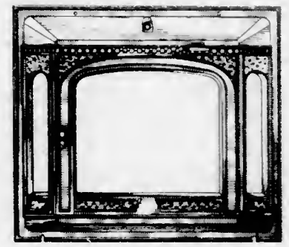
301,734
STRAP FOR SECURING A SEISMIC WATER HEATER
Richard J. Pernosky, 621 S. East St., Anaheim, Calif. 92805
Filed Sep. 15, 1986, Ser. No. 907,531
Term of patent 14 years
U.S. Cl. D23—322



301,735
CABINET FOR A FIREPLACE SIMULATION BURNER UNIT
Wayne E. Meyers, Chicago, Ill., assignor to Raphael Investments, Batavia, Ill.
Filed Jul. 23, 1987, Ser. No. 76,743
Term of patent 14 years
U.S. Cl. D23—345



301,736
FRONT PANEL FOR A FIREPLACE
Niels E. Heger, Jessheim, Norway, assignor to A/S Jotul, Oslo, Norway
Filed Aug. 7, 1987, Ser. No. 82,724
Claims priority, application Norway, Feb. 10, 1987, 68042
Term of patent 14 years
U.S. Cl. D23—404



301,737
MICROBIOLOGICAL CULTURE
John H. Powers, Silver Springs, Md., assignor to BioClinical Systems, Inc., Columbia, Md.
Filed May 7, 1986, Ser. No. 860,780
Term of patent 14 years
U.S. Cl. D24—8

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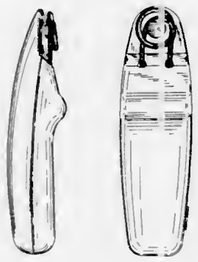
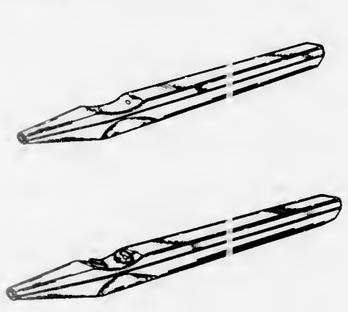
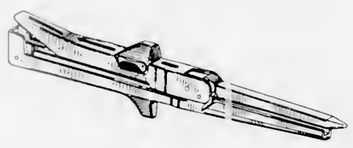
301,738
DEPILATOR
Yair Daar, Moshav Galia, and Shimon Yishav, 16 Remez Street, Rehovot, both of Israel
Filed Aug. 15, 1986, Ser. No. 897,108
Term of patent 14 years
U.S. Cl. D24—26



301,739
ELECTROSURGICAL PENCIL
Alexander Turner, Ithaca; Bradley W. Lewis, Spencer; Egidio L. De Oliveira, and John R. Scoville, both of Monroe, all of N.Y., assignors to MDT Corporation, Torrance, Calif.
Filed Oct. 15, 1986, Ser. No. 924,082
Term of patent 14 years
U.S. Cl. D24—26

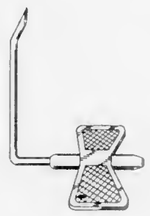


301,740
SURGICAL STAPLER
David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed Dec. 22, 1986, Ser. No. 944,884
Term of patent 14 years
U.S. Cl. D24—27

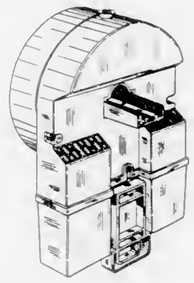


301,741
BABY BOTTLE
Michael G. Barber, 6707 S. 112th East Ave., Tulsa, Okla. 74133
Filed May 8, 1987, Ser. No. 47,065
Term of patent 14 years
U.S. Cl. D24—47

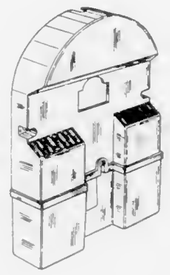
301,742
WINGED ANGULAR INFUSION NEEDLE
Mark Wyzgala, Mercer Island, Wash., and Thomas E. Morizio, Highland Park, Ill., assignors to Baxter International Inc., Deerfield, Ill.
Filed Mar. 18, 1986, Ser. No. 841,079
Term of patent 14 years
U.S. Cl. D24—52



301,743
DRIVE UNIT FOR ROLLING DOOR
Paul M. Schremmer, Hunters Hill, Australia, assignor to Byrne & Davidson Doors (N.S.W.) Pty. Limited, Revesby, Australia
Filed Oct. 15, 1986, Ser. No. 919,333
Claims priority, application Australia, Apr. 15, 1986, 4884/86
Term of patent 14 years
U.S. Cl. D25—49



301,744
COMBINED COVER UNIT AND LAMP HOUSING FOR A ROLLING DOOR
Paul M. Schremmer, Hunters Hill, Australia, assignor to Bryne & Davidson Doors (N.S.W.) Pty. Limited, Revesby, Australia
Filed Oct. 15, 1986, Ser. No. 919,334
Claims priority, application Australia, Apr. 15, 1986, 4880/86
Term of patent 14 years
U.S. Cl. D25—49



301,745
WALLBOARD CEILING RUNNER
Lowell Burkstrand, Rte. 1, Box 170, Braham, Minn. 55006, and George Burkstrand, 4335 4th St., Columbia Heights, Minn. 55421
Filed Oct. 31, 1986, Ser. No. 925,664
Term of patent 14 years
U.S. Cl. D25—119

301,746
WINDOW FRAME EXTRUSION
Raymond Dallaire, and Dominique Dallaire, both of St. David, Canada, assignors to P.H. Tech Inc., Levis, Canada
Filed Feb. 3, 1987, Ser. No. 10,565
Claims priority, application United Kingdom, Aug. 8, 1986, 1,035,965
Term of patent 14 years
U.S. Cl. D25—122

301,747
PAIR OF LINKED CANDLES
Michael C. B. Lam, Ground Floor, Kwai Bo Industrial Building, 40 Wong Chuk Hang Road, Aberdeen, Hong Kong
Filed Aug. 28, 1986, Ser. No. 901,475
Term of patent 14 years
U.S. Cl. D26—7

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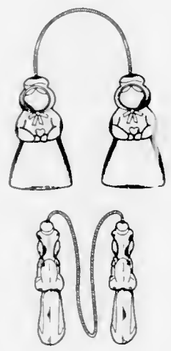
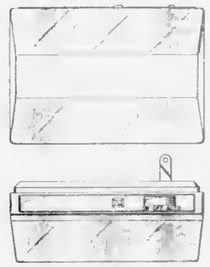
301,748
PAIR OF LINKED CANDLES
Michael C. B. Lam, Ground Floor, Kwai I o Industrial Building, 40 Wong Chuk Hang Road, Aberdeen, Hong Kong
Filed Aug. 28, 1986, Ser. No. 901,478
Term of patent 14 ye rs
U.S. Cl. D26—7

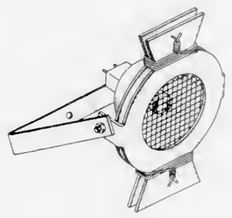


301,749
LIQUID CANDI E
Todd M. Comstock, Cotuit, Mass., assi nor to Renoir Candles, Ltd., Norfolk, Mass.
Division of Ser. No. 604,896, Apr. 27, 1984, Pat. No. 4,608,011. This application Jul. 16, 1986, Ser. No. 885,850
Term of patent 14 years
U.S. Cl. D26—9

301,750
NIGHTLIGHT
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Northbrook, Ill.
Filed Jun. 9, 1986, Ser. No. 872,462
Term of patent 14 years
U.S. Cl. D26—26

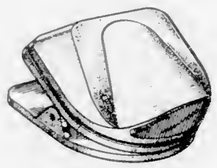


301,751
LIGHT FIXTURE
Robert J. Gaul, New York, N.Y., assignor to Archetype Gallery, Inc., New York, N.Y.
Filed Dec. 9, 1986, Ser. No. 939,762
Term of patent 14 years
U.S. Cl. D26—37

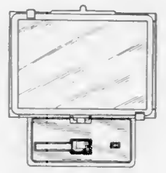


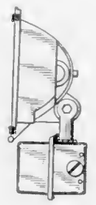
301,752
SPOTLIGHT
Ralph F. Osterhout, San Francisco, Calif., assignor to Tekna, Redwood City, Calif.
Filed Apr. 2, 1986, Ser. No. 847,614
Term of patent 14 years
U.S. Cl. D26—45

301,753
COMBINED BATTERY POWERED LIGHT AND UNIVERSAL SPRING ACTION CLIP
Marc R. Iacovelli, Miami, Fla., assignor to Rally Manufacturing, Inc., Miami, Fla.
Filed Dec. 5, 1986, Ser. No. 938,757
Term of patent 14 years
U.S. Cl. D26—60



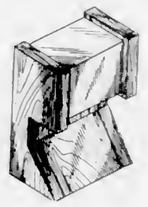
301,754
COMBINED OUTDOOR FLOODLIGHT AND PHOTO ELECTRIC CONTROL THEREFOR
Giovanni DeCandia, Germantown, Tenn., assignor to FL Industries, Inc., Livingston, N.J.
Filed May 22, 1986, Ser. No. 866,094
Term of patent 14 years
U.S. Cl. D26—63





301,755
ADJUSTABLE LAMP
Ernesto Gismondi, Milan, Italy, assignor to Artemide S.p.A., Milan, Italy
Filed Jan. 20, 1987, Ser. No. 5,526
Claims priority, application Italy, Jul. 23, 1986, 22610 B/86[U]
Term of patent 14 years
U.S. Cl. D26—63

301,756
FREE-STANDING DECK LIGHT
Mark L. Hanson, Golden Valley, Minn., assignor to MinnFac, Inc., Minneapolis, Minn.
Filed Apr. 3, 1987, Ser. No. 33,607
Term of patent 14 years
U.S. Cl. D26—68



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301,757
BOLT ON DECK LIGHT
Mark L. Hanson, Golden Valley, Minn., assignor to MinnFac, Inc., Minneapolis, Minn.
Filed Apr. 3, 1987, Ser. No. 33,608
Term of patent 14 years
U.S. Cl. D26—68

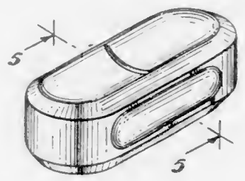
301,758
CEILING LAMP
Richard F. Sapper, Stuttgart, Fed. Rep. of Germany, assignor to Artemide S.P.A., Pregnana Milanese, Italy
Filed Jul. 8, 1986, Ser. No. 883,810
Claims priority, application Italy, Jan. 16, 1986, 20506 B/86[U]
Term of patent 14 years
U.S. Cl. D26—85

301,759
STANDING LAMP
Carlo Forcolini, Milan, Italy, assignor to Artemide S.P.A., Milan, Italy
Filed Jan. 20, 1987, Ser. No. 5,523
Claims priority, application Italy, Jul. 23, 1986, 22607 B/86
Term of patent 14 years
U.S. Cl. D26—106

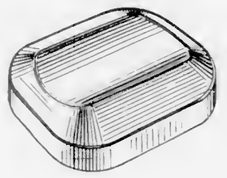
301,760
COMBINED LIGHT BULB ATTACHMENT AND SCENT RELEASING PEBBLES THEREFOR
Annick Goutal, Paris, France, assignor to Annick Goutal (a limited liability company), Paris, France
Filed Jul. 31, 1987, Ser. No. 82,425
The portion of the term of this patent subsequent to Jun. 13, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D26—113

301,761
LIGHTER THUMBROLLER
Jean G. Malamoud, Saint Jorioz, France, assignor to S. T. Dupont, Paris Cedex, France
Filed May 14, 1985, Ser. No. 733,814
Claims priority, application France, Nov. 29, 1984, 845 315
Term of patent 14 years
U.S. Cl. D27—161

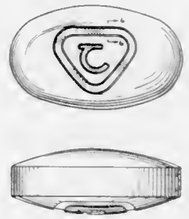
301,762
TABLET
Benjamin Oshlack, New York, N.Y., assignor to Euroceltique S.A., Luxembourg, Luxembourg
Filed Jul. 14, 1986, Ser. No. 885,037
Term of patent 14 years
U.S. Cl. D28—2



301,763
PHARMACEUTICAL TABLET
Gregory A. Rhoa, Collegeville, and Pravinchandra B. Shah, Warminster, both of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.
Filed Nov. 16, 1987, Ser. No. 121,772
Term of patent 14 years
U.S. Cl. D28—2



301,764
PHARMACEUTICAL TABLET
Avinash M. Contractor, Warminster; David E. Auslander, Yardley, and Wayne M. Grimm, Doylestown, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.
Filed Dec. 21, 1987, Ser. No. 136,156
Term of patent 14 years
U.S. Cl. D28—2



301,765
PHARMACEUTICAL TABLET
Avinash M. Contractor, Warminster; David E. Auslander, Yardley, and Wayne M. Grim, Doylestown, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.
Filed Dec. 21, 1987, Ser. No. 136,157
Term of patent 14 years
U.S. Cl. D28—2

301,766
PHARMACEUTICAL TABLET
Avinash M. Contractor, Warminster; David E. Auslander, Yardley, and Wayne M. Grim, Doylestown, all of Pa., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.
Filed Dec. 28, 1987, Ser. No. 138,884
Term of patent 14 years
U.S. Cl. D28—2

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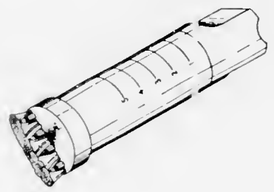
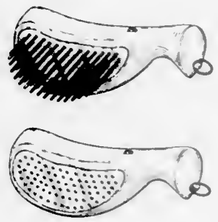
301,767
APPLICATOR FOR APPLYING CREAM FOR BALDNESS
James B. DeYarman, 990 Highland Rd., #310, Solana Beach, Calif. 92075
Filed May 29, 1986, Ser. No. 868,348
Term of patent 14 years
U.S. Cl. D28—7

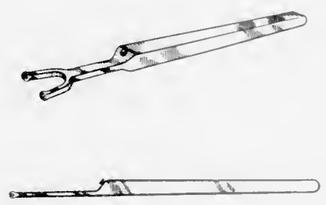
301,768
COMBINED CONTAINER AND APPLICATOR FOR HAIR TINT
Juanita Herndon, 8241 S. Marshfield St., Chicago, Ill. 60620
Filed Oct. 7, 1986, Ser. No. 916,458
Term of patent 14 years
U.S. Cl. D28—20



301,769
RETRACTABLE COMB
Fargo Chou, P.O. Box 10160, Taipei, Taiwan
Filed Oct. 2, 1986, Ser. No. 914,753
Term of patent 14 years
U.S. Cl. D28—21



301,770
DENTAL FLOSS HOLDER
Elizabeth A. Bethany, 203 Casa Urbano, Clinton, Miss. 39056
Filed Jul. 1, 1986, Ser. No. 880,906
Term of patent 14 years
U.S. Cl. D28—64

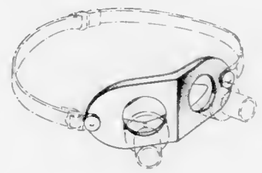


301,771
COSMETIC CASE
Karena Bakic, Munich, Fed. Rep. of Germany, assignor to Cosmede Anstalt, Vaduz, Liechtenstein
Filed May 21, 1986, Ser. No. 866,688
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1985, URA 1445/85
Term of patent 14 years
U.S. Cl. D28—76

301,772
LIPSTICK CASE
Karen E. McCready, New City, N.Y., assignor to Elleance Ltd., New City, N.Y.
Filed Feb. 9, 1987, Ser. No. 12,783
Term of patent 14 years
U.S. Cl. D28—85

301,773
ATOMIZER
Yukio Murakami, and Noboru Hara, both of Hiroshima, Japan, assignors to Fumakilla Limited, Tokyo, Japan
Filed Jan. 30, 1986, Ser. No. 825,676
Claims priority, application Japan, Jul. 30, 1985, 60-32247
Term of patent 14 years
U.S. Cl. D28—91.1

301,774
RESPIRATORY MASK
Kevin A. Rudolph, Leawood, Kans., and Donald C. Zavala, Iowa City, Iowa, assignors to Hans Rudolph, Inc., Kansas City, Mo.
Filed May 18, 1987, Ser. No. 51,124
Term of patent 14 years
U.S. Cl. D29—7



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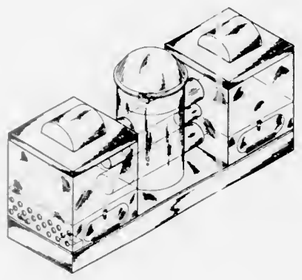
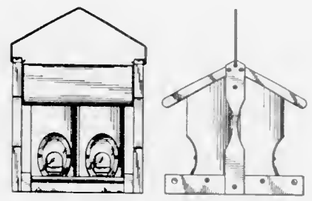
301,775
COMBINED TERRARIUM AND AQUARIUM
Michael D. McKeever, 1808 Sunset Pt. R L., Apt. K, Clearwater, Fla. 33575
Filed Aug. 4, 1986, Ser. No 892,775
Term of patent 14 years
U.S. Cl. D30—104

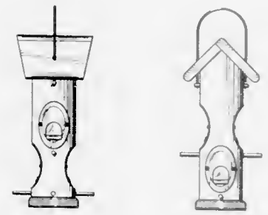


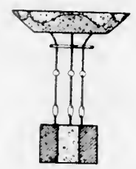
301,777
BIRD FEEDER
Victor Fasino, 62 Oneida Ave., Landing, N.J. 07850
Filed Jul. 24, 1987, Ser. No. 77,775
Term of patent 14 years
U.S. Cl. D30—126



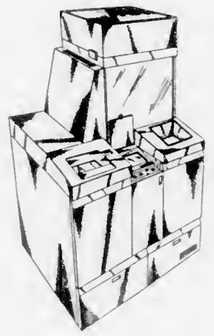
301,778
BIRD FEEDER
Victor Fasino, 62 Oneida Ave., Landing, N.J. 07850
Filed Jul. 24, 1987, Ser. No. 77,776
Term of patent 14 years
U.S. Cl. D30—127

301,776
COMBINED BIRD BATH AND PLANTER
Vernon Ochs, 3416 West 12th St., Apt. #1, Little Rock, Ark. 72204
Filed Feb. 13, 1987, Ser. No. 14,649
Term of patent 14 years
U.S. Cl. D30—123



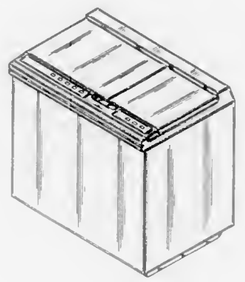


301,779
ACOUSTICAL CLEANING SYSTEM
Brian A. Giles, Honeoye Falls, and Frederick J. Schwab, Churchville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed May 16, 1986, Ser. No. 864,914
Term of patent 14 years
U.S. Cl. D32—1



301,781
WASHING MACHINE
Antonio G. Bover, Barcelona, Spain, assignor to Girbau, S.A., Spain
Filed May 2, 1986, Ser. No. 859,261
Term of patent 14 years
U.S. Cl. D32—6

301,780
COMBINED CLOTHES WASHER AND DRIER
Akira Ezaki; Tazuo Orihara, and Kiminori Yamaguchi, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Apr. 24, 1987, Ser. No. 42,094
Claims priority, application Japan, Oct. 27, 1986, 61-42737
Term of patent 14 years
U.S. Cl. D32—5



301,782
WASHING MACHINE
Antonio G. Bover, Barcelona, Spain, assignor to Girbau, S.A., Spain
Filed May 9, 1986, Ser. No. 862,417
Claims priority, application Spain, Dec. 20, 1985, 109662
Term of patent 14 years
U.S. Cl. D32—6

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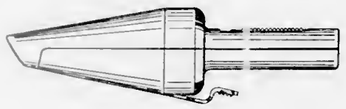
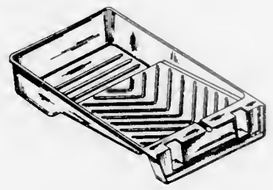
301,783
VACUUM CLEANER
Duane D. Adams, Deep River, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Dec. 19, 1985, Ser. No. 810,801
Term of patent 14 years
U.S. Cl. D32—18



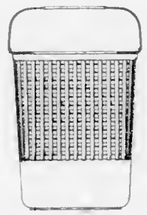
301,784
VACUUM CLEANER
Salvatore Petralia, Sayreville, and H. Gerald Young, South Plainfield, both of N.J., assignors to The Regina Company, Inc., Rahway, N.J.
Filed Feb. 19, 1986, Ser. No. 836,468
Term of patent 14 years
U.S. Cl. D32—22

301,785
PAINT TRAY
Charles R. Goetz, Carnegie, Pa., assignor to Alco Industries, Inc., Valley Forge, Pa.
Filed Mar. 23, 1987, Ser. No. 29,425
Term of patent 14 years
U.S. Cl. D32—53.1

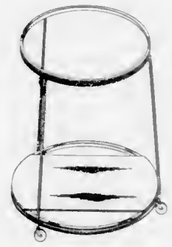


301,786
DUST BASKET
Toshimichi Yoshikawa, Kita Katsuragi, Japan, assignor to Kabushiki Kaisha Yoshikawa Kuni Kogyosho, Nara, Japan
Filed Apr. 22, 1986, Ser. No. 857,429
Claims priority, application Japan, Nov. 21, 1985, 60-48807
The portion of the term of this patent subsequent to Jun. 20, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D34—1

301,787
DUST BASKET
Toshimichi Yoshikawa, Kita Katsuragi, Japan, assignor to Kabushiki Kaisha Yoshikawa Kuni Kogyosho, Nara, Japan
Filed Apr. 22, 1986, Ser. No. 857,433
Claims priority, application Japan, Nov. 15, 1985, 60-48072
Term of patent 14 years
U.S. Cl. D34—1



301,788
TRASH BAG CART
Howard F. Werner, 1201 W. Verdugo Ave., Apt. F, Burbank, Calif. 91506
Filed Mar. 17, 1987, Ser. No. 26,654
Term of patent 14 years
U.S. Cl. D34—5



301,789
GOLF CART
Kinzo Tomoda, 3-4-8 Shirogane, Minato-Ku, Tokyo, Japan
Filed Mar. 4, 1987, Ser. No. 21,433
Term of patent 14 years
U.S. Cl. D34—15

301,790
SERVING CART
Morandi Ivano, Vacallo, Switzerland, assignor to Metaltex Italia S.p.A., Como, Italy
Filed Jun. 12, 1987, Ser. No. 62,197
Claims priority, application Italy, Dec. 15, 1986, 24032/86[U]
Term of patent 14 years
U.S. Cl. D34—21

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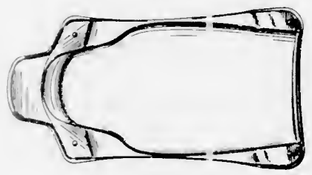
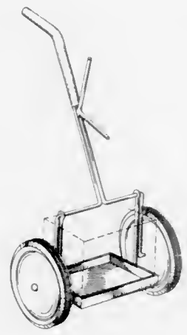
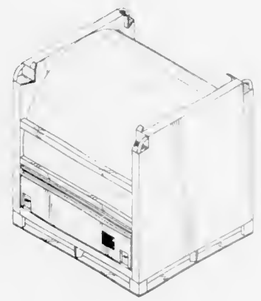
301,791
MECHANIC'S CREEPER
Bryce D. Osborne, 1581 Monrovia Ave., Newport Beach, Calif. 92663
Filed Apr. 27, 1987, Ser. No. 42,658
Term of patent 14 years
U.S. Cl. D34—23



301,792
STORAGE BATTERY CART
Allen R. Knauer, 11375 N. 114th Dr., Youngtown, Ariz. 85363
Filed Nov. 21, 1986, Ser. No. 933,591
Term of patent 14 years
U.S. Cl. D34—26



301,793
CONTAINER FOR TRANSPORTATION OF CRYOGENIC GASES
Torgny Wingbro, Hisings Backa, and Leif Bergstrom, Gothenburg, both of Sweden, assignors to AGA Aktiebolag, Lidingo, Sweden
Filed Feb. 7, 1986, Ser. No. 827,044
Term of patent 14 years
U.S. Cl. D34—93



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF JUNE, 1989

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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AB Volvo Penta: *See—*
Brandt, Lennart H., 4,840,136, Cl. 440-78.000.
Abbott Laboratories: *See—*
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Abbott, Martyn S., to Quest Medical, Inc. Infusion pump with direct pressure sensing. 4,840,542, Cl. 417-9.000.
Abbott, Richard E.: *See—*
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Abe, Akira; Mihayashi, Keiji; Kobayashi, Hidetoshi; and Kato, Hirohiko, to Fuji Photo Film Co., Ltd. Silver halide color photographic material and method for processing the same. 4,840,877, Cl. 430-350.000.
Abe, Kazuaki: *See—*
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Abe, Morio: *See—*
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Abe, Takao: *See—*
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Abel, Roy P.; and Welcome, Warren W., to Abel, Roy P. Vehicle low speed warning system. 4,841,276, Cl. 340-466.000.
Action Technologies, Inc.: *See—*
Schumacher, John E., III, 4,840,702, Cl. 156-643.000.
Adachi, Atsushi: *See—*
Sasaki, Jun; Adachi, Atsushi; Naruo, Kyoichi; Shinagawa, Yukio; and Ohtani, Sumio, 4,840,733, Cl. 210-500.410.
Adachi, Takeshi; and Masaki, Kazuo, to Yamaha Corporation. Tone signal generation device for an electric musical instrument. 4,840,100, Cl. 84-1.190.
Adams, Craig W.; Leary, Jeffry J.; and Rosenberg, Martin, to Smithkline Beckman Corporation. Polynucleotide hybridization probes. 4,840,892, Cl. 435-5.000.
Adams, George W.; Smock, Steven W.; and Helft, Ross G., to Emhart Industries, Inc. Appliance timer. 4,841,496, Cl. 368-107.000.
Adata Software Limited: *See—*
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ADC Telecommunications, Inc.: *See—*
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Addicks, Lyle F. Earthquake illuminating device. 4,841,288, Cl. 340-690.000.
Adell, Robert. Electric toy train track. 4,841,104, Cl. 191-29.00R.
Adger Kogyo Co., Ltd.: *See—*
Iijima, Zenshiro, 4,840,833, Cl. 428-207.000.
Adnyana, Dewa N.; and Rogen, Neil E., to Memory Metals, Inc. Apparatus for sealing a well blowout. 4,840,346, Cl. 251-1.300.
Adrian, Gerhard: *See—*
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Advanced Micro Devices, Inc.: *See—*
Walters, Donald M., Jr., 4,841,279, Cl. 340-146.200.
Aeschlimann, Peter; and Schwander, Hansrudolf. Reactive dyes comprising a reactive radical bonded to the chromophor by a urea bridge member. 4,841,028, Cl. 534-629.000.
AGA A.B.: *See—*
Ziegler, Michael J.; Millward, Barry; and Robb, Kenneth P., Jr., 4,840,656, Cl. 65-85.000.
Agfa - Gevaert Aktiengesellschaft: *See—*
Birgmeir, Klaus, 4,841,360, Cl. 358-80.000.
Ohlschlager, Hans; Renner, Gunter; Kunitz, Friedrich-Wilhelm; Odenwalder, Heinrich; and Hubner, Dirk, 4,840,880, Cl. 430-505.000.
Ohlschlager, Hans; Schranz, Karl-Wilhelm; and Sobel, Johannes, 4,840,890, Cl. 430-622.000.
AGFA-Gevaert Aktiengesellschaft: *See—*
Peters, Manfred; Ohlschlager, Hans; Kaluschke, Thomas; Wingender, Kaspar; Schenk, Gunther; and Boie, Immo, 4,840,871, Cl. 430-203.000.
Peters, Manfred; Helling, Gunter; and Reiff, Helmut, 4,840,885, Cl. 430-559.000.
Aglietto, Mauro: *See—*
Moggi, Giovanni; Cirillo, Gianna; Aglietto, Mauro; and Benedetti, Enzo, 4,840,994, Cl. 525-72.000.
Agro-Kanesho Co., Ltd.: *See—*
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Ahmad, Eddress: *See—*
Pack, Roger N.; and Ahmad, Eddress, 4,839,972, Cl. 36-117.000.
Aida, Akira; and Ikeda, Toshihiro, to Nippon Seiko Kabushiki Kaisha. Hydraulic lash adjuster. 4,840,153, Cl. 123-90.550.
Air Liquid: *See—*
Claudet, Gerard; Dewanckel, Bernard; Ravex, Alain; and Reale, Serge, 4,840,032, Cl. 62-6.000.
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Aiuchi, Susumu: *See—*
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akaba, Noriyuki: *See—*
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Akabane, Hidemitsu; Isobe, Toshimi; and Hoshino, Seiichi, to Sanden Corporation. Automotive air conditioning system damper position control. 4,840,308, Cl. 236-13.000.
Akahane, Kenji: *See—*
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Akedo, Jun: *See—*
Kobayashi, Hiroshi; Machida, Haruhiko; Ema, Hideaki; Akedo, Jun; Harigaya, Makoto; and Ide, Yasushi, 4,840,922, Cl. 437-129.000.
Tawara, Takao; Akedo, Jun; and Iwashita, Yoshiyuki, 4,841,129, Cl. 235-472.000.
Akimoto, Taizo: *See—*
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Akiyama, Hideki; and Morita, Toyoo, to Yoshida Kogyo K. K. Slider handling apparatus. 4,839,963, Cl. 29-766.000.
Akiyama, Toru, to Pioneer Electronic Corporation. Time-base error correction apparatus for video tape or disk player. 4,841,379, Cl. 358-337.000.
Akzo N.V.: *See—*
Brodowski, Walter, 4,841,014, Cl. 528-191.000.
Groenenboom, Cornelis J.; and Wieringa, Peter A., 4,840,724, Cl. 208-120.000.
van Boeckel, Constant A. A.; Beetz, Tom; and Petitou, Maurice, 4,841,041, Cl. 536-118.000.
Van Dedem, Gijsbert W. K.; and Van Houdenhoven, Francois E. A., 4,840,897, Cl. 435-69.000.
Alaki, Yasuhide: *See—*
Ihara, Keisuke; Alaki, Yasuhide; and Nomura, Jun, 4,840,381, Cl. 273-232.000.
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Alcan International Limited: *See—*
Tomaka, Jan Z., 4,840,127, Cl. 105-406.100.
Alexandrov, Andrei J.; Dolgikh, Viktor A.; Kerimov, Oleg M.; Samarin, Alexei J.; Rudoi, Igor G.; and Soroka, Arkady M. Medium for gas laser excited by ionizing particles. 4,841,537, Cl. 372-55.000.
Alexandrovich, Peter S.: *See—*
Bugner, Douglas E.; Alexandrovich, Peter S.; DeMejo, Lawrence P.; Guistina, Robert A.; and Anderson, James H., 4,840,864, Cl. 430-110.000.
Alfa-Laval Marine and Power Engineering AB: *See—*
Pallmar, Anders, 4,840,612, Cl. 494-2.000.
Alfred Grass Ges.m.b.H. Metallwarenfabrik: *See—*
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Burgdorf, Jochen; Reinartz, Hans-Dieter; Weise, Lutz; Oevirk, Norbert; Becker, Horst P.; and Determann, Otto, 4,840,436, Cl. 303-119.000.
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Allen, Andrew W.: *See—*
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Allen, James L.: *See—*
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Allied Products Corporation: *See—*
Pingry, Larry J., 4,840,019, Cl. 56-13.600

Allied-Signal Inc.: *See—*
Chai, Bruce H.; Lai, Shui T.; and Long, Margaret N., 4,841,530, Cl. 372-41.000.
Moore, David J., 4,840,594, Cl. 445-7.000.
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Allmineral Aufbereitungstechnik GmbH & Co. KG: *See—*
Jungmann, Andreas; and Reilard, Ulrich, 4,840,753, Cl. 261-76.000.

Allstar Vergrauchsguter GmbH: *See—*
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Alps Electric Co., Ltd.: *See—*
Ouchi, Junichi, 4,841,141, Cl. 250-221.000.
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Alsobrooks, Daniel E.; Bart, Hansueli; Chauvin, Richard; Horn, Thomas A.; Merte, John H.; Mesenich, Gerhard; and Mitts, Donna M., to Colt Industries Inc. Electromagnet valve assembly and fuel metering apparatus. 4,840,163, Cl. 123-533.100.

Alsthom: *See—*
Bourcier, Pierre; and Riollet, Gilbert, 4,840,539, Cl. 416-191.000.
Dumas, Jean-Claude; Thoraval, Maurice; and Genuit, Gerard, 4,840,221, Cl. 165-41.000.

Altendorf, Hans-Walter, to Siemens Aktiengesellschaft. Dental equipment having means for delivering RF and LF energy to a dental handpiece. 4,840,563, Cl. 433-29.000.

Althoff, Karl-Heinz, to O & K Orenstein & Koppel AG. Apparatus for transporting loads. 4,840,533, Cl. 414-495.000.

Aluminum Company of America: *See—*
Hyland, M. Elise; and Hunt, Warren H., Jr., 4,840,852, Cl. 428-654.000.

AM International, Inc.: *See—*
Szczesniak, Stanley J., 4,840,121, Cl. 101 415.100.

Amada, Eiichi; Shirasu, Hirotoshi; Takatori, Hiroshi; Kazawa, Tohru; Suzuki, Toshiro; Miyamoto, Takanori; and Kameyama, Tatsuya, to Hitachi, Ltd. Method and system for bidirectionally transmitting data. 4,841,521, Cl. 370-31.000.

Amano, Toshio: *See—*
Ichikawa, Norihito; Someya, Ikeo; Ota, Osamu; and Amano, Toshio, 4,841,367, Cl. 358-181.000.

Ambic Equipment Limited: *See—*
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Littlehales, William J., 4,840,714, Cl. 204-180.100.

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American Standard Inc.: *See—*
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American Telephone and Telegraph Company: *See—*
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American Telephone and Telegraph Company, AT&T Bell Laboratories: *See—*
Delaney, Robert H.; Kalmanek, Charles R., Jr.; and Restrick, Robert C., III, 4,841,295, Cl. 340-825.500.
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Ammeraal, Robert N.; Hedges, Allan R.; and Gottneid, David J., to American Maize-Products Company. Purification and separation of branched beta-cyclodextrins. 4,840,679, Cl 127-40.000.

Amoco Corporation: *See—*
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Ams, Felix; and Schafer, Roland, to Richard Wolf GmbH. Endoscopic video system. 4,841,363, Cl. 358-98.000.

Analgesic Associates: *See—*
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,840,962, Cl. 514-406.000.

Anand, Joginder N.; Bales, Stephen E.; Feay, Darrell C.; and Jeanes, Thomas O., to Dow Chemical Company, The. Tetrabromo bisphenol based polyestercarbonate membranes and method of using. 4,840,646, Cl. 55-16.000.

Anderson, Allen B. Power driven underwater viewing platform. 4,840,592, Cl. 441-135.000.

Anderson, David W., to Eleanor Roosevelt Institute for Cancer Research, Inc. Therapeutic method using T cell growth factor. 4,840,934, Cl. 514-2.000.

Anderson, Donald R.: *See—*
Hogan, Thomas J., Jr.; Kasprick, Jon J.; Anderson, Donald R.; and Kersh, Douglas W., 4,841,456, Cl. 364-550.000.

Anderson, James H.: *See—*
Bugner, Douglas E.; Alexandrovich, Peter S.; DeMejo, Lawrence P.; Guistina, Robert A.; and Anderson, James H., 4,840,864, Cl. 430-110.000.

Anderson, Roy E., to Mobile Satellite Corporation. Low cost method and system for automatically steering a mobile directional antenna. 4,841,303, Cl. 342-359.000.

Anderson, William B., to Rexnord Inc. Apron type conveyor. 4,840,269, Cl. 198-822.000.

Ando, Yoshiyasu: *See—*
Nishida, Minoru; Mizuno, Naohito; Hattori, Tadashi; Huzino, Seizi; and Ando, Yoshiyasu, 4,840,067, Cl. 73-726.000.

Andrus, Bryan: *See—*
Oglesby, Gary; and Andrus, Bryan, 4,840,372, Cl. 272-72.000.

Angelini, Sergio. Automatic plant for continuous electroplating treatment of metal bars. 4,840,716, Cl. 204-207.000.

Angelucci, Ernest A., to Unisys Corporation. Test probe accessibility method and tool. 4,841,231, Cl. 324-73.00R.

Anheuser-Busch, Incorporated: *See—*
Clyne, Carl W.; Woolever, Gary L.; Teng, James; and Naji, Hooshang, 4,841,457, Cl. 364-557.000.

Ankrom, Michael J.; Bowcutt, Corey H.; Buckley, John J., Jr.; and Rew, James A., to Westinghouse Electric Corp. Method for vapor phase soldering. 4,840,305, Cl. 228-232.000.

Antunez, Bruce A. Bi-stable, three condition flush tank system. 4,840,196, Cl. 137-410.000.

Antus, Sandor: *See—*
Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.

Aoki, Hiroyuki; Yahagi, Shinichiro; and Saito, Takanobu, to Nissan Motor Company Ltd.; and Daido Tokushuko Kabushiki Kaisha. Torque detecting device. 4,840,073, Cl. 73-862.360.

Aoki, Kozo: *See—*
Hirose, Takeshi; Furutachi, Nobuo; Aoki, Kozo; Nakazyo, Kiyoshi; and Furusawa, Genichi, 4,840,878, Cl. 430-380.000.

Aoki, Toshikazu: *See—*
Ariizumi, Ryozo; Kainuma, Masakuni; Aoki, Toshikazu; Suda, Shoji; Hoshi, Mitsunori; and Ejiri, Takashi, 4,840,347, Cl. 251-63.400.

Aoshima, Shinichiro; and Tsuchiya, Yutaka, to Hamamatsu Photonics Kabushiki Kaisha. Voltage detector utilizing an optical probe of electro-optic material. 4,841,234, Cl. 324-96.000.

Aoyagi, Yoshio, to Pioneer Electronic Corporation. Pickup position control method enabling restart of reproduction after interruption. 4,841,505, Cl. 369-32.000.

Aoyagi, Yoshio: *See—*
Kiyoura, Kazuhiro; Endo, Fumio; Kimura, Toshiyuki; Aoyagi, Yoshio; and Nakamura, Kazunari, 4,841,506, Cl. 369-32.000.

Aoyama, Hirokazu: *See—*
Fukui, Shosin; Shinjo, Masayoshi; and Aoyama, Hirokazu, 4,840,675, Cl. 106-38.220.

Appel, Jean: *See—*
Richard, Philippe; Soulage, Andre ; and Appel, Jean, 4,841,304, Cl. 342-460.000.

Appelgren, Curt H.; Eskilsson, Eva C.; and Uvdal, Jonas P., to Lejus Medical Aktiebolag. Process for preparing rapidly disintegrating granulates. 4,840,799, Cl. 424-493.000.

Appleton, Bill R.; Ashley, Paul R.; and Buchal, Christopher J., to United States of America, Energy. Method of fabricating optical waveguides by ion implantation doping. 4,840,816, Cl. 427-38.000.

Applied Techniques Inc.: *See—*
Pine, Bob G., 4,840,267, Cl. 198-498.000.

Aqualon Company: *See—*
Just, Ernst K.; and Nickol, Robert G., 4,841,040, Cl. 536-105.000.

ARA - Werk Kramer GmbH & Co.: *See—*
Segatz, Wilhelm, 4,840,293, Cl. 222-94.000.

Arai, Mikiro; Isoda, Takeshi; and Itoh, Takuji, to Toa Nenryo Kogyo Kabushiki Kaisha. Inorganic polysilazane and method of producing the same. 4,840,778, Cl. 423-324.000.

Arai, Ryuichiro: *See—*
Imai, Hitoshi; Arai, Ryuichiro; Koyanagi, Kimiyuki; and Tadokoro, Michihiro, 4,841,507, Cl. 369-44.000.

Arai, Takashi, to Canon Kabushiki Kaisha. Metal mold structure for molding multi-layer resin. 4,840,553, Cl. 425-129.100.

Arai, Tetsuji, to Ushio Denki. Method of treating photoresists. 4,840,876, Cl. 430-328.000.

Arai, Tetsuji: *See—*
Suzuki, Shinji; Arai, Tetsuji; Ohno, Kuniharu; Ueki, Kazuyeshi; Mimura, Yoshiki; Tanaka, Kazuya; Sugioka, Shinji; and Suzuki, Hiroko, 4,841,342, Cl. 355-71.000.

Arai, Yasunori, to Asahi Kogaku Kogyo Kabushiki Kaisha. Reflecting-/refractive optical system. 4,840,472, Cl. 350-442.000.

Arai, Yoshio: *See—*
Kobayashi, Hideo; and Arai, Yoshio, 4,840,428, Cl. 297-408.000.

Araki, Junichi; Saito, Nobuhiro; Tezuka, Hidenori; and Saito, Masuhiro, to Honda Giken Kogyo Kabushiki Kaisha. Toothed belt. 4,840,608, Cl. 474-205.000.

Arbizzani, Tommaso, to Sodibo S.p.A. Dried load detector for dry-cleaning machines. 4,840,065, Cl. 73-295.000.

Arch, Paul E.; and Niemann, Edwin H., to Arco Chemical Technology, Inc. Isopentane as blowing agent to improve coffee retention in foam cups molded from expandable polystyrene. 4,840,759, Cl. 264-53.000.

Archer, Timothy H. V.; and Sutera, Richard, to Burlington Industries, Inc. Multi-color fluid jet pattern generator for textiles. 4,841,306, Cl. 346-1.100.

Arco Chemical Technology, Inc.: *See—*
Arch, Paul E.; and Niemann, Edwin H., 4,840,759, Cl. 264-53.000.

Ariizumi, Ryozo; Kainuma, Masakuni; Aoki, Toshikazu; Suda, Shoji; Hoshi, Mitsunori; and Ejiri, Takashi, to Fujikura Rubber, Ltd. Pneumatically-operated valve. 4,840,347, Cl. 251-63.400.

Arimoto, Akira: *See—*
Mochizuki, Takeshi; Arimoto, Akira; and Saito, Susumu, 4,841,137, Cl. 250-236.000.

Arismendi, A. M. (Andy), Jr.: *See—*
Jackson, John R., 4,841,250, Cl. 324-349.000.

Aristodimou, Emilios. Stone tiles. 4,840,825, Cl. 428-77.000.

Arita, Koji: *See—*
Ikoma, Mitsuhiro; Nakatani, Kazuo; Yoshida, Yuji; Tomizawa, Takeshi; and Arita, Koji, 4,840,042, Cl. 62-324.100.

Ariyavisitakul, Sirikiat: *See—*
Ikegami, Fumio; Yoshida, Susumu; Takeuchi, Tsutomu; and Ariyavisitakul, Sirikiat, 4,841,547, Cl. 375-53.000.

Ariyoshi, Kimio: *See—*
Shimasaki, Yuuji; Ueshima, Michio; Tuneki, Hideaki; and Ariyoshi, Kimio, 4,841,061, Cl. 546-184.000.

Armco Inc.: *See—*
Arnett, Charles R.; and Bruner, James P., 4,840,686, Cl. 148-334.000.

Armstrong, David I.: *See—*
Nixon, Rodger J.; Roselli, Peter J. C.; Armstrong, David I.; Lindley, Martin K.; and de la Bere, Imogen E., 4,841,441, Cl. 364-401.000.

Armstrong, William D., to Scientific Design Company, Inc. Process for the oxidation of ethylene to ethylene oxide. 4,841,080, Cl. 549-536.000.

Arnett, Charles R.; and Bruner, James P., to Armco Inc. Bainitic core grinding rod. 4,840,686, Cl. 148-334.000.

Arnold, Halan P.: *See—*
Hood, Stephen K.; Norkoski, Joseph; and Arnold, Halan P., 4,840,008, Cl. 53-137.000.

Arzoumanian, Aram: *See—*
Wong, Kam C.; Rubinshtein, Bernard; and Arzoumanian, Aram, 4,840,501, Cl. 400-124.000.

Asada, Katsuhiko: *See—*
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.

Asahi Denka Kogyo Kabushiki Kaisha: *See—*
Endo, Takeshi; Nambu, Yoko; and Yamamoto, Kazutoshi, 4,841,058, Cl. 546-257.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Nejigaki, Tatuo; and Kakutani, Yoshimi, 4,840,769, Cl. 422-26.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Arai, Yasunori, 4,840,472, Cl. 350-442.000.
Kawasaki, Masahiro; and Sato, Osamu, 4,841,322, Cl. 354-400.000.

Asahina, Yasuo: *See—*
Nakayama, Nobuhiro; Asahina, Yasuo; Fushimi, Hiroyuki; and Iwamoto, Yasuaki, 4,841,331, Cl. 355-245.000.

Asai, Masahiko: *See—*
Katagiri, Shingo; Mori, Keiji; and Asai, Masahiko, 4,840,326, Cl. 242-199.000.

Asami, Kazuo; and Ogasawara, Fumihiro, to Ricoh Company, Ltd. Facsimile transmission control method in which a frame of stored image data is transmitted when either a predetermined time has elapsed or a predetermined amount of image data has been stored. 4,841,373, Cl. 358-257.000.

Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, to Matsushita Electric Industrial Co., Ltd.; Sanyo Electric Co., Ltd.; Mitsubishi Denki Kabushiki Kaisha; and Sharp Corporation. Tag Data processing apparatus for a data flow computer. 4,841,436, Cl. 364-200.000.

Asanuma, Yasuo: *See—*
Matsuura, Ryo; Yoshimura, Shigeyuki; Asanuma, Yasuo; Nasu, Katsuaki; Yoshizumi, Haruo; Tsujimoto, Kazumi; and Kimura, Toshiyuki, 4,840,932, Cl. 502-202.000.

Asao, Kouichiro: *See—*
Ohmae, Tadayuki; Sakurai, Tadashi; and Asao, Kouichiro, 4,840,847, Cl. 428-373.000.

Ashland Oil, Inc: *See—*
Culbertson, Billy M.; and Tiba, Omar, 4,841,002, Cl. 525-504.000.

Ashley, Paul R.: *See—*
Appleton, Bill R.; Ashley, Paul R.; and Buchal, Christopher J., 4,840,816, Cl. 427-38.000.

Aso, Akira, to NEC Corporation. Semi-custom integrated circuit provided with standardized capacitor cells. 4,841,352, Cl. 357-45.000.

Asoh, Seiichi, to Mazda Motor Corporation. Automotive rear underbody structure. 4,840,424, Cl. 296-204.000.

Atlantic Richfield Company: *See—*
Levine, Robert A., 4,840,729, Cl. 210-170.000.
Wakefield, John J., Jr., 4,840,726, Cl. 208-152.000.

Atlas Air (Australia) Pty. Limited: *See—*
Marton, Lewis, 4,841,122, Cl. 219-273.000.

Atsumi, Hiroaki: *See—*
Sasaki, Akihiko; and Atsumi, Hiroaki, 4,841,382, Cl. 360-32.000.

Attar, Amir J., to Perfect View, Inc. Gas dosimeter for colorimetrically indicating the presence of amides. 4,840,919, Cl. 436-111.000.

Audus, David: *See—*
Gabriel, David; Audus, David; and Strange, Norman, 4,840,490, Cl. 356-375.000.

Auerbach, Gunther; and Moser, Helmut A., to Sandoz Ltd. Monoazo compounds having a 6-(5'-chloro-2',4'-difluoropyrimid-6'-ylamino)-1-hydroxy-3-sulfonaphthalene group and their use as dyes. 4,840,642, Cl. 8-549.000.

Auergesellschaft GmbH: *See—*
Dahrendorf, Klaus-Dieter; Huennebeck, Volker; and Hoffman, Wilfried, 4,840,170, Cl. 128-202.260.

August, John L., Jr.: *See—*
Jones, Marshall G.; Ortiz, Angel L., Jr.; Chande, Tushar S.; and August, John L., Jr., 4,840,450, Cl. 350-96.200.

August Sauter GmbH: *See—*
Hermann, Bernhard; Muerdter, Herbert; Ehresmann, Walter; and Kammerer, Manfred, 4,841,280, Cl. 340-706.000.

Augustin, Eugene P. Microwave rotary junction with external rotary energy coupling. 4,841,261, Cl. 333-21.00A.

Augustin, Ulrich: *See—*
Notz, Wolfgang; Schwarz, Volker; and Augustin, Ulrich, 4,840,060, Cl. 73-119.00A.

Augustine, Douglas J.: *See—*
Augustine, Scott D.; and Augustine, Douglas J., 4,840,172, Cl. 128-207.140.

Augustine, Scott D.; and Augustine, Douglas J. Device for positioning an endotracheal tube. 4,840,172, Cl. 128-207.140.

Ausimont S.p.A.: *See—*
Moggi, Giovanni; Cirillo, Gianna; Aglietto, Mauro; and Benedetti, Enzo, 4,840,994, Cl. 525-72.000.

Ausnit, Steven: *See—*
Van Erden, Donald L.; and Ausnit, Steven, 4,840,611, Cl. 493-213.000.

Austin, Frederick D.; Barclay, John L.; and Hunter, James O., to British Petroleum Company p.l.c., The. Hydrocarbons pyrolysis. 4,840,723, Cl. 208-106.000.

Australian Building Industries Pty. Ltd.: *See—*
Cochrane, Ronald, 4,840,005, Cl. 52-667.000.

Avaneas, Napoleon G., to Grumman Aerospace Corporation. High speed data-clock synchronization processor. 4,841,551, Cl. 375-118.000.

Awazu, Koichi, to Kabushiki Kaisha Toshiba. Display controller with a variable scrolling speed, and method for operating same. 4,841,454, Cl. 364-521.000.

B. F. Goodrich Company, The: *See—*
Son, Pyong-Nae; Jacobs, Charles P.; Kovach, Ronald M.; and Lai, John T., 4,841,053, Cl. 544-384.000.

B. V. Gerbs. ter Braak: *See—*
van der Schaaf, Herman J., 4,840,678, Cl. 127-2.000.

Baba, Hisatoshi; Imokawa, Naoki; and Shiho, Makoto, to Canon Kabushiki Kaisha. Magnetic field generator having a plurality of coils for generating magnetic field in substantially the same space and method of driving the same. 4,841,407, Cl. 361-146.000.

Baba, Takeshi: *See—*
Kushibiki, Nobuo; Nose, Noriyuki; Nakajima, Toshiyuki; Baba, Takeshi; Matsugu, Masakazu; and Niwa, Yukichi, 4,840,473, Cl. 350-484.000.

Babcock & Wilcox Company, The: *See—*
Domian, Henry A.; LaCount, Dale F.; Miller, Alex S.; and Seibert, Kenneth D., 4,840,768, Cl. 420-582.000.
Mizerak, Dennis S., 4,841,413, Cl. 361-400.000.

Babyak, Richard M.: *See—*
Dulin, Thomas G.; Bass, Eric; and Babyak, Richard M., 4,840,591, Cl. 441-106.000.

Baes, Emile, to Redco N.V. Lightweight insulating boards and process for manufacturing same. 4,840,672, Cl. 106-86.000.

Baggio, Horacio A.; and Eckart, George R., to Woodhead Industries, Inc. String lights for construction sites. 4,841,420, Cl. 362-249.000.

Baika, Toyokazu: *See—*
Tanahashi, Toshio; Nakamura, Norihiko; Noguchi, Hiroshi; Nomura, Kenichi; Baika, Toyokazu; Kanamaru, Masanobu; Kobayashi, Tatsuo; Nagaosa, Hideo; Ito, Kazuhiro; Ito, Toshio; and Nakae, Kouichi, 4,840,147, Cl. 123-65.0VD.

Bailey, Steven P.: *See—*
Guslits, Vladimir S.; and Bailey, Steven P., 4,840,259, Cl. 192-48.200.

Baker, Brian N.: *See—*
Campbell, John S., Baker, Brian N.; and Katyal, Anil, 4,840,774, Cl. 423-79.000.

Baker Hughes: *See—*
Lillywhite, M. James; and Horn, Michael J., 4,840,283, Cl. 220-5.00A.

Baker Hughes Incorporated: *See—*
Berzin, Vel; and Mendez, Luis E., 4,840,231, Cl. 166-387.000.

Baker International Corporation: *See—*
LeBegue, Maurice K.; and Wilson, Henry E., 4,840,432, Cl. 299-64.000.

Baker, Ralph E.; and Landherr, Gordon G., to Ampro Photo Workshops Limited. Apparatus to move negatives. 4,840,415, Cl. 294-1.100.

Bakken, Theresa A.: *See—*
Johnson, Philip S.; and Bakken, Theresa A., 4,840,786, Cl. 424-43.000.

Balbierz, Daniel J., to Menlo Care, Inc. Protective sheath for catheter assembly. 4,840,613, Cl. 604-51.000.

Bales, Stephen E.: *See—*
Anand, Joginder N.; Bales, Stephen E.; Feay, Darrell C.; and Jeanes, Thomas O., 4,840,646, Cl. 55-1[illegible].000.

Bally Manufacturing Corporation: *See—*
Oglesby, Gary; and Andrus, Bryan, 4,84[illegible],372, Cl. 272-72.000.

Banks, Gilbert H., to Bev-Cap Plastics Pty. Ltd. Syringe hypodermic needle. 4,840,616, Cl. 604-110.000.

Banno, Hisao, to NGK Spark Plug Co., Ltd. Underwater piezoelectric arrangement. 4,841,494, Cl. 367-157.000.

Banzai, Hideo: *See—*
Ikeda, Go; Sasaki, Kiyoshi; Kumazaki, Hiroshi; Fujita, Shigeru; and Banzai, Hideo, 4,841,459, Cl. 364-557.00.

Baran, Michael S.: *See—*
Hastings, Jerome K.; Beihoff, Bruce C.; Baran, Michael S.; Juds, Mark A.; and Hansen, James E., 4,841,235, Cl. 324-117.00R.

Barbee, Robert B., to Eastman Kodak Company. Polyesters with improved gas barrier properties. 4,841,012, Cl. 528-125.000.

Barclay, John L.: *See—*
Austin, Frederick D.; Barclay, John L. and Hunter, James O., 4,840,723, Cl. 208-106.000.

Barclay, Randel L. Rubber crumb recovery from vehicle tires. 4,840,316, Cl. 241-279.000.

Bard Limited: *See—*
Brazier, Gary B., 4,840,187, Cl. 128-844.00.

Barmbilla, Luigi: *See—*
Katz, Egon; Bossenmaier, Alban; and Barmbilla, Luigi, 4,840,397, Cl. 280-739.000.

Barney, Jonathan A.; and Karunaratne, Arjuna R., to Lutron Electronics Co., Inc. Position-sensing circuit. 4,841,221, Cl. 323-320.000.

Barry, Irwin M. Nest extermination kit. 4,839,985, Cl. 43-132.100.

Bart, Hansueli: *See—*
Alsobrooks, Daniel E.; Bart, Hansueli; Chauvin, Richard; Horn, Thomas A.; Merte, John H.; Mesenich, Gerhard; and Mitts, Donna M., 4,840,163, Cl. 123-533.000.

Bartley, Donald L., to Kennametal Inc. Expanding mandrel. 4,840,360, Cl. 269-48.100.

Bartz, Wilfried, to Huels Aktiengesellschaft. Impact-resistant polyamide molding compounds. 4,840,993, Cl. 525-66.000.

BASF Aktiengesellschaft: *See—*
Goertz, Hans-Helmut; Straub, Ferdinand; Sanner, Axel; Kolb, Albrecht; Raubenheimer, Hans-Juergen; and Vogel, Friedrich, 4,841,066, Cl. 548-335.000.
Guentner, Andreas; Mayer, Udo; and Oberlinner, Andreas, 4,841,050, Cl. 544-150.000.
Gullbins, Erich; McKee, Graham E.; and Ley, Gregor, 4,840,990, Cl. 524-504.000.
Ostertag, Werner, 4,840,677, Cl. 106-456.500.
Sander, Bruno; Lauer, Herbert; and Neuwirth, Manfred, 4,840,736, Cl. 210-727.000.
Weber, Reinhold; Zuern, Ludwig; and Weilbacher, Manfred, 4,840,976, Cl. 521-79.000.

Baskett, Theodore N. Trailer hitch guide. 4,840,392, Cl. 280-477.000.

Bass, Eric: *See—*
Dulin, Thomas G.; Bass, Eric; and Babyak, Richard M., 4,840,591, Cl. 441-106.000.

Basso, Egidio. Light-sensitive switch structure and method with inverse off/on ratio. 4,841,164, Cl. 307-117.000.

Bata, John I.: *See—*
Jonelis, John A.; and Bata, John I., 4,840,649, Cl. 55-140.000.

Bateman, Glenn; and Brand, Donald L., to Tektronix, Inc. Digital time base with corrected analog interpolation. 4,841,497, Cl. 368-113.000.

Battelle-Institut e.V.: *See—*
Schmalfuss, Harald; Kurpiella, Hubert; and Schneider, Bernhard, 4,841,139, Cl. 250-223.00R.

Bauer, Barney J.: *See—*
Higbee, Wallace C.; and Bauer, Barney J., 4,840,324, Cl. 242-107.600.

Bauer, Karl-Heinz; and Eckert, Gerold, to Preh, Elektrofeinmechanische Werke, Jakob Preh, Nachf. GmbH & Co. Air outlet device. 4,840,114, Cl. 98-2.000.

Baum, Gary A.; and Habeger, Charles C., Jr., to Institute of Paper Chemistry, The. Method and apparatus for measuring fiber orientation anisotropy. 4,841,223, Cl. 324-58.50A.

Baumann, Karl-Heinz: *See—*
Matthias, Klaus; Baumann, Karl-Heinz; Schick, Gerald; Disson, Arno; Moller, Hermann; Seel, Holger; Topfer, Claus; Nerger, Uwe; Thiele, Peter; and Fleisch, Eugen, 4,840,398, Cl. 280-756.000.

Baumgartner, Hans; Brandstadter, Manfred; and Henke, Ulrich, to Pierburg GmbH. Internal axis rotary piston engine with protrusions having two sealing corners. 4,840,550, Cl. 418-150.000.

Bausch, Max: *See—*
Herzog, Siegfried; Eckert, Dieter; and Bausch, Max, 4,840,475, Cl. 350-604.000.

Bauser, Herbert; Schindler, Bernd; and Chmiel, Horst, to Fraunhofer Geselschaft E.V. Modifying the surface of the interior pore walls of objects such as membranes with gas activated by partial brush discharge. 4,840,636, Cl. 8-115.520.

Baxter Healthcare Corporation: *See—*
Miller, Robert A.; and Stone, Albert L., 4,840,017, Cl. 53-468.000.

Baxter, John: *See—*
Bishop, Arthur E.; and Baxter, John, 4,840,197, Cl. 137-625.210.

Bayer Aktiengesellschaft: *See—*
Brack, Alfred, 4,840,641, Cl. 8-534.000.
Diehr, Hans-Joachim; Fest, Christa; Knsten, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Ene, Ludwig, 4,840,661, Cl. 71-90.000.
Gayer, Herbert; and Jelich, Klaus, 4,841,086, Cl. 558-301.000.
Habich, Dieter; Hartwig, Wolfgang; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,840,946, Cl. 514-210.000.
Habich, Dieter; and Hartwig, Wolfgang, 4,841,042, Cl. 540-200.000.
Hagemann, Hermann; and Sasse, Klaus, 4,841,089, Cl. 558-412.000.
Harnisch, Horst; and Raue, Roderich, 4,841,052, Cl. 544-361.000.
Hassel, Tillmann; Hocker, Jurgen; Heywang, Gerhard; Muller, Hans-Klaus; and Fitzky, Hans G., 4,841,073, Cl. 549-232.000.
Holmwood, Graham; Weissmuller, Joachim; Brandes, Wilhelm; and Reinecke, Paul, 4,840,961, Cl. 514-399.000.
Jager, Horst, 4,841,030, Cl. 534-638.000.
Ohst, Holger; Podszun, Wolfgang; Suling, Carlhans; Goossens, John; and Penners, Gunther, 4,840,989, Cl. 524-544.000.
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,840,954, Cl. 514-254.000.
Schriewer, Michael; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,841,059, Cl. 546-312.000.
Tacke, Peter; Grogp, Ulrich; and Idel, Karsten-Josef, 4,841,000, Cl. 525-437.000.
Tarnow, Horst; and Homeyer, Bernhard, 4,840,969, Cl. 514-617.000.

Bayerische Motoren Werke Aktiengesellschaft: *See—*
Johnson, Paul; and Karnebogen, Karl W., 4,840,115, Cl. 98-2.030.
Mueller, Rudolf; and Strasser, Ludwig, 4,840,393, Cl. 280-661.000.

Bayerlein, Friedrich; Keramaris, Nikolaos; Kottmair, Nikolaus; Kuhn, Manfred; and Maton, Michel M., to Diamalt Aktiengesellschaft. Process for producing colorless, odorless and tasteless cassia endosperm flour. 4,840,811, Cl. 426-430.000.

BBC Brown Boveri AG: *See—*
Koromzay, Tibor, 4,841,117, Cl. 219-76.100.

Beachell, Vicki T., to ICI Americas Inc. Nonalcoholic sunscreen gel. 4,840,788, Cl. 424-59.000.

Beauvais, Thomas; Krenke, Vincent G.; Lupoli, Peter J.; and Mattis, Donald J., to Casco Products Corporation. Liquid level gauging apparatus. 4,840,137, Cl. 116-227.000.

Bechdel, John F.: *See—*
Mitchell, James A.; and Bechdel, John F., 4,841,476, Cl. 364-900.000.

Beck, Anton K.: *See—*
Reddy, Vermuri B.; Hsiung, Nancy; Beck, Anton K.; and Bernstine, Edward G., 4,840,896, Cl. 435-68.000.

Becker, Horst P.: *See—*
Burgdorf, Jochen; Reinartz, Hans-Dieter; Weise, Lutz; Ocvirk, Norbert; Becker, Horst P.; and Determann, Otto, 4,840,436, Cl. 303-119.000.

Becker, Rudolf: *See—*
Karl, Rupert; and Becker, Rudolf, 4,840,022, Cl. 57-263.000.

Beckman Instruments, Inc.: *See—*
Shope, William H., 4,841,151, Cl. 250-364.000.

Becton, Dickinson and Company: *See—*
Burns, James A., 4,840,908, Cl. 435-296.000.
Melinyshyn, Lev A.; Stupar, Jeffrey M.; and Goldberg, Edward M., 4,840,690, Cl. 156-242.000.
Nathans, Gene R.; and Rosenstein, Robert W., 4,841,024, Cl. 530-387.000.
Williamson, Edward; and Pfeiffer, Stanley, 4,840,771, Cl. 422-104.000.
Zdrahala, Richard J.; and Strand, Marc A., 4,841,007, Cl. 528-28.000.

Bedington, Bryan C.: *See—*
Hawkins, Ross H.; Laing, David; and Bedington, Bryan C., 4,841,359, Cl. 358-76.000.

Beeley, Nigel; and Cremer, Gerard, to Synthelabo. Carbamate or urea derivatives, their preparation and pharmaceutical compositions comprising them. 4,840,967, Cl. 514-466.000.

Beetz, Tom: *See—*
van Boeckel, Constant A. A.; Beetz, Tom; and Petitou, Maurice, 4,841,041, Cl. 536-118.000.

Beier, Rudolf: *See—*
Welschof, Hans-Heinrich; and Beier, Rudolf, 4,840,087, Cl. 74-713.000.

Beihoff, Bruce C.: *See—*
Hastings, Jerome K.; Beihoff, Bruce C.; Baran, Michael S.; Juds, Mark A.; and Hansen, James E., 4,841,235, Cl. 324-117.00R.
Juds, Mark A.; and Beihoff, Bruce C., 4,841,246, Cl. 324-208.000.

Bekkema, Jeen, to Vermeulen-Hollandia Octrooien II B.V. Control device for a movable part, designed for opening and closing an opening, especially a sliding/tilting roof for a vehicle. 4,841,205, Cl. 318-282.000.

Belka, Heinrich, to Esge-Marby GmbH & Co., KG. Bicycle luggage carrier attachment arrangement. 4,840,298, Cl. 224-39.000.

Bell, Malcolm R.: *See—*
D'Ambra, Thomas E.; and Bell, Malcolm R., 4,840,950, Cl. 514-235.200.

Bell, Ramona R. External catheter urine collection system. 4,840,625, Cl. 604-352.000.

Bellos, Thomas J.; and Lovett, Eva G., to Petrolite Corporation. Polyalkanolamines. 4,840,748, Cl. 252-344.000.

Belly, Robert T.: *See—*
Frank, David S.; and Belly, Robert T., 4,840,784, Cl. 424-3.000.

Beltzer, Morton; and Jahanmir, Said, to Exxon Research and Engineering Company. Ashless anti-wear additives. 4,840,741, Cl. 252-47.000.

Ben-Sasson, Shmuel, to Rafa Laboratories. Preparation and method for effecting fat and lipid adsorption. 4,840,795, Cl. 424-690.000.

Benda, John A.: *See—*
Sziklas, Edward A.; and Benda, John A., 4,841,541, Cl. 372-94.000.

Bendix Electronics Limited: *See—*
Cook, John E., 4,840,350, Cl. 251-129.110.

Benedetti, Enzo: *See—*
Moggi, Giovanni; Cirillo, Gianna; Aglietto, Mauro; and Benedetti, Enzo, 4,840,994, Cl. 525-72.000.

Benim, Thomas E., to Du Pont de Nemours, E. I., and Company. Method for unwinding elastic tape. 4,840,695, Cl. 156-344.000.

Bentley, Douglas P.: *See—*
Price, Zane A.; and Bentley, Douglas P., 4,839,945, Cl. 24-49.00R.

Benvegar, Carl E.: *See—*
Charbonnier, Francis M.; Rockwell, Martin G.; and Benvegar, Carl E., 4,840,177, Cl. 128-419.00D.

Berdat, Henry F.: *See—*
Pavone, Robert J.; Davidson, Bruce L.; and Berdat, Henry F., 4,841,316, Cl. 354-4.000.

Berg, Lloyd; and Rall, Richard R., to Berg, Lloyd. Separation of 3-methyl-2-butanone from formic acid by extractive distillation. 4,840,707, Cl. 203-51.000.

Bergen, Richard F.: *See—*
Gundlach, Robert W.; and Bergen, Richard F., 4,841,146, Cl. 250-324.000.

Bernot, Anthony J.; and Johnson, Michael J., to Honeywell Inc. Apparatus and method for providing a gray scale capability in a liquid crystal display unit. 4,840,460, Cl. 350-333.000.

Bernstine, Edward G.: *See—*
Reddy, Vermuri B.; Hsiung, Nancy; Beck, Anton K.; and Bernstine, Edward G., 4,840,896, Cl. 435-68.000.

Berry, Richard C., to Cooper Industries, Inc. Explosion proof electrical conduit sealing fitting. 4,840,194, Cl. 138-155.000.

Bertke, James H.: *See—*
Nash, Dudley O.; Knight, Glenn L., Jr.; and Bertke, James H., 4,840,026, Cl. 60-271.000.

Berzin, Vel; and Mendez, Luis E., to Baker Hughes Incorporated. Method and apparatus for setting an inflatable packer. 4,840,231, Cl. 166-387.000.

Bethlehem Steel Corporation: *See—*
Lynn, John D.; Jablonski, Charles E.; and Egan, Walter D., 4,840,671, Cl. 106-85.000.
Steinbicker, Richard N.; Townsend, Herbert E.; and Yau, Yung-Herng, 4,840,712, Cl. 204-28.000.

Betts, John E.; and Toledo, George, to Thomas Industries Inc. Panic exit device. 4,839,988, Cl. 49-141.000.

Betz Laboratories, Inc.: *See—*
Reid, Dwight K., 4,840,720, Cl. 208-48.0AA.

Bev-Cap Plastics Pty. Ltd.: *See—*
Banks, Gilbert H., 4,840,616, Cl. 604-110.000.

Beyrer, Karl-Heinz: *See—*
Nussbaumer, Walter; and Beyrer, Karl-Heinz, 4,840,095, Cl. 82-117.000.

Bezos, Angel P.: *See—*
Fernandez, Emilio A.; Bezos, Angel P.; and Kimball, Charles H., 4,840,056, Cl. 73-1.00H.

Bhadra, Dilip K.; Creedon, Richard L.; and Harder, C. Ross, to GA Technologies Inc. Combined valve/cylinder using electro-rheological fluid. 4,840,112, Cl. 91-459.000.

Bhatia, Usha: *See—*
Hyldon, Roy; and Bhatia, Usha, 4,840,806, Cl. 426-270.000.

Bianchin, Eugenio; Longo, Giovanni; and Lunardon, Gian F., to Montedison S.p.A. Modified polyisocyanates with biuret structure and process for their preparation. 4,841,095, Cl. 560-115.000.

Bibracher, Wilhelm; and Hauser, Josef, to Siemens Aktiengesellschaft. Electron beam catcher for velocity modulated electron tubes. 4,840,595, Cl. 445-28.000.

Bickler, Donald B., to United States of America, National Aeronautics and Space Administration. Articulated suspension system. 4,840,394, Cl. 280-677.000.

Bidal, Rene M. R., to Ste Look. Device for fastening a shoe on a bicycle pedal. 4,840,086, Cl. 74-594.600.

Biddlecombe, Thomas W. Hand and digit exerciser. 4,840,370, Cl. 272-68.000.

Biedermann, Kurt: *See—*
Bottger, Wolfgang; Biedermann, Kurt; and Pensel, Werner, 4,840,828, Cl. 428-120.000.

Biehler, Wolfgang: *See—*
Rieger, Hansjorg W.; and Biehler, Wolfgang, 4,840,399, Cl. 280-757.000.

Biersdorff, Jack L., to C & K Systems, Inc. Infrared intrusion detection system incorporating a fresnel lens and a mirror. 4,841,284, Cl. 340-567.000.

Bikson, Benjamin: *See—*
Williams, Samuel C.; Bikson, Benjamin; Nelson, Joyce K.; and Burchesky, Robert D., 4,840,819, Cl. 427-245.000.

Binder, Dieter; Rovenszky, Franz; and Ferber, Hubert P., to CL Pharma Aktiengesellschaft. Isoxazole derivatives with antiviral activities and pharmaceutical products containing these. 4,841,065, Cl. 548-238.000.

Bingham, George H. Method and apparatus for testing relief valve. 4,840,057, Cl. 73-4.00R.

Bipolar Integrated Technology, Inc.: *See—*
Miller, Bruce E.; and Owen, Robert E., 4,841,468, Cl. 364-754.000.

Birch, Barry, to Lucas Industries Public Limited Company. Gauge driving system. 4,841,238, Cl. 324-144.000.

Birgmeir, Klaus, to Agfa - Gevaert Aktiengesellschaft. Apparatus and method for the reproduction of colored originals with gray balance and/or contrast adjustment. 4,841,360, Cl. 358-80.000.

Birkenbach, Alfred: *See—*
Schonlau, Juergen; Birkenbach, Alfred; and Harth, Ralf, 4,840,433, Cl. 303-9.680.

Birkholz, Ulrich; Haertl, Christof; and Nassler, Peter, to Siemens Aktiengesellschaft. Apparatus for srewing a cover onto a screw neck of a hearing aid. 4,840,249, Cl. 181-129.000.

Bishop, Arthur E.; and Baxter, John. Power steering valve. 4,840,197, Cl. 137-625.210.

Bishop, Eugene R.; Schneider, Matthew L.; and Rosshirt, Hermann, to North American Philips Corp. Side-looking speed sensor. 4,841,243, Cl. 324-174.000.

Bisping, Heinz; Leibhard, Erich; and Mauthe, Peter, to Hiltu Aktiengesellschaft. Anchor member with electrical insulation jacket. 4,840,524, Cl. 411-82.000.

Bisson, Joel, to Northern Telecom Limited. Asynchronous processor arbitration circuit. 4,841,178, Cl. 307-518.000.

Bleckmann, Hugo: *See—*
Rubin, Gerhard; and Bleckmann, Hugo, 4,840,315, Cl. 241-24.000.

Blenkhorn, Gary P., to S. D. Warren Company. Replicating process for interference patterns. 4,840,757, Cl. 264-22.000.

Bleser, Edward M.: *See—*
Cobb, Dean L.; and Bleser, Edward M., 4,840,279, Cl. 211-88.000.

Block, Aleck. Abrasive apparatus. 4,839,998, Cl. 51-376.000.

Block, Frank: *See—*
Epstein, Joseph; Parsons, John A.; and Block, Frank, 4,840,911, Cl. 436-8.000.

Bloom, Jerome P.: *See—*
Denman, Stephen A., 4,840,601, Cl. 464-157.000.

Blumenthal, Michael. Artificial eye lens and method of transplanting same. 4,840,627, Cl. 623-6.000.

Board of Regents, The University of Texas System: *See—*
Weldon, William F., 4,840,107, Cl. 89-8.000.
Weldon, William F., 4,841,185, Cl. 310-115.000.

Board of Regents, University of Texas System: *See—*
Farquhar, David; and Wang, Yuqiang, 4,841,085, Cl. 538-180.000.

Bockenheuser, Charles A., to Pardners Unlimited, Inc. Protective shield and method of fastening protective shield to a frame. 4,840,418, Cl. 296-91.000.

Bodor, Janos; van Heteren, Jan; Willemse, Henricus W.; and Vermaas, Leo F., to Lever Brothers Company. Process for the preparation of an edible fat-containing product. 4,840,810, Cl. 426-312.000.

Boeckmann, Hugo, to Zip-Pak Incorporated. Zippered film feed 4,840,012, Cl. 53-410.000.

Boehringer Mannheim GmbH: *See—*
Grosskopf, Rudiger; and Kessler, Christoph, 4,840,901, Cl. 435-91.000.
Kearns, Michael J.; and Comer, Michael J., 4,840,905, Cl. 435-240.250.

Boeing Company, The: *See—*
Curtis, R. Eugene; Narayanan, G. Hari; and Quist, William E., 4,840,682, Cl. 148-12.70A.
Hogan, Thomas J., Jr.; Kasprick, Jon J.; Anderson, Donald R.; and Kersh, Douglas W., 4,841,456, Cl. 364-550.000.

Bogoch, Samuel, to Brain Research, Inc. Method for diagnosing malignant tumors. 4,840,915, Cl. 436-530.000.

Bohler, Erwin: *See—*
Muller, Kurt; and Bohler, Erwin, 4,840,109, Cl. 89-33.140.

Boie, Immo: *See—*
Peters, Manfred; Ohlschlager, Hans; Kaluschke, Thomas; Wingender, Kaspar; Schenk, Gunther; and Boie, Immo, 4,840,871, Cl. 430-203.000.

Boissier, Guy: *See—*
Rousset, Abel C.; Boissier, Guy; Jabry, El Hadj; and Caffin, Jean-Pierre, 4,840,925, Cl. 501-1.000.

Boissonnet, Alain: *See—*
Heng, Jean-Paul; Ruiz, Ariel; and Boissonnet, Alain, 4,840,579, Cl. 439-395.000.

Bojrab, Dennis: *See—*
Heide, Jorgen; Gooch, Timothy D.; Prescott, Anthony D.; and Bojrab, Dennis, 4,840,178, Cl. 128-41[illegible].00R.

Bolehovszky, Andrea: *See—*
Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.

Bon, Michel: *See—*
Mulawka, Jan; Konczykowska, Agnieszka; and Bon, Michel, 4,841,263, Cl. 333-173.000.

Bonnefoy, Jean, to Bull S.A. Method and apparatus for measuring the thermal resistance of an element such as a large scale integrated circuit assemblies. 4,840,495, Cl. 374-43.000.

Bonnet, Bernard, to Framatome. Element for filtering stress variations in a bolted assembly. 4,840,521, Cl. 411-14[illegible].000.

Bontemps, Guy: *See—*
Guevel, Jean; Francois, Marc; and Bontemps, Guy, 4,840,021, Cl. 57-210.000.

Boratto, Francisco; Yue, Stephen; and Jonas, John J., to Ipsco Inc. Steel rolling using optimized rolling schedule. 4,840,051, Cl. 72-11.000.

Borden, Inc.: *See—*
Lee, Yanien; Merritt, Carleton G.; and Dermody, Nancy E., 4,840,808, Cl. 426-270.000.

Boris, Allen J.: *See—*
Lockard, Walter G.; Boris, Allen J.; and Kosc, Wieslaw, 4,840,390, Cl. 280-250.100.

Boros, Leslie A. Convertible footwear. 4,83[illegible],948, Cl. 24-662.000.

Borrelli, Nicholas F.; and Wedding, Brent M , to Corning Glass Works. Method for making colored photochromic glasses. 4,840,655, Cl. 65-30.110.

Borsa, Massimiliano: *See—*
Giani, Roberto P.; Parini, Ettore; Tonon, Giancarlo; and Borsa, Massimiliano, 4,841,046, Cl. 540-495.000.

Borsani, Paolo, to Tecno S.p.A. Mobili e Forniture per Arredamento. Flexible cable guide with two-directional joints. 4,840,023, Cl. 59-78.100.

Bossenmaier, Alban: *See—*
Katz, Egon; Bossenmaier, Alban; and Barmbilla, Luigi, 4,840,397, Cl. 280-739.000.

Botsco, Ronald J.; Jones, Robert L.; and Methe, David E., to NDT Instruments, Inc. Ultrasonic thickness gauge having automatic transducer recognition and parameter optimization and method thereof. 4,840,066, Cl. 73-597.000.

Botsolas, Carol M.: *See—*
Botsolas, Chris J., 4,840,201, Cl. 138-178.000.

Botsolas, Chris J., to Botsolas, Carol M. Two piece pipe fitting cover. 4,840,201, Cl. 138-178.000.

Bottger, Wolfgang; Biedermann, Kurt; and Pansel, Werner, to Vorwerk & Co. Interholding GmbH. Structural element formed of a resin-hardened velour fabric and fabrication method. 4,840,828, Cl. 428-120.000.

Boula, Gerard; and Georges, Alain, to Framatome. Process for the installation of tubes in a steam generator. 4,839,951, Cl. 29-157.400.

Bourcier, Pierre; and Riollet, Gilbert, to Alsthom. Moving blading for steam turbines. 4,840,539, Cl. 416-191.000.

Bourdonne, Jean-Claude, to Framatome. Gripping device for tensioning screwing elements. 4,840,526, Cl. 411-[illegible]63.000.

Bourgeaux, Pierre; and Riaud, Alain, to S.A. Des Etablissements Staubli. Displacement coder. 4,841,297, Cl. 34[illegible]-11.000.

Bourgois, Luc, to N. V. Bekaert S. A. Tire belt reinforcing strip and method of making of same. 4,840,214, Cl. 152-527.000.

Boursier, Bernard, to Roquette Freres. Confectionery or pharmaceutical product with a sugarless coating obtained by hard coating and method for its preparation. 4,840,797, Cl. [illegible]24-475.000.

Bowcutt, Corey H.: *See—*
Ankrom, Michael J.; Bowcutt, Corey H.; Buckley, John J., Jr.; and Rew, James A., 4,840,305, Cl. 228-23[illegible].000.

Bowles, Gary L., to Heinmiller, Wesley H. D. C. power controller. 4,841,165, Cl. 307-132.00R.

Bowser, C. Frederick; and Kurtz, John L., to Bowser, C. Frederick. Electrical tape boundary sensor apparatus 4,840,377, Cl. 273-31.000.

Brack, Alfred, to Bayer Aktiengesellschaft. Cationic diazacyanine dyestuffs for dyeing polyacrylonitrile-wool blends. 4,840,641, Cl. 8-534.000.

Brain Research, Inc.: *See—*
Bogoch, Samuel, 4,840,915, Cl. 436-530.000.

Brand, Donald L.: *See—*
Bateman, Glenn; and Brand, Donald L., 4,841,497, Cl. 368-113.000.

Brandes, Wilhelm: *See—*
Holmwood, Graham; Weissmuller, Joachim; Brandes, Wilhelm; and Reinecke, Paul, 4,840,961, Cl. 514-399.000.

Brandstadter, Manfred: *See—*
Baumgartner, Hans; Brandstadter, Manfred; and Henke, Ulrich, 4,840,550, Cl. 418-150.000.

Brandt, Lennart H., to AB Volvo Penta. Propeller drive for boats. 4,840,136, Cl. 440-78.000.

Branovich, Louis E.; Freeman, Gerard L.; Smith, Bernard; and Eckart, Donald W., to United States of America, Army. Method of making a cathode from tungsten and iridium powders using a barium iridiate formed from barium peroxide and iridium oxide as the impregnant. 4,840,767, Cl. 419-27.000.

Brazier, Gary B., to Bard Limited. Sheath applicator. 4,840,187, Cl. 128-844.000.

Breaux, Vance V. Underwater exhaust system for boats of stepped-hull construction and including exhaust cooling. 4,840,589, Cl. 440-89.000.

Bremer, Ross L.; and Hogshead, Howard P., to Bremer, Ross L. Apparatus for positioning and supporting a patient for spinal surgery. 4,840,362, Cl. 269-328.000.

Breneman, Bruce C.: *See—*
Burnett, Sibley C.; Purcell, John R.; Breneman, Bruce C.; and Sarwinski, Raymond E., 4,841,268, Cl. 335-216.000.

Bretthauer, Hans Jurgen: *See—*
Focke, Heinz; and Bretthauer, Hans Jurgen, 4,840,010, Cl. 53-375.000.

Brewer, Edward L.; and Clark, John M., to Henny Penny Corporation. Locking mechanism for a pressure cooker. 4,840,287, Cl. 220-316.000.

Bridgestone Corporation: *See—*
Hagiwara, Yoshiaki; Ishida, Hiromi; and Takahashi, Takeyoshi, 4,840,491, Cl. 366-69.000.
Ihara, Keisuke; Alaki, Yasuhide; and Nomura, Jun, 4,840,381, Cl. 273-232.000.
Kajita, Ryota; Esaki, Hiroshi; and Shimazaki, Hirato, 4,840,380, Cl. 273-77.00A.
Koseki, Hiroyuki, 4,840,213, Cl. 152-454.000.
Kukimoto, Takashi, 4,840,210, Cl. 152-209.00A.
Makino, Shigeo, 4,840,211, Cl. 152-209.00R.
Murase, Masanori; Tomita, Naotaka; and Iida, Kazuyoshi, 4,840,251, Cl. 181-206.000.

Brink, Jan: *See—*
Maijers, Andries C.; Weekamp, Johannus W.; Van Den Ackerveken, Antonius C. J. C.; and Brink, Jan, 4,841,410, Cl. 361-306.000.

Bristol-Myers Company: *See—*
Deziel, Robert; and Endo, Masaki, 4,841,043, Cl. 540-200.000.
Gamble, Donald E.; Hunter, Harry L.; and McKinney, Gordon R., 4,840,952, Cl. 514-253.000.

British Aerospace PLC: *See—*
Williams, George H., 4,840,331, Cl. 244-212.000.

British Aerospace Public Limited Company: *See—*
Ralfs, Colin A.; and Murdock, Anthony, 4,840,070, Cl. 73-818.000.

British Gas PLC: *See—*
Waddington, John D., 4,840,560, Cl. 432-59.000.

British Petroleum Company p.l.c., The: *See—*
Austin, Frederick D.; Barclay, John L.; and Hunter, James O., 4,840,723, Cl. 208-106.000.

British Telecommunications public limited company: *See—*
Welsh, William J.; Fenn, Brian A.; and Challener, Paul, 4,841,575, Cl. 381-36.000.
Winter, Christopher S.; and Kashyap, Raman, 4,840,461, Cl. 350-346.000.

Brodowski, Walter, to Akzo N.V. Melt-processable, thermotropic, fully aromatic polyesters. 4,841,014, Cl. 528-191.000.

Bron, Michel: *See—*
Gercekci, Anil; Bron, Michel; and Hudson, Peter D., 4,841,133, Cl. 235-492.000.

Brookman, Donald L.; Merrill, David E.; and Grollimund, Everett C., to Philip Morris Incorporated. Methods and apparatus for handling double-sided adhesive tabs. 4,840,694, Cl. 156-344.000.

Brooktree Corporation: *See—*
Lou, Perry W., 4,841,252, Cl. 330-9.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Sasaki, Ryoichi, 4,840,499, Cl. 400-83.000.
Suzuki, Keiko, 4,841,338, Cl. 355-27.000.
Suzuki, Makoto; and Urukawa, Satoshi, 4,841,311, Cl. 346-108.000.
Ueda, Michio; and Shibata, Satoshi, 4,841,214, Cl. 318-696.000.

Broucksou, Robert H., to R.H. Sheppard Co. Automatic regulator valve assembly for vehicle power steering. 4,840,244, Cl. 180-143.000.

Brown, Sterling B.: *See—*
Campbell, John R.; Williams, Robert E., Jr.; Brown, Sterling B.; Conroy, Paul M.; and Florence, Robert A., 4,840,982, Cl. 524-151.000.

Browning, James A. High-velocity controlled-temperature plasma spray method and apparatus. 4,841,114, Cl. 219-121.470.

Brubaker, Clifford E.; and McLaurin, Colin A., to University of Virginia Alumni Patents Foundation, The. Lever drive apparatus. 4,840,076, Cl. 74-143.000.

Bruckert, Serge: *See—*
Lechelle, Alain; Guidat, Thierry; and Bruckert, Serge, 4,839,978, Cl. 42-65.000.

Brudal, Hans N.: *See—*
Tetlie, Per J.; Brudal, Hans N.; and Meisingset, Alf E., 4,841,192, Cl. 310-337.000.

Brunel, Andre, to Robert Bosch GmbH. Fuel injection pump. 4,840,162, Cl. 123-506.000.

Bruner, James P.: *See—*
Arnett, Charles R.; and Bruner, James P., 4,840,686, Cl. 148-334.000.

Brunker, David L.: *See—*
Sampson, Stephen A.; Dambach, Philip J.; and Brunker, David L., 4,840,451, Cl. 350-96.200.

Brunner, Matthias, to Siemens Aktiengesellschaft. Method for testing conductor networks. 4,841,242, Cl. 324-158.00R.

Brunswick Corporation: *See—*
Staerzl, Richard E., 4,840,148, Cl. 123-73.00A.

Bruni, Charles D., Jr. Regulator safety valve. 4,840,199, Cl. 137-883.000.

Brush Fuses, Inc.: *See—*
Howton, Kenneth D.; Stewart, Robert G.; and Zeitler, Herman R., 4,841,356, Cl. 337-248.000.

Bryna Pty. Ltd.: *See—*
Hawkins, Ross H.; Laing, David; and Bedington, Bryan C., 4,841,359, Cl. 358-76.000.

Bubliewicz, Leszek, to Southern Steel Company. Security hinge utilizing concealed radiative sensing to detect hinge position. 4,841,283, Cl. 340-545.000.

Buchal, Christopher J.: *See—*
Appleton, Bill R.; Ashley, Paul R.; and Buchal, Christopher J., 4,840,816, Cl. 427-38.000.

Buckley, John J., Jr.: *See—*
Ankrom, Michael J.; Bowcutt, Corey H.; Buckley, John J., Jr.; and Rew, James A., 4,840,305, Cl. 228-232.000.

Bugner, Douglas E.; Alexandrovich, Peter S.; DeMejo, Lawrence P.; Guistina, Robert A.; and Anderson, James H., to Eastman Kodak Company. New electrostatographic toners and developers containing new charge-control agents. 4,840,864, Cl. 430-110.000.

Bukowski, Eugene R.; and Hoffman, Charles R., to International Business Machines Corp. CMOS precision gain amplifier. 4,841,254, Cl. 330-253.000.

Bull S.A.: *See—*
Bonnefoy, Jean, 4,840,495, Cl. 374-43.000.

Bullivant, Roger A., to Roger Bullivant of Texas, Inc. Soil displacement tools. 4,840,517, Cl. 405-241.000.

Burchesky, Robert D.: *See—*
Williams, Samuel C.; Bikson, Benjamin; Nelson, Joyce K.; and Burchesky, Robert D., 4,840,819, Cl. 427-245.000.

Burgdorf, Jochen; Reinartz, Hans-Dieter; Weise, Lutz; Oevirk, Norbert; Becker, Horst P.; and Determann, Otto, to Alfred Teves GmbH. Anti-lock brake system with traction slip control. 4,840,436, Cl. 303-119.000.

Burkholder, Amy L.: *See—*
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Dishner, Bryan W.; Maddali, Vijay K.; and Dhyanchand, P. John, to Sundstrand Corporation. Speed-limited electrically compensated constant speed drive. 4,841,202, Cl. 318-14.000.
Disson, Arno: *See—*
Matthias, Klaus; Baumann, Karl-Heinz; Schick, Gerald; Disson, Arno; Moller, Hermann; Seel, Holger; Topfer, Claus; Nerger, Uwe; Thiele, Peter; and Fleisch, Eugen, 4,840,398, Cl. 280-756.000.
Dittmar, Andre ; Delhomme, Georges; Roussel, Bernard; and Chatonnet, Joseph, to Centre National De La Recherche Scientifique (C.N.R.S.). Probe for measuring the thermal conductivity of materials. 4,841,543, Cl. 374-44.000.
Dobner, Reinhold, to G. M. Pfaff, AG. Apparatus for lighting a sewing area of a sewing machine. 4,841,415, Cl. 362-90.000.
Dr. Hans Heubach GmbH & Co. KG: *See—*
Gawol, Manfred; and Adrian, Gerhard, 4,840,668, Cl. 106-14.210.
Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
Kolb, Eugen, 4,840,419, Cl. 296-108.000.
von Broock, Ulrich, 4,840,330, Cl. 244-17.270.
Dodge, David J., to Lange International S.A. Ski boot. 4,839,973, Cl. 36-121.000.
Dodiuk, Hanna, to State of Israel, Ministry of Defence, Armament Development Authority, Rafel. Triglycidyl ether/tetraglycidyl ether/alkadiene rubber/polyalkylene polyamine formulation. 4,841,010, Cl. 528-99.000.
Doenges, Gerhard; Dietrich, Rolf; Thoma, Helmut; and Von Unger, Eckart-Alfred, to Heimann GmbH. X-ray scanner for inspecting articles moving therethrough. 4,841,554, Cl. 378-57.000.

Doherty, Joseph P.; and Marek, James C., to United States of America, Energy. Precipitate hydrolysis process for the removal of organic compounds from nuclear waste slurries. 4,840,765, Cl. 376-310.000.
Dohogne, L. Ranney; and Heilman, Raymond D., to Emerson Electric Co. Dynamoelectric machine construction and method. 4,841,183, Cl. 310-90.000.
Doi, Kunio; and Kume, Yuichiro, to University of Chicago. Method and system for removing scatter and veiling glate and other artifacts in digital radiography. 4,841,555, Cl. 378-9[illegible].000.
Doke, Jack: *See—*
Clemens, Forrest E.; and Doke, Jack, 4,839,999, Cl. 52-36.000.
Dolgikh, Viktor A.: *See—*
Alexandrov, Andrei J.; Dolgikh, Viktor A.; Kerimov, Oleg M.; Samarin, Alexei J.; Rudoi, Igor G.; and Soroka, Arkady M., 4,841,537, Cl. 372-55.000.
Doll, Ronald J.: *See—*
Watkins, Robert; Doll, Ronald J.; Neuendadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., 4,840,772, Cl. 422-61.000.
Domagala, John M.; Hagen, Susan E.; Sanchez, Joseph P.; and Solomon, Marjorie S., to Warner-Lambert Company. Novel disubstituted-7-pyrrolidinoquinoline antibacterial agents. 4,840,956, Cl. 514-312.000.
Domian, Henry A.; LaCount, Dale F.; Miller, Alex S.; and Seibert, Kenneth D., to Babcock & Wilcox Company, The. Austenitic Fe-Cr-Ni alloy designed for oil country tubular products. 4,840,768, Cl. 420-582.000.
Dompe' Farmaceutici S.p.A.: *See—*
Giani, Roberto P.; Parini, Ettore; Tonon, Giancarlo; and Borsa, Massimiliano, 4,841,046, Cl. 540-495.000.
Dong-Il, Song, to Samsung Electronics Co., Ltd. High speed comparator circuit with single supply voltage. 4,840,171, Cl. 307-355.000.
Doom, Harvey A. Locking hitch pin assembly. 4,840,528, Cl. 411-351.000.
Dorsch, Glenn R., to Vaughan Co., Inc. Face-type shaft seal with shroud. 4,840,384, Cl. 277-12.000.
Doss, Todd. Solar charging lamp. 4,841,416, Cl. 362-183.000.
Doteuchi, Masami: *See—*
Matsutani, Shigeru; Mizushima, Yukio; Doteuchi, Masami; and Ishihara, Yasunobu, 4,840,953, Cl. 514-258.000.
Dougherty, Lawrence W.; and Kraner, James L., to Zenith Electronics Corporation. Factory fixture frame with means for temporarily and removably supporting an in-process tension mask for a color cathode ray tube. 4,840,596, Cl. 445-30.000.
Doughty, Robert E. Grocery cart. 4,840,388, Cl. 280-33.994.
Doumani, George: *See—*
Foley, John M.; Piuze, Ronald L.; Larson, Ralph I., Jr.; and Doumani, George, 4,840,225, Cl. 165-104.330.
Douwe Egberts Koninklijke Tabaks-fabriek Koffiebranderijen-Theehandel N.V.: *See—*
Henriquez, Percy C., 4,840,737, Cl. 210-772.000.
Dow Chemical Company, The: *See—*
Anand, Joginder N.; Bales, Stephen E.; Feay, Darrell C.; and Jeanes, Thomas O., 4,840,646, Cl. 55-1[illegible].000.
Clark, Howard W.; and Chapman, Tracy E., 4,840,676, Cl. 106-462.000.
Dow Corning Corporation: *See—*
Sweet, Randall P.; Lee, Chi-long; and Gornowicz, Gerald A., 4,840,796, Cl. 424-448.000.
Vincent, Gary A., 4,840,983, Cl. 524-265.000.
Dow Corning, Ltd.: *See—*
Gardiner, William, 4,840,743, Cl. 252-49.400.
Dow Corning Wright: *See—*
Sasaki, Gordon H., 4,840,190, Cl. 128-89[illegible].000.
Downing, John P., Jr. Optical backscatter turbidimeter sensor. 4,841,157, Cl. 250-574.000.
Draegerwerk AG: *See—*
Schmidt, Wolf-Dieter, 4,840,227, Cl. 165-162.000.
Dragerwerk Aktiengesellschaft: *See—*
Rohling, Holmer; Schulz, Frank; and Preininger, Siegfried, 4,840,171, Cl. 128-204.180.
Drent, Eit, to Shell Oil Company. Catalytic polymerization of carbon monoxide with functional substituted ethylenically unsaturated monomer. 4,841,020, Cl. 528-392.000.
Drevfors, Gunnar; Corniea, Donald G.; and Paulson, Norman J., to Tetra Pak Finance & Trading S.A. Method and apparatus for dispensing liquids. 4,840,205, Cl. 141-2.000.
Driemeier, Gunter: *See—*
Unland, Georg; and Driemeier, Gunter, 4,840,561, Cl. 432-106.000.
Driga, Mircea D.: *See—*
Weldon, William F.; Pratap, Siddharth L.; and Driga, Mircea D., 4,841,217, Cl. 322-8.000.
Dubost, Bruno, to Cegedur Societe de Transformation de l'Aluminium Pechiney. Al-Cu-Li-Mg alloys with very high specific mechanical strength. 4,840,683, Cl. 148-12.70A.
Dubrul, William R.: *See—*
Hancock, John C.; Dubrul, William R.; and Heyler, Charles J., III, 4,840,615, Cl. 604-93.000.
Dubur, Gunar Y.: *See—*
Lukevits, Edmund Y.; Kastron, Valeria V.; Vitolin, Rasma O.; Erchak, Nikolai P.; Skrastinsh, Indulis P.; Dubur, Gunar Y.; and Kimenis, Agris A., 4,841,054, Cl. 546-14.000.
Duerr, Wilhelm; Ingwersen, Hartwig; Krause, Norbert; and Oppelt, Ralph, to Siemens Aktiengesellschaft. Truncated cone shaped surface resonator for nuclear magnetic resonance tomography. 4,841,249, Cl. 324-318.000.
Dulin, Thomas G.; Bass, Eric; and Babyak, Richard M., to Therapentic Systems, Inc. Buoyant support apparatus and system for use in exercising. 4,840,591, Cl. 441-106.000.
Dumas, Jean-Claude; Thoraval, Maurice; and Genuit, Gerard, to Alsthom. Device for ventilating rheostats and/or fluid radiators in a locomotive. 4,840,221, Cl. 165-41.000.
Dunton, Arthur R., to Insulator Seal, Inc. High power radio frequency energy feedthrough for high vacuum vessel. 4,841,098, Cl. 174-15.300.
Du Pont de Nemours, E. I., and Company: *See—*
Benim, Thomas E., 4,840,695, Cl. 156-344.000.
Smiley, Robert A., 4,841,092, Cl. 558-455.000.
Wyss, Kurt H., 4,840,838, Cl. 428-234.000.
Duracell Inc.: *See—*
Chalilpoyil, Purush; Parsen, Frank E.; and Wang, Chih-Chung, 4,840,644, Cl. 29-623.100.
Durand, Daniel: *See—*
Quang, Dang Vu; Davidson, Michel; Durand, Daniel; and Courty, Philippe, 4,840,783, Cl. 423-648.100.
Durham, Roger O. Freewheel mechanism for bicycles. 4,840,084, Cl. 74-594.100.
Dutois, Franck: *See—*
Mouchart, Jacques; Villela, Gerard, Dutois, Franck; and Pountu, Bernard, 4,840,442, Cl. 350-1.600.
Dwan, William E.: *See—*
Caputo, Garry L.; Saldarelli, Thomas A.; and Dwan, William E., 4,840,270, Cl. 206-205.000.
Dyneer Corporation: *See—*
Hitchcock, Gary L.; Thomey, Henry W.; Hodjat, Yahya; Cadarette, Marc R.; and Collins, Dawson M., 4,840,607, Cl. 474-167.000.
Dzodin, Milton A. Silver recovery cell. 4,840,717, Cl. 204-237.000.
E. I. Du Pont Nemours and Company: *See—*
Ebersole, Richard C.; and Foss, Robert P., 4,840,756, Cl. 264-22.000.
E.P. Barrus Limited: *See—*
Glen, Robert D., 4,840,752, Cl. 261-72.100.
Eastman Kodak Company: *See—*
Barbee, Robert B., 4,841,012, Cl. 528-125.000.
Bugner, Douglas E.; Alexandrovich, Peter S.; DeMejo, Lawrence P.; Guistina, Robert A.; and Anderson, James H., 4,840,864, Cl. 430-110.000.
Debesis, John R., 4,840,443, Cl. 350-3.710.
Frank, David S.; and Belly, Robert T., 4,840,784, Cl. 424-3.000.
Guslits, Vladimir S.; and Bailey, Steven P., 4,840,259, Cl. 192-48.200.
Hansen, David E., 4,841,319, Cl. 354-275.000.
Lievense, Jefferson C.; Sawyer, Joanna D.; and Terpolilli, Anthony J., 4,840,898, Cl. 435-87.000.
Mooberry, Jared B.; and Singer, Stephen P., 4,840,884, Cl. 430-557.000.
Pochodylo, James M., 4,840,899, Cl. 435-87.000.
Sheu, Yea-Dean, 4,840,917, Cl. 437-10.000.
Sheu, Yea-Dean; and Hawkins, Gilbert, 4,840,918, Cl. 437-53.000.
Staudenmayer, William J.; Weiss, David S.; and Pavlisko, Joseph A., 4,840,860, Cl. 430-59.000.
Staudenmayer, William J.; Weiss, David S.; and Pavlisko, Joseph A., 4,840,861, Cl. 430-59.000.
Eaton Corporation: *See—*
Hastings, Jerome K.; Beihoff, Bruce C.; Baran, Michael S.; Juds, Mark A.; and Hansen, James E., 4,841,235, Cl. 324-117.00R.
Juds, Mark A.; and Beihoff, Bruce C., 4,841,246, Cl. 324-208.000.
Ebersole, Richard C.; and Foss, Robert P., to E. I. Du Pont Nemours and Company. Radiation process for preparation of electrophoresis gel material. 4,840,756, Cl. 264-22.000.
Eccleston, Larry E., to John Fluke Mfg. Co., Inc. Temperature controlled hybrid assembly. 4,841,170, Cl. 307-310.000.
Eccleston, Larry E., to John Fluke Mfg. Co., Inc. Method of and circuit for ohmmeter calibration. 4,841,229, Cl. 324-63.000.
Echosphere Corporation: *See—*
Burr, James D., 4,841,309, Cl. 343-766.000.
Ecia - Equipements et Composants pour L'Industrie Automobile: *See—*
Escaravage, Gerard, 4,840,403, Cl. 280-808.000.
Eckart, Donald W.: *See—*
Branovich, Louis E.; Freeman, Gerard L.; Smith, Bernard; and Eckart, Donald W., 4,840,767, Cl. 419-27.000.
Eckart, George R.: *See—*
Baggio, Horacio A.; and Eckart, George R., 4,841,420, Cl. 362-249.000.
Eckell, Wolfgang; Guentert, Josef; Haefele, Walter; Kraemer, Manfred; Kuhn, Uwe; and Warga, Johann, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,840,161, Cl. 123-500.000.
Eckert, Dieter: *See—*
Herzog, Siegfried; Eckert, Dieter; and Bausch, Max, 4,840,475, Cl. 350-604.000.
Eckert, Gerold: *See—*
Bauer, Karl-Heinz; and Eckert, Gerold, 4,840,114, Cl. 98-2.000.
Edamura, Kaoru, to Sharp Kabushiki Kaisha. Control unit for a heating system with memory means. 4,841,125, Cl. 219-506.000.
Edelstein, William A.; and Schenck, Frederick, to General Electric Company. Current streamline method for coil construction. 4,840,700, Cl. 156-634.000.
Edwards, Bill R. Polyester resin compositions. 4,841,016, Cl. 528-272.000.

Effland, Joseph T.: *See—*
Effland, Richard C.; and Effland, Joseph T., 4,840,972, Cl. 514-313.000.
Effland, Richard C.; and Effland, Joseph T., to Hoechst-Roussel Pharmaceuticals, Inc. Relief from memory dysfunction with α-alkyl-4-amino-3-quinolinemethanols and 1-(4-aralkylamino-3-quinolinyl)alkanones and related compounds. 4,840,972, Cl. 514-313.000.
Egan, Walter D.: *See—*
Lynn, John D.; Jablonski, Charles E.; and Egan, Walter D., 4,840,671, Cl. 106-85.000.
Eggler, James F.; Johnson, Michael R.; and Sherman, Lawrence, to Pfizer Inc. Benzopyrans. 4,841,078, Cl. 549-402.000.
EGIS Gyogyszergyar: *See—*
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.
Ehrenhalt, Dan; and Giles, George R., to LTV Aerospace & Defense Co. Method for packaging a microwave tube modulator. 4,841,258, Cl. 332-9.00R.
Ehresmann, Walter: *See—*
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Ehret, Bernhard: *See—*
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Ehrgott, Frederick J., Jr.: *See—*
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Eica-Equipements et Composants Pour L'Industrie Automobile: *See—*
Escaravage, Girard, 4,840,405, Cl. 280-808.000.
Eidt, Scott H.; Deavenport, Dennis L.; and Tran, Nam H., to Texas Alkyls, Inc. Preparation of dimethylzinc. 4,841,082, Cl. 556-129.000.
Eilender, Albert: *See—*
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Ohasi, Hiroyuki; Takami, Toru; Koyama, Noritoshi; Kogure, Yoshio; Ida, Katsumi; Iijima, Kazumi; and Kobori, Tomohiro, 4,840,970, Cl. 514-690.000.
Ejima, Shozo; Sugihara, Taizo; and Abe, Morio, to Chisso Corporation. Heat-adhesive composite fibers and method for making the same. 4,840,846, Cl. 428-373.000.
Ejiri, Takashi: *See—*
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Elam, Dennis C. Handcuff restraining apparatus and method of use. 4,840,048, Cl. 70-16.000.
Elco Industries, Inc.: *See—*
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Eleanor Roosevelt Institute for Cancer Research, Inc.: *See—*
Anderson, David W., 4,840,934, Cl. 514-2.000.
Electric Power Research Institute, Inc.: *See—*
Youd, T. Leslie; and Jackson, Garrett O., 4,840,230, Cl. 166-382.000.
Electronic Instrumentation and Technology, Inc.: *See—*
May, Joe T.; and Casacia, Edward A., 4,841,156, Cl. 250-461.100.
Elekes, Istvan: *See—*
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.
Elleman, Daniel D.; Allen, James L.; and Lee, Mark C., to United States of America, National Aeronautics and Space Administration. Noncontact temperature pattern measuring device. 4,840,496, Cl. 374-124.000.
Ellerbrock, Donald H.: *See—*
Fait, Roger J.; and Ellerbrock, Donald H., 4,840,289, Cl. 220-359.000.
Ellington, William E.: *See—*
Matza, Stephen D.; Ellington, William E.; and Fleming, Henry C., III, 4,840,910, Cl. 436-30.000.
Ellis, Roy J. Blow plug. 4,840,352, Cl. 254-134.400.
Elmer, William A. Lighting system for car top sign. 4,839,975, Cl. 40-592.000.
Elsaesser, Andreas; and Rode, Klaus, to Hoechst Aktiengesellschaft. Positive-working radiation-sensitive recording material with radiation-sensitive 1,2-quinone diazide underlayer and thicker positive-working radiation-sensitive overlayer. 4,840,867, Cl. 430-156.000.
Elsner, Hans F. K.; Prendel, Peter W.; Kandler, Wilfried H. K.; and Sandkuhl, Jurgen, to U.S. Philips Corporation. Electromagnetic shielding arrangement. 4,841,102, Cl. 174-35.0GC.
ELTI Apparatebau und Elektronik GmbH: *See—*
Kuehnert, Hans-Guenter E., 4,840,698, Cl. 156-485.000.
Elzenbeck, Manfred: *See—*
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Ema, Hideaki: *See—*
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Embry, James: *See—*
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Emerson Electric Co.: *See—*
Davis, Dwayne, 4,841,418, Cl. 362-223.000.
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Emhart Industries, Inc.: *See—*
Adams, George W.; Smock, Steven W.; and Helft, Ross G., 4,841,496, Cl. 368-107.000.
Amonett, Daniel K., 4,841,110, Cl. 200-574.000.
Emori, Hiroshi: *See—*
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Chu, Chung K.; and Schinazi, Raymond F., 4,841,039, Cl. 536-29.000.
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Endo, Akihiko; Takeda, Shigeki; and Takeda, Hiroshi, to Kyocera Corporation. Synchronous tracking device for direct spread spectrum receiver. 4,841,545, Cl. 375-1.000.
Endo, Fumio: *See—*
Kiyoura, Kazuhiro; Endo, Fumio; Kimura, Toshiyuki; Aoyagi, Yoshio; and Nakamura, Kazunari, 4,841,506, Cl. 369-32.000.
Endo, Masaki: *See—*
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Endo, Masayuki; Sasago, Masaru; and Ogawa, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Pattern forming method by use of X-ray exposure. 4,840,872, Cl. 430-273.000.
Endo, Masayuki: *See—*
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Endo, Takeshi; Nambu, Yoko; and Yamamoto, Kazutoshi, to Asahi Denka Kogyo Kabushiki Kaisha. Viologen derivative. 4,841,058, Cl. 546-257.000.
Endo, Tetsuo: *See—*
Yagino, Masamori; Taniguchi, Masato; Ito, Yoshitomo; Takano, Toshimitsu; Ishikawa, Wataru; Kikuchi, Sadatoshi; and Endo, Tetsuo, 4,841,120, Cl. 219-216.000.
Engel, Jurgen; and Scheffler, Gerhard, to Aasta Pharma AG. 4-benzyl-1-(2H)-phthalazinone-derivates. 4,841,047, Cl. 540-599.000.
Engel, Thomas H. Trailer air grill. 4,840,422, Cl. 296-180.400.
Enterprises International, Inc.: *See—*
Hood, Stephen K.; Norkoski, Joseph; and Arnold, Halan P., 4,840,008, Cl. 53-137.000.
Enthone, Incorporated: *See—*
Schultz, Paul B.; and Yarkosky, Eugene F., 4,840,820, Cl. 427-305.000.
Epsco, Incorporated: *See—*
Call, William F., 4,841,260, Cl. 333-21.00A.
Epstein, Arthur J.; Ewing, Joan R.; and Swift, Joseph A., to Xerox Corporation. Electrically insulating polymer matrix with conductive path formed in situ. 4,841,099, Cl. 174-68.500.
Epstein, Joseph; Parsons, John A.; and Block, Frank, to United States of America, Army. Use of sulfoxides for testing ionization detector system. 4,840,911, Cl. 436-8.000.
Erchak, Nikolai P.: *See—*
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Erdman, Timothy R.: *See—*
Wollenberg, Robert H.; Plavac, Frank; and Erdman, Timothy R., 4,840,744, Cl. 252-51.50A.
Erez Forensic Technology, Ltd.: *See—*
Glattstein, Baruch, 4,840,912, Cl. 436-92.000.
Ernst, Richard J., to Illinois Tool Works Inc. Adjustable dispensing tool. 4,840,294, Cl. 222-287.000.
Esaki, Hiroshi: *See—*
Kajita, Ryota; Esaki, Hiroshi; and Shimazaki, Hirato, 4,840,380, Cl. 273-77.00A.
Escaravage, Gerard, to Ecia - Equipements et Composants pour L'Industrie Automobile. Device for adjusting the position of a strap return element, in particular of a safety belt for an automobile vehicle. 4,840,403, Cl. 280-808.000.
Escaravage, Girard, to Eica-Equipements et Composants Pour L'Industrie Automobile. Mechanism for maintaining a strap of a safety belt in an adjustable position. 4,840,405, Cl. 280-808.000.
Esge-Marby GmbH & Co., KG: *See—*
Belka, Heinrich, 4,840,298, Cl. 224-39.000.
Eskilsson, Eva C.: *See—*
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Establissements Maurice Maillard: *See—*
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Etani, Tadao: *See—*
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Etat Francais, Administration des P.T.T. (Centre National d'Etudes des Telecommunications): *See—*
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Etat Francais represente par le Ministre Del gue des Postes et Telecommunications (CNET): *See*—
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Etat Francais Represente Par Le Ministre des Postes et Telecommunications-Centre National D'Etudes des Telec ommunications: *See*—
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Eue, Ludwig: *See*—
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European Atomic Energy Community (Euratom): *See*—
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Eusepi, Martin W.: *See*—
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Evans, Richard, III. Pet portal. 4,840,217, Cl. 160-368.100.

Evans, Vernon C.; and Heidinger, George H.. to Peabody Coal Company. Switching and testing system. 4,841,1 9, Cl. 307-38.000.

Ewing, Joan R.: *See*—
Epstein, Arthur J.; Ewing, Joan R.; and Sw ift, Joseph A., 4,841,099, Cl. 174-68.500.

Extrusion Punch & Tool Co.: *See*—
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Exxon Research and Engineering Company: See—
Beltzer, Morton; and Jahanmir, Said, 4,84 ,741, Cl. 252-47.000.

Eyraud, Marcel, to Rhone-Poulenc Films. Stre ched, composite polyester films usable particularly for graph c arts. 4,840,836, Cl. 428-213.000.

Fahlstroem, Ulf: *See*—
Lekholm, Anders; Fahlstroem, Ulf; an Groothoff, Hermann, 4,840,186, Cl. 128-784.000.

Faiola, Michael S.; and Faiola, Richard J. Greeting card and package. 4,840,275, Cl. 206-423.000.

Faiola, Richard J.: *See*—
Faiola, Michael S.; and Faiola, Richard J., 4,840,275, Cl. 206-423.000.

Fait, Roger J.; and Ellerbrock, Donald H., to Sonoco Products Company. Spin-bonded all plastic can and method of forming same. 4,840,289, Cl. 220-359.000.

Falterman, Wesley E. Seat belt system having shoulder height support. 4,840,404, Cl. 280-808.000.

Fan, Albert K.; Ginter, Douglas R.; Lenox, Joseph J.; and Henson, Thomas L., to GTE Products Corporation. Method for producing a terbium activated cerium magnesium alumin te phosphor. 4,840,747, Cl. 252-301.40R.

Fanuc Ltd.: *See*—
Kishi, Hajimu; Takegahara, Takashi; and Yukutomo, Masashi, 4,841,432, Cl. 364-191.000.
Neko, Noriaki, 4,841,211, Cl. 318-569.000

Farhangi, Hassan; and Konings, Johan W. M. I.., to U.S. Philips Corporation. Sequential buffer device. 4,841,513, Cl. 369-59.000.

Farmitalia Carlo Ebra S.r.l.: *See*—
Buzzetti, Franco; di Salle, Enrico; and Lo nbardi, Paolo, 4,840,943, Cl. 514-177.000.

Farmitalia Carlo Erba s.r.l.: *See*—
Gatti, Gaetano; Oldani, Diego; Confalon ri, Carlo; and Gambini, Luciano, 4,840,938, Cl. 514-34.000.

Farquhar, David; and Wang, Yuqiang, to Boa d of Regents, University of Texas System. Aldophosphamides. 4,841 085, Cl. 538-180.000.

Fasco Industries, Inc.: *See*—
Lakin, Bryan L.; and McDaniel, Willia n P. W., 4,840,222, Cl. 165-47.000.

Fattori, Joseph E.; and Wagner, Siegbert O., to Mennen Company, The. Elongated roll-on applicator package with resilient liner. 4,840,511, Cl. 401-213.000.

Faucher, Joseph A., to UOP. Process for inhi iting mono and diethanolamine degradation. 4,840,777, Cl. 423-225 000.

Fauconet, Michel: *See*—
Delavarenne, Serge; Fauconet, Michel; Simon, Michel; and Sommer, Jean, 4,840,750, Cl. 260-544.00A.

FBK International Corporation: *See*—
Quackenbush, John, 4,840,623, Cl. 604-28 .000.

Feay, Darrell C.: *See*—
Anand, Joginder N.; Bales, Stephen E. Feay, Darrell C.; and Jeanes, Thomas O., 4,840,646, Cl. 55-1 .000.

Fedele, Brian: *See*—
Liberman, Barnet L., 4,840,034, Cl. 62-64 000.
Liberman, Barnet L., 4,840,035, Cl. 62-64 000.

Fedele, Joseph: *See*—
Liberman, Barnet L., 4,840,034, Cl. 62-64 000.
Liberman, Barnet L., 4,840,035, Cl. 62-64 000.

Federmann, Helmut; Levacher, Friedrich K ; and Noack, Georg, to Felten & Guilleaume Energietechnik GmbH. Light wave conductor-sensor for tension. 4,840,452, Cl. 350-96.23 .

Federmann, Helmut: *See*—
Starke, J. Peter; Levacher, Friedrich K.; and Federmann, Helmut, 4,840,480, Cl. 356-32.000.

Feigel, Josef; and Pfendler, Klaus, to Standard Elektrik Lorenz Aktiengesellschaft. Electronically commutated, collectorless directed-current motor. 4,841,186, Cl. 310-156.000.

Feldmuhle Aktiengesellschaft: *See*—
Fingerle, Dieter; and Gundel, Wolf-Dieter, 4,840,154, Cl. 123-193.00H.

Felten & Guilleaume Energietechnik GmbH: *See*—
Federmann, Helmut; Levacher, Friedrich K.; and Noack, Georg, 4,840,452, Cl. 350-96.230.

Fenn, Brian A.: *See*—
Welsh, William J.; Fenn, Brian A.; and Challener, Paul, 4,841,575, Cl. 381-36.000.

Ferber, Hubert P.: *See*—
Binder, Dieter; Rovenszky, Franz; and Ferber, Hubert P., 4,841,065, Cl. 548-238.000.

Ferguson, Edward H. F.: *See*—
Neil, Gary A.; and Ferguson, Edward H. F., 4,840,345, Cl. 248-74.200.

Fernandez, Emilio A.; Bezos, Angel P.; and Kimball, Charles H., to Pulse Electronics, Inc. Fuel measuring system. 4,840,056, Cl. 73-1.00H.

Ferodo, Inc.: *See*—
Davis, Robert J., 4,840,824, Cl. 428-67.000.

Fest, Christa: *See*—
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, 4,840,661, Cl. 71-90.000.

Feustel, Mattias; Frotscher, Guenter; Nitschke, Wieland; Obenauf, Dieter; Saupe, Juergen; and Weidelt, Manfred, to VEB Forschung und Entwicklung. Electrically conductive two component twisted yarn and fabrics for textile flat goods for clean rooms and clean room wearing apparel. 4,840,202, Cl. 139-425.00R.

Field, Martha M.: *See*—
Smith, William B.; Field, Martha M.; Pierce, Lawrence, Jr.; and Dalbey, Jeffrey C., 4,840,635, Cl. 623-36.000.

Fields, John G.: *See*—
Saunders, Anne L.; and Fields, John G., 4,839,984, Cl. 43-112.000.

Fingerle, Dieter; and Gundel, Wolf-Dieter, to Feldmuhle Aktiengesellschaft. Tubular ceramic body for gas passages in cylinder head of internal combustion engine. 4,840,154, Cl. 123-193.00H.

Finlay, David E.; Hanna, Stephen D.; Stevenson, David C.; and Varga, John T., to International Business Machines Corporation. Multidirectional scan and print capability. 4,841,453, Cl. 364-519.000.

Fiori, David, Jr., to Sensor Technologies, Inc. Displacement sensor having multiplexed dual tank circuits. 4,841,245, Cl. 324-208.000.

Fioroli, Mario: *See*—
Kokkeler, Franciscus; Fioroli, Mario; Risman, Per O. G.; Vigano, Liliana; and Idebro, Mats G., 4,841,111, Cl. 219-10.55B.

Fischer, Helmut, to Rheinmetall GmbH. Device for storing and loading ammunition in a turret. 4,840,110, Cl. 89-46.000.

Fisher & Paykel: *See*—
Cheyne, Neil G., 4,841,207, Cl. 388-811.000.

Fitzky, Hans G.: *See*—
Hassel, Tillmann; Hocker, Jurgen; Heywang, Gerhard; Muller, Hans-Klaus; and Fitzky, Hans G., 4,841,073, Cl. 549-232.000.

Flagello, Donis G.; Wilczynski, Janusz S.; and Witman, David F., to International Business Machine Corporation. Simultaneous multiple level interconnection process. 4,840,923, Cl. 437-189.000.

Fleisch, Eugen: *See*—
Matthias, Klaus; Baumann, Karl-Heinz; Schick, Gerald; Disson, Arno; Moller, Hermann; Seel, Holger; Topfer, Claus; Nerger, Uwe; Thiele, Peter; and Fleisch, Eugen, 4,840,398, Cl. 280-756.000.

Fleiss, Hartmut W.: *See*—
Novak, Frank; and Fleiss, Hartmut W., 4,841,123, Cl. 219-125.120.

Fleming, Henry C., III: *See*—
Matza, Stephen D.; Ellington, William E.; and Fleming, Henry C., III, 4,840,910, Cl. 436-30.000.

Flexi-Coil Limited: *See*—
Friggstad, Terrance; and Hundeby, David R., 4,840,233, Cl. 172-311.000.

Flig, Alan Y.; and Regan, Paul. Earthquake utilities cut-off control system. 4,841,287, Cl. 340-690.000.

Flight Dynamics, Inc.: *See*—
Ford, Douglas W., 4,841,448, Cl. 364-433.000.

Florence, Robert A.: *See*—
Campbell, John R.; Williams, Robert E., Jr.; Brown, Sterling B.; Conroy, Paul M.; and Florence, Robert A., 4,840,982, Cl. 524-151.000.

Fluhrer, Henry: *See*—
Meisner, Alfred; Potthof, Erwin; and Fluhrer, Henry, 4,841,493, Cl. 367-140.000.

Fluid Regulators Corp.: *See*—
Hribar, Frank, 4,840,031, Cl. 60-338.000.

Flynn, Nigel; and Clark, Nigel, to Lantor (UK) Limited. Composite material. 4,840,840, Cl. 428-283.000.

FMC Corporation: *See*—
Rentmeester, Alan L.; and Pamperin, John M., 4,840,009, Cl. 53-373.000.
Tomasek, Jaroslav, 4,841,213, Cl. 318-661.000.
Vijay, Tumkur R.; and Mannen, Bryce L., 4,840,215, Cl. 157-1.000.

Focke & Co. (GMBH & Co.): *See*—
Focke, Heinz; and Liedtke, Kurt, 4,840,007, Cl. 53-137.000.
Focke, Heinz; and Bretthauer, Hans Jurgen, 4,840,010, Cl. 53-375.000.
Focke, Heinz; and Liedtke, Kurt, 4,840,321, Cl. 242-58.600.

Focke, Heinz; and Liedtke, Kurt, to Focke & Co. (GMBH & Co.). Packaging machine with a drying turret. 4,840,007, Cl. 53-137.000.

Focke, Heinz; and Bretthauer, Hans Jurgen, to Focke & Co. (GmbH & Co.). Device for actuation of sealing jaws of a packaging machine. 4,840,010, Cl. 53-375.000.

Focke, Heinz; and Liedtke, Kurt, to Focke & Co. (GmbH & Co.). Apparatus for feeding packaging-material reels to a packaging machine. 4,840,321, Cl. 242-58.600.

Fodale, Robert: *See*—
Hampton, Herbert R.; Fodale, Robert; and Conkling, Charles R., Jr., 4,840,069, Cl. 73-802.000.

Foell, Helmut; and Lehmann, Volker, to Siemens Aktiengesellschaft. Method and measuring instrument for identifying the diffusion length of the minority charge carriers for non-destructive detection of flaws and impurities in semiconductor crystal bodies. 4,841,239, Cl. 324-158.00R.

Foley, John M.; Piuze, Ronald L.; Larson, Ralph I., Jr.; and Doumani, George, to Digital Equipment Corporation. Heat exchange element and enclosure incorporating same. 4,840,225, Cl. 165-104.330.

Folsom, Fred. Ventilation system for artists. 4,840,169, Cl. 128-863.000.

Fonticoli, Alfredo R. Machine for the production of puffed cereals. 4,840,117, Cl. 99-323.400.

Ford, Douglas W., to Flight Dynamics, Inc. Windshear flight recovery command system. 4,841,448, Cl. 364-433.000.

Ford, Keith L. Grease fitting for dog. 4,840,414, Cl. 292-356.000.

Ford Motor Company: *See*—
Logothetis, Eleftherios M.; and Soltis, Richard E., 4,840,913, Cl. 436-116.000.
Orlando, James A., 4,839,941, Cl. 16-361.000.
Siegl, Walter O.; and Chattha, Mohinder S., 4,840,667, Cl. 106-14.150.

Foreman, Robert W. Mixture and method for preparing casting cores and cores prepared thereby. 4,840,219, Cl. 164-369.000.

Forman, Edward W., Jr.; Provan, Alexander R.; and Schmieder, Ronald R., to Mobil Oil Corporation. Holding arrangement for loading plastic bags. 4,840,335, Cl. 248-97.000.

Forsberg, John W.; Mullay, John J.; and Sohara, Joseph A., to Lubrizol Corporation, The. Explosive compositions. 4,840,687, Cl. 149-2.000.

Foseco International Limited: *See*—
Hartley, James F. M., 4,840,295, Cl. 222-598.000.
Meumann, Henry R.; and Stark, Johannes, 4,840,131, Cl. 110-336.000.

Foss, Robert P.: *See*—
Ebersole, Richard C.; and Foss, Robert P., 4,840,756, Cl. 264-22.000.

Foti, Michael; and Embry, James. Battery life extender. 4,840,855, Cl. 429-120.000.

Four Paws Products, Ltd.: *See*—
Simon, Allen, 4,840,143, Cl. 119-52.00R.

Fourcadier, Chantal: *See*—
Grollier, Jean-Francois; and Fourcadier, Chantal, 4,840,790, Cl. 424-70.000.

Fox, Daniel W.; Peters, Edward N.; and Sybert, Paul D., to General Electric Company. Low plate-out polycarbonate end capped with phenoxy acetic acid. 4,841,015, Cl. 528-198.000.

Framatome: *See*—
Bonnet, Bernard, 4,840,521, Cl. 411-14.000.
Boula, Gerard; and Georges, Alain, 4,839,951, Cl. 29-157.400.
Bourdonne, Jean-Claude, 4,840,526, Cl. 411-263.000.

Framatome & Cie.: *See*—
Martin, Alain; and Maillard, Philippe, 4,840,096, Cl. 82-113.000.

Francois, Marc: *See*—
Guevel, Jean; Francois, Marc; and Bontemps, Guy, 4,840,021, Cl. 57-210.000.

Francotyp-Postalia GmbH: *See*—
Geyer, Oswald; Lembens, Helmut; and Stoyhe, Helmut, 4,840,367, Cl. 271-160.000.

Frank, David S.; and Belly, Robert T., to Eastman Kodak Company. Use of pyrylium and thiapyrylium compounds as biological stains. 4,840,784, Cl. 424-3.000.

Franz, John E., to Monsanto Company. N-Phosphonomethylglycine phytotoxicant compositions. 4,840,659, Cl. 71-86.000.

Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V.: *See*—
Schmidt, Helmut; Patzelt, Helmut; Tunker, Gerhard; and Scholze, Horst, 4,840,666, Cl. 106-14.050.

Fraunhofer Geselschaft E.V.: *See*—
Bauser, Herbert; Schindler, Bernd; and Chmiel, Horst, 4,840,636, Cl. 8-115.520.

Fredriksson, Lars-Berno, to Kvaser Consultant, AB. Arrangement comprising a system providing movement, processing and/or production. 4,841,450, Cl. 364-468.000.

Freeman, Gerard L.: *See*—
Branovich, Louis E.; Freeman, Gerard L.; Smith, Bernard; and Eckart, Donald W., 4,840,767, Cl. 419-27.000.

Freese, James S., to Mirafi, Inc. Subterranean drain. 4,840,515, Cl. 405-45.000.

Freitag, Douglas W., to LTV Aerospace and Defense Company. Method for the production of reinforced composites. 4,840,763, Cl. 264-65.000.

Freitag, Elmar; Weller, Karl-Heinz; and Trube, Hans-Wilhelm, to Daimler-Benz Aktiengesellschaft. Louver vent for the ventilation of a motor vehicle passenger compartment. 4,840,113, Cl. 98-2.000.

Fremont, Owen K.: *See*—
St. Angelo, Stephen, Jr.; Carver, George C.; Patterson, David W.; and Fremont, Owen K., 4,839,958, Cl. 29-450.000.

Frick Company: *See*—
Garland, Milton W., 4,840,033, Cl. 62-59.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Hirschkorn, Ingo, 4,840,554, Cl. 425-190.000.

Friggstad, Terrance; and Hundeby, David R., to Flexi-Coil Limited. Agricultural implement having rock shaft actuated transport wheel frames. 4,840,233, Cl. 172-311.000.

Frotscher, Guenter: *See*—
Feustel, Mattias; Frotscher, Guenter; Nitschke, Wieland; Obenauf, Dieter; Saupe, Juergen; and Weidelt, Manfred, 4,840,202, Cl. 139-425.00R.

Fry, Emanuel D., to Tecumseh Products Company. Compressor including protective cap for hermetic terminal. 4,840,547, Cl. 417-422.000.

Fuchigami, Wataru: *See*—
Sakurai, Tadashi; and Fuchigami, Wataru, 4,840,029, Cl. 60-313.000.

Fudim, Efrem V., to Sundstrand Corp. Liquid volume monitoring apparatus and method. 4,840,064, Cl. 73-290.00B.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakikiyama, Ryuzo, 4,840,246, Cl. 180-247.000.

Fuji Photo Film Co., Ltd.: *See*—
Abe, Akira; Mihayashi, Keiji; Kobayashi, Hidetoshi; and Kato, Hirohiko, 4,840,877, Cl. 430-350.000.
Chikamasa, Hiroshi; Utsui, Masaaki; and Nojiri, Yasutami, 4,840,818, Cl. 427-130.000.
Goto, Chiaki; and Horikawa, Kazuo, 4,841,135, Cl. 350-6.800.
Hirose, Takeshi; Furutachi, Nobuo; Aoki, Kozo; Nakazyo, Kiyoshi; and Furusawa, Genichi, 4,840,878, Cl. 430-380.000.
Katagiri, Shingo; Mori, Keiji; and Asai, Masahiko, 4,840,326, Cl. 242-199.000.
Kato, Eiichi; Dan, Shigeyuki; Ishibashi, Hiroshi; Ishii, Kazuo; and Sera, Hidefuji, 4,840,865, Cl. 430-114.000.
Kose, Junichi; and Seto, Nobuyuki, 4,841,321, Cl. 354-324.000.
Kunichika, Kenji; Matsumoto, Hiroshi; and Shingu, Akira, 4,840,875, Cl. 430-309.000.
Makino, Naonori; Hioki, Takanori; Inagaki, Yoshio; and Horie, Seiji, 4,840,862, Cl. 430-75.000.
Mizuta, Akira, 4,839,953, Cl. 29-225.000.
Nakamura, Koki, 4,840,887, Cl. 430-564.000.
Nishiyama, Mikio; Yoshino, Tatsuo; and Akimoto, Taizo, 4,841,371, Cl. 358-244.000.
Oishi, Kengo, 4,840,760, Cl. 264-245.000.
Sano, Kuniniko; Nagao, Makoto; Nahara, Akira; Nishikawa, Yasuo; and Iwasaki, Hiroyuki, 4,840,843, Cl. 428-336.000.
Sano, Shojiro; and Saeki, Keiso, 4,840,927, Cl. 503-201.000.
Saotome, Shigeru, 4,841,147, Cl. 250-327.200.
Sasaki, Akihiko; and Atsumi, Hiroaki, 4,841,382, Cl. 360-32.000.
Sasaki, Jun; Adachi, Atsushi; Naruo, Kyoichi; Shinagawa, Yukio; and Ohtani, Sumio, 4,840,733, Cl. 210-500.410.
Shizukuishi, Makoto; and Kondo, Ryuji, 4,841,348, Cl. 357-30.000.
Takahashi, Motoaki, 4,840,369, Cl. 271-276.000.
Takekoshi, Tomoaki; Ohba, Hisao; and Kunichika, Kenji, 4,841,320, Cl. 354-299.000.
Takimoto, Masaaki, 4,841,293, Cl. 340-763.000.
Taniguchi, Isao, 4,841,339, Cl. 355-27.000.
Tokuda, Kanji, 4,841,340, Cl. 355-38.000.
Tsuruta, Masao; Kiuchi, Seiji; Honjyoh, Akira; Oishi, Kengo; and Suzuki, Osamu, 4,841,403, Cl. 360-132.000.
Urabe, Hitoshi; Shigaki, Takao; and Shimazaki, Osamu, 4,841,362, Cl. 358-80.000.
Usami, Toshimasa; Hatakeyama, Seiji; and Shimomura, Akihiro, 4,840,933, Cl. 503-213.000.
Yamaguchi, Nobutaka; Fujiyama, Masaaki; Suzuki, Masami; and Yamada, Yasuyuki, 4,840,842, Cl. 428-323.000.

Fuji Xerox Co., Ltd.: *See*—
Inoue, Nanao; Saito, Koichi; Kato, Ryoki; Fujimagari, Hiroshi; Fujimura, Yoshihiko; Kato, Seiichi; Naito, Koichi; and Horie, Kiyoshi, 4,841,312, Cl. 346-160.00R.

Fujii, Mamoru; Noda, Kazuo; Nagasaka, Shoji; Tajika, Hiroshi; and Ono, Koji, to Kawasaki Steel Corporation. Method and apparatus for cutting and welding steel strips. 4,840,303, Cl. 228-164.000.

Fujii, Satoshi, to Sumitomo Electric Industries, Ltd. Wear-resistant sintered iron-based alloy and process for producing the same. 4,840,665, Cl. 75-241.000.

Fujii, Yasushi: *See*—
Ikeda, Noriaki; Sugishima, Noboru; Fujii, Yasushi; Ikuta, Shinji; Nakanishi, Yoshiyuki; and Inoue, Akira, 4,840,749, Cl. 260-378.000.

Fujikawa, Yoshihiro; Wakamatsu, Masazumi; Fukui, Mariko; and Miyasaka, Tadashi, to Nissan Chemical Industries, Ltd. 3-hydroxy pyrazole derivatives. 4,841,068, Cl. 548-365.000.

Fujikura Kasei Co., Ltd.: *See*—
Otsu, Akira; and Nagase, Hiroshi, 4,840,863, Cl. 430-110.000.

Fujikura Ltd.: *See*—
Onishi, Akihumi; Hasegawa, Masakasu; Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; and Yoshida, Shotaro, 4,840,552, Cl. 425-72.100.

Fujikura Rubber, Ltd.: *See*—
Arilzumi, Ryozo; Kainuma, Masakuni; Aoki, Toshikazu; Suda, Shoji; Hoshi, Mitsunori; and Ejiri, Takashi, 4,840,347, Cl. 251-63.400.

Fujimagari, Hiroshi: *See*—
Inoue, Nanao; Saito, Koichi; Kato, Ryoki; Fujimagari, Hiroshi; Fujimura, Yoshihiko; Kato, Seiichi; Naito, Koichi; and Horie, Kiyoshi, 4,841,312, Cl. 346-160.00R.

Fujimura, Setsuo; Sagawa, Masato; and Matsuura, Yutaka, to Sumitomo Special Metals Co, Ltd. Isotropic permanent magnets and process for producing same. 4,840,684, Cl. 148-302.000.

Fujimura, Takashi: *See—*
Kokabu, Misao; Nakamura, Hitoshi; Fujimura, Takashi; and Hayashi, Nobuyasu, 4,841,315, Cl. 354-1.000.
Fujimura, Yoshihiko: *See—*
Inoue, Nanao; Saito, Koichi; Kato, Ryoki; Fujimagari, Hiroshi; Fujimura, Yoshihiko; Kato, Seiichi; Naito, Koichi; and Horie, Kiyoshi, 4,841,312, Cl. 346-160.00R.
Fujisawa Pharmaceutical Company, Limited: *See—*
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,841,062, Cl. 548-194.000.
Fujisu Limited: *See—*
Masuko, Takayuki; Suzuki, Norio; and Moriya, Kaoru, 4,839,993, Cl. 51-129.000.
Fujita, Akihiko: *See—*
Oikawa, Ryuetsu; and Fujita, Akihiko, 4,839,937, Cl. 16-2.000.
Fujita, Hiroya, to Toyota Jidosha Kabushiki Kaisha. Camshaft apparatus for an internal combustion engine. 4,840,149, Cl. 123-90.310.
Fujita, Shigeru: *See—*
Ikeda, Go; Sasaki, Kiyoshi; Kumazaki, Hiroshi; Fujita, Shigeru; and Banzai, Hideo, 4,841,459, Cl. 364-557.000.
Fujita, Shinichi, to Yamaha Corporation. Stereophonic signal processing circuit. 4,841,573, Cl. 381-27.000.
Fujita, Toshihito: *See—*
Nakazawa, Kogi; and Fujita, Toshihito, 4,840,755, Cl. 264-15.000.
Fujita, Yasuhiko: *See—*
Masuda, Eiji; Fujita, Yasuhiko; and Takasaki, Terufumi, 4,841,567, Cl. 379-355.000.
Fujitsu Limited: *See—*
Hosoyama, Osamu, 4,841,442, Cl. 364-4[illegible]5.000.
Kubota, Katuhisa, 4,841,168, Cl. 307-272.200.
Miyaou, Hirohisa; Furukawa, Takahiro; and Kosugi, Toru, 4,841,524, Cl. 370-112.000.
Murakami, Joji; Sibazaki, Syogo; and Tampaku, Junya, 4,841,298, Cl. 341-51.000.
Nakano, Motoo, 4,841,349, Cl. 357-30.000.
Yasuda, Kazuhito; and Kishi, Yutaka, 4,840,916, Cl. 437-3.000.
Yoshida, Akira; and Sasaki, Yuuichi, 4,841,438, Cl. 364-200.000.
Yoshida, Masanobu, 4,841,233, Cl. 324-73.00R.
Fujitsu Microcomputer Systems Limited: *See—*
Murakami, Joji; Sibazaki, Syogo; and Tampaku, Junya, 4,841,298, Cl. 341-51.000.
Fujiwara, Hideo: *See—*
Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 4,840,844, Cl. 428-336.000.
Fujiyama, Hirohisa: *See—*
Kimura, Akira; Kashiwabara, Hiroshi; and Fujiyama, Hirohisa, 4,841,116, Cl. 219-73.100.
Fujiyama, Masaaki: *See—*
Yamaguchi, Nobutaka; Fujiyama, Masaaki; Suzuki, Masami; and Yamada, Yasuyuki, 4,840,842, Cl. 428-323.000.
Fukae, Kensuke, and Kaieda, Shozo, to Ricoh Information Systems, Inc. Electrographic printer with small diameter drum and charged transfer belt. 4,841,334, Cl. 355-271.000.
Fukatsu, Takeo: *See—*
Takeuchi, Masaru; Fukatsu, Takeo; Nakano, Shoichi; Kuwano, Yukinori; Minami, Koji; and Iwamoto, Masayuki, 4,841,328, Cl. 355-211.000.
Fukuhara, Satoru: *See—*
Takada, Keiji; Okumura, Masahide; Fukuhara, Satoru; Morimura, Toshiyuki; Hosaka, Sumio; and Hosoki, Shigeyuki, 4,841,191, Cl. 310-317.000.
Fukui, Mariko: *See—*
Fujikawa, Yoshihiro; Wakamatsu, Masazumi; Fukui, Mariko; and Miyasaka, Tadashi, 4,841,068, Cl. 548-365.000.
Fukui, Norio: *See—*
Yokoi, Tsutomu; Tani, Hiroji; Kasanami, Tohru; Fukui, Norio; and Yamamoto, Keizou, 4,839,960, Cl. 29-620.000.
Fukui, Ryota: *See—*
Takayama, Kazuo; Yabe, Eiji; Takagi, Kenichi; Fukui, Ryota; and Kikuchi, Riichi, 4,841,197, Cl. 315-11[illegible].810.
Fukui, Shosin; Shinjo, Masayoshi; and Aoyama, Hirokazu, to Daikin Kogyo Co., Ltd. Mold release composition. 4,840,675, Cl. 106-38.220.
Fukui, Yoshio: *See—*
Iwasaki, Tetsuji; and Fukui, Yoshio, 4,840,942, Cl. 514-120.000.
Fukumura, Yoshikazu: *See—*
Sato, Tasuku; Nakanishi, Kiyoshi; Fukumura, Yoshikazu; and Nagasawa, Keizo, 4,840,740, Cl. 252-[illegible]2.70E.
Fukuouji, Kakujulo: *See—*
Kawasaki, Mikio; Shiozawa, Hiroaki; Fukuouji, Kakujulo; and Ono, Kouji, 4,840,888, Cl. 430-567.000.
Fukushima, Akio: *See—*
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Fukushima, Hiroshi: *See—*
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; Taguchi, Minoru; and Sota, Kaoru, 4,841,044, Cl. 540-2[illegible]7.000.
Funabashi, Tadashi: *See—*
Kurihara, Toshihiko; and Funabashi, Tadashi, 4,841,517, Cl. 369-270.000.
Fung, Kwok K., to American Standard Inc. Island type refrigeration display cabinet. 4,840,040, Cl. 62-255.000
Furihata, Makoto: *See—*
Watanabe, Kazuo; Furihata, Makoto; and Yamazaki, Kouichi, 4,841,484, Cl. 365-190.000.
Furrow, Robert E. Engine speed control circuit for drag racing. 4,840,157, Cl. 123-352.000.
Furukawa Aluminum Co., Ltd.: *See—*
Nabae, Motohiro, 4,840,685, Cl. 148-439.000.
Furukawa, Nobuhiro; Nishio, Koji; and Yoshinaga, Noriyuki, to Sanyo Electric Co., Ltd. Secondary cell. 4,840,858, Cl. 429-197.000.
Furukawa, Takahiro: *See—*
Miyaou, Hirohisa; Furukawa, Takahiro; and Kosugi, Toru, 4,841,524, Cl. 370-112.000.
Furusawa, Genichi: *See—*
Hirose, Takeshi; Furutachi, Nobuo; Aoki, Kozo; Nakazyo, Kiyoshi; and Furusawa, Genichi, 4,840,878, Cl. 430-380.000.
Furusawa, Masao: *See—*
Ototake, Satoshi; Matsunaga, Ryozo; and Furusawa, Masao, 4,841,034, Cl. 534-701.000.
Furuse, Masayasu: *See—*
Namiki, Tetsuro; Furuse, Masayasu; Kuroyanagi, Yoshimitsu; Miyata, Teruo; and Suzuki, Takashi, 4,840,937, Cl. 514-21.000.
Furutachi, Nobuo: *See—*
Hirose, Takeshi; Furutachi, Nobuo; Aoki, Kozo; Nakazyo, Kiyoshi; and Furusawa, Genichi, 4,840,878, Cl. 430-380.000.
Furuyama, Tohru, to Kabushiki Kaisha Toshiba. Semiconductor memory. 4,841,483, Cl. 365-189.070.
Fuse, Genzo: *See—*
Hamada, Akio; Tsujii, Gen; Fuse, Genzo; and Kondo, Masahide, 4,841,113, Cl. 219-110.000.
Fushimi, Hiroyuki: *See—*
Nakayama, Nobuhiro; Asahina, Yasuo; Fushimi, Hiroyuki; and Iwamoto, Yasuaki, 4,841,331, Cl. 355-245.000.
Fushimi, Shigeo: *See—*
Watanabe, Takaya; and Fushimi, Shigeo, 4,841,265, Cl. 333-194.000.
Futaba Denshi Kogyo K.K.: *See—*
Kishino, Takao; and Mizohata, Tadashi, 4,841,194, Cl. 313-496.000.
Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, to Hitachi, Ltd.; and Hitachi Maxell Ltd. Magnetic recording medium. 4,840,844, Cl. 428-336.000.
Futrell, James C., II, to United States of America, Interior. Fiber optic current meter with plastic bucket wheel. 4,840,062, Cl. 73-170.00A.
Fye, Donald M., to GTE Laboratories Incorporated. Methods of and apparatus for generation of radio frequency signals. 4,840,456, Cl. 350-162.170.
G & B Rubber Stamp Co., Inc.: *See—*
Swiech, Matthew J.; Munyon, Gary D.; and Dias, Kenneth J., 4,840,120, Cl. 101-228.000.
G. M. Pfaff, AG: *See—*
Dobner, Reinhold, 4,841,415, Cl. 362-90.000.
GA Technologies Inc.: *See—*
Bhadra, Dilip K.; Creedon, Richard L.; and Harder, C. Ross, 4,840,112, Cl. 91-459.000.
Gabriel, David; Audus, David; and Strange, Norman, to Lasercheck Limited. Laser position measurement and alignment. 4,840,490, Cl. 356-375.000.
Gafvelin, Guro; Carlquist, Mats; and Mutt, Viktor, to Kabigen AB. Mammal intestinal hormone precursor and its use. 4,840,785, Cl. 424-9.000.
Gaglani, Kamlesh; and Filender, Albert, to Cosan Chemical Corporation. Bactericidal (3,5-substituted polyoxymethylene oxazolidines. 4,841,064, Cl. 548-215.000.
Galbreath, Donald E., to Galbreath Incorporated. Roll-off hoist for variable positioning of containers. 4,840,532, Cl. 414-479.000.
Galbreath Incorporated: *See—*
Galbreath, Donald E., 4,840,532, Cl. 414-479.000.
Gambini, Luciano: *See—*
Gatti, Gaetano; Oldani, Diego; Confalonieri, Carlo; and Gambini, Luciano, 4,840,938, Cl. 514-34.000.
Gamble, Donald E.; Hunter, Harry L.; and McKinney, Gordon R., to Bristol-Myers Company. Method for treatment of male impotence. 4,840,952, Cl. 514-253.000.
Gammerler, Gunter. Cutting knife for rotary cutting apparatus for paper. 4,840,098, Cl. 83-841.000.
Garbini, Joseph L.: *See—*
Chalupnik, James D.; Garbini, Joseph L.; and Jorgensen, Jens E., 4,841,224, Cl. 324-61.00P.
Gardiner, William, to Dow Corning, Ltd. Liquid organopolysiloxane compositions. 4,840,743, Cl. 252-49.600.
Gardner, Christopher H.: *See—*
Weinle, Paul L.; Smith, Vernon C.; Gardner, Christopher H.; Peoples, Clarence A., Jr.; and Pierce, Matthew R., 4,840,832, Cl. 428-156.000.
Gardner, David A.; Ryan, James G.; Schaefer, Joseph G.; and Walton, Erick G., to International Business Machines Corporation. Chromium-titanium alloy. 4,840,302, Cl. 228-123.000.
Gareis, John: *See—*
Rooney, Craig E., 4,840,476, Cl. 351-63.000.
Garg, Rakesh K. Second method for using cannula including a valve structure and associated instrument elements. 4,840,184, Cl. 128-753.000.
Garland, Milton W., to Frick Company. Ice builder and control system therefor. 4,840,033, Cl. 62-59.000.

Garnjost, Kenneth D., to Moog Inc. Energy-conserving regenerative-flow valves for hydraulic servomotors. 4,840,111, Cl. 91-436.000.
Garret, Michael J., to Cardball International Limited. Poker and pool apparatus. 4,840,376, Cl. 273-14.000.
Garwood, Anthony J. M., to Garwood, Ltd. Improved thermoplastic skin packing means. 4,840,271, Cl. 206-213.100.
Garwood, Ltd.: *See—*
Garwood, Anthony J. M., 4,840,271, Cl. 206-213.100.
Gas Energy, Inc.: *See—*
Russo, Onofrio N., 4,840,049, Cl. 70-34.000.
Gas Research Institute: *See—*
Hemsath, Klaus H., 4,840,559, Cl. 432-3.000.
Gasser, George E. Quick release seat support. 4,840,343, Cl. 248-500.000.
Gastgeb, Raymond F., to Pennwalt Corporation. Piezoelectric phase locked loop circuit. 4,841,256, Cl. 331-25.000.
Gatti, Gaetano; Oldani, Diego; Confalonieri, Carlo; and Gambini, Luciano, to Farmitalia Carlo Erba s.r.l. Pharmaceutical compositions containing anthracycline glycosides. 4,840,938, Cl. 514-34.000.
Gaughan, Roger G., to Phillips Petroleum Company. Catalytic preparation of poly(arylene sulfide) from halothiophenol. 4,841,018, Cl. 528-374.000.
Gausman, Theodore J.; and Scheffel, Gary W., to Nupro Company. Inflatable valve. 4,840,191, Cl. 137-15.000.
Gawol, Manfred; and Adrian, Gerhard, to Dr. Hans Heubach GmbH & Co. KG. Corrosion-inhibiting pigments, their production and use. 4,840,668, Cl. 106-14.210.
Gayer, Herbert; and Jelich, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of 2-cyano-2-oximino-acetamide derivatives. 4,841,086, Cl. 558-301.000.
Geberth, John D., Jr. Clutch apparatus for rapid power source conversion. 4,840,543, Cl. 417-223.000.
Gebruder Heller GmbH. Werkzeugfabrik: *See—*
Kleine, Werner, 4,840,519, Cl. 408-226.000.
Gelinas, Yvon. Ceiling rack. 4,840,278, Cl. 211-18.000.
General Atomics: *See—*
Burnett, Sibley C.; Purcell, John R.; Breneman, Bruce C.; and Sarwinski, Raymond E., 4,841,268, Cl. 335-216.000.
Creedon, Richard L., 4,840,200, Cl. 138-172.000.
General Company Limited: *See—*
Ueyama, Seiji; and Onoe, Hiroyasu, 4,840,835, Cl. 428-212.000.
General DataComm, Inc.: *See—*
Hill, Gregory P., 4,841,561, Cl. 379-97.000.
General Dynamics Land Systems, Inc.: *See—*
Cory, Robert M., 4,840,438, Cl. 305-36.000.
General Electric Company: *See—*
Campbell, John R.; Williams, Robert E., Jr.; Brown, Sterling B.; Conroy, Paul M.; and Florence, Robert A., 4,840,982, Cl. 524-151.000.
Clark, Clarence O.; and Hong, Jauwhei, 4,840,850, Cl. 428-471.000.
Coffinberry, George A., 4,840,025, Cl. 60-217.000.
Crivello, James V.; and Lee, Julia L., 4,840,977, Cl. 522-25.000.
Edelstein, William A.; and Schenck, Frederick, 4,840,700, Cl. 156-634.000.
Fox, Daniel W.; Peters, Edward N.; and Sybert, Paul D., 4,841,015, Cl. 528-198.000.
Gross, David C.; Lewis, Larry N.; and Haig, Connie L., 4,840,974, Cl. 521-85.000.
Hawkins, Christopher M., 4,841,001, Cl. 525-468.000.
Ho, Chung-Yih; Molnar, Karl J.; and Staver, Daniel A., 4,841,467, Cl. 364-748.000.
Hsu, Sheng T., 4,841,347, Cl. 357-23.900.
Jones, Marshall G.; Ortiz, Angel L., Jr.; Chande, Tushar S.; and August, John L., Jr., 4,840,450, Cl. 350-96.200.
Raychaudhuri, Dipankar; and Joseph, Kuriacose, 4,841,527, Cl. 371-32.000.
Remer, James N., 4,840,457, Cl. 350-255.000.
Strong, Michael F., 4,840,459, Cl. 350-333.000.
Thomas, Sherman G., 4,840,586, Cl. 439-680.000.
General Instrument Corporation: *See—*
Wachob, David E., 4,841,569, Cl. 380-7.000.
General Mills, Inc.: *See—*
Greenberg, Norman A.; Chandan, Ramesh C.; Deeslie, William D.; and Conolly, Daniel D., 4,840,813, Cl. 426-565.000.
General Motors Corporation: *See—*
Hoying, John F.; and Lange, Bernard, 4,840,358, Cl. 267-140.100.
Lam, Michael K.; Kazewych, Bohdan; and Gionet, Edmond R., 4,839,990, Cl. 49-352.000.
Maschino, Dale C., 4,841,130, Cl. 235-96.000.
St. Angelo, Stephen, Jr.; Carver, George C.; Patterson, David W.; and Fremont, Owen K., 4,839,958, Cl. 29-450.000.
Genetic Engineering, Inc.: *See—*
van Blerkom, Jonathan, 4,840,891, Cl. 435-2.000.
Genuit, Gerard: *See—*
Dumas, Jean-Claude; Thoraval, Maurice; and Genuit, Gerard, 4,840,221, Cl. 165-41.000.
George, Frederick A., to George & Thomas Cone Company. Cone package. 4,840,276, Cl. 206-499.000.
George, Michael; Pierson, Lyndon G.; and Wilkins, Mark E., to United States of America, Energy. Universal null DTE. 4,841,550, Cl. 375-118.000.
George & Thomas Cone Company: *See—*
George, Frederick A., 4,840,276, Cl. 206-499.000.
George Weston Limited: *See—*
Lawford, Hugh G., 4,840,902, Cl. 435-161.000.
Georges, Alain: *See—*
Boula, Gerard; and Georges, Alain, 4,839,951, Cl. 29-157.400.
Gerbaud, Claude: *See—*
Krasuski, Marek; Gregoire, Jean-Pierre; and Gerbaud, Claude, 4,840,696, Cl. 156-353.000.
Gerber Garment Technology, Inc.: *See—*
Osthus, Harold L.; de Raismes, John F.; Wolfson, Lawrence S.; and Vaida, Robert M., 4,840,123, Cl. 104-100.000.
Gerber Scientific Instrument Company, The: *See—*
Pavone, Robert J.; Davidson, Bruce L.; and Berdat, Henry F., 4,841,316, Cl. 354-4.000.
Gercekci, Anil; Bron, Michel; and Hudson, Peter D., to Motorola, Inc. Data card circuits. 4,841,133, Cl. 235-492.000.
Gergely, Vera: *See—*
Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.
Gerhard, Helmut, to Westerwaelder Eisenwerk Gerhard GmbH. Pressure-resistant tank. 4,840,282, Cl. 220-1.500.
Gesellschaft fur Automation u. Organization mbH: *See—*
Grottrup, Helmut; and Maurer, Thomas, 4,841,128, Cl. 235-491.000.
Getech A/S: *See—*
Tetlie, Per J.; Brudal, Hans N.; and Meisingset, Alf E., 4,841,192, Cl. 310-337.000.
Geyer, Oswald; Lembens, Helmut; and Stoyhe, Helmut, to Francotyp-Postalia GmbH. Cassette with a tape box for tape dispensers of mail processing machines. 4,840,367, Cl. 271-160.000.
GH Trading AB: *See—*
Gustafsson, Hans; and Hallberg, Thomas, 4,840,340, Cl. 248-240.400.
Ghandeharizadeh, Shahryar, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Optical fiber splice organizer. 4,840,449, Cl. 350-96.200.
Ghemini Technologies: *See—*
Khattak, Chandra P.; White, Vernon E.; Schmid, Frederick; and Wohlgemuth, John H., 4,840,699, Cl. -//.000.
Gherardi, Gian L., to Sasib S.p.A. Method and device for controlling the vacuum in a succession of suction conveyors. 4,840,266, Cl. 198-471.100.
Giani, Roberto P.; Parini, Ettore; Tonon, Giancarlo; and Borsa, Massimiliano, to Dompe' Farmaceutici S.p.A. Process for the preparation of pyridobenzodiazepinone. 4,841,046, Cl. 540-495.000.
Giebel, Wolfgang: *See—*
Oestreich, Ulrich; and Giebel, Wolfgang, 4,841,103, Cl. 174-70.00S.
Gilbert, David A. Electric trolling motor steering system. 4,841,203, Cl. 318-53.000.
Giles, George R.: *See—*
Ehrenhalt, Dan; and Giles, George R., 4,841,258, Cl. 332-9.00R.
Giles, Randy K.: *See—*
Lucas, Gordon H.; and Giles, Randy K., 4,840,003, Cl. 52-233.000.
Gillet, Guy: *See—*
Chappoux, Claude; Rouesnel, Bernard; and Gillet, Guy, 4,840,264, Cl. 194-212.000.
Gillies, David, to Deutsche ITT Industries GmbH. Data compander for digital video signals. 4,841,357, Cl. 358-17.000.
Ginter, Douglas R.: *See—*
Fan, Albert K.; Ginter, Douglas R.; Lenox, Joseph J.; and Henson, Thomas L., 4,840,747, Cl. 252-301.40R.
Gionet, Edmond R.: *See—*
Lam, Michael K.; Kazewych, Bohdan; and Gionet, Edmond R., 4,839,990, Cl. 49-352.000.
Girmi S.P.A. Corso Matteoti: *See—*
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Giusti, Frank, Jr.: *See—*
Proctor, Lewis D.; Ross, Colby M.; Manzi, Brian P.; and Giusti, Frank, Jr., 4,840,229, Cl. 166-381.000.
Givaudan Corporation: *See—*
Virgilio, Joseph A.; Manowitz, Milton; and Heilweil, Emanuel, 4,841,063, Cl. 548-213.000.
Glamkowski, Edward J.; Chiang, Yulin; and Ehrgott, Frederick J., Jr., to Hoechst-Roussel Pharmaceuticals, Inc. Antiinflammatory and analgesic piperidin-4-yl-tetracyclic benzodiazepines and use thereas. 4,840,947, Cl. 514-219.000.
Glattstein, Baruch, to Erez Forensic Technology, Ltd. Process for drug detection. 4,840,912, Cl. 436-92.000.
Glen, Robert D., to E.P. Barrus Limited. Carburettor. 4,840,752, Cl. 261-72.100.
Glidden Company, The: *See—*
Pekarik, Alan J., 4,840,980, Cl. 523-456.000.
Glopak Inc.: *See—*
Jones, Elwyn D.; Lauzon, Robert; and Wetter, Bruno, 4,840,609, Cl. 493-28.000.
Gluckman, Jack L., to University of Cincinnati. Method of laser treatment of cancerization of the oral cavity. 4,840,174, Cl. 128-303.100.
Godtfredsen, Wagn O.; and von Daehne, Welf, to Leo Pharmaceutical Products Ltd. Antibacterial beta-lactams, pharmaceuticals thereof and methods of using them. 4,840,944, Cl. 514-195.000.
Goertz, Hans-Helmut; Straub, Ferdinand; Sanner, Axel; Kolb, Albrecht; Raubenheimer, Hans-Juergen; and Vogel, Friedrich, to BASF Aktiengesellschaft. Preparation of 3-methyl-1-vinylimidazolium chlorides. 4,841,066, Cl. 548-335.000.

Goetze, Werner; Mayr, Ernst; Oestreich, Ulrich; and Saller, Helmut, to Siemens Aktiengesellschaft. Filling compound for light waveguide leads and/or light waveguide cables. 4,839,170, Cl. 350-96.230.

Gogami, Masao: *See—*
Hida, Yoshiaki; Ishihara, Satoshi; Take, Shiji; Gogami, Masao; and Suzuki, Toshiyuki, 4,841,134, Cl. 235-418.000.

Goi, Kouichi; Emori, Hiroshi; and Sato, Daiki, to Laurel Bank Machines Co., Ltd. Dust-proof tube having a cylindrical portion that seals photosensor and integrally formed frustrum portion. 4,841,144, Cl. 250-239.000.

Goi, Masami: *See—*
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; Taguchi, Minoru; and Sota, Kaoru, 4,841,044, Cl. 540-227.000.

Golander, Carl G.; Jonsson, Erik S.; and Vladkova, Todorka G., to Ytkemiska Institutet. Surface coated article process and means for the preparation thereof and use thereof. 4,840,851, Cl. 428-523.000.

Gold, Elijah H.: *See—*
Watkins, Robert; Doll, Ronald J.; Neuskadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., 4,840,772, Cl. 422-61.000.

Goldberg, Edward M.: *See—*
Melinyshyn, Lev A.; Stupar, Jeffrey M.; and Goldberg, Edward M., 4,840,690, Cl. 156-242.000.

Goldman, Giora. Hydraulic-pneumatic actuator for impact cutter. 4,840,236, Cl. 173-134.000.

Goldman, Leman, Jr. Lid loosener and tightener. 4,840,093, Cl. 81-3.430.

Goldman, Michael C. Container for injection needles with safety apparatus. 4,840,272, Cl. 206-365.000.

Goller, Ernst; and Walker, Fritz, to H. Stoll GmbH & Co. Procedure and device for ensuring a precisely positioned introduction of a substitute yarn in a knitting machine. 4,840,146, Cl. 66-144.000.

Gombert, Guido: *See—*
Kallabis, Manfred; and Gombert, Guido, 4,840,633, Cl. 623-23.000.

Gonnet, Olivier; Ravet, Georges; and Rousset Jacky, to Coatex, S. A. Grinding agent based and/or copolymers for aqueous suspension of coarse mineral materials for pigment applications. 4,840,985, Cl. 524-425.000.

Gonzalez, Carlos H.: *See—*
McClanahan, Robert F.; Washburn, Robert D.; Gonzalez, Carlos H.; Sze, Jerry C.; and Lusher, David M., 4,841,429, Cl. 363-126.000.

Gooch, Timothy D.: *See—*
Heide, Jorgen; Gooch, Timothy D.; Prescott, Anthony D.; and Bojrab, Dennis, 4,840,178, Cl. 128-419.00R.

Goodfellow, Anthony G.; and Wright, Anthony R., to W&A Bates Limited. Apparatus for handling sheet material. 4,840,697, Cl. 156-405.100.

Goodman, Joseph R.; and Thrush, Roger L. to AMP Incorporated. Slide switch configured as an integrated circuit package. 4,841,105, Cl. 200-16.00D.

Goodwin, Ernest, to Hemlo Gold Mines Inc. Process for the removal of cyanide and other impurities from solution. 4,840,735, Cl. 210-721.000.

Goossens, John: *See—*
Ohst, Holger; Podszun, Wolfgang; Suling, Carlhans; Goossens, John; and Penners, Gunther, 4,840,989, Cl. 524-544.000.

Gornowicz, Gerald A.: *See—*
Sweet, Randall P.; Lee, Chi-long; and Gornowicz, Gerald A., 4,840,796, Cl. 424-448.000.

Gossett, Wayne L.: *See—*
Phillips, Roger W.; Spellman, Vernon C.; Gossett, Wayne L.; Kamerling, Marc A.; and Coombs, Paul G., 4,840,281, Cl. 215-230.000.

Gotanda, Motohiro. Lock device with trigger bolt. 4,840,050, Cl. 70-107.000.

Goto, Chiaki; and Horikawa, Kazuo, to Fuji Photo Film Co., Ltd. Rotary light beam deflector with revolution surface mirror. 4,841,135, Cl. 350-6.800.

Goto, Kenichi: *See—*
Watanabe, Yoshimi; Miyakoshi, Shinichi; and Goto, Kenichi, 4,840,152, Cl. 123-52.0MV.

Goto, Kiyoshi: *See—*
Kita, Noriyasu; and Goto, Kiyoshi, 4,840,869, Cl. 430-191.000.

Goto, Yoshihiko: *See—*
Muramatsu, Hidenori; Yamada, Kimichika; Nozawa, Katsuya; and Goto, Yoshihiko, 4,841,392, Cl. 360-85.000.

Gottneid, David J.: *See—*
Ammeraal, Robert N.; Hedges, Allan R., and Gottneid, David J., 4,840,679, Cl. 127-40.000.

Gottsegen, Agnes: *See—*
Korbonits, Dezso; Minker, Emil; Vargai Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Artus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tarlos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath Gabor, 4,840,949, Cl. 514-234.200.

Goud, Richard B.: *See—*
Mathewes, James K., Jr.; Hermam, Jan S.; Johnson, Stephen C.; Goud, Richard B.; and Stiffler, Jack J., 4,841,434, Cl. 364-200.000.

Grady, Robert J.: *See—*
Ranger, Michael H.; Lim, Esther H.; and Grady, Robert J., 4,841,343, Cl. 355-77.000.

Graeber, Richard N., to McWilliams Machinery Sales, Division of Bridgeport Machines Inc. Rotary table wire EDM machine. 4,841,126, Cl. 219-69.200.

Graham Engineering Corporation: *See—*
Johnston, Brian J.; and Klinedinst, Paul W., 4,840,366, Cl. 271-9.000.

Graham Fiber Glass Limited: *See—*
Perrella, Guido, 4,840,013, Cl. 53-429.000.

Graham, Louis A., to Burlington Industries, Inc. Fluid jet applicator apparatus. 4,841,307, Cl. 346-1.100.

Graham, Patricia K.; and Williams, Robert R., to International Business Machines Corporation. Method and apparatus for testing three state drivers. 4,841,232, Cl. 324-73.00R.

Graham, Samuel L.: *See—*
Shepard, Kenneth L.; and Graham, Samuel L., 4,840,963, Cl. 514-418.000.

Grantham, Debs E. Grafting apparatus. 4,839,986, Cl. 47-6.000.

Grass, Alfred, to Alfred Grass Ges.m.b.H. Metallwarenfabrik. Rapidcy mountable furniture hinge with snap closure. 4,839,940, Cl. 16-258.000.

Gratton, Enrico, to I.S.S. (U.S.A.) Inc. Frequency domain cross-correlation fluorometry with phase-locked loop frequency synthesizers. 4,840,485, Cl. 356-317.000.

Gray Electronics, Inc.: *See—*
Henry, Philip, 4,841,302, Cl. 342-20.000.

Grayline Housewares: *See—*
Cobb, Dean L.; and Bleser, Edward M., 4,840,279, Cl. 211-88.000.

Graziano, Anthony: *See—*
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Tarnow, Horst; and Homeyer, Bernhard, 4,840,969, Cl. 514-617.000.

Honda Giken Gokyo Kabushiki Kaisha: *See*—

Watanabe, Yoshimi; Miyakoshi, Shinichi; and Goto, Kenichi, 4,840,152, Cl. 123-52.0MV.

Honda Giken Kogyo Kabushiki Kaisha: *See*—

Araki, Junichi; Saito, Nobuhiro; Tezuka, Hidenori; and Saito, Masuhiro, 4,840,608, Cl. 474-205.000.

Hamada, Akio; Tsujii, Gen; Fuse, Genzo; and Kondo, Masahide, 4,841,113, Cl. 219-110.000.

Higuchi, Kazuo; Tabata, Hiroshi; Okuhara, Hisakazu; Saruwatari, Hidetoshi; and Akiyama, Akihiko, 4,840,325, Cl. 242-107.200.

Kubo, Kanji, 4,840,396, Cl. 280-690.000.

Sakata, Masayasu, 4,840,151, Cl. 123-90.430.

Shitanoki, Kazuaki, 4,840,078, Cl. 74-484.00R.

Yamato, Akihiro; and Hashiguchi, Makoto, 4,840,156, Cl. 123-339.000.

Honda, Yukio: *See*—

Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 4,840,844, Cl. 428-336.000.

Honeywell Inc.: *See*—

Bernot, Anthony J.; and Johnson, Michael J., 4,840,460, Cl. 350-333.000.

Kummer, Karl T., 4,841,286, Cl. 340-653.000.

Levine, Michael R.; Rigotti, Victor; Russo, James; and Skogler, Nicholas, 4,841,458, Cl. 364-557.000.

Nerheim, Eldon, 4,840,122, Cl. 102-202.500.

Sullivan, Charles T.; and Zook, J. David, 4,841,140, Cl. 250-226.000.

Westell, William E., 4,841,317, Cl. 354-65.000.

Hong, Bahk, to Kia Motors Corporation. Seat for an automobile. 4,840,427, Cl. 297-346.000.

Hong, Jauwhei: *See*—

Clark, Clarence O.; and Hong, Jauwhei, 4,840,850, Cl. 428-471.000.

Honjyo, Shigeru: *See*—

Minato, Osamu; Masuhara, Toshiaki; Ishibashi, Koichiro; Hanamura, Shoji; Honjyo, Shigeru; and Moriwaki, Nobuyuki, 4,841,486, Cl. 365-207.000.

Honjyoh, Akira: *See*—

Tsuruta, Masao; Kiuchi, Seiji; Honjyoh, Akira; Oishi, Kengo; and Suzuki, Osamu, 4,841,403, Cl. 360-132.000.

Honma, Takeo: *See*—

Sasaki, Akira; Takahashi, Yoshihito; Hakoyama, Akiyoshi; Mikami, Katsumasa; Suzaki, Masafumi; Honma, Takeo; Yasutomi, Tsuyoshi; Shiraishi, Ryoichi; and Nishiguchi, Yasuo, 4,840,500, Cl. 400-120.000.

Hood, Stephen K.; Norkoski, Joseph; and Arnold, Halan P., to Enterprises International, Inc. Roll wrapping head transfer and placement apparatus. 4,840,008, Cl. 53-137.000.

Hoover Group, Inc.: *See*—

Snyder, Andrew W., 4,840,284, Cl. 220-5.00A.

Hori, Taizou, to Canon Kabushiki Kaisha. Recording apparatus for rerecording by repositioning recording medium. 4,841,388, Cl. 360-721.000.

Horie, Kiyoshi: *See*—

Inoue, Nanao; Saito, Koichi; Kato, Ryoki; Fujimagari, Hiroshi; Fujimura, Yoshihiko; Kato, Seiichi; Naito, Koichi; and Horie, Kiyoshi, 4,841,312, Cl. 346-160.00R.

Horie, Seiji: *See*—

Makino, Naonori; Hioki, Takanori; Inagaki, Yoshio; and Horie, Seiji, 4,840,862, Cl. 430-75.000.

Horikawa, Kazuo: *See*—

Goto, Chiaki; and Horikawa, Kazuo, 4,841,135, Cl. 350-6.800.

Horikosi, Katsumi: *See*—

Iwasaki, Takao; and Horikosi, Katsumi, 4,841,019, Cl. 528-388.000.

Horino, Koichi: *See*—

Kobayashi, Hideki; Ikeda, Minoru; Saito, Koichi; Nagata, Shiro; and Horino, Koichi, 4,840,873, Cl. 430-273.000.

Horn, Michael J.: *See*—

Lillywhite, M. James; and Horn, Michael J., 4,840,283, Cl. 220-5.00A.

Horn, Petr, to Albert Koch. Calibrated temperature sensor and method of calibrating same. 4,840,494, Cl. 374-1.000.

Horn, Thomas A.: *See*—

Alsobrooks, Daniel E.; Bart, Hansueli; Chauvin, Richard; Horn, Thomas A.; Merte, John H.; Mesenich, Gerhard; and Mitts, Donna M., 4,840,163, Cl. 123-533.000.

Horner, Terry A. Motionless mixers and baffles. 4,840,493, Cl. 366-339.000.

Horowitz, Bernard, to New York Blood Center, Inc. Inactivation of viruses in labile protein-containing compositions using fatty acids. 4,841,023, Cl. 530-351.000.

Horton, Paul J., to Therm-O-Disc, Incorporated. High temperature sensing apparatus. 4,841,273, Cl. 338-28.000.

Horvath, Gabor: *See*—

Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.

Hosaka, Sumio: *See*—

Takada, Keiji; Okumura, Masahide; Fukuhara, Satoru; Morimura, Toshiyuki; Hosaka, Sumio; and Hosoki, Shigeyuki, 4,841,191, Cl. 310-317.000.

Hoshi, Mitsunori: *See*—

Ariizumi, Ryozo; Kainuma, Masakuni; Aoki, Toshikazu; Suda, Shoji; Hoshi, Mitsunori; and Ejiri, Takashi, 4,840,347, Cl. 251-63.400.

Hoshino, Chie, legal representative: *See*—

Hoshino, Kunihisa, deceased; Hamanishi, Yoshinari; and Utagawa, Ken, 4,841,325, Cl. 354-402.000.

Hoshino, Kimie: *See*—

Iwagaki, Masaru; Masukawa, Toyoaki; Komamura, Tawara; Ishikawa, Wataru; and Hoshino, Kimie, 4,840,870, Cl. 430-201.000.

Hoshino, Kunihisa, deceased (by Hoshino, Chie, legal representative); Hamanishi, Yoshinari; and Utagawa, Ken, to Nikon Corporation. Automatic focusing device for camera. 4,841,325, Cl. 354-402.000.

Hoshino, Seiichi: *See*—

Akabane, Hidemitsu; Isobe, Toshimi; and Hoshino, Seiichi, 4,840,308, Cl. 236-13.000.

Hoshino, Yasushi: *See*—

Yamada, Minoru; Ito, Eiji; Miyama, Kenji; Sawamura, Masataka; Hoshino, Yasushi; and Makino, Masamori, 4,841,323, Cl. 354-400.000.

Hosokawa, Kazutaka: *See*—

Shimizu, Tetsuo; and Hosokawa, Kazutaka, 4,840,998, Cl. 525-276.000.

Hosoki, Shigeyuki: *See*—

Takada, Keiji; Okumura, Masahide; Fukuhara, Satoru; Morimura, Toshiyuki; Hosaka, Sumio; and Hosoki, Shigeyuki, 4,841,191, Cl. 310-317.000.

Hosoya, Masachi: *See*—

Matsunaga, Shigeki; Ishikawa, Yuichi; and Hosoya, Masachi, 4,841,408, Cl. 361-220.000.

Hosoyama, Osamu, to Fujitsu Limited. POS system for updating look-up table. 4,841,442, Cl. 364-405.000.

Hotta, Yuji: *See*—

Iijima, Toshifumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Hotta, Yuji; Ohya, Hiroko; Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; and Shinozaki, Kaoru, 4,840,886, Cl. 430-558.000.

House Food Industrial Co., Ltd.: *See*—

Sugisawa, Ko; Matsumura, Yasushi; Okamoto, Hidefumi; and Abe, Kumiko, 4,840,805, Cl. 426-129.000.

Household Manufacturing, Inc.: *See*—

Spraker, Wilbur A., Jr., 4,840,036, Cl. 62-172.000

Howerton, Robert D.: *See*—

Walz, David K.; Howerton, Robert D.; Allen, Andrew W.; Moss, Thera C.; and Kenney, William H., 4,840,770, Cl. 422-49.000.

Howton, Kenneth D.; Stewart, Robert G.; and Zeitler, Herman R., to Brush Fuses, Inc. Fuses and their manufacture. 4,841,356, Cl. 337-248.000.

Hoying, John F.; and Lange, Bernard, to General Motors Corporation. Hydraulic engine mount with air bladder tuning. 4,840,358, Cl. 267-140.100.

Hoyt, David D. Golf ball holder. 4,840,332, Cl. 224-274.000.

Hoyt, Roger F.; Jefferson, Carl M.; and Millman, Steven E., to International Business Machines Corporation. Magnetic transducer crash anticipation and response method and apparatus. 4,841,389, Cl. 360-75.000.

Hribar, Frank, to Fluid Regulators Corp. Control system for fluid pressure operated actuator. 4,840,031, Cl. 60-338.000.

Hsiung, Nancy: *See*—
Reddy, Vermuri B.; Hsiung, Nancy; Beck, Anton K.; and Bernstine, Edward G., 4,840,896, Cl. 435-68.000.

Hsu, Sheng H., to Nestec S.A. Agglomeration process. 4,840,809, Cl. 426-285.000.

Hsu, Sheng T., to General Electric Company. MOS VLSI device having shallow junctions and method of making same. 4,841,347, Cl. 357-23.900.

Hsue, Ching-Wen; and Lee, Wha-Joon, to American Telephone and Telegraph Company, AT&T Bell Laboratories. Method and apparatus for verifying the continuity between a circuit board and a test fixture. 4,841,240, Cl. 324-158.00P.

Hua, Wang, to Chengdu Aircraft Corporation. Continuous spark electronic igniter. 4,840,165, Cl. 123-606.000.

Hubele, Adolf: *See*—
Zondler, Helmut; Hubele, Adolf; and Meyfeler, Robert, 4,840,662, Cl. 71-92.000.

Hubner, Dirk: *See*—
Ohlschlager, Hans; Renner, Gunter; Knitz, Friedrich-Wilhelm; Odenwalder, Heinrich; and Hubner, Dirk, 4,840,880, Cl. 430-505.000.

Hucks, Lacy K., Jr. Deer stand. 4,840,252, Cl. 182-187.000.

Hudson, Peter D.: *See*—
Gercekci, Anil; Bron, Michel; and Hudson, Peter D., 4,841,133, Cl. 235-492.000.

Huei-Chin, Chen. Surveying method allowing greater freedom in positioning the surveying instruments. 4,839,967, Cl. 33-228.000.

Huels Aktiengesellschaft: *See*—
Bartz, Wilfried, 4,840,993, Cl. 525-66.000.

Huennebeck, Volker: *See*—
Dahrendorf, Klaus-Dieter; Huennebeck, Volker; and Hoffman, Wilfried, 4,840,170, Cl. 128-202.260.

Huff, Darrel: *See*—
Connolly, James D.; and Huff, Darrel, 4,840,728, Cl. 209-405.000.

Hughes Aircraft Company: *See*—
Klayman, Arnold I., 4,841,572, Cl. 381-17.000.
McClanahan, Robert F.; Washburn, Robert D.; Gonzalez, Carlos H.; Sze, Jerry C.; and Lusher, David M., 4,841,429, Cl. 363-126.000.
Washburn, Robert D.; and McClanahan, Robert F., 4,841,428, Cl. 363-75.000.

Hughes, Cleveland L.; Williams, Timothy N. and Mandel, Paul M., Jr., to Color Quest Inc. Water soluble coloring compositions containing sparkle components. 4,840,669, Cl. 106-19.300.

Hughes, Cleveland L.; Williams, Timothy N. and Mandel, Paul M., Jr., to Color Quest Inc. Water soluble coloring compositions containing sparkle components. 4,840,670, Cl. 106-19.300.

Hughes, Elaine L. Syringe. 4,840,619, Cl. 604-187.000.

Hultsch, Guenter: *See*—
Pawlowski, Georg; Hultsch, Guenter; and Mack, Gerhard, 4,840,868, Cl. 430-155.000.

Humphrey, Cecil T. Double bank grain cleaner and aspirator therefor. 4,840,727, Cl. 209-32.000.

Humphrey, John R., to International Packaging Machines, Inc. Stretch wrapping machine. 4,840,006, Cl. 53-64.000.

Hundeby, David R.: *See*—
Friggstad, Terrance; and Hundeby, David R., 4,840,233, Cl. 172-311.000.

Hunt, Warren H., Jr.: *See*—
Hyland, M. Elise; and Hunt, Warren H., Jr., 4,840,852, Cl. 428-654.000.

Hunter Automated Machinery Corporation: *See*—
Hunter, William A., 4,840,218, Cl. 164-159.000.

Hunter, Clifford P., to Shell Oil Company. Plant generation method. 4,840,906, Cl. 435-240.490.

Hunter, Harry L.: *See*—
Gamble, Donald E.; Hunter, Harry L.; and McKinney, Gordon R., 4,840,952, Cl. 514-253.000.

Hunter, James O.: *See*—
Austin, Frederick D.; Barclay, John I.; and Hunter, James O., 4,840,723, Cl. 208-106.000.

Hunter, William A., to Hunter Automated Machinery Corporation. Automatic matchplate molding system. 4,840,218, Cl. 164-169.000.

Hunter, William H., to Lilly Industries Limited. Substituted hexahydro-4H-indolo[6,5,4-cd]indoles. 4,841,056, Cl. 546-68.000.

Hurlemann, Ernst; Muller, Kurt; and Ruppert, Bruno, to Werkzeugmaschinenfabrick Oerlikon-Buhrle AG. Apparatus for the infeed of ammunition from an ammunition container to an automatic firing weapon. 4,840,108, Cl. 89-33.140.

Husemeyer, Hans; Mager, Herbert; and Konrad, Eugen, to Wella Aktiengesellschaft. Agent for dyeing hair. 4,840,639, Cl. 8-410.000.

Husted, Eric F.; and Ladd, Judith A., to GTE Products Corporation. Method for removing sodium and chloride from cobaltic hydroxide. 4,840,775, Cl. 423-150.000.

Husted, Eric F., to GTE Products Corporation. Method for removing sodium and ammonia from cobalt. 4,840,776, Cl. 423-150.000.

Hutchins, Alma A., to Hutchins Manufacturing Company. Abrading tool. 4,839,995, Cl. 51-170.0MT.

Hutchins Manufacturing Company: *See*—
Hutchins, Alma A., 4,839,995, Cl. 51-170.0MT.

Hutchinson: *See*—
Jouade, Pierre, 4,840,357, Cl. 267-140.100.

Huzino, Seizi: *See*—
Nishida, Minoru; Mizuno, Naohito; Hattori, Tadashi; Huzino, Seizi; and Ando, Yoshiyasu, 4,840,067, Cl. 73-726.000.

Hwang, Chi Y.: *See*—
Chih, Liu P.; and Hwang, Chi Y., 4,840,242, Cl. 180-8.100.

Hyland, M. Elise; and Hunt, Warren H., Jr., to Aluminum Company of America. Aluminum alloy vehicular member. 4,840,852, Cl. 428-654.000.

Hyldon, Roy; and Bhatia, Usha, to Pillsbury Company, The. Storage stable tomato - based sauce. 4,840,806, Cl. 426-270.000.

I.S.S. (U.S.A.) Inc.: *See*—
Gratton, Enrico, 4,840,485, Cl. 356-317.000.

Ichihara, Masaki, to NEC Corporation. Device operable like an automatic level control circuit for decoding a multivalued signal. 4,841,301, Cl. 341-126.000.

Ichikawa, Norihito; Someya, Ikeo; Oda, Osamu; and Amano, Toshio, to Sony Corporation. Video source selecting system. 4,841,367, Cl. 358-181.000.

Ichikawa, Yuh-Ichiro: *See*—
Shiozawa, Akira; Ichikawa, Yuh-Ichiro; and Takahira, Takashi, 4,841,051, Cl. 544-287.000.

Ichinose, Makoto: *See*—
Sugimura, Tatuo; Satoh, Isao; Imai, Yoshihiko; and Ichinose, Makoto, 4,841,498, Cl. 369-32.000.

ICI Americas Inc.: *See*—
Beachell, Vicki T., 4,840,788, Cl. 424-59.000.

Ida, Katsumi: *See*—
Ohasi, Hiroyuki; Takami, Toru; Koyama, Noritoshi; Kogure, Yoshio; Ida, Katsumi; Iijima, Kazumi; and Kobori, Tomohiro, 4,840,970, Cl. 514-690.000.

Ide, Yasushi: *See*—
Kobayashi, Hiroshi; Machida, Haruhiko; Ema, Hideaki; Akedo, Jun; Harigaya, Makoto; and Ide, Yasushi, 4,840,922, Cl. 437-129.000.

Idebro, Mats G.: *See*—
Kokkeler, Franciscus; Fioroli, Mario; Risman, Per O. G.; Vigano, Liliana; and Idebro, Mats G., 4,841,111, Cl. 219-10.55B.

Idel, Karsten-Josef: *See*—
Tacke, Peter; Grogp, Ulrich; and Idel, Karsten-Josef, 4,841,000, Cl. 525-437.000.

Idemitsu Kosan Company Limited: *See*—
Tsubouchi, Toshiyuki; Abe, Kazuaki; and Hata, Hitoshi, 4,840,745, Cl. 252-73.000.

Igashira, Kiyoteru: *See*—
Maeba, Yukio; and Igashira, Kiyoteru, 4,841,425, Cl. 363-21.000.

Ignasiak, Martin C., to Minnesota Mining and Manufacturing Company. Expanding surface mount compatible retainer post. 4,841,100, Cl. 174-138.00G.

Ihara, Hirotaka: *See*—
Hirayama, Chuichi; Motozato, Yoshiaki; and Ihara, Hirotaka, 4,840,975, Cl. 521-183.000.

Ihara, Keisuke; Alaki, Yasuhide; and Nomura, Jun, to Bridgestone Corporation. Golf ball. 4,840,381, Cl. 273-232.000.

Iida, Kazuyoshi: *See*—
Murase, Masanori; Tomita, Naotaka; and Iida, Kazuyoshi, 4,840,251, Cl. 181-206.000.

Iijima, Kazumi: *See*—
Ohasi, Hiroyuki; Takami, Toru; Koyama, Noritoshi; Kogure, Yoshio; Ida, Katsumi; Iijima, Kazumi; and Kobori, Tomohiro, 4,840,970, Cl. 514-690.000.

Iijima, Toshifumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Hotta, Yuji; Ohya, Hiroko; Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; and Shinozaki, Kaoru, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic material containing a 1h-pyrazole (3,2-C)-s-triazole derived magenta coupler. 4,840,886, Cl. 430-558.000.

Iijima, Yasuo, to Kabushiki Kaisha Toshiba. Portable electronic device with means for checking data validity during read-out. 4,841,131, Cl. 235-380.000.

Iijima, Zenshiro, to Adger Kogyo Co., Ltd. Ink composition and a pressure sensitive reproducing. 4,840,833, Cl. 428-207.000.

Iimura, Kouichi: *See*—
Nakamura, Shunichi; Iimura, Kouichi; Nakamura, Kikuo; and Ozawa, Susumu, 4,840,290, Cl. 221-10.000.

Iio, Satoshi; and Okuno, Akiyasu, to NGK Spark Plug Co., Ltd. Surface structure of AlN substrate and a process for producing the same. 4,840,853, Cl. 428-698.000.

Iizuka, Hiroyuki: *See*—
Masukawa, Toyoaki; Ninomiya, Hidetaka; and Iizuka, Hiroyuki, 4,840,883, Cl. 430-553.000.

Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji, Umeyama, Hideaki; and Kiso, Yoshiaki, to Kissei Pharmaceutical Co., Ltd. Novel amino acid derivatives. 4,841,067, Cl. 548-344.000.

Ikawa, Syouji: *See*—
Takagi, Masayoshi; Yoshioka, Yoshio; Matsuzaki, Tetsuo; Noro, Shuhei; Ikawa, Syouji; and Naruse, Katutoshi, 4,841,431, Cl. 364-187.000.

Ikeda, Go; Sasaki, Kiyoshi; Kumazaki, Hiroshi; Fujita, Shigeru; and Banzai, Hideo, to Toshiba Kikai Kabushiki Kaisha. Temperature indicating control apparatus having data storing function. 4,841,459, Cl. 364-557.000.

Ikeda, Hiroshi: *See*—
Kondo, Shinichi; Katakura, Kageyoshi; Ogawa, Toshio; Umemura, Shin'ichiro; and Ikeda, Hiroshi, 4,841,491, Cl. 367-103.000.

Ikeda, Hisao; Suzuki, Fumio; Watanabe, Yoshitane; Matsumura, Mitsunobu; Takahashi, Yasuhiro; Murakami, Hirosi; and Maeda, Koichi, to Nissan Chemical Industries Ltd. Papermaking method. 4,840,705, Cl. 162-175.000.

Ikeda, Kenji: *See*—
Mihashi, Yutaka; Nagai, Yutaka; and Ikeda, Kenji, 4,841,535, Cl. 372-46.000.

Ikeda, Masamichi: *See*—
Kasamura, Toshirou; Takagi, Masafumi; Okuda, Naoki; Ohashi, Masashi; Kusumoto, Toshihiko; Sasaki, Nobukazu; Maeda, Yasunori; and Ikeda, Masamichi, 4,841,329, Cl. 355-245.000.

Ikeda, Minoru: *See*—
Kobayashi, Hideki; Ikeda, Minoru; Saito, Koichi; Nagata, Shiro; and Horino, Koichi, 4,840,873, Cl. 430-273.000.

Ikeda, Noriaki; Sugishima, Noboru; Fujii, Yasushi; Ikuta, Shinji; Nakanishi, Yoshiyuki; and Inoue, Akira, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Process for production of 1-aminoanthraquinone. 4,840,749, Cl. 260-378.000.

Ikeda, Shuji; Meguro, Satoshi; Nishimura, Kotaro; Yamamoto, Sho; and Tanimura, Nobuyoshi, to Hitachi, Ltd. Semiconductor memory device. 4,841,481, Cl. 365-154.000.

Ikeda, Toshihiro: *See*—
Aida, Akira; and Ikeda, Toshihiro, 4,840,153, Cl. 123-90.550.

Ikeda, Tsunemi; and Ota, Motoki, to Calsonic Corporation. Tail pipe structure of control type muffler. 4,840,030, Cl. 60-324.000.

Ikegami, Fumio; Yoshida, Susumu; Takeuchi, Tsutomu; and Ariyavisitakul, Sirikiat, to Ikegami, Fumio; and Mitsubishi Denki Kabushiki Kaisha. Digital communication system. 4,841,547, Cl. 375-53.000.

Ikoma, Mitsuhiro; Nakatani, Kazuo; Yoshida, Yuji; Tomizawa, Takeshi; and Arita, Koji, to Matsushita Electric Industrial Co., Ltd. Heat pump system. 4,840,042, Cl. 62-324.100.

Ikuhara, Isao: *See*—
Hasuo, Masayoshi; Mukai, Seiichi; Saito, Ryo; and Ikuhara, Isao, 4,840,981, Cl. 524-114.000.

Ikuta, Shinji: *See*—
Ikeda, Noriaki; Sugishima, Noboru; Fujii, Yasushi; Ikuta, Shinji; Nakanishi, Yoshiyuki; and Inoue, Akira, 4,840,749, Cl. 260-378.000.

Illinois Tool Works Inc.: *See*—
Ernst, Richard J., 4,840,294, Cl. 222-287.000.

Imagawa, Kazushige: *See*—
Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 4,840,844, Cl. 428-336.000.

Imahori, Seiichi; Himeno, Kiyoshi; and Yoshihara, Junji, to Mitsubishi Chemical Industries, Limited. Phenyl acothienylthiazoaniline dis-azo dye for polyester fibers. 4,841,036, Cl. 534-761.000.

Imai, Hitoshi; Arai, Ryuichiro; Koyanagi, Kimiyuki; and Tadokoro, Michihiro, to Mitsubishi Denki Kabushiki Kaisha. Optical head for an optical recording and reproducing apparatus. 4,841,507, Cl. 369-44.000.

Imai, Jun: *See*—
Takeda, Takao; Yamazaki, Hitoshi; Taniguchi, Yoshiteru; Tanaka, Norihiko; Ito, Hiroshi; Uchida, Minoru; and Imai, Jun, 4,840,593, Cl. 445-26.000.

Imai, Shigeo: *See*—
Suzuki, Migaku; Nozaki, Satoshi; Imai, Shigeo; Ishigami, Makoto; and Kobayashi, Toshio, 4,840,829, Cl. 428-131.000.

Imai, Yoshihiko: *See*—
Sugimura, Tatuo; Satoh, Isao; Imai, Yoshihiko; and Ichinose, Makoto, 4,841,498, Cl. 369-32.000.

Imanaka, Tadashi; Takagi, Masayuki; Togawa, Eisei; Saito, Harunobu; Nagaike, Sadanori; Ohura, Masaki; Suzuki, aburo; Kobayashi, Tetsuo; and Kuwatsuka, Shunichiro, to Hitachi, Ltd. Thin film magnetic head and method of manufacture. 4,841,402, Cl. 360-126.000.

Imokawa, Naoki: *See*—
Baba, Hisatoshi; Imokawa, Naoki; and Shiho, Makoto, 4,841,407, Cl. 361-146.000.

Imperial Chemical Industries PLC: *See*—
Cartwright, David, 4,840,664, Cl. 71-94.000.

INA Bearing Company, Inc.: *See*—
White, Craig E.; and Hodge, Bobby L., 4,840,600, Cl. 464-111.000.

INA Walzlager Schaeffler KG: *See*—
Zipprath, Michael; and Schmidt, Dieter, 4,840,160, Cl. 123-467.000.

Inaba, Tohru, to Hitachi, Ltd. Electronic device with peripheral protective electrode. 4,841,354, Cl. 357-71.000.

Inaba, Tsutomu: *See*—
Morishita, Etsuo; Kakuda, Masayuki; Sugihara, Masahiro; Inaba, Tsutomu; Nakamura, Toshiyuki; and Kimura, Tadashi, 4,840,549, Cl. 418-55.000.

Inagaki, Yoshio: *See*—
Makino, Naonori; Hioki, Takanori; Inagaki, Yoshio; and Horie, Seiji, 4,840,862, Cl. 430-75.000.

Ing. Gunter Klemm Spezialunternehmen fur Bohrtechnik: *See*—
Klemm, Gunter, 4,840,238, Cl. 175-92.000.

Ingwersen, Hartwig: *See*—
Duerr, Wilhelm; Ingwersen, Hartwig; Krause, Norbert; and Oppelt, Ralph, 4,841,249, Cl. 324-318.000.

Innofinance Altalanos Innovacios Penzintezet: *See*—
Kenyeres, Istvan; and Koch, Lehel, 4,840,751, Cl. 261-36.100.

Inoue, Akira: *See*—
Ikeda, Noriaki; Sugishima, Noboru; Fujii, Yasushi; Ikuta, Shinji; Nakanishi, Yoshiyuki; and Inoue, Akira, 4,840,749, Cl. 260-378.000.

Inoue, Hiroaki: *See*—
Nakamura, Hitoshi; Sakano, Shinji; Inoue, Hiroaki; Katsuyama, Toshio; and Matsumura, Hiroyoshi, 4,840,446, Cl. 350-96.130.

Inoue, Hiroshi; Kato, Toshikazu; Tomagou, Satoshi; and Emura, Noriaki, to Tosoh Corporation and Toso Susteel Co., Ltd. Process for producing a polyarylene sulfide. 4,840,986, Cl. 524-436.000.

Inoue, Nanao; Saito, Koichi; Kato, Ryoki; Fujimagari, Hiroshi; Fujimura, Yoshihiko; Kato, Seiichi; Naito, Koichi; and Horie, Kiyoshi, to Fuji Xerox Co., Ltd. Thermal-electrostatic ink jet recording apparatus. 4,841,312, Cl. 346-160.00R.

Inoue, Tohru: *See*—
Yoshida, Hideo; Inoue, Tohru; Yamagishi, Atsuhiro; Oda, Yoshiaki; Ozaki, Minoru; and Nishijima, Toshihisa, 4,841,300, Cl. 341-94.000.

Institut Francais du Petrole: *See*—
Quang, Dang Vu; Davidson, Michel; Durand, Daniel; and Courty, Philippe, 4,840,783, Cl. 423-648.100.

Institut National de la Sante et de la Recherche Medicale: *See*—
Wagnon, Jean; Guegan, Remy; LaCour, Colette; and Nisato, Dino, 4,840,935, Cl. 514-18.000.

Institute of Paper Chemistry, The: *See*—
Baum, Gary A.; and Habeger, Charles C., Jr., 4,841,223, Cl. 324-58.50A.

Insulator Seal, Inc.: *See*—
Dunton, Arthur R., 4,841,098, Cl. 174-15.300.

Integrated Genetics, Inc.: *See*—
Reddy, Vermuri B.; Hsiung, Nancy; Beck, Anton K.; and Bernstine, Edward G., 4,840,896, Cl. 435-68.000.

Intel Corporation: *See*—
Kreifels, Jerry A.; and Hoekstra, George, 4,841,482, Cl. 365-185.000.

International Business Machine Corporation: *See*—
Flagello, Donis G.; Wilczynski, Janusz S.; and Witman, David F., 4,840,923, Cl. 437-189.000.
Roberts, Sheldon D.; Samuels, Louann B.; and Shadwick, David T., 4,840,503, Cl. 400-208.000.

International Business Machines Corp.: *See*—
Bukowski, Eugene R.; and Hoffman, Charles R., 4,841,254, Cl. 330-253.000.
Finlay, David E.; Hanna, Stephen D.; Stevenson, David C.; and Varga, John T., 4,841,453, Cl. 364-519.000.
Gardner, David A.; Ryan, James G.; Schaefer, Joseph G.; and Walton, Erick G., 4,840,302, Cl. 228-123.000.
Graham, Patricia K.; and Williams, Robert R., 4,841,232, Cl. 324-73.00R.
Hoffman, Arthur R., 4,841,310, Cl. 346-75.000.
Hoyt, Roger F.; Jefferson, Carl M.; and Millman, Steven E., 4,841,389, Cl. 360-75.000.
Mitchell, James A.; and Bechdel, John F., 4,841,476, Cl. 364-900.000.
Pham, Xuan N.; and Wilson, John H., 4,841,574, Cl. 381-31.000.
Prilik, Ronald J.; and Varner, James R., 4,841,485, Cl. 365-201.000.
Swix, Scott R.; and Krueger, Leroy A., 4,841,291, Cl. 340-725.000.

International Flavors & Fragrances Inc.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; Sands, Keith P.; and Hagedorn, Myrna L., 4,840,801, Cl. 426-3.000.

International Packaging Machines, Inc.: *See*—
Humphrey, John R., 4,840,006, Cl. 53-64.000.

Intersonics Incorporated: *See*—
Danley, Thomas J.; and Rey, Charles A., 4,841,495, Cl. 367-191.000.

Inuzuka, Kenichi: *See*—
Shirasaki, Yoshikazu; and Inuzuka, Kenichi, 4,840,826, Cl. 428-36.910.

Invacare Corporation: *See*—
Lockard, Walter G.; Boris, Allen J.; and Kosc, Wieslaw, 4,840,390, Cl. 280-250.100.

Ioka, Hideyuki: *See*—
Tsuchiya, Kyoshi; Ioka, Hideyuki; and Takahashi, Hideyuki, 4,841,182, Cl. 310-68.00D.

Ipsco Inc.: *See*—
Boratto, Francisco; Yue, Stephen; and Jonas, John J., 4,840,051, Cl. 72-11.000.

Irie, Tsutomu, to See-Me Lights Corp. Electrical system for vehicle daytime running lights. 4,841,199, Cl. 315-83.000.

Ishibashi, Hiroshi: *See*—
Kato, Eiichi; Dan, Shigeyuki; Ishibashi, Hiroshi; Ishii, Kazuo; and Sera, Hidefuji, 4,840,865, Cl. 430-114.000.

Ishibashi, Kazuhisa: *See*—
Sato, Nobuyuki; Matsubayashi, Hiroshi; Kobayashi, Seishichi; Mitsuhashi, Minoru; Matsuno, Kenji; and Ishibashi, Kazuhisa, 4,840,304, Cl. 228-214.000.

Ishibashi, Koichiro: *See*—
Minato, Osamu; Masuhara, Toshiaki; Ishubashi, Koichiro; Hanamura, Shoji; Honjyo, Shigeru; and Moriwaki, Nobuyuki, 4,841,486, Cl. 365-207.000.

Ishida, Hiromi: *See*—
Hagiwara, Yoshiaki; Ishida, Hiromi; and Takahashi, Takeyoshi, 4,840,491, Cl. 366-69.000.

Ishida, Muneo; Yamashita, Mithuo; Onishi, Masanari; and Tanaka, Masahiro, to Kawai Musical Instrument Manufacturing Co., Ltd. Keyboard. 4,840,104, Cl. 84-437.000.

Ishida, Takeo; Hagiwara, Hiroshi; and Kakumu, Ichizo, to Sintobrator, Ltd. Polishing device. 4,839,992, Cl. 51-5.00D.

Ishigami, Makoto: *See*—
Suzuki, Migaku; Nozaki, Satoshi; Imai, Shigeo; Ishigami, Makoto; and Kobayashi, Toshio, 4,840,829, Cl. 428-131.000.

Ishige, Yoshio: *See—*
Yoshida, Tsukasa; Ishige, Yoshio; Matsuoaira, Masaki; and Takahashi, Tadashi, 4,840,807, Cl. 426-48.000
Ishiguro, Kazuyoshi: *See—*
Yamashita, Tatsuo; and Ishiguro, Kazuyoshi, 4,840,401, Cl. 280-804.000.
Ishihara, Ken: *See—*
Ogawa, Kazufumi; Sasago, Masaru; Endo, Masayuki; and Ishihara, Ken, 4,841,341, Cl. 355-43.000.
Ishihara, Satoshi: *See—*
Hida, Yoshiaki; Ishihara, Satoshi; Take, Seiji; Gogami, Masao; and Suzuki, Toshiyuki, 4,841,134, Cl. 235-488.000.
Ishihara, Yasunobu: *See—*
Matsutani, Shigeru; Mizushima, Yukio; Doteuchi, Masami; and Ishihara, Yasunobu, 4,840,953, Cl. 514 258.000.
Ishii, Fumio: *See—*
Iwagaki, Masaru; Sasaki, Takashi; Kumamura, Tawara; Ishii, Fumio; and Koshizuka, Kunihiro, 4,840,882, Cl. 430-505.000.
Ishii, Kazuo: *See—*
Kato, Eiichi; Dan, Shigeyuki; Ishibashi, Hiroshi; Ishii, Kazuo; and Sera, Hidefuji, 4,840,865, Cl. 430-114.000.
Ishikawa, Takeshi. Letter scale with coin counter-balance. 4,840,241, Cl. 177-172.000.
Ishikawa, Tetsushi; Okabe, Masato; and Kato, Hiroyasu, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo; and Kabushiki Kaisha Itoki. Apparatus for raising small animals. 4,840,142, Cl. 119-17.000.
Ishikawa, Wataru: *See—*
Iwagaki, Masaru; Masukawa, Toyoaki; Komamura, Tawara; Ishikawa, Wataru; and Hoshino, Kimie, 4,840,870, Cl. 430-201.000.
Yagino, Masamori; Taniguchi, Masato; Ito, Yoshitomo; Takano, Toshimitsu; Ishikawa, Wataru; Kikuchi, Sadatoshi; and Endo, Tetsuo, 4,841,120, Cl. 219-216.000.
Ishikawa, Yuichi: *See—*
Matsunaga, Shigeki; Ishikawa, Yuichi; and Hosoya, Masachi, 4,841,408, Cl. 361-220.000.
Ishimoto, Kenji; and Kawabata, Kouji, to UBE Industries, Ltd Vertical injection apparatus. 4,840,557, Cl. 425-555.000.
Ishinaga, Hideki: *See—*
Mitani, Katsuaki; and Ishinaga, Hideki, 4,840,471, Cl. 350-438.000.
Ishizawa, Isamu: *See—*
Yanagisawa, Shozo; Tamaki, Sigeo; and Ishizawa, Isamu, 4,840,146, Cl. 123-52.0MB.
Ishizuka, Takuo, to Hitachi, Ltd. Data transfer system and method for channels with serial transfer line. 4,841,472, Cl. 364-900.000.
Isobe, Toshimi: *See—*
Akabane, Hidemitsu; Isobe, Toshimi; and Hoshino, Seiichi, 4,840,308, Cl. 236-13.000.
Isoda, Takeshi: *See—*
Arai, Mikiro; Isoda, Takeshi; and Itoh, Takuji, 4,840,778, Cl. 423-324.000.
Isono, Koji: *See—*
Kajitani, Masahiko; Takeda, Kiyoshi; Isono, Koji; Hirose, Masumi; Matsubara, Kouji; and Shuda, Etsuji, 4,841,132, Cl. 235-472.000.
Israel Aircraft Industries Ltd.: *See—*
Ladan, Uri; Karton, Boaz; and Klipper, Aron, 4,840,105, Cl. 89-1.130.
Itagaki, Hidenobu, to Mitsubishi Denki Kabushiki Kaisha. Method for interpolative extension of nuclear magnetic resonance image. 4,841,247, Cl. 324-309.000.
Italtel Societa Italiana Telecomunicazioni s.r.l.a: *See—*
Lentini, Salvatore; and Patti, Giuseppe, 4,841,161, Cl. 307-85.000.
Ito, Akio; and Kato, Hiroshi, to Pilot Ink Co., Ltd. Synthetic resin pen unit. 4,840,509, Cl. 401-198.000.
Ito, Eiji: *See—*
Yamada, Minoru; Ito, Eiji; Miyama, Keiji; Sawamura, Masataka; Hoshino, Yasushi; and Makino, Masamori, 4,841,323, Cl. 354-400.000.
Ito, Hiroshi: *See—*
Kashihara, Yuji; Tage, Yutaka; Nakamura, Yasunari; Ito, Hiroshi; and Takahashi, Tokuyuki, 4,840,247, Cl. 180-249.000.
Takeda, Takao; Yamazaki, Hitoshi; Taniguchi, Yoshiteru; Tanaka, Norihiko; Ito, Hiroshi; Uchida, Minoru; and Imai, Jun, 4,840,593, Cl. 445-26.000.
Ito, Kazuhiro: *See—*
Tanahashi, Toshio; Nakamura, Norihiko; Noguchi, Hiroshi; Nomura, Kenichi; Baika, Toyokazu; Kanamaru, Masanobu; Kobayashi, Tatsuo; Nagaosa, Hideo; Ito, Kazuhiro; Ito, Toshio; and Nakae, Kouichi, 4,840,147, Cl. 123-65.0VD.
Ito, Ken: *See—*
Kawabe, Taketoshi; and Ito, Ken, 4,840,389, Cl. 280-91.000.
Ito, Mikio: *See—*
Someya, Shinzo; Koura, Seigo; Ito, Mikio; Nakanishi, Akira; and Nonaka, Yuji, 4,841,035, Cl. 546-270.000.
Ito, Noriki; Ogawara, Hiroshi; and Watanabe, Shunichi, to Yamanouchi Pharmaceutical Co., Ltd. Isoflavone derivatives, and salts thereof, and cancerocidal and immunosuppressive agents containing the same. 4,841,077, Cl. 549-402.000.
Ito, Toshio: *See—*
Tanahashi, Toshio; Nakamura, Norihiko; Noguchi, Hiroshi; Nomura, Kenichi; Baika, Toyokazu; Kanamaru, Masanobu; Kobayashi, Tatsuo; Nagaosa, Hideo; Ito, Kazuhiro; Ito, Toshio; and Nakae, Kouichi, 4,840,147, Cl. 123-65.0VD.
Ito, Yasunobu: *See—*
Yamamoto, Masanari; Ito, Yasunobu; and Yokoyama, Shouji, 4,841,445, Cl. 364-424.100.
Ito, Yoshitomo: *See—*
Yagino, Masamori; Taniguchi, Masato; Ito, Yoshitomo; Takano, Toshimitsu; Ishikawa, Wataru; Kikuchi, Sadatoshi; and Endo, Tetsuo, 4,841,120, Cl. 219-216.000.
Ito, Yukio; Sato, Yutaka; Kishimoto, Shinji; and Tamano, Satoshi, to Hitachi Medical Corp. Ultrasonic diagnosis apparatus for measurement of speed of moving medium in a living body. 4,840,180, Cl. 128-661.080.
Itoh, Hiroshi, to Toshiba Kikai Kabushi Kaisha. Position control system including a quick response control. 4,841,208, Cl. 318-561.000.
Itoh, Hiroshi: *See—*
Kato, Nobuyuki; Takahashi, Tokuyuki; and Itoh, Hiroshi, 4,840,263, Cl. 192-109.00F.
Itoh, Takuji: *See—*
Arai, Mikiro; Isoda, Takeshi; and Itoh, Takuji, 4,840,778, Cl. 423-324.000.
ITT Corporation: *See—*
Cabourne, Michael K., 4,840,569, Cl. 439-65.000.
Muzslay, Steven Z., 4,840,585, Cl. 439-556.000.
Iwagaki, Masaru; Masukawa, Toyoaki; Komamura, Tawara; Ishikawa, Wataru; and Hoshino, Kimie, to Konishiroku Photo Industry Co., Ltd. Heat-transfer image-receiving element. 4,840,870, Cl. 430-201.000.
Iwagaki, Masaru; Sasaki, Takashi; Kumamura, Tawara; Ishii, Fumio; and Koshizuka, Kunihiro, to Konishiroku Photo Industry Co., Ltd. Heat developable color light-sensitive material. 4,840,882, Cl. 430-505.000.
Iwama, Satoshi: *See—*
Nakayama, Rinichi; Yoshida, Yasunori; and Iwama, Satoshi, 4,840,988, Cl. 524-476.000.
Iwamoto, Masayuki: *See—*
Takeuchi, Masaru; Fukatsu, Takeo; Nakano, Shoichi; Kuwano, Yukinori; Minami, Koji; and Iwamoto, Masayuki, 4,841,328, Cl. 355-211.000.
Iwamoto, Yasuaki: *See—*
Nakayama, Nobuhiro; Asahina, Yasuo; Fushimi, Hiroyuki; and Iwamoto, Yasuaki, 4,841,331, Cl. 355-245.000.
Iwasaki, Akio; and Nagasawa, Kenichi, to Canon Kabushiki Kaisha. Rotary head type recording and/or reproducing apparatus having mode selecting mechanism. 4,841,391, Cl. 360-85.000.
Iwasaki, Hiroyuki: *See—*
Sano, Kunihiko; Nagao, Makoto; Nahara, Akira; Nishikawa, Yasuo; and Iwasaki, Hiroyuki, 4,840,843, Cl. 428-336.000.
Iwasaki, Takao; and Horikosi, Katsumi, to Kureha Kogyo Kabushiki Kaisha. Apparatus for producing polyarylenesulfides. 4,841,019, Cl. 528-388.000.
Iwasaki, Tameo; and Takashima, Kohki, to Tanabe Seiyaku Co., Ltd. Novel naphthalene derivative. 4,840,951, Cl. 514-239.500.
Iwasaki, Tetsuji; and Fukui, Yoshio, to Kao Corporation. Emulsifying dispersant and biocidal composition containing same. 4,840,942, Cl. 514-120.000.
Iwashita, Yoshiyuki: *See—*
Tawara, Takao; Akedo, Jun; and Iwashita, Yoshiyuki, 4,841,129, Cl. 235-472.000.
Iwata, Hitoshi: *See—*
Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 4,840,844, Cl. 428-336.000.
Iwata, Masanari, to Mitsubishi Denki Kabushiki Kaisha. Harmonic speed changer. 4,840,090, Cl. 74-804.000.
Iwata, Michihiro: *See—*
Yamamoto, Kouji; Tominaga, Shinji; Yamanaka, Akira; Ueda, Hiroshi; Taniguchi, Nobuyuki; Nakamura, Ikushi; and Iwata, Michihiro, 4,841,318, Cl. 354-173.100.
Iwata, Syuji: *See—*
Nakano, Masaaki; Watanabe, Syoyu; Saito, Yusaku; and Iwata, Syuji, 4,841,290, Cl. 340-707.000.
Iwatsuki, Kunihiro: *See—*
Hayashi, Kazuhiko; Kuroyanagi, Shigeru; and Iwatsuki, Kunihiro, 4,841,447, Cl. 364-431.070.
Izawa, Koji: *See—*
Nakajima, Shunichi; and Izawa, Koji, 4,841,375, Cl. 353-280.000.
Izawa, Tetsurou: *See—*
Nishizawa, Shigeki; Takemoto, Iwao; Miyazawa, Toshio; and Izawa, Tetsurou, 4,841,369, Cl. 358-213.260.
Izuhara, Koichi; Caruso, Jeffrey L.; and Johnson, Theodore C., to Minolta Camera Kabushiki Kaisha. Word processor capable of automatic tilting of documents. 4,841,472, Cl. 364-900.000.
Izuka, Akihiro; Onizawa, Yoshio; and Yamashita, Mitsuru, to Daicel Chemical Industries, Ltd. Plastic substrate for optical disk and process for producing the same. 4,841,501, Cl. 369-13.000.
Izumi, Akira; Kishi, Tomomi; and Niwa, Hideo, to Toyota Jidosha Kabushiki Kaisha; and Sanmei Denki Kabushiki Kaisha. Movable yoke-type lifting magnet device. 4,840,417, Cl. 294-65.500.
Izumi Seimitsu Kogyo Kabushiki Kaisha: *See—*
Uchiyama, Hiromi; and Nakano, Tsuyoshi, 4,839,964, Cl. 30-43.600.
J. M. Voith GmbH: *See—*
Henrich, Hans-Otto, 4,840,317, Cl. 241-282.000.
Jablonski, Charles E.: *See—*
Lynn, John D.; Jablonski, Charles E.; and Egan, Walter D., 4,840,671, Cl. 106-85.000.

Jabry, El Hadj: *See—*
Rousset, Abel C.; Boissier, Guy; Jabry, El Hadj; and Caffin, Jean-Pierre, 4,840,925, Cl. 501-1.000.
Jackson, Garrett O.: *See—*
Youd, T. Leslie; and Jackson, Garrett O., 4,840,230, Cl. 166-382.000.
Jackson, J. R.: *See—*
Jackson, John R., 4,841,250, Cl. 324-349.000.
Jackson, John R., to Jackson, J. R.; and Arismendi, A. M. (Andy), Jr. Passive geophysical survey apparatus based upon the detection of the DC component of the vertical electrical potential of natural earth currents. 4,841,250, Cl. 324-349.000.
Jacobs, Charles P.: *See—*
Son, Pyong-Nae; Jacobs, Charles P.; Kovach, Ronald M.; and Lai, John T., 4,841,053, Cl. 544-384.000.
Jacobs, Jan A. M. H.: *See—*
Schraven, Petrus E. G.; and Jacobs, Jan A. M. H., 4,840,831, Cl. 428-152.000.
Jacobs Manufacturing Company, The: *See—*
McCarthy, Donald J., 4,840,387, Cl. 279-1.00K.
Jacobsen, Ole A., to Dansk Industri Syndikat A/S. System comprising a power-actuated gripper and a number of gripping objects, especially for use in an automated foundry plant, with fluid communication between said gripper and a gripping object being gripped by it. 4,840,416, Cl. 294-2.000.
Jacquet, Bruno; Noirot, Frederic; and Tellier, Jean-Pierre, to La Telemecanique Electrique. Symmetric percussion switching device using a head point over-run device. 4,841,106, Cl. 200-462.000.
Jager, Horst, to Bayer Aktiengesellschaft. Azo reactive dyestuffs. 4,841,030, Cl. 534-638.000.
Jaguar Cars Limited: *See—*
Parsons, Bryan N. V., 4,840,164, Cl. 123-559.100.
Jahanmir, Said: *See—*
Beltzer, Morton; and Jahanmir, Said, 4,840,741, Cl. 252-47.000.
James, Robert B., Jr.: *See—*
Kalnes, Tom N.; and James, Robert B., Jr., 4,840,721, Cl. 208-57.000.
James, Wesley, to Micronic Interface Technologies. Read-write optical disk. 4,841,515, Cl. 369-100.000.
Jangaard, Erling S., to Ruvo Automation Corporation. Method of applying a door hinge. 4,839,957, Cl. 29-434.000.
Janome Sewing Machine Co., Ltd.: *See—*
Orii, Akira; and Kongo, Takeshi, 4,841,206, Cl. 388-828.000.
Japan Styrene Paper Corporation: *See—*
Kuwabara, Hideki; and Yoshimura, Shohei, 4,840,973, Cl. 521-58.000.
Japan Tobacco Inc.: *See—*
Matsumoto, Takashi; Okada, Takashi; and Mizusaki, Sigenobu, 4,841,055, Cl. 546-261.000.
Matsushita, Hajime; Shibagaki, Makoto; Takahashi, Kyoko; and Kuno, Hideyuki, 4,841,075, Cl. 549-341.000.
Shigeta, Toshio; Muto, Yoshiyuki; and Etani, Tadao, 4,840,320, Cl. 242-58.000.
Jasinski, Raymond J., to Cities Service Oil and Gas Corporation. Corrosion probe and method for measuring corrosion rates. 4,840,719, Cl. 204-404.000.
Jasper, Louis J., Jr., to United States of America, Army. Electromagnetic injector/railgun. 4,840,106, Cl. 89-8.000.
Javan, Ali, to Laser Science, Inc. System for generating a stable optical frequency. 4,841,529, Cl. 372-32.000.
Jeanes, Thomas O.: *See—*
Anand, Joginder N.; Bales, Stephen E.; Feay, Darrell C.; and Jeanes, Thomas O., 4,840,646, Cl. 55-16.000.
Jedick, Andrew L., to Diamond Products, Inc. Portable rotary power saw. 4,840,431, Cl. 299-39.000.
Jefferson, Carl M.: *See—*
Hoyt, Roger F.; Jefferson, Carl M.; and Millman, Steven E., 4,841,389, Cl. 360-75.000.
Jelich, Klaus: *See—*
Gayer, Herbert; and Jelich, Klaus, 4,841,086, Cl. 558-301.000.
Jelinek, Horst, to Siemens Aktiengesellschaft. Pyrolysis system. 4,840,129, Cl. 110-229.000.
Jenkins, Vaughn J.: *See—*
Morrison, Larry R.; and Jenkins, Vaughn J., 4,841,257, Cl. 331-26.000.
Jepson, Derek: *See—*
Hill, Adrian C.; and Jepson, Derek, 4,840,206, Cl. 141-349.000.
Jesmar S.A.: *See—*
Perez, Jose L. J., 4,840,597, Cl. 446-16.000.
Jessop, Paul A., to VG Instruments Group Limited. Multi-stream fluid sampling valve. 4,840,074, Cl. 73-864.810.
John D. Hollingsworth On Wheels, Inc.: *See—*
Hollingsworth, John D.; and Rookstool, Gary H., 4,839,944, Cl. 19-105.000.
John Fluke Mfg. Co., Inc.: *See—*
Eccleston, Larry E., 4,841,170, Cl. 307-310.000.
Eccleston, Larry E., 4,841,229, Cl. 324-63.000.
John, Julius F., to Home Fashions, Inc. Valance bracket for a vertical blind. 4,840,216, Cl. 160-178.100.
Johnson, Edward R. Process for absorbing liquid leaks and spills. 4,840,734, Cl. 210-660.000.
Johnson & Johnson Patient Care, Inc.: *See—*
Linsky, Gary; Cunningham, Timothy; and Pines, Eli, 4,840,626, Cl. 604-364.000.
Johnson, Michael J.: *See—*
Bernot, Anthony J.; and Johnson, Michael J., 4,840,460, Cl. 350-333.000.
Johnson, Michael R.: *See—*
Eggler, James F.; Johnson, Michael R.; and Sherman, Lawrence, 4,841,078, Cl. 549-402.000.
Johnson, Paul; and Karnebogen, Karl W., to Bayerische Motoren Werke Aktiengesellschaft. Air outlet arrangement of a heating and/or air-conditioning installation, especially for the rear space of a passenger motor vehicle. 4,840,115, Cl. 98-2.030.
Johnson, Philip S.; and Bakken, Theresa A., to Procter & Gamble Company, The. Aerosol antiperspirant compositions. 4,840,786, Cl. 424-43.000.
Johnson, Robert E.: *See—*
Chen, Hsiang M.; Eusepi, Martin W., and Johnson, Robert E., 4,841,184, Cl. 310-90.500.
Johnson, Russell W.; and Hilfman, Lee, to UOP. Non-catalytic process for the conversion of a hydrocarbonaceous stream containing halogenated organic compounds. 4,840,722, Cl. 208-95.000.
Johnson, Stephen C.: *See—*
Mathewes, James K., Jr.; Herman, Jan S.; Johnson, Stephen C.; Goud, Richard B.; and Stiffler, Jack J., 4,841,434, Cl. 364-200.000.
Johnson, Theodore C.: *See—*
Izuhara, Koichi; Caruso, Jeffrey L.; and Johnson, Theodore C., 4,841,472, Cl. 364-900.000.
Johnston, Brian J.; and Klinedinst, Paul W., to Graham Engineering Corporation. In-mold labeling apparatus and method. 4,840,366, Cl. 271-9.000.
Jolson, Joseph D.: *See—*
Williams, Mark T.; Winchester, Clinton S.; and Jolson, Joseph D., 4,840,859, Cl. 429-212.000.
Jonas, John J.: *See—*
Boratto, Francisco; Yue, Stephen; and Jonas, John J., 4,840,051, Cl. 72-11.000.
Jonelis, John A.; and Bata, John I., to Midwest Power Corporation. Adjustable buttress for use in an electrostatic precipitator. 4,840,649, Cl. 55-140.000.
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Konica Corporation: *See*—
Hiratsuka, Seiichiro; Yoshino, Kunihisa; Haneda, Satoshi; and Shoji, Hisashi, 4,841,337, Cl. 355-157.000.
Koshizuka, Kunihiro; and Abe, Takao, 4,840,848, Cl. 428-413.000.
Masukawa, Toyoaki; Ninomiya, Hidetaka; and Iizuka, Hiroyuki, 4,840,883, Cl. 430-553.000.
Matsunawa, Masahiko; and Yamamoto, Hiroyuki, 4,841,361, Cl. 358-80.000.

Konings, Johan W. M. E.: *See*—
Farhangi, Hassan; and Konings, Johan W. M. E., 4,841,513, Cl. 369-59.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Haneda, Satoshi; Shoji, Hisashi; and Hiratsuka, Seiichiro, 4,841,332, Cl. 355-251.000.
Hiratsuka, Seiichiro; and Matsunawa, Masahiko, 4,841,377, Cl. 358-283.000.
Iijima, Toshifumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Hotta, Yuji; Ohya, Hiroko; Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; and Shinozaki, Kaoru, 4,840,886, Cl. 430-558.000.
Iwagaki, Masaru; Masukawa, Toyoaki, Komamura, Tawara; Ishikawa, Wataru; and Hoshino, Kimie, 4,840,870, Cl. 430-201.000.
Iwagaki, Masaru; Sasaki, Takashi; Kumamura, Tawara; Ishii, Fumio; and Koshizuka, Kunihiro, 4,841,882, Cl. 430-505.000.
Kamitakahara, Atushi; and Ogi, Keiji, 4,840,879, Cl. 430-406.000.
Kawasaki, Mikio; Shiozawa, Hiroaki; Nukuouji, Kakujulo; and Ono, Kouji, 4,840,888, Cl. 430-567.000.
Kita, Noriyasu; and Goto, Kiyoshi, 4,840,869, Cl. 430-191.000.
Owada, Susumu; Kamegamori, Masayuki; and Kosugi, Akira, 4,841,330, Cl. 355-245.000.
Uesawa, Yutaka; and Morimoto, Isamu, 4,840,889, Cl. 430-597.000.
Watanabe, Yoshikazu; and Tanaka, Motoaki, 4,840,881, Cl. 430-512.000.
Yamada, Minoru; Ito, Eiji; Miyama, Kenji; Sawamura, Masataka; Hoshino, Yasushi; and Makino, Masamori, 4,841,323, Cl. 354-400.000.
Yamamoto, Hiroyuki; and Matsunawa, Masahiko, 4,841,376, Cl. 358-282.000.

Konno, Chisato: *See*—
Tsuji, Michiru; Konno, Chisato; and Saji, Miyuki, 4,841,479, Cl. 364-900.000.

Konrad, Eugen: *See*—
Husemeyer, Hans; Mager, Herbert; and Konrad, Eugen, 4,840,639, Cl. 8-410.000.

Kontoghiorghes, George: *See*—
Hider, Robert C.; Kontoghiorghes, George; and Silver, Jack, 4,840,958, Cl. 514-348.000.

Kooijmans, Petrus G.: *See*—
Van Iperen, Roeland; Van Der Mark, Johannes M.; and Kooijmans, Petrus G., 4,840,979, Cl. 523-404.000.

Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, to Chinoin Gyogyszer Es Vegyeszeti Termekek Gyara Rt. Oxadiazole-alkyl-purine derivatives useful as antitussive agents. 4,840,949, Cl. 514-234.200.

Kormoczy, Peter: *See*—
Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.

Koromzay, Tibor, to BBC Brown Boveri AG. Method for lengthening the blading aerofoil of turbo machines blades. 4,841,117, Cl. 219-76.100.

Korosi, Jeno: *See*—
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.

Kosaka, Norindo; and Yamaguchi, Chikatoshi, to Kawaguchi, Ltd. System for confirming the release of a molded article in an injection molding apparatus and for determining the quality of the article. 4,841,364, Cl. 358-101.000.

Kosc, Wieslaw: *See*—
Lockard, Walter G.; Boris, Allen J.; and Kosc, Wieslaw, 4,840,390, Cl. 280-250.100.

Kose, Junichi; and Seto, Nobuyuki, to Fuji Photo Film Co., Ltd. Circulating liquid flow detecting apparatus in a machine for automatically processing light-sensitive material. 4,841,321, Cl. 354-324.000.

Koseki, Hiroyuki, to Bridgestone Corporation. Heavy duty low profile pneumatic radial tires. 4,840,213, Cl. 152-454.000.

Koshizuka, Kunihiro; and Abe, Takao, to Konica Corporation. Thermal transfer recording medium. 4,840,848, Cl. 428-413.000.

Koshizuka, Kunihiro: *See*—
Iwagaki, Masaru; Sasaki, Takashi; Kumamura, Tawara; Ishii, Fumio; and Koshizuka, Kunihiro, 4,840,882, Cl. 430-505.000.

Kosugi, Akira: *See*—
Owada, Susumu; Kamegamori, Masayuki; and Kosugi, Akira, 4,841,330, Cl. 355-245.000.

Kosugi, Toru: *See*—
Miyaou, Hirohisa; Furukawa, Takahiro; and Kosugi, Toru, 4,841,524, Cl. 370-112.000.

Kosuzume, Hiroshi: *See*—
Ohnishi, Haruo; Kosuzume, Hiroshi; Mizota, Masahiro; Suzuki, Yasuo; and Mochida, Ei, 4,840,945, Cl. 514-206.000.

Kot, Edward J.: *See*—
Lindberg, Chris E.; Kot, Edward J.; and Chicoye, Etzer, 4,840,802, Cl. 426-16.000.

Kotani, Matahira; Hayashi, Motohiko; and Yamanoue, Masafumi, to Sharp Kabushiki Kaisha. Image processing method. 4,841,374, Cl. 358-280.000.

Kotani, Tsutomu: *See*—
Takahashi, Minoru; and Kotani, Tsutomu, 4,840,183, Cl. 128-715.000.

Kottmair, Nikolaus: *See*—
Bayerlein, Friedrich; Keramaris, Nikolaos; Kottmair, Nikolaus; Kuhn, Manfred; and Maton, Michel M., 4,840,811, Cl. 426-430.000.

Kotzab, Werner; and Zielke, Horst, to Daimler-Benz Aktiengesellschaft. Valve-actuating lever for internal combustion engines. 4,840,150, Cl. 123-90.390.

Koura, Seigo: *See*—
Someya, Shinzo; Koura, Seigo; Ito, Mikio; Nakanishi, Akira; and Nonaka, Yuji, 4,841,035, Cl. 546-270.000.

Kouzai, Tetsuo: *See*—
Takehana, Tsutomu; Kouzai, Tetsuo; Sagara, Masaaki; Yaginuma, Tamio; and Sasaki, Teruji, 4,840,014, Cl. 53-432.000.

Kovach, Ronald M.: *See*—
Son, Pyong-Nae; Jacobs, Charles P.; Kovach, Ronald M.; and Lai, John T., 4,841,053, Cl. 544-384.000.

Kovacs, Gabor: *See*—
Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.

Kovacs, Kerry; Simpson, William; Burkholder, Amy L.; Messer, Russell K.; and Thomas, Teresa M., to Mead Corporation, The. Microcapsule imaging system having improved dynamic range. 4,840,866, Cl. 430-138.000.

Kowarski, Szloma: *See*—
Schachter, David; Kowarski, Szloma; Cowen, Lisa A.; and Abbott, Richard E., 4,840,894, Cl. 435-7.000.

Kowite, William J.; and Oestreicher, Stephen L., to Rhone Poulenc Nederlands B.V. Plant growth regulator dispersions. 4,840,660, Cl. 71-86.000.

Koyama, Noritoshi: *See*—
Ohasi, Hiroyuki; Takami, Toru; Koyama, Noritoshi; Kogure, Yoshio; Ida, Katsumi; Iijima, Kazumi; and Kobori, Tomohiro, 4,840,970, Cl. 514-690.000.

Koyama, Satoshi: *See*—
Tanaka, Noriatsu; Tokunaga, Masami; Tanaka, Tsuyoshi; Koyama, Satoshi; and Kikuchi, Keiichi, 4,840,837, Cl. 428-216.000.

Koyama, Takeshi; and Ohtaka, Keiji, to Canon Kabushiki Kaisha. Apparatus for detecting the focus adjusted state of an objective optical system. 4,841,326, Cl. 354-406.000.

Koyama, Tsunehiro, to Mitsubishi Denki Kabushiki Kaisha. Bipolar logic circuit. 4,841,173, Cl. 307-456.000.

Koyanagi, Kimiyuki: *See*—
Imai, Hitoshi; Arai, Ryuichiro; Koyanagi, Kimiyuki; and Tadokoro, Michihiro, 4,841,507, Cl. 369-44.000.

Koyano, Toshihide: *See*—
Tezuka, Hirofumi; Nogami, Kouji; and Koyano, Toshihide, 4,841,278, Cl. 340-908.100.

Kozuki, Susumu; and Satoh, Keiji, to Canon Kabushiki Kaisha. Reproducing apparatus for intermittently driving recording medium. 4,841,380, Cl. 360-10.200.

Kraemer, Manfred: *See*—
Eckell, Wolfgang; Guentert, Josef; Haefele, Walter; Kraemer, Manfred; Kuhn, Uwe; and Warga, Johann, 4,840,161, Cl. 123-500.000.

Kramer, Hans: *See*—
Vollhardt, Frohmut; and Kramer, Hans, 4,840,145, Cl. 122-379.000.

Kraner, James L.: *See*—
Dougherty, Lawrence W.; and Kraner, James L., 4,840,596, Cl. 445-30.000.

Krasuski, Marek; Gregoire, Jean-Pierre; and Gerbaud, Claude, to SMH Alcatel. Label dispenser and a franking machine equipped with said dispenser. 4,840,696, Cl. 156-353.000.

Kraus, Rainer, to Siemens Aktiengesellschaft. Integrable evaluating circuit. 4,841,180, Cl. 307-530.000.

Krause, Norbert: *See*—
Duerr, Wilhelm; Ingwersen, Hartwig; Krause, Norbert; and Oppelt, Ralph, 4,841,249, Cl. 324-318.000.

Krautsack, Richard G., to Comark Merchandising, Inc. Mounting clip for dispensing sheet-like items. 4,839,977, Cl. 40-658.000.

Kreifels, Jerry A.; and Hoekstra, George, to Intel Corporation. Leakage verification for flash EPROM. 4,841,482, Cl. 365-185.000.

Krenke, Vincent G.: *See*—
Beauvais, Thomas; Krenke, Vincent G.; Lupoli, Peter J.; and Mattis, Donald J., 4,840,137, Cl. 116-227.000.

Krepski, Larry R.: *See*—
Katritzky, Alan R.; Krepski, Larry R.; Rasmussen, Jerald K.; Heilmann, Steven M.; and Tarr, Richard D., 4,841,021, Cl. 528-407.000.

Kress, Kenneth: *See*—
Chu, Mosi; Graziano, Anthony; and Kress, Kenneth, 4,840,504, Cl. 400-213.000.

Kriebel, Manfred: *See*—
Grunewald, Gerhard; and Kriebel, Manfred, 4,840,648, Cl. 55-44.000.

Kristen, Rolf: *See*—
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, 4,840,661, Cl. 71-90.000.

Krouskop, Thomas A.: *See*—
Muller, Walter; and Krouskop, Thomas A., 4,840,634, Cl. 623-24.000.

Krouzkevitch, Benjamin; and Litvinenko, Alexander. Hand-carried tool for cutting plaster-like material. 4,839,966, Cl. 30-475.000.

Krueger, Hans; Lamprecht, Herbert, deceased; by Lamprecht, Thekla, heir; by Lamprecht, Simon, heir; and Tiemann, Wilhelm, to Siemens Aktiengesellschaft. Gas laser arrangement. 4,841,540, Cl. 372-86.000.

Krueger, Hans: *See*—
Hahn, Guenther; Krueger, Hans; Lamprecht, Herbert; and Seiffarth, Werner, 4,841,539, Cl. 372-63.000.

Krueger, Leroy A.: *See*—
Swix, Scott R.; and Krueger, Leroy A., 4,841,291, Cl. 340-725.000.

Krupp Polysius AG: *See*—
Unland, Georg; and Driemeier, Gunter, 4,840,561, Cl. 432-106.000.

Kubo, Kanji, to Honda Giken Kogyo Kabushiki Kaisha. Rear suspension system for automobiles. 4,840,396, Cl. 280-690.000.

Kubo, Motonobu: *See*—
Tamaru, Sinji; and Kubo, Motonobu, 4,841,005, Cl. 526-245.000.
Tamaru, Sinji; and Kubo, Motonobu, 4,841,093, Cl. 560-65.000.

Kubo, Shinji: *See*—
Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Kubo, Shinji, 4,841,057, Cl. 546-183.000.

Kubota, Hitoshi: *See*—
Nakagawa, Toru; Kubota, Hitoshi; and Sakurai, Yasuo, 4,841,430, Cl. 364-167.010.

Kubota, Katuhisa, to Fujitsu Limited. Master slave latch circuit with race prevention. 4,841,168, Cl. 307-272.200.

Kubota, Shinji; Hirosawa, Kazutoyo; and Yoshida, Tomio, to Matsushita Electric Industrial Co., Ltd. Optical disk apparatus with an erase checking function. 4,841,512, Cl. 369-54.000.

Kubota, Tetsuhiro: *See*—
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,841,067, Cl. 548-344.000.

Kudo, Hiroaki: *See*—
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, 4,841,534, Cl. 372-46.000.

Kuehne, Martin, to University of Vermont & State Agricultural College. Synthesis of vinblastine and vincristine type compounds. 4,841,045, Cl. 540-478.000.

Kuehnert, Hans-Guenter E., to Hoechst Aktiengesellschaft; and ELTI Apparatebau und Elektronik GmbH. Apparatus for laminating a film under pressure and heat. 4,840,698, Cl. 156-485.000.

Kuenemund, Ronald; and Noll, Tobias, to Siemens Aktiengesellschaft. Matrix times matrix multiplier. 4,841,469, Cl. 364-754.000.

Kuhar nee Kurthy, Maria: *See*—
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.

Kuhn, Manfred: *See*—
Bayerlein, Friedrich; Keramaris, Nikolaos; Kottmair, Nikolaus; Kuhn, Manfred; and Maton, Michel M., 4,840,811, Cl. 426-430.000.

Kuhn, Uwe: *See*—
Eckell, Wolfgang; Guentert, Josef; Haefele, Walter; Kraemer, Manfred; Kuhn, Uwe; and Warga, Johann, 4,840,161, Cl. 123-500.000.

Kuhns, James J.: *See*—
Henry, Samuel B.; and Kuhns, James J., 4,840,437, Cl. 305-10.000.

Kukimoto, Takashi, to Bridgestone Corporation. Heavy duty pneumatic radial tires. 4,840,210, Cl. 152-209.00A.

Kulander, Hans, to MRT System Aktiebolag. Treatment of mercurial waste. 4,840,314, Cl. 241-24.000.

Kumabe, Hisao; and Susaki, Wataru, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor laser. 4,841,532, Cl. 372-45.000.

Kumamura, Tawara: *See*—
Iwagaki, Masaru; Sasaki, Takashi; Kumamura, Tawara; Ishii, Fumio; and Koshizuka, Kunihiro, 4,840,882, Cl. 430-505.000.

Kumashiro, Kenji: *See*—
Iijima, Toshifumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Hotta, Yuji; Ohya, Hiroko; Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; and Shinozaki, Kaoru, 4,840,886, Cl. 430-558.000.

Kumazaki, Hiroshi: *See*—
Ikeda, Go; Sasaki, Kiyoshi; Kumazaki, Hiroshi; Fujita, Shigeru; and Banzai, Hideo, 4,841,459, Cl. 364-557.000.

Kume, Masafumi: *See*—
Misawa, Masayuki; Ogasawara, Toshio; Sagane, Masahiko; Hirata, Yasuyuki; and Kume, Masafumi, 4,840,715, Cl. 204-181.100.

Kume, Tsutomu: *See*—
Yamamoto, Yoshihiro; Kume, Tsutomu; Yamazaki, Nobuo; Hashimoto, Fumiharu; and Ohya, Koichi, 4,841,461, Cl. 364-572.000.

Kume, Yuichiro: *See*—
Doi, Kunio; and Kume, Yuichiro, 4,841,555, Cl. 378-99.000.

Kummer, Fernand. Escapement mechanism for upright piano. 4,840,101, Cl. 84-247.000.

Kummer, Karl T., to Honeywell Inc. Apparatus and method for detection of an open thermocouple in a process control network. 4,841,286, Cl. 340-653.000.

Kunichika, Kenji; Matsumoto, Hiroshi; and Shingu, Akira, to Fuji Photo Film Co., Ltd.; and Oji-National Co., Ltd. Desensitizing gum for lithographic printing plate comprising a polybasic and monoester of polysaccharide. 4,840,875, Cl. 430-309.000.

Kunichika, Kenji: *See*—
Takekoshi, Tomoaki; Ohba, Hisao; and Kunichika, Kenji, 4,841,320, Cl. 354-299.000.

Kunitz, Friedrich-Wilhelm: *See*—
Ohlschlager, Hans; Renner, Gunter; Kunitz, Friedrich-Wilhelm; Odenwalder, Heinrich; and Hubner, Dirk, 4,840,880, Cl. 430-505.000.

Kuniya, Keiichi: *See*—
Sobue, Masahisa; Okada, Sensuke; Akahori, Kimihiko; Kuniya, Keiichi; Sasaki, Toshimi; Kajiwara, Toshiyuki; Kimura, Tomoaki; and Nihei, Mitsuo, 4,839,949, Cl. 29-132.000.

Kuno, Hideyuki: *See*—
Matsushita, Hajime; Shibagaki, Makoto; Takahashi, Kyoko; and Kuno, Hideyuki, 4,841,075, Cl. 549-341.000.

Kuno, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Coil device. 4,841,269, Cl. 335-299.000.

Kuno, Sachiko: *See*—
Ueno, Ryuzo; Ueno, Ryuji; Kuno, Sachiko; and Tabata, Akihiko, 4,840,941, Cl. 514-59.000.

Kuraray Co., Ltd.: *See*—
Kobayashi, Hideki; Ikeda, Minoru; Saito, Koichi; Nagata, Shiro; and Horino, Koichi, 4,840,873, Cl. 430-273.000.

Kuraray Plasmon Data Systems Co., Ltd.: *See*—
Kobayashi, Hideki; Ikeda, Minoru; Saito, Koichi; Nagata, Shiro; and Horino, Koichi, 4,840,873, Cl. 430-273.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Takita, Hitoshi; Kimura, Fumihiko; Noda, Sakuo; Mukaida, Yutaka; Nitta, Toyohiko; and Kobayashi, Hidetoshi, 4,841,097, Cl. 560-144.000.

Kureha Kogyo Kabushiki Kaisha: *See*—
Iwasaki, Takao; and Horikosi, Katsumi, 4,841,019, Cl. 528-388.000.

Kurihara, Kazumasa, to Nifco, Inc. Synthetic resin rivet. 4,840,522, Cl. 411-44.000.

Kurihara, Toshihiko; and Funabashi, Tadashi, to Pioneer Electronic Corporation. Disk clamping device. 4,841,517, Cl. 369-270.000.

Kurisu, Tetsuo: *See*—
Kakumoto, Shigeru; Sumi, Tatsuo; and Kurisu, Tetsuo, 4,841,443, Cl. 364-413.010.

Kuroe, Akio: *See*—
Satomi, Mitsuo; Kuroe, Akio; Sawai, Eisuke; Higashionji, Masaru; Sakakima, Hiroshi; and Kondo, Kenji, 4,841,401, Cl. 360-125.000.

Kurokawa, Yasuyoshi, to Sharp Kabushiki Kaisha. Electronic typewriter ribbon lift-up apparatus. 4,840,505, Cl. 400-697.100.

Kuromitsu, Hiromu; Nakanishi, Nobuyasu; Shirai, Akira; and Noguchi, Noboru, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Hydraulic pump assembly associated with accumulator. 4,840,544, Cl. 417-254.000.

Kuroyanagi, Shigeru: *See*—
Hayashi, Kazuhiko; Kuroyanagi, Shigeru; and Iwatsuki, Kunihiro, 4,841,447, Cl. 364-431.070.

Kuroyanagi, Yoshimitsu: *See*—
Namiki, Tetsuro; Furuse, Masayasu; Kuroyanagi, Yoshimitsu; Miyata, Teruo; and Suzuki, Takashi, 4,840,937, Cl. 514-21.000.

Kurozumi, Seizi: *See*—
Tanaka, Toshio; Hazato, Atsuo; Kurozumi, Seizi; and Koga, Masahiro, 4,841,091, Cl. 558-441.000.

Kurpiella, Hubert: *See*—
Schmalfuss, Harald; Kurpiella, Hubert; and Schneider, Bernhard, 4,841,139, Cl. 250-223.00R.

Kurtz, John L.: *See*—
Bowser, C. Frederick; and Kurtz, John L., 4,840,377, Cl. 273-31.000.

Kusaba, Tomoyuki; Takahashi, Junya; Sugano, Masayo; Uematsu, Tamon; Oguri, Yukio; and Teramae, Tomohiro, to Sumitomo Chemical Company, Limited. Iodopropargyl carbamate derivative, a method for its production and fungicidal compositions containing it as an active ingredient. 4,841,088, Cl. 558-417.000.

Kusano, Kenji: *See*—
Ozaki, Yoshihiko; Sumitani, Hiroaki; Tomoda, Toshimasa; Sato, Fumihide; and Kusano, Kenji, 4,841,489, Cl. 367-7.000.

Kusano, Takahiro: *See*—
Hagino, Hideyuki; and Kusano, Takahiro, 4,841,179, Cl. 307-520.000.

Kushibiki, Nobuo; Nose, Noriyuki; Nakajima, Toshiyuki; Baba, Takeshi; Matsugu, Masakazu; and Niwa, Yukichi, to Canon Kabushiki Kaisha. Optical device. 4,840,473, Cl. 350-484.000.

Kusuda, Takao; Yonemura, Masaaki; Shimoda, Hisanori; Takigawa, Masuo; and Mihara, Toshihiro, to Matsushita Electric Industrial Co., Ltd. Purifier of diesel particulates in exhaust gas. 4,840,028, Cl. 60-303.000.

Kusumi, Takenori: *See*—
Kakisawa, Hiroshi; Kusumi, Takenori; and Ohno, Nobuo, 4,840,658, Cl. 71-67.000.

Kusumoto, Toshihiko; Kasamura, Toshirou; Okuda, Naoki; Ohashi, Masashi; Sasaki, Nobukazu; and Nada, Minoru, to Canon Kabushiki Kaisha. Image forming apparatus with developing device accommodating means. 4,841,336, Cl. 355-245.000.

Kusumoto, Toshihiko: *See*—
Kasamura, Toshirou; Takagi, Masafumi; Okuda, Naoki; Ohashi, Masashi; Kusumoto, Toshihiko; Sasaki, Nobukazu; Maeda, Yasunori; and Ikeda, Masamichi, 4,841,329, Cl. 355-245.000.

Kutner, Andrzej: *See*—
DeLuca, Hector F.; Kutner, Andrzej; and Schnoes, Heinrich K., 4,841,038, Cl. 536-27.000.

Kuwabara, Hideki; and Yoshimura, Shohei, to Japan Styrene Paper Corporation. Polypropylene resin prefoamed particles. 4,840,973, Cl. 521-58.000.

Kuwano, Yukinori: *See*—
Takeuchi, Masaru; Fukatsu, Takeo; Nagano, Shoichi; Kuwano, Yukinori; Minami, Koji; and Iwamoto, Masayuki, 4,841,328, Cl. 355-211.000.

Kuwatsuka, Shunichiro: *See*—
Imanaka, Tadashi; Takagi, Masayuki; Togawa, Eisei; Saito, Harunobu; Nagaike, Sadanori; Ohura, Masaki; Suzuki, aburo; Kobayashi, Tetsuo; and Kuwatsuka, Shunichiro, 4,841,402, Cl. 360-126.000.

Kvaerner-Eureka A/S: *See*—
Skarstad, Torgeir, 4,840,535, Cl. 415-168.200.

Kvaser Consultant, AB: *See*—
Fredriksson, Lars-Berno, 4,841,450, Cl. 364-468.000.

Kwiatkowski, George T.: *See*—
Koleske, Joseph V.; and Kwiatkowski, George T., 4,840,978, Cl. 522-169.000.

Kyler, Arlene. Display and dispensing apparatus. 4,839,976, Cl. 40-42.000.

Kyocera Corporation: *See*—
Endo, Akihiko; Takeda, Shigeki; and Takeda, Hiroshi, 4,841,545, Cl. 375-1.000.
Kitamura, Yasuhiro, 4,840,630, Cl. 623-23.000.
Tezuka, Hirofumi; Nogami, Kouji; and Koyano, Toshihide, 4,841,278, Cl. 340-908.100.

L. Schuler GmbH: *See*—
Michael, Wolfgang; and Kaletka, Martin, 4,840,055, Cl. 72-345.000.

La Telemecanique Electrique: *See*—
Jacquet, Bruno; Noirot, Frederic; and Tellier, Jean-Pierre, 4,841,106, Cl. 200-462.000.

Labate, Michael D. Externally replaceable stirring plug for molten metal vessels. 4,840,356, Cl. 266-265.000.

LaBate, Micheal D. Stirring brick with shaped gas volume control openings. 4,840,354, Cl. 266-218.000.

LaBate, Micheal D. Slag controlling device for basic oxygen furnaces. 4,840,355, Cl. 266-220.000.

LaCount, Dale F.: *See*—
Domian, Henry A.; LaCount, Dale F.; Miller, Alex S.; and Seibert, Kenneth D., 4,840,768, Cl. 420-582.000.

LaCour, Colette: *See*—
Wagnon, Jean; Guegan, Remy; LaCour, Colette; and Nisato, Dino, 4,840,935, Cl. 514-18.000.

Ladan, Uri; Karton, Boaz; and Klipper, Aron; to Israel Aircraft Industries Ltd. Mine field clearing apparatus. 4,840,105, Cl. 89-1.130.

Ladd, Judith A.: *See*—
Husted, Eric F.; and Ladd, Judith A., 4,840,775, Cl. 423-150.000.

Lagache, Remi: *See*—
Moeneclaey, Denis; Lagache, Remi; Victoor, Johnny; and Coopman, Lucien, 4,840,203, Cl. 139-453.000.

Lagerwall, Sven T.: *See*—
Clark, Noel A.; and Lagerwall, Sven T., 4,840,463, Cl. 350-350.00S.

Lai, John T.: *See*—
Son, Pyong-Nae; Jacobs, Charles P.; Kovach, Ronald M.; and Lai, John T., 4,841,053, Cl. 544-384.000.

Lai, Shui T.: *See*—
Chai, Bruce H.; Lai, Shui T.; and Long, Margaret N., 4,841,530, Cl. 372-41.000.

Laing, David: *See*—
Hawkins, Ross H.; Laing, David; and Bedington, Bryan C., 4,841,359, Cl. 358-76.000.

L'air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Hay, Leon, 4,840,647, Cl. 55-26.000.

Lakin, Bryan L.; and McDaniel, William P. W., to Fasco Industries, Inc. Heat sink and mounting arrangement therefor. 4,840,222, Cl. 165-47.000.

Lam, Michael K.; Kazewych, Bohdan; and Gionet, Edmond R., to General Motors Corporation. Apparatus and method of a power spring counterbalance for tape drive window regulators. 4,839,990, Cl. 49-352.000.

Lampe, Donald R.; Mentzer, Mark A.; and Naviasky, Eric H., to Westinghouse Electric Corp. Cross-tie memory system. 4,841,480, Cl. 365-87.000.

Lamprecht, Herbert: *See*—
Hahn, Guenther; Krueger, Hans; Lamprecht, Herbert; and Seiffarth, Werner, 4,841,539, Cl. 372-63.000.

Lamprecht, Herbert, deceased: *See*—
Krueger, Hans; Lamprecht, Herbert, deceased; Lamprecht, Thekla, heir; Lamprecht, Simon, heir; and Tiemann, Wilhelm, 4,841,540, Cl. 372-86.000.

Lamprecht, Simon, heir: *See*—
Krueger, Hans; Lamprecht, Herbert, deceased; Lamprecht, Thekla, heir; Lamprecht, Simon, heir; and Tiemann, Wilhelm, 4,841,540, Cl. 372-86.000.

Lamprecht, Thekla, heir: *See*—
Krueger, Hans; Lamprecht, Herbert, deceased; Lamprecht, Thekla, heir; Lamprecht, Simon, heir; and Tiemann, Wilhelm, 4,841,540, Cl. 372-86.000.

Lancella, Attilio, to CONNEI S.p.A. Composite female contact. 4,840,587, Cl. 439-851.000.

Lancella, Attilio, to Connei S.p.A. Socket contact for contact devices of the pin and socket type. 4,840,588, Cl. 439-851.000.

Landherr, Gordon G.: *See*—
Baker, Ralph E.; and Landherr, Gordon G., 4,840,415, Cl. 294-1.100.

Landre, Bernard, to Universal Technic. Current-measuring device. 4,841,237, Cl. 324-127.000.

Lang nee Rihmer, Zsuzsanna: *See*—
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.

Lang, Robert: *See*—
Hartmann, Gunter; Swoboda, Ralf; and Lang, Robert, 4,839,954, Cl. 29-235.000.

Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, to EGIS Gyogyszergyar. 1-(hydroxystyrl)-5H-2,3-benzodiazepine derivatives, and pharmaceutical compositions containing the same. 4,840,948, Cl. 514-221.000.

Lange, Bernard: *See*—
Hoying, John F.; and Lange, Bernard, 4,840,358, Cl. 267-140.100.

Lange International S.A.: *See*—
Dodge, David J., 4,839,973, Cl. 36-121.000.

Lantor (UK) Limited: *See*—
Flynn, Nigel; and Clark, Nigel, 4,840,840, Cl. 428-283.000.

LaPierre, Rene B.; Partridge, Randall D.; Reischman, Paul T.; and Kerr, George T., to Mobil Oil Corporation. Method for preparing acid stable zeolites and high silica zeolites prepared by it. 4,840,930, Cl. 502-79.000.

Larkin, Mark E.; and Ogden, John E., to Abbott Laboratories. Piercing pin transfer device. 4,840,621, Cl. 604-29.000.

Larson, Ralph I., Jr.: *See*—
Foley, John M.; Piuze, Ronald L.; Larson, Ralph I., Jr.; and Doumani, George, 4,840,225, Cl. 165-104.330.

Laser Science, Inc.: *See*—
Javan, Ali, 4,841,529, Cl. 372-32.000.

Lasercheck Limited: *See*—
Gabriel, David; Audus, David; and Strange, Norman, 4,840,490, Cl. 356-375.000.

Laska, Eugene M.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,840,962, Cl. 514-406.000.

Latka, Franz, to Alfred Teves GmbH. Safety relay circuit for switching on electric systems of automotive vehicles. 4,841,158, Cl. 307-10.100.

Lauer, Herbert: *See*—
Sander, Bruno; Lauer, Herbert; and Neuwirth, Manfred, 4,840,736, Cl. 210-727.000.

Laurel Bank Machines Co., Ltd.: *See*—
Goi, Kouichi; Emori, Hiroshi; and Sato, Daiki, 4,841,144, Cl. 250-239.000.
Uehara, Kazuhiro, 4,840,368, Cl. 271-162.000.

Laurence Harold A., to Laurence & Laurence, Inc. Shooter's hat having flexible side blinder attachments. 4,839,924, Cl. 2-10.000.

Laurence & Laurence, Inc.: *See*—
Laurence Harold A., 4,839,924, Cl. 2-10.000.

Laut, Jack R. Tilt-responsive display case alarm. 4,841,285, Cl. 340-571.000.

Lauzon, Robert: *See*—
Jones, Elwyn D.; Lauzon, Robert; and Wetter, Bruno, 4,840,609, Cl. 493-28.000.

Lawford, Hugh G., to George Weston Limited. Continuous process for ethanol production by bacterial fermentation using pH control. 4,840,902, Cl. 435-161.000.

Lawlor, Patrick M.; and DeMar, Lawrence E. Pinball machine. 4,840,375, Cl. 273-121.00A.

Lay, Bor-Cherng; and Jou, Shoei-Sheng. Limiter switching apparatus. 4,841,162, Cl. 307-112.000.

Lay, Kurt; and Sailer, Erwin, to Daimler-Benz Aktiengesellschaft. Arrangement for repairing stone impact damages at windshields made of multi-layer safety glass. 4,840,551, Cl. 425-12.000.

Leary, Jeffry J.: *See*—
Adams, Craig W.; Leary, Jeffry J.; and Rosenberg, Martin, 4,840,892, Cl. 435-5.000.

LeBegue, Maurice K.; and Wilson, Henry E., to Baker International Corporation. Continuous miner with duct assembly. 4,840,432, Cl. 299-64.000.

Leberl, Franz W.; Curry, Sean; Henrot, Denis; Karspeck, Milan; and Lee, Scott, to Vexcel Corporation. Reseau apparatus for photogrammetry devices. 4,841,455, Cl. 364-525.000.

Lechelle, Alain; Guidat, Thierry; and Bruckert, Serge, to Matra Manurhin Defense. Support device for the mechanism of a revolver. 4,839,978, Cl. 42-65.000.

LeCour, Richard M.: *See*—
Wilson, Jon C.; Shick, David A.; Haynie, Robert L.; Wilder, Donald R.; Zimmerman, Larry D.; LeCour, Richard M.; and Guzy, D. James, 4,841,526, Cl. 371-32.000.

Lee, Chi-long: *See*—
Sweet, Randall P.; Lee, Chi-long; and Gornowicz, Gerald A., 4,840,796, Cl. 424-448.000.

Lee, Chun D.: *See*—
Wild, Leslie; and Lee, Chun D., 4,840,996, Cl. 525-193.000.

Lee, Edward, to Solv-X Inventions Ltd. Power back scrubbing and flushing system for cooling systems. 4,840,223, Cl. 165-95.000.

Lee, Fred C.: *See*—
Tabisz, Wojciech A.; and Lee, Fred C., 4,841,220, Cl. 323-282.000.

Lee, Henry J. Female condom device. 4,840,624, Cl. 604-349.000.

Lee, Julia L.: *See*—
Crivello, James V.; and Lee, Julia L., 4,840,977, Cl. 522-25.000.

Lee, Mark C.: *See*—
Elleman, Daniel D.; Allen, James L.; and Lee, Mark C., 4,840,496, Cl. 374-124.000.

Lee, Sae D., to Zenith Electronics Corporation. Cathode ray tube contrast enhancement systems. 4,841,372, Cl. 358-247.000.

Lee, Scott: *See*—
Leberl, Franz W.; Curry, Sean; Henrot, Denis; Karspeck, Milan; and Lee, Scott, 4,841,455, Cl. 364-525.000.

Lee, Ta J.; and Hoffman, William F., to Merck & Co., Inc. Intermediates and processes for 6-carboxy HMG-CoA reductase inhibitors. 4,841,074, Cl. 549-292.000.

Lee, Wha-Joon, to American Telephone and Telegraph Company. Printed circuit board fabrication technique. 4,841,500, Cl. 368-120.000.

Lee, Wha-Joon: *See*—
Hsue, Ching-Wen; and Lee, Wha-Joon, 4,841,240, Cl. 324-158.00P.

Lee, Yanien; Merritt, Carleton G.; and Dermody, Nancy E., to Borden, Inc. Method of preserving color of vegetable pasta products. 4,840,808, Cl. 426-270.000.

Lehmann, Volker: *See*—
Foell, Helmut; and Lehmann, Volker, 4,841,239, Cl. 324-158.00R.

Lehoczky, Kalman N. Interpolar body for cooling salient-type rotor by ventilation. 4,840,538, Cl. 416-96.00A.

Leiber, Heinz, to Robert Bosch GmbH. Vehicle brake system having an anti-skid apparatus. 4,840,434, Cl. 303-113.000.

Leiber, Heinz; and Ohnemuller, Hans-Joachim, to Daimler-Benz Aktiengesellschaft. Method for monitoring the operations of an electromechanical control system that ensures the adhesion of wheels of a motor vehicle. 4,841,446, Cl. 364-426.020.

Leibhard, Erich: *See*—
Bisping, Heinz; Leibhard, Erich; and Mauthe, Peter, 4,840,524, Cl. 411-82.000.

Leifeld, Ferdinand, to Trutzschler GmbH & Co. KG. Apparatus for detecting foreign bodies in a fiber tuft mass. 4,839,943, Cl. 19-80.00R.

Leitner, S.p.A.: *See*—
Pabst, Otto, 4,840,088, Cl. 74-661.000.

Lejus Medical Aktiebolag: *See*—
Appelgren, Curt H.; Eskilsson, Eva C.; and Uvdal, Jonas P., 4,840,799, Cl. 424-493.000.

Lekholm, Anders; Fahlstroem, Ulf; and Groothoff, Hermann, to Siemens Aktiengesellschaft. Implantable multi-pole coaxial lead. 4,840,186, Cl. 128-784.000.

Lem, Steven. Telephone VCR control. 4,841,562, Cl. 379-104.000.

Lembens, Helmut: *See*—
Geyer, Oswald; Lembens, Helmut; and Stoyhe, Helmut, 4,840,367, Cl. 271-160.000.

Lenox, Joseph J.: *See*—
Fan, Albert K.; Ginter, Douglas R.; Lenox, Joseph J.; and Henson, Thomas L., 4,840,747, Cl. 252-301.40R.

Lentini, Salvatore; and Patti, Giuseppe, to Italtel Societa Italiana Telecomunicazioni s.p.a. Monitoring circuit for control means and selective breakaway means in modular supply systems. 4,841,161, Cl. 307-85.000.

Leo Pharmaceutical Products Ltd.: *See*—
Godtfredsen, Wagn O.; and von Daehne, Welf, 4,840,944, Cl. 514-195.000.

Leonard, Henri, to Micro-Mega. Device for maintaining a boring tool in a vibratory dental instrument. 4,840,566, Cl. 433-127.000.

Lerat, Bernard, to Commisariat A L'Energie Atomique. System for locating an object in space. 4,840,445, Cl. 350-6.800.

Leufert, Walter P.; and Miller, David L., to AMP Incorporated. Cable jacket strain relief adapter assembly. 4,840,581, Cl. 439-472.000.

Levacher, Friedrich K.: *See*—
Federmann, Helmut; Levacher, Friedrich K.; and Noack, Georg, 4,840,452, Cl. 350-96.230.
Starke, J. Peter; Levacher, Friedrich K.; and Federmann, Helmut, 4,840,480, Cl. 356-32.000.

Leveen, Eric G.: *See*—
Leveen, Harry H.; Leveen, Robert F.; and Leveen, Eric G., 4,840,939, Cl. 514-25.000.

Leveen, Harry H.; Leveen, Robert F.; and Leveen, Eric G. Treatment of cancer with phlorizin and its derivatives. 4,840,939, Cl. 514-25.000.

Leveen, Robert F.: *See*—
Leveen, Harry H.; Leveen, Robert F.; and Leveen, Eric G., 4,840,939, Cl. 514-25.000.

Lever Brothers Company: *See*—
Bodor, Janos; van Heteren, Jan; Willemse, Henricus W.; and Vermaas, Leo F., 4,840,810, Cl. 426-312.000.

Levie, Mark W., to LK Mfg. Skimmer/separation ladle. 4,839,965, Cl. 30-324.000.

Levine, Michael R.; Rigotti, Victor; Russo, James; and Skogler, Nicholas, to Honeywell, Incorporated. Analog to digital conversion by measuring the ratio of RC time constants. 4,841,458, Cl. 364-557.000.

Levine, Robert A., to Atlantic Richfield Company. Oil spill recovery apparatus. 4,840,729, Cl. 210-170.000.

Lew, Hyok S. Convective attenuation flowmeter. 4,840,071, Cl. 73-861.380.

Lewis, Armis L.: *See*—
Maglica, Anthony; DeLong, Robert J.; and Lewis, Armis L., 4,841,417, Cl. 362-206.000.

Lewis, Larry N.: *See*—
Gross, David C.; Lewis, Larry N.; and Haig, Connie L., 4,840,974, Cl. 521-85.000.

Ley, Gregor: *See*—
Gullbins, Erich; McKee, Graham E.; and Ley, Gregor, 4,840,990, Cl. 524-504.000.

Liberman, Barnet L., to Liberman, Barnet L.; Chamberlain, Winthrop D.; Fedele, Joseph; and Fedele, Brian, a part interest. Method of freezing vital body fluids. 4,840,034, Cl. 62-64.000.

Liberman, Barnet L., to Liberman, Barnet L.; Chamberlain, Winthrop D.; Fedele, Joseph; and Fedele, Brian, a part interest. Method of freezing tissue. 4,840,035, Cl. 62-64.000.

Libor, Susan I.: *See*—
Hill, Hugh A. O.; and Libor, Susan I., 4,840,893, Cl. 435-6.000.

Licentia Patent-Verwaltungs-GmbH: *See*—
Hauke, Dieter; and Zelle, Edgar, 4,841,187, Cl. 310-171.000.
Wulff, Hans-Jurgen, 4,841,266, Cl. 335-16.000.

Lichtfuss, Gerhardt E., to Sundstrand Corp. Self-aligning journal bearing. 4,840,498, Cl. 384-213.000.

Liedtke, Kurt: *See*—
Focke, Heinz; and Liedtke, Kurt, 4,840,007, Cl. 53-137.000.
Focke, Heinz; and Liedtke, Kurt, 4,840,321, Cl. 242-58.600.

Lieske, Normen; and Seichter, Werner, to Siemens Aktiengesellschaft. Method and arrangement for testing mega-bit memory modules with arbitrary test patterns in a multi-bit test mode. 4,841,525, Cl. 371-21.000.

Lievense, Jefferson C.; Sawyer, Joanna D.; and Terpolilli, Anthony J., to Eastman Kodak Company. High temperature method for the production of ribavirin. 4,840,898, Cl. 435-87.000.

Lift Tech International Inc.: *See*—
Verbos, Stephen P., 4,841,215, Cl. 318-757.000.

Lighting Technology, Inc.: *See*—
Groh, Allen R., 4,841,422, Cl. 362-294.000.

Lii, Jong T. Faucet structure. 4,840,351, Cl. 251-230.000.

Lilly Industries Limited: *See*—
Hunter, William H., 4,841,056, Cl. 546-68.000.

Lillywhite, M. James; and Horn, Michael J., to Baker Hughes. Double shell thickener. 4,840,283, Cl. 220-5.00A.

Lim, Esther H.: *See*—
Ranger, Michael H.; Lim, Esther H.; and Grady, Robert J., 4,841,343, Cl. 355-77.000.

Lindberg, Chris E.; Kot, Edward J.; and Chicoye, Etzer, to Miller Brewing Company. Process for brewing beer while enhancing yeast growth. 4,840,802, Cl. 426-16.000.

Linde Aktiengesellschaft: *See*—
Grunewald, Gerhard; and Kriebel, Manfred, 4,840,648, Cl. 55-44.000.

Lindley, Martin K.: *See*—
Nixon, Rodger J.; Roselli, Peter J. C.; Armstrong, David I.; Lindley, Martin K.; and de la Bere, Imogen E., 4,841,441, Cl. 364-401.000.

Lines, Jerry L., to MiTek Industries, Inc. Apparatus for making wooden I-beams. 4,840,207, Cl. 144-41.000.

Linsky, Gary; Cunningham, Timothy; and Pines, Eli, to Johnson & Johnson Patient Care, Inc. Heparin-containing adhesion prevention barrier and process. 4,840,626, Cl. 604-364.000.

Litt, Timothe, to Digital Equipment Corporation. Braille encoding method and display system. 4,840,567, Cl. 434-114.000.

Littlehales, William J., to American Bionetics, Inc. Electroblotting technique for transferring specimens from a polyacrylamide electrophoresis or like gel onto a membrane. 4,840,714, Cl. 204-180.100.

Litvinenko, Alexander: *See*—
Krouzkevitch, Benjamin; and Litvinenko, Alexander, 4,839,966, Cl. 30-475.000.

Live International Co., Ltd.: *See*—
Tominaga, Yasunori, 4,840,812, Cl. 426-488.000.

LK Mfg.: *See*—
Levie, Mark W., 4,839,965, Cl. 30-324.000.

Locher, Mark R.: *See*—
Hakim, Shafik J.; Locher, Mark R.; Nieng, Kenneth Y.; and Vagnozzi, Barbara A., 4,841,433, Cl. 364-200.000.

Lockard, Walter G.; Boris, Allen J.; and Kosc, Wieslaw, to Invacare Corporation. Symmetrically modular wheelchair. 4,840,390, Cl. 280-250.100.

Locke, Norman: *See*—
Middlin, Bruce; Locke, Norman; and Kennedy, Alan W., 4,840,710, Cl. 204-12.000.

Logothetis, Eleftherios M.; and Soltis, Richard E., to Ford Motor Company. Oxides of nitrogen detector. 4,840,913, Cl. 436-116.000.

Logsdon, Hubert E. Golf green viewing apparatus. 4,839,968, Cl. 33-286.000.

Loher Aktiengesellschaft: *See—*
Rosinnes, Meir; Stadler, Hugo; and Strunz, Siegfried, 4,841,218, Cl. 322-24.000.

Lohr & Bromkamp GmbH: *See—*
Welschof, Hans-Heinrich; and Beier, Rudolf, 4,840,087, Cl. 74-713.000.

Lomangino, Michael, to United Technologies Corporation. Radio frequency power modification without phase shift. 4,841,262, Cl. 333-81.00R.

Lombardi, Paolo: *See—*
Buzzetti, Franco; di Salle, Enrico; and Lombardi, Paolo, 4,840,943, Cl. 514-177.000.

Lombardo, James W. Illuminated dart. 4,840,383, Cl. 273-420.000.

Lombardo, Leo, to Moore Business Forms, Inc. Fold-over mailer with side-open return envelope with slittable edge. 4,840,306, Cl. 229-73.000.

Lonardo, Robert. Combination arm splint and finger support means. 4,840,168, Cl. 128-77.000.

Lonergan, Kevin J., to Digital Equipment Corporation. Lossless over-current sensing circuit for voltage regulator. 4,841,219, Cl. 323-274.000.

Long, Alden O., Jr., to AMP Incorporated. Harness-making machine having improved cable guide. 4,839,962, Cl. 29-749.000.

Long, Margaret N.: *See—*
Chai, Bruce H.; Lai, Shui T.; and Long, Margaret N., 4,841,530, Cl. 372-41.000.

Longo, Giovanni: *See—*
Bianchin, Eugenio; Longo, Giovanni; and Lunardon, Gian F., 4,841,095, Cl. 560-115.000.

L'Oreal: *See—*
Grollier, Jean F., 4,840,787, Cl. 424-52.000
Grollier, Jean-Francois; and Fourcadier, Chantal, 4,840,790, Cl. 424-70.000.

Lorena, Emilio: *See—*
Siligoni, Marco; Saviotti, Vanni; and Lorena, Emilio, 4,841,565, Cl. 379-413.000.

Lott, Thomas M. Hold and dial accessory for telephone instrument. 4,841,566, Cl. 379-352.000.

Lou, Perry W., to Brooktree Corporation. System for compensating for offset voltages in comparators. 4,841,252, Cl. 330-9.000.

Lovett, Eva G.: *See—*
Bellos, Thomas J.; and Lovett, Eva G., 4,840,748, Cl. 252-344.000.

Lovgren, Einar. System for installing wood door jambs and hardwood door trim. 4,840,002, Cl. 52-213.000.

Loy, Fernand R.; Perrin, Jean-Claude; and Robin, Joel, to U.S. Philips Corporation. Device for correcting distortion. 4,840,465, Cl. 350-421.000.

LP COM: *See—*
Lubarsky, Andre; and Pospisil, Richard E., 4,841,437, Cl. 364-200.000.

LTV Aerospace & Defense Co.: *See—*
Ehrenhalt, Dan; and Giles, George R., 4,841,258, Cl. 332-9.00R.
Freitag, Douglas W., 4,840,763, Cl. 264-65.000.

Lubarsky, Andre; and Pospisil, Richard E., to LP COM. System architecture for a test apparatus having primary and dependent processors. 4,841,437, Cl. 364-200.000.

Lubrizol Corporation, The: *See—*
Forsberg, John W.; Mullay, John J.; and Sohara, Joseph A., 4,840,687, Cl. 149-2.000.

Luc-Co., Inc.: *See—*
Moody, Leonardo, 4,840,045, Cl. 63-12.000.

Lucas, Gordon H.; and Giles, Randy K., to Hearthstone Builders, Inc. Construction log and associated corner construction. 4,840,003, Cl. 52-233.000.

Lucas Industries Public Limited Company: *See—*
Birch, Barry, 4,841,238, Cl. 324-144.000.
Harrison, Anthony W., 4,840,257, Cl. 188/196.00D.

Lucchesi, Benedict R.: *See—*
Todd, Robert F., III; Lucchesi, Benedict R.; Simpson, Paul J.; Griffin, James D.; and Schlossman, Stuart F., 4,840,793, Cl. 424-85.800.

Luciani, Bernard, to Cibie Projecteurs. Additional headlight for use on a motor vehicle in conjunction with a dipped headlight. 4,841,423, Cl. 362-304.000.

Lueers, Wilbrand, to Siemens Aktiengesellschaft. Apparatus for rail operation comprising a long-stator linear motor. 4,840,125, Cl. 104-292.000.

Lukevits, Edmund Y.; Kastron, Valeria V.; Virolin, Rasma O.; Erchak, Nikolai P.; Skrastinsh, Indulis P.; Dubur, Gunar Y.; and Kimenis, Agris A. 2,6-dimethyl-3,5-dimethoxycarbonyl-4-(5'-trimethylsilyl-2'-furyl)-1,4-dihydropyridine. 4,841,054, Cl. 546-14.000.

Lunardon, Gian F.: *See—*
Bianchin, Eugenio; Longo, Giovanni; and Lunardon, Gian F., 4,841,095, Cl. 560-115.000.

Lunderman, William; and Seidler, David, to Revlon, Inc. Compact case with irreversible hinge. 4,840,288, Cl. 220-3 4.000.

Luong, Minh P.: *See—*
Martin, Andre ; and Luong, Minh P., 4,841,149, Cl. 250-330.000.

Lupoli, Peter J.: *See—*
Beauvais, Thomas; Krenke, Vincent G.; Lupoli, Peter J.; and Mattis, Donald J., 4,840,137, Cl. 116-22[illegible].000.

Lusher, David M.: *See—*
McClanahan, Robert F.; Washburn, Robert D.; Gonzalez, Carlos H.; Sze, Jerry C.; and Lusher, David M., 4,841,429, Cl. 363-126.000.

Lutron Electronics Co., Inc.: *See—*
Barney, Jonathan A.; and Karunaratne, Arjuna R., 4,841,221, Cl. 323-320.000.

Lyding, Joseph W., to University of Illinois, The Board of Trustees of The. Variable temperature scanning tunneling microscope. 4,841,148, Cl. 250-306.000.

Lynn, John D.; Jablonski, Charles E.; and Egan, Walter D., to Bethlehem Steel Corporation. Process for chemical stabilization of heavy metal bearing dusts and sludges as EAF dust. 4,840,671, Cl. 106-85.000.

M.I.M. Technology Marketing Limited: *See—*
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Gullbins, Erich; McKee, Graham E.; and Ley, Gregor, 4,840,990, Cl. 524-504.000.
McKinney, Gordon R.: *See—*
Gamble, Donald E.; Hunter, Harry L.; and McKinney, Gordon R., 4,840,952, Cl. 514-253.000.
McLaurin, Colin A.: *See—*
Brubaker, Clifford E.; and McLaurin, Colin A., 4,840,076, Cl. 74-143.000.
McMillin Wire & Plating, Inc.: *See—*
Stroh, Alvin L.; and Pilon, Terry C., 4,840,336, Cl. 248-97.000.
McWilliams Machinery Sales, Division of Bridgeport Machines Inc.: *See—*
Graeber, Richard N., 4,841,126, Cl. 219-69.200.
Mead Corporation, The: *See—*
Kovacs, Kerry; Simpson, William; Burkholder, Amy L.; Messer, Russell K.; and Thomas, Teresa M., 4,840,866, Cl. 430-138.000.
Mechanical Technology Incorporated: *See—*
Chen, Hsiang M.; Eusepi, Martin W.; and Johnson, Robert E., 4,841,184, Cl. 310-90.500.
Medisense, Inc.: *See—*
Hill, Hugh A. O.; and Libor, Susan I., 4,840,893, Cl. 435-6.000.
Meguro, Satoshi: *See—*
Ikeda, Shuji; Meguro, Satoshi; Nishimura, Kotaro; Yamamoto, Sho; and Tanimura, Nobuyoshi, 4,841,481, Cl. 365-154.000.
Mehdizadeh, Mehrdad; Patrick, John L.; and Misic, George J., to Picker International, Inc. Transverse field limited localized coil for magnetic resonance imaging. 4,841,248, Cl. 324-318.000.
Mehrgardt, Soenke; and Ehret, Bernhard, to Deutsche ITT Industries GmbH. Nonrecursive digital filter. 4,841,463, Cl. 364-724.160.
Meier, Stefan: *See—*
De Man, Erik; and Meier, Stefan, 4,841,175, Cl. 307-475.000.

Meiji Milk Products Company Limited: *See—*
Harada, Hidetoshi; Chihara, Satoshi; Suginaka, Yutaka; Suido, Shigeko; and Kobayashi, Toshitaka, 4,840,814, Cl. 426-580.000.
Meisingset, Alf E.: *See—*
Tetlie, Per J.; Brudal, Hans N.; and Meisingset, Alf E., 4,841,192, Cl. 310-337.000.
Meisner, Alfred; Potthof, Erwin; and Fluhrer, Henry, to Diehl GmbH & Co. Electronic acoustic signal emitter. 4,841,493, Cl. 367-140.000.
Meline, Harry R.; and Paulsen, Eric L., to MTS Systems Corporation. Capacitive extensometer with curved target surface. 4,841,226, Cl. 324-61.00R.
Melinyshyn, Lev A.; Stupar, Jeffrey M.; and Goldberg, Edward M., to Becton, Dickinson and Company. Method of constructing a blood flow conduit. 4,840,690, Cl. 156-242.000.
Melvin, Waymon A., Jr., to Westinghouse Electric Corp. Apparatus for controlling a switching amplifier. 4,841,281, Cl. 340-310.00A.
Memory Metals, Inc.: *See—*
Adnyana, Dewa N.; and Rogen, Neil E., 4,840,346, Cl. 251-1.300.
Mendez, Luis E.: *See—*
Berzin, Vel; and Mendez, Luis E., 4,840,231, Cl. 166-387.000.
Menlo Care, Inc.: *See—*
Balbierz, Daniel J., 4,840,613, Cl. 604-51.000.
Hardy, Dwayne E., 4,840,622, Cl. 604-264.000.
Mennen Company, The: *See—*
Fattori, Joseph E.; and Wagner, Siegbert O., 4,840,511, Cl. 401-213.000.
Mentzer, Mark A.: *See—*
Lampe, Donald R.; Mentzer, Mark A.; and Naviasky, Eric H., 4,841,480, Cl. 365-87.000.
Merck & Co., Inc.: *See—*
Lee, Ta J.; and Hoffman, William F., 4,841,074, Cl. 549-292.000.
Shepard, Kenneth L.; and Graham, Samuel L., 4,840,963, Cl. 514-418.000.
Merlin, Dennis, to Hillwell Manufacturing Inc. Container dispensing system. 4,840,291, Cl. 221-59.000.
Merrill, David E.: *See—*
Brookman, Donald L.; Merrill, David E.; and Grollimund, Everett C., 4,840,694, Cl. 156-344.000.
Merritt, Carleton G.: *See—*
Lee, Yanien; Merritt, Carleton G.; and Dermody, Nancy E., 4,840,808, Cl. 426-270.000.
Mersing, Roger L., to Odetics, Inc. Method of forming a magnetic head. 4,839,959, Cl. 29-603.000.
Merte, John H.: *See—*
Alsobrooks, Daniel E.; Bart, Hansueli; Chauvin, Richard; Horn, Thomas A.; Merte, John H.; Mesenich, Gerhard; and Mitts, Donna M., 4,840,163, Cl. 123-533.000.
Mesenich, Gerhard: *See—*
Alsobrooks, Daniel E.; Bart, Hansueli; Chauvin, Richard; Horn, Thomas A.; Merte, John H.; Mesenich, Gerhard; and Mitts, Donna M., 4,840,163, Cl. 123-533.000.
Messer, Russell K.: *See—*
Kovacs, Kerry; Simpson, William; Burkholder, Amy L.; Messer, Russell K.; and Thomas, Teresa M., 4,840,866, Cl. 430-138.000.
Metafuse Limited: *See—*
Joseph, Ady, 4,840,711, Cl. 204-15.000.
Metallgesellschaft Aktiengesellschaft: *See—*
Grunewald, Gerhard; and Kriebel, Manfred, 4,840,648, Cl. 55-44.000.
Methe, David E.: *See—*
Botsco, Ronald J.; Jones, Robert L.; and Methe, David E., 4,840,066, Cl. 73-597.000.
Metzger, Karl G.: *See—*
Habich, Dieter; Hartwig, Wolfgang; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,840,946, Cl. 514-210.000.
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,840,954, Cl. 514-254.000.
Schriewer, Michael; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,841,059, Cl. 546-312.000.
Meumann, Henry R.; and Stark, Johannes, to Foseco International Limited. Insulating linings for furnaces and kilns. 4,840,131, Cl. 110-336.000.
Meyer, Gerard B.: *See—*
Orr, Thomas V.; and Meyer, Gerard B., 4,840,789, Cl. 424-66.000.
Meyer, Hans U. Capacitive sensor for measuring a displacement. 4,841,225, Cl. 324-61.00R.
Meyer, Richard S.; Root, Jeffrey M.; Campbell, Michael L.; and Winter, Daryl B., to Curtice-Burns, Inc. Low caloric alkyl glycoside fatty acid polyester fat substitutes. 4,840,815, Cl. 426-611.000.
Michael, Wolfgang; and Kaletka, Martin, to L. Schuler GmbH. Drawing apparatus in a press. 4,840,055, Cl. 72-345.000.
Michel, Royer, to S.A.T. (Societe Anonyme de Telecommunications). HGCDTE Photodiode with high speed response. 4,841,351, Cl. 357-30.000.
Michels, Roger: *See—*
Reilly, Bernard J.; and Michels, Roger, 4,840,556, Cl. 425-543.000.
Michigan Bell Telephone Company: *See—*
Marson, Albert U., 4,840,582, Cl. 439-491.000.
Micro-Mega: *See—*
Leonard, Henri, 4,840,566, Cl. 433-127.000.
Micronic Interface Technologies: *See—*
James, Wesley, 4,841,515, Cl. 369-100.000.
Middlin, Bruce; Locke, Norman; and Kennedy, Alan W., to M.I.M. Technology Marketing Limited. Method of stripping electrolytically deposited copper from a cathode. 4,840,710, Cl. 204-12.000.
Midwest Power Corporation: *See—*
Jonelis, John A.; and Bata, John I., 4,840,649, Cl. 55-140.000.
Mihara, Toshihiro: *See—*
Kusuda, Takao; Yonemura, Masaaki; Shimoda, Hisanori; Takigawa, Masuo; and Mihara, Toshihiro, 4,840,028, Cl. 60-303.000.
Mihashi, Yutaka; Nagai, Yutaka; and Ikeda, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor laser device. 4,841,535, Cl. 372-46.000.
Mihayashi, Keiji: *See—*
Abe, Akira; Mihayashi, Keiji; Kobayashi, Hidetoshi; and Kato, Hirohiko, 4,840,877, Cl. 430-350.000.
Mikami, Katsumasa: *See—*
Sasaki, Akira; Takahashi, Yoshihito; Hakoyama, Akiyoshi; Mikami, Katsumasa; Suzaki, Masafumi; Honma, Takeo; Yasutomi, Tsuyoshi; Shiraishi, Ryoichi; and Nishiguchi, Yasuo, 4,840,500, Cl. 400-120.000.
Mikata, Yoshitaka: *See—*
Toyoda, Yoshiharu; Mikata, Yoshitaka; and Yamano, Shoji, 4,840,240, Cl. 177-25.180.
Miles Laboratories, Inc.: *See—*
Sterzel, R. Bernd; and Scriabine, Alexander, 4,840,960, Cl. 514-356.000.
Van Beveren, Shirley M.; and Pappenhagen, Albert R., 4,841,026, Cl. 530-394.000.
Miljanic, Petar N.; and Moore, William J. M., to Canadian Patents and Development Limited-Societe Canadienne Des Brevets Et D'Exploitation Limitee. Current ratio device. 4,841,236, Cl. 324-127.000.
Miller, Alex S.: *See—*
Domian, Henry A.; LaCount, Dale F.; Miller, Alex S.; and Seibert, Kenneth D., 4,840,768, Cl. 420-582.000.
Miller Brewing Company: *See—*
Lindberg, Chris E.; Kot, Edward J.; and Chicoye, Etzer, 4,840,802, Cl. 426-16.000.
Miller, Bruce E.; and Owen, Robert E., to Bipolar Integrated Technology, Inc. High-speed digital multiplier architecture. 4,841,468, Cl. 364-754.000.
Miller, David L.: *See—*
Leufert, Walter P.; and Miller, David L., 4,840,581, Cl. 439-472.000.
Miller, Robert A.; and Stone, Albert L., to Baxter Healthcare Corporation. Method for filling collapsible containers. 4,840,017, Cl. 53-468.000.
Miller, Steven S., to United States of America, Energy. Method of inducing surface ensembles on a metal catalyst. 4,840,931, Cl. 502-162.000.
Millhollan, Michael S.; and Sung, Chiakang, to National Semiconductor Corporation. Output disable control circuit for ECL programmable array logic device. 4,841,176, Cl. 307-475.000.
Millman, Steven E.: *See—*
Hoyt, Roger F.; Jefferson, Carl M.; and Millman, Steven E., 4,841,389, Cl. 360-75.000.
Mills, Simon F., to European Atomic Energy Community (Euratom). Multiconnector. 4,840,574, Cl. 439-191.000.
Millward, Barry: *See—*
Ziegler, Michael J.; Millward, Barry; and Robb, Kenneth P., Jr., 4,840,656, Cl. 65-85.000.
Mimura, Yoshiki: *See—*
Suzuki, Shinji; Arai, Tetsuji; Ohno, Kuniharu; Ueki, Kazuyeshi; Mimura, Yoshiki; Tanaka, Kazuya; Sugioka, Shinji; and Suzuki, Hiroko, 4,841,342, Cl. 355-71.000.
Minagawa, Shigekazu: *See—*
Kondow, Masahiko; Satoh, Shin; Minagawa, Shigekazu; Ohishi, Akio; and Kajimura, Takashi, 4,841,531, Cl. 372-43.000.
Minagawa, Shoichi: *See—*
Okamoto, Takeshi; Niitsuma, Teruo; and Minagawa, Shoichi, 4,841,470, Cl. 364-821.000.
Minami, Koji: *See—*
Takeuchi, Masaru; Fukatsu, Takeo; Nakano, Shoichi; Kuwano, Yukinori; Minami, Koji; and Iwamoto, Masayuki, 4,841,328, Cl. 355-211.000.
Minata, Shigeki; and Mori, Toshihiro, to NEC Corporation. Housing structure for decreasing a radio unit's susceptibility to static electricity. 4,840,571, Cl. 439-76.000.
Minato, Ichiro: *See—*
Tsukamoto, Takashi; Hatta, Toyoji; and Minato, Ichiro, 4,841,008, Cl. 528-45.000.
Minato, Osamu; Masuhara, Toshiaki; Ishibashi, Koichiro; Hanamura, Shoji; Honjyo, Shigeru; and Moriwaki, Nobuyuki, to Hitachi, Ltd. Semiconductor memory device and sense amplifier. 4,841,486, Cl. 365-207.000.
Mine Safety Appliances Company: *See—*
Williams, Mark T.; Winchester, Clinton S.; and Jolson, Joseph D., 4,840,859, Cl. 429-212.000.
Minebea Co., Ltd.: *See—*
Matsushita, Kunitake; Sakuma, Hiroshi; Yamawaki, Takayuki; Yoshikura, Takashi; Sano, Hiroshi; Suzuki, Yuzuru; Torii, Michihiro; and Ohnuki, Tohru, 4,841,190, Cl. 310-257.000.
Ming, Alex L. K., to Unimax Distribution Limited. Wheel for a toy vehicle and a toy vehicle having such a wheel. 4,840,599, Cl. 446-465.000.
Minigrip, Inc.: *See—*
Van Erden, Donald L.; and Ausnit, Steven, 4,840,611, Cl. 493-213.000.

Miyazaki, Yoshihiro: *See—*

Montedison S.p.A.: *See—*

Minker, Emil: *See—*
Korbonits, Dezso; Minker, Emil; Varga, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo ; Kormoczy, Peter; Gergely, Vera; and Horvath Gabor, 4,840,949, Cl. 514-234.200.

Minnesota Mining and Manufacturing Company: *See—*
Ignasiak, Martin C., 4,841,100, Cl. 174-128.00G.
Katritzky, Alan R.; Krepski, Larry R Rasmussen, Jerald K.; Heilmann, Steven M.; and Tarr, Richard D., 4,841,021, Cl. 528-407.000.
Ofstead, Ronald F., 4,840,992, Cl. 525-61.000.
Patel, Kalyanji U., 4,841,090, Cl. 558-437.000.

Minolta Camera Kabushiki Kaisha: *See—*
Izuhara, Koichi; Caruso, Jeffrey L.; and Johnson, Theodore C., 4,841,472, Cl. 364-900.000.
Ohmori, Naoto, 4,841,314, Cl. 346-160.000.
Yamamoto, Kouji; Tominaga, Shinji; Yamanaka, Akira; Ueda, Hiroshi; Taniguchi, Nobuyuki; Nakamura, Ikushi; and Iwata, Michihiro, 4,841,318, Cl. 354-173.100.

Mirafi, Inc.: *See—*
Freese, James S., 4,840,515, Cl. 405-45.000.

Misawa, Masayuki; Ogasawara, Toshio; Segane, Masahiko; Hirata, Yasuyuki; and Kume, Masafumi, to Kansai Paint Co., Ltd. Electrodeposition coating method. 4,840,715, Cl. 204-181.100.

Misic, George J.: *See—*
Mehdizadeh, Mehrdad; Patrick, John L ; and Misic, George J., 4,841,248, Cl. 324-318.000.

Mitani, Katsuaki; and Ishinaga, Hideki, to Matsushita Electric Industrial Co., Ltd. X-ray shielded projection lens. 4,840,471, Cl. 350-438.000.

Mitchell, James A.; and Bechdel, John F., to International Business Machines Corporation. Extended floating point operations supporting emulation of source instruction execution. 4,841,476, Cl. 364-900.000.

MiTek Industries, Inc.: *See—*
Lines, Jerry L., 4,840,207, Cl. 144-41.000

Mitsuba Electric Mfg., Co., Ltd.: *See—*
Tsuchiya, Kyoshi; Ioka, Hideyuki; and Takahashi, Hideyuki, 4,841,182, Cl. 310-68.00D.

Mitsubishi Chemical Industries Limited: *See—*
Hasuo, Masayoshi; Mukai, Seiichi; Saito, Ryo; and Ikuhara, Isao, 4,840,981, Cl. 524-114.000.
Imahori, Seiichi; Himeno, Kiyoshi; and Yoshihara, Junji, 4,841,036, Cl. 534-761.000.
Kato, Yoshiaki; and Hihara, Toshio, 4,841,029, Cl. 534-634.000.
Kondou, Tsutomu, 4,840,804, Cl. 426-10?.000.
Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Urashima, Hidetoshi, 4,840,640, Cl. 8-506.000.
Miura, Konoe; Ozawa, Tetsuo; Okumura Seigo; and Kubo, Shinji, 4,841,057, Cl. 546-183.000.
Oda, Masatsugu; Sasaki, Naoko; Sasaki, Toshiro; Tomita, Hirofumi; and Nonaka, Nobuyuki, 4,840,959, Cl. 514-355.000.
Ohta, Tokuya; Kobayashi, Masatsune; Suga, Yuko; Miura, Konoe; Takimoto, Hiroshi; and Yoneyama, Tomio, 4,841,037, Cl. 534-815.000.

Mitsubishi Denki K.K.: *See—*
Yoshida, Hideo; Inoue, Tohru; Yamaguchi, Atsuhiro; Oda, Yoshiaki; Ozaki, Minoru; and Nishijima, Toshihisa, 4,841,300, Cl. 341-94.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.
Ikegami, Fumio; Yoshida, Susumu; Takeuchi, Tsutomu; and Ariyavisitakul, Sirikiat, 4,841,547, Cl. 375-53.000.
Imai, Hitoshi; Arai, Ryuichiro; Kobayagi, Kimiyuki; and Tadokoro, Michihiro, 4,841,507, Cl. 369-44.000.
Itagaki, Hidenobu, 4,841,247, Cl. 324-309.000.
Iwata, Masanari, 4,840,090, Cl. 74-804.000.
Kato, Hisao, 4,841,210, Cl. 318-568.240.
Komurasaki, Satosi, 4,840,158, Cl. 123-419.000.
Koyama, Tsunehiro, 4,841,173, Cl. 307-456.000.
Kumabe, Hisao; and Susaki, Wataru, 4,841,532, Cl. 372-45.000.
Kuno, Kazuo, 4,841,269, Cl. 335-299.000
Majumdar, Gourab, 4,841,345, Cl. 357-23.400.
Matsumoto, Osamu, 4,840,159, Cl. 123-575.000.
Mihashi, Yutaka; Nagai, Yutaka; and Ikeda, Kenji, 4,841,535, Cl. 372-46.000.
Mizuta, Masaharu, 4,841,477, Cl. 364-900.000.
Morishita, Etsuo; Kakuda, Masayuki; Sugihara, Masahiro; Inaba, Tsutomu; Nakamura, Toshiyuki; and Kimura, Tadashi, 4,840,549, Cl. 418-55.000.
Nakano, Masaaki; Watanabe, Syoyu; Saito, Yusaku; and Iwata, Syuji, 4,841,290, Cl. 340-707.000.
Ozaki, Yoshihiko; Sumitani, Hiroaki; Tomoda, Toshimasa; Sato, Fumihide; and Kusano, Kenji, 4,841,419, Cl. 367-7.000.
Suda, Kakutaro, 4,840,920, Cl. 437-69.000.
Suyama, Mitiyo, 4,841,449, Cl. 364-449.000.
Takeda, Takao; Yamazaki, Hitoshi; Taniguchi, Yoshiteru; Tanaka, Norihiko; Ito, Hiroshi; Uchida, Minoru; and Imai, Jun, 4,840,593, Cl. 445-26.000.
Yamauchi, Satomi, 4,840,135, Cl. 112-27 .000.

Mitsubishi Kasei Corporation: *See—*
Tamura, Mitsuhiko; Miyamoto, Masaaki; and Miyamoto, Kazuo, 4,840,995, Cl. 525-133.000.

Mitsubishi Petrochemical Co., Ltd.: *See—*
Ohmori, Michio; Okamura, Michiya; and Yui, Hiroshi, 4,841,516, Cl. 369-264.000.

Mitsuhashi, Minoru: *See—*
Sato, Nobuyuki; Matsubayashi, Hiroshi; Kobayashi, Seishichi; Mitsuhashi, Minoru; Matsuno, Kenji; and Ishibashi, Kazuhisa, 4,840,304, Cl. 228-214.000.

Mitsui & Co., Ltd.: *See—*
Nakamura, Masanobu, 4,840,053, Cl. 72-58.000.

Mitsui Norin Co., Ltd.: *See—*
Hara, Yukihiko; and Suzuki, Tateo, 4,840,966, Cl. 514-456.000.

Mitsui Petrochemical Industries, Ltd.: *See—*
Kashiwa, Norio; Toyota, Akinori; and Kioka, Mamoru, 4,841,003, Cl. 526-125.000.

Mitsui Toatsu Chemicals, Incorporated: *See—*
Nagai, Yoichiro; and Matsumoto, Hideyuki, 4,841,083, Cl. 556-430.000.

Mitsui Toatsu Chemical, Inc.: *See—*
Hirayama, Chuichi; Motozato, Yoshiaki; and Ihara, Hirotaka, 4,840,975, Cl. 521-183.000.

Mitts, Donna M.: *See—*
Alsobrooks, Daniel E.; Bart, Hansueli; Chauvin, Richard; Horn, Thomas A.; Merte, John H.; Mesenich, Gerhard; and Mitts, Donna M., 4,840,163, Cl. 123-533.000.

Mitutoyo Mfg. Co., Ltd.: *See—*
Kabaya, Yoshihiko; Yasuda, Naofumi; and Omi, Toshihiro, 4,840,488, Cl. 356-374.000.

Miura, Hiroki: *See—*
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.

Miura, Kazuo: *See—*
Sakitani, Katsumi; Kang, Yoon M.; Shinozaki, Shinichiro; Taneya, Shoichi; Miura, Kazuo; Ogura, Tadashi; and Noguchi, Satoshi, 4,840,043, Cl. 62-51.200.

Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Urashima, Hidetoshi, to Mitsubishi Chemical Industries Limited. Polarizing film: polymer film base containing substituted anthraquinone dichroic dye. 4,840,640, Cl. 8-506.000.

Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Kubo, Shinji, to Mitsubishi Chemical Industries Limited. Cyclic imido anthraquinone compounds. 4,841,057, Cl. 546-183.000.

Miura, Konoe: *See—*
Ohta, Tokuya; Kobayashi, Masatsune; Suga, Yuko; Miura, Konoe; Takimoto, Hiroshi; and Yoneyama, Tomio, 4,841,037, Cl. 534-815.000.

Miura, Yoshio: *See—*
Suzuki, Motoyuki; Miura, Yoshio; and Fukushima, Akio, 4,841,511, Cl. 369-50.000.

Miyakoshi, Shinichi: *See—*
Watanabe, Yoshimi; Miyakoshi, Shinichi; and Goto, Kenichi, 4,840,152, Cl. 123-52.0MV.

Miyama, Kenji: *See—*
Yamada, Minoru; Ito, Eiji; Miyama, Kenji; Sawamura, Masataka; Hoshino, Yasushi; and Makino, Masamori, 4,841,323, Cl. 354-400.000.

Miyamoto, Kazuo: *See—*
Tamura, Mitsuhiko; Miyamoto, Masaaki; and Miyamoto, Kazuo, 4,840,995, Cl. 525-133.000.

Miyamoto, Masaaki: *See—*
Tamura, Mitsuhiko; Miyamoto, Masaaki; and Miyamoto, Kazuo, 4,840,995, Cl. 525-135.000.

Miyamoto, Takanori: *See—*
Amada, Eiichi; Shirasu, Hirotoshi; Takatori, Hiroshi; Kazawa, Tohru; Suzuki, Toshiro; Miyamoto, Takanori; and Kameyama, Tatsuya, 4,841,521, Cl. 370-31.000.

Miyaou, Hirohisa; Furukawa, Takahiro; and Kosugi, Toru, to Fujitsu Limited. Digital data multiple conversion system for converting data having a frequency to data having another frequency by a digital stuffing method. 4,841,524, Cl. 370-112.000.

Miyasaka, Tadashi: *See—*
Fujikawa, Yoshihiro; Wakamatsu, Masazumi; Fukui, Mariko; and Miyasaka, Tadashi, 4,841,068, Cl. 548-365.000.

Miyashita, Masahiko, to Nippon Gosei Kaagaku Kogyo. Cyclohexane-2,5-dione-1,4-ylene-bis (-3-propionic acid) derivatives and process for preparing the same. 4,841,096, Cl. 560-126.000.

Miyata, Souichi: *See—*
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.

Miyata, Teruo: *See—*
Namiki, Tetsuro; Furuse, Masayasu; Kuroyanagi, Yoshimitsu; Miyata, Teruo; and Suzuki, Takashi, 4,840,937, Cl. 514-21.000.

Miyazaki, Hideki; Onda, Kenichi; and Matsuda, Yasuo, to Hitachi, Ltd. Capacitive voltage lowering circuit with dual outputs. 4,841,427, Cl. 363-62.000.

Miyazaki, Toshihiko; Sakai, Kunihiro; Tomida, Yoshinori; Sugata, Hiroyuki; Matsuda, Hiroshi; and Nishimura, Yukuo, to Canon Kabushiki Kaisha. Method of and apparatus for forming film. 4,840,821, Cl. 427-430.100.

Miyazaki, Yoshihiro: *See—*
Nishikawa, Atsuhiko; Miyazaki, Yoshihiro; Tanji, Masayuki; Takaya, Soichi; and Yamaguchi, Shinichiro, 4,841,439, Cl. 364-200.000.

Miyazawa, Keiji: *See—*
Kadoya, Norio; Kawachi, Jun; and Miyazawa, Keiji, 4,841,296, Cl. 340-870.160.

Miyazawa, Toshio: *See—*
Nishizawa, Shigeki; Takemoto, Iwao; Miyazawa, Toshio; and Izawa, Tetsurou, 4,841,369, Cl. 358-213.260.

Mizerak, Dennis S., to Babcock & Wilcox Company, The. Snap on fuse cover. 4,841,413, Cl. 361-400.000.

Mizoguchi Manufacturing Company Limited: *See—*
Nakayama, Yasuyuki; and Sada, Tomoya, 4,841,136, Cl. 250-231.00R.

Mizohata, Tadashi: *See—*
Kishino, Takao; and Mizohata, Tadashi, 4,841,194, Cl. 313-496.000.

Mizota, Masahiro: *See—*
Ohnishi, Haruo; Kosuzume, Hiroshi; Mizota, Masahiro; Suzuki, Yasuo; and Mochida, Ei, 4,840,945, Cl. 514-206.000.

Mizumoto, Kouji: *See—*
Onogi, Yasuharu; Oka, Akinori; Nagatomo, Masakatsu; Kondo, Takumi; and Mizumoto, Kouji, 4,840,834, Cl. 428-211.000.

Mizuno, Naohito: *See—*
Nishida, Minoru; Mizuno, Naohito; Hattori, Tadashi; Huzino, Seizi; and Ando, Yoshiyasu, 4,840,067, Cl. 73-726.000.

Mizusaki, Sigenobu: *See—*
Matsumoto, Takashi; Okada, Takashi; and Mizusaki, Sigenobu, 4,841,055, Cl. 546-261.000.

Mizushima, Yukio: *See—*
Matsutani, Shigeru; Mizushima, Yukio; Doteuchi, Masami; and Ishihara, Yasunobu, 4,840,953, Cl. 514-258.000.

Mizuta, Akira, to Fuji Photo Film Co., Ltd. Magnetic disk cartridge assembly system. 4,839,953, Cl. 29-225.000.

Mizuta, Masaharu, to Mitsubishi Denki Kabushiki Kaisha. Response/-processing apparatus for external-abnormal-state in data processing system. 4,841,477, Cl. 364-900.000.

Mizutani, Isao; Hijikata, Toshihiko; and Harada, Takashi, to NGK Insulators, Ltd. Ceramic honeycomb structural bodies and method of producing the same. 4,840,827, Cl. 428-116.000.

Mizutani, Masashi: *See—*
Tomizawa, Youzi; and Mizutani, Masashi, 4,841,394, Cl. 360-99.060.

Mobil Oil Corporation: *See—*
Chen, Nai Y.; and McCullen, Sharon B., 4,840,929, Cl. 502-74.000.
Forman, Edward W., Jr.; Provan, Alexander R.; and Schmieder, Ronald R., 4,840,335, Cl. 248-97.000.
Harandi, Mohsen N.; and Owen, Hartley, 4,840,928, Cl. 502-41.000.
LaPierre, Rene B.; Partridge, Randall D.; Reischman, Paul T.; and Kerr, George T., 4,840,930, Cl. 502-79.000.
Pistner, Timothy W., 4,840,610, Cl. 493-194.000.
Valyocsik, Ernest W., 4,840,780, Cl. 423-329.000.

Mobile Satellite Corporation: *See—*
Anderson, Roy E., 4,841,303, Cl. 342-359.000.

Mochida, Ei: *See—*
Ohnishi, Haruo; Kosuzume, Hiroshi; Mizota, Masahiro; Suzuki, Yasuo; and Mochida, Ei, 4,840,945, Cl. 514-206.000.

Mochida Pharmaceutical Co., Ltd.: *See—*
Ohnishi, Haruo; Kosuzume, Hiroshi; Mizota, Masahiro; Suzuki, Yasuo; and Mochida, Ei, 4,840,945, Cl. 514-206.000.

Mochizuki, Takeshi; Arimoto, Akira; and Saito, Susumu, to Hitachi Koki Company, Limited; and Hitachi, Ltd. Beam position control device. 4,841,137, Cl. 250-236.000.

Modulite Corporation: *See—*
Weber, Franz K., 4,841,424, Cl. 362-352.000.

Moeneclaey, Denis; Lagache, Remi; Victoor, Johnny; and Coopman, Lucien, to Picanol N.V. Process for clamping, fastening and presentation of weft threads in gripper weaving looms and device used to this end. 4,840,203, Cl. 139-453.000.

Moggi, Giovanni; Cirillo, Gianna; Aglietto, Mauro; and Benedetti, Enzo, to Ausimont S.p.A. Compositions based on fluoroelastomers and on modified olefinic polymers. 4,840,994, Cl. 525-72.000.

Moilanen, John R., to American Standard Inc. Scroll compressor relief valve. 4,840,545, Cl. 417-301.000.

Molex Incorporated: *See—*
Sampson, Stephen A.; Dambach, Philip J.; and Brunker, David L., 4,840,451, Cl. 350-96.200.

Molitor, Robert P., to Spalding & Evenflo Companies, Inc. Softball. 4,840,378, Cl. 273-60.00B.

Moller, Hermann: *See—*
Matthias, Klaus; Baumann, Karl-Heinz; Schick, Gerald; Disson, Arno; Moller, Hermann; Seel, Holger; Topfer, Claus; Nerger, Uwe; Thiele, Peter; and Fleisch, Eugen, 4,840,398, Cl. 280-756.000.

Molnar, Karl J.: *See—*
Ho, Chung-Yih; Molnar, Karl J.; and Staver, Daniel A., 4,841,467, Cl. 364-748.000.

Momata, Kazuhiro: *See—*
Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; Nakamura, Hitoshi; Kobayashi, Tetsuo; Takeura, Tooru; and Momata, Kazuhiro, 4,841,399, Cl. 360-113.000.

Monsanto Company: *See—*
Franz, John E., 4,840,659, Cl. 71-86.000.
Mathews III, Marion J.; and Peoples, P. Robert, 4,841,087, Cl. 558-363.000.

Montedison S.p.A.: *See—*
Bianchin, Eugenio; Longo, Giovanni; and Lunardon, Gian F., 4,841,095, Cl. 560-115.000.

Montres Rado S.A.: *See—*
Scholpp, Werner, 4,840,044, Cl. 63-4.000.

Mooberry, Jared B.; and Singer, Stephen P., to Eastman Kodak Company. Photographic element and process comprising a dye releasing group. 4,840,884, Cl. 430-557.000.

Moody, Leonardo, to Luc-Co., Inc. Jewelry mounting construction. 4,840,045, Cl. 63-12.000.

Moog Inc.: *See—*
Garnjost, Kenneth D., 4,840,111, Cl. 91-436.000.

Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; Sands, Keith P.; and Hagedorn, Myrna L., to International Flavors & Fragrances Inc. Use of Schiff base reaction product of methyl anthranilate and canthoxal in augmenting or enhancing aroma or taste of foodstuff or chewing gum. 4,840,801, Cl. 426-3.000.

Moore Business Forms, Inc.: *See—*
Lombardo, Leo, 4,840,306, Cl. 229-73.000.

Moore, David J., to Allied-Signal Inc. Method for manufacturing electrodes for a spark plug. 4,840,594, Cl. 445-7.000.

Moore, Donald M. Automatic jumper cables. 4,840,583, Cl. 439-504.000.

Moore, Edward R.: *See—*
Mathews, Roger A.; Moore, Edward R.; and Cannell, David W., 4,840,791, Cl. 424-71.000.

Moore, William J. M.: *See—*
Milijanic, Petar N.; and Moore, William J. M., 4,841,236, Cl. 324-127.000.

Moravcsik, Imre: *See—*
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.

Moreaux, Francois: *See—*
Schwegler, Patrice; Debrie, Jean-Jacques; Clement, Bernard; Moreaux, Francois; and Olivier, Jacques, 4,840,353, Cl. 266-80.000.

Morgan, Harry C., to Ocutech. Method of molding articles. 4,840,754, Cl. 264-2.200.

Mori, Keiji: *See—*
Katagiri, Shingo; Mori, Keiji; and Asai, Masahiko, 4,840,326, Cl. 242-199.000.

Mori, Shigeru; and Takahashi, Takayuki, to Shin-Etsu Chemical Co., Ltd. Adhesive grease composition comprising a random copolymer of ethylene and an alpha-olefin. 4,840,739, Cl. 252-17.000.

Mori, Toshihiro: *See—*
Minata, Shigeki; and Mori, Toshihiro, 4,840,571, Cl. 439-76.000.

Morihisa, Toshiharu: *See—*
Sano, Yoshii; Totsu, Hideo; and Morihisa, Toshiharu, 4,841,563, Cl. 379-150.000.

Morikawa, Kiyoshi: *See—*
Takahashi, Akira; Kamimura, Testuro; Kawamura, Masahiko; Morikawa, Kiyoshi; and Onishi, Sei, 4,841,499, Cl. 369-38.000.

Morimitsu, Toshihiko; Kikkawa, Sadanobu; Harada, Naoki; and Omura, Takashi, to Sumitomo Chemical Company, Limited. Fiber reactive monoazo compounds having two vinylsulfone type fiber reactive groups in the molecule. 4,841,032, Cl. 534-642.000.

Morimitsu, Toshihiko; Kikkawa, Sadanobu; Harada, Naoki; and Omura, Takashi, to Sumitomo Chemical Company, Limited. Reactive red monoazo dye compound having two vinylsulfone type fiber reactive groups. 4,841,033, Cl. 534-642.000.

Morimoto, Isamu: *See—*
Uesawa, Yutaka; and Morimoto, Isamu, 4,840,889, Cl. 430-597.000.

Morimura, Toshiyuki: *See—*
Takada, Keiji; Okumura, Masahide; Fukuhara, Satoru; Morimura, Toshiyuki; Hosaka, Sumio; and Hosoki, Shigeyuki, 4,841,191, Cl. 310-317.000.

Morishita, Etsuo; Kakuda, Masayuki; Sugihara, Masahiro; Inaba, Tsutomu; Nakamura, Toshiyuki; and Kimura, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Scroll compressor with control of distance between driving and driven scroll axes. 4,840,549, Cl. 418-55.000.

Morita, Toyoo: *See—*
Akiyama, Hideki; and Morita, Toyoo, 4,839,963, Cl. 29-766.000.

Moriwaki, Nobuyuki: *See—*
Minato, Osamu; Masuhara, Toshiaki; Ishibashi, Koichiro; Hanamura, Shoji; Honjyo, Shigeru; and Moriwaki, Nobuyuki, 4,841,486, Cl. 365-207.000.

Moriya, Kaoru: *See—*
Masuko, Takayuki; Suzuki, Norio; and Moriya, Kaoru, 4,839,993, Cl. 51-129.000.

Moriyama, Keiji, to Nikon Corporation. Telephoto zoom lens. 4,840,469, Cl. 350-427.000.

Moroe, Tomomi, to Omron Tateisi Electronics Co. Terminal provided with a printer. 4,840,344, Cl. 248-676.000.

Morrison, Larry R.; and Jenkins, Vaughn J., to Unisys Corporation. High-speed sampling phase detector for clock and data recovery system. 4,841,257, Cl. 331-26.000.

Morton Thiokol, Inc.: *See—*
McDonald, Allan J., 4,840,024, Cl. 60-39.461.

Moser, Helmut A.: *See—*
Auerbach, Gunther; and Moser, Helmut A., 4,840,642, Cl. 8-549.000.

Moss, Thera C.: *See—*
Walz, David K.; Howerton, Robert D.; Allen, Andrew W.; Moss, Thera C.; and Kenney, William H., 4,840,770, Cl. 422-49.000.

Motai, Tsuneaki: *See—*
Onishi, Akihumi; Hasegawa, Masakasu; Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; and Yoshida, Shotaro, 4,840,552, Cl. 425-72.100.

Motorola, Inc.: *See—*
Gercekci, Anil; Bron, Michel; and Hudson, Peter D., 4,841,133, Cl. 235-492.000.

Motozato, Yoshiaki: *See—*
Hirayama, Chuichi; Motozato, Yoshiaki; and Ihara, Hirotaka, 4,840,975, Cl. 521-183.000.

Mouchart, Jacques; Villela, Gerard; Dutois, Franck; and Pointu, Bernard, to Compagnie Generale D'Electricite. Multidielectric mirror for carbon dioxide laser providing the mid infrared, in high reflectance with good protection against mechanical attack. 4,840,442, Cl. 350-1.600.

Mowry, Greg S., to Magnetic Peripherals Inc Non linear magnetoresistive sensor. 4,841,398, Cl. 360-113.000.

MRT System Aktiebolag: *See—*
Kulander, Hans, 4,840,314, Cl. 241-24.000.

MTS Systems Corporation: *See—*
Meline, Harry R.; and Paulsen, Eric L., 4,841,226, Cl. 324-61.00R.

MTU Motoren-und Turbinen-Union Muenchen GmbH: *See—*
Sikorski, Siegfried, 4,840,536, Cl. 415-19.000.

Mueller, Gottfried, to Siemens Aktiengesellschaft. Housing for long-field lamps having interchangeable louver insert. 4,841,421, Cl. 362-279.000.

Mueller, Jens, to Werner Turck GmbH Co., KG. Proximity switch immune to interference fields. 4,841,163, Cl. 307-116.000.

Mueller, Rudolf; and Strasser, Ludwig, to Bayerische Motoren Werke Aktiengesellschaft. Wheel suspension for steerable rear wheel on motor vehicles equipped with front wheel steering especially passenger vehicle. 4,840,393, Cl. 280-661.000.

Muerdter, Herbert: *See—*
Hermann, Bernhard; Muerdter, Herbert; Ehresmann, Walter; and Kammerer, Manfred, 4,841,280, Cl. 340-706.000.

Muhlbauer, Johann: *See—*
Zajicek, Ernst; Riegler, Ernst; and Muhlbauer, Johann, 4,841,542, Cl. 373-73.000.

Mukai, Seiichi: *See—*
Hasuo, Masayoshi; Mukai, Seiichi; Saito, Ryo; and Ikuhara, Isao, 4,840,981, Cl. 524-114.000.

Mukaida, Yutaka: *See—*
Takita, Hitoshi; Kimura, Fumihiko; Noda, Sakuo; Mukaida, Yutaka; Nitta, Toyohiko; and Kobayashi, Hidetoshi, 4,841,097, Cl. 560-144.000.

Mulawka, Jan; Konczykowska, Agnieszka; and Bon, Michel, to Etat Francais represente par le Ministre Delegue des Postes et Telecommunications (CNET); and Mulawka, Jan. Biquad block with switched capacitors without continuous feedback loop and with no sensitivity compared with the gain of operational amplifiers and the ratio of the capacitances. 4,841,263, Cl. 33[illegible]-173.000.

Mullay, John J.: *See—*
Forsberg, John W.; Mullay, John J.; and Sohara, Joseph A., 4,840,687, Cl. 149-2.000.

Muller, Hans-Klaus: *See—*
Hassel, Tillmann; Hocker, Jurgen; Heywang, Gerhard; Muller, Hans-Klaus; and Fitzky, Hans G., 4,841,073, Cl. 549-232.000.

Muller, John E., Jr., to Pomona Service & Supply Co., Inc. Paper bag feeder for bag-filling operations and process. 4,840,016, Cl. 53-459.000.

Muller, Klaus-Helmut: *See—*
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, 4,840,66[illegible], Cl. 71-90.000.

Muller, Kurt; and Bohler, Erwin, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Apparatus for delivering ammunition from a container structure to a firing weapon. 4,840,109, Cl. 89-33.140.

Muller, Kurt: *See—*
Hurlemann, Ernst; Muller, Kurt; and Ruppen, Bruno, 4,840,108, Cl. 89-33.140.

Muller, Walter; and Krouskop, Thomas A., to Clayton Foundation for Research. Calibration controller for controlling electrically operated machines. 4,840,634, Cl. 623-24.000.

Munyon, Gary D.: *See—*
Swiech, Matthew J.; Munyon, Gary D.; and Dias, Kenneth J., 4,840,120, Cl. 101-228.000.

Murai, Ryukichi, to Yoshida Kogyo K. K. Cord lock. 4,839,946, Cl. 24-115.00G.

Murai, Takaaki; and Sakai, Katsuhisa, to Daicel Chemical Industries, Ltd. Polyether compounds, epoxy resins and processes for production thereof. 4,841,017, Cl. 525-327.300.

Murakami, Akihiro; Matsunaga, Mitsunobu; and Tanemura, Yasunari, to Toyota Jidosha Kabushiki Kaisha. Controlling method for operation of painting booth. 4,840,116, Cl. 98-115.200.

Murakami, Hideto; and Kitamura, Terukiyo, to Nissan Motor Co., Ltd. Disc brake. 4,840,255, Cl. 188-73.350.

Murakami, Hirosi: *See—*
Ikeda, Hisao; Suzuki, Fumio; Watanabe, Yoshitane; Matsumura, Mitsunobu; Takahashi, Yasuhiro; Murakami, Hirosi; and Maeda, Koichi, 4,840,705, Cl. 162-175.000.

Murakami, Joji; Sibazaki, Syogo; and Terapaku, Junya, to Fujitsu Limited; and Fujitsu Microcomputer Systems Limited. Bit pattern conversion system. 4,841,298, Cl. 341-51.000.

Murakami, Shuichi; and Shimano, Yasunao, to Komatsu Seiren Co., Ltd. Method for treatment of fibrous materials. 4,840,817, Cl. 427-45.100.

Murakami, Teruo; and Seo, Naobumi, to Kabushiki Kaisha Toshiba. Information recording system and reproducing for recording and reproducing information on a magneto-optical disk. 4,841,502, Cl. 369-13.000.

Murakami, Yoichi; and Okawa, Yoshihisa, to NEC Corporation. Servo protection circuit for disk drive. 4,841,384, Cl. 360-60.000.

Muramatsu, Hidenori; Yamada, Kimichika; Nozawa, Katsuya; and Goto, Yoshihiko, to Clarion Co., Ltd. Tape loading apparatus having an arrangement for controlling movement of a guide roller holder arm. 4,841,392, Cl. 360-85.000.

Muramatsu, Mitsuru; and Tominaga, Ryuichiro, to Jujo Paper Co., Ltd. Device for laterally cutting carton case in carton automatic feeding device for a liquid filling machine. 4,840,011, Cl. 53-381.00R.

Murao Boki Kabushiki Kaisha: *See—*
Tadashima, Fumio, 4,840,124, Cl. 104-163.000.

Murase, Masanori; Tomita, Naotaka; and Iida, Kazuyoshi, to Bridgestone Corporation. Noise reducing apparatus. 4,840,251, Cl. 181-206.000.

Murashima, Hirotsugu; Maeda, Satoru; and Hirano, Shunji, to Sanyo Electric Co., Ltd. Automatic focusing circuit for automatically matching focus in response to video signal. 4,841,370, Cl. 358-227.000.

Murata Manufacturing Co., Ltd.: *See—*
Hibino, Eiichi; Kawakita, Kiyoshi; Yamamoto, Takami; Kinoshita, Kazunori; and Takase, Shigeki, 4,841,414, Cl. 361-424.000.
Maeba, Yukio; and Igashira, Kiyoteru, 4,841,425, Cl. 363-21.000.
Yokoi, Tsutomu; Tani, Hiroji; Kasanami, Tohru; Fukui, Norio; and Yamamoto, Keizou, 4,839,960, Cl. 29-620.000.

Murata, Mitsuo: *See—*
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; Taguchi, Minoru; and Sota, Kaoru, 4,841,044, Cl. 540-227.000.

Murata, Mitsuru, to Kabushiki Kaisha Toshiba. Thick-film integrated circuit device capable of being manufactured by means of easy-to-perform trimming operation. 4,841,275, Cl. 338-195.000.

Murayama, Seiichi: *See—*
Kato, Yasuo; Ochiai, Isao; Watanabe, Yoshio; and Murayama, Seiichi, 4,841,556, Cl. 378-119.000.

Murdock, Anthony: *See—*
Ralfs, Colin A.; and Murdock, Anthony, 4,840,070, Cl. 73-818.000.

Muro, Hideo, to Nissan Motor Co., Ltd. Photosensitive position sensor with logarithmic conversion. 4,841,138, Cl. 250-209.000.

Muto, Yoshiyuki: *See—*
Shigeta, Toshio; Muto, Yoshiyuki; and Etani, Tadao, 4,840,320, Cl. 242-58.000.

Mutt, Viktor: *See—*
Gafvelin, Guro; Carlquist, Mats; and Mutt, Viktor, 4,840,785, Cl. 424-9.000.

Muzslay, Steven Z., to ITT Corporation. Barrier wall connector. 4,840,585, Cl. 439-556.000.

N. V. Bekaert S. A.: *See—*
Bourgois, Luc, 4,840,214, Cl. 152-527.000.

Nabae, Motohiro, to Furukawa Aluminum Co., Ltd. Aluminum alloy for the substrate of magnetic disk. 4,840,685, Cl. 148-439.000.

Nabisco Brands, Inc.: *See—*
Polizzano, Robert A., 4,840,803, Cl. 426-94.000.

Nada, Minoru: *See—*
Kusumoto, Toshihiko; Kasamura, Toshirou; Okuda, Naoki; Ohashi, Masashi; Sasaki, Nobukazu; and Nada, Minoru, 4,841,336, Cl. 355-245.000.

Nagai, Hideo, to Yokogawa Medical Systems, Limited. Method of and apparatus for carrying out tomography. 4,841,553, Cl. 378-19.000.

Nagai, Yoichiro; and Matsumoto, Hideyuki, to Mitsui Toatsu Chemicals, Incorporated. Ladder polysilanes. 4,841,083, Cl. 556-430.000.

Nagai, Yutaka: *See—*
Mihashi, Yutaka; Nagai, Yutaka; and Ikeda, Kenji, 4,841,535, Cl. 372-46.000.

Nagaike, Sadanori: *See—*
Imanaka, Tadashi; Takagi, Masayuki; Togawa, Eisei; Saito, Harunobu; Nagaike, Sadanori; Ohura, Masaki; Suzuki, aburo; Kobayashi, Tetsuo; and Kuwatsuka, Shunichiro, 4,841,402, Cl. 360-126.000.

Nagaki, Kazuyoshi: *See—*
Nakamura, Yoshiaki; Marukawa, Kiichi; and Nagaki, Kazuyoshi, 4,841,022, Cl. 528-487.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Speed-change operating lever for a bicycle. 4,840,081, Cl. 74-502.200.

Nagano, Masashi, to Shimano Industrial Company Limited. Pedal for a bicycle. 4,840,085, Cl. 74-594.400.

Nagao, Makoto: *See—*
Sano, Kunihiko; Nagao, Makoto; Nahara, Akira; Nishikawa, Yasuo; and Iwasaki, Hiroyuki, 4,840,843, Cl. 428-336.000.

Nagaosa, Hideo: *See—*
Tanahashi, Toshio; Nakamura, Norihiko; Noguchi, Hiroshi; Nomura, Kenichi; Baika, Toyokazu; Kanamaru, Masanobu; Kobayashi, Tatsuo; Nagaosa, Hideo; Ito, Kazuhiro; Ito, Toshio; and Nakae, Kouichi, 4,840,147, Cl. 123-65.0VD.

Nagasaka, Shoji: *See—*
Fujii, Mamoru; Noda, Kazuo; Nagasaka, Shoji; Tajika, Hiroshi; and Ono, Koji, 4,840,303, Cl. 228-164.000.

Nagasawa, Keizo: *See—*
Sato, Tasuku; Nakanishi, Kiyoshi; Fukumura, Yoshikazu; and Nagasawa, Keizo, 4,840,740, Cl. 252-32.70E.

Nagasawa, Kenichi: *See—*
Iwasaki, Akio; and Nagasawa, Kenichi, 4,841,391, Cl. 360-85.000.

Nagase, Hiroshi: *See—*
Otsu, Akira; and Nagase, Hiroshi, 4,840,863, Cl. 430-110.000.

Nagata, Eiji: *See—*
Wada, Kenzo; and Nagata, Eiji, 4,841,353, Cl. 357-51.000.

Nagata, Shiro: *See—*
Kobayashi, Hideki; Ikeda, Minoru; Saito, Koichi; Nagata, Shiro; and Horino, Koichi, 4,840,873, Cl. 430-273.000.

Nagatomo, Masakatsu: *See—*
Onogi, Yasuharu; Oka, Akinori; Nagatomo, Masakatsu; Kondo, Takumi; and Mizumoto, Kouji, 4,840,834, Cl. 428-211.000.

Nahara, Akira: *See—*
Sano, Kunihiko; Nagao, Makoto; Nahara, Akira; Nishikawa, Yasuo; and Iwasaki, Hiroyuki, 4,840,843, Cl. 428-336.000.

Naito, Koichi: *See—*
Inoue, Nanao; Saito, Koichi; Kato, Ryoki; Fujimagari, Hiroshi; Fujimura, Yoshihiko; Kato, Seiichi; Naito, Koichi; and Horie, Kiyoshi, 4,841,312, Cl. 346-160.00R.

Naji, Hooshang: *See—*
Clyne, Carl W.; Woolever, Gary L.; Teng, James; and Naji, Hooshang, 4,841,457, Cl. 364-557.000.

Nakacho, Yoshifumi; Tada, Yuji; and Yamada, Sinichi, to Otsuka Kagaku Kabushiki Kaisha. Allyl group-containing oligoethyleneoxypolyphosphazenes, process for their preparation, and their use. 4,840,856, Cl. 429-192.000.

Nakae, Kouichi: *See—*
Tanahashi, Toshio; Nakamura, Norihiko; Noguchi, Hiroshi; Nomura, Kenichi; Baika, Toyokazu; Kanamaru, Masanobu; Kobayashi, Tatsuo; Nagaosa, Hideo; Ito, Kazuhiro; Ito, Toshio; and Nakae, Kouichi, 4,840,147, Cl. 123-65.0VD.

Nakagawa, Tatsushi: *See—*
Harada, Yukihiko; Nakagawa, Tatsushi; Kanesaka, Junichiro; and Kaneshige, Yousuke, 4,840,849, Cl. 428-419.000.

Nakagawa, Toru, Kubota, Hitoshi; and Sakurai, Yasuo, to Matsushita Electric Industrial Co., Ltd. Method of teaching a path to a moving body. 4,841,430, Cl. 364-167.010.

Nakajima, Kiyoji. Web winding and/or rewinding shaft structure. 4,840,323, Cl. 242-72.00B.

Nakajima, Shunichi; and Izawa, Koji, to Kabushiki Kaisha Toshiba. Image-resolution conversion apparatus for converting a pixel-density of image data. 4,841,375, Cl. 353-280.000.

Nakajima, Toshio: *See—*
Hirabayashi, Shigefumi; and Nakajima, Toshio, 4,840,243, Cl. 180-140.000.

Nakajima, Toshiyuki: *See—*
Kushibiki, Nobuo; Nose, Noriyuki; Nakajima, Toshiyuki; Baba, Takeshi; Matsugu, Masakazu; and Niwa, Yukichi, 4,840,473, Cl. 350-484.000.

Nakamura, Atsumi: *See—*
Kaneko, Shoji; and Nakamura, Atsumi, 4,841,558, Cl. 378-182.000.

Nakamura, Hitoshi; Sakano, Shinji; Inoue, Hiroaki; Katsuyama, Toshio; and Matsumura, Hiroyoshi, to Hitachi Cable, Ltd.; and Hitachi, Ltd. Photo semiconductor device having a multi-quantum well structure. 4,840,446, Cl. 350-96.130.

Nakamura, Hitoshi: *See—*
Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; Nakamura, Hitoshi; Kobayashi, Tetsuo; Takeura, Tooru; and Momata, Kazuhiro, 4,841,399, Cl. 360-113.000.
Kokabu, Misao; Nakamura, Hitoshi; Fujimura, Takashi; and Hayashi, Nobuyasu, 4,841,315, Cl. 354-1.000.
Ohishi, Aiko; Hirao, Motohisa; Chinone, Naoki; Tsuji, Shinji; Nakamura, Hitoshi; and Matsumura, Hiroyoshi, 4,841,536, Cl. 372-46.000.

Nakamura, Ikushi: *See—*
Yamamoto, Kouji; Tominaga, Shinji; Yamanaka, Akira; Ueda, Hiroshi; Taniguchi, Nobuyuki; Nakamura, Ikushi; and Iwata, Michihiro, 4,841,318, Cl. 354-173.100.

Nakamura, Kazunari: *See—*
Kiyoura, Kazuhiro; Endo, Fumio; Kimura, Toshiyuki; Aoyagi, Yoshio; and Nakamura, Kazunari, 4,841,506, Cl. 369-32.000.

Nakamura, Kensaku. Rotational screw for mixing. 4,840,492, Cl. 366-81.000.

Nakamura, Kikuo: *See—*
Nakamura, Shunichi; Iimura, Kouichi; Nakamura, Kikuo; and Ozawa, Susumu, 4,840,290, Cl. 221-10.000.

Nakamura, Koki, to Fuji Photo Film Co., Ltd. Silver halide photographic materials. 4,840,887, Cl. 430-564.000.

Nakamura, Masanobu, to Mitsui & Co., Ltd.; and Kokan Kako Co., Ltd. Method for manufacturing a pipe with projections. 4,840,053, Cl. 72-58.000.

Nakamura, Naoyuki; and Sangen, Masashi, to Matsushita Electronics Corporation. Fluorescent lamp device with incandescent bulb type base cap. 4,841,193, Cl. 313-318.000.

Nakamura, Norihiko: *See—*
Tanahashi, Toshio; Nakamura, Norihiko; Noguchi, Hiroshi; Nomura, Kenichi; Baika, Toyokazu; Kanamaru, Masanobu; Kobayashi, Tatsuo; Nagaosa, Hideo; Ito, Kazuhiro; Ito, Toshio; and Nakae, Kouichi, 4,840,147, Cl. 123-65.0VD.

Nakamura, Shozo; Mathusima, Tokunori; and Tsuji, Kunio, to Hitachi, Ltd. Method of and apparatus for controlling steam vent volume of moisture separator reheaters. 4,840,766, Cl. 376-378.000.

Nakamura, Shunichi; Iimura, Kouichi; Nakamura, Kikuo; and Ozawa, Susumu, to Kabushiki Kaisha Sigma. Bulk loaded coin dispensing machine. 4,840,290, Cl. 221-10.000.

Nakamura, Toshiyuki: *See—*
Morishita, Etsuo; Kakuda, Masayuki; Sugihara, Masahiro; Inaba, Tsutomu; Nakamura, Toshiyuki; and Kimura, Tadashi, 4,840,549, Cl. 418-55.000.

Nakamura, Tsutomu: *See—*
Sawaki, Toru; Sasaki, Hideharu; Nakamura, Tsutomu; and Sadanobu, Jiro, 4,840,762, Cl. 264-29.200.

Nakamura, Yasunari: *See—*
Kashihara, Yuji; Tage, Yutaka; Nakamura, Yasunari; Ito, Hiroshi; and Takahashi, Tokuyuki, 4,840,247, Cl. 180-249.000.

Nakamura, Yoshiaki; Marukawa, Kiichi; and Nagaki, Kazuyoshi, to Tohpren, Co., Ltd. Method for removing impurities from polyphenylene sulfide resin. 4,841,022, Cl. 528-487.000.

Nakanishi, Akira: *See—*
Someya, Shinzo; Koura, Seigo; Ito, Mikio; Nakanishi, Akira; and Nonaka, Yuji, 4,841,035, Cl. 546-270.000.

Nakanishi, Kiyoshi: *See—*
Sato, Tasuku; Nakanishi, Kiyoshi; Fukumura, Yoshikazu; and Nagasawa, Keizo, 4,840,740, Cl. 252-32.70E.

Nakanishi, Nobuyasu: *See—*
Kuromitsu, Hiromu; Nakanishi, Nobuyasu; Shirai, Akira; and Noguchi, Noboru, 4,840,544, Cl. 417-254.000.

Nakanishi, Yoshiyuki: *See—*
Ikeda, Noriaki; Sugishima, Noboru; Fujii, Yasushi; Ikuta, Shinji; Nakanishi, Yoshiyuki; and Inoue, Akira, 4,840,749, Cl. 260-378.000.

Nakano, Kenji, to Sony Corporation. Data signal reproducing apparatus. 4,841,385, Cl. 360-65.000.

Nakano, Masaaki; Watanabe, Syoyu; Saito, Yusaku; and Iwata, Syuji, to Mitsubishi Denki Kabushiki Kaisha. Display unit. 4,841,290, Cl. 340-707.000.

Nakano, Masakimi: *See—*
Okada, Tatsuo; Sumiya, Sadao; and Nakano, Masakimi, 4,840,059, Cl. 73-119.00A.

Nakano, Motoo, to Fujitsu Limited. Semiconductor photodetector device with light responsive PN junction gate. 4,841,349, Cl. 357-30.000.

Nakano, Shoichi: *See—*
Takeuchi, Masaru; Fukatsu, Takeo; Nakano, Shoichi; Kuwano, Yukinori; Minami, Koji; and Iwamoto, Masayuki, 4,841,328, Cl. 355-211.000.

Nakano, Tsuyoshi: *See—*
Uchiyama, Hiromi; and Nakano, Tsuyoshi, 4,839,964, Cl. 30-43.600.

Nakata, Tetsuya: *See—*
Toda, Fumio; Tanaka, Koichi; and Nakata, Tetsuya, 4,841,081, Cl. 549-541.000.

Nakatani, Kazuo: *See—*
Ikoma, Mitsuhiro; Nakatani, Kazuo; Yoshida, Yuji; Tomizawa, Takeshi; and Arita, Koji, 4,840,042, Cl. 62-324.100.

Nakayama, Hiromichi, to Nifco, Inc. Device for fastening bar-like objects. 4,840,333, Cl. 248-68.100.

Nakayama, Nobuhiro; Asahina, Yasuo; Fushimi, Hiroyuki; and Iwamoto, Yasuaki, to Ricoh Company, Ltd. Triboelectric charge application member for toner. 4,841,331, Cl. 355-245.000.

Nakayama, Noritaka: *See—*
Iijima, Toshifumi; Kumashiro, Kenji; Kashiwagi, Hiroshi; Hatta, Koichi; Hotta, Yuji; Ohya, Hiroko; Nakayama, Noritaka; Kawakatsu, Satoshi; Katoh, Katsunori; and Shinozaki, Kaoru, 4,840,886, Cl. 430-558.000.

Nakayama, Rinichi; Yoshida, Yasunori; and Iwama, Satoshi, to Toyo Tire & Rubber Co., Ltd. Rubber composition for tire tread. 4,840,988, Cl. 524-476.000.

Nakayama, Yasuyuki; and Sada, Tomoya, to Mizoguchi Manufacturing Company Limited. Sighting apparatus with automatic correction mechanism. 4,841,136, Cl. 250-231.00R.

Nakazawa, Isao: *See—*
Yamada, Yasuyuki; and Nakazawa, Isao, 4,840,466, Cl. 350-422.000.

Nakazawa, Kogi; and Fujita, Toshihito, to Nitto Boseki Co., Ltd. Method of and apparatus for producing compacted chopped strands. 4,840,755, Cl. 264-15.000.

Nakazyo, Kiyoshi: *See—*
Hirose, Takeshi; Furutachi, Nobuo; Aoki, Kozo; Nakazyo, Kiyoshi; and Furusawa, Genichi, 4,840,878, Cl. 430-380.000.

Nakeuchi, Fumiko: *See—*
Wada, Akio; Nakeuchi, Fumiko; and Nishizawa, Seiji, 4,841,145, Cl. 250-304.000.

Namba, Hideaki: *See—*
Kamei, Eiichi; and Namba, Hideaki, 4,840,245, Cl. 180-179.000.

Nambu, Yoko: *See—*
Endo, Takeshi; Nambu, Yoko; and Yamamoto, Kazutoshi, 4,841,058, Cl. 546-257.000.

Namiki, Tetsuro; Furuse, Masayasu; Kuroyanagi, Yoshimitsu; Miyata, Teruo; and Suzuki, Takashi, to Koken Co., Ltd.; and Shiseido Co., Ltd. Surfactant composed of acylated collagen or acylated gelatine and a production process thereof. 4,840,937, Cl. 514-21.000.

Nara, Kenichi; and Takahashi, Ryoichi, to Sanden Corporation. Display cabinet. 4,840,439, Cl. 312-116.000.

Narayanan, G. Hari: *See—*
Curtis, R. Eugene; Narayanan, G. Hari; and Quist, William E., 4,840,682, Cl. 148-12.70A.

Nartron Corporation: *See—*
Wilhelm, Daniel D., 4,841,198, Cl. 315-82.000.

Naruo, Kyoichi: *See—*
Sasaki, Jun; Adachi, Atsushi; Naruo, Kyoichi; Shinagawa, Yukio; and Ohtani, Sumio, 4,840,733, Cl. 210-500.410.

Naruse, Katutoshi: *See*—
Takagi, Masayoshi, Yoshioka, Yoshio; Matsuzaki, Tetsuo; Noro, Shuhei; Ikawa, Syouji; and Naruse, Katutoshi, 4,841,431, Cl. 364-187.000.

Naser, Georg; Reichenberger, Helmut; and Schwark, Hubert, to Siemens Aktiengesellschaft. Shock wave source with increased degree of effectiveness. 4,840,166, Cl. 128-24.00A.

Nash, Dudley O.; Knight, Glenn L., Jr.; and Bertke, James H., to United States of America, Air Force. Band clamp apparatus. 4,840,026, Cl. 60-271.000.

Nass, Ludvig. Pump for liquids and gases. 4,840,546, Cl. 417-403.000.

Nassler, Peter: *See*—
Birkholz, Ulrich; Haertl, Christof; and Nassler, Peter, 4,840,249, Cl. 181-129.000.

Nasu, Katsuaki: *See*—
Matsuura, Ryo; Yoshimura, Shigeyuki; Asanuma, Yasuo; Nasu, Katsuaki; Yoshizumi, Haruo; Tsujimoto, Kazumi; and Kimura, Toshiyuki, 4,840,932, Cl. 502-202.000.

Nathans, Gene R.; and Rosenstein, Robert W., to Becton Dickinson and Company. Purification of antibodies. 4,841,024, Cl. 530-387.000.

National Distillers and Chemical Corporation: *See*—
Wasileski, John M., 4,840,900, Cl. 435-96.000.

National Research Development Corporation: *See*—
Cobbold, Stephen P.; and Waldmann, Herman, 4,841,025, Cl. 530-387.000.
Hider, Robert C.; Kontoghiorghes, George; and Silver, Jack, 4,840,958, Cl. 514-348.000.

National Semiconductor Corporation: *See*—
Millhollan, Michael S.; and Sung, Chiakang, 4,841,176, Cl. 307-475.000.

Naviasky, Eric H.: *See*—
Lampe, Donald R.; Mentzer, Mark A.; and Naviasky, Eric H., 4,841,480, Cl. 365-87.000.

NCR Corporation: *See*—
Grey, Michael O., 4,840,502, Cl. 400-196.000.
Heys, George, Jr.; Yandora, Andrew E.; and McDowell, Philip D., 4,841,412, Cl. 361-393.000.
Ranger, Michael H.; Lim, Esther H.; and Grady, Robert J., 4,841,343, Cl. 355-77.000.
Yon, Steven A.; and Diaz, Luis A., 4,841,160, Cl. 307-66.000.

NDT Instruments, Inc.: *See*—
Botsco, Ronald J.; Jones, Robert L.; and Methe, David E., 4,840,066, Cl. 73-597.000.

NEC Corporation: *See*—
Aso, Akira, 4,841,352, Cl. 357-45.000.
Demura, Shigeki; and Oura, Toshio, 4,841,487, Cl. 365-230.010.
Ichihara, Masaki, 4,841,301, Cl. 341-126.000.
Kage, Kouzou, 4,841,571, Cl. 380-31.000.
Kimura, Yasuo, 4,841,508, Cl. 361-45.000.
Kinbara, Kouji, 4,840,924, Cl. 437-189.000.
Matsumoto, Takashi, 4,840,921, Cl. 437-8[illegible]0.000.
Minata, Shigeki; and Mori, Toshihiro, 4,840,571, Cl. 439-76.000.
Murakami, Yoichi; and Okawa, Yoshihisa, 4,841,384, Cl. 360-60.000.
Nishio, Makoto, 4,841,519, Cl. 370-3.000.
Saegusa, Noboru, 4,841,167, Cl. 307-269.000.
Sanada, Kohji, 4,841,488, Cl. 365-233.000.
Sugiyama, Takahiro; and Sugawara, Mitsutoshi, 4,841,177, Cl. 307-494.000.
Tamai, Hideki, 4,840,845, Cl. 428-336.000.
Wada, Kenzo; and Nagata, Eiji, 4,841,351, Cl. 357-51.000.
Watanabe, Takaya; and Fushimi, Shigeo, 4,841,265, Cl. 333-194.000.
Yonezu, Kazuya; and Matsumoto, Keiji, 4,841,440, Cl. 364-200.000.

NEC Home Electronics Ltd.: *See*—
Katagiri, Toshiyuki; and Marukado, Kazuhisa, 4,841,366, Cl. 358-167.000.

Neefe, Charles W., to Sunsoft Corp. Dyed color change contact lens. 4,840,477, Cl. 351-162.000.

Neil, Gary A.; and Ferguson, Edward H. F., to TRW United-Carr Ltd. Clips with overlapping engagement members. 4,840,345, Cl. 248-74.200.

Nejigaki, Tatuo; and Kakutani, Yoshimi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for sterilizing a filtration device. 4,840,769, Cl. 422-26.000.

Neko, Noriaki, to Fanuc Ltd. Metering method of injection molding machine. 4,841,211, Cl. 318-569.000.

Nelson, Joyce K.: *See*—
Williams, Samuel C.; Bikson, Benjamin; Nelson, Joyce K.; and Burchesky, Robert D., 4,840,819, Cl. 427-245.000.

Nerger, Uwe: *See*—
Matthias, Klaus; Baumann, Karl-Heinz; Schick, Gerald; Disson, Arno; Moller, Hermann; Seel, Holger; Topfer, Claus; Nerger, Uwe; Thiele, Peter; and Fleisch, Eugen, 4,840,398, Cl. 280-756.000.

Nerheim, Eldon, to Honeywell Inc. Integrated silicon plasma switch. 4,840,122, Cl. 102-202.500.

Nervina, Eugene E. Air conditioner wall sleeve. 4,840,041, Cl. 62-263.000.

Nestec S.A.: *See*—
Hsu, Sheng H., 4,840,809, Cl. 426-285.000.

Neustadt, Bernard R.: *See*—
Watkins, Robert; Doll, Ronald J.; Neustadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., 4,840,772, Cl. 422-61.000.

Neuwirth, Helmuth: *See*—
De Luca, Paul V.; and Neuwirth, Helmuth, 4,840,572, Cl. 439-92.000.

Neuwirth, Manfred: *See*—
Sander, Bruno; Lauer, Herbert; and Neuwirth, Manfred, 4,840,736, Cl. 210-727.000.

New York Blood Center, Inc.: *See*—
Horowitz, Bernard, 4,841,023, Cl. 530-351.000.

NGK Insulators, Ltd.: *See*—
Matsuzawa, Soichiro, 4,841,400, Cl. 360-125.000.
Mizutani, Isao; Hijikata, Toshihiko; and Harada, Takashi, 4,840,827, Cl. 428-116.000.

NGK Spark Plug Co., Ltd.: *See*—
Banno, Hisao, 4,841,494, Cl. 367-157.000.
Iio, Satoshi; and Okuno, Akiyasu, 4,840,853, Cl. 428-698.000.
Kojima, Takao; and Yamada, Tetsusyo, 4,840,854, Cl. 428-698.000.

Nguyen, Loc H. Transfer apparatus for semiconductor wafers. 4,840,530, Cl. 414-404.000.

Nice-Pak Products, Inc.: *See*—
Caputo, Garry L.; Saldarelli, Thomas A.; and Dwan, William E., 4,840,270, Cl. 206-205.000.

Nickol, Robert G.: *See*—
Just, Ernst K.; and Nickol, Robert G., 4,841,040, Cl. 536-105.000.

Niemann, Edwin H.: *See*—
Arch, Paul E.; and Niemann, Edwin H., 4,840,759, Cl. 264-53.000.

Nieng, Kenneth Y.: *See*—
Hakim, Shafik J.; Locher, Mark R.; Nieng, Kenneth Y.; and Vagnozzi, Barbara A., 4,841,433, Cl. 364-200.000.

Nierescher, David; and Yip, Douglas, to Data I/O Corporation. Zero insertion force socket for surface-mounted integrated circuits. 4,840,576, Cl. 439-331.000.

Nifco, Inc.: *See*—
Kikuchi, Akio, 4,840,334, Cl. 248-73.000.
Kimisawa, Toshihide, 4,840,001, Cl. 52-208.000.
Kuriharz, Kazumasa, 4,840,522, Cl. 411-44.000.
Nakayama, Hiromichi, 4,840,333, Cl. 248-68.100.
Oshida, Tsutomu, 4,840,523, Cl. 411-48.000.

Nihei, Mitsuo: *See*—
Sobue, Masahisa; Okada, Sensuke; Akahori, Kimihiko; Kuniya, Keiichi; Sasaki, Toshimi; Kajiwara, Toshiyuki; Kimura, Tomoaki; and Nihei, Mitsuo, 4,839,949, Cl. 29-132.000.

Nihon Bunko Kogyo Kabushiki Kaisha: *See*—
Wada, Akio; Nakeuchi, Fumiko; and Nishizawa, Seiji, 4,841,145, Cl. 250-304.000.

Nihon Shinku Gijutsu Kabushiki Kaisha: *See*—
Takayama, Kazuo; Yabe, Eiji; Takagi, Kenichi; Fukui, Ryota; and Kikuchi, Riichi, 4,841,197, Cl. 315-111.810.

Nitsuma, Teruo: *See*—
Okamoto, Takeshi; Nitsuma, Teruo; and Minagawa, Shoichi, 4,841,470, Cl. 364-821.000.

Nijhawan, Subash-Chander; Daniel, Horst; and Dennstedt, Welf, to Varta Batterie Aktiengesellschaft. Galvanic primary element with negative lithium electrode. 4,840,857, Cl. 429-197.000.

Nikken Chemicals Company, Limited: *See*—
Kondou, Tsutomu, 4,840,804, Cl. 426-103.000.

Nikon Corporation: *See*—
Hoshino, Kunihisa, deceased; Hamanishi, Yoshinari; and Utagawa, Ken, 4,841,325, Cl. 354-402.000.
Moriyama, Keiji, 4,840,469, Cl. 350-127.000.
Ogasawara, Akira, 4,841,324, Cl. 354-402.000.

Nilsson, Ingmar, to TX Controls AB. Push-pull control, e.g., a hand throttle or stop control for internal combustion engines. 4,840,079, Cl. 74-500.500.

Ninomiya, Hidetaka: *See*—
Masukawa, Toyoaki; Ninomiya, Hidetaka; and Iizuka, Hiroyuki, 4,840,883, Cl. 430-553.000.

Nippon Cable System, Inc.: *See*—
Kobayashi, Tetuo; and Hirai, Shoichi, 4,840,080, Cl. 74-501.50R.

Nippon Gosei Kaagaku Kogyo: *See*—
Miyashita, Masahiko, 4,841,096, Cl. 560-126.000.

Nippon Kayaku Kabushiki Kaisha: *See*—
Ototake, Satoshi; Matsunaga, Ryozo; and Furusawa, Masao, 4,841,034, Cl. 534-701.000.
Shiozawa, Akira; Ichikawa, Yuh-Ichiro; and Takahira, Takashi, 4,841,051, Cl. 544-287.000.

Nippon Seiko Co., Ltd.: *See*—
Katahira, Masayuki, 4,840,077, Cl. 74-424.8NA.

Nippon Seiko Kabushiki Kaisha: *See*—
Aida, Akira; and Ikeda, Toshihiro, 4,840,153, Cl. 123-90.550.
Matsunaga, Shigeki; Ishikawa, Yuichi; and Hosoya, Masachi, 4,841,408, Cl. 361-220.000.
Yamamoto, Kazuo; Ono, Katsuyasu; and Yamamuro, Shinichi, 4,840,402, Cl. 280-804.000.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Hino, Youichi; Shimasaki, Yuuji; and Ueshima, Michio, 4,841,060, Cl. 546-184.000.
Ikeda, Noriaki; Sugishima, Noboru; Fujii, Yasushi; Ikuta, Shinji; Nakanishi, Yoshiyuki; and Inoue, Akira, 4,840,749, Cl. 260-378.000.
Shimasaki, Yuuji; Ueshima, Michio; Tuneki, Hideaki; and Ariyoshi, Kimio, 4,841,061, Cl. 546-184.000.

Nippon Soken, Inc.: *See*—
Nishida, Minoru; Mizuno, Naohito; Hattori, Tadashi; Huzino, Seizi; and Ando, Yoshiyasu, 4,840,067, Cl. 73-726.000.

Nippon Steel Corporation: *See*—
Kimura, Akira; Kashiwabara, Hiroshi; and Fujiyama, Hirohisa, 4,841,116, Cl. 219-73.100.

Nippon Unicar Kabushiki Kaisha: *See*—
Chigami, Makoto; Ogihara, Sumio; Hoaki, Hiroshi; Kondo, Tomonobu; and Okamura, Masao, 4,840,823, Cl. 428-35.500.

Nippondenso Co., Ltd.: *See*—
Kamei, Eiichi; and Namba, Hideaki, 4,840,245, Cl. 180-179.000.
Okada, Tatsuo; Sumiya, Sadao; and Nakano, Masakimi, 4,840,059, Cl. 73-119.00A.
Saburi, Toshiki; Ohya, Nobuyuki; Yamazaki, Toru, and Katoh, Taisei, 4,840,926, Cl. 501-134.000.
Sakane, Takaaki; and Takeuchi, Kazuhiro, 4,840,541, Cl. 416-223.00R.
Ushida, Masahiko; and Shibata, Hitoshi, 4,841,155, Cl. 250-463.100.

Nisato, Dino: *See*—
Wagnon, Jean; Guegan, Remy; LaCour, Colette; and Nisato, Dino, 4,840,935, Cl. 514-18.000.

Nishida, Minoru; Mizuno, Naohito; Hattori, Tadashi; Huzino, Seizi; and Ando, Yoshiyasu, to Nippon Soken, Inc. Semiconductor pressure sensor with method diaphragm. 4,840,067, Cl. 73-726.000.

Nishiguchi, Yasuo: *See*—
Sasaki, Akira; Takahashi, Yoshihito; Hakoyama, Akiyoshi; Mikami, Katsumasa; Suzaki, Masafumi; Honma, Takeo; Yasutomi, Tsuyoshi; Shiraishi, Ryoichi; and Nishiguchi, Yasuo, 4,840,500, Cl. 400-120.000.

Nishihara Engineering Company, Ltd.: *See*—
Watanabe, Takashi, 4,839,927, Cl. 4-211.000.

Nishijima, Toshihisa: *See*—
Yoshida, Hideo; Inoue, Tohru; Yamagishi, Atsuhiro; Oda, Yoshiaki; Ozaki, Minoru; and Nishijima, Toshihisa, 4,841,300, Cl. 341-94.000.

Nishikawa, Atsuhiko; Miyazaki, Yoshihiro; Tanji, Masayuki; Takaya, Soichi; and Yamaguchi, Shinichiro, to Hitachi, Ltd. Method for restarting execution interrupted due to page fault in a data processing system. 4,841,439, Cl. 364-200.000.

Nishikawa, Hiroaki: *See*—
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.

Nishikawa, Yasuo: *See*—
Sano, Kunihiko; Nagao, Makoto; Nahara, Akira; Nishikawa, Yasuo; and Iwasaki, Hiroyuki, 4,840,843, Cl. 428-336.000.

Nishiki, Hiroyuki; and Kokuryu, Yuji, to Toyoda Gosei Co., Ltd. Hose intermediate retainer. 4,840,408, Cl. 285-62.000.

Nishimoto, Naomichi; Okauchi, Takeshi; and Kido, Koichi, to Victor Company of Japan, Ltd. Control pulse recording circuit for magnetic recording and reproducing apparatus. 4,841,383, Cl. 360-33.100.

Nishimura, Kotaro: *See*—
Ikeda, Shuji; Meguro, Satoshi; Nishimura, Kotaro; Yamamoto, Sho; and Tanimura, Nobuyoshi, 4,841,481, Cl. 365-154.000.

Nishimura, Takashi: *See*—
Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 4,840,844, Cl. 428-336.000.

Nishimura, Yukuo: *See*—
Miyazaki, Toshihiko; Sakai, Kunihiro; Tomida, Yoshinori; Sugata, Hiroyuki; Matsuda, Hiroshi; and Nishimura, Yukuo, 4,840,821, Cl. 427-430.100.

Nishio, Koji: *See*—
Furukawa, Nobuhiro; Nishio, Koji; and Yoshinaga, Noriyuki, 4,840,858, Cl. 429-197.000.

Nishio, Makoto, to NEC Corporation. Apparatus for discriminating an optical signal from others and an apparatus for tuning an optical wavelength filter used in the same. 4,841,519, Cl. 370-3.000.

Nishiyama, Mikio; Yoshino, Tatsuo; and Akimoto, Taizo, to Fuji Photo Film Co., Ltd. Apparatus for recording CRT image. 4,841,371, Cl. 358-244.000.

Nishizawa, Jun-ichi. Static induction photothyristor having a non-homogeneously doped gate. 4,841,350, Cl. 357-30.000.

Nishizawa, Seiji: *See*—
Wada, Akio; Nakeuchi, Fumiko; and Nishizawa, Seiji, 4,841,145, Cl. 250-304.000.

Nishizawa, Shigeki; Takemoto, Iwao; Miyazawa, Toshio; and Izawa, Tetsurou. Solid state imaging device with an arrangement for providing a high speed scan or omitting scanning in an unnecessary pick-up range. 4,841,369, Cl. 358-213.260.

Nissan Chemical Industries, Ltd.: *See*—
Fujikawa, Yoshihiro; Wakamatsu, Masazumi; Fukui, Mariko; and Miyasaka, Tadashi, 4,841,068, Cl. 548-365.000.
Ikeda, Hisao; Suzuki, Fumio; Watanabe, Yoshitane; Matsumura, Mitsunobu; Takahashi, Yasuhiro; Murakami, Hirosi; and Maeda, Koichi, 4,840,705, Cl. 162-175.000.

Nissan Motor Company Ltd.: *See*—
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Nishimoto, Naomichi; Okauchi, Takeshi; and Kido, Koichi, 4,841,383, Cl. 360-33.100.
Okawa, Tadashi: *See*—
Suzuki, Toshio; and Okawa, Tadashi, 4,840,693, Cl. 156-329.000.
Okawa, Yoshihisa: *See*—
Murakami, Yoichi; and Okawa, Yoshihisa, 4,841,384, Cl. 360-60.000.
Oki Electric Industry Co., Ltd.: *See*—
Tomikawa, Arifumi; and Yasukawa, Nihiko, 4,840,258, Cl. 190-102.000.
Okubo, Kazuo: *See*—
Okada, Yoshimi; Kimura, Masao; and Okubo, Kazuo, 4,841,216, Cl. 322-10.000.
Okuda, Naoki: *See*—
Kasamura, Toshirou; Takagi, Masafumi; Okuda, Naoki; Ohashi, Masashi; Kusumoto, Toshihiko; Sasaki, Nobukazu; Maeda, Yasunori; and Ikeda, Masamichi, 4,841,329, Cl. 355-245.000.
Kusumoto, Toshihiko; Kasamura, Toshirou; Okuda, Naoki; Ohashi, Masashi; Sasaki, Nobukazu; and Nada, Minoru, 4,841,336, Cl. 355-245.000.
Okuhara, Hisakazu: *See*—
Higuchi, Kazuo; Tabata, Hiroshi; Okuhara, Hisakazu; Saruwatari, Hidetoshi; and Akiyama, Akihiko, 4,840,325, Cl. 242-107.200.
Okumoto, Toyoharu: *See*—
Oishi, Konosuke; Okumoto, Toyoharu; Tobe, Hayato; and Tsukada, Masamichi, 4,840,484, Cl. 356-312.000.
Okumura, Atsuo, to Toyota Jidosha Kabushiki Kaisha. Double air-fuel ratio sensor system having improved exhaust emission characteristics. 4,840,027, Cl. 60-274.000.
Okumura, Masahide: *See*—
Takada, Keiji; Okumura, Masahide; Fukuhara, Satoru; Morimura, Toshiyuki; Hosaka, Sumio; and Hosoki, Shigeyuki, 4,841,191, Cl. 310-317.000.
Okumura, Seigo: *See*—
Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Urashima, Hidetoshi, 4,840,640, Cl. 8-506.000.
Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Kubo, Shinji, 4,841,057, Cl. 546-183.000.
Okuno, Akiyasu: *See*—
Iio, Satoshi; and Okuno, Akiyasu, 4,840,853, Cl. 428-698.000.
Okuwaki, Toyoji: *See*—
Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 4,840,844, Cl. 428-336.000.
Oldani, Diego: *See*—
Gatti, Gaetano; Oldani, Diego; Confalonieri, Carlo; and Gambini, Luciano, 4,840,938, Cl. 514-34.000.
Olin Corporation: *See*—
Pryor, Michael J., 4,840,654, Cl. 65-18.100.
Olivier, Jacques: *See*—
Schwegler, Patrice; Debrie, Jean-Jacques; Clement, Bernard; Moreaux, Francois; and Olivier, Jacques, 4,840,353, Cl. 266-80.000.
Olsen, Robert J., to Amoco Corporation. Ammonolysis-alkylation reactions using ammonia and an alcohol to prepare N-alkyl maleimides and N-alkyl succinimides. 4,841,069, Cl. 548-545.000.
Olsson, Sven G.; and Jonson, Bjorn, to Siemens Elema AB. Respirator and a method of utilizing the respirator to promote blood circulation. 4,840,167, Cl. 128-28.000.
Olympus Optical Co., Ltd.: *See*—
Ohno, Kunio, 4,840,176, Cl. 128-303.140.

Takada, Katsuhiro; and Yamanashi, Takanori, 4,840,467, Cl. 350-427.000.
Yoshizawa, Akihiko, 4,841,510, Cl. 369-[illegible]6.000.
Omi, Toshihiro: *See*—
Kabaya, Yoshihiko; Yasuda, Naofumi; and Omi, Toshihiro, 4,840,488, Cl. 356-374.000.
Omron Tateisi Electronics Co.: *See*—
Moroe, Tomomi, 4,840,344, Cl. 248-676.000.
Sakakino, Takahiro; Ohmori, Koji; Yoshimura, Takashi; Kazusaka, Shoji; and Sunagawa, Yoshitaka, 4,841,109, Cl. 200-302.100.
Omura, Takashi: *See*—
Kayane, Yutaka; Omura, Takashi; Tezuka, Yasuo; and Sone, Hideharu, 4,841,027, Cl. 534-599.000.
Morimitsu, Toshihiko; Kikkawa, Sadanobu; Harada, Naoki; and Omura, Takashi, 4,841,032, Cl. 534-64[illegible].000.
Morimitsu, Toshihiko; Kikkawa, Sadanobu; Harada, Naoki; and Omura, Takashi, 4,841,033, Cl. 534-64[illegible].000.
Sawamoto, Hirokazu; Omura, Takashi; and Harada, Naoki, 4,841,048, Cl. 544-74.000.
Onda, Kenichi: *See*—
Miyazaki, Hideki; Onda, Kenichi; and Matsuda, Yasuo, 4,841,427, Cl. 363-62.000.
Onishi, Akihumi; Hasegawa, Masakasu; Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; and Yoshida, Shotaro, to Fujikura Ltd. Apparatus for continuously producing heat-shrinkable crosslinked resin tube. 4,840,552, Cl. 425-72.100.
Onishi, Masanari: *See*—
Ishida, Muneo; Yamashita, Mithuo; Onishi, Masanari; and Tanaka, Masahiro, 4,840,104, Cl. 84-437.000.
Onishi, Sei: *See*—
Takahashi, Akira; Kamimura, Testuro Kawamura, Masahiko; Morikawa, Kiyoshi; and Onishi, Sei, 4,841,499, Cl. 369-38.000.
Onizawa, Yoshio: *See*—
Izuka, Akihiro; Onizawa, Yoshio; and Yamashita, Mitsuru, 4,841,501, Cl. 369-13.000.
Ono, Katsuyasu: *See*—
Yamamoto, Kazuo; Ono, Katsuyasu; and Yamamuro, Shinichi, 4,840,402, Cl. 280-804.000.
Ono, Koji: *See*—
Fujii, Mamoru; Noda, Kazuo; Nagasaka, Shoji; Tajika, Hiroshi; and Ono, Koji, 4,840,303, Cl. 228-164.000.
Ono, Kouji: *See*—
Kawasaki, Mikio; Shiozawa, Hiroaki; Fukuouji, Kakujulo; and Ono, Kouji, 4,840,888, Cl. 430-567.000
Ono, Motoyuki: *See*—
Onishi, Akihumi; Hasegawa, Masakasu; Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; and Yoshida, Shotaro, 4,840,552, Cl. 425-72.100.
Onodera, Akira: *See*—
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; Taguchi, Minoru; and Sota, Kaoru, 4,841,044, Cl. 540-227.000.
Onoe, Hiroyasu: *See*—
Ueyama, Seiji; and Onoe, Hiroyasu, 4,840,835, Cl. 428-212.000.
Onogi, Yasuharu; Oka, Akinori; Nagatomo, Masakatsu; Kondo, Takumi; and Mizumoto, Kouji, to Oji Paper Co., Ltd. Electrostatic recording material. 4,840,834, Cl. 428-211.000.
Oppelt, Ralph: *See*—
Duerr, Wilhelm; Ingwersen, Hartwig; Krause, Norbert; and Oppelt, Ralph, 4,841,249, Cl. 324-318.000
Optical Coating Laboratory, Inc.: *See*—
Phillips, Roger W.; Spellman, Vernon C.; Gossett, Wayne L.; Kamerling, Marc A.; and Coombs, Paul G., 4,840,281, Cl. 215-230.000.
Opticon Inc.: *See*—
Tawara, Takao; Akedo, Jun; and Iwashita, Yoshiyuki, 4,841,129, Cl. 235-472.000.
Orain, Roger, to Saint-Gobain Vitrage. Process and apparatus for bending glass plates. 4,840,657, Cl. 65-107.000.
Orii, Akira; and Kongo, Takeshi, to Janome Sewing Machine Co., Ltd. Speed control device for an electronic sewing machine. 4,841,206, Cl. 388-828.000.
Orlando, James A., to Ford Motor Company. Elevating and traversing hood hinge. 4,839,941, Cl. 16-361.000.
Orr, Thomas V.; and Meyer, Gerard B., to Procter & Gamble Company, The. Antiperspirant creams. 4,840,709, Cl. 424-66.000.
Orru, Vittoria: *See*—
Di Schiena, Michele G.; and Orru, Vittoria, 4,840,964, Cl. 514-448.000.
Ortiz, Angel L., Jr.: *See*—
Jones, Marshall G.; Ortiz, Angel L., Jr.; Chande, Tushar S.; and August, John L., Jr., 4,840,450, Cl. 350-96.200.
Osada, Mototsugu: *See*—
Otsuka, Takashi; Nose, Masahiko; Yamamoto, Kenji; Taniguchi, Tadao; Shigeta, Yoshifumi; and Osada, Mototsugu, 4,840,296, Cl. 222-600.000.
Osaka Soda Co., Ltd.: *See*—
Kasai, Naoya; Shima, Hisaharu; and Tsujimura, Kazuya, 4,840,907, Cl. 435-253.300.
Toda, Fumio; Tanaka, Koichi; and Nakata, Tetsuya, 4,841,081, Cl. 549-541.000.
Osaki, Norio: *See*—
Takao, Hisashi; Osaki, Norio; and Yasuhomi, Norio, 4,840,957, Cl. 514-326.000.
Osaki, Tatsuo, to Yoshida Kogyo K. K. Method of and apparatus for attaching top stops to slide fastener chain. 4,839,956, Cl. 29-408.000.
Oshida, Tsutomu, to Nifco, Inc. Securing device. 4,840,523, Cl. 411-48.000.
Oshidari, Toshikazu; Hattori, Noboru; and Kato, Yoshiaki, to Nissan Motor Co., Ltd. Automatic transmission having centrifugally operable drain valve in hydraulically operated clutch actuator. 4,840,261, Cl. 192-106.00F.
Oshikawa, Michitaka, to Toko Kabushiki Kaisha. Ladder-type ceramic filter. 4,841,264, Cl. 333-189.000.
Osterholm, Jewell L., to Thomas Jefferson University. Cerebral and lumbar perfusion catheterization apparatus for use in treating hypoxic/ischemic neurologic tissue. 4,840,617, Cl. 604-174.000.
Ostertag, Werner, to BASF Aktiengesellschaft. Plateletlike two-phase pigment. 4,840,677, Cl. 106-456.000.
Osthus, Harold L.; de Raismes, John F.; Wolfson, Lawrence S.; and Vaida, Robert M., to Gerber Garment Technology, Inc. Conveyorized apparatus with moveable rail section. 4,840,123, Cl. 104-100.000.
Ota, Motoki: *See*—
Ikeda, Tsunemi; and Ota, Motoki, 4,840,030, Cl. 60-324.000.
Otake, Katsumasa: *See*—
Kayane, Yutaka; Otake, Katsumasa; and Tezuka, Yasuo, 4,841,031, Cl. 534-638.000.
Otis Engineering Corporation: *See*—
Proctor, Lewis D.; Ross, Colby M.; Manzi, Brian P.; and Giusti, Frank, Jr., 4,840,229, Cl. 166-381.000.
Ototake, Satoshi; Matsunaga, Ryozo; and Furusawa, Masao, to Nippon Kayaku Kabushiki Kaisha. Water-soluble azo compounds having a triazine moiety and dyeing method therewith. 4,841,034, Cl. 534-701.000.
Otsu, Akira; and Nagase, Hiroshi, to Fujikura Kasei Co., Ltd. Positively chargeable toner for use in dry electrophotography. 4,840,863, Cl. 430-110.000.
Otsubo, Toru: *See*—
Noguchi, Minori; Otsubo, Toru; and Aiuchi, Susumu, 4,840,487, Cl. 356-355.000.
Otsuka Kagaku Kabushiki Kaisha: *See*—
Nakacho, Yoshifumi; Tada, Yuji; and Yamada, Sinichi, 4,840,856, Cl. 429-192.000.
Takao, Hisashi; Osaki, Norio; and Yasudomi, Norio, 4,840,957, Cl. 514-326.000.
Otsuka, Takashi; Nose, Masahiko; Yamamoto, Kenji; Taniguchi, Tadao; Shigeta, Yoshifumi; and Osada, Mototsugu, to Shinagawa Refractories Co., Ltd. Clamping and fixing apparatus for a refractory-made plate for a slide gate valve for controlling a molten steel flow. 4,840,296, Cl. 222-600.000.
Ott, Helmut, to Herion-Werke KG. Control valve. 4,840,198, Cl. 137-625.640.
Ouchi, Junichi, to Alps Electric Co., Ltd. Optical coordinates inputting apparatus having switching means to operate y-axis light emitters when operation of the x-axis emitters outputs a coordinates signal. 4,841,141, Cl. 250-221.000.
Oura, Toshio: *See*—
Demura, Shigeki; and Oura, Toshio, 4,841,487, Cl. 365-230.010.
Overbay, Mark A., to Combustion Engineering, Inc. Orbital weld head tool. 4,841,118, Cl. 219-124.030.
Owada, Susumu; Kamegamori, Masayuki; and Kosugi, Akira, to Konishiroku Photo Industry Co., Ltd. Recording apparatus. 4,841,330, Cl. 355-245.000.
Owen, Hartley: *See*—
Harandi, Mohsen N.; and Owen, Hartley, 4,840,928, Cl. 502-41.000.
Owen, Robert E.: *See*—
Miller, Bruce E.; and Owen, Robert E., 4,841,468, Cl. 364-754.000.
Ozaki, Minoru: *See*—
Yoshida, Hideo; Inoue, Tohru; Yamagishi, Atsuhiro; Oda, Yoshiaki; Ozaki, Minoru; and Nishijima, Toshihisa, 4,841,300, Cl. 341-94.000.
Ozaki, Yoshihiko; Sumitani, Hiroaki; Tomoda, Toshimasa; Sato, Fumihide; and Kusano, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Method of imaging an object by ultrasonic or electromagnetic waves. 4,841,489, Cl. 367-7.000.
Ozawa, Susumu: *See*—
Nakamura, Shunichi; Iimura, Kouichi; Nakamura, Kikuo; and Ozawa, Susumu, 4,840,290, Cl. 221-10.000.
Ozawa, Tetsuo: *See*—
Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Urashima, Hidetoshi, 4,840,640, Cl. 8-506.000.
Miura, Konoe; Ozawa, Tetsuo; Okumura, Seigo; and Kubo, Shinji, 4,841,057, Cl. 546-183.000.
Pabst, Otto, to Leitner, S.p.A. Mechanical transmission, particularly for cableway winches. 4,840,088, Cl. 74-661.000.
Pack, Roger N.; and Ahmad, Eddress. Footwear with pivotal toe. 4,839,972, Cl. 36-117.000.
Pallmar, Anders, to Alfa-Laval Marine and Power Engineering AB. Centrifugal separator and method of operating same. 4,840,612, Cl. 494-2.000.
Pamperin, John M.: *See*—
Rentmeester, Alan L.; and Pamperin, John M., 4,840,009, Cl. 53-373.000.
Panton, George S., Jr. Stretchable necktie. 4,839,925, Cl. 2-146.000.
Papenberg, Robert L., to Saxpy Computer Corporation. Data alignment system for random and block transfers of embedded subarrays of an array onto a system bus. 4,841,435, Cl. 364-200.000.
Pappenhagen, Albert R.: *See*—
Van Beveren, Shirley M.; and Pappenhagen, Albert R., 4,841,026, Cl. 530-394.000.
Pardners Unlimited, Inc.: *See*—
Bockenheuser, Charles A., 4,840,418, Cl. 296-91.000.

Parini, Ettore: *See*—
Giani, Roberto P.; Parini, Ettore; Tonon, Giancarlo; and Borsa, Massimiliano, 4,841,046, Cl. 540-495.000.
Parker, Ivan: *See*—
Weekley, David L.; and Parker, Ivan, 4,840,297, Cl. 222-607.000.
Parker, Janice P.: *See*—
Yananton, Patrick; and Parker, Janice P., 4,840,140, Cl. 119-1.000.
Parks, Howard L., to Amdahl Corporation. Three-dimensional microelectronic package for semiconductor chips. 4,841,355, Cl. 357-82.000.
Parsen, Frank E.: *See*—
Chalilpoyil, Purush; Parsen, Frank E.; and Wang, Chih-Chung, 4,840,644, Cl. 29-623.100.
Parsons, Bryan N. V., to Jaguar Cars Limited. Method and apparatus for supercharging internal combustion engines. 4,840,164, Cl. 123-559.100.
Parsons, John A.: *See*—
Epstein, Joseph; Parsons, John A.; and Block, Frank, 4,840,911, Cl. 436-8.000.
Partridge, Randall D.: *See*—
LaPierre, Rene B.; Partridge, Randall D.; Reischman, Paul T.; and Kerr, George T., 4,840,930, Cl. 502-79.000.
Paspek, Stephen C., to Standard Oil Company, The. Conversion of high boiling liquid organic materials to lower boiling materials. 4,840,725, Cl. 208-130.000.
Patel, Kalyanji U., to Minnesota Mining and Manufacturing Company. Treatment of fibrous substrates, such as carpet, with fluorochemical. 4,841,090, Cl. 558-437.000.
Patrick, John L.: *See*—
Mehdizadeh, Mehrdad; Patrick, John L.; and Misic, George J., 4,841,248, Cl. 324-318.000.
Patterson, David W.: *See*—
St. Angelo, Stephen, Jr.; Carver, George C.; Patterson, David W.; and Fremont, Owen K., 4,839,958, Cl. 29-450.000.
Patterson, Richard J.: *See*—
Plewright, William B.; Weir, Kenneth O.; and Patterson, Richard J., 4,839,933, Cl. 5-81.00R.
Patti, Giuseppe: *See*—
Lentini, Salvatore; and Patti, Giuseppe, 4,841,161, Cl. 307-85.000.
Patzelt, Helmut: *See*—
Peitsmeier, Karl; and Patzelt, Helmut, 4,840,386, Cl. 277-212.0FB.
Schmidt, Helmut; Patzelt, Helmut; Tunker, Gerhard; and Scholze, Horst, 4,840,666, Cl. 106-14.050.
Paul Stuart Kempf and Pilar Moreno Family Trust: *See*—
Kempf, Paul S., 4,840,455, Cl. 350-137.000.
Pauling, Horst; and Wehrli, Christof, to Hoffmann-La Roche Inc. Sulfinyl-ascorbic acid useful as an anti-oxidant. 4,841,070, Cl. 549-34.000.
Paulsen, Eric L.: *See*—
Meline, Harry R.; and Paulsen, Eric L., 4,841,226, Cl. 324-61.00R.
Paulson, Norman J.: *See*—
Drevfors, Gunnar; Corniea, Donald G.; and Paulson, Norman J., 4,840,205, Cl. 141-2.000.
Pavlisko, Joseph A.: *See*—
Staudenmayer, William J.; Weiss, David S.; and Pavlisko, Joseph A., 4,840,860, Cl. 430-59.000.
Staudenmayer, William J.; Weiss, David S.; and Pavlisko, Joseph A., 4,840,861, Cl. 430-59.000.
Pavone, Robert J.; Davidson, Bruce L.; and Berdat, Henry F., to Gerber Scientific Instrument Company, The. Photohead system for positioning an aperture wheel and method of making an aperture disc. 4,841,316, Cl. 354-4.000.
Pawlowski, Georg; Hultsch, Guenter; and Mack, Gerhard, to Hoechst Aktiengesellschaft. Photosensitive composition based on a diazonium salt polycondensation product with an ester polymer binder having urethane group. 4,840,868, Cl. 430-155.000.
Peabody Coal Company: *See*—
Evans, Vernon C.; and Heidinger, George H., 4,841,159, Cl. 307-38.000.
Pearson, David B.; and Wissell, Robert A., to Westinghouse Electric Corp. Elevator hoistway door interlock. 4,840,254, Cl. 187-57.000.
Peitsmeier, Karl; and Patzelt, Helmut, to Daimler-Benz Aktiengesellschaft. Sound deadening dual sleeve sealing arrangement. 4,840,386, Cl. 277-212.0FB.
Pekarik, Alan J., to Glidden Company, The. Method of stabilizing epoxy-polyamide coatings. 4,840,980, Cl. 523-456.000.
Peleg, Yigal, to Stouffer Corporation, The. Method and appliance for cooking a frozen pot pie with microwave energy. 4,841,112, Cl. 219-10.55E.
Pellacini, Franco: *See*—
Della Bella, Davide; Carenzi, Angelo; Chiarino, Dario; and Pellacini, Franco, 4,840,936, Cl. 514-18.000.
Peltier, Bertrand, to Schlumberger Technology Corporation. Method of detecting a fluid influx which could lead to a blow-out during the drilling of a borehole. 4,840,061, Cl. 73-155.000.
Pelzl, Leo: *See*—
Seidel, Peter; Pelzl, Leo; and Zell, Karl, 4,840,573, Cl. 439-92.000.
Penard, Pierre: *See*—
Vigarie, Jean-Pierre; Carlach, Jean-Claude; and Penard, Pierre, 4,841,462, Cl. 364-723.000.
Penners, Gunther: *See*—
Ohst, Holger; Podszun, Wolfgang; Suling, Carlhans; Goossens, John; and Penners, Gunther, 4,840,989, Cl. 524-544.000.
Pennwalt Corporation: *See*—
Gastgeb, Raymond F., 4,841,256, Cl. 331-25.000.
Pensel, Werner: *See*—
Bottger, Wolfgang; Biedermann, Kurt; and Pensel, Werner, 4,840,828, Cl. 428-120.000.
Peoples, Clarence A., Jr.: *See*—
Weinle, Paul L.; Smith, Vernon C.; Gardner, Christopher H.; Peoples, Clarence A., Jr.; and Pierce, Matthew R., 4,840,832, Cl. 428-156.000.
Peoples, P. Robert: *See*—
Mathews III, Marion J.; and Peoples, P. Robert, 4,841,087, Cl. 558-363.000.
Perceptron, Inc.: *See*—
Dewar, Robert; and Greer, Dale R., 4,841,460, Cl. 364-571.020.
Perez, Jose L. J., to Jesmar S.A. Doll with means for producing soap bubbles and having an anti-spill container. 4,840,597, Cl. 446-16.000.
Perfect View, Inc.: *See*—
Attar, Amir J., 4,840,919, Cl. 436-111.000.
Permian Research Corporation: *See*—
Hahn, Granville J., 4,839,969, Cl. 34-169.000.
Perrella, Guido, to Graham Fiber Glass Limited. Machine and process for sinuously folding a batt of non-woven fibrous material. 4,840,013, Cl. 53-429.000.
Perrin, Jean-Claude: *See*—
Loy, Fernand R.; Perrin, Jean-Claude; and Rollin, Joel, 4,840,465, Cl. 350-421.000.
Peter, Cornelius; Schaper, Uwe; and Schmidt, Lothar, to Robert Bosch GmbH. Device for actuating a throttle valve. 4,840,349, Cl. 251-129.110.
Peters, Edward N.: *See*—
Fox, Daniel W.; Peters, Edward N., and Sybert, Paul D., 4,841,015, Cl. 528-198.000.
Peters, Manfred; Ohlschlager, Hans; Kaluschke, Thomas; Wingender, Kaspar; Schenk, Gunther; and Boie, Immo, to AGFA-Gevaert Aktiengesellschaft. Color photographic heat development process. 4,840,871, Cl. 430-203.000.
Peters, Manfred; Helling, Gunter; and Reiff, Helmut, to Agfa-Gevaert Aktiengesellschaft. Color photographic recording material for the dye diffusion transfer process. 4,840,885, Cl. 430-559.000.
Petersen, Godber: *See*—
Kobler, Ingo; and Petersen, Godber, 4,840,365, Cl. 270-54.000.
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., to Bayer Aktiengesellschaft. 6,7-disubstituted 1-cycloproply-1,4-dihydro-4-oxo-1,8-naphthyridine-3-carboxylic acids. 4,840,954, Cl. 514-254.000.
Peterson, Miles L.: *See*—
MacLeod, Donald J.; Peterson, Miles L.; and Nowark, Charles G., Jr., 4,841,393, Cl. 360-98.070.
Petitou, Maurice: *See*—
van Boeckel, Constant A. A.; Beetz, Tom; and Petitou, Maurice, 4,841,041, Cl. 536-118.000.
Petrolite Corporation: *See*—
Bellos, Thomas J.; and Lovett, Eva G., 4,840,748, Cl. 252-344.000.
Peyman, Gholam A.: Method for modifying corneal curvature. 4,840,175, Cl. 128-303.100.
Pfalzgraf, Emile. Mounting device having a conical shank. 4,840,520, Cl. 409-232.000.
Pfau, Jean: *See*—
Simon, Laszlo; and Pfau, Jean, 4,840,652, Cl. 62-534.000.
Pfeiffer, Stanley: *See*—
Williamson, Edward; and Pfeiffer, Stanley, 4,840,771, Cl. 422-104.000.
Pfendler, Klaus: *See*—
Feigel, Josef; and Pfendler, Klaus, 4,841,186, Cl. 310-156.000.
Pfister, Theodor: *See*—
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Euc, Ludwig, 4,840,661, Cl. 71-90.000.
Pfizer Inc.: *See*—
Eggler, James F.; Johnson, Michael R.; and Sherman, Lawrence, 4,841,078, Cl. 549-402.000.
Urban, Frank J., 4,841,079, Cl. 549-404.000.
Pfleiderer Industrie GmbH & Co., KG: *See*—
Vogt, Winold, 4,840,688, Cl. 156-39.000.
Pham, Xuan N.; and Wilson, John H., to International Business Machines Corporation. Voice buffer management. 4,841,574, Cl. 381-31.000.
Philip Morris Incorporated: *See*—
Brookman, Donald L.; Merrill, David E.; and Grollmund, Everett C., 4,840,694, Cl. 156-344.000
Philips Kommunikations Industrie A: *See*—
Starke, J. Peter; Levacher, Friedrich K.; and Federmann, Helmut, 4,840,480, Cl. 356-32.000.
Phillips, Donald A. Adjustment lock. 4,840,529, Cl. 411-397.000.
Phillips Petroleum Company: *See*—
Gaughan, Roger G., 4,841,018, Cl. 528-374.000.
Snell, James B.; and Skinner, Marjorie B., 4,840,997, Cl. 525-210.000.
Thorsrud, Agmund K., 4,840,758, Cl. 264-26.000.
Phillips, Roger W.; Spellman, Vernon C.; Gossett, Wayne L.; Kamerling, Marc A.; and Coombs, Paul G., to Optical Coating Laboratory, Inc. Tamper evident optical device and article utilizing the same. 4,840,281, Cl. 215-230.000.
Photon Devices, Ltd.: *See*—
Waszkiewicz, Paul, 4,841,142, Cl. 250-227.000.

Picanol N.V.: *See*—
Moeneclaey, Denis; Lagache, Remi; Victoor, Johnny; and Coopman, Lucien, 4,840,203, Cl. 139-453.000.
Picker International, Inc.: *See*—
Mehdizadeh, Mehrdad; Patrick, John L.; and Misic, George J., 4,841,248, Cl. 324-318.000.
Pierburg GmbH: *See*—
Baumgartner, Hans; Brandstadter, Manfred; and Henke, Ulrich, 4,840,550, Cl. 418-150.000.
Pierce, Ben: *See*—
Chan, Aaron; Pierce, Ben; and Shafco, Leslie, 4,841,560, Cl. 379-29.000.
Pierce, Lawrence, Jr.: *See*—
Smith, William B.; Field, Martha M.; Pierce, Lawrence, Jr.; and Dalbey, Jeffrey C., 4,840,635, Cl. 623 36.000.
Pierce, Matthew R.: *See*—
Weinle, Paul L.; Smith, Vernon C.; Gardner, Christopher H.; Peoples, Clarence A., Jr.; and Pierce, Matthew R., 4,840,832, Cl. 428-156.000.
Pierson, Lyndon G.: *See*—
George, Michael; Pierson, Lyndon G.; and Wilkins, Mark E., 4,841,550, Cl. 375-118.000.
Pillsbury Company, The: *See*—
Hyldon, Roy; and Bhatia, Usha, 4,840,856, Cl. 426-270.000.
Pilon, Terry C.: *See*—
Stroh, Alvin L.; and Pilon, Terry C., 4,840,336, Cl. 248-97.000.
Pilot Ink Co., Ltd.: *See*—
Ito, Akio; and Kato, Hiroshi, 4,840,509, Cl. 401-198.000.
Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See*—
Tanaka, Noriatsu; Tokunaga, Masami; Tanaka, Tsuyoshi; Koyama, Satoshi; and Kikuchi, Keiichi, 4,840,817, Cl. 428-216.000.
Pilot Precision Kabushiki Kaisha: *See*—
Watanabe, Hiroyuki, 4,840,508, Cl. 401-65.000.
Pine, Bob G., to Applied Techniques Inc. Method and apparatus for cleaning a conveyor belt. 4,840,267, Cl. 198-498.000.
Pines, Eli: *See*—
Linsky, Gary; Cunningham, Timothy; and Pines, Eli, 4,840,626, Cl. 604-364.000.
Pingry, Larry J., to Allied Products Corporation. Disc mower. 4,840,019, Cl. 56-13.600.
Pioneer Electronic Corporation: *See*—
Akiyama, Toru, 4,841,379, Cl. 358-337.000.
Aoyagi, Yoshio, 4,841,505, Cl. 369-32.000.
Kiyoura, Kazuhiro; Endo, Fumio; Kimura, Toshiyuki; Aoyagi, Yoshio; and Nakamura, Kazunari, 4,841,506, Cl. 369-32.000.
Knrihara, Toshihiko; and Funabashi, Tadashi, 4,841,517, Cl. 369-270.000.
Nozu, Shinsaku; Kase, Masao; and Yamashita, Masakazu, 4,841,518, Cl. 369-270.000.
Takahashi, Akira; Kamimura, Testuro; Kawamura, Masahiko; Morikawa, Kiyoshi; and Onishi, Sei, 4,841,499, Cl. 369-38.000.
Yokosawa, Seiichi, 4,841,390, Cl. 360-77.140.
Pippert, Aaron J., to Utex Industries, Inc. Fishing lure apparatus with fish attractant. 4,839,983, Cl. 43-42.060.
Pistner, Timothy W., to Mobil Oil Corporation. Thermoplastic bag, bag pack and method of making the same. 4,840,610, Cl. 493-194.000.
Pittman, R. Aspen. High density headplate for a stringed instrument. 4,840,102, Cl. 84-293.000.
Pitts, Warren R., to Dennison Manufacturing Company. Method of mounting index tabs upon stenographic notebooks. 4,840,406, Cl. 281-1.000.
Piuze, Ronald L.: *See*—
Foley, John M.; Piuze, Ronald L.; Larson, Ralph L., Jr.; and Doumani, George, 4,840,225, Cl. 165 104.330.
Plavac, Frank: *See*—
Wollenberg, Robert H.; Plavac, Frank; and Erdman, Timothy R., 4,840,744, Cl. 252-51.50A.
Plewright, William B.; Weir, Kenneth O.; and Patterson, Richard J. Patient transfer and conveying vehicle. 4,839,933, Cl. 5-81.00R.
Pliefke, Engelbert, to Hoechst Aktiengesellschaft. Single-stage electrochemical image-forming process for reproduction layers 4,840,709, Cl. 204-2.000.
Pliefke, Engelbert, to Hoechst Aktiengesellschaft. Process for the electrochemical roughening of aluminum for use in printing plate supports. 4,840,713, Cl. 204-129.750.
Plutschuck, Lawrence; and Ochenski, James E., to GTE Valenite Corporation. Cutting insert. 4,840,518, Cl. 407-113.000.
Pochodylo, James M., to Eastman Kodak Company. Method for the production of ribavirin using high robose donor concentrations. 4,840,899, Cl. 435-87.000.
Podszun, Wolfgang: *See*—
Ohst, Holger; Podszun, Wolfgang; Stilling, Carlhans; Goossens, John; and Penners, Gunther, 4,840,989, Cl. 524-544.000.
Pointu, Bernard: *See*—
Mouchart, Jacques; Villela, Gerard; Dutois, Franck; and Pointu, Bernard, 4,840,442, Cl. 350-1.600.
Polgari, Istvan: *See*—
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.
Polizzano, Robert A., to Nabisco Brands Inc. Process and dough composition for producing multi-textured cookies containing hard fats. 4,840,803, Cl. 426-94.000.
Pollock, John A. Hermetically sealed feedthroughs and methods of making same. 4,841,101, Cl. 174-152.0GM.
Pomona Service & Supply Co., Inc.: *See*—
Muller, John E., Jr., 4,840,016, Cl. 53-459.000.
Pompe, Larry W. Contact lens cleaning device and method. 4,840,681, Cl. 134-42.000.
Pont-A-Mousson S.A.: *See*—
Defrance, Andre; and Hauer, Jean-Claude, 4,840,514, Cl. 404-25.000.
Pontbriand, James A. Counter top waste disposal unit. 4,839,931, Cl. 4-629.000.
Porta Systems Corp.: *See*—
De Luca, Paul V.; and Neuwirth, Helmuth, 4,840,572, Cl. 439-92.000.
Porter, John W., III. Endotracheal tube combination. 4,840,173, Cl. 128-207.150.
Pospisil, Richard E.: *See*—
Lubarsky, Andre; and Pospisil, Richard E., 4,841,437, Cl. 364-200.000.
Potthof, Erwin: *See*—
Meisner, Alfred; Potthof, Erwin; and Fluhrer, Henry, 4,841,493, Cl. 367-140.000.
Poumakis, Demetrius J., to United Technologies Corporation. Actuator control system with displacement sensor fault detection. 4,841,209, Cl. 318-564.000.
Poveromo, Melvin D. Tooth-die dowel-pin and locking assembly and method of making a dental model incorporating said assembly. 4,840,565, Cl. 433-74.000.
Prager, Lee A.; and Carbone, Douglas C., to GTE Products Corporation. Dual temperature hair curler utilizing a pair of PTC heaters. 4,841,127, Cl. 219-225.000.
Prange, Charles J., to Sewer Rodding Equipment Company. Automated sewer cleaning rodding machine. 4,839,936, Cl. 15-104.330.
Pratap, Siddharth B.: *See*—
Weldon, William F.; Pratap, Siddharth B.; and Driga, Mircea D., 4,841,217, Cl. 322-8.000.
Preferred Machining Corporation: *See*—
Stirbis, James S., 4,840,138, Cl. 118-694.000.
Preh, Elektrofeinmechanische Werke, Jakob Preh, Nachf. GmbH & Co.: *See*—
Bauer, Karl-Heinz; and Eckert, Gerold, 4,840,114, Cl. 98-2.000.
Preininger, Siegfried: *See*—
Rohling, Holmer; Schulz, Frank; and Preininger, Siegfried, 4,840,171, Cl. 128-204.180.
Prendel, Peter W.: *See*—
Elsner, Hans F. K.; Prendel, Peter W.; Kandler, Wilfried H. K.; and Sandkuhl, Jurgen, 4,841,102, Cl. 174-35.0GC.
Prescott, Anthony D.: *See*—
Heide, Jorgen; Gooch, Timothy D.; Prescott, Anthony D.; and Bojrab, Dennis, 4,840,178, Cl. 128-419.00R.
Price, Zane A.; and Bentley, Douglas P. Invisible tie tail holder. 4,839,945, Cl. 24-49.00R.
Priesnitz, Uwe: *See*—
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, 4,840,661, Cl. 71-90.000.
Prilik, Ronald J.; and Varner, James R., to International Business Machines Corporation. Read/write memory device with an embedded read-only pattern and method for providing same. 4,841,485, Cl. 365-201.000.
Primages, Inc.: *See*—
Chu, Mosi; Graziano, Anthony; and Kress, Kenneth, 4,840,504, Cl. 400-213.000.
Pritchard, Robert B., to Rolls-Royce plc. Brush seal manufacture. 4,839,997, Cl. 51-290.000.
Probasco, Timothy C. Device for lowering toilet seats. 4,839,928, Cl. 4-251.000.
Procter & Gamble Company, The: *See*—
Hardy, Frederick E.; and Walley, Darlene R., 4,840,738, Cl. 252-8.600.
Johnson, Philip S.; and Bakken, Theresa A., 4,840,786, Cl. 424-43.000.
Orr, Thomas V.; and Meyer, Gerard B., 4,840,789, Cl. 424-66.000.
Proctor, Lewis D.; Ross, Colby M.; Manzi, Brian P.; and Giusti, Frank, Jr., to Otis Engineering Corporation. Multiple position service seal unit with positive position indicating means. 4,840,229, Cl. 166-381.000.
Productive Products Limited: *See*—
Voorhees, John L.; and Kemp, James, 4,840,144, Cl. 119-96.000.
Prouty, David. Plug locking cover. 4,840,577, Cl. 439-373.000.
Provan, Alexander R.: *See*—
Forman, Edward W., Jr.; Provan, Alexander R.; and Schmieder, Ronald R., 4,840,335, Cl. 248-97.000.
Pryor, Michael J., to Olin Corporation. Method for making multi-layer and pin grid arrays. 4,840,654, Cl. 65-18.100.
Puippe, Jean-Claude. Process for the precise determination of the surface area of an electrically conducting shaped body. 4,840,708, Cl. 204-1.00T.
Pulse Electronics, Inc.: *See*—
Fernandez, Emilio A.; Bezos, Angel P.; and Kimball, Charles H., 4,840,056, Cl. 73-1.00H.
Purcell, John R.: *See*—
Burnett, Sibley C.; Purcell, John R.; Breneman, Bruce C.; and Sarwinski, Raymond E., 4,841,268, Cl. 335-216.000.

Pursell, Robert F., to Ranco Incorporated of Delaware. Trip-free resetting mechanism for an on-off unit. 4,841,271, Cl. 337-320.000.
Quackenbush, John, to FBK International Corporation. Medical catheter with splined internal wall. 4,840,623, Cl. 604-280.000.
Quadranti, Marco; Schmidli, Wilheim; and Zoschke, Andreas, to Ciba-Geigy Corporation. Synergistic composition and method for selective weed control in rice. 4,840,663, Cl. 71-93.000.
Quang, Dang Vu; Davidson, Michel; Durand, Daniel; and Courty, Philippe, to Institut Francais du Petrole. Process for the production of hydrogen by catalytic reforming of methanol with water vapor. 4,840,783, Cl. 423-648.100.
Quantum Chemical Corporation: *See*—
Wild, Leslie; and Lee, Chun D., 4,840,996, Cl. 525-193.000.
Quest Medical, Inc.: *See*—
Abbott, Martyn S., 4,840,542, Cl. 417-9.000.
Quiel, John M., to Westinghouse Electric Corp. Waste disposal system. 4,840,130, Cl. 110-234.000.
Quist, William E.: *See*—
Curtis, R. Eugene; Narayanan, G. Hari; and Quist, William E., 4,840,682, Cl. 148-12.70A.
R.H. Sheppard Co.: *See*—
Brocksou, Robert H., 4,840,244, Cl. 180-143.000.
Rabinovich, Eliezer M., to American Telephone and Telegraph Company, AT&T Bell Laboratories. Fabrication of high-silica glass article. 4,840,653, Cl. 65-3.120.
Rabloczky, Gyorgy: *See*—
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.
Racine, Philippe: *See*—
Joulain, Daniel; Racine, Philippe; and Maire, Francoise, 4,840,792, Cl. 424-76.100.
Rafa Laboratories: *See*—
Ben-Sasson, Shmuel, 4,840,795, Cl. 424-690.000.
Rahmen mit System GmbH: *See*—
Walter, Eckhard, 4,839,974, Cl. 40-152.000.
Raikov, Nikolai N., to Tsentralnoe Proektno-Konstruktorskoe Bjuro Vsesojuznogo Ryboprom yshlennogo Obiedinenia Azovo-Chernomorskogo Basseina. Machine for producing a triple-thread chain stitch for sewing webs over an edge. 4,840,134, Cl. 112-162.000.
Raiman Design, Inc.: *See*—
Raiskums, Olaf B.; and Mancel, James D., 4,840,689, Cl. 156-217.000.
Raiskums, Olaf B.; and Mancel, James D., to Raiman Design, Inc. Ornament production. 4,840,689, Cl. 156-217.000.
Ralfs, Colin A.; and Murdock, Anthony, to British Aerospace Public Limited Company. Laminate compression tester. 4,840,070, Cl. 73-818.000.
Rall, Richard R.: *See*—
Berg, Lloyd; and Rall, Richard R., 4,840,707, Cl. 203-51.000.
Rambo, Thomas A. Artificial reef. 4,840,516, Cl. 405-33.000.
Ranco Incorporated of Delaware: *See*—
Purssell, Robert F., 4,841,271, Cl. 337-320.000.
Ranger, Michael H.; Lim, Esther H.; and Grady, Robert J., to NCR Corporation. Dry film development process for an aperture card printer. 4,841,343, Cl. 355-77.000.
Rasmussen, Jerald K.: *See*—
Katritzky, Alan R.; Krepski, Larry R.; Rasmussen, Jerald K.; Heilmann, Steven M.; and Tarr, Richard D., 4,841,021, Cl. 528-407.000.
Rathgeb, Peter M. Retractable guard for motor vehicle door. 4,839,991, Cl. 49-462.000.
Raubenheimer, Hans-Juergen: *See*—
Goertz, Hans-Helmut; Straub, Ferdinand; Sanner, Axel; Kolb, Albrecht; Raubenheimer, Hans-Juergen; and Vogel, Friedrich, 4,841,066, Cl. 548-335.000.
Raue, Roderich: *See*—
Harnisch, Horst; and Raue, Roderich, 4,841,052, Cl. 544-361.000.
Rauma-Repola Oy: *See*—
Malmsten, Erkki, 4,840,703, Cl. 162-49.000.
Ravet, Georges: *See*—
Gonnet, Olivier; Ravet, Georges; and Rousset, Jacky, 4,840,985, Cl. 524-425.000.
Ravex, Alain: *See*—
Claudet, Gerard; Dewanckel, Bernard; Ravex, Alain; and Reale, Serge, 4,840,032, Cl. 62-6.000.
Rawlins, P. J. Thomas. Fuel tank cleaning system. 4,840,732, Cl. 210-306.000.
Raychaudhuri, Dipankar; and Joseph, Kuriacose, to General Electric Company. Stabilization of random access packet CDMA networks. 4,841,527, Cl. 371-32.000.
Raychem Limited: *See*—
Towle, Ian D. H., 4,841,011, Cl. 528-125.000.
Towle, Ian D. H., 4,841,013, Cl. 528-125.000.
Towle, Ian D. H., 4,841,094, Cl. 560-73.000.
Raytheon Company: *See*—
Mathewes, James K., Jr.; Hermam, Jan S.; Johnson, Stephen C.; Goud, Richard B.; and Stiffler, Jack J., 4,841,434, Cl. 364-200.000.
RCA Licensing Corporation: *See*—
Christopher, Todd J., 4,841,466, Cl. 364-733.000.
Reale, Serge: *See*—
Claudet, Gerard; Dewanckel, Bernard; Ravex, Alain; and Reale, Serge, 4,840,032, Cl. 62-6.000.
Rebentisch, Hugo E., to Unistrut International Corp. Fastener restrainer for framing system. 4,840,525, Cl. 411-85.000.
Reber, Werner. Front piece for shoes. 4,839,971, Cl. 36-77.00R.
Redco N.V.: *See*—
Baes, Emile, 4,840,672, Cl. 106-86.000.
Reddy, Vermuri B.; Hsiung, Nancy; Beck, Anton K.; and Bernstine, Edward G., to Integrated Genetics, Inc. Heteropolymeric protein. 4,840,896, Cl. 435-68.000.
Redken Laboratories, Inc.: *See*—
Mathews, Roger A.; Moore, Edward R.; and Cannell, David W., 4,840,791, Cl. 424-71.000.
Regan, Paul: *See*—
Flig, Alan Y.; and Regan, Paul, 4,841,287, Cl. 340-690.000.
Reichenberger, Helmut: *See*—
Naser, Georg; Reichenberger, Helmut; and Schwark, Hubert, 4,840,166, Cl. 128-24.00A.
Reid, Dwight K., to Betz Laboratories, Inc. Process for minimizing fouling of processing equipment. 4,840,720, Cl. 208-48.0AA.
Reiff, Helmut: *See*—
Peters, Manfred; Helling, Gunter; and Reiff, Helmut, 4,840,885, Cl. 430-559.000.
Reilard, Ulrich: *See*—
Jungmann, Andreas; and Reilard, Ulrich, 4,840,753, Cl. 261-76.000.
Reilly, Bernard J.; and Michels, Roger, to Extrusion Punch & Tool Co. Mixing plate for injection molding machine. 4,840,556, Cl. 425-543.000.
Reinartz, Hans-Dieter: *See*—
Burgdorf, Jochen; Reinartz, Hans-Dieter; Weise, Lutz; Ocvirk, Norbert; Becker, Horst P.; and Determann, Otto, 4,840,436, Cl. 303-119.000.
Reinecke, Paul: *See*—
Holmwood, Graham; Weissmuller, Joachim; Brandes, Wilhelm; and Reinecke, Paul, 4,840,961, Cl. 514-399.000.
Reinwall, Ernest W.: *See*—
Hagan, Robert A.; and Reinwall, Ernest W., 4,840,083, Cl. 74-574.000.
Reis, Gustave A. Smoke and liquid alarm. 4,841,282, Cl. 340-521.000.
Reisch, Wolfgang: *See*—
Rumpf, Bernd; and Reisch, Wolfgang, 4,841,451, Cl. 364-484.000.
Reischman, Paul T.: *See*—
LaPierre, Rene B.; Partridge, Randall D.; Reischman, Paul T.; and Kerr, George T., 4,840,930, Cl. 502-79.000.
Remer, James N., to General Electric Company. Angled strut diaphragm spring. 4,840,457, Cl. 350-255.000.
Reneau, Raymond P. Router guide assembly and method of using same. 4,840,209, Cl. 144-371.000.
Renner, Gunter: *See*—
Ohlschlager, Hans; Renner, Gunter; Kunitz, Friedrich-Wilhelm; Odenwalder, Heinrich; and Hubner, Dirk, 4,840,880, Cl. 430-505.000.
Rentmeester, Alan L.; and Pamperin, John M., to FMC Corporation. Rotary film sealing and severing head for thermoplastics. 4,840,009, Cl. 53-373.000.
Restrick, Robert C., III: *See*—
Delaney, Robert H.; Kalmanek, Charles R., Jr.; and Restrick, Robert C., III, 4,841,295, Cl. 340-825.500.
Revlon, Inc.: *See*—
Lunderman, William; and Seidler, David, 4,840,288, Cl. 220-334.000.
Rew, James A.: *See*—
Ankrom, Michael J.; Bowcutt, Corey H.; Buckley, John J., Jr.; and Rew, James A., 4,840,305, Cl. 228-232.000.
Rexnord Inc.: *See*—
Anderson, William B., 4,840,269, Cl. 198-822.000.
Rey, Charles A.: *See*—
Danley, Thomas J.; and Rey, Charles A., 4,841,495, Cl. 367-191.000.
Reye, Catherine: *See*—
Corriu, Robert J.; Cerveau, Genevieve E.; Chuit, Claude G.; and Reye, Catherine, 4,841,084, Cl. 556-464.000.
Rheinmetall GmbH: *See*—
Fischer, Helmut, 4,840,110, Cl. 89-46.000.
Rhode Island Hospital: *See*—
Carlson, Drew E., 4,840,182, Cl. 128-694.000.
Rhone-Poulenc Films: *See*—
Eyraud, Marcel, 4,840,836, Cl. 428-213.000.
Rhone Poulenc Nederlands B.V.: *See*—
Kowite, William J.; and Oestreicher, Stephen L., 4,840,660, Cl. 71-86.000.
Riaud, Alain: *See*—
Bourgeaux, Pierre; and Riaud, Alain, 4,841,297, Cl. 341-11.000.
Ricerche di Schiena S.n.c. del Dr. Michele G. di Schiena & C.: *See*—
Di Schiena, Michele G.; and Orru, Vittoria, 4,840,964, Cl. 514-448.000.
Richard, Philippe; Soulage, Andre; and Appel, Jean, to Office National d'Etudes et de Recherches Aerospatiales (ONERA). Installation for the detection and location by interferometry, in real time and at great distance of lightening strikes. 4,841,304, Cl. 342-460.000.
Richard Wolf GmbH: *See*—
Ams, Felix; and Schafer, Roland, 4,841,363, Cl. 358-98.000.
Richards Metal Company: *See*—
Heide, Jorgen; Gooch, Timothy D.; Prescott, Anthony D.; and Bojrab, Dennis, 4,840,178, Cl. 128-419.00R.
Richlen, Scott L., to United States of America, Energy. Corrosive resistant heat exchanger. 4,840,226, Cl. 165-134.100.

Richter, Hans-Jurgen, to Allstar Vergrauch guter GmbH. Household board. 4,840,361, Cl. 269-289.00R.
Richter, Johan C. F. C.; and Richter, Ole J., to Kamyr AB. Multiscreen pressure diffuser. 4,840,047, Cl. 68-181.00R.
Richter, Ole J.: *See*—
Richter, Johan C. F. C.; and Richter, Ole J., 4,840,047, Cl. 68-181.00R.
Ricoh Company, Ltd.: *See*—
Asami, Kazuo; and Ogasawara, Fumihiro, 4,841,373, Cl. 358-257.000.
Kammoto, Yoshiaki; and Saito, Masanori, 4,841,358, Cl. 358-75.000.
Kobayashi, Hiroshi; Machida, Haruhiko; Ema, Hideaki; Akedo, Jun; Harigaya, Makoto; and Ide, Yasushi, 4,840,922, Cl. 437-129.000.
Nakayama, Nobuhiro; Asahina, Yasuo Fushimi, Hiroyuki; and Iwamoto, Yasuaki, 4,841,331, Cl. 355-345.000.
Riebel, Hans-Jochem: *See*—
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, 4,840,661, Cl. 71-90.000.
Rieger, Hansjorg W.; and Biehler, Wolfgang, to Rud-Kettenfabrik Rieger & Dietz GmbH u.Co. Anti-skid devices for motor vehicles. 4,840,399, Cl. 280-757.000.
Riegler, Ernst: *See*—
Zajicek, Ernst; Riegler, Ernst; and Muhlbauer, Johann, 4,841,542, Cl. 373-73.000.
Riesmeyer, Juergen, to Siemens Aktiengesellschaft. Circuit arrangement for a telephone station with earth connection to the central supply device. 4,841,568, Cl. 379-380.000.
Rigotti, Victor: *See*—
Levine, Michael R.; Rigotti, Victor; Russo, James; and Skogler, Nicholas, 4,841,458, Cl. 364-557.000.
Rindfuss, Diane J. Arrangement for recording and indexing information. 4,841,387, Cl. 360-72.100.
Rinehart, Homer L. Outdoor grill with extractable food supporting rack. 4,840,118, Cl. 99-446.000.
Riollet, Gilbert: *See*—
Bourcier, Pierre; and Riollet, Gilbert, 4,840,539, Cl. 416-191.000.
Risman, Per O. G.: *See*—
Kokkeler, Franciscus; Fioroli, Mario; Risman, Per O. G.; Vigano, Liliana; and Idebro, Mats G., 4,841,111, Cl. 219-10.55B.
Robb, Kenneth P., Jr.: *See*—
Ziegler, Michael J.; Millward, Barry; and Robb, Kenneth P., Jr., 4,840,656, Cl. 65-85.000.
Robert Bosch GmbH: *See*—
Brunel, Andre, 4,840,162, Cl. 123-506.000.
Eckell, Wolfgang; Guentert, Josef; Haefele, Walter; Kraemer, Manfred; Kuhn, Uwe; and Warga, Johann, 4,840,161, Cl. 123-500.000.
Karle, Anton, 4,840,155, Cl. 123-300.000.
Leiber, Heinz, 4,840,434, Cl. 303-113.000.
Peter, Cornelius; Schaper, Uwe; and Schmidt, Lothar, 4,840,349, Cl. 251-129.110.
Robert Mathys Co.: *See*—
Mathys, Robert, 4,840,631, Cl. 623-22.000.
Robertet S.A.: *See*—
Joulain, Daniel; Racine, Philippe; and Maire, Francoise, 4,840,792, Cl. 424-76.100.
Roberts, Sheldon D.; Samuels, Louann B.; and Shadwick, David T., to International Business Machine Corporation. Stuffed chamber ribbon cartridge. 4,840,503, Cl. 400-208.000.
Robinson, Deborah L.: *See*—
Sipes, Donald L., Jr.; and Robinson, Deborah L., 4,841,528, Cl. 372-22.000.
Rock, Erich; and Hollenstein, Helmut, to Julius Blum Gesellschaft m.b.H. Fitting for fastening the rail member of a drawer. 4,840,512, Cl. 403-22.000.
Rockwell, Martin G.: *See*—
Charbonnier, Francis M.; Rockwell, Martin G.; and Benvegar, Carl E., 4,840,177, Cl. 128-419.00D.
Rode, Klaus: *See*—
Elsaesser, Andreas; and Rode, Klaus, 4,840,867, Cl. 430-156.000.
Roemer, Helmuth. Ram boring implement. 4,840,237, Cl. 175-19.000.
Roffinella, Daniele; and Sposini, Maurizio to Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A. Method of accessing local area networks with a unidirectional ring-transmission line, and local area network using this method. 4,841,523, Cl. 370-89.000.
Rogen, Neil E.: *See*—
Adnyana, Dewa N.; and Rogen, Neil E., 4,840,346, Cl. 251-1.300.
Roger Bullivant of Texas, Inc.: *See*—
Bullivant, Roger A., 4,840,517, Cl. 405-241.000.
Rogers, William H., to Sea Search, Inc. Spear gun tip assembly and method of use thereof. 4,839,979, Cl. 43-6.000.
Rohling, Holmer; Schulz, Frank; and Preininger, Siegfried, to Dragerwerk Aktiengesellschaft. Oxygen supply unit having an oxygen generator. 4,840,171, Cl. 128-204.180.
Rojas, Robert R. Multiple component comforter quilt. 4,839,934, Cl. 5-502.000.
Rolffs, Philip C. Synthetic ebony and method of producing the same (I). 4,840,637, Cl. 8-402.000.
Rolffs, Philip C. Synthetic ebony and method of producing the same (II). 4,840,638, Cl. 8-408.000.
Rollin, Joel: *See*—
Loy, Fernand R.; Perrin, Jean-Claude; and Rollin, Joel, 4,840,465, Cl. 350-421.000.
Rolls-Royce Inc.: *See*—
Szuminski, Gary F.; and Ward, Benjamin D., 4,840,329, Cl. 244-12.500.
Rolls-Royce Motors Limited: *See*—
Hill, Adrian C.; and Jepson, Derek, 4,840,206, Cl. 141-349.000.
Rolls-Royce plc: *See*—
Pritchard, Robert B., 4,839,997, Cl. 51-290.000.
Ronis S.A.: *See*—
Chappoux, Claude; Rouesnel, Bernard; and Gillet, Guy, 4,840,264, Cl. 194-212.000.
Rookstool, Gary H.: *See*—
Hollingsworth, John D.; and Rookstool, Gary H., 4,839,944, Cl. 19-105.000.
Rooney, Craig E., to Gareis, John. Compact eyeglass construction. 4,840,476, Cl. 351-63.000.
Root, Jeffrey M.: *See*—
Meyer, Richard S.; Root, Jeffrey M.; Campbell, Michael L.; and Winter, Daryl B., 4,840,815, Cl. 426-611.000.
Roquette Freres: *See*—
Boursier, Bernard, 4,840,797, Cl. 424-475.000.
Rose, Mark W., to Dalsat, Inc. Method of sectioning an antennae reflector. 4,841,305, Cl. 343-912.000.
Rose, William J., to Coleco Industries, Inc. Talking doll responsive to external signal. 4,840,602, Cl. 446-175.000.
Roselli, Peter J. C.: *See*—
Nixon, Rodger J.; Roselli, Peter J. C.; Armstrong, David I.; Lindley, Martin K.; and de la Bere, Imogen E., 4,841,441, Cl. 364-401.000.
Rosenberg, Martin: *See*—
Adams, Craig W.; Leary, Jeffry J.; and Rosenberg, Martin, 4,840,892, Cl. 435-5.000.
Rosenstein, Robert W.: *See*—
Nathans, Gene R.; and Rosenstein, Robert W., 4,841,024, Cl. 530-387.000.
Rosinnes, Meir; Stadler, Hugo; and Strunz, Siegfried, to Amin Engineers Ltd.; and Loher Aktiengesellschaft. Electronic controller and a system and method for optimizing generation of electrical power utilizing the same. 4,841,218, Cl. 322-24.000.
Ross, Colby M.: *See*—
Proctor, Lewis D.; Ross, Colby M.; Manzi, Brian P.; and Giusti, Frank, Jr., 4,840,229, Cl. 166-381.000.
Rosshirt, Hermann: *See*—
Bishop, Eugene R.; Schneider, Matthew L.; and Rosshirt, Hermann, 4,841,243, Cl. 324-174.000.
Rossoff, Irving S. Method of preparing a sulfonamide-food color additive for detection of sulforamides in animal feeds and pharmaceuticals preparations. 4,840,909, Cl. 436-20.000.
Roth, Rainer: *See*—
Haberrecker, Klaus; and Roth, Rainer, 4,841,557, Cl. 378-141.000.
Rouesnel, Bernard: *See*—
Chappoux, Claude; Rouesnel, Bernard; and Gillet, Guy, 4,840,264, Cl. 194-212.000.
Roussel, Bernard: *See*—
Dittmar, Andre ; Delhomme, Georges; Roussel, Bernard; and Chatonnet, Joseph, 4,841,543, Cl. 374-44.000.
Rousset, Abel C.; Boissier, Guy; Jabry, El Hadj; and Caffin, Jean-Pierre, to Universite Paul Sabatier (Toulouse III). Compositions of transition metal manganites in the form of particles or ceramics, their preparation and their use in the production of thermistors. 4,840,925, Cl. 501-1.000.
Rousset, Jacky: *See*—
Gonnet, Olivier; Ravet, Georges; and Rousset, Jacky, 4,840,985, Cl. 524-425.000.
Rovenszky, Franz: *See*—
Binder, Dieter; Rovenszky, Franz; and Ferber, Hubert P., 4,841,065, Cl. 548-238.000.
Rowe, Jay E., to Crompton & Knowles Corporation. Trichromatic combination of dyes for nylon. 4,840,643, Cl. 8-641.000.
Rowlett, Beb H.: *See*—
Woodworth, Lee R.; and Rowlett, Beb H., 4,840,645, Cl. 55-1.000.
Roy, Wolfgang: *See*—
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, 4,840,661, Cl. 71-90.000.
Rubin, Gerhard; and Bleckmann, Hugo, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method and installation for a continuous pressure communution of brittle grinding stock. 4,840,315, Cl. 241-24.000.
Rubin, Kenneth L. Electronic card reader and financial asset games. 4,840,382, Cl. 273-237.000.
Rubinshtein, Bernard: *See*—
Wong, Kam C.; Rubinshtein, Bernard; and Arzoumanian, Aram, 4,840,501, Cl. 400-124.000.
Rud-Kettenfabrik Rieger & Dietz GmbH u.Co.: *See*—
Rieger, Hansjorg W.; and Biehler, Wolfgang, 4,840,399, Cl. 280-757.000.
Rudoi, Igor G.: *See*—
Alexandrov, Andrei J.; Dolgikh, Viktor A.; Kerimov, Oleg M.; Samarin, Alexei J.; Rudoi, Igor G.; and Soroka, Arkady M., 4,841,537, Cl. 372-55.000.
Rudolph, Axel: *See*—
Hamaekers, Arno; and Rudolph, Axel, 4,840,359, Cl. 267-140.100.
Ruiz, Ariel: *See*—
Heng, Jean-Paul; Ruiz, Ariel; and Boissonnet, Alain, 4,840,579, Cl. 439-395.000.

Rumbolt, Robin B.; Guerinot, William F.; and Dargis, Daniel J., to North American Philips Corporation. Television customer control functions restorer. 4,841,368, Cl. 358-194.100.
Rumpf, Bernd; and Reisch, Wolfgang, to VDO Adolf Schindling AG. System for measuring the duration ratio of pulses of variable frequency. 4,841,451, Cl. 364-484.000.
Ruppen, Bruno: *See*—
Hurlemann, Ernst; Muller, Kurt; and Ruppen, Bruno, 4,840,108, Cl. 89-33.140.
Russell, Robert H., to North American Philips Corporation. Apodization of ultrasound transmission. 4,841,492, Cl. 367-105.000.
Russo, James: *See*—
Levine, Michael R.; Rigotti, Victor; Russo, James; and Skogler, Nicholas, 4,841,458, Cl. 364-557.000.
Russo, Onofrio N., to Gas Energy, Inc. Plunger lock and key. 4,840,049, Cl. 70-34.000.
Ruvo Automation Corporation: *See*—
Jangaard, Erling S., 4,839,957, Cl. 29-434.000.
Ryan, James G.: *See*—
Gardner, David A.; Ryan, James G.; Schaefer, Joseph G.; and Walton, Erick G., 4,840,302, Cl. 228-123.000.
S.A.T. (Societe Anonyme de Telecommunications): *See*—
Michel, Royer, 4,841,351, Cl. 357-30.000.
S. D. Warren Company: *See*—
Blenkhorn, Gary P., 4,840,757, Cl. 264-22.000.
Sa Schappe: *See*—
Guevel, Jean; Francois, Marc; and Bootemps, Guy, 4,840,021, Cl. 57-210.000.
Sabbadin, Antonio D.: *See*—
Sweeny, Henry D.; and Sabbadin, Antonio D., 4,840,342, Cl. 248-475.100.
Saburi, Toshiki; Ohya, Nobuyuki; Yamazaki, Toru; and Katoh, Taisei, to Nippondenso Co., Ltd. High frequency wave absorbing ceramics. 4,840,926, Cl. 501-134.000.
Sada, Tomoya: *See*—
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Sawaki, Toru; Sasaki, Hideharu; Nakamura, Tsutomu; and Sadanobu, Jiro, 4,840,762, Cl. 264-29.200.
Saegusa, Noboru, to NEC Corporation. Clock recovering device. 4,841,167, Cl. 307-269.000.
Saeki, Keiso: *See*—
Sano, Shojiro; and Saeki, Keiso, 4,840,927, Cl. 503-201.000.
Saell, Goesta; and Hirschberg, Jakub, to Siemens AG. Connector arrangement for a lead for an implantable stimulation device. 4,840,580, Cl. 439-431.000.
Sagane, Masahiko: *See*—
Misawa, Masayuki; Ogasawara, Toshio; Sagane, Masahiko; Hirata, Yasuyuki; and Kume, Masafumi, 4,840,715, Cl. 204-181.100.
Sagara, Masaaki: *See*—
Takehana, Tsutomu; Kouzai, Tetsuo; Sagara, Masaaki; Yaginuma, Tamio; and Sasaki, Teruji, 4,840,014, Cl. 53-432.000.
Sagawa, Masato: *See*—
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Saijo, Hiroyuki: *See*—
Shiozaki, Ryozi; Kaji, Atsuhiko; Saijo, Hiroyuki; and Deguchi, Katsuhiko, 4,840,746, Cl. 252-174.250.
Sailer, Erwin: *See*—
Lay, Kurt; and Sailer, Erwin, 4,840,551, Cl. 425-12.000.
St. Angelo, Stephen, Jr.; Carver, George C.; Patterson, David W.; and Fremont, Owen K., to General Motors Corporation. Method of using a robot for installing weather stripping in a door or like opening. 4,839,958, Cl. 29-450.000.
Saint-Gobain Vitrage: *See*—
Orain, Roger, 4,840,657, Cl. 65-107.000.
Saito, Akira: *See*—
Kamisada, Toshimasa; and Saito, Akira, 4,841,509, Cl. 369-46.000.
Saito, Harunobu: *See*—
Imanaka, Tadashi; Takagi, Masayuki; Togawa, Eisei; Saito, Harunobu; Nagaike, Sadanori; Ohura, Masaki; Suzuki, aburo; Kobayashi, Tetsuo; and Kuwatsuka, Shunichiro, 4,841,402, Cl. 360-126.000.
Saito, Ikuhiro: *See*—
Matsushita, Osami; Takagi, Michiyuki; Yoneyama, Mitsuho; Sugaya, Toyomi; and Saito, Ikuhiro, 4,841,212, Cl. 318-607.000.
Saito, Kazuo; Saito, Toshihiko; and Kishimoto, Ken, to Kabushiki Kaisha Toshiba. Pulsating combustion system. 4,840,558, Cl. 431-1.000.
Saito, Koichi: *See*—
Inoue, Nanao; Saito, Koichi; Kato, Ryoki; Fujimagari, Hiroshi; Fujimura, Yoshihiko; Kato, Seiichi; Naito, Koichi; and Horie, Kiyoshi, 4,841,312, Cl. 346-160.00R.
Kobayashi, Hideki; Ikeda, Minoru; Saito, Koichi; Nagata, Shiro; and Horino, Koichi, 4,840,873, Cl. 430-273.000.
Saito, Masanori: *See*—
Kammoto, Yoshiaki; and Saito, Masanori, 4,841,358, Cl. 358-75.000.
Saito, Masuhiro: *See*—
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Saito, Nobuhiro: *See*—
Araki, Junichi; Saito, Nobuhiro; Tezuka, Hidenori; and Saito, Masuhiro, 4,840,608, Cl. 474-205.000.
Saito, Ryo: *See*—
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Saito, Shinichiro: *See*—
Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 4,840,844, Cl. 428-336.000.
Saito, Susumu: *See*—
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Saito, Takanobu: *See*—
Aoki, Hiroyuki; Yahagi, Shinichiro; and Saito, Takanobu, 4,840,073, Cl. 73-862.360.
Saito, Toshihiko: *See*—
Saito, Kazuo; Saito, Toshihiko; and Kishimoto, Ken, 4,840,558, Cl. 431-1.000.
Saito, Yusaku: *See*—
Nakano, Masaaki; Watanabe, Syoyu; Saito, Yusaku; and Iwata, Syuji, 4,841,290, Cl. 340-707.000.
Saji, Miyuki: *See*—
Tsuji, Michiru; Konno, Chisato; and Saji, Miyuki, 4,841,479, Cl. 364-900.000.
Sakaguchi, Yoshikazu; Taga, Yutaka; and Kashihara, Yuji, to Aisin-Warner Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Hydraulic control device for automatic transmissions. 4,840,092, Cl. 74-869.000.
Sakai, Katsuhisa: *See*—
Murai, Takaaki, and Sakai, Katsuhisa, 4,841,017, Cl. 525-327.300.
Sakai, Kunihiro: *See*—
Miyazaki, Toshihiko; Sakai, Kunihiro; Tomida, Yoshinori; Sugata, Hiroyuki; Matsuda, Hiroshi; and Nishimura, Yukuo, 4,840,821, Cl. 427-430.100.
Sakaki, Toshiro: *See*—
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Sakakima, Hiroshi: *See*—
Satomi, Mitsuo; Kuroe, Akio; Sawai, Eisuke; Higashionji, Masaru; Sakakima, Hiroshi; and Kondo, Kenji, 4,841,401, Cl. 360-125.000.
Sakakino, Takahiro; Ohmori, Koji; Yoshimura, Takashi; Kazusaka, Shoji; and Sunagawa, Yoshitaka, to Omron Tateisi Electronics Co. Slide switch. 4,841,109, Cl. 200-302.100.
Sakamoto, Noriaki: *See*—
Yamada, Koji; and Sakamoto, Noriaki, 4,840,037, Cl. 62-199.000.
Sakamoto, Seiji; and Yasumura, Kiyoshi, to Diafoil Company, Limited. Polyester film for magnetic recording tape. 4,840,830, Cl. 428-141.000.
Sakamoto, Yoshito, to Sumitomo Electric Industries, Ltd. Flame retardant heat-shrinkable tube. 4,840,987, Cl. 524-436.000.
Sakane, Takaaki; and Takeuchi, Kazuhiro, to Nippondenso Co., Ltd Fan apparatus. 4,840,541, Cl. 416-223.00R.
Sakano, Shinji: *See*—
Nakamura, Hitoshi; Sakano, Shinji; Inoue, Hiroaki; Katsuyama, Toshio; and Matsumura, Hiroyoshi, 4,840,446, Cl. 350-96.130.
Sakata, Masayasu, to Honda Giken Kogyo Kabushiki Kaisha. Sealed-type lash adjuster. 4,840,151, Cl. 123-90.430
Sakikiyama, Ryuzo: *See*—
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakikiyama, Ryuzo, 4,840,246, Cl. 180-247.000.
Sakitani, Katsumi; Kang, Yooo M.; Shinozaki, Shinichiro; Taneya, Shoichi; Miura, Kazuo; Ogura, Tadashi; and Noguchi, Satoshi. Cryogenic refrigerator. 4,840,043, Cl. 62-51.200.
Sakuma, Hiroshi: *See*—
Matsushita, Kunitake; Sakuma, Hiroshi; Yamawaki, Takayuki; Yoshikura, Takashi; Sano, Hiroshi; Suzuki, Yuzuru; Torii, Michihiro; and Ohnuki, Tohru, 4,841,190, Cl. 310-257.000.
Sakurai, Tadashi; and Fuchigami, Wataru, to Yamaha Hatsudoki Kabushiki Kaisha. Exhaust gas control means for engine. 4,840,029, Cl. 60-313.000.
Sakurai, Tadashi: *See*—
Ohmae, Tadayuki; Sakurai, Tadashi; and Asao, Kouichiro, 4,840,847, Cl. 428-373.000.
Sakurai, Yasuo: *See*—
Nakagawa, Toru; Kubota, Hitoshi; and Sakurai, Yasuo, 4,841,430, Cl. 364-167.010.
Saldarelli, Thomas A.: *See*—
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Saller, Helmut: *See*—
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Salzman, Robert S.: *See*—
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Samarin, Alexei J.: *See*—
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Sampson, Stephen A.; Dambach, Philip J.; and Brunker, David L., to Molex Incorporated. Shielded fiber optic connector assembly. 4,840,451, Cl. 350-96.200.
Samsung Electronics Co., Ltd.: *See*—
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Samuels, Louann B.: *See*—
Roberts, Sheldon D.; Samuels, Louann B.; and Shadwick, David T., 4,840,503, Cl. 400-208.000.

Sanada, Kohji, to NEC Corporation. Semiconductor memory circuit with improved timing and delay control for data read out. 4,841,488, Cl. 365-233.000.

Sanchez, Joseph P.: *See—*
Domagala, John M.; Hagen, Susan E.; Sanchez, Joseph P.; and Solomon, Marjorie S., 4,840,956, Cl. 514-312.000.

Sanden Corporation: *See—*
Akabane, Hidemitsu; Isobe, Toshimi; and Hoshino, Seiichi, 4,840,308, Cl. 236-13.000.
Kazuhiko, Takai, 4,840,039, Cl. 62-244.000.
Nara, Kenichi; and Takahashi, Ryoichi, 4,840,439, Cl. 312-116.000.
Sato, Motoharu, 4,840,038, Cl. 62-210.000.

Sander, Bruno; Lauer, Herbert; and Neuwerth, Manfred, to BASF Aktiengesellschaft. Process for producing combustible sewage sludge filter cakes in filter presses. 4,840,736, Cl. 110-727.000.

Sandkuhl, Jurgen: *See—*
Elsner, Hans F. K.; Prendel, Peter W.; Kradler, Wilfried H. K.; and Sandkuhl, Jurgen, 4,841,102, Cl. 174-35.0GC.

Sandoz Ltd.: *See—*
Auerbach, Gunther; and Moser, Helmut A., 4,840,642, Cl. 8-549.000.

Sandoz Pharm. Corp.: *See—*
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Sands, Keith P.: *See—*
Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; Sands, Keith P.; and Hagedorn, Myrna L., 4,840,801, Cl. 426-3.000.

Sangen, Masashi: *See—*
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Sanmatsu Kogyo Kabushiki Kaisha: *See—*
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Sanmei Denki Kabushiki Kaisha: *See—*
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Sanner, Axel: *See—*
Goertz, Hans-Helmut; Straub, Ferdinand; Sanner, Axel; Kolb, Albrecht; Raubenheimer, Hans-Juergen; and Vogel, Friedrich, 4,841,066, Cl. 548-335.000.

Sano, Hiroshi: *See—*
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Sano, Kunihiko; Nagao, Makoto; Nahara, Akira; Nishikawa, Yasuo; and Iwasaki, Hiroyuki, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,840,843, Cl. 428-336.000.

Sano, Shojiro; and Saeki, Keiso, to Fuji Photo Film Co., Ltd. Desensitizer composition. 4,840,927, Cl. 503-201.000.

Sano, Tetsuo: *See—*
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Sano, Yoshi; Totsu, Hideo; and Morihisa, Toshiharu, to Tamura Electric Works, Ltd. Bucket type coin accumulation apparatus. 4,841,563, Cl. 379-150.000.

Sanofi: *See—*
Wagnon, Jean; Guegan, Remy; LaCour, Colette; and Nisato, Dino, 4,840,935, Cl. 514-18.000.

Sanofi S.A.: *See—*
van Boeckel, Constant A. A.; Beetz, Tom; and Petitou, Maurice, 4,841,041, Cl. 536-118.000.

Santel, Hans-Joachim: *See—*
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, 4,840,66 , Cl. 71-90.000.

Sanyo Electric Co., Ltd.: *See—*
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.
Furukawa, Nobuhiro; Nishio, Koji; and Yoshinaga, Noriyuki, 4,840,858, Cl. 429-197.000.
Murashima, Hirotsugu; Maeda, Satoru; and Hirano, Shunji, 4,841,370, Cl. 358-227.000.
Takeuchi, Masaru; Fukatsu, Takeo; Nakano, Shoichi; Kuwano, Yukinori; Minami, Koji; and Iwamoto, Masayuki, 4,841,328, Cl. 355-211.000.
Toguchi, Akira, 4,841,381, Cl. 360-10.300.

Saotome, Shigeru, to Fuji Photo Film Co., Ltd. Image read-out and recording apparatus. 4,841,147, Cl. 250-327.200.

Sarossy nee Kincsesy, Judit: *See—*
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.

Saruwatari, Hidetoshi: *See—*
Higuchi, Kazuo; Tabata, Hiroshi; Okuhara, Hisakazu; Saruwatari, Hidetoshi; and Akiyama, Akihiko, 4,840,325, Cl. 242-107.200.

Sarwinski, Raymond E.: *See—*
Burnett, Sibley C.; Purcell, John R.; Ireneman, Bruce C.; and Sarwinski, Raymond E., 4,841,268, Cl. 335-216.000.

Sasago, Masaru: *See—*
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Ogawa, Kazufumi; Sasago, Masaru; Endo, Masayuki; and Ishihara, Ken, 4,841,341, Cl. 355-43.000.

Sasaki, Akihiko; and Atsumi, Hiroaki, to Fuji Photo Film Co., Ltd. Audio recording device. 4,841,382, Cl. 360-32.000.

Sasaki, Akira; Takahashi, Yoshihito; Hakoyama, Akiyoshi; Mikami, Katsumasa; Suzaki, Masafumi; Honma, Takeo; Yasutomi, Tsuyoshi; Shiraishi, Ryoichi; and Nishiguchi, Yasuo, to Hitachi, Ltd. Thermal transfer printer having an improved thermal head to improve ink transfer eveness. 4,840,500, Cl. 400-120.000.

Sasaki, Gordon H., to Dow Corning Wright. Lozenge-shaped low profile injection reservoir. 4,840,190, Cl. 128-897.000.

Sasaki, Hideharu: *See—*
Sawaki, Toru; Sasaki, Hideharu; Nakamura, Tsutomu; and Sadanobu, Jiro, 4,840,762, Cl. 264-29.200.

Sasaki, Hiroshi: *See—*
Tsuboi, Nobuyoshi; Watanabe, Atsumi; Sato, Yoshio; Shimada, Satoshi; and Sasaki, Hiroshi, 4,841,514, Cl. 369-100.000.

Sasaki, Jun; Adachi, Atsushi; Naruo, Kyoichi; Shinagawa, Yukio; and Ohtani, Sumio, to Fuji Photo Film Co., Ltd. Fine porous membrane and process for producing the same. 4,840,733, Cl. 210-500.410.

Sasaki, Kiyoshi: *See—*
Ikeda, Go; Sasaki, Kiyoshi; Kumazaki, Hiroshi; Fujita, Shigeru; and Banzai, Hideo, 4,841,459, Cl. 364-557.000.

Sasaki, Naoko: *See—*
Oda, Masatsugu; Sasaki, Naoko; Sakaki, Toshiro; Tomita, Hirofumi; and Nonaka, Nobuyuki, 4,840,959, Cl. 514-355.000.

Sasaki, Nobukazu: *See—*
Kasamura, Toshirou; Takagi, Masafumi; Okuda, Naoki; Ohashi, Masashi; Kusumoto, Toshihiko; Sasaki, Nobukazu; Maeda, Yasunori; and Ikeda, Masamichi, 4,841,329, Cl. 355-245.000.
Kusumoto, Toshihiko; Kasanara, Toshirou; Okuda, Naoki; Ohashi, Masashi; Sasaki, Nobukazu; and Nada, Minoru, 4,841,336, Cl. 355-245.000.

Sasaki, Ryoichi, to Brother Kogyo Kabushiki Kaisha. Display control device for a typewriter which displays both input characters and format information. 4,840,499, Cl. 400-83.000.

Sasaki, Takashi: *See—*
Iwagaki, Masaru; Sasaki, Takashi; Kumamura, Tawara; Ishii, Fumio; and Koshizuka, Kunihiro, 4,840,882, Cl. 430-505.000.

Sasaki, Teruji: *See—*
Takehana, Tsutomu; Kouzai, Tetsuo; Sagara, Masaaki; Yaginuma, Tamio; and Sasaki, Teruji, 4,840,014, Cl. 53-432.000.

Sasaki, Toshimi: *See—*
Sobue, Masahisa; Okada, Sensuke; Akahori, Kimihiko; Kuniya, Keiichi; Sasaki, Toshimi; Kajiwara, Toshiyuki; Kimura, Tomoaki; and Nihei, Mitsuo, 4,839,949, Cl. 29-132.000.

Sasaki, Yuuichi: *See—*
Yoshida, Akira; and Sasaki, Yuuichi, 4,841,438, Cl. 364-200.000.

Sasib S.p.A.: *See—*
Gherardi, Gian L., 4,840,266, Cl. 198-471.100.

Sasse, Klaus: *See—*
Hagemann, Hermann; and Sasse, Klaus, 4,841,089, Cl. 558-412.000.

Sato, Daiki: *See—*
Goi, Kouichi; Emori, Hiroshi; and Sato, Daiki, 4,841,144, Cl. 250-239.000.

Sato, Fumihide: *See—*
Ozaki, Yoshihiko; Sumitani, Hiroaki; Tomoda, Toshimasa; Sato, Fumihide; and Kusano, Kenji, 4,841,489, Cl. 367-7.000.

Sato, Kensaku, to Hirose Electric Co., Ltd. Electrical contact. 4,840,578, Cl. 439-395.000.

Sato, Motoharu, to Sanden Corporation. Control device for use in a refrigeration circuit. 4,840,038, Cl. 62-210.000.

Sato, Nobuyuki; Matsubayashi, Hiroshi; Kobayashi, Seishichi; Mitsuhashi, Minoru; Matsuno, Kenji; and Ishibashi, Kazuhisa, to Toyo Seikan Kaisha Ltd. Butt-welded cans and process for manufacturing the same. 4,840,304, Cl. 228-214.000.

Sato, Osamu: *See—*
Kawasaki, Masahiro; and Sato, Osamu, 4,841,322, Cl. 354-400.000.

Sato, Tasuku; Nakanishi, Kiyoshi; Fukumura, Yoshikazu; and Nagasawa, Keizo, to NTN Toyo Bearing Co., Ltd. Grease for homokinetic joint. 4,840,740, Cl. 252-32.70E.

Sato, Yasuhiro; and Haraguchi, Kazuo, to Kabushiki Kaisha Maki Seisakusho. Object distributing and supplying method and apparatus. 4,840,265, Cl. 198-446.000.

Sato, Yoshio: *See—*
Tsuboi, Nobuyoshi; Watanabe, Atsumi; Sato, Yoshio; Shimada, Satoshi; and Sasaki, Hiroshi, 4,841,514, Cl. 369-100.000.

Sato, Yutaka: *See—*
Ito, Yukio; Sato, Yutaka; Kishimoto, Shinji; and Tamano, Satoshi, 4,840,180, Cl. 128-661.080.

Satoh, Isao: *See—*
Sugimura, Tatuo; Satoh, Isao; Imai, Yoshihiko; and Ichinose, Makoto, 4,841,498, Cl. 369-32.000.

Satoh, Kazumasa: *See—*
Kobayashi, Susumu; and Satoh, Kazumasa, 4,840,620, Cl. 604-246.000.

Satoh, Keiji: *See—*
Kozuki, Susumu; and Satoh, Keiji, 4,841,380, Cl. 360-10.200.

Satoh, Shin: *See—*
Kondow, Masahiko; Satoh, Shin; Minagawa, Shigekazu; Ohishi, Akio; and Kajimura, Takashi, 4,841,531, Cl. 372-43.000.

Satomi, Mitsuo; Kuroe, Akio; Sawai, Eisuke; Higashionji, Masaru; Sakakima, Hiroshi; and Kondo, Kenji, to Matsushita Electric Industrial Co., Ltd. Amorphous magnetic head. 4,841,401, Cl. 360-125.000.

Saunders, Anne L.; and Fields, John G. Insect guard system and method of use. 4,839,984, Cl. 43-112.000.

Saupe, Juergen: *See—*
Feustel, Mattias; Frotscher, Guenter; Nitschke, Wieland; Obenauf, Dieter; Saupe, Juergen; and Weidelt, Manfred, 4,840,202, Cl. 139-425.00R.

Saviotti, Vanni: *See—*
Siligoni, Marco; Saviotti, Vanni; and Lorena, Emilio, 4,841,565, Cl. 379-413.000.

Sawai, Eisuke: *See—*
Satomi, Mitsuo; Kuroe, Akio; Sawai, Eisuke; Higashionji, Masaru; Sakakima, Hiroshi; and Kondo, Kenji, 4,841,401, Cl. 360-125.000.

Sawaki, Toru; Sasaki, Hideharu; Nakamura, Tsutomu; and Sadanobu, Jiro, to Teijin Ltd. Process for preparation of high-performance grade carbon fibers. 4,840,762, Cl. 264-29.200.

Sawamoto, Hirokazu; Omura, Takashi; and Harada, Naoki, to Sumitomo Chemical Company, Limited. Dioxazine compound having vinylsulfone type fiber reactive group. 4,841,048, Cl. 544-74.000.

Sawamura, Masataka: *See—*
Yamada, Minoru; Ito, Eiji; Miyama, Kenji; Sawamura, Masataka; Hoshino, Yasushi; and Makino, Masamori, 4,841,323, Cl. 354-400.000.

Sawyer, Joanna D.: *See—*
Lievense, Jefferson C.; Sawyer, Joanna D.; and Terpolilli, Anthony J., 4,840,898, Cl. 435-87.000.

Saxena, Vinit, to Sepragen Corporation. Chromatography system using horizontal flow columns. 4,840,730, Cl. 210-198.200.

Saxpy Computer Corporation: *See—*
Papenberg, Robert L., 4,841,435, Cl. 364-200.000.

Scaglione, Mark W.: *See—*
Severin, Joel C.; Scaglione, Mark W.; Hinds, William S.; and Jusionis, Vytautas J., 4,841,115, Cl. 219-60.00A.

Schachter, David; Kowarski, Szloma; Cowen, Lisa A.; and Abbott, Richard E., to Columbia University in the City of New York, The Trustees of. Method for detecting a marker for essential hypertension and diagnostic use thereof. 4,840,894, Cl. 435-7.000.

Schaefer, Joseph G.: *See—*
Gardner, David A.; Ryan, James G.; Schaefer, Joseph G.; and Walton, Erick G., 4,840,302, Cl. 228-123.000.

Schafer, Roland: *See—*
Ams, Felix; and Schafer, Roland, 4,841,363, Cl. 358-98.000.

Schaper, Uwe: *See—*
Peter, Cornelius; Schaper, Uwe; and Schmidt, Lothar, 4,840,349, Cl. 251-129.110.

Schauflinger, Hans: *See—*
Hilz, Wolfgang; Schuster, Rudolf; and Schauflinger, Hans, 4,841,241, Cl. 324-158.00F.

Scheffel, Gary W.: *See—*
Gausman, Theodore J.; and Scheffel, Gary W., 4,840,191, Cl. 137-15.000.

Scheffler, Gerhard: *See—*
Engel, Jurgen; and Scheffler, Gerhard, 4,841,047, Cl. 540-599.000.

Schenck, Frederick: *See—*
Edelstein, William A.; and Schenck, Frederick, 4,840,700, Cl. 156-634.000.

Schenk, Gunther: *See—*
Peters, Manfred; Ohlschlager, Hans; Kaluschke, Thomas; Wingender, Kaspar; Schenk, Gunther; and Boie, Immo, 4,840,871, Cl. 430-203.000.

Schering Corporation: *See—*
Watkins, Robert; Doll, Ronald J.; Neustadt, Bernard R.; Smith, Elizabeth M.; Magatti, Charles V.; and Gold, Elijah H., 4,840,772, Cl. 422-61.000.

Schick, Gerald: *See—*
Matthias, Klaus; Baumann, Karl-Heinz; Schick, Gerald; Disson, Arno; Moller, Hermann; Seel, Holger; Topfer, Claus; Nerger, Uwe; Thiele, Peter; and Fleisch, Eugen, 4,840,398, Cl. 280-756.000.

Schiel, Lothar, to Alfred Teves GmbH. Electromagnetically actuatable three-way/two-position directional control valve. 4,840,193, Cl. 137-627.500.

Schiering, Rolf, to Deutsche AG fur Unterhaltungeselectronic OHG. Cassette recorder with recording programming. 4,841,386, Cl. 360-69.000.

Schinazi, Raymond F.: *See—*
Chu, Chung K.; and Schinazi, Raymond F., 4,841,039, Cl. 536-29.000.

Schindler, Bernd: *See—*
Bauser, Herbert; Schindler, Bernd; and Chmiel, Horst, 4,840,636, Cl. 8-115.520.

Schlossman, Stuart F.: *See—*
Todd, Robert F., III; Lucchesi, Benedict R.; Simpson, Paul J.; Griffin, James D.; and Schlossman, Stuart F., 4,840,793, Cl. 424-85.800.

Schlumberger Technologies, Inc.: *See—*
Sloane, Edwin A., 4,841,471, Cl. 364-825.000.

Schlumberger Technology Corporation: *See—*
Carron, Didier, 4,841,490, Cl. 367-38.000.
Peltier, Bertrand, 4,840,061, Cl. 73-155.000.

Schmalfuss, Harald; Kurpiella, Hubert; and Schneider, Bernhard, to Battelle-Institut e.V. Method for testing components of transparent material for surface irregularities and occlusions. 4,841,139, Cl. 250-223.00R.

Schmid, Frederick: *See—*
Khattak, Chandra P.; White, Vernon E.; Schmid, Frederick; and Wohlgemuth, John H., 4,840,699, Cl. -//.000.

Schmidli, Wilheim: *See—*
Quadranti, Marco; Schmidli, Wilheim; and Zoschke, Andreas, 4,840,663, Cl. 71-93.000.

Schmidt, Dieter: *See—*
Zipprath, Michael; and Schmidt, Dieter, 4,840,160, Cl. 123-467.000.

Schmidt, Helmut; Patzelt, Helmut; Tunker, Gerhard; and Scholze, Horst, to Fraunhofer-Gesellschaft zur Forderung der angewandten Forschung e.V. Lacquer, and process for producing anti-corrosion coatings. 4,840,666, Cl. 106-14.050.

Schmidt, Lothar: *See—*
Peter, Cornelius; Schaper, Uwe; and Schmidt, Lothar, 4,840,349, Cl. 251-129.110.

Schmidt, Paul. Pneumatic ram boring machine. 4,840,234, Cl. 173-90.000.

Schmidt, Robert R.: *See—*
Diehr, Hans-Joachim; Fest, Christa; Kristen, Rolf; Kluth, Joachim; Muller, Klaus-Helmut; Pfister, Theodor; Priesnitz, Uwe; Riebel, Hans-Jochem; Roy, Wolfgang; Santel, Hans-Joachim; Schmidt, Robert R.; and Eue, Ludwig, 4,840,661, Cl. 71-90.000.

Schmidt, Wolf-Dieter, to Draegerwerk AG. Process for producing a hollow fiber mass transfer module and module produced by this process. 4,840,227, Cl. 165-162.000.

Schmieder, Ronald R.: *See—*
Forman, Edward W., Jr.; Provan, Alexander R.; and Schmieder, Ronald R., 4,840,335, Cl. 248-97.000.

Schneider, Bernhard: *See—*
Schmalfuss, Harald; Kurpiella, Hubert; and Schneider, Bernhard, 4,841,139, Cl. 250-223.00R.

Schneider, Eckhard, to Man - Roland Druckmaschinen AG. Combination folding and cut product attachment apparatus. 4,840,364, Cl. 270-38.000.

Schneider, Karl D. Transportation of hospital patients. 4,840,391, Cl. 280-304.100.

Schneider, Matthew L.: *See—*
Bishop, Eugene R.; Schneider, Matthew L.; and Rosshirt, Hermann, 4,841,243, Cl. 324-174.000.

Schnoes, Heinrich K.: *See—*
DeLuca, Hector F.; Kutner, Andrzej; and Schnoes, Heinrich K., 4,841,038, Cl. 536-27.000.

Schodl, Richard, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Apparatus for measuring flow vectors in gas currents. 4,840,486, Cl. 356-338.000.

Scholpp, Werner, to Montres Rado S.A. Articulated wristlet. 4,840,044, Cl. 63-4.000.

Scholze, Horst: *See—*
Schmidt, Helmut; Patzelt, Helmut; Tunker, Gerhard; and Scholze, Horst, 4,840,666, Cl. 106-14.050.

Schonlau, Juergen; Birkenbach, Alfred; and Harth, Ralf, to Alfred Teves GmbH. Pressure control device, in particular for pressure-fluid-operable brake systems of automotive vehicles. 4,840,433, Cl. 303-9.680.

Schoofs, Franciscus A. C. M., to U.S. Philips Corporation. DC-supply arrangement for a telecommunication line. 4,841,564, Cl. 379-413.000.

Schranz, Karl-Wilhelm: *See—*
Ohlschlager, Hans; Schranz, Karl-Wilhelm; and Sobel, Johannes, 4,840,890, Cl. 430-622.000.

Schraven, Petrus E. G.; and Jacobs, Jan A. M. H., to Smitweld B.V. Packing material for relatively rigid objects and method for packing electrodes. 4,840,831, Cl. 428-152.000.

Schriewer, Michael; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., to Bayer Aktiengesellschaft. Pyridine-enamines. 4,841,059, Cl. 546-312.000.

Schroeder, Karl S. Sheet music binder. 4,840,407, Cl. 281-48.000.

Schubert & Salzer Maschinenfabrik: *See—*
Karl, Rupert; and Becker, Rudolf, 4,840,022, Cl. 57-263.000.

Schuetz, Robert W. Amusement projectile device. 4,840,598, Cl. 446-52.000.

Schultz, Gert, to Stormax International A/S. Method of continuously processing and packing elongated articles such as coherent pairs of chopsticks and an apparatus for carrying out the method. 4,840,015, Cl. 53-435.000.

Schultz, Gert, to Stormax International A/S. Method of manufacturing oblong wooden articles to be used for the manufacture of coupled-together pairs of chopsticks. 4,840,208, Cl. 144-367.000.

Schultz, Paul B.; and Yarkosky, Eugene F., to Enthone, Incorporated. Electroless nickel plating of aluminum. 4,840,820, Cl. 427-305.000.

Schulz, Frank: *See—*
Rohling, Holmer; Schulz, Frank; and Preininger, Siegfried, 4,840,171, Cl. 128-204.180.

Schumacher, John E., III, to Action Technologies, Inc. Apparatus and method for plasma treating of circuit boards. 4,840,702, Cl. 156-643.000.

Schuster, Rudolf: *See—*
Hilz, Wolfgang; Schuster, Rudolf; and Schauflinger, Hans, 4,841,241, Cl. 324-158.00F.

Schuyler, Martin: *See—*
Cox deceased, Duncan B.; and Schuyler, Martin, 4,841,124, Cl. 219-201.000.

Schvester, Pascal, to American Air Liquide. Sealing cap for liquid food or beverage containers. 4,840,280, Cl. 215-228.000.

Schwander, Hansrudolf: *See—*
Aeschlimann, Peter; and Schwander, Hansrudolf, 4,841,028, Cl. 534-629.000.

Schwark, Hubert: *See—*
Naser, Georg; Reichenberger, Helmut; and Schwark, Hubert, 4,840,166, Cl. 128-24.00A.

Schwarz, Volker: *See—*
Notz, Wolfgang; Schwarz, Volker; and Augustin, Ulrich, 4,840,060, Cl. 73-119.00A.
Schwarz, William M., to Xerox Corporation. Ink compositions. 4,840,674, Cl. 106-22.000.
Schwegler, Patrice; Debrie, Jean-Jacques; Clement, Bernard; Moreaux, Francois; and Olivier, Jacques, to Servimetal. Apparatus for studying quenching fluids and quenchability of materials. 4,840,353, Cl. 266-80.000.
Scientific Design Company, Inc.: *See—*
Armstrong, William D., 4,841,080, Cl. 549-536.000.
Harvey, Robert J., 4,841,072, Cl. 549-230.000.
Scriabine, Alexander: *See—*
Sterzel, R. Bernd; and Scriabine, Alexander, 4,840,960, Cl. 514-356.000.
Sea Search, Inc.: *See—*
Rogers, William H., 4,839,979, Cl. 43-6.000.
Seagate Technology, Inc.: *See—*
MacLeod, Donald J.; Peterson, Miles L.; and Nowark, Charles G., Jr., 4,841,393, Cl. 360-98.070.
SECO Industries, Inc.: *See—*
Walz, David K.; Howerton, Robert D.; Allen, Andrew W.; Moss, Thera C.; and Kenney, William H., 4,840,770, Cl. 422-49.000.
See-Me Lights Corp.: *See—*
Irie, Tsutomu, 4,841,199, Cl. 315-83.000.
Seel, Holger: *See—*
Matthias, Klaus; Baumann, Karl-Heinz; Schick, Gerald; Disson, Arno; Moller, Hermann; Seel, Holger; Topfer, Claus; Nerger, Uwe; Thiele, Peter; and Fleisch, Eugen, 4,840,398, Cl. 280-756.000.
Segal, Alan J. Dental measuring apparatus. 4,840,564, Cl. 433-72.000.
Segatz, Wilhelm, to ARA - Werk Kramer GmbH & Co. Apparatus for discharging a bead of pasty material from a flexible bag. 4,840,293, Cl. 222-94.000.
Seibert, Kenneth D.: *See—*
Domian, Henry A.; LaCount, Dale F.; Miller, Alex S.; and Seibert, Kenneth D., 4,840,768, Cl. 420-582.000.
Seichter, Werner: *See—*
Lieske, Normen; and Seichter, Werner, 4,841,525, Cl. 371-21.000.
Seidel, Peter; Pelzl, Leo; and Zell, Karl, to Siemens Aktiengesellschaft. Mechanism for connecting shielding caps of multi-pole plugs to the ground potential layers of a mother board. 4,840,573, Cl. 439-92.000.
Seidler, David: *See—*
Lunderman, William; and Seidler, David, 4,840,288, Cl. 220-334.000.
Seiffarth, Werner: *See—*
Hahn, Guenther; Krueger, Hans; Lamprecht, Herbert; and Seiffarth, Werner, 4,841,539, Cl. 372-63.000.
Seitz, Karl, to Ciba-Geigy Corporation. Reactive dyes of the dioxazine series. 4,841,049, Cl. 544-76.000.
Seki, Fumio, to Yoshida Kogyo K. K. Fastener conveying apparatus for fastener assembling machine. 4,840,301, Cl. 227-139.000.
Sekiya, Shinji, to Disco Abrasive Systems, Ltd. Method and apparatus for machining hard, brittle and difficultly-machinable workpieces. 4,839,996, Cl. 51-281.00R.
Sekmakas, Kazys, to DeSoto, Inc. Aqueous dispersions of partially cross-linked emulsion copolymers. 4,840,911, Cl. 524-812.000.
Self, Colin H., to Cambridge Patent Development Limited. Monoclonal antibodies reactive with immune complexes. 4,840,895, Cl. 435-7.000.
Sendvac M. Knape GmbH & Co. Maschinen und Anlagen KG: *See—*
Knape, Michael, 4,840,691, Cl. 156-245.000.
Senft, Helmut; and Hasenrath, Peter, to Maschinenfabrik Andritz Actiengesellschaft. Device for sealing shaft bearings or shaft bearing housings. 4,840,385, Cl. 277-53.000.
Sensor Technologies, Inc.: *See—*
Fiori, David, Jr., 4,841,245, Cl. 324-208.000.
Seo, Naobumi: *See—*
Murakami, Teruo; and Seo, Naobumi, 4,841,502, Cl. 369-13.000.
Sepragen Corporation: *See—*
Saxena, Vinit, 4,840,730, Cl. 210-198.200
Sera, Hidefuji: *See—*
Kato, Eiichi; Dan, Shigeyuki; Ishibashi, Hiroshi; Ishii, Kazuo; and Sera, Hidefuji, 4,840,865, Cl. 430-114.000.
Servimetal: *See—*
Schwegler, Patrice; Debrie, Jean-Jacques; Clement, Bernard; Moreaux, Francois; and Olivier, Jacques, 4,840,353, Cl. 266-80.000.
Seto, Nobuyuki: *See—*
Kose, Junichi; and Seto, Nobuyuki, 4,841,321, Cl. 354-324.000.
Severin, Joel C.; Scaglione, Mark W.; Hinds, William S.; and Jusionis, Vytautas J., to ST International. Orbital weldhead. 4,841,115, Cl. 219-60.00A.
Sewer Rodding Equipment Company: *See—*
Prange, Charles J., 4,839,936, Cl. 15-104.330.
Seymour, George W. Controlling characteristics of a pulp mat on a pulp washing surface. 4,840,704, Cl. 162-49.000
SGS Microelecttronica SpA: *See—*
Siligoni, Marco; Saviotti, Vanni; and Lorena, Emilio, 4,841,565, Cl. 379-413.000.
Shadwick, David T.: *See—*
Roberts, Sheldon D.; Samuels, Louann B.; and Shadwick, David T., 4,840,503, Cl. 400-208.000.
Shafto, Leslie: *See—*
Chan, Aaron; Pierce, Ben; and Shafto, Leslie, 4,841,560, Cl. 379-29.000.
Shamblin, Judy A. Shower dispensing head. 4,840,311, Cl. 239-74.000.
Shaner, Richard L. Heat exchanger having metal wire screens, and method of making stack of screens therefor. 4,840,228, Cl. 165-165.000.
Sharp Corporation: *See—*
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.
Sharp Kabushiki Kaisha: *See—*
Edamura, Kaoru, 4,841,125, Cl. 219-506.000.
Hayakawa, Toshiro; Suyama, Takahiro; Kondo, Masafumi; Takahashi, Kohsei; and Yamamoto, Saburo, 4,841,533, Cl. 372-45.000.
Kotani, Matahira; Hayashi, Motohiko; and Yamanoue, Masafumi, 4,841,374, Cl. 358-280.000.
Kurokawa, Yasuyoshi, 4,840,505, Cl. 400-697.100.
Tsuji, Masaru, 4,840,300, Cl. 226-187.000.
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, 4,841,534, Cl. 372-46.000.
Sheikh, Morris. Apparaus for reduction of COD in water. 4,840,731, Cl. 210-200.000.
Shell Oil Company: *See—*
Byers, Dallas L., 4,840,782, Cl. 423-576.600.
Drent, Eit, 4,841,020, Cl. 528-392.000.
Hunter, Clifford P., 4,840,906, Cl. 435-240.490.
Matza, Stephen D.; Ellington, William E.; and Fleming, Henry C., III, 4,840,910, Cl. 436-30.000.
Van Iperen, Roeland; Van Der Mark, Johannes M.; and Kooijmans, Petrus G., 4,840,979, Cl. 523-404.000.
Shen, Richard. Easily adjustable latch. 4,840,412, Cl. 292-337.000.
Shen, Richard. Length-adjustable latch. 4,840,413, Cl. 292-337.000.
Shepard, Kenneth L.; and Graham, Samuel L., to Merck & Co., Inc. 2-Sulfamoyl-1H-indole derivatives for the treatment of elevated intraocular pressure. 4,840,963, Cl. 514-418.000.
Sheppa, Alexander: *See—*
Calcagni, Robert A.; and Sheppa, Alexander, 4,839,935, Cl. 14-24.000.
Sherman, Lawrence: *See—*
Eggler, James F.; Johnson, Michael R.; and Sherman, Lawrence, 4,841,078, Cl. 549-402.000.
Sheu, Yea-Dean, to Eastman Kodak Company. Method of interface state reduction in MNOS capacitors. 4,840,917, Cl. 437-10.000.
Sheu, Yea-Dean; and Hawkins, Gilbert, to Eastman Kodak Company. Method of noise reduction in CCD solid state imagers. 4,840,918, Cl. 437-53.000.
Shibagaki, Makoto: *See—*
Matsushita, Hajime; Shibagaki, Makoto; Takahashi, Kyoko; and Kuno, Hideyuki, 4,841,075, Cl. 549-341.000.
Shibata, Hitoshi: *See—*
Ushida, Masahiko; and Shibata, Hitoshi, 4,841,155, Cl. 250-463.100.
Shibata, Satoshi: *See—*
Ueda, Michio; and Shibata, Satoshi, 4,841,214, Cl. 318-696.000.
Shibuya, Koichi: *See—*
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Phillips, Roger W.; Spellman, Vernon C.; Gossett, Wayne L.; Kamerling, Marc A.; and Coombs, Paul G., 4,840,281, Cl. 215-230.000.

Spillman, William B., Jr., to Simmonds Precision. Polarimetric optical frequency domain distributed strain sensor and method. 4,840,481, Cl. 356-32.000.

Sposini, Maurizio: *See—*
Roffinella, Daniele; and Sposini, Maurizio, 4,841,523, Cl. 370-89.000.

Spraker, Wilbur A., Jr., to Household Manufacturing, Inc. Air cycle refrigeration system. 4,840,036, Cl. 62-172.000.

Spring Valley Associates, Inc.: *See—*
Marshall, William W.; and Springer, Lamar D., 4,841,404, Cl. 361-30.000.

Springer, Lamar D.: *See—*
Marshall, William W.; and Springer, Lamar D., 4,841,404, Cl. 361-30.000.

ST International: *See—*
Severin, Joel C.; Scaglione, Mark W.; Hinds, William S.; and Jusionis, Vytautas J., 4,841,115, Cl. 219-60.00A.

Stadler, Hugo: *See—*
Rosinnes, Meir; Stadler, Hugo; and Strunz, Siegfried, 4,841,218, Cl. 322-24.000.

Staerzl, Richard E., to Brunswick Corporation. Two cycle engine with low pressure crankcase fuel injection. 4,840,148, Cl. 123-73.00A.

Stambaugh, Clayton S.: *See—*
Green, Edward A.; and Stambaugh, Clayton S., 4,841,121, Cl. 249-243.000.

Standard Elektrik Lorenz Aktiengesellschaft: *See—*
Feigel, Josef; and Pfendler, Klaus, 4,841,186, Cl. 310-156.000.

Standard Oil Company, The: *See—*
Paspek, Stephen C., 4,840,725, Cl. 208-130.000.

Stark, Johannes: *See—*
Meumann, Henry R.; and Stark, Johannes, 4,840,131, Cl. 110-336.000.

Starke, J. Peter; Levacher, Friedrich K.; and Federmann, Helmut, to Philips Kommunikations Industrie A. Light conduit arrangement for monitoring a physical condition of a structural part. 4,840,480, Cl. 356-32.000.

State of Israel, Ministry of Defence, Armament Development Authority, Rafel: *See—*
Dodiuk, Hanna, 4,841,010, Cl. 528-99.000.

Staudenmayer, William J.; Weiss, David S.; and Pavlisko, Joseph A., to Eastman Kodak Company. Multiactive electrophotographic element. 4,840,860, Cl. 430-59.000.

Staudenmayer, William J.; Weiss, David S.; and Pavlisko, Joseph A., to Eastman Kodak Company. Multiactive electrophotographic element. 4,840,861, Cl. 430-59.000.

Staver, Daniel A.: *See—*
Ho, Chung-Yih; Molnar, Karl J.; and Staver, Daniel A., 4,841,467, Cl. 364-748.000.

STC PLC: *See—*
Stern, Ronald C., 4,840,701, Cl. 156-637.000.

Ste Look: *See—*
Bidal, Rene M. R., 4,840,086, Cl. 74-594.600.

Steely, Lee W., to AMP Incorporated. Data transmission system with bus failure detection system. 4,841,520, Cl. 370-13.000.

Steffes, Helmut, to Alfred Teves GmbH. Hydraulic brake system for automotive vehicles with anti-skid control system. 4,840,435, Cl. 303-116.000.

Steinbicker, Richard N.; Townsend, Herbert E.; and Yau, Yung-Herng, to Bethlehem Steel Corporation. Process for improving wear on conductor rolls in electroplating of steel surfaces. 4,840,712, Cl. 204-28.000.

Sterling Drug Inc.: *See—*
D'Ambra, Thomas E.; and Bell, Malcolm R., 4,840,950, Cl. 514-235.200.

Stern, Ronald C., to STC PLC. Etching apparatus and method. 4,840,701, Cl. 156-637.000.

Sterzel, R. Bernd; and Scriabine, Alexander, to Miles Laboratories, Inc. Treatment of glomerulonephritis. 4,840,960, Cl. 514-356.000.

Stevenson, David C.: *See—*
Finlay, David E.; Hanna, Stephen D.; Stevenson, David C.; and Varga, John T., 4,841,453, Cl. 364-519.000.

Stewart, Robert G.: *See—*
Howton, Kenneth D.; Stewart, Robert G.; and Zeitler, Herman R., 4,841,356, Cl. 337-248.000.

Stierberger, Willy F., to North American Philips Consumer Electronics Corp. X-radiation protection circuit. 4,841,406, Cl. 361-91.000.

Stiffler, Jack J.: *See—*
Mathewes, James K., Jr.; Hermam, Jan S.; Johnson, Stephen C.; Goud, Richard B.; and Stiffler, Jack J., 4,841,434, Cl. 364-200.000.

Stirbis, James S., to Preferred Machining Corporation. Fluid dispensing system. 4,840,138, Cl. 118-694.000.

Stockl, Klaus, to Siemens Aktiengesellschaft. Motor-adjustable head support for a dental treatment chair. 4,840,429, Cl. 297-409.000.

Stone, Albert L.: *See—*
Miller, Robert A.; and Stone, Albert L., 4,840,017, Cl. 53-468.000.

Stormax International A/S: *See—*
Schultz, Gert, 4,840,015, Cl. 53-435.000.
Schultz, Gert, 4,840,208, Cl. 144-367.000.

Stouffer Corporation, The: *See—*
Peleg, Yigal, 4,841,112, Cl. 219-10.55E.

Stoyhe, Helmut: *See—*
Geyer, Oswald; Lembens, Helmut; and Stoyhe, Helmut, 4,840,367, Cl. 271-160.000.

Strand, Marc A.: *See—*
Zdrahala, Richard J.; and Strand, Marc A., 4,841,007, Cl. 528-28.000.

Strange, Norman: *See—*
Gabriel, David; Audus, David; and Strange, Norman, 4,840,490, Cl. 356-375.000.

Strasser, Ludwig: *See—*
Mueller, Rudolf; and Strasser, Ludwig, 4,840,393, Cl. 280-661.000.

Straub, Ferdinand: *See—*
Goertz, Hans-Helmut; Straub, Ferdinand; Sanner, Axel; Kolb, Albrecht; Raubenheimer, Hans-Juergen; and Vogel, Friedrich, 4,841,066, Cl. 548-335.000.

Stroh, Alvin L.; and Pilon, Terry C., to McMillin Wire & Plating, Inc.; and Challenge Bag California, Inc. Cantilevered support arms for plastic bag rack. 4,840,336, Cl. 248-97.000.

Strong, Michael F., to General Electric Co. Matrix addressed flat panel liquid crystal display device with dual ended auxiliary repair lines for address line repair. 4,840,459, Cl. 350-333.000.

Stroup, Steven L., to Crown Unlimited Machine, Incorporated. Method for making a tube and fin heat exchanger. 4,839,950, Cl. 29-157.30C.

Strunz, Siegfried: *See—*
Rosinnes, Meir; Stadler, Hugo; and Strunz, Siegfried, 4,841,218, Cl. 322-24.000.

Studer, Philip A. Combination electric motor and magnetic bearing 4,841,204, Cl. 318-254.000.

Stupar, Jeffrey M.: *See—*
Melinyshyn, Lev A.; Stupar, Jeffrey M.; and Goldberg, Edward M., 4,840,690, Cl. 156-242.000.

Sturmon, George. Bushing for vehicle suspension. 4,840,395, Cl. 280-688.000.

Suda, Kakutaro, to Mitsubishi Denki Kabushiki Kaisha. Method of isolating a semiconductor device using local oxidation. 4,840,920, Cl. 437-69.000.

Suda, Shoji: *See—*
Ariizumi, Ryozo; Kainuma, Masakuni; Aoki, Toshikazu, Suda, Shoji; Hoshi, Mitsunori; and Ejiri, Takashi, 4,840,347, Cl. 251-63.400.

Suga, Yuko: *See—*
Ohta, Tokuya, Kobayashi, Masatsune; Suga, Yuko; Miura, Konoe; Takimoto, Hiroshi; and Yoneyama, Tomio, 4,841,037, Cl. 534-815.000.

Sugano, Masayo: *See—*
Kusaba, Tomoyuki; Takahashi, Junya; Sugano, Masayo; Uematsu, Tamon; Oguri, Yukio; and Teramae, Tomohiro, 4,841,088, Cl. 558-417.000.

Sugata, Hiroyuki: *See—*
Miyazaki, Toshihiko; Sakai, Kunihiro; Tomida, Yoshinori; Sugata, Hiroyuki; Matsuda, Hiroshi; and Nishimura, Yukuo, 4,840,821, Cl. 427-430.100.

Sugawara, Mitsutoshi: *See—*
Sugiyama, Takahiro, and Sugawara, Mitsutoshi, 4,841,177, Cl 307-494.000.

Sugaya, Toyomi: *See—*
Matsushita, Osami; Takagi, Michiyuki; Yoneyama, Mitsuho; Sugaya, Toyomi; and Saito, Ikuhiro, 4,841,212, Cl. 318-607.000.

Sugihara, Masahiro: *See—*
Morishita, Etsuo; Kakuda, Masayuki; Sugihara, Masahiro; Inaba, Tsutomu; Nakamura, Toshiyuki; and Kimura, Tadashi, 4,840,549, Cl. 418-55.000.

Sugihara, Taizo: *See—*
Ejima, Shozo; Sugihara, Taizo; and Abe, Morio, 4,840,846, Cl. 428-373.000.

Sugimoto, Naoto, to Shizuoka Seiki Co., Ltd. Device for measuring moisture content in grains. 4,841,230, Cl. 324-65.00R.

Sugimura, Tatuo; Satoh, Isao; Imai, Yoshihiko; and Ichinose, Makoto, to Matsushita Electric Industrial Co., Ltd. Information recording/reproducing apparatus with means for substituting predetermined good sectors for defective ones. 4,841,498, Cl. 369-32.000.

Suginaka, Yutaka: *See—*
Harada, Hidetoshi; Chihara, Satoshi; Suginaka, Yutaka; Suido, Shigeko; and Kobayashi, Toshitaka, 4,840,814, Cl. 426-580.000.

Sugioka, Shinji: *See—*
Suzuki, Shinji; Arai, Tetsuji; Ohno, Kuniharu; Ueki, Kazuyeshi; Mimura, Yoshiki; Tanaka, Kazuya; Sugioka, Shinji; and Suzuki, Hiroko, 4,841,342, Cl. 355-71.000.

Sugisawa, Ko; Matsumura, Yasushi; Okamoto, Hidefumi; and Abe, Kumiko, to House Food Industrial Co., Ltd. Process for preparing sterilized packaged fish and product thereof. 4,840,805, Cl. 426-129.000.

Sugishima, Noboru: *See—*
Ikeda, Noriaki; Sugishima, Noboru; Fujii, Yasushi; Ikuta, Shinji; Nakanishi, Yoshiyuki; and Inoue, Akira, 4,840,749, Cl. 260-378.000.

Sugiyama, Takahiro; and Sugawara, Mitsutoshi, to NEC Corporation. Comparator circuit operable for a wide range of input signal. 4,841,177, Cl. 307-494.000.

Suido, Shigeko: *See—*
Harada, Hidetoshi; Chihara, Satoshi; Suginaka, Yutaka; Suido, Shigeko; and Kobayashi, Toshitaka, 4,840,814, Cl. 426-580.000.

Suling, Carlhans: *See—*
Ohst, Holger; Podszun, Wolfgang; Suling, Carlhans; Goossens, John; and Penners, Gunther, 4,840,989, Cl. 524-544.000.

Sullivan, Charles T.; and Zook, J. David, to Honeywell Inc. Real-time color comparator. 4,841,140, Cl. 250-226.000.
Sumi, Tatsuo: *See*—
Kakumoto, Shigeru; Sumi, Tatsuo; and Kurisu, Tetsuo, 4,841,443, Cl. 364-413.010.
Sumitani, Hiroaki: *See*—
Ozaki, Yoshihiko; Sumitani, Hiroaki; Tomioda, Toshimasa; Sato, Fumihide; and Kusano, Kenji, 4,841,489, Cl. 367-7.000.
Sumitomo Chemical Company, Limited: *See*—
Kakisawa, Hiroshi; Kusumi, Takenori; and Ohno, Nobuo, 4,840,658, Cl. 71-67.000.
Kayane, Yutaka; Omura, Takashi; Tezuka, Yasuo; and Sone, Hideharu, 4,841,027, Cl. 534-599.000.
Kayane, Yutaka; Otake, Katsumasa; and Tezuka, Yasuo, 4,841,031, Cl. 534-638.000.
Kusaba, Tomoyuki; Takahashi, Junya; Sugano, Masayo; Uematsu, Tamon; Oguri, Yukio; and Teramae, Tomohiro, 4,841,088, Cl. 558-417.000.
Morimitsu, Toshihiko; Kikkawa, Sadanobu; Harada, Naoki; and Omura, Takashi, 4,841,032, Cl. 534-642.000.
Morimitsu, Toshihiko; Kikkawa, Sadanobu; Harada, Naoki; and Omura, Takashi, 4,841,033, Cl. 534-642.000.
Ohmae, Tadayuki; Sakurai, Tadashi; and Asao, Kouichiro, 4,840,847, Cl. 428-373.000.
Sawamoto, Hirokazu; Omura, Takashi; and Harada, Naoki, 4,841,048, Cl. 544-74.000.
Tsushima, Kazunori; Matsuo, Noritada; Tanabe, Yoo; Yano, Toshihiko; and Hirano, Masachika, 4,840,911, Cl. 514-721.000.
Sumitomo Electric Industries, Ltd.: *See*—
Fujii, Satoshi, 4,840,665, Cl. 75-241.000.
Kitayama, Yoshinobu, 4,840,453, Cl. 350-96.230.
Sakamoto, Yoshito, 4,840,987, Cl. 524-436.000.
Shigematsu, Masayuki; and Suzuki, Shuzo, 4,840,482, Cl. 356-73.100.
Sumitomo Heavy Industries, Ltd.: *See*—
Takata, Yasuhira, 4,840,052, Cl. 72-45.000.
Sumitomo Special Metals Co, Ltd.: *See*—
Fujimura, Setsuo; Sagawa, Masato; and Matsuura, Yutaka, 4,840,684, Cl. 148-302.000.
Sumiya, Sadao: *See*—
Okada, Tatsuo; Sumiya, Sadao; and Nakano, Masakimi, 4,840,059, Cl. 73-119.00A.
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Sakakino, Takahiro; Ohmori, Koji; Yoshimura, Takashi; Kazusaka, Shoji; and Sunagawa, Yoshitaka, 4,841,109, Cl. 200-302.100.
Sundermeyer, Peter, to Diehl GmbH & Co. Method and arrangement for the autonomous determination of an inertial positional reference on board a guided projectile. 4,840,328, Cl. 244-3.150.
Sundstrand Corporation: *See*—
Dishner, Bryan W.; Maddali, Vijay K.; and Dhyanchand, P. John, 4,841,202, Cl. 318-14.000.
Fudim, Efrem V., 4,840,064, Cl. 73-290.00B.
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Sung, Chiakang: *See*—
Millhollan, Michael S.; and Sung, Chiakang, 4,841,176, Cl. 307-475.000.
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., to Analgesic Associates. Cough/cold mixtures comprising non-steroidal anti-inflammatory drugs. 4,840,962, Cl. 514-406.000.
Sunsoft Corp.: *See*—
Neefe, Charles W., 4,840,477, Cl. 351-162.000.
Super Market Systems: *See*—
Chappoux, Claude; Rouesnel, Bernard; and Gillet, Guy, 4,840,264, Cl. 194-212.000.
Susaki, Wataru: *See*—
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Sutera, Richard: *See*—
Archer, Timothy H. V.; and Sutera, Richard, 4,841,306, Cl. 346-1.100.
Suyama, Mitiyo, to Mitsubishi Denki Kabushiki Kaisha. Direction finder. 4,841,449, Cl. 364-449.000.
Suyama, Takahiro: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; Kondo, Masafumi; Takahashi, Kohsei; and Yamamoto, Saburo, 4,841,533, Cl. 372-45.000.
Suzaki, Masafumi: *See*—
Sasaki, Akira; Takahashi, Yoshihito; Hakoyama, Akiyoshi; Mikami, Katsumasa; Suzaki, Masafumi; Honma, Takeo; Yasutomi, Tsuyoshi; Shiraishi, Ryoichi; and Nishiguchi, Yasuo, 4,840,500, Cl. 400-120.000.
Suzuki, aburo: *See*—
Imanaka, Tadashi; Takagi, Masayuki; Togawa, Eisei; Saito, Harunobu; Nagaike, Sadanori; Ohura, Masaki; Suzuki, aburo; Kobayashi, Tetsuo; and Kuwatsuka, Shunichiro, 4,841,402, Cl. 360-126.000.
Suzuki, Fumio: *See*—
Ikeda, Hisao; Suzuki, Fumio; Watanabe, Yoshitane; Matsumura, Mitsunobu; Takahashi, Yasuhiro; Murakami, Hirosi; and Maeda, Koichi, 4,840,705, Cl. 162-175.000.
Suzuki, Hiroko: *See*—
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Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 4,840,844, Cl. 428-336.000.
Suzuki, Keiko, to Brother Kogyo Kabushiki Kaisha. Image recording and adhering apparatus. 4,841,338, Cl. 355-27.000.
Suzuki, Makoto; and Urukawa, Satoshi, to Brother Kogyo Kabushiki Kaisha. Laser beam printer with compactly arranged photosensitive element, laser beam emitting element and reflective element. 4,841,311, Cl. 346-108.000.
Suzuki, Masami: *See*—
Yamaguchi, Nobutaka; Fujiyama, Masaaki; Suzuki, Masami; and Yamada, Yasuyuki, 4,840,842, Cl. 428-323.000.
Suzuki, Migaku; Nozaki, Satoshi; Imai, Shigeo; Ishigami, Makoto; and Kobayashi, Toshio, to Uni-Charm Corporation. Nonwoven fabric patterned with apertures. 4,840,829, Cl. 428-131.000.
Suzuki, Motoyuki; Miura, Yoshio; and Fukushima, Akio, to Hitachi, Ltd. Constant linear velocity disk rotating apparatus. 4,841,511, Cl. 369-50.000.
Suzuki, Nobuyuki: *See*—
Yamamoto, Hiroshi; and Suzuki, Nobuyuki, 4,841,327, Cl. 354-412.000.
Suzuki, Norio: *See*—
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Suzuki, Osamu: *See*—
Tsuruta, Masao; Kiuchi, Seiji; Honjyoh, Akira; Oishi, Kengo; and Suzuki, Osamu, 4,841,403, Cl. 360-132.000.
Suzuki, Roichi: *See*—
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Suzuki, Shinji; Arai, Tetsuji; Ohno, Kuniharu; Ueki, Kazuyeshi; Mimura, Yoshiki; Tanaka, Kazuya; Sugioka, Shinji; and Suzuki, Hiroko, to Usnio Denki. Apparatus for treating photoresists. 4,841,342, Cl. 355-71.000.
Suzuki, Shuzo: *See*—
Shigematsu, Masayuki; and Suzuki, Shuzo, 4,840,482, Cl. 356-73.100.
Suzuki, Takashi: *See*—
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Suzuki, Tateo: *See*—
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Suzuki, Toshio; and Okawa, Tadashi, to Toray Silicone Co., Ltd. Organopolysiloxane hot-melt adhesive. 4,840,693, Cl. 156-329.000.
Suzuki, Toshiro: *See*—
Amada, Eiichi; Shirasu, Hirotoshi; Takatori, Hiroshi; Kazawa, Tohru; Suzuki, Toshiro; Miyamoto, Takanori; and Kameyama, Tatsuya, 4,841,521, Cl. 370-31.000.
Suzuki, Toshiyuki: *See*—
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Sweeny, Henry D.; and Sabbadin, Antonio D., to Swenco Limited. Picture frame standoff. 4,840,342, Cl. 248-475.100.
Sweet, Randall P.; Lee, Chi-long; and Gornowicz, Gerald A., to Dow Corning Corporation. Block copolymer matrix for transdermal drug release. 4,840,796, Cl. 424-448.000.
Swenco Limited: *See*—
Sweeny, Henry D.; and Sabbadin, Antonio D., 4,840,342, Cl. 248-475.100.
Swiech, Matthew J.; Munyon, Gary D.; and Dias, Kenneth J., to G & B Rubber Stamp Co., Inc. Printer for a strip of tickets. 4,840,120, Cl. 101-228.000.
Swift, Joseph A.: *See*—
Epstein, Arthur J.; Ewing, Joan R.; and Swift, Joseph A., 4,841,099, Cl. 174-68.500.
Swix, Scott R.; and Krueger, Leroy A., to International Business Machines Corp. Interactive animation of graphics objects. 4,841,291, Cl. 340-725.000.
Swoboda, Ralf: *See*—
Hartmann, Gunter; Swoboda, Ralf; and Lang, Robert, 4,839,954, Cl. 29-235.000.
Sybert, Paul D.: *See*—
Fox, Daniel W.; Peters, Edward N.; and Sybert, Paul D., 4,841,015, Cl. 528-198.000.
Syntex (U.S.A.) Inc.: *See*—
Jones, Gordon H.; Venuti, Michael C.; and Young, John M., 4,840,965, Cl. 514-450.000.
Synthelabo: *See*—
Beeley, Nigel; and Cremer, Gerard, 4,840,967, Cl. 514-466.000.
Szczesniak, Stanley J., to AM International, Inc. Master holding mechanism for duplicating machines. 4,840,121, Cl. 101-415.100.
Sze, Jerry C.: *See*—
McClanahan, Robert F.; Washburn, Robert D.; Gonzalez, Carlos H.; Sze, Jerry C.; and Lusher, David M., 4,841,429, Cl. 363-126.000.
Sziklas, Edward A.; and Benda, John A., to United Technologies Corporation. Coupling of ring lasers. 4,841,541, Cl. 372-94.000.
Szuminski, Gary F.; and Ward, Benjamin D., to Rolls-Royce Inc. Aircraft with stowable vectorable nozzle and ejector thrust augmentation. 4,840,329, Cl. 244-12.500.

Tabata, Akihiko: *See*—
Ueno, Ryuzo; Ueno, Ryuji; Kuno, Sachiko; and Tabata, Akihiko, 4,840,941, Cl. 514-59.000.
Tabata, Hiroshi: *See*—
Higuchi, Kazuo; Tabata, Hiroshi; Okuhara, Hisakazu; Saruwatari, Hidetoshi; and Akiyama, Akihiko, 4,840,325, Cl. 242-107.200.
Tabisz, Wojciech A.; and Lee, Fred C. Dc-to-Dc converters using multi-resonant switches. 4,841,220, Cl. 323-282.000.
Tachi-S Co., Ltd.: *See*—
Kobayashi, Hideo; and Arai, Yoshio, 4,840,428, Cl. 297-408.000.
Shimada, Makoto, 4,840,430, Cl. 297-452.000.
Tacke, Peter; Grogp, Ulrich; and Idel, Karsten-Josef, to Bayer Aktiengesellschaft. Process for the preparation of aromatic polyesters. 4,841,000, Cl. 525-437.000.
Tada, Yuji: *See*—
Nakacho, Yoshifumi; Tada, Yuji; and Yamada, Sinichi, 4,840,856, Cl. 429-192.000.
Tadashima, Fumio, to Murao Boki Kabushiki Kaisha. Rove bobbin transporting system. 4,840,124, Cl. 104-163.000.
Tadokoro, Michihiro: *See*—
Imai, Hitoshi; Arai, Ryuichiro; Koyanagi, Kimiyuki; and Tadokoro, Michihiro, 4,841,507, Cl. 369-44.000.
Taga, Yutaka: *See*—
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Tage, Yutaka: *See*—
Kashihara, Yuji; Tage, Yutaka; Nakamura, Yasunari; Ito, Hiroshi; and Takahashi, Tokuyuki, 4,840,247, Cl. 180-249.000.
Taguchi, Minoru: *See*—
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Taisho Pharmaceutical Co., Ltd.: *See*—
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; Taguchi, Minoru; and Sota, Kaoru, 4,841,044, Cl. 540-227.000.
Tajika, Hiroshi: *See*—
Fujii, Mamoru; Noda, Kazuo; Nagasaka, Shoji; Tajika, Hiroshi; and Ono, Koji, 4,840,303, Cl. 228-164.000.
Takada, Katsuhiro; and Yamanashi, Takanori, to Olympus Optical Co., Ltd. Compact zoom lens system with a high zooming ratio. 4,840,467, Cl. 350-427.000.
Takada, Keiji; Okumura, Masahide; Fukuhara, Satoru; Morimura, Toshiyuki; Hosaka, Sumio; and Hosoki, Shigeyuki, to Hitachi, Ltd. Piezoelectric actuator control apparatus. 4,841,191, Cl. 310-317.000.
Takagi, Kenichi: *See*—
Takayama, Kazuo; Yabe, Eiji; Takagi, Kenichi; Fukui, Ryota; and Kikuchi, Riichi, 4,841,197, Cl. 315-111.810.
Takagi, Masafumi: *See*—
Kasamura, Toshirou; Takagi, Masafumi; Okuda, Naoki; Ohashi, Masashi; Kusumoto, Toshihiko; Sasaki, Nobukazu; Maeda, Yasunori; and Ikeda, Masamichi, 4,841,329, Cl. 355-245.000.
Takagi, Masayoshi; Yoshioka, Yoshio; Matsuzaki, Tetsuo; Noro, Shuhei; Ikawa, Syouji; and Naruse, Katutoshi, to Toyoda Koki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Programmable transfer machine. 4,841,431, Cl. 364-187.000.
Takagi, Masayuki: *See*—
Imanaka, Tadashi; Takagi, Masayuki; Togawa, Eisei; Saito, Harunobu; Nagaike, Sadanori; Ohura, Masaki; Suzuki, aburo; Kobayashi, Tetsuo; and Kuwatsuka, Shunichiro, 4,841,402, Cl. 360-126.000.
Takagi, Michiyuki: *See*—
Matsushita, Osami; Takagi, Michiyuki; Yoneyama, Mitsuho; Sugaya, Toyomi; and Saito, Ikuhiro, 4,841,212, Cl. 318-607.000.
Takahashi, Akira; Kamimura, Testuro; Kawamura, Masahiko; Morikawa, Kiyoshi; and Onishi, Sei, to Pioneer Electronic Corporation. Multi-disc player. 4,841,499, Cl. 369-38.000.
Takahashi, Hideomi: *See*—
Yanabu, Satoru; Takahashi, Hideomi; Kaneko, Eiji; and Yasuoka, Koichi, 4,841,538, Cl. 372-58.000.
Takahashi, Hideyuki: *See*—
Tsuchiya, Kyoshi; Ioka, Hideyuki; and Takahashi, Hideyuki, 4,841,182, Cl. 310-68.00D.
Takahashi, Junya: *See*—
Kusaba, Tomoyuki; Takahashi, Junya; Sugano, Masayo; Uematsu, Tamon; Oguri, Yukio; and Teramae, Tomohiro, 4,841,088, Cl. 558-417.000.
Takahashi, Kohsei: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; Kondo, Masafumi; Takahashi, Kohsei; and Yamamoto, Saburo, 4,841,533, Cl. 372-45.000.
Takahashi, Kyoko: *See*—
Matsushita, Hajime; Shibagaki, Makoto; Takahashi, Kyoko; and Kuno, Hideyuki, 4,841,075, Cl. 549-341.000.
Takahashi, Minoru; and Kotani, Tsutomu, to TDK Corporation. Electrocardiograph. 4,840,183, Cl. 128-715.000.
Takahashi, Motoaki, to Fuji Photo Film Co., Ltd. Apparatus for conveying sheet member. 4,840,369, Cl. 271-276.000.
Takahashi, Mutsumi: *See*—
Terakawa, Takashige; Takahashi, Mutsumi; and akaba, Noriyuki, 4,841,308, Cl. 343-771.000.
Takahashi, Ryoichi: *See*—
Nara, Kenichi; and Takahashi, Ryoichi, 4,840,439, Cl. 312-116.000.
Takahashi, Sumio: *See*—
Watabe, Seiji; Yokoyama, Isao; Maeda, Tsutomu; Shibuya, Koichi; and Takahashi, Sumio, 4,841,267, Cl. 335-210.000.
Takahashi, Tadashi: *See*—
Yoshida, Tsukasa; Ishige, Yoshio; Matsudaira, Masaki; and Takahashi, Tadashi, 4,840,807, Cl. 426-48.000.
Takahashi, Takayuki: *See*—
Mori, Shigeru; and Takahashi, Takayuki, 4,840,739, Cl. 252-17.000.
Takahashi, Takeyoshi: *See*—
Hagiwara, Yoshiaki; Ishida, Hiromi; and Takahashi, Takeyoshi, 4,840,491, Cl. 366-69.000.
Takahashi, Tokuyuki: *See*—
Kashihara, Yuji; Tage, Yutaka; Nakamura, Yasunari; Ito, Hiroshi; and Takahashi, Tokuyuki, 4,840,247, Cl. 180-249.000.
Kato, Nobuyuki; Takahashi, Tokuyuki; and Itoh, Hiroshi, 4,840,263, Cl. 192-109.00F.
Takahashi, Tsutomu, to Canon Kabushiki Kaisha. Document processor. 4,841,478, Cl. 364-900.000.
Takahashi, Yasuhiro: *See*—
Ikeda, Hisao; Suzuki, Fumio; Watanabe, Yoshitane; Matsumura, Mitsunobu; Takahashi, Yasuhiro; Murakami, Hirosi; and Maeda, Koichi, 4,840,705, Cl. 162-175.000.
Takahashi, Yoshihito: *See*—
Sasaki, Akira; Takahashi, Yoshihito; Hakoyama, Akiyoshi; Mikami, Katsumasa; Suzaki, Masafumi; Honma, Takeo; Yasutomi, Tsuyoshi; Shiraishi, Ryoichi; and Nishiguchi, Yasuo, 4,840,500, Cl. 400-120.000.
Takahira, Takashi: *See*—
Shiozawa, Akira; Ichikawa, Yuh-Ichiro; and Takahira, Takashi, 4,841,051, Cl. 544-287.000.
Takami, Toru: *See*—
Ohasi, Hiroyuki; Takami, Toru; Koyama, Noritoshi; Kogure, Yoshio; Ida, Katsumi; Iijima, Kazumi; and Kobori, Tomohiro, 4,840,970, Cl. 514-690.000.
Takano, Toshimitsu: *See*—
Yagino, Masamori; Taniguchi, Masato; Ito, Yoshitomo; Takano, Toshimitsu; Ishikawa, Wataru; Kikuchi, Sadatoshi; and Endo, Tetsuo, 4,841,120, Cl. 219-216.000.
Takao, Hisashi; Osaki, Norio; and Yasudomi, Norio, to Otsuka Kagaku Kabushiki Kaisha. Pyran derivatives. 4,840,957, Cl. 514-326.000.
Takaoka, Michio: *See*—
Onishi, Akihumi; Hasegawa, Masakasu; Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; and Yoshida, Shotaro, 4,840,552, Cl. 425-72.100.
Takasaki, Terufumi: *See*—
Masuda, Eiji; Fujita, Yasuhiko; and Takasaki, Terufumi, 4,841,567, Cl. 379-355.000.
Takase, Shigeki: *See*—
Hibino, Eiichi; Kawakita, Kiyoshi; Yamamoto, Takami; Kinoshita, Kazunori; and Takase, Shigeki, 4,841,414, Cl. 361-424.000.
Takashima, Kohki: *See*—
Iwasaki, Tameo; and Takashima, Kohki, 4,840,951, Cl. 514-239.500.
Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,841,062, Cl. 548-194.000.
Takata, Yasuhira, to Sumitomo Heavy Industries, Ltd. Mobile nozzle device for die lubricating. 4,840,052, Cl. 72-45.000.
Takatori, Hiroshi: *See*—
Amada, Eiichi; Shirasu, Hirotoshi; Takatori, Hiroshi; Kazawa, Tohru; Suzuki, Toshiro; Miyamoto, Takanori; and Kameyama, Tatsuya, 4,841,521, Cl. 370-31.000.
Takaya, Soichi: *See*—
Nishikawa, Atsuhiko; Miyazaki, Yoshihiro; Tanji, Masayuki; Takaya, Soichi; and Yamaguchi, Shinichiro, 4,841,439, Cl. 364-200.000.
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, to Fujisawa Pharmaceutical Company, Limited. New cephem and cepham compounds and processes for preparation thereof. 4,841,062, Cl. 548-194.000.
Takayama, Kazuo; Yabe, Eiji; Takagi, Kenichi; Fukui, Ryota; and Kikuchi, Riichi, to Nihon Shinku Gijutsu Kabushiki Kaisha. Double-chamber ion source. 4,841,197, Cl. 315-111.810.
Take, Seiji: *See*—
Hida, Yoshiaki; Ishihara, Satoshi; Take, Seiji; Gogami, Masao; and Suzuki, Toshiyuki, 4,841,134, Cl. 235-488.000.
Takeda Chemical Industries, Ltd.: *See*—
Tsukamoto, Takashi; Hatta, Toyoji; and Minato, Ichiro, 4,841,008, Cl. 528-45.000.
Takeda, Hiroshi: *See*—
Endo, Akihiko; Takeda, Shigeki; and Takeda, Hiroshi, 4,841,545, Cl. 375-1.000.
Takeda, Kiyoshi: *See*—
Kajitani, Masahiko; Takeda, Kiyoshi; Isono, Koji; Hirose, Masumi; Matsubara, Kouji; and Shuda, Etsuji, 4,841,132, Cl. 235-472.000.
Takeda, Shigeki: *See*—
Endo, Akihiko; Takeda, Shigeki; and Takeda, Hiroshi, 4,841,545, Cl. 375-1.000.
Takeda, Takao; Yamazaki, Hitoshi; Taniguchi, Yoshiteru; Tanaka, Norihiko; Ito, Hiroshi; Uchida, Minoru; and Imai, Jun, to Mitsubishi Denki Kabushiki Kaisha. Low pressure mercury vapor discharge lamp and preparation thereof. 4,840,593, Cl. 445-26.000.
Takegahara, Takashi: *See*—
Kishi, Hajimu; Takegahara, Takashi; and Yukutomo, Masashi, 4,841,432, Cl. 364-191.000.
Takehana, Tsutomu; Kouzai, Tetsuo; Sagara, Masaaki; Yaginuma, Tamio; and Sasaki, Teruji, to Coca-Cola Company, The. Process for producing bottled beverages. 4,840,014, Cl. 53-432.000.

Takei, Tetsuya, to Canon Kabushiki Kaisha. Apparatus for the formation of a functional deposited film using microwave plasma chemical vapor deposition process. 4,840,139, Cl. 118 723.000.

Takekoshi, Tomoaki; Ohba, Hisao; and Kunichika, Kenji, to Fuji Photo Film Co., Ltd. Developing device for photosensitive material. 4,841,320, Cl. 354-299.000.

Takemoto, Iwao: *See*—
Nishizawa, Shigeki; Takemoto, Iwao; Miyazawa, Toshio; and Izawa, Tetsurou, 4,841,369, Cl. 358-213.160.

Takeuchi, Kazuhiro: *See*—
Sakane, Takaaki; and Takeuchi, Kazuhiro, 4,840,541, Cl. 416-223.00R.

Takeuchi, Masaru; Fukatsu, Takeo; Nakano, Shoichi; Kuwano, Yukinori; Minami, Koji; and Iwamoto, Masayuki, to Sanyo Electric Co., Ltd. Electrostatic recording apparatus. 4,841,328, Cl. 355-211.000.

Takeuchi, Tsutomu: *See*—
Ikegami, Fumio; Yoshida, Susumu; Takeuchi, Tsutomu; and Ariyavisitakul, Sirikiat, 4,841,547, Cl. 375-53.000.

Takeura, Tooru: *See*—
Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; Nakamura, Hitoshi; Kobayashi, Tetsuo; Takeura, Tooru; and Momata, Kazuhiro, 4,841,399, Cl. 360-113.000.

Takigawa, Kazunori; and Suzuki, Roichi, to Usui Kokusai Sangyo Kabushiki Kaisha. Valve actuator for slide exhaust brake systems. 4,840,348, Cl. 251-63.600.

Takigawa, Masuo: *See*—
Kusuda, Takao; Yonemura, Masaaki; Shimoda, Hisanori; Takigawa, Masuo; and Mihara, Toshihiro, 4,840,028, Cl. 60-303.000.

Takiguchi, Haruhisa: *See*—
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, 4,841,54, Cl. 372-46.000.

Takimoto, Hiroshi: *See*—
Ohta, Tokuya; Kobayashi, Masatsune; Sugai, Yuko; Miura, Konoe; Takimoto, Hiroshi; and Yoneyama, Tomio, 4,841,037, Cl. 534-815.000.

Takimoto, Masaaki, to Fuji Photo Film Co., Ltd. Process for displaying information. 4,841,293, Cl. 340-763.000.

Takita, Hitoshi; Kimura, Fumihiko; Noda, Shikuo; Mukaida, Yutaka; Nitta, Toyohiko; and Kobayashi, Hidetoshi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Dialkanoyloxybenzylidene dialkanoate. 4,841,097, Cl. 560-144.000.

Takizawa, Kazuyoshi; and Watanuki, Kiyoshi, to Hitachi, Ltd. Display device including flyback transformer constructed to control leakage currents. 4,841,201, Cl. 315-411.000.

Tam Ceramics Inc.: *See*—
Campbell, John S.; Baker, Brian N.; and Kattyal, Anil, 4,840,774, Cl. 423-79.000.

Tamai, Hideki, to NEC Corporation. Magnetic recording medium having perpendicular magnetic anisotropy. 4,840,845, Cl. 428-336.000.

Tamaki, Sigeo: *See*—
Yanagisawa, Shozo; Tamaki, Sigeo; and Ishizawa, Isamu, 4,840,146, Cl. 123-52.0MB.

Tamano, Satoshi: *See*—
Ito, Yukio; Sato, Yutaka; Kishimoto, Shinji; and Tamano, Satoshi, 4,840,180, Cl. 128-661.080.

Tamaru, Sinji; and Kubo, Motonobu, to Daikin Industries, Ltd. Tricyclodecane derivative. 4,841,005, Cl. 526-245.300.

Tamaru, Sinji; and Kubo, Motonobu, to Daikin Industries, Ltd. Aromatic dicarboxylic acid diallyl ester derivative, prepolymer derived from the derivative and curable resin composition containing the derivative. 4,841,093, Cl. 560-65.000.

Tamura Electric Works, Ltd.: *See*—
Sano, Yoshii; Totsu, Hideo; and Morihisa, Toshiharu, 4,841,563, Cl. 379-150.000.

Tamura, Hifumi; Shichi, Hiroyasu; and Umemura, Kaoru, to Hitachi, Ltd. Charged particle beam apparatus. 4,841,143, Cl. 250-288.000.

Tamura, Mitsuhiko; Miyamoto, Masaaki; and Miyamoto, Kazuo, to Mitsubishi Kasei Corporation. Aromatic polyester/aromatic polycarbonate/alpha-olefin unsaturated carboxylic acid reaction product compositions. 4,840,995, Cl. 525-133.000.

Tanabe, Hideo: *See*—
Kitada, Masahiro; Shimizu, Noboru; Tanabe, Hideo; Nakamura, Hitoshi; Kobayashi, Tetsuo; Takeura, Tooru; and Momata, Kazuhiro, 4,841,399, Cl. 360-113.000.

Tanabe Seiyaku Co., Ltd.: *See*—
Iwasaki, Tameo; and Takashima, Kohki, 4,840,951, Cl. 514-239.500.

Tanabe, Yoo: *See*—
Tsushima, Kazunori; Matsuo, Noritada; Tanabe, Yoo; Yano, Toshihiko; and Hirano, Masachika, 4,840,671, Cl. 514-721.000.

Tanahashi, Toshio; Nakamura, Norihiko; Noguchi, Hiroshi; Nomura, Kenichi; Baika, Toyokazu; Kanamaru, Masanobu; Kobayashi, Tatsuo; Nagaosa, Hideo; Ito, Kazuhiro; Ito, Toshio; and Nakae, Kouichi, to Toyota Jidosha Kabushiki Kaisha. Combustion chamber of a two-stroke engine. 4,840,147, Cl. 123-65.0VD.

Tanaka, Kazuya: *See*—
Suzuki, Shinji; Arai, Tetsuji; Ohno, Kunitharu; Ueki, Kazuyeshi; Mimura, Yoshiki; Tanaka, Kazuya; Sugioka, Shinji; and Suzuki, Hiroko, 4,841,342, Cl. 355-71.000.

Tanaka, Koichi: *See*—
Toda, Fumio; Tanaka, Koichi; and Nakata, Tetsuya, 4,841,081, Cl. 549-541.000.

Tanaka, Makoto: *See*—
Kitagawa, Masayuki; and Tanaka, Makoto, 4,841,076, Cl. 549-401.000.

Tanaka, Masahiro: *See*—
Ishida, Muneo; Yamashita, Mithuo; Onishi, Masanari; and Tanaka, Masahiro, 4,840,104, Cl. 84-437.000.

Tanaka, Motoaki: *See*—
Watanabe, Yoshikazu; and Tanaka, Motoaki, 4,840,881, Cl. 430-512.000.

Tanaka, Noriatsu; Tokunaga, Masami; Tanaka, Tsuyoshi; Koyama, Satoshi; and Kikuchi, Keiichi, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Heat transfer medium. 4,840,837, Cl. 428-216.000.

Tanaka, Norihiko: *See*—
Takeda, Takao; Yamazaki, Hitoshi; Taniguchi, Yoshiteru; Tanaka, Norihiko; Ito, Hiroshi; Uchida, Minoru; and Imai, Jun, 4,840,593, Cl. 445-26.000.

Tanaka, Toshio; Hazato, Atsuo; Kurozumi, Seizi; and Koga, Masahiro, to Teijin Limited. Process for producing 16-substituted prostaglandines. 4,841,091, Cl. 558-441.000.

Tanaka, Tsunefumi, to Canon Kabushiki Kaisha. Focusing method for zoom lens. 4,840,468, Cl. 350-427.000.

Tanaka, Tsuyoshi: *See*—
Tanaka, Noriatsu; Tokunaga, Masami; Tanaka, Tsuyoshi; Koyama, Satoshi; and Kikuchi, Keiichi, 4,840,837, Cl. 428-216.000.

Tandler, Peter; and Cezanne, Rudolf, to Alfred Teves GmbH. Device for indicating the filling level in a fluid reservoir. 4,841,107, Cl. 200-84.00C.

Tanemura, Yasunari: *See*—
Murakami, Akihiro; Matsunaga, Mitsunobu; and Tanemura, Yasunari, 4,840,116, Cl. 98-115.200.

Taneya, Shoichi: *See*—
Sakitani, Katsumi; Kang, Yoon M.; Shinozaki, Shinichiro; Taneya, Shoichi; Miura, Kazuo; Ogura, Tadashi; and Noguchi, Satoshi, 4,840,043, Cl. 62-51.200.

Tani, Hiroji: *See*—
Yokoi, Tsutomu; Tani, Hiroji; Kasanami, Tohru; Fukui, Norio; and Yamamoto, Keizou, 4,839,960, Cl. 29-620.000.

Taniguchi, Isao, to Fuji Photo Film Co., Ltd. Image forming method. 4,841,339, Cl. 355-27.000.

Taniguchi, Masato: *See*—
Yagino, Masamori; Taniguchi, Masato; Ito, Yoshitomo; Takano, Toshimitsu; Ishikawa, Wataru; Kikuchi, Sadatoshi; and Endo, Tetsuo, 4,841,120, Cl. 219-216.000.

Taniguchi, Nobuyuki: *See*—
Yamamoto, Kouji; Tominaga, Shinji; Yamanaka, Akira; Ueda, Hiroshi; Taniguchi, Nobuyuki; Nakamura, Ikushi; and Iwata, Michihiro, 4,841,318, Cl. 354-173.100.

Taniguchi, Tadao: *See*—
Otsuka, Takashi; Nose, Masahiko; Yamamoto, Kenji; Taniguchi, Tadao; Shigeta, Yoshifumi; and Osada, Mototsugu, 4,840,296, Cl. 222-600.000.

Taniguchi, Yoshiteru: *See*—
Takeda, Takao; Yamazaki, Hitoshi; Taniguchi, Yoshiteru; Tanaka, Norihiko; Ito, Hiroshi; Uchida, Minoru; and Imai, Jun, 4,840,593, Cl. 445-26.000.

Tanimura, Nobuyoshi: *See*—
Ikeda, Shuji; Meguro, Satoshi; Nishimura, Kotaro; Yamamoto, Sho; and Tanimura, Nobuyoshi, 4,841,481, Cl. 365-154.000.

Tanji, Masayuki: *See*—
Nishikawa, Atsuhiko; Miyazaki, Yoshihiro; Tanji, Masayuki; Takaya, Soichi; and Yamaguchi, Shinichiro, 4,841,439, Cl. 364-200.000.

Taper-Lok Corporation: *See*—
Welkey, Joseph J., 4,840,409, Cl. 285-167.000.

Tardos, Laszlo: *See*—
Korbonits, Dezso; Minker, Emil; Vargai, Zoltan; Heja, Gergely; Kovacs, Gabor; Gottsegen, Agnes; Antus, Sandor; Virag, Sandor; Bolehovszky, Andrea; Marton, Jeno; Marmarosi nee Kellner, Katalin; Debreczeni, Lorand; Tardos, Laszlo; Kormoczy, Peter; Gergely, Vera; and Horvath, Gabor, 4,840,949, Cl. 514-234.200.

Tarnow, Horst; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. N-substituted benzamides. 4,840,969, Cl. 514-617.000.

Tarr, Richard D.: *See*—
Katritzky, Alan R.; Krepski, Larry R.; Rasmussen, Jerald K.; Heilmann, Steven M.; and Tarr, Richard D., 4,841,021, Cl. 528-407.000.

Tawara, Takao; Akedo, Jun; and Iwashita, Yoshiyuki, to Opticon Inc. Pattern recognition device. 4,841,129, Cl. 235-472.000.

Taylor-Winfield Corporation, The: *See*—
Green, Edward A.; and Stambaugh, Clayton S., 4,841,121, Cl. 249-243.000.

TDK Corporation: *See*—
Takahashi, Minoru; and Kotani, Tsutomu, 4,840,183, Cl. 128-715.000.
Watabe, Seiji; Yokoyama, Isao; Maeda, Tsutomu; Shibuya, Koichi; and Takahashi, Sumio, 4,841,267, Cl. 335-210.000.

Teac Corporation: *See*—
Yamaguchi, Hirohisa; and Mashimo, Akira, 4,841,504, Cl. 369-32.000.

Technologies Speciales Ingenierie-T.S.I.: *See*—
Martin, Andre; and Luong, Minh P., 4,841,149, Cl. 250-330.000.

Tecno S.p.A. Mobili e Forniture per Arredamento: *See*—
Borsani, Paolo, 4,840,023, Cl. 59-78.100.

Tecumseh Products Company: *See*—
Fry, Emanuel D., 4,840,547, Cl. 417-422.000.

Teijin Ltd.: *See*—
Sawaki, Toru; Sasaki, Hideharu; Nakamura, Tsutomu; and Sadanobu, Jiro, 4,840,762, Cl. 264-29.200.
Tanaka, Toshio; Hazato, Atsuo; Kurozumi, Seizi; and Koga, Masahiro, 4,841,091, Cl. 558-441.000.

Teknekron Infoswitch Corporation: *See*—
Mann, James A., Jr.; and Haselton, E. Fletcher, 4,840,570, Cl. 439-74.000.

Tektronix, Inc.: *See*—
Bateman, Glenn; and Brand, Donald L., 4,841,497, Cl. 368-113.000.
Cleary, Edward J., Jr.; Coleman, Mike R.; and Jones, Michael R., 4,841,200, Cl. 315-363.000.

Telefunken Fernseh und Rundfunk GmbH: *See*—
Vuong, The A., 4,841,465, Cl. 364-725.000.

Tellier, Jean-Pierre: *See*—
Jacquet, Bruno; Noirot, Frederic; and Tellier, Jean-Pierre, 4,841,106, Cl. 200-462.000.

Tempaku, Junya: *See*—
Murakami, Joji; Sibazaki, Syogo; and Tempaku, Junya, 4,841,298, Cl. 341-51.000.

Teng, James: *See*—
Clyne, Carl W.; Woolever, Gary L.; Teng, James; and Naji, Hooshang, 4,841,457, Cl. 364-557.000.

Terada, Hiroaki: *See*—
Asano, Hajime; Terada, Hiroaki; Asada, Katsuhiko; Nishikawa, Hiroaki; Shimizu, Masahisa; Miura, Hiroki; Shima, Kenji; Komori, Shinji; Miyata, Souichi; and Matsumoto, Satoshi, 4,841,436, Cl. 364-200.000.

Terakawa, Takashige; Takahashi, Mutsumi; and akaba, Noriyuki, to Tokyo Keiki Co., Ltd. Slotted waveguide antenna assembly. 4,841,308, Cl. 343-771.000.

Teramae, Tomohiro: *See*—
Kusaba, Tomoyuki; Takahashi, Junya; Sugano, Masayo; Uematsu, Tamon; Oguri, Yukio; and Teramae, Tomohiro, 4,841,088, Cl. 558-417.000.

Terashima, Hideyuki; and Tsuchiya, Yasuhiko, to Nissin Kogyo Kabushiki Kaisha. Lever system for vehicles. 4,840,082, Cl. 74-523.000.

Teresi, Gaspare. Traction mat. 4,840,309, Cl. 238-14.000.

Terpolilli, Anthony J.: *See*—
Lievense, Jefferson C.; Sawyer, Joanna D.; and Terpolilli, Anthony J., 4,840,898, Cl. 435-87.000.

Terumo Corporation: *See*—
Kobayashi, Susumu; and Satoh, Kazumasa, 4,840,620, Cl. 604-246.000.
Yamaguchi, Keiji, 4,840,181, Cl. 128-680.000.

Testa, Sandro, to Campagnolo S.p.A. Rear derailer for bicycle gears. 4,840,605, Cl. 474-80.000.

Tetlie, Per J.; Brudal, Hans N.; and Meisingset, Alf E., to Getech A/S. Piezoelectric hydrophone. 4,841,192, Cl. 310-337.000.

Tetra Pak Finance & Trading S.A.: *See*—
Drevfors, Gunnar; Corniea, Donald G.; and Paulson, Norman J., 4,840,205, Cl. 141-2.000.

Texas Alkyls, Inc.: *See*—
Eidt, Scott H.; Deavenport, Dennis L.; and Tran, Nam H., 4,841,082, Cl. 556-129.000.

Texsa, S.A.: *See*—
Codina, Francisco C., 4,840,839, Cl. 428-240.000.

Tezuka, Hidenori: *See*—
Araki, Junichi; Saito, Nobuhiro; Tezuka, Hidenori; and Saito, Masuhiro, 4,840,608, Cl. 474-205.000.

Tezuka, Hirofumi; Nogami, Kouji; and Koyano, Toshihide, to Kyocera Corporation. Self-illuminant delineator and delineator system by use thereof. 4,841,278, Cl. 340-908.100.

Tezuka, Yasuo: *See*—
Kayane, Yutaka; Omura, Takashi; Tezuka, Yasuo; and Sone, Hideharu, 4,841,027, Cl. 534-599.000.
Kayane, Yutaka; Otake, Katsumasa; and Tezuka, Yasuo, 4,841,031, Cl. 534-638.000.

Thayer Coggin Incorporated: *See*—
Coggin, J. Thayer; and Hilton, Robert R., 4,839,938, Cl. 16-45.000.

Theil, Michael H.: *See*—
Cuculo, John A.; Theil, Michael H.; Yang, Kap S.; and Chen, Yue S., 4,840,673, Cl. 106-198.000.

Theon, Inc.: *See*—
Skaliotis, Dennis A., 4,840,798, Cl. 424-488.000.

Therapeutic Systems, Inc.: *See*—
Dulin, Thomas G.; Bass, Eric; and Babyak, Richard M., 4,840,591, Cl. 441-106.000.

Therm-O-Disc, Incorporated: *See*—
Horton, Paul J., 4,841,273, Cl. 338-28.000.
Yagher, Charles, Jr.; and Day, Kenneth C., 4,841,274, Cl. 338-28.000.

Thiele, Peter: *See*—
Matthias, Klaus; Baumann, Karl-Heinz; Schick, Gerald; Disson, Arno; Moller, Hermann; Seel, Holger; Topfer, Claus; Nerger, Uwe; Thiele, Peter; and Fleisch, Eugen, 4,840,398, Cl. 280-756.000.

Thiennot, Jean, to Etat Francais Represente Par Le Ministre des Postes et Telecommunications-Centre National D'Etudes des Telecommunications. Optical fiber transmission apparatus, in particular for submarine use. 4,840,448, Cl. 350-96.160.

Thoma, Helmut: *See*—
Doenges, Gerhard; Dietrich, Rolf; Thoma, Helmut; and Von Unger, Eckart-Alfred, 4,841,554, Cl. 378-57.000.

Thoman, Richard A., Jr., to Greene, Tweed & Co. Split sealing ring having a bias cut. 4,840,379, Cl. 277-222.000.

Thomas Industries Inc.: *See*—
Betts, John E.; and Toledo, George, 4,839,988, Cl. 49-141.000.

Thomas Jefferson University: *See*—
Osterholm, Jewell L., 4,840,617, Cl. 604-174.000.

Thomas, Sherman G., to General Electric Company. Keying apparatus for connecting a printed wiring assembly to a backplane structure. 4,840,586, Cl. 439-680.000.

Thomas, Teresa M.: *See*—
Kovacs, Kerry; Simpson, William; Burkholder, Amy L.; Messer, Russell K.; and Thomas, Teresa M., 4,840,866, Cl. 430-138.000.

Thomey, Henry W.: *See*—
Hitchcock, Gary L.; Thomey, Henry W.; Hodjat, Yahya; Cadarette, Marc R.; and Collins, Dawson M., 4,840,607, Cl. 474-167.000.

Thoraval, Maurice: *See*—
Dumas, Jean-Claude; Thoraval, Maurice; and Genuit, Gerard, 4,840,221, Cl. 165-41.000.

Thorsrud, Agmund K., to Phillips Petroleum Company. Methods of preparing molded thermoplastic articles wherein radio frequency energy is utilized to heat the thermoplastic material. 4,840,758, Cl. 264-26.000.

Thrush, Roger L.: *See*—
Goodman, Joseph R.; and Thrush, Roger L., 4,841,105, Cl. 200-16.00D.

Tiba, Omar: *See*—
Culbertson, Billy M.; and Tiba, Omar, 4,841,002, Cl. 525-504.000.

Tieke, Bernd; and Zahir, Sheik A., to Ciba-Geigy Corporation. Dehydrogenated polyspiroheptadiene. 4,840,999, Cl. 525-332.100.

Tiemann, Wilhelm: *See*—
Krueger, Hans; Lamprecht, Herbert, deceased; Lamprecht, Thekla, heir; Lamprecht, Simon, heir; and Tiemann, Wilhelm, 4,841,540, Cl. 372-86.000.

TIGG Corporation: *See*—
Tiggelbeck, Donald D., 4,840,651, Cl. 55-479.000.

Tiggelbeck, Donald D., to TIGG Corporation. Gas/solids contacting device. 4,840,651, Cl. 55-479.000.

Ting, Raymond M. L. Externally drained wall joint design. 4,840,004, Cl. 52-235.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Arai, Mikiro; Isoda, Takeshi; and Itoh, Takuji, 4,840,778, Cl. 423-324.000.

Tobe, Hayato: *See*—
Oishi, Konosuke; Okumoto, Toyoharu; Tobe, Hayato; and Tsukada, Masamichi, 4,840,484, Cl. 356-312.000.

Toda, Fumio; Tanaka, Koichi; and Nakata, Tetsuya, to Osaka Soda Co., Ltd. Method of optically resolving a racemate or a diastereomeric mixture of glycidyl compound. 4,841,081, Cl. 549-541.000.

Todd, Robert F., III; Lucchesi, Benedict R.; Simpson, Paul J.; Griffin, James D.; and Schlossman, Stuart F., to Dana-Farber Cancer Institute; and University of Michigan, The. Method of reducing tissue damage at an inflammatory site using a monoclonal antibody. 4,840,793, Cl. 424-85.800.

Togawa, Eisei: *See*—
Imanaka, Tadashi; Takagi, Masayuki; Togawa, Eisei; Saito, Harunobu; Nagaike, Sadanori; Ohura, Masaki; Suzuki, aburo; Kobayashi, Tetsuo; and Kuwatsuka, Shunichiro, 4,841,402, Cl. 360-126.000.

Toguchi, Akira, to Sanyo Electric Co., Ltd. Still reproduction controlling circuit. 4,841,381, Cl. 360-10.300.

Tohpren, Co., Ltd.: *See*—
Nakamura, Yoshiaki; Marukawa, Kiichi; and Nagaki, Kazuyoshi, 4,841,022, Cl. 528-487.000.

Toko Kabushiki Kaisha: *See*—
Oshikawa, Michitaka, 4,841,264, Cl. 333-189.000.

Tokuda, Kanji, to Fuji Photo Film Co., Ltd. Method of an apparatus for producing additional print. 4,841,340, Cl. 355-38.000.

Tokunaga, Masami: *See*—
Tanaka, Noriatsu; Tokunaga, Masami; Tanaka, Tsuyoshi; Koyama, Satoshi; and Kikuchi, Keiichi, 4,840,837, Cl. 428-216.000.

Tokyo Automatic Machinery Works Ltd.: *See*—
Shigeta, Toshio; Muto, Yoshiyuki; and Etani, Tadao, 4,840,320, Cl. 242-58.000.

Tokyo Keiki Co., Ltd.: *See*—
Terakawa, Takashige; Takahashi, Mutsumi; and akaba, Noriyuki, 4,841,308, Cl. 343-771.000.

Toledo, George: *See*—
Betts, John E.; and Toledo, George, 4,839,988, Cl. 49-141.000.

Tomagou, Satoshi: *See*—
Inoue, Hiroshi; Kato, Toshikazu; Tomagou, Satoshi; and Emura, Noriaki, 4,840,986, Cl. 524-436.000.

Tomaka, Jan Z., to Alcan International Limited. Top chord for open top hopper cars. 4,840,127, Cl. 105-406.100.

Tomasek, Jaroslav, to FMC Corporation. Current and torque feedback system and circuitry for sine-wave controlled brushless servo drive systems. 4,841,213, Cl. 318-661.000.

Tomida, Yoshinori: *See*—
Miyazaki, Toshihiko; Sakai, Kunihiro; Tomida, Yoshinori; Sugata, Hiroyuki; Matsuda, Hiroshi; and Nishimura, Yukuo, 4,840,821, Cl. 427-430.100.

Tomikawa, Arifumi; and Yasukawa, Nihiko, to Oki Electric Industry Co., Ltd. Brief case with a portable wireless telephone. 4,840,258, Cl. 190-102.000.

Tominaga, Ryuichiro: *See*—
Muramatsu, Mitsuru; and Tominaga, Ryuichiro, 4,840,011, Cl. 53-381.00R.

Tominaga, Shinji: *See—*
Yamamoto, Kouji; Tominaga, Shinji; Yamanaka, Akira; Ueda, Hiroshi; Taniguchi, Nobuyuki; Nakamura, Ikushi; and Iwata, Michihiro, 4,841,318, Cl. 354-173.100.
Tominaga, Yasunori, to Live International Co., Ltd. Method of adjusting the quality of liquors. 4,840,812, Cl. 426-488.000.
Tomita, Hirofumi: *See—*
Oda, Masatsugu; Sasaki, Naoko; Sasaki, Toshiro; Tomita, Hirofumi; and Nonaka, Nobuyuki, 4,840,959, Cl. 514-355.000.
Tomita, Naotaka: *See—*
Murase, Masanori; Tomita, Naotaka; and Iida, Kazuyoshi, 4,840,251, Cl. 181-205.000.
Tomizawa, Takeshi: *See—*
Ikoma, Mitsuhiro; Nakatani, Kazuo; Yoshida, Yuji; Tomizawa, Takeshi; and Arita, Koji, 4,840,042, Cl. 62-324.100.
Tomizawa, Youzi; and Mizutani, Masashi, to Alps Electric Co., Ltd. Cover mechanism for a recording medium holding device. 4,841,394, Cl. 360-99.060.
Tomoda, Toshimasa: *See—*
Ozaki, Yoshihiko; Sumitani, Hiroaki; Tomoda, Toshimasa; Sato, Fumihide; and Kusano, Kenji, 4,841,480, Cl. 367-7.000.
Tonon, Giancarlo: *See—*
Giani, Roberto P.; Parini, Ettore; Tonon, Giancarlo; and Borsa, Massimiliano, 4,841,046, Cl. 540-495.000.
Topfer, Claus: *See—*
Matthias, Klaus; Baumann, Karl-Heinz; Schick, Gerald; Disson, Arno; Moller, Hermann; Seel, Holger; Topfer, Claus; Nerger, Uwe; Thiele, Peter; and Fleisch, Eugen, 4,840,398, Cl. 280-756.000.
Toray Silicone Co., Ltd.: *See—*
Suzuki, Toshio; and Okawa, Tadashi, 4,840,693, Cl. 156-329.000.
Torii, Michihiro: *See—*
Matsushita, Kunitake; Sakuma, Hiroshi; Yamawaki, Takayuki; Yoshikura, Takashi; Sano, Hiroshi; Suzuki, Yuzuru; Torii, Michihiro; and Ohnuki, Tohru, 4,841,190, Cl. 310-257.000.
Toro Company, The: *See—*
Tyler, Stephen L., 4,840,312, Cl. 239-205.300.
Toshiba Kikai Kabushiki Kaisha: *See—*
Itoh, Hiroshi, 4,841,208, Cl. 318-561.000.
Toshiba Kikai Kabushiki Kaisha: *See—*
Ikeda, Go; Sasaki, Kiyoshi; Kumazaki, Hiroshi; Fujita, Shigeru; and Banzai, Hideo, 4,841,459, Cl. 364-557.000.
Toshiba Silicone Co., Ltd.: *See—*
Kobayashi, Keiji; and Urabe, Takashi, 4,841,006, Cl. 528-15.000.
Tosoh Corporation: *See—*
Harada, Yukihiko; Nakagawa, Tatsushi; Kanesaka, Junichiro; and Kaneshige, Yousuke, 4,840,849, Cl. 428-419.000.
Tosoh Corporation and Toso Susteel Co., Ltd.: *See—*
Inoue, Hiroshi; Kato, Toshikazu; Tomabou, Satoshi; and Emura, Noriaki, 4,840,986, Cl. 524-436.000.
Totsu, Hideo: *See—*
Sano, Yoshii; Totsu, Hideo; and Morihisa, Toshiharu, 4,841,563, Cl. 379-150.000.
Totty, Jerry, Automobile lift and tow hoist. 4,840,534, Cl. 414-563.000.
Towle, Ian D. H., to Raychem Limited. Preparation of arylene oligomers. 4,841,011, Cl. 528-125.000.
Towle, Ian D. H., to Raychem Limited. Preparation of poly(arylene ether ketones). 4,841,013, Cl. 528-125.000.
Towle, Ian D. H., to Raychem Limited. Preparation of monomers. 4,841,094, Cl. 560-73.000.
Townsend, Herbert E.: *See—*
Steinbicker, Richard N.; Townsend, Herbert E.; and Yau, Yung-Herng, 4,840,712, Cl. 204-28.000.
Toyo Boseki Kabushiki Kaisha: *See—*
Shirasaki, Yoshikazu; and Inuzuka, Kenichi, 4,840,826, Cl. 428-36.910.
Toyo Seikan Kaisha Ltd.: *See—*
Sato, Nobuyuki; Matsubayashi, Hiroshi; Kobayashi, Seishichi; Mitsuhashi, Minoru; Matsuno, Kenji; and Ishibashi, Kazuhisa, 4,840,304, Cl. 228-214.000.
Toyo Soda Mfg. Co.: *See—*
Someya, Shinzo; Koura, Seigo; Ito, Mikio; Nakanishi, Akira; and Nonaka, Yuji, 4,841,035, Cl. 546-270.000.
Toyo Tire & Rubber Co., Ltd.: *See—*
Nakayama, Rinichi; Yoshida, Yasunori; and Iwama, Satoshi, 4,840,988, Cl. 524-476.000.
Toyoda Gosei Co., Ltd.: *See—*
Nishiki, Hiroyuki; and Kokuryu, Yuji, 4,840,408, Cl. 285-62.000.
Toyoda Koki Kabushiki Kaisha: *See—*
Takagi, Masayoshi; Yoshioka, Yoshio; Matsuzaki, Tetsuo; Noro, Shuhei; Ikawa, Syouji; and Naruse, Katutoshi, 4,841,431, Cl. 364-187.000.
Toyoda, Yoshiharu; Mikata, Yoshitaka; and Yamano, Shoji, to Yamato Scale Company, Limited. Weighing and packing device. 4,840,240, Cl. 177-25.180.
Toyota, Akinori: *See—*
Kashiwa, Norio; Toyota, Akinori; and Koka, Mamoru, 4,841,003, Cl. 526-125.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Fujita, Hiroya, 4,840,149, Cl. 123-90.310.
Hayashi, Kazuhiko; Kuroyanagi, Shigeru; and Iwatsuki, Kunihiro, 4,841,447, Cl. 364-431.070.
Izumi, Akira; Kishi, Tomomi; and Niwa, Hideo, 4,840,417, Cl. 294-65.500.
Kashihara, Yuji; Tage, Yutaka; Nakamura, Yasunari; Ito, Hiroshi; and Takahashi, Tokuyuki, 4,840,247, Cl. 180-249.000.
Kato, Nobuyuki; Takahashi, Tokuyuki; and Itoh, Hiroshi, 4,840,263, Cl. 192-109.00F.
Kuromitsu, Hiromu; Nakanishi, Nobuyasu; Shirai, Akira; and Noguchi, Noboru, 4,840,544, Cl. 417-254.000.
Murakami, Akihiro; Matsunaga, Mitsunobu; and Tanemura, Yasunari, 4,840,116, Cl. 98-115.200.
Okumura, Atsuo, 4,840,027, Cl. 60-274.000.
Sakaguchi, Yoshikazu; Taga, Yutaka; and Kashihara, Yuji, 4,840,092, Cl. 74-869.000.
Takagi, Masayoshi; Yoshioka, Yoshio; Matsuzaki, Tetsuo; Noro, Shuhei; Ikawa, Syouji; and Naruse, Katutoshi, 4,841,431, Cl. 364-187.000.
Tanahashi, Toshio; Nakamura, Norihiko; Noguchi, Hiroshi; Nomura, Kenichi; Baika, Toyokazu; Kanamaru, Masanobu; Kobayashi, Tatsuo; Nagaosa, Hideo; Ito, Kazuhiro; Ito, Toshio; and Nakae, Kouichi, 4,840,147, Cl. 123-65.0VD.
Trading Post Restaurants Limited: *See—*
McFarlane, Robert; and Walker, Stewart M., 4,840,128, Cl. 108-50.000.
Tran, Nam H.: *See—*
Eidt, Scott H.; Deavenport, Dennis L.; and Tran, Nam H., 4,841,082, Cl. 556-129.000.
Transpower A/S: *See—*
Hansen, Ove, 4,841,270, Cl. 336-61.000.
Trenkle, Robert W.: *See—*
Mookherjee, Braja D.; Trenkle, Robert W.; Calderone, Nicholas; Sands, Keith P.; and Hagedorn, Myrna L., 4,840,801, Cl. 426-3.000.
Tri-tech, Inc.: *See—*
Cooper, Roy; and Hansen, Charles, 4,841,189, Cl. 310-257.000.
TriTech Laboratories, Inc.: *See—*
Curtis, Guy T., 4,841,559, Cl. 379-27.000.
Trube, Hans-Wilhelm: *See—*
Freitag, Elmar; Weller, Karl-Heinz; and Trube, Hans-Wilhelm, 4,840,113, Cl. 98-2.000.
Truth Incorporated: *See—*
Tucker, Daniel G., 4,840,075, Cl. 74-89.140.
Trutzschler GmbH & Co. KG: *See—*
Leifeld, Ferdinand, 4,839,943, Cl. 19-80.00R.
TRW United-Carr Ltd.: *See—*
Neil, Gary A.; and Ferguson, Edward H. F., 4,840,345, Cl. 248-74.200.
TRW Vehicle Safety Systems Inc.: *See—*
Higbee, Wallace C.; and Bauer, Barney J., 4,840,324, Cl. 242-107.600.
Tsay, Hwa-Yang. Multi-function satchel. 4,840,441, Cl. 312-231.000.
Tsentralnoe Proektno-Konstruktorskoe Bjuro Vsesojuznogo Rybopromyshlennogo Obiedinenia Azovo-Chernomorskogo Basseina: *See—*
Raikov, Nikolai N., 4,840,134, Cl. 112-162.000.
Tsironis, Christos, to U.S. Philips Corporation. Dual-gate fet amplifier-mixer with intermediate ohmic island for rejecting a frequency band. 4,841,169, Cl. 307-303.000.
Tsuboi, Nobuyoshi; Watanabe, Atsumi; Sato, Yoshio; Shimada, Satoshi; and Sasaki, Hiroshi, to Hitachi, Ltd. Optical recording method and apparatus using two light spots. 4,841,514, Cl. 369-100.000.
Tsubouchi, Toshiyuki; Abe, Kazuaki; and Hata, Hitoshi, to Idemitsu Kosan Company Limited. Fluid composition. 4,840,745, Cl. 252-73.009.
Tsuchiya, Kyoshi; Ioka, Hideyuki; and Takahashi, Hideyuki, to Mitsuba Electric Mfg., Co., Ltd. Rectifier in alternating generators for automotive vehicles. 4,841,182, Cl. 310-68.00D.
Tsuchiya, Yasuhiko: *See—*
Terashima, Hideyuki; and Tsuchiya, Yasuhiko, 4,840,082, Cl. 74-523.000.
Tsuchiya, Yutaka: *See—*
Aoshima, Shinichiro; and Tsuchiya, Yutaka, 4,841,234, Cl. 324-96.000.
Tsuji, Kiyoshi: *See—*
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,841,062, Cl. 548-194.000.
Tsuji, Kunio: *See—*
Nakamura, Shozo; Mathusima, Tokunori; and Tsuji, Kunio, 4,840,766, Cl. 376-378.000.
Tsuji, Masaru, to Sharp Kabushiki Kaisha. Paper conveying roller for image forming apparatus. 4,840,300, Cl. 226-187.000.
Tsuji, Michiru; Konno, Chisato; and Saji, Miyuki, to Hitachi, Ltd. Method for preparing a simulation program. 4,841,479, Cl. 364-900.000.
Tsuji, Shinji: *See—*
Ohishi, Aiko; Hirao, Motohisa; Chinone, Naoki; Tsuji, Shinji; Nakamura, Hitoshi; and Matsumura, Hiroyoshi, 4,841,536, Cl. 372-46.000.
Tsujii, Gen: *See—*
Hamada, Akio; Tsujii, Gen; Fuse, Genzo; and Kondo, Masahide, 4,841,113, Cl. 219-110.000.
Tsujimoto, Kazumi: *See—*
Matsuura, Ryo; Yoshimura, Shigeyuki; Asanuma, Yasuo; Nasu, Katsuaki; Yoshizumi, Haruo; Tsujimoto, Kazumi; and Kimura, Toshiyuki, 4,840,932, Cl. 502-202.000.
Tsujimura, Kazuya: *See—*
Kasai, Naoya; Shima, Hisaharu; and Tsujimura, Kazuya, 4,840,907, Cl. 435-253.300.
Tsukada, Masamichi: *See—*
Oishi, Konosuke; Okumoto, Toyoharu; Tobe, Hayato; and Tsukada, Masamichi, 4,840,484, Cl. 356-312.000.

Tsukamoto, Takashi; Hatta, Toyoji; and Minato, Ichiro, to Takeda Chemical Industries, Ltd. Coating compositions. 4,841,008, Cl. 528-45.000.
Tsuruta, Masao; Kiuchi, Seiji; Honjyoh, Akira; Oishi, Kengo; and Suzuki, Osamu, to Fuji Photo Film Co., Ltd. Lid spring locking structure in a magnetic tape cassette. 4,841,403, Cl. 360-132.000.
Tsushima, Kazunori; Matsuo, Noritada; Tanabe, Yoo; Yano, Toshihiko; and Hirano, Masachika, to Sumitomo Chemical Company, Limited. Novel ether compound, a process for manufacturing the same, a composition containing the same and a use thereof. 4,840,971, Cl. 514-721.000.
Tucker, Daniel G., to Truth Incorporated. Window operator. 4,840,075, Cl. 74-89.140.
Tufco Corporation: *See—*
Watkins, Charles W., 4,840,133, Cl. 112-80.300.
Tuneki, Hideaki: *See—*
Shimasaki, Yuuji; Ueshima, Michio; Tuneki, Hideaki; and Ariyoshi, Kimio, 4,841,061, Cl. 546-184.000.
Tunker, Gerhard: *See—*
Schmidt, Helmut; Patzelt, Helmut; Tunker, Gerhard; and Scholze, Horst, 4,840,666, Cl. 106-14.050.
Tush Cush, Inc.: *See—*
Noble, Roger H., 4,840,425, Cl. 297-284.000.
Twerdochlib, Michael, to Westinghouse Electric Corp. Fail safe valve for an air inleakage monitoring system in a steam turbine. 4,840,063, Cl. 73-203.000.
TX Controls AB: *See—*
Nilsson, Ingmar, 4,840,079, Cl. 74-500.500.
Tyler, Stephen L., to Toro Company, The. Sprinkler nozzle module. 4,840,312, Cl. 239-205.000.
UBE Industries, Ltd.: *See—*
Ishimoto, Kenji; and Kawabata, Kouji, 4,840,557, Cl. 425-555.000.
Uchida, Minoru: *See—*
Takeda, Takao; Yamazaki, Hitoshi; Taniguchi, Yoshiteru; Tanaka, Norihiko; Ito, Hiroshi; Uchida, Minoru; and Imai, Jun, 4,840,593, Cl. 445-26.000.
Uchiyama, Hiromi; and Nakano, Tsuyoshi, to Izumi Seimitsu Kogyo Kabushiki Kaisha. Fixing structure of blade force up spring for clothes shaver and electric shaver. 4,839,964, Cl. 30-43.600.
Udren, Eric A., to Westinghouse Electric Corp. Protective relaying apparatus for providing fault-resistance correction. 4,841,405, Cl. 361-80.000.
Ueda, Hiroshi: *See—*
Yamamoto, Kouji; Tominaga, Shinji; Yamanaka, Akira; Ueda, Hiroshi; Taniguchi, Nobuyuki; Nakamura, Ikushi; and Iwata, Michihiro, 4,841,318, Cl. 354-173.100.
Ueda, Michio; and Shibata, Satoshi, to Brother Kogyo Kabushiki Kaisha. Control device for a stepping motor. 4,841,214, Cl. 318-696.000.
Uehara, Kazuhiro, to Laurel Bank Machines Co., Ltd. Bill containing box apparatus of bill receiving and dispensing machine. 4,840,368, Cl. 271-162.000.
Ueki, Kazuyeshi: *See—*
Suzuki, Shinji; Arai, Tetsuji; Ohno, Kuniharu; Ueki, Kazuyeshi; Mimura, Yoshiki; Tanaka, Kazuya; Sugioka, Shinji; and Suzuki, Hiroko, 4,841,342, Cl. 355-71.000.
Uematsu, Tamon: *See—*
Kusaba, Tomoyuki; Takahashi, Junya; Sugano, Masayo; Uematsu, Tamon; Oguri, Yukio; and Teramae, Tomohiro, 4,841,088, Cl. 558-417.000.
Ueno, Masaji; and Masuoka, Hideaki, to Kabushiki Kaisha Toshiba. Bipolar-MOS logic circuit with high speed operation. 4,841,172, Cl. 307-443.000.
Ueno, Ryuji: *See—*
Ueno, Ryuzo; Ueno, Ryuji; Kuno, Sachiko; and Tabata, Akihiko, 4,840,941, Cl. 514-59.000.
Ueno, Ryuzo; Ueno, Ryuji; Kuno, Sachiko; and Tabata, Akihiko, to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo. Method for inhibiting infection of human T-cells. 4,840,941, Cl. 514-59.000.
Uesawa, Yutaka; and Morimoto, Isamu, to Konishiroku Photo Industry Co., Ltd. High whiteness silver halide photographic paper for direct positives. 4,840,889, Cl. 430-597.000.
Ueshima, Michio: *See—*
Hino, Youichi; Shimasaki, Yuuji; and Ueshima, Michio, 4,841,060, Cl. 546-184.000.
Shimasaki, Yuuji; Ueshima, Michio; Tuneki, Hideaki; and Ariyoshi, Kimio, 4,841,061, Cl. 546-184.000.
Ueyama, Seiji; and Onoe, Hiroyasu, to General Company Limited. Heat-sensitive transferring recording medium. 4,840,835, Cl. 428-212.000.
Ullrich, Georg J., to Hellige GmbH. Combined sensor for the transcutaneous measurement of oxygen and carbon dioxide in the blood. 4,840,179, Cl. 128-633.000.
Umemura, Kaoru: *See—*
Tamura, Hifumi; Shichi, Hiroyasu; and Umemura, Kaoru, 4,841,143, Cl. 250-288.000.
Umemura, Shin'ichiro: *See—*
Kondo, Shinichi; Katakura, Kageyoshi; Ogawa, Toshio; Umemura, Shin'ichiro; and Ikeda, Hiroshi, 4,841,491, Cl. 367-103.000.
Umeyama, Hideaki: *See—*
Iizuka, Kinji; Kamijo, Tetsuhide; Kubota, Tetsuhiro; Akahane, Kenji; Umeyama, Hideaki; and Kiso, Yoshiaki, 4,841,067, Cl. 548-344.000.
Umezawa, Mitsuo: *See—*
Yamakawa, Toru; Makita, Fujio; Umezawa, Mitsuo; and Sakikiyama, Ryuzo, 4,840,246, Cl. 180-247.000.
Umezu, Kenji; and Sano, Tetsuo, to Kabushiki Kaisha Toshiba. Heat pump with electrically heated heat accumulator. 4,840,220, Cl. 165-1.000.
Uni-Cardan AG: *See—*
Herrmann, Gert, 4,840,262, Cl. 192-106.200.
Uni-Charm Corporation: *See—*
Suzuki, Migaku; Nozaki, Satoshi; Imai, Shigeo; Ishigami, Makoto; and Kobayashi, Toshio, 4,840,829, Cl. 428-131.000.
Unimax Distribution Limited: *See—*
Ming, Alex L. K., 4,840,599, Cl. 446-465.000.
Union Carbide Corporation: *See—*
Koleske, Joseph V.; and Kwiatkowski, George T., 4,840,978, Cl. 522-169.000.
Williams, Samuel C.; Bikson, Benjamin; Nelson, Joyce K.; and Burchesky, Robert D., 4,840,819, Cl. 427-245.000.
Unistrut International Corp.: *See—*
Rebentisch, Hugo E., 4,840,525, Cl. 411-85.000.
Unisys Corporation: *See—*
Angelucci, Ernest A., 4,841,231, Cl. 324-73.00R.
Chenest, Gerard, 4,840,507, Cl. 400-713.000.
Kingston, Samuel C., 4,841,552, Cl. 377-43.000.
Morrison, Larry R.; and Jenkins, Vaughn J., 4,841,257, Cl. 331-26.000.
United Foam Plastics Corporation: *See—*
Waldner, Charles, 4,840,277, Cl. 206-523.000.
United States of America
Air Force: *See—*
Nash, Dudley O.; Knight, Glenn L., Jr.; and Bertke, James H., 4,840,026, Cl. 60-271.000.
Walter, Martin J., 4,841,150, Cl. 250-339.000.
Army: *See—*
Branovich, Louis E.; Freeman, Gerard L.; Smith, Bernard; and Eckart, Donald W., 4,840,767, Cl. 419-27.000.
Epstein, Joseph; Parsons, John A.; and Block, Frank, 4,840,911, Cl. 436-8.000.
Jasper, Louis J., Jr., 4,840,106, Cl. 89-8.000.
Energy: *See—*
Appleton, Bill R.; Ashley, Paul R.; and Buchal, Christopher J., 4,840,816, Cl. 427-38.000.
Cooper, James A., 4,841,570, Cl. 380-30.000.
Doherty, Joseph P.; and Marek, James C., 4,840,765, Cl. 376-310.000.
George, Michael; Pierson, Lyndon G.; and Wilkins, Mark E., 4,841,550, Cl. 375-118.000.
Miller, Steven S., 4,840,931, Cl. 502-162.000.
Richlen, Scott L., 4,840,226, Cl. 165-134.100.
Woodward, Jonathan, 4,840,904, Cl. 435-165.000.
Wu, Jung Fu, 4,840,903, Cl. 435-165.000.
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Futrell, James C., II, 4,840,062, Cl. 73-170.00A.
National Aeronautics and Space Administration: *See—*
Bickler, Donald B., 4,840,394, Cl. 280-677.000.
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U.S. Philips Corporation: *See—*
De With, Gijsbertus; and Van Dijk, Hendricus J. A., 4,841,195, Cl 313-636.000.
Elsner, Hans F. K.; Prendel, Peter W.; Kandler, Wilfried H. K., and Sandkuhl, Jurgen, 4,841,102, Cl. 174-35.0GC.
Farhangi, Hassan; and Konings, Johan W. M. E., 4,841,513, Cl 369-59.000.
Guenot, Andre; and Cantou, Christian J. R., 4,841,365, Cl. 358-147.000.
Hartmann, Wilbert J. A. M., 4,840,462, Cl. 350-350.00S.
Kokkeler, Franciscus; Fioroli, Mario; Risman, Per O. G.; Vigano, Liliana; and Idebro, Mats G., 4,841,111, Cl. 219-10.55B.
Loy, Fernand R.; Perrin, Jean-Claude; and Rollin, Joel, 4,840,465, Cl. 350-421.000.
Maijers, Andries C.; Weekamp, Johannus W.; Van Den Ackerveken, Antonius C. J. C.; and Brink, Jan, 4,841,410, Cl 361-306.000.
Schoofs, Franciscus A. C. M., 4,841,564, Cl. 379-413.000.
Tsironis, Christos, 4,841,169, Cl. 307-303.000.
Vermeer, Adrianus J. P. M., 4,839,961, Cl. 29-740.000.
Zandveld, Frederik; and Van Der Vlist, Peter C. L., 4,841,474, Cl. 364-900.000.
United Technologies Corporation: *See—*
Lomangino, Michael, 4,841,262, Cl. 333-81.00R.
Poumakis, Demetrius J., 4,841,209, Cl. 318-564.000.
Sziklas, Edward A.; and Benda, John A., 4,841,541, Cl. 372-94.000.
Universal Instruments Corporation: *See—*
Zemek, Albert W., 4,840,268, Cl. 198-817.000.
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Landre, Bernard, 4,841,237, Cl. 324-127.000.
Universite Paul Sabatier (Toulouse III): *See—*
Rousset, Abel C.; Boissier, Guy; Jabry, El Hadj; and Caffin, Jean-Pierre, 4,840,925, Cl. 501-1.000.
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University of Georgia Research Foundation, Inc.: *See—*
Chu, Chung K.; and Schinazi, Raymond F., 4,841,039, Cl. 536-29.000.
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Todd, Robert F., III; Lucchesi, Benedict R.; Simpson, Paul J.; Griffin, James D.; and Schlossman, Stuart F., 4,840,793, Cl. 424-85.800.
University of North Carolina at Chapel Hill: *See*—
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University of Texas System, The: *See*—
Weldon, William F.; Pratap, Siddharth B.; and Driga, Mircea D., 4,841,217, Cl. 322-8.000.
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Kuehne, Martin, 4,841,045, Cl. 540-478.000.
University of Virginia Alumni Patents Foundation, The: *See*—
Brubaker, Clifford E.; and McLaurin, Colin A., 4,840,076, Cl. 74-143.000.
Unland, Georg; and Driemeier, Gunter, to Krupp Polysius AG. Apparatus for the heat treatment of fine-grained material. 4,840,561, Cl. 432-106.000.
UOP: *See*—
Cannan, Thomas R., 4,840,779, Cl. 423-324.000.
Faucher, Joseph A., 4,840,777, Cl. 423-220.000.
Johnson, Russell W.; and Hilfman, Lee, 4,840,722, Cl. 208-95.000.
Kalnes, Tom N.; and James, Robert B., Jr., 4,840,721, Cl. 208-57.000.
Urabe, Hitoshi; Shigaki, Takao; and Shimazaki, Osamu, to Fuji Photo Film Co., Ltd. Apparatus for generating positive or negative image output signals from either positive or negative originals. 4,841,362, Cl. 358-80.000.
Urabe, Takashi: *See*—
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Urashima, Hidetoshi: *See*—
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Urban, Frank J., to Pfizer, Inc. Process for the production of asymmetric hydantoins. 4,841,079, Cl. 549-404.000.
Urukawa, Satoshi: *See*—
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Usami, Toshimasa; Hatakeyama, Seiji; and Shimomura, Akihiro, to Fuji Photo Film Co., Ltd. Heat sensitive recording material. 4,840,933, Cl. 503-213.000.
Ushida, Masahiko; and Shibata, Hitoshi, to Nippondenso Co., Ltd. Indicator arrangement for motor vehicles. 4,841,155, Cl. 250-463.100.
Ushio Denki: *See*—
Arai, Tetsuji, 4,840,876, Cl. 430-328.000.
Suzuki, Shinji; Arai, Tetsuji; Ohno, Kuniharu; Ueki, Kazuyeshi; Mimura, Yoshiki; Tanaka, Kazuya; Sugioka, Shinji; and Suzuki, Hiroko, 4,841,342, Cl. 355-71.000.
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Usui Kokusai Sangyo Kabushiki Kaisha: *See*—
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Utagawa, Ken: *See*—
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Utex Industries, Inc.: *See*—
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Utsui, Masaaki: *See*—
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Valyocsik, Ernest W., to Mobil Oil Corporation. ZSM-51, method of preparing same and catalytic conversion therewith. 4,840,780, Cl. 423-329.000.
Van Beveren, Shirley M.; and Pappenhagen, Albert R., to Miles Laboratories, Inc. Virally inactivated, non-toxic, human transferrin preparation. 4,841,026, Cl. 530-394.000.
van Blerkom, Jonathan, to Genetic Engineering, Inc. Encapsulation of sperm for artificial insemination. 4,840,891, Cl. 435-2.000.
van Boeckel, Constant A. A.; Beetz, Tom; and Petitou, Maurice, to Akzo N.V.; and Sanofi S.A. Pentasaccharides and tetrasaccharides having anti-thrombotic activity. 4,841,041, Cl. 536-118.000.
Van Dedem, Gijsbert W. K.; and Van Houdenhoven, Francois E. A., to Akzo N.V. Modified human insulin and its use as starting material for the preparation of human insulin. 4,840,897, Cl. 435-69.000.
Van Den Ackerveken, Antonius C. J. C.: *See*—
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van der Schaaf, Herman J., to B. V. Gerbs. ter Braak. Pipe coil cooker. 4,840,678, Cl. 127-2.000.
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Zandveld, Frederik; and Van Der Vliet, Peter C. L., 4,841,474, Cl. 364-900.000.
Van Dijk, Hendricus J. A.: *See*—
De With, Gijsbertus; and Van Dijk, Hendricus J. A., 4,841,195, Cl. 313-636.000.
Van Erden, Donald L.; and Ausnit, Steven, to Minigrip, Inc. Gusseted bags with reclosure features. 4,840,611, Cl. 493-213.000.
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Van Houdenhoven, Francois E. A.: *See*—
Van Dedem, Gijsbert W. K.; and Van Houdenhoven, Francois E. A., 4,840,897, Cl. 435-69.000.
Van Iperen, Roeland; Van Der Mark, Johannes M.; and Kooijmans, Petrus G., to Shell Oil Company. Process for preparing cationic coating compositions using ammonia adducts of epoxy resins which are further reacted with a cyclic anhydride. 4,840,979, Cl. 523-404.000.
Vannier, Jean, to Clextral. Method for mounting and removing screws of an extrusion machine. 4,839,955, Cl. 29-402.080.
Varga, John T.: *See*—
Finlay, David E.; Hanna, Stephen D.; Stevenson, David C.; and Varga, John T., 4,841,453, Cl. 364-519.000.
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Varta Batterie Aktiengesellschaft: *See*—
Nijhawan, Subash-Chander; Daniel, Horst; and Dennstedt, Welf, 4,840,857, Cl. 429-197.000.
Vaughan Co., Inc.: *See*—
Dorsch, Glenn R., 4,840,384, Cl. 277-12.000.
VDO Adolf Schindling AG: *See*—
Rumpf, Bernd; and Reisch, Wolfgang, 4,841,451, Cl. 364-484.000.
VEB Forschung und Entwicklung: *See*—
Feustel, Mattias; Frotscher, Guenter; Nitschke, Wieland; Obenauf, Dieter; Saupe, Juergen; and Weidelt, Manfred, 4,840,202, Cl. 139-425.00R.
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Venuti, Michael C.: *See*—
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Verbos, Stephen P., to Lift Tech International Inc. D.C. solenoid control circuit. 4,841,215, Cl. 318-757.000.
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Vermeer, Adrianus J. P. M., to U.S. Philips Corporation. Gripping device. 4,839,961, Cl. 29-740.000.
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Vexcel Corporation: *See*—
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VG Instruments Group Limited: *See*—
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Ohtake, Yoshichi, 4,840,470, Cl. 350-429.000.
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Vigarie, Jean-Pierre; Carlach, Jean-Claude; and Penard, Pierre, to Etat Francais, Administration des P.T.T. (Centre National d'Etudes des Telecommunications); and Etabilissement Public dit "Telediffusion de France". Random access memory and linear interpolation circuit comprising application thereof. 4,841,462, Cl. 364-723.000.
Vijay, Tumkur R.; and Mannen, Bryce L., to FMC Corporation. Tire changer safety post. 4,840,215, Cl. 157-1.000.
Villela, Gerard: *See*—
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Virgilio, Joseph A.; Manowitz, Milton; and Heilweil, Emanuel, to Givaudan Corporation. 2-alkyl-3-haloisothiazol-3-thione. 4,841,063, Cl. 548-213.000.
Vitolin, Rasma O.: *See*—
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Vogt, Winold, to Pfleiderer Industrie GmbH & Co., KG. Method for the production of fibrous plaster boards. 4,840,688, Cl. 156-39.000.
Vogtherr, Burkhard; and Elzenbeck, Manfred, to Davis Furniture Industries, Inc. Office chair. 4,840,426, Cl. 297-300.000.
Volejnik, Wilhelm, to Siemens Aktiengesellschaft. Method and apparatus for extracting an auxiliary data clock from the clock and/or the clock-phase of a synchronous or plesiochronic digital signal. 4,841,548, Cl. 375-110.000.
Vollhardt, Frohmut; and Kramer, Hans, to Man Gutehoffnungshuette GmbH. Process and a device for cleaning inner or outer walls of vertically extending or inverted tubes of heat exchangers. 4,840,145, Cl. 122-379.000.
von Broock, Ulrich, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Suspension system for a drive assembly of a helicopter. 4,840,330, Cl. 244-17.270.
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Voorhees, John L.; and Kemp, James, to Productive Products Limited. Child harness. 4,840,144, Cl. 119-96.000.
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Vuong, The A., to Telefunken Fernseh und Rundfunk GmbH. Transformation circuit arrangement. 4,841,465, Cl. 364-725.000.
W&A Bates Limited: *See*—
Goodfellow, Anthony G.; and Wright, Anthony R., 4,840,697, Cl. 156-405.100.
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Wachtel, Roberta S. Restraining vest. 4,840,189, Cl. 128-869.000.
Wacker Silicones Corporation: *See*—
Hoffman, Michael J., 4,840,742, Cl. 252-49.500.
Wada, Akio; Nakeuchi, Fumiko; and Nishizawa, Seiji, to Nihon Bunko Kogyo Kabushiki Kaisha. Apparatus for preparing sample solution for infrared spectrophotometer and method of analyzing sample solution. 4,841,145, Cl. 250-304.000.
Wada, Kenzo; and Nagata, Eiji, to NEC Corporation. Transistor devices for microwave oscillator elements. 4,841,353, Cl. 357-51.000.
Waddington, John D., to British Gas PLC. Heating stock in a heating chamber. 4,840,560, Cl. 432-59.000.
Wade, Leonard. Deodorant dispenser. 4,840,773, Cl. 422-124.000.
Wagner, Siegbert O.: *See*—
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Wagnon, Jean; Guegan, Remy; LaCour, Colette; and Nisato, Dino, to Sanofi; and Institut National de la Sante et de la Recherche Medicale. Peptide amino-alcohol derivatives containing a tetrasubstituted carbon atom, inhibiting renin and acid proteases, process for obtention and therapeutical use. 4,840,935, Cl. 514-18.000.
Wakamatsu, Hideki: *See*—
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Wakamatsu, Masazumi: *See*—
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Wakefield, John J., Jr., to Atlantic Richfield Company. Method for determining and controlling the amount of finely divided particulate solids added to a stream of fluid. 4,840,726, Cl. 208-152.000.
Waldmann, Herman: *See*—
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Walker, Fritz: *See*—
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Walley, Darlene R.: *See*—
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Walter, Eckhard, to Rahmen mit System GmbH. Closed decoration frame. 4,839,974, Cl. 40-152.000.
Walter, Martin J., to United States of America, Air Force. Reflection technique for thermal mapping of semiconductors. 4,841,150, Cl. 250-339.000.
Walters, Donald M., Jr., to Advanced Micro Devices, Inc. CMOS RAM data compare circuit. 4,841,279, Cl. 340-146.200.
Walton, Erick G.: *See*—
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Walz, David K.; Howerton, Robert D.; Allen, Andrew W.; Moss, Thera C.; and Kenney, William H., to SECO Industries, Inc. Odor control product dispenser. 4,840,770, Cl. 422-49.000.
Wang, Chih-Chung: *See*—
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Wang, Robert, to Societe Stein Heurtey, Z.A.I. Method for degreasing a cold rolled metallic band. 4,840,680, Cl. 134-40.000.
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Wanger, Werner: *See*—
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Washburn, Robert D.; and McClanahan, Robert F., to Hughes Aircraft Company. Non-saturating magnetic amplifier controller. 4,841,428, Cl. 363-75.000.
Washburn, Robert D.: *See*—
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Washington Technology Center: *See*—
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Wasileski, John M., to National Distillers and Chemical Corporation. Continuous process for the preparation of immobilized glucoamylase. 4,840,900, Cl. 435-96.000.
Waszkiewicz, Paul, to Photon Devices, Ltd. Document scanner with resolution selection control. 4,841,142, Cl. 250-227.000.
Watabe, Seiji; Yokoyama, Isao; Maeda, Tsutomu; Shibuya, Koichi; and Takahashi, Sumio, to TDK Corporation. Deflection apparatus for cathode ray tube. 4,841,267, Cl. 335-210.000.
Watanabe, Atsumi: *See*—
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Watanabe, Hiroyuki, to Pilot Precision Kabushiki Kaisha. Mechanical pencil capable of automatically propelling successive lengths of lead. 4,840,508, Cl. 401-65.000.
Watanabe, Kazuo; Furihata, Makoto; and Yamazaki, Kouichi, to Hitachi, Ltd. Tri-state IIL gate. 4,841,484, Cl. 365-190.000.
Watanabe, Shuichi: *See*—
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Watanabe, Shunichi: *See*—
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Watanabe, Syoyu: *See*—
Nakano, Masaaki; Watanabe, Syoyu; Saito, Yusaku; and Iwata, Syuji, 4,841,290, Cl. 340-707.000.
Watanabe, Takashi, to Nishihara Engineering Company, Ltd. Drainage system in multi-story building. 4,839,927, Cl. 4-211.000.
Watanabe, Takaya; and Fushimi, Shigeo, to NEC Corporation. Surface acoustic wave filter. 4,841,265, Cl. 333-194.000.
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; Taguchi, Minoru; and Sota, Kaoru, to Taisho Pharmaceutical Co., Ltd. Cephalosporin derivatives. 4,841,044, Cl. 540-227.000.
Watanabe, Yoshikazu; and Tanaka, Motoaki, to Konishiroku Photo Industry Co., Ltd. Process for the production of light-sensitive silver halide photographic material. 4,840,881, Cl. 430-512.000.
Watanabe, Yoshimi; Miyakoshi, Shinichi; and Goto, Kenichi, to Honda Giken Gokyo Kabushiki Kaisha. V-type vertical engine. 4,840,152, Cl. 123-52.0MV.
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Watanuki, Kiyoshi: *See*—
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Weber, Reinhold; Zuern, Ludwig; and Weilbacher, Manfred, to BASF Aktiengesellschaft. Production of closed-celled foams of high compressive strength. 4,840,976, Cl. 521-79.000.

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Weldon, William F.; Pratap, Siddharth B.; and Driga, Mircea D., to University of Texas System, The. Pulsed generator incorporating output waveform flexibility and a pulsed transformer. 4,841,217, Cl. 322-8.000.

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Watanabe, Kazuo; Furihata, Makoto; and Yamazaki, Kouichi, 4,841,484, Cl. 365-190.000.
Yamazaki, Nobuo: *See*—
Yamamoto, Yoshihiro; Kume, Tsutomu; Yamazaki, Nobuo; Hashimoto, Fumiharu; and Ohya, Koichi, 4,841,461, Cl. 364-572.000.
Yamazaki, Toru: *See*—
Saburi, Toshiki; Ohya, Nobuyuki; Yamazaki, Toru; and Katoh, Taisei, 4,840,926, Cl. 501-134.000.
Yanabu, Satoru; Takahashi, Hideomi; Kaneko, Eiji; and Yasuoka, Koichi, to Kabushiki Kaisha Toshiba. CO_2 gas laser device. 4,841,538, Cl. 372-58.000.
Yanagisawa, Shozo; Tamaki, Sigeo; and Ishizuwa, Isamu, to Hitachi, Ltd. Multiple throttle mechanism for internal combustion engines. 4,840,146, Cl. 123-52.0MB.
Yananton, Patrick; and Parker, Janice P. Securing means for odorless animal litter unit. 4,840,140, Cl. 119-1.000.
Yandle, Sylvester E., II. Hydraulic hammer reduction system for railroad tank cars. 4,840,192, Cl. 137-681.000.
Yandora, Andrew E.: *See*—
Heys, George, Jr.; Yandora, Andrew E.; and McDowell, Philip D., 4,841,412, Cl. 361-393.000.
Yang, Kap S.: *See*—
Cuculo, John A.; Theil, Michael H.; Yang, Kap S.; and Chen, Yue S., 4,840,673, Cl. 106-198.000.
Yano, Toshihiko: *See*—
Tsushima, Kazunori; Matsuo, Noritada; Tanabe, Yoo; Yano, Toshihiko; and Hirano, Masachika, 4,840,971, Cl. 514-721.000.
Yarkosky, Eugene F.: *See*—
Schultz, Paul B.; and Yarkosky, Eugene F., 4,840,820, Cl. 427-305.000.
Yasuda, Kazuhito; and Kishi, Yutaka, to Fujitsu Limited. Process for fabricating an avalanche photodiode. 4,840,916, Cl. 437-3.000.
Yasuda, Naofumi: *See*—
Kabaya, Yoshihiko; Yasuda, Naofumi; and Omi, Toshihiro, 4,840,488, Cl. 356-374.000.
Yasudomi, Norio: *See*—
Takao, Hisashi; Osaki, Norio; and Yasudomi, Norio, 4,840,957, Cl. 514-326.000.
Yasui, Toshihiko, to Shimano Industrial Company Limited. Fishing rod. 4,839,981, Cl. 43-18.100.
Yasukawa, Nihiko: *See*—
Tomikawa, Arifumi; and Yasukawa, Nihiko, 4,840,258, Cl. 190-102.000.
Yasumura, Kiyoshi: *See*—
Sakamoto, Seiji; and Yasumura, Kiyoshi, 4,840,830, Cl. 428-141.000.
Yasuoka, Koichi: *See*—
Yanabu, Satoru; Takahashi, Hideomi; Kaneko, Eiji; and Yasuoka, Koichi, 4,841,538, Cl. 372-58.000.
Yasutomi, Tsuyoshi: *See*—
Sasaki, Akira; Takahashi, Yoshihito; Hakoyama, Akiyoshi; Mikami, Katsumasa; Suzaki, Masafumi; Honma, Takeo; Yasutomi, Tsuyoshi; Shiraishi, Ryoichi; and Nishiguchi, Yasuo, 4,840,500, Cl. 400-120.000.
Yau, Yung-Herng: *See*—
Steinbicker, Richard N.; Townsend, Herbert E.; and Yau, Yung-Herng, 4,840,712, Cl. 204-28.000.
Yazaki Corporation: *See*—
Oikawa, Ryuetsu; and Fujita, Akihiko, 4,839,937, Cl. 16-2.000.
Yhtyneet Paperitehtaat Oy Jylhavaara: *See*—
Gustafsson, Helmer, 4,840,318, Cl. 241-294.000.
Yip, Douglas: *See*—
Nierescher, David; and Yip, Douglas, 4,840,576, Cl. 439-331.000.
Yokogawa Electric Corporation: *See*—
Yamagishi, Hideaki; and Nomiyama, Mayumi, 4,841,272, Cl. 338-2.000.
Yokogawa Medical Systems, Limited: *See*—
Nagai, Hideo, 4,841,553, Cl. 378-19.000.
Yokoi, Tsutomu; Tani, Hiroji; Kasanami, Tohru; Fukui, Norio; and Yamamoto, Keizou, to Murata Manufacturing Co.,Ltd. Method of manufacturing circuit component such as stator for variable resistor. 4,839,960, Cl. 29-620.000.
Yokoo, Chihiro: *See*—
Watanabe, Yoshiaki; Yokoo, Chihiro; Goi, Masami; Onodera, Akira; Murata, Mitsuo; Fukushima, Hiroshi; Taguchi, Minoru; and Sota, Kaoru, 4,841,044, Cl. 540-227.000.
Yokosawa, Seiichi, to Pioneer Electronic Corporation. Digital signal reproducing apparatus. 4,841,390, Cl. 360-77.140.
Yokoyama, Isao: *See*—
Watabe, Seiji; Yokoyama, Isao; Maeda, Tsutomu; Shibuya, Koichi; and Takahashi, Sumio, 4,841,267, Cl. 335-210.000.
Yokoyama, Michihiro, to Kabushiki Kaisha Yokoyama Seisakusho. Process for manufacturing toothed parts. 4,839,952, Cl. 29-159.200.
Yokoyama, Shouji: *See*—
Yamamoto, Masanari; Ito, Yasunobu; and Yokoyama, Shouji, 4,841,445, Cl. 364-424.100.
Yon, Steven A.; and Diaz, Luis A., to NCR Corporation. Power supply switching circuit. 4,841,160, Cl. 307-66.000.
Yonemura, Masaaki: *See*—
Kusuda, Takao; Yonemura, Masaaki; Shimoda, Hisanori; Takigawa, Masuo; and Mihara, Toshihiro, 4,840,028, Cl. 60-303.000.
Yoneyama, Mitsuho: *See*—
Matsushita, Osami; Takagi, Michiyuki; Yoneyama, Mitsuho; Sugaya, Toyomi; and Saito, Ikuhiro, 4,841,212, Cl. 318-607.000.
Yoneyama, Tomio: *See*—
Ohta, Tokuya; Kobayashi, Masatsune; Suga, Yuko; Miura, Konoe; Takimoto, Hiroshi; and Yoneyama, Tomio, 4,841,037, Cl. 534-815.000.
Yonezu, Kazuya; and Matsumoto, Keiji, to NEC Corporation. Control processor for controlling a peripheral unit. 4,841,440, Cl. 364-200.000.
Yoshida, Akira; and Sasaki, Yuuichi, to Fujitsu Limited. System for generating mask pattern for vector data processor. 4,841,438, Cl. 364-200.000.
Yoshida, Hideo; Inoue, Tohru; Yamagishi, Atsuhiro; Oda, Yoshiaki; Ozaki, Minoru; and Nishijima, Toshihisa, to Mitsubishi Denki K.K. Error correction encoder/decoder. 4,841,300, Cl. 341-94.000.
Yoshida, Kazuetsu: *See*—
Futamoto, Masaaki; Honda, Yukio; Saito, Shinichiro; Nishimura, Takashi; Yoshida, Kazuetsu; Okuwaki, Toyoji; Iwata, Hitoshi; Suzuki, Hiroyuki; Imagawa, Kazushige; Daimon, Hideo; Kitakami, Osamu; and Fujiwara, Hideo, 4,840,844, Cl. 428-336.000.
Yoshida Kogyo K. K.: *See*—
Akiyama, Hideki; and Morita, Toyoo, 4,839,963, Cl. 29-766.000.
Murai, Ryukichi, 4,839,946, Cl. 24-115.00G.
Osaki, Tatsuo, 4,839,956, Cl. 29-408.000.
Seki, Fumio, 4,840,301, Cl. 227-139.000.
Yoshida Kogyo K.K.: *See*—
Masuda, Yuichi; and Shimizu, Kozo, 4,840,322, Cl. 242-67.10R.
Yoshida, Masanobu, to Fujitsu Limited. Semiconductor integrated circuit adapted to carry out operation test. 4,841,233, Cl. 324-73.00R.
Yoshida, Shotaro: *See*—
Onishi, Akihumi; Hasegawa, Masakasu; Takaoka, Michio; Motai, Tsuneaki; Ono, Motoyuki; and Yoshida, Shotaro, 4,840,552, Cl. 425-72.100.
Yoshida, Susumu: *See*—
Ikegami, Fumio; Yoshida, Susumu; Takeuchi, Tsutomu; and Ariyavisitakul, Sirikiat, 4,841,547, Cl. 375-53.000.
Yoshida, Tomio: *See*—
Kubota, Shinji; Hirosawa, Kazutoyo; and Yoshida, Tomio, 4,841,512, Cl. 369-54.000.

Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; Kudo, Hiroaki; and Matsui, Sadayoshi, to Sharp Kabushiki Kaisha. Buried type semiconductor laser device. 4,841,534, Cl. 372-46.000.
Yoshida, Tsukasa; Ishige, Yoshio; Matsudaira, Masaki; and Takahashi, Tadashi, to Sanmatsu Kogyo Kabushiki Kaisha. Branched dextrin production and compositions containing same. 4,840,807, Cl. 426-48.000.
Yoshida, Yasunori: *See*—
Nakayama, Rinichi; Yoshida, Yasunori; and Iwama, Satoshi, 4,840,988, Cl. 524-476.000.
Yoshida, Yuji: *See*—
Ikoma, Mitsuhiro; Nakatani, Kazuo; Yoshida, Yuji; Tomizawa, Takeshi; and Arita, Koji, 4,840,042, Cl. 62-324.100.
Yoshihara, Junji: *See*—
Imahori, Seiichi; Himeno, Kiyoshi; and Yoshihara, Junji, 4,841,036, Cl. 534-761.000.
Yoshikawa, Masanori; and Watanabe, Shuichi, to Matsushita Electric Industrial Co., Ltd. Thermal copying apparatus. 4,841,154, Cl. 250-317.100.
Yoshikura, Takashi: *See*—
Matsushita, Kunitake; Sakuma, Hiroshi; Yamawaki, Takayuki; Yoshikura, Takashi; Sano, Hiroshi; Suzuki, Yuzuru; Torii, Michihiro; and Ohnuki, Tohru, 4,841,190, Cl. 310-257.000.
Yoshimura, Shigeyuki: *See*—
Matsuura, Ryo; Yoshimura, Shigeyuki; Asanuma, Yasuo; Nasu, Katsuaki; Yoshizumi, Haruo; Tsujimoto, Kazumi; and Kimura, Toshiyuki, 4,840,932, Cl. 502-202.000.
Yoshimura, Shohei: *See*—
Kuwabara, Hideki; and Yoshimura, Shohei, 4,840,973, Cl. 521-58.000.
Yoshimura, Takashi: *See*—
Sakakino, Takahiro; Ohmori, Koji; Yoshimura, Takashi; Kazusaka, Shoji; and Sunagawa, Yoshitaka, 4,841,109, Cl. 200-302.100.
Yoshinaga, Noriyuki: *See*—
Furukawa, Nobuhiro; Nishio, Koji; and Yoshinaga, Noriyuki, 4,840,858, Cl. 429-197.000.
Yoshino, Kunihisa: *See*—
Hiratsuka, Seiichiro; Yoshino, Kunihisa; Haneda, Satoshi; and Shoji, Hisashi, 4,841,337, Cl. 355-157.000.
Yoshino, Tatsuo: *See*—
Nishiyama, Mikio; Yoshino, Tatsuo; and Akimoto, Taizo, 4,841,371, Cl. 358-244.000.
Yoshioka, Yoshio: *See*—
Takagi, Masayoshi; Yoshioka, Yoshio; Matsuzaki, Tetsuo; Noro, Shuhei; Ikawa, Syouji; and Naruse, Katutoshi, 4,841,431, Cl. 364-187.000.
Yoshizawa, Akihiko, to Olympus Optical Co., Ltd. Optical characteristic measuring apparatus for an optical recording medium substrate. 4,841,510, Cl. 369-46.000.
Yoshizumi, Haruo: *See*—
Matsuura, Ryo; Yoshimura, Shigeyuki; Asanuma, Yasuo; Nasu, Katsuaki; Yoshizumi, Haruo; Tsujimoto, Kazumi; and Kimura, Toshiyuki, 4,840,932, Cl. 502-202.000.
Youd, T. Leslie; and Jackson, Garrett O., to Electric Power Research Institute, Inc. Retrievable wedging system for coupling downhole devices into cased bore holes. 4,840,230, Cl. 166-382.000.
Young, Gary. Protective device for coils of metal. 4,840,274, Cl. 206-389.000.
Young, John M.: *See*—
Jones, Gordon H.; Venuti, Michael C.; and Young, John M., 4,840,965, Cl. 514-450.000.
Young, Sidney F. Method and article of manufacture for inserting contact lens. 4,840,478, Cl. 351-177.000.
Ytkemiska Institutet: *See*—
Golander, Carl G.; Jonsson, Erik S.; and Vladkova, Todorka G., 4,840,851, Cl. 428-523.000.
Yue, Stephen: *See*—
Boratto, Francisco; Yue, Stephen; and Jonas, John J., 4,840,051, Cl. 72-11.000.
Yui, Hiroshi: *See*—
Ohmori, Michio; Okamura, Michiya; and Yui, Hiroshi, 4,841,516, Cl. 369-264.000.
Yukutomo, Masashi: *See*—
Kishi, Hajimu; Takegahara, Takashi; and Yukutomo, Masashi, 4,841,432, Cl. 364-191.000.
Zabrenski, John S., to Air Products and Chemicals, Inc. Piston-backed gas pressure regulator. 4,840,195, Cl. 137-312.000.
Zahir, Sheik A.: *See*—
Tieke, Bernd; and Zahir, Sheik A., 4,840,999, Cl. 525-332.100.
Zajicek, Ernst; Riegler, Ernst; and Muhlbauer, Johann, to Voest-Alpine Aktiengesellschaft. Electric furnace arrangement. 4,841,542, Cl. 373-73.000.
Zambon S.p.A.: *See*—
Della Bella, Davide; Carenzi, Angelo; Chiarino, Dario; and Pellacini, Franco, 4,840,936, Cl. 514-18.000.
Zandveld, Frederik; and Van Der Vliet, Peter C. L., to U.S. Philips Corporation. Computer system with work stations at remote positions and reserve battery power supply. 4,841,474, Cl. 364-900.000.
Zaugg, Hans, to ETA SA Fabriques d'Ebauches. Support formed of rigid plastic material. 4,840,337, Cl. 248-115.000.
Zavacki, Robert G. Tool retention device. 4,840,273, Cl. 206-372.000.
Zdrahala, Richard J.; and Strand, Marc A., to Becton Dickinson and Company. Fluorinated polyetherurethanes and medical devices therefrom. 4,841,007, Cl. 528-28.000.
Zeiler, Hans-Joachim: *See*—
Habich, Dieter; Hartwig, Wolfgang; Metzger, Karl G.; and Zeiler, Hans-Joachim, 4,840,946, Cl. 514-210.000.
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,840,954, Cl. 514-254.000.
Schriewer, Michael; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,841,059, Cl. 546-312.000.
Zeitler, Herman R.: *See*—
Howton, Kenneth D.; Stewart, Robert G.; and Zeitler, Herman R., 4,841,356, Cl. 337-248.000.
Zell, Karl: *See*—
Seidel, Peter; Pelzl, Leo; and Zell, Karl, 4,840,573, Cl. 439-92.000.
Zelle, Edgar: *See*—
Hauke, Dieter; and Zelle, Edgar, 4,841,187, Cl. 310-171.000.
Zemek, Albert W., to Universal Instruments Corporation. Adjustable width chain conveyor. 4,840,268, Cl. 198-817.000.
Zenhausern, Heinrich; and Weber, Robert, to Zenhausern, Heinrich. Process for making encapsulated anchor rung. 4,840,761, Cl. 264-254.000.
Zenith Electronics Corporation: *See*—
Dougherty, Lawrence W.; and Kraner, James L., 4,840,596, Cl. 445-30.000.
Lee, Sae D., 4,841,372, Cl. 358-247.000.
Zeno, John R., to Allied-Signal Inc. Third dimension pop up generation from a two-dimensional transformed image display. 4,841,292, Cl. 340-736.000.
Ziegler, Michael J.; Millward, Barry; and Robb, Kenneth P., Jr., to AGA A.B. Methods and apparatus for forming glass articles. 4,840,656, Cl. 65-85.000.
Zielke, Horst: *See*—
Kotzab, Werner; and Zielke, Horst, 4,840,150, Cl. 123-90.390.
Zimmerman, Larry D.: *See*—
Wilson, Jon C.; Shick, David A.; Haynie, Robert L.; Wilder, Donald R.; Zimmerman, Larry D.; LeCour, Richard M.; and Guzy, D. James, 4,841,526, Cl. 371-32.000.
Zip-Pak Incorporated: *See*—
Boeckmann, Hugo, 4,840,012, Cl. 53-410.000.
Zipprath, Michael; and Schmidt, Dieter, to INA Walzlager Schaeffler KG. Valve control device. 4,840,160, Cl. 123-467.000.
Zollner, Christine; and Hahn, Herbert, to C. Conradty Nurnberg GmbH & Co. KG. Inert composite electrode, in particular an anode for molten salt electrolysis. 4,840,718, Cl. 204-286.000.
Zolyomi, Gabor: *See*—
Lang, Tibor; Korosi, Jeno; Rabloczky, Gyorgy; Hamori, Tamas; Kuhar nee Kurthy, Maria; Polgari, Istvan; Elekes, Istvan; Zolyomi, Gabor; Heltai, Krisztina; Sarossy nee Kincsesy, Judit; Lang nee Rihmer, Zsuzsanna; and Moravcsik, Imre, 4,840,948, Cl. 514-221.000.
Zondler, Helmut; Hubele, Adolf; and Nyfeler, Robert, to Ciba-Geigy Corporation. N-(2-nitrophenyl)-5-aminopyrimidine derivatives and useful for controlling harmful micro-organisms. 4,840,662, Cl. 71-92.000.
Zook, J. David: *See*—
Sullivan, Charles T.; and Zook, J. David, 4,841,140, Cl. 250-226.000.
Zoschke, Andreas: *See*—
Quadranti, Marco; Schmidli, Wilhelm; and Zoschke, Andreas, 4,840,663, Cl. 71-93.000.
Zuern, Ludwig: *See*—
Weber, Reinhold; Zuern, Ludwig; and Weilbacher, Manfred, 4,840,976, Cl. 521-79.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 20TH DAY OF JUNE, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Elias, Donald R., executor: *See—*
Elias, Robert T., deceased; and Elias, Donald R., executor, Re. 32,957, Cl. 604-368.000.

Elias, Robert T., deceased; and Elias, Donald R., executor, to Johnson & Johnson. Absorbent article. Re. 32,957, Cl. 604-368.000.

Fuji Photo Film Co., Ltd.: *See—*
Ohmura, Hiroshi; Maemori, Takashi; and Ishii, Toshio, Re. 32,959, Cl. 354-403.000.

Hanada, Tsuneo: *See—*
Koshii, Taro; Morita, Yoshitsugu; Shinmi, Hideo; and Hanada, Tsuneo, Re. 32,958, Cl. 525-476.000.

Honeywell Inc.: *See—*
Levine, Michael R., Re. 32,960, Cl. 364-557.000.

Ishii, Toshio: *See—*
Ohmura, Hiroshi; Maemori, Takashi; and Ishii, Toshio, Re. 32,959, Cl. 354-403.000.

Johnson & Johnson: *See—*
Elias, Robert T., deceased; and Elias, Donald R., executor, Re. 32,957, Cl. 604-368.000.

Koshii, Taro; Morita, Yoshitsugu; Shinmi, Hideo; and Hanada, Tsuneo, to Toray Silicone Co., Ltd. Thermosetting epoxy resin compositions. Re. 32,958, Cl. 525-476.000.

Lamusga, Gary R., to Toro Company, The. Lawn mower grass collector bag support. Re. 32,954, Cl. 56-202.000.

Levine, Michael R., to Honeywell Inc. Electronic thermostat. Re. 32,960, Cl. 364-557.000.

Macy, Amelita J., executor: *See—*
Macy, Lawrence E., deceased, Re. 32,955, Cl. 123-198.00D.

Macy, Lawrence E., deceased (by Macy, Amelita J., executor), to Muncie Power Products, Inc. Electronic overspeed switch. Re. 32,955, Cl. 123-198.00D.

Maemori, Takashi: *See—*
Ohmura, Hiroshi; Maemori, Takashi; and Ishii, Toshio, Re. 32,959, Cl. 354-403.000.

Manville Service Corporation: *See—*
Schuster, Richard L., Re. 32,956, Cl. 206-428.000.

Morita, Yoshitsugu: *See—*
Koshii, Taro; Morita, Yoshitsugu; Shinmi, Hideo; and Hanada, Tsuneo, Re. 32,958, Cl. 525-476.000.

Muncie Power Products, Inc.: *See—*
Macy, Lawrence E., deceased, Re. 32,955, Cl. 123-198.00D.

Ohmura, Hiroshi; Maemori, Takashi; and Ishii, Toshio, to Fuji Photo Film Co., Ltd. Automatic focusing apparatus. Re. 32,959, Cl. 354-403.000.

Schuster, Richard L., to Manville Service Corporation. Carton and blank therefor. Re. 32,956, Cl. 206-428.000.

Shinmi, Hideo: *See—*
Koshii, Taro; Morita, Yoshitsugu; Shinmi, Hideo; and Hanada, Tsuneo, Re. 32,958, Cl. 525-476.000.

Toray Silicone Co., Ltd.: *See—*
Koshii, Taro; Morita, Yoshitsugu; Shinmi, Hideo; and Hanada, Tsuneo, Re. 32,958, Cl. 525-476.000.

Toro Company, The: *See—*
Lamusga, Gary R., Re. 32,954, Cl. 56-202.000.

U.S. Philips Corporation: *See—*
Wagner, Wolfgang, Re. 32,961, Cl. 378-4.000.

Wagner, Wolfgang, to U.S. Philips Corporation. Device for measuring local radiation absorption in a body. Re. 32,961, Cl. 378-4.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

AMCA International Corporation: *See—*
Heckelsberg, Robert E., B1 4,193,247, Cl. 52-713.000.

Heckelsberg, Robert E., to AMCA International Corporation. Panel mounting clip. B1 4,193,247, 6-20-89, Cl. 52-713.000.

Malot, James J.: *See—*
Visser, Melvin J.; and Malot, James J., B1 4,593,760, Cl. 166-267.000.

Soltis, Charles W. Air filtering and distribution for laminar flow clean room. B1 4,603,618, 6-20-89, Cl. 98-31.500.

Upjohn Company, The: *See—*
Visser, Melvin J.; and Malot, James J., B1 4,593,760, Cl. 166-267.000.

Visser, Melvin J.; and Malot, James J., to Upjohn Company, The. Removal of volatile contaminants from the vadose zone of contaminated ground. B1 4,593,760, 6-20-89, Cl. 166-267.000.

LIST OF DESIGN PATENTEES

A/S Jotul: *See—*
Heger, Niels E., 301,736, Cl. D23-404.000.

Adams, Duane D., to North American Philips Corporation. Vacuum cleaner. 301,783, 6-20-89, Cl. D32-18.000.

AGA Aktiebolag: *See—*
Wingbro, Torgny; and Bergstrom, Leif, 301,793, Cl. D34-93.000.

Ahlers, Ronald E.; and Emmerling, Ronald, to J.C. Penney Co. Inc. Control housing for an electric blanket. 301,694, 6-20-89, Cl. D10-50.000.

Alco Industries, Inc.: *See—*
Goetz, Charles R., 301,785, Cl. D32-53.100.

Allbritton, Michael, to Skeeter Products, Inc. Boat. 301,711, 6-20-89, Cl. D12-314.000.

Allen, David W.; and Kramer, David K., to Honiton Investments, N.V. Hydro-therapy fitting. 301,731, 6-20-89, Cl. D23-213.000.

Ambasz, Emilio. Combined toothbrush and container therefor. 301,660, 6-20-89, Cl. D4-108.000.

Anderson, Bruce O.: *See—*
Bush, Paul; and Anderson, Bruce O., 301,664, Cl. D6-436.000.

Annick Goutal (a limited liability company): *See—*
Goutal, Annick, 301,760, Cl. D26-113.000.

Archetype Gallery, Inc.: *See—*
Gaul, Robert J., 301,751, Cl. D26-37.000.

Armaturen & Presswerk GmbH: *See—*
Jans, Franz W., 301,681, Cl. D8-312.000.

Artemide S.P.A.: *See—*
Forcolini, Carlo, 301,759, Cl. D26-106.000.
Gismondi, Ernesto, 301,755, Cl. D26-63.000.
Sapper, Richard F., 301,758, Cl. D26-85.000.

Asics Corporation: *See—*
Hase, Yoshiaki, 301,658, Cl. D2-320.000.

Attwood Corporation: *See—*
Whitley, Warwick M., II, 301,683, Cl. D8-356.000.

Auslander, David E.: *See—*
Contractor, Avinash M.; Auslander, David E.; and Grimm, Wayne M., 301,764, Cl. D28-2.000.
Contractor, Avinash M.; Auslander, David E.; and Grim, Wayne M., 301,765, Cl. D28-2.000.

Contractor, Avinash M.; Auslander, David E.; and Grim, Wayne M., 301,766, Cl. D28-2.000.

Bakic, Karena, to Cosmede Anstalt. Cosmetic case. 301,771, 6-20-89, Cl. D28-76.000.

Barber, Michael G. Baby bottle. 301,741, 6-20-89, Cl. D24-47.000.

Barrs, Amy W.; Brown, Kurtis L.; Dickson, James F.; and Englebert, Stephen M., to Kimberly-Clark Corporation. Rolled material dispenser. 301,667, 6-20-89, Cl. D6-518.000.

Baxter International Inc.: *See—*
Wyzgala, Mark; and Morizio, Thomas E., 301,742, Cl. D24-52.000.

Bergstrom, Leif: *See—*
Wingbro, Torgny; and Bergstrom, Leif, 301,793, Cl. D34-93.000.

Bernstein, Michael. Motorcycle oil gauge fitting. 301,703, 6-20-89, Cl. D12-114.000.

Bethany, Elizabeth A. Dental floss holder. 301,770, 6-20-89, Cl. D28-64.000.

Bienwald, Wolfgang F.: *See—*
Pearse, James N.; and Bienwald, Wolfgang F., 301,675, Cl. D8-14.000.

BioClinical Systems, Inc.: *See—*
Powers, John H., 301,737, Cl. D24-8.000.

Bolan, Michael L.; Scherpenberg, Francis A.; and Davies, William F., Jr., to Dallas Semiconductor Corporation. Portable memory module. 301,713, 6-20-89, Cl. D14-114.000.

Bolzern, Carmen: *See—*
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Brune, David C. Toy robot. 301,727, 6-20-89, Cl. D21-166.000.

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Canta, Vittorio. Wrist watch. 301,693, 6-20-89, Cl. D10-39.000.

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Cassidy, Bruce A.; and Gray, James O. Mine roof support plate. 301,687, 6-20-89, Cl. D8-399.000.

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Contractor, Avinash M.; Auslander, David E.; and Grim, Wayne M., to Rorer Pharmaceutical Corporation Pharmaceutical tablet. 301,765, 6-20-89, Cl. D28-2.000.

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Davies, William F., Jr.: *See—*
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DeCandia, Giovanni, to FL Industries, Inc. Combined outdoor floodlight and photo electric control therefor. 301,754, 6-20-89, Cl. D26-63.000.

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Fasino, Victor. Bird feeder. 301,777, 6-20-89, Cl. D30-126.000.

Fasino, Victor. Bird feeder. 301,778, 6-20-89, Cl. D30-127.000.

Fenne, Kenneth R., to Pittway Corporation. Nightlight. 301,750, 6-20-89, Cl. D26-26.000.

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Fujiki, Tetsushi, to Sumitomo Rubber Industries, Ltd. Automobile tire. 301,709, 6-20-89, Cl. D12-149.000.

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Garner, Mary C. Combined dolls and carrier. 301,728, 6-20-89, Cl. D21-167.000.

Gaul, Robert J., to Archetype Gallery, Inc. Light fixture. 301,751, 6-20-89, Cl. D26-37.000.

Giles, Brian A.; and Schwab, Frederick J., to Eastman Kodak Company. Acoustical cleaning system. 301,779, 6-20-89, Cl. D32-1.000.

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Bover, Antonio G., 301,782, Cl. D32-6.000.

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Glaze, William W. Knife for cutting plastic cable insulation. 301,680, 6-20-89, Cl. D8-98.000.

Gobindram, Kash, to Kash 'N' Gold Ltd. Telephone set. 301,714, 6-20-89, Cl. D14-143.000.

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Goutal, Annick, to Annick Goutal (a limited liability company). Combined light bulb attachment and scent releasing pebbles therefor. 301,760, 6-20-89, Cl. D26-113.000.

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Green, Richard D. Dual compartment bottle. 301,688, 6-20-89, Cl. D9-341.000.

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Hase, Yoshiaki, to Asics Corporation. Shoe sole. 301,658, 6-20-89, Cl. D2-320.000.
Havelock, Ken. Toy badger animal figure. 301,725, 6-20-89, Cl. D21-148.000.
Heger, Niels E., to A/S Jotul. Front panel for a fireplace. 301,736, 6-20-89, Cl. D23-404.000.
Herndon, Juanita. Combined container and applicator for hair tint. 301,768, 6-20-89, Cl. D28-20.000.
Herzog, Richard, to Illinois Tool Works Inc. Grommet for electrical wires. 301,684, 6-20-89, Cl. D8-356.000.
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Hui-Neng, Chi. Stapling gun or similar article. 301,676, 6-20-89, Cl. D8-49.000.
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Iacovelli, Marc R., to Rally Manufacturing Inc. Combined battery powered light and universal spring action clip. 301,753, 6-20-89, Cl. D26-60.000.
Igarashi, Yasuo, to Sumitomo Rubber Industries, Ltd. Automobile tire. 301,706, 6-20-89, Cl. D12-136.000.
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Yoshikawa, Toshimichi, 301,787, Cl. D34-1.000.
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Lam, Michael C. B. Pair of linked candles. 301,748, 6-20-89, Cl. D26-7.000.
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Long, Randy L. Bracket for clock, figure toy or similar article. 301,686, 6-20-89, Cl. D8-373.000.
Malagrida, Joanna. Fluid distribution manifold. 301,732, 6-20-89, Cl. D23-263.000.
Malamoud, Jean G., to S. T. Dupont. Lighter thumbroller. 301,761, 6-20-89, Cl. D27-161.000.
Mansfield, Bentley. Microwave-powered water heater. 301,733, 6-20-89, Cl. D23-318.000.
Markovits, Jacob. Rope chain. 301,698, 6-20-89, Cl. D11-13.000.
Markovits, Jacob. Rose chain. 301,699, 6-20-89, Cl. D11-13.000.
McCready, Karen E., to Elleance Ltd. Lipstick case. 301,772, 6-20-89, Cl. D28-85.000.
McKeever, Michael D. Combined terrarium and aquarium. 301,775, 6-20-89, Cl. D30-104.000.
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Hanson, Mark L., 301,757, Cl. D26-68.000.
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Mobberley, Laura P., to Sealright Co., Inc. Container lid. 301,691, 6-20-89, Cl. D9-453.000.
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Morris, Gary F. Adjustable holder for water skiing safety flag. 301,697, 6-20-89, Cl. D10-121.000.
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Ogden, Ralph. Height adjustment handle for suspending a grid on a barbeque grill. 301,673, 6-20-89, Cl. D7-402.000.
Ohzu, Itsumi, to Casio Computer Co., Ltd. Portable radio receiver. 301,716, 6-20-89, Cl. D14-188.000.
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Schwab, Frederick J.: *See*—
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Mobberley, Laura P., 301,691, Cl. D9-453.000.
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van Zelderen, Gerard J. Alstroemeria named Zelpado. 6,866, 6-20-89, Cl. 68.000.
Weeks, O. L. Rose plant named 'Bacardi'. 6,862, 6-20-89, Cl. 11.000.

CLASSIFICATION OF PATENTS

ISSUED JUNE 20, 1989

NOTE.—First number, class; second number, subclass; third number, patent number

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97 4,840,335
4,840,336
4,840,337
115 4,840,338
168 4,840,339
205.2 4,840,340
240.4 4,840,341
316.5 4,840,342
475.1 4,840,343
500 4,840,344
676 4,840,344

CLASS 249

243 4,841,121

CLASS 250

209 4,841,138
221 4,841,141
223 R 4,841,139
226 4,841,140
227 4,841,142
231 R 4,841,136
236 4,841,137
239 4,841,144
288 4,841,143
304 4,841,145
306 4,841,148
317.1 4,841,154
324 4,841,146
327.2 4,841,147
330 4,841,149
339 4,841,150
364 4,841,151
374 4,841,152
390.04 4,841,153
461.1 4,841,156
463.1 4,841,155
574 4,841,157

CLASS 251

1.3 4,840,346
63.4 4,840,347
63.6 4,840,348
129.11 4,840,349
4,840,350
230 4,840,351

CLASS 252

8.6 4,840,738
17 4,840,739
32.7 E 4,840,740
47 4,840,741
49.5 4,840,742
49.6 4,840,743
51.5 A 4,840,744
73 4,840,745
174.25 4,840,746
301.4 R 4,840,747
344 4,840,748

CLASS 254

134.4 4,840,352

CLASS 260

378 4,840,749
544 A 4,840,750

CLASS 261

36.1 4,840,751
72.1 4,840,752
76 4,840,753

CLASS 264

2.2 4,840,754
15 4,840,755
22 4,840,756
4,840,757
26 4,840,758
29.2 4,840,762
53 4,840,759
65 4,840,763
102 4,840,764
245 4,840,760
254 4,840,761

CLASS 266

80 4,840,353
218 4,840,354
220 4,840,355
265 4,840,356

CLASS 267

140.1 4,840,357
4,840,358
4,840,359

CLASS 269

48.1 4,840,360
289 R 4,840,361
328 4,840,362
4,840,363

CLASS 270

38 4,840,364
54 4,840,365

CLASS 271

9 4,840,366
160 4,840,367
162 4,840,368
276 4,840,369

CLASS 272

8 N 4,840,371
68 4,840,370
72 4,840,372
134 4,840,373

CLASS 273

1 G 4,840,374
14 4,840,376
31 4,840,377
60 B 4,840,378
77 A 4,840,380
121 A 4,840,375
232 4,840,381
237 4,840,382
420 4,840,383

CLASS 277

12 4,840,384
53 4,840,385
212 FB 4,840,386
222 4,840,379

CLASS 279

1 K 4,840,387

CLASS 280

33.994 4,840,388
91 4,840,389
250.1 4,840,390
304.1 4,840,391
477 4,840,392
661 4,840,393
677 4,840,394
688 4,840,395
690 4,840,396
739 4,840,397
756 4,840,398
757 4,840,399
770 4,840,400
804 4,840,401
4,840,402
808 4,840,403
4,840,404
4,840,405

CLASS 281

1 4,840,406
48 4,840,407

CLASS 285

62 4,840,408
167 4,840,409
261 4,840,410

CLASS 292

251.5 4,840,411
337 4,840,412
4,840,413
356 4,840,414

CLASS 294

1.1 4,840,415
2 4,840,416
65.5 4,840,417

CLASS 296

91 4,840,418
108 4,840,419
116 4,840,420
122 4,840,421
180.4 4,840,422
194 4,840,423
204 4,840,424

CLASS 297

284 4,840,425
300 4,840,426
346 4,840,427
408 4,840,428
409 4,840,429
452 4,840,430

CLASS 299

39 4,840,431
64 4,840,432

CLASS 303

9.68 4,840,433
113 4,840,434
116 4,840,435
119 4,840,436

CLASS 305

10 4,840,437
36 4,840,438

CLASS 307

10.1 4,841,158
38 4,841,159
66 4,841,160
85 4,841,161
112 4,841,162
116 4,841,163
117 4,841,164
132 R 4,841,165
246 4,841,166
269 4,841,167
272.2 4,841,168
303 4,841,169
310 4,841,170
355 4,841,171
443 4,841,172
456 4,841,173
469 4,841,174
475 4,841,175
4,841,176
494 4,841,177
518 4,841,178
520 4,841,179
530 4,841,180

CLASS 310

12 4,841,181
68 D 4,841,182
90 4,841,183
90.5 4,841,184
115 4,841,185
156 4,841,186
171 4,841,187
200 4,841,188
257 4,841,189
4,841,190
317 4,841,191
337 4,841,192

CLASS 312

116 4,840,439
140 4,840,440
231 4,840,441

CLASS 313

318 4,841,193
496 4,841,194
636 4,841,195

CLASS 315

65 4,841,196
82 4,841,198
83 4,841,199
111.81 4,841,197
363 4,841,200
411 4,841,201

CLASS 318

14 4,841,202
53 4,841,203
254 4,841,204
282 4,841,205
561 4,841,208
564 4,841,209
568.24 4,841,210
569 4,841,211
607 4,841,212
661 4,841,213
696 4,841,214
757 4,841,215

CLASS 322

8 4,841,217
10 4,841,216
24 4,841,218

CLASS 323

274 4,841,219
282 4,841,220
311 4,841,222
320 4,841,221

CLASS 324

58.5 A 4,841,223
61 P 4,841,224
61 R 4,841,225
4,841,226
4,841,227
62 4,841,228
63 4,841,229
65 R 4,841,230
73 R 4,841,231
4,841,232
4,841,233
96 4,841,234
117 R 4,841,235
127 4,841,236
4,841,237
144 4,841,238
158 F 4,841,241
158 P 4,841,240
158 R 4,841,239
4,841,242
174 4,841,243
204 4,841,244
208 4,841,245
4,841,246
309 4,841,247
318 4,841,248
4,841,249
349 4,841,250

CLASS 328

36 4,841,251

CLASS 330

9 4,841,252
253 4,841,254
277 4,841,253

CLASS 331

14 4,841,255
25 4,841,256
26 4,841,257

CLASS 332

9 R 4,841,258

CLASS 333

17.2 4,841,259
21 A 4,841,260
4,841,261
81 R 4,841,262
173 4,841,263
189 4,841,264
194 4,841,265

CLASS 335

16 4,841,266
210 4,841,267
216 4,841,268
299 4,841,269

CLASS 336

61 4,841,270

CLASS 337

248 4,841,356
320 4,841,271

CLASS 338

2 4,841,272
28 4,841,273
4,841,274
195 4,841,275

CLASS 340

146.2 4,841,279
310 A 4,841,281
426 4,841,277
466 4,841,276
521 4,841,282
545 4,841,283
567 4,841,284
571 4,841,285
653 4,841,286
690 4,841,287
4,841,288
703 4,841,289
706 4,841,280
707 4,841,290
725 4,841,291
736 4,841,292
763 4,841,293
793 4,841,294
825.5 4,841,295
870.16 4,841,296
908.1 4,841,278

CLASS 341

11 4,841,297
51 4,841,298
65 4,841,299
94 4,841,300
126 4,841,301

CLASS 342

20 4,841,302
359 4,841,303
460 4,841,304

CLASS 343

766 4,841,309
771 4,841,308
912 4,841,305

CLASS 346

1.1 4,841,306
4,841,307
75 4,841,310
108 4,841,311
159 4,841,313
160 4,841,314
160 R 4,841,312

CLASS 350

1.6 4,840,442
3.71 4,840,443
3.85 4,840,444

6.8 4,840,445
4,841,135
96.13 4,840,446
96.14 4,840,447
96.16 4,840,448
96.20 4,840,449
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96.23 4,839,970
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137 4,840,455
162.17 4,840,456
255 4,840,457
319 4,840,458
333 4,840,459
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350 S 4,840,462
4,840,463
355 4,840,464
421 4,840,465
422 4,840,466
427 4,840,467
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429 4,840,470
438 4,840,471
442 4,840,472
484 4,840,473
572 4,840,474
604 4,840,475

CLASS 351

63 4,840,476
162 4,840,477
177 4,840,478
235 4,840,479

CLASS 353

280 4,841,375

CLASS 354

1 4,841,315
4 4,841,316
65 4,841,317
173.1 4,841,318
275 4,841,319
299 4,841,320
324 4,841,321
400 4,841,322
4,841,323
402 4,841,324
4,841,325
403 Re.32,959
406 4,841,326
412 4,841,327

CLASS 355

27 4,841,338
4,841,339
38 4,841,340
43 4,841,341
71 4,841,342
77 4,841,343
157 4,841,337
211 4,841,328
4,841,333
245 4,841,329
4,841,330
4,841,331
4,841,335
4,841,336
251 4,841,332
271 4,841,334

CLASS 356

32 4,840,480
4,840,481
73.1 4,840,482
153 4,840,483
312 4,840,484
317 4,840,485
338 4,840,486
350 4,840,489
355 4,840,487
374 4,840,488
375 4,840,490

CLASS 357

17 4,841,344
23.1 4,841,346
23.4 4,841,345
23.9 4,841,347
30 4,841,348
4,841,349
4,841,350
4,841,351
45 4,841,352
51 4,841,353
71 4,841,354
82 4,841,355

CLASS 358

17 4,841,357
75 4,841,358
76 4,841,359
80 4,841,360
4,841,361
4,841,362
98 4,841,363
101 4,841,364
147 4,841,365
167 4,841,366
181 4,841,367
194.1 4,841,368
213.26 4,841,369
227 4,841,370
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247 4,841,372
257 4,841,373
280 4,841,374
282 4,841,376
283 4,841,377
335 4,841,378
337 4,841,379

CLASS 360

10.2 4,841,380
10.3 4,841,381
32 4,841,382
33.1 4,841,383
60 4,841,384
65 4,841,385
69 4,841,386
72.1 4,841,387
75 4,841,389
77.14 4,841,390
85 4,841,391
4,841,392
98.07 4,841,393
99.06 4,841,394
103 4,841,395
104 4,841,396
105 4,841,397
113 4,841,398
4,841,399
125 4,841,400
4,841,401
126 4,841,402
132 4,841,403
721 4,841,388

CLASS 361

30 4,841,404
45 4,841,508
80 4,841,405
91 4,841,406
146 4,841,407
220 4,841,408
230 4,841,409
306 4,841,410
323 4,841,411
393 4,841,412
400 4,841,413
424 4,841,414

CLASS 362

90 4,841,415
183 4,841,416
206 4,841,417
223 4,841,418
226 4,841,419
249 4,841,420
279 4,841,421
294 4,841,422
304 4,841,423
352 4,841,424

CLASS 363

21 4,841,425
37 4,841,426
62 4,841,427
75 4,841,428
126 4,841,429

CLASS 364

167.01 4,841,430
187 4,841,431
191 4,841,432
200 4,841,433
4,841,434
4,841,435
4,841,436
4,841,437
4,841,438
4,841,439
4,841,440
401 4,841,441
405 4,841,442
413.01 4,841,443
421 4,841,444
424.1 4,841,445
426.02 4,841,446
431.07 4,841,447
433 4,841,448
449 4,841,449
468 4,841,450
484 4,841,451
519 4,841,453
521 4,841,454
525 4,841,455
550 4,841,456
557 Re.32,960
4,841,457
4,841,458
4,841,459
571.02 4,841,460
572 4,841,461
723 4,841,462
724.16 4,841,463
725 4,841,464
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748 4,841,467
754 4,841,468
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821 4,841,470
825 4,841,471
900 4,841,472
4,841,473
4,841,474
4,841,475
4,841,476
4,841,477
4,841,478
4,841,479

CLASS 365

87 4,841,480
154 4,841,481
185 4,841,482
189.07 4,841,483
190 4,841,484
201 4,841,485
207 4,841,486
230.01 4,841,487
233 4,841,488

CLASS 366

69 4,840,491
81 4,840,492
339 4,840,493

CLASS 367

- 4,841,489
38 4,841,490
103 4,841,491
105 4,841,492
140 4,841,493
157 4,841,494
191 4,841,495

CLASS 368

107 4,841,496
113 4,841,497
120 4,841,500

CLASS 369

13 4,841,501
4,841,502
14 4,841,503
32 4,841,498
4,841,504
4,841,505
4,841,506
38 4,841,499
44 4,841,507
46 4,841,509
4,841,510
50 4,841,511
54 4,841,512
59 4,841,513
100 4,841,514
4,841,515
264 4,841,516
270 4,841,517
4,841,518

CLASS 370

3 4,841,519
13 4,841,520
31 4,841,521
64 4,841,522
89 4,841,523
112 4,841,524

CLASS 371

21 4,841,525
32 4,841,526
4,841,527

CLASS 372

22 4,841,528
32 4,841,529
41 4,841,530
43 4,841,531
45 4,841,532
4,841,533
46 4,841,534
4,841,535
4,841,536
55 4,841,537
58 4,841,538
63 4,841,539
86 4,841,540
94 4,841,541

CLASS 373

73 4,841,542

CLASS 374

1 4,840,494
43 4,840,495
44 4,841,543
124 4,840,496

CLASS 375

1 4,841,544
4,841,545
53 4,841,547
110 4,841,548
111 4,841,549
118 4,841,550
4,841,551

CLASS 376

310 4,840,765
378 4,840,766

CLASS 377

43 4,841,552

CLASS 378

4 Re.32,961
19 4,841,553
57 4,841,554
99 4,841,555
119 4,841,556
141 4,841,557
182 4,841,558

CLASS 379

27 4,841,559
29 4,841,560
97 4,841,561
104 4,841,562
150 4,841,563
352 4,841,566
355 4,841,567
380 4,841,568
413 4,841,564
4,841,565

CLASS 380

4,841,569
4,841,570
30 4,841,571
31 4,841,572

CLASS 381

17 4,841,572
27 4,841,573
31 4,841,574
36 4,841,575

CLASS 383

4 4,840,497

CLASS 384

4,840,498

CLASS 388

811 4,841,207
828 4,841,206

CLASS 400

83 4,840,499
120 4,840,500
124 4,840,501
196 4,840,502
208 4,840,503
213 4,840,504
621 4,840,506
697.1 4,840,505
713 4,840,507

CLASS 401

65 4,840,508
149 4,840,510
198 4,840,509
213 4,840,511

CLASS 403

22 4,840,512
49 4,840,513

CLASS 404

25 4,840,514

CLASS 405

33 4,840,516
45 4,840,515
241 4,840,517

CLASS 407

113 4,840,518

CLASS 408

226 4,840,519

CLASS 409

232 4,840,520

CLASS 411

14 4,840,521
44 4,840,522
48 4,840,523
82 4,840,524
85 4,840,525
263 4,840,526
344 4,840,527
351 4,840,528
397 4,840,529

CLASS 414

404 4,840,530
409 4,840,531
479 4,840,532
495 4,840,533
563 4,840,534

CLASS 415

168.2 4,840,535
190 4,840,536
202 4,840,537

CLASS 416

96 A 4,840,538
191 4,840,539
223 A 4,840,540
223 R 4,840,541

CLASS 417

9 4,840,542
223 4,840,543
254 4,840,544
301 4,840,545
403 4,840,546
422 4,840,547
469 4,840,548

CLASS 418

55 4,840,549
150 4,840,550

CLASS 419

27 4,840,767

CLASS 420

582 4,840,768

CLASS 422

26 4,840,769
49 4,840,770
61 4,840,772
104 4,840,771
124 4,840,773

CLASS 423

79 4,840,774
150 4,840,775
4,840,776
4,840,777
229 4,840,778
324 4,840,779
328 4,840,780
329 4,840,781
345 4,840,782
576.6 4,840,783
648.1

CLASS 424

3 4,840,784
9 4,840,785
43 4,840,786
52 4,840,787
59 4,840,788
66 4,840,789
70 4,840,790
71 4,840,791
76.1 4,840,792
85.8 4,840,793
92 4,840,794
448 4,840,796
475 4,840,797
488 4,840,798
493 4,840,799
690 4,840,795

CLASS 425

12 4,840,551
72.1 4,840,552
129.1 4,840,553
190 4,840,554
500 4,840,555
543 4,840,556
555 4,840,557

CLASS 426

2 4,840,800
3 4,840,801
16 4,840,802
48 4,840,807
94 4,840,803
103 4,840,804
129 4,840,805
270 4,840,806
4,840,808
285 4,840,809
312 4,840,810
430 4,840,811
488 4,840,812
565 4,840,813
580 4,840,814
611 4,840,815

CLASS 427

38 4,840,816
45.1 4,840,817
130 4,840,818
245 4,840,819
305 4,840,820
430.1 4,840,821

CLASS 428

4 4,840,822
35.5 4,840,823
36.91 4,840,826
67 4,840,824
77 4,840,825
116 4,840,827
120 4,840,828
131 4,840,829
141 4,840,830
152 4,840,831
156 4,840,832
207 4,840,833
211 4,840,834
212 4,840,835
213 4,840,836
216 4,840,837
234 4,840,838
240 4,840,839
283 4,840,840
286 4,840,841
323 4,840,842
336 4,840,843
4,840,844
4,840,845
373 4,840,846
4,840,847
413 4,840,848
419 4,840,849
471 4,840,850
523 4,840,851
654 4,840,852
698 4,840,853
4,840,854

CLASS 429

120 4,840,855
192 4,840,856
197 4,840,857
4,840,858
212 4,840,859

CLASS 430

59 4,840,860
4,840,861
75 4,840,862
110 4,840,863
4,840,864
114 4,840,865
138 4,840,866
155 4,840,868
156 4,840,867
191 4,840,869
201 4,840,870
203 4,840,871
273 4,840,872
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296 4,840,874
309 4,840,875
328 4,840,876
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557 4,840,884
558 4,840,886
559 4,840,885
564 4,840,887
567 4,840,888
597 4,840,889
622 4,840,890

CLASS 431

1 4,840,558

CLASS 432

3 4,840,559
59 4,840,560
106 4,840,561

CLASS 433

23 4,840,562
29 4,840,563
72 4,840,564
74 4,840,565
127 4,840,566

CLASS 434

114 4,840,567

CLASS 435

2 4,840,891
5 4,840,892
6 4,840,893
7 4,840,894
4,840,895
68 4,840,896
69 4,840,897

87 4,840,898
89 4,840,5[illegible]
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426 4,840,986
642 4,841,832

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91 4,840,901
96 4,840,900
161 4,840,902
165 4,840,903
4,840,904
240.25 4,840,905
240.49 4,840,906
253.3 4,840,907
296 4,840,908

CLASS 436

8 4,840,911
20 4,840,909
30 4,840,910
92 4,840,912
111 4,840,919
116 4,840,913
183 4,840,914
530 4,840,915

CLASS 437

3 4,840,916
10 4,840,917
53 4,840,918
69 4,840,920
89 4,840,921
129 4,840,922
189 4,840,923
4,840,924

CLASS 439

49 4,840,568
65 4,840,569
74 4,840,570
76 4,840,571
92 4,840,572
4,840,573
191 4,840,574
267 4,840,575
331 4,840,576
373 4,840,577
395 4,840,578
4,840,579
431 4,840,580
472 4,840,581
491 4,840,582
504 4,840,583
538 4,840,584
556 4,840,585
680 4,840,586
851 4,840,587
4,840,588

CLASS 440

78 4,840,136
89 4,840,589

CLASS 441

74 4,840,590
106 4,840,591
135 4,840,592

CLASS 445

7 4,840,594
26 4,840,593
28 4,840,595
30 4,840,596

CLASS 446

16 4,840,597
52 4,840,598
175 4,840,602
372 4,840,604
465 4,840,599

CLASS 464

111 4,840,600
157 4,840,601
176 4,840,604

CLASS 474

80 4,840,606
153 4,840,605
167 4,840,607
205 4,840,603

CLASS 493

28 4,840,609
194 4,840,610
213 4,840,611

CLASS 494

2 4,840,612

CLASS 501

1 4,840,923
134 4,840,924

CLASS 502

41 4,840,925
74 4,840,926
79 4,840,930
162 4,840,931
202 4,840,932

CLASS 503

201 4,840,928
213 4,840,933

CLASS 514

2 4,840,934
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235-364 O.G.-89-1

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1101 O.G. 56 on Apr. 25, 1989.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as a Preliminary Examining Authority for PCT applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The Search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar with regard to the German Mark as of Oct. 1, 1988, and was announced in the *Official Gazette* at 1094 O.G. 2 on Sept. 6, 1988.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar with regard to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 80 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority (ISA)	
—No corresponding prior U.S. national application filed:	550.00
—Corresponding prior U.S. national application filed:	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as Searching Authority	1160.00
Preliminary examination fee	
U.S. Patent and Trademark Office as Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as Searching Authority.	400.00
—Additional examination fee, per additional invention	130.00
—Searching Authority not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee:	436.00
Basic Supplemental fee (for each page over 30):	9.00
Designation fee per country or region for the first 10 national or regional offices:	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee:	134.00

U.S. National Stage fees

	Small Entity	Non-small Entity
U.S. Patent and Trademark Office was Preliminary Examining Authority (IPEA)	165.00	330.00
USPTO was ISA but no IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39.1	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 39.1	30.00	30.00

May 3, 1989.

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Status of Appeal Cases

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Assignment to Panel For A Decision Without A Hearing as of May 31, 1989

Chemical Discipline	-	August 4, 1988
Mechanical Discipline	-	October 2, 1987
Electrical Discipline	-	February 1 , 1988

The Date of Examiner's Answer of Oldest Ex Parte Appeals Awaiting Hearing as of May 31, 1989.

Chemical	-	April 2, 1987
Electrical	-	April 27, 1987
Mechanical	-	March 2, 1987

Board of Patent Appeals and Interferences Decisions Rendered in Ex Parte Appeals During the Month of May 1989.

Affirmed	239
Affirmed-in-Part	71
Reversed	165
Total Decided	475

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on June 24, 1986, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,596,053 through 4,597,107
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on June 22, 1982 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,335,471 through 4,336,616
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00"

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$.245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small entity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of threee years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 27 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED APRIL 9,1989
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,509,213	06/389945	04/09/85
4,509,217	06/481943	04/09/85
4,509,221	06/539821	04/09/85
4,509,223	06/519586	04/09/85
4,509,225	06/459342	04/09/85
4,509,229	06/585447	04/09/85
4,509,232	06/517897	04/09/85
4,509,241	06/597886	04/09/85
4,509,242	06/503242	04/09/85
4,509,243	06/346516	04/09/85
4,509,247	06/216159	04/09/85
4,509,252	06/395686	04/09/85
4,509,253	06/614067	04/09/85
4,509,256	06/469887	04/09/85
4,509,257	06/496425	04/09/85
4,509,263	06/515580	04/09/85
4,509,271	06/439279	04/09/85
4,509,273	06/365002	04/09/85
4,509,282	06/505907	04/09/85
4,509,285	06/384280	04/09/85
4,509,297	06/435249	04/09/85
4,509,298	06/400303	04/09/85
4,509,301	06/371342	04/09/85
4,509,304	06/495947	04/09/85
4,509,306	06/512341	04/09/85
4,509,308	06/479571	04/09/85
4,509,312	06/523427	04/09/85
4,509,316	06/637609	04/09/85
4,509,327	06/461586	04/09/85
4,509,328	06/339498	04/09/85
4,509,329	06/421972	04/09/85
4,509,337	06/567268	04/09/85
4,509,348	06/420118	04/09/85
4,509,349	06/448025	04/09/85
4,509,353	06/467603	04/09/85
4,509,354	06/403017	04/09/85
4,509,361	06/556276	04/09/85
4,509,364	06/638537	04/09/85
4,509,368	06/467481	04/09/85
4,509,376	06/423366	04/09/85
4,509,379	06/374082	04/09/85
4,509,380	06/333476	04/09/85
4,509,382	06/478660	04/09/85
4,509,383	06/446066	04/09/85
4,509,386	06/441498	04/09/85
4,509,393	06/472115	04/09/85
4,509,394	06/486734	04/09/85
4,509,399	06/470998	04/09/85
4,509,404	06/525427	04/09/85
4,509,410	06/465671	04/09/85

Patent Number	Serial Number	Issue Date		
			4,509,784	06/435425

Patent Number	Serial Number	Issue Date
4,509,411	06/451[illegible]52	04/09/85
4,509,419	06/552[illegible]18	04/09/85
4,509,420	06/539[illegible]62	04/09/85
4,509,427	06/474[illegible]62	04/09/85
4,509,429	06/408[illegible]46	04/09/85
4,509,431	06/510[illegible]02	04/09/85
4,509,436	06/537[illegible]51	04/06/85
4,509,439	06/537[illegible]98	04/09/85
4,509,442	06/494[illegible]78	04/09/85
4,509,446	06/451[illegible]23	04/09/85
4,509,450	06/436[illegible]99	04/09/85
4,509,453	06/445[illegible]34	04/09/85
4,509,460	06/539[illegible]48	04/09/85
4,509,461	06/523[illegible]60	04/09/85
4,509,462	06/611[illegible]34	04/09/85
4,509,463	06/564210	04/09/85
4,509,474	06/345831	04/09/85
4,509,476	06/540[illegible]05	04/09/85
4,509,479	06/569[illegible]57	04/09/85
4,509,488	06/397[illegible]45	04/09/85
4,509,490	06/399[illegible]60	04/09/85
4,509,498	06/349[illegible]55	04/09/85
4,509,502	06/441[illegible]53	04/09/85
4,509,503	06/483[illegible]18	04/09/85
4,509,510	06/439[illegible]49	04/09/85
4,509,512	06/482[illegible]22	04/09/85
4,509,525	06/422[illegible]74	04/09/85
4,509,527	06/483[illegible]38	04/09/85
4,509,535	06/385[illegible]11	04/09/85
4,509,536	06/312[illegible]44	04/09/85
4,509,545	06/598[illegible]38	04/09/85
4,509,549	06/433[illegible]47	04/09/85
4,509,551	06/453[illegible]14	04/09/85
4,509,559	06/477[illegible]63	04/09/85
4,509,571	06/391[illegible]21	04/09/85
4,509,572	06/506[illegible]96	04/09/85
4,509,573	06/545[illegible]70	04/09/85
4,509,574	06/559[illegible]15	04/09/85
4,509,576	06/544[illegible]69	04/09/85
4,509,577	06/549[illegible]61	04/09/85
4,509,578	06/348[illegible]27	04/09/85
4,509,579	06/622[illegible]76	04/09/85
4,509,582	06/546[illegible]66	04/09/85
4,509,585	06/569[illegible]03	04/09/85
4,509,597	06/606[illegible]36	04/09/85
4,509,612	06/425[illegible]94	04/09/85
4,509,618	06/353[illegible]91	04/09/85
4,509,630	06/386[illegible]17	04/09/85
4,509,631	06/444[illegible]30	04/09/85
4,509,633	06/525[illegible]97	04/09/85
4,509,642	06/603[illegible]23	04/09/85
4,509,646	06/424[illegible]10	04/09/85
4,509,650	06/493[illegible]23	04/09/85
4,509,652	06/464[illegible]95	04/09/85
4,509,653	06/602[illegible]35	04/09/85
4,509,654	06/632[illegible]51	04/09/85
4,509,659	06/415[illegible]90	04/09/85
4,509,660	06/475[illegible]20	04/09/85
4,509,668	06/436[illegible]85	04/09/85
4,509,692	06/501[illegible]86	04/09/85
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4,509,740	06/457[illegible]09	04/09/85
4,509,742	06/501[illegible]63	04/09/85
4,509,748	06/510[illegible]90	04/09/85
4,509,751	06/477[illegible]93	04/09/85
4,509,753	06/467[illegible]14	04/09/85
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4,509,771	06/342[illegible]89	04/09/85
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4,509,784	06/425485	04/09/85
4,509,788	06/449621	04/09/85
4,509,792	06/484265	04/09/85
4,509,797	06/514483	04/09/85
4,509,808	06/476749	04/09/85
4,509,809	06/478117	04/09/85
4,509,816	06/528001	04/09/85
4,509,828	06/342821	04/09/85
4,509,837	06/348375	04/09/85
4,509,853	06/446097	04/09/85
4,509,861	06/461547	04/09/85
4,509,862	06/527130	04/09/85
4,509,867	06/564747	04/09/85
4,509,868	06/386360	04/09/85
4,509,881	06/386691	04/09/85
4,509,882	06/537827	04/09/85
4,509,886	06/555016	04/09/85
4,509,890	06/310376	04/09/85
4,509,894	06/377869	04/09/85
4,509,898	06/505860	04/09/85
4,509,913	06/455490	04/09/85
4,509,914	06/447848	04/09/85
4,509,917	06/492386	04/09/85
4,509,922	06/610025	04/09/85
4,509,925	06/496926	04/09/85
4,509,934	06/404842	04/09/85
4,509,936	06/531497	04/09/85
4,509,961	06/505381	04/09/85
4,509,963	06/570753	04/09/85
4,509,964	06/568074	04/09/85
4,509,967	06/567716	04/09/85
4,509,968	06/424293	04/09/85
4,509,969	06/472361	04/09/85
4,509,970	06/331496	04/09/85
4,509,971	06/524698	04/09/85
4,509,972	06/479708	04/09/85
4,509,996	06/508293	04/09/85
4,509,999	06/579854	04/09/85
4,510,005	06/426026	04/09/85
4,510,007	06/511200	04/09/85
4,510,010	06/506609	04/09/85
4,510,015	06/506587	04/09/85
4,510,022	06/521375	04/09/85
4,510,026	06/552484	04/09/85
4,510,030	06/521753	04/09/85
4,510,041	06/639893	04/09/85
4,510,073	06/510243	04/09/85
4,510,080	06/535930	04/09/85
4,510,100	06/559149	04/09/85
4,510,104	06/539933	04/09/85
4,510,107	06/523196	04/09/85
4,510,122	06/511478	04/09/85
4,510,124	06/549895	04/09/85
4,510,130	06/496717	04/09/85
4,510,132	06/534617	04/09/85
4,510,137	06/303605	04/09/85
4,510,140	06/412818	04/09/85
4,510,141	06/417788	04/09/85
4,510,154	06/484502	04/09/85
4,510,188	06/472093	04/09/85
4,510,189	06/412821	04/09/85
4,510,204	06/468181	04/09/85
4,510,231	06/462229	04/09/85
4,510,232	06/580430	04/09/85
4,510,238	06/471556	04/09/85
4,510,304	06/429804	04/09/85
4,510,321	06/462295	04/09/85
4,510,340	06/496651	04/09/85
4,510,342	06/454338	04/09/85
4,510,347	06/447159	04/09/85
4,510,352	06/409648	04/09/85
4,510,353	06/462314	04/09/85
4,510,357	06/574136	04/09/85
4,510,358	06/562062	04/09/85
4,510,376	06/400893	04/09/85
4,510,379	06/549467	04/09/85
4,510,384	06/408282	04/09/85
4,510,401	06/479179	04/09/85

Patent Number	Serial Number	Issue Date
4,510,421	06/512414	04/09/85
4,510,423	06/402726	04/09/85
4,510,429	06/524837	04/09/85
4,510,432	06/464490	04/09/85
4,510,434	06/478343	04/09/85
4,510,436	06/399126	04/09/85
4,510,439	06/652153	04/09/85
4,510,451	06/410787	04/09/85
4,510,452	06/389770	04/09/85
4,510,468	06/429032	04/09/85
4,510,475	06/346880	04/09/85
4,510,502	06/473018	04/09/85
4,510,511	06/539609	04/09/85
4,510,525	06/361016	04/09/85
4,510,528	06/407674	04/09/85
4,510,532	06/482064	04/09/85
4,510,540	06/393784	04/09/85
4,510,542	06/452276	04/09/85
4,510,545	06/416942	04/09/85
4,510,547	06/440863	04/09/85
4,510,556	06/557347	04/09/85
4,510,559	06/521037	04/09/85
4,510,561	06/591271	04/09/85
4,510,579	06/394820	04/09/85
4,510,602	06/386798	04/09/85
4,510,605	06/477456	04/09/85
4,510,614	06/577686	04/09/85

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE
(35 U.S.C. 41(c); 37CFR 1.378)

The patent(s) listed below is considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the mauntenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,361,586	06/300653	11/30/82.	9/09/81	5/25/89
4,404,842	06/368538	9/20/83	4/15/82	5/30/89
4,425,423	06/419405	1/10/84	9/17/82	5/30/89
4,465,110	06/339084	8/14/84	1/13/82	5/30/89
4,470,404	06/504376	9/11/84	6/14/83	5/30/89
4,492,306	06/571334	1/08/85	1/16/84	5/30/89

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,469,239, Re. S. N. 331,247, Filed Feb. 27, 1989, Cl. 220/337, CONTAINER HAVING REMOVABLE CLOSURES, Daniel J. Gallery IV, et al., Owner of Record: *Inventor(s)*, Attorney or Agent: Joseph J. Kelly, Ex. Gp.: 241

4,490,626, Re. S. N. 336,017, Filed Apr. 10, 1989, Cl. 307/243, MUITIPLEXER CIRCUITRY FOR HIGH DENSITY ANALOG SIGNALS, Randolph S. Carlson, Owner of Record: *Irvine Sensor Corp., Dana Point, Calif.*, Attorney or Agent: Thomas J. Plante, Ex. Gp.: 254

4,620,138, Re. S. N. 265,211, Filed Oct. 28, 1989, Cl. 318/254, DRIVE ARRANGEMENT WITH COLLECTORLESS D. C. MOTOR, Rolf Muller, Owner of Record: *Papst-Motoren Gmbh & Co. KG., St. Georgen, Federal Republic of Germany*, Attorney or Agent: Theodore J. Koss, Jr., Ex. Gp.: 217

4,643,527, Re. S. N. 311,710, Filed Feb. 16, 1989, Cl. 350/333, PROCESS FOR THE PRODUCTION OF A SUBSTRATE FOR AN ELECTRICAL CONTROLLED DEVICE AND DISPLAY SCREEN PRODUCED FROM SUCH A SUBSTRATE, Jose Magarino, et al., Owner of Record: *Thomson-CSF Paris, France*, Attorney or Agent: Roland Plottel, Ex. Gp.: 254

4,667,711, Re. S. N. 349,862, Filed May 10, 1989, Cl. 141/198, TANK OVERFILL VALVE, Rodger A. Draft, Owner of Record: *Inventor*, Attorney or Agent: Terrence J. Linn, Ex. Gp.: 243

4,694,656, Re. S. N. 347,172, Filed May 3, 1989, Cl. 62/72, ROTARY RELEASE ICE MACHINE AND METHOD, Robert C. Lane, Owner of Record: *Inventor*, Attorney or Agent: Guy E. Matthews, Ex. Gp.: 344

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,826,728. Reexam. No. 90/001,773, Requested May 17, 1989, Cl. 204/192, TRANSPARENT ARTICLE HAVING REDUCED SOLAR RADIATION TRANSMITTANCE AND METHOD OF MAKING THE SAME, Douglas L. Chambers, et al., Owner of Record: *BOC Group PLC, The Windlesham, Surrey, England*, Attorney or Agent: David Draegert, Ex. Gp.: 110, Requester: PPG Industries, Pittsburg, Pa.

4,747,946, Reexam. No. 90/001,774, Requested May 22, 1989, Cl. 210/321.8, TUBULAR MEMBRANE ULTRAFILTRATION MODULE, Mario Ikeyama, et al.,Owner of Record: *Nitto Denko Corp., Tokyo, Japan*, Attorney or Agent: Sughrue, Mion, Zinn, et al., Ex. Gp.: 130, Requester: Owner

Reinstatement to Register

The following is a list of persons whose names have been previously removed fron the Register of Attorneys and Agents pursuant to the provisions of 37 CFR 10.11(b), are now being

reinstated in view of the required fee and information they have furnished the Office of Enrollment and Discipline.

May 31, 1989 Cameron Weiffenbach, Director
Office of Enrollment and Discipline

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Johnston, James Lamont, 811 Chattanooga Bank Bldg. Chattanooga, Tenn. 37402
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Delayed Issuance

"Patent No. RE 32,925 to Ho-Sou Chen, et al. of N.J. for 'NOVEL AMORPHOROUS METALS AND AMORPHOROUS METAL ARTICLES' appearing in the Official Gazette of May 16, 1989 issued on May 9, 1989"

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by

certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default

Spys International, Inc., Sausalito, Calif. Reg. No. 1,306,065, for the mark "SPYS", Canc. No. 17,257 and Canc. No. 17,688.

Mego Corp., New York, N.Y., Reg. No. 1,221,055, for the mark "BLASTER", Canc. No. 17,735.

Wurm Brothers Co., Chicago, Ill., Reg. No. 347,241, for the mark "APPEALING", Canc. No. 17,756.

Erma S. Brown
Administrator of the Trademark Trial and Appeal Board
For Jeffery M. Samuels
Assistant Commissioner for Trademarks

Status of PTO Services

The following is an update of the status of PTO services for May 1989:

Service Item	FY 1989 Goal (Calendar Days [1])	Monthly Average (Calendar Days [1])
Filing Receipts:		
Patents	22	22
Trademarks	30	18
Patent/Trademark Copies:		
Special Window Coupons	24 Hours	16 Hours
Window Coupons	5	1
Mail Coupons	12	3
Letter Orders	16	7
Certified Copies:		
Trademark Registrations	21	35
Applications-As-Filed	17	10*
File-Wrapper/Contents	N/A	13
Walk-up Certification	1	1
Trademark Search Library:		
Filing Pending Marks	21	24
Filing Reg. Certificates	Issue Date+2 days	+5 Days
Filing Temp. Drawings	6	6
Assignments:		
Recording Patent Assignments	20	70**
Receipt Date of Oldest Patent Documents Returned		Dec. 15, 1988**
Recording Trademark Assignments	20	59**
Receipt Date of Oldest Trademarks Documents Returned		Feb. 15, 1989**
Avg. Days from Issue Fee Payment to Issue Date	90-100	85
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	+ 11 days***
Patent Copies Available	95% on Issue Date	72% within 16 days after Issue Date***
Trademark Copies Available	95% on Issue Date	99% within 2 days after Issue Date

[1] Unless otherwise noted.
* The 5% of orders for which fiche are not on site are not included in calculations.
** See narrative.
*** Contractor difficulties in keeping up with the increase in the quantities of patents being issued. See narative.

SERVICE STATISTICS

•*Delays in Patent Products* — As a result of the increased production by the Examining Corps, far more patents are being printed in each issue than planned. Whereas issue sizes normally contain 1800 patents, they currently contain about 2200. This increase temporarily exceeded the capacity of the PTO's contractor who captures the data and creates the tapes for the printing process. In response to the increased workload, the contractor has opened a third plant, and has employed a sub-contractor as a fourth plant.

The Official Gazette is expected to be back on schedule in August, with patent copies being on schedule by November. In the meantime, beginning with the June 6 issue, a copy of the preliminary proof of the patent section of the Official Gazette, which contains the patent text will be made available in the Patent Search Room on issue date. Also, copies of the preliminary proofs of the patents in the issue, along with the associated drawings, will be made available in patent number order in the Patent Search Room on issue date.

• *Assignment Backlog Update* — During this reporting period, over 12,000 assignment documents were mailed. During the past 2 months, over 24,000 documents were mailed.

Assignment Branch Conveyance Examiners are now reviewing documents received during March 1989.

IMPROVEMENTS TO SERVICE

• *Introduction of Mail Metering for Copy Fulfillment* — Over the past several months we have been making a gradual change in our methods of mailing U.S. patent and trademark copy orders. Previously, the PTO sent small packages via first class United

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States Postal Service (USPS) and all other packages via fourth class USPS. While these methods saved the Office postage costs, many orders reached their destination slowly.

Late in the calendar year 1988 we began metering mail, starting with domestic copy fulfillment mail. Recently, we also began metering international copy fulfillment mail, and we are now metering all outgoing copy orders with the exception of Electronic Ordering Service specials, which are delivered by an overnight carrier.

With metered mail, domestic copy orders weighing up to 12 ounces, and all copy orders addressed to a USPS Post Office Box (regardless of weight) are sent first class via the USPS. All other domestic copy orders are sent via United Parcel Service (UPS). International mail is sent via USPS or UPS, whichever offers the lowest rate. With these methods of delivery, copy orders should arrive much more quickly than before.

HELPFUL HINTS

• *Use of "BOX ASSIGNMENTS"* — To ensure proper routing of patent and trademark assignments other than those filed with new patent applications, please place assignment documents in a separate envelope addressed "BOX ASSIGNMENTS" and use the words "BOX ASSIGNMENTS" on associated transmittal letters. BOX ASSIGNMENTS cannot be used for assignments filed with new patent applications because these assignments remain with the patent applications until bibliographic data is key entered and the filing receipts are mailed.

June 2, 1989

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration

PATENT NOTICES

Certificates of Correction for Week of June 27, 1989

PP 6,340	4,765,135	4,783,155	4,795,864
RE 32,839	4,765,607	4,783,231	4,796,093
D 299,371	4,765,716	4,783,284	4,796,350
4,544,714	4,766,007	4,783,329	4,796,498
4,641,064	4,766,394	4,783,461	4,796,502
4,668,194	4,767,279	4,783,556	4,796,670
4,668,212	4,768,882	4,784,269	4,796,884
4,695,541	4,769,742	4,784,761	4,797,064
4,697,196	4,770,508	4,785,288	4,797,076
4,702,929	4,770,510	4,786,279	4,797,223
4,705,952	4,771,097	4,787,895	4,797,401
4,709,212	4,771,227	4,787,987	4,798,227
4,716,178	4,771,842	4,788,108	4,798,394
4,718,338	4,772,339	4,788,219	4,799,303
4,720,372	4,772,625	4,788,817	4,799,910
4,731,064	4,772,646	4,789,056	4,799,962
4,733,271	4,773,738	4,789,439	4,800,179
4,733,857	4,774,372	4,790,085	4,800,743
4,738,452	4,774,997	4,790,652	4,800,867
4,744,890	4,775,356	4,791,103	4,800,902
4,750,141	4,775,531	4,791,226	4,800,946
4,751,865	4,775,640	4,791,418	4,801,024
4,751,949	4,776,168	4,791,648	4,801,362
4,752,180	4,776,418	4,791,672	4,801,403
4,752,199	4,776,893	4,791,825	4,801,672
4,752,541	4,777,037	4,792,121	4,801,727
4,752,555	4,777,994	4,792,622	4,801,740
4,752,876	4,778,786	4,792,744	4,802,218
4,754,090	4,779,531	4,792,854	4,802,546
4,755,211	4,780,474	4,793,351	4,802,834
4,755,966	4,780,711	4,794,729	4,803,655
4,757,131	4,782,042	4,794,966	4,806,720
4,758,086	4,782,171	4,795,413	4,809,316
4,759,188	4,782,399	4,795,516	4,812,653
4,762,007	4,783,065	4,795,805	

Disclaimer

4,132,091.—*Ernesto M. Aro* Wilmington; *Donald J. Shanklin*, Fullerton, both of Calif. SELF LOCKING FUEL CAP. Patent dated Jan. 2, 1979. Disclaimer filed Mar. 29, 1989, by the assignee, Mr. Gasket Co.

Hereby enters this disclaimer to the entire term of said patent.

4,467,403.—*Richard L. May*, Manhattan Beach, Calif. TWIN BEAM PORTABLE LIGHT ASSEMBLY. Patent dated Aug. 21, 1984. Disclaimer filed Mar. 29, 1989, by the assignee, Mr. Gasket Co.

Hereby enters this disclaimer for the entire term of said patent.

4,489,892.—*Loren E. Tyler*, Benson, Minn. APPARATUS FOR DISTRIBUTING A SUBSTANCE. Patent dated Dec. 25, 1984. Disclaimer filed May 1, 1989, by the assignee, Lor-Al, Inc.

The term of this patent subsequent to July 31, 2001, has been disclaimed.

4,748,845.—*Art Rocco*, Spokane, Wash.; *David R. Ripley*, Flower Mound, Tex. TIRE PRESSURE GAUGE. Patent dated June 7, 1988. Disclaimer filed Mar. 20, 1989, by the assignee, Neotech Industries, Inc.

The term of this patent subsequent to Nov. 10, 2004, has been disclaimed.

4,755,329.—*Hector F. DeLuca; Heinrich K. Schnoes*, both of Madison, Wisc.; *Seok H. Lee*, Brighton, Mass. PROCESS AND INTERMEDIATES FOR PREPARING 1a-HYDROXYVITAMIN D COMPOUNDS. Patent dated July 5, 1988. Disclaimer filed Feb. 21, 1989, by the assignee, Wisconsin Alumni Research Foundation.

Hereby enters this disclaimer to claims 2 and 3 of said patent.

Disclaimer and Dedication

4,688,480.—*Kelly P. Ryan*, Blair, Nebr. AGRICULTURAL FEED BAGGER. Patent dated Aug. 25, 1987. Disclaimer and Dedication filed Apr. 24, 1989, by the assignee, Kelly Ryan Equipment Co.

Hereby disclaims and dedicates to the Public claim 1 of said patent.

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	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
JAMES E. DENNY, Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF May 20, 1989

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-26-87
ORGANIC CHEMISTRY GROUP 120—S. N. ZAHARNA, Director.	6-16-87
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-15-87
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-14-87
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	3-31-86
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	5-4-87
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	7-31-86
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SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	11-12-87
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-1-88

Expiration of patents: The patents within the range of numbers indicated below expire during May 1989, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,659,294 to 3,667,068, inclusive
Plant Patents ..... 3,143 to 3,204 inclusive

REEXAMINATIONS

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REEXAMINATIONS

JUNE 27, 1989

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 29,635 (1082nd)

ROW FOLDING SEATING STRUCTURE

Robert G. McClelland, Grand Rapids, Mich., and David W. Raymond, Champaign, Ill., assignors to Interkal, Inc., Kalamazoo, Mich.

Reexamination Request No. 90/001,447, Feb. 19, 1988.

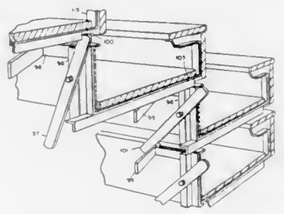
Reexamination Certificate for Reissue Patent Re. 29,635, issued May 23, 1978, Ser. No. 622,144, Oct. 14, 1975.

Original No. 3,667,171, dated Jun. 6, 1972, Ser. No. 104,917, Jan. 8, 1971.

The portion of the term of this patent subsequent to Jun. 8, 1988, has been disclaimed.

Int. Cl.[4] E04H *3/12*

U.S. Cl. 52—9



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The Patentability of claims **4**, **5**, **7**, **9**, **14** and **15** is confirmed.

Claims **1–3**, **6**, **8**, **10–13**, **16**, **17** and **18** are cancelled.

[**1**. A seating structure comprising a plurality of telescoping rows each having a bleacher seat portion at the forward end thereof and arranged for movement between extended and retracted positions, each row further including two wheel-equipped carriage members, a vertical column mounted on each carriage member and provided with a cantilever arm adapted to be supported on the top of the next adjacent row toward the front of the seating structure when the structure is in extended position, a rear riser member comprising a metal beam, said beam connecting the upper portion of the columns, forwardly-extending support arms anchored upon said rear riser and structurally supported over the rear riser member of said next adjacent row when the seating structure is in extended position, and a platform on said support arm; said metal beam having means for continuously supporting the rear edge of said platform, said riser providing sufficient structural support to permit the seat portion of a row to be removed to provide an aisle at the footrest level.]

B2 4,104,822 (1084th)

ROTATING CIRCULAR AIRFOIL

Henry W. Rodgers, 9725 W. 21st Ave., Lakewood, Colo. 80215

Reexamination Request No. 90/001,118, Oct. 23, 1986.

Reexamination Certificate for Patent No. 4,104,822, issued Aug. 8, 1978, Ser. No. 747,310, Dec. 3, 1976.

Reexamination Certificate B1 4,104,822, issued Oct. 14, 1986.

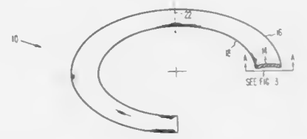
Int. Cl.[4] A63H *27/00*

U.S. Cl. 446—48

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **2**, **4**, **6–11** and **14–24** is confirmed.

Claims **1**, **3**, **5**, **12** and **13** were previously cancelled.



2. A rotating aerial device as claimed in claim **1**, wherein:

a. said bottom camber surface has a positive camber in the same direction as said upper camber surface; and

b. a maximum height of said bottom camber surface remains below said chord line.

B1 4,145,095 (1083rd)

HUB WITH FREE WHEEL FOR A BICYCLE

Takashi Segawa, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Reexamination Request No. 90/000,957, Feb. 14, 1986.

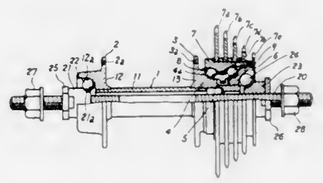
Reexamination Certificate for Patent No. 4,145,095, issued Mar. 20, 1979, Ser. No. 888,635, Mar. 21, 1978.

Continuation of Ser. No. 702,207, Jul. 2, 1976, abandoned.

Claims priority, application Japan, Jul. 10, 1975, 50-84991; Jun. 14, 1976, 51-70045

Int. Cl.[4] F16C *33/00*

U.S. Cl. 384—545



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–4** are cancelled.

[**1**. A unit hub for a bicycle, said hub comprising:

a hub shaft;

a hub body rotatably supported by said hub shaft, said hub body comprising a tube of a given length and two separate end members;

one of said two end members defining a bearing cone at one axial end of said hub body, said bearing cone comprising an extension having an intermediate portion and an end portion extending from a root portion thereof and terminating in said end, said bearing cone further comprising:

a ball race at the root portion of the extension thereof,

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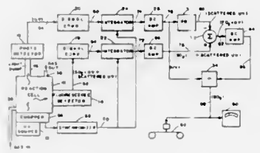
a threaded portion on the outer periphery of the end of the extension thereof, and
pawls on the intermediate portion of the extension intermediate the root portion and the end thereof;
a bearing ring screwed onto the threaded portion of the end of the bearing cone, said bearing ring having a ball race on the outer periphery of one axial end thereof;
a drive member sleeved onto the outer periphery of the bearing cone and bearing ring and being unidirectionally rotatably supported with respect thereto, said drive member having:
at least one sprocket wheel on the outer periphery thereof,
ratchet teeth on the inner periphery thereof, in mesh with said pawls, and
ball races at each axial end of the ratchet teeth with balls; and
a ball holder with balls screwed onto each end of said hub shaft,
said drive member being supported through balls positioned between said ball races thereon and said ball races on said bearing cone and on said bearing ring so that said hub body carrying said drive member therewith is rotatably supported with respect to said hub shaft by said ball holders screwed thereto and said balls, both of said ball races and balls supporting said drive member being disposed axially inwardly of said ball holders and balls screwed onto said hub shaft.]

B1 4,260,890 (1085th)
FLUORESCENT GAS ANALYZER
Steven A. Wright, San Diego, and Donald A. Watts, Ramona, both of Calif., assignors to Monitor Labs, Incorporated, San Diego, Calif.
Reexamination Request No. 90/001,384, Nov. 30, 1987.
Reexamination Certificate for Patent No. 4,260,890, issued Apr. 7, 1981, Ser. No. 51,498, Jun. 25, 1979.
Int. Cl.[4] G01J *1/42*; G01N *21/64*
U.S. Cl. 250—373

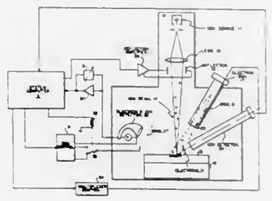


AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–8** are cancelled.

[
1. A fluorescent gas analyzer, comprising;
a reaction cell having inlet and outlet ports for enabling gas flow through the cell;
an excitation energy source coupled to the reaction cell for radiating the interior of the cell with excitation energy that causes a given gas to fluoresce in a given wavelength;
a first detector coupled to the reaction cell for detecting fluorescence in the given wavelength and for providing a first signal that is proportional to the intensity of said detected fluorescence and the intensity of detected scattered excitation energy radiated from the excitation energy source;
a second detector coupled to the reaction cell for detecting excitation energy radiated from the excitation energy source, and for providing a second signal that is proportional to said detected excitation energy;
a first circuit coupled to the first detector for responding to the first signal to provide a third signal having a level bearing a given proportional relationship to the sum of the quantity of said fluorescence detected by the first detector over a predetermined interval and the quantity of said scattered excitation energy detected by the first detector over said predetermined interval;
a second circuit coupled to the second detector for responding to the second signal to provide a fourth signal having a level bearing said given proportional relationship to the quantity of said excitation energy detected by the second detector over said predetermined interval;
a third circuit coupled to the second circuit for factoring the fourth signal to provide a fifth signal having a level bearing said given proportional relationship to the quantity of said scattered excitation energy detected by the first detector over said predetermined interval;
a fourth circuit coupled to the first and third circuits for providing a sixth signal having a level bearing said given proportional relationship to the difference between the levels of the third and fifth signals, to thereby provide a signal having a level bearing said given proportional relationship to the quantity of said fluorescence detected by the first detector over said predetermined interval; and
a fifth circuit for dividing the sixth signal by the fourth signal to provide a seventh signal having a level that is proportional to the concentration of said gas that fluoresces within the reaction cell in response to said excitation energy over said predetermined interval.]

B1 4,639,301 (1086th)
FOCUSED ION BEAM PROCESSING
John A. Doherty, Sudbury; Billy W. Ward, Rockport, and David C. Shaver, Carlisle, all of Mass., assignors to Micrion Limited Partnership, Beverly, Mass.
Reexamination Request No. 90/001,320, Aug. 31, 1987.
Reexamination Certificate for Patent No. 4,639,301, issued Jan. 27, 1987, Ser. No. 726,713, Apr. 24, 1985.
Int. Cl.[4] G01N *23/00*
U.S. Cl. 250—251



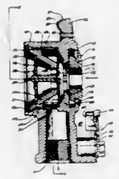
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **9** and **14** are determined to be patentable as amended.

Claims **2–8**, **10–13** and **15**, dependent on an amended claim, are determined to be patentable.

1. Focused ion beam processing apparatus comprising,
a source of a finely focused ion beam of submicron shape for impingement upon a substrate surface in a predetermined surface plane,
a source of an electron beam,
and means for directing said electron beam toward said surface plane in a region *of area significantly less than that of said substrate surface* embracing the target point in said surface plane intersected by said ion beam for neutralizing the surface charge in said surface plane otherwise produced thereat by said ion beam to reduce defocusing and undesired deflection of said ion beam in said surface plane to allow precise positioning of said ion beam on said target point and maintenance of said submicron shape of said ion beam on said target point.

B1 4,733,919 (1087th)
INTEGRATED PRESSURE EXHAUST VALVE AND FLUID COUPLING
John D. Jacobs, Brea, and Karl Dabritz, Bellflower, both of Calif., assignors to HWP Group, Inc., Montebello, Calif.
Reexamination Request No. 90/001,620, Oct. 14, 1988.
Reexamination Certificate for Patent No. 4,733,919, issued Mar. 29, 1988, Ser. No. 24,339, Mar. 10, 1987.
Int. Cl.[4] B60T *8/00*; F16K *1/00*
U.S. Cl. 303—28



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–12** is confirmed.

1. An integrated pressure exhaust valve and pneumatic coupling moiety comprising:
a hollow body having a pneumatic pressure inlet port on one face of the body, an exhaust opening on the opposite face of the body, and a pneumatic pressure outlet port at an end of the body;
an elastomeric seal having an approximately flat annular face around the inlet port;
a wing at one end of the body having an arcuate locking surface substantially concentric with the inlet port;
a pocket at the opposite end of the body from the wing, having an arcuate locking surface substantially concentric with the inlet port and complementary with the locking surface on the wing so that a second coupling moiety having an identical seal, wing and pocket can be assembled in locking and sealing engagement with the integrated valve and coupling moiety by placing the seals in face to face engagement and twisting one moiety relative to the other moiety for engaging the respective wings and pockets;
a membrane dividing the interior of the body between the inlet port and the outlet port, and including a plurality of apertures through the membrane for permitting air flow therethrough;
a generally circular plug sealed in the exhaust opening and having a plurality of apertures between the interior and exterior of the plug for exhausting pneumatic pressure from within the body, a face of the plug being spaced apart from the membrane; and
a circular, elastomeric, diaphragm in the body between the membrane and plug, the diaphragm having a sufficiently large diameter for alternatively blocking the apertures through the plug or the apertures through the membrane.

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REISSUES

JUNE 27, 1989

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,962

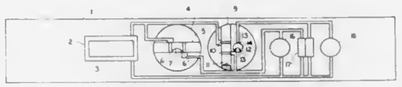
LEVEL WITH ELECTRONIC SIGNALS

Arthur L. Tudek, 507 Indiana Ave., Glassport, Pa. 15045

Original No. 4,720,920, dated Jan. 26, 1988, Ser. No. 343,486, Jan. 28, 1982. Application for reissue Apr. 4, 1988, Ser. No. 177,581

Int. Cl.[4] G01C *9/06*

U.S. Cl. 33—366 2 Claims



1. A level for gauging predetermined horizontal and vertical planes, comprising three mercury type switches disposed at right angles to each other, two of said switches when simultaneously operated indicating said predetermined vertical plane and two other of them when simultaneously operated, indicating said predetermined horizontal plane, two of said mercury type switches being arranged closely together in cruciform relationship and the other extending along the longitudinal axis of the level and wherein the second switch of each of said two cannot be actuated until the first switch is bridged and actuates a signal.

Re. 32,963

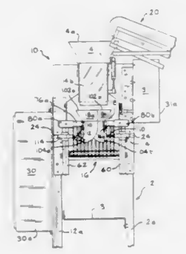
PACKAGING APPARATUS AND METHOD

Bernard Lerner, Peninsula, and Dana Liebhart, Cuyahoga Falls, both of Ohio, assignors to Automated Packaging Systems, Inc., Twinsburgh, Ohio

Original No. 4,651,506, dated Mar. 24, 1987, Ser. No. 834,132, Feb. 24, 1986. Continuation of Ser. No. 688,696, Jan. 4, 1985, abandoned. Application for reissue Nov. 27, 1987, Ser. No. 125,866

Int. Cl.[4] B65B *43/26*

U.S. Cl. 53—459 33 Claims



22. In a packaging machine:

(a) structure establishing a path of travel for a web of interconnected bag-like containers;

(b) means for advancing said web along said path to successively position each of said containers at a loading station;

(c) means for expanding a container positioned at said loading station;

(d) product guide means cooperable with said expanded container and operative to guide a product into said container;

(e) gripper means operative to restrict movement in said container; and,

(f) container separating means for severing said container from said web, comprising means for reversing movement in said web while said container is held by said gripper means said separating means operative to retract the web to cause separation along a line of weakness connecting said container to the web.

Re. 32,964

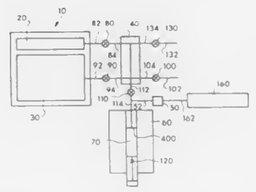
SYSTEM FOR MEASURING THE PORE VOLUME AND PERMEABILITY OF VERY TIGHT CORE PLUGS AND METHOD THEREFOR

Stanley C. Jones, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Original No. 4,627,270, dated Dec. 9, 1986, Ser. No. 816,608, Jan. 6, 1986. Application for reissue Sep. 25, 1987, Ser. No. 101,239

Int. Cl.[4] G01N *15/08*

U.S. Cl. 73—38 7 Claims



1. A method for determining the pore volume of *a* very tight core [samples] *sample* with an apparatus having a manifold in selective fluid communication with a sample holder holding said core sample, said sample holder having an outlet, said method comprising the steps of:

(a) sealing the outlet of the sample holder *while maintaining the sample holder in fluid communication with the manifold,*

(b) pressurizing the manifold [volume] and the sample holder with a gas to a predetermined pressure, P_{FILL},

(c) sealing the [core] *sample* holder and *a* pressure transducer from the manifold *while maintaining the pressure transducer in fluid communication with the sample holder,*

(d) waiting for the gas pressure in the [core] *sample* holder to reach a first equilibrium [state] *pressure*, P_{E1},

(e) measuring the value of *said* pressure P_{E1} *with the pressure transducer at a location between the manifold and the sample holder,*

(f) venting the manifold to *the* atmosphere so that the manifold [pressure obtains zero psig] *is at atmospheric pressure,*

(g) sealing the manifold in response to said venting so that the sealed manifold [contains zero psig] *remains at atmospheric pressure,*

(h) delivering the pressurized gas at said first equilibrium pressure, P_{E1}, from the sample holder into the manifold *such that the sample holder, manifold and pressure transducer are in fluid communication wiht one another,*

(i) waiting for the delivered pressurized gas to reach a second equilibrium [state] *pressure*, P_{E2},

(j) measuring the value of said *said* pressure [PE2] PE_2 with the pressure transducer at the aforesaid location, and

(k) determining the pore volume, [Vp] V_p, of the core [plug] *sample* in the sample holder based upon the measured values of *said first and second equilibrium* pressures, P_{E1} and P_{E2}.

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Re. 32,965
FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

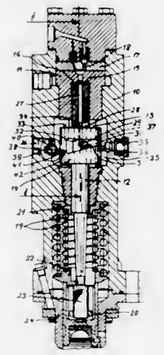
Walter Schmid, Munich, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Original No. 4,587,940, dated May 13, 1986, Ser. No. 730,617, May 6, 1985. Application for reissue Jul. 22, 1987, Ser. No. 76,464

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1984, 3428176

Int. Cl.[4] F02M *59, 20*

U.S. Cl. 123—503 **11 Claims**



1. A fuel injection pump provided with a housing for internal combustion engines comprising at least one pump piston defining a pump work chamber, a control slide having at least one oblique control edge axially displaceable on said pump piston, said control slide adapted to control two control bores arranged to discharge in an axially spaced manner on a jacket face of said pump piston and further adapted to communicate via a conduit with said pump work chamber, said bores adapted to control supply onset and end of supply, at least one window-like recess in said control slide, said recess having a lower oblique control edge and an upper control edge which limit said recess, whereby at bottom dead center (UT) of said pump piston one of said bores is uncovered by said recess and [said other bore] for said supply onset is covered by said upper control edge and further that said end of supply is effected by means of the uncovering of said other bore by means of said lower oblique control edge.

Re. 32,966
TOTE BOX

Daniel R. Miller, and Albert J. McGlasson, both of Cincinnati, Ohio, assignors to Buckhorn Material Handling Group, Inc., Milford, Ohio

Original No. 4,572,368, dated Feb. 25, 1986, Ser. No. 756,316, Jul. 18, 1985. Application for reissue Sep. 22, 1987, Ser. No. 99,910

Int. Cl.[4] B65D *73/02, 6/34*

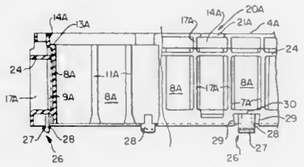
U.S. Cl. 206—328 **20 Claims**

1. A modular box system, comprising:

a base box constructed in one piece of molded synthetic resin, having a bottom, opposed sides sloping upwardly and outwardly from said bottom, opposed ends sloping upwardly and outwardly from said bottom, and said ends respectively connected at side edges to corresponding side edges of said sides to form an open top box [that may be nested within like open topped boxes];

a molded synthetic resin ring, separate from said base box, having opposed side walls and opposed end walls connected at their side edges to corresponding side edges of said side walls to be of a size and shape so that when placed in alignment on top of said base box, the ring side walls and end walls will form substantially coplanar extensions of the corresponding base box sides and ends;

interlocking elements respectively on the lower edge of said ring and the upper edge of said base box for interconnecting said ring and base box securely; and



said interlocking elements on one of said base box and ring, comprising opposed pairs of hooks spaced apart from each other in a direction perpendicular to their wall a distance sufficient to receive therebetween the interlocking elements of the other of said base box and ring.

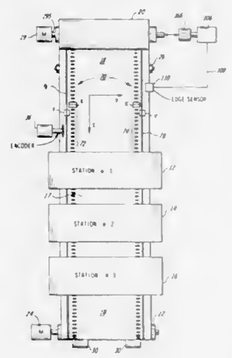
Re. 32,967
WEB TRACKING SYSTEM

Robert P. St. John, Cupertino, and William A. Lloyd, Los Altos, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Original No. 4,485,982, dated Dec. 4, 1984, Ser. No. 444,143, Nov. 24, 1982. Application for reissue Nov. 25, 1986, Ser. No. 934,586

Int. Cl.[4] B65H *25/26*

U.S. Cl. 242—57.1 **77 Claims**



37. Web tracking system for a continuous web of material which is transported from a supply roll means to a takeup roll means along a predetermined path via one or more sequentially positioned processing stations to treat regional portions of said web and wherein a desired positional relationship is to be maintained between said web and one or more of said processing stations and comprising

aligned tracking indicia continuous or closely spaced, intermittently continuous longitudinally along at least two regions of said web adjacent to said treated regional portions,

means mounted relative to the passage of said web to continuously observe said tracking indicia as said web is trasnported along said path and simultaneously produce on-the-fly informational signals based upon the passage of said tracking indicia relative to said observations means as said treated regional portions move into and through one or more of said processing stations,

means for utilizing said signals to correct on-the-fly for misalignment in the positional relationship of said web relative to at least one of said processing stations due to shrinkage or expansion changes in said web in either the lateral or longitudinal dimensions of said web or in both dimensions thereof.

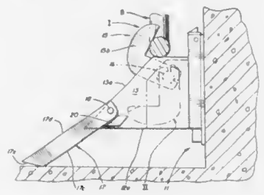
Re. 32,968
VEHICLE RESTRAINT

Norbert Hahn, South Milwaukee, Wis., assignor to Abon Corporation, Naples, Fla.

Original No. 4,560,315, dated Dec. 24, 1985, Ser. No. 629,685, Jul. 11, 1984. Application for reissue Dec. 10, 1987, Ser. No. 131,395

Int. Cl.[4] B65G *69/22*

U.S. Cl. 414—401 **24 Claims**



10. In a vehicle restraint for securing a vehicle parked on a roadway to an adjacent wall of a loading dock wherein the restraint has a carriage member mounted for vertical movement on the dock wall and biased to assume a predetermined elevated rest position relative to the roadway, the carriage member being movable vertically downwardly from the rest position upon an external force of a predetermined magnitude being exerted on an exposed cam surface of the carriage member, and an attaching means mounted on the carriage member for movement relative thereto between a vehicle locking mode and a vehicle release mode;, the improvement comprising toe means adjustably mounted on said carriage member and normally assuming a pendent relative position extending below the carriage member whereby an exposed portion thereof forms an extension of the carriage member cam surface, said toe means being movable relative to said carriage member from the normal pendent position upon the carriage member being moved vertically downward below a predetermined spaced position relative to the roadway.

Re. 32,969
INJECTIONABLE VISOELASTIC OPHTHALMIC GEL

Seymour F. Trager, 14 Sherwood Dr., Plainview, N.Y. 11803, and Victoria S. Chylinski, 11 Peghouse Rise, Slad Road, Stroud, Glos., England

Original No. 4,540,568, dated Sep. 10, 1985, Ser. No. 625,249, Jun. 27, 1984. Continuation-in-part of Ser. No. 434,412, Oct. 14, 1982, abandoned. Application for reissue Aug. 24, 1987, Ser. No. 116,579

Int. Cl.[4] A61K *31/78*

U.S. Cl. 424—81 **17 Claims**

1. An injectionable viscoelastic gel particularly adapted for use in ophthalmic surgical procedures and treatments [which], *said* gel consisting essentially of from about 2 to about 5 percent by weight of a polymer selected from polyacrylamide and polymethacrylamide, said polymer having a molecular weight of from about 1 to about 6 million[;], from about 0.4 to about 8.6 percent by weight sodium chloride, from about 0.075 to about 0.3 percent by weight [postassium] *potassium* chloride, from about 0.04 to about 0.33 percent by weight calcium chloride, from about 0.02 to about 0.04 percent by weight magnesium chloride hexahydrate, from about 0.3 to about 0.4 percent by weight sodium acetate, from about 0.15 to about 0.20 percent by weight of a buffer, remainder water.

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PLANT PATENTS

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Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

6,875

MINIATURE ROSE NAMED DEVROSADO

Stanley G. Marciel, Freedom, Calif., assignor to DeVor Nurseries, Inc., Freedom, Calif.

Filed Mar. 28, 1988, Ser. No. 174,522
Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—9 **1 Claim**

1. The new and distinct variety of miniature rose plant and parts thereof substantially as herein shown and described, characterized by the profuse and continuous production of small pink flowers borne on the sturdy, upright stems of a free-branching plant having abundant foliage and an average height of about 160 mm.

6,876

ROSE PLANT NAMED SAVACLOUD

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Mar. 29, 1988, Ser. No. 174,972
Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by very attractive near white flowers with a pink cast and which are long lasting on the plant and after cutting and are borne on a vigorous disease resistant plant.

6,877

SYRINGA VULGARIS CV MONORE

Ralph S. Moore, Visalia, Calif., assignor to Monrovia Nursery Company, Azusa, Calif.

Filed Nov. 25, 1987, Ser. No. 126,111
Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—66 **1 Claim**

1. A new and distinct selection of *Syringa vulgaris* as substantially shown and described herein, that is characterized particularly as a novelty by the unique combination of profuse blooming at an early age, flowering well in hot areas with little winter chilling required, or flowering well in the colder typical lilac growing areas and the two toned coloring of the purple buds that open to deep purple blue flowers.

6,878

KALANCHOE PLANT NAMED FANTASY

Hermann Finger, Wiesmoor, Fed. Rep. of Germany, assignor to Wiesmoor-Gartnerie und Baumschule GmbH, Wiesmoor, Fed. Rep. of Germany

Filed Mar. 1, 1988, Ser. No. 162,610
Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinct cultivar of Kalanchoe plant named Fantasy, as illustrated and described, and parts thereof.

6,879

CHRYSANTHEMUM PLANT NAMED GOLDEN MAXIMO

Dieter Sueptitz, Hamburg, Fed. Rep. of Germany, assignor to Ball Seed Company, Chicago, Ill.

Filed Mar. 18, 1988, Ser. No. 170,453
Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named Golden Maximo, as illustrated and described, and parts thereof.

6,880

CHRYSANTHEMUM PLANT NAMED YELLOW KARDO

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Mar. 25, 1988, Ser. No. 173,081
Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct Chrysanthemum plant named Yellow Kardo, as described and illustrated, and parts thereof.

6,881

CHRYSANTHEMUM PLANT NAMED FINA

Cornelius P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Mar. 25, 1988, Ser. No. 173,082
Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct Chrysanthemum plant named Fina, as described and illustrated, and parts thereof.

6,882

CHRYSANTHEMUM PLANT NAMED OREO

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Mar. 25, 1988, Ser. No. 173,083
Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct Chrysanthemum plant named Oreo, as described and illustrated, and parts thereof.

6,883

CHRYSANTHEMUM PLANT NAMED FASTO

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Mar. 25, 1988, Ser. No. 173,085
Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct Chrysanthemum plant named Fasto, as described and illustrated, and parts thereof.

6,884

CHRYSANTHEMUM PLANT-DAY NEUTRAL

Neil O. Anderson; Peter D. Ascher, and Richard E. Widmer, all of St. Paul, Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed May 23, 1988, Ser. No. 197,801
Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—77 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium*, Ramat., as shown and described, and particularly characterized as to novelty by the combined characteristics of day neutrality, a semidouble decorative flower type, short plant height, and insensitivity to thermophotoperiodic delay in flower bud initiation and development.

6,885

CHRYSANTHEMUM PLANT NAMED FLEX

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Barberton, Ohio

Filed Mar. 18, 1988, Ser. No. 170,452
Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct Chrysanthemum plant named Flex, as described and illustrated, and parts thereof.

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6,886
CHRYSANTHEMUM PLANT NAMED MODA
Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio
Filed Mar. 25, 1988, Ser. No. 173,086
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—78 1 Claim

I. A new and distinct Chrysanthemum plant named Moda, as described and illustrated, and parts thereof.

6,887
CHRYSANTHEMUM PLANT NAMED HADA
Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio
Filed Mar. 25, 1988, Ser. No. 173,084
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—80 1 Claim

I. A new and distinct Chrysanthemum plant named Hada, as described and illustrated, and parts thereof.

6,888
CHRYSANTHEMUM PLANT NAMED BRAVO
Grace H. Mack, 108 Wahackme Rd., New Canaan, Conn. 06840, and Cornelis P. VandenBerg, Salinas, Calif., assignors to Grace H. Mack, New Canaan, Conn.
Filed Sep. 16, 1987, Ser. No. 97,584
Int. Cl.[4] A01H 5/04
U.S. Cl. Plt.—82 1 Claim

I. A new and distinct Chrysanthemum plant named Bravo, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; red ray floret color; diameter across face of capitulum of up to 4.5 cm at maturity; short plant height with spreading and prolific branching pattern; average natural season flower date of August 23 in Salinas, Calif. and September 25 in Hightstown, N.J.; uniform seven week photoperiodic flowering response to short days in photoperiodic controlled flowering programs; and durable, uniform performance in outside fall flowerings and in spring small pot flowering programs.

6,889
CHRYSANTHEMUM PLANT NAMED PIRANGA
William E. Duffett, Salinas, Calif., assignor to Yoder Brothers Inc., Barberton, Ohio
Filed May 5, 1988, Ser. No. 190,405
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—82 1 Claim

I. A new and distinct Chrysanthemum plant named Piranga, as described and illustrated, and parts thereof.

6,890
POINTSETTIA PLANT NAMED H-524
Alexander Hrebenluk, R.D. #1, Box 118, Sugar Run, Pa. 18846
Filed Feb. 24, 1988, Ser. No. 159,955
Int. Cl.[4] A01H 5/00
U.S. Cl. Plt.—86 1 Claim

I. A new and distinct cultivar of Poinsettia plant named H-524, as described and illustrated, and parts thereof.

PATENTS

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ERRATA

For CLASS	See PATENT NO.
040-491	4,841,674
109-020	4,841,752
082-001	4,841,820
081-057	4,841,832
102-202	4,841,856
206-309	4,842,032
250-342	4,842,247
128-025	4,842,265
350-320	4,842,405
350-336	4,842,406
350-344	4,842,407
350-349	4,842,408
266-149	4,842,643
514-191	4,842,734
264-522	4,842,742
428-064	4,842,824
364-505	4,843,084
521-178	4,843,123
313-025	4,843,266
332-007	4,843,335
340-521	4,843,336
340-906	4,843,337
346-140	4,843,338
250-326	4,843,422
373-072	4,843,614

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PATENTS

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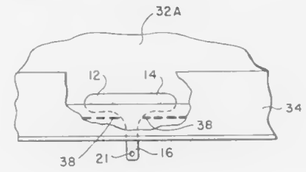
GENERAL AND MECHANICAL

4,841,576
DEVICE FOR ATTACHING A RETAINING STRING TO HEADWEAR
Jerry D. Beagley, Calera, Okla., assignor to Jerry Beagley Braiding Co., Inc., Calera, Okla.
Filed Mar. 14, 1988, Ser. No. 167,403
Int. Cl.[4] A42B *7/00*
U.S. Cl. 2—189 20 Claims

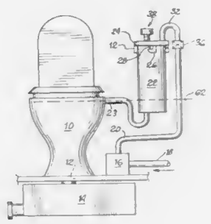


1. A device for attaching a retaining string or the like to headwear having a crown portion for receiving the user's head, a flexible band around the inside of the crown portion for contacting the user's head and a brim portion surrounding the crown portion, said band being attached to the crown portion by a plurality of stitches spaced at predetermined intervals around the inside of the crown portion, said device being comprised of first means for engaging the band to secure the device relative to the crown portion and second means connected to the first means for being coupled to said retaining string or the like to attach said retaining string or the like to the crown portion of said headwear, said second means for being inserted between adjacent ones of said stitches so that a portion of said second means which is distally disposed relative to said first means extends below said band.

4,841,577
GLOVE OF CHAIN ARMOUR STRUCTURE
Pehr Lars-Jos, Box 6, S-78 200 Malung, Sweden
Division of Ser. No. 124,907, Nov. 24, 1987, Pat. No. 4,802,242, which is a continuation of Ser. No. 21,592, Mar. 2, 1987, abandoned, which is a continuation-in-part of Ser. No. 780,653, Sep. 26, 1985, abandoned. This applicatioo May 6, 1988, Ser. No. 190,772
Claims priority, application Norway, Sep. 28, 1984, 843936
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—161 R 8 Claims

1. In a garment comprising at least two pieces of chain armour at least for two, bending parts of a body, one body part having skin which stretches when the one body part is bent and the other body part having skin which is subjected to compression when the other body part is bent, the improvement comprising:
at least two pieces of four-ring chain armour, the four-ring chain armour consisting essentially of rings which pass through and over two adjacent rings and through and under two, other adjacent rings for defining a longitudinal direction of each piece of the four-ring chain armour along ridges formed by successive ones of the rings passing over the two adjacent rings, whereby each piece of the four-ring chain armour stretches more in the longitudinal direction than in the direction transverse thereto; and
garment-making means for making a garment at least for two, bending parts of a body, one body part having skin which stretches when the one body part is bent and the other body part having skin which is subjected to compression when the other body part is bent, the garment comprising the two pieces of four-ring chain armour with the longitudinal direction of one of the pieces 90° to the longitudinal direction of the other of the pieces, whereby the one piece may be made into a portion of the garment at the one, bendable body part with the longitudinal direction thereof in the direction the skin stretches and the other piece may be made into a portion of the garment at the other, bendable body part,
wherein the garment is a glove with the one piece of four-ring chain armour on the dorsal side of the glove with the longitudinal direction of the one piece longitudinally thereof and the other piece on the palmer side of the glove.

4,841,578
SANITIZER FOR RECREATIONAL VEHICLE WASTE SYSTEM
Al Mercer, Post Office Box 531, Jacumba, Calif. 92034
Continuation-in-part of Ser. No. 920,111, Oct. 7, 1986. This application Mar. 28, 1988, Ser. No. 176,618
Int. Cl.[4] E03D *9/02*
U.S. Cl. 4—224 5 Claims



1. A chemical dispensing system for a waste management system having a toilet, a holding tank for receiving water from the toilet, and a fresh water flush system including a flush valve for introducing fresh flushing water into a flow channel inside the upper rim of said toilet, said chemical dispensing system comprising:
a. an upright canister downstream of said flush valve and having a lower body portion and a canister cap, and defining a hermetically sealed internal chamber and having an outlet in the chamber bottom emptying into said toilet through a U-trap, such that said U-trap will establish a solution level in said canister and an inlet connected to said fresh water flushing system via said flush valve, the substantial portion of said canister being above said flow channel and said inlet being substantially above said outlet so an air pocket is captured in said canister above said solution;

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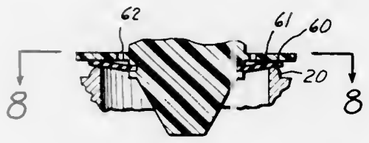
b. a chemical cartridge housed in said internal chamber and containing at least partially water soluble chemicals; and,
c. a vacuum breaker valve located in said canister above said solution level to allow air to enter but prevent air from escaping said canister such that solution inside said canister will be forced out of said canister through said trap approximately as fast as water is introduced from said flush valve until the solution drops to said solution level established by said trap.

4,841,579

FLUSH VALVE WITH SNAP-ON FLAPPER

Bruce A. Antunez, 1143 Indian Springs Dr., Glendora, Calif. 91740

Filed Nov. 20, 1987, Ser. No. 123,444
Int. Cl.⁴ E03D *1/35*
U.S. Cl. 4—393 **3 Claims**



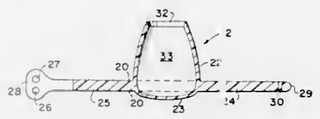
1. A seal assembly for a valve flapper, said assembly comprising:
a rigid backing disc having a flat backing face and a central post extending from it; and
a resilient deformable seal shaped as a flat disc mounted to said post in circumferential sealing contact with said post, said seal having a flat face spaced from the backing face of said backing disc near the post, said backing disc having a vent port therethrough near said central post and opening through said face into the space between the respective faces wherein, with said valve resting on a valve seat said deformable disc will contact said flat backing face along the periphery of said disc and backing face to create a space which is vented by said opening.

4,841,580

BUOYANT AND NON-BUOYANT VALVE

Michael Agostino, 101-A Spring St., St Augustine, Fla. 32084

Continuation-in-part of Ser. No. 25,374, Mar. 13, 1987, abandoned, and a continuation-in-part of Ser. No. 940,746, Dec. 12, 1986, abandoned, and a continuation-in-part of Ser. No. 30,369, Mar. 26, 1987. This application Dec. 14, 1987, Ser. No. 132,319
Int. Cl.⁴ E03D *1/14*
U.S. Cl. 4—393 **14 Claims**



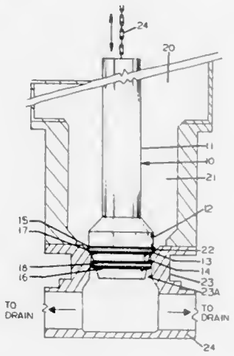
1. A buoyant and non-buoyant flush tank pivoting type valve for use in a flush tank having a selective valve operating means for moving said valve, a water inlet, a water outlet with a valve seat thereat selectively closeable by said valve and an upstanding overflow pipe adjacent the water outlet said valve comprising an elongated base with opposite end portions, said base having at one of its said end portions attachment means for connection to a valve operating means for moving said valve to a first position in which said valve is open and a second position in which said valve is closed on the valve seat, said base having at another of said end portions means for mounting said valve onto the overflow pipe for movement between said first and second positions, said elongate base having opposite generally planar side surfaces said surfaces being interrupted only on one side surface by a extending hollow frusto-conical cup member extending generally normal to said one side surface and only on the other side surface by an oppositely disposed generally hemispherical protuberance, said cup member being disposed downwardly when said flush valve is mounted in a buoyant position and being disposed within the water outlet when said flush valve is in said second position and said cup member being disposed upwardly when said flush valve is mounted in a non-buoyant position with said protuberance being disposed within the water outlet when said flush valve is in said second position said frusto-conical shape of said cup and said hemispherical shape of said protuberance each serving as valve self-centering members when either comes into contact with said valve seat.

4,841,581

DRAIN PLUG ASSEMBLY FOR DISHWASHER, AND THE LIKE

William K. Russell, 2715 Sparrow Cir., Costa Mesa, Calif. 92626

Filed May 12, 1987, Ser. No. 48,950
Int. Cl.⁴ E03D *1/35*
U.S. Cl. 4—400 **2 Claims**



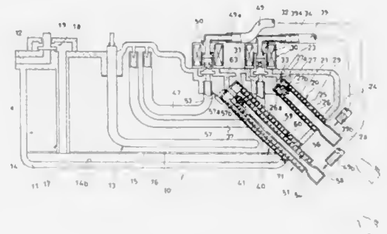
1. A drain plug assembly for a dishwasher, including an interconnecting dishwasher sump, drain sump and, drain tee, the drain sump including an inclined ball seat and a connecting drain pipe defining an inner wall; the drain plug assembly comprising:
(a) a hollow, elongate stem, providing upper and lower ends, the upper end of the stem being connected to a solenoid switch, the stem extending upwardly through the drain sump and into the dishwasher sump;
(b) a ball body mounted adjacent the lower end of the elongate stem, and providing a circumferential groove thereon;
(c) an inwardly tapered extension terminating the lower end of the stem, and providing a circumferential groove thereon; and,
(d) a replaceable, upper O-ring mounted within the groove on the ball body and a replaceable lower O-ring mounted within the groove on the tapered extension, the upper O-ring seating and sealing on the inclined ball seat, and the lower O-ring seating and sealing on the inner wall of the drain pipe; whereby:
(i) the ball body is moveable by gravity to seat and seal the inclined ball seat by contact with the upper O-ring thereon;
(ii) the tapered extension is adapted to guide the drain plug assembly in a vertically upright manner, without tilting, by forming a sliding fit with the lower O-ring and the inner wall of the drain pipe;
(iii) a constant level within the dishwasher and drain sumps is maintained by overflow of wash water through the hollow, elongate stem, thereby effecting a leakage reduction of about 85% of wash water; and,
(iv) elevation of the drain plug assembly releases wash water from the dishwasher through the dishwasher sump, drain sump, drain seat and drain tee.

4,841,582

WASHER CONSTRUCTION FOR A SANITARY DEVICE

Hideo Matsui, Toyota; Yuji Yamaguchi, Anjo, and Hideki Furukawa, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Mar. 30, 1988, Ser. No. 175,382
Claims priority, application Japan, Mar. 30, 1987, 62-76945
Int. Cl.⁴ A61H *35/00*; **A47K** *7/08*
U.S. Cl. 4—420.1 **3 Claims**



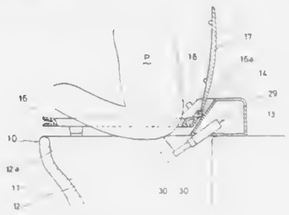
1. A washer construction for a sanitary device for use with a toilet bowl comprising:
tank means adapted to be filled with hot water warmed to a predetermined temperature and having a supply port to which cold water under pressure is supplied;
electrically operated valve means mounted on said tank and having an inlet port exposed to said hot water in said tank means,
a first outlet port, a second outlet port, a solenoid, and a valve member movable between a first position wherein said two outlet ports are connected with each other and disconnected from said inlet port upon de-energization of said solenoid and a second position wherein said inlet port is connected to said second outlet port and disconnected from said first outlet port upon energization of said solenoid;
nozzle means extending outwardly from said tank means and including a casing formed at one end portion thereof and at the other end portion thereof, a first opening and a second opening, respectively, said first opening being connected to said second outlet port of said electrically operated valve means, a plunger slidably fitted in said casing and extending through said second opening, a bore formed in said plunger and having an opening at one end portion thereof in communication with said first opening of said casing and said second outlet port of said electrically operated valve means, aperture means formed at the other end portion of said plunger, a spring disposed in said casing and urging said plunger so that said opening thereof may be adjacent to said first opening of said casing, and a one-way valve means disposed in said opening of said bore adapted to be opened when said plunger is extended from said casing to a position in an interior portion of a toilet bowl by water under pressure supplied to said first opening of said casing; and
a conduit having at opposite end portions an inlet opening and outlet opening, respectively, said inlet opening being connected to said first outlet port of said electrically operated valve and said outlet opening is exposed to said interior portion of said toilet bowl.

4,841,583

CAPACITANCE TOILET SEAT SWITCH FOR BIDET

Mitsuhiro Ohara, Toyoake, and Kenichi Kaneko, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Aug. 28, 1987, Ser. No. 90,472
Claims priority, application Japan, Aug. 29, 1986, 61-133562
Int. Cl.⁴ A47K *3/22*
U.S. Cl. 4—420.4 **3 Claims**



1. A sanitary device comprising:
a toilet bowl having a rear portion;
a casing fixedly mounted on said rear portion;
a seat including a rear end portion hingedly connected to said casing to be raised or lowered and a pair of spaced apart foward extensions, each of said extensions having an upper portion and a lower member with an opening therebetween;
an electrically operated washing device carried by said casing and having a nozzle from which an amount of water may be sprayed toward the anus portion of a person on said seat;
an operation switch;
a protecting switch connected to said operating switch in series;
a power supply connected to said electrically operated washing device via said operating switch and said protecting switch to thereby define an electric circuit;
a first electric conductor adhesively secured to an under side of said upper portion of said seat;
a second electric conductor adhesively secured on said lower member in spaced relation to said first electric conductor; and
a control means connected to said conductors for detecting a variation in capacitance between said electric conductors to thereby close said protecting switch upon detection of a predetermined increase in capacitance between the conductors after a person sits down on said seat.

4,841,584

SHAMPOO LOUNGE CHAIR

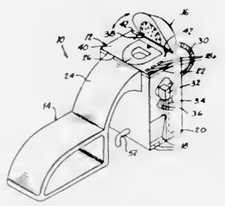
Charalotta A. Overcash, 1714 W. "A" St., Kannapolis, N.C. 28081, and George Spector, 233 Broadway, Rm. 3615, New York, N.Y. 10007

Filed Jul. 31, 1986, Ser. No. 891,141
Int. Cl.⁴ A45D *19/08*
U.S. Cl. 4—519 **2 Claims**

1. A shampoo lounge chair which comprises:
(a) a sink unit with a front side and a back side, having a plurality of controls for supplying hot water, cold water and shampoo, and a top portion with a sink therein;
(b) a chair having an inclined back rest attachable to said front side adjacent said sink so that a person can sit upon said chair and place their head back over said sink;
(c) a spray cap having a plurality of spouts fluidly connected to said controls, said spray cap adjustably affixed to said

back side, adjacent said sink, to be positioned over a person's head so that hot water, cold water and said shampoo can be ejected from said spouts on the person's head at different intervals by said operator activating said controls of said sink unit to wash the hair of said person, in combination with means for adjusting the spray cap position; wherein said means comprise:

(d) a hinge mounted at the rear of said sink so that said spray cap can pivot thereon;



(e) a pair of springs affixed between said spray cap and said top portion of sink unit to bias said spray cap in an opened position;

(f) a flange having a threaded hole therein and extending rearwardly from said top portion of said sink unit adjacent said hinge; and

(g) a bolt threaded into said threaded hole of said flange to engage with said spray cap so as to adjust the position of said spray cap.

4,841,585

SWINGABLE AND SLIDABLE BED APPARATUS

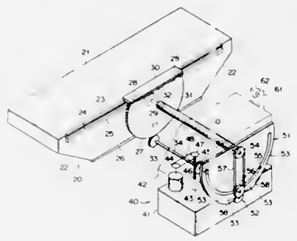
Yukikazu Masuzawa, Tochigi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 9, 1988, Ser. No. 165,903

Claims priority, application Japan, Mar. 12, 1987, 62-55344

Int. Cl.[4] A61G 7/00; A61B 6/04

U.S. Cl. 5—62 **10 Claims**



1. A swingable and slidable bed apparatus supported on a floor, comprising:

a bed having a plane on which a patient is mounted, and also having an axis line of rotation around which the bed can be swung;

a means for swinging the bed around the axis line of rotation;

a means for sliding the bed parallel to the patient-mounted plane while swinging the bed; and

a means for shifting the axis line of rotation of the bed remote from the floor while swinging and sliding the bed, wherein said shift means includes a cam means rotatable around the axis line of rotation of the bed, cooperating with said swing means, and when said cam means is rotated, it is shifted in the direction remote from the floor so that the axis line of rotation of the bed can be shifted.

4,841,586

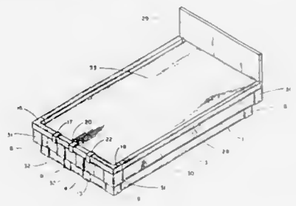
ADJUSTABLE WATERBED PADDED CAP, FRAME AND PEDESTAL

Andrew S. Juster, 2607 Canter Club Trail, Apopka, Fla. 32703, and Scott R. Pilato, 511 Georgetown Dr., Casselberry, Fla. 32707

Filed Jul. 6, 1987, Ser. No. 70,336

Int. Cl.[4] A47C 19/04

U.S. Cl. 5—181 **9 Claims**



1. An adjustable waterbed comprising:

a. a pedestal consisting of two side boards and two end boards connected by corner joints, said end boards being extendable in length to make any size pedestal by the insertion of short extension pieces having the same width as the boards and having grooves near each end thereof, and being secured to the boards by rigid shaped pieces, each having front and back surfaces separated by a perpendicular section between said surfaces, the back surfaces having inwardly pointing lips or ridges on the outermost side thereof, said lips fitting into matching grooves on the boards and extension pieces;

b. an adjustable frame consisting of side and end boards, said end boards being extendable in length by insertion of extension pieces; and

c. padded caps to cover the end boards of the frame, said padded caps being able to fit any size frame by insertion of padded extension elements.

4,841,587

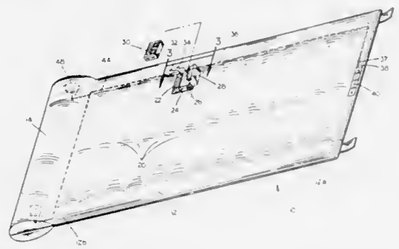
MAT WITH SOUND SYSTEM

John E. Carter, 705 W. 29th St., #6, Bellevue, Nebr. 68005, and David R. Hernandez, 298 Fairchild Cir., Offutt Air Force Base, Nebr. 68113

Filed Jan. 23, 1989, Ser. No. 300,825

Int. Cl.[4] A47G 9/06; H04B 1/06

U.S. Cl. 5—419 **11 Claims**



1. In combination:

a transportable mat, including a pair of opposite first and second ends, a pair of opposite longitudinal sides, and upper and lower faces;

said mat including a casing having resilient padding material enclosed therein;

a pillow mounted to the first end of said mat, for supporting a person's head;

speaker means mounted within said pillow for producing sound;

electrical conductor means electrically connected to said speaker means, mounted within said pillow and extending within said padding in said mat casing to a predetermined location on said mat; and

electrical connector means mounted on an end of said electrical conductor means, and extending outwardly through said mat casing for connection to an electronic audio transmitting means, such that audio signals will be transmitted to said speakers when connected to said connector means.

4,841,588

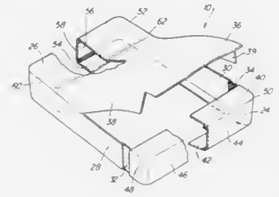
BLANKET WITH HEAD AND FOOT RETAINING POCKETS

Keith E. Harbin, and Deborah A. Harbin, both of 8107 Sorrento, Detroit, Mich. 48228

Filed Dec. 12, 1988, Ser. No. 282,696

Int. Cl.[4] A47G 9/04

U.S. Cl. 5—494 **10 Claims**



1. A blanket for a bed including a mattress having a head end, a foot end, a right side, and a left side comprising:

a head pocket having a top panel, a bottom panel, and a side panel connected to the top panel and the bottom panel, said side panel having a head face and a right side face and a left side face, said right and left side faces being disposed at right angles to the head face and extending toward the foot end of the mattress to form side edges on the right side and left side respectively, said heat pocket being adapted to be placed over the head end of the mattress;

a foot pocket having a top panel, a bottom panel, and a side panel connected to the top panel and the bottom panel, said side panel having a foot face and a right side face and a left side face, said right and left side faces being disposed at right angles to the foot face and extending toward the head end of the mattress on the right side and left side respectively, said foot pocket being adapted to be placed over the foot end of the mattress;

a right side extension panel and a left side extension panel extending from the right side face and left side face of the head pocket and the right side face and left side face of the foot pocket on right and left sides of the mattress, said right and left side extension panels each including an elastic strip extending transversely across a gap formed between the side extension panel and the right and left side faces of the head pocket;

an openable cover panel formed as an extension of the top panel of the foot pocket, said cover having a right edge and left edge; and

a right tuck flap and a left tuck flap extending from the right edge and the left edge of the cover panel between the head pocket and foot pocket, said tuck flaps being insertable between the right and left side extension panels and the right and left sides of the mattress.

4,841,589

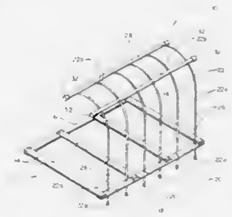
BED COVER SUPPORT STRUCTURE

Mary L. Moore, Rte. 2, Box 293, Kinston, N.C. 28365

Filed Mar. 16, 1987, Ser. No. 26,169

Int. Cl.[4] A47C 21/02

U.S. Cl. 5—504 **7 Claims**



1. An open frame foot or body part guard for supporting a bed cover thereover, comprising:

an open base frame designed to be inserted between the box springs and mattress of a bed;

said open base frame including an outer transverse edge strip that extends outwardly from between the box spring and the mattress;

a plurality of laterally spaced openings formed in the edge strip;

a plurality of equally and laterally spaced adjustable posts secured within the openings of the edge strip and extending upwardly therefrom to form an open frame structure;

each post including a vertical leg having upper and lower portions and a curved arm portion extending generally horizontally from the top portion of the leg, each curved portion having an outer remote end;

means for adjustably mounting the respective vertical posts for up and down movement within the openings of the edge strip;

a pair of detachably mounted transverse connector ties extending across the curve portions of the plurality of posts and interconnected between respective posts;

said pair of connector ties including a first connector tie connected to the remote ends of the curved arm portions of the posts, and a second connector tie disposed in parallel relationship to the first connector tie and connected to the curved arm portions of the post in the vicinity of where the curved arm portions extend from the upper leg portions of the post such that the pair of connector ties give stability to the entire guard and particularly to the post thereof and further wherein the connector ties prevent cover from falling downwardly between the curved arm portions; and

at least one of said connector ties being detachably connected between the respective horizontal arms of the respective posts.

4,841,590

WATER POWERED ROTATING SHOWER BRUSH

Robert L. Terry, Evergreen, and Daniel V. Sallis, Littleton, both of Colo., assignors to Synergetic Industries, Inc., The Woodlands, Tex.

Filed Apr. 13, 1987, Ser. No. 37,523

Int. Cl.[4] A46B 13/06

U.S. Cl. 15—28 **10 Claims**

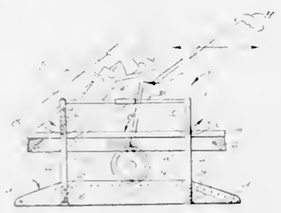
1. Hand held, water-powered device for a rotating working head comprising:

(a) elongated handle portion embodying a pair of generally parallel, longitudinally extending channels therethrough, said pair comprising a supply channel and a return channel; said supply channel and said return channel respectively having an inlet and an outlet end;

(b) a pair of flexible conduits comprising a supply line and a return line, the first end of said supply line having an inlet end which is connectable to a source of water under pressure and its second having an outlet end coupled to the lower said inlet end of said supply channel, and the first end of said return line having an outlet end which is connectable to means for utilizing water flow from said return line and having an inlet end its second end coupled to said outlet the lower end of said return channel;
(c) rotor housing affixed to the upper one end of said handle;
(d) a pair of intermeshing gear rotors comprising an internally toothed outer gear rotor and an externally toothed inner gear rotor disposed within said outer gear rotor, and said rotors rotatably mounted eccentrically with respect to one another with the larger diameter said outer rotor of said pair having more teeth than said inner the small rotor and adapted to be releasably coupled in drive relationship with a rotary working head attachment, said housing providing an elongate, generally circumferential supply

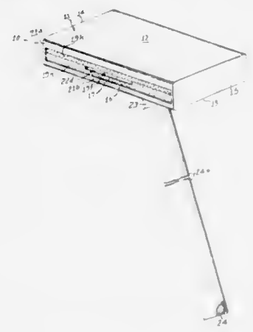
port adjacent first ends of said gear rotors for directing water flow axially into a first zone between the teeth of said outer larger rotor and said inner smaller rotor, and a return port also adjacent the first ends of said gear rotors for permitting general axial flow from a second zone between teeth of said rotors, said rotors arranged such that the flow of pressurized water therethrough via said ports will positively displace said rotors and drive them in rotation, said return port in flow communication with the upper said inlet end of said return channel and said supply port in flow communication with the upper said outlet end of said supply channel;
(e) flow diverter, having an external control knob and rotatably mounted within said handle and having an internal portion pivotable to a by-pass position in which water flow to and from said rotors is cut off and in which a direct flow path is opened between said supply channel and said return channel; and
(f) rotary working head, detachably coupled to said larger outer rotor.

4,841,591
GOLF BAG CART WHEEL CLEANER
A. J. Candow, 2721 Riverbluff Ct., Villa 99, Sarasota, Fla. 34231
Filed Dec. 16, 1988, Ser. No. 286,377
Int. Cl.[4] B60S *3/00*; A46D *1/00*
U.S. Cl. 15—160 14 Claims



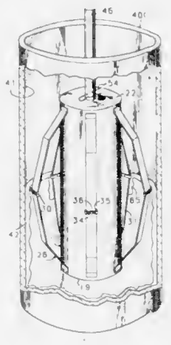
8. A golf bag cart wheel cleaner for cleaning a hand-operated golf bag cart's wheels comprising:
an elongated platform structured to be horizontally disposed atop the ground and having an upper, generally horizontal apertured surface extending along at least a portion of said platform structured to allow dirt and debris to pass downwardly therethrough;
two elongated, spaced apart brushes each held generally parallel and spaced above said platform by a frame connected between said platform and each said brush; each said brush having downwardly pointing bristles spaced above said apertured surface a distance somewhat less than a golf bag cart wheel diameter;
said platform and each said brush cooperatively structured and positioned to remove dirt and debris from the golf bag cart wheels as they are rolled along, said apertured surface and beneath said brushes.

4,841,592
FAN BLADE CLEANING TOOL
David J. Restivo, Orange Park, Fla., assignor to E.C.V. Company, Jacksonville, Fla.
Filed Dec. 17, 1986, Ser. No. 942,677
Int. Cl.[4] A47L *13/38, 13/42*; B25G *3/30*
U.S. Cl. 15—210 R 26 Claims



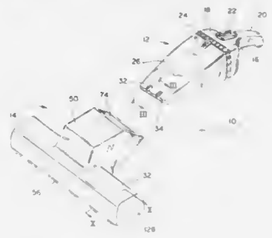
1. A fan blade cleaning tool comprising an enclosed housing having an open entrance and an open exit with said entrance and exit being in longitudinal alignment, a cleaning element removably mounted in said housing, said element having at least a pair of generally planar interior surfaces defining a centrally disposed passageway aligned to simultaneously and frictionally engage outer surfaces and both elongated side edges of a fan blade for removing debris therefrom, a handle affixed to said housing for moving said cleaning element over the length of the fan blade whereby substantially the entire fan blade is cleaned by a single reciprocating pass longitudinally onto and off the fan blade, said housing including a top wall, a bottom wall, a pair of spaced side walls and an open front and back wall defining a hollow closed shell, said cleaning element being under compression between said top and bottom walls, said top and bottom walls having substantially continuous shoulders directed inwardly along the length of said side walls to provide greater compression forces against said cleaning element along said shoulders than compressive forces on said cleaning element by said top and bottom walls engaged by said cleaning element whereby edges of the fan blade are cleaned while simultaneously cleaning a top and bottom surface of the fan blade.

4,841,593
HOLLOW WARE AND CHIMNEY CLEANING DEVICE
Dennis E. Bender, 614 Spruce St., Sauk City, Wis. 53583, and Mark Bender, E8566 Bender Dr., North Freedom, Wis. 53951
Filed Feb. 18, 1988, Ser. No. 157,404
Int. Cl.[4] F23J *3/02*
U.S. Cl. 15—242 8 Claims



1. A tube and chimney cleaning device for removing hard, crusty deposits from a conduction channel inside on elongated chimney flue or the like that has a predetermined and nearly constant crossection shape throughout, said device is comprised of an elongated body of cross-sectional shape generally similar to the cross-sectional shape of the elongated chimney flue or the like to be cleaned but smaller in size to enable insertion into the tube or chimney flue aperture to be reciprocated, said elongated body is capped at the proximal top end, last to enter the chimney flue or tube aperture; a plurality of bowed spring members disposed in spaced-apart fashion about the outside surfaces of said body that provides a common support means, said bowed spring members being of resilient material having first terminal end bent to be lap mounted semi-permanently to the side surfaces of said body nearest an open end of said body whereby attachment to various positions on said side surfaces can change the bowed extent of the curvature of a substantially semi-elliptically shaped flexible arch projecting outward, interposed between said first terminal end and a second terminal end bent to be lap-mounted to another point on the side surface of said body nearest the proximal top capped end of said body to hold said bowed spring members in adjusted position and curvature, said first terminal end and said second terminal end are independently positioned on side surface of said body so the flexible arch of said bowed spring member spans said elongated body generally parallel to the longitudinal axis of said body whereby the convex surface of said bowed spring member extends outward from and generally normal to the sides of said body; a plurality of scraping means attached to the convex surface of said flexible arch comprised of a grooved rasping surface raised outward from said convex surface interposed between bordering chisel-like edges held salient and attached generally normal to said convex surface, said chisel-like edges bordering said grooved rasping surface on both sides are disposed generally perpendicular to a plane that slices through said flexible arch and projects outward along said flexible arch from said body thereby providing a means to plow through, grind away, and scrape away interfering deposits in use; a unitary stroking means comprised of many short, generally thin members reversibly connected together in endwise fashion to form a semi-rigid and slender elongated member that has sufficient length to traverse a predetermined length of chimney flue or the like, and a terminal end that reversibly connects to a connection means attached onto said proximal capped top end of said body whereby said cleaning device can be stroked to and fro through the conduction channel of chimney flues or the like.

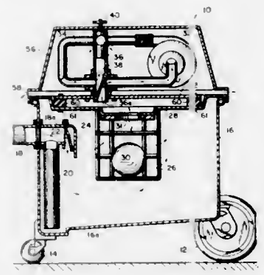
4,841,594
CORDLESS VACUUM CLEANER WITH POWER BRUSH
Donald E. Elson, Baltimore, Md.; Burton E. Gerke, Jr., Newtown, Conn.; Michael E. Bitzel, Monroe, Conn.; Bruce A. Wilder, Clinton, Conn.; Stanley J. Rodowsky, Jr., Baltimore, Md.; William R. Lessig, III, Hunt Valley, Md.; Jeffrey S. Adams, Baltimore, Md., and Todd A. Hagan, Hampstead, Md., assignors to Black & Decker, Inc., Newark, Del.
Filed Nov. 7, 1986, Ser. No. 929,103
Int. Cl.[4] A47L *5/26*
U.S. Cl. 15—344 13 Claims



1. A vacuum cleaner comprising:
a power unit;
a vacuum cleaner motor in said power unit;
a generallly rigid dust bowl sealably affixable to said power unit;
an air inlet opening at an end of said dust bowl remote from an end thereof attachable to said power unit;
an attachment;
means for agitating a surface in said attachment;
means for permitting said means for agitating to contact said surface;
an electric motor in said attachment;
connecting means for removably connecting said attachment to said dust bowl;
said connecting means including means for rigid connection;
cooperating electrical connection means for connecting said electric motor for concerted operation with said vacuum cleaner motor;
drive means for driving said means for agitating by said electric motor;
a source of electric power;
said cooperating electrical connecting means means for applying electric power from said source concertedly to said vacuum cleaner motor and said electric motor;
said dust bowl adjacent said air inlet opening includes first and second surfaces mutually disposed at an angle, and said connecting means includes:
an attachment portion in said attachment;
said attachment portion including an upper wall and a lower wall;
said upper wall and said lower wall having an inclination with respect to each other substantially equal to said angle, whereby said dust bowl is fittable into a predetermined position within said attachment portion;
a latch including cooperating latch means on said attachment portion and said dust bowl for detachably retaining said attachment portion on said dust bowl, whereby said rigid connection is attained;
said electrical connection means including first and second electrical contact members on said power unit and third and fourth electrical contact members on said attachment;
means for biasing said first and third electrical contact mem-

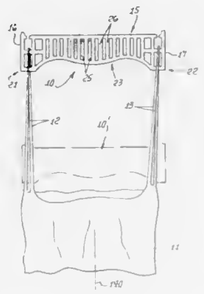
bers together into electrical contact when said connecting means connects said attachment to said dust bowl; and means for biasing said second and fourth electrical contact members together into electrical contact when said connecting means connects attachment to power unit.

4,841,595
VACUUM PUMP-OUT SYSTEM FOR WET/DRY VACUUM CLEANER
Martin Wiese, South Bend, Ind., assignor to The Kent Company, Ind.
Filed Aug. 7, 1987, Ser. No. 82,532
Int. Cl.[4] A47L 7/00
U.S. Cl. 15—352 **2 Claims**



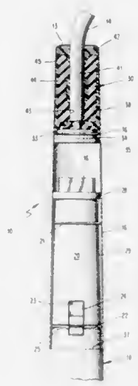
1. In a wet/dry vacuum cleaner device having a suction mode and a fluid pressurizing mode resulting in air and liquid discharge respectively, a tank provided with an inlet/outlet aperture, an automatic float type shut off means in said tank being operative when said liquid rises to a predetermined level in said tank, the improvement comprising a tangential fan motor, piping connected to said motor and said tank to form a circuit, a cover on said tank substantially enclosing said motor and associated piping, an opening from the interior of said cover to said atmosphere, and a hollow rotary valve connected substantially at right angles to said piping and having a knob control extending through the top surface of said cover, said valve having a cylindrical body with an upper port and a lower port therein, an inner sleeve rotatable within said cylindrical body, a baffle plate being fixedly secured to opposite sides of the inner wall of said inner sleeve, said inner sleeve having spaced openings whereby in different predetermined positions of said baffle plate said ports and openings are aligned in communication with said piping, and said lower port communicating with said piping while said upper port communicates with the interior of said cover whereby when said inner sleeve of said rotary valve is turned to one position air is drawn into the interior of said cover from said atmosphere through said opening and passes through said upper port and piping to be pressurized by said fan motor and directed by said baffle through said lower port and into said tank whereby the liquid in said tank is forced out said inlet/outlet aperture, and when said inner sleeve of said rotary valve is turned with the baffle in another position, dirt-laden air is drawn into said tank through said inlet/outlet aperture and lower port and is directed by said baffle plate to said fan-motor and piping and out said upper port and is discharged to said atmosphere through said opening.

4,841,596
HANDLE WITH SHAPED RECESSES TO SUPPORT FLIMSY BAG STRAPS
Michael P. Fink, Los Angeles, Calif., assignor to Nellie M. Fink; Martha M. Fink, both of West Los Angeles and Susan M. Edwards, Hollywood, all of, Calif.
Filed Jun. 3, 1988, Ser. No. 201,884
Int. Cl.[4] B25G 1/10
U.S. Cl. 16—114 B **8 Claims**



1. A one-piece handle for supporting the flimsy plastic strap or straps of a flimsy plastic grocery type bag, comprising:
(a) a handle body which is horizontally, longitudinally elongated and has opposite ends, front and rear sides, and top and bottom surfaces, the body having opposite end portions and an intermediate portion between said end portions,
(b) there being recesses extending downwardly at said end portions from said top surfaces and terminating within said end portions, said recesses intersecting said front and rear sides,
(c) the handle body defining local protuberances spaced part from one another in the length direction of said handle and extending into the recesses, the widths of the recesses being narrowed by said protuberances to form gaps spaced above the lowermost extents of the recesses.
all of the protuberances extending substantially at the level of the top surface,
(d) there being two pairs of said protuberances, the protuberances of a first pair extending longitudinally oppositely and into one said recess, and the protuberances of the second pair extending longitudinally oppositely and into the other said recess, a gap being formed between the protuberances of each pair, the width of each said recess in a longitudinal direction and directly below the protuberances thereabove, being substantially greater than the width of the said gap between the protuberances,
(e) each said recess having opposite vertical walls from which the two protuberances project toward one another, the protuberances having undersides normal to said walls and overhanging the recesses, one of said walls of each said recess having a vertical dimension substantially greater than the vertical dimension of the other wall, said one vertical wall located closer to the end of the handle than said other vertical wall, and said one vertical wall projecting above the protuberance projecting therefrom and associated therewith and being above the level of said top surface so as to block the sliding of the straps off an end of the handle when the straps are above the gap, the protuberances at each said gap have upper surfaces which taper downwardly and toward one another.

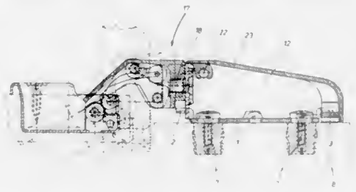
4,841,597
INTERCHANGEABLE HAND TOOL AND HANDLE THEREFOR
Robert A. Kolonia, R.D. 3, Agnes Rd., Box 318, Milford, N.J. 08848
Filed Aug. 8, 1986, Ser. No. 894,568
Int. Cl.[4] B25G 1/10, 3/00
U.S. Cl. 16—114 R **31 Claims**



I. A hand tool having an interchangeable handle member, said tool comprising:
(a) a tool member fixedly disposed at one end of a ferrule member,
(b) the handle member including a tool end section at one end thereof and a hand gripping section toward the other end thereof;
(c) the ferrule member including a socket portion open at the other end thereof to receive the tool end section of the handle member;
(d) said tool end section being elongate to extend into the socket portion and including an outer circumferential surface having an inner end and an outer end,
(e) shock absorbing means located intermediate the inner and outer ends of the tool end section along said outer circumferential surface,
(f) said shock absorbing means being effective to provide a tightened fit between the ferrule member and the tool end section when the ferrule member is slidingly displaced over the outer circumferential surface of the tool end section, and
(g) said shock absorbing means includes a resilient ring member movable along the outer circumferential surface of the tool end section.

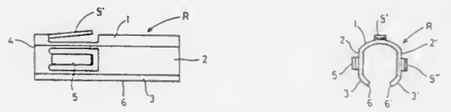
4,841,598
FURNITURE HINGE
Alfred Grass, Höchst, Austria, assignor to Alfred Grass Ges. mbH. Metallwarenfabrik, Hoechst/Vlbg., Austria
Filed May 31, 1988, Ser. No. 200,379
Claims priority, application Austria, Apr. 11, 1988, 937/88
Int. Cl.[4] E05D 7/12; E05F 1/12
U.S. Cl. 16—251 **14 Claims**

1. A furniture hinge comprising a hinge base, and a hingeable arm arrangement adjustably connected to a hinge bracket which is clipped onto the hinge base, the hinge, in use, being installed with the hinge base attached to a piece of furniture adjacent a door thereof, and the arm arrangement attached to the door thereof, wherein the hinge base is provided with front and rear extensions projecting away from the hinge base in generally longitudinal directions, wherein the hinge bracket has a generally U-shaped cross-section formed by two lateral limbs and a front base limb whereby it can be clipped and pivotally secured onto the front extensions which, in use, are situated adjacent the door, and wherein the generally U-shaped hinge bracket also has a rear spring catch at the rear of



each lateral limb which, in use, are situated remote from the door, by means of which the hinge bracket can be clipped onto the rear extensions of the hinge base.

4,841,599
SPRING MECHANISM FOR THE HINGE OF A MOTOR-VEHICLE SUN VISOR
Carlos G. Cebollero, 180, Calle Rocafort, 08029 Barcelona, Spain
Filed Feb. 24, 1988, Ser. No. 159,832
Claims priority, application Spain, Feb. 27, 1987, 8700679
Int. Cl.[4] E05F 1/08
U.S. Cl. 16—297 **9 Claims**



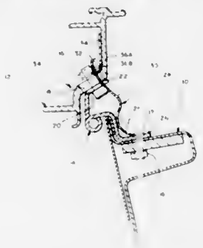
1. A spring mechanism for a hinge of a sun visor of a motor-vehicle and a housing for the spring mechanism, comprising:
a spring mechanism having a resilient sheet element, said resilient sheet element including a longitudinal curved wall portion with two opposite longitudinal edges, two flat parallel wall portions that are parallel to each other, and two curved wall portions having free edges facing each other so as to define an aperture, said two flat parallel wall portions extending between said two opposite longitudinal edges and said two curved wall portions, said resilient sheet element having a single piece structure, said resilient sheet element being of a tubular shape, said spring mechanism also including means for retaining said resilient sheet element and including at least one retaining tab extending outward from said resilient element;
a housing with an inner wall, all of said curved wall portions being fitted against said inner wall, said housing being tubular so that said tubular resilient sheet element can be inserted into said tubular housing by displacement only in a longitudinal direction, said two flat parallel wall portions thereby being arranged so that a space forms between said two flat wall portions and said inner wall, said two flat parallel wall portions being formed to resiliently expand into said space to accommodate and grip between said two flat parallel wall portions, a hinge rod insertable in the longitudinal direction to thereby retain a sun visor on the hinge rod in a desired angular position of use; and
means for preventing a relative rotation of said resilient sheet element and said housing and including a projection formed in said housing and fitted between said free edges of said two curved wall portions in said aperture, said housing having a recess in which is engaged said retaining tab so as to restrain said resilient sheet element against axially moving in said housing.

4,841,600

DOOR CHECK AND STOP

Ross S. Sasamura, and John H. Jewell, II, both of Fremont, Calif., assignors to Paccar Inc, Bellevue, Mass.

Filed Mar. 23, 1988, Ser. No. 171,554
Int. Cl.[4] E05F *5/06*; E05D *11/10*
U.S. Cl. 16—335 10 Claims



1. A hinge assembly for a vehicle, said vehicle having a door jamb, a door and a hinge mounted therebetween, said door rotatable between closed and fully opened positions, comprising:

an internal passageway defined by mated slotted portions of said hinge and said door jamb;

check means, mounted on said hinge and having a specifically configured free and extending through said passageway; and

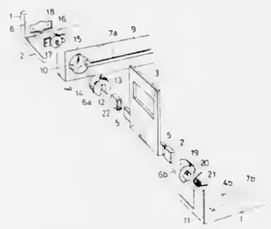
detent means, mounted on the interior of said door jamb, for engagement with said specifically configured free end of said check means to restrain rotation of said door in a primary intermediate open position, said check means being formed for releasable engagement with said detent means to permit free rotation of said door to said fully opened position.

4,841,601

HINGE DEVICE WITH TRANSVERSE SLOTS

Hajime Taima, Sagamihara, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Nov. 10, 1988, Ser. No. 269,781
Claims priority, application Japan, Dec. 2, 1987, 62-182978
Int. Cl.[4] E05D *15/06*
U.S. Cl. 16—361 1 Claim



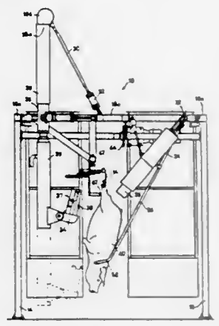
1. A device for opening and closing a door, comprising a pair of bearing recesses formed in a face-to-face relation to each other in opposed inner wall surfaces of a body to which a door is hinged, bearing pieces rotatably accommodated one each in said bearing recesses and having a surface facing the other with a radial bearing groove extending from the axial center, a pair of pivotable pieces provided one on each edge of said door at one end thereof and fitted in said bearing grooves so that said door is rotatably supported in said bearing recesses via said bearing pieces, and a pair of guide grooves formed in a face-to-face relation to each other in said opposed inner wall surfaces of said body and each having one end communicating with one of said bearing recesses and extending inwardly of said body from said bearing recess, said guide grooves being communicated with said bearing recesses when said door is opened, whereby said pivotable pieces of said door can be moved along said guide grooves to accommodate said door into said body.

4,841,602

DEVICE FOR CUTTING UP MEAT AND/OR BONES OF A SLAUGHTER ANIMAL

Rudolf J. G. A. van der Hoorn, and Marcelles Douwes, both of Nuenen, Netherlands, assignors to Nederlandse Centrale Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek, The Hauge, Netherlands

Filed Sep. 2, 1987, Ser. No. 92,367
Claims priority, application Netherlands, Sep. 2, 1986, 8602220
Int. Cl.[4] A22B *5/20*
U.S. Cl. 17—23 4 Claims



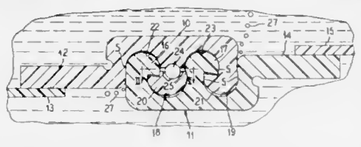
1. Apparatus for dividing carcasses of hogs or other big slaughter animals comprising a cutting element provided with a cutting edge and a counter support situated opposite the cutting edge of said cutting element, said counter support having an oblong, central, recessed space for receiving the cutting edge, with symmetrical bearing faces alongside this space, said cutting element being adjustable in angular position with respect to the counter support, the counter support further comprising a mandrel provided with a central groove, the cutting element further comprising a cutting blade lying opposite the counter support.

4,841,603

RECLOSABLE SEAMS FOR FLUID-TIGHT APPLICATIONS

Richard K. Ragni, Crystal Lake, Ill., assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Dec. 22, 1986, Ser. No. 944,964
Int. Cl.[4] A41F *1/00*
U.S. Cl. 24—576 9 Claims



1. A flexible closable continuous interlocking structure comprising in combination:

first and second spaced elongate flexible interlocking fasteners each having coacting rib and groove elements thereon with each of the rib elements adapted to be interlockingly received by a groove element for forming seals having fluid-tight integrity;

a compartment between said spaced fasteners adapted to receive a fluid above atmospheric pressure, said compartment being exposed to an internal side of said elements so that when said compartment is pressurized above atmospheric by said fluid and defects in the fluid-tight integrity between the surfaces of the interlocked rib and groove elements can be detected by the leaking of said fluid from the compartment between the interlocked rib and groove elements along their length;

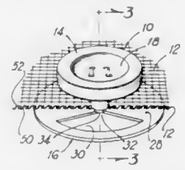
and means connected to said compartment for introducing said fluid at above atmospheric pressure into said compartment for testing the length of said elongate fastener for fluid-tight integrity.

4,841,604

DETACHABLE BUTTON

Robert B. Stevens, Baltalimani, Cami Sokak No. 5/3, Emirgan, Istanbul, Turkey

Filed Aug. 6, 1987, Ser. No. 82,229
Int. Cl.[4] F16B *19/00*
U.S. Cl. 24—704.1 11 Claims



1. A button attachable to a substrate, comprising:

a button front including a button structure having oppposing faces, and a hollow tube secured to one of said faces, a longitudinal axis of said tube being substantially normal to said one face;

a button back including a backing structure having a flat surface, and a shaft releasably secured to said flat surface, a longitudinal axis of said shaft being substantially normal to said flat surfce, said shaft including means for penetrating said substrate and the securement of said shaft to said flat surface being weakened by an aperture in said backing structure at said shaft secured thereto to facilitate removal of the backing structure from the shaft upon the application of force to the backing structure; and

means for securing said shaft within said tube.

4,841,605

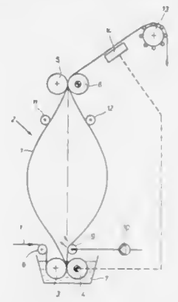
METHOD AND APPARATUS FOR STRETCHING TUBULAR MATERIAL

Manfred Schuierer, Michelstadt, Fed. Rep. of Germany, assignor to Bruckner Apparatebau GmbH, Fed. Rep. of Germany

Filed Aug. 9, 1985, Ser. No. 764,192
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1984, 3433701
Int. Cl.[4] D06C *5/00*
U.S. Cl. 26—74 4 Claims

1. A method of laterally stretching continuously moving tubular fabric, comprising the steps of delivering the fabric in a wet state to a stretching zone, removing the fabric from the stretching zone, the linear speed at which the fabric is delivered to the stretching zone being greater than the linear speed at which the fabric is removed from the stretching zone, injecting compressed air to inflate and stretch the tubular fabric in the stretching zone, sealing the inflated tubular fabric against escape of air during delivery of the fabric to and during removal of the fabric from the stretching zone, deflating the stretched tubular fabric leaving the stretching zone and measuring the width of the deflated stretched tubular fabric, and maintaining such width at a predetermined value by using the measurement of such width to control the excess of the linear speed at which the fabric is delivered to the stretching zone over the linear speed at which the fabric is removed from the stretching zone.

2. Apparatus for laterally stretching continuously moving wet tubular fabric, comprising a first pair and a second pair of continuously driven rollers through which the tubular fabric passes in succession, means for injecting compressed air to inflate and stretch the tubular fabric between the two pairs of



rollers while the two pairs of rollers seal the inflated tubular fabric against escape of air, and means for measuring the width of the flattened stretched tubular fabric leaving the second pair of rollers, said measuring means being connected to control the speed of at least one of the pairs of rollers to maintain such an excess of the peripheral speed of the first pair of rollers over the peripheral speed of the second pair of rollers as to maintain the measured width at a predetermined value.

4,841,606

NOTCHED GUIDE FILAMENT YARN INTERLACER

Andrew M. Coons, III, Anderson, S.C., assignor to BASF Corporation, Williamsburg, Va.

Filed Jul. 15, 1988, Ser. No. 220,042
Int. Cl.[4] D02J *1/08*
U.S. Cl. 28—274 6 Claims

1. An apparatus for entangling filaments of synthetic yarns, comprising:

(a) a housing;

(b) a yarn passageway through said housing comprising a larger diameter cylindrical bore concentric with and abutting a cylindrical bore of smaller diameter;

(c) a fluid passage through said housing intersecting the larger bore of the yarn passageway perpendicularly, said fluid passage being cylindrical and of lesser diameter than said larger yarn passage bore;

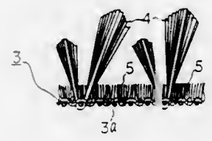
(d) a slot or notch at each end of the yarn passageway where the yarn will contact the entrance and exit areas of the passageway, each said slot or notch aligned on the same side of the yarn passageway as the fluid passage.

4,841,607

PROCESS FOR PRODUCING CLOTH FOR STUFFED ANIMAL TOYS

Yooesaku Sekino, 4-27-3 Shinkoiwa, Katsushika,-Ku, Tokyo, Japan

Filed Sep. 29, 1986, Ser. No. 912,238
Int. Cl.[4] D04D *7/00*; D04B *39/00*
U.S. Cl. 28—160 2 Claims



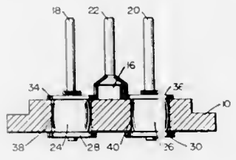
1. A process for producing a cloth having a simulated furry touch for making stuffed animal toys comprising: taking a base cloth having a high pile of predetermined length, forming a plurality of individual long fibers into a bundle, whereby said fibers are generally of uniform length, forming a plurality of such bundles, reversely folding each of said bundles of fibers to form a reverse fold of unequal lengths having a ratio of approximately 4 to 6, and securing each of said reversely folded bundles of fibers to said base cloth by knitting said bundles of fibers to said base cloth whereby said bundles of fibers extend above the pile of the base cloth and are knitted at such intervals as to form a pile surface having a soft touch simulating the feel of natural fur.

4,841,608

METHOD OF FORMING ELECTRICAL TERMINATION ON CAPACITOR TOPS

C. Wayne Hodges, Huntsville, Ala.; Dennis R. Henderson, Greenwood, and Edwin R. Koons, Whiteland, both of Ind., assignors to Aerovox M, Inc., Glasgow, Ky.

Filed Jan. 16, 1987, Ser. No. 4,321
Int. Cl.[4] H01G *7/00*
U.S. Cl. 29—25.42 20 Claims



11. A method for providing a capacitor top, said method comprising the steps of

providing a plastic member having therein two apertures and having extending therefrom a boss,

force fitting respective metal inserts into said apertures to form a seal between said member and said inserts,

attaching respective electrical leads to said inserts, and

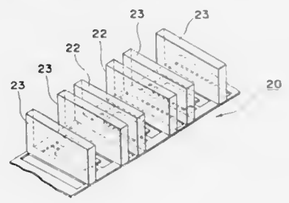
attaching a positioning lead to said boss.

4,841,609

A METHOD OF MANUFACTURING PIEZOELECTRIC VIBRATORS

Takeshi Nakamura, Uji, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Division of Ser. No. 799,735, Nov. 19, 1985, abandoned. This application Feb. 26, 1987, Ser. No. 19,202
Claims priority, application Japan, Nov. 29, 1984, 59-253396
Int. Cl.[4] H01L *41/22*
U.S. Cl. 29—25.35 2 Claims



1. A method of manufacturing piezoelectric vibrators which comprises the steps of preparing a piezoelectric vibrator wafer which has a plurality of vibrator chips each including a vibrator portion provided with a piezoelectric transducer, a frame portion surrounding the vibrator portion and connecting portions for connecting said vibrator portion and said frame portion, and joint portions for connecting said vibrator chips to each other, with said vibrator chips and said joint portions being integrally formed in one unit by a metallic material to constitute said piezoelectric vibrator wafer, causing electric current to flow through said joint portions for separation of said vibrator chips so as to be individually transportable for further processing thereof, said step of causing electric current to flow through said joint portions for separation of said vibrator chips being performed by arranging a plurality of electrodes in pairs with said joint portions connecting an adjacent pair of said vibrator chips located therebetween; passing electric current through said electrodes and said joint portions and automatically terminating the flow of current through said electrodes when fusion of said joint portions in completed, said frame portion of each of said vibrator chips including opposite ends, said joint portion being integrally formed with and extending from said opposite ends, and each of said electrodes having a length sufficient to completely cover a respective one of said opposite ends, said electrodes being held under pressure so as to completely cover said opposite ends during said step of causing current to flow through said joint portions for separation of said vibrator chips.

4,841,610

DEVICE FOR ADJUSTING THE PROFILE OF A ROLL WITH A DEFORMABLE WALL

André Quehen, Pontoise, France, assignor to Clecim, Courbevoie Cedex, France

Filed Mar. 13, 1987, Ser. No. 25,765
Claims priority, application France, Mar. 13, 1986, 86 03600
Int. Cl.[4] B21B *27/02, 29/00*
U.S. Cl. 29—116.2 3 Claims

1. Roll with a deformable wall especially for rolling metal sheets, comprising

(a) a central shaft in the form of an elongate beam having a bearing face, and guide faces perpendicular to said bearing face;

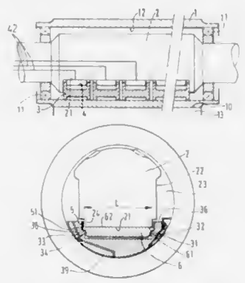
(b) a tubular casing mounted for rotation about its axis on said shaft and having a cylindrical circular inner face;

(c) a plurality of retaining blocks aligned in a series along said axis between said bearing face of the shaft and said cylindrical inner face of the casing, each retaining block having the form of a crescent delimited on one side by a

circular bearing face confronting the inner face of the casing along a contact arc and on the other side by a rectangular plane face confronting said bearing face of the shaft and in which is formed a recess having side walls adapted to slide along said guide faces of said shaft, a slight play being provided between said side walls and said guide faces to permit said block to adjust itself freely;

(d) said contact arc covering a relatively large angular sector of said casing and the number of said blocks being so large that each block has a width which is substantially less than the length of said contact arc;

(e) each of said retaining blocks being associated with a single hydraulic jack arranged between said bearing face of the shaft and said plane face of the retaining block for



individual adjustment of the radial position of the latter, said single hydraulic jack comprising a body delimiting a receptacle in which can slide a piston, said receptacle and said piston having an oblong cross section;

(f) said body of each single jack being constituted by the retaining block itself, said receptacle being formed in the thickness of said retaining block;

(g) said piston of each single jack being composed of a separate plate engaging into said receptacle and bearing on said shaft by means of a smooth face capable of sliding on said plane bearing face of said shaft, said plate being delimited laterally by a lateral face mounted for sliding movement along said lateral face of said receptacle, a gasket being inserted between said lateral faces of said receptacle and of said plate.

4,841,611

WORK ROLL WITH DULLED SURFACE HAVING GEOMETRICALLY PATTERNED UNEVEN DULLED SECTIONS FOR TEMPER ROLLING

Takashi Kusaba; Hideo Abe; Akira Torao, all of Chiba; Kusuo Furukawa, Tokyo; Takayuki Yanagimoto, and Hiroaki Sasaki, both of Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Tokyo, Japan

Filed Jul. 13, 1987, Ser. No. 72,429
Claims priority, application Japan, Jul. 14, 1986, 61-165147; Jul. 14, 1986, 61-165148; Nov. 13, 1986, 61-268530; Nov. 19, 1986, 610273946; Jan. 9, 1987, 62-3081; Jun. 5, 1987, 62-140098; Jun. 8, 1987, 62-141617
Int. Cl.[4] B21B *1/00*
U.S. Cl. 29—121.2 16 Claims

1. A work roll for temper rolling a metal sheet comprising; a peripheral surface formed with a plurality of uneven sections in a spaced apart relationship to each other, each uneven section being constituted of a depression and an annular ring shaped projection surrounding said depression, said uneven sections being arranged to have a ratio between a center-to-center distance between adjacent uneven sections and the external dimension of the uneven section in a range of 0.85 to 1.7, and a difference between

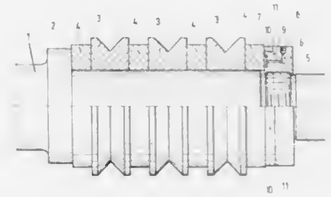
the center-to-center distance and the external size smaller than 280 μm.

4,841,612

ROLL DEVICE COMPRISING A SHAFT AND AT LEAST ONE ROLL RING ARRANGED THEREON

Uwe Kark, Cuxhavener Strasse 60a, 2104 Hamburg 92, Fed. Rep. of Germany

Filed Jul. 5, 1988, Ser. No. 215,299
Claims priority, application Fed. Rep. of Germany, May 27, 1988, 8806968[U]
Int. Cl.[4] B21B *31/00*
U.S. Cl. 29—123 6 Claims



1. A roll device comprising:

a shaft having a longitudinal axis;

at least one roll ring arranged on the shaft;

a collar integral with the shaft and located on one axial side of the roll ring;

a ring stop located on the other axial side of the roll ring, the ring stop being axially adjustable and lockable on the shaft and intended for clamping the roll ring against the collar;

power clamping means for pre-stressing the roll ring toward the collar before the ring stop is adjusted to the clamping position against the roll ring;

wherein the adjustable ring stop includes a support ring (6) axially secured to the shaft and defining a first end face, and an adjusting ring (10) defining a second end face which interacts with the first end face, the end faces (11) having matching sloping flanks distributed as sawtooth-shaped segments over the circumferential extent of the faces, the flanks having a small pitch in relation to the circumferential direction along the faces.

4,841,613

PRESSURE DEVELOPER OR PRESS HAVING A PRESSURE ROLL CONTAINING COMPOSITE MATERIAL

Jack Beery, Centerville, Ohio, and David S. Brookstein, Dedham, Mass., assignors to The Mead Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 62,266, Jun. 15, 1987, abandoned. This application Mar. 8, 1988, Ser. No. 165,214
Int. Cl.[4] B21B *27/00*
U.S. Cl. 29—130 6 Claims

1. A multiple roll press useful for the development of latent images by the rupture of microcapsules on a web or sheet, in which one of the nip-forming pressure rolls comprises:

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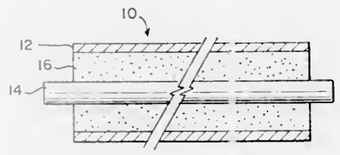
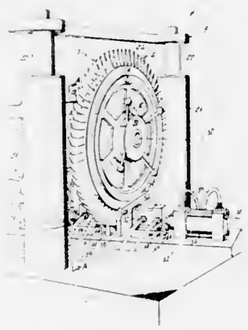
a tubular outer shell member formed of metal and having an outer cylindrical nip-forming surface and defining a cylindrical space therein,

a support shaft disposed in said cylindrical space in generally coaxial relation to said shell member and defining with said member an annular space, and



a composite fiber load-support material disposed in said annular space forming a bond with said shell member and said shaft, said composite fiber load-support material being formed of a wound carbon filament fabric impregnated with an epoxy resin.

4,841,614
METHOD FOR FABRICATING INTEGRALLY BLADED ROTORS
Donald G. MacNitt, Singer Island, and Raymond M. Walker, Port St. Lucie, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.
Filed Feb. 12, 1988, Ser. No. 155,428
Int. Cl.[4] B21K *3/04*; B23P *15/02*
U.S. Cl. 29—156.8 B **8 Claims**



1. A method for superplastic forming an integrally bladed rotor having a rim and a plurality of circumferentially spaced apart blades extending radially outwardly from the rim, to twist the blades from a first degree of twist to a second degree of twist, each blade having a pressure surface and a suction surface, the rotor having a microstructure particularly adapted for superplastic forming, and the rotor made from an alloy having a superplastic forming temperature range, the method comprising the steps of:

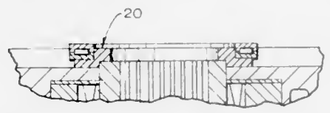
(a) securing the rotor in a fixed position such that the blade to be twisted is aligned between a pair of blade forming dies, one die having a surface for contacting the pressure side of the blade and the other die having a surface for contacting the suction side of the blade;

(b) providing a heating zone for raising the temperature of the blade to be twisted and the rim from which the blade extends to a temperature within the rotor alloy superplastic temperature range while the blade forming dies are maintained at substantially ambient conditions and in noncontacting relation with the blade;

(c) moving the blade forming dies into the heating zone and into contacting relation with the blade while the blade and rim are within the superplastic forming temperature range, and twisting the blade with the dies from the first degree of twist to a second degree of twist; and

(d) after twisting the blade according to step (c), moving the blade forming dies out of the heating zone and out of contacting relation with the twisted blade.

4,841,615
METHOD FOR MODIFYING STATORS
Michael Ratner, 67-33 170th St., Flushing, N.Y. 11365
Filed Mar. 7, 1988, Ser. No. 164,564
Int. Cl.[4] B21K *3/00*
U.S. Cl. 29—156.8 R **5 Claims**



1. A method of rebuilding a stator of a torque converter, said stator having a lip, a shaft opening and a surface, comprising the steps of removing the lip from the surface of the stator, then placing an adapter centrally on or within the shaft opening of the stator with a flange of the adapter lying flush against a surface of the stator and, thereafter, fastening said adapter to said stator.

4,841,616
HELICALLY WOUND ELBOW CONDUIT AND METHOD OF FABRICATING SAME
Daniel E. Whitney, Arlington, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.
Filed Aug. 3, 1987, Ser. No. 81,109
Int. Cl.[4] B21C *37/06*
U.S. Cl. 29—157 A **21 Claims**

1. A method of fabricating helically wound elbow conduit comprising:

constructing a conduit development including a set of sequential segments, each segment having opposing boundaries, a lateral axis parallel to corresponding lateral axes of the other segments, and a longitudinal axis oblique at least in part with respect to the lateral axis and having the same orientation as corresponding longitudinal axes of the other segments in the set; said longitudinal axis being defined as an axis which bisects each segment into identical parts;

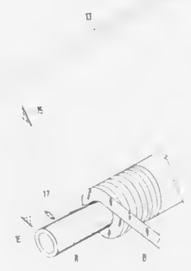
joining the segments end to end and transferring the dimensions of the joined segments to a continuous length of material thereby generating a continuous blank having periodically varying opposing boundaries which differ in phase from each other relative to said longitudinal axis by an amount other than 180 degrees;

defining on each segment of the blank at least one outer alignment mark for establishing an outer ridge line on an outside circumference of the elbow conduit to be fabricated, and defining on each segment at least one inner alignment mark for establishing an inner ridge line on an inner circumference of the elbow conduit to be fabricated; and

helically winding said continuous blank, thereby aligning the inner alignment marks with each other and the outer alignment marks with each other; abutting the opposing boundaries against each other; and

joining the abutting boundaries to each other.

4,841,617
METHOD FOR PRODUCING HEAT EXCHANGER TUBES
Martin Schmidt, Fröndenberg; Karl-Heinz Mayr, and Fritz Fobbe, both of Menden, all of Fed. Rep. of Germany, assignors to R. & G. Schmöle Metallwerke GmbH & Co. KG, Menden, Fed. Rep. of Germany
Filed Aug. 11, 1988, Ser. No. 231,073
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1987, 3726677
Int. Cl.[4] B23P *25/26*
U.S. Cl. 29—157.3 AH **11 Claims**



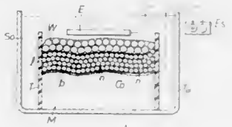
1. In a method of producing metallic heat exchanger tubes having a heat exchange surface that is increased by fins, whereby a rotating tube has helically wound about its outer surface a strip that forms said fins, with said strip being fed to the surface of said tube under tension, and with the bottom edge of said strip being welded to said tube, the improvement comprising the steps of:

fusing the contact surface that exists between said tube and the bottom edge of said strip, and that extends helically on the surface of said tube, exclusively at the surface of said tube via a laser beam that is directed in the region where said strip runs onto the surface of said tube, and that fuses a portion of said tube surface that in the axial direction of said tube corresponds at least to the width of said bottom edge of said strip and in the circumferential direction of said tube corresponds approximately to the same amount;

at the same time fusing with said laser beam said bottom edge of said incoming strip exclusively in the region where said strip runs onto the surface of said tube; and

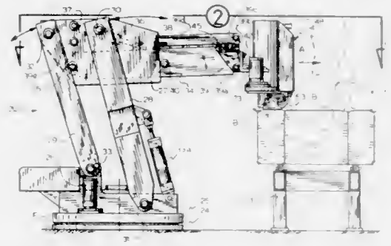
joining said two fused surface areas of said tube surface and said bottom edge of said strip in a gap-free manner as a consequence of said tension that is exerted upon said incoming strip as the same runs up on said tube surface, whereupon during subsequent cooling these two fused surface areas are connected to one another in such a way that a continuous, residual-gap-free welding of said helically wound strip with said tube results.

4,841,618
METHOD OF MANUFACTURING AN ELECTROCAST SHELL HAVING PERMEABILITY
Tamio Furuya, Hidaka; Yuichi Tazaki, Sakado; Toshiyuki Kinugasa, Hidaka; Yoshiki Ishige, Tokorozawa, and Yuichi Tsuchimoto, Sakado, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 813,252, Dec. 24, 1985, abandoned. This application Oct. 8, 1987, Ser. No. 106,238
Claims priority, application Japan, Jan. 11, 1985, 60-2669
Int. Cl.[4] C25D *1/08*
U.S. Cl. 29—423 **21 Claims**



1. A method of manufacturing an air permeable electrocast shell with a grain pattern on a surface thereof comprising forming a conductive layer on a surface of a model having a grain pattern such that said grain pattern is formed on said conductive layer; placing a layer of elutable particles into close contact with the surface of said conductive layer remote from the model; effecting an electrocasting treatment on said model so that portions between said conductive layer and said particles, except for contacting portions between said conductive layer and said particles and between adjoining particles, are filled by a deposited metal to form an electrocast shell, the metal being deposited in an amount such that the electrocast shell has a thickness less than that of said layer of particles; separating said electrocast shell from said model and eluting said particles from said electrocast shell to form fine vent holes in the shell having openings at both surfaces of said shell, the contacting portions of the elutable particles forming interconnecting passages between adjoining vent holes after elution of said particles, said contacting portions between said conductive layer and said particles becoming the openings at one of the surfaces of said shell at which said grain pattern is formed.

4,841,619
DEWIRING TOOL
Mario Thériault, 55 Madawaska St., St-Jacques, New Brunswick, Canada (E0L 1K0)
Filed Nov. 18, 1987, Ser. No. 122,212
Int. Cl.[4] B23P *19/00, 19/02*; B31B *1/25*
U.S. Cl. 29—426.3 **14 Claims**



1. A tool for cutting and removing bale strapping wires comprising: a casing, an open-ended tube rotatably mounted in said casing, first power means carried by said casing to rotate said tube in either direction; said tube having an outer end

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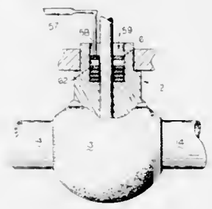
portion protruding from said casing and terminated by a free end edge, said outer end portion having a pair of diametrically-opposed slits, each formed of an outer portion with a slit opening at said end edge and inwardly spiralling through a fraction of a turn and of an inner portion having a junction with said outer portion and extending generally parallel to the tube longitudinal axis; said tube free edge adapted to be pressed against a bale surface with an overlying wire engaging the slit openings; rotation of said tube by said first power means in one direction causing said wire to engage said outer spiral slits and to become spaced from said bale surface until said wire reaches the junction of said inner and outer slit portions to take a first position; a grabber arm mounted in said tube for reciprocating movement longitudinally of said tube, second power means to reciprocate said grabber arm, the latter having a hook at its outer portion facing inwardly for hooking said wire in said first position, and cutting means in said tube for engaging and cutting said wire upon the latter being moved inwardly through said inner slit portions by inward movement of said grabber arm.

4,841,620

METHOD OF EXTRACTING PACKING MATERIAL FROM A STUFFING BOX

Thomas E. Kadlub, Cherokee County, Ga., assignor to Movats Incorporated, Kennesaw, Ga.

Continuation of Ser. No. 40,984, Apr. 21, 1987, Pat. No. 4,768,273. This application May 9, 1988, Ser. No. 191,375
Int. Cl.[4] B23P *19/02*
U.S. Cl. 29—426.4 **2 Claims**



1. Method of extracting packing material from a stuffing-box, said method comprising the steps of:

supporting a spray nozzle in a first position at the stuffing-box with the nozzle outlet positioned within the cavity of the stuffing-box;

directing fluid under pressure from the nozzle outlet in the first position at the stuffing material thus loosening the material and forcing the packing material to move toward the mouth of the stuffing-box and to push against the nozzle outlet;

maintaining a biasing force on the spray nozzle biasing the nozzle toward the mentioned first position;

overcoming the biasing force by a combination of the reactionary force on the nozzle in response to the fluid escaping the nozzle outlet under pressure and the pushing force of the packing material pushing against the nozzle outlet; and

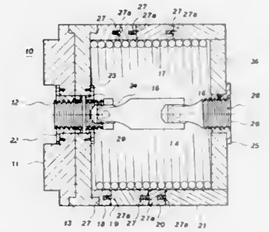
continuing to direct fluid under pressure from the nozzle into the stuffing-box to overcome the biasing force and maintain movement of the packing material together with the nozzle toward the mouth of the stuffing-box.

4,841,621

SHAFT ADJUSTER

Herbert H. Harry, Los Alamos, N. Mex., assignor to The United States of America as represented by The United States Department of Energy, Washington, D.C.

Filed Mar. 11, 1988, Ser. No. 167,206
Int. Cl.[4] B23Q *3/18*
U.S. Cl. 29—464 **3 Claims**



1. Apparatus for adjusting the axial alignment of a shaft extending from a base in a high power device comprising:

a plurality of adjacent rotatable cylinders having substantially equal diameters and angled faces interposed between said base and said shaft effective to produce an axial offset between said base and said shaft, said cylinders comprising an electrically conductive and structurally rigid material;

pin means attached to said base and to said shaft and axially located with respect to said cylinders for maintaining said angled faces of said cylinders in releasable sliding contact; and

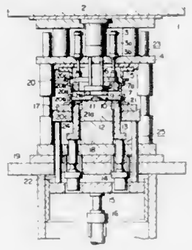
coiled spring means disposed within said plurality of cylinders for stabilizing said plurality of cylinders when contact between adjacent ones of said plurality of cylinders is released by said pin means.

4,841,622

APPARATUS FOR INTERFERENCE-FITTING AN INNER MEMBER WITH AN ANNULAR OUTER MEMBER

Tadao Murano, Zama; Hisao Hirata, Hiratsuka; Toshimitsu Hayakawa, Toyokawa, and Takeshi Saito, Yokohama, all of Japan, assignors to Topy Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1988, Ser. No. 224,906
Claims priority, application Japan, Jul. 28, 1987, 62-186516
Int. Cl.[4] B23P *19/02*
U.S. Cl. 29—525 **12 Claims**



1. An apparatus for interference-fitting an inner member with an annular outer member, said inner member having a flat portion substantially perpendicular to an axis of the inner member and a substantially cylindrical flange extending from an outermost end of said flat portion, said apparatus comprising:

means for carrying said inner member thereon at said flat portion of said inner member, said carrying means having a guide for centering said inner member;

means, arranged above said carrying means and moveable relative to said carrying means, for pushing said flat portion of said inner member against said carrying means to fixedly hold said inner member between said carrying means and said pushing means;

means, arranged radially outside said carrying means, for floatingly supporting said flange of said inner member before said inner member is fixedly held between said pushing means and said carrying means and securely supporting said flange of said inner member after said flat portion of said inner member has been fixedly held between said pushing means and said carrying means;

means, arranged coaxially with respect to said carrying means, for centering said outer member coaxially to said inner member which has been centered by said carrying means; and

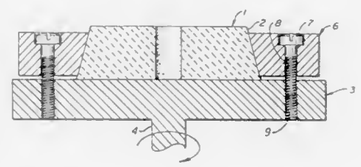
means, provided against at least one of said inner and outer members, for moving one of said inner and outer members relative to the other of said inner and outer members to interference-fit said inner and outer members with each other.

4,841,623

METHOD OF MOUNTING STONES IN DISC OR ATTRITION MILLS

James C. Rine, 1016 Lake Montgomery Dr., Lake City, Fla. 32055

Continuation-in-part of Ser. No. 689,147, Jan. 7, 1985, abandoned. This application Jan. 6, 1987, Ser. No. 676
Int. Cl.[4] B23P *19/04*
U.S. Cl. 29—525.1 **5 Claims**



1. A method of mounting abrasive wheels or wheel segments on a drive table for operation at surface speeds in excess of 4,000 surface feet per minute the improvement comprising prestressing the wheels or wheel segments applying an inwardly directed radial compressive force on the wheel greater than 1,000 psi to counter tension loads during use.

4,841,624

METHOD OF PRODUCING A THIN FILM MAGNETIC HEAD

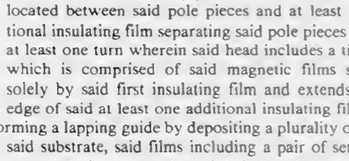
Eisei Togawa, Odawara; Saburo Suzuki, Minamiashigara; Kenji Sugimoto, and Shunichiro Kuwatsuka, both of Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 11, 1988, Ser. No. 142,696
Claims priority, application Japan, Jan. 13, 1987, 62-4081
Int. Cl.[4] G11B *5/42*
U.S. Cl. 29—603 **9 Claims**

1. In a method of producing a thin film magnetic head having an air bearing surface by successively depositing on a substrate a first magnetic material, a gap material, an electrically conductive material consisting of a coil, in insulating film, a second magnetic material and a protecting film, the improvement which comprises:

(i) a step following the depositing of said insulating film of forming a recessed portion in said insulating film in a region where there exists no conductive material on the air bearing surface side of the coil, said recessed portion having tapered side surfaces and a rectangular shape in cross section that is in parallel with said gap material layer, and of exposing the upper surface of said gap material to form a bottom surface corresponding to a position for forming the gap of said head;

(ii) a step of removing said gap material by etching using said



insulating film with said recessed portion as a mask, and making the thickness of the rectangular portion of said gap material corresponding to said recessed portion equal to a predetermined gap length;

(iii) a step of removing unnecessary portions of said gap material and of said insulating film; and

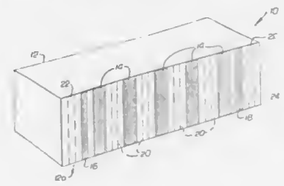
said step of depositing said second magnetic material being after said step (iii) has been finished and including depositing said second magnetic material onto the gap material to form a gap of the predetermined gap length.

4,841,625

AUTOMATIC THROAT HEIGHT CONTROL FOR FILM HEAD

Erich P. Valstyn, Santa Barbara, Calif., assignor to Computer and Communications Technology Corporation, San Diego, Calif. and Magnetic Peripherals, Inc., Minneapolis, Minn.

Division of Ser. No. 375,714, May 7, 1982, Pat. No. 4,511,942. This application May 3, 1984, Ser. No. 592,346
Int. Cl.[4] G11B *5/42*
U.S. Cl. 29—603 **7 Claims**



1. A method of making a thin film magnetic head comprising the steps of:

forming a head by depositing a plurality of films on a substrate, said films including a pair of magnetic films defining pole pieces, a first insulating film separating said pole pieces to define a head gap, at least one conductive turn located between said pole pieces and at least one additional insulating film separating said pole pieces from said at least one turn wherein said head includes a tip portion which is comprised of said magnetic films separately solely by said first insulating film and extends from an edge of said at least one additional insulating film;

forming a lapping guide by depositing a plurality of films on said substrate, said films including a pair of sensor films separated along a portion of their length by at least one additional film and having a connection therebetween, wherein said additional film is deposited during the same said depositing step as deposits said additional insulating

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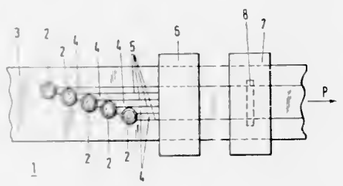
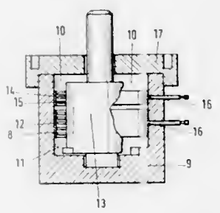
film of said head and offset form the edges of said additional insulating film a predetermined distance; and
lapping said tip portion and lapping guide until the connection between said sensor films is broken to thereby form pole faces which are spaced from the edge of said additional insulating film by said predetermined distance.

4,841,626
PROCESS FOR FORMING NONLINEAR RESISTANCE TRACKS

Franz Griebel, Bad Neustadt/Saale, Fed. Rep. of Germany, assignor to Preb, Elecktrofeinmechanische Werke, Jakob Preh, Nachf. GmbH & Co., Bad Neustadt/Saale, Fed. Rep. of Germany

Filed Sep. 11, 1987, Ser. No. 95,471
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1986, 3631057
Int. Cl.[4] H01C *17/06*
U.S. Cl. 29—620 **2 Claims**



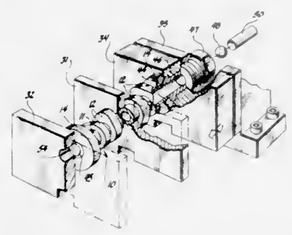


1. A process for forming nonlinear resistance tracks for rotary potentiometers, comprising:
feeding a supporting base, made of a flexible strip-shaped foil, under a coating device in a feeding direction;
wet-applying, with said coating device, a plurality of resistance pastes beside each other along said strip-shaped foil so as to form strips extending in said feeding direction, said resistance pastes having different resistance values so as to form a predetermined non-linear resistance pattern in a direction perpendicular to the feeding direction, said resistance pastes flowing inside each other in edge regions after being applied;
drying the resistance pastes located on said strip-shaped foil;
cutting a plurality of base strips out of said strip-shaped foil, said base strips extending in the direction perpendicular to the feeding direction;
curving the plurality of base strips into an annular shape;
arranging each of the annularly-curved base strips in a rotary potentiometer.

4,841,627
APPARATUS FOR MAKING TUBULAR CAMSHAFT ASSEMBLIES

Philip D. Arnold, Bloomfield Hills, and Roy G. Kaywood, Stockbridge, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 23,320, Mar. 9, 1987, abandoned. This application Jun. 24, 1988, Ser. No. 211,505
Int. Cl.[4] B23Q *15/26*
U.S. Cl. 29—720 **18 Claims**

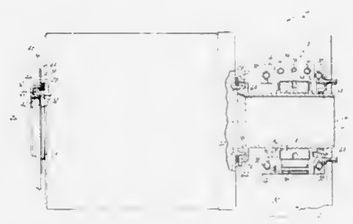


1. Apparatus for assembling a multipiece camshaft, said apparatus comprising
locating means for holding a plurality of hollow cam and journal elements in predetermined fixed orientation and spacing with central openings aligned on a common axis,
positioning means including a stop for axially locating one end of a hollow shaft extending through the openings of said elements,
force applying means engageable with an opposite end of the hollow shaft and operable to load the shaft against the stop with a force adequate to prevent substantial axial growth of the shaft during subsequent expansion, and
means for mechanically expanding the shaft into mechanical interference engagement with all the element openings to secure the elements permanently onto the shaft in said predetermined orientation and spacing.

4,841,628
FILTER REPLACEMENT MECHANISM

David P. Nagle, Windsor Locks, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1987, Ser. No. 135,906
Int. Cl.[4] B23P *19/00*
U.S. Cl. 29—723 **6 Claims**



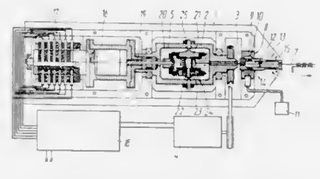
1. Apparatus for loading and unloading a nuclear and biological filter which has an inlet portion and an outlet portion and is disposed for use within an environmentally sealed military vehicle, said apparatus being characterized by:
a housing means disposed within said vehicle for enclosing said filter, said housing means having an inlet, an outlet, and a mounting disposed between said inlet and outlet,

said filter being loaded and unloaded between said inlet and said mounting; and
means for loading and unloading said filter under adverse environmental conditions, said means for loading and unloading said filter being attached to said mounting, said means for loading and unloading said filter comprising;
a nut for providing a rotational loading or unloading force, said nut having a first threaded portion disposed upon an interior surface thereof,
a sleeve means having a second threaded portion on an exterior surface thereof cooperating with said first threaded portion for transferring said loading or unloading force from said nut to said filter such that said filter is unloaded or sealingly loaded between said inlet and said mounting, and
locking means disposed about said sleeve means and said nut for ensuring that said sleeve means does not unload said filter unless required.

4,841,629
APPARATUS FOR THREADING A WIRE THROUGH MAGNETIC CORES OF A MEMORY MATRIX

Algimantas Y. Fedaravichjus, ulitsa Gvardechju, 98, kv.22.; Algis A. Kazla, ulitsa Topolju, 2, kv.12.; Klemensas K. Rimshyalis, ulitsa 50-letia SSSR, 48, kv.68., and Kazimeras M. Ragulskis, ulitsa Donelaichio, 17, kv.2., all of Kaunas, U.S.S.R.

Filed Aug. 6, 1987, Ser. No. 82,378
Int. Cl.[4] H01F *41/08*
U.S. Cl. 29—737 **2 Claims**



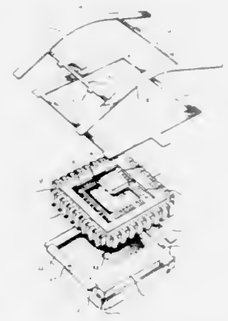
1. An apparatus for threading a wire through magnetic cores of a memory matrix comprising a housing; a shaft provided with an axial passage, accommodated inside said housing and having a cavity in its central portion; a drive for rotating said shaft; a spool for carrying wire to be threaded through said cores accommodated inside said cavity of said shaft mounted for rotation about its own axis and about an axis perpendicular to said shaft; a pneumatic transport unit disposed inside said housing before said shaft and including a guide with a central passage to allow said wire therethrough arranged in line with said axial passage of said shaft, walls of said guide having passages for feeding compressed gas to said central passage of said guide and passages for discharging compressed gas from said central passage of said guide; a reversible drive rigidly affixed on said shaft for moving the wire on said spool, said reversible drive being arranged on the opposite side of the spool in relation to said pneumatic transport unit.

4,841,630
FABRICATION OF LEADED PACKAGES

Leon Lubranski, 10 Christopher Ct., Lodi, N.J. 07644, and Theodore J. Sattler, P.O. Box 366, RD#4, Easton, Pa. 18042

Filed Mar. 11, 1988, Ser. No. 167,070
Int. Cl.[4] H05K *13/00, 13/04*
U.S. Cl. 29—827 **10 Claims**

1. A method of fabricating a package which includes a housing and conductive leads extending beyond the borders of the housing, the method comprising the step of temporarily mounting the package with said leads within a carrier, said carrier comprising means for enclosing said leads, while a

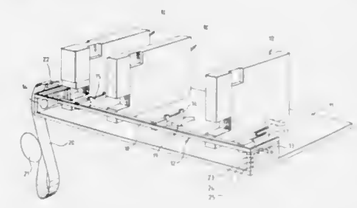


portion of said housing is exposed, so as to prevent damage to said leads due to forces applied to said package.

4,841,631
CABLE SUPPORTING APPARATUS

John A. Selby, Wokingham, England, assignor to Thomas & Betts Corporation, Bridgewater, N.J.

Filed Apr. 28, 1987, Ser. No. 43,667
Claims priority, application United Kingdom, Apr. 28, 1986, 8610322
Int. Cl.[4] H01R *43/04*
U.S. Cl. 29—749 **9 Claims**



1. Apparatus for supporting cable and for presenting cable to connector applying means, which apparatus comprises a base and cable support means mounted on the base for supporting a length of cable, said cable support means being movable relative to said base from a cable loading position, in which cable loading position, in use, said cable support means is spaced from said connector applying means, and a working position, in which working position, in use, cable supported on said cable support means is presented to said connector applying means for application of connector means to said cable, wherein said cable support means comprises a plurality of cable support elements selectively positionable thereon and an elongate member on which member said cable support elements are selectively positionable;
said apparatus further comprising means for controlling movement of said elongate member such that a cable supported on said cable support elements extends normal to the direction of movement of said elongate member, wherein said elongate member is supported at least at each end thereof on arm means extending in the direction of movement of the elongate member, and said movement controlling means comprises roller means in engagement with each said arm means, the roller means being fixed for rotation one with another, whereby unit movement of one

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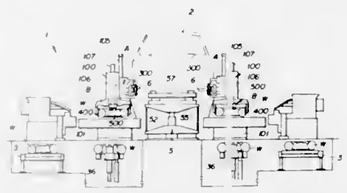
arm means will result in unit movement of the other arm means.

4,841,632

AUTOMATIC WHEEL ATTACHMENT APPARATUS

Kou Namiki; Takaji Mukumoto, and Keiichiro Gunji, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1987, Ser. No. 53,263
Int. Cl.[4] B23P *21/00*
U.S. Cl. 29—787 **9 Claims**



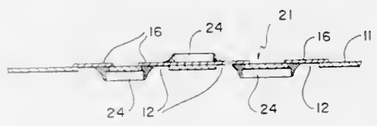
1. An automatic wheel attachment apparatus for attaching a wheel to a wheel attachment member of an automotive body, the wheel attachment member having a wheel attachment surface with wheel attachment bolts thereon, said automatic wheel attachment apparatus comprising:
- a reorienting device for reorienting a wheel attachment surface of the wheel attachment member;
- a phasing device for phasing said wheel attachment bolts, said phasing device being movable longitudinally and vertically of said automotive body to bring said wheel attachment member and the phasing device into central alignment with each other;
- a detecting device for detecting the amount and direction of movement of said phasing device;
- a control means for determining a position of said wheel attachment member based on a signal from said detecting device;
- a nut runner for fastening the wheel to the wheel attachment member while the position of said wheel attachment member as determined by said control means is being held in alignment with the center of said wheel; and
- at least said reorienting device, said phasing device, and said detecting device being combined in a single robot.

4,841,633

METHOD OF MOUNTING ELECTRONIC PARTS ONTO SINGLE-SIDED PRINTED WIRING BOARD

Seiichi Kinugawa, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 835,752, Mar. 3, 1986, abandoned. This application Nov. 4, 1988, Ser. No. 267,290
Claims priority, application Japan, Mar. 6, 1985, 60-45666
Int. Cl.[4] H05K *3/30*
U.S. Cl. 29—837 **12 Claims**



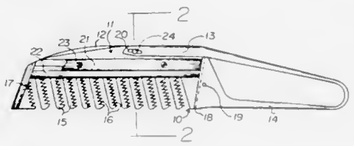
1. A method of mounting electronic parts onto a circuit board comprising the steps of:
- (a) providing a board with at least one through-hole;
- (b) providing a conductive pattern on one side of said board with a portion of said conductive pattern covering said at least one through-hole;
- (c) providing at least one electrical component in said at least one through-hole and connecting said component to said portion of said conductive pattern and
- (d) providing a key-contact pattern on said one side of said board.

4,841,634

HAIR CUTTING DEVICE

Wang M. Cho, 220 S. Roselle, Apt. 224, Schaumburg, Ill. 60193

Filed Dec. 12, 1988, Ser. No. 283,163
Int. Cl.[4] B26B *13/00*
U.S. Cl. 30—30 **4 Claims**



1. A hair cutting device comprising:
a comb member including:
- a comb body,
- a plurality of comb teeth disposed in one side of said comb body, said comb teeth containing a plurality of saw-toothed members,
- a pair of blade channels disposed at both sides of said comb body, and
- a bias handle extending from said comb body, to an integral extension having an elliptical aperture; and a razor member including:
- a razor body having a blade holder
- a blade for engaging with said blade holder, and
- an engagement member having a raised portion for being adapted to operatively engage with said elliptical aperture of the integral extension,

whereby upon grasping the handle, the razor member moves downward to cut hairs retained within the plurality of the comb teeth and saw-toothed members.

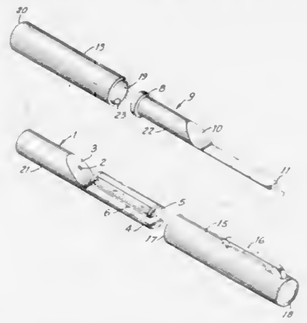
4,841,635

SHAVING DEVICE

Ennio S. Maurizi, Port Washington, N.Y., and Joannis A. Loizou, Union, N.J., assignors to Maurizi & Loizou Inc., Union, N.J.

Filed Apr. 28, 1988, Ser. No. 187,594
Int. Cl.[4] B26B *19/44*
U.S. Cl. 30—41 **3 Claims**

1. A substantially cylindrical pocket razor having:
- a substantially cylindrical body shaft having an upper portion and a lower portion, wherein the upper portion includes a slanted segment which is not parallel to the lower portion and front and back segments which are substantially parallel to the lower portion, the lower portion is substantially parallel to the shaft axis, the front segment of the shaft has a reduced diameter, the back segment has an interior chamber for containing shaving gel, and the slanted or front segment has one or more openings for removing the gel from the chamber;
- a razor blade base pivotably or removably attached to the front segment of the body shaft with a connector, the base having a razor blade;
- a substantially cylindrical plunger communicating with the body shaft, the plunger having an upper portion and a lower portion, wherein the upper portion includes a slanted segment which is not parallel to the lower portion and front and back segments which are substantially parallel to the lower portion, the lower portion is substantially parallel to the plunger axis which is substantially parallel to the shaft axis, wherein a major portion of the plunger has a diameter smaller than the inside diameter of the shaft, and wherein the communication is such that the plunger is slidable within the shaft;
- a substantially cylindrical plunger end cap having a closed end and an open end, the plunger cap having a diameter greater than either the plunger or the shaft, wherein the plunger cap interior surface communicates with the shaft outside surface and is capable of sliding along the shaft axis, and wherein plunger cap interior surface projections communicate with the plunger and transfer force which is administered to the plunger cap in the direction of the shaft front segment, to the plunger; and
- a substantially cylindrical shaft end cap having a closed end and an open end, the shaft cap having a diameter greater than the shaft, wherein the shaft cap interior surface communicates with the shaft outside surface and is capable of sliding along the shaft axis.

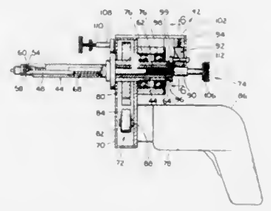


4,841,636

POSITIVE DRIVE MECHANISM FOR UNIFORM FEED OF INTERNAL TUBE CUTTER

Thomas B. Huggins, Sr., Columbia, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 31, 1987, Ser. No. 91,563
Int. Cl.[4] B23D *21/03, 21/14*
U.S. Cl. 30—107 **15 Claims**



1. In combination with an internal tube cutter including an elongated cutter body insertable into a tube to be severed, a cutting wheel, means supporting said cutting wheel on a forward portion of said cutter body and being movable radially of said cutter body for advancing and retracting said cutting wheel toward and away from the tube, and an elongated member mounted through said cutter body for movement longitudinally thereof in one direction to cause outward radial movement of said cutting wheel supporting means and advancement of said cutting wheel toward and into contact with the tube to cause severing of the same upon rotation of said cutter body and in an opposite direction to permit inward radial movement of said cutting wheel supporting means and retraction of said cutting wheel away from and out of contact with the tube, a positive drive mechanism comprising:
- (a) a housing rotatably mounting said cutter body;
- (b) a cutter body drive portion mounted to said housing and drivingly interconnected to said cutter body, said drive portion being operable for rotating or counterrotating cutter body; and
- (c) a cutter wheel feed portion including
  - (i) a feed member rotatably threadably mounted in a rear portion of said cutter body and engaged with said elongated member of said cutter, said feed member while being maintained stationary threading into said cutter body and causing movement of said elongated member in said one direction toward said cutting wheel supporting means as said cutter body is rotated in one direction, said feed member while being held stationary unthreading from said cutter body and permitting movement of said elongated member in said opposite direction away from said cutting wheel supporting means as said cutter body is counterrotated in an opposite direction,
  - (ii) a ratchet attached to said feed member for rotatable movement therewith,
  - (iii) a pawl pivotally mounted to said housing adjacent said ratchet for movement into and out of engagement therewith, said pawl when engaged with said ratchet maintaining said ratchet and feed member therewith stationary relative to said cutter body whereby said feed member threads into said cutter body upon rotation thereof, said pawl when disengaged from said ratchet permitting said ratchet and feed member to rotate with said cutter body,
  - (iv) biasing means normally urging said pawl into engagement with said ratchet,
  - (v) a cam attached to said rear portion of said cutter body for rotation therewith and having a periphery with first and second portions,
  - (vi) a cam follower mounted to said pawl and riding in engagement with said periphery of said cam such that as said cam rotates with said cutter body and said cam follower rides on said first peripheral cam portion said pawl is displaced toward said ratchet allowing said biasing means to urge said pawl into engagement with said ratchet, whereas as said cam follower rides on said second peripheral cam portion said pawl is displaced away from said ratchet and disengaged from said ratchet, and
  - (vii) means connected to said feed member for permitting holding the latter stationary to cause said unthreading thereof from said cutter body and permit said movement of said elongated member in said opposite direction away from said cutting wheel supporting means as said cutter body is counterrotated in said opposite direction.

4,841,637

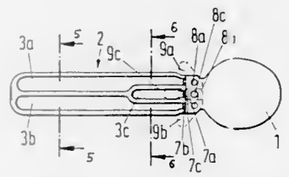
DISPOSABLE FLATWARE

Werner Scholzen, Jahnstrabe 12, Haan, Fed. Rep. of Germany

Filed Sep. 9, 1988, Ser. No. 243,063
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730507
Int. Cl.[4] B26B *1/00*
U.S. Cl. 30—125 **8 Claims**

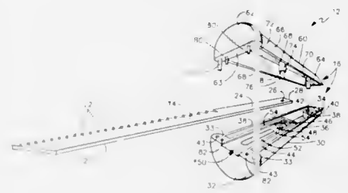
1. Flatware, especially a spoon, for throwaway or disposable use, with said flatware comprising:
- a front work part; and
- a rear handle that is formed on said work part and in which are provided a plurality of chambers that are separated from one another for receiving different ingredients; respective channels that are separated from one another are

provided in said handle and establish communication between said chambers and respective discharge outlets



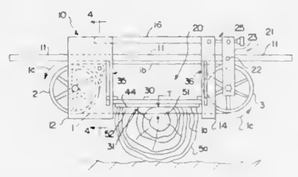
that are disposed in the vicinity of where said work part and said handle merge, and that are closed-off until used.

4,841,638
HAND-HELD CUTTING TOOL APPARATUS
John P. Bardeen, Denver, Colo., and Jerry K. Ellefson, Granite Shoals, Tex., assignors to Pumpkin, Ltd., Denver, Colo.
Filed Sep. 4, 1987, Ser. No. 93,494
Int. Cl.[4] A26B *1/00*
U.S. Cl. 30—332 18 Claims



1. A hand-held tool apparatus adapted for cutting relatively soft materials, comprising a tool element having an elongated shank on one end thereof and a cutting element projecting oppositely of said shank along a tool axis, and an elongated handle assembly having a handle axis, front and rear surfaces extending transversely to said handle axis and an outer surrounding side surface extending between said front and rear surfaces, said handle assembly operative to receive said shank along said handle axis to mount said tool element so that the cutting element projects outwardly and forwardly of the front surface, said handle assembly being constructed of two complementary first and second handle sections, the first handle section having a first front end portion extending transversely of said handle axis and a first central portion extending inwardly from a first side surface portion and the second handle section having a second front end portion extending transversely of said handle axis and having a second central portion extending inwardly from a second side portion, one of said first and second central portions having a longitudinal channel along said handle axis, said channel configured to receive the inner end of said shank in close-fitted engagement, securing means for securing said first and second handle sections together whereby said first and second end portions form said front surface, said first and second central portions sized to have opposed internal faces spaced apart to receive and support an inner end of said shank in close-fitted engagement therebetween, said first and second front end portions configured whereby said front surface has an axial opening therethrough sized to receive said shank, and cooperative engageable mounting means on said inner end of said shank and said first and second central portions for lockably securing said shank within said handle assembly when said first and second handle sections are secured together.

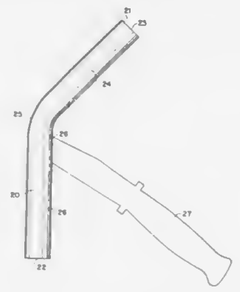
4,841,639
HAND OPERATED PORTABLE BAND SAW FOR CUTTING BOARDS FROM A LOG
Frank X. Graney, 50 Vale St., Tewksbury, Mass. 01876
Filed Jan. 27, 1987, Ser. No. 6,891
Int. Cl.[4] B27B *15/02*
U.S. Cl. 30—380 18 Claims



1. Portable band saw apparatus for cutting a board from a log comprising,
(a) a band saw having two upstanding wheels spaced on parallel axes and a continuous cutting band looped around each of said wheels providing the band cutting length from the bottom of one wheel to the bottom of the other wheel and the band return length from the top of one wheel to the top of the other wheel,
(b) a frame having first and second members that carry said wheels and a top transverse member that connects said first and second members,
(c) the return length of said band being below said frame transverse member,
(d) the space between said cutting length, said return length and said frame first and second members being large enough for the piece cut from said log to fit through and
(e) means carried by said frame in said space for riding on said log, including:
(f) a track on said frame first and second members extending downward from said return length of said band to just above said cutting length of said band and,
(g) a platform for riding on said log, moveably attached to said track so that said platform can be positioned on said track at any of a plurality of positions from an upper position on said track, just below said return length of said band, to a lower position, just above said cutting length of said band,
(h) whereby said apparatus rides on said log the length thereof and cuts said piece therefrom and the thickness of said piece is determined by the position of said platform on said track.

4,841,640
HAND AND GUT GUARD
Charley H. Daniels, 213 Arthur Moore Dr., Green Cove Springs, Fla. 32043
Continuation of Ser. No. 895,287, Aug. 11, 1986, abandoned.
This application Apr. 5, 1988, Ser. No. 180,592
Int. Cl.[4] B26B *29/02*
U.S. Cl. 30—294 2 Claims

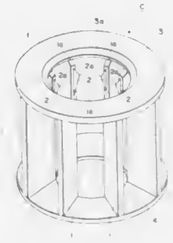
1. A knife guard for use in skinning animals comprising a rigid unitary tubular pipe section bent in the middle to form two linear portions joined to each other through a bent portion such that the included angle between the said linear portions is about 135°, and a lengthwise slit through the wall in one of said linear portions from adjacent said bent portion to adjacent the end of said portion and facing said included angle, each said linear portion having a longitudinal axis lying in substantially the same plane as that including said slit.



4,841,641
CHAIN SAW SAFETY STRUCTURE
Gerry A. Laidlaw, 6816 Barber Pl., NE., Albuquerque, N. Mex. 87109
Filed Feb. 16, 1988, Ser. No. 156,465
Int. Cl.[4] B27B *17/02*
U.S. Cl. 30—382 13 Claims

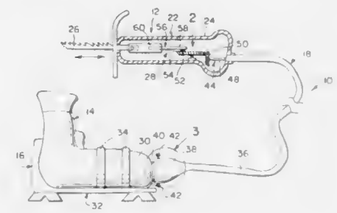
1. Chain saw safety structure, for use by an operator of a chain saw having a chain saw housing containing a chain saw motor means for driving a cutting chain mounted upon the perimeter of a chain guide projecting from the forward end of said chain saw housing, for allowing said operator to readily and safely hold and operate said chain saw with one arm of said operator and for retarding kickback of said chain saw, said chain saw safety structure being hereinbelow described with reference to operation of said chain saw in a horizontal configuration of said chain guide although operation in said horizontal configuration is not necessary, comprising:
(a) support lever means, pivotally connected to said chain saw housing, having a principal longitudinal axis and having a length just slightly less than the length of the forearm of a typical operator of said chain saw, for allowing the forearm of said operator to exert leverage for retarding kickback of said chain saw;
(b) lock means, connected to said support lever means and to said chain saw housing, for locking said support lever means in a fixed orientation when said support lever means is rotated to the rear of said chain saw housing to an orientation in which the principal longitudinal axis of said support lever means is at least substantially parallel to said chain guide;
(c) securing means, connected to said support lever means, for securing said support lever means to the forearm of said operator.

4,841,642
CUTTER
Toshiaki Kunishima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 15, 1987, Ser. No. 3,627
Claims priority, application Japan, Jan. 28, 1986, 61-014845
Int. Cl.[4] B26B *3/00*
U.S. Cl. 30—303 8 Claims



1. A cutter for cutting an object comprising:
a hollow structure having a ring-shaped forward end and a ring-shaped rearward end, with said forward end and said rearward end being in substantially parallel planes with each other, and a plurality of support portions connecting said forward end and rearward end and extending in a plane substantially perpendicular thereto;
a plurality of cutting edges for cutting the object, said cutting edges being supported by said support portions toward said rearward end thereof, and each cutting edge having a first and second side ascending gradually from said support portion to form an inwardly protruding vertex;
a guide portion provided on an inner circumference of said forward end for guiding said cutting edges over the object when said cutting edges cut the object; and
an outwardly extending slope portion provided on an inner surface of said rearward end.

4,841,643
DRILL POWERED SABER SAW
Vincent J. Colella, 1N 120 Morse, Wheaton, Ill. 60188, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007
Filed Apr. 22, 1988, Ser. No. 184,893
Int. Cl.[4] B77B *19/00*
U.S. Cl. 30—500 5 Claims



1. A device for actuating a saber saw from a hand drill which comprises:
(a) means for securing the hand drill in a stationary position;
(b) an elongated flexible operating cable extending from the chuck of the hand drill; and
(c) a saber saw unit including a housing, a blade and a drive

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mechanism with the housing driven by said cable, said drive mechanism converts rotary motion from motor of the hand drill to a reciprocating motion to said saber saw blade so that a person holding said saber saw unit can reach difficult places a standard saber saw will not reach.

4,841,644

METHOD AND SYSTEM OF TESTING GEAR TEETH OF CIRCULAR SPACING OF GEAR TEETH OF A GEAR WHEEL

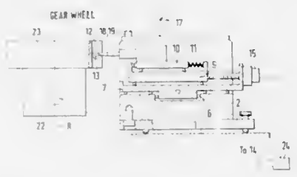
Hans-Ulrich Bertz, Rastatt, Fed. Rep. of Germany, assignor to Ing. Willy Höfler, Karlsruhe, Fed. Rep. of Germany

Filed Mar. 30, 1988, Ser. No. 175,153

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1987, 3712920

Int. Cl.[4] G01M *13/02*

U.S. Cl. 33—179.5 R **13 Claims**



1. A method of testing gear teeth and the circular spacing of gear teeth and gaps between gear teeth of a gear wheel (23), particularly the pitch of large gear wheels, utilizing a testing apparatus (2) having a single testing head (13), comprising the steps of

(a) positioning the testing head (13) at a reference position and placing the gear wheel opposite the testing head with a tooth gap facing the testing head;

(b) with the gear wheel stopped; introducing the testing head into a facing tooth gap;

(c) sensing and measuring the position of two flanks of teeth defining said facing tooth gap;

(d) recording sensed and measured data;

(e) withdrawing the testing head (13) from said facing tooth gap;

(f) with the gear wheel still stopped, moving the testing head to an adjacent tooth gap;

(g) repeating steps (b) to (f) until the testing head cannot be moved further to an adjacent tooth gap;

(h) then returning said testing head to at least approximately the reference position;

(i) rotating said gear wheel to a position in which the testing head, when at least approximately at the reference position, can be introduced into a tooth gap which is defined by at least one of the flanks sensed and measured in steps (b) to (g), to thereby determine the rotated position of the gear wheel (23); and

(j) repeating the steps (b) to (i) until the gear wheel was moved through one revolution.

4,841,645

VAPOR DRYER

H. Dean Bettcher, Santa Clara; Gary D. Bettcher; Galen D. Bettcher, both of Morgan Hill, and Ralph D. Bettcher, Santa Clara, all of Calif., assignors to Micro Contamination Components Industries, Santa Clara, Calif.

Filed Dec. 8, 1987, Ser. No. 130,131

Int. Cl.[4] F26B *21/06*

U.S. Cl. 34—78 **10 Claims**

1. A product drying system comprising:

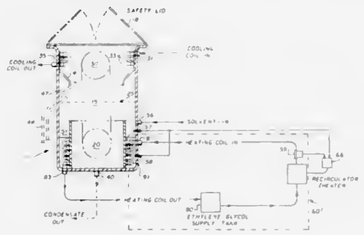
tank means including

means forming an interior chamber having a top opening for receiving products,

an upper-portion forming a drying and cooling zone,

a lower portion forming a saturating and heating zone within which a hot vapor cloud is to be formed, and

condensate diversion means disposed within said lower portion for collecting substantially all of the condensation formed by the cooling of said vapor cloud and for discharging said condensation from the tank means so that said condensation does not contaminate said vapor cloud;



cooling means for cooling said upper portion to prevent said vapor cloud from rising through said opening; and

means for creating a hot vapor cloud in said lower portion;

whereby products disposed within said chamber and immersed in said vapor cloud become saturated with hot vapor which condenses on the surface thereof and removes water as it drips therefrom to be collected and discharged from said tank means by said condensate diversion means.

4,841,646

BODY WARMER APPARATUS

Leon P. Maurer, Jr., R.D. #1, Box 59A, Hegins, Pa. 17938

Filed Feb. 1, 1988, Ser. No. 150,734

Int. Cl.[4] A43B *7/02;* **A61F** *7/08*

U.S. Cl. 36—2.6 **1 Claim**

1. A boot warmer apparatus for selective securement about a boot having an ankle portion, an instep portion and a sole portion wherein said apparatus comprises,

an elongate flexible housing strap means for securement about said instep portion of sole portion of said boot with a warming module receiving compartment formed on said housing strap means and a first and second securement strap means joined to said housing strap for securement to said ankle portion of said boot, and

said housing strap means includes a first side, a second side, a first terminal end and a second terminal end with said compartment formed on said housing strap means and extending upwardly of said housing strap means from said first side, and

wherein said compartment is defined by said second terminal end secured to said first side with said second terminal end having an attachment portion secured proximate thereto on said second side, and

wherein said compartment has formed at one end a closure member to define a closed end compartment with an open end orthogonally oriented relative to said first and second terminal ends and said open end extending upwardly of said housing strap means, and

wherein said first and second securement strap means depend from said housing strap means along a linear edge of said housing strap means defining the open end of said compartment, and

wherein said first securement strap means has formed thereto a hook fastening portion on a terminal end of said first housing strap cooperative with a loop fastener attachment portion on the second securement strap at its terminal end, and

wherein said first and second housing strap means are spaced along said housing strap means a distance approximately equal to the width of an associated boot.

4,841,647

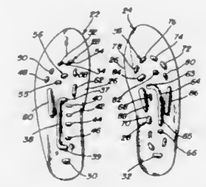
ACU-PRESSURE MASSAGING INSOLES

Sándor Turucz, 211½ South Howell Ave., Chattanooga, Tenn. 37411

Filed Jun. 1, 1988, Ser. No. 200,948

Int. Cl.[4] A43B *13/40, 13/38*

U.S. Cl. 36—44 **6 Claims**



1. Shoe insoles for massaging the feet of a person wearing said insoles in a shoe or the like, each insole comprising a toe portion, a heel portion, a ball portion adjacent the toe portion, an arch portion and an outer edge portion spaced transversely from said arch portion, a resilient base having an upper surface and a lower surface, said base being adapted to compress in reaction to the weight of a person walking or the like on said insoles, a plurality of spaced protuberances fixedly disposed on the upper surface of said base for applying a rhythmic pressure to the sole of the respective foot of the person while walking or the like, said protuberances being rigid relative to the base for descending into said base in reaction to the weight placed on the respective foot of the person and for extending proud from the base as the weight is removed, said protuberances having convex configurations extending from said base, each of said protuberances having a width varying from the respective length, a first series of said protuberances being spaced apart on the base at the ball portion, at least one protuberance disposed in said heel portion, an elongated protuberance having a longitudinal axis extending substantially in the direction of elongation of said insole and disposed intermediate said heel and ball portions adjacent said arch portion, and a second series of protuberances spaced apart adjacent said elongated protuberance and said arch portion.

4,841,648

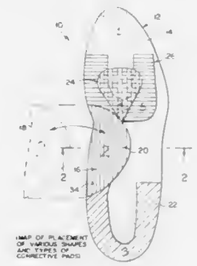
PERSONALIZED INSOLE KIT

David E. Shaffer, 386 Spruce La., East Meadow, N.Y. 11554, and Michael P. Della Corte, 283 Carnation Ave., Floral Park, N.Y. 11001

Filed Feb. 29, 1988, Ser. No. 161,954

Int. Cl.[4] A43B *13/38;* **A61F** *5/14*

U.S. Cl. 36—43 **26 Claims**



1. A personalized removable insole self made from simple construction by a patient for relief of foot discomfort, comprising:

(a) a plurality of removable and replaceable corrective components each having a shape formed for a specific correction so that the patient's money is saved because only said plurality of corrective components would need replacement;

(b) a removable insole having a surface containing a plurality of two-dimensional shapes forming a map in which each shape of said plurality of two-dimensional shapes being disposed for said specific correction, each shape of said plurality of two-dimensional shapes contained on said surface of said insole being substantially equivalent to a respective shape of a corrective component of said plurality of corrective components;

(c) means for self adhering said plurality of corrective components in a simple fashion to said surface of said insole so as to allow the patient to modify said insole by self adhering a corrective component for said specific correction of said plurality of corrective components to a substantially equivalent shape of said plurality of two-dimensional shapes contained on said surface of said insole so that a personalized removable insole can be self made from simple construction by the patient for the relief of foot discomfort.

4,841,649

LOCKING AND ADJUSTMENT DEVICE PARTICULARLY FOR SKI BOOTS

Giorgio Baggio, San Martino di Lupari, and Mirko Baratto, Bigolino di Valdobbiadene, both of Italy, assignors to Nordica S.p.A., Montebelluna, Italy

Filed Jan. 7, 1988, Ser. No. 142,119

Claims priority, application Italy, Jul. 3, 1987, 82576 A/87

Int. Cl.[4] A43B *5/04;* **A43C** *11/00*

U.S. Cl. 36—117 **17 Claims**

1. A locking and adjusting device, particularly for ski boots of the type having a substantially rigid shell and a plurality of movable portions including at least a pair of movable quarters and one movable foot presser, said device comprising:

a box-like body rigidly associated with a ski boot;

one first flexible traction element arranged to a first movable foot presser;

at least one second flexible traction element arranged to actuate a respective movable quarter of the boot;

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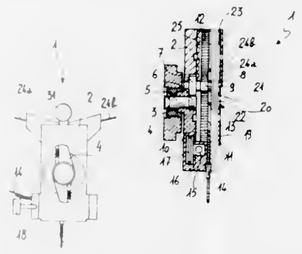
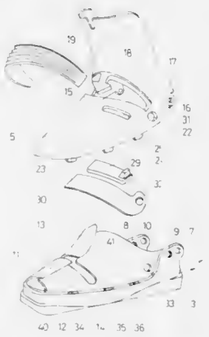
a first spool freely pivoted to said box-like body internally thereof for winding said first flexible traction element;
a second spool freely pivoted to said box-like body internally thereof for winding said at least one second flexible traction element;
mechanical transmission means located internally of said box-like body for simultaneously driving said first and said second winding spools; - a first control knob rotatably mounted externally of said box-like body for operating said mechanical transmission means;



tension adjustment means for finely adjusting the tension exerted on at least one of said first and said second flexible traction elements;
whereby rotation of said first knob is simultaneously transmitted with a reduced effort of the skier to said first and said second winding spools to thereby univocally adjust the tension exerted on said first and at least one second flexible traction element, and whereby operation of said tension adjustment means allows said first and said at least one second flexible traction elements to be locked at different tension values.

4,841,650
SKI BOOT
David Dodge, Shelburne, Vt., and Jean-Francois Lanvers, Park City, Utah, assignors to Lange International S.A., Switzerland
Filed Feb. 1, 1988, Ser. No. 150,743
Claims priority, application Switzerland, Feb. 4, 1987, 391/87
Int. Cl.[4] A43B 5/04
U.S. Cl. 36—119 17 Claims



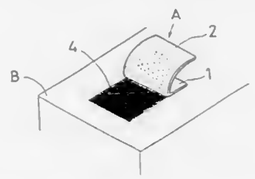
1. A ski boot comprising a shell of semi-rigid synthetic material comprising a lower portion including a sole surrounding the skier's foot and heel, a foot-covering portion, and a shaft including a front quarter and a back quarter fulcrumed to said lower portion, and a resilient member counteracting the forward flexion of said front quarter, and foot holding means disposed inside said shell, wherein the foot-covering portion of said shell includes at least one pair of opposed lateral flexible flaps connected to the sole and a fluid-tight vamp covering said flaps as well as substantially the entire lower portion of the fore part of the foot and having means for retaining said resilient member.

4,841,651
GRAPHIC DYNAMIC GREETING CARD AND METHOD FOR MAKING SAME
Steven A. Conner, 11 Wenwood Dr., Glenhead, N.Y. 11545
Filed Oct. 10, 1985, Ser. No. 786,227
Int. Cl.[4] A47G 1/06
U.S. Cl. 40—160 6 Claims

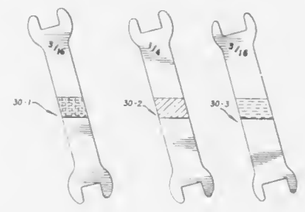
1. A greeting card, comprising:
(a) a relatively rigid substrate comprised of an air-impermeable material; and
(b) a layer of an air-impermeable resilient material having a first part defining continuous expanse in secured relation to a surface of said substrate by an air-impermeable adhesive material disposed between said layer and said substrate and a second part performed to define a self-sustaining and elastically deformable three-dimensioned graphic figure, said layer second part being in unsecured relation to said substrate and movable relative thereto, said layer second part being perimetrically continuous with said layer first part, said substrate, said layer and said adhesive entrapping air between said layer second part and said substrate surface, in the course of deformation of said layer second part.

4,841,652
ADHESIVE SHEET
Hitoshi Sakashita, Urawa; Yoshihisa Mineura, and Toshihiko Sato, both of Tokyo, all of Japan, assignors to Efuesukei Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 25, 1987, Ser. No. 18,387
Claims priority, application Japan, Feb. 26, 1986, 61-39012
Int. Cl.[4] G09F 3/100
U.S. Cl. 40—299 13 Claims

11. An adhesive sheet for attachment to an article, comprising:
a support sheet; and
an adhesive layer containing a migratory dye and being disposed on one side of said support sheet, said adhesive layer and migratory dye being selected so that said migratory dye will transfer from said adhesive layer into a surface of the article to provide a substantially unremovable mark on the article, when said adhesive layer is contacted with the surface of the article and then removed.



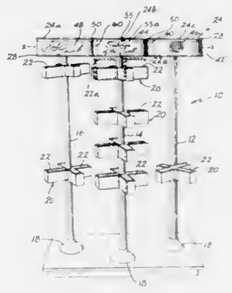
4,841,653
IDENTIFICATION OF WORK PIECES
Mike Negley, 2217 Woodereek Dr., East, Safety Harbor, Fla. 34695
Filed Nov. 23, 1987, Ser. No. 124,002
Int. Cl.[4] G09F 3/02
U.S. Cl. 40—625 6 Claims



1. The method of selecting a tool having a particular size designation from among a plurality of tools of different sizes comprising the steps of
(1) color coding the tools so that each tool has a plurality of bands wherein the color of each band represents a particular digit in the size designation of each tool; and
(2) selecting from the plurality of tools, the tool bearing a plurality of bands having colors corresponding to the digits of the desired particular size designation.

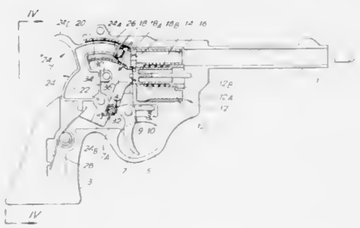
4,841,654
HEADER FOR MERCHANDISE DISPLAY FIXTURE AND SIGN ASSEMBLY THEREFOR
Dale Hodgson, Parma, and John Stram, Strongsville, both of Ohio, assignors to American Greetings Corporation, Cleveland, Ohio
Filed Mar. 9, 1987, Ser. No. 23,193
Int. Cl.[4] G09F 3/18
U.S. Cl. 40—642 18 Claims

1. A header for a merchandise display unit having means of arcuate configuration for mounting a sign thereon and operative to permit threading of a flexible strip sign into sign receiving and retaining relation on said means, and wherein said header comprises a plurality of arcuate, in plan, header sections connected together by portions at predetermined peripheral



locations thereon to form total header, with each said header section including thereon said sign mounting means.

4,841,655
TOY FIREARM FOR FIRING PROJECTILES BY COMPRESSED AIR, WITH THE PISTON OF THE CYLINDER-PISTON SYSTEM ATTACHED TO THE HAMMER OF THE FIREARM
Giampiero Ferri, Via Vecchia Fiesolane No. 74, Florence, Italy
Filed Jun. 6, 1988, Ser. No. 202,880
Claims priority, application Italy, Jun. 11, 1987, 9410 A/87
Int. Cl.[4] F41B 11/02
U.S. Cl. 42—58 6 Claims



1. A toy firearm operated by compressed air for firing projectiles comprising:
a body portion including a butt (3) with a trigger assembly (5,7) associated therewith, and incuding a barrel (1) extending from said body portion adapted to accomodate a projectile therein,
a trigger-operated firing pin mechanism (24,124) pivotally mounted about a pin (22,122) and having a firing pin (24A,124A) extending therefrom having a piston (26,126) located at its free end, with a manually operable cocking means (24E) also extending from said firing pin mechanism (24,124),
said firig pin (24A,124A) moving in an arcuate path about said pin (22,122),
an arcuately shaped cylinder (20,120) cooperably associated with said firing pin mechanism (24,124) and having an axis corresponding substantially with the axis of said pin (22,122),
said firing pin (24A, 124A) and its piston (26,126) being disposed to move in and out of said arcuate cylinder (20,120) when said firing pin mechanism (24,124) is actuated,
a loading spring (28,128) mounted within said butt (3) operated by said cocking means (24E),

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and trigger means (7,107) releasably coupled to said firing pin mechanism and said loading spring.

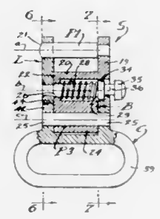
4,841,656
SLIDING SAFETY MECHANISM FOR PROJECTILE WEAPONS
Raymond W. Brandt, 11220 St. Joe Rd., Fort Wayne, Ind. 46815
Continuation of Ser. No. 11,354, Jan. 30, 1987, abandoned, which is a continuation of Ser. No. 744,042, Oct. 4, 1985, abandoned. This application Oct. 9, 1987, Ser. No. 107,883
Int. Cl.[4] F41C 17/02
U.S. Cl. 42—70.06 5 Claims

1. A safety mechanism for a projectile weapon, the weapon including a stock and a trigger mounted on the stock and capable of being moved between a non discharge position and a discharge position, comprising:
stop means including a lever arm pivotally movable between a first position blocking movement of a trigger of a projectile weapon from a non-discharge position to a discharge position and a second position permitting movement of the trigger between the non-discharge position and the discharge position, one end of said lever arm engaging the trigger in said first position and being spaced from the trigger in said second position;
means for biasing said lever arm to said first position;
a transfer bar having one end attached to an opposite end of said lever arm and an opposite end;
a lever adapted to be pivotally attached to the weapon and having one end attached to said opposite end of said transfer bar and an opposite end; and
an actuator adapted to be mounted for movement on a stock of the weapon and attached to said opposite end of said lever, and spaced from the trigger a distance
requiring two hands to discharge the weapon whereby when a person moves the weapon into position for firing, at least a portion of one hand engages the trigger and at least a portion of another hand engages said actuator and tenses as the stock is pulled into the person's shoulder to move said actuator thereby causing said lever and said transfer bar to move said stop means from said first position to said second position and allow the portion of said one hand to move the trigger to the discharge position.

4,841,657
SMOOTH BORE FIREARM HAVING AXIALLY ROTATABLE BARREL
Alan I. Mossberg, Hamden, Conn., assignor to O. F. Mossberg & Sons, Inc., North Haven, Conn.
Filed May 9, 1988, Ser. No. 191,697
Int. Cl.[4] F41C 21/00
U.S. Cl. 42—76.01 18 Claims

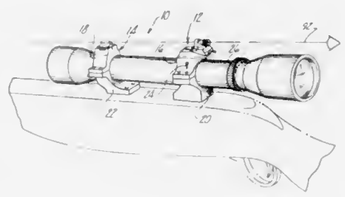
1. In a firearm having a receiver, an axially elongated barrel assembly supported on and projecting in an axially forward direction from the receiver and defining a coaxial bore extending therethrough, means defining a chamber for communicating with the rear end of the bore, and a firing mechanism supported by the receiver for discharging a round of ammunition contained within the chamber, the improvement comprising said barrel assembly including a barrel member defining said bore, means supporting said barrel member for axial and rotational movement relative to the receiver, means for moving the barrel member in an axially forward direction relative to the receiver in response to pressure exerted by gases of explosion generated by the discharge of a round of ammunition within said chamber, and means for rotating said barrel member about its axis in response to axial movement of said barrel member relative to said receiver.

4,841,658
QUICK DETACHABLE GUN SLING SWIVEL
Philip B. Katsenes, 4633 Via Benito, Santa Barbara, Calif. 93110
Filed Oct. 17, 1988, Ser. No. 258,626
Int. Cl.[4] F41C 23/02
U.S. Cl. 42—85 13 Claims



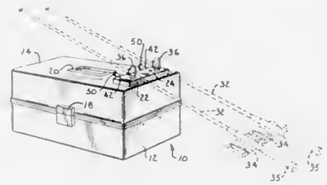
1. A detachable swivel having an operating condition, a safety condition and a release condition, for releasably coupling a strap and the like to a base fitting and the like, and including:
a link body member having three spaced and parallel axes disposed in a common transverse plane, a coupling pin carried thereby on an uppermost axis, a pivot pin carried thereby on a lowermost axis, and a lock pin carried thereby on an instermediate axis, and a leg carried at one side of said member and carrying the coupling pin cantilevered therefrom to project beyond the other side of said member,
a movable leg carried by the lock pin to engage said other side of the link body member when in the operating condition and having an opening engaged over an end of the coupling pin to embrace the base fitting when engaged over the coupling pin,
and a control member rotatable on the pivot pin and comprised of a depending loop to receive the strap and an upstanding safety lever to releasably engage a head portion on the lock pin,
the lock pin being slidable in the link body member on the axis thereof and rotatably carrying the movable leg, and the head portion of the lock pin having a flange spaced from the safety lever when in an operating position and engageable therewith when depressed to a stopped safety position, the control member being rotatable to remove the safety lever from the lock pin flange so as to release said pin and movable leg for disengagement of the latter from the coupling pin.

4,841,659
SIGHT OVER SCOPE GUN SIGHT
Paul D. Williams, 9241 Davison, Davison, Mich. 48423
Continuation of Ser. No. 579,464, Feb. 13, 1984. This application Jun. 15, 1987, Ser. No. 62,764
Int. Cl.[4] F41G 1/38
U.S. Cl. 42—101 21 Claims



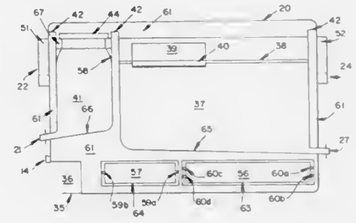
1. An iron sight in combination with a telescopic sight on a firearm such that the sighting axis of said iron sight is axially spaced farther from the bore axis of said firearm than the sighting axis of said telescopic sight, said iron sight comprising:
a front sight assembly disposed on said telescopic sight comprising a first means for adjusting the horizontal alignment relative to the sighting axis of said telescopic sight and a front sight element associated with said first adjustment means, and
a rear sight assembly disposed on said telescopic sight comprising a second means for adjusting the horizontal and vertical alignment relative to the sighting axis of said telescopic sight and a rear sight element associated with said second adjustment means.

4,841,660
FISHING ROD HOLDER
Francis O. James, 1160 E. Meadowmere, Springfield, Mo. 65807
Filed May 23, 1988, Ser. No. 197,293
Int. Cl.[4] A01K 97/10, 97/00
U.S. Cl. 43—21.2 17 Claims



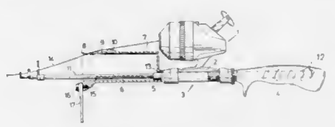
1. A fishing rod holder for attachment to a tackle box, said rod holder comprising:
a mounting base;
means for attaching said base to the tackle box;
a bracket presenting a passage large enough to receive a fishing rod in extension therethrough but small enough to prevent a reel carried on the rod from passing therethrough; and
means for mounting said bracket on said base in a manner permitting the bracket to turn about a substantially vertical axis, said mounting means comprising a substantially cylindrical bore in said base, a shank on said bracket received in said bore, and means for securing said shank in said bore while permitting the shank to turn in the bore to allow the fishing rod to track a fish hooked thereby.

4,841,661
FISHERMAN'S COMBINATION CHEST
Paul M. Moore, 9345 SW. 41 Ter., Miami, Fla. 33165
Filed Oct. 23, 1987, Ser. No. 111,926
Int. Cl.[4] A01K 97/00
U.S. Cl. 43—54.1 8 Claims



1. A portable fishing accessory comprising:
a box-like body having a bottom wall and front, back and opposite end walls which extend up from said bottom wall, said box-like body providing a food storage compartment which is open at the top;
a removable cover extending across the top of said box-like body and closing the top of said compartment;
said body having a cavity on the outside of one of said walls which extend up from said bottom wall;
a flashlight removably seated in said cavity;
and manually releasable latch means acting between said body and said flashlight to hold said flashlight seated in said cavity.

4,841,662
SPINNING ROD
Ettmar Zettervall, Norrby Skogsväg 27,, S-136 49 Handen, Sweden, and
Filed Oct. 27, 1988, Ser. No. 265,852
Claims priority, application Sweden, Apr. 29, 1986, 8601970
Int. Cl.[4] A01K 87/00
U.S. Cl. 43—25.2 7 Claims



1. A spinning rod having a line (14), on one end of which there is attached a trolling spoon and which is attached to a reeling device (1) at its other end, the reeling device being fastened to a handle part (3,4), the spinning rod having a rod portion, the rod portion (11) being in at least two parts, wherein in that for the major part of its length the handle part is tubular, the tubular portion at its end facing towards the rod portion being expanded so that the entire spoon and at least a portion of the rod portion (11) may be stored in the expanded tubular part (6,7).

penetrating the body of a fish, and combining means for releas-

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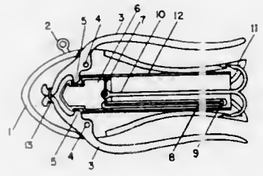
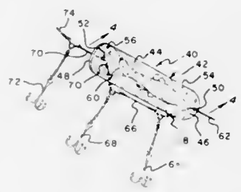
4,841,663
SNAGLESS FISHING LURE
David C. Tansel, 1200 Barton Hills Dr., #259, Austin, Tex. 78704, and Kent Collins, 4889 Southeast Pineridge Way, Stuart, Fla. 33494
Filed Dec. 21, 1987, Ser. No. 135,644
Int. Cl.[4] A01K *83/02*
U.S. Cl. 43—34 9 Claims



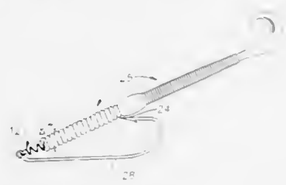
1. A snagless fishing lure comprising:
(a) a housing,
(b) a piston guide within said housing,
(c) a piston with a depression around a forward end and a first pin across a rearward end, of said piston in said piston guide,
(d) a hook with an eye of said hook around said first pin in said piston,
(e) dual levers with one lever pivotally connected on either side of said housing and with each of said levers having projections that engage said depression in said piston when said piston is pushed to a forward end of said piston guide,
(f) a first rubber bond means to bias said forward ends of said dual levers toward each other,
(g) a second pin in said housing to limit rearward travel of said piston,
(h) a second rubber band means stretched between said first pin and said second pin to bias said piston carrying said hook rearward when both of said dual levers are simultaneously depressed to cause said projections on said dual levers to disengage said piston,
(i) means whereby a force on one of said levers will disengage said projection on said one of said lever from said depression in said piston and will allow said one of said projections to re-engage said depression in said piston when said force is removed, said means comprising proper fit of said piston in said piston guide and said first rubber band means biasing together said forward ends of said dual levers.

4,841,664
FISH LURE
Robert J. Baldwin, 61 Skyline Ct., 3700 NE. Indian River Dr., Jensen Beach, Fla. 34957
Filed Aug. 14, 1987, Ser. No. 85,350
Int. Cl.[4] A01K *97/08*
U.S. Cl. 43—41 13 Claims



13. A fishing lure comprising:
(a) a tubular shaped container having a continuous side wall, a closed front wall, and a rear opening, wherein the container is constructed of a material that is sufficiently translucent that the interior of the container can be viewed from the outside,
(b) a detachable rear closure member to detachably close the rear opening
(c) a plurality of holes through the combination of the container and the rear closure member comprising a first hole through the center of the front wall, a second hole through the center of the rear closure member, the first and second holes being positioned proximate to the longitudinal center line of the tubular shaped container, and a plurality of holes through the side wall,
wherein at least one pair of holes through the side wall are aligned along the length of the side wall proximately parallel to the longitudinal center line of the tubular container, and
(d) a leader line with one end attachable to a long line to a reel and the other end is trained into the container through the front hole, out through one of the holes in the side wall closest to the front wall, in through the other hole of the pair closest to the rear of the container and out through the hole through the rear closure member,
wherein the leader line trained along the outside of the side wall is attached to at least one hook and the leader line training out through the closure member is attached to at least one hook.

4,841,665
COUPLING MEANS FOR SECURING PLASTIC WORMS TO FISH HOOKS
Welbourne D. McGahee, Melbourne, Fla., assignor to Loop-a-Line, Inc., Melbourne, Fla.
Filed Aug. 31, 1988, Ser. No. 238,490
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.24 24 Claims



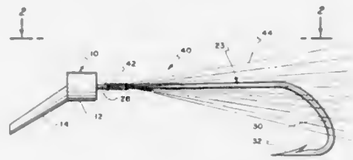
1. An apparatus for securing a lure to a hook, comprising:
a cylindrical helix made of wire with all adjacent coils spaced apart by a uniform distance greater than the diameter of the forming wire;
means for enabling said helix to be screwed into said lure, comprising an open termination of said helix created by an unattached end of said wire forming said helix; and
means for securing said helix to the eye of said hook, said securing means including a bent termination of a section of said wire extending from the coupling end of said helix opposite said open termination of said helix.

4,841,666
RELEASABLE FISH HOOK
Gust Dallas, 1960 Clover Rd., Northbrook, Ill. 60062
Filed Nov. 8, 1988, Ser. No. 268,484
Int. Cl.[4] A01K *83/00*
U.S. Cl. 43—43.16 5 Claims

1. A releasable fish hook for use with a rod and reel or other fishing device which includes a fishing line, said fish hook comprising: a stem member disposed at the distal end of said fishing line, a hook member having a connecting segment for engaging said stem member and a main body segment for penetrating the body of a fish, and anchoring means for releasably securing the hook member to the stem member when

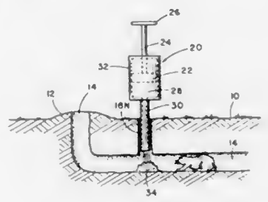
placed in a locked position and for releasing the hook member from the stem member and allowing said hook and stem members to separate when placed in an unlocked position.

4,841,667
FOIL FOR FLIES
Robert R. Johns, P.O. Box 7359, Oxnard, Calif. 93031
Filed Mar. 19, 1987, Ser. No. 27,890
Int. Cl.[4] A01K *85/00, 85/08*
U.S. Cl. 43—42.37 8 Claims



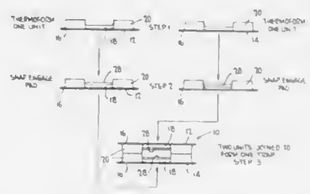
1. A foil for a fly comprising:
a rear section including an end wall, the front side of the end wall being attached to a body portion having a socket adapted to releasably receive a straight loop eye of a first hook;
a front section attached to the rear section at an angle adapted to cause the fly to move upwardly or downwardly; and
a pair of thread receiving channels extending through said end wall on each side of the socket.

4,841,668
GOPHER KILLER
Carl O. McKenzie, 17300 E. 121st, Broken Arrow, Okla. 74011
Filed Mar. 30, 1988, Ser. No. 175,141
Int. Cl.[4] A01M *1/20*
U.S. Cl. 43—124 3 Claims



1. A method of destroying underground gophers which burrow tunnels beneath the surface of the earth and deposits mounds of dirt on the earth's surface at an end of the tunnel which comprises:
punching holes in the earth in a path around said mound until a hole encounters the tunnel;
obtaining a mixture consisting only of molasses and a poison;
pumping only said mixture down a hole encountering said tunnel;
leaving said mixture down said hole until a gopher steps in it with its feet and licks the poisoned molasses off its feet with the gopher promptly being killed.

4,841,669
INSECT BAIT DEVICE
Scott W. Demarest; John Martin; John H. Hainze, and Stanley J. Flashinski, all of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Division of Ser. No. 69,338, Jul. 2, 1987, Pat. No. 4,823,506.
This application Aug. 17, 1988, Ser. No. 233,304
Int. Cl.[4] A01M *1/02*
U.S. Cl. 43—131 5 Claims



1. A method for manufacturing an insect bait device that includes two bait-device housing portions, the method comprising the steps of:
thermoforming from a deformable plastic material two identical housing portions, each one of said housing portions including a plurality of integral, spaced-apart upstanding shoulders defining an inner housing portion cavity of predetermined dimension, the plurality of housing-portion shoulders defining a complementary plurality of integral ledges that are inwardly disposed relative to each other and to the housing-portion cavity, said two housing portions further being thermoformed such that when joined together the thus-joined housing portions together define at least one entry means for enabling an insect to enter the insect bait device;
snap-engaging a relatively-stiff absorbent pad into one of the housing portion cavities, the relatively-stiff pad being so dimensioned relative to the housing-cavity dimensions and to the shoulders as to be snap-engageable past the ledges for removably retaining the relatively-stiff pad in the housing-portion cavity; and
impregnating the relatively-stiff absorbent pad with an insecticidal composition and joining together said two housing portions in a manner such that the pad is located therebetween.

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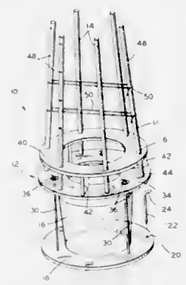
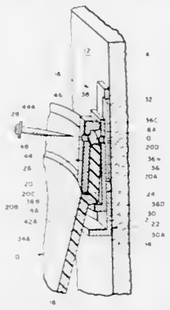
4,841,670
APPARATUS FOR SUPPORTING PLANTS
Paul L. Bitter, 27377 Fostoria Rd., Geneva, Ohio 43430
Filed May 12, 1988, Ser. No. 193,052
Int. Cl.[4] A01G *17/06*
U.S. Cl. 47—47 17 Claims



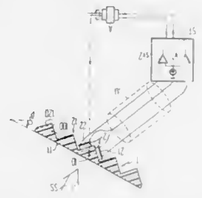
1. Plant growing and supporting apparatus comprising a generally cylindrical pot for containing a body of soil adapted for growing a plant therein, a base plate upon which said pot is supported, an annular base atop said pot, said annular base including a first annular collar supported upon the top of said pot and a second annular collar maintained in spaced relation above said first collar, means urging said base plate and first annular collar toward one another and against the bottom and top, respectively, of said pot, and a plurality of columns extending upwardly from and disposed radially around said annular base for supporting a plant growing upwardly through said first and second annular collars from said pot.

4,841,671
THREE-PIECE PLANT POT HANGER
Edward W. Reed, 537 Calle Grande Cir., Santa Maria, Calif. 93455
Filed Jul. 26, 1988, Ser. No. 224,366
Int. Cl.[4] A01G *9/02*
U.S. Cl. 47—67 18 Claims



1. In a plant pot hanger for releasably supporting a plant pot having a tapered body larger in size at an upper end than at a lower end thereof and an upper annular collar at the upper end of the body, the combination comprising:
(a) a rear support member including a bracing portion projecting outwardly to an outer end adapted to engage and laterally support the tapered body of the plant pot at a location spaced below the collar of the pot;
(b) a middle support member including a bracing part projecting outwardly to an outer end adapted to engage and laterally support the tapered body of the plant pot at a location spaced above said bracing portion of said rear support member and at a lower edge of the collar of the pot; and
(c) a front support member adapted to engage an interior side of the collar of the pot and for attachment with said middle and rear support members to a generally vertical mounting surface;
(d) said outer end of said bracing portion of said rear support member being disposed outwardly beyond said outer end of said bracing part of said middle support member such that said respective outer ends together define a pitch line at a given angle relative to the vertical, said rear and middle support members being movable longitudinally relative to one another for varying the distance between their respective bracing portion and part and thereby changing the angle relative to the vertical of the pitch line defined by said outer ends thereof for matching the pitch line of the tapered body of the plant pot to be supported by said hanger.

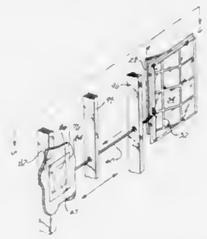
4,841,672
DEVICE FOR PROTECTION FROM THE SUN
Thomas Nebbuth, Coburg, and Herbert Loehner, Kueps, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jul. 6, 1987, Ser. No. 69,727
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1987, 3622564
Int. Cl.[4] E05F *15/20*
U.S. Cl. 49—25 19 Claims



13. A solar protection device including a plurality of slats of refractive material rotatable about a longitduinal axis, each slat having a substantially planar upper side and having a lower side with prisms arranged thereon serially running parallel to said longitudinal axis without gaps, said prisms having respective first and second legs and having a third leg formed by a plane portion of said lower side of said slat, said device comprising:
first and second light sensors oppositely arranged on said first and second legs, respectively, of one of said prisms; and
control means coupled for rotating said slats, said control means being further coupled to said light sensors for rotation said slats in one of first and second directions responsive to a light intensity exceeding a predetermined threshold level at a respective one of said first and second light sensors.

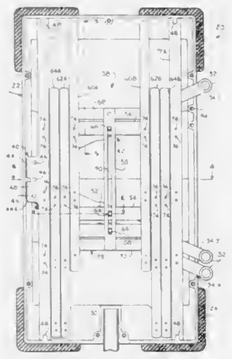
4,841,673
SECURITY WINDOW SYSTEM
Bryan J. Tjomsland, 4277 Verduge View Dr., Los Angeles, Calif. 90065
Filed Aug. 18, 1987, Ser. No. 86,703
Int. Cl.[4] E05B *65/10*
U.S. Cl. 49—141 17 Claims

1. A safety window comprising:
a window sash having a movable outer frame with rigid cross-bars within the outer frame for forming spaces for window panes of a size too small to permit entry through the window sash by an intruder,
a fixed window frame rigidly affixed in a wall of a dwelling, means for movably securing the window sash in the fixed window frame so the window sash moves relative to the fixed window frame between a close position and an open position,
a locking bolt mounted adjacent to the fixed window frame and movable between a locked position and an unlocked position, in which the bolt in its locked position is engaged with the fixed window frame and the outer frame of the window sash to prevent the window sash from moving to its open position, and in which the bolt in its unlocked position allows the window sash to move relative to the fixed window frame to an open position;



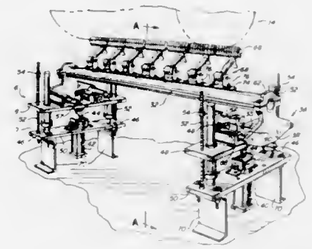
an elongated control rod secured to the locking bolt and extending interiorly through the wall of the dwelling for a distance spaced from the window to a remote position inaccessible to an intruder reaching through the window sash, in which the control rod in the wall passes through at least one wall stud spaced remotely from the side of the window frame; and
means for moving the control rod manually from said remote position for moving the control rod to release the locking bolt to permit the locking bolt to move from its locked position to its unlocked position, allowing the window sash to be moved to its open position.

4,841,674
ATHLETIC NUMERICAL INDICATOR DISPLAY
Robert L. Smith, Kansas City, Mo., assignor to Pro Down, Inc., Kansas City, Mo.
Filed Nov. 30, 1987, Ser. No. 126,862
Int. Cl.[4] G09F *11/00*
U.S. Cl. 40—491 12 Claims



1. An athletic numerical indicator display comprising:
a body having at least one transparent face;
a plurality of component numeral panels within said body;
an elongated lever for selecting a numeral to be displayed;
means coupling the lever to said body for shiftable movement between a first and second position;
means for connecting selected component numeral panels to said selector lever,
a stationary slotted bar fixed relative to and within said body; and
yoke means on said lever and in operable association with said connecting means for displaying a numeral composed of said panels behind said transparent face when said lever is shifted.

4,841,675
APPARATUS FOR CLEANING AND POLISHING ROLL ASSEMBLIES
George C. Perneczky, 8918 Biloba, Orland Park, Ill. 60462
Filed May 13, 1988, Ser. No. 193,596
Int. Cl.[4] B24B *5/37*
U.S. Cl. 51—67 13 Claims



1. An apparatus for cleaning and polishing the surface of a cylindrical roll, comprising
a shaft removably attached at one end thereof to a first end unit and removably attached at the other end thereof to a second end unit;
said first and second end units each being provided with lift means for moving said shaft from a first position to a second position;
said first end unit being further provided with a reciprocating means for translating said shaft alternately along its longitudinal axis;
said second end unit being further provided with a damping means cooperating with said reciprocating means for damping the longitudinal translation of said shaft;
at least one abrasive stone support means attached to said shaft, with each such support means including an arm having a resilient joint associated therewith and an abrasive stone attached thereto; and
a control means cooperating with said lift means for moving said shaft from the first position to the second position and further cooperating with said reciprocating means for translating said shaft alternately along its longitudinal axis.

4,841,676
TURNING TOOL FOR MACHINING THE EDGES OF PLASTIC LENSES
Günter Barwasser, Neuss, Fed. Rep. of Germany, assignor to Wernicke & Co. GmbH, Düsseldorf, Fed. Rep. of Germany
Filed Oct. 27, 1987, Ser. No. 113,870
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 8629226[U]
Int. Cl.[4] B24B *9/20*
U.S. Cl. 51—181 R 5 Claims

1. A turning tool for machining the edges of plastic lenses in a machine for machining the edges of lenses made of soft yet tough material such as polycarbonate, said tool comprising:
a cutter having at least one cutter tooth that defines a prede-

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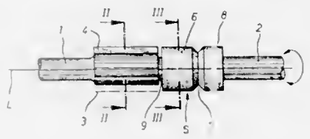
termined rotational diameter so that the lens is first machined by said cutter to predetermined periphery; and a grinding wheel that is coaxially connected to said cutter in such a way that both said grinding wheel and said cutter rotate together with each other, with said grinding wheel being provided with respective rough grinding, fine grinding, and beveling portions along which the lens is



transferred in linear progression respectively as a whole having a diameter substantially the same as said rotational diameter defined by said cutter tooth and with which peripheral portions of the plastic lens are smoothed and evened out to assure elimination of transverse grooves along the peripheral edges of the plastic lenses, said beveling portion being situated axially between said rough and fine grinding portions and comprising an annular groove.

4,841,677

DEVICE FOR DISENGAGING A SUCTION MECHANISM FROM A LENS

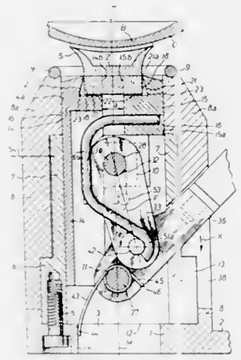
Fritz Kötting, Dormagen, Fed. Rep. of Germany, assignor to Wernicke & Co. GmbH, Düsseldorf, Fed. Rep. of Germany

Filed May 6, 1988, Ser. No. 191,231

Claims priority, application Fed. Rep. of Germany, May 11, 1987, 3715619

Int. Cl.[4] B25B *11/00*; B24B *13/005*

U.S. Cl. 51—216 LP **16 Claims**



1. A device for disengaging a suction mechanism, which has a base, from a lens, said device comprising:

a housing having a supporting rim for said lens; and

a gripping member that is adapted to grasp said base of said suction mechanism in a forceps like manner, with said gripping member being formed from two half shells, each of which has a section that is disposed in the vicinity of said base of said suction mechanism and is provided with a face that is directed toward the face of the other half shell, with a clearance being provided between said faces that are directed toward one another; at least one of said half shells is pivotable relative to the other half shell to thereby alter the size of said clearance and effect said grasping of said base of said suction mechanism; said gripping member being accommodated in said housing in such a way as to be axially movable therein, whereby when said gripping member moves out of a starting position one of the two half shells is pivoted towards the other half shell thereby grasping the base of said suction mechanism and drawing said lens against said supporting rim and said suction mechanism can be disengaged from said lens.

4,841,678

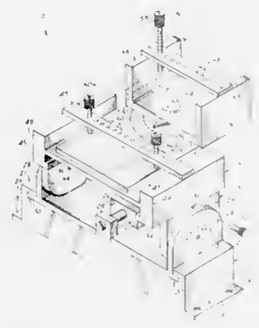
TOOL SHARPENING APPARATUS

Peter C. Thomas, 6750 Riverside Blvd., Sacramento, Calif. 95831

Filed Jan. 19, 1988, Ser. No. 145,150

Int. Cl.[4] B24B *41/00*

U.S. Cl. 51—219 R **10 Claims**



1. A tool sharpening apparatus for the clamping and selective orientation of a tool to cooperate with a shaping tool wherein said apparatus comprises

a base means for slidingly accepting a first support means in a first direction, and

said first support means including a measurement scale cooperating with an indicator on a second support means formed exteriorly on one of a plurality of spaced upwardly extending flanges integrally formed to said first support means, and

said second support means including a plurality of spaced downwardly extending flanges contiguously positioned interiorly of said upwardly extending flanges and pivotally mounted to said upwardly extending flanges of said first support means about an axis extending orthogonally through said upper and lower flanges;

a third support means slidingly positionable within said second support means in a second direction orthogonal to the first direction;

a fourth support means slidingly cooperating with said third support means in a third direction;

a fifth support means selectively securable to the fourth support means,

and a sixth support means angularly adjustable to the fifth support means wherein said fifth support means includes clamping means for securement of said tool.

4,841,679

METHOD AND APPARATUS FOR MANUFACTURING CAM ELEMENTS

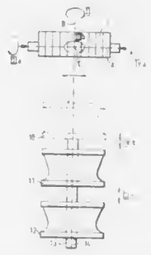
Helmut Riemscheid, Lohmar, and Engelbert Schwarz, Winterscheid, both of Fed. Rep. of Germany, assignors to Emitec Gesellschaft für Emissionstechnologie mbH, Fed. Rep. of Germany

Filed Aug. 7, 1987, Ser. No. 83,653

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1986, 3626683

Int. Cl.[4] B24B *19/12*

U.S. Cl. 51—281.C **17 Claims**



1. A method of grinding cam elements, each having an aperture extending along a cam shaft axis therethrough for receiving a cam shaft, the method comprising holding a plurality of the cam elements together in alignment with one another and grinding the peripheral surface of all the cam elements together by at least one contoured grinding wheel rotating about an axis perpendicular to and spaced from the cam shaft axis and moving one of the held-together cam elements and the grinding wheel relative to the other in a direction parallel to the cam shaft axis.

4,841,680

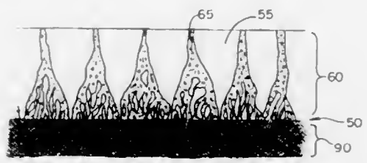
INVERTED CELL PAD MATERIAL FOR GRINDING, LAPPING, SHAPING AND POLISHING

Mark F. Hoffstein, Newark, Del., and Takehisa Shinagawa, Sakai, Japan, assignors to Rodel, Inc., Newark, Del.

Continuation of Ser. No. 89,695, Aug. 25, 1987, abandoned. This application Sep. 20, 1988, Ser. No. 248,335

Int. Cl.[4] B24D *7/22, 11/00*

U.S. Cl. 51—283 R **8 Claims**



1. A polishing pad material comprising a cellular polymeric layer containing elongated cells which are generally oriented normal to and have an opening on the polishing surface of said material, said cell openings comprising a majority of the surface area of said polishing surface, the depth of said cells is at least 1.5 times the diameter of the surface openings, and said cells having a mean diameter of about 50 to 200 microns with the diameter of said openings being generally larger than the diameter beneath the surface.

4,841,681

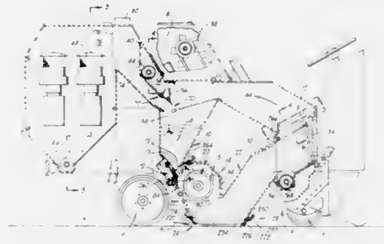
SURFACE BLASTING APPARATUS

Wayne E. Dickson, Tecumseh, Okla., assignor to Dickson Industries, Inc., Tecumseh, Okla.

Division of Ser. No. 23,490, Mar. 2, 1987, Pat. No. 4,753,052, which is a continuation-in-part of Ser. No. 729,466, May 1, 1985, Pat. No. 4,646,481, which is a continuation-in-part of Ser. No. 498,846, May 27, 1983, abandoned. This application May 26, 1988, Ser. No. 199,096

Int. Cl.[4] B24B *1/00*; B24C *1/00*

U.S. Cl. 51—319 **1 Claim**



1. The method of blast cleaning a plurality of substantially monoplanar surfaces of varying width comprising:

providing a mobile abrasive particle blasting machine having upstream mounting flange means thereon defining a plurality of bolt holes, and having a downstream mounting flange means thereon spaced from said upstream mounting flange means, and also defining a plurality of bolt holes;

providing a plurality of blasting head assemblies each having a different width from the others of said blasting head assemblies, and each including:

a housing having a different width than the width of the housing of each of the other blasting head assemblies, and including an upstream slotted blasting head mounting plate, said upstream mounting plates of the several blasting head assembly housings each defining a plurality of bolt holes positioned for registering with bolt holes in said upstream mounting flange, and each defining an abrasive admitting slot therethrough which differs in size from the abrasive admitting slot in every other one of said upstream mounting plates, each of said housings further including a downwstream mounting plate defining a plurality of bolt holes therein positioned for registry with the bolt holes in said downstream mounting flange means on said abrasive particle blasting machine, and each of said downstream mounting plates having an abrasive particle discharge opening therein which differs in size from the abrasive particle discharge opening in each of the other of said downstream mounting plates; and

a blasting wheel rotatably mounted within said housing and having its rotational axis extending co—directionally with the width of said housing, and extending parallel to the plane of said slotted blasting head assembly housing upstream mounting plate and to the surface to be cleaned;

selecting a first one of said blasting head assemblies having a width, and the blasting wheel of which has a width, such that said first one of said blasting head assemblies is the best adapted of said adapting head assemblies for the cleaning of one of said surfaces having a certain width;

bolting said selected blasting head assembly to said upstream mounting flange means by extending bolts through the registering bolt holes in said upstream mounting flange means and said upstream mounting plate of said housing of said selected blasting head assembly;

charging abrasive particles from said mobile blasting ma-

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chine through the slot in the slotted upstream blasting head mounting plate while rotating said blasting wheel at a high speed to propel abrasive against said one surface while moving said blasting machine over said one surface until said one surface is clean;

removing said first one of said blasting head assemblies from said blasting machine after said one surface has been cleaned;

selecting a second of said blasting head assemblies having a width differing from that of the selected first blasting head assembly, and the blasting wheel of which has a width differing from that of said first blasting head assembly, with the widths of said blasting wheel and blasting head assembly being such that the second of said selecting blasting head assemblies is the best of said several blasting head assemblies for cleaning a second of said surfaces having a certain width differing from the width of said first surface cleaned using said first blasting head assembly;

bolting said selected second blasting head assembly to said upstream mounting flange means by extending bolts through the registering bolt holes in said upstream mounting flange means and said upstream mounting plate of said second blasting head assembly; then

charging abrasive particles from said mobile blasting apparatus through the slot in the slotted upstream blasting mounting plate of said selected second blasting head assembly while rotating the blasting wheel of said selected second blasting head assembly at high speed to propel abrasive particles against said second surface, while moving said blasting machine over said one surface until said one surface is clean.

4,841,682

PROCESS AND DEVICE FOR PRODUCING TURNED PARTS FROM RODS OR BARS

Werner Waelti, Selzach, Switzerland, assignor to Tschudin Werkzeugmaschinenfabrik, Grenchen, Switzerland

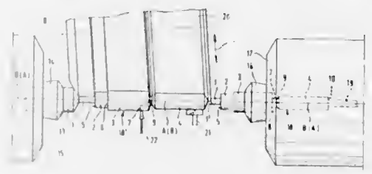
PCT No. PCT/CH87/00089, § 371 Date Mar. 17, 1988, § 102(e) Date Mar. 17, 1988, PCT Pub. No. WO88/00513, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 17, 1987, Ser. No. 180,110

Claims priority, application Switzerland, Jul. 21, 1986, 2913/86

Int. Cl.[4] B24B *5/04*

U.S. Cl. 51—289 R 10 Claims



1. A method of manufacturing profiled turned parts which are symmetric with respect to their longitudinal axis (A), with the starting stock being rods or bars, whereby a rod or bar (13) from which the turned parts (18) are to be fabricated is advanced on a collet axis (B) joining first and second collets, said advancing proceeds through said first collet (14) in a headstock (15) of a grinding machine comprised of at least the said headstock (15) and a synchronous tailstock (17), with said advancing continuing into said second collet (16) disposed in the synchronous tailstock (17), and said rod or bar is then ground by a profiled grinding disc (20) which can be advanced transversely with respect to said rod or bar; characterized in that the profiled grinding disc (20) is rotated around an axis (D) which is inclined with respect to the collet axis (B), and is advanced against the rod or bar (13) at an acute angle, such that faces (1', 5, 6) which are perpendicular to the longitudinal axis (A) of the rod or bar can be produced by plunging the said disc into the rod or bar (13) in a plunge-cut grinding operation; and in that a second profiled grinding disc (20'), also having a rotational axis (D') which is inclined with respect to the collet axis (B), is advanced against the rod or bar at an acute angle whereby it is possible to produce opposite transverse faces (8, 10) on the rod or bar (13) which faces are perpendicular to the axis (A) of the rod or bar.

4,841,683

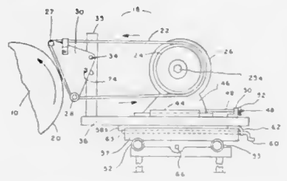
ROLL GRINDING SYSTEM

Clarence W. Williams, P.O. Box 9675, Richmond, Va. 23228

Filed Dec. 23, 1987, Ser. No. 137,240

Int. Cl.[4] B24B *21/02*

U.S. Cl. 51—142 7 Claims



1. Portable apparatus for accurate regrinding of a rubber-like cylindrical surface of a roll being rotated at its work station, comprising a pair of closed loop abrasive belts extending in spaced parallel planes, means to drive the belts, a pair of sets of means in supporting contact with the respective belts, a platform, means mounting the platform to move parallel to the axis of rotation of a roll being reground at its work station, means mounting the platform to move toward and from a roll being so reground, means to hold the platform at a fixed distance from a roll while the platform is moved parallel to the roll's axis, means mounted on the platform to support said sets of belt supporting means, said platform mounted support means including adjustment means to bring said sets of means into tight engagement with the belts, to present a substantially straight length of each belt for substantially tangential grinding contact with the surface of a roll, and to adjust the angle of each said straight length and thereby adjust the position of its contact along a roll's periphery, and said platform mounted support means also including means operable after such adjustment to hold said sets of means in fixed positions relative to the platform during regrinding of a roll, whereby the belts are held at a fixed spacing from a roll for accuracy of regrinding, and whereby, where clearances are limited at the ends of a roll, one belt may grind to one end of the roll and the other belt to the other end of the roll.

4,841,684

SURFACE-FINISHING MEMBER

E. Winthrop Hall, Jr., 16 Old Stone Way, Weymouth, Mass. 02189

Continuation of Ser. No. 894,074, Aug. 5, 1986, abandoned, which is a continuation of Ser. No. 618,569, Jun. 8, 1984, abandoned. This application Mar. 11, 1988, Ser. No. 170,102

Int. Cl.[4] B24D *11/00, 11/06*

U.S. Cl. 51—400 12 Claims

1. An elongated member comprising a body of a large multiplicity of wear-resistant fibers in a random, needled mass impregnated with an elastomeric material in an amount and disposition such that said impregnated, needled mass contains interstitial voids and free of particles of abrasive finishing compound, said member defining an extended working surface adapted for receiving, in voids therein, particles of abrasive finishing compound of desired grit, and, with abrasive finish compound particles in said working surface voids and operatively exposed at said working surface, said member adapted

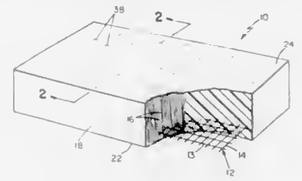
for surface finishing movement repetitively across a surface of an object to be finished,

said body formed of:

a reinforcement layer lying generally parallel to and spaced substantially below said working surface, said layer being substantially extensible in a direction of movement,

a relatively thick working layer lying above said reinforcement layer, said working layer having throughout a large multiplicity of wear-resistant fibers in a random, needled mass, component fibers of said layer being needled through said reinforcement layer,

a backing layer lying below said reinforcement layer, said backing layer being comprised of a continuation of said mass of needled fibers that define said working layer, and



said elastomeric material impregnated through said working layer, said backing layer and said reinforcement layer in a manner to fill some of the porosity of the mass of fibers,

when said finishing member is new, the thickness of said working layer between said working surface and said reinforcement layer comprising the major thickness of said finishing member, the ratio of thickness of said backing layer to the overall thickness of said member being of the order of between about 1:20 to 1:12,

whereby, during operation, and as gradual wear of said working layer occurs, said impregnated mass of needled fibers at said working surface enables continual definition of surface interstices in which particles of abrasive compound applied to said working surface can lodge and can be carried with resilient support across a surface to be finished.

4,841,685

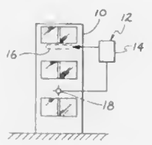
CONTROLLABLE DAMPER

Sami F. Masri, Pasadena; Tejav J. Dehghanyar, Redondo Beach, and Thomas K. Caughey, Pasadena, all of Calif., assignors to University of Southern California, Los Angeles, Calif.

Continuation of Ser. No. 766,614, Aug. 16, 1985, abandoned. This application Nov. 13, 1987, Ser. No. 120,771

Int. Cl.[4] F16M *13/00;* E04H *9/02*

U.S. Cl. 52—1 13 Claims



1. Apparatus for controlling stress due to oscillation of a flexible structure subjected to a dynamic environment having stochastic, wide band amplitude and time characteristics, comprising:

impact-type damper means having a main portion connectible to the flexible structure for force transmission therebetween;

the impact-type damper means having:

an auxiliary mass mounted for relative movement in response to oscillation of the flexible structure; and

means for causing impacts between the auxiliary mass and the main portion of the damper means to apply nonlinear impact forces to the flexible structure;

the means for causing impacts having deadspace characteristics and at least one variable operating parameter affecting the application of said impact forces;

means for sensing information relating to movement of the structure; and

means for controlling said operating parameter in accordance with sensed information so that said impact forces oppose movement of the structure and prevent buildup of uncontrolled oscillation.

4,841,686

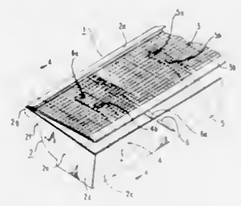
RAIN GUTTER ASSEMBLY

Herbert R. Rees, 32 Harbor View La., Toms River, N.J. 08753

Filed Aug. 12, 1988, Ser. No. 231,525

Int. Cl.[4] E04D *13/00*

U.S. Cl. 52—12 9 Claims



1. A rain gutter assembly for attachment to residences and other buildings which comprises in combination:

a gutter having an elongated opening constructed to be mounted along a sidewall or roof of a building to catch precipitation;

a gutter filter attachment constructed to cover said opening along the length of said gutter;

said filter attachment comprising in combination a screen;

a pad of fiberous material mounted on the underside of said screen substantially along the length and width of said gutter; and

clamping means attachable to said filter attachment for holding said filter attachment removably in place to cover the opening of said gutter.

4,841,687

MOISTURE DEFLECTOR FLASHING STRIP FOR A BUILDING WALL ASSEMBLY

Michael Navetta, 41075 Coventry, Novi, Mich. 48050

Filed Aug. 4, 1988, Ser. No. 228,052

Int. Cl.[4] E06B *1/04*

U.S. Cl. 52—58 14 Claims

1. In a building wall assembly including an outer veneer wall, a series of laterally spaced studs, and at least one upright laterally extending lower wall board spanning said studs and at last one upright laterally extending upper wall board spanning and secured to said studs and generally overlying said lower wall board;

said wall boards being spaced from said veneer wall;

a unit moisture deflector flashing strip of resilient material spanning said studs having laterally extending mount, deflection and sealing portions, said mount portion underlying the lower edge of said upper wall board along its width, bearing against and secured to said studs;

said deflection portion extending angularly downward and outwardly of said mount portion overlying the top edge of said bottom wall board along its width; and

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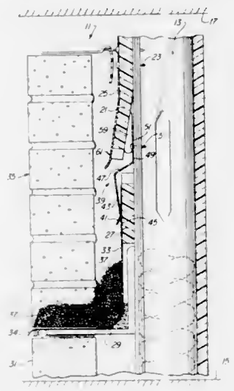
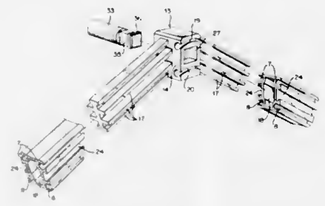
said sealing portion extending angularly downward and inwardly of said deflection portion and bearing against said bottom wall board along its width, and wherein any



liquids or moisture accumulating upon the upper wall board descends and is deflected outwardly of said lower wall board, preventing inward migration thereof to the space between said studs.

4,841,688
MODULAR PAVILION
Rinaldo Rinaldi, Bogliasco, Italy, assignor to Riri Italia, S.p.A., Vignole Borbera, Italy
Filed Aug. 5, 1987, Ser. No. 82,002
Claims priority, application Italy, Aug. 5, 1986, 21411 A/86
Int. Cl.[4] E04H *1/18*
U.S. Cl. 52—63 5 Claims



1. A modular pavilion comprising

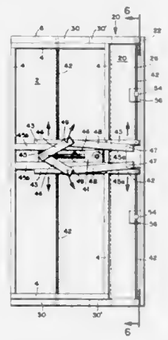
a support framework including a plurality of frames each spaced one from the other and comprised of a plurality of elongated modular elements, and modular joint means for connecting adjacent ends of said modular elements;

spacers releasably connecting said frames one to the other;

interior and exterior flexible sheets having marginal edges and extending between adjacent frames for substantially enclosing the pavilion; and

means integrally formed in said modular elements and said modular joint means for slidably receiving the marginal edges of said interior and exterior sheets such that the interior and exterior sheets are spaced one from the other, each of said frames including a plurality of said modular joint means, interconnecting adjacent ends of said modular elements, said elements and said modular joint means lying in a common plane, wherein said sheets are spaced one from the other in spaced generally parallel planes, with said sheets extending between adjacent frames, each of said elements having a pair of channels extending parallel to one another and substantially coextensive in length therewith for receiving said marginal edges of the interior and exterior sheets, the sheets being formed of canvas, the margins of which have enlarged portions for reception in said channels, a shoe, said modular element including means for receiving said shoe for lengthwise sliding movement thereof along said element and retaining said shoe on said element during said sliding movement thereof, means for releasably connecting said shoe and said modular element one to the other, means on said modular element at a predetermined location therealong enabling removal of said shoe from said element, and means for pivotally connecting said shoe and one end of said spacer one to the other.

4,841,689
TWO-SHELL TELESCOPIC ELEMENT
Karl Schussler, Oldenburg, Fed. Rep. of Germany, assignor to Huppe GmbH, Oldenburg, Fed. Rep. of Germany
Filed Jun. 8, 1987, Ser. No. 59,044
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1986, 3619393
Int. Cl.[4] E04B *2/82*
U.S. Cl. 52—64 8 Claims



1. A telescoping wall element for a wall partition, said wall element comprising:

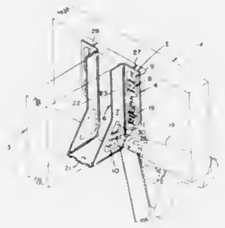
(a) a wall section including external cover panels on a supporting frame; and

(b) a telescoping part including cover panels on a supporting frame, said telescoping part extending horizontally from a vertical edge of said wall section, and said telescoping part being movable from a first retracted position to a second extended position, said cover panels overlapping and parallel to said wall section cover panels when said telescoping part is in said first retracted position, and said telescoping part cover panels parallel to and lying in plane with said wall section when said telescoping part is in said second extended position; and

(c) at least one packing strip between said wall section cover panels and between said telescoping part cover panels, said packing strip vertically extendable from a first retracted position to a second extended position; and

(d) an actuating mechanism for horizontally moving said telescoping part between said first retracted position and said second extended position, and for vertically moving said packing strip from said first retracted position to said second extended position.

4,841,690
IMPACT NAILED CONNECTOR
Alfred D. Commins, Danville, Calif., assignor to Simpson Strong-Tie Company, Inc., San Leandro, Calif.
Filed Jan. 21, 1988, Ser. No. 146,471
Int. Cl.[4] E04B *1/38*
U.S. Cl. 52—105 8 Claims



1. A wood frame building connection comprising:

a. a structural holding member of wood, concrete, steel or other selected material for receiving and holding a nailing gun driven nail fastener and having a generally planar nail fastener receiving face;

b. a wood structural held member for receiving and holding a nailing gun driven nail fastener and having a generally planar nail fastener receiving face;

c. a plurality of nailing gun driven nail fasteners each having a shank with a generally uniform cross sectional area;

d. a sheet metal connector including;

1. a first member having a generally planar face positioned in face to face relation to said generally planar ail fastener receiving face of said structural holding member;

2. a second member joined to said first member having a generally planar face positioned in face to face relation to said generally planar nail fastener receiving face of said structural held member;

3. non-aperture, first indicia means formed in a first selected portion of said nail receiving face of said first member defining a nailing zone having an area substantially larger than the cross sectional area of said nailing gun driven fastener for targeting said nailing gun driven nail fastener member for insertion therethrough into said structural holding member;

4. non-aperture second indicia means formed in a second selected portion of said face of said second member defining a nailing zone having an area substantially larger than the cross sectional area of said nailing gun driven fastener for targeting said nailing gun driven nail fastener member for insertion therethrough into said structural held member;

e. at least one of said nailing gun driven nail fasteners is driven through said sheet metal connector within said nailing zone of said first member and into said structural holding member; and

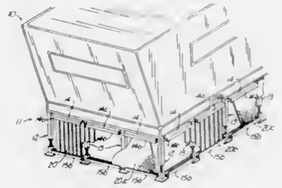
f. at least another one of said nailing gun driven nail fasteners is driven through said sheet metal connector within said nailing zone of said second member and into said structural held member.

4,841,691
MOBILE HOME SKIRTING SYSTEM
Don R. Stoecker, Georgetown Lake, Anaconda, Mont. 59711
Filed Apr. 28, 1988, Ser. No. 187,566
Int. Cl.[4] E02D *27/00*
U.S. Cl. 52—169.12 3 Claims

1. Apparatus for enclosing the underside of a mobile home comprising:

a corner post disposed under each exterior corner of said mobile home, each of said corner posts comprising a main housing having four sides, a first side having a pair of openings therein spaced apart by a predetermined distance and a second side, perpendicular to said first side, said second side also having a pair of openings spaced apart by said predetermined distance and a base member adapted to contact the ground, a threaded member engaging a bottom portion of said main housing said threaded member extending into said corner post, a threaded nut means disposed on the threaded member for selectively lengthening or shortening the effective distance between said main housing and said base member, and square tubular extension means extending from first and second sides of said base member thereof;

an intermediate post disposed between each of said corner posts, each of said intermediate posts comprising an elongated housing having the top end in abutment with a bottom portion of said mobile home, a base housing adapted to contact the ground and an extension rod rotatably disposed therein, the bottom of said elongated housing resting on a threaded nut threadably engaging said extension rod, whereby rotating said threaded nut effectively shortens or lengthens the distance between said elongated housing and said base housing, said elongated housing having a pair of spaced holes therein on each of a first and a second side thereof, said first and second sides of said elongated housing being parallel to each other, and said base housing having a square tubular extension means extending from each of first and second parallel sides thereof, said square tubular extension means being aligned with each other and having a common longitudinal axis;



top horizontally disposed link means for interconnecting adjacent corner posts and intermediate posts, the end of said top horizontally disposed link means having extensions thereon for extending into said openings in said main housings of said corner posts and holes in said elongated housing in said intermediate posts;

bottom horizontally disposed link means for interconnecting with adjacent base members of said corner posts and base housings of said intermediate posts, said bottom horizontally disposed link means being telescopically connected on the ends thereof to the square tubular extensions on said base members of said corner posts and said base housing of said intermediate posts;

sheets of skirt material for extending completely around the bottom of a mobile home;

upper flange means extending outwardly and downwardly from said top horizontally disposed link means for receiving the top of said sheets between the top horizontally disposed link means and said upper flange means for preventing substantial lateral movement of said sheets when the top of said sheets are positioned between the top horizontally disposed link means and said upper flange means;

lower flange means extending outwardly and upwardly from said bottom horizontally disposed link means for receiving the bottom of said sheets between the bottom horizontally disposed link means and said lower flange means for preventing substantial lateral movement of said sheets when the bottom of said sheets are positioned between the bot-

VOL 1103 ISS 4 JE 27 1989 UMI

tom horizontally disposed link means and the lower flange means; and wherein

the height of said sheets being more than the distance between the bottom of the upper flange means and the top of the lower flange means and less than the distance between the top of the upper flange means and the bottom of the lower flange means.

4,841,692

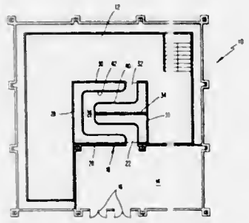
SHIELDED ACCESS APPARATUS FOR USE IN AN ENCLOSURE FOR PREVENTING PROPAGATION OF ELECTROMAGNETIC ENERGY INTO OR OUT OF THE ENCLOSURE

Donald N. Coupard, Bethesda; Andrew K. Chang, Potomac; John E. Fuller, Brookeville, all of Md., and Angelo J. Mauriello, Southampton, Pa., assignors to Donald N. Coupard, Bethesda; Andrew K. Chang, Potomac; John E. Fuller, Brookeville, all of, Md. and Angelo J. Mauriello, Southampton, Pa., a part interest

Filed Jan. 29, 1988, Ser. No. 150,069

Int. Cl.[4] H05K *9/00*; E06B *7/22*, *1/04*

U.S. Cl. 52—173 R **12 Claims**



1. A shielded access apparatus for enabling personnel access to and from a shielding enclosure which is shielded to prevent propagation of radiated electromagnetic energy into and out of the enclosure, the access apparatus comprising:

an access enclosure of electrically conductive material,

first and second access openings in said access enclosure,

a shielding wall within said access enclosure positioned between said first and second access openings for preventing radiated electromagnetic energy passing through one of said openings from travelling along a straight line to the other of said openings, and

absorbing means within said access enclosure for absorbing radiated electromagnetic energy passing through said access enclosure.

4,841,693

PARTICULATE MATERIAL STORAGE STRUCTURE

Michael J. Welsh, Pekin, Ill., assignor to UNR, Inc., Peoria, Ill.

Filed Jul. 26, 1988, Ser. No. 224,341

Int. Cl.[4] F04H *7/00*; E02B *17/12*

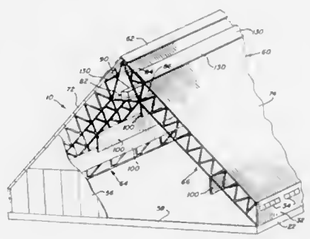
U.S. Cl. 52—197 **8 Claims**

1. A structure for storage of grain or other particulate material, such particulate material having an angle of repose and possessing internal friction characteristics, the structure comprising:

(a) walls enclosing the structure at least partially and including two side walls spaced laterally from each other, positioned to provide lateral support for the base of a pile of such particulate material between the side walls, and adapted to provide lower support for a roof;

(b) a roof spanning and supported fixedly on the side walls so as to cover the structure, the roof having a ridge extending longitudinally along the building, the roof having two arrays of structural trusses with one array of structural trusses extending between each of the side walls and the ridge, the roof having two canopies with one canopy covering the array of structural trusses on each side of the ridge, each canopy sloping upwardly from one of the side walls at an angle more than the angle of repose of such particulate material;

(c) a plurality of panels mounted within and extending longitudinally along the structure, the panels being arranged in at least one pair facing each other on opposite sides of the ridge, the panels of each pair being positioned vertically and horizontally to provide lateral support for a pile of such particulate material accumulated initially between



the side walls and prevent the pile from bearing directly against the canopy on either side of the ridge and when the pile accumulates subsequently to heights where part of the pile comes between the panels of such pair, each panel depending from and supported fixedly by one of the arrays of structural trusses so that the panels of each pair transmit lateral forces and vertical friction forces, as imposed by a pile of such particulate material between the panels of such pair, to the arrays of structural trusses and so that those forces are not borne directly by the canopy on either side of the ridge.

4,841,694

SASH PLATE USED FOR INSERTING A CABLE

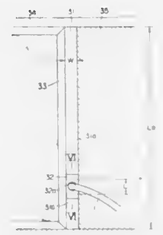
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Jun. 15, 1988, Ser. No. 207,149

Claims priority, application Japan, Jul. 24, 1987, 62-186279

Int. Cl.[4] E06B *3/00*

U.S. Cl. 52—198 **9 Claims**



1. A sash plate for use between an elongated sash member and a wall and arranged to insertably receive a cable to provide for indoor-outdoor access for said cable comprising a multi-part plate means insertable between said sash member and said wall, said multi-part plate means being elongated in a direction parallel to the elongate direction of said sash member, said multi-part plate means having at least two plate parts, one of said plate parts having a first longitudinal end and another of said plate parts having a second longitudinal end, said first and second longitudinal ends being separated from one another to define a space therebetween, a cable insertion plate disposed in said space, said insertion plate having a first end portion with a first groove and a second end portion with a second groove, said first longitudinal end of said first plate part being fixed in said first groove and said second longitudinal end of said other plate part being fixed in said second groove such that said plate parts and said insertion plate define a built-up sash plate having an elongate length substantially equal to the elongate length of said sash member, said insertion plate and said multi-part plate means each having the same width in a direction perpendicular to said elongate direction, said insertion plate having a cable-opening means insertably receiving a cable thereby providing for indoor-outdoor access for said cable.

4,841,695

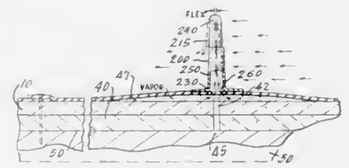
DEVICE FOR REDUCING MOISTURE BENEATH A ROOFING STRUCTURE

William H. Peters, R.R. #3, Bryan, Ohio 43506

Filed Apr. 29, 1988, Ser. No. 187,915

Int. Cl.[4] E04D *13/16*

U.S. Cl. 52—199 **3 Claims**



1. A device for aiding in the removal or alleviation of moisture from under a roof structure, said device comprising:

(a) a longitudinally extending finger-like housing member with a peripheral outer surface, said finger-like member having a first end and second end, said housing member having a longitudinally extending hollow chamber therein extending from the first end to just short of the second end, said longitudinally extending housing member having a plurality of openings therein extending from the inside of said chamber to areas outside said housing; and wherein said housing member has a circumferential ledge disposed around a portion of the peripheral outer surface of said housing member, said circumferential ledge being disposed between the first end and the second end of such housing member;

(b) a thimble-like cover concentrically mounted over a portion of said housing member, said thimble-like covering being somewhat larger in diameter than the diameter of the housing member, said thimble-like member having a circular bottom opening with a corresponding circular bottom opening edge defining said bottom opening on said thimble-like member, and wherein said circular bottom opening edge is adapted to rest in a nonfixed manner against the circular ledge on the outer periphery of the housing member, whereby said bottom opening edge of said thimble-like member can move away from said ledge with space between said bottom open ledge on said thimble-like covering and said circular ledge on the outer periphery of said housing.

4,841,696

SIZE-ADJUSTABLE WINDOW INSERT ASSEMBLY

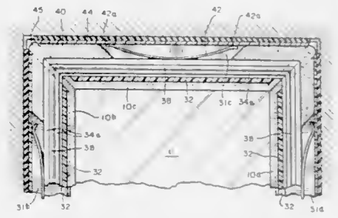
Clarence W. Miller, Bourbonnais, Ill., assignor to Thomas J. Kupensky, Darien, Ill.

Continuation of Ser. No. 760,274, Jul. 29, 1985, Pat. No. 4,702,051, which is a continuation-in-part of Ser. No. 605,616, Apr. 30, 1984, abandoned. This application Oct. 26, 1987, Ser. No. 113,616

The portion of the term of this patent subsequent to Oct. 27, 2004, has been disclaimed.

Int. Cl.[4] E06B *3/26*

U.S. Cl. 52—202 **4 Claims**



1. A size-adjustable window insert assembly comprising:

a first rectangular shaped frame with a window pane mounted therein, and an outboard facing frame surface;

a second rectangular shaped frame having an inboard open channel defined therein adapted to receive said first frame therein such that said first frame is surrounded by said second frame, an outboard facing second frame surface, said second frame further including at least a pair of adjacent and orthogonal frame sections which are movable relative to each other to change an outboard perimeter of said second frame, and means for capturing said first frame within said channel, said capturing means including corner members forming part of said second frame, said corner members defining a pair of orthogonal channels within which respective end portions of said adjacent and orthogonal frame sections are received and slide in telescoping fashion, said corner members closely embracing said second frame sections to substantially reduce air passage between said frame sections and said corner members, said second frame closely embracing said first frame is generally air-tight engagement therewith, and

means for biasing said second frame away from said outboard facing surface of said first frame, said biasing means permitting said second frame perimeter to be compressed in size for placement of said window insert assembly in a window frame, and then released from such compression with said biasing means pressing said second frame outboard facing surface against the window frame to engage said window insert assembly therein.

4,841,697

GLASS PANEL MOUNTING ASSEMBLY

Jeffrey Hogg, Collingham, and Harwood, Joseph T., Pudsey, both of England, assignors to Town Centre Securities, PLC, West Yorkshire, Great Britain

Filed Dec. 15, 1987, Ser. No. 133,027

Int. Cl.[4] E06B *3/00*

U.S. Cl. 52—208 **8 Claims**

1. A glass panel mounting assembly which comprises in combination:

a glass panel which is resiliently deflectable and which has at least a first edge;

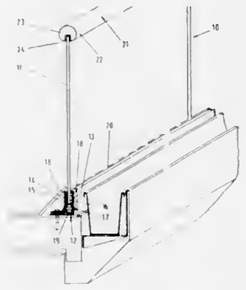
a U-shaped holder in which the first edge of the panel is securely mounted, said holder comprising a pair of substantially parallel metal limbs each having an inner face and a free end and which define a receiving channel hav-

ing an upper portion and a lower portion in which the first edge is received;

adjustable securing means extending between the metal limbs and below the first edge in order to clamp the first edge between the metal limbs;

a pair of packings positioned only within the lower portion of the channel and arranged one between each side of the first edge and the inner face of the respective adjacent limb of the holder, each packing being made of a material having a first resilience; and

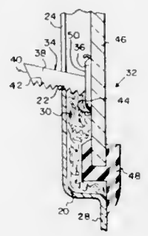
sealant material positioned within the upper portion of the



channel, the sealant material being made of a resilient material having a second resilience which is substantially greater than the first resilience of the packings

whereby the arrangement of the U-shaped holder, the packings and the sealant material constitutes holding means for allowing the panel to be deflected resiliently under a transversely applied loading, from its unloaded position, about the mounting of the first edge in the holder and substantially without any permanent deformation of the holder, the packings and the sealant material, such that the panel automatically restores itself to the unloaded position upon removal of the applied loading.

4,841,698
AUTOMOTIVE WINDOW RETENTION SYSTEM AND RETENTION ELEMENT THEREFOR
Peter Gold, 465 N. Wood Rd., Rockville Centre, N.Y. 11570
Filed Jun. 15, 1988, Ser. No. 206,823
Int. Cl.[4] E06B *3/00*
U.S. Cl. 52—208 7 Claims



1. A retention system for an automotive window of the type having a window assembly insertable onto a peripheral flange of a flanged window aperture formed in an automotive vehicle body, said window assembly to be adhesively secured thereto, the window assembly being positioned with respect to the aperture by a plurality of retention elements mounted on the window assembly and operatively disposed between the window assembly and the aperture, said retention system comprising:

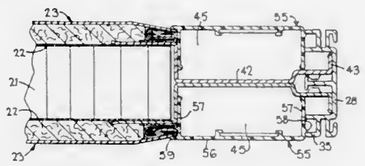
a suction cup-shaped base portion having an inner side adapted to be fixedly secured to an inner peripheral surface of the window assembly and having a resilient outer side;

a generally perpendicular outward extending stem attached at a joint formed between a first end of said stem and said resilient outer side of said cup-shaped base portion, said stem having a free end deflecting toward the interior of the flanged window aperture upon engagement therewith about said joint formed between said first end thereof by outwardly deforming said resilient outer side of said cup-shaped base portion in a direction toward the interior of the window aperture;

means integral with said generally perpendicular outwardly extending stem for lockingly engaging the peripheral flange of the flanged window aperture; and

curable adhesive means for application to said suction shaped base portion, prior to the placement thereof on said window assembly, said adhesive means allowing movement of said base portion with respect to said window assembly prior to curing, and fixing said base portion with respect to said window assembly after curing.

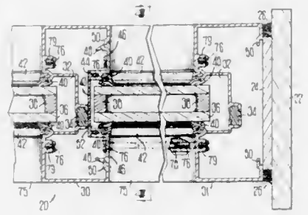
4,841,699
WALL PANEL WITH ACCESSIBLE INTERIOR CHANNELS FOR LAYING IN OF CABLES
Harold R. Wilson; Richard G. Haworth, both of Holland, and Bryan R. Gingrich, Wyoming, all of Mich., assignors to Haworth, Inc., Holland, Mich.
Continuation of Ser. No. 180,609, Apr. 5, 1988, abandoned, which is a continuation of Ser. No. 894,801, Aug. 8, 1986, abandoned. This application Sep. 20, 1988, Ser. No. 248,253
Int. Cl.[4] E04F *19/06*
U.S. Cl. 52—221 11 Claims



1. In a wall system formed from a plurality of upright prefabricated panels which are horizontally serially connected, at least one said panel including an upright panel-like core structure, said upright panel-like core structure including a pair of substantially vertically planar side plates disposed in substantially parallel relationship and secured adjacent opposite sides of a substantially rectangular frame, said frame including substantially horizontally extending top and bottom frame elements secured between the parallel side plates adjacent upper and lower edges thereof, said frame also including substantially parallel vertically extending side rails secured between said side plates adjacent opposite vertical edges thereof, and a pair of vertically enlarged flexible fabric-like side mats extending substantially coextensively over the planar side plates of the panel-like core structure for defining exterior vertical side surfaces of the panel, the improvement comprising vertically elongated cable-receiving channel means stationarily secured to and extending vertically along at least one side rail of said core structure substantially between said side mats, said channel means defining therein a vertically extending channel for receiving cables therein, said channel means having a vertically elongated opening in a sidewall thereof for providing access to said channel, said opening facing toward one of said vertical side surfaces of said panel, door means swingably

movable between a closed position wherein it closes off said opening and an open position wherein the door means projects transversely outwardly away from said one vertical side surfaces so as to provide free access to said channel through said opening, said door means including a door member which is hingedly interconnected to said core structure for swinging movement about a substantially vertical axis, said door means also including a flexible fabric-like mat part positioned externally of and extending coextensively over said door member, said mat part being integral with and defining a part of said side mat so as to define a substantially continuous exterior surface which visually hides said door means when the latter is closed, a first hook-and-slot connection means coacting between opposed vertical edges of said core structure and said channel means for releasably securing them together, a vertically elongated trim rail positioned adjacent and extending vertically along the other vertical edge of said channel means, and a second hook-and-slot connection means coacting between said trim rail and said other vertical edge of said channel means for releasably securing said trim rail to said channel means, said second connection means being identical to said first connection means so that said trim rail can be connected directly to the vertical edge of said core structure.

4,841,700
NARROW FLUSH GLAZED THERMAL FRAMING
Thomas E. Matthews, Lilburn, Ga., assignor to Kawneer Company, Inc., Norcross, Ga.
Filed Aug. 5, 1988, Ser. No. 229,127
Int. Cl.[4] E04B *2/28*
U.S. Cl. 52—235 6 Claims



1. A thermal mullion for narrow flush glazed framing, comprising:

an extruded structural profile having on one side a deep glazing channel and on the opposed side a slot for forming a shallow glazing channel;

a thermal break in the deep glazing channel; and

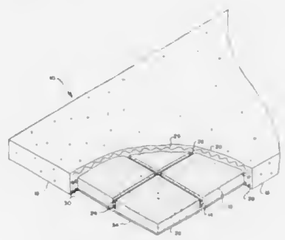
a thermal break filler assembly comprising a base formed at least in part of a relatively low thermal conductivity material and a pair of elongated lateral members, said base engaging each of said pair of lateral members to secure said pair of lateral members in parallel, spaced-apart relation, said pair of lateral members engaging said structural profile to secure said thermal break filler assembly within said slot, said thermal break filler assembly being configured to form a shallow glazing channel in said structural profile.

4,841,701
DRYING BIN FLOORS
Eugene G. Sukup, Beeds Lake, Hampton, Iowa 50441
Filed Aug. 12, 1987, Ser. No. 84,692
The portion of the term of this patent subsequent to Aug. 12, 2003, has been disclaimed.
Int. Cl.[4] E04B *1/70*
U.S. Cl. 52—263 19 Claims

1. A perforate grain bin floor assembly for a supported floor having a space therebeneath comprising a series of elongated panels of formed sheet material, each of said panels having a generally planar top portion and depending flanges along each longitudinal edge of said top portion, said top portions of successive panels in said series being perforate to permit the passage of air therethrough and being adapted for disposition contiguous to one another along said longitudinal edges of said top portions, said series comprising at least one symmetrical panel wherein both of said flanges thereof extend inwardly or outwardly and a plurality of asymmetrical panels each having

a first of said depending flanges extending outwardly along one edge and a second of said depending flanges extending inwardly along the opposite edge, said series including a panel along each edge of said symmetrical panel, and an inwardly extending flange of one of said panels engaging in nesting relation with a respective outwardly extending flange of a contiguous panel at each joint between contiguous panels in said series whereby said top portions form a generally continuous planar floor surface while permitting the passage of air therethrough.

4,841,702
INSULATED CONCRETE BUILDING PANELS AND METHOD OF MAKING THE SAME
Erik W. Huettemann, 285 Mill Rd., Madison, Ala. 35758
Filed Feb. 22, 1988, Ser. No. 158,476
Int. Cl.[4] E04C *1/06, 1/28, 1/40*
U.S. Cl. 52—309.12 25 Claims



1. A load-bearing building panel comprising:

a rigid slab of insulating material having a first face, a second face, and a plurality of edges, said first face having defined therein a plurality of grooves extending substantially into said slab and forming channels for containing supporting ribs; and

concrete integrally cast into said grooves, over said first face, and outside of and in contact with said edges, forming supporting ribs within said grooves and integral therewith a layer of concrete covering said first face and edge frames outside said slab edges.

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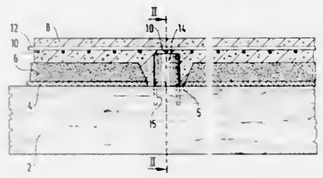
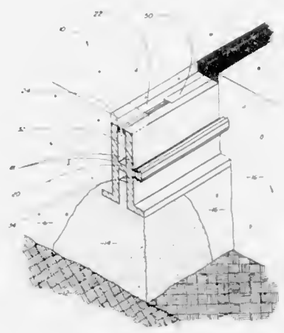
4,841,703
FLOOR WITH CO-OPERATION BETWEEN WOOD AND CONCRETE
Alain Grimaud, Saint Bonnet, France, assignor to Enterprise Paris Quest, Paris, France
Filed Feb. 24, 1988, Ser. No. 159,986
Claims priority, application France, Feb. 26, 1987, 87 02559
Int. Cl.[4] F04B *1/16*
U.S. Cl. 52—334 10 Claims



1. A floor having co-operation between wood and concrete, said floor comprising:
beams of wood extending along a longitudinal direction and following one another in a transverse direction in a substantially horizontal beam plane, said beams resting on supports for supporting the floor, each beam having a top face, a bottom face, and two side faces;
a slab of cast concrete formed on said beams in order to constitute the floor surface and to contribute to the strength of the floor, said concrete including aggregate and being in a solidified form; and
connectors each having a bottom length received in one of said beams and a top length received in said slab for transmitting internal longitudinal forces which are applied between the concrete of said slab and the wood of said beams and which result from bending loads applied to the floor;
the improvement wherein each of said connectors is in the form of a connector tube, said connector tube bottom length occupying a housing hollowed out in the wood from said top face of one of said beams and said bottom length constituting an extended bearing surface for said connector tube to bear against a wall of said housing for transmitting said internal longitudinal forces, and whereby such forces are spread over all of said bearing surface due to the stiffness which results from the tubular form of said connector tube.

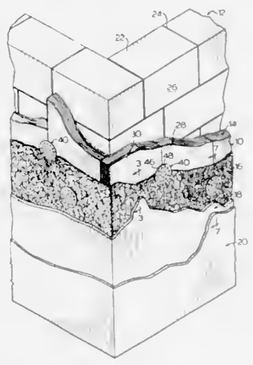
4,841,704
SCREED TRACK FOR CONCRETE SLAB CONSTRUCTION
Stephen E. Jarrell, 8501 Southfield Ll., Raleigh, N.C. 27615
Filed May 23, 1988, Ser. No. 197,645
Int. Cl.[4] E04B *01/68*; E01C *11/04*
U.S. Cl. 52—396 16 Claims

1. A leave-in-place, screed track assembly for use in connection with concrete slabs poured in place on an underlying support surface, the screed track assembly comprising:
(a) a base structure extending upwardly from the underlying support surface; and
(b) an integrated screed track interposed between two adjacent concrete slabs and supported by said base structure in a substantially horizontal position, the screed track including:
(1) two elongated, parallel side rails disposed in substantially vertical planes in close, spaced-apart relationship, each side rail including a top edge and a bottom edge;
(2) a generally horizontal, interconnecting member disposed between the spaced-apart, side rails for connecting the side rails;
(3) an elongated, bonding member projecting laterally from not more than one of the side rails for mechanically interlocking the screed track with the concrete slab on one side of the screed track, the opposite side rail being substantially flat so as not to mechanically interlock with the concrete slab; and



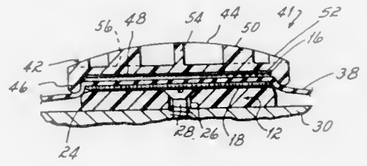
(4) a pair of oppositely extending flanges projecting laterally from the bottom edges of respective side rails for maximizing load transfer between the concrete slabs on opposite sides of the screed track.

4,841,705
REINFORCED CEMENTITIOUS PANEL
John P. R. Fubrer, Bolton, Canada, assignor to 698315 Ontario, Ltd., Canada
Filed Apr. 13, 1987, Ser. No. 37,807
The portion of the term of this patent subsequent to Aug. 19, 2003, has been disclaimed.
Int. Cl.[4] E04B *2/04*
U.S. Cl. 52—410 10 Claims



1. A cementitious building wall covering system comprising a wall support structure, a layer of insulative material and a layer of matting overlying said insulative material, said insulative material and matting being applied to said wall support by spaced apart mechanical fasteners, said matting comprising a bulky layer of open construction formed by randomly directed interconnected flexible filaments randomly looped construction as defined by said interconnected flexible filaments, a continuous layer of hardened cementitious material filling and essentially covering said open construction of said matting, said open construction having approximately 90% or more of its volume normally void and thereby filled with said cementitious material, said matting having a nominal thickness defined by extremities of said loops, said nominal thickness being less than a thickness for said cementitious layer and a hardened finish coat adheres to said layer of cementitious material.

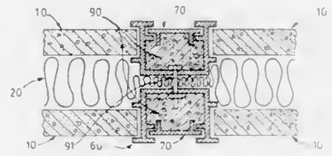
4,841,706
NON-PENETRATING FASTENER FOR AFFIXING ELASTOMERIC SHEETING TO A ROOF
Stevan A. Resan, Marshall, Va., assignor to Carlisle Corporation, Cincinnati, Ohio
Filed Nov. 18, 1987, Ser. No. 122,277
Int. Cl.[4] E04B *5/00*
U.S. Cl. 52—410 9 Claims



1. A non-penetrating fastener for securing elastomeric sheeting to a roof, comprising:
a base plate adapted to be fixedly mounted to the roof;
a first induction heating element mounted to said base plate, said first induction heating element having at least one surface coated with a hot melt adhesive material;
a rigid top plate;
a second induction heating element mounted to said rigid top plate, and second induction heating element having at least one surface coated with a hot melt adhesive material;
said base plate and said top plate being positionable on opposite sides of and in alignment with one another so that said adhesive coated surface of said first induction heating element mounted to said base plate and said adhesive coated surface of said second induction heating element mounted to said rigid top plate contact to the elastomeric sheeting, said first and second induction heating elements being effective to heat said hot melt adhesive thereon to a molten state in response to bombardment with magnetic flux for bonding the elastomeric sheeting to said base plate and to said rigid top plate
induction welding means for bombarding said heat induction elements of each of said base plate and said rigid cover plates with magnetic flux to heat said heat inductive elements for melting said hot melt adhesive material.

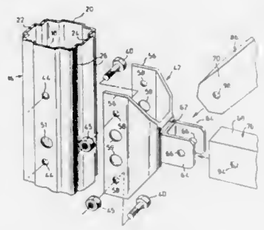
4,841,707
COMPOSITE DOUBLE OR MULTIPLE WALL
Jose M. Novoa, 350 W. Park Dr., Apt. 102, Miami, Fla. 33172
Filed Jan. 5, 1987, Ser. No. 689
Int. Cl.[4] F04B *2/00*
U.S. Cl. 52—426 4 Claims

1. An improved composite wall comprising the combination of:
a first generally flat vertical wall formed of a plurality of first planar panels arranged with the panel edges fitted together along horizontal edges;
a second general flat vertical wall formed of a plurality of second planar panels arranged with the panel edges fitted together along horizontal edges;
said first and second walls being horizontally spaced from each other forming an aperture therebetween for receiving insulation;
a pair of one piece vertical elongated columns arranged in parallel and spaced from one another forming an aperture between facing column sides;
vertical elongated outwardly opening channels positioned on opposite faces of each of said columns and positioned for receiving end edges of a plurality of the planar panels which comprise said first and second walls;



said apertures between said first and second walls and between said columns combining to form a continuous aperture extending along said walls and columns; and
vertically spaced connecting members attaching columns together.

4,841,708
BOLTED ALUMINUM SHORING FRAME
Ronald J. Johnston, Georgetown, Canada, assignor to Aluma Systems Incorporated, Downsview, Canada
Continuation of Ser. No. 660,564, Oct. 15, 1984, abandoned, which is a continuation of Ser. No. 249,732, Mar. 31, 1981, abandoned. This application Oct. 26, 1987, Ser. No. 115,587
Claims priority, application Canada, Sep. 29, 1980, 361888
Int. Cl.[4] E04G *1/12*
U.S. Cl. 52—646 12 Claims



9. A shoring frame, comprising:
a pair of legs, each leg being defined by a substantially uninterrupted periphery in a transverse cross section, wherein each leg is of generally rectangular cross section and wherein each said leg includes four longitudinally extending wall portions which are in outwardly stepped relation to the general cross-sectional contours of said leg;
means for bracing between said legs, said bracing means including means for diagonally bracing between said legs; and
means for boltably securing said bracing means to said legs, said boltable securing means adapted to engage at least two opposed wall portions of said longitudinally extending wall portions.

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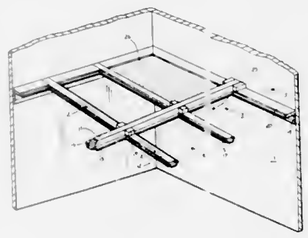
4,841,709

SUSPENDED CEILING ASSEMBLY

Marvin Peterson, 6120 Oxboro Ave. North #123, Stillwater, Minn. 55082, and Richard Petroske, 978 Seventeenth Ave. Southeast, Minneapolis, Minn. 55414.

Filed Mar. 13, 1987, Ser. No. 25,636
Int. Cl.[4] E04B 5/52
U.S. Cl. 52—664 2 Claims



1. A suspended ceiling assembly for installation in homes or offices, comprising:
   a. a plurality of elongate main beams having upper and lower surfaces extending along the length dimension of said main beam, said lower surface of said main beam including horizontally extending extensions extending outwardly along the length dimension of said main beam;
   b. a plurality of elongate cross beams having upper and lower surfaces extending along the length dimension of said cross beam, said lower surface of said cross beam including outwardly projecting side extensions extending outwardly in a generally horizontal orientation along the length dimension of said cross beam;
   c. at least one grooved end on said cross beams, said grooved end providing an interlocking fit with said horizontal extensions of said main beams;
   d. a wall support structure including a vertical support member extending around the periphery of the suspended ceiling assembly, said vertical support member being fastened to a wall surface;
   e. a top support member fastened to said vertical support member, said top support member having a horizontally projecting side member and an opposite flat side surface positioned against the wall surface;
   f. said main beams having ends adjacent to the vertical support member and in interlocing engagement with the top support members;
   g. a plurality of said cross beams having ends fastened to said wall support structure by interlocing engagement with said top support member, and wherein the cross beams, main beams and wall support structure are arranged to support ceiling tiles therein on their respective horizontal extensions and side members; and
   h. a support block fastened to the upper surfaces of said cross beams adjacent said main beam to reinforce the cross beam and main beam.

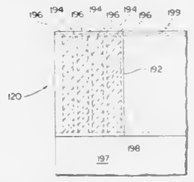
4,841,710

STRUCTURAL WALL PANEL, METHOD OF MANUFACTURE AND ASSEMBLY SYSTEM FOR A HOUSING UNIT

Richard Considine, Chestertown, N.Y., assignor to The Original Lincoln Logs Ltd., Chestertown, N.Y.

Filed Jul. 23, 1987, Ser. No. 76,751
Int. Cl.[4] E04B 2/56; E04G 21/14
U.S. Cl. 52—741 4 Claims

1. A method of building a structural housing unit, said method comprising:
   laying a foundation,
   securing a sole plate to said foundation in a pattern having corners,
   forming an exterior surface of a plurality of walls from a plurality of prefabricated wall sections having an exposed interior surface adapted for access to the interior of the walls to perform such functions as installation and inspection of plumbing and electrical lines in recesses formed from said exposed interior surface, said exterior surface



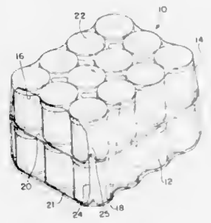
   being formed by securing said plurality of prefabricated wall sections to said sole plate while spacing terminal edges of said wall sections from each other at said corners,
   securing a top plate to said wall sections, following the pattern of said sole plate, and
   interconnecting said terminal edges at said corners with a series of studs extending between said top plate and said sole plate.

4,841,711

METHOD OF MAKING A FILM ENCASED PACKAGE

Peter Lems, Wilmette, and Edward J. Slomski, Woodstock, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Jun. 8, 1988, Ser. No. 204,032
Int. Cl.[4] B65B 13/10, 21/24
U.S. Cl. 53—398 4 Claims



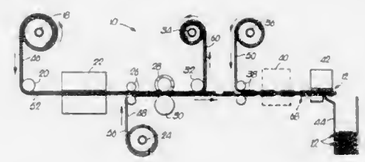
1. A method for producing a package for a plurality of containers including the steps of;
   forming sub-packages of containers by positioning a first plurality of containers in an integral multipackaging device having resilient bands creating apertures equal in number to the first plurality of containers;
   arranging a continuous non-spaced, stream of subpackages;
   placing a continuous strip of, thin, planar flexible material beneath the sub-packages;
   moving the non-spaced sub-packages and thin planar material through a stretch wrapping station;
   continuously, spirally winding a web of stretch film under tension to stretch wrap the groups of subpackages;
   thus creating a continuous stream of substantially contacting containers, spirally enveloped but adapted to be separated into discrete combination packages by cutting the film an thin planar material perpendicular to the continuous stream between predetermined, adjacent sub-packages.

4,841,712

METHOD OF PRODUCING SEALED PROTECTIVE POUCHS WITH PREMIUM OBJECT ENCLOSED THEREIN

Richard J. Roou, Gladstone, Mo., assignor to Package Service Company, Inc., Kansas City, Mo.

Filed Dec. 17, 1987, Ser. No. 134,369
Int. Cl.[4] B65B 61/18, 63/04
U.S. Cl. 53—412 15 Claims



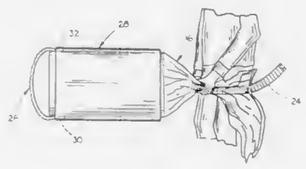
1. A method for producing a plurality of sealed protective pouches having a respective plurality of premium objects enclosed therein, said method comprising the steps of:
   providing a carrier sheet including a contact surface having an adhesive coating thereon;
   placing a web in aligned superimposed relationship with said carrier sheet;
   releasably adhering said web to said carrier sheet;
   cutting said web while adhered to said carrier sheet in order to produce a plurality of spaced-apart premium objects and a waste matrix;
   removing said waste matrix,
   said carrier sheet presenting a plurality of carrier sealing zones in respective, continuously surrounding, marginal relationship with said premium objects and presenting a corresponding plurality of carrier walls;
   positioning a top sheet aligned superposed relationship with said carrier sheet with said premium objects therebetween;
   said top sheet presenting a plurality of top sealing zones corresponding to said carrier sealing zones in respective, continuously surrounding, marginal relationship with said premium objects and presenting a corresponding plurality of top walls; and
   sealing said top sealing zones to said corresponding carrier sealing zones in order to form a plurality of continuous sealed zones respectively surrounding said premium objects, said sealed zones and respective corresponding carrier and top walls defining said sealed protective pouches with said respective plurality of premium objects enclosed therein.

4,841,713

METHOD FOR PACKAGING FOAM MATERIAL

John K. Beier, 901 S. 89th St., Omaha, Nebr. 68114

Filed Jan. 25, 1988, Ser. No. 148,334
Int. Cl.[4] B65B 11/58, 31/00, 61/14
U.S. Cl. 53—413 1 Claim



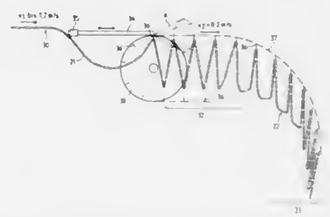
1. The method of packaging sheet material, comprising the steps of:
   providing a flexible plastic bag having a closed end and an open end,
   providing a flexible sheet member comprised of a foam material,
   providing a flexible first sleeve means having open ends, said first sleeve means having a diameter less than the diameter of said bag,
   folding the sheet member to form a roll,
   placing the roll into the bag,
   at least partially removing the air from the bag and the roll of material to compress the material thereby reducing the diameter thereof and the diameter of the bag,
   positioning an elongated handle means comprised of the same foam material as the flexible sheet member, relative to the bag so that the ends of the handle means are adjacent the sides of the bag adjacent the closed end thereof,
   placing the sleeve means around the bag so that the ends of the handle means are positioned between the bag and the sleeve means,
   permitting air to re-enter the interior of the bag so that the material will expand until restrained by the sleeve means with the ends of the handle means being held between the sleeve means and bag solely by frictional engagement therebetween.

4,841,714

METHOD AND APPARATUS FOR THE FURTHER PROCESSING OF A PACKAGING LINE

Jacques Meier, Bäretswil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed May 11, 1987, Ser. No. 48,295
Claims priority, application Switzerland, Jul. 21, 1986, 02910/86
Int. Cl.[4] B65B 35/00
U.S. Cl. 53—429 14 Claims



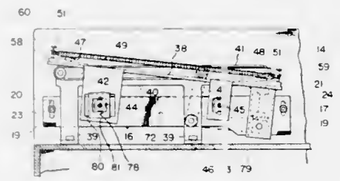
1. A method for ordering a coherent packaging line in a high speed process by varying the kinetic energy thereof and maintaining its process inherent order, comprising the steps of:
   taking up sectionwise the packaging line discharged at full process speed from a first production stage by the engagement of a support member with said packaging line between two individual product portions thereof, and a sequential engagement with a plurality of support members, each support member engaged between two additional individual product portions such that hanging first-formed loops are positioned between said support members with the aid of weight of the material such that said support members form apexes of said loops;
   varying a distance between loop apexes according to a required process speed of a second production stage, storage unit or intermediate buffer; and
   varying the length of each loop by making second-formed loops by releasing or reforming loop apexes intermediate said apexes of said first-formed loops by a plurality of second support members traveling a different path from said support members of said first-formed loops.

4,841,715

PACKAGING APPARATUS

Tadoru Suga, Ibaraki, Japan, assignor to Ibaraki Precision Machinery Co., Ltd., Osaka, Japan

Filed Apr. 15, 1988, Ser. No. 182,471
Int. Cl.[4] B65B *9/00, 11/20*
U.S. Cl. 53—547 6 Claims



1. A packaging apparatus for packaging articles with a plastic film sheet, comprising:

means for transporting a plurality of articles at equispaced intervals,

means for placing over said articles a belt-like plastic film payed out from a position above a transport path of said transporting means and at the upstream side of said path while causing the plastic film to be stretched in the widthwise direction thereof,

means for folding to the underside of the articles both side edge portions of the film placed over said articles, thereby forming the film into a tube shape so that the articles are enclosed in said tube of the film,

means for cutting said tube of the film between each two adjacent ones of the articles aligned in the direction of travel thereof, folding the leading and trailing ends of each cut tube of the film toward the underside of the corresponding article, then bringing the folded film ends into adhesion to the film portion covering the underside of the article,

said means for placing the film over the articles comprising:

a pair of endless chain means disposed on both sides of said transport path of said transporting means and driven to run along said transport path,

each of said pair of chain means including a plurality of clamps for sequentially clamping the side edge of said film at a starting end portion of the chain means and sequentially releasing said side edge at a terminal end portion of the chain means,

said pair of chain means being downwardly inclined from a position at a higher level than the upstream-side portion of said transport path of said transporting means and toward a position at a lower level than the downstream-side portion of said transport path whereby the film carried by said downwardly inclined chain means can be stretchably placed over the articles being packaged,

means for supporting said pair of endless chain means, said supporting means including a pair of parallel side plates spaced apart transversely of said transport path and extending lengthwise of said pair of endless chain means,

a machine frame having portions disposed adjacent said pair of side plates,

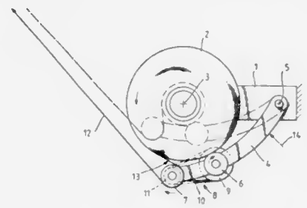
and means for fixing said pair of side plates to said machine from portions in a selected one of a plurality of positions having different downward inclinations in accordance with the stretchability of said plastic film whereby the packaging apparatus is useable with each of a plurality of types of plastic film having different draw ratios.

4,841,716

STRETCHING MEANS FOR BRAKING A WEB OF PLASTIC SHEET WHICH IS PULLED OFF A REEL

Erling Roymberg, Naerbo, Norway, assignor to Underhaug A/S, Naerbo, Norway

Filed May 13, 1988, Ser. No. 193,470
Claims priority, application Norway, May 13, 1987, 871987
Int. Cl.[4] B65B *11/04*
U.S. Cl. 53—556 15 Claims



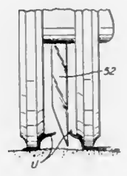
1. A stretching means for braking a web of plastic sheet being pulled off a plastic sheet reel, wherein it comprises an arm which is mounted to be pivotable about an axis extending in parallel with axis of the plastic sheet reel, a first roller rotatably mounted on said arm for resting against said plastic sheet reel, a second roller rotatably mounted on arm for receiving a loop of plastic sheet web pulled off said reel to cause said arm and said second roller to be pulled towards said reel when web is being pulled from the latter and press said first roller against said reel, and a drive connection between said rollers for driving the two rollers at different speeds and causing the plastic sheet web to be stretched in zone between said reel and said looped roller when it is pulled off said reel.

4,841,717

MOWER CUTTING UNIT

Lawrence L. Lloyd, 1001 Olmstead Ave., Pacific Grove, Calif. 93950

Continuation of Ser. No. 683,292, Dec. 18, 1984, Pat. No. 4,685,280, Continuation-in-part of Ser. No. 545,971, Oct. 26, 1983, Pat. No. 4,494,365. This application May 26, 1987, Ser. No. 54,653
The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.
Int. Cl.[4] A01D *34/42*
U.S. Cl. 56—256 6 Claims



1. A cutting head of the type for use with a mower cutting unit having a frame and support members mounted to the frame which support the cutting unit on a mowing surface, the improvement comprising:

one said support member comprising a generally horizontal slotted expunger roller mounted to the frame for rotation about an expunger roller axis, the expunger roller including a plurality of discs, the discs having outer surfaces and said faces, the discs spaced apart from one another to define annular slots therebetween, the side faces having inner and outer regions;

the portions of the annular slots defined by the outer regions of said side faces having inwardly sloping sides so that the portions of the annular slots defined by the outermost regions narrow in a radially inward direction so that discs pucker up plant matter into said annular slots as said discs roll over said plant matter; and

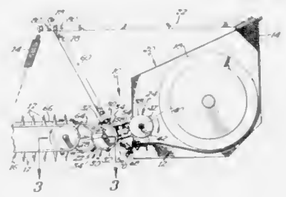
a supplementary cutter, mounted adjacent said expunger roller, including cutting elements aligned with at least some of the annular slots, the cutting elements positioned to cut the puckered up plant matter.

4,841,718

CONVEYING APPARATUS FOR CROP PICKUP

Lloyd P. Sund, P.O. Box 79, 200 Main St., Newburg, N. Dak. 58762

Filed Jul. 18, 1988, Ser. No. 220,257
Int. Cl.[4] A01D *43/02, 57/03, 89/00*
U.S. Cl. 56—364 14 Claims



1. An apparatus for conveying harvested crop materials to a combine having a grain receiving platform, comprising:

pickup means for picking up various windrowed grains and other crops from the surface of a field and directing them rearwardly towards the receiving platform of the combine;

a first elongated roller rotatably supported between said pickup means and said platform;

a plurality of segments mounted to said first roller peripherally, each said segment extending lengthwise of said first roller and including at least one row of flexible flippers thereon projecting radially outwardly from said first roller, each row containing at least one said flipper;

a second elongated roller rotatably supported behind said first roller in closer proximity to said platform and having a plurality of longitudinal strips fixedly attached thereto extending generally parallel to said segments; and

drive means for said first roller and said second roller causing said first and second rollers to rotate cooperatively, whereby grain directed rearwardly by said pickup means will be caught by said flippers and conveyed onto said second roller, which further assists in conveying grain rearwardly onto said platform.

4,841,719

APPARATUS FOR TRANSPORTING ROVING BOBBINS

Kenji Sasaki, Komaki, and Shunji Ito, Nagoya, both of Japan, assignors to Howa Machinery, Ltd., Japan

Filed Dec. 6, 1988, Ser. No. 280,581
Claims priority, application Japan, Dec. 10, 1987, 62-312942
Int. Cl.[4] D01H *9/18, 9/00*
U.S. Cl. 57—281 7 Claims

1. An apparatus for transporting roving bobbins along a transportation rail arranged between a spinning process and a roving process, comprising:

bobbin carriages, each having a plurality of bobbin hanger for suspendingly holding roving bobbins and movably supported by the transportation rail;

a driving device for intermittently displacing the bobbin carriage; and

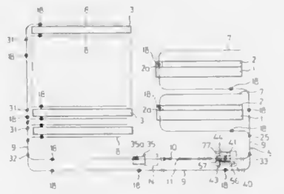
a roving stripper arranged midway of the transportation rail for clearing off a residual roving on the roving bobbin;

characterized in that

a miss bobbin treatment device is provided midway of the transportation rail between the roving stripper and the roving process, for removing a miss bobbin from which the residual roving has not been completely cleared off by the roving stripper from the bobbin hanger and, instead, donning a normal empty bobbin onto the bobbin hanger;

the miss bobbin treatment device comprising:

a detector, arranged midway of the transportation rail between the roving stripper and the roving process, for detecting presence and absence of the residual roving on the roving bobbin after the roving bobbin has been treated by the roving stripper;



a peg for selectively holding the miss bobbin and the normal empty bobbin;

a bobbin lift for displacing the peg between a first position at which the roving bobbin is transferred between the bobbin hanger of the bobbin carriage and the peg and a second position at which the normal empty bobbin is donned onto the peg;

means for withdrawing the miss bobbin held on the peg therefrom during the downward displacement of the peg; and

means for feeding the normal empty bobbin to the peg;

wherein the removal of the miss bobbin from the bobbin hanger is carried out by the co-operation of the peg, the bobbin lift, and the miss bobbin withdrawal means; the donning of the normal empty bobbin is carried out by the co-operation of the peg, the bobbin lift and the normal empty bobbin feeding means.

4,841,720

ROVING BOBBIN EXCHANGING METHOD AND APPARATUS FOR CARRYING OUT ROVING BOBBIN EXCHANGING METHOD

Yoshio Kawasaki; Tatutake Horibe, both of Fujieda; Kenji Sasaki, Komaki, and Kazuo Yamada, Inazawa, all of Japan, assignors to Howa Machinery Ltd., Aichi, Japan

Continuation-in-part of Ser. No. 91,209, Aug. 31, 1987, abandoned. This application Nov. 18, 1988, Ser. No. 273,348
Claims priority, application Japan, Aug. 30, 1986, 61-202734
Int. Cl.[4] D01H *9/18, 9/02, 9/10*
U.S. Cl. 57—281 13 Claims

1. A method for exchanging exhausted roving bobbins for full packaged roving bobbins applied to a conventional ring spinning frame provided with a creel in each side thereof, a plurality of bobbin hangers arranged on said creel in two rows so that each front bobbin hanger faces a corresponding back bobbin hanger, further provided with at least one supply rail extending in parallel to said creel at a position in front thereof, comprising

a preparatory operation of carrying an alignment of a plurality of bobbin hangers holding full packaged roving bob-

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bins to be exchanged for said exhausted roving bobbins, and two auxiliary bobbin hangers not holding roving bobbins to a position on said supply rail, in a condition such that said two auxiliary bobbin holders occupy a position upstream of said alignment of bobbin hangers,

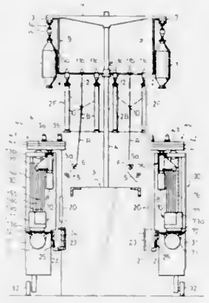
a first unit roving bobbin exchanging operation comprising

a first step of taking-off a first pair of exhausted roving bobbins suspended from a first pair of front and back bobbin hangers, facing each other, on said creel, to which is to be applied a first unit operation in a series of unit roving bobbin exchanging operations, when said roving bobbin exchanging operation is required,

a second step of displacing said exhausted roving bobbins taken from said first pair of front and back bobbin hangers of said creel, to respective positions directly below said auxiliary bobbin hangers, and then transferring said exhausted roving bobbins to the respective one of said auxiliary bobbin hangers,

a third step of taking-off a pair of full packaged roving bobbins from a first pair of adjacent bobbin hangers located downstream of said auxiliary bobbin hangers on said supply rail, and then displacing said full packaged roving bobbins at the respective position directly below said first pair of front and back bobbin hangers,

successive unit operations, stepwisely applied to the last pair of front and back bobbin hangers, facing each other on said creel, to which said unit roving bobbin exchanging operation is to be applied, comprising,



a first step of taking-off a pair of exhausted roving bobbins suspended from a pair of front and back bobbin hangers, facing each other, on said creel, which follow a pair of front and back bobbin hangers on said creel, completing said unit roving bobbin exchanging operation by an immediately previous unit operation,

a second step of displacing said exhausted roving bobbins taken from said pair of front and back bobbin hangers of said creel to the respective position directly below said bobbin hanger on said supply rail, from which a pair of full packaged roving bobbins were taken-off by the immediately previous unit roving bobbin exchanging operation, and then transferring said exhausted roving bobbins to the respective one of said bobbin hangers of said supply rail,

a third step of taking-off a pair of full packaged roving bobbins from an adjacent pair of bobbin hangers located immediately downstream of said bobbin hangers, to which said exhausted roving bobbins were transferred by said second step, and then displacing said full packaged roving bobbins at the respective positions directly below said pair of front and back bobbin hangers on said creel, from which exhausted roving bobbins were taken by said first step operation,

wherein, during each unit operation, an axial distance between two roving bobbins under operation is changed between an axial distance between said front bobbin hanger and said back bobbin hanger, facing each other, on said creel, and an axial distance between two adjacent bobbin hangers on said supply rail.

4. Apparatus for exchanging exhausted roving bobbins for full packaged roving bobbins, applied to a conventional ring spinning frame provided with a creel in each side thereof, a plurality of bobbin hangers being arranged on said creel in two rows so that each front bobbin hangers faces a corresponding back bobbin hanger, further provided with at least one supply rail extending in parallel to said creel at a position in front thereof comprising,

a peg unit provided with a pair of pegs detachably holding roving bobbins respectively, a telescopic mechanism mounting those pegs in a condition capable of changing an axial distance therebetween from an axial distance between said front bobbin hanger and said back bobbin hanger facing each other on said creel (b) to an axial distance between two adjacent bobbin hangers on said supply rail (a), and vice versa,

a lifting body supporting said peg unit

means for displacing said peg unit to a position by which said pair of pegs take the respective positions directly below the corresponding pair of said front and back bobbin hangers, facing each other on said creel, and the respective positions directly below the corresponding adjacent two bobbin hangers on said supply rail, said displacing means being mounted on said lifting body,

lifting means for vertically displacing said lifting body upwards and downwards to and from the corresponding pair of said front and back bobbin hangers, facing each other on said creel when said pegs of said peg unit take a position directly below said front and back bobbin hangers on said creel, respectively, and for vertically displacing said lifting body upwards and downwards to and from the corresponding adjacent two bobbin hangers on said supply rail when said pegs of said peg unit take a position right below said adjacent two bobbin hangers on said supply rail, respectively,

means for controlling a sequential action composed of motions of said telescopic mechanism of said peg unit, said displacing means and said lifting means,

a main body mounting said lifting body of said lifting means,

a displacing mechanism for stepwisely displacing said body along said creel of said spinning frame and stopping said unit at the respective position for carrying out a unit roving bobbin exchanging operation applied to said pair of front and back bobbin hangers, facing each other on said creel, to which such a unit roving bobbin exchanging operation is to be applied.

4,841,721

VERY HIGH EFFICIENCY HYBRID STEAM/GAS TURBINE POWER PLANT WIHT BOTTOMING VAPOR RANKINE CYCLE

John T. Patton, 2955 McDowell, and Ahmad R. Shouman, 1006 Bloomdale, both of Las Cruces, N. Mex. 88005

Continuation-in-part of Ser. No. 701,767, Feb. 14, 1985, abandoned. This application Jan. 28, 1987, Ser. No. 7,675

Int. Cl.[4] F02C *6/00, 7/00*

U.S. Cl. 60—39.05 **8 Claims**

5. A method extending the life of a turbine utilized in a hybrid steam/gas turbine power plant of the type utilizing a direct fired steam generator for supplying steam and combustion products to the inlet of a drive turbine having a shaft coupled compressor stage comprising the steps of:

Operating a direct fired steam generator having feedwater, combustion air and fuel inlets, and an outlet delivering exhaust steam and combustion products for operating a drive turbine at a predetermined pressure;

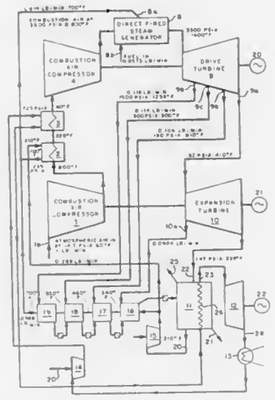
Providing a plurality of pressure and temperature staged exhaust discharges in said drive turbine;

transferring heat, from said turbine exhausts to said generator feedwater; thereby heating said feedwater;

limiting said feedwater heating to saturation temperatures and pressures of said feedwater;

compressing atmospheric air in said compressor to a predetermined pressure and temperature for use as generator combustion air;

supplying said combustion air, feedwater, and fuel to said generator inlets;



cooling said combustion air by transferring heat to said steam generator feedwater;

establishing a combination of said steam generator fuel, feedwater and combustion air flows such that said steam generator exhaust temperatures and pressure does not exceed a predetermined value.

4,841,722

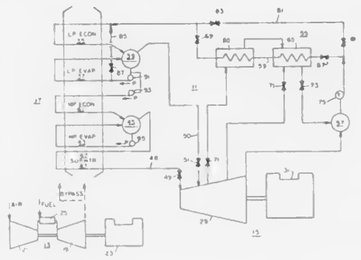
DUAL FUEL, PRESSURE COMBINED CYCLE

Robert W. Bjorge, Revere, Mass., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 26, 1983, Ser. No. 526,666

Int. Cl.[4] F02C *6/00*

U.S. Cl. 60—39.182 **3 Claims**



1. A dual fuel combined cycle power plant including at least one gas turbine and at least one steam turbine thermally interconnected through at least one heat recovery steam generator; the combined cycle power plant selectively operable on liquid or gas fuels and including an improved feedwater recirculation loop connecting the steam turbine and heat recovery steam generator wherein the improvement comprises:

a heater loop including at least one feedwater heater connected to receive extraction steam from the steam turbine and including an upstream and downstream feedwater flow isolation valve; and,

a bypass loop including an upstream and downstream feedwater flow isolation valve, the heater loop and bypass loop being connected in parallel; and, the heater loop valves open during liquid fuel operation; and, the bypass loop valves open during gas fuel operation.

4,841,723

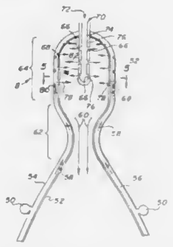
MULTIPLE-PROPELLANT AIR VEHICLE AND PROPULSION SYSTEM

Monica M. Lau, Okeana, and George A. Coffinberry, West Chester, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 14, 1986, Ser. No. 918,212

Int. Cl.[4] F02K *9/64*

U.S. Cl. 60—204 **26 Claims**



11. A method of improving the fuel system of a propulsion system having a rocket casing with a combustion chamber having a combustor liner and an exhaust gas throat having a throat liner with a fuel passageway adjacent to and surrounding the combustor liner and the throat liner, comprising:

(a) passing a hydrocarbon fuel selected from the group of hydrocarbons having a freezing point of about 150° R. to about 200° R. and a boiling point of about 275° R. to about 425° R. through the fuel passageway; and

(b) providing heat from the combustion of fuel in the combustion chamber to the fuel passageway by radiation through the combustor liner and the throat liner;

whereby the hydrocarbon fuel is heated at a temperature sufficient to cause the endothermic pyrolysis of the hydrocarbon in the fuel passageway, and the heat removed from the combustion chamber through the combustor liner and throat liner reduces the temperature in the combustion chamber at the combustor liner and the throat liner so the thermal limits of the combustor liner and throat liner are not exceeded.

4,841,724

ROCKETS

John M. Hall, Nr. Bristol; Roger Hurd, Bristol, and Geoffrey H. E. Wright, Bath, all of England, assignors to Rolls-Royce plc, London, England

Filed Aug. 3, 1977, Ser. No. 822,959

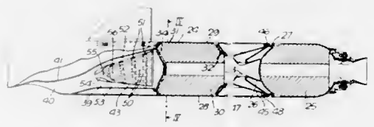
Claims priority, application United Kingdom, Aug. 17, 1976, 34243

Int. Cl.[4] F02K *7/18*

U.S. Cl. 60—245 **2 Claims**

1. A rocket having at its rearward end a propulsion assembly, the assembly comprising a chamber structured to accomodate a rocket fuel propellant, a diaphragm disposed at a forward end of the chamber and structured to withstand the pressure of burning rocket fuel propellant within the chamber, a diffusing passage ahead of the chamber and communicating with an air inlet at the side of the rocket, a flame holder disposed within the diffusing passage, said diffusing passage comprising, in flow series, a supersonic diffuser at said air inlet, and

a subsonic diffusion passage, said flame holder being disposed within the subsonic diffusion passage, the diaphragm being disposable following use of the rocket fuel propellant to allow combustion within the chamber of further fuel supplied to the flame holder with air received from the air inlet and wherein the chamber wall is part of the rocket casing and is directly



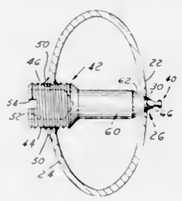
cooled during said combustion by the passage of air past the rocket, characterized in that said disposable diaphragm comprises an array of generally triangular segments closely fitted together to define a shallow angle cone with a central aperture at the apex of the cone and having a plug to close the aperture, the cone being overlaid on its outer surface with a layer of fibre reinforced resin and a further layer of an ablative coating.

4,841,725

FUEL SPRAY DEVICE FOR GAS TURBINE AUGMENTOR OR AFTERBURNER

John R. Farris, Southfield, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Sep. 2, 1983, Ser. No. 528,719
Int. Cl.[4] F02K .//10
U.S. Cl. 60—261 **3 Claims**



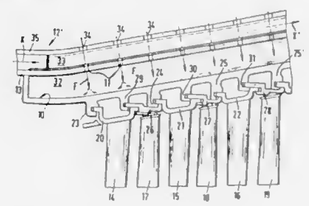
1. In a gas turbine engine including a turbine section and a supplemental thrust section downstream thereof, a fuel spray device disposed in the supplemental thrust section without shielding from hot gases discharging from the turbine section, said fuel spray device comprising a distensible fuel manifold haing a plurality of fuel ejection orifices each defined by an orifice wall and comprising a plurality of pintles attached to the manifold with each pintle extending through a respective one of said ejection orifices and having a decreasing cross-sectional portion against which the orifice wall seats when there is no fuel pressure in said manifold and relative to which the orifice wall moves from distention of the manifold with increases in fuel pressure to increase fuel flow rate through said orifices and a substantially constant cross-sectional portion downstream of said decreasing cross-sectional portion disposed at least partially in said orifice when said orifice wall is seated against said decreasing cross-sectional portion and having a length along which the orifice wall can move with said length selected to accommodate manifold distention from thermal growth effects so that there is minimal effect on fuel flow rate through said orifices from thermal growth effects.

4,841,726

GAS TURBINE JET ENGINE OF MULTI-SHAFT DOUBLE-FLOW CONSTRUCTION

Claus Burkhardt, Eching, Fed. Rep. of Germany, assignor to MTU-Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 19, 1986, Ser. No. 932,280
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1985, 3540943
Int. Cl.[4] F02K *3/06*
U.S. Cl. 60—226.1 **32 Claims**



1. A gas turbine jet propulsion unit including turbine guide blade support and cooling housing means, said housing means comprising:

a first housing wall having turbine guide blade support hook means at one side thereof, and

a second housing wall structurally supporting the first housing wall,

said first and second housing walls being spaced from one another to form a cooling air chamber therebetween at a side of the first housing wall which is opposite the support hook means, said second housing wall having a plurality of impact cooling air bore means therethrough for accommodating a supply of cooling air to said cooling air chamber to directly cool said first housing wall,

wherein the first housing wall extends axially over a plurality of guide blade sections and includes respective guide blade support hook means for each of said sections.

4,841,727

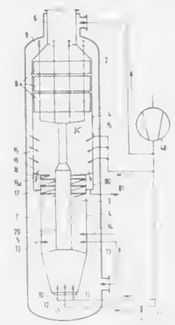
DEVICE FOR GENERATING FLUE GAS TO DRIVE A GAS TURBINE

Eberhard Wittchow, and Rudolf Pieper, both of Erlangen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 9, 1988, Ser. No. 154,071
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1987, 3703945; Dec. 4, 1987, 3741196
Int. Cl.[4] F02C *3/26*
U.S. Cl. 60—39.464 **22 Claims**

1. Device for generating flue gas for driving a gas turbine, comprising a closed hollow cylindrical housing having an air inlet connector, a stack longitudinally extended in said housing, said stack having upper and lower ends and having a stack wall spaced from said housing defining an intermediate space therebetween, a combustion chamber disposed at one of said ends of said stack, a closure element disposed at said one end of said stack, inlet opening means for combustion air being disposed at said one end of said stack and discharging into said combustion chamber, supply opening means for fine grained coal disposed at said one end of said stack and forming a pulverized coal burner along with said inlet opening means, first auxiliary inlet means for combustion air discharging in said combustion chamber, second auxiliary inlet means for fine grained coal disposed in said stack wall and discharging into said combustion chamber a distance from said closure element, a flue gas outlet connector disposed in and spaced from said air inlet connector of said housing at said other end of said stack, an air nozzle disposed in said stack wall a distance from said first auxiliary inlet means as seen in flue gas flow direction, said

air nozzle discharging tangentially into said stack providing means for creating a spin in supplied air having a given rotational direction and ending in said stack in a direction toward said lower end of said stack, a helically shaped guide plate for flue gas disposed on said stack wall inside said stack between



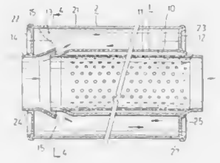
said first auxiliary inlet means and said air nozzle, said guide plate being wound in a direction providing means for imparting a spin to the flue gas having said given rotational direction, said stack wall having a step formed therein defining a change in cross section of said stack, and said step having an outlet opening for ash disposed therein.

4,841,728

STRAIGHT THROUGH TYPE MUFFLER FOR GENERATING THE EXHAUST FLOW FROM AN INTERNAL COMBUSTION ENGINE

Jyh-Jian Jean, No. 27, Hsi-Ning N. Rd., and Jyh-Perng Jean, both of Taipei, Taiwan, assignors to Jyh-Jian Jean, Taipei, Taiwan

Filed Jul. 10, 1987, Ser. No. 71,899
Int. Cl.[4] F02B *27/02*; F01N *1/02, 1/10*
U.S. Cl. 60—312 **14 Claims**



1. A straight through type muffler for generating an exhaust flow from an internal combustion engine producing gases, said muffler comprising:

a pipe having an exhaust main passage therein, said pipe receiving the gases at a forward end thereof and exhausting gases at a rear end thereof;

closed expansion chamber means in communication with an intermediate portion of said main passage, said expansion chamber means receiving a minority of said gases passing through said main passage until said expansion means is filled with the gases; and

at least one charging passage extending between the main passage and the expansion chamber means, said charging passage extending from the main passage at an angle thereto and extending in a direction toward the rear end of said pipe for enabling the minority of the gases passing through said main passage to readily be diverted to said expansion chamber means;

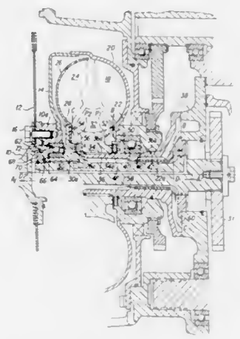
whereby, after said expansion chamber means is filled with the gases from said main passage and when the amount of the gases passing through said main passage is reduced, the gases in the main passage will be partially supplemented from the gases filling said expansion chamber means, thereby reducing pressure drop in said main passage of said muffler.

4,841,729

THRUST FORCE REDUCTION DEVICE FOR TORQUE CONVERTER

Mituyoshi Mori, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

PCT No. PCT/JP87/00290, § 371 Date Dec. 16, 1987, § 102(e) Date Dec. 16, 1987, PCT Pub. No. WO87/06990, PCT Pub. Date Nov. 19, 1987
PCT Filed May 11, 1987, Ser. No. 146,165
Claims priority, application Japan, May 13, 1986, 61-109785
Int. Cl.[4] F16D *33/00*
U.S. Cl. 60—361 **4 Claims**



1. A thrust force reduction device for a torque converter comprising a pump rotor to which is transmitted engine power, a turbine rotor connected to a turbine shaft, said turbine rotor being disposed opposite to said pump rotor, and at least one stator, a fixed cylindrical shaft fitted to a boss of said pump rotor; characterized by that a seal element is fixed to said shaft for producing a thrust reaction force canceling the thrust force occurring in the torque converter; said seal element facing a fluid chamber receiving pressurized hydraulic fluid exhausted from said turbine rotor and forming a fluid tight connection between said turbine shaft and a power input guide to said turbine from the engine to which said turbine is power connected.

4,841,730

THERMAL ACTUATOR

John E. McDonald, San Juan Capistrano, Calif., assignor to PDA Engineering, Costa Mesa, Calif.

Continuation-in-part of Ser. No. 69,110, Jul. 2, 1987. This application May 5, 1988, Ser. No. 191,287
Int. Cl.[4] F03G *7/06*
U.S. Cl. 60—527 **29 Claims**

1. An actuator comprising:

an actuator body;

a shape memory member that deforms from a distorted shape toward an original shape when subjected to a transition temperature, said shape memory member being in said distorted shape;

means for mounting the shape memory member on the actuator body so that the shape memory member can deform from said distorted shape toward said original shape;

a heating element in heat exchange relationship to the shape memory member, said heating element including at least

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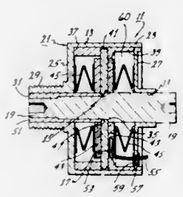
first and second components capable when activated of interacting exothermically even in the absence of atmospheric air to heat the shape memory member to said



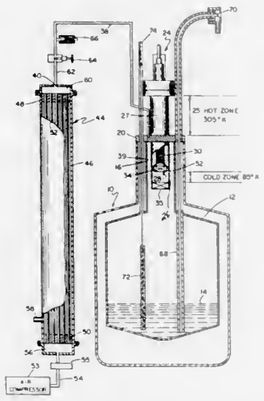
transition temperature whereby the shape memory member deforms toward the original shape; and
means for activating the first and second components.

4,841,731
ELECTRICAL ENERGY PRODUCTION APPARATUS
Gene Tindell, Dallas, Tex., assignor to Electrical Generation Technology, Inc., Dallas, Tex.
Filed Jan. 6, 1988, Ser. No. 141,154
Int. Cl.[4] F03G *7/02*
U.S. Cl. 60—641.8 **5 Claims**

1. An energy production apparatus comprising a solar energy conversion means adapted to produce a direct current electrical output when irradiated by the sun, an electrolysis means powered by the direct current electricity produced by the conversion means, means for receiving oxygen gas and hydrogen gas produced by the electrolysis means and for mixing pre-determined quantities of the hydrogen and oxygen gases, nozzle means for feeding the mixed hydrogen and oxygen to a burner chamber in which the oxygen and hydrogen gases are combined to produce steam, and an outlet of the burner chamber for discharging pressured steam, said nozzle means comprising central discharge orifices through which the oxygen and hydrogen gases pass and a surrounding array of openings for connection to a supply of distilled water.

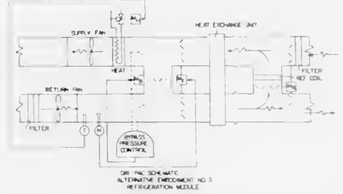
4,841,732
SYSTEM AND APPARATUS FOR PRODUCING AND STORING LIQUID GASES
Domenico S. Sarcia, 114 Sunset Rd., Carlisle, Mass. 01741
Filed Dec. 28, 1987, Ser. No. 138,706
Int. Cl.[4] F25J *3/00*
U.S. Cl. 62—36 **10 Claims**

1. A system for converting a gas to a liquid comprising:
a closed insulated container having a reservoir and a neck;
a cryogenic refrigerator having a cold head supported within said neck;
a narrow passageway between said cold head and said neck;
a source of said gas;
means for supplying the gas from said source to said narrow passageway under pressure, whereby said gas flows through said passageway in heat exchanging relationship



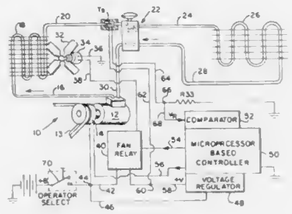
with said cold head, the temperature of said cold head being below the liquefaction temperature of said gas, whereby said gas liquefies and drops into said reservoir.

4,841,733
DRI-PC HUMIDITY AND TEMPERATURE CONTROLLER
David R. Dussault, 24 Roosevelt Ave., Hudson, N.H. 03051, and Richard E. Dussault, P.O. Box 250, Mirror Lake, N.H. 03853
Filed Jan. 7, 1988, Ser. No. 141,630
Int. Cl.[4] F25D *17/06*
U.S. Cl. 62—93 **23 Claims**



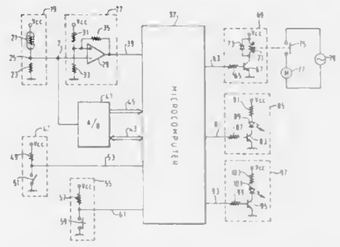
1. A system for providing a continuous flow of air to control surface condensation, humidity and temperture in a defined environment which comprises:
means to introduce return air into the system from the defined environment at a first humidity and first temperature; means to measure the humidity of said return air;
means disposed within the system to exhaust one portion of said return air to ambient;
means to recycle another portion of said return air;
means to flow through the system intake air, said intake air at a second humidity and a second temperature;
means to discharge continuously into the defined environment supply air at a third humidity and a third temprature;
a heat recovery module having an exhaust side through which the return air flows and an inlet side through which the intake air flows;
a refrigeration module having first and second zones, the first zone downstream of and in communication with the exhaust side of the heat recovery module, the second zone upstream of and in communication with the intake side of the heat recovery module, the second zone including means to cool the return air flowing therethrough;
means to control the flow of the return air from the first zone to the second zone to cool said return air;
means to flow said cooled recycled return air as intake air from the second zone through the intake side of the heat recovery module, said intake air in heat exchange relationship with the return air flowing through the exhaust side of the heat recovery module, to thereby cool the return air flowing through the exhaust side of the heat recovery module and to increase the relative humidity of said return air, which return air then flows through the second zone and means to control the flow rates of the return air and the intake air to discharge the supply air.

4,841,734
INDICATING REFRIGERANT LIQUID SATURATION POINT
Robert J. Torrence, Addison, Ill., assignor to Eaton Corporation, Cleveland, Ohio
Filed Nov. 12, 1987, Ser. No. 119,009
Int. Cl.[4] F25D *17/00*
U.S. Cl. 62—115 **14 Claims**



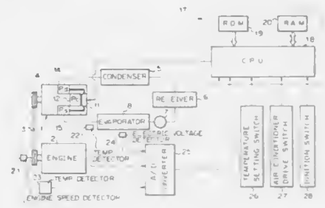
1. A compressor cut-out and condensor fan cycling system for controlling refrigerant flow between an exothermic and an endothermic heat exchanger comprising:
(a) pump means operable upon energization to compress said refrigerant and discharge same under pressure;
(b) conduit means operatively connecting the discharge of said pump means through said exothermic heat exchanger and said endothermic heat exchanger and return to the intake of said pump means to said endothermic heat exchanger;
(c) expansion means disposed in said conduit means and operative to control flow of refrigerant between said exothermic heat exchanger and said endothermic heat exchanger;
(d) a saturation thermistor disposed in said conduit between said exothermic heat exchanger and said expansion means for sensing the temperature of said refrigerant on the high pressure side of said expansion means;
(e) resistance means in series electrically with said thermistor;
(f) circuit means operable to effect a flow of current through said resistance means and said thermistor sufficient for effecting boiling of said refrigerant on said thermistor and including means operable to detect the voltage drop across said resistance means upon said flow of current;
(g) fan means operable upon electrical energization to direct a flow of coiling air over said exothermic heat exchanger;
(h) controller means operable in response to said voltage detection to energize said fan means when said detected voltage is greater than a first predetermined level and operable to de-energize said pump means when said detected voltage is greater than a second predetermined level.

4,841,735
TEMPERATURE CONTROLLER AND METHOD OF TEMPERATURE CONTROL FOR USE IN A REFRIGERATING DEVICE
Hiroshi Oike, Osaka, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Mar. 8, 1988, Ser. No. 165,605
Claims priority, application Japan, Mar. 13, 1987, 62-59702
Int. Cl.[4] F25B *49/00*
U.S. Cl. 62—126 **20 Claims**



1. A temperature controller for use in a refrigerating device and including a temperature sensor for detecting temperature, said temperature controller comprising:
conversion means for converting the temperature detected by the temperature sensor into a voltage value;
refrigerating cycle driving means for operating a refrigerating cycle to cool a compartment in accordance with the voltage value;
comparison means for comparing the voltage value with a changeable voltage range;
failure decision means for setting the changeable voltage range in at least two states, in a first state the changeable voltage range being set wider than an ordinary voltage range corresponding to an ordinary operating temperature range for the compartment and in a second state the changeable voltage range being set wider than the voltage range in the first state; and
memory means for storing a predetermined value when said comparison means determines the voltage value as being outside the changeable voltage range.

4,841,736
METHOD FOR CONTROLLING THE OPERATION OF A VARIABLE DISPLACEMENT REFRIGERANT COMPRESSOR FOR A CAR AIR-CONDITIONER
Shinichi Suzuki, Kariya, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan
Filed Jun. 22, 1988, Ser. No. 209,705
Claims priority, application Japan, Jun. 29, 1987, 62-163236
Int. Cl.[4] F25B *1/02*; F04B *1/28*
U.S. Cl. 62—133 **2 Claims**



1. A method of controlling the operation of a variable dis-

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placement refrigerant compressor incorporating therein a displacement varying means, and an actuating means for actuating the displacement varying means and arranged to be driven, by an engine of a car via a solenoid clutch, in a closed refrigerant circuit of a car air-conditioner including a refrigerant gas condenser connected to the compressor, a refrigerant receiver connected to the refrigerant gas condenser, an expansion valve connected to the refrigerant receiver, an evaporator connected to the expansion valve and to the compressor, and a control means operatively connected to the actuating means of the compressor for controlling the displacement of the compressor, comprising the steps of:

supplying an OFF-indication signal from at least one of an air-conditioner drive switch and an ignition switch, arranged to be operated by a driver of the car, to the control means when the car is to be stopped to thereby cause the control means to issue a predetermined control signal for operating the actuating means at a predetermined operating condition; and

moving the displacement varying means to a predetermined position whereat a minimum displacement of the compressor is obtained in response to the predetermined operating condition of the actuating means,

said control means comprising a CPU unit connected to said air-conditioner drive switch and said ignition switch, respectively, for carrying out a predetermined calculation to issue said control signal to be supplied to said actuating means of said compressor, a ROM unit for storing therein programmed data to permit said CPU unit to carry out said predetermined calculation and issue said predetermined control signal when said CPU unit receives said OFF-indication signal, and a RAM unit for temporarily storing a result of said predetermined calculation carried out by said CPU unit,

said CPU Unit of said control means further receiving a desired temperature indication signal for said car air-conditioner from a temperature setting switch operated by the driver, and at least an electric signal indicating a temperature of air blowing from said evaporator to thereby carry out a calculation for issuing another control signal different from said predetermined control signal and driving said actuating means until said displacement varying means is moved to a position whereat the displacement of said compressor is optimum, for achieving said desired temperature while said car is driven.

4,841,737

METHOD FOR CONTROLLING A DISPLACEMENT CHANGING MECHANISM OF A VARIABLE DISPLACEMENT REFRIGERANT COMPRESSOR FOR A CAR AIR-CONDITIONER

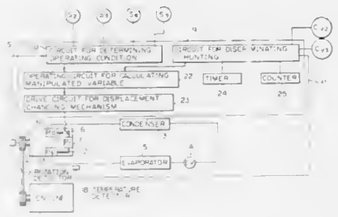
Toshiro Fujii; Shinichi Suzuki, and Akira Nakamoto, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed May 12, 1988, Ser. No. 193,368

Claims priority, application Japan, May 15, 1987, 62-119850

Int. Cl.[4] F25B *1/02*; F04B *1/28*

U.S. Cl. 62—133 **5 Claims**



1. A method for controlling the operation of a variable displacement type refrigerant compressor provided with a displacement changing mechanism and arranged in a closed refrigerant circuit of a car air-conditioner including a refrigerant gas condenser connected to a delivery side of the compressor, an expansion valve connected to the refrigerant gas condenser, an evaporator connected to the expansion valve and to a suction side of the compressor, and a control means operatively connected to the displacement changing mechanism of the compressor for controlling the displacement changing mechanism to thereby adjust a controlled variable of the car air-conditioner, comprising the steps of:

detecting a physical variable indicating an operating condition of the air-conditioner;

detecting a change in the controlled variable of the air-conditioner;

determining whether or not the operating condition of the air-conditioner is stable on the basis of said detected physical variable;

discriminating whether or not hunting of the controlled variable appears from the detected change in the controlled variable when it is determined that the operating condition of the air-conditioner is stable; and

adjusting a manipulated variable of the control means to be given to the displacement changing mechanism of the compressor so that the displacement changing mechanism of the compressor is driven to suppress hunting of the controlled variable of the air-conditioner when an appearance of hunting of the controlled variable is detected by said discriminating step.

4,841,738

METHOD AND APPARATUS OF AUTOMATICALLY SWITCHING BETWEEN COOLING AND HEATING MODES OF AN AIR CONDITIONER

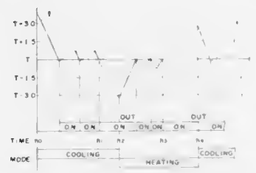
Hikaru Katsuki, Kiryu; Katsumasa Minakawa, Ota, and Masayuki Shimizu, Oizumi, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Mar. 3, 1988, Ser. No. 163,847

Claims priority, application Japan, Mar. 5, 1987, 62-50990; Mar. 5, 1987, 62-32453[U]

Int. Cl.[4] F25B *13/00*

U.S. Cl. 62—160 **10 Claims**



7. A method of automatically switching between a cooling mode and a heating mode of an air conditioner:

wherein said air conditioner comprises a control means for controlling said cooling mode to cool a room when a room temperature of said room is not lower than a desired temperature for controlling said heating mode for heating said room when said room temperature is not higher than said desired temperature;

wherein said control means sets temperature A so that said temperature A is higher than said desired temperature by a first value, and sets temperature B so that said temperature B is higher than said temperature A by a second value, and sets temperature C so that said temperature C is lower than said desired temperature by a third value, and sets temperature D so that said temperature D is lower than said desired temperature by a fourth value, and

wherein said control means has five temperature ranges comprising, from higher temperature to lower temperature, a first temperature range, a second temperature range, a third temperature range, a fourth temperature range, and a fifth temperature range;

said five temperature ranges being defined by temperatures A, B, C, and D, comprising the steps of:

changing from said cooling mode to said heating mode when said room temperature remains within said fifth temperature range, or otherwise remains within said fourth temperature range after a first duration of time during said cooling mode, and changing from said heating mode to said cooling mode when said room temperature remains within said first temperature range or otherwise remains within said second temperature range after a second duration of time during said heating mode.

4,841,739

AUTOMOTIVE AIR-CONDITIONING SYSTEM AND APPARATUS

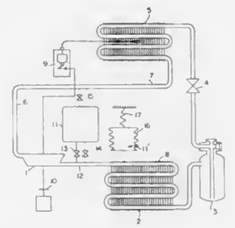
Rolf Wallner, Stuttgart, Fed. Rep. of Germany, assignor to Sueddeutsche Kuehlerfabrik Julius Fr. Behr BmgH. & Co. KG, Stuttgart, Fed. Rep. of Germany

Filed Jun. 22, 1988, Ser. No. 209,928

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1987, 3721388

Int. Cl.[4] F25B *41/00*

U.S. Cl. 62—174 **10 Claims**



1. A vehicle air-conditioning system comprising:

compressor means for pumping a gaseous refrigerant into a condenser and increasing the pressure thereof;

means for collecting condensed refrigerant from the condenser;

means for expanding the condensed refrigerant, decreasing the pressure thereof and increasing the absorbtion of ambient heat thereof;

means for returning the evaporated refrigerant to the compressor;

means for operably switching the compressor in and out of the system;

a delivery line interconnecting the compressor and the condenser; and

safety means for relieving excess pressures in the air conditioning system comprising:

a. intermediate means connected to the delivery line for retaining compressed but uncondensed refrigerant; and

b. valve means for interconnecting the intermediate means and the delivery line said valve means opening to permit refrigerant to flow from said delivery line into said intermediate means when the pressure in the delivery line exceeds a predetermined maximum level.

4,841,740

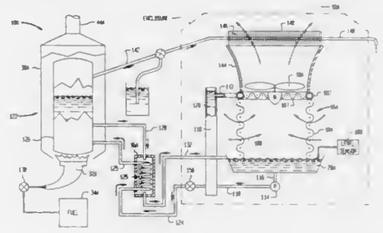
METHOD OF AND MEANS FOR CONTROLLING THE CONDITION OF AIR IN AN ENCLOSURE

Gad Assaf, Rehovot, Israel, assignor to Geophysical Engineering Company, Seattle, Wash.

Continuation-in-part of Ser. No. 479,009, Mar. 23, 1983, Pat. No. 4,819,447, which is a continuation-in-part of Ser. No. 377,368, May 12, 1982, abandoned. This application Jul. 2, 1987, Ser. No. 69,091

Int. Cl.[4] F25D *23/00*

U.S. Cl. 62—271 **26 Claims**



1. Apparatus for conditioning air in an enclosure comprising:

(a) a direct contact air/brine heat exchanger;

(b) means for exchanging air in the enclosure with said direct contact heat exchanger;

(c) a reservoir of concentrated brine;

(d) means for establishing a first brine loop in which brine from said reservoir is exchanged with said direct contact heat exchanger whereby water vapor in the enclosure condenses on the brine flowing from the reservoir to form dilute brine that flows into said reservoir;

(e) a brine boiler containing brine and including means for heating the last mentioned brine;

(f) means for establishing a second brine loop in which dilute brine from said first loop is exchanged with said boiler whereby water is evaporated from the dilute brine producing steam; and

(g) flow control means for maintaining a smaller flow rate in the second loop than in the first loop.

4,841,741

LIQUID COOLERS

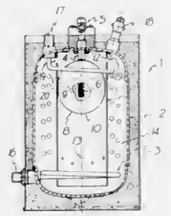
Roy G. Hilton, 4 Gibson Street, Bowden, South Australia 5007, Australia

Filed Mar. 28, 1988, Ser. No. 174,377

Claims priority, application Australia, Apr. 13, 1987, PI01408; Dec. 11, 1987, PI05864

Int. Cl.[4] B67D *5/62*

U.S. Cl. 62—394 **9 Claims**



1. A fluid cooler, comprising:

(i) a housing having

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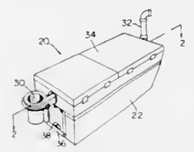
(a) an inner wall defining a cavity for refrigerant,
(b) an inlet and an outlet for refrigerant, and
(c) an inlet and an outlet for fluid to be cooled;
(ii) a chamber located in the housing and in engagement with the housing about the inlet for refrigerant, the chamber having openings therein to permit refrigerant to pass from the chamber into a space between the inner wall and the chamber;
(iii) a conduit for passage of fluid to be cooled therethrough, the conduit being located within the space and extending from the inlet to the outlet for the fluid to be cooled; and
(iv) a float controlled valve located in the chamber for control of ingress of liquid refrigerant into the chamber.

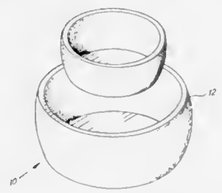
4,841,742
PORTABLE AIR CONDITIONER FOR AUTOMOTIVE VEHICLES
Robert Biby, 421 Arrowhead Ct., Troy, Ill. 62294
Continuation-in-part of Ser. No. 946,761, Dec. 29, 1986, abandoned. This application Jan. 22, 1988, Ser. No. 146,819
Int. Cl.[4] F25D *3/08*
U.S. Cl. 62—420 13 Claims



5. A portable air conditioner, said air conditioner comprising a box-like, heat insulated housing, said housing having a top lid adapted to be opened and closed, heat exchange means comprising a series of tube passes having an air inlet connected through a wall of said housing in communication with air outside said housing and an air outlet connected through a wall of said housing remote from said air inlet in communication with air outside said housing, blower means connected to said heat exchange means for forcing outside air through said inlet, through said heat exchange means and through said outlet, said housing receiving an ice coolant substantially filling said housing, around said heat exchange means, drain means at a bottom portion of said housing for draining said coolant, and handles at opposed end of said housing for transporting said air conditioner, said blower means being connected in line with said tube passes and is supported inside said housing upon said tube passes.

4,841,743
CONTAINER WITH INTEGRAL COOLING MEANS
John J. Brier, Beta Theta Pi, College Ave., Orono, Me. 04469
Filed Jan. 8, 1987, Ser. No. 1,525
Int. Cl.[4] F25D *3/08*
U.S. Cl. 62—457.9 5 Claims

1. A chillable food holding container, comprising:
a. wall means formed from a flexible and expandable material;
b. refrigerant holding chamber means formed in said wall means; and,
c. rigid frame structure retained within said refrigerant holding chamber means for causing said container to maintain its food holding shape when said refrigerant is in a liquid

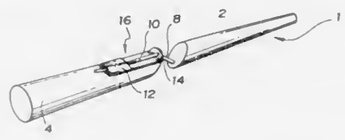


state, said rigid frame structure including upper and lower rims for defining upper and lower edges of said container.

4,841,744
DOUBLE EFFECT AIR COOLED ABSORPTION REFRIGERATING MACHINE
Shigekichi Kurosawa; Yoshikazu Nagaoka, both of Tokyo; Shinichi Kannoh, Habikino; Sadatoshi Takemoto, Nagoya; Shigeo Sugimoto, Ushiku; Tomihisa Oouchi, Tsukuba; Toshio Hatada, Tsuchiura; Yoshifumi Kunugi, Ibaraki; Hironobu Kawamura, Ibaraki; Kyoji Kohno, Ibaraki, and Kenzi Machizawa, Ibaraki, all of Japan, assignors to Hitachi, Ltd.; Osaka Gas Co., Ltd., both of Tokyo and Toho Gas Co., Ltd., Aichi, all of, Japan
Filed Jan. 19, 1988, Ser. No. 145,316
Claims priority, application Japan, Jan. 19, 1987, 62-8149; Feb. 17, 1987, 62-32371; Feb. 17, 1987, 62-32369
Int. Cl.[4] F25B *43/04*
U.S. Cl. 62—475 13 Claims

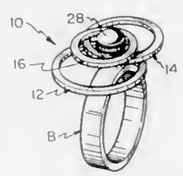
1. A double effect air cooled absorption refrigerating machine having at least an evaporator, an air cooled absorber, an air cooled condenser, a high-temperature regenerator, a low-temperature regenerator, a solution heat exchanger, pipes operatively connecting said parts together, and fans for supplying the cooling air to said air cooled absorber and said air cooled condenser, characterized in that said fans are provided on one side frame member out of the upper, lower, and four side frame members which constitute a frame of a machine body, an air cooled heat exchanger being provided on the remaining three side frame members, the main parts other than said air cooled heat exchanger, such as said evaporator, said high-temperature regenerator, said low-temperature regenerator, said solution heat exchanger and said pipes operatively connecting said parts together being provided so as to be surrounded by said side frame members, a cover being provided at the upper portion of said machine body.

4,841,745
EARRING DEVICE, AND METHODS OF CONSTRUCTING AND UTILIZING SAME
David S. Hudson, 349 E. Maplehurst, Ferndale, Mich. 48220
Filed May 15, 1987, Ser. No. 50,085
Int. Cl.[4] A44C *7/00*
U.S. Cl. 63—12 14 Claims



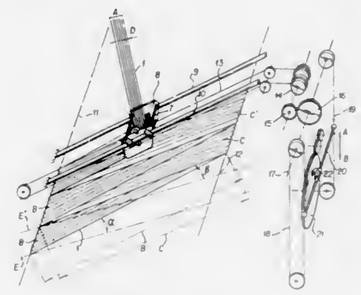
1. An ornamental earring, comprising: a male portion including a body part formed in the shape of half an elongated earring structure having a first end and an earring post which is adapted to be fitted through a pierced earlobe of a wearer;
a female portion including a body part formed in the shape of another half of said elongated earring structure and having a second end and an earring post-receiving part for slidably receiving and holding said post;
said male and female portions, when interlocked with one another while worn by said wearer, giving an overall appearance of a tapered elongated structure spiked through said wearers earlobe;
said male portion has a post end opposite said first end, said post end being substantially planar and being disposed oblique to the longitudinal axis of said male portion;
said female portion has a post receiving end opposite said second end, said post-receiving end being substantially planar and being disposed oblique to the longitudinal axis of said female portion; and
said substantially planar post end and said substantially planar post-receiving end being disposed substantially parallel to each other with said earlobe placed therebetween when said ornamental earring is worn by said wearer.

4,841,746
MULTIPLE TIER RING WITH INTERCHANGEABLE SETTINGS
Felix Y. C. Chen, P.O. Box 58498, Dallas, Tex. 75258
Filed Sep. 9, 1987, Ser. No. 94,456
Int. Cl.[4] A44C *9/00*
U.S. Cl. 63—15 1 Claim



1. A finger ring comprising, in combination:
a curved finger band;
a boss formed on said finger band and projecting externally thereof, said boss having a pocket disposed substantially in alignment with the radius of curvature of said finger band and having a bearing surface bordering said pocket;
an axle having a first end portion disposed within said pocket, a body portion projecting externally of said boss substantially in alignment with said radius of curvature, and an end cap secured onto said externally projecting body portion;
fastener means carried by said boss and axle, respectively, said fastener means being disposed in releasable, interlocking engagement within said pocket;
said fastener means comprising male threads formed on the first end portion of said axle and matching female threads formed on said boss body portion within said pocket, wherein said axle is releasably secured to said boss by threaded engagement of said male and female threads;
a ringlet mounted onto said axle body portion for axial movement and rotation with respect thereto, with axial travel of said ringlet along said body portion being limited by said boss bearing surface and said end cap;
a rotary coupling member interposed between said axle and said ringlet, said rotary coupling member positioning said ringlet relative to said axle whereby the center of gravity of said ringlet is offset with respect to its axis of rotation about said axle;
said rotary coupling member including a bearing housing rigidly attached to the inside diameter surface of said ringlet, and a roller bearing assembly mounted in said bearing housing, said roller bearing assembly including an outer sleeve received within said housing, an inner sleeve mounted on said axle and concentrically disposed within said outer sleeve, and roller bearings movably coupling said outer sleeve for rotation relative to said inner sleeve; and,
said bearing housing being substantially cylindrical and having a radially projecting tab overlapping said outer sleeve for retaining said roller bearing assembly within said housing.

4,841,747
WARP-KNITTING MACHINE, ESPECIALLY SEWING-KNITTING MACHINE, AND METHOD FOR THE PRODUCTION OF WARP-KNIT FABRIC WITH OBLIQUE AND DIAGONAL FILLING THREADS
Bertram Frenzel; Dietmar Grenzendorfer; Heinz Kemter; Wolfgang Wuensch, and Peter Zeisberg, all of Karl-Marx Stadt, German Democratic Rep., assignors to VEB Kombinat Textima, Karl-Marx-Stadt, German Democratic Rep.
Continuation-in-part of Ser. No. 14,152, Feb. 12, 1987, abandoned, which is a continuation of Ser. No. 559,116, Dec. 7, 1983, abandoned. This application Jun. 10, 1987, Ser. No. 61,254
Claims priority, application German Democratic Rep., Feb. 28, 1983, WPDO4B/2483026
Int. Cl.[4] D04B *23/06*
U.S. Cl. 66—84 A 6 Claims



1. A warp knitting machine, and especially a sewing-knitting machine, for forming layers of filling-thread sections of endless parallel filling threads, comprising
a pair of spaced-apart parallel chain conveyors for transporting a plurality of filling-thread sections to a stitch-forming site of the machine;
a plurality of hooks carried on each chain conveyor for

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holding a plurality of filling-thread sections between said chain conveyors;

means for laying filling thread sections in said hooks between said chain conveyors, said means for laying comprising a first filling laying device for laying filling thread sections, said first filling laying device being movable back and forth between said chain conveyors obliquely and diagonally with respect to the direction of transportation of said chain conveyors for inserting the endless filling threads of a filling-thread section onto the hooks of said chain conveyors at an oblique and diagonal angle to the direction of transportaioin of said chain conveyors, said first filling laying device including means for guiding the endless filling threads of a filling-thread section from said first filling laying device onto said hooks, said guiding means being provided parallel to said chain conveyors at least at a point where reversal of said back and forth movement of said first laying device occurs, said pair of conveyors having a rate of motion matched to the back and forth movement of said first filling laying device whereby a laid filling thread section adjoins a previously-laid filling thread section;

a cable means connected to the first filling laying device and a drum connected to said cable for winding said cable therearound, whereby alternating rotational motion of the drum moves the first filling laying device back and forth between said chain conveyors by means of said cable;

a driving mechanism for driving said drum in said alternating rotational motion, said driving mechanism including a spur-toothed wheel, a crank pin eccentrically positioned on a face of the spur-toothed wheel and oriented essentially perpendicularly to the face of the spur-toothed wheel, the spur-toothed wheel having an axis of rotation essentially perpendicular to the axis of the drum, at least one endless chain guided to lie in a plane essentially parallel to the axis of rotation of the spur-toothed wheel, a lifting shaft connecting each said endless chain to the crank pin, means operatively connecting each said endless chain to said drum for imparting rotation to said drum, whereby rotation of said spur-toothed wheel effects said alternating rotational motion of said drum and the length of back and forth movement of said first filling laying device between said chain conveyors is proportional to the distance of the crank pin from the axis of rotation of the spur-toothed wheel; and

knitting needle means for combining the endless filling threads of filling-thread sections inserted on the hooks of said chain conveyors by warp-knitted stitches.

4,841,748

JACQUARD CIRCULAR KNITTING MACHINE

Fumio Watanabe, Fujimi; Toshio Watanabe, Saitama; Chiharu Watanabe, Fujimi; Yuji Watanabe, Tokyo, and Yoshinori Watanabe, Yono, all of Japan, assignors to Watanabe Kutsushita Kogyo Co., Ltd., Saitama, Japan

Continuation of Ser. No. 917,237, Oct. 7, 1986, abandoned, which is a continuation of Ser. No. 680,552, Dec. 11, 1984, abandoned. This application Aug. 3, 1988, Ser. No. 228,846

Claims priority, application Japan, Dec. 19, 1983, 58-237960; Dec. 7, 1984, 59-257475

Int. Cl.[4] D04B *9/36, 15/78, 15/60, 35/10*

U.S. Cl. 66—218 **14 Claims**

1. A jacquard circular knitting machine comprising a needle cylinder provided thereon with a plurality of patterning functional members including knitting needles, a patterning mechanism capable of controlling at least every knitting needle mounted on the needle cylinder so that the knitting needles are moved vertically to knit a jacquard fabric, a plurality of yarn feed units mounted at predetermined positions around the needle cylinder and each having a plurality of yarn feed elements, yarn feed element switching means for performing a switching operation while the needle cylinder is rotated in either of a first direction and a second direction through a plurality of rotational positions and a driving mechanism for driving the needle cylinder;

said driving mechanism including an electric motor interlocked through mechanical transmission means with the needle cylinder and a first controller which transmits control signals successively to the electric motor to control the rotary motion of the same;

said first conductor including cylinder motion memory means for storing a predetermined cylinder operating procedure which includes a procedure for rotating the needle cylinder so that a plurality of spaced rotational positions of the needle cylinder is determined for each course according to a shape of a pattern to be knitted, first detecting means for detecting and generating a signal for each of said plurality of spaced rotational positions of said needle cylinder, second detecting means for detecting abnormalities in the yarn being fed to the needle cylinder and/or in the operating condition of the jacquard circular knitting machine, first reading and instructing means for comparing each signal given by the first detecting means with the contents of the cylinder motion memory means and instructing the electric motor of needle cylinder driving conditions and to stop the needle cylinder at a variable position predetermined by the shape of the pattern to be knitted, and stop instructing means for instructing the electric motor to stop upon the reception of a signal from the second detecting means;

said patterning mechanism including pattern forming means for operating the patterning functional members of the jacquard circular knitting machine and a second controller for controlling the pattern forming means by successively applying signals to the pattern forming means; and

said second controller including pattern memory means for storing a predetermined operation procedure of the patterning functional members and second reading and instruction means for comparing each signal given by the first detecting means of said first controller with the contents of the pattern memory means and instructing the pattern forming means of the operation of the patterning functional members;

said pattern forming means includes the needle driving means for driving the knitting needles for vertical motion and the yarn feed element switching means which move at least one of the yarn feed elements to the respective yarn feed positions and retract the same from the yarn feeding positions, and said pattern memory means includes first pattern memory means for storing a predetermined knitting needle driving procedure and second memory means for storing a predetermined yarn feed element switching procedure for controlling a plurality of the yarn feed elements so that each vertical motion of said knitting needles and each yarn feed element switching motion during knitting of the jacquard fabric is controlled at each of said plurality of spaced rotational positions of the needle cylinder as determined by said first pattern memory and said second pattern memory.

4,841,749

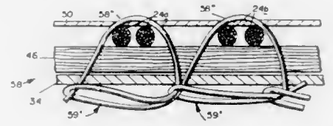
WARP-KNIT, WEFT-INSERTED FABRIC WITH MULTIPLE SUBSTRATE LAYERS AND METHOD OF PRODUCING SAME

Vaclav Petracek, Bayside, N.Y., and Julius R. Schnegg, Burlington, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 29,555, Mar. 24, 1987, which is a continuation-in-part of Ser. No. 784,355, , Pat. No. 4,682,480. This application Dec. 30, 1987, Ser. No. 139,547

Int. Cl.[4] D04B *7/12*

U.S. Cl. 66—190 **28 Claims**



1. A warp-knit, weft-inserted fabric comprising at least first and second substrate layers, warp yarns extending in the warp-wise direction of said fabric, weft yarns extending in the weft-wise direction of said fabric, at least one of said warp and weft yarns is interposed between said at least first and second substrate layers, and warp stitching yarns forming stitch wales spaced apart along the warp-wise direction of said fabric and being stitched through said at least first and second substrate layers to hold said warp and weft yarns in position relative thereto.

4,841,750

CONTROL MEMBER FOR THREADING TUBE LIFTERS IN CROCHET GALLOON LOOMS

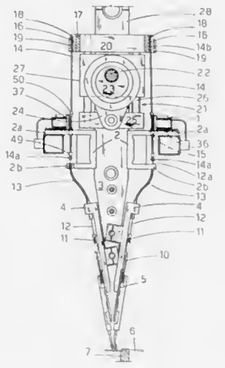
Luigi O. Zorini, Cilavegna, Italy, assignor to Comez, S.P.A., Cilavegna, Italy

Filed Jul. 22, 1988, Ser. No. 222,945

Claims priority, application Italy, Jul. 31, 1987, 21542 A/87

Int. Cl.[4] D04B *23/00*

U.S. Cl. 66—204 **8 Claims**



1. A control member for threading tube lifters in crochet galloon looms, comprising an electromagnet which is fixed with respect to a thread guide rail and associated with at least a lifter oscillatably engaged in relation to said thread guide rail, said electromagnet being energizable to bring the lifter from a disengagement condition in which the latter keeps a fixed positioning with respect to the thread guide rail, to an engagement condition in which it can be engaged by actuator means giving it an oscillating motion in synchronism with the oscillating motions performed by the thread guide rail wherein said control member further comprises a swing arm rotatably pivoted with respect to said electromagnet and provided with a guide element slidably engaging said lifter, said swinging arm being translatable, due to the energization of said electromagnet and against the action of at least a return spring, from a rest position corresponding to the disengagement condition of the lifter to a working position in which the lifter is in its engagement condition.

4,841,751

APPARATUS FOR TREATING FABRICS AND FABRIC GARMENTS

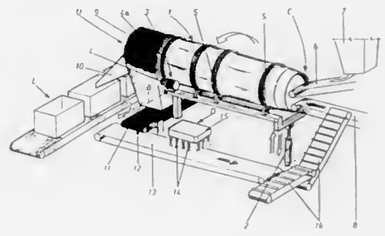
Francesco Ricci, Forli, Italy, assignor to Golden Trade S.r.l., Forli, Italy

Filed Jul. 27, 1988, Ser. No. 224,588

Claims priority, application Italy, Jul. 31, 1987, 3588 A/87

Int. Cl.[4] D06B *1/12*

U.S. Cl. 68—29 **13 Claims**



1. An apparatus for use in bleaching or dyeing cloth articles, comprising:

(a) a longitudinally-extending cylindrical drum, said drum having an entrance mouth and a discharge end;

(b) means for rotating said drum;

(c) means for inclining said drum relative to the horizontal plane;

(d) means for feeding cloth articles to the entrance mouth of the drum;

(e) means for feeding stones or granules to the entrance mouth of the drum;

(f) means for separating the cloth articles from the stones or granules at the discharge end of the drum; and

(g) means for recycling stones or granules from the discharge end to the entrance mouth of the drum, said recycling means further comprising means for impregnating the stones or granules with a bleaching agent or a dyestuff solution;

said cylindrical drum, further comprising at least three longitudinally-extending baffles attached to its inner surface, said baffles being spaced around the inner circumference of the drum, each of said baffles extending radially toward the center of the drum and being of sufficient depth that as said drum is rotated, said baffles serve to lift articles contained in the drum; and

said drum further comprising impervious, flexible liner sheets, the number of impervious sheets being equal to the number of baffles, each of said sheets being periodically flexed inwardly toward the center of the drum as the drum is rotated by the effect of gravity, thereby dislodging residual materials from the surface of said sheets.

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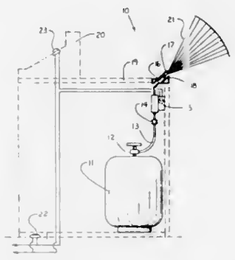
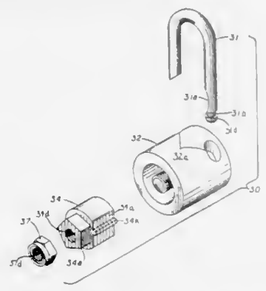
4,841,752
ROBBER DETERRENT APPARATUS
Richard N. Fletcher, Rt. 1, Box 343A, Lake Toxaway, N.C. 28747
Filed Oct. 27, 1987, Ser. No. 113,056
Int. Cl.[4] E05G *3/00*
U.S. Cl. 109—20 3 Claims



1. A robber deterrent apparatus for use in combination with a counter and cash register on which an individual may stand, wherein said apparatus comprises,
a pressurized reservoir supply means for containing a liquid disabling chemical under pressure, and
connection means operably associating said reservoir supply means to a valve means,
said valve means remotely operable by either of a plurality of switch means for introducing said liquid disabling chemical to a plurality of nozzle means, and
said plurality of switch means positioned behind said counter for actuation by said individual, and
wherein said connection means comprises a flexible hose-like member securable to said valve means by a coupler connection enabling said pressurized reservoir means to be selectively positionable by means of said flexible connection hose, and
wherein one of said switch means is mounted below said counter at a floor support level for engagement by said individual and a second switch means positioned on said cash register for enabling said selective actuation by said individual, and
wherein said nozzle means are positioned within a shield means comprising an overlying shield and an underlying shield to substantially enclose said nozzles and thereby prevent tampering of said nozzles and limit deflection of spray emanating therefrom.

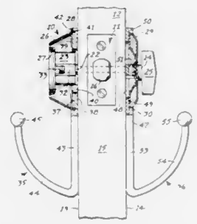
4,841,753
PADLOCK AND LOCKING MECHANISM THEREFOR
Victor L. Patton, 13435 Allison Ranch Rd., Grass Valley, Calif.
Division of Ser. No. 33,828, Apr. 3, 1987, Pat. No. 4,748,832. This application Apr. 18, 1988, Ser. No. 182,493
Int. Cl.[4] E05B *67/22*
U.S. Cl. 70—38 C 13 Claims

1. A padlock comprising, in combination:
a shackle having a generally U-shaped configuration with one short leg and one long leg;
said long leg having at a free end thereof a flange which underlies a cylindrical portion which in turn is spaced below a notch on said long leg;
a padlock main body having an opening therein to receive said shackle long leg;
lock body means within said main body to engage said long leg either at said notch, thereby locking said long leg, or at said cylindrical portion, thereby allowing said long leg to rotate about its longitudinal axis, or to removably free said long leg by having said lock body means clear said flange, thus defining three positions;
the notch formed on the long leg being substantially arcuate in shape;
the lock body means having a substantially annular outer wall for engaging the long leg at the arcuate notch, thereby locking said long leg;



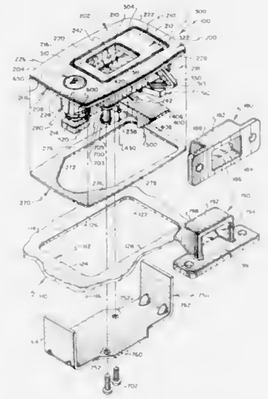
wherein said padlock main body is configured as a blind bore having a threaded portion to receive said lock body means; and
wherein said shackle leg define a plane oriented, such that axial movement of the lock body means is perpendicular thereto.

4,841,754
DEADBOLT DOOR HANDLE ASSEMBLY
Aroll A. Jones, 105 Cedarmont Cir., Nashville, Tenn. 37211
Filed Jun. 20, 1988, Ser. No. 208,968
Int. Cl.[4] E05B *15/02*
U.S. Cl. 70—207 9 Claims



1. In a door having a vertical outside face, a vertical inside face, and vertical edge surface, and a deadbolt assembly mounted on the door including a deadbolt housing within the door carrying a reciprocable deadbolt for movement through the edge surface, a lock cylinder operatively connected to the deadbolt, an inside thumb key operatively connected to the deadbolt, aligned bolt holes extending through the deadbolt housing, and the lock cylinder, a door handle assembly comprising:
(a) an annular lock cylinder housing having outer and inner end portions, an opening through said outer end portion for receiving a lock cylinder having an enlarged face, a recess in said outer end portion of said lock cylinder housing surrounding said opening for receiving said face and limiting the axial movement of said lock cylinder toward said inner end portion, said inner end portion comprising a circular rim opposing the outside face of said door,
(b) a thumb key housing surrounding said thumb key and having a circular rim opposing the inside face of said door,
(c) bolt holes in said thumb key housing aligned with the corresponding bolt holes in said deadbolt housing and said lock cylinder,
(d) a collar member having an opening therethrough coaxial with said lock cylinder housing, said collar member having a flat inner face fitting flush against a face of said door,
(e) said collar member having an outer annular recess receiving the circular rim of said lock cylinder housing or said thumb key housing,
(f) said collar member further comprising an annular ledge of slightly greater diameter than the diameter of the circular rim of the corresponding housing to restrain lateral movement of said corresponding housing received within said recess,
(g) said collar member further comprising a strap member having a flat rear surface coplanar with said flat inner face of said collar, and a handle arm projecting forward from said strap member, and
(h) bolts extending through said aligned bolt holes in operative position for securing said housings against opposite faces of said door.

4,841,755
LATCH AND LOCK ASSEMBLIES WITH SPRING-BIASED SLIDE BOLTS
Lee S. Weinerman, Medina; Steven A. Mayo, Akron; Joel T. Vargus, Middleburg Heights; Frank R. Albris, Parma, all of Ohio; Richard H. Russell, Farmington, Conn.; Thomas V. McLinden, Oxford, Conn.; Richard M. O'Grady, Southington, Conn., and Timothy H. Wentzell, South Windsor, Conn., assignors to The Eastern Company, Cleveland, Ohio
Continuation-in-part of Ser. No. 859,194, Apr. 28, 1986, Pat. No. 4,683,736, which is a continuation-in-part of Ser. No. 601,648, Apr. 18, 1984, abandoned. This application Jul. 10, 1987, Ser. No. 72,177
Int. Cl.[4] E05B *13/10*
U.S. Cl. 70—208 54 Claims



1. A flush-mountable latch, comprising:
(a) housing means including a pan-shaped housing having a front wall, and having recess-defining wall formations that define a forwardly facing recess, with portions of the front wall forming a mounting flange that surrounds the recess;
(b) the housing being formed as a rigid, one-piece molded structure, with the recess-defining wall formations including a back wall at the rear of the recess, and with the back wall defining a rearwardly facing mounting surface;
(c) fastener means rigidly connected to the back wall, including first and second fastener members that are rigidly connected to the back wall at first and second spaced locations near opposite sides of the mounting surface;
(d) handle means including a handle that resides in the recess, that is connected to the housing, and that is movable relative to the housing between a non-operated position and an operated position;
(e) opening means formed through the recess-defining wall formations of the housing to establish a path of communication between the forwardly facing recess and a region that is located behind the back wall;
(f) handle-connected means extending through the opening means for connection to the handle and having a portion that extends into said region located behind the back wall for being moved within said region in response to movement of the handle between its non-operated and operated positions;
(g) latch bolt means including an elongate latch bolt that engages and extends across the mounting surface along a path of travel that extends between the first and second locations where the first and second fastener members are rigidly connected to the back wall, with the length of the elongate latch bolt paralleling said path of travel, and with the latch bolt being slidably movable along said path of travel between latched and unlatched positions;
(h) latch bolt mounting plate means for extending along said path of travel and being configured to retain the latch bolt in engagement with the mounting surface during sliding movement of the latch bolt along said path of travel, including a mounting plate formed as a metal stamping that has first and second mounting flange portions that extend along opposite sides of said path of travel and are configured so as to engage the mounting surface on opposite sides of said path of travel, with the mounting plate also having guide formation means connected to the mounting flange portions and being configured to overlie said path of travel at locations behind the mounting surface so as to cooperate with the mounting surface of the back wall to define a slide channel that extends along said path of travel in surrounding relationship with portions of the elongate latch bolt for restricting movement of the latch bolt to a sliding type of movement within the slide channel along said path of travel;
(i) first and second openings formed through the first and second mounting flange portions, respectively, with the first opening being aligned with said first fastener member, and with the second opening being aligned with said second fastener member;
(j) first and second mounting means for rigidly connecting rigidly with the first and second fastener members, respectively, and for cooperating with the first and second fastener members to provide first and second retaining means for extending through the first and second openings and for engaging the first and second mounting flange portions to clamp the first and second mounting flange portions into engagement with the mounting surface, and to thereby rigidly mount the latch bolt mounting plate means on the back wall of the housing;
(k) operating means including an L-shaped operating arm that has a central portion and a pair of leg portions that extend in different directions from the central portion so as to give the operating arm a generally "L-shaped" configuration, with the central portion being pivotally connected to a selected one of the first and second retaining means for pivotal movement relative to the housing, with one of the leg portions interconnecting with the handle-connected means at a location within said region, and with the other of the leg portions interconnecting with the latch bolt means for effecting movement of the latch bolt means from its latched position to its unlatched position in response to movement of the handle from its non-operated position to its operated position, with the central portion and the leg portions of the L-shaped operating arm overlying portions of the back wall, and with said other of the leg portions extending transversely across said path of travel of the latch bolt.

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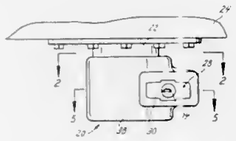
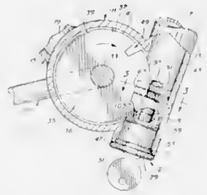
4,841,756
LOCKING DEVICE FOR A SHAFT END, SUCH AS A TRAILER KINGPIN
William A. Curtis, 4817 Colony Church Rd., St. Louis, Mo. 63129
Filed Oct. 14, 1988, Ser. No. 257,978
Int. Cl.[4] F16B *41/00*
U.S. Cl. 70—232 17 Claims



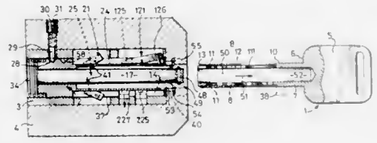
1. A locking device for use with a standard padlock of the type having a lock base and a generally U-shaped shackle, one leg of which is pivotally mounted in the base, the device comprising:
a body having an opening therein;
a socket in the body for receiving the padlock, the socket intersecting the opening so that a portion of a padlock received in the socket protrudes into the opening;
retaining means in the socket for engaging the shackle of the padlock when the padlock is locked to retain the padlock in the socket, while allowing the padlock to be freely inserted an removed from the socket when the padlock is unlocked; and
means for pivoting the shackle of an unlocked padlock to clear the retaining means as the unlocked padlock is inserted to socket, and means for pivoting the shackle of an unlocked padlock to bring the shackle back into locking orientation with the lock base and into position to engage the retaining means after the shackle has cleared the retaining means.

4,841,757
BICYCLE LOCK
Richard A. Guthrie, 62 W. Ivy Glen, Mesa, Ariz. 85201
Filed Jun. 7, 1988, Ser. No. 203,690
Int. Cl.[4] E05B *71/00*
U.S. Cl. 70—236 8 Claims



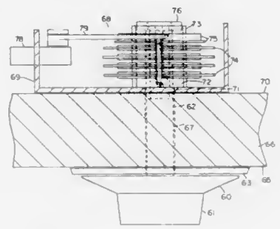
1. A bicycle locking system positioned internally within the pedal crank assembly housing and within a hollow support post of the bicycle frame, said pedal housing and support post being in internal open communication at the juncture thereof, said locking system being characterized in that it is impossible to pedal the bicycle when the locking system is in the locked position, which comprises:
(a) a locking disk secured to the axle of the pedal crank assembly and having at least one slot in the outer peripheary thereof, said locking disk having a circumference slightly less than the internal circumference of the pedal crank housing and
(b) a lock assembly positioned within said hollow support post which comprises a key actuated lock shaft and a rotary engagement locking disk which is directly responsive to movement of the key actuated lock shaft, said rotary locking disk having at least one slot in its peripheary, said slot of the rotary locking disk being of sufficient width and depth to permit free rotation of said pedal axle locking disk when the locking system is in the unlocked position, and said rotary locking disk and pedal crank axle locking disk being in communication at the juncture of the crank housing and said support post.

4,841,758
FERROMAGNETIC BARREL LOCK AND CORRESPONDING KEY
Yves J. Ramblier, 98, rue Saint-Charles, 75015 Paris, France
Continuation of Ser. No. 49,021, May 1, 1987, abandoned, which is a continuation of Ser. No. 888,081, Jul. 14, 1986, abandoned, which is a continuation of Ser. No. 671,878, Oct. 22, 1984, abandoned. This application May 18, 1988, Ser. No. 195,279
Claims priority, application France, Feb. 21, 1983, 83 02788
Int. Cl.[4] E05B *47/00*
U.S. Cl. 70—276 37 Claims



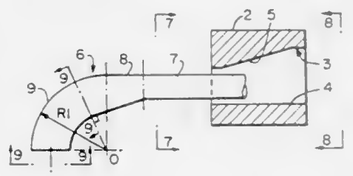
1. A locking, checking, and actuating device operated by a ferromagnetic lock and comprising a magnetic key having a stem and a barrel including a rotor, a stator, and locking, checking, or actuating means disposed at the rear of said barrel and positioned relative to said stator;
said rotor comprising a hollow cylindrical sleeve having a longitudinal sleeve axis, said sleeve having an inside wall and an outside wall, said outside wall having at least one elongate tumbler placed therein, said tumbler having a transverse axis substantially at the middle thereof and being mounted for pivotable movement about said transverse axis between a first position in which said tumbler spans the interface between said rotor and said stator and prevents displacement of said rotor relative to said stator and a second position in which said tumbler clears the interface and allows the free rotation of said rotor inside said stator, said tumbler having a magnet at one end thereof and being devoid of a magnet at the other end thereof, and said rotor including means for fastening said key thereto and means for unfastening said key therefrom and a cylindrical ferrous core in the center of said rotor extending longitudinally along said sleeve axis throughout the length of said sleeve and spaced from said inside wall of said sleeve a distance slightly greater than the thickness of said stem of said key, said central ferrous core exerting a permanent force of attraction on said magnet in said tumbler; said stem of said key comprising a hollow cylindrical tube having at least one magnet embedded in the periphery thereof corresponding to said at least one tumbler, said magnet in said stem cooperating by repulsion with said magnet in said corresponding tumbler, whereby when said key is fastened, said magnet in said stem cooperates with said magnet in said corresponding tumbler, moving said tumbler from said first position to said second position, thereby allowing free rotation of said rotor in said stator, said rotation operating said locking, checking, or actuating means; and
said stator surrounding said rotor and being provided with at least one opening corresponding to said at least one tumbler, said opening being positioned and configured to receive said end of said tumbler which is devoid of a magnet as long as said magnet of said key does not act on said magnet of said tumbler by repulsion to the extent of overcoming the permanent force of attraction that said central ferrous core exerts on said magnet in said tumbler.

4,841,759
AUTO GUIDING COMBINATION LOCK
Cathirgamathamby Balasingam, 102/2 Wolfendahl Street, Colombo 13,
Filed Sep. 25, 1986, Ser. No. 911,569
Int. Cl.[4] E05B *37/08*
U.S. Cl. 70—302 11 Claims



1. A lock apparatus having a dial for setting a combination of sequential characters which when correctly set, enables unlocking of the lock, the lock having a case, a bolt and ring tumblers, each of said tumblers corresponding with a correct character and a position in the sequence of combination characters, said tumblers having a scattered condition and an unscattered condition, a tumbler being in the unscattered condition responsive to the correct character for the tumbler being set in the correct position in the sequence, comprising:
a rotatable spindle in operative connection with said dial, said spindle journalled in said case and rotatable about an axis of rotation, said spindle having a first axial end and a second axial end;
an impeller mounted for axial movement on said spindle, said impeller including an impeller bit extending radially outward of said spindle;
a hollow cylinder mounted on said case coaxial with said spindle, said hollow cylinder including a plurality of spaced, circumferential tumbler slots extending therethrough, said cylinder further including cam guide projections adjacent each of said tumbler slots, said cam guide projections extending radially inward in said hollow cylinder, each of said cam guide projections terminating at an axial corridor inside said hollow cylinder;
a plurality of rotatable ring tumblers mounted for movement on said hollow cylinder, each tumbler mounted adjacent one of said tumbler slots, each tumbler including an ear extending radially toward said spindle through said adjacent tumbler slot, said ears of said tumblers being positioned in said corridor when said tumblers are in the scattered condition, each of said tumblers further including a gating in an external surface thereof, said gatings of said tumblers being aligned in said unscattered condition;
a driver mounted for movement adjacent said second end of said spindle, said driver including driver engagement means for engaging said impeller when said impeller is adjacent said second end;
bolt engagement means for selectively engaging said bolt and said driver responsive to alignment of said gatings of said tumblers;
biasing means for biasing said impeller toward said second end of said spindle;
whereby when unlocking said lock beginning with said tumblers in said scattered conditions and said impeller adjacent said first end of said spindle, said spindle bit engages said ear means of a first tumbler in said corridor, upon turning said dial in a first direction to a first combination character said impeller bit engages and is supported on a first cam guide projection associated with said first tumbler, said first combination being dialed and said gating of said first tumbler set in the unscattered condition: said dial is thereafter turned in a second opposed direction whereby said first tumbler is disengaged from said impeller bit and said bit is supported on said first cam guide projection until said bit returns to said corridor, wherein said impeller moves axially toward said second end of said spindle; said impeller bit thereafter engaging said ears of said further tumblers sequentially with the setting of combination characters to place the gatings of said tumblers in the unscattered conditions, whereby after all of said combination characters have been set said impeller engages said driver and said bolt engagement means engages said driver and said bolt, enabling opening of the lock.

4,841,760
PROCESS AND APPARATUS FOR MANUFACTURING TUBE BENDS
James M. Ferguson, Beresford House, 5/6 Claremont Terrace, Glasgow G3 7XR, Scotland
PCT No. PCT/GB87/00571, § 371 Date Apr. 7, 1988, § 102(e) Date Apr. 7, 1988, PCT Pub. No. WO88/01207, PCT Pub. Date Feb. 25, 1988
PCT Filed Aug. 13, 1987, Ser. No. 191,167
Claims priority, application United Kingdom, Aug. 13, 1986, 8619759
Int. Cl.[4] B21D *9/12*
U.S. Cl. 72--133 10 Claims



1. A process for making a tube bend by forcing a straight tube over a curved expanding mandrel is characterized by forming a straight tube of quasi-elliptical cross section with the portion of the tube wall on one side of the major axis of the quasi-elliptical cross section of non-constant thickness which is a maximum at the point where the minor axis of the quasi ellipse meets the tube wall on one side of the major axis of the quasi ellipse and which reduces progressively on each side of said point to a reduced thickness in the vicinity of the two points where said major axis meets the tube wall, applying against the portion of the inner surface of the tube wall on the other side of said major axis a radially directed expansion force of a magnitude sufficient to displace that portion of the tube wall away from said major axis to a position in which the tube has the required internal dimensions and shape of cross section of the bend to be formed and bending the tube about an axis parallel with and spaced from said major axis and lying on said other side of said major axis.

4,841,761.

MULTIPURPOSE ROLLING MILL

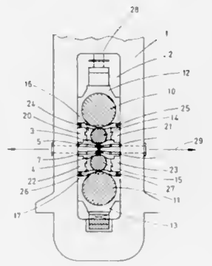
Erich Stoy, Ratingen; Wilfried Bald, Hilchenbach, and Hans Römmen, Dormagen, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

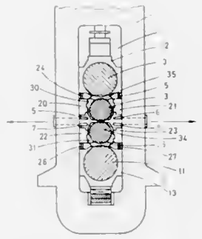
Filed Mar. 9, 1988, Ser. No. 165,699

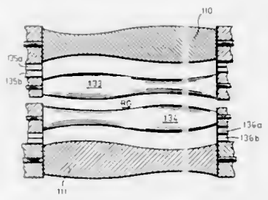
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1987, 3707560

Int. Cl.[4] B21B *31/08, 13/14*

U.S. Cl. 72—238 9 Claims







1. A rolling mill stand, comprising:

a pair of rolling mill stand frames formed with respective windows;

upper and lower backup rolls received in said frames and having respective journal blocks in said windows;

respective pairs of roll-bending blocks received in said windows below the journal blocks for said upper backup rolls and above the journal blocks of said lower backup rolls;

a respective intermediate roll engageable by each backup roll and provided at its ends with respective mounting pieces horizontally slidable into engagement with a respective pair of said roll-bending blocks for bending by fluid-operated means thereon;

a respective slender working roll braced by each of said intermediate rolls whereby said slender working rolls define a rolling gap between them, said slender working roll and the respective intermediate roll being removable axially from said stand together with the respective mounting pieces thereof while the respective roll-bending block and backup roll remain in the stand; and

a pair of thick working rolls having respective mounting members journaling same at opposite ends of the thick working rolls, insertable axially in said windows and engageable with said roll-bending blocks to define a rolling gap upon removal of said intermediate rolls and slender working rolls from the stand to convert said stand from a six-high mill stand to a mill stand free from intermediate rolls, said thick working rolls being bendable by the fluid-operated means of the respective roll-bending blocks, and wherein no contact exists between each of said thick working rolls and of an adjacent one of said backup rolls during use of said rolling mill stand as a two-high mill stand said two-high mill stand having a plurality of mounts of said working rolls provided with a plurality of spacer pieces engaging against a plurality of journal blocks of said backup rolls, each of said mounts of said working rolls being fitted in at least one guide piece which acts as a guide for said mounting piece of said intermediate rolls during use of said rolling mill stand as a six-high rolling mill stand.

9. A rolling mill stand for making a rolled product, comprising:

a plurality of backup rolls each having an asymmetric shape curved differently in the vicinity of each end of said supporting roll mounted in a mounting member, and

a plurality of guide pieces each formed to engage and hold either a mounting piece holding an intermediate roll or a mount holding a working roll so that said rolling mill stand can be easily changed from a six-high mill stand to a four-high mill stand and back again; and

at least one spacer piece engageable between said supporting roll and said working roll on said mount releasably so that said rolling mill stand can be operated as a two-high mill stand.

4,841,762

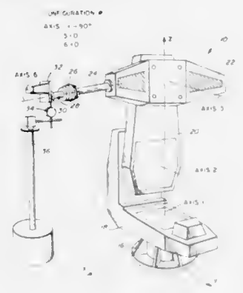
SYMMETRY CALIBRATION METHOD FOR MULTI-CONFIGURATION ROBOTS

Bradley L. Hunter, Sharon, Mass., assignor to Automatix Incorporated, Billerica, Mass.

Continuation of Ser. No. 115,654, Oct. 27, 1987, abandoned, Continuation of Ser. No. 16,999, Feb. 19, 1987, abandoned, Continuation of Ser. No. 786,652, Oct. 11, 1985, abandoned. This application Jul. 21, 1988, Ser. No. 224,192

Int. Cl.[4] G01L *25/00*

U.S. Cl. 73—1 R 5 Claims



1. A method for calibrating a plural axis robot having a plurality of links rotatable about a corresponding plurality of axes to permit the robot to move within an envelope and with each axis of said plurality of axes having an origin, said method comprising the steps of:

(1) selecting a point in the envelope of the robot;

(2) moving the robot to said envelope point in a first configuration of the links of the robot;

(3) making a linear distance measurement from an arbitrary surface to a point on one of the robot links;

(4) moving the robot to said envelope point in a second configuration of the links of the robot;

(5) remeasuring the linear distance from the arbitrary surface to the point on said one robot link; and,

(6) adjusting the origin of the axis of one of said axes if the two linear distance measurements are not substantially equal.

4,841,763

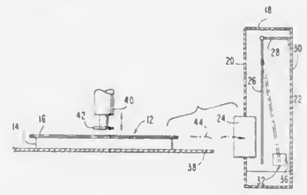
PACKAGE SEAL INSPECTION SYSTEM

Samsuk Kang, Monroeville, and Frank M. Bordelon, Export, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 17, 1988, Ser. No. 156,671

Int. Cl.[4] G01M *3/00*

U.S. Cl. 73—49.3 13 Claims



1. A package seal inspection system for detecting leaks in a sealed package comprising:

(a) a box having front and back walls;

(b) a plurality of louvers mounted in said front wall;

(c) a plurality of strips mounted in said box behind said louvers;

(d) means mounted in said box behind said strips for detecting movement of said strips;

(e) means for supporting said package in front of said louvers; and

(f) means for applying pressure to a surface of said package whereby when a leak is present in said package, air in said package is forced out and through said louvers to cause at least one of said strips to move and be detected by said detecting means.

4,841,764

DEVICE FOR A HARDNESS MEASURING INSTRUMENT

Helmut Fischer, Industriestrasse 20, 7032 Sindelfingen-6, Fed. Rep. of Germany

Filed Mar. 24, 1988, Ser. No. 172,479

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1987, 3737910

Int. Cl.[4] G01N *3/40, 3/42*

U.S. Cl. 73—81 18 Claims

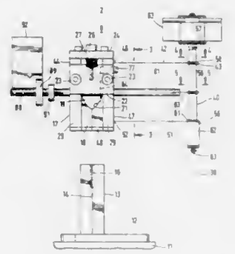
1. Device for a hardness measuring instrument, comprising

a bar device having a pair of end portions and a middle portion,

a test body supported on one end portion of said bar device, said middle portion being pivotable about a pivot center,

a gently lowerable measuring device that works on the basis of probes for measuring the thickness of thin layers, and the improvement wherein:

(a) a movable first part of an oscillation damping device is provided at one end portion of said bar device, and



(b) said movable first part has a longitudinal extension aligned with the direction of movement of said test body.

4,841,765

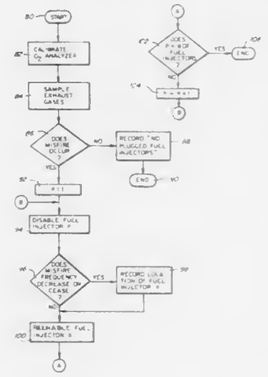
METHOD OF LOCATING A PARTIALLY PLUGGED PORT FUEL INJECTOR USING MISFIRE MONITOR

John D. Blanke, P.O. Box 1178, Barrington, Ill. 60011

Filed Jan. 21, 1988, Ser. No. 146,335

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—119 A 10 Claims



9. The method of locating a partially plugged port fuel injector in an internal combustion engine comprising using a misfire monitor to determine that the lean-roll frequency has decreased or ceased after the cylinder associated with the partially plugged port fuel injector is disabled.

4,841,766

METHOD AND APPARATUS FOR CHECKING THE CONCENTRICITY OF A PNEUMATIC VEHICLE TIRE

Dietmar Haack, Springe, Fed. Rep. of Germany, assignor to Continental Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 16, 1988, Ser. No. 245,819

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1987, 3731924

Int. Cl.[4] G01M *17/02*

U.S. Cl. 73—146 6 Claims

2. In an apparatus for checking the concentricity of a pneumatic vehicle tire that during operation has its bead portions mounted on the radially inner periphery of a wheel rim, said

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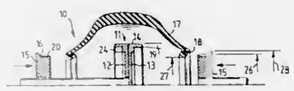
apparatus including a test rim comprised of two axially movable rim ring sections that have a common rim ring and against which is disposed a tire that is to be checked, with said tire being manufactured with trapezoidally axially outwardly directed sidewalls, and with said tire being disposed against said rim ring sections in this trapezoidal form, the improvement comprising:

rim ring sections that are each provided, in the region of said rim ring, with a laterally and axially outwardly projecting rim ring edge that has no rim flange and that merges



radially inwardly via a shoulder portion with an inboard member; and

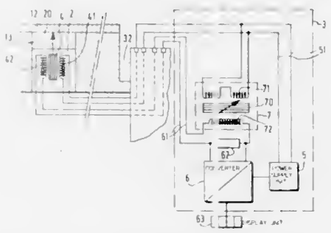
two axially movable bead-receiving rings, each of which is disposed axially outwardly of one of said rim rings sections and has a portion that faces said rim ring section and is provided with a radially outwardly directed, circumferential retaining rib that is adapted to be introduced axially into the region where said shoulder portion merges with said inboard member, whereby said tire is held in position between said bead-receiving rings on the one hand, and said rim ring sections on the other hand.

4,841,767

DEVICE FOR MEASURING FLATNESS DEFECTS IN A STRIP

Michel Morel, Chelles, France, assignor to Clecim, Courbevoie, France

Filed Dec. 2, 1987, Ser. No. 127,327
Claims priority, application France, Dec. 4, 1986, 86 16998
Int. Cl.[4] G01L 5/04
U.S. Cl. 73—159 5 Claims



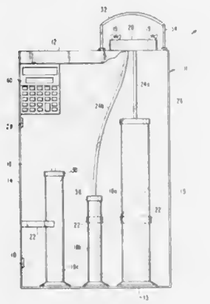
1. Device for measuring flatness defects in a strip moving continuously in a longitudinal direction and applied under tension against a roller mounted for rotation about an axis transverse to said longitudinal direction and along which there are mounted a plurality of transformer sensors each comprising an element moving radially between a rest position and a measuring position in response to a force exerted by said strip, a primary energizing winding connected to a circuit supplying current in periodic pulses and a secondary winding connected to a circuit for measuring a voltage appearing at the terminals of the secondary winding at each energizing pulse of said primary winding, this voltage, measured at a determined instant (t_2) after the pulse, being dependent on the position of said radially moving element with respect to the rest position at the instant (t_0) of the pulse, said measured voltage being transformed by a converter into a signal representing the force applied to said roller at the instant of the pulse, wherein, with the measurement of the voltage being carried out within an amplitude measurement interval smaller than the voltage variation interval after the pulse, each sensor is associated with a correction transformer capable of delivering on each energizing pulse an adjustable correction voltage (U_2) algebraically added to said voltage (U_1) at the terminals of the secondary winding of the sensor and whose value, at the instant of measurement, is determined so as to bring a measured voltage (U_3) within the measuring interval of said converter.

4,841,768

PLURAL COMPONENT TESTER

Timothy S. Kukesh, Indianapolis, and Larry G. Huber, Elkart, both of Ind., assignors to Glas-Craft, Inc., Indianapolis, Ind.

Filed Apr. 25, 1988, Ser. No. 185,536
Int. Cl.[4] G01M 19/00
U.S. Cl. 73—168 18 Claims



9. An apparatus for measuring the respective ratio of resin and catalyst dispersed by a plural component spraying system having separate apertures for each said component, comprising:

a housing forming a top, a bottom, and three sides;

an elastomeric coupling at the top of said housing including at least two openings and adapted to provide sealing engagement with each of its at least two openings in communication with one of said separate apertures of said plural component spraying system;

at least two conduits within said housing leading from said openings of said elastomeric coupling; and

at least two graduated containers within said housing, one of said at least two conduits leading from one of said openings in said elastomeric coupling to one of said graduated containers and the other of said at least two conduits leading from the other of said openings in said elastomeric coupling to the other of said graduated containers.

4,841,769

APPARATUS FOR MEASURING VELOCITY OF FLOW

Wolfgang Porth, Frank am Main, and Wolfgang Weibler, Hofheim, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

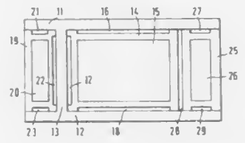
Filed Mar. 3, 1987, Ser. No. 21,300
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1986, 3606851
Int. Cl.[4] B01F 1/68
U.S. Cl. 73—204.26 2 Claims

1. In an apparatus for measuring the velocity of flow of fluids, and particularly of the intake air of internal-combustion engines, the apparatus having an electrically heatable resistance layer which is applied in insulated manner on a support, which layer is in thermal contact with the flowing fluid, the improvement wherein

the support is rectangular and includes a flat central part which carries a resistance layer, the support further comprising reinforcement strips integral one-piece therewith

on at least three sides of the support for securing the resistance layer, the apparatus further comprising

outer thermally insulating layers of low thermal conductivity overlying said resistance layer, said support and the



side of said support facing away from the resistance layer, and wherein

the insulating layers decrease in thickness continuously in the direction of flow.

4,841,770

APPARATUS AND METHOD FOR DETERMINING THE AMOUNT OF SUBSTANCE IN A VESSEL

Robert L. Davies, Pontypool, United Kingdom, assignor to Parke-Davis & Co. Ltd., Channel Islands, United Kingdom

Filed Oct. 19, 1987, Ser. No. 109,973
Int. Cl.[4] G01F 23/28
U.S. Cl. 73—290 V 13 Claims

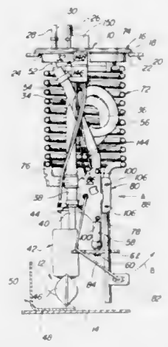
1. Apparatus for determining the amount of a substance in a vessel comprising detector means adapted to be insertable in said vessel to detect the surface of the substance and indicating means, indicating when said surface is detected wherein the detector means comprises at least two electrodes supported via an elongated member and located at a distal end thereof said electrodes adapted to cause an electric current to flow upon contact of the electrodes with the surface of the substance, a wave transmitting device and a wave receiving device, a first reference point on the detector means spaced a fixed distance from the distal end of said electrodes, said electrodes and reference point being movable with respect to the surface of the substance in said vessel, said first reference point being provided on a material suitable for reflecting waves from the wave transmitting device to the wave receiving device, whereby when the detector means detects the surface of the substance the wave transmitting device and the wave receiving device can be activated to measure the distance from the first reference point to a second reference point having a known position in relation to the bottom of the vessel whereby the amount of substance in the vessel can be determined.

4,841,771

FUEL LEVEL SENSOR

Alfred H. Glover, Decatur, and Daniel F. Lawless, Hazel Green, both of Ala., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Jul. 8, 1988, Ser. No. 216,568
Int. Cl.[4] G01F 23/32
U.S. Cl. 73—317 2 Claims



2. In a combination with a vehicle fuel delivery assembly including a depending member extending through the exterior of the vehicle fuel tank, an improved fuel level sensor attached to the depending member, comprising: a sensor housing; a float rod having a cylindrical end portion pivotally supported relative to the sensor housing; the housing including spaced walls with aligned apertures in the walls; a crank arm member of molded elastomeric material having a generally cylindrical portion with reduced diameter opposite ends for extending into the aligned apertures of the housing walls thereby supporting the crank for rotation in the housing; one of the opposite ends of the crank arm member having an axially extending bore therein adapted to have the float rod inserted therein; a generally flat metal insert member molded within the crank arm and extending in a plane generally normal to the axially extending bore of the crank arm; an aperture through the insert member positioned coaxially with the bore of the crank arm, the aperture having a slightly smaller diameter than the cylindrical portion of the float rod but allowing insertion of the rod through the aperture and providing good gripping between the crank arm and the rod to resist changes in relative angular positions without application of a significant torque force between the crank arm and the float rod; the fuel level sensor in which the crank arm has a noncircular socket formed in an end opposite the end through which the bore extends, the noncircular socket permitting access for application of a significant torque force on the crank arm and its included metal insert to produce relative rotation between the crank arm and fixed float rod for calibration purposes.

4,841,772

THREE-AXIS SUPERCONDUCTING GRAVITY GRADIOMETER

Ho J. Paik, Silver Spring, Md., assignor to University of Maryland, College Park, College Park, Md.

Filed Dec. 3, 1987, Ser. No. 127,971
Int. Cl.[4] G01V 7/00, 7/06, 7/08
U.S. Cl. 73—382 G 29 Claims

1. A gradiometer having a sensitive axis for detecting a gravity gradient along the sensitive axis, comprising:

a pair of accelerometers having respective sensitive axes;

each accelerometer including a proof mass having a pair of hollowed out annular portions;

each proof mass having at least one sensing coil arranged

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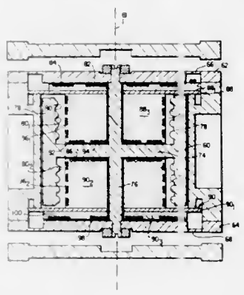
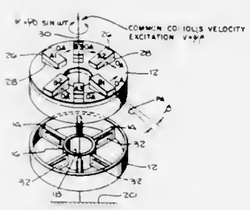
adjacent a bottom-side surface of the respective proof mass in one of the hollowed out portions and a levitation coil arranged adjacent a second bottom-side surface of the respective proof mass in the other hollowed out portion, said at least one sensing coil and said levitation coil thus being located on the same side of the respective proof mass in relation to the direction of an external force exerted on said gradiometer thereby to compensate for temperature induced changes in magnetic field penetration into the respective proof masses;



at least one first superconducting circuit in which the sensing coils of the accelerometers are interconnected and in which a first persistent current flows, said first circuit having an output indicative of a gravity gradient along the sensitive axis of the gradiometer; and

a second superconducting circuit in which the levitation coils of the respective component gradiometer are series connected, said second circuit having stored therein a second persistent current by which the levitation coils exert respective forces against respective proof masses to levitate the respective proof masses.

4,841,773
MINIATURE INERTIAL MEASUREMENT UNIT
Robert E. Stewart, Woodland Hills, Calif., assignor to Litton Systems, Inc., Woodland Hills, Calif
Filed May 1, 1987, Ser. No. 45,045
Int. Cl.[4] G01P 9/04
U.S. Cl. 73—510 **23 Claims**



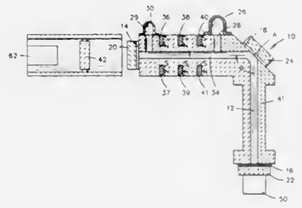
1. A three axis inertial measurement unit, comprising:

a platform mounted for rotary motion about a single axis with respect to an object whose motion is being measured;

a plurality of sensors mounted upon said platform, said sensors each having an input axis, an output axis, and a pendulous axis; and

said sensors mounted upon said platform such that said input axis of each sensor is at a predetermined angle to said single axis and said platform.

4,841,774
LASER ACCELEROMETER
Lawrence H. Hall, Woodland Hills, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.
Filed Jan. 20, 1988, Ser. No. 146,274
Int. Cl.[4] G01P 15/08
U.S. Cl. 73—517 R **9 Claims**



1. A laser accelerometer comprising:

a two-branched laser body enclosing a two-branched gas-laser cavity with laser mirrors at the ends of said cavity, one of said mirrors being partly transmissive, at least one branch of said body being flexible about a predetermined axis;

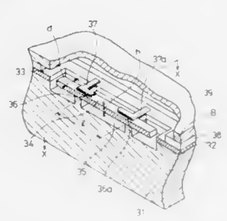
said laser cavity having a corner mirror, at the connecting corner between the two branches, that produces a differential phase shift between polarization modes, a laser gas within said cavity, and means for energizing said gas within a gain region of said cavity;

magnetic means in said gain region for polarizing laser beams produced in the laser;

a laser beam sensor positioned to receive output beams from said laser;

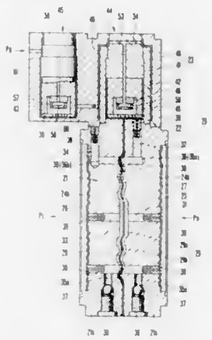
and a proof mass attached to the unconnected end of said at least one flexible branch of said body.

4,841,775
VIBRATORY TRANSDUCER
Kyoichi Ikeda; Tetsuya Watanabe, and Yasushi Higashino, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan
Division of Ser. No. 899,519, Aug. 22, 1986, abandoned. This application Jan. 19, 1988, Ser. No. 145,156
Claims priority, application Japan, Sep. 6, 1985, 60-192169
Int. Cl.[4] G01L 11/00
U.S. Cl. 73—704 **24 Claims**



1. A vibratory transducer for vibrating a vibratory beam formed on a single silicon crystal at a natural frequency thereof and for detecting a change in the frequency of vibration of the vibratory beam dependent on change in a force applied on said single silicon crystal or environment, said transducer comprising a single silicon crystal which comprises a p-type semiconductor conductor containing impurities at a concentration of 10^{-}or 10^{17} atoms/cm^3 or less, and an n^+ diffused layer of a single silicon crystal containing impurities at a concentration ranging from 10^{17} to 10^{18} atoms/cm^3; a vibratory beam formed of the n^+ diffused layer by underetching said n^+ diffused layer by the selective etching technique; said vibratory beam having at least one fixed point; means for causing said vibratory beam to vibrate at the natural frequency; and detecting means for detecting the vibration.

4,841,776
DIFFERENTIAL PRESSURE TRANSMITTER
Junji Kawachi; Shunichiro Awa, and Keizo Ohtani, all of Tokyo, Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan
Filed Jun. 29, 1987, Ser. No. 68,541
Claims priority, application Japan, Jun. 30, 1986, 61-153076
Int. Cl.[4] G01L 7/08, 9/00, 13/02, 15/00
U.S. Cl. 73—706 **2 Claims**



1. An apparatus for measuring a pressure differential between two points as a process variate and simultaneously measuring a high or low static pressure which comprises:

means for detecting and transmitting said pressure differential;

a sensor housing detachably coupled to said detecting and transmitting means for converting said pressure differential into an electrical output

wherein said sensor housing is detachably coupled to the upper surface of said detecting and transmitting means, said sensor housing comprising:

an outer body containing a first and a second recess;

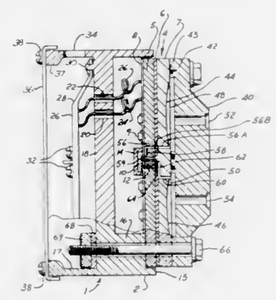
a hollow inner concentric cylindrical body contained within said first recess of said outer body forming a first gap path between said first recess and said hollow inner cylindrical body wherein said first gap path contains said noncompressed liquid;

means for converting said pressure differential into an electrical output contained within said hollow inner cylindrical body forming a second gap path between said converting means and said hollow inner cylindrical body wherein said second gap path contains said noncompressible liquid; and

means for measuring a static pressure differential contained within said second recess of said outer body forming a third gap path between said means for measuring static pressure differential and said second recess wherein said third gap path contains said noncompressible liquid;

whereby said first and said second gap paths communicate with said first said second sealing circuits of said detecting and transmitting means.

4,841,777
PRESSURE TRANSMITTER ASSEMBLY
George E. Hershey, Blue Bell; Charles E. Lane, III, Meadowbrook, and Douglas W. Wilda, Ambler, all of Pa., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Mar. 22, 1988, Ser. No. 171,599
Int. Cl.[4] G01L 7/08, 9/06
U.S. Cl. 73—721 **20 Claims**



1. A pressure transmitter comprising

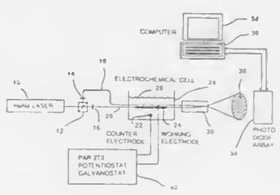
a pressure sensor means for providing an output signal representative of a differential pressure applied thereacross,

a first diaphragm means for developing a first fluid pressure representative of a first input pressure applied thereto,

a second diaphragm means for developing a second fluid pressure representative of a second input pressure applied thereto and

multilayer ceramic means including a plurality of contiguous ceramic layers between said first and second diaphragm means and said sensor means for directing said first and second fluid pressures to said sensor means as a differential pressure thereacross.

4,841,778
OPTICAL FIBER SENSOR TECHNIQUE FOR STRAIN MEASUREMENT
Michael A. Butler, and David S. Ginley, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.
Filed Jan. 21, 1988, Ser. No. 146,621
Int. Cl.[4] G01L 1/24
U.S. Cl. 73—800 **15 Claims**



1. A system for measuring strain, comprising:

means for providing laser light;

first and second optical fibers having substantially equal lengths, a selected portion of the length of said first optical fiber being subjectible to a strain over time, each of said fibers receiving a portion of said laser light at its first end for transmission along said length for emission out of its second end as a corresponding light beam, said corre-

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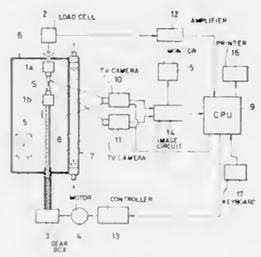
sponding light beams combining to form an interference pattern;
strain applying means comprising an electrically conductive layer attached to a surface of said portion of said first optical fiber;
light transducing means for receiving said interference pattern for transducing the same at predetermined intervals and for generating corresponding signals; and
means for processing said signals to determine changes in said interference pattern over time and thereby evaluate the corresponding strain experienced by said selected portion of said first optical fiber.

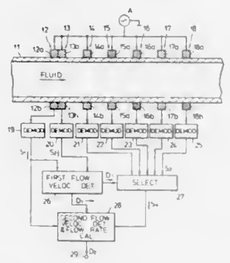
4,841,779
TENSION TESTER
Kenhachi Mitsuhashi; Yoshinobu Ohashi, both of Hiratsuka; Shohei Nakayama, Odawara, and Akira Yamada, Tokyo, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan
Filed Apr. 21, 1988, Ser. No. 184,631
Claims priority, application Japan, Apr. 27, 1987, 62-101845; Jun. 22, 1987, 62-153480; Mar. 30, 1988, 63-744489
Int. Cl.[4] G01N *3/08*
U.S. Cl. 73—826 **18 Claims**



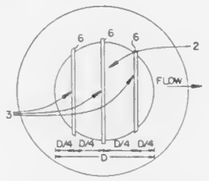
1. In a tension tester in which a specimen marked with at least one measuring marking whose optical characteristic is different from that of the specimen's ground color is held by chucks at the ends and subjected to a tensile load by moving one of the chucks; in which, while the specimen is being stretched, the marking is scanned by a scanner to detect a positional change of the marking in the tensile direction; and in which electric signals which are produced due to difference, in optical characteristic between the marking and the specimen's ground color are processed to determine the tensile characteristic of the specimen; said tension tester comprising:
a first optical scanner with its viewing field set to include an entire elongation range of the specimen; and
at least one second optical scanner with its viewing field set to include only a low elongation range of the specimen, the second scanner having a greater number of scanning lines than that of the first scanner.

4,841,780
CROSS CORRELATION FLOWMETER
Yutaka Inada, and Koyata Sugimoto, both of Tokyo, Japan, assignors to Tokico Ltd., Japan
Filed May 14, 1987, Ser. No. 50,203
Claims priority, application Japan, May 16, 1986, 61-73511
Int. Cl.[4] G01F *1/712*
U.S. Cl. 73—861.06 **11 Claims**

1. A cross correlation flowmeter for measuring a flow rate of a fluid involving a disturbance or second phase transported with said fluid, said disturbance or second phase continuously changing as it is transported with said fluid, said cross correlation flowmeter comprising:
a conduit for passing said fluid, the flow rate of which is to be measured;
first upstream sensing means disposed at an upstream position on said conduit for sensing a passage of said disturbance or second phase transported through the conduit with said fluid and providing a first output signal;
second upstream sensing means disposed on said conduit adjacent to said first upstream sensing means along a longitudinal direction of said conduit for sensing a passage of said disturbance or second phase transported through said conduit with said fluid and providing a second output signal, said first upstream sensing means and said second upstream sensing means being separated along the longitudinal direction of said conduit by a distance sufficiently short such that said first and second upstream sensing means respectively sense the passages of a substantially identical disturbance;
a plurality of downstream sensing means disposed on said conduit along the longitudinal direction of said conduit at a downstream side relative to said first and second upstream sensing means with respective predetermined distances from said first upstream sensing means for sensing passages of said disturbance or second phase sensed by said first upstream sensing means after respective delay times and providing output signals;
first flow velocity detection means supplied with said first and second output signals from said first and second upstream sensing means for calculating a first cross correlation between said first and second output signals while imposing a varying time difference between said first and second output signals, said first flow velocity detection means calculating a first flow velocity from a first time difference at which said first cross correlation is maximized and providing a signal indicating same;
selection means supplied with said output signals from said plurality of downstream sensing means and further supplied with said first flow velocity signal from said first velocity detection means for selecting, responsive to said first flow velocity, the one of said downstream sensing means which provides a maximum accuracy for the flow rate measurement in combination with said first upstream sensing means, said selection means producing a third output signal corresponding to an output signal from the selected one of said plurality of downstream sensing means; and
second flow velocity detection and flow rate calculation means supplied with said first output signal, said signal from said first flow velocity detection means and said third output signal from said selection means for calculating a second cross correlation of said first and third output signals while imposing a varying time difference between said first and third output signals and for calculating a second flow velocity and the flow rate from a second time difference at which said second cross correlation is maximized.

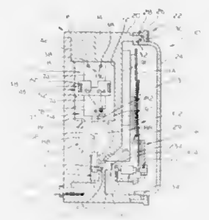


4,841,781
FLOW RECTIFIER FOR VORTEX FLOWMETER
Mohamed A. Khalifa, Greenwood, S.C., assignor to Schlumberger Industries, Inc., Atlanta, Ga.
Filed Dec. 4, 1987, Ser. No. 129,122
Int. Cl.[4] G01F *1/32*; F15D *1/04*
U.S. Cl. 73—861.22 **11 Claims**



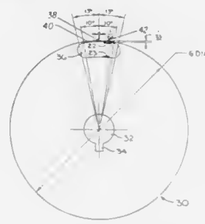
1. A flow straightener for use in a substantially cylindrical fluid flow pipe, comprising at lease three vanes arranged with their longitudinal axis parallel to each other and equidistantly spaced apart from each other across a diameter of said pipe and wherein each vane has first and second oppositely disposed sides having a thickness t and third and fourth oppositely disposed sides having a depth d, said third and fourth sides being arranged substantially parallel to the direction of fluid flowing in said pipe, said depth d being in the range of 0.25 to 0.125 of the diameter D of said pipe and said thickness t being approximately 0.05 the diameter D of the pipe.

4,841,782
TARGET FLUID FLOW INDICATOR GAUGE
Steven O. Buchanan, Rolling Prairie, Ind., assignor to Dwyer Instruments, Inc., Michigan City, Ind.
Filed Sep. 11, 1987, Ser. No. 95,432
Int. Cl.[4] G01F *1/28*
U.S. Cl. 73—861.74 **10 Claims**



3. A target fluid flow indicator guage comprising:
a housing formed from a non-magnetic material and defining a target chamber and fluid inflow and outflow ports disposed on opposite sides of said chamber and axially aligned to direct fluid flow into and out of said chamber in a predetermined fluid flow direction through said housing,
a leaf spring cantilever mounted in said housing, adjacent one end of said leaf spring, for disposing said leaf spring to extend substantially crosswise of said fluid flow direction, said leaf spring being exposed to said chamber,
a target centered in said direction of fluid flow within said chamber and fixed to the other end of said leaf spring for limited movement thereof in said direction of fluid flow when fluid flow through the housing impinges against said target,
a driving magnet assembly carried by and movable with said target within said housing,
an indicator pointer disposed externally of said chamber and journalled to pivot about an axis extending crosswise of said fluid flow direction,
and a follower magnet assembly disposed externally of said chamber and being magnetically coupled to said driving magnet assembly and being fixed with respect o said indicator pointer to pivot said pointer about said axis,
said housing including an imperforate wall structure of film thickness proportions separating said magnet assemblies, and the magnetic coupling of said magnet assemblies being through said wall structure,
said follower magnet assembly acting, in following the movement of said driving magnet assembly, to pivot said pointer about said axis through a leverage having a length which lies in the range of from about 0.100 to about 0.200 inch.

4,841,783
FLAT BELT TEST MACHINE
Kurt M. Marshek, 9701 Courtleigh Cir., Austin, Tex. 78759, and Hyunsoo Kim, Kangdong-ku, Shinchon-don 7, Jangmi Apt. 19-505, Seoul, Rep. of Korea
Filed Jun. 19, 1987, Ser. No. 63,980
Int. Cl.[4] G01L *5/10*
U.S. Cl. 73—862.48 **15 Claims**



1. An apparatus for measuring normal and tangential belt forces versus angular position for drive of flat belt, abrasive belt and the like, the apparatus comprising:
a normal force transducer driving pulley with two curved beams for measuring normal force each beam located at or near the pulley outermost surface and each beam having a radius of curvature and a surface characteristic similar to that of the outermost surface of the pulley;
a tangential force transducer driven pulley with a cantilever beam for measuring tnagential force and having a head located at or near the pulley outermost surface with a radius of curvature and a surface characteristic similar to that of the outer most surface of the pulley;
a torque disk connected to said driven pulley;
first and second transverse sliding plates (which slide on rails) on which respectively said driving and driven pulleys each are separately mounted;
input power supply means connected to the driving pulley to supply input power to the driving pulley;
means for applying belt initial tension through said second transverse sliding plate, by applying tension to a first cord operatively connected to said second transverse sliding plate and wound at least partially on a roller.

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4,841,784

METHOD AND APPARATUS FOR MONITORING THE TENSILE FORCE ON A THREAD

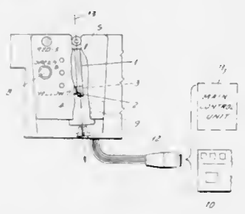
Erwin Leurer, Fuchsstadt, Fed. Rep. of Germany, assignor to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Continuation-in-part of Ser. No. 833,201, Feb. 25, 1986, Pat. No. 4,759,226. This application Mar. 15, 1988, Ser. No. 168,500

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1987, 3708565

Int. Cl.[4] G01L *5/10*

U.S. Cl. 73—862.48 **12 Claims**



7. A device for monitoring the tension on a thread comprising:

a frame;

resilient means on the frame for bearing against the thread and being displaced thereby as a function of such tension;

generating means for generating an electromagnetic field between the frame and the resilient means which varies as a function of such displacement;

sensor means for employing the Hall effect to sense such field and to generate an output signal indicative of such tension; and

electronic means for receiving said output signal and indicating at least at a location in the vicinity of said frame whether said output signal and thereby said thread tension is within a predetermined desirable range;

wherein said electronic means comprises

detecting means for receiving said sensor means output signal and detecting an AC component therein;

reference means for generating an upper limit voltage and a lower limit voltage;

comparing means for comparing said AC component against said upper and lower limit voltages and outputting comparison data; and

indicating means for receiving said comparison data and indicating at least at said location in the vicinity of said frame whether said AC component is above, between, or below said limit voltages; and

wherein said indicating means comprises three visual displays for indicating respectively when said AC component is above, between, and below said limit voltages.

4,841,785

VANISHING CHAMBER CONSTRUCTION FOR LIQUID SAMPLER

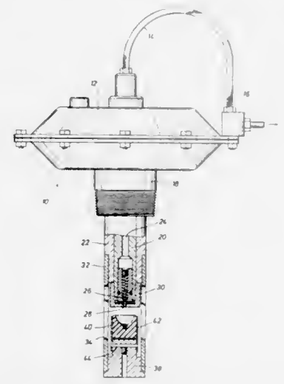
Brian Welker, Sugarland, Tex., assignor to Welker Engineering Company, Sugarland, Tex.

Continuation of Ser. No. 59,424, Jun. 8, 1987, abandoned. This application Jun. 27, 1988, Ser. No. 212,276

Int. Cl.[4] G01N *1/14*

U.S. Cl. 73—863.84 **3 Claims**

1. In a vanishing chamber liquid sampling system having a motor relatively moving a resilient plug against an anvil which anvil seals against the resilient plug and the resilient plug has a chamber for receiving a fluid to be sampled, the improvement which comprises a non-yielding insert in the resilient plug exposing a solid face at a spherical surface defining said fluid



receiving chamber and located opposite an opening through the anvil for evacuating liquid from the chamber.

4,841,786

SPECIMEN DISTRIBUTING SYSTEM

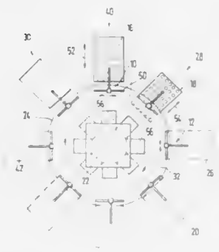
Peter Schulz, Ludwigsburg, Fed. Rep. of Germany, assignor to Forschungs-& Entwicklungs-KG, Ludwigsburg, Fed. Rep. of Germany

Filed Jun. 6, 1988, Ser. No. 202,393

Claims priority, application Fed. Rep. of Germany, May 2, 1986, 3614955

Int. Cl.[4] B01L *3/02;* **G01N** *35/00, 1/10*

U.S. Cl. 73—864.25 **11 Claims**



1. A specimen distribution apparatus for automated extraction of specified quantities of sample specimens from primary containers and transfer of said sample specimens to secondary containers for testing, said apparatus comprising: a circular table rotatable about a central vertical axis; a plurality of manipulator units supported on said table and spaced a radial distance from said central vertical axis, each said manipulator unit movable back and forth in a linear direction perpendicular to the radius of said table and each said manipulator unit supporting at least one pipette movable in vertical direction; a plurality of said primary containers forming a primary container assembly, said primary container assembly radially arranged with respect to said central vertical axis, extending beyond the circumference of and radially movable with respect to said central vertical axis of said table; a plurality of said secondary containers forming secondary container assemblies, each said secondary container assembly arranged radially with respect to said central vertical axis, extending beyond said circumference of and radially movable with respect to said central vertical axis of said table and circumferentially aligned with said primary container assembly; and a washing device for cleaning said pipettes circumferentially aligned with said primary and said secondary container assemblies and between the last said secondary container assembly and said primary container assembly with respect to said rotatable direction of said table.

4,841,787

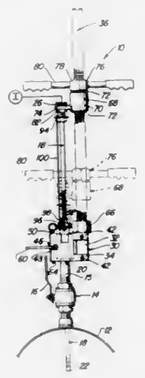
RETRACTOR TOOL

David K. Waterman, Chino, Calif., assignor to Rohrback Cosasco Systems, Inc., Santa Fe Springs, Calif.

Continuation of Ser. No. 118,580, Nov. 6, 1987, abandoned. This application Oct. 18, 1988, Ser. No. 262,174

Int. Cl.[4] G01F *15/18*

U.S. Cl. 73—866.5 **21 Claims**



1. A tool adapted to insert and retract a sensing probe into and from a pressurized fluid vessel through an access valve and stuffing box assembly connected to the pressurized vessel, said tool comprising:

clamp means detachably mountable to the access valve and stuffing box assembly of the pressurized vessel;

a threaded rod attached to said clamp means and extending longitudinally in the direction of insertion and retraction of the sensing probe, said threaded rod forming a pivot axis of said clamp means;

a thrust coupling coaxially mounted to said threaded rod, said thrust coupling including a mounting flange adapted to detachably receive the sensing probe for translational movement therewith; and

manual drive means threadably mounted to said threaded rod for moving said thrust coupling up and down said threaded rod wherein said sensing probe travels into and from the pressurized vessel through the access valve as said thrust coupling is moved up and down said threaded rod by said manual drive means.

4,841,788

ENERGY STORAGE DEVICE WITH ZERO LATCHING FORCE

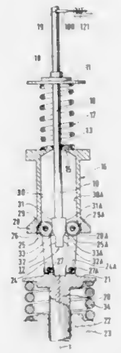
Edmond Thuries, Pusignan; Michel Perret, Tramole, and Jean-Paul Masson, Villeurbanne, all of France, assignors to Alsthom, Paris, France

Filed Mar. 17, 1988, Ser. No. 169,534

Claims priority, application France, Mar. 17, 1987, 87 03637

Int. Cl.[4] G05G *17/00*

U.S. Cl. 74—2 **8 Claims**



1. A zero latching force energy storage device comprising a first rod sliding along an axis X and subjected to axial thrust from a first spring, said rod being fixed at a first end to electromagnetic controlled latching means and being coupled at a second end to energy storage means, the latching means comprising a rod provided with a transverse bore which, in the set position, receives a latching member controlled by an electromagnet, wherein the energy storage means include a second rod slidable along the same axis X and subjected to axial force from a second spring, with the free end of the second rod facing the free end of the first rod and being connected to means for coupling it to said first rod and for locking it when the latching member is in a set position, wherein the coupling and locking means comprise at least one arm provided at a first end with at least one bearing having an axis of rotation perpendicular to the axis X, said arm being movable at a second end about an axis extending parallel to the axis of rotation of each bearing and fixed to the free end of the second rod, together with a fixed cage provided with at least one running surface extending parallel to th direction of the axis and to the axes of each bearing, said fixed cage terminating in an at least a partially flared portion facing the second rod, and the first rod terminating at its second end in an end piece provided with at least a first plane bearing surface parallel to the running surface and having a tapering free end; whereby each bearing, when the latching member is in the set position, is contained between said first plane bearing surface and the flared portion of the cage in such a manner as to lock the second spring.

4,841,789

DRIVE SYSTEM FOR DRIVING VALVES AND AN AUXILIARY MACHINE OF AN AUTOMOTIVE ENGINE

Katsumi Ochiai, Mitaka, Japan, assignor to Fuji Jikogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 20, 1988, Ser. No. 221,930

Claims priority, application Japan, Jul. 31, 1987, 62-191847

Int. Cl.[4] F02B *67/06*

U.S. Cl. 74—15.63 **11 Claims**

1. A driving system for driving intake and exhaust valves and auxiliary machines of an automotive engine having a crankshaft, comprising:

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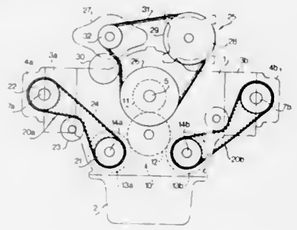
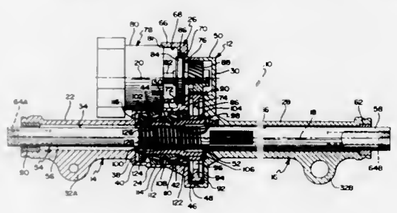
a drive gear securely mounted on said crankshaft at one end thereof;
a crankshaft pulley securely mounted on said crankshaft at an outermost end portion of the crankshaft whereby said drive gear is positioned between said engine and said crankshaft pulley;
an idler gear;



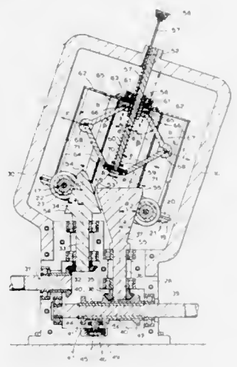
a driven gear meshed with said drive gear through said idler gear;
a drive pulley connected coaxially to said driven gear;
first means for driving said valves through said drive pulley;
second means for driving said auxiliary machines from said crankshaft pulley; and
both said first and second means are disposed in a common plane perpendicular to said crankshaft.

4,841,790
ELECTRO MECHANICAL ACTUATOR
Scott L. Williston, Flint, and Mark A. Sweigart, Saginaw, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed May 27, 1988, Ser. No. 199,733
Int. Cl.[4] F16H *25/22*; B62D *5/04*
U.S. Cl. 74—89.15 **3 Claims**



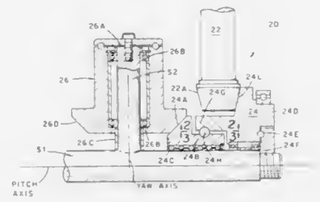
1. An electro-mechanical linear actuator comprising:
a case having a housing part rigidly connected to a cover part,
means on said housing part and on said cover part defining a cylindrical inside wall through said case aligned on a primary axis of said case,
an output rod,
means mounting said output rod on said case in said inside cylindrical wall for bodily shiftable movement in the direction of said primary axis,
means on said housing part and on said cover part defining a gear chamber therebetween,
an electric motor having a rotatable motor shaft,
a pinion gear rigidly attached to said motor shaft,
means mounting said motor on said housing part such that said motor shaft supports said pinion on said housing part in cantilever fashion in said gear chamber for rotation about a secondary axis of said case parallel to said primary axis,
a drive gear in said gear chamber encircling said output rod and meshing with said pinion gear,
a tubular hub around said output rod rigidly connected to said drive gear,
bearing means mounting said tubular hub on only said housing part for rotation about said primary axis whereby said drive gear is mounted on said housing part in cantilever fashion for rotation about said primary axis, and
ball screw means between said tubular hub and said output rod including screw threads on said output rod and and on said tubular hub and a plurality of bearing balls in channels defined between said screw threads whereby rotation of said tubular hub about said primary axis relative to said output rod effects bodily shiftable movement of said output rod in the direction of said primary axis.

4,841,791
SPEED GEARBOXES
Jose Juncosa Lopez, Po de la Habena, 80, Madrid, Spain
Filed Jun. 4, 1987, Ser. No. 58,353
Claims priority, application Spain, Sep. 18, 1986, 8601989
Int. Cl.[4] F16H *15/16*
U.S. Cl. 74—190 **5 Claims**



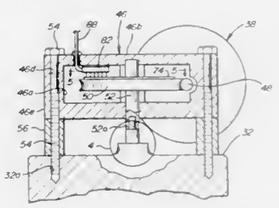
1. A speed gearbox, comprising:
two contrapositioned cones having the same conical semi angle and supported by respective shafts which are parallel to each other; and
means for transmitting a rotation from one cone to another cone, said transmitting means including a transmission crown surrounding said cones with said shafts, said crown being in shiftable contact with said two contrapositioned cones simultaneously so as to form two loci of points parallel to each other at which said contact occurs, said transmitting means having a central shaft positioned in an imaginary plane which extends through said two loci of points, said central shaft being parallel to said loci of points, said crown being rotatable about said central shaft during a transmission of rotation between said cones, said transmitting means having means for rolling on the cones, said rolling means being incorporated in said crown to facilitate a movement of said crown along said two loci points to vary relative speed of rotation of said cones.

4,841,792
VARIABLE LOADING ROLLER
Daniel M. Williams, Oliver Springs, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Jan. 21, 1988, Ser. No. 146,644
Int. Cl.[4] F16H *13/14*
U.S. Cl. 74—208 **4 Claims**



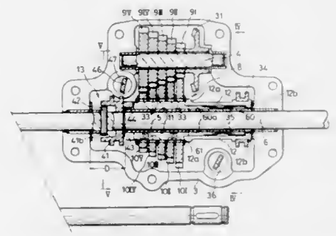
1. Variable loading roller means for differential traction drives and the like comprising:
input torque transmitting roller means for transmitting input torque and having a drive surface;
output torque transmitting roller means having a drive surface engaged with and responsive to said input torque transmitting roller means for providing an output torque;
said input torque transmitting roller means including variable loading means responsive to said input torque to cause said drive surfaces of said input and output torque transmitting roller means to be engaged with a resultant loading proportional to the torque transmitted thereby; said variable loading means comprising cam means for effecting said loading including a fixed cam portion and a transversing cam portion mounted for rotation about a common axis,
said fixed cam portion being mounted for in place rotation about said common axis and said transversing cam portion including the said drive surface of said input roller means and being mounted for both rotation about said axis and axial displacement thereon relative to said fixed cam portion;
complementary opposing reaction surface configurations formed in said cam portions; said complementary opposing reaction surface configuration being defined by at least one pair of surface grooves each defining right and left hand helical reaction surfaces converging at a central portion, said surface grooves being formed in surfaces of said cam portions parallel to the said common axis of said cam means and said helical reaction surfaces are defined by surface grooves of constant depth; and
bearing means engaging and interacting with said reaction surface configurations, transmitting torque between said cam portions and generating an axial force from said fixed cam portion to said transversing cam portion as a function of said transmitted torque, said bearing means comprising a spherical cam ball mutually engaged in said surface grooves for transmitting torque to said traversing cam portion and generating a said axial force from the interaction of said cam ball and said helical reaction surfaces of said surface grooves.

4,841,793
ELECTRIC SHIFT APPARATUS
Keith V. Leigh-Monstevens, 5622 Larkins Dr., Troy, Mich. 48098; Edward L. Tury, 9732 Rosemary La., Brighton, Mich. 48116; David C. Petersoo, 855 S. Pontiac Trail, #302, Walled Lake, Mich. 48088, and John G. Vanderpoorte, 22476 St. Clair Dr., St. Clair Shores, Mich. 48081
Continuation-in-part of Ser. No. 62,775, Jun. 16, 1987. This application Sep. 14, 1987, Ser. No. 95,856
Int. Cl.[4] B60K *20/10*; F16H *5/42*
U.S. Cl. 74—335 **19 Claims**



1. In a motor vehicle of the type comprising a body, an engine positioned within said body, drive wheels, and drive means interconnecting said engine to said drive wheels, the improvement wherein said drive means comprises:
(A) an automatic transmission drivingly connected to said engine and including a mode select member for selectively shifting the transmission between a plurality of shift positions including neutral reverse, park and a plurality of forward speed positions;
(B) an electric motor having a housing and an output shaft;
(C) a speed reduction unit having a housing secured to said motor housing and having an output shaft driven at a reduced speed in response to rotation of said motor output shaft and having an output end drivingly coupled to said mode select member; and
(D) encoder means operative to sense each of the shift positions of the transmission and generate a plurality of electrical encoder signals respectively corresponding to and representative of the sensed shift position.

4,841,794
TRANSMISSION FOR SELF-PROPELLED WALKING MOWERS
Keisaku Hikishima, Kobe, Japan, assignor to Kanzaki Kokyukoki Mfg. Co., Ltd., Amagasaki, Japan
Filed May 19, 1988, Ser. No. 195,778
Claims priority, application Japan, Jun. 10, 1987, 62-89418[U]; Oct. 14, 1987, 62-157193[U]
Int. Cl.[4] F16H *3/08*
U.S. Cl. 74—371 **3 Claims**



1. A transmission for self-propelled walking mowers comprising: an engine (1); a main clutch (2); a transmission casing

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(3); a drive shaft (4) journalled in said transmission casing and drivenly connected to said engine through said main clutch; a hollow speed-change shaft (5) journaled in said transmission casing and extending parallel with said drive shaft, one end of said speed-change shaft being spaced radially from an inner wall surface of said transmission casing by an interval (D); an axle (6) extending through said speed-change shaft and through said transmission casing and drivingly connected to left and right drive wheels (7); a key-shift transmission mechanism (8) disposed within said transmission casing and having a plurality of drive gears (9I, 9II, 9III, 9IV, 9V) fixedly mounted on said drive shaft, a plurality of speed-change gears (10I, 10II, 10III, 10IV, 10V) mounted rotatably on said speed-change shaft and meshed respectively with said drive gears, and a shift key (12) disposed slidably within an elongated axial groove (11) in the outer surface of said speed-change shaft and including a gear-engaging lug (12*a*) for coupling said speed-change gears one at a time to said speed-change shaft; an auxiliary clutch (13) disposed within said interval and operable to connect and disconnect between said speed-change shaft and said axle; and a clutch lever (14) connected to both of said main clutch and said auxiliary clutch and operable to engage and disengage said main and auxiliary clutches together.

4,841,795

DOUBLE-ROTATABLE UNIVERSAL HEAD FOR MACHINE TOOLS

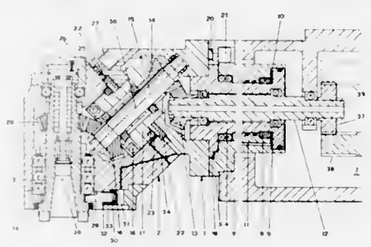
Gioacchino Obrietan, Valdagno, Italy, assignor to Novar S.p.A., Valdagno, Italy

Filed Jan. 27, 1987, Ser. No. 7,286

Claims priority, application Italy, Jan. 27, 1986, 84102 A/86

Int. Cl.⁴ F16H *1/14;* **B25J** *17/02;* **F16D** *25/061*

U.S. Cl. 74—417 **13 Claims**



1. A universal head for fitting to a machine tool, said universal head comprising

a carrier head mounted on said machine tool and capable of rotation with respect thereto about a first axis,

first means for normally preventing said carrier head from rotating with respect to said machine tool,

a spindle head mounted on said carrier head, and capable of rotation with respect thereto about a second axis oblique to said first axis,

second means for normally preventing said spindle head from rotating with respect to said carrier head,

only one rotary driveshaft extending into said carrier head from said machine tool along said first axis,

an intermediate shaft extending along said second axis from said carrier head into said spindle head,

a spindle shaft rotatably supported within said spindle head, and having a third axis of rotation oblique to said second axis, said spindle shaft having a tool receiver,

said driveshaft, intermediate shaft and spindle shaft being interconnected so as to rotate in unison as long as said spindle head and said carrier head are prevented from rotating,

third means for preventing spindle rotation, and

means, operable in conjunction with said spindle rotation preventing means, for releasing a selected one of said first and second rotation preventing means so as to permit the corresponding head to be rotated by said driveshaft, thus reorienting said third axis.

4,841,796

BALL SCREW HAVING AN AXIALLY EXTENDING BALL DEFLECTOR

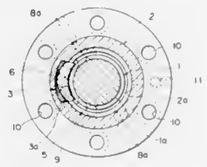
Hiroshi Teramachi, 34-8, Higashitamagawa 2-chome, Setagaya-ku, Tokyo, Japan

Filed May 13, 1987, Ser. No. 49,184

Claims priority, application Japan, May 19, 1986, 61-73957[U]

Int. Cl.⁴ F16H *55/17;* **F16B** *37/08*

U.S. Cl. 74—459 5 Claims



1. A ball screw comprising:

a screw stem having on its outer periphery a helical groove along which balls roll;

a nut having on its inner periphery a helical groove along which the ball rolls and corresponding to the groove on the screw stem, the nut having an axially extending fitting groove on its inner peripheral surface which is open to at least one of the open ends of the nut, the fitting groove narrowing from its radially outward side toward its radially inward open end;

a deflector fitted into the fitting groove in the nut and having a shape corresponding to that of fitting groove, the deflector having ball returning grooves on its inner surface for returning balls rolling between the grooves in the screw stem and nut to between the original grooves to form endless circulating passageways for the balls the ball returning grooves formed on the deflector corresponding in number to the endless circulating passageways; and

axial fixing means attached to opposing ends of the nut for fixing the deflector in said nut.

4,841,797

LUBRICATION OF GEARING

Brian E. Cerrington, Sutton Coldfield; Michael W. Arrindell, Birmingham; Kenneth E. Cooper, Tamworth, and Philip G. Isaacson, Sutton Coldfield, all of England, assignors to GKN Axles Limited, Birmingham, England

Filed Mar. 29, 1988, Ser. No. 174,851

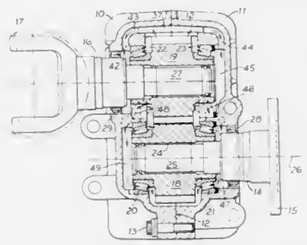
Claims priority, application United Kingdom, Apr. 3, 1987, 8707984

Int. Cl.⁴ F16H *57/04;* **F01M** *11/02;* **F16N** *7/36*

U.S. Cl. 74—467 **4 Claims**

1. A gearing assembly comprising a housing; two intermeshing gear wheels disposed in said housing, one of said gear wheels being positioned generally above the other; bearing means supporting said gear wheels in said housing for rotation about respective axes; a chamber for receiving liquid lubricant, said chamber being disposed in the housing substantially level with the lower one of said gear wheels but separated therefrom; a passage extending in said housing for feed of lubricant from a lower part of said chamber to a lower part of the periphery of said lower gear wheel; wall portions of said housing, extending close to and conforming to the shape of peripherally extending parts of both said gear wheels, so that lubricant is fed by entrainment by said gear wheels to an upper region on the

periphery of the upper gear wheel; a formation at said upper region for deflecting some of said lubricant from said upper gear wheel; passage means extending from said formation to convey said lubricant therefrom to the bearing means for said upper gear wheel; a further formation at a lower position on



said upper gear wheel for entrapping further lubricant entrained thereby; further passage means extending from said further formation to said bearing means for said lower gear wheel; and aperture means extending from a region adjacent the meshing between said gear wheels, and leading to an upper part of said chamber for return of lubricant thereto.

4,841,798

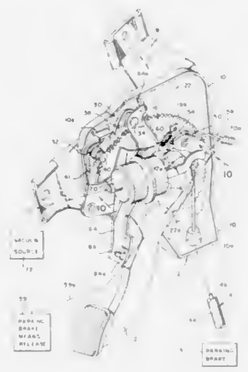
FOOT-OPERATED SELF-ADJUSTING PARKING BRAKE APPARATUS WITH CONTROLLED FLYBACK

Curtis H. Porter; Jeffrey E. Tayon, and Larry B. Champ, all of Moberly, Mo., assignors to Orscheln Co., Mo.

Filed Aug. 30, 1988, Ser. No. 238,131

Int. Cl.⁴ F16C *1/10;* **G05G** *5/06*

U.S. Cl. 74—501.5 R **10 Claims**



1. Apparatus for operating the inner member of a coaxial vehicle parking brake cable between brake-engaged and brake-released conditions, comprising:

(a) mounting bracket means (**8**, **10**) adapted for connection with the vehicle;

(b) a foot-operated lever (**12**);

(c) means including a main pivot shaft (**14**) pivotally connecting said lever for pivotal movement between brake-released and brake-engaged positions relative to said mounting bracket means;

(d) cable tensioning means including:

(1) a cable tension ratchet (**18**) including an integral sleeve portion (**20**) pivotally mounted concentrically on said main pivot shaft; and

(2) a drive plate (**16**) mounted concentrically on said main pivot shaft on the opposite side of said cable tension ratchet from said lever, said drive plate being connected with said lever and said cable tension ratchet being adapted for connection with one end of said inner cable member, thereby to tension said inner cable member when said lever is in the brake-engaged position;

(e) adjuster spring means biasing said cable ratchet in the cable tensioning direction relative to said lever, said spring means including a spiral spring (**26**) mounted concentrically on said ratchet integral sleeve portion, said cable tension ratchet containing an arcuate slot (**18***a*) arranged concentrically about said pivot shaft, said spiral spring reacting at its inner end (**26***b*) with a slot (**20***a*) contained in said ratchet sleeve, the outer end of said spiral spring reacting with a drive stud (**27**) that extends through said arcuate slot for connection at opposite ends with said drive plate and with said lever, respectively;

(f) means including a normally-engaged lock pawl (**30**) for releasably connecting said cable ratchet with said mounting bracket means;

(g) means including a normally-engaged drive pawl (**32**) for releasably connecting said cable ratchet with said lever;

(h) means including a pedal ratchet (**12***e*) and a normally-engaged pedal pawl (**52**) for connecting said lever with said mounting bracket means, each of said lock, drive and pedal pawls being operable in the ratcheting condition as said lever is pivoted in the brake-engaging direction;

(i) pedal pawl release means (**58**) operable to disengage said pedal pawl from said pedel ratchet;

(j) lock pawl release means (**64**) operable to disengage said lock pawl from said cable tensioning ratchet when said lever is pivoted toward the brake-released position; and

(k) drive pawl release means (**10***e*) operable to disengage said drive pawl from said cable tensioning ratchet when said lever is immediately adjacent its brake-released position, whereby said adjuster spring means is operable to pivot said cable ratchet relative to said housing and to said lever, thereby to tension the cable and to remove slack therefrom.

4,841,799

VARIABLE RATIO LEVER ARM MECHANISM

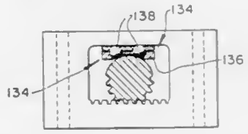
William W. Entzminger, 12890 Hillcrest Rd., Suite 200, Dallas, Tex. 75230

Continuation of Ser. No. 15,547, Feb. 13, 1987, Pat. No. 4,721,007, which is a division of Ser. No. 556,407, Nov. 30, 1983, abandoned. This application Jan. 22, 1988, Ser. No. 146,978

The portion of the term of this patent subsequent to Jan. 26, 2005, has been disclaimed.

Int. Cl.⁴ G05G *1/04;* **F01L** *1/34;* **F16H** *35/08*

U.S. Cl. 74—522 **3 Claims**



1. Rocker arm apparatus comprising, in combination:

a rocker arm having a first end portion for engaging a valve stem and having a second end portion for engaging a push rod, said rocker arm having a toothed rack extending intermediate said first and second end portions;

a stationary support member having a rod seat;

a fulcrum rod having a toothed sector and a bearing sector, said fulcrum rod toothed sector being disposed in mating

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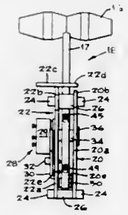
engagement with the toothed rack of said rocker arm, and said rod seat supporting said fulcrum rod bearing sector for translation along said stationary support member;
an operating arm coupled to said fulcrum rod for simultaneously rotating and translating said fulcrum rod along said toothed rack and rod seat; and,
a bearing member disposed intermediate said bearing sector and said rod seat.

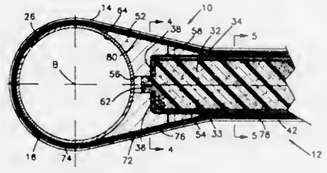
4,841,800
ADJUSTABLE CONTROL LEVER
Gary W. Deffner, Arvada, and Thomas R. Goldberg, Golden, both of Colo., assignors to Ampex Corporation, Redwood City, Calif.
Filed Mar. 9, 1987, Ser. No. 23,412
Int. Cl.[4] G05G 5/06
U.S. Cl. 74—531 11 Claims



1. A control mechanism including pivotable means frictionally engaged by said mechanism to effect the resistance to movement thereof, said mechanism comprising:
a pair of plates mounted in spaced relation;
pivotable means for supporting a lever mounted to extend outward of the plates, the plates supporting said pivotable means for rotary movement of the lever about an axis extending therebetween;
said lever mounted on said pivotable means; and
engaging means mounted on the lever for engaging the plates, said engaging means including at least one glide element disposed between the plates, for relative movement thereto as defined by the movement of the lever; and
an adjustment means disposed on the lever for urging said glide element into engagement with the plates to exert a force on the plates which resists the movement of lever, the adjustment means operable to selectively vary the force exerted on the plates by said element, thereby to control the amount of resistance to rotary movement of said lever.

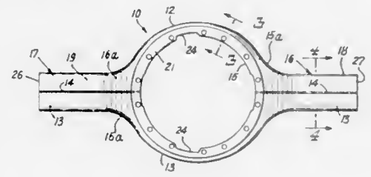
4,841,801
CONNECTING ROD
David A. Tice, Gainesville, Fla., assignor to TRW Inc., Lyndhurst, Ohio
Continuation of Ser. No. 30,454, Mar. 25, 1987, abandoned. This application Nov. 15, 1988, Ser. No. 274,702
Int. Cl.[4] G05G 1/00
U.S. Cl. 74—573 R 19 Claims

1. A connecting rod for interconnecting first and second structures, said connecting rod comprising:
a first connector for attachment to the first structure;
a second connector for attachment to the second structure;
a core located between said first and second connectors so said first and second connectors are located at axially opposite ends of said core;
a tubular member for resisting movement of said first and second connectors toward each other, said tubular member having a plurality of parallel fibers disposed about the outer periphery of said core and which fibers extend in a direction between the axially opposite ends of said core;
a strap extending along said tubular member and around said first and second connectors to define a closed loop for resisting movement of said first and second connectors away from each other; and
means disposed between said tubular member and each of



said first and second connectors for transmitting a force between said tubular member and said first and second connectors which force tends to move said first and second connectors toward each other and for restraining end portions of said plurality of parallel fibers of the tubular member against separating outwardly from said core, said means including a locator cap having a first opening for receiving an end portion of said tubular member.

4,841,802
MODIFIED FAST FADE DRIVE AXLE HOUSING
David E. Peck, Rochester, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed Mar. 27, 1986, Ser. No. 845,144
The portion of the term of this patent subsequent to Aug. 2, 2005, has been disclaimed.
Int. Cl.[4] F16H 57/02
U.S. Cl. 74—607 3 Claims

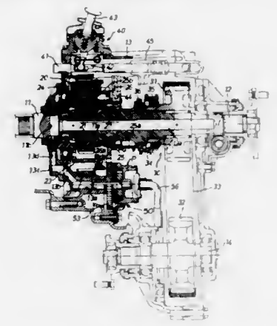


1. A modified fast fade drive axle housing comprising:
a differential receiving portion of generally convex outer curvature in an axial direction having two open side faces with an aperture of semicylindrical shape in each side face thereof providing a circular opening when two such portions are joined;
two circular members each secured to an annular zone adjacent each side aperture;
two oppositely extending beam arms of rectangular cross-section and a transition zone intermediate each of said beam arms and said differential receiving portion;
said drive axle housing formed by welding half-sections of substantially U-shaped cross-section together along a horizontal center line of said housing and by securing said circular members to the differential receiving portion on each side face;
at least one of said circular members being secured by a weld joint between the radially outer edge of said member and the contiguous side at said differential receiving portion;
each of said U-shaped half sections comprising a pair of substantially parallel side walls which are joined by arcuate corner sections to the semi-cylindrical walls of the

differential receiving portion, the curvature of said corner sections being defined by a plurality of corner radii (R_c) each of which is struck in a plane normal to the outer surface of said differential receiving portion of the drive axle housing and the walls of the beam arms;
the axially extending convex curvature of said corner sections forming the differential receiving portion being defined by a first radius (R_1) measured from a true origin O at the intersection of the vertical axis of the differential receiving portion and the longitudinal axis of the drive axle housing;
the axially extending convex curvature of the web forming the differential receiving portion of said axle housing being defined by a second eccentric radius (R_2) measured from a displaced origin O';
said displaced origin O' being located on the vertical axis of the differential receiving portion and displaced from O in a direction away from the side walls of said differential receiving housing;
said axially extending convex curvature of said arcuate corner sections defined by said first radius R_1 and said side walls of said differential receiving housing defined by said second radius R_2 respectively blending concavely in each transition zone into the corner sections and planar outer walls of said rectangular arm beams;
the concave blending curvature of said web being defined by a blending radius (R_3);
the concave blending curvature of said arcuate corner sections being defined by a blending radius (R_4);
said second radius (R_2) and the location of said displaced origin O' being selected to gradually displace said axially extending convexly curved walls outward relative to origin O thereby increasing the radii (R_c) of said arcuate corner sections as said axially extending convex curvatures approach said transition zone to increase the distance from said curved walls normal to said horizontal center line and the dimensions of the box section formed by said arms, said arcuated corner sections and said curved walls through said transition zone and the length of said blending radii (R_3 and R_4) being less than corresponding radii used in drive axle housings in which the convex curvature of the web is concentric with the true origin O to reduce the length of said transition zone thereby increasing the load carrying capacity of the differential receiving portion and each transition zone relative to said beam arms and increasing the axial length of said beam arms, and the length of said blending radii (R_3 and R_4) being less than one-half the length of said corresponding radii.

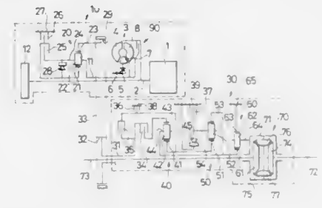
4,841,803
LUBRICATION MECHANISM IN POWER TRANSFER DEVICE FOR FOUR WHEEL DRIVE
Hideo Hamano; Yasumichi Funato, and Shuichiro Ida, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed Feb. 18, 1988, Ser. No. 156,746
Claims priority, application Japan, Feb. 20, 1987, 62-24797[U]
Int. Cl.[4] F16H 37/06, 57/04
U.S. Cl. 74—665 GE 6 Claims

1. A power transfer device for automotive vehicles, comprising:
a housing;
an input shaft rotatably mounted within said housing;
an output shaft rotatably mounted with said housing and arranged coaxially with said input shaft for relative rotation thereto;
an ancillary change-speed mechanism arranged within said housing and mounted on said input shaft, said change-speed mechanism having an input element mounted on said input shaft for rotation therewith and an output element connectable to said output shaft;
a clutch sleeve axially slidably mounted on said output shaft and shiftable between a first position in which it is retained to effect a drive connection between said input and output shafts and a second position in which it is retained to effect a drive connection between the output element of said change-speed mechanism and said output shaft; and
an oil pump assembly arranged within said housing to pump lubricating oil stored in said housing and supply it into an axial bore in said input shaft for lubrication of components of said change-speed mechanism;



wherein said oil pump assembly is mounted on a rotary shaft which is rotatably supported on an internal wall of said housing in parallel with said input and output shafts and is permanently in drive connection with the output element of said change-speed mechanism to drive said pump assembly during rotation of said input shaft.

4,841,804
AUTOMATIC TRANSMISSION FOR MOTOR VEHICLES
Masakatsu Miura, and Shiro Sakakibara, both of Aichi, Japan, assignors to Aisin Warner Kabushiki Kaisha, Aichi, Japan
Continuation of Ser. No. 919,576, Oct. 15, 1986, which is a continuation of Ser. No. 820,834, Jan. 21, 1986, which is a continuation of Ser. No. 256,179, Apr. 21, 1981. This application Jul. 30, 1987, Ser. No. 80,171
Claims priority, application Japan, Apr. 25, 1980, 55-55604
Int. Cl.[4] F16H 37/08, 37/00
U.S. Cl. 74—701 4 Claims



1. An automatic transmission for a motor vehicle, comprising:
a transmission housing;
a hydraulic torque converter having rotational axes, an input shaft, an output shaft and a direct coupling clutch for directly coupling said input shaft to said output shaft;
an auxiliary transmission mechanism provided coaxially with said hydraulic torque converter and having an input shaft, an output shaft with an input end and an output end and an overdrive mechanism of planetary gear type having a reduction ratio smaller than 1, said input shaft and said output shaft of said auxiliary transmission being located close to and on the side of said hydraulic torque

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converter with respect to said auxiliary transmission, respectively, and being coupled with a planetary gear carrier and a ring gear of said overdrive mechanism, respectively, a one-way clutch being provided between said planetary gear carrier and a sun gear of said overdrive mechanism, a clutch being provided between said planetary gear carrier and a position radially and outwardly of said one-way clutch for engaging and disengaging said planetary carrier and said sun gear, a brake being provided between said transmission housing and said sun gear and positioned radially and outwardly of said clutch for controlling engagement of said sun gear with a stationary portion of said transmission housing, and the output end of said output shaft being disposed between said auxiliary transmission mechanism and said hydraulic torque converter;

means for coupling said output shaft of said hydraulic torque converter to said input shaft of said auxiliary transmission mechanism;

a main transmission mechanism having an input shaft and an output shaft, said main transmission mechanism having rotational axes thereof disposed parallel with the rotational axes of said hydraulic torque converter and having a plural number of forward speed ranges and a reverse range;

means for transmitting the rotation of said output shaft of said auxiliary transmission mechanism to said input shaft of said main transmission including a sprocket wheel fixed on said output end of said output shaft of said auxiliary transmission mechanism, a sprocket wheel fixed on said input shaft of said main transmission mechanism and a chain means provided to link said two sprocket wheels rotationally and extending in a transverse direction to the rotational axes of said input and output shafts of said auxiliary transmission and main transmission mechanism;

a differential device having an input shaft and output shafts adapted for use as front wheel axles and disposed coaxially with the rotational axes of said main transmission mechanism;

means for transmitting the rotation of said output shaft of said main transmission mechanism to said input shaft of said differential device, said wheel axles being driven through said differential device; and

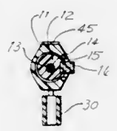
wherein said auxiliary transmission mechanism and said main transmission mechanism are disposed on opposite sides of said chain means.

4,841,805

ADJUSTABLE CABLE END COUPLING

Anthony J. Italiano, Waukesha, Wis., assignor to MPC Technologies Co., Moberly, Mo.

Filed Mar. 14, 1988, Ser. No. 168,134
Int. Cl.[4] F16C *1/10*
U.S. Cl. 74—501.5 R **16 Claims**



1. An adjustable cable end coupling and flexible control cable comprising:

a. a flexible control cable movably supported in a flexible conduit and having an end of said cable extending from an end of said conduit;

b. an elongated male end member affixed to said cable end, said member having a substantially cylindrical shape with its central axis substantially parallel to the path of movement of said cable;

c. said male end member having a plurality of spaced circumferential teeth formed along its peripheral surface;

d. female coupling means for receiving and permitting rotation on said male end member and including means for attaching said coupling to an article;

e. said female coupling means having a central aperture for movably receiving said male end member, said and a peripheral side wall comprising an elastically deformable material; and,

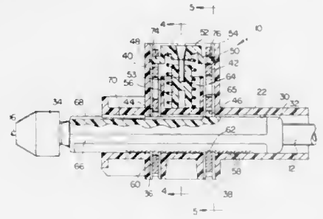
f. said side wall including a side aperture formed therein and having resilient lock means contiguously formed as one-piece from said side wall within said side aperture for engaging a portion of and retaining said male end member in a preselected position within said coupling means.

4,841,806

SELF-ADJUST MINI INCREMENT

Arthur L. Spease, Livonia, Mich., assignor to Teleflex Incorporated, Limerick, Pa.

Continuation of Ser. No. 51,253, May 7, 1987, abandoned, which is a continuation of Ser. No. 775,681, Sep. 13, 1985, abandoned.
This application Aug. 24, 1988, Ser. No. 240,354
Int. Cl.[4] F16C *1/10*
U.S. Cl. 74—501.5 R **22 Claims**



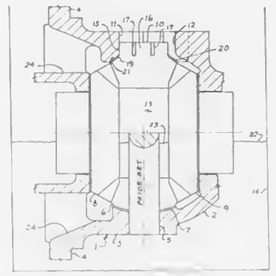
1. A motion transmitting remote control assembly of the type for transmitting forces along a curved path by a motion transmitting core element, said assembly comprising a flexible conduit (**12**) having opposite ends, a flexible motion transmitting core element (**16**) movably supported by said conduit (**12**), a support member (**22**) for supporting said conduit (**12**), locking means (**40,42**) engageable with said conduit (**12**) for controlling the longitudinal movement thereof relative to said support member (**22**), said conduit (**12**) having a plurality of locking teeth (**58**) spaced an equal distance apart longitudinally therealong, said locking means (**40,42**) supported by said support member (**22**) and coacting with said locking teeth (**58**) for locking said conduit (**12**) against longitudinal movement at increments less than the distance between adjacent locking teeth (**58**) as said core element is movable within said conduit, said locking means including latch members (**40,42**) for independently engaging said locking teeth (**58**) and being supported by said support means (**22**) a distance apart which is not a multiple of said distance between adjacent locking teeth (**58**) whereby only one of said latch members (**40,42**) is in locking engagement with said teeth (**58**) at an given position for establishing said increments of adjustment less than said distance between adjacent locking teeth (**58**), said locking means including biasing means (**56**) for urging said latch members (**40,42**) into engagement with said teeth (**56**), said latch members (**40,42**) being plates having apertures (**44,46,48,50**) at first and second ends therethrough with said conduit (**12**) extending through said apertures (**44,46**) at said first end and a cap member (**52**) including peripheral lips (**74,76**) extending through the apertures (**48,50**) at said second end.

4,841,807

SEMI-FLOATING DIFFERENTIAL PINION GEAR AND LUBRICATION THEREOF

Michael B. Merkler, Fort Wayne, Ind., assignor to Navistar International Transportation Corp., Chicago, Ill.

Filed Mar. 18, 1988, Ser. No. 170,178
Int. Cl.[4] F16H *1/40*
U.S. Cl. 74—710 **11 Claims**



1. An automotive vehicle differential comprising a differential housing having an inner cavity and defining axially aligned openings, side gears rotatably received in said openings for driving drive shafts, said differential housing having lubricant apertures extending in an axial direction through said housing into said cavity, a differential drive mechanism including pinion gears for engaging said gears, bearings formed in said differential housing rotatably supporting said pinion gears, means defining lubricant passages in said housing extending radially relative to the axis of said side gears for recirculating oil exteriorly of said housing for cooling and lubricating said gears and differential when said differential is operating.

4,841,808

DIFFERENTIAL CONTROL DEVICE

Mitsuyuki Ouchi, and Kouichi Aono, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Feb. 17, 1988, Ser. No. 156,574
Claims priority, application Japan, Mar. 23, 1987, 62-65842
Int. Cl.[4] F16H *1/44*; B60K *17/35*
U.S. Cl. 74—710.5 **14 Claims**

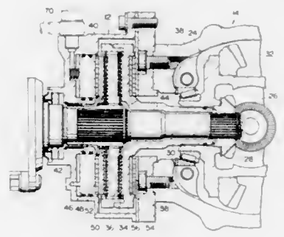
1. A differential control device for controlling a differential of a differential gear having a differential limiting mechanism, comprising:

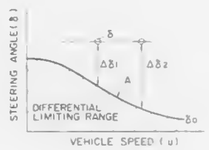
means for detecting a steering angle;

means for detecting a vehicle speed;

a controller for receiving signals from said steering angle detecting means and vehicle speed detecting means in which is stored as a map a reference steering angle which is changed in accordance with changes in vehicle speed; and

means for operating said differential limiting mechanism,





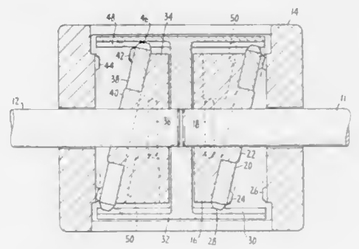
wherein said controller controls said operating means on the basis of said reference steering angle.

4,841,809

NUTATING GEAR POSITRACTION DIFFERENTIAL

Frank H. Jolly, Arcata, Calif., assignor to F. J. Engineering, Inc., Palo Alto, Calif.

PCT No. PCT/US87/03327, § 371 Date Dec. 21, 1987, § 102(e) Date Dec. 21, 1987
Continuation-in-part of Ser. No. 947,801, Dec. 30, 1986, abandoned. This PCT application Dec. 21, 1987, Ser. No. 161,637
Int. Cl.[4] F16H *37/06, 35/04*
U.S. Cl. 74—714 **4 Claims**



1. A limited slip differential comprising:

a driving member,

two driven shafts,

a pair of nutating drive trains one connecting the driving member to each driven shaft, each drive train having an input gear attached to the driving member, a cam connected to the driven shaft and a nutating gear connected between the input gear and the cam, each of the nutating drive trains having a first (larger) gear with a larger number of teeth and a second (smaller) gear with a few number of teeth with the first (large) gear of one drive train nutat-

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ing and the second (small) gear of the other driving train nutating, and

connecting means interconnecting the nutating gears of the drive trains for permitting the nutating gears to nutate with respect to each other when the shafts rotate in opposite directions.

4,841,810

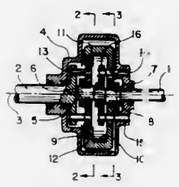
DUAL ORBITING GEAR PLANETARY DRIVE

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 891,114, Jul. 31, 1986, Pat. No. 4,733,579, and a continuation-in-part of Ser. No. 5,111, Jan. 20, 1987. This application Feb. 9, 1987, Ser. No. 12,679

Int. Cl.⁴ F16H *1/28*

U.S. Cl. 74—804 **22 Claims**



1. A mechanical transmission apparatus comprising in combination:

(a) a frame;

(b) a power output member of generally axisymmetric construction rotatably secured to the frame;

(c) a shaft disposed coaxially with the power output member and rotatably secured to the frame, said shaft including at least two first eccentric cylindrical sections and at least two second eccentric cylindrical sections wherein the first and second eccentric cylindrical sections are disposed in two generally opposing eccentric arrangements;

(d) at least two first rotary members respectively mounted on one of said two first eccentric cylindrical sections of the shaft and one of said two second eccentric cylindrical sections of the shaft in rotatable arrangement, each of said two first rotary members including an external generally circular cylindrical traction surface of a first pitch diameter disposed in a coaxial arrangement about the central axis of respective eccentric cylindrical section of the shaft mounted thereby;

(e) at least two second rotary members respectively mounted on the other of said two first eccentric cylindrical sections of the shaft and the other of said two second eccentric cylindrical sections of the shaft in rotatable arrangement, each of said two second rotary members including an internal generally circular cylindrical traction surface having a second pitch diameter greater than said first pitch diameter and disposed in a coaxial arrangement about the central axis of respective eccentric cylindrical section of the shaft mounted thereby; wherein, a portion of each of said external generally circular cylindrical traction surfaces engages a portion of each of said internal generally circular cylindrical traction surfaces in a nonslipping relationship;

(f) a first set of coupling nonrotatably coupling one pair of the two first and two second rotary members to the power output member in a radially shiftable relationship therebetween; and

(g) a second set of coupling nonrotatably coupling the other pair of the two first and two second rotary members to a cylindrical member in a radially shiftable relationship therebetween.

4,841,811

MECHANICAL REDUCER

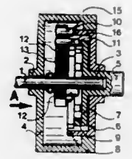
Roger Bajulaz, Chambesy, Switzerland, assignor to Reduto S.A., Fribourg, Switzerland

Continuation of Ser. No. 701,202, Feb. 13, 1985, Pat. No. 4,699,023. This application May 29, 1987, Ser. No. 56,469

Claims priority, application Switzerland, Mar. 2, 1984, 1039/84

Int. Cl.⁴ F16H *1/28*

U.S. Cl. 74—804 **15 Claims**



1. Mechanical reducer comprising a driving member and a driven member revolving at different angular speeds depending from the reduction ratio of the reducer, comprising two reduction members, coaxial with the driving and driven members, angularly displaceable the one with respect to the other, each comprising a series of driving elements uniformly distributed and concentric with the corresponding reduction members, the two said series having different numbers of driving elements; at least one eccentric rotor driven by at least one eccentric fast with the driving member; said rotor comprising at least three pairs of actuating members uniformly distributed around its center and each actuating member of a pair being located in one of two circles having two different diameters and concentric to said rotor, the actuating members of each said pair being radially aligned with respect to the center of the rotor, the number of said actuating members of the rotor located on each of said circles being equal, one of the actuating members of each said pair cooperating with the driving elements of one of the reduction members, the other actuating member of each pair cooperating with the driving elements of the other reduction member.

4,841,812

DEVICE FOR CONTROLLING MOVEMENTS OF COVERS IN SLIDING AND LIFTING ROOFS, AND SLIDING AND LIFTING ROOF UTILIZING SAME

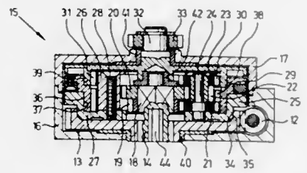
Arpad Fuerst, Munich, and Bernhard Wingen, Feldkirchen, both of Fed. Rep. of Germany, assignors to Webasto AG Fahrzeugtechnik, Gauting, Fed. Rep. of Germany

Filed Jul. 14, 1988, Ser. No. 219,442

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1987, 3723453

Int. Cl.⁴ F16H *5/52*; B60J *7/057*

U.S. Cl. 74—810 **20 Claims**



1. A device for controlling sliding and lifting movements of a cover of a sliding and lifting roof of a vehicle, comprising an input drive element, an output drive element, and a gear assembly which is operationally disposed between the input drive element and the output drive element in a manner for producing, starting from a predetermined gear position, a gearing ratio which changes automatically on the basis of the drive direction in such a way that, at equal input drive speeds, a lifting movement is produced by said output drive element in one drive direction that is slower than a sliding movement that is produced by said output drive element in an opposite drive direction, wherein the gear assembly has a double epicyclic gear and a blocking device is provided which automatically blocks a first element of the double epicyclic gear when the input drive element is driven starting, from the predetermined gear position, in a first direction and automatically blocks a second gear element of the epicyclic gear when driven from said predetermined position in a second, opposite, direction.

4,841,813

OIL PRESSURE CIRCUIT FOR AN AUTOMATIC TRANSMISSION

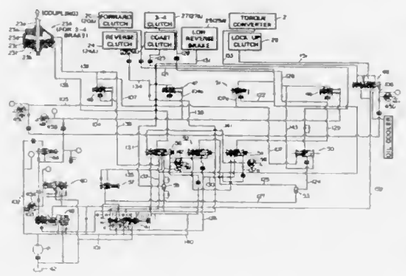
Takuji Fujiwara; Kozo Ishii, and Tatsutoshi Mizobe, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 28, 1988, Ser. No. 187,364

Claims priority, application Japan, Apr. 28, 1987, 62-103298; Apr. 28, 1987, 62-103300

Int. Cl.⁴ B60K *41/18*

U.S. Cl. 74—866 **15 Claims**



1. An oil pressure circuit comprising:

a multistage transmission gear mechanism having a shifting speed stage representing a ratio of rotation of an output shaft to rotation of an input shaft, said shifting stage being adapted to provide at least four speed stages from first speed stage to fourth speed stage;

a first coupling means and a second coupling means being each of a type operable hydraulically and being adapted to shift a power transmission passage of said multistage transmission gear mechanism, said first coupling means being arranged so as to be shifted between a coupled or engaged state and an uncoupled or disengaged state between first and second speed stages and third and fourth speed stages, said second coupling means being arranged so as to be shifted between a coupled or engaged state and an uncoupled or disengaged state between first and third speed stages and second and fourth speed stages, and said four speed stages being alternatively selected in accordance with a combination of the coupled state and the uncoupled state of said first and second coupling means;

a third coupling means being of a type operable hydraulically and capable of transmitting a torque in a reverse direction toward the side of said input shaft from the side of said output shaft at least at second and third speed stages;

a first actuator containing a first solenoid adapted to generate a first pilot pressure shifting a state between the first speed stage and the second, third and fourth speed stages, said first actuator being adapted to regulate a supply of operating oil pressure to said second coupling means in accordance with a state in which said first pilot pressure is generated;

a second actuator containing a second solenoid adapted to generate a second pilot pressure shifting a state between the first and second speed stages and the third and fourth speed stages, said second actuator being adapted to regulate a supply of operating oil pressure to said first coupling means in accordance with a state in which said second pilot pressure is generated;

a third actuator containing a third solenoid adapted to generate a third pilot pressure, said third actuator adapted to allow said third pilot pressure to cancel a regulation of said second coupling means by said first actuator at third speed stage; and

at the time of shifting between second and third speed stages, said second pilot pressure being set to act on said first actuator and prevail over said first pilot pressure so as to retain and fix said first actuator in a state at second, third and fourth speed stages and said first pilot pressure being adapted so as to regulate shifting said third coupling means.

4,841,814

SYSTEM FOR CONTROLLING THE PRESSURE OF OIL IN A SYSTEM FOR A CONTINUOUSLY VARIABLE TRANSMISSION

Keiji Satoh, Musashino, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1988, Ser. No. 189,973

Claims priority, application Japan, May 12, 1987, 62-115464

Int. Cl.⁴ B60K *41/12, 41/18*

U.S. Cl. 74—866 **19 Claims**

1. In a control system for a continuously variable transmission for transmitting the power of an internal combustion engine, the transmission comprising a drive pulley having a hydraulically shiftable first disc and a first hydraulic cylinder for shifting the disc, a driven pulley having a hydraulically shiftable second disc and a second hydraulic cylinder for operating the second disc, and a belt engaged with both pulleys, the system comprising a line pressure control valve having a shiftable first spool, a transmission ratio control valve having a shiftable second spool, a first hydraulic circuit having a pump for supplying oil to the first cylinder through the line pressure control valve and transmission ratio control valve, the improvement in the control system which comprises:

a second hydraulic circuit for supplying the oil from the pump to the line pressure control valve so as to shift the first spool of the line pressure control valve;

a flow rate control valve provided in the second hydraulic circuit for regulating flow rate of oil passing therethrough from an inlet port thereof to an oulet port thereof to a constant value;

a reducing valve provided in the second hydraulic circuit and having an inlet communicated with the outlet port of the flow rate control valve so as to produce a constant pressure of oil at an outlet from said reducing valve;

control valve means provided in the second hydraulic circuit at a downstream position of the reducing valve communicating with said outlet of said reducing valve for controlling the amount of oil supplied to the first spool of the line pressure control valve so as to shift the first spool of the line pressure control valve to control line pressure in the first hydraulic circuit; and

the flow rate control valve comprising a shiftable pressure responsive spool, the inlet port communicating with the pump, the outlet port variably communicating with the inlet port depending on position of the pressure responsive spool, at least one control port communicating with another of said ports of the flow rate control valve, and a spring mounted so as to urge the pressure sensitive spool in a direction against pressure applied on the pressure responsive spool from said at least one control port, the

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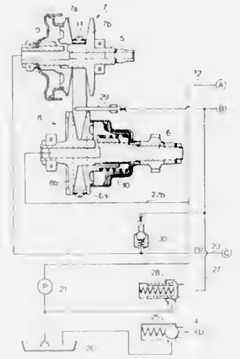
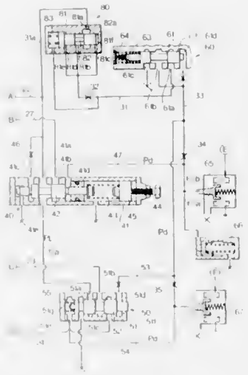
pressure responsive spool and said ports of said flow rate control valve being cooperatively arranged so as to keep





the flow rate of the oil passing from the inlet port to the outlet port constant.

4,841,815

FUZZY CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Hiroshi Takahashi, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 30, 1988, Ser. No. 175,350

Claims priority, application Japan, Mar. 31, 1987, 62-76004

Int. Cl.[4] B60K *41/06*

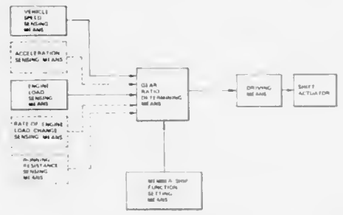
U.S. Cl. 74—866 **8 Claims**

1. A shift control system for a vehicular automatic transmission having different transmission positions, comprising:

vehicle condition detecting means comprising a vehicle speed sensor for sensing vehicle speed of a vehicle, and an engine load sensor for sensing engine load of an engine of the vehicle, and

fuzzy control means comprising setting means for setting, for each transmission position, a membership function of said vehicle speed and a membership function of said engine load for defining a fuzzy set, and determining means for determining a transmission ratio from said vehicle speed, said engine load and said membership functions by fuzzy inference, and producing a shift control signal for controlling shifting of the transmission,

wherein said condition detecting means further comprises acceleration sensing means for sensing an acceleration of the vehicle, rate of engine load change sensing means for sensing a rate of change of said engine load, and running resistance sensing means for sensing a running resistance of the vehicle, and wherein said setting means of said fuzzy control means further sets a membership function of



said acceleration, a membership function of said rate of engine load change and a membership function of said running resistance, and said determining means further uses said acceleration, said rate of engine load change, said running resistance, and said membership functions of said acceleration, said rate of engine load change and said running resistance for determining said transmission ratio.

4,841,816

HYDRAULIC CONTROL FOR A POWER TRANSMISSION WITH A MANUAL RANGE SELECTOR VALVE

Benton L. Bullock, New Palestine, Ind., assignor to General Motors Corporation, Detroit, Mich.

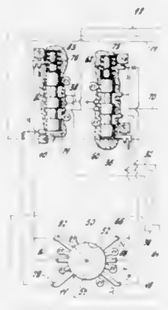
Filed Aug. 11, 1988, Ser. No. 230,813

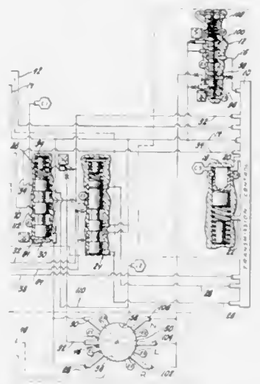
Int. Cl.[4] B60K *41/06*

U.S. Cl. 74—866 **1 Claim**

1. An improvement in power transmission controls having a plurality of shift control valve means including a forward valve means and a reverse valve means; forward-reverse direction control valve means; neutral valve means; regulator valve means; a plurality of solenoid means for controlling fluid pressure at control areas on said forward-reverse direction control valve means, said forward valve means and said reverse valve means, respectively; a pair of solenoid control means for controlling fluid pressure at a pair of control areas on the neutral valve means; solenoid valve means for controlling fluid pressure at a control area on said regulator valve means, each said solenoid means being controlled by electrical signals, when electrical power is available, to condition the power transmission for forward-reverse and neutral operation and said solenoids being ineffective when electrical power is not available, wherein the improvement comprises: a pair of interconnected manual valve means each having an inactive position, a neutral position, a forward position and a reverse position; one of said manual valve means being operable to exhaust one control area at the neutral valve means and one control area at a forward shift valve when the neutral position is selected, to exhaust the other control area on the neutral valve means and the one control area at the forward shift valve when the forward position is selected, to exhaust other control area on the neutral valve means and another control area at the forward shift valve when the reverse position is selected; said other manual valve means being operable to exhaust the control area on said regulator valve means when the neutral, forward and reverse positions are selected respectively, and to exhaust one control area on a reverse shift valve when the neutral and reverse positions are selected and to exhaust another control area on

the reverse shift valve when the forward position is selected; and said manual valve means being operable to prevent unre-





quested exhausting of said control areas when the inactive position is selected.

4,841,817

GUN DRILL COOLANT BUSHING AND METHOD OF MAKING SAME

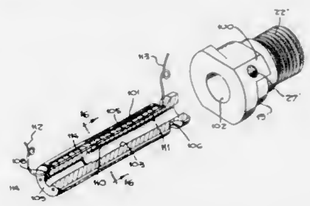
Gary Tsui, Rosemead, and Thomas Heimbigner, Bellflower, both of Calif., assignors to CBC Industries, Inc., City of Commerce, Calif.

Continuation of Ser. No. 928,201, Dec. 18, 1986, abandoned, which is a continuation-in-part of Ser. No. 725,102, Apr. 19, 1985, abandoned, and Ser. No. 895,477, Aug. 11, 1986, Pat. No. 4,770,570. This application Jun. 6, 1988, Ser. No. 203,630

Int. Cl.[4] B21K *5/02*

U.S. Cl. 76—101 R **15 Claims**

1. In a coolant handling device for a tool guide for directing flow of a coolant toward the shaft and cutting edge of a tool wherein said device is in the nature of a coolant directing assembly comprising a body having attachment means for engagement with a conventional power tool, a passage in said body and a separate shank extending from the passage in said body, the shank having an axial bore for reception of a tool, a free end of said shank adapted to extend outwardly of said body and a captive end of said shank in engagement within said body, a method for forming a coolant directing passage means extending from the exterior of the body at the captive end of the shank and to an outlet at the free end of the shank comprising forming an axial hole through the body corresponding to the outside diameter of the shank for reception of the shank, forming a coolant supply passage extending from the exterior of the body into the axial bore, forming a recess in the wall of said shank having open ends extending between the captive end and the free end of the shank and parallel to the axial bore at a location spaced diametrically outwardly of the axial bore, lodging a thread-like member comprising a material of alterable consistency in said recess, securing said thread-like mem-



ber in place with a mass of bedding material of relatively non-alterable consistency, subjecting said shank to a treatment capable of effecting alteration of the consistency of said thread-like material and incapable of effecting alteration of the mass of bedding material, removing the resulting thread-like material while of altered consistency from the recess in the shank to form a coolant directing passage means and then mounting the shank in the body with the exterior of the captive end of the shank in direct contact with the wall of the axial hole.

4,841,818

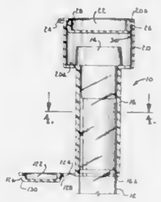
VIAL STOPPER REMOVAL DEVICE

Christopher V. Plapp, 8319 Reeds Ln., Overland Park, Kans. 66207; Frederick A. Plapp, 5000 Rock Creek La., Mission, Kans. 66205, and Frederick V. Plapp, 8319 Reeds Ln., Overland Park, Kans. 66207

Filed Feb. 1, 1988, Ser. No. 150,541

Int. Cl.[4] B25B *27/00*

U.S. Cl. 81—3.08 **9 Claims**



1. A device for removing a stopper from a vial, said device comprising:

an elongated tubular member having a cross-sectional dimension that is greater than the cross-sectional dimension of said vial and less than the cross-sectional dimension of said stopper thereby accommodating movement of said vial through said member while precluding movement of said stopper through said member, said tubular member having a length which is less than the length of said vial;

a housing member coupled with one end of said tubular member and in open communication with the latter, said housing member having a cross-sectional dimension large enough to accommodate said stopper; and

first closure means for completely closing the top of said housing member after said stopper is positioned therein,

whereby when said vial is positioned in said tubular member and said closure means is in place, said vial may be pulled

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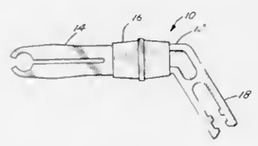
through said tubular member from the end opposite said one end to force said stopper from the vial while substantially precluding exposure of the operator to the contents of said vial.

4,841,819
FUSE PULLER
Danny L. Williams, Clarinda, Iowa, assignor to Lisle Corporation, Clarinda, Iowa
Filed Feb. 23, 1988, Ser. No. 159,231
Int. Cl.[4] B25B *27/14*
U.S. Cl. 81—3.8 4 Claims

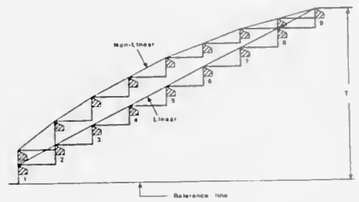


1. An improved fuse puller of the type usable to install or remove both cylindrical and blade type fuses, the improved puller comprising, in combination:
a. a body;
b. a pair of generally parallel, spaced resilient cylindrical type fuse jaws extending from one end of the body, said jaws terminating with cylindrical type fuse jaw ends, each cylindrical type fuse jaw and having an arcuate detent, said pair of arcuate detents being opposed and together defining an at least partially circular shaped gripping member for cooperation with a cylindrical fuse;
c. a pair of generally parallel, spaced resilient blade type fuse jaws extending from the other end of the body, said blade type fuse jaws terminating with blade fuse jaw ends, each blade type fuse jaw and having opposed pairs of blade clamp teeth, each said pair of blade clamp teeth comprising equally spaced teeth which are generally parallel and extend transversely from the blade fuse jaw end toward the other pair of teeth thereby defining an at least a partially rectangular shaped gripping jaw member for cooperation with a blade fuse; and
d. a slider mounted on the body and adapted to slide over both cylindrical type fuse jaws toward the opposing arcuate detents in the cylindrical type fuse jaws, to thereby force the resilient cylindrical fuse type jaws together so that the opposing arcuate detents can clamp the outer periphery of a cylindrical fuse;
e. said blade type fuse jaws comprising elastic members retained by elastic force about a blade fuse for removal or insertion of a blade fuse; and
f. one of said cylindrical type or blade type fuse jaws serving as a manual gripping member while the other of said fuse jaws completely engages with a compatible fuse.

4,841,820
METHOD OF DESIGNING A TURN BROACH
Brian D. Kaminski, and Pulak Bandyopadhyay, both of Rochester Hills, Mich., assignors to General Motors Corporation, Detroit, Mich.
Continuation-in-part of Ser. No. 37,660, Apr. 13, 1987, Pat. No. 4,784,534. This application Sep. 2, 1988, Ser. No. 239,806
Int. Cl.[4] B23B *1/00, 5/18;* B23D *43/02*
U.S. Cl. 82—1.11 2 Claims

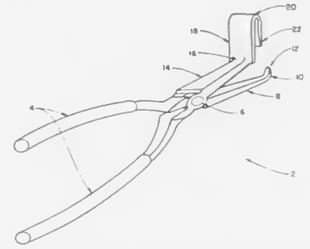
1. A method of designing a tool for machining a layer of material of thickness T from the surface of a cylindrical elongated workpiece of finite stiffness that is rotated about its axis, said tool being of the type in which a series of cutting teeth are rigidly supported on a tool base that is moved in a predetermined direction such that said teeth advance into said workpiece surface, comprising the steps of,
determining the deflection response of said workpiece, as it is rotated about its axis, to the advancement of a single rigidly supported cutting tooth into its surface in said predetermined direction,
determining an initial increment by which the first tooth may be advanced into the surface of said rotating workpiece so as to take a first, greatest depth of cut while still creating a cutting force sufficiently small to be withstood by said first cutting tooth,
using said determined deflection response and first increment to determine a second, smaller increment of advance that a second cutting tooth may be given relative to said first tooth so as to take a second depth of cut that creates a cutting force substantially equal to said first tooth,
using said determined deflection response to calculate subsequent, continually smaller increments of advance that may be given to each subsequent cutting tooth so that each takes a depth of cut that creates a substantially equal and constant cutting force, and,
providing said tool base with a rigidly supported series of cutting teeth located at said determined increments of advance,
whereby, as said tool base is moved in said predetermined direction, said series of teeth will remove a total thickness T of material from said workpiece while maintaining a substantially uniform cutting force on said cutting teeth.

2. A method of machining a layer of material of thickness T from the surface of a cylindrical elongated workpiece of finite stiffness, comprising the steps of,



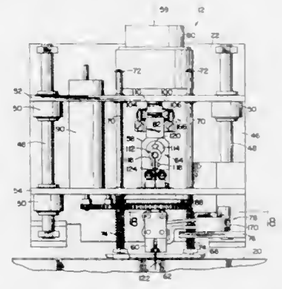
determining the deflection response of said workpiece, as it is rotated about its axis, to the advancement of a single rigidly supported cutting tooth into its surface in a predetermined direction relative to said axis,
determining an initial increment by which a first rigidly supported cutting tooth may be advanced into the surface of said rotating workpiece so as to take a first, greatest depth of cut while still creating a cutting force sufficiently small to be withstood by said first cutting tooth,
using said determined deflection response and first increment to determine a second, smaller increment of advance that a second cutting tooth may be given relative to said first tooth which is sufficiently smaller so as to take a second depth of cut that creates a cutting force less than said first tooth,
using said determined deflection response to calculate subsequent, continually smaller increments of advance that may be given to each subsequent cutting tooth which are each sufficiently smaller such that each tooth takes a depth of cut that creates a continually smaller cutting force,
providing a tool base with a rigidly supported series of cutting teeth located so as to have said predetermined relative increments of advance, with a sufficient number of teeth such that the final tooth is at a height above the uncut surface of said workpiece substantially equal to T, and,
moving said tool base in said predetermined direction such that said first tooth advances into said workpiece surface by said initial increment of advance, thereby eventually removing a total thickness T of material from said workpiece, while creating an initially decreasing cutting force profile on said cutting teeth, so that, with wear of the early teeth, the cutting force profile may flatten and shift, thereby further increasing tooth life.

4,841,821
J-NUT PLIER
Kenneth L. Cooper, c/o M. Graham, P.O. Box 8997, Savannah, Ga. 31412
Filed Sep. 9, 1987, Ser. No. 94,449
Int. Cl.[4] B25B *7/02*
U.S. Cl. 81—426 3 Claims



1. A device for engaging and prying open J-nut clips of various shapes and sizes from a locked position on a automobile body part to permit easy removal thereof without damaging the same, said J-nut clips having an open end and a closed end, said device comprising:
first and second handle members, each said handle member having a proximal portion and a distal portion, each said distal portion having a longitudinal axis, said handle members being pivotally coupled together at a point intermediate said proximal and distal portions such that movement of said proximal portions from a spaced apart relation to an adjacent relation effects movement of the distal portions of said handle members from a spaced apart relation to an adjacent relation;
said distal portion of said first handle member having a downwardly open U-shaped gripping member defined at a distalmost end thereof, said U-shaped gripping member consisting essentially of first and second legs defined in a vertical plane extending through said longitudinal axis of said distal portion of said first handle member, said first and second legs being spaced apart along said longitudinal axis of said distal portion of said first handle member and each having a longitudinal axis disposed substantially perpendicularly to said longitudinal axis of said distal portion of first handle member such that the opening of the U-shaped gripping member is in facing relation to said distal portion of said second handle member;
said distal portion of said second handle member having at least one upwardly extending distalmost end portion, said distalmost end portion having a longitudinal axis disposed at an obtuse angle relative to said longitudinal axis disposed at an obtuse angle relative to said longitudinal axis of said distal portion of said second handle member;
whereby, when said handle members are pivoted about said pivotal coupling so that said distal portions are adjacent one another, a J-nut clip can be supported at its closed end on the angled distalmost end portion of said second handle member and a leg of said U-shaped gripping member can be slipped into the open end of said J-nut clip and pry apart the walls thereof.

4,841,822
CUTTER HEAD AND KNIFE FOR CUTTING SHEET MATERIAL
Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Scientific, Inc., South Windsor, Conn.
Filed May 8, 1986, Ser. No. 861,148
Int. Cl.[4] B26D *7/12, 5/00*
U.S. Cl. 83—174 40 Claims

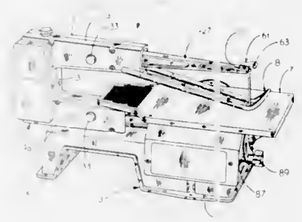


1. In a cutter head for use as part of a machine for cutting sheet material, the combination comprising:
a base frame vertically movable between a raised position and a lowered position,
a knife frame carried by said base frame and rotatable relative to said base frame about a theta axis fixed relative to said base frame,
knife guide means carried by said knife frame for supporting a knife for reciprocation relative to said knife frame along an axis parallel to said theta axis and for movement with said knife frame about said theta axis,
a knife reciprocating mechanism carried by said knife frame and including an input shaft rotatable about a shaft central axis fixed relative to said knife frame and rotatable about said theta axis with said knife frame when said knife frame is rotated, said knife reciprocating mechanism being operable to reciprocate a knife supported by said knife guide means along said theta axis relative to said knife frame in response to rotation of said input shaft about said shaft central axis,
a knife drive motor fixed to said base frame and having a rotatable output shaft, and
a drive means drivingly connecting said output shaft of said knife drive motor to said input shaft of said knife reciprocating mechanism while permitting said knife frame and said knife reciprocating mechanism to rotate about said theta axis independently of said knife motor.

4,841,823
SCROLL SAW BLADE POSITION ADJUSTMENT AND WORK TABLE DAMPENER
Richard B. Brundage, 2 Whitfield La., Ladue, Mo. 63124
Filed Jul. 23, 1987, Ser. No. 76,918
Int. Cl.[4] B27B *19/02*
U.S. Cl. 83—781 4 Claims

1. In a scroll saw comprising a frame, a pair of spaced generally parallel arms pivotally mounted on said frame, a blade interposed between said arms at one end thereof, means for tensioning said blade, means for pivotally driving said arms with respect to said frame thereby to reciprocably drive said blade, wherein said improvement comprises blade holder means for adjusting the position of the blade relative to said arms in a direction generally transverse to the plane of movement of the ends of the arms so that the plane of the blade is substantially coincident with the plane of movement of the ends of the arms, said blade holder means including a one piece

clip adapted to be adjustably secured to the end of at least one of said arms, said clip having means for mounting said blade thereon, said clip further having an elongated slot therein for receiving a fastener, said slot being larger than said fastener so



as to permit adjustment of said clip on said arm with respect to said fastener thereby to permit a blade received in said blade mounting means of said clip to be positioned so as to be substantially coincident with the plane of movement of the ends of said arms.

4,841,824

SAW CHAIN FOR A CHAIN SAW

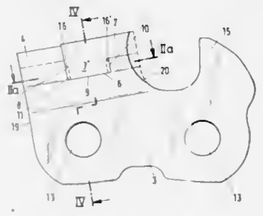
Werner Hartmann, Ostfildern; Hans Iolata, Waiblingen, and Jochen Buchholtz, Weinstadt, all of Fed. Rep. of Germany, assignors to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Jun. 21, 1988, Ser. No. 211,220

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1988, 3804954

Int. Cl.[4] B27B *17/00*

U.S. Cl. 83—830 **8 Claims**



1. A saw chain for a chain saw having a guide bar, the saw chain comprising:

a plurality of left-hand and right-hand cutting links and a plurality of connecting links, the links being pivotally interconnected by rivets or the like to define the saw chain and to permit movement thereof along the guide bar in a predetermined direction;

each one of said cutting links including a base body and an insert in the form of a cutting plate configured as a planing tooth made of wear-resistant metal;

said base body having an upper portion and said upper portion having a cutout formed therein for seating said cutting plate;

said cutout being defined by a lower supporting surface formed on said base body so as to extend in said direction of movement and to define the bottom of said cutout; a rearward surface formed on said body so as to extend transversely to said lower supporting surface; and a forward supporting surface approximately parallel to said rearward surface to complete said cutout and likewise extending transversely to said lower supporting surface;

said cutting plate having a downwardly extending projection defining a lower face for contact engaging said lower supporting surface and forward and rearward side faces adjacent corresponding ones of said forward and rearward supporting surfaces;

said forward supporting surface including a forward subregion and a forward remaining region; and, said rearward supporting surface including a rearward subregion and a rearward remaining region;

said forward side face including a forward subarea and a forward remaining area; and, said rearward side face including a rearward subarea and a rearward remaining area;

said forward subregion and said forward subarea being configured to conjointly define a first clamping interface and said rearward subregion and said rearward subarea being configured to conjointly define a second clamping interface;

said forward remaining region and said forward remaining area conjointly defining a first clearance adequate to define a first solder gap; and, said rearward remaining region and said rearward remaining area conjointly defining a second solder gap;

said clamping interfaces being dimensioned to effect a form-tight clamping fixation of said insert in said base body preparatory to a filling of said solder gaps with solder; and,

solder disposed in said gaps to define respective solder joints for solder holding said insert in said base body.

4,841,825

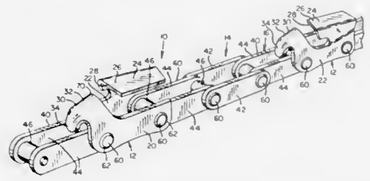
SAW CHAIN WITH WRAP-OVER DEPTH GAUGE

Kenneth B. Martin, Gresham, Oreg., assignor to Blount, Inc., Montgomery, Ala.

Filed Jun. 10, 1988, Ser. No. 205,300

Int. Cl.[4] B27B *33/14*

U.S. Cl. 83—833 **6 Claims**



1. In a saw chain cutting apparatus having a guide bar support means,

a plurality of links connected to form a chain, predetermined ones of said links having

a cutting portion,

spaced-apart longitudinally-extending planar side portions adapted to straddle said guide bar support means and forming a channel therebetween, said cutting portion being mounted on one of said side portions, said side portions providing means for connecting said predetermined ones of said links to others of the links in the chain, and

a cross-piece interconnecting said side portions forwardly of said cutting portion, said cross-piece forming with said side portions a continuous U-shaped zone,

said cutting portion comprising a cutting tooth integral with said one of said spaced-apart longitudinally-extending side portions, said tooth having a generally transversely-extending cutting edge, said cutting edge extending toward the other of said spaced-apart longitudinally-extending side portions,

said U-shaped zone defining a depth gauge to determine the depth of cut of said cutting tooth.

4,841,826

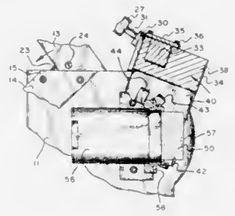
SHAPING APPARATUS AND METHOD

John Smith, III, Cherry Hill, N.J., assignor to Precision Automation Co., Inc., Cherry Hill, N.J.

Filed Feb. 16, 1988, Ser. No. 155,865

Int. Cl.[4] B23D *17/06, 23/02*

U.S. Cl. 83—862 **15 Claims**



1. The method of shaping a solid body of soft material comprising precutting a notch into one side of the body, rough cutting the body along a first line extending inwardly from the other side of and across the body and located to remove substantial material and enter the closed end of the notch, and then finish cutting the body along a second line extending entirely across the body at a location to remove relatively little material.

4,841,827

INPUT APPARATUS OF ELECTRONIC SYSTEM FOR EXTRACTING PITCH DATA FROM INPUT WAVEFORM SIGNAL

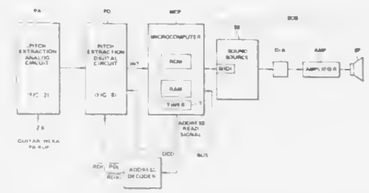
Shigeru Uchiyama, Sayama, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1988, Ser. No. 252,914

Claims priority, application Japan, Oct. 8, 1987, 62-254169

Int. Cl.[4] G10H *3/18, 7/00*

U.S. Cl. 84—1.01 **12 Claims**



1. An input control apparatus for an electronic system, comprising:

means for converting an input waveform signal into a digital waveform signal A;

memory means for storing a digital waveform signal B;

means for reducing a value of the digital waveform signal B stored in said memory means at a predetermined rate;

means for comparing the digital waveform signal B stored in said memory means with the digital waveform signal A supplied from said converting means; and

control means for causing said memory means to store the digital waveform signal A supplied from said converting means as the digital waveform signal B when said comparing means detects that the digital waveform signal A supplied from said converting means is larger than the digital waveform signal B stored in said memory means, and for inhibiting changing the digital waveform signal B stored said memory means with the digital waveform signal A when said comparing means detects that the digital signal A supplied from said converting means is smaller than the digital waveform signal B stored in said memory means,

wherein a peak timing of the input waveform signal is detected on the basis of a comparison output from said comparing means.

4,841,828

ELECTRONIC MUSICAL INSTRUMENT WITH DIGITAL FILTER

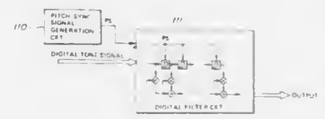
Hideo Suzuki, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamaamtsu, Japan

Filed Nov. 25, 1986, Ser. No. 934,781

Claims priority, application Japan, Nov. 29, 1985, 60-267542; Dec. 4, 1985, 60-271659; May 23, 1986, 61-117522; May 28, 1986, 61-121315; Jul. 3, 1986, 61-155066; Jul. 3, 1986, 61-155067

Int. Cl.[4] G10H *1/12, 7/00*

U.S. Cl. 84—1.19 **29 Claims**



1. An electronic musical instrument comprising:

tone signal generating means for generating digital tone signals;

pitch designating means for designating the pitch of atone to be generated;

pitch synchronizing signal generation mans, responsive to said pitch designating means, for generating a pitch synchronizing signal synchronized with the pitch of a digital tone signal to be filtered; and

digital filter means for receiving said digital tone signals and performing a digital filtering operation on said digital tone signals with a sampling period synchronized with aid pitch synchronizing signal generated by said pitch synchronizing signal generation means.

4,841,829

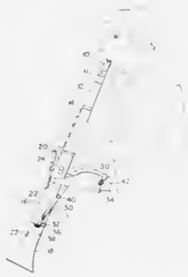
DEVICE FOR SUPPORTING THE WEIGHT OF A CLARINET

Walter J. Lehmann, P.O. Box 35, Lebanon Springs, N.Y. 12114

Filed Dec. 17, 1987, Ser. No. 134,253

Int. Cl.[4] G10G *5/00*

U.S. Cl. 84—385 A **6 Claims**

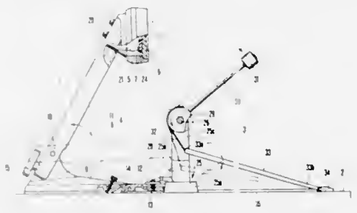


1. A device to be worn about the wrist and thumb and attached to a wind instrument for support thereof comprising;

A. a flexible and pliable strap such as cloth, substantially 2

centimeters in with, having a hook at one end and permanently fastened to a wrist band at the opposite end;
B. a clamp fastened at the instrument's lower end, having a looped appendage;
C. said hook attached to the looped appendage;
D. whereby when said wrist band is attached to the wrist and said strap wrapped over the thumb and index finger web, the instrument is thus supported.

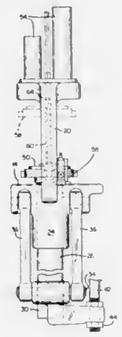
4,841,830
FOLDABLE ELECTRONIC BASS DRUM
Toshinori Yamashita, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan
Filed Oct. 23, 1987, Ser. No. 112,897
Claims priority, application Japan, Oct. 23, 1986, 61-161531[U]
Int. Cl.[4] G10H *3/14*; G10D *13/02*
U.S. Cl. 84—1.14 **2 Claims**



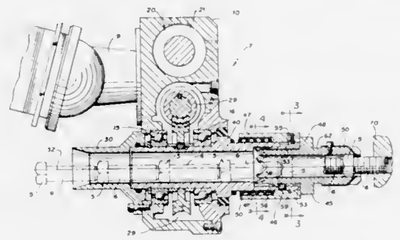
1. A foldable electronic drum comprising:
a base adapted to be placed on a floor, said base having first and seconds ends;
a support arm pivotally mounted on said first end of said base;
a pad mounted on said support arm
coupling means mounted on said second end of said base for movably coupling a beater to said base such that said beater may strike said pad;
restraining means connected to said support arm for fixing the position of said arm with respect to said base when said restraining means is engaged and allowing said arm to move toward said base when said restraining means is disengaged, thereby folding said drum; and
a pickup device connected to said pad for converting a vibration of said pad into an electrical signal when said pad is struck by said beater.

4,841,831
INDEXING RELOADER OF CARTRIDGES
Walter W. Bender, 95 Acacia, Oroville, Calif. 95966, and Charles A. Gaustad, 62 Black Tail Rd., Oroville, Calif. 95966
Filed Oct. 24, 1988, Ser. No. 261,273
Int. Cl.[4] F42B *33/02*; B23B *29/24*; B23Q *16/00, 16/02*
U.S. Cl. 86—27 **6 Claims**

1. A device for reloading cartridges comprising;
a support structure, an overhead die holder forming a part of the support structure for holding a plurality of cartridge reloading dies in a symmetrical pattern spaced around a center opening, a rotatable bushing positioned in said center opening and a one-way clutch mechanism permitting rotation of the bushing in one direction and preventing rotation thereof in the other direction,
a plunger slidably mounted relative to the support structure for reciprocal vertical sliding movement from below the die holder toward the center opening therein, and actuating means for actuating said reciprocal movement of the plunger,
a cartridge holding turret rotatably mounted to the top of the plunger for rotation thereof in a horizontal plane, and an indexing shaft fixedly attached to the turret and projected upwardly therefrom through the bushing, said shaft having a configured cross sectional portion and said bushing having a complimentary configuration to allow sliding movement of the shaft therethrough but prohibiting rotation relative to the bushing, the configuration of the shaft portion being twisted spiral around the shaft a determined angle along an indexing section of the shaft, said configured shaft portion and indexing section thereof being arranged relative to the reciprocal plunger movement whereby the configured shaft portion and indexing section are forced through the bushing during such movement to force indexing rotative movement of the shaft and turret by said determined angle of twist in the direction of reciprocating movement wherein the bushing is prevented from rotative movement by the one-way clutch mechanism.

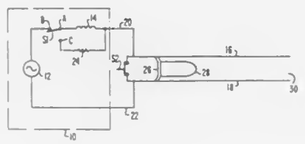


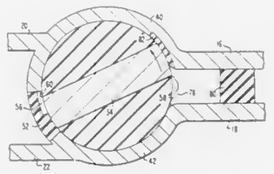
4,841,832
BOLTRUNNER
Gary L. Snavely, Farmington Hills, and Richard Pelachyk, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Aug. 13, 1987, Ser. No. 84,887
Int. Cl.[4] B25B *23/02*
U.S. Cl. 81—57.37 **4 Claims**



1. An axial feed boltrunner for torquing threaded fasteners of a plurality of selected sizes, said boltrunner in combination comprising:
a frame;
power means mounted to said frame;
means for feeding separated individual threaded fasteners to said frame;
spindle means accepting threaded fasteners from said feeding means including a spindle tube mounted to said frame and rotated by said power means, said spindle tube transverse dimension being large enough to accommodate a plurality of sizes of said threaded fasteners; and
a quick connect socket aligned with said spindle means having a portion with a transverse dimension for torsional contact with a selected sized threaded fastener said socket also having an orientation section for aligning said threaded fasteners with said torsional contact portion, said socket having on an end opposite of said spindle means to hold an individual threaded fastener whereby rotation by said spindle means causes a bolt held by said hold means to rotate and release from said hold means upon threaded engagement of said threaded fastener.

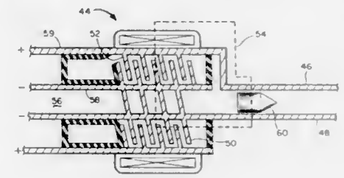
4,841,833
ROTARY SWITCH FOR MULTIPLE SHOT ELECTROMAGNETIC LAUNCHERS
David W. Scherbarth, Plum Borough; Daniel W. Deis, Churchill Borough, and John W. Olsen, Plum Borough, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Aug. 3, 1982, Ser. No. 404,671
Int. Cl.[4] F41F *1/02*; H01H *25/06*
U.S. Cl. 89—8 **18 Claims**





1. A switch for switching very large DC current comprising:
a rotor having an outer cylindrical surface;
a conducting element extending transversely through said rotor, said element having radial ends terminating at angularly spaced locations on the cylindrical surface of said rotor;
a stator having an inner cylindrical surface;
two brush members defining angularly spaced portions of said stator cylindrical surface, each of said brush members terminating in arcuate surfaces complementary to and in sliding contact with the cylindrical surface of said rotor, with the width of said arcuate surfaces increasing in an axial direction along said stator cylindrical surface;
means for rotating said rotor and for moving said rotor axially along said stator; and
insulation members disposed between said brush members, along said inner cylindrical surface of said stator.

4,841,834
COMMAND OPERATED LIQUID METAL OPENING SWITCH
James M. Gruden, Cary, N.C., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Oct. 13, 1987, Ser. No. 107,185
Int. Cl.[4] F41F *1/02*
U.S. Cl. 89—8 **6 Claims**



1. An opening switch, comprising:
(a) a generally cylindrical outer electrode having an inside surface;
(b) a generally cylindrical inner electrode substantially coaxial with the outer electrode and having an outside surface in a spaced relationship from the inside surface of the outer electrode, the inside surface of the outer electrode and the outside surface of the inner electrode defining adjacent first and second annular sections between the outer electrode and the inner electrode;
(c) insulating means inside the second annular section for electrically insulating the inside surface of the outer electrode from the outside surface of the inner electrode;
(d) an electrically conductive liquid sealed inside the first and second annular sections in an amount sufficient to substantially fill only one of said annular sections, so that electric current can flow between the outer electrode and the inner electrode through said liquid whenever any of said liquid is inside the first annular section and so that the insulating means prevents the flow of electric current between the outer electrode and the inner electrode when all of said liquid is inside the second annular section; and,
(e) means for moving said liquid between the first and second annular sections, wherein the moving means comprise:
(i) an outwardly extending spiral fin defined on the outside surface of the inner electrode in the first annular section;
(ii) an inwardly extending spiral fin defined on the inside surface of the outer electrode in the first annular section wherein the inner electrode spiral fin and the outer electrode spiral fin substantially mesh in a spaced relationship; and,
(iii) means for creating a magnetic field, said means substantially surrounding the first annular section.

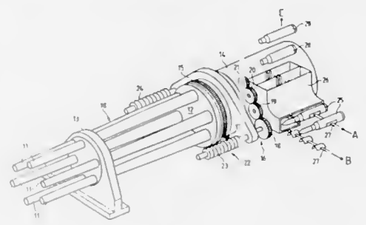
4,841,835
SAFETY APPARATUS FOR AN EXTERNALLY POWERED FIRING WEAPON
Erwin Bohler, Dübendorf, and Werner Bruderer, Zürich, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland
Filed Jan. 11, 1988, Ser. No. 142,699
Claims priority, application Switzerland, Jan. 16, 1987, 00146/86
Int. Cl.[4] F41F *11/00*; F41D *7/02*
U.S. Cl. 89—12 **11 Claims**

6. A safety apparatus for an externally powered weapon including a weapon barrel and into which cartridges are insertable which may be subject to ignition delay, said safety apparatus comprising:
a breechblock positively reciprocating between a forwardmost position and a rearmost position;

means for locking said breechblock to said weapon barrel in said forwardmost position;

said breechblock comprising a breechblock carrier and a breechblock head which are operatively coupled to each other;

means for decoupling said breechblock carrier from said breechblock head in said forwardmost position in which said breechblock head is locked to said weapon barrel in



response to an ignition delay of a cartridge located in the breechblock;

said means for locking the breechblock to the weapon barrel comprising rotary locking means for locking said breechblock head to said weapon barrel; and

said means for decoupling said breechblock carrier from said breechblock head including rotary coupling means for coupling said breechblock head to said breechblock carrier.

4,841,836

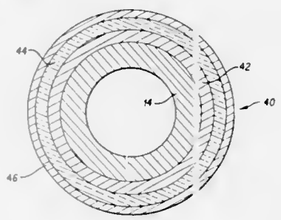
THERMAL SHROUD FOR A GUN TUBE

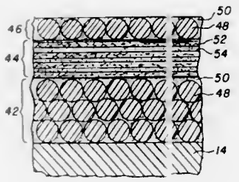
Mark L. Bundy, 1265 Allison Ct., Belcamp, Md. 21017

Filed Nov. 2, 1987, Ser. No. 115,958

Int. Cl.[4] F41F *17/14*

U.S. Cl. 89—14.1 15 Claims





13. A thermal shroud for a gun tube having an axis, comprising:

an inner layer of thermally conductive material in contact with the gun tube, wherein the thermal conductivity of the inner layer in a circumferential direction about the periphery of the gun tube is greater than the thermal conductivity of the inner layer in an axial direction along the gun tube axis, the inner layer including at least one thermally conductive filament which is wound about the gun tube and which is embedded in a thermally conductive flexible adhesive for maintaining the filament in thermal contact with the gun tube;

a middle layer of thermal insulation material in contact with the inner layer; and

an outer layer of thermally conductive material in contact with the middle layer, wherein the thermal conductivity of the outer layer in a circumferential direction about the periphery of the middle layer is greater than the thermal conductivity of the outer layer in an axial direction along the gun tube axis, the outer layer including at least one thermally conductive filament which is wound about the middle layer and which is embedded in a thermally conductive flexible adhesive.

4,841,837

CRADLE OR BUCKET CHAIN FOR INFEEDING CARTRIDGES TO AN AUTOMATIC FIRING WEAPON

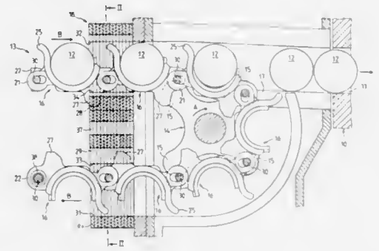
Hanspeter Novet, Volketswil, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Jan. 20, 1987, Ser. No. 4,577

Claims priority, application Switzerland, Jan. 22, 1986, 00239/86

Int. Cl.[4] F41D *10/06*

U.S. Cl. 89—33.25 5 Claims



1. A cradle chain for delivering cartridges from an ammunition magazine, by means of a cartridge infeed channel having two oppositely situated walls and provided with guide groove means, to an automatic firing weapon, comprising:

a plurality of interlinked cradle elements;

each cradle element of said plurality of interlinked cradle elements comprising:

a cradle for accommodating a cartridge;

at least two lug means attached to said cradle for connecting said cradle element with a leading cradle element and with a trailing cradle element as seen in a predetermined direction of travel of said plurality of cradle elements;

infeed cam means of said cradle directly acting upon said cartridge for infeeding the cartridge into the automatic firing weapon;

a sword member projecting into the guide groove means of said cartridge infeed channel;

means for pivotably interconnecting two immediately neighboring cradle elements with one another and coacting with said lug means of said two neighboring cradle elements, which lug means interfit with one another;

said at least two lug means and said infeed cam means being located on two opposite sides of said cradle;

said cradle being guided on a first one of its two opposite sides at one of the oppositely situated walls of the cartridge infeed channel by said infeed cam means during movement of said cradle through said cartridges infeed channel; and

said cradle being guided on a second one of its two opposite sides at an other one of the oppositely situated walls of the cartridge infeed channel by one of said at least two lug means during the movement of said cradle through said cartridge infeed channel.

4,841,838

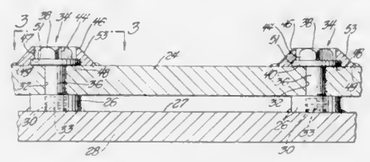
ARMOR RETENSION MECHANISM HAVING ANTI-THEFT MEANS

Andrew J. Scully, 39290 Tunstall Dr., Mt. Clemens, Mich. 48044, and Arthur H. Adlam, 12215 Canal, Sterling Heights, Mich. 48078

Filed Oct. 13, 1987, Ser. No. 111,487

Int. Cl.[4] F41H *5/16, 5/20*

U.S. Cl. 89—36.08 9 Claims



1. In a military vehicle having an outer surface and a plural number of add-on armor plates applied to said outer surface to provide increased ballistic protection for the vehicle: the improvement comprising means for mounting individual armor plates on the vehicle outer surface; each said mounting means comprising a plural number of pads adhered to the vehicle outer surface; each pad having a threaded opening therein; each armor plate having holes therethrough spaced apart the same distances as said threaded openings; a bolt extending through each hole in the armor plate into the threaded opening in the associated pad; each bolt having a threaded section meshed with a threaded surface in the pad, a smooth shank surface engaged with the hole surface in the armor plate, and an enlarged head overlying the outer face of the armor plate; each bolt head comprising an inner circular base section engaged with the outer face of the armor plate and an outer non-circular section sized to receive a wrench for bolt-turn purposes; and an annular anti-theft collar for each bolt; each collar being fixed upon the outer face of the add-on armor plate in surrounding relation to the head of the associated bolt; each said collar having a relatively small central opening accommodating the non-circular section of the bolt, and a relatively large counterbore accommodating the circular base section of the bolt, whereby the bolt is prevented from being unthreaded out of the pad except after removal of the collar from the outer face of the armor plate.

4,841,839

RECOIL ABSORBING GUN MOUNT DEVICE

Richard K. Stuart, Easley, S.C. 29640

Filed Jul. 30, 1987, Ser. No. 79,818

Int. Cl.[4] F41D *11/24*

U.S. Cl. 89—37.04 34 Claims

1. A gun mount device for absorbing the recoil from a gun mounted and fired on said device comprising:

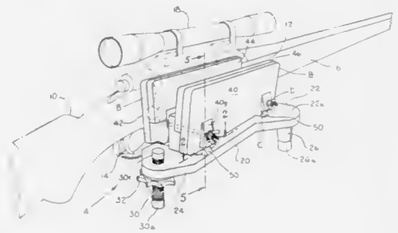
(a) a base for providing a support on a surface having a front and a rear;

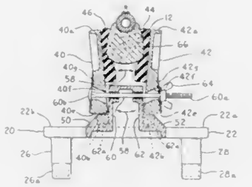
(b) a pair of clamping members carried by said base having upper and lower generally free edge portions and front and rear ends;

(c) a clamping space defined between said clamping members;

(d) friction gripping means carried adjacent said upper free edge portions of said clamping members for frictionally gripping a gun stock of said gun along a length of said gun stock;

(e) pivot means for carrying said clamping members on said base in a manner that said lower edge portions may move in pivotal and translational motions and said front and rear ends may move independently so that said clamping members may converge or diverge from the rear to the front of the base;





(f) clamp operating means for applying a clamping force to said clamping members urging said clamping members towards each other; and

(g) said base and clamping members effectively absorbing the recoil from said gun when said gun stock is frictionally clamped by said clamping members during firing.

4,841,840

FIRING MECHANISM FOR A SEMI-AUTOMATIC ARM

Bent Agner, Tyrolgade 1, and Kaj Balsborg, Erantisvej 12, both of DK-2300 Copenhagen, Denmark

Filed Apr. 22, 1987, Ser. No. 41,345

Int. Cl.[4] F41D *11/16*

U.S. Cl. 89—154 8 Claims

1. A firing mechanism for a semi-automatic arm comprising a firing chamber for discharging a cartridge positioned in said firing chamber, a firing pin chamber forming an elongation of said firing chamber, a firing pin including a striking end for striking a percussion cap of said cartridge to discharge said cartridge, and means to activate a trigger and thereby move

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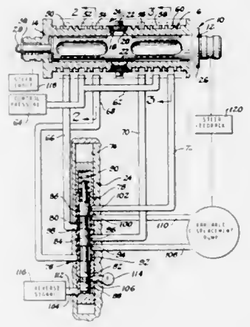
said firing pin to discharge said cartridge, said striking end of said firing pin being adjacent said firing chamber, wherein said firing pin is pivotable in a radial direction between an inactive position in which said striking end is radially outside of a cylinder defined by walls of a barrel of said semi-automatic arm of said cartridge and an active position in which said striking end is radially inside said cylinder, said firing pin being additionally movable in a substantially axial direction from a neutral position in which said striking end is axially offset from said percussion cap to a striking position in which said striking end contacts said percussion cap to discharge said cartridge.

4,841,841

STEER MECHANISM FOR A STEER-BY-DRIVING VEHICLE

James A. Redelman, and James W. Morrow, both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 27, 1988, Ser. No. 212,557
Int. Cl.[4] F15B *13/04, 9/10*
U.S. Cl. 91—30 **1 Claim**



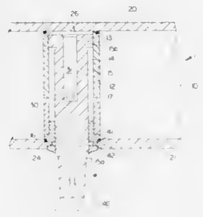
1. A steer valve servo mechanism in a steer-by-driving vehicle having a steering system with a variable displacement hydrostatic mechanism including servo steer means and feedback connection means, said steer valve servo mechanism comprising: a housing; fluid passages in said housing including forward steer passage means and a reverse steer passage means; a forward steer sleeve valve means rotatably supported in said housing; reverse steer sleeve valve means rotatably supported in said housing coaxial with said forward steer sleeve valve means; gear means connecting said forward steer sleeve valve means and said reverse steer sleeve valve means for imposing opposite rotation thereto; operator steer input means for selectively rotating one of said steer sleeve valve means; distribution valve means rotatably supported in both said steer sleeve means; means connecting said distribution valve means to the feedback connection means for rotating said distribution valve in response to a change in the displacement of the hydrostatic mechanism; passage means in said forward steer sleeve valve means for receiving fluid from said forward steer passage means when said vehicle is traveling forward and cooperating with said distribution valve means for delivering fluid to said servo steer means for urging a change in displacement of said hydrostatic means; and passage means in said reverse steer sleeve valve means for receiving fluid from said reverse steer passage means when said vehicle is traveling in reverse and cooperating with said distribution valve means for delivering fluid to said servo steer means for urging a change in displacement of said hydrostatic means.

4,841,842

APPARATUS FOR SCABBLING CONCRETE

David T. Allan, Rutherglen, Scotland, assignor to John MacDonald & (Pneumatic Tools) Ltd., Glasgow, Scotland

Continuation-in-part of Ser. No. 773,510, Sep. 5, 1985, abandoned, which is a continuation of Ser. No. 690,837, Jan. 14, 1985, abandoned, which is a continuation of Ser. No. 529,550, Sep. 6, 1983. This application Sep. 5, 1986, Ser. No. 904,564
Int. Cl.[4] F01L *21/02;* **F01B** *7/08*
U.S. Cl. 91—234 **1 Claim**



1. Apparatus for cutting concrete comprising: a hollow cylinder block, a top plate for said cylinder block, a bottom plate for said cylinder block, siad cylinder block top plate bottom plate defining a volume within said cylinder bock; inlet means for supplying compressed air to said volume; at least one bore in said bottom plate; an upper step in said bore directed towards the interior of said volume; a lower step in said bore direced to the exterior of the cylinder block; a flanged cylindrical bush provided in the upper step of said bore; a wiper ring located in the lower step of said bore; a parallel sided cylindrical liner located within said cylinder block, one end of the liner being in sealing engagement with said top plate and the other end of the liner surrounding said bush with an end surface of the liner engaging the flange of said cylindrical bush so as to position the liner within said volume; a piston slidably located within said liner and extending through said bush and said wiper ring and having an end positioned outside the cylinder block; aperture means in the wall of said liner for supplying said compressed air from the interior of said cylinder block to the interior of said liner to permit reciprocation of said piston; and cutting means attached to said end of said piston.

4,841,843

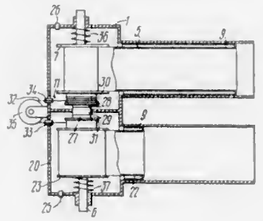
DEVICE FOR CONVERTING ENERGY OF FLUID MEDIUM INTO MECHANICAL WORK

Viktor V. Shishkin, ulitsa Festivalnaya, 16, kv. 5; Nikolai F. Kryazhevskikh, ulitsa Krasnykh Partizan, 559, kv. 13, and Jury P. Shapovalov, ulitsa Turgeneva, 18, all of Krasnodar, U.S.S.R.

PCT No. PCT/SU86/00135, § 371 Date Jul. 27, 1987, § 102(e) Date Jul. 27, 1987, PCT Pub. No. WO87/03940, PCT Pub. Date Jul. 2, 1987
PCT Filed Dec. 17, 1986, Ser. No. 112,566
Claims priority, application U.S.S.R., Dec. 24, 1985, 3988766; Dec. 24, 1985, 3988772; Dec. 24, 1985, 3988770; Dec. 24, 1985, 3988775
Int. Cl.[4] F15B *13/044*
U.S. Cl. 91—459 **8 Claims**

1. A device for converting energy of a fluid medium into mechanical work comprising a hermetically sealed chamber (1) communicating through a control valve and a discharge valve with systems for supply and removal of the fluid medium and having an opening (4) fixed wherein along the perimeter thereof is one end of a sleeve (5) made of a flexible material and reciprocatingly mounted in the chamber (1) with respect to the fixed end so that, when traversing from the initial position to the extreme position, a part of a sleeve (5) is turned inside out forming a space (9), which sleeve (5) is connected to a drum (7)

mounted on the shaft (6) which is coupled to a reverser (11) through an overrunning clutch (8), characterized in that the drum (7) is located inside the chamber (1), the other end of the



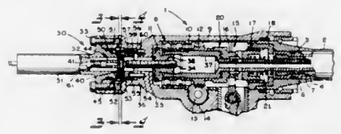
sleeve (5) is connected to the drum (7) so that in the initial position the sleeve (5) is wound onto the drum (7) and the space (9) formed by the part of the sleeve (5) turned inside out communicates with the chamber (1).

4,841,844

FLUID ACTUATORS WITH LVDT FEEDBACK MECHANISMS

James N. Tootle, Kalamazoo, Mich., assignor to Pneumo Corporation, Boston, Mass.

Filed Jul. 29, 1982, Ser. No. 402,995
Int. Cl.[4] F01B *25/26*
U.S. Cl. 92—5 R **23 Claims**



1. A fluid actuator comprising a cylinder, a piston axially movable in said cylinder, a rotatable member operatively connected to said piston such that axial movement of said piston causes rotation of said rotatable member, and means driven by said rotatable member for indicating the axial position of said piston, said means including an LVDT having a probe whose movements are proportional to the rate of movement and position of said piston, said LVDT including a lead screw, and means for causing axial movement in said lead screw in response to rotation of said rotatable member, said probe being connected to said lead screw for axial movement therewith, and said means for causing axial movement of said lead screw comprising a clutch mechanism for restraining said lead screw against rotation, said clutch mechanism including means for permitting rotation of said lead screw and probe connected thereto with said rotatable member whenever the stroke of said actuator exceeds the design stroke of said LVDT to prevent possible damage to said LVDT and actuator during such an overstroke condition.

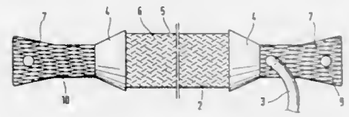
4,841,845

HYDRAULIC OR PNEUMATIC DRIVE DEVICE

Théophile Beullens, Middelweg 213, 3030 Heverlee, Belgium

Filed Sep. 21, 1987, Ser. No. 99,007
Claims priority, application Belgium, Sep. 22, 1986, PV0/217.191
Int. Cl.[4] F01B *19/00;* **F16J** *3/00*
U.S. Cl. 92—92 **17 Claims**

1. A fluid drive device comprising:
a wall of a substantially resiliently distortable material forming a substantially tightly sealable chamber in the shape of a body of revolution the surface of which is defined by said wall;
flexible substantially unstretchable spiral-wound filaments extending substantially next to one another about said wall and the axis of said chamber, part of said filaments being wound rightward and another part leftward in such a way that two arbitrary crossing filaments may undergo some angular displacement relative to one another, one end of each of said filaments being fixed relative to a working point at one end of said axis and the other end of each of



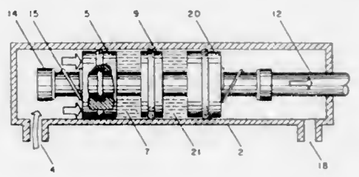
said filaments being fixed relative to another working point at the other end of said axis;
means defining a feed opening for said chamber through which a pressurized fluid may be introduced thereinto, said wall being distortable at least along one direction transverse to said axis in such a way that by regulating the fluid pressure in said chamber a relative displacement of said working points occurs; and
a truncated cone-shaped transition piece on each end of said body extending over said filaments.

4,841,846

PNEUMATIC ACTUATORS WITH LIQUID SEALS FOR OIL AND GAS WELL SWABS

William D. Grambling, 5144 Newport Ave., Chevy Chase, Md.

Continuation-in-part of Ser. No. 832,442, Feb. 24, 1986, abandoned. This application Jan. 16, 1987, Ser. No. 3,750
Int. Cl.[4] F16J *15/40;* **B65D** *53/00*
U.S. Cl. 92—60 **13 Claims**



5. Sealing apparatus for a piston and cylinder assembly, the apparatus comprising:
a cylinder, an actuating piston slidably and sealingly received in said cylinder, said actuating piston having a piston rod affixed thereto so that said actuating piston and said piston rod are movable together relative to said cylinder;
a first sealing piston member slidably received on said piston rod which is spaced from said actuating piston;
a viscous liquid filling the space between said actuating piston and said first sealing piston; and
a second sealing piston slidably received on said piston rod spaced from said actuating piston opposite said first sealing piston, and a further viscous liquid filling the space between said second sealing piston and said actuating piston wherein said actuating piston and said first and second sealing pistons are provided with sealing means between their respective side walls and the interior wall of said cylinder, said sealing means comprising O-rings and at least one respective further O-ring between the interior wall of each of said first and second sealing pistons and said piston rod.

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4,841,847

AIR CLEANING APPARATUS AND CONSTRUCTION OF CLEAN ROOM WITH THE SAME

Shoji Hirayama, No. 3-12-14, Chuorinkan, Yamato-Shi, Kanagawa-Ken, Japan

Continuation of Ser. No. 867,623, May 27, 1986, abandoned, which is a continuation of Ser. No. 778,730, Sep. 20, 1985, abandoned, which is a continuation of Ser. No. 506,541, Jun. 21, 1983, abandoned. This application Dec. 10, 1987, Ser. No. 132,670

Int. Cl.⁴ F24F *7/00*

U.S. Cl. 98—31.5 **16 Claims**

1. An air cleaning apparatus for cleaning air in a room defined by a floor, ceiling and two pairs of opposing side walls, said apparatus comprising:

a columnar body extending between the floor and ceiling and arranged in contact with a first side wall of the room, said columnar body defining an elongated vertical duct having an air outlet arranged adjacent the ceiling and an air inlet port spaced from and facing the floor of the room;

an air circulating blower means in the columnar body for drawing air into said air inlet port and directing air toward said air outlet;

a horizontal duct fluidly communicating with the air outlet of said vertical duct, said horizontal duct extending completely across said room between a first pair of opposing side walls, said horizontal duct being defined by an upper face contacting said ceiling, a lower face spaced from and below said upper face, and two side faces each extending between said upper and lower faces, said lower face and at least one side face having clean air diffuser exits formed substantially over the entire surface of said at least one side face and lower face, for the entire length thereof to uniformly diffuse clean air across the room; and

an air cleaning dust collector arranged between said blower means and said diffuser exits.

4,841,848

METHOD AND APPARATUS FOR RIDDLING WINE IN BOTTLES

Daniel C. Baker; Robert M. Stashak; William P. Owens, all of Santa Rosa, and Gregory B. Gessner, Healdsburg, all of Calif., assignors to F. Korbel and Bros., Guerneville, Calif.

Filed Feb. 17, 1987, Ser. No. 15,792

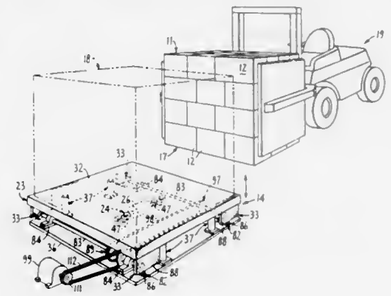
Int. Cl.⁴ C12H *1/22*; B01F *11/00*

U.S. Cl. 99—277.2 **70 Claims**

1. Apparatus for riddling bottled wine, comprising

holding means formed for carrying a bottle of wine in generally neck-down inverted position,

jounce means having an operative connection to said holding means and formed for selectively effecting abrupt limited generally vertical force on said bottle so as to accomplish riddling of the wine therein, and



control means formed for automatically cycling said jounce means through active and passive periods of predetermined and adjustable duration.

4,841,849

COFFEE MAKER OR LIKE BEVERAGE MAKING DEVICE

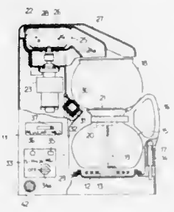
Nobuo Shimomura, Nagoya, and Tomio Hotta, Kuwana, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 14, 1988, Ser. No. 270,341

Claims priority, application Japan, Nov. 19, 1987, 62-176848[U]

Int. Cl.⁴ A47J *31/047*

U.S. Cl. 99—282 **8 Claims**



1. A coffee maker or like beverage making device comprising:

(a) a lower container for containing water;

(b) an upper container for containing coffee powder, said upper container including a water feed tube extending downwardly from the bottom thereof and a filter disposed so as to cover an upper end opening of the water feed tube, said upper container being disposed over said lower container so that the water feed tube is inserted into said lower container;

(c) a heater for applying heat to said lower container so that the water contained therein is heated to be boiled and that the hot water is transferred to said upper container through said water feed tube and said filter by aerial pressure in the lower container;

(d) temperature sensing means for sensing the temperature of a portion of the device, the temperature of which portion is increased as the temperature of the water contained in said lower container is increased;

(e) heater input power control means for reducing an input power to said heater in accordance with the temperature sensed by said temperature sensing means; and

(f) heater deenergizing means for deenergizing said heater after the temperature sensed by said temperature sensing means corresponds to the temperature of the hot water when the transferring of the hot water to said upper container is completed.

4,841,850

PROCESSING OF BIOLOGICAL PRODUCTS

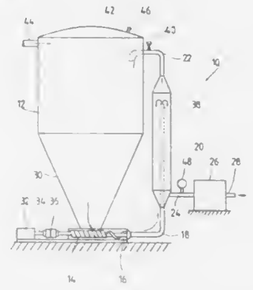
Eric H. Friedmann, Constantia, South Africa, assignor to Norzon Management Limited, Guernsey, Channel Islands

Filed Sep. 30, 1987, Ser. No. 102,677

Claims priority, application South Africa, Sep. 30, 1986, 86/7435

Int. Cl.⁴ A23B *7/00*

U.S. Cl. 99—472 **7 Claims**



1. An arrangement for processing raw material, which includes

(a) a collector container;

(b) a supply means for supplying raw material to the collector container;

(c) a de-aeration container;

(d) a discharge conduit for supplying raw material from the collector container to the de-aeration container;

(e) a high pressure unit;

(f) a feeding conduit for feeding de-aerated raw material from the de-aeration container to the high pressure unit;

(g) an outlet conduit for processed material leading from the high pressure unit;

(h) a return conduit joining the de-aeration container to the collector container so as to guide excess raw material in the de-aeration container back to the collector container;

(i) de-aeration means for de-aerating raw material in the de-aeration container; and

(j) displacing means adapted to displace raw material from the collector container along the discharge conduit to the de-aeration container, excess raw material from the de-aeration container along the return conduit to the collector container, and de-aerated raw material from the de-aeration container along the feeding conduit to the high pressure unit.

4,841,851

ROLL BALING PRESS FOR HARVEST PRODUCT

Pierre Quataert, Nuenen, Netherlands, assignor to P. J. Zweegers en Zonen Landbouwmachinenfabriek B.V., Netherlands

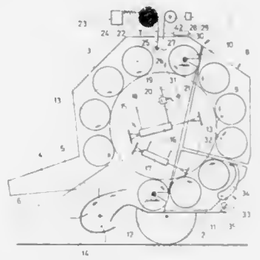
Filed Mar. 23, 1988, Ser. No. 172,300

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1987, 3710550

Int. Cl.⁴ A01D *39/00*; B30B *5/06*

U.S. Cl. 100—5 **28 Claims**

1. A roll baling press for harvest products, comprising a roll-winding chamber defined by press elements adapted to be driven in the winding direction, a product receiving and feeding mechanism in a feeder passage leading to said roll-winding chamber, a mechanism for supplying a binding material to said roll-winding chamber, and a buffer store for the temporary storage of a product received during the tying and ejection of a roll bale, characterized in that at least during said tying and ejection of said roll bale (R) a flexible partition element (T) is provided within said roll-winding chamber (7) for defining said buffer store (Z) within said roll-winding chamber (7).



4,841,852

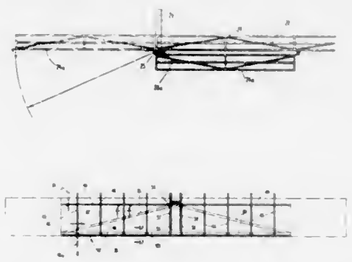
MOBILE TRUSS-MAKING APPARATUS

Jim Kubiak, 855 S. Waterview, Clermont, Fla. 32711, and S. R. Bliven, 4513 S. Trask St., Tampa, Fla. 33611

Filed Mar. 17, 1988, Ser. No. 169,370

Int. Cl.⁴ B30B *15/00*; B25C *7/00*

U.S. Cl. 100—100 **20 Claims**



1. An apparatus having utility in the construction of roof trusses comprising:

a frame member;

wheel and axle means operatively connected to said frame member so that said frame member is transportable over public highways;

a jig assembly supported by said frame member;

a primary track support member including a primary track means supported thereby;

said primary track support member and primary track means positioned above said jig assembly and being co-extensive therewith;

an auxiliary jig assembly means connectable to said jig assembly to increase its extent;

an auxiliary track support member including an auxiliary track means supported thereby;

said auxiliary track support member being hingedly connected to said primary track support member and having a first, closed position and a second, extended position where said primary track means and said auxiliary track means are co-extensive with said jig assembly and said auxiliary jig assembly, respectively.

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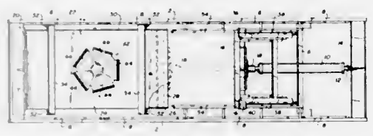
4,841,853
APPARATUS FOR COMPACING GARBAGE AND SALVAGE
Eugene L. Wallace, Richmond, Cana la, assignor to Wallace Disposal, British Columbia, Canada
Filed Aug. 31, 1987, Ser. No. 91,738
Int. Cl.[4] B30B *15/32*
U.S. Cl. 100—245 15 Claims

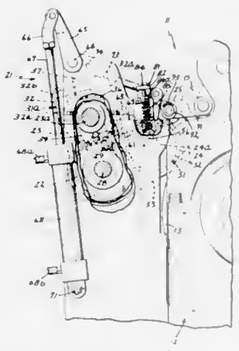


1. A compactor comprising:
a frame;
a fluid operated, double acting ram mounted on the frame;
a compactor plate slidably mounted in the frame to be reciprocable by the ram;
a back plate at an end of the frame remote from the ram;
a container to receive material to be compacted, the container being adapted to be mounted adjacent the back plate, the container being open ended and having a top, sides and a base, the base being hingedly attached to one side;
the compactor plate being dimensioned to be received in the container so that material in the container can be compacted by the plate;
lifting means on the container top comprising a plurality of open mouthed compartments adapted to receive a grapple to allow lifting of the container for unloading of compacted material by hinging downwardly of the base.

4,841,854
ADJUSTABLE SQUEEGEE APPARATUS
Henry J. Bubley, Deerfield, Ill., assignor to American Screen Printing Equipment Company, Chicago, Ill.
Filed Oct. 6, 1987, Ser. No. 106,753
Int. Cl.[4] B41F *15/44*
U.S. Cl. 101—123 8 Claims

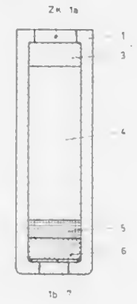
1. A squeegee assembly comprising:
a squeegee blade having a body of a predetermined stiffness and having a lower end which deflects with pressure in use;
a leading edge on the squeegee blade for presenting to a screen fabric;
a squeegee holder for holding the squeegee blade; said holder maintaining the squeegee lower end at a fixed height relative to said holder with changes in the squeegee blade's resistance to deflection, and
selectively adjustable means cooperating with the holder and the squeegee blade to adjust the stiffness of the lower portion of the squeegee blade to selectively limit the deflection of the leading edge due to pressure applied during use, said adjustable means including a front plate for engaging the front side of both the holder and the squeegee blade and a rear plate of engaging both the holder and the rear side of the squeegee blade,
a lower edge on said front plate disposed above the leading edge of the squeegee blade,
a lower edge on said rear plate offset by a fixed distance below the lower edge of the front plate, and
means joining said front and rear plates to maintain the fixed offset distance between the lower edges of the front and rear blades,
said front and rear plates being movable vertically as a unit along said blade to selectively limit the deflection of the leading edge of squeegee blade due to pressure applied during use without changing the height of the combined holder and squeegee blade assembly.

4,841,855
DAMPENING UNIT FOR PRINTING PRESS
Charles L. Marcum, 5461 Brenner Pass, Fridley, Minn. 55432
Continuation of Ser. No. 117,395, Nov. 2, 1987, abandoned, which is a continuation of Ser. No. 919,568, Oct. 20, 1986, abandoned, which is a continuation of Ser. No. 660,008, Oct. 11, 1984, abandoned. This application May 2, 1988, Ser. No. 188,650
Int. Cl.[4] B41F *7/40*
U.S. Cl. 101—148 22 Claims



1. Apparatus for dampening a lithographic plate on a printing press plate cylinder, comprising:
frame means;
first hanger means mounted to the frame means for pivotal movement between first and second positions about a first pivot axis;
a fluid supply roller carried by the first hanger means for rotation about a first axis coinciding with said first pivot axis;
first drive means for driving the fluid supply roller at a selected rotational speed;
means for supplying dampening fluid to the fluid supply roller over substantially its entire length;
a metering roller carried by the first hanger means for rotation about a second axis in rotating engagement with the fluid supply roller;
second drive means for driving the metering roller at a rotational speed different than that of the fluid supply roller;
second hanger means mounted to the first hanger means for pivotal movement between first and second positions about a second pivot axis;
a dampening form roller carried by the second hanger means for rotation about a third axis spaced from said second pivot axis;
third drive means for driving the dampening form roller at a rotational speed different than that of the fluid supply roller;
the fluid supply and form rollers and said first and second hanger means being constructed and arranged so that the dampening form roller moves into rotational engagement with the fluid supply roller when the second hanger means is moved from its first position to its second position, and for moving the form roller into engagement with the plate cylinder when the first hanger means is moved from its first position to its second position;
and actuator means for sequentially moving the second hanger means from its first to its second position, and the first hanger means from its first position to its second position, whereby the dampening form roller first engages the fluid supply roller and then engages the printing press plate cylinder.

4,841,856
PYROTECHNICAL DELAY ELEMENTS FOR DELAYED-ACTION FUSE AND USES THEREOF
Anton Gisler, Hilterfingen, and Walter Rauber, Gwatt, both of Switzerland, assignors to Schweizerische Eidgeno-senschaft vertreten durch die Eidg. Munitionsfabrik Thun der Gruppe fur Rustungsdienste, Switzerland
Filed Jul. 20, 1988, Ser. No. 221,832
Claims priority, application Switzerland, Jul. 29, 1987, 02890/87
Int. Cl.[4] F42C *19/12*
U.S. Cl. 102—202.13 10 Claims



1. A pyrotechnical delay element comprising at least a booster charge consisting of a combustible and an oxygen carrier, a delay charge consisting of a combustible, an oxygen carrier, a binder, a sensitizer and an inert additive, as well as of a primer charge for the main charge, said charges being arranged one after the other in a cartridge, characterized in that said cartridge is made of a metallic material of high thermal and chemical resistance, and that said delay charge consists of a mixture of a metallic combustible, a halogen-containing, polymerized oxidant and a metallocene as sensitizer.

4,841,857
THIN-FILM FORMING APPARATUS
Yasuhiro Hashimura, Kyoto; Satoshi Noguchi, Ootsu, and Nobuyuki Minami, Kyoto, all of Japan, assignors to Nissha Printing Co., Ltd., Kyoto, Japan
PCT No. PCT/JP87/00134, § 371 Date Oct. 29, 1987, § 102(e) Date Oct. 29, 1987, PCT Pub. No. WO87/05264, PCT Pub. Date Sep. 11, 1987
PCT Filed Mar. 3, 1987, Ser. No. 130,357
Int. Cl.[4] B41F *9/00*
U.S. Cl. 101—158 10 Claims

1. A thin-film forming apparatus for printing a thin film of ink on material to be printed, said apparatus comprising:
a base;
a transfer roller rotatably supported by said base,
said transfer roller having an outer surface, and an intaglio exposed at the outer surface thereof and defined by a plurality of recesses extending in said outer surface in a predetermined pattern;
an ink-supplying device disposed in the apparatus in communication with said transfer roller for supplying ink having a relatively low viscosity to the outer surface of said transfer roller;
a doctor mounted in the apparatus over said transfer roller for spreading ink, supplied onto the outer surface of said transfer roller by sain ink-supplying device, over said outer surface and for causing the recesses defining the intaglio to be filled with a predetermined amount of ink;
a printing roller rotatably supported by said base and having an outer surface that extends below the outer surface of said transfer roller,
the outer surface of said printing roller including a convex portion that is engageable with the intaglio of said transfer roller so as to receive, in said predetermined pattern, ink contained in said recesses defining the intaglio of said transfer roller;
frist driving means operatively connected to said transfer roller and to said printing roller for synchronously rotating said transfer roller and said printing roller;
a surface plate movably mounted on said base and having a top surface for supporting material to be printed;
second driving means operatively connected to said surface plate for moving said surface plate between an insertion position at which material to be printed is disposable on the top surface of said surface plate, a printing position confronting said printing roller and an output position at which material supported on the top surface of said surface plate is removable therefrom; and
control means operatively connected to said first and said second driving means for controlling the same to rotate said printing roller and move said surface plate in a manner in which the convex portion of said printing roller confronts said surface plate when at said printing position so that material supported by said surface plate at said printing position is printed with ink, in said predetermined pattern, received on the convex portion of said printing roller.

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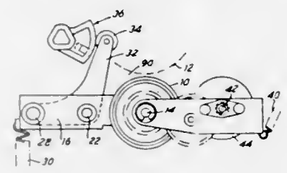
4,841,858

IMPRESSION ROLLER ASSEMBLY INCLUDING AN EJECTOR ROLLER

Ray L. Bannister, 14 Capel Lodge, Kew Rd., Richmond, Surrey TW9 3JU; Frederick C. Close, 3 Gypsy Close, Great Amwell, Herts., and Peter J. Loeber, 121 Greenfield, Earith, Cambridgeshire, all of United Kingdom

Filed Aug. 26, 1987, Ser. No. 89,640
Claims priority, application European Pat. Off., Aug. 27, 1986, 86306620.5
Int. Cl.[4] B65H *29/20*; B41F *21/00*
U.S. Cl. 101—232 14 Claims



1. An impression roller assembly, for use in a machine capable of ejecting relatively flat articles after a treatment operation, the assembly comprising means mounting a first roller for rotation about a first axis, means mounting a second roller having a surface in the shape of a curved surface of a cylinder and said surface being capable of applying a linear force by friction to eject said flat articles, means mounting said second roller for arcuate movement in an arc of a circle whose centre is colinear with said first axis, drive means for causing said first roller to rotate, and transmission means arranged to effect rotation of the second roller in response to rotation of said first roller.

4,841,859

SIDE LAY CONTROL APPARATUS FOR SHEET-FED PRINTING PRESS

Hideo Watanabe, Toride, Japan, assignor to Komori Printing Machinery Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1988, Ser. No. 275,047
Int. Cl.[4] B41F *13/24*
U.S. Cl. 101—233 3 Claims

1. A side lay position control apparatus for a sheet-fed printing press, comprising:

setting means for setting a distance from a reference point of the sheet-fed printing press to a side lay and a fine adjustment length with reference to the distance;

calculating means for calculating an actual distance from the reference point to said side lay in accordance with the distance from the reference point to said side lay and the fine adjustment length; and

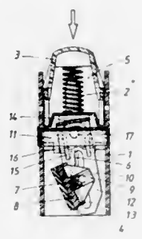
drive means for moving said side lay in accordance with the actual distance.

4,841,860

SELF-INKING STAMP FOR PERFORMING AN INKING UPSTROKE

Paul Fehling, Wels, Austria, assignor to Walter Just Gesellschaft m.b.H., Wels, Austria

Filed Dec. 20, 1988, Ser. No. 287,341
Claims priority, application Austria, Jan. 25, 1988, 126/88
Int. Cl.[4] B41K *1/42*
U.S. Cl. 101—334 2 Claims



1. In a self-inking stamp for performing an inking upstroke comprising

a base part comprising a bottom surface, which defines an aperture, and two vertical narrow side walls formed with respective, horizontally aligned, vertical slots and with respective, horizontally aligned bearing holes,

a downwardly facing ink pad, which is fixed to and spaced in said base part above said bottom,

a type plate carrier, which is movably mounted in said base part between said bottom surface and said ink pad and is formed with a longitudinal track groove adjacent to and open to each of said narrow side walls, and

an actuating mechanism for reciprocating said type plate carrier between said ink pad and said bottom in downward and upward strokes and for inverting said type plate carrier during each of said strokes, which mechanism comprises

an actuating member which is vertically movable relative to said base part and has two horizontally aligned side legs disposed on the outside of respective ones of said narrow side walls and having free bottom ends,

spring means urging said actuating member upwardly,

a horizontal pivot extending through said slots and connected to said free ends of said legs, said type plate carrier being pivoted on said pivot, and

two constraining straps, which extend between said type plate carrier and respective ones of said narrow side walls and are formed each with a cam slot, each of said straps carrying a pivot pin that is disposed above said cam slot and pivoted in one of said bearing holes and a guide pin disposed adjacent to the center of said cam slot and slidably extending into one of said track grooves,

the improvement residing in that

said constraining straps are interconnected by a crossbar, which is offset from said pivot pins and extends in said base part above said ink pad, and

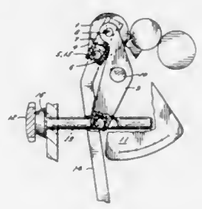
each of said straps is formed with a lanced tongue, which carries said pivot pin and axially urges said pivot pin toward the adjacent one of said longitudinal side walls.

4,841,861

SHIFTING GEAR FOR THE INKBOX OF A PRINTING PRESS

Kurt Difflipp, Steinberg, and Heinrich Ochs, Sinntal, both of Fed. Rep. of Germany, assignors to M.A.N. Roland, Offenbach AM Main, Fed. Rep. of Germany

Filed Oct. 22, 1987, Ser. No. 112,251
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1986, 8628071[U]
Int. Cl.[4] B41F *31/06*
U.S. Cl. 101—350 2 Claims



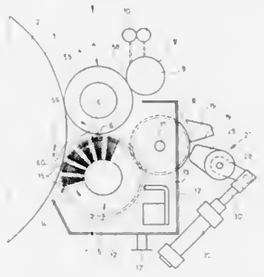
1. A shifting gear for the inkbox press roller of a printing press having a freewheeling journal arranged on an axis of the roller, comprising, in combination, a machine frame, a drive pin connected to a slide block carried by said journal and a swingably borne slide block frame having a swinging axis connected with an oscillating drive to the press roller, the swinging axis of the slide block frame being shiftably arranged by a setting gear with respect to the drive gear of the freewheeling journal, said setting gear having a setting spindle and drive nut connected with a bearing lever swingable on the machine frame and carrying the swinging axis of the slide block frame, said setting spindle having a setting groove whose pitch corresponds to the maximal setting range of the setting gear and said drive nut carrying a guide pin positioned in said setting groove.

4,841,862

DEVICE FOR WASHING THE OUTER SURFACE OF A BLANKET CYLINDER OF AN OFFSET PRINTING MACHINE

Karl-Heinz Seefried, Zuzenhausen, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Mar. 28, 1988, Ser. No. 174,091
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1987, 3710314; Mar. 2, 1988, 3806609
Int. Cl.[4] B41F *35/06*
U.S. Cl. 101—425 12 Claims



1. Washing device for washing the outer cylindrical surface of a blanket cylinder of an offset printing machine having a first washing roller for guiding a washing liquid to the blanket cylinder so as to loosen impurities thereon, the first washing roller being in rolling engagement with the blanket cylinder, at least during a washing operation a distributor roller for transferring the washing liquid to the first washing roller, the distributor roller being in rolling engagement with the first washing roller; an applicator device for controllably applying the washing liquid to the distributor roller; a second washing roller located beneath the first washing roller and being located downstream from the first washing roller as viewed in rotary direction of the blanket cylinder, the second washing roller being in contact with the blanket cylinder at least during the washing operation so as to carry away the loosened impurities from the blanket cylinder and a collecting tub for the washing liquid and the inpurities; comprising a tranmission system driveably connected to a driving pinion of the printing machine for driving the second washing roller in rotary direction of the blanket cylinder; the second washing roller having a cleaning covering thereon formed as a brush jacket, the second washing roller, at least during the washing operation, being in contact with the blanket cylinder at a first contact location and with the first washing roller at a second contact location, the blanket cylinder and the first washing roller during said contact with the second washing roller, respectively penetrating into said brush jacket.

4,841,863

SABOTED, LIGHT ARMOUR PENETRATOR ROUND WITH IMPROVED POWDER MIX

Tom J. Bourgeois, Tallahassee, Fla., assignor to Olin Corporation, Stamford, Conn.

Filed Apr. 19, 1985, Ser. No. 725,070
Int. Cl.[4] F42B *13/16*
U.S. Cl. 102—523 10 Claims

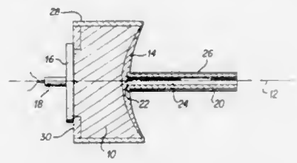
1. In a plastic-saboted small caliber ammunition round, having a hard metal core subcaliber core adapted to penetrate light armor, the improvement which comprises a propellant charge of unrolled spheroidal powder having a specific energy density of at least 350,000 ft/lbs./lb. with an average grain diameter within the range of from about 0.0100" up to about 0.0250", said round having a volumetric propellant charge loading density of at least 95%.

4,841,864

CONTROLLED EXPLOSIVELY FORMED PENETRATOR

Fred I. Grace, York, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 9, 1988, Ser. No. 157,424
Int. Cl.[4] F42B *1/02*
U.S. Cl. 102—307 19 Claims



1. Apparatus for explosively forming a penetrator, comprising:

an axis;

a metallic liner having a front side and a back side, said liner extending symmetrically about said axis and being concave in shape as viewed from the front side of the liner;

explosive means, disposed at the back side of the liner, for accelerating the liner in a forward axial direction and in an inward radial direction so that an outer portion of the liner

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is folded inwardly toward the axis to form said penetrator having net motion along the axis and

mandrel means including an outer surface extending symmetrically about and along the axis in front of the liner so that the liner being accelerated and folded by the explosive means impacts upon said outer surface of the mandrel means to form the penetrator.

4,841,865

SMOKE COMPOSITION AND METHOD OF MAKING SAME

Thomas Liberman, Montreal, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Continuation-in-part of Ser. No. 110,343, Nov. 10, 1987, abandoned. This application Mar. 23, 1988, Ser. No. 172,157
Claims priority, application Canada, Jun. 17, 1987, 539912
Int. Cl.[4] F42B *13/44*
U.S. Cl. 102—334 **31 Claims**

1. A composition for producing smoke from phosphorus vapor, the composition comprising a blended mixture of the following ingredients in the following weight percentage ranges:

red phosphorus—55% to 80%;

oxidizing agent selected from the group consisting of sodium nitrate and ammonium nitrate—10% to 30%;

metal fuel—5% to 10%;

acid absorber—1% to 5%; and

synthetic rubber binder—1% to 8%.

4,841,866

TRACER SHOTGUN SHELL

Delbert W. Miesner, 1375 Baker NE., Salem, Oreg. 97303

Filed Feb. 2, 1989, Ser. No. 305,071
Int. Cl.[4] F42B *7/00*
U.S. Cl. 102—458 **4 Claims**

1. A tracer shotgun shell, comprising:

a. a hollow cylindrical shell, having a base and a mouth;

b. a primer centrally positioned on said base, and propellant powder within said shell and adjacent to said base and primer;

c. a charge of shot, adjacent to said mouth;

d. a wad member substantially positioned within said shell between the propellant and charge of shot, said wad member including:

(1) a circular, powder-covering transverse base having a downwardly extending perimetric flange;

(2) a circular, shot supporting upper transverse section;

(3) a stem, which interconnects and spaces said powder-covering transverse base and said shot-supporting upper transverse section;

(4) a tracer element mounting platform formed on said shot supporting upper transverse section and extending into said charge of shot, said platform being of sufficiently less diameter that the shot-supporting upper transverse section to permit shot to transversely encircle said platform;

(5) said tracer element mounting platform including a central concave depression; and

(6) an ignition passage extending through the powder-covering transverse base, the stem and the shot-supporting upper transverse section and its tracer element mounting platform, and penetrating said concave depression;

e. a tracer element comprising a ball with a cylindrically shaped tail radially extending therefrom, with:

(1) a hole formed centrally through the tail and into the ball so as to form a cavity which extends past the center of the ball; and

(2) an igniter compoud positioned centrally within the ball in said cavity;

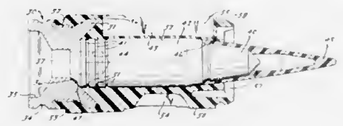
f. where the tail of the tracer element fits within the ignition passage, the surface of the ball adjacent to the tail fits closely within the concave depression of the tracer element mounting platform, and the portion of the tracer element opposing the tail extends on the mounting platform into the charge of shot.

4,841,867

DISCARDING SABOT PROJECTILE

Harold E. Garrett, Santa Anna, Calif., assignor to Ford Aerospace Corporation, Newport Beach, Calif.

Filed Dec. 28, 1987, Ser. No. 138,256
Int. Cl.[4] F42B *13/16*
U.S. Cl. 102—520 **9 Claims**



1. A discarding sabot projectile comprising:

a subcaliber projectile having a generally cylindrically shaped mid-section, a generally aerodynamic forward section and an aft section having a rearwardly tapering frustro-conical extension;

a unitary discarding sabot means for providing a full caliber carrier for said projectile, said discarding sabot means surrounding said projectible circumferentially, extending longitudinally over at least a major portion of said mid-section thereof and incorporating a rotating band unitary with said discarding sabot means;

a discarding sabot base axially aligned with said projectile and disposed aft thereof, comprising a forwardly opening frustro-conical recess concentric with said sabot base and wiht said projectile, in which opening nests said rearwardly tapering frusto-conical extension of said aft section of said projectile, said sabot base being free of direct positive coupling to said projectile, and having no cylindrical recess receiving a cylindrical portion of said projectile;

sabot/projectile coupling means for direct connection of said discarding sabot means to said projectile to prevent axially forward displacement of said projectile relative said sabot; and

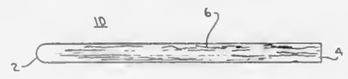
sabot/base coupling means for direct positive connection of said discarding sabot means to said sabot base to prevent axial displacement of said sabot base relative said discarding sabot means and to lock said projectible in position within them.

4,841,868

COMPOSITE LONG ROD PENETRATOR

Raymond P. Jackson, West Chester, Pa., assignor to The United States of America as represented by the Secretary of The Army, Washington, D.C.

Filed Jun. 30, 1988, Ser. No. 215,695
Int. Cl.[4] F42B *11/14*
U.S. Cl. 102—517 **13 Claims**



1. A composite long rod penetrator comprising:

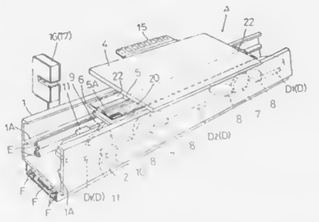
a long rod having a forward ogive end and an aft end, said long rod formed of a metal composite material and a plurality of reinforcing filaments, said reinforcing filaments disposed throughout said long rod increasing in volume percent from the forward ogive end towards the aft end for creating a longitudinal hardness gradient in said long rod that increases in hardness from a minimum value at the forward ogive end to a maximum value at the aft end.

4,841,869

CONVEYOR SYSTEM UTILIZING LINEAR MOTOR

Toshiyuki Takeuchi, and Masayuki Tsuneta, both of Kumaki, Japan, assignors to Daifuki, Co., Ltd., Osaka, Japan

Continuation of Ser. No. 7,117, Jan. 27, 1987, abandoned. This application Dec. 9, 1988, Ser. No. 283,269
Claims priority, application Japan, Jan. 27, 1986, 61-14928; Nov. 29, 1986, 62-285162
Int. Cl.[4] G05B *11/00*
U.S. Cl. 104—292 **13 Claims**



1. A conveyor system utilizing a linear motor, comprising;

a conveyor cart (A) including a pair of propelling wheels for supporting the same,

a guide rail (B) for movably supporting said conveyor cart (A),

a linear motor including,

primary coil means (C) mounted on said guide rail (B), and

a conductor (D) mounted on said conveyor cart (A) and horizontally opposed to said primary coil means (C),

wherein said conveyor cart (A) includes at lateral sides thereof a plurality of rollers (8), said rollers (8) being placed in rotatable contact with a horizontal face of said guide rail (B) for following horizontal flextion of the same

wherein said guide rail (B) is an integral structure including side walls interspersed with a constant distance therebetween for outwardly contacting said plurality of rollers (8), a rail portion (1A) for supporting said propelling wheels (7) against inner faces of said side walls and a bottom portion for supporting said primary coil (C), and

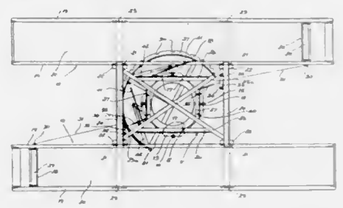
wherein said conductor (D) includes conductor portions (D1, D2) formed continuously with each other and horizontally flexes by a pivot mechanism, said conductor (D) together with said rollers (8) horizontally flexing to follow the horizontal flextion of said guide rail (B).

4,841,870

MOTOR VEHICLE TURNTABLE

Kenneth G. Coles, Sydney, Australia, assignor to K.G. Coles & Co. Pty. Limited, Australia

PCT No. PCT/AU86/00117, § 371 Date Dec. 5, 1986, § 102(e) Date Dec. 5, 1986, PCT Pub. No. WO86/06336, PCT Pub. Date Nov. 6, 1986
PCT Filed Apr. 30, 1986, Ser. No. 3,426
Claims priority, application Australia, May 2, 1985, PH0402
Int. Cl.[4] B60S *13/02*
U.S. Cl. 104—44 **9 Claims**



1. A motor vehicle turntable comprising rotatable vehicle support means the axis of rotation of which is inclined relative to othogonal vertical planes and brake means for arresting the rotation of said turntable, characterized in that said brake means comprises detent engagement means at spaced arcuately disposed locations concentric with said axis, said engagement means being slots formed at spaced intervals around the periphery of an arcuate member that is mounted for limited rotation about said axis, and detent means rotating with the turntable for braking engagement with said engagement means, said detent means comprising two lug means for engaging said slots, said lug means being diagonally opposite each other and mounted on levers which are spring biased toward said arcuate members.

4,841,871

MODULAR TRANSPORTATION SYSTEM WITH AERODYNAMIC LIFT AUGMENTED TRACTION VEHICLES

Martin N. Leibowitz, 11600 Audelia Rd., #187, Dallas, Tex. 75243

Filed Apr. 19, 1984, Ser. No. 601,989
Int. Cl.[4] B61B *13/08;* **E01B** *25/22*
U.S. Cl. **104—23.1** **10 Claims**

1. An elevated monorail transport system including at least a main trackway adapted to support a plurality of vehicles for traversal along said trackway, said vehicles each comprising traction carriage means including support wheels for supporting said vehicle on said trackway, propulsion motor means and propulsion wheel means continuously engaged with a portion of said trackway for propelling said vehicle along said trackway, said vehicle also comprising a body connected to said traction carriage means and having an aerodynamic lift surface formed thereon for providing lift forces during traversal of said vehicle along said trackway to reduce friction forces acting on said support wheels and vehicle induced structural loading on said trackway, said vehicle includes means for biasing said propulsion wheel means in engagement with said trackway during the lifting process of the vehicle with respect to said trackway, said trackway comprises means forming a continuous channel shaped member including a top web, opposed flanges, and opposed bottom webs defining a slot between said bottom webs, and said traction support wheels

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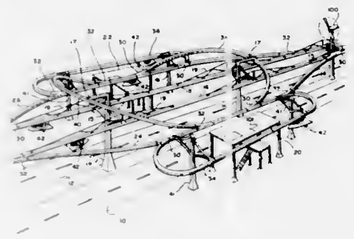
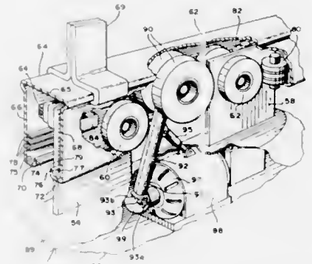
comprise a pair of spaced apart support wheel assemblies engageable with said bottom webs for supporting said vehicle on said trackway, and said traction wheel means is supported on said vehicle for continuous engagement with said top web for propelling said vehicle along said trackway.

6. An elevated monorail transport system including a main trackway adapted to support a plurality of vehicles for traversal along said trackway, said trackway comprising opposed parallel mainline track sections supported on spaced apart support towers, vehicle embarkation and disembarkation stations including a closed loop storage trackway section connected to said mainline track sections, respectively, for storing unused vehicles, and a continuous siding interconnecting each of said mainline track sections with said storage track sections at said stations.



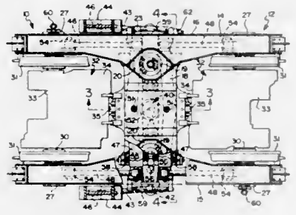


4,841,873

RAILWAY LOCOMOTIVE AND STABILIZED SELF STEERING TRUCK THEREFOR

David J. Goding, Palos Park, and Mostafa Rassaian, Westchester, both of Ill., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 3, 1987, Ser. No. 10,365
Int. Cl.[4] B61F 5/38
U.S. Cl. 105—168 11 Claims



8. A self steering railway truck comprising

a pair of wheel supported axles,

a frame carried by said axles through resilient suspension means nominally urging the axles into centered positions for motion along straight track but permitting yawing for movement along curved track,

force transmitting linkage connecting the axles with the frame and otherwise free from connection with an associated carbody to allow self steering of the axles while carrying longitudinal forces between the axles and the frame, and

resilient stabilizers disposed between the force transmitting linkage and the frame and operatively acting between the frame and the axles to supplementally urge the axles toward their centered positions at least when their yawing exceeds a predetermined degree, said stabilizers being sufficiently yieldable to allow predetermined yawing action of the axles under under curving forces developed during operation on curved track but sufficiently stiff to limit yawing action of the axles due to unstable hunting forces developed during operation on straight track.

4,841,872

RAILWAY TRAIN OF HIGHWAY VEHICLES, AND COMPONENTS THEREFOR

Harry O. Wicks, and Monte P. Kiefer both of Hamburg, N.Y., assignors to Railmaster System, Inc., Hamburg, N.Y.

Continuation-in-part of Ser. No. 740,650, Jun. 3, 1985, Pat. No. 4,669,391, which is a continuation-in-part of Ser. No. 469,215, Feb. 24, 1983, abandoned. This application Jun. 19, 1986, Ser. No. 876,248
Int. Cl.[4] B61D 3/12
U.S. Cl. 105—4.3 44 Claims

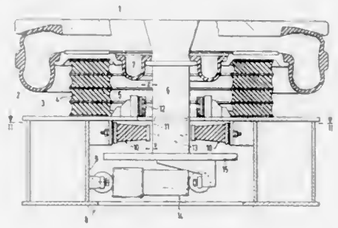
1. An improved railway train of highway trailers including leading and following trailers which are interconnected to each other, adjacent ends of said highway trailers being supported solely by railtruck assemblies, each of said highway trailers including a body, a forwardly extending load supporting tongue, rear tongue coupling means which receives and is removably coupled to the forward end of the forwardly extending tongue of an adjacent highway trailer and rear receiving means removably coupled to a load bearing portion of a railtruck assembly, and each of the railtruck assemblies including an intermodal adapter and a railtruck having longitudinally extending said frames and a transversely extending bolster supported on said side frames, the intermodal adapter being supported on said bolster for limited rotational movement about a generally vertically extension axis; characterized by said intermodal adapter being provided with first and second locating portions symmetrical about said axis and first and second coupling means also symmetrical about said axis, the first locating portion being received within said rear receiving means and being coupled thereto by said first coupling means, the second locating portion and second coupling means being provided so that after a railtruck assembly is disconnected from a leading trailer disposed to one side of the bolster, it may be coupled to a leading trailer disposed to the other side of the bolster.

4,841,874

PNEUMATIC-SPRING BOGIE

Rudolf Weigel, Markt Erlbach, Fed. Rep. of Germany, assignor to Man Gutteboffnungshütte GmbH, Oberhausen, Fed. Rep. of Germany

Filed Jan. 20, 1988, Ser. No. 145,893
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1987, 3701424
Int. Cl.[4] B61F 3/08
U.S. Cl. 105—199.4 10 Claims



1. In a pneumatic-spring bogie, particularly for high-speed rail vehicles, in which a car is mounted on a transverse member of a bogie frame via a pneumatic air or spring bellows that is disposed concentrically about an axis of rotation of the pneumatic-spring bogie, with the car being secured against rolling by a support which is mounted horizontally in longitudinal members of the bogie frame, transverse to the direction of travel, and is rotatable, with the ends thereof being fixedly secured to the longitudinal members of the car via levers and vertical hinged supports, the improvement therewith wherein:

said car is further connected to said transverse member of said bogie frame via a bogie pin, a vibration damping member, and a drive device, with said bogie pin having two ends, one connected to said car and the other to said damping member, which is in turn connected to said transverse member, and with said drive device comprising first and second rubber buffers as well as first and second fixed abutments, with said rubber buffers and said fixed abutments being spaced from said bogie pin by given clearances; said transverse member being provided with a recess into which said bogie pin extends, said transverse member being disposed higher as a result of said longitudinal members and therefore a pitch point of the bogie can be placed at a height between said buffers and the vibration damping member to avoid stimulation of any pitching motion of the bogie and consequently to avoid dreaded superposition of pitching frequency of the bogie on bending frequencies of the car.

4,841,875

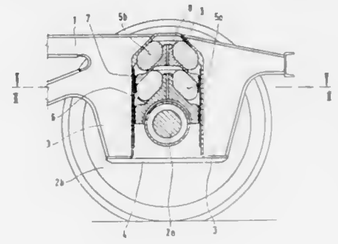
SUSPENSION ARRANGEMENT FOR RAIL VEHICLES

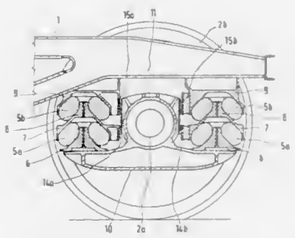
Leonard Corsten, Herzogenrath, Fed. Rep. of Germany; Franz-Joseph Collienne, Eupen, Belgium, and Johannes Nicolin, Aachen, Fed. Rep. of Germany, assignors to Waggonfabrik Talbot, Aachen, Fed. Rep. of Germany

Filed Feb. 25, 1987, Ser. No. 18,612
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1986, 3606325
Int. Cl.[4] B61F 5/30
U.S. Cl. 105—224.05 8 Claims

1. A multi-stage spring suspension arrangement for rail vehicles having at least two resilient-roll spring means arranged superimposed and having a main spring direction of shock absorption along which a spring deflection exists although permitting an adjustability of the arrangement for shock absorption movement in longitudinal and transverse directions of a vehicle, the improvement in combination therewith comprising:

at least one pair of superimposed elastomeric shock absorbers, having bell-shaped and mandrel parts spaced relative to each other as well as spaced relative to said resilient-roll spring means located in axial relationship with conical surfaces of said bell shaped and mandrel parts being parallel and having a first elastomeric shock absorber disposed between a first mandrel and a first bell-shaped member, and a second elastomeric shock absorber disposed between a second mandrel and a second bell-shaped member, with said first bell-shaped member and said second mandrel being disposed between said first and second shock absorbers having an added series arrangement of elasticity via twisting-rotational distortion in said elastomeric shock absorbers via said mandrels collectively having much softer elasticity in the transverse direction than compressive elasticity thereof during linear movement in said main spring direction of shock absorption and being interconnected to carry out not only a movement in the main spring direction of shock absorption, but also additionally to carry out a pendulum movement about any axis





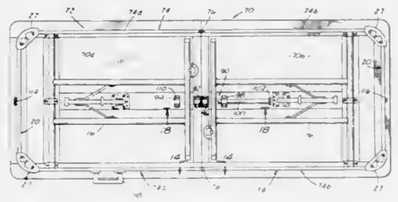
disposed transverse to said main spring direction of shock absorption, said first mandrel being embodied independently of said second mandrel to carry out a translatory movement and also a rotational movement since said mandrels are arranged independently of each other to permit shifting displacement thereof as is true also for said first and second bell-shaped members relative to each other although being coupled to permit linear movement in said main spring direction of shock absorption as well as to permit said bell-shaped and mandrel parts being arranged to carry out said pendulum movement around an axis located transverse to the main direction of shock absorption while said first bell-shaped member and said second bell-shaped member are subjected to a parallel shifting displacement upon encountering horizontal forces as well as longitudinal forces during the twisting-rotational distortion permitted by the arrangement via the elastomeric shock absorbers during the shock absorption movement of the vehicle in the longitudinal and transverse directions of the vehicle.

4,841,876
RAILROAD CONTAINER TRANSPORTING CAR OF INCREASED WEIGHT CARRYING CAPACITY
Harold E. Gramse; Richard E. Jamrozy, both of Lansing, Ill., and James M. Wilczynski, Highland, Ind., assignors to Thrall Car Manufacturing Company, Chicago Heights, Ill.
Filed May 27, 1988, Ser. No. 199,464
Int. Cl.[4] B61D 17/00
U.S. Cl. 105—406.1 **36 Claims**

16. A railroad car for transporting a horizontal shipping container comprising:
first and second railroad trucks supporting opposite ends of a railroad car body;
the car body having a well portion, defined in part by low longitudinal side walls and lateral end walls, which supports one or more horizontal longitudinally positioned containers;
a stub center sill at each end of the car body;
each stub center sill being joined at one end to an adjacent well end wall with the other end of the stub center sill having coupler means to couple the car to another car to make up a train;
each stub center sill having a pair of spaced apart substantially identical side walls, each of said side walls having a bottom edge extending forward from near the well end wall for a distance substantially less than the length of the stub center sill wall and terminating in an upwardly extending inner edge, a front end extending downward for a distance substantially less than the height of the stub center sill side wall and terminating in a rearwardly extending central edge, and an arced edge extending from the central edge to the inner edge;
a vertical web spaced between the stub center sill side walls;
a plate between and joined to the stub center sill side walls and joined to the vertical web top portion;
a substantially horizontal plate, joined to the stub center sill side walls and the vertical web, adjacent the bottom edge; and
a one piece curved angle plate joined to the vertical inner edges, the rearwardly extending central edges and the arced edges of the stub center sill side walls.

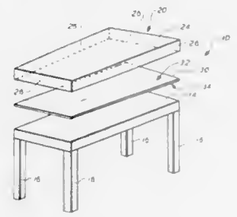
4,841,877
TABLE
Julian A. Virtue, Los Angeles, Calif., assignor to Virco Mfg. Corporation, Los Angeles, Calif.
Continuation-in-part of Ser. No. 918,486, Oct. 14, 1986, Pat. No. 4,727,816. This application Feb. 25, 1988, Ser. No. 160,136
The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.
Int. Cl.[4] A47B 3/00, 7/00
U.S. Cl. 108—36 **5 Claims**

1. A table construction, comprising:
(a) a generally planar top having first and second portions; and
(b) an apron assembly connected to said top, comprising:
(i) a first elongated angle end member connected to said first portion of said top, a second elongated angle end member connected to said second portion of said top each said first and second end member having a base and a generally perpendicularly extending wall connected to said base, said wall having end portions terminating in a curved lower edge portion; said edge portion being generally circular in cross-section:
(ii) two elongated angle side members each having a base and a generally perpendicularly extending wall connected to said base, said wall having end portions terminating in a curved lower edge portion; said edge portion being generally circular in cross-section, each said side members comprising first and second portions, said first portion being connected to said first portion of said top and said second portions being connected to said second portion of said top;
(iii) four one-piece, injection molded corner members attached to said planar top, each having a top wall, a spaced apart bottom wall, external side walls interconnecting said top and bottom walls, said external walls being provided with at least two vertically extending



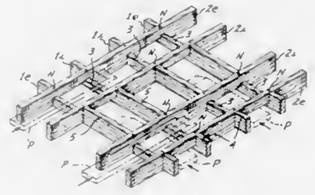
key-hole shaped slots adapted to closely receive said end portions of said walls of said elongated angle end and side members, internal side walls spaced from said external walls, and reinforcing means connected to said internal walls for structurally reinforcing said internal walls said reinforcing means comprising a plurality of wall members disposed intermediate said external side walls and said internal side walls; and
(iv) first hinge means for hingably interconnecting said first and second portions of said side members whereby said first and second portions of said top can be pivoted relative to one another from a first generally planar configuration into a folded configuration.

4,841,878
FURNITURE WITH APPEARANCE CHANGEABLE TOP
Elliot Kriegsman, 314 Chatterton Pkwy., Hartsdale, N.Y. 10530
Continuation of Ser. No. 580,344, Feb. 15, 1984, abandoned. This application Aug. 17, 1987, Ser. No. 87,996
Int. Cl.[4] A47B 13/08
U.S. Cl. 108—90 **2 Claims**



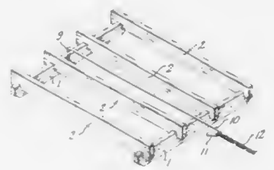
1. An item of furniture comprising:
(a) a tabletop substantially rectangular in configuration and having a plane surface, said surface having thickness defined by an undersurface and forming a base for said furniture;
(b) a plurality of legs coupled to and extending from said undersurface of said table top said legs positioned at the corners of said table top for supporting said table top from the floor;
(c) cover means having a plane surface and depending sides extending from said plane surface, said cover means of a size and configuration proximating and fitting over said table top said depending sides of a length for substantially covering said thickness of said table top, said cover means being formed from clear material;
(d) insert means having first and second surfaces and being of a size and configuration for covering said plane surface of said table top and having a thickness so that said insert means fits between said cover means and said plane surface of said table top when said cover means is positioned on said table top and
(e) said cover means being unattached and readily removable from said table top by lifting said cover means there from for permitting reversing said insert means for changing the surface of said insert means exposed through said clear material of said cover means, for changing the appearance of the surface of said table top.

4,841,879
FOUR-WAY SKELETON PALLET
Stewart Ferguson, P.O. Box 376, Pacific Beach, Wash. 98571
Continuation-in-part of Ser. No. 486,585, Apr. 19, 1983. This application Jul. 13, 1988, Ser. No. 218,746
Int. Cl.[4] B65D 19/00
U.S. Cl. 108—51.1 **10 Claims**



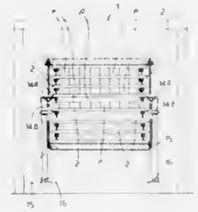
1. A skeleton stringer pallet comprising two sets of stringers crossing orthogonally, one of the stringers of a first set of stringers having upper and lower edges and one of said edges having a forkway notch therein which is elongated lengthwise of said one stringer and has two end portions and a central portion therebetween, a crossing stringer of the other set of stringers being received in one of said end portions of said forkway notch so that an upright face of said crossing stringer is exposed to the central portion of said forkway notch and said upright face serves as a guide for a forklift prong inserted into said central portion of said forkway notch.

4,841,880
SKELETON FOUR-WAY PALLET
Stewart Ferguson, P.O. Box 376, Pacific Beach, Wash. 98571
Filed Apr. 19, 1983, Ser. No. 486,585
Int. Cl.[4] B65D 19/31
U.S. Cl. 108—51.1 **10 Claims**



1. A four-way skeleton wooden pallet having four sides each constructed to receive the horizontally-projecting load-lifting fork of a forklift consisting of only two courses of beams, one course being a lower course having a plurality of wooden parallel lower base beams including spaced side beams disposed so that their lower edges for resting on a supporting surface are in a bottom plane, and the other course being an upper course having several wooden parallel upper load-supporting beams including beams disposed so that their upper edges are in a top plane, said upper load-supporting beams crossing said lower base beams mutually perpendicularly, and interfitted notched joint means connecting the lower edge portions of said upper load-supporting beams and upper edge portions of said lower base beams at their crossing locations, the widths of said lower base beams being greater than their thicknesses, and said lower base beams being arranged on edge with their widths vertical and located by said notched joint means with the major portion of such widths lower than the lower edges of said upper load-supporting beams to provide room for insertion of the load-lifting fork between said spaced side beams, below the entire lower edges of said upper load-supporting beams and above said bottom plane of said spaced side lower base beams lower edges, the widths of said upper load-supporting beams being greater than their thicknesses, and said upper load-supporting beams being arranged on edge with their widths vertical and located by said notched joint means with the major portion of such widths higher than the upper edges of said lower base beams to provide room for insertion of the load-lifting fork above the entire upper edges of said lower base beams and below said top plane of said upper load-supporting beams upper edges.

4,841,881
"DEVICE FOR SPACING APART, AT DESIRED DISTANCES, THE REFRIGERATING PLATES, IN HORIZONTAL PLATE FREEZERS"
Guido Battistella, Milan, Italy, assignor to Stal Samifi S.P.A., Italy
Filed Aug. 13, 1987, Ser. No. 84,898
Int. Cl.[4] A47B 3/08
U.S. Cl. 108—91 **12 Claims**



1. Device for spacing apart plates from one another at discrete distances, such as freezing/refrigerating plates in a horizontal plate freezer/refrigerator, comprising the combination of
at least one spacer for maintaining adjacent plates at a spaced apart, discrete distance, and
a seat provided on a lower surface of an upper plate of the adjacent plates when the plates are assembled in the stack, for receiving said spacer,
said seat comprising an opening arranged therein to face downwardly towards a lower plate of the adjacent plates when the plates are assembled in the stack, and
means for preventing separation of said spacer from said seat due to gravity when said spacer is received by said seat,
wherein said seat is formed by two substantially parallel-extending protrusions extending downwardly towards the lower plate when the plates are stacked and also extending in a substantially longitudinal direction thereof,

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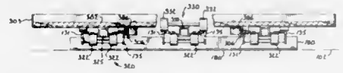
with said seat opening defined between inner surfaces of said protrusions facing one another,
said means comprise said seat being provided with a shaped engagement tooth extending therealong, and
said spacer comprising a shaped groove extending along a side thereof over the substantially longitudinal direction thereof,
said respective tooth and groove being shaped to mate with one another when said spacer is received in said seat, and
said tooth being positioned on one of said inner surfaces of said protrusions,
said protrusions define an inner area of said seat closest to said plate which is shaped to contact said spacer when the same is received in said seat, and
each said protrusion comprises an outer area situated on an opposite side of said inner area from said plate, and shaped to define a recess between the same and said spacer when said spacer is received in said seat,
whereby area of contact between said spacer and seat is minimized and water can drain out of said seat.

4,841,882
ARTICLES OF FOLDABLE FURNITURE
Ernest W. Ehrman, 444 E. 82nd St., New York, N.Y. 10028
Filed Aug. 18, 1988, Ser. No. 233,587
Int. Cl.[4] A47B 3/00
U.S. Cl. 108—115 **6 Claims**

1. A unitary blank having an initial unfolded configuration in the form of a substantially flat sheet and manipulatable to convert said flat sheet to a folded configuration in which said unitary blank self-interlocking by forms a complete assembled article of furniture having a flat top and at least three legs, said blank comprising:
(a) a central portion for defining the article top and having a peripheral edge; and
(b) at least three panels which project radially outwardly from said central portion of said blank in its initial unfolded configuration, each said panel defining a leg of said article in the folded configuration of said blank and comprising
(i) a region having a first edge contiguous with said peripheral edge of said central portion of the blank, a second edge disposed substantially parallel to said first edge, and two side edges, said region being foldable along said first edge relative to said central portion of the blank,
(ii) a lock flap extending from said second edge of said region, said lock flap having at least two lock notches and being foldable along said second edge relative to said region, and
(iii) a pair of members, each said member extending from a respective one of said side edges and sharing a common edge with one of said members of an adjacently-disposed one of said panels, adjacently-disposed ones of said members being relatively foldable about said shared common edge, each said member further comprising a notch engageable, in the folded configuration of said blank, for concurrent interlocking relationship with one of said lock notches of the respective panel and with one of said lock notches of an adjacently-disposed one of said panels;
whereby to convert said blank from said initial unfolded configuration to said folded configuration each of said regions is folded relative to said central portion along said first edge to bring adjacently-disposed ones of said members into substantial abutment and said notches of said adjacently-disposed members into substantial relative abutment, and each said lock flap is folded relative to said region along said second edge and so that each said lock notch is received in interlocking engagement with said notch of at least an adjacently-disposed one of said panels, each of said legs thus formed from said panels being thereby interlocked one to another so that said unitary blank self-interlockingly defines a complete assembled article of furniture.

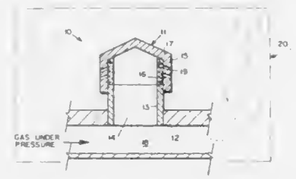
4,841,883
SHIFTABLE TRUCK BED
Charlie Kukovich, Jr., R.R. 1 Box 62A, Mulberry, Kans. 66756
Filed Oct. 23, 1987, Ser. No. 112,684
Int. Cl.[4] B65G 67/02
U.S. Cl. 108—137 **27 Claims**



1. A slidable platform assembly for placement atop a load supporting surface comprising:
at least one track mounted on said surface and extending in the direction of slidable movement, each track comprising;
a first rail having a generally vertical wall and a top wall extending therefrom;
a second rail having a generally vertical wall and a top wall extending therefrom, said first rail positioned adjacent said second rail with said walls presenting a channel therebetween;
a load supporting platform for movement along said track;
roller means for mounting said load supporting platform to said track in slidable movement therealong, said roller means comprising;
a first roller assembly connected to said platform for rolling movement along said channel of said track;
a second roller assembly connected to said platform for rolling movement along said top walls of said track rails upon placement of said platform thereon;
a third roller assembly mounted to said track for rolling contact with an underside surface of said platform upon placement of said platform on said track; and
releasable locking means extending between said platform and said track and having a first locked mode for precluding said rolling movement of said roller assemblies in a selected direction for maintaining said platform atop said track in a desired position relative to said track and a second unlocked mode allowing for rolling movement of said roller assemblies along the extent of said track.

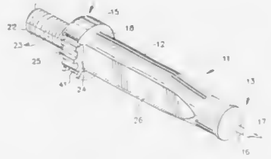
4,841,884
DISTRIBUTOR PLATE FOR FLUIDIZED BED REACTOR
Folke Engstrom, San Diego, Calif., and Reijo Kuivalainen, Karhula, Finland, assignors to A. Ahlstrom Corporation, Karhula, Finland
Filed May 26, 1988, Ser. No. 200,683
Int. Cl.[4] F23H 3/00
U.S. Cl. 110—298 **22 Claims**

1. A fluidized bed reactor containing a mass of fine particles, and in its lower part a dispersion plate having a plurality of injection nozzles through which fluidizing gas is distributed from a windbox into the reactor, at least some of said injection nozzles comprising:
an uppermost part of high heat and wear resistant material, on which the mass of particles would rest, being partially supported thereby, if the particles were subjected only to gravitational action, said uppermost part overlying any passageway from said windbox;



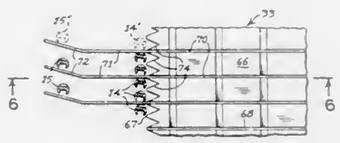
means defining at least one opening in each injection nozzle through which fluidizing gas passes between said upper part and said windbox; and
solid means substantially abutting said means for defining each said opening for allowing passage of gas therethrough but preventing passage of the particles therethrough.

4,841,885
ADJUSTABLE LENGTH NEEDLE IMPLEMENT
Michael Santino, San Marcos, Calif., assignor to The Special Touch, San Marcos, Calif.
Filed Oct. 25, 1988, Ser. No. 262,521
Int. Cl.[4] D05C 15/06
U.S. Cl. 112—80.03 **12 Claims**



1. An adjustable length thread carrying needle assembly comprising:
an elongated housing having a needle end, a rear end and an axis extending through said housing and both said ends, said housing having an internal generally cylindrical cavity extending from a point spaced rearwardly from said needle end and opening outwardly at said rear end;
an internally threaded nut mounted at said rear end for rotation with respect to said housing;
elongated needle retaining means having a threaded outer cylindrical surface, said threaded surface being engageable by said threads in said nut, said needle retaining means being adapted to removably retain a needle element comprising a needle which may be fully retracted within said housing; and
means on the inside of said housing and mating means on said needle retaining means for preventing relative rotation of said housing and said needle retaining means;
whereby rotation of said nut causes longitudinal movement of said needle retaining means within said housing to selectively adjust the length of said needle projecting outwardly from the needle end of said housing.

4,841,886
NEEDLE PLATE FOR DOUBLE NEEDLE BAR LOOP PILE TUFTING APPARATUS
Charles W. Watkins, Ooltewah, Tenn., assignor to Tuftco Corporation, Chattanooga, Tenn.
Filed Nov. 14, 1988, Ser. No. 270,241
Int. Cl.[4] D05C 15/08
U.S. Cl. 112—80.3 **9 Claims**

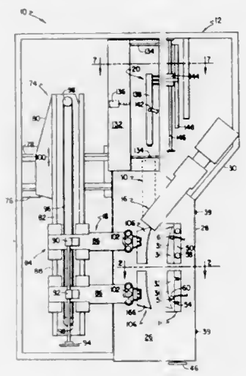


1. In a multiple needle tufting machine including a front transverse row of reciprocable front needles having a front needle gauge, and a rear transverse row of reciprocable rear needles having a rear needle gauge and spaced rearwardly of said front needles, each front and rear needle having a vertical reciprocable path and being adapted to carry yarn through a base fabric movable longitudinally through the machine, and a looper hook for each needle having a bill for seizing and forming a loop in each yarn carried through the base fabric by the corresponding needle, fabric support means for supporting the base fabric between the needles and the looper hooks, comprising:
(a) a needle plate having a longitudinal dimension and a transverse dimension and a free transverse edge portion,
(b) means supporting said needle plate so that said free edge portion extends transversely of the machine and closely adjacent the reciprocable paths of the transverse row of said front needles,
(c) a plurality of finger members mounted in said needle plate, each finger member projecting rearward from said free edge portion,
(d) each said finger member terminating in a rear end behind said rear transverse row of rear needles,
(e) each pair of said finger members having a uniform transverse spacing equal to twice the needle gauge of said transverse row of needles having the narrower needle gauge of both said transverse rows, and
(f) said finger members projecting rearwardly between every other pair of needles having said narrower needle gauge, said needle fingers extending rearwardly between the needles in said other transverse row of needles.

4,841,887
SEMI-AUTOMATIC SEWING STATION
Fernando del Castillo, Brownsville, Tex., assignor to Ideal Equipment Co., Ltd., Montreal, Canada
Filed Sep. 27, 1988, Ser. No. 250,253
Int. Cl.[4] D05B 21/00, 33/00
U.S. Cl. 112—121.12 **15 Claims**

1. A sewing station comprising
a table having, a generally planar section;
a loading guide having a recess for receiving a fabric blank therein;
means mounting the loading guide above the table section for movement between a loading position juxtaposed to the table and a removal position spaced from the table;
a sewing head having a reciprocable sewing needle defining a sewing location on the table;
means for sliding the fabric blank on the table section from the loading guide to the sewing location including
a positioner having a movable member;
a presser arm in the shape of the recess and sized to fit the loading guide recess for pushing the fabric blank against

the table section and sliding the fabric blank on the table section in response to movement of the movable member



after the loading guide is moved to the removal position; and

means mounting the presser arm on the movable member.

4,841,888

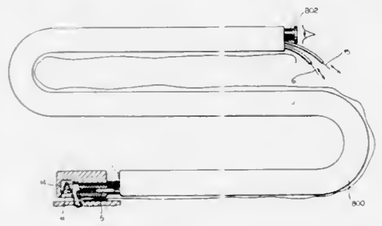
SEWING MACHINE

Timothy N. Mills, Flat 4, 45 Newman Street, London W.1., and Christopher P. Swain, 52 Gloucester Avenue, London NW1 8JD, both of England

Continuation of Ser. No. 774,335, Sept. 10, 1985, abandoned. This application Nov. 19, 1987, Ser. No. 123,102

Int. Cl.[4] D05B *27/02*

U.S. Cl. 112—169 11 Claims



11. A sewing machine for forming stitches in a substrate, comprising thread-carrying means for passing a thread into the substrate from one side thereof at a first location and for withdrawing the thread from the substrate at a second location spaced from the first location, the said means being remotely operable solely from the said one side of the substrate, the machine being mounted on the end of an endoscope.

4,841,889

METHOD AND APPARATUS FOR MAKING CONTOUR SEAMS

Helmut Schips, St. Gallen, Switzerland, assignor to Schips AG Nahautomation, Tuebach, Switzerland

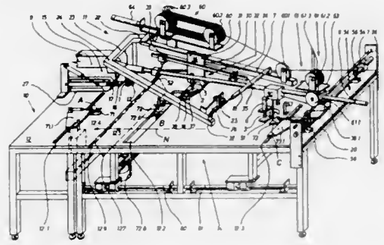
Filed Feb. 13, 1987, Ser. No. 14,448

Claims priority, application Switzerland, Feb. 17, 1986, 619/86

Int. Cl.[4] D05B *1/00*

U.S. Cl. 112—262.3 6 Claims

1. A method of making contour seams on material to be sewn, in particular elongated pieces of material to be sewn, wherein before the sewing operation, the material to be sewn is clamped in spread manner in sewing position at first, second and third gripping points provided along a contour line which is determined by a pattern of superimposed cut fabric edges of pieces of the material which are to be joined together, the first gripping point closest to the sewing-machine being stationary



and the second and third gripping points each being supported so as to be movable in a polar coordinate system, and wherein in at least part of the sewing operation, which is initiated in each particular case with simultaneous release of the material in the stationarily mounted first gripping point, the stitch chain is guided parallel to the contour line under opto-electronic control.

4,841,890

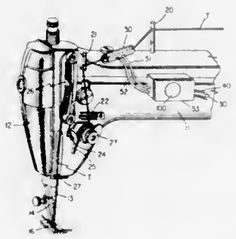
THREAD BREAK INDICATING DEVICE FOR SEWING MACHINES USING A PHOTO AMPLIFIER

Tibor L. Tancs, Roselle Park, N.J., assignor to SSMC Inc., Fairfield, N.J.

Filed May 23, 1988, Ser. No. 197,372

Int. Cl.[4] D05B *69/36*

U.S. Cl. 112—273 5 Claims



1. A sewing thread break indicator for a sewing machine comprising a photo amplifier delivering an output proportional to the intensity of light imput thereto, means for transmitting a beam of light to the imput of said photo amplifier, a guide for the sewing thread to be monitored, said guide defining a range of thread positions of varying influence on the intensity of said transmitted beam of light, and means responsive to uniformity in the output of said photo amplifier for signaling breakage of said sewing thread, said guide for the sewing thread including a thread accommodating tube with a polished light reflective interior, the internal diameter of said thread accommodating tube being sufficiently larger that said means for transmitting a beam of light to the imput of said photo amplifier as to define said range of thread positions of varying influence on said transmitted beam of light.

4,841,891

DATA PROCESSING DEVICE AND METHOD FOR A SEWING MACHINE

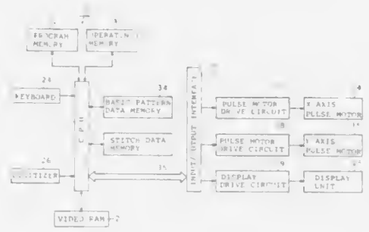
Miho Hashimoto, Fujisawa; Masaaki Yokoe, Nagoya; Yoshikazu Kurono, Hazu, and Koji Hayashi, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

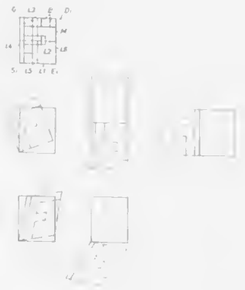
Filed Oct. 30, 1987, Ser. No. 115,058

Claims priority, application Japan, Nov. 13, 1986, 61-270613

Int. Cl.[4] D05B *21/00*

U.S. Cl. 112—262.3 15 Claims





9. In a data processing device for a sewing machine having stitch forming means, material holding means and driving means for effecting the relative movement between said stitch forming means and said material holding means based upon processed pattern data, a method for preparing stitch data and performing sewing operations in a single operating and calculating process, comprising the steps of:

storing a basic pattern data indicating the relative position between said stitch forming means and said material holding means, said basic pattern data including X and Y components of an X-Y coordinate plane;

designating a reference point on said X-Y coordinate plane;

designating two predetermined angles (αi, βi) respectively based on an X-axis and a Y-axis around said reference point;

rotating said X and Y components of said basic pattern data in accordance with said two predetermined angles (αi, βi) to form a transformed pattern; and

storing said transformed pattern so that the sewing machine can accurately and rapidly execute said transformed pattern by effecting corresponding relative movement between said stitch forming means and said material holding means.

4,841,892

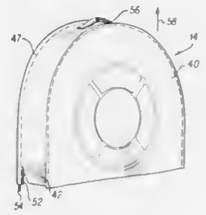
ARTICLE COVER AND SHELTER

Billy G. Pugh, Corpus Christi, Tex., assignor to Billy Pugh Co., Inc., Corpus Christi, Tex.

Filed Apr. 27, 1988, Ser. No. 186,934

Int. Cl.[4] B63C *9/22*

U.S. Cl. 114—190 9 Claims



1. A cover for a life ring, said life ring being detachably connected to a vertically disposed life ring support;

said cover having dimensions to shelter a face of said life ring, and said cover comprises a flat flexible sheet having a bottom edge and a flexible strip of material having first and second long edges, said first edge being secured to all edges of said sheet excluding the bottom edge thereof giving volume to said cover; and

a flexible elongated weight secured by the second long edge of said strip of material and being at least equal to the length of said strip of material.

4,841,893

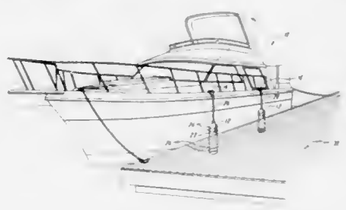
BOAT FENDER

Richard P. Ellison, Alexandria, Va., assignor to Boat America Corporation, Alexandria, Va.

Filed Mar. 18, 1988, Ser. No. 169,900

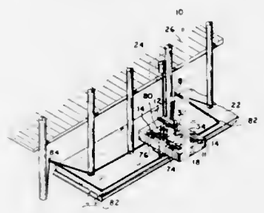
Int. Cl.[4] B63B *59/02*

U.S. Cl. 114—219 8 Claims



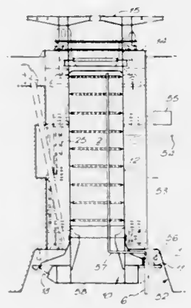
1. A fender having an elongated body portion with an elongated central region, and means for tethering one end thereof to a structure, said body portion including at least one circumferential exteriorally projecting ring at the tethered end thereof and at least one circumferential exteriorally projecting ring at the non-tethered end thereof, said elongated body being devoid of rings in the central region of said fender, thereby providing a spaced multi-point contact at said tethered and non-tethered ends with said structure when adjacent thereto, said exteriorally projecting rings projecting outwardly by an amount sufficient to provide a rolling and tracking motion of said fender over said structure substantially perpendicular to the direction of said tethering line when said fender is hung from said structure.

4,841,894
HULL CLEANER
Peter Nellessen, Jr., 7825 Normandy S., Miramar, Fla. 33023
Filed Mar. 2, 1988, Ser. No. 163,253
Int. Cl.[4] B63B *59/00*
U.S. Cl. 114—222 14 Claims



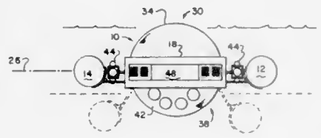
1. In a boat cleaning apparatus that may be active and inactive the combination comprising:
at least one pair of first brushes with pivotability, which brushes are horizontal when said apparatus is potentially active;
a trolley means for conveying said at least one pair of the first brushes, wherein said trolley means is adapted to hold said at least one pair of brushes against a symmetrical boat hull and move the brushes longitudinally along said boat hull,
biasing means included on said trolley means for variably forcing said at least one pair of first brushes against said hull wherein said biasing means includes chambers of variable buoyancy pressing said brushes against said hull by said variable buoyancy, and
at least one pair of second brushes with pivotability that are vertical when said cleaning apparatus is inactive also conveyed by said trolley means
whereby said boat hull may be cleaned without removing same from the water.

4,841,895
MOORING SYSTEM
Robert W. Brewerton, 4 Courtwood Drive, Sevenoaks, Kent, England
Filed Aug. 24, 1987, Ser. No. 88,672
Claims priority, application United Kingdom, Aug. 27, 1986, 8620694; Apr. 24, 1987, 8709721
Int. Cl.[4] B63B *21/52*
U.S. Cl. 114—230 22 Claims



22. A method of mooring a floating structure provided with a rotary turret that comprises a chimney portion extending upwardly into the floating structure from the underside thereof and a skirt around the periphery of the lower end of the chimney portion, a plurality of segmented mooring chains extending form the bed of a body of water to the skirt, chain stoppers for securing the chains to the skirt, hauling means on the floating structure for hauling the chains, guide means on the floating structure for guiding the chains from the skirt to the hauling means, upper main bearing means from which the chimney portion is rotatably suspended, and lower bearing means disposed around the lower periphery of the chimney portion, the method comprising the steps of
(i) connecting one of the chains such that it extends from the skirt through the guide means to the hauling means,
(ii) operating said hauling means,
(iii) securing the chain to the skirt with a said chain stopper, and
(iv) disconnecting the segmented chain line between the guide means and the skirt whereby to permit rotation of the floating structure relative to the turret.

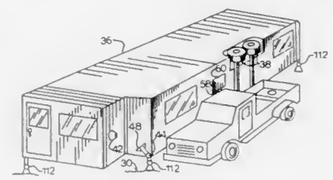
4,841,896
BEACH SUBMARINE
Tommy J. Fury, 1613 Colonial Pkwy., Clovis, N. Mex. 88101
Filed Apr. 26, 1988, Ser. No. 186,355
Int. Cl.[4] B63G *8/41*
U.S. Cl. 114—312 8 Claims



2. A submarine comprising in combination:
a. a body having a top canopy and a bottom closure member,
b. said body having a horizontal central plane,
c. a cylindrical ballast tank having and axis mounted on each side of the body on the center plane when in diving configuration,
d. flood means at least partially on the body for flooding and blowing the ballast tanks,
e. the ballast tanks having a beach configuration in which the ballast tanks are substantially lower than the body, and
f. strut means interconnecting the body and the ballast tanks for positioning the ballast tanks in either the diving configuration or the beach configuration.

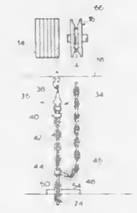
4,841,897
MOBILE HABITABLE CONTAINER
David H. Claflin, 1115 Jackson Ave., Wauconda, Ill. 60084
Filed Jan. 4, 1988, Ser. No. 140,776
Int. Cl.[4] B63C *13/00*; B60P *3/34*
U.S. Cl. 114—270 34 Claims

1. A mobile habitable container, said container to be functional in two mutually exclusive modes, the transformation between said modes requiring 90 degree rotation about an axis parallel to a longitudinal axis of said container comprising:
A. A set of highway wheels attached to one long side whose dimensions are less than or equal to maximum legal highway width X length;
B. A highway trailer mode as one of said two mutually exclusively modes conforming to all dimensional and weight limit restrictions for legal use on U.S. Highways without the need for an oversize permit;
C. A habitat mode as the other of said two mutually exclusive modes, in which a wide habitat width dimension is less than or equal to the maximum legal highway height dimension, in which said wide habitat's height dimension is less than or equal to the maximum legal highway width dimension and in which said wide habitat's length dimension is less than or equal to the maximum legal highway length dimension;



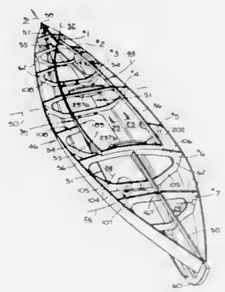
D. Means for rotating said container back and forth 90 degrees about an axis parallel to a longitudinal axis of said container the purpose of said 90 degree rotation to be to change back and forth between two said mutually exclusive modes; and
E. A composite outer shell for said container to be watertight and buoyant.

4,841,898
ANCHORING SYSTEM FOR FLOATING STRUCTURE
Ronald Ballantyne, Burlington, Canada, assignor to John T. Hepburn, Limited, Mississaugua, Canada
Filed May 8, 1986, Ser. No. 860,838
Claims priority, application Canada, May 10, 1985, 481239
The portion of the term of this patent subsequent to Apr. 27, 2005, has been disclaimed.
Int. Cl.[4] B63B *21/50*
U.S. Cl. 114—293 4 Claims



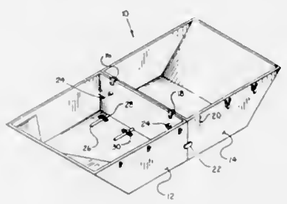
1. An anchoring system for a floating structure, comprising:
an anchor;
an anchor line including a chain cable connected to the anchor, a wire rope, and a connector joining the wire rope to a first length of lead chain;
a winch mounted on the floating structure for hauling in and paying out the wire rope;
a chain locker formed in the floating structure for storage of chain cable;
a windlass mounted on the structure for hauling in and paying out the chain cable, including a chain wheel and a second length of lead chain for leading the chain cable over the chain wheel to the chain locker;
an overwide chain link terminating the chain cable;
a first detachable link for connecting the first length of lead chain to the overwide chain link;
a second detachable link for connecting the second length of lead chain to the overwide chain link;
a fairlead sheave mounted on the floating structure for guiding the anchor line to and from the floating structure, the fairlead sheave having a wiring rope groove, and a chain groove formed about the wire rope groove, the chain groove being dimensioned to convey the chain links to the chain cable including the overwide link;
the chain wheel having a circumferential groove and paired whelps, one whelp of each pair on either side of the circumferential groove, defining pockets in the chain wheel, the circumferential groove having a depth sufficient to receive the overwide chain link when chain links attached to either side of the overwide chain link seat in the pockets of the chain wheel, the whelps being tapered sufficiently to permit the overwide link to ride within the pockets defined by the whelps when the chain links attached to either side of the overwide chain link extend into the circumferential groove.

4,841,899
KAYAK, FOLDING
Logan N. Fleckles, and Karen Fleckles, both of 576 S. Arlington Ave., Des Plaines, Ill. 60016
Filed Mar. 30, 1988, Ser. No. 175,300
Int. Cl.[4] B63B *35/71*
U.S. Cl. 114—347 28 Claims



1. A folding kayak wherein the following stated relationship between the elements thereof are determined by the position of the kayak in the water for use,
the kayak comprising,
a main frame and a hull, complementally shaped, and having a relatively broad beam and tapered to fore and aft ends of relatively sharp dimensions,
the hull being of flexible material, having a top opening and being otherwise continuous,
the main frame being separable at a position adjacent the middle longitudinally, forming fore and aft sections thereof,
the main frame sections being insertable into the hull at the respective ends of the hull, and detachably connectible together,
the main frame including logitudinal pieces extending nearly end-to-end of the main frame, stem pieces at the ends, and transverse ribs spaced longitudinally along the kayak,
the frame having a cockpit and the top opening in hull being in register with the cockpit, and
said longitudinal pieces including a keel,
the stem pieces being separate from the remainder of the frame and fitted to the respective ends of the keel and when so fitted held against displacement transversely but freely removable endwise from the keel, and the stem pieces being held in fitted positions by the gunwales which are interconnected to the ribs,
the keel including transversely spaced keel elements and floor boards above the keel elements,
the stem pieces having open ended longitudinal slots, which engage the respective floor boards and are interfitted thereby, and when so interfitted they are at substantially right angles to each other.

4,841,900
COMBINED BOAT AND CARTOP CARRIER
Jerzy Maselko, 1202 Trace Dr., #101, Austin, Tex. 78741
Filed Mar. 2, 1987, Ser. No. 20,710
Int. Cl.[4] B60R *9/04*; B63B *7/04*
U.S. Cl. 114—353 1 Claim



1. A new and improved foldable transportable boat and cartop carrier comprising:

boat means including first and second watertight boat sections hingedly attached together, thereby to permit relative movement therebetween; said first and second boat sections being movable into a first position to form a boat and into a second position to form a cartop carrier;

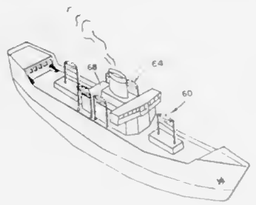
first connection means for securing said first and second boat sections in said first position including a plurality of threaded fasteners securable between said first and second boat section positioned remotely from a boat floor formed in said first and second sections said first connection means further including stiffening means comprising at least first and second slidable rods slidably secured to said boat floor in said first and second sections positionable through alinged aperatures in said first and second boat section when said boat is in said first position;

said stiffening means further including rigid bracket means to slidingly accept each of said slidable rods comprising a first plurality of rigid brackets slidingly accepting the first slidable rod therethrough when said boat is in said first position wherein said first plurality of brackets are directly secured to said boat floor with at least one bracket of said first plurality of rigid brackets secured in each of said first and second boat sections and a second plurality of rigid brackets slidingly accepting the second slidable rod therethrough when said boat is in said first position wherein said second plurality of brackets are directly secured to said boat floor with at least one bracket of said second plurality of rigid brackets secure in each of said first and second boat sections; said first and second plurality of rigid brackets configured to maintain said respective first and second slidable rods in contact with said bracket means and said boat floor when said first and second slidable rods are positioned through respective of said first and second plurality of brackets,

and second connection means for securing said first and second boat sections in said second position comprising at least one manually operable snap assembly positioned proximate a defined periphery of said first and second actions.

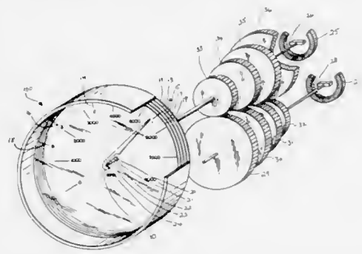
4,841,901
LIFE BOAT SUPPORT STRUCTURE
John J. McGlew, and John J. McGlew, Jr., both of Box 823 (E. Lake Rd.), Tuxedo Park, N.Y. 10987
Division of Ser. No. 268,160, May 29, 1981, Pat. No. 4,395,967.
This application Apr. 18, 1983, Ser. No. 486,098
Int. Cl.[4] B63B *23/10*
U.S. Cl. 114—370 9 Claims

1. A method of launching a lifeboat supported on the uppermost one of a plurality of support members which includes a lowermost one pivotally mounted over the deck of a ship and a plurality of other support members extending upwardly from the lowermost one and being pivotally interconnected together, comprising applying a force to pivot selected ones of any one of said support members relative to the others while blocking the pivotal connections of the others to maintain a



rigid interconnection of said others and so as to control the amount of lowering of the boat which is thereby effected as well as how much the boat will move outwardly of the lowermost support member.

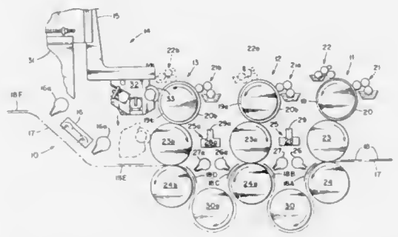
4,841,902
COMBINED SPEEDOMETER AND TACHOMETER
Daniel Gubin, P.O. Box 10, Coosada, Ala. 36020
Filed Sep. 19, 1986, Ser. No. 909,318
Int. Cl.[4] G01P *3/02*
U.S. Cl. 116—62.4 9 Claims



1. A combined tachometer and gear number indicator for a motor vehicle comprising a plurality of individual display means for separately representing engine speed and each gear number, and indicator means for simultaneously indicating both the engine speed and engaged gear number, wherein engine speed and each gear number are displayed on said individual separate display means, each said display means rotating independently of each of the other display means on an axis separate from and concentric with axes of each of the other display means, said indicator means simultaneously indicating, in a single viewing field, both the engine speed and engaged gear number.

4,841,903
COATING AND PRINTING APPARATUS INCLUDING AN INTERSTATION DRYER
John W. Bird, Westport, Conn., assignor to Birow, Inc., Westport, Conn.
Filed Jun. 24, 1987, Ser. No. 65,914
Int. Cl.[4] B05C *11/00*
U.S. Cl. 118—46 5 Claims

1. In a continuous in-line offset lithographic printing machine for printing and coating a continuous succession of receptive copy paper sheets, comprising a plurality of liquid application stations, each comprising a plate cylinder for supporting a lithographic printing plate and including means for supplying oleous printing composition to oleophilic image areas on the water-coated surface of a said printing plate supported thereon, a blanket cylinder for receiving said printing composition and water from said plate cylinder and for transferring said printing composition and water to a succession of individual receptive copy paper sheets, and an impression cylinder forming a nip with said blanket cylinder through which said individual receptive copy paper sheets are passed to receive printing composition and water from said blanket cylinder, at least one said liquid application station being an upstream ink printing station for the transfer of printing composition in the form of ink images containing a volatile vehicle onto said succession of copy sheets, and at least one said liquid



application station being a downstream coating station for the application of a printing composition in the form of a continuous or spot coating of liquid composition over the ink-imaged surface of said copy sheets, means for feeding said succession of individual receptive copy paper sheets through the nips of said blanket and impression cylinders of said liquid application stations, and a final downstream drying station for drying or otherwise solidifying said coated copy paper sheets, the improvements which comprises an intermediate in-line drying station positioned after each of said liquid application stations, each said drying station comprising means for directing forced hot air against the ink printed copy paper sheets to effect the evaporation of water and the volatile vehicle from the ink images printed on said copy paper sheets prior to the entry of the ink-imaged copy paper sheets into the next liquid application station including into said coating station.

4,841,904
FASTENER AIR BRUSH
J. Arthur Leifsen, Jr., Bethpage, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Feb. 1, 1988, Ser. No. 151,314
Int. Cl.[4] C23C *14/00*; B05B *5/02*; B05C *5/02*
U.S. Cl. 118—50 22 Claims

22. A handheld device for coating a fastener with a coating, said device comprising:

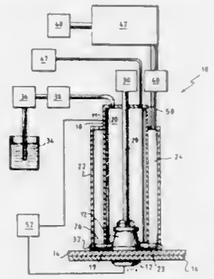
(a) A first body having a free end and defining a first chamber that is placeable over the fastener;

(b) means for supplying the coating under a pressure to said first chamber for coating the fastener with the coating;

(c) a second body having a free end and being disposed external to said first body forming a second chamber therebetween, said second body being rigidly attached to said first body and said free end of said second body being displaced a distance below said free end of said first body forming a passageway therebetween;

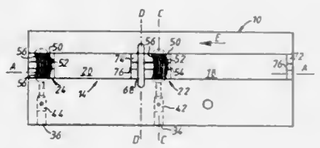
(d) an accumulator for storing excess coating; and

(e) evacuating means connected to said first chamber so that the coat is drawn back from said second chamber through said passageway and into said first chamber, via said evacuating means, where the fastener is recoated with the



coating to assure that all areas of the fastener are coated with the coating.

4,841,905
SAMPLE PROCESSING UNIT
John Scholefield, Kirkintilloch, and Robert Johnston, Stewarton, both of Scotland, assignors to Automated Bacteria Counting Limited, Scotland
Filed Oct. 1, 1987, Ser. No. 115,061
Int. Cl.[4] C23C *14/00*
U.S. Cl. 118—50 9 Claims



1. A sample processing unit comprising upper and lower body portions, said portions defining there-between a through-channel for receiving in use a sample carrier member and having formed therein at least one inlet port, at least one outlet port and associated inlet and outlet conduits connecting said ports, the arrangement being such that in use a sample borne upon a carrier member when positioned within the channel may be treated with an agent introduced through the said inlet ports and excess agent may be removed through said outlet ports by application of a vacuum thereto to produce a dried sample, wherein the said through-channel is provided with a plurality of drainage channels, grouped adjacent to the outlet conduits and outlet ports of said unit, said drainage channels being disposed in a substantially transverse direction to the longitudinal length of the through-channel and venting through said outlet conduits and outlet ports.

4,841,906
MASS TRANSFERABLE SEMICONDUCTOR SUBSTRATE PROCESSING AND HANDLING FULL SHELL CARRIER (BOAT)
Charles E. deGeest, Jr., Marble Falls, Tex., assignor to Heraeus Amersil, Inc., Sayreville, N.J.
Continuation of Ser. No. 929,965, Nov. 12, 1986, abandoned.
This application Apr. 4, 1988, Ser. No. 180,722
Int. Cl.[4] B05C *13/02*
U.S. Cl. 118—500 6 Claims

1. A carrier for mass transferable semiconductor substrate

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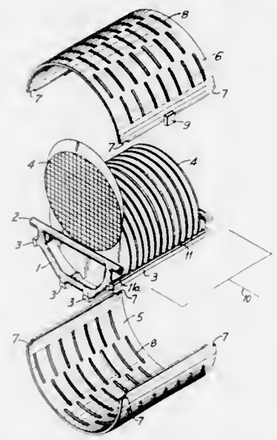
processing and handling, comprising: a two part shell including top and bottom semicylindrical halves made from clear fused quartz tubing and releasably assembled to form a cylindrical shell, wherein both shell halves have a relief cut in all four corners to define four slots when the halves are assembled; and

a semiconductor substrate carrier suspendable in the shell when the two halves are assembled including four clear

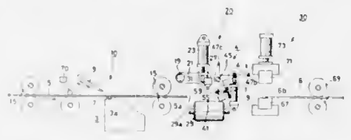


fused quartz rods having axially running slots for supporting substrates and clear fused quartz end braces connected to the ends of the rods and clear fused quartz pick-up tubes connected to, and in a same plane with, the end braces and each pick-up tube having end portions extending outwardly from the end braces and configured to be accommodated in the four slots to removably suspendable in the shell when the two halves are assembled.

4,841,907
DEVICE FOR APPLYING GLUE TO A CUT END OF VENEER SHEET

Toshiyuki Otsuka, Obu, Japan, assignor to Meinan Machinery Works, Inc., Obu, Japan

Filed Jul. 5, 1988, Ser. No. 215,201
Claims priority, application Japan Jul. 15, 1987, 62-109553[U]
Int. Cl.[4] B05C *11/00*
U.S. Cl. 118—669 **11 Claims**



1. A device for applying glue to a cut leading end of a sheet of wood veneer, comprising

means for feeding said veneer sheet in a given direction through said device,

a support member having a support surface thereof spaced away from a plane which is defined by said veneer sheet being fed for supporting the leading end portion of the veneer sheet,

glue feed means for feeding glue onto said support surface of said support member in such a way that glue deposit may be formed on said support surface along a line substantially perpendicular to said given direction, whereby the glue may be applied to said cut leading end of the veneer sheet by moving the veneer sheet in said given direction against said glue deposit on said support surface so that said cut leading end may pick up the glue deposit,

means disposed opposite to said support surface with respect to said plane of veneer feeding and having a surface for holding the veneer sheet adjacent its cut leading end against said support surface, said holding means being shiftable between inoperative position thereof where said holding surface is placed away from said support surface and operative position where it is placed in pressing contact with the veneer sheet adjacent said cut leading end so as to hold-down said leading end portion against said support surface

means for monitoring the movement of said veneer sheet in said given direction,

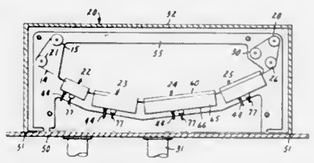
means for shifting said holding means between said inoperative and operative positions, and

control means connected to said monitor means and said shifting means for controlling the operation of the shifting means according to a position reached by said cut leading end of the veneer sheet which is detected by the monitor means.

4,841,908
MULTI-CHAMBER DEPOSITION SYSTEM

Richard L. Jacobson, Roseville; Frank R. Jeffrey, Shoreview, and Roger K. Westerberg, Cottage Grove, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 877,161, Jun. 23, 1986, abandoned. This application Feb. 16, 1988, Ser. No. 156,548
Int. Cl.[4] C23C *16/00*
U.S. Cl. 118—718 **4 Claims**



2. A vacuum deposition apparatus for depositing a plurality of layers of material of varying composition onto the surface of a moving substrate, each layer being applied in the presence of a glow discharge, said apparatus comprising

a vacuum chamber,

means for supporting a roll of said substrate within said vacuum chamber,

take-up means for rewinding the coated substrate being located within said vacuum chamber,

a plurality of deposition chambers located in spaced positions within said vacuum chamber,

means for guiding said substrate through each of said deposition chambers,

each deposition chamber comprising wall means defining an enclosure with an entrance slit and exit slit through which said substrate may pass, said slit affording restricted passageways,

means for introducing gas into each of said deposition chambers,

means for heating said chambers,

means for developing an electrical potential within said deposition chambers to develop a plasma for depositing at least one element from said gas onto said substrate,

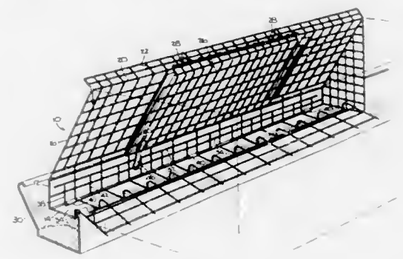
means for continuously advancing said substrate from said supply roll to said take-up roll, and

a pump connected to said vacuum chamber for maintaining a pressure within said vacuum chamber which is lower than the pressure in each said deposition chamber for restricting the diffusion of gas from any one deposition chamber to another deposition chamber.

4,841,909
POULTRY CAGE

Anthony J. Siciliano, South Lyon, Mich., assignor to Big Dutchman, New Holland, Pa.

Filed Jun. 22, 1987, Ser. No. 65,266
Int. Cl.[4] A01K *31/00*
U.S. Cl. 119—17 **6 Claims**



1. In a cage enclosure for housing birds of different sizes said enclosure being constructed of wire grid members providing openings therebetween, said enclosure including a front wall having an access opening and an enclosure member for closing said access opening and a floor extending rearwardly from said front wall; said floor comprising a substantially horizontally feeding floor portion disposed above a feeding trough and being provided with a plurality of feed openings of a first size and a support floor portion extending rearwardly from said feeding floor portion; an elongated partition pivotable between a first portion in which said partition cooperates with said feeding floor to change the feed openings to a second size, and a second position in which the partition is away from said feeding floor; the improvement comprising:

means for pivotally mounting said partition along one of its elongated edges proximate to the juncture between said front wall and feeding floor portion whereby birds of smaller size can feed through the feed openings when the partition is pivoted downwardly to said first position, and birds of a larger size can be feed through said feed openings when said partition is pivoted upwardly to said second position, said partition in said first position laying flat on said feeding floor portion and in said second position being located against said front wall;

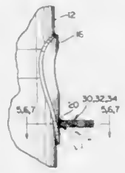
latching means on said front wall for latching said partition against said front wall out of interference with the movement of birds on said support floor portion, out of position for deposits of bird droppings and out of interference with the feeding of the birds in said cage; said latching means being accessible from outside of the cage through the openings between said wire grid members so as to be releasable without openings said enclosure member.

4,841,910
BENDABLE COILED WIRE BIRD PERCH

Peter Kilham, Mill Rd., Foster, R.I. 02825

Filed Dec. 31, 1987, Ser. No. 140,256
Int. Cl.[4] A01K *31/12*
U.S. Cl. 119—26 **10 Claims**

1. A bird perch adapted for use with wild bird feeders of the type having at least one feed opening extending through a substantially vertically disposed wall thereof, said perch outwardly laterally extending from said wall at a point substantially in line with and beneath said opening, said perch solely comprising a hollow, straight cylindrical, wound wire coil having first and second terminal ends and an intermediate laterally extending portion with said first end positioned in a perch opening extending into said wall and said second end terminating at a position outwardly spaced from said wall, that portion of said perch outwardly spaced from said wall being of a diameter easily grasped by perching birds and further being



easily bendable such that the weight of large birds thereon will cause the wire to bend downward and cause such birds to slide off while small birds will not cause the wire to bend substantially downward said coil having individual turns and being tightly wound with adjacent individual turns touching each other.

4,841,911
VARIABLE MAZE DEVICE

Paul Houghton, 16230 Skyline Blvd., Woodside, Calif. 94062

Continuation-in-part of Ser. No. 878,999, Jun. 26, 1986, Pat. No. 4,727,825. This application Feb. 29, 1988, Ser. No. 162,026
The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.
Int. Cl.[4] A63F *9/06*
U.S. Cl. 119—29 **9 Claims**

1. A variable maze device for use as a crib toy, comprising a container means having a variable maze through which a human infant can move an object, said maze being programmable to varying degrees of difficulty and said container means provided with a rear panel, an opposing front panel, and an interior therebetween, said front and rear panels having a plurality of substantially oppositely disposed access ports through which access to said interior of said container means may be had through each of said front and rear panels, wherein said device includes a means for instructing the infant as to the location of the correct path through the maze, said instructing means comprising a means for manipulating said object within said device through said rear panel, infant access to said object being through said front panel.

4,841,912
ANIMAL FEEDER

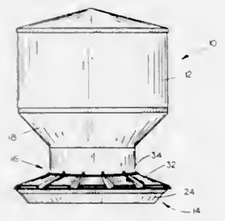
Robert L. Oswald, R.R. 2 - Box 50, Shickley, Nebr. 68436

Filed Oct. 19, 1987, Ser. No. 109,536
Int. Cl.[4] A01K *5/00*
U.S. Cl. 119—53 **6 Claims**

1. A pig feeder, comprising:

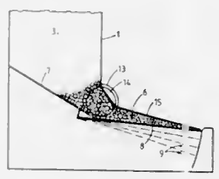
a ground supported pan portion having a bottom and an upstanding sidewall around is perimeter;

a tank portion mounted to said pan and positioned thereover, said tank having open upper and lower ends, whereby said tank will hold animal feed for deposit into said pan;
selectively adjustable valve means positioned between the lower end of said tank and said pan, for regulating the flow of feed from said tank into said pan;
said valve means including a vertically oriented hollow tube operatively mounted on said pan for rotatable and vertically-adjustable movement;
a feed-agitating member mounted within said hollow tube for rotation therewith, and extending within said hollow tube to agitate feed and prevent bridging prior to delivery of the feed to the pan;



an exteriorly projecting member mounted on said valve means for rotation said hollow tube and feed-agitating member;
means for selectively, vertically adjusting said hollow tube with respect to said pan; and
means for selectively engaging said vertical adjusting means with said hollow tube, operable between an engaged position, wherein said vertical adjusting means is inoperable and vertical adjustment of said hollow tube is prevented, and a disengaged position, wherein said vertical adjusting means is operable to vertically adjust the hollow tube with respect to the pan.

4,841,913
AUTOMATIC SOLID FOOD DISPENSER FOR DOMESTIC ANIMALS
Christian Forrer, Lieudit Carmagnole, Route de Fumel, F-47300 Villeneuve, France
Filed Sep. 29, 1987, Ser. No. 102,404
Claims priority, application France, Oct. 9, 1986, 86 14276
Int. Cl.[4] A01K *5/02*
U.S. Cl. 119—51.12 5 Claims

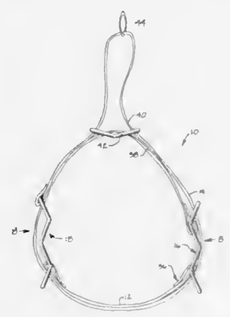


1. An automatic distributor for a series of portions of solid food for domestic animals, comprising a storage tank for solid food, a cup for receiving said solid food, control means to program the frequency of delivery of solid food from the tank to the cup, the tank and the cup being secured to each other by a casing, the tank having a lower access leading to said cup, a valve, an electric motor for moving said valve between a rest position in which the tank and cup are closed from each other by the valve and the upper side of the cup is open, and a feeding position in which the tank and cup communicate with each other for gravity feed of solid food from the tank to the cup, and a flap movable simultaneously with the valve to close the upper side of the cup in said feeding position.

4,841,914
METHOD AND APPARATUS FOR DETERRING BIRDS
Victor Chattan, 1567 W. 215th St., Torrance, Calif. 90501
Filed Jul. 23, 1987, Ser. No. 76,896
Int. Cl.[4] A01K *15/04*; E04H *9/16*
U.S. Cl. 119—97 AR 13 Claims

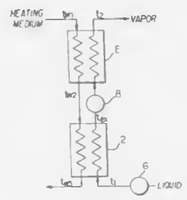
1. An apparatus for deterring birds from landing on a perch location, the apparatus comprising a length of coiled wire; said wire being expanded such that a spiral shape of the wire is achieved; said wire in that shape attached at the ends and intermediate of the ends thereof to the perch location such that the axis of the spiral shape is parallel to the perch location surface; and said wire being of sufficiently light gauge so as not to stably support the weight of the bird to be deterred, but of sufficiently heavy gauge and the individual spirals being of proper size and spacing so as to interfere with the bird's ability to comfortably close its wings, causing it to take flight, said wire having a diameter of not less than 0.005 inches and not more than 0.1 inches, said spirals being not less than 3 inches in diameter, and said wire being expanded such that the adjacent spirals are not less than 2 inches apart.

4,841,915
SPACE AGE DOG AND CAT COLLAR
Frankie Rocchetti, P.O. Box 195 Main St., Crumpler, W. Va. 24825
Filed Nov. 17, 1987, Ser. No. 121,869
Int. Cl.[4] A01K *27/00*
U.S. Cl. 119—106 19 Claims



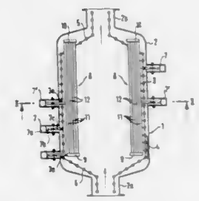
1. A collar comprising:
a first strap;
a second strap;
first and second side bracket members each including at least forward, rearward and intermediate cross-bar elements and first and second longitudinal side elements interconnecting said cross-bar elements so as to maintain said cross-bar elements in spaced, parallel relation;
said first strap being connected at a first end thereof to a first cross-bar element of the first side bracket member and being connected at a second end thereof to a cross-bar element of the second side bracket member, said second strap being connected at a first end thereof to another cross-bar of said first side bracket spaced from the first cross-bar element and being connected at a second end thereof to a second side bracket, said second strap being fed through said first and second brackets such that said second strap extends from said first bracket rearward to said second bracket to define an inner rear second strap portion, through said second bracket, across said first strap, through said first bracket, and rearwardly about said inner rear second strap portion to said second side bracket to thereby define an outer rear second strap portion whereby a circumferential throat receiving portion is defined by said first strap and said inner rear second strap portion which has a diameter which can be varied by pulling rearwardly on the outer rear second strap portion.

4,841,916
EVAPORATING APPARATUS WITH PREHEATER
Hiroyuki Sumitomo, and Akira Horiguchi, both of Osaka, Japan, assignors to Hisaka Works, Limited, Osaka, Japan
Filed May 23, 1988, Ser. No. 197,354
Claims priority, application Japan, May 25, 1987, 62-129283; Sep. 21, 1987, 62-238445
Int. Cl.[4] F22B *1/02*
U.S. Cl. 122—32 2 Claims



1. An evaporating apparatus with a preheater, comprising:
an evaporator for evaporating a liquid by heat exchange between a heat source fluid and said evaporation liquid,
a preheater for preheating the liquid by heat exchange between a heating medium and the liquid prior to being fed to the evaporator,
a first means for feeding to the preheater the liquid at a saturation pressure corresponding to a temperature slightly higher than the liquid temperature at the preheater outlet, and
a second means for pressurizing the liquid to a saturation pressure corresponding to the evaporation temperature as the liquid passes from the preheater to the evaporator.

4,841,917
RADIATION COOLING UNIT FOR COOLING DUST-LADEN GASES
Ulrich Premel, Gummersbach, Fed. Rep. of Germany, assignor to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany
Filed Jul. 29, 1988, Ser. No. 226,125
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1987, 3725424
Int. Cl.[4] F22B *37/18, 37/48*
U.S. Cl. 122—379 7 Claims



1. A radiation cooling unit for cooling dust-laden gas, said cooling unit comprising:
a tank having an inner wall;
at least one cylindrical radiation heat transfer surface that is disposed in said tank adjacent to, and extending essentially along the length of, said inner wall of said tank, with a free space being provided in said tank and being delimited by said cylindrical radiation heat transfer surface;
first knock- or impact-beating devices that are disposed externally of said tank and act upon said cylindrical radiation heat transfer surface through the wall of said tank;
a plurality of essentially radially and axially extending, partition-like radiation heat transfer surfaces that are disposed within said free space in said tank, with each partition-like radiation heat transfer surface comprising axially extending tubes and at least one header; and
second knock- or impact-beating devices that are also disposed externally of said tank, extend through said cylindrical radiation heat transfer surface, and act upon radially outwardly disposed edges of said partition-like radiation heat transfer surfaces, with the length-to-width ratio of said partition-like radiation heat transfer surfaces being such that said last-mentioned surfaces are adapted to be accelerated and cleaned by said second knock- or impact-beating devices.

4,841,918
BOILER CONTROL SYSTEM
Yukio Fukayama, Kure, and Atsushi Kuramoto, Fukuoka, both of Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 4, 1987, Ser. No. 116,582
Claims priority, application Japan, Nov. 6, 1986, 61-262781
Int. Cl.[4] F22D *7/00*
U.S. Cl. 122—406 ST 3 Claims

1. A boiler control system for a boiler apparatus including:
first means for obtaining a rate of change in steam temperature and a generated thermal stress in a pressure part of a boiler;
second means for controlling a steam temperature or a rate of change in the steam temperature at said part of said boiler in accordance with a desired value; and
third means which comprises:
storage means for storing combinations of said steam temperature and said thermal stress at each moment as obtained by said first means;
means for determining, from said combinations stored in said

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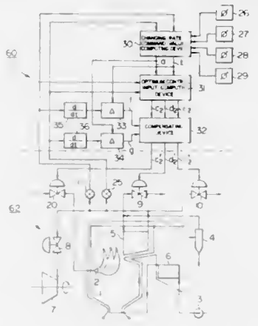
storage means, a relationship between a steam temperature changing rate and a local maximum thermal stress;

means for determining, in accordance with said relationship, a steam temperature changing rate limit value necessary for maintaining an actual thermal stress in said part of said boiler below a local maximum thermal stress limit value



which is predetermined beforehand or which is given for each start-up of said boiler; and

means for delivering said steam temperature changing rate limit value or a desired steam temperature value obtained by integrating said steam temperature changing rate limit value to said second means as said desired value.

4,841,919

FUEL FEED DEVICE, PARTICULARLY FOR INTERNAL COMBUSTION ENGINES, COMPRISING FUEL FILTERING AND EMULSIFYING MEMBERS

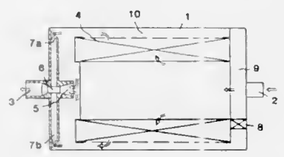
Angelo Cantoni, Rome, Italy, assignor to Ital Idee s.r.l. an Italian Limited Liability Company, Rome, Italy

Filed May 18, 1988, Ser. No. 195,501

Claims priority, application Italy, May 20, 1987, 47953 A/87

Int. Cl.[4] F02D *19/00*

U.S. Cl. 123—25 A **7 Claims**



1. A fuel feed device, particularly for internal combustion engines, with fuel filtering and emulsifying members, characterised by comprising a closed casing to which a fuel inlet pipe and outlet pipe are connected and which is divided by a filter element into two separate chambers which communicate with the inlet pipe and outlet pipe respectively, the outlet pipe being provided with a Venturi tube structure, the throat of the Venturi tube structure being provided with one or more sized ports, said ports being positioned in, or connected by one or more tubes to, that region of the closed casing in which any water present in the feed fuel can accumulate, the Venturi tube structure being dimensioned such that when water passes into the throat, said water is emulsified with the fuel leaving the closed casing.

4,841,920

ARRANGEMENT IN AN AIR-COOLED I. C. ENGINE

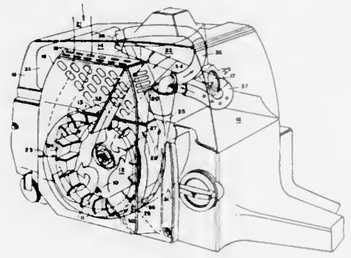
Bo C. Andreasson, Göteborg; Sören N. Henriksson, Kållered, and Lars-Olof Kärreman, Lerum, all of Sweden, assignors to Aktiebolaget Electrolux, Sweden

Filed Mar. 9, 1987, Ser. No. 23,539

Claims priority, application Sweden, Mar. 14, 1986, 8601210

Int. Cl.[4] B01D *45/14*; B23D *57/02*

U.S. Cl. 123—41.66 **9 Claims**



1. In an air cooled internal combustion engine arrangement having a fan system, air inlets to the fan system, and a carburetor, the improvement wherein said air inlets comprise a first air inlet positioned to supply a first portion of the cooling air for the engine as well as substantially all of the combustion air to the engine, and a second air inlet separate from the first air inlet and positioned to supply the remainder of the cooling air for the engine, said arrangement further comrising a guide rib for separating the first and second inlets from one another, and a fan shield, said fan shield defining both of the inlets.

4,841,921

TWO-CYCLE, DUAL PISTON INTERNAL COMBUSTION ENGINE WITH AIR TURBINE DRIVEN FUEL/AIR MIXTURE SUPPLY

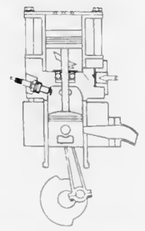
Tai-Her Yang, 5-1 Taipin St., Si-Hu Town, Dzan-Hwa, Taiwan

Division of Ser. No. 791,461, Oct. 25, 1985, Pat. No. 4,745,886. This application Feb. 29, 1988, Ser. No. 162,301

The portion of the term of this patent subsequent to May 24, 2005, has been disclaimed.

Int. Cl.[4] F02B *33/10*

U.S. Cl. 123—71 R **3 Claims**



1. A two-cycle internal combustion engine, comprising:

an engine block having an upper cylindrical gas chamber and a lower cylindrical gas chamber, a bottom portion of said upper gas chamber serving as a compression chamber for a fuel/gas mixture introduced into said lower gas chamber, said lower chamber serving as a combustion chamber;

a piston assembly comprised of a lower piston located in said lower gas chamber, an upper piston located in said upper gas chamber and dividing said upper chamber into two portions including a top upper chamber portion and the bottom upper chamber portion, and a shaft connecting said upper and lower pistons for moving both upper and lower pistons in phase with one another;

sealing means for permitting reciprocating movement of said connecting shaft within said upper and lower chambers and for providing a seal between said upper and lower chambers;

cooling means jacketing said sealing means for coiling said sealing means,

upper chamber intake for allowing a fuel/air mixture to be introduced into said bottom portion of said upper gas chamber;

one-way upper chamber intake valve means for preventing gas from exiting from said bottom portion of said upper gas chamber through said upper chamber intake means;

an inter-chamber passageway in said engine block for permitting flow of the fuel/air mixture from said bottom portion of said upper chamber directly to said lower chamber, said inter-chamber passageway located near the top of said upper chamber;

automatically controlled lower chamber intake valve means for controlling flow of the fuel/air mixture from said interchamber passageway to said lower chamber;

a fuel/air source for providing the fuel/air mixture to said lower chamber, wherein the fuel/air mixture from the fuel/air mixture source passes in sequence through said one-way upper chamber intake means, said lower portion of said upper chamber, said inter-chamber passageway in said engine block, and said automatically operated lower chamber intake valve means prior to entry into said lower chamber;

one-way air inflow means communicating with said top portion of said upper chamber and permitting air to be drawn into said top portion of said upper chamber when said upper piston moves toward said lower chamber;

an air driven turbine located in a housing, said air driven turbine in communication with said top portion of said upper chamber, said air driven turbine driven by air which exits from the top portion of said upper chamber when said upper piston moves away from said lower chamber;

a shaft connected to said air driven turbine,

a pumping turbine located in a housing, said pumping turbine connected to said shaft, said pumping turbine driven by said air driven turbine through said shaft, said pumping turbine in communication with the lower portion of said upper chamber, said pumping turbine in communication with the source of fuel/air mixture, said pumping turbine for pumping fuel/air mixture into the lower portion of said upper chamber,

lower chamber exit means for permitting the contents of said lower gas chamber to be discharged from said chamber, said lower chamber exit means located near the bottom of said lower chamber and controlled by travel of said lower piston thereby facilitating exhaustion of the combustion products of the fuel/gas mixture from said lower gas chamber when a fresh fuel/air mixture enters said lower gas chamber from said automatically controlled lower chamber intake valve means directly from said interchamber passageway;

ignition means for igniting the gaseous contents of said lower chamber, said ignition means automatically periodically being energized and unenergized in coordination with the automatic operation of said automatically controlled lower chamber intake valve means.

4,841,922

METHOD OF MAKING A ROCKER ARM

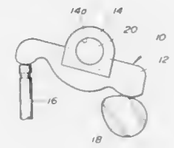
Masato Taniguchi; Mitsuyoshi Kawamura; Noboru Ishida, and Masaya Ito, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 21,859, Mar. 4, 1987, abandoned. This application Nov. 17, 1988, Ser. No. 273,622

Claims priority, application Japan, Mar. 6, 1986, 61-47188

Int. Cl.[4] F01L *1/18*

U.S. Cl. 123—90.51 **2 Claims**



1. A method of producing a rocker arm, comprising:

forming a rocker arm having a valve contacting portion, a cam contacting portion and a pivot portion for contact with a pivot of a lash adjuster and entirely made of ceramics;

processing said rocker arm by barrel finishing; and;

grinding said pivot portion by using said valve contacting portion and said cam contacting portion as datum surfaces and thereby locating said pivot portion in position relative to said valve contacting portion and said cam contacting portion.

4,841,923

METHOD FOR OPERATING I.C. ENGINE INLET VALVES

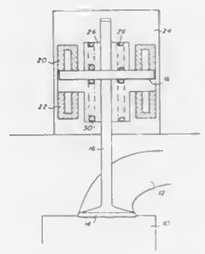
Josef Buchl, Rehsteig 12, Lenting 8071, Fed. Rep. of Germany

Filed Mar. 8, 1988, Ser. No. 165,484

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1987, 3708373

Int. Cl.[4] F01L *9/04*

U.S. Cl. 123—90.11 **19 Claims**



1. Method for operation of an inlet valve of an internal combustion engine having an electromagnetically activated inlet valve assembly comprising a valve spring system in association with an inlet valve anchor plate, at least one electromagnet for capturing and holding said inlet valve anchor plate in the closed position, and having a cycle of operation which includes as part thereof a top dead center (TDC) position of a piston related to said valve and a bottom dead center (BDC) position of said piston, said TDC position being defined as earlier in said cycle as compared to said BDC position, said method comprising in operative combination the step(s) of:

(a) controlling the duration of said closed position electro-

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magnet energization and de-energization to permit said valve to only partially open during low load conditions; and

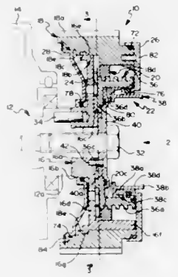
(b) controlling the timing of said electromagnet energization and de-energization to permit the point of commencing the opening of said valve slightly after BDC so that substantially maximum swirling of inlet fuel/air mixture occurs permitting use of leaner mixtures and resulting in reduced CO and NO_x.

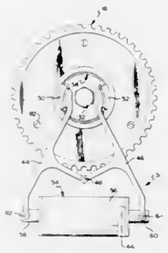
4,841,924

SEALED CAMSHAFT PHASE CHANGE DEVICE

Keith Hampton, Ann Arbor; Don J. Krzysik, Wixom, and Glen R. Lilley, Livonia, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 18, 1988, Ser. No. 233,703
Int. Cl.[4] F01L *1/34*
U.S. Cl. 123—90.15 **15 Claims**





1. An annular phase change device comprising:

support means adapted to be fixed to and rotate about an axis of a first shaft;

drive means journalled on the support means and secured thereto against axial movement, the drive means adapted to be driven by a second shaft;

advancing means including means drivingly interconnecting the support and drive means and operative in response to being moved axially to effect a limited relative rotation of the support and drive means;

drum means mounted for rotation about the axis and operative when rotated relative to the advancing means to effect the axial movement of the advancing means;

actuation means for effecting the relative rotation of the drum means;

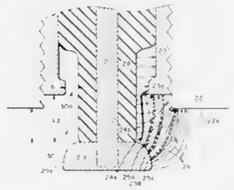
sealing means including first and second annular, radially extending covers disposed on axially opposite sides of the device for defining a sealed annular space containing portions of the support, drive, advancing and drum means, said covers each having a radially outer portion fixed and statically sealed to opposite sides of the drive means, said first cover having a radially inner portion in dynamic sealing relation with the drum means, and said second cover having a radially inner portion in dynamic sealing relation with the support means.

4,841,925

ENHANCED FLAME IGNITION FOR HYDROCARBON FUELS

Michael A. V. Ward, Lexington, Mass., assignor to Combustion Electromagnetics, Inc., Arlington, Mass.

Continuation-in-part of Ser. No. 944,882, Dec. 22, 1986, abandoned. This application Dec. 11, 1987, Ser. No. 131,948
Int. Cl.[4] F02P *3/08, 15/00*
U.S. Cl. 123—143 B **98 Claims**



1. A high efficiency, high output power electrical ignition system for igniting air-fuel mixtures in a combustion chamber of an internal combustion, or IC, engine, comprising in combination:

(a) means defining a spark plug and spark plug boot of combined capacitance Cspb to ground between 30 and 80 pf, said spark plug including a plug firing end having a central electrode and second electrode means disposed about said central electrode so as to provide a spark gap of at least 0.06" between said electrodes, across which gap one or more spark pulse discharges and electrical fields arise upon application of electrical energy to said plug;

(b) ignition firing circuit means for energizing said plug and comprising capacitive discharge ignition means including ignition coil means with primary and secondary winding of turns ratio N, input capacitor means of capacitance Cp connected to a power converter means for charging to a peak voltage V_p and other side of the capacitor connected to the hot side of the coil primary winding, switch means S for discharging primary energy stored in said input capacitor Cp to energize the coil, the coil secondary to primary turns ratio N defined approximately by the formula FN:

$$N=[Vs/(2*Vp)]*[1+(\tfrac{1}{4})*(Cs/Cp)*(Vs/Vp)**2],$$

wherein Cs is total secondary circuit capacitance, including Cspb, and Vs is the peak output voltage of said coil whose secondary winding is connected to the center electrode of said spark plug;

(c) means defining an IC engine portion including at least one combustion chamber with a movable compressing member therein creating air motion inside said combustion chamber including at least one of microscale turbulence, squish, or swirl, wherein said spark gap is exposed to said air motion such that under normal operation of said IC engine said spark discharges provide an arc burning voltage Varc substantially greater than that produced in still air;

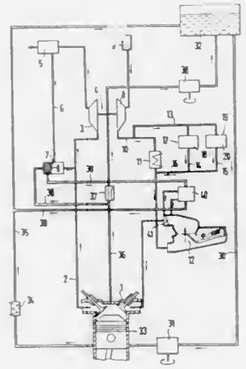
such that in the typical operation of said IC engine the ignition provides ignition spark discharge power output Parc greater than 100 watts at a discharge system efficiency EFF greater than 40% and at an overall ignition system efficiency EFFtot, including the power converter means, greater than 30%.

4,841,926

MULTI-CYLINDER INTERNAL COMBUSTION ENGINE WITH EXTERNALLY APPLIED IGNITION AND WITH TURBOCHARGER

Klaus Hain, Leonberg; Michael Beer, Wimsheim, and Staas Gietzen, Obereisesheim, all of Fed. Rep. of Germany, assignors to Dr. Ing h.c.F. Porsche Aktiengesellschaft. Stuttgart, Fed. Rep. of Germany

Filed May 6, 1987, Ser. No. 191,125
Claims priority, application Fed. Rep. of Germany, May 6, 1987, 3715062
Int. Cl.[4] F02P *1/00*
U.S. Cl. 123—146.5 A **5 Claims**



1. A multi-cylinder internal combustion engine with externally applied ignition, comprising turbocharger means including turbine and compressor means, a charging air line leading from the compressor means to the cylinder head of the engine including charging air cooler means for cooling the charging air from the turbocharger means ahead of entry into the cylinder head of the internal combustion engine, and an ignition distributor means whose distributor housing means surrounding the same is forcibly traversed with air, the distributor housing means being operatively connected to the charging air line leading from the compressor means of the turbocharger means to the cylinder head and being scavenged by charging air, and further comprising means for keeping the pressure of the charging air substantially constant independently of the geodetic height at which the internal combustion engine finds itself.

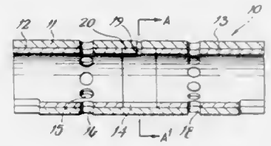
4,841,927

CERAMIC CYLINDERS

Roger H. Slee, Warwick, England, assignor to AE PLC, Rugby, England

Filed Feb. 10, 1988, Ser. No. 154,306
Claims priority, application United Kingdom, Feb. 13, 1987, 8703330
Int. Cl.[4] F01F *1/18*
U.S. Cl. 123—193 C **5 Claims**

1. A ceramic cylinder for an internal combustion engine said cylinder comprising at least two portions including at least one main cylinder portion and at least one combustion region portion, said at least two portions being contained within a metal housing, wherein said at least one combustion region



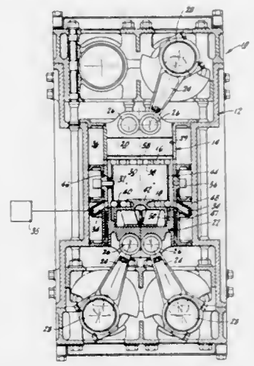
portion has a generally axially directed slit therein, said slit passing through the whole thickness of the ceramic material.

4,841,928

RECIPROCAL ENGINE WITH FLOATING LINER

Marius A. Paul, and Ana Paul, both of 969 La Paz Rd., Placentia, Calif. 92670

Filed Dec. 14, 1987, Ser. No. 132,018
Int. Cl.[4] F02B *77/00*
U.S. Cl. 123—193 CP **22 Claims**



1. An internal combustion engine with a heat recovery system comprising: a cylinder with a cylinder wall; a piston with a piston head, the piston being reciprocally displaceable in the cylinder; a fuel injection means with fuel connected to the cylinder; and, an air intake passage and an exhaust passage connected to the cylinder, such that air is delivered to the cylinder, compressed by the piston, and fuel from the fuel injection means is delivered to the cylinder and combusted in a working chamber; wherein the heat recovery system includes an air-porous, heat-resistant, tubular liner suspended in the cylinder and displaced from the wall of the cylinder, the piston having a deep groove with inner and outer walls in the head of the piston into which the liner is received when the piston is displaced compressing the air, said liner being spaced from the inner and outer walls of the groove such that three insulating zones are provided between combustion gases in the cylinder and the cylinder wall during displacement of the piston.

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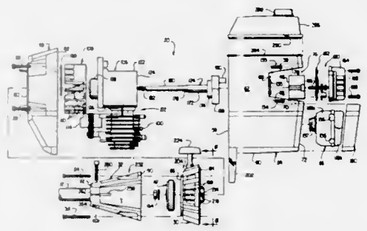
4,841,929

PORTABLE ROTARY POWER TOOL

Lloyd H. Tuggle, and Jeffery G. Sadler, both of Shreveport, La., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Continuation of Ser. No. 134,245, Dec. 17, 1987, abandoned.
This application Sep. 30, 1988, Ser. No. 253,303
Int. Cl.[4] B26D 1/53
U.S. Cl. 123—198 E 26 Claims



1. An internal combustion engine driven power tool comprising working means drivable to perform a predetermined work function; power transmitting means for receiving rotational power from a source thereof and responsively transmitting the received power to said working means to drive the same; and a power head assembly including:

a shroud member having an open front end, an engine support wall section spaced rearwardly from said open front end, a fuel-air mixture passage extending through said support wall section from an exterior surface thereof to an interior surface thereof, a reed valve operatively secured to said inner surface of said support wall section over said fuel-air mixture passage, and a chamber extending rearwardly of said support wall section, said chamber communicating with the interior of said shroud member and having a rear end opening;

an internal combustion engine for generating rotational power, said engine being partially enveloped by said shroud member and having a crankcase with an open rear end portion interiorly secured to said support wall section over said reed valve so that said support wall section defines a rear closure wall of said crankcase, the balance of said engine being supported from said crankcase, said engine further having a cylinder connected to a side portion of said crankcase within said shroud member, a muffler secured to said cylinder and positioned within said chamber, and a carburetor externally secured to said support wall section and operatively positioned over said fuel-air mixture passage;

housing means removably connectable to said shroud member over said open front end thereof;

coupling means, positioned within said housing means, for rotationally coupling said engine to said power transmitting means; and

manually operable starter means, internally carried by a portion of said housing means for removal therewith from said shroud member, for starting said engine.

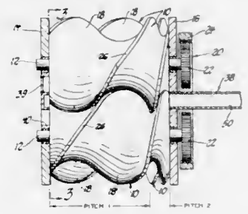
4,841,930

POSITIVE DISPLACEMENT ROTARY MECHANISM

Constantinos A. Koromilas, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 5,077, Jan. 20, 1987, Pat. No. 4,782,802.
This application Jul. 22, 1988, Ser. No. 222,867
Int. Cl.[4] F02B 53/00
U.S. Cl. 123—246 2 Claims

1. A positive displacement rotary mechanism comprising three essentially identical rotary helical intermeshing lobes with parallel axes and identical helical surfaces extending between axially spaced ends thereof, a three-sided stationary cylindrical member extending centrally of said lobes and parallel to said axes, said helical surfaces having a varying pitch and a cross sectional profile as viewed axially having at least two convex circular apexes joined by convex circular sides such that said helical surfaces cooperate through close apex-to-side and apex-to-apex relationships therebetween and also cooperate with the sides of said cylindrical member through close apex relationship therewith to define a repetitive working



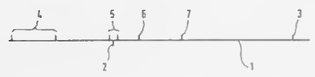
space internal of said lobes having boundaries along and between said lobes and along and between said lobes and said cylindrical member which boundaries move on rotation of said lobes to effect expansion and contraction of said working space while repetitively moving same from one of said ends of said lobes toward the other end, and said stationary member having an exhaust passage extending therethrough with an opening to said working space.

4,841,931

METHOD OF ADJUSTING A CONTROLLING ELEMENT AND CIRCUIT ARRANGEMENT FOR THE CARRYING OUT OF THE METHOD

Heinz-Friedrich Ohm, Weiterstadt; Klaus Bluhm, Steinbach/Ts.; Hans-Günter Appel, Bad Soden, and Kurt Probst, Schwalbach, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt, Fed. Rep. of Germany

Filed Apr. 25, 1988, Ser. No. 185,499
Claims priority, application Fed. Rep. of Germany, May 9, 1987, 3715557
Int. Cl.[4] F02D 41/08
U.S. Cl. 123—339 2 Claims



1. A method for providing adjustment to a given adjustment point of a controlling element which serves to actuate a displacement device in order to control the engine output of an internal combustion engine, a controlling of the controlling element being effected by an electronic automatic controller unit which acts upon the controlling element by a train of control pulses, the method comprising steps of

selecting a marking point for the controller unit at a specified distance from a desired adjustment point for at least one entire control pulse, the marking point serving for moving a correcting element to displace the controlling element from a marking point up to an adjustment point;

moving back the controlling element, after a first passage of the controlling element beyond the marking point and stopping, with constant control pulses past the marking point; and

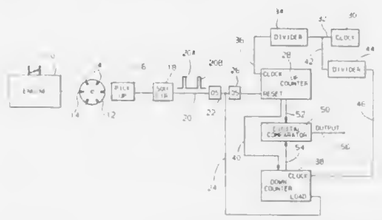
passing over the marking point in a direction towards the adjustment point, the controlling element being acted on, from the marking point, with as many defined control pulses as corresponds to a selected distance from the adjustment point.

4,841,932

SPARK TIMING CONTROL

Mark C. Hansen, and Greg J. Manlove, both of Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Jul. 19, 1988, Ser. No. 221,493
Int. Cl.[4] F02P 5/08, 5/04
U.S. Cl. 123—416 5 Claims



1. The method of developing a spark timing advance signal for an electronic internal combustion engine ignition system, the steps comprising, developing a series of consecutively occurring crankshaft position pulses that are related to the angular position of the crankshaft of the engine, periodically counting up first constant frequency clock pulses by means of an up-counter for durations of time corresponding to the duration of the time that elapses between consecutive occurring crankshaft position pulses whereby a pulse count magnitude T is periodically attained where T is a function of said duration of time, loading said count magnitude T into a down counter, periodically resetting said up-counter to a zero count magnitude, and then counting up said up-counter from a reset zero count magnitude at the frequency of said first clock pulses and simultaneously down-counting said down-counter from said count magnitude T at the rate of constant frequency second clock pulses, comparing the count magnitude of said counters and developing a signal when the count magnitude of said counters is equal.

4,841,933

ADAPTIVE CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Anthony McHale, Birmingham, and Andrew P. Frith, London, both of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

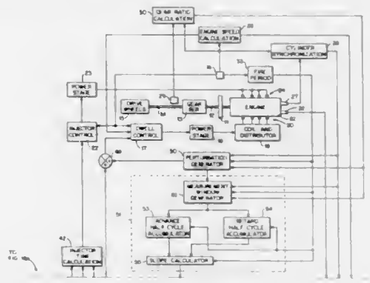
Filed Dec. 29, 1987, Ser. No. 139,301
Claims priority, application United Kingdom, Jan. 14, 1987, 8700758
Int. Cl.[4] F02P 5/08
U.S. Cl. 123—419 46 Claims

1. An adaptive control system for a power producing engine having at least one engine control parameter affecting an engine output, said engine having a drive train combination having at least one resonant frequency, said control system comprising:

(a) a perturbation generator for perturbing intermittently a particular said engine control parameter about a base line value in at least one perturbation mode in a given operating mode of said engine which includes said at least one resonant frequency;

(b) measuring means for measuring a slope of said engine output with respect to said particular control parameter caused by said perturbation generator; and

(c) control means, responsive to said slope, for controlling one said engine control parameter so as to obtain a desired value of said slope, wherein said perturbation generator operates in another perturbation mode in another operating mode of said engine to perturb said particular control



parameter at a frequency greater than said at least one resonant frequency.

4,841,934

OXYGEN PUMPING DEVICE FOR CONTROL OF THE AIR FUEL RATIO

Eleftherios M. Logothetis, Birmingham; Robert E. Hetrick, Dearborn Heights; Richard E. Soltis, Redford, and William C. Vassell, Birmingham, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 20, 1987, Ser. No. 17,292
Int. Cl.[4] F02D 41/14
U.S. Cl. 123—440 1 Claim

1. A method operating a two cell oxygen pumping device to control the air fuel ratio of an engine, the oxygen pumping device having a pumping cell and sensing cell, includes the steps of:

introducing exhaust gas from the engine to a region between the pumping cell and the sensing cell;

applying a pumping current to the pumping cell;

sensing an EMF across the sensing cell;

comparing an adjustable reference voltage with the sensed EMF;

generating an error signal from the comparison between the reference voltage and the sensed EMF;

changing the air fuel ratio in response to the error signal so as to reduce the absolute magnitude of the error signal, including the step of decreasing the engine air fuel ratio in response to a positive error signal until the measured EMF becomes equal to the reference voltage, and the step of increasing the engine air fuel ratio in response to a negative error signal until the measured EMF becomes equal to the reference voltage;

establishing a predetermined desired air fuel ratio from a range of possible operating air fuel ratio values;

establishing a predetermined desired pumping current which remains fixed for any given air fuel ratio value within said range; and

adjusting the reference voltage to a new value, consistent with the fixed desired pumping current, when it is desired to change the actual air fuel ratio, so as to cause the actual air fuel ratio magnitude to change until it is equal to the predetermined desired air fuel ratio.

4,841,935

VARIABLE AIR INDUCTION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

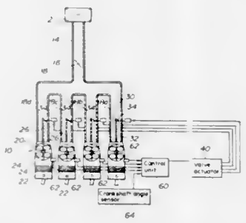
Hideji Yamada; Akira Nagao; Toyohei Nakajima; Yukihiko Suzaki; Masao Jogen, and Akira Tanaka, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 23, 1987, Ser. No. 111,743

Claims priority, application Japan, Oct. 24, 1986, 61-251583; Oct. 24, 1986, 61-251584

Int. Cl.[4] F02B *15/00*

U.S. Cl. 123—432 **22 Claims**



1. A variable air induction control system for a multi-cylindered internal combustion engine, comprising:

a first means disposed in the vicinity of the cylinders of the engine for respectively detecting a combustion state therein;

a second means for receiving an output signal of the first means and for generating a signal indicative of a pressure in the cylinders;

a third means disposed in a rotational shaft of the engine for detecting an angular position of a crankshaft to generate a signal indicative of the engine speed;

a first air intake passage provided upstream of a throttle valve for introducing an air into the chambers;

a second air intake passage connected to said first air intake passage at one end and at the other end thereof to the cylinders, said second air intake passage having a variable diameter and length;

control means for receiving the output signals from said second and third means, and for outputing a setting signal to set the diameter and length of said second air intake passage such that the cylinder pressure is constantly maximized; and

an actuator means receiving said setting signal from said control means for adjusting said second air intake passage to have diameter and length in accordance with said setting signal.

4,841,936

FUEL INJECTION CONTROL DEVICE OF AN INTERNAL COMBUSTION ENGINE

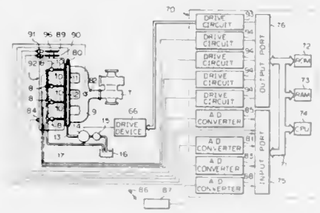
Takeshi Takahashi, Mishima, Japan, assignor to Toyota Jidosha kabushiki Kaisha, Aichi, Japan

Filed Jun. 4, 1986, Ser. No. 870,382

Claims priority, application Japan, Jun. 27, 1985, 60-138990; Jun. 27, 1985, 60-138991; Jun. 28, 1985, 60-140417

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—447 **20 Claims**



1. A fuel injection control device of an internal combustion engine, comprising:

a plurality of fuel injectors, each comprising a nozzle bore, a needle having a pressure receiving face, said pressure receiving face being urged to move away from said nozzle bore by the pressure of fuel which acts on said pressure receiving face, a spring urging said needle towards said nozzle bore to normally close said nozzle more, a control rod arranged in series relative to said needle and having an outer end and an inner end connected to said needle, said outer end of said control rod receiving the pressure of fuel to urge said needle against said nozzle bore, and actuating means for urging said control rod to move said needle away from said nozzle bore in order to inject fuel from said nozzle bore, said actuating means comprising a pressure receiving face formed on said control rod, a control rod pressure chamber formed around said pressure receiving face of said control rod, said control rod pressure chamber being a confined chamber and an actuator for pressurizing fuel in said control rod pressure chamber to urge said control rod, said actuator comprising a piston for pressurizing the fuel in said control rod pressure chamber, and a piezoelectric element for actuating said piston;

a pressurized fuel accumulating chamber having a fixed volume and connected to said fuel injectors to feed pressurized fuel in said pressurized fuel accumulating chamber into said fuel injectors;

a controllable fuel feed pump connected to said pressurized fuel accumulating chamber to feed pressurized fuel thereinto;

drive means for controlling the amount of pressurized fuel discharged from said fuel feed pump;

detecting means arranged in said pressurized fuel accumulating chamber to produce an output signal representing the pressure of the pressurized fuel in said pressurized fuel accumulating chamber;

injection control means controlling an injection start timing and injection end timing of said fuel injectors in accordance with a change in an operating state of said engine; and

pressure control means controlling said drive means in response to the output signal of said detecting means to equalize the pressure of the pressurized fuel in said pressurized fuel accumulating chamber to a predetermined pressure.

4,841,937

AIR/FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE WITH ASYNCHRONOUS FUEL DELIVERY CONTROL

Hatsuo Nagaishi, Kanagawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 1, 1988, Ser. No. 213,952

Claims priority, application Japan, Jul. 2, 1987, 62-166183

Int. Cl.[4] F02M *51/00*

U.S. Cl. 123—492 **14 Claims**

1. An air/fuel ratio control system comprising:

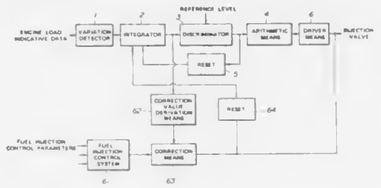
a fuel metering means for metering a controlled amount of fuel into flow of intake air for establishing an air/fuel mixture;

an engine speed sensor for monitoring an engine revolution speed for producing an engine speed indicative signal;

an engine load sensor for monitoring an engine load for producing an engine load signal;

first means for detecting variation of said engine load for generating an engine load variation data;

second means for detecting variation magnitude of engine load exceeding a predetermined threshold value for producing a detecting signal;



third means for deriving a fuel metering amount and controlling said fuel metering means in order to meter derived first amount of fuel to said intake air flow at a controlled timing normally in synchronism with engine revolution cycle, said third means being responsive to said detecting signal for deriving a second fuel metering amount so as to meter derived amount of fuel at a timing irrespective of the engine revolution cycle.

4,841,938

DEVICE FOR DETERMINING THE DIRECTION OF FLOW

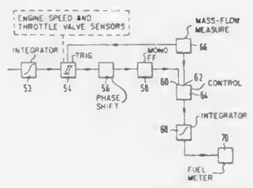
Wolfgang Weibler, Hofheim a. T., and Wolfgang Porth, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Vdo Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 17, 1987, Ser. No. 98,405

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1986, 3637540

Int. Cl.[4] G01P *13/04*; F02D *41/18, 41/30*

U.S. Cl. 123—494 **26 Claims**



1. In a device for determining direction of flow of a fluid of substantially undirectional flow, with known mass flow, the device having a flow straightener and a sensor element associated therewith for emitting electric signals; and wherein said device further comprises:

an eddy element located in a path of flow of the fluid; and wherein

said sensor element is sensitive to turbulence and is located in a path of flow of the fluid between the flow straightener and said eddy element, there being only one sensor element in said device, said one sensor element being located between the eddy element and the flow straightener.

4,841,939

KICK DOWN CONTROL SYSTEM

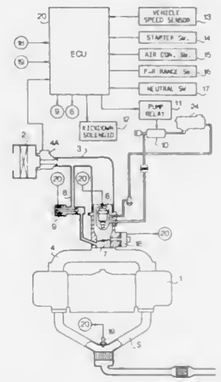
Masanori Sakamoto, Hamura, and Takuro Morozumi, Mitaka, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 20, 1987, Ser. No. 123,125

Claims priority, application Japan, Nov. 29, 1986, 61-285496

Int. Cl.[4] F02M *51/00*

U.S. Cl. 123—494 **8 Claims**



1. A kick down control system for an automatic transmission mounted on a motor vehicle having an internal combustion engine, and throttle valve provided on the engine for controlling a mixture of fuel and air induced in the engine, the system comprising

a throttle position sensor for repeatedly detecting opening degree of the throttle valve and for producing an opening degree signal representing the opening degree,

memory means for storing a value as a maximum value and for producing a maximum value signal representing the maximum value,

maximum value learning means responsive to the opening degree signal for rewriting the stored maximum value in the memory means with a new value larger than the stored value when the opening degree is larger than the stored value,

kick down solenoid means for down-shifting the transmission ratio of the automatic transmission to increase acceleration efficiency, and

kick down deciding means responsive to the opening degree signal and the maximum value signal for determining a kick down condition when the opening degree represented by the opening degree signal at least equals a predetermined value relative to the maximum value to accurately actuate the kick down solenoid means, so as to provide the down-shifting of the automatic transmission without receiving influences of variation in accuracy of the throttle position sensor.

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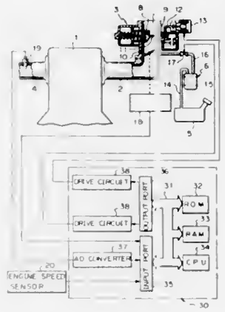
4,841,940

AIR-FUEL RATIO CONTROL DEVICE OF AN INTERNAL COMBUSTION ENGINE

Kouji Uranishi, Susono, and Takaaki Itou, Mishima, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 6, 1988, Ser. No. 178,373
Claims priority, application Japan, Apr. 7, 1987, 62-083848; Sep. 10, 1987, 62-225284; Sep. 11, 1987, 62-226554
Int. Cl.[4] F02M *25/03, 51/00*
U.S. Cl. 123—520 23 Claims



1. An internal combustion engine having at least one cylinder, an intake passage and an exhaust passage, said engine comprising:

a charcoal canister containing activated carbon therein and connected to the intake passage via a purge passage;

fuel supply means arranged in the intake passage to feed fuel into the intake passage;

an oxygen concentration detector arranged in the exhaust passage to produce a lean signal when an air-fuel ratio of an air-fuel mixture fed into the cylinder is larger than a predetermined air-fuel ratio and to produce a rich signal when said air-fuel ratio of the air-fuel mixture is smaller than the predetermined air-fuel ratio;

first means producing an electric correction signal for correcting the amount of fuel fed from said fuel supply means in response to said lean signal and said rich signal to equalize said air-fuel ratio of said air-fuel mixture with the predetermined air-fuel ratio, said electric correction signal having a level which normally varies between a predetermined upper limit and a predetermined lower limit and reaches either one of said predetermined upper limit and said predetermined lower limit when the air-fuel mixture fed into the cylinder becomes excessively rich;

determining means for determining whether or not the level of said electric correction signal reaches either one of said predetermined upper limit and said predetermined lower limit; and

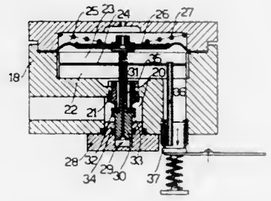
second control means operated on the basis of a determination by said determining means to increase the air-fuel ratio of the air-fuel mixture fed into the cylinder until said air-fuel ratio becomes approximately equal to the predetermined air-fuel ratio when the level of said electric correction signal reaches either one of said predetermined upper limit and said predetermined lower limit.

4,841,941

PRESSURE REDUCER FOR LIQUID AND COMPRESSED GASES

Pietro Parietti, Piacenza, Italy, assignor to Poliauto di Pietro Parietti & C. S.n.c., Piacenza, Italy

Filed Mar. 14, 1988, Ser. No. 167,978
Claims priority, application Italy, Apr. 1, 1987, 33511/87[U]
Int. Cl.[4] F02B *43/00*
U.S. Cl. 123—527 6 Claims



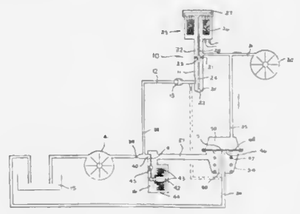
1. A pressure reducer for feeding gas-driven vehicles, comprising an inlet having an inlet valve with a first valvular closing element, an outlet having an outlet valve with a second valvular closing element, a gas bypass valve connected to said inlet, first means for connecting areas situated on opposite sides of said first valvular closing element in order to cancel out force components on said first valvular closing element due to gas pressure, and second means for regulating opening of said first valvular closing element according to a gas pressure at said outlet.

4,841,942

METHOD AND APPARATUS FOR METERING FUEL

Michael L. McKay, Willeton, Australia, assignor to Orbital Engine Company Proprietary Limited, Western Australia, Australia

PCT No. PCT/AU85/00176, § 371 Date Mar. 24, 1986, § 102(e) Date Mar. 24, 1986, PCT Pub. No. WO86/00960, PCT Pub. Date Feb. 13, 1986
PCT Filed Aug. 1, 1985, Ser. No. 849,501
Claims priority, application Australia, Aug. 1, 1984, PG6327
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—533 18 Claims



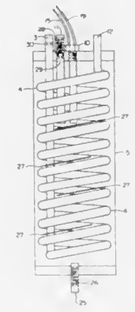
1. A method of metering fuel to an internal combustion engine comprising supplying fuel and gas at respective pressures separately and simultaneously to a chamber, cyclically communicating said chamber with the engine to deliver the fuel from the chamber to the engine by a flow of gas with fuel entrained therein from the chamber, and varying the pressure differential between the fuel and gas supplies to the chamber in response to changes in the engine load to thereby vary the rate of fuel flow into the chamber to control the quantity of fuel delivered to the engine per engine cycle.

4,841,943

GASOLINE SUPERHEATER

Danny W. Favreau, 3560 N. Terrace Cir., McConnelsville, Ohio 43756, and Clen H. Furr, 1504 20th St., Vienna, W. Va. 26105

Filed Aug. 6, 1987, Ser. No. 82,290
Int. Cl.[4] F02M *31/00, 31/10*
U.S. Cl. 123—557 6 Claims



1. In combination, an internal combustion engine and a gasoline superheating device comprised of a sealed chamber with an inlet in communication with a fuel pump, said inlet allowing the delivery of pressurized ambient temperature gasoline through a spring loaded check valve into a superheating chamber where said gasoline is heated by the action of a coil, and a dip tube device for the removal of said gasoline superheated above its ambient pressure boiling point and maintained liquid under pressure by action of the fuel pump, said dip tube device having uniquely positioned air bleed holes to allow the removal of tiny bubbles forming inside the superheater chamber from the superheater chamber to a conduit for delivery to a carburetor or fuel injection device, said superheater chamber being heated to a predetermined temperature between 100° F. and 235° F., said temperature being regulated by a calibrated orifice in the heating coil and an electronic sensing device, electrically connected to and serving as an actuator for a valve in combination with the hot liquid coolant line which controls the amount of liquid coolant fed to the superheater.

4,841,944

INGITION SYSTEM

Tsutomu Maeda; Kiyoshi Matsui; Takayuki Kanno, and Kunihiro Sato, all of c/o TDK Corporation 13-1, Nihonbashi 1-chome, Chuo-ku, Tokyo, Japan

Filed Jun. 24, 1988, Ser. No. 211,183
Claims priority, application Japan, Jun. 30, 1987, 62-100102[U]; Jul. 1, 1987, 62-101708[U]
Int. Cl.[4] F02D *1/00*
U.S. Cl. 123—647 3 Claims

1. An ignition system including:

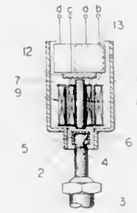
a direct current source;

a primary voltage stabilizing power source for the generation of a stabilized voltage from said direct current source;

a high-tension transformer which receives the voltage from said primary voltage stabilizing power source and applies a high voltage developed on its secondary side to a discharge load; and

a switching element for controlling the primary current in said transformer,

wherein a combination of said transformer and said switching element, or a combination of said transformer, said



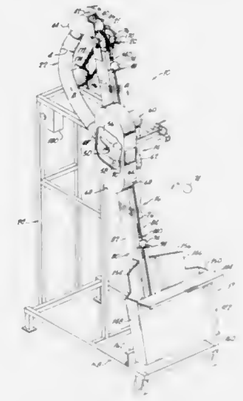
switching element and said primary voltage stabilizing power source, is integrally disposed within a case.

4,841,945

AUTOMATIC TENNIS BALL FEEDING AND SERVING APPARATUS

Victor K. Braden, 22395 Via Alondra, Trabuco Canyon, Calif. 92679

Filed May 7, 1987, Ser. No. 47,617
Int. Cl.[4] A63B *69/40, 69/38*
U.S. Cl. 124—78 17 Claims



7. Automatic tennis ball feeding and throwing apparatus which comprises:

(a) a hopper for holding a number of tennis balls, the hopper having substantially closed sides and a bottom;

(b) tennis ball projecting means having a ball infeed region and a ball ejection region;

(c) an elongate ball conveyor including an endless loop conveyor belt having connected thereto a plurality of tennis ball receiving and transporting members, said conveyor having a ball discharge region;

(d) an apparatus frame;

(e) means for mounting the hopper and ball projecting means to the frame in a mutually spaced apart relationship with the ball projecting means elevated above the hopper, and for mounting the conveyor to the frame intermediate the hopper and the ball projecting means, and with a lower region thereof in a ball loading relationship with the hopper;

(f) ball transferring means for transferring balls from the ball

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discharge region of the conveyor into the ball infeed region of the ball projector;

(g) means for driving the conveyor belt in a direction transporting tennis balls loaded from the hopper onto the ball receiving and transporting members to the ball transferring means;

(h) non-stacking means connected to the conveyor for preventing more than one ball at a time from being transported on any of the ball receiving and transporting members from the hopper to the ball transferring means.

4,841,946

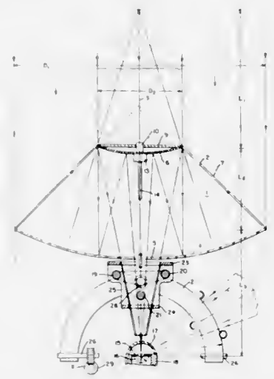
SOLAR COLLECTOR, TRANSMITTER AND HEATER

Alvin M. Marks, 359 R Main St., Athol, Mass. 01331

Continuation-in-part of Ser. No. 581,265, Feb. 17, 1984, Pat. No. 4,619,244. This application Oct. 27, 1986, Ser. No. 923,390

Int. Cl.[4] F23J *3/02*

U.S. Cl. 126—451 **25 Claims**



1. In a system for collecting, transmitting and receiving rays of light-power from the sun, a mounting base for said system, a focal point for said rays positioned on said base, a first axis on a first straight line through said focal point, a second axis on a second straight line from said sun through said focal point and focussing said rays concentric with said first axis, a first means to align with first axis with said second axis and the focal point, the optical system thereby intercepting and converging said rays of light power through said focal point, a receiver for said rays on said base, said focal point being located between said optical system and said receiver and a second means for transmitting said rays of light power from said focal point to said receiver, said system further including means for semi-circular motion about the focal point.

4,841,947

LENS-LIKE RADIANT ENERGY TRANSMISSION CONTROL MEANS

Roger N. Johnson, Mercer Island, Wash., assignor to Radiant Optics, Inc., Seattle, Wash.

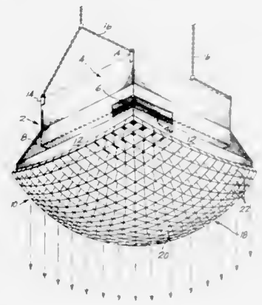
Continuation of Ser. No. 755,760, Jul. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 646,134, Aug. 31, 1984, abandoned. This application Jul. 14, 1986, Ser. No. 943

Int. Cl.[4] F24C *3/04*

U.S. Cl. 126—92 B **29 Claims**

1. In combination, a source of radiant energy, and means interposed on the axis of transmission between the radiant energy source and an area to be irradiated, to control the transmission of the radiant energy in the manner of a lens, said control means comprising a grid structure, the matrix of which defines an array of cells that are juxtaposed to one another about the axis of transmission, and have a pair of opposed radiant energy transmissive ends to the opposing sides of the structure at the opposing axially oriented faces thereof, the individual cells of the array having reflective walls about the inner peripheries thereof and being generally orthogonal in cross-section in planes perpendicular to those axes of the cells which extend in the general axial direction of the structure and outward through the radiant energy transmissive ends of the cells, the latter mentioned axes of the cells being angularly oriented to the axis of transmission so that the structure has a focal point on the axis of transmission at one side of the structure, and there being means including cells varying in length along the respective axes thereof, relative to the cross-sectional areas thereof, as the matrix progresses in directions radially outward from the axis of transmission so that when the source is shifted along the axis of transmission to one side or the other of the focal point, the energy is imaged on an area at the other side of the structure in a more or less intensified form than the source alone would provide by direct transmission to the area, depending on the location of the source with respect to the focal point.

2. Means for interposition on the axis of transmission between a radiant energy source and an area to be irradiated, to control the transmission of the radiant energy in the manner of a lens, said control means comprising a grid structure, the matrix of which defines an array of cells that are juxtaposed to one another about the axis of transmission, and have a pair of



opposed radiant energy transmissive ends to the opposing sides of the structure at the opposing axially oriented faces thereof, the individual cells of the array having reflective walls about the inner peripheries thereof, and being generally orthogonal in cross-section in planes perpendicular to those axes of the cells which extend in the general axial direction of the structure and outward through the radiant energy transmissive ends of the cells, the latter mentioned axes of the cells being angularly oriented to the axis of transmission so that the structure has a focal point on the axis of transmisson at one side thereof, and the cells being varied in length along the respective axes thereof, relative to the cross-sectional areas thereof, as the matrix progresses in directions radially outward from the axis of transmission so that when the source is disposed at the focal point, the energy which is radiated into the adjacent radiant energy transmissive ends of the cells from that point, undergoes reflection to and from the walls of the cells no more than twice before exiting from the cells at the opposing radiant energy transmissive ends thereof, and is reflected from the outwardly positioned ones of the peripheral walls of the cells in the direction of the other side of the structure along substantial parallels to the axis of transmission, at those points on the aforesaid outward ones of the peripheral walls of the cells where the centermost cross-sectional planes of the cells, axially thereof, intersect the aforesaid outward ones of the peripheral walls.

4,841,948

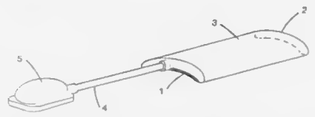
CONCAVE GASE TISSUE EXPANDER

Bruce S. Bauer, Lincolnwood, Ill.; William R. Dubrul, and Tor E. Allen, both of Santa Barbara, Calif., assignors to McGhan Medical Corporation, Santa Barbara, Calif.

Filed Oct. 6, 1987, Ser. No. 105,001

Int. Cl.[4] A61B *19/00;* **A61F** *2/02*

U.S. Cl. 128—897 **3 Claims**



1. A tissue expander device for surgical implantation beneath the skin and subcutaneous layer, the tissue expander comprising:

(a) a concave base;

(b) a thin expandable cover comprising biocompatible elastic material attached to the base to form a continuous fluid-tight envelope with a chamber therein;

(c) an injection reservoir in fluid communication with said chamber comprising means for admitting fluid to the chamber with a hypodermic needle without puncturing the cover or the base and means for substantially leak-proof sealing of the injection reservoir after the needle is withdrawn therefrom.

4,841,949

ENDOSCOPE WITH A DEVICE FOR RAISING A MEDICAL INSTRUMENT

Yoshihito Shimizu, Sagamihara, and Tatsuya Yamaguchi, Hino, both of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Dec. 9, 1987, Ser. No. 130,790

Claims priority, application Japan, Dec. 10, 1986, 61-189110[U]; Jul. 3, 1987, 62-101817[U]

Int. Cl.[4] A61B *1/00*

U.S. Cl. 128—4 **6 Claims**

1. An endoscope having a device for raising a medical instrument, comprising:

an operating section;

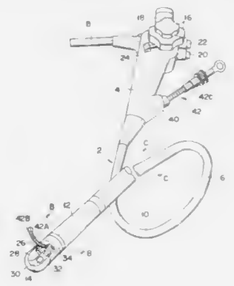
an insertion section having a distal end portion in which a storage room having an opening is provided;

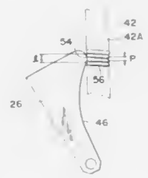
a channel duct located in said insertion section and communicating with said storage room;

a medical instrument raising block arranged in said storage room, said medical instrument raising block being used to raise the distal end portion of a medical instrument which, after passing through said channel duct, extends from said opening;

a raising operation wire running through internal passageways of said operating section and said insertion section, the distal end of said operation wire being attached to said medical instrument raising block; and

means for preventing the medical instrument from being caught by said operation wire, said means being formed at





the top of one side wall, closest to said operation wire, of the side walls defining said storage room.

4,841,950

BENDING DEVICE FOR AN ENDOSCOPE

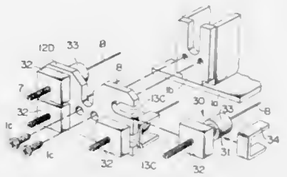
Hiroyuki Fukuda, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Mar. 15, 1988, Ser. No. 168,264

Claims priority, application Japan, Mar. 27, 1987, 62-71641; Jul. 3, 1987, 62-166669

Int. Cl.[4] A61B *1/00*

U.S. Cl. 128—4 **4 Claims**



1. A bending device for an endoscope including;

a coil sheath housed within the insertable portion thereof and an operating wire inserted in said coil sheath for connecting a bendable porton on the distal end side of said insertable portion and a bending operation portion on the proximal end side of the endscope, characterized by:

fixing means for fixing the distal end of said coil sheath on the bendable portion side so as not to rotate around its axis;

control means disposed at the proximal end of said coil sheath on said operating portion side for controlling rotation of said coil sheath around its axis within a limit, thereby causing no relative looseness between said coil sheath and said operating wire;

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said control means including a coil lock member and a coil lock holder;

said coil lock member comprising a small diameter portion in a substantially cylindrical form and a substantially rectangular parallelepiped portion at one end of said small diameter portion;

said coil lock holder being formed by a plate member and having upper and lower horizontal slits provided on the transversely opposite side thereof for rotatably inserting said small diameter portion of said coil lock member;

said slits being set apart by a distance such that said coil lock member connot be fully rotated by abutting one corner of one of said rectangular parallelepiped portion surfaces on a surface of the adjoining rectangular perallelepiped portion during rotation of said coil lock member thereby controlling rotation of said coil lock member around its axis within a limit.

4,841,951

ANGLE PORTION OF ENDOSCOPE

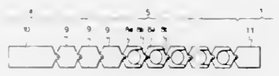
Hiroyuki Umeda, c/o Machida Endoscope Co., Ltd., 13-8, Honkomagome 6-chome, Bunkyo-ku, Tokyo, Japan

Filed Aug. 26, 1988, Ser. No. 237,500

Claims priority, application Japan, Aug. 28, 1987, 62-131098[U]

Int. Cl.[4] A61B 1/00

U.S. Cl. 128—4 1 Claim



1. In an endoscope comprising a flexible tube having a distal tip and an angle portion, a handle having a knob for operating an angle-operating wire and a conduit for guiding an article to be introduced, in which an angle portion is bendable in up-and-down and left-and-right four directions, the angle portion characterized in that a series of four-directional rings are arranged to form the rear part of the angle portion, a series of two-directional rings are subsequently arranged to from the front part of the angle portion, and the distal tip is connected to the top end of the front part of the angle portion.

4,841,952

ENDOSCOPE WITH AN OPTICAL SYSTEM

Michio Sato; Koji Kambara, and Yuki Nakajima, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 30, 1987, Ser. No. 116,018

Claims priority, application Japan, Nov. 6, 1986, 61-170750; Nov. 28, 1986, 61-183407; Nov. 28, 1986, 61-183408

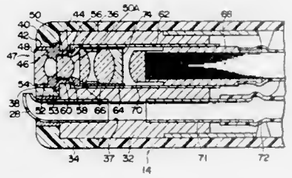
Int. Cl.[4] A61B 1/00

U.S. Cl. 128—6 5 Claims

1. An endoscope having an operation section and an insertion section containing an optical system, said endoscope comprising:

a tubular lens frame provided with a distal end portion of said insertion section and having an end face inclined to the axis of the lens frame;

a plurality of optical members arranged in said lens frame, one of said optical members partly projecting from the end face of said lens frame, which includes a convex lens having a spherical face and a cylindrical body, thus a substantially V-shaped annular groove being defined by the inclined end face of said lens frame and the external circumferential surface of said body; and



adhesive filled in a gap between said optical member and said lens frame.

4,841,953

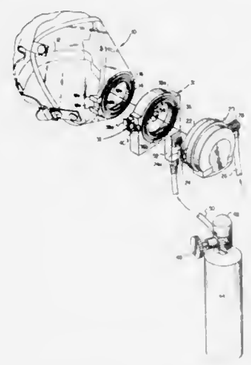
AUXILIARY SUPPLY SYSTEM FOR A PORTABLE SELF-CONTAINED BREATHING APPARATUS

Gregg W. Dodrill, 7308 Campbell Rd., Dallas, Tex. 75248

Filed Nov. 7, 1986, Ser. No. 928,540

Int. Cl.[4] A62B 9/04

U.S. Cl. 128—202.27 4 Claims



1. A portable breathing apparatus including a facepiece, a source of pressurized air, a pressure regulator, and first connecting means for connecting said facepiece to said regulator and second means for connecting said regulator to said air source for supplying air from said source into the interior of said facepiece under control of said regulator in response to demands by the user of said facepiece; wherein the improvement comprises a housing, third connecting means formed on said housing for cooperating with said first connecting means to connect said housing between said facepiece and said regulator, first passage means extending through said housing for permitting air from said source to pass into the interior of the facepiece, an additional source of pressurized air, means connecting said additional air source to said housing, second passage means formed in said housing for permitting air from said additional source to pass into the interior of the facepiece, and valve means disposed on said housing for controlling the flow of air through said second passage means.

4,841,954

OCULOFACIAL MASSAGER

Nirmal S. Kalsi, Vancouver, Canada, assignor to KLASI, Nirmal S., Vancouver, Canada

Filed Oct. 23, 1987, Ser. No. 111,608

Claims priority, application Canada, Dec. 17, 1996, 525607

Int. Cl.[4] A61H 9/00

U.S. Cl. 128—36 12 Claims

1. An oculo-facial massager for simultaneously massaging the nose and temple facial areas and the areas adjacent the eyes, nose and temples, said massager comprising frame means having an outer shell and an inner smooth substantially continuous cushioning material connected to said outer shell, said cushioning material being contoured so as to simultaneously and continuously contact the nose and temple facial areas and the areas adjacent the eyes, nose and temples of a user when in operation, vibration generating means connected to said frame means and retaining means for retaining said frame means adjacent to and in contact with the nose, the temples and the facial areas adjacent the eyes, nose and temples.

4,841,955

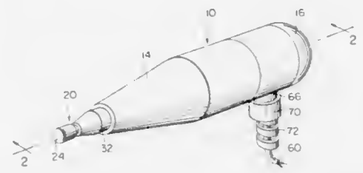
CHIROPRACTIC ADJUSTOR

Joseph M. Evans, Export, and E. Rex Moore, Pittsburgh, both of Pa., assignors to Kinetic Technology, Inc., Greensburg, Pa.

Continuation of Ser. No. 52,412, May 21, 1987, abandoned. This application Aug. 29, 1988, Ser. No. 237,651

Int. Cl.[4] A61H 7/00

U.S. Cl. 128—52 7 Claims



1. A chiropractic adjustor comprising a hollow housing, a thrust member having a patient contact member at one end thereof mounted in the housing, an electrically energized solenoid having a core mounted in the housing so that the housing is longitudially movable relative to the thrust member and the solenoid, the solenoid being mounted in alignment with the movable thrust member and imparting impact energy thereto when the solenoid is energized thereby imparting an impact energy to the thrust member which transfers the impact energy of the solenoid core to a patient, spring means interposed between the housing and solenoid which is compressed by inward movement of the housing toward a patient, and control means for triggering the solenoid to impart impact energy from the core to the thrust member which is reproducible thereby providing a reproducible transmission of energy to the patient, the control means being responsive to the compression of the spring means which is directly related to pressure between the patient contact member and a patient when the patient contact member is held against the body of a patient, the control means triggering the solenoid when the pressure between the patient contact member and a patient reaches a preset value.

4,841,956

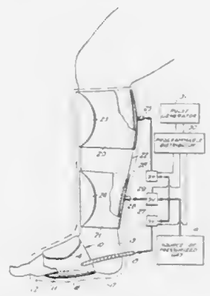
APPARATUS FOR INDUCING VENOUS-RETURN FLOW FROM THE LEG

Arthur M. N. Gardner, and Roger H. Fox, both of Devon, England, assignors to Electro-Biology, Inc., Parsippany, N.J.

Division of Ser. No. 787,124, Oct. 15, 1985, Pat. No. 4,702,232. This application Aug. 20, 1987, Ser. No. 94,286

Int. Cl.[4] A61H 9/00

U.S. Cl. 128—64 7 Claims



1. A medical appliance for promoting venous-blood flow in a human leg, said appliance comprising a first acutator for application circumferentially to the foot to induce individually pulsed actuation of the foot pump of the leg, a second actuator for application circumferentially to the proximal region of the calf to induce individually pulsed actuation of the proximal calf pump of the leg, a third actuator for application circumferentially to the distal region of the calf to induce individually pulsed actuation of the distal calf pump of the leg, and cyclically operative means connected to all said actuators and operative to sequentially operate said actuators in the sequence of first-actuator pulsed operation, then second-actuator pulsed operation, then third-actuator pulsed operation, with a period of relaxation between third-actuator pulsed operation and the next cycle of said sequence, said period of relaxation being free of pulsed actuation and exceeding (a) the time between first-actuator pulsed operation and second-actuator pulsed operation, and (b) the time between second-actuator pulsed operation and third-actuator pulsed operation.

4,841,957

BRACE FOR TREATING AND RELIEVING POSTERIOR HEEL PAIN

Beven P. Wooten, 305 Lindenhurst Dr., Apt. #2092, Lexington, Ky. 40509, and Tim L. Uhl, 3501 Pimlico Pkwy. #6, Lexington, Ky. 40502

Filed Mar. 28, 1988, Ser. No. 172,765

Int. Cl.[4] A61F 5/30, 5/00

U.S. Cl. 128—80 H 12 Claims

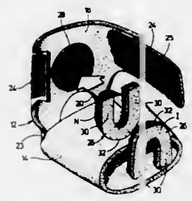
1. A brace, said brace including means for treating inflamed tissue and relieving posterior heel pain of a patient, comprising:

means for mounting said brace about the heel of the patient;

a treatment pad; and

means for selectively fastening said treatment pad to said mounting means so that said pad is in one of two positions, said positions consisting of a first position in which said pad is positioned around the posterior protrusion on the calcaneous of the patient to cushion and reduce pressure placed on the inflamed tissue, and a second position, in

which said pad is rotated relative to said first position, and extends across the Achilles tendon of the patient above the



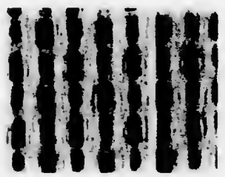
inflamed tissue to provide a counter force to the tendon that reduces longitudinal stress.

4,841,958

NONWOVEN ORTHOPEDIC CASTING MATERIALS WITH APERTURES

Dean A. Ersfeld, Maplewood, and Paul E. Hansen, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 5, 1987, Ser. No. 47,006
Int. Cl.[4] A61F 5/04
U.S. Cl. 128—90 **51 Claims**



1. An orthopedic support material, comprising:

a nonwoven, stretchable fabric comprising a pattern of fiber bundles and apertures between said fiber bundles, each said fiber bundle comprising a plurality of fibers having interstices therebetween, the average size of said apertures being from about 0.3 mm^2 to about 16 mm^2; and

a curable prepolymer resin which is impregnated into the interstices between said fibers of said fiber bundles so as to impart sufficient strength to the material upon curing to be used as an orthopedic support material while leaving the apertures between fiber bundles substantially unoccluded so as to permit sufficient water vapor permeability through the cured material.

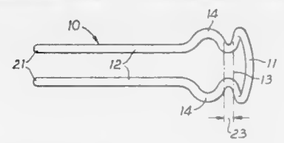
4,841,959

SPINAL/SKULL FIXATION DEVICE

Andrew O. Ransford, London, England, assignor to A. W. Showell (Surgicraft) Limited, Redditch, England

Filed Sep. 13, 1988, Ser. No. 244,053
Claims priority, application United Kingdom, Sep. 15, 1987, 8721661
Int. Cl.[4] A61F 5/04
U.S. Cl. 128—192 YM **8 Claims**

1. A device for fixation of a skull to bones of an adjacent spine comprising biocompatible rod-like material formed in the slope of a loop of substantially circular form terminating in and connecting a pair of generally parallel legs, with the loop and the legs at their junction lying in planes that are generally perpendicular to each other, and the legs being provided adjacent said junction with opposed kinks extending away from each other, whereby, when the loop has been secured to the base of the skull by means of wires passing through holes in the skull and the legs have been secured to bones of an adjacent spine by sublaminae wires, wires engaged round the legs at



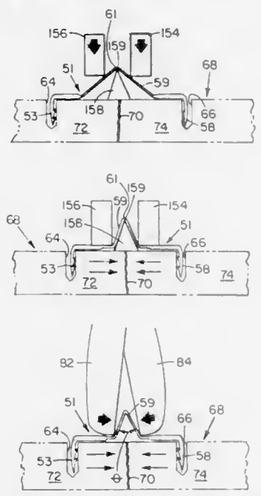
both sides of the kinks effect fixation of the skull in relation to the adjacent bones of the spine.

4,841,960

METHOD AND APPARATUS FOR INTEROSSEOUS BONE FIXATION

Eric T. Garner, 7123 Mountain Grove, San Antonio, Tex. 78250

Filed Feb. 10, 1987, Ser. No. 12,838
Int. Cl.[4] A61F 5/04
U.S. Cl. 128—92 YF **3 Claims**



1. A method for bone fixation, comprising the steps of:

(a) inserting first and second feet of a bone staple into first and second drill holes, respectively, in a section of bone, said first drill hole located on a first side of a fracture line in said bone section and said second drill hole located on a second side of said fracture line;

(b) crimping a web of said staple into substantially an inverted V shape, said crimping step providing an initial compression of said bone portions toward each other;

(c) compressing said crimped portion of said staple web, said compressing step providing a second compression of said bone portions toward each other; and

(d) folding said compressed portion of said staple web toward one side of said fracture line.

4,841,961

PATIENT RESTRAINING DEVICE AND TEMPORARY TRANSPORT

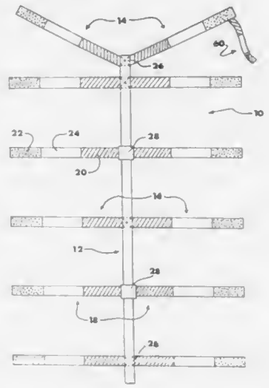
Bonnie Burlage, Box 473; Donna Steinmann, Rte. 2, and Margaret Reiman, Box 515, all of Ashton, Id. 83420

Filed Nov. 17, 1986, Ser. No. 931,555
Int. Cl.[4] A61F 5/37; A61G 1/00
U.S. Cl. 128—876 **3 Claims**

3. In combination, a patient restraint device and a temporary transport means having apertures therein, said patient restraint device comprising:

a. a single first ventral strap member adapted to be aligned along a longitudinal axis of a patient's body on the upper surface thereof from one end of said single first ventral strap member adapted to be positioned just below the chin of said patient to a second end of said strap member adapted to be adjacent the patient's feet when the patient is in a supine or prone position;

b. a pair of second strap members obliquely oriented to said single first ventral strap member and permanently directly affixed solely thereto at the one end thereof adapted to be positioned below said chin;



c. a plurality of pairs of additional strap members having a sleeve intermediate the lateral ends thereof, said single first ventral strap member positioned through said sleeves such that said additional strap members are oriented perpendicular to said single first ventral strap member and are slidably attached by said sleeves solely to the single first strap member; and

d. each of the second and additional strap members having latch means thereon such that said strap members are directed through said apertures provided on the temporary transport means in order to securely affix the patient restraint device to the temporary transport means with said patient immobilized therebetween.

4,841,962

COLLAGEN MATRIX/POLYMER FILM COMPOSITE DRESSING

Richard A. Berg, R.D. #1, Box 148, Lambertville, N.J. 08530; Frederick H. Silver, R.D. #1, Box 1128, Bangor, Pa. 18013; James M. Pachence, 7 Chopin La., Lawrenceville, N.J. 08648, and John D'Antonio, 11 Lovers La., Princeton, N.J. 08540

Continuation-in-part of Ser. No. 875,827, Jun. 18, 1986, which is a continuation-in-part of Ser. No. 843,828, Mar. 26, 1986, Pat. No. 4,703,108, which is a continuation of Ser. No. 593,733, Mar. 27, 1984, abandoned. This application Sep. 11, 1987, Ser. No. 95,779
Int. Cl.[4] A61L 15/00
U.S. Cl. 128—156 **8 Claims**

1. A wound dressing to promote the progressive healing of a wound comprising:

(a) a crosslinked collagen matrix;

(b) a bioabsorbable adhesive coated on the surface of the collagen matrix to be placed in contact with the wound bed whereby the matrix affords epithelial and fibroblast cells in the bed with a scaffold on which to attach themselves and grow and the adhesive facilities wound healing; and

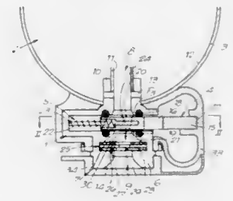
(c) a multilayer polymer film secured to the opposite surface of the collagen matrix comprising a first layer having predetermined moisture and gas transmissivity characteristics appropriate to the wound to be healed superposed with the collagen matrix, and a second layer remote from the collagen matrix having relatively reduced moisture and gas transmissivity characteristics to render it more occlusive than the first layer to promote new cell growth in the early stages of wound healing, and strippable from the film after a period of time sufficient for the earlier stages of wound healing to take place to provide thereafter increased moisture vapor transmission between the wound bed and the atmosphere.

4,841,963

ACCESSORY FOR GAS MASKS AND GAS MASKS EQUIPPED THEREWITH

Gilbert Vandeputte, Berchem, Belgium, assignor to Engicom Naamloze Vennootschap, Brussels, Belgium

Filed Sep. 4, 1987, Ser. No. 94,305
Claims priority, application Belgium, Sep. 8, 1986, 2/61046
Int. Cl.[4] B62B 18/00
U.S. Cl. 128—202.15 **8 Claims**



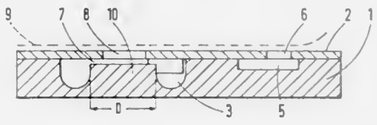
1. An accessory for a gas mask comprising a port member having a channel allowing communication between the space inside said gas mask and the environment outside said gas mask, said port member having a slidable sealing element arranged outside said gas mask and movable between a first position to open said channel and a second position to close said channel, said channel being defined in part by a collar which extends inwardly from said gas mask, the wall of said collar having opening means passing therethrough, said channel communicating with the lowest portion of said space inside said gas mask by way of said opening means for draining moisture from said space to said environment by way of said channel.

4,841,964

INHALER

Wilhelm Hurka, Am Pfarrfeld 1, A9851 Lieserbrücke, Austria, and Rudolf A. Hatschek, 3, rue Jacques-Vogt, Fribourg 5, Switzerland (CH-1700)

Filed Jul. 31, 1986, Ser. No. 892,197
Claims priority, application Austria, Aug. 1, 1985, 2272/85
Int. Cl.[4] A61M 16/00
U.S. Cl. 128—203.15 **16 Claims**



1. An inhaler for introducing a solid substance in particulate

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form into the inhaled air of a user, comprising (a) a body having

(1) an internal surface defining an endless path,

(2) an intake conduit for the inhaled air, the air intake conduit opening tangentially into said endless path, and

(3) an air outlet adapted for fluid communication with a breathing passage of the user and discharge means for the inhaled air in fluid communication with said endless path and the air outlet, and said air outlet and discharge means being disposed centripetally relative to the endless path whereby inhalation by the user through the outlet causes air to flow through the air intake conduit, the endless path and the discharge means to the outlet,

(b) a ball having a surface and being disposed in said endless path, the ball being arranged in said endless path to circulate therearound under the effect of the air flow, and

(c) a solid medicament substance distributed between the surface of the endless path and the ball.

4,841,955

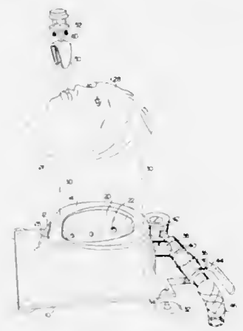
ANIMAL HOLDING AND POSITION RESTORING DEVICE EMPLOYING VACUUM HOLDER AND MOUTHPIECE

Deborah A. Jacobs, 173 Bonview St., San Francisco, Calif. 94110

Continuation of Ser. No. 670,891, Nov. 13, 1984, abandoned. This application Jun. 6, 1986, Ser. No. 873,261

Int. Cl.[4] A61B *19/00*

U.S. Cl. 128—303 B 9 Claims



5. Head-immobilizing and position-restoring apparatus for an animal, comprising:

(a) a base portion having a head cradle, said head cradle being rigid and shaped to receive the back of an animal's head and form at least a partial vacuum circumferential seal around the back of said animal's head, said cradle including a vacuum chamber in communication with the portion of said animal's head circumscribed by said seal,

(b) means for creating and maintaining at least a partial vacuum in said chamber adjacent the back of said animal's head so as to cause said head to be held against said cradle by air pressure,

(c) mounting means for holding said cradle in a fixed position, and

(d) means for remembering the position of said animal's anatomy as held by said head cradle after said animal is removed from said head cradle and for indicating when said position is accurately restored after said animal is again held by said head cradle.

4,841,966

ELECTRODE CONSISTING OF AT LEAST THREE ELEMENTS USEFUL FOR A HF SURGICAL INSTRUMENT

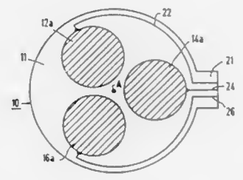
Uwe Hagen, Forchheim, and Udo Redler, Effeltrich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 22, 1988, Ser. No. 158,519

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1987, 3730603

Int. Cl.[4] A61B *17/39*

U.S. Cl. 128—303.13 4 Claims



1. Apparatus for performing electrosurgical procedures on the body of a patient, comprising:

a high frequency electrosurgical generator;

an active electrode coupled to said high frequency electrosurgical generator and adapted to make contact with a first portion of the body of said patient;

a neutral electrode including at least three electrode elements arranged on a common flexible carrier, said carrier including a link on a portion of its periphery on which connecting wires are run coupling said electrode elements to said high frequency electrosurgical generator, said electrode elements being adapted to make secure surface contact with a portion of the body of said patient which is remote from said first portion of said body; and

a safety monitor circuit coupled to said neutral electrode via said carrier link for using the electrode elements of said neutral electrode as sensors for monitoring the sufficiency of surface contact between said electrode elements and the body of said patient, wherein:

for improving the operation of said neutral electrode as a sensor for said safety monitor circuit, at least a portion of each of said electrode elements has a uniformly-curved circumferential edge, said electrode elements are arranged so as to be symmetrically disposed with respect to an axis of symmetry of said carrier which extends perpendicularly from approximately the center of said carrier, and said electrode elements have equal surface areas and are arranged on said carrier so as to be displaced with respect to one another in a circumferential direction.

4,841,967

POSITIONING DEVICE FOR PERCUTANEOUS NEEDLE INSERTION

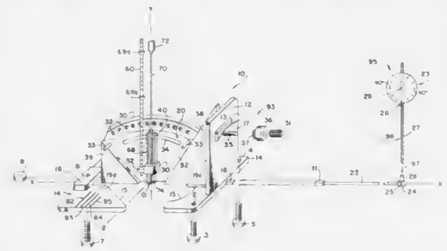
Ming Z. Chang, 8 Flynn Ter., West Orange, N.J. 07052; Chuen M. Yeh, and Chuen Y. Yeh, both of 15 Stratford Cir., Edison, N.J. 08820

Filed Jan. 30, 1984, Ser. No. 575,017

Int. Cl.[4] A61B *19/00*

U.S. Cl. 128—303 B 7 Claims

1. A device for accurately positioning needles for percutaneous insertion through the skin of a patient to a predetermined target point in the patient's body which comprises: (i) a base, provided at one end thereof with a vertically disposed support member; (ii) turning plate means movably affixed to said base and adapted to be controllably tilted in a direction which is substantially parallel to the plane defined by said vertical support member; (iii) means for adjusting the tilt angle of said turning plate means; (iv) needle holding means, movably affixed to said turning plate means, for removably securing said needle therein and adapted to be tilted along said turning plate in a plane which is substantially perpendicular to the plane defined by said vertical support member; (v) means for adjusting the tilt angle of the needle holding means along said turning plate means; and (vi) arcuate needle angle indicator means,



attached to said turning plate means and provided with a plurality of spaced-apart radiopaque needle angle indicators, for providing a visible indication of said needle tilt angle along said turning plate means when the device is exposed to X-ray radiation, the balance of said device being constructed of a material which is substantially transparent or transluscent to said radiation.

4,841,968

ANTITHROMBOTIC/THROMBOLYTIC SUTURE AND METHODS OF MAKING AND USING THE SAME

Richard L. Dunn, Birmingham, Ala.; John W. Gibson, Kingsport, Tenn.; Carlton A. Eddy, and Leonard E. Laufe, both of San Antonio, Tex., assignors to Southern Research Institute, Birmingham, Ala. and Texas Health Science Center, San Antonio, Tex., a part interest

Filed Sep. 26, 1986, Ser. No. 912,400

Int. Cl.[4] A61L *17/00*

U.S. Cl. 128—335.5 4 Claims

1. A surgical suture material for preventing postoperative thrombosis at an anastomosis site in animals, comprising a blend of a polymer and an effective amount of an antithrombotic or thrombolytic agent whereby said agent has a first-order rate of release from said suture material at said site and wherein said agent is prostacyclin or an analogue of prostacyclin.

3. A method of improving patency after anastomosis in animals, comprising the step of performing the anastomosis with surgical suture material formed of fibers of a polymer having an effective amount of an antithrombotic or thrombolytic agent incorporated therein as a blend having a first-order rate of release, wherein said agent is prostacyclin or an analogue of prostacyclin.

4. A method of making surgical sutures, comprising the steps of:

incorporating an effective amount of an antithrombotic or thrombolytic agent into a polymer to form a blend having first-order rate of release; and

extruding said blend into a fibrous suture material, wherein said agent is prostacyclin or an analogue of prostacyclin.

4,841,969

DEVICE FOR THE PRODUCTION OF A COLD TREATMENT-GAS FOR CRYOTHERAPY

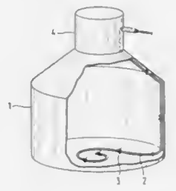
Andreas Donnerhack, Krefeld, and Kurt P. Schneider, Nettertal, both of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 1, 1987, Ser. No. 56,112

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1986, 3621425

Int. Cl.[4] A61F *7/00*; B65D *90/04*; F16C *7/02*

U.S. Cl. 128—400 4 Claims



1. In a device for the producing of a cold treatment-gas from liquid nitrogen, for cryotherapy, with an insulated container for storing the liquid nitrogen, and electrical heating arranged within the container interior, the improvement being said container being a small container with a narrow restricted neck and with a maximum volume space of 50 l, said electrical heating being a heating element consisting of a self-regulating strip heater secured in the interior of the container, and the supply line for said strip heater extending within and down said neck.

4,841,970

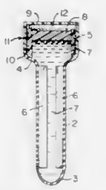
CRYOGENIC RECTAL INSERT

Herbert Rand, 5425 NW. 82 Ave., Miami, Fla. 33166

Filed Jan. 26, 1988, Ser. No. 148,549

Int. Cl.[4] A61F *7/12*

U.S. Cl. 128—401 6 Claims



1. A cryogenic rectal insert for the treatment of hemorrhoids comprising a plastic substantially cylindrical portion of a length and diameter suitable for insertion in the rectal canal of the body, one end of said cylindrical portion being bullet-shaped to facilitate rectal insertion, the other end of said cylindrical portion being outwardly flared, a congealable fluid filling said cylindrical portion, a cylindrical cap joined to an outer perimeter portion of said flared end for hermetically sealing said congealable fluid in said cylindrical portion and for forming an enlargement limiting rectal insertion; and means in contact with the internal surface of said cylindrical portion and extending into said congealable fluid to promote heat transfer into and out of said congealable fluid.

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4,841,971

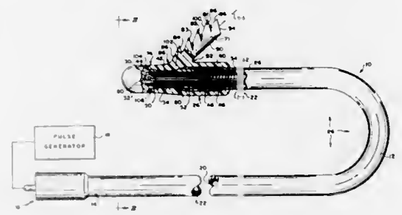
ENDOCARDIAL LEAD WITH PROJECTIONS HAVING SAW TOOTH FORMATION

Stanley R. Hess, Miami, Fla., assignor to Cordis Leads, Inc., Miami, Fla.

Continuation of Ser. No. 56,472, May 26, 1987, abandoned, which is a continuation of Ser. No. 783,820, Oct. 7, 1985, abandoned, which is a continuation of Ser. No. 502,225, Jun. 8, 1983, abandoned, which is a continuation-in-part of Ser. No. 311,620, Oct. 15, 1981, abandoned. This application Mar. 29, 1988, Ser. No. 172,967

Int. Cl.[4] A61N *1/04*

U.S. Cl. 128—419 P **28 Claims**



1. An endocaridal pacing lead comprising: an elongate electrical conductor extending substantially the length of said lead; an insulating sheath surrounding said conductor for substantially the entire length of said conductor; an electrode assembly at the distal end of said lead; said electrode assembly comprising a tip electrode having a distal tip and a proximal end and a sleeve of insulating material surrounding said proximal end of said tip electrode; said elongate conductor being electrically connected to said proximal end of said tip electrode; said sleeve having at least two circumferentially spaced projections which are made of a flexible elastomeric material that is sufficiently pliant to prevent penetration of heart tissue and which project outwardly from said sleeve, each projection extending radially and axially away from the outer surface of said sleeve, outwardly from the axis of said sleeve and rearwardly away from said distal tip; and each projection having a rear edge and a saw tooth formation defined by at least two saw teeth which extend radially outwardly of the axis of said electrode assembly and outwardly from an outer side edge or surface of said projection facing radially away from said lead and each tooth having a rear edge, whereby, when said electrode assembly at the distal end of said lead is implanted with a heart, said rear edges of said projections and of said teeth of said saw tooth formations engage trabeculae within a heart cavity thereby to aid in retaining said distal tip of said tip electrode in good electrical conductive engagement with a desired wall portion in the heart cavity.

4,841,972

LOW-FREQUENCY TREATMENT DEVICE DIRECTED TO USE IN BATH

Kazumi Masaki, Osaka, Japan, assignor to Ken Hayashibara, Okayama, Japan

Filed Nov. 3, 1987, Ser. No. 116,330

Claims priority, application Japan, Nov. 11, 1986, 61-26830

Int. Cl.[4] A61N *1/00* H05G *00/00*

U.S. Cl. 128—421 **5 Claims**

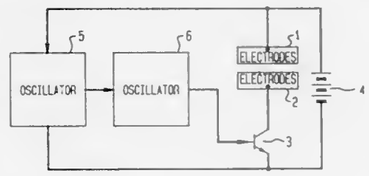
1. A low frequency treatment device for treatment of a subject's body in a bath comprising

a battery;

a pair of electrodes which come into contact with the subject's body when in use;

a switching transistor having a main current path connected with said battery only through said pair of electrodes;

and means for oscillating an interrupted train of pulses, said oscillating means having an output terminal connected



with a base of said switching transistor to control the conduction of the main current path.

4,841,973

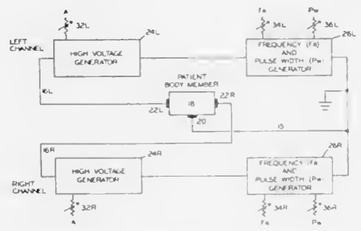
ELECTRICAL STIMULATORS

Harold D. Stecker, 73 Hedgerow Dr., Morrisville, Pa. 19067

Filed Sep. 21, 1987, Ser. No. 99,159

Int. Cl.[4] A61N *1/36*

U.S. Cl. 128—421 **4 Claims**



1. Two channel means for applying electrical impulses to a body through electrodes comprising:

a. a first circuit including a first electrode and a common electrode;

b. a second circuit including a second electrode and said common electrode;

and manual means in each circuit for independently controlling the frequency of pulses delivered to the first and second electrodes.

4,841,974

APPARATUS AND METHOD FOR THE EXAMINATION OF A LIQUID MEDIUM

Walter Gumbrecht, Erlangen; Wolfgang Schelter, Uttenreuth; Bernhard Montag, Forchheim, and Peter Höbel, Buckenhof, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 22, 1987, Ser. No. 136,831

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643980

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—635 **20 Claims**

1. Apparatus for the examination of a liquid medium to be analyzed, comprising:

(a) a catheter having a plurality of lumens, each of said lumens having a common opening to the liquid medium;

(b) means, coupled to a first one of said plurality of lumens, for providing a reversible flow of an infusion solution, at said opening, to and from said opening;

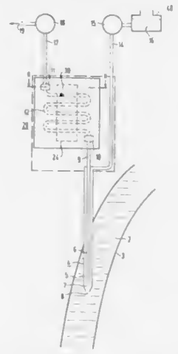
(c) a measuring canal coupled to a second one said plurality of lumens;

(d) means for providing an outflow through said measuring canal at a predetermined velocity;

(e) at least a first sensor and a second sensor, said measuring canal connecting said first sensor and said second sensor;

(f) means for measuring differences between outputs of said first sensor and said second sensor; and

(g) wherein the size of the measuring canal is chosen so that



during a first time interval said first sensor is adjacent to the infusion solution at the same time that said second sensor is adjacent to said liquid medium and during a second time interval said first sensor is adjacent to said liquid medium at the same time said second sensor is adjacent to said infusion solution.

4,841,975

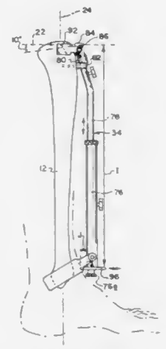
PREOPERATIVE PLANNING OF BONE CUTS AND JOINT REPLACEMENT USING RADIANT ENERGY SCAN IMAGING

Steven T. Woolson, Los Altos, Calif., assignor to Cemax, Inc., Santa Clara, Calif.

Filed Apr. 15, 1987, Ser. No. 38,515

Int. Cl.[4] A61B *6/00*

U.S. Cl. 128—653 **18 Claims**



1. A method of preoperative planning of surgical cuts of a selected bone in a body using a cutting guide having a guide surface defining the contour of a desired bone cut and a gauge member having a predetermined position relative to the guide surface and positionable adjacent a selected postion on the bone, comprising:

selecting regions of the body in which the selected bone is located to be used in determining a desired positioning of the cutting guide relative to the bone during cutting;

subjecting the selected body regions to radiant energy to produce radiant energy responses that are characteristic of the body and the selected bone and are detectable externally of the body;

detecting produced radiant energy responses to obtain representations of the selected body regions, including representations of the corresponding regions of the individual bone; and

determining from the representations a selected position of the gauge member relative to the bone so that when the gauge member is placed adjacent the selected position on the bone, the guide surface is in the selected position relative to the bone.

4,841,976

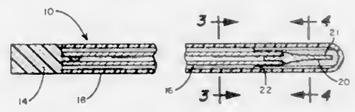
STEERABLE CATHETER GUIDE

Brian M. Packard, Delano, and Mark A. Rydell, Golden Valley, both of Minn., assignors to Schneider-Shiley (USA) Inc., Minneapolis, Minn.

Filed Dec. 17, 1987, Ser. No. 134,103

Int. Cl.[4] A61B *6/00*

U.S. Cl. 128—657 **7 Claims**



1. A steerable catheter guide member for facilitating the insertion of a catheter having a lumen surrounded by a catheter wall into a blood vessel, comprising:

(a) an elongated, flexible inner member having a proximal end and a distal end having a flexible formable distal tip portion;

(b) an elongated, flexible outer tube having a proximal end and a distal end, said outer tube surrounding said inner member with a predetermined clearance therebetween over a majority of the length of said inner member, the outside diameter of said outer tube being of a size receivable in and movable through the vascular system of the patient;

(c) means at the proximal end of said inner member for facilitating rotation of said inner member with respect to said outer tube; and

(d) means for bonding said formable distal tip portion on said inner member to said outer tube near said distal end of said outer tube.

4,841,977

ULTRA-THIN ACOUSTIC TRANSDUCER AND BALLOON CATHETER USING SAME IN IMAGING ARRAY SUBASSEMBLY

James M. Griffith, Idaho Falls, Id.; Mario Maciel, Phelan, Calif.; Walter L. Henry, South Laguna, Calif., and Paul J. Zalesky, Huntington Beach, Calif., assignors to Inter Therapy, Inc., Costa Mesa, Calif.

Filed May 26, 1987, Ser. No. 53,692

Int. Cl.[4] A61B *8/12*

U.S. Cl. 128—660.03 **33 Claims**

1. An ultra-thin electroacoustic transducer having an overall thickness less than 0.0075 inch and comprising:

an active piezoelectric layer having a thickness of approximately one-fourth wavelength at its acoustic operating frequency and having an acoustic impedance Z_1;

a backing layer affixed to a first face of said piezoelectric layer, said backing layer having an acoustic impedance Z_2 which is greater than Z_1;

a faceplate layer affixed to a second, opposite, face of said piezoelectric layer, said faceplate layer having a thickness of approximately one-fourth wavelength at said operating

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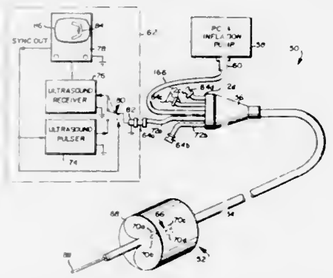
frequency and having an acoustic impedance Z_3 which is approximately the geometric mean of Z_1 and an ambient acoustic impedance during use; and



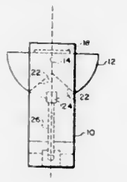
electrical lead means for making electrical connections to said first and second faces of the piezoelectric layer.

4,841,978

ULTRASONIC SCANNING DEVICE WITH ELASTIC PUMPER

Arnold T. Eventoff, Rye Brook, and Wyatt S. Newman, New York, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,371
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660.09 20 Claims



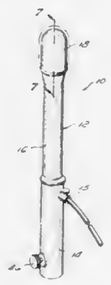
1. An ultrasonic scanning device comprising:
a stator;
a rotor having an axis of rotation, said rotor being pivotably mounted on the stator for oscillation around the axis of rotation;
an ultrasonic transducer mounted on the rotor; and
means for causing the rotor to oscillate around the axis of rotation;
characterized in that:
the rotor has two elastic bumper stops arranged spaced from the axis of rotation and spaced from each other;
the device further comprises an elastic bumper attached to the stator and arranged between the bumper stops; and
the means for oscillating the rotor oscillates the rotor with substantially constant angular velocity, and reverses the direction of the rotor by elastic collisions between the bumper stops.

4,841,979

ULTRASONIC PROSTATE PROBE ASSEMBLY

Julian Dow, San Clemente, and Paul F. Meyers, San Juan Capistrano, both of Calif., assignors to Capistrano Labs, Inc., San Clemente, Calif.

Filed Jan. 25, 1988, Ser. No. 147,793
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660.10 12 Claims



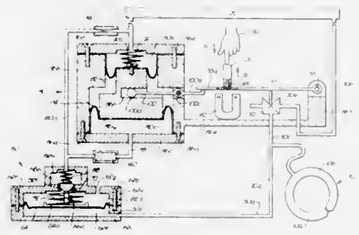
1. An ultrasonic probe assembly comprising:
a housing;
ultrasonic transducer means pivotally disposed within said housing for generating and receiving ultrasonic waves; means coupled to said ultrasonic transducer means for defining a scanning axis therefore
motor means for generating a reciprocating motion for pivoting said transducer means about said scanning axis;
means for biasing said transducer means in a first pivotal direction about said scanning axis;
a flexible linkage extending between said motor means and said transducer means for translating reciprocal motion of said motor means to pivotal motion of said transducer means about said scanning axis; and
means for selectively rotating said means for defining a scanning axis to enable pivoting of said transducer means in multiple scanning directions within said housing.

4,841,980

AUTOMATIC ARTERIAL BLOOD PRESSURE RECORDER SYSTEM

Arnold St. J. Lee, 2008 Corner Ave., Los Angeles, Calif. 90025

Filed Nov. 25, 1985, Ser. No. 801,248
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—682 12 Claims



1. A blood pressure recorder system of the type having an inflatable cuff in flow communication with a pressurized gas source, the system including:
a three-way inflation valve in flow communication with the inflatable cuff and the pressurized gas source;

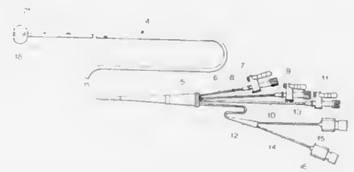
a pressure sensor having only two chambers with each chamber having a pressure responsive member;
means, responsive to the sensor, for operating the inflation valve;
a conduit connecting the pressurized gas directly from the pressurized gas source to one chamber of the pressure sensor; and
a flow restricted conduit connecting the pressurized gas from the pressurized gas source to the other chamber of the pressure sensor, whereby the pressure sensor facilitates deflation of the cuff when a predetermined small gas pressure remains in the cuff for a predetermined time period.

4,841,981

CATHETERS FOR MEASUREMENT OF CARDIAC OUTPUT AND BLOOD FLOW VELOCITY

Susumu Tanabe; Shigekazu Sekii; Kouji Tsuchida, and Yoshio Ishizu, all of Fujinomiya, Japan, assignors to Terumo Corporation, Tokyo, Japan

Filed Mar. 4, 1987, Ser. No. 21,912
Claims priority, application Japan, Mar. 7, 1986, 61-48681
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—692 5 Claims



1. A catheter connected to an apparatus for continuously measuring cardiac output based on a cardiac output value initially measured by using a dilution method, values of a continuously measured blood flow velocity signal and a relationship between the cardiac output value initially measured and blood flow velocity, said catheter comprising:
an aperture portion for discharging a liquid for measuring the cardiac output based on the thermodilution method;
temperature sensing means, including a temperature sensing element arranged at a predetermined distance from said aperture portion, for sensing the temperature of blood diluted by the liquid; and
a self-heating type thermistor, located at a distance of five to twenty-five millimeters from said temperature sensing means and having a calorific value of 0.01 to 50 joules with a direct relation between the distance and the calorific value, for sensing an equilibrium temperature resulting from a quantity of heat applied thereby and a quantity of heat absorbed by the blood.

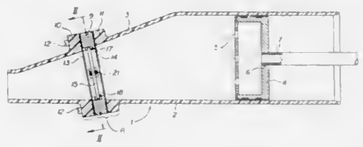
4,841,982

PLETHYSMOGRAPHIC MEASURING CHAMBER

Andrey Nikiforov, Flemington, N.J., and Roger Ventrone, Lucinges/Bonne, France, assignors to Research & Consulting Company A.G., Itingen, Switzerland

Filed Dec. 22, 1987, Ser. No. 136,322
Claims priority, application Switzerland, Dec. 22, 1986, 05128/86
Int. Cl.[4] A61M *15/00*
U.S. Cl. 128—716 4 Claims

1. A plethysmographic measuring chamber for receiving the body of a laboratory animal for measuring respiratory parameters, which chamber has two ends and comprises:
a tubular body having a front end, and a tapered portion at said front end, said tapered portion terminating in a aperture for admitting a flow of gas to the chamber for inhaling by the animal therein; adjacent said aperture, two annular seals spaced apart along a longitudinal chamber axis and provided with openings for admitting the snout of an animal placed in the chamber, said seals defining one end of the chamber; a movable wall defining the other end of the chamber; and adjustable in position to adapt the volume of the chamber to the size of the animal therein; and a retaining collar disposed in the spacing between the



said seals, and comprising two mutually opposite members each concave towards said axis of the chamber, mounting means for said concave members such that said members are movable towards and away from one another, and positioning means external to the chamber, adapted to position said concave members at selected radial positions relative to said chamber axis.

4,841,983

SPATIAL TRAJECTORY ANALYSIS IN BRAIN ELECTRICAL ACTIVITY MAPPING

Frank H. Duffy, 1990 Commonwealth Ave., Brighton, Mass. 02135

Filed Apr. 13, 1987, Ser. No. 38,037
Int. Cl.[4] A61B *5/04*
U.S. Cl. 128—731 14 Claims

1. The method of detecting and characterizing brain pathology in a patient, comprising the steps of:
determining the patient's evoked potential data;
preparing a brain electrical activity map representing said evoked potential data;
determining the location of one or more peaks of said evoked potential data in each of a sequence of frames;
calculating the center of gravity of said peaks for each frame;
plotting said center of gravities in a single frame to provide a spatial trajectory of said evoked potential data; and
detecting and characterizing brain pathology in the patient by comparing the appearance of said spatial trajectory to a comparable trajectory for normal patients.

4,841,984

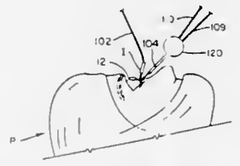
FLUID-CARRYING COMPONENTS OF APPARATUS FOR AUTOMATIC CONTROL OF INTRAOCULAR PRESSURE

C. D. Armeniades, and Louise C. Moorhead, both of Houston, Tex., assignors to Armoor Ophthalmics, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 775,217, Sep. 16, 1985, Pat. No. 4,722,350, which is a continuation-in-part of Ser. No. 653,723, Sep. 21, 1984, abandoned, which is a continuation-in-part of Ser. No. 436,953, Oct. 27, 1982, Pat. No. 4,548,205. This application Oct. 16, 1987, Ser. No. 109,077

Int. Cl.[4] A61B 5/00

U.S. Cl. 128—748 18 Claims



1. An apparatus for controlling fluid pressure in an ocular globe, comprising:
(a) a transfer conduit means adapted to communicate with the interior of the ocular globe; and
(b) damping means communicating with the transfer conduit means for attenuating transient and rapid periodic disturbances in intraocular pressure.

4,841,985

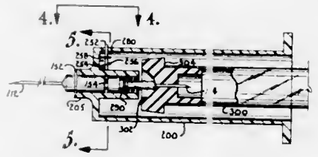
BLOOD DRAWING APPARATUS

Thomas Wanamaker, R.R. 2, Box 615, Smithville, Mo. 64089

Filed Apr. 21, 1986, Ser. No. 854,171

Int. Cl.[4] A61B 5/00

U.S. Cl. 128—763 40 Claims



1. A fluid collection system comprising:
a double-ended cannula structure open at both ends and having a bore for passage of fluid therethrough;
a holder having means therein for releasably mounting the cannula structure with one end extending forwardly of said holder for venipuncture and the other end extending rearwardly for coupling with a collection container, said mounting means comprising:
housing means at one end of said holder for receiving a portion of said structure therein with said one cannula end extending forwardly of said housing means in said venipuncture position and said other end extending rearwardly for said coupling with said collection container;
bias means for urging said structure from said housing means after said reception of said structure in said housing means; and
user-operable locking means having an operable element exterior of said housing means, said locking means releasably engaging said cannula structure to said housing means after said reception of said structure in said housing means, said engagement overcoming the effect of said bias means in a manner to maintain said respective ends of said cannula structure in said extensions beyond said housing means during use, said user operating said element for disengaging said locking means from said structure, whereupon said bias means urge said cannula structure from said housing means and said holder.

4,841,986

METHOD AND APPARATUS FOR MEASURING INTRACRANIAL FLUID PRESSURE

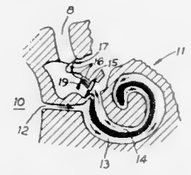
Robert J. Marchbanks, 19, Middle Road, Lymington, Hampshire SO41 9 HE, United Kingdom

Filed Sep. 17, 1987, Ser. No. 99,438

Claims priority, application United Kingdom, Sep. 19, 1986, 8622671

Int. Cl.[4] A61B 5/12

U.S. Cl. 128—746 16 Claims



1. A method of serially monitoring the intracranial fluid pressure of a subject which comprises alternately obtaining measurements related to the magnitude and direction of the volume displacement of an ear drum in response to induced stapedial muscle contraction and the acoustic compliance of said eardrum when pressure on opposite sides thereof is equalised by tympanometry, and using said measurements serially to monitor the intracranial fluid pressure of the subject.

4,841,987

AUTOMATICALLY RESETTING, FORCE-SENSING PROBE AND RELATED METHOD OF OPERATION

Stephen J. Brown, Harrisonburg, Va., and Stanley L. Pond, Berthoud, Colo., assignors to Accudent, Inc., Harrisonburg, Va.

Filed Jul. 2, 1987, Ser. No. 69,190

Int. Cl.[4] A61B 5/10

U.S. Cl. 128—777 14 Claims

1. An apparatus for probing periodontal tissue, comprising:
a housing for manipulating the apparatus;
a probe tip for engaging the periodontal tissue at a selected level of force;
a resilient beam portion connecting the probe tip to said housing, said beam portion extending in a predetermined angular alignment with said probe tip in the absence of force and being bendable from said predetermined angular alignment to another angular alignment in accordance with the force exerted against the probe tip;
strain gauge means coupled to the resilient beam portion operative to generate an electrical potential representative of the magnitude of the difference between said another angular alignment and the predetermined angular alignment; and
force indicating means responsive to said generated electrical potential for indicating the amount of force exerted against the probe tip.

4,841,988

MICROWAVE HYPERTHERMIA PROBE

Richard W. Fetter, Colgate; Peter D. Gadsby, Cedarburg, both of Wis., and Jeffery L. Kabachinski, Boynton Beach, Fla., assignors to Marquette Electronics, Inc., Milwaukee, Wis.

Filed Oct. 15, 1987, Ser. No. 108,923

Int. Cl.[4] A61N 5/02

U.S. Cl. 128—804 17 Claims

1. In a coaxial microwave probe for interstitial hyperthermia treatment having a conductive inner member extending axially along the length of the probe, a dielectric material surrounding the inner member along substantially its full length, and an outer conductive member surrounding the dielectric material, said outer conductive member having a generally open area defining an effective heating length of the probe to provide a desired heating pattern, the improvement comprising said outer conductive member disposed in a helical pattern along the effective length, said helical pattern defining a variable spaced pitch to provide a maximum open area in the center portion of the effective length and smaller open areas axially in both directions therefrom.

4,841,989

APPLICATOR FOR USE IN HYPERTHERMIA

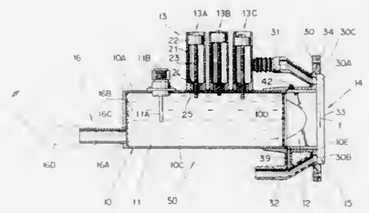
Makoto Kikuchi, Mitaka; Shinsaku Mori, Tokyo; Yoshio Nikawa, Tokyo, and Takashige Terakawa, Tokyo, all of Japan, assignors to Tokyo Keiki Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1986, Ser. No. 878,328

Claims priority, application Japan, Jun. 29, 1985, 60-143541; Jun. 29, 1985, 60-143542

Int. Cl.[4] A61N 5/00

U.S. Cl. 128—804 16 Claims



1. An applicator for use in hyperthermia comprising:
(a) a casing having opposite, axial ends;
(b) an electromagnetic wave supply portion mounted on one of said ends of transmitting into said toward the other of said ends, omnidirectional electromagnetic waves having electric and magnetic field components; and
(c) an electromagnetic lens portion having spaced lateral sides and being mounted on said other of said ends for receiving, focusing, and transmitting said electromagnetic waves;
(d) said lens portion including a plurality of laterally spaced, metal plates positioned parallel to said sides, the lateral spacing between said plates being non-uniform for deflecting both the electric and magnetic field components of the

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4,841,990

APPLICATOR FOR USE IN HYPERTHERMIA

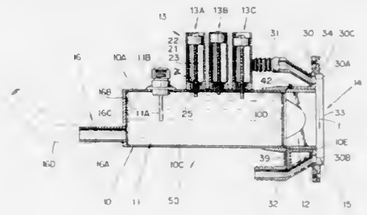
Makoto Kikuchi, Mitaka; Shinsaku Mori, Tokyo; Yoshio Nikawa, Tokyo, and Takashige Terakawa, Tokyo, all of Japan, assignors to Tokyo Keiki Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1986, Ser. No. 878,329

Claims priority, application Japan, Jun. 29, 1985, 60-143549; Jun. 29, 1985, 60-143550; Jun. 29, 1985, 60-143551

Int. Cl.[4] A61N 5/00

U.S. Cl. 128—804 6 Claims



1. An applicator for use in hyperthermia comprising:
(a) a casing having an electromagnetic wave supply portion mounted on one axial end, and an electromagnetic lens portion and an electromagnetic wave radiating end portion having a free end at the other axial end;
(b) a cooling mechanism on the free end of said electromagnetic wave radiating end portion for cooling the surface of a human body contacted by said radiating end portion; and
(c) a stub tuner mechanism mounted on said casing between said electromagnetic wave supply portion and said electromagnetic lens portion, said stub tuner mechanism including a cylinder secured to said casing and having an open free end; a piston member reciprocably mounted in said cylinder; and a screw member operatively associated with said piston member for reciprocating the piston member in response to rotation of said screw member; said piston member having connected thereto a stub bar which projects into the casing through a hole therethrough for effecting an impedance tuning function.

4,841,991

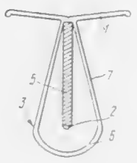
INTRAUTERINE CONTRACEPTIVE DEVICE

Raisa V. Gainutdinova; Vera M. Petrova; Alevtina I. Blokhina; Boris S. Fridman, and Pinkhos U. Gamer, all of Kazan, U.S.S.R., assignors to Nauchno-Proizvodstvennoe Obiedinenie "Medinstrument", Kazan, U.S.S.R.

Filed Sep. 1, 1987, Ser. No. 91,944

Int. Cl.[4] A61F 5/46

U.S. Cl. 128—833 3 Claims



1. An intrauterine contraceptive device, comprising:
a strip with rounded-off ends;
a rod connected to said strip to form a Tshaped element;
a coil fitted over said rod;
a fixing elment for retaining the entire device in the uterine

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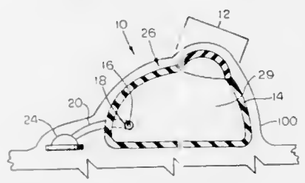
cavity, shaped as an elastic loop coplanar with said rod and said strip and encompassing said rod, said loop having an arc-shaped base and two elastic arms connected to said arc-shaped base, said arms being held to said strip at the base of said rod.

4,841,992

TISSUE EXPANDER AND METHOD OF MAKING AND USING

Gordon H. Sasaki, Pasadena, Calif.; Eugene R. Jakubczak, and John R. D. Gauger, both of Corderra, Tenn., assignors to Dow Corning Wright Corporation, Arlington, Tenn.

Filed Dec. 17, 1987, Ser. No. 134,331
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—899 12 Claims



1. A tissue expander comprising

(a) a fluid-tight envelope which is inflatable by a single means for inflation, said envelope having an expandable upper section comprising

(i) a first elastic portion formed of a first elastomer and

(ii) a second elastic portion formed of a second elastomer having a lower modulus of elasticity than that of said first elastomer and wherein the elastomers which form said portions have different levels of finely divided solid filler, so that during the inflation of said envelope the modulus of elasticity of each elastomer at least partially controls the amount of expansion of each portion and causes the envelope to assume a complex shape, and

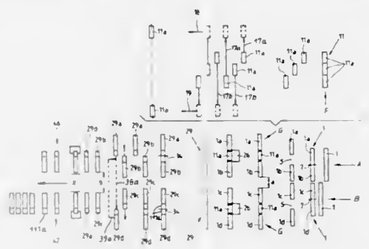
(b) means for inflating said envelope with a biocompatible fluid associated therewith for the controlled inflation of said envelope.

4,841,993

METHOD OF AND MACHINE FOR MAKING FILTER CIGARETTES

Werner Hinz, Lauenburg; Erwin Oesterling, Glinde, and Siegfried Schlisio, Geesthacht, all of Fed. Rep. of Germany, assignors to Körber AG, Hamburg, Fed. Rep. of Germany

Filed Feb. 23, 1988, Ser. No. 159,122
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1987, 3706752
Int. Cl.[4] A24C *5/47, 5/58*
U.S. Cl. 131—94 18 Claims



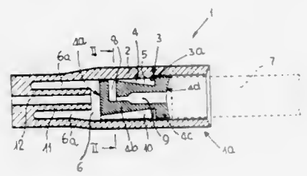
1. A method of making filter cigarettes from cigarettes of double unit length, filter mouthpieces of double unit length and adhesive-coated uniting bands, comprising the steps of delivering two rows of parallel cigarettes of double unit length into two discrete paths in a predetermined direction in such distribution that cigarettes of double unit length in one of said paths are staggered with reference to cigarettes of double unit length in the other of said paths; aligning each cigarette of double unit length in one of said paths with a cigarette of double unit length in the order of said paths; advancing the cigarettes along the respective paths in such orientation that each cigarette of one row remains aligned with a cigarette of the other row; subdividing the cigarettes in each of said rows into pairs of cigarettes of unit length; introducing a filter mouthpiece of double unit length between each pair of cigarettes of unit length to thus form groups each containing two cigarettes of unit length and a filter mouthpiece of double unit length between them; convoluting an adhesive-coated uniting band around each of said groups to thus convert the groups into filter cigarettes of double unit length wherein the uniting bands connect the respective pairs of cigarettes of unit length with the filter mouthpieces of double unit length between them; and subdividing each filter cigarette of double unit length into a pair of filter cigarettes of unit length.

4,841,994

MOUTH-PIECE FOR FILTERING THE SMOKE OF CIGARETTES AND THE LIKE

Carlo Lugli, Avenida Los Jabillos - Edificio Aconcagua - La Florida, Caracas, Venezuela

Filed Feb. 26, 1987, Ser. No. 19,044
Claims priority, application Italy, Mar. 6, 1986, 40019 A/86; Mar. 6, 1986, 40020 A/86
Int. Cl.[4] A24D *3/04*
U.S. Cl. 131—210 7 Claims



1. A mouthpiece for filtering smoke of cigarettes, comprising:

a tubular body having an inner wall, a smoke inlet end, a smoke aspiration end and an inner diameter;

tubular wall means extending in said tubular body at said smoke aspiration end;

an axial smoke outlet conduit formed in said tubular wall means;

a filter element accomodated in said tubular body and including a tubular filter body, said filter body having a first end base facing said smoke inlet end, a second end base facing said smoke aspiration end and a lateral surface extending between said first and second end bases and facing said inner wall of said tubular body, said first and second end bases having diameters substantially equal to said inner diameter of said tubular body;

an aspiration through cavity extending through said filter body from said end first base and ending at said lateral surface near to said second end base, said aspiration through cavity defining at said lateral surface an outlet opening;

at least one recessed portion formed on said lateral surface of said filter body near to said outlet opening, said recessed portion of said lateral surace defining with said inner wall of said tubular body a first collecting chamber;

a second collecting chamber formed between said second end base, said inner wall of said tubular body and said tubular wall means and including collecting cavities extending between said tubular body and said tubular wall means,

wherein said second collecting chamber is separated from said first collecting chamber by said second end base of said filter body; and

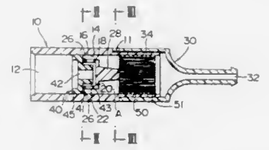
at least one through hole in said second end base of said filter body connecting said first chamber with said second chamber.

4,841,995

TAR REMOVING CIGARETTE HOLDER

Masahiro Terasaki, 43, Okimiya-cho, Edogawa-ku, Tokyo, Japan

Filed Dec. 8, 1987, Ser. No. 130,171
Claims priority, application Japan, Dec. 23, 1986, 61-197996[U]
Int. Cl.[4] A24D *3/04*
U.S. Cl. 131—212.1 2 Claims



1. A tar removing cigarette holder comprising a body including a tubular portion having a cylindrical bore serving at one end portion thereof as a cigarette attachment aperture and a cup portion formed integrally with said tubular portion and located in said bore and being supported from said tubular portion via integral bridge portions, said cup portion being open toward said cigarette attachment aperture with a cylindrical wall portion thereof defining a first annular space with a wall surface of said bore and having at least one partial cut away at an annular open edge portion thereof and a closed end wall portion, a leg projection extending from said closed end wall portion; a mouthpiece member attached to a second end portion of said body opposite to said cigarette attachment aperture, a filter element mounted in said cylindrical bore and inserted therein from said second end so as to abut against a free end of said leg projection; and a partition member inserted into said bore with an annular disk portion thereof being tightly engaged with the wall surface of said bore so as to close the open end of said cup portion and a central tubular projection thereof being inserted into said cup portion with a free end thereof spaced from the closed end wall portion of said cup portion and defining a second annular space with said cylindrical wall portion of said cup portion, said first and second annular spaces being in communication with one another through said cut away of said cup portion.

4,841,996

APPLICATOR DEVICE FOR A LIQUID PRODUCT, NAIL VARNISH IN PARTICULAR

Jean-Louis H. Gueret, Paris, France, assignor to "L'Oreal", Paris, France

Continuation of Ser. No. 893,921, Aug. 6, 1986, abandoned. This application Jan. 25, 1988, Ser. No. 147,641
Claims priority, application France, Aug. 9, 1985, 85 12206; May 29, 1986, 86 07700
Int. Cl.[4] A45D *40/26*
U.S. Cl. 132—320 15 Claims

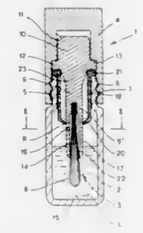
1. An applicator device, for a liquid product, comprising:

(a) a bottle;

(b) a cap for closing the neck of said bottle;

(c) applicator brush means constituted by a stem carrying at one end a tuft of hairs and being joined at its opposite end to said cap, said stem comprising a closed, solid body, said applicator brush means being disposed inside the bottle when the cap is fixed on said bottle neck;

(d) reservoir means for storing some of the liquid product for feeding the hairs of the applicator brush means when the applicator brush means is withdrawn from the bottle for application of the liquid product, said reservoir means including sleeve means disposed about said stem and spaced radially outwardly from said stem to define interstice means between said stem and said sleeve means, said reservoir means being capable of replenishment between two uses of the brush means; and



(e) a tubular sleeve surrounding a portion of the applicator brush means and having an end including wiper means which, at least when the applicator brush means is withdrawn from the bottle, is in wiping contact with the hairs of said brush means; said tubular sleeve being fixed relative to the neck of said bottle,

said tubular sleeve being cylindrical and having a central axis, said brush means having an axis coextensive with said axis of said tubular sleeve, at least a portion of said solid body of said stem being oval in cross-section at least adjacent said end of said stem which carries said tuft of hair.

4,841,997

METHOD FOR SETTING HAIR OR FUR

Henry G. Petrow, 32 Garfield St., Watertown, Mass. 02172

Filed Jan. 7, 1988, Ser. No. 142,115
Int. Cl.[4] A45D *7/00*
U.S. Cl. 132—204 25 Claims

1. In a method for setting hair or fur, comprising applying to the hair or fur a composition for reducing keratin disulfide bonds, allowing the hair or fur to stand in a desired configuration, applying to the hair or fur a composition to set the hair in a desired waved or straightened configuration, and washing and drying the hair or fur, the improvement comprising:

the composition to set the hair or fur being an ionic, water soluble compound, which is substantially non-oxidizing to the products of keratin reduction and which causes substantially all of the keratin disulfide bonds to reform while substantially avoiding precipitation.

4,841,998

SOIL DECONTAMINATION METHOD

James E. Bruya, 4201 35th Ave. W., Seattle, Wash. 98199

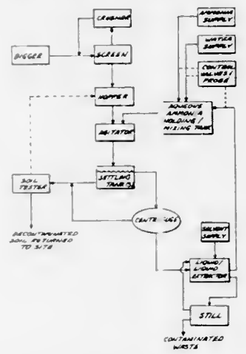
Filed Oct. 26, 1987, Ser. No. 113,628
Int. Cl.[4] B08B *3/08*
U.S. Cl. 134—10 27 Claims

1. A method for decontaminating soil comprising the steps:

(a) providing an aqueous ammonia solution effective for removing an organic hazardous waste from contaminated soil;

(b) contacting a soil contaminated with the organic hazardous waste with the aqueous ammonia solution for a period

of time effective to transfer the organic hazardous waste from the soil to the aqueous ammonia solution; and,



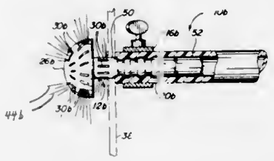
(c) separating the aqueous ammonia solution containing the organic hazardous waste from the soil.

4,841,990

BRAKE DURM CLEANER ASSEMBLY AND METHOD OF CLEANING

Donald Danko, 23530 Daisetta, Newhall, Calif. 91321

Filed Aug. 21, 1987, Ser. No. 87,916
Int. Cl.[4] B08B *3/02*
U.S. Cl. 134—22.1 12 Claims



1. An improved brake drum cleaner assembly, comprising, in combination:

(a) a water hose;

(b) a spray adapter, said adapter comprising a body having an elongated generally rear stem tubular portion having a generally central water passageway, said tubular portion being releasably secured in the front end of said water hose, and an expanded front spray head portion connected to said rear portion and having a generally central space connected to said passageway, said front portion defining a plurality of spaced orifices connected to said central space for delivery of cleaning water to the interior of a brake drum;

(c) said rear stem portion releasably secured to and lying outside a brake backing plate,

(d) said spray head releasably secured to and lying inside said brake backing plate, and

(e) connector means for releasably connecting said body to said hose,

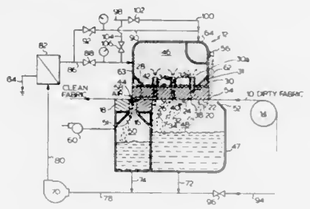
(f) wherein water can be introduced through said water hose to flush out a brake drum.

4,842,000

FABRIC CLEANING

Alexander Malashenko, Dollard des Ormeaux, Canada, assignor to Valmet-Dominion Inc., Lachine, Canada

Continuation-in-part of Ser. No. 865,398, May 21, 1987, abandoned. This application Feb. 11, 1988, Ser. No. 155,073
Int. Cl.[4] B08B *3/04*
U.S. Cl. 134—64 R 19 Claims



1. A fabric cleaning station through which a fabric to be cleaned travels along a predetermined path, said station including:

manifold means on one side of said predetermined path, said manifold means having a plurality of outlet means through which cleansing fluid contained by said manifold means may pass;

fluid communication means for communicating fluid from the outlet means of said manifold means to one side of said fabric comprising at least one slot extending from the outlet means of said manifold means and extending transverse to the direction of travel of said fabric through said station;

wall means spaced from said manifold means defining said predetermined path along which said fabric travels, said at least one slot having an opening extending through said wall means for applying cleansing fluid to the one side of said fabric, said wall defining a flow constricting passage extending from the opening of each said slot and narrowing in the direction of travel of said fabric for urging said fluid through said fabric; and,

means to collect said fluid on the other side of said fabric, opposite to the one side to which said fluid is applied, whereby fluid issuing from said slot passes through said fabric and is collected in said means to collect.

4,842,001

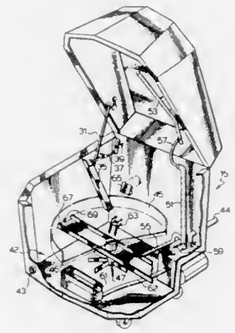
INDUSTRIAL WASHING MACHINE

James O'Leary, 117 Union Avenue, Komoka, Ontario, Canada (N0L 1R0)

Filed Oct. 23, 1986, Ser. No. 922,292
Int. Cl.[4] B08B *3/00*
U.S. Cl. 134—112 23 Claims

1. An industrial washing machine comprising a housing, a liquid reservoir receiving a cleaning liquid therein and a rotatable article receiving basket above said reservoir in said housing; braking means extending down from said basket into said liquid for braking rotational speed of said basket, in use; spray means susceptible to blockage for producing a plurality of cleaning sprays directed at articles in said basket; and substantially unblockable jet means directing at least one liquid stream for rotating said basket at a predetermined speed, said jet means providing an overflow relief, if required, from blockage

of a portion of said spray means, and increasing accordingly in flow rate when providing such relief, said braking means maintaining substantially unchanged said predetermined speed of said basket with an increased flow rate from said jet means.

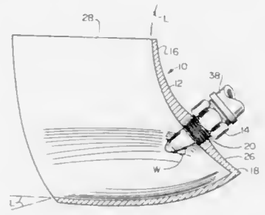


4,842,002

FLUSING ADAPTOR AND METHOD OF MANUFACTURE

James A. Ferguson, 5016 Calle Minorga, Sarasota, Fla. 34242

Filed May 9, 1988, Ser. No. 191,908
The portion of the term of this patent subsequent to Mar. 8, 2005, has been disclaimed.
Int. Cl.[4] B08N *3/02*
U.S. Cl. 134—167 R 9 Claims



1. A fresh water flushing adaptor for outboard and stern-drive marine engines having an external lower propulsion housing which includes a bottom forwardly pointed portion on the lower propulsion housing which further includes at least one water intake port along or immediately adjacent either side of the upper forwardly pointed portion of the lower housing, said flushing adaptor comprising:

a molded cover adapted to substantially mateably encase the forwardly pointed portion of the lower housing including at least one water intake port on the upper portion thereof such that said cover is releasably retainable over the forwardly portion of the lower housing;

fitting means connected to the upper forwardly portion of said cover for releasable attachment to a supply of water;

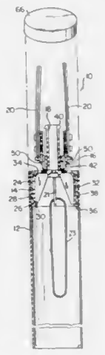
said fitting means having internal passages in registry and fluid communication with at least one water intake port for conveying water into said cover and into the water port intake.

4,842,003

EMERGENCY UMBRELLA

Blair F. Baldwin, New York, N.Y., and William C. Lamson, Huntington, Conn., assignors to Bexel Corporation, New York, N.Y.

Filed Nov. 27, 1987, Ser. No. 126,207
Int. Cl.[4] A45B *13/00*
U.S. Cl. 135—19.5 17 Claims



1. An umbrella comprising:

a hollow tubular handle having a longitudinal axis;

a hub slidably contained in said handle between an upper position and a stored position;

a sleeve slidably mounted on said hub between an upper position and a lower position, said sleeve resting on said hub when said umbrella is in a fully opened position and said hub is in said upper position and when said hub is in said stored position;

a plurality of struts connected to said sleeve, each strut hingedly movable between an upright position substantially parallel to the longitudinal axis of said handle and a radial position substantially radially outward from said longitudinal axis; and

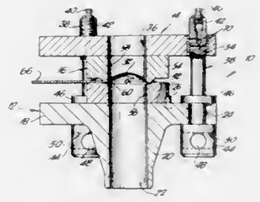
a web of flexible, water-resistant material connected to said struts.

4,842,004

QUICK-RELEASE ASSEMBLY FOR RUPTURE DISC INSERT TYPE HOLDER AND THE LIKE

Jack Steinman, 1501 Broadway, Hewlett, N.Y. 11557

Filed Jun. 27, 1988, Ser. No. 212,310
Int. Cl.[4] F16K *17/16*
U.S. Cl. 137—68.1 10 Claims



1. A quick release assembly for a rupture disc insert type holder and the like, comprising:

a pair of first and second flanges for receiving a rupture disc insert type holder and the like therebetween in a leak-tight seal;

first means for securing at least said first flange to a pressure relief conduit of a pressure system in flow communication therewith;

second means for both securing said first and second flanges together and for spreading said first and second flanges apart to provide quick access to the rupture disc insert holder and the like disposed between said flanges for inspection and replacement of a rupture disc contained within the insert type holder and the like;

said second means including at least two bolts;

said second flange having threaded openings to securely receive threaded portions of said bolts;

each of said bolts having an enlarged head for engaging an outer surface of said first flange;

said first flange having slots in its periphery to receive said bolts;

each of said bolts being provided with a collar spaced a predetermined distance from said enlarged head so that said first flange is disposed between said collar and said enlarged head; and

said collar engaging an inner surface of said first flange to mount said bolts on said first flange, and to force said second flange to move away from said first flange when said bolts are rotated to spread said first and second flanges apart.

10. A quick release assembly according to claim 1, including an orifice plate disposed between said first and second flanges.

4,842,005

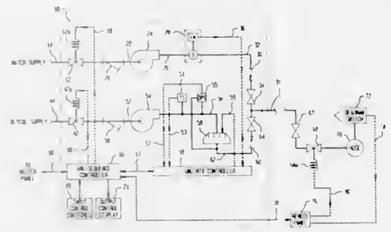
MIXING APPARATUS AND SYSTEM

James E. Hope, Batavia; John C. Leyerle, Deerfield; Richard Birzer, Schaumburg, and Jeffrey L. Hohman, Lincolnshire, all of Ill., assignors to ITT Corporation, New York, N.Y.

Filed Jan. 26, 1988, Ser. No. 148,722

Int. Cl.[4] B64D *15/06*

U.S. Cl. 137—101.19 **20 Claims**



1. Apparatus comprising:

water pump means for supplying water to an output line means;

flow sensor means for detecting the flow rate of said water;

additive pump means for supplying an additive;

a multi-port control valve having an input coupled to said additive pump means and an output coupled to said output line means;

a temperature sensor for detecting the temperature of the additive coupled to said input of said multi-port control valve;

a differential pressure sensor means coupled across the input and output of said multi-port control valve to detect the differential pressure across said multi-port control valve; and

controller means responsive to said flow, temperature, and differential pressure sensor means to control the amount of additive supplied from said multi-port control valve.

4,842,006

DASHPOT FOR FUEL TANKS

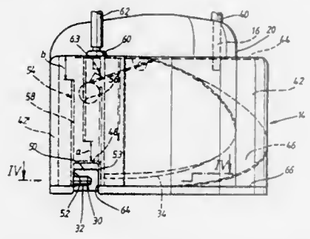
Dieter Scheurenbrand, Wolfschlugen; Helmut Wawra, Korb, and Wolfgang Kleineberg, Attbach, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jun. 13, 1988, Ser. No. 206,122

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719808

Int. Cl.[4] F02M *37/20*

U.S. Cl. 137—202 **10 Claims**



1. Dashpot for fuel tanks, having an upper wall which closes off the dashpot at a top area thereof, a gas separation space which has lateral wall parts and a lower fuel guide surface which is connected to a vent outlet opening above a maximum fuel level provided in the fuel tank, fuel means for returning fuel having gas bubbles therein to said gas separation space via a fuel return line, said dashpot having an inlet opening near a base wall thereof and via which fuel can be drawn off into a dashpot interior from a supply of fuel present in the fuel tank for degassing thereof in said pot interior and subsequent discharge from the pot interior, an injector nozzle utilizing the returning fuel to generate an ejector jet for drawing off the fuel from the fuel tank into the dashpot interior through the inlet opening, wherein the gas separation space is separated from the dashpot interior and wherein a degassing line means leads away from the gas separation space for discharging bubbles in the returning fuel into the fuel tank through the vent outlet opening at a point above the maximum fuel level of the fuel in the tank, said degassing line means being connected to a vent inlet opening provided in an upper wall of the dashpot interior, and wherein the injector nozzle is connected to the gas separation space for providing the returning fuel for the ejector jet.

4,842,007

SELF-SEALING VALVE FOR INFLATED BODIES

Richard J. Kurtz, Arvada, Colo., assignor to Guard Associates, Inc., Denver, Colo.

Filed Sep. 8, 1988, Ser. No. 241,464

Int. Cl.[4] F16K *15/20*; **A63H** *27/10*

U.S. Cl. 137—223 **10 Claims**

1. A self-sealing valve for an inflatable body comprising:

a valve member having opposed wall portions coated inside with a layer of viscid, non-hardening sealing composition consisting essentially of a polyglycol which is a viscous liquid at substantially room temperature to seal said wall portions together to minimize exiting gas flow through said valve member when an inflatable body to which the valve is mounted is inflated, said wall portions being movable upon forcible separation to provide a gas flow passage for inflation and deflation of said inflatable body.

4,842,008

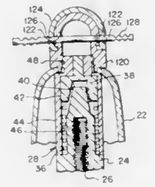
FIRE HYDRANT

Philip Avelli, c/o George Spector, 233 Broadway Rm 3815, and George Spector, 233 Broadway Rm 3815, both of New York, N.Y. 10007

Filed Feb. 29, 1988, Ser. No. 161,778

Int. Cl.[4] E03B *9/02*

U.S. Cl. 137—307 **6 Claims**



1. In a water control system for a hydrant of the type having an elbow, a bury, a barrel with a lateral hose nozzle, a removeable bonnet, an operating yoke stem hex nut and a main valve rod threaded to said nut in combination with a clutch for operating said nut with a wrench, whererin said cluth comprises:

(a) a compression spring mounted on said nut;

(b) a clutch member having a tapered hex recess and a hex shaped exterior, said clutch member suspended over said nut by said spring; and

(c) an operating member with a neck and a hex shaped interior engaging said clutch member exterior, said operating member surrounds said compression spring and clutch member and wherein said clutch member is longitudinally moveable to engage said hex nut and wherein said wrench includes means for having said clutch member engage said nut when mounted on said neck.

4,842,009

VALVE HANDLE ADAPTOR KIT

Richard L. Reback, 5649 Sorrento Dr., Long Beach, Calif. 90803

Continuation-in-part of Ser. No. 167,502, Mar. 14, 1988, Pat. No. 4,794,945. This application Oct. 21, 1988, Ser. No. 260,584

Int. Cl.[4] F16K *43/00*, *31/60*

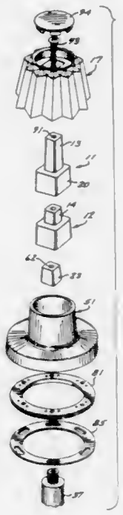
U.S. Cl. 137—315 **10 Claims**

6. A valve handle adaptor kit for mounting a handle on selected ones of a plurality of valve stems, each formed with broaches of selected different configurations, such handle being of the type including a central, axially projecting boss formed with an open-ended multisided handle pocket and a central axial fastener-receiving bore leading to such handle pocket, said kit comprising:

an elongated handle adaptor formed at one extremity with an elongated multisided male shank shaped to be complementally received in such handle pocket and formed at its opposite extremity with an axially opening multisided adaptor socket configured to correspond with such handle pocket, said adaptor being further formed with an axial fastener-receiving bore arranged and disposed to be aligned with such central axial fastener-receiving bore, when such adaptor is fitted in such handle pocket;

an extender formed at its one extremity with a multisided extender shank shaped to be complementally received within such handle pocket, or alternatively within said adapator socket or in the further alternative, within another extender and formed at its opposite end with an axially opening multisided extender socket configured to correspond with such handle pocket, said extender being further formed with axial fastener-receiving bore arranged and disposed to, when said respective extender shank is received in such handle pocket, be disposed in alignment with such central axial fastener-receiving bore;

a plurality of interchangeable spuds, forming a set of spuds formed with identically shaped exterior multisided cross sectional configurations for being complementally and selectively received in such handle pocket or, alternatively in said adaptor socket or, in the further alternative in said extender socket, each spud being formed with respective open ended broach sockets of selected different cross sectional configurations formed for complemental receipt on selected ones of said valve stem broaches, said spuds being further formed with respective axial fastener-receiving bores arranged and disposed to, when the respective spuds are received in said handle pocket, be

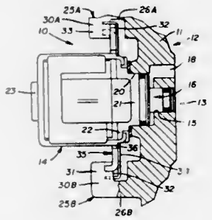


aligned with such central axial fastener-receiving bore; and

a plurality of fastener screws, of varying length for receipt through such central axial fastener-receiving bore in said handle boss, through a fastener-receiving bore in said adaptor, and through a fastener-receiving bore of said extender and through said fastener receiving bore of said spud, to be screwed into a threaded bore of one of such broaches whereby, said spuds may be inserted interchangeably in either such handle pocket or said adaptor socket or said extender socket so that such handle may be mounted directly from a first selected valve stem broach by inserting a selected spud of said set of spuds in such handle pocket and fitting it directly on said selected valve stem broach or, in the alternative, said handle may be mounted in spaced relation to a second selected valve stem broach by inserting said shank of said adaptor in such handle pocket, or, in the alternative, said handle may be mounted in a spaced relation from a third valve stem broach by inserting an extender between said adaptor and said spud.

VOL 1103 ISS 4 JE 27 1989 UMI

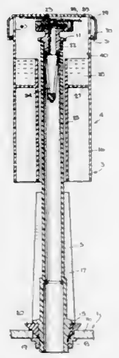
4,842,010
LOCKING MECHANISM
Robert K. Edgecomb, Anderson, Ind.; Maurice T. Rose, La-Grange, Ky., and Rodney B. Smith, South Lyon, Mich., assignors to General Motors Corporaion, Detrolt, Mich.
Filed Oct. 18, 1988, Ser. No. 258,951
Int. Cl.[4] F16L *3/00*
U.S. Cl. 137—343 6 Claims



1. A locking mechanism for demountably securing a solenoid valve assembly within a receptacle in the wall of a transmission housing, said locking mechanism comprising: retention means presented from the solenoid valve assembly; a stop means presented from said retention means; a first blocking face presented from said transmission housing; rotation of the solenoid housing within the receptacle being limited by engagement of said stop means with said first blocking face; an engaging surface presented from said retention means; a second blocking face presented from the transmission housing; said engaging surface being disposed in opposition with said second blocking face to preclude withdrawal of the solenoid assembly from the receptacle when said stop means engages said first blocking face; latching means presented from said retention means; a third blocking face presented from the transmission housing; engagement of said latching means with said third blocking face normally precluding retro-rotation of the solenoid assembly within the receptacle when said stop means engages said first blocking face; biasing means to permit selective displacement of at least said latching means to permit selective rotation, and retro-rotation, of the solenoid valve assembly within the receptacle and thereby transport said engaging surface into, and out of, opposition with said second blocking face to permit mounting, and demounting, of the solenoid valve assembly with respect to the receptacle.

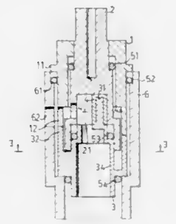
4,842,011
FLUSHING MEANS
Vernon D. Roosa, West Hartford, Conn., assignor to Elwyn V. Harp, West Hartford and Glen H. Baron, Simsbury, both of, Conn.
Filed Nov. 9, 1987, Ser. No. 118,437
Int. Cl.[4] F16K *31/18, 33/00*
U.S. Cl. 137—414 6 Claims

1. An improved liquid inlet means for a flushing tank comprising the combination of:
an inlet fitting **5** adapted for being coupled to a source of liquid under pressure and for being mounted within the tank **1**;
a float **4** movably mounted on said inlet fitting for movement between raised and lowered positions responsive to the level of liquid **32** in the tank **1**;
an inlet valve **11** positioned on said inlet fitting;
a first valve shut-off means **35**, **38** in said inlet valve;
means **23** operatively coupling said float **4** to said first valve shut-off means **35**, **38**;
said first valve shut-off means comprising an outlet port **38** in said inlet valve **11** with a valve seat **37** in said port and the port sealing ball **35** movably mounted at said port **38** for movement off of said seat **37** by said coupling means **23** and against said seat **37** by the pressure of liquid at said port **38**;
a second valve shut-off means comprising a flexible diaphragm **41** moveable between open and closed positions by the fluid pressure in said inlet valve **11** in response to the position of said sealing ball **35** of said first shut-off means;
said flexible diaphragm **41** being mounted in a cavity **36** in said inlet valve **11** intermediate to said outlet port **38** and a liquid inlet port **42**;



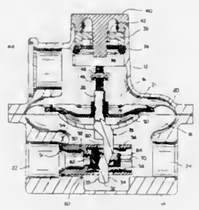
an aperture **46** in said diaphragm **41** spaced from the center of the diaphragm **41**, whereby the ball **35** has an improved seating action offset position of the water flow through the aperture **46** and tends to move the ball **35** and center it more effectively in its seat **37**;
and valve outlet means **46** positioned in said inlet valve **11** on the opposite side of siad diaphragm **41** from said outlet port **38**.

4,842,012
FAUCET VALVE STRUCTURE
Guang Y. Sheen, No.1-2, Lane 23, Yeong Chang Third St., Hsi Tun District, Taichung City, Taiwan
Filed Mar. 4, 1988, Ser. No. 164,274
Int. Cl.[4] F16K *3/26*
U.S. Cl. 137—454.2 1 Claim



1. An improved faucet valve structure, comprising a valve case, an insert and a valve body, wherein a hole is disposed in a central axis of the valve case to receive the insert therein, characterized in that:
an annular projection is arranged at a periphery of said valve case, an inverted U-shaped outlet is located at a bottom of said valve case to permit an accommodation of a protrusion provided on said valve body, said inverted U-shaped outlet having enough room for water to flow therethrough; an arched protrusion is arranged at a bottom of said insert to fit into an arched groove of said valve body; a sealing cap is disposed to contact with an inner side of a hollow portion which is provided inside said insert, such that water flow is controllable by a relative position of said outlet with respect to said sealing cap.

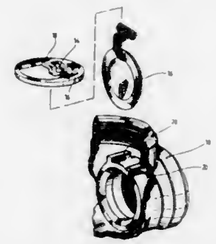
4,842,013
DROOP COMPENSATED DIRECT ACTING PRESSURE REGULATOR
Donald D. Rice, Wylie, and Mark E. Hood, Allen, both of Tex., assignors to Fisher Controls International, Inc., Marshalltown, Iowa
Filed Feb. 29, 1988, Ser. No. 161,860
Int. Cl.[4] G05D *16/06*; F16K *31/524*
U.S. Cl. 137—484.4 10 Claims



1. A droop compensated regulator valve having an inlet and an outlet comprising:
diaphragm means;
means applying a regulating force to one side of said diaphragm means;
valve means coupled to said inlet and including an orifice tube, a valve seat and a movable valve disk means movable into and out of engagement with said valve seat;
stem means coupled to said diaphragm means and having a cam profile for adjusting the position of said valve disk means with respect to said valve seat at a non linear rate responsive to movement of said diaphragm means;
said orifice tube supporting said valve seat and including guide means, said movable valve disk means including a valve disk holder having a cam follower surface contacting said cam profile and a valve disk, and said guide means cooperating with said disk holder to restrict movement of said disk holder to straight line movement along the axis of said orifice tube;
pressure relief means in direct flow communication with said orifice tube;
boost means comprising an extension of said orifice tube communicating with said outlet for applying pressure to the other side of said diaphragm means; and
bias means for maintaining said cam profile in contact with said cam follower surface.

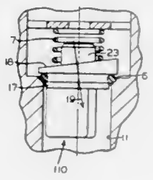
4,842,014
CHECK VALVE HANGER MECHANISM
John L. Strelow, Broken Arrow, and Robert I. Clarkson, Tulsa, both of Okla., assignors to Wheatley Pump and Valve, Inc., Del.
Continuation of Ser. No. 885,790, Jul. 15, 1986, abandoned. This application Jan. 4, 1988, Ser. No. 140,735
Int. Cl.[4] F16K *15/03*
U.S. Cl. 137—527.2 13 Claims

1. A check valve clapper hanger apparatus capable of suspending a check valve clapper in a check valve housing, comprising:
a disc containing a bulb-shaped opening, said opening comprising a central neck section, and said disc adapted to seat on its underside within the housing of a check valve; and U-shaped arms open at the top projecting from the underside



of said disc and located on each side of the central neck section of the bulb-shaped opening contained in said disc, said arms capable of receiving a check valve clapper that is dropped into place from above said arms.

4,842,015
CHECK VALVE
Wilhelm Haak, Wennigsen; Peter Schiwik, Hanover, and Gerd Röver, Wennigsen, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany
Filed May 9, 1988, Ser. No. 191,634
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1987, 3732077
Int. Cl.[4] F16K *15/02*
U.S. Cl. 137—543.23 16 Claims



10. A check valve assembly to control a flow of a pressurized medium in a fluid pressure system, said check valve assembly comprising:
(a) a housing member having a cavity therein, said cavity being in fluid communication with a source of fluid pressure at an inlet side thereof and being in fluid communication with a consuming source of said fluid pressure at an outlet side thereof;
(b) an inlet valve formed by a valve seat positioned within said cavity and a valve body positioned within said cavity in a position to sealingly engage said valve seat when said check valve is in a closed position;
(c) a valve body guide means positioned within said cavity for guiding said valve body during an opening and closing of said check valve, said valve body being pressed against said guide means when said inlet valve is undergoing said opening and a force generated by said pressurized medium is greater than that exerted by said pressurized medium when said check valve is closed; and
(d) a valve spring engageable with said valve body to prestress said valve body against said valve seat when said check valve is closed, said valve spring being positioned in relationship to said valve body in a manner such that a point of impact on said valve body by a deformation line

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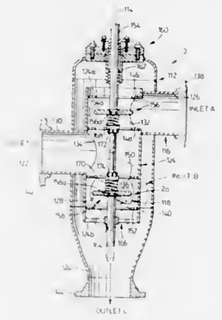
of said valve spring in relationship to said force generated by said pressurized medium is inclined.

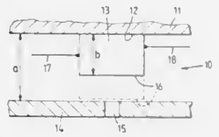
4,842,016
SWITCHING VALVE
Donald G. McKenzie, Calgary, Canada, assignor to Delta Projects Inc., Calgary, Canada
Filed Feb. 22, 1988, Ser. No. 158,528
Int. Cl.[4] F16K *11/044, 11/048*
U.S. Cl. 137—597 **7 Claims**



1. A four-way switching valve comprising:
a hollow member defining an internal chamber having open opposite ends;
first, second and third ports in a wall of said member, said ports being spaced along a defined axis;
a valve stem disposed on said axis and supported for movement along said axis;
in association with each of said first and third ports, a valve seal carried by said stem and disposed between a pair of valve seats within said hollow member, the seats in each pair being disposed on opposite sides of the associated port and being co-operable with the valve member for preventing fluid flow along said member, the valve seals and seats being arranged so that, in a first axial position of said valve stem, the two seals co-operate with the valve seats in the respective pairs closest to a first said end of the hollow member, and in a second axial position of the valve stem, said seals co-operate with the valve seats in the respective pairs closest to the opposite said end of the hollow member;
wherein said valve seals are designed to form plugs for sealing with said seats, each seal comprising a seal disc slidably mounted on said valve stem, the seal discs being spring biassed outwardly against respective shoulders on said stem so as to permit sealing to be achieved while accommodating dimensional variations due to thermal changes; and,
a piston ring-type seal between each said valve disc and the valve stem.

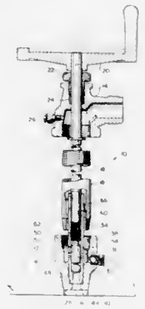
4,842,017
FLUID FLOW CONTROL APPARATUS
Graham A. Reynolds, Coventry, England, assignor to Rolls-Royce plc, London, England
Filed Apr. 4, 1988, Ser. No. 177,140
Claims priority, application United Kingdom, Jun. 3, 1987, 8712951
Int. Cl.[3] G05D *7/06;* **F16L** *31/02*
U.S. Cl. 137—601 **7 Claims**

1. An array of fluid flow valves for use with a fluid flow controller, the controller monitoring and controlling the fluid flow through the array by outputting data defining the open or closed positions of the valves in accordance with a desired fluid flow, the array comprising:
primary valves to regulate the flow of fluid through the array in accordance with the controller data, and
redundancy valves to selectively operate only when any said primary valve becomes inoperable, each said primary valve and redundancy valve including:



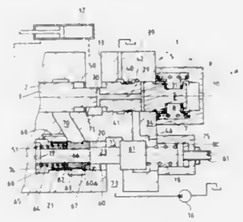
a member having an orifice adapted for the passage of a fluid through the orifice,
a piezo-electric crystal, and
means, electrically connected to the controller, for providing a potential difference across the crystal to deform the crystal, the crystal being disposed within said orifice to selectively block and unblock said orifice in accordance with said deformation.

4,842,018
VALVE ASSEMBLY
Jeffrey A. White, 9 The Mews, Ottawa, Ontario, Canada (K1M 2G3); Bruno Tolledi, 641 Bathgate Drive, Ottawa, Ontario, Canada (K1K 3Y3); T. Rayman Ringer, 10 Oriole Dr., Ottawa, Ontario, Canada (K1J 7E9), and Andrzej Arkuszewski, 10-21 Bayshore Dr., Ottawa, Ontario, Canada (K2B 6M7)
Filed Apr. 13, 1987, Ser. No. 40,045
Int. Cl.[4] F16K *31/58*
U.S. Cl. 137—614.11 **2 Claims**



1. A valve assembly, comprising,
(a) a valve body,
(b) a valve insert in said valve body defining a flow passage, said valve insert having a plurality of flow outlet orifices therefrom spaced therealong,
(c) a valve seat in said valve insert and located in said flow passage,
(d) shut-off means comprising a ball in said valve insert and engageable with said valve seat to make line contact therewith, and
(e) a close fitting control member in said flow passage for closing said flow outlet orifices in a closed position, and movable along said flow passage to free said ball from said valve seat and then, after moving a predetermined distance along said flow passage to avoid high velocity cavitation, selectively opening said flow outlet orifices in dependance of the position of said control member along said flow passage to control the rate of flow of fluid through said valve seat, along said flow passage and out of the opened flow orifices into said valve body.

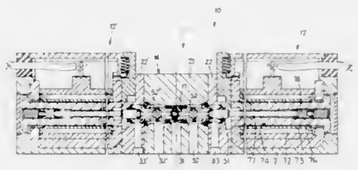
4,842,019
PRESSURE COMPENSATOR DEVICE FOR PROPORTIONAL TYPE HYDRAULIC DISTRIBUTOR AND HYDRAULIC DISTRIBUTOR INCORPORATING SAME
André Rousset, Saint-Priest-en-Jarez, and Maurice Tardy, Lorette, both of France, assignors to Bennes Marrel, France
Filed Aug. 2, 1988, Ser. No. 227,627
Claims priority, application France, Aug. 3, 1987, 87 11435
Int. Cl.[4] F15B *13/04*
U.S. Cl. 137—614.2 **8 Claims**



1. A pressure compensator device for a proportional type hydraulic distributor comprising a stator; a distributor slide valve; a feed chamber for said slide valve, said feed chamber defining a feed channel and being at a feed pressure; an inlet channel; an outlet channel having an output pressure adapted to communicate with said feed chamber; a housing in said stator for communicating with said inlet and outlet channels; a compensator slide valve slidable in said housing; a spring exerting an axial force on said compensator slide valve in the same direction as a force exerted on it by said output pressure and in the opposite direction to a force exerted on it by said feed pressure, an annular obturator member on said compensator slide valve adapted to isolate said inlet channel and feed channel; a return spring on said compensator slide valve acting on said obturator member; a recessed part of said compensator slide valve on which said obturator member can slide without clearance; two abutment members between which said obturator member can slide; a cylindrical bore inside which said obturator member can slide and into which said feed channel opens; a back in said housing; and a back chamber in said back of said housing containing said return spring and a passage through which said back chamber communicates at all times with said feed chamber whereby said device is adapted to regulate said feed pressure to said feed chamber according to said output pressure of said slide valve.

4,842,020
DOUBLE-SOLENOID SINGLE-STEM FOUR-WAY VALVE
Thomas Tinholt, Galesburg, Mich., assignor to Humphrey Products Company, Kalamazoo, Mich.
Continuation-in-part of Ser. No. 226,265, Jul. 29, 1988. This application Aug. 19, 1988, Ser. No. 234,467
Int. Cl.[4] F15B *13/044*
U.S. Cl. 137—625.65 **7 Claims**

1. A single-stem four-way valve assembly, comprising:
housing means having substantially cylindrical bore means formed therein and extending therethrough;
a supply port formed in said housing means and communicating with said bore means substantially adjacent a midpoint thereof;
first and second load ports formed in said housing means and communicating with said bore means on axially opposite sides of said supply port;
first and second discharge ports formed in said housing means and communicating with said bore means at locations spaced axially outwardly from said first and second load ports, respectively;
first and second axially elongated sleevelike liners positioned within said bore means and projecting axially outwardly of said bore means in opposite directions from opposite sides of said supply port, said first and second liners being substantially identical and disposed so as to be substantially mirror images of one another relative to a central transverse plane extending through said supply port, said liners having annular valve seats formed on axially inner ends thereof so that said valve seats are disposed adjacent one another but on axially opposite sides of said supply port;
a single elongated and axially shiftable valve slidably supported within said liners for controlling flow of fluid between said ports, said valve including an elongated rodlike stem disposed within and extending substantially



coaxially along said liners, said valve also having radially enlarged annular elastomeric ring means mounted on said stem substantially axially midway thereof and disposed axially between the valve seats for creating sealing engagement with one or the other valve seat as the valve is shifted axially between one or the other end position;
said rodlike stem having first and second radially-enlarged cylindrical guide portions fixedly associated therewith and disposed in axially-spaced relationship on opposite sides of said elastomeric ring means, said guide portions being snugly but freely axially slidably supported on cylindrical inner walls defining the bores through said lines, said first and second cylindrical guide portions being respectively disposed close to the point where said first and second load ports communicate with said bore means;
each said liner having opening means extending radially therethrough for providing communication between said bore and the respective load port; and
first and second electrically-operated solenoid means for respectively effecting shifting of said valve into said one and said other end position, each said solenoid means having a reciprocal plunger coaxially aligned with and disposed adjacent a respective end of said rodlike stem for engaging and shifting said stem in response to actuation of the respective solenoid means.

4,842,021
SUPPORT FOR FLUID POWER DEVICES
Kurt Stoll, Leazhalde 72, 7300 Esslingen, Fed. Rep. of Germany
Continuation of Ser. No. 756,049, Jul. 17, 1985, abandoned. This application Aug. 21, 1986, Ser. No. 899,743
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1984, 3427589
Int. Cl.[4] F16K *31/02*
U.S. Cl. 137—884 **1 Claim**

1. A valve support for a plurality of electrically operated pneumatic valve components comprising:

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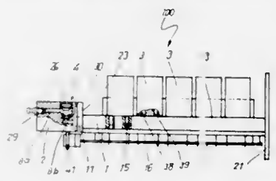
a mounting plate having a component surface with a plurality of component sites, an opposite surface, a first edge face between said component and opposite surfaces on one end and a second edge face between said component and opposite surfaces at an opposite end, said component sites lying in two parallel spaced apart rows extending between said first and second edge faces, said mounting plate having a plurality of compressed air ducts therein each extending to said first edge face, each component site being adapted for receiving one valve component and including at least one compressed air port communicating with at least one of said compressed air ducts; an electronic circuit board detachably connected to said opposite surface of said mounting plate, said circuit board being planar and parallel to said opposite surface of said mounting plate; a plug-in bar on said component surface of said mounting plate extending between said two rows of component sites at a location spaced from said component sites and connected to said circuit board, for making electrical connections to valve components positioned at component sites on said mounting plate, said plug-in bar having an upper surface spaced above said component surface and a plurality of electrical connection sockets at said upper surface; wiring connected to said sockets; a plug connector electrically connected to said wiring; said circuit board being detachably plugged to said plug connector for electrical connection to said sockets; an elongate manifold having compressed air feed and load ducts; a double nipple plug-in sealing plate connected between said mounting plate and said elongate manifold which said



manifold is detachably mounted to said first edge face of said mounting plate for interconnecting said feed and load ducts to said compressed air ducts in said mounting plate, said manifold further having a discharge duct connected to atmosphere for each load duct; a pressure venting valve in each load duct of said manifold for venting pressure to each discharge duct; a display panel connected to said second edge face of said mounting plate, said display panel having a display for showing the operating state of valve components at said component sites of said mounting plate and having means for controlling the operation of valve components at said component sites; each component site further having a plurality of openings; and a plurality of pneumatic valve components connected to said mounting plate, each valve component being at one of said component sites, each valve component having at least one connection contact extending laterally therefrom over said upper surface of said plug-in bar and plugged into one of said connection sockets, each valve component being movable toward said component surface of said mounting plate for connecting each valve component to its respective component site, and each valve component having guiding projections extending into said component site openings during such movement to ensure simultaneous plugging engagement of its connection contact into its connection socket; so that said circuit board can be readily changed by unplugging from said plug connector and said valve components can be readily changed by unplugging from said connection sockets and from said component sites.

4,842,022

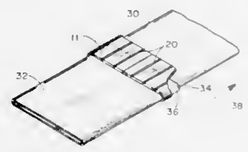
SPLICED STUFFABLE CELLULOSIC FOOD CASING

Jeffery A. Oxley, Naperville, and Darrel L. Wilhoit, Worth, both of Ill., assignors to Viskase Corporation, Chicago, Ill.

Filed Mar. 31, 1988, Ser. No. 176,005

Int. Cl.[4] F16L *11/12*

U.S. Cl. 138—118.1 **10 Claims**



1. A stuffable spliced food casing comprising:

(a) first and second lengths of a tubular fibrous casing having adjacent ends longitudinally aligned and at least abutting one against another, and each of said lengths having a moisture content of at least 17% based on total casing weight;

(b) a pressure sensitive adhesive tape having a length longer than its width, said tape composed of a backing strip and an adhesive on at least one surface of said backing strip, and said adhesive tape disposed against said lengths in only a pressure sensitive adhering relationship and encircling and overlapping said adjacent ends such that the longitudinal axis of said tape is disposed transverse the longitudinal axis of said casing lengths to join said casing lengths together and form a splice; and

(c) said adhesive tape backing strip being stretchable at least 500% in the tape longitudinal direction and restraining means disposed along said backing strip for rendering said tape stretchable not more than 50% in the tape transverse direction.

4,842,023

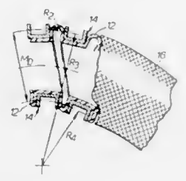
FLEXIBLE HOSE

Barrie F. Whitworth, Brighouse, United Kingdom, assignor to Standard Hose Limited, Brighouse, United Kingdom

Filed Feb. 10, 1988, Ser. No. 154,362

Int. Cl.[4] F16L *11/11, 11/12*

U.S. Cl. 138—122 **13 Claims**



1. Flexible hose which comprises a flexible helically convoluted plastic material tube would helically on its exterior with a reinforcing profiled strip of non-circular cross section having an axial component extending substantially axially of the tube and a radial component extending substantially radially of the tube, such that in unflexed condition the axial and radial components are arranged in supporting contact with the tube wall along their corresponding coextensive portions and the axial spacing between adjacent helical windings of the strip is substantially smaller than the dimension of the axial component for providing a relatively minimized spacing between said windings and a relatively maximized axial component dimension consistent with maintaining hose flexibility so as to reduce the area of unsupported hose between said windings, the height

of the peaks of the tube convolutions between said windings being less than the height of the corresponding radial component, whereby the axial and radial components support the tube wall and limit the maximum radius of curvature at maximum flexion of any portion of the tube wall to a value less than that which is obtained with an equivalent standard hose as constituted by a round wire reinforced helically convoluted hose of the same plastic material of the same thickness, with equal sectional area of round wire reinforcement, and the same overall weight per unit length.

4,842,024

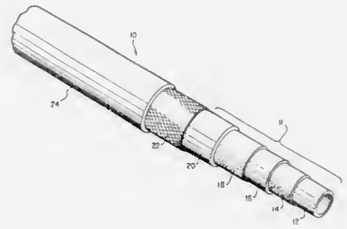
COMPOSITE HOSE FOR CONVEYING REFRIGERANT FLUIDS IN AUTOMOTIVE AIR-CONDITIONED SYSTEMS

Stephen Palinchak, Bucyrus, Ohio, assignor to Harvard Industries, Inc., St. Louis, Mo.

Filed Jul. 21, 1987, Ser. No. 76,013

Int. Cl.[4] F16L *11/08*

U.S. Cl. 138—125 **17 Claims**



1. A composite hose for conveying refrigerant fluids and lubricating fluids in automotive air conditioning systems, comprising:

an innermost three-ply tube adapted to be in direct communication with said refrigerant fluids;

a textile fiber reinforcing layer surrounding said three-ply tube; and

a cover surrounding said reinforcing layer;

wherein the three-ply tube comprises,

an inner ply of an elastomer compound,

a middle ply of a thermoplastic polymer bonded to the inner ply, and

an outer ply of an elastomer compound bonded to the middle ply, and

first and second adhesive layers respectively provided between said inner and middle plies and said middle and outer plies of said three-ply tube to bond the three plies of the three-ply tube together;

said inner ply of the three-ply tube being an elastomer compound selected from the group consisting of nitrile-butadiene rubber (NBR), chloro-sulfonyl-polyethylene rubber (CSM), chloroprene rubber (CR), epichlorohydrin polymer (CO), epichlorohydrin copolymer (ECO), and chloropolyethylene (CM);

said middle ply of the three-ply tube comprising a thermoplastic polyamide polymer; and

said outer ply of the three-ply tube being an elastomer compound selected from the group consisting of chloroprene rubber (CR), chloro-sulfonyl-polyethylene rubber (CSM), ethylenepropylene copolymer (EPM), ethylene-propylene-diene terpolymer (EPDM), isobutene-isoprene rubber (IIR), bromo-isobutene-isoprene rubber (BIIR), chloroisobutene-isoprene rubber (CIIR), and chloropolyethylene (CM).

4,842,025

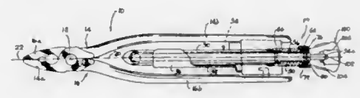
WIRE TWISTING TOOL

Joe G. Box, Macedonia, and J. E. C. Anderson, Moreland Hills, both of Ohio, assignors to Milbar Corporation, Chagrin Falls, Ohio

Continuation-in-part of Ser. No. 820,540, Jan. 17, 1986, abandoned. This application Nov. 5, 1986, Ser. No. 927,098

Int. Cl.[4] B21F *7/00*

U.S. Cl. 140—119 **26 Claims**



1. A wire twisting tool, comprising:

(a) a pair of jaws for clamping wire to be twisted;

(b) means for locking said jaws in a wire clamping position;

(c) means for rotating said jaws while clamping the wires in order to twisting said wires together, said rotating means including:

(i) a drive mechanism including a housing slidably receiving a spiral drive shaft including means for imparting rotation to said housing upon relative axial movement between said shaft and said housing;

(ii) said housing including a pair of shaft engaging elements, one of said elements fixed to said housing and including structure engageable with said shaft;

(iii) another of said elements spaced from said first element and slidably receiving said shaft to maintain said shaft in predetermined alignment with respect to said housing:

(iv) mounting means mounting said other element such that relative axially movement between said other element and said housing is substantially inhibited while enabling relative axial movement between said shaft and said other element.

4,842,026

MACHINE FOR FILLING RECEPTACLES WITH FLOWABLE MATERIALS AND METHOD OF CLEANING THE MACHINE

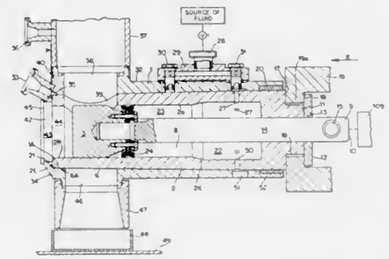
Manfred Nordmeyer, and Helmut Grüne, both of Schwarmstedt, Fed. Rep. of Germany, assignors to Lieder-Maschinenbau GmbH & Co. KG, Schwarmstedt, Fed. Rep. of Germany

Filed Nov. 26, 1985, Ser. No. 801,796

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1984, 3443557

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—1 **52 Claims**



1. A method of transferring metered quantities of flowable material from a source to a succession of receptacles with a machine wherein a hollow metering device is movable with reference to a housing in a plurality of different directions, comprising the steps of repeatedly moving the metering device

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with reference to the housing in one of said directions between a first position in which the metering device accepts flowable material from the source and a second position in which the thus accepted material is ready to enter a receptacle; and periodically cleaning the housing and the metering device, while the latter remains in the housing, including displacing the metering device with reference to the housing in another of said directions.

4,842,027

VAPOR PASSAGE FUEL BLOCKAGE REMOVAL

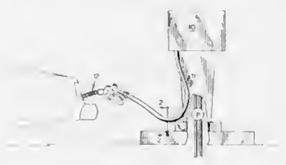
Warren P. Faeth, Fort Wayne, Ind., assignor to Tokheim Corporation, Fort Wayne, Ind.

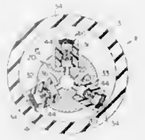
Division of Ser. No. 803,152, Dec. 2, 1985, Pat. No. 4,749,009. This application Sep. 18, 1987, Ser. No. 98,453

The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.

Int. Cl.[4] B67D *5/06*

U.S. Cl. 141—45 **19 Claims**





1. In a liquid dispensing hose for distributing liquid fuel from a pump to a valved nozzle adapted to be inserted into the fill pipe of a vehicle fuel tank, said hose having an inner tube defining a fuel conduit and a tubular outer sleeve that defines with said inner tube an annular passage for recovering fuel vapors from said fuel tank, the improvement comprising:

a venturi section disposed in serial connection with said inner tube within said outer sleeve and comprising a cylindrical block having connecting means at each end for connecting to end portions of said inner tube and defining a venturi forming part of said fuel conduit; and

aspirator means in said venturi section and defining at least three radial port means communicating between said venturi forming part and said annular vapor passage, said radial port means extending through said block at uniformly circumferentially spaced locations in a transverse plane that intersects said block at said venturi forming part, said radial port means each having an inlet means that faces directly toward said tubular outer sleeve whereby said inlet means of at least one radial port means is always located below the centerline of said venturi section when the centerline of said venturi section is disposed substantially horizontal in said liquid dispensing hose so that liquid fuel collected in said annular passage adjacent said venturi block is adapted to be drawn through said aspirator means due to suction adapted to be produced in said venturi forming part upon the flow of liquid fuel therethrough.

4,842,028

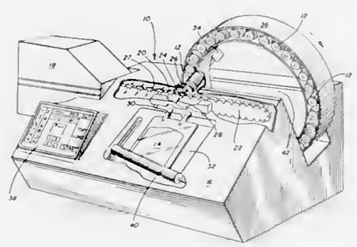
FLUID TRANSFER APPARATUS

Stephen B. Kaufman, and Dale L. Robson, both of Highland Park, Ill., assignors to Baxter International Inc., Deerfield, Ill.

Filed May 13, 1987, Ser. No. 49,233

Int. Cl.[4] B65B *3/16*

U.S. Cl. 141—114 **11 Claims**



1. An apparatus for the automated transfer of contents between a rubber diaphragm port-type vial and a flexible, collapsible bag for medical solutions, said bag having a first needle-pierceable access port, and utilizing a double-pointed hollow needle having a first and second ends:

a row of said vials,

a row of said double-pointed hollow needles,

linear advancement means for holding and sequentially positioning said row of said double-pointed hollow needles, one by one into a first position for vial and bag engagement;

multiple advancement means for holding and sequentially positioning said row of said vials, one by one, into a position for engagement with said first end of said double-pointed hollow needle in said first position through said rubber diaphragm;

means for holding said medical solution bag with said first needle-pierceable access port facing said second end of the needle in said first position;

means for bringing the vial in said engagement position and the bag into needle-penetrated relation, to provide flow communication therebetween through said hollow needle; and

mechanical means for holding and compressing said bag to force liquid from said bag into the vial, and for releasing said compression to allow said liquid to flow from the vial back to the bag, whereby the original contents of the vial may be carried into the bag in an automated manner.

4,842,029

WOODWORKING MACHINE

Alfredo F. De Abreu, Trofa, Portugal, assignor to Mida-Máquinas Industriais do Ave, Lda., Trofa, Portugal

Filed May 11, 1988, Ser. No. 192,830

Claims priority, application Portugal, May 26, 1987, 84951; Nov. 10, 1987, 86105

Int. Cl.[4] B27C *1/00*

U.S. Cl. 144—117 R **8 Claims**

2. A woodworking unit for use with a woodworking machine, of a type having a tool spindle for carrying tools, a bearing housing disposed at one end of the tool spindle, and means accommodated in the bearing housing for rotatingly supporting the tool spindle, wherein the improvement comprises:

a further bearing housing disposed at the other end of said tool spindle;

further means accommodated in said further bearing housing for rotatingly supporting said tool spindle for achieving smooth and true rotation with a spindle length of up to two meters;

means for detachably connecting said tool spindle to said bearing housings for carrying and changing said tools;

said tool spindle including two conical end portions;

said two bearing housings including, projecting from mutually facing sides thereof, two respective journals disposed on a straight line and each having an inner core matching one of said conical end portions;

each of said conical end portions including at a center thereof a blind hole having an internal thread;

each of said journals including a continuous concentric bore; and

fastening means passing through each said bore and engaging said internal thread.

4,842,030

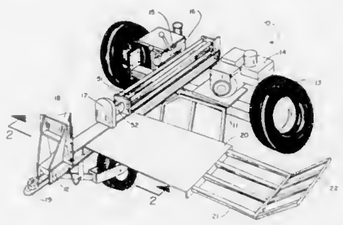
LOG SPLITTER IMPROVEMENTS

John P. Meyer, 5104 North Montana, Helena, Mont. 59601

Filed Dec. 28, 1987, Ser. No. 137,973

Int. Cl.[4] B27L *7/00*

U.S. Cl. 144—193 A **4 Claims**



1. An improvement in a log-splitting machine of the type having an elongated frame, a log-splitting station defined by a wedge mounted to the frame, a log-splitting cylinder mounted to the frame and having a reciprocating piston adapted to push a log against the wedge, a log lifter for feeding logs to the splitting station of the type having a frame means extending laterally from and pivotally connected at a first end to the log-splitting frame for rotation about an axis between a first ground-contacting position and a second elevated position, the improvement comprising:

a wedge having at least two pairs of working faces defining a cutting angle and a splitting angle and wherein the cutting angle has an angle from about 45 to 60 degrees and said splitting edge has an angle of from about 100 to 140 degrees; and

wherein said log lifter is a two-part pivotally attached log-lifting table operably connected to a lifting hydraulic cylinder.

4,842,031

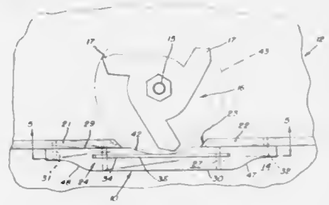
SHAPER GUARD

William M. Peek, P.O. Box 511, Crane Ct., Kingston Springs, Tenn. 37082

Filed Nov. 17, 1988, Ser. No. 272,437

Int. Cl.[4] B23C *9/00*

U.S. Cl. 144—251 A **8 Claims**



1. A guard for a shaper apparatus including a table having a planar work surface, a shaper head mounted for rotary movement about a vertical axis above the work surface, and a fence for guiding a workpiece along the work surface into operative engagement with the shaper head, comprising:

(a) an elongated guard body having top and bottom surfaces, front and rear surfaces, and opposite end portions,

(b) support means supporting said guard body in a fixed position in front of and adjacent said shaper head, so that said bottom surface is spaced above said work surface to permit a workpiece to be moved along said work surface and beneath said bottom surface for operative engagement of said workpiece with said shaper head,

(c) said guard body having an elongated guide slot extending vertically through said body and opening through said bottom surface,

(d) an elongated guard panel received in said guide slot, said panel having a length slightly less than the length of said guide slot,

(e) mounting means supporting said guard panel in said guide slot for limited vertical travel between a lower position and an upper position, and

(f) said guard panel having an elongated bottom surface adapted normally to rest upon said work surface in said lower position, but adapted to be engaged and elevated to an upper position by a workpiece moving longitudinally beneath said guard body.

4,842,032

COMPACT DISC CARRYING CASE

Patrick Mastronardo, Stamford, Conn., assignor to Lebo Peerless, Inc., Bloomfield, N.J.

Filed Nov. 9, 1987, Ser. No. 118,166

Int. Cl.[4] A45C *11/38, 13/02;* **B65D** *85/58, 85/62*

U.S. Cl. 206—309 **3 Claims**

1. A carrying case for compact discs comprising; a case having elongated opposed front and back sides, opposed elongated top and bottom, and opposed end sides forming a first compartment in the case; a cross-shaped partition comprising one elongated wall between the end sides and extending upwardly from the bottom, further comprising Velcro means at the edges of each of the cross walls, said sides having means for detachably attaching the Velcro means so that the partition is disposed in the case, and with the partition disposed in the case, four second compartments are provided wherein at least one partition wall comprises means to pivot said wall relative to the other immediately adjacent walls and away from said sides, whereby with detachment of the Velcro means of said one partition wall is detached from the respective side and the one partition wall is pivoted to be parallel to the immediately adjacent walls, said top and said end sides forming a detachable flap with opposed parallel edges and transversely disposed

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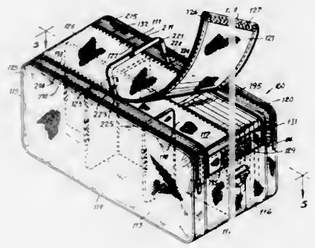
ends, one of said ends being fixed and the other being a free end, and further comprising two zippers in parallel disposition, disposed at the opposed edges of the flap whereby with opening the zippers, the flap is pulled away from the case for access to the compartments, and further comprising cooperative Velcro means disposed on said free flap end and on one of said case end sides, and further comprising stitching means at the fixed flap end for affixing to said other end side, whereby with opening of the zippers the flap Velcro means is detached from



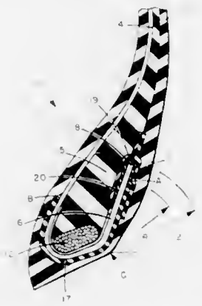
the end side Velcro means and the flap pulled over the elongated wall towards the other case end side, further comprising a member having opposite ends and cooperative means for attaching said member ends to a respective zipper so that when the member is pulled the zippers are simultaneously opened or closed and, said front and back sides each comprising a pair of pockets, each said pocket being disposed parallel to and adjacent one of each said flap zippers, and each pocket comprising a zipper, and wherein the compact discs are disposed in said second compartments for ready removal from the case.

4,842,033

PNEUMATIC TIRE HAVING GUM STRIPS ENCASING A CARCASS TURNUP

Gia V. Nguyen, Arlon, Belgium, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 16, 1987, Ser. No 120,905
Int. Cl.[4] B60C *15/06*
U.S. Cl. 152—541 **8 Claims**



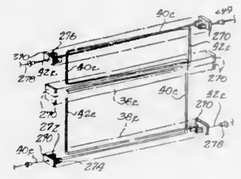
1. A pneumatic tire for heavy duty use comprising a radial carcass and two bead portions each reinforced by a bead core, with the bead portion comprising a rubber apex strip of a substantially triangular cross-section extending radially outwardly from the bead core and having a Shore A Hardness greater than 70, and with the radial carcass comprising at least one cord reinforced elastomeric ply, extending between the bead cores and passing around each bead core from the axially inner side to the axially outer side, end portions of the carcass ply turn-up being encased in a pair of non fiber cord reinforced gum strips wherein said gum strips are formed from an elastomeric compound having a Shore A Hardness comprised between 55 and 65, a 300% Modulus comprised between 5 and 7 MPa, and a minimum Elongation-at-break which is comprised between 550 and 700%; each turn-up has one of said gum strips located between said turn-up and the respective apex, and the other gum strip located axially outside of the turn-up, the two gum strips being joined together radially outwardly of the carcass ply end and extending radially inwardly to encapsulate at least 50% of the length of the turn-up, and wherein the thickness of the gum strips is comprised between 1.0 mm and 2.0 mm.

4,842,034

WINDOW SHADE

Richard K. Haines, Elkhart, Ind., assignor to Elkhart Door, Incorporated, Elkhart, Ind.

Division of Ser. No. 854,158, Apr. 21, 1986, and a continuation-in-part of Ser. No. 785,800, Oct. 9, 1985, Pat. No. 4,733,710. This application Feb. 23, 1988, Ser. No. 159,230
The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.
Int. Cl.[4] E06B *3/94*
U.S. Cl. 160—84.1 **5 Claims**



1. A window shade construction for mounting adjacent a window frame comprising: a top header and a bottom header, a first pleated shade member having one end thereof coupled to said top header; a second pleated shade member having one end thereof coupled to an opposite end of said first shade member; cord means operatively coupled to said first and second shade members allowing selective movement of either or both of said first and second shade members between a fully collapsed position and a fully extended position relative to said window frame; wherein said cord means comprise a pair of cords located generally at opposite lateral sides of said shade construction and extending from said top header to said bottom header; a middle header comprising a generally hollow elongate member having a through apertures for receiving said cords therethrough; said top header being coupled to a top portion of said window frame and said bottom header being coupled to a bottom portion of said window frame; and mounting means for mounting said pair of cords to said middle header for slidable, frictional engagement therewith so as to permit said middle header to be set in any desired orientation along said cords relative to the window to thereby hold said first and second pleated shade members in corresponding positions relative to the window frame.

4,842,035

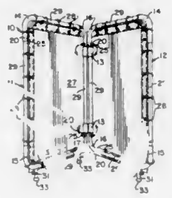
SPACE DIVIDER AND FRAMING MEMBERS THEREFOR

Owen Thompson, Oak Park, Ill., assignor to Singer Safety Company, Chicago, Ill.

Filed Jul. 20, 1987, Ser. No. 75,625
Int. Cl.[4] A47G *5/00*
U.S. Cl. 160—135 **15 Claims**

1. A space divider comprising:
at least a pair of frames formed from primary and secondary frame members, said primary frame members forming the corners of said frame and said secondary frame members

at least interconnecting said primary frame members to complete each of said pair of frames;
said pair of frames being aligned in side-by-side relationship, each said primary frame member having threaded nut means attached to the external surface of said primary member, said nut means defining a raised bearing surface at an end thereof;
hinge means interconnecting pairs of primary frame members to permit pivoting of said pair of frames relative to each other, an end of said hinge means slidably engaging said raised bearing surface of said nut means; and



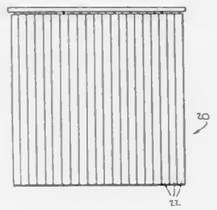
said hinge means includes a double collar and has a collar section slidingly received about each of said pair of frames and between said raised bearing surface of said threaded nut means and an outwardly projecting bearing surface means of at least one of said frames, said bearing surface means and said nut means being on said frames in sufficiently spaced relation for receiving said collar section therebetween;
whereby said interconnected pair of primary frame members are freely rotatable relative to each other about said hinge means.

4,842,036

VERTICAL BLIND SLATS, AND ASSEMBLIES AND COMPONENTS THEREOF

Barry I. Goodman, 10220 SW. 129th St., Miami, Fla. 33176

Filed Aug. 8, 1983, Ser. No. 521,353
Int. Cl.[4] E06B *9/26*
U.S. Cl. 160—166.1 **33 Claims**



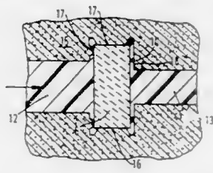
1. A blind comprising a plurality of associated slats each comprising a light transmissive laminate said laminate comprising a first layer of not free hanging material comprised of strands arranged in spaced relation to each other forming openings thru which light can pass; a second layer of light transmissive material stitchlessly joined to said first layer; and, said first layer providing a surface dimension or texture to the laminate.

4,842,037

METAL CASTING PATTERNS

John R. Brown, Shifnal; Nigel K. Graham, Tamworth, and Russell A. King, Sutton Coldfield, all of United Kingdom, assignors to Foseco International Limited, Birmingham, England

Filed May 16, 1988, Ser. No. 194,566
Claims priority, application United Kingdom, Jun. 10, 1987, 8713569; Dec. 5, 1987, 8728489
Int. Cl.[4] B22C *7/02, 9/04*
U.S. Cl. 164—45 **6 Claims**



1. A metal casting pattern of expanded thermoplastics material, said pattern comprising:
a first sprue or runner part;
a second sprue or runner part; and
a filter comprising a porous ceramic body located between said two parts, the cross-sectional area of the first part being larger than that of the second part, said porous ceramic body being a foam structure and being totally enclosed in said expanded thermoplastics material.

5. A method of making a metal casting pattern of expanded thermoplastics material comprising a first sprue or runner part, a second sprue or runner part, and a filter comprising a porous ceramic body located between the two parts, the cross-sectional area of the first part being larger than that of the second part, said filter being totally enclosed in the thermoplastics material, said method comprising the steps of:
locating said filter in a die or mould having an internal shape conforming to the shape of the pattern so that all porous surfaces of the filter are accessible to thermoplastics material when said thermoplastics material is introduced into the die or mould; and
introducing beads of said thermoplastics material into the die or mould until the die or mould is filled, said beads of thermoplastics material having a size which is smaller than the size of the pores or cells of the ceramic body to ensure that said beads penetrate into said ceramic body; and
heating said beads so as to expand and cure said beads to form said pattern.

4,842,038

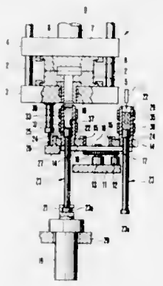
INJECTION METHOD OF DIE CASTING MACHINE

Kiyoshi Fujino, and Toyoaki Ueno, both of Yamaguchi, Japan, assignors to UBE Industries, Inc., Yamaguchi, Japan

Continuation of Ser. No. 932,718, Nov. 19, 1986, abandoned. This application Feb. 26, 1988, Ser. No. 163,208
Claims priority, application Japan, Nov. 26, 1985, 60-263758; Mar. 10, 1986, 61-50450
Int. Cl.[4] B22D *17/00, 23/06*
U.S. Cl. 164—80 **13 Claims**

9. An injection method of a die casting machine comprising the steps of: (a) preheating a billet having a size required for a single injection, said preheating performed outside an injection sleeve, (b) melting an inner portion of said billet to a predetermined temperature so as to leave a solid layer which contains

said molten inner portion of said billet therein, (c) loading said billet in said injection sleeve, (d) heating said billet until said



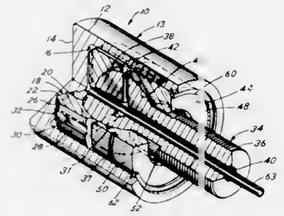
billet is substantially molten, and (e) injecting said molten billet into a die cavity.

4,842,039

SELF-ALIGNING PLUNGER TIP

Otto Kelm, 3149 M-63 North, Benton Harbor, Mich. 49022

Filed Jun. 27, 1988, Ser. No. 211,570
Int. Cl.[4] B22D *17/08, 17/20*
U.S. Cl. 164—312 2 Claims



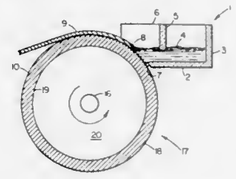
1. A plunger tip for use in a die casting process having an exterior wall and an end wall defining a cavity, means carried within said cavity for connecting said plunger tip to a plunger rod, said connecting means having a bore therethrough in communication with said cavity for ingress and egress of a coolant, the improvement wherein said connecting means includes a socket part defining a spherical cavity being retained within the first mentioned cavity, said socket part further defining an outer bore in communication with said cavity, a rod member having a spherically tipped end and a connecting shaft through said outer bore into said socket part wherein said spherically tipped and is pivotally accommodated within said spherical cavity, said shaft of said rod member being of a smaller dimension than said socket part outer bore for accommodating shiftable movement of said rod member relative to said socket part, and means for cooling said plunger tip, said cooling means including a plurality of channels defined about the periphery of said socket part, said socket part defining a second through bore opposite the first mentioned bore and in flow communication with said channels, said cooling means further including a longitudinal bore defined in said rod member and a plurality of transverse bores formed in said spherically tipped end communicating with said longitudinal bore, said longitudinal bore and said transverse bores constituting a flow path for injection of a coolant into said plunger tip.

4,842,040

UNIFORM COOLING OF CAST STRIP

James R. Bibler, and Richard A. Gleixner, both of Columbus, Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Aug. 10, 1988, Ser. No. 230,623
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—429 13 Claims



1. A liquid-cooled substrate for casting uniform metal products directly from a metal melt comprising

(A) a cylindrical core body having multiple coolant inlets and outlets in the outer cylindrical surface thereof and also having supply passages communicating the inlets with a coolant source and return passages communicating the outlets with a coolant dump, and

(B) an annular, heat-conductive casting shell having inside and outside cylindrical surfaces, the outside surface being a casting surface for the metal melt and the inside surface overlaying the core outer surface and cooperating therewith to define a plurality of adjacent coolant channels extending substantially circumferentially around the core outer surface, wherein each coolant channel communicates with at least one inlet and one outlet and wherein the inlets of each coolant channel are staggered circumferentially from the inlets of each adjacent coolant channel and the outlets of each coolant channel are staggered circumferentially from the outlets of each adjacent coolant channel.

4,842,041

METAL STRIP MANUFACTURING METHOD AND NOZZLE THEREFOR

Yuichi Sato; Takashi Sato, and Toshio Yamada, all of Kawasaki, Japan, assignors to Nippon Steel Corporation, Otemachi, Japan

Filed Dec. 24, 1987, Ser. No. 137,755
Claims priority, application Japan, Jun. 11, 1987, 62-145706
Int. Cl.[4] B22D *11/06, 37/00*
U.S. Cl. 164—463 18 Claims

1. A method for manufacturing a metal strip by depositing molten metal on a moving chill surface comprising:

moving said chill surface in a predetermined direction of movement;

arraying a plurality of elongated orifices at approximately a right angle to said direction of movement of said chill surface, wherein each of said elongated orifice has a longitudinal centerline;

positioning the longitudinal centerline of each elongated orifice at an angle of from 10 to 80 degrees with respect to said direction of movement of said chill surface;

ejecting molten metal from said elongated orifices onto said moving chill surface; and

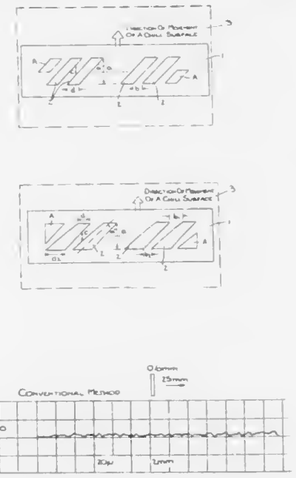
rapidly solidifying said molten metal ejected onto said moving chill surface thereby forming said metal strip.

7. A nozzle for the manufacture of metal a trip on a chill surface moving in a predetermined direction, said nozzle comprising:

a nozzle discharge end having a longitudinal length between a first edge portion and an opposite second edge portion and a longitudinal centerline, said nozzle discharge end longitudinal length and longitudinal centerline being adapted for positioning at approximately right angles to said predetermined direction of movement of said chill surface;

said nozzle discharge end having a width, said width having a width centerline perpendicular to said nozzle discharge end longitudinal centerline, said nozzle discharge end width being adapted for positioning approximately parallel to said predetermined direction of movement of said chill surface;

a plurality of elongated orifices arrayed along said length of said nozzle discharge end, each elongated orifice having a longitudinal centerline, with each elongated orifice longitudinal centerline forming an angle of from 10 to 80 degrees with respect to said nozzle discharge end with centerline.

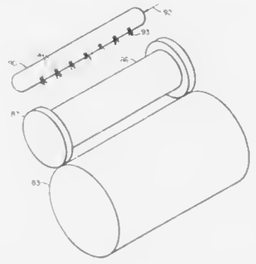


4,842,042

THICKNESS CONTROL OF DIRECT CAST STRIP

Edwin S. Bartlett, Worthington, and James L. McCall, Columbus, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Mar. 7, 1988, Ser. No. 164,710
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—463 15 Claims



1. Apparatus for direct casting of metal strip including an open tundish for containing molten metal, a rotating chill wheel having an outer cylindrical surface with dimensional irregularities closely adjacent the open tundish to extract a layer of molten metal from the tundish and solidify it to a solid strip on the outer cylindrical surface and an uncooled, cylindrical roll skimmer located downstream of the tundish and having an axis of rotation substantially parallel to the axis of rotation of the chill wheel and being spaced therefrom such that an outer cylindrical surface of the roll skimmer is in contact with the layer of molten metal, wherein the improvement comprises means for communicating the outer cylindrical surface of the roll skimmer with the chill wheel outer cylindrical surface to define a gap of preselected thickness therebetween which does not vary with dimensional irregularities of the outer cylindrical surface of the chill wheel.

8. Method for direct casting of metal strip comprising

extracting molten metal from an open tundish on the outer cylindrical surface of a chill wheel having dimensional irregularities and gradually solidifying it to a solid strip from the chill wheel upwards,

providing an uncooled, cylindrical roll skimmer downstream of the tundish having an axis of rotation substantially parallel to the axis of rotation of the chill wheel,

positioning the roll skimmer such that it contacts the molten metal above the solidifying strip,

rotating the roll skimmer to smooth the molten metal and to provide gauge control, and

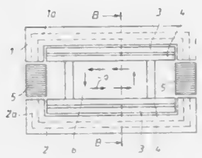
wherein the improvement comprises communicating the outer cylindrical surface of the roll skimmer with the chill wheel outer cylindrical surface to define a gap therebetween which does not vary with dimensional irregularities of the chill wheel outer surface.

4,842,043

MOLD STIRRER

Ingvar T. Andersen, and Jan E. Eriksson, both of Helsingborg, Sweden, assignors to Asea Brown Boveri AB, Västerås, Sweden

Filed Apr. 11, 1988, Ser. No. 180,326
Claims priority, application Sweden, Apr. 16, 1987, 8701615
Int. Cl.[4] B22D *27/02*
U.S. Cl. 164—504 9 Claims



1. A mold stirrer for the electromagnetic stirring of a molten metal strand in a mold having opposite sides during continuous casting, the mold stirrer including two stirrer members located outside the mold and respectively adjacent said opposite sides thereof, each stirrer member having opposite ends which respectively face corresponding ends of the other stirrer member, and each stirrer member being provided with an iron core and an electrical coil,

and a pair of intermediate iron cores which are respectively placed between corresponding ends of said stirrer members, whereby said intermediate iron cores, together with the cores of the stirrer members, form a closed magnetic circuit around the mold to enable rotation of the cast metal normal to the casting direction.

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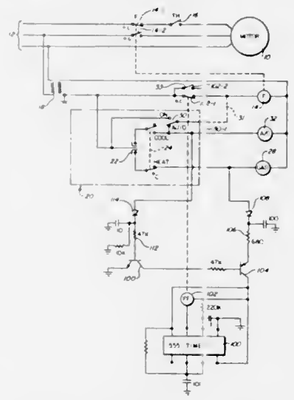
4,842,044

FURNACE CONTROL SYSTEM

Staunton O. Flanders, Highland Park, and William A. Ness, Kildeer, both of Ill., assignors to Ha en Energy, Ltd., Northbrook, Ill.

Filed Dec. 28, 1987, Ser. No. 138,310
Int. Cl.[4] F25B *29/00*
U.S. Cl. 165—12 11 Claims



1. In a combined heating and cooling system of the type which is selectively energized to heat and cool a building space by transferring thermal energy to a fluid and by energizing fluid circulating means to circulate the fluid through the building space, a control system comprising:

switching means normally connected to effect energization of said fluid circulating means;

switching control means energizable in response to deenergization of said heating and cooling system for operating said switching means to inhibit energization of said fluid circulating means;

said switching control means being deenergized for operating said switching means to effect substantially immediate energization of the fluid circulating means in response to energization of said heating and cooling system; and

circuit means responsive to the deenergization of said heating and cooling system for energizing said switching control means a selected time interval after deenergization of said heating and cooling system to operate said switching means and deenergize said fluid circulating means.

4,842,045

EXPANDABLE RADIATOR

Donald L. Reinmuller, Enon, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 11, 1988, Ser. No. 255,803
Int. Cl.[4] B64G *1/50*; F28D *15/02*
U.S. Cl. 165—41 6 Claims

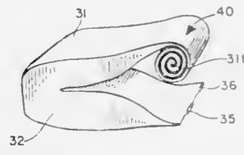
1. A heat rejection system for radiating heat generated by a source of heat on a spacecraft or like vehicle, comprising:

(a) a fluid heat exchange medium for contacting said source in operative circulating heat exchange relationship therewith, said medium comprising a fluid material for absorbing heat by conversion of said medium from a liquid phase of said medium to a vapor phase of said medium;

(b) a flexible inflatable elongate sleeve of preselected length and coilable along said length between a first end and a second end thereof, said sleeve being closed at said first end defining an expandable and collapsible volume and having an inner condensation surface for condensing said vapor phase of said medium to said liquid phase of said medium and an outer heat radiating surface whereby heat is rejected from said sleeve;

(c) means at said second end of said sleeve defining an inlet for conducting said vapor phase of said medium into said sleeve and an outlet for conducting liquid phase of said medium from said sleeve;

(d) means for attachment to said vehicle and operatively attached to said first end of said sleeve for selectively



winding and unwinding said sleeve generally along the length thereof in response to the pressure within said system;

(e) means communicating with said sleeve through said inlet for conducting said medium in the vapor phase from said source to said volume;

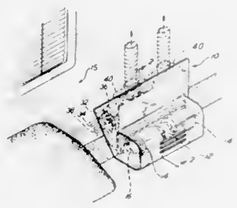
(f) means communicating with said outlet for conducting said liquid phase of said medium from said outlet into said heat exchange relationship with said source.

4,842,046

SLIM-LINE VAN HEATER/AIR CONDITONER UNIT

James D. Stech, Elkhart, Ind., assignor to Quality Components, Inc., Elkhart, Ind.

Filed Jan. 22, 1988, Ser. No. 146,842
Int. Cl.[4] B60H *1/00*
U.S. Cl. 165—42 8 Claims



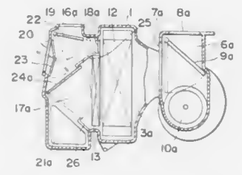
1. A heat exchanger unit in combination with a vehicle having an outer and an inner side wall, said unit including a heat exchanger means for cooling or warming air, blower means for delivering said air to said heat exchanger means, duct means in air flow communication with said heat exchanger means for delivering said air to an interior of said vehicle, said heat exchanger means enclosed by a housing, the improvement wherein said housing and said heat exchanger means are positioned substantially between an outer side wall and an inner side wall of said vehicle, said blower means in air flow communication with said heat exchanger means and including a housing enclosing the blower means connected to said heat exchanger means housing.

4,842,047

AIR CONDITIONER FOR AUTOMOBILES

Muneo Sakurada, Konan, and Yuusuke Takahashi, Higashi-matsuyama, both of Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 201,966
Int. Cl.[4] G05D *23/13*
U.S. Cl. 165—43 4 Claims



1. An automobile air conditioner comprising:

a casing having an upper side wall and a lower side wall and defining therebetween separated first and second air flow passages through which passages air flows in a flow direction;

a first blower disposed in said first air flow passage for blowing air therethrough in the flow direction;

a second blower disposed in said second air flow passage for blowing air therethrough in the flow direction;

a single motor operatively connected to said first and said second blowers for driving said blowers;

a first heat exchanger disposed in said casing downstream of said blowers with respect to the air flow direction for cooling air passing therethrough, said first heat exchanger extending across said first and said second air flow passages;

a second heat exchanger disposed in said casing downstream from, with respect to said air flow direction, and adjacent to said first heat exchanger for heating air passing therethrough,

said second heat exchanger extending across said first and said second air flow passages, being adjacent the lower side wall of the casing, and spaced from the upper side wall of said casing,

first and second bypass passages defined between said second heat exchanger and the upper side wall of said casing in said air flow passages, respectively, said bypass passages each aligned with a portion of said first heat exchanger as taken in said flow direction;

a first bypass door disposed in said first bypass passage for regulating the amount of air blown by said first blower through said first heat exchanger that flows through said first bypass passage;

a second bypass door disposed in said second bypass passage for regulating the amount of air blown by said second blower through said first heat exchanger that flows through said second bypass passage,

said first and said second bypass doors being operable to regulate the amount of air flowing through said respective bypass passages independently of one another;

a first air distribution chamber defined by said casing contiguous to said first air flow passage downstream of said second heat exchanger with respect to the flow direction;

a second air distribution chamber defined by said casing separate from said first air distribution chamber and contiguous to said second air flow passage downstream of said second heat exchanger with respect to the flow direction,

each of said air distribution chambers having an upper portion in which an upper air outlet means is defined and a lower portion in which a lower air outlet is defined,

the upper portion of each of said air distribution chambers open to said bypass passages, respectively;

a first air distribution door movably mounted to said casing and movable within said first air distribution chamber between a first position at which the upper portion of said first air distribution chamber is closed to said second heat exchanger while the lower portion of said first air distribution chamber is open to said second heat exchanger and closed to said first bypass passage by the first air distribution door, a second position at which both the upper and the lower portions of the first air distribution chamber are open to said second heat exchanger while the lower portion of said first air distribution chamber is closed to said first bypass passage by the first air distribution door and a third position at which the lower portion of said first air distribution chamber is closed to said second heat exchanger and said first bypass passage while the upper portion of said first air distribution chamber is open to said second heat exchanger by the first air distribution door; and

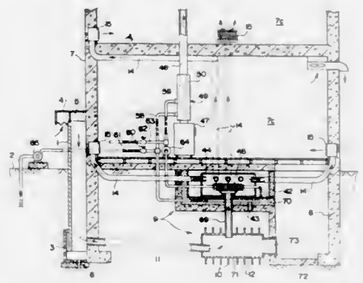
a second air distribution door movably mounted to said casing and movable within said second air distribution chamber between a first position at which the upper portion of said second air distribution chamber is closed to said second heat exchanger while the lower portion of said second air distribution chamber is open to said second heat exchanger and closed to said second bypass passage by the second air distribution door, a second position at which both the upper and the lower portions of the second air distribution chamber are open to said second heat exchanger while the lower portion of said second air distribution chamber is closed to said second bypass passage by the second air distribution door, and a third position at which the lower portion of said second air distribution chamber is closed to said second heat exchanger and said second bypass passage while the upper portion of said second air distribution chamber is open to said second heat exchanger by the second air distribution door.

4,842,048

SYSTEM FOR DRAWING THE OPEN AIR INDOORS

Yasuo Higaki, Eniwa, Japan, assignor to Sapporo Alna Co., Ltd., Hokkaido, Japan

Filed Jun. 30, 1987, Ser. No. 68,680
Claims priority, application Japan, Apr. 28, 1987, 62-105747
Int. Cl.[4] F24F *3/00*
U.S. Cl. 165—45 3 Claims



1. A system for drawing the open air indoors, comprising:

a transferring tank, buried underground;

an open-air flow-pipe buried underground over substantially its total length, having its one end connected to an intake port disposed above the ground, and its other end connected to the transferring tank;

an open-air distribution pipe having its one end connected to at least one room of a building and having its other end communicating with the other end of said open-air flow pipe through the transferring tank;

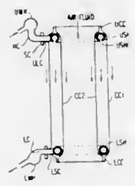
a first heat exchange disposed within the transferring tank, for exchanging heat with the air present in the transferring tank;
heating apparatus having an exhaust gas flue attached thereto;
a second heat exchange apparatus being fitted around the exhaust gas flue to extract thermal energy present in the exhaust gas flue; and
said first and second heat exchange apparatus connected to each other through a fluid circulation pipe.

4,842,049

HEAT EXCHANGING APPARATUS FOR COOLING AND CONDENSING BY EVAPORATION

Diego E. F. Dodds, Buenos Aires, Argentina, assignor to Dodds-Oboler, Inc., Dade County, Fla.

Division of Ser. No. 797,734, Nov. 14, 1985, Pat. No. 4,693,302.
This application Jun. 16, 1987, Ser. No. 62,651
Claims priority, application Argentina Dec. 28, 1984, 299141
Int. Cl.[4] F28D *3/00;* **F28F** *7/00, 21/06;* **F28G** *5/00*
U.S. Cl. 165—46 **2 Claims**



1. A heat exchange apparatus for cooling and condensing by evaporation, comprising a plurality of plastic heat exchange elements having a fluid passage therein and external surfaces adapted to be mounted in a heat exchange zone wherein a cooling medium, including water in droplet form contacts said external surface, said plastic heat exchange elements being constituted by a pair of thin-walled plastic sheets, and means sealing said plastic sheets together so as to define the boundaries of an annular passage through said heat exchange zone, and means for joining one end of said passage to said first header means and means for joining the other end of said passage to said second header means at least one said plastic sheets being a thin-walled plastic film such that the cross-sectional shape of said annular passage is attained when fluid in said annular passage is subjected to a predetermined internal pressure, each said plastic heat exchange element and the annular passage therein is vertically oriented.

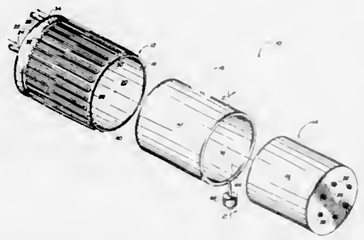
4,842,050

HEAT TRANSFER APPARATUS AND METHOD

Allen D. Harper, Phoenix, Ariz., assignor to Allied-Signal Inc., Morris Township, Morris County, N. J.

Filed Dec. 22, 1988, Ser. No. 289,956
Int. Cl.[4] F28F *27/00;* **F28D** *15/00*
U.S. Cl. 165—47 **5 Claims**

1. Chemical energy heat source apparatus comprising a fuel storage/reaction chamber including a store of fuel for reaction with a reactant introduced thereto and means for receiving reactant for reaction with said fuel store to produce heat energy, said storage/reaction chamber defining an outwardly disposed heat transfer surface through which heat energy is delivered upon reaction of said fuel store with said reactant; heat receiver means for receiving said heat energy from said fuel/storage reaction chamber and transferring said heat energy to a working fluid, said heat receiver defining a cavity receiving said fuel storage/reaction chamber therein and an inwardly disposed wall surface at least in part defining said cavity and in heat transfer relation with said working fluid; said fuel storage/reaction chamber and said heat receiver means cooperatively defining a gap between said heat transfer surface and said wall surface; expansible heat transfer means for receipt into said gap for in a first expanded position transferring said heat energy between said heat transfer surface and said wall surface while substantially preventing relative movement



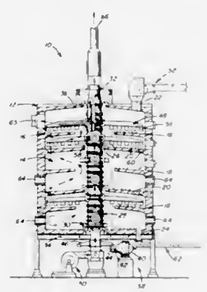
of said fuel storage/reaction chamber relative said cavity and in a second contracted position allowing relative movement and withdrawal of said fuel storage/reaction chamber from said cavity.

4,842,051

RABBLE ARM USED IN MULTIPLE HEARTH FURNACE

David A. Brownlee, 2177 Stowe Dr., Springfield, Ohio 45505

Filed Dec. 21, 1987, Ser. No. 136,098
Int. Cl.[4] F28F *5/00*
U.S. Cl. 165—93 **5 Claims**



1. A rabble arm adapted arm adapted for use in a multiple hearth furnace and being particularly adapted to withstand the stress caused by the thermal cycling of said furnace comprising,
an elongated tubular member having an open end portion and an opposite closed end portion,
said tubular member having an outside surface of substantially oval cross-sectional configuration and an inside surface arranged to form a tubular member hollow interior portion of substantially uniform cross-section throughout its length connected with said tubular member open end portion,

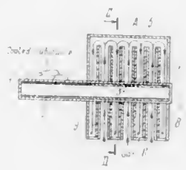
socket means connected to said tubular member open end portion,
said socket means having an inlet end portion adapted to be connected to a center shaft of said multiple hearth furnace and a tubular member connecting end position,
said socket means tubular member connecting end portion having an oval cross-sectional configuration substantially conforming to the oval cross-sectional configuration of said tubular member outside surface for receiving said tubular member open end portion,
said socket means having a hollow interior portion, said socket means hollow interior portion and said tubular member hollow interior portion each including partition means for forming a plurality of flow paths for receiving a cooling medium circulated through said socket means and said tubular member,
said tubular member partition means being longitudinal partition means positioned within said hollow interior portion and extending from said tubular member open end portion to a location spaced from said tubular member closed end portion,
said partition means forming a flow path for said cooling medium introduced into said hollow interior portion at said tubular member open end portion and circulated through said hollow interior portion,
bracket means positioned longitudinally and secured to said tubular member outside surface, and
a plurality of rabble teeth secured to said bracket means, each of said rabble teeth extending radially from said tubular member outside surface.

4,842,052

COOLER

Alexandr N. Gershuni, Kiev; Valery S. Maisotsenko, Odessa; Vladilen K. Zaripov, and Mikhail G. Semena, both of Kiev, all of U.S.S.R., assignors to Kievsky Politekhnichesky Institut, Kiev, U.S.S.R.

PCT No. PCT/SU87/00129, § 371 Date Jul. 12, 1988, § 102(e) Date Jul. 12, 1988, PCT Pub. No. WO88/04022, PCT Pub. Date Jun. 2, 1988
PCT Filed Nov. 16, 1987, Ser. No. 241,987
Claims priority, application U.S.S.R., Nov. 18, 1986, 4148435
Int. Cl.[4] F28D *15/02;* **F25B** *19/00*
U.S. Cl. 165—104.11 **3 Claims**



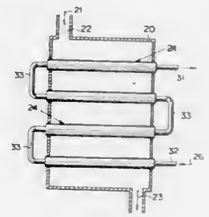
1. A cooler having the form of a thermal tube (1) comprising an evaporation zone (2) in which heat is drawn off a substance to be cooled, and a condensation zone (3) having outer fins (4) passed over by a flow of gas, characterized in that it has a casing (5) open at one side for admitting a flow of gas and accommodating the fins (4) so that their ends define with a wall of the casing (5) at the other side a cavity (A) to reverse the flow of gas, adjacent fins (4) at the side of admission of the gas being connected hermetically into pairs (6) to form passages (7, 8) between each such pair and inside each such pair walls of the thus formed inner passages (8) having a capillary porous lining (9) ends of which are in contact with a liquid medium (10).

4,842,053

HEAT EXCHANGER USING HEAT PIPES

Motoharu Yatsuhashi, Funabashi; Masataka Mochizuki, Nagareyama, and Shinich Sugihara, Tokyo, all of Japan, assignors to Fujikura Ltd. and Doryokuro Kakunenryo Kaihatsu Jigyodan, both of Tokyo, Japan

Filed Nov. 4, 1987, Ser. No. 116,685
Claims priority, application Japan, Nov. 13, 1986, 61-270222
Int. Cl.[4] F28D *15/02*
U.S. Cl. 165—104.14 **2 Claims**



1. A heat pipe type heat exchanger for use in a nuclear reactor, said heat exchanger comprising:
(a) a container having:
(i) an upper end and a lower end;
(ii) an inlet for liquid sodium at said upper end; and
(iii) an outlet for the liquid sodium at said lower end;
(b) a plurality of tubes extending through said container fluidtightly and with at least substantially horizontal axes, the lowest one of said plurality of tubes having one end connected to an inlet for cooling water, the highest one of said plurality of tubes having one end connected to an outlet for the cooling water, and said plurality of tubes being connected fluidtightly and in zig-zag shape to the adjacent one or ones of said plurality of tubes to form a continuous, fluidtight path;
(c) a plurality of heat pipes, each one of said plurality of heat pipes surrounding a corresponding one of said plurality of tubes coaxially and being spaced therefrom, each one of said plurality of heat pipes protruding outside said container at each end thereof and being closed at each end fluidtightly on the corresponding one of said plurality of tubes outside said container;
(d) a plurality of annular porous wicks, each one of said plurality of annular porous wicks being in continuous circumferential contact with a corresponding one of said plurality of heat pipes over the full axial length thereof and being spaced radially from the corresponding one of said plurality of tubes; and
(e) mercury contained in the annular space between each one of said plurality of tubes and the corresponding one of said plurality of annular porous wicks.

4,842,054

PUMP/HEAT EXCHANGER ASSEMBLY FOR POOL-TYPE REACTOR

Richard D. Nathenson, Pittsburgh, and Robert M. Slepian, Monroeville Boro, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 17, 1986, Ser. No. 875,150
Int. Cl.[4] F28D *15/00*
U.S. Cl. 165—104.28 **7 Claims**

1. A heat exchanger and pump assembly for transferring thermal energy from a heated, first electrically conductive fluid to a pumped, second electrically conductive fluid and for transferring internal energy from said pumped, second electrically conductive fluid to said first electrically conductive fluid, said assembly adapted to be disposed within a pool of said first electrically conductive fluid and comprising:

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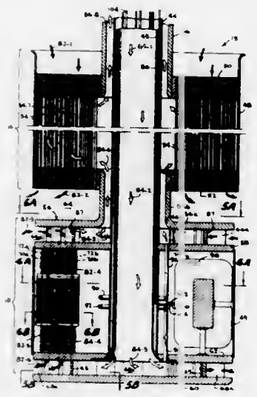
(a) a heat exchanger comprising means for defining a first annularly shaped cavity for receiving a flow of said second electrically conductive fluid and a plurality of tubes disposed within said cavity, whereby said second electrically conductive fluid in said cavity is heated, each of said tubes having an input and an output end, said input ends being disposed at the top of said heat exchanger for receiving from said pool a flow of said first electrically conductive fluid therein, said output ends being disposed at the bottom of and free of said cavity defining means for discharging said first electrically conductive fluid directly into said pool;

(b) a pump disposed beneath said heat exchanger and comprised of a plurality of flow couplers disposed in a circular array, each flow coupler comprised of a pump duct for receiving said first electrically conductive fluid and a generator duct for receiving said second electrically conductive fluid;

(c) a conduit disposed centrally of said annularly shaped cavity and within said circular array of said flow couplers for receiving said second electrically conductive fluid;



(d) a first plenum chamber disposed beneath said pump in communication with said centrally disposed conduit for receiving said second electrically conductive fluid and in communication with each of said generator ducts of said flow couplers for directing said pumped, second electrically conductive fluid upwardly through said generator ducts; and

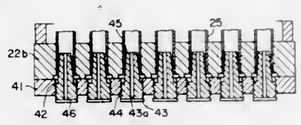
(e) means for defining a second cavity disposed above and adjacent said pump and comprising a baffle for dividing said second cavity into a second plenum chamber and a third plenum chamber, said second plenum chamber being disposed in open communication with said pool and in communication with said pump ducts for directly receiving said first electrically conductive fluid from said pool and for directing said first electrically conductive fluid in parallel through said pump ducts, said third plenum chamber being disposed in communication with said generator ducts for receiving in parallel and collecting said second electrically conductive fluid therefrom.

4,842,055

HEAT EXCHANGER

Seiichi Ohtsu, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 30, 1988, Ser. No. 175,325
Claims priority, application Japan, Aug. 4, 1987, 62-193831
Int. Cl.[4] F28D *7/02*; **F28F** *9/02*
U.S. Cl. 165—174 **9 Claims**



1. A heat exchanger of vertical type in which fluid flows vertically downwardly, comprising:

a shell having sealed opposite ends;

a pair of upper and lower tube plates disposed in said shell dividing the inside of said shell into an upper plenum, a lower plenum, and a heat exchanging passage between said upper plenum and said lower plenum bound by a portion of the wall of said shell extending between said upper and lower tube plates;

a plurality of heat exchanger tubes disposed longitudinally in said heat exchanging passage, each of said heat exchanger tubes having upper and lower ends connected to said upper and lower tube plates, respectively, whereby said upper plenum and said lower plenum are communicatively joined;

a support member provided with a plurality of through holes therein at portions corresponding to the lower end of said heat exchanger tubes and detachably mounted to a face of said lower tube plate; and

means adjustably contacted to a portion of the lower ends of said heat exchanger tubes to constitute metal-to-metal seal contact and fixed to said through holes of said support member for causing a pressure loss of the fluid flows flowing downwardly through said heat exchanger tubes.

4,842,056

PROCESS FOR METAL PLATING CEMENT IN A PERFORATED WELL

Hermanus G. Van Laar, Calgary, Canada, assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 21, 1987, Ser. No. 135,213
Claims priority, application Canada, Dec. 22, 1986, 525984
Int. Cl.[4] E21B *33/13, 41/02*
U.S. Cl. 166—292 **8 Claims**

1. A process for metal plating cement perforations in a subterranean well comprising:

injecting into the cement perforations a plurality of pore volumes of an aqueous solution containing an activating agent, such that the surface of the cement perforations is activated;

injecting into the cement perforations a first spacer;

injecting into the cement perforations a plurality of pore volumes of an aqueous solution containing a metal plating compound and a reducing agent, such that the surface of the cement perforations is metal plated; and

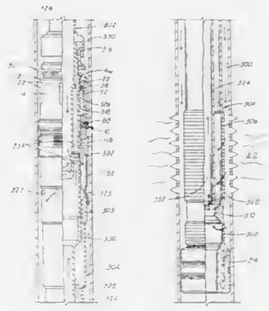
injecting into the cement perforations a second spacer.

4,842,057

RETRIEVABLE GRAVEL PACKER AND RETRIEVING TOOL

Eric P. Lubitz, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 29, 1988, Ser. No. 213,203
Int. Cl.[4] E21B *33/128, 33/129, 43/04*
U.S. Cl. 166—51 **20 Claims**



1. A gravel packer comprising:

packer mandrel means for connecting to an operating tool;

sealing means disposed around said packer mandrel means for sealingly engaging a well bore when in a set position;

slip means disposed around said packer mandrel means for grippingly engaging said well bore when in a set position, said slip means comprising:

a slip housing;

an upper slip wedge adjacent to said slip housing and slidably engaged with said packer mandrel means;

a lower slip wedge adjacent to said slip housing and slidable therewith; and

a plurality of slips disposed in said slip housing and engagable by said upper and lower slip wedges;

sleeve means disposed around said packer mandrel means and slidable therewith for actuating said sealing means and said slip means into said set positions;

means on said packer mandrel means for engaging said upper slip wedge whereby said upper slip wedge may be moved away from said slips during a retrieving operation; and

means on said upper slip wedge for engaging said slip housing during said retrieving operation after said packer mandrel means engages said upper slip wedge.

4,842,058

LOAD DETECTION AND INDICATOR APPARATUS FOR WELL TUBING OR THE LIKE

David L. Sipos; Duane M. Kuske, and Paul D. White, Jr., all of Houston, Tex., assignors to Bowen Tools, Inc., Houston, Tex.

Filed Sep. 26, 1988, Ser. No. 248,579
Int. Cl.[4] E21B *19/08*
U.S. Cl. 166—77 **11 Claims**

1. Apparatus for detecting and indicating loads on an elongate object supported by a support apparatus above a well for movement downwardly or upwardly relative to the apparatus, comprising:

a load cell housing having a longitudinally extending central portion;

a tubular guide positioned in said central portion of said housing for limited longitudinal movement relative to said housing;

a load cell chamber between said housing and said tubular guide;

a first piston extending into said chamber and adapted for longitudinal movement relative to said housing;

a second piston extending into said chamber and longitudinally spaced from said first piston and adapted for longitudinal movement relative to said housing;

said load cell chamber having a sealed first chamber section adjacent said first piston with fluid therein which is adapted to be pressurized by longitudinal movement of said first piston relative to said housing;

said load cell chamber also having a sealed second chamber section adjacent said second piston with fluid therein which is adapted to be pressurized by longitudinal movement of said second piston relative to said housing;

means for imparting longitudinal movements of said tubutar guide to either said first piston or said second piston independently of each other to develop a pressure on the fluid in said chamber sections which is indicative of the amount of longitudinal force on said tubular guide;

indicator means associated with each of said chamber sections for indicating the amount of force on said tubular guide; and

a weight compensating means operable connected to said tubular guide for offsetting the downward force of said support apparatus for the elongate object, whereby only the upward or downward force of the elongate object is indicated.

7. A load cell apparatus for detecting and indicating loads on tubing wherein the tubing is injected or withdrawn into or out of a well by a tubing injector apparatus, comprising:

a tubular load cell housing disposed directly below said tubing injector apparatus with its longitudinal center in longitudinal alignment with the tubing in the injector apparatus;

a tubular guide disposed in said load cell housing and connected to said tubing injector apparatus for longitudinal movement with said injector apparatus relative to said housing, and through which the tubing moves into and out of the well;

a first annular chamber having a first chamber section and a second chamber section between said tubular housing and said tubular guide and having fluid therein;

a second annular sealed chamber between said tubular housing and said tubular guide and having fluid therein;

means for pressurizing said fluid in said second annular sealed chamber and maintaining a required pressure to support said tubular guide;

a first annular piston disposed in said first chamber section for longitudinal movement with said tubular guide in a first longitudinal direction for developing a fluid pressure in said first chamber section which is indicative of the amount of force exerted by the tubing in said first longitudinal direction;

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a second annular piston disposed in said second chamber section longitudinally spaced from said first piston for longitudinal movement with said tubular guide in a second longitudinal direction for developing a fluid pressure in said second chamber section which is indicative of the amount of the force exerted by the tubing in said second longitudinal direction; and

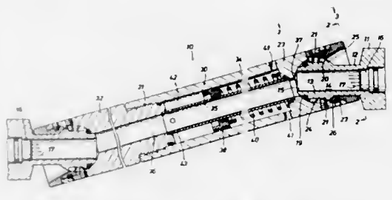
a separate indicator means connected to each of said first chamber section and said second chamber section for indicating the amount of load exerted by the tubing in each of said longitudinal directions.

4,842,059

FLEX JOINT INCORPORATING ENCLOSED CONDUCTORS

Martin L. Tomek, Houston, Tex., assignor to Halliburton Logging Services, Inc., Houston, Tex.

Filed Sep. 16, 1988, Ser. No. 245,234
Int. Cl.[4] E21B *17/046*; F16L *27/04*
U.S. Cl. 166—65.1 **8 Claims**



1. A downhole elongate oil tool adapted to flex as required in placing the elongate tool in a crooked well borehole wherein electrical signals are transmitted along conductors along the elongate tool, the elongate tool incorporating a flex tool comprising:

(a) a generally spherical knuckle;

(b) a surrounding socket engaging said knuckle with a limited rotational range relative to a defined axis through said knuckle and socket;

(c) a passage through said knuckle opening at an outlet into said socket;

(d) a serially communicated passage through said socket aligned with said knuckle;

(e) means cooperative with said knuckle and said socket;

(1) permitting flexure in a conic angle relative to an axis through said knuckle and socket and

(2) preventing relative axial rotation betwen said knuckle and said socket; and

(f) means for filling said passages with a pressure isolated oil bath for contacting structural components in said passages, and further wherein said oil bath is pressure isolated by a piston responsive to external fluid pressure in the well borehole to sustain a pressure on said oil bath equal to and in excess of prevailing external pressure.

4,842,060

PLASTIC WELL WITH PLASTIC WELL ADAPTER

Cecil H. Paulus, Rte. 2, Box 495, Leesburg, Ind. 46538

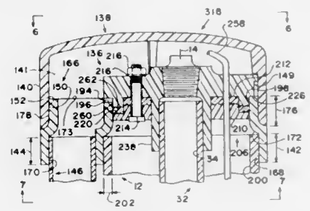
Continuation-in-part of Ser. No. 39,942, Apr. 20, 1987, Pat. No. 4,785,881. This application Apr. 7, 1988, Ser. No. 178,682
Int. Cl.[4] E21B *33/03*, *33/04*
U.S. Cl. 166—75.1 **18 Claims**

1. A well closure assembly (318) for use with a well having a well casing (12) that includes a longitudinal axis (14) and a top (28) that is orthogonal to said axis, which well closure assembly comprises:

a support plate (136) having means (34) for supporting a well pipe in said well casing;

a well cap (138) having means (140) for enclosing said support plate; and

adapter means (166), being inserted between said top of said well casing and said support plate, for supporting said



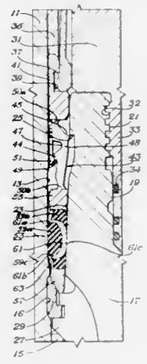
support plate and said well cap above said top of said well casing, and having means (168 and 170) for providing insect-proof connections between said adapter means and both said well casing and an electrical conduit.

4,842,061

CASING HANGER PACKOFF WITH C-SHAPED METAL SEAL

Philippe C. Nobileau, Paris, France, assignor to Vetco Gray Inc., Houston, Tex.

Filed Feb. 3, 1988, Ser. No. 152,516
Int. Cl.[4] E21B *17/08*
U.S. Cl. 166—115 **6 Claims**



1. In a wellhead assembly having a wellhead within which a casing hanger lands, an improved packoff assembly for sealing between the wellhead and the casing hanger, comprising in combination:

a frusto-conical tapered sealing surface formed on the casing hanger;

metal upper and lower rings;

an annular metal seal member, the seal member having located between the upper and lower rings a single upper lip and a single lower lip, each facing outward for metal-to-metal sealing contact with the wellhead, the upper and lower lips being connected together with a single C-shaped curved section that has a single central portion facing inward for metal-to-metal sealing contact with the tapered sealing surface on the casing hanger, the upper and lower lips being connected to the upper and lower rings, respectively; and

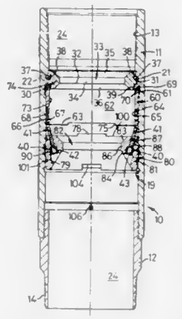
means for moving the upper ring downward relative to the lower ring to deform the metal seal member, the tapered sealing surface pushing the lips into sealing engagement with the wellhead.

4,842,062

HYDRAULIC LOCK ALLEVIATION DEVICE, WELL CEMENTING STAGE TOOL, AND RELATED METHODS

David E. Schneider, and Terry D. Timmerman, both of Houston, Tex., assignors to Weatherford U.S., Inc., Houston, Tex.

Filed Feb. 5, 1988, Ser. No. 152,934
Int. Cl.[4] E21B *33/16*
U.S. Cl. 166—154 **28 Claims**



1. An hydraulic lock alleviation apparatus for disposition adjacent a first space in a wellbore in which an hydraulic lock can be created and a second space into which fluid trapped in the first space may be communicated by the hydraulic lock alleviation apparatus, the apparatus comprising

a body member, the body member having a central bore therethrough permitting fluid communication between the first and second spaces,

a channel through the body member in fluid communication with both the first space and the second space so that fluid communication is allowed between the two spaces through the channel,

a pressure responsive member sealingly disposed in the channel to prevent the flow of fluid through the channel from the first space into the second space,

wherein upon closure of the central bore to the flow of fluid therethrough thereby trapping fluid in the first space, the trapped fluid acts on the pressure responsive member to permit flow of the trapped fluid through the channel from the first space into the second space, thereby alleviating the formation of an hydraulic lock by the trapped fluid in the first space.

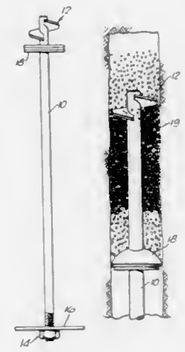
4,842,063

ANCHORING METHOD AND CAPSULE THEREFOR

John A. Coetzee, 13 Louw Wepener Street, Alberante, Alberton; Ernest E. Cranko, 12 Beryl Street, Carletonville, both of South Africa, and Roger K. Moore, 18 Chandlers Close, Crabbs Cross, Redditch, West Midlands, England (B97 5HU)

Filed Dec. 21, 1987, Ser. No. 135,770
Claims priority, application United Kingdom, Dec. 30, 1986, 86.31004; South Africa, May 5, 1987, 87/3194; Aug. 31, 1987, 87/6480; United Kingdom, Dec. 10, 1987, 87.28475
Int. Cl.[4] E21B *33/12*; E21D *20/00*
U.S. Cl. 166—285 **18 Claims**

1. A method of anchoring an anchor element in a borehole, the method comprising the steps of locating a supply of loose particulate material in the borehole, the material having an aggregate crushing value of from about 6 to about 20 as measured according to British Standard BS812 Part 3; 1975 and being selected from the group consisting of andalusite, andesite, basalt, dolerite, emery, flint, metal bulls and other materials having said crushing value, inserting the anchor element into the borehole, and then rotating the element in the borehole to subject the particles of the material to compaction to cause the



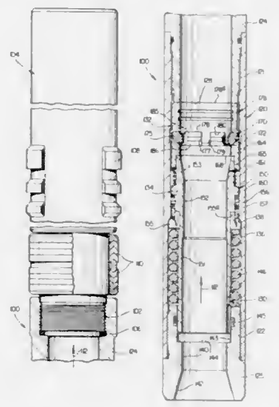
particles to slide over each other and interlock to form a load bearing annulus between the element and the wall of the borehole.

4,842,064

WELL TESTING APPARATUS AND METHODS

Imre I. Gazda, Tarrant county, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 22, 1987, Ser. No. 137,093
Int. Cl.[4] E21B *34/10*, *49/08*
U.S. Cl. 166—250 **23 Claims**



1. A test tool for testing a well to be run on a flexible line and anchored in a downhole receptacle having anchor means therein, said test tool being openable and closable by tensioning and relaxing the flexible line to permit and prohibit flow therethrough, said test tool comprising:

(a) tubular mandrel means having a lateral flow port near its upper end and means near its lower end engageable with said anchor means in said receptacle;

(b) tubular housing means having a lateral flow port intermediate its ends, means on its upper end for connection with a flexible line, and having its other end telescoped over the upper end portion of said tubular mandrel means for lim-

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ited longitudinal movement relative thereto between upper and lower positions responsive to tensioning and relaxing the flexible line while the test tool is anchored in said downhole receptacle for opening and closing said test tool;

(c) means biasing said housing means toward its lower position relative to said mandrel means; and

(d) means on said mandrel means and said housing means coengageable for retaining said housing means in its upper position relative to said mandrel means, whereby said flexible line may be slacked when said housing means is retained in such upper position.

19. The method of testing a well having a tubing with a landing receptacle and a test tool therein, said test tool including a valve which is operable between open and closed positions by raising and lowering the upper portion of said test tool relative to the lower portion thereof, said method comprising the steps of:

(a) running the test tool into the tubing on a flexible line and landing it in the landing receptacle;

(b) alternately flowing and shutting-in the well by raising and lowering the upper portion of the test tool while the lower portion thereof is engaged in said landing receptacle;

(c) slacking the flexible line after the upper portion of the test tool has been raised to actuate the valve to retain said upper portion of said test tool in raised position; and

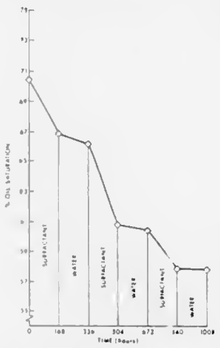
(d) determining well conditions while the well is shut-in and flowing.

4,842,065

OIL RECOVERY PROCESS EMPLOYING CYCLIC WETTABILITY ALTERATION

D. Craig McClure, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed May 11, 1988, Ser. No. 192,454
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—252 **20 Claims**



1. A process for recovering oil from an oil-wet fractured subterranean oil-bearing formation penetrated by at least two wells from the surface which are in fluid communication with said formation and with one another comprising:

(a) injecting a first slug of a surfactant solution into said fractured formation via a first of said at least two wells, said surfactant solution capable of becoming the preferred wetting phase of an oil-wet matrix block in said fractured formation;

(b) contacting a face of said oil-wet matrix block with said surfactant solution for a time sufficient for said surfactant solution to penetrate and become the preferred wetting phase of at least a portion of said matrix block thereby displacing oil from said portion of said matrix block toward said face of said matrix block;

(c) injecting a second slug of water into said formation via a second of said at least two wells;

(d) contacting said face of said matrix block with said water for a time sufficient for said water to penetrate and restore said portion of said matrix block to an oil-wet condition;

(e) displacing said oil away from said face of said matrix block with said water toward said first well;

(f) recovering said oil from said formation via said first well; and

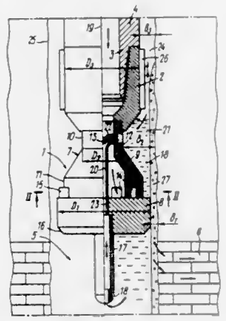
(g) repeating steps (a), (b), (c), (d), (e), and (f).

4,842,066

METHOD FOR ISOLATION OF INTAKE BEDS IN DRILL HOLES AND A DEVICE FOR CARRYING SAME INTO EFFECT

Vil F. Galiakbarov; Rashit K. Sannikov; Midkhat R. Mavljutov, all of Ufa; Alexandr S. Fomin, Syktyvkar; Vladimir D. Baranovsky, Moscow; Radil A. Galiev, Ufa, and Rinat G. Sedakov, deceased, late of Dudinka, all of U.S.S.R. (by Tatyana Pavlovna Sedakova, Elvira Rinatovna Sedakova, Boris Rinatovich Sedakov, administrators), assignors to Ufimsky Neftyanoi Institut, U.S.S.R.

Filed May 5, 1987, Ser. No. 46,998
Int. Cl.[4] E21B *7/00, 33/138, 43/38*
U.S. Cl. 166—265 **6 Claims**



1. A method for isolation of intake beds in drill holes, wherein an original cement slurry is pumped into a drill pipe string from a hole mouth, flash setting and thickening of the cement slurry is ensured with phases of higher and lower densities obtained by centrifugal separation of the cement slurry once it has left the drill pipe string the higher density phase of the cement slurry being directed to the intake bed to harden and the separated phase of lower density is directed to the hole mouth via an annular space of the hole above a lost circulation zone.

2. A device for carrying into effect a method for isolating intake beds in drill holes, comprising:

an adapter;

a housing connected with a lower end of the drill pipe string by means of said adapter;

an upper portion of said housing, which is in fact a diffuser;

upper and lower cylindrical portions of said diffuser provided at the upper and lower ends of said diffuser;

passages of spiral-tangential shape for circulation of the cement slurry evenly spaced circumferetially in said lower cylindrical portion of the diffuser;

an opening provided in said upper cylindrical portion of the diffuser;

a lower cylindrical portion of said housing welded to the lower portion of the diffuser and having a lower end;

a connecting pipe installed in a hole coaxial with the lower end of said lower cylindrical portion of the housing;

a branch pipe coaxially arranged within said housing, one end of said branch pipe being bent and located in said opening of the upper cylindrical portion of the diffuser and the other end of said branch pipe being connected with said pipe.

4,842,067

PROCESS FOR ENHANCED RECOVERY OF OIL FROM A SUBSURFACE RESERVOIR FOR SURFACTANT FLOODING

Dieter Balzer, Haltern, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Dec. 23, 1987, Ser. No. 137,030
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1986, 3644385
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—274 **17 Claims**

1. In a process for enhanced oil recovery from a subsurface reservoir which is penetrated by at least one injection well and at least one production well, comprising injecting at said injection well a solution or dispersion of at least one surfactant and recovering said oil at said production well, the improvement comprising using as the surfactant a mixture of effective amounts of two sulfonates having different solubilities:

(a) a sulfonate of higher solubility, a 4% by weight solution of which is produced by addition of, by weight, 3–11% of butylglycol or 2–8 of butyldiglycol at room temperature in synthetic seawater; and

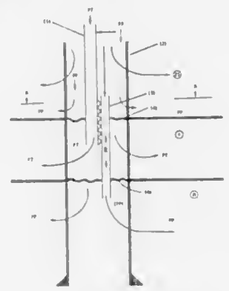
(b) a sulfonate of lesser solubility, a 4% by weight solution of which is produced by addition of a minimum of, by weight, 20–60% of butylglycol, or 16–40% of butyl diglycol at room temperature in synthetic seawater.

4,842,068

PROCESS FOR SELECTIVELY TREATING A SUBTERRANEAN FORMATION USING COILED TUBING WITHOUT AFFECTING OR BEING AFFECTED BY THE TWO ADJACENT ZONES

Claude Vercaemer, St Etienne; R. Lemanczyk, St Galmier, and Bernard Plot, St Priest En Jarez, all of France, assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Dec. 21, 1987, Ser. No. 135,215
Claims priority, application France, Dec. 31, 1986, 86 18488; Feb. 4, 1987, 87 01345
Int. Cl.[4] E21B *43/25*
U.S. Cl. 166—269 **11 Claims**



1. Process for selectively treating a subterranean formation without affecting adjacent zones above and below the formation characterized by:

injecting a treatment fluid into a wellbore annulus adjacent the formation to be treated and

simultaneously injecting two protection fluids, immiscible with said treatment fluid, into said annulus adjacent said zones

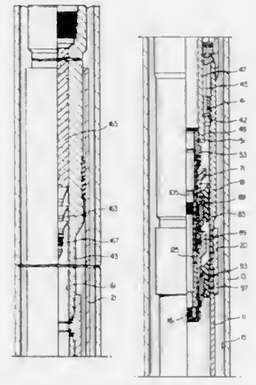
wherein said treatment fluid and protection fluids are separated within said wellbore annulus solely by a fluid interface between said treatment fluid and each of said immiscible protection fluids.

4,842,069

APPARATUS AND METHOD FOR CEMENTING A LINER IN A WELL BORE

John L. Baugh, Houston, and David L. Nevels, The Woodlands, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Jan. 25, 1988, Ser. No. 147,699
Int. Cl.[4] E21B *33/16*
U.S. Cl. 166—285 **10 Claims**



1. An apparatus for cementing a liner string in a well bore, comprising:

a liner string insertible in a well bore;

an operating string of smaller diameter than the internal diameter of the liner string and insertible therein;

means connecting said operating string within the internal diameter of the liner string operable by rotation of the operating string to release the operating string form the liner;

a plug carrying body connected to the lowermost extent of the operating string;

a top plug having an interior;

a first pressure releasable collet latch securing the top plug to the plug carrying body whereby said top plug is releasably supported from the plug carrying body;

a longitudinally space bottom plug having an interior;

a second pressure releasable collet latch securing the bottom plug to the top plug, whereby said bottom plug is releasably supported from the top plug;

a longitudinally shiftable top sleeve located within the interior of the top plug for locking the top plug to the plug carrying body until the second pressure-releasable collet latch securing the bottom plus is released;

a longitudinally shiftable bottom sleeve located below the longitudinally shiftable top sleeve for initially locking the bottom plug to the top plug;

wherein the plug carrying body is provided with an internal recess and wherein the top plug is provided with a plurality of upwardly extending collet fingers, each of the collet finger terminating in a lug, the collet lugs being received within the internal recess when the top plug is secured to the plug carrying body; and

wherein the top plug is also provided with a plurality of downwardly extending collet fingers, each of the fingers terminating in a lug, and wherein the bottom plug is pro-

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vided with an internal recess, the downwardly extending lugs of the top plug being received within the internal recess of the bottom plug when the bottom plug is secured to the top plug.

7. A method for cementing a liner string in a well bore, comprising the steps, of:

running a liner string into the well bore to the desired depth of a running tool provided as a part of an operating string extending to the well surface, the operating string being of smaller diameter than the internal diameter of the liner string and insertible therein;

providing a plug carrying body on the lowermost extent of the operating string, a top plug releasably supported from the plug carrying body and bottom plug releasably supported from the top plug;

securing the top plug to the plug carrying body by means of a first pressure-releasable, top collet latch and securing the bottom plug to the top plug by means of a second pressure-releasable, bottom collet latch;

locking the bottom plug to the top plug by means of a longitudinally shiftable bottom sleeve, the bottom sleeve being provided with an internal profile adapted to receive a first pump down plug propelled by pressure through the operating string to exert release pressure on the bottom sleeve, the bottom sleeve also being provided with an exterior including a region of greater relative external diameter which initially underlies the bottom collet latch and a region of reduced external diameter, downward movement of the bottom sleeve serving to bring the region of reduced external diameter into registry with the bottom collet latch to allow release of the bottom plug from the top plug;

locking the top plug to the plug carrying body by means of a longitudinally shiftable top sleeve, the top sleeve being provided with an internal profile adapted to receive a second pump down plug of greater relative diameter than the first pump down plug, the second pump down plug being propelled by pressure through the operating string to exert release pressure on the top sleeve, the top sleeve being provided with an exterior region which initially underlies the top collet latch, downward movement of the top sleeve serving to release the top collet latch and, in turn, the top plug from the plug carrying body;

pumping a first pump down plug through the operating string from the well surface to release the bottom plug; and

pumping a second pump down plug through the operating string from the well surface to release the top plug.

4,842,070

PROCEDURE FOR IMPROVING RESERVOIR SWEEP EFFICIENCY USING PARAFFINIC OR ASPHALTIC HYDROCARBONS

Kenneth A. Sharp, Sedalia, Colo., assignor to Amoco Corporation, Chicago, Ill.

Filed Sep. 15, 1988, Ser. No. 244,967
Int. Cl.[4] E21B *33/134, 43/24, 37/00*
U.S. Cl. 166—288 **3 Claims**

1. A method for selectively placing and removing a plugging agent in a formation adjacent a wellbore to thereby provide a reduction of permeability in a high permeability zone without a corresponding loss of permeability in a low permeability zone of the formation, said method comprising preheating the wellbore using steam or hot oil, heating and injecting the plugging agent at a temperature higher than its melting point, shutting in the well to allow the plugging agent in the formation to cool and solidify, reheating the formation adjacent the wellbore, and swabbing back the liquified plugging agent from the low permeability zones adjacent the wellbore.

4,842,071

PROCESS FOR THE SELECTIVE REDUCTION OF WATER INFLOWS IN OIL OR GAS PRODUCING WELLS

Alain Zaitoun, Rouen, and Norbert Kohler, St Germain en Laye, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Mar. 7, 1988, Ser. No. 164,939
Claims priority, application France, Mar. 6, 1987, 87 03224
Int. Cl.[4] E21B *33/138*
U.S. Cl. 166—295 **8 Claims**

1. A process for the selective reduction of water inflows from an oil or gas producing formation towards a production well, comprising the successive steps of:

(a) injecting from a production well, into at least a part of the formation, an aqueous dispersion or solution of a nonhydrolyzed polyacrylamide or of a nonhydrolyzed copolymer of acrylamide with at least one other comonomer,

(b) injecting from said production well into said part of the formation an alkali metal basic compound and maintaining conditions providing for an at least partial hydrolysis of the polyacrylamide or of the copolymer, so as to plug said part of the formation selectively with hydrolyzed polyacrylamide or copolymer of acrylamide with at least one other comonomer, and

(c) placing said production well in condition of oil or gas production and recovering the produced oil or gas from said selectively plugged formation containing said hydrolyzed polyacrylamide or copolymer through said production well.

4,842,072

SAND CONSOLIDATION METHODS

Robert H. Friedman, and Billy W. Surles, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 25, 1988, Ser. No. 223,822
Int. Cl.[4] E21B *33/138*
U.S. Cl. 166—295 **20 Claims**

1. A method for consolidating unconsolidated mineral particles including sand in a subterranean petroleum formation penetrated by a well in fluid communication with at least a portion of the formation, comprising:

(a) providing a fluid comprising a polymerizable resin, a polar organic diluent for the resin, and an oil soluble acid catalyst capable of causing polymerization of the resin at formation temperatures comprising orthonitrobenzoic acid;

(b) injecting said fluid into the formation to saturate at least a portion of the formation adjacent to the well;

(c) providing an aqueous fluid comprising water containing selected inorganic salts including sodium chloride in a concentration at least 70% of saturation of said inorganic salts at surface ambient temperature;

(d) injecting the salt containing aqueous solution into the same portion of the formation contacted by the resin containing fluid; and

(e) allowing the injected fluids to remain in the formations for a period of time sufficient to accomplish at least partial polymerization of the resin, forming a permeable consolidated mass around the wellbore.

4,842,073

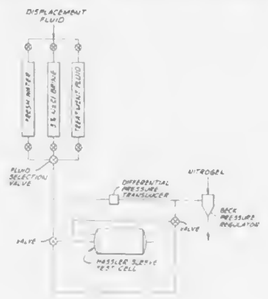
FLUID ADDITIVE AND METHOD FOR TREATMENT OF SUBTERRANEAN FORMATIONS

Ronald E. Himes, Rush Springs, and Edward F. Vinson, Duncan, both of Okla., assignors to Halliburton Services, Duncan, Okla.

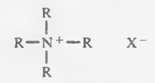
Filed Mar. 14, 1988, Ser. No. 167,677
Int. Cl.[4] E21B *43/267*; C09K *17/00*
U.S. Cl. 166—294 **16 Claims**

10. A method of stimulating production of hydrocarbons from a clay-containing subterranean formation comprising:

preparing an aqueous treatment fluid comprising an aqueous fluid, a selected gelling agent and a formation control additive consisting essentially of at least one member selected from the group comprising N,N,N-trimethylbenzylammonium halides



N,N-dialkylmorpholinium halides, alkyl quaternary ammonium salt of a 2 mole oligomer of epihalohydrin wherein the alkyl radical is selected from the group of methyl, ethyl, propyl and butyl radicals and compounds of the general formula:



wherein at least one R is methyl and at least one of the remaining R is independently an ethyl, propyl or butyl radical and X— is any anion that does not adversely react with the subterranean formation or aqueous treatment fluid constituents and contacting said formation with said aqueous treatment fluid under conditions such that at least one fracture is caused to be created in said formation by said fluid whereby the subsequent production of hydrocarbons is facilitated, said formation control additive being present in said treatment fluid in an effective amount whereby permeability damage resulting from contact of the clays in the formation with the aqueous fluid in the treatment fluid is reduced.

4,842,074

GAS STORAGE WELL SAFETY SYSTEM AND METHOD

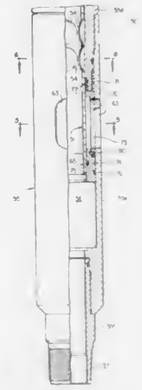
Craig D. Hines, Carrollton; Michael J. Bednarz, Prosper, and Ronald K. Churchman, Carrollton, all of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Oct. 15, 1987, Ser. No. 108,790
Int. Cl.[4] E21B *43/12, 34/10*
U.S. Cl. 166—305.1 **5 Claims**

1. The method of injecting gas into and producing gas from an underground reservoir via a well completed with a casing string, a tubing string concentrically disposed therein, an annulus between the tubing and casing strings, a well packer forming a fluid barrier between the casing and tubing strings, and two surface controlled subsurface safety valves in the tubing string above the well packer comprising:

a. injecting gas from the well surface into the underground reservoir through the tubing string and both safety valves;

b. injecting gas from the well surface into the underground reservoir through the annulus above the well packer, radial openings in one of the safety valves and the tubing below the one safety valve; and



c. producing gas from the underground reservoir after injection has been completed via the flow paths defined in step (a) and/or step (b).

4,842,075

SUBSEA FLOWLINE CONNECTION SYSTEM

Bjorn K. Kalvenes, Slependen; Oyvind Guthormsen, Hovik, and Troels Erstad, Oslo, all of Norway, assignors to Mobil Oil Corporation; Kvaerner Engineering A.S. and Den Norske Stats Oljeselskap A.S., both of, Norway

Filed May 19, 1988, Ser. No. 196,395
Claims priority, application Norway, Jun. 9, 1987, 872399
Int. Cl.[4] E21B *43/013*
U.S. Cl. 166—341 **15 Claims**

1. A subsea flowline connection system comprising:

a terminal connector adapted to be affixed to one end of a flowline; and

a connector base structure adapted to be positioned on the sea bed at an offshore location; said base structure comprising an alignment funnel which is adapted to receive said terminal connector, the external configuration of said terminal connector cooperating with the internal configu-

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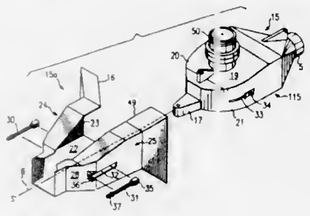
ration of said funnel to form a means for preventing relative movement in the vertical plane but to permit limited relative misalignment in the horizontal plane as said terminal connector is drawn into said alignment funnel; and



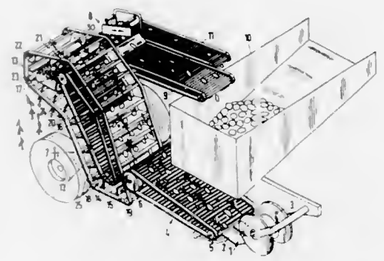
securing means for locking said terminal connector within said alignment funnel.

4,842,076

POTATO HARVESTER

Johannes Welp, Damme/Dümmer, Fed. Rep. of Germany, assignor to Franz Grumme Landmaschinenfabrik GmbH & Co. KG, Damme, Fed. Rep. of Germany

Filed Aug. 5, 1986, Ser. No. 893,433
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1985, 3529464
Int. Cl.[4] A01D *33/02, 17/22*
U.S. Cl. 171—124 7 Claims



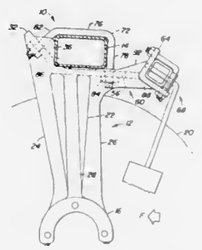
1. In a potato harvester comprising an inside conveyor belt means, inside support means for supporting said inside conveyor belt means for movement about an inner path of travel, said inner path of travel defining an enclosed first area bounded by said inside conveyor belt means, a haulm-separating outside conveyor belt means, outside support means for supporting said outside conveyor belt means for movement about an outer path of travel, said outer path of travel defining an enclosed second area bounded by said outside conveyor belt means, said inside conveyor belt means being disposed inside said outside conveyor belt means such that said enclosed first area is disposed within said enclosed second area each of said inside and outside supporting means supporting said inside and outside conveyor belt means along an inclined run disposed along said respective inner and outer paths of travel, said inside and outside conveyor belt means at said inclined run being parallel to and spaced from one another, one of said inside or outside conveyor belt means having transverse entrainment elements which extend generally transversely from said one conveyor belt means into said space between said inside and outside conveyor belt means at said inclined run, said entrainment elements being spaced from one another and defining entrainment compartments between successive entrainment elements and between said inside and outside conveyor belt means moving in the same direction such that said entrainment compartments move upwardly along said inclined run, said outside conveyor belt means separating the haulms from the harvested potatoes and conveying the separated haulms up said inclined run, said outside conveyor belt means having spaced bars defining openings, said inclined run of said inside conveyor belt means generally underlying said inclined run of said outside conveyor belt means such that the harvested potatoes from which the haulms have been separated pass through said openings in said outside conveyor belt means into said entrainment compartments and are carried up said inclined run within said entrainment compartments.

4,842,077

DISK HARROW STANDARD FOR SUPPORT BEAMS OF DIFFERENT CROSS SECTIONS

Willard E. Peterson, Jr., Geneseo, Ill., and James F. Bierl, West Des Moines, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jun. 20, 1988, Ser. No. 208,693
Int. Cl.[4] A01B *15/16, 23/06*
U.S. Cl. 172—599 13 Claims



1. A disk harrow bearing standard adapted for attachment to a selected one of a plurality of support beams of different rectangular cross sections having opposed upper and lower and front and back faces, the standard comprising:

an upright support having a lower bearing-receiving end and an upper end;

a mounting structure connected to the upper end of the support, said mounting structure including a lower surface adapted for contacting the lower face of the beam, an upright front locating member adapted for contacting the front face of the beam, a bolt-receiving member angling upwardly in the forward direction relative to the front locating member and including an upwardly inclined opening, a bolt-receiving extension extending rearwardly from the lower surface and including aperture means;

a U-bolt having a bight portion of length substantially equal to the distance between the front and back faces of the selected support beam, a rear leg extending downwardly from the upper portion and through the aperture means in the extension, and a forward leg extending downwardly and forwardly from the upper portion through the inclined opening;

means for urging the U-bolt legs through the respective opening and aperture means to draw the rear leg and bight portion tightly against the rear and upper faces, respectively, and the front locating member and lower surface tightly against the front and lower faces, respectively; and

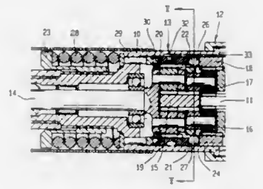
said aperture means for optionally receiving the U-bolt rear leg in one of at least two alternate positions dependent upon the distance between the faces of the selected beam.

4,842,078

SCREW JOINT TIGHTENING POWER TOOL

Gunnar C. Hansson, Stockholm, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Continuation of Ser. No. 56,788, May 29, 1987, abandoned. This application Nov. 7, 1988, Ser. No. 268,637
Claims priority, application Sweden, Jun. 6, 1986, 86025673
Int. Cl.[4] B25B *23/14*
U.S. Cl. 173—12 2 Claims



1. A screw joint tightening power tool with a torque limiting means, comprising:

a housing (10);

a rotation motor mounted in said housing (10);

an output spindle (14) connectable to a screw joint engaging means;

at least one planetary reduction gear (13) including a ring gear (20) which is rotatably supported in said housing (10);

a torque responsive release clutch means (22, 26, 27) formed between said ring gear (20) and said housing (10) for transferring a reaction torque from said planetary reduction gear (13) to said housing (10), said clutch means having a rotation axis;

spring means (28) for exerting an axial bias force on said ring gear (20);

said ring gear (20) comprising a substantially flat annular surface (21) which extends transversely to said rotation axis of said clutch means and which surface is broken by at least

two axially directed teeth (22) with inclined cam surfaces;

said housing (10) comprising a substantially flat annular transverse surface (24) extending in parallel with and facing said annular surface (21) of said ring gear (20), said annular surface (24) of said housing (10) being broken by at least two axially directed teeth (26) with inclined cam surfaces; and

at least two rolling elements (27) located between said substantially flat annular surface (21) of said ring gear (20) and said substantially flat annular surface (24) of said housing (10) and forming an axial roller bearing between said substantially flat annular surfaces of said ring gear (20) and said housing (10), said at least two rolling elements (27) and said at least two teeth (22, 26) of said ring gear (20) and of said housing (10) forming together a cam means for coupling said ring gear (20) to said housing (10) and for interrupting said coupling when a predetermined reaction torque level between said ring gear (20) and said housing (10) is exceeded,

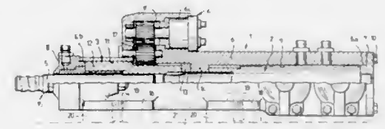
said axial rolling bearing providing for a free running movement of said ring gear (20) relative to said housing (10) after each interruption of said coupling, said free running movement being considerably longer due to the rolling action of said rolling elements (27) than the angular distance between two subsequent teeth on each of said ring gear (20) and said housing (10).

4,842,079

BODY CONSTRUCTION FOR A DRILLING MACHINE

Jarmo Heinonen, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland

Filed Apr. 20, 1987, Ser. No. 40,354
Claims priority, application Finland, May 9, 1986, 861938
Int. Cl.[4] B23B *45/16*
U.S. Cl. 173—105 6 Claims



1. A body construction for a drilling machine, comprising:

an integral body (6) having two, axially successive housing spaces (9, 11) therethrough;

a shank (5) axially in one of the housing spaces (11) of the integral body (6) and projecting at one end therefrom, away from the other of the housing spaces (9) of the integral body (6);

rotation means in the one housing space (11) of the integral body (6) between the shank (5) in the one housing space (11) and the integral body (6) thereabout for rotating the shank (5) about its axis in the one housing space (11) of the integral body (6);

percussion means (2) axially movable in the other housing space (9) of the integral body (6) for axial percussive cooperation with the opposite end of the shank (5); and

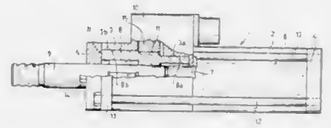
two end cover means (7, 8) connectable to the integral body (6) for respectively covering axially opposite ends of the housing spaces (9, 11) of the integral body (6) with the one end of the shank (5) projecting through the one covering the corresponding end of the one housing space (11) of the integral body (6) when connected to the integral body and for allowing removal of the rotation and percussion means from the housing spaces when not connected to the integral body (6).

4,842,080

ARRANGEMENT FOR MOUNTING OF A ROTATION ELEMENT IN A DRILLING MACHINE

Jarmo Heinonen, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland

Filed Apr. 28, 1987, Ser. No. 43,841
Claims priority, application Finland, May 9, 1986, 861941
Int. Cl.[4] B23B *45/16*
U.S. Cl. 173—105 3 Claims



1. A mounting for a rotation element in a drilling machine comprising:

a body having an end cover

removably fastened to the body by fastening means;

percussion means mounted withm said body;

a rotation element mounted rotatably with said body in an integral body part in axial alignment with said percussion means;

rotation means supported by the body and in rotational engagement with a gear ring on said rotation element for rotating said rotation element;

first and second bearing surfaces on said rotation element, said first bearing surface being located on a side of said rotation element nearest said percussion means, said second bearing surface being located on a side of said rotation element nearest said end cover, said first bearing surface, said gear ring and said second bearing surface being arranged in a stepped manner whereby said rotation element is axially removable from said body part by removing only said end cover.

4,842,081

SIMULTANEOUS DRILLING AND CASING DEVICE

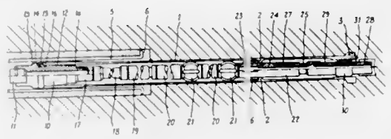
Jean P. Parant, Bizanos, France, assignor to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Continuation of Ser. No. 32,856, Mar. 31, 1987, abandoned. This application May 18, 1988, Ser. No. 198,462

Claims priority, application France, Apr. 2, 1986, 8604678

Int. Cl.[4] E21B *7/20*

U.S. Cl. 175—23 **6 Claims**



1. A simultaneous drilling and casing device including a revolving table for use in drilling comprising, in combination:
- a drill string means (**11**) rotatably driven by said revolving table and including hollow drill rods for conducting fluid;
- a casing section (**1**) having an abrasive ring (**3**) at its leading end and having a rear end;
- a portion (**17, 18, 19, 20, 21**) of said drill string means being received within said casing section (**1**);
- a drive connection (**10**) between said drill string means and said rear end of said casing section (**1**) for rotating said casing section by said revolving table;
- a motor (**22**) carried by said drill string portion within said casing section and driven by fluid conducted by said drill rods;
- a drilling tool (**28**) connected to said motor (**22**) adjacent and in selected axially spaced relation to said abrasive ring (**3**) on said casing section;
- said motor rotating said tool at a selected speed greater than the selected speed of said casing section and said abrasive ring;
- means positioning said drilling tool (**28**) in said selected axial relation to said abrasive ring including
- an internal shoulder (**2**) on said casing section (**1**) spaced a selected distance from the end of said casing section;
- and a stator portion (**23**) on said motor (**22**) including surfaces to abut said shoulder (**2**) to provide said selected axially spaced relation between said drilling tool (**28**) and said abrasive ring (**3**) on said casing section.

4,842,082

VARIABLE OUTSIDE DIAMETER TOOL FOR USE IN PIKEWELLS

Johann Springer, Hanover, Fed. Rep. of Germany, assignor to Smith International (North Sea) Limited, Aberdeen, Scotland

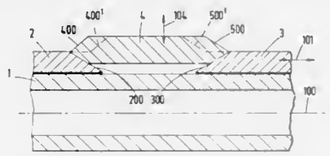
Filed Aug. 18, 1987, Ser. No. 86,899

Claims priority, application United Kingdom, Aug. 21, 1986, 8620363

Int. Cl.[4] E21B *10/32, 17/10, 31/20*

U.S. Cl. 175—279 **25 Claims**

1. A variable outside diameter tool for use in pipewells including a support tubular member for connection to a drilling string, a longitudinal axis of said support tubular member, an external surface of said support tubular member supporting a movable member which is axially movable therealong and a further member axially spaced from said movable member, a radially movable member which is movable in a radial direction with respect to said longitudinal axis toward and away respectively from said exertanl surface, said radially movable member being supported radially outwardly from said support tubular member by said axially movable member and said further member, a taper on a radially outer side from said longitudinal axis on at least one of said axially movable member and said further member, a complementary taper with said taper on a radially inner side of the radially movable member for sliding abutment between said complementary taper and said taper, a radially outer surface of said radially movable



member having a pair of oppositely angled tapers facing in opposing longitudinal axial directions, and resilient means for exerting a resilient force on said axially movable member in an axial direction toward said further member to urge said radially movable member along said sliding abutment in a radially outward direction from said longitudinal axis and whereby when a leading one of said oppositely angled tapers meets an obstruction in a pipewell and the reactive force produced therebetween exceeds said resilient force then said radially movable member is thereby urged inwardly so that said sliding abutment moves the axially movable member away from said further member against the force of said resilient means.

4,842,083

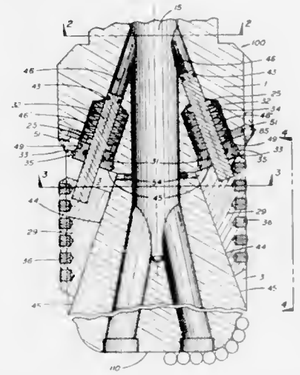
DRILL BIT STABILIZER

Richard C. Raney, 3609 Godfrey Ct., Midland, Tex. 79707

Continuation-in-part of Ser. No. 820,742, Jan. 22, 1986, Pat. No. 4,690,229. This application Jul. 23, 1987, Ser. No. 76,920

Int. Cl.[4] E21B *10/62, 17/10*

U.S. Cl. 175—325 **25 Claims**



1. A drill but stabilizer comprising; a main body having a central axis, means by which the upper end of said main body can be attached to a driving means; means at a lower end of said main body forming a drill bit; a throat formed through said main body for passage of drilling fluid therethrough and to the face of a bit that may be attached thereto;

means forming an inclined slide surface on said main body, radially active stabilizing means slidably and guidably mounted to said inclined slide surface for radially stabilizing said main body relative to a borehole;
- a plunger; means by which said plunger is arranged diagonally relative to the central axis of said main body; said plunger being positioned in said main body for engaging and applying an outward directed force on said radially active stabilizing means to thereby move said radially active stabilizing means into any one of a range of different extended positions;
- and blocking means including and radially active stabilizing means and said inclined slide surface for frictional interaction with one another to selectively prevent inward radial movement of said radially active stabilizing means from any of said extended positions upon application of a radially directed force on said main body that is opposed to outward movement of said radially active stabilizing means sufficient to displace said outward force.

4,842,084

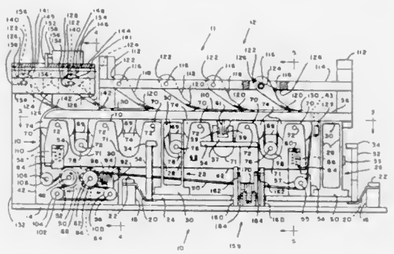
LOCKING MECHANISM FOR A WEIGHING SCALE TRAY

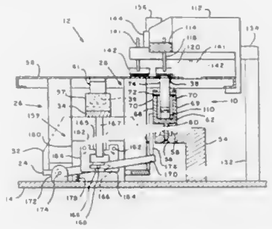
Vladimir V. Pirc, Norwalk, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 29, 1988, Ser. No. 290,348

Int. Cl.[4] G01G *19/00, 23/02, 3/14*

U.S. Cl. 177—145 **8 Claims**





1. A locking mechanism for a vibrating tray scale of the type having a frame, a tray, springs resiliently connecting the tray to the frame, and a transporting mechanism for transporting articles onto and across the tray, the transporting mechanism having an operative mode and an inoperative mode, the combination comprising:
- a bracket supported by said frame,
- a pair of arms pivotally supported by said bracket,
- a finger secured to and depending from said tray, said finger being received between said arms and
- pivot means for causing said arms to engage said finger when said transporting mechanism is in said inoperative mode and for causing said arms to disengage from said finger when said transporting mechanism is in said operative mode.

4,842,085

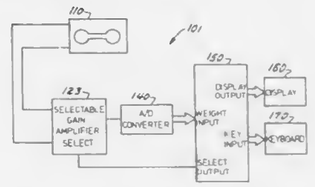
MULTIPLE RANGE ELECTRONIC WEIGH SCALE

David A. Lang, Novi, Mich., assignor to GSE, Incorporated, Farmington Hills, Mich.

Filed Mar. 28, 1988, Ser. No. 174,199

Int. Cl.[4] G01G *23/14, 3/14*

U.S. Cl. 177—164 **11 Claims**



1. A multiple range electronic weigh scale comprising:
- a load cell for generating an electrical analog weight signal proportional to the weight of an object to be weighed;
- a selectable gain amplifier connected to said load cell for amplifying said weight signal by an amplification factor corresponding to a selected one of a set of predetermined gains;
- an analog to digital conversion means connected to said selectable gain amplifier means for generating a digital weight corresponding to said amplified analog weight signal;
- a microscope connected to said selectable gain amplifier means and said analog to digital conversion means for comparing said digital weight signal to an upper limit digital value and to a lower limit digital value less than said upper limit digital value,
- generating an output gain selection signal for controlling selectable gain amplifier means to select the next lower gain of said set of predetermined gains if said digital weight signal is greater than said upper limit digital value,
- generating an output gain selection signal for controlling said selectable gain amplifier means to select the next higher gain of said set of predetermined gains if said digital weight signal is less than said lower limit digital value, and
- generating an output weight signal corresponding to said digital weight signal and said output gain selection signal,
- generating an overrange signal if said digital weight signal is greater than said upper digital limit value of said output gain selection signal controls said selectable gain amplifier to select the lowest gain of said set of predetermined gains; and
- a display device connected to said microprocessor for generating a visually perceivable indication of said output weight signal in the form of a plurality of digits and for generating a visually perceivable overrange indication upon generation of said overrange signal.

4,842,086

ELECTROMAGNETIC LEVITATION DEVICE FOR WHEELED-VEHICLES

Claus G. Michna, 4 Toby La., Brookfield Center, Conn. 06804

Filed Jun. 13, 1988, Ser. No. 205,870

Int. Cl.[4] B62D *55/00*

U.S. Cl. 180—9.1 **13 Claims**

1. An electromagnetic device which levitates and moves a wheeled-vehicle over a surface, comprising:

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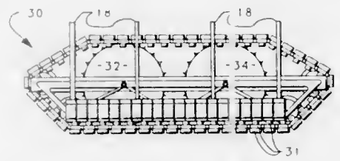
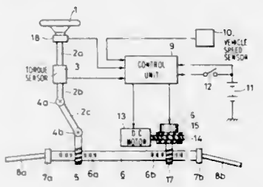
(a) an endless link-belt arranged to contact the surface over which said vehicle is moved;
(b) a first and second series of magnets positioned on the inner surface of said link-belt and arranged to simultaneously repel a third series of magnets suspended from the body of said vehicle, and a fourth series of magnets suspended from the axles of said vehicle;
(c) a wheel track arranged in between the first and second series of magnets, positioned on the inner surface of said belt;
(d) a minimum of one set of metal drive wheels positioned on the axles of said vehicle and arranged to engage said wheel track to move said belt by rotation of said wheels; and



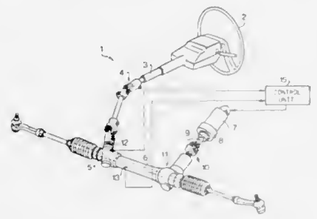
(e) a set of electric harnesses each having a fixed edged-grooved metal bar attached to said wheels and an electric wire harness rotating in said edge-groove in coordination with the moving belt, each of said electric harnesses being arranged to conduct electrical energy from the vehicle power source to said magnet series positioned on the inner surface of said belt, whereby when said series of magnets suspended from the vehicle body and axles of said wheels are engaged, the series of magnets arranged on the inner surface of said belt are also energized to repel said suspended magnets, thereby transferring the vehicle weight from the axle to said endless belt to suspend the wheeled-vehicle and reduce the energy necessary to move said vehicle.

4,842,087
MOTOR DRIVEN TYPE POWER STEERING CONTROL DEVICE
Mitsuharu Morishita, and Shinichi Kouge, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
PCT No. PCT/JP87/00498, § 371 Date Mar. 7, 1988, § 102(e) Date Mar. 7, 1988, PCT Pub. No. WO88/00547, PCT Pub. Date Jan. 28, 1988
PCT Filed Jul. 11, 1987, Ser. No. 178,056
Claims priority, application Japan, Jul. 11, 1986, 61-164160; Jul. 11, 1986, 61-164162; Jul. 11, 1986, 61-166197
Int. Cl.[4] B62D 5/04
U.S. Cl. 180—79.1 **6 Claims**



1. A motor driven power steering control device, comprising:
a vehicle speed sensor for sensing a vehicle speed;
a torque sensor mounted on a steering shaft for detecting a rotational force of a steering wheel;
means for distinguishing whether a lock state of said steering wheel is caused by at least one of a motor lock and a lock of a mechanical system or by steering said steering wheel through angular steering wheel lock positions;
a control unit supplied with signals from said vehicle speed sensor, said torque sensor and said distinguishing means and providing a responsive output accordingly;
a d.c. motor driven by a vehicle mounted battery through said control unit; and
and electromagnetic clutch connected directly to an output shaft of said d.c. motor and on-off controlled in accordance with said output of said control unit.

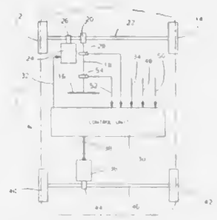
4,842,088
ELECTRIC POWER STEERING SYSTEM
Saiichiro Oshita; Toyohiko Mouri, and Tsutomu Takahashi, all of Ohta, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 24, 1988, Ser. No. 198,396
Claims priority, application Japan, May 25, 1987, 62-127426
Int. Cl.[4] B62D 5/04
U.S. Cl. 180—79.1 **13 Claims**



1. In an electric power steering system having a motor operatively connected to a steering system for reducing steering effort, a torsion torque sensor provided for detecting torsion torque generating in the steering system in steering operation; first means responsive to an output signal of the torsion torque sensor for producing an assist signal, second means for producing an auxiliary assist signal dependent on a differential of the output signal of the torsion torque sensor, third means responsive to a total assist signal of the assist signal and the auxiliary assist signal for producing a signal for driving the motor; the improvement comprising:
detector means for detecting whether variation value of the output signal of the torsion torque sensor is in an increasing direction or in a decreasing direction and for producing a direction signal dependent on the detected direction; and
said second means includes corrector means responsive to the direction signal representing the variation value of the output signal of the torsion torque sensor in the decreasing direction for providing a reduced value of the auxiliary assist signal, thereby reducing the total assist signal.

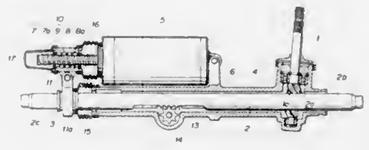
4,842,089
FOUR WHEEL STEERING SYSTEM WITH CLOSED-LOOP FEEDBACK AND OPEN-LOOP FEEDFORWARD
Scott S. Kimbrough, Warren, and Steven J. Hallman, Saginaw, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Jun. 27, 1988, Ser. No. 211,737
Int. Cl.[4] B62D 5/04
U.S. Cl. 180—79.1 **2 Claims**

1. A rear wheel steering system for a four-wheeled motor vehicle in which the front wheels of the vehicle are steered at an angle directly related to a steering input generated by the operator of the vehicle, the system comprising in combination:
open-loop control means for developing an open-loop steering command in relation to a representation of the steering angle of the front wheels;
closed-loop control means for (1) generating yaw and lateral velocity commands in relation to a representation of the steering angle of the front wheels and the open-loop steering command developed by said open-loop steering control means, (2) determining the actual yaw and lateral velocities of the vehicle, and (3) developing a closed-loop



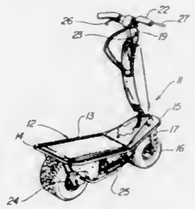
steering command in relation to the deviation of the actual yaw and lateral velocities from the commanded yaw and lateral velocities;
combining means for forming an overall steering command according to a combination of the open-loop and closed-loop steering commands and; and
actuator means for steering the rear wheels of the vehicle in accordance with the overall steering command formed by said combining means.

4,842,090
ELECTRICALLY POWER-ASSISTED FOUR-WHEEL STEERING SYSTEM FOR VEHICLES
Yasuo Shimizu, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 37,589, Apr. 13, 1987, abandoned. This application Sep. 20, 1988, Ser. No. 248,338
Claims priority, application Japan, Apr. 23, 1986, 61-61246[U]
Int. Cl.[4] B62D 5/04
U.S. Cl. 180—140 **7 Claims**



1. An electrically power-assisted four-wheel steering system for vehicles with front wheels and rear wheels, comprising:
a front-wheel steering device operatively connected to a steering wheel, said front-wheel steering device including a first pinion operatively connected to said steering wheel and a rack which extends transversely and has an end portion thereof formed with a first toothed part meshing with said first pinion, said rack being steerably connected to said front wheels;
a rear-wheel steering device;
a linkage mechanism operatively interconnecting said rack and said rear-wheel steering device, said linkage mechanism including a second pinion meshing with a second toothed part formed over a predetermined region at one side of a transversely substantially central portion of said rack;
an electric motor for operatively providing auxiliary torque to said front-wheel steering device and said rear-wheel steering device; and
a control means which is operatively connected to said motor and drives to control said motor, wherein:
said motor is connected to said front-wheel steering device near said rack, at another side of the transversely substantially central portion of said rack different in position from said one side thereof, and has a rotating output shaft disposed at another end portion of said rack;
said steering system further comprises a ball and screw mechanism disposed between said output shaft of said motor and said another end portion of said rack to transmit auxiliary torque produced by said motor to said rack;
said ball and screw mechanism comprises said output shaft of said motor, said output shaft being formed with a spiral groove, a ball bearing nut fitted on said output shaft and formed along an inner circumference thereof with a spiral groove cooperating with said spiral groove of said output shaft, and balls interposed between said spiral grooves so that said nut moves in the axial direction of said output shaft as said output shaft rotates; and
said output shaft of said motor is arranged substantially parallel to said rack so that torque of said output shaft is converted through said nut of said ball and screw mechanism to be exerted on said rack as assisting power in the axial direction of said rack.

4,842,091
TWO-WHEELED RECREATIONAL MOTOR VEHICLE
William J. Badsey, 30162 Silver Spur Rd., San Juan Capistrano, Calif. 92675
Filed Aug. 3, 1987, Ser. No. 80,710
Int. Cl.[4] B62D 61/00; A63C 17/00
U.S. Cl. 180—219 **8 Claims**

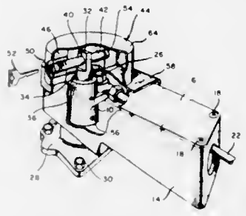


1. A self-propelled wheeled vehicle comprising a platform having a generally planar unencumbered rider's area adapted to carry a rider standing upon said platform area with feet in side by side or front and rear positions, at least one rear wheel rotatably journaled by said platform and contacting the ground within an area that underlies a vertical projection of said rider's area on the ground, power means under said platform for driving said rear wheel and at least one dirigible front wheel position beneath said platform and forwardly of said rear wheel.

4,842,092
VEHICLE ANTI-THEFT DEVICE
Felix Castro, West Palm Beach, Fla., assignor to Fuelock, Inc., West Palm Beach, Fla.
Filed Aug. 4, 1987, Ser. No. 81,888
Int. Cl.[4] B60R 25/00
U.S. Cl. 180—287 **21 Claims**

1. An anti-theft device for vehicles and equipment powered by engines having a governor mechanism with an external governor linkage lever, comprising:
means separate to the governor mechanism for engaging the external governor linkage lever;

means for engaging a portion of the vehicle or equipment that is fixed relative to the operation of the governor linkage lever; and



locking means for disengagably locking said means for engaging the governor linkage lever to the means for engaging a fixed portion of the vehicle or equipment, whereby movement of the governor linkage lever necessary for operation of the engine is prevented.

4,842,093

VEHICULAR THEFT PREVENTION SYSTEM AND METHOD

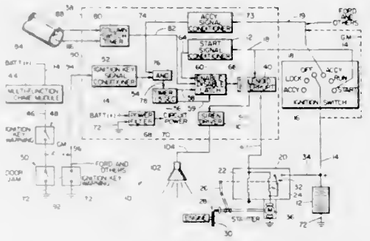
Nolan C. Lerche, 12114 Dorrance, Stafford, Tex. 77477; Edward A. Fletcher, 13419 Linden, and Michael H. Twedell, 2411 N. Ferrisberg, both of Sugarland, Tex. 77478

PCT No. PCT/US88/01183, § 371 Date Apr. 19, 1988, § 102(e) Date Apr. 19, 1988, PCT Pub. No. WO88/08381, PCT Pub. Date Nov. 3, 1988

PCT Filed Apr. 19, 1988, Ser. No. 192,223

Int. Cl.[4] B60R *25/00*

U.S. Cl. 180—287 **48 Claims**



1. A method of controlling a vehicle engine starter solenoid to prevent unauthorized starting thereof wherein the vehicle utilizes a key and a key ignition switch, comprising the steps of:

detecting the presence of the key in the ignition switch in a first preselected switch position and in response thereto generating a first electrical signal,

generating a second electrical signal in response to key manipulation of the vehicle ignition switch to a second preselected switch position,

detecting the occurrence of said first and second electrical signals and in response thereto generating a third electrical signal having a preselected time period,

generating a fourth electrical signal in response to key manipulation of the vehicle ignition switch to the START position,

comparing the initiation of said forth electrical signal to the time interval of said third electrical signal and generating an ignition control signal in response thereto, and

controlling the application of electrical power to the vehicle engine starter solenoid in response to said ignition control signal,

wherein during said comparing step if the initiation of said forth signal occurs during said third electrical signal time period said ignition control signal is an enabling control signal for permitting energization of the vehicle engine starter solenoid and starting of the vehicle engine, and

wherein during said comparing step if the initiation of said fourth signal occurs outside of the time period of said third electrical signal said ignition control signal is a disabling control signal for blocking energization of the vehicle engine starter solenoid and prohibiting starting of the vehicle engine.

4,842,094

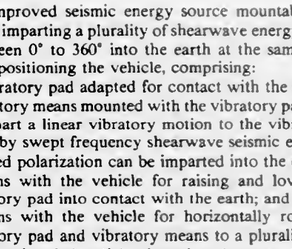
ROTATABLE HORIZONTAL VIBRATOR

Howard A. Willis, Tulsa; Marvin G. Bays, Ponca City, both of Okla., and Jose P. Munoz, Joplin, Mo., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 834,701, Feb. 28, 1986, abandoned. This application Nov. 16, 1987, Ser. No. 122,574

Int. Cl.[4] G01V *1/00*

U.S. Cl. 181—114 **3 Claims**



1. An improved seismic energy source mountable with a vehicle for imparting a plurality of shearwave energy polarizations between 0° to 360° into the earth at the same location without repositioning the vehicle, comprising:

(a) a vibratory pad adapted for contact with the earth;

(b) vibratory means mounted with the vibratory pad adapted to impart a linear vibratory motion to the vibratory pad whereby swept frequency shearwave seismic energy of a selected polarization can be imparted into the earth;

(c) means with the vehicle for raising and lowering the vibratory pad into contact with the earth; and

(d) means with the vehicle for horizontally rotating the vibratory pad and vibratory means to a plurality of individual azimuthal radial orientations between 0° to 360°, whereby when the vibratory pad is in contact with the earth, swept frequency shearwave seismic energy can be imparted in any of a plurality of polarizations between 0° to 360° thereby reducing data acquisition time and eliminating vibratory pad misplacement induced data errors.

4,842,095

UNITARY ANTI-SKID VIBRATION DAMPENING STRUCTURE

Roy J. Rozek, Plymouth, Wis., assignor to Thomas Industries, Inc., Sheboygan, Wis.

Filed May 4, 1987, Ser. No. 46,247

Int. Cl.[4] F16F *7/12*

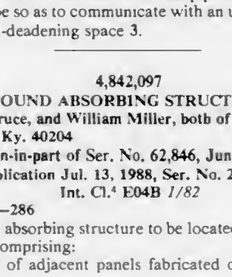
U.S. Cl. 181—207 **6 Claims**

1. In an apparatus subject to vibration, the combination of an apparatus capable of being vibrated,

means for vibrating said apparatus whereby relative movement is capable of being induced between said apparatus and a support surface and

a skid resistant and vibration dampening member disposed between said apparatus and said support surface, said member including

a first portion, said first portion being composed of a material having characteristics, with respect to texture and deformability, of non-rigid cellular foam, and having therefore the characteristics of high absorption of vibratory shocks per unit volume of material,



a second portion, said second portion being composed of a material having characteristics, with respect to texture and deformability, of rubber, and having a high coefficient of friction,

an integrating material which joins the first portion to the second portion in a manner which obliterates a sharp line of demarcation between the two portions.

to thereby form a structurally integral skid resistant and vibratory dampening member.

4,842,096

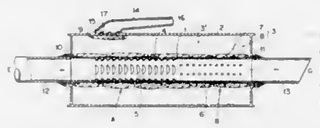
AUTOMOBILE MUFFLER

Isamu Fujitsubo, Yokohama, Japan, assignor to Fujitsubo Giken Co., Ltd., Yokohama, Japan

Filed Aug. 16, 1988, Ser. No. 232,818

Int. Cl.[4] F01N *1/10*

U.S. Cl. 181—252 **3 Claims**



1. An automobile muffler comprising an exhaust pipe 1 having a plurality of apertures made on a circumference thereof, an outer pipe 2 enclosing the exhaust pipe 1 and sound-deadening material 3' packed in a sound-deadening space 3 defined between the exhaust pipe and the outer pipe, said outer pipe 2 having a drain pipe 14 for drawing water from said sound-deadening space 3 to an exterior of the automobile muffler, characterized in that said drain pipe 14 is connected to said outer pipe so as to communicate with an upper half area X of said sound-deadening space 3.

4,842,097

SOUND ABSORBING STRUCTURE

Woodward Bruce, and William Miller, both of 912 Baxter Ave., Louisville, Ky. 40204

Continuation-in-part of Ser. No. 62,846, Jun. 16, 1987. This application Jul. 13, 1988, Ser. No. 218,212

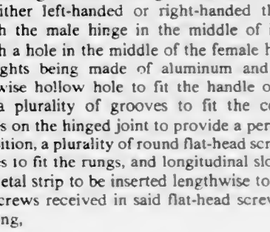
Int. Cl.[4] E04B *1/82*

U.S. Cl. 181—286 **15 Claims**

1. A sound absorbing structure to be located over a supporting surface comprising:

a plurality of adjacent panels fabricated of a substantially solid material, the panels being disposed in generally edge-by-edge relationship to each other and spaced from each other such that the adjacent side edges of adjacent panels define a slot therebetween;

a panel supporting bracket attached to each of the panels between adjacent slots such that when the panels are located over the supporting surface the panels, the support surface, and the brackets cooperate to define first acoustical cavities between adjacent brackets with each



slot in air flow communication with a different one of the first acoustical cavities, and each bracket defines a second acoustical cavity;

sound absorbing insulation material inside the second cavities; and

apertures formed in the mounting brackets establishing communication between the first and second cavities whereby reflected sound waves enter said second cavity from said first cavity to be absorbed by the sound absorbing material therein.

4,842,098

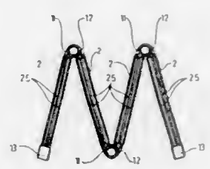
ADJUSTABLE FOLDING LADDER

Haison Yuen, 2-1, Jinlon Rd, Jeo-Ay Village, Yen-Pu Shian, Pintung Hsien, Taiwan

Filed Oct. 29, 1987, Ser. No. 114,022

Int. Cl.[4] E06C *1/28, 7/08*

U.S. Cl. 182—22 **3 Claims**



1. An adjustable folding ladder, said ladder comprising:

A pair of uprights;

A plurality of rungs supported by said uprights; and

hinged joints made of fiber glass nylon providing electrical shock insulation, each composed of a male and a female hinge with matching teeth for close tollerance engagement, having handles with grooves, and having screws with either left-handed or right-handed threads to fit through the male hinge in the middle of its teeth and through a hole in the middle of the female hinge,

said uprights being made of aluminum and including a lengthwise hollow hole to fit the handle of the hinged joint, a plurality of grooves to fit the corresponding grooves on the hinged joint to provide a permanent locking position, a plurality of round flat-head screw holes and grooves to fit the rungs, and longitudinal slots to allow a long metal strip to be inserted lengthwise to prevent flat-head screws received in said flat-head screw holes from loosening,

said rungs being made of aluminum in tube shape to provide rigidity, having lengthwise swellings to minimize slipping, and having screw holes and walls to be attached to the uprights by respectively screwing and fitting into the corresponding said holes and grooves in the uprights to provide increased load carrying capacity, and

said ladder further comprising connectors having female left-hand and right-hand threaded holes on opposite ends to fit the corresponding screws of the hinged joints such that the hinged joints can be tightened or loosened by turning the connector.

4,842,099

FOLDABLE LADDER

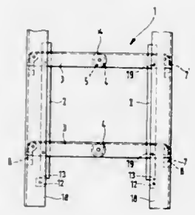
Dieter Collet, Hemsbach, and Emil Freiwald, Ober-Ramstadt, both of Fed. Rep. of Germany, assignors to Emil Freiwald, Ober-Ramstadt, Fed. Rep. of Germany

Filed Dec. 10, 1987, Ser. No. 131,628

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1987, 3733702

Int. Cl.[4] E06C *1/393*

U.S. Cl. 182—160 **12 Claims**



1. A foldable ladder comprising:

first and second opposite side rails;

a plurality of articulate crosspieces disposed between the first and second rails, each being movable between a folded position and an extended position;

means, connected to the plurality of crosspieces, for synchronizing the movement of the plurality of crosspieces;

each articulate crosspiece including a first crosspiece segment having a distal end and a proximal end pivotally connected to the first rail, and a second crosspiece segment having a distal end and a proximal end pivotally connected to the second rail, and a central hinge pivotally connecting the distal ends of the first and second crosspiece segments to each other; and

bracket rods having first and second ends, the first ends being connected respectively to lower end portions of the first and second rails, and the second ends being connected to the central hinge of a lowermost one of the crosspieces through rotatable locking means interposed between said second ends and said center hinge, thereby bracing the crosspieces when in the extended position.

4,842,100

LUBRICATION SYSTEM FOR AUTOMOTIVE TRANSMISSION POCKET BEARING

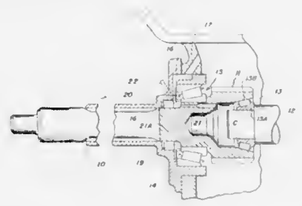
Robert W. Cameron, Canton; Gary J. Dressler, Massillon, and Jack I. Hartline, North Canton, all of Ohio, assignors to The Timken Company, Canton, Ohio

Continuation of Ser. No. 833,967, Mar. 4, 1986, abandoned. This application Nov. 19, 1987, Ser. No. 122,922

Int. Cl.[4] F01M *9/06*

U.S. Cl. 184—6.2 **5 Claims**

1. In a lubricating system for delivering a lubricant to a pocket bearing adjacent the forward end of an elongated transmission assembly receiving the rearward end of an engine power output shaft, the rearward end of the engine power output shaft being formed with an internal pocket adjacent the forward end of the transmission assembly, a power receiving shaft in the transmission assembly having a forward end projecting into the internal pocket, and bearing means disposed in the internal pocket between the rearward end of the engine output shaft and the power receiving shaft end of the transmission assembly, the improvement of an arrangement for lubricating the bearing means in the internal pocket when the engine output shaft is inclined at least to a position in which the engine is higher than the internal pocket and the bearing means therein, the improvement comprising:



(a) a lubricant retaining cavity in the rearward end of the elongated transmission assembly, said cavity being separated from the location of the internal pocket enclosing the end of the engine output shaft;

(b) lubricant transfer means interconnecting the separated lubricant retaining cavity in the rearward end of the transmission assembly with the internal pocket; and

(c) lubricant pumping means in the lubricant retaining cavity which is operable in response to operation of the transmission assembly to pump lubricant from the lubricant retaining cavity into the lubricant interconnecting means to supply lubricant to the bearing means disposed in the internal pocket under transmission operating conditions.

4,842,101

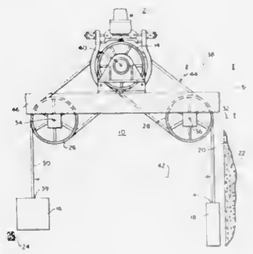
ELEVATOR SYSTEM

Miles P. Lamb, Somerset, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 16, 1988, Ser. No. 156,066

Int. Cl.[4] B66B *11/04*

U.S. Cl. 187—22 **8 Claims**



1. A traction elevator system, comprising:

an elevator car,

a counterweight,

a drive sheave having a rotational axis,

first and second idler sheaves having rotational axes,

said drive sheave being disposed intermediate said first and second idler sheaves, with the rotational axes of said drive sheave and said first and second idler sheaves all being in parallel relation,

and a wire rope interconnecting said elevator car and said counterweight via a roping arrangement which is equally balanced between said drive sheave and said first and second idler sheaves, said rope crossing over said drive sheave to define a mid-point of said balanced roping arrangement, with the rope proceeding from said mid-point to said elevator car via successive 180 degree wraps about said first idler sheave and said drive sheave, and from said mid-point to said counterweight via successive 180 degree wraps about said second idler sheave and said drive sheave, to provide a 360 degree total wrap about said drive sheave.

4,842,102

DISC BRAKE FOR WHEELED VEHICLE OR THE LIKE

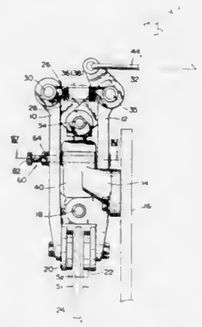
Masayuki Tateyama, Ome, and Ryuji Tsutsui, Kodaira, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 17, 1983, Ser. No. 552,816

Claims priority, application Japan, Nov. 18, 1982, 57-202394

Int. Cl.[4] B62L *3/00*

U.S. Cl. 188—24.21 **14 Claims**



1. A disc brake for a vehicle comprising;

a rotatable disc;

a mounting bracket fixedly secured to a chassis of said vehicle;

a first lever pivotally mounted on said mounting bracket in a manner to be pivotal about an axis;

a second lever pivotally mounted on said mounting bracket so as to be pivotal about said axis,

said first and second levers having thereon first and second brake pads immovably fixed thereto respectively;

a linkage interconnecting said first and second levers for inducing in response to a manual command, said first and second levers to rotate in opposite rotational directions about said axis and in a manner to clamp said pads against the opposite faces of said disc;

a first clearance adjustment device projecting from said first lever toward said second lever, said first clearance adjustment device being arranged to engage said second lever in a manner to limit the clearance which occurs between said first and second pads in the absence of said command signal; and

a second clearance adjustment device projecting from said first lever toward said mounting bracket, said second clearance adjustment device being arranged to engage said mounting bracket in a manner to limit the clearance which occurs between said disc and said first pad in the absence of said command signal.

4,842,103

AUTOMATIC ADJUSTING DEVICE FOR A DISC BRAKE WITH PRESS FIT MEMBERS

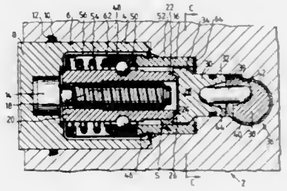
Rolf Weiler, Frankfurt am Main; Claus-Peter Panek, Steinbach, and Bodo Schmidt, Lauterbach, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 21, 1987, Ser. No. 136,044

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1986, 3643923; Jan. 22, 1987, 3701693

Int. Cl.[4] F16D *55/224, 65/56*

U.S. Cl. 188—71.9 **13 Claims**



1. An automatic adjusting device for a disc brake, comprising a brake piston which is displaceably arranged in a brake cylinder and which is acutatable by means of an actuating device; an extensible adjusting member arranged between the brake piston and the actuating device, said adjusting member comprising two adjusting elements interconnected by a thread; a friction clutch having conical friction surfaces for the purpose of selectively fixing one of the adjusting elements in position; one of the conical surfaces being on one of the adjusting elements and the other friction surface being on an actuatable clamping member; a bearing mechanism comprised of an inner bearing ring formed on one of the adjusting element which cooperates with an outer bearing ring to carry ball bearing means, one side of said bearing mechanism abutting a shoulder of an accommodation sleeve, the other side of said bearing mechanism bearing against one end of a spring in an associated bearing cage; a cupshaped spring retainer which supports the other end of said spring and which is secured to the brake housing by means of the accommodation sleeve, wherein the accommodation sleeve is a straight tubular member which can be pressed into a corresponding smooth circular bore in a brake housing, said bore having substantially the same diameter as said accommodation sleeve, whereby said accommodation sleeve is press fit into said corresponding bore.

4,842,104

INTERNAL SHOE DRUM BRAKE

George A. Harmer, Solihull, England, assignor to Lucas Industries public limited company, Birmingham, England

Filed Nov. 28, 1984, Ser. No. 675,750

Claims priority, application United Kingdom, Dec. 9, 1983, 8332878

Int. Cl.[4] F16D *51/16, 65/22*

U.S. Cl. 188—79.51 **13 Claims**

1. An internal shoe drum brake comprising:

a pair of brake shoes mounted on a backplate, each brake shoe having a web portion; and

a mechanism operatively associated with said brake shoes for expanding said brake shoes comprising,

a lever mounted on one of said brake shoes for angular movement in a plane generally parallel to said backplate,

an edge on said lever,

an elongated abutment plate lying against one side of the web portion of said one brake shoe,

a hold-down device operatively associated with said one brake shoe and abutment plate for mounting and retaining said abutment plate on said one brake shoe,

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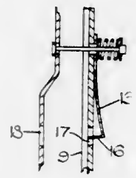
an edge surface portion on the web portion of said one brake shoe,

a projection extending from said abutment plate out of the plane thereof in a plane substantially perpendicular to said web portion of said one brake shoe to a position adjacent said lever substantially perpendicular to said edge on said lever and engaging said edge surface portion on said web portion to form a backstop for said lever to set a predetermined retracted position for said lever,



a lateral edge portion on said projection, and

a continuous edge surface extending along substantially the entire length of at least one side of said abutment plate and including said lateral edge portion on said projection, said lateral edge portion on said projection extending in a plane substantially perpendicular to said projection and being engageable with said edge on said lever when in said retracted position.

4,842,105

SAFETY BRAKE MECHANISM

Gordon O. Salmela, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jun. 1, 1987, Ser. No. 57,395

Int. Cl.[4] B60T *8/52, 7/12;* **B66R** *1/26;* **B66B** *5/16*

U.S. Cl. 188—185 **23 Claims**

1. A safety brake for limiting acceleration of an apparatus comprising:

a pair of flyweights coupled together for providing a braking action in response to only an acceleration in a clockwise or a counterclockwise direction above a predetermined level;

rotating means coupled between said flyweights and said apparatus for transferring said apparatus acceleration to said flyweights; and

fixed housing means concentric with said rotating means and enclosing said flyweights for providing said braking action by said flyweights pivoting to contact said fixed housing means.

4,842,106

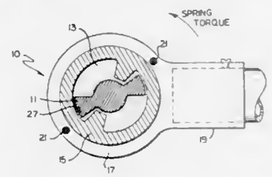
RATE CONTROLLABLE DAMPING MECHANISM

Howard R. Ludwig, Rancho Palos Verdes; John W. Haidler, Wilmington; Mark S. C. Yuan, Fountain Valley, and Robert J. Elson, San Pedro, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 8, 1987, Ser. No. 105,838

Int. Cl.[4] F16D *57/00;* **F16F** *9/12;* **B64G** *1/22, 1/44*

U.S. Cl. 188—266 **7 Claims**



1. An improved damping and strain relief mechanism comprising:

a chamber disposed within a housing;

paddle means mounted for movement within said chamber;

a damping material disposed within said chamber, said damping material being a solid, for preventing the movement of said paddle means at a first temperature and, said damping material being a liquid, for damping the movement of said paddle means at a second temperature; and

heating means for selectively increasing the temperature of said damping material from said first temperature to said second temperature.

6. A method for relieving stress on a spacecraft cradle comprising the steps of:

(a) mounting the cradle within a transport vehicle through a plurality of strain relief mechanisms, each mechanism including a chamber disposed within a housing; paddle means mounted for movement within said chamber; a damping material disposed within said chamber for preventing the movement of said paddle means at a first temperature and for damping the movement of said paddle means at a second temperature; and heating means for selectively increasing the temperature of said damping material from said first temperature to said second temperature;

(b) launching said transport with said cradle and a satellite within said cradle as the payload of said transport;

(c) activating the heating means of each relief mechanism to allow the cradle to relax; and

(d) ejecting the satellite from said cradle.

4,842,107

FLUID SYSTEM BLEEDING APPARATUS

Nigel Buchanan, New Gilston, by Leven, Fife, United Kingdom (KY8 5TF), and John Brodie, Fife, United Kingdom, assignors to Nigel Buchanan, United Kingdom

PCT No. PCT/GB87/00054, § 371 Date Nov. 24, 1987, § 102(e) Date Nov. 24, 1987, PCT Pub. No. WO87/04675, PCT Pub. Date Aug. 13, 1987

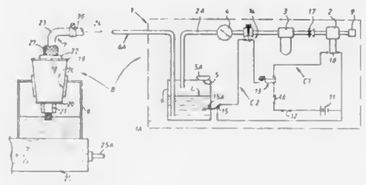
PCT Filed Jan. 28, 1987, Ser. No. 123,857

Claims priority, application United Kingdom, Jan. 31, 1986, 8602486

Int. Cl.[4] B60T *11/00;* **F16D** *65/00*

U.S. Cl. 188—352 **9 Claims**

1. Apparatus for use in the bleeding of fluid system, especially the hydraulic brake system of a motor vehicle, which systems include a master reservoir for fluid, said apparatus comprising a fluid pumping assemblage including a primary reservoir to supply fluid to the master reservoir of a fluid system to be bled, a pump for pumping air to said primary reservoir for the displacement of fluid from the primary reservoir, a feed conduit connecting said pump and the primary reservoir, an electric motor connectible to an electric power supply source and serving to drive said pump, and control circuit means for the electric motor, said control circuit means including an air pressure control device for controlling the operation of the electric motor dependent on the air pressure supply to said primary reservoir to maintain the pressure of the



displaced fluid below a predetermined limit, said fluid pumping assemblage additionally including a support member for carrying said pump, the feed conduit, the electric motor and the control circuit means all in an assembled condition; a supply conduit for the delivery of fluid displaced from the primary reservoir to the master reservoir of a fluid system via a fluid supply opening in said master reservoir; and a sealing unit removably fitted at an outer end portion of said supply conduit by releasable securing means, said sealing unit including resilient sealing means enabling the sealing unit to be sealingly fitted into a fluid supply opening in a master reservoir.

4,842,108

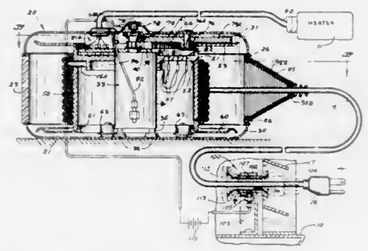
POWER RETRACT ELECTRIC CORD REEL

Marvin L. Anderson, Williston, N. Dak., and Gerald O. Irvine, Crosby, Minn., assignors to Circle A Product, Inc., Sioux City, Iowa

Continuation of Ser. No. 28,034, Mar. 18, 1987, abandoned, which is a continuation of Ser. No. 738,677, May 28, 1985, abandoned. This application Nov. 1, 1988, Ser. No. 266,335

Int. Cl.[4] H02G *11/02*

U.S. Cl. 191—12.2 A **8 Claims**



5. A power driven cord reel comprising:

a reel having a drum, and spaced apart flanges mounted on the drum;

a case member housing said reel;

a drive motor mounted on the interior of said drum, said case member having end portions held relative to opposite ends of said drive motor, said drive motor having an output shaft rotatable about a central axis;

a plurality of support means mounted at the end of the motor adjacent the output shaft and having portions supported on the case member and extending to provide support for said drum to maintain said drum centered for rotation about the same axis as the axis of the output shaft;

gear means mounted on said support means engaging an interior of said drum adjacent one end of said drum to drive said drum for rotation about an axis, said drive motor having a drive gear drivably engaging said gear means to rotate said drum; and

idler roller means journaled on the case member at the opposite end of said drum and engaging and rotatably supporting said drum relative to said case, whereby energization of said drive motor will drive said drum through the gear means while supported.

4,842,109

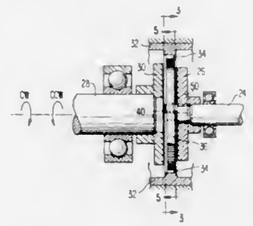
BIDIRECTIONAL DRIVE WITH A UNIDIRECTIONAL IRREVERSIBILITY MECHANISM

Eli Avny, Rockford, Ill., assignor to Suodstand Corp., Rockford, Ill.

Filed Dec. 22, 1987, Ser. No. 136,863

Int. Cl.[4] F16D *67/02*

U.S. Cl. 192—8 R **16 Claims**



1. A bidirectional drive with a unidirectional irreversibility mechanism comprising:

a pair of plates mounted in parallel facing relationship on facing ends of aligned input and output shafts;

a ratchet and pawl assembly having an annular member fixed relative to said shafts at a position surrounding said plates and a lever mounted for pivotal movement on the output shaft plate to be between said plates, said lever having free end spring biased to engage teeth on said annular member;

a first means on said input shaft for engaging said lever along a mid-portion to move the lever free end against the bias of the spring to abut a stop member on the output shaft plate to drive said output shaft in a forward drive direction, and upon removal of drive power from the input shaft, the free end of said lever being spring biased into engagement with said annular member teeth thereby to prevent shaft rotation due to the load tending to continue causing rotation of the output shaft in the forward drive direction; and

a second means separate from said first means, alternately responsive to rotation of either the input shaft or the output shaft in a direction opposite the forward drive direction to provide a drive force in said opposite direction to the other of said shafts while dragging the free end of the lever along the annular member teeth.

4,842,110

DOCUMENT TRANSPORT AND PRINTING APPARATUS AND ASSOCIATED CLUTCH

Graham Luckhurst, Kitchener, Canada, assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 8, 1986, Ser. No. 939,505

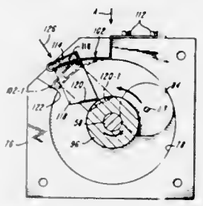
Int. Cl.[4] F16D *13/02, 67/02;* **F16H** *13/06*

U.S. Cl. 192—16 **9 Claims**

1. A clutch comprising:

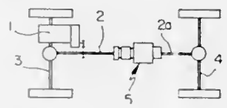
an input shaft;

mounting means for mounting said input shaft for rotation at a substantially constant velocity;
an output member mounted on said shaft for independent rotation thereon;
coupling means moveable between active and inactive positions for operatively coupling said input shaft to said output member when said coupling means is in said active position and for uncoupling said input shaft from said output member when said coupling means is in said inactive position; and
actuating means for moving said coupling means between said active and inactive positions;
said coupling means including a planetary unit which is coupled to said input shaft to produce circular movement which rotates said output member when said input shaft is rotated and when said coupling means is moved to said active position, with said planetary unit being uncoupled



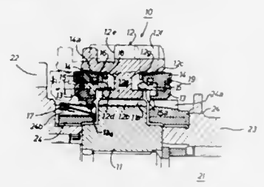
from said input shaft when said coupling means is moved to said inactive position;
said coupling means also including a cooperating member having an inner cylindrical wall with which said planetary unit cooperates to produce said circular movement;
said cooperating member having a portion of said inner cylindrical wall removed therefrom;
said coupling means also including a section which is mounted for movement towards an active position in which said section completes said inner cylindrical wall and couples said planetary unit to said input shaft to enable said planetary unit to produce said circular movement, and also for movement towards an inactive position in which said planetary unit is uncoupled from said input shaft to stop said circular movement;
said actuating means being effective to move said section to said active position when said coupling means is moved to said active position.

4,842,111
DRIVE SYSTEM FOR MOTOR VEHICLES HAVING DRIVEN FRONT AND REAR AXLES
Heribert Lanzer, Gossendorf, and Peter Resele, Graz, both of Austria, assignors to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria
Filed Apr. 27, 1988, Ser. No. 192,323
Claims priority, application Austria, Apr. 28, 1987, 1050/87
Int. Cl.[4] F16D *13/04;* **F16H** *37/00*
U.S. Cl. 192—35 **5 Claims**



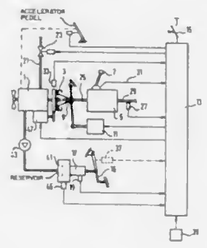
1. A drive system for motor vehicles having driven front and rear axles, which drive system comprises
a rear axle drive train including a liquid friction coupling and a first clutch, which is connected in series with said liquid friction coupling and is arranged to be released in response to a rear axle speed exceeding the front axle speed,
a second clutch, which is engageable to bridge said liquid friction coupling and said first clutch, and
clutch-actuating means for engaging said second clutch with said liquid friction coupling during forward and reverse travel in dependence on at least one operating parameter of the vehicle.

4,842,112
GEAR SYNCHRONIZER FOR POWER TRANSMISSION
Masaki Inui, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan
Filed May 9, 1988, Ser. No. 191,962
Claims priority, application Japan, May 9, 1987, 62-113101
Int. Cl.[4] F16D *11/06, 23/04*
U.S. Cl. 192—53 F **8 Claims**



1. A gear synchronizer comprising a gear member rotatable on a transmission shaft, a spline piece formed thereon with external splines and provided on a hub portion of said gear member for rotation therewith, a hub member formed thereon with external splines and mounted on said transmission shaft for rotation therewith, a clutch sleeve encircling said hub member and having internal splines in continual engagement with the external splines of said hub member, said clutch sleeve being axially shiftable toward and away from said gear member to be engaged at the internal splines thereof with the external splines of said spline piece,
a support ring encircling said spline piece and having a radial projection formed at an inner periphery thereof and disposed axially movably in a corresponding radial recess formed in said spline piece;
a first synchronizer ring coupled with said support ring and having an external frustoconical surface for frictional engagement with an internal frustoconical surface formed on one side of said clutch sleeve;
a second synchronizer ring disposed between said support ring and said first synchronizer ring and being axially movably coupled with said first synchronizer ring for relative rotation and axially movably coupled with said support ring for rotation therewith, said second synchronizer ring having an internal frustoconical surface for frictional engagement with an external frustoconical surface formed on the one side of said clutch sleeve;
resilient means disposed between said first and second synchronizer rings to bias said first synchronizer ring for engagement with said support ring and to bias said second synchronizer ring for engagement with said first synchronizer ring;
cam means arranged to effect relative axial displacement of said synchronizer rings against the biasing force of said resilient means in response to relative rotation between said synchronizer rings; and
support means disposed in the radial recess of said spline piece to resiliently receive the radial projection of said support ring thereon.

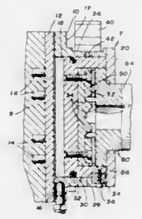
4,842,113
SYSTEM FOR CONTROLLING THE FREE-WHEELING RELEASE OPERATION OF A MOTOR VEHICLE CLUTCH
Dieter Lutz, Schweinfurt, Fed. Rep. of Germany, assignor to SACHS-Systemtechnik GmbH, Fed. Rep. of Germany
Filed Feb. 8, 1983, Ser. No. 464,997
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208715
Int. Cl.[4] B60K *41/28*
U.S. Cl. 192—0.055 **10 Claims**



1. Driving and braking system for a motor vehicle comprising an internal combustion engine (**1**) having a torque drive path, a gas pedal operatively connected to said engine for controlling engine operation, a clutch (**3**) located in the torque drive path, a clutch drive device (**11**) for operatively releasing and engaging said clutch, a brake device, a brake pedal (**16**) for operating said brake device, a manually actuatable control switch (**15**) for controlling a free-wheel release operation of said clutch, a first sensor (**33**) for detecting the idling operational position of said gas pedal, a second sensor (**19**;**37**) for detecting the operation o said brake pedal (**16**), a control circuit (**13**) connected to said clutch drive device (**11**), said control switch (**15**), said first sensor (**33**) and said second sensor (**19**;**37**) for controlling said drive device (**11**) when said control switch (**15**) is switched on for disengaging said clutch (**3**) when said brake pedal (**11**) is actuated, wherein the improvement comprises a fuel supply conduit (**21**) connected to said engine, a fuel valve (**23**) in said supply conduit (**21**) for controlling fuel flow therethrough to said engine, said control circuit (**13**) operably connected to said fuel valve so that when said control switch (**15**) is switched on for effecting free-wheeling operation, said control switch opens said fuel valve (**23**) when said clutch (**3**) is disengaged and closes said fuel valve (**23**) when said clutch (3) is engaged.

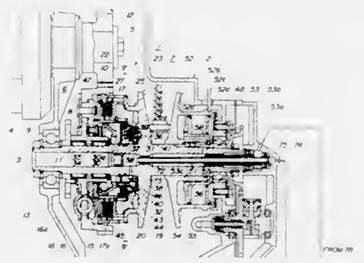
4,842,114
AIR CLUTCH WITH TOOL CHANGER
Ludwig K. Hepp, Oshawa, Canada, assignor to GM of Canada Limited, Oshawa, Canada
Filed Jan. 29, 1988, Ser. No. 150,117
Int. Cl.[4] B25J *19/00;* **F16D** *43/286*
U.S. Cl. 192—56 F **11 Claims**

1. A clutch adapted for connection between a robot or like and an attached EOAT for deformation upon an applied load on said EOAT beyond a predetermined amount, said clutch in combination comprising:
a shell for connection with said robot or like, said shell having a generally cylindrical inner chamber with a generally inward facing flange at an end generally opposite said robot or like;
a rigid piston slidably and sealably mounted within said inner chamber responsive to the fluid pressure within said inner chamber, said piston on a surface opposite said robot or like having a nonplanar surface;
a connector plate having a first section for connection with said EOAT and a second enlarged section captured within said shell between said flanged end and said piston, said connector plate having a nonplanar surface generally in mesh with said piston whereby said connector plate is held



in position by said piston and a load of a predetermined amount on said EOAT causes movement of said connector plate and said piston within said shell.

4,842,115
HYDRAULIC CLUTCH
Kouhei Ohzono; Kazuhiro Takeuchi, both of Wako, and Yoshihisa Iwatsuka, Shizuoka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 8, 1987, Ser. No. 59,060
Claims priority, application Japan, Jun. 10, 1986, 61-135434
Int. Cl.[4] F16D *25/063, 25/14, 43/284*
U.S. Cl. 192—85 F **6 Claims**



1. A hydraulic clutch comprising:
an input shaft;
an input rotating member rotating in unison with said input shaft;
an output shaft;
an output rotating member rotatable in unison with said output shaft;
a plurality of friction plates interposed between said input and output rotating members in such a manner as to be engageable with an disengageable from each other to transmit torque from said input rotating member to said output rotating member when said friction plates are brought into frictional engagement with each other;
urging means interposed between said friction plates and said output rotating member for urging said friction plates in such a direction as to permit torque to be transmitted from said input rotating member to said output rotating member;
a hydraulic pressure chamber defined between said urging means and said output rotating member and adapted to be supplied with a hydraulic fluid acting upon said urging means to cause said urging means to urge said friction plates;
a hydraulic fluid source of supplying the hydraulic fluid;

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first passage means having restriction means provided therein and communicating said hydraulic fluid source and a low pressure side with each other;

second passage means branching off from said first passage means at a location upstream of said restriction means and communicating said hydraulic fluid source with said hydraulic pressure chamber;

pressure regulating valve means interposed between said restriction means and said low pressure side and being operable to permit the hydraulic fluid to leak from said hydraulic pressure chamber to said low pressure side when said pressure regulating valve means is opened;

control means for controlling said pressure regulating valve means in response to rotational speed of said input shaft, said control means including means for causing said pressure regulating valve means to be opened when said input shaft is not rotating, to be open until the rotational speed of said input shaft reaches a predetermined value, and to be closed after the rotational speed of said input shaft has reached said predetermined value to thereby regulate the hydraulic pressure within said hydraulic pressure chamber; and

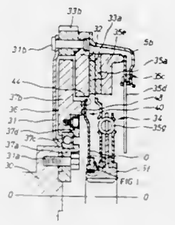
pilot valve means provided in said second passage means for permitting the hydraulic fluid to flow into said hydraulic pressure chamber from said first passage means through said second passage means when said pressure regulating valve means is closed;

said pilot valve means being responsive only to hydraulic pressure regulated by said pressure regulating valve means for regulating the hydraulic fluid flowing into said hydraulic pressure chamber from said first passage means.

4,842,116
FLYWHEEL ASSEMBLY

Hirotaka Fukushima, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Jan. 29, 1987, Ser. No. 8,224
Claims priority, application Japan, Jan. 30, 1986, 61-12168[U]; Feb. 4, 1986, 61-14966[U]; Feb. 4, 1986, 61-22427; Feb. 4, 1986, 61-22428
The portion of the term of this patent subsequent to Jun. 21, 2005, has been disclaimed.
Int. Cl.[4] F16D *13/50, 3/14*
U.S. Cl. 192—106.2 **5 Claims**

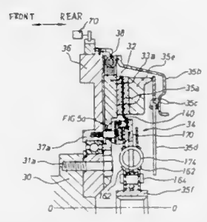


1. A flywheel assembly including a first flywheel fastened to an engine crank shaft and engaged and disengaged by a clutch disc, a second flywheel supported concentrically with the first flywheel and set to a specified mass, and a friction damping mechanism which connects an inertial mass of the second flywheel to a spline hub of the clutch disc and damps a torsional vibration of the drive-transmission system only when the clutch disc contacts with the first flywheel; characterized by that an outer peripheral part of said first flywheel and the crank shaft are connected by a comparatively thin connecting plate disposed along an end face of the second flywheel opposite to the clutch disc, a bearing is installed which supports the damper inertial part of the second flywheel relatively to an inner peripheral flange of the second flywheel in a circumferentially rockable manner, a pressure surface on which a friction member of the friction damping mechanism presses is formed on said damper inertial part, the friction member being fixed to an approximately annular friction plate provided on the spline hub of the clutch disc in an axially sliding manner, and a spring member urging the friction plate and the friction member toward the second flywheel is interposed between the friction plate and the spline hub.

4,842,117
FLYWHEEL ASSEMBLY

Hirotaka Fukushima, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Division of Ser. No. 8,224, Jan. 29, 1987. This application Mar. 9, 1988, Ser. No. 165,690
Claims priority, application Japan, Jan. 30, 1986, 61-12168; Feb. 4, 1986, 61-14966; Feb. 4, 1986, 61-22427; Feb. 4, 1986, 61-22428
The portion of the term of this patent subsequent to Jun. 21, 2005, has been disclaimed.
Int. Cl.[4] F16D *13/50, 3/14*
U.S. Cl. 192—106.2 **4 Claims**



1. A flywheel including a first flywheel fastened to an engine crank shaft and engaged and disengaged by a clutch disc having a spline hub, an annular plate with friction facings on the opposite sides thereof, a secondary clutch plate and a sub-plate, a second flywheel supported concentrically with the first flywheel and set to a specific mass, a damper mechanism resiliently connecting the flywheels to each other, and a friction damping mechanism which transmits power from the second flywheel to the spline hub of the clutch disc and damps vibration only when said clutch disc contacts with the first flywheel; characterized by that a friction member of the friction damping mechanism is fastened to said secondary clutch plate of the clutch disc, said secondary clutch plate and said sub-plate are clamped by a connecting pin to the spline hub, said annular plate having said friction facings on the opposite sides thereof provided on a radially outer peripheral part of the clutch disc is installed between said secondary clutch plate and the sub-plate in a circumferentially rotatable manner, a torsion spring is interposed between the annular plate, said secondary clutch plate and the sub-plate, and a spring member of the friction damping mechanism is connected to said second flywheel.

4,842,118
CLUTCH

Daniel Puzio, Boonton, N.J.; William H. Georges, Saginaw, Mich., and Gary L. Bevilacqua, York, Pa., assignors to General Motors Corporation, Detroit, Mich.

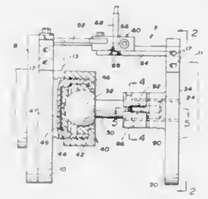
Filed Feb. 19, 1988, Ser. No. 158,221
Int. Cl.[4] B25J *9/00*
U.S. Cl. 192—150 **11 Claims**

1. A clutch adapted to be connected between an EOAT and a robot or like for deformation upon loading upon said EOAT beyond a predetermined amount, said clutch comprising in combination:

a first plate for connection with said robot or like;

a second plate spaced from said first plate for connection with said EOAT;

a rod pivotally mounted with respect to one of said plates and mounted with said other plate; and

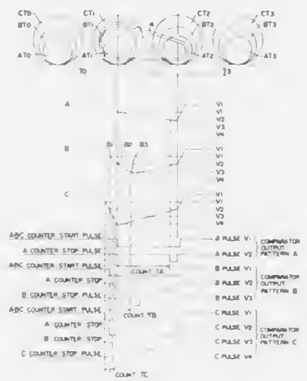


means to angularly restrain said rod with respect to said plate said rod is pivotally mounted to whereby said second plate has a fixed position with respect to said first plate unless said EOAT is loaded beyond a predetermined amount causing said rod to pivot.

4,842,119
SENSOR COIL FOR DISCRIMINATING COIN ACCEPTOR OR REJECTOR

Hiroshi Abe, Tokyo, Japan, assignor to Asahi Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1987, Ser. No. 132,264
Claims priority, application Japan, Jun. 18, 1985, 60-130810
Int. Cl.[4] G07D *5/00*
U.S. Cl. 194—317 **4 Claims**

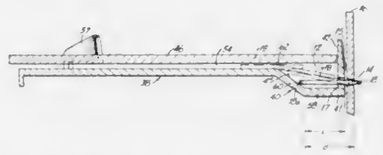


1. A coin discriminating inductive sensor coil for use in a coin acceptor comprising a coin passage, a guide rail along which coins pass on their edges and substantially in a predetermined plane through the coin passage, and at least one inductive sensor coil arranged at at least one of opposite sides of the coin passage to produce an oscillating magnetic field in the coin passage and to have its coil inductance varied by a coin travelling in the coin passage, said coin discriminating inductive sensor coil having an oval configuration with one end in the longitudinal direction of the oval configuration having a large radius of curvature and the other end in the longitudinal direction of the oval configuration having a small radius of curvature, and said coin discriminating inductive sensor coil being so arranged that the major axis of its oval configuration is extended in the direction of the path of a coin along the guide rail and substantially parallel with said predetermined plane.

4,842,120
JAM REDUCING APPARATUS FOR USE IN A COIN OPERATED MACHINE

Bob M. Dobbins, Villanova; Raymond D. Regan, Downington, and John Zouzoulas, Westchester, all of Pa., assignors to Mars, Incorporated, McLean, Va.

Filed Apr. 29, 1988, Ser. No. 188,038
Int. Cl.[4] G07F *1/02*
U.S. Cl. 194—349 **4 Claims**



1. A jam reducing apparatus for use in a coin operated machine having a front panel with a coin insert slot, said apparatus comprising:

a lid having an extended portion and a flared end with an inclined inner surface, said flared end having an integral entrance blocker substantially parallel to the front panel of the coin operated machine;

a deck substantially parallel to the extended portion of the lid, said deck connected to a first inclined coin track starting proximate to the front panel and providing a pathway into said machine;

the lid, deck and coin track defining a coin entryway proximate the front panel of said machine for directing a coin into said machine, access to said entryway being gained through an entrance slot in the entrance blocker;

said lid and deck being hingedly mounted together so that the lid has a normally closed position wherein said panel slot and said entrance slot are in substantial alignment, said lid being spring biased by a spring for providing a restoring force tending to restore said lid to said first normally closed position;

said lid subject to movement from said normally closed position due to a sufficient camming force exerted upon the inclined inner surface of the flared end of the lid of said entryway such that when the lid moves from the normally closed position, said coin insert slot and said coin entrance slot move out of alignment.

4,842,121
COUPLING FOR A CONTINUOUS TRANSPORT SYSTEM

Daniel Michalon, 20 rue Gauthier Dumont, Saint Etienne (Loire), France

Continuation of Ser. No. 917,557, Jun. 21, 1978, abandoned. This application May 25, 1983, Ser. No. 497,896
Claims priority, application France, Jun. 23, 1977, 77 20219
Int. Cl.[4] B65G *23/00*
U.S. Cl. 198—334 **7 Claims**

1. A continuous coupling for circulation along a closed path, comprising:

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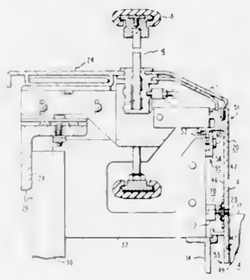
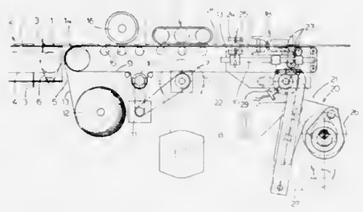
variable length links including bogies, each provided with at least one bobbin connected together by flexible lines winding on bobbins guided by a wheeled railway system;
said bogies driving vehicles of a continuous transport system;
said vehicles being secured to said flexible lines at distinct anchorage ponts on said flexible lines;
said flexible lines and the vehicles traveling at substantially the same speed;
said vehicles being mounted independently of said bogies;
said vehicles having a displacement following a different law from that of the displacement of adjacent bogies;
at least a portion of said vehicle and a portion of said bogies traveling in the same flat predetermined plane;
said flexible lines being disposed parallel to said flat predetermined plane and parallel to the direction of travel of said vehicles in said bogies, except for a portion of the flexible lines which are wound on said bobbins;
the bogie of each link comprising a single rotatable bobbin rotated by a fixture capable of circular motion, having two fingers in a predetermined configuration each having a rail wheel rotatably mounted thereon connected to the bobbin and a fixed rail and on which are wound and anchored two lines, namely a first line which unwinds upstream and a second line which unwinds downstream, the winding of the two lines being simultaneous when the bobbin turns in a given direction.

4,842,122
TRANSPORTATION APPARATUS HAVING ADJUSTABLE SKIRTS
Alan D. Van Nort, Randolph, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Apr. 11, 1988, Ser. No. 179,932
Int. Cl.[4] B65G *17/00*
U.S. Cl. 198—335 **6 Claims**



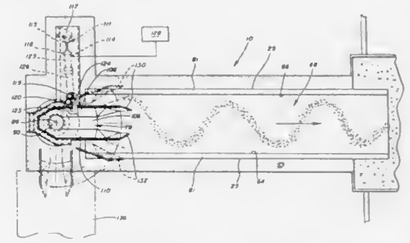
1. Transportation apparatus for transporting passengers between spaced landings, comprising:
a supporting structure,
first and second spaced balustrades on said support structure,
a conveyor having a plurality of platforms which define first and second sides of the conveyor,
said conveyor being mounted on said supporting structure with said first and second sides respectively adjacent to said first and second spaced balustrades,
skirt panels disposed between said support structure and the first and second sides of said conveyor,
said skirt panels each having an inner side facing said support structure, an outer side facing said plurality of platforms, and an upper edge,
first and second inner decks extending from the upper edges of said skirt panels to said first and second balustrades, respectively,
and adjustment means adjustably spacing said skirt panels from said support structure, for adjusting a running clearance gap between the outer sides of said skirt panels and said plurality of platforms,
said adjustment means including a screw having first and second ends and a longitudinal axis extending between said ends, with said first end being an adjustment end, said screw being disposed with the longitudinal axis perpendicular to the inner side of at least one of said skirt panels, and with said adjustment end closely adjacent to said inner side,
said at least one skirt panel defining an opening aligned with the adjustment end of said screw such that said screw is actuatable through the opening in said at least one skirt panel, from the platform side thereof to adjust the running clearance without removing skirt panels or an inner deck.

4,842,123
APPARATUS FOR PROCESSING OBJECTS POSITIONED ON A CONVEYOR BELT
Friedrich W. Visser, Zaandam, Netherlands, assignor to Buhrs-Zaandam B.V., Netherlands
Filed Feb. 24, 1988, Ser. No. 159,724
Claims priority, application Netherlands, Mar. 4, 1987, 8700525
Int. Cl.[4] B65G *43/00*
U.S. Cl. 198—341 **6 Claims**



1. Apparatus for processing objects positioned on a conveyor belt, comprising a processing device that for carrying out the process is movable to and fro substantially in parallel to the conveyor belt and that during at least a part of its forward processing stroke has the same velocity as the conveyor belt and engages an object to be processed, characterized by a correction mechanism for correcting the relative position of the processing device and the object to be processed during the processing stroke of the processing device, the correction mechanism being provided with a first detection device for detecting the position of the objects to be processed, the first detecting device comprising detectors for determining the point of time on which the objects to be processed pass a pre-set location, the first detecting device being located such that the position of an object to be processed is determined at the point of time on which the preceding object is processed by the processing device, a second detection device for detecting the position of the processing device, as well as a control unit for comparing the detection signals generated by said two detection devices and for in relation therewith generating a correction signal for changing the position of the processing device, the conveyor belt being provided with at least two parallel series of slits extending in the longitudinal direction of the conveyor belt, wherein the slits of the series mutually overlap and wherein a detector cooperates with each series of slits, said detectors being aligned crosswise of the conveyor belt.

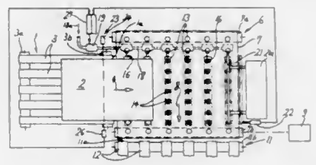
4,842,124
PNEUMATIC CONTROLS FOR OSCILLATING DISCHARGE CHUTE
Albert Musschoot, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.
Filed Mar. 31, 1987, Ser. No. 32,876
Int. Cl.[4] B65G *47/46*
U.S. Cl. 198—360 **14 Claims**



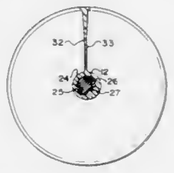
1. A structure for controllably discharging articles that are being continuously transported by a primary conveying structure, said discharging structure comprising:
a base;
a secondary conveying means for conveying articles in a substantially linear conveying path in a first direction, said secondary conveying means having a trough;
a discharge assembly having a chute with an inlet and an outlet;
a fixed support on said base and having an axis;
means for directing articles from the primary conveying structure into said chute inlet,
said trough having an article conveying surface with a width transverse to said linear path onto which conveying articles from said chute outlet are deposited;
means for reciprocatively moving said discharge assembly so that the chute outlet moves back and forth across the trough width to distribute articles from the chute outlet across the secondary conveying means as the secondary conveying means moves the articles away from the discharge assembly;
said means for moving said discharge assembly including a first means for moving predetermined range wherein articles from said chute outlet are deposited on said trough surface and second means for moving said discharge assembly in cooperation with said first means reciprocatively outside of said first predetermined range through a second predetermined range, said second predetermined range having at least one extreme of travel wherein said chute outlet is situated to deposit conveying articles outside of said trough conveying surface.

4,842,125
APPARATUS FOR TRANSPORTING STACKS OF PAPER SHEETS AND THE LIKE
Alfred Besemann, Hamburg, Fed. Rep. of Germany, assignor to E.C.H. Will GmbH, Hamburg, Fed. Rep. of Germany
Filed Mar. 30, 1988, Ser. No. 175,162
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1987, 3711584
Int. Cl.[4] B65G *47/26, 43/00, 47/22*
U.S. Cl. 198—457 **14 Claims**

1. Apparatus for transporting commodities, particularly stacks of paper sheets and the like, comprising a first conveyor arranged to advance successive commodities in a first direction and having a discharge end; a second conveyor arranged to advance commodities in a second direction substantially at right angles to said first direction and having a receiving end; a transfer conveyor adjacent said discharge end and said receiving end and arranged to receive commodities from said first conveyor and to advance the commodities in one of said directions, said transfer conveyor comprising an endless foraminous band having an upper reach for reception of commodities from said first conveyor; means for intermittently driving said transfer conveyor in said one direction; and pneumatic lifting means activable to at least partially raise the commodities off said transfer conveyor, said lifting means comprising nozzles disposed beneath said upper reach of said endless foraminous conveyor and activatable to direct streams of compressed gaseous fluid upwardly through said upper reach while said driving means is deactivated.



4,842,126
AUGER FLIGHT SECTION
Allan R. McConnell, 255 Whiteswan Dr., Saskatoon, Saskatchewan, Canada (S7K 4M6)
Continuation of Ser. No. 62,698, Jun. 16, 1987, abandoned. This application Jan. 17, 1989, Ser. No. 298,292
Int. Cl.[4] B65G *33/32*
U.S. Cl. 198—666 **5 Claims**

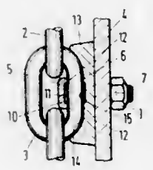


1. An auger comprising a shaft rotatable about a longitudinal axis thereof, a tube surrounding the shaft, a main flight section fixed to the shaft for rotation therewith to forward material along the tube and an inlet flight section separate from the main flight section, the inlet flight section comprising a sleeve portion having a generally cylindrical outer surface and an inner surface for directly surrounding and contacting the shaft, a helical flight mounted on said outer surface for rotation therewith about said longitudinal axis, said sleeve portion and said flight being integrally moulded from a rubber material, said inner surface having a cross section which is a circle having a single flat portion at one part of the circle arranged such that when engaging a corresponding cross section on said shaft it can receive torque therefrom communicated by coaction between the flat portion of the inner surface and a flat portion of the shaft up to a predetermined maximum and above said maximum allows slippage to occur between said shaft and said sleeve while said fixed connection between the said main flight section and the said shaft precludes slippage therebetween, and said helical flight is shaped in cross section such that it is symmetrical about a center line thereof extending outwardly from the sleeve portion and a thickness thereof increases from a thinner part remote from the outer edge to a thicker part at the outer edge with the outer edge being substantially flat and lying in the surface of an imaginary cylinder surrounding the sleeve portion, the thinner part being flexible to allow the flight to flex when engaging a rigid object.

4,842,127
CHAIN CONVEYOR

Hartwig Zenker, Aalen, Fed. Rep. of Germany, assignor to Rub-Kettenfabrik Rieger & Dietz GmbH & Co., Aalen, Fed. Rep. of Germany

Filed Jan. 19, 1988, Ser. No. 145,539
Claims priority, application Fed. Rep. of Germany, Jan. 30, 1987, 3703214
Int. Cl.[4] B65G *17/36*
U.S. Cl. 198—712 18 Claims



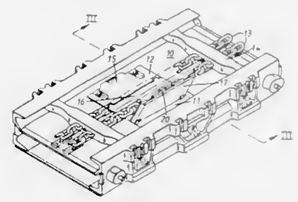
1. Chain conveyor comprising at least one chain strand having oval chain links, including round steel links, which can be driven by a toothed chain wheel, and having a single U-shaped connecting shackle having a curved portion (10) and two parallel arms (7) each of which having a thread at its end, said chain conveyor further comprising conveying members, including buckets, each of said buckets being screwed to said at least one chain strand by said connecting shackle, said connecting shackle enclosing a straight part of one leg of a chain link aligned perpendicularly to the rotational axis of the chain wheel, said chain conveyor further including a support guide bed formed by a component which is detachably connected by said connecting shackle to said conveying member whose base facing said conveying member is slightly concave, said straight part of said one leg resting in said support and guide bed, said support and guide bed defining a recess in the center region thereof, said connecting shackle having lateral support webs (12) limiting a recess (11) provided on the side of the curved portion (10) of the connecting shackle (5) which faces the straight part of said one leg of the chain link enclosed by the shackle (5), said lateral support webs (12) serving to transmit forces from the connecting shackles (5) to the leg (6) of the chain link enclosed by said shackle (5) to aid in preventing deformation of said chain link during operation of the conveyor.

4,842,128
INSPECTION LINE PANS

James E. Tomlinson, Barnsley, United Kingdom, assignor to Anderson Strathclyde PLC, United Kingdom

PCT No. PCT/GB87/00069, § 371 Date Nov. 16, 1987, § 102(e) Date Nov. 16, 1987, PCT Pub. No. WO87/04687, PCT Pub. Date Aug. 13, 1987
PCT Filed Feb. 2, 1987, Ser. No. 123,068
Claims priority, application United Kingdom, Feb. 5, 1986, 8602862
Int. Cl.[4] B65G *15/28*
U.S. Cl. 198—735 11 Claims

1. An inspection line pan having an opening (11) in the deck plate (10) thereof and a door (12) in said opening, characterized in that said door (12) comprising three panels (15, 16, 17) transversely disposed to each other, the centre panel (16) being supported on a slideway on the line pan for transverse movement and the two outer panels (15, 17) being pivotal on the centre panel (16) about the longitudinal sides thereof and supported, when horizontal, at their extreme outer sides by the line pan, each outer panel being pivotally liftable to allow inspection therebelow and to create a space into which the centre panel can slide transversely at that side of the line pan

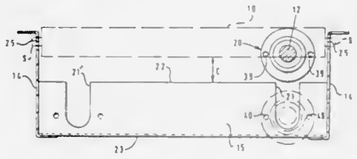


opening, for removal of the panels when repair is required below the line pan.

4,842,129
HOUSING AND BEARING ASSEMBLY FOR A LIVE ROLLER CONVEYOR

Edward W. Toye, Hereford; Leslie Bowen, deceased, late of Hereford; Janet R. Bowen, legal representative, Hereford, and Walter L. Danks, legal representative, Market Place Rowley Regis Warley West, all of United Kingdom, assignors to Conveyor Units Limited, Worcestershire, England

Filed Jul. 31, 1986, Ser. No. 891,964
Claims priority, application United Kingdom, Aug. 1, 1985, 8519381; Nov. 29, 1985, 8529488
Int. Cl.[4] B65G *13/02*
U.S. Cl. 198—790 10 Claims



1. A conveyor for transporting a plurality of articles comprising spaced parallel individually rotatable rollers, means for rotatably mounting said rollers to define a pass line extending along the length of said conveyor, the rollers extending between side frame members which are interconnected by cross braces, each cross brace having a downwardly extending slot which opens to the top of the cross brace, means for driving at least some of the rollers, said means for driving said rollers including a rotatable drive shaft and drive belts engaged with the drive shaft and the rollers to transmit drive from the drive shaft to the rollers, the drive shaft extending transverse to the rollers generally in the direction of said pass line, said shaft being mounted in said slot to extend generally perpendicularly to the cross brace for rotation in a series of bearing assemblies each dismountably supported by said cross brace beneath the rollers and above a surface containing the lowermost points of the cross braces, the mounting provided by each cross brace and bearing assembly, when the bearing assembly is dismounted from its respective cross brace, permitting a drive belt to be moved along the drive shaft from one side of the respective cross brace to the other side thereof.

4,842,130
BELT BENDER

Dennis Mraz, Saskatoon, Canada, assignor to D M Enterprises Inc., Saskatoon, Canada

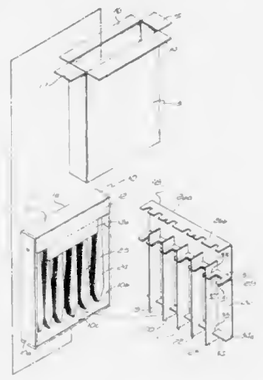
Continuation-in-part of Ser. No. 670,563, Nov. 13, 1984, abandoned, which is a continuation-in-part of Ser. No. 640,749, Aug. 14, 1984, abandoned. This application Jul. 22, 1985, Ser. No. 757,852
Int. Cl.[4] B65G *47/94*
U.S. Cl. 198—839 30 Claims

1. For use in a conveyor system such as employed in mining operations, a belt guidance arrangement comprising at least one pair of vertically spaced rollers, one of said rollers being mounted on a first frame and the other roller being mounted on a second frame swingable horizontally relative to said first frame, an endless belt wrapped about said pair of rollers so as to define a reach between said rollers which undergoes twisting generally about a longitudinal twist axis and is thereby subjected to transverse components of tension forces acting on opposite sides of said longitudinal twist axis upon horizontal swinging movement of said second frame relative to said first frame, means for mounting each of said rollers to be adjustable longitudinally of the direction of movement of the belt so as to balance the sum of the transverse components of tension forces acting on opposite sides of said longitudinal twist axis and thereby maintain stable training of the belt about said rollers.

4,842,131
COMBINATION DISPLAY STRUCTURE AND SHIPPING CARTON FOR NECKTIES OR THE LIKE

Andrew M. Mandelbaum, Beverly Hills, Calif., assignor to Superba, Inc., Los Angeles, Calif.

Filed Jul. 28, 1988, Ser. No. 225,861
Int. Cl.[4] B65D *5/32*
U.S. Cl. 206—45.15 14 Claims



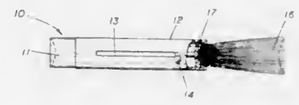
1. A combination shipping and display carton assembly for neckties or the like, comprising:
a generally rectangular open-faced first carton having a back panel opposite said open face, two side panels and a top panel hinged at its joint with said back panel;
a pair of first flaps attached to and extending upward, one from each of the tops of said side panels;
a pair of second flaps extending laterally outward one from the top end of each of said side panels;
a generally, outwardly, U-shaped framework for supporting a plurality of hanger bars to extend generally perpendicularly outward with respect to said back and within said inner carton, said framework including lateral sections nesting against said side panels adjacent the top of said inner carton, said first flaps being folded substantially 180 degrees downward over corresponding lateral sections of said framework and said second flaps being folded substantially 180 degrees inwardly over said first flaps;
and fastener means for joining each of said second flaps to the corresponding side panel.

10. A combination shipping and display carton assembly for neckties or the like comprising:
a generally rectangular open-faced carton having a back panel opposite said open face, two side panels and a top panel hinged at its joint with said back panel;
a framework anchored to the interior of said carton adjacent its top for providing a plurality of laterally spaced hanger rods for hanging a corresponding plurality of neckties or the like;
a retainer assembly inserted into said open face of said carton, said retainer assembly comprising a closure panel which fits into said carton open face to provide closure of said carton, said retainer assembly including a spaced plurality of generally vertically mounted baffles for providing lateral separation of columns of neckties hanging from said spaced hanger rods, said baffles being generally planar and mounted perpendicular to said closure panel;
means for mounting said baffles comprising a first 90 degree inward fold of said closure panel along a laterally extending line, a subsequent 180 degree outward fold of said closure panel and a second 90 degree fold of said closure panel into the unfolded plane of said closure panel thereby producing a double thickness inwardly extending rib having an inward dimension not exceeding the inside depth of said carton;
and means comprising a pattern of U-shaped slots into said rib, said slot alternately being of narrow width to friction grip said baffles placed therein and wider width to laterally contain said neckties at the location of relatively narrow necktie column width.

4,842,132
DEVICE AND KIT FOR CLEANING LENSES OF TELESCOPES, CAMERAS AND THE LIKE

Thomas L. Wells, Houston, Tex., assignor to Randalette, Inc., Houston, Tex.

Filed May 14, 1987, Ser. No. 50,090
Int. Cl.[4] A47L *13/12*
U.S. Cl. 206—229 7 Claims



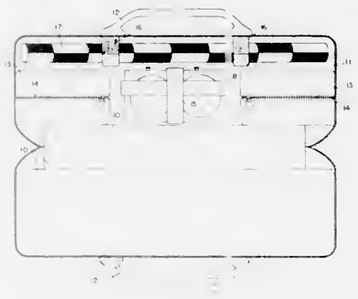
1. A device for cleaning convex lenses, comprising:
an elongated holder supporting tip means at one end thereof for transferring a cleaning force applied to said holder to said tip means and for distributing said force substantially uniformly over an outer surface of said lens, at least one surface of said tip means comprising symmetrically concave and resilient means for applying disposable cleaning means to substantially all of the outer surface of a recessed, convex lens; and
brush means supported at another end of said elongated holder for removing particulate matter from said convex lenses.

4,842,133

CHESS EQUIPMENT CARRYING BAG

Beverly C. LaBarge, and Daniel C. LaBarge, both of 183 Lake Ave., Saratoga Springs, N.Y. 12866

Filed Mar. 29, 1988, Ser. No. 140,599
Int. Cl.[4] A45C *11/00, 13/30*
U.S. Cl. 206—315.1 4 Claims



1. A chess equipment carrying bag comprising hollow, rectangular first and second fabric casing sections, said casing sections each including a rectangular peripheral side wall defined by opposed end portions and opposed front and back portions, said hollow first section being of less depth than said second section, said second section connected to said first section by a zipper means, said hollow second section including zippered pockets at each end portion thereof for holding chess pieces, attachment means located between said zippered pockets for holding a chess clock, and holding means for storing a rolled up fabric chess board located above said zippeed pockets adjacent said front portion.

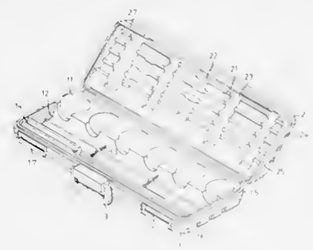
4,842,134

CASE FOR CROQUET EQUIPMENT

Mao J. Chang, No. 32, 267 South Lane, Sec. 2, Tien Hsin Road, Feng Yuean City, Taichung Hsien, Taiwan

Filed Sep. 6, 1988, Ser. No. 240,933
Int. Cl.[4] B65D *81/20*
U.S. Cl. 206—315.1 1 Claim

1. A case for croquet equipment, which is substantially rectangular, comprising a lower case section and an upper case section, on each outer surface of said case sections, a plurality of symmetrical grooves being disposed; said case sections being moulded integrally to form a hinge at one side and a handle arranged on the opposite side of said lower case section; two locks being set at each side of said handle; in said upper case section, a plurality of concave elements, U-shaped recesses and protrusions being moulded; in said lower case section, a plurality of sockets, recesses and semicircular recesses being



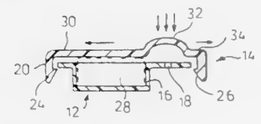
moulded; two projections being provided on the outer surface of said upper and lower case section.

4,842,135

CARRIER TAPE AND COVER APPLYING AND REMOVAL DEVICES FOR SAME

Herbert A. Borst, West Nyack; Zdenek MacHacek, Nanuet; Ernest Schnittger, Suffern, all of N.Y.; Richard D. Schulte, Niles, Ill.; Richmond Scott, Pleasantville, and Paul A. Tilman, New City, both of N.Y., assignors to Illinois Tool Works Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 8,293, Jan. 29, 1987, which is a continuation-in-part of Ser. No. 913,131, Sep. 25, 1986. This application May 4, 1987, Ser. No. 46,259
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—328 7 Claims



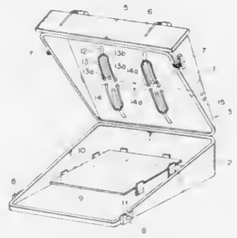
1. A carrier tape comprising:
an elongated base strip;
an elongated cover strip formed of a resilient plastic material substantially coextensive in length with said base strip, said cover strip having a top surface and opposed sidewalls extending downwardly from the top surface and spaced apart from each other a distance substantially equal to the width of said base strip and cooperating to secure said cover strip to said base strip, and a hump coextensive with said cover strip extending longitudinally, parallel to said sidewalls, projecting upwardly from the top surface, whereby when said hump is depressed said sidewalls move outwardly, away from each other to release said cover strip from said base strip.

4,842,136

DUST-PROOF CONTAINER HAVING IMPROVED CONSTRUCTION FOR HOLDING A RETICLE THEREIN

Hirosbi Nakazato, Ohme, and Mamoru Iijima, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1988, Ser. No. 154,308
Claims priority, application Japan, Feb. 13, 1987, 62-029803; Feb. 13, 1987, 62-029804; Feb. 13, 1987, 62-029805
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—328 3 Claims



1. A dust-proof container, comprising:
a casing for keeping therein a reticle, said casing having an opening for allowing insertion and extraction of the reticle therethrough;
a door pivotably supported by said casing and being adapted to cover said opening;
a plate-like spring member cantilevered in said casing, said spring member being operable to press the reticle to hold the same within the casing;
a releasing member cantilevered in said casing so as to be related to said spring member, said releasing member being comprised of a shape-memory alloy that is deformable, in response to supply of a predetermined electric energy, in a direction effective to separate said spring member from the reticle, and
a connection terminal provided on said casing through which electric energy may be supplied to said shape-memory alloy releasing member.

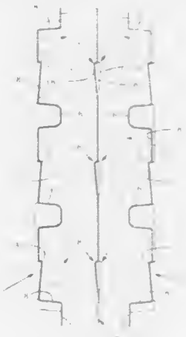
4,842,137

HIGH DENSITY MAGAZINE FOR ELECTRICAL CONNECTORS

Robert E. Gallagher, Sr., Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 31, 1988, Ser. No. 238,953
Int. Cl.[4] B65D *73/02*
U.S. Cl. 206—328 10 Claims

1. A high density magazine for electrical connectors, comprising:
a pair of identical outer members, each having a cavity defined by at least a base wall and opposing side walls and a longitudinally extending shoulder projecting outwardly from said base wall, said shoulder being parallel to, spaced from and facing one sidewall; and
a sheet of material providing a center member having a size about equal to the length and width of said outer members and having a plurality of spaced apart segments extending towards opposite ends of said sheet and projecting outwardly from each surface, each segment defining a shoulder with said shoulders on each surface being normal thereto and at the same distance from and facing a given edge of said sheet, said magazine formed by joining the two outer members to opposite surfaces of the center member with the respective cavities facing the center member so that the shoulder in each cavity cooperates



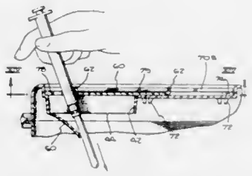
with a plurality of shoulders on a facing surface of the center member to thereby provide supports for electrical connectors on both sides of the center member.

4,842,138

RIGID DISPOSABLE CONTAINER FOR HOLDING AND DISPENSING OF USED MEDICAL SHARPS AND OTHER MEDICAL-SURGICAL MATERIALS

Dan Sandel, Tarzana, and Mike Hoftman, Northridge, both of Calif., assignors to Devon Industries, Inc., Chatsworth, Calif.

Continuation of Ser. No. 838,296, Mar. 10, 1986. This application Mar. 10, 1988, Ser. No. 169,172
Int. Cl.[4] B65D *83/10*
U.S. Cl. 206—370 17 Claims



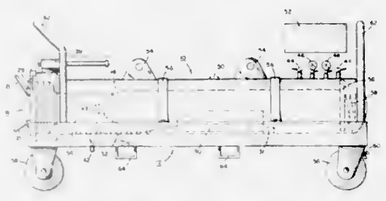
1. A rigid container for holding and disposing of used surgical sharps and other medical-surgical materials, comprising:
enclosure means for rigidly enclosing a space to contain said disposed medical-surgical materials, wherein said enclosure means further comprises a first part having an open top and faster means disposed thereon; and a second part having an open bottom and fastener means disposed thereon to engagably-mate and fasten with said first part to form said rigidly enclosed space, said enclosure means having at least one aperture therethrough to permit the passage of said materials into said space; and
one-way barrier means at said at least one aperture to permit the insertion of said medical-surgical materials therethrough into said space and to prevent the passage of said materials therefrom, said barrier means comprising rigid flap means disposed substantially across a portion only of said aperture to form a barrier hingably-attached at one edge to said enclosure means and so disposed to hinge inwardly to said space when displaced by said insertion of said medical-surgical materials therethrough and to return to said normally-closed position otherwise; wherein:
said aperture for the passage of said medical-surgical materi-

als therethrough has an area slightly larger than the area of a transverse plane through an average human hand; and

said flap means further includes a leaf molded into said enclosure at said aperture along one edge of said leaf to extend substantially entirely across said aperture in a direction parallel to said edge and only partially across said aperture in a direction perpendicular to said edge such that said leaf blocks a portion only of said aperture; and such that said leaf blocks a portion only of said aperture; and

closure means are provided in addition to said barrier means attached to said enclosure means to close at least one aperture against the further insertion or removal of said medical-surgical materials therethrough.

4,842,139
CYLINDER CONTAINMENT VESSEL
Adrian H. Krieg, 119 Maplevale Dr., Woodbridge, Conn. 06525
Filed Apr. 5, 1988, Ser. No. 177,922
Int. Cl.[4] B65D *81/18 88/06*
U.S. Cl. 206—386 10 Claims



1. A containment vessel system for a fluidcontaining cylinder, comprising:

(a) a horizontally disposed cylindrical tank having a bore sized to accommodate therein said cylinder;

(b) closure means at one end of said containment vessel, which closure means can be opened to insert said cylinder in said containment vessel and which can be closed to seal said containment vessel to prevent the escape therefrom of fluid which may leak from said cylinder; and

(c) means upon which said cylinder is axially adjustably disposed to prevent said cylinder from moving radially with respect to said containment vessel.

4,842,140
NOVELTY MAILER
Curtis L. Mesnard, 4118 59th St., West, Bradenton, Fla. 33529
Filed Nov. 18, 1987, Ser. No. 122,213
Int. Cl.[4] G09F *3/00*; B65D *79/00*
U.S. Cl. 206—457 3 Claims

1. A novelty mailer comprising:

a relatively thin-wall, substantially transparent, molded plastic, shatterproof container having a generally flattened shape to facilitate mailing;

an opening into the interior of said container disposed at one end thereof;

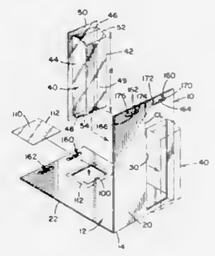
said opening forming a neck and sized to be relatively small compared to said container, whereby a bottle appearance is achieved;

decorations and a means for transmitting a message located in the interior of said container;

a closure means for releasably closing said opening after decorations and a message have been deposited into said container thus rendering said closed container mailable;

label means connectable onto said container adapted to receive written indicia identifying an addressee.

4,842,141
PACKAGE FOR A NUMBER OF PRODUCTS AND METHOD OF USING SAME
William J. Segal, Torrance, Calif., assignor to Mr. Gasket Company, Cleveland, Ohio
Filed Mar. 31, 1988, Ser. No. 176,214
Int. Cl.[4] B65D *75/56*
U.S. Cl. 206—462 4 Claims



I. A method of displaying several packages of consumer products on a single cantilever hang fixture having a pair of parallel spaced support arms extending form a support wall horizontally outwardly, said method comprising the steps of:

(a) providing a generally flat reversible package comprising a front sheet and a back sheet adhered together back-to-back to form a composite, substantially planar display panel having a generally flat front surface and a generally flat back surface, said display panel lying in a plane adapted to be vertical when said package is hung on the said fixture, said front surface having a vertically extending center line dividing said front surface into side-by-side first and second display segments, a self-sustaining blister container formed from transparent plastic, said blister container having a total volume for housing N products in side-by-side relationship and secured on said first display segment extending from said front surface a distance generally corresponding to said height of one of said products and occupying a given area of said first segment, rear vision access means for allowing observation of at least one of said products in said container from said back surface, and a hanging aperture formed at the top of said package, generally at the center of gravity of the loaded said package;

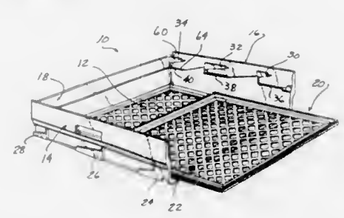
(b) placing a first of said packages on said fixture with said front surface facing away from said support wall;

(c) placing a second of said packages on said fixture with said front surface facing toward said support wall to nest with said first package; and,

(d) continuing said steps (b) and (c) to produce a number of nested first and second packages on said cantilever fixture.

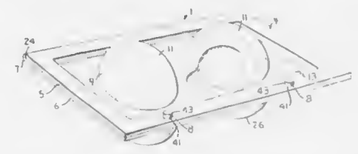
2. A generally flat reversible package for shipping and displaying, in either of two reversed positions of the package on a hang fixture having a pair of horizontally extending and spaced apart parallel support arms, a finite number (N) of like consumer products each having a circumventing volume with the same given dimensions of length, width and height, said package comprising a front sheet and a back sheet adhered together back-to-back to form a composite, substantially planar display panel having a generally flat front surface and a generally flat back surface, said display panel lying in a plane adapted to be vertical when said package is hung on said fixture, said front surface having a vertically extending center line dividing said front surface into side-by-side first and second display segments, a self-sustaining blister container formed from transparent plastic, said blister container having a total volume for housing N products in side-by-side relationship, means securing said blister container on said display panel in a position extending outwardly from the said front surface thereof and located entirely within the profile of said first display segment and projecting outwardly from the said front surface on said display panel a distance generally corresponding to said height of said circumventing volume of each respective one of said products, rear vision access means for allowing observation of at least one of said products in said container from said back surface, and a pair of hang apertures through said package at a position generally vertically above said container and located within respective ones of said first and second display segments, with the one of said hang apertures located within said first display segment being vertically aligned with the center of gravity of the loaded package and the two said hang apertures being horizontally spaced apart a distance matching the spacing of said pair of support arms and symmetrically located with respect to the said center line of said package.

4,842,142
OPEN-FRONT, TWO-LEVEL STACKING CONTAINER
Elsmer W. Kreeger, Howell, Mich., assignor to Pinckney Molded Plastics, Inc., Howell, Mich.
Filed Dec. 21, 1987, Ser. No. 135,589
Int. Cl.[4] B65D *21/00*
U.S. Cl. 206—505 13 Claims



1. An open-top, open-front container comprising a rectangular bottom, opposed side walls and a rear wall projecting upwardly from the opposed side edges and the rear edge of said bottom, said side walls each comprising a main web, a plurality of stacking feet mounted on the outer side of said main web at spaced locations along the lower edge of said main web, a like plurality of horizontally aligned open upper support shelves located at spaced locations along the upper edge of said main web in respective vertical alignment with said stacking feet, a stacking foot receiving opening including an access opening extending downwardly into said main web forwardly of each of said upper support shelves and an undercut opening extending rearwardly from the access opening beneath each upper support shelf for essentially the entire length of the upper support shelf and terminates in a rearwardly-oriented bulkhead, means at the lower edge of each undercut opening defining a lower support shelf vertically aligned with and spaced below the overlying upper support shelf, a first locking slot extending vertically downwardly into the lower edge of the forwardmost access opening, a vertically extending first locking web on the bottom of the forwardmost stacking foot in vertical alignment with said locking slot, a second locking a slot extending vertically downwardly into the rearwardmost upper support shelf at an essentially central location therein, a vertically extending second locking web on the bottom of the rearwardmost stacking foot in vertical alignment with said second locking slot, the first locking webs of a first container being adapted to be received within the first locking slots of a second like container when the stacking feet of the first container are supported on the lower shelves of the second container to lock the first and second containers against forward and rearward displacement relative to each other, and the second locking webs of said first container being adapted to be received in the second locking slots of the second container when the stacking feet of the first container are supported on the upper shelves of said second container to lock said first and second containers against forward and rearward displacement relative to each other.

4,842,143
DEVILED EGG CONTAINER
John W. McKee, Sr., 1918 - 4th St., and John W. McKee, Jr., 503 Blunt St., both of Clay Center, Kans. 67432
Filed Mar. 22, 1988, Ser. No. 171,890
Int. Cl.[4] B65D *43/16*
U.S. Cl. 206—521.1 6 Claims



1. A deviled egg container for housing deviled eggs in their prepared shape which comprises:

(a) a lower plate having therein a first formed portion approximately having a shape of one-half of an egg white bisected along a major axis thereof for containing a white portion of a deviled egg;

(b) an upper plate having therein a second formed portion approximately having a shape of a deviled yolk that extends above the white portion of a deviled egg for containing a yolk mixture of a deviled egg; said second formed portion being smaller in cross-section than said first formed portion, whereby when placed in abutting and facing relationship to one another, said first and second formed portions and form an egg white abutting shoulder therebetween;

(c) plate alignment means for centering said second formed portion over said first formed portion when in use containing a deviled egg and when in a closed portion such that a deviled yolk portion of an egg is in said first formed portion, an egg white portion is in said second formed

portion and the egg white abuts against and is retained in position by said shoulder; and

(d) fastening means for releasably holding said upper and lower plates together when in a closed position thereof.

4,842,144

GRAIN SORTER FOR USE IN A ROTARY TYPE RICE HULLING AND SORTING DEVICE

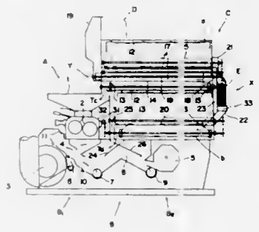
Satoru Yahashi, Nangoku, Japan, assignor to Seirei Industry Company Limited, Okayama and Yanma Agricultural Equipment Company Limited, Osaka, both of, Japan

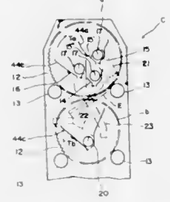
Filed Jan. 25, 1983, Ser. No. 460,990

Claims priority, application Japan, Jan. 28, 1982, 57-10926[U]

Int. Cl.⁴ B07B *13/04*

U.S. Cl. 209—44.1 3 Claims





1. A grain sorter for use in a rotary type rice hulling and sorting device comprising:

a hulling part;

a pneumatical sorting part;

a rotary sorting part, said rotary sorting part being constructed with rotatably mounted sorting cylinders having a large number of recesses on an inside peripheral surface thereof and troughs therein;

wherein said pneumatical sorting part communicates with a feeding side of said sorting cylinders through a hulled rice-conveying path and a discharging side of said sorting cylinders communicates with said hulling part through a hull-conveying path,

one of said cylinders including a group of said troughs having a finished sorted rice-receiving trough for taking out a portion of sorted rice grains and a rice grain to be resorted-receiving trough for taking out a mixture of husks and rice grains to be resorted, said group of said troughs being installed parallel and adjacent to each other so that said finished sorted rice-receiving trough can be arranged in an upper region along a direction of rotation of said cylinder;

an adjusting plate pivoted at its lower end being provided between both said troughs so that its inclined posture can be freely changed; and

said finished sorted rice-receiving trough communicating with a taking-out path to a side opening of the device while said rice grain to be resorted-receiving trough communicates with a resorting path within the device.

4,842,145

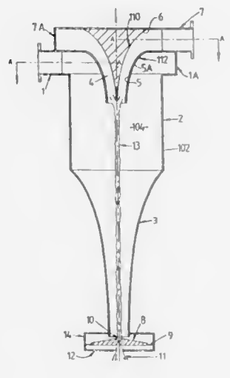
ARRANGEMENT OF MULTIPLE FLUID CYCLONES

John D. Boadway, Kingston, Canada, assignor to B.W.N. Vortoil Rights Co. Pty. Ltd., Danenong, Australia

Continuation-in-part of Ser. No. 854,716, Apr. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 661,455, Oct. 16, 1984, abandoned, which is a continuation of Ser. No. 473,479, Mar. 9, 1983, abandoned, which is a division of Ser. No. 275,987, Jun. 22, 1981, Pat. No. 4,389,307. This application Aug. 25, 1987, Ser. No. 89,262

Int. Cl.⁴ B04C *5/13, 5/181*

U.S. Cl. 209—144 13 Claims



1. A fluid cyclone having an upper cylindrical end portion with an inlet thereto and outlet therefrom, each of which is tangential to said cylindrical portion, said cylindrical portion merging into a lower conical portion with tapers inwardly towards a cone plate means positioned directly beneath but spaced from a reject outlet in the lower end of said lower portion, the improvement comprising vortex finder means defining an uninterrupted annular outlet passage, having an axially extending portion and a radially extending portion, said passage gradually increasing in cross sectional flow area, from an axial inlet of said vortex finder means, which inlet is located in the cylindrical portion of the cyclone, said passage extending upwardly from said axial inlet toward said tangential outlet without any constriction from said axial inlet to said tangential outlet and said radially extending portion of said passage merging smoothly into said tangential outlet, said vortex finder means defining said outlet passage comprising an inner core cone and an outer core cone spaced apart from one another, said space defining said annular outlet passage the inlet to said annular passage being disposed co-axially with said cylindrical portion of the cyclone, and originating at the end of said inner cone closest to said lower conical portion of said cyclone and the length of the axially extending portion of the outlet passage being sufficiently long relative to the radially extending portion thereof so as to produce a gradual transition of velocity energy into pressure energy and thereby avoiding vortex instability in said outlet passage.

4,842,146

PULSATOR FOR ENRICHING, PARTICULARLY HARD COAL

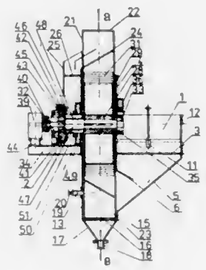
Boleslaw Jondro, Zabrze; Jan Janik, Gliwice, and Herbert Pyka, Ruda, all of Poland, assignors to Zabrzanskie Gwarectwo Weglowe Kopalnia Wegla Kamiennego "Zabrze-Bielszowice" , Poland

Continuation of Ser. No. 863,037, May 14, 1986, abandoned. This application Jan. 11, 1988, Ser. No. 142,262

Claims priority, application Poland, Nov. 6, 1984, 250329; Nov. 6, 1984, 250330

Int. Cl.⁴ B03B *5/12, 5/24*

U.S. Cl. 209—455 18 Claims



1. A pulsator for enriching, particularly, hard coal, comprising a working trough, a screen deck dividing said working trough into an upper part and a lower part, a first chute at one side of said trough for useful mineral, a second chute at another side of said trough for receiving enriched useful mineral, a float in said trough for regulating the thickness of a layer of heavy products on the screen deck, a cylindrical pulsation compartment connected to said trough and separated from said trough by a wall, a hoisting wheel disposed in said pulsation compartment, a drive shaft for said hoisting wheel, bearings for said drive shaft disposed above a liquid level in said working trough, and a displacer comprising a bracket mounted on said drive shaft and disposed in said pulsation compartment.

4,842,147

METHOD AND APPARATUS FOR CONDUCTIVE FILM DETECTION

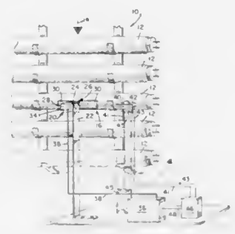
William E. Carl, and Ronald W. McGohon, both of Versailles, Ky., assignors to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 327,340, Dec. 4, 1981, Pat. No. 4,779,739. This application Feb. 29, 1988, Ser. No. 161,519

The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.

Int. Cl.⁴ B07C *5/344;* **G01R** *31/24*

U.S. Cl. 209—575 13 Claims



1. Apparatus for detecting the conductivity of a conductive film enclosed within a nonconductive member comprising;

means for supporting the nonconductive member at an inspection station,

proximity switch means,

means for supporting the proximity switch means at the inspection station and spaced from the nonconductive member,

said proximity switch means comprising a capacitive proximity sensor having a single conductive element spaced from the conductive film and including means responsive to measured capacitance therebetween for generating a sensor signal representative of measured capacitance,

control means including means for reading said sensor signal, and

reject means responsive to said means for reading for rejecting nonconductive members having a conductivity less than a predetermined conductivity.

4,842,148

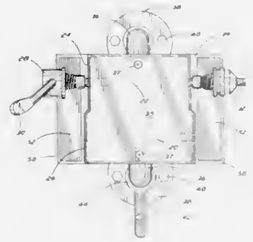
QUICK RELEASE BICYCLE RACK

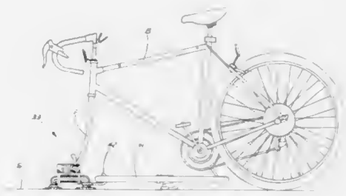
Tracy L. Bowman, 2848 Auburn Blvd. #2, Sacramento, Calif. 95821

Filed Feb. 23, 1988, Ser. No. 159,103

Int. Cl.⁴ B60R *9/10*

U.S. Cl. 211—18 9 Claims





2. A quick release bicycle rack, comprising:

base means;

a generally U-shaped pivot rod on said base means for mounting said base means on a planar surface;

mounting block means on said base means;

cylindrical bore means extending through said mounting block means; and

quick release clamping spindle means extending through said cylindrical bore means.

4,842,149

PITCHER DISPENSER

Curtis G. Vining, Milwaukee, Oreg., assignor to Curtis G. Vining, Portland, Oreg.

Filed Sep. 22, 1986, Ser. No. 909,904

Int. Cl.⁴ A47F *1/00*

U.S. Cl. 211—59.2 3 Claims

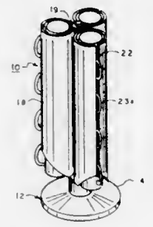
1. A rack for holding a plurality of pitchers of the type

having a general cylindrical body with a pouring spout extending laterally therefrom and a handle extending laterally from the side of said body opposite said pouring spout the combination comprising a vertically disposed rigid tube having an open top end and an open bottom end,

said tube having an internal cross-sectional size which is greater than the maximum cross-sectional size of said body and said spout,

said tube having a vertical slot extending from said top and to said bottom end,

the width of said slot exceeding the maximum thickness of said handle to permit said handle to move freely up and down said slot as the associated one of said pitches is moved up and down in said tube and being less than the diameter of said body portion of said pitcher, and



ledge means in proximity to said bottom end of said tube providing a shoulder located opposite to said slot for engaging only an arcuate portion of said bottom of said tube for engaging the spout of a pitcher disposed in said tube to retain said pitcher in said tube,

the bottom portion of said slot being flared outward to an angular distance of about 180 degrees;

said flared portion of said slot having a vertical length substantially less than the height of each of said pitchers, and

said tube being internally dimensioned to permit the lowermost pitcher to be cocked a sufficient amount within said tube so as to be removed from said tube through said flared out portion of said slot when said lowermost pitcher is lifted in said tube off of said ledge.

4,842,150

APPARATUS FOR STABILIZING THE LOAD OF A CRANE OR THE LIKE

Tomislav Potocnjak, Lauffen/Neckar, Fed. Rep. of Germany, assignor to TEPORA Transportsysteme Entwicklings-GmbH, Lauffen, Fed. Rep. of Germany

Filed Mar. 25, 1988, Ser. No. 173,277

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1987, 3709960

Int. Cl.[4] B66C *13/06*

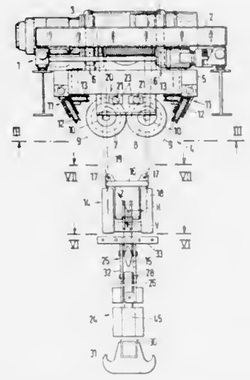
U.S. Cl. 212—147 **15 Claims**

1. An apparatus for installation on an existing crane or the like to stabilize against swinging of a load carried thereby, with said crane including a support structure that can be raised or lowered by a lifting mechanism of a movable carriage of the crane, said apparatus comprising:

a guide mechanism that is connected only to said carriage of the crane and includes: guide means; guide cables that are connected with one end thereof relative to said support structure adjustable in height thereby and extend in a diverging manner from the latter to said guide means in such a way as to essentially form the shape of an upside-down pyramid, with said guide means defining the base of said pyramid; and at least one cable drum to which said guide cables, coming from said guide means, are fixed for winding and unwinding said guide cables, with said at least one cable drum being provided with spring-wound motor means for keeping said guide cables taut;

a locking mechanism to prevent said at least one cable drum from unintentionally winding and unwinding said guide cables,

said at least one cable drum being provided with tooth means, said locking mechanism including locking pin means adapted to engage said tooth means and adapted to



be withdrawn from said tooth means to permit winding and unwinding of said guide cables,

said carriage including a carrier that supports a frame structure on which said at least one cable drum and said locking mechanism are disposed.

4,842,151

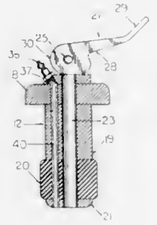
PRESSURIZING CLOSURE APPARATUS FOR A CARBONATED BEVERAGE BOTTLE

Stephen T. Scott, 9030 Jamacha Blvd., Spring Valley, Calif. 92077

Filed Jul. 25, 1988, Ser. No. 223,940

Int. Cl.[4] B65D *51/24*

U.S. Cl. 215—228 **4 Claims**



1. A pressurizing closure apparatus for closing the opening in a bottle that contains a carbonated beverage or the like comprising in combination:

a closure plug assembly for removable engagement in the opening of said bottle comprising an elongated cylindrically shaped shank portion having a top end and a bottom end, a top cap portion connected to the top end of said shank portion, a cylindrically shaped pressure seal plug located adjacent the bottom end of said shank portion, a compression cap located adjacent the bottom end of said pressure seal plug, an elongated shaft passing vertically through aligned apertures in said top cap portion, said shank portion and said pressure seal plug, the bottom end of said shaft fixedly captured by said compression cap, the top end of said shift having a pin passing laterally therethrough, cam lever means pivotally connected to said pin for laterally expanding said pressure seal plug in the opening in said bottle, a one-way valve unit having a top end and a bottom end, the bottom end of said one-way valve unit being removably received in a recess formed in the top surface of said top can portion, air passage means connecting the bottom end of said one-way valve unit with the bottom end of said compression cap;

a female quick disconnect coupling having a first female end detachably connected to the one-way valve unit of said closure plug assembly; and

an air pumping unit having a first end and a second end, said first end being detachably connected to one end of said female quick disconnect coupling.

4,842,152

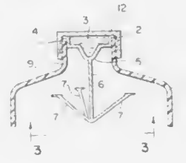
SPILL PROOF PLUG

James E. Donegan, Rte. 1, Box 97, Aldie, Va. 22001

Filed Jun. 16, 1988, Ser. No. 207,657

Int. Cl.[4] B65D *55/16*

U.S. Cl. 215—294 **8 Claims**



1. A one piece spill proof plug adapted to fit tightly within the neck of a container which comprises,

a plug member and a stem member extending therefrom,

one end of said stem member being connected to said plug member, and

the other end of said stem member being provided with retainer members which extend upwardly therefrom in a configuration larger than said neck portion of a container, whereby as the plug member is being inserted into said neck portion of a container said retainer members are compressed but then expand within said container such that when pressure is applied to the outside of said container, the plug is forced from the neck of the container to open the container but is held to the container by of the retainer member.

4,842,153

BIOLOGICAL PRODUCT SHIPPING TUBE

Walter C. Hulon, P.O. Box 40745, Baton Rouge, La. 70835

Filed Apr. 4, 1988, Ser. No. 176,857

Int. Cl.[4] B65D *59/00*

U.S. Cl. 215—365 **20 Claims**

1. A biological product shipping tube comprising:

a first tubular section having a closed end, said first tubular section defining the bottom portion of said shipping tube;

a second tubular section integrally connected to said first tubular section, said second tubular section having a non-tapered exterior, the interior of said first tubular section communicating with said second tubular section;

a collar formed at the end of said second tubular section opposite said first tubular section, said collar having a greater outer diameter than said second tubular section, said collar having a first flat chordal edge on one side of said collar and a second flat chordal edge on the side of said collar opposite said first flat chordal edge; and

closure means formed at the other side of said collar from said second tubular section, said closure means for sealing the interior of said shipping tube.

4,842,154

APPARATUS FOR UNDERWATER WORKING

Ensi K. J. Niinivaara, Koria, Finland, assignor to OY GSS General Sea Safety Ltd., Helsinki, Finland

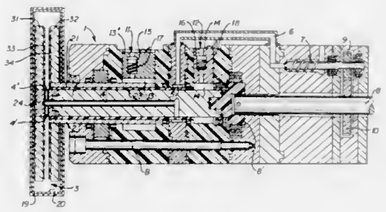
PCT No. PCT/FI86/00085, § 371 Date May 15, 1987, § 102(e) Date May 15, 1987, PCT Pub. No. WO87/00698, PCT Pub. Date Jan. 29, 1987

PCT Filed Jul. 23, 1986, Ser. No. 44,842

Claims priority, application Finland, Jul. 24, 1985, 852876

Int. Cl.[4] B23K *9/00*

U.S. Cl. 219—136 **10 Claims**



1. An apparatus for underwater work, such as heating, welding, torch cutting, cleaning and electrolytic coating of a metal workpiece, the apparatus comprising an electrically conductive rotatable shaft (2) mounted on a frame element (1), said shaft adapted to conduct electric current to a removable tip element (3) attached to the end of shaft (2) for rotation therewith, said tip element including means in the form of a heating bushing, welding electrode, cutting, cleaning and/or coating disk, the shaft (2) further comprising an outer shaft element (21) and an inner shaft element (22) nesting concentrically, within each other and insulated electrically from each other, the frame element (1) having two chambers (13, 14) formed therein and containing liquid electrically conductive medium, one of said chambers (13 or 14) adapted to be connected to a "+" pole of a power source to establish electrical contact with one of the outer and inner shaft elements (21 or 22), and the other of said chambers (13 or 14) is adapted to be connected to a "−" pole of a power source to establish electrical contact with the other one of the outer and inner shaft elements, and wherein the tip element (3) is electrically conductive and comprises two parts, including a first part (31) electrically connected with one of the outer and inner shaft elements (21 or 22) and a second part (32) electrically connected with the other of the outer and inner shaft elements (22 or 21) and wherein

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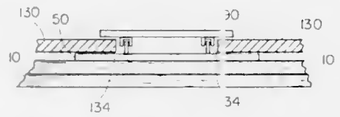
said two chambers (13, 14) containing said liquid electrically conductive medium are each provided with pressure balancing means communicating with an exterior portion of said frame element (1) and with said conductive medium for establishing a pressure in said conductive medium equal to a hydrostatic pressure acting on the exterior of said frame element when the apparatus is submerged in water.

4,842,155

MOUNTING APPARATUS FOR ELECTRICAL DEVICES

John R. Begin, Jr., 109 Longview Ave., Hackensack, N.J. 07601

Filed Jun. 1, 1987, Ser. No. 55,832
Int. Cl.[4] H02G 3/08
U.S. Cl. 220—3.6 **8 Claims**



1. Mounting apparatus for an electrical device in a wall which is to have siding applied thereto comprising

a first plate adapted to be secured to a wall to be sided, said wall containing an electrical outlet box and an electrical outlet,

said first plate having a top surface and a bottom surface,

a first wall means rising from said top surface of said first plate,

a second plate adapted to be coupled to said first plate, said second plate having a top surface and a bottom surface, and

a second wall means extending downwardly from said bottom surface of said second plate,

said first wall means and said second wall means including structure which permits them to form a tight mechanical fit with each other when said first plate is coupled to said second plate to form a unitary assembly,

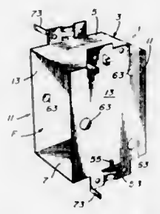
said first and second walls including aligned opening which are adapted to receive said electrical outlet for mounting to the unitary assembly of said first wall one of said wall means comprising a single wall and the other of said wall means comprising a pair of closely spaced walls and said second wall.

4,842,156

ELECTRICAL OUTLET BOX WITH LOCATING FINGERS

William Nattel, Montreal, Canada, assignor to Commander Electrical Materials, Inc., Saint-Jean-sur-Richelieu, Canada

Filed Mar. 18, 1988, Ser. No. 170,263
Int. Cl.[4] H02G 3/08
U.S. Cl. 220—3.9 **3 Claims**



1. A metallic knockdown, electrical outlet box having:

a U-shaped plate forming top, bottom and back walls of the box;

two side plates, the side plates forming side walls of the box;

means detachably connecting each side plate to the U-shaped plate to close an open side of the U-shaped plate;

each side plate having a rectangular main body with first and second ends and front and back sides;

at least one of the plates having a first extension extending longitudinally from the main body at its first end, and a second extension extending longitudinally from the main body at its second end such that the first extension and the second extension extend beyond the top and bottom walls of the box;

a locating finger initially projecting from each extension toward the front side of the main body, generally parallel to the ends of the main body,

each finger being bent along a bend line extending parallel to the front side of the main body to extend outwardly, transversely from the main body and said locating finger on said second extension being spaced outwardly of said second end of said side plate main body.

4,842,157

RETAINER FOR DRINKING CONTAINER

Elaine W. Stone-Parker, and John J. Stone-Parker, both of 1971 Spear St., South Burlington, Vt. 05403

Filed Sep. 4, 1987, Ser. No. 92,941
Int. Cl.[4] A47G 19/22
U.S. Cl. 220—90.4 **16 Claims**

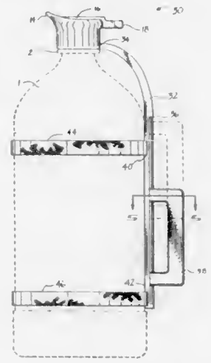
1. In combination, a drinking container having generally upright sides and a retainer device therefor, said device extending generally horizontally across the container and comprising a solid central portion and at least three resilient arms extending radially outwardly from the central portion, said central portion located at the center of the container, and said resilient arms extending radially outwardly from the central portion into engagement with the inside wall of the container, said arms resiliently engaging the inside wall of the container so as to retain the device in the container in a generally horizontal orientation, extending across the inside of the container at a height between the bottom and the top of the container, the resiliency of the arms being sufficient to allow them to retain the device over a limited range of inside diameters of the container, the central portion having a diameter between the arms of no more than 75 percent of the diameter of a circle formed by the outer tips of the resilient arms, and the arms themselves being sufficiently spaced apart that the space formed between adjacent arms, an adjacent edge of the central portion and an adjacent portion of the inside wall is small enough to retain relatively large objects such as ice cubes and the like when the container is tilted for drinking or pouring of its liquid contents and large enough to allow the free flow of liquid therethrough.

4,842,158

CONTAINER HANDLE ATTACHMENT

Ruben Reyes, Jr., 5757 S. Staples Apt. 2816, Corpus Christi, Tex. 78413

Filed Feb. 19, 1988, Ser. No. 157,953
Int. Cl.[4] B65D 23/10, 83/14
U.S. Cl. 220—94 R **1 Claim**



1. A container handle attachment, comprising:

internally threaded spout means;

pivotal closure means on said spout means;

an elongated handle mounting bar having a first end integrally formed with said spout means;

a pair of elongated grooves extending along opposite side walls of said mounting bar;

a generally U-shaped handle having a pair of free ends each provided with a "T"-slot groove forming opposed inwardly extending ribs received for sliding movement in said mounting bar side wall grooves;

a pair of spaced transverse slots in said mounting bar;

an elongated strap extending through each of said transverse slots; and

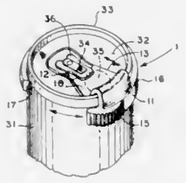
a pair of elongated straps, each extending through one of said transverse slots, and each having opposite ends provided with cooperating hook and loop fasteners for securing said straps around a container.

4,842,159

TEMPORARY CLOSURE FOR BEVERAGE CAN

Dennis A. Heidrich, 174 Mac Arthur La., Erlanger, Ky. 41018

Filed Aug. 22, 1988, Ser. No. 234,563
Int. Cl.[4] A47G 19/22
U.S. Cl. 220—90.4 **16 Claims**



1. A closure for removable, rotatable attachment to a cylindrical can having a sidewall, a top, a rim at the junction of the sidewall and top, and an opening in the can top between the rim and center, the closure comprising:

a plate having an inner edge, side edges, and a curved outer edge with approximately the same radius as the can rim, the plate having a length between the inner and outer edges and a width between the side edges sufficient to substantially cover the opening in the can top; and

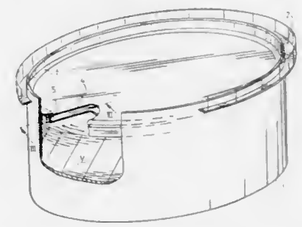
a ring consisting of an incomplete circle of at least 180 degrees but less than 360 degrees and having an inside diameter approximately the same as the outside diameter of the can sidewall, the ring being connected to the plate at the plate's outer edge.

4,842,160

FLOATING COVERING FOR LIQUID STORAGE TANK

Bastiaan D. F. Piso, St. Michielweg 13, Curacao, Netherlands Antilles

PCT No. PCT/NL87/00008, § 371 Date Dec. 14, 1987, § 102(e) Date Dec. 14, 1987, PCT Pub. No. WO87/06211, PCT Pub. Date Oct. 22, 1987
PCT Filed Apr. 16, 1987, Ser. No. 143,948
Claims priority, application Netherlands, Apr. 17, 1986, 8600974
Int. Cl.[4] B65D 88/48, 88/50
U.S. Cl. 220—225 **11 Claims**



1. In a storage tank having a cylindrical side wall with an open top and having an inner surface enclosing a space in which liquid is to be stored, disk-like cover means for floating on the liquid, the cover means having a nominal diameter smaller than the nominal diameter of the inner surface of the side wall to define a circumferential margin providing an annular gap between such circumferential margin and the inner surface of the side wall, annular closing body means joined to the cover means for bridging said gap and effecting a circumferential seal against said inner wall, said annular closing body means comprising an elastic annular body portion defining a gas-tight annular chamber having a nominal diameter greater than that of said circumferential margin but smaller than that of the inner surface and presenting an annular hollow space and an annular body portion of foam material interposed between said annular hollow space and the circumferential margin of the cover means, and pressure control means communicating with said hollow space for selectively pressurizing and releasing pressure from said hollow space.

4,842,161

COUNTERTOP SNACK VENDOR

Merrill Krakauer, Short Hills, N.J., assignor to Rowe International, Inc., Whippany, N.J.

Continuation of Ser. No. 762,938, Aug. 6, 1985, abandoned. This application Jun. 4, 1987, Ser. No. 58,611
Int. Cl.[4] G07F 11/52
U.S. Cl. 221—76 **20 Claims**

1. A snack vendor including in combination, a cabinet comprising a body having a top and a front, a drum having a plurality of groups of circumferentially arranged compartments for receiving articles of merchandise to be dispensed, means mounting said drum in said cabinet for rotation around a generally horizontal axis to present a drum upper front quadrant extending over a plurality of compartments of each of said

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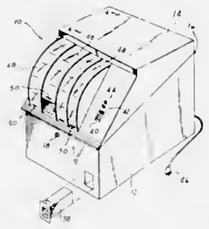
groups, an opening in said cabinet extending over said drum upper front quadrant from a first location in the front of the cabinet below the cabinet top and adjacent to the lower terminus of said drum upper front quadrant to a second location in the top of the cabinet spaced rearwardly of the cabinet front and adjacent to the upper terminus of said drum upper front quadrant, transparent means in said cabinet opening spanning said drum upper front quadrant so that a potential customer has a view of a plurality of articles in respective compartments and of the articles next to be dispensed said transparent means comprising a plurality of transparent doors disposed in side-by-side relationship in registration respectively with said groups



of compartments, means mounting said doors for movement from closed positions at which the lower edges thereof register with the edge of said front at the bottom of said opening to prevent access to the compartments of the associated group to open positions at which a compartment of the associated group is accessible, means for rotating said drum selectively to position said groups of compartments in registry with said doors, means normally locking said doors in their closed positions, money responsive means for releasing said doors, and means in the upper portion of said cabinet behind said second location and below said top for controlling the movement of said doors between said open and closed positions.

4,842,162

APPARATUS AND METHOD FOR DISPENSING FLUID MATERIALS USING POSITION-DEPENDENT VELOCITY FEEDBACK

Stephen L. Merkel, Bay Village, Ohio, assignor to Nordson Corporation, Westlake, Ohio

Continuation of Ser. No. 32,048, Mar. 27, 1987, abandoned. This application Mar. 7, 1988, Ser. No. 164,536

Int. Cl.[4] G01F *9/00, 1/85*; B67D *5/08*

U.S. Cl. 222—1 **14 Claims**

1. An apparatus for dispensing fluid material, comprising:

(a) inlet means for receiving the fluid connectable to a source of fluid;

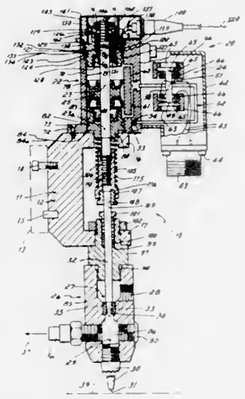
(b) nozzle means downstream of said inlet means for discharging the fluid;

(c) metering valve means operably disposed between said inlet means and said nozzle means, said metering valve means including a seat and a stem axially moveable relative to the seat to modulate the flow of fluid material;

(d) actuator means connected to said metering valve means for axially shifting said valve stem relative to said valve seat;

(e) first transducer means operably connected to said nozzle means for generating a flow rate signal correlated to the rate of flow of fluid through said nozzle means; and

(f) second transducer means connected to said metering valve stem for generating a position-dependent velocity



signal correlated to both the velocity and the position of said stem relative said seat.

4,842,163

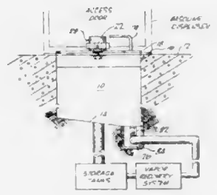
GASOLINE COLLECTOR PIT BOX AND SUBMERSIBLE UNIT BOX

Sergio M. Bravo, 1823 N. Hill Dr., South Pasadena, Calif. 91030

Continuation of Ser. No. 909,289, Sep. 19, 1986, abandoned. This application May 27, 1988, Ser. No. 201,336

Int. Cl.[4] B67D *5/32*

U.S. Cl. 222—40 **15 Claims**



1. An apparatus for reducing pollution and fire hazard associated with gasoline handling equipment, comprising:

means for collecting gasoline spilling from the gasoline handling equipment;

means for providing an externally manifested signal when a predetermined amount of gasoline has accumulated in the means for collecting gasoline;

means for amplifying the effect of gasoline accumulation so that the means for providing an externally manifested signal can be triggered for even low levels of accumulation; and

means for selectively draining away gasoline that has accumulated in the means for collecting gasoline.

4,842,164

STRIPED PASTE DISPENSER

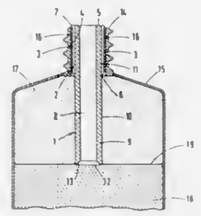
Adrian F. Davis, Weybridge, and Peter R. Watt, Betchworth, both of England, assignors to Beecham Group p.l.c., England

Filed Jun. 25, 1987, Ser. No. 66,823

Claims priority, application United Kingdom, Jun. 26, 1986, 8615670

Int. Cl.[4] B65D *35/22*

U.S. Cl. 222—94 **11 Claims**



1. A nozzle insert for a squeezable tube or other dispenser to dispense a striped paste therefrom comprising a hollow cylindrical body having an open proximal end and an open distal end; said hollow cylindrical body having a first axial part and a second axial part; the external cylindrical surface of said first axial part being formed with a plurality of raised circumferentially spaced plateau regions commencing at said proximal end and extending axially therefrom, said plateau regions being separated from each other by grooves formed in said external cylindrical surface of said first axial part and commencing at said proximal end and extending axially therefrom, said external surface of said first axial part being uninterrupted along the entire extent of said grooves to prevent communication between pasty materials flowing within said grooves and within said hollow body until said pasty materials flow beyond said proximal end; and said second axial part has a smoothly cylindrical external surface.

4,842,165

RESILIENT SQUEEZE BOTTLE PACKAGE FOR DISPENSING VISCOUS PRODUCTS WITHOUT BELCHING

Robert H. Van Coney, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 28, 1987, Ser. No. 90,862

Int. Cl.[4] B65D *35/28*

U.S. Cl. 222—95 **25 Claims**

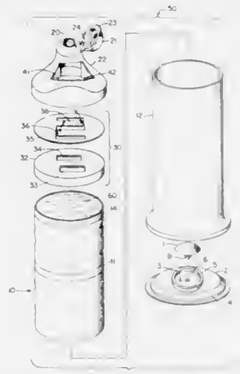
1. A resilient squeeze bottle package for dispensing a viscous product contained therein without any significant belching due to entrained air, said package comprising:

(a) a flexible inner bag, said bag containing said viscous product;

(b) an outer container body surrounding said flexible bag, said outer container body comprising a resilient outer wall and a closed bottom, said flexible bag being secured about its perimeter both at its uppermost end and substantially at its midpoint to the interior surface of said resilient outer wall, said outer wall of said package being sufficiently resilient that it will return the midpoint of said bag secured thereto to its substantially undeformed cross-section upon removal of opposed squeezing forces which are applied to deform said resilient outer wall of said outer container body, said return of said midpoint of said flexible bag to its substantially undeformed cross-section causing a substantially instantaneous decrease of viscous product pressure inside said flexible bag;

(c) a shroud sealingly secured to the uppermost end of said resilient outer wall, said shroud including a dispensing orifice for dispensing said viscous product from said flexible bag;

(d) a suckback valve interposed between the uppermost end of said flexible bag containing said viscous product and said dispensing orifice in said shroud, said suckback valve being capable of opening in response to an increase of viscous product pressure inside said flexible bag to permit said viscous product to pass therethrough on its way to said shroud and said dispensing orifice, said suckback valve being further capable of automatically returning to a fully closed and substantially leak resistant position in response to a sudden decrease of viscous product pressure inside said flexible bag, said suckback valve having positive stop means to prevent the flow of viscous product or air from said shroud into said flexible inner bag when said suckback valve is in its fully closed and substantially leak resistant position, whereby a substantially instantaneous



decrease of viscous product pressure occurring inside said flexible bag due to removal of said opposed squeezing forces from said resilient outer wall of said outer container body will cause the flow of viscous product from said dispensing orifice to cease and air to flow back into said dispensing orifice until said suckback valve has returned to its fully closed and substantially leak resistant position; and

(e) means for restricting the exit of air from inside said container body in the area beneath the lowermost end of said flexible bag when opposed squeezing forces are applied to the exterior surface of said resilient outer sidewall of said package, whereby the pressure of said viscous product contained in said flexible bag is increased in response to said opposed squeezing forces to effect dispensing of said viscous product from said dispensing orifice in said shroud so long as said opposed squeezing forces are maintained on said resilient outer wall of said package.

4,842,166

DISPENSER FOR PRODUCING AND DISPENSING BEVERAGES MIXED OF FRUIT SYRUP OR CONCENTRATE AND WATER

Willem van Zijverden, Lübeck, Fed. Rep. of Germany, assignor to Dagma Deutsche Automaten- und Getrankemaschinen GmbH & Co. KG, Rheinfeld, Fed. Rep. of Germany

Filed Mar. 2, 1987, Ser. No. 20,378

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1986, 3607623

Int. Cl.[4] B67D *5/56*

U.S. Cl. 222—129.2 **9 Claims**

1. A dispenser for a mixture of water with another substance, comprising:

a dispenser housing formed with a compartment;

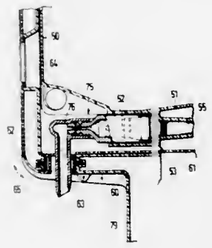
a storage vessel for said substance removably received in said compartment and formed with a downwardly opening outlet at a bottom portion of said vessel, said said dispenser housing having wall means disposed so that said storage vessel can be inserted into said compartment by sliding it linearly into said dispenser housing in one direction and can be removed by sliding said storage vessel linearly in an opposite direction from said dispenser housing;

a water jet injection device coupled with said storage vessel and insertable therewith into said dispenser housing and removable with said storage vessel from said dispenser housing, said water jet injection device comprising:

an elongated mixer housing extending generally in said one direction and formed with a generally elongated mixing chamber, and a mixture-discharge nozzle extending away from one end of said mixing chamber,

means including a connecting flange on said mixer housing for mechanically connecting said water jet injection device to said storage vessel and a sealing element in said flange for sealing said mixer housing to said bottom of said storage vessel with a passage on said mixer housing communicating with said outlet,

a water jet tube projecting into said mixing chamber from an opposite end thereof, and



a tubular water-feed member extending in said one direction from said mixer housing; and

connector means on said dispenser housing for releasably receiving said tubular water-feed member, said connector means comprising:

a bushing portion formed in said dispenser housing and opening in said opposite direction,

a coupling sleeve received in said bushing portion with limited axial and radial play therein, said sleeve having a mouth opening in said opposite direction at one end and a bottom at an end opposite said mouth,

another sealing element between said bottom of said sleeve and said bushing portion and a sealing cover extending across said mouth for floatingly supporting said sleeve on said bushing portion with said play while sealing the interior of said sleeve against said housing, said cover being provided with means for guiding said tubular water-feed member into the interior of said sleeve and a sliding lip seal for sealing said tubular water-feed member against said sleeve whereby said tubular water-feed member automatically enters and is received in said lip seal upon insertion of said storage vessel and said water jet injection device as a unit into said dispenser housing, and

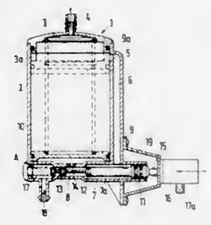
means for connecting a water-supply pipe to said sleeve at said bottom thereof.

4,842,167

LIQUID DISPENSING DEVICE WHICH DELIVERS A PRE-SET, CONSTANT VOLUME INDEPENDENT OF THE PRESSURE AND VOLUME OF THE LIQUID SUPPLIED TO IT

Paolo Fornasari, Alessandria, Italy, assignor to Eltek S.p.A., Alessandria, Italy

Filed Dec. 17, 1987, Ser. No. 134,149
Claims priority, application Italy, Feb. 2, 1987, 67066 A/87
Int. Cl.[4] G01F *11/04*
U.S. Cl. 222—249 7 Claims



1. A dispensing device for dispensing pre-set, constant volumes of liquids comprising:

a cylinder for metering the liquid to be dispensed;

a cap for closing one end of said cylinder, said cap including a port for outflow of the liquids and at least one stop;

a sealed, mobile piston housed in said cylinder for expressing the liquid contained within said cylinder above said piston out through said port, said piston having a maximum extended position defined by said at least one stop;

a first spring disposed between said cap and said piston for biasing said piston away from said cap;

an ancillary cylinder associated with a base of said cylinder;

a passage communicating said cylinder with said ancillary cylinder;

a first orifice in said cylinder allowing the passage of the liquids from said cylinder to said passage;

a second orifice between said cylinder and said ancillary cylinder for communicating an area of said cylinder under said piston with said ancillary cylinder;

said ancillary cylinder comprising:

a smaller diameter section;

a small piston housed in said ancillary cylinder;

a plunger for operating said small piston;

a thermoactuator for actuating said plunger to axially move said small piston between a first and a second position;

a chamber at one end of said ancillary cylinder having a larger diameter than that of the smaller diameter section;

a second spring exerting pressure against a tip of the shaft of the small piston for biasing said small piston towards a position in which liquid can pass from the area of said cylinder under said piston into said passage;

said chamber comprising a coupling for the inflow of liquids to be dispensed; and

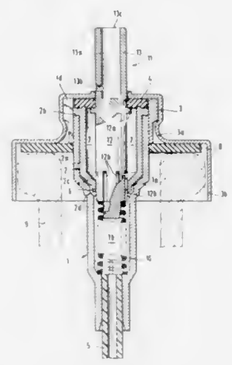
a dual ended valve disposed on a shaft of the small piston having spaced structures, one on each end of the valve and O-rings associated with the spaced structures, said valve moving in the smaller diameter section and being disposed such that one end is on either side of the second orifice for allowing liquid to pass through said second orifice from the area of said cylinder under said piston when said small piston is in the first position and from said chamber to the area under said piston when said small piston is in the second position.

4,842,168

DISPENSING VALVE

Jean-Louis Bougamont, and Alain Behar, both of Eu, France, assignors to Societe Francaise d'Aerosol et de Bouchage, Courbevoie, France

Filed Jul. 29, 1987, Ser. No. 79,184
Int. Cl.[4] B65D *83/00*
U.S. Cl. 222—402.2 5 Claims



1. In a metering and dispensing valve for a container of pressurized material, said valve comprising a body formed of a cylindrical casing of rigid material, a sleeve fitted inside of said casing, the top end of said casing having disposed thereon a cover defining an aperture through which an elongated atomizer member mounted for reciprocal movement in said aperture protrudes, a front seal creating a fluid-tight joint between said sleeve and said atomizer member, a rear seal creating a fluid-tight joint between said sleeve and said cover, said front and rear seals and said sleeve defining a lock chamber inside of which there is disposed said atomizer member provided with a sliding distributor guided at its ends, a return spring positioned below said distributor which operatively biases the distributor to return towards the cover, and the volume of the lock chamber being dependent on the internal dimensions of said sleeve, the improvement wherein:

(a) the sleeve and the front seal are formed of semi-rigid plastic material having an elastic limit;

(b) the casing forms an abutment surface immediately adjacent to and supporting the front seal such that deformation of the front seal is constrained by said abutment surface so as not to exceed the elastic limit of the front seal; and

(c) a filling means is provided which allows liquid to enter by a route other than the front seal when a reverse pressure is applied during filling.

4,842,169

TWIST CAP HAVING ADJUSTABLE FLOW RATE

Gene Stull, 5 Oak St., Chester, N.J. 07930

Divisioo of Ser. No. 10,464, Feb. 3, 1987, Pat. No. 4,754,899.
This application May 2, 1988, Ser. No. 188,855
Int. Cl.[4] B65D *47/00*
U.S. Cl. 222—521 3 Claims

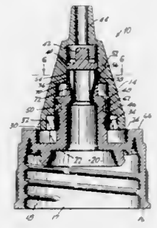
1. A dispensing cap construction for controlling the flow rate of a liquid, comprising, in combination:

(a) a base cap (**12**) attachable to a container, said base cap having a spout formation (**34**) with a bore,

(b) a cover cap (**14**) which is both turnably mounted on the base cap and axially movable thereon between a lowered sealing position and a fully raised position, said cover cap having a dispensing orifice (**44**),

(c) said base cap and cover cap having cooperable sealing means (**42**, **44**) closing off the dispensing orifice of the cover cap when the latter is disposed in its lowered sealing position,

(d) said base cap and cover cap having cooperable valving means (**36**, **38**, **54**, **56**, **52**) located below and spaced from said sealing means, said valving means comprising a flow passage (**36**, **38**) on the base cap (**12**), said valving means



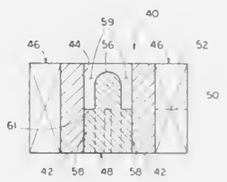
further comprising a blocking shutter (**54**, **56**) turnable with the cover cap (**14**), said valving means being separate and distinct from said sealing means, said valving means being responsive to turning of the cover cap when the cover cap is in its fully raised position on the base cap, for varying the liquid flow rate between the bore of the spout formation and the dispensing orifice of the cover cap.

4,842,170

LIQUID METAL ELECTROMAGNETIC FLOW CONTROL DEVICE INCORPORATING A PUMPING ACTION

Robert M. Del Vecchio, Turtle Creek, and Robert M. Slepian, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 6, 1987, Ser. No. 70,017
Int. Cl.[4] B22D *41/08*
U.S. Cl. 222—594 15 Claims



1. In combination with a nozzle constructed of nonconductive material, being connected to a source of liquid metal and defining an orifice for the flow of liquid metal from said source through said orifice, a liquid metal electromagnetic flow control device for controlling the flow of liquid metal through said nozzle orifice, said device comprising:

(a) an alternating current electromagnetic coil disposed adjacent said nozzle and surrounding said orifice therein, said coil being operable to produce a magnetic field being axially directed and eddy currents being azimuthally directed within said orifice of said nozzle and the liquid metal flowing therethrough; and

(b) a nonconductive structure disposed along a portion of said coil and occupying an axial portion of said nozzle orifice and leaving an adjacent portion of said nozzle orifice unoccupied by said structure, said structure defining axially extending flow regions and axially extending nonflow regions through said occupied portion of said orifice, said nonflow regions of said structure being positioned axially adjacent to said flow regions thereof so as to

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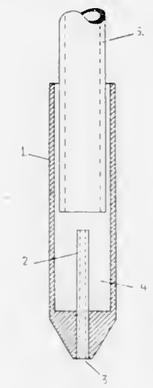
substantially block production of eddy currents in the liquid metal as it flows through said axially extending flow regions of said structure and thereby reshape the magnetic field within said orifice at a region of transition therewithin between said occupied and unoccupied portions of said orifice to have a radially directed component which produces a substantially axially directed pumping force in said nozzle which controls the flow of liquid metal therethrough.

4,842,171

METERING CASTING LADLE

Gary L. Trammel, 5540 Walnut Ave., Long Beach, Calif. 90805, assignor to Gary L. Trammel, Long Beach, Calif.

Filed Nov. 25, 1988, Ser. No. 276,119
Int. Cl.[4] B22D *39/02*
U.S. Cl. 222—595 3 Claims



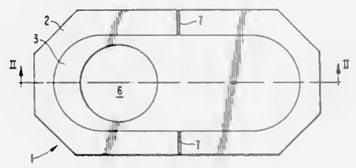
1. A tool for metering precise volumes of molten metal, comprising a tubular barrel with a nozzle on one end, a drop tube, a reservoir, a tubular displacer with a fixed flange at one end, a coil spring, a tubular sleeve with a threaded hole accommodating a set screw, and an insulating handle, said drop tube being fixed in said nozzle and projecting into and terminating within the hollow interior of said barrel to form said reservoir in the vacant space adjacent to and surrounding said drop tube, the length of said reservoir corresponding to the length of said drop tube, said coil spring being positioned onto said displacer to bear against said flange, said insulating handle being affixed onto said sleeve, said sleeve being positioned onto said barrel, said sleeve encircling said barrel and being slidable thereon, said set screw securing said sleeve at any desired location on said barrel, said displacer being inserted into and movable within said barrel, said coil spring bearing against the end of said barrel, the presence and tension of said coil spring between said flange and said barrel maintaining said displacer at a position outside of but close to said reservoir, this said tool then being held in a vertical attitude and in that way submerged into said molten metal to allow said molten metal to enter said nozzle and flow up through said drop tube to fill said reservoir and said hollow barrel to the surface level of said molten metal in its container, said tool then being withdrawn from said molten metal in said container to permit the quantity of said molten metal inside of said barrel above said drop tube to drain down through said drop tube and out of said nozzle, said reservoir retaining the quantity of said molten metal that is below the upper end of said drop tube, at which time said displacer can be pushed toward and into said reservoir, said coil spring being compressed between said flange and said barrel, the linear travel of said displacer being terminated when said flange contacts the upper end of said sleeve, the immersed volume of said displacer below the end of said drop tube causing an equal volume of said molten metal contained within said reservoir to rise and overflow through said drop tube and out of said nozzle, the location of said sleeve on said barrel being changeable, thereby providing means to regulate the immersion depth of said displacer into said reservoir for the purpose of controlling the amount of said molten metal that is displaced from said reservoir, said displacer being retracted from said reservoir by said coil spring when downward pressure on said displacer is released.

4,842,172

COMPOSITE REFRACTORY MEMBER

Albert Kleinevoss, Höhr-Grenzhausen, and Jochen Kopia, Bendorf, both of Fed. Rep. of Germany, assignors to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Apr. 15, 1987, Ser. No. 38,824
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1986, 3614730
Int. Cl.[4] B22D *41/08*
U.S. Cl. 222—600 11 Claims



1. A refractory member having therethrough a discharge opening and for use in discharging molten metal from a metallurgical vessel, said refractory member comprising:

at least one insert at least partially defining said discharge opening and formed of an oxide ceramic material having resistance to the molten metal;

a base structure enclosing and supporting said insert, said base structure being formed of a chemically setting refractory concrete including a refractory granulate of low-iron sintered magnesia with a MgO content over 80 weight percent; and

said base structure having therein means for preventing said base structure from stress cracking due to thermal shock, said means comprising at least one expansion joint filled with mortar.

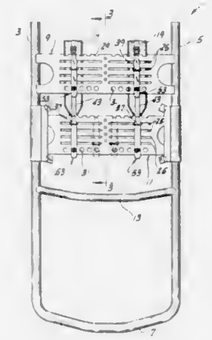
4,842,173

BACKPACK FRAME

Michael J. Scherer, Boulder, Colo., assignor to American Recreation Products, Inc., New Haven, Mo.

Filed Feb. 24, 1988, Ser. No. 159,785
Int. Cl.[4] A45F *3/08*
U.S. Cl. 224—210 10 Claims

1. A backpack frame comprising a pair of spaced apart side frame members, a first cross plate member extending between the side frame members having a plurality of generally parallel slots therein extending in side-to-side direction with respect to the frame and spaced at intervals heightwise of the frame and first and second edges extending in side-to-side direction with respect to the frame and a series of notches spaced at intervals along said first edge, a pair of shoulder straps for the frame having a first pair of loops attached thereto, each loop of the pair being selectively insertable through one of the slots in the first cross plate member according to the desired heightwise position of the respective shoulder strap relative to the frame and being movable along the slot to a desired lateral position of the shoulder strap relative to the frame, and means for retaining each loop in the selected slot in said desired lateral position, said retaining means comprising a clip having a pair of generally parallel arms joined at one of their ends via a juncture, said juncture being receivable in a selected notch in said series of notches with one arm of the clip extending heightwise across one face of the first cross plate member through a respective loop of said first pair of loops and the other arm extending heightwise across the opposite face of the first cross plate member, and quickoperating fastening means adjacent the other ends of the arms for releasably holding the arms together



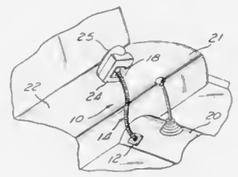
in a position embracing the first cross plate member and preventing movement of the clip out of said notch, and wherein said first cross plate member has a series of openings therein extending laterally across the plate member generally adjacent its second edge, said openings being spaced at intervals corresponding to the notch intervals in said first edge of the first cross plate member, said quick-operating fastening means including fastening elements on the arms adapted to interengage one another in an opening corresponding to the notch in said first edge in which the juncture of the clip is received.

4,842,174

FLEXIBLE MOUNT FOR MOBILE APPARATUS

Mark E. Sheppard, 8891 Henton Dr., Huntington Beach, Calif. 92646, and David L. Yacobucci, 25331 Via Viejo, El Toro, Calif. 92630

Filed Apr. 7, 1987, Ser. No. 35,396
Int. Cl.[4] F16L *3/08*; B60R *11/02*
U.S. Cl. 224—273 19 Claims



1. A mounting apparatus for use in a vehicle for supporting an electrical or electronic device in proximity to the driver of the vehicle, said apparatus comprising:

a mounting member for attachment to a supporting portion of the vehicle;

a plate memer for attachment to a surface of the device;

a flexible support arm having an axial opening therethrough and first and second ends, said first end having means for securing said first end to said mounting member, said mounting member being configured for enabling passage of electrical lead wires from the device through said axial opening; and

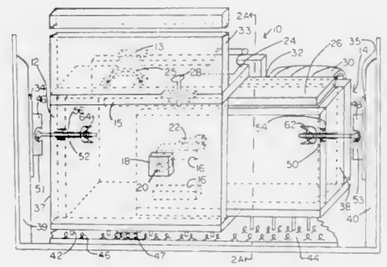
a fitting secured to said second end, said plate member and said fitting having matingly threaded portions for threadably attaching said plate member to said fitting with said fitting configured for enabling access to the electrical lead wire within said axial opening, said plate member having a dimensional surface smaller than the surface of the device to which it is attached, said support arm having flex sufficient to enable a user to place the device thereon at a set position within the vehicle and having a resistance to flex sufficient to preclude displacement of the device on the apparatus from the set position during motion of the vehicle.

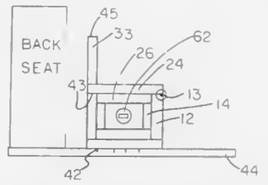
4,842,175

STORAGE CONTAINER FOR A STATION WAGON

Marvin S. Towsend, Rockville, Md., assignor to Genvention, Inc., Rockville, Md.

Filed Sep. 10, 1987, Ser. No. 94,834
Int. Cl.[4] B60R *11/00*
U.S. Cl. 224—275 24 Claims





1. A storage container for storing articles in the interior of a passenger compartment of an automobile having interior vertical surfaces, said container comprising:

a storage element including two ends, said ends exerting pressure on the interior vertical surfaces,

a cover for said storage element, said cover permitting placement and removal of the articles stored in said storage element, and

end stabilizing means for stabilizing the ends of said storage element against the vertical surfaces in the interior of the passenger compartment of the automobile.

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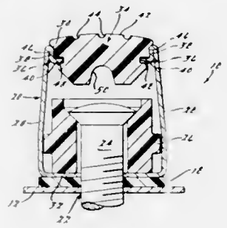
4,842,176
LOAD-BEARING SLAT FOR VEHICLE LUGGAGE CARRIERS

Craig Stapleton, Port Huron, Mich., assignor to Huron/St. Clair Co., a Division of Masco Industries, Inc., Port Huron, Mich.

Continuation of Ser. No. 874,715, Jun. 16, 1986, abandoned. This application Oct. 13, 1987, Ser. No. 110,039
Int. Cl.[4] B60R 9/14
U.S. Cl. 224—326 **10 Claims**

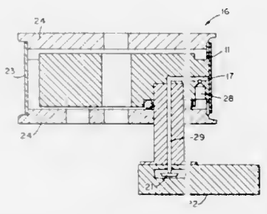


1. A load-bearing slat for a surface mounted vehicle luggage carriage, said slat comprising:
an elongated channel member mounted to the vehicle surface, said channel member having a pair of side walls defining a top opening, said side walls including integrally formed retaining shoulders disposed inwardly from said side walls into said top opening, said shoulders including a first portion extending substantially downwardly from the top of said side wall and a second portion extending substantially inwardly and formed at an angle to said first portion; and
an elongated rub strip having opposite sides and fixedly retained within said top opening of said channel member between said retaining shoulders, said inwardly disposed retaining shoulders engaging said sides of said rub strip to thereby prevent vertical displacement of said rub strip relative to said opening of said channel member.

4,842,177
AIR BEARING TAPE SUPPORT FOR GUIDING TAPE AND SENSING TAPE TENSION

Bernard L. Callender; William W. Chow; Thomas G. Osterday, and William J. Rueger, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 787,007, Oct. 11, 1985, abandoned, which is a continuation of Ser. No. 557,571, Dec. 2, 1983, abandoned. This application Dec. 15, 1986, Ser. No. 940,208
Int. Cl.[4] B65H 20/14, 23/02; G01L 5/08
U.S. Cl. 226—97 **2 Claims**

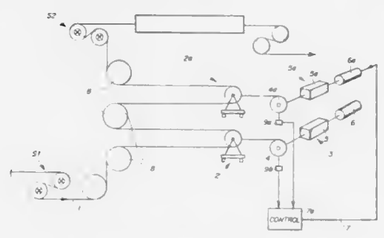


1. A tape drive including a substantially cylindrical tape support having an arcuate surface around which a tape is passed and top and bottom ends, said arcuate surface having a plurality of apertures therein through which a gaseous medium can be supplied under pressure for supporting said tape on a gaseous cushion, said tape drive comprising:
a port in said arcuate surface for sensing gaseous pressure between said tape and said arcuate surface;
a solid state sensing transducer connected to said bottom end of said substantially cylindrical tape support and extending perpendicular therefrom, said transducer coupled to said port by a right angle sense line, containing compacted molecules of said gaseous medium, said sense line having substantially the same internal diameter from said port to said transducer, said transducer first calibrated by putting a known amount of tension on said tape such that said transducer produces an output voltage proportional to the gain of said transducer multiplied by the air pressure measured at said port plus an offset voltage dependent upon said transducer, after calibration the output voltage of said transducer providing a direct indication of the pressure existing at said port and the tension on said tape
a purge line located at the port end of said sense line providing a continuous air flow out of said sense line keeping said port clear of contaminants and preventing said tape from collapsing on said port due to a vacuum within said sense line; and
first and second flanges affixed to the top and bottom ends, respectively, of said substantially cylindrical tape support for guiding said tape at a wrap angle on the order of 180 degrees around said arcuate surface and for maintaining said tape in substantially constant proximity to said port, said first and second flanges each comprising a first semidisk-shaped section, and a second semidisk-shaped section joined to said first semidisk-shaped section, said tape contacting the flanges and being guided thereby only at the points where said first semidisk-shaped and second semidisk-shaped sections are joined, said first semidisk-shaped section having a peripheral portion of a thickness less than the thickness of the peripheral portion of said second semidisk-shaped section, to form vents so that the edges of said tape will not contact said first semidisk-shaped section and said gaseous medium can escape to prevent tape vibration caused by a take-up reel.

4,842,178
BAND STORAGE SYSTEM FOR MOVING BANDS

Oskar Noé; Rolf Noé, and Andreas Noé, all of Mülheim, Fed. Rep. of Germany, assignors to Blug Bergwerk und Walzwerk GmbH, Fed. Rep. of Germany

Filed May 7, 1987, Ser. No. 47,898
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1986, 3636652
Int. Cl.[4] B65H 25/20
U.S. Cl. 226—113 **2 Claims**

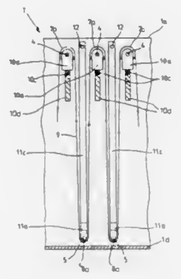


1. A band storage system comprising means for guiding a band through a plurality of horizontally extending loop paths, a plurality of movable loop carts, each of said loop carts being arranged in one of said horizontal loop paths and having a rotatable reel around which said band is looped, a traction control drive connected to a first of said loop carts, a speed control drive connected to a second of said loop carts, and control means connected to said traction control drive and to said speed control drive for controlling the speed and traction of said loop carts and for effecting synchronous running of said loop carts, said control means including means for detecting the speed of the traction-controlled drive and means for controlling the speed of the speed controlled drive in response to the detected speed of the traction-controlled drive.

4,842,179
WET PROCESSING ARRANGEMENT FOR PHOTOSENSITIVE MATERIAL

Wolfgang Viehrig, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 848,727, Apr. 4, 1986, abandoned. This application Mar. 17, 1988, Ser. No. 171,153
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1985, 3513346
Int. Cl.[4] B65H 20/00
U.S. Cl. 226—108 **25 Claims**



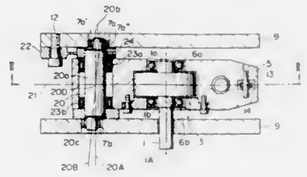
1. An arrangement for processing, particularly wet processing, running lengths of photosensitive material such as photographic paper, comprising support means; at least one shaft having a pair of end portions; at least one roller on said shaft for guiding the running lengths of photosensitive material, said one roller being spaced from said end portions; a conveying band trained over said one roller; bearing means for said shaft, said bearing means comprising a bearing unit which is mounted on said support means and supports said shaft in the region of said one roller, and said end portions of said shaft being cantilevered; and a pair of additional rollers each of which is disposed on said shaft to a different side of said one roller, said additional rollers being free of conveyor bands, and all bearing support for said shaft being restricted to the region between said additional rollers.

4,842,180
ROLL FEED APPARATUS

Heizaburou Kato, Shizuoka, Japan, assignor to Sankyo Manufacturing Co., Ltd., Tokyo, Japan

Filed Feb. 29, 1988, Ser. No. 161,818
Claims priority, application Japan, Dec. 25, 1987, 62-328839
Int. Cl.[4] B65H 20/00
U.S. Cl. 226—176 **1 Claim**

1. A roll feed apparatus comprising:
a first roll fixedly carried by a first roll shaft which is on a first axis;
a second roll fixedly carried by a second roll shaft which is on a second axis, said second roll cooperating with said first roll in clamping a sheet material therebetween and feeding said sheet material;
a turning shaft including a first shaft portion which is on a third axis and second shaft portions on both axial ends of said first shaft portion, said second shaft portions being on a fourth axis and rotatably supported by a housing through respective self-centering bearings;
a pivotable member rotatably supporting portions of said first roll shaft on both sides of said first roll thus rotatably carrying said first roll, said pivotable member being pivotally supported by said first shaft portion of said turning shaft so as to pivot in such a manner as to move said first roll towards and away from said second roll; and
operating means for causing said first shaft portion of said turning shaft to rotate relative to said pivotable member;

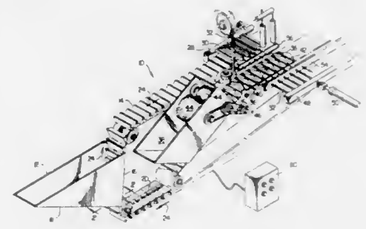


said third axis extending substantially in parallel with said first axis at a position which is laterally spaced from said first roll, while said fourth axis extends such as to cross said third axis at a predetermined small angle, the point at which said third and fourth axes cross being positioned on or on the vicinity of a straight line which passes an axial mid-portion of said first roll and extends substantially perpendicular to said first axis.

4,842,181
APPARATUS FOR LOADING FOOD FOR ALIGNMENT WITH FOOD STICKS

Glenn E. Walser, Duncanville, Tex., assignor to Automated Food Systems, Inc., Duncanville, Tex.

Filed Jul. 16, 1987, Ser. No. 74,081
Int. Cl.[4] B21J 15/28; B27F 7/17
U.S. Cl. 227—3 **11 Claims**



1. An automated food handling apparatus comprising:
a first continuous belt having individual food accepting sections spaced about said belt;
means for loading a food item on each of said food accepting sections;
a second continuous belt parallel to said first belt, said second continuous belt having a first side opposite said first continuous belt and having individual food stick receiving slots spaced about said second belt such that each of said food accepting sections is aligned with each of said food stick accepting slots;
means for loading a food stick on each of said food stick accepting slots;
a predetermined number of food stick inserting members movably mounted on said apparatus;
means for driving said first and said second belts in the same direction and at the same speed with said food accepting

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sections of said first belt aligned with said food stick accepting slots of said second belt;

counting means for detecting when said drive means has positioned a number of food sticks opposite said food stick inserting members equal to a predetermined number of inserting members, including means for generating a signal when the number of food sticks equals said predetermined number;

electronic signal processing means for controlling the starting and stopping of said drive means and being responsive to said signal generating means, such that said drive means is started to load and advance a number of said food sticks and food items and momentarily stopped responsive to receiving said signal generated by said signal generating means; and

means for moving said food stick inserting members whereby said food stick inserting members drive each of the predetermined number of food sticks on said second belt into each of said food items on said first belt responsive to a signal from said electronic signal processing means, and whereby food items are automatically loaded onto food handling sticks.

4,842,182

IMPACT WELDING

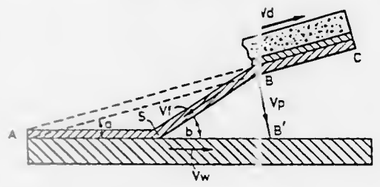
Alexander Szecket, 24 Codsell Avenue, Downsview, Ontario, Canada (M3H 3V5), assignor to Alfredo Bentivoglio; Richardo Rodriquez, both of Mississauga, Canada and Alexander Szecket, Alburqerque, N. Mex.

Division of Ser. No. 710,433, Mar. 11, 1985, Pat. No. 4,747,350. This application Feb. 10, 1988, Ser. No. 154,272

Claims priority, application Canada, Jun. 18, 1984, 456836

Int. Cl.[4] B23K *20/08*

U.S. Cl. 228—108 **18 Claims**



1. In the process for metallurgically bonding two layers of metal capable of forming brittle intermetallics by means of propelling one of said layers progressively into collision along said other layer, the improvement comprising; selecting the velocity and impact angle so as to produce a waveless complete metal to metal bond substantially free of the formation of brittle intermetallics along the entire interfacial region of contact between said layers.

4,842,183

CRACK REPAIR IN HOT SECTION COMPONENTS OF SUPERALLOYS

Kenneth C. Antony, Old Saybrook, and Vincent J. Russo, West Haven, both of Conn., assignors to Turbine Components Corporation, Branford, Conn.

Filed Nov. 25, 1987, Ser. No. 125,356

Int. Cl.[4] B23K *31/02*

U.S. Cl. 228—119 **4 Claims**

1. The process of treating engine induced cracks in turbine vanes and other components comprising the steps of:

(a) converting the engine induced cracks to post induced cracks by welding;

(b) causing said weld induced cracks to occur in a chromium halide environment and

(c) vacuum brazing said weld-induced cracks.

4,842,184

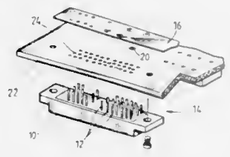
METHOD AND APPARATUS FOR APPLYING SOLDER PREFORMS

Grady A. Miller, Jr., Grand Prairie, Tex., assignor to LTV Aerospace & Defense Company, Grand Prairie, Tex.

Filed Jun. 23, 1988, Ser. No. 210,736

Int. Cl.[4] B23K *35/14*

U.S. Cl. 228—180.1 **12 Claims**



6. A method of soldering contacts to holes of a circuit board, the contacts spaced apart according to a given arrangement, comprising the steps of:

a. perforating a soluble adhesive material to form perforations in a pattern according to the given arrangement;

b. affixing solder preforms to the adhesive material so that each respective preform is in substantial alignment with each perforation ;

c. positioning the adhesive material to center the solder preforms around the contacts so that the contacts pass through the preforms;

d. dissolving the soluble adhesive material leaving the solder preforms encompassing the contacts; and

e. heating the contacts to the flow-point temperature of the solder.

4,842,185

METHOD OF BRAZING A HEAT EXCHANGER USING A REACTION FLUX

Hajime Kudo; Masami Asano, both of Susonoshi; Ken Toma, Mishimashi, and Yo Takeuchi, Susonoshi, all of Japan, assignors to Mitsubishi Aluminum Co., Ltd., Tokyo, Japan

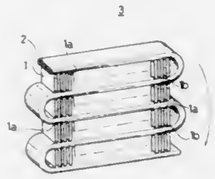
Filed Apr. 6, 1987, Ser. No. 34,835

Claims priority, application Japan, Apr. 25, 1986, 61-94637

Int. Cl.[4] B23K *1/12*

U.S. Cl. 228—183 **16 Claims**

1. A method of producing a heat exchanger comprising abutting a tube made of an aluminum material and fins made of an aluminum material, applying to the resulting abutments a flux containing 10–50 weight % of zinc chloride and 10–60 weight % of Zn powder, drying at a temperature of from about



100° to 300° C., and thereafter reaction soldering the heat exchanger in an inert gas atmosphere.

4,842,186

METHOD AND APPARATUS FOR BUILDING A WORKPIECE BY DEPOSIT WELDING

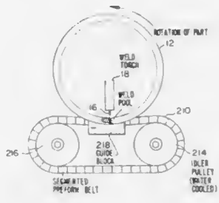
Thomas E. Doyle, Louisville, Ohio; David P. Edmonds, Jackson, Mo.; Michael D. McAninch, and Patrick M. Ryan, both of Alliance, Ohio, assignors to The Babock & Wilcox Company, New Orleans, La.

Continuation-in-part of Ser. No. 115,131, Oct. 30, 1987, Pat. No. 4,775,092. This application Jun. 20, 1988, Ser. No. 209,160

The portion of the term of this patent subsequent to Oct. 4, 2005, has been disclaimed.

Int. Cl.[4] B23K *9/04, 9/225, 9/32*

U.S. Cl. 228—222 **24 Claims**



17. An apparatus for building a workpiece by deposit welding, comprising:

a welding head for depositing molten weld material;

a rotatable reusable preform belt for forming, supporting, and cooling the molten weld material deposited directly on the surface thereof;

means for cooling the rotatable reusable preform belt;

means for varying the tilt angle between the reusable preform and the workpiece so as to vary the geometry of the workpiece; and

means for moving the workpiece which continuously provides a new region of the rotatable reusable preform belt surface underneath the welding head to cool the molten weld material as it is deposited.

4,842,187

OPAQUE FILM FOR CANDY TWIST WRAPPING

Siegfried Janocha, Wiesbaden; Guenther Crass, Taunusstein; Gunter Schloegl, Kelkheim, and Lothar Bothe, Mainz-Goosenheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 30, 1987, Ser. No. 31,379

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1986, 3611341

Int. Cl.[4] B65D *11/16, 65/38;* **B32B** *27/08*

U.S. Cl. 229—87 F **22 Claims**

21. An opaque, biaxially draw-oriented thermoplastic film comprising a polymer mixture, consisting essentially of:

(a) from about 40 to about 60% by weight of polypropylene;

(b) from about 35 to about 55% by weight of polystyrene; and

(c) from about 5 to about 15% by weight of a filler material, said amounts being relative to the total weight of said polymer mixture where the twist rate of said film comprises a value of at least 85%, as measured at a total rate of winding in a range of from about 360° to 900°.

4,842,188

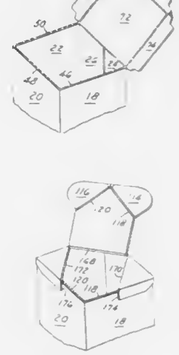
TWO-PIECE FLAT TOP CONTAINER

Robert E. Lisiecki, West Bloomfield, Mich., assignor to Elopak Systems A.G., Glattbrugg, Switzerland

Filed Jul. 28, 1988, Ser. No. 225,382

Int. Cl.[4] B65D *5/54*

U.S. Cl. 229—123.3 **15 Claims**



1. A thermoplastic coated two-piece container comprising:

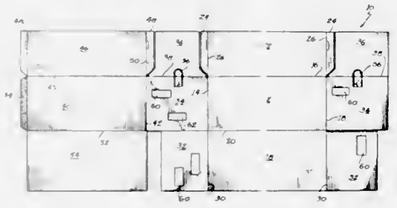
(a) four body panels;

(b) a plurality of top fold-down edge panels integrally connected to the top ends of selected body panels and folded outwardly and downwardly onto said selected body panels to serve as lift tabs;

(c) a separate top cover panel mounted on the top edges said body panels and including a central portion and four side edge fold-down panel segments folded onto and sealed to the underlying panel surfaces;

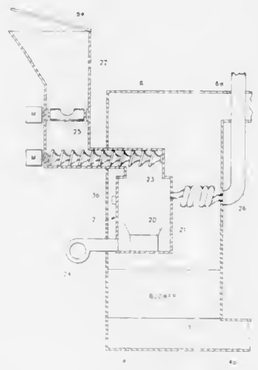
(d) a plurality of weakened lines formed on said plurality of top fold-down edge panels where connected to said body panels and adapted to being broken upon the lifting and raising of said lift tabs.

4,842,189
SELF-SUPPORTING STORAGE CONTAINER
Mitch Czosnyka, 118 S. Hillside, Northlake, Ill. 60164
Filed Mar. 10, 1988, Ser. No. 166,435
Int. Cl.[4] B65D *5/20*
U.S. Cl. 229—143 5 Claims



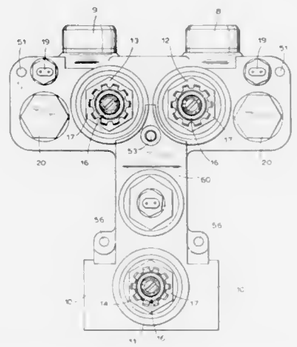
1. A carton blank for forming a self-supporting storage structure comprising: a series of integrally connected foldable wall panels including side wall panels and two cover wall panels, and at least one tab means formed from a portion of said side wall panels for extending through apertures formed in said cover wall panels, wherein each of said tab means will independently secure both of said cover wall panels in a closed position by simultaneously extending through an aperture in each cover wall panel, thereby guarding against exposure of carton contents in the event of accidental opening of one of said cover wall panels.

4,842,190
CONTROL CIRCUIT FOR A FORCED-AIR HEATING SYSTEM
Kenneth L. Orchard, Beaverton, Oreg., assignor to Ortech Industries, Inc., Aloha, Oreg.
Filed Apr. 22, 1988, Ser. No. 185,118
Int. Cl.[4] F23N *5/18*; F04B *21/00*
U.S. Cl. 236—11 27 Claims



1. A control circuit for a heating system having a furnace, a plenum defining an interior space which is in heat exchange relationship with the furnace, and an electrically-driven blower for establishing a flow of air through the plenum, the control circuit comprising:
a sensor device that is positionable in thermally-conductive relationship with the interior space of the plenum for sensing the temperature in the plenum,
means for controlling the operating speed of the blower in response to the temperature sensed by the sensor device, and
a display device for providing a visually-discernible display of the operating speed of the blower.

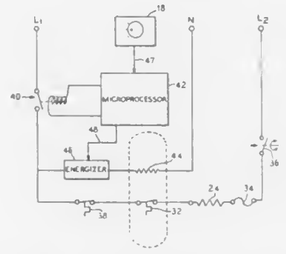
4,842,191
TEMPERATURE-CONTROLLED MIXING FITTING
Konrad Bergmann, Wittlich, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.
Filed May 5, 1988, Ser. No. 190,446
Claims priority, application Fed. Rep. of Germany, May 28, 1987, 3718039
Int. Cl.[4] G05D *23/13*
U.S. Cl. 236—12.12 6 Claims



1. A temperature-controlled mixing fitting having hot and cold water inlets and a discharge passageway comprising:
a control module housing electronic means, operably coupled to a valve module having at least one valve for mixing, shutting off and distribution of water flow therethrough, with at least one temperature sensor operably coupled to said discharge passageway and being in fluid communication therewith, said control module including manual means for operating said fitting due to a power failure, and
an electromechanical motor module including electronically operated drive means and being adapted to electrically connect at least one motor and said at least one temperature sensor for automatically controlling the flow of hot and cold water discharged through said passageway.

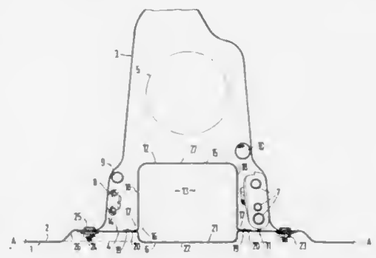
4,842,192
MICROPROCESSOR CONTROLLED THERMOSTAT FOR DRYER
Michael E. Range, Lincoln Township, Berrien County, and David P. Langendonk, Coloma Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Filed Dec. 30, 1987, Ser. No. 139,388
Int. Cl.[4] G05D *23/00*
U.S. Cl. 236—68 B 15 Claims

1. A thermostat control circuit comprising:
a heating circuit having at least a thermostat connected in series with a heating element, said heating circuit connected to a source of alternating electrical power;
a bias heater located adjacent said thermostat;



means for providing a temperature level signal; and
means for periodically energizing the bias heater in response to said temperature level signal.

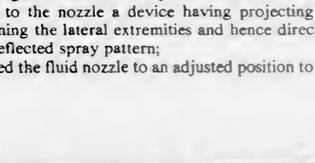
4,842,193
FLOOR GROUP FOR A VEHICLE, ESPECIALLY FOR A MOTOR VEHICLE
Georg Eger, Hochdorf-Vaihingen, and Walter Pross, Sindelfingen, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Filed Jan. 25, 1988, Ser. No. 148,022
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1987, 3701911
Int. Cl.[4] B60H *1/02*
U.S. Cl. 237—12.3 A 20 Claims



1. A floor group for a vehicle, especially a motor vehicle, comprising tunnel means arranged in the floor center and extending in the vehicle longitudinal direction, power plant parts and at least one line means for heating and/or ventilating the motor vehicle being provided inside or adjacent the tunnel means, the tunnel means being closed off in the direction toward the road surface by a cover element, and the line means being constructed over at least a partial area of its longitudinal extent in one piece with the cover element.

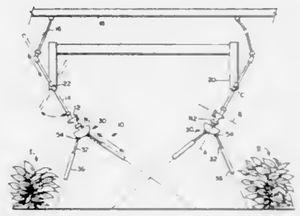
4,842,194
TOY ROAD BOARDS
Linda D. Halbert, 1567 Hooker Oak Ave., Chico, Calif. 95926
Filed Jul. 14, 1987, Ser. No. 73,090
Int. Cl.[4] E01B *23/00*
U.S. Cl. 238—10 B 1 Claim

1. Attachable toy road boards, comprising:
substantially rectangular plastic panels having upwardly oriented surfaces as top sides embossed microcosmically into connectable roadways coursed through realistic geographical areas, said panels having downwardly oriented surfaces as bottom sides;
velcro tabs of substantially square configuration affixed on said bottom sides of said panels to the corners thereof being arranged for removable attachment of said panels edge to edge by connective free pads of velcro in rectangular and square shapes fastening said corner affixed velcro tabs to each other with said removable attachment allowing repositioning of said panels making said toy road board useful in a variety of positions and providing continuing road connections for said connectable roadways;
said geographical areas including:
miniature replicas of buildings, city streets, and city features of said embossed panels designated city boards;



miniature replicas of residential homes, streets, landscaping, and residential features on said embossed panels designated residential boards;
miniature replicas of off-road dirt streets, lakes, and camp areas on said embossed panels designated off-road boards;
miniature replicas of a road race track with pit area, lake, and race area structures on said embossed panels designated road race boards;
miniature replicas of a variety of other localities on said embossed panels affixed with said connectable roadways arranged to align with said panels adjacent in various placements and said panels affixed on said bottom sides with said velcro corner tabs for said removable attachment by said connective fastening of said velcro corner tabs by said free pads of velcro.

4,842,195
APPARATUS AND METHODS FOR DIRECTING SPRAY NOZZLES
Laurel A. Koll, P.O. Box 3 - One Juniper La., and John E. Watts, Rte. 1 Box 750, both of Ruleville, Miss. 38771
Filed Jan. 19, 1988, Ser. No. 145,280
Int. Cl.[4] B05B *17/00*
U.S. Cl. 239—1 19 Claims



13. A method for adjusting the direction of a fluid spray pattern issuing from a fluid nozzle prior to flowing fluid through the nozzle, comprising the steps of;
attaching to the nozzle in a predetermined orientation relative to the nozzle a device having projecting arms for defining the lateral extremities and hence direction of an undeflected spray pattern;
adjusted the fluid nozzle to an adjusted position to provide a

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spray pattern corresponding to a desired spray pattern direction as indicated by the direction of the extent of said arms from said device; and

removing the device from the nozzle before flowing fluid through the nozzle.

4,842,196

MODIFIED SPRAY GUNS FOR VAPOROUS AMINE-ASSISTED SPRAY COATINGS AND METHOD THEREFOR

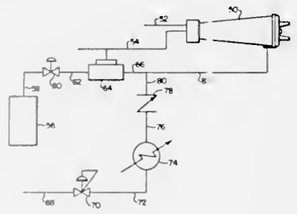
Timothy Y. Moy, and Jeffery W. Radcliff, both of Dublin, Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 930,721, Nov. 13, 1986, Pat. No. 4,771,946. This application May 27, 1988, Ser. No. 199,661

The portion of the term of this patent subsequent to Sep. 20, 2005, has been disclaimed.

Int. Cl.[4] B05B *1/24, 15/02*

U.S. Cl. 239—3 **11 Claims**



1. In an electrostatic spray gun for spraying electrostatically-charged atomizing liquid with the assistance of an atomizing gas flow is an atomizing gas flow path in said gun and with the assistance of a fan gas flow vaporous amine line connected with either or both of said atomizing gas flow or said fan gas flow, and means actuable in the absence of vaporous amine flow in said vaporous amine line to cause a heated non-amine purge gas to flow through and purge either or both of said atomizing gas flow path or said fan gas flow path for maintaining a desired flow path temperature adequate for suppressing amine condensation in said gun.

4,842,197

FUEL INJECTION APPARATUS AND ASSOCIATED METHOD

Burkhard Simon, Röhrmoos, and Franz Joos, Munich, both of Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union GmbH, Munich, Fed. Rep. of Germany

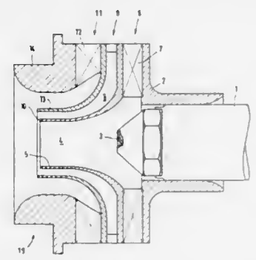
Filed Dec. 10, 1987, Ser. No. 131,206

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1986, 3642122

Int. Cl.[4] F23D *11/24;* **F02C** *7/232;* **F23R** *3/28*

U.S. Cl. 239—5 **13 Claims**

1. A fuel injection apparatus for a combustion chamber of a gas turbine for mixing fuel and compressed air and supplying the mixture to the combustion chamber, said apparatus comprising an injection nozzle for discharging fuel therefrom, a sleeve facing said nozzle in surrounding relation and including a tubular portion extending downstream of the injection nozzle, said nozzle being provided with circumferentially spaced radial injection openings facing said sleeve to discharge fuel onto the sleeve, said tubular portion projecting a substantial axial distance downstream of said nozzle such that fuel discharged from the nozzle forms a film of fuel on said tubular portion, inner and outer air-feed devices respectively encircling said sleeve internally and externally thereof for supplying inner and outer streams of air with opposite directions of swirl around the sleeve for atomizing the film of fuel, said sleeve including a tapered portion which merges with said tubular portion to form a nozzle, said injection nozzle projecting into said tapered portion of said sleeve, said tubular portion of said sleeve being axially displaced downstream of said injection nozzle, and a central air-feed device disposed between said inner and outer air-feed devices, said central air-feed device having an air channel whose cross section tapers in narrowing fashion in the direction of air flow in said air channel, said



tubular portion of said sleeve having a terminal edge at which fuel is discharged, said central air-feed device having a narrowest cross section at the terminal edge of said sleeve to feed a stream of air externally of the sleeve and radially inside said outer stream of air from said outer air-feed device without turbulence around said terminal edge of the sleeve.

4,842,198

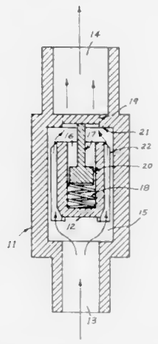
DEVICE FOR DAMAGE PROTECTION AGAINST LOCAL FLOODING CAUSED BY SPRINKLER FAILURE

Shih-Chih Chang, 2239 Davison Ave., Richland, Wash. 99352

Filed Oct. 26, 1987, Ser. No. 112,555

Int. Cl.[4] F16K *17/04;* **B05B** *1/30*

U.S. Cl. 239—200 **2 Claims**



1. A valve for isolating a sustained abnormal elevated fluid flow and allowing normal flow and temporary flow surges to pass therethrough comprising

a valve housing having an flow passage therethrough, an inlet and an outlet ports for connection to upstream and downstream conduits respectively, and a valve seat near said outlet port;

a closure means housed in said housing and being moveable along the longitudinal direction of said flow passage, the cross-section of said closure means being substantially smaller than the cross-section of said flow passage such that a flow gap is formed between the inner walls of said housing and the outer walls of said closure means so that said fluid can flow freely through said gap;

a spring means exerting a mechanical force on said closure means against the motion of said closure means towards said valve seat, said mechanical force being so predetermined such that it can withstand the hydraulic force of said normal flow and being overcome by the hydraulic force of said sustained abnormal elevated fluid flow to cause a closure;

a dashpot means connected to said closure means for producing damping force upon a closure motion of said closure means, said damping force being so predetermined that it can prolong said closure motion to a sufficient time period to prevent closures responding to aaid temporary flow surges; said dashpot means being formed by a piston means housed in a circular cylindrical cavity of said closure means such that a motion of said closure means towards said valve seat generating a sliding motion of said piston in said cylindrical cavity, a small flow path being provided for communicating the interior and exterior of said spaced; said sliding motion of said piston pressurizing the fluid in said cylindrical cavity and forcing said fluid in to exit through said small flow path; the resistance force of the flow through said small flow path transmitting to said plug and consequently providing damping action on said plug.

4,842,199

SELF-ADJUSTING ROTARY-ARM IRRIGATION SPRINKLER

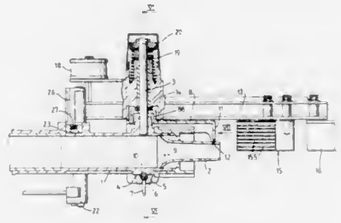
Arno Drechsel, Via Castel Mareccio, 4, 39100 Bolzano, Italy

Filed May 23, 1988, Ser. No. 197,150

Claims priority, application Italy, Jun. 11, 1987, 46854 A/87

Int. Cl.[4] B05B *3/02, 3/14*

U.S. Cl. 239—230 **12 Claims**



1. A self-adjusting rotary-arm irrigation sprinkler comprising:

a propulsion tube for emitting a water jet;

a rotary arm for undergoing swing rotation being mounted on a support pin about which said rotary arm rotates projecting from said propulsion tube, said rotary arm having at least one deflector mounted on a front portion thereof which interferes with said water jet, and said rotary arm being biased against elastic means disposed on said support pin which urges said rotary arm towards a position overlying said propulsion tube;

mobile arresting means mounted on said propulsion tube adjacent to said rear portion of said rotary arm for arresting the rotation of said rotary arm; and

an intermediate member disposed between said propulsion tube and said rotary arm, which supports said rotary arm, said intermediate member including an adjusting means for adjusting both height and inclination of said rotary arm relative to said propulsion tube.

4,842,200

PIVOTABLE NOZZLE

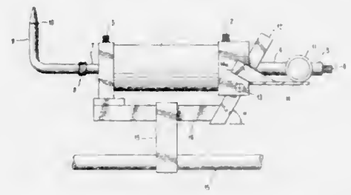
Klas G. I. Hermansson, Tyringe, Sweden, assignor to Dinol International Aktiebolag, Hasslcholm, Sweden

Filed Sep. 14, 1988, Ser. No. 244,474

Claims priority, application Sweden, Sep. 16, 1987, 8703578

Int. Cl.[4] B05B *3/02;* **F04B** *19/02, 29/00*

U.S. Cl. 239—263 **4 Claims**



1. A pivotable spraying nozzle intended to be used for treating a chassis of a car body comprising a nozzle and a feeding tube for a chassis treatment agent characterized in that the nozzle is supported on a front end of a hydraulic/pneumatic piston rod which extends through and is movably arranged within a cylinder said piston rod being provided with a roller at its rear end, said cylinder having a rear end eccentrically rotably attached to an angular plate and wherein upon forward movement of the piston rod, the roller is brought into contact with the angular plate thereby causing the cylinder to rotate about its eccentric attachment.

4,842,201

ROTARY STREAM SPRINKLER UNIT

Edwin J. Hunter, 5551 Codorniz Rd., Rancho Santa Fe, Calif. 92067

Continuation-in-part of Ser. No. 878,591, Jun. 26, 1986. This application Nov. 16, 1987, Ser. No. 121,400

Int. Cl.[4] A62C *31/02;* **B05B** *3/04, 1/26*

U.S. Cl. 239—396 **10 Claims**

1. A rotating stream sprinkler unit comprising:

a tubular housing having a central axis, an inlet, an outlet, and a flow passage communicating therebetween for conducting a stream of water from said inlet to said outlet;

means for forming said stream of water into at least one substantially thin wide primary stream parallel to said axis at said outlet;

said means for forming said stream of water comprises a body member mounted in said channel;

at least one substantially arcuate flow passage in said body member disposed in a circular arc and extending along said body member parallel to said central axis toward the outlet;

said passage is shaped at the outlet thereof for providing a substantially rectangular distribution pattern;

said passage further covers a generally 180 degree arc and is shaped to have portions at the sides thereof being larger than the adjacent portions of said passage;

a rotating distributor head having a plurality of flow channels therein rotatably mounted at said outlet for receiving and forming said primary stream into a plurality of final

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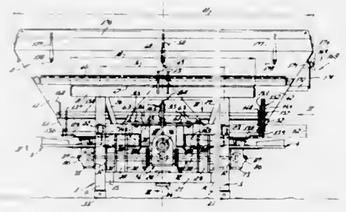
streams and continuously directing said plurality of streams over a predetermined area.

4,842,202
SPREADER

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

Continuation of Ser. No. 558,553, Dec. 5, 1983, abandoned, which is a continuation of Ser. No. 215,127, Nov. 27, 1981, abandoned, which is a continuation-in-part of Ser. No. 35,075, May 1, 1979, which is a continuation-in-part of Ser. No. 89,755, Oct. 30, 1979. This application Feb. 28, 1986, Ser. No. 836,221
Claims priority, application Netherlands, Nov. 27, 1980, 800654
Int. Cl.[4] A01C *17/00*
U.S. Cl. 239—661 20 Claims



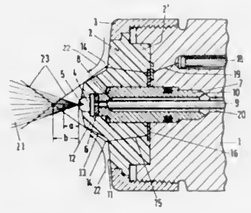
1. A spreader for spreading granular and/or powdery material which comprises a frame provided with coupling means for attaching the spreader to the lifting device of a vehicle, a hopper having at least two delivery parts and at least two distribution members, a horizontal supporting plate rigidly connecting said delivery parts, a carrier mounting said two distribution members for movement about upwardly extending axes, a pair of generally vertically disposed beams rigidly depending from said supporting plate between said distribution members and rigidly supporting said carrier so that said distribution members are positioned to receive material supplied through said delivery parts from said hopper, said carrier interconnecting said distribution members to maintain their axes a fixed distance apart and being supported from and coupled to said hopper by said supporting plate and said vertically disposed beams in an arrangement whereby said carrier fixes the axes of said distribution members in a predetermined relationship and further fixes the orientation of the said distribution members with respect to their respective delivery parts whereby the orientation of said distribution members is substantially unaffected by varying the loading of said material in said hopper and substantially resistant to disorientation due to flexing of said carrier induced by movement of the vehicle.

4,842,203
NOZZLE ASSEMBLY FOR SPRAY GUNS

Wolfgang Kuhn, Schloss Holte, and Karsten Jüterbock, Herzebrock-Clarholz, both of Fed. Rep. of Germany, assignors to Kopperschmidt-Mueller GmbH & Co. KG, Bielefeld, Fed. Rep. of Germany

Filed Feb. 23, 1988, Ser. No. 159,115
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1987, 3705815
Int. Cl.[4] B05B *5/10*
U.S. Cl. 239—705 15 Claims

1. In a spray gun, a nozzle assembly comprising an adapter of electrically insulating material, said adapter having a centrally located orifice for the material to be sprayed and a forwardly tapering extension surrounding said orifice, said adapter further having a peripheral surface, a front surface surrounding said extension and extending to said peripheral surface, said extension having a base at said front surface and an external surface defining with said front surface an annular space surrounding said extension and permitting substantially unobstructed flow of air radially inwardly along said front surface toward said external surface and into contact with sprayed

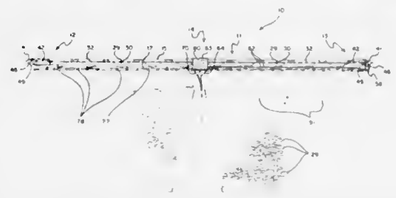


material in response to spraying of material by way of said orifice; and means for charging the material which issues from said orifice, including at least one high-voltage electrode carried by said adapter and having a tip which is disposed in said space in the region of said base to ionize the air flowing toward contact with sprayed material.

4,842,204
TRAVELING IRRIGATION SYSTEM

Ray Debrubl, Jr., 308 Forest Dr., La Grange, N.C. 28551

Filed Jul. 30, 1987, Ser. No. 79,472
Int. Cl.[4] A01G *25/09*
U.S. Cl. 239—744 10 Claims



1. An end supported boom type traveling irrigation system for moving through a greenhouse and watering plants therein, comprising:

(a) a pair of generally parallel rails extending along opposite sides of the greenhouse;

(b) a transverse boom assembly extending between and supported by the rails and adapted to move back and forth thereon;

(c) the boom assembly including a pair of longitudinally spaced drive rollers mounted to opposite ends of the boom assembly and supported by the guide rails;

(d) a power source mounted intermediately on the boom assembly;

(e) a drive train operatively interconnected between the power source and the drive rollers for driving both rollers at each end of the boom assembly;

(f) guide roller means associated with the boom assembly and engaged with the rails for maintaining the boom assembly generally perpendicular to the rails and in alignment therewith an the boom assembly moves along the rails;

(g) the guide roller means including a first pair of longitudinally spaced rollers fixed with respect to a first side of the boom assembly and mounted for engagement with the inner side of one of the rails, and a second pair of guide rollers movably mounted to a second side of the boom assembly;

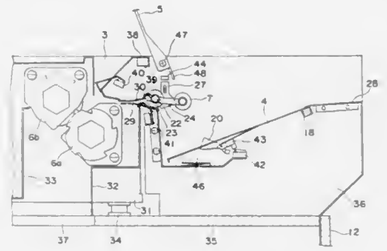
(h) biasing means associated with the second pair of movable guide rollers for biasing the same outwardly for engagement with the inner side of the rail adjacent the second side of the boom assembly such that as the boom assembly moves down the rails, the guide rollers on both ends of the boom assembly engage the inner side of the rails and maintain the drive rollers in general alignment with the rails; and

(i) a water system attached to the boom assembly and including a sprinkling line secured to the boom assembly for dispensing water onto the underlying plants located in the greenhouse.

4,842,205
SHREDDING MACHINE

Yasuo Araki, Fujiidera; Tetsuya Itoh, Nara; Shougo Iwai, Yamatokoriyama, and Yoshihalu Fujii, Sakurai, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 13, 1988, Ser. No. 143,383
Claims priority, application Japan, Jan. 13, 1987, 62-7067; Jan. 13, 1987, 62-7068; Jan. 13, 1987, 62-7069; Jan. 13, 1987, 62-7070
Int. Cl.[4] B02C *25/00*
U.S. Cl. 241—34 4 Claims



1. A shredding machine which comprises:

a cutting means for shredding paper material;

a paper feed mechanism including a paper feed tray adapted to support thereon the paper material to be shredded and a paper feed means for feeding the paper material from the paper feed tray towards the cutting means;

a first detector for detecting the presence of the paper material on the paper feed tray;

a second detector disposed in a path of travel of the paper material from the paper feed mechanism to the cutter means;

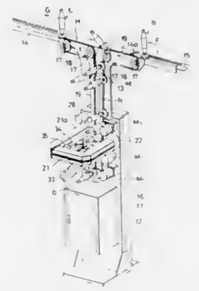
means for determining, during a period in which the first detector detects the presence of the paper material on the paper feed tray, whether or not the time passed from the timing, at which the second detector detects the passage of the trailing end of one paper material therethrough with respect to the direction of feed towards the cutting means, to the timing at which the second detector detects the passage of the leading end of the next succeeding paper material therethrough with respect to the direction towards the cutting means has exceeded a predetermined time; and

a control means operable in response to a signal from the determining means to interrupt the operation of the paper feed mechanism.

4,842,206
AUTOMATIC YARN END FINDING DEVICE FOR A SPINNING BOBBIN

Yosio Kawasaki, and Tatutake Horibe, both of Fujieda, Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Dec. 21, 1987, Ser. No. 135,850
Int. Cl.[4] B65H *54/00*
U.S. Cl. 242—18 R 16 Claims



1. An automatic yarn end finding device for a spinning bobbin which is located intermediate the passage of a spinning bobbin fitted on a peg tray and transported by a conveyor belt and readys a spinning bobbin from which an end of yarn is found and hung into a take-up tube of the spinning bobbin, characterized in that said yarn end finding device comprises:

a rotary cutter for releasing and cutting a bunch winding portion of yarn on a spinning bobbin;

a stopper located at a position opposing to the rotary cutter;

a suction tube for sucking the cut and released yarn end from the spinning bobbin;

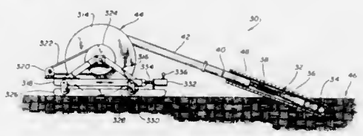
a sensor for detecting a spinning yarn sucked into the suction tube and having a cutter for cutting the found yarn end portion; and

means for releasing said stopper in response to said sensor detecting a spinning yarn sucked into the suction tube to allow the spinning bobbin to be moved.

4,842,207
DEVICE FOR DETECTING AND MEASURING THE TENSION ON A CABLE

Frank R. Kinnan, Camas Valley, Oreg., assignor to Underground Technologies, Inc., Byron, Calif.

Division of Ser. No. 115,987, Nov. 2, 1987. This application Jun. 2, 1988, Ser. No. 202,007
Int. Cl.[4] B65H *75/00, 75/40*
U.S. Cl. 242—54 R 2 Claims



1. A device for detecting the tension applied to a service cable being withdrawn from a bore comprising a reel having a central hub and circular end plates adjacent the ends thereof; an axle extending through said hub and end plates and resting upon supports anchored to a first skid means; a variable speed motor mounted upon said first skid means and coupled to a drive hub upon said reel by a driving belt to control the speed of rotation of said reel; second skid means loner than said first skid means aligned with its first end adjacent the first end of

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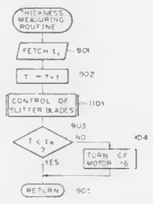
said first skid means and a second end of said second skid means extending beyond the second end of said first skid means; link means joining said first end of said first and second skid means and the second end of said first skid means to said second skid means at a point intermediate said first and second ends and tension means coupled between the second ends of said first and second skid means to measure the tension in the service cable as a result of the rotation of the reel.

4,842,208

METHOD AND APPARATUS FOR MANUFACTURING WOUND CORE

Fumio Kitamura, Chino, Japan, assignor to Kitamura Kiden Co., Ltd., Japan

Filed Dec. 23, 1987, Ser. No. 137,255
Claims priority, application Japan, Dec. 29, 1986, 61-315841; Dec. 29, 1986, 61-315842
Int. Cl.[4] B65H *35/02*
U.S. Cl. 242—56.2 **12 Claims**



1. A method for manufacturing a wound core by winding a continuous strip, having a desired shape in the width direction thereof, on a winding spool, comprising the steps of:
measuring a thickness of said strip which is being wound on said winding tool;
summing said measured thickness of said strip at predetermined periods;
determining whether or not said summed thickness of said strip has reached a predetermined value;
stopping a winding operation by said winding spool when said summed thickness of said strip has reached said predetermined value;
preparing a material having two straight edges on sides thereof;
performing a cutting operation upon said material with slitter blades to obtain said strip;
controlling a cut-with of said slitter blades in accordance with said summed thickness of said strip.

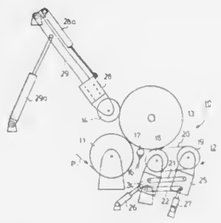
4,842,209

METHOD AND DEVICE IN THE WINDING OF A WEB

Seppo Saukkonen, Vantaa, Finland, assignor to Valmet Paper Machinery Inc., Helsinki, Finland

Filed May 16, 1988, Ser. No. 194,444
Claims priority, application Finland, May 20, 1987, 872223
Int. Cl.[4] B65H *16/10*
U.S. Cl. 242—56 R **20 Claims**

1. A method of winding a web onto a succession of cores, comprising:
(a) locating a first core in a web winding position between a first carrier roll device and a second carrier roll device, said second carrier roll device comprising first and second belt rolls and the first belt roll being closer than the second belt roll to the first carrier roll device,
(b) attaching a leading end of the web to the core in the winding position and rotating the core so as to wind the web onto the core and form a reel thereon, and concurrently employing a press roll to press the reel into contact with the carrier roll devices,
(c) when the reel is completed, reducing the speed of rotation of the carrier roll devices, removing the press roll from contact with the complete reel, and shifting the press roll to a position over the first carrier roll device,
(d) displacing the second carrier roll device away from the first carrier roll device and inserting a new core into the space defined between the first and second carrier roll



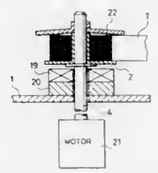
devices and the complete reel and returning the second carrier roll device towards the first carrier roll device,
(e) employing the press roll to push the complete reel away from the first carrier roll device, and substantially simultaneously lowering the second belt roll, whereby the completed reel is positioned for transfer to a reel lowering device.

4,842,210

METHOD AND DEVICE FOR WINDING MAGNETIC TAPE USING MAGNETIC ALIGNMENT

Kazuo Kubota, and Masaaki Sakaguchi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 6, 1987, Ser. No. 34,955
Claims priority, application Japan, Apr. 7, 1986, 62-78309
Int. Cl.[4] B65H *18/00*; G11B *15/30*
U.S. Cl. 242—67.1 R **4 Claims**



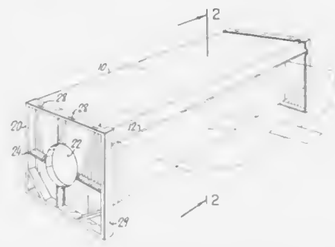
1. A magnetic tape winding apparatus, comprising:
a tape winding body having a flange on one side and to which a magnetic tape is attached;
means for rotating said tape winding body, whereby said magnetic tape is wound on said tape winding body;
a pressure disk disposed on a side of said winding tape opposite said flange for urging a tape edge of said magnetic tape against said flange, said pressure disk being a conically shaped disk sloping outward toward said flange; and
magnetic means for generating at least in a vicinity of said tape winding body a magnetic field extending at least partially in a direction of a width of said wound tape to energize said magnetic tape toward said flange.

4,842,211

FOOTED CASSETTE FOR PHOTOSENSITIVE MATERIAL

Daniel H. Robbins, Rochester, N.Y., assignor to Itek Graphix Corp., Waltham, Mass.

Filed Sep. 18, 1987, Ser. No. 98,484
Int. Cl.[4] B65H *75/00*; B65D *85/66*
U.S. Cl. 242—71.1 **5 Claims**



1. A cassette for containing and dispensing a roll of photosensitive material, comprising:
(a) a one-piece generally rectangular cassette body having at least one trihedral corner and formed from a sheet of inexpensive material having an orifice therein;
(b) a light-tight seal along said orifice;
(c) molded rectangular cassette end covers disposed at each end of said cassette body, extending beyond the cassette body on the trihedral corners thereof and adapted to connect to the ends of said cassette body to form a light-tight enclosure and support the roll of photosensitive material within said cassette body; and
(d) means for fixedly attaching said cassette end covers to said cassette body.

4,842,212

APPARATUS FOR SEAMING PAPERMAKER'S FABRIC

Andre Loiselle, and Jacques Cadieux, both of Quebec, Canada, assignors to Asten Group, Inc., Charleston, S.C.

Continuation of Ser. No. 40,948, Apr. 21, 1987, abandoned. This application Jun. 6, 1988, Ser. No. 204,937
Int. Cl.[4] B65H *75/02*; B65D *85/66*
U.S. Cl. 242—96 **7 Claims**

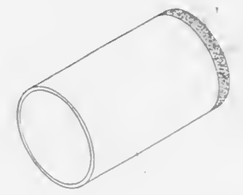
1. A two piece, ring-shaped apparatus for storing and handling a seaming element for a papermaker's fabric, said apparatus comprising:
(a) a ring-shaped, open center spool element for receiving a seaming element thereabout, said spool having a base which defines the minimum open center diameter of said spool and at least one upright thereon which defines the maximum diameter of said spool, said seaming element received about said spool between said minimum and maximum diameters; and
(b) a ring-shaped, open center cover element having a generally U-shaped radial opening that is substantially equal to said upright and encloses said spool element on the sides adjacent to and opposite said upright, said cover and said spool retained by a friction fit between said radially disposed opening and said spool.

4,842,213

CATCHING RIBBON HAVING THREAD-ENGAGING ELEMENTS FOR CATCHING AND HOLDING A THREAD ON A THREAD SUPPORT AND SLIP-ON RING PROVIDED WITH SUCH CATCHING RIBBON

Peter Bärtschi, Kriens, and Peter Fust, Winterthur, both of Switzerland, assignors to Viscosuisse SA, Emmenbrücke and Maschinenfabrik Rieter AG, Winterthur, both of, Switzerland

Continuation-in-part of Ser. No. 882,302, Jul. 7, 1986, abandoned. This application May 9, 1988, Ser. No. 191,340
Claims priority, application Switzerland, Jul. 12, 1985, 03043/85
Int. Cl.[4] B65H *75/28*
U.S. Cl. 242—125.1 **21 Claims**



1. A catching ribbon structure for catching and holding a thread on a thread support means rotating at high speed, comprising:
a catching ribbon capable of being attached to the thread support means;
said catching ribbon being provided with catching elements for catching and holding the thread;
each of said catching elements possessing a head supported by a pin;
each said head defining a thread engaging portion;
said thread engaging portions of said heads of said catching elements being adjacently arranged to define therebelow respective spaces for receiving threads; and
said thread engaging portions of said heads of said catching elements being adjacently arranged in sufficiently close relationship so as to nearly touch each other such that only a single thread can pass between two adjacently arranged thread engaging portions and into the space therebelow without again passing out of said space so that the single thread is reliably retained in said space.

4,842,214

ADAPTOR FOR TWIST FRAME FORMING TUBE

Kenneth T. Harrop, and Ray T. Carver, both of Aiken, S.C., assignors to Owens - Corning Fiberglass Corp., Del.

Filed Oct. 26, 1987, Ser. No. 112,197
Int. Cl.[4] B65H *49/20*
U.S. Cl. 242—130 **4 Claims**

1. An improved twist frame creel adaptor having a front edge and a rear edge for receiving a cylindrical forming tube

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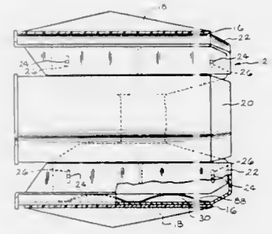
having an inner surface of specified inner diameter containing wound glass fiber product and for rotating such cylindrical forming tube to unwind such glass fiber product comprising in combination:

a rotatably driven central hub member;

a plurality of finger members engaged with said hub member; and,



means for orienting said finger members to form an outer surface to receive such cylindrical forming tube wherein the front edge of said adaptor is of a diameter slightly less that such specified inner diameter of such cylindrical forming tube and such rear edge of said adaptor is of a diameter larger than said front edge diameter to engage such inner surface of said cylindrical forming tube.

4,842,215

TAPE ROLLING UP DEVICE OF PACKAGE STRAPPING MACHINE

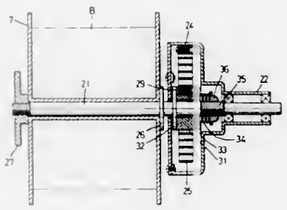
Masaho Takami, 9-50, Kohrienyama Kote-cho, Hirakata-shi, Japan

Filed Mar. 31, 1988, Ser. No. 176,174

Claims priority, application Japan, Oct. 31, 1987, 62-167179[U]

Int. Cl.[4] B65H *59/02, 23/08*

U.S. Cl. 242—156 9 Claims



1. A tape rolling up device for a package strapping machine, comprising:

a rotatably supported shaft;

a tape reel mounted on said shaft;

a frictional member surrounding said shaft;

said shaft having an integral contact surface frictionally engaging one side of said frictional member, said integral contact surface comprising a fixed collar on said shaft;

a movable plate contacting another side of said frictional member, thereby sandwiching said frictional member between said fixed collar and said movable plate;

means for biasing said movable plate toward said fixed collar, thereby frictionally engaging said fixed collar and said frictional member; and

a spiral spring having an inner end connected to said frictional member and an outer end connected to a fixed member, whereby a tape being drawn off of said tape reel causes said shaft to rotate said fixed collar and thereby rotate said frictional member to wind said spiral spring, thus storing a tape rolling up force in said spiral spring.

4,842,216

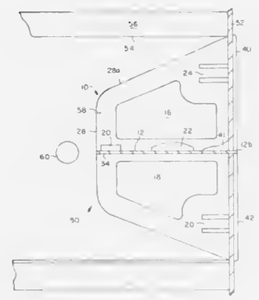
FOLDING CONE PACKAGE DESIGN

Ronald E. Zajac, Goldens Bridge, N.Y., assignor to Windings, Inc., Goldens Bridge, N.Y.

Filed May 6, 1988, Ser. No. 191,196

Int. Cl.[4] B65H *55/02*

U.S. Cl. 242—163 6 Claims



4. A wound package, comprising:

coils of flexible material wound in a FIG. 8 configuration with an axial opening extending through eh longitudinal axis of the coils and radial opening extending from the inner surface to the outer surface of the coils.

a carton for holding said coils of flexible material and including respective opposing side portions adjacent the opposed ends of the axial opening of said coils;

a pair of cone members inserted into each respective axial opening to support the inner windings of said coils and being mounted to a respective one of said opposing side portions for retaining said coils within said carton, each of said pair of cone members comprising:

a first member having a base portion and an opposed end portion, said base portion including a pair of upstanding projections extending along the bottom thereof with a gap therebetween, said end portion having a narrower width than said base portion and being shaped to be positioned within the inner surface of said coils;

said base portion and end portion being interconnected by a strip portion extending to said gap and including spaced guide members each having opposed spaced projections forming a channel;

a second member having a second base portion and a second opposed end portion and being connected to said first member by a fold line extending in said gap and connected to said second base portion, said second base portion and said second end portion being interconnected by at least a second strip member connected substantially perpendicularly to said second base portion by a second fold strip, said second end portion being narrower than said second base member and positioned within the inner surface of said coil windings, said second strip member having an edge portion with an enlarged portion along a section thereof and engaged in said channels with said second end portion folded perpendicular to said second base portion along said second fold line and said second base portion folded perpendicular to said first base member and the folding cone formed thereby being held by said enlarged portion being retained in one of said channels.

4,842,217

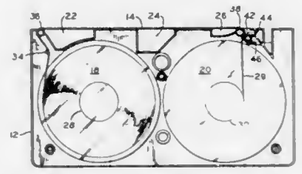
SELF DESTRUCT VIDEO TAPE CASSETTE

David A. Vinson, 807 Lincolnway South, Ligonier, Ind. 46767

Filed Aug. 22, 1988, Ser. No. 235,018

Int. Cl.[4] G11B *23/02*

U.S. Cl. 242—199 14 Claims



1. A video tape cassette adapted to be removably inserted into a video tape cassette machine which includes a magnetic reading head, said cassette comprising:

a housing defining a generally enclosed chamber;

a supply reel and a take-up reel rotatably mounted within said chamber, said supply reel adapted to have wound thereon a flexible magnetic tape having pre-recorded information thereon, said magnetic tape including a substrate and a layer of magnetic material thereon;

said take-up reel adapted to take up said tape from said supply reel, a portion of said tape being accessible to a reading head as said tape is being wound on said take-up reel; and

mutilating means mounted in said chamber for physically progressively and continuously puncturing said substrate and layer of magnetic material to mutilate of said tape as it is being would onto the take-up reel, whereby said tape may be read only once for a one time viewing of the pre-recorded information prior to the progressive mutilation of said tape.

4,842,218

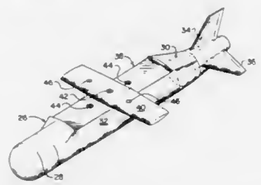
PIVOTAL MONO WING CRUISE MISSILE WITH WING DEPLOYMENT AND FASTENER MECHANISM

Frederick D. Groutage, Laramie, Wyo.; Samuel N. Conjerti, and Lockburn S. Shaw, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 182,335, Aug. 29, 1980, abandoned. This application Feb. 8, 1988, Ser. No. 159,423

Int. Cl.[4] F42B *15/053*

U.S. Cl. 244—3.28 29 Claims



1. A mono wing aircraft comprising:

an elongate aircraft fuselage;

a single, moveable wing coupled to said fuselage, selectively positionable between a storage position and an extended free flight position, the longitudinal axis of said moveable wing being aligned with the longitudinal axis of said fuselage when in said storage position and being perpendicular to the longitudinal axis of said fuselage when in said extended free flight position;

bias means connected to said single, moveable wing and to said fuselage for mechanically biasing said wing towards said free flight position when said wing is in said storage position;

at least one aperture in said single, moveable wing; and

attachment means connected to said fuselage and extending through said at least one aperture for securing said mono wing aircraft to a carrier said attachment means being retractable through said at least one aperture to allow said single, moveable wing to move towards said extended free flight position.

4,842,219

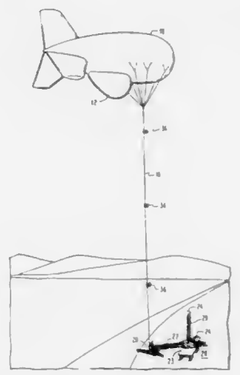
TETHER ATTACHMENT DEVICE

Paul R. Jakubowski, Lutherville, and Ronald L. Boles, Baltimore City, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 30, 1987, Ser. No. 115,000

Int. Cl.[4] B64B *1/50, 1/66*

U.S. Cl. 244—31 21 Claims



1. Apparatus for attachment of a visibility enhancement device to a tether subject to deployment and in-haul operation, comprising:

(A) at least one pair of rollers each having, and each being rotatable about, an axis of rotation;

(B) a clamp assembly operable to structurally support said rollers and to clamp around said tether in a manner that said rollers firmly engage said tether; and

(C) means for limiting rotation of at least one of said rollers in one direction around its axis of rotation while allowing unlimited rotation in an opposite direction around said axis.

4,842,220

APPARATUS FOR MOVING AN AIRCRAFT

Gijsbert Versteeg, Nunspeet, Netherlands, assignor to Aarding B.V., Nunspeet, Netherlands

Continuation of Ser. No. 13,400, Feb. 11, 1987, abandoned. This application Aug. 5, 1988, Ser. No. 230,674

Claims priority, application Netherlands, Feb. 12, 1986, 8600340

Int. Cl.[4] B64C *25/38;* B64F *1/22*

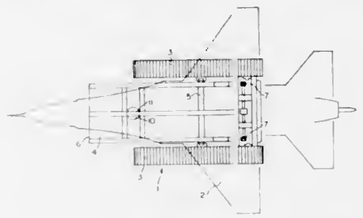
U.S. Cl. 244—50 11 Claims

1. An apparatus for moving an aircraft comprising:

a carrier with at least two tracks, one of said tracks positioned on a side of said carrier, the other of said tracks positioned the other side of said carrier, said carrier being movable by the thrust of the aircraft positioned on said carrier; and

a steering means to control the rotations per minute ratio

between said at least two tracks, said steering means positioned on said carrier so that said steering means is settable



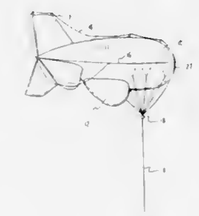
between two extreme positions by the nose wheel of the aircraft.

4,842,221

LIGHTNING HARDENED TETHER CABLE AND AN AEROSTAT TETHERED TO A MOORING SYSTEM THEREWITH

Glenn R. Beach, Columbia; Myron S. Wheeler, Catorsville, and Paul R. Jakubowski, Lutherville, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 21, 1988, Ser. No. 184,530
Int. Cl.[4] B64F *1/14*; H02G *13/00*; H01B *7/04*
U.S. Cl. 244—115 **19 Claims**



1. A lightning hardened tether cable, comprising:
(A) a non-metallic central strength member;
(B) metallic braiding surrounding said strength member for connection to a structure used in an environment subject to lightning strikes;
(C) an outer jacket surrounding said metallic braiding;
(D) said outer jacket being constructed and arranged such that at least one relatively small longitudinal portion thereof is interrupted to define a window which exposes said metallic braiding; and
(E) means for electrically connecting the exposed metallic braiding in said interrupted portion to an electrical ground system.

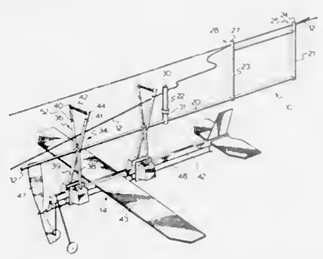
15. In combination:
(A) an aerostat having a lightning protection system;
(B) an electrically grounded aerostat mooring system;
(C) a tether cable connecting said aerostat with said mooring system;
(D) said cable including:
(i) a non-metallic central strength member;
(ii) member braiding surrounding said strength member;
(iii) an outer jacket surrounding said metallic braiding;
(iv) said outer jacket being constructed and arranged such that at least one relatively small longitudinal portion thereof is interrupted to define a window which exposes said metallic braiding; and
(v) means for electrically connecting the exposed metallic braiding in said interrupted portion to said mooring system; and
(E) said metallic braiding being electrically connected to said lightning protection system.

4,842,222

KITE LOAD-RELEASING DEVICE

Eric A. Baird, 137 Sixth St., Rm. 2, Toronto, Ontario, Canada (M8V 3A6)

Filed Sep. 19, 1988, Ser. No. 245,520
Int. Cl.[4] A63H *27/08*
U.S. Cl. 244—155 R **10 Claims**



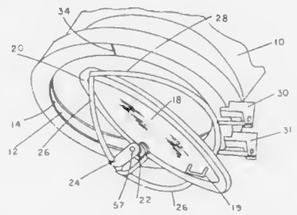
1. A load carrying and releasing, pendular device for attachment to a kite string spaced from the kite to hang downwardly from the kite string and release the load on jerking of the string, the device comprising:
first coupling means for fixedly coupling the device to the string at a first location on the string,
second coupling means for releasably coupling the device to the string at a second location on the string spaced from the first location, the second coupling means releasably engaging the string so as to release the string on jerking of the string,
wherein, with the first coupling means coupling the device to the kite string at the first location, the device hangs from the string in a first position when the second coupling means engages the string, and the device pivots about the first location to move from the first position to a second position upon the kite string being released by the second coupling means,
load engaging means on the device releasably engaging the load,
activation means to cause the load engaging means to release the load,
the activation means being activated by relative movement of the kite string and a portion of the device spaced from the first location on pivoting of the device from the first position to the second position.

4,842,223

HATCH COVER

Charles S. Allton, Houston, and James H. O'Kane, Friendswood, both of Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 9, 1988, Ser. No. 165,956
Int. Cl.[4] B64G *1/22*
U.S. Cl. 244—158 R **12 Claims**



7. A hatch cover in a space vehicle system for opening and closing a hatch port in a housing of a space vehicle including:
a space vehicle having a housing, said housing having a non-circular opening defined by orthogonal long and short opening axes;
a hatch cover member having a non-circular configuration defined by orthogonal long and short member axes, said hatch cover member being adapted to sealingly engage an internal peripheral wall surface about said non-circular opening;
support means pivotally coupled to one side of the outside of said housing means for pivotal movement about an axis parallel to said long opening axis, said support means including a semicircular arm member pivoted at a central location to the housing means and central support arm members connected to the ends of said semicircular arm member, said arm members defining a "D" shaped configuration; and
gimbal means having a first end pivotally coupled to a central location of said central support arm member and a second end pivotally and rotationally coupled to a central location on said hatch cover member for rotating for transversely translating and for pivoting said hatch cover member relative to said opening.

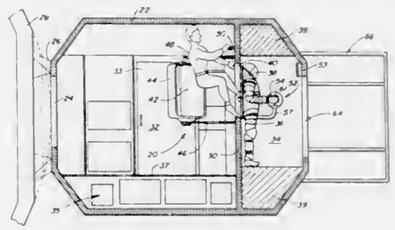
4,842,224

SUITPORT EXTRA-VEHICULAR ACCESS FACILITY

Marc M. Cohen, Menlo Park, Calif., assignor to The United States of American as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 20, 1987, Ser. No. 110,388
Int. Cl.[4] B64G *6/00*
U.S. Cl. 244—159 **15 Claims**

1. A suitport system for egress from and ingress to a sealed environment, which comprises a protective suit with a back having an access opening for donning and doffing said suit and a portable life support system releasably attached to said suit at said access opening, an airlock, a hatch connecting said airlock with the sealed environment, means for releasably attaching said suit at said hatch with said access opening sealed to and facing said hatch, a removable hatch cover for sealing said



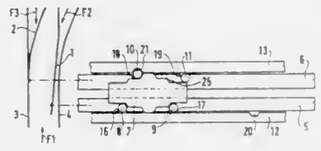
hatch, and means for releasably attaching said portable life support system to said hatch cover.

4,842,225

DEVICE FOR OPERATING A RAILROAD SWITCH

Francis Carmes, Voisins le Bretonneux, France, assignor to Alsthom, Paris Cedex, France

Filed May 3, 1988, Ser. No. 189,873
Claims priority, application France, May 5, 1987, 87 06315
Int. Cl.[4] E01B *7/02*
U.S. Cl. 246—439 **12 Claims**



1. A device for operating a railroad switch constituted by two moving blades, namely a right point blade and a left point blade, with one of the blades touching and the other blade not touching an associated respective backing rail, with at least the touching blade being locked in position, the device comprising a right drive rod perpendicularly connected to the right point blade in the vicinity of its tip, a left drive rod perpendicularly connected to the left point blade in the vicinity of its tip, and axial drive motor means for said drive rods, wherein the device further comprises a carriage driven in axial translation by said motor means, said carriage being axially movable between a right locking plate and a left locking plate which are mutually parallel to the axes of said drive rods, said plates being held by a frame, the right drive rod being situated between the right locking plate and said carriage by being at least partially received in a right longitudinal groove of said carriage, the left drive rod being situated between the left locking plate and said carriage by being at least partially received in a left longitudinal groove of said carriage, each drive rod being provided with two cylindrical vertical floating pegs extending perpendicularly to said longitudinal grooves and each received in a notch provided in the rod, each locking plate including at least one vertical locking recess having sloping side walls flaring apart on going from the plate towards the rod, and having a depth which is not greater than one-half of the diameter of one of said floating pegs, and wherein the width of said carriage between the two locking plates is stepped over three distinct widths, comprising: at each end, a first step whose width is not greater than the distance L between the two locking plates less twice the diameter D of a floating peg; followed on each side of the carriage going axially towards the middle of the carriage by a second step having a width lying between L-2D and L-D; and

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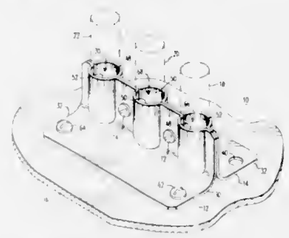
finally a central step whose width is less than L and greater than the width of said second step; the transition between the first step and the second step taking place via a sloping wall, and with the distance between the two notches of a drive rod being not less than the length of the central step plus twice the width of a second step, and being not greater than the length of the central step plus the length of a second step plus the length of a first step.

4,842,226
Patent Not Issued For This Number

4,842,227
STRAIN RELIEF CLAMP

Robert L. Harrington, Eden Prairie; Terry G. Larson, Prior Lake, and Richard F. Unger, New Prague, all of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Apr. 11, 1988, Ser. No. 179,797
Int. Cl.[4] F16L 5/00
U.S. Cl. 248—56 2 Claims



1. A strain relief clamp comprising:
first and second identical metallic clamp members,
said first and second clamp members each having first and second ends, and a bend intermediate said ends which defines first and second right angle leg portions which respectively extend from said bend to said first and second ends,
the first leg portion of each of said first and second clamp members being corrugated to define a plurality of uniformly spaced, integrally joined, curved recesses separated by flat portions,
and means for fixing said first and second clamp members in assembled relation wherein the spaced curved recesses of the first leg members of the assembly cooperatively define a plurality of elongated open-ended apertures,
said means for fixing the first and second clamp members in assembled relation including openings defined by the first leg portions located in said flat portions between the spaced curved recesses, and fastener means disposed to link adjacent openings in the first and second clamp members,
said second leg portions of the first and second clamp members each defining openings adapted to fix one of the first and second clamp members of the assembly to an associated structure,
said bend which joins the first and second right angle leg portions being a radiused bend which defines a circular arc having a radius of at least about .75 inch to enable each of said first and second clamp members to be formed by a single break and form operation,
said curved recesses extending in parallel relation from the first end of said first leg portion, through said radiused bend, and partially into said second leg portion.

4,842,228
SUPPORT FOR A TRASH BAG AND METHOD OF USING SUCH SUPPORT

Brenda M. Kasper, Hollywood, Calif., assignor to Stan Phillips Incorporated, Hollywood, Calif.

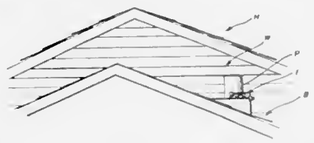
Filed Sep. 14, 1987, Ser. No. 95,996
Int. Cl.[4] B65B 1/04
U.S. Cl. 248—97 3 Claims

1. A device for holding a plastic trash bag in an open, upright position comprising
a hollow, truncated, conical liner member having a length slightly longer than the length of the bag and open top and bottom ends, with the bottom end being wider than the top end and having a diameter slightly less than the diameter of the open bag, said bottom end having thereat a circumferential rim,
a cover for the bottom end which is removably attached to the bottom end and which has a circumferential rim that receives the circumferential rim of the liner member when said liner member is nested in said cover, each of said rims having a top edge and said top edges being aligned when the liner member is nested in the cover,
said cover including opposed handle elements hingedly mounted to the cover and movable between a locked position and an unlocked position, each of said handles including a gripping section which bears against and engages the aligned rims when the handles are in the locking position and the liner member is nested in the cover, and
handle means for the liner member adjacent the open top end that enable the user to grip the device with both hands and lift said device.

4,842,229
PAINT BUCKET HOLDER

Alvin Murray, Rt. #2, Box 198A, Douglas, Ga. 31533

Filed Aug. 30, 1988, Ser. No. 238,144
Int. Cl.[4] E04D 15/00
U.S. Cl. 248—148 2 Claims

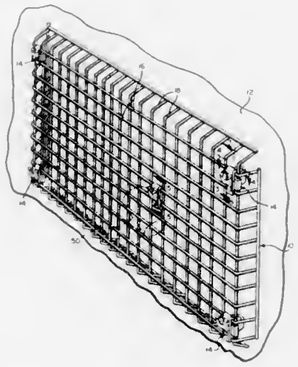


1. A portable adjustable roof platform for use on an inclined roof comprising:
a horizontal platform base having a structural frame means and a supporting base affixed to said frame means, said structural frame means having side frame means with right angle end means, said supporting base comprises expanded metal and has an upright arcuate wall affixed to it to retain a paint bucket;
a pair of female rod receiving members on said right angle end means of said side frame means, each female rod receiving member including a threaded screw bore means and a thumb screw means for tightening a rod member in locked position;
a pair of rod members slidable in said female rod receiving members for vertically adjusting said roof platform to a horizontal position when on an inclined roof;
and said pair of rod members haivng pointed ends to embed themselves in said roof to prevent movement;
and include holes in a spiral line around the surfaces of said rods to provide incremental adjustment vertically of said platform.

4,842,230
FASTENER MEANS FOR SECURING WALL GRIDS TO A SUPPORT SURFACE

Dean L. Cobb, Hoffman Estates, and Edward M. Bleser, Elgin, both of Ill., assignors to Grayline Housewares, Elgin, Ill.

Filed Feb. 1, 1988, Ser. No. 153,720
Int. Cl.[4] A47B 96/06
U.S. Cl. 248—225.2 10 Claims

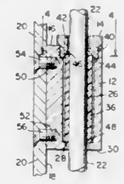


1. In combination, a wall grid formed of a plurality of horizontal and vertical wires affixed together in spaced-apart relationship forming a grid and a fastener means securing said wall grid to a support surface, said fastener means comprising a generally U-shaped grid bracket having a pair of arms, the ends of said arms each having on the ends thereof a wire receiving slot receiving therein one of said wires of said wire grid, said grid bracket being
received within the open space defined by two of said horizontal wires and two of said vertical wires with one of said two vertical wires each disposed within the respective ones of said wire receiving slots on the ends of said pair of arms, means securing said grid bracket to a support surface while disposed within said open space thereby
securing said wall grid to said support surface, a concealment member comprising a backing plate having a hook member on a front face thereof, said backing plate having thereon on the back face thereof adjacent its upper edge a first wire receiving slot, said concealment member
extending between said pair of arms of said grid bracket, said concealment member being releasably affixed to said wire grid to conceal the manner in which said grid bracket is used to secure said wall grid to said support surface by engaging the upper one of said pair of horizontal wires defining the open space in which said grid bracket is disposed within said first wire receiving slot on said backing plate and with said concealment member disposed between said pair of arms of said grid bracket.

4,842,231
ADJUSTABLE FRICTION MOUNTING FOR LAMPS

Jerome Warshawsky, 3284 Bertha Dr., Baldwin Harbor, N.Y. 11510

Continuation of Ser. No. 930,049, Nov. 12, 1986, abandoned.
This application Jan. 12, 1988, Ser. No. 144,661
Int. Cl.[4] F16M 13/00
U.S. Cl. 248—316.2 8 Claims



1. An adjustable friction mounting for lamps comprising:
(a) an elongated fitting body having a through passage, said body being cylindrical and having a flat surfaced inwardly-extending terminal circular shoulder at one end thereof, and perpendicular to the elongated axis of said body, and an outwardly-extending threaded circular recess at the other end thereof, said recess being of greater diameter than said through passage and said terminal circular shoulder having an inside diameter for limiting said through passage;
(b) said elongated fitting body extending in an axial direction of predetermined length which is in excess of the width of said elongated fitting body;
(c) a flexible resilient cylindrical inner sleeve or bushing, said sleeve or bushing being split longitudinally and being disposed coaxially within said through passage in said fitting body, said inner sleeve or bushing being compressible in service, so that its inner circumferential dimension is decreased, and being of a size and configuration to receive there within a selected portion of a lamp fixture, but in its compressed condition said inner sleeve or bushing has an outside diameter substantially larger than said inside diameter of said circular shoulder;
(d) said sleeve or bushing having a first end which rests upon said flat inwardly extending terminal shoulder when disposed within said through passage and a second end disposed proximate said outwardly-extending circular recess when so disposed;
(e) an externally threaded ring, said ring having a predetermined axis and an inner face at one end at an angle in the range of 40 to 50 degrees relative to said predetermined axis, such that when said ring is screwed coaxially into said threaded recess, said inner face contacts said second end of said inner sleeve or bushing and compresses same inwardly so that its inner circumferential dimension is decreased, whereby said sleeve or bushing squeezes against said selected portion of said lamp fixture when said lamp fixture is disposed therewithin for providing a frictionally controlled mounting for said lamp; and
(f) external means on said elongated fitting body for mounting said fitting body to a wall or other surface.

4,842,232
CURVED SLIDE MEMBER

Yves Pipon, and Georges Droulon, both of Flers, France, assignors to A. & M. Cousin Etablissements Cousin Freres, Orne, France

Filed Sep. 16, 1987, Ser. No. 97,634
Claims priority, application France, Sep. 19, 1986, 86 13157
Int. Cl.[4] F16M 13/00
U.S. Cl. 248—395 5 Claims

1. A curved slide member formed of two curved and parallel sections as provided with horizontal control means in a side of

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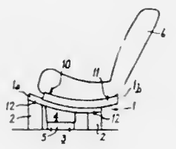
an arcuate movable member particularly for longitudinal setting of a vehicle seat both frontwardly and rearwardly for a person occupying the seat to have a seated position as well as a lying position and also any intermediate position therebetween, comprising in combination:

an inner section included as one of the two curved and parallel sections;

an outer section included also as one of the two curved and parallel sections, with one of said inner and outer sections being movable as a mobile section relative to the other as a fixed section, which is fixed to a floor of the vehicle;

a Z-shaped rack additionally fixedly mounted on one of said inner and outer sections, said rack having a toothing; and



a pinion carried by that inner section or outer section on which said Z-shaped rack is not mounted, said pinion being in meshing engagement with said toothing of said rack so that said pinion drives in translation the mobile section with respect to the fixed section;

said inner and outer sections having a radius of curvature in a range of from 500 to 800 mm, said outer section being mobile;

means for preventing accidental reversal of the rotation of said pinion;

a device having a memory for storing a given position of said slide member; and

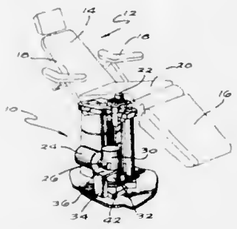
a locking device for stopping rotation of said pinion in the event of manual actuation.

4,842,233

LIFTING MECHANISM

Mark M. Rusin, Napa, Calif., assignor to Dexta Corporation, Napa, Calif.

Filed Nov. 12, 1987, Ser. No. 119,734
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—405 **23 Claims**



13. A lifting mechanism for providing a vertical movement relative to a floor, including,

a platform movable in a vertical direction between a first lower position and a second higher position,

a motor including a drive shaft extending along a substantially horizontal axis for providing a rotary motion of the drive shaft,

at least one axial drive means coupled to the platform and extending in a vertical direction for providing a movement of the platform in the vertical direction,

gear means coupled to the drive shaft of the motor and to the axial drive means for traslating the rotary motion of the drive shaft on the horizontal axis to motion of the axial drive means in the vertical direction to provide the movement of the platform in the vertical direction,

a movable ram member supported on the platform and movable relative to the platform in the vertical direction,

means associated with the ram member and the platform for producing a movement of the ram member in the vertical direction in accordance with the movement of the platform in the vertical direction to produce a double action movement of the ram member in the vertical direction upon rotation of the motor,

the ram member having a plurality of planar side surfaces, and

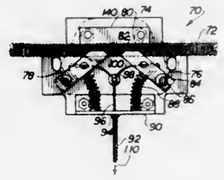
bearing disposed in abutting relationship with at least some of the planar side surfaces of the ram member to provide the ram member with a firm support as the ram member moves upwardly.

4,842,234

METHOD AND APPARATUS FOR LINEAR BRAKING AND CHAIR WITH LINEAR BRAKE

Roger Koch, 311 NE. 103rd St., Miami Shores, Fla. 33138

Filed Feb. 25, 1987, Ser. No. 18,647
Int. Cl.[4] F16M *13/00*
U.S. Cl. 248—429 **13 Claims**



1. A linear brake for a carriage riding over a surface of an elongated member and having a plurality of spaced surface recesses thereon, said brake comprising:

a. two jaws each independently operable and each including a fore end and an aft end, said fore end of one jaw being juxtaposed next to a fore end of the other jaw such that braking occurs in both linear directions over said surface;

b. each jaw having an arcuate jaw face at one end thereof in substantially corresponding to an arcuate configuration of said surface, said jaw face including a plurality of matching spaced jaw recesses formed transversely of said jaw face and extending along the length thereof between a fore end of said jaw face and an aft end of such jaw face and adapted to mate with a portion of said surface recesses in at least one plane of engagement,

c. each jaw having a hole therethrough being both laterally and longitudinally spaced from said jaw face with respect to the longitudinal axis of the elongated member and normal to said plane of engagement;

d. a carriage means for carrying each of said jaws, said carriage means having a pivot means for movement of the jaw thereabout and comprising two pivot pins, each pivot pin extending through a different one of said corresponding holes of said respective jaws, each pivot pin being smaller than a respective one of said holes through which it extends thereby allowing for rotational movement and lateral movement away from said surface recesses in said plane of engagement;

e. biasing means acting on each of said jaws to rotate said respective jaw face into inter-engagement with said portion of said surface recesses, said biasing means comprising two independent biasing members mounted on said carriage and disposed in biasing engagement with separate ones of said jaws; said biasing member cooperatively

disposed with said respective jaws such that said fore end of each arcuate jaw face are substantially disengaged from said arcuate surface and said aft end of each jaw face are biased into engagement with said arcuate surface;

f. a controllable counter-acting force means secured to each of said jaws for movement thereof substantially against the biasing force of said biasing members and away from said portion of surface recesses and further serves to partially rotate said jaws in said plane of engagement;

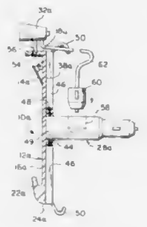
g. said controllable counter-acting force means comprising a bifurcated cable disposed in a cable shield with one cable section of said cable attached to a respective jaw and extending through an elongated receiving channel formed in said jaw and disposed between said jaw face and said hole of each jaw in substantially transverse orientation to the longitudinal axis of said jaw, the proximal end of said cable shield attached to said carriage such that movement of a distal end of said bifurcated cable with respect to said cable shield causes movement of said pair of jaws relative to said biasing force and into and out of engagement with said surface of said elongated member.

4,842,235

AUTOMOBILE CLIP BOARD AND LIGHT UNIT

Robert L. Brown, P.O. Box 10843, Glendale, Calif. 91209, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007

Filed Apr. 25, 1988, Ser. No. 186,028
Int. Cl.[4] F21V *33/00*
U.S. Cl. 248—447.2 **1 Claim**



1. An illuminated clipboard for a motor vehicle which comprises:

(a) a generally rectangular flat faced panel;

(b) a spring biased clip mounted onto front surface near upper end of said panel for engaging and retaining articles thereto;

(c) a flange formed onto the front surface across lower end of said panel for holding additional articles thereon;

(d) a male cigarette lighter adapter plug transversely mounted centrally to rear surface of said panel so that then said adapter plug is placed into a female cigarette lighter socket on a dashboard of the motor vehicle, said panel will be held thereto viewing by a person in the motor vehicle; and

(e) a lamp electrically connected to said male adapter plug so that said lamp can illuminate the articles on said panel of said clipboard;

(f) said panel having a curved upper end, and a curved lower end;

(g) a collar formed centrally at the rear surface of said panel and having a plurality of radial ribs extending from said collar along the rear surface thereof for strengthening said panel, whereby said male adapter plug is detachable from said collar;

(h) a plurality of set screws, each threadable into said collar for securing and releasing a distal end of said male adapter plug in said collar;

(i) a plurality of finger hooks extending from the curved upper end and the curved lower end of said panel so that said panel can be removably attached to a steering wheel of the motor vehicle

(j) a ledge formed onto the front surface at the upper end of said panel so that said lamp can be pivotly connected to said ledge;

(k) said male adapter plug having an auxiliary female cigarette lighter socket transversely connected therein; and

(l) an auxiliary male cigarette lighter adapter plug electrically connected to said lamp so that said auxiliary male adapter plug can be placed into said auxiliary female socket when said collar is connected to said male adapter plug and said auxiliary male adapter plug can be placed into said female cigarette lighter socket on the dashboard of the motor vehicle when said finger hooks on said panel are connected to the steering wheel of the motor vehicle.

4,842,236

SPRING-LOADED TIEDOWN APPARATUS FOR BOATS, CAMPERS AND OTHER CARGO

James T. Yeats, 6147 Rhythm Cir., Orlando, Fla. 32808

Filed Apr. 16, 1987, Ser. No. 39,967
Int. Cl.[4] B65D *63/00*
U.S. Cl. 248—499 **1 Claim**

1. A tiedown apparatus for holding and securing a boat, camper or other cargo comprising:

a first hook for attaching the tiedown apparatus to a trailer or other carrier:

a second hook for attaching the other end of the tiedown apparatus to a trailer or other carrier; wherein said second hook includes a main portion and a hooking portion extending perpendicular to the main portion:

a connection portion comprised of two straps interconnected by a buckle for adjusting the length of the tiedown apparatus:

a spring mechanism between said first and second hooks on the connecting portion of the apparatus comprising a spring having two ends attached to the connecting portion on one end and the second hook on the other end enclosed partially in first cover which, in turn, is concentrically interconnected to a second cover having a smaller diameter than the first so as to allow said second cover to slide both inward and outward as the spring is extended or depressed;

a handle or foot pedal connected to a side of the main portion opposite the hooking portion of second hook, said handle or foot pedal extending outward so that the user can apply downward pressure to extend the spring mechanism when attaching or detaching the tiedown apparatus;

said second hook further comprising an offset portion extending outwardly from the main portion on a side opposite the hooking portion wherein the other end of the spring is attached to the offset portion a distance spaced from the main portion of the second hook.

4,842,237

ONE-PIECE WIRE RETAINER CLIP MOUNTABLE ON THREADED STUD

Burnell J. Wollar, Barrington, Ill., assignor to Phillips Plastics Corporation, Phillips, Wis.

Filed Nov. 23, 1988, Ser. No. 275,574
Int. Cl.[4] H02G *3/26*
U.S. Cl. 248—548 **9 Claims**

1. A one-piece plastic retainer clip for supporting an elongated member, such as a wire or tube, and mountable on a stud on a structure comprising:

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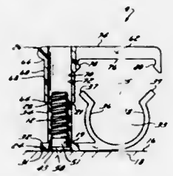
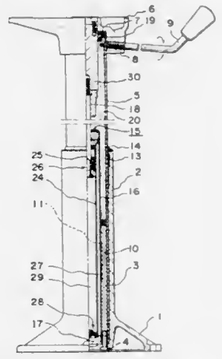
a first tubular member having a stud-receiving bore for frictionally engaging said stud;
retainer means connected to said first tubular member and defining a slot having a slot opening for receiving said elongated member laterally inserted thereinto;
a second tubular member axially movable relative to said first tubular member between open and closed positions and having a second bore for slidably receiving said first tubular member when in closed position;
a closure member connected to said movable with said second tubular member;
interengageable latch means on said retainer means and on said closure member;
and frangible means connected between said first tubular member and said second tubular member,



said frangible means being operable to initially maintain said second tubular member in axial alignment with and in open position relative to said first tubular member and to initially maintain said closure member in an open position spaced from said slot opening;
said frangible means being sufficiently strong to remain intact when axial force is exerted on said second tubular member sufficient to force said first tubular member onto said stud;
said web means being frangible, when axial force is exerted on said second tubular member after said stud is received in said first tubular member, to enable said second tubular member to be slid onto said first tubular member and thereby move said closure member to a closed position wherein it blocks said slot opening and wherein said latch means interengage to maintain said closure member and said second tubular member in closed position.

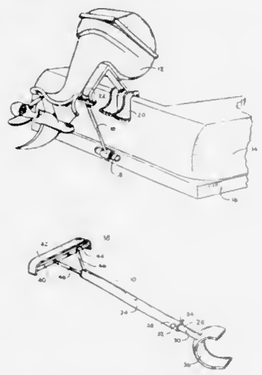
4,842,238
SEAT DAMPER ASSEMBLY
Yoshiro Toiyama, Gifu, Japan, assignor to Kayaba Kogyo K.K., Japan
Filed Jun. 9, 1988, Ser. No. 204,590
Claims priority, application Japan, Jun. 12, 1987, 62-90561[U
Int. Cl.⁴ F16M *13/00*
U.S. Cl. 248—562 **3 Claims**

1. A seat damper assembly for supporting a seat of a vehicle, comprising:
(a) a lower bracket adapted to be attached to a floor of the vehicle;
(b) an upper bracket adapted to be attached to the seat; and
(c) a damper mounted between said upper and lower brackets and including
(1) an outer tube extending upwardly from said lower bracket and terminating short of said upper bracket,
(2) an inner tube extending downwardly from said upper bracket and telescopically inserted into said outer tube,
(3) a sealing member mounted on an upper end of said outer tube and slidingly contacting an outer peripheral surface of said inner tube so as to prevent dust and water from penetrating into said outer and inner tubes,
(4) a guide tube connected to said lower bracket and telescopically inserted in said inner tube,
(5) means connecting said inner tube and said guide tube together so as to allow said inner tube to slide vertically on said guide tube but so as to prevent said inner tube from rotation or turning about said guide tube, and



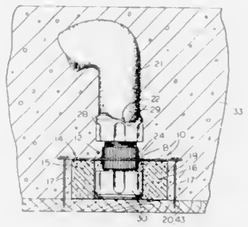
(6) an abrasion-proof friction member disposed between said inner and guide tubes at said connecting means.

4,842,239
OUTBOARD BOAT MOTOR SUPPORT DEVICE
Darrell Kinsey, Lindale, and David Kinsey, Tyler, both of Tex.
Filed Jan. 11, 1988, Ser. No. 142,868
Int. Cl.⁴ F16M *1/00*
U.S. Cl. 248—640 **13 Claims**



1. For the purpose of supporting, in an elevated tilted position, an outboard boat motor mounted on a boat by means of a motor mounting assembly having a fixed bracket attached to the transom of the boat and a swivel bracket pivotally interconnected to the fixed bracket and with the outboard boat motor interconnected to the swivel bracket, with the boat on a boat trailer, an outboard motor support device comprising:
a rigid support means having first and second ends and having a longitudinal axis;
a swivel bracket engagement head, disposed at the first end of said rigid support means for engaging the swivel bracket of the motor mounting assembly, including a U-shaped plate having an elongate base and two short legs extending from the same face of said base perpendicular thereto, and an elongate cylindrical rod interconnected between said short legs of said U-shaped plate parallel to said base and spaced a short distance therefrom, with said elongate cylindrical rod disposed perpendicular to the longitudinal axis of said rigid support means and interconnected thereto such that the longitudinal axis of said rigid support means intersects said elongate cylindrical rod at its longitudinal midpoint; and
trailer engaging means disposed at and interconnected to the second end of said rigid support means for engaging the rear of the trailer upon which the boat is placed.

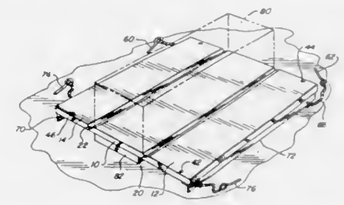
4,842,240
CONDUIT POSITIONER FOR CONCRETE FORM STRUCTURE
James S. Pickett, Dekalb County, Ga., assignor to PK Products, Inc., Conyers, Ga.
Filed Aug. 20, 1987, Ser. No. 87,413
Int. Cl.⁴ E04F *17/08*
U.S. Cl. 249—18 **10 Claims**



1. A conduit supporting and accessing apparatus for supporting conduit at a desired location relative to a form for concrete and for accessing the conduit within the hardened concrete after removal of the form, said apparatus comprising:
a conduit extension member including an externally threaded top portion and an externally threaded bottom portion;
a first compression nut and washer assembly threaded to said top portion of said extension member;
a second compression nut and washer assembly threaded to said bottom portion of said extension member;
a protruding member protruding from said extension member from between said first compression assembly and said second compression assembly, said protruding member defining a top side and a bottom side;
a filler element removably placed adjacent said bottom side of said protruding member, said filler element at least temporarily encircling said second compression nut and washer assembly and the segment of said extension member beneath said protruding member; and
a plurality of openings defined through said protruding member for accepting fastening members.

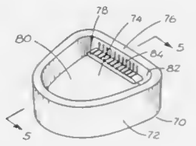
4,842,241
LIGHTWEIGHT PLASTIC CONCRETE MOLD
John M. Fitzgerald, Lake Bluff, and Gary L. Workman, Lombard, both of Ill., assignors to Deslauriers, Inc., Bellwood, Ill.
Filed May 5, 1988, Ser. No. 190,655
Int. Cl.⁴ B28B *7/22;* **E04G** *11/50*
U.S. Cl. 249—50 **6 Claims**

1. A lightweight beam mold having a bottom and side walls formed froma single panel of rigid plastic and with the side walls hinged to the bottom for movement between beam-forming and beam-release positions by integral hinge elements defined by elongate sections of the panel extending for the full length of the panel between the bottom and side walls and which are of sufficiently reduced thickness to be flexible, a pair of separate end walls each having a generally U-shaped channel removably attachable one to each end of the bottom and side walls when in beam-forming position, and said panel having at least one smooth surface to have smooth interior surfaces



for the bottom and side walls and locking means to lock the end walls to the bottom and side walls.

4,842,242
RIBBED FLEXIBLE MOLD FOR DENTAL MODEL BASES
Ronald E. Huffman, Tucson, Ariz., assignor to KV33 Corporation, Tucson, Ariz.
Filed Jan. 30, 1987, Ser. No. 9,276
Int. Cl.⁴ A61C *13/01;* **B28B** *7/06, 7/20;* **B29C** *33/42*
U.S. Cl. 249—54 **8 Claims**



1. A flexible mold for forming a base of a dental model usable with an articulator, said base being formed from a pourable hardenable compound deposited therein, said mold comprising in combination:
(a) a flexible sidewall for defining a perimeter of a mold cavity having a planform that delineates the configuration of said base to be formed and having an upper edge for defining an opening to said mold cavity, said opening being dimensionally coincident with a maximum dimensional planform of said mold cavity;
(b) a flexible substrate for defining a flat bottom of said cavity, said substrate and said sidewall member cooperating to define said bottom and lateral surfaces of said mold cavity;
(c) a shelf attached to a limited portion of said sidewall and extending within said perimeter of said mold cavity along a projection axis parallel to said bottom and partially across said mold cavity, said shelf having a plurality of ribs disposed upon said shelf to define a ribbed shelf, said plurality of ribs extending upon said sidewall in proximity to said shelf, said ribbed shelf and said plurality of ribs extending upon said sidewall delineating a striated receptacle within said base and striations on said base in proximity to said receptacle for enhancing adhesive wicking action during attachment of said articulator to said base; and
(d) said substrate and said sidewall being bendable in concert to lower a part of said upper edge of said sidewall across said mold cavity from said shelf to permit withdrawal of said base from said mold cavity along said projection axis of said shelf and allow sliding disengagement of said receptacle from said shelf.

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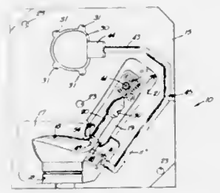
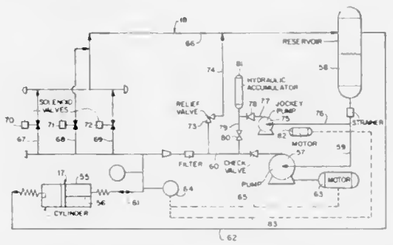
4,842,243
METHOD AND APPARATUS FOR MOLDING GOLF CLUB HEADS
Byron Butler, Newhall, Calif., assignor to Lie Angle Solutions, Inc., West Chester, Ohio
Filed Jan. 19, 1988, Ser. No. 140,981
Int. Cl.[4] B22C 7/02; B28B 7/04
U.S. Cl. 249—124 32 Claims



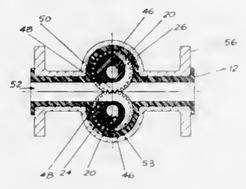
1. Apparatus for molding wax patterns for metalwood golf club heads having hollow bodies and hosels comprising annular hosel bases joined to the bodies and tubular necks projecting from the bases at selected lie angles relative to the club bodies, said apparatus comprising:
- a mold base;
- a first mold on said mold base having formed therein a first cavity in the shape of one side portion of the club head, and a branch cavity on one side of said first cavity in the shape of one side portion of the annular hosel base, said first mold having a first side surface through which an end of said branch cavity opens;
- a second mold in the form of a block having formed therein a second cavity in the shape of one side portion of the tubular neck, said block having a second side surface through which said second cavity opens;
- said mold base having a recess larger than said block beside said first mold on said one side of said first cavity, said block being disposed in said recess with said second side surface abutting against said first side surface and the end of said second cavity aligned with the end of said branch cavity;
- a pivot on said mold base having an axis extending through said first cavity adjacent the juncture of said branch cavity, said pivot being connected to said second mold to mount the same in said recess for pivotal movement relative to said first mold;
- said first and second side surfaces being arcuately curved and coaxial with said pivot to slide closely together as said second mold pivots relative to said first mold;
- a body core supported in said first cavity in spaced relation with the walls of the first cavity to define a hollow interior for the golf club head;
- a core pin supported in said second cavity in spaced relation with the walls of the second cavity to define a tubular neck for the golf club head, said core pin projecting out of said second cavity and into said branch cavity and having an end abutting against said body core;
- said body core and said core pin having part-spherical abutting surfaces that are coaxial with said pivot and said first and second side surfaces to slide closely together as said second mold pivots relative to said first mold;
- means for securing said second mold in different selected angular positions in said recess;
- and cover means for completing and closing said cavities.

4,842,244
VALVE CONTROL SYSTEM FOR POWER GENERATING PLANTS
Joseph J. Panchison, Jr., Fallsington, Pa., assignor to Niagara Mohawk Power Corporation, Syracuse, N.Y.
Filed Nov. 10, 1987, Ser. No. 118,938
Int. Cl.[4] F16K 31/124, 5/06
U.S. Cl. 251—26 22 Claims



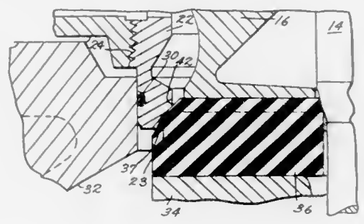
1. In a steam generating plant having a main steam line and a pivotally actuated valve movable between open and closed positions for controlling the flow of steam in said main steam line, a system for operating said main steam line valve comprising means for biasing said valve pivotally into said closed position, fluid actuated means for urging said valve pivotally into said open position against the action of said biasing means, means for supplying fluid under pressure to said fluid actuated means, said fluid supply means including a pump operatively connected to said fluid actuated means and at least one exhaust valve operatively connected to the pressure end of said pump, and means for deactivating said pump when said exhaust valve is in a open position relieving pressure from the pressure end of said pump.

4,842,245
VALVE
Christopher G. Kelsey, Sydney, Australia, assignor to Geoflow International Pty. Limited, Australia
Filed Aug. 7, 1987, Ser. No. 82,726
Claims priority, application Australia, Aug. 15, 1986, PH7462
Int. Cl.[4] F16K 13/00
U.S. Cl. 251—212 2 Claims



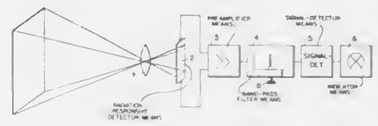
1. A fluid valve including two cylinders arranged parallel to each other with their circumferential surfaces in contact, at least one of said cylinders having a circumferentially extending groove formed in the cylindrical surface thereof the depth of which varies along its length, said cylinders at the, or each, groove defining an aperture through which, in use, fluid is constrained to pass, whereby upon rotation of said cylinders relative to each other the size of said aperture varies to vary the rate of flow of fluid through said valve, said cylinders being located within a valve housing comprising opposed walls at each end of said cylinders and side walls having arcuate portions conforming to said cylindrical surfaces for sealing engagement therewith, said cylindrical surfaces being provided with continuous gear teeth extending between the ends of the cylinders, the gear teeth of respective cylinders sealingly engaging at the region of contact between the cylinders, the gear teeth of each cylinder sealingly engaging said arcuate portions over the region of contact of said cylinders therewith; drive means to rotate said cylinders in unison and in opposite directions; said cylinders having extended support shafts formed integrally therewith or attached thereto; said drive means comprising a pair of identical pinion gears carried by the respective extended support shafts and meshing with each other; the teeth of said pinion gears being off-set relative to said continuous teeth of said cylinders, thereby to maintain positive engagement between the teeth of the respective cylinders.

4,842,246
VALVE SEAT CONFIGURATION
Carl E. Floren, Decatur, and Timothy M. Logman, Monticello, both of Ill., assignors to Mueller Co., Decatur, Ill.
Filed Apr. 15, 1988, Ser. No. 182,024
Int. Cl.[4] F16K 1/42
U.S. Cl. 251—333 2 Claims



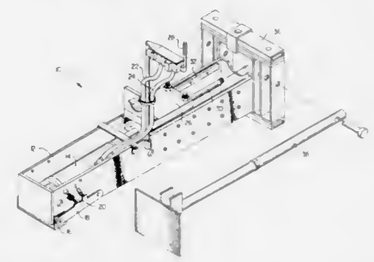
1. A compression-type valve for a fire hydrant or the like, comprising:
- means defining a first space to which fluid may be supplied;
- means defining a second space to which the flow of fluid is to be controlled;
- seating ring means interposed between said means defining said first and second spaces;
- valve means for sealingly engaging said seating ring means including a resilient cylindrical body having a central axis and having a side surface, a top surface and a bottom surface, a first inward bevel being defined circumferentially from said side surface toward said top surface, and a second bevel defined circumferentially between said first bevel and said top surface, said second bevel being inclined at a greater angle with respect to the axis of said cylindrical body than said first bevel, whereby polymer creep and resultant fragmentation along the top surface of the valve element is prevented, said first bevel being inclined with respect to the axis of said cylindrical body at an angle of 30° and said second bevel being inclined with respect to the axis of said cylindrical body at an angle of 45°; and
- means for moving said valve means relative to said seating ring means.

4,842,247
METHOD AND APPARATUS FOR THE DETECTION OF HELICOPTERS
Gunther Kürbitz, Aalen; Karl-Heinz D. Simon, Oberkochen, and Hans-Richard Weinheimer, Königsbronn, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany
Filed Sep. 14, 1978, Ser. No. 944,606
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1977, 27417896
Int. Cl.[4] G01J 1/00
U.S. Cl. 250—342 8 Claims



1. The method of remotely and passively detecting the presence of an operating helicopter within a given field of view, said method comprising the steps of:
- (a) optically imaging said field at a focal surface;
- (b) selecting a detector which will produce an electrical-signal output in response to incident infrared radiation;
- (c) positioning said detector in said surface to thereby monitor said field of view for emitted infrared radiation, whereby said detector will produce an electrical signal corresponding to such emitted infrared radiation;
- (d) filtering said electrical signal with a narrow pass-band having a center frequency corresponding to the modulation frequency of the characteristic infrared radiation emitted by the rotating rotor blades of a helicopter; and
- (e) providing an indication of such component of said electrical signal as survives the filtering step.

4,842,248
HYDRAULIC ROD PUSHER-PULLER
Max H. Shy, Mauldin, S.C., assignor to McLaughlin Mfg. Co., Inc., Greenville, S.C.
Filed Oct. 20, 1987, Ser. No. 110,331
Int. Cl.[4] E21B 19/00
U.S. Cl. 254—29 R 3 Claims



1. Apparatus for moving a rod or pipe along its longitudinal axis, comprising:
- a frame having an hydraulic actuator and an actuator plate mounted therein;
- a slide connected to said hydraulic actuator and mounted on said actuator plate for reciprocating motion parallel to said longitudinal axis;
- a guide plate rigidly mounted on said actuator plate in spaced-apart parallel relationship therewith;

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an actuator key mounted atop said slide and extending through a slot in said guide plate

said slide and said actuator key having corresponding cam surfaces with an actuator roller disposed therebetween for converting longitudinal motion of said slide into vertical motion of said actuator key;

a lower clamp plate mounted atop said actuator key and disposed above said guide plate;

a jaw attached to an upper clamp plate rigidly mounted on said actuator plate in spaced-apart parallel relationship with said guide plate for gripping the rod between said jaw and said lower clamp plate;

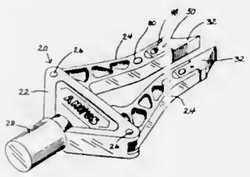
said actuator plate, guide plate, clamp plates, actuator key, and slide forming a rod-gripping carriage mounted for longitudinal reciprocating motion along rails attached to said frame.

4,842,249

SPREADER TYPE RESCUE TOOL

George R. Weigand, 4409 Fender Rd., Lisle, Ill. 60532

Filed Sep. 16, 1983, Ser. No. 533,259
Int. Cl.[4] B66F *3/24*
U.S. Cl. 254—93 R 4 Claims



1. In a portable spreader type rescue tool for applying push pull force, said tool having a body, a pair of forced arms pivotably mounted on fulcrum means in said body, power means for swinging said arms toward and away from one another, and a hardened jaw tip member extending forwardly from each arm, an improved connecting means between each arm and tip member comprising:

(a) each arm being I shaped in cross section so as to provide a central web and a pair of transverse flanges defining a pair of substantially rectangular cross section sockets on opposite sides of the web,

(b) each of the tip members having a main body portion with inner and outer toothed work engaging surfaces and a shank comprising a pair of transversely spaced rearwardly extending tongues formed to fit within said sockets in the arm,

(c) first and second connections aligned along the center line of said tongues and cooperating to fixedly connect said tongues within said sockets of the arms,

(d) said first connection comprising an annular cross section sleeve forceably pressed through transverse aligned bored holes in both the arm web and the tip member tongues respectively and a pin forcefully pressed through the sleeve, and

(e) said second connection being spaced lengthwise of the arm from the first connection and comprising a pin forceably pressed through transverse aligned bored holes in the arm web and the tip member tongues respectively.

4,842,250

LINE REEVING SYSTEM FOR EARTH DRILLING MACHINE

Clyde A. Willis, and Keith M. Haney, both of Wichita Falls, Tex., assignors to W-N Apache Corporation, Wichita Falls, Tex.

Filed Sep. 3, 1987, Ser. No. 92,632
Int. Cl.[4] B66D *1/36, 3/08*
U.S. Cl. 254—337 25 Claims

1. In an earth drilling machine of the type having a mast including a mast base; a crown block assembly mounted on the mast and comprising a fast line sheave; a travelling block assembly movable along the mast, and a drawworks assembly comprising a drawworks drum having a drum rotation axis, the improvement comprising:

means for mounting the drawworks assembly adjacent the mast substantially no higher than the mast base such that the drawworks drum is substantially no higher than the mast base and the drum rotation axis is parallel to a fast line plane passing through the fast line sheave; and

a line reeved from the drawworks drum to the fast line sheave and between the crown block assembly and the travelling block assembly, said line remaining within two line diameters of said fast line plane as the line passes between the drum and the fast line sheave throughout the complete range of rotation of the drawworks drum, thereby ensuring that the fleet angle of the line at the fast line sheave is substantially equal to zero;

wherein the complete range of rotation of the drum produces a plurality of layers of the line on the drum, and wherein a central one of the layers is aligned with the fast line plane.

4,842,251

PULLEY WITH CORD RETENTION MEMBER

Glenn A. Porter, c/o BTM Industries, Inc., 604 Washington, Woodstock, Ill. 60098

Filed Aug. 28, 1987, Ser. No. 90,572
Int. Cl.[4] B66D *3/04*
U.S. Cl. 254—390 15 Claims

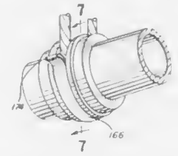
1. In combination:

a pulley having a body with a rotational axis, an annular radially outwardly facing surface concentric with the rotational axis, and an annular recess extending radially inwardly of said annular outwardly facing surface; and

a cord retention member having a curved radially inwardly facing surface extending through more than 180° for placement around the radially outwardly facing pulley surface with the pulley and cord retention member in operative relationship, said pulley and cord retention member, in the absence of a cord being passed around the pulley, being separable from each other by relative movement axially with respect to each other,

there being a recess in said cord retention member extending radially outwardly of said curved radially inwardly facing surface and in axial coincidence with said annular recess in the pulley,

whereby with said pulley and cord retention member in said



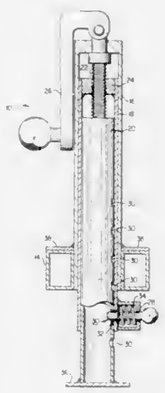
operative relationship and a cord passed around the pulley so as to extend into both the annular recess on the pulley and the recess in the cord retention member, the cord retention member prevents the cord from being drawn axially off of the pulley and the cord provides the sole means to prevent the pulley and cord retention member from being moved axially relative to each other out of said operative relationship with each other.

4,842,252

RAPIDLY EXTENDABLE JACK

Dale A. McMahan, 1316 Lemon, Sulphur Springs, Tex. 75482

Filed Feb. 19, 1988, Ser. No. 157,797
Int. Cl.[4] B01J *37/00*
U.S. Cl. 254—420 15 Claims



1. A jack comprising:

a first elongated tubular member capable of rigid attachment to the tongue of a trailer;

a second elongated tubular member slidable within the first member and having an upper end positioned within the first member and a lower end extending beyond the first member;

fine adjustment means for securing the second member in a desired position in relation to the first member and allowing fine adjustment of the position of the second member in relation to the first member;

a third elongated tubular member slidable within the second member and having an upper end positioned within the second member and a lower end extending beyond the second member; and

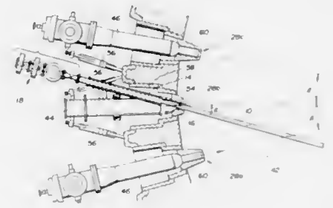
coarse adjustment means for securing the third member in a desired position in relation to the second member and allowing rapid extension or retraction of the third member in relation to the second member.

4,842,253

METHOD AND DEVICE FOR MONITORING COMBUSTION IN FURNACE

Kanji Takeda; Seiji Taguchi, both of Chiba; Toshikazu Nakai, Tokyo, and Haruo Kato, Chiba, all of Japan, assignors to Kawasaki Steel Corporation, Tokyo, Japan

Filed Jul. 1, 1986, Ser. No. 880,898
Claims priority, application Japan, Jul. 2, 1985, 60-143942
Int. Cl.[4] C21B *7/24*
U.S. Cl. 266—44 16 Claims



1. A device for monitoring combustion in a furnace comprising:

a tuyere mounted in a tuyere assembly of said furnace and defining a through opening extending oblique to a radius of said furnace extending through the center of said tuyere, a combustion region being formed around said tuyere,

a probe extending through said through opening into the interior of said furnace,

guide means arranged in such a manner that the axis of said probe extending across the combustion region formed around said tuyere is oblique to the radial axis of the furnace for monitoring combustion in said furnace; and

a drive mechanism for thrusting said probe at said oblique angle into and retracting said probe from said furnace.

4,842,254

APPARATUS FOR PURIFYING LITHIUM

Raymond Roumieu, Valence, France, assignor to Metaux Speciaux S.A., Paris, France

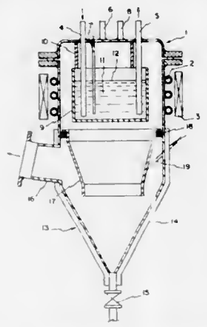
Division of Ser. No. 852,552, Apr. 16, 1986, Pat. No. 4,738,716.
This application Dec. 16, 1987, Ser. No. 133,882
Claims priority, application France, Apr. 24, 1985, 85 06606
Int. Cl.[4] F27D *11/02*
U.S. Cl. 266—88 2 Claims

1. Apparatus for purifying lithium, comprising a metal enclosure having a wall defining an interior sealed with respect to ambient air, and having upper and lower communicating portions,

said upper portion comprising an open container suspended therein for containing lithium to be purified, said container defining a surface area for lithium contained therein, means for supplying lithium to the container, means for removing lithium from the container, means for agitating lithium in the container, means for heating lithium in the container and means for determining the level and temperature of lithium in the container; and

said lower portion comprising a heat exchange means associated with the wall thereof for cooling said lower portion and whereby condensing lithium, an emptying means communicating with the interior in said lower portion for removing condensed lithium and including a valve means, a pipe means communicating with the interior in said

lower portion and adapted for connection to a pump means for reducing the pressure in said enclosure, and a condensing means for impurities in the form of a surface of revolution having a circumference and a height and defining an interior portion, said condensing means being fixed



sealingly over its complete circumference and at least a portion of its height to the interior wall of said enclosure, the interior portion of said condensing means serving as communication between said upper portion said pipe means.

4,842,255

DROSS COOLING APPARATUS

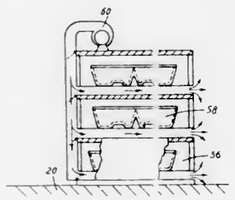
Andris B. Innus, and Michel Villeneuve, both of Jonquiere, Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Oct. 30, 1986, Ser. No. 925,741

Claims priority, application United Kingdom, Nov. 1, 1985, 8526969

Int. Cl.[4] F27D *9/00*

U.S. Cl. 266—158 **8 Claims**



1. Apparatus for cooling non-ferrous metal dross comprising an open-top pan to receive the dross and an outer vessel, the pan being having internal partitions that divide the pan into open-top compartments and being formed of metal of sufficient heat capacity to act as a heat-sink to absorb heat from the dross, and the outer vessel being shaped to fit over and round the pan when filled with dross to form a substantially closed cavity round the pan, there being provided means for introducing an inert gas into the said cavity so as to reduce the extent of reaction of free metal in the dross.

4,842,256

APPARATUS FOR MELTING METAL

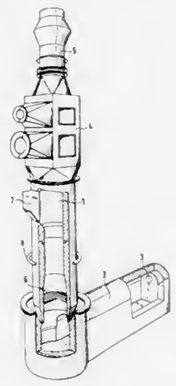
Peter Bardenheuer, Düsseldorf, Fed. Rep. of Germany, assignor to KGT Giessereitechnik GmbH, Dusseldorf, Fed. Rep. of Germany

Division of Ser. No. 23,392, Mar. 9, 1987. This application Apr. 13, 1988, Ser. No. 181,182

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1986, 3610498

Int. Cl.[4] C21B *13/02*

U.S. Cl. 266—197 **2 Claims**



1. An apparatus for melting metal comprising: a shaft furnace having a vertical shaft, a grid located at a lower end of said shaft for supporting metal to be melted and introduced into said furnace, a horizontally extending hearth below said grid, a burner in said hearth, means for supplying a liquid or gaseous fuel to said burner, and means for supplying combustion air to said burner, the metal being melted by combustion products from said burner passed from bottom to top through the grid and shaft and collecting below the grid, and a stack above the shaft and equipped with a recuperator for preheating the combustion air in said means for supplying combustion air, and equipped with a blower for controlling the rate of draft of combustion products through said recuperator to thereby regulate the temperature of the combustion air.

4,842,257

VEHICLE SEAT SUSPENSION COMPONENT AND ITS METHOD OF MANUFACTURE

Ismat A. Abu-Isa, Rochester; Elio Eusebi, Troy; Craig B. Jaynes, Bloomfield Hills; Susan C. Moran, Ann Arbor, and Michael A. Roy, Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1987, Ser. No. 119,965

Int. Cl.[4] A47C *7/14;* **F16F** *1/36;* **B28B** *3/20*

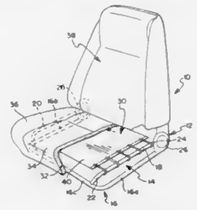
U.S. Cl. 267—133 **13 Claims**

1. In a vehicle seat assembly having a seat frame with a seat thereon and a back assembly extending generally vertically with respect to the seat frame the improvement comprising:

a seat suspension means located between the seat and the frame and suspended from the frame for absorbing vehicular vibrations and providing increased support in response to increased load;

said seat suspension means including a membrane dimensioned to extend across substantially the full planar extent of the frame and including a direction of orientation of

polymeric material which is greater across one dimension of said membrane so that the membrane has a greater



modulus of elasticity in the direction of orientation and a lesser modulus of elasticity in other directions.

4,842,258

COMPOSITE ENGINE MOUNT

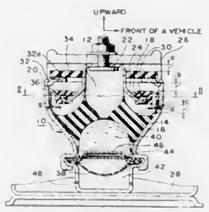
Toru Misaka, and Sadafumi Fukumura, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 17, 1988, Ser. No. 169,509

Claims priority, application Japan, Apr. 17, 1987, 62-57407[U]; Apr. 21, 1987, 62-59272[U]; Jul. 8, 1987, 62-103890[U]; Nov. 18, 1987, 62-175048[U]; Nov. 18, 1987, 62-175049[U]

Int. Cl.[4] B60G *15/04;* **F16F** *7/10, 15/04;* **F16M** *13/00*

U.S. Cl. 267—140.1 **13 Claims**



1. A composite engine mount for supporting an engine on a vehicle body defining three orthogonal directions, a longitudinal direction, a transverse direction perpendicular to said longitudinal direction, and a vertical direction perpendicular to a plane defined by said longitudinal and transverse directions, said composite engine mount comprising:

a first member of rigid material to be fixed to an engine-side bracket;

a second member of rigid material to be fixed to a body-side bracket, said first and second members defining a space inside said second member into which one portion of said first member extends;

an elastic member extending between and connected to said first and second members so as to allow said first and second members to move relative to each other; and

a first stopper rubber fixed to said one portion of said first member for cooperation with said second member to bear loads in each of said orthogonal directions.

4,842,259

TILTING DIAGNOSTIC TABLE

Paul Rice, c/o XRE Corporation, 300 Foster St., Littleton, Mass. 01460

Filed Mar. 18, 1988, Ser. No. 170,273

Int. Cl.[4] G03B *41/16*

U.S. Cl. 269—323 **19 Claims**

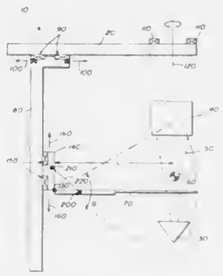
1. Apparatus for tilting a patient supported on a diagnostic table and simultaneously maintaining a selected isocenter of the patient at a selected fixed point in space comprising:

a table for supporting the patient within an examination zone of a diagnostic apparatus;

vertical carriage means connected to an end of the table for raising and lowering the end of the table through a predetermined ranged of vertical travel;

a tilt pivot connecting the end of the table and the vertical carriage means, for supporting the table and tilting the table through an arc of at least about 10 degrees;

a horizontal leg means movably mounted to the vertical carriage means for moving the vertical carriage means and the table through a predetermined range of horizontal travel;



the vertical carriage means being movably mounted on the horizontal leg means;

the horizontal leg means being movably mounted on an overhead arm means;

wherein the vertical carriage means is movable along a vertical travel and the horizontal leg means is movable along a horizontal travel sufficient to maintain the isocenter of the patient at the fixed point in spaced when the table is tilted around the tilt pivot;

the apparatus further comprising means for rotating the arm means, the vertical carriage means, the horizontal leg means, and the table around an axis intersecting the selected isocenter of the patient.

4,842,260

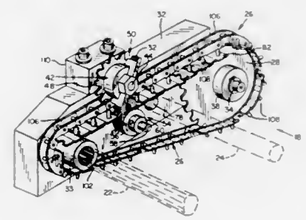
MODULAR COLLATING ASSEMBLY

Jan A. McAnelly, West Linn, and Joseph Joiner, Portland, both of Oreg., assignors to Continuous Graphics, Inc., Portland, Oreg.

Filed Dec. 4, 1987, Ser. No. 128,722

Int. Cl.[4] B65H *39/00*

U.S. Cl. 270—52 **20 Claims**



1. An apparatus for collating a plurality of continuous sheets of the type having pinholes along a margin thereof into continuous multiple copy forms, said apparatus comprising:

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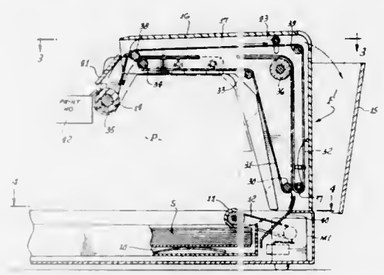
(a) pin drive means having pins mounted thereon for engaging said pinholes and for aligning and moving said sheets substantially within a reference plane;
(b) a rotatable platen arranged adjacent to said sheets and located substantially on one side of said reference plane;
(c) a rotary plunger means for cooperating with said platen to crimp said continuous sheets into said multiple copy forms, said plunger means arranged adjacent to said sheets and substantially opposed to said platen on the opposite side of said reference plane; and
(d) said platen being freely rotatable.

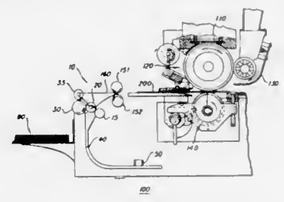
4,842,261
PRINTER FEEDER
Klaus Thogersen, Newport Beach, and Frederick J. Lawrence, Tustin, both of Calif., assignors to Gradco Systems, Inc., Irvine, Calif.
Filed Apr. 13, 1983, Ser. No. 484,608
Int. Cl.[4] B65H *5/22*
U.S. Cl. 271—6 **1 Claim**



1. Sheet feeding apparatus for automatic printers having a platen on a shaft rotatable in the frame of the printer, said apparatus comprising a support structure including an upper section adapted to be disposed horizontally above the printer and a rear section adapted to extend downwardly at the rear of the printer, a drive shaft, power take off drive means for driving said drive shaft in response to rotation of said platen, conveyor means supported by said support structure and extending upwardly through said rear section and horizontally through said upper section, for carrying sheets upwardly through said rear section and across said upper section, means at the front of said conveyor means in said upper section to direct sheets downwardly to said platen, said conveyor means including a first pair of continuous belts, a pair of rollers adjacent to the lower end of said rear section, a second pair of rollers at the front of said upper section, a single roller at the rear of said top section, said belts extending about said first pair and second pair of rollers in continuous confronting relation to one another to define a sheet path from the bottom rear of the printer, over-the-top of the printer to the platen, one of said belts having a return run extending over said single roller from one of said second pair of rollers to carry sheets from said platen, said upper section also having means to direct a sheet from the platen to the top of said return run.

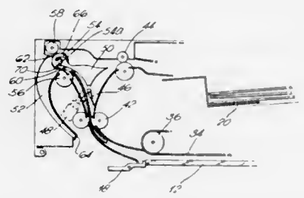
4,842,262
DOCUMENT INVERTER
Jeffrey J. Carrish, Milford, Mass., assignor to Delphax Systems, Randolph, Mass.
Filed Feb. 22, 1984, Ser. No. 582,244
Int. Cl.[4] B65H *29/20*
U.S. Cl. 271—186 **19 Claims**

1. Surface reversing sheet-feeding apparatus comprising:
a roller assembly, including an infeed roller wth a curved input guide, a central roller, and a pair of outfeed rollers, wherein said central roller is intermediate to and in driving engagement with said infeed and outfeed rollers, and respectively forms infeed and outfeed nips therewith;
a chute having a mouth adjacent said roller means and defining an interior channel, wherein a sheet passing through the infeed nip will enter said chute, and a sheet contained within the chute can exit through the outfeed nip;



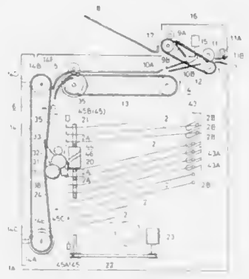
recoil means for arresting the leading edge of a sheet entering the chute and imparting a countervailing force thereto; and
a flipper assembly mounted to the central roller to guide the trailing edge of a sheet from the infeed nip to the outfeed nip.

4,842,263
SHEET REVERSING APPARATUS
William B. Robertson, Buckinghamshire, England, assignor to Xerox Corporation, Stamford, Conn.
Filed Jun. 1, 1984, Ser. No. 616,335
Claims priority, application United Kingdom, Jun. 8, 1983, 8315734
Int. Cl.[4] B65H *29/58*
U.S. Cl. 271—186 **6 Claims**



1. Sheet reversing apparatus including a buckle chamber and sheet feed means for feeding a sheet into and out of one end of said buckle chamber against an end stop to reverse the lead and trail edge orientation of the sheet, said sheet feed means comprising lower input and upper output rollers which cooperate with a common roller respectively to form input and output nips for conveying sheets into and to of the buckle chamber, and at least one finger arranged to engage the trail edge of the sheet immediately after it exits said input nip and lift the trail end of the sheet while guiding it into contact with said common roller and maintaining the contact of the sheet with said common roller for a period of time causing said common roller to transport the trail end of the sheet into said output nip.

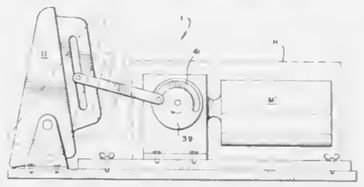
4,842,264
SORTING MACHINE
Kenji Kosaka, Naka, and Akihiro Suzuki, Ibaraki, both of Japan, assignors to Ikegami Tsushinki Co., Ltd., Tokyo, Japan
Filed Sep. 1, 1987, Ser. No. 91,905
Claims priority, application Japan, Sep. 9, 1986, 61-210675; Sep. 9, 1986, 61-210676; Sep. 9, 1986, 61-137365[U]
Int. Cl.[4] B65H *39/10*
U.S. Cl. 271—293 **8 Claims**



1. A sorting machine comprising:
a plurality of trays vertically stacked for receiving recorded sheets, each tray having a tray pin on each side of the tray's sheet entry end;
horizontal transport means for transporting the recorded sheets horizontally;
first guide means for deflecting said horizontally transported sheets to a vertical direction;
vertical transport means for transporting said deflected sheets vertically;
discharge means for discharging into one of said plurality of trays the recorded sheets transported by said vertical transport means;
second guide means for guiding the sheets transported by said vertical transport means to said discharge means and deflecting the sheets back to a horizontal direction in a face-down condition;
transfer means for transferring said discharge means and said second guide means, said transfer means comprising entry forming means for forming an entry for a tray to which recorded sheets are to be discharged according to the transfer of said discharge means;
hold means, being retractile in the vertical transport direction of said sheets according to the movement of said discharge means, for holding said recorded sheets between said hold means and said vertical transport means; and
tray support means, having plungers which are retracted by said tray pins of said trays when said entry forming means has formed an entry, for allowing vertical movement of said trays and for supporting said tray pins when said trays are at rest.

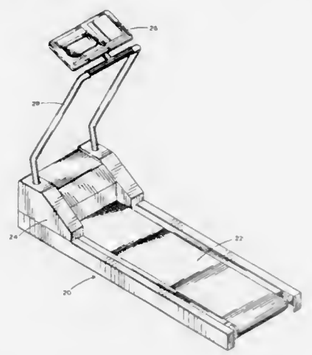
4,842,265
MULTI-MODE CPM PHYSIOTHERAPY FOOT MANIPULATING DEVICE
Chester E. Kirk, 6780 Carlisle Pike, Mechanicsburg, Pa. 17055
Filed Dec. 10, 1987, Ser. No. 131,409
Int. Cl.[4] A61H *1/02*
U.S. Cl. 128—25 B **16 Claims**

1. A multi-mode physiotherapy foot manipulating device comprising: a support, a reversible motor and a pair of pivotally oscillatable foot supports carried by said support, and drive means for interconnecting said reversible motor with each of said foot supports, said drive means including means for changing the oscillating phase, relationship of one of said foot supports relative to the other of said foot supports when the direction of operation of said reversible motor is reversed,



whereby said foot supports are selectively oscillatable in an in-phase, simultaneous dorsiflexing action and an out-of-phase dorsiflexing action.

4,842,266
PHYSICAL EXERCISE APPARATUS HAVING MOTIVATIONAL DISPLAY
James S. Sweeney, Sr., and James S. Sweeney, Jr., both of 2775 Temple Hills Dr., Laguna Beach, Calif. 92651
Filed Aug. 27, 1986, Ser. No. 900,720
Int. Cl.[4] A63B *23/06*
U.S. Cl. 272—69 **20 Claims**



1. In an exercise apparatus having a moving surface for running or walking, a motor for driving the moving surface, and means for varying the motor speed; a control and display system comprising:
user-operated command means for selecting desired motor speeds;
an electronic processor for storing the commands and causing them to control the motor-speed-varying means;
sensor/feedback means for conveying to the electronic processor information as to the distance represented by the motion of the moving surface;
a visual display including: (a) a closed course, the length of which represents a given distance; and (b) a position-indicating means which travels along the course repeatedly; and
means under the control of the electronic processor for causing the position-indicating means to travel continuously and repetitiously along the course as a function of the distance represented by the motion of the moving surface, in order to pictorally inform the user as to the distance covered.

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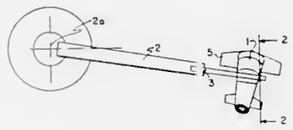
4,842,267

AMUSEMENT PARK DEVICE

Helmut Kastner, Goldene Aue 23, 2800 Bremen 41, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 93 1,737, Nov. 17, 1986, abandoned. This application Apr. 29, 1988, Ser. No. 188,276
Claims priority, application Fed. Re . of Germany, Nov. 23, 1985, 3541452
Int. Cl.[4] A63G *1/30*
U.S. Cl. 272—28 S **12 Claims**



1. An amusement device comprisin :
a carousel rotatable about a vertica axis;
a support arm carried by said caro sel;
a vertically arranged rotational su porting ring carried by said support arm and having a substantially horizontal device rotational axis;
a device car having a least one passe iger receiving place and supported in said ring with the ro ational axis extending in a forward orientation of the de ice car and being rotational therein about the device ro ational axis of said ring;
passenger operable control means c mprising a drive motor;
an internal gear carried by said de ice car;
the drive motor having a gear me hing with said internal gear;
means connected between said cont ol means and said drive motor for driving said drive moto to rotate said gear with said car about said device rotatio al axis in the direction of rotation of the carousel independ ntly of the movement of the carousel;
at least one pair of air foil flaps pi otally mounted on said device car;
the control being connected to said flaps to rotate said flaps to initiate rotation of said device car;
said means connected between saic control means and said drive motor device car having a central shaft portion having a radial projection, a holl w shaft portion extending around said central shaft po tion, said hollow shaft portion having diametrically opp site projections thereon and a spring extending between ach radial projection of said hollow shaft portion and th projection of said shaft portion, one of said shaft portio and said hollow shaft portion being attached to said de ice car and being urged by said springs into a rotationall starting position.

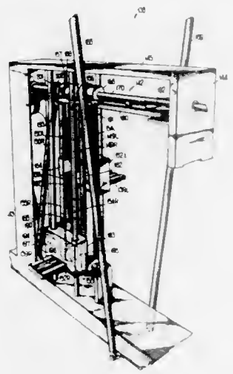
4,842,268

EXERCISE MACHINE

John W. Jenkins, Hampton, Ga., assi nor to Bellwether, Inc., Hampton, Ga.

Divisio of Ser. No. 82,742, Aug. 7, 1987, Pat. No. 4,798,379. This application Dec. 5, 1988, Ser. No. 280,026
Int. Cl.[4] A63B *21/00, 1/00*
U.S. Cl. 272—73 **2 Claims**

1. An exercise machine comprising
a rotatable device for dissipating e ergy;
a pair of foot engaging members e ch mounted for reciprocable substantially parallel move ent along a substantially linear first path, said foot engagi g members being operatively interconnected for alterna ing reciprocable movement causing movement of each oot engaging member in a first direction in response to m vement of the other foot engaging member in a second di ection, and vice versa;
a pair of hand levers each operat vely interconnected for alternating reciprocable substan ially parallel movement along a second path non-parallel to said first path causing movement of each hand lever in a first direction in response to movement of the other hand lever in a second direction and vice versa;
one-way clutch means driven alternately in said two directions by reciprocating movement of said pair of foot engaging members, and transmitting force to drive the rotatable device in one direction only;
means connecting said pair of hand levers to said one-way clutch means for transmitting force to drive the rotatable device in response only to a force acting on each lever in one direction; and



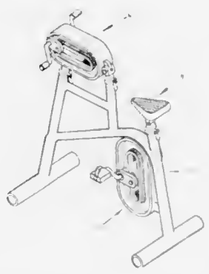
means operatively interconnecting the hand levers and the foot engaging members so that each movement of either foot engaging member causes movement of the hand levers, and vice versa,
so that the user of the exercise machine can do work on the rotatable means by reciprocating either foot engaging member of either hand lever in one direction along at least part of said paths, and can move that foot engaging member or hand lever in the other direction without interference from the rotatable device.

4,842,269

MULTI-FUNCTIONAL STATIONARY BIKE FOR GYMNASTIC PURPOSE

Gwo-Ming Huang, No. 181, Lane 412, Chenhsing Rd., Taichung, Taiwan

Filed Dec. 30, 1987, Ser. No. 139,759
Int. Cl.[4] A63B *21/00, 21/22*
U.S. Cl. 272—73 **6 Claims**



6. A stationary bike, in combination of:

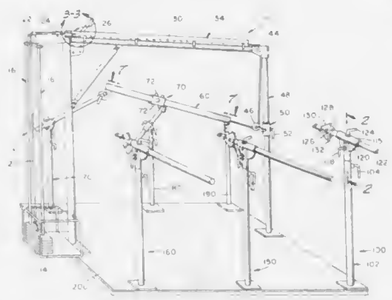
a bike frame including a lower portion and an upper portion;
a foot exercise mechanism including a foot pedal shaft having opposite ends extending therefrom, said foot pedal shaft being carried by the foot exercise mechanism for rotational movement, said foot exercise mechanism further including a pair of foot pedals, each foot pedal being carried by a respective opposite end of the foot pedal shaft, and a foot gearing mechanism for engaging the foot pedal shaft, such that the application of force upon the foot pedals rotates the foot pedal shaft and moves the foot pedals in upward and downward reciprocal movements in a substantially vertical plane;
a hand exercise mechanism including a hand pedal shaft having opposite ends extending therefrom, said hand pedal shaft being carried by the hand exercise mechanism for rotational movement, said hand exercise mechanism further including a pair of hand pedals, each hand pedal being carried by a respective opposite end of the hand pedal shaft, and a hand gearing mechanism for engaging the hand pedal shaft, such that the application of force upon the hand pedals rotates the hand pedal shaft and moves the hand pedals in forward and rearward reciprocal movements in a substantially horizontal plane;
a seat carried by the upper portion of the frame substantially above the foot exercise mechanism; and
such that the simultaneous application of force on the hand pedals and on the foot pedals rotationally moves said pedals and simultaneously moves both the hand pedals in the forward and rearward reciprocating movements in the substantially horizontal plane and the foot pedals in the upward and downward reciprocating movements in the substantially vertical plane, whereby the hand pedals and foot pedals each rotate and translate when driven by the user.

4,842,270

INTERCHANGEABLE TRACK EXERCISING DEVICE

Olaf Lange, Ua Noe St., 121 B, Waikoloa, Hi.

Fiied Aug. 22, 1988, Ser. No. 235,007
Int. Cl.[4] A63B *21/06, 69/00*
U.S. Cl. 272—117 **24 Claims**



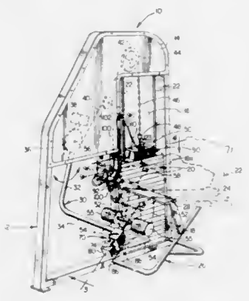
1. An exercising device comprising.
weight frame means having variable and moveable weight means for applying force to a user of the exercising device, cable means attached to the weight means, and pulley means attached to the weight frame means for receiving the cable means, the weight frame means guiding the movement of the weight means;
cable channel means attached to the weight frame means for receiving the output end of the cable means from the weight frame means and directing it toward the user further comprising pulley means attached to the cable guide means for receiving and guiding the cable means;
sliding means attached to the output of the cable means from the cable channel means, which sliding means is gripped and pulled by the user during exercise and thus transmits force for lifting the weight means via the cable means;
track means upon which the sliding means is slidably attached for guidance of the user's arm and hand in accordance with a particular exercise; and
a plurality of adjustable track support means attached to the track means to hold it stationary in one of a plurality of desired positions.

4,842,271

LEG EXTENSION EXERCISE MACHINE WITH LEG LENGTH AND EXERCISE MOTION RANGE ADJUSTMENT APPARATUS

John D. Vinciguerra, Dallas, Tex., assignor to Nautilus Sports/-Medical Industries, Inc., Dallas, Tex.

Filed May 24, 1988, Ser. No. 198,132
Int. Cl.[4] A63B *21/06*
U.S. Cl. 272—118 **12 Claims**



1. An exercise machine comprising:
an input member supported for forcible movement by a portion of an exerciser's body through a maximum exercise motion range extending between a first end position of said input member and a second end position of said input member;
resistance means, operatively connectable to said input member, for providing a yielding resistance to exerciser movement of said input member toward said second end position thereof;
connecting means for operatively connecting said resistance means to said input member, said connecting means having an elongated flexible section with an end portion connectable to said resistance means; and
resisted range adjustment means operable to selectively vary the portion of said exercise motion range through which movement of said input member is resisted by said resistance means, said resisted range adjustment means including:
roller means carried by said resistance means and secured to said end portion of said flexible section, said roller means being rotatable in opposite directions to selectively roll up said end portion to tension said flexible section and operatively associate said resistance means and said input member, or to permit payout said end portion relative to said resistance means to permit said input member to be moved from said first end position thereof toward said second end position thereof without resistance from said resistance means, and
locking means selectively operable to lock said end portion to said resistance means or to unlock said end portion and permit payout thereof relative to said resistance means,
whereby the resisted starting point of said input member within said motion range may be shifted from said first end position to a preselected intermediate position

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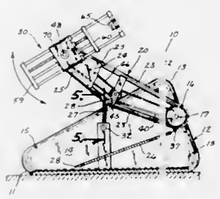
within said motion range by unlocking said locking means with said input member in said first end position to operatively disassociate said input member and said resistance means, moving said input member from said first end position to said intermediate position to cause end portion payout relative to said resistance means, and then re-locking said locking means to operatively reassociate said input member and said resistance means.

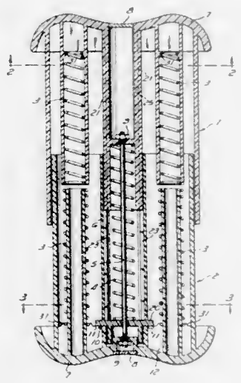
9. A leg extension exercise machine comprising:
a support frame;
an elevated seat structure associated with said support frame and having a seat upon which an exerciser may sit with his legs hanging over a front edge portion thereof;
a leg force input lever member carried by said support frame for leg-driven pivotal motion relative thereto about a generally horizontal axis, said lever member having an outer end portion which, with said lever member in an at rest start position, is positioned forwardly of and lower than said front edge portion of said seat;
foot engagement means pivotally carried by said outer end portion of said lever member and having a foot engagement portion engageable by the legs of the seated exerciser, generally adjacent his feet, in a manner such that extension of the exerciser's legs pivotally drives said lever member in a first rotational direction about said axis, the weight of said foot engagement means passing through a center of gravity thereof and exerting a first torque on said lever member in a second rotational direction about said axis;
counterweight means operatively associated with said lever member for exerting a second torque thereon in said first rotational direction about said axis to rotationally counterbalance said first torque;
resistance means, operatively connected to said lever member, for yieldingly resisting leg-driven pivotal movement of said lever member about said axis; and
adjustment means for pivotally adjusting said foot engagement means relative to said outer end portion of said lever member in a manner selectively varying the height of said foot engagement portion relative to said outer end portion to compensate for exerciser leg length variances without shifting said center of gravity relative to said outer end portion, whereby leg length adjustments may be made to said foot engagement means without rotationally imbalancing said lever member about said axis.

4,842,272
EXERCISE APPARATUS
Joe M. Jennings, 112 Sunset Dr., Hot Springs, Ark. 71913
Filed Sep. 8, 1988, Ser. No. 241,586
Int. Cl.[4] A63B *21/22 5/00*
U.S. Cl. 272—132 **7 Claims**



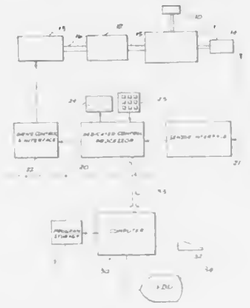
1. An exercise apparatus comprising:
a base;
a first support member attached to said base;
a second support member attached to said base, the second support member being spaced from said first support member;
a first arm;
means for rotatably attaching said first arm to said first support member about a substantially horizontal axis;
a second arm;
means for rotatably attaching said second arm to said second support member about a substantially horizontal axis;
first handle means operably attached to one end of said first arm for permitting a person to hold onto the first handle means;
second handle means operably attached to one end of said second arm means for permitting a person to hold onto said second handle means;
resistance means for resisting the rotation of said first and second arms;
the distance between said first handle means and said first substantially horizontal axis being substantially the average length of a human arm;
first means for pivotally attaching said first handle means to said one end of said first arm for allowing pivoting of said first handle means with respect to said first arm about at least two axes, whereby a user can grasp said first handle means with one hand and keeping the respective elbow straight can rotatably windmill the respective arm 360° about the respective shoulder joint thereof; and
second means for pivotally attaching said second handle means to said one end of said second arm for allowing pivoting of said second handle means with respect to said second arm about at least two axes, whereby a user can grasp said second handle means with one hand and keeping the respective elbow straight can rotatably windmill the respective arm 360° about the respective shoulder joint thereof; and transmission means for synchronizing the rotation of said arms.

4,842,273
VARIABLE COMPRESSION RESISTANCE EXERCISE DEVICE
Reinhard Schmeiss, 31 Lindall St., Laguna Niguel, Calif. 92677
Filed Jul. 9, 1987, Ser. No. 71,753
Int. Cl.[4] A63B *21/02*
U.S. Cl. 272—141 **6 Claims**



1. An exercise apparatus comprising:
a pair of coaxial members telescoping relative to each other along their common axis;
a plurality of opposing springs affixed to the pair of coaxial members for biasing the coaxial members toward separation when engaged therebetween; and
a rotary index mechanism rotatable about the common axis and disposed between the pair of coaxial members for registering selected ones of the plurality of springs in engagement between the pair of coaxial members.

4,842,274
EXERCISE APPARATUS
Albertus D. Oosthuizen; Janusz K. Buczkowski; Teresa Buczkowska, and Joanne A. Buczkowska, all of 48 Hamilton Street, Lane Cover, Australia (2066)
Continuation of Ser. No. 835,115, Feb. 10, 1986, abandoned.
This application Jan. 19, 1988, Ser. No. 145,742
Claims priority, application Australia, Jun. 14, 1984, PG5504
Int. Cl.[4] A63B *21/24*
U.S. Cl. 272—129 **23 Claims**



1. An exercise apparatus comprising:
a rotary driving means for generating a torque, said rotary driving means having a variable speed of rotation;
an adjustable speed control means, operably connected to said rotary driving means, for varying the speed of rotation of said rotary driving means;
an exercise element for manipulation by a user, said manipulation imparting a motion to said exercise element;
torque transmission means, operably connecting said rotary driving means and said exercise element, for providing a resistance to said user's manipulation of said exercise element and allowing for lost motion between said rotary driving means and said exercise element, said torque transmission means transmitting torque from said rotary driving means to said exercise element, said transmitted torque being of a magnitude that is substantially indepenent of said exercise element motion and is dependent only upon said speed of rotation of said rotary driving means.

4,842,275
METHOD FOR CONDUCTING A COMPETITION
Yury Tsatskin, 1083 Brighton Beach Ave., Brooklyn, N.Y. 11235
Filed Apr. 21, 1988, Ser. No. 184,259
Int. Cl.[4] A63B *71/00*
U.S. Cl. 273—1 R **12 Claims**

1. A method for conducting a competition which comprises:
(a) means for dividing competitors into a plurality of zones, wherein each zone comprises four or eight lower stage groups, and wherein each lower stage group comprises a plurality of competitors;
(b) means for collecting a first place finisher from one lower stage group in each of said zones to form an intermediate group, whereby the first place finishers in each of said lower stage groups are part of an intermediate group, and wherein the number of intermediate groups is equal to the number of lower stage groups;
(c) means for collecting four first place finishers from said intermediate groups to form a final group of competitors, wherein the number of final groups is equal to one quarter the number of lower stage groups in each zone;
(d) means for collecting second place finishers from:
(i) each of the lower stage groups in which one of the final group competitors competed and
(ii) each of the intermediate stage groups in which one of the final group competitors competed, to form one or two additional tournament groupings, each additional tournament grouping comprising eight competitors, wherein the number of additional tournament groupings is equal to one fourth the number of lower stage groups in each zone, and wherein the second place finishers from the lower stage group and from the intermediate stage group in which a final group competitor competed are separated so as to be matched against each other in said additional tournament grouping no earlier than the final round therein;
(e) means for adding the first place finisher from each of said one or two additional tournament groupings to a final group of competitors, such that each final group of competitors comprises five competitors; and

	NUMBER OF GROUPS IN ZONES	PLACES IN FINAL OF WINNERS OF GROUPS ON INTERMEDIATE STAGE	PLACES IN ADDITIONAL TOURNAMENT	
			FOR SECOND PLACE FINISHERS IN GROUPS ON INTERMEDIATE STAGE	FOR SECOND PLACE FINISHERS IN GROUPS WHERE FINALISTS PLAYED ON LOWER STAGE
GAMES	4	FROM 1 TO 4	FROM 1 TO 4 OR FROM 5 TO 8	FROM 5 TO 8 OR FROM 1 TO 4
	8	FROM 1 TO 4 OR FROM 6 TO 9	FROM 9 TO 12 OR FROM 13 TO 16	FROM 13 TO 16 OR FROM 9 TO 12
			FROM 1 TO 4 OR FROM 5 TO 8	FROM 5 TO 8 OR FROM 1 TO 4
NON GAMES	4	FROM 1 TO 4	FROM 1 TO 8	
	8	FROM 1 TO 8	FROM 1 TO 8 OR FROM 9 TO 16	

(f) displaying the winner from said final group or groups of competitors.

12. A method for conducting a competition comprising:
(a) means for randomly dividing six teams into two groups, each group comprising three teams, wherein each of said teams comprises players who are from countries where the same language is the primary spoken language, and wherein the teams within each group compete in a single round-robin tournament;
(b) means for pairing the first place finishers and for pairing the second place finishers from each of said groups; and
(c) displaying the positional finishes of said four paired teams, wherein the winner of said pairing of first place finishers is the overall first place finisher, the loser of said pairing of first place finishers is the overall second place finisher, the winner of said pairing of second place finishers in the overall third place finisher, and the loser of said pairing of second place finishers is the overall fourth place finisher.

4,842,276
GAME DEVICE FOR RANDOMLY SELECTING PLAYERS
Christian Darby, 224 Sullivan #23C, New York, N.Y. 10012
Filed Jul. 7, 1987, Ser. No. 70,432
Int. Cl.[4] A63B *71/04*
U.S. Cl. 273—1 E **14 Claims**

1. An electronic game device for randomly selecting the player or players to participate in each round of a preselected game, said device comprising a control module, a plurality of output stations, one output station associated with each player playing the game device, each output station having signal means for emitting a sensory signal to the player associated therewith, start means to initiate the device and control means, responsive to the start means having means for randomly determining the player or players to participate in a round and

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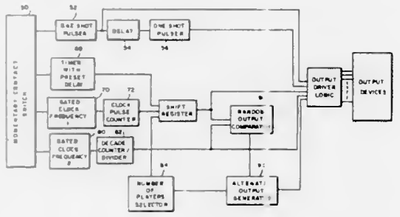
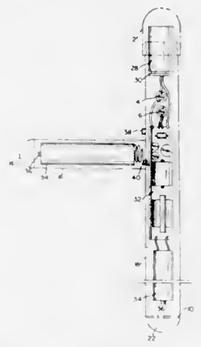
for generating and substantially simultaneously transmitting a signal to two or more selected output stations to indicate that



the players associated with the selected stations have been selected to participate in that round of the game.

4,842,277
MULTI-PURPOSE BATON
Eugene F. LaCroix, 5611-240th SE, Woodinville, Wash. 98072
Filed May 20, 1987, Ser. No. 52,589
Int. Cl.[4] A63B 59/00
U.S. Cl. 273—84 ES 2 Claims



1. An improved hand carried stick, for law enforcement personnel, functioning as a billy, night stick, or baton, in conventional ways, with additional self contained components which, when selectively activated, via finger tipped switches, provide more control power when subduing a person, or persons in a crowd, comprising:
(a) a main hollow lightweight body made of a strong non conducting material having a handle end portion and a continuing projecting portion;
(b) a self contained assembly of essentially end to end arranged electrical components and overall circuitry placed within the hollow body and extending from the handle end portion and continuing on throughout the continuing projecting portion, comprising:
overall circuitry;
a low voltage battery electrical energy source;
a push-button switch to control the passage of battery electrical energy to the overall circuitry;
a three position switch to selectively control the operations of the overall circuitry, after the push-button switch is activated;
the said overall circuitry, in turn comprising a direct current to direct current converter circuit, a feedback circuit, a magnetic solid core transformer circuit, and a multiplier circuit;
a laser light source connected to the overall circuitry;
a discharge ring connected to the overall circuitry and positioned in the continuing projecting portion at the end thereof; and
a grouping of paired longitudinal electrodes, paired to receive positive and negative charges, with these paired longitudinal electrodes spaced about the self contained assembly of essentially end to end arranged electrical components, and partially longitudinally embedded in the continuing projecting portion of the main hollow lightweight body and connected to the overall circuitry;
(c) a combined end cap and lens to cover over the end of the continuing projecting portion; and
(d) an end cap to cover over the hand held end portion;
(e) a second handle hollow portion of like body construction secured perpendicularly to the main hollow lightweight body at the locale of where the handle end portion of main body ends and the continuing projecting portion of the main body commences, whereby this second handle hollow portion is optionally used, when directing the laser light; and
(f) a second laser light source removably connected to the overall circuitry and positioned within this second handle hollow portion, which is then removably attached to the main hollow lightweight body, and which then also has a combined end cap and lens to cover the projecting end thereof, and uncoilable circuitry used in removably connecting this second laser light source,

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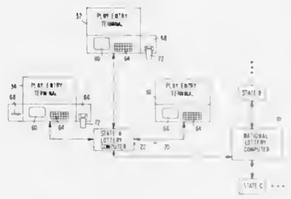
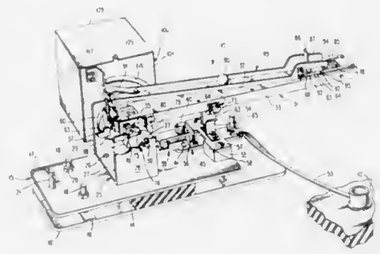
4,842,278
HIERARCHICAL LOTTERY NETWORK WITH SELECTION FROM DIFFERENTIATED PLAYING POOLS
Victor Markowicz, 11 Daniel Dr., Englewood, N.J. 07631
Continuation of Ser. No. 869,413, Jun. 2, 1986, abandoned. This application Jun. 10, 1988, Ser. No. 207,009
Int. Cl.[4] A63B 71/04
U.S. Cl. 273—138 A 20 Claims



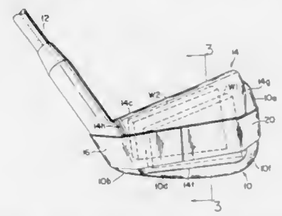
1. A lottery game, comprising:
a plurality of entry and validation stations, each having means to accept player entry data and means to record the player entry data, the player entry data for each of the stations including selections of entries relating to a regional game and also entries in a further centralized game in which players entering a plurality of separate and distinct regional games also select plays for the further game at a more centralized level than said separate and distinct regional games, the further centralized game having at least one means for selecting a winner from players from all of the separate and distinct regional games;
a plurality of regional processing stations in data communication with the entry and validation stations, the regional processing stations receiving the player entry data for the further centralized game according to a predetermined game format, winning players being chosen according to predetermined game procedures in each of the regional games, from at least part of said player entry data;
a central processing station in data communication with at least one of the entry and validation stations and the regional processing stations, the central processing station receiving the player entry data according to a further predetermined game format, winning players to be chosen at the more centralized level according to a further predetermined game procedure in which the player entry data is compared to a winning data pattern; and,
means differentiating at least one of the player entry data, the predetermined game format and the predetermined game procedure, such that player entry data for successive plays is differentiated into separate playing pools, including regional and more centralized separate playing pools, the separate playing pools all operating according to procedures for determining winning players, and the separate playing pools varying over time as different numbers of plays and wins occur in said differentiated pools.

4,842,279
INDICATING DEVICE
Benny R. Coleman, 102 W. Oak St., Nicholasville, Ky. 40356
Filed Sep. 26, 1988, Ser. No. 248,590
Int. Cl.[4] A63B 69/36
U.S. Cl. 273—183 A 18 Claims



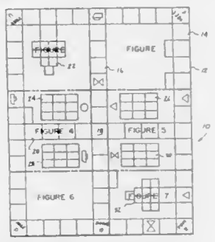
1. A device for indicating to a person striking a ball at a fixed position that eye contact was maintained at the fixed position until after the ball is struck including:
ball support means for supporting a ball to be struck at the fixed position;
movable means mounted for movement between an inactive position and an indicating position;
advancing means for advancing said movable means from its inactive position to its indicating position in response to movement of said ball support means when a ball on said ball support means is struck;
said movable means having disposing means including a plurality of different indicators for disposing one of said plurality of different indicators for viewing at a viewable position, adjacent the fixed position, by the person striking a ball on said ball support means when said movable means is moved to its indicating position;
control means supported by said movable means for controlling the period of time that the one disposed indicator can be viewed at the viewable position by the person striking a ball on said ball support means so that the person cannot view the one disposed indicator unless eye contact is maintained at the fixed position until after striking a ball on said ball support means;
and moving means for moving said disposing means of said movable means to a position in which the one disposed indicator previously disposed at the viewable position may be viewed when said movable means is returned to its inactive position from its indicating position.

4,842,280
SWING WEIGHT FOR GOLF CLUB IRON
Carol M. Hilton, 240 Cedar Ridge Dr., Glastonbury, Conn. 06033
Filed May 27, 1988, Ser. No. 200,070
Int. Cl.[4] A63B 69/36
U.S. Cl. 273—194 B 20 Claims



1. A device for use with a golf club iron having a hosel and attached head with front and rear faces, and having top and bottom edges that extend from a toe to a heel of the iron's head, said device comprising:
envelope means having opposed envelope edges spaced symmetrically from a center line located between said opposed envelope edges, said envelope means being foldable at least along said central line,
two metal weights provided inside said envelope means, each weight having one edge adjacent one of said opposed envelope edges, each weight having a second edge oriented generally parallel to and adjacent said envelope means central line,
attachment means for securing said envelope means to the iron's head such that each weight is adjacent a face of the iron's head and such that the envelope means center line lies on the top edge of the iron's head,
said attachment means including at least one flexible strap secured to said envelope means and having a projecting portion extending away from said envelope means generally parallel to said central line whereby said strap is adapted to encircle the heel of the iron's head, and means for securing said strap projecting portion of said envelope means.

4,842,281
OPTION BOARD GAME
Gerald Turner, Rt. 2, 116 Fantasy Dr., Lyles, Tenn. 37098
Filed Jan. 28, 1988, Ser. No. 149,365
Int. Cl.[4] A63F 3/00
U.S. Cl. 273—256 4 Claims



3. An option board game, comprising:
a game board;
a plurality of intersecting movement paths on said game board, each of said movement paths formed from a series of adjacent squares;
a plurality of random consequence charts on said game board designated by various symbol; each of said random consequence charts having a plurality of numbered boxes designated by possile numerical totals obtained by rolling a pair of dice;

said squares being variously designated by letters of a key phrase and an associated dollar value, by a key word and one of the letters thereof, by one of said random consequence chart symbols, by a choice of optional courses of play, by a monetary award, and by the word "FREE" and one of the letters of said key phrase;

a pair of dice;

a plurality of players pieces; and

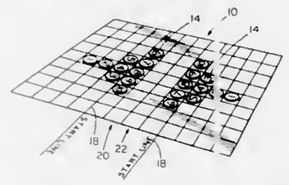
a plurality of scoreboards, each of said scoreboards having specified locations designated by the letters of said key phrase and by the letters of said key word, and numerical counter means for maintaining a player's bank account value.

4,842,282

METHOD FOR PLAYING A TRIANGULAR PYRAMID BOARD GAME

Michael Sciarra, P. O. Box 71923, Los Angeles, Calif. 90071-0923

Filed Mar. 18, 1987, Ser. No. 27,242
Int. Cl.[4] A63F 3/02
U.S. Cl. 273—258 5 Claims



1. In a method of playing a board game, which game board has a playing surface divided into a plurality of squares arranged into rows and columns, and for which are provided two sets of a plurality of consecutively numbered playing pieces for movement along the squares of the playing surface, the playing surface being divided into a first player's territory at one end portion thereof, a second player's territory at the other end portion thereof, and a middle portion serving as a neutral territory, said method comprising:

arranging said sets of playing pieces on the playing surface such that each set is positioned in a respective player's territory, said step of arranging comprising positioning each player's playing pieces in consecutive order into a plurality of rows with the playing piece numbered one lying in a center square of a row farther away from the middle portion of the playing surface than the other rows in which are positioned other ones of the playing pieces, positioning the second numbered playing piece in the center square of the row next-closest to the middle portion, positioning the third, fourth and fifth numbered playing pieces in the row next closest to the middle portion such that the fourth numbered playing piece lies in the same column as the first and second numbered playing pieces, and positioning the sixth, seventh, eighth, ninth and tenth numbered playing pieces in the row next closest to the middle portion of the playing surface such that the eighth numbered playing piece lies in the same column as the first, second and fourth numbered playing pieces;

alternatively moving a playing piece of the first set and a playing piece of the second set, said step of moving comprising moving one respective piece in one of the forward, backward, and sideways directions; and

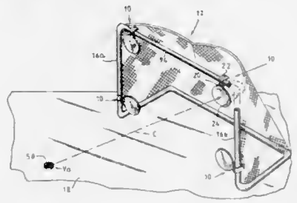
rearranging each set of playing pieces in consecutive order on the other player's territory which defines the game-winning state; said step of rearranging comprising positioning the first numbered piece in a first row of the other player's territory on the center square thereof, positioning the second and third numbered playing pieces in a second row farther away from the middle portion than the first row containing the first-numbered playing piece, positioning the fourth, fifth and sixth numbered playing pieces in a third row farther away from the middle portion than the second row, and positioning the seventh, eighth, ninth and tenth playing pieces in a fourth row still farther away from the middle portion than the third row to form a triangular array, such that the first, second, fourth and tenth playing pieces lie along a diagonal, and the first, third, sixth and tenth numbered playing pieces lie along a different diagonal to thus form the two sides of the triangular array.

4,842,283

TARGET ASSEMBLY

Kenneth LeBel, and John P. Melendez, both of 16 La Marcus Ave., Glen Cove, N.Y. 11542

Filed May 5, 1987, Ser. No. 46,276
Int. Cl.[4] A63B 69/00; F41J 7/04
U.S. Cl. 273—392 21 Claims



1. A target assembly adapted to be mounted on a support member which comprises:

a support arm;

a contact target member having a visibly observable surface;

means for pivotally interconnecting said contact target member and said support arm so that said contact target member is permitted to undergo angular displacement from a preselected target position;

biasing means for biasing said contact target member to return to said preselected target position;

means for preventing said contact target member from undergoing angular displacement in a preselected direction beyond said preselected target position;

means for removably affixing said support arm to the support member and for adjustment of the position of said target assembly therealong; and

said support arm and said contact member being positionable so that, when said support arm is affixed to said support member, said visually observable surface of said contact target member is in the predetermined selected target position for engagement and deflection by a moving projectile, so that when the projectile contacts said surface, the accompanying force of the projectile causes said contact target member to be angularly displaced from the preselected target position, and after angular displacement beyond said preselected target position, resiliently returning thereto.

4,842,284

CENTER SOCCER TWO WAY GOAL

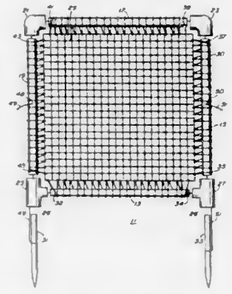
James L. Rushing, and John L. Rushing, both of 577 S. Coast Hwy., Laguna Beach, Calif. 92652

Continuation of Ser. No. 937,745, Dec. 4, 1986, abandoned. This application Sep. 16, 1988, Ser. No. 245,949
Int. Cl.[4] F41J 1/10
U.S. Cl. 273—395 7 Claims

1. A collapsable two sided soccer goal adapted to receive a soccer ball from either of two opposing sides, said two sided soccer goal comprising:

a plurality of generally tubular members, each said member having a hollow bore extending axially therethrough, said plurality of tubular members being alternately disposable in an assembled configuration wherein said tubular members are rigidly interconnected to form a soccer goal framework having at least two vertical upright members and at least one horizontal crossmember and in a disassembled configuration characterized by a lack of rigid interconnection between said tubular members;

a net engaged to and suspended within the framework, said net being sized and positioned so as to form two directly opposing, vertically disposed, ball-receiving surfaces of substantially identical configuration, each of said ball-



receiving surfaces being exposed to receive a ball from substantially any location forward of the respective ball receiving surface; and

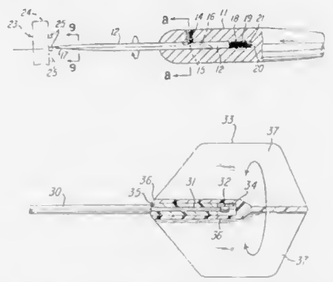
lacing disposed about the framework and engaging the net to the framework, said lacing further passing through the axial bore of each tubular member so as to maintain all of the tubular members comprising the framework in connected condition when the framework is disassembled.

4,842,285

ANTI-BOUNCE-OUT DART

Charles W. Farler, 4503 Woodbine Ave., Dayton, Ohio 45420

Continuation-in-part of Ser. No. 868,621, May 29, 1986, abandoned. This application May 26, 1987, Ser. No. 53,476
Int. Cl.[4] A63B 65/02
U.S. Cl. 273—420 6 Claims



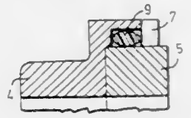
5. An anti-bounce-out dart comprising a retractable needle having an off-center point which is from about 0.010 inch to about 0.025 inch off-center in relation to the central axis of the remaining straight portion of said needle located in the forward portion of the needle; a grooved portion located in the rearward portion of the needle wherein said needle groove is formed at an angle of about 60 degrees to about 80 degrees with respect to the central axis of said dart body and said off-center needle point; a seated member whose lower portion seats in said needle grooved portion; a dart body; a cavity in the forward portion of the dart body which receives the rearward portion of the needle and permits it to rotate, a spring located in said cavity between the rear portion of the needle and the forward most portion of the head portion of a spring retainer which about the dart body at the end of said cavity with the tail portion of said spring retainer passing through the central part of a helical opening formed by said spring thereby permitting resetting the position of said seated member in said needle groove and repositioning said needle when the dart needle sticks in a dart board, and a flight assembly comprised of an integral flight rotation shaft having a cylindrical forward portion and a flight mating portion, wherein said flight mating portion has either one or more extension(s) and/or recess(es) than its remaining portion(s) to enable it to mate at such portion(s) in a slip fit with one or more respective recess(es) or extension(s) in the axial cavity portion(s) of a dart flight having mounted thereon a snap-on, rotatable fliqht such that no portion of the means of flight attachment is external to any external surface of said flight and wherein said flight is comprised of a flight bushing tube having a plurality of vanes or fins equally spaced around said flight bushing tube and an axial flight cavity whose inner diameter has one or more respective extension(s) and/or recess(es) whose distances and shape conform substantially to, yet leave a gap or space between, those respective extension(s) and/or recess(es) on the mating portion of said flight rotation shaft to cause a slip fit union therewith permitting said flight to rotate freely around said shaft, said dart having a dual action of rotation of said needle and forcing said needle point off a dart board wire, upon striking same, and forcing same into the dart board holding material.

4,842,286

SLIDE RING SEAL WITH CIRCUMFERENTIALLY VARIABLY-BEVELED COUNTER-SURFACE ON A SHRINK FITTED SLIDE RING THEREOF

Antti-Jussi Heilala, Starnberg, Fed. Rep. of Germany, assignor to OY Safematic Ltd., Muurame, Finland

Filed Sep. 17, 1987, Ser. No. 97,873
Claims priority, application Finland, Oct. 27, 1986, 864339
Int. Cl.[4] F16J 15/34, 15/38
U.S. Cl. 277—38 5 Claims



1. A slide ring seal for sealing between a wall part and a shaft part which is rotatable with respect to the wall part, about a longitudinal axis of the shaft part,

said slide ring seal comprising:

a first assembly comprising:

a first seating ring adapted to be mounted on one of said parts, said first seating ring having means providing a circumferentially-extending first recess;

a first slide ring received in said first recess and secured to said first seating ring, said first slide ring having an axially-presented first slide ring counter-surface which is exposed from said first seating ring; and

a second assembly comprising:

a second seating ring adapted to be mounted on the other of said parts, said second seating ring having means providing a second recess;

a second slide ring received in said second recess and secured to said second seating ring, said second slide ring having an axially-presented second slide ring counter-surface which is exposed from said second seating ring;

said means providing said second recess including an axially-facing inner end wall surface perimetrically-bounded by an axially-extending flange means having an axial length and a radial thickness, a radially inner counter-surface and a free end;

wave-forming means for forming a wave-like pattern on said counter surface of said second slide ring, said wave-forming means defining a plurality of angularly-spaced notches

in said radially inner counter-surface extending from said free end at least part way through said axial length and radial thickness of said axially-extending flange means, said notches thereby dividing said radially inner counter-surface into a plurality of angularly-spaced radially inner counter-surface portions;

said second seating ring having said radially inner counter-surface portions disposed in interference-fit engagement with a radially outwardly-facing outer circumferential surface of said second slide ring for securing said second slide ring to said second seating ring;

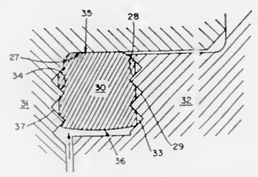
said first slide ring counter-surface is coaxially disposed in surface-to-surface sliding engagement with said second slide ring counter-surface, whereby said second slide ring, including said second slide ring counter-surface, in use, is locally worn to a greater degree where surrounded by said radially inner counter-surface portions than where surrounded by said notches so as to become waveform in a circumferential direction of said second slide ring counter-surface with sites of greater wear being located angularly intermediate each respective pair of said notches closest to each other.

4,842,287

HELIUM PRESSURE SEAL FOR A CRYOGENIC REFRIGERATOR

Alan L. Weeks, Lunenburg, Mass., assignor to Helix Technology Corporation, Waltham, Mass.

Filed Oct. 22, 1987, Ser. No. 112,222
Int. Cl.[4] F02F *11/00*; F25B *9/00*
U.S. Cl. 277—53 **4 Claims**



1. A seal for pressurized gaseous claim helium containment comprising:

a deformable gasket;

first and second members enclosing pressurized helium and having a plurality of concentric serrations such that said gasket is positioned between the serrations of said members;

pressure means for applying pressure to said first and second members such that said serrations deform the gasket forming concentric grooves therein to form a seal; and

an axial wall concentric about the gasket such that the wall supports the gasket.

4,842,288

KEYLESS CHUCK

Takaharu Ando, Aichi, Japan, assignor to EMU-ESU Industrial Co., Ltd., Nishio, Japan

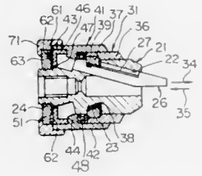
Filed Feb. 29, 1988, Ser. No. 162,207
Claims priority, application Japan, Jul. 3, 1987, 62-103098
Int. Cl.[4] B23B *31/04*
U.S. Cl. 279—62 **7 Claims**

1. A keyless chuck for gripping an article such as a tool, said keyless chuck comprising:

a body having formed therein a plurality of bores arranged about an axis of the body, said bores having their respective one ends opening at an axial one end face of said body, said bores having their respective axes inclined along the axis of said body so as to diverge toward the other axial end of said body;

a plurality of jaws fitted respectively in said bores for sliding movement therealong, each of said jaws being formed with male threads;

a substantially cylindrical, first operating component mounted on said body for rotation relative thereto about the axis of said body in a first rotational direction and a second rotational direction opposite thereto, said first operating component being movable along the axis of said body in a first axial direction away from the other axial end of said body and in a second axial direction opposite to said first axial direction, said first operating component being provided with female threads in engagement with said male threads on the respective jaws so that rotation of said first operating component in said first rotational direction causes said jaws to be moved respectively along said bores in said body away from the other axial end thereof to enable said jaws to grip therebetween the article, and rotation of said first operating component in said second rotational direction causes said jaws to be moved respectively along said bores in said body toward the other axial end thereof to permit the article to be released from said jaws;



a substantially cylindrical, second operating component mounted about an outer peripheral surface of said first operating component for angular movement in said first and second rotational directions and for movement in said first and second axial directions, said second operating component having at least one projection extending radially inwardly, said projection being located in engaging relation to an axial end face of said first operating component remote from said axial one end face of said body, said second operating component comprising a cylindrical sleeve fitted about the outer peripheral surface of said first operating component, and a pressure receiving member, said projection being in the form of an annular projection formed on an inner peripheral surface of said sleeve, said pressure receiving member having a cylindrical wall portion fixedly fitted in an end portion of said sleeve adjacent the other axial end of said body, and a flange portion extending radially inwardly from said cylindrical wall portion and confronted with said end member;

an end member fixedly mounted to said body adjacent the other axial end thereof; and

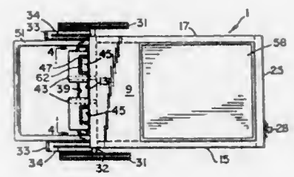
cam means arranged between said flange portion and said end member for moving said second operating component in said first axial direction when said second operating component is angularly moved in one of said first and second rotational directions, to cause said projection of said second operating component to move said first operating component in said first axial direction thereby moving said jaws threadedly engaged with said first operating component respectively along said bores in said body away from the other axial end of said body, and for enabling said second operating component to be moved in said second axial direction when said second operating component is angularly moved in the other of said first and second rotational directions.

4,842,289

PORTABLE SKI LOCKER

G. Kevin Samuels, 7513 Fountain Ave., #310, Los Angeles, Calif. 90046

Filed Jan. 22, 1988, Ser. No. 147,150
Int. Cl.[4] B62B *13/18*
U.S. Cl. 280—8 **4 Claims**



1. A portable ski locker device, including:

a container having intercoupled front, back and side vertical panels and top and bottom horizontal panels;

opposed front and back vertical frame members joined to each other by opposed, horizontal top and bottom frame members for supporting said vertical panels and horizontal panels, respectively;

said front vertical panel having a door portion and a fixed portion, said door portion being rotatably supported from said fixed portion to permit opening of said container;

first locking means supported in said door portion and rotatable therewith;

second locking means supported in said fixed portion of said front panel and positioned for cooperation with said first locking means when said door portion is in a closed position;

ski-retaining means carried by the outer surface of said back panel of said container, said ski-retaining means including at-least-one hinged member for encompassing skis transversely, said at-least-one hinged member including third locking means for selectively securing skis therein;

a support flange welded to said back vertical frame members in alignment with said hinged members;

gusset means removably secured to said support flange;

said gusset means terminating at their ends remote from said support flange, in runner members, said runner members being oriented at an angle to said vertical frame members;

said bottom panel member being perforated.

4,842,290

COMBINATION SEAT POST AND AIR PUMP FOR BICYCLE

Kevin J. Alioto, 40 Locksly La., San Rafael, Calif. 94901

Filed May 27, 1988, Ser. No. 199,420
Int. Cl.[4] B65B *3/04*
U.S. Cl. 280—201 **11 Claims**

1. An air pump for a bicycle having a tubular frame part for normally receiving a seat part comprising:

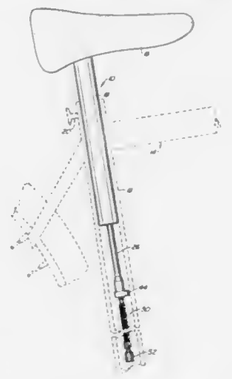
a hollow post removably receivable in the frame part of the bicycle;

means mounted on the upper end of the post for coupling a bicycle seat thereto;

a tube partially extending into the post through the lower end thereof;

a diaphragm secured to the inner end of the tube and in sliding engagement with the inner surface of the post;

a check valve adjacent to the diaphragm for providing a one-way flow of air through the tube; and



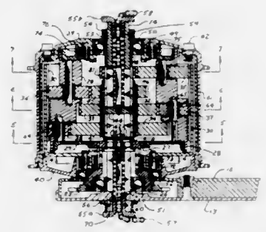
a hose mounted on the opposite end of the tube for connecting the tube to a device to be inflated.

4,842,291

ENCLOSED MULTIPLE SPEED DRIVE FOR LOW MAINTENANCE CHAIN DRIVEN BICYCLES

Dirck T. Hartmann, 4121 Morning Star Dr., Huntington Beach, Calif. 92649

Filed Jul. 22, 1987, Ser. No. 77,282
Int. Cl.[4] B62M *9/06*
U.S. Cl. 280—238 **4 Claims**



1. In a bicycle with a frame with a bottom bracket, a chain stay on one side, a pair of conventional seat stays with dropouts on the lower ends of said seat stays, a rear spindle located in said dropouts and fixed by said frame, an enclosed chain drive comprising:

a steel tube with a flange on one end rotatably mounted and axially captive within said bottom bracket;

a chain case press fit on said steel tube inside said flange;

a pedal drive shaft mounted on conventional ball bearings within said steel tube with said steel tube forming the outer race for said ball bearings on the chain case side, and a conventional bearing nut threaded in the opposite end of said steel tube forming the outer race for the ball bearings on the other side;

a locknut securing the position of said bearing nut;

a forward sprocket located within said chain case and fixed on said pedal drive shaft for rotation therewith;

a rear sprocket fixed on a drive fitting rotatably mounted on said rear spindle and located within said chain case;

a conventional drive chain located within said chain case and trained about said rear sprocket and said forward

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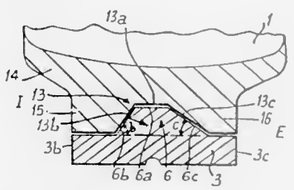
sprocket for driving said rear sprocket from said forward sprocket;
a chain case cover enclosing said sprockets and said drive chain; said chain case cover being attached to said chain case with screws and providing axial support and indexing for said rear spindle;
left and right side pedal crank arms fixed on said pedal drive shaft with a shoulder on one of said pedal crank arms a close running fit inside said chain case cover and a shoulder on the other a close running fit inside said locknut;
and an over center quick disconnect located on each of said dropouts and clamping each end of said rear spindle in said dropouts.

4,842,292
FOLDABLE MULTIPURPOSE BICYCLE
Fu-Chao Wang, 3rd F., No. 31, Chao Chou St., Taipei, Taiwan
Filed Dec. 16, 1987, Ser. No. 134,510
Int. Cl.[4] B62K *15/00*
U.S. Cl. 280—287 **23 Claims**

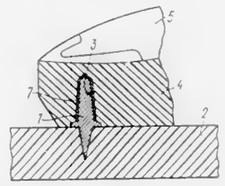
1. A foldable multipurpose bicycle comprising:
a foldable main frame;
a handlebar assembly mounted foldably on said main frame;
a seat assembly having a saddle mounted removably on said main frame;
a left pedal assembly mounted foldably on said main frame;
a right pedal assembly mounted foldably on said main frame;
a front wheel assembly having a front wheel of a standard diameter mounted removably on said main frame;
a rear wheel assembly having a rear wheel of said standard diameter mounted removably on said main frame;
a front brake assembly mounted on a front portion of said bicycle;
a rear brake assembly mounted foldably on a rear portion of said bicycle;
a float assembly mounted removably on said main frame;
a propeller assembly mounted removably on said main frame, said propeller assembly being comprised of:
a pipe structure including a vertical pipe, an upper horizontal pipe secured to and communicating with an upper end of said vertical pipe, and a lower horizontal pipe secured to and communicating with a lower end of said vertical pipe;
a propeller having a horizontal rotating shaft journalled on an end of said lower horizontal pipe, and a plurality of propeller blades fixed on said rotating shaft;
a drive shaft extending through said vertical pipe of said pipe structure;
a wheel axle socket mounted rotatably within said upper horizontal pipe and adapted to be sleeved rigidly on a wheel axle;
a first pair of interconnecting bevel gears respectively fixed on said drive shaft and said wheel axle socket for transferring rotation therebetween;
a second pair of interconnecting bevel gears respectively fixed on said drive shaft and said rotating shaft of said propeller for transferring rotation therebetween; and
a pair of generally parallel rudder cables adapted to be fixed separately on a steering column at an end thereof and fixed separately on said vertical pipe of said pipe structure at the other end thereof, said rudder cables being interdisposed with sufficient tension between said steering column and said vertical pipe of said pipe structure to enable said upper and lower horizontal pipes to rotate about said vertical pipe by rotating said handlebar assembly;
whereby, said handlebar assembly can drive said lower horizontal pipe of said pipe structure and hence said rotating shaft of said propeller to rotate about said vertical pipe of said pipe structure while said left and right pedal assemblies can drive said propeller blades of said propeller to rotate;
two quick-release lock mechanisms for locking releasably said front wheel and said rear wheel respectively on said main frame; and
a wheel connecting rod assembly mounted removably on said bicycle for attaching said front and rear wheels rotatably to center of said main frame when said bicycle is folded;
whereby, when said float assembly and propeller assembly are removed from said main frame, the remaining parts of said bicycle form a bicycle for riding on land; when said front and rear wheels are removed from said main frame, the remaining parts of said bicycle can be adjusted to form a hydro-bicycle for riding on smooth surfaced water, so that said propeller assembly propels said hydro-bicycle by rotating said left and right pedal assemblies and varies the advancing direction of said hydro-bicycle by rotating said handlebar assembly; when said bicycle is idle, said float assembly and propeller assembly may be removed from said main frame and the remaining parts of said bicycle are collapsible to form a wheel-like small unit.

4,842,293
APPARATUS FOR LATERAL GUIDANCE OF A SKI BOOT, ATTACHED AT ITS FRONT END, TO A CROSS-COUNTRY SKI
Jean-Claude Rochard, Annecy Le Vieux, France, assignor to Salomon, S.A., Annecy Cedex, France
Filed Nov. 29, 1985, Ser. No. 802,820
Int. Cl.[4] A63C *9/00, 5/00;* **A43B** *5/04*
U.S. Cl. 280—615 **57 Claims**



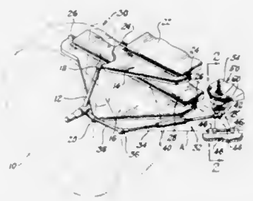
1. An apparatus for laterally retaining a boot housing the foot of a skier on a cross-country ski, wherein said boot is attached at its front end to said cross-country ski, wherein said apparatus comprises:
a lateral retention element positioned at the upper surface of said ski, wherein said element has an asymmetrical cross-sectional configuration with respect to a plane perpendicular to the centerline of said upper surface of said ski.

4,842,294
SKI BINDING
Vladimir S. Makarenko, Leningrad, U.S.S.R., assignor to Leningradsky Politekhnichesky Institut, Leningrad, U.S.S.R.
PCT No. PCT/SU86/00033, § 371 Date Dec. 3, 1986, § 102(e) Date Dec. 3, 1986, PCT Pub. No. WO86/06290, PCT Pub. Date Nov. 6, 1986
PCT Filed Apr. 18, 1986, Ser. No. 14,057
Claims priority, application U.S.S.R., Apr. 26, 1985, 3879999
Int. Cl.[4] A63C *9/10*
U.S. Cl. 280—615 **4 Claims**



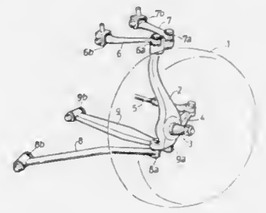
1. A ski binding comprising:
rest pins disposed on one of a ski and a boot;
holes corresponding to said rest pins disposed on the other of said ski and boot;
an outer surface of at least one rest pin forming a friction couple with an inner surface of at least one corresponding hole; and
the friction couple represents a Morse taper.

4,842,295
VEHICLE WHEEL SUSPENSION
Gene R. Hawkins, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 28, 1988, Ser. No. 173,895
Int. Cl.[4] B62D *17/00*
U.S. Cl. 280—661 **3 Claims**



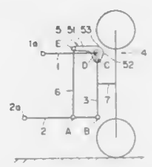
1. In a vehicle road wheel suspension connecting such wheel with the chassis mass of the vehicle for guided motion relative thereto, the combination comprising, a wheel support member, support member guidance means including at least one laterally extending control arm pivotally attached to the support member and swingably mounted at its inboard end to the chassis mass, laterally extending toe-controlling link means in spaced relation with the control arm, pivotally attached to the support member, and adapted for swingable movement about an axis inboard of the chassis mass, and power-operated means for locating said axis selectively adjustably to various positions vertically with respect to said chassis mass without substantial lateral displacement, whereby to vary the toe-in/toe-out displacement of said wheel support member during motion of the latter relative to the chassis mass.

4,842,296
VEHICLE SUSPENSION SYSTEM FOR A STEERABLE WHEEL
Kanji Kubo, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 21, 1987, Ser. No. 135,250
Claims priority, application Japan, Dec. 27, 1986, 61-314022
Int. Cl.[4] B60G *3/00*
U.S. Cl. 280—663 **6 Claims**



1. A suspension system for a steerable wheel, comprising a knuckle rotatably supporting a wheel, two pairs of lateral links, each pair being located one above the other, having outer ends pivotally connected to upper and lower parts of the knuckle, respectively, and inner ends pivotally connected to a vehicle body, so as to allow a steering action and a vertical motion of the knuckle, wherein:
a tread contact surface is made to coincide with a certain horizontal plane in such a manner that a range of a curve, given as a curve of a intersection between the horizontal plane and trajectory surface defined by a generatrix which is formed by connecting an instantaneous center of rotation of the knuckle as given by the upper pair of the lateral links with another instantaneous center of rotation of the knuckle as given by the lower pair of the lateral links is minimized for a given range of steering angle, wherein said trajectory surface comprises a conical surface convergent from said upper lateral links toward said horizontal plane.

4,842,297
SUSPENSION SYSTEM OF MOTOR VEHICLES
Mitsuo Takahashi, Ota, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 7, 1988, Ser. No. 216,362
Claims priority, application Japan, Jul. 13, 1987, 62-174457
Int. Cl.[4] B62D *7/20*
U.S. Cl. 280—675 **2 Claims**



1. A suspension system of wishbone type in a motor vehicle comprising:
an upper suspension arm having one end pin-connected to a body portion of the motor vehicle;
a lower suspension arm having one end pin-connected to the body portion of the motor vehicle;
a knuckle member operatively connected to an axle of a wheel of the motor vehicle and operatively connected to

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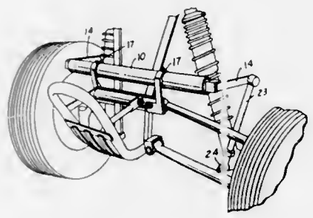
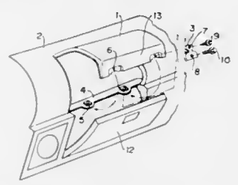
the other ends of said upper and lower suspension arms, respectively;
a connecting rod having one end pin-connected to one of said upper and lower suspension arms; and
a bell crank lever having a first arm with an end pin-connected to the other end of said connecting rod, a second arm with an end pin-connected to one end of said knuckle member and a bent portions between said first and second arms of the bell crank lever, said bent portion being pin-connected to the other end of the other one of said upper and lower suspension arms.

4,842,298
SWAY BAR FOR ALL TERRAIN VEHICLE
Patrick Jarvis, 5744 Kinmore, Dearborn Heights, Mich. 48127
Filed Feb. 29, 1988, Ser. No. 161,734
Int. Cl.[4] B60G *19/00*
U.S. Cl. 280—689 **8 Claims**



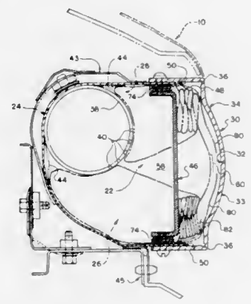
1. Front end sway bar attachment to the front end frame of a four wheel ATV vehicle having independent front wheel suspension, comprising a single tube carrier, bracket means attaching said carrier rigidly to said frame, a closely fitted torsionally yieldable solid plastic torsion bar extending through said tube carrier with clearance for unlubricated rotary oscillation, a pair of end bracket lever arms torsionally connected to the end of said torsion bar projecting normally to its axis, a pair of connecting rod means adjustable in length connecting the ends of said lever arms and a lower shock mount sprung element of each front wheel suspension whereby unsymmetric centrifugal force spring loading at either wheel will be at least partially transmitted through the levers, torsion bar and connecting rod means to the spring suspension of the other wheel.

4,842,299
AIR BAG DOOR FASTENING STRUCTURE
Shotaro Okamura, Toyota, and Satoshi Shimomura, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan
Filed Jan. 13, 1988, Ser. No. 143,382
Claims priority, application Japan, Jan. 13, 1987, 62-3150[U]
Int. Cl.[4] B60R *21/10*
U.S. Cl. 280—732 **6 Claims**



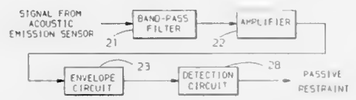
1. An air bag door fastening structure having an air bag door including a base layer of synthetic resin, coupled at one side end thereof through hinges with an instrument panel and at another side end thereof through breakaway members with said instrument panel, said breakaway member comprising two fastening portions integrally coupled through a thin integral hinge with each other as a coupler in such a manner that one fastening portion is coupled fixedly with said base layer and the other fastening portion is coupled fixed with said instrument panel, said other fastening portion comprising a projection formed thereon; and said instrument panel comprises an opening to be positioned with said projection of said breakaway member.

4,842,300
VEHICLE AIR BAG MODULE WITH INTERNAL REINFORCING STRUCTURE
Joseph F. Ziomek, West Bloomfield; Joseph G. Dick, Mt. Clemens, and George W. Goetz, Rochester Hills, all of Mich., assignors to TRW Vehicle Safety Systems Inc., Romeo, Mich.
Filed Apr. 1, 1988, Ser. No. 177,482
Int. Cl.[4] B60R *21/16, 21/10*
U.S. Cl. 280—732 **27 Claims**



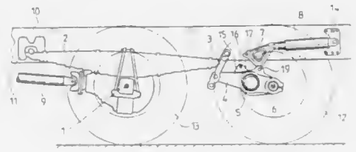
1. Apparatus comprising a vehicle air bag container including a wall defining a cavity for a gas generator and at least part of a vehicle air bag, said wall further defining an opening in said container, the gas generator being actuatable to generate a gas under a pressure in said cavity, said part of said air bag being adapted to be forced out of said cavity through said opening by the pressure of the gas generated when the gas generator is actuated, a reaction member connecting two spaced apart portions of the wall defining the opening and extending across the opening, said reaction member resisting deformation of the container adjacent the opening as the air bag is forced out of the cavity.

4,842,301
ACOUSTIC EMISSION AUTOMOTIVE CRASH SENSOR
Douglas A. Feldmaier, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Sep. 2, 1988, Ser. No. 239,900
Int. Cl.[4] B60R *21/08*
U.S. Cl. 280—735 **8 Claims**



1. In combination with a vehicle having a welded unit body structure including a pair of frame side rails, one on each side of the vehicle extending longitudinally back from the front of the body structure, the body structure further emitting an acoustic signal upon deformation thereof in a crash which is transmitted to at least one of the side rails, crash sensing and occupant restraint activating apparatus comprising, in combination:
an acoustic sensor attached to each side rail near the front thereof;
a bandpass filter effective to pass a signal from either acoustic sensor in a predetermined high frequency range;
an envelope detector responsive to the bandpass filter to derive an envelope of filtered signals therefrom, the envelope detector having a predetermined time constant;
comparator/timer means effective to compare the output of the envelope detector with a predetermined amplitude reference and generate a crash signal when the amplitude reference is exceeded for a predetermined minimum time; and
means responsive to the crash signal for activating an occupant restraint.

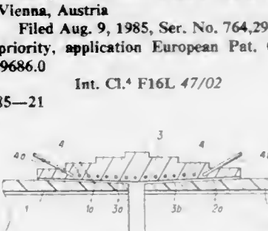
4,842,302
LIFTING BOGIE FOR A VEHICLE
Joel Laurønen, Helsinki, and Pentti Kyrölä, Espoo, both of Finland, assignors to OY Sisu-Auto AB, Karjaa, Finland
PCT No. PCT/FI87/00127, § 371 Date May 2, 1988, § 102(e) Date May 2, 1988, PCT Pub. No. WO88/02314, PCT Pub. Date Apr. 7, 1988
PCT Filed Sep. 23, 1987, Ser. No. 193,287
Claims priority, application Finland, Sep. 25, 1986, 863867
Int. Cl.[4] B60C *5/04*
U.S. Cl. 280—704 **4 Claims**



1. A lifting bogie for a commercial vehicle, comprising:
on both sides of the vehicle a rocker arm journalled on a rocker arm shaft and supported at one end thereof on a bogie spring by means of a spring pendant, and an auxiliary shaft journalled on the rocker arm acentrically with respect to the rocker arm shaft for a bogie wheel,
at least one double-acting hydraulic cylinder for pivoting the rocker arm by means of at least one transmission lever for lifting and lowering the bogie, and
means for temporarily interconnecting the transmission lever and the rocker arm when desired so as to enable an upwardly lifting force to be exerted on the driving shaft by means of the hydraulic cylinder by the action of the transmission lever, the spring pendant and the bogie spring.

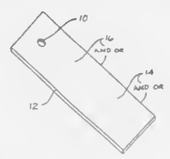
4,842,303
REPOSITIONABLE ADVERTISING INSERT
Robert P. Molenda, Grant Township, Washington County, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Jul. 23, 1987, Ser. No. 77,599
Int. Cl.[4] B42D *1/00, 1/10, 5/00*; G09F *19/00*
U.S. Cl. 281—38 **20 Claims**

1. A repositionable advertising insert comprising:
a printed support sheet having a registration edge, and
a printed sheet of paper stock having on one surface along one edge a narrow band of repositionable pressure sensitive adhesive, said edge along which said band of pressure sensitive adhesive is coated being aligned with said registration edge of said support sheet, and said layer of pressure sensitive adhesive bonding said sheet of paper stock to said support sheet,



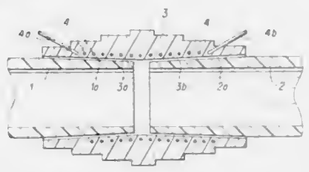
said suport sheet being perforated along a line parallel to said registration edge and adjacent said band of pressure sensitive adhesive.

4,842,304
SERVICE LOCATOR
Alvin K. Jones, 37115 Immigrant Rd., Pleasant Hill, Oreg. 97455
Filed Nov. 2, 1987, Ser. No. 115,513
Int. Cl.[4] B42F *13/02*; G09C *1/06*; B42D *15/00*; G03C *1/92*
U.S. Cl. 283—81 **5 Claims**



1. In combination:
a grease fitting head; and
a service locator tag attached to the head, the tag comprising:
a flat strip piece of flexible elastic material,
an aperture disposed in the piece of material adjacent one end thereof, the aperture being sized so that by stretching the material about the aperture, the fitting head can be received within the aperture and the tag retained in place on the head, and
information pertaining to lubrication disposed on the tag.

4,842,305
PIPE JOINT CONNECTING PLASTIC PIPES AND PROCESS OF MAKING SUCH JOINT
Johann Kistenich, Krems, and Christian Völk, St. Poelten, both of Austria, assignors to Osterreichische Salen-Kunststoffwerk GmbH, Vienna, Austria
Filed Aug. 9, 1985, Ser. No. 764,292
Claims priority, application European Pat. Off., Aug. 14, 1984, 84109686.0
Int. Cl.[4] F16L *47/02*
U.S. Cl. 285—21 **13 Claims**



1. A pipe joint for connecting non-shrinkable plastic pipes with tapered pipe ends comprising:
a non-shrinkable thermoplastic sleeve body (3) having at

least one opening with a tapered shape corresponding to one of said pipe ends to form an interference fit therewith; and

a heating element (4) imbedded in said sleeve body for heating at least a portion of said sleeve and a pipe end disposed in said opening whereby to melt said portion and said one pipe end so as to flow into contact with each other to form a homogeneous joint.

4,842,306

PIPE COUPLING

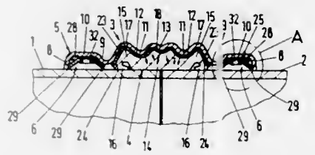
Siegmund Zeidler, Hanau, and Manfred Krüger, Büdingen, both of Fed. Rep. of Germany, assignors to Rasmussen GmbH, Maintal, Fed. Rep. of Germany

Filed Mar. 24, 1988, Ser. No. 173,250

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1987, 3710852

Int. Cl.[4] F16L *21/06*

U.S. Cl. 285—104 24 Claims



1. A coupling for neighboring unprofiled end portions of two objects, such as pipes, comprising an annular band arranged to surround the end portions of the objects and having at least one substantially axially parallel gap, said band comprising a plurality of circumferentially extending corrugations including two outermost corrugations defining first chambers which have open inner sides and each of which is arranged to surround the end portion of a different one of the objects and at least two additional corrugations between said outermost corrugations, said additional corrugations defining an additional chamber which is open toward the axis of said band, each of said outermost corrugations having an inner and an outer end wall; an annular safety device in each of said first chambers, each of said devices including a set of arcuate sections each having two end wall members with at least one of the end wall members abutting the respective end wall of the corresponding outermost corrugation, said end wall members having radially innermost portions arranged to penetrate into the end portions of the respective objects, at least two sections of each of said devices being connected to each other; a ring-shaped insert of deformable material disposed in said additional chamber, extending across said gap and having deformable annular marginal sealing lips each arranged to surround the end portion of a different one of the objects and each sloping in a direction toward the other of said lips, said additional annular corrugations being arranged to extend into and to provide the insert with annular hills and valleys including a median valley and two outermost hills intermediate said sealing lips; and clamping means operative to reduce the diameter of said band by reducing the width of said gap to thereby maintain said insert in sealing engagement with the end portions of the objects and with said band

4,842,307

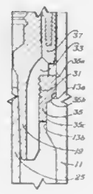
WELLHEAD LOAD SUPPORTING SYSTEM

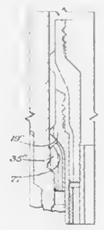
Thomas F. Sweeney, Newbury Park, Calif.; Philippe C. Nobileau, Paris, France, and Charles E. Jennings, Houston, Tex., assignors to Vetco Gray Inc., Houston, Tex.

Filed May 24, 1988, Ser. No. 197,922

Int. Cl.[4] E21B *33/047;* F16L *3/12, 7/00*

U.S. Cl. 285—140 8 Claims





1. In a well having a wellhead housing with a bore, an internal inclined load shoulder located in the bore, an upper cylindrical portion in the bore immediately above the load shoulder and a lower cylindrical portion immediately below the load shoulder in the bore, an improved means for supporting a string of casing in the well, comprising in combination:

a casing hanger having an axial passage, positioned in the wellhead housing and secured to a string of casing extending into the well; and

a landing profile rigidly secured to the exterior of the casing hanger, the landing profile having a downward facing inclined shoulder that mates with the load shoulder, the landing profile having an upper cylindrical portion that engages the upper cylindrical portion of the bore, the landing profile having a lower cylindrical portion that engages the lower cylindrical portion of the bore, the landing profile being of a material substantially harder than the material of the casing hanger.

4,842,308

ROTATION LIMITING BALL-JOINT CONDUIT APPARATUS

James C. Spotts, Kowloon, Hong Kong, assignor to Australux North America Limited, Inverness, Ill.

Filed Jun. 23, 1988, Ser. No. 210,230

Int. Cl.[4] F16L *27/04*

U.S. Cl. 285—261 6 Claims

1. A ball-joint conduit apparatus for the adjustable mounting and electrical connection of an electrical fixture to a desired fixed service mount, comprising:

a cylinder which is adapted to allow passage of electrical wire through its longitudinal axis and which has opposed first and second cylinder ends;

said first cylinder end including integral means for attaching said cylinder to an electrical fixture, said means allowing

passage of electrical conductors through it and into said cylinder;

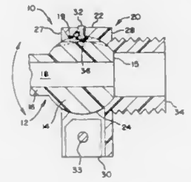
said second cylinder end including a spherical flange extending radially around a circumference of said cylinder end defining a ball member;

said spherical flange having at least one flat exterior surface, said flat surface being formed in the plane of a chord of said spherical flange with said chord being parallel with a longitudinal axis of said cylinder;

a C-shaped collar having an inner surface, an outer circumferential surface, opposed sides and offset ends;

said offset ends being in parallel alignment and having a space between them;

said collar inner surface being semi-spherically concave defining a socket adapted to receive said spherical flange of



said cylinder for pivotal movement therein;

means to reduce a diameter of said C-shaped collar once said spherical flange is received therein so that said flange is kept therein and frictionally stabilized once adjusted to a given position;

means to attach said C-shaped collar to a fixed service mount, said means allowing passage of electrical conductors through it and into said cylinder;

an indexing member extending from said collar inner surface to a point centered above said at least one flat surface of said spherical flange;

said indexing member being located so that said indexing member engages only upon a point along a periphery of said flat surface of said spherical flange when said spherical flange is rotated, thus preventing further rotation in that direction.

4,842,309

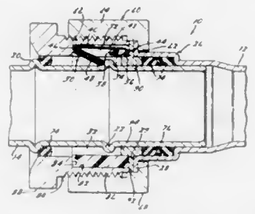
QUICK-CONNECT FLUID FITTING ASSEMBLY

Leon F. LaVene, Durand, and Peter Palajac, Jr., Farmington Hills, both of Mich., assignors to Schmelzer Corporation, Flint, Mich.

Filed May 20, 1987, Ser. No. 51,835

Int. Cl.[4] F16L *37/12*

U.S. Cl. 285—319 34 Claims



1. A quick-connect fitting assembly for releasably connecting a pair of fluid conduits to one another for fluid communication therebetween, said quick-connect fitting assembly comprising:

socket means on a first of the fluid conduits for receiving a second of the fluid conduits inserted longitudinally inwardly into said socket means, said second fluid conduit having a laterally outwardly-extending protuberance thereon; and

retainer means for releasably retaining said second fluid conduit within said socket means, said retainer means including a retaining ring removably disposable generally adjacent said socket means and adapted for generally surrounded said second conduit, a number of barb members longitudinally interconnectable with said retaining ring, said retaining ring including a number of retainable ring sections interconnected by a number of retaining ring pin portions, said barb members being interconnectable in a longitudinal engagement with said retaining ring pins, said barb members being resiliently and laterally deflectable into a longitudinally interlocking engagement with said protuberance as said second fluid conduit is inserted into said socket means, and retaining collar means longitudinally and releasably interconnectable with said socket means in a longitudinally restraining relationship with at least said retaining ring for longitudinally restraining said retaining ring, said barb members and said second fluid conduit relative to said socket means on said first fluid conduit.

4,842,310

TUBE CONNECTION FOR THIN-WALLED SMALL-DIAMETER METAL PIPES

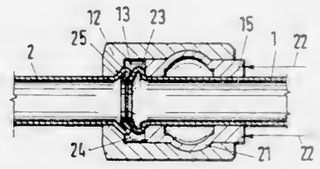
Walter Müffke, Wiesenbach, and Günter Raschdorff, Eppelheim, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Jan. 20, 1988, Ser. No. 145,899

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1987, 3701555

Int. Cl.[4] F16L *13/14*

U.S. Cl. 285—334.5 20 Claims



1. A pipe connection for thin-walled, small-diameter metal pipes comprising a first conically flared metal pipe with a flare;

a second conically flared metal pipe with a flare;

a pressure bushing, which is in part provided with a relatively thin wall in radial direction and having a set deformation zone, is slid onto the first metal pipe up to resting at the flare of the first pipe;

a sleeve provided with an axially fixed annular channel into which sleeve the second conically flared metal pipe is sealingly set;

a sealing seat surrounding the flares of the first and second pipe wherein the contact pressure of the flare of the first pipe against the sealing seat is generated in axial direction by said set deformation zone of the pressure bushing, whereby the relatively thin wall of the pressure bushing is radially deformable into the axially fixed annular channel of the sleeve by an axial upsetting of the pressure bushing into the sleeve.

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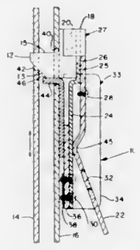
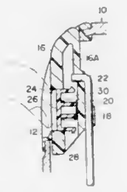
4,842,311
SAFETY LATCH
Donald L. White, Kent, Ohio, assignor to Creative Light & Sound Corporation, Twinsburg, Ohio
Filed Aug. 3, 1987, Ser. No. 81,033
Int. Cl.[4] E50C *1/12*
U.S. Cl. 292—85 2 Claims



1. A safety latch for preventing unintended telescoping movement of an inner support member relative to an outer sleeve support member within which the inner support member telescopes, comprising:
a spring operated pawl;
spring means;
pawl engaging means; and
pawl release means, and wherein said safety latch is mounted on said outer sleeve support member, and said spring means urges said spring operated pawl into one of a plurality of pawl engaging holes located in said inner support member, said pawl comprising a key having an angular lower edge and a horizontal top edge, whereby said inner support member can be raised within said outer support member without activating said pawl release means, but said inner support member cannot be lowered without activating said pawl release means, hereby preventing an unintended telescoping of the inner support member into said outer sleeve support member, and which further comprises a pawl support member having a flange extending horizontally into an interior of said outer support member so as to support said spring operated pawl when said pawl is reached within one of said pawl engaging holes, said pawl being received by said pawl release means and adapted for relative movement with respect thereto, allowing said pawl to contact and be supported by said pawl support said pawl release means comprises a rocker lever attached to said spring operated pawl, the activation of said rocker lever resulting in the disengagement of said pawl from one of said pawl engaging holes, said spring means comprises a flexible strip of metal secured by said fixed outer sleeve support member, and slidingly received within a recess defined by said spring operated pawl opposite said pawl engaging holes and said rocker lever, said strip urging said pawl into one of said holes, and said strip also securing said pawl release means to said safety latch.

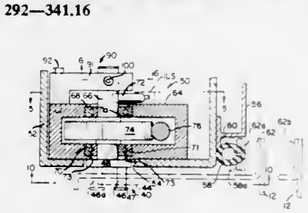
4,842,312
DOOR LOCKING KNOB STRUCTURE
Eiji Iwasaki, Shizuoka, and Yukio Isomura, Aichi, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisin Seiki Kabushiki Kaisha, both of, Japan
Filed Jun. 20, 1986, Ser. No. 876,840
Claims priority, application Japan, Jun. 21, 1985, 60-094895[U]
Int. Cl.[4] E05C *21/00*
U.S. Cl. 292—336.3 20 Claims

1. A locking knob for the interior side of a vehicle door, comprising:
(a) a knob main body slidably mounted on said door, and adapted to be connected to locking means for selectively locking or unlocking said door by sliding movement of said knob main body with respect to said door; and
(b) a depressable push-button resiliently mounted on the knob main body, said push-button projecting only slightly so as to be substantially flush with the remainder of the knob main body when undepressed and defining when depressed a finger receiving recess on the knob main body;



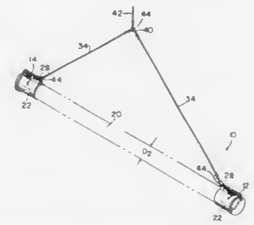
(c) whereby when said push-button is depressed by a finger the knob main body can be moved by this finger which is positioned within said finger receiving recess, and when undepressed said finger receiving recess disappears by virtue of said push-button being substantially flush with the knob main body to prevent any accidental or undesirable unlocking of said door.

4,842,313
AUTOMATIC VEHICLE STRIKER POWERED BY A UNIDIRECTIONAL MOTOR
James G. Boyko, and Timothy J. Farrar, both of Gorham, Me., assignors to Masco Industries, Inc., Taylor, Mich.
Filed Nov. 12, 1987, Ser. No. 119,824
Int. Cl.[4] E05B *15/02*
U.S. Cl. 292—341.16 10 Claims



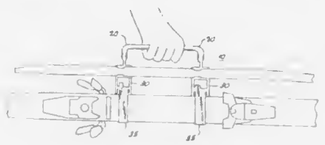
1. A final closing device for a closure member, which closure member is mounted for movement between open and closed positions on a vehicle body member and includes a latch bolt movable between latched and unlatched positions, said device comprising a striker support plate mounted on said body member for unidirectional rotational movement about an axis perpendicular to said plate, a striker carried by said striker support plate and projecting therefrom at a position eccentrically offset from said axis, means carried by said body member and connected to said striker support plate for rotating said striker support plate. and means coupled to said rotating means and constructed and arranged to preclude reverse rotation of said striker plate for preventing unintended opening of the closure member when high opening forces are applied thereto, said striker being movable between extended and retracted positions upon rotation of said striker support plate so that when said striker is in latching engagement with said latch bolt and said striker support plate is rotated, said closure member is moved between a partially open position, away from said body member, and a fully closed position, in sealing engagement therewith.

4,842,314
PIPE LIFT CAP ASSEMBLY
Don W. Bellow, P.O. Box 608, Careocro, La. 70520-0608
Filed Mar. 24, 1988, Ser. No. 172,475
Int. Cl.[4] B66C *1/16, 1/62*
U.S. Cl. 294—74 8 Claims



1. An assembly for lifting individual sections of drill casing, the assembly comprising:
(a) a first cap member positionable to encircle the end portion of a section of drill casing to be lifted;
(b) a second cap member positionable to encircle the second end portion of the section of drill casing to be lifted;
(c) lifting lug means secured to an outer wall of each of the first and second cap members for attaching a lifting cable thereonto; and
(d) means attachable to a second end of the lifting cables at a common apex for lifting the section of drill casing upwardly in a substantially horizontal fashion.

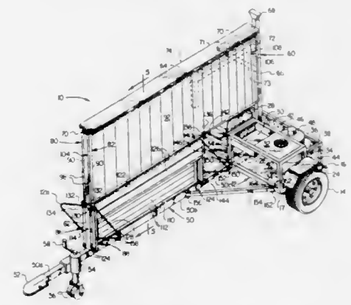
4,842,315
SKI CARRIER
Robert Nordmeyer, Woodland Hills, Calif., assignor to Ski Tote USA, Canoga Park, Calif.
Filed Nov. 12, 1987, Ser. No. 119,736
Int. Cl.[4] A63C *11/02*
U.S. Cl. 294—147 20 Claims



1. A ski carrier comprising a pair of generally "L" shaped arms which are movably articulated to each other; a pair of yoke members, each one of which is movably articulated to one of said arms; a pole clip unit movably articulated to each yoke; and means associated with the pair of yokes for carrying a pair of skis.

4,842,316
PICNIC TRAILER APPARATUS
Larry Lerma, Rte. #1, Box 405; Demetrio Lerma, Jr., Rte. #1, Box 407, both of Abilene, Tex. 79601, and Faustino Lerma, Jr., 1938 Park, Abilene, Tex. 79603
Filed Apr. 11, 1988, Ser. No. 181,216
Int. Cl.[4] B60P *3/02*
U.S. Cl. 296—22 19 Claims

1. Picnic trailer apparatus comprising:
wheel mounted rear frame means for supporting picnic food preparation equipment;
picnic food preparation equipment operatively supported on said rear frame means;
elongated towbar means extending longitudinally forwardly from said rear frame means and pullable by a towing vehicle to move said rear frame means along the ground;
a support frame structure secured to and extending upwardly from a longitudinally intermediate portion of said towbar means; and
a collapsible picnic table carried by said support frame structure above said towbar means and including:
a table top member pivotally mounted on said support frame structure for movement between horizontal and vertical positions,



first and second seat members pivotally mounted on opposite sides of said support frame structure for movement between a horizontal position in which said seat members project laterally outwardly of said towbar means in opposite directions, and a vertical position in which said seat members extend upwardly along said support frame structure and sandwich said table top member in its vertical position, and
means for releasably holding said seat members in said vertical position thereof to thereby hold said table top member in its vertical position.

4,842,317
SIDE RAILS FOR FLAT BED VEHICLES
Vernon S. Moore, Ringgold, Ga., assignor to Holmes International Inc., Chattanooga, Tenn.
Filed Jul. 1, 1988, Ser. No. 214,496
Int. Cl.[4] B62D *27/00*
U.S. Cl. 296—36 19 Claims

1. For a flat bed vehicle having a bed comprising an elongated platform including front, rear and side edges, and rails disposed at each side edge, said rails comprising a longitudinally extending rail cap and at least one support post extending therefrom, apparatus for selectively positioning each rail between a raised operative position with said post upstanding and said cap disposed above said platform and a lowered stowed position with said post extending transverse to said platform and said cap disposed substantially coextensive with said platform, said apparatus comprising a cam plate having a cam track disposed beneath said platform adjacent said post, cam follower means carried by said post at a location remote from said cap disposed for traveling on said cam track, and said cam track having a configuration for permitting said follower means to be moved from a first location disposed beneath said rail cap when said rail is in the operative position and to be guided to a second location disposed transversely relative to said rail cap when said rail is in the stowed position, whereby

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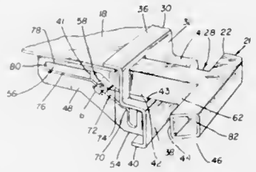
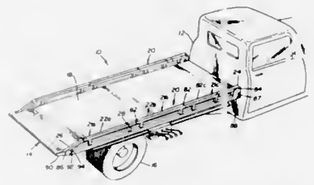
said rail may be moved manually from the operative position and guided by said follower means to be moved to said stowed





position and may be returned manually to said operative position selectively.

4,842,318

MOTOR CAR SEAT GUIDE RAIL SUPPORT SYSTEM

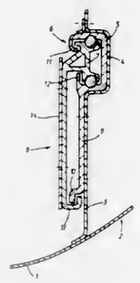
Wolfgang Fussnegger, Horb-Betra; Egon Rieth, Boeblingen; Antonin Koucky, Sindelfingen, and Bernd Hector, Neuhengstett, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 3, 1987, Ser. No. 128,416

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641294

Int. Cl.[4] B60N *1/02*

U.S. Cl. 296—65.1 **11 Claims**



1. Motor car seat support system comprising:

a relatively fixed guide rail exhibiting a channel opening toward a movable vehicle seat,

a slide rail fixedly connected to the movable vehicle seat and slidably supported in said channel,

a flange member extending downwardly from the channel and connected to a vehicle body support wall of the vehicle, a lower portion of said flange member exhibiting a cranked part,

and a part connected to the movable car seat which engages behind the cranked part whereby forces directed toward the seat are reliably transmitted to the vehicle body support wall.

4,842,319

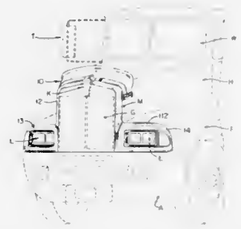
DEFLECTOR SHIELD AND GUARD ASSEMBLY FOR MOTOR VEHICLES

John H. Ziegler, Longmont; Gerald R. Oakley, Berthoud, and Daniel F. Krause, Sr., Loveland, all of Colo., assignors to Autotron Products, Inc., Longmont, Colo.

Filed Oct. 13, 1987, Ser. No. 107,151

Int. Cl.[4] B60J *1/20*

U.S. Cl. 296—91 **13 Claims**



1. A deflector shield unit for a motor vehicle wherein the motor vehicle has a hood and grille with an outer surrounding portion extending between an upper horizontal edge and vertical sides of said hood and said grille, said unit comprising:

an elongated shield of unitary construction having a front, generally horizontal edge and opposite vertical side edges conforming to and overlying the upper horizontal edge and vertical sides, respectively, of said hood and a transparent shield portion inclining rearwardly at an acute angle away from said horizontal and opposite vertical side edges;

shock mount means comprising at least one elongated flexible strip composed of a rubber or rubber-like material interposed between said shield and said hood including a rearwardly and upwardly inclined channel into which said horizontal edge of said shield is inserted; and

fastener means for fastening said shock mount means to said hood including means for retaining said horizontal edge of said shield in said channel of said shock mount means.

4,842,320

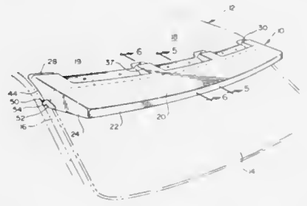
VEHICLE EXTERIOR SUN VISOR

Richard J. Kingsley, North Bonneville, Wash., assignor to Saturn Corporation, Tacoma, Wash.

Filed Oct. 3, 1986, Ser. No. 915,064

Int. Cl.[4] B60J *3/00*

U.S. Cl. 296—95.1 **7 Claims**



1. An exterior visor for use with automotive vehicles of the type having a roof and a windshield bounded on three sides by left and right side frame members and the leading edge of the vehicle roof, said exterior visor comprising, in combination:

(a) a generally flat, horizontal, transversely extending visor member having a top surface and a bottom surface, said visor member including:

(i) an integral, transversely extending, depending, vertically oriented front edge member;

(ii) an integral, transversely extending, discontinuous, depending, substantially vertically oriented rear edge member having respective discontinuous transversely spaced lowermost edges;

(iii) a pair of integral, longitudinally extending, depending, vertically oriented side members at opposite ends of said visor member, each of said side members having a bottom edge with a rearmost end shaped to generally conform to the leading edge of the vehicle roof and to one of the side frame members bounding the windshield of the vehicle to which said exterior visor is attached; and,

(iv) a rearwardly extending, generally horizontally disposed, first mounting flange integral with and extending rearwardly from each of said lowermost edges of said transversely extending, discontinuous, depending, substantially vertically oriented rear edge member for permitting anchoring of said exterior visor to the roof of an automotive vehicle;

(b) said visor member having a plurality of transversely space, recessed air cavities formed therein intermediate said front and rear edge members, each of said air cavities being hidden from view by said front edge and side members, respectively, from the side and front of said exterior visor when mounted on a vehicle, each of said recessed air cavities being defined by:

(i) a depending, transversely extending, vertically oriented midwall having a lowermost edge, opposed ends, and a vertical dimension equal to the vertical distance between said top surface of said visor member and said lowermost edge of said midwall, said midwall being integral with said visor member and located forward of said rear edge member and aft of said front edge member;

(ii) a pair of transversely spaced, axially extending, vertically oriented, depending side walls each having a forward end and each being integral with said visor member and integrally attached at said forward end of each of said side walls to respective ones of said opposed ends of said midwall; and

(iii) a rearwardly extending floor member integral with the lowermost edges of said transversely extending midwall and said pair of axially extending side walls, each of said floor members defining a transversely extending second mounting flange for permitting anchoring of said exterior visor to the vehicle roof of an automotive vehicle at points intermediate said rearwardly extending, generally horizontally disposed, first mounting flanges, and wherein said first and second mounting flanges are adapted to be mounted in flush face-to-face engagement with the vehicle roof across said transversely extending visor member;

(c) through aperture defining means formed in each of said midwalls for permitting air movement therethrough and thus precluding pressure buildup beneath said exterior visor; and,

(d) means for mounting said exterior visor to an automotive vehicle so that said visor member extends forward from the vehicle above the windshield thereof and in such a manner that each of said midwalls extends outwardly and upwardly from the windshield at an angle therewith.

4,842,321

PANEL HAVING A BENDING REGION, PARTICULARLY FOR VEHICLES

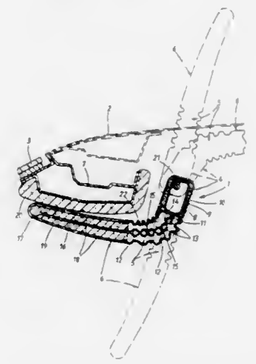
Heinz Baumert, Sindelfingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Dec. 16, 1987, Ser. No. 133,649

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1986, 3642876

Int. Cl.[4] B60J *3/02*

U.S. Cl. 296—97.1 **26 Claims**



1. A panel, particularly for use with vehicles, comprising a plurality of surface sections mutually flexible at common bending areas to form a bending region, which surface sections are transferable alternately into multiple desired bending positions and are retained therein, wherein the panel is flexible only at an obtuse angle at each bending axis located between two adjacent surface sections, wherein a plurality of mutually aligned surface sections of the panel are constructed as narrow connecting strips, wherein all the surface sections of the panel are retained in the desired mutual bending positions by self-locking at the bending axes, wherein the panel forms a sun visor having a base section mounted on a vehicle body, which is connected to a terminal section by a bending region formed by the connecting strips, the sun visor being arranged behind an associated windscreen of a motor car, while the base section of the sun visor is located behind a top frame profile of a windscreen frame so that a head collision zone of the frame profile is masked by the base section, and wherein the bending region is designed so that the terminal section is foldable round the frame profile until it is located close beneath the frame profile.

4,842,322

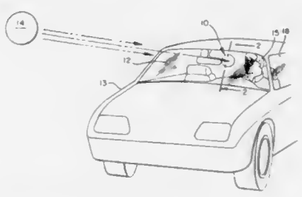
VEHICLE WINDOW SUNSHINE SHIELDS DOT

Stephen C. Iu, 4537 E. Side, Dallas, Tex. 75226

Filed May 2, 1988, Ser. No. 189,214

Int. Cl.[4] B60J *3/06*

U.S. Cl. 296—97.7 **14 Claims**



1. A sunshine shield dot comprising: a small planar area sheet

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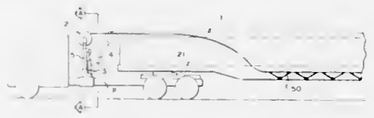
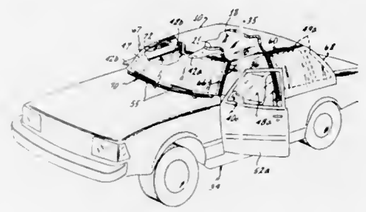
of dark tinted yet transparent plastic; a resiliently depressible suction cup formed integrally in said sheet of dark tinted yet transparent plastic such that viewing through the sunshine shield dot in the area of said suction cup is not subject to material optical distortion; and with said planar area sheet of dark tinted yet transparent plastic having a maximum transvese dimension less than approximately eight inches.

4,842,323
TARP HANDLER
Robert Trickett, 209 -3100 - 272 Street Box 340, Aldergrivem B.C., Canada (V0X 1A0)
Filed Dec. 28, 1987, Ser. No. 134,727
Claims priority, application Canada, Dec. 30, 1986, 526499
Int. Cl.[4] B60J *11/00*
U.S. Cl. 297—98 18 Claims



1. An apparatus for storing and handling a tarpaulin for a vehicle hauling freight on an open flat deck comprising:
(a) powered spool means adapted to permit the tarpaulin to be power rolled onto the spool means, or power unrolled from the spool means over the top of the freight carried on the open deck, the tarpaulin being removable from the spool means, when unrolled from the spool means;
(b) spool supporting means the base of which is pivotally mounted on the open deck about a transversely extending axis, and adapted to be located at any position along the length of the open deck, said spool supporting means being adapted to enable the position of the spool to be adjusted upwardly or downwardly, or forwardly or rearwardly so that it coincides approximately with the forward upper position of the freight on the deck.

4,842,324
COVER FOR THE CAB PORTION OF AN AUTOMOBILE
Harvey K. Carden, 4550 Via Bella Vista, Yorba Linda, Calif. 92686
Continuation of Ser. No. 61,956, Jun. 15, 1987, abandoned. This application Aug. 24, 1988, Ser. No. 236,281
Int. Cl.[4] B60J *11/00*
U.S. Cl. 296—136 5 Claims



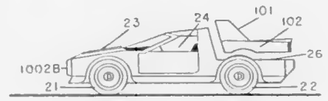
5. A cover for the cab portion of a vehicle, said cab portion including a roof, a windshield having sides and a bottom, a rear window having sides, and side windows on each side of the vehicle, said vehicle further including wipers located at the bottom of said windshield, a sidedoor on each side of the vehicle, each sidedoor having a window frame in which the side window resides, each said window frame having a lower front corner, and an external side view mirrow unit mounted on each sidedoor adjacent the lower front corner of the window frame thereof, said cover comprising:
a generally rectangular sheet of insulating material having front corner portions and rear corner portions, each corner portion having an arcuate edge with an inwardly directed V shaped opening thereon, a front corner joint provided on each front corner portion by joining the edges of the V shaped opening thereon and a rear corner joint provided on each rear corner portion by joining the edges of the V shaped opening thereon, thereby forming a four-sided cover including a front side and a rear side, each with an outer edge, and opposite lateral sides;
a pocket formed on an outer portion of the lateral side of each front corner portion of the cover and spaced outwardly from the front corner joint thereon; and
a front transverse tubular member on the outer edge of the front side of the cover;
said four-sided cover placed over the roof of the vehicle with the front corner joints thereof lying over the sides of the windshield, the rear corner joints lying over the sides of the rear window, and the front transverse tubular member located at the bottom of the windshield with the wipers positioned thereover; and
each said front corner pocket snugly fitting over the external side view mirror unit mounted on the lower front corner of the window frame of the sidedoor on a respective side of the vehicle; and
means for securing the outer edge of the rear side of said cab cover to said vehicle after positioning said cover in a taut manner over the cab portion of the vehicle.

4,842,325
TOWABLE CAMPER
John A. Irelan, Elkhart, Ind., assignor to Coachmen Industries, Inc., Middlebury, Ind.
Filed Oct. 23, 1987, Ser. No. 111,866
Int. Cl.[4] B60J *5/04*
U.S. Cl. 296—146 8 Claims

1. In combination, a towable vehicle including a frame and an outer skin which defines an interior space, and an access member pivotally connected to said vehicle frame, said access member shiftable between a closed position substantially flush with said outer skin wherein access to said interior space is denied, and an open position substantially horizontal and adjacent to said frame wherein access to said interior space is gained, said access member including support brackets connected to said frame, said access member further including a door pivotally connected to said brackets, pivot means associated with said door for allowing pivotal movement of the door between its said open and closed positions, said pivot means including spaced arms pivotally connected at corresponding ends to said brackets, a stud connected to the opposite end of each arm, said door including a frame having interconnected horizontal and vertical door frame members, said door frame

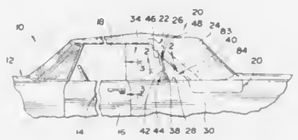
including means for effecting slidable movement of the door frame with respect to the studs, said door frame including a substantially horizontal cross member extending between said door frame vertical members, said cross member constituting means when contacting said arms for stopping downward sliding motion of said door.

4,842,326
MOTOR VEHICLES WITH INTERCHANGEABLE FUNCTIONAL BODY MODULES
Robert DiVito, Springfield, Pa., assignor to John A. DiVito, Springfield, Pa.
Filed May 8, 1987, Ser. No. 48,018
Int. Cl.[4] B62D *25/08*
U.S. Cl. 296—196 2 Claims



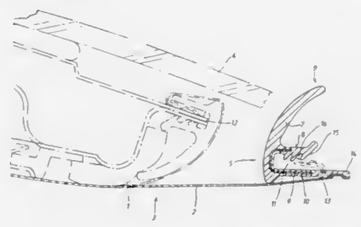
1. A modular vehicle comprising:
one of a plurality of functionally different core vehicles and at least one of a plurality of interchangeable functionally different body modules attached to the core vehicle, wherein the core vehicle is selected from automobile and truck types of configurations, the core vehicle having
a first closed contour frame deck engagement section spaced from a perimeter of a rear section of said core vehicle and an adapter floor plate mountable to said rear section of said core vehicle; and
said at least one module is selected from passenger, utility, occupational, recreational, and storage type configurations; and has a second engagement frame section adapted to conform and mount to said first frame section and aligning and connecting elements on said first and second sections for the interchangability of said modules.

4,842,327
CONVERTIBLE VEHICLE HAVING DUAL REAR QUARTER WINDOW ASSEMBLY
Robert E. Hennessy, Allen Park, Mich., assignor to Cars & Concepts, Inc., Brighton, Mich.
Filed Mar. 7, 1988, Ser. No. 164,553
Int. Cl.[4] B60J *1/14, 7/12*
U.S. Cl. 296—201 16 Claims



1. In a convertible vehicle including an occupant compartment, a side door for providing access to the occupant compartment, and a convertible top having a frame and a soft top supported by the frame for movement between raised and storage positions with respect to the occupant compartment, a rear quarter window assembly located to the rear of the side door and comprising: a first rear quarter window; a window regulator for moving the first rear quarter window vertically between an upper closed position and a lower open position; the first rear quarter window having a rear edge that is spaced forwardly from the frame of the raised convertible top with the first rear quarter window in the upper closed position; a second rear quarter window having a rear edge fixedly mounted on the frame of the convertible top for movement in a substantially vertical plane between a closed position with the convertible top frame in the raised position and an open position with the convertible top frame in the storage position; and the second rear quarter window having a front edge that seals with the rear edge of the first rear quarter window with both rear quarter windows in the closed positions.

4,842,328
RETAINING RAIL FOR THE END-WISE FIXING OF THE INNER ROOF COVERING
Gerhard Zweigart, Aidlingen; Werner Belke; Ewald Günther, both of Böblingen, and Walter Gantzhorn, Grafenau, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiegesellschaft, Stuttgart, Fed. Rep. of Germany
Filed Aug. 19, 1987, Ser. No. 86,806
Claims priority, application Fed. Rep. of Germany, Aug. 19, 1986, 3628109
Int. Cl.[4] B62D *25/06*
U.S. Cl. 296—214 2 Claims

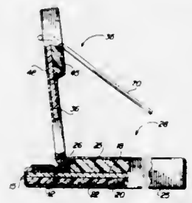


1. A retaining rail for the end-wise fastening of an inner roof covering means in a motor vehicle, comprising a U-shaped strip means adapted to be slipped over a roof-side flange means, said strip means including lip means covered by the ceiling material, said lip means being constructed as foldable extension of a U-shaped leg and together with the ceiling material being pivoted in the direction toward a flange-receiving means, the lip means being formed at the leg of the strip means opposite the distention of the ceiling material and being operatively connected with the same by way of a film hinge, the ceiling material being welded to the lip means, and the lip means together with the ceiling material being bent within the area of the film hinge and being moved into the flange-receiving means.

4,842,329
PORTABLE SEAT
Russell P. Owens, 2159 S. Cholla, Mesa, Ariz. 85202
Filed Jun. 3, 1988, Ser. No. 201,754
Int. Cl.[4] A47C *13/00, 7/62*
U.S. Cl. 297—3 7 Claims

1. A portable, temporary seating device comprising:
(a) a seat member with opposite surfaces having front, rear and side edges, said seat member having top and bottom cushions disposed on said opposite surfaces with said top cushion defining a transverse recess along the rear edge;
(b) a backrest including a rigid panel with a front and rear side having a top, bottom and side edges, said backrest having locking members associated therewith, said backrest being pivotally secured at the bottom edge thereof to the said rear edge of said seat member at a flexible hinge transversely extending in the area of said recess;
(c) generally U-shaped rigid support means having side arms and a bight portion, said side arms being pivotally secured to said seat member whereby said seating device may be folded to a carrying position with the backrest and seat

member in generally parallel relationship with the support means extending generally parallel thereto to form a handle and said seat being positionable with the backrest disposed at an upstanding position with respect to the seat member and with the support member engaging said locking members with the bight portion at least partially engaging said rear side of said backrest to support same



whereby the seating device may be disposed for use in a first position on a relatively flat surface with the backrest generally upstanding and the top cushion facing upwardly and whereby the seating device may be disposed in an inverted position for use in a second position on an inclined surface with the backrest depending to support the seat member in a generally horizontal position with the bottom cushion upwardly facing.

4,842,330

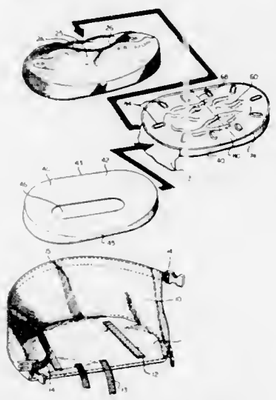
PROTECTIVE SEAT CUSHION

Eric C. Jay, Boulder, Colo., assignor to Jay Medical, Ltd., Boulder, Colo.

Continuation of Ser. No. 68,561, Jun. 30, 1987, abandoned. This application Sep. 26, 1988, Ser. No. 249,593

Int. Cl.[4] A47C *1/00*

U.S. Cl. 297—4 **25 Claims**



1. A light-weight, low-profile seat cushion consisting of a cushion and a sling attachment system comprising:

said cushion comprising:

an envelope partially filled with fluid, said envelope having a plurality of short segments about its periphery, thus limiting the flow of said fluid into the portion of said envelope adjacent to its periphery; and

a supporting foam base comprising a flat bottom and a centrally positioned dished-out oval portion in the upper surface;

said fluid filled envelope positioned upon said foam base, said envelope being centered over said dished-out oval portion, whereby said fluid is substantially maintained over said dished-out oval portion;

said sling attachment system comprising body engaging straps and means to affix said straps to said cushion and

said cushion cooperating with said sling attachment system to provide a portable cushion attachable to the body of the user.

4,842,331

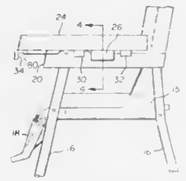
HIGHCHAIR WITH ADJUSTABLE REMOVABLE TRAY FOR ONE-HAND OPERATION

David G. Waples, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Nov. 2, 1984, Ser. No. 667,900

Int. Cl.[4] A47B *39/00*

U.S. Cl. 297—149 **15 Claims**



1. In combination, a highchair and an adjustable removable tray comprising:

first and second arms having upper tray supporting surfaces;

a tray;

latch means on said tray movable among first, second and third positions, said first positions disengaging said tray from said arms; said second position allowing said tray to be moved on said arms, but not removed therefrom; and said third position holding said tray in a fixed position on said arms;

means on said arms for engaging said latch means to provide a plurality of fixed positions of said tray on said arms; and

control means connected to said latch means and movable between first and second positions for moving said latch means between said second and third positions only.

4,842,332

CUSHIONING SEAT COVERING FOR A CYCLE SADDLE

Donald W. Conner, Jr., 12231 Tamerlane Dr., No. C, Garden Grove, Calif. 92640, and Craig A. Munoz, 2544 W. Winston, Unit D-2, Anaheim, Calif. 92804

Continuation of Ser. No. 15,173, Feb. 17, 1987, abandoned. This application Mar. 31, 1988, Ser. No. 175,765

Int. Cl.[4] B62J *1/18*

U.S. Cl. 297—214 **6 Claims**

1. A cycle saddle comprising:

a. a molded rigid plastic saddle having:

(1) an elongated, narrow seat with a smooth, unbroken and arcuate surface and opposite, vertical side flanks;

(2) a contiguous pommel, and

(3) a horizontal saddlehorn; and

b. a single seat covering of uniform thickness centrally positioned on said seat, with its entire periphery spaced inwardly of the periphery of the arcuate seat of said saddle, and comprising:

(1) a cushioning elastomeric base layer having a thickness from 0.25 to about 1.0 inch and bevelled about its entire peripheral edge;

(2) a fabric overlay adhesively bonded to the top surface of said elastomeric base and extending to the bevelled edge thereof; and

(3) a permanent, pressure sensitive adhesive coating on the underside of said elastomeric base and bonding said seat covering to said seat; with said seat covering overlying and bonded to the arcuate seat of said saddle, said seat covering having its edges bevelled sufficiently to provide substantial vertical side edges along the sides of said arcuate seat of said saddle; whereby said edges of said seat covering are recessed from rubbing and wearing contact with the legs of a cyclist on said saddle.

4,842,333

SEAT

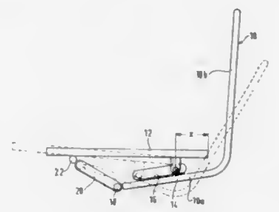
Hermann Meiller, Amberg, Fed. Rep. of Germany, assignor to Grammer Sitzsysteme GmbH, Amberg, Fed. Rep. of Germany

Filed Jul. 27, 1988, Ser. No. 224,750

Claims priority, application European Pat. Off., Aug. 14, 1987, 87111789

Int. Cl.[4] A47C *1/02*

U.S. Cl. 297—318 **16 Claims**



1. A seat comprising: a seat carrier means; a backrest carrier means having first and second limb portions defining a generally L-shaped configuration in side view, the first limb portion of the backrest carrier means extending under the seat carrier means; first rail means disposed at the underside of the seat carrier means; a pivot axis means on said first limb portion of said backrest carrier means and engaged in said first rail means pivotably and slidably therein; a guide means disposed at the underside of said seat carrier means at a spacing from said pivot axis means; and mounting means on said first limb portion of the backrest carrier means, guided at said guide means in such a way that upon a forward movement of said seat carrier means the free end of said second limb portion of said backrest carrier means moves in the opposite direction and downwardly.

4,842,334

VEHICLE SEAT ADJUSTABLE BOTH AS TO HEIGHT AND INCLINATION

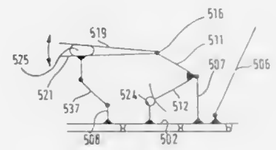
Hans W. Voss, Rockenhausen; Heinz P. Cremer, Kaiserslautern; Harald Cwiertnia, and Peter-Ulrich Putsch, both of Rockenhausen, all of Fed. Rep. of Germany, assignors to Keiper Recaro GmbH & Co., Fed. Rep. of Germany

Filed May 27, 1987, Ser. No. 54,769

Claims priority, application Fed. Rep. of Germany, May 27, 1986, 3617810

Int. Cl.[4] A47C *1/024;* **B60N** *1/02*

U.S. Cl. 297—338 **4 Claims**



1. Vehicle seat, in which the angle of the back rest is adjustable and in which the height and inclination of the seat portion are adjustable, comprising:

(a) an upholstery support for the upholstery forming the seat surface, in which the height and inclination of the upholstery support are adjustable relative to a seat supporting means that is connected with the vehicle;

(b) at least one front and one rear height adjustment devices supporting the upholstery support at a front support point and a rear support point, respectively, in which:

(b1) the rear height adjustment device has at least one lever pivotable about an axle running in the lateral direction of the seat, whereby the axle of the lever of the rear height adjustment device is mounted on the seat supporting means;

(b2) said height adjustment devices can be activated independently of each other by means of respective drive mechanisms, and

(b3) said height adjustment devices are connected with each other by means of a coupling drive which transfers the height adjustment of the rear support point to the front support point only when the rear height adjustment device is activated, wherein;

(c) the back rest (**506**) is directly connected with the seat supporting means (**502**, **507**, **508**);

(d) the upholstery support is pivotally connected at its rear end to said rear adjustment device lever at said rear support point and supported adjacent its front end by the front adjustment device;

(e) the coupling drive has a first lever (**521**) which is hinged to the rear height adjustment device at said rear support point (**516**) and extends forwardly from said rear support point to underlie said front adjustment device, which first lever (**521**) is connected with one end of a second lever (**537**) by means of a pivot joint at a hinge point spaced a distance apart from said rear support point (**516**), which second lever (**537**) is further hinged at its other end at a stationary point on the seat supporting means (**502**, **507**, **508**); and

(f) the drive mechanism of the front height adjustment device is a deformable, inflatable hollow element (**525**), which at least indirectly supports the upholstery support at a distance from its rear support point and is supported on the seat supporting means (**502**, **507**, **508**) by means of the coupling drive (**521**, **537**).

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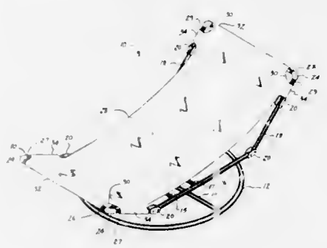
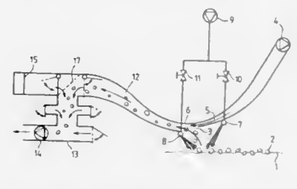
4,842,335
P.V.C. SWIVEL BEACH CHAIR
Arthur K. Wunderlich, 221 Green Ave., Lansdowne, Pa. 19050
Filed Aug. 26, 1988, Ser. No. 238,265
Int. Cl.[4] A47C 1/02
U.S. Cl. 297—349 **2 Claims**



1. A polyvinylchloride swivel beach chair, comprising:
a circular base formed by four interconnected arcuate polyvinylchloride pipe segments;
ends of each adjacent pair of arcuate pipe segments connected by a T fitting;
a central fitting having four connectors arranged at ninety degree intervals;
a strut extending from each of said four connectors to one of said T fittings, forming a reinforcement cross within said circular base;
a stationary swivel base overlying said central fitting and secured to said reinforcement cross;
a rotary swivel base mounted by bearings for rotation on said stationary swivel base;
a chair frame formed from interconnected polyvinylchloride pipe segments including a seat frame portion having parallel side rail members;
a seat reinforcement strut assembly extending between said side rail members;
said strut assembly secured for rotation on said rotary swivel base;
a pair of parallel leg support rails, each secured by an angularly adjustable connector to one of said side rail members;
a lower frame end bar having opposite ends attached to one of said leg support rails;
a pair of parallel back support rails, each secured by an angularly adjustable connector to one of said side rail members;
a pair of parallel head rest support rails, each secured by an angularly adjustable connector to one of said back support rails;
an upper frame end bar having opposite ends attached to one of said head rest support rails;
a fabric cover over said chair frame, an upper end of said cover attached to said head rest support rails and said upper frame end bar, a lower end of said cover attached to said leg support rails and said lower frame end bar, whereby said cover is suspended over said chair frame;
each of said angularly adjustable connectors being incrementally adjustable and comprising a pair of elongated tabs secured at diametrically opposite locations through an outer end surface at one end of a first pipe segment to be connected;
a lock aperture in said first pipe segment adjacent one of said tabs;
a pair of axially aligned apertures in said tabs;
a pair of axially aligned axle holes formed through diametrically opposed points adjacent an outer end of a second pipe segment to be connected;
a plurality of index apertures in said second pipe segments arranged in an arc about one of said axle holes;
an elongated axle extending through said aligned tab apertures and through axle holes and pivotally connecting said first and second pipe segments;
a transversely extending locking bar connected at one end of said axle, said locking bar having a first projection at one end for engagement with one of said index apertures and a second projection at an opposite end for engagement with said lock aperture;
a coil spring around said axle and within said second pipe segment biasing said locking bar into engagement with said index and lock apertures; and
a knob at an end of said axle opposite said locking bar for manually moving said locking bar out of engagement with said index and lock apertures.

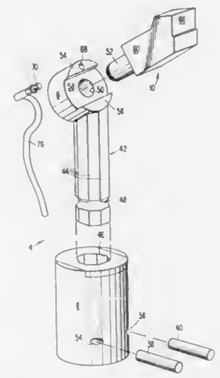
4,842,336
METHOD AND DEVICE FOR COLLECTING OBJECTS FROM THE SEABED
Henrik Erämetsä, Turku; Kari Kuvaja, Tampere; Kalevi Mäki-Kihniä, Vesilahti, and Jorma Terävä, Tampere, all of Finland, assignors to Rauma-Repola Oy, Tampere, Finland
Filed Dec. 8, 1987, Ser. No. 130,328
Claims priority, application Finland, Dec. 8, 1986, 864998
Int. Cl.[4] E02F 3/88; E21C 45/00
U.S. Cl. 299—8 **20 Claims**



1. A method of collecting objects protruding from the bottom level of a seabed with a collecting device having a removing means, comprising the steps of:
moving the collecting device along the seabed with the removing means at or above the bottom level of the seabed;
removing the objects protruding from the bottom level of the seabed with the removing means while allowing the remainder of the seabed to remain substantially undisturbed;
creating a waterflow in a conveying channel independently of the removing means; and
conveying the removed objects through the conveying channel to a collection location by means of the waterflow flowing through said conveying channel.

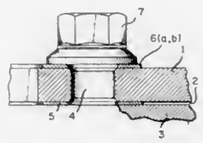
5. A device for collecting objects protruding from the bottom level of a seabed, comprising:
a conveying channel having an object intake opening;
first means for flowing water through said conveying channel;
second means located adjacent the object intake opening for first separating the objects protruding from the bottom level of the seabed from the remainder of the seabed so as to leave the remainder of the seabed substantially undisturbed and then conveying the objects to the conveying channel through the object intake opening when said separating means is at or above the bottom level of the seabed; and
means for collecting the objects at the end of the conveying channel.

4,842,337
MINING BIT AND HOLDER
Philip W. Southern, 280 Ohio, Clarksburg, W. Va. 26301
Filed Nov. 4, 1986, Ser. No. 926,554
Int. Cl.[4] E21B 10/62; E21C 25/10
U.S. Cl. 299—80 **17 Claims**



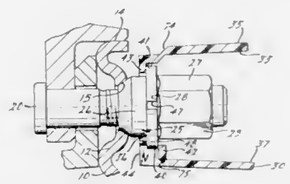
1. A mining apparatus comprising
orientable holder means for holding a cutting bit, said orientable holder means comprising a shank having at least two sets of parallel faces thereon,
fixed holder means having an opening for receiving said shank, said opening having faces for engaging said parallel faces of said shank for securing said orientable holder means in any of at least four orientations, and a cutting bit held by said orientable holder means, whereby said orientable holder means may be placed in a predetermined orientation of a plurality of possible orientations with respect to said holder means.

4,842,338
WHEEL FOR A COMMERCIAL VEHICLE
Vatroslav Grubisic, Zum Stetteritz 1, 6107 Reinheim 4, and Gerhard Fischer, Menzelweg 6, 6100 Darmstadt, both of Fed. Rep. of Germany
Filed Nov. 29, 1982, Ser. No. 445,253
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1981, 3147820
Int. Cl.[4] B60B 1/00
U.S. Cl. 301—9 DN **20 Claims**



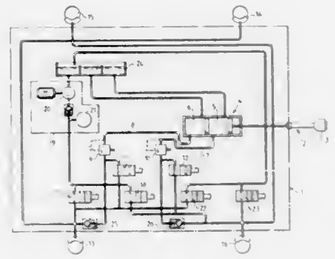
1. A wheel for a commerical vehicle comprising
a wheel disc having bolt holes in the region of the wheel mounting face for attaching the wheel disc to wheel support means by way of wheel bolts; and
intermediate discs for covering an area of the bolt holes in the wheel for attachment bolts, which intermediate discs are attached to the wheel disc on the two opposite sides of the wheel disc, which intermediate discs have a hole for each bolt with the hole surrounding the bolt holes directly and concentrically and which intermediate discs disposed between wheel and support means provide a support surface between support means and wheel mounting face.

4,842,339
VEHICLE WHEEL COVER AND ASSEMBLY
Daniel A. Roulinson, Wyandotte, Mich., assignor to Ford Motor Company, DE
Filed Dec. 21, 1987, Ser. No. 135,882
Int. Cl.[4] B60B 7/00
U.S. Cl. 301—37 S **15 Claims**



10. A wheel cover for a vehicle wheel having a spider portion forming a central mounting portion defining a central hub receiving opening and a plurality of circumferentially spaced lug stud receiving openings arranged radially outwardly of said central opening, said wheel cover comprising a plurality of circumferentially spaced openings adapted to receive lug studs extending through the lug stud receiving openings of the wheel, each of said spaced openings having at its periphery an expandable ring, a radially outer portion of said expandable ring being trapped in an annular channel formed by said wheel cover at said periphery, said expandable ring being capable of resiliently expanding radially in said annular channel, wherein said annular channel is defined by outer retention means integral with said wheel cover and inner retention means integral with said wheel cover, said outer retention means being spaced axially outward of said inner retention means.

4,842,340
BRAKE FOR A VEHICLE TRAILER
Bernhard Kullmann, Frankfurt; James Remfrey, Oberursel, and Klaus Schlechtriem, Floersheim, all of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt Am Main, Fed. Rep. of Germany
Filed Apr. 21, 1988, Ser. No. 184,219
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1987, 3714383
Int. Cl.[4] B60T 7/20, 8/00, 13/08
U.S. Cl. 303—7 **1 Claim**



1. A brake for a vehicle trailer which is adapted to be coupled to a towing vehicle by a drawbar, comprising hydrauli-

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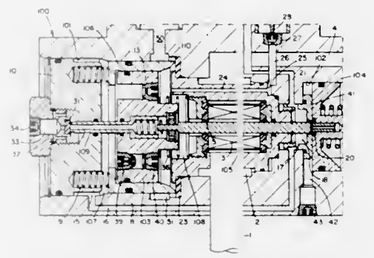
cally operated trailer wheel brakes, a dual working chamber master brake cylinder having at least one piston therein operatively connected to the drawbar to activate said master brake cylinder when the velocity of said trailer is greater than the velocity of said towing vehicle and the working chambers of said master brake cylinder being connected to the wheel brakes for controlling the rotational behavior of the trailer wheels and means for supplying and relieving hydraulic pressure to the wheel brakes during brake slip control and independently of said master brake cylinder including a pressure fluid source which is arranged at the trailer and which is connected to said wheel brakes, wherein the wheel brakes are respectively selectively connectable by a plurality of normally open and normally closed electromagnetically operated valves to the pressence fluid source, to a working chamber of the master cylinder, and to a supply reservoir, wherein the wheel brakes are connectable by non-return valves to selected ones of the working chambers of the master cylinder, the non-return valves opening toward the working chambers, and wherein connected between the working chambers and the non-return valves are pressure-limiting valves which limit the pressure in the brake lines to a maximum value.

4,842,341

BRAKE PIPE PRESSURE MODULATING VALVE DEVICE

Lawrence E. Vaughn; Walter E. Rojecki, both of Watertown, and Thomas H. Engle, Cape Vincent, all of N.Y., assignors to General Signal Corporation, Stamford, Conn.

Filed May 12, 1988, Ser. No. 192,966
Int. Cl.[4] B60T *15/22*
U.S. Cl. 303—37 **17 Claims**



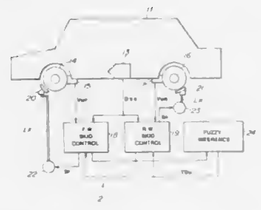
1. A modulation valve device for facilitating propagation of application and release pressure signals through brake pipe wherein an improved modulation valve device comprises;
(a) a valve housing having first and second coaxial stepped bores,
(b) an accelerated application valve piston in the first of the stepped bores and a vent valve piston in the second of the stepped bores,
(c) a pushrod coaxially operably connecting the accelerated application piston with the vent valve piston,
(d) a cup-shaped accelerated release piston in the first stepped bore having the accelerated application piston telescoped therewith,
(e) a quick action fluid pressure and brake pipe fluid pressure chambers formed in the housing that are common to both the accelerated application piston and the accelerated release piston being formed in the first stepped bores at opposite ends of the accelerated application and accelerated release pistons,
(f) spring biasing means for biasing the accelerated release and accelerated application pistons in opposite directions to each other, and
(e) valve means governed by the accelerated application and accelerated release pistons for alternately locally reducing and increasing brake pipe pressure for accelerating transmission of pressure signal changes through a brake pipe of a train.

4,842,342

ANTISKID BRAKE CONTROL SYSTEM BASED ON FUZZY INFERENCE

Hiroshi Takahashi, Komae, and Yasuki Ishikawa, Zama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 14, 1988, Ser. No. 270,974
Claims priority, application Japan, Nov. 17, 1987, 62-291594
Int. Cl.[4] B60T *8/58*
U.S. Cl. 303—102 **3 Claims**



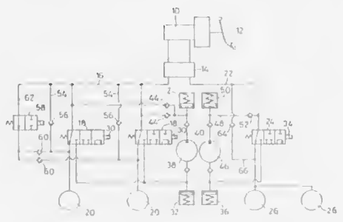
1. An antiskid brake control system for a vehicle, comprising;
sensing means for sensing behaviors of a vehicle body and a vehicle wheel of the vehicle,
preparing means connected with said sensing means for determining parameters representing the behaviors of the vehicle body and wheel,
fuzzy inference means for storing predetermined membership functions each of which is a function of one of said parameters, determining values of said membership functions by using said parameters, and determining a manipulated quantity in accordance with said values of said membership functions, and
modulator means for varying a brake actuation force applied to said vehicle wheel in accordance with said manipulated quantity.

4,842,343

VEHICLE BRAKING SYSTEM FOR DRIVE WHEELS, HAVING MEANS FOR DETERMINING A TIME FOR REDUCING BRAKING PRESSURE

Michio Akiyoshi, and Chiaki Hamada, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Apr. 25, 1988, Ser. No. 185,539
Claims priority, application Japan, Apr. 23, 1987, 62-100820
Int. Cl.[4] B60T *8/60*
U.S. Cl. 303—103 **10 Claims**



1. A method of controlling an anti-lock braking system having a brake for a wheel of a motor vehicle, wherein a slip ratio of a wheel of the vehicle is maintained within an optimum range, by detecting a skidding or locking condition of the wheel based on a running condition of the vehicle and a rotating condition of the wheel, and by increasing, decreasing and holding a brake fluid pressure applied to said brake, in response to the detected locking condition of the wheel, comprising the steps of:
detecting a lapse of a predetermined pressure-decrease time after the commencement of a decrease in said fluid pressure;
detecting a deceleration rate of a rotating speed of said wheel when said pressure-decrease time has elapsed;
determining an extension time during which the fluid pressure is further decreased, said extension time being determined so as to increase with the detected deceleration rate of said wheel; and
decreasing said fluid pressure for the determined extension time.

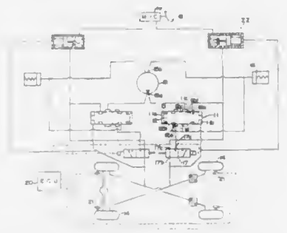
9. A control system for controlling an anti-lock braking system having a brake for a wheel of a motor vehicle, including detector means for detecting a skidding or locking condition of the wheel based on a running condition of the vehicle and a rotating condition of the wheel, and pressure-regulating means for maintaining a slip ratio of the vehicle within an optimum range by increasing, decreasing and holding a brake fluid pressure applied to said brake, in response to the detected locking condition of the wheel, comprising:
time-measuring means for measuring a predetermined pressure-decrease time during which said fluid pressure is decreased;
detecting means for detecting a deceleration rate of a rotating speed of said wheel when said pressure-decrease time has elapsed; and
decrease-time extending means for determining an extension time during which the fluid pressure is further decreased, such that said extension time increases with the detected deceleration rate of said wheel, said decrease-time extending means activating said pressure-regulating means to further decrease said fluid pressure for the determined extension time.

4,842,344

ANTISKID APPARATUS

Kazutaka Kuwana, Toyota; Hiromu Kuromitsu, Chiryu; Hiroaki Takeuchi; Nobuyasu Nakanishi, both of Toyota, and Tomohiko Hosoda, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Sep. 24, 1987, Ser. No. 100,447
Claims priority, application Japan, Sep. 24, 1986, 61-223840
Int. Cl.[4] B60T *8/48, 15/02*
U.S. Cl. 303—117 **4 Claims**



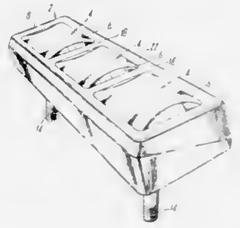
1. An antiskid apparatus for an automotive vehicle comprising:
a master cylinder;
a wheel brake;
a reservoir;
a pump;
a changeover valve positioned in a line connecting said master cylinder and the wheel brake, the changeover valve including means for defining a first mode of the changeover valve and a second mode of the changeover valve, the first mode cutting off said wheel brake from said master cylinder and connecting the wheel brake to said reservoir, and the second mode alternately connecting said wheel brake to said pump and reservoir when an antiskid operation is performed;
a pressure increase control valve connected in a line between said pump and the changeover valve with wheel brake pressure serving as a control signal pressure, said pressure increase control valve including means for decreasing and increasing an amount of pressurized oil flow, said pressure increase control valve decreasing the amount of pressurized oil flow from said pump to said wheel brake when the wheel brake pressure decreases and increasing the amount of pressurized oil flow from said pump when the wheel brake pressure increases; and
a pressure decrease control valve disposed in a line between said wheel brake and said reservoir with the wheel brake pressure serving as a control signal pressure, said pressure decrease control valve including means for increasing and decreasing an amount of pressurized oil flow, said pressure control valve increasing the amount of pressurized oil flow from said wheel brake to said reservoir when the wheel brake pressure decreases and decreasing the amount of pressurized oil flow from said wheel brake when the wheel brake pressure increases, wherein said pressure increase control valve and said pressure decreases control valve are integrally formed as a hydraulic control valve, said hydraulic control valve including a spool, a spring backing the spool, an oil chamber acting against the spring and receiving the wheel brake pressure, a land of said spool associated with a pair of ports and serving as said pressure increase control valve, and a further land of said spool associated with a pair of ports and serving as said pressure decrease control valve.

4,842,345

TRACK LINK ADHESION PAD ASSEMBLY

James W. Elder, Reading, and Robert A. Parker, Camberley, both of England, assignors to The Secretary of State for Defence in Her Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, United Kingdom

Continuation of Ser. No. 592,597, Mar. 23, 1984, abandoned.
This application Aug. 24, 1987, Ser. No. 89,018
Claims priority, application United Kingdom, Mar. 30, 1983, 8308828
Int. Cl.[4] B62D *55/205*
U.S. Cl. 305—35 R **18 Claims**



1. An adhesion pad assembly for a track link of a tracked vehicle including:
a resilient adhesion pad having a ground engageable face;
a rigid encasement having side walls of a material having greater tear strength and less abrasion resistance and lower wear resistance than the material of the adhesion

pad such that in use the encasement material wears more rapidly than the pad such that the face of the pad after a period of use will be domed with its peripheral areas substantially flush with the encasement;

the adhesion pad being laterally confined at its peripheral area by the said side walls of the encasement through substantially the whole thickness of the pad so as to be engageable with the ground.

4,842,346

CHAIN TRACK

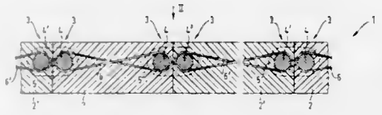
Eugen Schlegl, Groebenzell, Fed. Rep. of Germany, assignor to Krauss-Maffei A.G., Fed. Rep. of Germany

Continuation-in-part of Ser. No. 743,688, Aug. 8, 1985, abandoned. This application Apr. 21, 1987, Ser. No. 8,834

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1984, 3429171; Feb. 7, 1986, 3603933

Int. Cl.[4] **B62D** *55/24*

U.S. Cl. 305—38 **28 Claims**



1. A chain track comprising:

a plurality of adjoining chain links made of an elastomeric material;

means for reinforcing said chain links extending from a first end of each link adjacent to a previous link to a second opposing end of said chain link adjacent to a subsequent link, said means for reinforcing is a shear field support made up of a flexible high tensile material exhibiting a high shear strength mounted in a substantially horizontal plane and embedded in said elastomeric material;

first means for positively connecting said means for reinforcing of a first chain link to means for reinforcing a second adjacent chain link.

4,842,347

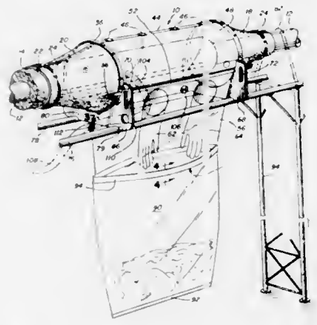
GLOVE BOX FOR REMOVAL OF HAZARDOUS WASTE FROM PIPES

Earl B. Jacobson, 510 S. Shore Dr., Crystal Lake, Ill. 60014

Filed May 3, 1988, Ser. No. 189,611

Int. Cl.[4] **B65D** *3/12*

U.S. Cl. 312—1 **20 Claims**



1. An improved reusable glove box hazardous waste removal system, adapted to be mounted onto and removed from pipes, comprising:

a sealable box unit including a pair of semirigid side walls having an opening along upper ends thereof, said box unit including means for opening and closing said opening to mount said box unit onto a pipe and at least one glove sleeve therein;

said side walls including a flexible skirt depending therefrom, said skirt including means for sealingly attaching a containment bag to an open end of said skirt and means for sealinging closing said skirt for attaching and removing said bag therefrom including a spring hinge member attached to said open end of said skirt, said member having a closed and an open position and said containment bag includes means for securing said bag to said spring hinge of said skirt; and

said box including means for sealing the ends of said box onto said pipe.

4,842,348

CONTAINER FOR THE STORAGE OF MAGNETIC-TAPE CASSETTES OF OTHER RECORDING MEDIA

Peter Ackeret, Kusnacht, Switzerland, assignor to IDN Inventions and Development of Novelties AG, Switzerland

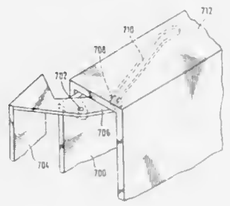
Division of Ser. No. 735,293, May 17, 1985, abandoned, which is a continuation of Ser. No. 456,392. Jan. 7, 1983, abandoned. This application Sep. 12, 1986, Ser. No. 906,426

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1982, 3201486

The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.

Int. Cl.[4] **A47B** *81/06*

U.S. Cl. 312—12 **21 Claims**



1. A container for the storage of articles, such as magnetic tape cassettes, compact phonographic disks, or other recording media, comprising:

a housing having an opening in one side thereof,

a transport slide guided in said housing for movement relative to said housing,

an ejector spring operatively connected between said slide and said housing and adapted to convey said slide relative to said housing into an extraction position for the extraction of the article stored in said housing,

a locking means for locking said slide in a stored position in said housing against the bias of said ejector spring,

a front plate carried by said slide and closing said opening when said slide is locked by said locking means,

a pivotable connecting means between said slide and said front plate for pivotably connecting said slide and said front plate such that said front plate is pivotable between a first storage position and a second extraction position when said slide is in said extraction position, and

a transmission means operatively connected between said front plate and sid housing for transmitting, upon said movement of said slide relative to said housing, a torque to said front plate tending to pivot said front plate into said second extraction position.

4,842,349

DISPLAY COUNTER

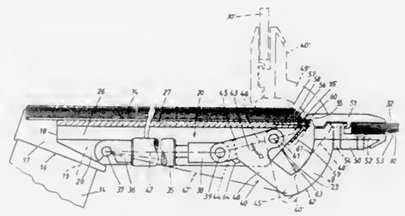
Bruno Stenemann, Beckum, Fed. Rep. of Germany, assignor to Gerd Und Bernd Vieler KG, Iserlohn, Fed. Rep. of Germany

Filed Sep. 30, 1987, Ser. No. 103,177

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1986, 3634684

Int. Cl.[4] **A47F** *3/04*

U.S. Cl. 312—116 **13 Claims**



1. A counter, particularly an article of furniture for temporary storage, cooling and simultaneous displaying of foodstuffs in supermarkets and like establishments, comprising a case having a front side which is faced by customers when the counter is set up in a supermarket or a like establishment and a service side opposite said front side, said case including a hollow portion and a plurality of fixedly mounted substantially horizontal arms extending forwardly from said service side toward said front side and having front end portions; a substantially horizontal first panel arranged to serve as a counter top, having a front portion and supported by said arms; a second panel having a marginal portion adjacent said arms; a hinge having a first section including holding members engaging said marginal portion of said second panel, at least one pintle defining a substantially horizontal pivot axis and provided on said arms, and an arcuate second section pivotable with said first section and with said second panel about said axis between a first position in which said first section is located in front of said arms and said second panel closes said hollow portion at the front side of said case beneath said arms, and a second position in which said second panel affords access to the interior of said hollow portion, said second section connecting said first section to said at least one pintle and being arranged to maintain said holding members substantially at the level and in front of the front end portions of said arms in the first position of said sections, said first section having a portion which is adjacent the front portion of said first panel in the first position of said sections; and motor means substantially parallel to said arms and operative to move said sections and said second panel between said positions, said motor means being connected to at least one of said arms and to at least one of said sections.

4,842,350

BAR UNIT

James A. Collings, 4437 Magazine St., #B, New Orleans, La. 70115

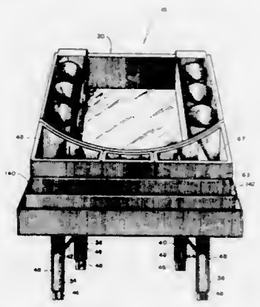
Filed Apr. 18, 1988, Ser. No. 182,921

Int. Cl.[4] **A47B** *77/06*

U.S. Cl. 312—228 **20 Claims**

1. A bar unit, comprising:

a housing having an inclined closed bottom, vertically extending walls attached to the bottom, such that an upper edge of a rear wall is on a higher vertical level than an upper edge of a front wall, said housing having an open top, and being mounted on and supported by a vertically adjustable leg means, said housing being provided an arucate insert means positionable inside the housing, said insert means having a vertically extending arcuate wall,



said arcuate wall facilitating scooping of a material deposited into the housing.

4,842,351

DRAWER METAL SIDE WALL WITH HOOKS FOR CONNECTION TO DRAWER BOTTOM PLATE

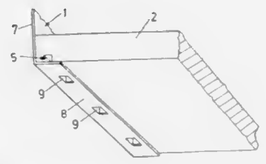
Erich Röck, Höchst, and Helmut Hollenstein, Lustenau, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Feb. 10, 1988, Ser. No. 154,216

Claims priority, application Austria, Mar. 5, 1987, 496/87

Int. Cl.[4] **A47B** *48/00*

U.S. Cl. 312—263 **2 Claims**



1. A drawer comprising:

spaced metal side walls having respective vertical flanges forming drawer sides, each said vertical flange having extending inwardly from a lower end thereof a horizontal flange;

a drawer bottom plate of wood or the like resting at opposite sides thereof on said horizontal flanges of said side walls, said bottom plate having formed in the bottom thereof along each said side thereof a continuous groove;

said horizontal flange of each said side wall having punched therefrom a plurality of bendable hooks, each said bendable hook having a pointed tip;

each said hook being bent upwardly angularly from the respective said horizontal flange and extending into a respective said groove in said bottom plate; and

each said pointed tip being bent angularly from the respective said hook and piercing a wall of the respective said groove to extend into the material of said bottom plate.

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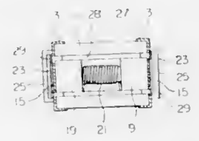
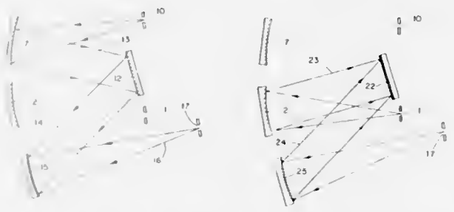
4,842,352
CHIP-LIKE INDUCTANCE ELEMENT
Yoshinori Sasaki, Hoajo, and Toshihiro Kuroshima, Yamagata, both of Japan, assignors to TDK Corporation, Tokyo, Japan
Filed Oct. 5, 1988, Ser. No. 254,325
Int. Cl.[4] H01F 15/02 15/10
U.S. Cl. 336—83 4 Claims



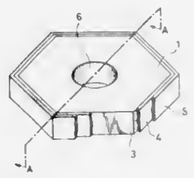
1. A chip-like inductance element comprising:
a magnetic sleeve having a feed-through hole extending between two end surfaces thereof and electrode layers formed substantially on the entire end surfaces;
a drum-like magnetic bobbin which is fitted in the hole such that a gap is formed between the bobbin and the sleeve and which includes two end flanges having a diameter slightly smaller than the diameter of the hole and a central cylindrical region around which a coil winding is wound;
solder layers connecting terminals of the coil winding to the electrode layers except a part of the circumference of end surfaces of said end flanges of the drum-like magnetic bobbin; and
insulating layers which cover the solder layers and said end surfaces of the drum-like magnetic bobbin, and fill said gap.

4,842,353
DIFFRACTION APPARATUS WITH CORRECTING GRATING AND METHOD OF MAKING
Alain Thevenon, Bretigny-Sur-Orge, France, assignor to Instruments S.A., France
Filed Oct. 11, 1985, Ser. No. 787,243
Claims priority, application France, Oct. 19, 1984, 84 16027
Int. Cl.[4] G01J 3/18; G02B 5/32; G03H 1/04
U.S. Cl. 350—3.7 25 Claims



23. A method of making an aberration corrected system incorporating an aberration correction optical element, a plurality of aberration causing optical elements, an optical inlet and an optical output, comprising the steps of recording aberrations associated with the optical geometric shape and the position of a respective aberration causing optical element on an intermediate holographic element and recording on said aberration correcting optical element the aberrations associated with said respective element using said intermediate elements and abberations associated with the optical geometric shape and position of another aberration causing optical element using said other element.

4,842,354
ROTARY POLYGONAL MIRROR AND METHOD OF MAKING THE SAME
Kimio Takahashi, Machida, and Norihisa Saito, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 24, 1986, Ser. No. 831,835
Claims priority, application Japan, Feb. 27, 1985, 60-036457; Feb. 27, 1985, 60-036458
Int. Cl.[4] G02B 26/10
U.S. Cl. 350—6.8 6 Claims

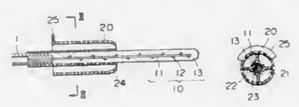


1. A rotary polygonal mirror for use in a scanner or the like, comprising:
a base member with a portion of a polygonal cross-section, said base member being wholly formed of one of a member of plastic materials and composite plastic materials whose main component consists of a plastic material, and having a bottom surface and sidewalls;
a reflective mirror face formed on one or more sidewalls of said portion by means of a precision cutting operation; and
a mounting reference surface for positioning the polygonal mirror within the scanner, said reference surface being formed on the bottom surface of said portion by means of a precision cutting operation.

4,842,355
MULTICHANNEL OPTICAL ROTARY JOINT FOR WELL LOGGING USAGE
Randy Gold, and Darren E. Smith, both of Houston, Tex., assignors to Halliburton Logging Services, Inc., Houston, Tex.
Filed Jul. 11, 1988, Ser. No. 217,736
Int. Cl.[4] G02B 6/36
U.S. Cl. 350—96.2 15 Claims

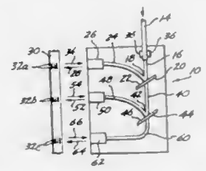
2. A multi-channel optical rotary joint for transmission of data transmitted along a well logging cable wherein the logging cable includes at least two optical fiber channels comprising:
(a) a rotary joint formed of coacting stationary and rotary halves aligned with one another and adapted for connection in a logging cable;
(b) a first optical fiber transmission channel having:
(1) a stationary lens;
(2) an opposing rotary lens; and
(3) means for aligning said stationary and rotary lenses coaxial of the rotary joint and optically coupled with one another for transmission between the rotary and stationary lens; and
(c) a second optical fiber channel having:
(1) a first lens system in the stationary side of the rotary joint;
(2) a second optical lens system in the rotary side of the rotary joint;
(3) wherein said first and second lens systems are arranged in coacting facing relationship to transmit optical data between the stationary and rotary sides of the optical joint; and
(4) wherein said first and second lens systems form a hollow cylinder of light which is concentric about the lens system of said first optical fiber channel.

4,842,356
LIGHT RAY RADIATION DEVICE FOR USE IN MEDICAL TREATMENT OF THE NOSE AND THROAT PASSAGES
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan
Filed Dec. 30, 1987, Ser. No. 139,493
Claims priority, application Japan, Apr. 15, 1987, 62-94156
Int. Cl.[4] G02B 6/00
U.S. Cl. 350—96.10 7 Claims



1. A light rays radiation device for use in medical treatment of a person's body passage such as the nose and throat, comprising an optical conductor cable for transmitting the visible light rays component of solar rays from which harmful ultraviolet and infrared rays have been excluded, a light radiator means removably connected to said cable, said light radiator means comprising a transparent cover member and an elongated optical conductor disposed within said transparent cover member such that said visible light rays are transmitted through said cable to said optical conductor, said optical conductor having discharge means spaced along its longitudinal length for discharging said transmitted light rays such that said transmitted light rays are thereby radiated outwardly along the longitudinal length of said optical conductor, said cover member having an outer longitudinal end section and an inner longitudinal end section, and a holder means for supporting said inner longitudinal end section of said cover member within said passage, said holder means comprising a generally cylindrical holder tube through which said inner longitudinal end section of said cover member extends, said holder tube being spaced from said inner longitudinal end section of said cover member to define an annular space therebetween, said holder means further comprising spaced support parts disposed in said annular space and extending between said holder tube and said inner longitudinal end section of said cover member, said holder tube having longitudinal ends which are open and which together with said annular space define ventilating passages which extend longitudinally through said annular space and which are disposed between said support parts, whereby said holder tube is insertable into said passage such that said outer longitudinal end section extends further into said passage than said holder tube as said holder tube supports said radiating means in said passage and said light rays from said light radiating means are radiated into said passage.

4,842,357
INTEGRATED WAVELENGTH DIVISION MULTIPLEXED OPTICAL SENSOR
Patrick M. Doneen, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Aug. 8, 1988, Ser. No. 229,612
Int. Cl.[4] G02B 6/10
U.S. Cl. 350—96.12 20 Claims



1. A wavelength division multiplexed optical sensor for use with a source of light having either a broad band of wavelengths or a plurality of discretely different wavelengths, said optical sensor comprising:
a silicon substrate, including a plurality of light conductive channels thereon, pairs of said light conductive channels meeting at a plurality of spaced apart junctions disposed in a source path along which one of the light conductive channels comprising each pair is aligned, the other light conductive channel of each pair defining a sensor path directed toward an edge of the substrate, said pairs of light conductive channels defining an acute angle at each junction, with respect to the direction that light propagates along the source path from the source;
a plurality of filters, each having a different reflectance characteristic associated with it, said filters each being disposed at one of the junctions so as to reflect light having a range of wavelengths determined by said reflectance characteristic associated with the filter through said acute angle and into the light conductive channel defining the sensor path, light having other wavelengths continuing to propagate along the source path;
means disposed at the distal end of each sensor path for optically coupling the sensor paths to a reflective surface, light of the different characteristic wavelengths conveyed through each sensor path being reflected from said surface, traveling through the sensor path in the opposite direction, and being reflected from the filter at the junction back toward the source along the source path.

4,842,358
APPARATUS AND METHOD FOR OPTICAL SIGNAL SOURCE STABILIZATION
David B. Hall, La Crescenta, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.
Filed Feb. 20, 1987, Ser. No. 17,426
Int. Cl.[4] G01B 9/02; H01S 3/13
U.S. Cl. 350—96.15 12 Claims

1. A fiber optic rotation sensing system, comprising:
an optical source that includes a gain medium and means for defining a resonant cavity in which light emitted from the gain medium constructively interferes to produce an optical signal;
a first optical fiber for receiving optical signals from the optical source;
a second optical fiber having a sensing coil formed therein;
optical coupling means for coupling optical signals between the first and second optical fibers; and
means external from the cavity for dividing signals output

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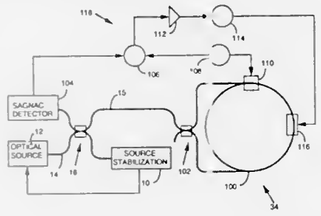
from the source into a first signal portion having a first polarization and a second signal portion having a second polarization;

a first birefringent device positioned external from the cavity to receive the first and second signal portions;

a second birefringent device positioned external from the cavity to receive the first and second signal portions after they have propagated through the first birefringent device;

the first and second birefringent devices being arranged to provide a first optical path for the first signal portion and a second optical path for the second signal portion;

means for controlling the frequency of optical signals output from the optical signal source, including:



means for providing a first optical path for the first signal portion;

means for providing a second optical path for the second signal portion;

means for combining the first and second signal portions to form a first optical beam and a second optical beam that each includes a component of the first signal portion and a component of the second signal portion, the beams having intensities dependent upon the frequency of the two beams; and

means for adjusting the frequency of the optical signal output from the signal source as a function of the difference of the intensities of the first and second optical beams.

4,842,359

OPTICAL STAR COUPLER AND METHOD OF MANUFACTURING THE SAME

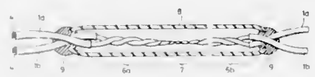
Katsuyuki Imoto, Sayama; Minoru Maeda, Nishitama; Masayoshi Kameyama, Sagamihara; Yasushi Ikuta, Nishitama; Hiroshi Araki, Katsuta, and Shigeru Ono, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 772,914, Sep. 5, 1985. This application Dec. 9, 1987, Ser. No. 130,615

The portion of the term of this patent subsequent to Feb. 23, 2005, has been disclaimed.

Int. Cl.[4] G02B 6/28

U.S. Cl. 350—96.16 **10 Claims**



1. An optical star coupler comprising:

a protection tube;

a plurality of optical fibers suspended in said protection tube, having a twisting, fusing and pulling portion at a central portion of said optical fibers and twisting and fusing portions on both sides, of said twisting, fusing and pulling portion; and

means for fixing said optical fibers on both ends of said protection tube,

wherein said optical fibers are further covered with plastic material.

4,842,360

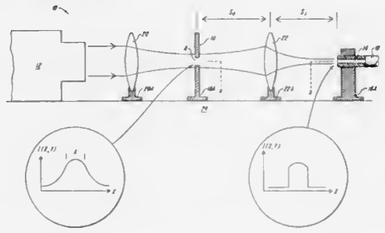
HIGH ENERGY LASER-TO-WAVEGUIDE COUPLING DEVICES AND METHODS

Richard G. Caro, Boston, and Troy M. Harmon, Watertown, both of Mass., assignors to Summit Technology, Inc., Watertown, Mass.

Filed Jun. 18, 1987, Ser. No. 64,827

Int. Cl.[4] G02B 6/32

U.S. Cl. 350—96.18 **33 Claims**



1. A coupling apparatus for coupling a high energy laser radiation beam from a laser to an optical waveguide, the coupling apparatus comprising:

an aperture-defining element disposed between a high energy laser and an optical waveguide, the aperture-defining element having an aperture which permits a central portion of the radiation beam to pass therethrough while a peripheral portion of the beam is clipped, such that the spatial intensity profile of the beam is flattened; and

an imaging lens for imaging the plane of the aperture onto an end face of the optical waveguide.

4,842,361

CONNECTION CLAMP AND CUTTING DEVICE FOR FIBER OPTIC LIGHT GUIDE

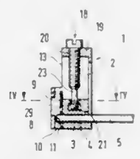
Franz Schrauder, Litzendorf, Fed. Rep. of Germany, assignor to F. Wieland Elektrische Industrie GmbH, Bamberg, Fed. Rep. of Germany

Filed Aug. 10, 1988, Ser. No. 230,645

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1987, 3727092

Int. Cl.[4] G02B 6/38; B26D 7/00; B26F 3/02

U.S. Cl. 350—96.20 **20 Claims**



1. A connection clamp for fiber optic light guides for receiving and holding a fiber optic light guide comprising a guide housing having a slide passage, a slide block slidable in said slide passage between a mounting position and a use position, means defining a through hole in said slide block, said through hole receiving said light guide, said through hole having an exit end, a cutting edge means mounted on said housing and disposed adjacent to said exit end, and threaded means

threaded in said housing and operatively connected to said slide block such that rotation of said threaded means moves said slide block between said mounting position and said use position, said cutting edge means being operable to cut said light guide disposed in said through hole in said slide block as said slide block is moved from said mounting position to said use position by said threaded means.

4,842,362

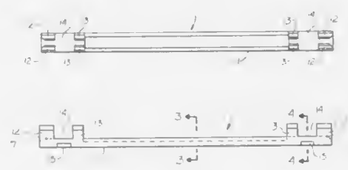
HOUSING FOR A FIBER OPTIC SPLICE

John J. Anderton, Oil City, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 418,339, Sep. 14, 1982, abandoned. This application Jan. 16, 1985, Ser. No. 691,739

Int. Cl.[4] G02B 6/36, 7/26

U.S. Cl. 350—96.20 **11 Claims**



1. A housing for a fiber optic splice, the housing including:

a bottom section comprising:

(a) a substantially rectangular, longitudinally extending primary portion,

(b) a first set of teeth positioned at one end of the primary portion,

(c) a second set of teeth positioned at the other end of the primary portion,

(d) a first pair of cavities, cut out of the bottom surface of the primary portion and positioned on opposite sides and at one end of the primary portion, and

(e) a second pair of cavities cut out of the bottom surface of the primary portion and positioned on opposite sides and at the other end of the primary portion, said housing further including:

a top section comprising:

(a) a substantially rectangular, longitudinally extending center portion,

(b) a pair of wall members extending downwardly along the sides of the center portion,

(c) a pair of elevated members integral to and protruding downwardly from a surface of the center portion, said elevated members positioned at opposite ends of the center portion, and

(d) tapered tabs extending inwardly from the inner surfaces of the wall members, whereby the top section may be positioned over the bottom section so that the elevated members of the top section align with the teeth of the bottom section thereby providing an aperture into which a glass fiber may be inserted and whereby the tapered tabs of the top section may be pressed flat so as to lock into the cavities of the lower section so as to maintain a relatively secure relationship between the two sections.

4,842,363

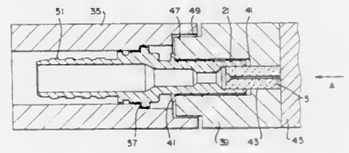
FIBER OPTIC CONNECTOR, TOOL FOR ASSEMBLING FIBER OPTIC CONNECTOR AND METHOD OF ASSEMBLING FIBER OPTIC CONNECTORS

Mark Margolin; Igor Grois, both of Lincolnwood, and James E. Moore, Wheaton, all of Ill., assignors to Amphenol Corporation, Wallingford, Conn.

Continuation of Ser. No. 892,976, Aug. 4, 1986, abandoned. This application Dec. 11, 1987, Ser. No. 131,435

Int. Cl.[4] G02B 6/36

U.S. Cl. 350—96.21 **6 Claims**



1. In a fiber optic connector of the type comprising a main body having a longitudinal passage extending therethrough and having two ends, a first end for attaching a fiber optic cable thereto and a second end for having a mating ferrule secured thereto, and said passage opening at each end and being coextensive with a passage extending through said ferrule, said second end being comprised of a recess having a forward and rearward end in which is secured said mating ferrule, and said mating ferrule being constructed having the fiber of said fiber optic cable extending in a passage therethrough secured therein and terminating at the end of said ferrule, the improvement wherein said mating ferrule is a ceramic ferrule arranged in press-fit engagement within said recess, said press-fit engagement being such that said ferrule does not abut against the rearward end of said recess and extends beyond said forward end of said recess a distance compatible for mating with other like connectors whereby the requirement for using epoxy to fix said ferrule to said body and later polishing down of said ferrule to achieve said distance is eliminated.

4,842,364

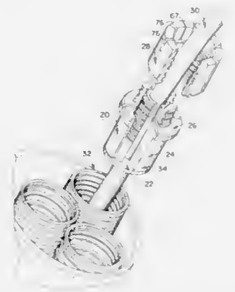
FIBER OPTIC CABLE INNERDUCT PLUG AND ASSEMBLY

Chung F. Chen, Missioo Viejo, Calif., assignor to Jack Moon Co. Ltd., Taiwan, Taipei, Taiwan

Filed Oct. 11, 1988, Ser. No. 255,375

Int. Cl.[4] G02B 6/44; H02G 3/00

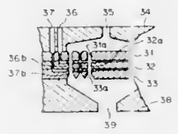
U.S. Cl. 350—96.23 **12 Claims**



1. An improved plug device for a fiber optic cable innerduct system, said device comprising, in combination:

a. a lower rigid compression plate comprising a horizontal disc bearing a first central vertical fiber optic cable-receiving passageway extending therethrough, a plurality of upright elongated spaced arms comprising segments of a circle connected to said disc and rising thereabove, said arms being spaced in a circle around said passageway and bearing threads on the outer surfaces thereof;
b. a flexible resilient generally cylindrical gasket having an upper circular flange and having inner surfaces defining a second vertical central fiber optic cable-receiving passageway extending therethrough aligned with said first passageway, said gasket being seated on said disc and having a plurality of curved vertical slots extending therethrough, arranged in a circle around said gasket passageway and releasably receiving said arms, which extend thereabove;
c. an upper rigid compression plate comprising a circular horizontal disc having a central tube extending up therefrom and defining a third vertical central fiber optic cable-receiving passageway, said upper compression plate disc being seated on said flange and having a plurality of curved vertical slots extending therethrough, arranged in a circular around said tube and releasably receiving said arms, the upper portions of which extend thereabove; and,
d. a locking collar having a fourth internally threaded central vertical fiber optic cable-receiving passageway aligned with said first, second and third passageways and threadably received over said upper portions of said arms, said collar being tightenable down over said arms to draw said lower compression plate towards said upper compression plate, causing said gasket to bulge externally for a releasably tight sealing fit in a fiber optic innerduct system in which said device can be disposed and for securely holding a fiber optic cable in said aligned passageways.

4,842,365
MULTIFILAMENT TYPE PLASTIC OPTICAL FIBER AND PROCESS FOR PREPARATION THEREOF
Hiromu Terada; Kenichi Sakunaga, both of Otake, and Naoyuki Fukahori, Ayase, all of Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan
Filed Jun. 15, 1987, Ser. No. 61,346
Claims priority, application Japan, Jun. 20, 1986, 61-144456; Jul. 25, 1986, 61-114442[U]; Sep. 22, 1986, 61-221781
Int. Cl.[4] G02B *6/04*
U.S. Cl. 350—96.24 **5 Claims**

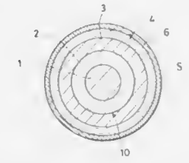


1. A multifilament type plastic optical having a substantially rectangular cross-section and an islands-in-the-sea structure in which 100 to 10,000 islands are arranged in the sea, wherein respective islands have a substantially circular cross-section and a core-sheath structure, the islands are arranged in a zigzag-stacked structure, the core occupancy ratio in the multifilament type optical fiber cores-section is at least 50%, and the brightness index value I indicating the brightness of the transmitted image, which is defined by the following formula (1), is at least 4.5×10^{-2}:

$$I = S\cdot NA^2\cdot 10^{-(\alpha L/10)} \quad (1)$$

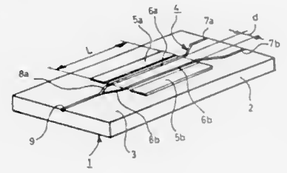
wherein S is the core's occupancy ratio in the optical fiber crossection, α is the transmission loss (dB/m) per meter of the optical fiber, NA is the numerical aperture, and L is the length (m) of the used optical fiber.

4,842,366
CERAMIC SUPERCONDUCTOR AND LIGHT TRANSMITTING COMPOSITE WIRE
Kazuo Sawada; Hajime Hitotsuyanagi, and Kengo Ohkura, all of Osaka, Japan, assignors to Sumitomo Electric Industries, LTD, Osaka, Japan
Filed Mar. 3, 1988, Ser. No. 163,585
Claims priority, application Japan, Mar. 5, 1987, 62-051141; Mar. 27, 1987, 62-075423
Int. Cl.[4] G02B *6/10;* **H01L** *39/24;* **H01P** *1/00;* **H01B** *5/00*
U.S. Cl. 350—96.30 **13 Claims**



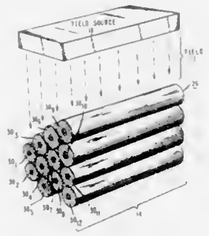
1. An electricity-light transmitting composite wire comprising light transmitting body means (1, 11, 26) and ceramic type superconductor means (2, 12, 26) exhibiting superconductive phenomena at an operating temperature.

4,842,367
OPTOELECTRONIC DIRECTIONAL COUPLER FOR A BIAS-FREE CONTROL SIGNAL
Anders G. Djupsjöbacka, Solna, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed Apr. 22, 1987, Ser. No. 41,099
Claims priority, application Sweden, May 16, 1986, 86022340
Int. Cl.[4] G02B *6/26*
U.S. Cl. 350—96.14 **3 Claims**



1. Optoelectronic directional coupler including a) two mutually spaced, coupled led lightwave conductors extending in a coupling area, the conductors each being connected to a waveguide output on the directional coupler and two electrodes in the coupling area, with the aid of which the optical coupling between the coupled conductors can be acted on with the aid of a control signal, b) extra lightwave conductors, of which at least one is in communication with a wave conductor input on the directional coupler, the extra lightwave conductors being arranged such that an incoming lightwave on the directional coupler wave conductor input is divided between the extra lightwave conductors into two partial lightwaves, each having substantially the same power and being in phase with the other, or being phase-shifted half a revolution in relation to the other, characterized in that the coupled lightwave conductors (**6***a*, **6***b*; **22***a*, **22***b*; **33***a*, **33***b*; **43***a***43***b*) are each connected to one of the extra lightwave conductors (**8***a*, **8***b*; **36***a*, **36***b*; **46***a*, **46***b*) and in that the incoming lightwave (P) can be switched between the outputs (**7***a*, **7***b*; **35***a*; **35***b*, **45***a*, **45***b*) of the directional coupler (**1**;**30**;**40**) by the partial lightwaves (**P1**,**P2**;**P4**,**P5**;**P6**,**P7**) being switched between the coupled lightwave conductors with the aid of the control signal (S) connected to one of the electrodes (**5***a*; **34***a*; **44***a*), the signal assuming a positive (+VO) or a negative (−VO) potential on switching, in relation to a reference potential to which the other electrode (**5***b*; **34***b*; **44***b*) is connected, the positive potential (+VO) having substantially the same numerical value as the negative potential (−VO).

4,842,368
N×N SINGLE-MODE OPTICAL WAVEGUIDE COUPLER
Thomas E. Darcie, Hazlet, and Adel A. M. Saleh, Holmdel, both of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Bell Laboratories, Murray Hill, N.J.
Filed Aug. 17, 1987, Ser. No. 85,924
Int. Cl.[4] G02B *6/26, 6/42*
U.S. Cl. 350—96.15 **10 Claims**

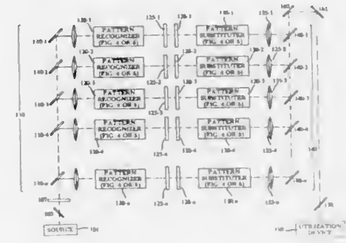


1. An optical coupler comprising:
a plurality of N single-mode optical waveguides arranged in a mutually adjacent relationship wherein each waveguide is disposed sufficiently close to at least one other waveguide to experience evanescent wave coupling in a predetermined coupling region, and includes a separate input and output port, and $N>3$; and
means for applying a field throughout the coupling region of the plurality of waveguides that will vary both (1) propagation constants for each waveguide and (2) coupling coefficients among the waveguides to distribute an input signal, comprising an optical signal of a predetermined narrow frequency band, propagating in one of the plurality of waveguides among all of the plurality of waveguides and provide a substantially uniform power distribution pattern at the output ports of the waveguides.

4,842,369
CLADDING MATERIAL FOR PLASTIC OPTICAL FIBER AND PLASTIC OPTICAL FIBER USING THE SAME
Shinichi Teshima, Yokohama; Shigeki Katsuta, Kawasaki; Kazuhiko Maeda, Akishima; Taku Yamauchi, Kamifukuoka, and Toshio Koishi, Sakado, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka and Central Glass Company Limited, Yamaguchi, both of, Japan
Filed Sep. 8, 1988, Ser. No. 241,952
Claims priority, application Japan, Sep. 9, 1987, 62-226066
Int. Cl.[4] G02B *6/00;* **D02G** *3/00;* **C08L** *27/12*
U.S. Cl. 350—96.34 **4 Claims**

1. A cladding material for a plastic optical fiber comprising a vinylidene fluoride-trifluoroethylenehexafluoroacetone copolymer which comprises 3.5 to 6.5% by mole of hexafluoroacetone units, a molar ratio of vinylidene fluoride unit to trifluoroethylene unit of 3 to 6:1, and a melt index of 10 to 60 g/10 min.

4,842,370
OPTICAL SPATIAL LOGIC ARRANGEMENT
Karl-Heinz Brenner, Nuremberg, Fed. Rep. of Germany, and Alan Huang, Middletown, N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jul. 14, 1986, Ser. No. 885,550
Int. Cl.[4] G06F *7/56, 9/00;* **G01B** *11/00;* **G06K** *9/32*
U.S. Cl. 350—321 **21 Claims**

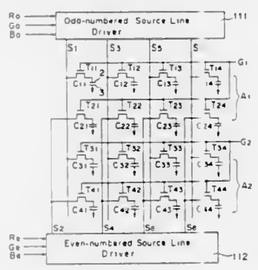


1. Apparatus for processing information residing in the energy pattern of radiant energy beams comprising:
means for receiving at least one array of information-carrying radiant energy beams where said information, representing a first or a second logic level, is expressed in the spatial pattern of said array;
means responsive to each received array for detecting occurrences of a prescribed pattern of radiant energy beams in said received array;
means responsive to each occurrence of said prescribed pattern in said received array for modifying the radiant energy beams therein; and
means for combining the modified radiant energy beam array from said radiant energy beams modifying means with other information-carrying radiant energy beam arrays.

4,842,371
LIQUID CRYSTAL DISPLAY DEVICE HAVING INTERLACED DRIVING CIRCUITS FOR DRIVING ROWS AND COLUMNS ONE-HALF CYCLE OUT OF PHASE
Shuhei Yasuda, and Yutaka Takafuji, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Apr. 14, 1988, Ser. No. 181,377
Claims priority, application Japan, Apr. 15, 1987, 62-92903; May 18, 1987, 62-120690; May 20, 1987, 62-123219; Jun. 15, 1987, 62-148844
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—333 **22 Claims**

1. An active matrix liquid crystal display device operable on an interlaced scanning scheme and having a plurality of liquid crystal cells and switching active elements for driving the liquid crystal cells, said liquid crystal cells and said switching active elements being arranged in a matrix fashion having rows and columns intersection with each other, the device comprising:
a plurality of sets, each comprised of each neighboring members of the rows of the matrix;
means for scanning each set with an interlaced scanning signal during any fields, odd-numbered source lines each connected with one of said row forming the respective set,

even-numbered source lines each connected with the other of said row forming the respective set; and



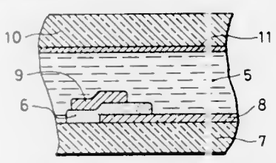
means for applying an odd-numbered field signal to said odd-numbered field signal to said even-numbered source line during any field time.

4,842,372

ELECTRO-OPTICAL DEVICE HAVING AN AMORPHOUS SILICON RESISTIVE ELEMENT WITH CARBON

Motoo Toyama, Tokyo, Japan, assignor to Seiko Instruments Inc., Tokyo, Japan

Filed Jun. 17, 1988, Ser. No. 208,260
Claims priority, application Japan, Oct. 22, 1986, 61-251076
Int. Cl.[4] G02F *1/1...*
U.S. Cl. 350—334 **13 Claims**



1. An electro-optical device comprising: a pair of substrates, at least one of the substrates being light transmissive; an electro-optical material sandwiched between the substrates; a plurality of electro-optical switching elements disposed on an inner surface of at least one of the substrates, each of the switching elements including a first electrode layer, a non-linear-resistive layer substantially composed of an amorphous material of silicon and carbon and a picture element electrode electrically connected to the first electrode layer through the non-linear-resistive layer; and a second electrode layer disposed on an inner surface of the other substrate to define a plurality of picture elements between the second electrode layer and the plurality of picture element electrodes for applying a voltage to the electro-optical material in a desired picture element.

4,842,373

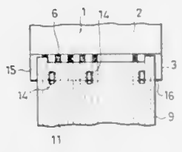
CONNECTING STRUCTURE FOR CONNECTING A LIQUID CRYSTAL DISPLAY AND A FLEXIBLE FLAT CABLE

Makoto Tomofuji, and Fumiaki Yamashashi, both of Iwaki, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Mar. 17, 1988, Ser. No. 170,917
Claims priority, application Japan, Jun. 15, 1987, 62-90709[U]
Int. Cl.[4] G02F *1/1...*
U.S. Cl. 350—336 **1 Claim**

1. A connecting structure for connecting a liquid crystal display having a lower glass substrate with a free end with electrode terminals formed thereon, to a flexible flat cable having connecting electrodes formed thereon, said electrode terminals and said connecting terminals being joined together by a solder layer and forming a junction, said junction being covered by a resin;

wherein the improvement comprises through holes formed in said flexible flat cable between said connecting electrodes such that said through holes extend from the surface of said lower glass substrate to an area beyond said free end of said lower glass substrate when said flexible flat cable is put in place on said lower glass substrate, and said through holes allow a resin applied to an upper surface of said flexible flat cable to flow therethrough to a lower surface thereof wherein said resin spreads over said lower surface of said flexible flat cable and further spreads over said free end of said lower glass substrate.

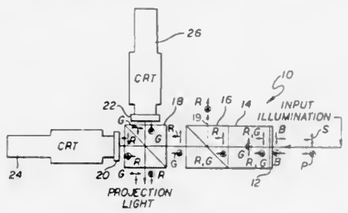


4,842,374

UNITARY PREPOLARIZING PRISM ASSEMBLY FOR A FOUR COLOR LIQUID CRYSTAL LIGHT VALVE IMAGE PROJECTOR

Arno G. Ledebuhr, Pleasanton, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 013,480, Jul. 27, 1987. This application Sep. 23, 1988, Ser. No. 248,464
Int. Cl.[4] G02F *1/13*; G02B *27/28, 21/00*
U.S. Cl. 350—337 **10 Claims**



1. A four color liquid crystal light valve image projector comprising:

a prepolarizing prism assembly for which provides, from an input beam of unpolarized white light, an output beam of light having a first component of a first color and first polarization state and a second component of a second color and a second polarization state, said prepolarizing prism assembly providing a first optical path from an input end to an output end;

a main polarizer disposed to receive said output beam of light from said prepolarizing assembly, said main polarizer directing light of said first color and said first polarization state along a second optical path, said main polarizer directing light of said second color and said second polarization state along a third optical path, said main polarizer receiving polarization-modulated light along said second and third optical paths and directing said polarization-modulated light along a fourth optical path;

liquid crystal light valve means disposed on said second and third optical paths for receiving the light transmitted on said second and third optical paths, said liquid crystal light valve means modulating the polarization state of received light and directing said polarization-modulated light along said second and third optical paths to said main polarizer.

4,842,375

METHOD FOR THE ORIENTATION OF LIQUID CRYSTALS

Arno Seeboth; Joerg Gloede; Hans-Dieter Koswig; Horst Ladwig; Hartwin Obernik, and Helmuth Seeboth, all of Berlin, German Democratic Rep., assignors to VEB Werk fuer Fernsehelektronik im VEB Kombinat Mikroelektronik, Berlin, German Democratic Rep.

Filed Jul. 10, 1987, Ser. No. 72,074
Claims priority, application German Democratic Rep., Sep. 4, 1986, 294147
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—339 R **14 Claims**

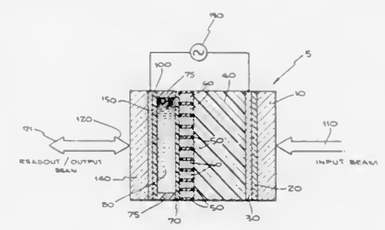
1. A method for orienting liquid crystals uniformly on a substrate surface, comprising bonding thermotropic liquid crystals to a portion of functional groups of a matrix of a copolymer of maleic acid and maleic anhydride, and then linking the matrix as an orienting layer to a substrate surface.

4,842,376

DOUBLE-SCHOTTKY DIODE LIQUID CRYSTAL LIGHT VALVE

Paul O. Braatz, Canoga Park, and Uzi Efron, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 25, 1985, Ser. No. 758,917
Int. Cl.[4] G02F *1/133*; H01L *21/48*
U.S. Cl. 350—342 **12 Claims**



1. A double-Schottky diode light valve, comprising:

liquid crystal means for spatially modulating a first incident beam by polarization rotation to produce a modulated beam; and

photoconductor means, disposed adjacent said liquid crystal means for receiving a second incident beam and for controlling the polarization rotation of said first incident beam responsively to said second incident beam, said photoconductor means including semi-conductor substrate means for absorbing said second incident beam, said absorption producing photogenerated carriers; and

first and second Schottky diode means, disposed on opposing sides of said substrate means, for maintaining said substrate substantially depleted of said carriers and for reflecting said modulated beam back through said liquid crystal means, wherein said first Schottky diode means comprises a plurality of metal-semiconductor diodes disposed on the side of said photoconductor means opposite said liquid crystal means and in optical communication with said second incident beam, said diodes including a grid of metal disposed adjacent said substrate means, whereby said diodes are formed by said grid and said substrate means,

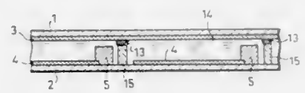
whereby said modulated beam passes through said liquid crystal means twice and is polarization rotated on each passage.

4,842,377

LIQUID CRYSTAL DEVICE HAVING "DUMMY" THIN-FILM TRANSISTORS AS SPACERS

Jun Nakanowatari, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Apr. 12, 1988, Ser. No. 180,299
Claims priority, application Japan, Jul. 25, 1987, 62-186134
Int. Cl.[4] G02F *1/13*
U.S. Cl. 350—344 **1 Claim**



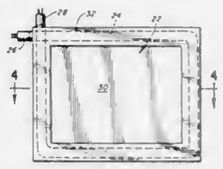
1. In a liquid crystal device having a pair of first and second opposed substrates, a ferroelectric liquid crystal filled in a space defined between said substrates, and a thin film transistor formed on at least one of said substrates; the improvement comprising a dummy corresponding to said thin film transistor being formed on said substrate on which said thin film transistor is formed comprising a pseudo pixel electrode electrically insulated from said thin film transistor, and a pseudo thin film transistor; a thickness of said dummy is equal to the sum of a thickness of said thin film transistor and thickness of said pseudo pixel electrode, wherein said dummy is used as a spacer between said substrates, and said dummy is bonded to said first substrate opposed to said second substrate on which said dummy is formed.

4,842,378

METHOD OF ILLUMINATING FLAT PANEL DISPLAYS TO PROVIDE CRT APPEARING DISPLAYS

Richard A. Flasck, San Ramon; Beany Irwin, San Jose, and Scott H. Holmberg, San Ramon, all of Calif., assignors to Alphasil, Inc., Fremont, Calif.

Filed Apr. 7, 1987, Ser. No. 35,515
Int. Cl.[4] G02F *1/13*; F21V *7/04*; F21L *19/00*; F21P *1/00*
U.S. Cl. 350—345 **10 Claims**



1. A method of illuminating flat panel display screens, comprising:

providing a liquid crystal display screen having a predetermined configuration with a front and a back side;

forming a neon tube with at least one bend therein to accommodate at least a portion of said screen configuration;

placing said tube adjacent said screen configuration on the front side thereof to front light said screen; and

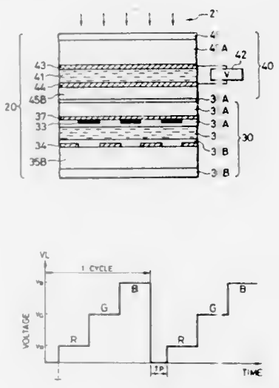
activating said tube to illuminate said screen.

4,842,379

IMAGE RECORDING APPARATUS UTILIZING AN ECB MODE LIQUID CRYSTAL

Hisao Oishi; Kazuhiko Yanagihara; Tadashi Miyakawa, all of Kanagawa; Takeshi Nakamura, Osaka; Kazuhiko Akimoto, Osaka, and Mitsuaki Shioji, Osaka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa and Sharp Kabushiki Kaisha, Osaka, both of, Japan

Filed Nov. 13, 1987, Ser. No. 120,451
Claims priority, application Japan, Nov 13, 1986, 61-270533
Int. Cl.[4] G02F 1/13
U.S. Cl. 350—347 E 9 Claims



7. An image recording apparatus comprising:
a liquid crystal shutter array comprising a plurality of pixel electrodes and a common electrode disposed in opposition to said pixel electrodes with a gap therebetween, a liquid crystal filling said gap, a first transparent substrate for supporting said pixel electrodes, and a polarization plate stacked on a side of said transparent substrate opposite said pixel electrodes;
a color liquid crystal layer stacked on said liquid crystal shutter array and comprising a first electrode disposed in opposition to said common electrode with a gap therebetween, an ECB mode liquid crystal filling said gap between said first and common electrodes, and a second transparent substrate for supporting said first electrode; and
voltage application means for applying a predetermined voltage between said first and common electrodes.

4,842,380

LIQUID CRYSTAL OPTICAL ELEMENTS

Takashi Takayanagi, and Hideo Kawaguchi, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 19, 1987, Ser. No. 86,982
Claims priority, application Japan, Aug 19, 1986, 61-193706
Int. Cl.[4] G02F 1/13; C09K 19, 54, 19/52
U.S. Cl. 350—351 9 Claims

1. A liquid crystal optical element comprising a cell comprising two or more supports each having a transparent electroconductive layer, said cells containing a polymeric liquid crystal with positive dielectric anisotropy having a mesogenic biphenyl side chain, said polymeric liquid crystals being capable of being placed in the form of a vertically oriented state and being optically transparent in the vertically oriented state. and from 0.01% to 10% by weight, on the basis of said polymeric liquid crystal, of a non-liquid crystal biphenyl or biphenyl derivative represented by formula (I)

(I)

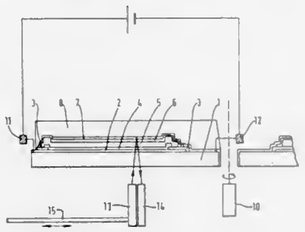
wherein X and Y each represents a hydrogen atom, an alkyl group, an oxyalkyl group, a halogen atom, a nitrile group, or a nitro group.

4,842,381

ELECTROCHROMIC DATA RECORDING SYSTEMS

Mino Green, London, England, assignor to National Research Development Corp., London, England

PCT No. PCT/GB87/00185, § 371 Date Nov. 17, 1987, § 102(e) Date Nov. 17, 1987, PCT Pub. No. WO87/05737, PCT Pub. Date Sep. 24, 1987
PCT Filed Mar. 17, 1987, Ser. No. 130,458
Claims priority, application United Kingdom, Mar. 18, 1986, 8606651
The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.
Int. Cl.[4] G02F 1/01, 1/17
U.S. Cl. 350—357 21 Claims



1. An electrochromic data recording device comprising means defining an axis of rotation and a data recording portion surrounding the said axis characterised in that the device further comprises at least one electrochromic zone (4) in said recording portion and means (2,5,6,7) for selectively supplying to and withdrawing from said zone guest atoms which produce an optical change in said zone, which means is substantially inoperable at a first temperature but is operable at a temperature elevated with respect to said first temperature.

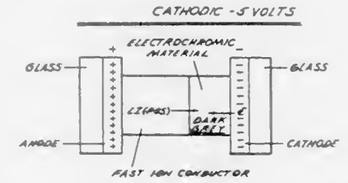
4,842,382

ELECTROCHROMIC DEVICE, NEW CATHODIC ELECTROCHROMIC MATERIAL AND METHOD OF MAKING

Hulya Demirvent, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1987, Ser. No. 137,629
Int. Cl.[4] G02F 1/01, 1/17
U.S. Cl. 350—357 14 Claims

2. An electrochromic device comprising:
an anode,
a cathode,
a fast ion conductor capable of generating ions when an electrical field is applied thereto, said fast ion conductor permitting ion movement therethrough while prohibiting electron movement therethrough, and
cathodic electrochromic material comprising electrochromic bismuth oxide made by a method which comprises heating bismuth oxide (Bi_2O_3) at a temperature below the evaporation temperature of said bismuth oxide for a time sufficient to insure that it is in its base state,



said fast ion conductor and said electrochromic bismuth oxide being arranged between said anode and said cathode.

4,842,383

ELECTRODELESS PLATING METHOD FOR COMBINING THE POLYMERIZATION AND THE COATING OF ELECTROCHROMIC POLYMERS

Sze C. Yang, Kingston, and Robert L. Clark, Middletown, both of R.I., assignors to Board of Governors for Higher Education, State of Rhode Island and Providence Plantations, Providence, R.I.

Continuation-in-part of Ser. No. 856,384, May 1, 1986, Pat. No. 4,749,260. This application Jun. 7, 1988, Ser. No. 203,270
Int. Cl.[4] G02F 1/01, 1/17
U.S. Cl. 350—357 12 Claims

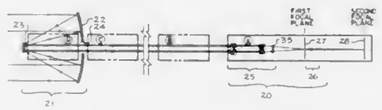
1. A method for forming a thin film of an electrochromic material on a surface which includes:
coating on said surface an acidic solution containing monomeric aniline and effective amounts of an oxidant and a catalyst, the monomeric aniline polymerizing in situ on said surface to form an electrochromic film.

4,842,384

OPTICAL SYSTEM OF THE PETZVAL TYPE

Romeo I. Mercado, San Jose, Calif., assignor to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Division of Ser. No. 676,295, Nov. 29, 1984. This application Jan. 11, 1988, Ser. No. 142,891
Int. Cl.[4] G02B 3/00
U.S. Cl. 350—412 4 Claims



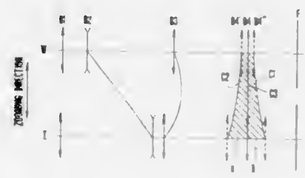
1. A lens system of the Petzval type comprising a first group of lens elements, a second group of lens elements, and a lens element functioning as a field flattener, said lens system bringing five wavelengths to a common focus on a focal surface intersecting an optic axis of said system, each of said lens elements being made from one of only two different kinds of optical materials, at least one of said lens elements being made of a glass having a refractive index of approximately 1.65 and an Abbe number of approximately 58.15 at a wavelength of 0.546 micron, and at least one other of said lens elements being made of a calcium fluoride crystal.

4,842,385

ZOOM LENS

Tsunefumi Tanaka, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 622,687, Jun. 20, 1984, abandoned. This application May 2, 1988, Ser. No. 191,795
Claims priority, application Japan, Jun. 25, 1983, 58-114486
Int. Cl.[4] G02B 15/22, 9/64
U.S. Cl. 350—427 6 Claims



1. A zoom lens comprising:
from front to rear, a varifocal lens portion for varying the focal length of the entire zoom lens; and
a focusing lens portion for performing focusing from an infinite object distance to a close object distance;
said varifocal lens portion and said focusing lens portion being arranged such that for a predetermined finite object distance between said infinite object distance and said close object distance, despite said focusing lens portion being held stationary, the position of an image plane is maintained constant during variation of the focal length by said varifocal lens portion, said zoom lens satisfying the condition:

$$-4<(a/b)<-0.2,$$

where a represents an amount of movement of the focusing lens portion, from a position when focused to said predetermined object distance to a position when focused to said close object distance, and b represents an amount of movement of the focusing lens portion from the predetermined object distance position to a position when focused to the infinite object distance.

4,842,386

VARIABLE FOCAL LENGTH OBJECTIVE

Nozomu Kitagishi, Tokyo; Hiroki Nakayama, Kanagawa; Shigeyuki Suda, Tokyo; Jun Hattori, Kanagawa, and Akihisa Horiuchi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

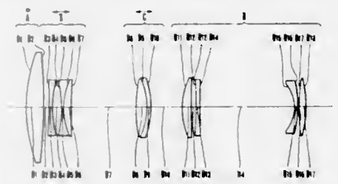
Filed Jun. 23, 1986, Ser. No. 877,102
Claims priority, application Japan, Jun. 26, 1985, 60-139915
Int. Cl.[4] G02B 15/00, 15/16, 15/14
U.S. Cl. 350—427 4 Claims

1. A variable focal length objective comprising a plurality of lens units of which the first from the object side is a positive lens unit, the second from the object side is a negative lens unit, and in which when varying the image magnification, the separation between said first and said second lens units varies, wherein at least one of the plurality of lens units has at least one

gradient-index lens having a gradient of refractive index defined by the following equation:

$$N(h)=N_0+N_1h^2+N_2h^4+\ldots$$

wherein h is the height from the optical axis; N_0 is the refractive index on the optical axis, and N_1, N_2, ... are constants, and wherein when the refractive power of said at least one lens unit



is denoted by ϕ_G, and when the sign of the strongest curvature surface of said gradient-index lens is denoted by K such that $K=+1$ when said strongest curvature surface is convex, and $K=-1$ when said strongest curvature surface is concave, the following conditions are satisfied:

$$\phi_G N_1<0$$

$$K\cdot\phi_G N_2<0$$

4,842,387

AUTOMATIC FOCUSING APPARATUS FOR USE IN VIDEO CAMERA AND THE LIKE

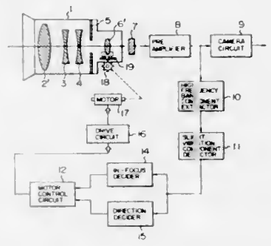
Toshio Murakami; Takashi Azumi, both of Yokohama; Hiroshi Sakurai, Kamakura; Takesuke Maruyama, and Yoshihiro Todaka, both of Yokohama, all of Japan, assignors to Hitachi, Ltd. and Hitachi Video Engineering Incorp., both of, Japan

Filed Feb. 3, 1988, Ser. No. 151,963

Claims priority, application Japan, Feb. 6, 1987, 62-24586; Dec. 23, 1987, 62-323945

Int. Cl.[4] G02B *7/04*

U.S. Cl. 350—429 **11 Claims**



1. An automatic focusing apparatus for use in a video camera and the like comprising:
- an optical system including optical elements comprised of an objective lens means, a variator lens means, a compensator lens means, an image forming lens means and an image sensing device;
- means for moving and for slightly vibrating on optical element of said variator lens means, compensator lens means, image forming lens means and image sensing device for enabling focusing;
- means for extracting a high frequency band component containing a slight vibration component indicative of the slight vibration from an image signal produced from said image sensing device; and
- a feedback control system for controlling said moving means to control the position of said one optical element of the basis of said slight vibration component in said high frequency band component, so that the maximum of the high frequency band component from said extracting means is obtained.

4,842,388

SINGLE OPTICAL LENSE WITH DIFFRACTION LIMIT CONVERGING CAPABILITY AND WIDE FIELD ANGLE

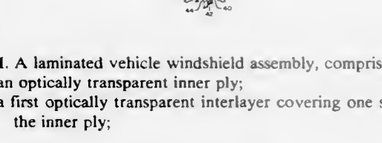
Yasuhiro Tanaka, Nishinomiya; Yasuo Nakajima, Ibaraki, and Yoshitomi Nagaoka, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jun. 11, 1987, Ser. No. 60,618

Claims priority, application Japan, Jul. 2, 1986, 61-155383

Int. Cl.[4] G02B *13/18*

U.S. Cl. 350—432 **3 Claims**



1. A single lens having first and second aspherical surfaces each having a positive power, satisfying the following conditions:

$$0.1<|m|<0.5 \quad (1)$$

$$0.9<(d/f)<1.2 \quad (2)$$

where

m denotes magnification;

d denotes thickness of the lens; and

f denotes focal length of the lens.

4,842,389

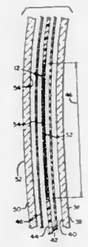
VEHICLE DISPLAY SYSTEM USING A HOLOGRAPHIC WINDSHIELD PREPARED TO WITHSTAND LAMINATION PROCESS

Robert B. Wood, Hillsboro; Mark A. Thomas, Lake Oswego, both of Oreg.; James L. Valimont, Cheswick; H. Edward Littell, Jr., Gibsonia, both of Pa., and Glenn E. Freeman, Tarentum, Pa., assignors to Flight Dynamics, Inc., Portland, Oreg.

Filed Jun. 12, 1987, Ser. No. 62,447

Int. Cl.[4] G02B *5/32, 27/14;* **B29C** *71/00;* **C03C** *27/12*

U.S. Cl. 350—3.7 **9 Claims**



1. A laminated vehicle windshield assembly, comprising:
- an optically transparent inner ply;
- a first optically transparent interlayer covering one side of the inner ply;

- a second optically transparent interlayer covering the first interlayer, the second interlayer having an opening formed therein;
- exposed photosensitive material having wavelength selective properties and fitted within the opening of the second interlayer;
- a third optically transparent interlayer covering the second interlayer and the photosensitive material fitted within the opening in the second interlayer; and
- an optically transparent outer ply covering the third interlayer,
- thereby to provide a laminated windshield assembly that is capable of maintaining the wavelength selective properties of the photosensitive material during a lamination process.

4,842,390

FIBER OPTIC DEVICE FOR ANGIOPLASTY

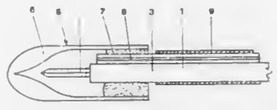
Stefano Sottini, Caldine-Florence; Vera Russo, Florence; Filippo Crea, Roma, and Giancarlo Margheri, Florence, all of Italy, assignors to Consiglio Nazionale Delle Ricerche, Viale Liegi, Italy

Filed Jul. 15, 1988, Ser. No. 219,192

Claims priority, application Italy, Jul. 17, 1987, 84143 A/87

Int. Cl.[4] G02B *6/36, 6/02;* **A61B** *1/00*

U.S. Cl. 350—96.15 **14 Claims**



1. A fiber optic device for the transmission and lateral irradiation of laser energy, particularly for angioplasty, characterized by comprising at least one optical fiber (1), to the inlet end of which there is coupled a laser source (4) and to the outlet end of which, after removing its coating (3), there is applied a microcapsule (5) which is transparent to laser radiation and has a substantially toroidal thickened portion (6) surrounding said end and arranged to give rise to a "corolla-shaped" output laser beam further comprising sealing means interposed between the outer lateral surface of the optical fiber (1) and the inner lateral surface of the microcapsule (5).

4,842,391

TWO SPHERICAL LENS OPTICAL COUPLER

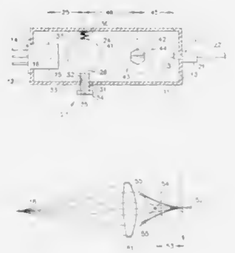
Ernest M. Kim, and Jack Peter, both of San Diego, Calif., assignors to Tacan Corporation, Carlsbad, Calif.

Filed Feb. 5, 1988, Ser. No. 152,958

Int. Cl.[4] G02B *6/32*

U.S. Cl. 350—96.18 **25 Claims**

1. Optical coupler apparatus comprising:
- a housing;
- a source of optical signals mounted to one side of said housing;
- an optical target mounted to the opposite side of said housing, there being an optical axis between said source and said target;
- a spherical source lens positioned adjacent said optical signal source at about the focal length of said source lens from said signal emitting port;
- a spherical target lens positioned adjacent said optical target at about the focal length of said target lens from said target;
- first means for adjusting the position of said source lens along only a first axis substantially perpendicular to said optical axis, said first adjusting means being connected between said source lens and said housing;
- second means for adjusting the position of said target lens along only a second axis substantially perpendicular to both said optical axis and said first axis, said second adjusting means being connected between said target lens and said housing.



4,842,392

OBJECTIVE LENS DRIVING UNIT

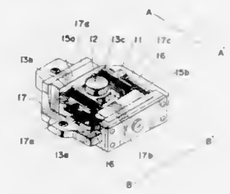
Hiroyuki Nakamura, Kobe; Masashi Ito, Settsu; Toshiki Itoi, Nara, and Akifumi Hashimoto, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 22, 1987, Ser. No. 52,922

Claims priority, application Japan, May 26, 1986, 61-120538; May 26, 1986, 61-120539

Int. Cl.[4] G02B *7/11*

U.S. Cl. 350—247 **4 Claims**



1. An objective lens driving unit comprising:
- a movable bobbin having an objective lens fixed thereto and drive coils wound thereon, and
- a magnetic circuit having at least one permanent magnet and a magnetic yoke for forming a magnetic flux to cross said drive coils, wherein said magnetic yoke has looped peripheral parts completely encircling said bobbin so that a plane transverse to the axis of said lens which intersects said magnetic yoke also intersects said bobbin.

4,842,393

CUSPATED LENS

Michael A. Gorman; Mark H. Sterling; Robert M. Klehn, and Lowell T. Wood, all of Houston, Tex., assignors to University of Houston-University Park, Houston, Tex.

Filed Jul. 9, 1987, Ser. No. 71,493

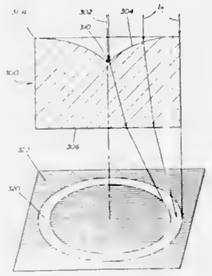
Int. Cl.[4] G02B *13/18*

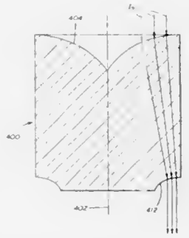
U.S. Cl. 350—432 **14 Claims**

1. A refractive device for transmitting radiation in a selected geometric pattern, comprising:
- a central longitudinal axis and a periphery in spaced relation thereto;
- a front surface extending laterally from said axis to said

periphery for receiving radiation oriented parallel with respect to said axis, said front surface having a cusp at least at said axis, a maximum slope magnitude within said periphery and spaced therefrom, and a decreasing slope magnitude in a direction from said cusp toward said periphery for refracting all of said radiation away from said axis; and

a rear surface having at least one annular section sloped oblique to said axis for transmitting all of said refracted radiation from said device in an annular pattern.



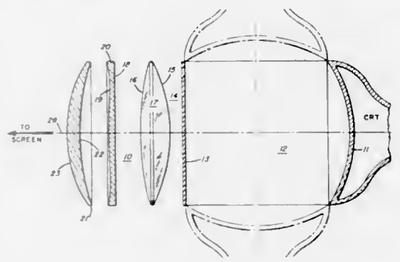


4,842,394

SIMPLIFIED HIGH SPEED CORRECTED PROJECTION LENS SYSTEM FOR CURVED IMAGE SURFACES

Richard A. Buchroeder, Tucson, Ariz., assignor to TDS Patent Management, Inc., Scarsdale, N.Y.

Filed Feb. 18, 1988, Ser. No. 160,783
Int. Cl.[4] G02B *13/18, 27/18*
U.S. Cl. 350—432 **9 Claims**



1. A multiple element lens system for projecting images which are generated from a curved image projection surface, comprising:

a first spherical projection lens having an axis which is coincident with an axis of said projection surface, and having an entrance aperture positioned to receive curved images from said curved image projection surface;

a single aspheric plate having an optical axis coincident with said spherical projection lens, said aspheric plate having at least one aspheric surface imposed on a substantially planar surface;

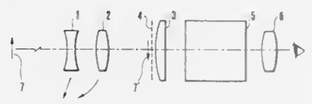
a second spherical projection lens facing said aspheric plate having an optical axis coincident with said aspheric plate optical axis.

4,842,395

FINDER OF VARIABLE MAGNIFICATION

Yasuhisa Sato, Kanagawa; Nozomu Kitagishi; Yasuyuki Yamada, both of Tokyo; Hiroki Nakayama, and Kouji Oizumi, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 814,092, Dec. 27, 1985, abandoned.
This application Feb. 19, 1988, Ser. No. 159,471
Claims priority, application Japan, Dec. 27, 1984, 59-280574
Int. Cl.[4] G02B *15/177*
U.S. Cl. 350—519 **21 Claims**



15. A variable magnification finder comprising, from front to rear:

(a) a first lens group or unit of negative power;

(b) a second lens group or unit of positive power;

(c) a third lens unit having a positive refractive power positioned on or near an imaging plane formed by said first and second lens groups;

(d) optical means for inverting an image formed by said first and second lens groups or units; and

(e) an eyepiece having a positive refractive power for observing an image formed by said first and second lens groups or units, wherein variable magnification is achieved by changing air space between said first and second lens groups or units.

4,842,396

LIGHT MODULATION ELEMENT AND LIGHT MODULATION APPARATUS

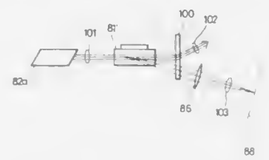
Kazuo Minoura, and Kazuhiko Matsuoka, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1985, Ser. No. 748,835
Claims priority, application Japan, Jun. 29, 1984, 59-135841; Jun. 29, 1984, 59-135842; Aug. 6, 1984, 59-164401; Aug. 6, 1984, 59-164402; Aug. 6, 1984, 59-164403; Aug. 6, 1984, 59-164404
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.5 **29 Claims**

29. A light modulation apparatus comprising:

a light modulation element, said element modulating light incident thereon in accordance with an input signal to selectively provide a modulated light and a non-modulated light;

means for directing the incident light to said element; and



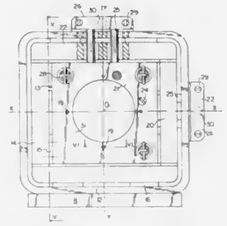
optical means disposed in light paths of said modulated and non-modulated lights for increasing a separation angle between said modulated and non-modulated lights.

4,842,397

APPARATUS FOR ADJUSTING THE ANGULAR POSITION OF OPTICAL ELEMENTS

Gyula Eisler, 81/a, Endrodi Sándor utca, 1026 Budapest, Hungary

Filed Dec. 1, 1987, Ser. No. 127,287
Claims priority, application Hungary, Dec. 3, 1986, 5005/86
Int. Cl.[4] G02B *7/02, 7/18*
U.S. Cl. 350—634 **8 Claims**



1. Apparatus for adjusting the angular position of an optical element, comprising

(a) a stand;

(b) a deformation frame connected with said stand by a deformation knuckle joint system for angular adjustment of said frame independently about two perpendicular axes of rotation;

(c) a supporting platform connected with said deformation frame by a tilting mechanism for angular adjustment of said platform relative to said deformation frame independently about two perpendicular axes of rotation, all of said rotation axes intersecting in the center of the optical element:

(d) means for fine angular adjustment of said deformation frame relative to said stand; and

(e) means for coarse angular adjustment of said supporting platform relative to said deformation frame.

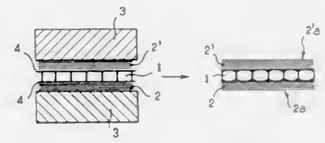
4,842,398

ULTRALIGHT-WEIGHT MIRROR AND METHOD OF MANUFACTURING IT

Didier Ducassou, Palaiseau, France, assignor to Societe de Fabrication D'Instruments de Mesure (S.F.I.M.), Massy Cedex, France

Filed Dec. 29, 1987, Ser. No. 139,287
Claims priority, application France, Dec. 30, 1986, 86 18339
Int. Cl.[4] G02B *5/08;* **B32B** *3/12*
U.S. Cl. 350—641 **29 Claims**

1. A method of manufacturing an ultralight weight mirror having good mechanical properties, in which a stack is made of plies constituted by fibers impregnated with a polymerizable resin, one such stack being applied at least to one of two opposite faces of a cellular structure core, the resin being polymerized by heating while pressure is applied and reflecting surfaces made on the stack, the method including the improvement whereby each ply is made in such a manner that the fibers of the ply extend in one direction only, wherein said polymerization is performed prior to applying and fixing the stack on the cellular structure core, and wherein the orientations of the fibers in the various plies are at angles respectively of $K\pi/n$ where K takes all integer values from 0 to (n−1) once and once only, and wherein n is the number of plies, said reflecting surface being provided by applying a layer of metallization to the last ply of the stack, and wherein the fibers of said last ply are used as electrodes for laying a metal coating on the outside of the ply of the stack by electrolytic means.

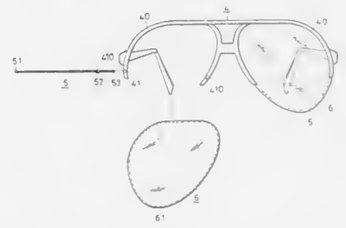


4,842,399

APPARATUS AND METHOD FOR RETAINING A SPECTACLE LENS ON A RIMLESS SPECTACLE FRAME WITH A TOUGH CORD

Chiang-Tung Tsai, Tainan Hsien, Taiwan, assignor to Lien-Chiang Optician's Company, Ltd., Tainan Hsien, Taiwan

Filed Jan. 29, 1988, Ser. No. 150,289
Claims priority, application Taiwan, Aug. 6, 1987, 76207542
Int. Cl.[4] G02C *1/04, 5/00*
U.S. Cl. 351—106 **6 Claims**

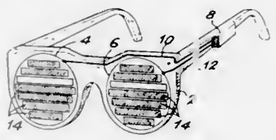


1. An assembly of a rimless spectacle frame, a spectacle lens, and a tough cord, said frame having an inverted U-shaped portion, said inverted U-shaped portion having an inward surface in which an open-ended lens receiving slot is formed along its full length for engaging and receiving an upper peripheral portion of said lens, said lens having an cord receiving slot formed in a lower peripheral surface thereof, said cord being fastened to two ends of said inverted U-shaped portion of said frame so as to engage with said cord receiving slot in said lens, thereby retaining said lens on said inverted U-shaped portion of said frame, wherein:

each of said end portions of said inverted U-shaped portion of said frame has a counterbore formed therethrough, each of said counterbores extending from an outward surface of said inverted U-shaped portion to an inward surface of said inverted U-shaped portion and consisting of a large-diameter outer end portion and a small-diameter inner end portion,

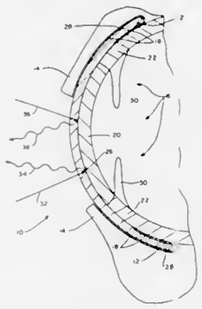
said cord extending through said counterbores in said frame and having an intermediate portion extending between said counterbores, and two enlarged ends confined within said large-diameter outer end portions of said counterbores, respectively, said intermediate portion being engaged with said cord receiving slot in said lens for retaining said lens on said inverted U-shaped portion of said frame at least one of said enlarged ends being sized and shaped so as to be insertable through each of said counterbore but not removable back through said small diameter portions of said counterbores.

4,842,400
VISUAL APPARATUS
Siegfried Klein, Paris, France, assignor to Commissariat a L'Energie Atomique and Siegfried Klein, both of Paris, France
Filed Jul. 6, 1988, Ser. No. 215,611
Claims priority, application France, Jul. 7, 1987, 87 09642
Int. Cl.[4] G02C *1/00, 7/10, 7/16*
U.S. Cl. 351—158 **14 Claims**



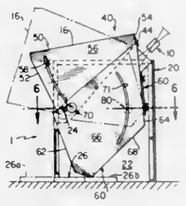
1. Visual apparatus to be worn in front of the eyes of a person, characterized in that it comprises a plate having an opaque surface provided with a transparent slot, a support (2) on which is mounted said plate, the support bearing on part of the body of said person, said plate being placed in front of the eye of said person and a scanning means (8) connected to the plate for scanning the opaque surface of said plate by the said transparent slot.

4,842,401
EYE DIAGNOSIS PROCESS
David Maurice, Atherton, Calif., assignor to The Board of Trustees of the Leland Stanford Jr. University, Palo Alto, Calif.
Filed Jun. 15, 1987, Ser. No. 62,213
Int. Cl.[4] A61B *3/10, 3/00*
U.S. Cl. 351—221 **5 Claims**



1. A process for eye diagnosis, which comprises instilling into the eye a solution of a fluorescent dye which is excitable with a wavelength of light longer than a wavelength of light that will cause natural fluorescence in the eye B2, exciting the fluorescent dye in the eye with a wavelength of light longer than a wavelength that will cause natural fluorescence in the eye, and observing patterns of light produced by fluorescence of the dye in the eye, the fluorescent dye being responsive to exciting light having a wavelength of at least 520 nanometers and the exciting wavelength of light being at least 520 nanometers.

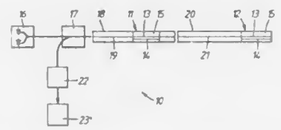
4,842,402
PROJECTION AND VIEWING APPARATUS
David S. Wise, Solon, Ohio, assignor to McGraw-Hill, Inc., New York, N.Y.
Filed Apr. 30, 1986, Ser. No. 857,848
Int. Cl.[4] G03B *21/10, 21/30*
U.S. Cl. 353—74 **14 Claims**



1. In a projection and viewing apparatus:
a substantially hollow housing having an open top, a front wall and a rear wall;
an optical system carriage having a front, rear, top and bottom, said carriage having a viewing screen thereon defining a portion of an optical system;
means defining upper and lower carriage portions mounted to be relatively adjustable to an inactive storage position and an active position, said carriage portions being retracted one into the other in said inactive position so as to be capable of being substantially contained within said housing in a substantially upright position with said viewing screen in a substantially upright position, the lateral dimension of said carriage portions in their inactive position being aligned between the front and rear walls of said housing, this lateral dimension being no greater than the distance between the front and rear walls of said housing, said carriage portions being relatively extended in said active position to define said optical system carriage in its active position wherein the carriage protrudes outside said housing;
means mounting said optical system carriage for pivotal movement relative to said housing between a position in which said viewing screen is substantially horizontal and a position in which said viewing screen is substantially vertical.

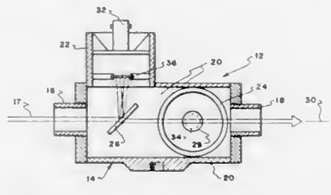
4,842,403
SENSING STRAIN AND TEMPERATURE
Eleanor J. Tarbox, West End, and Paul L. Scrivener, Shirley, both of United Kingdom, assignors to Pirelli General plc, United Kingdom
Continuation of Ser. No. 61,734, Jun. 11, 1987, abandoned. This application Dec. 5, 1988, Ser. No. 281,963
Claims priority, application United Kingdom, Jun. 19, 1986, 8614960
Int. Cl.[4] G01B *11/16*; G01J *5/38*
U.S. Cl. 356—73 **13 Claims**

1. A strain and temperature sensing apparatus including: an optical fiber sensor element having at least two monomode cores arranged in a common cladding to allow cross-talk of optical signals between said cores as a function of strain, temperature and optical wavelength; means for generating two optical signals at two different wavelengths, the cross-talk between said cores at one of said wavelengths being temperature independent and the cross-talk between said cores at the other of said wavelengths being both temperature and strain dependent, and each signal being substantially of a single wavelength; means for combining said generated optical signals and injecting both said signals into said element; means for extracting optical signals from said element; and processing



means for comparing the optical signals which are temperature independent with the signals which are temperature and strain dependent and thereby separately determining both the temperature and strain at the element from said extracted signals.

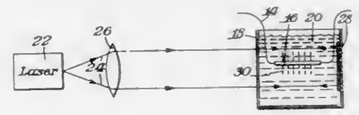
4,842,404
DUAL DETECTOR LASER BEAM POWER MONITOR
C. Richard Duda, El Segundo, Calif., assignor to ILC Technology, Inc., Sunnyvale, Calif.
Filed Jan. 13, 1988, Ser. No. 144,556
Int. Cl.[4] A01J *1/00*
U.S. Cl. 356—218 **18 Claims**



1. An apparatus for monitoring the light energy power level of a beam of light having an axis, comprising:
beam directing means located along the axis of the light beam for directing first and second portions of the light beam into first and second paths, respectively orthogonal to each other and at an angle to the axis equal to or less than 90° while transmitting the remaining portion of the light beam therethrough;
first and second photodetector means positioned to intercept said first and second light beam portions respectively, each having similar spectral responsively for detecting the light energy power level of the beam portion directed thereto, and each providing an output signal indicative of the energy power level of the impinging light beam portion; and
analysis system means, coupled to said first and second photodetector means and responsive to the output signals therefrom for calculating the total light energy power level of the light beam.

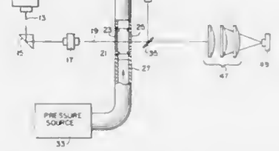
4,842,405
PROCESS FOR PRODUCING A GRATING ON AN OPTICAL FIBER
Mahmoud El-Sherif, 131 Linwood Ave., Ardmore, Pa. 19003
Filed Apr. 3, 1987, Ser. No. 34,339
Int. Cl.[4] G02B *27/00, 6/18*
U.S. Cl. 350—320 **7 Claims**

1. A process for producing a diffraction grating pattern on a section of an optical fiber wherein the diffraction grating pattern covers the entire cylindrical surface of said section comprising:
(a) etching a section of the optical fiber having a cladding layer and a core layer to reduce the thickness of the cladding layer to up to 2 microns in thickness;
(b) coating said section of the optical fiber with a photoresist;
(c) exposing the photoresist coated optical fiber to an interference pattern produced from a laser light source;



(d) developing the exposed photoresist to produce therein the diffraction grating pattern on the section of the optical fiber; and
(e) etching the diffraction grating pattern into the surface of said section.

4,842,406
OPTICAL INSTRUMENTS FOR MEASURING PARTICLE SIZES
Kenneth P. VonBargen, Berwyn Heights, Md., assignor to Pacific Scientific Company, Newport Beach, Calif.
Filed Jan. 15, 1988, Ser. No. 144,225
Int. Cl.[4] G01N *21/53, 15/02*
U.S. Cl. 356—336 **11 Claims**



1. An instrument for measuring a wide range of size of particles in a fluid, comprising a means to define a sample stream of fluid containing particles to be measured, means to direct a light beam through said sample stream, photodetecting means to detect light scattered from said beam in response to particles in said sample stream passing through said beam to generate a pulse in response to each particle passing through said beam, measuring means to measure the amplitude of each pulse produced by said photodetecting means and the length of each pulse produced by said photodetecting means, the amplitudes of the pulses produced by the photodetecting means providing measurements of the corresponding particle sizes in a first range and the lengths of the pulses produced by the photodetecting means providing measurements of the particle sizes in a second range of particle sizes greater than said first range, and sizing means responsive to the measurements made by said measuring means to provide an indication of the sizes of the particles causing said pulses to be generated, the amplitude measurements made by said measuring means representing particle sizes in said first range in said indication and the length measurements made by said measuring means representing particle sizes in said second range in said indication.

4,842,407

APPARATUS FOR IMAGING AN OBJECT ON AN ELECTROOPTICAL TRANSDUCER

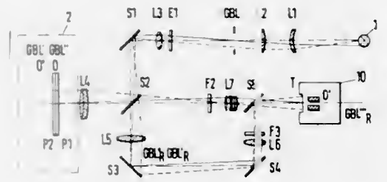
Manfred Käser, Friesenried, Fed. Rep. of Germany, assignor to J. Hirschmann Geratebau GmbH & Co. KG, Fed. Rep. of Germany

Filed Jun. 26, 1987, Ser. No. 67,097

Claims priority, application Fed. Rep of Germany, Jun. 27, 1986, 3621631

Int. Cl.[4] G01N 27/36

U.S. Cl. 356—344 20 Claims



1. Apparatus for imaging an object on an electrooptical transducer for measuring the transparency and/or dispersion of the object, comprising a light source, a first beam path for illuminating the object and a second beam path for imaging the object on the electrooptical transducer, characterized in that a third beam path is provided which forms a reference beam path (S2, S3, S4, S5; S2', S3', S5') and which conducts a part of the light of the first beam path (L1, L2, L3, S1, S2, LA, LB, S1', S2', S5, LC) onto the same electrooptical transducer (10), and the reference beam path conducting the light of the first beam path to the transducer (10) locally offset with respect to the image of the object.

4,842,408

PHASE SHIFT MEASURING APPARATUS UTILIZING OPTICAL METERODYNE TECHNIQUES

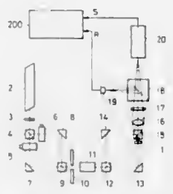
Minoru Yoshii, Tokyo; Noriyuki Nose, Sagamihara; Yukichi Niwa, Atsugi, and Yoshimichi Okada, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 8, 1987, Ser. No. 47,258

Claims priority, application Japan, May 9, 1986, 61-106439; May 9, 1986, 61-106440; Jan. 20, 1987, 62-010872

Int. Cl.[4] G01B 9/02

U.S. Cl. 356—349 9 Claims



1. A phase shift measuring apparatus for detecting a phase shift of a light wave passing through an object to be measured, including:

supplying means for supplying first and second light waves having different frequencies from each other;

means for supplying third and fourth light waves having the same frequency;

optical means for directing the first light wave toward the object and combining the first light wave passing through the object and the second light wave to obtain a composite light wave;

detecting means for receiving the composite light wave and detecting a measured beat signal;

measuring means for comparing the measured beat signal with a predetermined reference beat signal to measure a phase shift of the first light wave;

interfering means for directing the third light wave toward the object and causing the third light wave passing through the object to interfere with the fourth light wave; and

monitoring means for causing an operator to monitor interference fringes formed by the third and fourth light waves by said interfering means, wherein said interfering means and monitoring means are inoperative when said phase shift of the first light wave is measured.

4,842,409

MONOMODE OPTICAL FIBER RING INTERFEROMETRIC DEVICE WITH SEMICONDUCTOR DIODE AS LIGHT ENERGY EMISSION RECEPTION/AMPLIFICATION MEANS

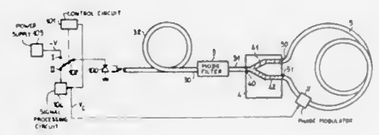
Hervé Arditty, Marly le Roi, and Hervé Lefevre, Paris, both of France, assignors to Thomson-CSF, Paris, France

Filed May 27, 1986, Ser. No. 867,097

Claims priority, application France, May 30, 1985, 85 08163

Int. Cl.[4] G01B 9/02

U.S. Cl. 356—350 7 Claims



1. A ring interferometer device comprising:

a monomode optical fiber forming a ring;

coherent light energy emission-reception means;

means for separating and mixing the radiation for directing, simultaneously and in equal parts, the emitted coherent light energy to the two ends of the monomode optical fiber and for recombining the radiation emerging from both ends of the monomode optical fiber;

a mode filter disposed between the separation and mixing means and the light energy emission-reception means;

wherein said light energy emission-reception means are formed by a semiconductor diode which, polarized in the forward direction, emits light of a given wave length and which, polarized in the reverse direction, detects light of the same wave length; and further comprising

means for biasing said diode in the forward direction for controlling the light emission thereof;

electric signal processing means for obtaining a measurement of non-reciprocal effects from any phase shift indicated by an interference signal;

switching means and means for controlling said switching means, so as to establish alternately an electric connection between said semiconductor diode and respectively, the forward direction biasing means and the electric signal processing means;

at least one reciprocal effect phase modulator controlled by a periodic signal of frequency $\frac{1}{t}$, where t is the time which a wave takes for traveling the optical path defined by the ring; said electric signal processing circuits comprising a detector synchronous at the same frequency; and

an additional monomode optical fiber disposed between the semiconductor diode and said separation and mixing means of a length equal to a quarter of a length of the monomode optical fiber forming the ring, said additional optical fiber forming a delay line.

4,842,410

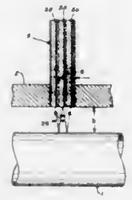
APPARATUS AND METHOD UTILIZING INTERFERENCE FRINGES TO DETERMINE THE THERMAL STABILITY OF A LIQUID

Shirley D. Darrah, Needham; Thomas G. DiGiuseppe, Danvers; Edward P. Marram, Newton Centre, all of Mass.; Richard A. Kamin; Clarence Nowack, both of Churchville, Pa., and Rolf Steendal, Natick, Mass., assignors to Geo-Centers, Inc., Newton Ctr., Mass. and United States of America, Washington, D.C.

Continuation-in-part of Ser. No. 922,900, Oct. 24, 1986, abandoned. This application Apr. 7, 1987, Ser. No. 35,465

Int. Cl.[4] G01B 9/02

U.S. Cl. 356—357 14 Claims



1. A method of evaluating the thermal stability of a liquid utilizing interference fringes to determine the thickness of a film deposited on a surface of a heated tube by the liquid, said method comprising the steps of:

(a) illuminating the film deposited on the heated tube with light,

(b) detecting at a predetermined wavelength the variation in reflected light caused by interference between the light reflected from the surface of the heated tube and light reflected from the film's surface as the film thickness changes over time or space from zero to the measured thickness,

(c) ascertaining the number of cycles in the variation of the intensity of the reflected light to determine the thickness of the film, and

(d) determining the thermal stability of the liquid from the film thickness.

4,842,411

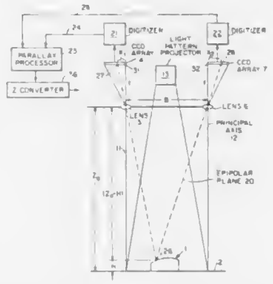
METHOD OF AUTOMATICALLY MEASURING THE SHAPE OF A CONTINUOUS SURFACE

George A. Wood, Nashua, N.H., assignor to Vectron, Inc., Columbus, Ind.

Filed Feb. 6, 1986, Ser. No. 826,829

Int. Cl.[4] G01B 11/24

U.S. Cl. 356—376 16 Claims



1. Method of performing 3-dimensional measurement of the shape of a surface portion of an object within a field of view comprising the steps of:

(a) projecting one light pattern upon said surface portion, said pattern having a periodic, smoothly varying light intensity pattern along a first direction across said surface portion;

(b) electronically producing a pair of stereo images of said surface portion illuminated in accordance with step (a), said images stored as first and second arrays of discrete grey-scale values;

(c) measuring positional placement of corresponding homologous points in said first and second arrays and producing a third array of accumulated parallax data for a substantial number of pairs of said corresponding points; and

(d) converting said accumulated parallax data to a fourth array of depth data indicative of displacement of said surface portion from a given datum plane, to define the shape of said object.

4,842,412

EXPOSURE APPARATUS EMPLOYED FOR FABRICATING PRINTED CIRCUIT BOARDS

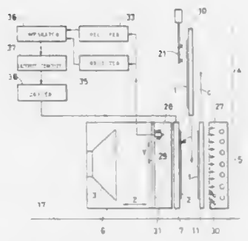
Eiichi Miyake, D3-304, 7 Shinsenriminami-machi 3-chome, Toyonaka-shi, Osaka, Japan

Filed Jan. 21, 1987, Ser. No. 5,858

Claims priority, application Japan, Jan. 22, 1986, 61-12914; May 28, 1986, 61-76411; May 21, 1986, 61-77467; Jul. 15, 1986, 61-167278

Int. Cl.[4] G03B 27/04

U.S. Cl. 356—401 14 Claims



1. An exposure apparatus for arranging a photomask having a plurality of alignment marks in opposition to a surface to be exposed of a board having a plurality of corresponding alignment marks, with said alignment marks being substantially aligned with each other to radiate light through said photomask to thereby expose said board, said alignment marks of said board being different in size from said alignment marks of said photomask, said exposure apparatus comprising:

a board standby station and an exposure station;

a board holder, operable to transmit light, for holding said board by vacuum suction and reciprocating between said board standby station and said exposure station;

a photomask holder for holding said photomask in said exposure station;

optical detecting equipment including a position detecting light source and an optical sensor for detecting said alignment marks of both said board and said photomask overlapping in said exposure station;

comparing equipment for comparing positions of said alignment marks of said board detected by said optical sensor with the positions of said alignment marks of said photomask;

X-Y-θ direction driving equipment for moving said photomask holder in vertical, lateral and rotational directions to correct misalignment of said alignment marks based on data obtained by said comparing equipment; and

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an exposure light source for radiating light on said board through said photomask, wherein said alignment marks of said board are larger than corresponding ones of said alignment marks of said photomask said alignment marks of said board being formed as through holes provided in said board and said alignment marks of said photomask being formed as non-transparent regions provided in said photomask and said position detecting light source and said optical sensor provided in said optical detecting equipment are oppositely arranged to put therebetween said board and said photomask overlapping in said exposure station, whereby said alignment marks of said board and said photomask are detected by said optical sensor by light transmitted from said position detecting light source, said board holder having a suction face adapted to engage and hold the board with suction applied through a plurality of suction holes formed in and throughout substantially the entire area of the face, said suction holes being chamfered to prevent substantial variation in density of light transmitted through the suction face from the position detecting light source.

4,842,413

APPARATUS FOR ASSESSING THE WELD IN BELT LAYERS FOR RADIAL PNEUMATIC TIRES

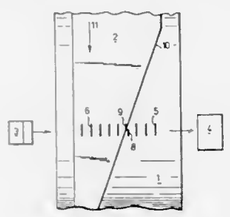
Johannes A. M. Kuijpers, Dh Molenhoek; Piet van Berkum, Eb Apeldoorn, and Henk Huisman, Da Epe, all of Netherlands, assignors to VMI EPE Holland B.V., Netherlands

Filed Apr. 29, 1988, Ser. No. 188,336

Claims priority, application Netherlands, Apr. 29, 1987, 8701019

Int. Cl.[4] G01N *21/89*

U.S. Cl. 356—426 **12 Claims**



1. Apparatus for assessing the weld in a belt layer for a radial pneumatic tyre in which the belt layer has been disposed onto a rotary drum, characterized by an apparatus for directing at least one laser beam towards the drum and the belt layer, said laser beam being directed obliquely with respect to the perpendicular on the belt layer and the drum and by a camera for viewing the postition of the projection of the laser beam on the drum and the belt layer.

4,842,414

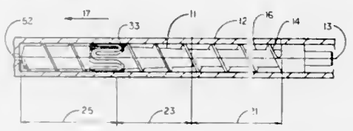
MIXING DEVICE FOR A FEED SCREW

Robert F. Dray, Box 273M, Route #1, Hamilton, Tex. 76531

Filed Sep. 16, 1987, Ser. No. 97,192

Int. Cl.[4] B01F *7/08*; B29B *7/42*

U.S. Cl. 366—82 **4 Claims**



1. A mixing device for a feed screw rotatable within a cylindrical barrel of an apparatus for melting and conveying plasticated material, said barrel having an inside surface, said feed screw including at least consecutive feed, transition and metering sections, said feed screw further including at least one helical main channel for conveying plasticated material in a downstream direction and a longitudinal axis for rotation, said mixing device comprising:

(a) cylinder means rotatable with said feed screw about said axis within said barrel and further having a predetermined clearance between said inside suirface of said barrel and an outer surface of said cylinder means, said cylinder means interposed between an upstream section of said main channel and a downstream section of said main channel;

(b) a continuous mixing channel extending over said outer surface of said cylinder means, said mixing channel being disposed in a circuitous route such that material conveyed in said mixing channel experiences a plurality of reversals in its direction parallel to said longitudinal axis while said material passes around said outer surface of said cylinder means within said mixing channel;

(c) said mixing channel having a converging inlet for receiving of all said material from said upstream section of said main channel into said mixing channel of said cylinder means; and

(d) said mixing channel having a diverging outlet for delivering said material from said mixing channel into said downstream section of said main channel.

4,842,415

PAINT SHAKER

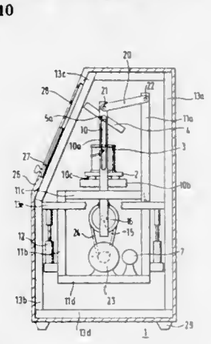
Michael R. Cane, Stockton, and Michael H. Groves, Warwick, both of United Kingdom, assignors to Imperial Chemical Industries plc, London, England

Filed Nov. 14, 1988, Ser. No. 270,547

Claims priority, application United Kingdom, Nov. 16, 1987, 8726800; May 3, 1988, 8810410; Sep. 5, 1988, 8820823

Int. Cl.[4] B01F *11/00*

U.S. Cl. 366—110 **16 Claims**



1. A paint shaker (1) which comprises

(a) a shakeable platform (2) on which a paint container (3) can be positioned whereby paint (65) in a container on the platform can be shaken by shaking the platform,

(b) agitating means (14 to 18, 23 and 24) for shaking the platform.

(c) actuating means (32 and 36) for the agitating means,

(d) a clamping member (4) moveable downwards to clamp a paint container in position on the platform,

(e) clamping sensing means which can detect clamping by sensing a reaction to the clamping force and which on sensing the reaction produces a transducible response,

(f) clamping member detection means (34) which can detect when the clamping member is in a pre-selected position and which on detecting the member in that position produces a transducible response and

(g) transducing means (30, 31*a*, 31*b*, 36*a* and 36*b*) which transduces the responses to the actuating means

wherein the actuating means is operable only when in receipt of responses transduced both from the clamping sensing means and from the clamp member detection means whereby the agitating means can be actuated only if a paint container is being clamped by the clamping member when in a pre-selected position.

4,842,416

AGITATING AND KNEADING TOOL

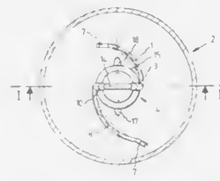
Albrecht Kullen, Wörthsee-Steinebach; Manfred Klawuhn, Frankfurt; Sigrun Hickel, Waldems, and Wolfgang Franke, Langen, all of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Mar. 23, 1987, Ser. No. 29,087

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1986, 3610740

Int. Cl.[4] B01F *7/20*; A21C *1/02*

U.S. Cl. 366—314 **8 Claims**



1. Agitating and kneading tool for insertion into the center of a mixing bowl of an electrically driven household appliance, said tool comprising a hub and a one-piece wire member,

said hub having an upper portion and two radially projecting, upwardly extending kneading rib portions in said upper portion, said hub being drivable in rotation by a drive shaft, and

said one-piece wire member having two agitating arm portions and upwardly extending web portions that connect said agitating arm portions,

said web portions being embedded in said kneading rib portions of said hub, and

said agitating arm portions laterally projecting from said hub closely adjacent to the bottom of said hub, said agitating arm portions being differently shaped and extending radially outwardly in circumferential direction in opposition to the direction of rotation of said hub.

4,842,417

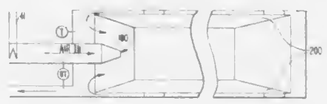
METHOD AND APPARATUS FOR INDIRECTLY MEASURING A SOLID-LIQUID INTERFACE EQUILIBRIUM TEMPERATURE

Odd A. Asbjornsen, Arnold, Md., assignor to Norsk Hydro A.S., Oslo, Norway

Continuation-in-part of Ser. No. 69,528, Jul. 1, 1987, abandoned. This application Aug. 9, 1988, Ser. No. 230,698

Int. Cl.[4] G01K *13/00, 11/00*

U.S. Cl. 374—139 **16 Claims**



1. An apparatus for indirectly measuring a solid-liquid interface equilibrium temperature comprising:

a coldfinger arrangement disposed within the liquid whose solid-liquid interface equilibrium temperature is to be measured, said coldfinger comprising a pair of substantially concentric and substantially cylindrical members arranged one within the other so as to have an outer member and an inner member and a space therebetween; said outer and inner members having closed ends and first and second apertures arranged to form a closed system wherein when a gas is fed through said first aperture, said gas flows through said inner member and said space between said inner and outer members and exits said second aperture;

a means for providing a flow of gas to said first aperture via a gas line;

a heating means arranged within said gas line for raising the temperature of said gas by supplying heat thereto;

another gas line connected to said second aperture for exhausting said gas exiting from said second aperture;

a temperature measuring means for measuring an average gas temperature within said space of said coldfinger and a differential temperature measuring means for measuring the difference in temperature between the gas entering said coldfinger via said gas line and the gas exiting said coldfinger via said another gas line;

a means for varying the dynamic excitation of the heat flux flowing through said coldfinger by varying in a time varying fashion either the amount of heat supplied by said heating means to said gas or the amount of gas flowing through said gas line;

wherein the solid-liquid interface equilibrium temperature is determined on the basis of the respective temperatures measured by the temperature measuring means and differential temperature measuring means and the specific parameters of the gas and the solid and the liquid and the gas flowrate and the dimensions of the coldfinger.

4,842,418

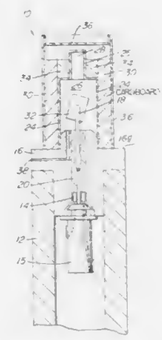
TWO TEMPERATURE MEASURING PROBE

Richard Conti, Holland, Pa., assignor to Electro-Nite Company, Philadelphia, Pa.

Continuation of Ser. No. 929,232, Nov. 10, 1986, abandoned. This application Nov. 17, 1988, Ser. No. 273,614

Int. Cl.[4] G01N *25/04*; G01K *1/14*

U.S. Cl. 374—139 **12 Claims**



1. A process for determining the alloy content of a molten metal mixture in a bath comprising the steps of: immersing a measuring probe into the molten metal bath; taking a sample portion of the bath into a chamber of said probe; chilling the sample portion within said chamber measuring and recording the liquidous arrest temperature of the sample portion with a single thermocouple element positioned within said chamber; exposing the sample portion to the bath; remelting the sample portion; measuring and recording the molten metal bath temperature with said single thermocouple element after remelt of

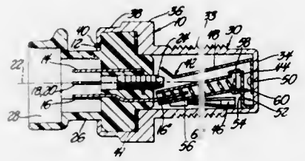
the sample portion; and correlating the liquidous arrest temperature measurement to a known alloy content of the bath.

4,842,419

COMBINATION TEMPERATURE SENSOR AND SWITCH ASSEMBLY

James E. Nietert, Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 6, 1988, Ser. No. 202,360
Int. Cl.[4] G01K *1/14, 13/00*
U.S. Cl. 374—145 5 Claims



1. An engine coolant temperature sensor and switch assembly for supplying a plurality of temperature signals to external utilization devices comprising;

temperature sensing units comprising a thermal switch and first and second thermistors,

a thermally and electrically conductive housing having a cup portion with an end wall, a cylindrical side wall defining a housing axis, and a coaxial opening opposite the end wall,

an insulating closure secured in the opening of the housing,

a plurality of terminals extending through the closure into the housing, one of the terminals having an adjustable screw contact movable within the housing and mounted on the housing axis whereby its position is insensitive to the closure orientation about the axis,

the thermal switch having a temperature sensitive leaf secured at one end to the end wall on the housing axis, the other end extending toward the closure and being arranged to make and break contact with the adjustable screw contact,

means for mounting the first thermistor in thermal and electrical contact with the housing including a shelf attached to the housing and spaced from the end wall for holding the first thermistor on the housing axis and spring means between the thermistor and the second one of the terminals for biasing the thermistor against the shelf for maintaining thermal contact with the shelf and for connecting the thermistor to the second one of the terminals, and means for electrically and mechanically coupling the second thermistor to third and fourth ones of the terminals,

whereby the three sensing units are compactly arranged in the housing.

4,842,420

VARIABLE-WIDTH DRAW TAPE FOR THERMOPLASTIC BAGS

Daniel J. DiBiasi, Pittsford, and Fox J. Herrington, Holcomb, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

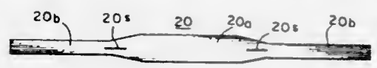
Filed Dec. 14, 1987, Ser. No. 134,270
Int. Cl.[4] B65D *33/10, 33/12, 33/28*
U.S. Cl. 383—6 2 Claims

1. A draw tape bag for carrying trash and the like comprising:

two panels forming an open top, closed bottom bag, said panels being joined along the sides of said bag;

a hem on said panels being folded over adjacent said top, the bottom of said hem being secured to the adjacent panel;

a draw tape in each said hem secured at the side of said panels, each said draw tape comprising a center section and two side sections, said side sections having a width narrower than said center section, said center section having a length adequate to provide a hand grip for said tape whereby when said center section is gripped and pulled to draw closed the open top of the bag, the draw tape is stressed and yields becoming narrower, the stress being greater where the tape narrowers at the side sections whereby the elongation and narrowing occurs at the



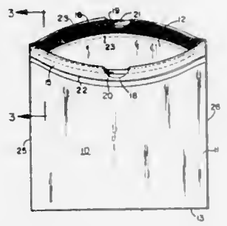
side sections rather than the center section where the hand grips the tape, and wherein each draw tape has slit structure at the ends of the center section adjoining the narrower side sections, said slit structure being located longitudinally of the tape whereby the elongating material adjacent the wide region of the center section concentrates its load on either side of the center of the tape thereby avoiding a collapse in width of the wide region of the tape.

4,842,421

THERMOPLASTIC DRAW TAPE BAG WITH TACKY CLOSURE SURFACE

Edward M. Bullard, East Rochester, and Fox J. Herrington, Holcomb, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 19, 1988, Ser. No. 195,919
Int. Cl.[4] B65D *33/20, 33/28*
U.S. Cl. 383—61 4 Claims



1. A thermoplastic draw tape bag comprising:

two panels forming an open top, closed bottom bag, said panels being joined along the sides of said bag;

a hem on said panels being folded over adjacent said top to form an open mouth for said bag, the bottom of said hem being secured to the adjacent panel;

a draw tape in each hem secured at the side of said panels, each said draw tape being accessible for pulling through an opening in the respective hem of said bag; and

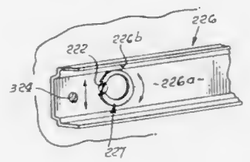
a tacky surface on the inside lip of the mouth of the bag and extending around the inner periphery of said lip on said open mouth of the bag, said surface comprising a material having the characteristic of sticking to itself and being adapted to seal the open mouth and hold the bag closed after the draw tape is pulled tight.

4,842,422

ECCENTRIC ADJUSTER FOR DRAWER OR CABINET TRACK

Gary W. Nelson, 22933 Hatteras St., Woodland Hills, Calif. 91367

Filed Aug. 25, 1988, Ser. No. 236,534
Int. Cl.[4] F16C *29/12*
U.S. Cl. 384—19 13 Claims



1. Track level adjustment mechanism for adjusting the level of an elongated drawer track relative to cabinetry track support structure, comprising:

(a) said track having a wall portion facing the support structure,

(b) a dog element adjacent said wall portion and a fastener attaching that element to the support structure to be loosened for allowing movement of the dog element relative to the support structure and to the track wall portion,

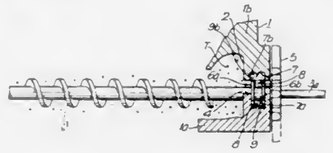
(c) and shoulder means on the track to be engaged by the dog element in response to said dog element movement relative to the support structure, thereby to level adjust said track wall portion relative to the support structure.

4,842,423

SEALED BEARING ASSEMBLY

Anil G. Bhagwat, Hemel Hempstead, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 24, 1988, Ser. No. 172,665
Int. Cl.[4] F16C *33/74, 35/02;* F16J *15/34;* B65G *33/32*
U.S. Cl. 384—130 8 Claims



1. An apparatus for sealing a shaft mounted rotatably on a bearing member, including:

at least two spaced apart annular flanges mounted on the shaft, one of said flanges being arranged to bear radially against the bearing member with the bearing engaging a side of one of said flanges to prevent movement of the shaft in the direction of the longitudinal axis thereof;

an annular sealing member accommodated on the shaft between said flanges in abutting relation with at least one of said flanges to form a radial seal with the bearing member; and

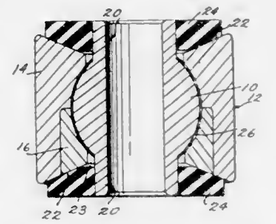
means, secured to the bearing member and engaging said sealing member, for preventing said sealing member from rotating with the shaft.

4,842,424

SELF-ALIGNING TRACK ROLLER

Glenwood H. Narkon, Rockville, and Stanley S. Orkin, Vernon, both of Conn., assignors to Kamatics Corporation, Bloomfield, Conn.

Continuation-in-part of Ser. No. 567,612, Jan. 3, 1984, Pat. No. 4,717,268, which is a continuation of Ser. No. 255,634, Apr. 20, 1981, abandoned. This application Jul. 24, 1987, Ser. No. 77,395
Int. Cl.[4] F16C *23/04*
U.S. Cl. 384—203 5 Claims



1. A track-roller bearing assembly comprising:

an inner ball race member having a central axis and an outwardly facing arcuate peripheral bearing surface, said inner race member including a cylindrical portion extending outwardly along said central axis from each end thereof;

an outer race member coaxial with said central axis of said inner race member and including a bearing portion having an annular arcuate surface, said outer race member having inwardly tapered conical end faces, said outer race member being rotatable about said central axis of said inner race member and angularly displacable relative to said axis; and

means for realigning said central axis of said outer race member with said central axis of said inner race member when said race members have rotated angularly relative to each other, said realigning means being disposed between each said cylindrical portion and a respective conical end face of said outer race member.

4,842,425

ODOMETER SHAFT RETAINER AND SUPPORT

Joseph T. Betterton, Arab; Alfred H. Glover, Decatur, and Bruce Hepler, Huntsville, all of Ala., assignors to Chrysler Motors Corporation, Highland Park, Mich.

Filed Apr. 18, 1988, Ser. No. 182,677
Int. Cl.[4] F16C *35/02;* B65H *54/553;* F16L *3/08;* G01C *22/00*
U.S. Cl. 384—440 4 Claims

1. In a device including a base member with at least one shaft supported in spaced relation thereto, an improved shaft support and retainer mechanism to allow installation of the shaft by simple movement thereof in the shaft's radial direction toward the base member, comprising: a support post projecting from the base member having a bearing configuration at its outward end against which the shaft is adapted to rest; a separate retainer member projecting from the base member adjacent to and along side of the support post, the retainer member configured with an aperture therethrough in the direction of the axis of the shaft, this aperture being formed by spaced side legs and an end portion configured and positioned so that the shaft extends through the aperture when in its installed position and whereby the end portion of the retainer overlies the shaft to prevent radial movement of the shaft away from the support post; the legs of the retainer being constructed so a relatively low force in the shaft's axial direction flexes the retainer to

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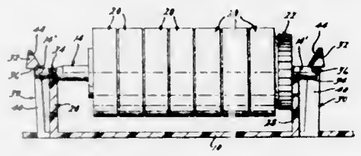
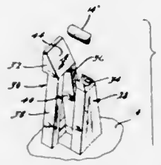
move its end portion so that the end of the shaft may pass thereby and into engagement with the support post thereafter





the retainer returns to its unstressed condition with the end portion overlying the shaft.

4,842,426

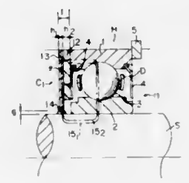
BEARING ASSEMBLY

Kyozaburo Furumura, Ninomiya, and Shigeki Matsunaga, Tokyo, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 774,077, Sep. 9, 1985, abandoned. This application Dec. 16, 1987, Ser. No. 133,558

Int. Cl.[4] F16C 33/82; F16J 15/40

U.S. Cl. 384—478 2 Claims



1. A bearing assembly, which comprises:

a non-magnetic housing;

a rotatable shaft extending through said housing;

bearing means disposed between said housing and said shaft, said bearing means including an outer race mounted in said housing, an inner race and a plurality of balls between said outer race and said inner race, and a grease seal plate mounted within a recess formed in an inner portion of said outer race, along an outside of said outer race; and

seal means disposed between said housing and said shaft mounted in said housing and comprising an annular and axially-polarized magnet contacting axially an outside portion of said outer race and with a side of said grease seal plate, a pole piece fixed to an outer side of said magnet opposite to an inner side of said magnet contacting said outer race, said pole piece not being in contact with said outer race and forming a gap with said shaft and a ferrofluid disposed in said gap formed between said pole piece and said shaft thereby forming a magnetic circuit among said annular magnet, said outer race, said balls, said inner race, said shaft, said gap and said pole piece and another magnetic circuit among said annular magnet, said grease seal plate, said outer race, said balls, said inner race, said shaft, said gap and said pole piece.

4,842,427

PLOTTING MECHANISM MOUNTED ON A RIBBON CASSETTE FOR TYPEWRITERS OR OFFICE MACHINES

Ernst Kloppenburg, Gronenhain-4-Strockhoit, Fed. Rep. of Germany, assignor to AEG Olympia Aktiengesellschaft, Wilhelmshaven, Fed. Rep. of Germany

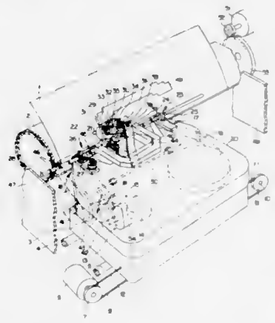
Filed Oct. 22, 1987, Ser. No. 111,508

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1986, 3635861

The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.

Int. Cl.[4] B41J 29/28

U.S. Cl. 400—16 10 Claims



1. A plotting device for typewriters or office machines of similar construction comprising:

a motor driven carriage;

a record carrier;

a print head;

a ribbon;

a ribbon cassette having a supply reel, a take-up reel and guide means disposed in said ribbon cassette, said ribbon being unwound from said supply reel and guide by said guide means to said take-up reel;

a reversible, controllable drive motor means for moving said record carrier up and down, said motor driven carriage being movable along said record carrier, said ribbon being housed within said ribbon cassette and said ribbon cassette being removably disposed on said carriage with a portion of said ribbon extending outside of said ribbon cassette for being contacted by said print head, and said print head being operatively connected to said carriage so that said print head can strike said ribbon and produce a full set of alpha-numeric characters on said record carrier;

an X-Y plotting mechanism mounted on said ribbon cassette and equipped with styli; and

control means for selectively moving one of said styli from a detent position into an operating position with respect to said record carrier.

4,842,428

ELECTRONIC TYPEWRITER WITH SPELL CHECKING AND CORRECTION

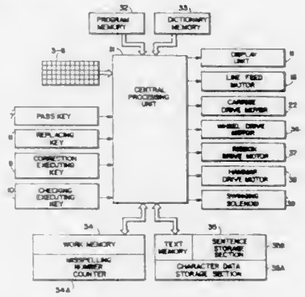
Makoto Suzuki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed May 13, 1987, Ser. No. 48,927

Claims priority, application Japan, Oct. 16, 1984, 59-216764

Int. Cl.[4] G06K 5/00

U.S. Cl. 400—697 14 Claims



1. An electronic typewriter comprising:

a keyboard for generating signals responsive to depressed keys, said keyboard including character keys for entering at least character data, a separating key for separating said character data entered by said character keys into words, and a confirmation key for generating a confirmation mode therefrom when an operator confirms the spelling of a word;

a dictionary memory for storing a plurality of word data corresponding to spellings of words;

at least one memory for storing words entered from said keyboard;

memory writing means for writing said words entered from said keyboard into at least one memory;

spelling check control means for reading out said words from said at least one memory and said word data from said dictionary memory, for comparing the spelling of each read word with said word data, and for determining a misspelled word if word data coincident with said spelling of each read word does not exist in said dictionary memory;

a counter for producing a count number of said misspelled words;

a printer for printing and erasing characters on a printing medium, said printer including feed means for feeding said printing medium and carriage drive means for guiding a printing head;

print control means for printing a character entered in accordance with depression of said character keys on said keyboard by driving said printer;

printed position detection means for determining respective printing positions of said misspelled words;

a work memory for storing said misspelled words and for storing said respective printing positions;

drive control means for generating said confirmation mode in accordance with depression of said confirmation key, for driving said carriage drive means in accordance with one of said stored printing positions to guide said printing head to said one of said stored printing positions and for driving said carriage drive means to guide said printing head to another stored printing position in response to depression of a pass key without erasure of the misspelled word at said one of said stored positions;

count control means for incrementing said count number upon determination of each of said misspelled words by said spelling check control means and decrementing the count number every time the printing head is driven to each of said stored printing positions in accordance with depression of said confirmation key or said pass key in the confirmation mode;

print correct means for erasing a printed word at a respective stored printing position, when said printing head is at said respective position, in accordance with depression of a correction executing key during the confirmation mode, and for printing a word newly entered by said character keys;

cancelling means for automatically cancelling the confirmation mode when said number of said counter is indicative that no printed misspelled words remain to be corrected;

display means responsive to said count number for displaying whether there is at least one printed misspelled word which remains to be corrected; and to said cancelling means for automatically displaying whether said confirmation mode is cancelled; and

display control means for reading out a respective misspelled word corresponding to the printing head position from said word memory and for displaying said misspelled word on said display means during the confirmation mode.

4,842,429

TYPE FACE STRIKING SYSTEM IN AN OFFICE WRITING MACHINE

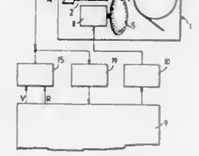
Hans Wehking, Jerxheim, and Manfred Gottschlich, Braunschweig, both of Fed. Rep. of Germany, assignors to AEG Olympia AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Dec. 5, 1983, Ser. No. 558,031

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1982, 3244936

Int. Cl.[4] B41J 9/42

U.S. Cl. 400—157.2 6 Claims



1. A type face striking system for striking a type face to produce an imprint on a record carrier in a writing machine, said system comprising:

an electromagnetically actuatable printing hammer movable under the influence of an electrically generated magnetic field between a rest position and a striking position for striking the type face;

actuating means including magnetic field producing means in the form of a conductor coil connected for receiving an operating voltage for producing the electrically generated magnetic field;

control means connected to said coil and operative for successively applying thereto: a voltage pulse of a first polarity for causing said actuating means to produce a magnetic field which drives said hammer from its rest position to its striking position; and a voltage pulse of a second polarity, opposite to the first polarity, initiated substantially immediately upon striking of the type face by said hammer, for causing said actuating means to produce a magnetic field which drives said hammer from its striking position toward its rest position; and means for detecting impact of said hammer against a type face when said hammer reaches its striking position and means for producing, in

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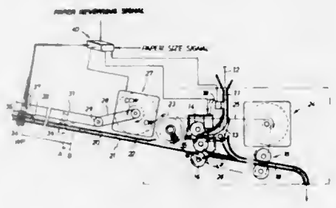
response to such detection, a signal which initiates production of the voltage pulse of a second polarity.

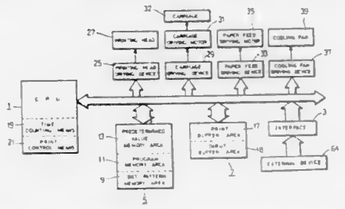
4,842,430
PRINTING PAPER REVERSING DEVICE
Hideo Yamazaki, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan
Filed Jul. 8, 1988, Ser. No. 216,347
Claims priority, application Japan, Jul. 11, 1987, 62-106526[U]
Int. Cl.[4] B41J *29/18*
U.S. Cl. 400—708 15 Claims



1. A paper reversing device comprising:
a passageway for feeding a printing paper therealong;
a paper inlet roller disposed in the vicinity of one end of the feeding passageway;
a reversing roller disposed in contacting to the paper inlet roller for guiding the printing paper out of the feeding passageway in association with the paper inlet roller;
a paper outlet roller disposed in contacting to the reversing roller for feeding, in association with the reversing roller, the printing paper having passed between the paper inlet roller and the reversing roller in the direction opposite to the direction in which the paper inlet roller and the reversing roller guide the printing paper;
a first guide plate extending from near the position where the paper inlet roller contacts the reversing roller in the direction in which the printing paper having passed between the paper inlet roller and reversing roller moves for receiving the passed printing paper;
means disposed above the first guide plate for forcing the printing paper toward the paper outlet roller when the printing paper has passed between the paper inlet roller and reversing roller; and
means for driving the paper inlet roller, reversing roller, paper outlet roller and forcing means;
wherein at least one of the paper inlet roller and reversing roller has a collar at each end thereof for imparting rigidity to the printing paper during the period of time when the printing paper is passing between the paper inlet roller and reversing roller.

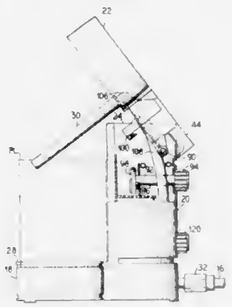
4,842,431
MULTI-SPEED COOLING FAN FOR PRINTING DEVICE
Satoshi Katsukawa, Ichinomiya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Oct. 13, 1987, Ser. No. 107,100
Claims priority, application Japan, Oct. 15, 1986, 61-244936; Nov. 18, 1986, 61-274574
Int. Cl.[4] B41J *29/00*
U.S. Cl. 400—719 8 Claims

1. A printing device comprising:
a printing head;
a carriage mounting said printing head thereon;
a carriage driving device for moving said carriage along a printing line;
a paper feed driving device for moving a printing paper in a direction perpendicular to said printing line, wherein various characters and figures are printed on said printing paper by the operation of said printing head and the movements of said carriage and said printing paper in combination;
a cooling fan for cooling said printing device;
a cooling fan driving device for driving said cooling fan;
a cooling fan control device including
a determining means for determining if there exists a driving command for driving said carriage driving device, said paper feed driving device or both said devices, wherein when said driving command for said carriage driving device, said paper feed driving device or both devices exists, then said cooling fan is driven at a high speed, and said cooling fan is driven at a low speed at other times,



whereby overheating of said printing device during the print operation and the paper feed operation is prevented, and noise of said cooling fan during idling is reduced;
a time counting means for counting elapsed time; and
said determining means determining whether or not a predetermined time has elapsed by comparing said elapsed time with said predetermined time and sending a fan driving signal to said cooling fan control device for controlling said cooling fan in such a manner that said cooling fan is repeatedly energized and deenergized every time when said predetermined time has elapsed, whereby said cooling fan rotates at either said low speed or said high speed depending on the existence of said driving command.

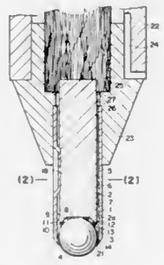
4,842,432
POWER PAINTING UNIT
Mark Snetting, Eden Prairie, Minn., assignor to Wagner Spray Tech Corporation, Minneapolis, Minn.
Continuation-in-part of Ser. No. 894,889, Aug. 8, 1986, abandoned, and a continuation-in-part of Ser. No. 943,806, Dec. 19, 1986, abandoned. This application Jan. 7, 1988, Ser. No. 284,977
Int. Cl.[4] B44D *3/28*
U.S. Cl. 401—197 18 Claims



1. A power member for applying paint, comprising:

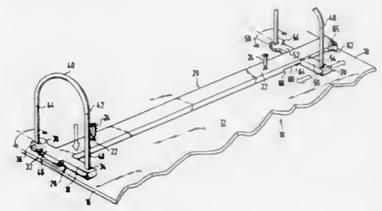
a base unit having a base member with a receptacle receiving top surface portion;
an upright member projecting above said base member from adjacent said receiving surface;
a substantially horizontal member supported from said upright member and having a portion overlying said receiving surface in spaced relation thereto and a portion overlying a portion of the upright member,
said substantially horizontal member hingedly connected to said upright member and movable between a first position wherein said horizontal top member lies in a plane substantially parallel to a plane of the base unit and a second position wherein the horizontal member does not lie in a plane parallel to the plane of the base member and said portions of the horizontal member being rotatable with respect to the upright member above portions of the upright member, whereby a receptacle received on said receptacle receiving surface will underlie said horizontal member when said top member is in said first position, and said receptacle will be easily partially vertically removable from said unit when said horizontal member is in said second position;
lock means carried by one of said members for selectively locking said horizontal member in said first position;
pump means located substantially in said base member;
an elongated stiff suction tube depending from said horizontal member and projectable into a receptacle on said receptacle receiving surface for drawing material from the receptacle, the hinge connection between said horizontal member and said upright member cooperating with a position of said suction tube with respect to said horizontal member such that movement of said top member from said first position to said second position allows said tube to pivot into and out of a paint container received on the receptacle receiving top surface portion;
means connecting said pump means and said suction tube; for fluid communication therebetween; and
discharge means operatively connected to said pump means for discharging material drawn from the receptacle on said receptacle receiving surface.

4,842,433
PEN TIP STRUCTURE
Katsumi Otsuka, Chiba, Japan, assignor to Teibow Co., Ltd., Shizuoka, Japan
PCT No. PCT/JP86/00529, § 371 Date Jun. 17, 1987, § 102(e) Date Jun. 17, 1987, PCT Pub. No. WO87/02313, PCT Pub. Date Apr. 23, 1987
PCT Filed Oct. 17, 1986, Ser. No. 69,632
Claims priority, application Japan, Oct. 17, 1985, 60-229938; Oct. 17, 1985, 60-229939
Int. Cl.[4] B43K *7/00, 7/10*
U.S. Cl. 401—209 22 Claims



1. A pen tip structure which comprises
an elongated core which has a generally cylindrical outer surface, a first end for contact with an ink-containing material and a second end for supporting a rotatable sphereical ball, said second end having a recess therein shaped to provide a flat, circular center surface and an annular projection surface which flares outwardly from the periphery of said flat, circular center surface,
a pipe which includes a shank portion positioned around said elongated core and an end portion located beyond said second end of said elongated core, said shank portion of said pipe defining an inner surface and including a plurality of indentations therein which contact the cylindrical outer surface of said elongated core and thereby provide a longitudinal ink flow channel between said cylindrical outer surface of said elongated core and said inner surface of said shank portion of said pipe along which ink can flow by capillary action, said end portion of said pipe including an inwardly-extending tip which provides a mouth for retaining a rotatable ball between said tip and said second end of said elongated core, and
a rotatable ball positioned between said mouth of said pipe and said second end of said elongated core, said rotatable ball having a surface, a first portion of said surface extending beyond said mouth of said pipe and an opposite, second portion of said surface being in rubbing contact with said flat, circular center surface of said second end of said elongated core, said rotatable ball having a diameter such that a gap is formed between said surface of said rotatable ball and said annular projection surface which will enable ink to pass therethrough from said ink flow channel to said surface of said rotatable ball by capillary action.

4,842,434
ORGANIZATIONAL AID FOR PAPER SHEETS, ESPECIALLY EDP PAPER SHEETS
Manuel Ferreira-Godinho, Bergiusweg 10, D-3250 Hameln 1, Fed. Rep. of Germany
Filed Oct. 27, 1987, Ser. No. 113,885
Int. Cl.[4] B42F *3/04, 13/00*; G09F *3/18*; B41J *11/54*
U.S. Cl. 402—34 21 Claims



1. An organizational aid for paper sheets especially EDP paper sheets, each of said sheets including along the side margin thereof a equi-distantly spaced punched holes (15), said organizational aid comprising a strong carrier member (10, 12) having holding means (20, 26, 28) mounted thereon, and U-shaped clamps (40) detachably secured in said holding means (20, 26, 28) for accommodating and fixing the paper sheets (11),
said holding means (20, 26, 28) including a bar (20) and an upper holding member (28) and a lower holding member (26) extending transversely to the bar (20), said U-shaped clamps secured to said upper holding member and to said lower holding member and being outwardly extended and passing through said punched holes, said bar includes a sheet support surface and said upper holding member and said lower holding member each being located with an upper surface no higher than said support surface to support said sheet in a corresponding planar position,
said lower holding member (26) being fixedly joined to the bar (20) and said upper holding member (28) being movable along the longitudinal direction of the bar (20), and

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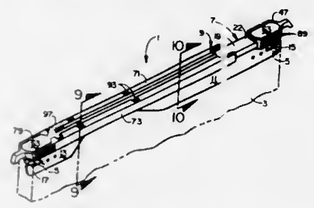
said two holding members (26, 28) have means releasably receiving said clamps (40).

4,842,435

ADJUSTABLE DOCUMENT HANDLE

Kent Thomas, Mayville; Daniel R. Bullis, Jr., Madison, and Thomas J. Bottelson, Baraboo, all of Wis., assignors to Tab Products Company, Palo Alto, Calif.

Filed Feb. 8, 1988, Ser. No. 153,346
Int. Cl.[4] B42F *13/00, 7/16, 15/10*; B60R *7/00*
U.S. Cl. 402—80 R **35 Claims**



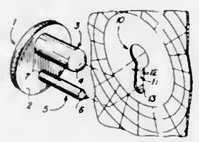
1. An adjustable document handle comprising:
a. an elongated generally U-shaped channel terminating in opposed inside and outside ends, the channel having a top leg that defines at least one set of first openings therein;
b. a web depending from the channel top leg at the outside end thereof, the web having an outside end that defines a second opening in predetermined spaced relation to the top leg first openings; and
c. slide means for sliding within the U-shaped channel and having forked means for locking thereto by means of the first openings therein, the slide means defining a third opening spaced predetermined distance from the U-shaped channel web second opening when the U-shaped channel and slide means are locked together,
so that the U-shaped channel and slide means are lockable together to provide a predetermined spacing between the second and third openings.

4,842,436

CHART ORGANIZER

Ed W. Stinson, 120 LeMont Dr., West Monroe, La. 71291

Continuation-in-part of Ser. No. 943,173, Dec. 18, 1986. This application Aug. 1, 1988, Ser. No. 227,063
Int. Cl.[4] B42F *13/10*
U.S. Cl. 402—80 R **20 Claims**



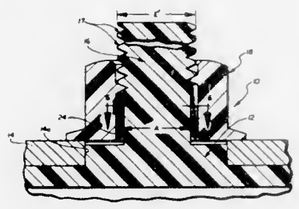
1. A chart organizer for arranging and organizing recording charts having keyholes and keyhole slots, comprising a base plate, a keyhole post extending from said base plate for engaging the keyholes, respectively, and a keyhole slot post extending from said base plate in substantially parallel relationship with respect to said keyhole post for engaging the keyhole slots, respectively, wherein said keyhole post is spaced from said keyhole slot post a distance substantially equal to the length of the keyhole slots in the recording charts and said keyhole slot post is longer than said keyhole post.

4,842,437

THREAD FORMING NUT WITH LOCKING PORTION

Ronald J. Egner, Birmingham, Mich., assignor to Ryder International Corporation, Arab, Ala.

Filed Nov. 16, 1987, Ser. No. 120,863
Int. Cl.[4] F16B *1/00*
U.S. Cl. 403—24 **13 Claims**



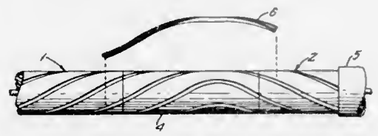
1. A fastening nut for securement to an unthreaded stud, comprising: A nut body having a central through bore, said bore comprising guide formation means projecting radially therein for providing alignment guidance during sliding insertion of said stud into said bore; and a helical thread disposed in said bore axially distinct from said guide means and terminating within said bore adjacent said guide means, said helical thread projecting radially inwardly into said bore further than said guide formation such that sequentially following the sliding insertion of said stud into said bare past said guide formation, said thread engages said stud periphery and cold-forms a mating thread therein, said mating thread including radially outwardly displaced, cold-formed stud material which obstructs relative retraction of said guide means from said stud and thereby promotes secured retention of said nut thereon.

4,842,438

METHOD FOR JOINING PLASTIC CORES WITH SPACED SURFACE GROOVES AND JOINT SO OBTAINED

Bruno Bortolin, Via Cantore, 23-Cinisello Balsiamo, and Enrico Dotti, Via Archimede 22, both of Milan, Italy

Filed Apr. 3, 1987, Ser. No. 34,422
Claims priority, application Italy, Apr. 14, 1986, 20079 A/86
Int. Cl.[4] G02B *6/40*; B25G *3/34*
U.S. Cl. 403—266 **9 Claims**



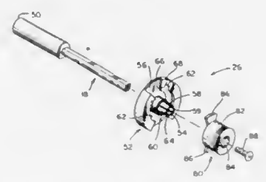
5. A joint between a pair of grooved cylindrical cores with an outer layer of thermoplastic material, each core having a plurality of peripherally spaced grooves in said outer layers, a joining piece intermediate and abutting the ends of said cores, said joining piece being made of a thermoplastic material and having peripherally spaced grooves in the outer surface thereof, each of the latter grooves extending respectively between a groove of one of said cores to a groove of the other of said cores and a plurality of metal elements longer than the length of said joining piece disposed in said grooves of said joining piece and having one end portion in a groove of one of said cores and the opposite end portion thereof in a groove of the other of said cores, each said metal element having an inner surface corresponding in shape to the shape of the surface of the groove in which it is received.

4,842,439

LABEL SUPPLY COLLET-CLAMP FITTING

Edward B. Caldwell, Seattle, and Pamela M. Koury, Lynnwood, both of Wash., assignors to Intermec Corporation, Lynnwood, Wash.

Filed Jun. 17, 1987, Ser. No. 63,168
Int. Cl.[4] B25G *3/24*
U.S. Cl. 403—290 **21 Claims**



1. A fitting for gripping a shaft, comprising:
a collet having an axis and a plurality of axially tapered fingers that are pliably urgeable against the shaft, the plurality of fingers being connected to a base supporting a plurality of helical wedging surfaces having a predetermined handedness; and
a finger-tightenable clamp having an inner surface that forces the plurality of fingers against the shaft when the clamp is moved axially toward the collet, and a plurality of bearing surfaces that bear against the wedging surfaces of the collet and cause the clamp to move axially toward the collet when the clamp is twisted about the collet axis in a predetermined clamping direction, the collet and clamp being engaged in assembly prior to placing the collet-clamp fitting on the shaft by an axial twisting motion of the clamp with respect to the collet in the direction opposite to the clamping direction.

4,842,440

ROAD GRADER AND SCARIFIER

Robert Alguire, Brockville, Canada, assignor to Frink America, Inc., Clayton, N.Y.

Filed Jan. 7, 1988, Ser. No. 141,479
Int. Cl.[4] E01C *23/12*
U.S. Cl. 404—90 **9 Claims**

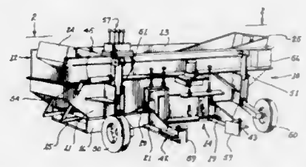
1. Apparatus for grading and scarifying the surface of a road bed that includes
a dump body having a pivot means at the front thereof for supporting the dump body on a vehicle chassis,
a power cylinder acting between the chassis and the dump body for tilting the dump body about the pivot to raise and lower the back of the dump body between a first rest position wherein the back of the dump body against the chassis and an elevated position wherein the back of the body is raised above the chassis,
a vertically disposed frame centrally mounted upon the back of the dump body whereby the frame hangs behind the chassis when the dump body is in a rest position,
a transversely disposed scraper blade suspended from the lower part of the frame in an adjusting means whereby the angle of attack of the blade in reference to the road bed can be regulated, and
a downwardly disposed rod mounted at each rear corner of the dump body having a slide member mounted on the rod for reciprocal movement along the rod said slide member being attached to one end of the blade and a compressing spring wound about the rod that acts between the slide member and a stationary plate secured to rod for urging the blade downwardly away from the dump body whereby the spring absorbs the impact of road obstructions striking the blade.

4,842,441

APPARATUS FOR FILLING A TRENCH IN A PAVED SURFACE

Lester Watkins, Phoenix, Ariz., assignor to Mable M. Watkins, Phoenix and Ella N. Norman, Casa Grande, both of, Ariz.

Continuation of Ser. No. 827,557, Feb. 10, 1987, abandoned. This application Jun. 18, 1987, Ser. No. 63,649
Int. Cl.[4] E01C *19/50*
U.S. Cl. 404—98 **13 Claims**



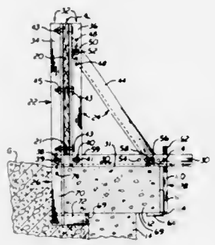
1. A machine for introducing selected course material into a trench in an existing, paved surface, said machine comprising a frame which carries:
(A) application means for depositing paving material to the trench to a desired level, said application means comprising:
1. first and second guide rails resiliently biased outwardly to bear against opposite sides of the trench and follow the contours of the trench;
2. a strike-off gate extending across the trench between said guide rails, said strike-off gate comprising;
a. a plurality of strike-off gate sections, at least one of said gate sections being movable in response to mutual lateral movement of said guide rails, said strike-off gate sections overlapping and movable relative each other to accommodate changes in width of the trench sensed by said guide rails as they follow the contour of the trench;
b. height adjustment means for establishing the effective vertical position of each said strike-off gate section;
(B) feed means comprising at least one hopper adapted to receive selected course material from a source of supply as needed;
(C) dispensing means for transferring the selected course material from said at least one hopper into the trench.

4,842,442

SEAWALL EXTENSION APPARATUS

Hubert E. Caulfield, 1351 Bay St., S.E. St. Petersburg, Fla. 33731

Filed Jun. 1, 1987, Ser. No. 55,918
Int. Cl.[4] E02B 3/06
U.S. Cl. 405—31 18 Claims



1. A seawall extension apparatus for use with a capped seawall, said apparatus comprising:

a wall section;

a support assembly for holding said wall section such that said wall section extends generally upwardly from the cap of said seawall, and

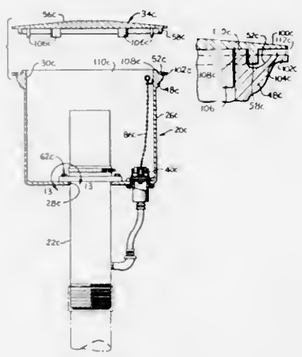
means for releasably securing said support assembly to the cap of said seawall, said means for releasably securing comprising clamp means and adjustment means interconnecting said clamp means and said support assembly for selectively opening and closing said claim means relative to said seawall cap, whereby said clamp means are operated to secure said support assembly to said seawall cap.

4,842,443

SPILL CONTAINMENT DEVICE

Toby Argandona, 21221 Running Branch Rd., Diamond Bar, Calif. 91765

Continuation of Ser. No. 874,858, Jun 16, 1986, Pat. No. 4,762,440. This application Jul. 15, 1988, Ser. No. 219,668
Int. Cl.[4] B65B 1/04
U.S. Cl. 405—52 1 Claim



1. A spill containment device for an underground storage tank having a fill tube located below ground level, said containment device comprising:

a spill container having a top access opening to the container interior, and annular rim circumferentially surrounding said top opening an annular lip radially outward of and circumferentially surrounding said rim, and an upwardly opening annular channel between said rim and lip and circumferentially surrounding said rim, said rim having an upper edge circumferentially surrounding said top opening and disposed in a first transverse plane of said container, said lip having an upper surface circumferentially surrounding said rim and disposed in a second transverse plane of said container substantially parallel to and located below the level of said first plane of said upper rim edge, and said channel extending below and having an open upper side disposed in said second plane of said upper lip surface,

a cover for said container including a top wall having a circumferential edge and an annular flange depending from the underside of said top wall radially inward of said cover circumferential edge, whereby said cover has a lip radially outward of and circumferentially surrounding said flange, and said cover is positionable on the top of said container with said top wall seating on said upper edge of the container rim about the full circumference of the rim to form a relatively water-tight seal between the cover and the container about the full circumference of the container rim, and with said flange surrounding the container rim and extending downwardly into said container channel in spaced relation to the bottom of the channel to permit seating of said top wall on said upper rim edge, and with said cover lip overlying and disposed in close proximity of said container lip, and

means for coupling said container to the storage tank fill tube, and wherein

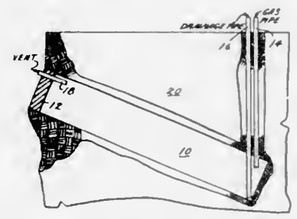
said spill container is adapted to be placed in the ground with said container lip upper surface disposed substantially at ground level and with the container coupled to the tank fill tube to catch any spillage during filling of the tank through the spill tube.

4,842,444

METHOD FOR DISPLACING OXYGEN FROM A MINE

Phillip B. Cowan, Littleton, Colo., assignor to Tusco, Incorporated, Commerce City, Colo.

Filed Oct. 9, 1987, Ser. No. 106,460
Int. Cl.[4] E21F 5/00, 17/00, 17/16
U.S. Cl. 405—132 5 Claims



1. A method of sealing a mine cavity comprising the steps of:

substantially closing off access to said mine cavity;

placing inert gas charging means in the mine cavity for charging said mine cavity with inert gas;

placing displaced gas vent and monitoring means in the mine cavity for venting free oxygen containing gases which are displaced from said mine cavity and monitoring the free oxygen content thereof,

placing residual mine water discharge and monitoring means in the mine cavity for discharging and monitoring the chemical content of residual water exiting the mine cavity,

flooding said mine cavity with inert gas under slight positive pressure so as to displace said free oxygen containing gases from said mine cavity;

monitoring the free oxygen content of said displaced gas until said content is substantially zero;

sealing the remaining inert gases within the mine cavity under slight positive pressure;

monitoring said discharging mine water until neutrality is observed;

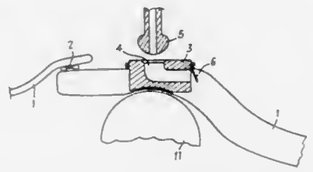
flooding said mine cavity with water until said cavity is sealed.

4,842,445

COVERING STRUCTURE INTENDED ESPECIALLY TO BE PLACED ON A CONDUIT OR THE LIKE LAID ON THE OCEAN FLOOR

Xavier Rocher, Paris; Bruno Faure, Suresnes, and Lucien Legallais, Orgeval, all of France, assignors to Coflexip, Paris, France

Filed Jul. 28, 1987, Ser. No. 78,627
Claims priority, application France, Jul. 30, 1986, 86 11036
Int. Cl.[4] F16L 1/04
U.S. Cl. 405—172 9 Claims



1. An apparatus for covering an elongated member lying on a seabed with a covering structure in the form of a flattened tubular element having a plurality of discrete longitudinally spaced injection orifices therein for receiving a hardenable material, and for filling the covering structure with hardenable material, the apparatus comprising

a frame,

means for moving the frame along the seabed,

means on said frame for receiving said covering structure from a supply thereof, and for delivering said structure to the seabed,

an injector nozzle movably supported on said frame, in a position facing said orifices,

means for automatically connecting said injector nozzle to said orifices in sequence as the frame moves along the seabed, and

means for delivering hardenable material from a source of said material to said injector nozzle.

4,842,446

OFFSHORE SUPPORT STRUCTURE METHODS AND APPARATUS

Samuel C. Carruba, Fulshear, Tex., assignor to CBS Engineering, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 908,408, Sep. 16, 1986. This application May 29, 1987, Ser. No. 57,035
The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.
Int. Cl.[4] E02B 17/00
U.S. Cl. 405—227 9 Claims

1. A support structure for use with a well located in a body of water, the well having an upstanding conductor pipe, having upper and lower ends, extending from the ground below the body of water to above the surface of the water, comprising:

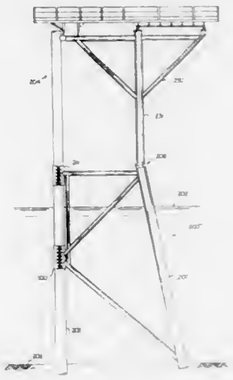
two tubular legs, each leg having upper and lower ends, the upper end of each leg adapted to

extend beyond the surface of the water and the lower end of each leg adapted to be disposed upon the ground;

a first set of bracing members disposed between and interconneting the legs in a spaced relationship from one another;

first and second conductor pipe clamps, the first conductor pipe clamp adapted to be disposed about the upper end of the conductor pipe, and the second conductor pipe clamp adapted to be disposed about the conductor pipe intermediate the upper and lower ends of the conductor pipe;

a second set of bracing members, each bracing member of the set having first and second ends, the first ends of each bracing member being connected to one of the legs, the second ends of each bracing member being secured to the first conductor pipe clamp, the second set of bracing members extending outwardly and away from each of the legs; and



a third set of bracing members, each bracing member of the set having first and second ends, the first ends of each bracing member being connected to one of the legs, the second ends of each bracing member being secured to the second conductor pipe clamp, the third set of bracing members extending outwardly and away from each of the legs, whereby upon the first and second conductor pipe clamps being secured to the upper and lower ends of the conductor pipe, the conductor pipe will be supported by the legs and the second and third sets of bracing members.

4,842,447

MANUFACTURING METHOD AND DEVICE OF HOLLOW-TYPED REVERSE CIRCULATING PILES

Jaei-Jse Lin, 4th Fl., 39, Szu Chuan Rd., Sec. 2, Panchiao,, Taipei Hsien, Taiwan

Filed Oct. 21, 1987, Ser. No. 111,435
Int. Cl.[4] E02D 5/30
U.S. Cl. 405—243 4 Claims

1. A method for forming a hollow type reverse circulation foundation pile comprising the steps of:

providing a pile bore, reinforcing cage therein disposed against the wall of said bore, and grouting pipes extending to the bottom of said bore disposed within said reinforcing cage, said reinforcing cage defining a central open area;

providing a movable sand barrel adapted to move vertically within the central part of said reinforcing cage, the outer diameter of sad movable sand barrel being smaller than the inner diameter of the reinforcing cage;

providing sand pouring pipes extending into the moveable sand barrel;

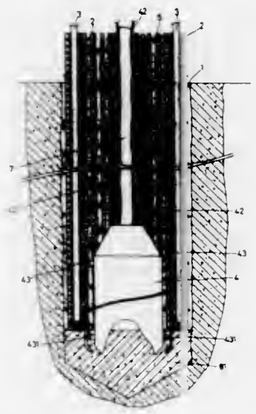
providing sensing means around the surface of the moveable sand barrel for sensing inner and outer pressure thereon;

pouring grouting through said grouting pipes into the bottom of said bore until the grouting has reached a predetermined height, moving said sand barrel to the upper surface of said pored grouting;

pouring grouting through said grouting pipes into the reinforcing cage surrounding said sand barrel while pouring sand through said sand pipes into said sand barrel;

equalizing the inner and outer pressure on the wall of said sand barrel;

successively moving said sand barrel upwardly through said bore as said grouting is poured into said reinforcing cage and sand is deposited into the hollow central portion



through said sand barrel until the pile has been formed; and

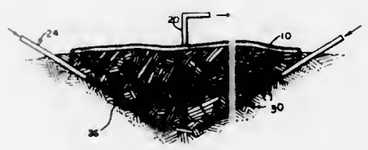
after solidification of said concrete grout pouring water into said sand and sucking sand out of the foundation pile to provide the hollow type reverse circulation foundation pile.

4,842,448

METHOD OF REMOVING CONTAMINANTS FROM CONTAMINATED SOIL IN SITU

Robert M. Koerner; Arthur E. Lord, Jr., both of Springfield, Pa., and John E. Brugger, Hightstown, N.J., assignors to Drexel University, Philadelphia, Pa

Filed Nov. 12, 1987, Ser. No. 119,584
Int. Cl.[4] E02D *3/00*
U.S. Cl. 405—258 11 Claims



1. A method of removing contaminants from a contaminated soil area in situ, which comprises:

placing a barrier in engagement with the exposed surface of the contaminated soil area, the barrier comprising an outer fluid impermeable and an inner fluid permeable layer, substantially the entire inner fluid permeable layer engaging the surface of the contaminated soil area; and

sealing the barrier around the periphery of the contaminated soil area; and

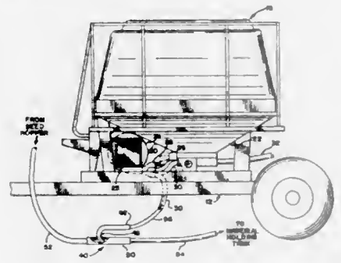
reducing the pressure beneath the outer layer of the barrier to draw the contaminants out of the soil and through the inner fluid permeable layer.

4,842,449

PNEUMATIC EVACUATOR-FILLER FOR GRAIN DRILL HOPPER

Marvin L. Nelson, Downers Grove, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Jul. 13, 1987, Ser. No. 72,412
Int. Cl.[4] B65G *53/14*
U.S. Cl. 406—153 3 Claims



1. A pneumatically-operated evacuator-filler for a grain drill having a storage hopper, a plurality of metering gates, and blower means for delivering planting material from said storage hopper to said plurality of metering gates, said evacuator-filler comprising:

air splitter means operatively connected to an outlet of said blower means, said splitter means defining a plurality of outlet ports corresponding in number to said plurality of metering gates;

closing means for closing all but one of said outlet ports of said splitter means so that substantially all of the air flow from said blower means is directed through said one of said outlet ports of said splitter means;

an air flow director comprising an elongated open-ended chamber, and including air directions means for directing air flow longitudinally through said chamber to create a positive downstream pressure at one end of said chamber and a negative upstream pressure at the other end of said chamber;

conduit means connectable between said air direction means of said air flow director and said one outlet port of said splitter means for supplying air flow from said blower means to said air direction means;

a pick-up hose connected to the said chamber at the negative pressure end of said chamber, and adapted to aspirate planting material into said air flow director; and

an output hose connected to the said chamber at the positive pressure side of said chamber, and adapted to discharge and direct the planting material from said director.

4,842,450

METHOD AND APPARATUS FOR SELF-ADJUSTING BORING BAR

David A. Donovan, Chelsea, and Nathaniel L. Field, Northville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

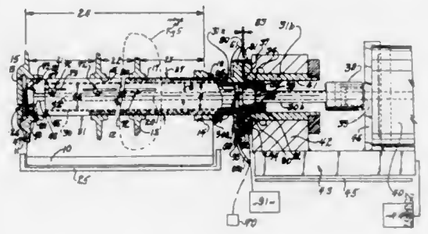
Filed Oct. 5, 1988, Ser. No. 253,467
Int. Cl.[4] B23B *41/12, 35/00*
U.S. Cl. 408—1 R 17 Claims

1. A method of boring blind multiple aligned openings in a series of spaced walls of a workpiece, comprising the steps of:

(a) supporting a spindle in a rotationally fixed tubular housing to provide an assembly having an unsupported extremity adapted to extend throughout said series of walls, said support providing said spindle with independent rotary movement but conjoint axial movement within said tubular housing, said spindle carrying a rotary cutting tool to project beyond the tubular housing;

(b) providing an angularly flexible joint in each of said spindle and tubular housing effective to cooperate with each other;

(c) advancing said cutting tool successively through said series of walls to machine said aligned openings and thereby causing said spindle and tubular housing to follow successively through said machined openings, said spindle and housing providing, during advancement to machine the second and successive walls of said series, (i) concentric macroalignment of the spindle within said tubular



housing and macroalignment of the tubular housing within the walls of openings traversed by said cutting tool, and (ii) a sense of microalignment of the housing within at least the previously machined opening; and

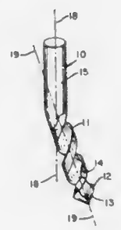
(d) selectively imparting an angular steering force to the tubular housing in response to any micromisalignment of the spindle in such opening undergoing machining, and thereby a steering force to said spindle to achieve the desired microalignment.

4,842,451

DEBURRING DRILL BIT

Ben A. Dugger, 5738 Blueridge Dr., Columbus, Ga. 31907

Filed Feb. 5, 1988, Ser. No. 156,903
Int. Cl.[4] B23B *51/08*
U.S. Cl. 408—21 4 Claims



1. Apparatus for drilling and deburring an aperture in a single operation comprising:

(a) a shank having a first longitudinal axis;

(b) an elongated shaft securred to said shank and having a second longitudinal axis not coincident with and not parallel to said first longitudinal axis;

(c) a drill bit head securred to said shaft having a longitudinal axis coincident with said second longitudinal axis;

(d) drilling surfaces formed in the forward edge of said head, said drilling surfaces having a longitudinal axis coincident with said second longitudinal axis;

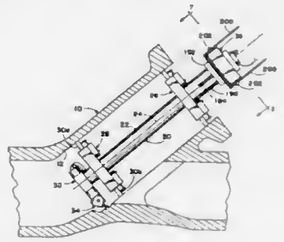
(e) deburring surfaces formed in the side of said shaft, said deburring surfaces having a longitudinal axis coincident with said first longitudinal axis.

4,842,452

SURFACING MACHINE

David S. Strait, Newberg, Oreg., assignor to Climax Portable Machine Tools, Inc., Newberg, Oreg.

Continuation-in-part of Ser. No. 108,542, Oct. 14, 1987. This application Nov. 23, 1987, Ser. No. 124,038
Int. Cl.[4] B23B *41/00*
U.S. Cl. 408—80 24 Claims



1. A machine for surfacing a workpiece, the machine comprising:

a cylindric turning bar having an external surface of circular cross section defining a central axis;

support means bearing against said external surface for rotatably supporting the turning bar while allowing axial movement of the turning bar;

drive means including motor means positionable upon said turning bar for rotating said turning bar about its central axis; and

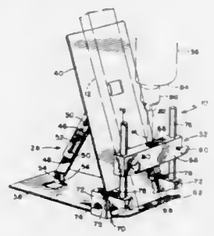
means for holding said drive means against rotational movement relative to the central axis.

4,842,453

GUIDE APPARATUS FOR DRILLING OBLIQUE HOLES

James G. Raines, Lakeside, and Harry Coleman, San Diego, both of Calif., assignors to West Products, San Diego, Calif.

Filed Nov. 26, 1986, Ser. No. 935,288
Int. Cl.[4] B23B *49/00*
U.S. Cl. 408—89 13 Claims



1. A holding apparatus for holding a workpiece in angular relation to a drill bit attached to a driving mechanism for drilling an oblique hole in a workpiece, the apparatus comprising: holding means consisting of a base member for mounting on a reference surface and an upstanding tiltable table attached at a selected angle to said base member, said table comprising a flat portion and an outwardly projecting foot portion forming a generally L-shaped support surface, said table supporting a workpiece in said L-shaped surface

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4,842,454

METHOD AND AN ARRANGEMENT FOR THE PREPARATION OF INSERT BODIES FOR THE ARTIFICIAL REBUILDING OF TEETH AND HUMAN LIMBS, ETC.

Axel G. V. Gustavsson, Gullsbovägen 1, S-691 44 Karlskoga; Knut M. G. Andersson, Fack 45, S-830 22, Fåker, and Karl E. M. Andersson, Kungsgärden, S-830 30 Lit, all of Sweden

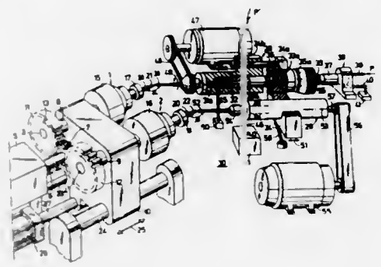
PCT No. PCT/SE87/00194, § 371 Date Dec. 23, 1987, § 102(e) Date Dec. 23, 1987, PCT Pub. No. WO87/06451, PCT Pub. Date Nov. 5, 1987

PCT Filed Apr. 23, 1987, Ser. No. 138,910

Claims priority, application Sweden Apr. 23, 1986, 8601870

Int. Cl.[4] B23C *1/18*; B23Q *33/00, 35/18*

U.S. Cl. 409—84 10 Claims



1. A method for the production of bodies for the artificial rebuilding of teeth, human limbs or similar three-dimensional bodies having external contours with individual characteristic features, comprising the steps of:

securing a replica of a body which is to be produced to a first element which, together with a second element, form a first pair of elements which are capable of co-rotating,

securing a blank from which the body is to be produced to the second element;

causing the first and second elements to co-rotate in such a way that the replica and the blank rotate about the axes of rotation of the respective elements;

providing a second pair of elements which includes a third element for supporting a sensing device which is capable of interacting with the external contour of the replica, and a fourth element which supports a tool by means of which the blank is being worked on, with the first and second pairs of elements being displaceable relative to one another;

controlling said fourth element by the third element in such a way that the tool executes movements which correspond to the shape of the external contour of the replica sensed by the sensing device; wherein

said sensing device includes a component member movable with respect to a frame of said third element for longitudinal displacement of said component member, said third element further supporting a servo system, by means of which the fourth element and the tool are controlled by the third element for interacting with the blank; and

wherein the servo system includes a fluid piston which is acted upon on either side by fluid pressure, and said longitudinally displaceable component member is so arranged, as to regulate, depending on the variation in the longitudinal displacement, a first variable constriction in the fluid piston, which together with a fixed constriction, provides variation of the fluid pressure acting on one side of the piston, such that a differential pressure is created across the fluid piston, producing a corresponding displacement of the fluid piston.

4,842,455

PROTECTIVE COVERING FOR A MACHINE TOOL COMPRISING A LOADING DOOR

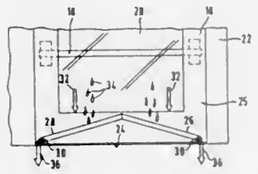
Hans-Henning Winkler, Brunnentalstrasse, and Eugen Rütschle, Schönenbergstrasse, both, Fed. Rep. of Germany, assignors to Chiron-Werke GmbH & Co. KG, Tuttlingen, Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 256,820

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1987, 3734719

Int. Cl.[4] B23Q *11/08*

U.S. Cl. 409—134 4 Claims



1. Protective covering for a machine tool, wherein work pieces can be mounted on a worktable of said machine tool comprising a loading door which can be pivotally moved between two end positions, said loading door closes in a first end position said protective covering while in a second end position it clears an opening in said protective covering, thereby providing access to said work piece, a bottom of said loading door describes during this movement between said first and said second end positions an upwardly curved locus extending above and across said work piece, wherein said loading door is provided on its inside with a device for diverting liquid flowing down at said inside of said loading door toward lateral corners of said loading door and wherein said loading door does not project beyond the outer contour of said protective covering during its movement between said first and said second end positions.

4,842,456

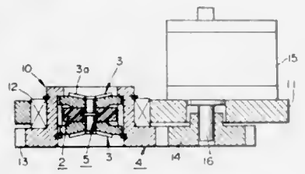
FORMING UNIT FOR ELECTRODE CHIP OF WELDER

Akihiro Saito, 864 Nakashinden, Ebina-shi, Kanagawa-ken, Japan

Filed Nov. 19, 1987, Ser. No. 122,969

Int. Cl.[4] B23C *3/12*

U.S. Cl. 409—145 4 Claims



1. A forming unit for an electrode chip of a welder comprising:

a cylindrical housing;

a cylindrical electrode chip separator within said housing and axially aligned with the longitudinal axis of said housing;

upper and lower circular cutters slidably mounted on said chip separator for movement along said longitudinal axis of said housing;

a resilient cutter separator disposed between said cutters and around said chip separator for urging axial separation of said cutters;

means for attaching said cutter separator to said chip separator to prevent axial movement of said cutter separator relative to said chip separator; and

means for limiting axial separation of said cutters.

4,842,457

MACHINE TOOL WITH IMPROVED SPINDLEHEAD MOUNTING AND TRAVERSING MEANS

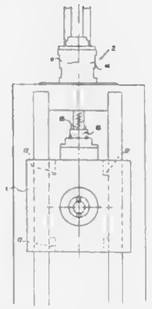
Giuseppe Badagnani, San Giorgio Piacentino, Italy, assignor to Mandelli S.P.A., Piacenza, Italy

Filed Aug. 12, 1987, Ser. No. 84,906

Claims priority, application Italy, Sep. 10, 1986, 21657 A/86

Int. Cl.[4] B23C *1/06*; B23B *47/18*; F16H *1/18*

U.S. Cl. 400—183 4 Claims



1. In a machining center or machine tool comprising a spinglehead carrying a rotary spindle and a driving motor therefor, and means mounting said spindlehead for reciprocatory movement along a rectilinear path under the control of a recirculating-ball screw and nut assembly; the improvement in which the screw of said assembly is rigid with the spindlehead and has its axis passing through the center of gravity of the spindlehead and perpendicular to the axis of rotation of the spindle, said axes intersecting each other whereby the screw axis passes substantially through the point at which the resultant of all the forces and reactions applied to the spindlehead acts, motor means to rotate the nut of said assembly, and means to keep the nut of said assembly axially fixed during the rotation thereof.

4,842,458

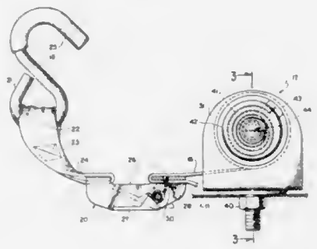
RETRACTABLE TIE-DOWN

Victor S. Carpenter, 8728 Tyrone, Panorama City, Calif. 91402

Filed Jan. 4, 1988, Ser. No. 140,602

Int. Cl.[4] B60P *7/08, 7/16*

U.S. Cl. 410—3 3 Claims



1. A retractable tie-down for the bed of a truck comprising the combination of:

an elongated belt having opposite ends provided with loops;

a hook member carried in one of said belt end loops and a spindle carried in the other of said belt end loops;

a reel having a slotted storage hub, said hub surrounding said spindle and provided with a slot for passing said belt end loop therethrough for engagement with said spindle;

a securement pin interconnecting said reel hub with said spindle;

a mounting yoke carried on the bed of the truck rotatably supporting said reel and said belt;

a spring retractor operably coupled between said reel and said mounting yoke for normally biasing said belt into a yieldable storage position in the form of a coil about said hub;

an adjustment clamp carried on the length of said belt midway between its opposite ends in spaced relationship to said hook and said mounting yoke for selectively shortening or lengthening said belt;

anchor means pivotally supporting said mounting yoke on the bed of the truck for operation under load in a fixed position or in a pivoting position; and

securement means carried on said anchor means for selectively selectively securing said mounting yoke in said fixed position and releasing said mounting yoke for operation in said pivoting position.

4,842,459

SUPPORT ASSEMBLY WITH RETAINER

Flan Jensen, Dolton, and Rudolph E. Nadherny, Naperville, both of Ill., assignors to Ireco, Inc., Chicago, Ill.

Filed Apr. 14, 1988, Ser. No. 181,748

Int. Cl.[4] B60R *7/00*

U.S. Cl. 410—97 19 Claims

1. A bulkhead assembly comprising:

a bulkhead door suspended from an overhead traveling beam through a bracket assembly; and

a safety cable generally encircling a component of the bulkhead door and a component of the overhead traveling beam, wherein said safety cable includes:

a plurality of elongated cables;

a plurality of securement members spaced along and rigidly attached to said cables;

a stiff, elongated eye formed from the combination of said cables and said spaced apart securement members;

said cables being sufficiently resilient such that said elongated eye will expand and move back in a direction generally transverse to the length of the support assembly, said cables of the elongated eye being biased toward a generally closed orientation to provide wedging means for receiving an end assembly of the support assembly;

said end assembly including a rigid one-way member securely attached onto a length of at least one of said cables, said end assembly further including retainer means for controlling passage of said one-way member through said elongated eye;

said retainer means being slidably mounted on said cable length, said retainer means being slidable along said cable length up until it engages said rigid one-way member and not therebeyond;

said retaining means having a generally longitudinal orienta-

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tion with respect to said cable length for allowing passage thereof through said elongated eye, and said retaining means having a generally transverse orientation with respect to said cable length for preventing passage thereof and of said one-way member through said elongated eye; and

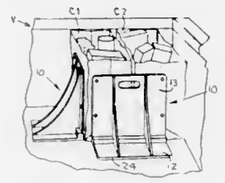
said retaining means including an aperture having a size smaller than a trailing end of said one-way member so that said one-way member cannot pass through said aperture of the retaining means.

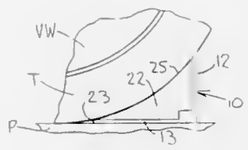
4,842,460

LOAD HOLDING DEVICE

Ronald D. Schlesch, Stuart, Fla., assignor to Armstrong International, Inc., Three Rivers, Mich.

Filed Sep. 18, 1987, Ser. No. 98,482
Int. Cl.[4] B61D *45/00*; B60D *25/24*
U.S. Cl. 410—121 **12 Claims**





1. A releasable cargo anti-skid block for gripping the cargo bed of a vehicle, comprising:

a rigid body having a cargo engageable upstanding side and a cargo bed engageable bottom, the bottom and upstanding side joining at a corner edge;

gripping means on said bottom of said body, said gripping means being fixed with respect to said body for forcibly but releasably gripping the surface of the cargo bed of the vehicle;

said gripping means including an elongate recess in said bottom of said body adjacent to and extending along said bottom, a magnet assembly received in said recess and thus extending along and adjacent said corner edge, and fastening means for locating said magnet assembly in said recess to secure the bottom of said body adjacent said corner edge releasably to a cargo bed of magnetizable material;

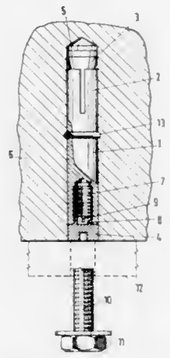
said recess divergently tapering towards its open bottom and away from the side of the magnet assembly therein, said magnet assembly being loosely received in said recess, said fastening means comprising plural elongate members extending through holes in said body and magnet assembly in a direction generally parallel to said bottom, said elongate fastening members being loosely received in the holes and at least one of said body and magnet assembly for permitting limited movement of said magnet assembly up and down parallel to said side and in pitching and rolling angular directions as seen from the free edge of said bottom remote from said corner edge, to enable said magnet assembly to most efficiently grip a cargo bed which may be dented or have other surface deformations while said bottom is supported on said cargo bed.

4,842,461

ANCHORING ASSEMBLY

Artur Fischer, Waldachtal, Fed. Rep. of Germany, assignor to fischerwerke Artur Fischer GmbH & Co KG, Tumlingen, Fed. Rep. of Germany

Filed Mar. 28, 1988, Ser. No. 174,096
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1987, 3712213
Int. Cl.[4] F16B *13/06*
U.S. Cl. 411—55 **4 Claims**



1. An anchoring assembly for anchoring objects to solid masonry and insertable in a borehole formed in the masonry, comprising a threaded anchoring bolt including at one end thereof an expansion sleeve and at another end thereof an inner thread for receiving a fastening screw for fastening an object to the masonry; an expander member insertable into said expansion sleeve; and a spacer removably-insertable into said inner thread and engageable therein, said spacer, during a driving-in of said anchoring assembly into said borehole defining a distance between an end of said inner thread and an outer wall face of the masonry, so that when after driving-in of said anchoring assembly into said borehole and replacing said spacer with a fastening screw screwed into said inner thread, said expander member is drawn into said expansion sleeve by a predetermined distance which corresponds to said distance defined said spacer.

4,842,462

DIECAST SCREWTHREADED INSERTS AND METHOD OF MAKING THEM

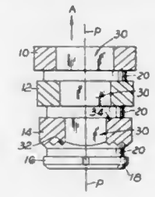
James M. G. Tildesley, Shropshire, United Kingdom, assignor to P.S.M. Fasteners Limited, Willenhall, England

Continuation of Ser. No. 11,390, Feb. 5, 1987, abandoned, which is a continuation of Ser. No. 780,644, Sep. 26, 1985, abandoned. This application Aug. 15, 1988, Ser. No. 233,883
Claims priority, application United Kingdom, Nov. 15, 1984, 8428862
Int. Cl.[4] F16B *37/04, 39/02*
U.S. Cl. 411—180 **19 Claims**

1. A diecast fastener suitable for being installed in an installation material and having a longitudinal axis comprising:

(a) a body portion having first and second sections, the first section being substantially diametrically opposite to the second section on the fastener, the first section having helically-oriented ribs oriented against one direction of rotation of the fastener and the second section having helically-oriented ribs oriented against the opposite direction of rotation of the fastener, the body portion further having first and second flats defining first and second planes, the first and second sections being separated by the first and second flats on the fastener, the ribs not extending from the fastener beyond the first and second planes; and

(b) a pilot portion of lesser diameter in cross-section than the body portion, the pilot portion being located at one end of



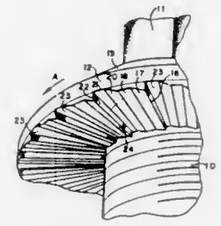
the fastener for guiding the fastener into the installation material.

4,842,463

VIBRATION RESISTANT FASTENERS

Richard C. Landt, Souderton, Pa., assignor to SPS Technologies, Inc., Newtown, Pa.

Continuation of Ser. No. 680,212, Dec. 10, 1984, Pat. No. 4,657,459. This application Feb. 24, 1987, Ser. No. 18,326
The portion of the term of this patent subsequent to Apr. 14, 2004, has been disclaimed.
Int. Cl.[4] F16B *39/282*
U.S. Cl. 411—188 **19 Claims**



1. A self-locking fastener having a predetermined direction of tightening and a bearing surface, said bearing surface comprising:

a plurality of serrations in the form of teeth when viewed along a cylinder concentric with the longitudinal axis of the fastener, each of said teeth having a root and a crest such that said roots of said teeth generally form a first plane and said crests of said teeth generally form a second plane;

a plurality of walls, each wall extending from the crest of each said tooth to the root of said tooth; and

a plurality of intermediate surfaces each being disposed between two of said teeth; said intermediate surfaces being generally disposed between said first and second planes;

a plurality of first inclined surfaces each extending from one of said crests in the direction of tightening to one of said first intermediate surfaces, such that said teeth are adapted to penetrate into a workpiece surface in which said self-locking fastener is being installed and said first intermediate surfaces are adapted to control and limit the extent of penetration of said teeth into the workpiece surface when said self-locking fastener is operatively installed and said roots of said teeth do not bear against said workpiece surface; and

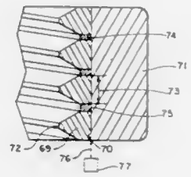
a plurality of second inclined surfaces each extending in the direction of tightening from one of said intermediate surfaces to one of said roots.

4,842,464

EQUALIZATION OF LOAD IN THREADED CONNECTIONS

William P. Green, Pasadena, Calif., assignor to Mark Hattan, Orange, Calif., a part interest

Filed May 28, 1985, Ser. No. 738,256
Int. Cl.[4] F16B *39/30*
U.S. Cl. 411—307 **91 Claims**



1. A fastener comprising:

a body structure containing a passage;

an element within said passage forming an internal thread adapted to engage an external thread and which progressively increases in pitch through a plurality of turns of said internal thread;

said element being formed separately from said body structure and being coiled helically at an increasing pitch and secured in essentially fixed position relative thereto;

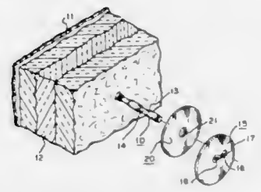
said element which forms said internal thread progressively increasing in axial dimension and progressively decreasing in radial dimension at it advances heclially in a predetermined direction, and at a rate maintaining the cross sectional area of said element transversely of its length substantially uniform.

4,842,465

INSULATION HANGER WITH LOCKING DEVICE

Charles C. Pease, Vincentown; Eugene P. Schaeffer, Marlton; Kevin L. Bernd, Maple Shade, all of N.J., and David A. Higton, Little Budworth, United Kingdom, assignors to KSM Fastening Systems Inc., Moorestown, N.J.

Filed Apr. 16, 1982, Ser. No. 368,959
Int. Cl.[4] F16B *21/00*; E04B *5/00*
U.S. Cl. 411—337 **8 Claims**



1. An insulation hanger for supporting a compressible insulation blanket to a supporting wall comprising:

an elongate end weldable stud of a first cross section adapted to be secured at one end to the supporting wall and over which the insulation blanket is to be positioned;

a plurality of stud shoulders of reduced cross section along at least a portion of the stud;

a substantially flat insulation blanket retainer having an aperture therein which includes a first portion thereof large enough to permit the retainer to pass over the first cross section of the stud when in a first position to a given shoulder to provide desired compression of the blanket axially of the stud and an adjacent second portion of size to interlock with the stud shoulders upon movement of the retainer translationaliy of the stud axis to a second position to secure the blanket; and

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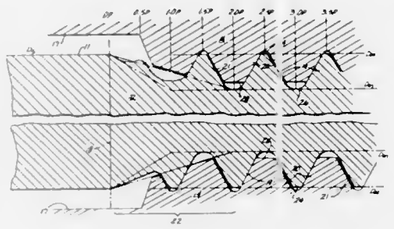
separate retainer locking means adapted to be positioned over the stud and between the retainer and insulation blanket and held into contact with the retainer by the compressed insulation blanket for preventing movement of the retainer between its second and first positions preventing undesired unlocking of the retainer from the stud.

4,842,466
LIGHTWEIGHT FASTENER
Roland A. Wheeler, and Jack Rath, both of Los Angeles, Calif., assignors to VSI Corporation, Culver City, Calif.
Filed Apr. 1, 1986, Ser. No. 846,940
Int. Cl.[4] F16B 35/00
U.S. Cl. 411—366 **29 Claims**



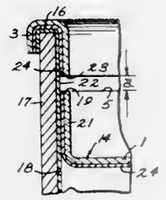
1. A threaded bolt which can be engaged by a nut comprising:
a cylindrical shank having a radius D_s,
a tip having a roll formed thread with a uniform pitch P, a major radius D_M smaller than D_s, and a minor radius D_m;
a maximum grip plane defined between the shank and tip; and
a run-out zone between the shank and tip having a maximum length of 2P, the run-out zone having a roll formed thread wherein the root of the thread is in a triangular envelope in a Cartesian coordinate system with the length of the fastener being the abscissa, radium being the ordinate and the centerling of the fastener at the maximum grip plane being the origin, the abscissa units being the pitch P and the distances D_s being the radius to the shank diameter, D_M being the radium to the major diameter, and D_m being the radius to the minor diameter, and defined by the lines (OP, D_s), (1.1P, D_m); (1.1P,D_m), (2P, D_m); and OP, D_s), (2P, D_m) and the crest of the thread is within a triangular envelope defined by the lines (OP, D_s), (0.75P, D_s); (OP, D_s), (0.75P, D_M); and (0.75P, D_s), (0.75P, D_M), and substantially along a line D_M when the crest of the thread is further from the maximum grip plane than 0.75P, and the flanks of the thread in the run-out zone outside the envelope of the thread root and where the thread crest extends along the line D_M are substantially a helical continuation of the flanks of hhe thread on the tip.

4,842,467
CONCRETE SCREW
William D. Armstrong, Grapevine, Tex., assignor to Yamashina Seiko-sho, Ltd., Japan
Continuation of Ser. No. 643,725, Aug. 24, 1984. This application Nov. 9, 1987, Ser. No. 118,055
Int. Cl.[4] F16B 23/00, 35/06
U.S. Cl. 411—399 **13 Claims**

1. A self-tapping anchoring concrete screw in a pre-drilled bore in a concrete structure having individual concrete aggregate components comprising a driving head and a tip, a shank portion extending between said head and tip, said shank portion having a substantially constant diameter and only one spaced, helical thread formed thereon, said helical thread having an intermediate thread portion with a substantially constant thread crest diameter and a leading end portion extending from the tip axially toward the intermediate thread portion for a predetermined distance, said shank portion including a frusto-conical portion extending between said head and the intermediate thread portion, said frusto-conical portion having a greater diameter adjacent the head, the thread crest diameter of the leading end portion being approximately 0.250 inches and tapering from a first diameter at the tip to a second,

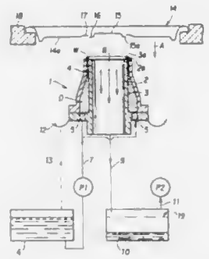
greater diameter at said predetermined distance, said screw having 8 or less threads per inch, said helical thread having a plurality of thead cutting notches formed therein over at least said predetermined distance from said tip, said helical thread having a surface hardness of at least Rockwell "C" whereby damage to the helical thread by the individual concrete aggregate components is substantially prevented.

4,842,468
PROCESS FOR FORMING A CLOSURE DIAPHRAGM FOR A CONTAINER
Werner Grabher, Au, Switzerland, assignor to Grabber Indosa-Macschinenton AG, Au-SG, Switzerland
Filed Nov. 25, 1987, Ser. No. 125,370
Claims priority, application Switzerland, Jul. 10, 1985, 2995/85
Int. Cl.[4] B21D 51/26
U.S. Cl. 413—12 **1 Claim**



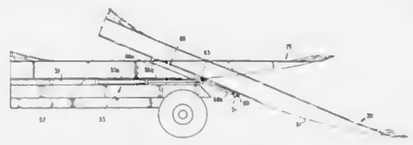
1. In a process for forming a closure diaphragm for a container of the type having a body having an edge surrounding an opening in said body with die means the diaphragm being of the type having a dish portion including a peripheral wall having a rim with said wall having a plurality of slits extending along a circumferential line and separated by ligaments, said rim terminating in a radially extending flange shaped to engage said edge of said body, comprising the steps of:
(a) moving said dish into said opening with said die means until said flange engages said edge of said body of said die means,
(b) holding fast said flange on said edge, and
(c) subsequently continuing to move said dish into said opening to sever said ligaments and disconnect said dish portion from said flange.

4,842,469
DEVICE FOR APPLYING A VISCOUS SEALANT IN ANNULAR FORM ONTO A SUBSTANTIALLY FLAT SURFACE, SPECIFICALLY TO A CAN END
Gunter H. R. Schmidt, Neuwied, Fed. Rep. of Germany, assignor to The Broken Hill Proprietary Company Limited, Victoria, Australia
Filed Nov. 16, 1987, Ser. No. 121,639
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1986, 3639427
Int. Cl.[4] B21D 51/46
U.S. Cl. 413—60 **7 Claims**



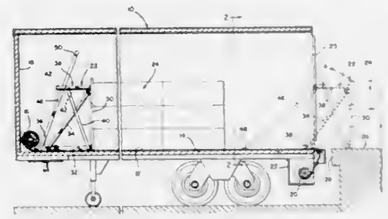
1. A device for applying viscous sealant in annular form onto a substantially flat surface, and specifically onto a can end, said device comprising:
a material transfer head having an annular transfer surface provided at a free upper end thereof, including an annular passage opening toward said annular transfer surface, such that the sealant flows through said annular passage to said annular transfer surface, and wherein an open-top interior is formed in the interior of said annular transfer surface;
a pump means for continuously pumping the sealant into said material transfer head;
a backflow pipe connected to said open-top interior for removing excess sealant therefrom;
a transfer means for moving said can end vertically up and down with respect to said annular transfer surface; and
a vacuum source operatively coupled to said open-top interior for maintaining a suction in said open-top interior.

4,842,470
LOW ANGLE APPROACH TILT BED
John S. Hubbard, R.R. 1, Box 36, Parker City, Ind. 47368
Filed Mar. 2, 1987, Ser. No. 20,896
Int. Cl.[4] B60P 3/12
U.S. Cl. 414—478 **17 Claims**



1. In a tow truck having a vehicle frame with a longitudinal axis, and a pair of wheel axles at longitudinally opposite ends of said frame, a towing bed comprising:
a substantially continuously arcuate floor having a constant radius of curvature and a generally rectangular shape having a pair of lateral edges, a forward edge and a rear approach edge and being substantially concave between said forward and said rear edges; and
means connected to said towing bed and said vehicle frame and operable for moving said towing bed from a horizontal carrying position generally parallel to said vehicle frame, to a loading position in which the towing bed is tilted about the end of the vehicle frame.

4,842,471
UNLOADING MECHANISM FOR TRUCKS AND TRAILERS
Graham L. Hodgetts, Mars, Pa., assignor to Rolflor Industries, Inc., Warrendale, Pa.
Filed May 17, 1988, Ser. No. 195,268
Int. Cl.[4] B60P 1/00; B65G 65/42
U.S. Cl. 414—515 **6 Claims**



1. An unloading mechanism for a load carrying wheeled vehicle, such as a truck or trailer, which has a bed, a front wall, and a back opening through which the vehicle is to be unloaded, said mechanism including a flexible conveyor on the bed of the vehicle, a forward conveyor wind-up roll adjacent the front wall of the vehicle, a rear conveyor wind-up roll adjacent the back opening of the vehicle, a bulkhead structure attached to the conveyor for location adjacent the front wall of the vehicle when the conveyor is wound on said forward roll and for pushing a load out the back opening of the vehicle as the conveyor is wound on said rear roll, the bulkhead structure having a rear pusher element and a base extending forwardly of said pusher element, attachment means securing said base to the conveyor at a distance from the pusher element whereby the pusher element may be moved rearwardly beyond the back opening of the vehicle when pushing a load out the opening, and automatically extending and retracting elongate brace means slidably mounted on the bulkhead structure and in contact with the vehicle bed adjacent the conveyor forwardly of said pusher element for extending to a relatively inclined position and reacting against the bed of the vehicle to resist tipping of the bulkhead structure about said attachment means when the bulkhead structure pushes a load rearwardly beyond said opening, and for retracting to a relatively vertical position when the bulkhead structure is located adjacent the front wall of the vehicle to minimize the lengthwise space occupied thereby.

4,842,472
VEHICLE RECOVERY UNIT
John D. Plant, Long Buckby, England, assignor to PCM (Long Buckby) Engineering Ltd., Northampton, United Kingdom
Filed Nov. 30, 1987, Ser. No. 126,148
Claims priority, application United Kingdom, Dec. 1, 1986, 8628640
Int. Cl.[4] B60P 3/12
U.S. Cl. 414—563 **23 Claims**

1. A vehicle recovery unit for attachment to a recovery vehicle, which unit comprises a first boom, mountable on the rear portion of the recovery vehicle for pivotable movement about a vertical axis during normal towing and about a horizontal axis during the lifting of a vehicle to be recovered, which boom, when mounted, extends essentially horizontally beyond the rear of the recovery vehicle, and a second boom, positionable underneath the vehicle to be recovered, pivotally attachable to the first boom, to the rear of the recovery vehicle when in position, the second boom comprising at the end

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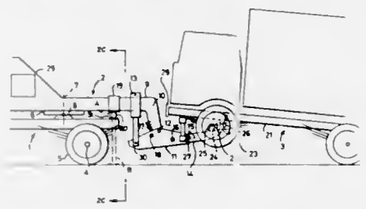
remote from the recovery vehicle when in position, means for attaching the second boom to the chassis of a vehicle to be recovered, power transmission means for effecting relative pivotal movement of the second boom with respect to the first



boom for the lifting of the vehicle to be recovered, and means for preventing pivotal movement of the vehicle to be recovered about said attachment means, such that the position of the vehicle to be recovered relative to the second boom is fixed during towing.

4,842,473

MANIPULATOR FOR SHEET-METAL PIECES TO BE SHAPED IN A SHEET-METAL-WORKING MACHINE

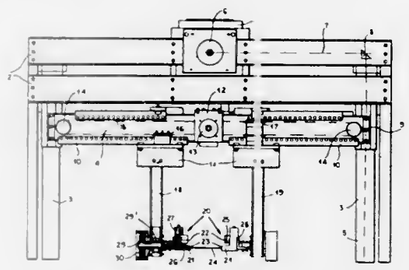
Vaclav Zbornik, Oftringen, Switzerland, assignor to Hammerle AG, Zofingen, Switzerland

Filed May 29, 1987, Ser. No. 56,603

Claims priority, application Austria, May 30, 1986, 1462/86; Apr. 28, 1987, 1053/87

Int. Cl.[4] B66C *1/16*

U.S. Cl. 414—626 **4 Claims**



1. A manipulator for the handling of sheet-metal sheets to be shaped in a sheet-metal-working machine, comprising:

a mobile support;

two arms mounted on said support so that ends of said arms can be approached to and displaced away from one another;

means forming respective clamping members on said ends of said arms engageable with opposite edges of a sheet-metal workpiece received between said members and displaceable in a direction parallel to a plane of said sheet-metal workpiece whereby said clamping members exert a clamping pressure on said workpiece in said plane, said arms being provided with means enabling rotation of said clamping members about an axis; and

holding means actuatable independently of the displacement of said clamping members and acting upon said sheet-metal workpiece in a direction perpendicular to said plane for seizing said workpiece until shaping of said workpiece renders the workpiece sufficiently stiff to be supported exclusively by said clamping pressure, said holding means being formed as a respective clamping tongs on each end of said arm and said clamping members being clamping strips, said support comprising a supporting structure fastened to a slide movable in two coordinate directions and carrying a horizontal beam adjustable in the vertical direction, said beam being provided with said arms which are adjustable in terms of the distance between them, said arms being provided with holders each carrying a respective one of said tongs and a respective clamping member and being arranged to be rotated by a horizontal shaft, the free ends of said arms being each provided with a holding member having both a clamping tongs and a clamping strip are each fastened rotatably to a lower end of the respective arm and said arms are vertical and each holding member having a lower jaw with a horizontal clamping face and a vertical clamping strip, and a clamping jaw which is movable relative to the lower jaw and which has a clamping face located opposite the clamping face of the lower jaw.

4,842,474

VERTICAL MULTI-ARTICULATED ROBOT

Nobutoshi Torii, Hachioji; Hitoshi Mizuno, Hino, and Kyoji Iwasaki, Tokyo, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

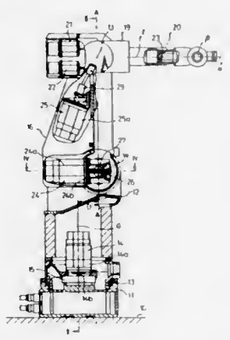
PCT No. PCT/JP87/00333, § 371 Date Jan. 25, 1988, § 102(e) Date Jan. 25, 1988, PCT Pub. No. WO87/07200, PCT Pub. Date Dec. 3, 1987

PCT Filed May 26, 1987, Ser. No. 150,429

Claims priority, application Japan, May 26, 1986, 61-119085

Int. Cl.[4] B25J *18/00*

U.S. Cl. 414—680 **5 Claims**



1. A vertical multi-articulated robot comprising:

a base secured to a horizontal plane of installation;

a turning body provided on the base and rotatable to take angular diverse positions with respect to the base about a first axis thereof perpendicular to said horizontal plane of installation;

a first body drive motor for driving and rotating the turning body with respect to the base about the first axis;

an upper arm having a base end and a tip and coupled at the base end thereof to the turning body so as to be rotatable with respect to the turning body about a second axis, said second axis being in parallel with the horizontal plane and perpendicular to and spaced from the first axis;

an upper arm drive motor for driving and rotating the upper arm with respect to the turning body about the second axis, the upper arm drive motor being fixed to said upper arm at one end thereof substantially at said second axis such that said upper arm drive motor is extended from the second axis over the first axis with a fixed angle between the axis of said upper arm drive motor and a longitudinal axis of said upper arm;

a forearm coupled to the tip of the upper arm so as to be rotatable with respect to the upper arm about a third axis parallel to the second axis and provided at the front end thereof with a wrist assembly, the forearm being extended from the third axis away from the first axis;

a forearm drive motor for driving and rotating the forearm with respect to the upper arm about the third axis, the forearm drive motor being fixed to said upper arm with a fixed angle therebetween at a position away from said second axis over said first axis;

wherein the upper arm drive motor and the forearm drive motor are attached to the upper arm and extended from a first plane including the second and third axes toward the first axis in a manner such that the rotational axes of said motors are located on a second plane which intersects with the second axis at a right angle and such that the weights of the motors generate a substantial moment of inertia opposite to the one generated by the weight of said forearm.

4,842,475

COMPUTER CONTROLLED ADAPTIVE COMPLIANCE ASSEMBLY WORKSTATION

Morris R. Driels, W. Kingston, R.I., assignor to Board of Governors for Higher Education, State of Rhode Island and Providence Plantations, both of Providence, R.I.

Continuation of Ser. No. 686,605, Dec. 27, 1984, abandoned. This application Jun. 9, 1987, Ser. No. 60,942

Int. Cl.[4] B66C *1/00*

U.S. Cl. 414—730 **5 Claims**

1. An adaptive compliance control system wherein workpieces are joined to one another on a reorientation station to form a product which comprises:

a reorientation station adapted to receive a workpiece, said reorientation station deflectable from a first position to a second position the amount of deflection based on the interactive force between the workpiece and the reorientation station;

robot means to move the workpiece and to place the workpiece into contacting engagement with the reorientation station;

means to control the stiffness between the reorientation station and the workpiece which includes:

means to sense the interactive force between the reorientation station and the workpiece;

means to increase the stiffness while the reorientation station and the workpiece move from the first to the second position; and

means to move the reorientation station and the workpiece to a third known position wherein the interactive force has exceeded a preset force value.

4,842,476

MANIPULATOR

Yosuke Shiotani, Nagoya, Japan, assignor to Star Seiki Co., Ltd., Aichi, Japan

Filed May 2, 1988, Ser. No. 190,477

Claims priority, application Japan, Mar. 24, 1988, 63-70986

Int. Cl.[4] B65G *65/00*

U.S. Cl. 414—751 **2 Claims**

1. A manipulator for moving a workpiece to a predetermined position, comprising:

a supporting member so supported on a frame as to be movable in a moving direction of said workpiece;

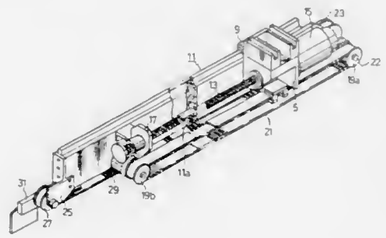
a nut member fixed to said supporting member; a feeding screw engaging with said nut member;

electromotive motor means connected with said feed screw for rotating said feeding screw so as to reciprocate said supporting member;

a pair of first pulleys rotatably supported with a given spacing on one side of said supporting member;

first timing belt means for connecting said pair of first pulleys, said first timing belt means partially fixed to said frame so as to rotate said first pulleys as said supporting member moves;

a pair of second pulleys rotatably supported with a predetermined spacing on the other side of said supporting member;



second timing belt means for connecting said pair of second pulleys;

at least one of said second pulleys coaxially connected with one of said first pulleys, said one of said second pulleys having an outside diameter ratio corresponding to a predetermined variable speed ratio for rotating said one of said second pulleys at a predetermined rotational frequency with respect to said first pulley as said first timing belt means moves; and

chuck means connected with said second timing belt means for chucking said workpiece.

4,842,477

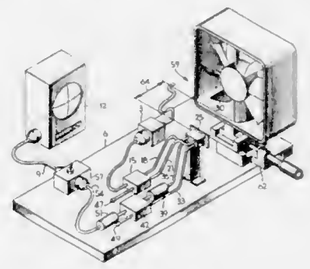
ACTIVE CLEARANCE CONTROL

William R. Stowell, Rising Sun, Ind., assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 24, 1986, Ser. No. 946,356

Int. Cl.[4] F03B *15/00*; F01B *25/16*

U.S. Cl. 415—118 **14 Claims**



1. In a gas turbine engine having a clearance between a blade and a shroud, the improvement comprising:

(a) a sensor (i) through which two signals pass along two lines in the same direction and (ii) in which a relative phase shift occurs between the signals in response to changes in the clearance.

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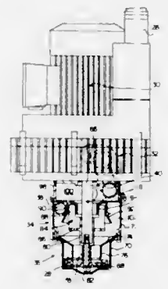
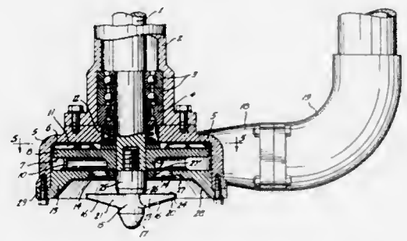
4,842,478
DENTAL SUCTION APPARATUS
Walter S. Durr, Leonberg; Hans-Joachim Hofmann, Remshalden, and Andreas B. Bollmann Ingersheim, all of Fed. Rep. of Germany, assignors to Dürr Dental GmbH & Co, Fed. Rep. of Germany
Continuation of Ser. No. 4,546, Jan. 16, 1987, abandoned. This application Jun. 14, 1988, Ser. No. 206,289
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1986, 3601254
Int. Cl.[4] F01D 25/32
U.S. Cl. 415—169.2 15 Claims



1. A dental aspirating unit comprising
(1) a vacuum pump (32) exhibiting a rotating pump shaft (66),
(2) a drive motor (30) operating on said pump shaft (66),
(3) an air/liquid cyclone extractor (34) which is provided at spaced points of its casing with
an inlet port (38) for the air/liquid mixture, and
an outlet port (40) for air from which liquid has been expelled, and
a liquid discharge port (76) formed in its base section,
(4) a motor driven discharge pump (36) receiving liquid from the liquid discharge port (76) of said cyclone extractor (34) and including a discharge pump causing (70) and a pump impeller (68) rotating therein; characterized in that
(a) the air/liquid cyclone extractor (34), the vacuum pump (32) and the discharge pump (36) are coaxially combined into one unit and the vacuum pump (32) and the discharge pump (36) are both driven by the only drive motor (30);
(b) the liquid discharge port (76) defined in the funnel shaped base section of the cyclone extractor (34) lies above and is aligned with the suction hub portion of the pump impeller (68) which rotates about a vertical axis coinciding with the axis of said liquid discharge port (76) so that liquid removed from the mixture in the cyclone extractor (34) flows under gravitational force into the discharge pump (36) and the surface of the mass of liquid contained in the discharge pump casing under gravitational force is established in a horizontal plane being parallel to the plane of motion of the pump impeller (68).

4,842,479
HIGH HEAD CENTRIFUGAL SLURRY PUMP
Glenn R. Dorsch, Aberdeen, Wash., assignor to Vaughan Co., Inc., Montesano, Wash.
Filed Jan. 29, 1981, Ser. No. 229,700
Int. Cl.[4] F01D 25/24
U.S. Cl. 415—121.1 3 Claims

3. In a centrifugal pump for pumping slurry containing chunks or lumps of solid material, a pump casing having a bowl of generally circular cross section with an inlet aperture at one end offset from the axis of the bowl and a circumferential outlet, an impeller received in the bowl, rotatable about the axis of the bowl and having a shroud plate spaced from the bowl inlet aperture, a booster propeller located outside the bowl and adjacent to the bowl inlet aperture, and a drive shaft extending into the side of the casing remote from the casing inlet aperture and carrying the impeller and the booster propeller for effecting rotation thereof, the improvement comprising the impeller having a blade with a concave leading side including a first, gradually curved fillet faired into the shroud plate and a tip portion remote from the shroud plate curved gradually forward and forming a cutting edge cooperating with the margin of the inlet aperture, the axial extent and curvature of said first fillet being about the same as the axial extent and curvature of said tip portion curvature so that the concave leading side of said impeller blade is generally symmetrical about a first plane perpendicular to the axis of rotation of the impeller, said impeller blade having a second fillet fairing its trailing side into the shroud plate, the thickness of said impeller blade tapering from the shroud plate toward the blade cutting edge, the pump casing having an outwardly flared intake fun-

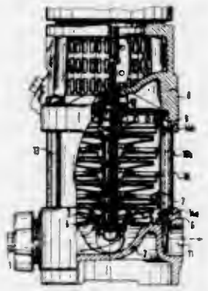


nel leading toward the pump casing inlet aperture, the booster propeller being located axially substantially in registration with the outer end of said intake funnel, having a generally radially extending solid blade without any internal cavities or ducts, of generally right triangular transverse cross section along at least a major portion of its radial extent, with its side remote from the casing inlet aperture for at least the major portion of its radial extent being in a second plane substantially perpendicular to the propeller axis and its trailing edge being substantially perpendicular to said second plane and tapering from its root portion to its tip portion, the axial extent of the propeller blade trailing edge over a substantial portion of the radial extent of the propeller blade being equal to a major portion of the circumferential extent of the side of said propeller blade remote from the casing inlet aperture and the propeller blade tapering from its trailing edge to a relatively sharp leading edge for forming the propeller blade side nearer the pump casing inclined relative to said second plane to drive material toward the casing inlet opening by rotation of the booster propeller blade.

4,842,480
MULTI-STAGE INLINE ROTARY PUMP
Niels D. Jensen, and Soren Simonsen, both of Bjerringbro, Denmark, assignors to Grundfos International a/s, Bierringbro, Denmark
Filed Aug. 25, 1987, Ser. No. 89,211
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1986, 3629123
Int. Cl.[4] F04D 17/12
U.S. Cl. 415—199.1 6 Claims

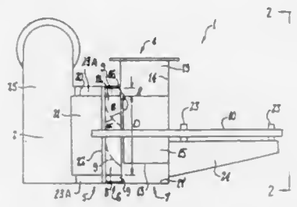
1. A multistage in-line rotary pump comprising a closed pump body, a base element provided with the suction and delivery connectors and a head element, the pump body being surrounded by a cylindrical casing spaced therefrom to form an annular return space, which casing is braced between said base and head elements by means of stay bolts with flat joints

provided between said base and head elements and respective axial ends of the casing, wherein said casing ends have their wall thickness increased by plastic deformation relative to the



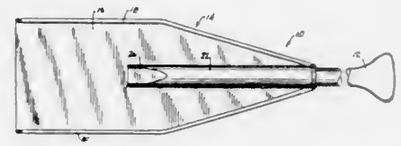
wall thickness of the rest of the casing, wherein said casing ends are predeformed asymmetrically and radially inwards so that their wall thickness is increased by plastic deformation relative to the rest of the casing.

4,842,481
FLUID PUMPS
Ross S. Collins, Echuca, Victoria, Australia
Filed Dec. 16, 1987, Ser. No. 133,521
Int. Cl.[4] F04D 3/00
U.S. Cl. 415—206 20 Claims



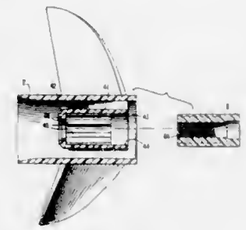
1. A liquid pump comprising a pump casing having a cylindrical body portion providing a chamber with a cylindrical wall and end walls therein and an inlet and an outlet to the chamber, an impeller rotatably mounted about its axis within the chamber, the impeller having a central hub with a plurality of vanes extending from the hub, rotation of the impeller causing transference of liquid admitted into the chamber via the inlet through the chamber and out the outlet, the outlet being at a higher level than the chamber when the pump is located with the axis of the impeller in a substantially horizontal in use position, an inlet flow guide situated between the inlet and impeller to direct the liquid towards the impeller in a direction substantially parallel to the impeller axis, and an outlet flow guide situated between the impeller and outlet comprising a non-circular stator having an outer peripheral wall, the stator mounted on and extending from one of the end walls of the chamber and located adjacent the impeller, the cylindrical wall of the chamber surrounding the stator, the one end wall and the outer peripheral wall of the stator defining a volute apace to direct liquid flow to the outlet in a direction substantially tangential relative to the axis of the impeller.

4,842,482
PADDLE CONSTRUCTION
Frank S. Beckerer, Jr., 40 Dock Rd., Milford, Conn. 06460
Filed Aug. 15, 1988, Ser. No. 232,278
Int. Cl.[4] B63H 16/04
U.S. Cl. 416—70 R 15 Claims



1. A paddle construction comprising, in combination:
(a) a blade,
(b) an elongate slender stick-like handle extending from the blade,
(c) said blade having a pair of opposite, longitudinally extending edges and having flanges extending along said edges to impede the flow of fluid from said blade laterally past said edges,
(d) said handle having a protuberant mounting portion of greater thickness than the blade, which mounting portion is affixed to the blade at points thereon which are located intermediate opposite terminal portions of said longitudinally extending edges,
(e) said blade having an unobstructed transverse free leading edge at the location thereon which is opposite said handle, and
(f) reinforcement means connecting said mounting portion of the handle to the blade to minimize the likelihood of breakage of the handle from the blade.

4,842,483
PROPELLER AND COUPLING MEMBER
Edwin S. Geary, P.O. Box 1246, Fajardo, P.R. 00648
Continuation-in-part of Ser. No. 882,171, Jul. 7, 1986, abandoned. This application Nov. 4, 1987, Ser. No. 116,358
Int. Cl.[4] B63H 1/20
U.S. Cl. 416—93 A 10 Claims



1. A two-piece, non-metallic, screw-type propeller that will shatter upon contact with a solid object in the water comprising:
(a) a rigid propeller member molded in one piece from thermoplastic resins comprising 55% glass and mica particles and 45% polyehtylene terepthalate, said propeller member having
(i) a central core having a base adapted to receive a coupling member;
(ii) a cylindrical hub;
(iii) a plurality of blades attached to the hub; and
(iv) a plurality of splines that shatter upon contact with a solid object in the water said splines attached at one end

to the central core and extending radially with the other end of said spline attached to the hub, and

(b) a rigid coupling member having

(i) an inner surface adapted to receive the driveline of a vessel;

(ii) an outer surface adapted to fit snugly into, but removable from the base in the central core of the propeller member, and

(iii) a means for securing said coupling member to the driveline,

wherein said propeller member is removably secured to the coupling member such that the outer surface of the coupling member is in secure contact with the core in the coupling member, and said coupling member drives said propeller member.

4,842,484

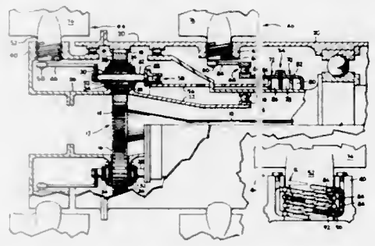
BLADE GEARING AND PITCH CHANGING MECHANISMS FOR COAXIAL COUNTERROTATING PROPELLERS

Kenneth O. Johnson, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 527,141, Aug. 29, 1983, abandoned. This application Aug. 28, 1985, Ser. No. 770,362

Int. Cl.[4] B64C 11/48

U.S. Cl. 416—127 13 Claims



13. An aircraft propeller system comprising:

first and second propellers, said first propeller including a plurality of first blades and said second propeller including a plurality of second blades; each of said blades having a radially inner threaded shaft;

forward and aft propeller carrier members each separately rotatable about a common axis;

said forward member including a plurality of first ball screw hubs, each of said first hubs being adapted to mate with one of said first blade shafts;

said aft member including a plurality of second ball screw hubs, each of said second hubs, each of said second hubs being adapted to mate with one of said second blade shafts;

means in each of said hubs for converting the centrifugal force on each of said propellers when rotating into a pitch changing force;

primary nonrotating actuating means for changing the pitch of said first and second blades, said primary means being operatively connected to each of said first blades through a first set of thrust bearings and being operatively connected to said second blades through a second set of thrust bearings;

secondary nonrotating actuating means for changing the pitch of either said first or second blades, said secondary means being operatively connected to said blades through said first or second set of thrust bearings, respectively;

a sun gear centered on said common axis;

means for applying a rotary torque to said sun gear;

a planet carrier;

a plurality of planet gears supported between said planet carrier and said forward member, said planet gears engaging said sun gear around the periphery of the latter;

a ring gear coaxially surrounding said sun gear and in engagement with said planetary gears, said ring gear being mechanically connected to said aft member;

whereby said planetary gears and said ring gear are effective to counterrotate said first and second propellers respectively about said common axis;

wherein said first set of thrust bearings and said plurality of first hubs are positioned on opposite sides of said planetary gears; and

a plurality of fingers each axially journaled in one of said planetary gears, each of said fingers being mechanically connected to a respective thrust bearing of said first set and being adapted to transmit the linear force of the latter to a corresponding one of said first shafts.

4,842,485

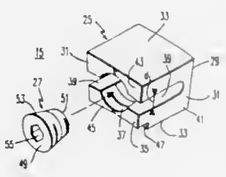
BALANCED TURBINE ROTOR AND METHOD FOR MAKING THE SAME

Ralph R. Barber, Waxhaw, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 10, 1988, Ser. No. 154,401

Int. Cl.[4] F01D 5/10

U.S. Cl. 416—144 7 Claims



1. A balanced turbine rotor comprising:

a cylindrical member having a pair of opposed end shafts and an enlarged central portion, the enlarged central portion having first and second end faces;

a circular groove in at least one of said end faces concentric with the end shafts; and

expandable weight assemblies engageable within said circular groove, such that said weight assemblies are insertable into said groove in a direction parallel to the axis of the end shafts and expandable therein to secure the same in a predetermined location about the end face; said expandable weight assemblies comprising an arcuate body member having a rear wall, side walls, top and bottom arcuate walls and a front wall, with a threaded bore formed from the front to the rear wall, terminating at a spaced location from the rear wall, and a slot formed in each side wall extending from the side wall outer surface to said threaded bore forming upper and lower deformable sections; and an expander screw threadedly engageable within said threaded bore arranged to spread said upper and lower deformable sections apart to secure said body in said circular groove, wherein a radially inwardly extending lip is provided, adjacent said face, which lip extends radially into said groove, and the bottom wall of said body has a recess therein at the edge of a said arcuate wall, with said lip seated in said recess when said upper and lower deformable sections of the body are spread apart, wherein the radially extending lip is radially spaced from the bottom arcuate wall of the body member.

4,842,486

METHOD AND APPARATUS FOR INCREASING THE OPERATING EFFICIENCY OF A LIQUID-FLOW MACHINE

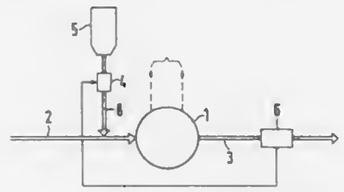
Hans R. Neubauer, Weisendorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 29, 1986, Ser. No. 924,878

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1986, 3643101

Int. Cl.[4] F04C 19/00

U.S. Cl. 417—53 21 Claims



2. A method for increasing the operating efficiency of a liquid-flow machine having a means for driving a liquid ring in a housing to transport a gas, comprising the steps of:

feeding a working fluid to an input of said machine;

adding to the working fluid, at a point upstream of said input, a substantially controlled number of macromolecular bodies acting as friction reducing agents;

operating said machine with said working fluid including said macromolecular bodies to transport said gas through a gas outlet;

separating said working fluid from said gas downstream of said gas outlet; and

recirculating substantially all of said working fluid, including said macromoleuclar bodies, to said input.

4,842,487

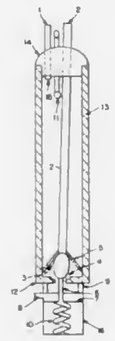
PUMPING DEVICE USING PRESSURIZED GAS

William G. Buckman, 504 Memphis Junction Rd., and Robert L. Boots, 3036 Hunting Creek Dr., both of Bowling Green, Ky. 42101

Continuation of Ser. No. 819,683, Jan. 17, 1986, abandoned. This application Sep. 17, 1987, Ser. No. 97,258

Int. Cl.[4] F04F 1/06, 3/00

U.S. Cl. 417—132 17 Claims



1. A fluid pumping device comprising;

an enclosure adapted to be placed downhole in a well containing fluid;

first, second and third openings in said enclosure;

a first hollow tube connected to said first opening in said enclosure; said first hollow tube for receiving fluid as it is pumped out of said enclosure and up and out of the well;

a second hollow tube;

portions of said first and second hollow tubes forming a part of said enclosure; said second hollow tube connected to said second opening in said enclosure; said second hollow tube for receiving a gas and for forcing the gas into the remainder of said enclosure;

said third opening for permitting fluid to enter said enclosure;

means for forcing the closing of said third opening in said enclosure;

non-mechanical means for sensing the level of fluid inside of said enclosure for initiating the forcing of gas into said enclosure through said second tube;

means for opening said first opening in response to said means for sensing;

whereby columns of fluid may be intermittently forced from said enclosure through said first tube and out of the well.

4,842,488

SLANT PLATE TYPE COMPRESSOR WITH VARIABLE DISPLACEMENT MECHANISM

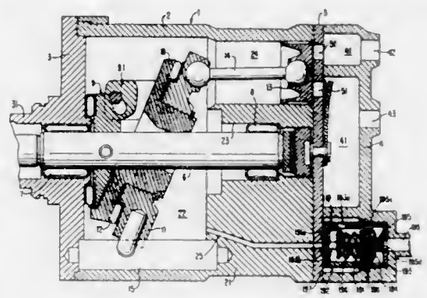
Kiyoshi Terauchi, Gunma, Japan, assignor to Sanden Corporation, Gunma, Japan

Continuation of Ser. No. 66,102, Jun. 30, 1987, abandoned. This application Jun. 6, 1988, Ser. No. 203,632

Claims priority, application Japan, Jul. 8, 1986, 61-159680

Int. Cl.[4] F04B 1/28

U.S. Cl. 417—222 16 Claims



1. In a slant plate type compressor for use in a refrigeration circuit, said compressor including a compressor housing having a central portion, a front end plate at one end and a rear end plate at its other end, said housing having a cylinder block provided with a plurality of cylinders and a crank chamber adjacent said cylinder block, a piston slidably fitted within each of the said cylinders, a drive mechanism coupled to said pistons to reciprocate said pistons within said cylinders, said drive mechanism including a drive shaft rotatably supported in said housing, a rotor coupled to said drive shaft and rotatable therewith, and coupling means for drivingly coupling said rotor to said pistons such that the rotary motion of said rotor is converted into reciprocating motion of said pistons, said coupling means including a member having a surface disposed at an incline angle relative to said drive shaft, said incline angle of said member being adjustable to vary the stroke length of said pistons and the capacity of the compressor, said rear end plate having a suction chamber and a discharge chamber, a passageway connected between said crank chamber and said suction chamber, and valve means for controlling the closing and opening of said passageway to vary the capacity of the compressor by adjusting the incline angle, the improvement comprising said valve means including a valve to directly close and open said passageway,

first valve control means for controlling the movement of

said valve to open and close said passageway in response to changes in refrigerant pressure in said compressor, said first valve control means comprising a bellows element for applying a biasing force in a direction toward the closed position of said valve, and

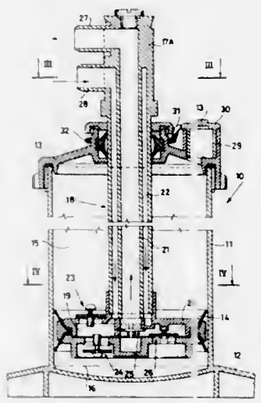
second valve control means coupled to said first valve control means for changing the operating point of said first valve control means in response to an external condition, said second valve control means including means for applying an adjustable negative pressure force to said bellows element to adjustably reduce the biasing force of said first valve control means, said means for applying the negative pressure force including a conduit for coupling to a source of variable negative pressure.

4,842,489

HAND-OPERATED PUMP CHANGEABLE FROM DUAL ACTION TO SINGLE ACTION

Francesco Lucisano, Via Ronchi, 39, Milan, Italy

Filed Apr. 3, 1987, Ser. No. 33,667
Claims priority, application Italy, Apr. 4, 1986, 21427/86[U]
Int. Cl.[4] F04B *21/04*, *9/00*
U.S. Cl. 417—238 **12 Claims**



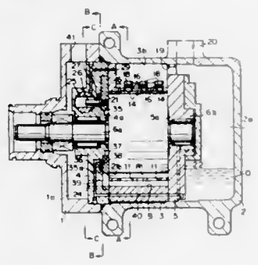
1. A hand-operated pump changeable from double action to single action comprising: a hollow cylindrical body having a side wall; a plunger slidably positioned within the cylindrical side wall for dividing the interior of the body into a first variable volume chamber and a second variable volume chamber; each of said first and second variable volume chambers having a closed end wall; the body having a passage therein to the outside in communication with the first chamber; a pump comprising unidirectional valve means for controlling intake of fluid from the outside of the body into the chambers and from the inside of the chambers to outside the body; a handle, coupled to the plunger for reciprocally driving the plunger in opposite directions, including a to-stroke during which the handle is drawn away from the pump body and during which to-stroke the pump intakes fluid from the outside of the body into the second chamber, and in which fluid is delivered from the first chamber to the outside, and a fro-stroke in which the handle is urged towards the pump body and during which fro-stroke fluid is drawn in from the outside of the body into the first chamber and fluid is delivered from the second chamber to the outside; and normally closed means located in the passage for selectively venting the first chamber to the outside, when the passage is closed the pump operates with dual action on the to-stroke and the fro-stroke and when the passage is vented, the pump operates with aingle action on the fro-stroke.

4,842,490

VARIABLE DISPLACEMENT VANE COMPRESSOR

Yasushi Watanabe; Shinichi Suzuki; Masahiro Kawaguchi, and Tatsuya Naki, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Apr. 4, 1988, Ser. No. 176,872
Claims priority, application Japan, Apr. 16, 1987, 62-094867
Int. Cl.[4] F04B *49/02*; F04C *29/08*
U.S. Cl. 417—295 **3 Claims**



1. A variable displacement vane compressor for an air conditioning system used in a vehicle such as an automobile, comprising:

a cylinder assembly including a cylindrical body having a bore and opposed end wall members secured to opposed ends of the cylindrical body, respectively, for closing open ends of the bore;

a rotor disposed within the bore for rotation so as to form at least one crescent chamber between the rotor and the bore of the cylindrical assembly for receiving a refrigerant, the rotor having at least one vane which is extendably fitted in the rotor so that a free end of the vane is in contact with the circumferential inner wall surface of the bore during the rotation of the rotor whereby, when the vane has passed through the crescent chamber, the refrigerant received therein can be compressed;

the cylinder assembly having a discharge chamber for receiving the refrigerant discharged from the crescent chamber after compression therein and a suction chamber for receiving the refrigerant returned from the air conditioning system before being introduced into the crescent chamber;

an annular plate member disposed between one of the end wall members and associated end portion of the cylindrical body in such a manner that one surface of the annular plate member is in close contact with the associated surface of the end wall member and is rotatingly displaceable between first and second positions while sliding on the associated surface of the end wall member;

the annular plate member having an arcuate slot for adjusting the maximum volume of the crescent chamber when the effective compression mode begins to compress the refrigerant received therein by the throttling effect of the slot, which varies in accordance with the displacement of the annular plate member between the first and second positions;

a driving means for displacing the annular plate member between the first and second positions in response to a change of a cooling load of the air conditioning system, comprising a hydraulic actuator including a spool member movably received within a cylindrical bore so as to divide the cylindrical bore into first and second compartments, the first compartment being communicated with the discharging room filled with the refrigerant discharged from the crescent chamber and the second compartment being communicated with a reservoir for the lubricant oil under pressure corresponding to a pressure of the refrigerant discharged from the crescent chamber, the spool being

connected to the annular plate member through a pin fixed on the annular plate member, whereby the movement of the spool is transferred to the annular plate member to cause a movement thereof between the first and second positions;

a valve means for controlling an amount of oil introduced through an oil passage from the reservoir to the second compartment;

a valve actuator for operating the valve means, comprising a piston member having one end exposed to a pressure of the refrigerant returned from the air conditioning system to the suction chamber so that the valve means is actuated in response the change of the refrigerant pressure;

a sealing means for fluid-tightly separating high and low pressure regions in the compressor, the sealing means being disposed between the surfaces of the annular plate member and the end wall member which are in contact with each other, the low pressure chamber being located radially inwardly of the seal means; and

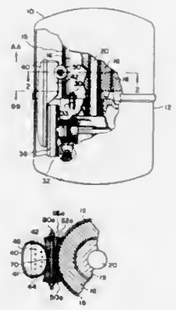
an oil supplying means for introducing an oil from the oil reservoir, under the pressure corresponding to that of the refrigerant discharge from the crescent chamber, to a low pressure side of the sealing means.

4,842,491

APPARATUS AND METHOD OF DETERMINING COMPRESSOR STRUCTURAL RESONANT FREQUENCY

Chih M. Lin, Tyler, Tex., assignor to American Standard Inc., New York, N.Y.

Filed Feb. 12, 1988, Ser. No. 155,431
Int. Cl.[4] F04B *21/00*
U.S. Cl. 417—312 **23 Claims**



1. A gas compressor comprised of:

means for compressing a gas;

means for driving said compressing means, said drive means having an exterior portion thereof;

a muffler attached to said compressing means, said muffler having an exterior portion thereof in a generally spaced relationship to said exterior portion of said drive means; and

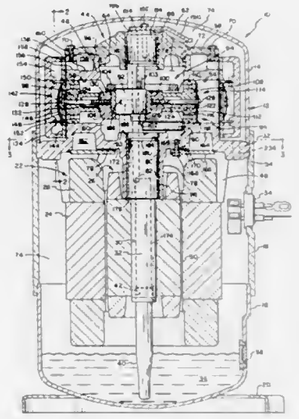
means for mechanically linking said exterior portion of said drive means and said exterior portion of said muffler, said means disposed between said drive means and said muffler, and said linking means being adjustable to selectively determine a resonant frequency of said gas compressor when said drive means is operative.

4,842,492

COMPRESSOR DISCHARGE MUFFLER HAVING COVER PLATE

Edwin L. Gannaway, Adrian, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Jan. 25, 1988, Ser. No. 148,073
Int. Cl.[4] F04B *11/00*
U.S. Cl. 417—312 **19 Claims**



1. A compressor assembly, comprising:

a hermetically sealed housing defining a discharge pressure space therein;

pressure space therein;

a crankcase within said housing, including a plurality of radially disposed cylinders formed therein, said crankcase including a cavity into which said plurality of cylinders open;

a crankshaft rotatably received in said crankcase and having a plurality of pistons operably connected thereto within said cavity, said pistons being operably received in respective said cylinders to compress gaseous refrigerant received therein;

a first muffling chamber and a second muffling chamber located on respective opposite axial ends of said crankcase, said second muffling chamber comprising an annular channel formed in said respective axial end, and a substantially planar, ring-shaped channel cover plate fixedly mounted to said respective axial end portion at one of a radially inner adjacent portion and a radially outer adjacent portion of said axial end with respect to said channel, said cover plate being biased in engagement with the other of said radially inner adjacent portion and said radially outer adjacent portion;

means for discharging gaseous refrigerant compressed within said plurality of cylinders into said first muffling chamber;

gas passage means extending through said crankcase for providing communication between said first muffling chamber and said second muffling chamber; and

means for exhausting gaseous refrigerant from said second muffling chamber into said discharge pressure space, said means comprising an annular exhaust port defined by an annular space between said cover plate and said one of said radially inner adjacent portion and said radially outer adjacent portion.

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4,842,493

PIEZOELECTRIC PUMP

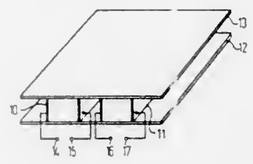
Kenth Nilsson, Akersberga, Sweden, assignor to Qenico AB, Sweden

Filed Nov. 16, 1987, Ser. No. 121,347

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1986, 3638883

Int. Cl.[4] F04B *17/00*

U.S. Cl. 417—322 13 Claims



1. A piezoelectric pump, comprising:

a pump channel formed by first and second piezoceramic parts arranged substantially parallel to and at a distance from one another and wherein each is provided with electrical contacts at both sides;

said piezoceramic parts being polarized such that a polarization direction lies parallel to a field strength generated with voltage applied to the electrical contacts;

a space between the first and second piezoceramic parts being enclosed with closure means for closing opposite sides of the space so as to form the pump channel; and

the electrical contacts being arranged substantially perpendicular to the closure means.

4,842,494

REFRIGERATOR COMPRESSOR/INTERNAL COMBUSTION ENGINE UNIT OF THE ROTARY PISTON TYPE

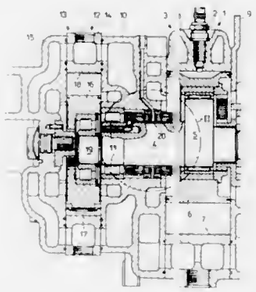
Josef Speiser, Wasserburg, Fed. Rep. of Germany, assignor to Wankel GmbH, Berlin, Fed. Rep. of Germany and Aisin Seiki Co., Ltd., Kariya, Japan

Filed Mar. 17, 1988, Ser. No. 169,298

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709106

Int. Cl.[4] F04C *2/00*

U.S. Cl. 417—364 4 Claims



1. A machine unit comprising: a refrigerating compressor and an internal combustion engine of the trochoid type including casing elements therewith and including pistons revolving in a planetary arrangement on eccentric means of an eccentric shaft, in common therewith, as well as a ventilatable intermediate sealing means arranged in a central casing element between the casing elements of said internal combustion engine and said compressor, around said eccentric shaft, and

a main bearing located between both machines, with the compressor being cantilever mounted at an end of the eccentric shaft outside of said main bearing, said intermediate sealing means of said eccentric shaft being disposed between said eccentric means of said internal combustion engine and said main bearing.

4,842,495

NON THROTTLING DISCHARGE PUMP ASSEMBLY

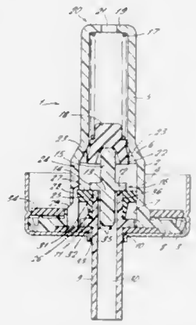
David J. Howlett, King's Lynn, United Kingdom, assignor to Bespak Plc, Norfolk, United Kingdom

Filed Oct. 23, 1987, Ser. No. 111,548

Claims priority, application United Kingdom, Oct. 24, 1986, 8625491

Int. Cl.[4] F04B *13/00*

U.S. Cl. 417—488 12 Claims



1. A pump assembly for an atomising piston pump comprising a piston slidably located in a cylinder, a variable volume fluid storage chamber in communication with the cylinder on one side of the piston, means for varying the volume of the chamber, resilient means urging the varying means into a position corresponding to the minimum volume of the chamber, a fluid flow passageway through the piston, a resilient valve member normally closing the passageway and deforming means for deforming the valve member so as to open the passageway only after the piston has moved relative to the cylinder by a predetermined amount greater than zero, the piston including a cylindrical surface in which an aperture of the passageway is formed, the resilient valve member including a sleeve portion which overlays the cylindrical surface where it normally obturates the aperture, the sleeve portion is axially compressible by the deforming means so as to at least partially uncover the aperture to open the passageway, the resilient valve member is movable with and mounted coaxially on the piston and further comprises a piston ring portion of larger radius than the sleeve portion, the piston ring portion forming a circumferentially complete seal between the piston and the cylinder throughout at least part of the piston stroke.

4,842,496

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES INCLUDING ONSET OF SUPPLY CONTROL MEANS

Walter Häfele, Fellbach, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 31, 1984, Ser. No. 687,900

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1984, 3409295

Int. Cl.[4] F02M *59/38*

U.S. Cl. 417—490 14 Claims

1. A fuel injection pump for internal combustion engines comprising

a pump housing, a bushing in said pump housing, a cylinder bore in said pump housing and said bushing,

at least one pump piston guided inside said cylinder bore and defining a pump work chamber;

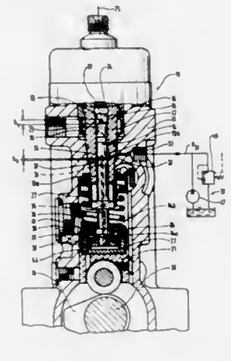
a fuel inlet opening in said housing and said bushing that discharges into said cylinder bore,

a control face on the pump piston which after a pre-stroke (h_F), closes said opening discharging into said cylinder bore thereby controlling supply onset;

a drive tappet subjected to the restoring force of a tappet spring coupled with a piston base of the pump piston;

a hydraulic supply onset adjusting device integrated into the drive tappet said device arranged to contain an adjusting piston supporting the piston base and guided in a work cylinder inside the tappet having an end portion and defining a pressure chamber in the work cylinder;

a control fluid source,



a delivery conduit in said housing connected to said control fluid source,

a connecting conduit in said bushing arranged to establish a connection between said control fluid source and the pressure chamber in said work cylinder, when the pump piston is at bottom dead center said conduit communicates with said delivery conduit in said pump housing;

the delivery conduit in said housing and said conduit in said bushing arranged to discharge into a section of the cylinder bore located between the pump work chamber and an end section of said bushing with said section of the cylinder bore continuously covered by the pump piston during pump delivery;

and a connecting conduit which extends inside said pump piston and thereby serves to connect the delivery conduit in said pump housing and said conduit in said bushing with the pressure chamber of the supply onset adjusting device.

4,842,497

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Walter Häfele, Fellbach; Manfred Krämer, Schwieberdingen, and Johann Warga, Bietigheim-Bissingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE87/00116, § 371 Date Oct. 13, 1987, § 102(e) Date Oct. 13, 1987, PCT Pub. No. WO87/05664, PCT Pub. Date Sep. 24, 1987

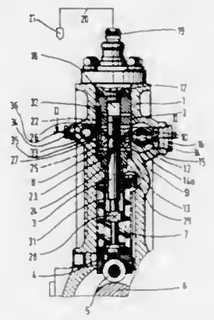
PCT Filed Mar. 19, 1987, Ser. No. 130,232

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1986, 3609760; Sep. 10, 1986, 3630799

Int. Cl.[4] F02M *59/24, 59/44*

U.S. Cl. 417—499 12 Claims

1. Fuel injection pump for internal combustion engines comprising a pump casing, several pump elements arranged in-line in the pump casing and driven by a common camshaft, each pump element having a pump piston and a pump cylinder and a pump working space bound by said cylinder and said piston, a plurality of control spools each axially displaceable on each pump piston and controlling at least one control opening formed in an outer surface of the pump piston and connected to a central blind hole formed in the pump piston and open to the pump working space, a suction space surrounding said individual control spools and bounded by said casing and filled with fuel at low pressure flowing through it, a torque shaft provided with adjustable drive trunnions and supported in the pump



casing at two ends thereof for a simultaneous operation of all control spools for the beginning and ending of pumping, said torque shaft (12) being divided into a first shaft part (38) having a free end and rotatably supported at said free end in the pump casing (1) and carrying said drive trunnions (14a), and a second shaft part (39) which is rotationally connected to the first shaft part (38) and is supported so as to be sealed in the pump casing (1) and which forms a radial guide (40, 41) for an end of the first shaft part (38) facing towards said second shaft part (39).

4,842,498

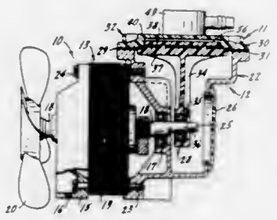
DIAPHRAGM COMPRESSOR

David Bramstedt, Sheboygan, and Roy J. Rozek, Plymouth, both of Wis., assignors to Thomas Industries, Inc., Sheboygan, Wis.

Continuation of Ser. No. 4,899, Jan. 20, 1987, abandoned. This application Apr. 28, 1988, Ser. No. 187,318

Int. Cl.[4] F04B *21/02, 35/04, 43/04*

U.S. Cl. 417—571 5 Claims



1. A single use valve and pumping chamber assembly for a diaphragm compressor, said single use valve and pumping chamber assembly including

a single use flexible diaphragm,

a single use connecting rod structure for actuating the flexible diaphragm by an eccentrically rotated compressor shaft,

said connecting rod structure comprising a unitary plastic structure having means for receiving an eccentric portion of a rotating compressor shaft at the lower end portion thereof, and means for fixing the flexible diaphragm to the upper end portion thereby whereby as said unitary struc-

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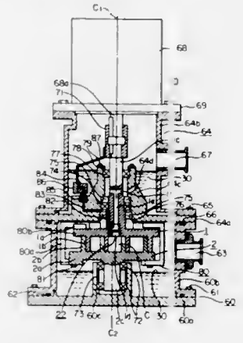
ture moves in generally upward and generally downward directions, it raises and lowers the flexible diaphragm,
a unitary, one piece housing adapted to be air tightly secured to the flexible diaphragm to thereby form, with the flexible diaphragm, an expandable and collapsible pumping chamber, fastening means for securing the housing to the compressor,
header means over the inlet passage in the housing and communicating with a source of inlet fluid, and over the outlet passage in the housing for exhausting fluid from the pumping chamber,
an inlet passage and an outlet passage in said header means,
inlet valve means in the inlet passage and outlet valve means in the outlet passage,
an access port in said housing adjacent to the lower end of said connecting rod structure to facilitate removal of said connecting rod structure from the compressor shaft, and
said diaphragm, connecting rod structure, housing, valve means and header means being removable and discardable as a unit with and from a driving compressor after a single use.

4,842,499

SCROLL-TYPE POSITIVE DISPLACEMENT APPARATUS WITH OIL SUPPLY TO COMPRESSION CHAMBER

Mitsuhiro Nishida; Isamu Etou, both of Fuknoka, and Etsuo Morishita, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Division of Ser. No. 98,961, Sep. 21, 1987. This application Apr. 6, 1988, Ser. No. 178,356
Claims priority, application Japan, Sep. 24, 1986, 61-226976; Mar. 31, 1987, 62-79901; Jul. 16, 1987, 62-179357
Int. Cl.[4] F04C *18/04* *27/02*
U.S. Cl. 418—55 **7 Claims**



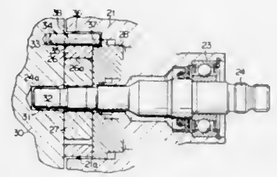
1. A scroll-type fluid machine comprising:
a first vessel which has a suction port;
a second vessel which is hermetically connected to said first vessel, which has an exhaust port, and which is partially filled with lubricating oil;
a first scroll which is disposed in said first vessel and which has at its center a discharge port which communicates with the interior of said second vessel beneath the level of the oil;
a second scroll which is combined with said first scroll so as to define at least one compression chamber;
drive means for rotating at least one of said scrolls so that said compression chamber is moved from a position in which it communicates with said suction port to a position in which it communicates with said discharge port and which at the same time is decreased in volume;
a check valve which blocks reverse flow through said discharge port;
an oil supply passageway which is formed in said first scroll and which has one end which communicates with the inside of said second vessel and another end which opens onto said compression chamber, the lubricating oil in said second vessel being able to flow through said oil supply passageway into said compression chamber when said oil supply passageway is open; and
a valve member which opens and closes said oil supply passageway.

4,842,500

VANE PUMP WITH POSITIONING PINS FOR CAM RING

Tohru Fujie, and Yoshio Hirose, both of Atsugi, Japan, assignors to Atsugi Motor Parts Company, Limited, Japan

Continuation of Ser. No. 40,333, Apr. 20, 1987, abandoned. This application Aug. 9, 1988, Ser. No. 230,701
Claims priority, application Japan, May 20, 1986, 61-117066
Int. Cl.[4] F04C *2/344*
U.S. Cl. 418—133 **2 Claims**



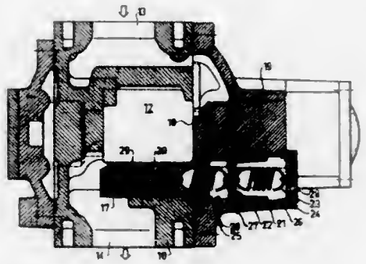
1. A vane pump comprising
a housing having front and rear surfaces and an inner peripheral wall, said housing being formed with a cam ring housing portion which is open to said front surface, the housing being further formed at its peripheral wall with recess portions and an axial bore extending from said rear surface, said axial bore being open to a center of said cam ring housing portion;
a drive shaft freely rotatably supported in said axial bore of said housing;
a rotor inserted on said drive shaft and engaged with said drive shaft, the rotor having a plurality of slits and a plurality of vanes, each vane projectable from and retractable in a corresponding slit;
a cam ring having open ends, an inner peripheral wall and, at its inner peripheral wall, a cam surface which surrounds said rotor and forms pump chambers in cooperation with said vanes, said cam ring further having an outer peripheral wall and, at its outer peripheral wall, recess portions of substantially semicircular configuration in cross section;
a front end plate by which said cam ring is closed at one end;
a rear end plate formed with a bearing portion through which one end portion of said drive shaft is freely rotatably supported, the rear end plate also formed with at least a pair of openings, each of said openings being spaced at a predetermined distance from a center axis of said bearing portion of said rear end plate; and
knock pins fixedly inserted in said at least a pair of openings of said rear end plate, disposed to engage said cam ring in said semicircular recess portions of said cam ring, and disposed with clearance in bores defined by said recess portions of said housing so that said cam ring is held and positioned only with respect to said rear end plate.

4,842,501

DEVICE FOR CONTROLLING THE INTERNAL COMPRESSION IN A SCREW COMPRESSOR

Lauritz B. Schibbye, Saltsjö-Duvnäs, and Rolf A. England, Spanga, both of Sweden, assignors to Sullair Technology AB, Sweden

Continuation-in-part of Ser. No. 489,788, Apr. 29, 1983, abandoned. This application Mar. 4, 1985, Ser. No. 707,545
Claims priority, application Sweden, Apr. 30, 1982, 8202734
Int. Cl.[4] F04C *29/08*
U.S. Cl. 418—201 **5 Claims**



1. A fluid injected screw compressor having a compressor housing with a suction side communicating with a compression space including two intermeshing rotors, said compression space having an inlet part including an inlet end plane adjacent the suction side and a compression part, the improvement comprising:
an axially movable sliding valve for controlling the internal compression in the compressor arranged in parallel with the rotors at the compression part of the compression space, which sliding valve in the position yielding the highest internal compression extends over the major part of the length of the rotors and outwardly over said inlet end plane and is axially adjustable in response to the outlet pressure from the compressor,
at least one unloading valve on each side of the compressor housing movable radially to the rotors for controlling the compressor capacity, each of said unloading valves being substantially positioned in the plane going through the centers of both rotors and connected to the compression space so that when opened a part of the gas will be discharged from the compression space to the suction side of the compressor, and
pressure spaces and tension springs arranged in series and acting upon the sliding valve to make the sliding valve adjustable in steps.

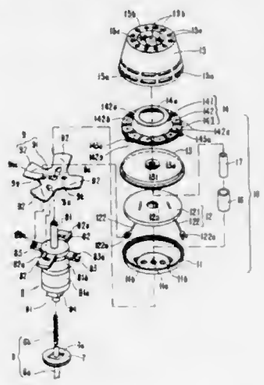
4,842,502

COTTON CANDY MACHINE

Mitsuyo Tsumita, and Yuji Yamane, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Jan. 15, 1988, Ser. No. 144,064
Claims priority, application Japan, May 20, 1986, 61-76105
Int. Cl.[4] B29C *67/02*
U.S. Cl. 425—9 **11 Claims**

1. A cotton candy machine comprising,
a rotary pan having upper and lower plates and a radial outlet defined between peripheral edges of the upper and lower plates,
a plate-shaped heating element disposed beneath the lower plate of the rotary pan and being rotatable with the rotary pan and in surface contact with the lower plate,
a motor having an output shaft connected to the rotary pan for imparting rotary motion to the rotary pan and to the heating element,
a sliding electrical connection for connecting the heating element to a power source,
a dish for supporting the heating element beneath the lower plate and being supported on the output shaft of the motor beneath the rotary pan, and



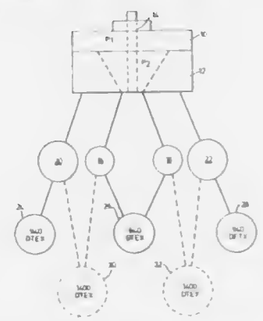
a cooling fan disposed beneath the dish for cooling melted sugar which is discharged by centrifugal force from the radial outlet of the rotary pan.

4,842,503

SPINNING PACK DESIGN

Ronald J. Judge, Kingston, Canada, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 24, 1988, Ser. No. 261,563
Int. Cl.[4] D01D *1/06*
U.S. Cl. 425—72.2 **6 Claims**



1. Apparatus for spinning, said apparatus comprising:
a spinning pack comprising a polymer inlet zone and a spinneret assembly;
a first metering pump for pumping a first set of molten polymer streams of equal flow rate to said polymer inlet zone; and
a second metering pump for pumping a second set of two molten polymer streams of equal flow rate to said polymer inlet zone, said second pump having twice the capacity of said first pump;
wherein said spinneret assembly comprises a pair of spinnerets interchangeably locatable in said spinning pack, one of said spinnerets being adapted to combine said first set of streams to produce three ends of filaments and the other of said spinnerets being adapted to combine each of said first

streams with a respective one of said second streams to provide two ends of filaments.

4,842,504

LIP HEATER FOR PLASTIC EXTRUSION DIE

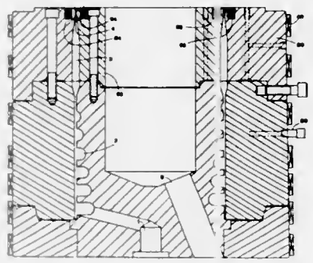
Alfredo Bontvoglio, and Ricardo P. Rodrigues, both of Ontario, Canada, assignors to Polysystem Machinery MFG. Inc., Mississauga, Canada

Continuation of Ser. No. 45,514, May 4, 1987. This application Aug. 16, 1988, Ser. No. 232,668

Claims priority, application United Kingdom, May 8, 1986, 8611186

Int. Cl.[4] B29C 47/86

U.S. Cl. 425—143 **9 Claims**



1. Apparatus which is suitable for use in producing plastic film by extrusion, wherein:

the apparatus includes an inner die (6) and an outer die (80);

the dies have complementary surfaces which comprise the respective inner (6) and outer (8) lips of an annular nozzle (4);

the outer die comprises a massive bulk of material of generally cylindrical-annular form, having an upper face;

the upper face is annular in form, having an inner diameter and an outer diameter;

the surface which comprises the outer lip extends down into the outer die from the inner diameter of the annular upper face;

the outer die includes a means for heating the bulk of the die to a first temperature;

the outer die is provided with a deep annular groove, having a base, an inner wall and an outer wall;

the depth of the groove extends down into the bulk of the outer die from the annular upper face;

the inner wall of the groove is in close proximity to the surface which comprises the outer lip;

the apparatus includes an outer lip heater, for heating the die to a second temperature, which is higher than the first temperature;

the outer lip heater includes an annular ring (82), and a means (84) for heating the ring;

the ring (82) is made of a good heat-conducting material, whereby all locations around the annulus of the ring are constrained to be at substantially the same temperature;

the form of the ring in cross-section taken at one radius of the ring is in substance identical to the form of the ring in cross-section taken at every other radius of the ring;

the apparatus includes a heat-conduction means for ensuring that heat from the ring (82) is transferred easily and evenly to the outer lip (8) of the nozzle (4);

the apparatus includes a heat-insulating means for insulating the bulk of the outer die (80) against heat transfer from the said ring (82);

the ring is received inside the deep annular groove;

and the depth of the groove is such that substantially all of the ring (82) is effectively isolated inside the groove against the impingement against the ring of drafts in the surrounding air.

4,842,505

APPARATUS FOR PRODUCING FIBROUS STRUCTURES ELECTROSTATICALLY

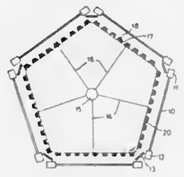
David Annis, Bromborough, and John P. Berry, West Kirby, both of England, assignors to Ethicon, Somerville, N.J. and University of Liverpool

Filed Mar. 20, 1987, Ser. No. 28,519

Claims priority, application United Kingdom, Mar. 24, 1986, 8607235

Int. Cl.[4] B29B 13/08

U.S. Cl. 425—174.8 E **2 Claims**



1. Apparatus for continuously producing a plurality of individual tubular fibrous structures, which apparatus comprises a plurality of spaced apart fiber collectors, electrostatically charged in use, each of said collectors comprising a rotatable mandrel, and delivery means for delivering fiberizable material towards the collectors, which delivery means comprises a continuous delivery loop path, said collectors being disposed substantially uniformly outwardly of said delivery loop path, a multiplicity of ejection outlets for fiberizing materials spaced apart along the loop path, means for supplying fiberizable material to the ejection outlets, and means for moving the outlets around the loop path to cause, in use, continuous movement of the ejection outlets past the collectors, said collectors further comprising electrostatically charged means in the regions of the ends of the collectors to provide a continuous electrostatic field around the loop path to attract material from the ejection outlets to avoid discontinuity in ejection.

4,842,506

CLAMPING DEVICE FOR REMOVABLY SECURING SHAPING MOULDS ON THE PLATES OF MOULDING PRESSES

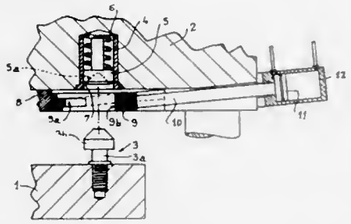
André Coutier, Le Pont d'Eafen, Champfromier, France (01410)

Filed Mar. 23, 1988, Ser. No. 172,417

Claims priority, application France, Mar. 26, 1987, 87 04441

Int. Cl.[4] B28B 17/00

U.S. Cl. 425—193 **3 Claims**



1. A clamping device for removably securing shaping moulds on the plates of moulding presses comprising the shaping mould having an upper surface, a catch secured to said upper surface of the shaping mould, said catch having a generally cylindrical shank and an outer head, said outer head having a greater width dimension than the diameter of said shank and a lower surface which is substantially parallel to said upper surface of the shaping mould, the plate of the moulding press having a lower surface, a bushing within the plate and being open at said lower surface, said bushing being in generally opposing relationship to said catch and being of a size to cooperatively receive said catch therein, a guide member secured to said plate and having grooves which are obliquely oriented with respect to said lower surface of the plate, a slide element mounted within said grooves of said guide member, said slide element having a button hole opening therein, said button hole opening having a first opening size of a large diameter to permit said outer head of said catch to pass therethrough and into said bushing when said slide element is in a first position with respect to the plate and having a second opening of a smaller size which is less than the width dimension of said outer head of said catch so that said shank of said catch extends therethrough and said slide element engages said lower surface of said head when said slide element is moved to a second position with respect to the plate, said second position being in closer proximity to the plate than said first position, and jack means for moving said slide element obliquely along said grooves of said guide member whereby when said slide element is moved to said second position, said catch is urged inwardly with respect to said bushing by said slide element to thereby securely lock the shaping mould into engagement with the plate.

4,842,507

INJECTION APPARATUS

Toshiro Kawaguchi, Yamaguchi; Takefumi Someda, and Kiyoshi Hashimoto, both of Ube, all of Japan, assignors to UBE Industries, Ltd., Japan

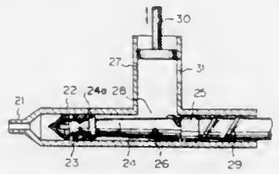
Continuation of Ser. No. 852,573, Apr. 16, 1986, Pat. No. 4,767,306. This application Jun. 7, 1988, Ser. No. 202,497

Claims priority, application Japan, Apr. 16, 1985, 60-79197; Jul. 31, 1985, 60-168898

The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.

Int. Cl.[4] B29C 45/23

U.S. Cl. 425—382.4 **6 Claims**



1. An injection molding apparatus for injecting a thermosetting resin having fibers into a mold, comprising:

a cylindrical barrel having a central axis and a tapered first end forming an injection nozzle;

supply means for injecting a predetermined flow of the thermosetting resin into said cylindrical barrel, said supply means including an outlet port extending axially along said barrel;

plunger means disposed within said barrel for channeling the thermosetting resin toward said injection nozzle and for injecting the thermosetting resin through said injection nozzle, said plunger means including an elongated plunger and motor means connected to said plunger at a second end of said barrel for selectively rotating and reciprocating said plunger about the axis of said barrel, said plunger means including a plunger head at an end of said plunger facing said injection nozzle, groove means along the periphery of said plunger substantially adjacent said plunger head, and a check ring slidably and rotatably confined within said barrel along said groove means to admit the thermosetting resin into an expandable metering chamber extending between said injection nozzle and said plunger head, said check ring also preventing a backflow of the thermosetting resin from said metering chamber, said plunger having a peripheral portion between said groove means and said outlet port of said supply means sized to have a cross section narrower than the diameter of said cylindrical barrel, said peripheral portion and said barrel defining a continuous annular gap between said groove means and said outlet port to channel the thermosetting resin containing the fibers into said metering chamber; and

means for generating back pressure within said barrel to urge said plunger toward said second end further filling said metering chamber with the thermosetting resin, the metered resin being injected through axial movement of said plunger in the direction of said injection nozzle.

4,842,508

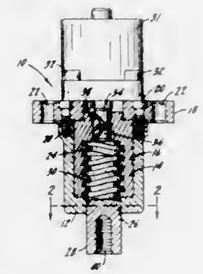
CORE INSERT ACTUATOR

Borislav Boskovic, 2182 Bannockburn, Inverness, Fl. 60067

Filed Aug. 15, 1988, Ser. No. 232,276

Int. Cl.[4] B29C 45/36

U.S. Cl. 425—468 **6 Claims**



1. A device for inserting and withdrawing a core in a plastic mold to create a void in a molded plastic article, comprising

a. a housing having a hollow cylindrical interior,

b. a rotatable cylindrical nut conforming to and captured within said interior, said nut having a threaded inner cavity,

c. an aperture in said housing in axial alignment with said inner cavity,

d. a non-rotatable elongated slide having a portion extending from said housing through said aperture, said slide having a threaded end engaging said threaded inner cavity,

e. means for preventing rotation of said slide relative to said housing, and

f. means for rotating said nut to axially extend and retract said slide through said aperture.

4,842,509

PROCESS FOR FUEL COMBUSTION WITH LOW NO_x SOOT AND PARTICULATES EMISSION

Hendrikus J. A. Hasenack, Badhuisweg, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 595,132, Mar. 30, 1984, abandoned. This application Apr. 6, 1987, Ser. No. 35,202

Claims priority, application United Kingdom, Mar. 30, 1983, 8308836

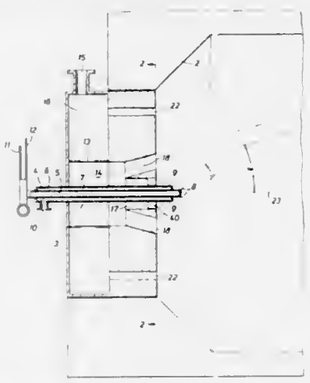
Int. Cl.[4] F23D 11/00

U.S. Cl. 431—10 **10 Claims**

1. A process for combustion of a liquid fuel comprising combusting said fuel initially with a substoichiometric amount of air in a combustion chamber, the fuel and combustion air being introduced, respectively, in an equal number of fuel jets and high velocity combustion air jets into the chamber in such manner that

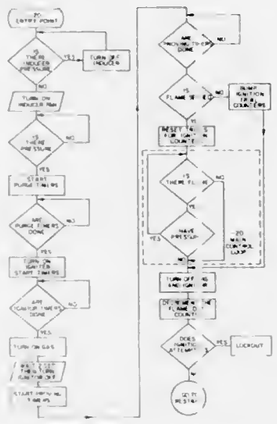
(a) each fuel jet merges into one high velocity air jet,

(b) the characteristic mixing time of each fuel jet with each therefor air jet is less than about 10^{-4} sec, and
(c) a plurality of separate fuel/air jets are generated forming at ignition a plurality of primary flames in which a resi-



dence time for the fuel of substantially at least 100 ms is maintained;
and introducing additional combustion air into said chamber for complete combustion of the fuel.

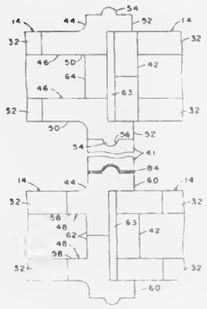
4,842,510
INTEGRATED FURNACE CONTROL HAVING IGNITION AND PRESSURE SWITCH DIAGNOSTICS
Michael T. Grunden; Stephen E. Yount, and Eugene P. Mierzwinski, all of Fort Wayne, Ind., assignors to Hamilton Standard Controls, Inc., Farmington, Conn.
Filed Sep. 10, 1987, Ser. No. 95,506
Int. Cl.[4] F23N *5/18*
U.S. Cl. 431—19 **12 Claims**



1. An integrated digital electronic burner control for a gas burner of the type having at least one gas valve control relay operable upon command from the integrated burner control to open a gas valve and supply gas to a burner combustion chamber, an inducer fan for supplying air to the burner combustion chamber, and a pressure sensor for sensing operation of the inducer fan comprising:
means operable upon command for sending an interrogation signal to the sensor, the sensor selectively providing a return signal to the integrated burner control indicative of the presence of adequate air flow;
means for checking whether said sensor has provided said return signal to the integrated burner control; and
means for enabling the gas valve control relay upon command only following determination of the receipt of the return signal.

12. An integrated burner control for a gas burner of the type having at least one gas valve control relay operable upon command from the integrated burner control to open a gas valve and supply gas to a burner combustion chamber, an inducer fan for supplying air to the burner combustion chamber, and a sensor for sensing operation of the inducer fan comprising:
means for performing a first interrogation on the sensor prior to enabling the inducer fan and a second interrogation on the sensor subsequent to enabling the inducer fan; and
means for proceeding with an attempt to ignite the burner only if a result of the second interrogation differs from a result of the first interrogation.

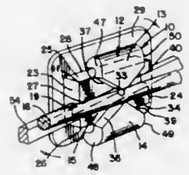
4,842,511
CARBON BAKING FURNACE—REFRACTORY CONSTRUCTION
Leland L. Young, Allison Park, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Dec. 28, 1987, Ser. No. 138,205
Int. Cl.[4] F27B *7/00*
U.S. Cl. 432—192 **16 Claims**



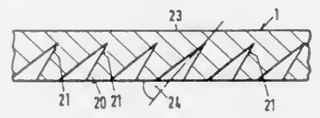
1. A ring furnace, comprising:
a plurality of pits in rows and sections with flues separating adjacent pits in sections with the flues joined end-to-end with slip joints to provide a continuous flue on each side of each row of pits, the slip joints accommodating expansion of the flues while blocking incursion of carbon powder or packing coke into the flues without need for packing with a non-bonding sealing material, and with individual headwalls separating adjacent pits in each row with opposing ends of each headwall connected to flues on each side of the pits.

4,842,512
COMBINATION EDGEWISE BRACKET
Christopher K. Kesling, LaPorte, Ind., assignor to TP Orthodontics, Inc., Westville, Ind.
Filed Nov. 21, 1986, Ser. No. 933,578
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—8 **17 Claims**

1. A combination edgewise bracket comprising, a base portion and a tie wing extending buccolabially from the base portion, first and second horizontally opening and horizontally aligned archwire slots formed in said base portion and said tie wing, one of said slots being Sved shaped to coact with an archwire and allow free tipping, and the other of said slots being rectangular to coact with an archwire and obtain uprighting and torquing, and said second slot opening into said first slot, whereby said Sved slot will permit tipping and uprighting movements when aligned with an archwire, and said rectangular slot will prevent tipping or uprighting movements when aligned with an archwire and will provide torquing movement when aligned with a mating rectangular archwire.



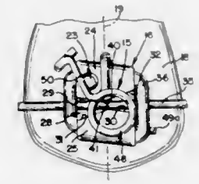
4,842,513
ORTHODONTIC DEVICE
Bodo Haarmann, Bad Rothenfelde, Fed. Rep. of Germany, assignor to Harodent-KFO Dental-Vertrieb GmbH, Georgsmarienhuette, Fed. Rep. of Germany
Filed Nov. 17, 1986, Ser. No. 931,767
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1985, 3541506
Int. Cl.[4] A61C *3/00*
U.S. Cl. 433—9 **13 Claims**



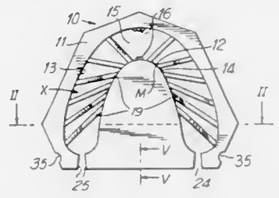
1. An orthodontic device in the form of a bracket comprising wings disposed on a baseplate, welding means welding said wings to said baseplate, said baseplate being formed as a separate preformed individual part, said wings being formed as separate shaped parts which are individually cut out in final shape from a bar by laser cutting, said baseplate having one side to which said wings are welded and an opposite side defining a base side, and a plurality of recesses in said base side formed by a laser beam, said recessed having a conical configuration with one end being the apex and the other end being circular, said circular end opening up onto said base side, said recesses having a longitudinal axis extending through said apex and through the center of said circular end, said apex extending at an acute angle relative to said base side.

4,842,514
UPRIGHTING SPRING
Peter C. Kesling, LaPorte, Ind., assignor to TP Orthodontics, Inc., Westville, Ind.
Filed Jan. 7, 1988, Ser. No. 141,587
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—21 **26 Claims**

1. An uprighting spring for use with an orthodontic bracket having an archwire slot, an archwire secured in said slot and a vertically extending opening at one side of said archwire slot, said spring comprising a coil, an arm terminating in a hook and connected to one end of the coil, and a tail or leg connected to the other end of the coil, said coil being disposed between the arm and leg, said tail or leg adapted to extend through said opening to anchor one end of the spring, said hook on said arm being adapted to engage the archwire and activate the spring, and said coil, arm and leg being arranged and positioned relative to the bracket such that said coil is disposed at the labial of said bracket and generally within the labial profile of the bracket to thereby compact the overall profile of the bracket and spring.



4,842,515
SUPPORTING PLATE FOR A DENTAL MODEL AND METHOD OF MAKING A DENTAL MODEL
Manfred P. Zeiser, Im Wolfsgalgen 8, 7141 Schwieberdingen, Fed. Rep. of Germany
Filed Apr. 30, 1987, Ser. No. 44,979
Claims priority, application Fed. Rep. of Germany, May 10, 1986, 3615821
Int. Cl.[4] A61C *19/00*
U.S. Cl. 433—74 **45 Claims**



1. A supporting plate for a dental model for preparation of dental prothesis parts, comprising a first tongue-side portion and a second cheek-side portion both having side walls which are to be aligned with each other, said first and second portions defining therebetween a groove of a shape corresponding to the shape of a tooth arch and forming respective guiding surfaces for the guiding a model tooth stump during the hardening of a model material, and means including a plurality of connection elements (19) for holding said second portion to said first portion and at the same time permitting uniform movement between opposite sides of said first and second portions so as to permit a change in a distance between a side wall (13) of said second portion and a side wall (14) of said first portion.

41. A method of making a dental model by means of a mold with a supporting plate comprising a first tongue-side portion and a second cheek-side portion both having side walls which are to be aligned with each other, said first and second portion defining therebetween a groove of a shape corresponding to the shape of a tooth arch and forming respective guiding surfaces for guiding a model tooth stump during the hardening of a model material, and at least one connection element (19) for holding said second portion to said first portion, said connection element being formed so that it permits a change in a distance between a side wall (13) of said second portion and a side wall (14) of said first portion, the method comprising the steps of filling a hardenable model material into said supporting plate, the side walls of which during hardening of said material form guide surfaces on a guide abutment of a model tooth stump, wherein at least during a predetermined time interval while said material is hardened, a deflection of a side wall of a portion of the supported plate is permitted.

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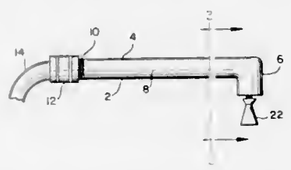
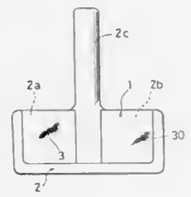
4,842,516
DISPOSABLE HAND TOOL FOR HEALTH CARE PROCEDURES
George P. Choisser, 14130 Michael St. Orland Park, Ill. 60462
Filed Feb. 10, 1988, Ser. No. 154,397
Int. Cl.[4] A61C *1/05*
U.S. Cl. 433—132 9 Claims



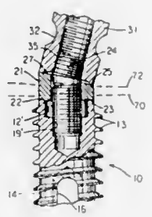
1. A disposable hand tool for performing dental and other health care procedures on a single patient and a repeatedly useable flexible power supply hose combination, said disposable hand tool comprising a disposable structure to be disposed of after use with a single patient to support a turbine therein for rotation, connecting means for connection of said disposable structure to said repeatedly useable flexible power supply hose, said disposable structure having an operating chamber section to receive and rotatably support said turbine therein for use in close proximity to a said patient, an elongated section integrally joined to said operating chamber section to provide a hand grasp means for manipulating said operating chamber section and said turbine when in use on a said patient and to space said operating chamber section when used in close proximity to a said patient apart from said flexible power supply hose to keep it out of close proximity to a said patient, a passageway in said disposable structure to direct a supply of pressurized fluid to said turbine to cause it to rotate, a tubular wall portion of said disposable structure surrounding said passageway and a tool for performing a dental or health care procedure connected to said turbine for rotation therewith, wherein said operating chamber section is bounded by a tubular side wall, said tubular side wall of said operating chamber being integrally formed with and extending from said elongated tubular wall portion surrounding said passageway at an oblique angle thereto.

4,842,517
ENDOSSEOUS IMPLANT HAVING MESH PORE STRUCTURE
Haruyuki Kawahara, Moriguchi; Katsumi Tanaka, Ninomiya; Yasuyuki Ashiura, Odawara, and Motonobu Yoshimura, Samukawa, all of Japan, assignors to Haruyuki Kawahara, Osaka and Toho Titanium Co., Ltd. Tokyo, both of, Japan
Filed Sep. 30, 1987, Ser. No. 103,433
Claims priority, application Japan, Dec. 5, 1986, 61-290126
Int. Cl.[4] A61C *13/00*; *8/00*
U.S. Cl. 433—173 6 Claims

1. An endosseous implant having a mesh pore structure comprising a portion to be embedded in a living bone tissue, said embedding portion comprising a hollow cylindrical body having two surfaces and being formed from at least a single sheet of metal mesh and into a desired shape by working the single sheet of metal mesh, said embedding portion having a multiplicity of mesh pores passing therethrough, whereby the embedding portion provides a mesh pore structure for ingrowth and penetration of said living bone tissue into both surfaces of said embedding portion;
a post for mounting a prosthetic member thereon connected to said embedding portion; and
a reinforcing frame for reinforcing the embedding portion connected to said post, whereby said hollow cylindrical body is reinforced to prevent circumferential deformation and said reinforcing frame includes a plurality of vertical rods provided spacedly away from one another along a peripheral direction of said post and has a ring-like frame secure to ends of said rods.

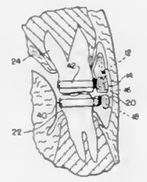


4,842,518
SUBMERGIBLE SCREW-TYPE DENTAL IMPLANT AND METHOD OF UTILIZATION
Leonard I. Linkow, New York, N.Y., and Anthony W. Rinaldi, Philadelphia, Pa., assignors to Vent-Plant Corporation, Philadelphia, Pa.
Continuation-in-part of Ser. No. 904,381, Sep. 4, 1986, Pat. No. 4,713,004. This application Mar. 16, 1987, Ser. No. 25,942
Int. Cl.[4] A61C *8/00*
U.S. Cl. 433—174 7 Claims



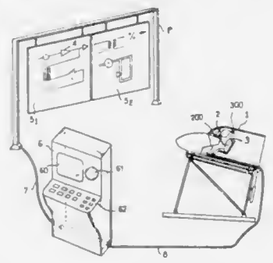
7. An oral implant for supporting an artificial tooth structure comprising:
an implant portion adapted to be fitted in an opening in a bone of a patient in the vicinity of the occlusal plane, which bone has exposed by an incision in the covering of fibromucosal tissue;
a threaded member connectable at one end to an outer end of said implant portion which is directed away from the opening in the bone when the implant portion is installed therein,
a beveled transition collar connectable to the threaded member and located about the member between the upper end of the implant portion and the support, the collar having one end surface at a right angle to the collar axis and the other end surface being at an angle with respect to the one end surface, and means for connecting the support with the threaded member.

4,842,519
INTRAORAL APPLIANCE AND METHOD OF TREATING PATIENT
Jeffrey Dworkin, 3373 E. Fairfax, Cleveland Heights, Ohio 44118
Filed Nov. 30, 1987, Ser. No. 126,881
Int. Cl.[4] A61C *5/00*
U.S. Cl. 433—215 29 Claims



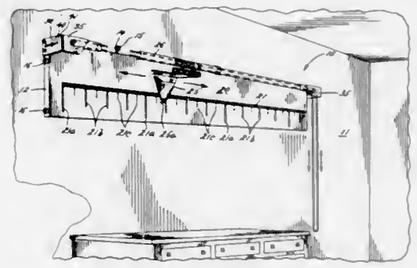
1. An intraoral appliance comprising proximity detector means for sensing the relative positon of body parts in the oral cavity and signal means connected with the detector for signaling when body parts in the oral cavity are in an undesirable position, said signal means including time delay means for delaying a signal until the body parts have been in an undesirable position for a predetermined length of time.

4,842,520
ANALOGUE SIMULATOR FOR CONTROL CIRCUITS, ACTUATED FROM OPERATING STATION OR COCKPIT
Daniel Dupont, 12, Sente de la Loge à Vallée, 77100 Neufmontiers, France
PCT No. PCT/FR86/00096, § 371 Date Nov. 7, 1986, § 102(e) Date Nov. 7, 1986, PCT Pub. No. WO86/05614, PCT Pub. Date Sep. 25, 1986
PCT Filed Mar. 20, 1986, Ser. No. 936,342
Claims priority, application France, Mar. 21, 1985, 85 04195
Int. Cl.[4] G09B *9/08*, *250/00*; G06G *7/62*; G08B *5/36*
U.S. Cl. 434—30 7 Claims



1. An analogue simulator for control circuits actuated from an operating station or cockpit (1), particularly for control of an aircraft, comprising:
an exact reproduction of the control cockpit (1) provided with all its controls (2) capable of ensuring the actuation of circuit simulation devices of said circuits by a student operator (3),
simulation devices (4) having at least one instruction panel (5_1,5_2), each showing at least one control circuit and intended to display different parameters or simulation motifs visible by the student operator (3),
an operating console (6) ensuring the connection (7,8) between the simulation devices (4) and the cockpit (1) and able to permit a modification by an instructor operator of the parameters of simulation of the simulation devices according to a priority procedure between the orders coming from the operating console and the orders coming from the controls of the cockpit, wherein the simulation devices each comprise at least one panel for an electric circuit, a plurality of hydraulic or fluid circuits, and a plurality of service circuits such as the air conditioning, pressurization and heating, and means for electronic control of the display of these panels and wherein each panel (5_1,5_2) comprises a support body (10) of a plexiglas sheet (11), said plexiglas sheet having motifs representative of the outlines of the circuits and/or of apparatus constituting these circuits, the active elements of these circuits, being shown by windows (12,13) of colour which are illuminated on simulated bringing to service of the active elements.

4,842,521
VISUAL AID RULER
Kenneth L. Johansen, 1111 W. Cedar Ln., Arlington Heights, Ill. 60005
Filed Aug. 29, 1988, Ser. No. 237,960
Int. Cl.[4] G09B *19/00*
U.S. Cl. 434—187 19 Claims



1. A visual teaching aid comprising
an elongated board adapted for horizontal mounting with a face thereof forwardly directed,
said board having a scale along the length of said forwardly directed face depicting known units of length proportionally larger than the actual units,
a track mounted in parallel relation to said board and scale,
a slide mounted for relative movement in said track,
a pointer carried by said slide with an end thereof disposed in closely adjacent relation to said scale, and
means operable from an end of said board for moving said slide in said track to selectively position said pointer at desired locations along said scale.

4,842,522
TRAINING SHOELACE
Dean D. Alexander, 5681 Edgecliff, Yorba Linda, Calif. 92686, and James S. Stanfield, P.O. Box 1983, Santa Monica, Calif. 90406
Continuation of Ser. No. 708,797, Mar. 6, 1985, Pat. No. 4,721,468. This application Oct. 16, 1987, Ser. No. 109,277
The portion of the term of this patent subsequent to Jan. 26, 2005, has been disclaimed.
Int. Cl.[4] G09B *19/00*
U.S. Cl. 434—260 5 Claims

1. A shoelace for use by young children or the handicapped which, after being threaded through the eyelets of a shoe so its opposite end portions are free for tying a bow, facilitates the tying of the bow, comprising:
a shoelace which has an end portion which includes a pair of markings spaced apart by a plurality of inches so when the

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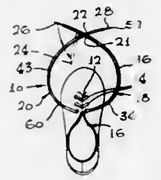
shoelace locations which are marked are brought together they form a loop which is useful in typing a bow, said shoelace being devoid of additional markings identical to said pair of markings and that are spaced less than an inch



apart, said end portion being stiff enough to substantially retain the loop shape when the marked locations are brought together, but said end portion being flexible enough to permit a child to tie a bow with said looped end portion and the opposite end portion of the shoelace.

4,842,523

MAKEUP METHOD AND DEVICE

Jean-Claude Bourdier, 17, Place des Vosges, F-75004 Paris; Frederic G. Bourdier; Brigitte E. Bourdier, both of 8, rue Francaise, F-75002 Paris, and Claude H. Bourdier nee Serre, 17, Place des Vosges, F-75004 Paris, all of France

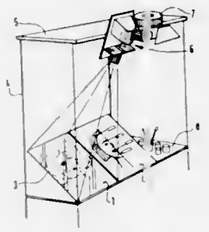
PCT No. PCT/FR86/00312, § 371 Date May 6, 1987, § 102(e) Date May 6, 1987, PCT Pub. No. WO87/01567, PCT Pub. Date Mar. 26, 1987

PCT Filed Sep. 16, 1986, Ser. No. 54,275

Claims priority, application France, Sep. 16, 1985, 8513667

Int. Cl.[4] A45D 44/00

U.S. Cl. 434—371 **5 Claims**



1. A method for making up a client characterized in that the method consists of projecting an image of the client's face onto a projection surface which has an opaque medium (1) thereon, said medium being suitable for receiving makeup and for reproducing exact nuances thereof as when applied to skin and of disposing makeup on said projection surface in suitable locations to achieve a desired style of makeup.

4,842,524

TRAILER LIGHT CONNECTION SYSTEMS

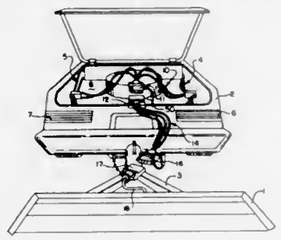
Ross E. Hopkins, and P. David Tan, both of Emporia, Kans., assignors to Hopkins Manufacturing Corporation, Emporia, Kans.

Filed Nov. 3, 1987, Ser. No. 116,471

Int. Cl.[4] H01R 33/79

U.S. Cl. 439—35 **17 Claims**

1. A trailer light connector system extending between a towing vehicle and a towed vehicle to provide electrical power from a vehicle light circuit to the trailer light circuit, the system comprising a trailer wiring harness selectively extending between a split wire extension and the trailer light circuit, the trailer wiring harness having means at one end thereof adapted selectively to be coupled to the trailer light circuit and having a first plug means at the other end thereof adapted selectively to be coupled to a second plug on the the split wire extension, the split wire extension having electrical



wires respectively extending to two separate connector means at the ends thereof, each such connector means having means adapted selectively to make an insulation displaced electrical connection with each insulated wire of the towing vehicle light circuit to complete the electrical connection between the towing vehicle and trailer.

4,842,525

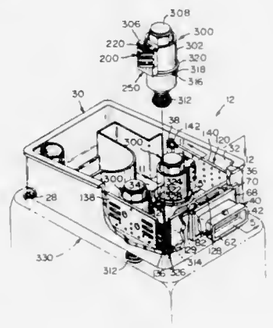
ELECTRICAL CONNECTOR ASSEMBLY FOR ANTISKID BRAKING SYSTEM

Michael D. Galloway, Middletown; William H. Rose, and David T. Shaffer, both of Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 67,900, Jun. 29, 1987, Pat. No. 4,785,532, which is a division of Ser. No. 789,999, Oct. 22, 1985, Pat. No. 4,697,863. This application Aug. 22, 1988, Ser. No. 234,988

Int. Cl.[4] H01R 33/00

U.S. Cl. 439—34 **13 Claims**



1. A connector assembly for an anti-skid bydraulic braking system for an automobile having a master cylinder from which hydraulic lines extend to brake cylinders of each wheel and solenoids in communication with said hydraulic lines proximate said master cylinder each having at least one coil means to effectuate controlled changes in the pressure of respective hydraulic lines when actuated by electrical current controlled by a microprocessor receiving individual wheel speed data from respective wheel sensors and processing said data to project skidding of a said wheel about to skid, wherein said solenoids are mounted on a floor of a brake fluid reservior and extending trough solenoid-receiving apertures in said floor into respective passeways of said master cylinder in communication with respective said hydraulic lines, said connector assembly comprising:

a bulkhead connector including a housing means mounted on a sidewall of said reservior and extending through an aperture thereof sealed therearound such that an outer mating section is matable outside said reservior with a wire harness connector of a wire harness extending from said micropcessor to said reservoir, and further including a plurality of contact members extending from said outer mating section to an inner section within said reservoir;

a connector harness including conductive contact means and insulative cover means over portions thereof mounted within said reservior, said conductive contact means being in electrial engagement with said plurality of of contact members of said bulkhead connector and extending along sidewall portions of said reservior locations to proximate each said solenoid; and

solenoid connectors secured on respective ones of said solenoids including respective housing means and contact members electrically engageable with respective said conductive contact means of said connector harness when said solenoids are mounted in said reservoir, said contact members being in electrical engagement with respective terminals teminated to respective wire ends of said at least one coil means of said solenoids,

whereby said connector assembly and said solenoids are mounted to said reservoir and the connector assembly; brake fluid reservoir and master cylinder are capable of being assembled into a unit mountable into the automobile.

4,842,526

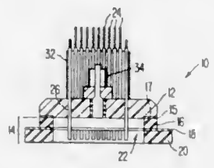
TEST FIXTURE FOR ELECTRONIC COMPONENTS

Felix Stukalin, Framingham, and Kristopher F. Pruyn, Bedford, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 2, 1988, Ser. No. 151,577

Int. Cl.[4] H01R 13/533

U.S. Cl. 439—42 **4 Claims**



1. A fixture for connecting test leads to a multi-pin electronic component, comprising:

a base member, generally flat in shape, having an upper surface, a lower surface, and sides surrounding and joining said surfaces, formed from a transparent plastic material;

resilient seal means, mounted around the periphery of said lower surface to define a well, including

an upper stiffening member, formed of a light, strong metal, bonded to the underside of said base member;

an upper seal member, formed of a resilient material, bonded to the underside of said upper stiffening member;

a lower stiffening member, formed of a light, strong metal, bonded to the underside of said upper seal member;

a lower seal member, formed of a resilient material, bonded to the underside of said lower stiffening member; and

said upper and lower stiffening and sealing members cooperating to define said well;

vacuum means for introducing subatmospheric pressure within said well, including a vacuum fitting carried in said base member in fluid communication with said well; and

connector means for making contact with the electronic component pins, passing through said base member and extending into said well and being arranged in a pattern identical to the pattern of the electronic component pins and including

a test lead connector member, adapted for attachment to the test leads;

a body member, having a lower end extending into said base member and an upper end extending above said upper surface of said base member, said upper end carrying said test lead connector member; and

a pin connector member, extending from said body member into said well, said pin connector member being carried resiliently in said body member for longitudinal movement therein.

4,842,527

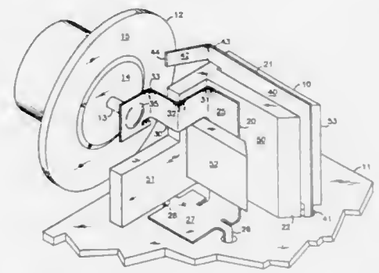
CONTACT ASSEMBLY FOR INTERCONNECTING CIRCUIT BOARD AND A COAXIAL CONNECTOR

Mark E. Tellam, Parkland, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 80,026, Jul. 31, 1987, abandoned. This application Dec. 9, 1988, Ser. No. 282,869

Int. Cl.[4] H05K 1/00

U.S. Cl. 439—63 **2 Claims**



1. A contact assembly for interconnecting a circuit board located within a housing and a coaxial connector mounted on the housing comprising:

a center contact means, constituting a formed metal element, including a strip of electrically conductive material, means for electrically connecting and supporting the strip on the circuit board, and a resiliently flexible center contact arm extending from the strip for selectively engaging the coaxial connector;

a ground contact means, constituting a formed metal element, including a ground plane of electrically conductive material, means for electrically connecting and supporting the ground plane from the circuit board in spaced relation to the strip, and a resiliently flexible ground contact arm extending from the ground plane for selectively engaging the coaxial connector, and

dielectric means including an intermediate wall positioned between the strip and the ground plane,

wherein the strip and the ground plane comprise a microstrip.

4,842,528

SOLDER POST RETENTION MEANS

Robert H. Frantz, Newville, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 32,150, Mar. 27, 1987, abandoned. This application Apr. 15, 1988, Ser. No. 181,841

Int. Cl.[4] H01R 23/70

U.S. Cl. 439—80 **25 Claims**

1. An electrical connector assembly, comprising:

a dielectric housing defining a mating face and a mounting face orthogonal to said mating face, said housing having a plurality of terminal receiving passages extending from the mating face;

a locator plate extending outwardly along said mounting

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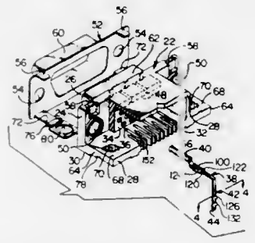
face from said housing to an end, said locator plate having first and second surfaces, said locator plate having a plurality of parallel channels therein extending inwardly from said end and through the locator plate from said first surface to said second surface and defined by pairs of opposed walls;

a plurality of electrical terminals mounted in the housing, each terminal having a mating portion extending into a terminal receiving passage and a mounting portion orthogonal thereto extending proximate and outwardly from said mounting face, said mounting portion passing through a respective said channel in the locator plate and having a U-shaped cross-section convex toward said housing to facilitate insertion of said mounting portion along said channel during assembly, said mounting portion having a first stop means adjacent the first surface of said locator plate for preventing axial movement of the mounting portion toward the first surface, said first stop means defining at least one first stop shoulder offset laterally outwardly from a respective side wall of said U-shaped cross-section of the mounting portion of said terminal, said stop shoulder adapted to extend beyond a respective one of said channel defining-walls to engage the first surface of said locator plate, whereby axial movement of said mounting portion of the terminal toward said locator plate is prevented.

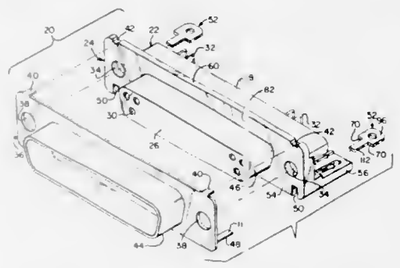


4,842,529

CONNECTOR WITH TWO-PIECE GROUND STRAP

Robert H. Frantz, Newville, and Robert N. Whiteman, Jr., Middletown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 31, 1988, Ser. No. 175,838
Int. Cl.[4] H01R *13/648*
U.S. Cl. 439—95 **14 Claims**



1. An electrical connector for mounting to a printed circuit board, comprising:

a dielectric housing defining a front surface, said housing having a plurality of terminal receiving passages with terminals secured therein, said housing having an integral flange defining a mounting face for engaging the printed circuit board and an opposed holding face, said housing having a recess in the front surface, said recess having an opening in communication with the holding face;

an electrically conductive shell, said shell having a shroud portion disposed proximate the mating face to engage shielding of a complementary shielded connector and to shield the terminals, said shell having a tab extending into said recess; and

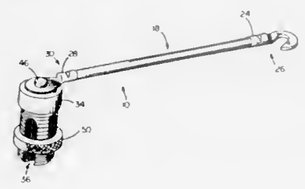
a ground strap, received against the flange, said ground strap having a tab portion and a contact portion, said tab portion received in said opening and extending into said recess, the tab of said shell folded over said tab portion and biasingly engaging said ground strap, whereby the ground strap is secured to the connector.

4,842,530

ELECTRICAL FLOATING BOND ASSEMBLY

David J. Erickson, II, Raymond, N.H.; Michael G. Naylor, Mounds View, Minn., and Robert R. Knobloch, Jamestown, N.Y., assignors to The Dexter Corporation, Windsor Locks, Conn.

Filed Jan. 28, 1988, Ser. No. 149,572
Int. Cl.[4] H01R *4/66*
U.S. Cl. 439—98 **1 Claim**



1. An electrical floating bond for interconnecting an electrical conductive sheath of a cable to a ground terminal, comprising:

an electrically-conductive, axially slotted, externally-threaded bolt which slot is open at one end thereof corresponding to the threaded end of the bolt;

a nut threadingly engaging said threaded bolt;

at least one electrical conducting means comprising multiple, individually insulated, conductors surrounded by a conductive sheath surrounded in turn by insulation, firmly clamped in said slot between said nut and the closed end of said slot in such manner that only said sheath makes good electrical contact with said bolt, said insulated cable extending away from said bolt in one direction and said individual conductors, substantially free of said sheath and its surrounding insulation, extending away from said bolt in the other direction;

a substantially cylindrical boss extending from the closed end of said bolt substantially coaxially with said threading end and directed away from the open end of said slot;

a flexible electrical conductor having a substantially flat eye terminal at one end closely engaged about said boss and held in such close engaging relationship by a river integral with said bolt, and having a substantially flat hook-shaped terminal at the other end; and

a ground conductor affixed to said hook-shaped terminal;

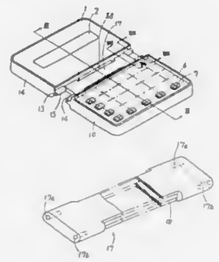
wherein said electrical conducting means is substantially rigidly positioned through said slotted bolt and said ground conductor is flexibly and movably related thereto through said flexible electrical conductor.

4,842,531

CONNECTOR FOR FOLDABLE ELECTRONIC APPARATUS

Shigekazu Takemura, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 8, 1988, Ser. No. 204,077
Claims priority, application Japan, Jun. 26, 1987, 62-98755
Int. Cl.[4] H01R *13/502*
U.S. Cl. 439—165 **3 Claims**



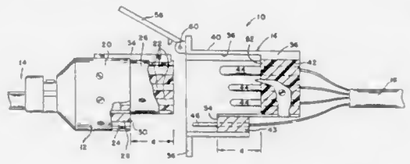
1. A connector for a foldable electronic apparatus having a first apparatus part and a second apparatus part which are connected to each other rotatably around shafts, the improvement wherein said connector comprises a plate-like shaped body having first and second edge sections at opposite sides thereof, first shaft-accepting holes being formed in said first edge section and second shaft-accepting holes being formed in said second edge section such that said connector and said first apparatus part can be rotatably connected by and around shafts which are inserted into said first shaft-accepting holes and that said connector and said second apparatus part can be rotatably connected by and around shafts which are inserted into said second shaft-accepting holes, a throughhole being provided to said plate-like shaped body from said first edge section to said second edge section for allowing a connecting sheet which electrically connects said first and second apparatus parts to pass therethrough.

4,842,532

ELECTROPNEUMATIC JUMPER CABLE CONNECTORS

Jeffrey J. Krause, Westlake, Ohio, assignor to Allied-Signal Inc., Morristown, N.J.

Filed Sep. 17, 1987, Ser. No. 97,771
Int. Cl.[4] H01R *29/00*
U.S. Cl. 439—174 **5 Claims**



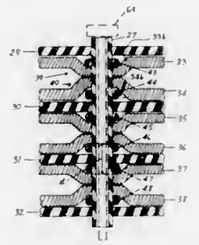
1. A connecting member for connecting with either of a pair of junction members, one of said junction members having both first and second sets of contacts, the other of said junction members having only one set of contacts corresponding to said first set of contacts of said one junction member, said connecting member comprising a body having a first portion carrying a first set of contact members and a second portion carrying a second set of contact members, said second portion of said connecting means being offset from said first portion of said connecting member to permit connection of said first set of contact members with the set of contacts of said other junction members while leaving said second set of contact members disconnected and to permit connection of both the first and second sets of the contact members with the first and second sets of contacts of said one junction member, said body having an axis, said second portion being offset axially with respect to said first portion.

4,842,533

THERMALLY EFFICIENT SPLICE JOINT FOR ELECTRICAL DISTRIBUTION BUSWAY

Julie A. Beberman, New Hartford; Ira B. Goldman, Waterbury; Harold F. Larkin, Plainville, and David A. Hibbert, South Windsor, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed May 12, 1988, Ser. No. 193,000
Int. Cl.[4] H01R *13/60*
U.S. Cl. 439—213 **18 Claims**



4. An electric busway joint comprising:

first and second apertured outer metallic plates; and

a connector module fastened between said first and second outer metallic plates, said connector module including a pair of first metallic insulating-splice plates having first apertured depressions formed therein, each said first depression comprising a first projection on an electrically conducting surface of a respective said first splice plate and a first recess on an electrically insulating opposing surface thereof, each of said first projections being arranged in abutment with each other to define a first bus-receiving space, a pair of second metallic insulating-splice plates having second apertured depressions formed therein, each said second depression comprising a second projection on an electrically conducting surface of a respective said second splice plate and a second recess on an electrically insulating opposing surface thereof, each of said second projections being arranged in abutment with each other to define a second bus-receiving space, a pair of third metallic insulating-splice plates having third apertured depressions formed therein, each said third depression comprising a third projection on an electrically conducting surface thereof and a third recess on an electrically insulating opposing surface of a respective said third splice plate, each of said third projections being arranged in abutment with each other to define a third bus-receiving space.

4,842,534

FUSE/BUS BAR ASSEMBLY

Dewey F. Mobley, Lake Orion; Robert G. Peterson, Canton, and Robert S. Collar, Orchard Lake, all of Mich., assignors to Interlock Corporation, Westland, Mich.

Filed Oct. 14, 1988, Ser. No. 257,531
Int. Cl.[4] H01R *25/16*
U.S. Cl. 439—214 **4 Claims**

1. A fuse/bus bar assembly comprising:

a one piece bus bar member of highly conductive material;

at least one fixed female terminal mounted on said bus bar

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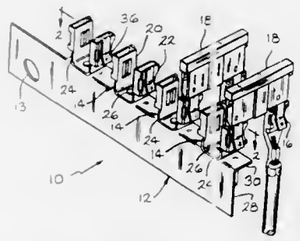
member for mating connection to a leg of a fuse plug having two flat legs; and

at least one discrete female termina arranged in a predeter-



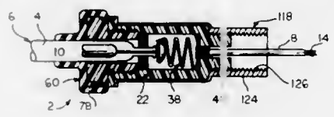
mined spaced relation with said f xed terminal for mating connection to the other leg of said fuse plug to fusably connect said discrete terminal electrically to said bus bar member.

4,842,535

GAS TUBE ELECTRODE CONNECTOR

David C. Velke, Sr., 3305 Aldie Rd., Catharpin, Va. 22018; George P. Marsden, 7621 Mary Cassatt Dr., Potomac, Md. 20854, and Burton C. Leffingwell, 242 Meadows La. NE., Leesburg, Va. 22075

Filed Jun. 28, 1988, Ser. No. 212,586
Int. Cl.[4] H01R 33/02
U.S. Cl. 439—232 16 Claims



1. In an electrical connector for joining a first wire conductor to a second conductor as formed by one or more electrode wires projecting from the headed tip of a luminous gas tube and wherein the gas tube includes a cylindrical main body joined to a reduced dimension crimped portion terminating in the headed tip, comprising:

a housing of dielectric material having first and second bores therein communicating with a cavity,

threads surrounding at least said second bore,

a cap having threads mating with said second bore threads and having an axial bore adapted to closely surround the gas tube main body,

an axially compressible resilient contact member within said housing cavity having opposite end segments respectively engageable with the first and second conductors,

a lock element removably attachable about the gas tube crimped portion intermediate the tube main body and headed tip, said lock element having a lateral dimension greater than the diameter of the gas tube main body and said bore of said cap, whereby,

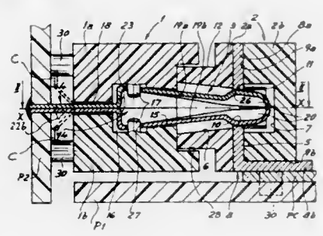
with said cap disposed about the gas tube main body and said lock element then attached about the gas tube crimped portion the tube headed tip is insertable within one said housing bore with the second conductor projecting therefrom engageable with one said contact member end segment to complete a circuit through the other said contact member end segment following which said cap threads are engaged with said housing second bore threads to urge said lock element to maintain said second conductor in positive abutment with said one contact member segment.

4,842,536

MINIATURE CONNECTOR AND METHOD FOR THE MANUFACTURE THEREOF

Pierre-André Meyrat, and Alain Oppliger, both of La Chaux-de-Fonds, Switzerland, assignors to Nivarox-Far S.A., Le Locle, Switzerland

Filed Feb. 5, 1988, Ser. No. 152,629
Claims priority, application France, Feb. 9, 1987, 87 01671
Int. Cl.[4] H01R 13/64
U.S. Cl. 439—246 9 Claims



1. A miniature connector assembly having a male plug and a female socket mating with said male plug,

(a) said male plug including a first insulating block having at least one first contact member floatingly mounted therein;

(b) said female socket including a second insulating block having at least one second contact member fixedly mounted therein;

(c) said first contact member including a pair of opposed, non-unitary, resilient foils which are independently floatingly mounted, having an extending free end portion for insertion into said socket;

(d) said second contact member including a receptacle positioned for receiving said first contact member, said receptacle including a wall fixed in said second insulating block;

(e) whereby said first and second insulating blocks align and mate with each other in assembly; and

(f) said second insulation block and said receptacle including means for gripping and immobilizing the free end portions of said opposing resilient foils and making electrical contact therewith by virtue of the opposing forces caused by the inherent resilience of said resilient foils.

4,842,537

DEVICE FOR SUPPORTING TWO CONNECTOR ELEMENTS ASSOCIATED RESPECTIVELY WITH TWO BASES WHICH CAN BE REMOVABLY ASSEMBLED TOGETHER AND WHICH ARE LIKELY TO SHOW MUTUAL POSITIONING DISCREPANCIES AND A CONNECTION DEVICE USING SUCH A SUPPORT DEVICE

Gérard Villiers, Vanves, France, assignor to Souriau et Cie, France

Filed Mar. 23, 1988, Ser. No. 172,221
Claims priority, application France, Apr. 2, 1987, 87 04643
Int. Cl.[4] H01R 13/64
U.S. Cl. 439—246 9 Claims

1. A device for supporting two connector elements such as electric connector elements, associated respectively with two bases which can be mechanically and removably assembled together, these two bases being likely to show mutual positioning discrepancies when assembled or separated, as well as variable mutual positioning discrepancies in their assembled position at least in places which support the two connector elements, characterized in that it comprises:

(i) a first support supporting a first one of said connector elements and fixed without play on a first one of said bases;

(ii) a second support supporting a second connector element and fixed to a second base which is movable with respect to the first base;

(iii) and mechanical control means provided on the first and second supports and comprising:

transverse positioning means provided on the first and second supports for mutually positioning the two connector elements transversely relative to their axis, so that, during assembly of the two bases, the second connector element is presented opposite the first connector element and coaxially thereto;

releasable mechanical securing means provided on the second connector element and interposed between the second connector element and the transverse positioning means, and placed under the dependence of said transverse positioning means so as to be able to occupy two functional positions, namely a first functional position in which the transverse positioning means does not function to effect transverse positioning and the securing means provide rigid mechanical coupling of the second connector element with the second support, and a second functional position in which the transverse positioning means does function to effect transverse positioning and the securing means no longer provide mechanical coupling of the second connector element to the second support;

mounting means for mounting the second connector element on the second support, said mounting means being adapted so as to allow a movement of the second connector element with respect to the second support when said mechanical securing means are in their second functional position;

locking means for locking the two connector elements in the coupled position, said locking means being adapted so as to occupy a first functional position in which the second connector element is not secured mechanically to the first connector element and may be moved axially with respect thereto and a second functional position in which the two connector elements are secured mechanically to each other;

and releasable mechanical connection means interposed between the second support and the second base, said releasable mechanical connection means being placed under the dependence of the locking means and being adapted so as to be able to occupy two functional positions, namely a first functional position in which said connection means provide an indeformable mechanical connection between the second support and the second base, wherein the means for locking the two connector elements are themselves in their first functional position and so that the two connector elements are not lock together, and a second functional position in which said connection means release the second base with respect to the second member, wherein the means for locking the two connector elements are themselves in their second functional position and the two connector elements are locked together.

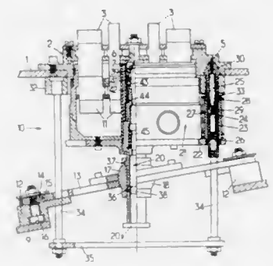
whereby the coupling together and locking of the two connector elements is achieved entirely automatically when the first and second bases are presented one in front of the other and assembled together, wherein, when the two connector elements are locked together, the mechanical connection between the second support and the second base is suppressed and it is possible for the two bases to undergo relative movement without the coupling of the two connector elements being affected thereby.

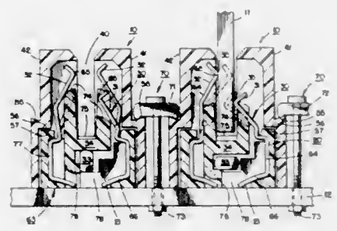
4,842,538

LOW INSERTION FORCE CIRCUIT BOARD CONNECTOR ASSEMBLY

Rocco J. Noschese, Wilton, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Continuation of Ser. No. 554,745, Nov. 23, 1983, abandoned.
This application Dec. 14, 1988, Ser. No. 284,109
Int. Cl.[4] H01R 13/62
U.S. Cl. 439—260 24 Claims





1. In a low insertion force electrical connector system comprising an electrical connector receptacle having a plurality of electrical contacts arranged in at least two opposing rows and a low insertion force means selectively spacing apart the electrical contacts in one row from the electrical contacts in an opposing row to allow the insertion of an electrical plug member with a low insertion force and also providing engagement of said contacts in said one and said opposing rows with said plug member so that said receptacle contacts make electrical connection with desired contacts of said plug member; the improvement wherein, said electrical connector system further comprises:

(a) means for aligning and locking said electrical plug member by positive engagement therewith within defined limits after insertion between one and opposing rows of contacts of said electrical connector receptacle; and

means for actuating said low insertion force means and said aligning and locking means in a multi-phase operation wherein, prior to insertion of said plug member into said receptacle, said actuating means is initially moveable to actuate said low insertion force means to selectively space apart said rows of electrical contacts and wherein after insertion of said plug member between said rows of contacts of said receptacle said actuating means is initially moveable to actuate serially first said aligning and locking means to align and lock said plug member within said receptacle and then said low insertion force means to provide engagement of said receptacle contacts with said desired contacts of said plug member.

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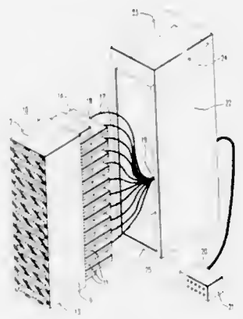
4,842,539

STRAND-TO-STRAND SHORT CIRCUIT TESTER

Emil M. Fort, Maitland, and Leonard B. Simmonds, Winter Springs, both of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 1, 1988, Ser. No. 226,704
Int. Cl.[4] H01R *13/15 4/50*
U.S. Cl. 439—262 10 Claims



1. An apparatus for attaching a testing unit to a plurality of strands in a column of strands on a stator winding, said apparatus comprising:

a plurality of connector members, each of said connector members being shaped to fit between two adjacent strands in the column of strands, each of said connector members having an exposed portion adapted to extend from the column of strands upon fitting said member between adjacent strands, each of said connector members having a first side provided with an electrically conductive material and a second side provided with an electrically insulating material;

a plurality of electrically conductive leads, each of said leads being connected to said first side of a corresponding one of said plurality of connector members;

releasable coupling means having a plurality of terminals, each of said terminals being connected to a corresponding one of said plurality of electrically conductive leads, for electrically connecting said electrically conductive lead with the testing unit; and

securing means for pressing the strands against said connector members fitted between the strands in order to establish a conductive connection between each strand and said conductive material of a respective connector member, said securing means comprising:

a tubular member having a first open end and a second open end, said tubular member being adapted to slide over the column of strands, said tubular member being substantially rectangular shaped and having a first wall and a second wall facing opposite said first wall, said first wall having a tapered inside surface;

a filler member adapted to fit between the inside surface of said second wall of said tubular member and a first end of the column of strands;

a wedge-shaped member adapted to wedge between said tapered inside surface of said first wall of said tubular member and a second end of the column of strands to thereby secure said tubular member to the column of strands; and

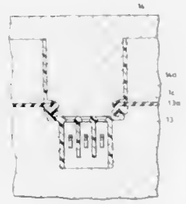
wherein said plurality of electrically conductive leads are adapted to extend through said tubular member upon sliding said tubular member over the column of strands.

4,842,540

CONNECTOR HOUSING AND METHOD FOR PRODUCING SAME

Takayoshi Endo, and Satoshi Yamada, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Feb. 24, 1988, Ser. No. 160,040
Claims priority, application Japan, Mar. 10, 1987, 62-53065
Int. Cl.[4] H01R *13/432*
U.S. Cl. 439—271 3 Claims



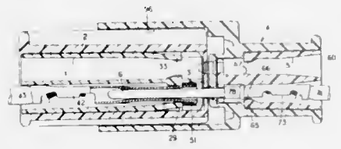
1. A connector housing assembly comprising: a substantially elongated annular cylindrical housing formed integrally of a resin material; and a rubber ring-like packing formed by pouring an adhesive rubber material into said housing through a metal mold such that said rubber ring-like packing adheres to an inner side wall of said housing at a fitting portion thereof so as to form a unitary connector housing assembly, whereby when said connector housing assembly is coupled to a second connector housing, said rubber ring-like packing sealingly engages said second connector housing.

4,842,541

ELECTRICAL CONNECTOR

Sergio Leandris, Fenouillet, France, assignor to Precision Mechanique Labinal, Montigne Le Brettonneux, France

Filed May 20, 1988, Ser. No. 196,544
Claims priority, application France, May 22, 1987, 87 07234
Int. Cl.[4] H01R *11/11*
U.S. Cl. 439—281 31 Claims



1. An electrical connector comprising:

a first insulative housing member,

said first insulative housing member having at least one first parallel passage means,

at least one cylindrical female contact member, one of said at least one cylindrical female contact member being positioned in each said at least one first parallel passage means,

each said at least one first parallel passage means having an opening at one end for retaining said female contact member,

each said at least one cylindrical female contact member having attachment means at a first end for attachment to an electrical conductor and collar means proximate a second end, said second end being opposite said first end, and

a second insulative housing member,

said second insulative housing member having at least one second parallel passage means,

at least one male contact member, one of said at least one male contact member being positioned in each of said at least one second parallel passage means,

each said at least one second parallel passage means having an opening for insertion of said male contact member, and retaining means for retaining said male contact member,

attachment means at a first end of each male contact member for attachment of an electrical conductor,

said male contact member having a cylindrical member at a second end,

said first end of said male contact member being opposite said second end of said male contact member, said second end of said male contact member being adapted to be inserted into said at least one female contact member, and

collet means intermediate said first end and said second end of each male contact member,

one of said first insulative housing member or said second insulative housing member having skirt means, said skirt means being adapted to receive the other of said first or second insulative housing member, and latching means for holding said first and second insulative housing members together,

each of said first insulative housing member and said second insulative housing member having a first part member and a second part member,

and locking means for locking together said first part member and said second part member,

said first part member of said first insulative housing member having said at least one first parallel passage means,

an abutment member adapted to retain said second end of said female contact member, said abutment member being at the end of each said at least one first parallel passage means which is opposite to the end at which said opening is located, and

first resilient tang means, said first resilient tang means having at least one projection, said at least one projection being adapted to cooperate with said collar means,

said second part member of said first insulative housing member having body means, said body means being adapted to receive said first part member of said first insulative housing member,

said body means having a back wall, and said back wall having holes, said holes being adapted to be aligned with said at least one first parallel passage means,

said first part member of said second insulative housing member having said at least one second parallel passage means, said at least one second parallel passage means having a hole at one end, said hole being adapted to have said cylindrical member pass through and cooperate with one end of said collet means,

second resilient tang means in said at least one second parallel passage means, each said second resilient tang means having a projection adapted to cooperate with the other end of said collet means, and

said second part member of said second insulative housing member having a skirt means, said skirt means being adapted to receive said first part member of said second insulative housing member.

4,842,542

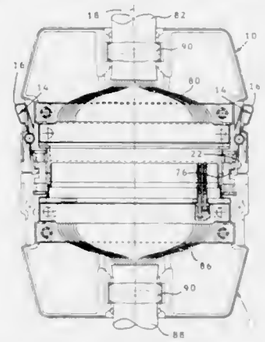
CONNECTOR WITH REMOVABLE LATCH BLOCK AND REMOVABLE LATCH BLOCK THEREFOR

Wayne S. Davis, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 7, 1988, Ser. No. 281,152
Int. Cl.[4] H01R *13/73*
U.S. Cl. 439—357 16 Claims

11. A latch block for reception in a channel in an electrical connector, said channel having a wider first region and a narrower second region, said narrower second region opening both onto the wider first region and an exterior surface of the connector, said latch block comprising:

a latching section and a retaining section, said latching section having a latching shoulder for engagement by latching means, said retaining section having an enlarged first retaining portion adapted to be slidingly received in the wider first region of the channel and a narrower second retaining portion extending from said first retaining portion and adapted to be slidingly received in and extend through the narrower second region of the channel to



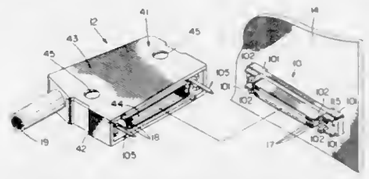
interconnect said enlarged first retaining portion with said latching section, whereby upon sliding the latch block into the channel and mating a complementary connector to the electrical connector, latching means on the mating connector engage the latch shoulder to latchingly secure the connectors together.

4,842,543

CONTACT PROTECTION SYSTEM FOR ELECTRICAL CONNECTORS

Wayne S. Davis, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 3, 1988, Ser. No. 202,075
Int. Cl.[4] H01R *13/645*
U.S. Cl. 439—378 18 Claims



1. A contact protection system for electrical connectors, comprising:

a cable terminating connector having a pair of generally T-shaped slots extending into a lower back shell from a mating face thereof, each of said slots including an enlarged first slot portion and a second slot portion of reduced size extending from said enlarged slot portion to the mating face of said cable terminating connector;

a second connector, said second connector complementary with said cable terminating connector and having a plurality of passageways extending thereinto from a mating face thereof and a plurality of female contacts which are adapted to engage a plurality of male pin contacts of said cable terminating connector when said connectors are mated, said generally T-shaped slots being aligned with said plurality of passageways when said connectors are aligned for mating;

an elongate generally T-shaped post adapted to be removably mounted in each of said T-shaped slots, each of said T-shaped posts includes an enlarged body section of generally rectangular shape adapted to be received within said first enlarged slot portion, and a second elongated

body section of generally cylindrical cross-section, said second elongated body section including a first portion adapted to be received within said second slot portion and a second extended portion adapted to extend out of said slot beyond said mating face of said cable terminating connector, said second extended portion being adapted to be received within an aligned passageway in said second connector during mating of said connectors to permit said connectors to be mated, and wherein said posts function as spacers to space the male pin contacts from features extending from the mating face of said second connector to prevent said male pin contacts from moving across and impinging against said features extending from the mating face of said second connector during mating of said connectors; and

a cover for said lower back shell, said cover having a pair of projections extending from the inner face thereof and adapted to extend into said pair of slots when said cover is mounted to said lower back shell, said projections cooperating with said posts for locking said posts in said slots of said cable terminating connector.

4,842,544

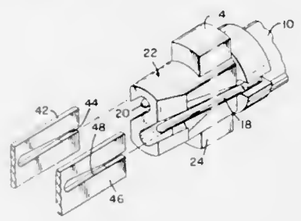
METHOD AND APPARATUS FOR TERMINATING HIGH-SPEED SIGNAL TRANSMISSION CABLE

Norman R. Birch, Jacobus, and William V. Pauza, Palmyra, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 897,577, Aug. 18, 1986, abandoned. This application Jan. 14, 1988, Ser. No. 145,671

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—387 **13 Claims**



1. In an electrical connector for connection with multiple wires of an electrical cable, comprising; wire receiving passages extending through an insulative first body, said first body having sides for receiving corresponding said wires emerging from corresponding said passages, conductive electrical terminals supported by an insulative second body and received by said sides for connection with corresponding said wires received by said sides, the improvement comprising;

the first body having tactile orientation means for providing a larger width portion of the first body and a smaller width portion of the first body extending transversely of the larger width portion,

the first body being adapted with a slender size for connection with wires of a cable having a corresponding slender size, by said passages being spaced apart laterally from one another along the larger width portion, and by wire receiving groove means extending along opposite sides of the smaller width portion for receiving corresponding said wires, said opposite sides being said sides of said first body,

said passages emerging at an end of said first body, and

said groove means having depths that decrease as said groove means extend from said end of said first body.

4,842,545

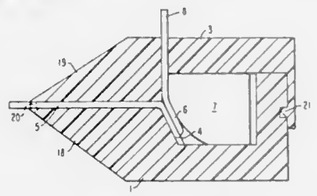
CABLE CONNECTOR

Wilhelm Tilse, Birkenfeld, Fed. Rep. of Germany, assignor to Inovan GmbH & Co. KG, Birkenfeld, Fed. Rep. of Germany

Filed May 20, 1988, Ser. No. 196,676

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—393 **13 Claims**



1. A connector for a flat conductor strip cable comprising a two-part housing adapted to receive a portion of said cable and to be engaged in said housing by compression of the two parts of said housing, the housing parts having engagement means for retaining said parts in compression with one another, said housing parts further including means for controlling the movement of the housing parts together for compression in a predetermined direction, one of said housing parts having a support surface disposed at a first acute angle with respect to said predetermined direction of relative movement of said housing parts, and the other housing parts carrying leaf spring contact members projecting therefrom toward said support surface and disposed at a second acute angle with respect to the predetermined direction of relative movement of said housing parts which is smaller than said first acute angle, said leaf spring contact members having cutting edges formed at their front ends adapted to cut through the insulation material of said conductor strip cable and slide onto the surface of said flat conductors upon compression of said housing parts thereby to provide for firm contact of said leaf spring contact members with said flat conductors.

4,842,546

COVERED WIRE CONNECTING DEVICE FOR POWER SOURCE CONNECTING PLUG

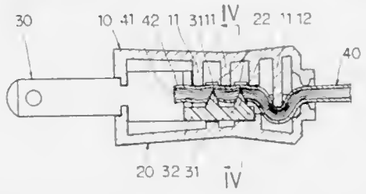
Won J. Song, 295-9, Jangan 1-dong, Dongdaemun-ku, Seoul, Rep. of Korea

Filed Apr. 25, 1988, Ser. No. 185,782

Claims priority, application Rep. of Korea, May 25, 1987, 1987/8145

Int. Cl.[4] H01R *4/24*

U.S. Cl. 439—409 **1 Claim**



1. In a covered wire connecting device for a power source connecting plug having upper and lower bodies in which is inserted a connecting terminal coupled with a core wire of a covered wire, the improvement comprising:

connecting pieces formed at the inner end of the connecting terminal and having several needles protruding therefrom,

supporting pieces having an inserting groove mounted on the lower body of the plug and associated with the connecting pieces, and

a plurality of pressing pieces for pressing each covered wire fitted in the inserting groove of the supporting pieces, each pressing piece being formed on the inner side of the upper body of the plug and being mounted relative to the supporting pieces so that each connecting needle of the connecting pieces pierces a covered portion of each covered wire.

4,842,547

STAPLE CABLE STRAIN RELIEF

George R. Defibaugh, Mechanicsburg, and William C. Ohl, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

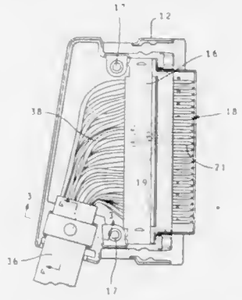
Filed May 19, 1988, Ser. No. 196,642

Int. Cl.[4] H01R *13/58*

U.S. Cl. 439—460 **16 Claims**

8. An electrical connector, comprising:

a housing having a plurality of contacts disposed therein, a cable-receiving opening in said housing, said cable-receiving opening being bounded by two sides and a bottom abutment surface, each of said sides having two spaced mutually facing engagement surfaces defining a channel therebetween, a multiconductor cable received in said cable-receiving opening with each of said conductors terminated to a respective contact, a U-shaped staple having a bight and two legs extending therefrom, said legs being of a cross-section having major edges and minor edges with barb means on each of said minor edges, said U-shaped staple received in said cable-receiving opening



with said legs received in said channels, said barb means engaging said engagement surfaces in an interference fit, said staple compressing said multiconductor cable passing through said cable-receiving opening, whereby strain relief is provided to the cable.

4,842,548

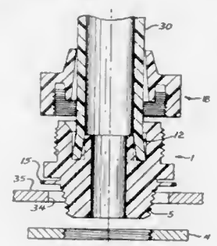
PLASTIC CONDUIT CONNECTOR FOR FLEXIBLE CONDUIT

Jay J. Bolante, Chicago, Ill., assignor to Appleton Electric Co., Chicago, Ill.

Continuation-in-part of Ser. No. 037,632, Apr. 13, 1987, abandoned. This application Jun. 24, 1988, Ser. No. 211,089

Int. Cl.[4] F16L *19/00*

U.S. Cl. 439—461 **11 Claims**



1. A connector assembly for connecting liquid-tight flexible electrical conduit to an electrical fixture, comprising:

(a) a plastic connector body including: a first portion formed with a means for connecting said connector body to the electrical fixture; a central portion; said first portion and central portion having a centrally located axially extending bore; a second portion having a ring member formed with a first set of screwthreads, said ring member having a deflection ramp formed therein; an internal conduit support forming an extension of said axially extending bore such that an annular cavity is formed between said ring member and said internal conduit support; and a rim member formed along the periphery of said deflection ramp and extending outwardly therefrom;

(b) a plastic connector cap comprising: a first portion having an axially extending centrally located bore; a second portion formed with a second set of screwthreads engageable with said first set of screwthreads on said connector body second portion; a wedging ring having a plurality of ridges formed at substantually the distal end thereof, said wedging ring being coextensive with said bore such that said bore is extended into the area defined by said second set of screwthreads forming a second annular cavity between said wedging ring and said second set of screwthreads; and a recess formed on the periphery of said wedging ring and being coextensive with said rim member, said recess being disposed within said second annular cavity;

(c) said bore of said connector cap and said bore of said connector body being adapted to receive a conduit; said second set of screwthreads being engageable with said first set of screwthreads to join said connector cap to said connector body; said wedging ring being deformed inwardly by said deflection ramp as said connector cap is screwed into engagement with connector body such that said rim member engages said recess to lock the wedging ring in its deformed position and said plurality of ridges of said wedging ring being able to grip the conduit and force the conduit into said annular cavity to form a liquid-tight seal as the wedging ring is deformed inwardly.

4,842,549

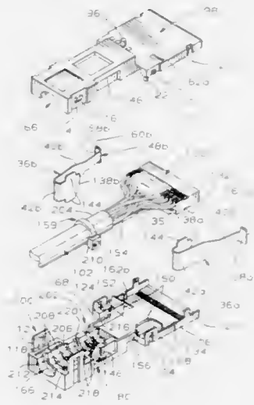
DUAL DIAMETER CABLE STRAIN RELIEF

John C. Asick, Harrisburg, and Stephen M. Yingst, Hummelstown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 39,556, Apr. 16, 1987, abandoned. This application Apr. 6, 1988, Ser. No. 177,795

Int. Cl.[4] H01R *13/58*

U.S. Cl. 439—464 **9 Claims**



1. An electrical connector assembly for providing strain relief to a cable received therein, the cable having a cable tie wrapped therearound, comprising:

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an insulative housing having first and second covers and defining a mating section, a strain relief section having a cylindrical strain relief passage, and a channel therebetween, said mating section terminating in a mating face, said strain relief section of said first and second covers having a semi-cylindrical passage opening into said channel, said semi-cylindrical passage having a wall, a diameter substantially the same as the outside diameter of a cable to be received therein, and a recess in the passage wall forming a semicircular arc around the axis of the passage, said recess adapted to receive therein a cable tie surrounding the cable; and

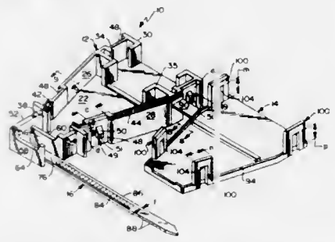
latching means on the first and second covers for detachably securing the first and second covers together, whereby the semi-cylindrical passages in the first and second covers form a cylindrical strain relief passage for receiving the cable and the semicircular recesses in the passage walls of the first and second covers form an annular recess for receiving the cable tie such that when the cable is received in the cylindrical strain relief passage and the cable tie is received in the recess, the cable tie engages wall means of the recess thereby preventing the cable from moving axially along the strain relief passage as forces to which the cable is subjected are transferred from the cable to the cable tie and recess, thence to the housing.

4,842,550

INTEGRALLY MOLDED ENVIRONMENTALLY PROTECTED STRAIN RELIEF BACKSHELL

Rupert J. Fry, Jr., Des Plaines, and Raymond A. Silbernagel, Naperville, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Jul. 1, 1988, Ser. No. 214,076
Int. Cl.[4] H01R *13/56, 13/58*
U.S. Cl. 439—471 19 Claims



1. A unitarily molded backshell for receiving an electrical connector and at least one cable extending therefrom, said backshell comprising:

a base comprising a foward connector receiving portion and a rearward cable receiving portion;

a flexible strain relief tie strap extending unitarily from the rearward portion of said base, said tie strap being formed to define an array of ratchet teeth;

a rearwardly disposed strap guiding wall extending adjacent the cable receiving portion of said base;

a deflectable ratchet trigger cantilevered from said base and angularly aligned to said strap guiding wall, said ratchet trigger being spaced from said strap guiding wall by a distance generally corresponding to the thickness of the tie strap such that said ratchet trigger is lockingly engageable with said tie strap for retaining said tie strap intermediate the strap guiding wall and the ratchet trigger; and

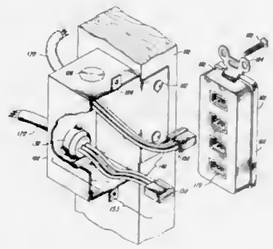
a cover hingedly connected to said base and rotatable into environmentally protective locked relationship to said base, whereby the connector can be environmentally protected in the backshell and whereby the tie strap achieves strain relief connection to the cable.

4,842,551

MODULAR CONNECTOR ASSEMBLY FOR ELECTRICAL UTILITY BOX

Anthony J. Heimann, Willow Rd., Harvard, Mass. 01451

Continuation of Ser. No. 884,498, Jul. 11, 1986, abandoned. This application Mar. 21, 1988, Ser. No. 175,663
Int. Cl.[4] H01R *11/00*
U.S. Cl. 439—502 9 Claims



1. A modular connector assembly comprising a sheathed multiple-conductor cable on electrical utility box having at least one punch hole;

a preformed integral interconnector for fixably mounting the sheathed multiple-conductor cable to the electrical utility box, said preformed integral interconnector including:

a clamp receptacle for electrically and mechanically engaging exposed multiple conductors of the sheathed multiple-conductor cable, said clamp receptacle integrally including clamping means for mechanically engaging the sheath of the sheathed multiple-conductor cable to restrain the sheathed multiple-conductor cable therein, means for electrically engaging stripped conductors of the sheathed multiple-conductor cable and means for fixably mounting said clamp receptacle in the at least one punch hole of the electrical utility box.

an interconnect plug module having at least two electrical conductors fixedly associated in spaced relationship within said module, and

a flexible electrical conductor having ends integrally molded in said clamp receptacle and said interconnect plug, respectively, for electrically interconnecting the stripped muliple conductors and the at least two electrical conductors of said interconnect plug; and

a function module located within said utility box frictionally receiving said interconnect plug and having at least two conductive strips in spaced array, each of said at least two conductive strips having at one face a plurality of projecting conductors, and wherein each of said plurality of projecting conductors is configured to engage a corresponding one of said at least two electrical conductors of said interconnect plug.

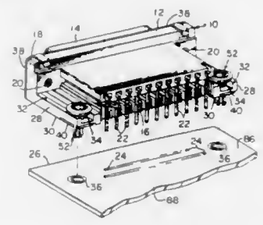
4,842,552

TOLERANCE FORGIVING BOARDLOCK

Robert H. Frantz, Newville, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 4, 1988, Ser. No. 164,312
Int. Cl.[4] H01R *13/74*
U.S. Cl. 439—557 22 Claims

1. A boardlock for securing an electrical connector to a printed circuit board having an aperture for receiving a portion of the boardlock, the aperture extending between first and second major surfaces of the printed circuit board and, where the connector includes a housing with a flange having a mounting face for engaging the printed circuit board, a recess extending into said flange from said mounting face, the boardlock having an axis and comprising body means adapted to be received in the recess of the connector flange in an interference fit, said body means having depending therefrom a first leg and a second leg, said legs extending to respective free ends remote from said body means, said free ends adapted to extend beyond the connector housing for disposition in the circuit board aperture from a first major surface of the printed circuit board, each of said legs having a diverging section intermediate said body means and said free ends, said diverging section diverging from the axis in the direction from said body portion to said



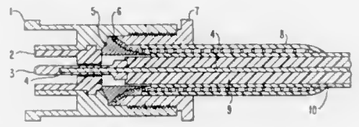
respective free ends, at least a portion of the diverging section of said first leg being axially displaced from the diverging section of said second leg, said diverging section of one of said legs adapted to extend through the circuit board aperture and engage the second major surface at the periphery of the circuit board aperture when the mounting face is engaged with the first major surface.

4,842,553

METHOD AND ASSEMBLY FOR TERMINATING A CONDUCTIVE POLYMER-SHIELDED COAXIAL ELECTRICAL CABLE

Glenn B. Ingram, Flagstaff, Ariz., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Feb. 26, 1988, Ser. No. 160,963
Int. Cl.[4] H01R *17/18*
U.S. Cl. 439—583 6 Claims



6. A cable assembly comprising:

(a) a coaxial electric cable which has been stripped at an end to expose a length of center conductor, dielectric insulation surrounding said conductor, and conductive polymer shielding surrounding said dielectric insulation said conductive polymer shielding and said dielectric insulation having been trimmed to equal length;

(b) a conductive metal center pin attached to said center conductor;

(c) a highly-tensioned conductive metal coil spring wrapped around said conductive polymer shield and extending past the end of said shield;

(d) a polymeric plastic shrinkable wrap shrunk into place surrounding said coil spring from the cable end to the end of said conductive shielding; and

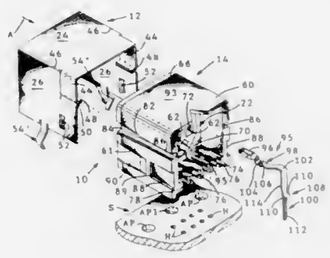
(e) a standard electrical connector, including an internal tapered cone portion spread inside and beneath said coil spring and a center passage surrounding said center conductor and attached conductive metal center pin, an optional plug of dielectric insulation having a center passage surrounding said conductive metal center pin and a tapered screw-threaded sleeve portion engaging and holding said coil spring between its tapered portion and the tapered portion of said tapered cone, said sleeve being threaded into tensional engagement against said cone in a completed termination.

4,842,554

ONE-PIECE SHIELD FOR A CIRCULAR DIN

Pete Cosmos, Mechanicsburg; Benjamin H. Mosser, III, Middletown, and William C. Ohl, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 3, 1988, Ser. No. 202,069
Int. Cl.[4] H01R *13/648*
U.S. Cl. 439—609 31 Claims



16. A surface mounted, shielded electrical connector comprising in combination;

a substantially rectangular cross-section connector body having a forward end and a rear end and in which projects forwardly a circular cross-section plug portion for mating with a circular cross-section externally shielded electrical socket, said body being formed with opposed external grooves each opening into said forward end and extending towards said rear end and each having therein proximate to said rear end a shield retaining means; and

a substantially rectangular, box-like, one-piece metal shield for slidably receiving said body in the longitudinal direction of said plug portion with the forward end of said body leading, said shield having a top wall dimensioned fully to enclose a top wall of said body, a pair of shield side walls each adjacent to said top wall and depending from opposite lateral edges thereof and being dimensioned fully to enclose opposite side walls of said body, a shield front wall adjacent to said shield top wall and having a circular, through opening therein for receiving said socket, a series of resilient cantilever fingers spaced from each other around said opening and projecting from a circular edge of said opening into said shield for resiliently engaging the external shielding of said socket, and internally projecting shield anchoring means remote from said front wall for slidable reception in said grooves and snap engagement with said shield retaining means therein to anchor said shield to said body proximate to said rear end thereof.

4,842,555

CIRCULAR DIN RECEPTACLE COVER FOR LATCHING PLUG

Peter Cosmos, Mechanicsburg, and William C. Ohl, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 3, 1988, Ser. No. 202,276
Int. Cl.[4] H01R *13/648, 13/627*
U.S. Cl. 439—609 10 Claims

1. In combination, a first electrical connector having a circular cross-section first mating portion and a second electrical connector having a circular cross-section, shielded, second mating portion for receiving, and mating with, the first mating portion in a mating direction, the first mating portion being surrounded in spaced relationship by a metal shield formed with an opening providing access for said second mating portion to mate with the said first mating portion, cantilever spring fingers on the shield projecting from the periphery of said opening, inwardly of the shield, to engage the shielding on the second mating portion when it has been mated with the first mating portion, the said second mating portion having on

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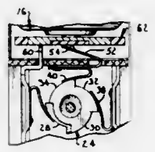
its circular surface, a resiliently depressably protrusion, a rudimentary, resilient, cantilever latching finger having a free end projecting inwardly of the shield from said periphery to depress said protrusion as said first and second mating portions

are being mated, the length of rudimentary finger being such that said protrusion resiles when the mating portions have been mated to assume a latching position behind the free end of the rudimentary finger, to latch said mating portions in their mated condition.

4,842,556
LIGHT SWITCH CONVERTOR
Ray I. Vogel, 7720 E. 24th St. Ct., Wichita, Kans. 67226
Filed Mar. 7, 1988, Ser. No. 165,159
Int. Cl.[4] H01R *25/00*
U.S. Cl. 439—638 **10 Claims**

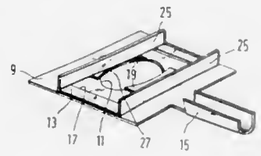


1. For use with a 3-way lamp switch for 3-way bulbs having an electrically conductive collar, a first filament circuit extending from a lead-in disposed centrally of the bulb base to the collar, and a second filament circuit extending from a second lead-in electrically insulated from the first lead-in to the collar, apparatus for converting said switch for use with 1-way bulbs having an electrically conductive collar and a single filament circuit extending from a single lead-in disposed centrally of the bulb base to the collar, said switch including a socket adapted to receive a bulb therein, said socket having a base terminal engageable with the bulb collar and adapted to be coupled with a source of electricity, a first terminal disposed to electrically engage the central bulb lead-in and a second terminal engageable with the second lead-in of said 3-way bulb, said switch including a 4-position rotary element rotatable in 90 degree increments in one direction, three electrically conductive and mutually interconnected contacts and an electrically nonconductive contact carried by the element for rotation therewith, said contacts being spaced at 90 degree intervals around the axis of rotation of the element to correspond with the four positions of the latter, said switch having a first contactor electrically connected with the socket first terminal, a second contactor electrically connected to the socket second terminal and a third contactor adapted to be coupled with said source of electricity, said first, second and third contactors being mounted adjacent said element for each contactor to physically engage a corresponding contact of the element when the latter is in each of its respective positions, the normal path for flow of electricity to the bulb central lead-in being from the element through the first contactor to the switch first terminal said converting apparatus comprising:

means for preventing a flow of electrical current between the switch element and the central lead-in of a bulb directly through said normal path when the latter is in the socket irrespective of the position of rotation of the switch element; and

means for electrically connecting said second contactor of the switch with the central lead-in of the bulb through an alternate electrical current path, whereby said bulb filament circuit is alternately energized and interrupted by the switch as the switch element is rotated successively through its respective positions.

4,842,557
CONTACT DEVICE FOR MAKING AN ELECTRICALLY CONDUCTIVE CONNECTION
Edwin Muz, Reutlingen, Fed. Rep. of Germany, assignor to Nicolay GmbH, Kirchheim, Fed. Rep. of Germany
Filed Jun. 7, 1988, Ser. No. 203,073
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1987, 3719474
Int. Cl.[4] H01R *11/22*
U.S. Cl. 439—851 **6 Claims**



1. Contact means for making an electrically conductive connection between a conductor and a contact stud having a recessed section located behind a rounded head portion, said contact means comprising:

a holder made of an electrically insulating material for supporting a contact part which in order to make a push-button-type snap-in connection with the contact stud is in the form of an integral spring element with contact zones for resiliently snapping into the recessed section of the contact stud;

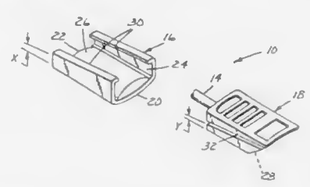
wherein the spring element has an apertured plate having an aperture with a diameter which is adapted to that of the head portion of the contact stud;

wherein the contact zones are arranged on a plate-shaped extension of the apertured plate, said extension being bent back towards the apertured plate in such a way that its contact zones are aligned in approximation with an inner contour of the aperture of the apertured plate;

wherein said extension of the apertured plate provided for formation of the contact zones is a rectangular, planar metal plate with a central cut-out section enabling passage of the head portion of the contact stud therethrough, an inside diameter of the cut-out section being reduced in regions thereof by opposed contact tongues projecting towards each other; and

characterized in that, in order to form spring legs contacting the head portion of the inserted contact stud in a resilient manner, longitudinal edges of the extension adjacent to the projecting contact tongues are bent out of a plane of the extension about bending lines which extend at right angles to a bending line laterally defining the apertured plate.

4,842,558
ELECTRICAL CONNECTOR
Jerome E. Strand, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 14, 1988, Ser. No. 258,182
Int. Cl.[4] H01R *4/50*
U.S. Cl. 439—863 **14 Claims**



1. An electrical connector for releasably connecting a substantially flat terminal to an electric wire, the connector comprising:

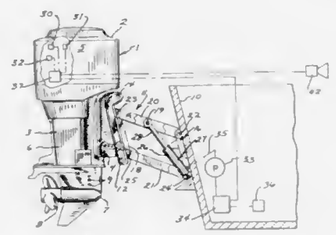
a housing having a passageway extending substantially therethrough defining a longitudinal direction, and a first terminal-engaging surface in the housing defining at least a portion of the passageway;

an actuator having a second terminal-engaging surface complementary to the first terminal-engaging surface of the housing;

means for conductively attaching the electric wire to the connector; and

cooperable positioning means for slidably positioning the actuator along the passageway of the housing such that the actuator is slidable generally diagonally with respect to the passageway between an open position, wherein the first and second terminal-engaging surfaces are spaced apart a distance at least as large as the thickness of the terminal so that the terminal may be placed between the surfaces, and a wedged position, wherein the first and second terminal-engaging surfaces are sufficiently close to clamp the terminal between the surfaces with the actuator being wedged against the terminal to retain the terminal in the connector.

4,842,559
POSITION CONTROL SYSTEM FOR A MARINE PROPULSION DEVICE
John J. Litjens, Omro; John M. Griffiths, Fond du Lac, and Michael A. Karls, Hilbert, all of Wis., assignors to Brunswick Corporation, Skokie, Ill.
Filed Mar. 24, 1988, Ser. No. 172,399
Int. Cl.[4] B63H *21/26*
U.S. Cl. 440—1 **14 Claims**



6. A position control system for a transom-mounted outboard boat motor including a water-cooled engine, said system comprising:

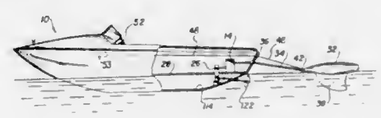
mounting means for supporting the outboard motor aft of the boat transom, said mounting means including a first portion attachable to a boat transom and a second portion adapted to support the outboard motor;

means for moving said second portion relative to said first portion to move the outboard motor between raised and lowered positions relative to the boat transom;

sensor means including an engine cooling water pressure sensor and an engine speed sensor for sensing an undesirable operating condition in the outboard motor and for generating a signal indicative of said undesirable operating condition; and

means responsive to said signal for actuating said moving means to move the outboard motor to a lower position.

4,842,560
WAVE POWERED PROPULSION SYSTEM FOR WATERCRAFT
Choong G. Lee, 510 F Keawe St., Honolulu, Hi. 96813
Continuation-in-part of Ser. No. 781,719, Sep. 30, 1985, abandoned. This application Dec. 28, 1987, Ser. No. 138,042
Int. Cl.[4] B63H *19/02*
U.S. Cl. 440—9 **23 Claims**



1. A wave-powered propulsion system for a watercraft, comprising:

a first and second hydraulic pump, each having an axially movable piston for pressuring and moving a working fluid;

means for actuating said first pump, including an arm connected to said piston and buoyant means connected to said arm and responsive to wave motion to reciprocate said piston;

second means for actuating said second pump, including an elongated element connected at one end to the piston of said second pump and connected at the other end to a buoyant member disposed aft of the watercraft and responsive to wave motion to reciprocate the piston in said second pump;

a fluid motor coupled to said pumps and operated by the working fluid from said pumps;

means for propelling the watercraft;

transmission means coupling said fluid motor and propelling means to transmit the driving output of said fluid motor to said propelling means; and

a steering assembly operatively associated with said aft buoyant member and adapted to move vertically with said buoyant member in response to wave motion and to move rotationally to provide steering control for the watercraft.

4,842,561
AQUATIC VEHICLE
Carlos J. Perrone, Azcuenaga 1233, Buenos Aires, Argentina (1115)
Filed Oct. 27, 1987, Ser. No. 113,875
Claims priority, application Argentina, Apr. 15, 1987, 307300
Int. Cl.[4] B63H *1/32*
U.S. Cl. 440—100 **14 Claims**

1. An aquatic vehicle for transporting passengers at high speeds over water, comprising:

an elongated body having a cabin to accommodate the passengers;

means for sustaining said body above the water, said sustaining means including freely rotatable wheels and axles, said axles projecting from said body to said wheels, said wheels having inflated tires with oval cross-sections;

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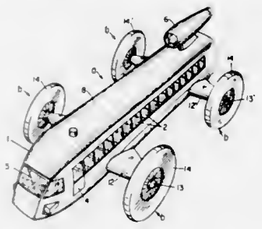
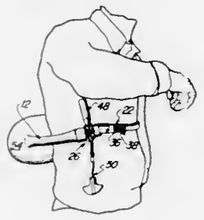
means for maintaining floatability even after a portion of said tires becomes damaged, said maintaining means including a plurality of partitions extending in said tires radially outward relative to said axles so as to form a plurality of hermetically sealed and watertight chambers; and



means for propelling said body independently of said wheels at a speed so that said wheels roll on top of a surface of the water rather than penetrate the surface of the water, said wheels being free of any transmission means from said propelling means.

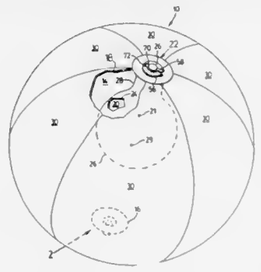
4,842,562
INFLATABLE BUOYANCY BELT
Mark L. Supal, 20300 Yale St., St. Clair Shores, Mich. 48081
Filed Jan. 28, 1988, Ser. No. 149,582
Int. Cl.[4] B63C *9/16*
U.S. Cl. 441—94 **11 Claims**



11. A method of forming a buoyancy chamber in a segment of extensible tubing connected at the ends thereof with a non-extensible belt to be able to be fit around the trunk of a human wearer, comprising the step of inflating said tubing segment with a volume of gas at a pressure and volume to produce a localized distension of said tubing segment at an intermediate region along the length thereof to form a bubble therein acting as said buoyancy chamber, while extending the length of said tubing segment by said inflation sufficient to loosen the fit to a wearer to enable ready repositioning of said bubble on said wearer.

4,842,563
INFLATABLE BALL WITH SWINGABLE VARIABLE INTERNAL WEIGHT
Gordon K. Russell, Islington, Canada, assignor to Pressers International Products Inc., Mississauga, Canada
Filed Apr. 1, 1988, Ser. No. 175,979
Claims priority, application Canada, Mar. 30, 1988, 562984
Int. Cl.[4] A63H *3/06, 17/00;* **A63B** *37/00, 39/00*
U.S. Cl. 446—221 **9 Claims**

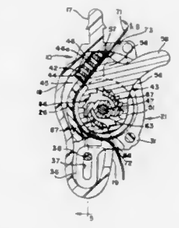
1. An inflatable ball comprising an outer inflatable chamber having a first resealable orifice, an outer skin, and a first center of volume, and an inner fillable chamber having a second resealable orifice, the second sealable orifice being in said outer skin of said outer inflatable chamber, the inner fillable chamber being substantially smaller than the outer inflatable chamber and being contained therein, the inner fillable chamber having a second center of volume displaced from said first center of volume of said outer inflatable chamber, the inner fillable chamber having a body portion and a neck portion, the neck portion extending between the body portion and the second sealable orifice and being attached to the outer inflatable chamber at said second sealable orifice, said neck portion being the only connection between said inner and outer chambers and



being a hollow flexible tube for permitting said inner fillable chamber to swing back and forth within said outer inflatable chamber about said second sealable orifice when said ball is in use, said outer inflatable chamber being inflated with air, said inner fillable chamber containing a selected amount of medium much denser than air, the amount of said medium in said inner chamber being adjustable through said second orifice, whereby said ball has eccentric and unpredictable flight characteristics.

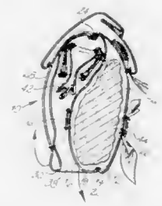
4,842,564
CAP-FIRING MECHANISM FOR A TOY
Gregory L. Gerold, and Bruce W. Dickerhoof, both of Cincinnati, Ohio, assignors to Tonka Corporation, Minnetonka, Minn.
Filed Aug. 31, 1988, Ser. No. 238,486
Int. Cl.[4] A63H *3/28, 5/00*
U.S. Cl. 446—297 **16 Claims**

1. A cap firing mechanism for use with a cap tape having a series of spaced caps thereon, comprising:
(a) a plurality of adjacent walls;
(b) an anvil mounted on one of said walls;
(c) mounting means connected to other of said walls adjacent said anvil;
(d) a hammer movably mounted on said mounting means, said hammer including a hammer surface located to engage said anvil;
(e) a hammer spring connected to said hammer and urging said hammer in the direction where said hammer surface strikes said anvil;
(f) an advance wheel on said mounting means and adapted to engage the tape and to move the tape when said wheel is rotated; and



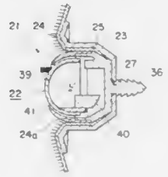
(g) advance means connected between said hammer and said wheel for turning said wheel when said hammer is moved away from said anvil.

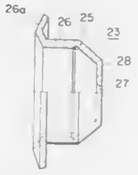
4,842,565
REVERSIBLE, STUFFED DOLL
Robert VonPhilp, Sr., 4247 Conway Blvd., Port Charlotte, Fla. 33952
Filed May 28, 1988, Ser. No. 55,780
Int. Cl.[4] A63H *3/12, 3/02*
U.S. Cl. 446—321 **6 Claims**



1. A reversible stuffed doll head comprising:
a first fabric section and a second fabric section;
said first and second fabric sections each having an inner surface and an outer surface;
said fabric sections having edge portions including bottom edge portions;
said edge portions of said first and second fabric sections joined to form an internal cavity between said inner surfaces;
a filler material contained in said cavity separating said first and second fabric sections except at their joined edge portions forming said stuffed doll head;
each of said outer surfaces of said first and second fabric sections bearing accent devices representing first and second doll faces;
a third fabric section coextensive with said first and second fabric sections;
said third fabric section having edge portions including a bottom edge portion joined to said first and second fabric sections except at said bottom edge portion;
said bottom edge portion of said third fabric section and said bottom edge portions of said first and second fabric sections forming an opening through which said stuffed doll head may be deformably pushed to conceal one of said first and second faces and exhibit the other of said faces.

4,842,566
EYE DEVICE FOR USE IN A DOLL
Keisuke Nagao, Ichikawa, Japan, assignor to Kabushiki Kaisha Nagao, Chiba, Fed. Rep. of Germany
Filed Jun. 4, 1987, Ser. No. 58,043
Claims priority, application Japan, Sep. 5, 1986, 61-136142; Oct. 31, 1986, 61-167573
Int. Cl.[4] A63H *3/40, 3/38;* **B25G** *3/02*
U.S. Cl. 446—345 **4 Claims**





1. An eye device for use in a doll comprising a synthetic resin cup-shaped mounting member having a circular engaging groove on an inner periphery of a wall portion of the mounting member and having a flange portion formed on a peripheral edge of the mounting member and having an inserting hole which is tapered toward an outside of a central portion of a rear end wall portion of the mounting member; and an eye member including an eyeball and an eyeball-mounting body which has a circular engaging step portion on an outer periphery of the eyeball-mounting body, said circular engaging groove and said circular engaging step portion to cooperate to engage and secure doll facial fabric, said eyeball mounting body being provided with a projecting bar portion which has at least one engaging step on an outer periphery of the project-

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ing bar portion, said projecting bar portion being arranged to engage said inserting hole in said cup-shaped mounting member, wherein said eyeball is rotatably mounted in engaging grooves in the eyeball-mounting body by means of pivot pins on said eyeball, said eyeball including a weight fixed rigidly on a bottom portion of an inner surface of the eyeball and biased toward the rear of the eyeball.

4,842,567

SPIRAL-SPRING TYPE DRIVING UNIT

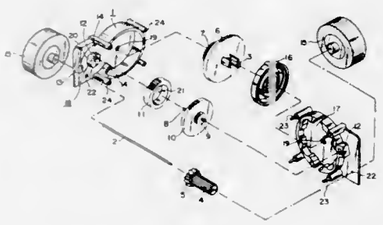
Hideyuki Hiraide, 29-10, Kamakura 2-chome, Katsushika-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 29,316, Mar. 20, 1987, abandoned, which is a continuation of Ser. No. 758,191, Oct. 7, 1985, abandoned. This application Oct 14, 1987, Ser. No. 108,246

Claims priority, application Japan, Apr. 5, 1985, 60-50821; Apr. 6, 1985, 60-51261

Int. Cl.[4] A63H *17/00, 29/24;* F03G *1/08*

U.S. Cl. 446—464 **3 Claims**



1. In a spiral-spring type driving unit having a gear housing mounted in a toy wheeled-vehicle to drive the wheels of said vehicle, said toy vehicle being moved backwards for a relatively short distance by an external force to wind up the spiral-spring and store sufficient energy therein so that during its moving operation the energy in said spiral-spring will operate said driving unit to drive the wheels of said toy vehicle and propel it for a relatively long distance, the improvement wherein in ring-like centerless external gear is used as a meshing gear to mesh with other gears of said driving unit during winding up of the spiral-spring, and means to swingably and rotatably support said ring-like centerless external gear in said driving unit during the winding of said spiral-spring to unmesh said ring-like centerless external gear to allow driving of the wheels of said toy vehicle and propel the toy vehicle forwardly.

4,842,568

REAR DERAILLEUR FOR BICYCLE GEARS

Giorgio Marchigiano, Torino, Italy, assignor to Marelmo S.n.c., Torino, Italy

Filed Jul. 22, 1988, Ser. No. 223,043

Claims priority, application Italy, Jul. 24, 1987, 67646 A/87; Feb. 15, 1988, 67110 A/88

Int. Cl.[4] F16H *11/08*

U.S. Cl. 474—80 **6 Claims**

1. A rear derailleur for bicycle gears which is adapted to derail a bicycle chain on a series of sprockets of increasing diameter carried on a rear hub of a bicycle, said hub having an axis of rotation and said derailleur comprising:

a support body for connection to a bicycle frame;

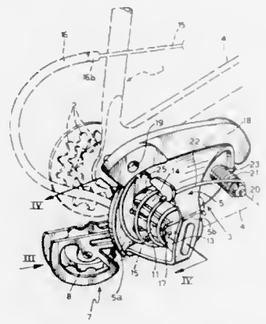
a rocker arm mounted on said support body for sliding movement along an axis parallel to said axis of said rear hub between a first end position in which said chain is engaged with the smallest-diameter sprocket and a second end position in which said chain is engaged with the largest-diameter sprocket, said rocker arm also being pivotable about said axis parallel to said rear-hub axis;

idler wheels for the chain carried by said rocker arm;

resilient means for urging said rocker arm towards said first position and for urging said rocket arm to pivot about said axis in a sense corresponding to the tensioning of said chain, and

means for moving said rocker arm towards said second end position, and

wherein said derailleur further includes an auxiliary member for fixing to said bicycle frame to connect said support



body thereto for pivoting about a further axis parallel to said rear hub axis and displaced forwardly of said rear-hub axis, said derailleur also including auxiliary resilient means interposed between said support body and said auxiliary member for urging said support body towards a position in which said idler wheels are nearest said sprocket, and wherein said support body and said rocker arm constitute an assembly which is pivotable relative to said auxiliary member, towards a position in which said idler wheels are further from said sprocket, by the greater pull exerted on said rocker arm by said chain when the latter is derailed onto larger-diameter sprockets.

4,842,569

BICYCLE TRANSMISSION HAVING INFINITELY VARIABLE DRIVE RATIO

James E. Orr, San Antonio, Tex., assignor to Recreational Accessoried Corporation, San Antonio, Tex.

Filed Nov. 16, 1987, Ser. No. 121,398

Int. Cl.[4] F16H *9/08*

U.S. Cl. 474—83 **11 Claims**

1. A torque transmission apparatus having an infinitely variable gear ratio, comprising:

an input shaft;

an output shaft;

an input sprocket wheel rotatably mounted on said input shaft;

an output sprocket wheel rotatably mounted on said output shaft;

an input spool rotatably mounted on said input shaft;

a plurality of planar segments rigidly connected to said input spool in a radial orientation such that the outer edges of said planar segments collectively approximate a conical shape;

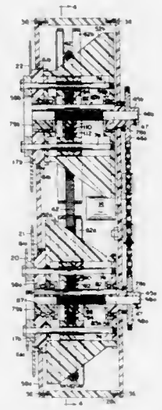
an output spool rotatably mounted on said output shaft;

a plurality of planar segments rigidly connected to said output spool in a radial orientation such that the outer edges of said planar segments collectively form a generally conical shape;

an input chain guide and an output chain guide each comprising two sheaves with each sheave having a plurality of radially oriented slots, said chain guides being mounted on said input and output spools, respectively, such that each of said planar segments are slidably inserted through a corresponding slot of said chain guides;

means for mounting said shafts and spools such that the cones approximated by the outer edges of the planar segments of each spool are oppositely oriented;

a flexible means coupling the rotation of said output chain guide and spool to the rotation of said input chain guide and spool by engaging the outer edges of the planar segments of each spool;



means for coupling the rotation of said input sprocket wheel to said input spool;

means for coupling the rotation of said output sprocket wheel to said output spool;

means for maintaining the positions of each of said chain guides along the length of the spool on which said chain guide is mounted; and

means for adjusting the position of each of said chain guides along the length of the spool on which said chain guide is mounted.

4,842,570

DEVICE FOR THE AUTOMATIC SHIFTING OF A TENSIONING ROLLER

Peter Niebling, Bad Kissingen, Fed. Rep. of Germany, assignor to FAG Kugelfischer Georg Schafer (KGaA), Fed. Rep. of Germany

Filed Jun. 22, 1988, Ser. No. 209,993

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1987, 3724169

Int. Cl.[4] F16H *7/08*

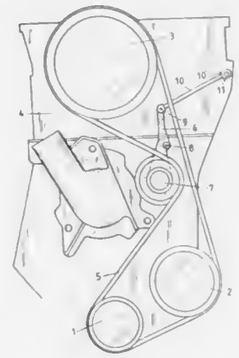
U.S. Cl. 474—118 **9 Claims**

1. A device for automatically shifting a tensioning roller for maintaining a level of tension on a belt, wherein the belt is trained on a plurality of belt rollers and a tensioning roller is applied against the trained belt to deflect the belt and apply tension thereto;

a pivotable base plate; a point of pivot attachment about which the plate pivots; the tensioning roller being mounted to the pivoting plate eccentric of the pivot point of the plate, and the pivot point of the plate being oriented such that pivoting of the plate around the pivot thereof moves the tensioning roller against the belt to alter the tension on the belt;

connecting means connected to the plate eccentrically of the pivot point of the plate and further connected to another point of attachment;

a housing on which at least one of the belt rollers is attached having a different coefficient of thermal expansion than the coefficient of thermal expansion of the connecting means, and the connecting means being oriented so that upon a change in temperature of the housing, the connecting means moves the plate for maintaining a constant level of tension on the belt as the housing is heated and is expanded thereby.



4,842,571

FLEXIBLE LINK BELT

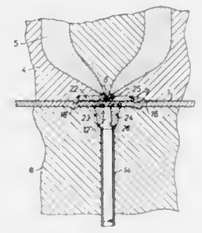
Rudolf Liebl, Altstaetten, and Ernst Bosshard, Adliswil, both of Switzerland, assignors to EgoKiefer AG, Altstaetten, Switzerland

Division of Ser. No. 63,244, Jun. 15, 1987, which is a division of Ser. No. 926,978, Nov. 4, 1986, Pat. No. 4,705,469. This application Jun. 24, 1988, Ser. No. 211,332

Claims priority, application Switzerland, Nov. 6, 1985, 4767/85; Sep. 23, 1986, 3813/86

Int. Cl.[4] F16G *1/22*

U.S. Cl. 474—204 **13 Claims**



1. A flexible link belt, comprising a flexible carrier webbing made of filaments forming interstices in the webbing between crossing filaments, link means of synthetic material melted through said interstices for intimately bonding said link means to said carrier webbing, said link means comprising a plurality of links spaced from each other, each link means having a first link portion on one side of said flexible carrier webbing and a second link portion on the other side of said flexible carrier webbing, said first and second link portions being permanently bonded to each other through said interstices in said flexible webbing and thereby also to said webbing, said filaments being embedded in said link means for reinforcing said link means, and wherein at least one of said first and second link portions has a cavity therein reaching substantially to said webbing for facilitating an elastic action of said one link portion having said cavity.

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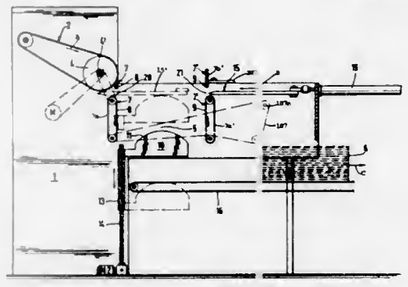
4,842,572

APPARATUS FOR SUBDIVIDING A RUNNING WEB OF PANELS IN ZIG-ZAG FORMATION INTO STACKS

Oscar Roth, Zufikon, Switzerland, assignor to Involvo AG, Bünzen, Switzerland

Filed Apr. 14, 1988, Ser. No. 181,555
Claims priority, application Switzerland, Apr. 16, 1987, 01495/87; Oct. 2, 1987, 03867/87
Int. Cl.[4] B65H 35/06
U.S. Cl. 493—357 14 Claims



1. Apparatus for subdividing a continuous web of mutually inclined panels in zig-zag formation wherein neighboring panels are connected to one another by fold lines, comprising a substantially upright duct including two spaced-apart sidewalls having confronting substantially vertical surfaces and a bottom wall; conveyor means for advancing the web longitudinally toward the duct while the neighboring panels of the advancing web at least partially overlap each other; means for directing successive panels of the advancing web into said duct so that the foremost panel of the web rests on said bottom wall and successive fold lines abut the surfaces of different sidewalls of the duct whereby the latter accumulates a growing stack of overlapping panels; and means for severing the web between two neighboring panels in said duct at a predetermined level between said directing means and said bottom wall by destroying a fold line which is located at said level adjacent one of said surfaces and connects the topmost panel of the stack between said bottom wall and said level with the panel above said level, including a flat severing tool having a dull leading edge, said tool including a substantially roller-shaped rotary element which defines said leading edge, said roller-shaped rotary element ensuring that the tool does not buckle, fold, and/or otherwise adversely affect the two neighboring panels at the predetermined level and means for moving said tool between a retracted position in which the tool is outside said duct and the leading edge is outwardly adjacent the other of said surfaces, along a substantially horizontal path extending across said duct at said level so that the leading edge destroys the fold line at said level to thereby separate the stacks between said bottom wall and said level from the panel above said level, and an extended position in which said leading edge is outwardly adjacent said one surface.

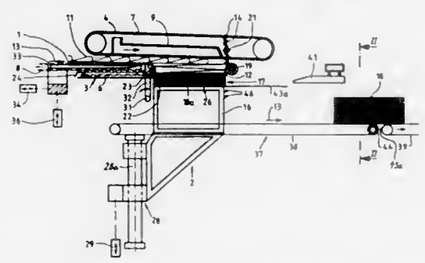
4,842,573

APPARATUS FOR FORMING STACKS OF PANELS IN ZIG-ZAG FORMATION

Jürgen Peter, Hamburg, and Karl-Heinz Schlottke, Tangstedt, both of Fed. Rep. of Germany, assignors to E.C.H. Will GmbH, Hamburg, Fed. Rep. of Germany

Filed May 17, 1988, Ser. No. 195,075
Claims priority, application Fed. Rep. of Germany, May 29, 1987, 3718081
Int. Cl.[4] B65H 45/16, 29/56, 29/24
U.S. Cl. 493—412 24 Claims

1. Apparatus for converting at least one running web of coherent panels into a succession of stacks with superimposed panels in zig-zag formation, comprising means for advancing the web longitudinally in a predetermined direction along a predetermined path; means for superimposing successive panels in a predetermined portion of said path to form a growing stack of superimposed panels in zig-zag formation with a lowermost panel and two rows of fold lines connecting each panel above the lowermost panel to the neighboring panels; and



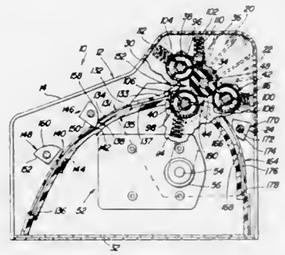
means for supporting the lowermost panel of the growing stack in said portion of said path, said supporting means having means for bending the fold lines of said rows to thereby impart to the lowermost panel and at least some panels close to the lowermost panel a concavo-convex configuration with resulting being of the fold lines adjacent said lowermost panel and said at least some panels close to the lowermost panel.

4,842,574

BUCKLE CHUTE FOLDER HAVING SHEET SQUARING FEATURE

Noel L. Noble, 23313 Melville, Hazel Park, Mich. 48030; Edward A. Bluthardt, 6478 Canmoore, Troy, Mich. 48098, and Jeffrey L. Goins, 55605 Card Rd., New Haven, Mich. 48048

Filed Jul. 21, 1987, Ser. No. 76,129
Int. Cl.[4] B65H 45/14
U.S. Cl. 493—421 15 Claims



1. A buckle fold machine of the type including a plurality of rollers mounted for rotation about axes parallel and adjacent to each other, means directing a leading edge of a sheet of paper introduced between a first set comprising a first pair of said rollers normally closely spaced to grip said sheet of paper, means driving said first set of rollers to be rotated to feed said introduced sheet; a stop surface extending parallel to said rotational axis of said first set of rollers located to be contacted by said leading edge of said sheet to be buckled thereagainst, said plurality of rollers including a second set of rollers comprising a closely spaced pair of said rollers, said buckle so formed drawn between said second set of said rollers to be folded, and drive means for rotating said second sets of rollers, the improvement comprising:

squaring means for squaring said piece of paper to said first set of rollers, including an auxiliary light frictional drive means separate from said first set of rollers, acting on said sheet of paper introduced between said set of said rollers,

said frictional drive means allowing lateral squaring movement of said sheet of paper after contacting said stop, said stop surface contacting said leading edge of said sheet of paper advanced by said light frictional drive tending to square said sheet of paper thereagainst; and,

cam means periodically separating said first set of rollers gripping said sheet of paper to allow lateral movement therebetween to accommodate said squaring movement of said sheet.

4,842,575

METHOD FOR FORMING IMPREGNATED SYNTHETIC VASCULAR GRAFTS

Harmon Hoffman, Jr., Wyckoff, N.J., and Kemal Schankereli, Stillwater, Minn., assignors to Meadox Medicals, Inc., Oakland, N.J.

Division of Ser. No. 67,390, Jun. 24, 1987, which is a continuation of Ser. No. 4,765, Jan. 7, 1987, abandoned, which is a continuation of Ser. No. 575,082, Jan. 30, 1984, abandoned.
This application Aug. 5, 1988, Ser. No. 228,613
Int. Cl.[4] A61F 2/06, 2/04
U.S. Cl. 600—36 15 Claims

1. A process for preparing a blood-tight collagen-impregnated synthetic vascular graft, comprising:

providing a porous tubular flexible synthetic graft substrate;

placing an aqueous slurry of water-insoluble collagen fibrils and plasticizer onto at least the inner surface of the substrate;

massaging the substrate to insure intimate mixing of the collagen fibrils into the porous structure of the substrate;

drying the collagen;

cross-linking the collagen by exposure to formaldehyde vapor; and

vacuum drying to remove excess formaldehyde.

4,842,576

SYSTEM FOR GENERATING SUBSTANTIALLY CONSTANT FLUID PRESSURE

Michael J. Lysaght, Barriogton; Daniel R. Boggs, and Philip L. Ritger, both of Vernon Hills, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Filed Oct. 15, 1986, Ser. No. 919,044
Int. Cl.[4] A61M 37/00
U.S. Cl. 604—6 22 Claims

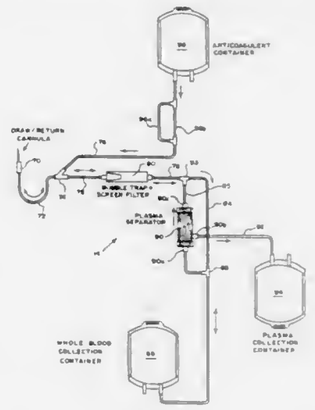
1. A fluid separation system comprising

a variable volume container for accumulating a desired volume of fluid,

means for separating the fluid into component parts,

means for holding said variable volume container, including an element rotatably supported adjacent to said variable volume container, and

means including a mass subject to the force of gravity for generating an essentially constant torque to press said element against said variable volume container to reduce its volume while rotating said element to advance said container by said element and sequentially express the accumulated fluid from said container into said separation means at a substantially constant pressure, said mass being



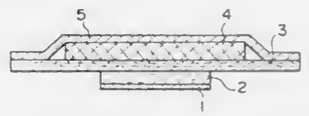
coupled to said rotatably mounted element by an elastic tubing member to slow the rate of descent of said mass.

4,842,577

PLASTER STRUCTURAL ASSEMBLY FOR IONTOPHORESIS

Yutaka Konno; Mitsuo Mitomi; Takashi Sonobe, all of Shizuoka, and Sbumpei Yamaguchi, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1987, Ser. No. 109,083
Claims priority, application Japan, Oct. 20, 1986, 61-250364
Int. Cl.[4] A61N 1/30
U.S. Cl. 604—20 5 Claims



1. A plaster structural assembly for iontophoresis comprising an electrode layer and a medicament containing layer, wherein a water supplying layer is disposed between the electrode layer and the medicament-containing layer and further a sealing cover is formed at the outside of the electrode layer, said water supplying layer composed of water and water retentive fibers.

4,842,578

SURGICAL ABRADING INSTRUMENT

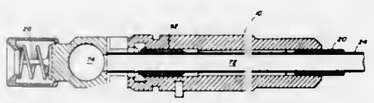
Lanny L. Johnson, Okemos, Mich., and Robert E. Brissette, Lynnfield, Mass., assignors to Dyonics, Inc., Andover, Mass.

Continuation of Ser. No. 840,462, Mar. 12, 1986, abandoned, which is a continuation of Ser. No. 587,554, Mar. 8, 1984, abandoned, which is a continuation-in-part of Ser. No. 237,895, Feb. 25, 1982, abandoned. This application Apr. 14, 1988, Ser. No. 186,645
Int. Cl.[4] A61B 17/32
U.S. Cl. 604—22 11 Claims

1. A surgical instrument for a joint space of the body capable of performing intra-articular closed surgery through a puncture wound comprising the combination of an inner drive shaft carrying on its end a cartilage- and bone-abrading element, a fixed outer tubular member surrounding said inner shaft, said inner drive shaft carrying said abrading element and said sur-

rounding outer tubular member sized and constructed for insertion into said joint space via said puncture wound, said outer tubular member providing, at a distal bearing region disposed only proximally of said abrading element, distal support for said inner shaft extending distally, in cantilever fashion, from said distal bearing region when subjected to side load during abrading of cartilage and bone by the side of said cartilage- and bone-abrading element,

a distal extension of said tubular supporting member providing a sheath for a portion of said cartilage- and bone-abrading element sized and shaped to protect adjacent cartilage and bone surfaces of said joint and a vacuum passage communicating proximally from the region of said abrading element, past said bearing region, to a proximal vacuum connection, whereby during driving of said shaft and drawing of suction through said connection, cartilage and bone particles dislodged by the driven, side-supported cartilage- and bone-abrading element may be drawn past said bearing region and out of said instrument.



4,842,579

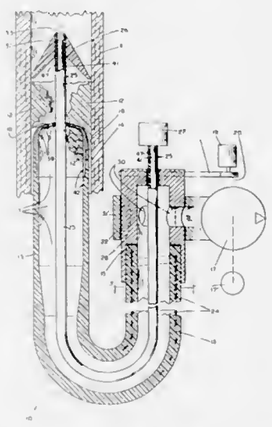
ATHERECTOMY DEVICE

Samuel Shiber, Mundelein, Ill., assignor to Surgical Systems & Instruments, Inc., Mundelein, Ill.

Continuation-in-part of Ser. No. 018,083, Feb. 24, 1987, which is a continuation-in-part of Ser. No. 874,546, Jun. 16, 1986, Pat. No. 4,732,154, which is a continuation-in-part of Ser. No. 609,846, May 14, 1984, abandoned. This application Jul. 29, 1988, Ser. No. 225,380

Int. Cl.[4] A61B *17/32*

U.S. Cl. 604—22 5 Claims



1. An atherectomy system for cutting, ingesting and removing an obstruction from within a patient's artery, comprising in combination:

a flexible guide-wire insertable into the artery,

a flexible rotary catheter being rotatably disposed and insertable into the artery, over said flexible guide-wire,

a blade at a distal end of said flexible rotary catheter for cutting an obstruction located in front of said blade, said blade having teeth on its periphery which are rounded and bent toward the center of the blade and an outer wall for slidingiy and rotatably bearing against the artery,

a rotating inner-wall formed by the inside surfaces of said flexible rotary catheter and said blade,

a continuous passage surrounding said flexible guide-wire for ingesting the cut obstruction material, said continuous passage being defined between said rotating inner-wall and said flexible guide-wire,

coupling means at said proximal end of said flexible rotary catheter for coupling it to a rotating means.

4,842,580

COLONIC IRRIGATOR

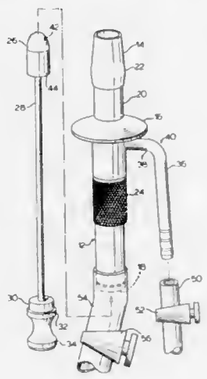
Gloria Ouelette, 2829A Dundas Street West, Apartment 2, Toronto, Ontario, Canada

Filed Dec. 24, 1987, Ser. No. 137,586

Claims priority, application Canada, Jan. 6, 1987, 526774

Int. Cl.[4] A61M *1/00*

U.S. Cl. 604—30 5 Claims



3. A colonic irrigator for insertion through the rectum of a prostrate person comprising an open ended nozzle, a flange on said nozzle intermediate of its ends, a tapered one end to said nozzle, a conduit for delivering gravity fed irrigating fluid downward to said nozzle and attached thereto between said flange and the other end of said nozzle, said conduit where it is attached to the nozzle, being offset in relation to the longitudinal axis of said nozzle to define means for inducing spiral action to the entering fluid, a rounded nose obturator head adpated for bearing location in said tapered end, said obturator head projecting therefrom, a spindle traversing said nozzle, secured at one end to said obturator head and at the other end to a stop bearing against the other end of said nozzle, said stop limiting the travel of said obturator head in said nozzle for said bearing relationship, said spindle being adapted to permit manual removal of said obturator head after insertion into the rectum, another conduit attachable to said other end of said nozzle after said obturator has been withdrawn and valve means on said another conduit adapted to variably control the discharge of fluid from said nozzle thereby varying the pressure of fluid acting on the colon.

4,842,581

MEDICAL LAVAGE APPARATUS

Richard C. Davis, 14802 Dunstand Pl., Tampa, Fla. 33618

Filed Sep. 11, 1987, Ser. No. 95,077

Int. Cl.[4] A61M *5/18*

U.S. Cl. 604—38 10 Claims

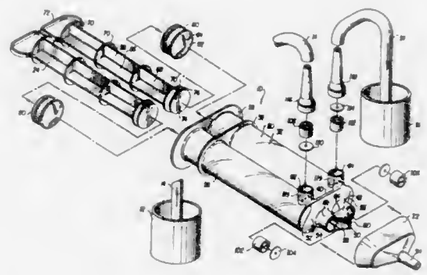
1. A medical lavage syringe device for irrigating and aspirating a body cavity, said device comprising:

an integral rigid housing defining an elongated irrigation cylinder with an irrigation bore and an elongated aspiration cylinder with an aspiration bore, said bores being substantially parallel and side-by-side, said irrigation and aspiration cylinder bores each being open and unconnected at first ends thereof, said rigid housing further defining respectively an inlet port and an outlet port in said respective irrigation and aspiration cylinders intermediate said first and second ends thereof;

a separate rigid common exchange tube rigidly attached to said housing having a single manifold wall surrounding said second ends of said bores so as to enclose said second ends of said bores in a common manifold chamber and leading to a common nozzle;

an irrigation plunger and an aspiration plunger having first ends for respectively fitting into said first open ends of said irrigation and aspiration cylinders and having sliding seals at said first ends thereof for making sealing, sliding contact with internal cylinder surfaces of said respective bores and including hand-engaging portions at second ends outside the cylinders for engaging a hand and thereby being moved into and out of their respective bores by said hand;

a system of check valves comprising an inlet check valve



located at said inlet port for allowing the flow of fresh irrigation fluid into said inlet port but hindering the flow of fluid from said inlet port, an outlet check-valve located at said outlet port for allowing the flow of aspiration fluid from said outlet port but hindering the flow of fluid into said outlet port, an irrigation check-valve located at said irrigation bore between said inlet port and said common exchange tube for allowing flow of irrigation fluid from said irrigation bore into said common exchange tube but for hindering the flow of fluid from said common exchange tube into said irrigation bore and an aspiration check-valve located at said aspiration bore between said outlet port and said common exchange tube for allowing flow of irrigation fluid from said common exchange tube into said aspiration bore but hindering flow in the opposite direction;

wherein said housing further includes at said second end thereof an inwardly V-shaped septum positioned between said irrigation and aspiration cylinder bores for allowing fluid flowing from these bores to come gradually together, said V-shaped septum extending longitudinally from said second end of said housing to be surrounded by said manifold wall, said septum including baffle means for preventing of cross mixing of fluids.

4,842,582

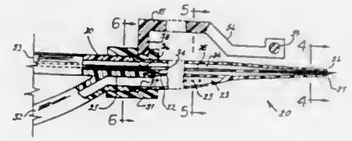
METHOD AND APPARATUS FOR USING DUAL-LUMEN CATHETERS FOR EXTRACORPOREAL TREATMENT

Sakharam D. Mahurkar, 6171 N. Sheridan, Suite 1112, Chicago, Ill. 60660

Division of Ser. No. 888,251, Jul. 18, 1986, Pat. No. 4,770,652, which is a division of Ser. No. 700,695, Feb. 12, 1985, Pat. No. 4,623,327. This application Apr. 19, 1988, Ser. No. 183,601

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—43 17 Claims



1. A catheter assembly comprising a catheter having first and second lumens for concurrently withdrawing and returning blood to a venous segment via axially-displaced first and second lumen openings in the distal end portion of said catheter, and external means mounted on said catheter for aligning a veno-occlusive ligature when the distal end portion of said catheter is inserted into said venous segment so that said veno-occlusive ligature occludes said venous segment at a location between said first and second lumen openings.

4,842,583

COLONIC IRRIGATION TUBE

Heshmat Majlessi, 33 Cedar St., Rye, N.Y. 10580

Filed Dec. 23, 1987, Ser. No. 136,948

Int. Cl.[4] A61M *3/00*

U.S. Cl. 604—43 9 Claims

1. A colon irrigation device comprising a tube made of flexible material and defining, during use, a distal end received within a colon to be irrigated and an opposing proximal end which is maintained external of the colon, said tube further defining first and second conduit means extending between said proximal and distal ends; the proximal end of said first conduit means being connectable to a source of irrigation fluid and the proximal end of said second conduit means being connectable to a fluid evacuation system, the distal ends of said first and second conduit means being substantially closed and having inlet or irrigation aperture means for discharging fluid from the distal end of said first conduit means into the colon

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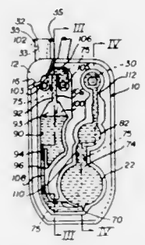
and outlet or suction aperture means for receiving the irrigating fluid at the distal end of said second conduit means; and gripping means at the distal end of said tube for allowing sensing and gripping said distal end of said tube through the wall of the colon, said tube having predetermined external dimensions, and said gripping means comprising an enlarged distal end of said tube having dimensions greater than said predetermined external dimensions, said gripping means providing an enlarged surface area within which to increase the sizes or dimensions of said inlet or suction apertures disposed on said gripping means, whereby clogging of said inlet or suction apertures is minimized and said device can be effectively used to provide post-surgery decompression of the colon wherein the dimensions or cross sectional areas of said inlet or suction aperture means are greater than the dimensions or cross sectional areas of said outlet or irrigation aperture means on at least said enlarged distal end.

4,842,584

DISPOSABLE FLUID INFUSION PUMPING CHAMBER CASSETTE AND DRIVE MECHANISM THEREOF

John Pastrone, Los Gatos, Calif., assignor to Abbott Laboratories, Abbott Park, Ill.

Filed May 1, 1987, Ser. No. 45,958
Int. Cl.[4] A61M *31/00*
U.S. Cl. 604—50 **46 Claims**



1. A pump cassette adapted to be driven by a pump driver having a plunger and valve actuators, comprising:
- a cassette inlet, a cassette outlet and a fluid path therebetween;
- a rigid face member;
- a rigid back member having an enlarged recess forming a pumping chamber along said fluid path;
- an elastomeric member positioned between said face and back members;
- said face member including a plunger opening therethrough opposite said pumping chamber to permit the passage of the plunger and valve actuator openings to permit valve actuators to control the flow of fluid through said pumping chamber;
- a flow control member mounted on said face member for controlling the flow of fluid along said fluid path; and
- air detection means projecting from said face member to detect the presence of air in said cassette.

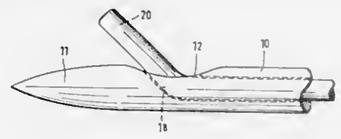
4,842,585

STEEL CANNULA FOR SPINAL AND PERIDURAL ANAESTHESIA

Hans-Hinrich Witt, Körle, Fed. Rep. of Germany, assignor to B. Braun Melsungen AG, Melsungen, Fed. Rep. of Germany

Filed Dec. 7, 1987, Ser. No. 129,643
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1986, 3643235
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—158 **4 Claims**

1. A steel cannula for spinal and peridural anaesthesia, comprising:
- a substantially straight tube having a tube channel therein, the tube terminating in an atraumatically pointed, rotationally symmetric tip, the tube having an elongated lateral opening therein provided behind the tip, the opening extending to the tube channel and having a border thereabout,
- a guide surface extending from the bottom of the tube channel and ascending obliquely towards the end of the opening,



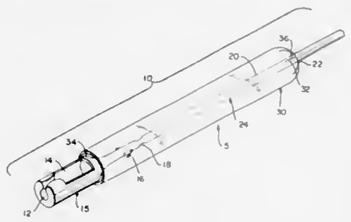
- a ground surface enclosing the opening, the ground surface forming an elongated funnel whose wall is universally inclined towards the border of the opening, and
- a catheter displaceably positioned in the tube channel, the catheter having a front end supported by the guide surface,
- whereby the guide surface urges the catheter to exit the tube laterally.

4,842,586

SAFETY DEVICE AND METHOD FOR REMOVAL AND DISPOSAL OF MEDICAL NEEDLES

John M. Hogan, Long Beach, Calif., assignor to City of Hope National Medical Center, Duarte, Calif.

Filed Mar. 18, 1987, Ser. No. 27,251
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—192 **9 Claims**



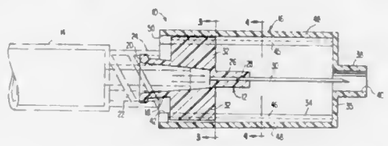
1. An apparatus separate from a spinal or bone marrow biopsy needle for protection from such a needle upon withdrawal from a patient comprising:
- a housing component and
- a needle pulling component comprising cradle means for engaging the receptacle end of a spinal or bone marrow biopsy needle to be withdrawn from a patient and pulling rod means attached to said cradle means
- said housing component having an open distal end defining a passage for said cradle and a proximal end defining a passage for said pulling rod
- said housing means being dimensional to slidably engage said cradle and to enclose said needle upon withdrawal from a patient.

4,842,587

NO-PRICK HYPODERMIC SYRINGE

George W. Poucy, 3725 Investment La., Riviera Beach, Fla. 33404

Filed Jul. 15, 1987, Ser. No. 73,802
Int. Cl.[4] A61M *5/32*
U.S. Cl. 604—198 **25 Claims**



1. A no-prick assembly for a hypodermic syringe having a syringe body, comprising:
- a needle portion, including a needle for injecting and withdrawing fluid, and a needle hub for mounting the needle on an end of the syringe body;
- an elongate closure movably mounted on said needle portion, said closure being movable between a first position, in which said closure encloses said needle, and a second position, in which said needle projects externally of said closure, said closure having an end to be positioned proximal to said syringe body defining a large opening large enough to receive said syringe body and an end to be positioned distal to said syringe body defining a small opening large enough for said needle to pass through and small enough to prevent a human finger from passing through; and
- means for supporting said closure for reciprocation relative to said needle, said supporting means comprising a plurality of radially projecting flaps and resilient portions extending from said flaps, said closure engaging said resilient portions.

4,842,588

METHOD OF LOADING AND DISCHARGING A DRIP CHAMBER

J. Paul Jones, Chester Springs, Pa., assignor to PRD Corporation, Exton, Pa.

Continuation of Ser. No. 51,521, May 19, 1987, abandoned, Division of Ser. No. 836,503, Mar. 5, 1986, Pat. No. 4,685,912.
This application Feb. 1, 1988, Ser. No. 151,117
Int. Cl.[4] A61M *5/16*
U.S. Cl. 604—51 **1 Claim**

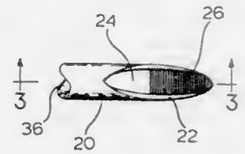
1. A method of loading and discharging a drip chamber in an intravenous infusion system including a source of fluid, a drip chamber, control means, a hypodermic needle, and a flexible tube connecting the needle to the drip chamber, comprising the steps of:
- (a) operating said control means to cause drops of fluid from said source to enter the drip chamber;
- (b) while said drops are entering the drip chamber operating said control means to simultaneously vent the drip chamber to atmosphere through said flexible tubing and hypodermic needle without fluid flowing through the flexible tubing and hypodermic needle;
- (c) when fluid in the drip chamber has reached a desired level, operating said control means to stop the drops from entering the drip chamber;
- (d) when said control means is operated to stop the drops from entering the drip chamber, operating said control means to stop the venting of the chamber and permit fluid in the chamber to flow out through the flexible tubing and the hypodermic needle until the fluid in the chamber is stabilized by a partial vacuum in the unvented chamber.

4,842,589

INTERCAVITY CATHETER

David C. Fecht, Manchester; Thomas B. Ferguson, St. Louis; Ronald Crouther, Chesterfield, and Alan B. Ranford, St. Louis, all of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Nov. 26, 1986, Ser. No. 935,378
Int. Cl.[4] A61M *25/00*; A61B *17/28*
U.S. Cl. 604—280 **9 Claims**



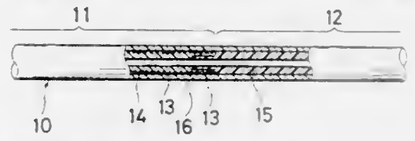
1. A catheter adapted to have one end pulled through an incision from inside a body to the outside of the body comprising a tubular member having a distal end portion for placement within the body, and a proximal end portion adpated to be grasped by forcep means and pulled through an incision in the body for subsequent positioning outside of the body, the inner wall of said proximal portion having a roughened area including a plurality of serrations adapted to be grasped by the forcep means during use, said roughened area extending distally substantially from the proximal most point of said proximal end portion for a predetermined distance, and the inner wall of the rest of said tubular member being substantially smooth.

4,842,590

CATHETER AND METHOD FOR MAKING

Susumu Tanabe, Fujinomiya, and Tatsuo Suzuki, Machida, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 918,613, Oct. 10, 1986, abandoned, which is a continuation of Ser. No. 655,333, Sep. 27, 1984, abandoned. This application Jun. 2, 1988, Ser. No. 204,965
Claims priority, application Japan, Dec. 14, 1983, 58-234292
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—282 **33 Claims**



1. A catheter comprising
- a body portion including a proximal inner tube made of an elastomer and a reinforcing layer embedded in the surface of the proximal inner tube; and
- a tip portion including a distal inner tube made of a radi-

opaque substance-containing material and which is more flexible than said elastomeric proximal inner tube;

said reinforcing layer of said proximal inner tube comprising a metal material wire braiding to provide an increased response of said tip portion to rotation of said body portion;

said proximal inner tube having substantially the same outside diameter as said distal inner tube, said proximal inner tube being axially interconnected to said distal inner tube at a joint via radially and axially directed joint surfaces, the outer diameters of said proximal and distal inner tubes being substantially the same at least at portions thereof adjacent said radially and axially directed joint surfaces to provide a substantially smooth and continuous connection at least on the outer surfaces of said interconnected proximal and distal inner tubes; and

said body and said tip portions including a sheath of a radiopaque substance-free elastomer continuously covering the outer surface of said proximal inner tube and the outer surface of said distal inner tube and bonded to the outer surfaces of said proximal and distal inner tubes at least at the portions thereof in the vicinity of said joint surfaces.

4,842,591

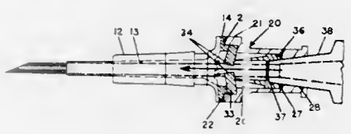
CONNECTOR WITH ONE-WAY SEPTUM VALVE, AND ASSEMBLY

Ronald B. Luther, 530 Kings Rd., Newport Beach, Calif. 92663

Filed Jan. 21, 1988, Ser. No. 146,718

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—283 **7 Claims**



1. A connector with a one-way septum valve, including:

(a.) a proximal portion having a forward bore for mounting a catheter therein, the proximal portion being enlarged rearwardly for seating a deformable, slit septum;

(b.) a distal portion attached to the proximal portion, and securing the said septum therebetween, the distal portion defining a rearward bore for engaging a syringe, I.V. unit, and the like, and for securing a moveable plug therein;

(c.) a hollow, moveable plug secured in the rearward bore of the distal portion, the plug being positioned adjacent the septum; whereby:

i. the plug is adapted to be moved forwardly within the bore upon contact with the I.V. unit, syringe, and the like at a tip thereof, and then to enter the septum slit and deform the septum open;

ii. liquid from the I.V. unit, syringe, and the like will pass through the connector to a patient when the septum is open;

iii. when the I.V. unit, syringe and the like is withdrawn from the patient, the septum will deform to its closed position and force the plug back along the bore of the distal portion; and,

iv. the plug is adapted to support the septum against liquid flow from the patient through the connector, thereby maintaining the connector in a leak proof and sterile manner after repeated use.

4,842,592

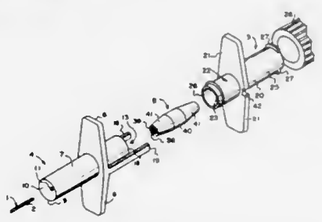
CONNECTOR ASSEMBLY

Carlos A. Caggiani; Thomas A. Coneys, both of Peterborough, and Kenneth W. Larson, Keene, all of N.H., assignors to Teleflex Incorporated, Limerick, Pa.

Continuation of Ser. No. 47,842, May 6, 1987, abandoned, which is a continuation of Ser. No. 607,295, May 4, 1984, abandoned. This application Feb. 26, 1988, Ser. No. 163,170

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—283 **44 Claims**



1. An adaptive connector for engaging a tubular member, comprising:

a pair of segments adapted for telescoping engagement with one another, said segments combining to develop a centrally disposed cavity, and at least one of said segments having an opening in an end thereof which communicates with said cavity and which is adapted to receive said tubular member therein; and

a plug formed of a compressible material and located within said cavity, said plug having a channel extending longitudinally therethrough for receiving said tubular member from said opening;

said cavity and said plug having cooperating surfaces for compressing said plug and for applying substantially uniform forces against said tubular member along the length of said member receiving channel to uniformly constrict said channel about said tubular member and thereby securely engage said tubular member within said adaptive connector when said telescoping segments are engaged with one another.

4,842,593

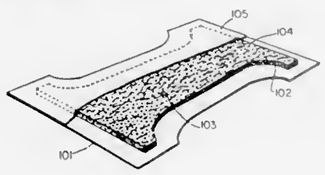
DISPOSABLE ABSORBENT ARTICLES FOR INCONTINENT INDIVIDUALS

William E. Jordan, Cincinnati, and Leslie D. Ryan, Millville, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 9, 1987, Ser. No. 107,226

Int. Cl.[4] A61F *13/16, 13/18*

U.S. Cl. 604—360 **15 Claims**



1. A disposable absorbent article useful for absorbing urine and feces discharged by incontinent individuals and also useful for reducing or preventing diaper rash, said absorbent article comprising

(A) a liquid impervious backing sheet;

(B) a relatively hydrophobic, liquid pervious topsheet;

(C) an absorbent core positioned between said backing sheet and said topsheet, said absorbent core comprising hydrophilic fiber material, and

(D) a pH control system consisting essentially of

(i) an acidic buffering agent which releases protons when contacted with aqueous liquids, said buffering agent being in the form of particles of a partially neutralized, slightly cross-linked polymeric gelling agent having a gel volume of at least about 20 grams of synthetic urine per gram of gelling agent buffer, said particles being combined with the hydrophilic fiber material of the absorbent core and present within said core in a concentration of from about 2% to 50% by weight of the core; and

(ii) an antimicrobial agent selected from quaternary nitrogen-based compounds and bis-biguanide compounds, said antimicrobial agent being combined with said absorbent core and present in or on said core in a concentration of from about 0.02% to 2.0% by weight of the core;

said buffering agent compound and said antimicrobial agent component being present within said pH control system in a weight ratio of from about 3:1 to 2000:1 with said pH control system being present in said absorbent article in an amount which is effective to maintain the pH of *Proteus vulgaris*-contaminated, bicarbonate-containing urine discharged into said article at a value below about 7.5.

4,842,594

ABSORBENT ARTICLE WITH INTERNAL WICKING MEANS

Irving S. Ness, Palmetto Dunes, S.C., assignor to Chicopee, New Brunswick, N.J.

Continuation of Ser. No. 889,448, Jul. 23, 1986, abandoned, which is a continuation of Ser. No. 721,832, Apr. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 525,850, Aug. 24, 1983, abandoned. This application Feb. 3, 1988, Ser. No. 152,208

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—368 **3 Claims**

1. An absorbent article comprising a first discrete superabsorbent containing layer, a second discrete superabsorbent containing layer, and a continuous wicking means extending about and between said first and second discrete superabsorbent containing layers, each of said layers having a pair of major surfaces and a pair of side edges, the major surfaces and at least one side edge of each of said discrete superabsorbent containing layers being in contact with said wicking means.

4,842,595

ABSORBENT ARTICLE

Minoru Nakanishi, and Akira Sakurai, both of Utsunomiya, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Oct. 29, 1987, Ser. No. 114,018

Claims priority, application Japan, Nov. 5, 1986, 61-263542

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—372 **21 Claims**

1. An absorbent article comprising:

a liquid-permeable surface sheet,

a liquid-permeable leakproof sheet contained within said surface sheet, and

an absorbent layer disposed within said leakproof sheet and at least partially exposed to said surface sheet wherein said absorbent layer comprises 20 wt.% or more of a nodular

fiber, said nodular fiber comprising a hydrophilic fiber having a wet to dry tenacity ratio of 80% or more.

4,842,596

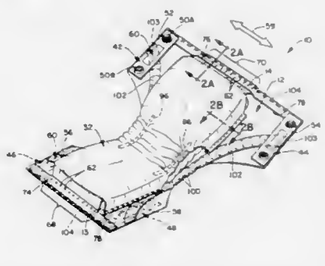
METHOD OF MAKING A BREATHABLE ELASTIC FABRIC COMPOSITE AND PERSONAL ARTICLE INCORPORATING SAME

David P. Kielpikowski, Appleton, and Duane G. Uitenbroek, Little Chute, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Dec. 31, 1986, Ser. No. 947,949

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—385.2 **9 Claims**



1. A disposable absorbent garment comprising:

an outer cover including a pair of leg openings, front and rear waist sections defining a waist opening, inner and outer surfaces, a central crotch portion between said leg openings and opposed front and rear panels separated by said crotch portion;

an absorbent structure superposable on said outer cover, for absorbing and retaining bodily exudates;

gathers at either of said leg opening and said waist opening; and

wherein either of said leg and waist gathers are formed from a breathable elastomeric nonwoven laminar fabric comprising a liquid impervious elastomeric film carrier sheet sandwiched and bonded at spaced apart sites between two or more nonwoven facing sheets thereby forming air permeable apertures therein at said bond sites, providing a cushioned cloth-like fit of said garment about the body of a wearer.

4,842,597

HYDROPHILIC COPOLYMERS FOR WOUND DRESSINGS AND OTHER BIOMEDICAL USES

Michael G. Brook, Chessington, England, assignor to Fulmer Yarsley Ltd., Surrey, England

Filed May 15, 1987, Ser. No. 50,019

Claims priority, application United Kingdom, May 15, 1986, 8611838

Int. Cl.[4] A61F *13/18; A61L 15/00*

U.S. Cl. 604—368 **9 Claims**

1. A wound dressing comprising a hydrogel layer having a water content of at least 50% by weight, said hydrogel consisting essentially of a water-swollen, substantially uncross-linked hydrophilic copolymer of a hydrophobic monomer compo-

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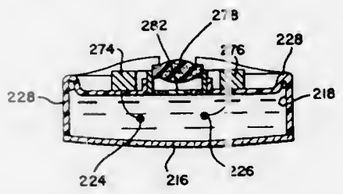
nent and a hydrophilic monomer component, wherein the hydrophobic monomer component comprises a lower alkyl acrylate or methacrylate ester and the hydrophilic monomer component is selected from N-vinyl pyrrolidone (NVP), and mixtures of NVP and one or more hydroxy alkyl acrylate and methacrylate, the hydrophobic and hydrophilic monomer components being copolymerized in the molar ratio of from 1:1 to 1:4.

4,842,598

THERAPEUTIC AGENT DELIVERY SYSTEM AND METHOD

Loi H. Tran, Wheaton, Ill., assignor to Controlled Release Technologies, Inc., Batavia, Ill.

Division of Ser. No. 679,128, Dec. 6, 1984, Pat. No. 4,715,850. This application Dec. 24, 1987, Ser. No. 137,761
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—891.1 6 Claims



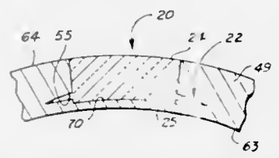
1. A therapeutic agent delivery system comprising:
a housing retaining a semipermeable membrane and together with the membrane defining a donor chamber adapted to hold the therapeutic agent, the membrane being made of a material that is substantially impermeable to the therapeutic agent in an ionic form;
an anode and a cathode exposed within the donor chamber such that an electromotive force between the anode and the cathode will alter the electrical charge of the therapeutic agent to permit the agent to pass through the membrane.

4,842,599

PROSTHETIC CORNEA AND METHOD OF IMPLANTATION THEREFOR

Leonard Bronstein, Phoenix, Ariz., assignor to Ann M. Bronstein, Phoenix, Ariz.

Continuation-in-part of Ser. No. 923,893, Oct. 28, 1986, abandoned. This application Nov. 12, 1987, Ser. No. 120,329
Int. Cl.[4] A61F 2/14
U.S. Cl. 623—5 42 Claims



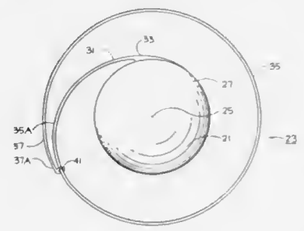
1. A unitary prosthetic cornea for implantation into a living cornea, which living cornea includes:
(A) a receptacle formed therein as a result of the excision of an aberrated section of predetermined dimension and to a predetermined depth terminating in the posterior one-third of the stroma;
(B) a remaining portion adjacent the receptacle;
(C) a posterior surface; and
(D) an annular stromal pocket formed continuous with and extending outwardly from said receptacle, said stromal pocket residing within the posterior one-third of the stroma;
and for correcting defects inherent in said aberrated section, said prosthetic cornea:
(E) being formed of a material which is relatively inert, transparent and substantially rigid;
said prosthetic cornea further comprising:
(F) an optical portion sized and shaped to be received within the receptacle in said living cornea; and
(G) an attachment portion carried by said optical portion for securement to the remaining portion of said living cornea, said attachment portion including an annular flange extending generally outwardly from said optical portion, said annular flange:
(1) being dimensioned and configured and positioned with respect to said optical portion to be received within said stromal pocket and to reside entirely within the posterior one-third of the stroma; and
(2) including a plurality of circumferentially distributed apertures therethrough, said apertures being of sufficient diameter to transfer fluids through said annular flange.

4,842,600

INTRAOCULAR LENS WITH VARIABLE CIRCUMFERENCE ENCIRCLING HAPTIC

Fred T. Feaster, 800 8th Ave., Suite 234, Fort Worth, Tex. 76104

Filed Mar. 17, 1988, Ser. No. 169,412
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 20 Claims



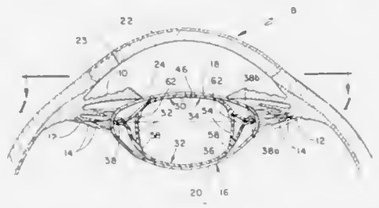
1. An intraocular insert suitable for use as an artificial lens implant in a human eye, comprising:
a lens body having a central axis and an outer periphery,
haptic means for supporting said lens body in a human eye,
said haptic means comprising a surrounding portion adapted to engage the tissue of a human eye,
said surrounding portion extending at least 360° around said axis and being spaced outward from said periphery of said lens body,
said haptic means comprising at least one inner connecting portion having an inner end joined to said periphery of said lens body and extending outward to said surrounding portion,
said surrounding portion comprising at least one outer portion having an outer end portion and an adjacent portion located between said outer end portion and said axis,
coupling means for coupling said outer end portion and said adjacent portion together such that said outer end portion may be moved along said adjacent portion to decrease or expand the circumference of said surrounding portion of said haptic means.

4,842,601

ACCOMMODATING INTRAOCULAR LENS AND METHOD OF IMPLANTING AND USING SAME

S. Gregory Smith, Cloud Farm, Nine Gates Rd., Yorklyn, Del. 19736

Filed May 18, 1987, Ser. No. 50,782
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 30 Claims



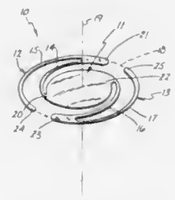
1. An accommodating intraocular lens comprising first and second flexible membrane-like lens members adapted to be inserted into a natural human lens capsule, said members having mutually interengaging means for connecting each other adjacent their edges after insertion into a natural human lens capsule, said lens members being yieldably biased in a direction to increase the distance therebetween and to thus produce a normal bulging thereof so as to allow a repeated bi-directional movement of central portions of said members relative to each other when subjected to the muscular or contractile action of a natural human capsule, the amount of yieldable biasing force being correlated with the capability of the natural capsule to contract and overcome the amount of biasing force to thereby reduce the amount of said normal bulging.

4,842,602

ENDOCAPSULAR INTRAOCULAR LENS

Tuan A. Nguyen, Fountain Valley, Calif., assignor to Allergan, Inc., Irvine, Calif.

Filed Sep. 13, 1988, Ser. No. 243,989
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 11 Claims



1. An intraocular lens, comprising:
an optic for implantation in a human eye; and
first and second fixation members attached to the optic for supporting the optic from the capsular bag of the eye, each of the fixation members having inner and outer legs;
the inner leg of each of the fixation members extending radially outwardly and circumferentially in na first circumferential direction form a respective one of first and second attachment sites on the optic to an intermediate portion of the fixation member, each of said inner legs extending circumferentially for a substantially greater distance than it extends radially;
the outer leg of each of the fixation members extending in a second circumferential direction along a respective one of first and second arcs from the intermediate portion of the fixation member to a distal endn portion of the fixation member, which second circumferential direction is opposite to the first circumferential direction;
the first and second arcs being concave toward the optic
the outer legs being dimensioned and arranged to be received in the capsular bag; and
each of the outer legs having a length such that the distal end portion of each of the fixation members is disposed proximate the intermediate portion of the other fixation member.

4,842,603

MATERIALS FOR IMPLANTATION COMPRISING A POLYACRYLATE CONTAINING SPHERICAL TRICALCIUM PHOSPHATE PARTICLES

Klaus Draenert, Ottobrunn, Fed. Rep. of Germany, assignor to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Continuation of Ser. No. 711,504, Mar. 12, 1985. This application Feb. 12, 1987, Ser. No. 14,418
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1983, 3325111
Int. Cl.[4] C08K 3/10, 3/32; A61F 1/00
U.S. Cl. 623—16 10 Claims

1. In an implantation material comprising a polyacrylate which contains 5 to 35 percent by weight of non-closely packed particles comprising absorbable tricalcium phosphate having a particle size between 20 and 300 μm, said particles being packed within the polyacrylate so that complete absorption of the particles does not occur after implantation, the improvement wherein said particles predominantly have an approximately spherical shape.

4,842,604

COMPOSITES OF UNSINTERED CALCIUM PHOSPHATES AND SYNTHETIC BIODEGRADABLE POLYMERS USEFUL AS HARD TISSUE PROSTHETICS

Linneaus C. Dorman, Midland, Mich., and Paul A. Meyers, Dublin, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 914,419, Oct. 2, 1986, Pat. No. 4,698,225, which is a division of Ser. No. 702,998, Dec. 19, 1985, Pat. No. 4,636,526. This application Jun. 1, 1987, Ser. No. 56,496
Int. Cl.[4] A61F 2/28
U.S. Cl. 623—16 8 Claims

1. A process for the prosthetic supplementation or replacement of hard tissue which comprises molding into an anatomically-shaped form a composite material containing from about 25 to about 75 percent by weight of an unsintered calcium phosphate biomaterial and about 75 to about 25 percent by weight of synthetic biodegradable polymer selected from the group consisting of a polyester of glycolic acid, a polyester of lactic acid, polyhydroxybutyrate, an α-amino acid polymer, and mixtures thereof, said composite material also containing from about 5 to about 30 percent by weight of a pore-forming agent (based on the total weight of the composite material plus the pore-forming agent); and implanting said anatomically-shaped form into an animal or human in need thereof.

4,842,605

HIP PROSTHESIS

Claude Sonnerat, Annecy-Le-Vieux, and André Brunet, Maintenon, both of France, assignors to S.N.R. Roulements, Annecy Cedex, France

PCT No. PCT/FR86/00243, § 371 Date Mar. 6, 1987, § 102(e) Date Mar. 6, 1987
PCT Filed Jul. 7, 1986, Ser. No. 34,417
Claims priority, application France, Jul. 9, 1985, 85 10689
Int. Cl.[4] A61F 2/34
U.S. Cl. 623—22 6 Claims

1. A hip prosthesis comprising:
a femoral member adapted to be implanted in a femur and an

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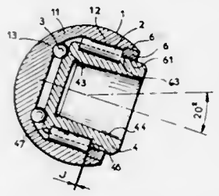
integral pin member extending from a proximal end of said femoral member at approximately an angle of 20 degrees to the horizontal;

a joint head adapted to engage an acetabulum and rotatably connected to said pin so as to oscillate around said pin, said joint head comprising a substantially cylindrical bore defining a circumferential side wall and a bottom end wall; and

a substantially cylindrical shell having a circumferentially outer wall and an outer end wall configured to engage said bore of the joint head and an inner bore to be affixed to said pin; and



first bearings positioned between said circumferential outer wall of said shell and said circumferential side wall of said joint head, said first bearings comprising means for supporting said joint head for rotation about said pin and for supporting radial loads to said joint head; and

second bearings positioned between said outer end wall of said shell and said bottom end wall of said joint head, said second bearings comprising means for supporting said joint head for rotation about said pin and for supporting the axial load to said joint head.

4,842,606

BONE IMPLANT

Curt Kranz, Berlin; Amir Zabedi, Münster, and Emmanuel Anapliotis, Berlin, all of Fed. Rep. of Germany, assignors to Mecron Medizinische Produkte GmbH, Berlin, Fed. Rep. of Germany

Filed Mar. 16, 1987, Ser. No. 26,320

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1986, 3609121; Jul. 29, 1986, 3625520

Int. Cl.[4] A61F *2/32*

U.S. Cl. 623—23 16 Claims

1. A nonmirror-symmetrical bone prosthesis comprising an elongated shaft which is divided into nirror symmetrical anterior and posterior halves about a medial-lateral plane, said halves forming outer anterior and posterior surfaces, respectively, and each of said anterior and posterior surface including an anchoring recess formed therein; and

a wedge element having a tapered bone engaging surface and an opposite shaft engaging surface; said shaft engaging surface having anchoring means formed thereon, wherein said wedge is attached to one of said coupling said anchoring means to said recess to form said nonmirror-symmetrical prosthesis that is specific to only one of the bone structure of the right of left side of the body.

4,842,607

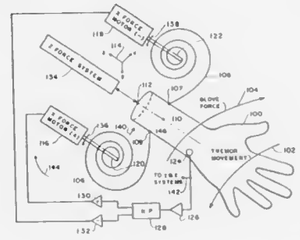
ACCURATE HAND MOVEMENT ASSISTANCE

Daniel W. Repperger, Vandalia, and Augustus Morris, Jr., Trotwood, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 5, 1987, Ser. No. 58,466

Int. Cl.[4] A61F *2/72*

U.S. Cl. 623—24 2 Claims



1. Stabilization apparatus for attenuating living subject hand tremor movements comprising the combination of:

a force coupling member receivable on a hand portion of said subject;

motion-sensing transducer means connected with said coupling member for generating an electrical signal responsive to acceleration movement of said hand portion;

electrical-to-mechanical transducer meansn mechanically coupled with said force coupling member for applying electrically generated physical force thereto;

signal processing means electrically coupled with said motion-sensing transducer means and said electrical-to-mechanical transducer means for converting said motion-sensing transducer acceleration signal to a larger electrical-to-mechanical transducer means energizing signal and for energizing said electrical-to-mechanical transducer means into tremor movement opposing mechanical motions; and

a frequency responsive filter element having selective response to signals of four Hertz frequency disposed in a predetermined location along a signal ltransmission path joining said motion-sensing transducer means, said signal processing means, and said electrical to mechanical transducer means.

4,842,608

FLUCTUATING VOLUME ADJUSTABLE PREPARATORY BELOW KNEE PROSTHETIC SOCKET

Herbert W. Marx, and Norbert Marx, both of West Islip, N.Y., assignors to Ortho-Bionics Laboratory, Inc., South Ozone Park, N.Y.

Filed Jan. 27, 1988, Ser. No. 148,933

Int. Cl.[4] A61F *2/78*

U.S. Cl. 623—33 8 Claims

1. A fluctuating volume adjustable prosthetic socket for below-the-knee amputees, comprising

(a) a generally hollow main body support of rigid plastic;

(b) said main support having a generally flat rectangular bottom wall, an anterior wall, a posterior wall, and medial and lateral walls forming a cavity to receive a residual limb;

(c) a posterior popliteal section of rigid plastic generally contoured to conform to the posterior anatomy of the knee;

(d) said popliteal section including a lower curved posterior wall merging in generally U-shaped cross section with medial and lateral popliteal walls each having supracondylar extension;

(e) the uppermost portions of said main support medial and lateral walls including supracondylar support portions;

(f) said posterior section nesting within said main support section with patella tendon support portions generally juxtaposed with said supracondylar extensions;

(g) cooperating locking means disposed on said posterior section and said main support section for adjustably joining said sections for controlled limited anterior-posterior displacement with respect to each other in which

(i) said locking means is a screw jack mechanism including an anterior housing, a posterior housing, and an elongated cylindrical threaded screw;

(ii) one of said housings having a threaded portion adapted to mate with said screw;

(iii) the other of said housings mounting the free end of said screw;

(iv) whereby rotation of said screw in one of said housings will effect the relative displacement of said two housings by the advancement or retraction of said threaded screw in said threaded portion;

(h) elasticized sleeve means supported at lower portions of said posterior popliteal section;

(i) adjusting means associated with said sleeve means for controlling the diameter and snugness of said sleeve means on a residual limb;

(j) whereby the volume of the residual limb receiving cavity

defined by the combination of the main support section, posterior popliteal section, and sleeve means may be readily and precisely adjusted to compensate for changes in volume of a residual limb to be received therein.

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4,842,609

FLAME RETARDANT TREATMENTS FOR POLYESTER/COTTON FABRICS

James R. Johnson, McLeansville, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

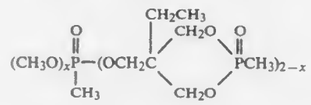
Continuation-in-part of Ser. No. 870,892, Jun. 5, 1986, abandoned. This application Jul. 7, 1988, Ser. No. 216,185

Int. Cl.[4] D06M *9/00*; D06P *5/00*

U.S. Cl. 8—115.7 23 Claims

1. A process of imparting flame-resistant properties to a polyester/cotton blend fabric comprising the steps of:

(1) applying to a polyester/cotton blend fabric, at least 35% by weight of which is polyester, balance cotton, a flame retarding amount of a cyclic phosphonate ester flame retardant represented by the formula:



in which x is 0 or 1, that fixes onto polyester fibers, and a flame-retarding amount of a tetrakis-(hydroxymethyl) phosphonium salt flame retardant that fixes onto the cotton fibers, the flame retardant chemicals applied to the fabric simultaneously; and

(2) curing the fabric at elevated temperatures to fix the flame retardants to the polyester and to the cotton.

4,842,610

DEPILATORY COMPOSITIONS AND METHODS

Harry W. Gordon, Wantagh, and Kenneth Chung, Greenlawn, both of N.Y., assignors to Del Laboratories, Inc., Farmingdale, N.Y.

Continuation of Ser. No. 863,930, May 15, 1986, abandoned, which is a continuation of Ser. No. 672,461, Nov. 19, 1984, abandoned, which is a continuation-in-part of Ser. No. 475,460, Mar. 15, 1983, abandoned. This application Nov. 28, 1987, Ser. No. 121,953

Int. Cl.[4] C14C *1/00*

U.S. Cl. 8—160 1 Claim

1. A method of removing body hair, comprising the steps of:

(A) applying as a coating to a hairy area a depilatory composition consisting of

(i) about 90% to 99.5% by weight of the composition consisting of a corn syrup mixture composed of a plurality of different saccharides having a viscosity of about 700,000 cps at about 80° F. and a dextrose equivalent in a range from about 40 to 44, said corn syrup mixture having an overall solids content in the range from about 75% to 95% by weight, and a water balance content in a range from about 25% to 5% by weight,

(ii) about 10%–0.5% by weight of the composition consisting of added distilled/deionized water,

(iii) a germicidally effective amount of imidazolidinyl urea,

(iv) an effective preservative amount of an alkyl p-hydroxybenzoate, and

(v) an effective opacifying amount of styrene polyvinyl pyrrolidone;

(B) pressing a fibrous material sheet against the composition-coated hairy area to enmesh hair in the coating; and

(C) lifting the sheet away from the hairy area with the hair from the hairy area embedded in the coating.

4,842,611

FLAME RETARDANT COMPOSITIONS AND PROCESS

Daniel D. Huffman, 4301 N. Vinewood, Indianapolis, Ind. 46254

Filed Dec. 1, 1987, Ser. No. 127,218

Int. Cl.[4] B27K *3/00*; B32B *7/00*

U.S. Cl. 8—188 4 Claims

1. A flame retardant composition suitable for in situ application to textile fabrics composed of natural or synthetic fibers, or blends thereof, and natural fibrous materials, consisting of:

an admixture of ammonium phosphate, monobasic; ammonium phosphate, dibasic; ammonium sulphate; ammonium bromide; urea; and water wherein the constituents of said admixture are present in about the following weight percentages:

ammonium phosphate, monobasic: 2.0–3.5
ammonium phosphate, dibasic: 2.0–3.5
ammonium sulphate: 0.0–1.5
ammonium bromide: 4.0–10.0
urea: 2.0–5.0
water: 90.0–76.5

4,842,612

AMINOPHENYL ALKYLENEDIAMINES USEFUL IN OXIDATION HAIR DYES

David Rose, Hilden; Edgar Lieske, Duesseldorf, and Norbert Mank, Neuss, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

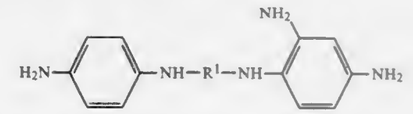
Filed Mar. 23, 1988, Ser. No. 172,106

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1987, 3711579

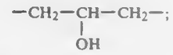
Int. Cl.[4] A61K *7/13*; C07C *87/50*

U.S. Cl. 8—411 25 Claims

1. An N-4-aminophenyl-N'-2,4-diaminophenyl alkylenediamine corresponding to the formula



wherein R1 is: $-C_nH_{2n}-$ where n is 2 to 4; or



or a water soluble salt thereof.

4,842,613

TECHNIQUE FOR PRINTING DISPERSE DYES ON GLASS OR CERAMIC SURFACES

Terence B. Purser, Greensboro, N.C., assignor to Terence Brook Purser and John Howell, both of High Point, N.C.

Filed Nov. 27, 1987, Ser. No. 125,876

Int. Cl.[4] D06P *1/16*

U.S. Cl. 8—471 13 Claims

1. The process for applying a frosted disperse dye finish to a glass or ceramic surface comprising the steps of:

(a) applying a coating of an organic polymeric resin selected from the group containing thermoplastic and thermosetting resins;

(b) applying a carrier sheet containing sublimable or disperse dyes thereon onto the organic polymeric resinous coating;

(c) transferring said disperse dyes into the polymeric resinous coating by the application of heat; and

(d) applying a protective coating formed of a material from the group containing lacquer, varnish, and polymeric resins, and incorporating a flatting agent in said protective

coating, said flatting agent comprising a material selected from the group containing heavy metal soaps, finely divided silica, and diatomaceous earth whereby a frosted coating is formed across the printed image.

4,842,614

DEMINERALIZATION OF AQUEOUS LIQUID DYE COMPOSITION

Noriaki Yamauchi, Hirakata; Kunihiko Imada, Sakai, and Yutaka Kayane, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 20, 1987, Ser. No. 39,954

Claims priority, application Japan, Apr. 30, 1986, 61-101329; Jun. 3, 1986, 61-128805

Int. Cl.[4] C09B *67/00*

U.S. Cl. 8—564 **10 Claims**

1. A process for producing an aqueous liquid composition containing a reactive dye of the following formula,

$$D—SO_2X_n$$

wherein D is an organic dye residue having 1 to 3 sulfonic acid groups, X is a group of $—CH=CH_2$ or $—CH_2CH_2Y$ in which Y is a splittable group by the action of an alkali, and n is a number of 1 or 2, in an amount of 5 to 50% by weight based on the weight of the composition, which comprises steps of preparing an undemineralized aqueous solution consisting essentially of the dye of the above formula and water, dissolving at least one additive selected from lactams and aminoalcohols in the solution, controlling the resulting solution to a temperature of −10° C. to 5° C. to crystallize inorganic salts contained therein, and separating the crystallized inorganic salts, the said additive being used in an amount of 0.1 to 20% by weight based on the weight of the composition.

4,842,615

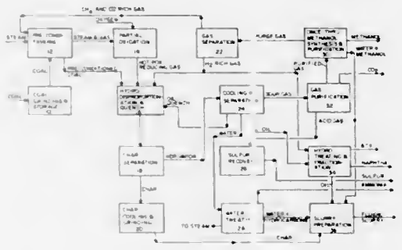
UTILIZATION OF LOW RANK AND WASTE COALS IN TRANSPORTABLE FLUIDIC FUEL SYSTEMS

Edmond G. Meyer, Laramie, Wyo.; Lee G. Meyer, and Gerald F. Cavaliere, both of Englewood, Colo., assignors to Carbon Fuels Corporation, Englewood, Colo

Continuation-in-part of Ser. No. 722,689, Apr. 12, 1985, abandoned, and a continuation-in-part of Ser. No. 658,880, Oct. 9, 1984, Pat. No. 4,685,936, and a continuation-in-part of Ser. No. 658,878, Oct. 9, 1984, Pat. No. 4,671,800, which is a continuation-in-part of Ser. No. 427,937, Sep. 29, 1982, Pat. No. 4,475,924, which is a continuation-in-part of Ser. No. 247,382, Mar. 24, 1981. This application Jun. 8, 1987, Ser. No. 59,289

Int. Cl.[4] C10L *1/32*; **C10G** *1/00*

U.S. Cl. 44—51 **18 Claims**



1. An improved method for refining a carbonaceous material selected from low rank coals, waste coals, peat, or mixtures thereof, to produce a slate of hydrocarbon containing coproducts by short residence time hydrodisproportionation comprising the steps of:

(a) contacting said carbonaceous material at a volatilization temperature for a time sufficient to volatilize said carbonaceous material, with a hydrogen donor rich gaseous reducing atmosphere which is obtained in substantial part from said carbonaceous material wherein said hydrogen donor rich gaseous atmosphere and said volatilizing temperatures are produced in substantial part in a partial oxidation reaction wherein steam and hydrodisproportionation recycle gas rich in methane and carbon monoxide are reacted with a sub-stoichiometric amount of oxygen, to yield char and hydrocarbon containing vapor; and

(b) cooling said vapor to reduce the temperature of said vapor below said volatilization temperature.

4,842,616

METHOD FOR HOMOGENIZING A MIXTURE OF AQUEOUS RESIDUAL LIQUID OR SOLID FUELS

Marcel Verhille, Mantes la Jolie, France, assignor to Sodecim, France

Continuation of Ser. No. 913,099, Sep. 29, 1986, abandoned. This application May 6, 1988, Ser. No. 191,802

Claims priority, application France, Oct. 1, 1985, 85 14512

Int. Cl.[4] C10L *1/04*

U.S. Cl. 44—51 **23 Claims**

1. A method for forming homogeneous mixtures of aqueous residual liquids with oily combustible materials, comprising the steps of

forming in a first stage a stable emulsion of an oily hydrocarbon fuel in water,

adding a colloid to the emulsion, and

mixing this oil in water emulsion, in a second stage, with a solid or liquid fuel.

4,842,617

COMBUSTION CONTROL BY ADDITION OF MAGNESIUM COMPOUNDS OF PARTICULAR PARTICLE SIZES

Ira Kukin, 45 Edgemont Rd., West Orange, N.J. 07052

Filed Aug. 10, 1987, Ser. No. 83,161

Int. Cl.[4] C10L *1/32*

U.S. Cl. 44—51 **18 Claims**

1. In the operation of a fuel burning system having a fuel burning furnace and means for conveying the products of combustion from the furnace to a low temperature area and then to exhaust, the improvement which comprises adding to said system a magnesium compound in the form of a blend of coarse and fine particles, said blend having a loosely packed bulk density of 35–67 lbs./cu.ft., said blend comprising said coarse and fine particles in a ratio by weight of 90/10–30/70.

4,842,618

METHOD OF PRODUCING MAGNETIC DISK

Yasushi Ito, Minami-ashigara; Masaaki Imamura, Odawara; Yoshiki Kato, Tokyo, and Jun Fumioka, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 935,336, Nov. 26, 1986, Pat. No. 4,762,534. This application Jun. 7, 1988, Ser. No. 203,098

Claims priority, application Japan, Nov. 27, 1985, 60-266926

The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.

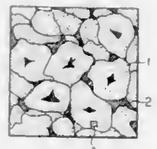
Int. Cl.[4] B24D *3/00*

U.S. Cl. 51—293 **5 Claims**

1. A lapping tape comprising:

a substrate made of a tape of plastics;

an abrasive layer provided on the substrate and having abrasive particle clusters and chip pockets having an area of 15 to 30% of the entire surface of said abrasive layer formed between adjacent two clusters, each of said clusters having 40 to 89% by weight abrasive particles of Al_2O_3 or SiC, abrasive particles of 1 to 10% by weight



diamond and a binder resin bonding these abrasive particles to each other.

4,842,619

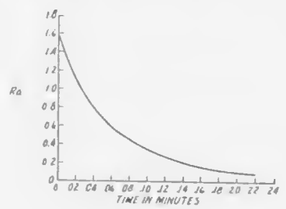
GLASS POLISHING ARTICLE

Peter J. Fritz, St. Louis Park, and Joseph C. Nnebedum, Cottage Grove, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 11, 1987, Ser. No. 131,764

Int. Cl.[4] B24D *11/00*

U.S. Cl. 51—295 **15 Claims**



1. An article especially suited for polishing glass or ceramic surfaces, said article comprising:

(a) a three-dimensional nonwoven web of organic fibers,

(b) a quantity of particles of abrasive material suited for polishing said surfaces dispersed throughout said web and adhered to said fibers,

(c) a quantity of inorganic glass polishing aid dispersed throughout said web and adhered to said fibers, and

(d) a binder adhering said fibers together at contacting points and said particles of abrasive material and said inorganic polishing aids to said fibers;

wherein the quantity of particles of abrasive material and the quantity of inorganic glass polishing aid are each selected to provide said article with the ability to polish said surface more quickly than the same article having only said abrasive particles or said inorganic glass polishing aid.

4,842,620

PROCESS OF GAS ENRICHMENT WITH POROUS SILICEOUS-CONTAINING MATERIAL

Joseph J. Hammel, Pittsburgh; Walter J. Robertson, Aspinwall; William P. Marshall, Pittsburgh; Herbert W. Barch, Natrona Heights; Balbhadra Daas, Allison Park; Michael A. Smoot, Oakmont, and Richard P. Beaver, Library, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 871,731, Jun. 6, 1986, abandoned. This application Dec. 1, 1987, Ser. No. 127,150

Int. Cl.[4] B01D *53/22*

U.S. Cl. 55—16 **37 Claims**

1. A process of enriching at least one gas from a mixture of gases utilizing a porous, silica-rich membrane material, comprising:

using at least one hollow porous silica-rich fiber as a porous separation membrane that is non-crystalline and has pore sizes within the range of 1 to around 50 Angstroms in diameter, a mean or average pore size of around 5 to 50 Angstroms in diameter, filament diameter in the range of around 1 to 250 microns and wall thickness in the range of around 1 to 50 microns, wherein the silica-rich fiber results form extracting extractable components selected from the group consisting of acid extractable components and water extractable components or a mixture thereof, from hollow glass fibers formed by attenuation from melt at speeds in the range of at least 500 ft/min to around 30,000 ft/min where the glass fibers are selected from the group consisting of: hindered, phase separable, hollow glass fibers having a borosilicate, or alkali metal borosilicate glass composition with at least one oxide of a metal from Group IVB of the Periodic Table that are heat treated at a temperature in the range of 400 to 600° C. for about 0.5 to 12 hours; and phase-separable but non-phase separated borosilicate, hollow, glass fibers heat treated at a temperature in the range of about 400° to less than 480° C. for a time in the range of about 0.5 to 12 hours where the borosilicate glass fibers have an amount of boron oxide from above 40 to 60 weight percent, whereby membrane performance in terms of selectivities and permeabilities in gas separation can be enhanced over that performance predicted from Knudsen diffusion calculations.

4,842,621

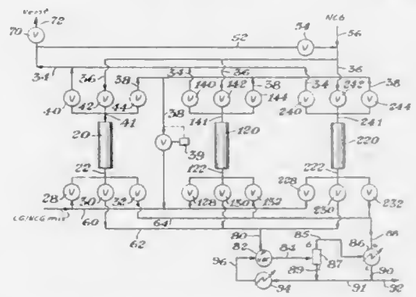
RECOVERY PROCESS

Lanny A. Robbins, and Herbert A. Johnson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 26, 1987, Ser. No. 30,183

Int. Cl.[4] B01D *53/04*

U.S. Cl. 55—26 **10 Claims**



1. A process for separating a condensable gas from a non-condensable gas comprising switching at least three adsorber beds which preferentially adsorb the condensable gas serially through the following steps:

(a) an adsorption step in which a mixture of the condensable and non-condensable gases are passed through the bed and the separated non-condensable gas is withdrawn therefrom;

(b) a supercharging step in which a stream relatively rich in the condensable gas is passed through the bed, said stream having an actual volume at least three times that necessary to displace a void volume of the bed and wherein a pressure in the bed undergoing step (b) is elevated over that in the bed undergoing step (a);

(c) a desorption step in which a vacuum is drawn on the bed and an amount of non-condensable gas is bled through the bed; and wherein said non-consensable gas in conjunction with entrained condensable gas from step (c) is passed into a vacuum pump, is compressed,

at least some of the condensable gas is condensed and at least part of the non-condensable gas and remaining

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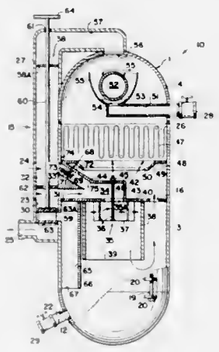
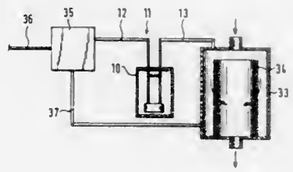
condensable gas is then passed to step (b) as the stream relatively rich in the condensable gas;
and such that continuous operation of the process with at least one of the beds in the adsorption step is permitted.

4,842,622
GAS/LIQUID/SOLIDS SEPARATOR
Robert H. Wamsley, Jr., 7755 Praver Dr., E., Jacksonville, Fla. 32217
Filed Mar. 31, 1988, Ser. No. 176,355
Int. Cl.[4] B01D *19/00*
U.S. Cl. 55—216 38 Claims



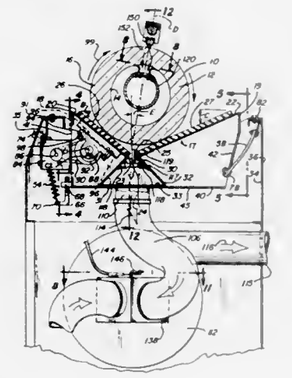
1. An apparatus for separating gas from liquid and solid matter in the exhaust from an interal combustion engine comprising:
(A) an enclosed container for liquid and solid matter having a top wall, a bottom wall, and side wall and having a first inlet for exhaust, a first outlet for liquid, a second outlet for gas;
(B) said first exhaust inlet including an exhaust passageway through said side wall and a discharge port located generally centrally inside said container having a swirl vanes device disposed generally horizontallay for suddenly changing the direction of and materially reducing the velocity of and increasing the path of the exhaust being discharged through said port;
(C) said first liquid outlet including a liquid passageway through said side wall with a shut-off valve in said liquid passageway;
(D) said second gas outlet including a gas passageway through said top wall;
(E) filter means spaced below said second gas outlet and disposed horizontally with respect to said side wall to remove entrained liquid and solid matter from the exhaust while passing there-through with the gases passing out said second gas outlet; and
(F) means for selectively closing said gas passageway in said second gas outlet to raise the pressure of the exhaust in said container, said latter means when closed and said shut-off valve open causing liquid collected in said container to be forced out said liquid passageway by the raised exhaust pressure in said container.

4,842,623
SOOT COLLECTOR WITH FLUID METERING DEVICE
Fritz Zundel, Besigheim, Fed. Rep. of Germany, assignor to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany
Filed Oct. 18, 1988, Ser. No. 259,588
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1987, 3740907
Int. Cl.[4] B01D *46/04*
U.S. Cl. 55—262 12 Claims



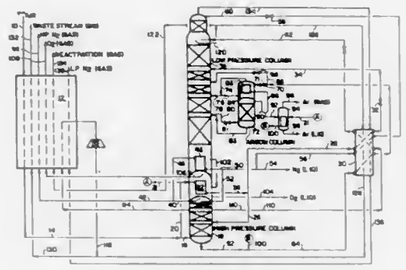
1. A soot collector including a filter medium and a fluid metering device for feeding a specified quantity of a soot remover by means of compressed air onto the filter medium, wherein said fluid metering device comprises:
(a) a reservoir,
(b) a metering tank in fluid communication with said reservoir through a fluid inlet opening,
(c) a first connecting line leading from a compressed-air supply device to said metering tank,
(d) a second connecting line leading from said metering tank to the soot collector filter,
(e) a metering tank bypass line communicating between said first and second connecting lines, and
(f) means for closing said fluid inlet opening in response to a flow of compressed air through said metering tank.

4,842,624
APPARATUS FOR CLEANING AIR FILTERS
Ronald R. Barton, Rte. 1, Sterling, Colo. 80751
Filed May 19, 1988, Ser. No. 195,954
Int. Cl.[4] B01D *29/05, 29/28*
U.S. Cl. 55—291 29 Claims



1. Apparatus for cleaning an air filter comprising:
support means for an air filter having trapped impurities, said support means including first and second inclined walls arranged in a generally V-shaped configuration, said inclined walls sloping down at selected angles from the horizontal and in from outer edges toward adjacent inner edges, said first wall being more steeply inclined that said second wall to effect rotation of said air filter upon being vibrated; and
means for vibrating said support member to shake the supported air filter so that trapped impurities are loosened from said filter and so that said air filter is rotated while supported on said support means.

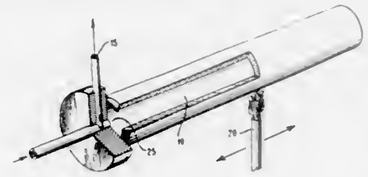
4,842,625
CONTROL METHOD TO MAXIMIZE ARGON RECOVERY FROM CRYOGENIC AIR SEPARATION UNITS
Rodney J. Allam, Guildford, and Alan L. Prentice, Surbiton, both of United Kingdom, assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Filed Apr. 29, 1988, Ser. No. 187,683
Int. Cl.[4] F25J *3/04*
U.S. Cl. 62—22 5 Claims



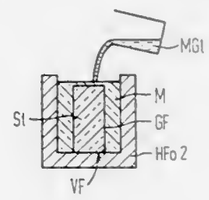
1. In a process for the separation of mixtures, which comprise oxygen, nitrogen, and argon, by cryogenic distillation in a distillation unit comprising an argon sidearm column with an overhead condenser and a low pressure column, wherein the argon sidearm column integrally communicates with the low pressure column, the improvement for increasing argon recovery comprises reducing the pressure of feed gas withdrawn from a lower-intermediate location of the low pressure column and fed to a lower location of the argon sidearm column whereby the operating pressure of the argon sidearm column is controlled at the lowest effective pressure which is consistent with a minimum temperature difference across the overhead condenser and an unrestricted return of crude oxygen vapor from the overhead condenser of the argon sidearm column to the low pressure column.

4,842,626
PROCESS FOR MAKING OPTICAL FIBERS
Robert L. Barns; Edwin A. Chandross, both of Berkeley Heights, and Suzanne R. Nagel, Morristown, all of N.J., assignors to American Telephone and Telegraph Company, AT&T Bell Laboatories, Murray Hill, N.J.
Continuation of Ser. No. 762,803, Aug. 2, 1985, abandoned, which is a continuation of Ser. No. 466,293, Feb. 14, 1983, abandoned. This application May 28, 1987, Ser. No. 57,681
Int. Cl.[4] C03B *37/014, 37/025*
U.S. Cl. 65—2 11 Claims

1. A process for fabricating an optical fiber preform suitable for use in the formation of a glass optical fiber from a glass tube, said process comprising the steps of subjecting the bore of said tube to a drying gas composition, said composition including a drying gas which provides a reduction in the amount of OH entities in said preform, heating said glass tube to an elevated temperature, and modifying said glass tube through said heating by collapsing said bore to form said preform; wherein said drying gas comprises a carbon tetrahalide and wherein the total volume of all and any gas introduced into said bore contains a level less than 10 parts per million by weight of hydrogen however bound, of a hydrogen-containing contaminant capable of producing loss in said optical fiber whereby the optical adsorption loss of said fiber due to hydrogen-containing entities is substantially reduced relative to the loss obtained in the absence of said carbon tetrahalide use.



4,842,627
METHOD FOR THE MANUFACTURE OF A PREFORM FOR DRAWING GLASS FIBERS PARTICULARLY INFRARED LIGHT WAVEGUIDES FOR OPTICAL COMMUNICATIONS TECHNOLOGY
Hartmut Schneider, and Achim Schoberth, both of Muenchen, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Continuation of Ser. No. 17,992, Feb. 24, 1987, abandoned. This application Jun. 20, 1988, Ser. No. 210,192
Claims priority, application Fed. Rep. of Germany, May 27, 1986, 3617716
Int. Cl.[4] C03C *25/02*
U.S. Cl. 65—3.2 8 Claims



1. In a method for the manufacture of a preform comprising a core of core glass and a jacket of jacket glass for drawing glass fibers by casting molten glass onto a pre-defined body of solid glass, the improvement comprising etching the surface of a solid rod of said core glass and only then surrounding said solid rod of said core glass with molten jacket glass by introducing said solid rod into a cylindrical hollow form having a larger cross-section and composed of material having good thermal conductivity, filling out a resulting annular cavity between said rod and the surrounding hollow form with said molten jacket glass, allowing said molten jacket glass to solidify in said hollow form and subsequently removing the solidified cast member from the hollow form.

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4,842,628

METHOD OF VERIFYING A POROUS ARTICLE MADE OUT OF GLASS SOOT AND FURNACE FOR CARRYING OUT THE METHOD

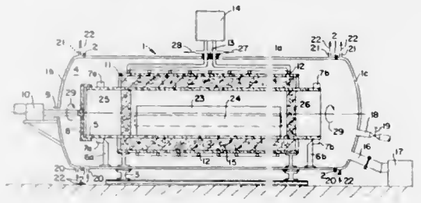
Karl Kreutzer; Fritz Simmat, both of Gelnhausen; Anton Steinkohl, Grundau, and Wolfgang Englisch, Kelkheim, all of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Quarzstrabe, Fed. Rep. of Germany

Filed Mar. 2, 1988, Ser. No. 162,823

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1987, 3711281

Int. Cl.[4] C03B 20/00, 23/04

U.S. Cl. 65—3.12 12 Claims



1. In a method of vitrifying a porous cylindrical article made out of glass soot, especially for manufacturing a preliminary blank for optical fibers whereby the article is heat-treated in a furnace in a vacuum or in an atmosphere that contains helium, the improvement comprising placing the porous article in a horizontal graphite tube in the furnace, sintering the article therein for 20 to 40 minutes in a vacuum or in a helium atmosphere with reduced pressure at 1250° to 1400 ° C., and subsequently vitrifying the sintered article by heat-treating the sintered article in a first stage in the sintering atmosphere while slowly rotating the article in the graphite tube for 20 to 40 minutes at 1450° to 1600 ° C. and then, while rotating the article in the graphite tube more rapidly than in the first stage, and heating the article in a second stage for 10 to 30 minutes at 1650° to 1750 ° C.

8. In a furnace for carrying out a method of vitrifying a porous cylindrical article made out of glass soot, the furnace including a horizontal, stationary first chamber having disposed therein a horizontal second chamber which is rotatable around its longitudinal axis, said second chamber connected to a motor via a longitudinal rotatable shaft that passes through a bearing, said furnace with a connection for evacuating the inside of the furnace and a connection for supplying inert gas to the inside of the furnace, the improvement comprising said horizontal second chamber in the furnace comprising a longitudinally rotatable graphite tube with the article being disposed inside the graphite tube during heat treatment, the second chamber being surrounded by and electrically insulated from a stationary heating coil, and the furnace comprising a stationary tube made out of fused quartz or quartz glass, said tube being disposed between the graphite tube and the heating coil.

4,842,629

METHOD FOR PRODUCING BURIED REGIONS OF RAISED REFRACTIVE INDEX IN A GLASS MEMBER BY ION EXCHANGE

Peter Clemens; Herbert Michel, both of Munich, and Christoph Thoma, Vaterstetten, all of Fed. Rep of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 12, 1987, Ser. No. 119,563

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1986, 3641018

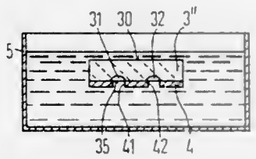
Int. Cl.[4] C03C 21/00

U.S. Cl. 65—30.13 8 Claims

1. In a method for producing a buried region of a raised refractive index in a glass member by ion exchange process, said method comprising providing a glass member having one surface provided with a mask of a titanium coating to block the penetration of the ions from

a salt melt of refractive-index-raising ions into the glass and said one surface of said glass member having surface areas free of the titanium coating, conducting a first field-assisted ion exchange having an ion for raising the refractive index of the glass coming from a salt melt contacting the exposed surfaces of the glass through the mask to thereby raise the refractive index of the glass immediately beneath the exposed surface portions

and thus provide regions of raised refrative index immediately beneath the exposed surface portions, then etching away the titanium coating with an etching solution and then burying the regions of raised refractive index by a



second field-assisted ion exchange with another ion contacting the surface of the glass member containing the regions of raised refractive index, said another ion having a neutral effect with regard to the refractive index of the glass, the improvements comprising the step of etching away the titanium coating which has been exposed to a hot salt melt of the first ion exchange being etched away with an

ethylene dinitrilo tetraacetic acid (EDTA) disodium etching solution, and then removing any ion barrier on the surface free of the titanium coating by creating a slight material erosion of the surface freed of the titanium coating without deteriorating the regions of the raised refractive index at the surface prior to implementing the second field-assisted ion exchange step.

4,842,630

MANUFACTURE OF GLASSWARE ARTICLES OF IMPROVED STRENGTH

David Braithwaite, Doncaster, England; Robert J. Douglas, North Granby, Conn.; Stanley P. Jones, Doncaster, England; James P. Poole, Brockway, Pa., and Harold Rawson, Sheffield, England, assignors to International Partners in Glass Research, Windsor, Conn.

Filed May 18, 1988, Ser. No. 195,143

Claims priority, application United Kingdom, May 18, 1987, 8711679

Int. Cl.[4] C03B 9/193; C03C 10/04, 17/02, 21/00

U.S. Cl. 65—30.14 23 Claims

1. A method of making an article of glassware comprising the steps of forming a parison from a gob of molten glass in a blank mould, allowing the outer surface of the parison to reheat when the parison is no longer in contact with the blank mould, forming the article of glassware from the reheated parison in a blow mould, and thereafter cooling the formed glassware article, wherein the outer surface of the parison is treated during the reheating step in a manner which will cause the glass in the outer surface layer of the formed glassware article to be in a state of compression.

4,842,631

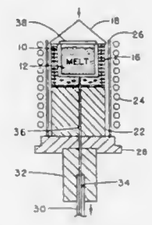
METHOD OF MAKING CARBON DIOXIDE AND CHLORINE FREE FLUORIDE-BASED GLASS

Joseph J. Hutta, Groton, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 20, 1988, Ser. No. 213,007

Int. Cl.[4] C03B 37/027; C03C 3/32

U.S. Cl. 65—32.5 1 Claim



1. A process of manufacturing a bulk heavy metal fluoride glass having minimal carbon dioxide and chlorine therein, said process comprising the steps of:

obtaining constituent fluoride compounds of said heavy metal fluoride glass in as pure a form as possible;

weighing each of said compounds to obtain a desired composition of said heavy metal fluoride glass;

mixing said compounds together to form said desired composition;

forming a charge of said composition;

loading a crucible with said charge;

placing said crucible in a furnace enclosure;

sealing said furnace;

evacuating said furnace enclosure;

backfilling said furnace with sulphur hexafluorde gas;

quickly raising a temperature of said charge above said fusion temperature to insure admixture of molten constitutent compounds of said charge;

holding said charge at this higher temperature for a short period of time, said charge reaching said higher temperature in less than two hours from the start of said heating; and

lowering a temperature of said charge from said high temperature in a short period of time to a temperature less than said fusion temperature, said charge forming a bulk glass.

4,842,632

METHOD OF MAKING MULTIFOCAL LENS BLANKS

Milford L. Buckley, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

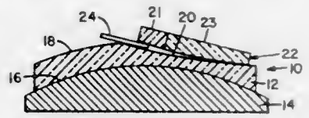
Filed Nov. 3, 1987, Ser. No. 116,152

Int. Cl.[4] C03B 11/08

U.S. Cl. 65—38 8 Claims

1. A method of assembling and fusing the segment and major glass elements of a multifocal lens, wherein the segment element consists of a crown glass portion and a barium glass portion, which comprises the steps of:

(a) placing the segment element in a countersink on the major element with an edge of the barium glass portion of the segment element resting against the countersink, the remainder of the segment element being maintained in spaced relation to the countersink by a spacing member inserted between the opposed upper edge of the crown glass portion of the segment element and the countersink, said spacing member being formed from a glass that will fuse compatibly with the glass of the major element, but has a lower softening point than the glass of the major element; and then



(b) heating that so-formed assembly of segment and major glass elements and said glass spacing member to the temperature for fusing the segment and major elements together, the lower softening point of said glass spacing member allowing the segment to gradually slump into the countersink as the fusion temperature is approached.

4,842,633

METHOD OF MANUFACTURING MOLDS FOR MOLDING OPTICAL GLASS ELEMENTS AND DIFFRACTION GRATINGS

Kiyoshi Karibayashi, Neyagawa; Makoto Umetani, Hirakata; Hideto Monji, Katano, and Masaki Aoki, Mino, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 23, 1988, Ser. No. 235,301

Claims priority, application Japan, Aug. 25, 1987, 62-210432; Nov. 30, 1987, 62-302219

Int. Cl.[4] C03B 11/08; G02B 5/18

U.S. Cl. 65—44 6 Claims

1. A method of manufacturing a diffraction grating characterized by using a pair of molds, a molding surface of at least one of the molds having a relief corresponding to the diffraction grating, heating a glass material to be molded to a temperature higher than its softening point in an inert gas atmosphere, and pressure molding the glass material to transfer the shapes of the molding surfaces of the molds onto the glass material to be molded, thereby to obtain the diffraction grating.

3. A method of manufacturing a mold for molding optical glass elements comprising the steps of: processing a base material which is excellent in heat resistance and high-temperature strength into a desired configuration; either coating the base material with a heat-resistant film low in reactivity with a glass material to be molded and forming a desired pattern of a resist on said heat-resistant film, or coating said heat-resistant film with an intermediate layer susceptible to etching followed by forming on said intermediate layer a desired pattern of a resist and removing a part of the intermediate layer by wet etching or dry etching; and removing all of the resist and the intermediate layer and a part of the heat resistant film by dry etching thereby to form a molding surface of the mold into a desired configuration.

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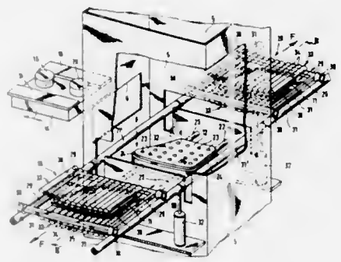
4,842,634

METHOD AND APPARATUS FOR CURVING A GLASS SHEET

Luc Vanaschen, Eupen, Belgium; Hans-Werner Kuster, Aachen, Fed. Rep. of Germany, and Herbert Radermacher, Raeren, Belgium, assignors to Saint-Gobain Vitrage, Courbevole, France

Filed Nov. 19, 1987, Ser. No. 122,851
Claims priority, application Fed. Rep of Germany, Nov. 29, 1986, 3640892
Int. Cl.[4] C03B *23/025*
U.S. Cl. 65—106 10 Claims



1. A method for curving a glass sheet, comprising heating the glass sheet to a bending temperature,

engaging the heated glass sheet in a horizontal attitude with an overhead suction device,

transporting it to a location above a curving-form frame the surface of which corresponds to the desired contour of the glass sheet,

ending the suction so as to deposit the glass sheet onto said frame,

allowing the perimeter of the glass sheet to take on the shape of the frame,

simultaneously providing a curving form which fills the interior space of the curving-form frame the surface of which corresponds to the desired configuration of the glass sheet,

continuing to curve the glass sheet against the combined curving-form means by blowing a stream of hot gas under pressure from above onto the glass sheet until said sheet conforms to the surface of said combined curving means,

subsequently separating the frame from the curving form and transporting the glass sheet to a cooling station.

4. An apparatus for curving a glass sheet, comprising means for heating the glass sheet to a bending temperature, means for applying suction to said glass sheet from above, said section means being capable of transporting said sheet, in a horizontal attitude, to a curving form means,

said curving form means comprising a separable curving form frame the surface of which corresponds to the desired contour of the glass sheet and a curving form which fills the interior space of said curving form frame, the surface of which curving form corresponds to the desired configuration of said glass sheet,

means for directing a hot gas stream from above onto said curving form means, and

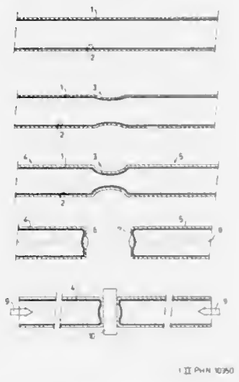
means for separating said curving form frame from said curving form, and advancing said frame to a cooling means.

4,842,635

METHOD OF MANUFACTURING A LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP AND LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP MANUFACTURED BY MEANS OF THIS METHOD

Antonius J. Spaapen, and Cornelis J. van den Broek, both of Roosendaal, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 107,857, Oct. 7, 1987, abandoned, which is a continuation of Ser. No. 792,615, Oct. 21, 1985, abandoned, which is a continuation of Ser. No. 490,803, May 2, 1983, abandoned. This application Jul. 18, 1988, Ser. No. 220,925
Claims priority, application Netherlands, May 12, 1982, 8201944
Int. Cl.[4] C03B *23/09*
U.S. Cl. 65—108 13 Claims



1. A method of manufacturing a low-pressure mercury vapor discharge lamp comprising two parallel tube parts and a transverse section joining said tube parts near adjacent ends, said method comprising:

(a) providing a single elongate circular cross-section glass tube having a given diameter and a given tube wall thickness;

(b) coating the interior of said tube with a luminescent material; and

(c) dividing said coated tube into two tube parts having respective facing end walls each having a thickness at least at an area of transition between the tube wall and the end wall between 0.4 and 0.8 times said given tube wall thickness, comprising

heating an axial section of said coated tube over a length less than said diameter causing said axial section to rise to a temperature such that the heated glass softens,

drawing cooler portions of said coated tube away from each other until a construction is formed in said heated axial section having a diameter approximately half said given diameter, and

heating said axial section with said cooler portions fixed relative to each other until said constriction is at a temperature such that the heat-softened glass moves in the direction of the cooler portions, said single tube separating into said two tube parts and said heat-softened glass forms respective end walls on said tube parts,

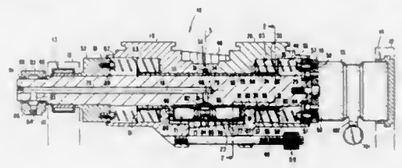
said wall thickness being selected and said dividing step being carried out such that the movement of the soft glass towards the cooler portions forms the end walls and avoids penetration of the luminescent material into the glass.

4,842,636

HYDRAULIC INVERT/NECKRING MECHANISM

Harold C. Libert, Union City, Ind., assignor to Maul Technology Co., Winchester, Ind.

Filed Oct. 2, 1987, Ser. No. 104,636
Int. Cl.[4] C03B *9/16, 9/40*
U.S. Cl. 65—232 20 Claims



1. An invert and neckring mechanism for an I.S. glass forming machine, comprising:

a frame;

a horizontally disposed shaft supported by said frame for rotation through 180° degrees about the center line axis of said shaft;

a pair of mutually opposing neckring arm holders mounted for rotation as a unit with said shaft and for axial movement away from and towards one another along said shaft;

spring means for biasing said arm holders toward one another; and,

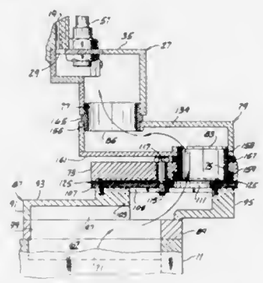
piston means, located totally offset from the center line axis of said shaft, for urging said arm holders apart, said piston means disposed between said arm holders.

4,842,637

GLASSWARE FORMING MACHINE WITH COOLING SYSTEM

James A. Bolin, Tulsa, Okla., and Irving Powers, Ladue, Mo., assignors to Glass Technology Development Corp., Sapulpa, Okla.

Continuation-in-part of Ser. No. 67,238, Jun. 25, 1987, abandoned. This application Feb. 17, 1988, Ser. No. 157,460
Int. Cl.[4] C03B *9/38*
U.S. Cl. 65—265 19 Claims



1. A glassware forming machine comprising:

a pair of carriers each pivoted on a generally vertical axis for swinging movement toward and away from each other between an open position and a closed position,

a plurality of mold members carried by each carrier, each mold member on each carrier being related to a mold member on the other so that, with the carriers in their said closed position, each mold member on one carrier mates with a mold member on the other to define a mold cavity for molding an item of glass,

each mold member having air passages extending upwardly from the bottom thereof for passage of air therethrough for cooling,

and means for blowing air through said air passages comprising:

a plenum carried by each carrier for delivering air to the air passages of the mold members carried by the carrier, the mold members extending up from the plenum and the plenum having ports at the top thereof for flow of air up into the passages in the mold members and thence up through and out of said passages,

means providing a chamber below said carriers for air to be blown into the plenums and thence up through said air passages, and

means for delivery of air from said chamber means to each plenum allowing swinging of said carriers and comprising, for each carrier:

means defining an air outlet at the top of the chamber means,

said air outlet means having a generally flat top with an opening therethrough in communication with said chamber for delivery of air from said chamber up through said opening,

a generally flat circular closure for said outlet means oscillable on its center on a generally vertical axis spaced from the carrier axis,

said closure overlying the opening in the top of the outlet means,

said closure and the top of the outlet means having adjacent annular surfaces centered in the closure axis inhibiting air from escaping at the periphery of the closure from between the closure and the top of the outlet means,

said circular closure having a circular hole extending therethrough from its top to its bottom spaced from its axis,

the plenum having a bottom wall with an opening therein,

air duct means for flow of air from the outlet to the plenum having a generally horizontal section, an inlet end section extending down from one end thereof into the hole in the closure and an outlet end section extending up from the other end thereof to the opening in the bottom wall of the plenum,

said inlet end section being in communication at its lower end with said outlet,

said inlet end section and said closure being relatively rotatable in generally sealed relation with respect to the circular hole in the closure,

said outlet end section being relatively rotatable in generally sealed relation with respect to the opening in the bottom all of the plenum,

said circular closure being oscillable on its axis through an angle in one direction from a first position to a second position on swinging of the respective plenum with the respective carrier from open to closed position and back in the opposite direction to its first position on swinging of the respective plenum with the respective carrier back to open position,

air flowing up from said outlet passing directly upwardly through the inlet end section to the horizontal section, thence through the horizontal section, and thence up through the outlet end section of the air duct means to the plenum throughout the range of oscillation of the closure.

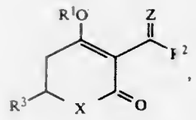
4,842,638

HERBICIDAL TETRAHYDRO(THIO)PYRAN-2,4-DIONE DERIVATIVES

Juergen Kast, Boehl-Iggelheim; Michael Keil, Freinsheim; Dieter Kolassa, Ludwigshafen; Ulrich Schirmer, Heidelberg; Bruno Wuerzer, Otterstadt; Norbert Meyer, Ladenburg; Wilhelm Rademacher, and Johann Jung, both of Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 12, 1988, Ser. No. 142,911
Int. Cl.[4] A01N *43/16, 43/18;* C07D *407/04, 409/04*
U.S. Cl. 71—88 7 Claims

1. A tetrahydropyran-2,4-dione of the formula



(I)

where R^1 is hydrogen, C_1–C_{10}-alkylcarbonyl, C_2–C_{10}-alkenylcarbonyl, or benzoyl which is unsubstituted or substituted in the phenyl ring by C_1–C_8-alkyl, R^2 is C_1–C_5-alkyl, R^3 is a non-aromatic, unsubstituted or C_1–C_3-alkyl-substituted, tetrahydropyranyl, tetrahydrothiopyranyl, 5,6-dihydro-2H-pyranyl, 5,6-dihydro-2H-thiopyranyl, tetrahydrofuranyl or 1,3-dioxepanyl, X is oxygen and Z is oxygen or the radical NO—R^4, R^4 denoting C_1–C_4-alkyl, C_3–C_4-alkenyl, C_3–C_4-alkynyl, C_2–C_4-haloalkyl, C_2–C_4-haloalkenyl, C_2–C_3-alkoxyalkyl or the radical CH_2—R^5, where R^5 is thienyl optionally bearing up to 2 halogen substituents and their agriculturally useful salts.

6. A herbicidal composition containing inert additives and an effective amount of a tetrahydropyran-2,4-dione of the formula I as set forth in claim **1**.

4,842,639

PHENYL-SUBSTITUTED SULFONAMIDES

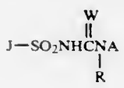
Robert J. Pasteris, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 716 351, Mar. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 663,555, Oct. 22, 1984, abandoned, which is a continuation-in-part of Ser. No. 607,989, May 7, 1984, abandoned. This application Sep. 25, 1986, Ser. No. 911,628

Int. Cl.[4] C07D *251/52, 251/46, 41 7/12;* A01N *43/66*

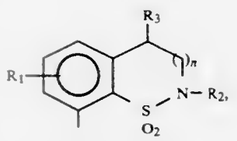
U.S. Cl. 71—91 **35 Claims**

1. A compound of the formula

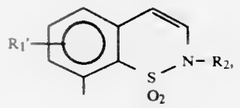


1

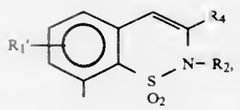
wherein J is



J-1



J-2



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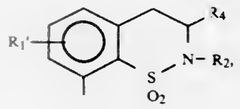

J-4

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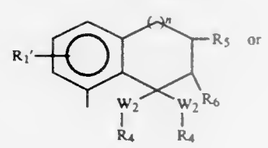

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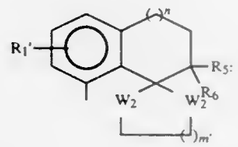


J-12

n is 0 or 1;

W is O or S;

W_2 is O or S;

R is H or CH_3;

R_1 is H, C_1–C_6 alkyl, C_1–C_6 haloalkyl, halogen, nitro, C_1–C_6 alkoxy, $SO_2NR_aR_b$, C_1–C_6 alkylthio, C_1–C_6 alkylsulfinyl, C_1–C_6 alkylsulfonyl, CN, CO_2R_c, C_1–C_6 haloalkoxy, C_1–C_6 haloalkylthio, NH_2, C_1–C_6 alkylamino, di(C_1–C_6 alkyl)amino, $Si(CH_3)_2(C_1$–C_4 alkyl), $Si(CH_3)_2$-phenyl or C_1–C_3 alkyl substituted with C_1–C_3 alkoxy, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl, $SO_2NR_dR_e$, NO_2, CN, CO_2R_f, C_1–C_3 haloalkoxy or C_1–C_3 haloalkylthio;

R_a is H, C_1–C_4 alkyl, C_1–C_3 cyanoalkyl, methoxy or ethoxy;

R_b is H, C_1–C_4 alkyl or C_3–C_4 alkenyl; or

R_a and R_b may be taken together as —$(CH_2)_3$—, —$(CH_2)_4$—, —$(CH_2)_5$— or —$CH_2CH_2OCH_2CH_2$—;

R_c is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_2–C_4 haloalkyl, C_2–C_3 cyanoalkyl, C_5–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl or C_2–C_4 alkoxyalkyl;

R_d is C_1–C_3 alkyl;

R_e is H or C_1–C_3 alkyl;

R_f is C_1–C_3 alkyl;

R_1' is H, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_1–C_3 haloalkoxy, C_1–C_3 haloalkyl, C_1–C_3 alkylthio, C_1–C_3 haloalkylthio, amino, C_1–C_3 alkylamino, di(C_1–C_3 alkyl)amino, halogen or NO_2;

R_2 is H, R_{11}, SR_{11}', SO_2R_{11}, OR_{11}'; $C(O)R_{11}$, $C(O)OR_{11}'$, $(C(O))_2OR_{11}$, $(CO)_2R_{11}$, $C(O)NR_{12}R_{18}$, C(O)NRA, $C(S)SR_{11}'$, NH_2, $NR_{12}R_{18}$, OH, CN, $P(O)R_{13}R_{14}$, $P(S)R_{13}R_{14}$, $Si(CH_3)_2R_{15}$, L or C(O)L;

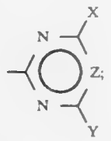
R_3 is H or CH_3;

R_4 is C_1–C_4 alkyl;

R_5 is H or C_1–C_4 alkyl;

R_6 is H or CH_3;

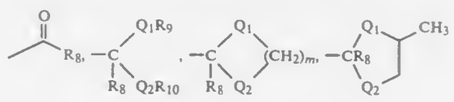
A is



X is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, F, Cl, Br, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, amino, di(C_1–C_3 alkyl)amino or C_3–C_5 cycloalkyl;

Y is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3

alkyl)amino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkylthioalkyl, C_1–C_4 haloalkyl, azido, cyano,



or $N(OCH_3)CH_3$;

m is 2 or 3;

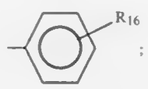
Q_1 and Q_2 are independently O or S;

R_8 is H or C_1–C_3 alkyl;

R_9 and R_{10} are independently C_1–C_3 alkyl;

Z is N;

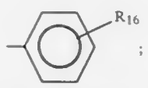
R_{11} is C_1–C_{10} alkyl, C_3–C_{10} alkoxyalkoxyalkyl, C_2–C_{10} alkenyl, C_4–C_{10} alkenylalkenyl, C_3–C_{10} epoxyalkyl, C_2–C_{10} alkynyl, C_4–C_{10} alkynylalkynyl, C_4–C_{10} alkynylalkenyl, C_3–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl or



;

when R_{11} is C_3–C_6 cycloalkyl or C_4–C_7 cycloalkylalkyl it may optionally be substituted by C_1–C_4 alkyl, 1 to 3 atoms of Cl or F or 1 Br; when R_{11} is C_1–C_{10} alkyl, C_2–C_{10} alkenyl or C_2–C_{10} alkynyl it may optionally be substituted by one or more halogens and/or by $(R_{17})_{m'}$, where m' is 2, the values of R_{17} may be identical or different;

R_{11}' is C_1–C_{10} alkyl, C_3–C_{10} alkoxyalkoxyalkyl, C_3–C_{10} alkenyl, C_5–C_{10} alkenylalkenyl, C_3–C_{10} epoxyalkyl, C_3–C_{10} alkynyl, C_5–C_{10} alkynylalkynyl, C_5–C_{10} alkynylalkenyl, C_3–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl or



;

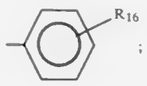
when R_{11}' is C_3–C_6 cycloalkyl or C_4–C_7 cycloalkylalkyl it may be optionally substituted by C_1–C_4 alkyl, 1 to 3 atoms of Cl or F or 1 Br; when R_{11}' is C_1–C_{10} alkyl, C_3–C_{10} alkenyl or C_3–C_{10} alkynyl, it may optionally be substituted by one or more halogens and/or by $(R_{17})_{m'}$, where when m' is 2, the values of R_{17} may be identical or different;

m' is 1 or 2;

R_{12} is H or C_1–C_4 alkyl;

R_{13} and R_{14} are independently C_1–C_4 alkyl, C_1–C_4 alkoxy or C_1–C_4 alkylthio;

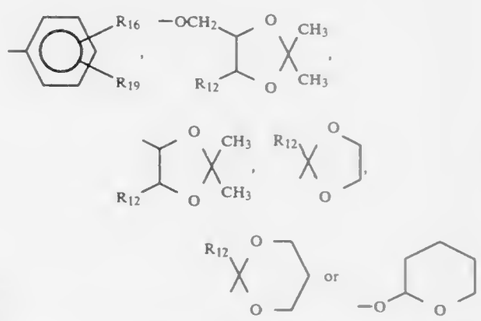
R_{15} is C_1–C_{10} alkyl, benzyl or



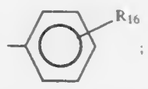
;

R_{16} is H, F, Cl, Br, CH_3, OCH_3, NO_2, CN, SCH_3, SO_2CH_3 or CF_3;

R_{17} is OR_{18}, $OC(O)R_{18}$, $P^+R_9R_{10}R_{15}$, $P^+(C_6H_5)_3$, $OC(O)NR_{12}R_{18}$, OSO_2R_{18}', $OP(O)R_{13}R_{14}$, $P(O)R_{13}R_{14}$ $OP(S)R_{13}R_{14}$, $P(S)R_{13}R_{14}$, $OSi(CH_3)_2R_{15}$. $Si(CH_3)_2R_{15}$, SR_{18}, SOR_{18}, SO_2R_{18}, SCN, CN, $SP(O)R_{13}R_{14}$, $SP(S)R_{13}R_{14}$, $N^+R_{12}R_{15}R_{18}$, $NR_{12}R_{18}$, $NR_{12}C(O)R_{18}$, $NR_{12}C(O)OR_{18}$, $NR_{12}C(O)NR_{12}R_{18}$, $NR_{12}SO_2R_{18}'$, $NR_{12}P(O)_{13}R_{14}$, $NR_{12}P(S)R_{13}R_{14}$, NO_2, $C(O)R_{18}$, $C(O)OR_{18}$, $C(O)NR_{12}R_{18}$, SeR_{18}, naphthyl, L,

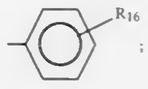


R_{18} is H, C_1–C_{10} alkyl, C_1–C_{10} haloalkyl, C_2–C_{10} alkenyl, C_2–C_{10}alkynyl, C_3–C_6 cycloalkyl or



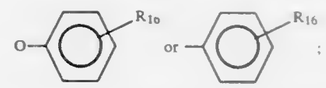
;

R_{18}' is C_1–C_{10} alkyl, C_1–C_{10} haloalkyl, C_3–C_{10} alkenyl, C_3–C_{10} alkynyl, C_3–C_6 cycloalkyl or



;

R_{19} is H, F, Cl, Br, CH_3,



and

L is a pyridinyl, thienyl, furanyl, 4,5-dihydrofuranyl, pyrrolyl, oxazolyl, 4,5-dihydrooxazolyl, thiazolyl, isoxazolyl, oxadiazolyl, pyrazolyl, triazolyl, imidazolyl, 4,5-dihydroimidazolyl, thiadiazolyl, morpholinyl, triazinyl, 1,3-dioxolanyl, tetrahydropyranyl or pyrimidinyl, and these heterocycles may optionally be substituted by 1–4 CH_3, 1–2 OCH_3, SCH_3, Cl, $N(CH_3)_2$ or CN or L is a 5- or 6-membered lactone, lactam or cycloalkanone which may optionally be substituted by 1–4 C_3 groups;

provided that

(a) when W is S, then R is H, J is J_1, J_2, J_3 or J_4; and Y is CH_3, OCH_3, OC_2H_5, CH_2OCH_3, C_2H_5, CF_3, SCH_3, $OCH_2CH{=}CH_2$, $OCH_2{\equiv}CH$, OCH_2CF_3, $OCH_2CH_2OCH_3$, $CH(OCH_3)_2$ or

;

(b) when R_3 is CH_3, the n is O;

(c) when J is J-1 or J-2 and R_2 is H or C_1–C_4 alkyl, then R_1 and R_1' are other than H, F, Cl, Br, CH_3, OCH_3, CF_3, OCF_2H, or SCH_3 or X is other than CH_3, OCH_3, OCH_2CH_3, F, CL, Br, OCF_2 H, CH_2Cl, CH_2Br, CH_2F, cyclopropyl or CF_3or Y is C_3–C_4 alkyl, C_3–C_4 alkoxy, C_4

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haloalkoxy, C_4 haloalkylthio, C_3-C_5 alkoxyalkyl, C_4-C_5 alkoxyalkoxy, C_2-C_3 alkylamino, di(C_2-C_3 alkyl)amino, C_4 alkenyloxy, C_4 alkynyloxy, C_3-C_5 alkylthioalkyl, C_2-C_4 haloalkyl, C_2-C_4 alkynyl, $C(O)R_8$ or $N(OCH_3)CH_3$;

(d) the total number of carbon atoms in R_2 does not exceed 13;

(e) when X is C_3-C_5 cycloalkyl, then Y is CH_3, CH_2CH_3, OCH_3, OCH_2CH_3, $CH_2OCH_3OCF_2H$, SCF_2H, OCH_2CF_3, CF_3, $OCH_2CH{=}CH_2$, $OCH_2C{\equiv}CH$, $NHCH_3$, $N(CH_3)_2$ or $CH(OCH_3)_2$;

(f) when R_1 or R_1' is para to the sulfonylurea bridge then R_1 or R_1' are H, CH_3, F, Cl, Br or OCH_3; and

(g) when X or Y is OCH_2CH_2F or OCH_2CHF_2 then R_2 is other than C_5 alkyl, $CH_3OCH_2CH_2$, $C_2H_5OCH_2CH_2$ or C_1-C_4 alkyl substituted with 1-3 atoms of F, Cl or Br;

(h) when X or Y is OCH_2CH_2F, OCH_2CHF_2 or OCH_2CF_3, then the other is not di(C_1-C_3 alkyl)amino C_1-C_3 alkylamino or $N(OCH_3)CH_3$;

(i) X or Y is not OCF_2H; and

(j) when R_{17} and the bridging nitrogen of a cyclic sulfonamide are attached to the same carbon, then R_{17} is other than OH, SH, $OC(O)R_{18}$, $OC(O)NR_{12}R_{18}$, OSO_2R_{18}', $OP(O)R_{13}R_{14}$, $OSi(CH_3)_2R_{15}$, $SP(O)R_{13}R_{14}$, $SP(S)R_{13}R_{14}$, $NR_{12}R_{18}$ or $N^+R_{12}R_{15}R_{18}$;

and their agriculturally suitable salts.

16. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

4,842,640

OXADIAZOLONE DERIVATIVE, PRODUCTION PROCESS THEREOF, AND HERBICIDE CONTAINING SAME

Hidejiro Yokoo, Fukushima; Toshishige Maruyama, Ibaraki; Yasuhide Toshima, Kawasaki, and Yasuo Kobori, Saitama, all of Japan, assignors to Rhone-Poulenc Agrochimie, Lyons, France

Filed Dec. 4, 1987, Ser. No. 128,602
Claims priority, application Japan, Dec. 16, 1986, 61-297457
Int. Cl.[4] C07D *271/10*; A01N *43/82*
U.S. Cl. 71—92 6 Claims

1. A compound 5-t-butyl-3-(4-chloro-2-fluoro-5-propargyloxy-phenyl)-1,3,4-oxadiazol-2-one.

4,842,641

SYNTHESIS OF IRON-COBALT POWDERS

Kenneth E. Gonsalves, Hoboken, N.J., assignor to GAF Corporation, Wayne, N.J.

Filed Apr. 20, 1988, Ser. No. 183,931
Int. Cl.[4] C01G *51/02*; C22C *1/00*; C22B *5/20*
U.S. Cl. 75—0.5 AA 16 Claims

1. A process for producing iron-cobalt organometallic clusters which comprises reacting a mixture of iron pentacarbonyl and $HFeCo_3(CO)_{12}$ in an inert gas.

5. A process for producing iron-cobalt alloy powder by pyrolysis of iron-cobalt organometallic clusters at a temperature of about 130° C. to about 400° C.

6. A process for producing iron-cobalt powders which comprises reacting iron pentacarbonyl with $HFeCo_3CO_{12}$, then removing the excess iron pentacarbonyl and subjecting the composition of pyrolysis.

4,842,642

ADDITIVE FOR PROMOTING SLAG FORMATION IN STEEL REFINING LADLE

Bradford C. Bowman, Ancaster, Canada, assignor to Hamilton Specialty Bar Division of Slater Industries Inc., Hamilton, Canada

Continuation-in-part of Ser. No. 145,549, Jan. 19, 1988. This application Jun. 14, 1988, Ser. No. 207,112
Int. Cl.[4] C22B *4/00*
U.S. Cl. 75—10.58 13 Claims

1. A process of ladle refining of steel, comprising the steps of disposing in a ladle a quantity of molten steel to be refined; adding a material which forms a covering of a molten protective slag on the steel in the ladle; heating at least a region of the slag with electric current passed to carbon electrodes immersed in the slag; gently stirring the steel to allow it to be heated by heat transfer from the heated region of the slag without substantially disturbing the continuity of the protective slag, and to substantially homogenize the steel; and subsequently discharging the heated and homogenized steel from the ladle, wherein the improvement comprises the material which forms a molten protective slag consisting essentially of iron blast furnace slag, or of a mixture of solid particulate burnt lime or of burnt dolomitic lime, or both, with iron blast furnace slag in an amount effective to serve as a flux promoting the melting of the lime and dolomitic lime, and wherein the iron blast furnace slag comprises the following in percentages by weight based on the total weight of the slag:

CaO about 30 to about 55%
SiO_2 about 30 to about 55%
MgO about 5 to about 20%
Al_2O_3 about 5 to about 20%

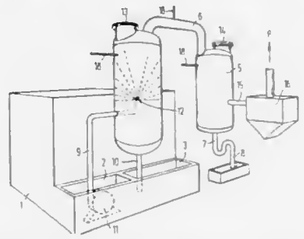
together with about 0 to 2% each of P, Na, K and Mn, about 1 to about 2% S, and about 1 to about 4% Fe.

4,842,643

APPARATUS FOR, PURIFYING A MELT, WHICH, BESIDES ONE OR MORE IMPURITIES, ESSENTIALLY CONTAINS A LIGHT METAL, IN PARTICULAR ALUMINUM

Gijsbert W. M. van Wijk, Baalder Esch 41, 7772 JX Hardenberg, Netherlands

Filed May 1, 1987, Ser. No. 44,928
Claims priority, application Netherlands, May 6, 1986, 8601158
Int. Cl.[4] F27B *5/04*
U.S. Cl. 266—149 10 Claims



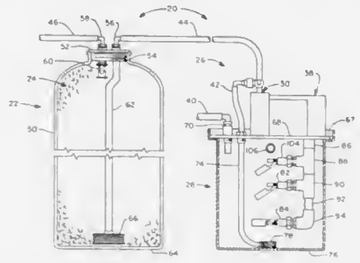
1. Apparatus for removing volatilizable metallic impurities from light metals comprising reservoir means for containing molten metal to be purified, a vacuum processing vessel having a bottom portion, inlet conduit means extending from said reservoir into said vessel, outlet conduit means leading from said bottom portion of said vessel to said reservoir means, liquid pump means operatively connected to said inlet conduit means for forcing a continuous stream of liquid metal under pressure along said conduit means, spray nozzle means at the end of said inlet conduit means within said processing vessel at a position spaced upwardly of said bottom portion for atomizing metal forced into said processing vessel by said pump means discharge conduit means extending from said processing vessel for the discharge of impurities, a separating chamber connected to said discharge conduit means and vacuum pump means operatively connected to said separating chamber for maintaining said chamber and, through said discharge conduit, said processing vessel at a sub-atmospheric pressure.

4,842,644

SILVER RECOVERY METHOD

Anthony N. Senff, P.O. Box 354, Mt. Vernon, Wash. 98273

Filed Oct. 7, 1986, Ser. No. 916,184
Int. Cl.[4] C22B *11/04*
U.S. Cl. 75—118 P 3 Claims



1. In a method of recovering a selected metal from a solution containing ions of such metal:

(a) the step of effecting a flow of said solution under pressure through the interstices of a reaction medium which is housed in a reactor and is composed of a material that:

(i) is reactable with said ions to precipitate said metal, and

(ii) has multitudinous interstitial flow passages extending therethrough;

(b) said solution being so caused to flow at a constant rate through said reaction medium as to provide a controlled time of residence of said solution in the reactor and also keep said solution from dissolving said reaction medium in a manner which could result in the formation of channels in said material through which said solution might flow without contacting the reaction medium and said rate of flow of said solution being high enough to keep precipitates formed by reactions between said ions and said reaction medium from settling out of said solution and plugging interstices of the reaction medium; and

(c) said reaction medium being provided in said reactor by the step of blowing discrete fibers of the material of which the reaction medium is composed into said reactor to thereby produce in said reactor a reaction medium which is composed of multitudinous, discrete, randomly oriented, and interdigitated fibers of said material.

4,842,645

RUST-PROOFING AGENT, RUST-PROOFING COATING COMPOSITION AND COATING METHOD FOR PREVENTING OR INHIBITING CORROSION OF METALLIC/SURFACE

Shigeo Miyata, Takamatsu, and Hideo Takahashi, Sakaide, both of Japan, assignors to Kyowa Chemical Industry Co., Ltd., Tokyo, Japan

Filed May 2, 1988, Ser. No. 188,854
Claims priority, application Japan, May 2, 1987, 62-109282
Int. Cl.[4] C04B *9/02*
U.S. Cl. 106—14.14 17 Claims

1. A rust-proofing agent containing as an active ingredient an oxide solid solution represented by formula (1)

$$[(Zn)_{1-y}(Mg)_y]_{1-x}Al_xO_{1+x/2} \quad (1)$$

wherein x denotes a positive number satisfying $0.1 < x < 0.6$ and y denotes a positive number satisfying $0 < y < 1$.

4,842,646

SUBSTANTIVE DYES, INKS AND DYE BATHS

Rodger L. Gamblin, Dayton, Ohio, assignor to Saranda Consolidated Limited Partnership, Dayton, Ohio

Filed Sep. 23, 1986, Ser. No. 910,653
Int. Cl.[4] C09D *11/00*
U.S. Cl. 106—22 17 Claims

3. An ink or dye bath comprising an aqueous solution that comprises:

(a) about 0.0001 to about 15 parts by weight of a solubilized water insoluble nigrosine dye, induline dye or basic dye;

(b) about 0.0001 to about 60 parts by weight of a water miscible solvent;

(c) about 0.0001 to about 60 parts by weight of a hydroxycarboxylic acid having at least three hydroxy groups and not more than six hydroxy groups; and

(d) about 25 to about 100 parts by weight of water.

4,842,647

MOULD ADDITIVE FOR CONTINUOUS CASTING OF STEEL

Kenji Ichikawa; Osamu Nomura, both of Bizen; Yoichiro Kawabe, Wake County, and Koyo Yanagawa, Bizen, all of Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1988, Ser. No. 154,211
Claims priority, application Japan, Feb. 12, 1987, 62-28293
Int. Cl.[4] B28B *7/36*; C21C *7/00*
U.S. Cl. 106—38.2 4 Claims

1. In a mould additive for the continuous casting of steel, which mould additive has uniform fusibility, imparts heat insulation and oxidative preventive properties to the molten steel, serves as a lubricant between the molten steel surface and the mould, and absorbs floating substances on the steel, the improvement wherein the mould additive has an essentially spherical and non-hollow shape, a bulk density of about 0.82 gm/cm^3 and an average grain size in the range of 100 to 800 μm, said mould additive comprising the following ingredients:

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PARAFFIN WAX REPLACER

Tajchai Phadoemchit, 43 Soi Sang Chan, Sukhumvit 40, Phraknong, Bangkok 10110, and Saovaluck Boonvichitr, 7/2 Mou 8 Bangphli Yai, Samudprakarn, both of Thailand

Filed Oct. 22, 1987, Ser. No. 112,352
Int. Cl.[4] C08L *91/00*; C11C *3/12*
U.S. Cl. 106—244 14 Claims

1. A composition of matter comprising glyceryl monostearate and refined, bleached and de-odorized palm stearin (RBD palm stearin), wherein the weight percent of said glyceryl monostearate, based on the weight of said RBD palm stearin, is about 1 to 5 percent.

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CEMENT COMPOSITION CURABLE AT LOW TEMPERATURES

Richard F. Heitzmann, Pearland; Billy B. Gravitt, Katy, and James L. Sawyer, Friendswood, all of Tex., assignors to Pyrament, Inc., Houston, Tex.

Filed Oct. 2, 1987, Ser. No. 103,755
Int. Cl.[4] C04B 22/10
U.S. Cl. 106—89 16 Claims

1. A blended hydraulic cement composition, capable of curing at temperatures below freezing consisting essentially of:

From 50 parts to about 80 parts portland cement
From 13 parts to about 35 parts fly ash
From 0 parts to about 10 parts metakaolin
From 0 parts to about 6 parts slag
From 0 parts to 4 parts admixture, wherein said admixture is a set regulating additive,
From 1 part to about 5 parts potassium carbonate, wherein the parts of potassium carbonate plus one-half of the parts of metakaolin is equal to at least 2

9. A blended hydraulic cement composition, capable of curing at temperatures below freezing consisting essentially of:

From 50 parts to about 80 parts portland cement
From 13 parts to about 35 parts fly ash
From 0 parts to about 10 parts metakaolin
From 0 parts to about 6 parts slag
From 0 parts to 4 parts admixture, wherein said admixture is a set regulating additive,
From 1 part to about 5 parts sodium carbonate, wherein the parts of sodium carbonate plus one-half of the parts of metakaolin is equal to at least 2.

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POLYMER MODIFIED CEMENT COMPOSITIONS

Wayne J. Blounts, Las Vegas, Nev., assignor to Sencon Systems Incorporated, Northbrook, Ill.

Filed Apr. 11, 1986, Ser. No. 850,494
Int. Cl.[4] C04B 16/12, 24/28
U.S. Cl. 106—90 25 Claims

1. A dry mix for making a polymer modified cementitious composition, the dry mix comprising:

(a) sand and cement in a ratio of between about 1.75:1 and about 3.5:1 sand to cement;
(b) fibers in a range of about 0.06% to 0.4% of the dry mix;
(c) dry, redispersible polymer selected from the group consisting of polyvinyl acetate, polyvinyl chloride, vinyl acetate-ethylene copolymer and mixture thereof in a polymer-cement ratio of between about 0.04:1 and about 0.15:1.

11. A polymer modified cementitious composition comprising:

(a) polymer at a polymer to cement ratio of between about 0.04:1 and about 0.15:1 and
(b) about 0.02 to about 0.15% sodium acyl (coco) isethionate (on a dry basis).

4,842,651

AGENT FOR PRE-TREATMENT OF ROUGH MINERAL MATERIALS FOR PIGMENTARY APPLICATIONS

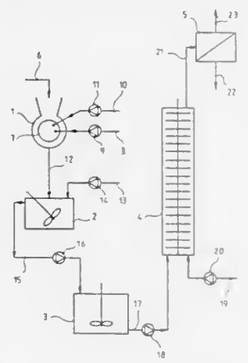
Georges Ravet, St. Genis-Les-Ollières; Catherine Bonnet, Pierre-Bénite, and Jacques Mongoin, Lyons, all of France, assignors to Coatex S.A., Caluire, France

Filed Jan. 28, 1988, Ser. No. 149,371
Claims priority, application France, Feb. 11, 1987, 87 01897
Int. Cl.[4] C04B 14/10
U.S. Cl. 106—487 15 Claims

1. A method of pre-treating a rough pigmentary mineral material containing a swelling clay, comprising the steps of:

(i) obtaining a rough pigmentary mineral material containing a swelling clay; and
(ii) contacting said rough mineral material prior to grinding with a pre-treating agent comprising at least one carboxylate ethylenic acid containing polymer or copolymer, in an amount sufficient to provide a pigmentary mineral material suspension after grinding which comprises at least 75% by weight of said mineral material wherein said contacting step comprises:

(a) impregnating substantially dry rough pigmentary mineral material with said pre-treating agent with agitation,
(b) adding water to said impregnated mineral material up to



an amount at most equal to 25% by weight with regard to said impregnated mineral material,
(c) mixing said water containing impregnated mineral material to produce a viscous plaste state or a granular particle state,
(d) treating said viscous paste or said granular particles with an aqueous solution of an alkali or alkaline earth hydroxide to obtain a pH of about 9 to form a fluid aqueous suspension, and
(e) colleting said fluid aqueous suspension.

4,842,652

METHOD FOR IMPROVING FRACTURE TOUGHNESS OF HIGH STRENGTH TITANIUM ALLOY

Michael P. Smith, Glastonbury; Edgar E. Brown, South Windsor, and Martin J. Blackburn, Kensington, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 19, 1987, Ser. No. 122,865
Int. Cl.[4] C22F 1/18
U.S. Cl. 148—12.7 B 10 Claims

1. Method for heat treating Ti-6246 alloy having a beta transus of about 1730° F. to improve LCF and toughness including the steps of:

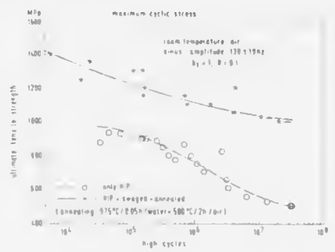
a. hot die forging the alloy above the beta transus;
b. solution treating the forged alloy below but within about 50° F. of the beta transus;
c. salt quenching the forged alloy in a bath held at 400°-1400° F., and
d. precipitation treating the forged alloy at 1100°-1200° F. for 2-16 hours.

4,842,653

PROCESS FOR IMPROVING THE STATIC AND DYNAMIC MECHANICAL PROPERTIES OF ($\alpha+\beta$)-TITANIUM ALLOYS

Günter Wirth, Rosrath; Karl-Josef Grundhoff, Troisdorf, and Hartmut Scburmann, Seelscheid, all of Fed. Rep. of Germany, assignors to Deutsche Forschungs-und Versuchsanstalt fur luft-und Raumfahrt e.V., Koln, Fed. Rep. of Germany

Filed Jun. 30, 1987, Ser. No. 67,864
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1986, 3622433
Int. Cl.[4] C22F 1/18
U.S. Cl. 148—12.7 B 11 Claims



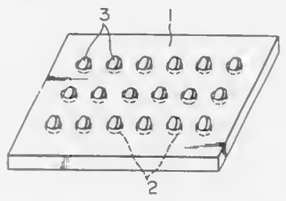
1. Process for improving the static and dynamic mechanical properties of ($\alpha+\beta$)-titanium alloys by thermomechanical treatment comprising the steps of: (a) deforming an ($\alpha+\beta$)-titanium alloy by more than 60% with simultaneous strain-hardening at a temperature just above the recrystallization temperature of the alloy in one or more deforming steps, (b) structure stress-relief heating the alloy without complete recrystallization following each of the one or more deforming steps, (c) tempering the alloy after all deforming and heating steps for about 2 to 4 minutes near the transus of the alloy, (d) quenching the alloy after tempering, and (e) aging the alloy at temperatures of about 400°-600° C. after quenching.

4,842,654

METHOD OF HEAT TREATMENT OF LOW MELTING-POINT METAL ON AN ELECTRODE OF A CHIP PART

Yasuhiro Shindo; Yukio Tsujimoto; Isami Saito, all of Fukui; Isamu Hiraoka, Akigawa, and Hiroshi Hirayama, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Japan

Filed Jan. 19, 1988, Ser. No. 145,403
Int. Cl.[4] C21D 1/50
U.S. Cl. 148—20.6 9 Claims



1. A method of heat treatment of an electrode of a chip part, comprising the steps of:

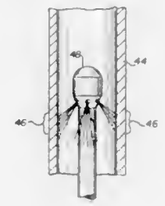
placing a high boiling-point liquid into a tubular container;
providing said high boiling-point liquid in said container with a temperature gradient;
allowing a chip part having in an electrode portion thereof both a high melting-point metallic film or a high melting-point alloy film as a substrate layer thereof and a low melting-point metallic film or a low melting-point alloy film in an outermost layer thereof to move from a high-temperature portion to a low-temperature portion of the temperature gradient of said high boiling-point liquid;
whereby said low melting-point metallic film or said low melting-point alloy film of said electrode portion is made to melt in said high-temperature portion and is cooled in said low-temperature portion, thereby allowing a melt or a molten portion thereof to solidify.

4,842,655

PROCESS FOR IMPROVING RESISTANCE OF METAL BODIES TO STRESS CORROSION CRACKING

Jan S. Porowski; Manu L. Badlani; William J. O'Donnell, all of Pittsburgh, and Edward J. Hampton, Murrysville, all of Pa., assignors to O'Donnell & Associates, Inc., Pittsburgh, Pa.

Filed Feb. 16, 1988, Ser. No. 156,529
The portion of the term of this patent subsequent to Oct. 27, 2004, has been disclaimed.
Int. Cl.[4] C21D 9/14, 9/08
U.S. Cl. 148—130 18 Claims



1. A process for improving resistance of a metal body selected from the group consisting of pressure vessel shells, tubesheets, pipes and pipe fittings to stress corrosion cracking which comprises heating at least those portions of said metal body endangered by stress corrosion cracking to an elevated temperature level, cooling at least the surfaces of those heated portions of said metal body endangered by stress corrosion cracking to a temperature below said elevated temperature, and then permitting said portions of said metal body to come to ambient temperature, said elevated temperature level being below the characteristic temperature resulting in metallurgical change in the material of said metal body but at least an elevated temperature level such that the difference between said elevated temperature level and the temperature to which said surfaces are cooled is sufficient to result in plastic flow of said cooled surfaces to a depth equivalent to at least one grain size.

4,842,656

ANISOTROPIC NEODYMIUM-IRON-BORON POWDER WITH HIGH COERCIVITY

James R. Maines, Westfield, and David Arnold, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 12, 1987, Ser. No. 62,533
Int. Cl.[4] H01F 1/06
U.S. Cl. 148—302 3 Claims

3. Magnetically anisotropic particles of a composition that has as its magnetic constituent the tetragonal crystal phase $RE_2TM_{14}B$, the particles each comprising many aligned, platelet-shaped grains of said phase no larger than about 500 nanometers in greatest dimension and having an intrinsic coercivity at room temperature of at least 1,000 Oersteds, the composition of said particles comprising, on an atomic percent basis, about 40 to 90 percent transition metal (TM) taken from the group consisting of iron and mixtures of iron and cobalt such that iron

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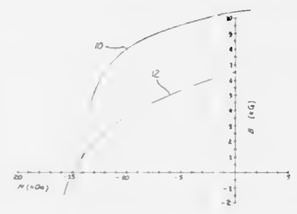
makes up at least 40 percent of the total composition, about 10 to 40 percent rare earth metal (RE) such that at least about 6



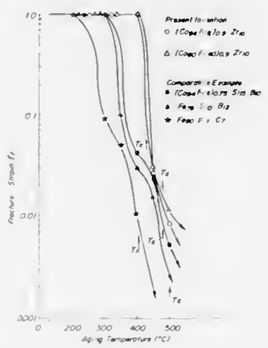
percent of the total composition is neodymium and/or praseodymium, and at least 0.5 percent boron

4,842,657

AMORPHOUS ALLOYS CONTAINING IRON GROUP ELEMENTS AND ZIRCONIUM AND PARTICLES MADE OF SAID ALLOYS

Tsuyoshi Masumoto, Sendai; Kiyoyuki Esashi, Higashiosaka, and Masateru Nose, Itami, all of Japan, assignors to Shin-Gijutsu Kaihatsu Jigyodan, Tokyo, Japan

PCT No. PCT/JP80/00046, § 371 Date Dec. 5, 1980, § 102(e) Date Dec. 5, 1980, PCT Pub. No. WO80/02159, PCT Pub. Date Oct. 16, 1980
PCT Filed Mar. 19, 1980, Ser. No. 220,046
Claims priority, application Japan, Apr. 11, 1979, 54-43838
Int. Cl.[4] C22C *19/07*
U.S. Cl. 148—403 19 Claims



1. Amorphous alloys containing iron group elements and zirconium and having the composition defined by the following formula

$$X_{\alpha'}Y_{\beta'}Z_{\gamma'},$$

wherein $X_{\alpha'}$ shows that least one element selected from the group consisting of Fe, Co and Ni is contained in an amount of α' atomic %,

$Y_{\beta'}$ shows that at least one element selected from the group consisting of Cr, Mo, W, Ti, V, Nb, Ta, Mn, Cu, Be, Al, In, Sn, N, and lanthanum group elements is contained in an amount of β' atomic %, $\beta'>0$, and

$Z_{\gamma'}$ shows that Zr is contained in an amount of γ' atomic %, the sum of β', β' and γ' is 100 and each value of α', β' and γ' is as shown in the following (A), (B), (C), (D), (E) and (F):

(A) when Y is at least one element selected from the group consisting of Cr, Mo and W, α' is 40 to 92, β' is not more than 40 and γ' is 5 to 20, provided that the sum of β' and γ' is not less than 8,

(B) when Y is at least one element selected from the group consisting of Ti, V, Nb, Ta, Cu and Mn, α' is 45 to 92, β' is not more than 35, γ' is 5 to 20, provided that the sum of β' and γ' is not less than 8,

(C) when Y is at least one element selected from the group consisting of Be and Al, α' is 67 to 92, β' is less than 13 and γ' is 3 to 20, provided that the sum of β' and γ' is not less than 8,

(D) when Y is at least one element selected from the group consisting of N, In and Sn, α' is 70 to 92, β' is not more than 10 and γ' is within the range of 5 to 20 wherein amorphous formation is possible, provided that the sum of β' and γ' is not less than 8,

(E) when Y is at least one element selected from lanthanum group elements, α' is 70 to 92, β' is not more than 10 and γ' is 8 to 20, provided that the sum of β' and γ' is not less than 8, and

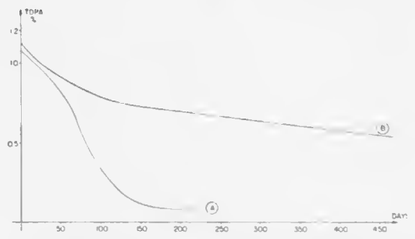
(F) when elements of at least two groups selected from the above described groups (A), (B), (C), (D) and (E) are combined, β' is within the range of β' value in each of the groups (A), (B), (C), (D) and (E) and the total value of β' is not more than 40, α' is 40 to 92, γ' is 5 to 20 and the sum of β' and γ' is not less than 8, provided that when at least one element is selected from each of the groups (C) and (D), the sum of these elements is less than 13 atomic %.

4,842,658

AGING-RESISTANT SINGLE-BASE POWDER, PROCESS FOR MANUFACTURE, AND APPLICATION TO GAS GENERATORS

Jacques Boileau, Paris; Louis Leneveu, Chateaulin, and Monique Tromeur, Daoulas, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris Cedex, France

Filed Mar. 31, 1988, Ser. No. 175,904
Int. Cl.[4] C06G *25/34*
U.S. Cl. 149—92 12 Claims



1. A nitrocellulose single-base propellant powder containing a stabilizer and zinc carbonate as an additive.

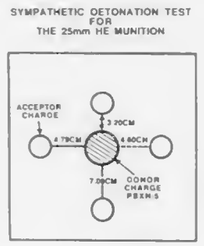
4,842,659

INSENSITIVE HIGH ENERGY EXPLOSIVE COMPOSITIONS

Mark Mezger, Hackettstown; Bernard Strauss, Rockaway; Sam M. Moy, Parsippany, and Joseph L. Prezelski, Budd Lake, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 22, 1988, Ser. No. 184,930
Int. Cl.[4] C06B *45/10*
U.S. Cl. 149—19.2 10 Claims

1. In an improved high energy explosive composition containing about 80 to 95 percent cyclotetramethylene tetranitramine being relatively insensitive to sympathetic detonation, the improvement consisting essentially of the incorporation of between about 2.9 to 10 percent cellulose acetate butyrate and about 10 to 17.1 percent of 1:1 mixture of bis 2,2 - dinitropropyl acetate and bis 2,2 - dinitropropyl formal, and about 0.5 percent tri (dioctyl phosphato) titanate, all said percents being by weight based on the total weight of said composition.

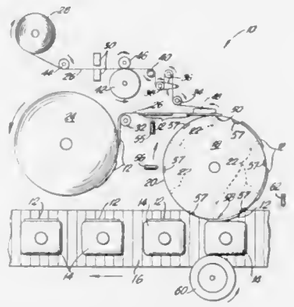


4,842,660

CONTINUOUS MOTION PRESSURE SENSITIVE LABELING SYSTEM AND METHOD

Helmut Voltmer, Park Ridge; Alfred F. Schwenzer, Totowa, and Anthony Freakes, Leonia, all of N.J., assignors to New Jersey Machine, Inc., Fairfield, N.J.

Continuation of Ser. No. 45,315, May 4, 1987, abandoned, which is a continuation of Ser. No. 845,524, Mar. 28, 1986, Pat. No. 4,687,535. This application Jul. 27, 1988, Ser. No. 225,669
Int. Cl.[4] B65C *3/08, 9/18*
U.S. Cl. 156—64 2 Claims



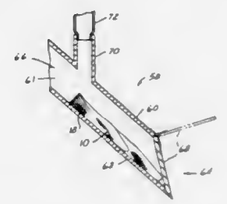
2. A method of applying pressure sensitive labels to articles at a label applying station, wherein the labels are initially carried by a web which is rolled up on a supply spindle supporting a supply roll including the web carrying the labels thereon, the method comprising the steps of continuously advancing the articles in a given direction past the label applying station, while continuously advancing said web with the labels thereon as the web leaves the supply spindle, stripping labels from said web and applying stripped labels to the articles by advancing the stripped labels in said given direction to meet the articles at the label applying station, while continuously sensing the speeds of advance of the articles and the web and adjusting the speed of advance of the web to match the speed of advance of the articles.

4,842,661

METHOD AND APPARATUS FOR BINDING EDGES OF WOVEN, NON WOVEN AND KNITTED ARTICLES

Acie B. Miller; Ralph H. Simpson, Jr., both of Roaring River, and Jimmy W. Luffman, Wilkesboro, all of N.C., assignors to Golden Needles Knitting & Glove Co., Inc., Wilkesboro, N.C.

Division of Ser. No. 14,948, Feb. 17, 1987, Pat. No. 4,755,242. This application Mar. 15, 1988, Ser. No. 168,359
Int. Cl.[4] B02C *11/08;* B30B *15/34*
U.S. Cl. 156—88 10 Claims



8. A method of finishing an edge of an article which is automatically woven or knitted by a knitting or weaving machine, of a type which ejects the article from an ejection area of the machine, and wherein the edge of the article includes a heat meltable thermoplastic material which binds the edge when the thermoplastic material is melted, said method comprising the steps of:

(A) delivering said article from said ejection area of said machine to a first station beneath said ejection area using gravitational influence said first station including an inclined bottom wall for supporting said article;

(B) holding said article at said first station;

(C) melting said thermoplastic material by applying heated air to said article while said article is held in step (B);

(D) releasing said article after step (C) is performed; and

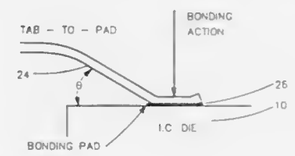
(E) delivering said article from said first station to a second station using the influence of gravity after step (D) is performed.

4,842,662

PROCESS FOR BONDING INTEGRATED CIRCUIT COMPONENTS

John W. Jacobi, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 1, 1988, Ser. No. 201,494
Int. Cl.[4] H01L *21/58, 21/60;* B23K *1/06;* B32B *31/16*
U.S. Cl. 156—633 12 Claims



1. A process for bonding tape-automated-bonding (TAB) tape to a bonding pad of an integrated circuit die, said process comprising:

(a) aligning a TAB tape lead with a bonding pad;

(b) bending the TAB tape lead into

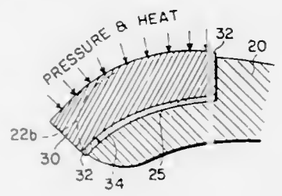
(c) applying ultrasonic energy to vibrate the TAB lead with respect to the bonding pad and thereby bond the tape lead to the bonding pad.

4,842,663

STEAM TURBINE BLADE ANTI-EROSION SHIELD AND METHOD OF TURBINE BLADE REPAIR

Leslie D. Kramer, 633 Riverpark Cir., Longwood, Fla. 32779

Filed Apr. 29, 1988, Ser. No. 187,850
Int. Cl.[4] B32B *35/00*
U.S. Cl. 156—98 14 Claims



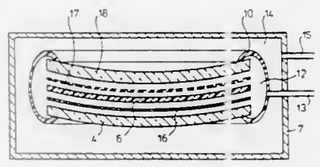
8. A method of in situ repair of an eroded anti-erosion shield welded to a steam turbine blade comprising the steps of:
(a) removing the remainder of the eroded anti-erosion shield;
(b) removing the eroded shield welding material;
(c) providing a repair anti-erosion shield having:
(i) a film supported adhesive disposed on the surface of the repair shield to be attached to the turbine blade, and
(ii) fluoropolymer gaskets disposed along edge surfaces of the repair shield;
(d) installing the repair shield on the turbine blade after removing the film from said repair shield; and
(e) curing the adhesive.

4,842,664

PROCESS OF BENDING THERMOPLASTICS SHEETS AND MANUFACTURING LAMINATED LIGHT TRANSMITTING PANELS

Pol Baudin, l'Evêque, Belgium, assignor to Glaverbel, Brussels, Belgium

Filed Aug. 10, 1987, Ser. No. 83,275
Claims priority, application United Kingdom, Aug. 9, 1986, 8619464
Int. Cl.[4] B32B *31/12, 17/10*
U.S. Cl. 156—102 21 Claims



1. A process of imparting a predetermined curvature to a sheet of thermoplastics material in which a said thermoplastic sheet is bent by placing it against a face of a bending form having a moulding surface area of the required curvature, heating said thermoplastics sheet and causing or allowing it to conform to said moulding surface area, wherein said thermoplastics sheet is formed oversized and is bent by placing it against a bending form having a moulding surface area portion of the required dimensions and curvature which is surrounded by a bending form surround, said thermoplastics sheet being heated and caused or allowed to conform to said moulding surface area portion while its oversized margins are supported by said bending form surround, and said thermoplastics sheet is thereafter cooled at a rate slow enough to maintain such conformity, and wherein said thermoplastics sheet is thereafter trimmed to size and, while it remains in contact with said bending form moulding surface, the thermoplastics material is caused or allowed to cool from its maximum temperature for a first period at a first cooling rate and thereafter for a second period at a second cooling rate which is higher than said first cooling rate.

4,842,665

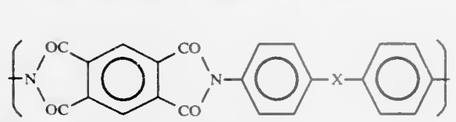
METHOD OF PRODUCING A GRAPHITE MONOCHROMATOR FOR X-RAYS AND NEUTRONS

Satoshi Taguchi, Suita, and Wataru Utsumi, Tokyo, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 2, 1987, Ser. No. 92,141
Claims priority, application Japan, Sep. 9, 1986, 61-212958; Jun. 16, 1987, 62-150699
Int. Cl.[4] G21K *1/06*
U.S. Cl. 156—155 6 Claims

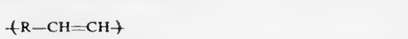
1. A process for producing a graphite monochromator for X-rays or neutrons having a mosaic spread of 4° or less, which comprises

pyrolyzing a plurality of sheets of film of a polymer selected from the group consisting of aromatic polyimides having the repeating unit represented by the formula (I):


(I)

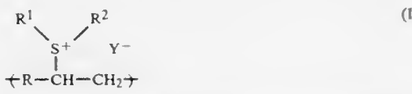
wherein X denotes O, CH_2 or SO_2;

polyphenylene-vinylenes having the repeating unit represented by the formula (II):


(II)

wherein R denotes an aromatic hydrocarbon group conjugating with the adjacent vinylene group:

polymeric sulfonium salts represented by the formula (III):


(III)

wherein R denotes the same as defined in the formula (II) above, R^1 and R^2 each denote an alkyl group of 1 to 10 carbon atoms and Y denotes a counter ion; and

polyoxadiazoles having the repeating unit represented by the general formula (IV):

(IV)

in an inert atmosphere at a temperature of 2,000° C. to 3,500° C. to form a graphitized film and

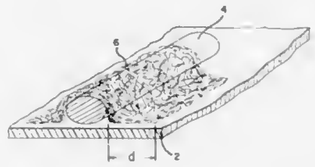
laminating the sheets of the resulting graphitized film to one another or laminating a plurality of sheets of the polymer film to one another prior to the pyrolysis.

4,842,666

PROCESS FOR THE PERMANENT JOINING OF STRETCHABLE THREADLIKE OR SMALL RIBBONLIKE ELASTIC ELEMENTS TO A FLAT SUBSTRATE, AS WELL AS USE THEREOF FOR PRODUCING FRILLED SECTIONS OF FILM OR FOIL STRIP

Harald Werenicz, Luneburg, Fed. Rep. of Germany, assignor to H. B. Fuller Company, St. Paul, Minn.

Filed Mar. 4, 1988, Ser. No. 164,256
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1987, 3707349; Nov. 28, 1987, 3740410
Int. Cl.[4] B32B *31/10, 31/12*
U.S. Cl. 156—161 23 Claims



1. A process for the permanent joining of stretchable threadlike or small ribbonlike elements to a flat substrate by means of an adhesive, characterized by the fact that, prior to application of the adhesive, one or several threadlike or small ribbonlike elastic elements (**4**) are disposed or fixed in the desired position at some distance from, the flat substrate (**2**), and that afterwards these threadlike or small ribbonlike elements (**4**) as well as the adjoining area of the substrate (**2**) are covered with a sprayable melt adhesive (**6**).

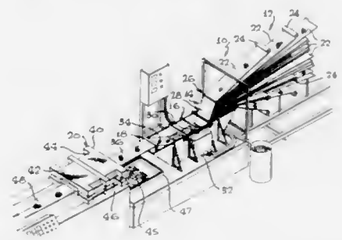
21. A process according to claim 1 for producing frilled sections of film, with stretchable threadlike or small ribbonlike elements located in the respective edge area between a film and a covering layer, an absorbent inlay disposed therebetween, and a layer of felt covering these latter, further characterized by the additional steps of:
(a) placing or fixing on the film (**22**) serving as a substrate, in the respective, later-frilled edge areas, either on this film
(i) in the frilled or pleated condition one or several not, or slightly, stretched,
(ii) in the flatly laid condition, one or several threadlike or small ribbonlike elements (**24**, **24'**),
(b) intermittently spraying with the melt adhesive the respective threadlike or small ribbonlike elements, as well as their adjoining areas, and simultaneously the area (**27**) lying between the threadlike or small ribbonlike elements,
(c) next, placing on the area (**27**) sprayed with melt adhesive between the threadlike or small ribbonlike elements a course made of an absorbent padding material (**28**),
(d) placing onto the film (**22**) and the course made of absorbent padding material (**28**) a fleece course (**29**), in a manner such that this latter covers the absorbent padding material (**28**) and also lies over the threadlike or small ribbonlike elements (**24**, **24'**) sprayed with the melt adhesive,
(e) pressing the fleece course (**29**), at least in the area of the threadlike or small ribbonlike elements, together with these latter and,
(f) cutting off the thusly obtained bonded material in sections transversely to the course direction.

4,842,667

EPOXY RESIN SYSTEM AND PULTRUSION PROCESS EMPLOYING SAME

Ted H. Thorsted, Jr., Moorpark, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Division of Ser. No. 946,995, Dec. 29, 1985, Pat. No. 4,754,015.
This application Oct. 19, 1987, Ser. No. 109,688
Int. Cl.[4] B29C *35/02;* B29K *63/00;* B32B *31/12*
U.S. Cl. 156—166 13 Claims



1. A pultrusion process for the production of fiber-resin composite which comprises:
creeling a plurality of fabric bands,
collating said creeled bands to align same and form an array of closely spaced but separated bands,
passing said array of collated bands through a heated epoxy resin system in a wet-out tank to wet and impregnate said array, said system comprising a tris (hydroxyphenyl) methane based epoxy resin and a combination of the cross-linking agents (methyl)bicyclo (2,2,1) heptane-2,3-dicarboxylic anhydride and poly sebacic poly anhydride, and a small amount of an imidazole accelerator, the ratio of said respective cross-linking agents to the total amount of cross-linking agents, and the total amount of cross-linking agents to resin, being effective to provide a resin system having a pot life of at least 3 hours at 70° C., a cure rate of less than 3 minutes at elevated temperature, and a viscosity profile less than 2500 cps at 70° C. and greater than 100 cps at 120° C.,
passing said wetted and impregnated array of fabric bands through a forming guide which forms said last mentioned array into a resin impregnated laminate,
passing said laminate through a heated pultrusion die, the rate of passage of said laminate through said die being sufficient to cure the resin in said laminate during said passage, and
discharging a continuous length of cured fiber-epoxy composite from said die.

4,842,668

METHOD FOR THE AUTOMATED MANUFACTURE OF LAMINATED PLASTICS PRODUCTS

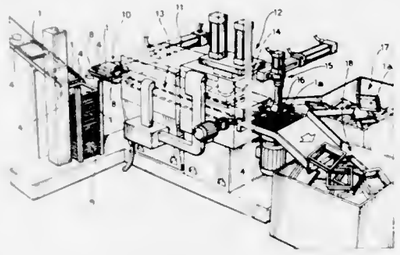
Giovanni Monetti, Racconigi, Italy, assignor to Monetti S.p.A., Italy

Filed Oct. 29, 1987, Ser. No. 113,980
Claims priority, application Italy, Oct. 31, 1986, 67819 A/86
Int. Cl.[4] B29C *31/04, 43/20;* B32B *31/20*
U.S. Cl. 156—196 7 Claims

2. A method for the automated manufacture of laminated plastics products including the steps of:
forming a pack of superimposed layers of thermosetting material,
placing the pack in a rigid support structure in the form of a hollow rectangular frame having an L-shaped cross section with a horizontal flange extending inwardly to define a seat for supporting the corresponding pack of superimposed layers and a vertical wall having a surface against which the various layers of the pack are located so as to assume the correct position,

supplying the rigid structure and the corresponding pack by gripping and transfer means to a molding press for hot forming,

molding the pack into a plastics laminate of the desired form,



separating the rigid structure and the respective plastics laminate obtained by thermoforming of the corresponding pack of superimposed layers, and

directing the rigid structure and the plastics laminate to respective unloading stations.

4,842,669

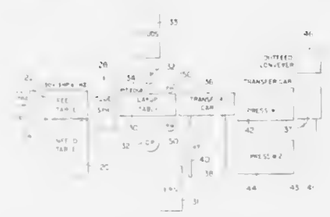
METHOD OF MANUFACTURE AND ASSEMBLY SYSTEM FOR A STRUCTURAL WALL PANEL

Richard Considine, Chestertown, N.Y., assignor to The Original Lincoln Logs Ltd., Chestertown, N.Y.

Continuation-in-part of Ser. No. 76,751, Jul. 23, 1987. This application Aug. 31, 1987, Ser. No. 90,925

Int. Cl.[4] **B32B** *31/04, 31/10, 31/12, 31/20*

U.S. Cl. 156—288 **19 Claims**



1. A system for manufacturing prefabricated wall sections having a panel and a plurality of wall section components, said system comprising:

loading means for holding a stack of panels,

feed means for repetitively feeding successive top panels from said stack of panels in a predetermined direction,

adhesive means for applying adhesive to each successive top panel as said top panel is being fed,

a lay-up table for assemblying wall sections,

first guide means for aligning and compressing said plurality of wall section components in a predetermined position after being loosely placed on said table,

second guide means for locating said side edges of said panel offset from peripheral side edges of said plurality of wall section components in said predetermined position so that said peripheral side edges of said plurality of wall section components are recessed from said side edges of said panel on three sides of said panel and one of said side edges of said plurality of wall section components projects beyond one of said peripheral side edges of said panel, and

press means for pressing said panel with adhesive onto said wall section components for a time sufficient to secure said panel to said components.

4,842,670

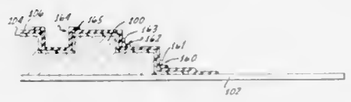
MOLDED VACUUM BAG FOR DEBULKING AND AUTOCLAVING LAMINATES OF COMPLEX SHAPES

Richard A. Callis, Thousand Oaks, Calif., and Darryl G. James, Camarillo, both of Calif., assignors to Northrop Corporation, Hawthorne, Calif.

Division of Ser. No. 52,670, May 19, 1987, which is a continuation-in-part of Ser. No. 837,616, Mar. 7, 1986, abandoned. This application Aug. 25, 1988, Ser. No. 236,581

Int. Cl.[4] **B32B** *31/06*

U.S. Cl. 156—382 **11 Claims**



2. A preshrunk molded bag for use in vacuum debulking and autoclave operations in the manufacture and curing of composite parts on a tool including a shaped mold on which the part is formed, said mold having first portions of relatively low curvature and second portions of high curvature, said second portions having much smaller surface extent than said first portions, said bag comprising:

a molded blanket of elastomer formed about said mold to form said bag, said bag being of dimensions to fully cover said mold and to fully conform to said mold shape and dimensions throughout said first and second portions without stretching and further being fully preshrunk throughout,

said bag being formed from a plurality of cured, preshrunk, and stabilized panels of elastomer covering said tool over said first portions and extending over all of said tool except said second portions to form a partial bag structure, and

strips of uncured sheet elastomer bridging the cured panels across the second portions and interconnecting said panels into a unitary, complete bag structure for completely covering the mold, said strips being cured and shrink stabilized together with the panels after which said entire bag is substantially fully preshrunk and has the shape of the full dimensions of the tool.

4,842,671

APPARATUS FOR CONNECTING ELONGATE MATERIAL SUCH AS ELECTRICAL CONDUCTORS BY MEANS OF ULTRASONICS

Lothar Nuss, Offenbach, Fed. Rep. of Germany, assignor to Stapla Ultraschall-Technik GmbH, Frankfurt, Fed. Rep. of Germany

Filed Sep. 17, 1987, Ser. No. 98,068

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1986, 3636072; Mar. 31, 1987, 3710603

Int. Cl.[4] **B29C** *65/08;* **B65H** *69/08*

U.S. Cl. 156—433 **21 Claims**

1. An apparatus for joining, by means of ultrasonics, elongate material, such as wires, cords, sheet strips or the like, the apparatus comprising a housing, a sonotrode mounted on the housing for generating ultrasonic vibrations, a two-part anvil comprising three working surfaces, and a compaction chamber, which chamber is adjustable in its cross-sectional dimensions to accommodate the size of the objects to be joined, the compaction chamber being bounded by the sonotrode and the three working surfaces of the anvil and having end faces which are open for the passage of the objects to be joined, the two parts of the anvil being mounted on the housing so as to be moveable in two different directions relative to each other and to the sonotrode, and there being pneumatic piston and cylinder assemblies in the housing alongside each other and axially parallel to each other and to the longitudinal axis of the sonotrode; the apparatus further comprising transmission elements on which said piston and cylinder assemblies act, which transmission elements are arranged to actuate said movable anvil parts and there being a handle mounted in the manner of a pistol grip on the housing, which handle is equipped with a trigger controlling the movement of the anvil parts and the actuation of said sonotrode.

4,842,672

APPARATUS FOR CONVEYING BASE

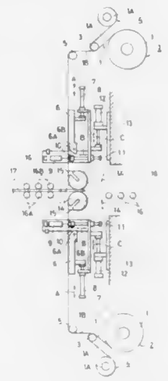
Takao Matsuo, Hyogo, and Shigeo Sumi, Saitama, both of Japan, assignors to Somar Corporation, Tokyo, Japan

Filed Oct. 22, 1986, Ser. No. 921,511

Claims priority, application Japan, Oct. 22, 1985, 60-236862

Int. Cl.[4] **B32B** *31/10, 31/18, 31/20*

U.S. Cl. 156—497 **4 Claims**



1. An apparatus for conveying and holding a base, comprising:

conveying means for transporting said base to a predetermined fixed position;

means for aligning a centerline of said base with a centerline of said apparatus while said base is being conveyed by said conveying means;

a base holding member disposed above said base at said fixed position and movable in a direction perpendicular to a substantially horizontal plane defined by said base for holding said base at said fixed position;

a base support member movable in a direction parallel to said horizontal plane for supporting said base from below at said fixed position; and

means for clamping a sheet to be arranged on said base and pressing said sheet onto said base after said base has been held in said fixed position by said base holding member and said base support member.

4,842,673

APPARATUS FOR TRANSFERRING AND PLACING DECORATIVE ARTICLES

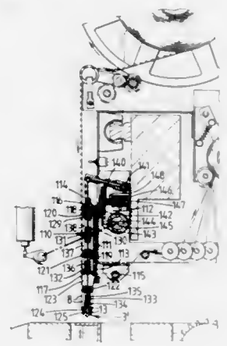
Akira Kurihara, Gunma, Japan, assignor to Jakob Schlaepfer & Co. AG, Switzerland

Filed Dec. 10, 1986, Ser. No. 939,869

Claims priority, application United Kingdom, Dec. 12, 1985, 8530561

Int. Cl.[4] **B65C** *9/18*

U.S. Cl. 156—541 **9 Claims**



1. Apparatus for transferring and placing decorative articles which are located at spaced intervals along a carrier tape, wherein the carrier tape also has sequentially aligned channels provided along the carrier tape, the apparatus comprising:

an elongate element and means for actuating the elongate element to move along a linear path;

a circular rotatable head means having at least one channel passing diametrically all the way therethrough, the channel being placed and formed on the rotatable head means so that at predetermined rotational positions of the rotatable head means the elongate element is able to pass through the channel that is then on the linear path;

the rotatable head means having teeth for guiding the tape to move from off the rotatable head means, past the rotatable head means by the rotation of the rotatable head means and for sequentially aligning respective ones of the channels of the rotatable head means and respective ones of the decorative articles in the linear path of the elongate element passing through the head means; and

the channel in the rotatable head means including at least one channel passing through the axis of rotation of the rotatable head means, thereby to accurately locate each decorative article relative to the linear path.

4,842,674

METHOD OF MEASUREMENT OF THE RATE OF OXIDATION OF A METAL MELT

Silvano Freti, Chippis, and Kurt Buxmann, Sierre, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Apr. 29, 1983, Ser. No. 490,125

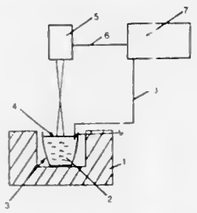
Claims priority, application Switzerland, May 19, 1982, 3126/82

Int. Cl.[4] **G01J** *5/20*

U.S. Cl. 156—601 **2 Claims**

1. A process for measuring the rate of oxidation of a metal melt comprising providing a metal melt having an oxide skin on the surface thereof, providing an infra-red radiation pyrometer for measuring the intensity of the thermal radiation emanating from the surface of the metal melt, removing the oxide skin from the surface of the metal melt at a constant temperature, measuring the decrease in intensity of the thermal radia-

tion emanating from the surface of the metal melt as a function of time during subsequent oxidation at the surface of the metal



melt and determining the rate of oxidation at the surface of the melt.

4,842,675

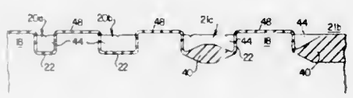
INTEGRATED CIRCUIT ISOLATION PROCESS

Richard A. Chapman, Dallas, and Clarence W. Teng, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 7, 1986, Ser. No. 882,732

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **32 Claims**



1. A method for isolating regions in a semiconductor substrate separated by narrow and wide recesses comprising:

growing a first field oxide only in the wide recesses, and

depositing a second field oxide over the substrate to fill the narrow recesses and any remaining unfilled portion of the wide recesses.

4,842,676

PROCESS FOR ETCH OF TUNGSTEN

Rhett B. Jucha, Celeste; Cecil J. Davis, Greenville, and Lee M. Loewenstein, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 754,454, Jul. 16, 1987, abandoned. This application Nov. 17, 1987, Ser. No. 122,605

Int. Cl.[4] C23F *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*

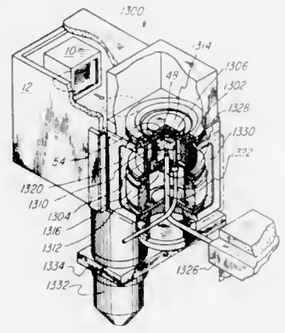
U.S. Cl. 156—643 **45 Claims**

1. A process for etch of a tungsten film comprising the steps of:

(a) disposing said film in a low pressure process chamber;

(b) generating remote plasma from a gas comprised of a mixture of SF_6, HBr, and a hydrocarbon source;

(c) introducing said remote plasma into said chamber and to said film; and



(d) generating an in situ plasma within said chamber from a gas mixture of SF_6, HBr, and a hydrocarbon source.

4,842,677

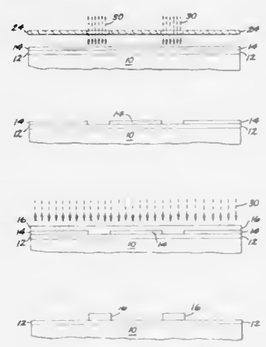
EXCIMER LASER PATTERNING OF A NOVEL RESIST USING MASKED AND MASKLESS PROCESS STEPS

Robert J. Wojnarowski, Ballston Lake, and Charles W. Eichelberger, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 152,510, Feb. 5, 1988, Pat. No. 4,780,177. This application Jul. 26, 1988, Ser. No. 224,416

Int. Cl.[4] B44C *1/22;* **B29C** *37/00;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **19 Claims**



1. A method for photopatterning conductive patterns, said method comprising the steps of:

disposing a thin layer of ablatable photoabsorptive polymer on a substrate having a conductive layer thereon, so that said polymer material is in contact with said conductive layer;

directing a beam of laser energy on said ablatable polymer, through a mask so as to ablate said polymer layer, whereby said conductive layer is partially exposed;

disposing a thick layer of substantially transparent material over said partially ablated polymer layer and said exposed conductive layer, said photoabsorptivity and said transparency being determined with respect to the same frequency range;

directing a beam of laser energy through said thick layer so as to ablate said polymer layer and so as to simultaneously remove said thick layer above said ablated polymer layer, whereby select portions of said conductive layer are exposed.

4,842,678

POLISHING CLOTH AND METHOD

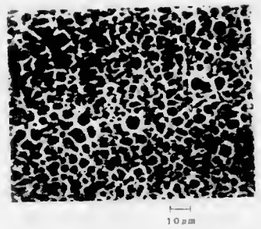
Shoji Noro, Iruma, and Shigemi Mukaiyama, Suzuka, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 13, 1988, Ser. No. 193,730

Claims priority, application Japan, May 15, 1987, 62-118685

Int. Cl.[4] H01L *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/00*

U.S. Cl. 156—636 **17 Claims**



17. A polishing method, which comprises mirror polishing a material to be worked by moving a polishing cloth comprising an expanded thermoplastic resin product having a cellular structure and an expansion ratio of 1.5-fold to 30-fold, with substantially uniform cells having an average cell diameter of 300 μm or less being distributed within the cross-section of the expanded product, and with unexpanded phases of 0.5 μm to 45 μm surrounded by three or more cells, wherein the proportion of the unexpanded phases are 0.01% to 70% in terms of area ratio within the expanded product cross-section, relative to the material to be worked while supplying a polishing liquid onto the surface of the polishing cloth.

4,842,679

METHOD FOR THE PRODUCTION OF SEMICONDUCTOR DEVICES

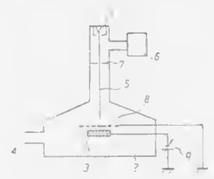
Hiroaki Kudo, and Sadayoshi Matsui, both of Tenri, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 19, 1987, Ser. No. 27,735

Claims priority, application Japan, Mar. 25, 1986, 61-67639

Int. Cl.[4] B44C *1/22*

U.S. Cl. 156—643 **3 Claims**



1. A method for the production of semiconductor devices comprising introducing source gases, etching gases or source molecules into a chamber having a substrate, to grow crystalline layers on said substrate or to etch said substrate, resulting in a semiconductor device, wherein said method further comprises

applying a predetermined electric potential to said substrate;

applying an electric potential that is different from that applied to said substrate to an intermediate body disposed directly above said substrate; and

irradiating said body with electron beams from an electron-beam emitting means, whereby said substrate is irradiated with secondary electron beams generated from said body or is irradiated with said secondary electron beams and the electron beams transmitted through said body.

4,842,680

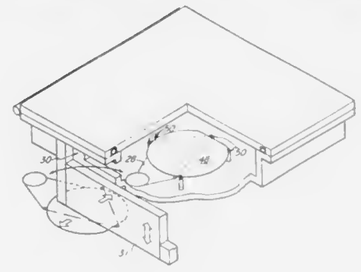
ADVANCED VACUUM PROCESSOR

Cecil J. Davis, Greenville; Timothy J. Wooldridge, Richardson, and Duane E. Carter, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 118,824, Nov. 9, 1987, abandoned, which is a continuation of Ser. No. 60,976, Jun. 12, 1987, abandoned, which is a continuation of Ser. No. 790,708, Oct. 24, 1985, abandoned. This application May 2, 1988, Ser. No. 188,633

Int. Cl.[4] B44C *1/22;* **H01L** *21/306;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **48 Claims**



16. A method for fabricating integrated circuits, comprising the steps of:

providing a plurality of wafers in a vacuum sealable wafer carrier box;

placing said wafer carrier box into a vacuum sealable load lock attached to a process module;

pumping down said load lock to a hard vacuum;

opening said wafer carrier and extending a load lock transfer arm into said wafer carrier, to remove a selected one of said wafers therefrom;

transferring wafers in a desired sequence from said wafer carrier to one or more selected process stations inside said process module and back until a desired sequence of processing operations has been completed; and then

closing said wafer carrier and raising the pressure of said load lock to approximately atmospheric,

so that said wafers remain in vacuum inside said wafer carrier while said door of said wafer carrier is held closed by differential pressure.

4,842,681

SPLICING METHOD AND APPARATUS FOR SHEET MATERIALS

B. Robert Bader, 6802 Bristol Way, Yakima, Wash. 98908, and Bernard W. Bader, 1313 Browne Ave., Apt. 109, Yakima, Wash. 98902

Filed Mar. 30, 1987, Ser. No. 32,711

Int. Cl.[4] B65H *19/14, 69/02*

U.S. Cl. 156—504 **35 Claims**

1. In combination:

a storage station for sheet material, including a first storage roll of sheet material and a second storage roll of sheet material;

feed means spaced horizontally from the storage station, said feed means serving to receive sheet material from a storage roll and feed it one to a utilization station; and

a splicing machine located in series between the storage station and the feed means, comprising:

a frame;

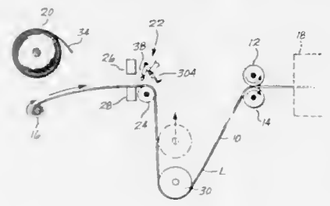
a web support means on said frame, over which a first web

of sheet material travels as it moves from the first storage roll to the feed means;

a loop forming roll positioned in series between the web support means and the feed means for forming a loop in said first web of sheet material, said loop forming roll including a center support having end portions and a roller mounted for rotation about the center support;

said frame including a first pair of vertical guideways, one on each side of the machine, for engaging and guiding the end portions of the center support of the loop forming roll, for supporting the loop forming roll for movement vertically between an inactive upper position above the level of the web support means and a loop forming lower position substantially below the level of the web support means;

splicing means of said frame adjacent the web support means, for connecting a leading end portion of a second web of sheet material from the second storage roll to the first web of sheet material while said first web of sheet material is being fed by the feed means out from the loop, on to the utilization station, said splicing means comprising upper and lower splicer heads each having a presser surface directed towards the presser surface of the other, and between the first web of sheet material moves as it is being fed by the feed means from the first storage roll to the utilization station, and also between which a leading end portion of the second web of sheet material can be placed when it is desired to connect the second web to the first web, said upper and lower splicer heads each including end portions;



said frame comprising a second pair of vertical guideways, one on each side of the machine, for engaging and guiding the end portions of the upper and lower splicer heads; and

means engaging the end portions of the upper and lower splicer heads, for moving the upper and lower splicer heads together and apart.

26. In combination:

a storage station for sheet material, including a first storage roll of sheet material and a second storage roll of sheet material;

feed rolls spaced horizontally from the storage rolls, said feed rolls serving to receive sheet material from a storage roll and feed it onto a utilization station; and

a splicing machine located between the storage station and the feed rolls, comprising:

a support means over which a first web of sheet material travels as it moves from the first storage roll to the feed rolls;

a loop forming roll positioned horizontally between the support means and the feed rolls, and movable vertically between an inactive upper position above the level of the support means and a loop forming lower position substantially below the level of the support means;

means for moving the loop forming roll downwardly from its upper position to its lower position, to form a free loop in the first web of sheet material, and then back upwardly to its upper position, while the first web of sheet material is being fed by the feed rolls out from the free loop to the utilization station; and

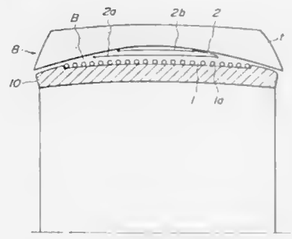
means adjacent the support means for connecting a leading end portion of a second web of sheet material from the second storage roll to the first web of sheet material while said first web of sheet material is being fed by the feed rolls out from the loop and onto the utilization station, including an upper splicer head, a lower splicer head, and means for moving the splicer heads together and apart, each splicer head having a presser surface directed toward the presser surface of the other, and between which the first web of sheet material moves as it is being fed by the feed rolls from the first storage roll to the utilization station, and also between which a leading end portion of the second web of sheet material can be placed when it is desired to connect the first web to the second web, and means for applying an adhesive to a surface of one of the webs of sheet material which is directed towards the other web, while the two splicer heads are apart, said means for moving the upper and lower splicer heads together and apart being operable to insert a squeezing pressure on the leading end portion of the second web of sheet material and the portion of the first web of sheet material below it, to cause to the adhesive to bond the webs together, and vacuum pick-up means associated with each splicer head, with said vacuum pick-up means associated with the upper splicer head being operable to grip the leading end portion of the second web of sheet material and hold it against the presser surface of the upper splicer head, and with the vacuum pick-up means associated with the lower splicer head being operable to grip the first web of sheet material and hold it against the presser surface of the lower splicer head, and wherein each vacuum pick-up means comprises a plurality of suction tubes which are extendible and retractable as a group, between a retracted position within their splicer head and an extended position out from their splicer head in which said suction tubes are positioned to grip ahold of their web of sheet material.

4,842,682

HEAVY DUTY LOW-SECTION PNEUMATIC RADIAL TIRE AND A PROCESS FOR MANUFACTURING THE SAME

Norio Iwata, Amagi; Masao Nakamura, Tokyo, and Takashi Takusagawa, Ohme, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 834,123, Feb. 26, 1986, Pat. No. 4,702,295, which is a continuation of Ser. No. 564,046, Dec. 21, 1983, abandoned. This application Jun. 12, 1987, Ser. No. 60,794
Claims priority, application Japan, Dec. 29, 1982, 57-230059
Int. Cl.⁴ B29D *30/20, 30/70*
U.S. Cl. 156—130 **6 Claims**



1. A process for manufacturing a heavy duty low-section pneumatic radial tire, which comprises the steps of:

forming a first green case in which a ply for a carcass is placed on an outer circumference of a first drum and said ply is turned around each of a bead core and a stiffener at each side of the ply so as to sandwich a stiffener above each bead core between the ply and a ply turnup portion thereof, applying a sidewall rubber layer thereto; forming a second green case in which one or plural steel cords are spirally wound directly on a second drum with an outer profile substantially corresponding to the carcass form when the tire to be manufactured is mounted on a rim and inflated at a given internal pressure and being capable of contracting the outer profile to form a second belt layer for belt; said second belt layer having a bearing ratio on resistance to tensile load per unit width larger than that of a first nonspiral form belt layer, and stacking said first belt layer and a tread rubber layer successively on said second belt layer;

forming a green tire casing assembly in which the first green case removed from the first drum is inserted into the inside of the second green case removed from the second drum, said first and second green cases being in alignment with each other to comprise a green tire casing assembly and, the resulting green tire casing assembly brought to a toroidal form; and

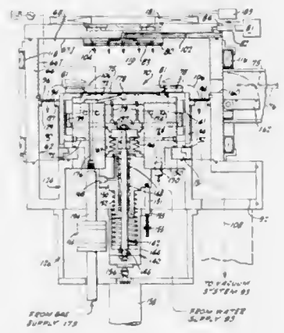
placing the green tire casing assembly of green tire casings in a vulcanizer to conduct the curing thereof.

4,842,683

MAGNETIC FIELD-ENHANCED PLASMA ETCH REACTOR

David Cheng, San Jose; Dan Maydan; Sasson Somekh, both of Los Altos Hills; Kenneth R. Stalder, Redwood City; Dana L. Andrews, Mountain View; Mei Chang, San Jose; John M. White, Hayward; Jerry Y. K. Wong, Fremont; Vladimir J. Zeitlin, Santa Clara, and David N. Wang, Cupertino, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 147,594, Jan. 22, 1988, which is a continuation of Ser. No. 944,843, Dec. 19, 1986, abandoned.
This application Apr. 25, 1988, Ser. No. 185,215
Int. Cl.⁴ B44C *1/22;* **C03C** *15/00, 25/06;* **H01L** *21/306*
U.S. Cl. 156—345 **16 Claims**



1. A vacuum processing reactor, comprising a housing defining a vacuum chamber therein adapted for etching a wafer positioned within the chamber at a high rate and with etching uniformity substantially independent of pressure, comprising: a pedestal having a convex-shaped surface for supporting the wafer in a bowed configuration parallel to the pedestal surface; a gas manifold for supplying reactant gases to the chamber; means for applying RF energy between the wafer support pedestal and the gas manifold for generating a wafer etching plasma; electric current-controlled magnetic field generating means for forming a D.C. magnetic field generally parallel to the wafer surface; means for selectively applying current to the field generating means for independently controlling the intensity and orientation of the magnetic field; and means for applying gas under pressure between the surface of the pedestal and the wafer to provide uniform thermal conduction between the wafer and the pedestal.

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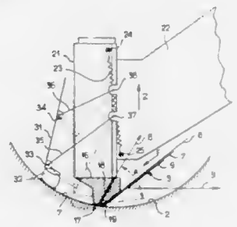
DEVICE FOR AUTOMATICALLY SHAPING A SHEET OF FIBRES ON A MOULD, AND APPARATUSES COMPRISING SUCH A DEVICE

Pierre Tillement, Decazeville, and Andre Greffioz, Figeac, both of France, assignors to Forest Line of B.P., Capdenac, France

Filed Jul. 21, 1987, Ser. No. 76,252
Claims priority, application France, Jul. 21, 1986, 86 10538
Int. Cl.⁴ B32B *31/00*
U.S. Cl. 156—538 **11 Claims**



1. A device for automatically shaping a ribbon of fibers onto a mold from a composite strip formed of a ribbon of adhesive sized fiber elements precut to required shape and dimensions, and retained between a bottom protective film and a top protective film, the device comprising

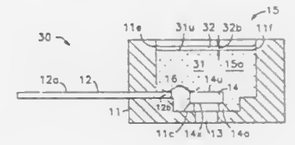
applicator means arranged for automatically engaging said ribbon under pressure at a selective place on the mold and thereby defining a place of engagement of the ribbon on the mold, first removal means arranged for automatically removing the bottom protective film from the ribbon at a first point spaced upstream of said place of engagement, and second removal means arranged for automatically removing the top protective film from the ribbon at a second point downstream from said first point and substantially immediately upstream of and adjacent to said place of engagement, and simultaneously arranged for automatically guiding the composite strip accurately up to said second point for automatically applying to and engaging the ribbon accurately on the mold at said place of engagement.

4,842,685

METHOD FOR FORMING A CAST MEMBRANE PROTECTED PRESSURE SENSOR

Victor J. Adams, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 855,055, Apr. 22, 1986, Pat. No. 4,732,042.
This application Oct. 22, 1987, Ser. No. 111,376
Int. Cl.⁴ B29C *39/10, 41/12*
U.S. Cl. 156—308.2 **8 Claims**



1. A method for forming an environmentally protected pressure sensor, comprising:

providing a body having an opening containing a cavity, wherein said cavity has a first surface for receiving a solid

pressure sensor element and a second surface extending from said opening to said first surface;
mounting said pressure sensor element on said first surface;
partially filling said cavity around said pressure sensor element with a pressure transfer material in contact with said second surface and having an exposed surface; and
casting a diaphragm means on said exposed surface and in contact with said second surface.

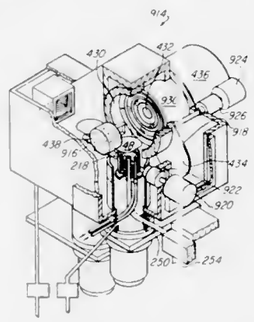
8. A method for forming a sealed pressure sensor, comprising:
providing a body for receiving a pressure sensor element on a first surface of said body;
mounting said pressure sensor element on said first surface;
placing a non-gaseous pressure transfer medium on said pressure sensor element and in contact with said body, wherein said pressure transfer medium has an exposed surface;
loosely covering said exposed surface with a heat softenable membrane forming material in contact with said exposed surface and said body surrounding said exposed surface; and
heating said membrane forming material to collapse it onto said exposed surface and stick it to said body surrounding said exposed surface.

4,842,686

WAFER PROCESSING APPARATUS AND METHOD

Cecil J. Davis, Greenville; Lee M. Lowenstein, Plano; Robert T. Matthews, Plano; John I. Jones, Plano, and Rhett B. Jucha, Celeste, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 17, 1987, Ser. No. 75,016
Int. Cl.[4] B44C *1/22;* D05D *3/06;* C03C *15/00, 25/06*
U.S. Cl. 156—643 63 Claims



2. A method for processing of wafer, comprising the steps of:
(a) transferring a wafer into a vacuum processing chamber;
(b) flowing a desired mixture of process gases through the space in proximity to the surface of the wafer; and
(c) illuminating the surface of said wafer with ultraviolet light generated by plasma which is within said chamber but which is generated remotely from the surface of said wafer.

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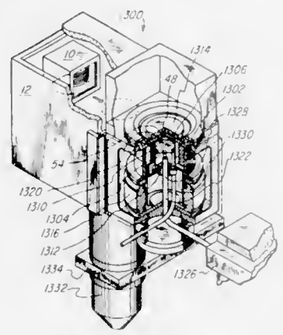
METHOD FOR ETCHING TUNGSTEN

Rhett B. Jucha, Celeste, and Cecil J. Davis, Greenville, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 74,399, Jul. 16, 1987, abandoned. This application May 25, 1988, Ser. No. 203,512
Int. Cl.[4] C23F *1/02;* B44C *1/22*
U.S. Cl. 156—643 7 Claims



1. A method for etching Tungsten on a wafer comprising:
(a) transferring a wafer into a process vacuum chamber;
(b) applying a pressure to said chamber less than ambient to maintain said chamber at less than ambient;
(c) providing fluorine containing gas to a remote plasma chamber separated from said chamber and producing a remote plasma;
(d) adding a methane containing gas to said remote plasma chamber;
(e) adding a bromine containing gas and a resist selectively enhancement gas to said remote plasma chamber; and
(f) applying a radio frequency signal across two electrodes one of which is adjacent to the wafer and causing a plasma to be formed whose dark space is in the vicinity of the surface of the slice;
(g) flowing the gas mixture over said wafer disposed within said chamber.

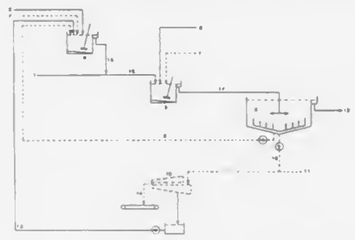
4,842,688

METHOD OF REMOVING MACROMOLECULAR ORGANIC DISSOLVED AND COLLOIDAL MATERIAL FROM WOOD PROCESSING INDUSTRY EFFLUENTS

Johan Gullichsen, Sjundea, and Pertti Hynninen, Helsinki, both of Finland, assignors to A. Ahlstrom Corporation, Karbula, Finland

Continuation of Ser. No. 905,555, Sep. 10, 1986, abandoned. This application Nov. 18, 1987, Ser. No. 122,597
Claims priority, application Finland, Feb. 14, 1985, 850607
The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.
Int. Cl.[4] C02F *1/58;* D21C *11/00*
U.S. Cl. 162—29 4 Claims

1. A method of removing macromolecular organic dissolved and colloidal compounds from paper and cellulose mill effluents, comprising the steps of:
(a) acidifying a waste sludge containing cellulosic fibers so that it has a pH in the range of 1.5–2.5;
(b) adding the acidified waste sludge to the effluent, to produce a sludge-effluent mixture;
(c) adding a material selected from the group consisting of calcium or calcium hydroxide to the effluent-sludge mixture so that the pH of the mixture is within the range of 4.5–60 so that precipitation of fibers therefrom is facilitated and macromolecular organic dissolved and colloidal compounds are bound to said fibers; and
(d) separating the fraction containing fibers, with said macromolecular organic dissolved and colloidal compounds



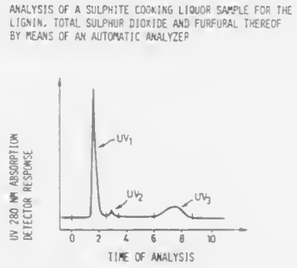
bound thereto, from the sludge-effluent mixture by precipitation in a sedimentation vessel; and
(e) taking a portion of the fraction containing fibers that have separated in step (d), and recirculating it as waste sludge to step (a).

4,842,689

METHOD FOR CONTROLLING SULPHITE PULPING AND HYDROLYTIC PROCESSES BY MEANS OF RAPID FURFURAL ANALYZER

Panu O. Jikka, and Nils-Erik Virkola, both of Helsinki, Finland, assignors to Oy Advanced Forest Automation Ab, Finland

Continuation of Ser. No. 745,910, Jun. 18, 1985, abandoned. This application Sep. 1, 1987, Ser. No. 93,102
Claims priority, application Finland, Jun. 20, 1984, 842488
Int. Cl.[4] D21C *3/04, 3/06, 7/12*
U.S. Cl. 162—49 4 Claims



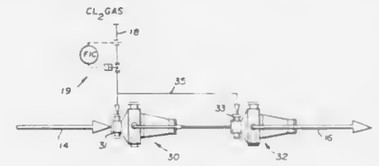
1. A method for controlling sulphite pulping comprising
(a) separating furfural and 5-hydroxymethylfurfural from the other UV-absorbing compounds contained in a sulphite cooking liquor under absorption separation conditions in a cation exchange resin;
(b) determining the content of furfural and 5-hydroxymethylfurfural of the sulphite cooking liquor by UV light analysis at 280 nm; and
(c) controlling the pulping of wood with a sulphite cooking liquor at a cooking temperature by adjusting the cooking temperature or adding fresh cooking liquor having a high degree of bound sulfur dioxide in order to obtain a desired furfural content or a desired cellulose viscosity based upon the previously determined content of furfural and 5-hydroxymethylfurfural.

4,842,690

MIXING CHLORINE GAS INTO PAPER PULP SLURRIES

Lawrence E. Gazdik, and Edward F. Allard, both of Glens Falls, N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed May 27, 1986, Ser. No. 866,732
Int. Cl.[4] D21C *9/12*
U.S. Cl. 162—57 4 Claims



1. A method of treating a slurry of comminuted cellulosic fibrous material having a consistency of between about 8–15 percent comprising the steps of:
(a) providing a flow controlled feed of chlorine gas;
(b) splitting the flow controlled feed into a plurality of different flow paths;
(c) providing a flow of slurry having a consistency between about 8–15 percent to a plurality of series connected fluidizing mixers; and
(d) introducing gas into each of the mixers from a respective one of said plurality of different flow paths so that chlorine gas is added directly to the slurry at an inlet to each of the mixers and the mixers effect fluidization of the slurry with chlorine gas dispersed therein to effect intimate mixing of the chlorine gas with the slurry.

4,842,691

SIZING AGENTS IN NEUTRAL RANGE AND SIZING METHODS USING THE SAME

Masato Nakajima, Katano; Toshiaki Otsuki, Neyagawa, and Atsushi Ikeda, Takarazuka, all of Japan, assignors to Arakawa Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 10, 1987, Ser. No. 24,030
Claims priority, application Japan, Mar. 19, 1986, 61-63725; Apr. 21, 1986, 61-91448
Int. Cl.[4] D21H *3/02*
U.S. Cl. 162—158 16 Claims

1. A neutral sizing agent comprising an aqueous dispersion of a reaction product prepared by reacting (i) a rosin compound and (ii) at least one polyhydric alcohol selected from the group consisting of trihydric alcohol and tetrahydric alcohol both consisting of carbon, hydrogen and oxygen in such proportion that the ratio of equivalent of hydroxyl group in the polyhydric alcohol (ii) to equivalent of carboxyl group in the rosin compound (i) is 0.4–1.5:1.

4,842,692

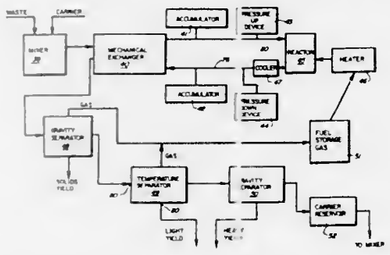
CHEMICAL REFORMER

David L. Baker, 100 S. Home Ave., Oak Park, Ill. 60302

Continuation-in-part of Ser. No. 661,342, Oct. 16, 1984, Pat. No. 4,636,318, which is a continuation-in-part of Ser. No. 662,708, Jun. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 560,520, Dec. 12, 1983, abandoned. This application Jul. 29, 1985, Ser. No. 759,398
Claims priority, application PCT Int'l Appl., Dec. 10, 1984, PCT/US84/02025
The portion of the term of this patent subsequent to Jan. 13, 2004, has been disclaimed.
Int. Cl.[4] C10B *57/04;* C10G *1/00*
U.S. Cl. 201—23 24 Claims

1. The process of producing liquid oils and gases from coal, which comprises: mixing an oil based carrier with coal, said coal containing at least about 10 weight percent water, the

amount of oil-based carrier present being sufficient to permit the mixture to be a more readily flowable material than corresponding coal free of oil carrier, and pyrolyzing at a pressure of at least 700 psi. said flowable material at elevated temperature to produce said liquid oils and gases, in which said flowable material is passed in a substantially continuous stream



through a heating and pressurizing zone to produce liquid oils and gases in the resulting heated substantially continuous stream, and said heated, substantially continuous stream is passed through out-of-contact heat exchange means to transfer heat in said stream to an upstream portion of the substantially continuous stream.

4,842,693

APPARATUS FOR REMOVING WATER FROM ETHANOL

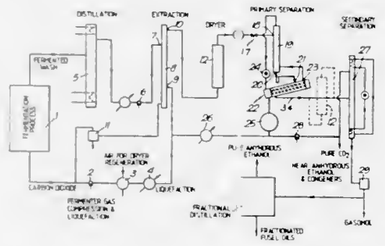
Alfred G. Wheldon, Essex, Great Britain, assignor to The Distillers Company PLC, Edinburgh, Scotland

Division of Ser. No. 4,447, Jan. 20, 1987, Pat. No. 4,769,112. This application Aug. 25, 1988, Ser. No. 89,103

Claims priority, application United Kingdom, Jan. 17, 1986, 8601081

Int. Cl.[4] B01D *3/14, 11/04, 15/00*

U.S. Cl. 202—154 **12 Claims**



1. A plant for removing water from a mixture containing water and ethanol comprising:

an extraction column, said extraction column having a first inlet for a mixture containing ethanol and water, a second inlet for liquid carbon dioxide, said second inlet being located below said first inlet, a first outlet for a stripped raffinate mixture, said first outlet being located below said second inlet, and a second outlet for a solution of ethanol and liquid carbon dioxide, said second outlet being located above said first inlet;

a dryer, said dryer including an adsorbent material and having an inlet and an outlet, said inlet being connected to said second outlet of said extraction column;

a first heat exchange means, said first heat exchange means having a liquid inlet, a liquid outlet and a vapour outlet;

a second heat exchange means, said second heat exchange means having a vapour inlet and a liquid outlet;

a tailing column, said tailing column having a liquid inlet, a liquid outlet, a vapour inlet and a vapour outlet, said vapour outlet from said tailing column being coupled with said vapour inlet of said second heat exchange means, said liquid outlet of said tailing column being connected to said liquid inlet of said first heating exchange means, said vapour outlet of said first heat exchange means being connected to said vapour inlet of said tailing column and said outlet of said dryer being connected to said liquid inlet of said tailing column;

means connecting said liquid outlet of said second heat exchange means and said second inlet of said extraction column; and,

a distillation column, said distillation column having a top and bottom, a liquid inlet, a vapour outlet at said top and a liquid outlet at said bottom, said liquid outlet of said first heat exchange means being connected to said liquid inlet of said distillation column.

4,842,694

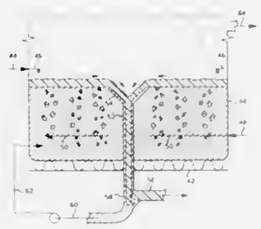
APPARATUS FOR TREATING THERMOPLASTIC POLYMERS

Richard J. Bennett, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 813,348, Dec. 26, 1985, Pat. No. 4,683,290. This application May 7, 1987, Ser. No. 46,607

Int. Cl.[4] C10B *1/04, 49/14*

U.S. Cl. 202—219 **2 Claims**



1. Apparatus adapted to devolatilize a thermoplastic polymeric material, comprising:

(a) contact vessel means having an upper end portion and a lower end portion, wherein said contact vessel is adapted to maintain an extended surface area body of high density heat exchange material;

(b) means for introducing into said contact vessel and withdrawing from said contact vessel said high density heat exchange material;

(c) heating means operatively associated with said contact vessel adapted to maintain said body of high density heat exchange material in a flowable state;

(d) means for introducing into said contact vessel and means for withdrawing from said contact vessel said thermoplastic material, wherein said means for withdrawing said thermoplastic material comprises a generally vertical conduit having an upper end portion terminating within said upper end portion of said contact vessel and a lower end portion terminating below said lower end portion of said contact vessel, said conduit is centrally located in said contact vessel and said upper end portion of said conduit defining a weir for withdrawal of said thermoplastic material and a kportion of the high density heat exchange material from said upper end portion of said contact vessel, and wherein said means for introducing said thermoplastic material into said contact vessel is at a location below said upper end portion of said centrally located conduit means, said lower end portion of said centrally located conduit includes a separator means adapted to separate said portion of said high density heat exchange material from said devolatilized thermoplastic material; and

(e) means for discharging a volatile material from said upperend portion of said contact vessel.

4,842,695

ARRANGEMENT OF A DRY COOLER FOR COKE

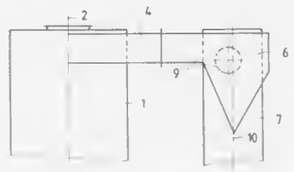
Karl Schmid; Friedrich Jokisch, both of Essen; Dieter H. W. Heese, Bochum, all of Fed. Rep. of Germany; Bruno Hillinger, Hinterbruehl, Austria; Georg Beckmann, and Norbert Heger, both of Vienna, Austria, assignors to Krupp Koppers GmbH, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 449,493, Dec. 13, 1982, abandoned. This application Mar. 2, 1984, Ser. No. 585,018

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1982, 3202573

Int. Cl.[4] C10B *39/00*

U.S. Cl. 202—228 **4 Claims**



1. An arrangement of a dry cooler for coke including an upright cooling shaft provided with an upper inlet for coke to be cooled and a lower inlet for a recirculating counterstream of cooling gas, comprising two gas discharge ducts connected side-by-side to said cooling shaft and each terminating in a dust separator; and a waste heat boiler arranged between and communicating at opposite lateral sides thereof with said separators so that streams of cleaned cooling gas from the latter enter the boiler substantially at right angles to the direction of movement of the dust-gas streams from said ducts.

4,842,696

PURIFICATION OF PENTACHLORONITROBENZENE BY DISTILLATION

Arturo S. Cazares, Norte, Mexico, assignor to Quimica Organica De Mexico, S.A. De C.Y.

Filed Oct. 8, 1987, Ser. No. 105,677

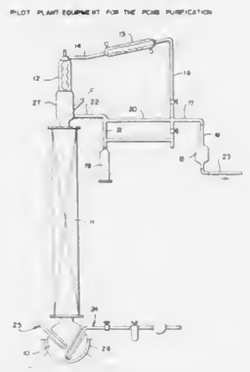
Int. Cl.[4] B01D *3/34;* **C07C** *79/10*

U.S. Cl. 203—49 **18 Claims**

1. A process for purifying impure pentachloronitrobenzene (PCNB) having an initial hexachlorobenzene (HCB) content in excess of 0.1% by weight, which comprises the steps of:

distilling the impure PCNB at a temperature between about 150° and about 300° C. and at a pressure at or below atmospheric pressure;

removing an impure distillate product containing PCNB and HCB, wherein the HCB content of said distillate product is in excess of 0.1% by weight; and



recovering a purified PCNB residue product, wherein the HCB content of said purified PCNB product is less than 0.1% by weight.

4,842,697

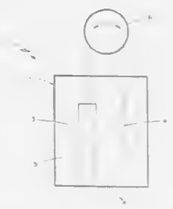
METHOD OF DETERMINING AMMONIA IN A GASEOUS OR LIQUID SAMPLE

John N. Driscoll, Wellesley Hills, and Edwards S. Atwood, Natick, both of Mass., assignors to HNU Systems, Inc., Newton, Mass.

Division of Ser. No. 38,849, Apr. 15, 1987, Pat. No. 4,780,185, which is a division of Ser. No. 810,412, Dec. 18, 1985, Pat. No. 4,659,434, which is a division of Ser. No. 726,957, Aug. 26, 1985, abandoned, which is a continuation of Ser. No. 526,914, Aug. 26, 1983, abandoned. This application Sep. 16, 1988, Ser. No. 245,466

Int. Cl.[4] G01N *27/30, 27/56*

U.S. Cl. 204—1 T **4 Claims**



1. A method for detecting NH_3 in a gaseous or liquid sample, said method comprising testing said sample in an electrochemical cell comprising a body and within said body a detection electrode, a reference electrode, a liquid electrolyte connecting said electrodes, and a membrane permeable to said gas in close proximity to said detection electrode and arranged to separate said electrodes and said electrolyte from said sample, said liquid electrolyte being an aqueous buffer solution buffered to a pH value of between 5.5 and 7.5 and being initially essentially free of any salt capable of dissociating to form in said electrolyte NH_4^+, said electrolyte containing at least 25% v/v of a water miscible solvent having a dielectric constant of at least 10 and being non-interfering with said detecting and reference electrodes.

3. A method for detecting NH_3 in a gaseous or liquid sample, said method comprising testing said sample in an electrochemical cell comprising a body and within said body a detection

electrode, a reference electrode, a liquid electrolyte connecting said electrodes, and a membrane permeable to said gas in close proximity to said detection electrode and arranged to separate said electrodes and said electrolyte from said sample, said liquid electrolyte being in aqueous buffer solution buffered to a pH value of between 4.5 and 6.5 and being initially essentially free of any salt capable of dissociating to form in said electrolyte NH_4^+.

4,842,698

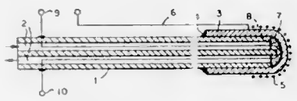
SOLID STATE ARSENIC PROBE FOR USE IN PYROMETALLURGICAL PROCESSES

Jitka Kirchnerova, Montreal; James M. Skeaff, Ottawa, and Christopher W. Bale, Montreal, all of Canada, assignors to Canadian Patents and Development Limited/Société Canadienne des Brevets et d'Exploitation Limitée, Ottawa, Canada

Filed May 19, 1987, Ser. No. 52,027

Int. Cl.[4] G01N *27/58*; G01G *28/02*

U.S. Cl. 204—1 T **10 Claims**



1. The compound silver zirconium arsenate of the formula $AgZr_2(AsO_4)_3$.

2. An arsenic oxide species sensor adapted to operate at a temperature in the range of from about 600° C. to about 900° C. comprising in combination:

a reference electrode;

a working electrode; and

in electrical connection therewith, a solid electrolyte chosen from sodium zirconium arsenate [$NaZr_2(AsO_4)_3$] and silver zirconium arsenate [$AgZr_2(AsO_4)_3$].

8. A method of detecting arsenic oxides in a gas in the temperature range of from about 600° C. to about 900° C. which comprises exposing the solid electrolyte in a cell comprising a working electrode, a solid electrolyte, and a reference electrode to the gas, and observing the EMF generated by the cell, wherein the solid electrolyte is chosen from sodium zirconium arsenate [$NaZr_2(AsO_4)_3$] and silver zirconium arsenate [$AgZr_2(AsO_4)_3$].

4,842,699

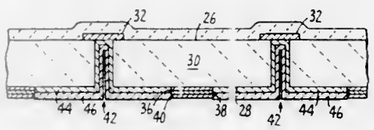
METHOD OF SELECTIVE VIA-HOLE AND HEAT SINK PLATING USING A METAL MASK

Chang-Hwang Hua, Palo Alto; Ding-Yuan S. Day, Sunnyvale, and Simon S. Chan, Belmont, all of Calif., assignors to Avantek, Inc., Santa Clara, Calif.

Filed May 10, 1988, Ser. No. 192,199

Int. Cl.[4] C25D *5/02*

U.S. Cl. 204—15 **12 Claims**



1. A method for selective plating of via-holes and heat sinks associated with a semiconductor wafer having a first side and a second side by the use of a metal mask comprising the steps of:

(a) coating the first side of the wafer with an insulating layer to prevent electroplating on the first side;

(b) patterning a metal mask on the second side of the wafer for defining the areas where plating should not occur;

(c) etching via-holes through the wafer from the second side of the wafer;

(d) depositing a thin conductive film to coat the bottom and walls of the via-holes as well as areas of the second side of the wafer not covered by the metal mask; and

(e) electrolytically plating the resulting wafer so that the walls of the via-holes are plated and beat sinks are simultaneously plated on the second side of the wafer.

4,842,700

PREPARATION OF ω-HYDROXYALDEHYDES OR CYCLIC HEMIACETALS THEREOF

Fritz Beck, Duisburg; Bernd Wermeckes, Muelheim/Ruhr, both of Fed. Rep. of Germany, and Harry Schulz, Baden, Switzerland, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

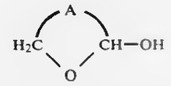
Filed May 7, 1987, Ser. No. 47,177

Claims priority, application Fed. Rep. of Germany, May 7, 1986, 3615472

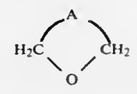
Int. Cl.[4] C25B *3/02*

U.S. Cl. 204—59 R **11 Claims**

1. A process for preparing a cyclic hemiacetal of the formula



where A is saturated hydrocarbyl of 2 to 16 carbon atoms or an alkylether chain of 2 to 16 carbon atoms containing —O— as a bridge member, which comprises subjecting a cyclic ether of the formula



where A has the above-mentioned meaning, to anodic oxidation in aqueous solution at a current density of over 30 $mAcm^{-2}$ and recovering said hemiacetal as the predominant product.

4,842,701

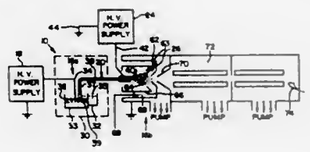
COMBINED ELECTROPHORETIC-SEPARATION AND ELECTROSPRAY METHOD AND SYSTEM

Richard D. Smith, Richland, and José A. Olivares, Kennewick, both of Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Apr. 6, 1987, Ser. No. 34,875

Int. Cl.[4] B01D *57/02*

U.S. Cl. 204—180.1 **41 Claims**



1. A method of producing high resolution analyte separations capable of being analyzed by numerous analytical detectors, which comprises:

providing a source of an analyte sample solution;

electrophoretically separating said analyte sample solution to form a high resolution analyte eluent; and

electrospraying the separated analyte eluent into near atmospheric pressure as it elutes from the electrophoretic separation to form an electrically-charged spray.

4,842,702

METHOD FOR FINISHING A WORK

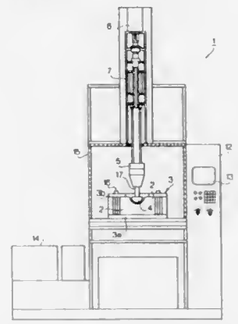
Youhei Kuwabara, Fukuroi; Teruo Asaoka, Kakegawa, and Yasuhiro Iwasaki, Mori, all of Japan, assignors to Shizuoka Seiki Co., Ltd., Fukuroi, Japan

Filed Apr. 18, 1988, Ser. No. 182,808

Claims priority, application Japan, Apr. 23, 1987, 62-100292; May 13, 1987, 62-117486; May 15, 1987, 62-119943

Int. Cl.[4] B23H *3/10*

U.S. Cl. 204—129.43 **3 Claims**



1. A method for finishing a work comprising:

positioning an electrode to form a predetermined gap between the electrode and the surface of the work;

supplying electrolyte to an electrolyte tank so as to submerge the electrode and the work;

applying working pulses to the electrode;

supplying clean electrolyte to the gap and discharging the electrolyte including residual products after one cycle of machining;

re-supplying clean electrolyte to the electrolyte tank;

applying working pulses to the electrode after a predetermined period of time, said predetermined period of time being a time in which a swirl of the electrolyte in the tank is reduced, said swirl generated by re-supplying the clean electrolyte; and

applying a removing pulse having a higher current density than the working pulse.

4,842,703

MAGNETRON CATHODE AND METHOD FOR SPUTTER COATING

Walter H. Class, W. Newbury, and James F. Smith, Haverhill, both of Mass., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 23, 1988, Ser. No. 159,318

Int. Cl.[4] C23C *14/34*

U.S. Cl. 204—192.12 **12 Claims**

11. A method for sputter coating a generally circular, planar substrate with a target material comprising the steps of:

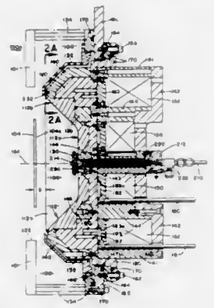
(a) positioning a concave target having a generally planar inner base and radially outer inclined walls in proximity to the substrate so that said substrate is generally parallel to the generally planar base of the target;

(b) positioning a plurality of electro-magnetic pole pieces in symmetric relation to an axis that intersects both the target and the substrate;

(c) positioning two or more electro-magnetic coils concentrically around the axis to modify the magnetic field in a region between the substrate and the target;

(d) establishing an electric field in a region between the substrate and the target to cause ions in said region to bombard said target; and

(e) adjusting the polarity and magnitude of current in said two or more electro-magnetic coils to cause said ions to bombard said target in multiple concentrated circular regions spaced from each other about said axis, said coil energization causing the concentrated regions to move radially inward and outward along the base and inclined walls of said target to erode said target not only along the base and inclined walls but in a transition region between the base and the inclined walls.



4,842,704

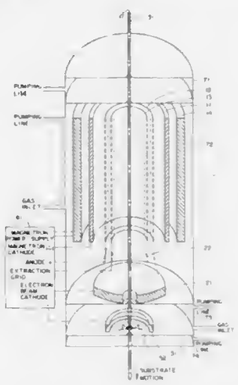
MAGNETRON DEPOSITION OF CERAMIC OXIDE-SUPERCONDUCTOR THIN FILMS

George J. Collins, 807 W. Oak St., Fort Collins, Colo. 80521; John R. McNeil, 13423 Desert Hills NE., Albuquerque, N. Mex. 87111, and Zeng-gi Yu, North Aggie Village Apt. 7C, C.S.U., Fort Collins, Colo. 80523

Filed Jul. 29, 1987, Ser. No. 79,879

Int. Cl.[4] C23C *14/08, 14/34*

U.S. Cl. 204—192.24 **33 Claims**



1. A method for depositing a superconducting thin film of metal oxide ceramic materials onto the outer surface of a substrate, the method comprising:

introducing a substrate to be coated into a vacuum chamber apparatus that includes a cylindrical magnetron having a longitudinal axis substantially coincident with a longitudinal axis of the substrate, having a cylindrical extraction

grid coaxially positioned with respect to the substrate, having a cylindrical anode of diameter greater than that of the cylindrical extraction grid and coaxially positioned with respect to the substrate, having a cylindrical cathode of diameter greater than that of the cylindrical anode and coaxially positioned with respect to the substrate and the cylindrical anode, said cylindrical cathode comprising at least three metal materials, and having a cylindrical solenoid of diameter greater than that of the cylindrical cathode and coaxially positioned with respect to the substrate, the cylindrical extraction grid, the cylindrical cathode, and the cylindrical anode;

establishing a controlled gas atmosphere within the vacuum chamber apparatus, the controlled gas atmosphere including a sputter gas comprising an inert gas and a reactive gas mixture comprising at least oxygen;

applying operating voltages to the elements of the cylindrical magnetron such that the metal materials of the cylindrical cathode are sputtered therefrom and deposited uniformly onto the outer surface of the substrate and such that a cylindrical magnetron plasma dissociates the reactive gas mixture into oxygen atoms to enhance oxidation of the one or more sputtered ternary metal materials to form the film of metal oxide ceramic materials.

4,842,705

METHOD FOR MANUFACTURING TRANSPARENT CONDUCTIVE INDIUM-TIN OXIDE LAYERS

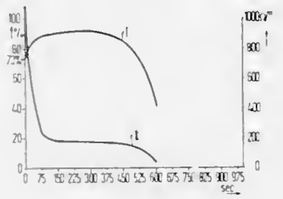
Werner Mueller, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 28, 1988, Ser. No. 174,183

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1987, 3718762

Int. Cl.⁴ C23C *14/34*; B 5D *3/06*

U.S. Cl. 204—192.29 **9 Claims**



1. A method for applying a transparent, conductive indium-tin oxide coating on a substate of amorphous, hydrogen-containing silicon which method comprises the steps of:

providing an unheated substrate of amorphous, hydrogen-containing silicon in an enclosed coating zone;

applying sources of both indium and tin in a first stage onto said substrate while maintaining the substrate unheated and maintaining an oxygen partial pressure at a low level in said zone until a partial coating is built-up on said substrate;

temporarily reducing the oxygen partial pressure in said coating zone in a second stage and maintaining the substrate unheated and continuing the coating until an additional coating thickness is built-up on said substrate;

continuing coating in a third stage with the oxygen partial pressure the same as during the first stage to complete the coating to a final thickness; and

thereafter heating the coated substrate in an oxygen containing atmosphere at a temperature less than 250° C.

4,842,706

SPUTTERING TARGET

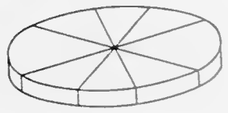
Yoshiharu Fukasawa; Mitsuo Kawai; Hideo Ishihara, and Takashi Yamanobe, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 2, 1988, Ser. No. 162,898

Claims priority, application Japan, Mar. 6, 1987, 62-49940

Int. Cl.⁴ C23C *14/34*

U.S. Cl. 204—298 **3 Claims**



1. A sputtering target comprising a plurality of single blocks combined together to form a combined block, said combined block including single blocks of metal prepared by a melting process and single blocks of silicon, said single blocks of metal having crystal grains with an average size between 1 μm and 1 mm.

4,842,707

DRY PROCESS APPARATUS

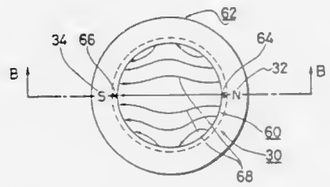
Haruhisa Kinoshita, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1987, Ser. No. 62,185

Claims priority, application Japan, Jun. 23, 1986, 61-146501; Oct. 31, 1986, 61-258535; Jan. 29, 1987, 62-17148

Int. Cl.⁴ C23C *14/34*

U.S. Cl. 204—298 **27 Claims**



1. A dry process apparatus comprising

a reactor,

a first electrode and a second electrode, mounted in spaced relation to each other inside said reactor, said first electrode being provided to mount a material to be processed thereon between said first and second electrodes,

an electric power supply electrically connected to one of said first electrode and said second electrode, to create an electric field, and

means for generating a magnetic field that interacts with the electric field to induce a magnetron discharge in a space above the material to be processed,

wherein said means for generating the magnetic field is a permanent magnet in the form of a continuous loop of permanently magnetized material with an N-pole and an S-pole opposite said N-pole.

4,842,708

PERPENDICULAR MAGNETIC RECORDING MEDIUM, METHOD FOR PRODUCING THE SAME, AND SPUTTERING DEVICE

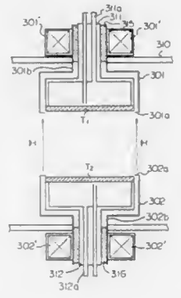
Sadao Kadokura, Hachioji; Kazuhiko Honjo; Takashi Tomie, both of Hino, and Masahiko Naoe, Tokyo, all of Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 819,229, Jan. 15, 1986, Pat. No. 4,666,788, which is a division of Ser. No. 466,863, Feb. 16, 1983, Pat. No. 4,576,700. This application Mar. 6, 1987, Ser. No. 22,664

Claims priority, application Japan, Feb. 16, 1982, 57-22080; Mar. 31, 1982, 57-20975

Int. Cl.⁴ C23C *14/00*

U.S. Cl. 204—298 **4 Claims**



1. A sputtering device comprising: a vacuum vessel; at least one pair of rectangular targets arranged in the vacuum vessel so that their long sides are opposed; at least one means for generating a magnetic field along the perimeter of each of said rectangular targets in a direction perpendicular to the targets, each of said magnetic-field generating means having an end portion thereof positioned close to one of said targets, each end portion constituted by a tip made of high permeability soft magnetic materials, said tip having an outside front and being shaped into a point at the outside front end thereof; and a base-conveying means for conveying a nonmagnetic base arranged adjacent to the long sides of said at least one pair of said rectangular targets so that the nonmagnetic base faces a space between said at least one pair of the targets in a direction perpendicular to the long side of said targets, and so that layers having the same composition of said targets are deposited on said nonmagnetic base by sputtering.

4,842,709

ELECTROLYTIC CELL AND PROCESS FOR THE OPERATION OF ELECTROLYTIC CELLS, FOR MOISTURE ANALYZERS

Donald P. Mayeaux, Prairieville, La., assignor to EG&G Chandler Engineering, Tulsa, Okla.

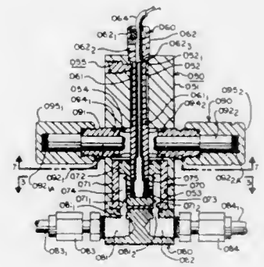
Filed Dec. 7, 1987, Ser. No. 129,602

Int. Cl.⁴ G01N *27/46*

U.S. Cl. 204—402 **9 Claims**

1. In an apparatus for detecting and measuring the amount of moisture in a moisture-containing stream which utilizes as part of an electrical circuit an electrolytic cell characterized as a compartmented cell housing formed by an enclosing wall which includes a first compartment separated from a second compartment by a partitioning semi-permeable membrane through which moisture can be passed, said first compartment being contained within the enclosing wall of said cell housing and including an inlet within said wall through which a moisture-containing stream can be admitted, and an outlet through which said moisture-containing stream can be discharged from said first compartment, said second compartment containing at least one pair of exposed wire electrodes which constitute a portion of said electrical circuit and which are adapted to carry a hydroscopic electrolyte which is electrically conductive when wet and in contact with both wires of an electrode pair such that when a moisture-containing stream is admitted via said inlet and discharged via said outlet of said first compartment and contacted with an exposed side of the semi-permeable membrane within said first compartment moisture can be transported from said moisture-containing stream for contact with said hydroscopic electrolyte within said second compartment,

a direct current power source of voltage sufficient to electrolyze said hydroscopic electrolyte when wetted by moisture passed through said semi-permeable membrane from said first compartment to said second compartment, and



current measuring means connected in circuit with said direct current power source for measuring the water content of said hydroscopic electrolyte as a function of the current delivered by said power source in electrolyzing said hydroscopic electrolyte,

the improvement comprising

a plunger opening within said housing, and

a plunger carrying the wire electrodes mounted in a reciprocably movable manner within said plunger opening, said electrodes being adapted to be positioned within said second chamber by movement of the plunger for operation of the cell in analyzing a stream for moisture.

4,842,710

METHOD OF MAKING MIXED NITRIDE FILMS WITH AT LEAST TWO METALS

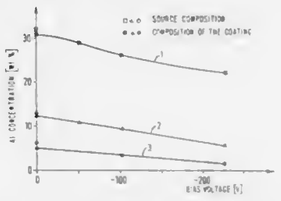
Helmut Freller, Roethenbach, and Peter Schack, Nuremberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 9, 1988, Ser. No. 165,872

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1987, 3709468

Int. Cl.⁴ C23C *14/22*

U.S. Cl. 204—192.38 **11 Claims**



1. A method for producing a reactively deposited compound film on a substrate to provide a coating for a surface subject to wear, the method comprises the steps of:

using at least one cathode comprising an alloy including at least two metallic elements wherein at least one of the

metallic elements has a markedly different melting point from the melting point of the other metallic element;

producing a highly ionized metal vapor from the alloy of the at least one cathode by using at least one electric arc wherein the metal vapor includes ions of a first metallic element and ions of a second metallic element and the amount of ionization for the first metallic element is different from the second metallic element,

controlling the ratio between at least the first and the second metallic elements in the deposited compound film by applying a variable voltage potential to the substrate for attracting the ions of the first metallic element to a different extent than the ions of the second metallic element; and

varying the voltage potential applied to the substrate over time and as a function of thickness of the deposited film on the substrate.

4,842,711

DEVICE FOR DETECTING AIR-FUEL RATIO OF ENGINE

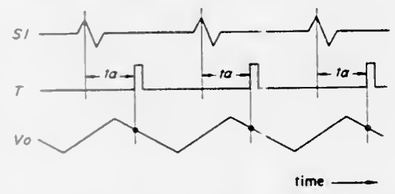
Masahiko Asakura, Saitama; Tomohiko Kawanabe, Tochigi, and Noritaka Kushida, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 865,568, May 21, 1986, abandoned. This application Nov. 20, 1987, Ser. No. 124,377

Claims priority, application Japan, May 27, 1985, 60-113405

Int. Cl.⁴ G01N *27/46*

U.S. Cl. 204—406 **4 Claims**



1. A device for detecting an air-fuel ratio of an engine by measuring an oxygen concentration of an exhaust gas by means of an oxygen sensor including a pair of oxygen-ion conductive and solid electrolytic materials arranged in the gas to be measured, said solid electrolytic materials having electrodes formed on the surfaces thereof and being arranged in confronting relationship with each other with a predetermined restricted region therebetween, said restricted region being subject to the influence of pulsations existent in said exhaust gas, one of said solid electrolytic materials constituting an oxygen pump element and the other constituting a cell element that develops an electromotive force for use in measuring an oxygen concentration ratio, said device comprising means for applying a variable electromotive current to the oxygen pump element in response to variations in oxygen concentration for causing the cell element to generate a constant predetermined reference voltage, thereby detecting an air-fuel ratio of a mixed gas fed to the engine by means of a pump current value under such state that said oxygen concentration in said restricted region is held constant by feeding a variable current to the oxygen pump element so that a terminal voltage of the cell element becomes constant, means for producing an output signal of the oxygen pump, said output signal being subjected to variation as the result of variation of said oxygen concentration in said restricted region caused under the influence of said pulsation of said exhaust gas passing through said restricted region, and an air-fuel ratio detecting circuit which reads the output signal of the oxygen sensor and means for effecting the detection of the air-fuel ratio at a predetermined point in the engine operation following a TDC signal and a predetermined period previously set by a timer having passed after said TDC signal.

4,842,712

DEVICE FOR MEASURING ION ACTIVITY

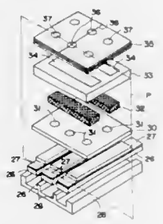
Osamu Seshimoto; Masaaki Terashima, and Yoshio Saito, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 2, 1987, Ser. No. 9,470

Claims priority, application Japan, Jan. 31, 1986, 61-19950; Apr. 11, 1986, 61-83676

Int. Cl.⁴ G01N *27/46*

U.S. Cl. 204—416 **4 Claims**



1. In a device for measuring ion activity in a liquid sample comprising at least one pair of ion-selective electrodes selectively responsive to a specific ion, a porous liquid distributing member for feeding a liquid sample to one electrode of the pair of electrodes, a porous liquid distributing member for feeding a reference liquid to another electrode of the pair of electrodes and a porous bridge for electrically connecting both liquids to each other, the improvement wherein said liquid distributing members are made of a nonwoven fabric composed of cellulosic long fibers prepared from cotton linters.

4,842,713

POLAROGRAPHIC OXYGEN SENSOR, PARTICULARLY FOR COMBUSTION EXHAUST GASES

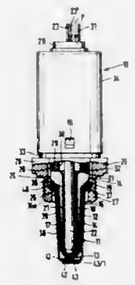
Roland Stahl, Freiberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 865,959, May 20, 1986, abandoned, which is a continuation of Ser. No. 692,382, Jan. 17, 1985, abandoned. This application Nov. 3, 1987, Ser. No. 119,218

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1984, 34051627

Int. Cl.⁴ G01N *27/46*

U.S. Cl. 204—428 **19 Claims**



1. A polarographic oxygen sensor, to measure the concentration of oxygen in gases, especially exhaust gases from a combustion process, having

a metal housing (25);

a closed solid electrolyte tubular body (12) sealingly secured to the housing;

a reference electrode (18) located in the inside of the solid electrolyte body (12);

a gas measuring electrode (15) located at the outside of the solid electrolyte body (12);

means (5,25,31) applying a bias voltage, having a value in the range of about ½ to 1½ volts, across said electrodes (15,18), to cause a current to flow, the value of said current depending upon the reaction, with said measuring electrode (15), of the oxygen in the gas reacting said measuring electrode (15);

means (7) providing a signal representative of the value of said current flow;

a protective sleeve (38), essentially solid throughout its length except for an opening (41) formed therein, sealingly secured to the metal housing (25) and surrounding the tubular solid electrolyte body (12);

wherein, to facilitate economical manufacturing,

said protective sleeve (38) includes a diffusion resistance zone (43/1, 43/2), which can be constructed separately from said electrolyte body (12) and said electrodes (15,18), across said opening (41) which is gas-permeable for oxygen molecules and forms a diffusion resistance element, which sufficiently throttles migration of oxygen molecules to the measuring electrode (15) on the solid electrolyte body (12) to control the speed of the consequent reaction and hence, the value of the current which flows, and thereby assure that the sensor operates under diffusion-limited-current conditions,

and wherein, to increase response speed of the sensor, the protective sleeve is tubular and surrounds the solid electrolyte body with a small but finite space (39') therebetween defined by grooves, striations, or a roughened surface, sufficient to allow for vibration and to permit permeation of oxygen molecules, passing to the inside of the protective sleeve, through said diffusion resistance element (43/1, 43/2) and along at least a portion of the measuring electrode (15) on the surface of the solid electrolyte body (12).

4,842,714

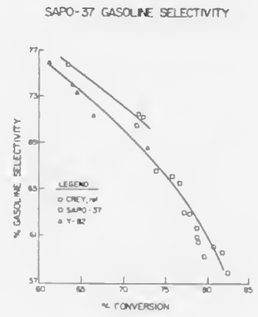
CATALYTIC CRACKING PROCESS USING SILICOALUMINOPHOSPHATE MOLECULAR SIEVES

Regis J. Pellet, Croton; Peter K. Coughlin, Yorktown Heights; Mark T. Staniulis, Peekskill; Gary N. Long, Putnam Valley, and Jule A. Rabo, Armonk, all of N.Y., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 767,038, Aug. 19, 1985, abandoned, which is a division of Ser. No. 675,279, Nov. 27, 1984, abandoned. This application Jul. 23, 1987, Ser. No. 76,851

Int. Cl.⁴ C10G *11/04*

U.S. Cl. 208—114 **23 Claims**



1. The process for cracking a crude oil feedstock to produce lower boiling hydrocarbons which comprises contacting said crude oil feedstock unde effective catalytic cracking conditions with a catalyst consisting essentially of at least one silicoaluminophosphate molecular sieve comprising SAPO-37 and between about 0 and about 99 percent by weight inorganic oxide matrix.

14. The process for cracking a crude oil feedstock to produce lower boiling hydrocarbons which comprises contacting said crude oil feedstock under effective catalytic cracking conditions with a cracking catalyst consisting essentially of: (1) a silicoaluminophosphate molecular sieve characterized in its calcined form by an adsorption of isobutane of at least 2 percent by weight at a pressure of 500 torr and a temperature of 20° C. and having an effective amount of the cations associated with said silicoaluminophosphate molecular sieve selected from the group consisting of H^+, ammonium, Group IIA, Groups IIIB to VIIB, cerium, lanthanum, praseodymium, neodymium, promethium, samarium, europium, gaolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium and mixtures thereof; and (2) at least one inorganic oxide matrix component.

4,842,715

NOVEL TECHNIQUE FOR RENDERING OILY SLUDGES ENVIRONMENTALLY ACCEPTABLE

Stephen C. Paspek, Jr., North Royalton; Jeffrey B. Hauser, Middleburg Heights; Christopher P. Eppig, Cleveland Heights, and Richard B. Stalzer, Broadview Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 14, 1987, Ser. No. 132,221

Int. Cl.⁴ C10G *17/00, 21/00*

U.S. Cl. 208—13 **15 Claims**

1. A process of treating a waste stream produced in an oil refinery said waste stream containing organic material intermixed with particulate solids comprising (1) contacting a light hydrocarbon fluid with said waste stream ot extract at least some of said organic materials from said waste stream and (2) adding an oxidizing agent to said treated waste stream in an amount sufficient to remove substantially all of the residual organic material.

4,842,716

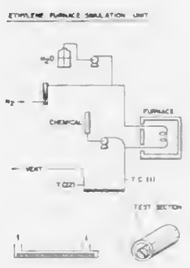
ETHYLENE FURNACE ANTIFOULANTS

Morris Kaplan, and John C. Kisalus, both of Houston, Tex., assignors to Nalco Chemical Company, Naperville, Ill.

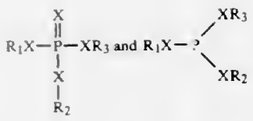
Filed Aug. 13, 1987, Ser. No. 84,942

Int. Cl.⁴ C10G *9/16*

U.S. Cl. 208—48 AA **17 Claims**



1. An improvded method for reducing fouling and corrosion of ethylene cracking furnaces using petroleum feedstocks, the improvement comprising treating the petroleum feed stock with at least 10 ppm of a compound selected from one member of the group consisting of phosphite esters, phosphate esters, thiophosphite esters, thiophosphate esters and mixtures thereof, said esters being characterized by the formulas



where X equals S or O, and R_1, R_2, and R_3, are each independently selected from the group consisting of hydrogen, water soluble amine, alkyl, aryl, alkaryl, cycloalkyl, alkenyl, and aralkyl group provided that in at least one and not more than two of each R_1, R_2, and R_3 are water soluble amines having partition coefficients greater than 1.0 mixed with a filming quantity of about 2–20 ppm of an imidazoline filming inhibitor prepared from naphthenic or fatty acids and polyamines.

4,842,717

PROCESS FOR DEWAXING GAS OILS

Jacques F. Grootjans, Leefdaal, and Pierre J. Bredael, Bruxelles, both of Belgium, assignors to Labofina, S.A., Brussels, Belgium

Filed Jan. 28, 1987, Ser. No. 7,954

Claims priority, application Luxembourg, Jan. 28, 1986, 86269

Int. Cl.[4] C10G *11/16*

U.S. Cl. 208—118 **15 Claims**

1. A process for removing waxy paraffins from hydrocarbon feedstock having an initial boiling point of at least 180° C. and containing sulfur in an amount of at least 1% by weight by selective cracking of straight chain paraffinic hydrocarbons comprising passing said hydrocarbon feedstock over an unmodified crystalline silica polymorph silicalite dewaxing catalyst under suitable operating conditions for cracking the straight chain paraffins.

4,842,718

PROCESS FOR RECOVERY OF HYDROCARBONS FROM A FLUID FEED

Cornelis P. Luteijn; Michel Muylle, and Carolus T. Sanders, all of The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 19, 1987, Ser. No. 109,893

Claims priority, application United Kingdom, Sep. 30, 1986, 8623431

Int. Cl.[4] B01D *59/12*

U.S. Cl. 208—308 **7 Claims**

1. Process for recovery of hydrocarbons (C_2) having at least two carbon atoms per molecule from a fluid feed containing C_2 hydrocarbons and components normally boiling at temperatures lower than C_2 hydrocarbon and having at most one carbon atom per molecule which comprises the following steps:

(i) contacting the fluid feed with one side of at least one membrane which is substantially permeable for methane and substantially non-permeable for C_2 hydrocarbons to afford permeate fluid containing a substantial amount of components having at most one carbon atom per molecule and a retentate fluid having a C_2 hydrocarbon content higher than said feed to the membrane(s), and

(ii) fractionating by fractionation distillation said retentate fluid into at least a product containing C_2 hydrocarbons and a gaseous product.

4,842,719

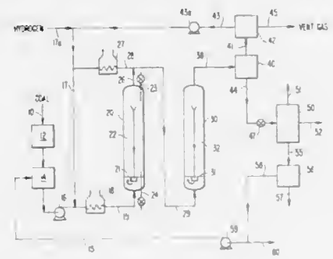
CATALYTIC TWO-STAGE COAL HYDROGENATION AND HYDROCONVERSION PROCESS

James B. MacArthur, Denville; Joseph B. McLean, So. Somerville, both of N.J., and Alfred G. Comolli, Yardley, Pa., assignors to HRI, Inc., Lawrenceville, N.J.

Continuation of Ser. No. 725,458, Apr. 22, 1985, abandoned. This application Jun. 18, 1986, Ser. No. 876,307

Int. Cl.[4] C10G *1/06, 1/08*

U.S. Cl. 208—421 **11 Claims**



1. A process for two-stage catalytic hydrogenation of coal to produce low-boiling hydrocarbon liquid and gaseous products, consisting essentially of:

(a) mixing particulate coal and a process-derived recycled hydrocarbon slurrying liquid in a coal slurrying step to provide a flowable slurry, and feeding said slurry at a temperature below about 650° F. into a pressurized first stage back-mixed catalytic reaction zone containing coal-derived liquid and hydrogen and an ebullated bed of particulate hydrogenation catalyst, said particulate catalyst having effective diameter of 0.030–0.125 inch;

(b) passing said coal and hydrogen gas upwardly through said first stage back-mixed ebullated bed of particulate hydrogenation catalyst, said catalyst containing an active metal component wherein the metal in said component is selected from the group consisting of cobalt, iron, molybdenum, nickel, tin, tungsten and mixtures thereof deposited on a support material, said catalyst bed being maintained at 650°–800° F. temperature and 1000–4000 psig hydrogen partial pressure and space velocity of 10–60 lb coal/hr ft^3 reactor volume to rapidly heat the coal and catalytically hydrogenate it and recycled solvent with minimal retrogressive dehydrogenation reactions to produce a partially hydrogenated and hydroconverted coal-derived effluent material containing less than about 6 W % C_1–C_3 hydrocarbon gases, 15–25 W % 650° F.-light liquid fraction and 60–70 W % 650° F.+ hydrocarbon material fraction;

(c) withdrawing said partially hydrogenated coal-derived material containing gas and liquid fractions from said first stage reaction zone, and passing said material together with additional hydrogen gas directly to a close-coupled second stage back-mixed catalytic reaction zone, said second stage reaction zone containing a bed of particulate catalyst, said catalyst having an effective diameter of 0.030–0.125 inch and containing an active metal component wherein the metal in said component is selected from the group consisting of cobalt, iron, molybdenum, nickel, tin, tungsten and mixtures thereof deposited on a support material, said second stage reaction zone being maintained at a temperature at least about 25° F. higher than the temprature for the first stage reaction zone and within a range of 750°–875° F. temperature and 1000–4000 psig hydrogen partial pressure and space velocity of 10–60 lb coal/hr ft^3 reactor volume for further reacting and hydrocracking the liquid fraction material therein with minimal dehydrogenation reactions to produce an effluent material containing hydrocarbon gases and lower boiling hydrocarbon liquids containing a 650° F.+ fraction; wherein the 650° F.+ fraction for said first stage reaction zone effluent has a hydrogen/carbon ratio greater than said 650° F.+ fraction for said second stage reaction zone effluent;

(d) withdrawing from said second stage catalytic reaction zone the hydrocracked effluent material containing said hydrocarbon gases and liquid fractions, and phase separating said material into separate gas and liquid fractions;

(e) passing said liquid fraction to a distillation step and a liquid-solids separation step, from which a liquid stream normally boiling above about 550° F. and containing a reduced concentration of particulate solids is recycled as said hydrocarbon slurrying liquid directly to the coal slurrying step; and

(f) recovering hydrocarbon gas and high yields of low boiling hydrocarbon distillate liquid products normally boiling between 150°–975° F. from the process, wherein at least 90 W % conversion of the coal feed to lower boiling hydrocarbon liquid and gaseous materials is achieved.

4,842,720

FISCHER-TROPSCH SYNTHESIS PROCESS UTILIZING A CATALYST CONTAINING A SILICEOUS METAL-CONTAINING CRYSTALLINE COMPOSITION

Eric L. Moorehead, Diamond Bar, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 335,887, Dec. 30, 1981, abandoned. This application May 18, 1987, Ser. No. 50,885

Int. Cl.[4] C07C *1/04*

U.S. Cl. 208—950 **18 Claims**

1. A process for converting synthesis gas into Fischer-Tropsch synthesis products which comprises contacting said synthesis gas under Fischer-Tropsch synthesis conditions with a catalyst containing a crystalline composition comprising silicon, oxygen, a metal selected from the group consisting of iron, nickel and cobalt, and a rare earth metal selected from the group consisting of lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium and mixtures thereof, wherein said crystalline composition is substantially free of aluminum, boron and gallium and is characterized by an X-ray powder diffraction pattern having a line of at least strong intensity at an interplanar spacing less than about 5 Angstroms and lines of at least medium intensity at interplanar spacings of 3.64 Angstroms, 3.44 Angstroms, 3.30 Angstroms and 3.14 Angstroms.

4,842,721

TRANSVERSELY INCLINED RAMP SEPARATOR

Ernst F. R. A. Schloemann, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 946,669, Dec. 31, 1986, abandoned, Continuation of Ser. No. 747,380, Jun. 21, 1985, abandoned, Continuation of Ser. No. 435,160, Oct. 19, 1982, abandoned. This application Dec. 11, 1987, Ser. No. 133,167

Int. Cl.[4] B03C *1/02*

U.S. Cl. 209—212 **7 Claims**

1. Materials separator apparatus comprising:

material guide means including a base and a plurality of elongated receiving surfaces having respective longitudinal centerlines, said surfaces being disposed in juxtaposed relationship transversely to said longitudinal centerlines, said surfaces being sloped at a preferred angle of longitudinal inclination with respect to the base, adjacent surfaces having contiguous first longitudinal edges and being sloped transversely upward therefrom relative to the base at respective reverse angles of transverse inclination greater than zero degrees and no greater than ten degrees in magnitude, said adjacent surfaces defining an interposed trough for receiving commingled dielectric items and electrically conductive items and directing said items along paths extended longitudinally and transversely downward of said surfaces in directions related to said respective reverse angles of transverse inclination, said items being directed transversely downward of said surfaces under the influence of transversely directed components of gravity having respective magnitudes limited by said angles of transverse inclination;

steady-state magnetic means magnetically coupled to each of said surfaces for forming along each of said surfaces a respective spatially alternating array of oppositely directed static magnetic fields extending transversely at an oblique angle relative to said respective longitudinal centerlines and subjecting said electrically conductive items to electromagnetic forces having lateral components directed transversely upward of said surfaces in opposition to said transversely directed components of gravity having respective magnitudes limited by said angles of transverse inclination, said oblique angle being predetermined

with respect to said longitudinal centerlines for providing said lateral components with respective magnitudes greater than said respective magnitudes of said transversely directed components of gravity and producing lateral deflection of said electrically conductive items transversely upward of said surfaces, said oblique angle also being predetermined for disposing said magnetic fields at a preferred angle to said paths and increasing said lateral deflection of said electrically conductive items transversely upward of said surfaces; and

said plurality of receiving surfaces being disposed in corrugated array and each adjacent surface extending transversely upward from respective first longitudinal edges to respective second longitudinal eedges disposed in contiguous relationship with respective second longitudinal edges of adjacent surfaces and forming therewith respective crests in said corrugated array.

4,842,722

PRESSURE SORTER

Emil Holz, Esingen, Fed. Rep. of Germany, assignor to Hermann Finckh Maschinenfabrik GmbH & Co., Fed. Rep. of Germany

Filed Jul. 14, 1987, Ser. No. 72,875

Claims priority, application European Pat. Off., Jul. 15, 1986, 86109682.4

Int. Cl.[4] B07B *1/24*

U.S. Cl. 209—270 **17 Claims**

1. A pressure sorter comprising:

a housing;

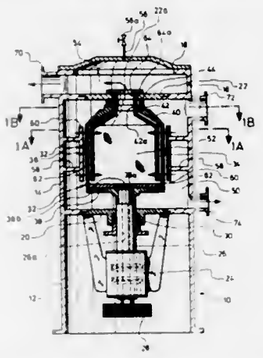
a screen which has a screen wall and is mounted for rotation about an upright axis of rotation in said housing, said screen wall being of axially symmetrical configuration in relation to said axis of rotation and separating within said housing a first chamber for a fiber suspension to be sorted from a second chamber for the accepted material which

has passed through said screen wall, both of said chambers being arranged concentrically in relation to each other with respect to said axis of rotation

a set of first cleaning blades stationarily arranged in said first chamber, said first blades being spaced from each other in the circumferential direction of the screen wall and following the contour of said screen wall at a small distance therefrom;

a set of second cleaning blades stationarily arranged in said second chamber, said second blades being spaced from each other in the circumferential direction of the screen wall and following the contour of said screen wall at a small distance therefrom;

a housing inlet opening for the fiber suspension to be sorted;



a first housing outlet opening for the accepted material;

a second housing outlet opening for rejected material which has not passed through the screen wall;

said screen being closed in the axial direction at least at one of its ends, except for an axial channel, by an end portion fastened to said screen wall and being provided with a cylindrical neck having said axial channel which neck communicates with one of said housing openings and whose cross-section is substantially smaller than the cross-section of said screen;

said housing having a partition wall with an opening adjacent to said neck; and

a seal between said partition wall opening and said neck.

4,842,723

WATER PURIFYING APPARATUS

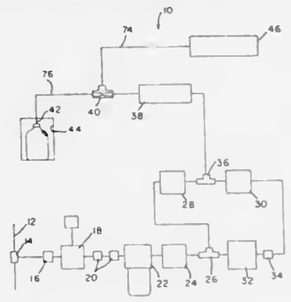
Elmer L. Parks, New Cumberland, and Fred A. Pennington, Mechanicsburg, both of Pa., assignors to Bowman, Mell Company, Inc., Harrisburgh, Pa.

Filed Dec. 17, 1987, Ser. No. 134,099

Int. Cl.[4] C02F 1/78

U.S. Cl. 210—95 **12 Claims**

1. Water purifying apparatus including a water line extending between a water source and a water dispensing nozzle; the line including first means for removing solids from the water flowing through the line, second means for killing bacteria in the water flowing through the line, the first and second means being located on the water line away from the nozzle, and a venturi located on the water line adjacent to the nozzle and having a low pressure port; an ozone generator; and an ozone line extending between the ozone generator and the low pressure port of the venturi whereby ozonated air from the generator is drawn into the water flowing through the water line at the venturi and is flowed with the water along the water line and out the nozzle to sanitize the nozzle, the water line including an inspection portion located between the venturi and the nozzle whereby bubbles of ozonated air entrained with the



water passing through the water line are visible through such portion.

4,842,724

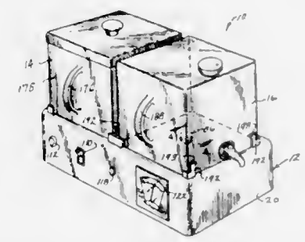
WATER PURIFICATION APPARATUS

Donald T. Bray, Escondido, and Richard A. Simonis, San Diego, both of Calif., assignors to Nimbus Water Systems, Inc., Escondido, Calif.

Filed Aug. 3, 1988, Ser. No. 227,694

Int. Cl.[4] B01D 13/00

U.S. Cl. 210—104 **13 Claims**



1. Apparatus for providing purified water for drinking purposes, which apparatus comprises

a base compartment containing a pump and electrically powered drive means connected to said pump and a water treatment device containing a filter with an average pore size of about 0.5 micron or less and having an inlet, a pure water outlet, and a concentrate outlet,

a supply container for holding a quantity of tap water or the like,

a purified water container,

said containers being adapted to be supported atop said base compartment,

detachable first connection means in the upper surface of said base compartment and in the undersurface of said supply container for allowing liquid flow from said supply compartment to said base,

first conduit means connecting said first connection means to the suction side of said pump,

means connecting said pump discharge to the inlet of said water treatment device,

detachable second connection means interconnecting said base and said supply container for returning concentrate to said supply container,

second conduit means connecting said second connection means to said concentrate outlet from said treatment device,

detachable third connection means interconnecting said purified water container and said base compartment so as to permit the flow of purified water therebetween,

third conduit means connecting said third connection means to said purified water outlet from said treatment device,

said first, second and third connection means each containing valve means which prevent outflow of liquid therethrough upon separation of said respective container from said base compartment, and

means for halting operation of said pump drive means upon reaching a certain predetermined condition.

4,842,725

ASSEMBLY FOR MAKING UP UNTREATED WATER ACCORDING TO THE PRINCIPLE OF REVERSE OSMOSIS

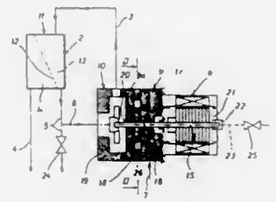
Thomas Blad; Mogens Ellegaard, and Niels D. Jensen, all of Bjerringbro, Denmark, assignors to Grundfos International A/S, Bjerringbro, Denmark

Filed Jun. 9, 1988, Ser. No. 204,673

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1987, 3719292

Int. Cl.[4] B01D 13/00

U.S. Cl. 210—137 **11 Claims**



1. An assembly for making up untreated water by removing undesirable materials according to the principle of reverse osmosis, said assembly comprising a driven feed pump fed with untreated water, and a water circuit connected thereto with a driven circulation pump, where the pressure of the delivered untreated water is increased above the osmotic pressure, and a reverse osmosis unit, wherefrom subsequent to the reverse osmosis treatment part of the water is available as pure water whereas the remaining part leaves the reverse osmosis unit in form of concentrated untreated water and is at least partially returned to the circulation pump, wherein the feed pump (**9**) and the circulation pump (**10**) are arranged on a common shaft (**16**) driven by a motor (**8**).

4,842,726

INSIDE FILTER FOR AQUARIUMS

Allan H. Willinger, Eaglewood, N.J., assignor to Willinger Brothers, Inc., Oakland, N.J.

Division of Ser. No. 808,094, Dec. 12, 1985, Pat. No. 4,753,723.

This application Nov. 9, 1987, Ser. No. 118,478

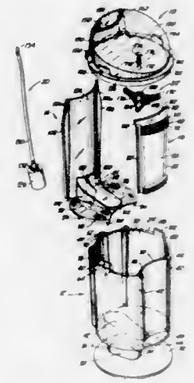
The portion of the term of this patent subsequent to Jun. 28, 2005, has been disclaimed.

Int. Cl.[4] A01K 63/04; B01D 35/30

U.S. Cl. 210—169 **14 Claims**

1. An aquarium filter for an aquarium tank, said filter formed of separable walls which independently do not form closed operational filter chambers and only in the assembled condition form such chambers, said filter comprising in combination:

a container having a forward wall, a separate removable grill wall member coupled in opposition to said forward wall to define therewith an inlet chamber for receiving contaminated water from the aquarium, a separate removable insert member having a perforated platform wall and an upstanding partition wall, said platform wall spacedly seated on the bottom of said container and defining with said container a filtration chamber above said platform wall and a clear water chamber beneath said platform wall, said partition wall mating in opposition to a rear peripheral wall of said container and defining therewith a return tube air lift chamber on one side thereof with said filtration chamber being on the other side thereof, means on the sides of said partition wall mating with opposing means on said rear peripheral wall to hold the partition wall against the rear peripheral wall, and a removable cover member for mounting onto said container and including a mouth aligned with said air lift chamber, whereby contaminated water from said inlet chamber can flow over said forward wall and into said filtration chamber where said contaminated water is substantially decontaminated before passing through said perforated platform



to said clear water chamber for egress through said air lift chamber back into the aquarium.

13. An aquarium filter assembly for an aquarium tank, comprising a container, a removable grill wall confrontingly engaging a portion of said container to define therewith a receiving chamber for contaminated water from the aquarium tank, means providing replacement of said removable grill wall for permitting changing of the grill size of the grill wall to accommodate fish size, an air lift chamber defined in conjunction with another part of the container, a filtration chamber in said container in flow communication with said receiving chamber for filtering the contaminated water, a clear water chamber in flow communication between said filtration chamber and said air lift chamber, and cover means securely retaining the grill member in assembled condition with said container.

4,842,727

AQUARIUM FILTER

Allan H. Willinger, Oakland, and Klaus Woltmann, Demarest, both of N.J., assignors to Willinger Brothers, Inc., Oakland, N.J.

Filed Dec. 29, 1987, Ser. No. 139,016

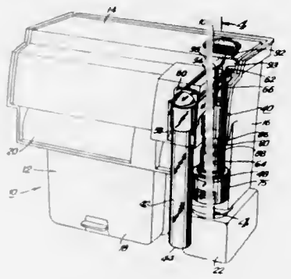
Int. Cl.[4] A01K 63/04

U.S. Cl. 210—169 **20 Claims**

1. An intake unit for an aquarium filter comprising:

a substantially inverted U-shaped tube having an inlet end for insertion into an aquarium tank and an outlet end for insertion into an intake chamber of an aquarium filter, an impeller unit operatively coupled to the outlet end for discharge of water from the tube into the intake chamber, at least one bypass port positioned along the tube proximate the outlet end, and control means operatively associated with the tube for selective exposure of the bypass port to thereby regulate the flow rate of aquarium water

from the tank into the filter, and wherein said control means comprises a sleeve positione i around said tube and



movable between a maximum flow position covering the port and a minimum flow position exposing the port.

4,842,728

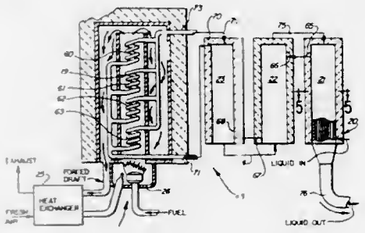
CHEMICAL REFOR MER

David L. Baker, 100 S. Home Ave., Oak Park, Ill. 60302

Division of Ser. No. 661,342, Oct. 16, 1984, Pat. No. 4,636,318, which is a continuation-in-part of Ser. No. 622,708, Jun. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 560,520, Dec. 12, 1983, abandoned. This application Sep. 29, 1986, Ser. No. 912,122

Int. Cl.[4] B01D *17/00*; C10B *51/00*

U.S. Cl. 210—180 22 Claims



1. A system for pyrolyzing sewage or other organic material comprising: a mixer for combining the organic material with an oil-based carrier, means for supplying an oil-based carrier to the mixer, a reactor for receiving the combined organic material and carrier mixture from the mixer and pyrolyzing the combined mixture, flow conduit means communicating between the mixer and reactor, said reactor including a temperature elevation zone having an inlet and an outlet, said reactor including a regeneration zone for passing the elevated temperature mixture from the outlet of the temperature elevation zone in out-of-contact heat exchange relation with the incoming mixture from the temperature elevation zone inlet, means for separating resulting yield oil or gas from the pyrolyzed mixture, and means for returning at least a portion of the pyrolyzed mixture to the mixer as oil-based carrier.

21. A system for pyrolyzing organic material comprising: a mixer for combining the organic material with an oil-based carrier, means for supplying an oil-based carrier to the mixer, a reactor having an inlet for receiving the combined organic material and carrier mixture from the mixer and pyrolyzing the combined mixture, said reactor including a temperature elevation zone having an inlet and an outlet, said reactor including a regeneration zone ending in a reactor outlet, for passing the elevated temperature mixture from the outlet of the temperature elevation zone in out-of-contact heat exchange relation with incoming mixture from the temperature elevation zone inlet, and means for separating resulting yield oil or gas from the pyrolyzed mixture, said system including an exchanger connecting the mixer and reactor for supplying combined organic material and carrier mixture to and from the reactor in equal quantities, said exchanger comprising first and second chamber means, plus means for varying the volume of each of said first and second chamber means, said first chamber means being connected to the reactor inlet and said second chamber being connected to the reactor outlet, and means for causing said volume varying means of the first and second chamber means to operate in essentially 180 degree out-of-phase movement to expand the volume of one chamber while reducing the volume of the other chamber and vice versa, and one way valve means to permit one way flow through said first and second chambers, whereby unprocessed organic material and carrier mixture from the mixer enters the reactor inlet in quantities equal to processed organic material and carrier mixture leaving the outlet of the reactor

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4,842,729

TREATMENT OF LIQUIDS

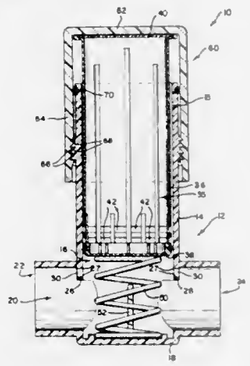
Leon Buchan, Johannesburg, South Africa, assignor to Control Chemicals (Proprietary) Limited, Johannesburg, South Africa

Filed Sep. 5, 1986, Ser. No. 904,172

Claims priority, application South Africa, Sep. 6, 1985, 85/6860; Feb. 14, 1986, 86/1124; Apr. 25, 1986, 86/3127; Jun. 4, 1986, 86/4176

Int. Cl.[4] B01F *1/00*; C02F *1/76*

U.S. Cl. 210—198.1 18 Claims



1. Apparatus for controllably treating a liquid with a liquid treatment substance, which includes

a body having a first portion providing a container-receiving zone and an opening leading into this zone, as well as a second portion having a liquid inlet and a liquid outlet defining a liquid flow path between them, with the zone being in communication with the liquid flow path;

a removable closure member closing off the opening to the container-receiving zone;

a container for a liquid treatment substance, the container being located in the container-receiving zone and comprising a cylindrical sleeve, with a first end of the sleeve directed towards the liquid flow path, an end piece closing off the first end of the cylindrical sleeve, and at least one aperture in the sleeve in proximity to its first end, with the sleeve being movable in the container-receiving zone from an inoperative to an operative position;

a compressible ring between the first end of the sleeve and the sleeve aperture, the ring preventing liquid from passing from the flow path into the sleeve aperture when the sleeve is in its inoperative position; liquid regulating means with which the ring cooperates to permit controlled passage of a slipstream of liquid from the flow passage into the inside of the sleeve via the aperture in the sleeve and from the inside of the sleeve, via the aperture, into the flow passage, when the sleeve is in its operative position;

bias means inside the body for biassing the first end of the sleeve out of the liquid flow path; and

actuating means for moving the sleeve from its inoperative position to an operative position

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4,842,730

LIQUID CHOMATOGRAPH APPARATUS

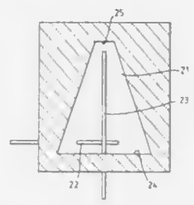
Phillip A. James, Mepal, and Martin A. Whitehead, Land Beach, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 9, 1987, Ser. No. 94,578

Claims priority, application United Kingdom, Sep. 17, 1986, 8622327

Int. Cl.[4] B01D *15/08*

U.S. Cl. 210—198.2 7 Claims



1. A liquid chromatograph apparatus comprising

a separating column,

first means for feeding at least one of a plurality of solvents to said separating column, wherein said first means includes mixing means for mixing said solvents and pump means for pumping said solvents to said mixing means, and wherein said mixing means includes a tapering enclosed chamber having inlet means for feeding said solvents into said tapering enclosed chamber, said inlet means being disposed adjacent to a larger end of said tapering chamber, and outlet means for passing said solvents from said first means, said outlet means extending within said chamber adjacent to a smaller end of said tapering chamber, wherein said outlet means includes a tube extending through said larger end of said tapering chamber, said tube having an open end adjacent to said smaller end of said tapering chamber, said smaller end being disposed above said larger end of said tapering chamber,

second means after said first means for injecting a sample into said solvents passing from said outlet means, said second means delivering said solvents and injected sample to said separating column, and

detector means connected to said separating column for detecting sample components in an outlet from said separating column.

4,842,731

COOLANT FILTER MANUFACTURE AND COMPOSITION FOR USE IN SAME

John F. Dobrez, Flossmoor, and David Ganbarg, Chicago, both of Ill., assignors to Dober Chemical Corporation, Midlothian, Ill.

Continuation-in-part of Ser. No. 904,485, Sep. 9, 1986, abandoned. This application Feb. 8, 1988, Ser. No. 152,966

Int. Cl.[4] B01D *35/02*

U.S. Cl. 210—209 15 Claims

1. In a method for manufacturing a circulating coolant system filter which includes assembling a filter medium, a filter canister into which a supplemental coolant additive is placed to provide said supplemental coolant additive to the circulating coolant and means for placing said supplemental coolant additive in said filter canister in fluid communication with the circulating coolant, the improvement comprising: automatically introducing said supplemental coolant additive into said filter canister in the form of a liquid-powdered solids slurry.

4,842,732

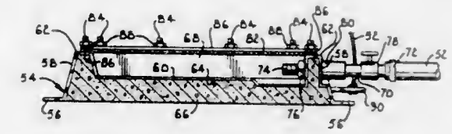
APPARATUS FOR AERATING AND MIXING WASTE WATER

Charles E. Tharp, 504 Stalcup, Columbia, Mo. 65201

Division of Ser. No. 675,992, Nov. 27, 1984, Pat. No. 4,563,277, which is a continuation-in-part of Ser. No. 434,848, Oct. 18, 1982, abandoned. This application Jan. 6, 1986, Ser. No. 816,561

Int. Cl.[4] C02F *3/00*

U.S. Cl. 210—220 5 Claims



1. An aerator device for aerating waste water containing in a waste water treatment basin, said device comprising:

a portable aerator body having a base adapted to rest on the bottom of the basin;

an air chamber in said body enclosed on the sides and bottom;

a ballast compartment in said body located generally below said air chamber;

a mass of poured concrete substantially filling said ballast compartment, said concrete forming a structural part of said earator body and serving as ballast for maintaining the aerator body on the bottom of the basin;

an air inlet to said air chamber adapted for connection with an air line to direct air into said air chamber; and

a porous plate secured to said aerator body at a location to cover the top of said air chamber, said porous plate having a plurality of small pores providing the sole egress from said air chamber, whereby air is discharged from said air chamber through said pores to release a plurality of fine air bubbles into the waste water for aeration thereof.

4,842,733

FILTER PLATE OF FILTER PRESS

Tetsuya Kurita, Takarazuka, Japan, assignor to Kurita Machinery Manufacturing Company Ltd., Osaka, Japan

PCT No. PCT/JP86/00452, § 371 Date Apr. 8, 1987, § 102(e) Date Apr. 8, 1987, PCT Pub. No. WO87/01300, PCT Pub. Date Mar. 12, 1987

PCT Filed Sep. 5, 1986, Ser. No. 53,910

Claims priority, application Japan, Sep. 6, 1985, 60-198247; Sep. 6, 1985, 60-198248; Dec. 3, 1985, 60-272967; Sep. 3, 1986, 61-208390

Int. Cl.[4] B01D *25/12*

U.S. Cl. 210—225 23 Claims

1. A filter press having a plurality of filter plates (2); a plurality of pairs of filter cloths (5, 27, 40, 48*a*, 53) each pair being between an adjacent pair of the plates; clamping means (36, 29) for clamping the filter plates in a direction in which the plates are arranged, wherein after a plurality of the filter plates (2) are clamped and a raw liquid is introduced between each pair of the filter cloths (5, 27, 40, 48*a*, 53) so as to filter the raw liquid and a filtrate passes through the filter cloths (5, 27, 40, 48*a*, 53) and flows downward along the filter plates (2), and filter residue (14) is maintained between each pair of the filter cloths (5, 27, 40, 48*a*, 53), each of the filter plates including a frame (1) forming a closed loop with an inner periphery of said loop forming a through hole penetrating front and back surfaces of

said frame so as to define an empty space; flat filtrate drainage guide means (3, 41, 52); and supporting means (5, 5d, 40, 48, 53) comprising said filter cloths for movably supporting said filtrate drainage guide means (3, 41, 52) so as to be hung within

said space in said frame (1) such that an outer periphery of said filtrate drainage guide means is within said inner periphery of said loop and said filtrate drainage guide means is movable within said space towards and away from said inner periphery of said loop.

4,842,734

ESSENTIALLY PURE ACIDIC AMINE LIGAND ALUMINUM COMPLEXES AND THEIR PREPARATION

Arthur P. G. Wright, Markham; Betty I. L. Wen, Scarborough; Terry G. Schenck, Willowdale, and Antonina Maron, Scarborough, all of Canada, assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 937,174, Dec. 2, 1986, Pat. No. 4,766,216. This application May 27, 1988, Ser. No. 199,964

Claims priority, application Canada, Nov. 21, 1986, 523589

Int. Cl.[4] A61R *31/33*; A61K *31/195*

U.S. Cl. 514—191 **7 Claims**

1. A method for treating a physiological condition in a mammalian body that is benefited from treatment with an antacid which comprises administering to said mammalian body an antacid effective quantity of at least one essentially pure complex of an acidic amine ligand and aluminum having the formula:

$$Al(L)_x(OH)_y$$

wherein: L is an acidic amine ligand having at least 3 carbon atoms and two donating atoms at least one of which is a nitrogen and a second an oxygen, said oxygen atom is in the form of an acidic group; and x=1 and y=2, wherein the acidic amine ligand is selected from the group consisting of iminodiacetic acid, and hydroxyquinoline.

4,842,735

OIL SKIMMING APPARATUS

Calvin L. Hollis, Rt. 1, Box 12, and James L. Taylor, Rt. 2, Box 284, both of, Spearsville, La. 71277

Filed Mar. 21, 1988, Ser. No. 171,277

Int. Cl.[4] F02B *15/04*

U.S. Cl. 210—242.3 **11 Claims**

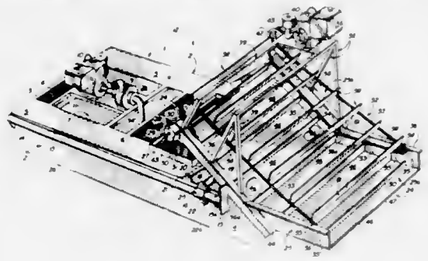
1. An oil skimming apparatus for removing oil from the oil-covered surface of a water body, comprising:

(a) a watercraft capable of mounting on a trailer for transportation and adapted for launching and floating on the water body;

(b) a skimming boom slidably mounted on one end of said watercraft in angular relationship, said skimming boom having an oil-collecting end and an oil-dispensing end, whereby said oil-collecting end of said skimming boom is at least partially immersed in the oil-covered surface of the water body to a selected depth;

(c) a skimming plate provided in upward-standing relationship on said oil-collecting end of said skimming boom for skimming the oil from the oil-covered surface of the water body; and

(d) a pair of conveyor chains rotatably carried by said skimming boom in spaced, substantially parallel relationship, said conveyor chains oriented substantially parallel to the longitudinal axis of said watercraft; at least one paddle means carried by said conveyor chains and spanning said skimming boom in transverse relationship, said paddle means contacting said skimming boom in spaced relationship with respect to said skimming plate; and drive means carried by said skimming boom, said drive means connected in driving relationship to at least one of said conveyor chains for operating said conveyor chains and causing said paddle means to traverse said skimming boom and substantially wipe the oil from said skimming boom.



4,842,736

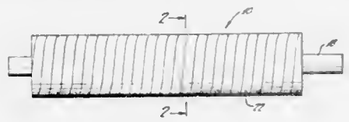
SPIRAL WOUND MEMBRANE

Donald T. Bray, and David H. Hopkins, both of Escondido, Calif., assignors to Desalination Systems, Inc., Escondido, Calif.

Filed Sep. 6, 1988, Ser. No. 240,941

Int. Cl.[4] B01D *13/00*

U.S. Cl. 210—321.61 **13 Claims**



1. A spiral wound membrane cartridge for separating a first component from a feed fluid mixture of the first component and a second component, said cartridge comprising:

a permeate collection tube;

at least one permeate carrier leaf extending outwardly from said tube;

at least one sandwich leaf disposed adjacent a said permeate carrier leaf and extending outwardly from said tube, said sandwich leaf comprising a length of a semipermeable membrane sheet, having an active membrane side and a backing side, said sheet being folded in two having a fold disposed adjacent said tube and with the membrane sides of the two parts of the folded sheet facing, said sandwich leaf further comprising a length of a feed carrier positioned between said two parts, said sandwich leaf further comprising means for preventing leakage of said fluid mixture to said permeate collection tube in the event of damage to said membrane side adjacent said fold, including, flexible sealing means penetrating and sealing the interstices of the backing side in the area of said fold.

4,842,737

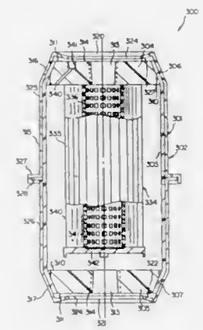
FILTER ASSEMBLY WITH AN EXPANDABLE SHELL

Clayton L. Reed, Cortland, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

Filed Dec. 3, 1986, Ser. No. 937,378

Int. Cl.[4] B01D *27/08*

U.S. Cl. 210—321.87 **21 Claims**



1. A filter assembly for removing one or more substances from a fluid flowing through the filter assembly, the filter assembly comprising:

a generally cylindrical shell having an axis and first and second end portions, at least one end portion having a continuously decreasing outside diameter along the axis of the shell;

first and second end caps sealingly disposed at the first and second end portions of the shell, respectively;

a porous filter element disposed within the shell adjacent to the first end cap, the filter element including upstream and dowmstream surfaces and means for directing fluid from the upstream surface to the downstream surface;

inlet and outlet means for channeling the fluid into the shell to the upstream surface of the filter element and for channeling the fluid from the downstream surface of the filter element out of the shell, respectively; and

a rigid casing coaxially disposed about the shell and having first and second end portions cooperatively arranged with the first and second end portions, respectively, of the shell wherein the end portion of the casing cooperatively arranged with the end portion of the shell which has the continuously decreasing outside diameter has a correspondingly continuously decreasing inside diameter and wherein at least one end portion of the casing has an opening communicating with the exterior of the casing.

4,842,738

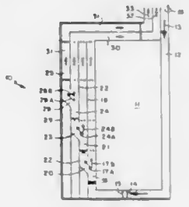
CENTRIFUGE DEVICE

Harvey P. Greenspan, 15 Chatham Cir., Brookline, Mass. 02146

Filed Apr. 29, 1988, Ser. No. 187,972

Int. Cl.[4] B01D *17/038*

U.S. Cl. 210—380.1 **9 Claims**



1. A centrifuge device for separating and fractionating particles of at least two different species contained in a fluid medium, said device comprising

high speed rotation means for producing a centrifugal field;

a plurality of channel means successively positioned adjacent to one another in said centrifugal field to form an internal cascade;

means for causing said fluid medium containing said different particle species to flow continuously into said centrifugal field through said plurality of channel means;

said channel means being arranged so that portions of the fluid medium containing substantially all of the particles of one of said species and a fraction of the particles of the another of said species are successively diverted from one channel means to a next adjacent channel means, the remaining portions of said fluid medium containing substantially only particles of said another specie continuing to flow in said one channel means; and

at least two output means responsive to said channel means for separately supplying, respectively, a continuous flow of a portion of fluid medium containing substantially all of the particles of said one species and a portion of a fluid medium containing substantially all of the particles of said another species.

4,842,739

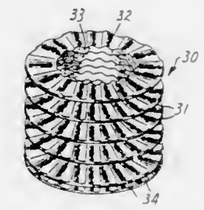
HIGH SURFACE AREA FILTER CARTRIDGE

Yuan-Ming Tang, New Brighton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 20, 1987, Ser. No. 87,264

Int. Cl.[4] B01D *27/06, 29/34*

U.S. Cl. 210—489 **21 Claims**



1. A generally tubular filter cartridge for separating constituent components of a fluid mixture, said cartridge comprising a sheet that includes at least one layer of filter media arrayed in a nested arrangement of substantially disk-shaped filter members, each filter member comprising first and second annular sections of said sheet connected together at their outer circum-

ference and having a pattern of radial pleats thereon which nest with the radial pleats on an adjoining section.

4,842,740

MEMBRANES PREPARED FROM BLEND OF POLYBENZIMIDAZOLE WITH POLYARYLATES

Tai-Shung Chung, Morris Plains; Paul M. Chen, Sr., Gillette, and Vincent J. Provino, Clifton, all of N.J., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Aug. 5, 1988, Ser. No. 228,624
Int. Cl.[4] C08J 9/28
U.S. Cl. 210—500.27 20 Claims

1. A membrane prepared by the process of:
a. preparing a polybenzimidazole solvent solution;
b. blending a polyarylate with the polybenzimidazole solvent solution; and
c. forming a membrane from the polybenzimidazole/polyarylate blend.

4,842,741

HETEROGENEOUS MEMBRANES FROM HIGHLY FILLED THERMOPLASTIC ORIENTABLE POLYMERS

Michael C. Coughlin; Arthur Z. Moss, both of Wilmington, Del., and Kenneth E. Stevens, Kingston, Canada, assignors to Du Pont Canada Inc., Mississauga, Canada

Filed Mar. 25, 1988, Ser. No. 172,837
Int. Cl.[4] B01D 13/00, 13/04
U.S. Cl. 210—500.36 6 Claims

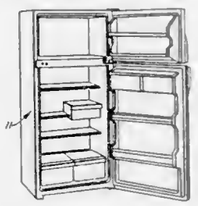
1. A heterogeneous membrane film comprising a composition comprising a thermoplastic orientable polymer and a particulate filler, said thermoplastic orientable polymer being characterized by (i) a hydrophobic surface, as indicated by a contact angle between said surface and a droplet of water of at least about 40°, (ii) a glass transition temperature T_g of less than about 25° C., (iii) a Vicat softening point T_v of more than about 25° C., (iv) an ultimate elongation at a temperature between T_g and T_v of at least 100%, and (v) a flexural modulus at 25° C. of less than about 200 MPa, said polymer being selected from the group consisting of (a) at least one copolymer of ethylene and at least one other monomer, said monomer being selected from the group consisting of vinyl esters of saturated C_1–C_4 carboxylic acids, unsaturated C_3–C_5 mono- or dicarboxylic acids, salts of such mono- or dicarboxylic acids with ammonia and/or with metals of Groups I–IV of the Periodic Table, and C_1–C_8 alkyl esters of said mono- or dicarboxylic acids; b) at least one terpolymer of the general formula E/X/Y, where E is ethylene, X is butyl acrylate or vinyl acetate, and Y is carbon monoxide or sulphur dioxide, the weight porportion of Y to (E+X+Y) being up to about 15%; (c) at least one elastomeric dipolymers and terpolymers or ethylene with other 1-olefins and 1,4-dienes; (d) mixtures of at least two of (a), (b) and (c); and (e) at least one copolyetherester; said particulate filler being in a concentration of about 20–40%, based on the volume of the composition, said particulate filler being chemically unreactive with the polymer and dispersed therein by melt-blending, and being characterized by (i) a sufficiently high softening temperature to avoid particle distortion at the lowest temperature at which the polymer is sufficiently fluid to be satisfactorily melt-blended, (ii) an aspect ratio of less than about 3, (iii) an average equivalent spherical diameter of about 0.50–50 μm, (iv) an at most negligible electrostatic or dipole attraction to the polymer, and (v) a surface tension which either has at the lowest temperature at which the polymer is sufficiently fluid to be satisfactorily melt-blended a value at most about equal to that of the polymer or has been modified by the adsorption of an organic compound to have at most such a value, said organic compound, if present, being liquid at the lowest temperature at which the polymer is sufficiently fluid to be satisfactorily melt-blended and being capable at that temperature of being adsorbed on the surface of the filler to the extent of at least about 0.5×10^{-5} mole of the organic compound per square meter of surface area of the filler, as calculated from the average equivalent spherical diameter of the filler, and being present in an amount at least sufficient to satisfy the surface tension requirement, said organic compound being characterized by (i) at most negligible solubility on the polymer at the melt-blending temperature, (ii) chemical inertness to the polymer, (iii) a number average molecular weight of 100–10 000, and (iv) a surface tension which at a temperature at which the organic compound is liquid has a value at most about equal to that of the polymer, said film being characterized by a core layer sandwiched between two outer layers, said core layer having cavities consisting of a network of voids surrounding the filler particles, ahving a substantial absence of cracks in the polymer and a low degree of apparent adhesion between polymer and filler, said outer layers having a substantial absence of pores.

4,842,742

METHOD FOR FORMING LARGE OBJECTS SUCH AS REFRIGERATOR LINERS FROM CRYSTALLINE SYNTHETIC RESINS

Robert F. Plante, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 25, 1986, Ser. No. 899,826
Int. Cl.[4] B29C 43/02
U.S. Cl. 264—522 24 Claims



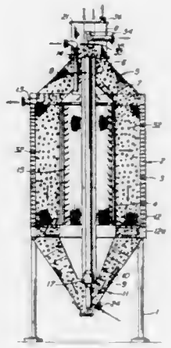
1. The method of forming a large generally rectangular object, having overall dimensions of at least approximately 27″×60″×20″, and a wall thickness of less then approximately 0.090″, formed of polypropylene synthetic resin, comprising the steps of:
cutting polypropylene sheet material into rectangular blanks, each blank having a maximum dimension which is perpendicular to the direction of the maximum molecular orientation of the sheet material, and a peripheral edge portion;
heating one of said blanks to a temperature within the range of 315° F. to 328° F. to be subjacent the crystalline melting temperature thereof;
allowing a first surface of the blank to cool;
positioning the blank over a generally rectangular female die member;
clamping the peripheral edge portion of the blank to said female die member and progressively increasing the clamping force so as to cause a portion of the clamped material beneath said clamping means to flow inwardly toward the central portion of the blank;
creating a vacuum pressure within said female die member so as to vacuum form the blank to cause the central portion of the blank to move approximately one-half the distance into the female die member;
stretch forming the blank by contacting said first surface of the blank with a male die member and moving said male die member into said female die member;
terminating the inward motion of the male die member at a point prior to that at which the central portion of the blank contacts said female die member; and
pressure forming the stretched blank against the surface of the female die member by applying positive air pressure through a nose portion of said male die member to complete the formation of said object.

4,842,744

METHOD FOR CONTINUOUS FILTERATION OF FLUIDS

Horst Schade, In der Marpe 16, 4320 Hattingen, Fed. Rep. of Germany

Filed May 12, 1988, Ser. No. 193,349
Claims priority, application European Pat. Off., May 14, 1987, 87106976.1
Int. Cl.[4] B01D 33/00, 35/16, 35/30
U.S. Cl. 210—636 16 Claims

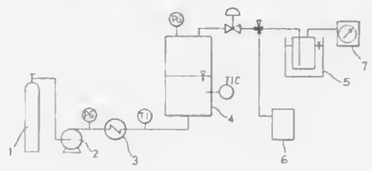


4,842,743

METHOD OF REMOVING SOLVENT FROM CHLORINATED RESIN

Kageo Yoshida; Osamu Nittani; Toshinobu Ito; Makoto Kokura, and Kouzi Hirano, all of Tokyo, Japan, assignors to Asahi Denka Kogyo K.K., Tokyo, Japan

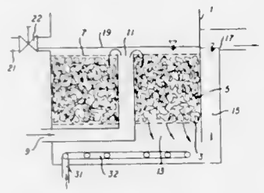
Filed Mar. 16, 1988, Ser. No. 168,646
Claims priority, application Japan, Mar. 27, 1987, 62-73445; Jul. 31, 1987, 62-192195
Int. Cl.[4] B01D 11/04
U.S. Cl. 210—634 3 Claims



1. In a method for removing an organic solvent impurity contained in a chlorinated polyolefin or a chlorinated rubber, wherein said chlorinated polyolefin or chlorinated rubber also contains a plasticizer in an amount of from 1 to 10%, and said organic solvent was used in the production of said chlorinated polyolefin or said chlorinated rubber, the improvement comprising: contacting said organic solvent impurity-containing chlorinated polyolefin or chlorinated rubber with a fluid carbon dioxide in a supercritical or a liquid state.

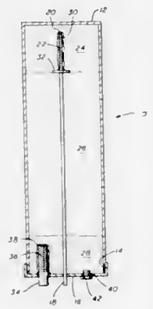
10. A method for the continuous filtration of a liquid effluent, comprising the steps of:
supplying the effluent to a top end of an enclosed, upstanding container, said container being divided into an inner cylindrical section and an outer-annular section by a permeable coaxial inner cylindrical wall;
forming a continuously recirculating filter bed in the outer-annular section of the container, said filter bed comprised of particulate filter particles supplied to a top end of the outer-annular section, said filter particles allowed to fall through the outer-annular section to be then recirculated to the top end of the outer-annular section;
positioning a microfilter means to extend about and to be supported by the permeable coaxial inner cylindrical wall, said microfilter means having a mesh width of ten to two hundred microns, wherein said microfilter means filters the effluent of floucculated impurity particles, and allows the effluent to pass through the permeable coaxial inner cylindrical wall and transversely to the outer-annular section with the recirculating filter bed formed thereat to be further filtered thereby;
cleaning said microfilter by supplying a pressurized cleaning fluid to rotary nozzles supported at a top end of the inner cylindrical section, said rotary nozzles having lengths to extend along the height of the microfilter means such that the pressurized cleaning fluid is sprayed along the entire height of the microfilter means to thereby remove the in fluctuated impurity particles from the microfilter means as the rotary nozzles rotate to spray the entire area of the microfilter means, and
withdrawing the liquid effluent, now filtered, from the annular container.

4,842,745
PROCESS FOR SEPARATING ORGANIC COMPOUNDS FROM WATER BY EXTRACTION
Walter Weller, Diez, and Peter Belouschek, Essen, both of Fed. Rep. of Germany, assignors to Passavant-Werke AG & Co. KG, Fed. Rep. of Germany
Filed Jun. 4, 1987, Ser. No. 58,187
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1986, 3618698
Int. Cl.[4] B01L 15/00
U.S. Cl. 210—679 17 Claims



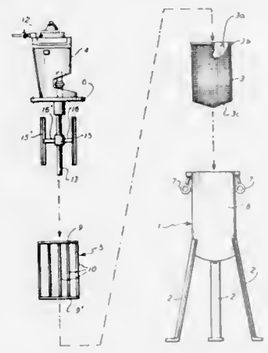
1. In a process for separating halogenated hydrocarbons from water by extraction using a lipophilic extraction agent which is immiscible with water, the extraction being carried out by allowing the water to flow through the extraction agent, the improvement comprising carrying out the extraction process by allowing the water to flow through a porous carrier having substantially no propensity to extract halogenated hydrocarbons from water and including a large internal contact surface area upon which the extraction agent is deposited.

4,842,746
METHOD OF REMOVING TOXIC AGENTS FOR TRICHLOROTRIFLUOROETHANE
David E. Fowler, and Eugene T. Mellvaine, both of Gainesville, Fla., assignors to Quadrex Hps Inc., Gainesville, Fla.
Filed Jun. 16, 1986, Ser. No. 874,679
Int. Cl.[4] B01D 15/00
U.S. Cl. 210—689 8 Claims



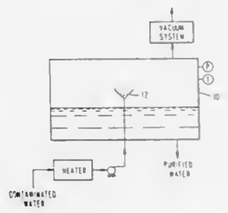
1. A process for removing chemical nerve agents and chemical blister agents from trichlorotrifluoroethane and from mixtures of solvents wherein trichlorotrifluoroethane is a constituent thereof comprising:
conducting a liquid solvent wherein trichlorotrifluoroethane is a constituent thereof having chemical nerve agents selected from the group consisting of tabun, sarin and soman and chemical blister agents selected from the group consisting of lewisite and mustard agent dissolved therein through an absorbent selected from the group consisting of Fuller's Earth, activated carbon, activated alumina, silica gel, and silica gel coated with a metallic salt, said adsorbent preferentially adsorbing the chemical nerve and blister agents.

4,842,747
BAG FILTER
John Dragasevich, Willowdale, Canada, assignor to GAF Corporation, Wayne, N.J.
Filed Feb. 18, 1988, Ser. No. 157,387
Int. Cl.[4] B01D 37/00
U.S. Cl. 210—767 18 Claims



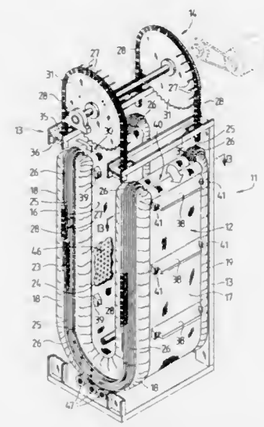
1. A filter for liquids containing suspended flake like particles which comprises a body member having an inner wall defining an axial, main flow passage, an inlet and exit conduit for the liquid to be filtered, an annular straining and filter bag sealingly mounted within said main flow passge so as to define a chamber between the outer surface of said straining bag and said inner wall of the body member, agitator means mounted within said main flow passage so as to be spaced from said filter bag, a filter bag container and a backwash retainer to separate the agitator means from the filter bag, wherein said agitator means includes an adjustable angle blade means.

4,842,748
METHODS FOR REMOVING VOLATILE SUBSTANCES FROM WATER USING FLASH VAPORIZATION
Chaitanya Agnihotri, Cedar Knolls, and Robert M. Cobiella, Lakewood, both of N.J., assignors to Assigned to the Government of the United States as represented by the Administrator of the U.S. Environmeotal Protection Agency, Washington, D.C.
Filed Feb. 23, 1988, Ser. No. 158,968
Int. Cl.[4] B01D 17/00
U.S. Cl. 210—774 10 Claims



1. A method for removing volatile organic substances from water, said volatile organic substances, including halogenated hydrocarbons, having higher pure component vapor pressures and lower boiling points than water, comprising the steps of (a) providing water that contains the volatile organic substances, including halogenated hydrocarbons, and is at a pressure of at least about 35 psig and a temperature in the range of about 140° F. to about 180° F., (b) releasing the water into a vacuum chamber maintained under a vacuum in the range of about 1 to about 5 psia, (c) removing resulting vapors from the chamber through a vacuum pump system, and (d) collecting purified liquid water from the chamber, at least a portion of the volatile organic substances originally contained in the water being removed as vapors from the vacuum chamber.

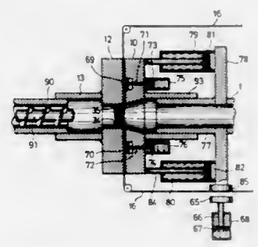
4,842,749
INVERSION TUBE PRESS
Clyde H. Cox, 3309 Blue Bell La., Birmingham, Ala. 35243
Filed Sep. 30, 1988, Ser. No. 251,557
Int. Cl.[4] B01D 33/00
U.S. Cl. 210—783 26 Claims



1. A method of treating sludge-like material for separating solids and liquids therein comprising:
(a) defining a restricted volume region using a frame structure;
(b) forming a continuous tube having at least one longitudinal segment comprising a filter media, said tube having an inner and outer wall defining a cavity therebetween;
(c) encapsulating said frame structure within said cavity such that said inner wall passes through said frame structure;
(d) urging said continuous tube through said frame such that the portion of said tube forming said inner and outer wall are simultaneously exchanged;
(e) introducing a slurry of solids and liquid suspension into the defined region at one end of said tube;
(f) extracting liquids from said slurry through said filter media segment; and
(g) discharging solids from said restricted volume region and said tube at a second end of said tube.

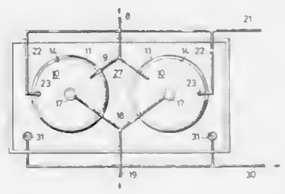
4,842,750
APPARATUS FOR CLEANING VISCOUS MATERIALS
Lucian Britchi, Philipp-Weber Strasse 3, D-6457 Maintal 3, Fed. Rep. of Germany
Filed Oct. 3, 1986, Ser. No. 914,778
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1985, 3535491
Int. Cl.[4] B01D 29/02, 33/04, 37/04
U.S. Cl. 210—791 30 Claims

1. A method of cleaning viscous materials, wherein said viscous materials are passed in the molten condition under pressure through a movable strip-shaped screen having an upstream face which retains impurities, comprising the following steps:
a. reducing the pressure of the viscous material against the upstream face of said strip-shaped screen when the latter is obstructed by the impurities it retains;
b. temporarily eliminating the sealing pressure between the strip-shaped screen and a first chamber which feeds the molten material through the strip-shaped screen and a second chamber which receives the filtered molten material;
c. moving said strip-shaped screen crossways with respect to the direction of flow of said viscous material to replace a soiled area of the screen by a clean area;



d. immobilizing the strip-shaped screen;
e. resealing the first chamber, screen and second chamber together, the molten material upstream of said screen being simultaneously repressurized; and
f. continuing to filter material through said strip-shaped screen;
wherein the reduction of the pressure of the viscous material is achieved by increasing the original volume of said first chamber supplying the molten material to said strip-shaped screen, and repressurization of the viscous material is accomplished by restoring the first chamber to its original volume.

4,842,751
METHOD AND APPARATUS FOR FILTRATION USING WASHABLE FILTER BAG FOR WATER AND WASTEWATER TREATMENT
Karl R. Dunkers, Hästskovägen 7, S-183 50 Täby, Sweden
Filed Mar. 11, 1987, Ser. No. 24,667
Int. Cl.[4] B01D 29/38
U.S. Cl. 210—798 8 Claims



1. A method of removing filterable particles from water, comprising
providing in a body of water a filter bag made from a filter material suitable for separating said particles, with the bottom of the bag situated below the water surface and its top opening above the water surface,
introducing particle-containing water to be filtered into the interior of the bag, whereby the water flows through the filter bag to the surrounding body of water, while particles remain within the bag,
and after a predetermined amount of particles have been collected in the filter bag, backwashing the filter bag and

removing the particles collected in the bag to a place remote from said body of water while the bag remains disposed in the body of water by causing water to flow from the surrounding body of water through and into the filter bag.

7. An apparatus for removing filterable particle from water, comprising:

at least one filter bag made from a material suitable for filtering off said particles and means enabling said bag to be arranged in a body of water with its bottom below the surface of said body of water and its top opening above said surface,

an inlet conduit arranged for supplying water to be filtered into the interior of the filter bag and a pump arranged within the bag and connected to a conduit including means for backwashing and transferring particles collected within the filter bag to a location remote from the body of water while the bag remains disposed in the body of water.

4,842,752

STABLE EXTREME PRESSURE GREASE

Bryant J. Hardy, and Charles J. Swartz, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Mar. 22, 1988, Ser. No. 171,987

Int. Cl.[4] C10M *169/06 117/04*

U.S. Cl. 252—17 **13 Claims**

1. A stable grease composition comprising:

(a) a base oil,

(b) an oil insolube extreme pressure agent,

(c) from about 1 percent to about 5 percent dispersed metal soap, and

(d an excess of undispersed soap formed at temperatures of about 370° C. or less.

4,842,753

SILICONE GREASE COMPOSITION

Shigeru Mori, and Toshikazu Sugita, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co. Ltd., Tokyo, Japan

Filed May 4, 1988, Ser. No. 188,328

Claims priority, application Japan, May 7, 1987, 62-111506

Int. Cl.[4] C10M *107/08*

U.S. Cl. 252—42.7 **6 Claims**

1. A silicone grease composition which comprises, in admixture:

(a) 100 parts by weight of an organopolysiloxane fluid having a viscosity in the range from 200 to 100,000 centistokes at 25° C. and represented by the average unit formula

$$R^1_nSiO_{(4-n)/2},$$

in which R^1 is an optionally substituted monovalent hydrocarbon group having 1 to 21 carbon atoms and the subscript n is a positive number in the range from 1.2 to 2.2;

(b) from 10 to 90 parts by weight of a thickening agent; and

(c) a copper dialkyl dithiocarbamate represented by the general formula

$$(R_2N—CS—S)_2Cu,$$

in which R is an alkyl group having 1 to 10 carbon atoms, in an amount from 0.5 to 20% to substantially improve the boundary lubrication of the silicone grease composition composed of the components (a) and (b).

4,842,754

COMPATIBLE BLENDS OF MAIN CHAIN AND SIDE CHAIN THERMOTROPIC LIQUID CRYSTAL POLYMERS

Hassan A. Hakemi, Milan, Italy; Husam A. A. Rasoul, and Robert W. Stackman, both of Racine County, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

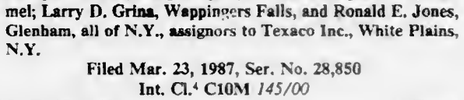
Filed Oct. 22, 1987, Ser. No. 111,179

Int. Cl.[4] C09K *19/52, 19/00*

U.S. Cl. 252—299.01 **4 Claims**

1. A compatible blend of thermotropic liquid crystal polymers comprising:

(i) a main chain liquid crystal polymer having repeating units of



and

(ii) a side chain liquid crystal polymer having repeating units of

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4,842,755

MARINE LUBRICATING COMPOSITION

Adrian Dunn, Faringdon, United Kingdom, assignor to Exxon Chemical Patents Inc., Linden, N.J.

Filed Feb. 3, 1987, Ser. No. 10,227

Claims priority, application United Kingdom, Feb. 4, 1986, 8602627

Int. Cl.[4] C10M *105/32*

U.S. Cl. 252—32.7 E **22 Claims**

1. A marine diesel cylinder lubricant composition comprising a major amount of an oil of lubricating viscosity and

(a) at least 0.5 wt % of a borated ashless dispersant;

(b) at least 12.1 wt % of one or more overbased metal compounds; and

(c) at least 0.1 wt % of a zinc dialkyl dithiophosphate,

wherein the boron content of the lubricant composition is from 0.01 to 0.016 wt %, the zinc content of the lubricant composition is from 0.02 to 0.023 wt % and the TBN is at least 60.

4,842,756

MULTIFUNCTIONAL VISCOSITY INDEX IMPROVER

Christopher S. Liu, Poughkeepsie; Maria M. Kapuscinski, Carmel; Larry D. Grina, Wappingers Falls, and Ronald E. Jones, Glenham, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 23, 1987, Ser. No. 28,850

Int. Cl.[4] C10M *145/00*

U.S. Cl. 252—48.2 **8 Claims**

1. A lubricating oil composition containing a major portion of a lubricating oil and a minor effective amount of a polymer composition capable of use as a multifunctional viscosity index improver in lubricating oils, said polymer composition containing a carbon-carbon backbone and, graft polymerized onto said backbone, a graft monomer containing a carbon-carbon chain and an epoxide group spaced from said polymer carbon-carbon backbone, said graft monomer containing (i) a hydrocarbon chain or (ii) a hydrocarbon chain and an ester group or (iii) a hydrocarbon chain and an ether oxygen, said epoxide group having been functionalized with functionalizing reactant containing, as an active group, $—NH_2$, $—NHR^{iv}$, —OH, —COOH, or —SH wherein R^{iv} is an alkyl, alkaryl, aralkyl, aryl, or cycloalkyl hydrocarbon group.

4,842,757

THICKENED LIQUID, IMPROVED STABILITY ABRASIVE CLEANSER

Paul F. Reboa, Dublin; Frances E. Mitchell, Pleasanton, and Clement K. Choy, Walnut Creek, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Jan. 21, 1988, Ser. No. 146,519

Int. Cl.[4] C11D *7/54*

U.S. Cl. 252—76 **9 Claims**

1. A method for preparing a thickened liquid cleanser with enhanced long-term stability comprising combining:

(a) an initial portion of all the water with sufficient colloidal aluminum oxide thickener to provide a 1–50% dispersion thereof, and optionally, a phase stabilizing-effective amount of a C_{10-15} alkyl benzene sulfonate;

(b) a final portion of all the water and an effective amount of a neutralizing agent to neutralize the collodal aluminum oxide thickener;

(c) 0.1–15% of a halogen bleach;

(d) a fatty acid soap;

(e) a bleach stable nonionic surfactant, optionally, a phase stabilizing-effective amount of a C_{10-15} alkyl benzene sulfonate; and

(f) 1–25% of buffer/electrolyte which interacts with the surfactants recited in steps (d) and (e) and the thickener recited in step (a) to result in a plastic rheology, and optionally, a phase stabilizing-effective amount of C_{10-15} alkyl benzene sulfonate;

wherein the step of adding a phase stabilizing-effective amount of an alkyl benzene sulfonate must occur in either (a), (e) or (f); the total amount of all of the water comprising 10–80%; and the amount of soap and surfactant of steps (d) and (e) being about 0.1–5%.

4,842,758

STABILIZED ENZYME SYSTEM FOR USE IN AQUEOUS LIQUID BUILT DETERGENT COMPOSITIONS

Andre Crutzen, Sclessin, Belgium, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 31, 1986, Ser. No. 925,437

The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.

Int. Cl.[4] C11D *3/33, 3/386;* D06M *11/00*

U.S. Cl. 252—8.7 **13 Claims**

1. A heavy duty built aqueous liquid detergent composition containing a stabilized enzyme system wherein said detergent composition comprises

	Weight [by] %
Water	30–60
Phosphate Builder Salt	5–30
Anionic Surfactant or mixture of anionic and nonionic surfactant	10–25
Clay Softener	0–15
and said stabilized enzyme system comprises	
Boron Compound	0.5 to 2.5
Alpha-hydroxy Carboxylic Acid	1 to 5
[Proteinaceous Material] Casein	1 to 6
Enzyme	0.5 to 3

4,842,759

ACICULAR PROCESS FOR PRODUCING PARTICULATE MATERIAL

Kazuo Okamura, Itami; Ikuo Kitamura, Kyoto; Hideki Aomi; Satoshi Koyama, both of Osaka; Katsushi Tokunaga, Habikino; Yoshiyuki Shibuya, and Shiego Daimon, both of Osaka, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 790,238, Oct. 22, 1985, and a continuation-in-part of Ser. No. 790,237, Oct. 22, 1985, and a continuation-in-part of Ser. No. 909,008, Sep. 16, 1986, which is a continuation of Ser. No. 603,080, Apr. 23, 1984, abandoned.

This application Oct. 14, 1986, Ser. No. 918,783

Claims priority, application Japan, Apr. 25, 1983, 58-73251; Jul. 5, 1983, 58-122879; Sep. 17, 1983, 58-171765; Nov. 17, 1983, 58-217530; Dec. 7, 1983, 58-231876; Dec. 7, 1983, 58-231875; Dec. 14, 1983, 58-236753; Dec. 28, 1983, 58-250163; Jan. 23, 1984, 59-10400; Oct. 25, 1984, 59-224968; Oct. 25, 1984, 59-224967

Int. Cl.[4] C01B *31/30*

U.S. Cl. 252—62.51 **5 Claims**

1. A process for producing acicular primary particles having an average axial ratio of 3 to 20 and an average particle size of 0.1 to 2 μm, said particles containing an iron carbide, said iron carbide containing Fe_5C_2 as a main component, said process comprising contacting an acicular iron compound having a surface pH of at least 5 and selected from the group consisting of acicular iron oxyhydroxide and acicular iron oxide with a gas containing a component selected from the group consisting of CO and a mixture of CO and H_2 at a contact temperature of about 250° to about 400° C. at a gas flow rate of CO or mixture thereof with H_2 of about 1 to 1000 ml (STP)/min per gram of said acicular iron compound.

4,842,760

SOFT FINISHING AGENT

Masaki Tsumadori; Kazuo Shimizu; Junichi Inokoshi, and Moriyasu Murata, all of Utsunomiya, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed May 20, 1988, Ser. No. 196,546

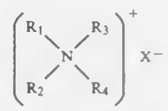
Claims priority, application Japan, May 26, 1987, 62-129552

Int. Cl.[4] D06M *13/46*

U.S. Cl. 252—8.8 **5 Claims**

1. A soft finishing agent comprising the following di-long-chained quaternary ammonium salts (A) or (B):

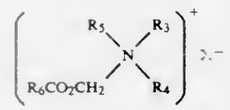
(A) di-long-chained quaternary ammonium salt which is represented by formula (I):



(I)

(in which R_1 and R_2 independently represent alkyl groups having an average carbon atom content of 10–24 and are derived from a naturally occurring oil or fat, provided that at least R_1 or R_2 have an average carbon atom content of not less than 14, R_3 and R_4 independently represent alkyl or hydroxyalkyl groups each having an average carbon atom content of 1–3, benzyl groups, or groups represented by $—(C_2H_4O)_nH$, wherein n denotes an integer of 1–3, and X represents a halogen or an alkyl sulfate having a carbon atom content of 1–3), and of which 5% by weight aqueous dispersion has a gel-liquid crystal transition point of not more than 20° C., or

(B) di-long-chained quaternary ammonium salt which is represented by formula (II):



(II)

(in which R_5 and R_6 independently represent alkyl or alkenyl groups having an average carbon atom content of 10–40, provided that at least R_5 or R_6 have and average carbon atom content of not less than 16, R_3, R_4 an X have the same meanings as defined in formula (I)), and of which 5% by weight aqueous dispersion has a gel-liquid crystal transition point of not more than 10° C.

4,842,761

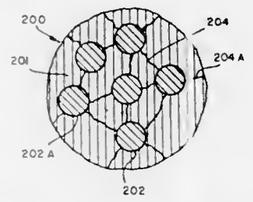
COMPOSITIONS AND METHODS FOR CONTROLLED RELEASE OF FRAGRANCE-BEARING SUBSTANCES

Howard J. Rutherford, Highlands, N.J., assignor to International Flavors & Fragrances, Inc., New York, N.Y.

Filed Mar. 23, 1988, Ser. No. 172,089

Int. Cl.[4] C11D *3/50, 3/37;* **C08J** *9/12*

U.S. Cl. 252—90 **19 Claims**



1. A composition for laundering textiles which composition has improved olfactory performance and which comprises a detergent composition and a particulate fragrance-bearing polymer comprising a water-soluble normally solid polymer, a water-insoluble normally solid polymer, and at least one perfume composition, a portion of the perfume composition being incorporated in the water-soluble polymer and a portion being incorporated in the water-insoluble polymer, the water-soluble polymer and the water-insoluble polymer being physically associated with each other in such a manner that one is in the form of discrete entities in a matrix of the other, the matrix substantially comprising the surface of the particle.

4,842,762

LAUNDRY SOIL AND STAIN REMOVER IN APPLICATOR STICK FORM

John S. Sabel, Jr., Indianapolis, and Wayne A. Kester, Whitestown, both of Ind., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 851,857, Apr. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 742,627, Jun. 7, 1985, abandoned. This application Nov. 13, 1987, Ser. No. 119,866

Claims priority, application European Pat. Off., Feb. 6, 1986, 86107435; Australia, May 6, 1986, 56371/86; Argentina, Jun. 6, 1986, 304270; Canada, Jun. 6, 1986, 511966; Colombia, Jun. 6, 1986, 256980; Brazil, Sep. 6, 1986, 860804

Int. Cl.[4] C11D *3/386, 3/04, 9/60, 17/00*

U.S. Cl. 252—109 **8 Claims**

1. In a laundry soil and stain remover composition in applicator stick form for application to fabrics as an aid in laundering, said composition establishing a balance and functional optimization of the values of interrelated parameters including pH, drop point and hardness, and including a laundry enzyme operable digestively to attack and to eliminate grease and food-derived stains from fabrics, a surfactant, a bodying agent constituting a gelling carrier vehicle for said enzyme and said surfactant,

said enzyme and said surfactant being intimately and uniformly dispersed throughout said carrier to provide a physically self-sustaining solid for direct positive application and material transfer to selectable zones of fabrics to be treated, prior to subjecting the fabrics to a laundering cycle, said composition having a pH in the range of about 9.3 to about 9.8, having a dropping point in the range of from about 100 degrees F. to about 140 degrees F., and melting in the range of 40 degrees C. (104 degrees F.) to 80 degrees C. (176 degrees F.) and having a hardness in the range of 3 mm to 30 mm measured using an ASTM standard needle with no weight added, and said composition being effective to enhance likelihood of effectively removing stains present in the fabrics,

the improvement comprising a chemical agent incorporated into said stain removing composition for maintaining the dropping point of said composition in said 100° F. to 140° F. range, holding the pH in a range of said about 9.3 to about 9.8 to ensure effective enzyme activity, maintaining the hardness of said composition, in said 3–30 mm range, and the melting range from 40°–80° C., said chemical agent comprising a salt in a concentration of from about 1% to about 4% by weight in said composition, said salt being other than said surfactant and other than said bodying agent, and including a member selected from the group consisting of sulfate, carbonate, phosphate, bromide, formate, acetate, tartrate, borate, metaborate, and mixtures thereof as anions, and a member selected from the group consisting of sodium, potassium, calcium, lithium, magnesium, and aluminum, and mixtures thereof as cations.

4,842,763

LIQUID CLEANING SUSPENSION

Wolfgang Tröger, Pulheim/Stommeln, and Otto Mesmer, Neuss, both of Fed. Rep. of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Dec. 19, 1986, Ser. No. 943,763

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1985, 3545288

Int. Cl.[4] C11D *3/12, 3/26*

U.S. Cl. 252—155 **27 Claims**

1. A liquid hard surfaces cleaning suspension for cleaning smooth hard surfaces, consisting essentially of:

from about 5 to 40% by weight of a sodium aluminum silicate having a particle size up to about and including 110μ;

from about 0.1 to 15% by weight of a pulverized urea-formaldehyde resin foam having a particle size up to about and including 110μ;

from about 2 to 50% by weight of a low-molecular weight alcohol;

from about 0.5 to 15% by weight of an anionic or non-ionic surfactant;

from about 10 to 60% by weight of water; and,

from about 0.1 to 10% by weight of a thickener selected from the group consisting of polysaccharides and derivatives thereof.

21. The process of claim 18, wherein conducting the drying step for a period of time effective for the sodium silicate to become bound to the formaldehyde urea foam and to the soil of the surface.

4,842,764

AZEOTROPE-LIKE COMPOSITIONS OF 1,1-DICHLORO-1-FLUOROETHANE AND METHANOL

Earl A. E. Lund, West Seneca; Robert G. Richard, Cheektowaga; Ian R. Shankland, and David P. Wilson, both of Williamsville, all of N.Y., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed May 3, 1988, Ser. No. 189,932

Int. Cl.[4] C09D *9/00;* **C11D** *7/50;* **C23G** *5/02*

U.S. Cl. 252—171 **8 Claims**

1. Azeotrope-like compositions consisting essentially of 1,1-dichloro-1-fluoroethane and methanol which boil at about 29.8° C.±0.05° C. at about 765 mm Hg.

4,842,765

AQUEOUS DISPERSION OF ORGANIC PEROXIDE

Nobuyuki Satomi, Aichi, Japan, assignor to Nippon Oil & Fats Co., Ltd., Tokyo, Japan

Filed Sep. 25, 1987, Ser. No. 100,967

Claims priority, application Japan, Oct. 7, 1986, 61-237199

Int. Cl.[4] C07C *179/00;* **C08F** *4/32, 4/34, 2/18*

U.S. Cl. 252—186.26 **5 Claims**

1. An aqueous dispersion consisting essentially of an organic peroxide of at least one member selected from the group consisting of peroxydicarbonates, aliphatic diacylperoxides, and aromatic diacylperoxides and assuming a solid state at normal room temperature and 0.01 to 10% by weight, based on the amount of said dispersion, of particles of crystalline cellulose having diameters in the range of 0.001 to 1,000 μ, an average polymerization degree in the range of 15 to 2,000, an ash content falling in the range of 10 to 2,000 parts per million by weight and an ether extractable content not exceeding 1,000 parts per million by weight.

4,842,766

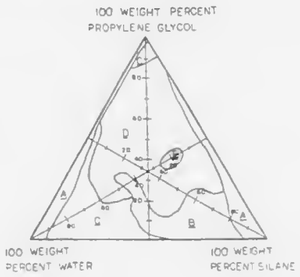
SILANE MICROEMULSIONS

Lynne M. Blehm, and William C. White, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Feb. 17, 1987, Ser. No. 15,645

Int. Cl.[4] B01J *13/00*

U.S. Cl. 252—309 **21 Claims**



1. A clear stable liquid crystalline solution comprising

(a) a silane represented by the formulae:

$$X_{4-n}Si(RNH_aR'_bY_c)_n \quad \text{(i)}$$

where X denotes an alkoxy radical with 1 to 6 carbon atoms, or an alkoxyalkoxy radical with 2 to 8 carbon atoms, or an alkyl radical with 1 to 6 carbon atoms;

Y denotes an acid anion;

n is 1, 2 or 3;

R denotes a divalent hydrocarbon radical with 1 to 6 carbon atoms;

R' denotes alkyl radicals with 1 to 22 carbon atoms; saturated hydrocarbon radicals containing nitrogen, or unsaturated hydrocarbon radicals containing nitrogen;

a is 0, 1 or 2;

b is 0, 1, 2, or 3;

c is 0 or 1; the sum of a+b is 2 or 3, and when the sum of a+b is 3, c is 1, otherwise c is 0;

$$X_{4-n}Si(RPR''_3Y)_n \quad \text{(ii)}$$

where X denotes an alkoxy radical with 1 to 6 carbon atoms, or an alkoxyalkoxy radical with 2 to 8 carbon atoms, or an alkyl radical with 1 to 6 carbon atoms, R denotes a divalent hydrocarbon radical with 1 to 6 carbon atoms, R'' denotes an alkyl radical with 1 to 20 carbon atoms, or a phenyl radical, and n is 1, 2, or 3; or

$$X_3SiR''' \quad \text{(iii)}$$

where X denotes an alkoxy radical with 1 to 6 carbon atoms, or an alkoxyalkoxy radical with 2 to 8 carbon atoms, or an alkyl radical with 1 to 6 carbon atoms and R''' denotes an alkyl radical with 1 to 6 carbon atoms or a phenyl radical;

(b) cosurfactant compound which has an HLB factor of at least 1 and which when combined with said silane forms a clear liquid crystalline solution at room temperature when mixed with water;

(c) sufficient water to form a clear liquid crystalline solution with a mixture of (a) and (b).

4,842,767

HEAVY DUTY BUILT AQUEOUS LIQUID DETERGENT COMPOSITION CONTAINING STABILIZED ENZYMES

D. Warschewski, Spotswood, and H. Greenland, Martinsville, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Sep. 10, 1986, Ser. No. 905,440

The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.

Int. Cl.[4] C11D *3/065, 3/33, 3/386*

U.S. Cl. 252—525 **16 Claims**

1. A heavy duty built aqueous liquid detergent composition containing a protein stabilized enzyme which composition comprises

an effective amount of an enzyme in an amount of 0.5 to 5%,

a sufficient amount of an enzyme stabilizing proteinaceous material selected from the group consisting of casein and collagen to stabilize the enzyme against loss of enzyme activity in an amount of 1 to 8%,

an alkali metal phosphate builder salt in an amount of 5 to 30%, and

at least one of an anionic, nonionic or mixture of anionic and nonionic surfactant detergents in an amount of 10 to 40%, wherein said composition has a pH of 9.5–11.5.

4,842,768

ELECTRICALLY CONDUCTIVE ADHESIVE

Kozo Nakao, and Susumu Hirokawa, both of Niigata, Japan, assignors to Kyowa Gas Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jan. 15, 1986, Ser. No. 819,146

Claims priority, application Japan, Jan. 16, 1985, 60-5488

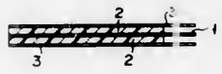
Int. Cl.[4] H01B *1/00*

U.S. Cl. 252—500 **10 Claims**

1. An electrically conductive adhesive, formed by polymerizing and cross-linking

(a) a radically polymerizable ionic unsaturated monomer soluble in a mixture of a water-soluble polyhydric alcohol with water,

(b) A trialkoxysilylalkyl (meth)acrylate represented by the general formula I:



(I)

$$CH_2=C(R^1)-COO(CH_2)_nSi(OR^2)_3$$

wherein R^1 denotes a hydrogen atom or a methyl group, R^2 an alkyl group of 1 or 2 carbon atoms, and n an integer of the value of 2 or 3, and

(c) a (meth)acrylate represented by the general formula II:

(II)

$$CH_2=C(R^1)-COO(CH_2CH_2O)_mR^3$$

wherein R^1 denotes the same meaning as defined above, R^3 a hydrogen atom or an alkyl group of 1 or 4 carbon atoms, and m an integer of the value of 1 to 23, in the presence of

(d) a water-soluble polyhydric alcohol and

(e) water;

wherein the amount of (a) said radically polymerizable ionic unsaturated monomer is in the range of 10 to 40% by weight, that of (b) said trialkoxysilylalkyl (meth)acrylate of said general formula I in the range of 0.05 to 1% by weight, that of (c) said (meth)acrylate of said general formula II in the range of 2 to 30% by weight, that of (d) said water-soluble polyhydric alcohol in the range of 10 to 80% by weight, and that of (e) said water in the range of 5 to 40% by weight based on the total amounts; and wherein said radically polymerizable ionic unsaturated monomer is at least one member selected from the group consisting of unsaturated organic carboxylic acids, unsaturated organic sulfonic acids, and salts thereof.

4,842,769

STABILIZED FABRIC SOFTENING BUILT DETERGENT COMPOSITION CONTAINING ENZYMES

Jan E. Shulman, Old Bridge, and Pallassana Ramachandran, Robbinsville, both of N.J., assignors to Colgate-Palmolive Co., Piscataway, N.J.

Continuation of Ser. No. 792,710, Oct. 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 759,523, Jul. 26, 1985, abandoned. This application Sep. 2, 1987, Ser. No. 153,362

The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.

Int. Cl.[4] C11D *3/06, 3/386;* **D06M** *11/00*

U.S. Cl. 252—8.6 **22 Claims**

1. A stabilized fabric softening enzyme-containing built liquid detergent composition comprising:

(a) from about 5 to 80%, by weight, of one or more surface active detergent compounds selected from the group consisting of anionic, nonionic and amphoteric detergent compounds;

(b) from about 5 to 30%, by weight, of one or more builder salts selected from the group consisting of alkali metal tripolyphosphates, and alkali metal carbonates;

(c) from about 5 to 20%, of a swelling bentonite clay;

(d) an effective amount of an enzyme or an enzyme mixture for stain removal selected from the group consisting of alkali protease enzymes and alpha-amylase enzymes;

(e) an enzyme-stabilizing system containing, based on the weight of the detergent composition, (i) from about 1% to 10% glycerine; (ii) from about 1 to 8% of a boron compound selected from the group consisting of boric acid, boric oxide and alkali metal borates; and (iii) from about 0.5 to 8% of a carboxylic acid compound selected from the group consisting of di and/or polycarboxylic acids selected from the group consisting of oxalic acid, malonic acid, maleic acid, succinic acid, malic acid, tartaric acid, aspartic acid and citric acid and water-soluble salts thereof;

(f) the balance comprising water.

4,842,770

DRILLING FLUID THINNER

Bharat Patel, Tulsa, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 2, 1988, Ser. No. 162,835

Int. Cl.[4] C09K *7/02*

U.S. Cl. 252—8.514 **10 Claims**

1. A drilling fluid additive comprising a mixture of: (a) a sulfoalkylated tannin and (b) chromium acetate selected from the group consisting of chromium (III) acetate and chromium (II) acetate, wherein said chromium acetate is present in a weight ratio of said chromium acetate to said sulfoalkylated tannin in the range of from about 1:20 to about 1:1.

4,842,771

THICKENED AQUEOUS CLEANING COMPOSITIONS

Hans Rörig, Merzenich, and Norbert Porta, Nörvenich, both of Fed. Rep. of Germany, assignors to Akzo N.V., Arnhem, Netherlands

Filed Sep. 29, 1987, Ser. No. 102,333

Claims priority, application European Pat. Off., Sep. 29, 1986, 86201667.2

Int. Cl.[4] C11D *1/75, 3/395*

U.S. Cl. 252—547 **10 Claims**

1. A thickened aqueous single phase cleaning composition comprising:

a. from 0.1% to 10% by weight of a surfactant selected from the group consisting of (1) quaternary ammonium compounds wherein at least one of the hydrocarbon groups linked to nitrogen is a linear or branched alkyl group containing at least 12 carbon atoms being saturated or unsaturated and wherein two or three of the groups linked to the nitrogen are independently unsubstituted or substituted alkyl groups which contain 1 to 6 carbon atoms and wherein one or more said alkyl groups may contain an aryl substituent or may be replaced by an aryl group and wherein an anion may be present such as halide, acetate, methosulphate and the like, and (2) tertiary amine oxides wherein at least one of the hydrocarbon groups linked to nitrogen is a linear or a branched alkyl group containing at least 16 carbon atoms being saturated or unsaturated and wherein two of the groups linked to the nitrogen are independently unsubstituted or substituted alkyl groups which contain 1–6 carbon atoms and wherein one or more said alkyl groups may contain an aryl substituent or may be replaced by an aryl group,

b. from 0.01% to 3% by weight of an organic anionic sulphonate selected from the group consisting of cumene sulphonate, xylene sulphonate, and toluene sulphonate in their acid or salt form and mixtures thereof,

c. from 1 to 15% by weight of an acid, and

d. water, wherein one or more cleaning, disinfecting and/or odorizing agents may be dissolved or dispersed, the percentage by weight being calculated on the weight of the total aqueous composition, and the pH of said composition being from 0 to 6.

4,842,772

FIRE RETARDANT PIGMENT

Withiam Michael C., Elkton, Md., assignor to J. M. Huber Corporation, Rumson, N.J.

Filed Jun. 1, 1987, Ser. No. 56,464

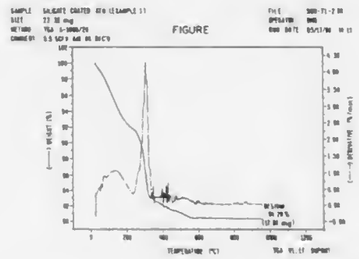
Int. Cl.[4] C09K *21/00;* **D06P** *5/00;* **B05D** *3/02;* **B32B** *9/04*

U.S. Cl. 252—601 **16 Claims**

1. An uncalcined pigment composition having high opacity,

brightness and reinforcing and fire-retardant characteristics, consisting essentially of

finely divided alumina trihydrate particles having coated thereon a synthetic silicate selected from the group consisting of alkali metal silicates, alkaline earth metal silicates, alkali metal alumino silicates, alkaline earth metal alumino silicates and alkaline earth metal-alkali metal alumino silicates, wherein the alumina trihydrate particles are entrapped within particles of the synthetic silicate so as to be coated with the synthetic silicate in intimate relationship.



4,842,773

METHOD OF PRODUCING A SOLID PRODUCT CONTAINING CEMENT FOR STORING TRITIUM WATER IN AN ACCESSIBLE TERMINAL STORAGE FACILITY

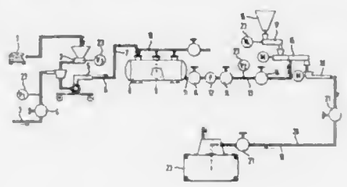
Willfried Kunz, Garbsen; Winfried Gramatte, Wölfersheim; Rolf-Erhard Schmitt, Nackenheim, and Udo Pohl, Hofheim, all of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH and Hanover Battelle Institut E.V., Frankfurt, both of, Fed. Rep. of Germany

Filed Dec. 14, 1987, Ser. No. 132,412

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1986, 3642975

Int. Cl.[4] G21F *9/16, 9/02;* **C04B** *7/02*

U.S. Cl. 252—628 **22 Claims**



1. A method of producing a solid product containing cement for terminally storing tritium water, the method comprising the steps of:

feeding tritium water and chemically activated bentonite capable of swelling to a dispersion pump wherein high shearing forces are developed;

applying high shearing forces to said tritium water and activated bentonite to dispersingly mix said tritium water and said bentonite in said dispersion pump to break up the grain aggregate of said bentonite and obtain a suspension of tritium water and bentonite;

subjecting said suspension of tritium water and bentonite to a swelling operation; and,

admixing cement with the swollen suspension.

4,842,774

PYRAMIDING TUMULI WASTE DISPOSAL SITE AND METHOD OF CONSTRUCTION THEREOF

Martin P. Golden, Hamburg, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 7, 1987, Ser. No. 83,756

Int. Cl.[4] G21F *9/12, 9/24, 5/00;* **B09B** *1/00*

U.S. Cl. 252—633 **26 Claims**

24. A method of constructing a site for the above-ground disposal of radioactive wastes, comprising the steps of

a. constructing a deformable floor for a first tumulus that includes a deformable layer of water-shedding material;

b. constructing a shield wall means on said floor capable of blocking radiation from said wastes;

c. depositing an array of packages containing radioactive wastes over said floor and behind said shield wall;

d. constructing a deformable roof over the array of waste packages which includes a deformable layer of water-shedding material, and an intrusion barrier beneath the deformable layer of water-shedding material, said barrier being constructed by overlaying the array of waste packages with a plurality of flexibly interlocking structures;

e. constructing a second tumulus in accordance with steps a-d which is close enough to the first tumulus so that the deformable layers in the roofs of the first and second tumuli adjoin one another; and

f. constructing a third tumulus over the roofs of the first and second tumuli in accordance with steps a-d wherein the mutually adjoining, deformable layers of water-shedding material in said roofs provide the deformable layer of water-shedding material of the floor of the third tumulus.

4,842,775

REDUCTION OF CARBOXYLIC ESTERS

Taiti Okada, Kyoto, and Yasuaki Abe, Takarazuka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 26, 1988, Ser. No. 186,297

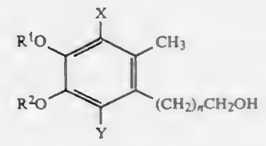
Claims priority, application Japan, Apr. 27, 1987, 62-105795; Apr. 29, 1987, 62-105744

Int. Cl.[4] C07C *50/28*

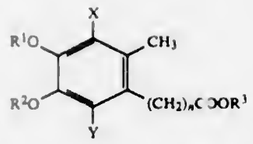
U.S. Cl. 260—396 R **6 Claims**

I. A method for producing a compound of the formula:

(II)



wherein R^1 and R^2 each stand for a lower alkyl group; n denotes an integer of 0 to 21; X stands for a hydrogen atom or an optionally protected hydroxyl group; and Y stands for an optionally protected hydroxyl group, which comprises reducing an ester compound of the formula:



(I)

wherein R^1, R^2, n, X and Y each has the same meaning as defined above, and R^3 stands for a lower alkyl group, with a mixture of sodium borohydride and aluminum chloride in the presence of water.

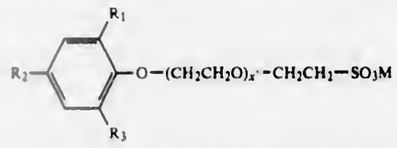
4,842,776

STYRYLARYLOXY ETHER SULFONATES, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN THE RECOVERY OF CRUDE OIL

Manfred Schmidt, Kelkheim; Walter Rupp; Gerhart Schneider, both of Königstein, and Eva M. Kohn Bad Soden am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 22, 1987, Ser. No. 112,560
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1986, 3636277
Int. Cl.[4] C07C *143/29*
U.S. Cl. 260—512 C 2 Claims

1. A styrylaryloxy ether sulfonate of the formula



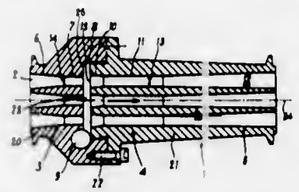
in which either R_1 denotes styryl and simultaneously R_2 and R_3 are identical or different and denote hydrogen or styryl, or R_1 and R_2 are nonidentical and each denote methyl or styryl and simultaneously R_3 denotes hydrogen or styryl, a denotes a number from 2 to 20, and M denotes an ammonium or alkali metal cation.

4,842,777

PRESSURIZED MIXING INJECTOR

Jean-Pierre Lamort, Vitry Le Francois, France, assignor to E & M Lamort, France and Feldmuhle AG, Fed. Rep. of Germany

Filed Aug. 1, 1988, Ser. No. 226,638
Claims priority, application France, Aug. 7, 1987, 87 11273
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—79.2 9 Claims



1. Liquid-air mixing device of the pressurized injector type comprising a feed for liquid under pressure, a feed for air at atmospheric pressure, at least one injection tube, each tube comprising successively a converging inlet conduit, an aeration space, a cylindrical mixing conduit, and a diverging conical outlet and draft conduit, characterized in that in combination:

the aeration space (8) is planar and perpendicular to the longitudinal axis (24) of the injector, and it is limited by the walls (25) of a cylindrical chamber of an axis parallel to said axis of the injector, and fed tangentially so as to form a current of air rotating in the chamber;

the diameter (13) of the mixing conduit (11) is constant and slightly greater than the diameter (14) of the inlet conduit (7);

the length of the mixing conduit (11) is much greater than its diameter (13), of the order of 4 to 9 times;

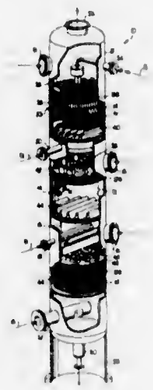
the length of the outlet conduit (5) is at least equal to that of the mixing conduit (11) and the opening angle alpha of the cone is of the order of 1° to 3°.

4,842,778

APPARATUS FOR FLOW DISTRIBUTION IN PACKED TOWERS

Gilbert Chen, Farmers Branch, Tex.; Timothy L. Holmes, Sparta, N.J.; Augusto Mastrodomenico, Rome, Italy, and Michael J. Binkley, DeSoto, Tex., assignors to Glitsch, Inc., Dallas, Tex.

Continuation of Ser. No. 812,704, Dec. 23, 1985, abandoned.
This application Nov. 23, 1987, Ser. No. 123,811
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—97 4 Claims



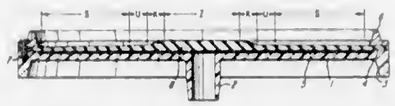
1. A process column of the type facilitating enhanced interaction of vapor and liquid passing in counter-current flow therethrough and being constructed of a vessel having a liquid inlet and a vapor outlet in an upper region thereof and a liquid outlet and a vapor inlet in a lower region thereof for facilitating the counter-current flow of said liquid and vapor therethrough, with dispersion means for dispersing said liquid in said vessel and column packing means disposed within said vessel for passage of said liquid and vapor therethrough for the enhanced interaction therebetween, and wherein said column packing means includes a plurality of packing sections, at least a portion of said packing sections being structured packing of established height, and comprising an improved flow distribution packing for enhancing even distribution of liquid downwardly through said column packing, said flow distribution packing being positioned below said liquid dispersion means and above at least one of said column packing means, said flow distribution packing further comprising a plurality of relatively thin layers of corrugated sheets angularly oriented one to the other for lateral bi-directional dispersion and relatively full distribution of said liquid passing therethrough, and wherein said sections of corrugated sheets forming said flow distributor packing have a combined height of between one-half and one-third of the height of said structured packing section.

4,842,779

DEVICE FOR AERATING WATER

Sebastian Jäger, Burgdorf, Fed. Rep. of Germany, assignor to Arnold Jäger, Burgdorf, Fed. Rep. of Germany

Filed Mar. 31, 1988, Ser. No. 175,528
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1987, 3710910[U]
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—122 5 Claims



1. In a device for aerating water, with said device including a rigid, essentially planar support member and a plate of elastomeric material, such as rubber or rubber-like synthetic material, with said plate being disposed on said support member and being provided with fine slits for the release of air, whereby said support member is provided with one or more connectors for receiving air and supplying same to between said support member and said plate, and whereby the rim of said plate is connected in an airtight manner to said support member, the improvement wherein:

said plate has a central portion, and an outer portion that is disposed between said central portion and said rim of said plate, with said central portion having a thickness that is greater than the thickness of said outer portion, and

the thickness of said plate decreases gradually in a direction toward said rim of said plate,

the thickness of said central portion of said plate being approximately two to four times greater than the thickness of said outer portion of said plate, and

said central portion of said plate is not provided with any of said slits,

said one or more connectors of said support member are covered by said central portion of said plate,

said central portion of said plate includes a center region, of approximately uniform thickness, adjoined by a conical zone that merges with said outer portin of said plate, and

the thickness of said outer portion of said plate decreases slightly in a direction toward said rim of said plate,

the thickness of said outer portion decreases from approximately 3 mm to approximately 2 mm.

4,842,780

SYSTEM FOR PREPARING GROUND-IMPREGNATING MATERIAL

Shunsuke Shimada, and Takeshi Sato, both of Tokyo, Japan, assignors to Kyokado Engineering Co., Ltd. and Sanshin Corporation, both of Tokyo, Japan

Filed Aug. 14, 1987, Ser. No. 86,107
Claims priority, application Japan, Sep. 25, 1986, 61-227835
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—64.3 4 Claims

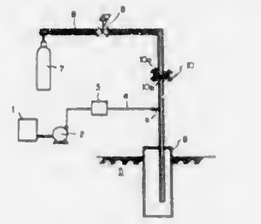
1. A system for preparing a ground impregnating material, comprising a

feed line for feeding a base liquid component of the ground impregnating material,

a carbon dioxide gas delivery line, and

gas means for supplying carbon dioxide gas at a predetermined pressure, said gas means including a high pressure carbon dioxide gas bomb and a pressure reduction valve connected to an outlet of the bomb, said valve being connected via said carbon dioxide gas delivery line to the base liquid component feed line, the carbon dioxide gas delivery line having a carbon dioxide blowing nozzle provided therein,

said carbon dioxide blowing nozzle comprising a disk centrally perforated with a nozzle bore which is sized to provide a substantially constant flow speed of carbon dioxide independent of back pressure over a predetermined region of back pressure, thereby to fill interstices in the earth with ground impregnating material.



4,842,781

COLORED POLARIZING FILM AND METHOD OF MAKING SAME

Tsutomu Nishizawa; Yasuyuki Yamada, both of Oomuta; Junichi Fujio, and Shin Hosonuma, both of Nagoya, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

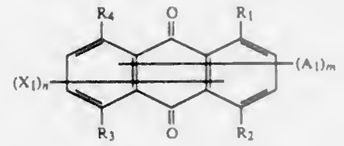
Division of Ser. No. 584,911, Feb. 29, 1984, abandoned. This application Jan. 11, 1988, Ser. No. 141,839
Int. Cl.[4] C09K *3/00*
U.S. Cl. 264—1.3 3 Claims

1. A method of making a polarizing film wherein a hydrophobic polymer is mixed with at least one water-soluble dichroic dye, melted, extruded, and formed into a homogeneously colored film followed by being stretched in one direction, characterized in that:

(a) said hydrophobic polymer is selected from the group consisting of polyvinyl chloride resins, polyamide resins and polyester resins, said polarizing film formed by said polymer being stretched in one direction; and

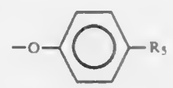
(b) said water insoluble dichroic dye has a structure represented by:

(I) the general formula (I):

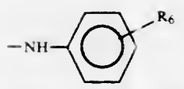


(I)

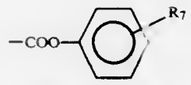
wherein R_1, R_2, R_3, and R_4 each independently is a hydrogen atom, an hydroxy group, a nitro group, a halogen atom or an amino group and at least one of the R_1, R_2, R_3, and R_4 radicals is an amino group or an hydroxy group, A_1, is an alkoxy group $—OCH_2CH_2OH$, $—OCH_2CH_2OOCCH_3$,



wherein R_5 is a hydrogen atom, an alkyl group having 1 to 9 carbon atoms, a halogen atom or $—OCH_3$, an alkylamino group,

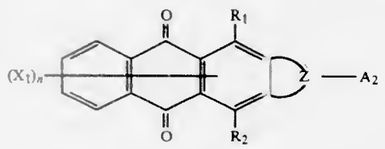


wherein R_6 is a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, or an alkoxy group having 1 to 9 carbon atoms, a phenyl group substituted with an alkoxy group of 1 to 15 carbon atoms, a hydroxy group, an alkoxycarbonyl group



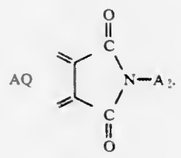
wherein R_7 is a hydrogen atom, or an alkyl group having 1 to 8 carbon atoms, or —CONHR$_8$ wherein R_8 is an alkyl group having 1 to 4 carbon atoms or a phenyl groupp, X_1 is a halogen atom or a cyano group, and m and n each independently is a whole number equal to 0, 1 or 2; or

(ii) the general formula (II):

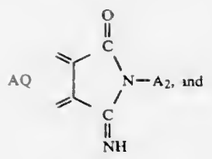


(II)

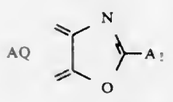
wherein R_1, R_2, X_1 and n have the same meanings as described for formula (I), Z is a five-membered ring of the one of the formulas:



(III)



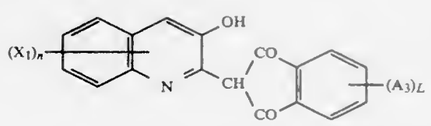
(IV)



(V)

which ring is fused to the anthraquinone nucleus (AQ), and A_2 is an alkyl group having 1 to 15 carbon atoms, a phenyl group, an alkylsubstituted phenyl group, an alkoxyalkyl group; or

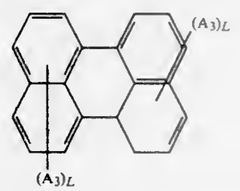
(iii) the general formula (VI):



(VI)

wherein X_1 and n have the same meanings as described for formula (I), A_3 is a hydrogen atom, a halogen atom, an alkoxycarbonyl group, an unsubstituted phenoxycarbonyl group or a substituted phenoxycarbonyl group, and L is a whole number equal to 1 or 2; or

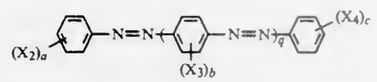
(iv) the general formula (VII):



(VII)

wherein A_3, and L have the same meanings as described for formula (VI); or

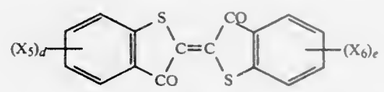
(v) the general formula (VIII)



(VIII)

wherein X_2 is a hydrogen atom, a halogen atom, a nitro group, a lower alkyl group, a lower alkoxy group or a cyano group, X_3 is a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group or a cyano group, X_4 is a hydrogen atom, a hydroxy group, a lower alkoxy group, an amino group or a di(lower alkyl) amino group, a, b and c each independently is a whole number equal to 1, 2 or 3, and q is a whole number to 0, 1 or 2; or

(vi) the general formula (IX):



(IX)

wherein X_5 and X_6 each independently is a hydrogen atom, a halogen atom, a methyl group, an ethyl group or an alkoxycarbonyl group, and d and e each independently is a whole number equal to 1, 2 or 3; and

(c) said polarizing film has a degree of polarization of about 60 or greater.

4,842,782

MANUFACTURE OF OPHTHALMIC LENSES BY EXCIMER LASER

Valdemar Portney, Irvine, and Albert C. Ting, Laguna Niguel, both of Calif., assignors to Allergan, Inc., Irvine, Calif.

Filed Oct. 14, 1986, Ser. No. 919,206
Int. Cl.[4] B29D *11/00;* **B23K** *26/06;* **C03B** *23/00*
U.S. Cl. 264—1.4 **34 Claims**

1. A method of making small objects from a blank of ablatable material, comprising the steps of:

cutting a workpiece from said blank by exposing said blank to laser light in the outline of said workpiece without focusing the laser light at the workpiece;

exposing the surface of said workpiece to laser light through a mask having areas transmitting said light in varying degrees; and

beveling the edges of said workpiece by exposing them to an inclined beam of laser light.

31. A method comprising:

directing laser energy through a mask without focusing the laser energy at the mask and with the mask having variable reflective characteristics to the laser energy to provide a first laser beam of variable energy across its width; and

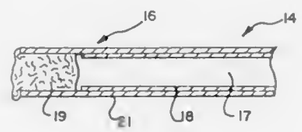
directing the laser beam of variable energy against a surface of a workpiece for a sufficient time to remove material from multiple locations on the surface of the workpiece in accordance with said characteristics with more of the material being removed at one of the locations than is removed at another of the locations.

4,842,783

METHOD OF PRODUCING FIBER OPTIC CHEMICAL SENSORS INCORPORATING PHOTOCROSSLINKED POLYMER GELS

Mark E. Blaylock, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Sep. 3, 1987, Ser. No. 92,645
Int. Cl.[4] G02B *6/02;* **B29D** *11/00*
U.S. Cl. 264—1.4 **10 Claims**



1. A method for making a fiber optic chemical sensor for monitoring at least one parameter of a fluid, comprising:

preparing a photocrosslinkable gel-forming polymer composition including a photopolymer component that crosslinks when subjected to actinic radiation and a solvent within which said photopolymer component is soluble;

contacting said photocrosslinkable polymer composition with a portion of an optical fiber waveguide in order that the photocrosslinkable polymer composition adheres to the optical fiber waveguide;

subjecting said photocrosslinkable polymer composition to actinic radiation while said composition is adhered to the portion of the optical fiber waveguide to thereby photocrosslink said composition into a photocrosslinked polymeric gel member of said optical fiber; and

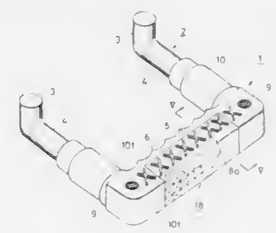
absorbing a dye component into said photocrosslinked polymeric gel member, said dye component being responsive to a parameter of a fluid to be monitored.

4,842,784

METHOD OF MANUFACTURING A CLIMBING STEP WITH EMBEDDED REFLECTION PLATE

Eizo Takahashi, Soka, Japan, assignor to Miyama Kogyo Kabushiki Kaisha, Saitama, Japan

Division of Ser. No. 76,071, Jul. 21, 1987, Pat. No. 4,778,032.
This application Jul. 26, 1988, Ser. No. 224,314
Claims priority, application Japan, Jul. 30, 1986, 61-116926
Int. Cl.[4] B29C *41/20, 45/16, 65/02*
U.S. Cl. 264—1.9 **2 Claims**



1. A method of manufacturing a reflective climbing step comprising a metal core member having a pair of leg members and a tread portion between said pair leg members and a transparent reflective plate embedded in a layer of synthetic resin coating at least the tread portion and portions of the leg members, said method comprising the steps of:

providing the metal core member and the transparent plastic reflective plate having a smooth upper surface and an undersurface formed with prism-like rugged portions;

setting said metal core member and said plastic reflective plate in a cavity in a set of metal molds, said cavity generally corresponding to the shape of said core member, and locating the undersurface of the reflective plate adjacent said tread portion of said metal core member and the upper surface of the reflective plate adjacent protrusion-defining portions of said metal molds;

injecting melted synethetic resin into said cavity of said set of metal molds and between said reflective plate and said tread portion thereby coating said portions of said core member in said mold cavity; and

during said injection, pressing said plate against said protrusion-defining portions of said metal molds and softening said plate with heat evolved during injection of said melted synthetic resin, thereby forming non-slip protrusions on the upper surface of said reflective plate.

4,842,785

METHOD FOR INSTALLING GASKET IN A POURED CONCRETE STRUCTURE

Clement Daigle, Saint-Jean Chrysostome, and Emile Gonthier, St.-Henri, Cte Levis, both of Canada, assignors to Les Industries Fortier Ltee, Canada

Division of Ser. No. 777,613, Sep. 19, 1985, Pat. No. 4,693,482.
This application Jun. 9, 1987, Ser. No. 60,060
Int. Cl.[4] B28B *1/16;* **B29C** *39/10;* **E04B** *1/16*
U.S. Cl. 269—35 **9 Claims**

1. A method of installing a gasket having a first exposed pipe-engaging portion and a second portion which is anchored within a peripheral wall of an opening in a poured-in-place concrete wall, said method comprising the steps of:

(i) erecting a form including an inner wall and an outer wall to define said poured-in-place concrete wall, said outer wall of said form having an opening in the region where said opening in said poured-in-place concrete wall is to be;

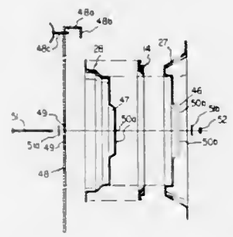
(ii) providing an assembly of:

(a) an inner mold disc having a central aperture, an inner peripheral rim and a radially outwardly extending flange,

(b) said gasket, with one face of said first portion thereof abutting said inner peripheral rim of said inner mold disc and with its second portion extending radially outwardly, and

(c) an outer mold disc having a central aperture, an inner flange abutting a second face of said first portion of said gasket, and an outer rim, such that said inner mold disc and said outer mold disc are assembled together about said gasket with their central apertures being aligned;

(iii) suspending said assembly at a desired predetermined location between said inner and outer walls, where said opening in said poured-in-place concrete wall is to be, by means of a depending fixing bar, said fixing bar having an upper crown adapted to rest atop said outer wall of said form and a plurality of spaced apart apertures therein, said suspending being by resting said crown atop said outer



wall of said form and by positioning said assembly at said desired predetermined location by passing bolt means through said aligned central apertures in said inner and outer mold discs and through a selected aperture in said fixing bar, said selected aperture also being aligned with said central apertures in said inner and outer mold discs, and securing said bolt means in place;

(iv) in-filling the space between said inner and outer walls of said form with settable concrete material, so as to anchor said second portion of said gasket in said settable concrete material; and

(v) after setting of said settable concrete material, removing said form and said inner and outer mold discs, so as to leave said first, exposed pipe-engaging portion of said gasket which is not embedded in said set concrete material projecting into said opening intended to receive a pipe.

4,842,786

METHOD FOR PRODUCING AN EMBOSSED GYPSUM PANEL

William E. Betzner, St. Petersburg, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Division of Ser. No. 911,932, Sep. 26, 1986, Pat. No. 4,781,558. This application Oct. 3, 1988, Ser. No. 252,327

Int. Cl.[4] B28B *3/12, 11/14;* B29C *43/44, 47/00*

U.S. Cl. 264—40.1 2 Claims

1. A process for making an embossed gypsum panel having a predetermined pattern comprising the steps of making a settable gypsum slurry, conveying said slurry toward an embossing means, leveling the surface of said slurry ahead of said embossing means, continuously determining the degree to which said gypsum slurry has set while said slurry is conveyed toward said embossing means, and thereby continuously determining an optimum location for embossing said slurry along the conveyor, said optimum locating having an optimum degree of set for embossing said slurry, and then moving said embossing means along the length of said conveyor to said determined optimum location for embossing said slurry, and embossing a pattern into said surface of said slurry at said determined optimum location for embossing, and cutting and drying said embossed slurry, such that when said optimum location having said optimum degree of set for embossing said slurry changes along said length of said conveyor, said embossing means is moved up or down said length of said conveyor in response to said changes in said optimum location.

4,842,787

HIGH SPEED PROCESS FOR PRODUCTION OF ORIENTED STRUCTURAL YARN/POLYMER MATRIX COMPOSITE STRUCTURAL PARTS

Henry L. Chess, Jr., Bloomington; Roger A. Engdahl, St. Paul, and James A. Wedin, Minnetonka, all of Minn., assignors to Xerkon, Inc., Minneapolis, Minn.

Filed Dec. 22, 1986, Ser. No. 944,446

Int. Cl.[4] B29C *35/02, 43/56, 43/58, 43/10*

U.S. Cl. 264—40.6 10 Claims

9. A process for molding an oriented structural yarn/polymer matrix composite part comprised of at least one layer of oriented structural yarns in a polymer matrix, comprising:

providing an uncured preform comprised of oriented structural yarns saturated with a curable resin,

placing said article in a shape-defining mold which has been heated to a temperature sufficient to maintain said resin in a liquid state, said mold bearing internal heating means,

placing said mold in a pressurizable enclosure bearing an internally collapsable, fluid-impermeable liner therein, said liner lying between the interior of said enclosure and said mold,

collapsing said liner about said mold in a fashion so as to apply vacuum to the mold cavity and uniform pressure about said mold by evacuating the space between said mold and said liner,

pressurizing said enclosure,

activating said mold heating means to a temperature and for a time sufficient to cure said resin,

releasing the liner from said mold,

withdrawing the mold from the enclosure and allowing the part to cool under temperature conditions which prevent the part from being locked into the mold, and trimming said part to final dimension.

4,842,788

PROCESS OF AN APPARATUS FOR EXTRUDING A MELTABLE COMPOSITION

D. Emil Johnson, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 4, 1988, Ser. No. 140,443

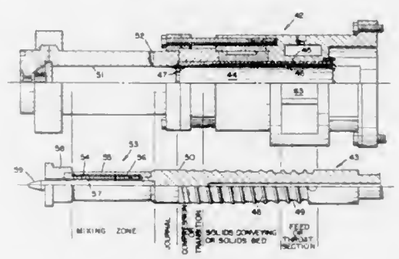
The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

Int. Cl.[4] B29C *35/00, 47/00, 47/60, 47/80*

U.S. Cl. 264—68 13 Claims

1. An apparatus for receiving and extruding solid meltable composition into a desired shape, comprising an elongate extrusion barrel containing an elongate extrusion screw having at least one helical screw flight forming a helical channel or channels, means for rotating said screw within said barrel, said barrel comprising a feed section which is open to receive a continuous supply of solid, meltable extrusion composition therein for engagement with the extrusion screw, a solids conveying section which is open to said feed section to receive solid extrusion composition moved axially thereto from the feed section by rotation of the screw, and a compression section which is open to said solids conveying section to receive solid extrusion composition moved axially thereto from the solids conveying section by rotation of the screw and to compress and melt the composition, said compression section being in communication with a downstream extrusion orifice to which the melted composition is advanced for extrusion in a desired shape, the feed and solids conveying sections of the barrel having an interior surface having a plurality of flat or slightly curved axial surfaces which extend somewhat tangentially relative to the flight of the extrusion screw and merge to form a plurality of axial grooves on the interior surface of the barrel, which grooves promote rotational compression of the composition therewithin by means of the extrusion screw to substantially prevent rotation of the packed composition while permitting axial movement of the packed composition by the screw into the compression section of the barrel, the channel or channels of the extrusion screw and the axial grooves of the extrusion barrel both diminishing within the compression section of the barrel so that both the screw and the barrel are substantially cylindrical at the downstream end of the compression section to provide a narrow annular slot therebetween for passage of the melted composition to the downstream extrusion orifice.

10. A method for the extrusion of an extrusion composition through a plastic extrusion apparatus having an elongate extrusion barrel containing an elongate extrusion screw rotatable



therewithin to move solid extrusion composition from a feed section of said barrel to and through a solids conveying section to a compression section for the melting thereof and to a downstream extrusion orifice for the extrusion of said melted composition, said method comprising providing said extrusion barrel with a plurality of flat or slightly curved axial surfaces which extend somewhat tangentially relative to the circumference of the screw, and which merge to form a plurality of axial grooves which extend through the feed section and the solids conveying section thereof and which disappear at the exit end of the compression section of the barrel, and providing said extrusion screw with at least one helical screw thread providing a helical screw channel or channels having a maximum depth in the area of the feed section of the barrel and a decreasing depth through the compression section of the barrel in which the channel or channels disappear(s), whereby solid extrusion composition introduced to the feed section of the barrel is packed by the screw channel into the axial barrel grooves to form a rotating-resistant mass which is moved axially by the screw to substantially fill the solids conveying and compression sections of the barrel, thereby increasing the dead head pressure exerted by the extrusion composition and increasing the output of said composition from the extrusion orifice.

4,842,789

PREPARATION OF HIGH-MODULUS, HIGH-STRENGTH LINEAR POLYCONDENSATES

Michail G. Evstatiev; Stoyko C. Fakirov, both of Sofia, Bulgaria, and Jerold M. Schultz, Newark, Del., assignors to University of Delaware, Newark, Del.

Filed Jun. 23, 1988, Ser. No. 210,263

Int. Cl.[4] B29C *55/00*

U.S. Cl. 264—101 5 Claims

1. The process for the preparation of high-modulus and high-strength linear polycondensates by increasing their orientation degree through drawing at room temperature characterized in that drawing is followed by isothermal annealing with fixed ends in vacuum or in an inert gas flow at a temperature of 180°–270° C. for 60 to 360 minutes, a second drawing at room temperature; and by a second isothermal annealing with fixed ends in vacuum or in an inert gas flow at a temperature of 120°–260° C. for 60 to 120 minutes, the overall orientation degree achieved after the second drawing being 20–25.

4,842,790

METHOD AND APPARATUS FOR PRODUCING HIGH-STRENGTH GRANNULAR PARTICULATES FROM LOW-STRENGTH PRILLS

Luther M. Nunnelly, Florence, Ala., assignor to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation-in-part of Ser. No. 158,977, Feb. 22, 1988, abandoned. This application Mar. 31, 1988, Ser. No. 176,056

Int. Cl.[4] B29B *9/10;* B05D *7/00;* B05C *5/00*

U.S. Cl. 264—117 6 Claims

1. In an improved process for granulation of materials wherein same is effected in an enclosed vessel by spraying particles of molten material onto rapidly moving granules of substrate such that said granules of substrate are increased in size by accretion as the sprayed particles solidify quickly on the surface of said substrate, said enclosed vessel comprising a rotating generally cylindrical drum equipped with lifting flights, the angle of the axis of which ranges upwards to about 3 degrees from the horizontal and said drum being equipped with deflector means, said deflector means comprising a plurality of deflector pans, said pans generally vertically displaced from one another wherein at least the top surface of each pan is substantially parallel with the axis of said drum; extends substantially throughout the length of said drum; is sloped downward at an angle of at least about 25 degrees with the horizontal in the direction toward the portion of the shell of said rotating drum moving in an upward direction and wherein at least said pan at the highest elevation therein is located horizontally above the axis of said drum and that portion, of each of said pans, juxtaposed its uppermost edge, with the exception of said pan at the highest elevation therein, subtends the lower edge of each succeeding pan thereabove, which improved process comprises:

(a) alternately causing at least a portion of said granules of substrate in said enclosed vessel to be generally vertically displaced upwardly, by means of said lifting flight, from a bed of rolling discrete particles generally maintained in the lowermost section of said drum and thereafter transferred in a succession of first cascades onto the top surface of at least said pan at the highest elevation in said drum and over substantially the full top surface thereof to effect movement thereover downwardly to the lower edge thereof wherefrom said particles free fall to the top surface of the next pan vertically disposed therebeneath and move thereover downwardly to the lower edge thereof and wherein the cycle of discharge of particles from the lower edge of a pan in free-fall mode to the top surface of the next pan vertically disposed therebeneath is repeated

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until said particles discharge from the lower edge of the lowermost pan comprising said deflector means and eventually free fall back to said bed, the successive free-fall modes of said particles from the lowermost edge of said pans comprising an interrupted curtain, or a succession of second cascades of particles, said second cascades, having a particle density substantially greater than the particle density of said first cascades formed by discharge of said particles from said lifting flights, with the angle of the fall line of said granules of substrate in the free fall portion of the descending attitude of said vertical displacement for eventual return to said bed ranging from about 90 degrees to the horizontal to about 5 degrees greater than the angle of repose of said granules of substrate;

(b) causing at least a portion of the air in said enclosed vessel to be utilized as cooling air and moved in a generally horizontal attitude in a manner so as to intersect said granules of substrate in a free-fall mode of their descending attitude of said vertical displacement, said generally horizontal movement of air being sufficient to at least partially penetrate at least one of said cascades of said free falling granules of substrate, with the contact angle between said air and the plane of the fall line of said at least one cascade ranging from between about −45 degrees to about +45 degrees from the direction perpendicular to the plane of said fall line; and

(c) causing at least a portion of said air in said enclosed vessel having intersected and at least partially penetrated said at least one cascade of said granules of said substrate therein to be displaced to exhaust means

the improvement in combination therewith for effecting substantially improved heat transfer between the granulated material in said enclosed vessel and the air introduced therein which comprises the additional steps of:

(1) confining the portion of said cooling air to be moved in step (b) supra within first manifold means and moving same therein generally parallel to the axis of said drum to effect introduction of same into said drum;

(2) subsequently effecting a change in the direction of said cooling air movement, from the perspective of the planer view thereof, in the range of from about 45 degrees to about 135 degrees from the direction of said cooling air movement in step (1) supra;

(3) subsequently causing said cooling air to move through a plurality of apertures, the total area of said apertures ranging from about 8 to about 15 times the cross-sectional area of said first manifold means with the points of origin of said cooling air exiting said apertures extending substantially throughout the length of said drum and generally defining a plane substantially parallel to the axis of said drum and angularly disposed between about −45 degrees to about +45 degrees from a vertical plane, said vertical plane substantially parallel to the axis of said drum;

(4) substantially confining said cooling air exiting said plurality of apertures within second manifold means, said second manifold means having, as one generally planner boundary thereof, said at least one second cascade, the confinement of said air by said second manifold means substantially;

(i) eliminating lateral short circuiting or by-passing of said at least one second cascade by said cooling air; and

(ii) intersecting said granules of substrate in a free-fall mode of their descending attitude of vertical displacement in a manner to thereby effect total penetration of said at least one second cascade with said confined cooling air; and

(5) removing said air to said exhaust means; said improved process for granulation characterized by the fact that the substantial elimination of lateral by-passing of particles comprising said at least one second cascade by said cooling air substantially increases the penetration thereof and enhances the cooling efficiency of said process to a degree such that adjustments to the enthalpy of the cooling air, subsequent to its penetration of said at least one second cascade for recycling of same for purposes of subsequent contact with particles subsequently comprising said at least one second cascade, is substantially eliminated.

5. In a granulating device including a rotary cylindrical drum having open ends and a length at least equal to its diameter, said drum disposed with its axis generally in about a horizontal attitude; a plurality of generally equally spaced lifting flights located on the inner peripheral surface of said drum and extending generally inwardly toward the axis thereof, two retaining rings singly disposed at the ends of said drum; liquid distributing means generally located in that lower quadrant, when viwed in a plane perpendicular to the axis of said drum, into which a point located at the bottommost position on said inner peripheral surface of said drum would next enter; said distributing means being substantially equal to the length of said drum between said retaining rings and generally disposed within said drum parallel to the axis thereof, means for passing a current of air through said drum; deflector means rigidly supported by support means located outside the confines of said drum; said deflector means positioned within the confines of said drum and being of a length substantially equal to the length of said drum between said retaining rings and in a plane substantially parallel with the axis of said drum; the uppermost portion of said deflector means, along the width thereof, being generally horizontally inclined upwardly from that first upper quadrant 90 degrees removed from said lower quadrant and into that second upper quadrant which is 180 degrees removed from said lower quadrant, the width of said deflector means being predetermined to allow for rotation of said drum and lifting flights thereover, said deflector means having a discharge aperture along the lower edge thereof generally parallel to the axis of said drum, said deflector means comprising a plurality of deflector pans, said pans generally vertically displaced from one another wherein at least the top surface of each pan is substantially parallel with the axle of said drum; extends substantially throughout the length of said drum; is sloped downward at an angle of at least about 25 degrees with the horizontal in the direction toward the portion of the shell of said rotating drum moving in an upward direction and wherein at least said pan at the highest elevation therein is located horizontally above the axis of said drum and that portion, of each of said pans, juxtaposed its uppermost edge, with the exception of said pan at the highest elevation therein, subtends the lower edge of each succeeding pan thereabove, the improvement in combination therewith which comprises:

(a) first manifold means in parallel alignment with the axis of said drum and disposed through an open end thereof and having a plurality of apertures on one side thereof, said apertures generally defining a plane parallel to the axis of said drum and angularly disposed upwards to about 45 degrees from a vertical plane parallel with and intersecting said axis, the length of said plane defined by said apertures being disposed within the confines of said drum and substantially equal to the inner dimensional length of said drum and the total area of said apertures ranging from about 8 to about 15 times the cross-sectional area of said first manifold means;

(b) said first manifold means being juxtaposed at least two said generally vertically displaced and adjacent pans and being in sealed relationship therewith; and

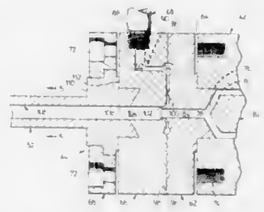
(c) second manifold means juxtaposed said first manifold means and disposed between said at least two generally vertically displaced and adjacent pans to which said first manifold means is in sealed relationship, said second manifold means being in sealed relationship with said first manifold means and said at least two generally vertically displaced and adjacent pans and having as the first boundary thereof a cascade a particles free falling through the area defined by said first boundary, said first boundary defined at the upper edge thereof by the lower edge of the higher elevated pan and at the bottom edge thereof by that portion near the lower edge of the lowest most elevated pan which subtends said higher elevated pan of said at least two generally vertically displaced and adjacent pans.

4,842,791

EXTRUSION APPARATUS AND PROCESS FOR PRODUCTION OF MULTILAYER FILM CONTAINING AN INNER BARRIER LAYER

Gordon E. Gould, and Robert A. Loecke, both of Newark, Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 30, 1987, Ser. No. 67,847
Int. Cl.[4] B29C *47/06*
U.S. Cl. 264—171 18 Claims



I. In a process for coextruding a multilayer film having a thermally degradable core material, a method for reducing carbonization of said thermally degradable core material comprising:

extruding a core extrudate of thermally degradable core material with a core extruder,

providing a preencapsulation means adjacent the outlet of said core extruder and a transfer tube downstream of said preencapsulated means,

extruding a preencapsular extrudate of preencapsular material and directing said preencapsular extrudate to said preencapsulation means,

joining together said core extrudate and said preencapsular extrudate in said preencapsulation means in a coaxial relation wherein said preencapsular extrudate is disposed radially outwardly of said core extrudate to form a preencapsulated core extrudate, and

directing said preencapsulated core extrudate through said transfer tube to a feed block

extruding an outer layer extrudate and transferring said outer layer extrudate to said feed block,

extruding a glue extrudate and transferring said glue extrudate to said feed block,

joining together in said feed block, said outer layer extrudate, said glue extrudate, and said preencapsulated core extrudate, and

feeding said joined extrudates through a coextrusion die to form a multilayer film having said outer layer extrudate disposed at the upper and lower surfaces of said multilayer film, said glue extrudate disposed interiorly of said outer layer extrudate, said preencapsular extrudate disposed interiorly of said glue extrudate and said core extrudate disposed interiorly of said glue extrudate.

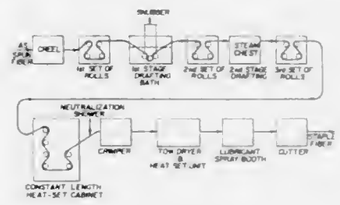
2. The process of claim 1 wherein said preencapsular extrudate is a polymeric material not generally susceptible to thermal degradation during the extrusion process.

4,842,792

DRAFTING PROCESS FOR PREPARING A MODIFIED POLYESTER FIBER

Shriram Bagrodia, Kingsport, and Bobby M. Phillips, Jonesborough, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 16, 1988, Ser. No. 157,551
Int. Cl.[4] D01D *5/253;* D01F *11/08*
U.S. Cl. 264—130 17 Claims



1. A drafting process for preparing a modified polyester fiber comprising:

hydrolyzing and drafting an unhydrolyzed polyester fiber having formed therein and extending along the length thereof at least one continuous groove,

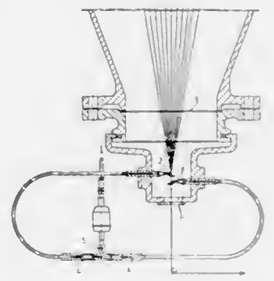
wherein the cross-section of said fiber has at least one groove such that 0.15 - W/H - 8.0 where W is width of the groove and H is height of the groove; said hydrolyzing occurring to the extent necessary to modify said polyester fiber such that the mean EB Roughness at the bottom of said groove is about 10% to about 600% higher than the mean EB Roughness outside said groove.

4,842,793

PROCESS FOR WETTING THREAD BUNDLES WITH LIQUIDS

Ulrich Reinehr; Rolf-Burkhard Hirsch; Joachim Dross, and Hermann-Josef Jungverdorben, all of Dormagen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 851,064, Apr. 11, 1986, Pat. No. 4,714,045.
This application Sep. 9, 1987, Ser. No. 94,966
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1985, 3515091
Int. Cl.[4] D01D *5/12, 11/06*
U.S. Cl. 264—136 7 Claims



1. In a process for evenly applying a preparation liquid on a thread bundle which has been obtained from a spinnning solution according to a dry spinning process, including transporting the thread bundle downwardly with a liquid by releasing the liquid from a storage container, the improvement wherein the step of releasing the liquid comprises transporting the

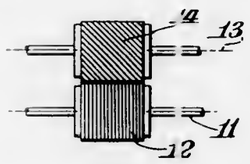
liquid through at least two slotted nozzles positioned one above the other and opposite each other and each having a horizontal slot and rods attached at slot ends, which, seen from above, form an angle with the slot of from 100° to 170°.

4,842,794

METHOD OF MAKING APERTURED FILMS AND NET LIKE FABRICS

Edward E. Hovis, Newark, and Eric D. Johnson, Wilmington, both of Del., assignors to Applied Extrusion Technologies, Inc., Middletown, Del.

Filed Jul. 30, 1987, Ser. No. 79,502
Int. Cl.⁴ B29D *28/00*; B29C *47/88*
U.S. Cl. 264—145 **23 Claims**



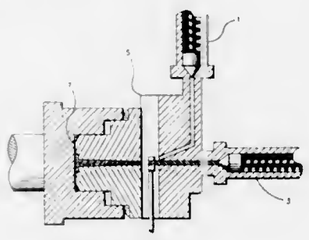
1. A process for the preparation of an apertured thermoplastic film comprising the steps of (a) extruding a molten thermoplastic polymer film between 0.5 and 20 mils thick; and (b) providing the extruded molten polymer film with a multiplicity of small slits by passing the film through the nip of two rollers engraved with patterns containing edges of lands such that the edges cross each other such that the angle formed by the crossing edges is between 15° and 75° with the slits being formed by the edges of the lands at their intersections cutting through the film and with the slits being arranged in patterns having from 10 to 150 slits per inch.

4,842,795

METHOD OF MAKING COINJECTION MOLDED DAISYWHEEL PRINTHEAD

Larry O. Anlick, Cynthiana, and Charles L. DeCoste Jr., Lexington, both of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 27, 1987, Ser. No. 78,324
Int. Cl.⁴ B29C *45/16*
U.S. Cl. 264—155 **12 Claims**



1. A process for manufacturing a print element having a central hub and flexible spokes attached to the hub, each of said spokes having an outer end, with said outer end of said spokes having raised regions forming symbols for impact printing, comprising forming said element by conjection molding including injecting into a mold of said element a first material to form an outer layer of said element resistant to flexural fatigue during impact printing in an amount not reaching said symbols and separately injecting into said mold a second material to form a core of said element and to extend past said first material to form all of said outer ends having impact resistance during impact printing by said raised regions.

4,842,796

PROCESS FOR PRODUCING HIGH STRENGTH POLYMETAPHENYLENE ISOPHTHALAMIDE FIBER

Hideo Matsui, and Hiroshi Fujie, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 937,341, Dec. 3, 1986, abandoned. This application Dec. 11, 1987, Ser. No. 133,175
Claims priority, application Japan, Dec. 11, 1985, 60-276934
Int. Cl.⁴ D01F *6/60*; D01D *5/12, 10/06*
U.S. Cl. 264—184 **16 Claims**

1. A process for producing a high strength poly-m-phenylene isophthalamide fiber having a birefringence of from 0.18 to 0.22, a degree of crystallinity of from 45% to 55%, a crystalline size of from 35 to 45 angstroms, a tensile strength of 6.5 g/denier or more and a silk factor of 35 or more, comprising the steps of;

extruding a dope solution of an m-phenylene isophthalamide polymer containing at least 95 molar % of recurring m-phenylene isophthalamide units and having an intrinsic viscosity ([η]) of from 0.7 to 2.5, determined at a concentration of 0.5 g/100 ml in dehydrated N-methyl-2-pyrrolidone at a temperature of 30° C., in an organic solvent through a spinneret having at least one spinning orifice, into a coagulating liquid to form at least one undrawn polymer filament;

making a first adjustment of the content of the organic solvent in the undrawn filament to a level of from 15% to 30% based on the weight of the polymer in the filament;

carrying out a first wet drawing of the first organic solvent content-adjusted undrawn filament at a draw ratio of from 1.1 to 1.5 in at least one aqueous wet drawing bath;

making a second adjustment of the content of the organic solvent in the filament to a level of less than 15% based on the weight of the polymer in the filament;

carrying out a second wet drawing of the second organic solvent content-adjusted filament at a draw ratio of 1.1 or more in at least one aqueous wet drawing bath;

drying the second wet drawn filament; and

dry drawing the dried filament to an extent such that the entire draw ratio in the first and second wet drawing and dry drawing operations is in the range of from 4.0 to 7.0.

4,842,797

PROCESS FOR PRODUCING SHAPED POLYAMIDE ARTICLES

Shunichi Matsumura, and Hiroo Inata, both of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 18, 1987, Ser. No. 86,585
Claims priority, application Japan, Aug. 21, 1986, 61-194060; Nov. 17, 1986, 61-271943
Int. Cl.⁴ D01F *1/02, 6/60, 11/04*
U.S. Cl. 264—203 **19 Claims**

1. A process for producing a shaped article of polyamide which comprises

(1) melt-shaping an intimate mixture of 100 parts by weight of a polyamide having hexamethylene terephthalamide as main recurring units and 20 to 500 parts by weight of an aromatic hydroxy compound, said aromatic hydroxy compound having a phenolic hydroxyl group and at least one electron attracting group selected from the group consisting of halogen atoms, a nitro group, halogenoalkyl groups, a carbonyl group and a sulfone group on a phenyl ring to which said hydroxyl group is bonded, and then

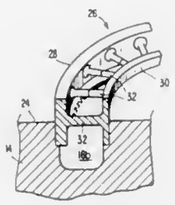
(2) removing the aromatic hydroxy compound from the resulting shaped article by extraction.

4,842,798

METHOD OF MOULDING RACQUETS WITH STRINGING HOLES

Jonathan C. Mott, Liss, England, assignor to Diversified Products Corporation, Opelika, Ala.

Filed Sep. 15, 1987, Ser. No. 96,336
Claims priority, application United Kingdom, Sep. 17, 1986, 8622368
Int. Cl.⁴ B29C *33/48, 45/14*
U.S. Cl. 264—219 **9 Claims**



1. A method of making a moulded racquet frame, the method comprising the steps of:

forming at least one ladder-shaped member of two separable parts with the ladder-shaped member having two side pieces and a plurality of rung pieces;

assembling the two separable parts to have the ladder-shaped member have the two side pieces interconnected by the rung pieces and the side pieces being curved in a plane containing the rung pieces to substantially confrom to the curved shape of at least a part of the frame of the racquet;

entrapping the assembled ladder-shaped member between two mould plates and thereby defining a mould cavity between the interior walls of the mould plates and interior walls of the side pieces of the ladder-shaped member, and defining an area for stringing holes with the rung pieces extending across the mould cavity;

injecting a plastic material into the mould cavity to mould a racquet frame between the interior walls of the mould plates and side pieces and with the stringing holes formed around the rung pieces;

removing the moulded racquet from the mould plates; and

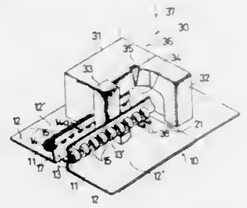
separating the two parts of the ladder-shaped member to remove the ladder-shaped member from the moulded racquet frame.

4,842,799

METHOD FOR INJECTION MOLDING END STOPS ON SLIDE FASTENER

Masahiro Kusayama, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Apr. 6, 1987, Ser. No. 34,931
Claims priority, application Japan, Apr. 7, 1986, 61-79571
Int. Cl.⁴ C29C *45/14*; B29D *5/00*
U.S. Cl. 264—265 **1 Claim**



1. A method of applying end stop members by injection molding to a slide fastener having a pair of stringer tapes, each carrying along its inner longitudinal edge a row of coupling elements, each of said coupling elements include a head and a heel portion and said inner longitudinal edge being folded relative to said tape, said method comprising:

(a) supporting the length of said folded inner longitudinal edge in a position substantially perpendicular to the plane of the tape by disposing said heel portion of at least one coupling element in a recess in a support pin prior to and during formation of an end stop;

(b) injecting an end stop forming material to flow in a direction opposite to the position in which said inner longitudinal edge is supported; and

(c) molding an end stop in place on a predetermined length of said inner longitudinal edge while maintaining alignment with its neighboring edge portion of the tape outside the end stop.

4,842,800

METHOD OF ENCAPSULATING ELECTRONIC DEVICES

Erik W. Walles, Rensselaer; James V. Crivello, Clifton Park, and John H. Lupinski, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 1, 1987, Ser. No. 103,153
Int. Cl.⁴ B29C *45/14*
U.S. Cl. 264—272.13 **7 Claims**

1. A method for making plastic encapsulated electronic devices capable of exceeding a 50% survival rate when subjected to a moisture-ladened environment at a temperature of about 130° C. for a period of at least 100 hours under highly accelerated stressed test conditions, which comprises encapsulating the electronic devices at a temperature of 120° to 230° C. at a pressure of 400 to 1500 psi, with a heat curable composition comprising by weight,

(A) 100 parts of an epoxy resin having less than 100 ppm of hydrolyzable chloride,

(B) 10 to 100 parts of fused silica filler,

(C) an amount of a compatible monomeric or polymeric onium salt catalyst as the diaryliodonium hexafluoroantimonate salt, which is sufficient to provide from about 0.01 to 100 mg. of antimony, per gram of epoxy and

(D) up to 100 mg. of copper as a compound cocatalyst for (C), per gram of antimony.

4,842,801

METHOD OF CONTROLLING SWITCHING FROM PRESSURE HOLDING TO METERING AND KNEADING

Masao Kamiguchi, Hooya, and Hiroshi Umemoto, Hino, both of Japan, assignors to Fanac Ltd, Minamitsuru, Japan

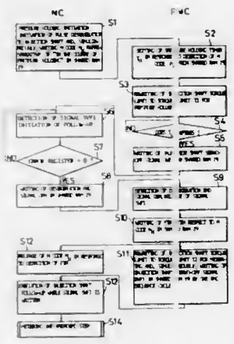
PCT No. PCT/JP87/00541, § 371 Date Feb. 10, 1988, § 102(e) Date Feb. 10, 1988, PCT Pub. No. WO88/00518, PCT Pub. Date Jan. 28, 1988

PCT Filed Jul. 24, 1987, Ser. No. 175,000

Claims priority, application Japan, Jul. 24, 1986, 61-172823

Int. Cl.[4] B29C *45/76*

U.S. Cl. 264—40.1 2 Claims



1. A method of controlling switching of an injection molding machine from pressure holding to metering and kneading in the injection molding machine employing a servomotor as an injection shaft driving source for axially driving a screw and driving said the servomotor through a servo circuit having an error register to apply a back pressure during injection, during pressure holding and during metering and kneading, comprising the steps of:

(a) reducing an error amount accumulated within the error register at completion of a pressure holding step, to a predetermined value so that the error register does not overflow.

(b) switching a torque limit for the servomotor, from a set value for the pressure holding to a set value for the metering and kneading;

(c) reducing an error amount within the error register caused by step (b) to a value equal to or lower than said predetermined value over a predetermined period of time from the time of execution of said switching; and then

(d) transferring to a metering and kneading step.

4,842,802

METHOD FOR PRODUCING A HOLLOW VESSEL HAVING OUTER ANNULAR PROJECTIONS

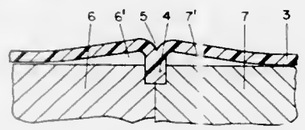
Dietmar Przytulla, Kerpen, Fed. Rep. of Germany, assignor to Mauser-Werke GmbH, Brühl, Fed. Rep. of Germany

Filed Oct. 17, 1988, Ser. No. 258,546

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3732898

Int. Cl.[4] B29C *49/18, 49/30*

U.S. Cl. 264—530 5 Claims



3. A method for producing a hollow vessel having an outer wall with at least one annular projection integrally formed from the wall and encircling the vessel, comprising the steps of:

(a) blow molding a hollow intermediate vessel comprising an annular projection and side walls on each side of and adjacent said annular projection which taper inwardly toward a center of said hollow intermediate vessel; and,

(b) blow molding the intermediate vessel to an intended final shape while fixing the annular projection to prevent its increase in diameter and while allowing said inwardly tapering side walls to expand outwardly from said center of said hollow intermediate vessel and thereby forming said intended final shape hollow vessel having a smooth wall surface.

4,842,803

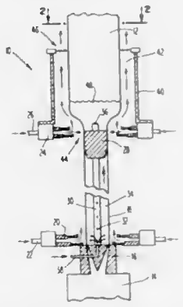
METHOD AND APPARATUS FOR EXTRUDING BLOWN THERMOPLASTIC FILM TUBES

Ajit K. Bose, Lawrenceville; Kurt F. Strater, and Kenneth S. Geick, both of Trenton, all of N.J., assignors to Union Camp Corporation, Wayne, N.J.

Filed Mar. 25, 1988, Ser. No. 173,692

Int. Cl.[4] B29C *47/88*

U.S. Cl. 264—565 11 Claims



1. Apparatus for extruding a tubular film of a thermoplastic, polymeric resin, which comprises:

extruder means for providing a thermally plasticized, thermoplastic polymeric resin;

a shaping die associated with the extruder means, for shaping the thermally plasticized resin into a hollow tube of a substantially uniform first diameter and for discharging the shaped resin on a predetermined, axial pathway;

a first annular nozzle radially disposed about the outer periphery of a pathway, at a point adjacent to the site of discharge;

means of delivering a cooling gas to the annular nozzle for release to the outer periphery;

said annular nozzle being constructed and positioned to direct the delivered cooling gas to the outer surface of the shaped resin at the site of discharge;

a second annular nozzle radially disposed about the outer periphery of the pathway, at a point spaced apart from the first annular nozzle;

second means for delivering a cooling gas to the second annular nozzle for release to the outer periphery, whereby the frost line of said tube forms just downstream of said second nozzle;

said second annular nozzle being constructed and positioned to direct the cooling gas delivered by the second means to the outer surface of the shaped resin at a point spaced from the site of discharge;

means for expanding the diameter of the thermally plasticized shaped resin at a point of the pathway beyond the first and second annular nozzles;

a sleeve housing enclosing a portion of the pathway over which the thermally plasticized, shaped resin of expanded diameter travels, said housing extending from about said second nozzle to an opening downstream from said frost line, providing a zone of cooling gas flowing along said pathway downstream from said frost line;

said sleeve housing defining an annular chamber between the housing and the periphery of the pathway portion over which the shaped resin of expanded diameter travels;

said annular chamber being in fluid communication with the second annular nozzle; and

adjustable vent means at said downstream opening for providing an adjustable vent between the annular chamber and the exterior of the sleeve housing.

7. A method for forming a blown tubular film of a synthetic polymeric resin, which comprises;

thermally plasticizing the resin;

shaping a progressively advancing, unexpanded tubular film of a substantially uniform first diameter from the thermally plasticized resin;

moving the advancing tubular film over a predetermined axial pathway to take-up reel;

applying a first cooling gas to the exterior of the advancing tubular film, at a first point on said pathway immediately as it is shaped so as to cool the shaped tubular film to a first temperature above the solidification temperature of the resin, but below melt temperature;

applying a second cooling gas to the exterior of the cooled tubular film at a second point on said pathway downstream of said first point to further cool the resin to a second temperature above the solidification temperature of the resin;

expanding the tube diameter to a second, substantially uniform diameter;

passing a cooling gas axially in a zone around the expanded tubular film to solidify the resin, said zone extending from about said second point to a third point downstream from where the resin film solidifies; and

controlling the velocity and volume of said passed cooling air by adjusting the radial dimension of said zone at said third point.

4,842,804

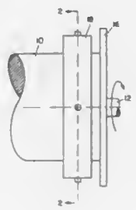
INTEGRAL REACTOR CAVITY SEAL/SHIELD

William C. Hopkins, Germantown, Md., assignor to Bechtel Eastern Power Corporation, Gaithersburg, Md.

Continuation of Ser. No. 869,149, May 30, 1986, abandoned. This application Dec. 21, 1987, Ser. No. 135,570

Int. Cl.[4] O21C *11/00*

U.S. Cl. 376—203 5 Claims



1. In a nuclear reactor wherein a reactor pressure vessel having a lower portion and a removable head is surrounded by a structural wall to define a gap between the pressure vessel and the structural wall, a seal/shield assembly normally in place during operation and refueling of the reactor, comprising:

a water-tight seal welded to the lower portion of the pressure vessel and the structural wall, said seal having an associated bellows for accommodating relative movement between the pressure vessel and the structural wall; and

a shield defined by a substantially consolidated body of solid neutron-absorbing material fixed to and supported by said seal and generally coextensive therewith.

4,842,805

METHOD OF DETECTING THAT AN ANTI-REACTIVE ELEMENT HAS FALLEN INTO THE REACTOR OF A NUCLEAR POWER STATION, AND A POWER STATION PROTECTED AGAINST SUCH A FALL

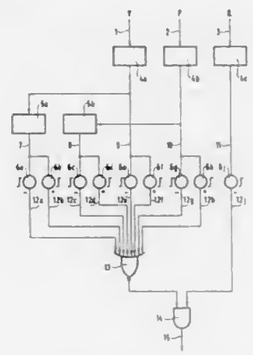
Jean-Michael Bouria, Paris; Michel Bruyère, Evecquemont, and Isaac Rousseau, Paris, all of France, assignors to Framatome, France

Filed Feb. 17, 1988, Ser. No. 156,672

Claims priority, application France, Feb. 20, 1987, 8702222

Int. Cl.[4] G21C *7/36*

U.S. Cl. 376—215 7 Claims



2. A nuclear power station having a reactor protected against the fall of an anti-reactive element, said reactor comprising:

a core containing fissile fuel elements for maintaining a nuclear reaction providing nuclear power;

a cooling fluid circuit having a branch passing through said core to remove said power in the form of heat and to enable said heat to be utilized outside the reactor;

measurement means for continuously measuring the current nuclear power of the reactor;

anti-reactive regulation elements suitable for reversibly reducing said power; and

regulation drive means controlled by said power measurement means in order to cause said regulation elements to penetrate to a greater or lesser extent into said core depending on whether the current nuclear power is greater than or less than a power reference value, in such a manner as to constitute a nuclear power regulation loop and to enable the reactor to be controlled by varying said reference value, with any reaction of said loop giving rise to transient power variations before settling if possible;

at least one anti-reactive element being suspended above a passage into said core such that an accidental fall of said element causes it to penetrate into the core, thereby initiating a rapid decrease in nuclear power, followed by a reaction from said regulation loop, which reaction is accompanied by transient variations in said power prior to said power settling back on its value prior to said fall;

said reactor further including stop means under the control of a reactor stop signal; and

accident detection means for providing such a reactor stop signal after an accident in the core, in particular such a fall of an anti-reactive element, and thus for protecting the reactor against the damage which would result if said

reaction were to continue without the accident being repaired;

said power station further including

a power outlet member receiving input thermal power from another branch of said cooling fluid circuit and providing variable and/or interruptible output power to a load; and

at least one nuclear power regulating system receiving the values of parameters external to the reactor such as parameters relating to the operation of said power outlet member, and generating said power reference value in response thereto in order to continuously match the current nuclear power to variations in said parameters so that if such a variation is large it is capable of causing a rapid variation in nuclear power;

said power station being characterized by the fact that said accident detection means comprise a circuit specifically for detecting the fall of an anti-reactive element, said circuit being suitable for detecting firstly rapid drops in nuclear power and secondly said large variations in at least one said external parameter, and for providing a said reactor stop signal (15) when such a drop in nuclear power is detected with no such external parameter variation in a predetermined time relationship with said drop.

4,842,806

DEVICE FOR MEASURING RECIRCULATING FLOW RATE IN A NUCLEAR REACTOR

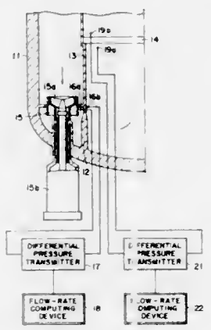
Koichi Ohtomi, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 8, 1987, Ser. No. 93,560

Claims priority, application Japan, Sep. 16, 1986, 61-217798

Int. Cl.[4] G21D *1/00*

U.S. Cl. 376—247 **2 Claims**



1. In a boiling water nuclear reactor having a reactor pressure vessel with a bottom, an internal recirculation pump mounted in said bottom of said vessel, said vessel being at least partially filled with a primary coolant, a reactor core disposed diagonally above said internal recirculation pump, and means for measuring the recirculation flow rate of said coolant, comprising:

a flow passage resisting means disposed in a recirculating flow passage of the primary coolant in the reactor pressure vessel and adapted to cause, between an upstream side and a downstream side thereof, a pressure difference in the primary coolant while the flow of the primary coolant is maintained constant;

means disposed at an upstream position and a downstream position relative to said flow passage resisting means for providing a first detecting mean for detecting a value of said pressure difference;

means operatively connected to said first detecting means for converting the detected pressure difference value into an electrical signal representing the pressure difference and transmitting the electrical signal; and

means operatively connected to said transmitting means for computing the recirculating flow rate of the primary coolant in response to the electrical signal from said transmitting means;

wherein said flow passage resisting means comprises a plurality of support legs which extend between the bottom of the reactor pressure vessel and a lower end part of a cylindrical shroud disposed within the reactor pressure vessel to partition the interior thereof and serving to support said lower end part of said shroud, and said differential pressure detecting means are disposed, respectively, at upstream and downstream sides of said shroud support legs which are interposed therebetween.

4,842,807

SUPPORT STAND FOR TOP ACCESS REACTOR CAVITY DOSIMETRY

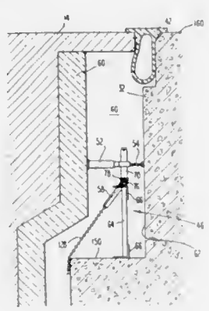
Arnold H. Fero, New Kensington, and Stanwood L. Anderson, Jr., Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 32,894, Mar. 31, 1987. This application Mar. 21, 1988, Ser. No. 171,369

The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.

Int. Cl.[4] G21C *17/00*

U.S. Cl. 376—254 **28 Claims**



1. In a nuclear power plant having a reactor vessel including a wall and a head assembly, a core contained within the reactor vessel which includes an array of neutron-producing fuel elements adapted for cyclical replacement upon exhaustion of the fuel, ex-core detector means for measuring a neutron flux, and a primary biological shield substantially surrounding the reactor vessel thereby forming a reactor cavity between the wall and the shield, a system for monitoring neutron exposure to the reactor vessel, comprising:

passive dosimetry means for indicating a neutron dosage accumulated over the fuel cycle at a plurality of different preselected locations axially with respect to the core within the cavity, wherein said indicating means is supplemental to the ex-core neutron detecting means; and

means for remotely positioning said indicating means accurately and repeatedly at said same plurality of different preselected locations within the cavity, said remote positioning means disposed substantially at a plane where the head assembly joins the wall.

4,842,808

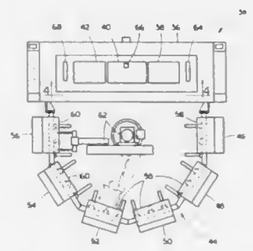
NUCLEAR FUEL PELLET COLLATING SYSTEM

Stuart L. Rieben; Ralph W. Kugler, both of Pittsburgh, Pa.; Joseph J. Scherpenberg, Columbia, S.C.; Dale T. Wiersema, Florence, S.C., and James L. Fogg, Columbia, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 25, 1988, Ser. No. 172,827

Int. Cl.[4] G21C *19/00, 21/00*; B65B *1/04*

U.S. Cl. 376—261 **30 Claims**



17. A system for collating nuclear fuel pellets, comprising:

(a) a pellet collating line including serially-arranged pellet input, work and output stations;

(b) a plurality of mobile carts, some supporting pellet supply trays and others supporting pellet storage trays, said trays adapted to support pellets in multiple rows thereof, said pellets on a given one tray being of the same enrichment with enrichments of pellets on some trays being different from on other trays;

(c) a tray positioning station located adjacent to said pellet collating line and defining positions in which are lodged said mobile carts;

(d) tray transfer robot located between said pellet collating line and said tray positioning station, said robot being operable to transfer supply and storage trays one at a time between said respective carts at said tray positioning station and said respective input and output stations;

(e) an input sweep head disposed adjacent said input station and being operable for sweeping pellets resting in multiple rows on a given one of said supply trays at said input station from said supply tray onto said work station;

(f) a gripping and measuring head disposed adjacent said work station and being operable for measuring a desired length of pellets in the multiple rows thereof on said work station and then separating the measured desired length of pellets from the remaining pellets, if there be any;

(g) an output sweep head disposed adjacent to said output station and operable for sweeping the measured lengths of pellets from said work station onto a given one of said storage trays at said output station;

(h) one of said input sweep head, said gripping and measuring head and said output sweep head being operable for sweeping the remaining pellets, if any, in the multiple rows thereof from said work station back onto the given one of said supply trays at said input station.

4,842,809

VERTICAL CLOSE PACK ROD ARRAYING SYSTEM

Douglas J. Attix; Michael J. Kelly; Fred L. Mesou, and Carlton E. Stinnett, all of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Apr. 15, 1988, Ser. No. 181,858

Int. Cl.[4] G21C *19/00*

U.S. Cl. 376—261 **17 Claims**

7. A rod arraying system, comprising:

a. a rigid support structure;

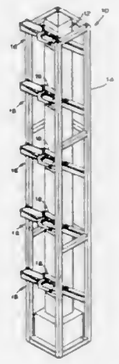
b. a canister positioned in and supported by said support structure;

c. a mounting base slidably attached to said support structure on an incline;

d. a guide assembly attached to said mounting base for positioning rods inside said canister, comprising:

i. an upper guide plate mounted on said mounting base;

ii. a lower guide plate slidably mounted on said upper guide plate;



iii. means for causing forward and backward cycling of said lower guide plate relative to said upper guide plate; and

e. said canister having a window for receiving said guide assembly.

4,842,810

NUCLEAR POWER PLANT WITH A HIGH TEMPERATURE REACTOR LOCATED ECCENTRICALLY IN A CYLINDRICAL PRESTRESSED CONCRETE PRESSURE VESSEL

Josef Schoening, Hambruecken; Winfried Wachholz, Gorxheimertal, and Ulrich Weicht, Weinheim, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 66,464, Jun. 26, 1987, Pat. No. 4,761,260. This application Dec. 11, 1987, Ser. No. 131,724

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1986, 3642542

Int. Cl.[4] G21C *1/32, 15/12, 15/18*

U.S. Cl. 376—299 **8 Claims**

1. A nuclear power plant comprising:

a cylindrical prestressed concrete pressure vessel defining a cavity exhibiting a liner;

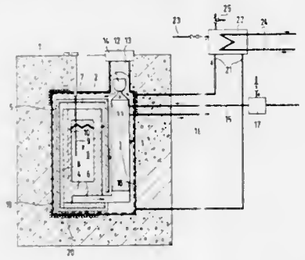
a high temperature reactor arranged eccentrically in said cavity;

a pile of spherical fuel elements arranged in a core of said reactor;

said reactor including a graphite reflector surrounding and defining said core, and means for inserting a plurality of absorber rods into a lateral portion of said reflector and into said core;

a cold gas collector chamber located above said high tem-

perature reactor configured to withstand hot gas temperature levels;
thermal insulation and liner cooling means for removal of decay heat at an elevated temperature arranged on an inside surface of said pressure vessel;
at least two heat exchangers arranged in parallel, and adjacent to said reactor and elevated with respect to said core



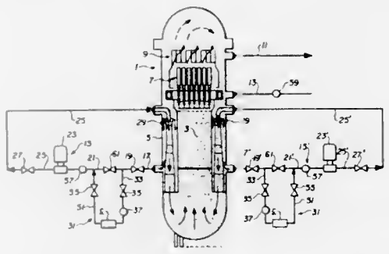
wherein said heat exchangers are arranged for removal of operational and decay heat;
a blower associated with each heat exchanger arranged in a coolant flow path subsequent to said heat exchanger and configured for downward coolant flow through said pile;
a power generation water-steam loop connected to a secondary side of each heat exchanger.

4,842,811

METHOD FOR PREVENTING OXYGEN CORROSION IN A BOILING WATER NUCLEAR REACTOR AND IMPROVED BOILING WATER REACTOR SYSTEM

Sunil G. Desilva, Wilkins Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 5, 1985, Ser. No. 698,486
Int. Cl.[4] G21C *7/00*
U.S. Cl. 376—301 **17 Claims**



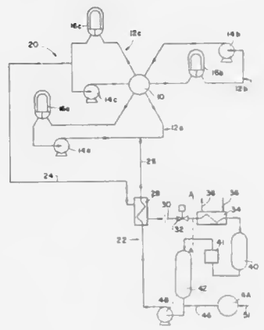
1. In a method for prevention of corrosion, due to oxygen activity, in a boiling water nuclear reactor system having a main feedwater recirculation loop comprising a reactor vessel with a reactor core, and with a steam off-take line and a condensate return line in flow communication with the vessel for recirculating feedwater between the reactor and a steam turbine, and coolant water recirculation loops comprising coolant water off-take and return lines in flow communication with the vessel for recirculating coolant water in the vessel, wherein hydrogen is added to the coolant water passing through the reactor core to reduce the oxygen content of the coolant water, the improvement wherein:
recirculation coolant water containing dissolved oxygen, after passage through the reactor core, is diverted from the recirculation loop;
hydrogen gas is added to said diverted coolant water;
the hydrogen-containing diverted coolant water is contacted with a catalyst effective to enhance reaction of hydrogen with oxygen contained in the coolant water; and
the diverted coolant water, after reaction of the hydrogen gas with the oxygen contained therein, is returned to the recirculation loop for passage through the reactor core.

4,842,812

REACTOR COOLANT CRUD CONTROL BY PARTICULATE SCAVENGING AND FILTRATION

Armand J. Panson, Pittsburgh, Pa., and Michael Troy, Augusta, Ga., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 11, 1987, Ser. No. 95,076
Int. Cl.[4] G21C *19/30*
U.S. Cl. 376—306 **17 Claims**



12. A method for removing colloidal corrosion products from a nuclear reactor coolant comprising:
providing a batch of particles that are suspensible in said coolant and which have surface characteristics that attract said corrosion products;
suspending said particles in said coolant whereby said corrosion products deposit on the surfaces of said particles; and
removing said particles and the corrosion products deposited thereon from said coolant.

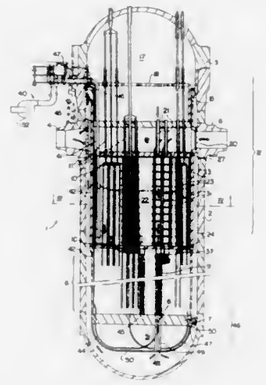
4,842,813

NUCLEAR REACTOR HAVING A LONGITUDINALLY ELONGATED VESSEL

Guy Desfontaines, Puteaux, and Jean P. Millot, Elancourt, both of France, assignors to Framatome, Courbevoie, France

Filed Mar. 9, 1987, Ser. No. 23,351
Claims priority, application France, Mar. 7, 1986, 86 03253
Int. Cl.[4] G21C *15/00, 15/18*
U.S. Cl. 376—353 **9 Claims**

1. Nuclear reactor comprising:
(a) a pressure resistant vessel for containment of a pressurized coolant,
(b) a removable cover for said vessel,
(c) coolant outlet nozzle means provided through said vessel in close proximity of said cover,
(d) a core located in said vessel arranged to be upwardly traversed by said coolant in operation and having a plurality of mutually adjacent fuel assemblies each having an upper end piece,
(e) a plurality of clusters of control elements, each having an upwardly expending drive shaft and each vertically movable into and out of said core by said drive shaft,
(f) upper internal equipments located in said vessel between said core and said cover, having:
separating means directly located above said core, for collecting the coolant flowing out of said core and comprising a lower plate and an upper plate, said lower plate and said upper plate each being perforated with a plurality of holes consisting of:
first holes formed in said lower plate and in said upper plate, for passage of the coolant flowing out of said core through said plates, each of said first holes in said lower plate being connected to a respective one of said first holes in said upper plate by a respective continuous fluid tight spacer tube for guiding substantially all the coolant flowing out of said core within the spacer tubes through said separating means,
second holes, formed in said lower plate, for passage of the clusters through said lower plate into and out said fuel assemblies, said second holes being located above respective ones of said upper end pieces of said fuel assemblies, said upper end pieces being arranged for deflecting the coolant flowing out of said fuel assemblies away from said second holes and towards adjacent first holes in said lower plate, whereby the coolant flowing out of said core is forced to traverse the separating means through the spacer tubes, and
third holes, formed in said upper plate, for passage of the drive shafts of said clusters through said upper plate,



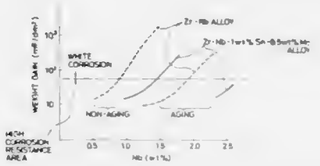
said separating means further comprising a plurality of cluster guides, each located between one of said second holes and a corresponding one of said third holes, said cluster guides being along and between the spacer tubes each for guiding a respective one of said clusters and of their drive shafts through said separating means,
and said separating means comprising an external envelope unperforated on its peripheral wall and connected to said upper and said lower plates therefore forming an enclosure which constitutes radial external limits of said separating means,
a plenum chamber for collecting the coolant flowing out of said spacer tubes through the first holes in said upper plate, said plenum chamber communicating radially with the outlet nozzle means, and
a plurality of fluid tight guiding tubes in said plenum chamber connected to the upper plate and aligned with said cluster guides for guiding the drive shafts of said clusters across said plenum chamber, and separating said drive shafts from the coolant flowing out of the separating means and through the plenum chamber toward said outlet nozzle means.

4,842,814

NUCLEAR REACTOR FUEL ASSEMBLY

Iwao Takase, Tokai; Masahisa Inagaki, Hitachi; Masayoshi Kasuno, Kitaibaraki; Toshimi Yoshida, Mito; Jiro Kuniya, Hitachi; Isao Masaoka, Hitachi; Tetsuo Yasuda, Hitachi; Hajime Umehara, and Hideo Maki, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 2, 1987, Ser. No. 9,477
Claims priority, application Japan, Feb. 3, 1986, 61-20128; Jan. 11, 1986, 61-133606
Int. Cl.[4] G21C *3/34*
U.S. Cl. 376—438 **27 Claims**



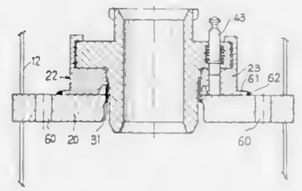
1. A nuclear reactor fuel assembly comprising a channel box, a plurality of fuel rods each disposed in said channel box and having a cladding and fuel pellets inserted therein, and a plurality of spacers each arranged in a longitudinal direction of said fuel rods and spacing said fuel rods in said channel box, at least one of said channel box and said each spacer being of welded construction, characterized in that said at least one, of welded construction, of said channel box and said each spacer is constructed of a Zr-Nb-Sn alloy comprising 0.5–2.2 wt % Nb, 0.5–2.0 wt % Sn, said Nb and Sn contained so as to satisfy the relation of $Sn(wt\ \%) \geq 2 \times Nb(wt\ \%) - 3.0$, and balance Zr, and a welded portion and a heat affected zone have an equilibrium phase structure of more than 85% by area ratio, and an unwelded portion has an equilibrium phase structure.

4,842,815

DEVICE FOR LOCKING A GUIDE RING ON A PLATE HAVING AN ORIFICE AND ITS USE FOR A GUIDE TUBE OF A NUCLEAR REACTOR

Claude Cauquelin, Neauphle le Chateau, and Pierre Poitrenaud, Elancourt, both of France, assignors to Framatome, Courbevoie, France

Filed Jun. 4, 1986, Ser. No. 870,579
Claims priority, application France, Oct. 1, 1985, 85 14542
Int. Cl.[4] G21C *1/01;* **F41D** *1/00*
U.S. Cl. 376—463 **10 Claims**



1. A device for locking a guide ring (21) for a follower of a control rod on a plate (20) in a nuclear reactor having an orifice (32), so that the central orifice (36) of the ring (21) is coaxial with the orifice (32) in the plate (20), said device comprising
(a) a tubular intermediate piece (22) fastened rigidly to the plate (20), so that its central orifice is coaxial with the orifice (32) of the plate (20);
(b) receptacles (28) machined radially in the intermediate piece (22), arranged on its inner periphery and defining

passages (30) open toward an end of the intermediate piece; and

(c) attachment parts (39) extending from the guide ring (21) on its outer periphery and having a shape corresponding to the shape of the receptacles (28) of the intermediate piece, said attachment parts being received in the receptacles.

4,842,816

HIGH TOUGHNESS STEEL

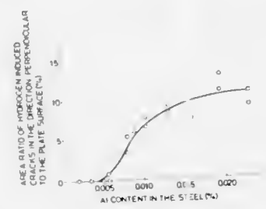
Akihiro Miyasaka; Hiroyo Haga, and Takeshi Terasawa, all of Sagamihara, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 799,978, Nov. 20, 1985, abandoned. This application Jul. 27, 1987, Ser. No. 77,976

Claims priority, application Japan, Nov. 20, 1984, 59-243287

Int. Cl.[4] C22C *38/14, 38/28, 38/50*

U.S. Cl. 420—84 **5 Claims**



1. The high toughness steel composition having excellent sour resistance suitable for the production of electric resistance welded steel pipe, consisting of (in % by weight):

0.01 to 0.35% of C,

0.02 to 0.5% of Si,

0.1 to 1.8% of Mn,

0.0005 to 0.008% of Ca,

0.006 to 0.2% in total of one or both of Ti and Zr as a deoxidizing agent,

not more than 0.005% of Al,

not more than 0.015% of P, and not more than 0.003 of S with the balance being iron and unavoidable impurities.

4,842,817

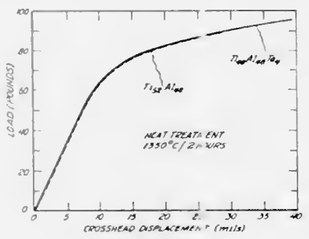
TANTALUM-MODIFIED TITANIUM ALUMINUM ALLOYS AND METHOD OF PREPARATION

Huang Shyh-Chin, Latham, and Michael F. X. Gigliotti, Jr., Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,485

Int. Cl.[4] C22C *14/00; C21D 1/00*

U.S. Cl. 420—418 **12 Claims**



1 A tantalum modified titanium aluminum alloy consisting essentially of titanium, aluminum and tantalum in the following approximate atomic ratio:

$Ti_{48-47}Al_{46-49}Ta_{3-5}$,

said alloy having a tensile strength of greater than 100 ksi.

4,842,818

METHOD FOR MANUFACTURING TAPERED RODS

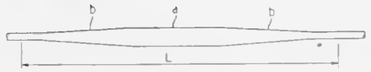
Tetsuo Kato, Nagoya; Shozo Abeyama, Aichi, and Makoto Saito, Nagoya, all of Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Aichi, Japan

Division of Ser. No. 512,699, Jul. 11, 1983, abandoned, which is a continuation of Ser. No. 240,115, Mar. 3, 1981, abandoned. This application Jun. 4, 1984, Ser. No. 617,131

Claims priority, application Japan, Mar. 17, 1980, 55-34345; Dec. 11, 1980, 55-175031; Dec. 13, 1980, 55-176276

Int. Cl.[4] C22C *38/26, 38/34*

U.S. Cl. 420—100 **3 Claims**



1. A tapered coil spring formed of a steel wire member consisting essentially of carbon, silicon, manganese, chromium, niobium and iron in the amounts of 0.35%–1.10% by weight of carbon, not more than 2.5% by weight of silicon, not more than 1.5% by weight of manganese, not more than 5.0% by weight of chromium, not more than 0.5% by weight of niobium, and the remainder of iron by being given axial tensile force while being imparted heating with a predetermined pattern of temperature gradient in the axial direction of said steel wire member so as to possess a tapered portion thereof where the diameter of said tapered wire member is varied in the axial direction thereof.

4,842,819

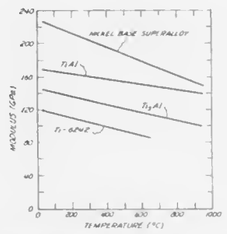
CHROMIUM-MODIFIED TITANIUM ALUMINUM ALLOYS AND METHOD OF PREPARATION

Shyh-Chin Huang, Latham, and Michael F. X. Gigliotti, Jr., Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,481

Int. Cl.[4] C22C *14/00; C21D 1/00*

U.S. Cl. 420—418 **12 Claims**



1. A chromium modified titanium aluminum alloy consisting essentially of titanium, aluminum and chromium in the following approximate atomic ratio:

$Ti_{54-48}Al_{45-49}Cr_{1-3}$.

4,842,820

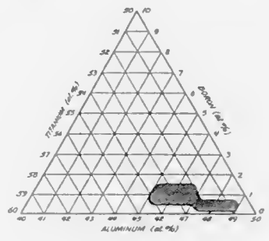
BORON-MODIFIED TITANIUM ALUMINUM ALLOYS AND METHOD OF PREPARATION

Shyh-Chin Huang, Latham, and Michael F. X. Gigliotti, Jr., Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 28, 1987, Ser. No. 138,486

Int. Cl.[4] C25C *3/06;* **C22C** *14/00*

U.S. Cl. 420—418 **9 Claims**



1. A boron-modified titanium aluminum alloy consisting essentially of titanium, aluminum and boron in the approximate atomic ratios displayed in the hatched area of FIG. 10.

4,842,821

PRODUCING TITANIUM CARBIDE

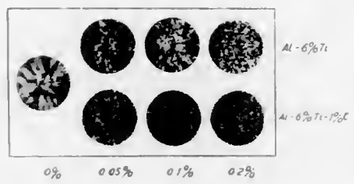
Abinash Banerji, and Winfried Reif, both of Berlin, Fed. Rep. of Germany, assignors to London & Scandinavian Metallurgical Co. Limited, London, England

Division of Ser. No. 835,747, Mar. 3, 1986, Pat. No. 4,748,001. This application Mar. 29, 1988, Ser. No. 174,809

Claims priority, application United Kingdom, Mar. 1, 1985, 8505904; Aug. 2, 1985, 8519447

Int. Cl.[4] C22C *21/00*

U.S. Cl. 420—528 **25 Claims**



1. A method of producing an alloy containing titanium carbide particles, the method comprising thoroughly dispersing carbon powder particles into a metal melt, causing the dispersed carbon particles to react with titanium within the metal melt so as to produce a dispersion of fine particles comprising titanium carbide within the melt, and holding the melt at a suitable degree of superheating above 1000 degrees Centigrade to produce decontamination of contaminated titanium carbide particles which may be present in the melt.

4,842,822

ALUMINUM-LITHIUM ALLOY AND METHOD OF INVESTMENT CASTING AN ALUMINUM-LITHIUM ALLOY

Gregory N. Colvin, Charlottesville, Va., and Stewart J. Veeck, North Muskegon, Mich., assignors to Howmet Corporation, Greenwhich, Conn.

Filed Dec. 19, 1986, Ser. No. 943,434

Int. Cl.[4] C22C *21/00*

U.S. Cl. 420—533 **14 Claims**

4. An aluminum-lithium alloy consisting essentially of about 2.0 to about 2.8 w/o lithium, about 1.2 to about 1.8 w/o copper, the combined lithium and copper content being 4.0 w/o or

less, about 0.8 to about 1.1 w/o magnesium, about 0.1 to about 1.0 w/o titanium, and the balance essentially aluminum.

4,842,823

AUSTENITIC STEEL HAVING IMPROVED HIGH-TEMPERATURE STRENGTH AND CORROSION RESISTANCE

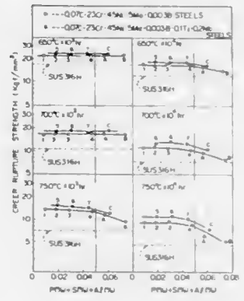
Yoshiatsu Sawaragi, Nishinomiya; Kunihiko Yoshikawa, Suita, and Hiroshi Teranishi, Kobe, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 817,413, Jan. 9, 1986, abandoned. This application Aug. 14, 1987, Ser. No. 85,198

Claims priority, application Japan, Jan. 10, 1985, 60-002457

Int. Cl.[4] C22C *30/00, 19/05*

U.S. Cl. 420—584 **8 Claims**



1. An alloy having improved high-temperature strength and corrosion resistance, which consists essentially of, by weight %:

C: not more than 0.15%; Si: not more than 1.0%; Mn: not more than 10%; Cr: 20–30%; Ni: 30–55%; at least one of Mg and Ca in a total amount of 0.0010–0.0500%; W: 1.0–12.0%; either B: 0.0010–0.0100% and Zr: 0.005–0.200% or B=0.0010–0.0100%; with the balance being: Fe and incidental impurities, of which impurities P, S, and Al are restricted to: P: not more than 0.020%; S: not more than 0.010%; and Al: not more than 0.030% wherein P(%)+S(%)+Al(%) is less than 0.050%.

4,842,824

OPTICAL STORAGE MEDIUM

Yuzo Ono, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 22, 1987, Ser. No. 111,493

Claims priority, application Japan, Oct. 23, 1986, 61-253033

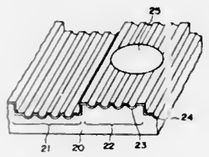
Int. Cl.[4] B32B *3/02*

U.S. Cl. 428—64 **1 Claim**

1. An optical information storage medium from which recorded information may be read out by reflecting monochromatic light from the medium comprising:

a thermoplastic resin substrate having a periodic concave

and convex surface grating on one surface thereof, the period of said concave and convex surface grating being less than the wavelength of the light reflected from the medium to read out stored information and said thermoplastic resin being selected from the group consisting of



polycarbonate, acrylic, vinyl chloride, and polystyrene; and

a metal layer selected from the group consisting of gold, platinum, aluminum, and chromium coating said concave and convex surface grating.

4,842,825

APPARATUS FOR DETERMINING CHEMICAL STRUCTURE

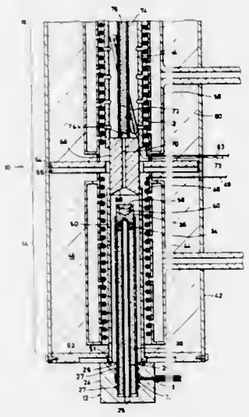
Stephen J. Martin, Katy, and Raymond D. Worden, Houston, both of Tex., assignors to Ruska Laboratories, Inc., Houston, Tex.

Filed Jun. 19, 1986, Ser. No. 876,129

The portion of the term of this patent subsequent to Nov. 15, 2005, has been disclaimed.

Int. Cl.[4] G01N *25/22, 31/12*

U.S. Cl. 422—80 **11 Claims**



1. A pyrolysis apparatus comprising

a first, fused quartz tubular member defining an infrared transparent pyrolysis chamber therein, said tubular member defining a gas outlet from said pyrolysis chamber and an inlet to said pyrolysis chamber;

means for introducing sample material into said pyrolysis chamber formed by said tubular member;

means for radiantly heating the sample material to effect pyrolysis thereof and to produce gaseous components;

means for cooling said pyrolysis chamber;

means for passing a first gas stream through said pyrolysis chamber and out said gas outlet to produce a second gas stream containing gaseous components;

gas splitter means, said gas splitter means comprising a first quartz tube having an inlet and an outlet, the inlet of said first quartz tube being in open communication with said gas outlet, said gas splitter means further comprising a second quartz tube of smaller diameter than said first quartz tube and having a first end and a second end, the first end of said second quartz tube being received into the outlet of said first quartz tube whereby a smaller fraction of the second gas stream flowing through said first quartz tube is introduced into said first end of said second quartz tube and a larger portion of the second gas stream flowing through said first quartz tube passes through said outlet of said first quartz tube.

4,842,826

DISPOSABLE DEVICE FOR COLLECTING PHYSIOLOGICAL SAMPLES, IN PARTICULAR COPROLOGICAL SAMPLES

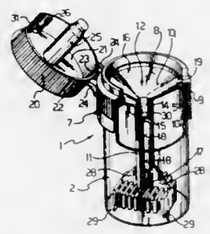
Piergiacomo Guala, Alessandria, Italy, assignor to STA.TE. S.p.A., Alessandria, Italy

Filed Apr. 6, 1987, Ser. No. 35,046

Claims priority, application Italy, Apr. 16, 1986, 21561/86[U]

Int. Cl.[4] B01L *3/00;* **B65B** *39/00*

U.S. Cl. 422—102 **9 Claims**



1. A device for collecting physiological samples, in particular coprological samples, comprising a container, a cap for said container, and a pick-up stick fastened to and extending downward from a bottom of said cap toward a bottom of said container, said stick comprising at least one slot extending along a length thereof, a passageway extending through said cap and said pick-up stick and a stopper for hermetically sealing said passageway.

4,842,827

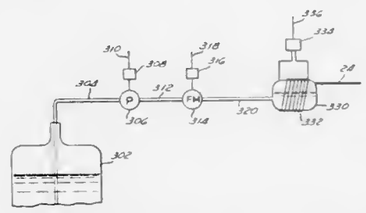
VACUUM VAPOR TRANSPORT CONTROL

Hans-Juergen Graf, Oceanside; Robert E. Fletcher, Vista; Peter T. Randtke, San Marcos; Bruce E. Rhine, and J. R. Monkowski, both of Encinitas, all of Calif., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Dec. 30, 1986, Ser. No. 948,120

Int. Cl.[4] B01J *19/00*

U.S. Cl. 422—112 **10 Claims**



1. A method of introducing reagent into a vacuum chemical vapor reaction chamber comprising the steps of:

(a) controlling the temperature of the reagent in a reagent vapor generator to thereby generate reagent vapor at a pressure, which pressure is proportional to and a predetermined function of the vapor pressure of the reagent at the temperature at which the reagent is controlled;

(b) flowing the reagent vapor from the reagent vapor generator through a critical orifice into the vacuum chemical reaction chamber; and

(c) controllably varying the rate of flow into the vacuum chemical reaction chamber by controllably varying the temperature of the reagent in the reagent vapor generator thereby controllably varying the vapor pressure of the reagent.

5. A system for introducing reagent into a vacuum chemical reaction chamber comprising:

(a) a vacuum chemical reaction chamber;

(b) means for generating a vapor of a reagent to be introduced into said vacuum chemical reaction chamber;

(c) an orifice having an inlet side and an outlet side, the inlet side of the orifice being in fluid communication with the means for generating a vapor of a reagent;

(d) conduit means in fluid communication with the orifice for flowing reagent vapor through the orifice to the vacuum chemical reaction chamber;

(e) means for maintaining the pressure on the inlet side of the orifice at a pressure of from about 0.1 to about 100 torr at least twice the pressure of the vacuum chemical reaction chamber, to thereby operate the orifice as a critical or sonic orifice wherein the flow rate through the orifice is independent of the pressure on either the inlet side or the outlet side of the orifice and therefor independent of pressure changes in the vacuum chemical reaction chamber, the flow through the orifice being solely a function of the vapor pressure of the reagent in the means for generating a vapor of a reagent and the size of the sonic orifice.

4,842,828

APPARATUS FOR TREATING SURFACE OF OBJECT WITH ULTRAVIOLET RAYS AND REACTION GAS

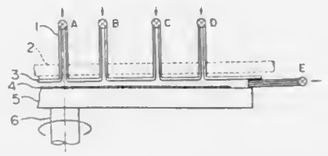
Ken-ichi Kawasumi, Ome, and Akio Inada, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 27, 1988, Ser. No. 148,897

Claims priority, application Japan, Feb. 18, 1987, 62-33251

Int. Cl.[4] B01J *19/12*

U.S. Cl. 422—186.3 **6 Claims**



1. A substrate surface treatment apparatus, comprising: means for rotating the substrate about an axis of rotation, plate means transmissive of ultraviolet rays mounted in parallel with the surface of the substrate for forming a predetermined uniform gap between said substrate surface and said plate means, ultraviolet radiation means for irradiating the surface of the substrate through said plate means, said plate means including plural supply nozzles, and means for supplying reactive gas to the surface of said substrate through said plural supply nozzles, each of said nozzles being arranged opposite the substrate surface at positions of different radius of rotation with respect to said axis of rotation.

4,842,829

DEODORIZING APPARATUS

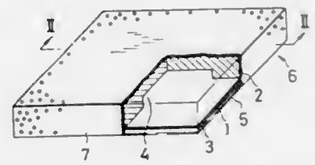
Yoichi Hirai, Obbu, and Toshikazu Ito, Nagoya, both of Japan, assignors to Tokkai Kogyo Co., Ltd., Aichi, Japan

Filed Nov. 14, 1986, Ser. No. 931,392

Claims priority, application Japan, Nov. 19, 1985, 60-259108; Jan. 13, 1986, 61-4768

Int. Cl.[4] B01J *19/08*

U.S. Cl. 422—186.08 **15 Claims**



1. A deodorizing apparatus comprising energy means for creating an electric field for generating ozone and imparting thermal and kinetic energy to the ozone, and a deodorizer body, said deodorizer body comprising a layer operating for decomposing ozone, said deodorizer body having an interior free space portion, said energy means being mounted adjacent said free space portion such that it creates an electric field within said space to generate ozone therein, said layer being constructed and positioned with respect to said free space portion to require ozone generated in said free space portion to flow in a path in contact with said layer.

4,842,830

APPARATUS FOR UPGRADING CARBONACEOUS MATERIALS

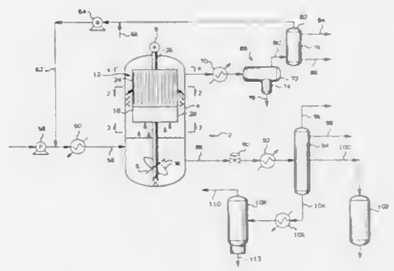
Jim Y. Low, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 631,366, Jul. 16, 1989, Pat. No. 4,708,788.

This application Sep. 11, 1987, Ser. No. 95,374

Int. Cl.[4] B01J *8/02*

U.S. Cl. 422—193 **4 Claims**



1. Apparatus comprising

(a) a vessel suitable for use with internal pressure in the range of 300 to 3000 psig;

(b) a mechanical agitator means for mixing fluids, wherein the mechanical agitator means is positioned on the inside of the vessel in a lower portion thereof;

(c) a drive means coupled to the mechanical agitator for causing fluid mixing in the lower portion of the vessel due to the action of the mechanical agitator;

(d) a means for supporting a catalyst bed positioned in an upper portion of the vessel; and

(e) a means, separate from the mechanical agitator means for mixing fluids, or establishing fluid flow from an upper

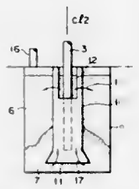
portion of the vessel through the means for supporting a catalyst bed and into the lower portion of the vessel.

4,842,831

CHLORINE HYDRATE TANK

Toshiaki Yabumoto, and Kunihiko Fujiwara, both of Yokohama, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 590,684, Mar. 19, 1984, abandoned. This application May 28, 1987, Ser. No. 56,361
Claims priority, application Japan, Mar. 26, 1983, 58-50744
Int. Cl.[4] C01B *11/04*; H01M *2/38, 8/04*
U.S. Cl. 422—198 **5 Claims**



1. In a chlorine hydrate tank wherein a chlorine gas supply pipe is inserted inside a tank holding chilled water therein for injecting chlorine gas at a given rate into the water from means defining an opening in a distal end of the chlorine gas supply pipe to form a chlorine hydrate. the improvement comprising, in combination:

a hollow cylinder having means defining an upper opening and a lower opening, chlorine gas supply pipe being positioned and arranged in the upper opening of the hollow cylinder and having distal end extending toward the lower opening of the hollow cylinder, said hollow cylinder being positioned and arranged coaxially around and radially spaced from the chlorine gas supply pipe;

means for supporting said hollow cylinder so that the upper opening of the hollow cylinder is at least partially submerged in the water and the lower opening of said hollow cylinder receives the chlorine gas from the distal end of the gas supply pipe for reacting the chlorine gas with chilled water to form solid chlorine hydrate crystals;

said hollow cylinder including gas defining means having a diameter for permitting the rising speed of the unreacted chlorine gas within the hollow cylinder to be higher than the precipitating speed of the formed chlorine hydrate crystals, said gap defining means forming a predetermined gap between the hollow cylinder and the gas supply pipe for enabling substantially all said chlorine hydrate crystals to rise within said predetermined gap for discharge from said upper opening to be deposited in the tank only outside said hollow cylinder and out of contact with the gas supply pipe in the vicinity of said distal end.

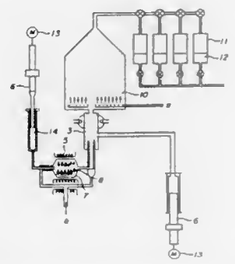
4,842,832

ULTRA-FINE SPHERICAL PARTICLES OF METAL OXIDE AND A METHOD FOR THE PREPARATION THEREOF

Hakuai Inoue, and Hiroshi Komiyama, both of Tokyo, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Continuation of Ser. No. 928,280, Oct. 23, 1986, abandoned. This application Mar. 21, 1988, Ser. No. 172,970
Claims priority, application Japan, Mar. 5, 1985, 60-41828; Apr. 4, 1985, 60-71639
Int. Cl.[4] C01L *1/00*
U.S. Cl. 423—211 **8 Claims**

1. A method for the preparation of ultra-fine spherical particles of a metal oxide having an average particle diameter of 40 nm or smaller comprising vaporizing a vaporizable metal to form a concentration of 0.06 to 10% by volume and decomposing the vaporizable metal compound by heating to a temperature not exceeding 600° C. in the presence of water vapor in an amount in the range of from 30 to 120 moles per mole of vaporized metal compound to give ultra-fine particles of a metal



oxide, the decomposition being immediately followed by cooling by direct quenching with a cooling medium to a temperature not exceeding 100° C. and at which coalescence of the ultra-fine particles of the metal oxide no longer takes place.

4,842,833

METHOD FOR SEPARATING BARIUM FROM WATER-SOLUBLE STRONTIUM COMPOUNDS

Paul Jüger, Bad Hönningen, Fed. Rep. of Germany, assignor to Kali-Chemie Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 1, 1988, Ser. No. 214,382
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1987, 3723320
Int. Cl.[4] C01F *11/46*
U.S. Cl. 423—160 **10 Claims**

1. A method for separating barium from watersoluble strontium compounds wherein

(a) aqueous sulfuric acid and a basic strontium compound are added with thorough stirring to an aqueous solution containing a dissolved strontium compound and barium ions, either

(I) the sulfuric acid and the basic strontium compound being added successively, the addition of sulfuric acid taking place up to a reduction in the pH value to not below about 3, and the addition of the basic strontium compound taking place up to an increase in the pH value to at most about 10, or

(II) the sulfuric acid and the basic strontium compound being added simultaneously, the pH value in the reaction mixture being kept in the range of about 3 to about 10 by controlling the amounts of material added, and

(b) subsequently precipitated solid is separated from the solution, and a strontium compound which is depleted in barium is obtained from the solution.

4,842,834

PROCESS FOR REDUCING THE CONCENTRATION OF POLLUTANTS IN AN EFFLUENT

Albert A. Burton, Norwalk, Conn., assignor to Fuel Tech, Inc., Stamford, Conn.

Filed Feb. 2, 1987, Ser. No. 9,696
Int. Cl.[4] C01B *21/00*; B01J *8/00*
U.S. Cl. 423—235 **9 Claims**

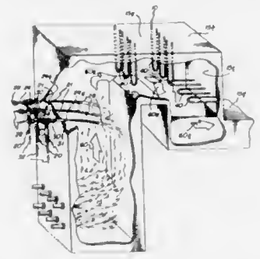
1. A process for reducing the concentration of nitrogen oxides in an effluent from the combustion of a carbonaceous fuel, the process comprising:

(a) providing an atomization conduit which extends into the effluent;

(b) providing a supply conduit coaxial with and axially slidable within said atomization conduit;

(c) supplying an effluent treatment fluid effective to reduce nitrogen oxides through said supply conduit; and

(d) supplying an atomization fluid through said atomization conduit to effect atomization of said treatment fluid and to disperse said treatment fluid throughout the effluent, wherein the slidable adjustment of said supply conduit and



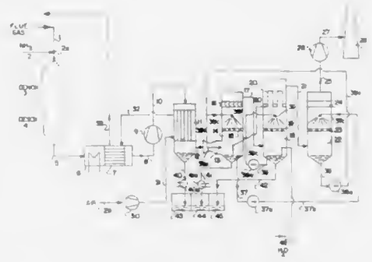
the rate of supply of said atomization fluid are selected to provide droplets of a size effective to achieve reduction of nitrogen oxides in the effluent and to disperse said droplets throughout a substantial portion of said effluent.

4,842,835

PROCESS OF PURIFYING FLUE GASES

Karl H. Dörr, Mainz; Hugo Grimm, Miltenberg; Heinz Neumann, Riedstadt; Wolfgang Fennemann, Karben, and Norbert Ohlms, Münster, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main and Stadtwerke Munster GmbH, Münster, both of, Fed. Rep. of Germany

Filed Jul. 17, 1987, Ser. No. 74,645
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1986, 3624462
Int. Cl.[4] C01B *17/00*
U.S. Cl. 423—242 **8 Claims**



1. A process of purifying flue gases or other contaminated humid exhaust gases which contain SO_3, characterized in that

(a) the flue gas is cooled by an indirect heat exchange in a heat exchanger to a temperature below the dew point temperature of sulfuric acid,

(b) the cooled gas is cooled further to about 75° to 92° C. in an SO_3 condenser by means of dilute sulfuric acid, which is sprayed to flow in a countercurrent to the gas, whereby dilute sulfuric acid having a predetermined concentration is condensed,

(c) the gas leaving the SO_3 condenser is scrubbed and cooled to a temperature from 40° to 55° C. in a fine scrubber by a treatment with a sprayed aqueous sulfuric acid liquor capable of absorbing HCl and HF,

(d) the gas leaving the fine scrubber is reheated to a temperature of about 80° to 105° C. in a reheater by a treatment with sprayed dilute sulfuric acid from the SO_3 condenser,

(e) the gas from which SO_3 has been condensed is passed through a filter,

(f) dilute sulfuric acid leaving the reheater is sprayed into the SO_3 condenser,

(g) the temperature of the gas in step (d) is so selected that the water absorbed in step (c) is not condensed but remains in the gaseous effluent,

(h) the exit temperature of the gas in step (a) is approximately 120° to 157° C. so that the temperature of the dilute sulfuric acid obtained in step (b) is approximately the same as the temperature of the gas in step (d), and

(i) the rate at which dilute sulfuric acid is sprayed in step (d) is so adjusted that the dilute sulfuric acid withdrawn in step (d) is at a temperature which approximately corresponds to the required exit temperature of the gas in step (b).

4,842,836

ZEOLITE LZ-133

Brent M. Lok, New City; Thomas R. Cannan, Valley Cottage, and Edith M. Flanigen, White Plains, all of N.Y., assignors to UOP

Continuation-in-part of Ser. No. 363,109, Mar. 29, 1982, abandoned. This application Mar. 24, 1986, Ser. No. 843,295
Int. Cl.[4] C01B *33/28*
U.S. Cl. 423—328 **8 Claims**

1. Crystalline aluminosilicate zeolite composition having a chemical composition in terms of mole ratios of oxides:

$$x\ M_{2/n}O{:}Al_2O_3{:}y\ SiO_2{:}z\ H_2O$$

wherein "M" is at least one cation having the valence "n", "x" has a value of from zero to 3.5, "y" has a value of from 10 to 80 and "z" has a value from zero to 15, said aluminosilicate having an X-ray powder diffraction pattern which does not contain a d-spacing in the range of 4.01–4.03 A and containing at least the d-spacings set forth in Table III or Table IV, the pore diameters of said zeolite being about 4.3 A.

4,842,837

PROCESS FOR PRODUCING FINE SPHERICAL SILICA

Takaaki Shimizu, and Toshihiro Okon, both of Joetsu, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

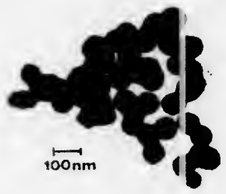
Filed Sep. 18, 1987, Ser. No. 98,301
Claims priority, application Japan, Sep. 19, 1986, 61-221569
Int. Cl.[4] C01B *33/12*
U.S. Cl. 423—335 **16 Claims**

1. A process for producing highly monodisperse fine spherical silica having a particle size of 100 nm or less, comprising a step of hydrolyzing an alkoxysilane in a mixed solution comprising water and alcohol and containing an alkaline catalyst, wherein the amount of said alkaline catalyst is 0.5 to 10 in molar ratio to the alkoxysilane used, the concentration of water in said mixed solution of water and alcohol is 5 to 20 mol/lit., and the reaction temperature in said hydrolysis is 30° C. or more.

4,842,838
SILICA WITH A HIGH OIL ABSORPTION CAPABILITY AND A CONTROLLED PRIMARY STRUCTURE AND PROCESS FOR THE PRODUCTION THEREOF

Yvonick Chevallier, Decines, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Continuation-in-part of Ser. No. 879,492, Jun. 24, 1986, Pat. No. 4,708,859, which is a continuation of Ser. No. 753,874, Jul. 11, 1985, abandoned. This application Jan. 16, 1987, Ser. No. 5,012
Claims priority, application France, Jul. 11, 1984, 84 11004
The portion of the term of this patent subsequent to Nov. 24, 2004, has been disclaimed.
Int. Cl.[4] C01B *33/12*
U.S. Cl. 423—339 2 Claims



1. A process for the production of precipitated silica comprising:

(a) providing a colloid of silica by

(i) forming a reaction medium by simultaneously adding an acidifying agent and an alkaline silicate solution to a reaction vessel;

(ii) reacting said acidifying agent and said alkaline silicate solution; and

(iii) maintaining a constant volume of said reaction medium by drawing off said reaction medium while adding additional acidifying agent and alkaline silicate solution in a constant volume to the reaction medium wherein said alkaline silicate is added to said reaction medium to provide a SiO_2 concentration of from about 5 g/l to about 50 g/l;

(b) reacting at least a portion of the colloid obtained in step (a) with an electrolyte, said colloid having a mean diameter of between about 10 and 100 nm and a polydispersity factor of from about 1 to 4; and

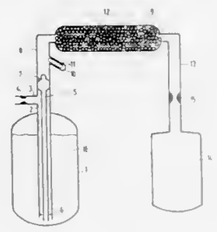
(c) consolidating the substance obtained in step (b) by adding a solution of silicate and an acidifying agent to obtain said precipitated silica with a CTAB specific surface area from about 20–120 m^2/g.

4,842,839
PROCESS FOR THE REMOVAL OF HYDROGEN FROM HYDROGEN COMPOUNDS DISSOLVED IN SILICON TETRACHLORIDE OR GERMANIUM TETRACHLORIDE

Hans Rau, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 53,603, May 20, 1987, abandoned. This application Jun. 21, 1988, Ser. No. 211,085
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1985, 3502367
Int. Cl.[4] C01B *33/107*; C01G *17/04*
U.S. Cl. 423—342 1 Claim

1. A process for the removal of all hydrogen from hydrogen compounds dissolved in silicon tetrachloride or germanium tetrachloride comprising chlorinating said hydrogen compounds dissolved in said silicon tetrachloride or germanium

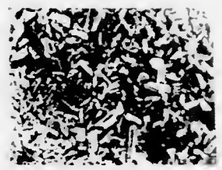


tetrachloride with a chlorinating agent essentially consisting of chlorine at a temperature of at least 1000° C.

4,842,840
METHOD FOR PRODUCTION OF OXIDATION-RESISTANT SIALON AND SILICON CARBIDE MATERIALS

Nobuyuki Azuma, Kasugai; Kazuo Nakamura, Owari-Asahi; Minoru Maeda, Konan, and Mamoru Yamada, Nagoya, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Jan. 5, 1988, Ser. No. 140,995
Claims priority, application Japan, Jan. 8, 1987, 62-2446; Jan. 8, 1987, 62-2447
Int. Cl.[4] B05G *3/02*; C01B *31/36*
U.S. Cl. 423—345 6 Claims



1. A method for the production of an oxidation-resistant silicon carbide material possessing a phase of closely packed crystals in the surface region thereof, which method consists essentially of:

coating a surface of a silicon carbide substrate with a layer of a mixture of at least one alkali metal compound selected from the group consisting of halogenides, carbonates, nitrates and sulfates of alkali metals and at least one carbonaceous substance selected from the group consisting of elementary carbon and hydrocarbons,

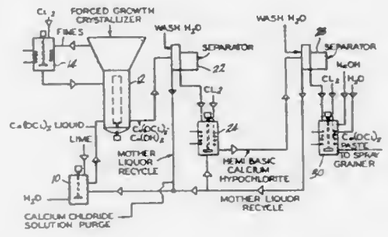
firing the resultant coated substrate at a temperature in the range of 800° to 1300° C. in the presence of oxygen, thereby forming on the surface of said silicon carbide substrate a coated layer consisting substantially of an alkali metal-containing vitreous substance and crystallizing the surface of said silicon carbide substrate, and

subsequently removing said coated layer to expose the crystallized surface of said silicon carbide substrate.

4,842,841
CONTINUOUS PROCESS FOR PRODUCING GRANULAR CALCIUM HYPOCHLORITE PARTICLES

Walter C. Saeman, Cleveland, Tenn., assignor to Olin Corporation, Cheshire, Conn.

Division of Ser. No. 431,427, Sep. 30, 1982, Pat. No. 4,584,457. This application Jan. 29, 1984, Ser. No. 626,875
Int. Cl.[4] C01B *11/04*
U.S. Cl. 423—474 9 Claims



1. A continuous process for producing dibasic calcium hypochlorite crystals by forced-growth crystallization which consists essentially of:

(a) admixing lime and an aqueous liquid in a mixing zone to form a lime slurry;

(b) feeding said lime slurry to a crystallizing zone;

(c) feeding into said crystallizing zone a calcium hypochlorite-containing liquid to react with said lime to produce a slurry of coarse dibasic calcium hypochlorite crystals and to elutriate a fines slurry comprised of particles of unreacted lime and excess crystal nuclei from said crystallizing zone;

(d) conveying said fines slurry to a fines chlorinating zone;

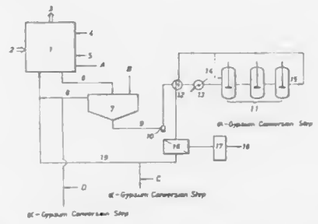
(e) chlorinating said fines slurry to destroy said excess crystal nuclei and produce said calcium hypochlorite-containing liquid and returning said calcium hypochlorite-containing liquid to said crystallizing zone; and

(f) recovering said coarse dibasic calcium hypochlorite crystals from a dibasic hypochlorite mother liquor.

4,842,842
PROCESS FOR PRODUCING α-FORM GYPSUM HEMIHYDRATE

Yoshihiko Kndo, Iwaki, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 774,342, Sep. 10, 1985, abandoned. This application Jun. 15, 1987, Ser. No. 62,720
Claims priority, application Japan, Sep. 17, 1984, 59-194468; Jun. 21, 1985, 60-135404; Jul. 3, 1985, 60-146145
Int. Cl.[4] C04B *11/024*
U.S. Cl. 423—554 5 Claims

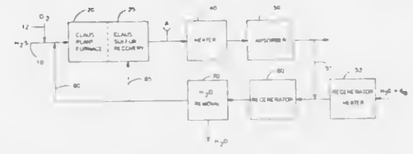


1. A method for producing α-form gypsum hemihydrate, comprising contacting an exhaust combustion gas containing sulfur dioxide with an absorbent liquid containing at least 10–100 mmol of magnesium sulfosuccinate per kg of the absorbent liquid and 5 to 25% by weight of gypsum dihydrate based on the absorbent liquid, subjecting to oxidation with air and to neutralization with limestone, heating to 110°–140° C. under a pressure of 0.5 to 2.7 kg/cm^2G the thus formed slurry containing gypsum dihydrate to convert the gypsum dihydrate into α-form gypsum hemihydrate, separating the thus formed α-form gypsum hemihydrate from a liquid medium by solid-liquid separation, and reusing the thus obtained, separated liquid by recirculation as the absorbent liquid.

4,842,843
REMOVAL OF WATER VAPOR DILUENT AFTER REGENERATION OF METAL OXIDE ABSORBENT TO REDUCE RECYCLE STREAM

Paul T. Pendergraft, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed Dec. 17, 1987, Ser. No. 134,329
Int. Cl.[4] C01B *17/04*; B01D *53/04*
U.S. Cl. 423—574 R 14 Claims

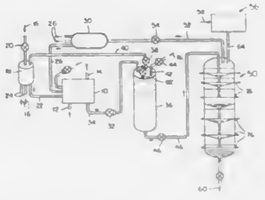


1. In a process in which ZnO is used to absorb at least one of H_2S and SO_2 from Claus Plant tail gas producing ZnS and in which ZnS is regenerated using O_2 producing a regeneration effluent which is returned to the Claus Plant from which the tail gas is derived, the step of reducing the volume flow of regeneration effluent containing sulfur species which must be further processed by diluting the O_2-containing gas used for regeneration with a diluent consisting essentially of added water prior to regeneration of ZnS to ZnO and after such regeneration removing at least a portion of the added water.

4,842,844
METHOD OF GENERATING HYDROGEN

William G. Harris, Seattle, and Douglas J. Silva, Kent, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 761,995, Aug. 2, 1985, Pat. No. 4,753,779. This application May 18, 1987, Ser. No. 50,447
Int. Cl.[4] C01B *1/07*
U.S. Cl. 423—657 20 Claims



1. A method for efficiently generating hydrogen by the reaction of HCl with a metal, comprising the steps of:

(a) introducing an HCl solution to the bottom of a bed of metal particles;

(b) forcing the HCl solution upwardly through the bed at a flow rate and velocity sufficiently low to avoid fluidizing the particles;

(c) collecting the HCl solution as the solution emerges from the top of the bed; and

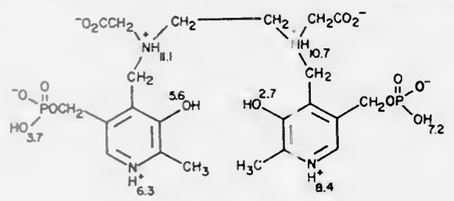
(d) collecting hydrogen created by the reaction of HCl with the metal.

4,842,845

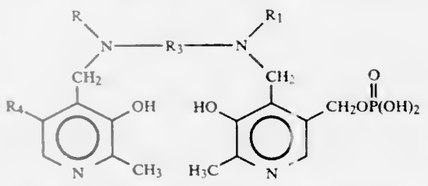
RADIOACTIVE METAL CHELATES FOR DIPYRIDOXYL PHOSPHATE

Scott M. Rocklage, Saratoga, and Steven C. Quay, Los Altos Hills, both of Calif., assignors to Syntex, Inc., Sunnyvale, Calif.

Filed May 8, 1987, Ser. No. 47,616
Int. Cl.[4] A61K *49/02;* **C07F** *13/00*
U.S. Cl. 424—1.1 **44 Claims**



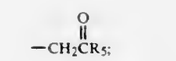
1. A radioactive metal ion chelate of the chelating compound of the formula:



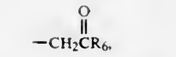
(I)

wherein said compound is chelated with a radioactive metal iron, wherein

R is hydrogen or



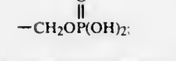
R_1 is hydrogen or



and one of R and R_1 is other than hydrogen;

R_3 is alkylene having from 1 to 8 carbons, 1,2-cycloalkylene having from 5 to 8 carbons, or 1,2-arylene having from 6 to 10 carbons, or

R_4 is hydrogen, hydroxymethyl, alkyl having from 1 to 6 carbons or



R_5 and R_6 are each, individually, hydroxy, alkoxy having from 1 to 18 carbons, hydroxy-substituted alkoxy having from 1 to 18 carbons, amino or alkylamido having from 1 to 18 carbons;

the phosphate group mono and diesters of the compounds thereof with monohydric and polyhydric alcohols having from 1 to 18 carbons, or alkylamino alcohols, each having from 1 to 18 carbons, and the salts thereof.

4,842,846

SUPEROXIDE DISMUTASE COMPOSITION FOR PERIODONTAL USE

Minoru Nakano, 7-9 Otemachi-3-chome, Maebashi-shi, Gunma-ken, Japan

Filed Nov. 20, 1987, Ser. No. 123,286
Claims priority, application Japan, Nov. 22, 1986, 61-279497
Int. Cl.[4] A61K *7/28, 7/16, 9/68, 7/22*
U.S. Cl. 429—50 **19 Claims**

1. A composition for the treatment or prevention of periodontal disease by application to oral cavity tissue, said composition comprising: (1) superoxide dismutase in an amount sufficient for said treatment or prevention and (2) catalase in an amount sufficient to remove hydrogen proxide.

4,842,847

DENTAL CALCULUS INHIBITING COMPOSITIONS

Zahid Amjad, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 21, 1987, Ser. No. 135,803
Int. Cl.[4] A61K *7/18*
U.S. Cl. 424—52 **17 Claims**

1. An oral composition comprising:
(a) an effective amount of a fluoride source,
(b) effective amount of a dental abrasive; and
(c) 0.01 to 10% by weight of an anticalculus agent selected from homopolymers of monounsaturated monocarboxylic and dicarboxylic acids of 3 to 5 carbon atoms, salts and anhydrides thereof, and from copolymers containing at least 30% by weight of a carboxylic monomer selected from said acids, and mixtures of such anticalculus agents.

4,842,848

MAKE-UP COSMETICS

Kenji Saita, Toyonaka, and Kunio Saegusa, Niihama, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 24, 1986, Ser. No. 946,061
Int. Cl.[4] A61K *7/021*
U.S. Cl. 424—63 **1 Claim**

1. In a make-up cosmetic comprising conventional base materials, the improvement comprising having incorporated in said make-up cosmetic at least one synthetic flaky oxide compound consisting essentially of alumina, silica or magnesia, or comprising a mixture of at least one synthetic flaky oxide compound consisting essentially of alumina, silica or magnesia, and at least one synthetic flaky oxide compound consisting essentially of tiatania, zirconia or zinc oxide, the flakes of said flaky oxide or flaky oxide mixture having an average thickness of 0.1 to 2 μm and an average size of 1 to 100 μm and a refractive index of 1.4 to 1.8, said average size being defined herein as an average value of the longest diameter of flakes plus the shortest diameter thereof divided by 2 for 100 flakes.

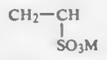
4,842,849

COMPOSITION INTENDED FOR THE TREATMENT OF KERATIN FIBRES, BASED ON A CATIONIC POLYMER AND AN ANIONIC POLYMER CONTAINING VINYLSULPHONIC GROUPS

Jean F. Grollier; Claire Fiquet; Chantal Fourcadier, all of Paris; Claude Dubief, Versailles; Jean Mondet, Drancy, and Daniele Cauwet, Crosne, all of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 376,036, May 7, 1982, abandoned. This application Oct. 30, 1987, Ser. No. 115,612
Claims priority, application Luxembourg, May 8, 1981, 83.350
Int. Cl.[4] A61K *7/06*
U.S. Cl. 424—70 **22 Claims**

1. Process for the cosmetic treatment of hair, which comprises applying a composition which contains 0.01 to 10% by weight of at least one polymer containing one or more cationic groups and selected from a cationic or amphoteric polymer containing primary, secondary, tertiary or quaternary amine units or mixtures thereof and having a molecular weight of 1,000 to 5,000,000 and 0.01 to 10% by weight of at least one anionic polymer containing vinylsulphonic groups of the formula:



in which M denotes hydrogen, an alkali metal or alkaline earth metal or an ammonium or amine group in a solvent medium which is water, a monoalcohol, a polyalcohol, glycol ether or a mixture thereof.

4,842,850

HAIR CARE COMPOSITIONS

Hoang D. Vu, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 18, 1987, Ser. No. 51,548
Int. Cl.[4] A61K *7/075*
U.S. Cl. 424—70 **7 Claims**

1. A shampoo composition comprising:
(a) from about 0.01% to about 10% of a rigid silicone having a complex viscosity of at least 2×10^5 poise selected from the group consisting of filler reinforced polydimethyl siloxane gums, silicone resin reinforced silicone gums and mixtures thereof;
(b) from about 10% to about 30% of a synthetic surfactant;
(c) from about 0.1% to about 10% of a volatile solvent;
(d) from about 0.2% to about 12% of about a 50% aqueous solution of an alkyl glyceryl sulfonate; and
(e) the balance water, wherein a premix consisting of the rigid silicone and the alkyl glyceryl sulfonate is formed prior to mixing with the other shampoo components.

4,842,851

POLYAMINO AMIDES FOR PROTECTING HAIR AGAINST ATMOSPHERIC ATTACK, AND IN PARTICULAR AGAINST LIGHT, AND PROCESS FOR PROTECTING HAIR EMPLOYING SUCH POLYAMINOAMIDES

Jean F. Grollier, Paris, and Claude Dubief, Le Chesnay, both of France, assignors to L'Oreal, Paris, France

Filed Jun. 2, 1987, Ser. No. 56,693
Claims priority, application Luxembourg, Jun. 2, 1986, 86452
The portion of the term of this patent subsequent to Nov. 3, 2088, has been disclaimed.
Int. Cl.[4] A61K *7/11, 7/08, 7/075, 7/42*
U.S. Cl. 424—70 **14 Claims**

1. A process for protecting hair keratin against light comprising applying to hair an effective quantity to protect said hair keratin against light of a cosmetic composition containing, in a cosmetically acceptable medium, at least one polyaminoamide selected from the group consisting of

(I) a polyaminoamide (A) prepared by polycondensation of an acidic compound selected from the group consisting of (a) an organic dicarboxylic acid, (b) a double bonded aliphatic mono- or dicarboxylic acid, (c) an ester of the acid defined in (a) and (b), and (d) a mixture of the compounds defined in (a), (b) and (c), with a polyamine chosen from a mono- or bis-secondary bis-primary polyalkylene-polyamine, it being possible for 0 to 40 mol % of said polyalkylene polyamine being replaceable by a bis-primary amine or by a bis-secondary amine and it further being possible for 0 to 20 mol % of said polyalkylene polyamine being replaceable by hexamethylenediamine;

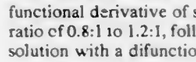
(II) said polyaminoamide (A) of (I) crosslinked with a crosslinking agent selected from the group consisting of an epihalohydrin, a diepoxide, a dianhydride, an unsaturated anhydride and a bis-unsaturated derivative, said crosslinking agent being employed in an amount of 0.025 to 0.35 mole of crosslinking agent per secondary amine group of said polyaminoamide (A);

(III) said crosslinked polyaminoamide (A) of (II) alkylated with an epoxide or an unsaturated derivative;

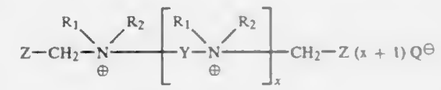
(IV) a water-soluble crosslinked polyaminoamide obtained by crosslinking said polyaminoamide (A) defined in I above, with a crosslinking agent selected from the group consisting of:
(1) a simple difunctional compound selected from the group consisting of (a) bishalohydrin, (b) a bisazetidinium, (c) a bishaloacyldiamine and (d) an alkyl bishalide;
(2) an oligomer obtained by reaction of a compound (a) selected from the group consisting of (i) a bishalohydrin, (ii) a bisazetidinium, (iii) a bishaloacyldiamine, (iv) an alkyl bishalide, (v) an epihalohydrin, (vi) a diepoxide and (vii) a bis-unsaturated derivative with a compound (b) which is a difunctional compound reactive towards said compound (a);
(3) the quaternization product of a compound selected from the group consisting of said compound (1) and said oligomer (2) and containing one or more tertiary amine groups capable of being completely or partially alkylated with an alkylating agent (c) selected from the group consisting of methyl or ethyl chloride, bromide, iodide, sulphate, mesylate and tosylate, benzyl chloride or bromide, ethylene oxide, propylene oxide and glycidol;

the crosslinking being carried out by means of 0.025 and 0.35 mole of crosslinking agent per amine group of said polyaminoamide;

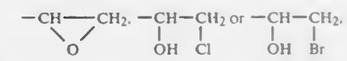
(V) a water-soluble polyaminoamide derivative resulting from the condensation of a polyalkylene polyamine containing two primary amino groups, at least one secondary amino group and alkylene groups containing 2 to 4 carbon atoms with a dicarboxylic acid having the formula:



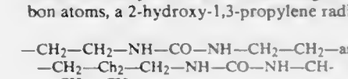
in which m denotes an integer from 4 to 8, or with a functional derivative of said dicarboxylic acid, in a molar ratio of 0.8:1 to 1.2:1, followed by an alkylation in aqueous solution with a difunctional agent having the formula



in which
x denotes an integer from 0 to 7,
Z denotes one of



R_1 and R_2 each denote a lower alkyl group or a lower hydroxyalkyl group containing 1 to 4 carbon atoms, Y denotes an alkylene radical containing from 2 to 6 carbon atoms, a 2-hydroxy-1,3-propylene radical or one of



$Q^{\ominus}$ denotes halogen, sulphate or methosulphate, the quantity of said difunctional alkylating agent being chosen so that the alkylation product remains in solution; and

(VI) a water-soluble polymer obtained by reaction of a polyalkylenepolyamine containing two primary amine groups and at least one secondary amine group with a

dicarboxylic acid selected from diglycolic acid and a saturated aliphatic dicarboxylic acid containing 3 to 8 carbon atoms; the molar ratio of said polyalkylenepolyamine to said dicarboxylic acid being between 0.8:1 and 1.4:1; the resultant polyamide being reacted with epichlorohydrin in a molar ratio of epichlorohydrin to the secondary amine group of the said polyamide of between 0.5:1 and 1.8:1.

4,842,852

HYDROCARBON TOLERANT HAIR FIXING COMPOSITIONS

Frank A. Nowak, Jr., Somerville; Albert L. Micchelli, Middletown, and William M. Rouse 3, Morristown, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Mar. 10, 1988, Ser. No. 166,332
Int. Cl.[4] A61K 7//1
U.S. Cl. 424—71 6 Claims

L An improved hair fixing composition having increased hydrocarbon tolerance, for use in aerosol formulations, comprising a terpolymer of 40–60% (by wt.) of a C_3–C_{11} alkyl methacrylate, 20–40% (by wt.) of a C_4–C_{10} N-substituted alkyl acrylamide, and 10–25% (by wt.) of acrylic acid or methacrylic acid, wherein all percentages total 100% and the improvement comprises neutralizing at least 70% of the carboxylic acid functionalities with an alkaline neutralizing agent comprising at least one base selected from the group consisting of NaOH or KOH, such that the tolerance of the copolymer to hydrocarbons is enhanced.

4,842,853

SOLID WHICH RELEASES A FRAGRANT SUBSTANCE AND/OR A DISINFECTANT

Helmut Gebauer, Munich, and Franz-Heinrich Kreuzer, Martinsried, both of Fed. Rep. of Germany, assignors to Consortium für Elektrochemische, Munich, Fed. Rep. of Germany

Division of Ser. No. 721,141, Apr. 9, 1985, abandoned, Continuation of Ser. No. 524,007, Aug. 17, 1983, abandoned. This application Aug. 4, 1986, Ser. No. 892,547
Claims priority, application European Pat. Off., May 27, 1983, 83105270.9
Int. Cl.[4] A61L 9/01, 13/00
U.S. Cl. 424—76.1 9 Claims

1. A solid which releases a fragrant substance and/or a disinfectant to the environment comprising a substance selected from the group consisting of a fragrant substance, a disinfectant and mixtures thereof and a sublimable carrier in which at least a portion of the sublimable carrier is a mixture consisting of from 10 to 90 weight percent of hexamethylcyclotrisiloxane and from 90 to 10 weight percent of tetramethylcyclobutanedione based on the weight of hexamethylcyclotrisiloxane and tetramethylcyclobutanedione.

4,842,854

ANTIANGINAL PLATE FOR TREATING ISCHEMIC HEART DISEASE

Eduard A. Babaian; Galina A. Gerasimova; Anatoly B. Davydov; Rustam I. Utyamyshev; Gennady L. Khromov; Vladimir I. Metelitsa; Anatoly M. Vikhert; Konstantin L. Savvateev; Vladimir K. Plotrovsky, and Elizaveta B. Novikova, all of Moscow, U.S.S.R., assignors to Vsesojuzny Kardiologichesky Nauchny Tsentr Akademii Meditsinskiki Nauk SSR, Moscow, U.S.S.R.

Continuation-in-part of Ser. No. 799,200, Nov. 19, 1985, Pat. No. 4,713,239, which is a continuation of Ser. No. 42,874, May 29, 1979, abandoned. This application May 13, 1987, Ser. No. 50,526
Int. Cl.[4] A61K 9/20, 31/79
U.S. Cl. 424—81 9 Claims

1. An antianginal film composition in plate form useful for treating ischemic heart diseases in patients subject to anginal pectoris and which is capable of adherence to a selected site of the mouth mucosa for rapid arresting or prevention of anginal pectoris attacks whereby said composition when highly adhered remains fixed and glued to a chosen sit of the mouth mucosa and insures immediate, uniform and sustained delivery of an antianginal nitrate directly into the blood circulation system through the mouth mucosa, in an effective sustained amount for an average of about 5 hours per plate, and with the great advantage that it is possible to control and easily discontinue the nitrate uptake by removing the unresolved film in cases where it becomes necessary or, on the contrary, to renew the therapy, said antianginal composition comprising from about 3 to 30 weight percent of an antianginal nitrate in a complex labile bond with from about 70 to 97 weight percent of a mouth mucosa soluble, swellable and resolvable polymeric film-forming carrier selected from the group consisting of homopolymers of acrylamide and vinylpyrrolidone and their copolymers with acrylates, in which solutions of the biologically resolvable soluble polymer carrier and the active substance were mixed, and a film cast and dried until the residual amount of the solvent does not exceed about 10 percent by weight;

said film-forming carrier having the ability to:

(a) form labile complex bonds with said anti-anginal coronary vasodilating nitrate;

(b) remain highly adhered to the mouth mucosa, but can be removed to interrupt or discontinue treatment; and

(c) release the active principle of said coronary vasodilator nitrate immediately, and thereafter at such a sustained rate and for a period of time that the pharmacodynamic effects as expressed by the mean data of the repeated individual selected standard physical loads with treadmill in combination ECG-monitoring

(i) are detectable practically instantaneously after affixing to the mouth mucosa,

(ii) confirm the presence of a continuous therapeutic concentration of said active principle in the patient's blood during resolution of said carrier, and

(iii) confirm a bioavailability of said active principle in an amount substantially greater than that obtained with a sublingual nitroglycerin tablet as the standard.

4,842,855

ANTITUMOR PROCESS USING A *BRUCELLA ABORTUS* PREPARATION

Julius S. Youngner; David S. Feingold, and Georg Keleti, all of Pittsburgh, Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.

Continuation of Ser. No. 218,076, Dec. 19, 1980, abandoned, which is a continuation of Ser. No. 49,880, Jun. 19, 1979, abandoned, which is a continuation-in-part of Ser. No. 889,273, Mar. 23, 1978, abandoned. This application May 7, 1984, Ser. No. 608,007
Int. Cl.[4] A61K 35/56
U.S. Cl. 424—95 11 Claims

1. A process of inhibiting tumors in a patient comprising

providing BRU-PEL in a dosage effective to resist tumor development in said patient, and

administering said BRU-PEL to said patient.

4,842,856

PARENTERAL SOLUTION

Wolfgang Hoederath, Lindlar-Linde; Hans J. Ahr; Klaus Bühner, both of Wuppertal; Ahmed Hegasy, Leverkusen, and Manfred Winter, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 11, 1988, Ser. No. 142,619
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1987, 3702105
Int. Cl.[4] A61K 9/00, 47/00, 31/44, 9/22
U.S. Cl. 424—101 6 Claims

1. A parenteral solution comprising

(a) a sparingly soluble medicament active compound,

(b) a solvent consisting of

(i) 5–100 W/V % of an organic solvent or a mixture of organic solvents and

(ii) 0–95 W/V % of water,

(c) a 0.5–30 W/V % strength aqueous solution of a human serum protein and customary auxiliaries and/or excipients, 1 to 40,000 parts by weight of solvent (b) and 1 to 1,000,000 parts by weight of human serum protein solution (c) being present per part by weight of said medicament active compound.

4,842,857

GLYPHOMICINS A AND B

Edward Meyers, East Brunswick, and William L. Parker, Pennington, both of N.J., assignors to E. R. Squibb and Sons, Inc., Princeton, N.J.

Filed May 12, 1986, Ser. No. 861,803
Int. Cl.[4] A61K 35/74; C12P 1/06
U.S. Cl. 424—116 2 Claims

1. Glyphomicin A, or a pharmaceutically acceptable salt thereof, the sodium salt of which has the infrared spectrum in potassium bromide as shown in FIG. 1, the 400 MHz ^1H NMR spectrum as shown in FIG. 3, and having the approximate elemental analysis C, 47.69%, H, 6.30%, N, 2.06%, P, 2.0%.

4,842,858

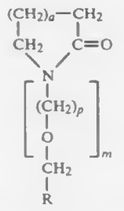
POLYMERIC HALOPHORS

David J. Tracy, Lincoln Park; Mohamed M. Hashem, Wayne, and Robert B. Login, Oakland, all of N.J., assignors to GAF Corporation, Wayne, N.J.

Division of Ser. No. 21,284, Mar. 3, 1987. This application Dec. 11, 1987, Ser. No. 131,789
Int. Cl.[4] A61K 31/395; C11D 1/58, 3/58
U.S. Cl. 424—150 12 Claims

1. The process of adding to a detergent solution an effective cleansing and disinfecting amount of the halogen complex selected from the group consisting of an iodine complex and a bromine complex of an alkyleneoxy lactam polymer containing between about 2 and about 40% halogen and said polymer contains

(i) at least one pyrrolidonyl unit having the formula



wherein a has a value of 1–3; p has a value of 1–2; m has a value of 0–1; R is a radical selected from the group of

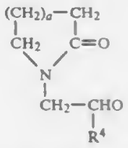
and wherein R^4 is hydrogen or methyl;

(ii) at least two propyleneoxy units

or

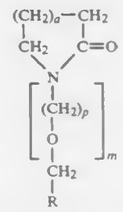
(iii) at least two propyleneoxy units and one or more ethyleneoxy units; and said polymer having terminal groups selected from the group consisting of hydroxy and the radical

wherein R^1 is alkyl having from 6 to 20 carbon atoms; Y is alkyl having from 1 to 4 carbon atoms; v has a value of 0–2 and g has a value of 0–1; and, when m is O, the polymer contains only one of said lactam units,

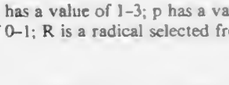


7. The process for extending the gradual release of halogen which comprises adding to a topical medicinal solution an effective disinfecting amount of the halogen complex selected from the group of a iodine complex and a bromine complex of an alkyleneoxy lactam polymer containing between about 2 and about 40% halogen and said polymer contains

(i) at least one pyrrolidonyl unit having the formula



wherein a has a value of 1–3; p has a value of 1–2; m has a value of 0–1; R is a radical selected from the group of

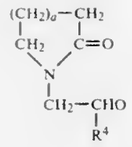


and wherein R^4 is hydrogen or methyl;

(ii) at least two propyleneoxy units or

(iii) at least two propyleneoxy units and one or more ethyleneoxy units; and said polymer having terminal groups selected from the group consisting of hydroxy and the radical

wherein R^1 is alkyl having from 6 to 20 carbon atoms; Y is alkyl having from 1 to 4 carbon atoms; v has a value of 0–2 and g has a value of 0–1; and, when m is O, the polymer contains only one of said lactam units,



4,842,859
PHARMACEUTICAL COMPOSITIONS FOR REDUCING HYPERLIPIDEMIA AND PLATELET-AGGREGATION
Yaguang Liu, 67-08, 168th St., Flushing, N.Y. 11365
Filed Sep. 8, 1986, Ser. No. 905,554
Int. Cl.[4] A61K 3/73
U.S. Cl. 424—195.1 6 Claims

1. A crude pharmaceutical composition comprising plant extracts, in weight %, derived from the following plants:
Artemisia capillaris Thunb, Citrus aurantium L, Citrus spp or Poncirus trifoliata Raf, 20–50
Angelica spp, Angelica sinensis Diels or Levisticum officinale Kock, 20–50
Curcuma aromatica salisb, or Curcuma zedoaria roscoe, 5–30 and
Chrysanthemum indicum L., Matricaria chamomilla L., Tagetes patula L. or Tagetes minnuta L., 5–30.

4,842,860
PROCESS FOR PRODUCING CONTROLLED RELEASE PREPARATION
Hisao Sugiura, and Masanori Watanabe, both of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan
Filed Jun. 23, 1987, Ser. No. 65,770
Claims priority, application Japan, Jun. 1, 1986, 61-152625
Int. Cl.[4] A01N 25/14
U.S. Cl. 424—403 9 Claims

1. A process for producing a controlled release preparation, which comprises:
mixing a resin selected from the group consisting of polyethylene, polypropylene, nylon, polyvinyl chloride, and polyvinyl acetate, with a carrier in a ratio of resin to carrier of 2:1 to 1:100 by weight;
impregnating the resulting mixture with an effective amount of an active agent; and
applying pressure to the mixture to form a solid; and wherein said resin, said carrier and said active agent are mutually exclusive substances.

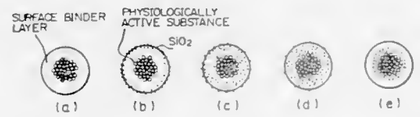
4,842,861
ARTIFICIAL MAPLE CONCENTRATE ATTRACTANT RODENT BAITS
John P. Hollis, Jr., 7146 Spring Ter., San Antonio, Tex. 78249
Continuation-in-part of Ser. No. 848,639, Jan. 16, 1984, abandoned, which is a continuation-in-part of Ser. No. 168,368, Jul. 10, 1980, abandoned. This application May 26, 1988, Ser. No. 198,864
Int. Cl.[4] A01N 25/18
U.S. Cl. 424—410 4 Claims

1. A sugar-free rodenticidal composition which comprises a rodenticidal amount of Warfarin, a rodenticidal masking amount of about 0.05 to 0.10 weight percent of the composition of saccharine (sodium) a rodent attracting amount of about 0.04 to 0.08 weight percent of the composition of sugar-free artificial maple encentrate, about 43 to 48 weight percent of cracked corn and 43 to 48 weight percent of roiled oats and about 5 to 10 weight percent of cornstarch.

4,842,862
IMMUNOSTIMULATING AGENTS
Martin J. Jacobs; Carl K. Edwards, III, and Paula Myers-Keith, all of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.
Filed Jul. 3, 1986, Ser. No. 881,926
Int. Cl.[4] A61F 13/00; A61K 39/00
U.S. Cl. 424—422 18 Claims

1. A method for non-specifically stimulating the vertebrate immune system comprising the step of:
administering to said vertebrate from about 1–20 mg/kg of body weight of at least one compound selected from the group consisting of zearalenone, zearalanone, zearalene, zearalane, zearalenol, zearalanol, and dideoxyzearalane.

4,842,863
GRANULAR AGENT FOR RUMINANT AND PRODUCTION METHOD THEREOF
Kunio Nishimura, and Hitoshi Iijima, both of Kawasaki, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 26, 1988, Ser. No. 148,524
Claims priority, application Japan, Jan. 26, 1987, 62-13999
Int. Cl.[4] A23K 2/00
U.S. Cl. 424—438 5 Claims

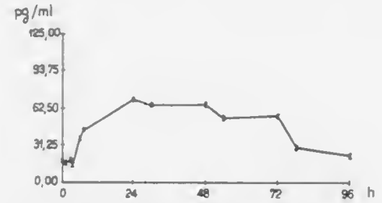


1. A solid granular agent for a ruminant consisting essentially of:
(i) 15% to 60% by weight of at least one physiologically active substance,
(ii) 10% to 35% by weight of a waxy substance having a melting point of 40° C. to 120° C.,
(iii) 30% to 50% by weight of a solid auxiliary substance, which is stable under a neutral condition and is disintegrated or dissolved under an acidic condition, and
(iv) 0.02% to 1.0% by weight, of fine solid particles having an average particle size of 10 μm or less and a melting point of 120° C. or more, which is substantially slightly soluble in water and insoluble in the waxy substance,
said granular agent being prepared by granulating components (i), (ii), and (iii) in a one-step agitation granulating method, followed by adding component (iv), whereby the physiologically active substance (i) is coated with a thin film of the waxy substance (ii) having a thickness of 0.2 to 20 μm and containing the solid auxiliary substance (iii) therein and the fine solid particles (iv) are embedded in the surface thin film of the granular agent.

4,842,864
SELF-ADHESIVE DEVICE FOR THE PERCUTANEOUS ADMINISTRATION OF AN ACTIVE INGREDIENT
Alain Guillemet, Dijon; Eric Teillaud, Talant, and Philippe Reginault, Fontaine les Dijon, all of France, assignors to Laboratories D'Hygiene et de Dietetique, Paris, France
Filed Mar. 25, 1988, Ser. No. 174,414
Claims priority, application France, Mar. 25, 1987, 87 04133
Int. Cl.[4] A61K 9/16
U.S. Cl. 424—448 12 Claims

1. A self-adhesive matrix for the percutaneous administration of an active ingredient, which comprises:
(a) 40 to 60 parts by weight of an ethylene/vinyl acetate copolymer material,
(b) 40 to 60 parts by weight of a higher aliphatic monoalcohol compound,
(c) 1 to 20 parts by weight of a cellulose derivative material,

(d) 0.1 to 8 parts by weight of a polybydric alcohol compound, and



(e) 0.01 to 10 parts by weight of an active ingredient which can be administered percutaneously,
the weight ratio a+c/b+d being between 0.7 and 1.3.

4,842,865
USE OF GLYCOFUROL FOR THE LIQUIDIZATION OF PHARMACEUTICAL PREPARATIONS TO BE FILLED INTO SOFT GELATINE CAPSULES
Manfred Durr, Pulheim/Dansweiler; Hans U. Fribolin, Neuss; Ekkerhard Harhausen, Sarkwitz, and Jurgen Seidel, Pulheim, all of Fed. Rep. of Germany, assignors to A. Nattermann & CIE GmbH, Cologne, Fed. Rep. of Germany
Filed Apr. 23, 1987, Ser. No. 41,443
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1986, 3613799
Int. Cl.[4] B61K 9/64, 37/22
U.S. Cl. 424—456 7 Claims

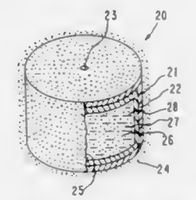
1. Process for the liquidization of pharmaceutical preparations containing more than 50%, based on the total preparation, of phosphatidyl choline with a high content of unsaturated and essential fatty acids comprising combining said phosphatidyl choline with a glycofurol liquidizer in an amount effective to liquidize the phosphatidyl choline.

4,842,866
SLOW RELEASE SOLID PREPARATION
Rodney Horder, Sittingbourne; Michael Banks, Herne Bay, and Thomas H. Hoadley, Sheppey, all of England, assignors to Abbott Laboratories Ltd., Queenborough, England
Continuation of Ser. No. 818,443, Jan. 10, 1986, abandoned. This application Dec. 14, 1987, Ser. No. 132,678
Claims priority, application European Pat. Off., Jan. 11, 1985, 85300215.2
Int. Cl.[4] A61K 9/22, 9/26
U.S. Cl. 424—468 10 Claims

1. A controlled, slow release, solid preparation comprising sodium alginate, sodium-calcium alginate and a therapeutically effective amount of at least one active ingredient.

4,842,867
PULSED DRUG DELIVERY OF DOXYLAMINE
Atul D. Ayer, Mountain View; Felix Theeuwes, Los Altos, and Patrick S. Wong, Hayward, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.
Filed May 9, 1986, Ser. No. 861,188
Int. Cl.[4] A61K 9/24
U.S. Cl. 424—473 1 Claim

1. A single dosage form comprising two doses of a beneficial drug formulation useful as a sleep-aid for administering to a recipient, said dosage form comprising:
(a) a dosage amount of a first dose of a doxylamine formulation coated on the exterior surface of the dosage form;
(b) a first wall comprising in at least a part a semipermeable composition permeable to the passage of fluid, said wall surrounding;
(c) a second wall comprising means for delaying release of a doxylamine formulation from the interior of the dosage form, said second wall surrounding;
(d) a first layer comprising a second dose of a doxylamine formulation;

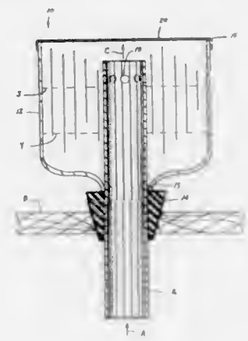


(e) a second layer comprising a hydrophilic hydrogel formulation that swells in the presence of fluid; and,
(f) at least one exit means in the wall for releasing doxylamine formulation from the interior of the dosage form.

4,842,868
COVALENTLY BONDED ACTIVE AGENTS WITH CARBONIUM ION BASE GROUPS
Robert F. Helwing, 1537 Bedford Ave., Sunnyvale, Calif. 94087
Filed Sep. 26, 1986, Ser. No. 912,352
Int. Cl.[4] A61K 9/14; A61F 13/00
U.S. Cl. 424—486 45 Claims

1. A composition of matter comprising:
an effective amount of a base component including at least one available CIM group; and
an effective amount of an active agent component, wherein the active agent includes at least one available PA group and is attached by a covalent bond between said PA group and said CIM group in a non-crosslinked manner,
wherein a CIM group is a moiety capable of forming a covalent bond by a carbonium ion mechanism with hydrogen releasing polar groups and a PA group is a hydrogen releasing polar group capable of forming a covalent bond with a CIM group, by way of an orthoester-type linkage.

4,842,869
METHOD FOR MAKING FERMENTED BEVERAGES
Vincent Forino, 2922 E. Main St., Waterbury, Conn. 06705
Filed Jun. 10, 1988, Ser. No. 204,888
Int. Cl.[4] C12G 1/08; C12H 1/00; C12N 1/02
U.S. Cl. 426—8 3 Claims



1. A method of making a fermented beverage comprising the steps of:
providing a fermentation container having a top opening;
filling said fermentation container with a beverage mixture of a sugar containing liquid, and yeast;

providing a fluid conduit inserted into the fermentation container top opening;
providing a trap container having a narrow bottom neck portion receiving said fluid conduit;
providing a sealing closure sealing said fluid conduit in airtight relation within said trap container and sealing said fluid conduit within the fermentation container;
said top container having an open top;
providing a cover over said trap container open top;
said fluid conduit having an open upper end terminating slightly below said cover;
providing a circumferential array of evenly spaced drain apertures in said fluid conduit spaced slightly below the upper end thereof; and
allowing said beverage mixture to ferment causing a portion of said beverage mixture and suspended contaminants to flow through said fluid conduit, out said drain apertures and into said trap container.

4,842,870

ANHYDROUS, NON-STALING CHEWING GUM COMPOSITION

Zdravko Dokuzovic, Mississanga; Zoltan Bodor, Pickering; Ramola Lewis, Toronto, and Costantina Kostantelon, Markham, all of Canada, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 22, 1987, Ser. No. 136,314
Int. Cl.[4] A23G *3/30*
U.S. Cl. 426—3 **11 Claims**

1. A substantially anhydrous, non-staling chewing gum composition, which comprises: a two component composition, the first being a homogenous premixture of about 10 to about 60% of a chewing gum base and about 2 to about 20% of a polyisobutylene having an average molecular weight of about 20,000 to about 100,000, a second component being about 38% to about 70% of a sweetening agent.

4,842,871

METHOD AND INOCULANT FOR PRESERVING AGRICULTURAL PRODUCTS FOR ANIMAL FEED

John E. Hill, Des Moines, Iowa, assignor to Pioneer Hi-Bred International, Inc., Johnston, Iowa

Filed Aug. 1, 1985, Ser. No. 761,557
Int. Cl.[4] A23B *9/00, 7/10, 4/12*; C12N *1/20*
U.S. Cl. 426—44 **17 Claims**

1. A method of preserving an agricultural product which comprises treating said product with an effective amount of *Lactobacillus plantarum* ATCC 53187 or effective mutants thereof.

4,842,872

METHOD OF PRODUCING RETORT FOOD

Ko Sugisawa; Yasushi Matsumura, both of Nara; Hidefumi Okamoto, Sakai, and Kumiko Abe, Furashiki, all of Japan, assignors to House Food Industrial Company Limited, Osaka, Japan

Filed Sep. 1, 1987, Ser. No. 91,878
Claims priority, application Japan, Sep. 11, 1986, 61-214788
Int. Cl.[4] A23L *1/305, 1/238, 1/31, 1/325*
U.S. Cl. 426—46 **7 Claims**

1. A method of producing retort food comprising the steps of: enclosing and sealing in a packaging container meat broiled with a flavoring liquid containing a soy component in such a manner that the content of amino nitrogen originating from said soy component within the flavoring liquid is 0.08 to 0.25% by weight and also containing 4.8 to 8.0% by weight of salt; and subjecting the meat to retort sterilization processing.

4,842,873

YOGHURT LIKE FOOD, AND YOGHURT LIKE FOODS MANUFACTURED WITH USE OF A COAGULANT

Seishi Takenawa, Nara; Mikio Ueda, Ashiya, and Hideki Takeda, Tenri, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Apr. 9, 1987, Ser. No. 36,455
Claims priority, application Japan, Apr. 28, 1986, 61-100142
Int. Cl.[4] A23L *1/20*
U.S. Cl. 426—49 **18 Claims**

1. An unfermented yoghurt-like food comprising protease coagulated soya milk and a tofu coagulant obtained, in the absence of fermentation, by coagulating soya milk with protease and a coagulant for tofu selected from the group consisting of glucono delta lactone, calcium sulfate, calcium chloride, calcium gluconate, calcium lactate, magnesium sulfate, magnesium chloride, calcium pantothenate and calcium glycerophosphate.

4,842,874

COMPOSITION FOR PREPARING FREEZE-THAW MICROWAVEABLE PRE-FRIED FOODSTUFFS

Louie R. D'Amico, Flemington; Susan E. Waring, Belle Meade, and Julianne M. Lenchin, Cranbury, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 883,259, Jul. 8, 1986, Pat. No. 4,778,684.
This application Jan. 29, 1988, Ser. No. 128,965
The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.
Int. Cl.[4] A23D *1/08*
U.S. Cl. 426—94 **6 Claims**

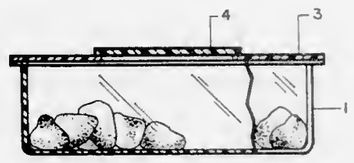
1. A dry predust composition for the preparation of a freeze/thaw stable batter coated, pre-fried microwaveable foodstuff comprising greater than 20%, by weight, of an hydroxypropylmethyl cellulose ether having a methoxyl content greater than 22% and an hydroxypropyl content of at least about 5%, said predust composition applied to the outer surface of a foodstuff prior to the application of an aqueous batter slurry whereby said predusted, batter coated pre-fried foodstuff possesses improved freeze/thaw stability and exhibits an acceptable crispness after microwave cooking.

4,842,875

CONTROLLED ATMOSPHERE PACKAGE

Harry S. Anderson, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 37,657, Apr. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 915,836, Oct. 6, 1986, abandoned. This application Nov. 20, 1987, Ser. No. 123,465
Int. Cl.[4] A23B *7/148*; B65D *85/50, 81/20*
U.S. Cl. 426—118 **5 Claims**



1. A container for retarding the maturation of respiring fresh produce selected from the group consisting of fruit, vegetables, or flowers contained therein by creating within the container a preselected carbon dioxide and oxygen concentration in the presence of said respiring fresh fruit, vegetables or flowers, said containers being constructed of a substantially gas-impermeable material completely enclosing said fresh fruit, vegetables or flowers, said gas impermeable material having a gas-permeable panel in one or more its walls to provide a controlled flow or flux of CO_2 and O_2 through its walls, where the panel is a microporous plastic membrane that is a biaxially oriented film comprised of a blend of a propylene homopolymer and a propylene-ethylene copolymer having an ethylene-moeity concentration of 2% to 5% by weight, filled with 40% to 60% of calcium carbonate, based on the total weight of the film, and having an oxygen permeance between about 77,500 and 465,000,000 cc/m^2-day-atmosphere, the permeance and area of the membrane being such as to provide a flux of O_2 approximately equal to the predicted O_2 respiration rate for not more than 3.0 kg of the enclosed fruit, vegetable or flower, and the carbon dioxide permeance of the membrane being such as to maintain the desired optimum ranges of carbon dioxide and oxygen sufficient for optimum retardation of the maturation process of said produce for not more than the said 3.0 kg of enclosed produce.

4,842,876

METHOD OF MICROWAVE HEATING OF STARCH-BASED PRODUCTS

Kathleen H. Anderson, Zimmerman; Matthew W. Lorence, Bloomington, and Gwen E. DeVay, Minneapolis, all of Minn., assignors to The Pillsbury Co., Minneapolis, Minn.

Filed Jun. 29, 1988, Ser. No. 213,013
Int. Cl.[4] A21D *8/06, 15/02*
U.S. Cl. 426—243 **32 Claims**

1. A method for producing an edible starch-based bread-type product having a desired degree of firmness, the method comprising the steps of:
forming a dough comprising water and flour;
preparing a product intermediate from said dough;
exposing said product intermediate to microwave irradiation for a time sufficient to produce a desired edible product; and
cooling said edible product at a rate of less than about 0.2 min^{-1} wherein said cooling rate is the absolute value of the slope of $\ln [(T-T_f)/(T_i-T_f)]$ versus time in minutes where T is the product center temperature at any time and the initial temperature (T_i) is normalized to 100° C. and the final temperature (T_f) is normalized to 30° C.

4,842,877

DELIGNIFICATION OF NON-WOODY BIOMASS

George J. Tyson, Madison, Wis., assignor to Xylan, Inc., Madison, Wis.

Filed Apr. 5, 1988, Ser. No. 177,786
Int. Cl.[4] A23K *1/00*
U.S. Cl. 426—271 **34 Claims**

1. A process for continuously treating a non-woody lignocellulosic substrate consisting of organic plant material having no more than about 20% lignin content, the process consisting essentially of:
(a) reacting the substrate in a reaction medium including an aqueous solution of a strong alkali at a pH in the range of about 10.5 and 12.5;
(b) reacting a chelating agent with the substrate the chelating agent being in an amount and for a time effective to chelate any metal ions in the solution;
(c) continuously feeding the product of step b) to an aqueous solution in a pressurized extruder reactor and reacting the substrate in an oxygen atmosphere at a temperature between about 150° and 315° F. and at a pressure between about 250 and 450 psi, and in the presence of hydrogen peroxide for a period of time effective to delignify the substrate wherein the hydrogen peroxide is added to the extruder at a rate of between about 20 and 40 pounds of hydrogen peroxide per ton of substrate.

4,842,878

PROCESS FOR THE EXTRACTION OF NONPOLAR CONSTITUENTS OF HOPS

Adrian Forster; Stefan Geyer; Josef Schulmeyr; Roland Schmidt, and Manfred Gehrig, all of Wolnzach, Fed. Rep. of Germany, assignors to Hopfen-Extraktion HVG Barth, Raiser & Co., Wolnzach, Fed. Rep. of Germany

Filed Sep. 24, 1987, Ser. No. 100,798
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632401
Int. Cl.[4] C12C *3/00*
U.S. Cl. 426—286 **14 Claims**

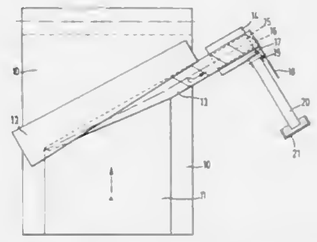
1. A process for extracting nonpolar constituents from hops while simultaneously separating residues of nonpolar plant protectives from the hops, comprising, in a first step, extracting the soluble plant protective residue and nonpolar constituents from said hops with a solvent comprising compressed carbon dioxide, under selected temperature and pressure conditions sufficient to extract the soluble plant protective residue and nonpolar constituents from said hops to form a dissolved mixture, and then, in a second step, passing the dissolved mixture through an adsorbent to selectively adsorb the plant protective residue from the mixture.

4,842,879

APPARATUS AND PROCESS FOR ROLLING A SHEET OF PASTRY MATERIAL

Kurt L. Ek, Vaesteraes, Sweden, assignor to Nestec S.A., Vevey, Switzerland

Filed Dec. 14, 1987, Ser. No. 132,791
Claims priority, application European Pat. Off., Dec. 23, 1986, 86117993.5
Int. Cl.[4] A21C *15/02*; A23P *1/00*
U.S. Cl. 426—297 **11 Claims**



9. A process for rolling pastry material comprising advancing a sheet of baked pastry material on a conveyor belt and contacting the advancing sheet of pastry material with a roller having its longitudinal axis extending diagonally across the width of the belt and having a diameter which diminishes, with respect to the direction of travel of the belt, from its upstream end to its downstream end and having its surface rotating in a direction substantially opposite that of the travel of the belt for transmitting rotatory movement to the sheet of pastry material for rolling the pastry material over onto itself for forming a layered roll of the pastry material and for discharging the rolled pastry material from the belt at the downstream end of the roller.

4,842,880

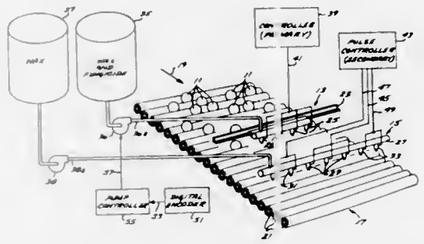
FRUIT WAXING METHOD

Kenneth C. Creason, Fillmore; John A. Salka, Santa Paula, and Ralph R. Holland, Castaic, all of Calif., assignors to Fillmore-Piru Citrus Association, Fillmore, Calif.

Continuation of Ser. No. 76,782, Jul. 23, 1987, abandoned. This application Jul. 11, 1988, Ser. No. 217,236

Int. Cl.[4] A23L *3/36*; A21D *4/00*

U.S. Cl. 426—303 27 Claims



1. A method for applying a coating of wax and fungicide to the surface of fruit, comprising steps of:

transporting fruit along a path;

first spraying onto the fruit being transported a first liquid consisting essentially of both wax and fungicide; and

second spraying onto the fruit being transported a second liquid consisting essentially of wax;

wherein the first and second spraying steps provide a coating of wax and fungicide on the fruit surfaces, the coating having a substantially higher concentration of fungicide at its inside surface than at its outside surface, thereby providing an effective control of fruit decay while simultaneously providing an effective surface shine.

4,842,882

METHOD OF MAKING DOUGH CRUST PRODUCT

Jeno F. Paulucci, Sanford, Fla., assignor to The Pillsbury Co., Minneapolis, Minn.

Continuation of Ser. No. 795,415, Nov. 6, 1985, abandoned, which is a continuation-in-part of Ser. No. 583,615, Feb. 27, 1984, Pat. No. 4,574,090. This application Jun. 2, 1987, Ser. No. 57,728

The portion of the term of this patent subsequent to Mar. 4, 2003, has been disclaimed.

Int. Cl.[4] A21D *8/00*

U.S. Cl. 426—439 10 Claims

1. A process of preparing a crust comprising the sequential steps of:

(a) forming dough from flour and producing a dough sheet from said dough, said dough sheet having exterior upper and lower surfaces;

(b) docking the dough sheet to provide a plurality of spaced-apart docking holes that extend through the dough sheet and connect the upper and lower dough surfaces;

(c) cutting the dough sheet into individual dough pieces;

(d) proofing said dough pieces prior to cooking said dough pieces; and

(e) cooking each dough piece by sequential cooking steps, at least one of the cooking steps including a baking step, wherein the baking step is sufficient to set the interior structure of said dough piece and render the dough surfaces and the cooking side surfaces resistant to oil penetration and a subsequent frying step which is sufficient to crisp the exterior surfaces of the dough piece, said sequential cooking steps further forming cooked pieces having a bready interior and crisp exterior surfaces.

4,842,883

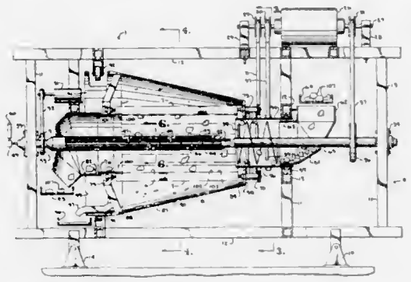
CONTINUOUS PRODUCE SURFACE TREATER AND METHOD

John H. Amstad, 10103 W. 96th Ter., Shawnee Mission, Kans. 66212

Filed Jan. 11, 1988, Ser. No. 142,908

Int. Cl.[4] A23L *1/216*; A23N *7/02*

U.S. Cl. 426—483 16 Claims



13. A method of removing and separating dirt and peeling form the surface of produce comprising the steps of:

(a) transferring said produce into a cage having an interior chamber with an abrading surface facing said chamber;

(b) rotating said cage with produce therein such that an axis of rotation of said cage is generally horizontally aligned and such that said produce is rotated at a sufficient velocity while against said surface to apply a combined force of greater than one g acting radially outward on said produce during the entire period the produce is within the cage; whereby said produce is urged against said surface by the combined force comprising gravity and a centrifugal force produced by said rotating such that said combined force varies substantially as said produce passes through one full revolution so as to reduce clustering of said produce within said cage and so as to urge the produce against the abrading surface substantially during the entire period the produce is within said cage;

(c) retaining said produce within said rotating cage for sufficient residence time for said abrading surface to act thereagainst and remove dirt and peeling therefrom; and

(d) thereafter removing said produce from said cage.

4,842,881

COATING 5'-NUCLEOTIDE

Toshihiko Kanemaru, Nagaokakyo; Hiroshi Kasai, Kawabe, and Takeshi Toyota, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 41,250, Apr. 22, 1987, abandoned. This application Nov. 21, 1988, Ser. No. 275,652

Claims priority, application Japan, Apr. 22, 1986, 61-94258

Int. Cl.[4] A23L *1/229*

U.S. Cl. 426—307 5 Claims

1. A method for producing a seasoning composition which comprises coating fine particles of a water-soluble 5'-ribonucleotide having a total water content of about 2 to 7weight % with an oil/fat and/or a wax melting at a temperature between about 55° to about 90° C., the fine particles being spray-dried powders prepared from an aqueous solution of the 5'-ribonucleotide and having a particle diameter not exceeding about 250μm, and the amount of the coating material used being in the range of about 120 to 400 weight parts per 100 weight parts of 5'-ribonucleotide.

4,842,884

FORMULATED MILK CONCENTRATE AND BEVERAGE

George N. Bookwalter, Peoria, and Steven A. Lyle, East Peoria, both of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 2, 1988, Ser. No. 189,079

Int. Cl.[4] A23C *11/04, 3/04*

U.S. Cl. 426—585 12 Claims

1. A formulated milk concentrate emulsion comprising about 25–60% by weight of nonfat dry milk solids, 15–40% by weight of water, 3–40% by weight of a nondairy edible oil, and 0–35% by weight of sugar, wherein the weight ratio of nonfat dry milk solids to water is between 1:0.55 and 1:0.75 and wherein there is no added emulsifier.

4,842,885

FOOD COMPOSITION

Robert G. Hamilton, 14 Bonniebrae St., Wynnum W., Queensland, Australia (4178), and Frank J. Van Doore, 148 Windsor Road, Kelvin Grove QLD 4059, Australia

Filed Sep. 11, 1986, Ser. No. 905,649

Claims priority, application Australia, Apr. 22, 1986, PH5570

Int. Cl.[4] A23K *8/10*

U.S. Cl. 426—635 3 Claims

1. A method for preparing an intermediate moisture stable pet food composition for use as a component in the preparation of a pet food said method consisting essentially of:

(a) providing a protein source which comprises hash and optionally contains bone-in fractions in an amount effective to provide a minimum protein content of 15% by weight and a humectant in an amount of approximately 5 to 15% by weight based on the total weight of the food composition and which is sufficient to provide a water activity no greater than 0.90; and

(b) blending the protein source and the humectant for a time sufficient to provide a product of dough-like consistency, said product having a moisture content of approximately 25% to 35% by weight based on the total weight of the food composition and a pH of approximately 4–6 which product can be stored indefinitely without substantial deterioration.

4,842,886

METHOD FOR ELECTROLESS PLATING

Nathaniel C. Anderson, Pine Island; Marlin E. Miner, Dodge Center, both of Minn.; Lubomyr T. Romankiw, Briarcliff Manor, N.Y., and Steven F. Starcke, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 4, 1987, Ser. No. 117,164

Int. Cl.[4] B05D *1/18*

U.S. Cl. 427—10 10 Claims

1. A system for repeatedly controlling the thickness of an electroless plated metal layer including detecting the onset of plating in an electroless plating process and subsequently terminating the plating process at a predetermined time after onset of plating has been detected, comprising,

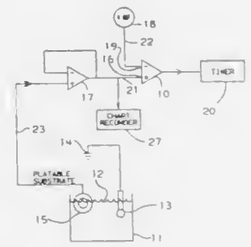
providing an electroless plating bath controlled to provide a uniform deposition rate,

placing a standard reference electrode in said bath,

placing a surface to be plated in said bath,

measuring the mixed potential between said reference electrode and said surface,

detecting a predetermined mixed potential level that indicates the initiation of plating,



timing a predetermined plating interval, beginning with the detection of said predetermined mixed potential level, and terminating the plating process after a predetermined interval has been measured.

4,842,887

METHOD OF AND SYSTEM FOR COATING EXPOSED CAN EDGES

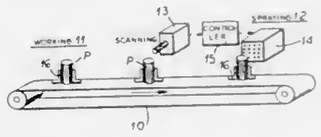
Georg Bolte, Vechelde, Fed. Rep. of Germany, assignor to Schmalbach-Lubeca AG, Brunswick, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 6,763, Jan. 27, 1987, abandoned. This application Jun. 15, 1988, Ser. No. 208,826

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1986, 3603126

Int. Cl.[4] B05D *1/02*; B05B *15/04*

U.S. Cl. 427—10 11 Claims



1. In a method of making a can comprising the steps of:

applying to at least one complete surface of at least one metallic pat of a can a uniform coating of corrosion-preventing lacquer; and

subsequently working on the part such that the metal of the part is exposed at regions at least immediately adjacent the coated surface,

the improvement comprising the step of:

spraying by the ink-jet method dots of lacquer substantially only on the exposed regions of the part after working thereof and so that the dots together form a continuous layer covering the exposed regions.

8. A system for coating exposed metallic regions created on an otherwise coated surface of a can part after working of the can part, the system comprising:

conveyor means for transporting the part after working to a sprayer station;

means for scanning the can part after working thereof but upstream of the station and for generating a scanner output representing the locations on the can part of the respective exposed regions;

an ink-jet sprayer; and

control means connected to the ink-jet sprayer and the scanning means for operating the sprayer so as to spray dots of lacquer, therefrom substantially only on the exposed regions of the part after working thereof such that the dots

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together form a continuous layer covering the exposed regions.

4,842,888

CERAMIC COATINGS FROM THE PYROLYSIS IN AMMONIA OF MIXTURES OF SILICATE ESTERS AND OTHER METAL OXIDE PRECURSORS

Loren A. Haluska; Keith W. Michael, both of Midland, and Lee Turley, Sanford, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Apr. 7, 1988, Ser. No. 178,749
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—38 16 Claims

1. A process for forming on a substrate a ceramic coating which process comprises:

(A) applying to the substrate a flowable solution of a composition comprising a hydrolyzed or partially hydrolyzed mixture of a silicate ester and a metal oxide precursor selected from the group consisting of acyloxy and alkoxy compounds of aluminum, titanium, and zirconium wherein the proportion by weight of metal oxide precursor as metal oxide is abouut 0.1 to about 30 percent;

(B) drying the solution to deposit a preceramic coating on the substrate; and

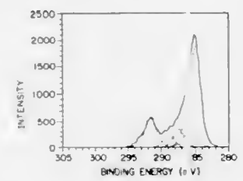
(C) heating the coated substrate in a substantially ammonia atmosphere to a temperature of 200° to 100° C. to produce a nitrided ceramic coating on the substrate.

4,842,889

METHOD FOR PREPARING LUBRICATED SURFACES

Can B. Hu; Donald D. Solomon, both of Spring Valley, and Victor A. Williamitis, Dayton, all of Ohio, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 81,200, Aug. 3, 1987, abandoned. This application Jun. 16, 1988, Ser. No. 209,161
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—38 15 Claims



1. A method for preparing a lubricated surface comprising treating a perfluorinated polymeric surface with a plasma generated from a gas to give a plasma-treated polymeric surface and applying thereto by a process other than plasma deposition a film of a polydialkylsiloxane lubricant, said film having a surface tension substantially the same as or less than the surface energy of said plasma-treated surface, said film thereby fully wetting said plasma treated surface.

4,842,890

METHOD FOR COATING FASTENERS

Eugene D. Sessa, Mt. Clemens, and Richard Duffy, Utica, both of Mich., assignors to Nylok Fastener Corporation, Rochester, Mich.

Filed Jul. 7, 1987, Ser. No. 70,416
Int. Cl.[4] B05D 3/14
U.S. Cl. 427—47 10 Claims

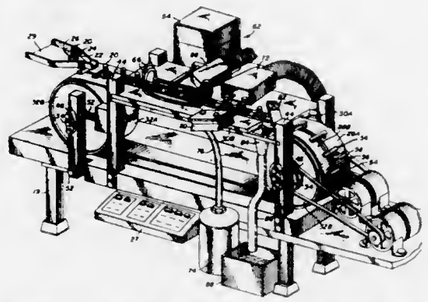
1. A method of coating a fastener having a head portion and shank portion with a material comprising the steps of:

supporting the fastener for coating;

controllably advancing the fastener for coating;

heating the shank portion of said fastener to a temperature above the melting point of said material;

applying said material to the heated shank portion of said fastener; and



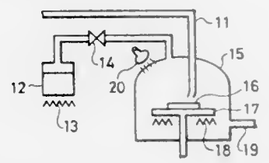
controllably rotating the fastener at least 360 degrees during application of said material to coat the entire circumference of at least a segment of said shank portion with said material.

4,842,891

METHOD OF FORMING A COPPER FILM BY CHEMICAL VAPOR DEPOSITION

Hiroshi Miyazaki, Kokubunji; Yoshio Homma, Tokyo, and Kiichiro Mukai, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1988, Ser. No. 153,606
Claims priority, application Japan, Feb. 20, 1987, 62-35718
Int. Cl.[4] B05D 3/06; C23C 16/06
U.S. Cl. 427—35 11 Claims



1. A method of forming a copper film by depositing copper on a semiconductor substrate that is placed in a reaction chamber, wherein vapor of cuprous nitrate is brought into contact with a reducing gas in said reaction chamber, said vapor of cuprous nitrate being obtained by heating solid cuprous nitrate.

4,842,892

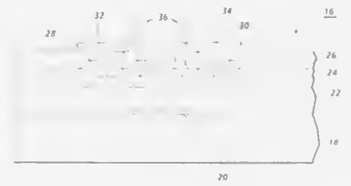
METHOD FOR DEPOSITING AN N+ AMORPHOUS SILICON LAYER ONTO CONTAMINATED SUBSTRATE

Donald L. Smith, Palo Alto, and Andrew S. Alimonda, Los Altos, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 29, 1987, Ser. No. 101,451
Int. Cl.[4] B05D 3/06, 1/36
U.S. Cl. 427—39 4 Claims

1. A method of depositing a thin film n+ amorphous silicon layer, from the decomposition of a gaseous mixture of silane and phosphine, upon the exposed surface of a substrate having one or more thin film layers thereon, wherein there is contamination upon said exposed surface, comprising the steps of

placing said substrate in a plasma chamber, flowing silane into said chamber for a purge period, and depositing an n+ amorphous silicon layer upon said exposed surface by igniting a plasma in said chamber, for decomposing said silane and for depositing a protective layer of intrinsic amorphous silicon, of sufficient thickness to cover said contamination, and



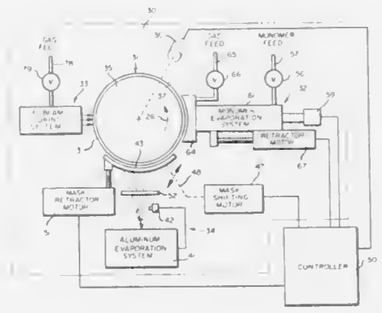
then flowing a gaseous mixture of silane and phosphine into said chamber, for decomposing said silane and phosphine and for depositing a layer of n+ amorphous silicon upon said protective layer.

4,842,893

HIGH SPEED PROCESS FOR COATING SUBSTRATES

Angelo Yializis; David G. Shaw, both of Tucson, Ariz.; Donald S. Stryker, Glen Falls, and Mooyoung Ham, Scotia, both of N.Y., assignors to Spectrum Control, Inc., Erie, Pa.

Continuation-in-part of Ser. No. 946,146, Dec. 22, 1986, which is a continuation of Ser. No. 620,647, Jun. 14, 1984, abandoned, which is a continuation-in-part of Ser. No. 562,779, Dec. 19, 1983, abandoned. This application Apr. 29, 1988, Ser. No. 188,036
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—44 20 Claims



1. A high-speed process for coating the surface of a substrate with an adherent film comprising the following steps:

(a) providing a vacuum chamber containing: (i) a movable support, (ii) a vapor outlet of a vaporizer mounted adjacent to an upstream portion of said support, (iii) curing means mounted adjacent to a downstream portion of said support, and (iv) means for maintaining said support at a temperature below that of said vaporizer;

(b) placing said substrate in thermal contact with said movable support in a manner permitting the surface of said substrate to move sequentially past said vapor outlet and said curing means;

(c) evacuating gas from said chamber until the pressure within said chamber is less than about 1×10^{-2} Torr;

(d) selecting a curable component having an average of about two or more olefinic groups per molecule, an average molecular weight between 150 and 1000, and a vapor pressure in the range of 1×10^{-6} to 1×10^{-1} Torr at standard temperature and pressure;

(e) metering a quantity of said curable component into an inlet portion of said vaporizer;

(f) vaporizing said component within said vaporizer;

(g) moving said support at a speed sufficient to pass said substrate relative to said vapor outlet and said curing means at a rate between about 1 cm/sec and 1000 cm/sec;

(h) condensing a film of said component on the surface of said substrate, said film having a thickness of less than 4 microns; and

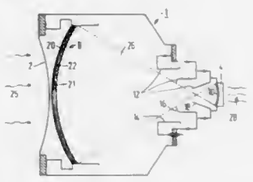
(i) activating said curing means whereby a adherent film is formed on said substrate surface.

4,842,894

METHOD OF VAPOR DEPOSITING A LUMINESCENT LAYER ON THE SCREEN OF AN X-RAY IMAGE INTENSIFIER TUBE

Martinus A. C. Ligtenberg, and August L. H. Simons, both of Heerlen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 12, 1986, Ser. No. 906,476
Claims priority, application Netherlands, Sep. 20, 1985, 8502570
Int. Cl.[4] B05D 5/06, 5/12
U.S. Cl. 427—65 6 Claims



1. A method of manufacturing an X-ray image intensifier tube comprising a support having a smooth surface having a layer of luminescent material thereon, said method comprising the following steps:

providing a vapor deposition source of luminescent material facing said smooth surface at an angle above approximately thirty degrees from the central normal to said surface,

rotating said support with respect to said source about said central normal to the center of the surface,

vapor depositing said luminescent layer on said surface.

4,842,895

METHOD OF TREATING A CORE

Delmar E. Crawford, Holland, Mich., and Harold T. Fields, Ft. Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

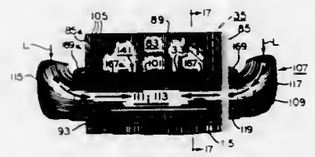
Division of Ser. No. 66,840, Jun. 26, 1987, Pat. No. 4,788,761. This application Jun. 6, 1988, Ser. No. 173,929
Int. Cl.[4] B05D 5/12
U.S. Cl. 427—116 7 Claims

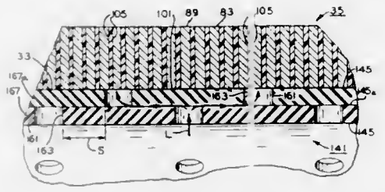
2. A method of treating a core for a dynamoelectric machine with a hardenable liquid adhesive material, the core including a plurality winding receiving slots, a plurality of layers of generally thin dielectric material associated in overlaying relation at least in part within each slot, respectively, a plurality of apertures in each layer with the apertures in adjacent layers being in non aligned relation, respectively, and a plurality of non-apertured sections in each layer with at least some of the non-apertured sections being disposed in overlaying relation with at least some of the apertures in the adjacent layers, respectively, the method comprising the steps of:

passing the liquid adhesive material by capillary action through at least some of the at least some apertures in one of the layers in the slots; then

channeling the liquid adhesive material by capillary action past at least some of the at least some non-apertured sec-

tions in the one layer and another of the layers interposed between the one layer and the slots respectively; and then





flowing the liquid adhesive material through at least some of the apertures in the another layers into communication with the slots, respectively.

4,842,896

PRODUCTION OF MAGNETIC RECORDING MEDIA

Werner Grau, Bobenheim-Roxheim; Albert Kohl, Laumersheim; Jenoe Kovacs, Hessheim; Werner Bolz, Limburgerhof, and Wulf Muenzer, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 878,219, Jun. 23, 1986, abandoned. This application Sep. 22, 1987, Ser. No. 99,624

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1985, 3522681

Int. Cl.[4] B05D *5/12*

U.S. Cl. 427—131 **3 Claims**

1. A process for improving the abrasion properties and durability of a magnetic recording medium consisting of a nonmagnetic base and a magnetic layer firmly bonded thereto, which comprises: (1) applying a dispersion of inorganic particles having a Mohs' hardness of not less than 5 and a particle size from 0.01 to 3.0 μm in a solvent, the concentration of the inorganic particles in the dispersion being from 0.02 to 0.25% by weight based on the solvent, to the surface of the magnetic layer, and (2) drying the dispersion to remove the solvent and to deposit the inorganic particles in the pores, valleys and pits in the surface of the magnetic layer.

4,842,897

METHOD FOR FORMING DEPOSITED FILM

Eiji Takeuchi; Jun-Ichi Hanna, both of Yokohama; Isamu Shimizu, Yokohama; Masaaki Hirooka, Toride; Akira Sakai, Yokohama, and Masao Ueki, Urayasu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1986, Ser. No. 947,036

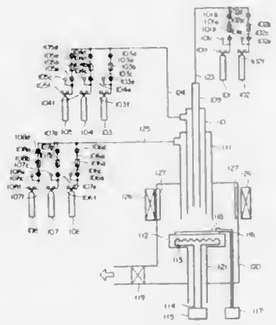
Claims priority, application Japan, Dec. 28, 1985, 60-298047; Jan. 14, 1986, 61-4369; Jan. 14, 1986, 61-4374

Int. Cl.[4] C23C *16/30*

U.S. Cl. 427—255.2 **12 Claims**

1. A method for forming a deposited film on a substrate in a film forming space by introducing into a reaction space a gaseous starting material for formation of a deposited film and a gaseous halogenic oxidizing agent selected from the group consisting of F_2, Cl_2, Br_2 and I_2, said gaseous halogenic oxidizing agent having the property of oxidation action on said starting material to effect chemical contact therebetween to thereby form a plural number of precursors including precursors in an excited state, said film forming space positioned adjacent and in communication with said reaction space and said deposited film including at least one of these precursors as a constituent element thereof, said method comprising:

forming in said reaction space a first mixture of said gaseous starting material and said gaseous halogenic oxidizing agent in an amount ratio relative to each other such that said first mixture is capable of effecting an etching action on said substrate;



introducing said first mixture into said film forming space to effect said etching action on said substrate and form an etched substrate;

increasing the amount of said gaseous starting material relative to the amount of said gaseous halogenic oxidizing agent to form a second mixture in said reaction space capable of effecting film formation on said etched substrate; and

introducing said second mixture into said film forming space to effect said film formation on said etched substrate.

4,842,898

METHOD OF PRESERVING WOOD WITH LANTHANIDE DERIVATIVES LANTHANIDE DERIVATIVES

Peter S. Gradeff, Pottersville, N.J., assignor to Rhone Poulenc Inc., Monmouth Junction, N.J.

Continuation-in-part of Ser. No. 17,159, Feb. 20, 1987, Pat. No. 4,743,473. This application Nov. 17, 1987, Ser. No. 121,616

Int. Cl.[4] B05D *1/18, 3/00*

U.S. Cl. 427—297 **12 Claims**

1. A method for preserving wood comprising the steps of:

(a) subjecting wood to a vacuum;

(b) introducing a composition comprising an aqueous solution of an effective amount of one or more lanthanide derivatives and contacting the wood and composition for a period of time sufficient to bond the lanthanide to the wood.

4,842,899

PROCESS FOR FORMING METALLIC FILM ON INORGANIC MATERIAL

Yoshiyuki Tsuru; Toshiro Okamura, both of Shimodate; Tetsuya Okishima; Masayoshi Ikeda, both of Katsuta, and Masahiro Kawamura, Shimodate, all of Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1987, Ser. No. 32,511

Int. Cl.[4] C23C *18/22, 18/24*

U.S. Cl. 427—309 **5 Claims**

1. A process for forming a metallic film on a surface of a ceramic material which comprises:

roughening a surface of a ceramic material by the following two-step procedure:

(a) dissolving and removing a vitreous substance richly distributed on the surface of the ceramic material with an inorganic acid which can dissolve and remove only the vitreous substance, or dipping in a molten alkali under the conditions of temperature and time for dissolving and removing only the vitreous substance, and

(b) roughening the resulting surface from which the vitreous substance has been removed in a molten alkali to form a roughened first surface layer of the ceramic material, the surface of the ceramic material being roughened in the range of 0.6 μm to 3 μm in terms of an average roughening depth defined by dividing the weight loss and surface roughening by the product of a roughened surface area by a density of a bulk composition, and

conducting conventional electroless plating on the roughened surface of the ceramic material.

4,842,900

METHOD AND APPARATUS FOR COATING

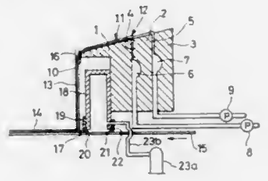
Kimiaki Miyamoto, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 12, 1987, Ser. No. 13,805

Claims priority, application Japan, Feb. 12, 1986, 61-28707

Int. Cl.[4] B05D *3/12, 1/26, 1/30*

U.S. Cl. 427—348 **13 Claims**



1. A coating method, comprising the steps of:

moving a web over a slit of a die from a first side of said die;

flowing a liquid coating composition through said slit onto said moving web to form a layer on a first surface of said web; and

exposing said first surface of said web proximate to said first side of said die to a gas substantially more soluble in said liquid coating composition than air to displace air in contact with said first surface of said moving web upstream of said die slit such that the gas having higher solubility than that of air instantly dissolves in the liquid when entrained to thereby prevent residual bubbles in said coating composition.

4,842,901

COATING SOLUTION AND PROCESS FOR PRODUCING GLASSY LAYERS

Hans-Joachim Merrem, Seeheim-Jugenheim, and Werner Graf, Burghausen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 2, 1988, Ser. No. 151,547

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1987, 3704518

Int. Cl.[4] B05D *3/02*

U.S. Cl. 427—387 **18 Claims**

1. A coating solution for producing glassy layers on a substrate, consisting essentially of a silicic acid ester, a solvent comprised of an aliphatic alcohol, a catalytically active quantity of acid, and water, wherein the alcohol has at least 4 carbon atoms and the acid has a pK_a of less than +3.

4,842,902

PRESSURE SENSITIVE ADHESIVE RELEASE LINER

Paul L. Brown, Saginaw, and David L. Stickles, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 870,567, Jun. 4, 1986, Pat. No. 4,736,048. This application Dec. 21, 1987, Ser. No. 135,905

Int. Cl.[4] B05D *3/02*

U.S. Cl. 427—387 **8 Claims**

1. A method for providing a substrate with a coating that will release pressure sensitive adhesives, said method comprising

(i) applying to the surface of said substrate a coating of a coating composition comprising a curable mixture consisting essentially of

(A) a fluorosilicone polymer containing an average of at least two silicon-bonded curing radicals per molecule selected from the group consisting of hydrogen, hydroxyl and alkenyl and at least 2 mol percent, based on the total number of siloxane units in the fluorosilicone polymer, of fluorinated siloxane units, any remaining siloxane units in the polymer being non-fluorinated siloxane units; said fluorinated siloxane units having the formula

$$(RQ)(R')_a(Z)_bSiO_{(3-a-b)/2}$$

and said non-fluorinated siloxane units having the formula

$$(R')_c(Z)_dSiO_{(4-c-d)/2}$$

where, in said fluorinated and non-fluorinated siloxane units, R denotes a perfluoroalkyl radical having from 4 to 8 carbon atoms and, additionally, 2 to 3 carbon atoms when the fluorosilicone polymer contains less than 90 mol percent fluorinated siloxane units and 1 carbon atom when the fluorosilicone polymer contains from 7 to 10 mol percent fluorinated siloxane units, Q denotes a divalent hydrocarbon, hydrocarbon ether or hydrocarbon thioether radical linking the R radical to a silicon atom through at least 2 carbon atoms, R' denotes a silicon-bonded, monovalent hydrocarbon radical free of aliphatic unsaturation, Z denotes said silicon-bonded curing radical, a=0 to 2, b=0 to 2, a+b=0 to 2, c=0 to 3, d=0 to 3 and c+d=0 to 3 and,

(B) an effective amount of a curing agent for the fluorosilicone polymer and,

(ii) thereafter causing the applied curable mixture to cure.

4,842,903

WAX, SULFONATE, DISPERSING OIL, SEPIOLITE CLAY COMPOSITIONS FOR PROTECTIVE SOFT COATINGS

Roger E. Hayner, Flatwoods, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Apr. 12, 1988, Ser. No. 180,429

Int. Cl.[4] B32B *9/00*; **B05D** *1/02*

U.S. Cl. 427—428 **14 Claims**

1. Corrosion preventive compositions comprising, in combination:

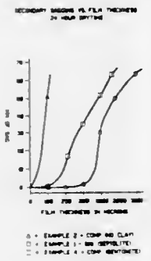
a. waxes having melting point of about 50°–100° C. and an oil content of about 0.1–5.0 wt.%;

b. organic sulfonate of an alkali metal or alkaline earth metal;

c. sepiolite clays present from about 0.1–10% by weight;

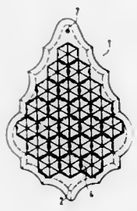
d. carboxylic acid soap of an alkali metal or alkaline earth metal;

e. diluent oil having a viscosity in the range of about 60–800 SUS;



f. organic solvent in quantity necessary to provide desired viscosity.

4,842,904
CHANDELIER PENDANT
Daniel Swarovski, Wattens, Austria, assignor to D. Swarovski & Co., Wattens, Austria
Filed Oct. 3, 1986, Ser. No. 915,991
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1985, 3536367
Int. Cl.⁴ F21V *5/06;* **B44F** *1/10;* **A47G** *35/00*
U.S. Cl. 428—28 **2 Claims**

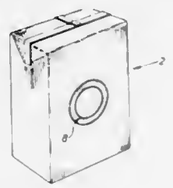


1. A chandelier pendant having a plurality of faceted surfaces comprising a carrier element having at least one flat surface and suspension means for suspending said element on a chandelier, a plurality of pyramid shaped decorative elements each of which includes a faceted upperside and a flat underside, wherein said flat underside of said decorative elements are cemented to said flat surface of said carrier element adjacent and abutting one another in an ornamental staggered arrangement.

4,842,905
TESSELLATED PAPERMAKERS FABRIC AND ELEMENTS FOR PRODUCING THE SAME
William J. Stech, Summerville, S.C., assignor to Asten Group, Inc., Charleston, S.C.
Filed Feb. 3, 1988, Ser. No. 151,892
Int. Cl.⁴ F16B *2/00*
U.S. Cl. 428—33 **17 Claims**

1. A papermakers fabric comprised of:
a plurality of tessellated elements interconnected by complementary geometric shapes in a tessellation commensurate with the desired length and width of the fabric.

4,842,906
PACKING LAMINATE FOR THE MANUFACTURE OF LIQUID-TIGHT PACKING CONTAINERS AND USE OF SUCH LAMINATE
Gert Ekdahl, Helsingborg, and Tommy Nyström, Lund, both of Sweden, assignors to AB Tetra Pak, Lund, Sweden
Filed Jul. 2, 1987, Ser. No. 69,484
Claims priority, application Sweden, Jul. 4, 1986, 8602985
Int. Cl.⁴ B32B *23/08, 27/10;* **B65D** *65/40*
U.S. Cl. 428—34.2 **6 Claims**



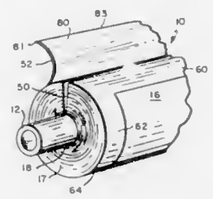
1. A packing laminate for use in the manufacture of liquid-tight packing containers, comprising:
at least one layer of fibrous material having outer layers of plastic material and including a color layer on one of the plastic layers, the color layer being hardenable through electron irradiation; and
a coating arranged between the at least one fibrous layer and the outer layer upon which the color layer is provided, the coating comprising a material capable of absorbing electrons for the hardening of the color layer which are directed towards the outer layer upon which the color layer is provided.

4,842,907
BIAXIALLY STRETCHED TUBULARLY EXTRUDED FILM WITH TRANSVERSE CLOSURE STRIP
Donald L. VanErden, Wildwood, Ill., assignor to Minigrip, Inc., Orangeburg, N.Y.
Filed Dec. 31, 1987, Ser. No. 139,970
The portion of the term of this patent subsequent to Oct. 20, 2004, has been disclaimed.
Int. Cl.⁴ B32B *3/30;* **B65D** *33/64*
U.S. Cl. 428—35.5 **13 Claims**

1. A plastic film especially adapted for making bags closable with transverse interlocking closure strips, comprising:
a plastic circumferentially and longitudinally continuous film tube having a longitudinal tube axis;
at least one closure strip having a continuous longitudinal strip axis and joined to a surface of said tube with said strip axis extending helically relative to said tube axis;
the film of said tube being biaxially oriented as a result of axially machine direction draw and also cross machine diameter-increasing draw;
said closure strip having a stretched structure corresponding to both said machine direction draw and said cross machine diameter-increasing draw of said tubular film, and

having a predetermined helix angle in the increased diameter tube; and
said predetermined helix angle of the closure strip on the tube surface being such that the plastic film tube is convertible into ribbon sheet form with said longitudinal strip axis still extending across the longitudinal tube axis as exists in said ribbon sheet form and the closure strip on the ribbon sheet form occurring at longitudinally spaced intervals.

4,842,908
INSULATION WITH TAPE ADHERING SURFACE
Lewis S. Cohen, Hingham, Mass., and Ivan Rodrigues, North Providence, R.I., assignors to Venture Tape Corp., Rockland, Mass.
Filed Sep. 15, 1987, Ser. No. 96,660
Int. Cl.⁴ B32B *27/36;* **F16L** *9/14*
U.S. Cl. 428—34.2 **26 Claims**



1. An insulation system for an elongated fluid conduit comprising:
means for insulating the elongated fluid conduit, said insulating means comprising an insulating layer and an outwardly facing top layer, said insulating means having a slit defined by a pair of spaced, parallel, confronting edges;
a first strip of a water resistant, nontacky coating material disposed on said top layer closely adjacent at least one of said two edges defining said slit and extending the length of said slit; and
means having a pressure sensitive adhesive thereon for sealing said slit, the adhesive of said sealing means being adhesively bonded to said first strip of coating material adjacent said one of said edges, said sealing means extending across said slit to the other of said edges.

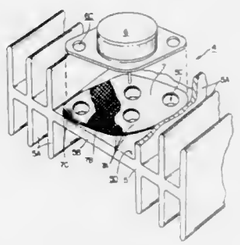
4,842,909
CONTAINER FOR STORING LIQUIDS COMPRISING CARBON-CARBON COMPOSITES
Gilbert W. Brassell, 13237 W. Eighth Ave., Golden, Colo. 80401
Continuation-in-part of Ser. No. 822,164, Jan. 24, 1986, Pat. No. 4,772,508. This application Feb. 11, 1987, Ser. No. 13,501
Int. Cl.⁴ B32B *9/00;* **B01D** *46/00*
U.S. Cl. 428—34.1 **13 Claims**

1. A container useful for storing liquids comprising (a) containment walls defining interior region for containing a liquid, and (b) material substantially filling said interior region which is carbon bonded carbon fiber composite having a surface area greater than about 100 m^2/g and a compressive strength of about 20 psi or higher.

4,842,910
ASSEMBLY OF WATER WET HOLLOW FIBERS AND A TUBESHEET DERIVED FROM A DIGLYCIDYL ETHER OF A DIHYDROXY BENZENE
Terrence L. Caskey, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.
Continuation of Ser. No. 894,221, Aug. 7, 1986, abandoned. This application Apr. 22, 1988, Ser. No. 185,172
Int. Cl.⁴ B29C *6/00, 27/30*
U.S. Cl. 428—36.3 **24 Claims**

1. A hollow fiber and tubesheet assembly which comprises (1) contacting
(A) a non-random fiber bundle comprising water wet cellulose ester hollow fibers wherein the fiber is water wet when the assembly is fabricated, wherein any of said fibers processed using plasticizers have been leached to remove the plasticizer; and
(B) a tubesheet which comprises the reaction product of:
(i) an epoxy resin composition comprising about
(a) between about 10 and about 100 percent by weight of a diglycidyi ether of a dihydroxy benzene; and
(b) between about 0 and about 90 percent by weight of a polyglycidyl ether of a polyhydric phenol which is not a diglycidyl ether of dihydroxy benzene; and
(ii) a curing agent in sufficient amount to cure the epoxy resin composition;
wherein a portion of the hollow fibers are embedded in the tubesheet.

4,842,911
INTERFACING FOR HEAT SINKS
Herbert J. Fick, Northfield, Minn., assignor to The Bergquist Company, Minneapolis, Minn.
Continuation of Ser. No. 820,217, Jan. 21, 1986, abandoned, which is a division of Ser. No. 529,033, Sep. 2, 1983, Pat. No. 4,602,678. This application Jul. 8, 1988, Ser. No. 222,069
Int. Cl.⁴ B32B *7/00, 27/06*
U.S. Cl. 428—40 **7 Claims**



1. An interfacing for effecting transfer of heat between an electrical device and a heat sink, comprising a substantially flat, thin and uniform-thickness composite of dual layers of

material promoting conduction of heat the material of each of said layers being curable for controlled conversion from an uncured substantially amorphous conditions to a dry and relatively firm state, one of said layers being cured or vulcanized silicone rubber filled with heat conducting particles so as to be durable under heat and pressure, and having an exposed surface which is compliant after conversion to the dry and relatively firm state, the other of said layers being silicone rubber in an uncured condition filled with heat conducting particles and adhering on one side to the under surface of said one of said layers opposite said exposed surface, and a strippable temporary liner covering the other side of said other of said layers, said strippable liner being removable to expose said other side for substantially voidless abutment with a receiving surface through which heat is to be conducted by said composite of layers, said other of said layers being curable under heat and pressure to form a permanent bond with both said receiving surface and said one of said layers, the surface of said permanent bond being in replication of said receiving surface.

4,842,912

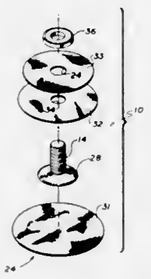
ADHESIVE ATTACHMENT AND MOUNTING FIXTURE

Charles G. Hutter, III, Carson City, Nebr., assignor to Physical Systems, Inc., Carson City, Nebr.

Continuation of Ser. No. 863,620, May 15, 1986, Pat. No. 4,778,702, which is a continuation-in-part of Ser. No. 772,610, Sep. 4, 1985, Pat. No. 4,668,546. This application Feb. 8, 1988, Ser. No. 153,33

Int. Cl.[4] B32B *1/00, 7/06*

U.S. Cl. 428—65 **7 Claims**



1. A mounting fixture for mounting an adhesive attachment onto a substrate, comprising:

spring means for supporting the adhesive attachment, said spring means being normally in a first position and movable to a second position; and

connector means carrying said spring means and having means for at least temporary connection of said connector means to the substrate, said connector means carrying said spring means in said first position with the attachment oriented to land upon the substrate prior to said connector means upon movement thereof toward the substrate, said spring means being movable to said second position upon further movement of said connector means toward the substrate to land said connector means thereon;

said spring means applying a positive force when in said second position pressing the attachment toward the substrate.

2. The mounting fixture of claim 1 wherein said spring means comprises a central spring plate, an outer connection member carrying said spring plate, and a connector rim on said connection member, and further including adhesive means for at least temporarily connecting said rim to the substrate.

4,842,913

SOUND PROTECTION SUIT

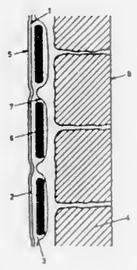
Dieter Föller, Weiterstadt, and Jürgen Tews, Wächtersbach, both of Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany

Filed May 21, 1987, Ser. No. 52,594

Claims priority, application Fed. Rep. of Germany, May 21, 1986, 3617088

Int. Cl.[4] B32B *3/00*

U.S. Cl. 428—71 **20 Claims**



1. In a protective suit against sound waves formed of a plurality of attached layers including a flexible outer layer and at least two flexible soundproofing layers, with one of said soundproofing layers being a weighting layer and the other of said soundproofing layers being a soft cushioning layer; the improvement wherein said weighting layer is disposed adjacent the inner surface of said outer layer and said cushioning layer is disposed behind said weighting layer in the direction toward the inside of said suit.

4,842,914

EDGE PROTECTOR ANGLE PIECE

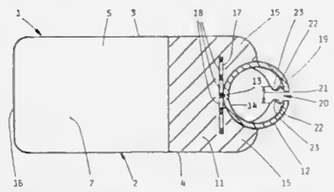
Heinz Franke, Übach-Palenberg, Fed. Rep. of Germany, assignor to Spanset Inter AG, Oetwil am See, Switzerland

Filed May 16, 1988, Ser. No. 194,251

Claims priority, application Fed. Rep. of Germany, May 16, 1987, 8707080[U]

Int. Cl.[4] B65D *81/08*

U.S. Cl. 428—99 **12 Claims**



1. An edge protector angle piece for protecting an edge of a load to be lifted by a lifting device, comprising:

first and second angle arms having inner faces for contacting said load and outer faces forming a ring segmentshaped continuous cylinder surface including a vertex region between said angle arms;

a continuous guide groove provided in said cylinder surface for accommodating said lifting device; and

a guide tube provided on said outer faces at said vertex region in alignment with said guide groove for receiving said lifting device.

4,842,915

TUFTING BASE FOR CARPETS MADE OF A SPUNBONDED FABRIC, A METHOD OF MANUFACTURING THE BASE, AND A TUFTING CARPET

Ludwig Hartmann, Mozartstrasse 11, 6940 Weinheim; Engelbert Loecher, Theodor-Storm-Strasse 39, 6520 Worms; Ivo Ruzek, Am Harzhuebel 56, and Norbert Weber, Keltenweg 75, both of 6750 Kaiseslautern, all of Fed. Rep. of Germany

Filed Dec. 8, 1987, Ser. No. 130,282

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1986, 3642089

Int. Cl.[4] D04H *1/04*

U.S. Cl. 428—95 **6 Claims**

1. A spunbonded fabric consisting of polyester matrix filaments that is suitable for use as a tufting base for carpets and that is strengthened by means of a binding component in the form of thermoplastically softenable filaments, characterized in that the binding component consists of polypropylene with a melting range of 150° to 160° C., that the melting range of the polyester matrix filaments is at least 90° C. above that of the binding component, and that the base, in the tufted condition, before the coating of the back, has a maximum tensile stretching value of more than 50%.

4,842,916

SEPARABLE FASTENER COMPONENT & MOLDINGS ATTACHED WITH SUCH FASTENER COMPONENT

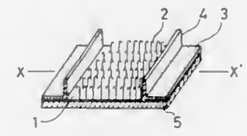
Kunihiko Ogawa, Tsurugashima, and Yoshio Noguchi, Sakado, both of Japan, assignors to Kuraray Company Ltd., Kurashiki, Japan

Filed Dec. 31, 1987, Ser. No. 140,112

Claims priority, application Japan, Jan. 19, 1987, 62-6688[U]; Jan. 19, 1987, 62-6689[U]; Jan. 19, 1987, 62-6690[U]; Sep. 9, 1987, 62-138531[U]

Int. Cl.[4] A44B *21/00*

U.S. Cl. 428—100 **28 Claims**



1. A separable fastener component suitable for attachment to plastic moldings, said separable fastener component comprising:

(a) an elongated fastener strip having hook-shaped coupling elements on the front side of a base;

(b) an anchor member provided on the rear side of said elongated fastener strip;

(c) longitudinal edge portions void of said hook-shaped coupling elements provided along the opposite longitudinal side edges of said elongated fastener strip;

(d) a barrier member formed on and along each longitudinal edge portion by applying a bunch of fiber in a height not greater than twice the height of said hook-shaped coupling elements, said bunch of fiber being in the form of non-woven cloth.

4,842,917

MAGNETIC RECORDING MEDIUM AND PROCESS FOR PRODUCING THE SAME

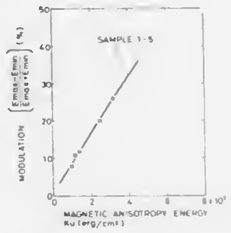
Tomoyuki Ohno, Kokubunji; Yoshihiro Shiroishi, Hachioji; Sadao Hishiyama, Sayama; Hiroyuki Suzuki, Kawasaki; Takaaki Shirakura, Chigasaki; Shinya Matsuoka, Odawara; Makoto Sano, Kanagawa; Takao Nakamura, Yokohama; Kazumasa Takagi, Tokyo; Tokuumi Fukazawa, Tachikawa, and Kenzo Susa, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 24, 1987, Ser. No. 88,380

Claims priority, application Japan, Sep. 1, 1986, 61-203610; Sep. 1, 1986, 61-203609

Int. Cl.[4] G11B *5/64*

U.S. Cl. 428—141 **30 Claims**



1. A magnetic recording medium having a magnetic film formed on a substrate through an underlayer having a thickness from 150–500 nm, characterized in that the central line average surface roughness Ra and maximum surface roughness Rmax of said magnetic film in a direction perpendicular to the direction of magnetic recording are within the ranges of $1\ nm \leqq Ra \leqq 20\ nm$ and $Rmax \leqq 25Ra$, respectively, the in-plane magnetic anisotropy energy Ku of said magnetic film is within the range of $0 \leqq Ku \leqq 8 \times 10^5\ erg/cm^3$, and said magnetic film is made of Co or an alloy containing Co as a principal component.

4,842,918

THERMOPLASTIC HALOCARBON POLYMER LAMINATES

Masahide Ochiumi, Yokkaichi, Japan, assignor to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1987, Ser. No. 129,760

Claims priority, application Japan, Dec. 10, 1986, 61-292299

The portion of the term of this patent subsequent to Jun. 7, 2005, has been disclaimed.

Int. Cl.[4] B32B *7/02, 15/08*

U.S. Cl. 428—215 **8 Claims**

1. A thermoplastic halocarbon polymer laminate which comprises a modified vinylidene halide polymer containing at least one functional group (a) selected from the group consisting of a carboxyl group, a hydroxyl group, and an epoxy group and a modified styrene polymer containing at least one functional group (b) which is selected from the above-defined group but which differs from the functional group (a), with the contents of the functional groups (a) and (b) being 1×10^{-3} to 3×10^{-1} mol/100 g respectively.

4,842,919

PAD FORMING METHOD

John R. David, and Daniel P. Pohl, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 3, 1987, Ser. No. 10,213

Int. Cl.[4] B32B *3/10*

U.S. Cl. 428—40 **5 Claims**

1. A pad of pressure sensitive adhesive coated sheets with a

similar discontinuity on each sheet substantially aligned with said discontinuity on adjacent sheets said discontinuity in-

creasing slightly in size from the bottom most sheet to the top most sheet in said pad, and wherein said discontinuity on each sheet is an opening through the sheet.

4,842,920

PLASTICS ELEMENTS FOR INORDINATE FILM-FLOW PACKINGS

Endre Banai; Tibor Bacsinsky; Vladimir Kormos, all of Budapest, and József Molnár, Solymar, all of Hungary, assignors to "Hungaria" Muanyagfeldolgozo Vallalat and Melyepitesi Tervezo Vallalat, both of Budapest, Hungary

Filed Aug. 4, 1987, Ser. No. 81,498

Claims priority, application Hungary Aug. 4, 1986, 3364/86; Aug. 4, 1986, 3365/86

Int. Cl.[4] B05D *3/12*

U.S. Cl. 428—184 7 Claims

1. A packing element for biological film processes comprising a one-piece synthetic-resin generally spherical body consisting essentially of:

a flat circular-disk base plate having a circular periphery and formed inward thereof with an elongated slot-shaped opening rounded at its ends and with a major axis along a diameter of the plate;

a flat circular and imperforate disk reinforcing plate extending along the diameter of said base plate through said opening and lying in a plane perpendicular to said base plate; and

a plurality of spaced-apart, imperforate, and mutually parallel circular lamellae perpendicular to both said plates, traversing the opening, and spaced apart in the direction of said diameter, said body having a specific surface area of at least 250 m^2/m^3.

4,842,921

PATTERNED MIRROR

Paul O. Sorko-Ram, 63412 M-66 N., Sturgis, Mich. 49091

Filed Mar. 16, 1987, Ser. No. 26,536

Int. Cl.[4] G02B *5/08*

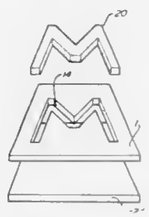
U.S. Cl. 428—187 5 Claims

1. A patterned mirror comprising:

a first planar section of a first optically transparent thermoplastic material of a first color, having a front surface and a back surface, and having at least one cavity formed therein with substantially vertical side walls, said side walls having a smooth and optically reflective surface;

a first layer of optically reflective material disposed on the back surface of said first planar section;

at least one second planar section equal in number to the number of said at least one cavity of said first planar section, each formed of a second optically transparent thermoplastic material of a second color contrasting with said first color, each having a front surface and a back surface, each having dimensions complementary to and disposed within a corresponding cavity of said first planar section with said back surface of each of said at least one second planar section within the same plane as said back



surface of said first planar section, and each having substantially vertical side walls, said side walls having a smooth and optically reflective surface;

a second layer of optically reflective material disposed on the back surface of each of said at least one second planar section; and

a mounting means coupled to said first planar section and each of said at least one second planar section for holding said back surface of each of said at least one second planar section within the same plane as said back surface of said first planar section.

4,842,922

POLYETHYLENE FIBERS AND SPUNBONDED FABRIC OR WEB

Stephen P. Krupp; Edward N. Knickerbocker, and John O. Bieser, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 27, 1987, Ser. No. 114,169

Int. Cl.[4] D04H *3/03;* C08L *23/06, 23/08, 23/18*

U.S. Cl. 428—198 9 Claims

1. A spunbonded fabric of web prepared from a blend of linear polyethylenes suitable for spunbonding at throughput rates of about 1.0 to about 1.2 grams/minute/hole, at linear spinning velocities of at least about 3500 meters per minute, to produce fiber sizes of less than 3.0 denier/filament, said blend comprising

high molecular weight linear polyethylenes having a MFR value within the range between about 0.5 to 25 g/10 min. and a density above about 0.91 g/cm^3, and

low molecular weight linear polyethylene having a MFR value within the range of greater than 25 to about 300 g/10 min. and a density above about 0.91 g/cm^3,

said spunbonded fabric or web being prepared therefrom and exhibiting improved properties over that similarly prepared from the high molecular weight linear polyethylene alone.

4,842,923

BALLISTIC MATERIALS

David R. Hartman, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 27, 1987, Ser. No. 78,429

Int. Cl.[4] B32B *27/42, 31/20, 33/00*

U.S. Cl. 428—219 19 Claims

1. A glass fiber composite, said composite being resistant to buckling and deformation, fire-resistant and smoke resistant,

machineable, self-supporting and having an areal density of at least about 2.5 pounds per square foot, said composite having a thickness greater than about ¼ inch and comprising a plurality of layers of a balanced interlaced high strength magnesia aluminosilicate glass fiber fabric in a matrix of a cured phenol formaldehyde resole resin, said composite being substantially free of entrapped water vapor, said fiber of said fabric having an impact debondable size coating thereon said size being, said size being characterized by an interfacial shear strength (ASTM D2344) of less than 6,000 psi and a compression value (ASTM D695) of in excess of about 90,000 psi, and said phenol formaldehyde resole resin being a resin formed by reacting formaldehyde and phenol at a molar ratio of greater than about 1:1 and less than about 3:1.

4,842,924

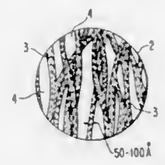
NOVEL COMPOSITIONS BASED ON REINFORCEMENT WITH MICROFIBRILLAR NETWORKS OF RIGID-ROD POLYMERS

Richard J. Farris, 428 Chesterfield Rd., Northampton, (Leeds), Mass. 01053; Yachin Cohen, 3 Manila Street, Haifa, Israel, and Steven J. DeTeresa, 874 Adams Ave., Livermore, Calif. 94550

Filed Aug. 25, 1986, Ser. No. 899,910

Int. Cl.[4] D03D *3/00*

U.S. Cl. 428—221 22 Claims



1. A composite that comprises a network of interconnected microfibrils of rigid polymer chains that are oriented along the long axis of the microfibrils and constitute one continuous microfibrillar-network-reinforcing phase of the composite, and a solid-matrix material interpenetrated within the three dimensional network and adhered to the microfibrils of the three dimensional microfibrillar chains to constitute a second continuous phase, in which the matrix phase serves to transmit at least one of enhanced shear forces, compression forces and tension forces between the microfibrils.

4,842,925

PROCESS TO MANUFACTURE A FELT WITH FLAP AND A FELT PRODUCED THEREBY

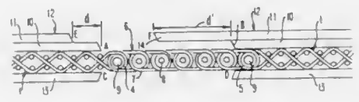
Marcel Dufour, Saint Yrieix, and Jacques Piat, Fléac, both of France, assignors to Asten Group, Inc., Charleston, S.C.

Filed Mar. 1, 1988, Ser. No. 162,807

Claims priority, application France, Mar. 2, 1987, 87 02776

Int. Cl.[4] D21F *7/10;* D04H *1/46*

U.S. Cl. 428—223 24 Claims



1. Process of manufacturing a papermaker's felt having at least two batts (12, 13), one needled onto each side of a base fabric which has two ends, each end including a row of loops (4, 5), for seaming the felt, characterized by extending at least one of the batts in a flap of a selected dimension substantially beyond the row of loops of one end of the base fabric and joining the rows of loops during needling by temporary connecting means (6) which spans between the rows of loops with a dimension greater than the selected dimension of the flap such that the flap does not cover the entire temporary connecting means.

9. An improved seamed papermaker's wet end felt, of the type having an open base fabric terminated at each end thereof in a row of complementary seam loops with at least one layer of batt material needled onto each side of the base fabric, said improvement characterized by at least one of said layers extending in a flap of a selected dimension substantially beyond the row of loops of one end of the base fabric, and removable connecting means interconnected with the seam loops at each end of the base fabric which spans between the rows of loops with a dimension greater than the selected dimension of the flap such that the flap does not cover the entire removable connecting means.

4,842,926

LAMINATED PRODUCT

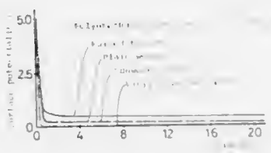
Eiji Sawa; Susumu Moriya; Hiroya Fukuda, and Takashi Ohashi, all of Yokohama, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Apr. 13, 1988, Ser. No. 180,970

Claims priority, application Japan, Apr. 17, 1987, 62-93338

Int. Cl.[4] B32B *3/26*

U.S. Cl. 428—224 25 Claims



1. A laminated product characterized in that polyurethane foam whose surface apparent resistivity is smaller than 1×10^{13} ohms/sq. (condition: 23° C., 8%RH) to create antistatic effect is laminated on the back side of a skin material.

4,842,927

PROCESS FOR PREPARATION OF WATER ABSORPTIVE COMPOSITE

Kiichi Itoh, and Takeshi Shibano, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo and Uni-Charm Corporation, Kawanoe, both of, Japan

Filed May 26, 1988, Ser. No. 198,867

Claims priority, application Japan, May 26, 1987, 62-128830

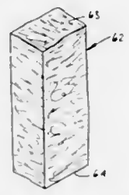
Int. Cl.[4] B05D *3/02;* B32B *7/00;* D04B *1/00*

U.S. Cl. 428—254 20 Claims

1. A process for preparing a water absorptive composite consisting of a highly water absorptive polymer and a prefabricated fibrous substrate, which comprises applying an aqueous solution containing effective amounts of (a) a polymerizable monomer comprising as a main component acrylic acid, of which 20% or more of the carboxyl groups have been neutralized to its alkali metal salt or ammonium salt, (b) 2-vinylpyridine or(and) 4-vinylpyridine or(and) their salts, (c) a crosslinking agent and (d) an oxidative radical polymerization initiator to a prefabricated fibrous substrate, and then carrying out polymerization with addition of a reducing agent.

20. A water absorptive composite produced by the process according to claim 1.

4,842,928
LOOSE-FILL INSULATION
William H. Kielmeyer, Englewood, Colo., assignor to Johns-Manville Corporation, Denver, Colo.
Division of Ser. No. 834,616, Sep. 19, 1977, abandoned. This application Apr. 26, 1979, Ser. No. 33,355
The portion of the term of this patent subsequent to Jul. 12, 2005, has been disclaimed.
Int. Cl.[4] D04H 1/68
U.S. Cl. 428—288 7 Claims



1. A thermal insulation, suitable for application in building spaces by pneumatic means, comprising a multitude of small, uniformly sized, low density pieces of bonded fibers, said fibrous pieces having a generally hexahedral configuration and a density of about 0.4 lb/ft^3 to 1.0 lb/ft^3.

4,842,929
PAPERMAKER'S WET PRESS FELT WITH PREDENSIFIED BATT THEREON
Marcel Dufour, Saint Yrieix, and Jacques Pint, Fléac, both of France, assignors to Asten Group, Inc., Charleston, S.C.
Filed Mar. 1, 1988, Ser. No. 162,556
Int. Cl.[4] B32B 5/06
U.S. Cl. 428—300 6 Claims

1. An improved wet press felt of the type having a base which is combined with at least one batt consisting of multiple fiber layers, the improvement characterized in that prior to being combined with said base said batt is predensified by at least three passages through a needling machine having a high needle density board on the order of 3,000 needles per meter of length for a 40 centimeters width and with at least one of those passages in the opposite direction of the others.

4,842,930
HEAT-SEALABLE MULTI-LAYER FILMS OF POLYOLEFINS
Ingo Schinkel, Walsrode, and Jürgen Fischer, Bomlitz, both of Fed. Rep. of Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Fed. Rep. of Germany
Filed Jul. 13, 1987, Ser. No. 72,311
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1986, 3624543
Int. Cl.[4] B32B 27/00
U.S. Cl. 428—349 6 Claims

1. A heat-sealable, at least monoaxially oriented multi-layer film of a base layer of a polypropylene and at least one heat-sealable layer of an olefin polymer, the heat-sealable layer consisting essentially of

(I) 35 to 70% by weight of an olefin polymer of

(A) at least one terpolymer consisting of

(a) 65 to 82% by weight of propylene,

(b) 25 to 14% by weight of but-1-ene,

(c) 10 to 4% by weight of ethylene, and

(B) 0 to 7% by weight of a copolymer of ethylene and butene-1,

the sum of (A) and (B) or of (a), (b) and (c) equalling 100% by weight and the monomer content of components A) and B) comprising 65 to 82% by weight of propylene, 25 to 14% by weight of butene-1 and 10 to 4% by weight of ethylene, and

(II) 65 to 30% by weight of a propylene/ethylene copolymer with 2 to 6% by weight of ethylene.

4,842,931
AFFIXABLE PADDING MATERIAL USING GELATINOUS VISCOELASTIC POLYMER
Gerald P. Zook, 1860 Friendly, Eugene, Oreg. 97405
Filed Jul. 19, 1988, Ser. No. 221,213
Int. Cl.[4] C09J 7/02
U.S. Cl. 428—354 14 Claims

SECTION A-A

1. An affixable soft tissue padding device comprising:

(a) a sheet of flexible fabric;

(b) a layer of gelatinous viscoelastic padding material impregnated onto one surface of said sheet of flexible fabric; and

(c) a layer of pressure-sensitive adhesive coating the surface of said sheet of flexible fabric opposite the surface impregnated with said layer of gelatinous viscoelastic padding material.

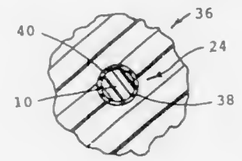
4,842,932
FIBER-CONTAINING YARN POSSESSING ANTIMICROBIAL ACTIVITY
Wendel L. Burton, Arden, N.C., assignor to BASF Corporation, Williamsburg, Va.
Filed Mar. 8, 1988, Ser. No. 165,645
Int. Cl.[4] B32B 27/18; D02G 3/04; D03D 27/00
U.S. Cl. 428—375 33 Claims

1. A yarn having antimicrobial properties containing a mixture of individual filaments comprising a fiber-forming synthetic polymer wherein at least one of said individual filaments but less than 20% of the total number of said individual filaments has an effective amount of an antimicrobial agent to inhibit microbial growth on the entire yarn.

4,842,933
COMPOSITES WITH IMPROVED FIBER-RESIN INTERFACIAL ADHESION
Muzaffer Cizmecioglu, Pasadena, Calif., assignor to California Institute of Technology, Pasadena, Calif.
Filed May 21, 1986, Ser. No. 866,565
Int. Cl.[4] D02G 3/00; B05D 1/18
U.S. Cl. 428—378 14 Claims

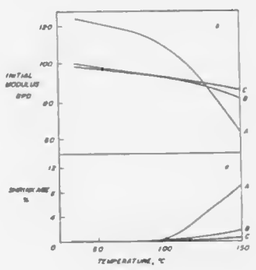
12. A composite comprising a dispersion of:

10 to 80 percent by weight of high modulus graphite fibers in matrix resin said fibers containing a precoated layer having a thickness from a monolayer to 1000 Angstrom thick of said matrix resin in thermoplastic form and at least



65 percent of the surface of said fibers being coated with the matrix resin at the time of fracture.

4,842,934
FIBER FOR REINFORCING PLASTIC COMPOSITES AND REINFORCED PLASTIC COMPOSITES THEREFROM
David S. Cordova; David R. Coffin, both of Richmond; Stanley D. Lazarus, Petersburg, all of Va.; Hugh H. Rowan, Chapel Hill, N.C., and Robert M. Marshall, Chester, Va., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.
Division of Ser. No. 624,897, Jun. 27, 1984, Pat. No. 4,748,197.
This application Oct. 30, 1987, Ser. No. 114,916
Int. Cl.[4] C08L 77/00; D01F 6/62; D06M 13/00, 13/50
U.S. Cl. 428—378 8 Claims

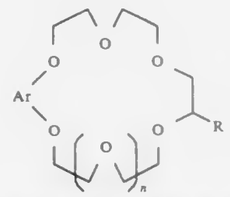


4. A fiber reinforced plastic composite comprising a cured resin matrix reinforced with fiber, said fiber comprising a high tenacity reinforcing polyester fiber that is treated to enhance adhesion with the cured resin, has a thermal shrinkage of 3 percent or less, a modulus after cure of at least 70 grams per denier and a tenacity of at least 5.5 grams per denier, said polyester fiber being present in an amount sufficient to provide improved notched impact strength to the composite.

4,842,935
FILLER FOR SEPARATING OPTICAL ISOMER
Toshio Shinbo; Koichiro Nishimura; Tomohiko Yamaguchi, and Masaaki Sugiura, all of Ibaraki, Japan, assignors to Director-General Agency of Industrial Science and Technology, Tokyo, Japan
Filed Mar. 5, 1987, Ser. No. 22,039
Claims priority, application Japan, Mar. 7, 1986, 61-51062
Int. Cl.[4] B01D 15/08; C02F 1/28; B32B 9/00
U.S. Cl. 428—404 8 Claims

1. A column filler for separating an optical isomer comprising a surface-hydrophobic filler component and an optically active lipophilic crown compound adsorbed on said surface-hydrophobic filler component;

said lipophilic crown compound represented by the formula:

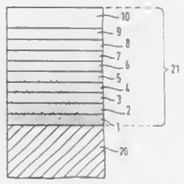


wherein Ar is an optically active divalent aromatic group; R is a hydrogen or an alkyl group, and n is an integer of 1 or 2.

4,842,936
COMPOSITE BASIC RESIN PARTICLES, ITS PREPARATION AND RESINOUS COMPOSITION FOR COATING USE CONTAINING THE SAME
Akio Kashihara, Osaka; Keizou Ishii, Hyogo, and Shinichi Ishikura, Kyoto, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan
Filed Nov. 18, 1986, Ser. No. 932,161
Claims priority, application Japan, Nov. 19, 1985, 60-259348
Int. Cl.[4] B32B 5/16; C08L 63/00
U.S. Cl. 428—407 7 Claims

1. Composite basic resin particles each of which comprises a granular body portion of crosslinked polymer having a means diameter of 0.01 to 10μ and a number of linear polymer chains, said crosslinked polymer selected from the group consisting of polyester resin, epoxy resin, amino resin, acrylic resin and vinyl resin, a part of the respective linear polymer chain penetrating into the inside of said granular body portion and the remaining part extending outwardly therefrom, and at least part of said linear polymer chains bearing basic functional groups selected from amino groups and ammonium group.

4,842,937
METHOD OF DEPOSITING A WEAR-PROTECTIVE LAYER ON A CUTTING TOOL AND WEAR PROTECTIVE LAYER PRODUCED BY THE METHOD
Hans-Robert Meyer, and Hans-Joachim Wiemann, both of Hamburg, Fed. Rep. of Germany, assignors to Ernst Winter & Sohn (GmbH & CO.), Hamburg, Fed. Rep. of Germany
Filed Feb. 26, 1988, Ser. No. 160,597
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1987, 3706340
Int. Cl.[4] C23C 28/04; B32B 7/02, 15/04
U.S. Cl. 428—408 11 Claims



1. A wear-protective layer for a support of a metallic or non-metallic hard material, said layer being formed by chemical vapor deposition or plasma deposition as a multilayer comprising a layer of diamond, and means for reducing a difference in elasticity between said support and said layer of diamond said means comprising plurality of layers arranged to be located between said support and said layer of diamond and formed so that each following layer remoter from said support

has a greater diamond portion and a higher elasticity module than each preceding layer positioned below said remoter layer.

4,842,938

METAL REINFORCING PATCH AND METHOD FOR REINFORCING METAL

Sidky D. Rizk, Westfield; Navinchand a B. Shah, and John W. Powers, both of Oldbridge, all of N.J., assignors to Essex Specialty Products, Inc., Clifton, N. J.

Division of Ser. No. 926,528, Nov. 4, 1986, Pat. No. 4,766,183, which is a continuation-in-part of Ser. No. 822,777, Jan. 27, 1986, abandoned. This application Mar. 23, 1988, Ser. No. 172,149

Int. Cl.[4] B32B *15/08*

U.S. Cl. 428—416 8 Claims

1. A metal reinforcing patch comprising

a flexible carrier having thereon

an adhesive comprising

a one package heat crosslinkable composition made by combining a polyepoxide compound and a thermo-reversibly blocked polyamine curing agent with an extended polyurethane prepolymer, free of isocyanate groups, prepared by thermo-reversibly blocking some of the isocyanate groups of a polyurethane prepolymer having a plurality of isocyanate groups and reacting the non-blocked isocyanate groups with a silicone polycarbinol and a polyol,

in combination with at least one filler.

4,842,939

PROCESS FOR PROTECTING AND LUBRICATING SURFACES SUBJECTED TO FRICTION AND WEAR

Mario A. Scarati, 20, via Bronzino, 20133 Milan; Alberto Re, 40, via Lamarmora, 20122 Milan; Carlo Tognoni, 4/c, via Pastorelli, 20143 Milan, and Piero Gavezotti, 9, via Cimabue, 20148 Milan, all of Italy

Filed Oct. 30, 1986, Ser. No. 925,704

Claims priority, application Italy, Oct. 30, 1985, 22669 A/85

Int. Cl.[4] G11B *5/70*

U.S. Cl. 428—421 20 Claims

1. A process for the protection and lubrication of a magnetic recording medium surface subjected to friction and wear comprising coating directly said surface with a layer comprising a polyurethane containing polyoxyfluoroalkylene blocks, said blocks comprising repeating fluoropolyoxyalkylene units of the following classes:

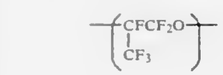
(I) (C_2F_4O), (CF_2O), said units being randomly distributed along the fluoropolyoxyalkylene chain;

(II) (C_3F_6O), (C_2F_4O), (CFXO) wherein X is —F or $—CF_3$, said units being randomly distributed along the fluoropolyoxyalkylene chain;

(III) $—CH_2—CF_2—CF_2—O—$;

(IV) $—CF_2—CF_2—CF_2O—$; or

(V)



(V)

4,842,940

ELECTRODEPOSITION COATING COMPOSITION, ELECTRODEPOSITION PROCESS AND ELECTRODEPOSITED ARTICLE

Tatsushiro Yoshimura; Nobuyuki Tomihashi, and Tsutomu Terada, all of Takatsuki, Japan, assignors to Daikin Kogyo Co, Ltd., Osaka, Japan

Filed Nov. 26, 1986, Ser. No. 935,418

Claims priority, application Japan, Nov. 28, 1985, 60-269160

Int. Cl.[4] C25D *13/06, 13/12*

U.S. Cl. 428—422 12 Claims

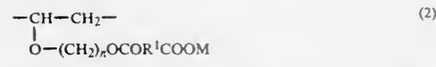
1. An electrodepositing coating composition consisting essentially of a fluorine-containing copolymer having an anionic functional group, a curing agent and water, said copolymer comprising:

(a) 20 to 80% by mole of the structure unit of the formula (1):

$$—CFX—CF_2— \quad (1)$$

wherein X is chlorine or fluorine,

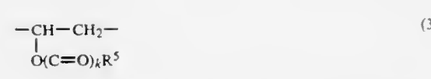
(b) 5 to 60% by mole of the structural unit of the formula (2):



(2)

wherein R^1 is an alkylene group having 2 to 6 carbon atoms or a bivalent alicyclic group having 4 to 10 carbon atoms, n is an integer of 2 to 6, and M is hydrogen, an alkali metal, a $—NHR^2R^3R^4$ group or a —RH group in which R^2, R^3 and R^4 are the same or different and each is hydrogen, an alkyl group having 1 to 6 carbon atoms or a hydroxyalkyl group having 1 to 6 carbon atoms, and R is a nitrogen-containing cyclic group having 4 to 9 carbon atoms,

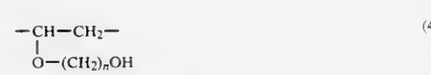
(c) 0 to 40% by mole of the structural unit of the formula (3):



(3)

wherein R^5 is an alkyl group having 1 to 12 carbon atoms, a monovalent alicyclic group having 4 to 10 carbon atoms or a fluoroalkyl group having 2 to 10 carbon atoms, and k is 0 or 1, and

(d) 0 to 40% by mole of the structural unit of the formula (4):



(4)

wherein n is as defined above,

the total amount of the structural units (a), (b), (c) and (d) being 100% by mole, said copolymer having an acid value in the range 54–150.

4,842,941

METHOD FOR FORMING ABRASION-RESISTANT POLYCARBONATE ARTICLES, AND ARTICLES OF MANUFACTURE PRODUCED THEREBY

John C. Devins, Burnt Hills; Clive W. Reed, Scotia, and Stefan J. Rzad, Rexford, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 6, 1987, Ser. No. 34,890

Int. Cl.[4] B32B *27/36;* B05D *3/06, 5/06*

U.S. Cl. 428—412 2 Claims

1. A method for forming an abrasion-resitant article, comprising the steps of:

(a) Applying an interfacial layer on the surface of a polycarbonate substrate wherein the interfacial layer comprises a curable organopolysiloxane composition containing a dispersion of colloidal silica in a solution of the partial condensate of a silanol having the formula RSi(OH)3 or R2Si(OH)2, wherein R is selected from the group consisting of alkyl groups having about 1 to 3 carbon atoms and aryl groups having about 6 to 20 carbon atoms, wherein at least 70 weight percent of the silanol is CH3Si(OH)3 or (CH3)2Si(OH)2 in a mixture of an aliphatic alcohol and water; and

(b) Applying an abrasion-resistant top layer containing a material selected from the group consisting of silicon carbide, silicon dioxide, silicon nitride, silicon oxynitride, boron oxide, boron nitride, aluminum oxide, aluminum nitride, and titanium dioxide, on the interfacial layer by:

(i) situating the polycarbonate substrate having the interfacial layer disposed thereover in a reactor chamber which is pressurized at between about 50 millitorrs and about 10 torrs; and

(ii) passing into the reactor chamber with a carrier gas at least one gaseous reactant capable of reacting to form the composition of said top layer in a laminar flow having a Reynolds value of about 2.5 relative to the surface of the interfacial layer at a flow rate of between 500 sccm and 10,000 sccm while generating an electric field in the chamber to form a sustained plasma of the gaseous reactant, wherein the plasma is formed by an electrical generator operating at dc or at ac frequencies of betwen about 50 Hz and about 10 GHz and at a power value of between 10 watts and 5000 watts, said substrate being heated to a temperature between about room temperature and 130° C., said gaseous reactant reacting in the plasma and on the interfacial layer to form said top layer.

4,842,942

MAGNETIC RECORDING MEDIUM

Takeshi Yatsuka, Ootsu; Nobukazu Kotera, Kyoto, and Yutaka Mizumura, Ootsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

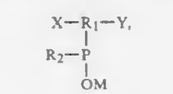
Filed Aug. 8, 1985, Ser. No. 763,786

Claims priority, application Japan, Aug. 15, 1984, 59-170737; Sep. 25, 1984, 59-199994

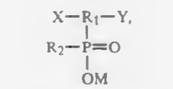
Int. Cl.[4] G11B *5/70*

U.S. Cl. 428—425.9 8 Claims

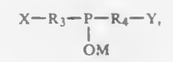
1. A magnetic recording medium prepared by applying onto a non-magnetic support a magnetic coating material containing fine ferromagnetic particles dispersed in a binder and curing said magnetic coating material, characterized in that said binder comprises a thermoplastic resin selected from polyester resins and polyurethane resins or a radiation-curable resin selected from polyester acrylate resins and polyurethane acrylate resins wherein there is chemically bonded as a comonomer in the polymer chain of the resin, at least one phosphorus compound represented by the following formulas:



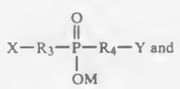
(I)



(II)



(III)



(IV)

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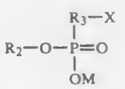


(V)

wherein each of X and Y is an ester-forming functional group, R_1 is a trivalent hydrocarbon group having 3–10 carbon atoms, R_2 is a member selected from the class consisting of alkyl groups having 1–12 carbon atoms, cycloalkyl groups, aryl groups, alkoxy groups having 1–12 carbon atoms, cycloalkoxy groups and aryloxy groups wherein the aryl group may be substituted with a halogen atom, a hydroxyl group, a group of the formula —OM', wherein M' represents an alkali metal, or an amino group, each of R_3 and R_4 is a member selected from the class consisting of alkylene groups having 1–12 carbon atoms, cycloalkylene groups, arylene groups and groups of the formula $—CH_r(OR_5)m$ wherein R_5 is a group selected from the class consisting of alkylene groups having 1–12 carbon atoms, cycloalkylene groups and arylene groups, and m is any number from 1 to 4, and M represents an alkali metal, hydrogen atom, an alkyl group having 1–4 carbon atoms or an amino group, the content of the phosphorus compound in the resin being 100 ppm to 20,000 ppm calculated as phosphorus atoms.

4,842,943

UNITARY MOLDED SILICONE RUBBER PRODUCT FROM TWO DIFFERENT SILICONE RUBBERS AND A METHOD FOR THEIR MANUFACTURE

Hideki Kobayashi; Hiroshi Honma, both of Ichihara, and Mitsuo Hamada, Kisurazu, all of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 447,588, Dec. 7, 1982, abandoned. This application Aug. 20, 1987, Ser. No. 87,571

Claims priority, application Japan, Dec. 7, 1981, 56-197139

Int. Cl.[4] A01B *1/06;* B32B *9/04*

U.S. Cl. 428—447 9 Claims

1. A molded product consisting essentially of a portion of silicone rubber containing 5 to 75 weight percent carbon black based on the total weight of the silicone rubber, and a portion of silicone rubber containing substantially no carbon black and in which both portions of silicone rubber are obtained from an addition reaction using a platinum catalyst, said portions are united together forming a unitary body.

4,842,944

ELASTIC ROTATABLE MEMBER

Tsukasa Kuge, Tokyo; Masahiro Goto, Kawasaki, and Isamu Sakane, Obtsu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1985, Ser. No. 793,546

Claims priority, application Japan, Nov. 7, 1984, 59-234780; Jan. 24, 1985, 60-011367; Jan. 24, 1985, 60-011368; Jan. 24, 1985, 60-011369; Jan. 28, 1985, 60-014078; Jan. 28, 1985, 60-014079; Jan. 29, 1985, 60-016166

The portion of the term of this patent subsequent to Feb. 14, 2006, has been disclaimed.

Int. Cl.[4] B32B *13/12, 27/00, 3/26;* G03B *21/00*

U.S. Cl. 428—451 117 Claims

1. An elastic rotatable member for fixing an unfixed image, said member comprising:

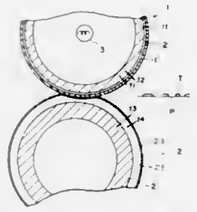
a core member;

an elastic rubber layer comprising silicone rubber formed outside said core member; and

a surface layer of fluorine resin material formed outside said elastic layer;

wherein said surface layer is provided by forming an unsintered resin material layer together with liquid outside said

elastic rubber layer and sintering the resin material by heating the resin material up to a temperature which is



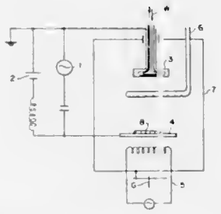
higher than that of said elastic rubber layer and which is higher than a melting temperature of the resin material.

4,842,945

STAINLESS STEEL COATED WITH THIN FILM OF CARBON CONTAINING SPECIFIED AMOUNT IN A STATE OF DIAMOND AND HAVING AN ADJUSTABLE BLACK TRANSPARENT COLOR TONE

Wataru Ito, and Satoshi Ito, both of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 26, 1987, Ser. No. 53,659
Claims priority, application Japan, May 29, 1986, 61-122215
Int. Cl.[4] B05D *3/06;* **C23C** *15/00*
U.S. Cl. 428—457 **9 Claims**



1. A stainless steel with black transparent appearance comprising a stainless steel substrate and a thin film formed on said substrate, said thin graphite film having a thickness not greater than 1 μm and consisting of graphite and 10 to 75 wt % of carbon existing in a state of diamond.

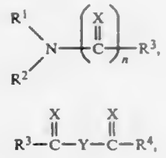
4,842,946

METHOD FOR TREATING A POLYIMIDE SURFACE TO IMPROVE THE ADHESION OF METAL DEPOSITED THEREON, AND ARTICLES PRODUCED THEREBY

Donald F. Foust, Scotia; William V. Dumas, Delanson; Edward J. Lamby, Scotia, and Bradley R. Kuras, Amsterdam, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 28, 1987, Ser. No. 103,618
Int. Cl.[4] C23C *18/20;* **C25D** *5/56*
U.S. Cl. 428—458 **20 Claims**

1. A method for improving adhesion of a metallization layer on a polyimide surface which comprises the steps of: treatment of the surface with an adhesion-promoting organic double bond-containing compound selected from the group consisting of



and salts or hydrates thereof;

wherein each X is independently oxygen or sulfur;

R^1 and R^2 independently selected from the group consisting of hydrogen, alkyl groups containing about 1 to about 15 carbon atoms, aromatic groups containing about 6 to about 20 atoms, and alkoxy groups containing about 1 to about 10 carbon atoms;

R^3 and R^4 are independently selected from the group consisting of R^1, S^-NH_2, NHR^1, $NHNH_2$ and R^1CO—;

R^5 is selected from the group consisting of R^1, NHR^1, and S^-;

R^6 and R^7 are each independently hydrogen or an alkyl group containing about 1 to 10 carbon atoms;

Y is selected from the group consisting of NH, NHNH, —S—S—, alkylene groups containing from 1 to about 10 carbon atoms, and arylene groups containing about 1 to about 20 carbon atoms; and

n is 1 or 2;

electroless deposition of the metallization layer on the treated surface; and heating of the resulting metallized article.

4,842,947

ADHESIVE BLENDS AND COMPOSITE STRUCTURES

Kevin V. Jachec, Arlington Heights, and Peter D. Becker, Roselle, both of Ill., assignors to Quantum Chemical Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 133,191, Dec. 15, 1987, Pat. No. 4,774,144, which is a continuation of Ser. No. 890,936, Jul. 28, 1986, abandooed. This application Jan. 29, 1988, Ser. No. 149,832
The portion of the term of this patent subsequent to Sep. 27, 2005, has been disclaimed.
Int. Cl.[4] C08L *51/06;* **B32B** *15/08, 27/08, 27/28*
U.S. Cl. 428—461 **59 Claims**

1. An adhesive blend comprising a mixture of

(a) a substantially non-elastomeric copolymer of propylene and ethylene wherein said ethylene comprises at least about 5 wt. % of said copolymer;

(b) about 0.1 to 30 wt. % of said blend of a non-elastomeric graft copolymer comprising a propylene polymer backbone and a grafting monomer comprising at least one polymerizable ethylenically unsaturated carboxylic acid or acid derivative grafted onto said backbone; and

(c) an adhesion-promoting effective amount of an ethylene homopolymer having a specific gravity in the range of about 0.915–0.930, inclusive, and a melt index of less than about 4 dg/min. as measured at 190° C.

4,842,948

METHODS AND COMPOSITIONS FOR PRODUCING POLYIMIDE COATINGS

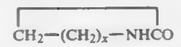
John Gagliani, 6280 Lance Pl., San Diego, Calif. 92120, and John V. Long, 1756 E. Lexington Ave., El Cajon, Calif. 92121

Division of Ser. No. 682,574, Dec. 17, 1984, Pat. No. 4601,908. This application Jun. 20, 1985, Ser. No. 746,858
Int. Cl.[4] B32B *27/00;* **B05D** *5/10*
U.S. Cl. 428—473.5 **23 Claims**

1. A method of forming a coating on a surface which comprises the steps of:

providing a quantity of a solvent;

adding thereto in either order, an aromatic tetracarboxylic acid dianhydride and from just above 0 to 10 moles of an oxoimine per mole of said dianhydride, said oxoimine having the general structure.



where x is 4 to 7:

maintaining the resulting mixture at a temperature of from about 30° to 120° C.;

stirring said mixture until solution is complete;

cooling the resulting solution to a temperature of from about 20° to 60° C.;

adding thereto about 1.0 moles of a diamine per mole of dianhydride;

stirring until solution is complete;

forming a layer of said material having a thickness of up to about 3 mils on a surface; and

heating said material to a temperature of from about 175° to 320° C. for from about 30 minutes to 5 hours to form a smooth, adherent coating of a high molecular weight polymer.

23. The product produced according to the method of claim 1.

4,842,949

METHODS AND COMPOSITIONS FOR PRODUCING POLYIMIDE ADHESIVE BONDS

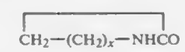
John Gagliani, 6280 Lance Pl., San Diego, Calif. 92120, and John V. Long, 1756 E. Lexington Ave., El Cajon, Calif. 92121

Division of Ser. No. 682,574, Dec. 17, 1984, Pat. No. 4,601,908. This application Jun. 20, 1985, Ser. No. 746,867
Int. Cl.[4] B32B *27/00;* **C09J** *3/14*
U.S. Cl. 428—473.5 **10 Claims**

1. A method of bonding two smooth surfaces together which comprises the steps of:

providing a quantity of a solvent;

adding thereto in either order, an aromatic tetracarboxylic acid dianhydride and from just above 0 to 10 moles of an oxoimine per mole of said dianhydride, said oxoimine having the general structure.



where x is 4 to 7;

maintaining the resulting mixture at a temperature of from about 30° to 120° C.;

stirring said mixture until solution is complete;

cooling the resulting solution to a temperature of from about 20° to 60° C.;

adding thereto about 1.0 moles of a diamine per mole of dianhydride; and

stirring until solution is complete producing an imide precurser solution;

forming a coating of said imide precurser solution on at least one of two smooth surfaces to be bonded together;

drying said coating;

pressing said surfaces together with said coating therebetween; and

heating the resulting assembly at a temperature of about 200° to 300° C. for from about 30 minutes to 5 hours.

4,842,950

OVERLAY PROOFING FILM

O. Alfred Barton, Florham Park, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 691,313, Jan. 14, 1985, abandoned, and Ser. No. 927,191, Nov. 4, 1986, Pat. No. 4,748,101. This application May 26, 1988, Ser. No. 199,011
Int. Cl.[4] B32B *27/08, 27/30, 27/36;* **G03C** *1/80*
U.S. Cl. 428—483 **20 Claims**

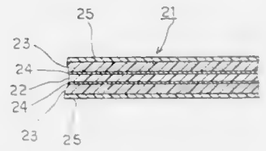
1. A substantially transparent polyester film having improved transparency, said polyester film having a substantially transparent non-light sensitive coating directly coated thereon, said coating consisting essentially of a copolymer of polymethyl methacrylate and methacrylic acid having a refractive index of less than about 1.6.

4,842,951

THERMOFORMING RESIN LAMINATE SHEET

Toyokazu Yamada, Himegi; Masao Miyama, Sodegaura; Hideo Sugimura, and Takeshi Shinohara, both of Himegi, all of Japan, assignors to Idemitsu Petrochemical Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 867,982, May 29, 1986, abandoned. This application Dec. 24, 1987, Ser. No. 137,627
Claims priority, application Japan, Jun. 5, 1985, 60-122257
Int. Cl.[4] B32B *27/68*
U.S. Cl. 428—516 **4 Claims**



1. A thermoformable resin laminate sheet comprising:

(a) a gas permeation-resistant resin layer;

(b) on each side of the gas permeation-resistant resin layer, a polyolefin based resin layer laminated on the gas permeation-resistant layer through an adhesive layer, said polyolefin based resin layer comprising a mixture of 35–70% by weight, based on the weight of the mixture, of at least one inorganic filler selected from the group consisting of talc and calcium carbonate and a resin selected from the group consisting of a polypropylene resin, a mixture of a polypropylene resin and an ethylene-propylene elastomer, and a mixture of a polypropylene resin and a polyethylene resin;

(c) on the outer surface of each polyolefin based resin layer, a thermoplastic resin layer free from inorganic filler and laminated on the outer surface of the polyolefin based resin layer, said thermoplastic resin being selected from the group consisting of a polypropylene resin, and a mixture of a polypropylene resin and a polyethylene resin.

4,842,952

INTER-PLY ADHESION BETWEEN SARAN AND LINEAR ETHYLENE COPOLYMERS

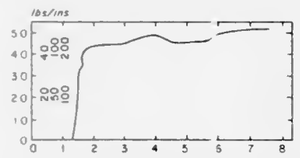
Steven B. Garland, Simpsonville, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Continuation of Ser. No. 880,258, Jun. 30, 1986, Pat. No. 4,755,436. This application Mar. 31, 1988, Ser. No. 175,896
Int. Cl.[4] B32B *27/08*
U.S. Cl. 428—518 **4 Claims**

1. A multi-layer film comprising:

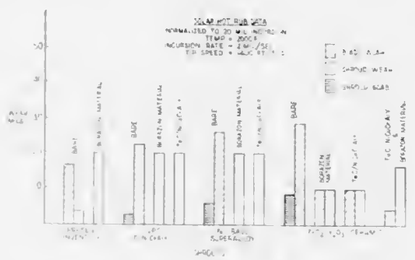
(a) a blended layer comprising ethylene/butyl acrylate co-

polymer blended with linear ethylene/alpha-olefin copolymer; and



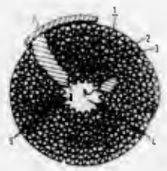
(b) a layer comprising vinylidene chloride copolymer having one surface thereof directly joined to the blended layer.

4,842,953
ABRADABLE ARTICLE, AND POWDER AND METHOD FOR MAKING
Roger J. Perkins, Evendale, and Murray S. Smith, Jr., Green Hills, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio
Filed Nov. 28, 1986, Ser. No. 935,997
Int. Cl.[4] C22C *19/05, 19/07*
U.S. Cl. 428—553 11 Claims



1. A mixture of two powdered alloys each comprising a base of elements M, Cr and Al in which M is at least one element selected from the group consisting of Co and Ni, the mixture having a total mixture composition consisting essentially of, by weight, 10–35% Cr, 4–10% Al, from a small but effective amount up to about 0.09% Y, 2–6% Si, with the balance M and incidental impurities, and further characterized by the substantial absence of B;
a first of the powdered alloys having a solidus and a liquidus, consisting of 50–70 wt % of the mixture and having a melting range higher than a second of the powdered alloys;
the first alloy characterized by the substantial absence of Si and the presence of Y in an amount, up to 0.15 wt %, which will provide the Y content in the total mixture composition;
the second of the powdered alloys having a solidus and a liquidus, consisting essentially of the balance of the mixture, being characterized by the substantial absence of Y, and consisting essentially of, by weight, 8–12% Si, 1.5–4% Al, 10–30% Cr, with the balance M and incidental impurities.

4,842,954
METAL CATALYST CARRIER BODY, BLANK FOR PRODUCING THE BODY
Theodor Cyron, Bergisch Gladbach; Manfred Vierkötter, Neunkirchen-Seel., and Rolf Hetzelberger, Cologne, all of Fed. Rep. of Germany, assignors to Emitec Gesellschaft für Emissionstechnologie mbH, Lohmar, Fed. Rep. of Germany
Filed Nov. 20, 1987, Ser. No. 123,386
Claims priority, application Fed. Rep. of Germany, Nov. 20, 1986, 3639597
Int. Cl.[4] B01J *35/04;* F01N *3/28*
U.S. Cl. 428—593 7 Claims

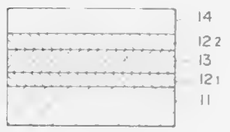


1. Blank for the production of a catalyst carrier body, comprising spirally-wound alternating layers of smooth and corrugated metal sheets, at least one of said corrugated sheets forming an innermost layer defining a coil-free central zone surrounded by said innermost layer.

4,842,955
HOMOGENEOUS, METASTABLE BAG-GROUP BRAZING ALLOYS
Anatol Rabinkin, Morris Plains, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.
Filed Sep. 14, 1987, Ser. No. 97,016
Int. Cl.[4] C22C *5/08, 30/02*
U.S. Cl. 428—606 1 Claim

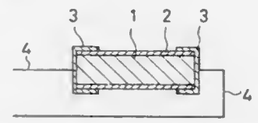
1. A homogeneous brazing foil composed of metastable material having a composition consisting essentially of about 15 to 40 weight percent copper, 0 to 32 weight percent zinc, 0 to 24 weight percent cadmium, 0 to 3 weight percent nickel and 0 to 10 weight percent tin, the balance being silver and incidental impurities and a phase structure such that the largest dimension of any precipitated phase ranges from about 0.01 to 0.1 micrometer, said foil having a thickness less than 60 micrometer and being incapable of being bent through a radius smaller than 0.8 mm without cracking.

4,842,956
OPTO-MAGNETIC RECORDING MEDIUM HAVING THREE EXCHANGE-COUPLED MAGNETIC LAYERS
Tadashi Kobayashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 30, 1987, Ser. No. 114,518
Claims priority, application Japan, Nov. 6, 1986, 61-262629
Int. Cl.[4] H01F *10/06*
U.S. Cl. 428—611 11 Claims



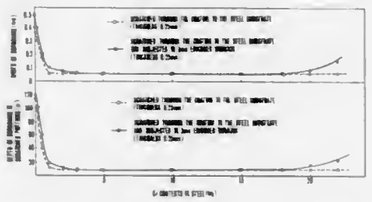
1. An opto-magnetic recording medium comprising:
a substrate;
a first magnetic layer formed on said substrate and having perpendicular magnetic anisotropy, said first magnetic layer consisting of a rare-earth and iron group amorphous alloy thin film whose iron group auxiliary lattice magnetization is dominant; and
second magnetic layers respectively formed on two major surfaces sides of said first magnetic layer and having perpendicular magnetic anisotropy, said second magnetic layers having a lower coercive force and a higher Curie temperature than those of said first magnetic layer, and being respectively exchange-coupled to said first magnetic layer and each of said second magnetic layers consisting of a rare-earth and iron group amorphous alloy thin film whose iron group auxiliary lattice magnetization is dominant, and having a direction of spontaneous magnetization parallel to that of said first magnetic layer.

4,842,957
PRESSURE SENSOR ELEMENT
Tetsuo Yamamoto; Hiroshi Hayashi; Tenshiro Muta, all of Nagoya; Yoshisada Hori, Ichinomiya, and Katsushi Kubo, Nagoya, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan
Filed Oct. 29, 1987, Ser. No. 113,917
Claims priority, application Japan, Nov. 8, 1986, 61-266358
Int. Cl.[4] G01L *9/04*
U.S. Cl. 428—622 4 Claims



1. A pressure sensor element, consisting of a high-strength electrically insulating ceramic substrate, a firmly adhering silver coating deposited on the surface of said substrate, and electroconductive grounding metallic caps disposed one on each of the opposite ends of said ceramic substrate possessing the firmly adhering deposited silver coating and in conductive contact with the silver coating, which pressure sensor element, upon being placed in a liquid, manifests changes in liquid pressure exerted thereon by proportionate changes in the resistance of electric current flowing through the sensor element.

4,842,958
CHROMATE SURFACE TREATED STEEL SHEET
Seijun Higuchi; Tomonari Obga; Toshinori Katayama, and Fumio Yamamoto, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan
Filed Apr. 14, 1987, Ser. No. 38,349
Int. Cl.[4] B32B *15/04*
U.S. Cl. 428—629 8 Claims



1. A chromate surface-treated steel sheet, excellent in paintability, corrosion resistance and workability comprising a chromium-containing steel substrate containing not more than 0.15% carbon, 0.005 to 0.10% acid soluble aluminium, 0.5 to 20% chromium with the balance being iron and unavoidable impurities, and a chromate coating applied on said steel substrate, said coating comprising a metallic chromium layer in an amount ranging from 1 to 300 mg/m^2, and a hydrated chromium oxide layer in an amount ranging from 5 to 50 mg/m^2 in term of the metallic chromium contained therein.

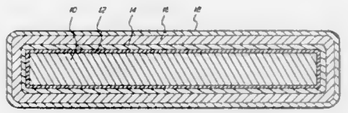
4,842,959
ALUMINUM ENAMEL BOARD
Ryu Maeda; Shingoro Fukuoka, both of Tokyo, and Hiroshi Yatabe, Yokohama, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan
Filed Oct. 13, 1987, Ser. No. 107,944
Claims priority, application Japan, Oct. 17, 1986, 159140[U]; Oct. 27, 1986, 61-164810[U]; Feb. 5, 1987, 62-25248[U]
Int. Cl.[4] B32B *15/04, 17/06*
U.S. Cl. 428—630 17 Claims

13. An aluminum enamel board for printed circuits, comprising a base plate and an electrically insulating glass layer which comprises a ceramic material and a metal powder on said base plate, said base plate being selected from the group consisting of an Al-Si alloy plate containing at least 5% of Si, and a composite metal plate consisting of a metal plate and an Al or Al alloy layer formed on said metal plate such that said Al or Al alloy layer is interposed between said metal plate and said insulating glass layer, and said metal plate consists essentially of a material selected from the group consisting of an Al-Si alloy containing at least 5% of Si, an Fe-Ni alloy, W, Mo, Si and combination of Cu and any one of W, Mo and Si.

4,842,960
HIGH EFFICIENCY PHOTOLUMINESCENT MATERIAL FOR OPTICAL UPCONVERSION
Joseph Lindmayer, Potomac, Md., assignor to Quantex Corporation, Rockville, Md.
Continuation-in-part of Ser. No. 870,809, Jun. 6, 1986, which is a continuation-in-part of Ser. No. 786,095, Oct. 10, 1985, Pat. No. 4,705,952. This application Jul. 28, 1987, Ser. No. 78,829
Int. Cl.[4] C09K *11/56*
U.S. Cl. 428—690 7 Claims

1. An electron trapping photoluminescent material emitting orange light when subjected to infrared radiation, consisting essentially of:
a base material formed of a mixture of 60–80% by weight of strontium sulfide and 40–20% by weight of calcium sulfide;
a first dopant of 50–500 parts per million by weight of samarium; and
a second dopant of 200–600 parts per million by weight of europium oxide.

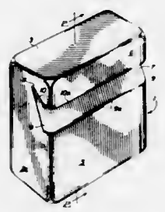
4,842,961
ALTERNATE ELECTROLYTIC/ELECTROLESS-LAYERED LID FOR ELECTRONICS PACKAGE
Thomas J. Basile, New Hartford, and Jean LaPlante, Oriskany, both of N.Y., assignors to Advanced Materials Technology Corp., Oriskany, N.Y.
Filed Mar. 4, 1988, Ser. No. 164,395
Int. Cl.[4] B32B *15/18*
U.S. Cl. 428—672 15 Claims



1. A closure device for hermetically sealing an electronics package, comprising

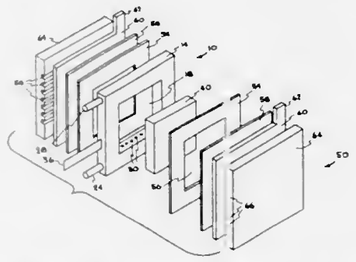
a base layer of iron-based alloy,
a first layer of an electroplated nickel,
a second layer of an electroless nickel,
a third layer of an electroplated nickel having a thickness of at least 50 microinches, and
a fourth layer of a plated noble metal.

4,842,962
FUEL CELL AND MOLD THEREFOR
Robert H. Bass, 2830 Mill Creek, Garland, Tex. 75042
Filed Apr. 11, 1988, Ser. No. 180,325
Int. Cl.[4] H01M 2/02
U.S. Cl. 429—12 **19 Claims**



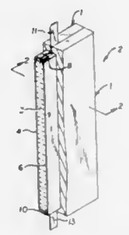
1. A fuel cell comprising a molded plastic container having oppositely-disposed sides, oppositely-disposed ends joining said sides; a top panel and a bottom panel joining said sides and said ends, respectively, and further comprising molded wedge means provided in said bottom panel said wedge means projecting from said bottom panel into said sides and extending into the interior of said container in angular relationship, whereby fuel contained in said container may be trapped and accumulated between said wedge means and one of said ends of said container.

4,842,963
ZINC ELECTRODE AND RECHARGEABLE ZINC-AIR BATTERY
Philip N. Ross, Jr., Kensington, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Jun. 21, 1988, Ser. No. 209,592
Int. Cl.[4] H01M 4/06
U.S. Cl. 429—21 **20 Claims**



1. An improved zinc electrode for a rechargeable zinc-air battery comprising an outer frame, a porous foam electrode support within said frame having zinc deposited thereon and treated prior to the deposition of zinc thereon to inhibit the formation of zinc dendrites on the external surface thereof, and means within said outer frame for circulating an alkaline electrolyte through the interior of said treated zinc-coated porous foam.

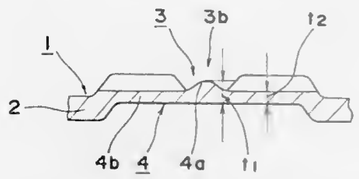
4,842,964
IN-SITU ELECTROLYTE STORAGE FOR BATTERIES
Gary P. Tarcy, Plum Borough, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.
Filed Mar. 21, 1988, Ser. No. 171,280
Int. Cl.[4] H01M 10/44, 6/36
U.S. Cl. 429—52 **12 Claims**



1. A reserve battery which has long-term in-situ storage of electrolyte including a housing, an anode, a cathode, said anode and said cathode being disposed in relative spaced relationship within said housing, an interelectrode space being defined by said anode and cathode, wherein the improvement comprises

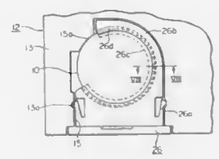
a sealed container composed of an elastomeric material;
said sealed container being disposed in said housing;
said sealed container containing a sufficient amount of electrolyte to effect activation of said battery when brought into contact with said anode and said cathode; and
fracturing means for releasing said electrolyte from said sealed container, whereby when said fracturing means breaks said sealed container electrolyte floods said interelectrode space.

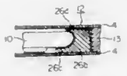
4,842,965
NON AQUEOUS ELECTROCHEMICAL BATTERY WITH EXPLOSION PROOF ARRANGEMENT AND A METHOD OF THE PRODUCTION THEREOF
Hisashi Urushiwara, Toride; Tugiyasu Iwamaru, Settsu; Kenya Kazehara, Ako; Osamu Watanabe, Toyonaka; Kenichi Sawada, Osaka; Kiyoshi Sato; Hirokazu Yoshikawa, both of Ibaraki; Shigeru Ikenari, Suita; Kenichi Yokoyama, Takatsuki, and Yoshio Uetani, Ibaraki, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan
Filed Sep. 25, 1987, Ser. No. 101,259
Claims priority, application Japan, Sep. 27, 1986, 61-228760; Sep. 27, 1986, 61-228761; Sep. 27, 1986, 61-228764; May 19, 1987, 62-123142; May 19, 1987, 62-123143; May 19, 1987, 62-123144; May 19, 1987, 62-123145; May 27, 1987, 62-130246; Jul. 20, 1987, 62-180770
Int. Cl.[4] H01M 2/12; B65D 51/16
U.S. Cl. 429—56 **7 Claims**



1. A non-aqueous electrochemical battery comprising a positive active electrode material comprised of an oxyhalide liquid selected from thionyl chloride, sulfuryl chloride or phosphoryl chloride, a negative electrode comprised of an alkaline metal selected from lithium, sodium or potassium and a battery container which is sealed hermetically providing an air chamber on the top portion of the container, the improvement which comprises a plurality of grooves formed on the bottom of the battery container each of said grooves having a thinned and flat bottom and inclined side wall continued to both side edges of the thinned and flat bottom to form a reversed trapezoidal shape in a cross sectional view, each of side grooves being intersected with another of said grooves at least at one point, wherein the thickness of the thinned and flat bottom of the groove at the intersecting point is 1.05 to 1.5 times the thickness of the thinned and flat bottom of the rest of the groove, thereby providing an explosion-proof arrangement of the battery.

4,842,966
BATTERY HOLDER MECHANISM
Makoto Omori; Toshinobu Banjo, and Shigeo Onoda, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan
Filed Feb. 23, 1988, Ser. No. 158,733
Claims priority, application Japan, Mar. 31, 1987, 62-79922
Int. Cl.[4] H01M 2/10; G04B 1/00; G04C 3/00
U.S. Cl. 429—96 **9 Claims**





3. A battery holder mechanism comprising:
a battery holder body having a resilient circular-arc portion extending for at least 180 degrees along a circle and having an inner peripheral surface which has two sides, first supporting projection means projecting radially inwardly from one of the sides of the inner peripheral surface of said circular-arc portion for supporting a battery from one side thereof, and second supporting projection means projecting radially inwardly from the other side of the inner peripheral surface of said circular-arc portion for supporting the battery from a side opposite the one side thereof; and
resilient stop means for resiliently locking said battery holder body with a battery receiving hole of a device into which said battery holder mechanism is inserted.

4,842,967
ALKALINE EARTH-OXYHALIDE ELECTROCHEMICAL CELL FOR LOW TEMPERATURE USE
Michael Binder, Brooklyn, N.Y., and Charles W. Walker, Jr., Neptune, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed May 20, 1988, Ser. No. 196,708
Int. Cl.[4] H01M 4/36, 6/14
U.S. Cl. 429—101 **6 Claims**

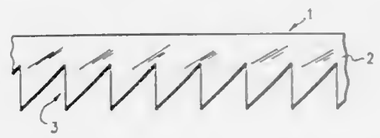
1. In an alkaline earth-oxyhalide electrochemical cell including calcium as the anode, a solution of a soluble tetrachloroaluminate salt in an oxyhalide solvent as the electrolyte, and carbon black as the cathode, the improvement of including relatively small quantities of bromine in the electrolyte to permit discharge of the cell at −30° C. at 5mA/cm² for several minutes with a load potential about 2.0 volts.

4,842,968
HOLOGRAM RECORDING MEDIUM
Chiaki Kojima, and Hidetoshi Shimizu, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Dec. 16, 1985, Ser. No. 809,009
Claims priority, application Japan, Dec. 14, 1984, 59-264241
Int. Cl.[4] G03C 5/16, 1/68; G03H 1/04
U.S. Cl. 430—1 **11 Claims**

1. A hologram recording medium comprising a rigid substrate formed of transparent and non-light scattering material having a plurality of open pores in said substrate, photopolymerizable composition impregnated in said open pores, said photopolymerizable composition consisting essentially of: a photopolymerizable material selected from the group consisting of photopolymerizable monomers or photopolymerizable oligomers having an adhesive property to surface of said open pores; a photopolymerization initiator, and an inactivator for controlling photopolymerization speed, wherein said inactivator is a material having a triplet interaction with the photopolymerization initiator, where energy emitted by said photopolymerization initiator upon returning from an excited state by irradiation of light to a ground state is partially a triplet state, and said excited inactivator dissipates energy as heat upon returning to a ground state of said inactivator.

10. A hologram recording medium comprising a rigid substrate formed of transparent and non-light scattering material having a plurality of open pores in said substrate, photopolymerizable composition impregnated in said open pores, said photopolymerizable composition consisting essentially of: a photopolymerizable material selected from the group of consisting of photopolymerizable monomers or photopolymerizable oligomers having an adhesive property to surface of said open pores; a photopolymerization initiator, and an inactivator for controlling photopolymerization speed; and
said inactivator is a material having a triplet interaction with the photopolymerizable initiator; wherein said inactivator is selected from the group consisting of 1-phenylnapthalene and olive oil.

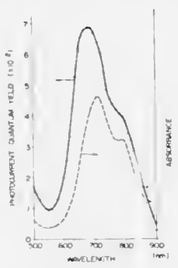
4,842,969
TRANSMITTANCE MODULATION PHOTOMASK, PROCESS FOR PRODUCING THE SAME, AND PROCESS FOR PRODUCING DIFFRACTION GRATINGS USING THE SAME
Nobubiro Kawatsuki; Katsuya Fujisawa; Ichiro Matsuzaki, and Masao Uetsuki, all of Kurashiki, Japan, assignors to Kuraray Company, Ltd., Kurashiki, Japan
Filed Dec. 1, 1987, Ser. No. 127,170
Claims priority, application Japan, Dec. 6, 1986, 61-290992
Int. Cl.[4] G03F 1/00
U.S. Cl. 430—5 **17 Claims**



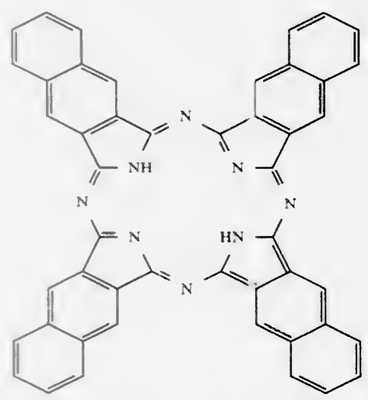
1. A transmittance modulation photomask which comprises:
(a) a first blazed diffraction grating made of a transparent material and
(b) a second blazed diffraction grating made of a material containing a ray absorbing agent,
wherein:

(c) said first diffraction grating and said second diffraction grating mate with each other at their respective grating surfaces;
(d) the refractive index of the material constituting said first diffraction grating is at least approximately equal to the refractive index of the material constituting said second diffraction grating; and
(e) the upper and lower surfaces of the photomask are at least approximately parallel to each other.

4,842,970
ELECTROPHOTOGRAPHIC PLATE CONTAINING A NAPHTHALOCYANINE COMPOUND
Seiji Tai; Shigeru Hayashida, and Nobuyuki Hayashi, all of Hitachi, Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan
Filed Apr. 20, 1988, Ser. No. 184,027
Claims priority, application Japan, Apr. 22, 1987, 62-99043
Int. Cl.[4] G03G *54/04, 5/06*
U.S. Cl. 430—58 9 Claims

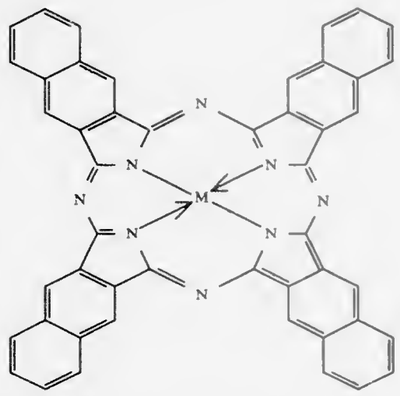


1. An electrophotographic plate comprising an electroconductive supporting substrate and a photoconductive layer formed thereon, wherein the photoconductive layer contains an organic photoconductive material as a charge generation material, said organic photoconductive material being a naphthalocyanine compound represented by the formula



(I)

or the general formula



(II)

wherein M denotes one member selected from the group consisting of Cu, Zn, Mg, OTi, OV, ClAl, ClGa, ClIn, Cl_2Si, Cl_2Ge, and Cl_2Sn.

2. The electrophotographic plate of claim 1, wherein the photoconductive layer is a complex type comprising a charge generation layer containing the naphthalocyanine compound of the formula (I) or (II) and a charge transport layer.

4,842,971
PHOTORECEPTOR FOR ELECTROPHOTOGRAPHY HAVING A HYDROXYSTYRENE SUBBING LAYER
Takayuki Sugaiwa; Akira Kinoshita, and Kiyoshi Sawada, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Filed Mar. 25, 1987, Ser. No. 30,694
Claims priority, application Japan, Mar. 28, 1986, 61-70081
Int. Cl.[4] G03G *5/14*
U.S. Cl. 430—64 21 Claims

1. An electrophotographic photoreceptor adapted to repeatedly form electrostatic toner images through dry development, said photoreceptor comprising;
an electroconductive support and a subbing layer thereon containing a hydroxystyrene as a monomer substituent thereof and a photoreceptive layer containing a carrier generating material.

4,842,972
PROCESS FOR IMAGE PRODUCTION CONTAINING THE HEAT-AND-PRESSURE FIXING OF A STILL WET OR MOIST TONER IMAGE
Serge M. Tavernier, Lint; William C. Waterschoot, Belsele, and Robert T. Overmeer, Mortsel, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium
Filed May 15, 1987, Ser. No. 49,994
Claims priority, application European Pat. Off., May 29, 1986, 86200930.5
Int. Cl.[4] G03G *9/16*
U.S. Cl. 430—117 14 Claims

1. In a process of image production which comprises the steps of developing an electrostatic charge pattern with toner particles comprised of colouring matter in a thermoplastic resin binder and dispersed in a carrier liquid and fixing of said pattern-wise deposited toner particles while still damp with said carrier liquid on a support by simultaneously subjecting the same to heat and pressure, the improvement wherein said toner particles have at 120° C. a melt viscosity when dry of from 500 to 100,000 Pa.s, a mean average diameter of from 0.1 to 5 μm, and a ratio of colouring matter to resin binder of from 1/1 to 1/9 by weight.

4,842,973
VACUUM DEPOSITION OF SELENIUM ALLOY
Santokh S. Badesha, Pittsford; Paul Cherin, Fairport; Geoffrey M. T. Foley, Fairport; Barry A. Lees, Fairport, and John Woznisk, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Apr. 8, 1988, Ser. No. 179,374
Int. Cl.[4] G03G *5/082*
U.S. Cl. 430—128 12 Claims

1. A process for fabricating an electrophotographic imaging member comprising providing in a vacuum chamber at least one first layer crucible containing particles of selenium or a selenium alloy, at least one second layer crucible containing particles of an alloy comprising selenium and an alloying component selected from the group consisting of tellurium, arsenic, and mixtures thereof, and a substrate, applying a partial vacuum to said vacuum chamber, heating said particles in said first layer crucible to deposit a thin continuous selenium or a selenium alloy first layer on said substrate, maintaining said particles in said second layer crucible at a first temperature below about 130° C. while said thin continuous selenium or a selenium alloy first layer is being deposited on said substrate, and rapidly heating the particles in said second layer crucible to a second temperature between about 250° C. and about 450° C. to deposit a thin continuous selenium alloy second layer on said substrate.

4,842,974
TONER FOR USE IN COMPOSITIONS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES, METHOD OF MAKING THE SAME, AND LIQUID COMPOSITION USING THE IMPROVED TONER
Benzion Landa, Edmonton, Canada; Peretz Ben-Auraham; Joseph Hall, both of Rehovot, Israel, and George A. Gibson, Vandalia, Ohio, assignors to Savin Corporation, Stamford, Conn.
Continuation-in-part of Ser. No. 45,168, Apr. 24, 1987, which is a continuation of Ser. No. 679,906, Dec. 10, 1984. This application Jun. 11, 1987, Ser. No. 61,796
Int. Cl.[4] G03G *9/08*
U.S. Cl. 430—137 13 Claims

1. A method of producing toner particles adapted for electrophoretic movement through a nonpolar liquid comprising the steps of plasticizing a thermoplastic polymer and a pigment with a nonpolar liquid to form a sponge, shredding said sponge into pieces, adding more nonpolar liquid, wet-grinding the pieces into particles, and continuing the grinding step to pull the particles apart to form fibers extending therefrom, said particles having a diameter of less than 5 microns.

4,842,975
METHOD OF MAKING LIQUID DEVELOPER FOR ELECTROSTATIC PHOTOGRAPHY
Eiichi Kato; Kazuo Ishii; Hiroshi Ishibashi; Shigeyuki Dan, and Hidefumi Sera, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Continuation of Ser. No. 912,663, Sep. 29, 1986, abandoned, which is a continuation of Ser. No. 706,993, Feb. 28, 1985, abandoned. This application Dec. 22, 1987, Ser. No. 136,517
Claims priority, application Japan, Feb. 28, 1984, 59-36789
Int. Cl.[4] G03G *9/12*
U.S. Cl. 430—137 25 Claims

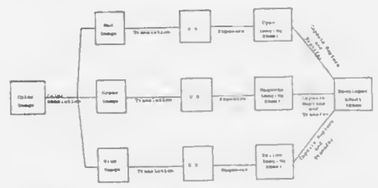
1. A method for producing an electrostatic photographic liquid developer comprising (i) forming a dispersion of copolymer resin particles by polymerizing a solution containing at least one monofunctional monomer (A) which is soluble in a non-aqueous solvent but becomes insoluble upon polymerization and at least one monomer (B) containing an aliphatic group having at least 8 carbon atoms, being copolymerizable with the monomer (A) and being represented by the following formula (I):

(I)

wherein R represents an aliphatic group having at least 8 carbon atoms, X represents —COO—, —CONH—,

wherein R′ represents an aliphatic group, —OCO—, —CH_2OCO— or —O—, and Y_1 and Y_2 are the same different and each represents hydrogen, an alkyl group, —COOR″ or —CH_2COOR″, wherein R″ represents an aliphatic group, in the presence of a resin being soluble in said solvent and having no grafting group polymerizable with the monomers and of a non-aqueous solvent miscible with said solvent, with the monomer (B) being used in an amount of 0.1 to 5 mole % based on the amount of the monomer (A); and (ii) adding a non-aqueous solvent to the dispersion of copolymer resin particles to adjust the properties of a carrier liquid in the resulting diluted dispersion of copolymer resin particles to an electric resistance of at least 10^9 ohms-cm and a dielectric constant of not more than 3.5.

4,842,976
COLOR IMAGE-FORMING PROCESS
Frederick W. Sanders, Chillicothe, Ohio, assignor to Mead Corp., Nebr.
Filed Jan. 18, 1982, Ser. No. 339,917
Int. Cl.[4] G03C *1/68*
U.S. Cl. 430—138 29 Claims



1. An imaging process employing:
a first imaging sheet comprising a support and a coating composition adhered to one surface of said support, said coating composition including a first color precursor selected from a cyan, magenta and yellow color precursor, and a radiation curable photosensitive composition, wherein at least said photosensitive composition is encapsulated in pressure rupturable capsules and said first color precursor is soluble in said radiation curable photosensitive composition or a solvent for said first color precursor is encapsulated with said radiation curable photosensitive composition,
a second imaging sheet comprising a support and a coating composition adhered to one surface of said support, said coating composition comprising a second color precursor selected from a cyan, magenta and yellow color precursor other than said first color precursor, and a radiation curable-photosensitive composition, wherein at least said photosensitive composition is encapsulated in pressure rupturable capsules and said second color precursor is soluble in said radiation curable photosensitive composition or a solvent for said second color precursor is encapsulated with said radiation curable photosensitive composition,
a third imaging sheet comprising a support and a coating composition adhered to one surface of said support, said

VOL 1103 ISS 4 JE 27 1989 UMI

coating composition comprising a third color precursor selected from a cyan, magenta and yellow color precursor other than said first and second color precursors, and a radiation curable photosensitive composition, wherein at least said photosensitive composition is encapsulated in pressure rupturable capsules and said third color precursor is soluble in said radiation curable photosensitive composition or a solvent for said third color precursor is encapsulated with said radiation curable photosensitive composition,

a developer sheet comprising a support coated on one surface with a dry material capable of reacting with said color precursors and providing an image, comprising:

(a) resolving a multi-color image into its red, green, and blue images,

(b) translating, individually, each of said red, green and blue images into a radiation which is actinic with respect to the radiation curable photosensitive composition on said imaging sheet bearing the color precursor compliment of said image,

(c) image-wise exposing said first imaging sheet to said radiation translated from said red, green or blue image which is complimentary to said first color precursor, to form exposed and unexposed areas in said first sheet,

(d) image-wise exposing said second imaging sheet to said radiation translated from said red, green or blue image which is complimentary to said second color precursor to form exposed and unexposed areas in said second sheet,

(e) image-wise exposing said third imaging sheet to said radiation translated from said red, green or blue image which is complimentary to said third color precursor to form exposed and unexposed areas in said third sheet,

(f) rupturing the capsules in at least the unexposed areas of said first imaging sheet,

(g) rupturing the capsules in at least the unexposed areas of said second imaging sheet,

(h) rupturing the capsules in at least the unexposed areas of said third image sheet,

(i) transferring said first color precursor from the unexposed areas of said first sheet to said developer sheet to form an image,

(j) transferring said second color precursor from the unexposed areas of said second sheet to said developer sheet to form an image and

(k) transferring said third color precursor from the unexposed areas of said third imaging sheet to said developer sheet to form an image, and thereby obtaining a full color image.

4,842,977

LIGHT-SENSITIVE MATERIAL CONTAINING SILVER HALIDE, REDUCING AGENT, POLYMERIZABLE COMPOUND AND A BASE OR BASE PRECURSOR

Fujio Kakimi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 28, 1988, Ser. No. 149,455

Claims priority, application Japan, Jan. 28, 1987, 62-18084

The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.

Int. Cl.⁴ G03C 1/72

U.S. Cl. 430—138 **12 Claims**

1. A light-sensitive material comprising a light-sensitive layer containing silver halide, a reducing agent, an ethylessically unsaturated polymerizable compound and a base or base precursor provided on a support, said silver halide and polymerizable compound are contained in microcapsules to form light-sensitive microcapsules which are dispersed in the light-sensitive layer, wherein the base or base precursor is contained in particles which are arranged outside of the light-sensitive microcapsules, at least 30% of said particles being adsorbed on the surface of the light-sensitive microcapsules.

4,842,978

PROCESS FOR PREPARATION OF LIGHT-SENSITIVE MICROCAPSULES CONTAINING SILVER HALIDE AND POLYMERIZABLE COMPOUND

Shunichi Ishikawa, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 12, 1987, Ser. No. 119,449

Claims priority, application Japan, Nov. 11, 1986, 61-269303

Int. Cl.⁴ B01J 13/02; G03C 1/72

U.S. Cl. 430—138 **9 Claims**

1. A process for the preparation of light-sensitive microcapsules which comprises encapsulating silver halide and an ethylenically unsaturated polymerizable compound with a shell comprising an amino-aldehyde resin in an aqueous medium in the presence of an anionic protective colloid, wherein the anionic protective colloid is a mixture of pectin and a polymer comprising a repeating unit derived from stylenesulfonic acid, and the weight ratio of the pectin to the polymer ranges from 0.1 to 10.

4,842,979

BLACK COLOR HEAT-SENSITIVE DIAZO MICROCAPSULE RECORDING MATERIAL WITH BENZOYLACETIC AMIDE COUPLER

Sadao Ishige, Kanagawa; Toshimasa Usami, Shizuoka; Hiroshi Kamikawa, Shizuoka, and Toshiharu Tanaka, Schizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 813,206, Dec. 24, 1985, abandoned. This application Nov. 30, 1987, Ser. No. 129,350

Claims priority, application Japan, Dec. 27, 1984, 59-278859

Int. Cl.⁴ G03C 1/58; B41M 5/18

U.S. Cl. 430—138 **8 Claims**

1. A heat-sensitive recording material comprising a support having provided thereon a heat-sensitive layer containing an admixture of (a) microcapsules containing at least one light-sensitive diazonium salt capable of azo-coupling with a 2-hydroxy-3-naphthoic acid anilide to develop a blue color, (b) a 2-hydroxy-3-naphthoic acid amide derivative, (c) a benzoylacetic amide derivative represented by the following formula (I) and (d) a basic substance, wherein said components (a), (b), (c) and (d) are contained in amounts sufficient to form a black color upon heat-developing, said black color being fixable by light:

(I)

wherein X represents a hydrogen atom, a halogen atom, a lower alkyl group or an alkoxy, aralkyloxy, phenoxy or acylamino group having up to 18 carbon atoms; Y represents an alkyl or aralkyl group having from 7 to 18 carbon atoms, an alkoxy, aralkyloxy, phenoxy, naphthyloxy, alkylthio, aralkylthio or phenylthio group having from 6 to 18 carbon atoms, a naphthylthio group, a sulfonyloxy group, a sulfamoyl group, a ureido group, a thioureido group or an acylamino group; X' and Y' each represents a hydrogen atom, a halogen atom, a lower alkyl group or a lower alkoxy group; and Y and Y' may combine to form a substituted or unsubstituted benzene ring.

4,842,980

PHOTOSENSITIVE MATERIALS CONTAINING IONIC DYE COMPOUNDS AS INITIATORS

Peter Gottschalk, Centerville; Douglas C. Neckers, Perrysburg, both of Ohio, and Gary B. Schuster, Champaign, Ill., assignors to The Mead Corporation, Dayton, Ohio

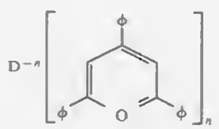
Continuation of Ser. No. 944,305, Dec. 18, 1986, Pat. No. 4,772,530, which is a continuation-in-part of Ser. No. 860,367, May 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 800,014, Nov. 20, 1985, abandoned. This application Jul. 20, 1988, Ser. No. 221,569

Int. Cl.⁴ G03C 1/78, 1/495, 1/68, 1/71

U.S. Cl. 430—138 **7 Claims**

1. A photohardenable composition comprising a free radical addition polymerizable or crosslinkable compound and an ionic dye-reactive counter ion compound, said ionic dye-reactive counter ion compound being a stable, non-transient compond capable of absorbing actinic radiation and producing free radicals which initiator free radical polymerization or crosslinking of said polymerizable or crosslinkable compound, said ionic dye-reactive counter ion compound being represented by the formula (IV) or (V):

(IV)



(V)

wherein D is an anionic dye, R^5 and R^6 are independently selected from the group consisting of phenyl or naphthyl groups and n is 1 or 2.

4,842,981

IMAGING SYSTEM

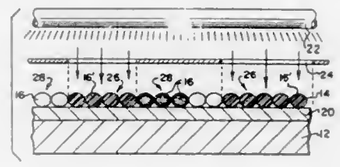
Frederick W. Sanders; Gary F. Hillenbrand; Jonathan S. Arney, and Richard F. Wright, all of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 562,308, Dec. 16, 1983, Continuation of Ser. No. 320,643, Nov. 12, 1981, Pat. No. 4,440,846. This application May 24, 1984, Ser. No. 613,548

The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.

Int. Cl.⁴ G03C 1/68, 5/16; B41L 1/20; B32B 5/16

U.S. Cl. 430—138 **17 Claims**



1. An imaging process which comprises:

image-wise exposing to actinic radiation a coating comprising a substantially colorless chromogenic material and rupturable capsules containing a photosensitive composition which undergoes a change in viscosity in areas in which it has been exposed to actinic radiation, and

subjecting said capsules to a uniform rupturing force in the presence of a developer material such that there is a patterned reaction between said chromogenic material and said developer which produces a positive or negative image corresponding to said exposure.

4,842,982

RADIATION-SENSITIVE RECORDING MATERIAL HAVING RADIATION-SENSITIVE RECORDING LAYER AND DISCONTINUOUS RADIATION-SENSITIVE COVERING LAYER OF THE SAME COMPOSITION

Markus Seibel, Mainz, and Guenther Kaempf, Oestrich-Winkel, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 772,704, Sep. 5, 1985, abandoned. This application Jun. 9, 1987, Ser. No. 62,340

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1984, 3433247

Int. Cl.⁴ G03C 1/74, 1/54; G03F 7/16

U.S. Cl. 430—156 **7 Claims**

1. A radiation-sensitive recording material, consisting essentially of a support, a radiation-sensitive recording layer and a radiation-sensitive, rough, discontinuous covering layer which is distinct from said radiation-sensitive recording layer, said covering layer being sprayed on said recording layer in the form of a solution which contains an organic solvent, said solvent partially dissolving the surface of said recording layer, wherein (A) said rough covering layer and said recording layer comprise substantially the same composition, said composition being an admixture suited for the preparation of a planographic printing plate that presents a roughened outer surface; and (B) said rough covering layer comprises a plurality of discrete particles formed by drying at least a portion of the liquid droplets of said solution.

4,842,983

LIGHT-SENSITIVE COMPOSITIONS AND LIGHT-SENSITIVE MATERIALS WITH PHENOLIC RESOL HAVING DIBENZYLIC ETHER LINKAGES

Akira Hasegawa, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

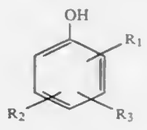
Division of Ser. No. 842,217, Mar. 21, 1986, Pat. No. 4,732,840. This application Oct. 14, 1987, Ser. No. 108,278

Claims priority, application Japan, Mar. 22, 1985, 60-57797; Mar. 22, 1985, 60-57798; Apr. 1, 1985, 60-68661

Int. Cl.⁴ G03C 1/60, 1/68, 1/495

U.S. Cl. 430—175 **8 Claims**

1. A light sensitive composition (i) a phenolic resol wherein the ratio of the number of dibenzylic ether linkages to the total number of dibenzylic ether, methylene and methylol linkages linked to phenolic nucleus is 15 mol. % or more and which phenolic resol is obtained by a reaction between at least one phenol of the formula (I):



(I)

wherein R_1, R_2 and R_3 may be the same or different and represent a hydrogen, halogen, hydroxyl, nitro, alkyl having 1 to 20 carbon atoms, alkoxy having 1 to 20 carbon atoms, phenyl having 6 to 20 carbon atoms, or substituted phenyl having 6 to 20 carbon atoms, and an aldehyde and/or ketone under neutral or weakly acidic conditions and subsequent removal of water, and (ii) at least one member selected from the group consisting of diazo resins, o-quinone diazide compounds, light-sensitive azide compounds, high molecular compounds having a —CH=CH—CO— group in the main or side chain thereof, addition-polymerizable unsaturated compounds and acid-decomposition compounds, and wherein ingredients (i) and (ii) are together in admixture or as a light-sensitive esterified reaction product of the phenolic resol with o-quinone diazide sulfonyl halide.

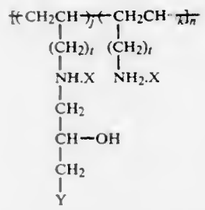
4,842,984

WATER SOLUBLE PHOTOSENSITIVE RESIN COMPOSITIONS WITH BISAZIDE COMPOUND

Hajime Serizawa; Koichi Ojima, and Kiyoshi Shimizu, all of Koriyama, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Jun. 29, 1987, Ser. No. 67,942
Claims priority, application Japan, Apr. 30, 1986, 61-100467
Int. Cl.[4] G03C *1/60, 1/72*
U.S. Cl. 430—197 **9 Claims**

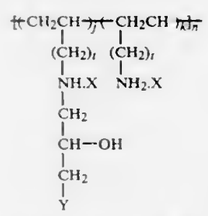
1. A photosensitive resin composition comprising in admixture a resin represented by the formula



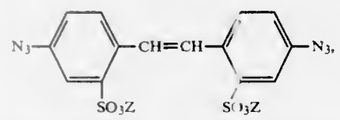
wherein X, which may be present or absent, represents acetic acid when present, Y stands for a group represented by the formula $-OCH_2CH=CH_2$, n is an integer of 10 or greater, j/j+k is more than 0 and less than 1, and t is 0 or 1; and a photosensitivity-enhancing amount of a salt represented by the formula:

where Z stands for sodium or potassium.

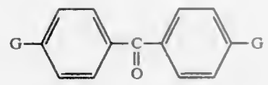
3. A photosensitive resin composition comprising in admixture a resin represented by the formula



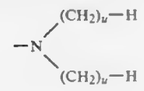
wherein X, which may be present or absent, represents acetic acid when present, Y stands for a group represented by the formula $-OCH_2CH=CH_2$, n is an integer of 10 or greater, j/j+k is more than 0 and less than 1, and t is 0 or 1; and a photosensitivity-enhancing amount of a salt represented by the formula:



where Z stands for sodium or potassium; and a photosensitivity-enhancing amount of an aromatic ketone represented by the formula:



wherein G stands for hydrogen, an amino group of a dialkylamino group represented by the formula:



where u is 0, 1 or 2.

4,842,985

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Mitsunori Ono; Koji Tamoto; Keiji Mihayashi; Seiji Ichijima; Isamu Itoh, and Yoshisada Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 811,913, Dec. 20, 1985, abandoned.
This application Dec. 8, 1987, Ser. No. 130,127
Claims priority, application Japan, Dec. 27, 1984, 59-278860
Int. Cl.[4] G03C *5/54, 1/48*
U.S. Cl. 430—226 **30 Claims**

1. A conventional silver halide color photographic material containing a coupler having a dye moiety having the maximum absorption wave length shifted to a short wave length by a linkage which is cleaved directly or through a timing group by a coupling reaction with the oxidation product of a developing agent and forming a compound or the precursor thereof (compound A) having a dye moiety having a maximum absorption wave length before shifting as the result of the above-described reaction and a compound (dye-fixing compound) capable of fixing the hue of said compound A at a long wave length or capable of immobilizing said compound A in the photographic layer, or both.

4,842,986

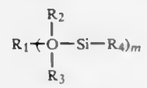
POSITIVELY WORKING RESIST MATERIAL

Nobuaki Matsuda; Tadayoshi Kokubo; Toshiaki Aoai; Akira Umehara, and Yoshimasa Aotani, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

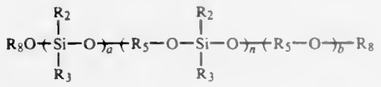
Filed Jul. 28, 1986, Ser. No. 889,707
Claims priority, application Japan, Jul. 26, 1985, 60-165512
Int. Cl.[4] B03C *1/76*
U.S. Cl. 430—270 **20 Claims**

1. A positively working resist material consisting essentially of a compound having at least one silyl ether group and an alkali-soluble resin in an amount of from about 30 to about 90% by weight based on the total weight of the resist material,

and said compound having at least one silyl ether group is present in an amount sufficient to render the positively working resist material alkali-insoluble but which renders the material alkali-soluble upon irradiation with far ultraviolet rays, X-rays, an electron beam, or an ion beam, and said compound is selected from the group consisting of compounds represented by formulae (II), (III), and (IV)



(II)



(III)

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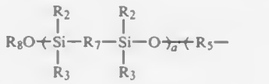
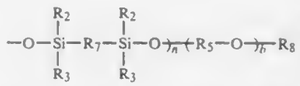


(IV)



wherein R_1 represents a substituted or unsubstituted m-valent aliphatic or aromatic hydrocarbon group; R_2, R_3, and R_4 each represents a hydrogen atom, an alkyl group, an alkenyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted aralkyl group, a halogen atom, or $-OR_6$, where R_6 represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted aralkyl group; R_5 and R_7 each represents a substituted or unsubstituted divalent aliphatic or aromatic hydrocarbon residue; or R_5 together with R_6 in R_2 or R_3 form a part of an aliphatic or aromatic ring; R_8 represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted acyl group, or

m and n each represents a positive integer; and a and b each represents 0 or 1.

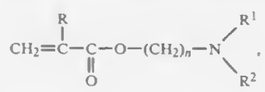
4,842,987

PHOTOSENSITIVE ELEMENT FOR PRODUCING PRINTING PLATES OR RESIST IMAGES

Albert Elzer, Otterstadt; Axel Sanner, Frankenthal; Hans Schupp, Worms, and Erich Beck, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 15, 1987, Ser. No. 62,162
Int. Cl.[4] G03B *1/68*
U.S. Cl. 430—281 **11 Claims**

1. In a photosensitive recording element which is suitable for the production of negative-working printing plates or resist images and possesses a photopolymerizable recording layer which is applied to a dimensionally stable base, which layer can be developed in an aqueous alkaline medium and which layer contains a polymeric binder, the improvement which comprises: using as the polymeric binder, one or more film-forming copolymers which are insoluble in water but soluble or dispersible in aqueous alkaline solutions and consists essentially of from 10 to 50% by weight of one or more N-vinylamides, from 5 to 30% by weight of acrylic acid, methacrylic acid or a mixture of acrylic acid and methacrylic acid and from 30 to 80% by weight of one or more comonomers from the group consisting of the vinylaromatics and esters of acrylic acid or methacrylic acid with monoalkanols of 1 to 8 carbon atoms and from 0.2 to 5% by weight of at least one copolymerizable, olefinically unsaturated organic compound which contains basic nitrogen atoms and has a $pK_a > 4$, selected from the group consisting of compounds of the formulae



(I)

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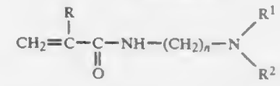


(II)

where n is from 2 to 6, R is hydrogen or methyl and R^1 and R^2 are identical or different and are each hydrogen, a straight-chain or branched alkyl or hydroxyalkyl radical of 1 to 6 carbon atoms, a straight-chain or branched hydroxyalkyl radical of 1 to 6 carbon atoms whose hydroxyl groups are etherified with alkanols of 1 to 4 carbon atoms, or cycloakyl of 5 or 6 carbon atoms, or R^1 and R^2 together form a five-membered or six-membered ring which may contain a further hetero atom, N-vinylimidazole and 2-methyl-1-vinylimidazole as copolymerized units.

4,842,988

PRESENSITIZED WATERLESS PLANOGRAPHIC PRINTING PLATE WITH AMORPHOUS SILICIC ACID INTERLAYER AND PROCESS OF MAKING AND USING

Heinz Herrmann, and Hans-Joachim Schlosser, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 20, 1987, Ser. No. 87,677
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1986, 3628719
Int. Cl.[4] G03C *1/54, 1/68, 1/71;* **G03F** *7/08*
U.S. Cl. 430—14 **24 Claims**

1. A presensitized printing plate for waterless planographic printing comprising

a support;

a radiation-sensitive layer on the support comprising a negative-working composition that is rendered insoluble in irradiated areas or a positive-working composition that is rendered soluble in irradiated areas;

an ink-repellent silicone layer; and

an amorphous silicic acid layer between the radiation-sensitive layer and the silicone layer.

17. A process for making a presensitized printing plate for waterless planographic printing comprising the steps of:

providing a support layer;

coating a radiation-sensitive composition in a solvent;

coating a silicic acid sol on the radiation-sensitive coating; and

coating an ink-repellent silicone elastomer on the silicic acid coating.

23. A process for preparing a printing form suitable for waterless planographic printing, wherein a presensitized planographic printing plate as claimed in claim 1 is imagewise exposed and then immersed into a developer solution and thereafter the photosensitive layer is removed from the image areas by rubbing, together with the portions of the silicone rubber layer, which are present over these areas.

24. A printing form prepared by the process of claim 23.

4,842,989

RESIST LAYER AND PROCESS FOR FORMING RESIST PATTERN THEREON

Ichiro Taniguchi, Kyoto; Hideo Hotomi, Suita, and Izumi Osawa, Ikeda, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 17, 1987, Ser. No. 134,060
Claims priority, application Japan, Dec. 19, 1986, 61-304981
Int. Cl.[4] G03C *5/00*
U.S. Cl. 430—296 **6 Claims**

1. A resist pattern formation process comprising:

a step of forming a resist layer comprising an organic polymer layer by subjecting at least a methacrylate incorporating fluorine and/or an acrylate incorporating fluorine to a glow-discharge plasma polymerization process;

a step of plasma exposing said resist layer to a carbon tetrafluoride to be able to be used as a positive resist layer;
a step of forming a latent image by exposing said resist layer to an electron beam; and
a step of visualizing said latent image by plasma etching.

4,842,990

PRESENSITIZED NEGATIVE WORKING WATERLESS PLANOGRAPHIC PRINTING PLATE WITH AMORPHOUS SILICIC ACID INTERLAYER AND PROCESS OF MAKING AND USING

Heinz Herrmann; Hans-Joachim Schlosser, both of Wiesbaden, and Susanne Billino, Ruesselsheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 20, 1987, Ser. No. 87,619
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1986, 3628720
Int. Cl.[4] G03C *1/495, 1/74, 7/10*
U.S. Cl. 430—272 20 Claims

1. A presensitized printing plate for waterless planographic printing comprising:
1. a support;
2. a radiation-sensitive layer on the support comprising
(a) a compound possessing at least one C—O—C bond, which can be split by acid,
(b) a compound forming a strong acid upon irradiation, and
(c) a water-insoluble binder;
3. an ink-repellent silicone layer; and
4. an amorphous silicic acid layer between the radiation-sensitive layer and the silicone layer.

14. A process for making a presensitized printing plate for waterless planographic printing comprising the steps of:
providing a support layer;
coating on said support layer a radiation-sensitive composition comprising
(a) a compound possessing at least one C—O—C bond which can be split by acid,
(b) a compound forming a strong acid upon irradiation,
(c) a water-insoluble binder, and
(d) a solvent;
coating a silicic acid sol on the radiation-sensitive coating; and
coating an ink-repellent silicone elastomer on the silicic acid coating.

18. A process of using the presensitized printing plate of claim 1 to make a printing form suitable for waterless planographic printing comprising the steps of:
imagewise exposing the presensitized plate of claim 1 to radiation to produce exposed and unexposed areas on the
immersing the exposed printing plate in an aqueous solution containing a water-miscible organic solvent; and
removing the radiation-sensitive layer and the overlying silicone layer from the exposed areas of the plate.

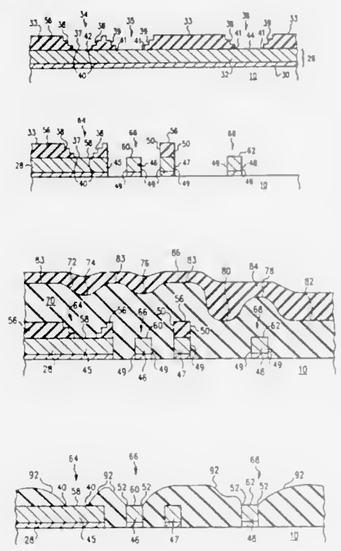
4,842,991

SELF-ALIGNED NONNESTED SLOPED VIA

Jeffrey E. Brighton, Katy, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 31, 1987, Ser. No. 80,116
Int. Cl.[4] G03C *5/00*
U.S. Cl. 430—316 20 Claims

1. A method for fabricating a via through an insulator layer to a conductor, comprising the steps of
forming a conductor layer on a support layer;
forming an insulator layer on the conductor layer;
opening an orifice in the insulator layer to the conductor layer;
etching the conductor layer and the insulator layer to define a conductor that intersects the orifice;
defining a via border to enclose a surface of the conductor inside the orifice; and



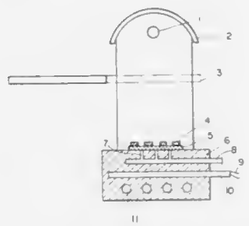
insulating all surfaces of the conductor outside of the via border.

4,842,992

METHOD OF TREATING PHOTORESISTS

Tetsuji Arai, Yokohama, Japan, assignor to Ushio Denki, Tokyo, Japan

Continuation of Ser. No. 923,505, Oct. 27, 1986, abandoned.
This application May 12, 1988, Ser. No. 195,415
Claims priority, application Japan, Mar. 17, 1986, 61-56979
Int. Cl.[4] G03C *5/36*
U.S. Cl. 430—328 2 Claims



1. A method of enhancing the thermal stability of a developed photoresist image on a semiconductor wafer comprising the steps of:
placing said semiconductor wafer on a support being exposed to ultraviolet radiation and having means for controlling the temperature of said developed photoresist image,
initially heating the developed photoresist image to a temperature greater than the initial flow temperature of said photoresist image and exposing said photoresist image to ultraviolet radiation to increase the flow temperature of said photoresist image,
continuing said exposure of said photoresist image to ultraviolet radiation while increasing the temperature of said photoresist image to maintain said temperature of said photoresist image above the increased flow temperature of said photoresist image during at least a portion of said continued exposure of said photoresist image to said ultraviolet radiation, and
controlling the temperature of said photoresist image to permit only minimal change in the shape of said photoresist image.

4,842,993

METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Morio Yagihara; Hiroshi Fujimoto; Takatoshi Ishikawa, and Kazuto Andoh, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 4, 1988, Ser. No. 164,368
Claims priority, application Japan, Mar. 4, 1987, 62-49082
Int. Cl.[4] G03C *7/30*
U.S. Cl. 430—380 18 Claims

1. A method for processing a silver halide color photographic material, which comprises treating said material after imagewise exposure with a color developer containing an aromatic primary amine developing agent and at least one compound represented by formula (I)

(I)

in which X_1 and X_2 each represents a divalent organic group.

4,842,994

MATERIAL COMPRISING A NOVEL BLEACH ACCELERATOR-RELEASING COUPLER

Kei Sakanoue, and Seiji Ichijima, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 12, 1987, Ser. No. 119,615
Claims priority, application Japan, Nov. 12, 1986, 61-268872
Int. Cl.[4] G03C *1/08, 7/26, 7/32, 5/44*
U.S. Cl. 430—543 20 Claims

1. A silver halide photographic material comprising a support having provided thereon at least one silver halide photographic emulsion layer and comprising a bleach accelerator releasing coupler, wherein said bleach accelerator releasing coupler is represented by formula (I)

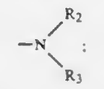
$$A—(TIME)_n—S—X—(Y)_m—(Z)_l]_a \quad (I)$$

wherein A represents a coupler residual group; TIME represents a timing group; n represents 0 or 1; X represents a cyclic aliphatic group or a saturated heterocyclic group; Y represents an aliphatic group having from 1 to 8 carbon atoms which may contain a group of —O—, a group of —S—, a group of —COO—, a group of —CO—, a group of

a group of

a group of $—SO_2—$, or a group of

in its chain; m represents an integer of from 0 to 3, and when m represents 2 or more, the two or more Y groups may be the same or different; Z represents a group of —OH, a group of —COOM, a group of $—SO_3M$ or a group of



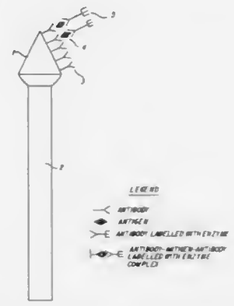
l represents an integer of from 1 to 3, and when l represents 2 or more, the two or more Z groups may be the same or different; a represents 1 or 2, and when a represents 2, the two $(Y)_m—(Z)_l$ groups may be the same or different; R_1, R_2, and R_3 each represents a hydrogen atom, or an aliphatic group having from 1 to 4 carbon atoms; and M represents an alkali metal ion, an ammonium ion, or a hydrogen atom.

4,842,995

DIAGNOSTIC METHOD FOR THE EVALUATION OF CLINICAL PARAMETERS BY DIRECT COLLECTION OF BIOLOGICAL MATERIALS AND DEVICE FOR ITS ACCOMPLISHMENT

Ennio Iaccheri, and Paola Piro, both of Milan, Italy, assignors to Boehringer Biochemia Robin, S.p.A., Milan, Italy

PCT No. PCT/EP85/00675, § 371 Date Jul. 31, 1986, § 102(e) Date Jul. 31, 1986, PCT Pub. No. WO86/03590, PCT Pub. Date Jun. 19, 1986
PCT Filed Dec. 5, 1985, Ser. No. 921,053
Claims priority, application Italy, Dec. 6, 1984, 23926 A/84
Int. Cl.[4] C12Q *1/70;* A61B *5/00;* B65D *71/00*
U.S. Cl. 435—5 2 Claims



2. A method for the quantitative diagnostic determination of a virus selected from the group consisting of herpes virus, Eppstein-Barr virus, Varicella Zoster virus, and Human T-Lymphocyte virus, said method comprising puncturing an animal or human body with a pointed member having a corresponding specific antibody to the virus to be detected coated thereon proximate the point to cause the coated pointed member to be contacted by a body fluid sample for a time sufficient for a binding reaction to occur, removing unfixed substances from the coating remote from said body, thereafter contacting the coating with an enzyme-labeled antibody which is a binding partner of the virus to be determined, removing unbound labeled antibodies from the coating, thereafter contacting the coating with a detecting solution containing a substrate capable of a detecting reaction with said enzyme, and detecting the presence or absence of the product of the detecting reaction as

an indication of the presence or absence of said virus in the sample.

4,842,996

PROBES COMPRISING MODIFIED ADENINE GROUPS, THEIR PREPARATION AND THEIR USES

Tam Huynh-Dinh, Croissy sur Seine, and Jean Igolen, Le Mesnil St Denis, both of France, assignors to Institut Pasteur and Centre National de la Recherche Scientifique, both of Paris, France

Filed Aug. 22, 1985, Ser. No. 768,042

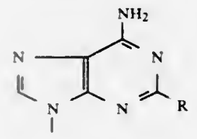
Claims priority, application France, Aug. 22, 1984, 84 13095

Int. Cl.⁴ C12Q *1/6*

U.S. Cl. 435—6 **14 Claims**

1. A method of detecting a DNA segment which encodes for a peptide of known amino acid sequence, and wherein said DNA segment has more than one possible nucleotide sequence because of the degeneracy of the genetic code, wherein the method comprises:

providing a DNA probe comprising an oligonucleotide containing adenosine groups, at least a portion of which comprise a substituted adenine group of the formula:



in which R is an $-NH_2$, $-OH$, or $-SH$ moiety;

contacting said probe with said DNA segments under conditions to form a hybrid duplex molecule in which said adenine in said probe pairs with thymine in said DNA segment and forms three hydrogen bonds with reactive groups of said thymine; and

detecting said hybrid duplex molecule;

wherein the DNA probe is substantially complementary to the DNA segment, and wherein said DNA segment, because of the degeneracy of the genetic code, has one or more C/T degeneracies and/or one or more G/A degeneracies, and said probe has a G at the complementary position to said C/T degeneracies and a T at the complementary position to said G/A degeneracies.

4,842,997

ENHANCED LUMINESCENT AND LUMINOMETRIC ASSAY

Timothy J. N. Carter, Geneva, Switzerland; Carol J. Groucutt; Richard A. W. Stott, both of West Midlands, England; Gary H. G. H. Thorpe, Birmingham, England, and Thomas P. Whitehead, Warwickshire, England, assignors to National Research Development Corporation, London, England

PCT No. PCT/GB83/00058, § 371 Date Oct. 27, 1983, § 102(e) Date Oct. 27, 1983, PCT Pub. No. WO83/03104, PCT Pub. Date Sep. 15, 1983

PCT Filed Feb. 25, 1983, Ser. No. 551,985

Claims priority, application United Kingdom, Mar. 3, 1982, 8206263

Int. Cl.⁴ C12Q *1/68, 1/28;* G01N *33/53*

U.S. Cl. 435—6 **24 Claims**

1. In a luminescent or luminometric assay which comproses carrying out a chemiluminescent reaction between a peroxidase enzyme, an oxidant, and a chemiluminescent 2,3-dihydro-1,4-phthalazinedione and measuring or detecting the chemiluminescence thereby produced, the improvement wherein the reaction is carried out in the presence of a 6-hydroxybenzothiazole.

4,842,998

HETEROHYBRIDOMA SCREENING METHOD

Y. Gloria Meng, Albany, and Jurgen Trawinski, El Sobrante, both of Calif., assignors to Miles Inc., Elkhart, Ind.

Filed Nov. 9, 1987, Ser. No. 120,047

Int. Cl.⁴ G01N *33/77*

U.S. Cl. 435—7 **14 Claims**

1. A method of selecting a human-nonhuman heterohybridoma which expresses IgM antibodies having a human J chain component from a collection of human-nonhuman heterohybridoma clones capable of expressing human IgM type antibodies, the method comprising the steps of

(a) collecting tissue culture fluid containing samples of IgM antibodies from each of the heterohybridomas and treating the antibodies under conditions sufficient to expose the J chain components of the antibodies;

(b) separately contacting the samples of IgM antibodies to anti-human J chain antibodies and anti-nonhuman J chain antibodies capable of complexing with the nonhuman J chain components of IgM antibodies;

(c) determining which of the antibodies of step (b) complexes with the IgM antibodies; and

(d) selecting those heterohybridomas which produced IgM antibodies which bind to anti-human J chain antibodies.

4,842,999

CANINE HEARTWORM VACCINE AND DIAGNOSTIC TEST

Steven A. Fuller, and John G. R. Hurrell, both of Georgetown, Canada, assignors to ADI Diagnostics Inc., Rexdale, Canada

Filed Aug. 11, 1986, Ser. No. 895,450

Int. Cl.⁴ G01N *33/577*

U.S. Cl. 435—7 **5 Claims**

1. An antibody producing cell of the cell line IDi10.

2. The antibody produced by the cell of claim 1 wherein said antibody is capable of binding to a polypeptide associated with infection by *D. immitis*, wherein said polypeptide has a molecular weight selected from the group consisting of approximately 14 kd; approximately 58 kd; approximately 66 kd; and approximately 90 kd; and wherein said polypeptide is detectable in the serum of a canine infected with *D. immitis* three months post-infection.

4,843,000

SIMULTANEOUS CALIBRATION HETEROGENEOUS IMMUNOASSAY

David J. Litman, Mountain View, and Edwin F. Ullman, Atherton, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 374,849, May 4, 1982, Pat. No. 4,533,629, which is a continuation-in-part of Ser. No. 255,022, Apr. 17, 1981, Pat. No. 4,391,904, which is a continuation-in-part of Ser. No. 106,620, Dec. 26, 1979, Pat. No. 4,299,916. This application May 21, 1985, Ser. No. 736,493

The portion of the term of this patent subsequent to Aug. 6, 2002, has been disclaimed.

Int. Cl.⁴ G01N *33/535;* C12N *9/96*

U.S. Cl. 435—7 **8 Claims**

1. In a method for determining the presence in a sample of an analyte, which analyte is a member of a specific binding pair ("mip") consisting of ligand and receptor ("antiligand"),

said method employing at least one catalyst including a catalyst bound to a mip ("catalyst-bound-mip") and a solute which is catalytically transformed by a catalyst bound to a mip-containing measurement first surface to produce a detectable signal at said first surface in proportion to the amount of catalyst-bound-mip bound to said first surface, wherein contacting of said first surface with said sample and said catalyst-bound-mip results in binding of said catalyst-bound-mip to said first surface in proportion to the amount of analyte in said sample,

the improvement which comprises:

having adjacent to said first surface a calibration second surface to which said catalyst is directly bound in an amount to produce a signal level at said second surface corresponding to a predetermined amount of analyte and said analyte in said sample is determined by comparing the intensity of the signal at said first surface to the intensity of the signal at said second surface.

4,843,001

CONJUGATE FOR ENZYME IMMUNO DETERMINATIONS

Harald Haug, Peissenberg; Gerd Kleinhammer, Tutzing, and Johann Mattersberger, Munich, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Jul. 11, 1986, Ser. No. 884,431

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1985, 3525911

Int. Cl.⁴ G01N *33/53;* C12Q *1/28;* C12N *9/96*

U.S. Cl. 435—7 **9 Claims**

1. Process for preparation of a conjugate useful in an immunoassay comprising oxidizing a labelling enzyme containing a carbohydrate part with periodic acid or an alkali metal salt thereof in an aqueous medium to form an oxidation product, reducing said oxidation product with sodium borohydride to form a second product and coupling said second product with an immunologically effective substance to form a conjugate therebetween.

2. Process for preparation of a conjugate useful in an immunoassay comprising coupling a labelling enzyme containing a carbohydrate part to an immunologically effective substance, oxidizing said labelling enzyme with periodic acid or an alkali metal salt thereof in an aqueous medium to form an oxidation product and reducing said oxidation product with sodium borohydride.

4,843,002

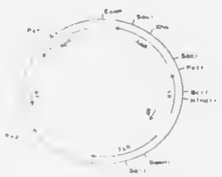
METHOD OF SELECTING RECOMBINANT DNA-CONTAINING STREPTOMYCES

R. Nagaraja Rao, Indianapolis, and Richard K. Stanzak, Poland, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 27, 1984, Ser. No. 655,180

Int. Cl.⁴ C12N *15/00, 1/20;* C12P *21/00*

U.S. Cl. 435—172.3 **38 Claims**



Restriction Site and Function Map of Plasmid pKC309 (6621bp)

1. A method for selecting a recombinant DNA-containing Streptomyces host cell, said method comprising:

(a) transforming an apramycin-sensitive, restrictionless Streptomyces host cell with a recombinant DNA cloning vector capable of autonomous replication or integration in said Streptomyces host cell, said vector comprising the apramycin resistance-conferring gene of plasmid pKC309, and

(b) culturing said transformed cell under conditions suitable for selection for apramycin resistance,

subject to the limitation that expression of apramycin resistance-conferring activity is controlled by the promoter of said apramycin resistance-conferring gene of plasmid pKC309 and that said host cell in susceptible to transformation, cell division and culture.

36. A method for selecting a recombinant DNA-containing Nocardia host cell, said method comprising:

(a) transforming an apramycin-sensitive, restrictionless Nocardia host cell with a recombinant DNA cloning vector capable of autonomous replication or integration in said Nocardia host cell, said vector comprising the apramycin resistance-conferring gene of plasmid pKC309, and

(b) culturing said transformed cell under conditions suitable for selection for apramycin resistance,

subject to the limitation that expression of apramycin resistance-conferring activity is controlled by the promoter of said apramycin resistance-conferring gene of plasmid pKC309 and that said host cell is susceptible to transformation, cell division and culture.

4,843,003

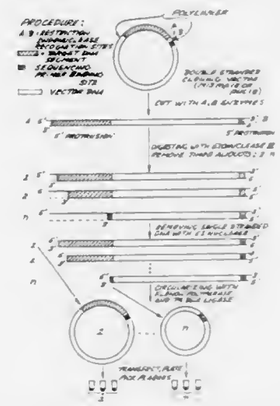
PROCESS FOR PRODUCING SHORTENED TARGET DNA FRAGMENTS USABLE IN SEQUENCING LARGE DNA SEGMENTS

Steven Henikoff, and Richard E. Gelinas, both of Seattle, Wash., assignors to Fred Hutchinson Cancer Research Center, Seattle, Wash.

Filed Feb. 17, 1984, Ser. No. 581,311

Int. Cl.⁴ C12P *19/32;* C12N *15/00;* C07H *15/12*

U.S. Cl. 435—91 **33 Claims**



1. A process for producing a plurality of cloned, circular DNA molecules containing shortened target DNA fragments, said fragments derived from a long target DNA segment, said cloned, circular DNA molecules suitable for use in determining the nucleotide sequence of said long target DNA segment, comprising the steps of:

producing, by molecular cloning, a plurality of double-stranded circular recombinant DNA molecules, each molecule containing vector DNA, a sequencing primer binding site, and a DNA region comprising a long target DNA segment, a first restriction site adjacent to said long target DNA segment adapted to be cut by a first restriction endonuclease in a manner that creates a first terminus on the DNA molecules adjacent the long target DNA segment that is susceptible to digestion by an exonuclease, and a second restriction site located between said first restriction site and said sequencing primer binding site adapted to be cut by a second restriction endonuclease in a manner that creates, without additional terminus blocking or digestion, a second terminus on the DNA molecules that is not susceptible to digestion by an exonuclease;

cutting said double-stranded circular recombinant DNA molecules at said first restriction site using a first restric-

tion endonuclease and at said second restriction site using a second restriction endonuclease to form double-stranded linear recombinant DNA molecules having a first terminus that is susceptible to digestion by an exonuclease and a second terminus that is not susceptible to digestion by an exonuclease;

unidirectionally digesting the linear double-stranded DNA molecules with an exonuclease from the first terminus that is susceptible to digestion by an exonuclease, without digesting vector DNA contained in the linear double stranded DNA molecules;

removing, at timed intervals during the unidirectional digestion, a portion of the exonuclease digested linear double-stranded DNA molecules;

circularizing the shortened linear DNA molecules; and

cloning the circular DNA molecules and isolating the clones to obtain a plurality of circular DNA molecules containing overlapping target DNA fragments derived from the long target DNA segment.

4,843,004

METHOD FOR THE PRODUCTION OF HUMAN T-T CELL HYBRIDS AND PRODUCTION SUPPRESSOR FACTOR BY HUMAN T-T CELL HYBRIDS

Chris Platsoucas, New York, N.Y., assignor to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Continuation-in-part of Ser. No. 609,173, May 11, 1984, abandoned. This application May 31, 1984, Ser. No. 615,889

Int. Cl.[4] C12N *5/00*; C12P *21/00*; C12R *1/91*; C07K *15/06*

U.S. Cl. 435—240.26 **3 Claims**

1. A method for production of human T-T cell hybrids which produce Suppressor Factor wherein cells of lymphoid origin are fused with comprises:

(a) mixing cells from a first parent cell line comprising a non-mutagenized Jurkat lymoblastoid T cell line, wherein the Jurkat lymphoblastoid cells are not sensitive and cannot be killed by hypoxanthine-aminopterin-thymidine medium, with a second parent cell comprising mitogen or alloantigen activated peripheral blood leukocyte T cells or purified T-cels,

(b) allowing the first and second parent cells to fuse in the presence of polyethylene glycol for about 10–20 minutes with gentle agitation to generate hybrids in the cell mixture,

(c) incubating the cell mixture containing the hybrids and the first and second parent cells, after removal of the polyethylene glycol, for periods for between one to sixty days at 37° in 5% CO_2,

(d) selecting for the hybrids by separating the hybrids from the first parent Jurkat lymphoblastoid cells by coloning in agar medium wherein the hybrids form colonies,

(e) recovering the hybrids that form colonies in agar medium and expanding them in culture, and

(f) determining the presence of Suppressor Factor in the culture and recovering the T-T cell hybrids which produce suppressor factor.

4,843,005

PROCESS FOR REGENERATING CORN

David S. K. Cheng, Foster City, and Andrew S. Wang, Palo Alto, both of Calif., assignors to Sungene Technologies Corporation, San Jose, Calif.

Filed Aug. 18, 1986, Ser. No. 897,209

Int. Cl.[4] C12N *5/00*

U.S. Cl. 435—240.49 **20 Claims**

1. A process for regenerating corn plants from 2,4-D recalcitrant genotypes through cell or tissue culture which comprises the steps of:

(a) in vitro conditioning a zygote to obtain a conditioned immature embryo wherein said in vitro conditioning is performed by a method selected from the group consisting of:

(1) in vitro fertilization;

(2) isolating an intact zygote about three days post-pollination, removing the pericarp, and culturing the remaining material on an endosperm development medium which comprises mineral salts, vitamins, L-glutamine and sucrose; and

(3) isolating an individual zygote from the embryo sack about four to four and one-half days post-pollination, and culturing the zygote on a zygote maturation medium which comprises mineral salts, vitamins, sucrose and a mixture of 2,4-D and coconut milk as a hormone;

(b) culturing the conditioned immature embryo on a callud induction medium comprising mineral salts, vitamins, sucrose and a hormone selected from the group consisting of (1) a mixture of 2,4-dichlorophenozyacetic acid (2,4-D), α-naphthalene acetic acid (NAA) and α-indole butyric acid (IBA), and (2) a mixture of 2,4-D and coconut milk for callus formation; and

(c) subculturing said callus on a regeneration medium comprising mineral salts, vitamins and sucrose for plant formation.

4,843,006

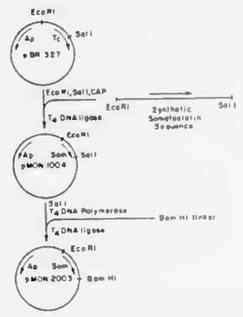
RECA PROMOTER DEPENDENT POLYPEPTIDE PRODUCTION

Michael L. Bittner, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 523,254, Aug. 15, 1983, abandoned, which is a continuation-in-part of Ser. No. 436,209, Oct. 25, 1982, abandoned. This application Apr. 21, 1986, Ser. No. 856,850

Int. Cl.[4] C12N *15/00*; C12P *21/00*; C07H *15/12*

U.S. Cl. 435—172.3 **2 Claims**



1. A double-stranded DNA cloning vector comprising, in phase from the 5' end to the 3' of the sense strand thereof:

(a) a recA promoter/operator region;

(b) a 5' non-translated region including a ribosomal binding site suitable for translation of a structural sequence in *E. coli* bacteria; and

(c) a structural sequence capable of being translated into a fusion polypeptide in *E. coli*, wherein the fusion polypeptide comprises at least about 150 amino acid residues of a recA sequence coupled to a heterologous polypeptide sequence.

4,843,007

ALCALIGENES EUTROPHUS FOR BIODEGRADING PCBS

Donna L. Bedard, Latham, and Michael J. Brennan, Jr., Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 24, 1986, Ser. No. 855,274

Int. Cl.[4] C12N *1/20*; C12R *1/40, 1/05*

U.S. Cl. 435—252.1 **4 Claims**

1. A biologically pure culture of *Alcaligenes eutrophus* having the identifying characteristics of *Alcaligenes eutrophus*, NRRLB-15940, said characteristics including the ability to degrade polychlorinated biphenyls to provide a degradation mixture comprising a member selected from the class consisting of bis-3,4-dihydro-3,4-dihydroxychlorobiphenyls, ring-chlorinated acetophenones, and derivatives thereof.

4,843,008

NOVEL MICROORGANISMS AND A NOVEL PROCESS FOR PRODUCING ANTIBIOTICS

Harumitsu Imai, Kanagawa; Ken-ichi Suzuki; Shigeru Miyazaki, both of Saitama, and Shigenobu Kadota, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1985, Ser. No. 810,391

Claims priority, application Japan, Dec. 24, 1984, 59-272570

Int. Cl.[4] C12N *1/00*; C12P *19/62, 17/18*

U.S. Cl. 435—252.1 **2 Claims**

1. A biologically pure culture of *Micromonospora* sp. YS-02930 K strain capable of producing at least one antibiotic selected from the group consisting of YS-02930 K-D, YS-02930 K-E and YS-02930 K-H.

4,843,009

PSEUDOMONAS PUTIDE CAPABLE OF DEGRADING PCBS

Lawrence H. Bopp, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 23, 1986, Ser. No. 866,501

Int. Cl.[4] C12N *1/12*; C12R *1/40*

U.S. Cl. 435—253.3 **1 Claim**

1. A biologically pure culture of *Pseudomonas putida* having all the identifying characteristics of NRRL B-18064.

4,843,010

POLYMERIZATION-INDUCED SEPARATION IMMUNOASSAYS

Robert C. Nowinski, and Allan S. Hoffman, both of Seattle, Wash., assignors to Genetic Systems Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 550,929, Nov. 10, 1983, Pat. No. 4,511,478. This application Jan. 27, 1984, Ser. No. 574,558

The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.

Int. Cl.[4] G01N *33/537*

U.S. Cl. 435—7 **20 Claims**

1. An immunoassay method for determining the presence of an analyte in a fluid sample suspected of containing said analyte comprising:

(a) combining said fluid sample with a monomer/reactant conjugate, capable of binding specifically to said analyte, in order to form a monomer/reactant conjugate—analyte complex, and a reporter/reactant conjugate, which binds specifically to said complex or to said anaylte, for labeling said monomer/reactant conjugate—analyte complex, wherein said monomer is an addition polymerizable monomer;

(b) separating said labeled complex by initiating polymerization of the monomer/reactant conjugate—complex;

(c) detecting the incorporation of reporter into said polymerized complex as a measure of the analyte present in the sample.

4,843,011

MONOCLONAL ANTIBODIES FOR BINDING HTLV-III PROTEINS, AND CELL LINES FOR THEIR PRODUCTION

Mangalasseril G. Sarngadharan, Vienna, Va.; Fulvia di Marzo Veronesé, Washington, D.C., and Robert C. Gallo, Bethesda, Md., assignors to Akzo N.V., Arnhem, Netherlands

Continuation-in-part of Ser. No. 761,489, Aug. 1, 1985, abandoned, which is a continuation-in-part of Ser. No. 756,237, Jul. 18, 1985, abandoned. This application Jan. 3, 1986, Ser. No. 816,573

Int. Cl.[4] G01N *33/577*; C12N *15/00*

U.S. Cl. 435—240.27 **13 Claims**

1. A monoclonal antibody produced by the hybridoma cell line of claim 13, said antibody having binding specificity for epitopes on HTLV-III proteins selected from the group consisting of p41, p24 and p17.

4,843,012

NOVEL COMPOSITION FOR NUCLEIC ACID PURIFICATION

David A. DeBonville, Cambridge, and Gerard E. Riedel, Concord, both of Mass., assignors to Genetics Institute, Inc., Cambridge, Mass.

Filed Sep. 17, 1986, Ser. No. 908,413

The portion of the term of this patent subsequent to May 23, 2006, has been disclaimed.

Int. Cl.[4] C12N *1/06, 1/08*

U.S. Cl. 435—270 **5 Claims**

1. A single phase aqueous composition that is stable against a separation of phases for at least thirty days of storage at about 25° C. and is useful in isolating nucleic acids from cell or virus cultures comprising:

(a) about 1.6 to 3.2M potassium acetate;

(b) about 5 to 15% by weight phenol;

(c) about 5 to 15% by weight chloroform; and

(d) glacial acetic acid in an amount such that the weight ratio of potassium acetate to glacial acetic acid is 3:2, wherein the weight ratio of (a) to the combination of (b) and (c) is in the range of 4:1 to 4:3.

4,843,013

MULTIPLE CONTROL STANDARD FOR BLOOD ANALYSIS

Ching Chiang, Acton, Mass., assignor to Bionostics, Incorporated, Acton, Mass.

Continuation-in-part of Ser. No. 849,758, Apr. 9, 1986, Pat. No. 4,753,888. This application Mar. 2, 1988, Ser. No. 163,330

The portion of the term of this patent subsequent to Jun. 28, 2005, has been disclaimed.

Int. Cl.[4] G01N *33/00*

U.S. Cl. 436—11 **7 Claims**

1. A multiple liquid control standard comprising an aqueous solution useful as a control for blood gas instrumentation systems buffered by a buffering agent to a pH of from about 7.1 to about 7.7 and containing sufficient bicarbonate ions to provide a pCO_2 from about 15 to about 80 mm Hg, gaseous oxygen to provide a pO_2 of from about 50 to about 400 mm Hg retained, absorbance means to provide a control test which corresponds to a predetermined level of hemoglobin and hemoglobin fractions and salts of electrolytes to provide ions selected from the group consisting of ionic lithium, ionic calcium, ionic sodium and ionic potassium, said composition providing a control test for a corresponding ion selective electrode systems.

4,843,014

APPAREL HAVING A BREACH INDICATOR

Daniel S. Cukier, 450 Knollwood Rd., Ridgewood, N.J. 07450

Filed Dec. 2, 1987, Ser. No. 127,440

Int. Cl.[4] G01N *21/00*; A41D *19/00*; A61B *5/00*

U.S. Cl. 436—63 **3 Claims**

1. A method for detecting a breach of an impervious layer of

apparel by at least one specific body fluid comprising providing apparel for at least a bodily portion of a wearer, which bodily portion is likely to come into contact with specific bodily fluid, said apparel comprising a bodily fluid impervious first layer and a second layer adjacent to said first layer, said second layer comprising bodily fluid detection means for indicating the presence of said at least one specific bodily fluid, and

further comprising the step of having a person wear said apparel with said first layer positioned in relation to said bodily portion so that in the event of a breach in the said first layer, which results in the passage of said specific bodily fluid through said breach, the second layer is penetrated by said specific bodily fluid and provides an indication of such penetration whereby said person is made aware of such penetration.

4,843,015

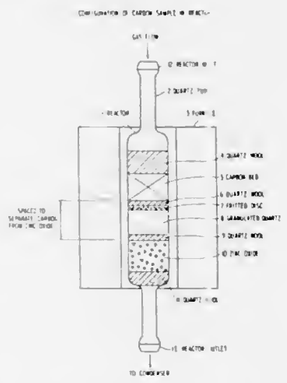
METHOD FOR DETERMINING VOLATILE PHOSPHORUS IN CARBON

John R. Grubbs, Jr., Mt. Pleasant; Aravamuthan P. Sarathy, James Island, and Robert C. Flowe, Summerville, all of S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Nov. 5, 1987, Ser. No. 116,973

Int. Cl.[4] G01N *31/12, 33/00*

U.S. Cl. 436—103 **19 Claims**



1. A method for determining the volatile phosphorus content in a solid sorbent comprising the steps of:

heating the solid sorbent and liberating the phosphorus contained therein in gaseous form;

passing the liberated gases through a zinc oxide layer and retaining the volatile phosphorus therein;

forming a colored solution comprising the zinc oxide layer and a vanadate-molybdate reagent;

determining the intensity of the colored solution by means of a spectrophotometer; and

determining the content of phosphorus by comparison with a standard intensity graph.

16. Apparatus for determining the volatile phosphorus content of a solid comprising:

means for heating a solid and liberating the phosphorus contained therein in gaseous form;

means for passing the liberated gases through a zinc oxide layer;

means for forming a colored solution comprising the zinc oxide layer and a vanadate-molybdate reagent;

spectrophotometric means for determining the intensity of the colored solution by means of a spectrophotometer; and

means for determining the content of phosphorus in the solution by comparison with a standard intensity graph.

4,843,016

DETECTION SYSTEM AND METHOD

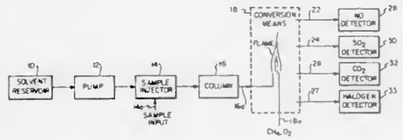
David H. Fine, Framingham, Mass., assignor to Thermedics Inc., Woburn, Mass.

Continuation of Ser. No. 512,374, Oct. 7, 1974, Pat. No. 4,778,764. This application Feb. 26, 1987, Ser. No. 19,029

The portion of the term of this patent subsequent to Oct. 18, 2005, has been disclaimed.

Int. Cl.[4] G01N *21/76*

U.S. Cl. 436—106 **36 Claims**



1. The method of determining the quantity of a nitrogen compound in a sample of material containing nitrogen, without interference from atmospheric nitrogen comprising the steps of:

a. combining said sample with a carrier gas,

b. passing said combination through a gas chromatograph,

c. heating the effluent from said chromatograph in an oxygen-rich atmosphere at a temperature less than about 600° C. in the presence of a catalyst to convert said compound to nitric oxide (NO) in a single step, while not converting atmospheric nitrogen,

d. causing the nitric oxide produced by such heating to undergo a chemiluminescent reaction with ozone, and

e. determining the magnitude of the chemiluminescent reaction to indicate the quantity of said nitrogen compound in said sample, whereby said indication is made independent of contaminating nitrogen in said carrier or from atmospheric leakage.

4,843,017

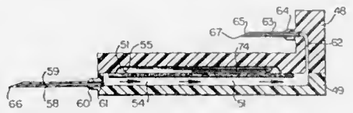
DEVICE FOR THE SEPARATION OF THE LIGHTER FRACTION FROM THE HEAVIER FRACTION OF A LIQUID SAMPLE

Bruce J. Oberhardt, Raleigh, and Phyllis J. Palmer, Durham, both of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Division of Ser. No. 694,717, Jan. 25, 1985. This application Oct. 27, 1987, Ser. No. 113,577

Int. Cl.[4] G01N *1/18*

U.S. Cl. 436—177 **5 Claims**



1. A method of separating the lighter fraction from the heavier fraction of a liquid sample using a device including a

housing having an interior cavity, a separator membrane dividing said cavity into a first portion and a second portion, said separator membrane having a porosity selected for the desired separation thereacross, inlet means for providing fluid communication between said first portion and the source of the liquid sample, first communication means for providing fluid communication between said first portion and a first evacuated receptacle, second communication means for providing fluid communication between said second portion and a second evacuated receptacle comprising:

establishing fluid communication between said inlet means and the source of the liquid sample; and

establishing fluid communication between a first evacuated receptacle and said first communication means and between a second evacuated receptacle and said second communication means so that the liquid sample flows through said inlet means along said membrane, through said first communication means and into said first evacuated receptacle, simultaneously, the lighter fraction of the liquid sample being drawn through said membrane and said second communication means into said second evacuated receptacle.

4,843,018

PROCESS FOR THE QUANTATIVE DETERMINATION OF FREE THYROXINE

Johann Berger, and Helmut Jering, both of Tutzing, Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Nov. 13, 1985, Ser. No. 797,634

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1984, 3442817

Int. Cl.[4] G01N *33/543*

U.S. Cl. 436—500 **6 Claims**

1. Process for quantitative determination of free thyroxin (FT_4) in a sample of plasma, serum or whole blood comprising incubating the sample with a 10 to 2000 fold insufficiency of labelled anti-T_4 antibodies, referred to the molar amount of total T_4 in the sample in a first incubation step for from 1 to 5 minutes, incubating said sample and anti-T_4 antibodies with immobilized T_4 which is in excess as compared to said antibodies in a second incubation step for from 1 to 5 minutes, separating the phases and measuring the label in one of the phases as a measure of free thyroxin in the sample.

4,843,019

IMMUNOASSAY FOR DETECTING ACINO-FOETAL DIFFERENTION PROTEIN ASSOCIATED WITH CANCER OF THE PANCREAS

Maria J. Escribano-Crespo, Bagneux, and Pierre Burtin, Paris, both of France, assignors to Centre National de la Recherche Scientifique, Paris, France

PCT No. PCT/FR85/00268, § 371 Date May 29, 1986, § 102(e) Date May 29, 1986, PCT Pub. No. WO86/02081, PCT Pub. Date Apr. 10, 1986

PCT Filed Sep. 30, 1985, Ser. No. 878,838

Claims priority, application France, Oct. 10, 1984, 84 15081

Int. Cl.[4] G01N *33/53, 33/533, 33/534*

U.S. Cl. 436—501 **3 Claims**

1. In an immunological assay useful for the detection of pancreatic tumors, pretumoral lesions of pancreas and normality of fetal pancreas the improvement which consists of using as marker protein an acino fetal differentiation protein (AFDP) associated with cell-multiplication, said protein being a mano-side containing glycoprotein of average apparent molecular mass chosen from: 120 KD, 94 KD, 75 KD and 58 KD, said detection involving the use of a composition containing a monoclonal antibody corresponding to said protein.

4,843,020

METHOD FOR DETECTING TETRAHYDROCANNABINOL IN HUMAN URINE INVOLVING MELANIN PRECIPITATION

W. James Woodford, 585 Lakeshore Dr., NE., Atlanta, Ga. 30307

Filed Jan. 14, 1988, Ser. No. 143,973

Int. Cl.[4] G01N *33/534, 33/94*

U.S. Cl. 436—518 **16 Claims**

1. A method for the detection of tetrahydrocannabinol in a human urine specimen comprising the steps of:

a. precipitating a quantity of the pigment melanin from said urine specimen by combining said urine specimen with a de-melanizing agent, rendering said urine specimen substantially de-melanized; and

b. analyzing said de-melanized urine specimen for tetrahydrocannabinol.

4,843,021

IMMUNOLOGICAL ASSAY METHOD

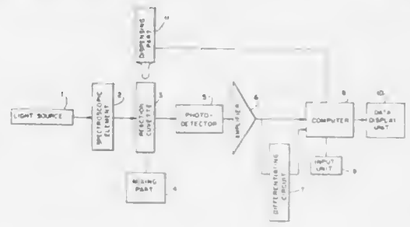
Yasuhiko Noguchi, Machida; Masahiro Naito, Kanagawa; Kenji Morinaga, Machida; Yohji Takahashi, Sagamihara, and Katsuo Mitani, Fujisawa, all of Japan, assignors to Shino-Test Laboratory Inc., Kanagawa and Tokuyama Soda Co. Ltd., Yamaguchi, both of, Japan

Filed Jul. 30, 1987, Ser. No. 79,318

Claims priority, application Japan, Jul. 30, 1986, 61-177651

Int. Cl.[4] G01N *33/546*

U.S. Cl. 436—533 **2 Claims**



1. An immunological assay for an analyte in a sample wherein calibration curves for assay results are prepared based on a change in transmitted or scattered light caused by a change in turbidity accompanying formation of an antigen-antibody complex by an antigen-antibody reaction comprising:

providing a latex particle containing reagent having an average reagent particle diameter (D) in the range of 0.1 to 0.5 μm, a D to d ratio (D/d), wherein d represents the average particle diameter of said latex particles, in the range of 1.3 to 3.0 and a zeta potential in the range of −20 to 10 mV, for use in said assay;

obtaining calibration curves or parameters which make up calibration curves for said latex particle containing reagent used in the assay;

providing said calibration curves or said parameters in a magnetic medium;

outputting said calibration curves or calibration curves that have been prepared using of said parameters from said magnetic medium to an analyzer;

said analyzer being incorporated into a computer;

reacting in said analyzer said latex particle containing reagent with a sample;

obtaining any change in transmitted or scattered light caused by any change inturbidity accompanying any formation of an antigen-antibody complex by an antigen-antibody reaction;

and comparing any change in transmitted or scattered light with said calibration curves for said latex particle contain-

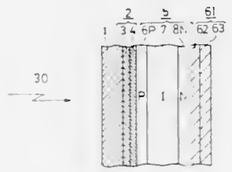
ing reagent in order to determine the amount of analyte in said sample.

4,843,022

METHOD OF MAKING FIBROUS SILICON SEMICONDUCTOR BY PLASMA CVD

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 741,145, Jun. 4, 1985, abandoned, which is a division of Ser. No. 497,702, May 24, 1983, Pat. No. 4,591,893. This application May 18, 1987, Ser. No. 51,170
Claims priority, application Japan, May 24, 1982, 57-87801
Int. Cl.[4] H01L *21/205*
U.S. Cl. 437—4 8 Claims



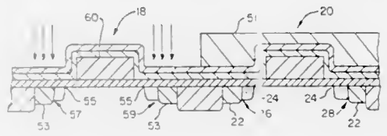
1. A method of forming a fibrous structure of silicon semiconductor by plasma CVD with process gas comprising silane and hydrogen, said method comprising the steps of selecting a deposition temperature and pressure in a reaction chamber such that the decomposed silicon atoms are deposited both in crystalline phase and in amorphous phase, causing the amount of oxygen present to be about 1 ppm or less, allowing a predetermined content of water to be present in the reaction chamber, and selecting the hydrogen/silane ratio to selectively eliminate by hydrogen etching the silicon semiconductor deposited in amorphous phase and to leave crystalline silicon in said fibrous structure.

4,843,023

PROCESS FOR FORMING LIGHTLY-DOPED-DRAIN (LDD) WITHOUT EXTRA MASKING STEPS

Kuang Y. Chiu, Palo Alto, and Fu-Chieh Hsu, Cupertino, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 779,919, Sep. 25, 1985, abandoned. This application Jun. 30, 1987, Ser. No. 65,617
Int. Cl.[4] H01L *21/265*
U.S. Cl. 437—34 6 Claims



1. A method of producing a plurality of lightly doped drain MOS transistors of different polarities on a single substrate, the method comprising:

(a) forming a plurality of gates on a surface of a single semiconductor substrate, selected one of the gates defining first polarity areas and the remainder of the gates defining second polarity areas;

(b) covering top and side portions of said gates and portions of said surface of said substrate with an etch-stop layer comprising a silicon nitride;

(c) covering said etch-stop layer with a polysilicon layer;

(d) selectively removing portions of said polysilicon layer to leave polysilicon sidewalls abutting said etch-stop covered gates;

(e) forming a first ion implantation mask over the first polarity areas,

(f) doping the substrate using as masks the gates and abutting sidewalls in the second polarity areas and the first ion implantation mask to form self-aligned second polarity main source and drain regions in the second polarity areas;

(g) removing the sidewalls abutting the gates in the second polarity areas;

(h) relatively lightly doping the substrate using as masks the gates in the second polarity areas and the first implantation mask to form self-aligned, lightly doped second polarity source and drain regions which contact said main source and drain regions, respectively, whereby a portion of the substrate extending between each gate and its associated lightly doped source and drain reigons defines a channel region, each such gate and its associated source and drain regions defining a transistor of the second polarity;

(i) removing the first ion implantation mask;

(j) forming a second ion implantation mask over the second polarity areas,

(k) doping the substrate using as masks the gates and abutting sidewalls in the first polarity areas and the second ion implantation mask to form self-aligned first polarity main source and drain regions in the first polarity areas;

(l) removing the sidewalls abutting the gates in the first polarity areas;

(m) relatively lightly doping the substrate using as masks the gates in the first polarity areas and the second implantation mask to form self-aligned, lightly doped first polarity source and drain regions which contact said first polarity main source and drain regions, respectively, whereby a portion of the substrate extending between each gate and its associated lightly doped first polarity source and drain regions defines a channel region, each such gate and its associated source and drain regions defining a transistor of the first polarity; and

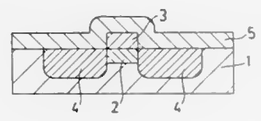
(n) removing the second ion implantation mask.

4,843,024

METHOD OF PRODUCING A SCHOTTKY GATE FIELD EFFECT TRANSISTOR

Kazuhiko Ito, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 17, 1988, Ser. No. 258,498
Claims priority, application Japan, Oct. 22, 1987, 62-268439
Int. Cl.[4] H01L *21/28*
U.S. Cl. 437—41 16 Claims



1. A method of producing a Schottky gate field effect transistor comprising the steps of:

depositing a first thin film on a first conductivity type semiconductor layer which is disposed in and at a surface of a semiconductor substrate;

producing first conductivity type high impurity concentration regions in said semiconductor substrate adjacent said first thin film by impurity ion implantation;

depositing a second thin film on said surface of said semiconductor substrate and on said first thin film of the same thickness as said first thin film;

applying a first mask on said second thin film in a sufficient thickness that the exposed surface thereof becomes flat;

etching said first mask and said second film until said first thin film is exposed;

removing said first thin film and leaving said second thin film as two regions with an aperture therebetween;

masking part of said second thin film regions leaving an unmasked portion therebetween overlying and larger than said aperture; and

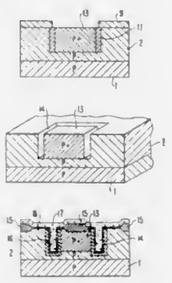
depositing a gate electrode metal forming a Schottky barrier with said layer in said aperture and on the unmasked portions of said second thin film regions.

4,843,025

METHOD OF FABRICATING TRENCH CELL CAPACITORS ON A SEMOCONDCUTOR SUBSTRATE

Yoshikimi Morita, Takatsuki, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

Filed May 10, 1988, Ser. No. 194,262
Claims priority, application Japan, May 25, 1987, 62-127560
Int. Cl.[4] H01L *21/72, 21/385*
U.S. Cl. 437—47 8 Claims



1. A method of fabricating trench cell capacitors on a semiconductor substrate comprising steps of:

a step of forming a first trench having side walls and a bottom, said side walls are substantially vertical to a surface of said semiconductor substrate of one conductive type;

a step of forming an oxide layer on said side walls and said bottom of said first trench;

a step of selectively forming a silicon nitride layer on said oxide layer of said side walls of said first trench;

a step of removing said oxide layer on said bottom of said first trench by an anisotropic etching using said silicon nitride layer as a mask;

a step of removing said silicon nitride layer;

a step of growing an epitaxial layer of the same conductive type as said semiconductor substrate in said first trench so as to embed said first trench with said epitaxial layer; and

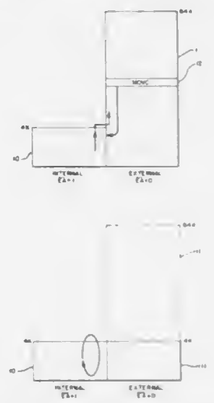
a step of removing said oxide layer remaining on said side walls of said first trench, thereby a second trench having predetermined shape between said semiconductor substrate and said epitaxial layer is formed.

4,843,026

ARCHITECTURE MODIFICATION FOR IMPROVED ROM SECURITY

Dewitt Ong, Tempe, and Scott Rider, Chandler, both of Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Filed Sep. 24, 1987, Ser. No. 101,206
Int. Cl.[4] H01L *21/265, 21/70*
U.S. Cl. 437—51 4 Claims



1. In a semiconductor device which includes a processor and an associated program memory and wherein said memory is programmed by program code during fabrication of said device, a method of preventing external access of said memory comprising the steps of:

patterning initially a coding mask layer wherein openings in said coding mask layer provide for implantation of underlying areas, said initial patterning providing said coding mask layer which provides coding of a predetermined program and an associated circuit which permits external access of said memory;

modifying said coding mask layer to provide a modified pattern which still provides coding of said predetermined program, but disables said associated circuit to prevent external access of said memory;

using said modified coding mask layer during fabrication of said device,

wherein said associated circuit which permits external access of said memory is permanently disabled.

4,843,027

METHOD OF FABRICATING A HIGH VALUE SEMICONDUCTOR RESISTOR

James Geekie, Santa Clara, Calif., assignor to Siliconix Incorporated, Santa Clara, Calif.

Filed Aug. 21, 1987, Ser. No. 88,157
Int. Cl.[4] H01L *29/04*
U.S. Cl. 437—63 16 Claims

1. A method for forming a resistor in a semiconductor structure comprising the steps of:

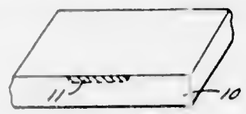
forming a semiconductor layer of a first conductivity type on a supporting sublayer;

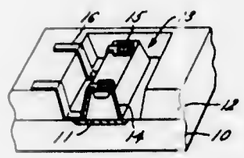
forming a groove in said semiconductor layer substantially to said sublayer, thereby forming an island of said semiconductor layer;

introducing dopants of a second conductivity type opposite said first conductivity type into a peripheral region of said island of said semiconductor layer while not introducing said dopants into a central portion of said island in order to cause said peripheral region to be doped to said second

conductivity type while said central portion of said island remains doped to said first conductivity type; and

forming connections to said central portion of said island,





whereby said central portion of said island serves as said resistor and said peripheral portion of said island is junction isolated from said central portion.

4,843,028

METHOD FOR PRODUCING A SPATIALLY PERIODIC SEMICONDUCTOR LAYER STRUCTURE

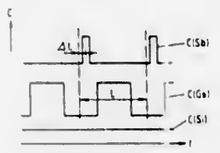
Hans-Joest Herzog, Neu-Ulm; Helmut Jorke, Gerstetten, and Horst Kibbel, Erbach, all of Fed. Rep. of Germany, assignors to Icentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 864,469, May 19, 1986, abandoned. This application Dec. 8, 1988, Ser. No. 282,940

Claims priority, application Fed. Rep. of Germany, May 17, 1985, 3517701; Jul. 31, 1985, 3527363

Int. Cl.[4] H01L *29/205*

U.S. Cl. 437—81 **17 Claims**



1. In a method for producing, by a molecular beam epitaxy process, a spatially periodic semiconductor layer structure in the form of a superlattice composed of an alternating arrangement of semiconductor layers of at least two different semiconductor compositions forming at least one heterojunction, one of the different semiconductor composition being SiGe, the improvement comprising: producing, by the molecular beam epitaxy process, in at least one of the SiGe semiconductor layers a doped layer which extends essentially parallel to the heterojunction and whose layer thickness is no greater than the thickness of the SiGe semiconductor layer in which it is produced, and producing at least one of the semiconductor layers forming a heterojunction with a subcritical layer thickness.

4,843,029

METHOD OF MANUFACTURING A HETEROEPITAXIAL COMPOUND SEMICONDUCTOR DEVICE USING PHOTO SMOOTHING BETWEEN LAYER GROWTH

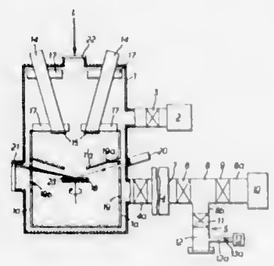
Bruce A. Joyce, East Grinstead, and Philip Dawson, Horsham, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 4, 1988, Ser. No. 176,914

Claims priority, application United Kingdom, Apr. 6, 1987, 8708153

Int. Cl.[4] H01L *21/205*

U.S. Cl. 437—82 **16 Claims**



1. A method of manufacturing a semiconductor device, which method comprises supplying gaseous material via supply means into a reaction chamber containing a substrate to cause a first epitaxial layer of a first material to grow on the substrate and operating switching means to alter within a predetermined period the supply of gaseous material via the supply means into the reaction chamber to cause a second epitaxial layer of a second material to grow on the first layer characterised by, during the predetermined period, activating a radiant heat source directed at a surface of the first layer so as to radiantly heat the surface of the first layer only during the predetermined period so as to smooth the first layer before growth of the second layer is commenced.

4,843,030

SEMICONDUCTOR PROCESSING BY A COMBINATION OF PHOTOLYTIC, PYROLYTIC AND CATALYTIC PROCESSES

J. Gary Eden, Mahomet; Kevin K. King, Urbana, and Viken Tavitian, Champaign, all of Ill., assignors to Eaton Corporation, Cleveland, Ohio

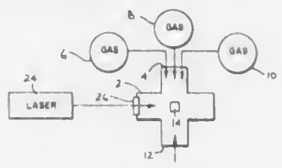
Filed Nov. 30, 1987, Ser. No. 126,891

Int. Cl.[4] H01L *21/306, 21/26, 21/265*

U.S. Cl. 437—88 **22 Claims**

1. A semiconductor processing method comprising providing a gas and providing a substrate at a temperature below the pyrolytic threshold of said gas and photodissociating said gas to a species which pyrolyzes at the surface of said substrate

forming several monolayers of catalytically active material for semiconductor deposition, wherein deposition of said semiconductor material is triggered by laser radiation, and continues by chemical vapor deposition.



4,843,031

METHOD OF FABRICATING COMPOUND SEMICONDUCTOR LASER USING SELECTIVE IRRADIATION

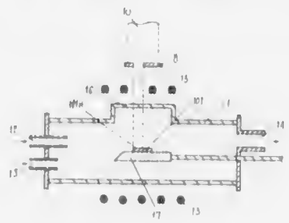
Yuzaburo Ban, Osaka; Hiraaki Tsujii, Nara; Yoichi Sasai, Hirakata; Mototsugu Ogura, Takaichi, and Hiroyuki Serizawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 15, 1988, Ser. No. 168,256

Claims priority, application Japan, Mar. 17, 1987, 62-61527; Mar. 18, 1987, 62-62905; Apr. 28, 1987, 62-105142; Nov. 2, 1987, 62-277604

Int. Cl.[4] H01L *00/00*; B05D *3/06*

U.S. Cl. 437—129 **11 Claims**



1. A method of fabricating a compound semiconductor device comprising:

a step of epitaxially growing a first clad layer on a semiconductor substrate, an active layer on said first clad layer, a second clad layer on said active layer and a contact layer on said second clad layer while partially illuminating said semiconductor substrate with light;

a step of electrically insulating between the illuminated part and non-illuminated part of said first clad layer, active layer, second clad layer and contact layer; and

a step of forming first and second electrode layers in the illuminated part and non-illuminated part of said contact layer, and a third electrode layer on the side of said semiconductor substrate where said first clad layer is not formed.

4,843,032

PROCESS FOR PRODUCING A DFB LASER WITH A DIFFRACTION GRATING SUPERLATTICE

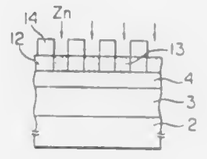
Yasunori Tokuda, and Kenzo Fujiwara, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

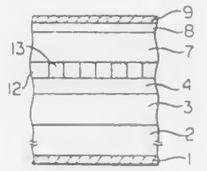
Division of Ser. No. 828,375, Feb. 11, 1986. This application Jun. 30, 1988, Ser. No. 213,354

Claims priority, application Japan, Feb. 12, 1985, 60-25415; Oct. 2, 1985, 60-219344

Int. Cl.[4] H01L *21/203, 21/265*

U.S. Cl. 437—129 **9 Claims**





1. A process for producing semiconductor optical elements comprising:

successively forming a first cladding layer consisting of a semiconductor layer of a first type of conductivity, an active layer, and a semiconductor superlattice layer on a semiconductor substrate of a first type of conductivity;

periodically mixing crystals in said semiconductor superlattice layer;

successively forming a second cladding layer consisting of a semiconductor layer of a second type of conductivity and a cap layer consisting of a semiconductor layer of the second type of conductivity on said semiconductor superlattice layer in which the crystal layers are periodically mixed; and

forming a first electrode on said semiconductor substrate and a second electrode on said cap layer.

4,843,033

METHOD FOR OUTDIFFUSION OF ZINC INTO III-V SUBSTRATES USING ZINC TUNGSTEN SILICIDE AS DOPANT SOURCE

Donald L. Plumton, Dallas, Tex., and Shiban K. Tiku, Camarillo, Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 781,280, Sep. 27, 1985, abandoned. This application Apr. 20, 1987, Ser. No. 40,425

Int. Cl.[4] H01L *21/24, 21/225*

U.S. Cl. 437—161 **17 Claims**

1. A method of fabrication of self-aligned doped-region/contact structures in a semiconductor device, comprising the steps of:

(a) forming metallic silicide and dopants over the surface of semiconductor material comprising elements of periodic table Groups III and V; and

(b) diffusing some of said dopants into said semiconductor material.

4. A method of fabrication of junction field effect transistors, comprising the steps of:

(a) forming metallic silicide and dopants over the surface of a semiconductor channel region;

(b) patterning said silicide and dopants to define a junction gate location;

(c) diffusing some of said dopants into said channel region to form the junction gate; and

(d) forming source and drain contacts adjacent the channel region.

7. A method of fabrication of a bipolar transistor, comprising the steps of:

(a) forming a substrate with layer doped for the emitter, base, and collector at least said base comprising elements from periodic table Groups III and V;

(b) depositing and patterning, to define the active area plus extrinsic base, an insulating and diffusion barrier on the emitter layer;

(c) depositing a metallic silicide and a dopant on said insulating and diffusion barrier;

(d) depositing an insulator on said metallic silicide and said dopant;

(e) patterning and etching said insulator and combination to define the active area;

(f) depositing a further insulating and diffusion barrier on said patterned insulator, exposed combination, and active area;

(g) heating said combination to diffuse some of said dopants into said layers to form the extrinsic base and define the emitter;

(h) anisotropically etching said further insulating and diffusion barrier to remove all of it except for sidewall portions on said exposed combination; and

(i) depositing a contact for said emitter which is isolated from said combination by said sidewall portions and said insulator.

4,843,034

FABRICATION OF INTERLAYER CONDUCTIVE PATHS IN INTEGRATED CIRCUITS

Terry O. Herndon, Carlisle, and Glenn H. Chapman, Bedford, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 61,885, Jun. 12, 1987, abandoned. This application May 23, 1988, Ser. No. 194,720

Int. Cl.[4] H01L *21/44, 21/88*

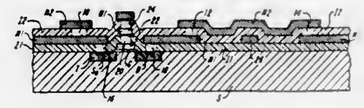
U.S. Cl. 437—189 **23 Claims**

1. A method for producing interlayer conductive paths in an integrated circuit structure, the method comprising the steps of:

depositing an insulative layer upon a lower element of an integrated circuit structure;

implanting ions into at least one selected region of the insulative layer to form a modified region possessing a diffusion pathway for alloying with a conductive material;

depositing an upper layer of conductive material over the selected region of the insulative layer; and



sintering the deposited layers and integrated circuit structure to diffuse material from the upper conductive layer into said selected region of the insulative layer, thereby forming a conductive path in the selected region between the upper conductive layer and the lower element.

4,843,035

METHOD FOR CONNECTING ELEMENTS OF A CIRCUIT DEVICE

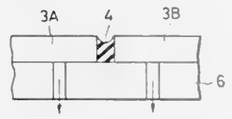
Shoji Takashima, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

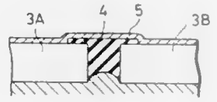
Filed Jul. 22, 1982, Ser. No. 400,815

Claims priority, application Japan, Jul. 23, 1981, 56-115503; Jul. 31, 1981, 56-120445

Int. Cl.[4] H01L *21/60*

U.S. Cl. 437—209 **15 Claims**





1. A method of interconnecting two circuit elements which each have a front surface and a back surface on opposite sides thereof, comprising the steps of:

providing a support member having a substantially planar support surface thereon;

releasably securing said circuit elements to said support member at spaced locations thereon so that said front surface on each said circuit element is disposed against said support surface on said support member;

thereafter introducing a first insulating adhesive material between said circuit elements so that it engages said circuit elements and a portion of said support surface on said support member, and then permitting said first insulative adhesive material to cure, said first insulative adhesive material connecting said circuit elements;

thereafter removing said circuit elements and said first insulative adhesive material from said support member, said front surfaces of said circuit elements being substantially coplanar;

securing said circuit elements to a substrate with an orientation so that said back surfaces thereof face said substrate; and

providing metallic wiring which is located directly on and extends along said front surfaces of said circuit elements and a surface on said first insulating adhesive material;

wherein one of said circuit elements is a semiconductive chip and the other of said circuit elements is a surface acoustic wave chip;

wherein a further insulative adhesive material is provided between said surface acoustic wave chip and said substrate, and wherein a conductive adhesive material is provided between said semiconductive chip and said substrate.

4,843,036

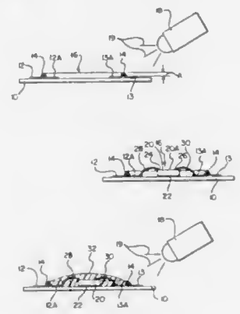
METHOD FOR ENCAPSULATING ELECTRONIC DEVICES

John D. Schmidt, and Martin A. Maurinus, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 29, 1987, Ser. No. 67,743

Int. Cl.[4] H01L *1/10*

U.S. Cl. 437—224 **16 Claims**



1. A method of encapsulating an electronic device, in the form of a photoelectric device having a light-sensing surface, on a substrate comprising the steps of:

forming a barrier in place on the substrate by depositing a radiatively curable material about a predetermined location on said substrate, and curing said deposited material using suitable radiation;

placing said electronic device within said formed barrier with the light-sensing surface facing away from the substrate; and

depositing an optically clear encapsulant in a viscous state over said electronic device within said barrier, and curing said deposited encapsulant to form an encapsulation to enhance the focusing onto said light-sensing surface of light received from an external source.

11. A method of encapsulating a photoelectric device having a light-sensing surface on a substrate, comprising the steps of:

forming a barrier in place on the substrate by depositing a curable material about a predetermined location on said substrate, and curing said deposited material;

placing the device within the formed barrier with the light-sensing surface facing away from the substrate;

depositing an optically clear encapsulant in a viscous state over said device within said barrier, and curing said deposited encapsulant to form a concave lens-like cross-sectional shaped encapsulation to enhance the focusing onto said light-sensing surface of light received from an external source.

4,843,037

PASSIVATION OF INDIUM GALLIUM ARSENIDE SURFACES

Eli Yablonovitch, Middletown Township, Monmouth County, and Thomas J. Gmitter, Lakewood, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Aug. 21, 1987, Ser. No. 87,420

Int. Cl.[4] H01L *21/465*

U.S. Cl. 437—235 **4 Claims**

1. A method for passivating and attaining a low surface recombination velocity in an indium gallium arsenide surface, said method comprising the steps of

cleaning an indium gallium arsenide surface,

forming on said cleaned indium gallium arsenide surface a layer consisting of an hydroxide in an aqueous solution,

and annealing said indium gallium arsenide surface so that said hydroxide forms a passivation layer on said indium gallium arsenide surface while attaining the low surface recombination velocity required for high-speed devices.

4,843,038

BLACK SINTERED BODY OF ALUMINUM NITRIDE AND PROCESS FOR PRODUCING THE SAME

Shusei Kuratani; Kohichi Uno, both of Nagoya; Shinya Mizuno, Seto; Hisashi Sakuramoto, and Satoshi Nishiyama, both of Nagoya, all of Japan, assignors to Narumi China Corporation, Nagoya, Japan

Filed Nov. 6, 1987, Ser. No. 118,192

Claims priority, application Japan, Nov. 13, 1986, 61-270390; Mar. 28, 1987, 62-75620; Jul. 11, 1987, 62-173279

Int. Cl.[4] C04B *35/58*

U.S. Cl. 501—98 **11 Claims**

1. A black sintered body of aluminum nitride produced by adding a sintering aid to aluminum nitride to form a composition consisting essentially of said aluminum nitride and said sintering aid, said sintering aid being selected from the group consisting of (a) a mixture of (i) calcium oxide and (ii) at least one additional oxide selected from the group consisting of tungsten oxide and molybdenum oxide, (b) a composite oxide of calcium and at least one element selected from the group consisting of tungsten and molybdenum, and (c) a mixture of a calcium compound and at least one additional compound selected from the group consisting of tungsten compounds and molybdenum compounds, wherein said compounds are capable of being converted into said mixture (a) or said composite oxide (b) by sintering, the amount of said sintering aid, calculated as the oxides of Ca, W and Mo, being from 0.1 to 20 wt. %, based on the total weight of said composition, said sintering aid containing at least 0.02 wt. % of CaO, and one or both of at least 0.06 wt. % of WO_3 and at least 0.07 wt. % of MoO_3, based on the total weight of said composition, and then sintering said composition in a nonoxidizing atmosphere or in a vacuum.

4,843,039

SINTERED BODY FOR CHIP FORMING MACHINING

Leif A. E. Akesson, Älvsjö, and Marian Mikus, Skärholmen, both of Sweden, assignors to Santrade Limited, Lucerne, Switzerland

Filed May 12, 1987, Ser. No. 48,775

Claims priority, application Sweden, May 12, 1986, 8602147

Int. Cl.[4] C04B *35/56;* **C22C** *29/00*

U.S. Cl. 501—87 **17 Claims**

1. Sintered body for chip forming machining comprising at least one hard constituent comprising a carbide, nitride and/or carbonitride of a metal of group IVB, VB or VIB of the peri-

odical system and a binder metal based on Co, Ni and/or Fe, said sintered body comprising (i) a core containing at least one of (a) eta-phase and (b) an intermediate phase being essentially free of carbon and/or nitrogen, said core being surrounded by (ii) a hard constituent-and binder phase - containing surface zone free of said eta-phase or said intermediate phase.

4,843,040

SILICON NITRIDE SINTERED BODIES

Isao Oda, Nagoya, and Tomonori Takahashi, Chita, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed Feb. 9, 1987, Ser. No. 12,159
Claims priority, application Japan, Feb. 20, 1986, 61-33716
Int. Cl.[4] C04B *35/56, 35/50*
U.S. Cl. 501—92 **17 Claims**

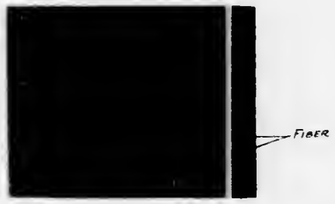
1. A ceramic article comprising:
a silicon nitride sintered body; and
a silicon carbide coating on a surface of said silicon nitride sintered body;
wherein the thermal expansion coefficient of said silicon nitride sintered body is greater than 3.7×10^{31} 6/° C.

4,843,041

PROCESS FOR SEPARATING SHORT FIBERS

Vimal K. Pujari, Northboro, Mass., assignor to Norton Company, Worcester, Mass.

Filed May 27, 1986, Ser. No. 866,806
Int. Cl.[4] C04B *35/12*
U.S. Cl. 501—95 **12 Claims**



1. A process for separating individual short fibers which spontaneously tend to clump together under normal gravitational force, comprising passing said fibers through a screen having substantially uniform openings with a width between two and ten times the diameter of the cross section of the fiber.

4,843,042

ALKALINE EARTH FLUORIDE ADDITIVE FOR SINTERING ALUMINUM NITRIDE

Stephen L. Dole, Burnt Hills; Ronald H. Arendt, Schenectady, and Wayne D. Pasco, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y

Filed Jun. 30, 1986, Ser. No. 880,516
Int. Cl.[4] C04B *35/58*
U.S. Cl. 501—96 **26 Claims**

1. A process for producing a sintered polycrystalline aluminum nitride body having a porosity of less than about 10% by volume and a thermal conductivity of at least 0.5 W/cm.K at 25° C. which consists essentially of forming a mixture consisting essentially of aluminum nitride powder containing oxygen ranging in amount from greater than about 1.0% by weight to less than about 4.0% by weight and an alkaline earth additive, said alkaline earth additive being a member selected from the group consisting of CaF_2 ranging from about 0.2% by weight to about 10% by weight, SrF_2 ranging from about 0.5% by weight to about 8% by weight, BaF_2 ranging from about 1% by weight to about 8% by weight, and mixtures of said member ranging from greater than about 0.2% by weight to less than about 10% by weight, said % by weight of said additive being based on the amount of said aluminum nitride powder, shaping said mixture into a compact, said aluminum nitride in said compact having an oxygen content ranging from greater than about 1% by weight to less than about 4.5% by weight, and sintering said compact in a nitrogen-containing nonoxidizing atmosphere at a temperature ranging from about 1800° C. to about 2050° C. producing said polycrystalline body, said sintering temperature being sufficient to produce said sintered body, said nitrogen-containing atmosphere containing sufficient nitrogen to prevent significant weight loss of said aluminum nitride.

4,843,043

METHOD FOR MANUFACTURING A SINTERED BODY WITH HIGH DENSITY

Hiroaki Nishio, Tokyo, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1988, Ser. No. 163,024
Claims priority, application Japan, Mar. 10, 1987, 62-53162
Int. Cl.[4] C04B *35/58*
U.S. Cl. 501—97 **25 Claims**

1. A method for manufacturing a sintered body with high density which comprises the steps of:
heating a layer comprising a liquid inorganic polysilazane positioned on the surface of a porous body to oxidize a surface portion of said layer to an oxide layer and pyrolyzing the remainder of the inorganic polysilazane, said inorganic polysilazane having the formula $(-SiH_2NH-)_n$ wherein n represents the polymerization degree and is from 6 to 25;
softening said oxide layer to make the oxide layer impermeable; and
sintering the porous body with said impermeable oxide layer at a high pressure and at a high temperature.

4,843,044

REFRACTORY COMPOSITION

David I. Neville, Spotswood; William E. Herberger, Freehold, both of N.J., and Dominick M. Colavito, Easton, Pa., assignors to Quigley Company, Inc., New York, N.Y.

Filed Mar. 1, 1988, Ser. No. 162,768
Int. Cl.[4] C04B *35/04*
U.S. Cl. 501—111 **8 Claims**

1. A refractory composition consisting essentially of: from about 0.05 to about 0.5% by weight of an alkali metal phosphate; from about 1.7 to about 5% by weight of an alkali metal polyphosphate; from about 0.1 to about 0.35% by weight of a lime aggregate having at least 90% available CaO and passing a 30 mesh screen; from about 0.1 to about 1.5% by weight of a plasticizer; with the balance being sized refractory aggregate, wherein at least 10% of said refractory aggregate is MgO-containing grain having at least 50% MgO and passing a five mesh screen, all percentages by weight being based on the weight of the total refractory composition.

4,843,045

PROCESS OF MAKING CERAMIC COMPOSITES WITH IMPROVED THERMAL SHOCK RESISTANCE

Ronald R. Smyth, Freeport, and Walter W. Henslee, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 874,322, Jun. 13, 1986, abandoned, which is a continuation of Ser. No. 643,619, Aug. 24, 1984, abandoned, which is a continuation of Ser. No. 451,122, Dec. 20, 1982, abandoned. This application Mar. 10, 1988, Ser. No. 166,291
Int. Cl.[4] C04B *35/44, 35/04*
U.S. Cl. 501—120 **1 Claim**

1. A process for preparing an improved thermal shock resistant and compressive deformation resistant ceramic material comprising mixing
(1) 1 to 4 mol of a reactive densifiable oxide ceramic matrix which is densifiable at between about 1000° and 1750° C. selected from the group consisting of mono and polymetal spinels with
(2) 1.5 to 1 mol, respectively of a metal salt of one or more metal oxides, said salt having
(a) a thermal expansion characteristic different from said matrix; and
(b) a volume as the oxide less than that of its decomposable salt form; and, being a metal oxide which does not melt at the matrix densification temperature;

said decomposable salt being present in an amount to provide a quantity of oxide after decomposition in excess of that which goes into solid solution in the matrix,
forming a shape from said mixture,
heating said shape to a temperature sufficient to cause the metal salt to decompose and the mixture to density yielding a microstructure, comprised of the oxide matrix (1) surrounding the metal oxide produced from said salt (2) as discrete islands within the matrix.

4,843,046

CERAMIC COMPOSITION OF HIGH DIELECTRIC CONSTANT COMPRISING PBO_3, LA_2O_3, MO, ZRO_2 AND TIO_2

Takashi Yamaguchi, Saitama; Takeshi Inoue, Sakura, and Masashi Saito, Saitama, all of Japan, assignors to Mitsubishi Mining and Cement Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1987, Ser. No. 82,007
Claims priority, application Japan, Oct. 15, 1986, 61-244360
Int. Cl.[4] C04B *35/49, 35/46*
U.S. Cl. 501—136 **12 Claims**

1. A ceramic composition of high dielectric constant which comprises the major constituents of PbO, La_2O_3, MO, ZrO_2, and TiO_2 in the ratio defined by the formula below;

$$(1-x-y)PbO\cdot(x/2)La_2O_3\cdot yMO\cdot(1-z)ZrO_2\cdot zTiO_2$$

where,
M represents Ba and/or Sr;
$0.06\leqq x\leqq0.30$
$0.03\leqq y\leqq0.48$
$0.20\leqq z\leqq0.50$
and an additive represented by one of $PbWO_4$ and a combination of $PbWO_4$ and $Pb(Mg_{\frac{1}{3}}W_{\frac{1}{3}})O_3$ in an amount of 1–40 wt%, in total based on the above-mentioned major constituents, provided that the amount of $PbWO_4$ is less than 15 wt% of the amount of the major constituents and the amount of $Pb(Mg_{\frac{1}{3}}W_{\frac{1}{3}})O_3$ is less than 40 wt% of the amount of the major constituents.

4,843,047

METHOD FOR PRODUCING A HIGH STRENGTH FELDSPATHIC PORCELAIN

Isao Oda, Nagoya, Japan, assignor to NGK Insulators, Ltd., Japan

Division of Ser. No. 814,508, Dec. 30, 1985, Pat. No. 4,717,695. This application Sep. 16, 1987, Ser. No. 98,225
Claims priority, application Japan, Jan. 18, 1985, 60-7139
Int. Cl.[4] C04B *33/24*
U.S. Cl. 501—143 **20 Claims**

1. A method for producing high strength feldspathic porcelain having an unglazed bending strength of greater than 1,400 kg/cm^2 and said porcelain being free from defects greater than 40 μm, comprising the steps of preparing a starting material selected from the group consisting of quartz material, feldspathic material, alumina material and mixtures thereof; pulverizing the starting material so as to form 85–95% by weight thereof into particles having effective diameters of not greater than 10 μm; calcining the pulverized material at 900°–1,400° C.; mixing a clay-mineral material with the calcined material to form a mixture; pulverizing said mixture to result in not greater than 85% by weight thereof being particles with effective diameters of not greater than 10 μm; forming and drying the pulverized mixture; and firing the formed and dried mixture at 1,100°–1,400° C., whereby said porcelain thus produced contains a crystal phase of corundum in an amount of 20–60% by weight and at least one second crystal phase selected from the group consisting of corundum, mullite, cristobalite, and quartz, said crystal phases having a grain size of not greater than 20 μm and a total amount of crystalline phase of greater than 40% by weight.

4,843,048

ORGANOPHILIC CLAY COMPOSITIONS

Roy F. House, Houston, Tex.; Victor M. Granquist, and Jack C. Cowan, both of Lafayette, La., assignors to Venture Innovations, Inc., Lafayette, La.

Continuation-in-part of Ser. No. 887,360, Jul. 21, 1986, Pat. No. 4,737,295. This application Nov. 23, 1987, Ser. No. 124,171
Int. Cl.[4] C09K *7/06*
U.S. Cl. 501—148 **7 Claims**

1. The method of preparing an organophilic clay, comprising an adduct of a smectite clay which exhibits osmotic swelling and commercial lecithin, said commercial lecithin comprising from about 30% to about 50% of a vegetable oil, from about 35% to about 70% of one or more phosphatides having the empirical formula

$$R_1—CO—O—CH_2—CH(R_2)—CH_2—Q$$

where: R_1 is an aliphatic group containing from about 15 to abouto 17 carbon atoms; R_2 is selected from the group consisting of R_1COO and $OP(O)(O^-zM^{a+})OZ$; Q is selected from the group consisting of R_1COO and $OP(O)(O^-zM^{a+})OZ$; Z is selected from the group of consisting of xM^{a+}, $C_6H_6(OH)_5$, and $CH_2—CH(Y)—N(R_3)(R_4)(R_5)_y(A^{b-})_v$; Y is selected from the group consisting of H and $COO(wM^{a+})$; R_3, R_4, and R_5 are independently selected from the group consisting of H, CH_3, and R_1CO; M is a cation selection from the group consisting of H, an alkali metal, an alkaline earth metal, ammonium, and mixtures thereof; A is an anion of valence b; y=0 or 1; w, x and z=0 or 1/a where a is the valence of M; v=0 or 1/b; and Q is R_1COO only when R_2 is $OP(O)(O^-zM^{a+})OZ$; and from 0% to about 18% of other phosphatides, which comprises mixing the clay with the phosphatide in the presence of water and an acid at a pH less than about 4.0.

4,843,049

CATALYST COMPONENT FOR POLYMERIZING ETHYLENE OR COPOLYMERIZING ETHYLENE WITH AN ALPHA-OLEFIN

Renzo Invernizzi, Via Primaticcio, 98, 20147 Milano; Francesco Masi, Via Kennedy, 36, 20097 San Donato Milanese (Milano), and Angelo Moalli, Via del Cantiere, 1, 28053 Castelletto Ticino, all of Italy

Filed Feb. 1, 1988, Ser. No. 150,744
Claims priority, application Italy, Jun. 2, 1987, 19276 A/87
Int. Cl.[4] C08F *4/64*
U.S. Cl. 502—9 **15 Claims**

1. A catalyst component for polymerizing ethylene or copolymerizing ethylene with an alpha olefin comprising a spherical granular solid with at least 80% of said granules having a particle size of 30 to 40 microns, a surface area of 15 to 30 m^2/g

and a porosity of 40 to 80 volume % produced by the process comprising:

(a) spray-drying an ethanolic solution of magnesium chloride to thereby form a solid granular spherical free-flowing substrate containing from 18 to 25% by weight of alcoholic hydroxyls expressed as ethanol;

(b) suspensing the substrate in an inert liquid to thereby form a suspension;

(c) reacting the substrate with $Ti(OR')_4$ where R' denotes a straight-chain or branched alkyl group containing from 1 to 8 carbon atoms at a temperature between room temperature and 90° C., wherein the atomic ratio of magnesium in said magnesium chloride to titanium in said $Ti(OR')_4$ is from 0.5/1 to 3/1;

(d) reacting the thus treated substrate with diethyl aluminium chloride or ethyl aluminum sesquichloride at a temperature between room temperature and 80° C. wherein the ratio of chlorine atoms in said diethyl aluminum chloride or ethyl aluminum sesquichloride to alkoxy groups in said $Ti(OR')_4$ and ethanol is in the range of from 0.5/1 to 1.5/1, to thereby obtain the solid catalyst component in which the ratio of trivalent titanium to the sum of trivalent and tetravalent titanium is in the range from 0.8/1 to 1.1; and

(e) recovering said solid catalyst component from said reaction.

4,843,050

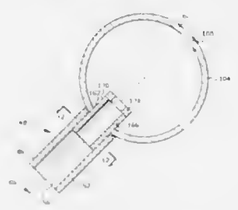
CATALYST REGENERATION

William C. Rahlwes, West Columbia, Tex., and Kelly G. Knopp, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 879,681, Jun. 27, 1986, Pat. No. 4,738,830. This application Nov. 24, 1987, Ser. No. 125,029

Int. Cl.[4] B01J *8/18*

U.S. Cl. 502—41 **3 Claims**



1. In a process for regenerating a coked hydrocarbon cracking catalyst in a regeneration vessel containing a fluidized bed of hydrocarbon cracking catalyst particles, wherein said process comprises the steps of:

(a) introducing said coked hydrocarbon cracking catalyst into said regeneration vessel,

(b) introducing an oxidant gas into said regeneration vessel through at least one oxidant gas distributor means, having an external wall and an internal wall and being positioned in said regeneration vessel, to regenerate said coked hydrocarbon cracking catalyst, and

(c) withdrawing said regenerated hydrocarbon cracking catalyst from said regeneration vessel,

the improvement comprises introducing at least a portion of said oxidant gas into said regeneration vessel through at least one elongated nozzle comprising a generally straight, cylindrically-shaped pipe section having an inlet end portion, opening into said at least one oxidant gas distributor means, an outlet end portion, opening into said regeneration vessel and at least one flat baffle plate attached tangentially to the cylindrical exterior surface of said at least one pipe section, said baffle plate being generally parallel to the longitudinal axis of said at least one pipe section and extending at least along that portion of said at least one pipe section which extends beyond said external wall of said at least one oxidant gas distributor means.

4,843,051

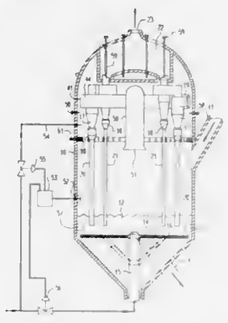
FLUID CATALYTIC CRACKING REGENERATION WITH REDUCTION OF NITROGEN EMISSIONS

Richard C. Kovacs, Mantua; Frederick J. Krambeck, Cherry Hill, and Michael S. Sarli, Haddonfield, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 9, 1987, Ser. No. 71,247

Int. Cl.[4] B01J *29/38, 21/20;* **C10G** *11/18;* **F27B** *1/20*

U.S. Cl. 502—42 **1 Claim**



1. A method of reducing the emissions of nitrogen oxides from the regeneration of a fluid catalytic cracking catalyst, which comprises:

(i) contacting spent fluid catalytic cracking catalyst from an FCC reactor, the catalyst having coke deposited on it from cracking with an oxygen-containing regeneration gas, in a dense, fluidized bed in a regeneration vessel to effect oxidative removal of the coke deposited on the catalyst,

(ii) maintaining an oxygen/coke ratio in the dense bed to produce regeneration effluent gases containing carbon monoxide by combustion of the coke,

(iii) adding additional oxygen-containing regeneration gas in the region above the dense bed,

(iv) oxidizing carbon monoxide to carbon dioxide in the presence of entrained catalyst particles in the regeneration effluent gases passing upwards through a substantially vertical, elongated duct within the regeneration vessel, the duct having an inlet above the dense bed to receive the carbon monoxide-containing regeneration effluent gases and entrained catalyst particles from the region above the dense bed to form effluent gases containing carbon dioxide and

(v) separating the catalyst particles from the regeneration effluent gas in a plurality of cyclone separators within the regeneration vessel which receive the effluent gases and entrained catalyst particles from said elongated duct and returning the separated particles to the dense bed.

4,843,052

ACID-REACTED METAKAOLIN CATALYST AND CATALYST SUPPORT COMPOSITIONS

Roger J. Lussier, Ellicott City, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Continuation of Ser. No. 786,711, Oct. 11, 1985, abandoned, which is a continuation of Ser. No. 552,894, Nov. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 367,648, Apr. 12, 1982, abandoned, which is a continuation-in-part of Ser. No. 380,716, May 21, 1982, abandoned. This application Mar. 14, 1988, Ser. No. 171,496

Int. Cl.[4] B01J *21/16, 29/06*

U.S. Cl. 502—68 **30 Claims**

26. A hydrocarbon conversion catalyst comprising:

(i) a crystalline aluminosilicate zeolite; and

(ii) an acid reacted metakaolin prepared by the method comprising:

(a) heating a kaolin at a temperature of about 700° to 910° C. for a period in excess of about one minute to obtain a reactive metakaolin;

(b) reacting said reactive metakaolin with an acid selected from the group consisting of hydrochloric and nitric acid, and salts and mixtures thereof in amountsw of less than about 1.5 moles of acid per mole of reactive metakaolin; and

(c) heating or reacting the reaction mixture of step (b) with sufficient base to precipitate alumina and to obtain a product which possesses a silica to alumina ratio essentially that of the kaolin used in step (a).

4,843,053

LOW TEMPERATURE SYNTHESIS OF CONDENSATION POLYMERS

Naoya Ogata, Tokyo, Japan, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 11,464, Feb. 5, 1987, Pat. No. 4,804,730. This application Apr. 11, 1988, Ser. No. 180,924

Int. Cl.[4] B01J *31/06*

U.S. Cl. 502—159 **10 Claims**

1. A catalyst system which is particularly useful in synthesizing condensation polymers which is comprised of (1) at least one polymeric agent having pendant diphenylphosphine groups and a bound acid acceptor group and (2) at least one halogenated organic compound.

4,843,054

PREPARATION OF FILTERABLE DOUBLE METAL CYANIDE COMPLEX CATALYST FOR PROPYLENE OXIDE POLYMERIZATION

Stephen D. Harper, West Chester, Pa., assignor to Arco Chemical Technology, Inc., Wilmington, Del.

Continuation of Ser. No. 19,386, Feb. 26, 1987, abandoned. This application Aug. 8, 1988, Ser. No. 231,619

Int. Cl.[4] B01J *27/26*

U.S. Cl. 502—175 **15 Claims**

1. A process for preparing unsupported double metal cyanide complex catalyst particles suitable for use to polymerize epoxides which consists essentially of:

(a) reacting in a liquid medium at least one Zn(II) metal salt with at least one alkali metal hexacyanometallate selected from the group consisting of the metallates of Fe(II), Fe(III), Co(II), and Co(III) to form the unsupported double metal cyanide complex catalyst particles and at least one soluble alkali metal salt;

(b) adding to or carrying out reaction (a) in the presence of about 0.01 to about 100 times the total weight of the Zn(II) metal salt plus alkali metal hexacyanometallate of inert filter-aid particles to form a mixture of unsupported double metal cyanide complex catalyst and filter-aid particles dispersed in the liquid medium which has dissolved therein the soluble alkali metal salt formed during reaction (a);

(c) separating the mixture of unsupported double metal cyanide complex catalyst and filter-aid particles from the liquid medium containing the soluble alkali metal salt by filtration, whereby the use of the filter-aid particles reduces the filtration time required to separate the unsupported double metal cyanide complex catalyst particles from the liquid medium as compared to the time required in the absence of the filter-aid particles; and

(d) drying the mixture in a vacuum or a stream of inert gas or air at a temperature of less than about 100° C.

4,843,055

CATALYST SYSTEM FOR AMMOXIDATION OF PARAFFINS

Linda C. Glaeser, Lyndhurst, and James F. Brazdil, Jr., Mayfield Village, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 16, 1988, Ser. No. 194,665

Int. Cl.[4] B01J *21/02, 23/84, 23/88, 27/185*

U.S. Cl. 502—202 **1 Claim**

1. A catalytic mixture suitable for the ammoxidation of propane to acrylonitrile, which comprises an intimate particulate mixture of a first catalyst composition and a second catalyst composition, said feed to the reaction zone containing a mole ratio of paraffin:NH_3 in the range from 2 to 16, and a mole ratio of paraffin to O_2 in the range from 1 to 10, said first catalyst composition being 0–99 weight percent of a diluent-/support and 100–1 weight percent of a catalyst having oxygen and the cation components in the proportions indicated by the empirical formula:

$$Bi_aV_bL_lM_mT_tO_x, \qquad \text{formula (1)}$$

wherein

L is one or more of K, Cs, Rb and Tl;

M is one or more of Mo, W, Cr, Ge, Sb, Sn, P, Pb and B;

T is one or more of Zn, Nb, Ta, Fe, Co, Ni Cu, Mn, Ti and rare earths,

$a = 1–25$

$b = 1–50$

$l = 0–1$

$m = 0.1–20$

$t = 0–20$

x is determined by the oxidation state of the other elements in the catalyst,

$(a+b):(l+m+t) = 20:1$ to $1:5$,

$a:b = 1:5–5:1$

with the proviso that the atomic ratio of Mo:V is zero to <10; said second catalyst composition being 0–99 weight percent of a diluent/support and 100–1 weight percent of a catalyst having oxygen and the cation components in the proportions indicated by the empirical formula:

$$Bi_kFe_lMo_{12}V_vD_dE_eF_fG_gO_x \qquad \text{formula (2)}$$

where

D is one or more of an alkali or alkaline earth metal, Sm, Ag

E is one or more of Mn, Cr, Cu, Zn, Cd, La,

F is one or more of P, As, Sb, Te, W, B, Sn, Pb, Se

G is one or more of Co, Ni

and k is 0.1–12, l is 0.01–12, v is 0–0.5, d is 0–0.5, e is 0–10, f is 0–10, g is 0–12, $v+k+l+d+e+f+g \leqq 24$, and x is a number determined by the valence requirements of the other elements present, wherein the weight ratio in said mixture of said first catalyst composition to said second catalyst composition is in the range of 0.001 to 2.5.

4,843,056

EXHAUST GAS PURIFYING CATALYST AND PROCESS FOR PRODUCING THE SAME

Shinichi Matsumoto, Aichi; Naoto Miyoshi; Hideaki Muraki, both of Nagoya; Hideo Sobukawa; Masayuki Fukui, both of Aichi; Mareo Kimura, Nagoya, and Hirofumi Shinjoh, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkusho and Toyota Jidosha Kabushiki Kaisha, both of, Japan

Filed Mar. 4, 1988, Ser. No. 164,237

Claims priority, application Japan, Mar. 5, 1987, 62-51096; May 15, 1987, 62-119765

Int. Cl.[4] B01J 23/0

U.S. Cl. 502—302 17 Claims

1. An exhaust gas purifying catalyst sequentially comprising on alumina grains:

(a) at least one rare earth element oxide,

(b) rhodium, and

(c) at least one of platinum and palladium.

4,843,057

PREPARATION OF PROMOTED SILICA CATALYSTS

Michael B. D'Amore, Wilmington, and Nutan K. Pande, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 29, 1988, Ser. No. 174,944

Int. Cl.[4] B01J 21/12

U.S. Cl. 502—263 4 Claims

1. In a process for the preparation of silica catalyst which includes the steps of mixing colloidal silica aquasol with a template compound, followed by formation of a solid crystalline product, and the eventual activation of the crystalline product by heating, the improvement which comprises forming the colloidal silica aquasol from an aqueous mixture obtained by combining an alkali metal aluminate with an aqueous solution of an alkali metal silicate.

4. The catalyst obtained by the process of claim 1.

4,843,058

THERMOSENSITIVE RECORDING SHEET

Shingo Araki, Settsu; Kikuo Tsuchiya, Nishinomiya; Masaji Inagaki, Ashiya; Yumi Kudoh, Osaka, and Teijiro Kitao, Tondabayashi, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

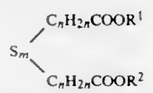
Filed Apr. 4, 1988, Ser. No. 177,159

Claims priority, application Japan, Apr. 7, 1987, 62-85507

Int. Cl.[4] B41M 5/18

U.S. Cl. 503—209 6 Claims

1. A thermosensitive recording sheet comprising a substrate sheet and a film coated on said substrate sheet, said film comprising a color-forming lactone compound, an acidic substance and a sensitizer, said sensitizer being a sulfur-containing dibasic acid ester represented by formula (I)



(I)

wherein n is an integer of 1 to 3, m is an integer of 1 or 2, R^1 and R^2 may be the same or different and each denotes an alkyl group having 1 to 20 carbon atoms, a cycloalkyl group, an aryl group, $—C_lH_{2l}—Ar$ or $—C_lH_{2l}—CO-Ar$ in which l is an integer of 1 to 8 and Ar denotes an aryl group, provided the alkyl group having 1 to 20 carbon atoms may be substituted by a halogen atom, and the cycloalkyl group, the aryl group and Ar of $—C_lH_{2l}—Ar$ or $—C_lH_{2l}—CO—Ar$ may be substituted by an alkyl group, a cycloalkyl group, an aryl group, an aralkyl group, a phenacyl group, an alkyloxy group, an aryloxy group, an aralkyloxy group, an arylcarbonyl group, an arylsulfonyl group, a nitro group, an ammonium sulfonic acid group or a halogen atom.

4,843,059

SUPERCONDUCTIVE MIXED VALENCE COPPER OXIDE, AND METHOD OF MAKING IT

Francis Deslandes, Saint Ouen; Claude Michel, Herouville Saint Clair; Jackie Provost, Villons Les Buissons; Bernard Raveau, Beuville; André Sulpice; Jean-Louis Tholence, both of Grenoble, and Bernard Chevalier, Talence, all of France, assignors to Compagnie Generale D'Electricite, Paris Cedex, France

Filed Mar. 10, 1988, Ser. No. 166,548

Claims priority, application France, Mar. 19, 1987, 87 03847

Int. Cl.[4] C01F 17/00; C01G 3/02, 29/00; H01L 39/12

U.S. Cl. 505—1 1 Claim

1. A superconducting mixed valence copper oxide having the general formula

$$(La_{2-x}(Y_{4/3}Bi_{1-x''})_{x'}Sr_{x-x'})_{1-e}CuO_{4-y},$$

wherein:

$0<x<0.3$

$0<x'\leqq 0.2$ with $x'<x$

$0\leqq x''<1$

$0<y\leqq 0.1$

$0\leqq e\leqq 0.05$.

4,843,060

METHOD FOR GROWING PATTERNED THIN FILMS OF SUPERCONDUCTORS

Howard Lessoff, Potomac, and Richard F. Greene, Bethesda, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 23, 1987, Ser. No. 123,629

Int. Cl.[4] B05D 5/12

U.S. Cl. 505—1 27 Claims

1. A method for growing a patterned superconductive oxide film of the general formula $XZ_2Cu_3O_{6+x}$, wherein X is yttrium, a lanthanide or a mixture thereof, Z is one or more alkaline earth elements and x is a number between 0 and 1, said method comprising the steps of:

preparing an aqueous solution of the nitrates of X, Z and Cu in the X:Z:Cu stoichiometric ratio of 1:2:3;

spraying said aqueous solution onto a substrate heated to a temperature between at least the decomposition temperature of the nitrates in said solution and the lowest temperature above said decomposition temperature at which a film does not form on said substrate, thereby forming on said substrate a thin film of $XZ_2Cu_3O_y$ material, wherein y is an undefined number;

spot-heating preselected portions of said thin film of $XZ_2Cu_3O_y$ material in a substantially pure oxygen atmosphere to a temperature between 800° C. and 950° C. for a time sufficient to convert said preselected portions into a patterned superconductive oxide film $XZ_2Cu_3O_{6+x}$; and

removing the unheated $XZ_2Cu_3O_y$ material in order to leave only said patterned superconductive oxide film of $XZ_2Cu_3O_{6+x}$ material on said substrate.

4,843,061

CYCLOHEXANE-, CYCLOHEXENE- AND CYCLOHEXADIENE-, BICYCLO (2.2.1)-HEPTENECARBOXYLIC ACID ESTERS, AND ALSO PERFUME COMPOSITIONS AND PERFUMED PRODUCTS WHICH CONTAIN ONE OR MORE OF SAID COMPOUNDS AS PERFUME COMPONENT

Nicolaas L. J. M. Broekhof, Naarden; Jan G. Witteveen, and Antonius J. A. van der Weerdt, both of Huizen, all of Netherlands, assignors to Naarden International N.V., The Hague, Netherlands

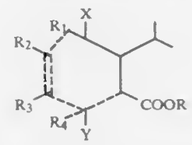
Filed Jun. 9, 1987, Ser. No. 59,914

Claims priority, application Netherlands, Jun. 13, 1986, 8601541

Int. Cl.[4] C11B 9/00; C07C 69/753

U.S. Cl. 512—22 13 Claims

1. A perfume composition comprising an effective odorant amount of at least one compound having the formula I



wherein

X and Y each represent a hydrogen atom or X and Y together represent a methylene bridge,

R represents an alkyl, alkenyl or cycloalkyl group containing 1–6 carbon atoms, and

R_1–R_4 each represent a hydrogen atom or a methyl group, with the proviso that

if X and Y each represent a hydrogen atom, the following cases apply:

if R_1 represents a methyl group, R_4 represents a methyl group and R_2 and R_3 represent a hydrogen atom;

if R_3 represents a methyl group, R_1 and R_4 both represent a hydrogen atom; and

if neither R_1 nor R_3 represents a methyl group, R_2 and R_4 both represent, or one of the two represents, or neither of the two represents, a methyl group; and

if X and Y together represent a methylene bridge, at most one of the symbols R_1–R_4 represents a methyl group;

the double dotted line represents a single or a double bond, in which case

if X and Y and also R_1–R_3 represent a hydrogen atom and R_4 represents a methyl group, the double dotted line together with a single dotted line, or two single dotted lines, may together represent a pair of conjugated double bonds, and

if X and Y and also R_1–R_3 represent a hydrogen atom, R_4 may also represent a methylene group, in which case the double dotted line together with the dotted line directed towards R_4 represent a pair of conjugated double bonds.

4,843,062

N-ACYL-N-NAPTHOYLGLYCINES AS ALDOSE REDUCTASE INHIBITORS

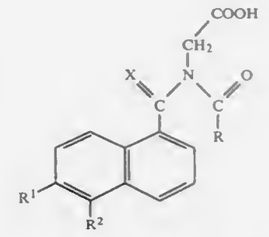
Kazimir Sestanj, Monmouth Junction; Jay E. Wrobel, Lawrenceville, and Joseph M. Kelly, Bloomfield, all of N.J., assignors to American Home Products Corporation, Del.

Filed Dec. 23, 1987, Ser. No. 137,479

Int. Cl.[4] A61K 37/26

U.S. Cl. 514—4 9 Claims

1. A compound of formula (I)



(I)

wherein R is hydrogen, lower alkyl containing 1 to 3 carbon atoms, lower alkoxy containing 1 to 6 carbon atoms, trifluoroethoxy, phenyl, benzyloxy, chloro-or nitro-substituted benzyloxy, or dimethylamino; R^1 is hydrogen or lower alkoxy containing 1 to 3 carbon atoms; R^2 is halogen or lower perfluoralkyl containing 1 to 3 carbon atoms; X is oxygen or sulfur, or the pharmaceutically acceptable salts thereof.

4,843,063

POLYPEPTIDE CARTILAGE-INDUCING FACTORS FOUND IN BONE

Saeid Seyedin, Sunnyvale; Thomas Thomas, Davis; Hanne Bentz, Palo Alto; Larry Ellingsworth, San Jose, and Rosa Armstrong, Palo Alto, all of Calif., assignors to Collagen Corporation, Palo Alto, Calif.

Continuation of Ser. No. 129,864, Dec. 10, 1987, Pat. No. 4,774,322, which is a continuation of Ser. No. 767,144, Aug. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 630,938, Jul. 16, 1984, abandoned. This application Jun. 8, 1988, Ser. No. 204,173

Int. Cl.[4] C07G 7/00; A61K 9/00

U.S. Cl. 514—2 8 Claims

1. A method of promoting proliferation of cells in an animal comprising

administering to the animal a composition comprising a TGF-beta activating agent, a pharmaceutically acceptable carrier, and a polypeptide that (a) is found in mammalian bone, (b) is active in the TGF-beta assay, (c) is a co-factor for inducing cartilage formation in vivo, (d) is a dimer having an approximate molecular weight of 26,000 daltons as determined by SDS-PAGE, and (e) is substantially pure, wherein said polypeptide and activating agent are present in amounts sufficient to promote bone growth.

4,843,064

GRF ANALOGS V

Joan Vaughan, San Diego; Joachim Spiess, Encinitas; Jean E. F. Rivier, and Wylie W. Vale, Jr., both of La Jolla, all of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 2,723, Jan. 13, 1987, abandoned, and a continuation-in-part of Ser. No. 60,149, Jun. 10, 1987, Pat. No. 4,784,987. This application Sep. 11, 1987, Ser. No. 96,513

Int. Cl.[4] A61K 37/43; C07K 7/10

U.S. Cl. 514—12 20 Claims

1. A peptide, or a nontoxic salt thereof, having the sequence:

His-Ala-Asp-Gly-R_5-Phe-Asn-Lys-Ala-Tyr-Arg

-Lys-Ala-Leu-Gly-Gln-Leu-Ser-Ala-Arg-Lys-Tyr-Leu-H

is-Thr-Leu-R_{27}-R_{28}-R_{29}-R_{30}-R_{31}-Gly-R_{33}-R_{34}-R_{35}-R_{36}-R_{37}-R_{38}-R_{39}-R_{40}-R_{41}-R_{42}-R_{43}-R_{44}-Ser wherein R_5 is Met, Leu, Val, Nva, Gln, Thr, Ile or Nle; R_{27} is Met, Leu, Val, Nva, Gln, Thr, Ile or Nle; R_{28} is Ala, Ser or Asn; R_{29} is Lys or Arg; R_{30} is Arg or Gln; R_{31} is Val or Gln; R_{33} is Gly or Glu; R_{34} is Gly, Arg or Ser; R_{35} is Ser or Asn; R_{36} is Met, Leu, Val, Nva, Gln, Thr, Ile or Nle; R_{37} is Ile or Glu; R_{38} is Glu, Gln or Arg; R_{39} is Asp, Arg or Gly; R_{40} is Asp, Ser or Ala; R_{41} is Asn, Arg or Lys; R_{42} is Glu, Phe, Ala or Val; R_{43} is Pro, Asn or Arg; R_{44}

is Leu or Ala; provided however that any or all of the residues after R_{27} may be deleted.

4,843,065

METHOD OF PRODUCING PRODUCTS FOR USE IN THE TREATMENT OF BACTERIAL AND/OR VIRUS INFECTIONS

Robert A. Collins, 22 6th Ave., and Philip F. Weighner, Rte. #1, both of Waukon, Iowa 52172

Continuation-in-part of Ser. No. 736,268, May 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 545,000, Oct. 24, 1983, abandoned. This application Oct. 13, 1987, Ser. No. 108,937

Int. Cl.[4] A61K *39/395*

U.S. Cl. 514—21 4 Claims

1. The method of producing a remedial product useful in the treatment of bacterial and/or viral infections consisting essentially of:

A. preparing a vaccine of killed microorganisms of the infection to be treated;

B. during lactation, introducing into the udder of an ungulate by infusion or injection, the vaccine comprising killed microorganisms prepared from those of the infection to be treated;

C. removing lacteal secretory fluid in about two days from the ungulate thus treated;

D. filtering out larger molecules including antibodies from the lacteal secretory fluid with approximately a 0.2 micro filter; and

E. preparing dosages of the remaining lacteal secretory fluid proportional in amount to the size of the animal to be treated.

4,843,066

NOVEL ADENOSINE DERIVATIVES AND PHARMACEUTICAL COMPOSITION CONTAINING THEM AS AN ACTIVE INGREDIENT

Toshio Yamada, Hyogo, and Ken-ichi Kageyama, Kyogo, both of Japan, assignors to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

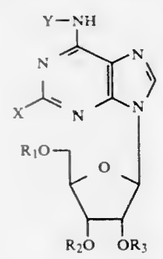
Filed Nov. 20, 1987, Ser. No. 123,519

Claims priority, application Japan, Nov. 27, 1986, 61-283904

Int. Cl.[4] A61K *31/70;* C07H *19/16*

U.S. Cl. 514—45 11 Claims

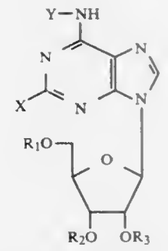
1. An adenosine compound having the formula (I):



(I)

wherein each of R_1, R_2 and R_3, which may be the same or different, is hydrogen or a lower alkyl group, and at least one of R_1, R_2, and R_3 is a lower alkyl group X is hydrogen, a lower alkyl group, an amino group or halogen; and Y is hydrogen or a lower alkyl group; or pharmaceutically acceptable salt thereof.

11. A method for treating hypertension which comprises administering to an animal in need thereof an antihypertensive effective amount of at least one adenosine compound or pharmaceutically acceptable salt thereof of the formula (I):



(I)

wherein each of R_1, R_2 and R_3, which may be the same or different, is hydrogen or a lower alkyl group, and at least one of R_1, R_2 and R_3 is a lower alkyl group; X is hydrogen, a lower alkyl group, an amino group or halogen; and Y is hydrogen or a lower alkyl group.

4,843,067

POLYSACCHARIDE CONTAINING PHARMACEUTICAL COMPOSITION FOR INCREASING THE IMMUNE FUNCTION

Yaguang Liu, 67-08 168th St., Flushing, N.Y. 11365

Filed Nov. 19, 1986, Ser. No. 932,404

Int. Cl.[4] A61K *35/78, 31/715*

U.S. Cl. 514—54 7 Claims

1. A composition pharmaceutically effective for increasing the immune function in humans comprising:

polysaccharides of Huang QI 50–95% by weight and

polysaccharides of Dankuei 5–40% by weight.

6. A method for treatment of immunosuppression in humans comprising administering to said humans suffering therefrom a therapeutically effective dose of a composition comprising polysaccharides of Huang QI 50–95 wt.% and polysaccharides of Dankuei 5–40 wt.%.

4,843,068

PYRAZOLE OXIME DERIVATIVES AND COMPOSITIONS

Hiroshi Hamaguchi, Kyoto; Hideo Takaishi; Tetsuji Ohshima, both of Nishinomiya, all of Japan; Takamichi Konno, Raleigh, N.C.; Yukio Miyagi, Osaka, Japan; Shiraiwa Yutaka, Sakai, Japan, and Takayuki Akita, Yachiyo, Japan, assignors to Nihon Nohyaku Co., Ltd., Tokyo, Japan

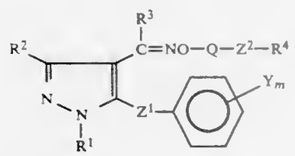
Filed Dec. 29, 1986, Ser. No. 947,408

Claims priority, application Japan, Dec. 27, 1985, 60-295759; Dec. 27, 1985, 60-295760; Feb. 8, 1986, 61-26582; Jun. 27, 1986, 61-151187; Sep. 2, 1986, 61-206442; Sep. 3, 1986, 61-206993

Int. Cl.[4] A01N *43/56, 55/00;* C07D *231/20;* C07F *7/10*

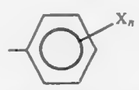
U.S. Cl. 514—63 8 Claims

1. A pyrazole oxime derivative represented by the general formula (I),



(I)

wherein R^1 represents C_1–C_4 alkyl or phenyl; R^2 represents hydrogen, C_1–C_5 alkyl, C_1–C_3 haloalkyl or phenyl; R^3 represents hydrogen, C_1–C_4 alkyl or phenyl; R^4 represents hydrogen, C_2–C_4 alkylcarbonyl, benzoyl, naphthyl or a substituent of the formula,

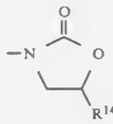


[in which X represents hydrogen; halogen; C_1–C_{12} alkyl; C_1–C_6 alkyl substituted with halogen, cyano, hydroxy, C_1–C_5 alkoxy or C_2–C_6 alkoxycarbonyl; C_3–C_8 cycloalkyl; cycloalkyl substituted with from one to three members selected from the group consisting of C_1–C_4 alkyl, halogen and cyano; C_2–C_4 alkenyl substituted with halogen, hydroxy, C_2–C_4 alkoxycarbonyl or C_2–C_6 alkylcarbonyl; phenyl; hydroxy; C_1–C_6 alkoxy; C_1–C_4 alkoxy substituted with halogen or C_2–C_6 alkoxycarbonyl; phenoxy which may or may not be sustituted with C_1–C_3 haloalkyl; benzyloxy; C_1–C_3 alklenedioxy formed by two adjacent Xs; pyridyloxy which may or may not be substituted with halogen of C_1–C_3 haloalkyl; a substituent of the formula, $-S(O)_pR^5$ (in which R^5 represents C_1–C_6 alkyl, C_1–C_5 haloalkyl or phenyl, and p represents an integer of 0, 1 or 2); cyano; formyl; nitro; a substituent of the formula, $-COOR^6$ {in which R^6 represents hydrogen; alkali metal; C_1–C_{10} alkyl; C_1–C_5 alkyl substituted with halogen, C_1–C_4 alkoxy, phenoxy, C_2–C_4 alkoxycarbonyl or phenoxyphenyl; C_2–C_7 alkenyl; C_3–C_7 alkynyl; C_3–C_8 cycloalkyl; C_3–C_8 cycloalkyl substituted with C_1–C_3 alkyl; phenyl; or a substituent of the formula,

(in which R^7, R^8 and R^9, which may be the same or different, represent C_1–C_4 alkyl or C_3–C_8 cycloalkyl)}; C_2–C_6 alkylcarbonyl; C_2–C_6 alkylcarbonyl substituted with cyano or C_2–C_6 alkoxycarbonyl; benzoyl which may or may not be substituted with halogen or C_1–C_6 alkyl; C_2–C_6 alkylthiocarbonyl; C_3–C_7 alkoxycarbonylcarbonyl; a substituent of the formula,

(in which R^{10} and R^{11}, which may be the same or different, represent hydrogen, C_1–C_6 alkyl or phenyl); piperidinocarbonyl; morpholinocarbonyl which may be or may not be substituted with one or two C_1–C_4 alkyls; a substituent of the formula,

(in which R^{12} represents hydrogen or C_1–C_5 alkyl, and R^{13} represents formyl, C_2–C_{12} alkoxycarbonyl, or C_2–C_5 alkoxycarbonyl substituted with halogen or C_1–C_4 alkoxy); a substituent of the formula,

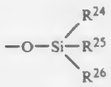


(in which R^{14} represents hydrogen, C_{1-C4} alkyl or C_2–C_6 alkoxyalkyl); a substituent of the formula,

(in which R^{15} and R^{16}, which may be the same or different, represent C_1–C_4 alkyl or, taken together, may form C_1–C_4 alkylene, R^{17} represents C_1–C_5 alkyl, cyano or C_2–C_6 alkoxycarbonyl, and Z^1 represents oxygen or sulfur); a substituent of the formula,

(in which R^{18} represents hydrogen or C_2–C_4 alkycarbonyl, and R^{19} and R^{20}, which may be the same or different, represent hydrogen or C_1–C_6 alkyl); a substituent of the formula,

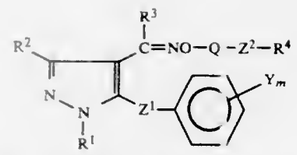
(in which R^{21}, R^{22} and R^{23}, which may be the same or different, represent C_1–C_4 alkyl); or a substituent of the formula,



(in which R^{24}, R^{25} and R^{26}, which may be the same or different, represent C_1–C_4 alkyl), and n represents an integer of from 1 to 5, and when n represents an integer of from 2 to 5, X may be the same or different]; Y represents hydrogen, C_1–C_6 alkyl, C_1–C_4 haloalkyl, halogen, hydroxy, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_3 alkylenedioxy, phenoxy which may or may not be substituted with trifluoromethyl, a substituent of the formula, $-S(O)_qR^{27}$ (in which R^{27} represents C_1–C_3 alkyl and q represents an integer of 0, 1 or 2), hydroxycarbonyl, C_2–C_5 alkoxycarbonyl or a substituent of the formula,

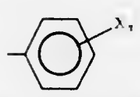
(in which R^{28} and R^{29}, which may be the same or different, represent hydrogen, C_1–C_4 alkyl, or benzyl which may or may not be substituted with C_2–C_6 alkoxycarbonyl); Z^1 represents oxygen or sulfur; Z^2 represents oxygen, sulfur or single bond; Q represents C_1–C_8 alkylene, C_1–C_8 alkylene substituted with halogen or phenyl, C_3–C_{12} alkenylene, C_3–C_{12} haloalkenylene or C_3–C_6 alkynylene; and m represents an integer of from 1 to 3, and when m represents an integer of 2 or 3, Y may be the same or different.

5. An insecticidal and acaricidal composition for use in agriculture and horticulture comprising an insecticidally and/or acaricidally effective amount of a pyrazole oxime derivative as an active ingredient and a suitable carrier, said pyrazole, oxime derivative being represented by the general formula (I),

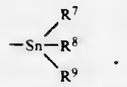


(I)

wherein R^1 represents C_1–C_4 alkyl or phenyl; R^2 represents hydrogen, C_1–C_5 alkyl, C_1–C_3 haloalkyl or phenyl; R^3 represents hydrogen, C_1–C_4 alkyl or phenyl; R^4 represents hydrogen, C_2–C_4 alkylcarbonyl, benzoyl, naphthyl or a substituent of the formula,



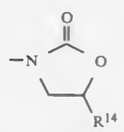
[in which X represents hydrogen; halogen; C_1–C_{12} alkyl; C_1–C_6 alkyl substituted with halogen, cyano, hydroxy, C_1–C_5 alkoxy or C_2–C_6 alkoxycarbonyl; C_3–C_8 cycloalkyl; cycloalkyl substituted with from one to three members selected from the group consisting of C_1–C_4 alkyl, halogen and cyano; C_2–C_4 alkenyl substituted with halogen, hydroxy, C_2–C_4 alkoxycarbonyl or C_2–C_6 alkylcarbonyl; phenyl; hydroxy; C_1–C_6 alkoxy; C_1–C_4 alkoxy substituted with halogen or C_2–C_6 alkoxycarbonyl; phenoxy which may or may not be substituted with C_1–C_3 haloalkyl; benzyloxy; C_1–C_3 alkylenedioxy formed by two adjacent Xs; pyridyloxy which may or may not be substituted with halogen or C_1–C_3 haloalkyl; a substituent of the formula, —$S(O)_pR^5$ (in which R^5 represents C_1–C_6 alkyl, C_1–C_5 haloalkyl or phenyl, and p represents an integer of 0, 1 or 2); cyano; formyl; nitro; a substituent of the formula, —$COOR^6$ {in which R^6 represents hydrogen; alkali metal; C_1–C_{10} alkyl, C_1–C_5 alkyl substituted with halogen, C_1–C_4 alkoxy, phenoxy, C_2–C_4 alkoxycarbonyl or phenoxyphenyl; C_2–C_7 alkenyl; C_3–C_7 alkynyl; C_3–C_8 cycloalkyl; C_3–C_8 cycloalkyl substituted with C_1–C_3 alkyl; phenyl; or a substituent of the formula,



(in which R^7, R^8 and R^9, which may be the same or different, represent C_1–C_4 alkyl or C_3–C_8 cycloalkyl)}; C_2–C_6 alkylcarbonyl; C_2–C_6 alkylcarbonyl substituted with cyano or C_2–C_6 alkoxycarbonyl; benzoyl which may or may not be substituted with halogen or C_1–C_6 alkyl; C_2–C_6 alkylthiocarbonyl; C_3–C_7 alkoxycarbonylcarbonyl; a substituent of the formula,

(in which R^{10} and R^{11}, which may be the same or different, represent hydrogen, C_1–C_6 alkyl or phenyl); piperidinocarbonyl; morpholinocarbonyl which may or may not be substituted with one or two C_1–C_4 alkyls; a substituent of the formula,

(in which R^{12} represents hydrogen or C_1–C_5 alkyl, and R^{13} represents formyl, C_2–C_{12} alkoxycarbonyl, or C_2–C_5 alkoxycarbonyl substituted with halogen or C_1–C_4 alkoxy); a substituent of the formula,

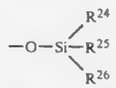


(in which R^{14} represents hydrogen, C_1–C_4 alkyl or C_2–C_6 alkoxyalkyl; a substituent of the formula,

(in which R^{15} and R^{16}, which may be the same or different, represent C_1–C_4 alkyl or, taken together, may form C_1–C_4 alkylene, R^{17} represents C_1–C_5 alkyl, cyano or C_2–C_6 alkoxycarbonyl, and Z^1 represents oxygen or sulfur); a substituent of the formula,

(in which R^{18} represents hydrogen or C_2–C_4 alkylcarbonyl, and R^{19} and R^{20}, which may be the same or different, represent hydrogen or C_1–C_6 alkyl); a substituent of the formula,

(in which R^{21}, R^{22} and R^{23}, which may be the same or different, represent C_1–C_4 alkyl); or a substituent of the formula,



(in which R^{24}, R^{25} and R^{26}, which may be the same or different, represent C_1–C_4 alkyl), and n represents an integer of from 1 to 5, and when n represents an integer of from 2 to 5, X may be the same or different]; Y represents hydrogen, C_1–C_6 alkyl, C_1–C_4 haloalkyl, halogen, hydroxy, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_3 alkylenedioxy, phenoxy which may or may not be substituted with trifluoromethyl, a substituent of the formula, —$S(O)_qR^{27}$ (in which R^{27} represents C_1–C_3 alkyl and q represents an integer of 0, 1 or 2), hydroxycarbonyl, C_2–C_5 alkoxycarbonyl or a substituent of the formula,

(in which R^{28} and R^{29}, which may be the same or different, represent hydrogen, C_1–C_4 alkyl, or benzyl which may or may not be substituted with C_2–C_6 alkoxycarbonyl); Z^1 represents oxygen or sulfur; Z^2 represents oxygen, sulfur or single bond;

Q represents C_1–C_8 alkylene, C_1–C_8 alkylene substituted with halogen or phenyl, C_3–C_{12} alkenylene, C_3–C_{12} haloalkenylene or C_3–C_6 alkynylene; and m represents an integer of from 1 to 3, and when m represents an integer of 2 or 3, Y may be the same or different.

4,843,069

MEDICAMENT FORMULATIONS CONTAINING RUTHENIUM COMPOUNDS WITH AN ANTITUMORAL ACTION

Heimo Keller, and Bernhard Keppler, both of Heidelberg, Fed. Rep. of Germany, assignors to Asta Pharma AG, Fed. Rep. of Germany

PCT No. PCT/EP85/00369, § 371 Date Mar. 21, 1986, § 102(e) Date Mar. 21, 1986, PCT Pub. No. WO86/00905, PCT Pub. Date Feb. 13, 1986
PCT Filed Jul. 24, 1985, Ser. No. 849,455
Claims priority, application Switzerland, Jul. 24, 1984, 03594/84; Jul. 4, 1985, 02907/85
Int. Cl.[4] A61K *31/40, 31/435;* C07F *4/00*
U.S. Cl. 514—184 18 Claims

1. A pharmacologically-acceptable complex compound of formula Ia

$$(AH_n)_m\{RuX_{3+nm-q-r}(OH)_r(AH_p)_{3-nm+q}\}_{1+p+q} \quad \text{Ia}$$

wherein

A denotes an optionally-substituted mononuclear or polynuclear unsaturated heterocyclic radical having no hetero ring member other than a nitrogen atom, each unsaturated ring of which has 5 or 6 ring members, no more than 4 of which are nitrogen atoms, with the exception of pyrazole and imidazole,

X denotes chlorine or bromine,

m denotes 1 or 2,

n denotes 1 or 2, the sum of n and m being not greater than 3,

p denotes 0 or 1, but not 1 if n is 1,

q denotes 0 or 1, but not 1 if p is 1 and

r denotes 0 or 1.

4. A medicament formulation useful for alleviating pain and suffering associated with cancer therapy and containing pharmaceutically-acceptable excipient and an effective amount of one or more pharmacologically-acceptable complex compounds of formula I

$$(BH_n)_m\{RuX_{3+nm-q-r}(OH)_r(BH_p)_{3-nm+q}\}_{1+p+q} \quad \text{I}$$

wherein

B denotes an optionally-substituted mononuclear or polynuclear unsaturated basic heterocyclic radical having no hetero member other than a nitrogen atom, each unsaturated ring of which has 5 or 6 ring members, and no more than 4 of which are nitrogen atoms,

X denotes chlorine or bromine,

m denotes 1 or 2,

n denotes 1 or 2, the sum of n and m being not greater than 3,

p denotes 0 or 1, but not 1 if n is 1,

q denotes 0 or 1, but not 1 if p is 1 and

r denotes 0 or 1.

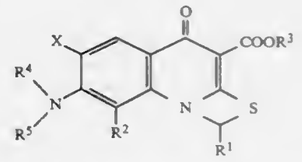
4,843,070

SUBSTITUTED THIAZETOQUINOLINE-3-CARBOXYLIC ACIDS AND PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Masahiro Kise; Masahiko Kitano, both of Kyoto; Masakuni Ozaki, Joyo; Kenji Kazuno, Shige; Ichiro Shirahase, Kyoto; Yoshifumi Tomii, Katano, and Jun Segawa, Kyoto, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

Filed May 13, 1987, Ser. No. 49,814
Claims priority, application Japan, May 14, 1986, 61-111620
Int. Cl.[4] C07D *513/04;* A61K *31/495, 31/425, 31/55*
U.S. Cl. 514—210 75 Claims

26. A pharmaceutical composition useful for treating bacterial or fungal infections in humans and animals which comprises a therapeutically effective amount of a compound of the formula I



[I]

or a pharmaceutically acceptable salt thereof wherien R^1 is hydrogen, straight or branched chain alkyl of 1 to 6 carbon atoms or phenyl unsubstituted or substituted by straight or branched chain alkyl of 1 to 6 carbon atoms, straight or branched chain alkoxy of 1 to 4 carbon atoms, hydroxy, halogen, trifluoromethyl or nitro; R^2 is hydrogen, straight or branched chain alkyl of 1 to 6 carbon atoms, straight or branched chain alkoxy of 1 to 4 carbon atoms, hydroxy, halogen, nitro or amino unsubstituted or substituted by acyl of 2 to 6 carbon atoms in the acyl moiety; R^3 is hydrogen or straight or branched chain alkyl of 1 to 6 carbon atoms unsubstituted or substituted by hydroxy, acyloxy of 2 to 6 carbon atoms or straight or branched chain alkoxy of 1 to 4 carbon atoms; R^4 and R^5 together with the nitrogen atom to which they are attached form a piperazinyl ring unsubstituted or substituted by 1 to 3 substituents selected from the group consisting of straight or branched chain alkyl of 1 to 6 carbon atoms, straight or branched chain alkenyl of 2 to 6 carbon atoms, aryl of 6 to 12 carbon atoms, aralkyl of 7 to 12 carbon atoms, hydroxyalkyl wherein the alkyl moiety is straight or branched chain of 1 to 6 carbon atoms, alkoxyalkyl of 2 to 6 carbon atoms or said alkoxyalkyl of 2 to 6 carbon atoms substituted by hydroxyl, aminoalkyl wherein the alkyl moiety is straight or branched chain of 1 to 6 carbon atoms, cyanoalkyl wherein the alkyl moiety is straight or branched chain of 1 to 6 carbon atoms, carboalkoxyalkyl wherein the alkoxy moiety is straight or branched chain of 1 to 4 carbon atoms and the alkyl moiety is straight or branched chain of 1 to 6 carbon atoms, acylalkyl wherein each of the acyl moieties and the alkyl moiety is straight or branched chain of 1 to 6 carbon atoms, acyl of 1 to 6 carbon atoms, hydroxy, oxo, amino, alkylamino wherein the alkyl moiety is straight or branched chain of 1 to 6 carbon atoms or dialkylamino wherein each alkyl moiety is straight or branched chain of 1 to 6 carbon atoms; and X is halogen, in combination with a pharmaceutically acceptable carrier.

4,843,071

METHOD AND COMPOSITION FOR TREATING OBESITY, DRUG ABUSE, AND NARCOLEPSY

Mark Hohenwarter, Mobile, Ala., assignor to Serotonin Industries of Charleston, Charleston, S.C.

Filed Dec. 5, 1986, Ser. No. 938,307
Int. Cl.[4] A61K *31/55, 31/435, 31/44*
U.S. Cl. 514—217 27 Claims

1. A composition useful for the treatment of obesity, drug abuse and narcolepsy comprising effective amount of:

a. a norepinephrine precursor; and

b. a norepinephrine re-uptake inhibitor.

4,843,072

ANTIHYPERTENSIVE PYRIDAZINONE AMINOISOPROPANOL DERIVATIVES

Kikuo Yasuda, Yokohama; Kenyu Shibata, Isagi; Seijiro Honma, Yokohama; Toshimi Seki Kawasaki; Kohichi Hasumi, Machida; Takeshi Masuda Yokohama; Akihiro Izumi, Machida; Tsutomu Ishimori, Kawasaki; Kotaro Gotanda, Kawasaki, and Masako Uno, Kawasaki, all of Japan, assignors to Teikoku Hormone Mfg. Co., Ltd., Tokyo, Japan

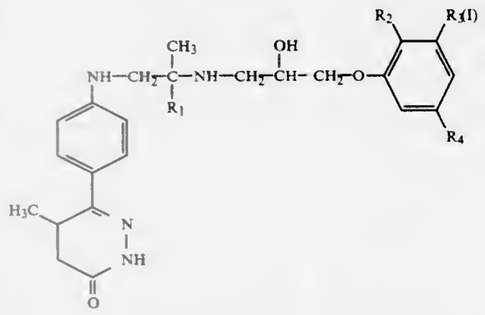
Filed Sep. 4, 1987, Ser. No. 93,033

Claims priority, application Japan, Sep. 8, 1986, 61-209673

Int. Cl.[4] C07D *237/04*; A61K *31/50*

U.S. Cl. 514—247 **7 Claims**

1. A pyridazinone derivative represented by the following formula



(I)

wherein R_1 represents a hydrogen atom or a methyl group, one of R_2, R_3 and R_4 represents a hydrogen atom and the remaining two of them represent a lower alkyl group, a trifluoromethyl group, a halogen atom, a cyano group or a nitro group, and a salt thereof.

6. A method of treating a patient with a hypertension, which comprises administering an antihypertensive amount of the pyridazinone derivative of formula (I) or its pharmaceutically acceptable salt as set forth in claim 1 to the patient.

4,843,073

1-T-BUTYL ERGOLINES USEFUL IN THE TREATMENT OF CEREBRAL INSUFFICIENCY AND SENILE DEMENTIA

Aldemio Temperilli, Milan; Enzo Brambilla, Mariano Comense; Mauro Gobbini, Sesto Calende, and Maria A. Cervini, Cardano Al Campo, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

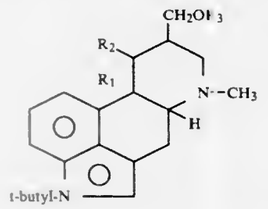
Filed Jun. 23, 1987, Ser. No. 65,597

Claims priority, application United Kingdom, Jun. 25, 1986, 8615471

Int. Cl.[4] A61K *31/48*; C07D *457/02*

U.S. Cl. 514—288 **3 Claims**

1. An ergoline derivative having the formaula I



wherein

R_1 and R_2 taken together represent a ring bond; or

R_1 is a hydrogen atom or a methoxy group and R_2 is a hydrogen atom; and

R_3 is a 1-oxo-2-cyclopenten-3-yl group; or a pharmaceutically acceptable salt thereof.

3. A pharmaceutical composition comprising a pharmaceutically effective amount of an ergoline derivative according to claim 1, or a pharmaceutically acceptable salt thereof, in admixture with a pharmaceutically acceptable diluent or carrier.

4,843,074

1-AZABICYCLO[2.2.2]OCTAN-3-YL 2-ARYL-3-AZACYCLO-2-HYDROXYPROPIONATES AND THEIR QUATERNARY SALTS

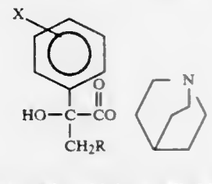
Waclaw J. Rzeszotarski, Millersville; Vicki H. Audia, and Moshe Weitzberg, both of Baltimore, all of Md., assignors to Marion Laboratories, Inc., Kansas City, Mo.

Filed May 17, 1988, Ser. No. 194,905

Int. Cl.[4] A61K *31/435, 31/54, 31/535*; C07D *453/00*

U.S. Cl. 514—228.2 **7 Claims**

1. The invention provides novel compounds of formula:



and their quaternary salts with lower alkyl halides, wherein:

X=H, halogen, lower alkyl, lower alkoxy, hydroxy, and

R=morpholinyl, thiomorpholinyl, piperidinyl, 1,4-dioxa-8-azaspiro[4.5]decanyl, 4-(2,6-dimethylmorpholinyl), 4-ketopiperidinyl, 4-hydroxypiperidinyl, 4-substituted piperazinyl (wherein the substituent is lower alkyl, hydroxyalkyl, acetoxyalkyl, or acyl).

6. A pharmaceutical composition comprising an effective amount of the compound of claim 1 and a pharmaceutically acceptable carrier.

4,843,075

BENZOTHIOPYRANO[4,3-C]PYRIDAZINE COMPOUNDS, METHODS FOR PREPARING SAID COMPOUNDS AND USES OF SAID COMPOUNDS

Toru Nakao, Nakatsu; Minoru Kawakami, Fukuoka; Yasuto Morimoto, Nakatsu; Shuzo Takehara, Nakatsu, and Tetsuya Tahara, Nakatsu, all of Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP86/00672, § 371 Date Jul. 17, 1987, § 102(e) Date Jul. 17, 1987, PCT Pub. No. WO87/04162, PCT Pub. Date Jul. 16, 1987

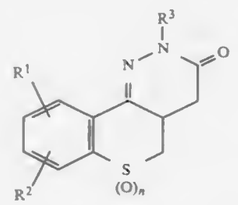
PCT Filed Dec. 27, 1986, Ser. No. 87,569

Claims priority, application Japan, Jan. 10, 1986, 61-3904

Int. Cl.[4] A61K *31/50*; C07D *495/04*

U.S. Cl. 514—248 **5 Claims**

1. A benzothiopyrano[4,3-C]pyridazine compound of the formula:



(I)

wherein

R^1 and R^2 are the same or different and each is hydrogen, halogen, trifluoromethyl, hydroxy, amino, nitro, cyano, C_{1-4} alkyl, C_{1-4} alkoxy or C_{2-5} alkanoylamido, with the proviso that R^1 and R^2 are not hydroxy and C_{1-4} alkoxy at the same time,

R^3 is hydrogen, C_{1-8} hydroxy-C_{1-4} alkyl, C_{2-5} alkanoyloxy-C_{1-4} alkyl, pyridyl, phenyl, naphthyl, phenyl-C_{1-4} alkyl, or naphthyl-C_{1-4} alkyl wherein said phenyl, naphthyl, phenyl-C_{1-4} alkyl and naphthyl-C_{1-4} alkyl groups are each unsubstituted or substituted by one or two substituents selected from the group consisting of halogen, trifuloromethyl, hydroxy, amino, nitro, cyano, C_{1-4} alkyl, C_{1-4} alkoxy and C_{2-5} alkanoylamido on the aromatic ring,

n is 0, 1 or 2, and

the bond between the 4-position and the 4a-position is a single bond or double bond.

4,843,076

DIHYDROPYRIDINE-5-PHOSPHONIC ACID CYCLIC ESTER

Kiyotomo Seto; Ryozo Sakoda; Hiroo Matsumoto; Yoshimasa Kamikawaji, all of Funabashi, and Sakuya Tanaka, Shiraoka, all of Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

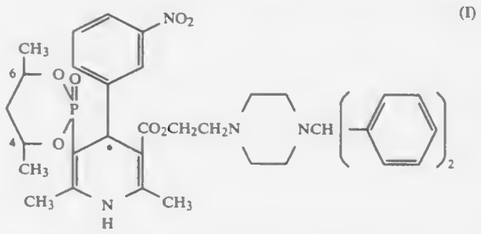
Continuation-in-part of Ser. No. 792,981, Oct. 30, 1985, and Ser. No. 851,158, Apr. 14, 1986, said Ser. No. 792,981, is a continuation-in-part of Ser. No. 654,473, Sep. 26, 1984, Pat. No. 4,576,934. This application Jul. 24, 1987, Ser. No. 77,220

Claims priority, application Japan, Sep. 10, 1986, 61-213412

Int. Cl.[4] C07D *401/12*; A61K *31/44*

U.S. Cl. 514—252 **5 Claims**

1. An optical isomer of a compound having the formula:



(I)

wherein the two methyl groups at 4-and 6-positions of the dioxaphosphorinane ring assume trans configurations to each other, which has a levo-rotatory angle of optical rotation attributable to the asymmetric carbon atom at 4-position of the dihydropyridine ring, and a pharmaceutically acceptable salt thereof.

4,843,077

ISOQUINOLINE DERIVATIVES HAVING RENAL VASODILATING PROPERTIES AND/OR CARDIOTONIC PROPERTIES AND/OR PHOSPHODIESTERASE INHIBITING PROPERTIES

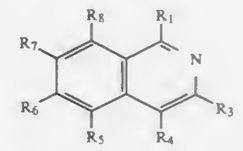
Jeffery S. Hinkle, Pennington, and O. William Lever, Jr., Skillman, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Jan. 9, 1987, Ser. No. 59,698

Int. Cl.[4] A61K *31/495*; C07D *401/06*

U.S. Cl. 514—253 **14 Claims**

1. A compound of the formula:



wherein

R_1 is selected from the group consisting of hydrogen, lower alkyl, cycloalkyl having 3–7 carbon atoms, phenyl, naphthyl, phenyl lower alkyl, naphthyl lower alkyl, and halogen-substituted radicals thereof;

R_3 is hydrazino, phenyl hydrazino, naphthyl hydrozino, lower alkyl hydrazino or NR'R" wherein R' and R" are independently selected from hydrogen, lower alkyl, amino lower alkyl, lower alkylamino lower alkyl, lower dialkylamino lower alkyl, cycloalkyl having 3–7 carbon atoms, phenyl, naphthyl, phenyl lower alkyl, naphthyl lower alkyl, C_{3-5} alkenyl, C_{2-5} alkynyl, substituted phenyl lower alkyl and naphthyl lower alkyl wherein the substituent is selected from lower alkyl, halo lower alkyl, hydroxy, lower alkoxy, lower alkylthio, halo, CN, NO_2, NH_2, sulfonic acid derivatives thereof and carboxylyic acid derivatives COX wherein X is hydroxy, lower alkoxy or NR' R" wherein R' and R" are as defined above, imidazolyl lower alkyl, phenylpiperazinyl lower alkyl, naphthyl piperazinyl lower alkyl, substituted phenyl piperazinyl lower alkyl and substituted naphthyl piperazinyl lower alkyl wherein the substituent is selected from lower alkyl, halo lower alkyl, hydroxy, lower alkoxy, lower alkylthio, halo, CN, NO_2, NH_2, sulfonic acid and carboxylic acid derivatives thereof, lower alkyl, phenyl alkyl piperidinyl, naphthyl alkyl piperidinyl, and benzoyl piperidinyl;

R_4 is selected from the group consisting of nitro, nitroso, an amino radical of the formula NR'R" wherein R' and R" are as defined above, NR"COR' wherein R' and R" independently are as defined above, $N(CONHR')_2$ wherein R' is as defined above, NHCONR'R" wherein R' and R" are as defined above;

R_5, R_6, R_7, and R_8 may be independently selected from the group consisting of hydrogen, halogen, hydroxy, cyloxy and lower alkoxy; and R_5 and R_6, R_6 and R_7 or R_7 and R_8 when taken together may form a methylenedioxy ring.

13. A method for increasing the contractile force of cardiac muscle in a mammal comprising administering to said mammal a unit dose of the pharmaceutical composition according to claim 8.

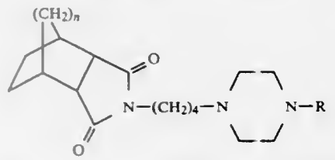
4,843,078

SUCCINIMIDE DERIVATIVES AND THEIR PRODUCTION AND USE

Kikuo Ishizumi, Toyonaka; Fujio Antoku, Takarazuka; Isamu Maruyama, Kawanishi, and Atsuyuki Kojima, Takarazuka, all of Japan, assignors to Sumitomo Pharmaceutical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 852,702, Apr. 15, 1986, abandoned. This application Apr. 15, 1988, Ser. No. 182,085
Claims priority, application Japan, Apr. 17, 1985, 60-83297
Int. Cl.[4] A61K *31/505*; C07D *401/14, 401/14*
U.S. Cl. 514—253 21 Claims

1. A succinimide derivative of the formula:



(I)

wherein R is a pyridyl or pyrimidinyl group substituted with at least one member selected from the group consisting of halogen, lower alkyl, lower alkoxy, cyano and hydroxyl, and n is an integer of 1 or 2, or a pharmaceutically acceptable acid addition salt thereof.

21. A method for the treatment of anxiety which comprises administering a pharmaceutically effective amount of at least one succinimide derivative (I) or its pharmaceutically acceptable acid addition salt as claimed in claim 1 to a patient suffering from anxiety.

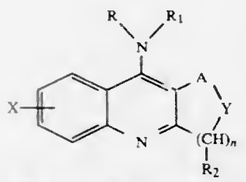
4,843,079

FUSED HETEROALKYLENE QUINOLINAMINES

Gregory M. Shutske, Somerset, and Richard C. Effland, Bridgewater, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 41,512, Apr. 23, 1987, abandoned. This application Apr. 4, 1988, Ser. No. 171,103
Int. Cl.[4] A61K *31/38, 31/395*; C07D *471/04*
U.S. Cl. 514—292 11 Claims

1. A compound of the formula



wherein n is 1–4; R is hydrogen, loweralkyl or loweralkylcarbonyl; R_1 is hydrogen, loweralkyl, loweralkylcarbonyl, aryl, diloweralkylaminoloweralkyl, aryllowealkyl, diarylloweralkyl, oxygen-bridged aryllowealkyl, or oxygen-bridged [diaryllowerallyl]diaryllowealkyl; A is a direct bond or $(CHR_3)_m$, m being 1–3; X is hydrogen, loweralkyl, cycloalkyl, loweralkoxy, halogen, hydroxy, nitro, trifluoromethyl, formyl, loweralkylcarbonyl, arylcarbonyl, —SH, loweralkylthio, —NHCOR$_4$ or —NR$_5$R$_6$, R_4 being hydrogen or loweralkyl, and R_5 and R_6 being independently hydrogen, loweralkyl or cycloalkyl; Y is O, S or NR_7; and each R_2, each R_3 and R_7 are independently hydrogen or loweralkyl, or taken two at a time form a methylene or ethylene group constituting a part of a ring of at least five atoms; with the proviso that A, Y and $(CHR_2)_n$ together form a six-membered ring consisting of five carbon atoms and one nitrogen and the further proviso that when A is CH_2, Y is NCH_3, $(CHR_2)_n$ is CH_2CH_2, X is H, CH_3, Cl, Br or NO_2 and R is H, R_1 is not H, methyl, ethyl, propyl, butyl or benzyl, and that when A is —CH_2—or —CHR'—, Y is NH or NR' and $(CHR_2)_n$ is —CH_2CH_2—or —CH_2CHR'—, the group —NRR_1 is not —NH_2, —NHC_6H_5 or diloweralkylaminoloweralkylamino, each R' being independently loweralkyl, stereo, optical and geometrical isomer thereof, or a pharmaceutically acceptable acid addition salt thereof.

10. A pharmaceutical composition for increasing the cholinergic function in a mammal which comprises an effective amount of a compound as defined in claim 1 and a carrier therefor.

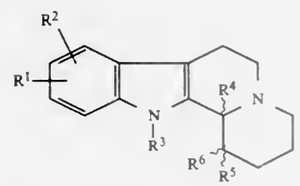
4,843,080

1,12-DISUBSTITUTED OCTAHYDROINDOLO[2,3-]QUINOLIZINE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS

Csaba Szántay; Ferenc Sóti; Maria Incze; Zsuzsanna Balogh née Kardos; Zsolt Szombathelyi; Egon Kárpáti, all of Budapest; Béla Kiss, Vecsés; Katalin Csomor, Budapest; István Laszlovszky, Budapest; Erzsébet Lapis, Budapest; Lilla Forgács, Budapest; Csaba Kuthi, Budapest, and László Szporny, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Apr. 17, 1986, Ser. No. 853,353
Claims priority, application Hungary, Apr. 19, 1985, 1517/85
Int. Cl.[4] C07D *471/08*; A61K *31/40*
U.S. Cl. 514—285 4 Claims

1. A compound of the Formula (I)



(I)

wherein

R^1 and R^2 are the same or different and are hydrogen, halogen, nitro, C_1 to C_6 alkyl, C_1 to C_6 alkoxy or hydroxy;

R^3 and R^5 are the same or different and are hydrogen, C_1 to C_6 alkyl, phenyl, or phenyl-C_1 to C_6 alkyl;

R^4 is C_1 to C_6 alkyl, phenyl, or phenyl-C_1 to C_6 alkyl, and

R^6 is alkoxycarbonyl having 1 to 6 carbon atoms in the alkoxy group, alkylcarbonyl having 1 to 6 carbon atoms in the alkyl group, phenylcarbonyl, or phenyl-C_1 to C_6-alkylcarbonyl;

or a cis or trans isomer, an optical isomer or a pharmaceutically acceptable acid addition salt thereof.

2. A vasodilating method of treatment which comprises the step of administering to a mammalian subject in need of said treatment, a vasodilatingly effective amount of a compound of the Formula (I) as defined in claim 1 or a pharmaceutically acceptable acid addition salt thereof.

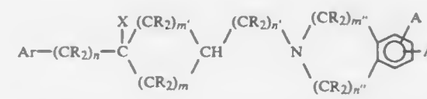
4,843,081

ARYL AND HETEROARYL SUBSTITUTED CYCLOALKYL COMPOUNDS

John R. Regan, Princeton, N.J.; Jeffrey N. Barton, Philadelphia; John T. Suh, Maple Glen, both of Pa., and Jerry W. Skiles, Tuckahoe, N.Y., assignors to Rorer Pharmaceutical Corporation, Fort Washington, Pa.

Division of Ser. No. 732,557, Nov. 20, 1986, Pat. No. 4,795,757, which is a continuation-in-part of Ser. No. 646,735, Sep. 4, 1984, abandoned. This application Jun. 27, 1988, Ser. No. 213,043
Int. Cl.[4] A61K *31/47*; C07D *217/04*
U.S. Cl. 514—307 4 Claims

2. A pharmaceutical composition for the treatment of cardiovascular diseases comprising as an active ingredient a member of the formula:



wherein:

Ar is phenyl, naphthyl, or indole optionally substituted with hydroxy, halo, CF_3, NO_2, C_{1-6} alkyl or C_{1-6} alkoxy;

A and A' are each hydrogen, C_{1-6} alkyl, C_{1-6} alkoxy or hydroxy;

X is cyano, nitro, COOR, SR, SOR or SOOR;

R is H or C_{1-6} alkyl;

n, n' and n'' are each 0 to 4; and m, m' and m'' are each 1 to 4 or pharmaceutically acceptable salts thereof in a pharmaceutically acceptable carrier.

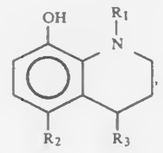
4,843,082

1,2,3,4-TETRAHYDRO-8-QUINOLINOL DERIVATIVES AND ANTI-ALLERGIC USE THEREOF

Scott A. Biller, Ewing, and Raj N. Misra, Hopewell, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 5, 1986, Ser. No. 859,981
Int. Cl.[4] C07D *213/36*; A61K *31/47*
U.S. Cl. 514—311 15 Claims

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein

R_1 and R_2 are each hydrogen and R_3 is alkyl or arylalkyl;

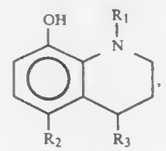
R_1 and R_3 are each hydrogen and R_2 is arylmethyl or arylcarbonyl;

R_1 is methyl, R_2 is arylmethyl and R_3 is hydrogen; or

R_1 is alkyl of seven or more carbons or arylalkyl and R_2 and R_3 are each hydrogen;

wherein the term "aryl" refers to phenyl or phenyl substituted with 1, 2 or 3 alkyl of one to four carbons, alkoxy of one to four carbons, halogen or hydroxy groups.

15. A method of treating allergies in a mammalian species which comprises administering to a mammal in need thereof, an effective amount of a compound having the formula



or a pharmaceutically acceptable salt thereof, wherein

R_1 and R_2 are each hydrogen and R_3 is alkyl or arylalkyl;

R_1 and R_3 are each hydrogen and R_2 is arylmethyl or arylcarbonyl;

R_1 is methyl, R_2 is arylmethyl and R_3 is hydrogen; or

R_1 is alkyl of seven or more carbons or arylalkyl and R_2 and R_3 are each hydrogen;

wherein the term "aryl" refers to phenyl or phenyl substituted with 1, 2 or 3 alkyl of one to four carbons, alkoxy of one to four carbons, halogen or hydroxy groups.

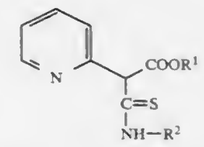
4,843,083

2-PYRIDYLACETIC ACID DERIVATIVE, AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME AND METHOD OF TREATING A PEPTIC ULCER

Mitsuhito Okitsu, Osaka, Japan, assignor to Suntory Limited, Osaka, Japan

Continuation-in-part of Ser. No. 925,175, Oct. 31, 1986, Pat. No. 4,738,977. This application Mar. 3, 1988, Ser. No. 163,711
Claims priority, application Japan, Nov. 8, 1985, 60-248970
The portion of the term of this patent subsequent to Apr. 19, 2005, has been disclaimed.
Int. Cl.[4] C07D *213/55, 401/06*; A61K *31/445*
U.S. Cl. 514—318 3 Claims

1. A 2-pyridylacetic acid derivative having the formula (I):



(I)

wherein R^1 represents an alkyl having 5 to 10 carbon atoms or —$(CH_2)_m$—cycloalkyl group having C_5–C_8 cycloalkyl, which is optionally substituted with 1 to 3 alkyl groups having 1 to 6 carbon atoms, where m represents zero or an integer of 1 to 4; R^2 represents hydrogen, a linear alkyl having from 1 to 10 carbon atoms, a cyclic alkyl having 3 to 10 carbon atoms, a hydroxylalkyl having 2 to 16 carbon atoms, an alkenyl having 3 to 6 carbon atoms, an aryl having 6 to 10 carbon atoms, an aralkyl having 7 to 15 carbon atoms, or a group —$(CH_2)_n$—A, wherein n represents an integer of 0 to 3 and A represents a pyridine or piperidine ring, or a pharmacologically acceptable acid addition salt thereof.

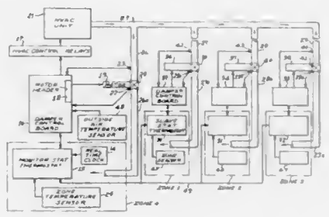
3. A method for treating a peptic ulcer in an individual in need of such treatment, comprising administering to the individual a therapeutically effective amount of the compound as claimed in claim 1.

4,843,084

THERMOSTAT CONTROL SYSTEM

Jeffrey L. Parker, and Edward Parker, both of Jacksonville, Fla., assignors to Parker Electronics, Inc., Jacksonville, Fla.

Filed Feb. 12, 1987, Ser. No. 13,869
Int. Cl.[4] G05D *23/00*
U.S. Cl. 364—505 72 Claims



1. In a system for monitoring and controlling the condition of air in a plurality of zones within predetermined operating limits using a single zone HVAC unit, operated by a first control means, in which conditioned air passes into a plurality of zones via a plurality of dampers, each operated by a control means, in a plurality of ducts communicating with respective zones, a thermostat means for operating said first control means and said control means for one said damper in one said zone, said thermostat means comprising:

first circuit means responsive to input signals for establishing

operating limits for said one zone and providing a first digital word output signal representative of said operating limits;

second circuit means responsive to input signals indicative of the actual condition of air in said one zone for providing a second digital word output signal representative of the actual condition of air therein;

third circuit means adapted to be coupled to a peripheral circuit means for receiving data from a peripheral circuit means and for providing a third digital word output signal representative of the information contained in such data;

fourth circuit means responsive to output signals from said first, second, and third circuit means for providing fourth digital word output signals for operating said control means of said one damper and said first control means;

programmable logic means for providing digital word input signals to said fourth circuit means for selectively controlling said fourth circuit means; and

logic means for selectively operating said one damper control means and said first control means in response to respective said fourth digital word input signals from said fourth circuit means.

4,843,085

PYRIDINE DERIVATIVES, PROCESS FOR PRODUCTION THEREOF AND PHARMACEUTICAL COMPOSITIONS USEFUL AS ANTI-ARHYTMICS

Takashi Fujikura; Yuzo Matsumoto, both of Saitama, and Masharu Asano, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

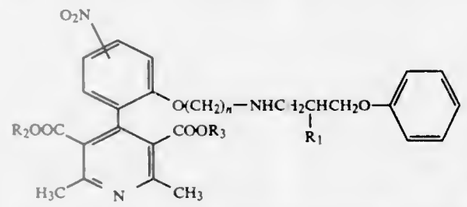
Filed Jun. 29, 1988, Ser. No. 212,929

Claims priority, application Japan, Jul. 1, 1987, 62-165746; Dec. 15, 1987, 62-318076

Int. Cl.[4] C07D *213/70*; A61K *31/44*

U.S. Cl. 514—356 **16 Claims**

1. A pyridine derivative represented by the following formula:



and the physiologically acceptable acid addition salts thereof, wherein R_1 represents a hydrogen atom or a hydroxy group, R_2 and R_3, which may be the same or different, each represents a lower alkyl group, and n represents an integer of 1 to 6.

4,843,086

TETRAHYDRO-BENZTHIAZOLES, THE PREPARATION THEREOF AND THEIR USE AS INTERMEDIATE PRODUCTS OR AS PHARMACEUTICALS

Gerhart Griss, deceased, late of Biberach (by Elisabeth Griss, legal representative); Claus Schneider, Ingelheim am Rhein; Rudolf Hurnaus, Biberach, all of Fed. Rep. of Germany; Walter Kobinger; Ludwig Pichler, both of Vienna, Austria; Rudolf Bauer, Wiesbaden, Fed. Rep. of Germany; Joachim Mieran, Mainz, Fed. Rep. of Germany; Dieter Hinzen, Zornheim, Fed. Rep. of Germany, and Gunter Schingnitz, Bad Kreuznach, Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Division of Ser. No. 810,947, Dec. 19, 1985, Pat. No. 4,731,374.

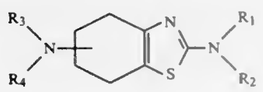
This application Nov. 23, 1987, Ser. No. 124,197

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1984, 34470751; Mar. 13, 1985, 3508947

Int. Cl.[4] A61K *31/425*

U.S. Cl. 514—367 **40 Claims**

1. A method for lowering the blood pressureof a host which comprises administering a blood pressure lowering amount of a tetrahydro-benzthiazole of the formula:



(I)

wherein

wherein

R_1 is a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, an alkenyl or alkynyl group each having 3 to 6 carbon atoms, a phenyl alkyl group having 1 to 3 carbon atoms in the alkyl part, wherein the above mentioned phenyl nucleus may be substituted by 1 or 2 halogen atoms;

R_2 is a hydrogen atom or an alkyl group with 1 to 4 carbon atoms;

R_3 is a hydrogen atom, an alkyl group with 1 to 7 carbon atoms, a cycloalkyl group having 3 to 7 carbon atoms, an alkenyl or alkynyl group having 3 to 6 carbon atoms, a phenyl alkyl group having 1 to 3 carbon atoms in the alkyl part, while the phenyl nucleus may be substituted by fluorine, chlorine or bromine atoms; and,

R_4 is a hydrogen atom, an alkyl group with 1 to 4 carbon atoms, an alkenyl or alkynyl group having 3 to 6 carbon atoms; or,

R_3 and R_4 together with the nitrogen atom between them form a pyrrolidino, piperidono, hexamethyleneimino or morpholino group; or, a pharmaceutically acceptable acid addition salt thereof.

4,843,087

DI-HETEROCYCLIC COMPOUNDS AND THEIR USE AS ANTIVIRAL AGENTS

Guy D. Diana, Stephentown, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

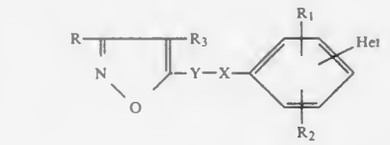
Continuation-in-part of Ser. No. 751,348, Jul. 2, 1985, abandoned, which is a continuation-in-part of Ser. No. 624,302, Jun. 25, 1984, abandoned, which is a continuation-in-part of Ser. No. 527,583, Aug. 29, 1983, abandoned. This application Jun. 17, 1987, Ser. No. 63,182

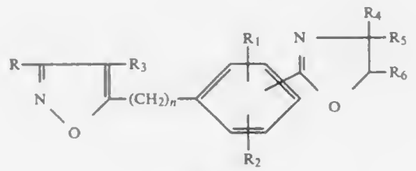
Claims priority, application Canada, Jun. 24, 1986, 512264

Int. Cl.[4] A61K *31/42*; C07D *413/10, 413/12*

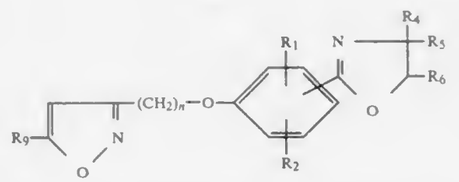
U.S. Cl. 514—374 **43 Claims**

1. A compound having one of the formulas:



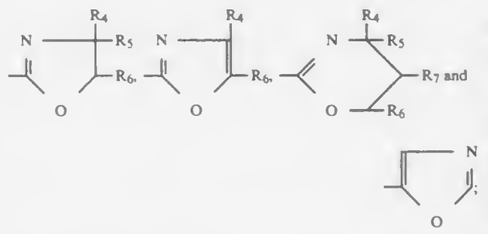


and



wherein:

Het in Formula I and the oxazolinyl ring in Formulas II and III are in the meta or para position with respect to the phenoxy or phenylalkyl linkage, and Het is selected from the group consisting of:



Y is an alkylene bridge of 3 to 9 carbon atoms optionally interrupted by one or two oxygen atoms, by cyclohexyl or by an olefinic linkage;

X is O, S or SO;

n is an integer from 3 to 9;

R_1 and R_2 are selected from the group consisting of hydrogen, lower-alkyl, lower alkenyl, halogen, nitro, lower-alkoxy, lower-alkylthio, difluoromethyl, trifluoromethyl, amino, lower-alkanoylamino, di-lower-alkylamino, hydroxy, lower-alkenoyl, lower-alkanoyl, hydroxymethyl and carboxy;

R, R_3, R_4, R_5, R_6 and R_7 are each hydrogen or alkyl of 1 to 3 carbon atoms optionally substituted by a member of the group consisting of hydroxy, lower-alkanoyloxy, lower-alkoxy, halo or N=Z', wherein N=Z' is amino, lower-alkanoylamino, lower-alkylamino, di-lower-alkylamino, 1-pyrrolidyl, 1-piperidinyl or 4-morpholinyl; with the proviso that R is other than hydrogen; and

R_9 is alkyl of 1 to 3 carbon atoms;

or a pharmaceutically acceptable acid-additon salf of basic members thereof.

29. A method for combating an antiviral infection in a mammalian host which comprises administering to said host an antivirally effective amount of a compound according to claim 1.

4,843,088

HYDROXYETHYL-AZOLE DERIVATIVES

Graham Holmwood; Wolfgang Krämer, both of Wuppertal; Karl H. Büchel, Burscheid; Paul Reinecke, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 650,965, Sep. 14, 1984, Pat. No. 4,645,767.

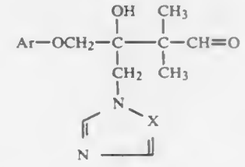
This application May 29, 1986, Ser. No. 868,402

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1983, 3334779

Int. Cl.[4] C07D *249/12*; A01N *43/653*

U.S. Cl. 514—383 **6 Claims**

1. A hydroxyethyl-azole derivative of the formula



in which

Ar represents naphthyl, or represents phenyl which is unsubstituted, monosubstituted or disubstituted by identical or different substituents selected from the group consisting of halogen; alkyl with 1 to 4 carbon atoms; halogenoalkyl having 1 to 2 carbon atoms and 1 to 5 identical or different halogen atoms; and phenyl, and X represents a nitrogen atom or an addition product thereof with an acid or metal salt.

4,843,089

ANTIMYCOTIC AGENT

Graham Holmwood; Wolfgang Krämer, both of Wuppertal; Karl H. Büchel, Burscheid, and Manfred Plempel, Haan, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

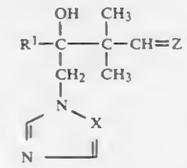
Continuation of Ser. No. 778,347, Sep. 20, 1985, abandoned. This application May 29, 1987, Ser. No. 55,818

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1984, 3436452

Int. Cl.[4] A61K *31/41, 31/415*

U.S. Cl. 514—383 **8 Claims**

1. A method of combating mycoses which comprises administering to a patient an antimycotically effective amount of a hydroxyethyl-azole of the formula



in which

R^1 represents alkyl or the grouping Ar—Y—,

Ar represents aryl optionally substituted by halogen, alkyl with 1 to 4 carbon atoms, alkoxy or alkylthio with 1 or 2 carbon atoms, nitro, halogenoalkyl, halogenoalkoxy or halogenoalkylthio with 1 or 2 carbon atoms,

Y represents a direct bond or the groupings $—CH_2—$, $—CH_2—CH_2—$, $—OCH_2—$, $—SCH_2—$, —CH—CH— or —C=C—,

X represents a nitrogen atom or the CH group,

Z represents oxygen or the NOR^2 group and

R^2 represents hydrogen, alkyl, alkenyl, alkinyl, aralkyl op-

tionally substituted by halogen, alkyl with 1 to 4 carbon atoms, alkoxy or alkylthio with 1 or 2 carbon atoms, nitro, halogenoalkyl, halogenoalkoxy or halogenoalkylthio with 1 or 2 carbon atoms, or C_1–C_6-cycloalkylmethyl optionally substituted by alkyl with up to 3 carbon atoms, or an acid addition salt thereof.

4,843,090

SOIL FUNGICIDAL BENZIMIDAZOLES

Hiroki Tomioka, Takarazuka; Tadashi Ooishi, Toyonaka, and Naonori Hirata, Sakai, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

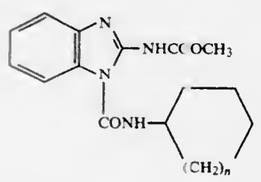
Continuation of Ser. No. 841,761, Mar. 20, 1986, abandoned. This application Sep. 8, 1988, Ser. No. 243,193

Claims priority, application Japan, Jul. 5, 1985, 60-148985

Int. Cl.⁴ A01N *43/52*

U.S. Cl. 514—388 **1 Claim**

1. A method for controlling Fusarium diseases of living plants or parts of living plants caused by a benzimidazole-resistant strain of Fusarium selected from the group consisting of *Fusarium nivale* f. sp. griminicola of wheat, and *Fusarium moniliforme* of rice which comprises applying to any of the above-listed Fusaria a fungicidally effective amount of a compound of the formula:



wherein n is 2 or 3.

4,843,091

INDOLYLPROPIONIC ACIDS, COMPOSITIONS OF, AND USE THEREOF TO INHIBIT THROMBOCYTE AGGREGATION

Ulrich Rosentreter, Wuppertal; Horst Böshagen, Haan; Folker Lieb, Leverkusen; Hermann Oediger, Cologne; Volker-Bernd Fiedler, Leverkusen; Elisabeth Perzborn, and Friedel Seuter, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

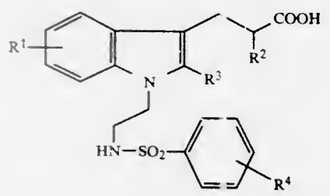
Filed Jun. 5, 1987, Ser. No. 58,489

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1986, 3621761

Int. Cl.⁴ C07D *209/04*; A61K *31/405*

U.S. Cl. 514—419 **10 Claims**

1. An N-sulphonamidoethyl-indole of the formula



in which

R^1 represents hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, fluorine, chlorine, bromine, trifluoromethyl, C_1–C_4-alkylamino or di-C_1–C_4-alkylamino,

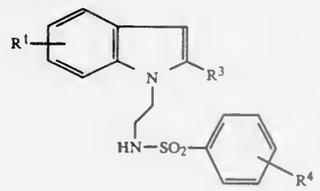
R^2 represents hydrogen or C_1–C_4-alkyl,

R^3 represents hydrogen, C_1–C_4-alkyl or phenyl, and

R^4 represents hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, fluorine, chlorine, bromine, trifluoromethyl, C_1–C_4-alkylamino or di-C_1–C_4-alkylamino. or a pharmacologically acceptable salt thereof.

8. A method of inhibiting aggregation of thrombocytes in blood or plasma which comprises adding thereto an aggregation-inhibiting amount of a compound or a pharmacologically acceptable salt thereof according to claim 1.

10. A compound of the formula



in which

R^1 represents hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, fluorine, chlorine, bromine, trifluoromethyl, C_1–C_4-alkylamino or di-C_1–C_4-alkylamino,

R^3 represents hydrogen, C_1–C_4-alkyl or phenyl, and

R^4 represents hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, fluorine, chlorine, bromine, trifluoromethyl, C_1–C_4-alkylamino or di-C_1–C_4-alkylamino.

4,843,092

IMMUNOSUPPRESSIVE AGENT

Hitoshi Shichi, 4455 Pine Tree Trail, Bloomfield Hills, Mich. 48013; Yoshihito Tanouchi, Troy, Mich., and Yoshio Kamada, Tokyo, Japan, assignors to Hitoshi Shichi, Bloomfield Hills, Mich.

PCT No. PCT/JP86/00204, § 371 Date Jul. 30, 1987, § 102(e) Date Jul. 30, 1987

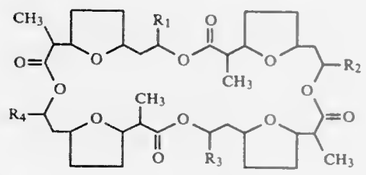
PCT Filed Apr. 25, 1986, Ser. No. 94,679

Int. Cl.⁴ A61K *31/335*

U.S. Cl. 514—450 **4 Claims**

1. A method of treating a patient having an autoimmune disease selected from the group consisting of rheumatoid arthritis, systemic lupus erythematosus, glomerulonephritis, autoimmune uveitis, and autoimmune disease in the thyroid, comprising administering to said patient, in order to suppress anti-SBRC antibody production, from about 10 to about 500 mg per day of an antibiotic of the following formula:

(I)



wherein each of R_1, R_2, R_3, and R_4 is selected from the group consisting of methyl and ethyl, in a pharmaceutically acceptable carrier.

4,843,093

BUTYROLACTONE DERIVATIVES, PROCESS FOR PRODUCTION THEREOF AND USE THEREFOR

Yoichiro Nagai, Yamato; Taichi Nakano, Maebashi, and Yutaka Oomura, Fukuoka, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

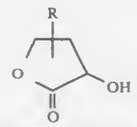
Filed May 29, 1987, Ser. No. 55,324

Claims priority, application Japan, Nov. 27, 1986, 61-282775

Int. Cl.⁴ A61K *31/365*; C07D *307/20*

U.S. Cl. 514—473 **6 Claims**

1. A butyrolactone compound of the formula:



wherein R is an alkyl group of 6 to 10 carbon atoms.

4,843,094

DERIVATIVES OF P-GUANTIDINOBENZOIC ACID AND PHARMACEUTICAL AGENTS CONTAINING THEM AS ACTIVE INGREDIENT

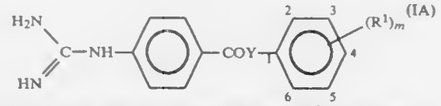
Katsuhiro Imaki, Kyoto; Yoshinobu Arai, Osaka, and Hiroyuki Ohno, Shiga, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Filed Nov. 12, 1986, Ser. No. 929,317

Int. Cl.⁴ A61K *31/255*; C07C *143/68*

U.S. Cl. 514—518 **3 Claims**

1. A derivative of p-guanidinobenzoic acid of the formula:



(IA)

wherein Y represents an oxygen atom and $(R^1)_m$ represents a member selected from the group consisting of 5-ethanesulfonyloxy-3-methoxymethyl, 5-mesyloxy-3-methoxy, 3-chloro-5-mesyloxy, 3-chloro-5-ethanesulfonyloxy, 3-chloro-5-isopropanesulfonyloxy, 5-benzenesulfonyloxy-3-chloro and 5-ethanesulfonyloxy-3-methyl group, or an acid addition salt thereof.

4,843,095

FREE FATTY ACIDS FOR TREATMENT OR PROPYHLAXIS OF RHEUMATOID ARTHRITIS ARTHRITIS

David Rubin, San Diego, Calif., assignor to Century Laboratories, Inc., Port Washington, N.Y.

Filed Aug. 7, 1987, Ser. No. 82,701

Int. Cl.⁴ A61K *31/23*

U.S. Cl. 514—558 **9 Claims**

1. A method for treating rheumatoid arthritis comprising administering to a patient suffering from such arthritis an effective amount of a fatty acid selected from the group consisting of EPA, DHA, and a mixture thereof, said fatty acid being in the free acid form thereof or in the form of a pharmaceutically acceptable salt thereof.

4,843,096

TREATMENT OF ACNE

Werner K. Stiefel, Coral Gables, Fla., assignor to Stiefel Laboratories, Inc., Coral Gables, Fla.

Continuation of Ser. No. 748,913, Jun. 26, 1985, abandoned. This application Dec. 1, 1986, Ser. No. 935,603

Int. Cl.⁴ A61K *31/20*

U.S. Cl. 514—559 **3 Claims**

1. The method of treating inflammatory acne in a human which comprises topically applying an effective amount of a substantially non-aqueous gel composition comprising from about 0.025 to about 0.1% by weight of 13-cis retinoic acid.

4,843,097

10-ARYL-1,8-DIHYDROXY-9-ANTHRONES AND THEIR ESTERS, PROCESS FOR PREPARING SAME, AND USE OF SAME IN HUMAN AND VETERINARY MEDICINE AND IN COSMETICS

Braham Shroot, Antibes; Gérard Lang, Saint Gratien; Jean Maignan, Tremblay les Gonesse; Serge Restle, Aulnay-sous-Bois; Christopher Hensby, Biot, and Michel Colin, Livry-Gargan, all of France, assignors to Groupement d'Intérêt Economique dit: Centre International de Recherches Dermatologiques C.I.R.D., Valbonne, France

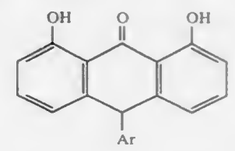
Continuation-in-part of Ser. No. 744,240, Jun. 13, 1985, abandoned, and Ser. No. 940,068, Dec. 10, 1986. This application Apr. 4, 1988, Ser. No. 176,974

Claims priority, application France, Jun. 13, 1984, 84 09203; Dec. 11, 1985, 85 18338

Int. Cl.⁴ A61K *31/12, 7/13, 7/40*; C07C *50/16*

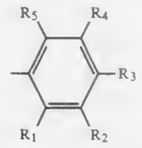
U.S. Cl. 514—680 **9 Claims**

1. A 10-aryl-1,8 dihydroxy anthrone having the formula:



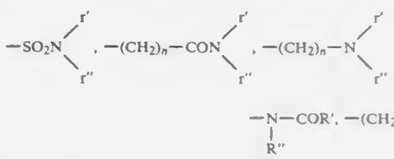
(I)

wherein: Ar represents an aromatic radical having a formula selected from:



(i)

wherein R_1, R_2, R_3, R_4 and R_5, each independently represent hydrogen, halogen, $-CF_3$, hydroxyl, lower alkyl, lower cycloalkyl, lower hydroxyalkyl, lower alkoxy, nitrile



wherein r' and r'' each independently represent hydrogen or lower alkyl; n=0 or a whole number ranging from 1 to 3 inclusive; and R' and R'' represent hydrogen, linear or branched lower alkyl, or with the proviso that at least one of R_{1-R5} is other than hydrogen.

4,843,098

INGESTIBLE AGGREGATE AND DELIVERY SYSTEM PREPARED THEREFROM

James J. Shaw, Morristown, and Shri C. Sharma, Mendham, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 698,511, Feb. 5, 1985, Pat. No. 4,747,881. This application Feb. 29, 1988, Ser. No. 161,569

Int. Cl.[4] A23L *1/29*; A61K *9/16*

U.S. Cl. 514—778 8 Claims

1. An ingestible substantially anhydrous aggregate, having a particle size of about 4 to about 80 mesh, U.S. Std. Sieve and a density of about 0.25 g/cc, comprising a pre-swelled hydrocolloid and a solid substrate, wherein the hydrocolloid at least partially entraps and binds the substrate, the substrate comprising a drug, wherein the substrate and the hydrocolloid are not the identical material and wherein the drug is selected from the group consisting of mineral supplements, analgesics, antipyretics, anti-arrhythmics, ion exchange resins, appetite suppressants, vitamins, anti-inflammatory substances, coronary dilators, cerebral dilators, peripheral vasodilators, anti-infectives, phychotropics, anti-manics, stimulants, antihistamines, laxatives, decongestants, anti-diarrheal preparations, anti-anginal drugs, vasodialators, antihypertensive drugs, vasoconstrictors and migraine treatments, antibiotics, tranquilizers, antipsychotics, antitumor drugs, anticoagulants and anti-thrombotic drugs, hypnotics, sedatives, anti-emetics, anti-nauseants, anti-convulsants, neuromuscular drugs, hyper- and hypoglycaemic agents, thyroid and anti-thyroid preparations, diuretics, anti-spasmodics, uterine relaxants, mineral and nutritional additives, anti-obesity drugs, anabolic drugs, erythropoietic drugs, anti-asthmatics, expectorants, cough suppressants, mucolytics, anti-uricemic drugs and mixtures thereof.

4,843,099

DEVICE AND COMPOSITION FOR TREATMENT OF THE GUMS

Abdul Gaffar, Princeton, and John Affiitto, Brookside, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Jul. 20, 1987, Ser. No. 75,165

Int. Cl.[4] A61K *31/165*, *9/08*

U.S. Cl. 514—576 3 Claims

1. A method for treating inflamed and swollen gingiva comprising inserting the tip portion of a periodontal gum device into inflamed and swollen gingival pocket and irrigating the affected areas with a sufficient amount of solution in said device to cause reduction of gingival inflammation and swelling; said device comprising an elongated member terminating proximally in a flexible tip portion provided with at least one aperture for discharge of the solution said solution containing 0.1–5% by weight of Ibuprofen, a pharmaceutically acceptable salt thereof or lower alkyl C_{1-6} ester thereof, which is stored in a fluid reservoir in said device from which said solution is delivered to said aperture, said tip portion being configured to expedite probing contact with gingival sulcus and permit discharge of said solution into gingival sulcus.

4,843,100

BENZOYLUREAS, THEIR PRODUCTION AND USE

Hiroshi Nagase, Kawanishi, and Yasuo Sato, Kyoto, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 706,164, Feb. 27, 1985, abandoned. This application Jun. 19, 1987, Ser. No. 63,749

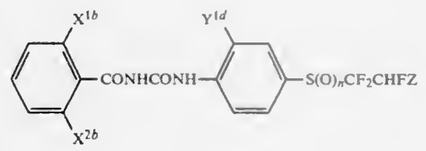
Claims priority, application Japan, Feb. 27, 1984, 59-36881

The portion of the term of this patent subsequent to Dec. 30, 2003, has been disclaimed.

Int. Cl.[4] C07C *147/14*, *147/12*; A01N *47/34*

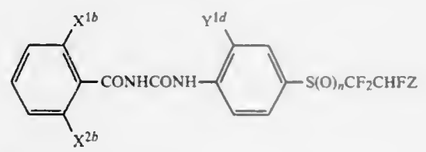
U.S. Cl. 514—594 5 Claims

1. A compound of the formula:



wherein n is 1 or 2; X^{1b} is F or Cl; X^{2b} is F or Cl, when X^{1b} is F, or X^{2b} is hydrogen or Cl, when X^{1b} is Cl; Y^{1d} is F, Cl, Br or methyl; and Z is F or Cl.

5. An insecticidal and/or ovicidal composition which contains an effective amount compound of the formula:



wherein n is 1 or 2; X^{1b} is F or Cl; X^{2b} is F or Cl, when X^{1b} is F, or X^{2b} is hydrogen or Cl, when X_{1b} is Cl; Y^{1d} is F, Cl, Br or methyl; and Z is F or Cl, and

a suitable carrier or carriers.

4,843,101

CATALYST AND METHOD FOR PRODUCING METHANOL

Kamil Klier, Bethlehem; Richard G. Herman, Whitehall, and Gamimi Vedage, Bethlehem, all of Pa., assignors to Lehigh University, Bethlehem, Pa.

Continuation of Ser. No. 70,593, Jul. 7, 1987, abandoned, which is a continuation of Ser. No. 919,592, Oct. 17, 1986, abandoned, which is a continuation of Ser. No. 759,494, Jul. 26, 1985, abandoned, which is a continuation of Ser. No. 558,366, Dec. 5, 1983, abandoned, which is a continuation of Ser. No. 500,037, Jun. 1, 1983, Pat. No. 4,480,131. This application Dec. 21, 1987, Ser. No. 135,571

Int. Cl.[4] C07L *27/06*

U.S. Cl. 518—713 6 Claims

1. A method of poducing methanol by reacting synthesis gas mixtures of hydrogen and carbon monoxide at a temperature of 180° C.–300° C. over a catalyst system comprising a binary alkalized catalyst consisting essentially of metallic copper dispersed in zinc oxide, said catalyst including a dopant comprising one or more alkaline metals selected from the group of cesium, rubidium, and potassium, wherein the dopant concentration is in the range from 0.01 to 1.0 mol % with respect to copper and zinc and the methanol is produced with a selectivity of at least 97% with respect to carbon monoxide conversion.

4,843,102

REMOVAL OF MERCURY FROM GASES

Robert L. Horton, South Russel, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 662,737, Oct. 19, 1984, Pat. No. 4,591,490. This application Sep. 18, 1985, Ser. No. 777,114

Int. Cl.[4] C08D *5/20*

U.S. Cl. 521—28 2 Claims

1. A method for treating a polysulfide-resin complex comprising: (1) producing a polysulfide-resin complex by the method comprising (1) contacting basic insoluble anion exchange resin with a source of polysulfide anions under ion exchange conditions to produce a polysulfide-resin complex, (b) washing said polysulfide-resin complex with distilled water to produce a washed product and (c) drying said washed product at ambient temperature to produce a dried product; (2) contacting said dried polysulfide-resin complex with mercury vapor for a time sufficient to provide a mercury-containing polysulfide-resin complex; and (3) contacting said mercury containing polysulfide-resin complex with a source of polysulfide anions under ion exchange conditions for a time sufficient at least partially to displace the contained mercury thereby producing an at least partially regenerated polysulfide-resin complex.

4,843,103

FOAMED PLASTIC MATERIALS

Aldino Albertelli; Lothar M. Hohmann, both of London, and Anthony N. Curtis, Dorchester, all of England, assignors to Company "A" (Foam) Limited, London, England

Continuation of Ser. No. 697,009, Jan. 31, 1985, which is a continuation of Ser. No. 271,364, Jun. 8, 1981, abandoned, which is a continuation-in-part of Ser. No. 74,318, Sep. 11, 1979, abandoned. This application Apr. 2, 1986, Ser. No. 847,320

Claims priority, application United Kingdom, Jul. 14, 1978, 36820/78

Int. Cl.[4] C08J *9/12*

U.S. Cl. 521—83 14 Claims

1. A method for the production of a foamed phenolic resin material comprising

(i) effecting a curing reaction between

(a) a liquid phenolic resole containing not more than 35% by weight of water and having a reactivity number of at least 1, where reactivity number is defined as 10/x where x is the time in minutes required for a mixture of 5 ml of the resole and 10% by weight of the resole of a 66–67% aqueous solution of p-toluene sulfonic acid to become hard to the touch after the mixture has been prepared in a test tube and the test tube containing the mixture has been immersed in a water bath which is at 60° C., and

(b) an amount of a strong acid suitable as a hardener for said resole which is equivalent to 2 to 20 parts, per 100 parts of the phenol/aldehyde condensation product in the resole, by weight, of p-toluene sulfonic acid, in the presence of

(c) a finely divided inert and insoluble particulate solid which has a particle size of 0.5 to 800 microns and is present in an amount of from 20 to 250% by weight of the liquid resole and is substantially uniformly dispersed through the mixture of resole and hardener; and optionally

(d) a compound having two active hydrogen atoms and capable of reacting with the phenol/aldehyde condensation product in the resole,

the temperature of the mixture containing resole and hardener due to any applied heat not exceeding 85° C. and said temperature and the concentration of the acid hardener being such that at least one compound present in the resole or generated as a by-product of the curing reaction is volatilized within the mixture whereby to cause the mixture to foam before the mixture sets, and

(iii) recovering a foamed phenolic resin product having a cellular texture of substantially uniform cell size and being substantially free of blow holes,

wherein the mixture of liquid phenolic resole, hardener and particulate solid includes an added blowing agent in a small amount insufficient to have an adverse effect on the foaming reaction and insufficient to achieve a foamed product when used by itself.

4,843,104

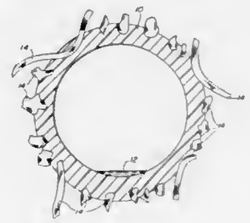
SYNTACTIC POLYMER FOAM COMPOSITIONS CONTAINING MICROSPHERE FILLERS

George E. Melber, Depew, N.Y.; William A. Oswald, Darien, Ill., and Leon E. Wolinski, Cheektowaga, N.Y., assignors to Pierce & Stevens, Buffalo, N.Y.

Division of Ser. No. 28,119, Mar. 19, 1987. This application Nov. 25, 1987, Ser. No. 103,204

Int. Cl.[4] C08J *9/22*, *9/32*

U.S. Cl. 521—54 9 Claims



1. A syntactic polymer foam composition comprising a continuous polymer binder matrix and a low density filler comprising dry, free-flowing microspheres, said microspheres comprising from about 3 to about 80 weight percent hollow thermoplastic resin microspheres and from about 97 to about 20 weight percent of a processing aid embedded in and adhered to the surface of said microspheres.

4,843,105

PROCESS FOR THE PREPARATION OF FILLER-CONTAINING, ANTIONICALLY MODIFIED POLYURETHANE (UREA) COMPOSITIONS, THE POLYURETHANE (UREA) COMPOSITIONS SO-OBTAINED, AND THE USE THEREOF

Artur Reischl, Leverkusen, and Kurt Mack, Wuppertal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 11, 1986, Ser. No. 884,681

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1985, 3526185

Int. Cl.[4] C08L *95/00*, *97/02*, *75/04*, *75/02*

U.S. Cl. 521—54 20 Claims

1. A process for the production of filler-containing polyurethane (urea) compositions comprising reacting:

(A) at least one di- and/or polyfunctional isocyanate-terminated prepolymer having an isocyanate group content of from 1 to 12% by weight,

(B) from 0 to 50% by weight based on the weight of (A) of a lower molecular weight organic di- and/or polyisocyanate, with the mixture of (A) and (B) having anisocyanate group content of 30% by weight or less.

(C) a stoichiometric excess quantity of water, and

(D) from 0 to 50 equivalent % based on the total isocyanate equivalents in (A) and (B) of a member selected from the group consisting of

(i) organic di- and/or polyamines,

(ii) organic compounds containing at least one group which is reactive with an isocyanate group and at least one anionic group or group capable of forming an anionic group, and

(iii) mixtures thereof, in the presence of

(E) from 5 to 97% by weight of fillers selected from the group consisting of

(i) finely divided or lumpy foam particles,

(ii) fossil lignocelluloses,

(iii) carbon powder, and
(iv) mixtures thereof, said % by weight of component (E) being based on the total moisture-free weight of components (A), (B), (D) and (E),

said filler-containing polyurethane (urea) having a water absorbability of from 33 to 97% by weight, and having an anionic group content of from 10 to 3000 milliequivalents of anionic groups and/or groups capable of anionic group formation per 1000 grams of components (A), (B) and (D).

10. The process of claim 1 wherein component (E) comprises polyurethane foam particles.

4,843,106

MODIFIED POLYMER POLYOLS

Joelle Y. Fis, Ferney-Voltaire, France; Werner A. Lidy, Collonge-Bellerive, Switzerland; Brian D. Phillips, South Glamorgan, and David B. Thomas, Gwent, both of Wales, assignors to BP Chemicals Limited, London, England

PCT No. PCT/GB87/00719, § 371 Date May 9, 1988, § 102(e) Date May 9, 1988, PCT Pub. No. WO88/02760, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 14, 1987, Ser. No. 193,283
Claims priority, application United Kingdom, Oct. 14, 1986, 8624560
Int. Cl.⁴ C08G 18/14
U.S. Cl. 521—107 **5 Claims**

1. A fluid polymer polyol dispersion prepared by reacting a polyol with one or more monomers and an effective amount of a free radical polymerization catalyst under conditions where monomer is grafted onto the polyol, the reaction being carried out in the presence of between 1 and 10% by weight of a flame retardant.

4,843,107

PROCESS FOR THE PREPARATION OF POLYAMINES AND THEIR USE FOR THE PREPARATION OF POLYURETHANES

Andreas Ruckes, Leverkusen; Werner Rasshofer, Cologne; Klaus König, Odenthal, and Richard Kopp, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Mar. 24, 1988, Ser. No. 173,204
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1987, 3712117
The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.
Int. Cl.⁴ C08G 18/14
U.S. Cl. 521—155 **12 Claims**

1. A single stage process for the production of a polyamine containing primary amino groups in which

(a) an isocyanate prepolymer having an isocyanate content of from 0.5 to 40 wt. % and having a monomer content of no more than 0.3 wt. %

is hydrolyzed with

(b) 0.75-40 mol of water per isocyanate equivalent of (a)

in the presence of

(c) 0.001-0.02 wt. % sodium hydroxide and
(d) at least 10 wt. % water-miscible polar organic solvent containing nitrile, ketone, sulfoxide and/or ether groups which boils at 50°–250° C. in substantially homogeneous phase at 40° to 170° C.

4,843,108

PROCESS FOR THE PRODUCTION OF POLYAMINES

Andreas Ruckes, Leverkusen; Werner Rasshofer, Colonge; Klaus König, Odenthal, and Richard Kopp, Colonge, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Mar. 24, 1988, Ser. No. 173,350
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1987, 3710426
The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.
Int. Cl.⁴ C08G 18/14
U.S. Cl. 521—155 **9 Claims**

1. A one-step process for the production of a polyamine containing primary amino groups comprising hydrolyzing

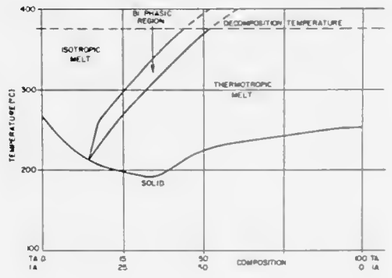
(a) a compound containing NCO groups having an NCO content of 0.5 to 40 wt. % with
(b) from 0.75 to 40 moles water per equivalent of NCO in component (a), in the presence of
(c) from 0.021 to 0.099 wt. %, based on 100 wt. % of component (a) of sodium hydroxide and
(d) ≧10 wt. %, based on 100 wt. % of component (a) of a water-miscible, polar organic solvent containing nitrile, ketone, sulfoxide or ether groups and having a boiling point within the range of from 56 to 250° C. in a homogeneous reaction phase at 40° to 170° C.

4,843,109

SHAPED ARTICLES FORMED FROM POLYMERS CAPABLE OF EXHIBITING ANISOTROPIC MELTS

Derrick S. Bailey, Welwyn; Frederic N. Cogswell, Welwyn Garden City, and Brian P. Griffin, St Albans, all of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 678,411, Dec. 5, 1985, which is a division of Ser. No. 463,292, Feb. 2, 1983, which is a continuation of Ser. No. 282,952, Jul. 13, 1981. This application Dec. 15, 1987, Ser. No. 133,089
Claims priority, application United Kingdom, Jul. 16, 1980, 8023193; Sweden, May 31, 1985, 8502693; Mar. 20, 1986, 8601313
Int. Cl.⁴ C08G 63/18; B29C 25/00; B29D 27/00
U.S. Cl. 521—182 **9 Claims**



1. A shaped article containing a polymer which is capable of exhibiting anisotropy in the melt characterised in that the ratio of the stiffness in any two directions at right angles in the shaped article differs by at least 10%, and preferably by at least 50%, from the ratio in the same two directions for a control sample made from a melt consisting entirely of the polymer in anisotropic form.

4,843,110

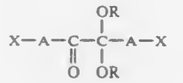
LIGHT CURING COMPOSITIONS FOR DENTAL RESTORATION

Takao Kubota, Kamakura; Tetsuro Sakuma, and Ryoji Nakazato, both of Tokorozawa, all of Japan, assignors to G-C Dental Industrial Corporation, Tokyo, Japan

Filed Sep. 11, 1986, Ser. No. 906,196
Claims priority, application Japan, Sep. 11, 1985, 60-199386
Int. Cl.⁴ C08F 2/50, 4/40, 20/34
U.S. Cl. 522—14 **5 Claims**

1. A light curing paste composition adapted for producing a film of 1 mm or more in thickness for dental restoration comprising the following five constitutional components:

(a) a polymerizable compound containing at least one ethylenically unsaturated double-bond,
(b) at least one photo-polymerization initiator selected from ketal base compounds expressed in terms of the following general formula (1):

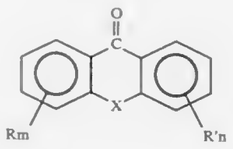


(1)

wherein

X is H, Cl, an alkyl group having 1 to 5 carbon atoms or an alkoxy group having 1 to 5 carbon atoms,
A is a six-membered aromatic group, and
R is an alkyl group having 1 to 10 carbon atoms, an aralkyl group having 7 to 9 carbon atoms or a $-C_nH_{2n}O)_mR'$ in which n is an integer of 2 to 5, m is an integer of 1 to 5, and R' is an alkyl group having 1 to 5 carbon atoms, in an amount of 0.01 to 1.0 weight % relative to polymerizable compound (a),

(c) at least one photo-polymerization initiator selected from thioxanthone base compounds expressed in terms of the following general formula (2):



(2)

wherein

X indicates $>S_1$ $>SO$ and $>SO_2$,
R and R' each represents a lower alkyl group, a substituted alkyl group, an alkoxy group, a halogen atom, a nitro group or a divalent unsaturated group forming a condensation ring structure, and
m and n each denotes 0 or an integer of 1 to 4, in an amount of 0.01 to 0.3 weight % relative to polymerizable compound (a),
(d) a reducing agent in an amount of 0.1 to 5 weight % relative to polymerizable compound (a), and
(e) a filler.

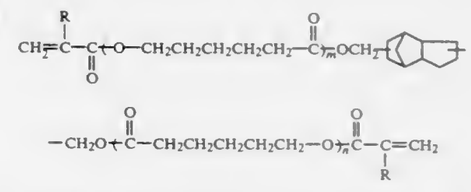
4,843,111

DIESTERS OF (METH)ACRYLIC ACID AND RESIN COMPOSITIONS COMPRISING THE SAME

Minoru Yokoshima, Yamaguchi; Tetsuo Otkubo, Ube; Hideaki Hattori, Yono, and Masayuki Kiyomoto, Yamaguchi, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP85/00509, § 371 Date Jan. 21, 1987, § 102(e) Date Jan. 21, 1987, PCT Pub. No. WO87/01697, PCT Pub. Date Mar. 26, 1987
PCT Filed Sep. 12, 1985, Ser. No. 41,872
Int. Cl.⁴ C08F 2/50, 20/20
U.S. Cl. 522—42 **14 Claims**

1. Diesters of (meth)acrylic acid represented by the formula;



wherein the mean values of m and n are respectively 0 to 5, the mean value of m+n is 1 to 10 and R represents a hydrogen atom or a methyl group.

4,843,112

BIOERODABLE IMPLANT COMPOSITION

Tobin N. Gerhart, Brookline, and Wilson C. Hayes, Lincoln, both of Mass., assignors to The Beth Israel Hospital Association, Boston, Mass.

Filed Mar. 12, 1987, Ser. No. 24,973
Int. Cl.⁴ C08K 3/32
U.S. Cl. 523—114 **16 Claims**

1. A composition comprising a particulate biocompatible resorbably calcium salt and a sintered particulate calcium phosphate ceramic dispersed in a polymer matrix formed by cross-linking a biodegradable polyester of fumaric acid and a polyhydric C_2–C_6 alcohol with methyl methacrylate, said polyester having a number average molecular weight of about 500 to about 1200.

4,843,113

AROMATIC POLYSULFONE RESIN COMPOSITION HAVING EXCELLENT PLATING CHARACTERISTICS

Yoshiharu Tatsukami, Toyonaka; Masakazu Inoue, Shiga; Kuniaki Asai, Tondabayashi, and Kazuo Hieda, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 10, 1988, Ser. No. 166,379
Claims priority, application Japan, Mar. 24, 1987, 62-70942
Int. Cl.⁴ C08K 3/26, 3/34
U.S. Cl. 524—425 **10 Claims**

1. An aromatic polysulfone resin composition with excellent plating characteristics comprising:

(A) 50 to 90% by weight of an aromatic polysulfone,
(B) 3 to 40% by weight of wollastonite of which 90% by weight or more of the total amount have a particle size smaller than 300 meshes, and
(C) 3 to 30% by weight of an alkaline earth material carbonate.

4,843,114
RUBBER COMPOUND FOR TRACKED VEHICLE TRACK PADS

Paul Touchet, Woodbridge; Gumersindo Rodriguez, Fredericksburg; Paul E. Gatza, Alexandria; Daniel P. Butler, both of Alexandria; Dawn Crawford, Stafford; Alan R. Teets, Springfield; Hank O. Feuer, Woodbridge, and David P. Flanagan, Alexandria, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 29, 1988, Ser. No. 150,107
Int. Cl.[4] C08K 3/04; C08F 8/00
U.S. Cl. 524—87 25 Claims

1. An improved vulcanizable elastomeric composition that has a unique combination of respective polymer, filler, curing, and antidegradant systems, comprising:

A. said polymer system is selected from the group consisting of

(a) about 100 parts by weight of highly saturated nitrile polymer having a degree of unsaturation ranging between about 1% to about 20%;

(b) a blend of from about 80 to about 90 parts by weight of highly saturated nitrile polymer having a degree of unsaturation ranging between about 1% to about 20%, and of from about 10 to about 20 parts by weight of carboxylated nitrile; and

(c) a blend of from about 45 to about 90 parts of highly saturated nitrile polymer having a degree of unsaturation ranging between about 1% to about 20%, and of from about 1 to a maximum of about 5 parts of carboxylated nitrile polymer, and of from about 5 to about 50 parts of nitrile rubber; and

B. said curing system comprising

(a) from about 1.5 to about 30 parts by weight of a metallic oxide selected from the group consisting of zinc oxide and magnesium oxide;

(b) from about 25 to about 50 parts by weight of a metallic methylmethacrylate resin selected from the group consisting of at least a zinc methyl methacrylate resin and a zinc dimethyl-methacrylate resin;

(c) a curative compound of from about 0.25 parts to about 3 parts selected from the group consisting of:

(i) dicumyl peroxide,

(ii) derivatives of dicumyl peroxide;

(iii) sulfur, and

(iv) sulfur donor chemicals.

4,843,115
POLYACETAL STABILIZER FORMULATION WITH IMPROVED COLOR STABILITY

Andrew B. Auerbach, Livingston; James L. Paul, Summit, and K. M. Natarajan, New Brunswick, all of N.J., assignors to Hoechst Celanese Corporation, Chatham, N.J.

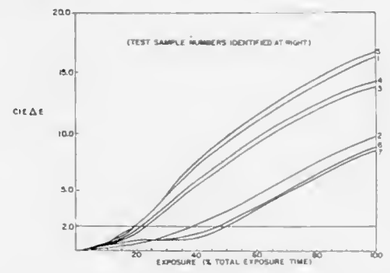
Continuation of Ser. No. 932,238, Nov. 18, 1986, abandoned. This application Feb. 9, 1988, Ser. No. 154,439
Int. Cl.[4] C08K 5/34; C08L 51/00
U.S. Cl. 524—100 7 Claims

1. An oxymethylene polymer composition which comprises an oxymethylene polymer having incorporated therein a stabilizer comprising a major amount of a superpolyamide and a minor amount of benzoguanamine.

4,843,116
UV LIGHT STABILIZER COMPOSITION COMPRISING CYCLIC ALIPHATIC EPOXY, UV SCREENER, AND POLYALKYLDIPIPERIDINE (HALS) COMPOUNDS

Richard C. Bopp, West Coxsackie, N.Y., assignor to General Electric Company, Selkirk, N.Y.

Filed Mar. 17, 1986, Ser. No. 840,391
Int. Cl.[4] C08K 5/34, 5/13, 5/15
U.S. Cl. 524—102 12 Claims



1. An ultraviolet light stabilizer composition for a shaped plastic article, comprising a mixture of

(a) a β-hydroxy-substituted benzophenone compound;

(b) a polyalkyl-substituted dipiperidine compound;

(c) a cyclic aliphatic epoxy compound; and optionally

(d) a liquid organic vehicle (carrier) for the foregoing.

4,843,117
DIMETHYL SULFONE AS A SOLID SOLVENT FOR VINYLIDENE CHLORIDE CONTAINING POLYMERS

Chan I. Chung, Schenectady, N.Y., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 17, 1987, Ser. No. 15,763
Int. Cl.[4] C08K 5/41
U.S. Cl. 524—173 6 Claims

1. A method for processing, with reduced melt viscosity, vinylidene chloride containing polymers having a majority of polymerized vinylidene chloride in the polymer, comprising the steps of:

(A) combining dimethyl sulfone and the vinylidene chloride containing polymer;

(B) heating the combination of A to a temperature at which the combination of A is melted; and

(C) processing B into a final form.

4,843,118
ACIDIZED FRACTURING FLUIDS CONTAINING HIGH MOLECULAR WEIGHT POLY(VINYLAMINES) FOR ENHANCED OIL RECOVERY

Ta-Wang Lai, Allentown, and Bheema R. Vijayendran, Emmaus, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 914,046, Oct. 1, 1986. This application Jun. 19, 1987, Ser. No. 64,962
Int. Cl.[4] C08F 8/00
U.S. Cl. 524—555 10 Claims

1. An acidized fracturing fluid consisting essentially of 5 to 28% aqueous hydrochloric acid containing 0.2 to 2% by weight poly(vinylamide) of at least 10^6 average molecular weight and greater than 50% hydrolyzed to vinylamine units, the fluid having a FANN 35 viscosity of 10 to 100 cps at 300 rpm, 510 sec^{-1} and R_1B_1 sensor.

4,843,119
ADHESIVE PRODUCT FOR THE BONDING OF STEEL, PARTICULARLY IN THE AUTOMOTIVE SHEETWORK OPERATIONS

Joseph Schapira, Paris; Paul Louis-Gavet, Montlignon, and Pierre Maillard, Paris, all of France, assignors to Compagnie Francaise de Produits Industriels, Gennevilliers, France

Filed Jan. 22, 1988, Ser. No. 146,925
Claims priority, application France, Jan. 22, 1987, 87 00727
Int. Cl.[4] C08L 75/04
U.S. Cl. 524—730 13 Claims

1. An adhesive product comprising a polyurethane produced by reacting an epoxy resin with a polyol compound selected from the group consisting of polyether polyols, polyester polyols, mixed polyols, binary mixtures and ternary mixtures of diols and triols, to produce a modified polyol; and then reacting the modified polyol with a diisocyanate to produce the polyurethane.

4,843,120
RUBBER COMPOSITION

Adel F. Halasa, Bath; Bill B. Gross, Stow; Joel L. Cox, and George F. Balogh, both of North Canton, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 29, 1986, Ser. No. 912,489
Int. Cl.[4] C08F 36/04; C08L 9/06; B60C 5/00
U.S. Cl. 525—53 27 Claims

1. A rubbery polymer which has an excellent combination of properties for use in making tire treads which is comprised of repeat units which are derived from at least one conjugated diolefin monomer, wherein the rubbery polymer has a first glass transition temperature which is between −110° C. and −65° C. and a second glass transition temperature which is between −35° C. and 0° C.

4,843,121
POLYVINYLAZIDONITRATE

Everett E. Gilbert, Morristown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 600,869, Apr. 16, 1984. This application Jun. 24, 1985, Ser. No. 747,744
Int. Cl.[4] C08F 226/06, 226/02
U.S. Cl. 525—56 4 Claims

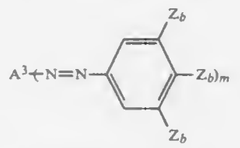
1. Polyvinylazidonitrate.

4,843,122
DETECTABLE MOLECULES, METHOD OF PREPARATION AND USE

Jannis G. Stavrianopoulos, New York, N.Y., assignor to Enzo Biochem, Inc., New York, N.Y.

Division of Ser. No. 575,396, Jan. 30, 1984, Pat. No. 4,707,440. This application Apr. 28, 1987, Ser. No. 43,568
Int. Cl.[4] C08F 8/00; C07H 15/12; C07A 15/00
U.S. Cl. 525—61 13 Claims

1. A compound of the formula:



where A^3 is A^2 or a biopolymer selected from the group consisting of an oligo- or polynucleotide, oligo- or polysaccharide, oligo- or polypeptide or a synthetic polymer, each of A^2 and said oligo-or polynucleotide, oligo- or polysaccharide, oligo- or polypeptide or synthetic polymer having m modifiable reactive groups consisting of amino, hydroxy, 1,2-cis diOH, halide, aryl, imidazoyl, carbonyl, carboxyl, thiol or a residue comprising an activated carbon; Z_b is fluorine, chlorine or bromine; and m is an integer from 1 to the total number of modifiable reactive groups on A^3.

4,843,123
CELLULAR THERMOSETTING FLUORODIEPOXIDE POLYMERS

Sheng Y. Lee, Silver Spring, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 867,987, May 29, 1986, Pat. No. 4,731,211. This application Mar. 4, 1988, Ser. No. 163,928
Int. Cl.[4] C08G 59/00
U.S. Cl. 521—178 6 Claims

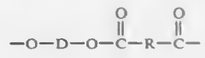
1. A foamed thermosetting fluorodiepoxide polymer product having a gas-filled closed cell structure.

4,843,124
THERMOPLASTIC ELASTOMERIC BLENDS

James R. Wolfe, Jr., Wilmington, Del., assignor to E. I. Du Pont de Neumours and Company, Wilmington, Del.

Filed Jun. 3, 1987, Ser. No. 56,987
Int. Cl.[4] C08L 11/00, 65/00
U.S. Cl. 525—92 20 Claims

1. A thermoplastic composition comprising about 15 to 90 parts by weight per 100 parts polymer present of a continuous phase multi-block copolyester elastomer having a melting point of from about 100°–200° C., consisting essentially of (A) repeating high melting point blocks comprising repeating short-chain ester units having the formula:



wherein D is a divalent radical remaining after removal of hydroxyl groups from a low molecular weight diol having a molecular weight not greater than 250 and R is a divalent radical remaining after the removal of carboxyl groups from a dicarboxylic acid having a molecular weight not greater than 300, D and R being selected so that a polymer which consists essentially of short-chain ester units having a number average molecular weight of at least 5000 has a melting point above 100° C., (B) repeating low melting point blocks which are derived from compounds containing two hydroxyl or carboxyl groups or mixtures thereof and have a number average molecular weight of 400–4000 and a melting point not greater than 100° C., and (C an amount of difunctional radicals sufficient to join repeating blocks of (A) and (B) to form a multi-block copolyester elastomer, the weight ratio of (A) to (B) being from about 1:4 to 1:0.1. and about 10–85 parts by weight per 100 parts polymer present of a crosslinked polychloroprene which is either homopolychloroprene or a copolymer of chloroprene and up to 50 weight percent of an ethylenically unsaturated monomer, present in the form of finely divided particles being dispersed in said copolyester elastomer, said polychloroprene being crosslinked to an extent such that not more than about 45% by weight of said polychloroprene is extractable with toluene at 25° C.

4,843,125

MOLDING RESIN COMPOSITION

Takanobu Kawamura; Tamihiro Ookoshi, and Shinji Chiku, all of Ichiharashi, Japan, assignors to Chisso Corporation, Japan

Division of Ser. No. 24,962, Mar. 12, 1987, Pat. No. 4,777,203. This application Jan. 21, 1988, Ser. No. 146,402

Claims priority, application Japan, Mar. 18, 1986, 61-60082; Mar. 18, 1986, 61-60083

Int. Cl.[4] C08L *23/16, 53/02*

U.S. Cl. 525—98 **4 Claims**

1. A molding elastomeric composition comprising 10 to 50% by weight of a hydrogenated derivative of a block copolymer expressed by the formula III

$$B—A—B' \qquad III$$

wherein A represents a conjugated diene polymer block and B and B' each represent an aromatic vinyl compound polymer block, and having a solution viscosity of 800 cps or less as measured in a 20% by weight toluene solution at 25° C., and 50 to 70% by weight of a crystalline propylene-ethylene random copolymer having a melt flow rate of 1 to 100 g/10 min. and a flexural modulus of 3,000 to 9,000 kg f/cm^2, the percent by weight of said hydrogenated derivative of a block copolymer and said crystalline proplyene-ethylene random copolymer based on the total of their weights in said elastomeric composition.

4,843,126

AMINOPLAST CATALYST AND COMPOSITIONS

Robert E. Quinn, Cleveland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Dec. 30, 1987, Ser. No. 139,897

Int. Cl.[4] C08L *61/28*

U.S. Cl. 525—162 **34 Claims**

1. A curable composition comprising:

(A) at least one organo substituted thiophosphoric, thiophosphonic or thiophosphinic acid or salt thereof; and,

(B) at least one aminoplast composition.

4,843,127

REACTIVE ELASTOMERIC BLOCK CO-OLIGOMER AND LACTAM-BLOCK COPOLYMERS DERIVED THEREFROM

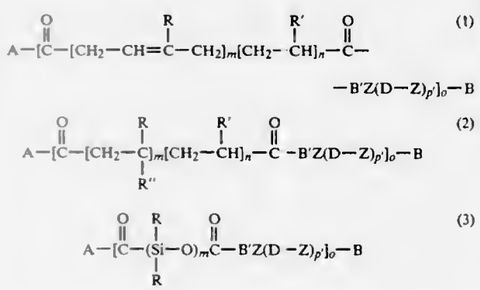
Murali K. Akkapeddi, Morris Plains, N.J.; David E. Bradley, Buffalo, N.Y., and Thomas D. Gallagher, deceased, late of Highbridge, N.J. (by Karen A. Gallagher, executrix), assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Apr. 19, 1985, Ser. No. 725,061

Int. Cl.[4] C08L *77/06, 67/02, 81/00*

U.S. Cl. 525—183 **9 Claims**

1. An improved copolymer comprising lactam monomers, and a coupling co-catalyst compound, wherein the improvement is that the copolymer further comprises a block co-oligomer selected from the group consisting of:



(1)

(2)

(3)

where

A is selected from HD—(Z—D)—; and $H_2N(Z—O)_p$—;

B is selected from —DH, and —NH_2;

B' is selected from —D—, and —NH—;

D is selected from —O, and —S;

Z is a divalent group;

R is selected from —H, —CH_3 and —Cl, and a combination thereof;

R' is selected from —CN, —H, a halogen, —CH=CH_2, and a combination thereof;

R'' is selected from —CH=CH_2, —CH_3, and —C_2H_5 and a combination thereof;

m is greater than 20;

n is greater or equal to 0 and less than m;

o is greater or equal to 1; and

p and p' are greater or equal to 5.

4,843,128

ELASTOMERIC COMPOSITION HAVING INCREASED OZONE RESISTANCE

Frank C. Cesare, Woodbury, Conn., assignor to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Continuation-in-part of Ser. No. 866,854, May 23, 1986, abandoned. This application Jun. 1, 1988, Ser. No. 201,131

Int. Cl.[4] C08L *23/26, 23/16, 9/00, 7/00*

U.S. Cl. 525—193 **16 Claims**

1. An elastomeric composition formed by curing a blend comprised of

(A) between about 70 and about 94 phr of a highly unsaturated rubber;

(B) between about 3 and about 27 phr of an ethylene/-propylene/nonconjugated diene terpolymer having a number average molecular weight of more than about 35,000;

(C) between about 3 and about 27 phr of a liquid ethylene/-propylene/nonconjugated diene terpolymer having a number average molecular weight of between about 500 and about 15,000;

(D) between about 2 and about 7.5 phr of a quinoline antidegradant; and

(E) an effective amount of curative.

4,843,129

ELASTOMER-PLASTIC BLENDS

Lawrence Spenadel, Westfield; Joel H. Grosser, Perth Amboy, and Stephen M. Dwyer, Howell, all of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 813,980, Dec. 27, 1985, abandoned, Ser. No. 813,725, Dec. 27, 1985, and Ser. No. 813,848, Dec. 27, 1985, abandoned, which is a continuation-in-part of Ser. No. 681,950, Dec. 26, 1985, said Ser. No. 813,980, is a continuation-in-part of Ser. No. 813,511, Dec. 26, 1985, which is a continuation-in-part of Ser. No. 681,950, , which is a continuation-in-part of Ser. No. 504,582, Jun. 15, 1983, Pat. No. 4,540,753, said Ser. No. 813,725, is a continuation-in-part of Ser. No. 840,562, Dec. 26, 1985, which is a continuation-in-part of Ser. No. 681,951, Dec. 14, 1984, which is a continuation-in-part of Ser. No. 504,582,. This application Mar. 3, 1986, Ser. No. 835,211

Int. Cl.[4] C08L *23/16, 23/08*

U.S. Cl. 525—240 **17 Claims**

1. A composition comprising:

(a) at least one elastomer copolymer comprising ethylene and at least one other alpha-olefin, having a weight average molecular weight of at least 20,000, and at least one of $\overline{M}_w/\overline{M}_n$ less than 2 and $\overline{M}_z/\overline{M}_w$ less than 1.8, wherein at least two portions of essentially each copolymer chain of said copolymer, each portion comprising at least about 5 wt. % of the chain, differ in composition from one another by at least about 5 wt.% ethylene; and

(b) at least one plastic composition.

4,843,130

ANTIBACTERIAL POLYMER

Hiroki Kourai, and Yoshio Yabuhara, both of Tokushima, Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

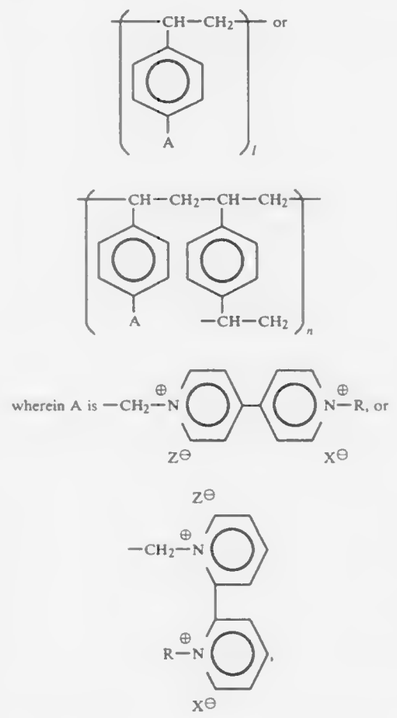
Filed Apr. 11, 1988, Ser. No. 180,132

Claims priority, application Japan, Apr. 17, 1987, 62-96042

Int. Cl.[4] C08F *236/18*

U.S. Cl. 525—331.3 **1 Claim**

1. An antibacterial polymer containing a repeating unit of the formula



wherein A is or

l is 20 to 2000, n is a number of at least 1000, X and Z are the same or different and are an anion, R is alkyl group having 6 to 18 carbon atoms.

4,843,131

PREPARATION OF POLY(ARYLENE ETHER KETONES) BY SEQUENTIAL OLIGOMERIZATION AND POLYMERIZATION IN DISTINCT REACTION ZONES

Paul Becker, San Francisco; Larry M. Edwards, Fremont, both of Calif.; Patrick J. Horner, Swindon, England; A. Brian Macknick, Los Altos Hills, Calif.; Stephen Moore, Redwood City, Calif., and Ronald J. Mosso, Fremont, Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Oct. 20, 1987, Ser. No. 110,899

Int. Cl.[4] C08G *75/20, 65/00, 67/00*

U.S. Cl. 526—65 **25 Claims**

1. A method of preparing a poly(arylene ether ketone) by a Friedel-Crafts polymerization wherein a gelled reaction mixture is produced, comprising the steps of:

(A) forming, in a first reactor, a reaction mixture for polymerization comprising

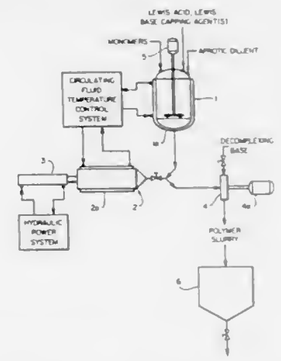
(I) a monomer system comprising

(a) (i) phosgene or an aromatic dicarboxylic acid dihalide and (ii) a substantially stoichiometric amount of a polynuclear aromatic comonomer having two active hydrogen atoms or

(b) a polynuclear aromatic carboxylic acid halide having an active hydrogen atom; and

(II) a Lewis acid in an amount of at least one equivalent per equivalent of carbonyl groups in the monomer system, plus an amount effective to act as a catalyst for the polymerization;

(B) permitting the reaction mixture to polymerize in the first reactor until substantial partial polymerization has occurred, but before substantial gelation of the reaction mixture;



(C) transferring the partially polymerized reaction mixture into a second reactor having a nozzle at one end thereof and a piston which, in its retracted position, is at the other end of the second reactor and has a stroke substantially equal to the length of the second reactor;

(D) permitting polymerization to continue in the second reactor until a gelled, polymerized reaction mixture containing polymer of the desired molecular weight has been obtained;

(E) discharging the gelled, polymerized reaction mixture from the second reactor through the nozzle by stroking the piston the length of the second reactor; and

(F) recovering and purifying the polymer.

4,843,132

PREPARATION OF HOMO- AND COPOLYMERS OF PROPENE USING A ZIEGLER-NATTA CATALYST SYSTEM

Rainer A. Werner, Bad Durkheim, and Ralf Zolk, Hessheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 1, 1988, Ser. No. 176,861

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1987, 3711919

Int. Cl.[4] C08F *4/64*

U.S. Cl. 526—125 **1 Claim**

1. A process for the preparation of homopolymers of propene and copolymers of propene with minor amounts of other C_2–C_{12}-α-monoolefins by polymerization of the monomer or monomers at from 20° to 160° C. and under from 1 to 100 bar using a Ziegler-Natta catalyst system consisting of

(1) a titanium component which contains titanium, magnesium, chlorine and a benzenecarboxylic acid derivative on a carrier,

(2) an aluminum component of the formula

$$AlR_3,$$

where R is alkyl of not more than 8 carbon atoms, and

(3) a silane component of the formula

$$R^1{}_nSi(OR^2)_{4-n},$$

where R^1 is an aryl, alkylaryl or alkyl radical of not more than 16 carbon atoms, R^2 is alkyl of not more than 15 carbon atoms and n is from 0 to 3, with the provisos that the atomic ratio of titanium from the titanium component (1) to aluminum from the aluminum component (2) is from 1:10 to 1:800, and the molar ratio of aluminum component (2) to silane component (3) is from 1:0.03 to 1:0.8, wherein the titanium component (1) used is one which is obtained by a method in which first

(1.1) in a first stage, a solid-phase intermediate is prepared from

(I) finely divided magnesium chloride,

(II) a C_1–C_8-alkanol,

(III) a carrier consisting of a finely divided, porous, inorganic oxide carrier material which has a particle diameter of from 1 to 1,000 μm, a pore volume of from 0.3 to 3 cm^3/g and a surface area of from 100 to 1,000 m^2/g, is of the formula SiO_2·a Al_2O_3, where a is from 0 to 2, and has been pretreated with an alkylchlorosilane of the formula $R^3{}_mSiCl_{4-m}$, where R^3 is C_1–C_{10}-alkyl and m is from 1 to 3, in such a way that

either (A)

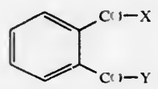
the carrier material and the alkylchlorosilane are combined once or several times, in a liquid inert hydrocarbon with constant thorough mixing at from 20° to 160° C., a total of from 1 to 50 molar parts of the alkylchlorosilane being used per 10 molar parts of the carrier material, and a total of from 20 to 200 molar parts of the hydrocarbon being used per 10 molar parts of the alkylchlorosilane, and the combined substances are kept at from 20° to 160° C., for a total of from 0.1 to 5 hours, and the resulting solid is then isolated as the carrier (III),

or (B)

the carrier material and the alkylchlorosilane are combined with constant thorough mixing at from 20° to 140° C., from 5 to 50 molar parts of the alkylchlorosilane being used per 10 molar parts of the carrier material, and the combined substances are kept at a temperature in the stated range for from 0.1 to 5 hours, and the resulting solid is then isolated as the carrier (III),

(IV) titanium tetrachloride and

(V) a phthalic acid derivative of the formula



where X and Y together form oxygen or X and Y are each chlorine or C_1–C_{10}-alkoxy, in such a way that first

either (a)

(1.1.1.a) in a first substage, the magnesium chloride (I) and the alkanol (II) are combined in a liquid inert hydrocarbon with constant thorough mixing at from 0° to 140° C., from 20 to 1,000 parts by weight of the hydrocarbon being used per 10 parts by weight of the magnesium chloride (I) and from 10 to 80 molar parts of the alkanol (II) being used per 10 molar parts of the magnesium chloride (I), and the combined substances are kept at from 20° to 140° C., for from 0.1 to 6 hours, after which

(1.1.2.a) in a second substage, the carrier (III) is introduced into the reaction mixture resulting from the first substage, with constant thorough mixing at from 0° to 140° C., from 20 to 100 parts by weight of the carrier (III) being used per 10 parts by weight of the magnesium chloride (I),

or (b)

(1.1.1.b) in a first substage, the magnesium chloride (I) and the alkanol (II) are combined with constant thorough mixing at from 0° to 140° C., from 100 to 1,000 molar parts of the alkanol (II) being used per 10 molar parts of the magnesium chloride (I), and the combined substances are kept at from 20° to 140° C. for from 0.1 to 6 hours, after which

(1.1.2.b) in a second substage, the carrier (III) is introduced into the reaction mixture resulting from the first substage with constant thorough mixing at from 0° to 140° C., from 20 to 100 parts by weight of the carrier (III) being used per 10 parts by weight of the magnesium chloride (I), and the entire mixture is evaporated to dryness with recovery of a solid-phase reaction product,

and thereafter

(1.1.3) in a third substage, the solid-phase reaction product obtained in the second substage and the titanium tetrachloride (IV) are combined in a liquid inert hydrocarbon with constant thorough mixing at from −20° to 40° C., from 20 to 300 molar parts of the titanium tetrachloride (IV) being used per 100 molar parts of the alcohol (II), and from 10 to 100 parts by weight of the hydrocarbon being used per 10 parts by weight of the carrier (III), and the combined substances are kept at from 10° to 150° C., for from 0.1 to 4 hours, and the resulting solid-phase intermediate is isolated with removal of the liquid phase, with the proviso that the phthalic acid derivative (V) is introduced in the course of one or more of the substages (1.1.1) to (1.1.3), from 1 to 100 molar parts of the phthalic acid derivative being used per 100 molar parts of the magnesium chloride (I), then

(1.2) in a second stage, the solid-phase intermediate obtained from the first stage is subjected to a singlestage or multistage or continuous extraction with titanium tetrachloride at from 100° to 150° C., for from 0.2 to 5 hours, a total of from 10 to 1,000 parts by weight of the titanium tetrachloride being used per 10 parts by weight of the solid-phase intermediate obtained from the first stage, and finally

(1.3) in a third stage, the solid-phase intermediate obtained in the second stage is extracted with a liquid inert hydrocarbon until the solid contains from 0.01 to 30% by weight of free titanium tetrachloride, and the titanium component (1) is obtained in this manner.

4,843,133

POLYMERIZATION AND CATALYSTS

James N. Short, and Max P. McDaniel, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 101,375, Feb. 7, 1979, Pat. No. 4,565,795. This application Jun. 10, 1985, Ser. No. 733,838

Int. Cl.⁴ C08F *4/66, 10/02*

U.S. Cl. 526—129 **2 Claims**

1. A process for the production of ethylene homopolymer which comprises contacting ethylene under polymerization conditions with a catalyst comprising

(1) a solid complex titanium-containing catalyst A obtained by mixing

(a) a pretreated particulate silicia-containing supporting containing at least 80 wt. % silica formed by reacting said support with an oroganoboron compound comprising a trihydrocarbyl boron compound having the formula $B(R^3)_3$ in which R^3 is selected from among hydrogen, alkyl, aryl and cycloalkyl, at least one R^3 in each compound being a hydrocarbon radical containing from 1 to about 6 carbon atoms under conditions such that at least a portion of the OH group on the surface of the silica-containing support is reacted with the treating agent with

(b) an organomagnesium compound of the formula MgR_2 wherein R is a hydrocarbon radical having from 1 to 12, inclusive, carbon atoms and

(c) a halogenated tetravalent titanium compound of the formula $TiX_n(OR')_{4-n}$ in which X is a bromide, chlorine, or iodine, R' is a hydrocarbon radical selected from saturated aliphatic, saturated cycloaliphatic and aromatic groups containing from 1 to about 12, inclusive, carbon atoms, and n in an integer of 3 to 4 and

(2) a cocatalyst component B comprising a metallic hydride or organometal compound wherein said metal is selected from a metal of Groups IA, IIA, and IIIA of the Periodic Table.

4,843,134

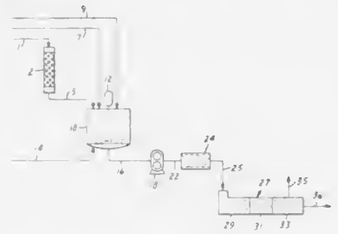
ACRYLATE PRESSURE-SENSITIVE ADHESIVES CONTAINING INSOLUBLES

Thomas A. Kotnour, Cottage Grove; Ronald L. Barber, Oakdale, and Walter L. Krueger, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 21,137, Mar. 3, 1987, abandoned, which is a continuation of Ser. No. 852,437, Apr. 15, 1986, abandoned, which is a continuation of Ser. No. 594,278, Mar. 28, 1984, Pat. No. 4,619,979. This application Nov. 30, 1987, Ser. No. 127,611

Int. Cl.⁴ C08F *2/02*

U.S. Cl. 526—318.4 **3 Claims**



1. An acrylate pressure-sensitive adhesive polymer consisting essentially of a major portion derived from isooctylacrylate and a minor portion derived from at least one modifying monomer selected from the group consisting of acrylic acid, methacrylonitrile, vinyl acetate, itaconic acid, and mixtures thereof, which acrylate polymer is characterized by:

(a) monomeric units about 70 to 99 percent of which are derived from isooctylacrylate;

(b) a degree of polymer branching indicated by a substantial fraction of GPC insolubles comprising more than about 15 percent of the total polymer; and

(c) a weight average molecular weight of not more than 1.6 (10^6).

4,843,135

PROCESS FOR PRODUCTION OF ETHYLENE COPOLYMERS

Masato Tanaka; Syuji Machida, both of Sodegaura, and Michitake Uoi, Ichihara, all of Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Division of Ser. No. 915,712, Oct. 6, 1986. This application Sep. 16, 1988, Ser. No. 245,765

Claims priority, application Japan, Oct. 11, 1985, 60-224890; Sep. 17, 1986, 61-218956; Sep. 17, 1986, 61-218957

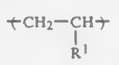
Int. Cl.⁴ C08F *4/64, 200/10*

U.S. Cl. 526—169 **20 Claims**

1. A process for producing an ethylene copolymer comprising:

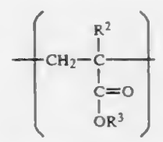
a repeating unit (A) represented by the formula: —CH_2—CH_2—;

a repeating unit (B) represented by the formula:

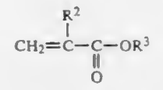


(wherein R^1 represents an alkyl group having 1 to 20 carbon atoms); and

a repeating unit (C) represented by the formula:



(wherein R^2 represents a hydrogen atom, a halogen atom, an alkyl group having 1 to 20 carbon atoms, an alkenyl group having 3 to 20 carbon atoms, a cycloalkyl group having 3 to 20 carbon atoms, an aryl group having 6 to 20 carbon atoms or an aralkyl group having 7 to 20 carbon atoms, and R^3 represents a hydrogen atom, an alkyl group having 1 to 20 carbon atoms, an alkenyl group having 3 to 20 carbon atoms, a cycloalkyl group having 3 to 20 carbon atoms, an aryl group having 6 to 20 carbon atoms or an aralkyl group having 7 to 20 carbon atoms), said repeating units (A), (B) and (C) being orientated in a random and straight chain arrangement, said repeating unit (B) content being 0 to 45 mol %, said repeating unit (C) content being 0.001 to 45 mol %, and said copolymer having a weight average molecular weight of at least 5,000, which process comprises copolymerizing ethylene and unsaturated carboxylic acid or its ester represented by the general formula:



(wherein R^2 and R^3 are the same as defined above) by the use of a catalyst containing (a) transition metal compound and (b) an organometallic compound as main components and in the presence of a Lewis acid, wherein the transition metal compound (a) is at least one chromium compound selected from chromium carboxylic acid salts, chromium alkoxy compounds, chromium chelate compounds, chromium π-complexes, chromium aryl compounds and chromium halide, and the organometallic compound (b) is at least one compound selected from the organic compounds of Groups I to V metals of the Periodic Table.

4,843,136

(METH)-ACRYLATES OF SILOXANES CONTAINING TRICYCLODECANE GROUPS

Jürgen Reiners, Leverkusen; Ottfried Schlak, Cologne; Wolfgang Podszun, Cologne, and Jens Winkel, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

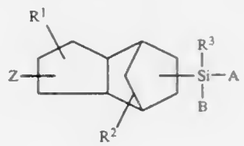
Filed Sep. 9, 1987, Ser. No. 94,971

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1986, 3632657; Sep. 26, 1986, 3632792; Japan, Mar. 12, 1987, 3707908

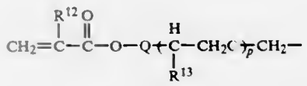
Int. Cl.⁴ C08F *30/08*

U.S. Cl. 526—279 **9 Claims**

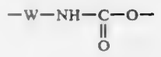
1. A (Meth)-acrylate of a siloxane containing tricyclodecane groups of the formula



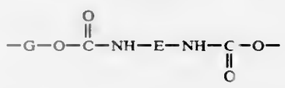
in which
R^1 and R^2 each independently denote hydrogen, lower alkyl, halogen or trifluoromethyl,
R^3 denotes lower alkyl, cycloalkyl, cycloalkyl-alkyl
or optionally substituted aryl or aralkyl wherein the optional substituents are selected from the group consisting of lower alkyl, halogen or aryl,
Z represents the



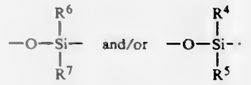
group in which
R^{12} and R^{13} each independently denote hydrogen or methyl
p represents a number from 0 to 20 and
Q represents a single bond, or denotes a radical of the formula



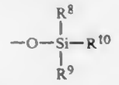
in which
W denotes an alkylene chain,
or denotes a radical of the formula



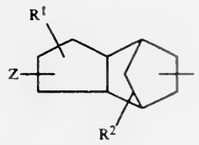
in which
E is a divalent, straight-chain or branched aliphatic radical having 2 to 24 carbon atoms, an aromatic radical having 6 to 26 carbon atoms, an araliphatic radical having 7 to 26 carbon atoms, or a cycloaliphatic radical having 6 to 26 carbon atoms, or the aliphatic, aromatic, araliphatic and/or cycloaliphatic radicals can contain 1 or 2 oxygen bridges, or several of the aliphatic, aromatic, araliphatic and/or cycloaliphatic radicals can be connected via optionally substituted methylene groups wherein said substituents are methyl or ethyl and
G denotes a divalent straight-chain or branched aliphatic hydrocarbon radical, having 3 to 15 carbon atoms, or a divalent straight-chain or branched aliphatic hydrocarbon radical having 3 to 15 carbon atoms which contains 1 to 3 oxygen bridges and said radicals can be substituted by 1 to 4 additional (meth)acryloyloxy radicals,
A and B each independently represents a siloxane chain which comprises m structural elements of the formula



and the terminal group



where
R^4, R^5, R^6, R^7, R^8 and R^9 each independently denote lower alkyl, cycloalkyl, cycloalkyl-alkyl or optionally substituted aryl or aralkyl wherein the optional substituents are selected from the group consisting of lower alkyl, halogen or aryl,
where the radicals R^5, R^7, and R^8 can also represent the



group in which
R^1, R^2 and Z have the abovementioned meaning,
R^{10} represents lower alkyl, and
where the total number of structural elements m, independently of one another, represent a number from 0 to 600, and B can also represent lower alkyl.

4,843,137

METHOD FOR MAKING POLYSILANES

Richard G. Taylor, Newhaven, United Kingdom, and James W. White, Barry, Wales, assignors to Dow Corning, Ltd., Barry, Wales

Filed Apr. 22, 1988, Ser. No. 184,992
Claims priority, application United Kingdom, May 2, 1987, 8710531
Int. Cl.[4] C08C *77/00;* **C07F** *7/04, 7/08*
U.S. Cl. 528—10 **7 Claims**

1. A method for preparing polysilanes comprising reacting at a temperature of at least 150° C. one or more diorganodihalosilanes with an alkali metal in a medium which comprises a first solvent has a boiling point of silanes, wherein the first solvent has a boiling point of at least 150° C. at normal atmospheric pressure (760 mm Hg).

4,843,138

POLYUREAURETHANES HAVING IMPROVED LOW TEMPERATURE PROPERTIES BASED ON HIGH MOLECULAR WEIGHT POLYETHER INTERMEDIATES

Joseph H. Tazewell, Akron, Ohio; Christopher P. Christenson, Lake Jackson, Tex.; Robert B. Turner, Lake Jackson, Tex., and Manuel Gonzales, Jr., Lake Jackson, Tex., assignors to The Firestone Tire & Rubber Company, Akron, Ohio and The Dows Chemical Company, Midland, Mich.

Filed Feb. 8, 1988, Ser. No. 153,054
Int. Cl.[4] C08G *18/00*
U.S. Cl. 528—52 **19 Claims**

1. A low glass transition temperature polyureaurethane comprising:
a polyureaurethane made from (a) a poly(oxypropylene)-based polyol intermediate having a molecular weight of at least about 3,000 and alkyl substituted oxyethylene or oxyethylene repeating units therein, the majority of said polyol being triol, (b) a polyisocyanate, and (c) a metal halide salt complex of methylenedianiline, the molecular weight of said polyether intermediate being an effective molecular weight so that said polyureaurethane has a glass transition temperature of −20° C. or lower.

4,843,139

MOLDABLE HIGH MOLECULAR WEIGHT AROMATIC POLYAMIDE FROM POLY ARYLENE OXY DIAMINE

Juergen Finke, Marl, and Martin Bartmann, Recklinghausen, both of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jun. 10, 1988, Ser. No. 205,355
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1987, 3731185
Int. Cl.[4] C08G *63/28*
U.S. Cl. 528—125 **11 Claims**

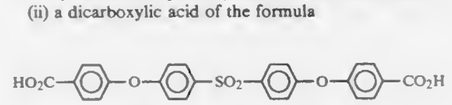
1. A high molecular weight moldable aromatic polyamide of:
(A) An aromatic diamine of the formula:

$$H_2N—Ar'—O—Ar''—CO—Ar''—O—Ar'—NH_2$$

wherein Ar' and Ar'' are meta- or para-phenylene, or a mixture thereof with up to 70 mole % of a second aromatic diamine having the formula:

$$H_2N—Ar—((Z)_q—Ar)_r—NH_2$$

wherein Ar is meta- or para-phenylene, Z is identical or different radicals selected from the group consisting of —O—, —S—, $—SO_2—$, —CO—, and $—C(CH_3)_2—$, q is 0 or 1, and r is 0, 1 or 2, with
(B) An aromatic dicarboxylic acid selected from the group consisting of:
(i) isophthalic acid, or a mixture thereof with up to 60 mole % of terephthalic acid, wherein said isophthalic acid and said terephthalic acid are unsubstituted or are ring substituted with one or more substituents selected from the group consisting of C_{1-6} alkyl, phenyl, alkyl or aryl substituted phenyl, C_{1-6} alkoxy, phenoxy, alkyl or aryl substituted phenoxy and halogen substituents;
(ii) a dicarboxylic acid of the formula



(iii) a dicarboxylic acid of the formula:

$$HO_2C—Ar—(A—Ar)_p—CO_2H$$

wherein Ar is meta- or para-phenylene, A is —O—, —S—, $—SO_2—$, or —CO—, and p is 0 or 1; and mixtures of (i), (ii) and (iii).

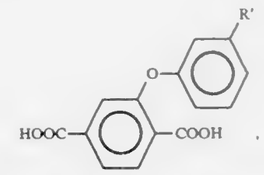
4,843,140

AROMATIC POLYESTERS BASED ON PHENOXYTEREPHTHALIC ACID, AND METHODS OF MANUFACTURING AND USING SAME

Heinz-Guenter Poll, Hilden, and Martin Bartmann, Recklinghausen, both of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Dec. 15, 1987, Ser. No. 133,334
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1987, 3710643
Int. Cl.[4] C08G *63/00*
U.S. Cl. 528—176 **18 Claims**

1. A partially crystalline aromatic polymer with melting point<360° C., which forms an anisotropic melt phase and is processible at <360° C., said polymer comprising:
(a) component A, comprising a mixture of 10–80 mol % a phenoxyterephthalic acid and 90–20 mol % of at least one other aromatic dicarboxylic acid said phenoxyterephthalic acid being of the formula



where R' is hydrogen, halogen, or an alkyl, aryl, alkoxy, or aryloxy group with up to 12 carbon atoms;
(b) component B, comprising one or more compounds with 2 OH groups attached to an aromatic ring; and
(c) component C, comprising one or more hydroxyaromatic carboxylic acids.

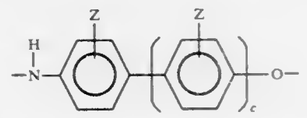
4,843,141

MELT-PROCESSABLE AROMATIC POLYESTERAMIDE HAVING REPEATING 2,2'-SUBSTITUTED BIPHENYLENE RADICALS

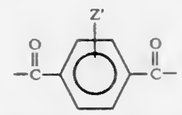
Russell A. Gaudiana, Merrimack, N.H.; Howard G. Rogers, Weston, and Roger F. Sinta, Woburn, both of Mass., assignors to Polaroid Corporation, Patent Department, Cambridge, Mass.

Filed Dec. 28, 1987, Ser. No. 138,064
Int. Cl.[4] C08G *63/68*
U.S. Cl. 528—183 **23 Claims**

1. A melt-processable polyesteramide capable of forming an anisotropic melt phase at a temperature of approximately 360° C. or lower, said polyesteramide comprising repeating units (I) and (II), with or without repeating units (III) and (IV), wherein:
(I) is a repeating unit of the formula
wherein X is a substituent other than hydrogen;
(II) is a repeating unit of the formula



wherein each Z is hydrogen, alkyl, alkoxy, aryl, halogen or trifluoromethyl and c is zero or one;
(III) is a repeating unit of the formula



wherein Z' is hydrogen, alkyl, alkoxy, aryl, halogen or trifluoromethyl;
(IV) is a repeating unit of the formula

—Y—Ar—W—

wherein Ar is a divalent arylene radical; Y is —O— or —NH— and W is —O—, —NH— or —C(O)—;
wherein the total number of equivalents of carboxylic groups in monomeric compounds providing said repeating units (I), (III) and (IV) by polycondensation is equivalent to the total number of equivalents of amino and hydroxyl groups in monomeric compounds providing said repeating units (II) and (IV); wherein the repeating unit of formula (I) is present in an amount of 15 to 60 mole percent of said polyesteramide; wherein the repeating unit of formula (II) is present in an amount of from 30 to 60 mole percent of said polyesteramide;

wherein the repeating unit of formula (III) is present in an amount of from 0 to 35 mole percent of said polyesteramide; and wherein the repeating unit of formula (IV) is present in an amount of from 0 to 10 mole percent of said polyesteramide.

4,843,142

CATALYTIC PROCESS FOR PRODUCING CROSS-LINKED RESIN FROM PHENOLIC COMPOUND AND BIS-OXAZOLINE

Yasuo Sano, Minoo; Kouichi Shirahama, Toyonaka, and Takahiko Hirono, Amagasaki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 24, 1986, Ser. No. 947,412

Claims priority, application Japan, Dec. 27, 1985, 60-296959; Jun. 30, 1986, 61-154783

Int. Cl.[4] C08G *65/40, 69/44*

U.S. Cl. 528—211 **9 Claims**

1. A process for producing a cross-linnked resin which comprises:

reacting at least one phenolic reactant selected from the group consisting of

(a) a compound having phenolic hydroxyls and having the general formula:

HO—Ar—OH

wherein Ar represents a divalent aromatic group composed of single or condensed aromatic rings, or a divalent aromatic group composed of two or more aromatic rings connected by C—C covalent bond, or a divalent aromatic group composed of two or more aromatic rings connected by a divalent hydrocarbon group or a divalent group selected from the group consisting of carbonyl, thioether, ether and amide group, and wherein the aromatic ring is unsubstituted or substituted by additional hydroxyls or substituents which are inactive to a bis(2-oxazoline) compound, and

(b) a polymer having not less than two phenolic hydroxyls in the molecule,

with a bis(2-oxazoline) compound in a molar ratio of the bis(2-oxazoline) compound to the phenolic reactant of not less than about 1, in the presence of a catalyst selected from the group consisting of, organic monophosphites and oxazoline ring-opening polymerization catalysts selected from the group consisting of phosphorous acid, sulfuric acid, nitric acid, hydrochloric acid, hydrogen sulfide, phenyl phosphoric acid, hydrogen sulfide, phenyl phosphoric acid, methanesulfonic acid, benzenesulfonic acid, p-toluenesulfonic acid, dodecylbenzenesulfonic acid, naphthalene-α-sulfonic acid, naphthalene-β-sulfonic acid, sulfanilic acid, phenylphosphonic acid, a sulfonic acid ester, a dialkylsulfate or an organic halide which contains at least one halomethyl group in the molecule at elevated temperatures.

4,843,143

COPOLYMERIZATION OF BISOXAZOLINE AND POLYPHENOLIC COMPOUND WITH A HYDROCARBON HALIDE CATALYST

Billy M. Culberton, Worthington, and Omar Tiba, Dublin, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 22,310, Mar. 5, 1987, abandoned. This application Apr. 18, 1988, Ser. No. 182,668

Int. Cl.[4] C08G *69/40, 14/04*

U.S. Cl. 528—211 **8 Claims**

1. A process comprising copolymerizing a polyphenolic compound having more than two hydroxyl groups per molecule with a bis-oxazoline at a temperature in the range of from about 130° to 250° C. in the presence of a catalytic amount of a halohydrocarbon catalyst.

4,843,144

POLYMERIZATION OF CARBON MONOXIDE/OLEFIN WITH P LIGAND HAVING POLAR ARYL GROUP

Johannes A. M. Van Broekhoven, and Richard L. Wife, both of CM Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 26, 1987, Ser. No. 89,375

Claims priority, application Netherlands, Aug. 26, 1986, 8602164

Int. Cl.[4] C08G *67/02*

U.S. Cl. 528—392 **10 Claims**

1. In the process of producing linear alternating polymers by contacting under polymerization conditions carbon monoxide and at least one ethylenically unsaturated hydrocarbon in the presence of a catalyst composition formed from a palladium compound, an anion of a non-hydrohalogenic acid having a pKa less than 2 and bidentate phosphorus ligand, the improvement wherein the bidentate phosphorus ligand has the formula R^1R^2-P-R-P-R^3R^4 wherein R^1, R^2, R^3 and R^4 independently are aryl groups of from 6 to 20 carbon atoms inclusive and R is a divalent bridging group of from 1 to 20 carbon atoms inclusive and of from 2 to 4 carbon atoms inclusive in the phosphorus-phosphorus bridge, with the provision that at least one of R^1, R^2, R^3 and R^4 is substituted with a polar group in a position ortho to the phosphorus.

4,843,145

CATALYTIC POLYMERIZATION OF CO/OLEFIN WITH ORTHO POLAR SUBSTITUTED ARYL BIDENTATE P LIGAND

Eit Drent; Petrus W. N. M. Van Leeuwen, and Richard L. Wife, all of CM Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 26, 1987, Ser. No. 89,373

Claims priority, application Netherlands, Oct. 6, 1986, 8602507

Int. Cl.[4] C08G *67/02*

U.S. Cl. 528—392 **14 Claims**

1. In the process of producing linear alternating polymers of carbon monoxide and at least one ethylenically unsaturated hydrocarbon by contacting under polymerization conditions the carbon monoxide and hydrocarbon in the presence of a catalyst formed from a palladium compound, an anion of a non-hydrohalogenic acid and a bidentate phosphorus ligand, the improvement wherein (1) the acid supplying the anion has a pKa from 2 to about 6 and (2) the phosphorus bidentate ligand has at least one substituent directly attached to phosphorus, which substituent is aromatic and is substituted in an ortho position relative to the phosphorus with a polar substituent.

4,843,146

IMMUNOLOGICALLY ACTIVE POLYPEPTIDES USEFUL FOR THE PREPARATION OF ANTIMALARIAL VACCINES AND OF DIAGNOSTIC KITS FOR THE DETECTION OF ANTISPOROZOITE ANTIBODIES

Adriano Bernardi, Monterotondo; Fabio Bonelli; Antonello Pessi, both of Rome, and Antonio S. Verdini, Monterotondo, all of Italy, assignors to Enitricerche, S.p.A., Milan, Italy

Filed Dec. 3, 1987, Ser. No. 128,082

Claims priority, application Italy, Dec. 4, 1986, 22560 A/86

Int. Cl.[4] C07C *103/52;* **A61K** *39/00*

U.S. Cl. 530—324 **2 Claims**

1. Immunologically active polypeptides of the following general formula:

(Asn-Val-Asp-Pro-Asn-Ala-Asn-Pro)$_3$-(Asn-Ala-Asn-Pro)$_n$-Asn-Ala

wherein:

Ala = alanine
Asn = asparagine
Asp = aspartic acid
Pro = proline

Val = valine

and wherein n has a value within the range of from 3 to 40.

4,843,147

ANHYDROUS ENHANCED COUPLING OF PROTEINS

Julia G. Levy, and Daniel Liu, both of Vancouver B. C., Canada, assignors to University of British Columbia, Vancouver, Canada

Continuation of Ser. No. 927,847, Nov. 6, 1986, abandoned. This application Sep. 21, 1988, Ser. No. 248,267

Int. Cl.[4] C07K *3/08, 17/06;* **A61K** *39/395*

U.S. Cl. 530—391 **12 Claims**

1. A method for conjugating an immunoglobulin or an immunologically reactive fragment thereof through an amide linkage with a variable component, said component having a functionality capable of forming an amide bond to the immunoglobulin or fragment by means of a dehydration reaction effected by a dehydrating agent, which method comprises

mixing said immunoglobulin or fragment thereof with said variable component and dehydrating agent in a medium consisting essentially of an anhydrous polar aprotic solvent for a time up to about ten minutes.

4,843,148

PROCESS FOR THE PREPARATION OF FLUOROTRIAZINE USING ALKALI METAL FLUORIDE SALTS

Emil Bonometti, Basel, and Herbert Seiler, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 23, 1986, Ser. No. 945,731

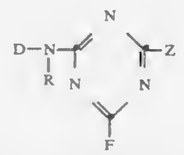
Claims priority, application Switzerland, Dec. 24, 1985, 5527/85

The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.

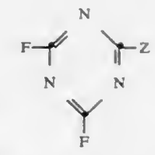
Int. Cl.[4] C09B *43/00, 50/00, 62/038, 62/018*

U.S. Cl. 534—598 **7 Claims**

1. In a process for the preparation of a reactive dye of the formula



in which D is a formazan, dye containing a sulfo group, R is hydrogen or C_1–C_4-alkyl unsubstituted or substituted by halogen, hydroxyl, cyano, C_{1-4}-alkoxy, methoxycarbonyl, ethoxycarbonyl, aminosulfonyl, carboxyl, suflo or sulfato; and Z is —NH_2, alkylamino, N,N-dialkylamino, cyclohexylamino, N,N-dicyclohexylamino, benzylamino, phenethylamino, phenylamino, naphthylamino, N-alkyl-N-cyclohexylamino, N-alkyl-N-phenylamino, N-alkyl-N-naphthylamino, furanyl-, thiophenyl-, pyrazolyl-, pyridinyl-, pyrimidinyl-, quinolinyl-, benzimidazolyl-, benzthiazolyl- or benzoxazolylamino, morpholino, piperidino or piperazino, the alkyl, cyclohexyl, phenyl, naphthyl or heterocyclic radicals being unsubstituted or substituted by halogen, nitro, cyano, trifluoromethyl, sulfamoyl, carbamoyl, C_{1-4}-alkyl, C_{1-4}-alkoxy acetylamino, benzoylamino, ureido, hydroxyl, carboxyl, sulfomethyl, sulfato, sulfatoethylsufonyl, vinylsulfonyl or sulfo; comprising the steps of condensing 2,4,6-trifluoro-s-triazine with an amino dye of the formula D—NH—R and an amine of the formula H—Z, the improvement comprising condensing 2,4,6-trifluoro-s-triazine with the amine of the formula H—Z in a strongly acid solution and in the presence of an alkali metal fluoride, and then condensing the resulting primary condensation product of the formula



with the amino dye of the formula D—NH—R to give the reactive dye.

4,843,149

FIBER REACTIVE YELLOW DYE OF ACETOACETONILIDE HAVING VINYL SULFONE-TYPE REACTIVE GROUP

Yutaka Kayane, Ibaraki; Hirokazu Sawamoto, Minoo; Takashi Omura, Ashiya; Naoki Harada, Suita, and Akira Takeshita, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

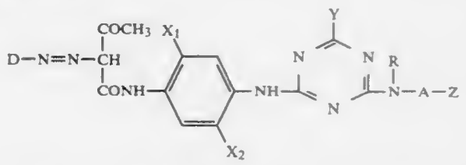
Filed Nov. 13, 1985, Ser. No. 797,488

Claims priority, application Japan, Nov. 20, 1984, 59-245670; Dec. 27, 1984, 59-279450

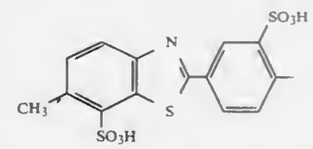
Int. Cl.[4] C09B *62/08, 62/51;* **D06P** *1/38, 3/66*

U.S. Cl. 534—632 **8 Claims**

1. A monoazo compound, or a salt thereof, represented by the formula,



wherein D is sulfophenyl unsubstituted or substituted by methyl, ethyl, methoxy, ethoxy, phenoxy, acetylamino or propionylamino; naphthyl substituted twice or three times by sulfo; or a group of the formula,



X_1 is methoxy or ethoxy and X_2 is sulfo when D is the sulfophenyl or the naphthyl as defined above, or any one of X_1or X_2 is sulfo and the other is methoxy or ethoxy when D is the group of the above-defined formula; Y is fluorine, chlorine or phenyl- or naphthyl-amino substituted once or twice by sulfo; R is hydrogen or C_1–C_4 alkyl unsubstituted or substituted with carboxy or carbamoyl; A is phenyl unsubstituted or substituted once by methoxy, or naphthylene unsubstituted or substituted once by sulfo; and Z is —SO_2CH=CH_2 or —$So_2CH_2CH_2Z_1$ in which Z_1 is a group capable of being split by the action of an alkali.

4,843,150

PYRAZOLONE OR PYRIDONE TYPE WATER SOLUBLE DISAZO COLORANT CONTAINING ONE OR TWO TRIAZINE RINGS

Toshio Hihara; Yukiharu Shimizu, and Kanzi Shimizu, all of Kitakyushu, Japan, assignors to Mitsubushi Chemical Industries Limited, Japan

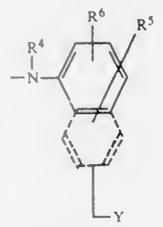
Filed Jul. 9, 1987, Ser. No. 71,644

Claims priority, application Japan, Jul. 9, 1986, 61-162556; Jul. 9, 1986, 61-162557; Feb. 3, 1987, 62-21804; Feb. 3, 1987, 62-21805

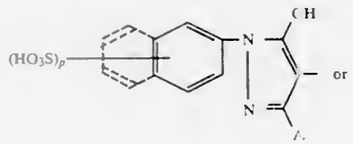
Int. Cl.[4] C09B *62/09, 62/513;* **D06P** *1/382, 1/384*

U.S. Cl. 534—634 **10 Claims**

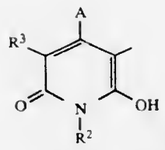
1. A water solule disazo colorant represented by formula (I) in the form of free acid:



wherein K represents



or



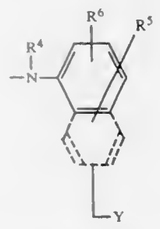
[wherein A represents methyl or carboxyl;

R^2 represents hydrogen, allkyl of 1 to 8 carbon, sulfoalkyl of 1 to 4 carbon, or alkyl group of 1 to 4 carbon which is substituted by alkoxy of 1 to 4 carbon;

R^3 represents hydrogen, halogen, cyano, $—CONH_2$, carboxyl, sulfonic, or sulfomethyl;

p represents an integer of 1 to 2];

Z represents



[wherein R^4 represents hydrogen or alkyl of 1 to 4 carbon;

R^5 and R^6 each represents independently hydrogen, alkyl of 1 to 4 carbon, alkoxy of 1 to 4 carbon, sulfonic, or halogen;

Y represents $—SO_2CH=CH_2$ or $—SO_2CH_2CH_2W$ (wherein W represents $—OSO_3H$, $—SSO_3H$, $—OPO_3H_2$, $—OCOCH_3$, or halogen];

R^1 represents hydrogen or lower alkyl of 1 to 4 carbon;

Q represents phenylene or naphtylene which may be substituted by alkyl of 1 to 4 carbon, alkoxy of 1 to 4 carbon, halogen, carboxylic, or sulfonic; and

l, m, and n each represents an integer of 0 or 1.

4,843,151

MONOAZO DYES CONTAINING A 4'-METHYL-3'-SULFO-5-ACYLAMINO-2-AZO-1,1'-DIPHENYLSULFONE COMPONENT

Rudolf Hurter, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

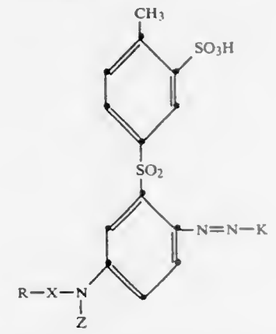
Continuation-in-part of Ser. No. 819,489, Jan. 15, 1986, abandoned, which is a continuation of Ser. No. 696,855, Jan. 30, 1985, abandoned, which is a continuation of Ser. No. 357,932, Mar. 15, 1982, abandoned. This application Apr. 9, 1987, Ser. No. 36,423

Claims priority, application Switzerland, Mar. 27, 1981, 2096/81

Int. Cl.[4] C09B *29/01, 29/085, 29/09, 29/36*

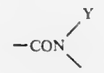
U.S. Cl. 534—643 **10 Claims**

1. A monoazo dye of the formula



in which K is the radical of an aminobenzene, alkoxybenzene, hydroxybenzene, pyrazolone, aminopyrazole, pyrimidine, indole or acetoacetamide coupling component; R is C_{1-12}-alkyl which is unsubstituted or substituted by a member selected from the group consisting of hydroxyl, sulfato, halogen, sulfo, carboxyl, cyano, C_{1-4}-alkoxy, C_{1-6}-alkanoyl and benzoyl, or is cycloalkyl, aralkyl or aryl which is unsubstituted or substituted by a member selected from the group consisting of C_{1-4}-alkyl, C_{1-4}-alkoxy, halogen, C_{1-6}-alkanoylamino, hydroxyl and carboxyl; X is a —CO— or $—SO_2—$ group, a

group, R being attached to the oxygen atom, or an $—SO_2NH—$ or



group, R being attached to the nitrogen atom and Y being hydrogen or C_{1-4}-alkyl; and Z is hydrogen or C_{1-4}-alkyl; provided that K is not a diphenylamine coupling component.

4,843,152

COPPER COMPLEXES OF DISAZO COMPOUNDS HAVING DI- OR TRI- SULFONAPHTHOL AND 6-[2,4-DI-(AMINO OR SUBSTITUTED AMINO)-1,3,5-TRIAZIA-6-YLAMINO-]-1-HYDROXY-3-SULFONAPHTHALENE COUPLING COMPONENT RADICALS

Paul Doswald, Münchenstein, and Hans-Rudolf von Tobel, Rieben, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

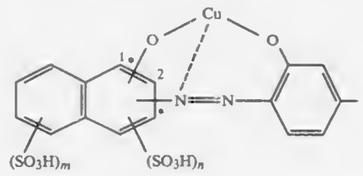
Filed Apr. 10, 1987, Ser. No. 36,601

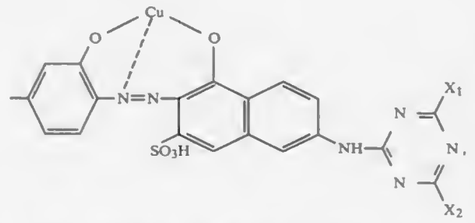
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1986, 3612952

Int. Cl.[4] C09B *45/24, 45/28;* **D06P** *1/10, 3/60*

U.S. Cl. 534—701 **16 Claims**

1. A complex of the formula





or a water-soluble salt thereof each cation of which is independently a non-chromophoric cation,

wherein each of X_1 and X_2 is independently $—NR_1R_2$,

wherein

R_1 is hydrogen,, C_{1-4}alkyl or C_{2-4}alkyl monosubstituted by hydroxy or C_{1-4}-alkoxy, and

R_2 is hydrogen; C_{1-10}alkyl; C_{2-8}hydroxyalkyl; C_{2-8}dihydroxyalkyl the hydroxy groups of which are attached to different carbon atoms; C_{1-6}alkyl monosubstituted by halo, cyano, $—OR_3$, (C_{1-4}alkyl)carbonyl, (C_{1-4}-alkoxy)-carbonyl, sulfo or sulfato; phenyl; phenyl substituted by 1 or 2 substituents selected from halo, C_{1-4}alkyl, C_{1-4}alkoxy, acetamido and $—SO_2—R_4$; phenyl(C_{1-4}alkyl); phenyl(C_{1-4}alkyl) the phenyl group of which is substituted by 1 or 2 substituents selected from halo, C_{1-4}-alkyl, C_{1-4}alkoxy, acetamido and $—SO_2—R_4$; C_{5-6}cycloalkyl or C_{5-6}-cycloalkyl substituted by 1 to 3 C_{1-4}alkyl groups,

wherein

R_3 is C_{1-4}alkyl, C_{2-4}-hydroxyalkyl or (C_{1-4}-alkyl)carbonyl, and

R_4 is hydroxy, amino, C_{1-4}-alkyl or phenyl, or

$—NR_1R_2$ is an unsubstituted 5- or 6-membered saturated heterocyclic ring containing 1 or 2 further hetero atoms selected from nitrogen, oxygen and sulfur or a 5- or 6-membered saturated heterocyclic ring containing 1 or 2 further hetero atoms selected from nitrogen, oxygen and sulfur which is substituted by 1 to 3 C_{1-4}alkyl groups,

m is 1 or 2, and

n is 0 or 1,

with the proviso that m+n is 2 or 3,

with the proviso that one of the asterisked bonds is in the 1-position of the naphthalene ring and the other asterisked bond is in the 2-position of the naphthalene ring, or a mixture of such complexes or water-soluble salts.

4,843,153

AZO DYES CONTAINING THIENOTHIOPHENE RADICALS AS RADICALS OF THE DIAZO COMPONENT

Heinz Ellingsfeld; Karl-Heinz Etzbach, both of Frankenthal; Guenter Hansen, Ludwigshafen, and Helmut Reichelt, Niederkirchen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

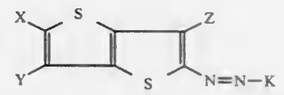
Filed Jul. 1, 1987, Ser. No. 68,341

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1986, 3622136

Int. Cl.[4] C09B *29/033, 29/08, 29/36;* **D06P** *3/52*

U.S. Cl. 534—752 **6 Claims**

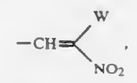
1. A thienothiophene dye of the formula I



(I)

where

Z is C_1–C_8-alkoxycarbonyl or C_1–C_8alkoxycarbonyl whose alkyl chain is interrupted by one or more oxygen atoms, or is C_{1-4} alkyl, C_{1-4} alkoxy or halogen substituted phenoxycarbonyl or unsubstituted phenoxycarbonyl, carbamoyl, C_1–C_8-mono-alkylcarbamoyl or -dialkyl-carbamoyl, pyrrolidinocarbonyl, piperidinocarbonyl, morpholinocarbonyl, piperazinocarbonyl, (N-C_1–C_4-alkyl)piperazinocarbonyl, carboxyl, cyano, C_1–C_{10}-alkanoyl, C_{1-4} alkyl, C_{1-4} alkoxy or halogen substituted phenylcarbonyl or unsubstituted phenylcarbonyl, C_1–C_4-alkylsulfonyl, C_{1-4} alkyl, C_{1-4} alkoxy or halogen substituted phenylsulfonyl or unsubstituted phenylsulfonyl or nitro, X is hydrogen, fluorine, chlorine, bromine, Z or a group of the formula $—CH=CT^1T^2$, —CH=N—OH, —CH=N—NH—C_6H_5 or



where

T^1 and T^2 are identical or different and each is, independently of the other, cyano, C_1–C_8-alkoxy carbonyl or C_1–C_8-alkoxycarbonyl whose alkyl chain is interrupted by one or more oxygen atoms, or is C_3–C_6-alkenyloxycarbonyl, carbamoyl or C_1–C_4-monoalkylaminocarbonyl or -dialkylaminocarbonyl and W is hyrogen, methyl or ethyl, Y is hydrogen, chlorine or bromine and K is the radical of a coupling component.

4,843,154

ISOMALTAMINES AND THEIR N-ACYL DERIVATIVES, METHODS FOR THEIR PRODUCTION, AND THEIR USES AS SURFACTANTS AND MONOMERS

Joachim Klein, Braunschweig; Wolfgang Behrens, Wolfsburg, and Markwart Kunz, Braunschweig, all of Fed. Rep. of Germany, assignors to Sueddeutsche Zucker-Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

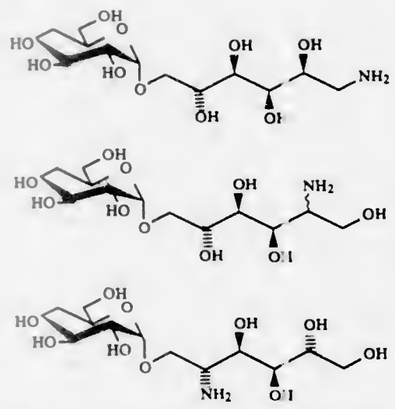
Filed Jul. 31, 1987, Ser. No. 80,266

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1986, 3625931

Int. Cl.[4] C07H *15/04;* **C08F** *20/36, 22/22;* **B01F** *17/56*

U.S. Cl. 536—4.1 **7 Claims**

1. Isomaltamines having the formulae (I) to (III):



(I)

(II)

(III)

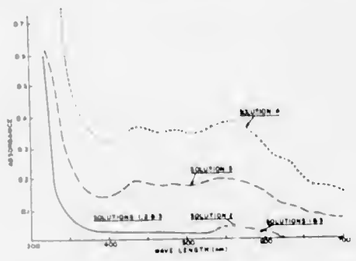
and the isomers thereof, and mixtures thereof in any ratio.

4,843,155

PRODUCT AND PROCESS FOR ISOLATING RNA

Piotr Chomczynski, 727 Martin Luther King Dr., Cincinnati, Ohio 45220

Filed Nov. 19, 1987, Ser. No. 123,107
Int. Cl.[4] C02H *21/02*
U.S. Cl. 536—27 **7 Claims**



1. A method of isolating RNA from a biological tissue sample including RNA, DNA and proteins, comprising:

homogenizing said tissue sample with a denaturing solvent which consists essentially of a guanidinium compound selected from the group consisting of guanidinium thiocyanate and guanidinium chloride, phenol and a buffer in an amount sufficient to maintain said solvent at or about pH 4, to form a homogenate;

adding a water-insoluble organic solvent to said homogenate and centrifuging to form a two-phase mixture having an aqueous phase and an organic phase, wherein said RNA is concentrated in said aqueous phase, and said DNA and proteins are concentrated in said organic phase or in the interphase;

precipitating said RNA from said aqueous phase by adding a lower alcohol to said aqueous phase; and recovering the precipitated RNA by centrifugation of said aqueous phase and decanting the supernatant liquid.

7. A solvent, which remains stable after prolonged storage, for extracting RNA from biological tissue when said solvent is added to the tissue, said solvent consisting essentially of:

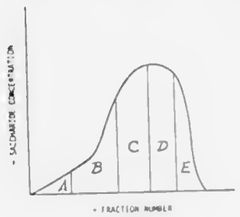
a solution of a guanidinium compound selected from the group consisting of guanidinium thiocyanate and guanidinium chloride, phenol and a buffer in an amount sufficient to maintain said solvent at or about PH 4, said solution present in a proportion which is effective both to substantially reduce oxidation and decomposition of said phenol and thereby to maintain said solvent stable during storage in comparison to phenol stored alone, and, in conjunction with said phenol, to separate RNA from said biological tissue, said proportion of said solution making up from about 40% to about 60% of said solvent by volume.

4,843,156

PROCESS FOR PRODUCING HIGH-PURITY OLIGOGLUCOSYLFRUCTOSIDES

Toshio Miyake; Shuzo Sakai, and Takashi Shibuya, all of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Jan. 16, 1985, Ser. No. 692,066
Claims priority, application Japan, Feb. 9, 1984, 59-22614
Int. Cl.[4] C07H *1/06*
U.S. Cl. 536—127 **5 Claims**



1. A process for producing a high-purity oligoglucosylfructoside wherein an oligoglucosyl residue having a glucose polymerization degree of 21 or 3 is bound to a fructose residue via fructosyl linkage, comprising the steps of:

(a) providing a mixture solution containing said oligoglucosylfructoside, oligosaccharides having a glucose polymerization degree higher than 3 and oligosaccharides having a glucose polymerization degree lower than 2, the concentration of the dry solid solute in said mixture solution being in the ramge of 40–70 w/w %;

(b) sequentially admitting predetermined volumes of the mixture solutio and water to a column of a strongly-acidic cation exchange resin in alkaline-earth metal form, the bed depth and tempreature of the resin being at least 4 m and 45°–85° C. respectively, the volume of the mixture solution being 1–50 v/v % with respect to the volume of the resin;

(c) sequentially separating the effluents from the column into the following fractions;

a first fraction rich in the oligosaccharides having a glucose polymerization degree higher than 3;

a second fractin rich in the oligosaccharides having a glucose polymerization degree higher than 3, but highly contaminated with the oligoglucosylfructoside;

a third fraction rich in the oligoglucosylfructoside, the oligoglucosylfructoside content of the third fraction being at least 70% on the basis of dry solid;

a fourth fraction rich in the oligoglucosylfructoside, but highly contaminated with the oligosaccharides having a glucose polymerization degree lower than 2; and

a fifth fraction rich in the oligosaccharides having a glucose polymerization degree lower than 2; and

(d) recovering the third fraction;

(e) sequentially admitting to the column:

the second fraction obtained in step (c),

a mixture solution containing said oligoglucosylfructoside, oligosaccharides having a glucose polymerization degree higher than 3 and oligosaccharides having a glucose polymerization degree lower than 2,

the fourth fraction obtained in step (c), and water; and

(f) cyclically repeating steps (c), and (d) and (e).

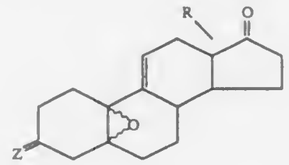
4,843,157

13ALPHA-ALKYLGONAN-DELTA 9(11)-5,10-EPOXIDES

Guenter Neef, and Harry Vierhufa, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Aug. 31, 1987, Ser. No. 91,247
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1986, 3630030
Int. Cl.[4] C07J *71/00*
U.S. Cl. 540—76 **16 Claims**

1. A 13alpha-alkylgonan-delta[9(11)]-5,10 epoxide of the formula



wherein

R is hydrogen, methyl or ethyl and

Z is a ketal or thioketal group effective as a keto blocking group.

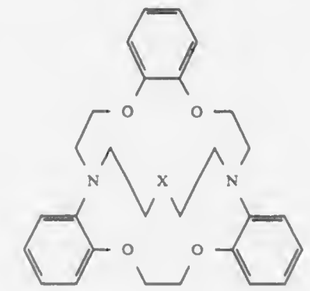
4,843,158

[2,2,1]CRYPTAND COMPOUNDS THAT SELECTIVELY BIND SODIUM

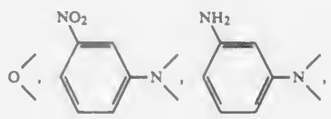
Gerald A. Smith, Cambridge, Great Britain, assignor to Amersham International PLC, Little Chalfont, England

Filed Nov. 19, 1986, Ser. No. 932,643
Claims priority, application United Kingdom, Nov. 22, 1985, 8528804
Int. Cl.[4] C07D *498/06*
U.S. Cl. 540—469 **5 Claims**

1. A compound having the property of selectively binding sodium ions in the presence of potassium ions and having the formula:



where X is:



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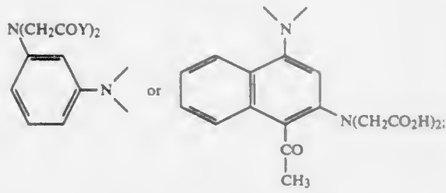


and Y is —OEt or —OH and where any or all of the aromatic rings may carry substituents at any free position and/or may form part of a fused aromatic ring system.

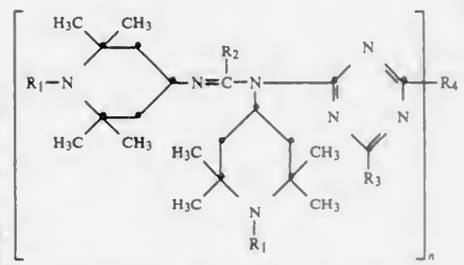
4,843,159

TRIAZINE DERIVATIVES OF PIPERIDINYLAMIDINES

Giuseppe Cantatore, Bitonto, and Valerio Borzatta, Bologna, both of Italy, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

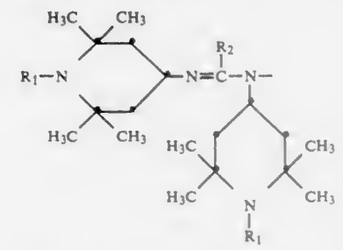
Filed Jun. 8, 1987, Ser. No. 59,650
Claims priority, application Italy, Jun. 16, 1986, 20798 A/86
Int. Cl.[4] C07D *401/14*
U.S. Cl. 544—198 **9 Claims**

1. A compound of formula (I)

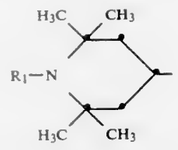


(I)

in which R_1 is hydrogen, O', CN, NO, cyanomethyl, C_1–C_{12}-alkyl, C_3–C_{12}-alkenyl or C_3–C_{12}-alkynyl, with the proviso that the carbon atom attached to the nitrogen atom is a primary carbon atom, C_7–C_{12}-aralkyl, C_1–C_{12}-acyl, 2,3-epoxypropyl, 2,3-dihyroxypropyl or OH-monosubstituted C_2–C_6-alkyl, R_2 is hydrogen, C_1–C_{18}-alkyl, C_5–C_{18}-cycloalkyl, C_6–C_{18}-aryl or C_7–C_{18}-aralkyl, R_3 is a group



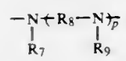
in which R_1 and R_2 are as defined above, or R_3 is a group R_5X— in which R_5 is hydrogen, C_1–C_{18}-alkyl, C_2–C_6-alkyl which is monosubstituted by OH, by C_1–C_{18}-alkoxy or by C_2–C_{18}-dialkylamino, C_5–C_{18}-cycloalkyl, C_3–C_{18}-alkenyl, C_6–C_{18}-aryl, C_7–C_{18}-aralkyl or a group of the formula (II)



(II)

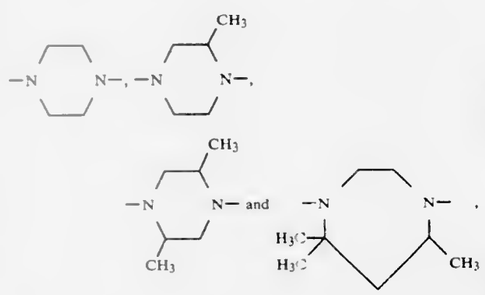
in which R_1 is as defined above, and X is —O—, —S— or

with R_6 being as defined for R_5, or R_3 is a 5-membered to 7-membered nitrogen containing heterocyclic group with the free valency on the nitrogen selected from the group consisting of 1-pyrrolidinyl, piperidino, morpholino, 1-hexahydroazepinyl and 4-methyl-1-piperazinyl, and n is an integer from 2 to 6, if n is 2, R_4 is a group

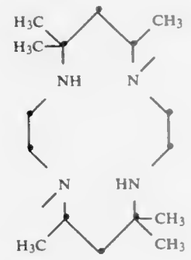


in which p is zero or 1, R_7 and R_9, which are identical or different, are as defined for R_5, and R_8 is a direct bond, C_2–C_{18}-alkylene, C_5–C_{18}-cycloalkylene, C_6–C_{18}-arylene, C_7–C_{18}-aralkylene or C_4–C_{14}-alkylene which is interrupted in the chain by one or two oxygen atoms or by one or two

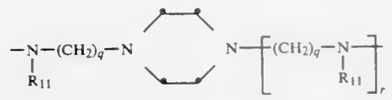
groups, in which R_{10} is hydrogen, C_1–C_{12}-alkyl, C_6–C_{12}-cycloalkyl or a group of the formula (II), or R_4 is the divalent radical of a 5-membered to 7-membered heterocyclic compound with two nitrogen atoms and the free valencies on the nitrogen atoms selected from the group consisting of



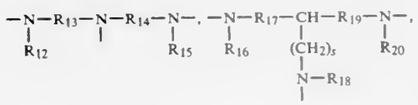
or R_4 is



or

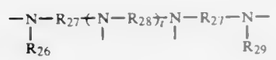


in which R_{11} is as defined for R_{10}, q is an integer from 2 to 6 and r is zero or 1, if n is 3, R_4 is

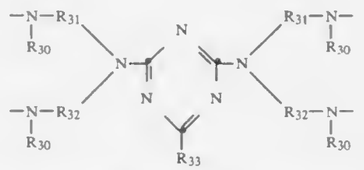


in which R_{12}, R_{15}, R_{16}, R_{18}, R_{20}, R_{22}, R_{23} and R_{25}, which are identical or different, are as defined for R_{10}, and R_{13} and R_{14}, which are identical or different, are C_2–C_{12}-alkylene or C_4–C_{14}-alkylene which is interrupted in the chain by an

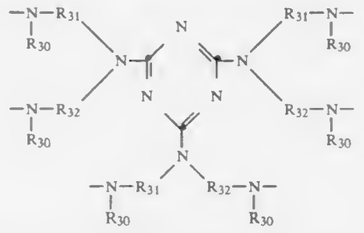
group, R_{17}, R_{19}, R_{21} and R_{24}, which are identical or different, are C_2–C_{12}-alkylene and s is zero or 1, if n is 4, 5 or 6, R_4 is a group



in which R_{26} and R_{29}, which are identical or different, are as defined for R_{10}, and R_{27} and R_{28}, which are identical or different, are C_2–C_{12}-alkylene and t is 1, 2 or 3, or, if n is 4, R_4 is additionally a group



in which R_{30} is as defined for R_{10}, R_{31} and R_{32}, which are identical or different, are C_2–C_{12}-alkylene and R_{33} is as defined for R_3, or, if n is 6, R_4 is additionally a group



in which R_{30}, R_{31} and R_{32} are as defined above.

4,843,160

PREPARATION OF ALPHA-AMINOALKYLPHENOLS

Eric W. Otterbacher, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 1, 1984, Ser. No. 656,377

Int. Cl.[4] C07D *295/00;* C07C *87/28*

U.S. Cl. 544—398 **20 Claims**

1. A process comprising contacting an ortho- or para- α-alkenylphenol and ammonia or a primary or secondary amine under reaction conditions to form an α-aminoalkylphenol.

11. A process comprising contacting an ortho- or para-α-alkenylphenol and ammonia or a primary or secondary amine at a temperature of from about 0° C. to about 100° C. and under such other reaction conditions that an α-aminoalkylphenol selectively is produced.

4,843,161

PLATINUM-INTERCALATIVE COMPLEXES FOR THE TREATMENT OF CANCER

Stephen J. Lippard, and Bruce E. Bowler, both of Cambridge, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 1, 1984, Ser. No. 616,362

Int. Cl.[4] C07F *15/00;* A61K *31/555, 31/70;* C07H *73/00*

U.S. Cl. 546—10 **7 Claims**

1. A platinum-intercalative composition comprising a DNA intercalative compound chemically linked to a platinum antitumor compound, wherein said composition exhibits biological activity attributable to each compound.

4,843,162

ALKYL ESTERS OF SUBSTITUTED 2-METHYL-3-QUINOLINECARBOXYLIC ACID AND QUINOLINE-2,3-DICARBOXYLIC ACID

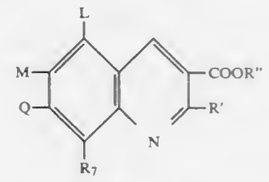
Robert F. Doehner, Jr., East Windsor, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 698,192, Feb. 4, 1985, Pat. No. 4,656,283, which is a continuation-in-part of Ser. No. 489,401, May 5, 1983, abandoned, which is a continuation-in-part of Ser. No. 381,815, May 25, 1982, abandoned. This application Feb. 21, 1987, Ser. No. 929,575

Int. Cl.[4] C07D *215/48*

U.S. Cl. 546—170 **6 Claims**

1. A compound having the structure:



wherein R' is CH_3 or COOR"; R" is C_1–C_4 alkyl; L, M, Q and R_7 are each H, Cl, Br, F, I, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkylsulfonyl, halo(C_1–C_4)alkyl, NO_2, CN, phenyl, phenoxy, difluoromethoxy, loweralkylamino, chlorophenyl or phenoxy substituted with one Cl, CF_3, NO_2 or CH_3 group, with the proviso that at least one of L, M, Q and R_7 is a substituent other than hydrogen and that only one of L, M, Q or R_7, may represent a substituent other than hydrogen, halogen, C_1–C_4 alkyl or C_1–C_4 alkoxy, with the further proviso that at least two of L, M, Q and R_7 are hydrogen.

4,843,163

CERTAIN 3-(2-PHENETHYL)-1-CARBAMOYLOXYPYRIDINIUM HALIDE INTERMEDIATES

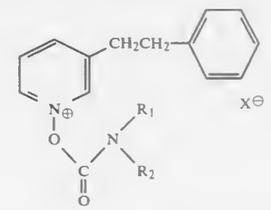
Raymond E. Dagger, Warminster, and Linda A. Motyka, Exton, both of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Dec. 2, 1987, Ser. No. 127,840

Int. Cl.[4] C07D *213/18, 401/12*

U.S. Cl. 546—194 **5 Claims**

1. A compound of the formula:



in which:

R_1 and R_2 are C_{1-4} alkyl or, taken together with the nitrogen atom to which they are attached, prolidinyl or piperidinyl; and

X is chloro, bromo or iodo.

4,843,164

AMINOTHIAZOLYL ACETIC ACID DERIVATIVES

René Heymes, Romainville, and André Lutz, Strasbourg, both of France, assignors to Roussel Uclaf, Paris, France

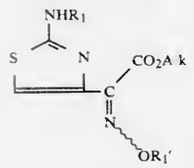
Division of Ser. No. 257,984, Apr. 27, 1981, Pat. No. 4,376,203, which is a continuation of Ser. No. 71,295, Aug. 30, 1979, abandoned, which is a division of Ser. No. 917,985, Jun. 22, 1978, Pat. No. 4,283,396, which is a division of Ser. No. 817,114, Jul. 19, 1977, Pat. No. 4,152,432, which is a continuation-in-part of Ser. No. 761,270, Jun. 21, 1977, abandoned. This application Dec. 14, 1982, Ser. No. 449,680

Claims priority, application France, Mar. 11, 1976, 72 07307; Jun. 11, 1976, 76 17743; Jun. 23, 1976, 76 01834; Aug. 18, 1976, 76 25051

Int. Cl.[4] C07D *277/56*

U.S. Cl. 548—194 3 Claims

1. A compound of the formula



V

wherein R_1 is trityl R_1' is trityl and Alk is alkyl of 1 to 4 carbon atoms and OR_1' is in the syn position.

4,843,165

PROCESS FOR PREPARING A 2,3-DIHYDRO-1H-IMIDAZOLYL-ETHOXY INDENE ANTITHROMBOTIC AGENT AND ITS PHARMACEUTICALLY ACCEPTABLE SALTS

Rafael Foguet; Ernesto Forne; Aurelio Sacristan; Josep M. Castello, and José A. Ortiz, all of Barcelona, Spain, assignors to Ferrer Internacional S.A., Barcelona, Spain

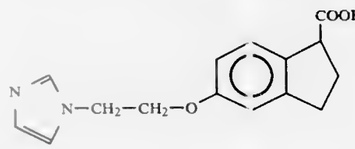
Filed Dec. 18, 1987, Ser. No. 135,040

Claims priority, application Spain, Jun. 14, 1987, 8700155

Int. Cl.[4] C07D *233/60*

U.S. Cl. 548—341 4 Claims

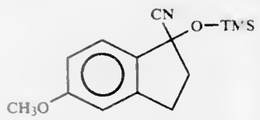
1. A process for preparing a compound having the formula:



(I)

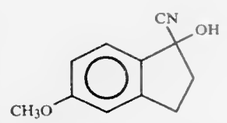
and its pharmaceutically acceptable salts; said process comprising:

(a) reacting 5-methoxy-1-indanone with trimethylsilylcyanide in the presence of a Lewis acid as a catalyzer to obtain the O-trimethylsilyl cyanohydrine having the formula:



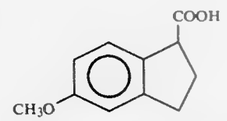
(II)

(b) subjecting said O-trimethylsilyl cyanohydrine (II) to acid hydrolysis to obtain the cyanohydrine having the formula:



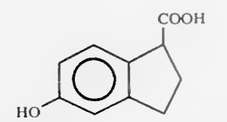
(III)

(c) reacting said cyanohydrine (III) with stannous chloride in acid medium to obtain the carboxylic acid having the formula:



(IV)

(d) subjecting said carboxylic acid (IV) to demethylation with hydrobromic acid to obtain the carboxylic acid having the formula:

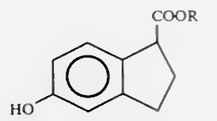


(V)

(e) reacting said carboxylic acid (V) with an aliphatic alcohol having the formula:

ROH (V')

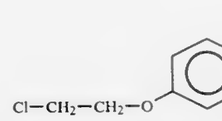
wherein R is an aliphatic alkyl of 1–4 carbon in the presence of a sulphonic acid as a catalyzer to obtain an ester having the formula:



(VI')

wherein R is as defined above;

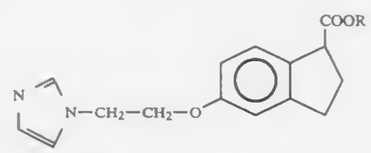
(f) reacting said ester (VI') with a 2-chloroethyl sulphonate in the presence of an alkaline or earthalkaline carbonate or bicarbonate to obtain an ester having the formula:



(VII')

wherein R is as defined above;

(g) reacting said ester (VII') with imidazole and sodium hydride as a coadjuvant to obtain an ester having the formula:



(VIII')

wherein R is as defined above; and

(h) subjecting said ester (VIII') to acid hydrolysis to obtain said Formula I compound.

4,843,166

4-BENZYLOXY-3-PYRROLIN-2-ON-1-YL ACETAMIDE PRODUCTION

Thomas Meul, Visp, Switzerland, assignor to Lonza Ltd., Gampel/Valais, Switzerland

Division of Ser. No. 60,262, Jun. 10, 1987. This application Apr. 14, 1988, Ser. No. 181,646

Claims priority, application Switzerland, Jun. 26, 1986, 2567/86

Int. Cl.[4] C07D *207/38*

U.S. Cl. 548—544 11 Claims

1. Process for the production of 4-Benzyloxy-3-pyrrolin-2-on-1-yl acetamide of the formula:

Comprising transetherifying a 4-(C_1–C_2)-alkoxy-3-pyrrolin-2-one with benzyl alcohol in the presence of an acid to 4-benzyloxy-3-pyrrolin-2-one, alkylating the transetherified compound with 2-bromoacetic acid-(C_1–C_4) alkyl ester in the presence of an alkali hydride to 4-benzyloxy-3-pyrrolin-2-on-1-yl acetic acid (C_1–C_4) alkyl ester, and converting the alkylated compound with ammonia to the end product.

4,843,167

PROCESS FOR THE PREPARATION OF ORTHO-SUBSTITUTED ARYLCARBOXIMIDOESTERS

Harald Knorr, Frankfurt am Main, and Gerhard Salbeck, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

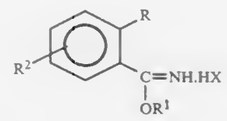
Filed Apr. 1, 1988, Ser. No. 176,794

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1987, 3711450

Int. Cl.[4] C07C *119/20*

U.S. Cl. 558—6 9 Claims

1. A process for the preparation of a compound of the formula I



(I)

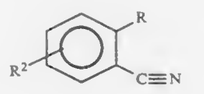
in which

R is fluorine, chlorine, bromine or (C_1–C_4)alkyl,

R^1 is (C_1–C_4)alkyl,

R^2 is H, methyl, methoxy, fluorine, chlorine, bromine or trifluoromethyl, and

X is Cl or Br, which process comprises reacting a nitrile of the formula II



(II)

-continued

R^1—OH (III)

with an alcohol of the formula III and hydrogen chloride or bromide under pressure at a temperature from −10° C. to +50° C. and subsequently converting the resulting hydrochloride or hydrobromide into the free base.

4,843,168

CATALYSIS USING PILLARED HYDROTALCITES

Mark A. Drezdzon, Aurora; Eric J. Moore, Carol Stream, and Mark P. Kaminsky, Lisle, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Dec. 22, 1987, Ser. No. 136,364

Int. Cl.[4] C07C *119/48, 4/02, 2/64*

U.S. Cl. 558—357 11 Claims

1. A process to dehydrogenate a C_1 to C_5 alkyl-substituted ethyl benezene to a C_1 to C_5 alkyl-substituted styrene comprising contacting said alkyl-substituted ethylbenzene under dehydrogenation conditions with a catalyst comprising a pillared, hydrotalcite-structure composition of formula $[Mg_{2x}Al_2(OH)_{4x4}]A^{n-}{}_{2/n}.ZH_2O$ having an X-ray diffraction d(003) value substantially greater than the hydrotalcite value of about 8 Angstroms, wherein A is an anionic polyoxometalate selected from the group consisting of polyoxometalates of vanadium, tungsten, and molybdenum, and x runs between about 1.5 and about 1.5, n is 6, and Z runs between about 0 to 3.

7. A process to ammoxidize a methyl-substituted benzene comprising contacting said methyl-substituted benzene under ammoxidation conditions with a catalyst comprising a pillared, hydrotalcite-structure composition of formula $[Mg_{2x}Al_2(OH)_{4x+4}]A^{n-}{}_{2/n}.ZH_2O$ having an X-ray diffraction d(003) value substantially greater than the hydrotalcite value of about 8 Angstroms, wherein A is an anionic polyoxometalate selected from the group consisting of polyoxometalates of vanadium, tungsten, and molybdenum, and x runs between about 1.5 and about 2.5, n is 6, and Z runs between about zero and about 3.

4,843,169

METHOD OF PREPARING ALPHA-ARYLALKANOIC ESTERS

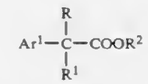
Robert C. Chapman, Manchester, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jul. 21, 1986, Ser. No. 888,539

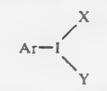
Int. Cl.[4] C07C *69/76*

U.S. Cl. 560—105 18 Claims

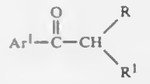
1. A method for preparing an α-arylalkanoic ester represented by the general formula



wherein Ar^1 is an aromatic hydrocarbon, R is an alkyl group or a hydrogen atom, R^1 is an alkyl group or a hydrogen atom, and R^2 is an alkyl group, which comprises reacting, under α-arylalkanoic ester-producing conditions, a trivalent iodine compound represented by the general formula



wherein Ar is an aromatic hydrocarbon and X and Y each represents a group which can be elimiated as an anion, with a carbonyl compound represented by the general formula



wherein Ar^1, R and R^1 are as defined above, in the presence of an orthocarboxylic ester represented by the general formula

$$ZC(OR^2)_3$$

wherein Z is an alkyl group or a hydrogen atom and R^2 is as defined above, and in the presence of sulfuric acid in an amount from about 0.2 mole to about 0.8 mole per mole of said carbonyl compound.

4,843,170

PROCESS FOR PRODUCING VINYL ACETATE

Tomiya Isshiki, Tokyo; Yasuhiko Kijima; Akira Ito, both of Matsudo, and Kenji Ishii, Tokyo, all of Japan, assignors to Mitsuhishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation of Ser. No. 197,137, Oct. 15, 1980, abandoned. This application Feb. 15, 1983, Ser. No. 466,653

Claims priority, application Japan, Oct. 18, 1979, 54-134358

Int. Cl.[4] C07C *69/15, 67/297*

U.S. Cl. 560—261 **8 Claims**

1. A process for producing vinyl acetate from methanol, carbon monoxide and hydrogen which comprises the following five steps:

(a) methanol is hydrocarbonylated in a hydrocarbonylation zone to produce ethanol, acetaldehyde, methyl acetate and dimethylacetal in the presence of a catalyst consisting essentially of (i) at least one member selected from the group consisting of metals belonging to Group VIII of the Periodic Table and compounds of the metals as a primary component and (ii) at least one halide as a secondary component, said primary component being used in an amount within the range of from 10^{-6} to 0.5 moles per liter of the reaction of metal atom and said secondary component being used in an amount within the range of from 10_{-5} to 0.005 moles per liter of the reaction medium in terms of halogen atom, and the products are separated in a separation zone;

(b) methyl acetate is carbonylated in a carbonylation zone to produce acetic anhydride;

(c) the acetaldehyde and dimethylacetal produced in step (a) and the acetic anhydride produced in step (b) are converted to ethylidene diacetate and methyl acetate in the presence of at least one acid catalyst selected from the group consisting of Bronsted acids and Lewis acids, the molar ratio of said acetic anhydride to said acetaldehyde plus dimethylacetal being within the range of from 5 to 60;

(d) the ethylidene diacetate produced in step (c) is thermally decomposed at a temperature between 50° and 200° C. to vinyl acetate and acetic acid, and the products are separated in a separation zone; and

(e) the methyl acetate produced and separated in steps (a) or (c) is supplied to the carbonylation step (b).

4,843,171

1,1-DIALKOXY-2-METHYL-4,4-DICYCLOXY-2-BUTENES

Bernhard Schulz, Schwertzingen, and Rolf Fischer, Heidelberg, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

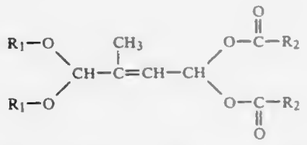
Filed Jul. 1, 1987, Ser. No. 68,442

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1986, 3622601

Int. Cl.[4] C07C *67/02*

U.S. Cl. 560—262 **4 Claims**

1. A compound having the formula:



in which the R_1 substituents are selected from the group consisting of alkyl substituents having from 1 to 5 carbon atoms, an alkylene bridge having from 2 to 3 carbon atoms, the alkylene bridge being unsubstituted or substituted with a C_1 to C_4 alkyl group, and a 2,2-dimethylpropylene bridge, and the R_2 substituents are selected from the group consisting of alkyl substituents having from 1 to 5 carbon atoms, cyclo alkyl substituents having from 5 to 7 carbon atoms, and phenyl substituents.

4,843,172

PROCESS FOR PREPARING α-PHENYLPROPIONIC ACID DERIVATIVE

Yasutaka Tanaka; Hidetaka Kojima, and Yasuo Tsuji, all of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

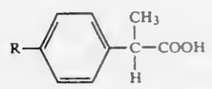
Filed Sep. 30, 1987, Ser. No. 103,309

Claims priority, application Japan, Dec. 24, 1986, 61-313868

Int. Cl.[4] C07C *51/12*

U.S. Cl. 562—406 **5 Claims**

1. A process for preparing a compound having the formula (I)



wherein R is hydrogen, alkyl, alkenyl, or aryl, which comprises contacting (1) a compound having the formula (II)

T,0290

wherein R is the same as defined above, with (2) carbon monoxide, in the presence of a catalytically effective amount of (3) a rhodium- and iodine-containing catalyst system effective to carbonylate the formula (II) compound and convert it to the formula (I) compound, then adding an extraction solvent comprising water to the reaction mixture while maintaining the reaction mixture under an inert atmosphere, then allowing the reaction mixture to separate into a first layer containing the formula (I) compound and an aqueous layer containing said rhodium, recovering said rhodium from said aqueous layer and recycling said rhodium to said contacting step.

4,843,173

PROCESS FOR PRODUCING GLUCONIC ACID

Hisashi Saito, Murayama; Shinji Ohnaka, and Shigeo Fukuda, both of Kawagoe, all of Japan, assignors to Kawaken Fine Chemicals Co., Ltd. and Kao Corporation, both of Tokyo, Japan

Continuation of Ser. No. 888,097, Jul. 17, 1986, abandoned, which is a continuation of Ser. No. 662,937, Oct. 19, 1984, abandoned. This application May 16, 1988, Ser. No. 195,466

Claims priority, application Japan, Oct. 24, 1983, 58-198872

Int. Cl.[4] C07C *51/16*

U.S. Cl. 562—531 **5 Claims**

1. A process for producing gluconic acid, which comprises: contacting an aqueous alkaline reaction solution containing a glucose with an oxygen-containing gas, while simultaneously adding an alkali at a rate effective to maintain the pH of said reaction solution in the range of 8 to 11, in the presence of a catalyst which comprises palladium and bismuth supported on a carbon carrier whereby to convert said glucose into a salt of gluconic acid, said catalyst is prepared by adsorbing a bismuth compound on active carbon carrier, then adsorbing a palladium compound on said active carbon carrier containing adsorbed bismuth compound and then reducing said bismuth compound and said palladium compound to obtain said catalyst.

4,843,174

PROCESS FOR SEPARATING PYETHROID GEOMETRIC ISOMERS

Gyula Balogh, Budapest; Iren Boros neée Gundar, Budaórs; Antal Gajáry; György Hidasi, both of Budapest; András Rappi, Érd; József Rákóczi, Budapest; Rudolf Soós, Budapest; István Székely, Dunakeszi, and Sandor Zoltan, Budapest, all of Hungary, assignors to Chinoin Gyogyszer Es Vegyeszeti Temekek Gyara Rt, Budapest, Hungary

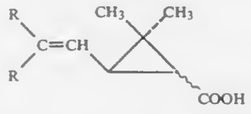
PCT No. PCT/HU85/00072, § 371 Date Sep. 26, 1986, § 102(e) Date Sep. 26, 1986, PCT Pub. No. WO86/03487, PCT Pub. Date Jun. 19, 1986

PCT Filed Dec. 6, 1985, Ser. No. 902,460

Int. Cl.[4] C07C *51/43*

U.S. Cl. 562—506 **5 Claims**

1. A process for separating cis and trans isomers of the Formula (I)



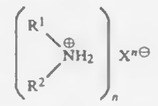
(I)

wherein

R is C_1 to C_4 alkyl or halogen, which comprises the steps of:

(a) forming a sodium or potassium salt of a mixture of cis and trans isomers of the compound of the Formula (I);

(b) treating the sodium or potassium salt comprising a mixture of cis and trans isomers of the compound of the Formula (I) at 45° to 55° C. with an aqueous solution of a salt of the Formula (III)



(III)

wherein

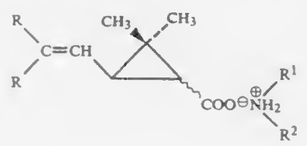
R^1 and R^2 are independently hydrogen, C_1 to C_5 straight or branched chain alkyl, C_2 to C_5 straight or branched chain alkenyl, phenyl, or aralkyl having 7 to 9 carbon atoms; or

R^1 and R^2 together with the adjacent nitrogen atom form a heterocyclic group containing 4 or 5 carbon atoms and which also contains an oxygen atom or an additional nitrogen atom;

X is chloride, bromide, carbonate, sulfate, nitrate, phosphate, acetate or formate; and

n is 1, 2 or 3;

wherein the salt of the Formula (III) is employed in an amount of 100 to 300 mole% with respect to the sodium or potassium salt to provide a buffer effect and to obtain an aqueous solution of a salt of the Formula (IV)



(IV)

(c) cooling the aqueous solution of the salt of the Formula (IV) comprising cis and trans isomers to 15° C. and filtering same to obtain a precipitate of the salt of the Formula (IV);

(d) dissolving the precipitate of the salt of the Formula (IV) in water at 50° to 55° C. and adjusting the pH of the solution to 1.5 to 2 by adding an amount of a mineral or organic acid stoichiometrically corresponding to the cis isomer content of the salt down to 10% less than the stoichiometric cis isomer content of the salt thereby selectively acidifying the salt of the cis isomer of the Formula (IV) to obtain a precipitate rich in the cis isomer of the compound of the Formula (I) and a mother liquor rich in the trans isomer of the salt of the Formula (IV);

(e) separating the precipitate rich in the cis isomer of the compound of the Formula (I) from the mother liquor and recovering same; and

(f) acidifying the mother liquor to obtain a precipitate rich in the trans isomer of the compound of the Formula (I).

4,843,175

PROCESS FOR THE PREPARATION OF ALKYLANILINE USING A FRIEDEL-CRAFTS CATALYST

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 31, 1986, Ser. No. 925,198

Int. Cl.[4] C07C *85/24*

U.S. Cl. 564—409 **8 Claims**

1. A process for the preparation of alkylaniline having from about 10 to 30 carbon atoms in the alkyl substituent which comprises reacting aniline with an olefin having from about 10 to 30 carbon atoms in the presence of a Friedel-Crafts catalyst selected from the group consisting of aluminum chloride, aluminum bromide, boron trichloride, boron trifluoride and boron trifluoride-etherate, and wherein the reaction is carried out in the absence of an aluminum anilide or a gallium anilide.

4,843,176

COMPOUNDS CONTAINING SULFUR AND AMINO GROUPS

Neil E. S. Thompson, Creve Coeur; Derek Redmore, Webster Groves; Bernardus A. Oude Alink, St. Louis, and Benjamin T. Outlaw, Webster Groves, all of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Continuation of Ser. No. 464,523, Feb. 7, 1983, abandoned, which is a continuation-in-part of Ser. No. 320,144, Nov. 10, 1981, abandoned, which is a division of Ser. No. 161,198, Jun. 19, 1980, Pat. No. 4,332,967. This application Oct. 25, 1985, Ser. No. 792,623

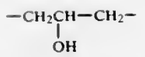
Int. Cl.[4] C07C *91/04*

U.S. Cl. 564—292 **20 Claims**

1. The product prepared by reacting an epihalohydrin with a hydrocarbon thiol and amine in molar ratios other than 1:1:1, said amine being selected from the group consisting of aminoethylethanolamine and amines of the formula R_2

where R_2 and R_3 are hydrogen or alkyl, R_4 is

and n is 1 or more, said product containing the moieties R_1S—,



and N where R_1 is a hydrocarbon group and N is an amino moiety.

4,843,177

SUBSTITUTED ACETAMIDE DERIVATIVES WITH AN ANTIDOTE ACTION, ANTIDOTE COMPOSITIONS CONTAINING SUCH COMPOUNDS, SELECTIVE HERBICIDE COMPOSITIONS CONTAINING THESE ANTIDOTES AND A PROCESS FOR THE PREPARATION OF SUBSTITUTED ACETAMIDE DERIVATIVES

Gyorgy Matolcsy; Barna Bordas; Antal Gimesi; Magdolna Kovacs, and Marton Tüske, all of Budapest, Hungary, assignors to Eszakmagyarorszagi Vegyimuvek, Sajobabony, Hungary

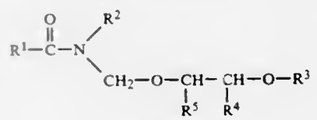
Continuation of Ser. No. 513,215, Jul. 13, 1983, Pat. No. 4,605,764. This application Mar. 10, 1986, Ser. No. 838,271

Claims priority, application Hungary, Jul. 14, 1982, 2288/82

Int. Cl.[4] C07C *103/127, 103/34*; A01N *37/18*

U.S. Cl. 564—209 **10 Claims**

1. A compound of the Formula (III)



wherein

R^1 stands for a halogenated alkyl group containing 1 to 2 carbon atoms;

R^2 stands for a straight or branched alkyl group containing 1 to 6 carbon atoms or an alkenyl group containing 2 to 6 carbon atoms;

R^3 stands for an alkyl group containing 1 to 6 carbon atoms, an alkoxyalkyl group of altogether 2 to 6 carbon atoms, or a phenyl group; or

R^3 and R^4 together stand for a propylene group or a butylene group; or

R^4 and R^5 stand independently from each other for hydrogen or a methyl group; or

R^4 and R^5 together stand for a propylene group or a butylene group.

4,843,178

COMPOSITIONS POSSESSING PHEROMONE-LIKE ACTIVITY

Jim D. Byers, 1457 Oakdale Dr., Bartlesville, Okla. 74006, and Charles A. Drake, Rte. 1, Box 206, Nowata, Okla. 74048

Filed Dec. 2, 1987, Ser. No. 127,864

Int. Cl.[4] C07C *45/29, 45/30*

U.S. Cl. 568—469.9 **20 Claims**

1. A process for producing E,Z-9-alkenyl-1-aldehydes comprising:

(a) disproportionating cyclooctene and an alpha-olefin containing from 3 to 12 carbon atoms in the presence of a disproportionation catalyst selected from the group consisting of

(1) silica or thoria promoted by an oxide or compound convertible to an oxide by calcination, or sulfide of tungsten or molybdenum; or by an oxide or compound convertible to an oxide by calcination of rhenium or tellurium;

(2) alumina promoted with an oxide or compound convertible to an oxide by calcination of molybdenum, tungsten, or rhenium; a sulfide of tungsten or molybdenum; or an alkali metal salt, ammonium salt, alkaline earth metal salt, or bismuth salt of phosphomolybdic acid;

(3) one or more of the group aluminum phosphate, zirconium phosphate, calcium phosphate, magnesium phosphate, or titanium phosphate promoted by one or more of a sulfide of molybdenum or tungsten, or an oxide or compound convertible to an oxide by calcination of molybdenum, tungsten or rhenium or magnesium tungstate or beryllium phosphotungstate;

(4) silica, alumina, aluminum phosphate, zirconium phosphate, calcium phosphate, magnesium phosphate, or titanium phosphate promoted by a hexacarbonyl of molybdenum or tungsten; and

(5) (a) molybdenum oxide or tungsten oxide associated with suitable support material and (b) at least one organoaluminum compound, optionally, treated with nitric oxide or nitrosyl halides, selected from the group consisting of organoaluminum compounds which have the formula R''_aAlX_b where R'' is a saturated aliphatic or aromatic hydrocarbon having up to about 20 carbon atoms. X is chlorine, bromine, iodine, or fluorine, a is an integer of at least 1, b can be 0.1 or 2, and the total of a and b is 3, thus a can be 1, 2 or 3 producing a 1,9-alkadiene;

(b) reacting the 1,9-alkadiene obtained in step (a) with a metallating agent selected from the group consisting of:

(1) organoboranes of the formula R_2BH wherein each R is independently selected form the group consisting of C_2 to C_{10} hydrocarbon radicals, wherein at least one R group is a secondary or tertiary alkyl group and each R group can be connected to the other as part of a ring structure;

(2) organomagnesium compounds of the formulae R'MgX or R_2Mg wherein each R is independently selected from the group consisting of a C_3–C_{10} hydrocarbon radical having at least one β hydrogen and X is selected from the group consisting of Cl, Br, or I; and

(3) organoaluminum compounds selected from the group consisting of AlH_3 and compounds of the formula R_2AlH wherein each R group is independently selected from the group consisting of C_1 to C_{10} hydrocarbon radicals, wherein at least one R group is a secondary or tertiary alkyl group and each R group can be connected to the other as part of a ring structure producing a 1-metallo-9-alkene;

(c) contacting the 1-metallo-9-alkene obtained in step (b) with oxygen, producing a 1-oxymetallo-9-alkene;

(d) hydrolysing the 1-oxymetallo-9-alkene obtained in step (c) with a hydrolysing agent selected from the group consisting of hydrochloric acid, sulfuric acid, phosphoric acid and acetic acid, producing an E,Z-9-alkenyl-1-alcohol;

(e) oxidizing the E,Z-9-alkenyl-1-alcohol obtained in step (d) with an oxidizing agent selected from the group consisting of pyridinium chlorochromate, pyridinium dichromate and, dimethyl sulfoxide, producing an E,Z-9-alkenyl-1-aldehyde.

4,843,179

PREPARATION OF 4,4'-DIPHENOXYBENZOPHENONE

Viktors Jansons, Los Gatos, and Heinrich C. Gors, Mountain View, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jan. 5, 1988, Ser. No. 141,017

Int. Cl.[4] C07C *45/46*

U.S. Cl. 568—322 **6 Claims**

1. A method of preparing 4,4'-diphenoxybenzophenone, comprising reacting diphenyl ether and carbon dioxide in the presence of a Friedel-Crafts catalyst selected from the group consisting of aluminum trichloride, aluminum tribromide, antimony trichloride, gallium trichloride, boron trichloride, boron trifluoride ferric chloride, molybdenum pentachloride, and mixtures thereof and a promoting agent selected from the group consisting of phosphoryl chloride, phosphorus pentoxide, tetrachlorosilane, methyltrichlorosilane, dimethyldichlorosilane, titanium tetrachloride, zirconium tetrachloride, zirconium oxyhalide, and phosphorus pentachloride.

4,843,180

PREPARATION OF ETHERS

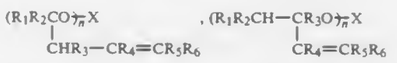
Michael J. Mullins, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 929,880, Nov. 13, 1986, abandoned, and a continuation-in-part of Ser. No. 517,548, Jul. 27, 1983, abandoned, which is a continuation-in-part of Ser. No. 368,537, Apr. 15, 1982, abandoned. This application Jun. 21, 1988, Ser. No. 209,386

Int. Cl.[4] C07C *41/06*

U.S. Cl. 568—689 **15 Claims**

1. A process for the preparation of unsaturated ethers corresponding to the formula:



or mixtures thereof; wherein R_1–R_6 independently are selected from the group consisting of hydrogen, C_{1-4} alkyl and C_{1-4} alkenyl, X is the remnant of an aliphatic hydroxyl-containing compound formed by removal of the hydroxyl group thereof, and n is one comprising contacting a conjugated alkadiene corresponding to the formula $R_1R_2C{=}CR_3{-}CR_4{=}CR_5R_6$ or a mixture thereof, with an aliphatic hydroxyl-containing compound corresponding to the formula $X(OH)_n$ wherein R_1–R_6, X and n are as previously defined at an elevated temperature in the presence of a catalyst consisting essentially of a chelating phosphine adduct of zero valent nickel under conditions sufficient to form the unsaturated ether in a yield of at least 60 mole percent based on the limiting reactant and to prevent the formation of oligomers including bisethers in a total amount greater than 5 mole percent based on the limited reactant.

4,843,181

PROCESS FOR THE MANUFACTURE OF 1,1,1-TRIFLUORODICHLOROETHANE AND 1,1,1,2-TETRAFLUOROCHLOROETHANE

William H. Gumprecht; Leo E. Manzer, and V. N. Mallikarjuna Rao, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 22, 1987, Ser. No. 111,292

Int. Cl.[4] C07C *17/20, 19/02*

U.S. Cl. 570—169 **11 Claims**

1. A process for the preparation of 1,1,1-trifluorodichloroethane and/or 1,1,1,2-tetrafluorochloroethane by fluorination of a tetrahaloethylene, $C_2Cl_{4-x}F_x$, wherein x=0 to 3, and/or pentahaloethane, $C_2HCl_{5-x}F_x$, wherein x=0 to 2, comprising

contacting in the gaseous phase at effective temperature, mol ratio and contact time, said tetrahaloethylene and/or pentahaloethane with HF and Cr_2O_3, said Cr_2O_3 prepared by pyrolysis of $(NH_4)_2Cr_2O_7$,

said contacting producing a product stream containing 1,1,1-trifluorodichloroethane and/or 1,1,1,2-tetrafluorochloroethane and pentafluoroethane, wherein the amount of said 1,1,1-trifluorodichloroethane and/or 1,1,1,2-tetrafluorochloroethane produced is greater than the amount of pentafluoroethane produced and, thereafter,

separating the 1,1,1-trifluorodichloroethane and/or 1,1,1,2-tetrafluorochloroethane from the product stream.

4,843,182

PROCESS FOR THE PRODUCTION OF MONOMER VINYL CHLORIDE BY CRACKING OF DICHLOROETHANE AND SYSTEM SUITABLE TO CARRY OUT THE PROCESS

Marco Simonetta, Milan, and Giacomo DiClaudio, San Donato Milanese, both of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Filed Jul. 24, 1987, Ser. No. 77,078

Claims priority, application Italy, Sep. 5, 1985, 22068 A/85

Int. Cl.[4] C07C *17/24, 17/34*

U.S. Cl. 570—226 **5 Claims**

1. Process for the production of monomer vinyl chloride by dichloroethane cracking in an oven with a convection section and a radiant section, characterized in that a stream of dichloroethane is fed to the convective section of an oven, so to heat it up to a temperature lower than its boiling temperature, the dichloroethane stream outflowing from the convective section of the oven is vapourized in an area external to said oven by indirect heat exchange with a high-temperature gaseous fluid, heated by indirect heat exchange with the hot dichloroethane cracking products outflowing from said oven, the stream of vapourized dichloroethane is drawn from said outer area, and is introduced into the radiant section of said oven wherein it undergoes the cracking and forms vinyl chloride.

4,843,183

PROCESS FOR PRODUCING LOWER OLEFINIC HYDROCARBONS FROM METHANOL

Tomoyuki Inui, Kyoto, Japan, assignor to Showa Shell Sekiyu Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 30,297, Mar. 23, 1987, abandoned, which is a continuation of Ser. No. 762,955, Aug. 6, 1985, abandoned. This application Jul. 20, 1987, Ser. No. 75,612

Claims priority, application Japan, Aug. 15, 1984, 59-169368

Int. Cl.[4] C07C *1/22*

U.S. Cl. 585—640 **14 Claims**

1. A process for conversion of C_2–C_4 olefinic hydrocarbons from methanol by bringing gaseous methanol into contact with a synthetic metallosilicate catalyst prepared by the following steps:

(1) the first step of preparing a gel mixture by mixing the following solutions (A), (B) and (C); solution (A) being an aqueous solution containing a salt of a metal (Me) of Fe, Ni or Co,. a quaternary alkyl ammonium cation and an inorganic acid; solution (B) being an aqueous silicate solution; solution (C) being an aqueous solution of an ion modifier, the solutions (A) and (B) being added to the solution (C) at a rate such that the pH of the solution (C) is kept at about 10, and the ion modifier has been added to the solution (A) and the quaternary alkyl ammonium cation, the inorganic acid and an alkaline hydroxide have been added to the solution (C) at the time of the addition,

(2) the second step of grinding the resulting gel mixture;

(3) the third step of heating the gel mixture to a temperature from room temperature to 150°–190° C. at a constant speed followed by heating to 190°–220° C. at a constant speed or an exponential speed to obtain a precursor synthetic metallosilicate having the following chemical composition in molar ratio;

Si/Me	25–3200
OH^-/SiO_2	0.3–1.0
H_2O/SiO_2	30–100
R/R + alkali metal	0.05–0.15
$NaCl/H_2O$	0.01–0.06

wherein R is quaternary alkylammonium cation, the alkali metal is sodium or potassium, and Me is Fe, Ni or Co, and

(4) the fourth step of calcining the precursor.

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4,843,184

PROCESS FOR EXTRACTING PARAFFINS FROM THEIR MIXTURES WITH PARAFFINSULFONIC ACIDS

Lucio Faggian, San Donato Milanese; Maurizio Castellano, Turin; Edoardo Platone, San Donato Milanese, and Cosimo Franco, Locri, all of Italy, assignors to Enitricerche S.p.A., Milan and Enichem Augusta S.p.A., Palermo, both of, Italy

Filed Jul. 10, 1987, Ser. No. 71,872
Claims priority, application Italy, Jul. 23, 1986, 21224 A/86
The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.
Int. Cl.[4] C07C *143/21*
U.S. Cl. 585—864 11 Claims

1. A process for extracting C_{12}–C_{18} n-paraffins from a reaction mixture of C_{12}–C_{18} n-paraffins with paraffinsulfonic acids having the same number of carbon atoms, water and sulfuric acid, where said reaction mixture is obtained by sulfoxidation of a mixture of C_{12}–C_{18} paraffins at a temperature of between 25°–50° C. with sulfur dioxide and oxygen in the presence of water and ultraviolet radiation, comprising the steps of;

(a) removing excess sulfur dioxide, if present, from said reaction mixture,

(b) decanting said reaction mixture to remove most of the C_{12}–C_{18} paraffins and to obtain a residual mixture,

(c) adding sulfuric acid to said residual mixture until a two-phase system forms, or at least until said residual mixture becomes a turbid mixture,

(d) separating a supernatant phase from said two-phase system, and

(e) extracting said turbid mixture or said supernatant phase with supercritical carbon dioxide.

4,843,185

METHOD FOR ENHANCING THE POLYMERIZATION ACTIVITY OF CRUDE CYCLOOLEFIN MONOMERS FOR BULK POLYMERIZATION

James T. Ware, Doylestown, and Robert J. Minchak, Parma Heights, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 8, 1988, Ser. No. 179,253
Int. Cl.[4] C07C *7/00*
U.S. Cl. 585—803 16 Claims

1. A method for enhancing the polymerization activity of crude grade cycloolefin monomers comprising:

providing a crude grade monomer mixture of one or more cycloolefin monomers having at least one norbornene functional group, said crude grade mixture containing polymerization retarding impurities in amounts sufficient to reduce the degree of monomer conversion upon polymerization by at least 1%, as measured by thermal gravimetric analysis on a thermal analyzer utilizing the weight loss of a polymerized sample up to 400° C. as the weight of unreacted monomer;

said crude grade monomer mixture containing at least about 10 weight percent dicyclopentadiene monomer, based on the total weight of the crude grade mixture;

heating said crude grade monomer mixture to a temperature sufficiently high and for a period sufficiently long to dissociate a portion of the dicyclopentadiene monomers to cyclopentadiene and to react said cyclopentadiene with the polymerization retarding impurities in a quantity sufficient to increase the degree of monomer conversion by at least 1% as measured by thermal gravimetric analysis on a thermal analyzer utilizing the weight loss of a polymerized sample up to 400° C. as the weight of unreacted monomer;

wherein the crude grade monomer mixture is maintained free of a complete polymerization catalyst/co-catalyst system.

11. A method for producing ring-opened polymerized polymers comprising:

(a) providing a crude grade monomer mixture of one or more cycloolefins having at least one norbornene functional group, said crude grade monomer mixture comprising about 1 to 10% by weight linear olefinic impurities and at least about 25% by weight dicyclopentadiene;

(b) heating the crude grade monomer mixture to a temperature sufficiently high and for a period sufficiently long to dissociate a portion of the dicyclopentadiene monomer to cyclopentadiene and to react the cyclopentadiene with the linear olefinic impurities in an amount sufficient to increase the degree of monomer conversion by at least 1% as measured by thermal gravimetric analysis on a thermal analyzer, utilizing the weight loss of a polymerized sample up to 400° C. as the weight of unreacted monomer;

wherein the crude grade monomer mixture is maintained substantially free of a complete ring-opening polymerization catalyst/co-catalyst system during step (b);

(c) forming a reactive liquid mixture comprising the heated crude grade monomer mixture of step (b) and a complete ring-opening bulk polymerization catalyst/co-catalyst system; and

(d) conveying said reactive liquid mixture into a mold maintained at a temperature sufficiently high to thermally accelerate ring-opening polymerization.

4,843,186

LONG SHELF LIFE HETEROZYGOUS TOMATO PLANT

Kedar Nahum, Rehovot, Israel, assignor to LSL, Inc., Tiburon, Calif.

Filed Jul. 28, 1986, Ser. No. 889,915
Int. Cl.[4] A01H *1/02*
U.S. Cl. 800—1 9 Claims

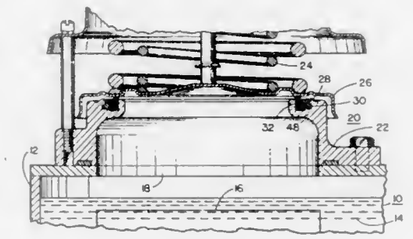
1. A heterozygous tomato plant resulting from crossing a male parent containing the Rin/Rin gene with a female parent, said tomato plant having a Rin gene from the male parent as a heterozygote and having the characteristics of a very firm fruit with excellent tomato-like taste having a shelf like of at least two weeks, without substantially deteriorating taste or firmness, and developing a full red color.

4,843,187

GASKET ASSEMBLY AND ELECTRICAL POWER TRANSFORMER INCLUDING THE SAME

Wendell D. Johnson, Rochester, N.Y., assignor to Qualitrol Corporation, Fairport, N.Y.

Filed Feb. 5, 1988, Ser. No. 152,668
Int. Cl.[4] H01F *27/02*; F16K *25/00*
U.S. Cl. 174—11 R 2 Claims



2. The combination comprising:

a base member having a substantially circular central opening and a circular slot formed therein surrounding the central opening, the circular slot having a side wall, a base, and an undercut portion;

a circular gasket having a side, a base, and a tapered portion, the gasket being mounted within the slot such that the gasket side abuts the slot side wall, the gasket base abuts the slot base, and the gasket tapered portion is proximate the undercut portion of the slot; and

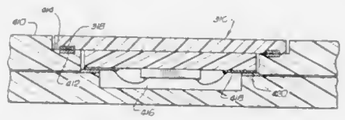
cementitious sealant material abutting the gasket tapered portion and within the undercut portion of the slot, whereby the gasket is securely retained in a position relative to the base member.

4,843,188

INTEGRATED CIRCUIT CHIP MOUNTING AND PACKAGING ASSEMBLY

Timothy P. Patterson, Santa Ana, and Carl E. Hoge, Encinitas, both of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Filed Mar. 25, 1986, Ser. No. 843,592
Int. Cl.[4] H01L *23/02*
U.S. Cl. 174—52.4 34 Claims



1. An electronic component mounting and packaging assembly, comprising:

an insulating printed circuit board substrate having a cavity therein and a plurality of electronic component connection locations on said substrate disposed at a distance from said cavity;

a plurality of first conductors each having an end spaced about the periphery of the mouth of said cavity, wherein said first conductors are electrically coupled to the electronic connection locations;

an insulating member covering the mouth of said cavity, said member having a first side facing the interior of said cavity and an electronic component bonding pad centrally located on the first side;

a plurality of second conductors, said second conductors being disposed on the first side of the said insulating member so that each one of said second conductors contacts a first conductor;

an electronic component, substantially one entire side of the component being mounted to the bonding pad of said insulating member; and

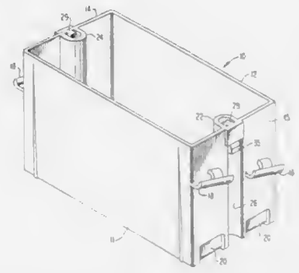
connecting means for electrically connecting said electronic component to said second conductors.

4,843,189

SCREW ATTACHMENT POCKET WITH GUIDE TAB

Robert W. Jorgensen, Niles, Mich., and Kenneth R. Schnell, South Bend, Ind., assignors to Hubbell Incorporated, Orange, Conn.

Filed Sep. 20, 1988, Ser. No. 246,754
Int. Cl.[4] H02G *3/08*
U.S. Cl. 174—53 2 Claims



1. A molded electrical box of the type including generally parallel side walls, generally parallel end walls perpendicular to said side walls and a back wall forming a box with an open front for receiving wires and an electrical device, first and second screw attachment housings, one in each of said end walls at said open front, each said attachment housing including a cavity having an opening facing in the same direction as said open front into which a screw can be inserted, means in said cavity defining an arcuate surface, a first sloping surface in said cavity and a generally triangular cam member having a second sloping surface and means on another surface defining a set of partial threads, the cam member being insertable into said cavity with said first and second sloping surfaces facing each other and with the arcuate surface facing the set of partial threads so that a screw can be received between the arcuate surfaces, and a guide comprising

a guide tab extending partially across said opening of said cavity to block direct access to said cam member, said guide tab having an arcuate distal end surface dimensioned to receive a screw being inserted and to guide said screw between said arcuate surfaces.

4,843,190

CIRCUIT BOARD SUBSTRATE WITH GOLD PLATED CONTACT ELEMENTS AND A METHOD FOR MOUNTING GOLD PLATED CONTACT ELEMENTS TO THE SUBSTRATE

Laurentius M. Verboeven, Veghel, Netherlands, assignor to E. I. DuPont De Nemours and Company, Wilmington, Del.

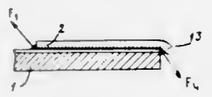
Filed Jun. 15, 1987, Ser. No. 61,514
Claims priority, application Netherlands, Jun. 17, 1986, 8601567
Int. Cl.[4] H05K *3/24*, *3/40*
U.S. Cl. 174—68.5 9 Claims

1. A method for mounting contact elements on a surface of a circuit board substrate having a plurality strip conductors formed on said substrate for interconnecting a plurality of components, said method comprising the steps of

applying a solder paste containing solder particles and an

adhesive to the ends of said strip conductors terminating as contact areas along one edge of said substrate surface to form a plurality of separate solder surfaces,

placing a contact element on each of said soldering surfaces, each said contact element being preformed into a substantially flat, rectangular shape except at one side which is bent downward to provide a curved surface for engaging the edge of the substrate, each said contact element having a gold layer at its top surface and an activated bottom



surface which faces and contacts the solder surface on the substrate, and

applying heat to melt and liquify the solder paste causing said contact element to float on said liquid solder paste, whereby said liquid paste exerts a surface tension against the bottom surface of said contact element, a component force of said surface tension urging the downwardly bent side of said contact element against the edge of the substrate and thereby centering said contact element on said soldering surface.

4,843,191

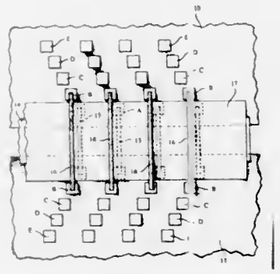
INTERCONNECTION TECHNIQUE USING DIELECTRIC LAYERS

Donald A. Thomas, Titusville, N.J., assignor to American Telephone and Telegraph Company, AT&T Bell Laboratories, Murray Hill, N.J.

Filed Nov. 27, 1987, Ser. No. 125,975

Int. Cl.[4] H01R 4/00

U.S. Cl. 174—88 R **12 Claims**



1. A process for bonding conductors to bonding pads of an element comprising the steps of arranging a plurality of the bonding pads in a first array; each bonding pad having a significantly wider width than the width of a corresponding conductor;

forming a plurality of first conductors on a first dielectric tape such that free ends thereof overlap an edge of the first tape and are configured in an array that corresponds to the first array;

bringing the tape into proximity with one side of the first array of bonding pads; and

bonding each of a plurality of the free ends of the first conductors to a corresponding bonding pad of the first array characterized in that

a second array of bonding pads is located on the element on a side of the first array opposite the side on which the first dielectric tape is located;

a plurality of second conductors is formed on a second dielectric tape such that free ends thereof overlap an edge of the second tape and are configured in an array that corresponds to the second array;

the second tape being wider than the first tape;

the second dielectric tape is overlaid upon the first conductors and the first array of bonding pads such as to cover all of the first array but none of the second array of bonding pads; and

each of a plurality of the free ends of the second conductors is bonded to a bonding pad of the second array of bonding pads.

12. A product made by the process of claim 1.

4,843,192

PUSH-BUTTON SWITCH DEVICE HAVING INDIVIDUAL/NTERLOCKING ACTION

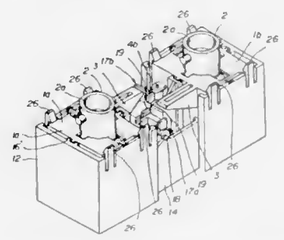
Soetsu Kamada, and Yujiro Shimoyama, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jan. 25, 1988, Ser. No. 147,698

Claims priority, application Japan, May 7, 1987, 62-67405[U]

Int. Cl.[4] H01H 9/24

U.S. Cl. 200—50 C **9 Claims**



1. A push-button switch device, comprising a casing, first and second sliders mounted for sliding movement in said casing, first and second actuating pins supported for rocking motion on said first and second sliders, respectively, first and second cam plates having heart-shaped cams formed thereon for engagement with said first and second actuating pins, respectively, each of said first and second cam plates further having a cam bank formed thereon, a pair of springs for urging said first and second cam plates to resiliently engage said heart-shaped cams with ends of said first and second actuating pins, first and second push-button switches mounted on a bottom wall of said casing and each including a push-button, a pair of actuators mounted for sliding movement between two limit positions in said first and second sliders and in an opposing relationship to said push-buttons of said first and second push-button switches, a pair of spring elements for urging said actuators toward said push-buttons of said first and second push-button switches, a first cam element provided on said first slider for pressing engagement with said cam bank provided on said second cam plate, and a second cam element provided on said second slider for pressing engagement with said cam bank of said first cam plate.

4,843,193

RESERVOIR FOR A HYDRAULIC BRAKE SYSTEM

Ludwig Budecker, Frankfurt am Main, and Gerd Klostermann, Friedrichsdorf, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

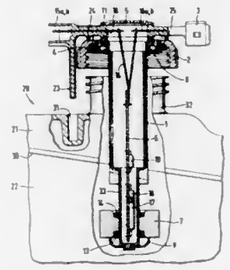
Filed Mar. 28, 1988, Ser. No. 173,977

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1987, 3711369

Int. Cl.[4] H01H 35/18

U.S. Cl. 200—84 C **5 Claims**

1. In a supply reservoir assembly including a supply reservoir having a threaded filler nozzle; a reservoir telltale device comprising an elongate hollow tubular housing closed at one end and open at its other end, a screw coupling member rotatably mounted on said housing adjacent said other end and being threadably engageable with said nozzle to mount said housing on said reservoir with said one end of said housing located within said reservoir, electrical circuit board means mounted within said housing and having a switch connected thereto, an electrical plug member having first and second opposed surfaces and having a bore extending into said member from said first surface, electrical connection means sealed



in said plug member and projecting into said bore and from the exterior of said plug member to establish an external electrical connection to said circuit board means, means fixedly and sealingly securing said other end of said housing to said first surface of said plug member with said bore opening into said housing, means fixedly and sealingly closing the end of said bore remote from said first surface, and means on said plug member engageable with said reservoir for locking said plug member and housing against rotation relative to said reservoir during threading and unthreading movement of said coupling upon said nozzle, a float slidable on said tubular housing and having means thereon for actuating said switch.

4,843,194

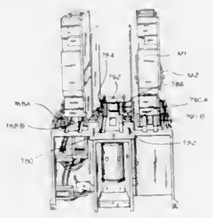
AIR BREAK CONTACTOR

Miklos J. Orosz, Columbia, S.C., assignor to Square D Company, Palatine, Ill.

Continuation of Ser. No. 754,878, Jul. 12, 1985, abandoned. This application Feb. 18, 1988, Ser. No. 161,235

Int. Cl.[4] H01H 9/44

U.S. Cl. 200—144 C **4 Claims**



1. An air break contactor having an arc chute, comprising:

a frame for supporting parts of said contactor, said frame being a part of said contactor and having a top surface mounted therein.

a track for said arc chute to rest upon, said track formed as a pair of grooves in said top surface and,

said arc chute having on its bottom surface both a first projection along a first side and a second projection along a second side for fitting into said pair of grooves of said track so that said arc chute may slide into position on said track.

4,843,195

SWITCH HAVING DUST-PROOF COVER

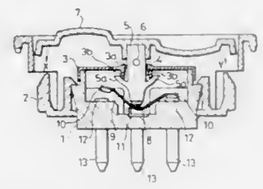
Hiroyuki Sato, and Yujiro Shimoyama, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Feb. 26, 1988, Ser. No. 160,702

Claims priority, application Japan, Jun. 2, 1987, 62-85495

Int. Cl.[4] H01H 21/08

U.S. Cl. 200—302.3 **2 Claims**



1. A switch device, comprising:

a casing having an opening, a switch operating member supported for pivotal motion on said casing and extending through said opening of said casing into the inside of said casing;

a conductor plate mounted for rocking motion within said casing and located such that a tilting motion of said switch operating member will cause rocking motion of said conductor place to make a switching operation of said switch device;

and a cover made of a synthetic resin material and mounted over said opening of said casing, said cover having an opening formed therein through which said switch operating member extends into the inside of said casing;

said cover having a pair of projected walls extending into said opening of said cover formed on opposite peripheral edges of said opening thereof in the direction of rocking motion of said switch operating member;

said switch operating member having a pair of semicylindrical flanges formed thereon which extend in a curve centered at an axis of pivotal motion of said switch operating member and are opposed to and engaged at concave faces thereof with said projected walls of said cover.

4,843,196

MODE SWITCHING DEVICE FOR AN ELECTRICAL SWITCH

Josef Bissig, Altdorf, and Peter Hilfiker, Buchs, both of Switzerland, assignors to Sprecher & Schuh AG, Aarau, Switzerland

Filed Mar. 16, 1987, Ser. No. 35,527

Claims priority, application Switzerland, Mar. 20, 1986, 01132/86

Int. Cl.[4] H02B 1/08

U.S. Cl. 200—336 **11 Claims**

1. An electrical device containing an electrical switch and mode switching means for switching between a plural number of operative modes of the electrical switches, said device comprising:

a housing of the electrical switch;

said housing including a housing wall containing an opening;

a plural number of latching means located at said housing wall in the region of said opening;

said plural number of latching means being arranged in circumferentially mutually spaced relationship;

said plural number of latching means defining a plural number of latching locations each of which is associated with a selected one of the plural number of operative modes of the electrical switch;

a plural number of bayonet claws located at said housing

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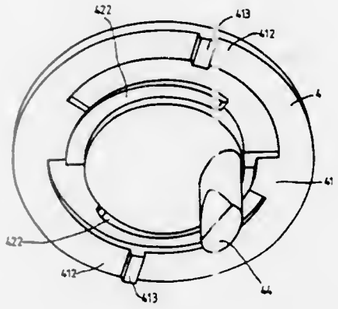
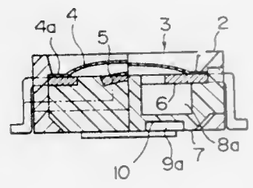
wall and partially extending into said opening substantially in radial direction;
an actuator member mounted in said opening of said housing wall of said electrical switch for rotation about an axis of rotation which extends substantially perpendicular to said housing wall;
said actuator member containing guide ring means interengaged with said bayonet claws on said housing wall and forming a bayonet joint;
said actuator member further containing resilient bracket means extending in substantially arcuate configuration about said axis of rotation of said actuator member;
said resilient bracket means being axially resilient for reversible displacement in a direction of extent of said axis of rotation;
a plural number of latching elements located at said resilient bracket means of said actuator member;

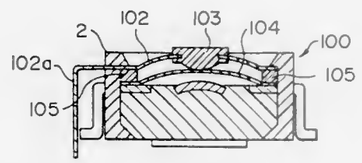


said plural number of latching elements being arranged in circumferentially mutually spaced relationship;
said plural number of latching elements located at said resilient bracket means of said actuator member and said plural number of latching means located at said housing wall having mutually substantially complementary shapes;
at least one operating projection protruding from said actuator member into the interior space of said electrical switch; and
said at least one operating projection, in each rotary position of said actuator member and in which rotary position one of said plural number of latching elements of said actuator member is interengaged with one of said plural number of latching means of said housing wall, acting upon said electrical switch and thereby placing said electrical switch into said selected operative mode.

4,843,197
BUSH SWITCH AND METHOD OF PRODUCTION THEREOF
Hisano Kojima, Amagasaki, and Michio Hirabayashi, Ibaraki, both of Japan, assignors to Idec Izumi Corporation, Osaka, Japan
Filed Oct. 27, 1987, Ser. No. 113,026
Claims priority, application Japan, Oct. 31, 1986, 61-260958; Oct. 31, 1986, 61-260959
Int. Cl.[4] H01H *5/30*
U.S. Cl. 200—406 7 Claims

1. A push switch comprising:
a central contact member and a peripheral contact member, both of said members forming a conductive path; said peripheral contact member having an annular shape and surrounding said central contact member, said members being radially spaced from each other;
an insulating contact support member for supporting said central and peripheral contact members;
a first conductive belleville spring having a central portion adapted to contact said central contact member and an outer edge portion in contact with a top surface of said peripheral contact member;
a second belleville spring having an outer edge portion, provided with an insulating annular member and an insulating, operating button fixedly secured to said central portion of said second belleville spring, said second belleville spring being separated from said first belleville spring through said insulating annular member;
at least one air chamber formed within said insulating



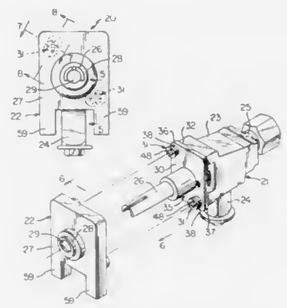


contact support member, said air chamber at a bottom part being defined by a thin, flexible bottom wall of said contact support member, with at least one hole provided in said contact support member on the side opposite said thin, flexible wall;
a sealed space formed below an inner side of said first belleville spring facing said central contact member and being open into said air chamber; and
an insulating case in close contact with an outside surface of said contact support member for fixedly securing outer edge portions of said first and second belleville springs and said peripheral contact member between said case and a top surface of said contact support member along a whole periphery thereof, such that said central and peripheral contact members are surrounded by a completely sealed space.

4,843,198
BURNER CONTROL DEVICE AND ELECTRICAL SWITCH UNIT ASSEMBLY, PARTS THEREFOR AND METHODS OF MAKING THE SAME
William J. Lichtenberger, Murrysville, Pa., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Oct. 31, 1988, Ser. No. 265,037
Int. Cl.[4] H01H *9/06*
U.S. Cl. 200—61.86 20 Claims

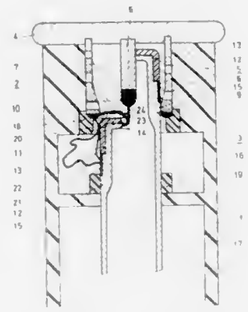
1. In the combination of a burner control device having a rotatable selector shaft and an electrical switch unit carried by the burner control device and being operated by said selector shaft, said burner device having a cover secured thereto by a plurality of screws each having a head, said switch unit having a plurality of cavities therein respectively receiving said heads

of said screws therein, the improvement wherein it least one of said cavities has snap-fit means therein that is snap-fitted to its



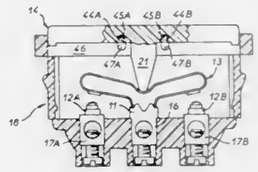
respective head to hold said switch unit to said burner control device.

4,843,199
GAS-BLAST CIRCUIT BREAKER
Lutz Niemeyer, Birr, Switzerland, assignor to BBC Brown, Boveri AG, Switzerland
Filed Dec. 7, 1987, Ser. No. 129,728
Claims priority, application Switzerland, Dec. 8, 1986, 4883/86
Int. Cl.[4] H01H *33/70*
U.S. Cl. 200—148 R 13 Claims



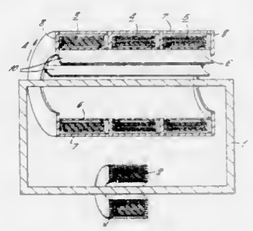
1. A gas-blast circuit breaker, comprising:
a casing filled with an arc-extinguishing gas;
a first, cylindrically shaped, switching element secured to said casing and having a first arcing contact;
a second, cylindrically shaped, switching element, mounted to move into and out of engagement with said first switching element along a common axis of said switching elements and having a nozzle shaped forward end and a second arcing contact disposed on an exterior surface of said switching element;
an arc-extinguishing-contact adjacent a forward free end of said second switching element and a capping of insulating material extending from said second arcing contact of said second switching element to said arc-extinguishing-contact thereof; enable an arc, drawn during a switching-off operation of said circuit breaker, to freely develop between said respective first and second arcing contacts of said first and second switching element; and
an expansion chamber defined by said casing and effective for collecting arc-extinguishing gas generated by an arc developing in said heating chamber, said heating chamber and expansion chamber being so disposed relative to one another as to cause said arc to initially develop between said respective first and second arcing contacts and to be, thereafter and shortly before a current to be switched off passes through zero, commuted through the action of said of arc-extinguishing gas to said arc-extinguishing contact of said second switching element.

4,843,200
SWITCH MECHANISM HAVING A CONDUCTIVE CONTACT ARM WITH A DOUBLE PIVOT
Roger Parlatore; Alain Leluc, both of Solignac, and Christian Besse, Limoges, all of France, assignors to Legrand, Limoges, France
Filed Oct. 27, 1987, Ser. No. 113,136
Claims priority, application France, Oct. 29, 1986, 86 15041
Int. Cl.[4] H01M *23/24*
U.S. Cl. 200—553 20 Claims



1. A double pivot switch mechanism comprising an electrically conductive yoke having parallel pivoting areas, at least one fixed contact, an electrically conductive contact arm of resilient construction having a generally open loop configuration, ends of said open loop defining contact areas cooperable with said pivoting areas for articulating said conductive arm, said contact arm having a median strip having a depressed central part cooperable with an operating member for operating the switch mechanism in a first and a second position, said contact arm ends each projecting in a first direction and outwardly form the open loop, a bearing area being provided on said contact arm cooperable with said fixed contact in one of said two positions of the switch mechanism.

4,843,201
INDUCTION HEATER COUPLING CONTROL BY CORE SATURATION
John T. Griffith, Clwyd, United Kingdom, assignor to The Electricity Council, London, United Kingdom
Filed May 17, 1988, Ser. No. 198,253
Claims priority, application United Kingdom, Jun. 10, 1987, 8713539
Int. Cl.[4] H05B *5/00, 6/00, 6/64*
U.S. Cl. 219—10.491 5 Claims



1. An induction heater comprising an alternating-current-carrying conductor extending along an axis; a plurality of core

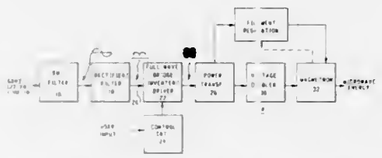
sections arranged in line and each substantially encircling the axis to guide magnetic flux resulting from the alternating current in the conductor; a plurality of heating element sections respectively associated with the core sections and each comprising an electrically conductive closed loop encircling magnetic flux in the associated core section and being heated by electrical current induced thereby; and means to at least partially saturate at least one of the core sections thereby to reduce the coupling between the conductor and the heating element section associated with said one core section and thus control the heating effected by said one core section and its associated heating element section.

4,843,202

MAGNETRON WITH FREQUENCY CONTROL FOR POWER REGULATION

Peter H. Smith, deceased, late of Anchorage, Ky. (by Pamela Sheila Smith, Executor), and Flavian Reising, Jr., Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Dec. 28, 1987, Ser. No. 138,135
Int. Cl.[4] H05B 6/64
U.S. Cl. 219—10.55 B **24 Claims**



20. A method of stabilizing a system with a heating magnetron against variations in power output of the heating magnetron due to variations in line voltage of an AC input line, the steps comprising:

using power from the AC input line to power an inverter such that the inverter operates at a switching frequency;

supplying power to a primary of a power transformer from the inverter;

supplying power to a heating magnetron from a secondary of the power transformer;

sensing variations in line voltage of the AC input line; and

changing the switching frequency in an amount determined by the sensed variations such that the power output of the cooking magnetron remains relatively constant as a result of changes in the difference between the switching frequency and a resonant frequency of a resonant circuit including said secondary.

4,843,203

TAPER CUTTING CONTROL METHOD AND CONTROL SYSTEM IN WIRE-CUT ELECTRIC DISCHARGE MACHINE

Gotaro Gamo, and Mitsuo Kinoshita, both of Hachioji, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

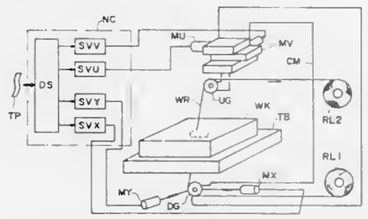
Continuation of Ser. No. 941,712, Dec. 9, 1986, abandoned, which is a continuation of Ser. No. 769,806, Aug. 27, 1985, abandoned, which is a continuation of Ser. No. 387,860, May 28, 1982, abandoned. This application June 14, 1988, Ser. No. 208,859
Claims priority, application Japan, Oct. 8, 1980, 55-141062
Int. Cl.[4] B23H 7/06
U.S. Cl. 219—69.12 **4 Claims**

2. A system for controlling a wire-cutting electric discharge machine for moving a workpiece relative to a wire electrode and moving upper and lower guides which support the wire electrode, relative to each other, to machine a workpiece to generate a twisted taper surface according to a machining command, said system comprising:

(a) means for computing distances Lu and Ld of the upper and lower guides, respectively, and a machining distance Lw on a commanded prescribed surface of the workpiece from positional information contained in the machining command;

(b) means for computing ratios Lu/Lw and Ld/Lw of said distances Lu and Ld of movement of the upper and lower guides to the machining distance Lw;

(c) means for computing speeds Fu and Fd of movement of the upper and lower guides, respectively, by multiplying a relative speed Fw of movement between the workpiece and the wire electrode on the prescribed surface by said ratios Lu/Lw and Ld/Lw;



(d) interpolating means for generating interpolation pulses to drive said upper and lower guides based on the speeds Fu and Fd of movement of the upper and lower guides and the positional information contained in the machining command; and

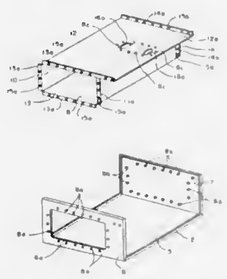
(e) upper and lower guide driving means driveable by the interpolation pulses generated by said interpolating means for simultaneously starting said upper and lower guides and simultaneously stopping said upper and lower guides.

4,843,204

MICROWAVE OVEN CAVITY HOUSING

Yoshiharu Ueno, Neyagawa, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 144,618, Jan. 11, 1988, abandoned, which is a continuation of Ser. No. 73,336, Jul. 13, 1987, abandoned, and a continuation of Ser. No. 811,725, Dec. 20, 1985, abandoned. This application Sep. 29, 1988, Ser. No. 251,946
Int. Cl.[4] H05B 6/64; B21J 15/00
U.S. Cl. 219—10.55 R **4 Claims**



1. An oven cavity housing comprising

a first frame structure made from a sheet material which is bent to define a top, a bottom and two side walls, and

a second frame structure made from a sheet material which defines a front, a bottom and a rear wall,

either of said frame structures having thereon a plurality of tubular protruding pieces each with a closed end, the other of said frame structure having therein a plurality of holes at positions corresponding to said protruding pieces,

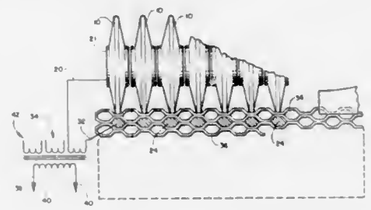
said pieces being inserted through said holes and said closed ends being crushed such that said first and second frame structures form an integrally connected housing.

4,843,205

RESISTANCE WELD JOINING OF HIGH ELECTRICAL CONDUCTIVITY COPPER FOIL

Guy S. Greene, Borrego Springs; Francis J. Gojny, Bonita, and Paul L. McGrath, Jamul, all of Calif., assignors to Rohr Industries, Inc., Chula Vista, Calif.

Filed Feb. 26, 1988, Ser. No. 161,181
Int. Cl.[4] B23K 11/00
U.S. Cl. 219—78.12 **7 Claims**



1. Apparatus for resistance welding together thin ribbons of high thermally and high electrically conductive materials comprising:

an energizeable welding transformer having a primary winding connected to a source of electrical energy and a secondary having a terminal at each end thereof, and

a pair of weld electrodes, one of said electrodes being a wheel electrode and the other electrode being a pin electrode, each of said electrodes is connected to opposite ends of the secondary winding of said welding transformer, said wheel electrode and said pin electrode are constructed of molybdenum;

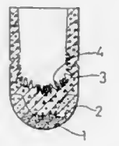
whereby a pair of adjacent contacting thin ribbons of highly thermally and electrically conductive material can be resistance welded together by energizing said transformer and applying specific pressure.

4,843,206

RESISTANCE WELDING ELECTRODE CHIP

Kazuo Azuma, Toyota, and Masahiko Inoue, Aichi, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Sep. 15, 1988, Ser. No. 245,173
Claims priority, application Japan, Sep. 22, 1987, 62-237631
Int. Cl.[4] B23K 35/22
U.S. Cl. 219—119 **20 Claims**



1. A resistant welding electrode chip comprising:

a front end to be brought into contact with a substance to be welded;

an intermediate cylinder disposed on and in contact with the tail end of said front end; and

a main cylinder having a closed end disposed on and in contact with the tail end of said front end and the tail end and the inner wall of said intermediate cylinder, wherein said front end is made of a mixed powder material of at least one conductive ceramic powder selected from a group consisting of titanium carbide (TiC) powder, zirconium carbide (ZrC) powder, hafnium carbide (HfC) powder, tantalum carbide (TaC) powder, niobium carbide (NbC) powder, tungsten carbide (WC) powder, chromium carbide (Cr_3C_2) powder, titanium nitride (TiN) and niobium nitride (NbN), and at least one of copper powder and copper alloy powder;

said intermediate cylinder is made of a mixed powder material of at least one powder material selected from a group consisting of zirconium boride (ZrB_2) powder, titanium boride (TiB_2) powder, tungsten carbide powder (WC) and molybdenum (Mo) metal powder, and at least one of copper powder and copper alloy powder; and

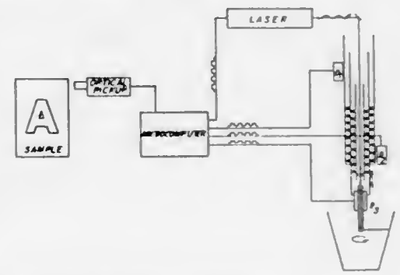
said main cylinder is made of at least one of copper powder and copper alloy powder.

4,843,207

METHOD AND APPARATUS FOR SELECTIVE CREATION OF A DECOR ON HOLLOW AXIALLY-SYMMETRIC PRODUCTS BY A LASER BEAM

Peter Urbánek; Peter Farkas; Rudolf Cvopa, all of Trencín; Mária Faková, Banská Bystrica, and Jaroslav Drbohlav, Turnov, all of Czechoslovakia, assignors to Vyskumny a vyvojovy ustav sklarsky, Trencin, Czechoslovakia

Filed Jan. 11, 1988, Ser. No. 142,178
Int. Cl.[4] B23K 26/00
U.S. Cl. 219—121.6 **5 Claims**



1. A method for selective creation of a decor on a hollow axially symmetrical product by a laser beam comprising the steps of

preparing the product to consist of an internal and an external layer, the internal layer formed by a material having a maximum thickness of 40 mm with a maximum absorption coefficient of 29% and the external layer formed of a material having a maximum thickness of 1.2 mm with a minimal absorption coefficient of 75% where the laser beam has a wave length of from 0.5 to 2.0 μm;

arranging said laser beam coaxial with the axis of symmetry of the hollow product with a maximum allowance of ±10 mm; and

reflecting said laser beam from the interior of the hollow product through the internal layer to the external layer of the hollow product in order to achieve a phase change of the external layer.

4,843,208

PLASMA TORCH

Thomas J. French, Aiken, S.C.; Lester R. Harrell, Concord, and Anthony L. Dellinger, McAdenville, both of N.C., assignors to EPRI, Palo Alto, Calif.

Filed Dec. 23, 1987, Ser. No. 137,196
Int. Cl.[4] B23K 9/00
U.S. Cl. 219—121.39 **5 Claims**

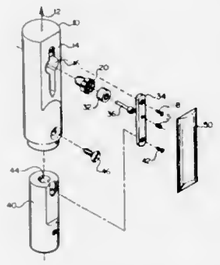
1. A plasma torch head comprising in combination:

(a) a cylindrical body of electrically insulating material

having an outer cylindrical surface, a longitudinal bore, a transverse bore intersecting said longitudinal bore, a flat substantially rectangular surface portion intersecting said transverse bore and having first and second edge portions, said first and second edge portions intersecting said outer cylindrical surface;

(b) a plasma cup positioned in said transverse bore, said plasma cup including a first dome shaped end having an opening therein;

(c) electrode means supported by a bar affixed to said cylindrical body and postioned within and coaxially with respect to said plasma cup;



(d) a cover adapted to mate with said substantially rectangular surface, covering said bar and closing a first end of said transverse bore; and

(e) electrically conductive means positioned in said longitudinal bore and coupled to said electrode means, said electrically conductive means also including means for selectively supplying gas to said torch head such that said gas flows through and around said plasma cup and out the second end of said transverse bore, said electrically conductive means also being adapted to mechanically support said plasma torch head and for coupling electrical power to said electrode means.

4,843,209

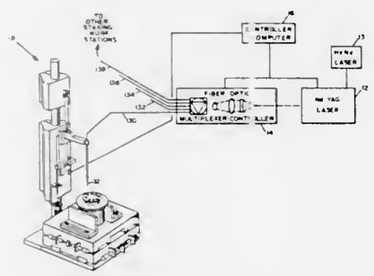
METHOD AND APPARATUS FOR LASER STAKING

Russ Milligan, Ventura, Calif., assignor to Dennis T. Grendahl, Shoreview, Minn.

Filed Nov. 5, 1987, Ser. No. 116,874

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121.63 **4 Claims**



1. A staking work station comprising:

a. a base;

b. an x-y axis positioning table affixed to said base;

c. a carousel fixture affixed to said x-y axis positioning table;

d. a vertical support post affixed to said base;

e. an adjustable lower clamp base attached to said support post;

f. a slide bar attached to said lower clamp base;

g. a laser stylus attached to said slide bar;

h. a pneumatic actuator attached to said vertical support post and said slide bar to move said laser stylus relative to said fixture; and,

i. switch means actuated by said slide bar when said laser stylus reaches a predetermined position relative to said carousel.

4,843,210

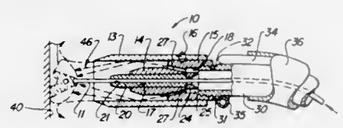
DOWNWARD GAS-METAL-ARC WELDING PROCESS

John G. Church, 7405 Kimbel, Mississanga, Ontario, Canada (L4T 3M6)

Filed Jun. 10, 1988, Ser. No. 204,826

Int. Cl.[4] B23K *9/16*

U.S. Cl. 219—126 **12 Claims**



1. A gas-metal-arc welding process utilizing a consumable wire electrode for forming a narrow, elongated weld bead in a downward direction comprising essentially the steps of:

positioning a generally horizontally arranged, consumable, then wire electrode with its free end gapped from a weld deposit surface to provide an air gap therebetween;

applying an electrical voltage to the electrode and applying an electrical current to the electrode sufficient to produce a relatively high current density in the electrode;

continuously flowing a stream of gas, formed of a mixture of major proportions of argon and helium and minor proportions of carbon dioxide and oxygen, along and coaxial with the end of the electrode and the arc gap towards the weld deposit surface to form a roughly conically-shaped hot plasma field within and coaxial with the air gap;

adjusting the length of the arc gap and the voltage applied to the electrode to locate the base of the conically-shaped field upon the surface and substantially coextensively overlapping transversely the width of the weld bead;

generating a globular, free-flight transfer of molten metal globules from the electrode across the gap to the weld deposit surface;

advancing the electrode longitudinally towards the surface at a speed correlated to the rate of melting and transfer of globules from the end thereof to maintain a constant length of arc gap;

moving the electrode downwardly in alignment with the central axis of the downwardly directed weld bead deposited by the globule transfer, at a speed correlated to the rate of melting of the globules from the electrode end for producing a substantially uniform weld bead along a downward direction.

4,843,211

METHOD FOR WELDING ALUMINUM-MAGNESIUM-SILICON-COPPER ALLOYS

Richard P. Martukanitz, Greensburg, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 17, 1987, Ser. No. 26,945

Int. Cl.[4] B23K *9/23*

U.S. Cl. 219—137 WM **5 Claims**

1. A process for welding an assembly of members with at least one of the members being made of a 6XXX aluminum alloy, comprising:

providing at least two members to be welded together, at least one of the members being made of a 6XXX aluminum alloy having Cu as one of its constituents; and

Cross section of 6013-T4/535h butt weld showing fusion line cracking (50X - HF/H_2SO_4 etch).

welding the members together with a 5XXX aluminum filler alloy containing 7.0 to 8.5% Mg as one of its constituents.

4,843,212

COMPOSITION OF WELDING WIRE

Yakov A. Shneerov, Rostovskaya naberezhnaya, 3, kv. 75, Moscow; Valery A. Vikhlevschuk, ulitsa Rogaleva, 9, kv. 33, Dnepropetrovsk; Arkady E. Asnis, bulvar L. Ukrainki, 2, kv. 5, Kiev; Vitaly A. Kondrashkin, ulitsa Feodosiiskaya, 11, kv. 1, Dnepropetrovsk; Oleg V. Filonov, ulitsa Kosiora, 12, kv. 8.; Vadim N. Gurov, ulitsa Lenina, 35, kv. 20, both of Krivoi Rog; Lia M. Gutman, bulvar L. Ukrainki, 2, kv. 14; Vadim R. Poklady, ulitsa Petrovskogo, 10, kv. 26, both of Kiev; Vasily V. Zhilinsky, ulitsa Berdyanskaya, 1, kv. 163; Valery A. Polyakov, ulitsa Plekhanova, 15b, kv. 56, both of Dnepropetrovsk; Valery I. Nikitenko, prospekt Metallurgov, 14, kv. 28, Krivoi Rog; Jury V. Bashmakov, ulitsa Kosiora, 11, kv. 50, Krivoi Rog; Vladislav B. Burshtein, ulitsa Lenina, 24, kv. 53, Krivoi Rog; Emanuil F. Anastasiadi, ulitsa Schepkina, 17, kv. 2, Odessa; Yaroslav I. Krainik, ulitsa Vatchenko, 72, kv. 123, Dnepropetrovsk; Konstantin P. Demerly, ulitsa Sovetskoi Armii, 30b, Odessa; Pavel V. Ignatchenko, ulitsa Bolshaya Kitaevskaya, 10, kv. 39, Kiev; Dmitry E. Kozachenko, ulitsa Kamo, 7, kv. 38, Krivoi Rog, and Vitaly P. Piptjuk, pereulok Skorikovsky, 4a, kv. 20, Dnepropetrovsk, all of U.S.S.R.

Filed Apr. 30, 1987, Ser. No. 44,893

Int. Cl.[4] B23K *35/34*

U.S. Cl. 219—146.23 **2 Claims**

1. A composition of welding wire, consisting essentially of carbon, manganese, silicon, aluminium, chromium, copper, nickel, calcium, rare-earth metals, and iron in the following proportions, mass %:

carbon	0.03 to 0.25
manganese	0.8 to 2.2
silicon	0.7 to 2.2
aluminium	0.005 to 0.2
chromium	0.01 to 0.25
copper	0.01 to 0.25
nickel	0.01 to 0.25
calcium	0.001 to 0.02
rare-earth metals	0.01 to 0.1
iron	the balance.

4,843,213

WELDING AND/OR CUTTING MACHINE

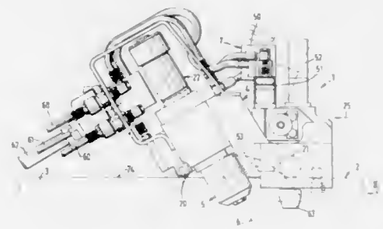
Tullio Raimondi; Pierre Presle; Leandro Galbiati, all of Abingdon, England, and Stephane de Burbure, Moll, Belgium, assignors to European Atomic Energy (EURATOM), Plateau du Kirchberg, Luxembourg

Filed Jul. 30, 1987, Ser. No. 79,590

Int. Cl.[4] H05B *1/00*

U.S. Cl. 219—159 **13 Claims**

1. A machine for use on a workpiece formed by a pair of metal sheets in face to face contact, the machine comprising a for travel movement along said work piece and carriage mounted on a pair of cylindrical drive rollers means to drive said rollers, with said rollers being operable to grip the sheets of the workpiece in the nip of the rollers, the axes of rotation of the rollers inclined at an angle to said movement whereby



each roller driving force has a force component disposed perpendicular to the direction of travel of the machine so that as the drive rollers rotate, forces are generated which cause the carriage to be pulled on to the workpiece, the carriage being capable of transporting welding means for lip-welding the sheets of the workpiece together, or alternatively, cutter means for subsequent removal of weld material.

4,843,214

HEAT ROLL TYPE ARRANGEMENT FOR ELECTROSTATIC RECORDING APPARATUS

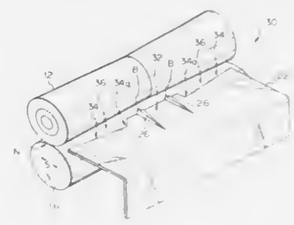
Yuitiro Higashi, Yokohama; Junji Nakai, Tokyo; Hidenori Kawabuchi, and Yasuhisa Kato, both of Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 6, 1988, Ser. No. 191,056

Claims priority, application Japan, May 7, 1987, 62-109729; Jul. 8, 1987, 62-168771

Int. Cl.[4] G03G *15/20*

U.S. Cl. 219—216 **5 Claims**



1. A heat roll type fixing arrangement for fixing a visible image provided on a paper by applying heat to the image, comprising:

fixing roll means for fixing the visible image on the paper which is moved along a predetermined paper transport path;

pressing roll means pressed against said fixing roll means, said fixing roll means and said pressing roll means constituting a nipping section;

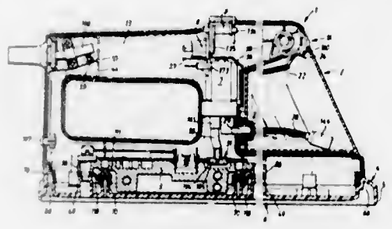
guide means constituted by an upper and a lower guide plate for guiding the paper into the nipping section; and

curl preventing means provided in a central portion of a guide surface of the lower guide plate with respect to a widthwise direction of said guide surface for preventing a trailing end portion of the paper from curling;

said lower guide plate having a front end which faces the nipping section and includes recessed portions each being

formed by notching said lower guide plate at a respective one of opposite sides of the central portion and inclined portions each being formed by notching said lower guide plate such that each of said inclined portions individually extends from a respective one of said recessed portions to a respective one of opposite side edges of said lower guide plate while sequentially protruding toward the nipping section.

4,843,215
WALLPAPER STEAMER
Peter R. Wilkins, Blackwell, England, assignor to Black & Decker Inc., Newark, Del.
Filed Nov. 19, 1987, Ser. No. 123,079
Claims priority, application United Kingdom, Nov. 20, 1986, 86.27734
Int. Cl.[4] F22B 1/28
U.S. Cl. 219—271 **30 Claims**



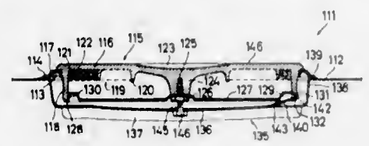
1. A hand-held, wallpaper steamer for use in stripping wallpaper comprising a housing accommodating a water tank, and a steam generator with an inlet connected to the water tank via an electrically powered pump for pumping water from the tank to said steam generator, the generator having a plurality of steam exits, and in which the housing has a base portion, the base portion having a peripheral wall to form an open-faced steam chamber into which steam from said plurality of exits issues via plurality of spaced openings provided in said base portion.

4,843,216
INFRA-RED REWORK STATION
Roger H. Gibbs, Redhill, and David J. Lowrie, Brighton, both of England, assignors to PDR Microelectronics Limited, Redhill, England
Filed Mar. 31, 1988, Ser. No. 175,842
Int. Cl.[4] F24H 3/00; H05B 1/00
U.S. Cl. 219—354 **10 Claims**

1. A rework station comprising a work table and a heating unit mounted at an adjustable height above the work table, the heating unit comprising a source of visible and infra-red radiation, an adjustable aperture and a system of lenses, the aperture and lens system being positioned between the source of infra-red radiation and the work table, the aperture permitting the size of an area of infra-red radiation projected by the heating unit onto a piece requiring rework positioned on the work

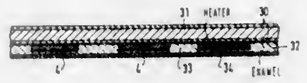
table to be adjusted, and the lens system providing a substantially uniform temperature within said area.

4,843,217
COOKING UNIT
Felix Schreder, Oberderdingen, Fed. Rep. of Germany, assignor to E.G.O. Elektro-Geräte Blanc u. Fischer, Fed. Rep. of Germany
Filed Feb. 16, 1988, Ser. No. 156,167
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1987, 8702478[U]; Jun. 13, 1987, 8708395[U]
Int. Cl.[4] H05B 3/70
U.S. Cl. 219—458 **33 Claims**



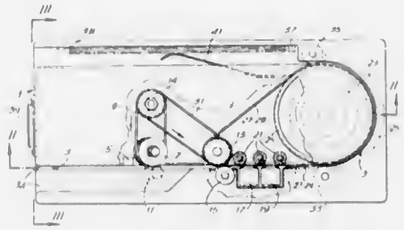
1. A cooking unit comprising:
an upper mounting plate (112);
at least one electric hotplate (115) arranged ijn a reception opening (113) of said mounting plate (112), said electric hotplate (115) having an outer lower marginal edge (128), at least one depression (132), being provided in the vicinity of said outer, lower marginal edge (128);
at least one retaining member (135) for fixing said electric hotplate (115) by downward bracing in said reception opening (113), said retaining member (135) and said electric hotplate (115) being engaed by tightening means (146) for tightening said electric hotplate (115) against said mounting plate (112) and,
at least one rotation prevention member (140) acting between said electric hotplate (115) and said retaining member (135),
wherein said rotation prevention member (140) is at least one tongue member provided on said retaining member, said rotation prevention member (140) cooperating with said depression (132) and being elastically movable with respect to said retaining member (135).

4,843,218
HEATING ELEMENT FOR THERMAL HEATING DEVICES, ESPECIALLY COOKING STATIONS
Julius Husslein, Vachendorf; Günther Wittauer, and Heinz Kotsch, both of Traunreut, all of Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgeräte GmbH, Munich, Fed. Rep. of Germany
Continuation of Ser. No. 944,716, Dec. 22, 1986, abandoned. This application Sep. 8, 1988, Ser. No. 243,241
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1985, 3545442
Int. Cl.[4] H05B 3/72
U.S. Cl. 219—468 **6 Claims**



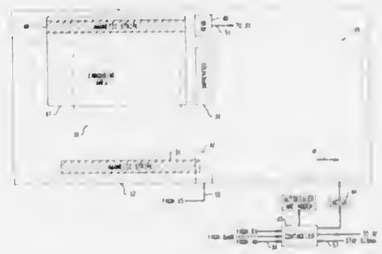
1. Heating element for thermal household appliances, comprising a sandwich structure including:
a heating element layer formed of insulating material having flat heating conductor strips constructed according to a thick film paste technique embedded in said heating element layer;
an inherently stable metal carrier element having a heating surface in close thermal contact with and supporting a substance to be heated and an insulation layer facing said heating element layer above said heat conductor strips; and
a reflector layer disposed directly below said heating element layer;
said heating element layer, said carrier element and said reflector layer of said sandwich structure being rigidly connected to each other.

4,843,219
DEVICE FOR AUTOMATIC READING OF CHEQUES, BILLS AND THE LIKE AND FOR ELECTRONIC MANAGEMENT OF THE DATA DETECTED
Sergio Franchi, Pisa, Italy, assignor to SEAC Engineering S.R.L., Italy
Filed May 9, 1988, Ser. No. 191,552
Claims priority, application Italy, May 11, 1987, 9389 A/87
Int. Cl.[4] G06F 15/30
U.S. Cl. 235—379 **10 Claims**



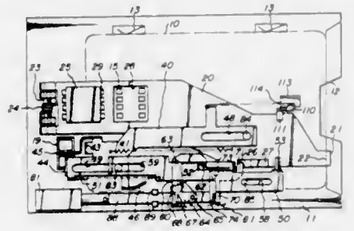
1. Device for automatic reading of data on cheques, bankable bills and the like, characterized in that it comprises a housing in which is made a slot or open channel defining a U-shaped track for the said cheques and bills, and that along the said track there are arranged a combination of sensor devices for detecting the presence of a cheque or bill to be read, devices for conveying the said cheque or bill, and devices for reading the data on the said cheque or bill.

4,843,220
AUTOMATIC DATA CAPTURE FOR MULTIPLE FORM POINT OF SALE SLIP PACKS
Marion W. Haun, Torrance, Calif., assignor to American Magnetics Corporation, Carson, Calif.
Filed Mar. 13, 1987, Ser. No. 25,482
Int. Cl.[4] G06K 5/00
U.S. Cl. 235—380 **12 Claims**



1. A POS terminal including a tray for receiving a credit card and a sales slip in juxtaposition, said card and slip having first and second data bearing stripes in first and second reference positions, respectively,
said terminal also including a stripe reader and an encoder in said first and second positions for reading and encoding data in said first and second stripes respectively, means responsive to a first signal for moving said tray in a first direction with respect to said reader and encoder and for activating said reader and encoder for reading data in said first stripe and for encoding the data read in said second stripe respectively.

4,843,221
ELECTRONIC CARD RECEIVING DEVICE
Tomonari Ohtsuki; Yoshiaki Igarashi; Toru Uno, all of Mooka, and Yoshiaki Tanaka, Satte, all of Japan, assignors to Dalichi Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 22, 1987, Ser. No. 76,488
Claims priority, application Japan, Jul. 26, 1986, 61-176470; Sep. 5, 1986, 61-136116[U]
Int. Cl.[4] G06K 7/06
U.S. Cl. 235—441 **10 Claims**



1. An electronic card receiving device including a card holder forming a card receiving space in the device for receiving an electronic card, a card latching mechanism for holding the electronic card in position in the card receiving space formed by the card holder, a contacting mechanism for electrically connecting the device to contacts of the electronic card held in position, and a card pushing mechanism for disconnecting the device from the electronic card and pushing it out of the device, wherein said card pushing mechanism comprises a first ejecting plate and a second ejecting plate slidable in direc-

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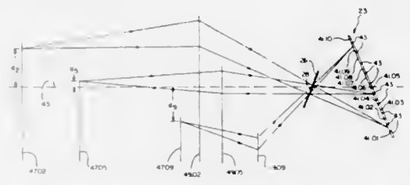
tions of inserting and removing the electronic card, said first ejecting plate including an abutting portion for applying a force to an inserted electronic card to push it in the direction of removing the card, and said second ejecting plate includes a stopper guide for obtaining an initial stable condition of the second ejecting plate, a latched condition of the inserted card and a transitional condition of the second ejecting plate during its sliding, said second ejecting plate further including a stopper portion, said stopper portion being guided by said stopper guide of said second ejecting plate and including a stopper driving member for transmitting a force to said stopper for releasing said latched condition and obtaining said transitional condition, said card latching mechanism including a card latch member including a latch portion having a surface extending substantially perpendicularly to the direction of inserting the electronic card for latching the inserted card, a latch head for selectively permitting the latch portion to latch the card and prohibiting the latching, and an ejecting head for releasing the card from the latched condition.

4,843,222

BAR CODE READER FOR READING BAR CODE SYMBOLS AT DIFFERENT DISTANCES

Neil A. Hochgraf, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 29, 1986, Ser. No. 868,907
Int. Cl.[4] G06K *7/10*
U.S. Cl. 235—470 **15 Claims**



1. A bar code reader for reading bar code symbols disposed at different distances within a range of distances, including:
lens means; and
detector means disposed in the image space of said lens means and having a plurality of zones;
said lens means including a plurality of regions with different principal planes located at differing displacements from said image space whereby a bar code symbol disposed at a greater distance within said range is conjugate with a respective zone of said detector means through a region of said lens means having its principal plane at a greater displacement from said image space.

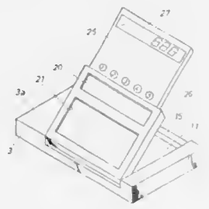
4,843,223

INFORMATION PROCESSING DEVICE FOR IC CARD

Katsuhide Shino, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 11, 1986, Ser. No. 940,447
Claims priority, application Japan, Dec. 11, 1985, 60-278448
Int. Cl.[4] G06K *7/06, 19/00*
U.S. Cl. 235—487 **6 Claims**

1. An information processing device for an IC card, said IC card being one of a card which can read out information stored therein and a card which can read out and write in the information, said IC card having an IC with a memory and having a connecting part, said device comprising:
a lid having a pocket formed therein, said pocket being defined by at least an upper wall, a lower wall, and an end wall, said pocket being stationary relative to said lid, said lower wall of said pocket having an opening therein, said opening extending over a minority of said lower wall, and said pocket having an access through which said IC card can be inserted into engagement with said pocket, said connecting part of the IC card being aligned with the opening when inserted into said pocket;
a main body having a recess formed therein, said main body having a circuit board attached thereto;
pivot means for pivotably attaching said lid to said main body, said lid being movable from an open position whereat said IC card can be inserted into said pocket and a closed position whereat said IC card in the pocket is



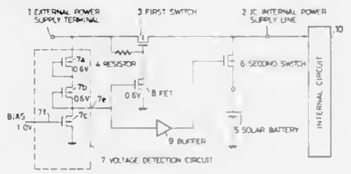
received in the recess of said main body, the lid and main body forming a relatively thin enclosure when said lid is pivoted to said closed position; and
plug means extending through said main body from said circuit board into said recess, said plug means being positioned to extend through the opening of the lower wall of the lid and into operative engagement with said connecting part of said IC card when said lid is pivoted to the closed position.

4,843,224

IC CARD

Satoshi Ohta, and Kouzi Tanagawa, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 6, 1988, Ser. No. 206,415
Claims priority, application Japan, Jun. 12, 1987, 62-89652[U]
Int. Cl.[4] G06K *19/00*
U.S. Cl. 235—487 **5 Claims**



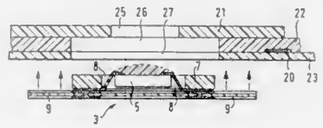
1. An IC card with a built-in IC, comprising
an external power supply terminal,
a solar battery,
a first swith connecting said external power supply terminal to an IC internal power supply line,
a second switch connecting said solar battery to said IC internal power supply line, and
a voltage detection circuit connected to said external power supply terminal,
wherein when said voltage detection circuit detects a voltage on said external power supply terminal, it switches ON the first switch and switches OFF the second switch, and when said voltage detection circuit does not detect a voltage on the external power supply terminal it switches OFF the first switch and switches ON the second switch.

4,843,225

IDENTIFICATION CARD WITH AN INTEGRATED CIRCUIT

Joachim Hoppe, Munich, Fed. Rep. of Germany, assignor to G A O Gesellschaft fur Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Division of Ser. No. 910,351, Sep. 24, 1986, Pat. No. 4,746,392, which is a continuation of Ser. No. 562,217, Dec. 16, 1983, abandoned. This application May 22, 1987, Ser. No. 53,040
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1982, 3248385
Int. Cl.[4] G06K *19/06*
U.S. Cl. 235—492 **8 Claims**



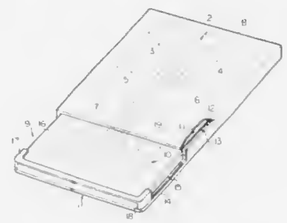
1. A multi-layer identification card comprising:
(a) at least one layer having a cavity;
(b) an IC module mounted on a carrier disposed in said cavity so that space exists in said cavity between said IC module and said at least one card layer;
(c) a hollow area in a layer of said card in communication with said cavity;
(d) a channel in a layer of said card having one end opening into said cavity and another end opening into said hollow area to allow for said communication;
(e) elastic material filling said space, wherein said channel and said hollow area are adapted to be at least partially filled with elastic material in excess of an amount of elastic material required to fill said space.

4,843,226

CARD-SHAPED INFORMATION STORAGE MEDIUM

Kaneyuki Kato; Kazufumi Teraji; Seiichi Nishino, and Teruo Suzuki, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jan. 14, 1988, Ser. No. 143,882
Claims priority, application Japan, Jan. 14, 1987, 62-7801
Int. Cl.[4] G06K *19/06*
U.S. Cl. 235—492 **13 Claims**



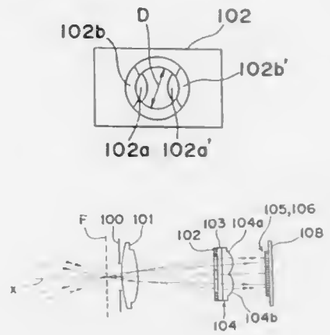
1. A card-shaped information storage medium used for providing data informations to an information processing unit, comprising:
(a) a board member of an insulating material having an first occupation area for at least one semiconductor chip capable of preserving said data informations and a second occupation area for a plurality of communication terminals electrically coupled to the semiconductor chip;
(b) a protective member covering said semiconductor chip and exposing said communication terminals to the outside thereof; and
(c) a protective shutter movable into or out of said protective member for shifting a position of said information storage medium between a closed state and an open state, said communication terminals being covered with said protective shutter in said closed state, said communication terminals being exposed in said open state.

4,843,227

FOCUS DETECTING APPARATUS WITH BOTH PASSIVE AND ACTIVE FOCUS CAPABILITY

Toru Matsui, and Kazuo Kimura, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 11, 1987, Ser. No. 95,524
Claims priority, application Japan, Sep. 11, 1986, 61-215424; Sep. 26, 1986, 61-228685
Int. Cl.[4] G03B *3/00*
U.S. Cl. 250—201 **10 Claims**



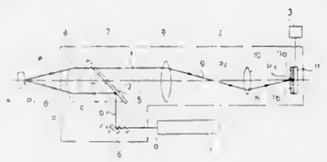
1. A focus detecting apparatus for detecting the focusing condition of a photo-taking lens, comprising:
means for projecting light having a predetermined wavelength range toward an object to be focused through the photo-taking lens, the projected light having a projection optical axis different from the optical axis of the objective lens;
means, located at the image side of a predetermined focal plane of the photo-taking lens, for forming a secondary image of an image formed on the predetermined focal plane by the phototaking lens;
means, located nearby the secondary image forming means, for limiting light passed therethrough, the light limiting means including an aperture mask having a pair of aperture openings, each of the aperture openings being positioned in a symmetrical arrangement with respect to the optical axis of the photo-taking lens and lying on a line which includes the optical axis of the photo-taking lens and which is perpendicular to another line connecting the optical axis of the photo-taking lens with the projection optical axis, and the pair of the aperture openings being defined by a pair of inner regions and a pair of outer regions;
means, located at optical paths passed through the inner regions of the aperture openings, for cutting off light having the predetermined wavelength range; and
means, located at a predetermined focal plane of the secondary image forming means, for receiving light passed through the secondary image forming means, the light limiting means, and the light cutting off means.

4,843,228

METHOD AND APPARATUS FOR NONCONTACT AUTOMATIC FOCUSING

Katushige Nakamura, Tokyo, Japan, assignor to Mitaka Kohki Company Ltd., Mitaka, Japan

Filed Dec. 18, 1987, Ser. No. 134,739
Claims priority, application Japan, Dec. 25, 1986, 61-308029
Int. Cl.[4] G01J *1/20*
U.S. Cl. 250—201 **20 Claims**



1. A method for non-contact automatic focusing of a light beam upon a transparent body, comprising the steps of:

reflecting a laser beam as a measuring beam, which is emitted in parallel with an optical axis of an optical system, by means of a movable mirror which is movable in a direction which is parallel with said optical axis and which is disposed at an angle of inclination of 45 degrees with respect to said optical axis;

reflecting said measuring beam, reflected from said movable mirror, by means of a fixed mirror which is disposed at an angle of inclination of 45 degrees with respect to said optical axis so as to also be disposed parallel to said movable mirror;

conducting said measuring beam, reflected from said fixed mirror and then refracted by an objective lens, into a transparent body;

receiving said measuring beam, reflected from the front surface of said transparent body and the refracted again by said objective lens, by means of a light position detector, said movable mirror being movable in said direction parallel to said optical axis such that when said movable mirror is progressively moved away from said transparent body said measuring beam is reflected from said fixed mirror and refracted by said objective lens at a location which is progressively further away from said optical axis whereby the angle of incidence and reflection of said measuring beam upon and from said transparent body is progressively greater, whereas when said movable mirror is progressively moved toward said transparent body said measuring beam is reflected from said fixed mirror and refracted by said objective lens at a location which is progressively closer to said optical axis whereby the angle of incidence and reflection of said measuring beam upon and from said transparent body is progressively smaller, as desired; and

adjusting the distance between said transparent body and said objective lens by means of a focusing mechanism in response to a position signal output from said light position detector so as to thereby achieve automatic focusing of said measuring beam upon said front surface of said transparent body.

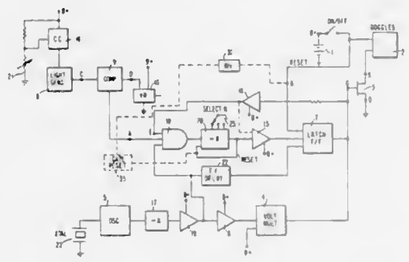
4,843,229

HIGH LIGHT LEVEL CUTOFF APPARATUS FOR USE WITH NIGHT VISION DEVICES

Joseph Reed, Stamford, Conn., and Joseph N. Caserta, Roanoke, Va., assignors to ITT Electro Optical Products, A Division of ITT Corporation, Roanoke, Va.

Filed Dec. 2, 1987, Ser. No. 127,869
Int. Cl.[4] H01J *31/50, 40/14*
U.S. Cl. 250—213 VT **20 Claims**

1. In a night vision device of the type employing image intensification circuitry means between an input and output port and including a high light level cutoff apparatus for removing power applied to said image intensification circuitry during a high light intensity condition which persists for a given period during a low light use, said cutoff apparatus including a switchable impedance device having a control electrode, said impedance in series with said image intensification circuitry to provide a high impedance for said given period indicative of said high light level in a first mode to effectively remove power from said circuitry and a low impedance in a second mode to allow said night vision device to operate, said light intensity being monitored by a light sensor means for providing an output signal according to the intensity of received light, means for comparing said output signal with a reference signal to provide a control signal indicative of said high light level for a given period to operate said impedance in one of said first or second modes, the improvement therewith of apparatus for controlling the operation of said switchable impedance to assure reliable operation of the same in said first and second modes comprising:



high voltage supply means including a stable oscillator means for providing a stable frequency signal at an output, voltage multiplier means responsive to said frequency for providing a high voltage bias signal for application to said control electrode of said switchable impedance device,

latching means coupled to said control electrode and operative in a first state to place said impedance in said first mode and in a second state to place said impedance in said second mode,

counting means having an output coupled to said latching means and having input means coupled to said output of said stable oscillator means and said means for comparing to provide at an output a control signal indicative of a given time interval of said high light condition and specified according to said stable output frequency to operate said latching means in said first mode when said counting means provides said control signal indicative of counting a predetermined number of said stable frequency cycles.

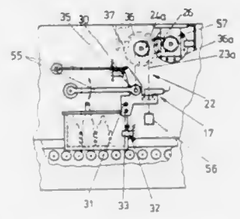
4,843,230

DEVICE FOR MECHANICALLY RECEIVING EMPTIES WITH MOVING SENSOR HEAD

Dieter Schmid, and Peter Kasberger, both of Aystetten, Fed. Rep. of Germany, assignors to Lescha Maschinenfabrik GmbH & Co. KG, Fed. Rep. of Germany

Filed Apr. 29, 1988, Ser. No. 187,928
Claims priority, application Fed. Rep. of Germany, May 12, 1987, 3715816
Int. Cl.[4] G01N *9/04*
U.S. Cl. 250—223 B **15 Claims**

1. A device for mechanically receiving empties in the form of bottle crates and other containers for bottles subject to a deposit, comprising a frame, at least one conveying device forming the lower limit of a conveying passage and which is adapted to move the empties past a sensing device which comprises a sensing head extending over the conveying device, said sensing head being able to be raised and lowered by means of an actuator operated by the passage of an article moved by the conveying device and cooperating with a measuring device responding to its stroke, said sensing device comprising sensing elements arranged in the form of a row arranged to extend perpendicularly to the direction of conveying and arranged in



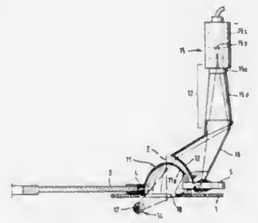
relation to a fixed plane of an aligning device aligning the passing articles so as to be parallel to the conveying direction, said sensing elements being arranged to be actuated by articles under them and cooperating with a counting device.

4,843,231

APPARATUS FOR THE INSPECTION OF TRANSPARENT MATERIALS UTILIZING A DIFFUSING SCREEN

Theodore Caloyannis, Courbevoie, and Pierre Lamborot, Paris, both of France, assignors to Saint-Gobain Cinematique et Controle, Gennevilliers, France

Continuation of Ser. No. 76,518, Jul. 22, 1987, abandoned. This application Dec. 2, 1988, Ser. No. 279,325
Claims priority, application France, Jul. 28, 1986, 86 10900
Int. Cl.[4] G01N *21/90*
U.S. Cl. 250—223 B **12 Claims**



1. An apparatus for the optical inspection of transparent bodies which comprises:

(a) a means for transporting said bodies to an inspection station located upon said apparatus;

(b) a means for rotating said bodies at the inspection station;

(c) a fixed light emitter placed at a distance from said body and used for generating a narrow light beam which is capable of passing through a narrow zone of said transparent body;

(d) a narrow translucent diffusing screen mounted on said apparatus and situated in the immediate vicinity of said transparent body, said screen having a front and a back, the front of said screen being illuminated by the narrow light beam from the emitter after said beam passes through the transparent body; and

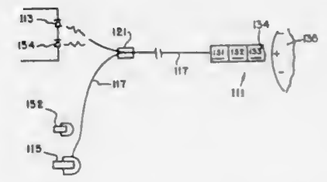
(e) a receiver comprising an objective lens and a line of photosensitive elements formed by a continuous strip of diodes wherein said receiver is placed at a distance from the transparent body and the objective lens faces the back of said screen and is located so that an image of the back of said screen is in focus at the line of photosensitive elements.

4,843,232

OPTIC SWITCH AND SPEED SENSOR

Stephen M. Emo, Elkhart, and Terrance R. Kinney, South Bend, both of Ind., assignors to Allied-Signal Inc., Morristown, N.J.

Filed Dec. 28, 1987, Ser. No. 138,258
Int. Cl.[4] G02F *1/01*
U.S. Cl. 250—225 **2 Claims**



1. An electro-optic sensor system comprising:

means for generating a first source of light having a first bandwidth;

means for generating a second source of light having a second bandwidth;

means for collimating the first and second sources of light;

means for polarizing the first and second sources of collimated light;

a Faraday material for receiving the polarized first and second sources of collimated light, said Faraday material rotating the linear polarization vector of said first source of collimated light while allowing said second source of collimated light to pass through without being affected;

means for moving a ferrous metal with respect to said Faraday material causing the polarized vector of said first source of collimated light to be modified as a function of a magnetic field produced in said Faraday material; and

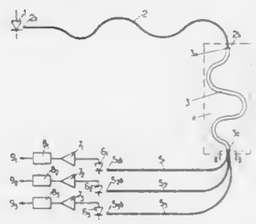
photodetector means for receiving collimated light of said first and second sources from said Faraday material, said photodetector means creating a first output signal which represents the movement of the ferrous metal with respect to said Faraday material and second output signal which represents said second source of light, said second output signal being compared with a reference to assure that the first output signal is the result of the relationship of the Faraday material and ferrous metal.

4,843,233

DEVICE FOR DETECTING VIBRATIONS INCLUDING A MULTIMODE OPTICAL FIBER AS SENSITIVE ELEMENT

Luc Jeunhomme, Fontenay Le Fleury, France, assignor to Photonetics S.A., Marly Le R, France

Filed May 9, 1988, Ser. No. 192,003
Claims priority, application France, May 11, 1987, 87 06568
Int. Cl.[4] H01J *5/16*
U.S. Cl. 250—227 **8 Claims**



1. In a vibration detection device having an optical fiber

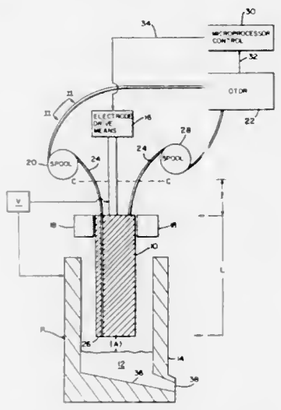
sensitive element, a coherent light source, photodetecting means and means for analysing the output of the photodetector means, said sensitive element is formed by a single optical fiber of multimode type and it further comprises a monomode optical fiber disposed between the coherent light source and the first end of the multimode optical fiber and at least one optical fiber, whose core diameter is smaller than that of the multimode optical fiber and which is disposed between the other end of the multimode optical fiber, forming the output face thereof and on which a speckle appears, and the photodetector means.

4,843,234

CONSUMABLE ELECTRODE LENGTH MONITOR BASED ON OPTICAL TIME DOMAIN REFLECTOMETRY

John W. Berthold, Salem, and H. Randy Carter, Alliance, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Apr. 5, 1988, Ser. No. 177,751
Int. Cl.[4] H01J *5/16, 40/14*
U.S. Cl. 250—227 **12 Claims**



1. A method for determining the change in length of a consumable element comprising the steps of:
- introducing an optical fiber having a known length along with the element;
- changing said optical fiber along with a change in the element;
- measuring a change in length of said optical fiber; and
- calculating the change in length of the element from the change in optical fiber length.

4,843,235

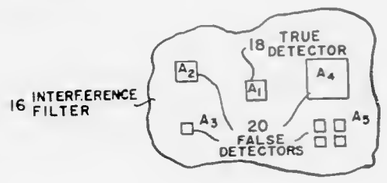
DEVICES FOR PROTECTION OF SENSORS FROM DAMAGING AND INTERROGATING RADIATION

Warren L. Malone, Falls Church, Va., assignor to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 23, 1973, Ser. No. 334,787
Int. Cl.[4] G01J *5/08*
U.S. Cl. 250—237 R **3 Claims**

1. in a remote sensing device comprising an optical element which focuses incoming radiation on a detector, a device for protecting said detector from interrogating radiation comprising:

an optical filter placed over said detecting having a reflective surface;



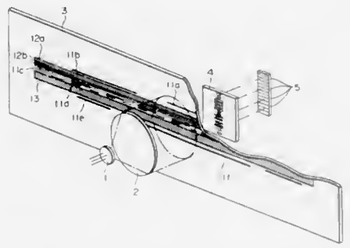
elemental semi-opaque areas placed on said optical filter which absorb light of specific frequencies.

4,843,236

MOVABLE OBJECT POSITION DETECTING METHOD AND APPARATUS

Norio Okutani, Neyagawa, Japan, assignor to Matsusbita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 29, 1988, Ser. No. 174,950
Claims priority, application Japan, Apr. 2, 1987, 62-81416
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 SE **4 Claims**



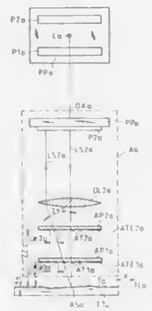
1. A movable object position detecting method comprising the steps of:
- detecting an absolute position of a code plate attached to the movable object by a first-order position detection part provided with patterns regularly arranged in the code plate, thereby providing binary detection data;
- detecting a position of the code plate within a predetermined detection range by respective second and higher order position detection parts, each of said second and higher order position detection parts providing respective binary detection data, the predetermined detection range of each of said second and higher order detection parts being twice as large as a minimum detection width of a next lower order position detection part; and
- performing position detection at a boundary portion between a lower-order position detection part and a next higher-order position detection part on the basis of the coincidence or difference between respective overlapping digits of detecting data obtained by the lower-order position detection part and detection data obtained by the next higher-order position detection part.

4,843,237

PHOTOELECTRIC LENGTH AND ANGLE MEASURING DEVICE

Dieter Michel, Traunstein, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Oct. 28, 1987, Ser. No. 114,640
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1986, 3636744
Int. Cl.[4] H01J *3/14*
U.S. Cl. 250—237 G **19 Claims**



1. A photoelectric measuring device for measuring the relative position of a first object and a second object comprising:
- a graduation support connected to said first object;
- a graduation located on said graduation support; and
- a scanning unit, connected with said second object, for scanning said graduation, said scanning unit comprising a light source emitting a light beam in a light beam direction, and at least two scanning graduations positioned at different scanning distances from said graduation and displaced laterally from one another in a direction perpendicular to said light beam direction, such that each of said scanning graduations is used to produce a distinct measuring value from the other and from which two distinct measuring values a true measuring value may be determined.

4,843,238

METHOD FOR IDENTIFYING A BLISTERED FILM IN LAYERED FILMS

Tadashi Nishioka; Hiroaki Morimoto; Yoji Mashiko, and Hiroshi Koyama, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Feb. 11, 1988, Ser. No. 155,101
Claims priority, application Japan, Feb. 13, 1987, 52-32003
Int. Cl.[4] G01D *18/00;* **G01N** *23/00*
U.S. Cl. 250—252.1 **9 Claims**

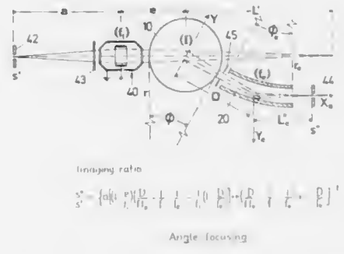
1. A method for identifying a blistered film in layered films comprising:
- a first step of irradiating with a focused ion beam a portion, which has no blister, of layered films having a blister while measuring the number of secondary electrons generated by said irradiation as a function of time, thereby providing a first set of measurement data corresponding to said number of the second electrons;
- a second step of irradiating with said focused ion beam the approximate center of said blister in said layered films while measuring the number of secondary electrons generated by said irradiation as a function of time, thereby providing a second set of measurement data corresponding to said number of the secondary electrons; and
- a third step of comparing said first set of measurement data obtained in said first step with said second set of measurement data obtained in said second step to determine the kind of film having said blister.

4,843,239

COMPACT DOUBLE FOCUSSING MASS SPECTROMETER

Helmut Liebl, Eching, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Foerderung der Wisserschaften e.V., Eching, Fed. Rep. of Germany

Filed May 18, 1987, Ser. No. 51,728
Int. Cl.[4] H01J *49/32*
U.S. Cl. 250—296 **9 Claims**



1. A double-focussing mass spectrometer system comprising in the order named along an ion beam path between entrance and exit aperture planes
- an einzel lens,
- first means for producing a magnetic field to cause a predetermined first nominal angle of deflection of the ion beam in a predetermined direction,
- second means for producing an electrical deflection field to cause a predetermined second nominal angle of deflection of the ion beam in a direction opposite to said predetermined direction,
- said einzel lens imaging said entrance aperture plane onto said exit aperture plane, and said magnetic and electric fields being chosen to effect energy focussing of said ions at said exit aperture plane, said first and second nominal angles of deflection being each less than 45 degrees.

4,843,240

RADIATION IMAGE RECORDING AND READ-OUT APPARATUS

Nobuyoshi Nakajima, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 18, 1988, Ser. No. 182,821
Claims priority, application Japan, Apr. 17, 1987, 62-94550
Int. Cl.[4] G03B *42/02*
U.S. Cl. 250—327.2 **5 Claims**

1. A radiation image recording and read-out apparatus which comprises:
- (i) a recording and read-out unit provided with:
  - (a) a case for housing therein a stimulable phosphor sheet and having longitudinal and transverse dimensions approximately equal to the longitudinal and transverse dimensions of a single image recording area on said stimulable phosphor sheet,
  - (b) an image recording section for holding said stimulable phosphor sheet is said case at an image recording position exposed to radiation passing through an object, and having a radiation image of said object stored on said stimulable phosphor sheet,
  - (c) an image read-out section provided in said case for exposing said stimulable phosphor sheet carrying said radiation image stored thereon to stimulating rays which cause said stimulable phosphor sheet to emit light in proportion to the stored radiation energy, and photo-

electrically detecting the emitted light to obtain image signals, and

(d) an erasing section provided in said case for releasing the radiation energy remaining on said stimulable phosphor sheet, for which the detection of said emitted light has been carried out, before the image recording is carried out on said stimulable phosphor sheet,

(ii) a grid device provided with a grid having a size approximately equal to the longitudinal and transverse dimensions of said case, and

(iii) a unit movement means for moving said recording and read-out unit so that said recording and read-out unit takes a first image recording position at which said image recording section faces said grid device, and a second image recording position at which said image recording section deviates from the position facing said grid device.

4,843,241

RADIATION IMAGE RECORDING AND READ-OUT APPARATUS

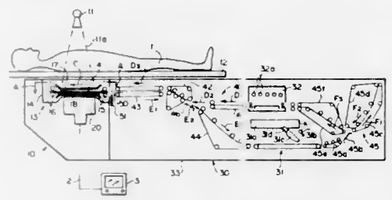
Shigeru Saotome, and Masamitsu Ishida, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 789,261, Oct. 18, 1985, abandoned. This application Feb. 16, 1988, Ser. No. 158,040

Claims priority, application Japan, Oct. 20, 1984, 59-220742

Int. Cl.[4] G01N 21/04

U.S. Cl. 250—327.2 **5 Claims**



1. A radiation image recording and read-out apparatus comprising:

(i) a circulation and conveyance means **(40)** for conveying at least one stimulable phosphor sheet **(4)** for recording a radiation image thereon along a predetermined circulation path;

(ii) an image recording section **(10)** provided with a sheet holding means **(13)** positioned outside said circulation path for recording a radiation image of an object **(1)** on said stimulable phosphor sheet by exposing said stimulable phosphor sheet to radiation passing through said object, said circulation and conveyance means including reversible sheet feeding means for conveying the phosphor sheet in opposite directions between said circulation path and said image recording section, and a fluoroscopic means **(20)** for receiving said radiation passing through said sheet holding means when said stimulable phosphor sheet is not held by said sheet holding means and for converting said radiation into a signal for producing a visible image,

(iii) an image read-out section **(31)** positioned on said circulation path and provided with stimulating ray source **(13a)** for emitting stimulating rays for scanning a stimulable phosphor sheet carrying a radiation image stored thereon at said image recording section, and a photoelectric read-out means for detecting light emitted by said stimulable phosphor sheet scanned with said stimulating rays to obtain an electric image signal;

(iv) an erasing section **(32)** positioned on said circulation path for releasing the radiation energy remaining on said stimulable phosphor sheet, prior to the next image recording on said stimulable phosphor sheet; and switch-back conveying means located between said image read-out section and said erasing section.

4,843,242

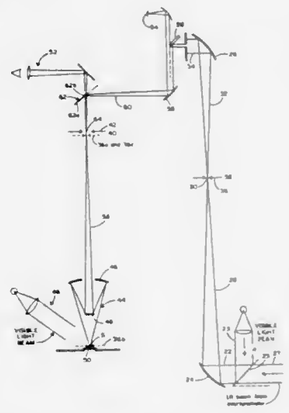
INFRARED MICROSCOPE EMPLOYING A PROJECTED FIELD STOP

Walter M. Doyle, Laguna Beach, Calif., assignor to Laser Precision Corporation, Irvine, Calif.

Filed Oct. 20, 1986, Ser. No. 921,066

Int. Cl.[4] G02B 21/00

U.S. Cl. 250—330 **8 Claims**



1. In a microscope having a sample supporting member which retains a sample in a sample image plane, an objective, a detector of infrared radiation, and means for causing an infrared radiation beam to enter the microscope, an optical system having a reflectance mode for sample viewing, comprising:

means for reflecting the entering radiation beam into the objective in such a way that it passes through the objective on its way to the sample, is reflected at the sample, and travels back through the objective on its way to the detector;

means through which image plane the radiation passes as it moves toward the sample, but not as it moves from the sample toward the detector for providing a first image plane between the entering radiation and the reflecting means;

means for providing a second image plane between the objective and the detector; and

an adjustable field stop which is located at the first image plane, and which is adjustable so as to determine the size of the illuminated area at the sample when the sample is viewed in the reflectance mode;

the image at the adjustable field stop being reimaged at the second image plane and at the sample when the sample is viewed in the reflectance mode.

4,843,243

METHOD AND APPARATUS FOR CONTINUOUS COLLECTION OF CHROMATOGRAPHIC EFFLUENT

Klaus Biemann, Alton Bay, N.H., and John J. Gagel, Cumberland Center, Me., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 14, 1986, Ser. No. 851,445

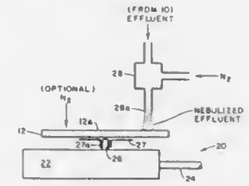
Int. Cl.[4] G01N 30/02

U.S. Cl. 250—341 **36 Claims**

16. A method of preparing off-line a sample for spectroscopy or spectrometry by continuous collection of components separated by chromatography, comprising the steps of

discharging chromatographic effluent including mobile phase and solute,

substantially eliminating the mobile phase from the discharged effluent, and



depositing chromatographic effluent substantially without the mobile phase along a continuous predetermined sample track on a removable compact rigid unitary planar fully IR reflective surface, said surface being constructed such that it may be readily removed from the chromatographic device and subsequently readily received by a spectrometer or spectroscopy device.

4,843,244

SECURITY SENSORS

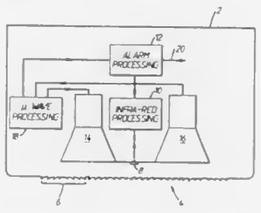
John L. Galloway, Edinburgh, Scotland, assignor to Racal-Guardall (Scotland) Limited, Edinburgh, Scotland

Filed Jan. 5, 1988, Ser. No. 141,571

Claims priority, application United Kingdom, Jan. 15, 1987, 8700866

Int. Cl.[4] G01J 1/00

U.S. Cl. 250—342 **5 Claims**



1. A sensor including a housing, a passive infra-red detector and a microwave detector mounted in said housing, and a panel in said housing, which panel is shaped to define at least one Fresnel lens segment through which infra-red radiation can pass for detection by the passive infra-red detector, and said panel also constituting a radome for said microwave detector, said panel allowing microwave radiation to pass therethrough, said passive infra-red detector including at least one infra-red sensitive element having an electrical output and being positioned in said housing behind said panel in order to receive infra-red radiation through said panel, and a processing circuit connected to said output of said element, said microwave detector including means for transmitting microwaves through said panel and means for receiving microwaves reflected back from a target through said panel, and a processing circuit connected to said receiving means.

4,843,245

SCINTILLATION DETECTOR FOR TOMOGRAPHS

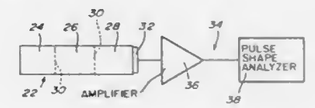
Roger Lecomte, Sherbrooke, Canada, assignor to Universite de Sherbrooke, Sherbrooke, Canada

Filed Jun. 4, 1987, Ser. No. 58,363

Claims priority, application Canada, Jun. 6, 1986, 510983

Int. Cl.[4] G01T 1/164, 1/202

U.S. Cl. 250—367 **7 Claims**



1. A tomograph for obtaining information on a subject emitting radiation, said tomograph comprising:

radiation detecting means comprising an array of radiation detectors which are optically isolated from each other each said detector including:

(a) a scintillator having a multi-layered structure, each layer having a scintillation timing constant which is different from all other timing constants of other layers in the detector, the layers of the detector being arranged one on top of the other in a direction of the path of travel of radiation from said subject toward said radiation detecting means, said multi-layered scintillator defining a light guide; and

(b) a photodetector optically coupled to said light-guide, said photodetector generating an electric signal indicative of a scintillation in said scintillator caused by radiation interacting therewith, said electric signal being representative of the scintillation timing constant of the layer of said scintillator in which an interaction has occurred; and

processing means, operatively connected to the photodetectors of the radiation detectors of said array, for processing the signals generated by said photodetectors to provide said information, said processing means comprising signal discrimination means for identifying a particular layer of a scintillator of a radiation detector in which an interaction has occurred.

4,843,246

APPARATUS FOR DETECTING THE POSITION OF INCIDENCE OF A BEAM OF CHARGE CARRIERS ON A TARGET

Ewald Benes, Biedermannsdorf; Franz Viehbock, Spitz; Herbert Stori, Vienna, all of Austria; Friedrich-Werner Thomas, Gelnhausen, and Gernot Thorn, Hanau, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Hanau, Fed. Rep. of Germany

Continuation of Ser. No. 799,581, Nov. 19, 1985, abandoned. This application Dec. 3, 1987, Ser. No. 129,340

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1984, 3442207

Int. Cl.[4] G01J 1/00

U.S. Cl. 250—491.1 **11 Claims**

1. Apparatus for detecting the absolute position of incidence of a beam of charged particles impinging on a target and producing x-ray radiation at the point of incidence, the apparatus including an imaging system comprising:

a diaphragm arranged in proximity to the target and containing at least one aperture therethrough permitting the passage of x-ray radiation from the point on the target where it is produced to a stationary detector;

the detector being positioned on the opposite side of the diaphragm from the target and having a planar surface of sufficient area to intercept any x-ray radiation from the diaphragm and at least one sensing device for sensing the x-ray radiation impinging on any location on the detector

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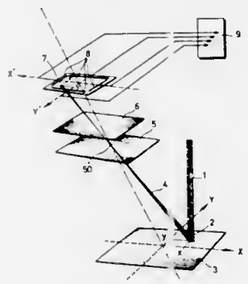
surface and for producing in response thereto two signals, one of which depends monotonically on a first coordinate of the location of incidence on the detector surface of the radiation and the other of which depends monotonically on a second coordinate of the location of incidence on the detector surface of the x-ray radiation;



an analyzing circuit for receiving the signal from the sensing device; and

a filter which is highly and selectively transparent to x-ray radiation, interposed between the diaphragm and the detector.

4,843,247

DETERMINATION OF ASPHALTENE CONTENT AND DEVICE THEREFOR

Seigo Yamazoe, and Hiroshi Tsuji, both of Saitama, Japan, assignors to Cosmo Oil Co., Ltd., Tokyo, Japan

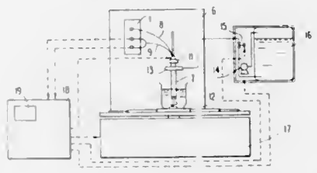
PCT No. PCT/JP86/00565, § 371 Date Jul. 8, 1987, § 102(e) Date Jul. 8, 1987, PCT Pub. No. WO87/03090, PCT Pub. Date May 21, 1987

PCT Filed Nov. 7, 1986, Ser. No. 80,511

Claims priority, application Japan Nov. 8, 1985, 60-248733

Int. Cl.⁴ G01N *15/06*

U.S. Cl. 250—573 **7 Claims**



4. A device for determining an asphaltene content in a heavy hydrocarbon oil, which comprises a dip probe or flow cell for sampling a sample solution having dispersed therein asphaltene particles which is prepared from a sample oil to be determined, said dip probe or flow cell being set so as to face with the sample solution and being movable with up-and-down strokes so as to be in contact with or apart from the sample solution, a two-wavelength absorbance detector including a light source, passages for light to allow the light from the light source to pass through a sample solution of a given thickness introduced in the dip probe or flow cell, two interference filters each capable of transmitting the light having transmitted through the sample solution having a different wavelength selected from a range of from 500 to 1,000 nm, and phototubes or photocells each capable of converting the intensity of each of incident light and transmitted light having two different wavelengths into an electrical current and a computing means capable of converting the electrical current values into an asphaltene content.

4,843,248

MIXING RATIO SENSOR FOR LIQUID FUEL

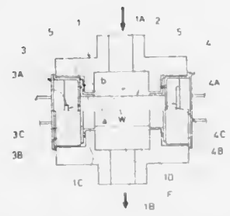
Shigeru Miyata, and Yoshihiro Matsubara, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed May 26, 1987, Ser. No. 54,380

Claims priority, application Japan, Sep. 22, 1986, 61-145285

Int. Cl.⁴ G01N *15/06*

U.S. Cl. 250—574 **3 Claims**



1. A sensor for mixing ratio of liquid fuel comprising:

a cylindrical enclosure having both inlet and outlet openings to act as passages through which a mixing liquid flows;

a transparent column lengthwise disposed within said enclosure to provide an outer surface contact with said mixing liquid fuel, each end of said column being inserted into a ring-shaped wall provided at an open end portion of said enclosure;

a light emitting diode placed at one end of said column so that light beams emanating from said diode enter into said column, reach the boundary or interface of said column and said mixing liquid fuel, said light beams incident on said boundary or interface at an angle of less than a critical angle being passed to said mixing liquid fuel and said light beams which incident on said boundary or interface at an angle of more than the critical angle are totally reflected back from said boundary or interface;

a photo diode at other end of said column to receive said light beams totally reflected back from said boundary or interface so as to produce an output, an intensity of which is in accordance with a ratio of said mixing liquid fuel;

a metallic sealant having a sleeve and a flange provided at one open end of said sleeve, said sleeve being liquid-tight telescoped into each end of said column, while said flange having a circumferential projection liguid-tight secured to an outer side of said wall, thereby securing said mixing liquid fuel against leakage.

4,843,249

HYDROELECTRIC SYSTEM

Jean L. Bussiere, 2 Ballou St., Dana Ct., Apt. 24, Putnam, Conn. 06260

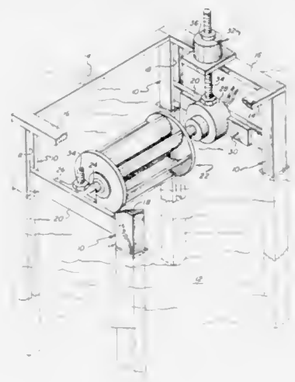
Filed Aug. 9, 1988, Ser. No. 187,564

Int. Cl.⁴ F03B *13/12*

U.S. Cl. 290—53 **17 Claims**

1. A hydroelectric system for the generation of power from waves formed in a body of water, comprising: a multiplicity of turbine units, each including mounting means, a turbine wheel rotatably supported by said mounting means, and a machine operatively connected to said wheel for the generation of electrical power by rotation thereof, said units being adapted to permit the flow of water along paths so as to effect rotation of said turbine wheels; and means for positioning a set of a plurality of said turbine units side-by-side, with the axes of rotation of said turbine wheels disposed somewhat above the nominal surface of the body of water and substantially on a common axis, said common axis extending horizontally and at

an acute angle to the general direction of progression of wave fronts along the water surface, and said mounting means and positioning means cooperating to cause the flow of water to



occur unless diverted predominantly below said axis of rotation, to impinge upon and effect rotation of said wheels in one direction.

4,843,250

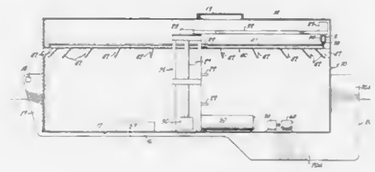
WAVE ACTION POWER GENERATOR

John S. Stupakis, Orange, Calif., assignor to JSS Scientific Corporation, Orange, Calif.

Filed Nov. 3, 1988, Ser. No. 266,696

Int. Cl.⁴ F03B *13/12*

U.S. Cl. 290—53 **19 Claims**



1. Apparatus for converting the energy of wave or current motion into electrical energy, comprising:

a buoyant vessel adapted to be rocked by passing waves, said vessel being of a cylindrical configuration with a cylindrical sidewall and an upper surface and a lower surface;

rail means secured to the interior of said sidewall and extending about the periphery thereof in a plane in proximate relation to said upper surface;

pylon means secured within said vessel and having a rotatable shaft means on the axial centerline of the cylindrical sidewall;

arm means having one end thereof secured to said shaft means, said arm means extending in a direction generally perpendicular to the axis of said shaft means;

weight means secured to the other end of said arm means;

wheel means at the other end of said arm means for engagement with said rail means; and

hydraulic pump means adjacent the lower surface of the interior of said vessel and operable in response to movement of said shaft means; and

other means including electrical power generating means for providing electrical energy, at least in part, in response to operation of said pump means.

4,843,251

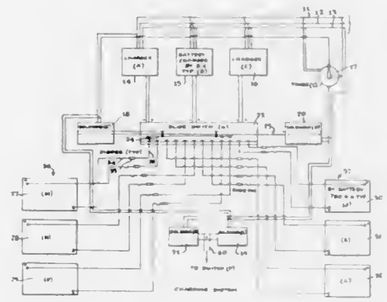
ENERGY STORAGE AND SUPPLY SYSTEM

Harry J. McSorley, Sr., 1717 S. Washington, Wichita, Kans. 67211

Filed Mar. 23, 1988, Ser. No. 172,161

Int. Cl.⁴ H02J *7/00*; **H01M** *10/44*

U.S. Cl. 307—66 **8 Claims**



1. An energy storage and supply system comprising:

input means for connecting to a source of electrical energy;

first storage means for storing electrical energy;

second storage means for storing electrical energy;

output means for providing stored electrical energy to a load;

charging means operably connected to said input means for providing an electrical charging output that may be stored; and,

switch means for controlling

which of said first and second storage means is connected to said charging means; and which of said first and second storage means is connected to said output means for allowing electrical energy to be supplied to said load, such that one of the storage means is always connected to said charging means and another of said storage means is always connected to said output means; wherein, said switch means includes a slide switch for controlling which of said storage means is connected to said charging means.

4,843,252

SELECTING ELECTRODE DRIVE CIRCUIT FOR A MATRIX LIQUID CRYSTAL DISPLAY

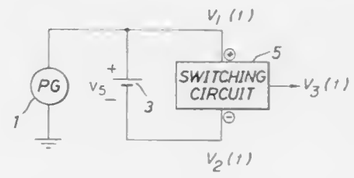
Shigeru Morokawa, Higashi-yamato, and Fuminori Suzuki, Tokorozawa, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 737,421, May 24, 1985, abandoned. This application Aug. 27, 1987, Ser. No. 91,300

Claims priority, application Japan, May 24, 1984, 59-105586

Int. Cl.⁴ H03K *3/01*, *5/156*

U.S. Cl. 307—264 **25 Claims**



1. An electrode drive circuit for driving an electrode of a matrix liquid crystal display comprising:

switching circuit means for developing a switching waveform having first, second and third voltage levels at an output thereof, said switching means having a first and second supply input terminal;

power supply means for supplying power to said switching circuit means, said power supply means supplying a constant supply voltage across [to] said first and second supply input terminals of said switching circuit means;

a circuit ground; and

pulse voltage generator means, connected between said circuit ground and said first supply input terminals, for supplying a periodic voltage pulse waveform having a pulse voltage amplitude of Vm and for varying the voltage supplied to said switching circuit means with respect to said ground, thereby [vary] varying the voltage developed by said switching circuit means with respect to said ground.

4,843,253

MONOLITHICALLY INTEGRATABLE CIRCUIT FOR THE GENERATION OF EXTREMELY SHORT DURATION CURRENT PULSES

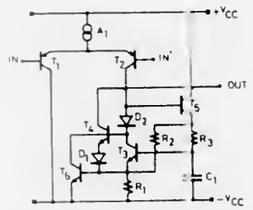
Vanni Poletto, Camino, Italy, assignor to SGS Microelettronica SpA, Agrate Brianza, Italy

Filed Dec. 15, 1987, Ser. No. 134,308

Claims priority, application Italy, Dec. 22, 1986, 22799 A/86

Int. Cl.⁴ H03K *3/17 3/01*

U.S. Cl. 307—266 **8 Claims**



1. A current pulse generator circuit comprising: first and second transistors, each having a first type of conductivity and each having first and second and control terminals, the first terminal of said first transistor and the first terminal of said second transistor being connected together and both connected via a constant current generator to a first terminal of a supply voltage source, the second terminal of said first transistor being connected to a second terminal of said supply voltage source, the control terminal of said first transistor and the control terminal of said second transistor respectively forming first and second input terminals of the circuit; third, fourth and fifth transistors having a second type of conductivity opposite to said first type of conductivity, and each having first and second and control terminals, the first terminal of said third transistor being connected to said second terminal of said supply voltage source via a first resistor, and to the first terminal of said fourth transistor via a first diode and to the first terminal of said fifth transistor via a second resistor, the second terminal of said third transistor being connected via a second diode both to the second terminal of said second transistor and to the control terminal of said fifth transistor and also connected to the control terminal of said fourth transistor, the control terminal of said third transistor being connected to the first terminal of said fifth transistor via a third resistor and to said second terminal of said supply voltage source via a capacitor, the second terminal of said fifth transistor being connected to said first terminal of said supply voltage source and the second terminal of said fourth transistor forming an output terminal of the circuit.

4,843,254

MASTER-SLAVE FLIP-FLOP CIRCUIT WITH THREE PHASE CLOCKING

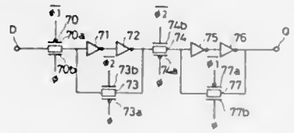
Hisatoshi Motegi, and Akira Nomura, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Feb. 29, 1988, Ser. No. 162,226

Claims priority, application Japan, Mar. 2, 1987, 62-47064

Int. Cl.⁴ H03K *3/284, 3/26, 21/16*

U.S. Cl. 307—272.2 **10 Claims**



1. A master-slave flip-flop circuit comprising:

an input terminal and an output terminal;

a master circuit switching means;

a master circuit data holding means;

said master circuit switching means being controlled by a first clock signal for controlling transfer of data from said input terminal to said master circuit data holding means,

said master circuit data holding means holding data transferred through said master circuit switching means;

a slave circuit switching means;

a slave circuit data holding means;

said slave circuit switching means being controlled by a second clock signal for controlling transfer of data from said master circuit data holding means to said slave circuit data holding means;

said slave circuit data holding means holding data transferred through said slave circuit switching means;

said first clock signal being nearly in phase with and lagging a little behind said second clock signal;

said master circuit switching means comprising a transfer gate formed of a p-channel MOS FET and an n-channel MOS FET connected in parallel with each other, and said slave circuit switching means comprising a transfer gate formed of a p-channel MOS FET and an n-channel MOS FET connected in parallel with each other;

said p-channel MOS FET of said master circuit switching means receiving said first clock signal;

said n-channel MOS FET of said slave circuit switching means receiving at its gate electrode said second clock signal; and

said n-channel MOS FET of said master circuit switching means and said p-channel MOS FET of said slave circuit switching means receiving at their gate electrodes a third clock signal lagging behind said second clock signal and leading said first clock signal.

4,843,255

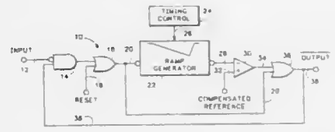
SELF-LATCHING MONOSTABLE CIRCUIT

Carlton Stuebing, Tigard, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 10, 1988, Ser. No. 154,814

Int. Cl.⁴ H03K *3/284, 5/04, 5/12, 4/10*

U.S. Cl. 307—273 **8 Claims**



1. A self-latching monostable circuit responsive conditionally to an input signal for generating an output signal having a pulse of a predetermined duration comprising:

AND gate means having two input ports including an inverting input on one of the input ports and an output port, one of said input ports being coupled to the input signal and the other of said input ports being coupled to said output signal;

OR gate means having two input ports for generating the output signal, one of said input ports of said OR gate means being coupled to said output of said AND gate means; and

timing means having an input port coupled to said output port of said AND gate means, an output port coupled to the other of said input ports of said OR gate means, and a ramp capacitor coupled to the input port, the ramp capacitor being charged by a variable charging current, said timing means being responsive to the output of said AND gate means for changing the signal at said output port of said timing means from a first logic state to second logic state a predetermined period of time after the output of said AND gate means changes from a first logic state to a second logic state, said predetermined period of time being variable, whereby the output signal has a pulse of a predetermined width beginning when the input signal changes from a first to a second logic state while preventing further changes in the input signal from affecting the output signal during the predetermined duration, the output signal being latched in a predetermined logic state for the predetermined duration.

4,843,256

CONTROLLED CMOS SUBSTRATE VOLTAGE GENERATOR

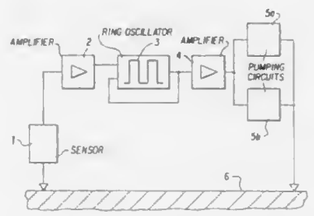
Andreas Scade; Reinhard Hoenig, and Horst-Guenther Schniek, all of Dresden, German Democratic Rep., assignors to Jenoptik Jena GmbH, Jena, German Democratic Rep.

Filed Nov. 13, 1987, Ser. No. 120,560

Claims priority, application German Democratic Rep., Dec. 23, 1986, 2983011; Mar. 31, 1987, 3012800; Mar. 31, 1987, 3012817

Int. Cl.⁴ H03K *3/01, 3/335, 17/56;* **H03L** *29/78*

U.S. Cl. 307—296.2 **6 Claims**



1. In a controlled CMOS substrate voltage generator having a comparator for comparing a substrate voltage and ground potential, a ring oscillator coupled to the output of the comparator, an amplifier coupled to the output of the oscillator, a pumping circuit coupled to the output of the amplifier, the comparator being comprised of a sensor with an amplifier, the sensor being comprised of a series arrangement of a power source and a resistance combination connected between the supply voltage and the substrate, the resistance combination being comprised of MOS transistors, the supply voltage comprising an essentially constant output voltage across the resistance combination with respect to ground, the improvement comprising first delay means and second inverting delay means, the pumping circuit comprising first and second pumping circuits each having a pumping capacitor and parallel connected nMOS and pMOS decoupling means connected between the respective pumping capacitor and signal ground, said decoupling means having gates, said first and second pumping circuits also having separate pMOS diodes, the output of the amplifier being connected to the first pumping circuit via the first delay means and to the second pumping circuit via the second inverting delay means whereby the first and second pumping circuits operate in phase opposition, the first and second delay means having the same time lag (π_1), a first control circuit comprised of a third inverting delay means and a first capacitor connected between the amplifier and the gates of the decoupling members of the first pumping circuit, and a second control circuit comprised of a fourth delay means and a second capacitor connected between the amplifier and the gates of the decoupling means of the second pumping circuit, the third and fourth delay means having the same time lag (π_2), which is smaller than the time lag (π_1), the gates of the decoupling means of the first and second pumping circuits being connected to the respective pMOS diodes, said diodes being biased in the direction of flow and having ground potential (U_{SS}).

4,843,257

REGULATED POWER SUPPLY FOR MOS TRANSISTORS WITH SHORT CHANNEL LENGTH

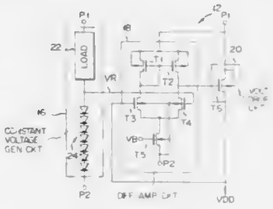
Takashi Ohsawa, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 104,588, Sep. 29, 1987, abandoned, which is a continuation of Ser. No. 694,819, Jan. 25, 1985, abandoned. This application Sep. 9, 1988, Ser. No. 243,140

Claims priority, application Japan, Jan. 26, 1984, 59-12618

Int. Cl.⁴ H03K *3/01;* **H03F** *3/16*

U.S. Cl. 307—296.8 **11 Claims**



1. A voltage converting circuit for supplying a suitable voltage to a load circuit on a semiconductor chip comprising:

first and second power source terminals for receiving a power source voltage;

voltage drop means, connected in series with said load circuit between said first and said second power source terminals, for producing said suitable voltage to said load circuit, the resistance value of said voltage drop means being variable by a control voltage;

voltage generating means for generating at an output terminal a constant voltage lower than said power source voltage; and

differential amplifying means, connected to receive directly from said voltage generating means said constant voltage as a reference voltage and connected to receive directly from said voltage drop means said suitable voltage as a feedback voltage, for detecting a voltage difference between said reference and feedback voltages and for producing said control voltage from said detected voltage difference to gently change said resistance value of said voltage drop means to reduce said voltage difference and maintain said suitable voltage at said load circuit,

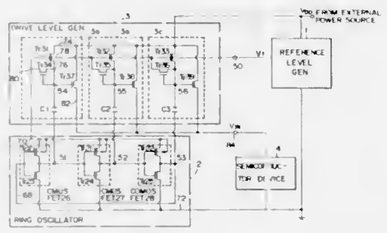
said differential amplifying means including a first MOS transistor and a second MOS transistor wherein a gate of said first MOS transistor is connected to a junction between said voltage drop means and said load circuit and a gate of said second MOS transistor is connected to said voltage generating means at said output terminal.

4,843,258

DRIVE CIRCUIT WITH A RING OSCILLATOR FOR A SEMICONDUCTOR DEVICE

Masahumi Miyawaki; Sampei Miyamoto, and Tamihiro Ishimura, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1988, Ser. No. 226,087
Claims priority, application Japan, Jul. 29, 1987, 62-189688
Int. Cl.[4] H03L *1/00*; H03K *3/353*
U.S. Cl. 307—296.2 6 Claims



1. A drive circuit for driving a semiconductor load circuit, comprising:

reference voltage level generator means for outputting a reference voltage level which is associated with an input voltage level from an external power source;

ring oscillator means responsive to the reference voltage level for oscillating a frequency signal having a predetermined frequency; and

drive voltage level generator means responsive to the reference voltage level and the frequency signal for producing a drive voltage level which is constantly substantially equal to the reference voltage level in synchronism with the frequency signal;

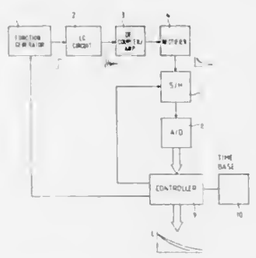
said drive voltage level generator means feeding power from said external power source to said semiconductor load circuit at the drive voltage level.

4,843,259

PROCESS FOR THE NON-CONTACTING DETECTION OF EDDY CURRENT-INDUCED BODIES, PARTICULARLY METAL OBJECTS, AS WELL AS TO SENSORS BASED ON THE PROCESS

Bruno Weisshaupt, Frauenfeld, Switzerland, assignor to Baumer Electric AG, Frauenfeld, Switzerland

Filed Oct. 26, 1987, Ser. No. 113,147
Claims priority, application Switzerland, Oct. 29, 1986, 4289/86
Int. Cl.[4] H03K *17/90, 17/687*; G01N *27/00*; G01B *7/14*
U.S. Cl. 307—308 13 Claims



1. A process for the detection and location of a movable body in which eddy currents can be induced by a magnetic field when the body is within the field of an inductive resonant circuit component in a resonant circuit comprising the steps of

exciting the inductive resonant circuit component with a short duration step function electrical pulse,

measuring the quantitive response of the resonant circuit to the step function pulse,

retaining the measurement as being representative of an instantaneous position of the body,

repeatedly exciting the inductive resonant circuit component with step function pulses,

measuring the response to each pulse, and

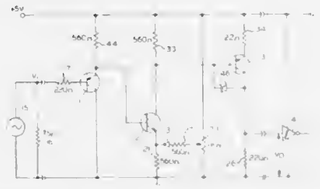
retaining the response measurements representative of a sequence of instantaneous positions as a locus of points defining a path of movement of the body.

4,843,260

VARIABLE THRESHOLD AMPLIFIER

Robert H. Lacy, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 27, 1982, Ser. No. 412,348
Int. Cl.[4] H03K *5/153, 5/24*
U.S. Cl. 307—362 3 Claims



1. A variable threshold amplifier comprising:

an npn transistor having a base, emitter and collector;

a first pnp transistor having a base, emitter and collector;

a positive voltage supply, wherein the collector of said npn transistor is electrically connected through a first resistor to said positive voltage supply and is electrically connected to the base of said first pnp transistor, wherein the emitter of said first pnp transistor is electrically connected through a second resistor to said positive voltage supply, and wherein the collector of said first pnp transistor is electrically connected through a third resistor to a first reference voltage;

a potentiometer having first and second terminals and a wiper, wherein the first terminal of said potentiometer is electrically connected to said positive voltage supply and the second terminal of said potentiometer is electrically connected to said first reference voltage;

a diode having an anode and a cathode, wherein the anode of said diode is electrically connected through a fifth resistor to the wiper of said potentiometer and wherein the cathode of said diode is electrically connected to the emitter of said npn transistor and is electrically connected to said first reference voltage through a sixth resistor; and

a second pnp transistor having a base, emitter and collector, wherein the emitter of said second pnp transistor is electrically connected through a fourth resistor to said positive voltage supply and is electrically connected to the base of said npn transistor and wherein the collector of said second pnp transistor is electrically connected to said first reference voltage; and

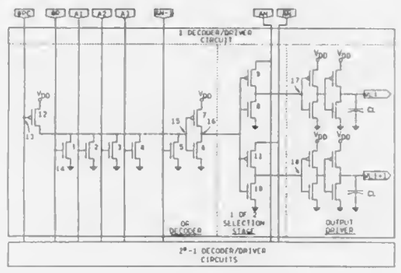
means for providing a second signal having a voltage which varies as a function of time to the base of said second pnp transistor, wherein the voltage level of said second signal is increased by about 0.7 volts at the emitter of said second pnp transistor and is thus provided as said first signal to the base of said npn transistor.

4,843,261

COMPLEMENTARY OUTPUT, HIGH-DENSITY CMOS DECODER/DRIVER CIRCUIT FOR SEMICONDUCTOR MEMORIES

Barbara A. Chappell; Terry I. Chappell, both of Amawalk, and Stanley E. Schuster, Granite Springs, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 29, 1988, Ser. No. 161,813
Int. Cl.[4] H03K *19/096*
U.S. Cl. 307—449 12 Claims



1. A decoder/driver circuit means for semiconductor memories of the type including a precharge clock, a reset clock and address lines comprising an OR circuit means including AN-1 n-type channel devices having gate electrodes respectively connected to AN-1 address lines and responsive to address bit signals A1 through AN-1 and drain electrodes connected in common, an n-type channel device having a gate electrode connected to a reset clock and responsive to a reset clock signal ϕR, a p-type channel device having a gate electrode connected to a precharge clock and responsive to a precharge clock signal ϕPC, and an output node,

a one of two selection circuit means connected to said OR circuit means and to AN and $\overline{AN}$ address lines and responsive to an AN address bit signal and the complement of an AN address bit signal, respectively, thereon, and

an output driver stage connected to said selection circuit means, said output driver stage including first and second nodes connected to said selection circuit means, first and second transistor driver circuits connected, respectively, to said first and second nodes, and a first driver output line and a second driver output line connected respectively to said first and second transistor driver circuits,

said decoder/driver circuit being responsive to said address bit signals on said A1 through AN address lines for providing an output signal on said first driver output line and said second driver output line in response to said address bit signals.

4,843,262

PULL UP OR PULL DOWN ELECTRONIC DEVICE

Yoshihiro Abe, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

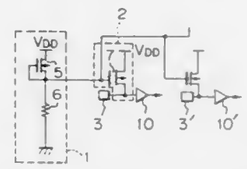
Filed Jul. 31, 1987, Ser. No. 80,011
Claims priority, application Japan, Aug. 7, 1986, 61-185976
Int. Cl.[4] H03K *19/094*
U.S. Cl. 307—475 12 Claims

1. An electronic device comprising:

a voltage source of a predetermined potential;

first constant current means comprising a first field effect transistor coupled so that it operates within a saturation range; and

an output terminal connected to said voltage source through said first constant current means said output terminal being pulled up or down to the predetermined potential, in response to said first constant current means.

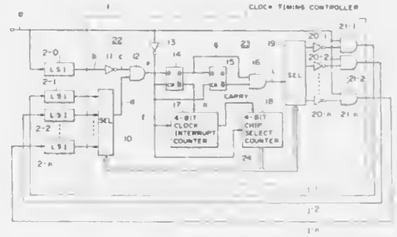


4,843,263

CLOCK TIMING CONTROLLER FOR A PLURALITY OF LSI CHIPS

Mitsugu Ando, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 25, 1988, Ser. No. 172,879
Claims priority, application Japan, Jan. 10, 1986, 61-1975; Mar. 26, 1987, 62-72809
Int. Cl.[4] G06F *1/04*; H03K *5/15*
U.S. Cl. 307—480 8 Claims



1. A clock timing controller for a plurality of integrated circuit chips, each of said integrated circuit chips having a frequency divider for deriving a lower-frequency output clock signal from a higher-frequency input clock signal, wherein said integrated circuit chips are divided into a first chip and a plurality of second chips, comprising:

means for coupling a higher-frequency input clock signal from an external clock source to said first chip to produce a lower-frequency output clock signal therefrom;

chip selector means for selecting one of said second chips;

phase comparator means for comparing the output clock signal of said selected second chip with the output clock signal of said first chip for generating a phase difference signal in response to a phase difference between said compared output clock signals;

a plurality of gate means associated respectively with said second chips, said plurality of gate means having inputs connected to said external clock source and outputs connected respectively to inputs of said second chips;

gate control means responsive to said phase comparator means for enabling all of said gate means in the absence of said phase difference signal to supply said higher-frequency input clock signal to all of said second chips and disabling the one of said gate means which is associated with said selected second chip in the presence of said phase difference signal; and

selector control means responsive to said phase comparator means for causing said chip selector means to sequentially

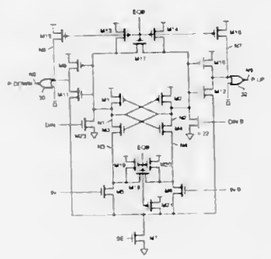
shift to another of said second chips at periodic intervals in the absence of said phase difference signal.

4,843,264

DYNAMIC SENSE AMPLIFIER FOR CMOS STATIC RAM

Douglas C. Galbraith, Fremont, Calif., assignor to Visic, Inc., San Jose, Calif.

Filed Nov. 25, 1987, Ser. No. 125,293
Int. Cl.[4] G01R *19/00;* **H03K** *3/26, 17/16;* **G11C** *7/02*
U.S. Cl. 307—530 **9 Claims**



1. A dynamic sense amplifier for use in a static random access memory, said memory including: an array of memory cells arranged in rows and columns; for each said column, a pair of differential bit lines coupled to the memory cells in said column; at least one dynamic sense amplifier having a pair of differential input nodes; and means for selectively coupling said differential input nodes of each said dynamic sense amplifier to one of said pairs of differential bit lines;

said dynamic sense amplifier comprising:

two sensing transistors having gate electrodes coupled to a pair of differential input nodes, both sensing transistors having their source electrodes coupled to a common pull down node;

a pull down transistor for drawing current from said pull down node during sensing operations;

a four transistor latch coupled to the drains of said two sensing transistors for generating a pair of amplified differential signals on two latch output nodes, said four transistor latch comprising two cross coupled CMOS inverters;

transfer means for generating two signals on two isolation nodes which correspond to the voltage levels on said latch output nodes; said transfer means including two CMOS inverters, each said CMOS inverter having gate electrodes coupled to one of said latch output nodes, and a source node coupled to said pull down node;

output driver means coupled to said isolation nodes for generating an output signal on a driver output node, said output signal corresponding to the voltage levels on said latch output nodes; and

precharge means for precharging said latch output nodes and said isolation nodes between sensing operations;

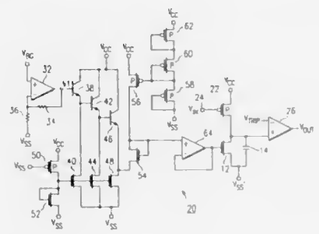
whereby, when the pull down transistor is activated, the four transistor latch automatically amplifies the voltage differential on the gates of the two sensing transistors, generating a pair of differential output signals, and the four transistor latch is closely coupled to the output driver means, providing fast propagation of data read from a memory cell to the driver output node.

4,843,265

TEMPERATURE COMPENSATED MONOLITHIC DELAY CIRCUIT

Ching-Lin Jiang, Dallas, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.

Continuation of Ser. No. 828,049, Feb. 10, 1986, abandoned.
This application Jun. 30, 1988, Ser. No. 217,142
Int. Cl.[4] G05F *1/567*
U.S. Cl. 307—591 **11 Claims**



1. A temperature compensated time delay circuit of the type which can be fabricated in an integrated circuit comprising:

(a) a capacitive element having first and second terminals and charged to a first voltage;

(b) a field effect transistor having its source and drain respectively coupled to the first and second terminals of the capacitive element;

(c) means for generating a bias voltage which is coupled to the gate of the field effect transistor such that the charge from the capacitive element flows through the field effect transistor at a rate determined principally by the characteristics of the field effect transistor and the bias voltage; and

(d) means for temperature compensating said bias voltage wherein temperature induced changes in the field effect transistor are compensate for by appropriate changes in the bias voltage which compensation approximates the temperature variations of the surface mobility in said field effect transistor.

4,843,266

METAL-HALOGEN DISCHARGE LAMP WITH CONICALLY SHAPED INSULATING ELEMENTS IN OUTER ENVELOPE

János Szántó, Budapest; Sándor Holló, Eger; Balázs Nyiri, and Ferenc Nágel, both of Budapest, all of Hungary, assignors to Tungsram Reszvenytarsasag, Hungary

Filed Oct. 19, 1987, Ser. No. 109,960
Claims priority, application Hungary, Oct. 20, 1986, 4339/86
Int. Cl.[4] H01J *61/30*
U.S. Cl. 313—25 **5 Claims**

1. A metal halogen discharge lamp containing an alkali halogenoid additive comprising:

(a) a discharge tube having two ends and an active part in between;

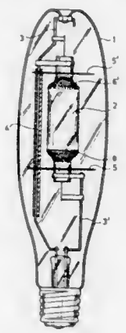
(b) two electric leads extending out of said discharge tube, one from each end;

(c) an outer bulb with said discharge tube located therein;

(d) metal armatures extending through the outer bulb to the electric leads of said discharge tube providing support and means of current flow for said discharge tube;

(e) metal contacts on an outside portion of said outer bulb communicating with said armatures, said contacts positioned to contact a current supply to power said discharge lamp; and

(f) conically shaped insulating elements positioned at each end of said discharge tube such that the active part of said discharge tube is separated from said armatures, wherein the metal armatures are coated with a ceramic or glass



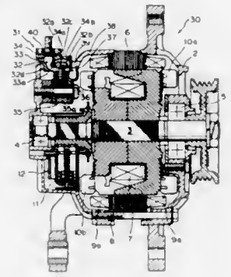
characterized by having poor conductivity with respect to alkali ions.

4,843,267

CHARGING GENERATOR

Kazutoshi Kaneyuki, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1989, Ser. No. 293,038
Claims priority, application Japan, Jan. 21, 1988, 62-6462[U]
Int. Cl.[4] H02K *11/00*
U.S. Cl. 310—68 D **9 Claims**



1. A charging generator having a rectifier within a casing and an output terminal which is connected to said rectifier and projects radially with respect to a rotary shaft, comprising:

a terminal screw having a threaded shaft portion which constitutes said output terminal, a mounting arm portion formed integral with said threaded shaft portion, and a mounting bore provided in said mounting arm portion, the central axis of said mounting bore extending parallel with the axis of said threaded shaft portion;

an output terminal base made of an insulating resin material which covers said mounting arm portion in such a manner that said mounting bore is not closed therewith, said base being formed integral with said terminal screw;

an opening formed in said casing at a position which faces said rectifier so as to accommodate said output terminal base; and

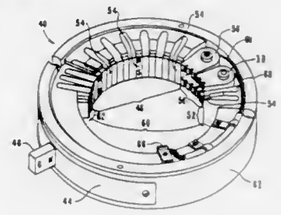
a screw inserted through said mounting bore in said terminal screw to connect said terminal screw, together with said output terminal base, to said rectifier.

4,843,268

ASYMMETRIC FIELD ELECTROMAGNETIC MOTOR

Jiri J. Hovorka, Tulsa, Okla., assignor to Marketing Systems of the South, Inc., Tulsa, Okla.

Filed Sep. 17, 1987, Ser. No. 97,681
Int. Cl.[4] H02K *1/00*
U.S. Cl. 310—181 **8 Claims**



1. A motor, comprising:

a stator assembly, including:

a first segment having permanent magnets;

a second segment being a coil segment and including an electromagnet adjacent and abutting said first segment; and

a third segment having permanent magnets adjacent and abutting said second segment, and said first through third segments occupying less than the entire circumference of said stator assembly; and

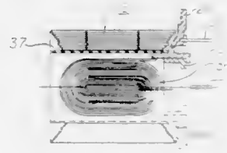
a rotor assembly rotating in said stator assembly and including a single rotor segment having permanent magnets occupying less than one-half of the circumference of the rotor assembly.

4,843,269

LARGE AIR GAP MOTOR

Daniel J. Shramo, Rocky River, Ohio, assignor to Adalet/Scott Fetzer Company, Westlake, Ohio

Filed Oct. 1, 1987, Ser. No. 103,518
Int. Cl.[4] H02K *5/128, 21/14*
U.S. Cl. 310—208 **10 Claims**



1. An electric motor comprising, in combination:

first and second magnetically permeable members with an air gap therebetween;

winding means disposed in said air gap;

means to provide a magnetic flux circulating from said first to said second magnetically permeable member and return through said air gap;

means to provide relative movement between said winding means and said second magnetically permeable member in response to an electrical current flowing in said winding means for a mechanical output of said motor;

said winding means being disposed outside of any slots in said first and second magnetically permeable members;

a plurality of pancake coils in said winding means stacked consecutively in said air gap in the direction from said second to said first magnetically permeable members, said

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plurality of pancake coils including at least four coils with two at one location and two at another location, successive coils at each location becoming progressively larger in the direction towards said first magnetically permeable member, and a larger coil being connected to a smaller coil in at least two coil groups for substantially equal coil turns in said at least two coil groups.

4,843,270

ELECTRICAL MACHINE WITH UNEQUAL POLE FACES

Reinder H. Dijken, Groningen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 8, 1987, Ser. No. 70,856

Claims priority, application Netherlands, Jul. 17, 1986, 8601869

Int. Cl.[4] H02K *1/08, 3/18, 21/00*

U.S. Cl. 310—208 **9 Claims**

1. An electromagnetic machine comprising a rotor and a stator as machine parts, means for generating an excitation flux, and active coils carried on a first of said machine parts, in operation each of said active coils periodically linking at least a portion of the excitation flux and having a rotational emf generated in the respective coil,

said rotor comprising a plurality of spaced rotor poles and being rotatable about a rotor axis defining an axial direction, and said stator comprising a plurality of spaced stator poles, and

each said active coil being a cylindrical winding wound about a winding axis at least substantially diametrically arranged with respect to said rotor axis,

characterized in that the pole faces of at least some of the stator poles have angular dimensions in the direction of relative rotation different from the angular dimensions of at least some of the rotor poles in the direction of relative rotation,

in a relative position in which a respective active coil links a maximal portion of the excitation flux, such respective active coil links the entire excitation flux except for stray components thereof, and

during operation, as a result of relative rotation of the rotor with respect to the stator, the flux pattern of the portion of the excitation flux linking with the active coils rotates with respect to the first machine part at an angular velocity different from the relative angular velocity between the two machine parts.

4,843,271

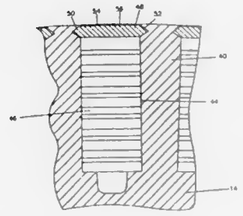
CONDUCTIVE METAL INSERTS IN ROTOR DYNAMOELECTRIC MACHINE

Manoj R. Shah, Latham, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 10, 1987, Ser. No. 130,866

Int. Cl.[4] H02K *3/48*

U.S. Cl. 310—217 **10 Claims**



1. A rotor for a dynamoelectric machine comprising:

a generally cylindrical rotor having at least first and second pole regions and at least first and second conductor regions;

said conductor regions containing conductor for producing a magnetic field in said rotor;

a coating of a high-conductivity metal on at least ten percent of a surface area of said cylindrical rotor;

each of said conductor regions contains a plurality of longitudinal slots having conductors therein;

each of said longitudinal slots includes a wedge covering an opening thereof; and,

said high-conductivity coating metal is disposed at least on an outer surface of at least some of said wedges.

4,843,272

MINIATURE MOTOR HAVING RESILIENT BRUSH ARMS

Kazuichi Mabuchi, Matsudo, Japan, assignor to Mabuchi Motor Co., Ltd., Japan

Continuation-in-part of Ser. No. 755,069, Jul. 15, 1985. This application Jun. 4, 1987, Ser. No. 57,952

Int. Cl.[4] H02K *13/00*

U.S. Cl. 310—239 **5 Claims**

1. In a miniature motor comprising a motor case, a rotor rotatably mounted in said case including a rotatable shaft having a rotor with a commutator rotatable therewith, the improvement comprising a casing wall with a brush receiving recess, and a brush having a fork-shaped brush arm with a fork-shaped commutator engaging sliding part end disposed in bearing contact against said commutator and an opposite brush base end with a portion engaged in the brush receiving recess and held therein so as to hold said brush arm fork-shaped commutator engaging sliding part end in sliding engagement with said commutator, and a flexible photo-setting resin coating said brush at least over said brush base end.

4,843,273

HEATER MECHANISM WITH THERMOELECTRIC POWER GENERATOR

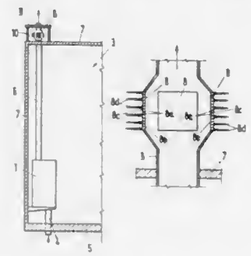
Helmut Dammers, and Dieter Dammers, both of Düsseldorf, Fed. Rep. of Germany, assignors to Thermo-Watt Stromerzeugungsanlagen GmbH, Düsseldorf, Fed. Rep. of Germany

Filed May 6, 1988, Ser. No. 191,216

Claims priority, application Fed. Rep. of Germany, May 12, 1987, 8706762[U]; May 12, 1987, 8706763[U]

Int. Cl.[4] F24H *3/02;* **F28D** *21/00;* **H01L** *35/30*

U.S. Cl. 310—306 **10 Claims**



1. In a heater mechanism for vehicles, boats, and weekend houses, with said mechanism including a closed combustion chamber that is heated by open flames of a combustion gas generated from solid, liquid, or gaseous fuel, whereby heat is transferred from said combustion chamber to a heat-carrier that is located in a heating chamber that surrounds said combustion chamber, with said heat-carrier, for indirect or direct transfer of heat to a room that is to be heated, being conveyed via at least one flow-producing mechanism, which is driven by an electric motor that is supplied with power that is obtained via at least on thermoelectric generator from the heat generated by the flame in said combustion chamber, the improvement wherein:

said at least one theroelectric generator is embodied as a plate-like semiconductor element having a cold side and a side that is to be heated, with this latter side receiving heat generated in said combustion chamber, and

a partition disposed between said combustion chamber and said heating chamber, with said at least one semiconductor element being disposed in said partition in such a way that said side of said element that is to be heated is disposed in the convection range of flames of said combustion chamber, and said cold side of said semiconductor element is disposed in an inlet region in said heating chamber for still-cool heat-carrier that is to be heated by the transfer of heat from said combustion chamber.

4,843,274

BRUSH HOLDER

Thomas D. Paisley, Commack, N.Y., assignor to Aircraft Parts Corp., Farmingdale, N.Y.

Filed Jan. 28, 1985, Ser. No. 695,872

Int. Cl.[4] H02K *13/00*

U.S. Cl. 310—239 **13 Claims**

1. A dynamoelectric machine having a housing, a rotatable commutator within the housing, a brush contacting said commutator, said brush having a top surface spaced from said commutator, a front surface meeting said top surface at a front edge thereof and a back surface meeting said top surface at a spaced opposite rear edge thereof, first and second spaced substantially parallel side holes formed through said brush and opening on said front and rear surfaces and first and second spaced substantially parallel top holes formed in said brush opening on said top surface and extending to said first and second side holes, respectively, said top holes accommodating a plurality of brush pigtails, an electrically conductive brush holder affixed to said housing and supporting said brush, a brush pigtail having a first end connected to said brush and a second end, said pigtail having a plurality of stranded electrically conductive wires, and electrical conductor connected to said pigtail at a junction, said machine comprising

support means affixed to said housing and passing through said hole for supporting the junction of said pigtail and said conductor, said support means including

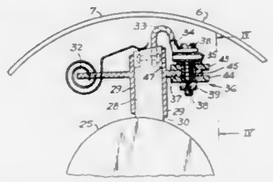
a bracket extending from said housing, said bracket having a hole formed therethrough and spaced opposite first and second surfaces;

a first insulator which electrically isolates said junction from said bracket at the first surface of said bracket;

a second insulator which electrically isolates said junction from said bracket at the second surface of said bracket;

a third insulator which electrically isolates said junction from said bracket in said hole; and

a terminal at the second end of said pigtail for conducting maximum current between said brush and said junction, said terminal accommodating a plurality of pigtails, each



extending through said terminal, and having a hole formed therethrough at which electrical connection is made with said junction, said hole intercepting a group of said plurality of pigtails in a manner whereby electrical connection is directly effected between said pigtails and said junction when said junction passes through said hole; and

an electrically conductive hammer plate having a back plate and a top plate extending from said back plate at an acute angle therewith, said back plate having a pair of spaced holes formed therethrough, and first and second electrically conductive members extending through said holes of said back plate and said first and second side holes of said brush and affixing said hammer plate to said brush with said back plate in juxtaposition with said back surface of said brush and said top plate in juxtaposition with said top surface or said brush, said brush pigtails accommodated in said first and second top holes being in electrical contact with said first and second electrically conductive members, respectively.

4,843,275

AIR BUOYANT PIEZOELECTRIC POLYMERIC FILM MICROPHONE

Peter F. Radice, Upper Merion, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 19, 1988, Ser. No. 145,454

The portion of the term of this patent subsequent to Jan. 20, 2004, has been disclaimed.

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—334 **24 Claims**

1. An apparatus for receiving sound waves, comprising:

a piezoelectric polymer film having electrodes disposed on opposing sides thereof;

air buoyant inflatable means with said film attached thereto for supporting said film in an air buoyant position, said inflatable means is filled with a gas which is lighter in weight than air; and

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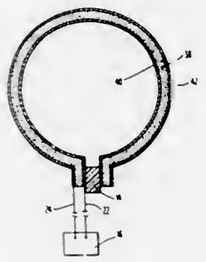
receiving means electrically coupled with the electrodes of said film for processing the electrical signal generated by



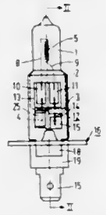
said film when said film is caused to vibrate by the pressure of the received sound waves.

4,843,276

ELECTRIC INCANDESCENT LAMP ASSEMBLY HAVING SIMPLIFIED CONSTRUCTION

Michel Jacrot, Barjouville, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 18,108, Feb. 25, 1987, abandoned. This application Dec. 6, 1988, Ser. No. 283,049
Claims priority, application France, Feb. 25, 1986, 86 02569
Int. Cl.[4] H01J *5/48, 5/50*
U.S. Cl. 313—318 18 Claims



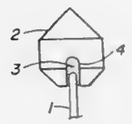
1. An incandescent lamp assembly, comprising:
a lamp comprising a gas-tight bulb defining a lamp axis, a filament within said bulb, said bulb having a planar press seal with two major opposing surfaces defining a width dimension of said press seal, and a pair of current-supply conductors connected to said filament, passing through said press seal, and extending out of said lamp away from said press seal;
a metallic lamp holder for holding said lamp, said holder comprising two opposing parallel flat walls with said press seal disposed therebetween, each said well having a portion bounding a respective major side of said planar press seal for securing said lamp within said holder, said walls extending away from said press seal parallel to said lamp axis and having a width dimension transverse to the lamp axis, and each wall having an end remote from said bulb terminating in an integral tongue extending away from said bulb in the plane of said walls and said tongues having a width which is a major part of the width of said holder walls,
one of said current-supply conductors of said lamp being connected to said metallic holder; and
a metallic base on which said lamp holder is mounted, said base comprising a planar portion transverse to said lamp holder and having two slots aligned with said tongues, a tubular portion between said slots extending from the side of said base facing away from said bulb and in the direction away from said bulb, said tubular portion having two major opposing surfaces parallel with said holder walls spaced so that said lamp holder tongues extend through a respective slot and securely contact a major surface of said tubular portion for aligning said filament and said lamp holder with respect to said base,
means for fixing each tongue to a respective major surface of said tubular portion,
a conductive contact extending through said tubular portion connected to the other of said current-supply conductors, and
an insulative material within the space between said tubular portion and said contact for electrically insulating said contacting from said lamp base.

4,843,277

SINGLE CRYSTAL EMITTER WITH HEATER WIRE EMBEDDED THEREIN

Otto Winkler, and Hans Hofer, both of Balzers, Switzerland, assignors to Balzers Aktiengesellschaft, Liechtenstein

Filed Sep. 28, 1987, Ser. No. 101,575
Claims priority, application Switzerland, Sep. 29, 1986, 03898/86
Int. Cl.[4] H01J *1/22, 9/04*
U.S. Cl. 313—346 R 10 Claims



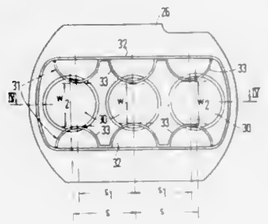
1. A single crystal for anchoring heating elements of an indirect resistance heater particulary a thermionic emission cathode for optoelectronic applications, comprising: a crystal body, said crystal body including an element from the series of rare earth elements, said crystal body having a top portion, a bottom portion, a first end a second end and said crystal body having a recess in the form of a continuous slot extending from said first end to said second end along the bottom of said crystal body, said slot having substantially parallel walls; an individual heating element embedded in said slot positioned extending throughout said slot parallel to said slot walls; and, a sintered composition permanently connecting said heating element to said crystal body in said slot.

4,843,278

IN-LINE GUN SYSTEM FOR A COLOR PICTURE TUBE

Bernhard Lau, Elchingen, Fed. Rep. of Germany, assignor to Nokia Graetz GmbH, Pforzheim, Fed. Rep. of Germany

Filed Feb. 19, 1987, Ser. No. 16,351
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1986, 3605247
Int. Cl.[4] H01J *29/56, 29/62*
U.S. Cl. 313—414 4 Claims



1. A color picture tube, comprising:

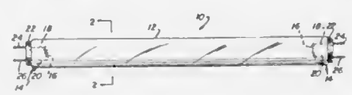
a screen;
a funnel;
a neck;
a deflection system mounted on said neck at the transition of said neck to said funnel and which contains an inline gun system comprising cathodes and grid and focus electrodes, said focus electrodes having separate apertures each with a continuous edge for guiding electron beams to said screen, at least one of said focus electrodes having plates attached thereto which are located on both sides of the electron beams and are disposed on the screen side of said at least one said focus electrodes; said plates having curved portions which project into said apertures and are arranged in a spaced relationship from the screen side of the aperture of the respective focus electrode; and
one of the grid electrodes contains a slit diaphragm.

4,843,279

FLUORESCENT LAMP SUBSTANTIALLY APPROXIMATING THE ULTRAVIOLET SPECTRUM OF NATURAL SUNLIGHT

Kendrick D. Rattray, Danvers, Mass., and Leo J. Plante, Seabrook, N.H., assignors to GTE Products Corporation, Danvers, Mass.

Continuation of Ser. No. 689,539, Jan. 7, 1985, Pat. No. 4,703,224. This application Jun. 25, 1987, Ser. No. 66,279
The portion of the term of this patent subsequent to Oct. 27, 2004, has been disclaimed.
Int. Cl.[4] H01J *61/44*
U.S. Cl. 313—487 6 Claims



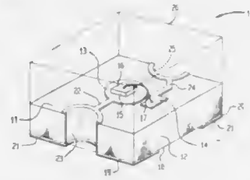
1. A suntanning fluorescent lamp comprising:
a glass envelope having a substantially circular configuration in cross-section and having axially opposed end portions, said envelope having an impurity level within a predetermined limit and being capable of transmitting UVA and UVB radiation;
first and second electrodes, each of said electrodes located within a respective one of said axially opposed end portions;
An ionizable medium enclosed within said envelope including an inert starting gas and a quantity of mercury which when energized generates a plasma discharge comprising ultraviolet radiation and a limited proportion of visible radiation; and
a phosphor means disposed on the interior surface of said envelope, said phosphor means being responsive to said ultraviolet radiation generated by said plasma discharge to provide a predetermined emission spectrum, and the combined emissions of said phosphor means and said visible radiation from said plasma discharge transmitted through said envelope having a spectral energy distribution of substantially UVA and UVB radiation as compared to visible radiation, said spectral energy distribution of said combined emissions substantially approximating the spectral energy distribution of natural sunlight below about 400 nanometers, the intensity value of said spectral energy distribution of said combined emissions at about 320 nanometers being less than the intensity value at about 400 nanometers.

4,843,280

A MODULAR SURFACE MOUNT COMPONENT FOR AN ELECTRICAL DEVICE OR LED'S

Marvin Lumbard, Los Gatos, and Lynn K. Wiese, Santa Clara, both of Calif., assignors to Siemens Corporate Research & Support, Inc., Iselin, N.J.

Filed Jan. 15, 1988, Ser. No. 144,370
Int. Cl.[4] H01L *33/00*
U.S. Cl. 313—500 10 Claims



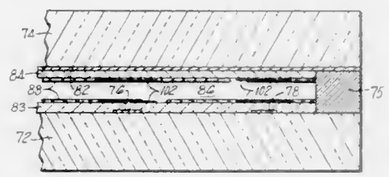
1. A modular surface mount component comprising:
an electrically insulating generally planar substrate having two opposing major surfaces and at least two lateral edges forming two opposite ends of the substrate, the first of said two major surfaces including at least one land area and at least one connection pad, the second of said two major surfaces including at least two terminal pads each next to one of the two lateral edges, and at least two plated through grooves having semicircular crosssections and electrically connecting said land area and said connection pad to respective ones of the two terminal pads each plated through groove located in one of the two lateral edges;
at least one device having at least two terminals, one of said terminals being electrically and mechanically coupled to said land area and the second of said terminals being electrically connected to said connection pad;
at least one layer of insulative material on said first major surface, said insulative material encapsulating said device and said electrical connection between the second of said terminals and said connection pad; and
the two terminal pads physically displaced on the second of said two major surfaces for mechanically surface mounting the modular component when the modular component is electrically connected.

4,843,281

GAS PLASMA PANEL

Charles Mendelsohn, Monsey, N.Y., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 17, 1986, Ser. No. 919,938
Int. Cl.[4] H01J *17/49*
U.S. Cl. 313—587 5 Claims



1. A plasma display device comprising:
an ionizable gas disposed between two sidewalls of dielectric material, each sidewall having an inside surface closest to the ionizable gas, each inner surface having an array of electrodes disposed on the surface wherein the electrodes of one sidewall are positioned substantially perpendicular

to the electrodes positioned on the other sidewall, thereby forming pixel points where they cross;

said electrodes and substrates being coated with a second dielectric layer;

said second dielectric layer coated with an electrically emissive material; wherein the improvement comprises an electrically conductive dopant material introduced into the second dielectric layer's surface adjacent to the emissive layer, said electrically conductive material being so configured about the electrode pixel point so as to concentrate the wall charge about said point and prevent said charge from spreading along the second dielectric's surface.

4,843,282

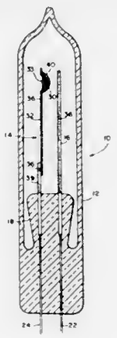
GLOW DISCHARGE STARTER CONTAINING SILVER

Nikolaos Barakitis, Salem, and Gregory Zaslavsky, Brookline, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.

Filed Feb. 16, 1988, Ser. No. 156,123

Int. Cl.[4] H01J *17/04, 61/06, 61/64*

U.S. Cl. 313—619 **6 Claims**



1. A glow discharge starter comprising an hermetically sealed envelope containing an ionizable medium, a bimetallic electrode and a counter electrode located within said envelope, said bimetallic electrode including a bimetallic element secured to a post, said bimetallic electrode and said counter electrode being of nickel-containing materials, and a silver plating completely covering said electrodes.

4,843,283

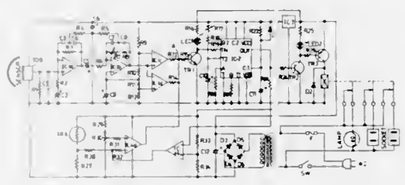
INFRARED RAY DETECTOR CONTROL ILLUMINATION SYSTEM

Jack Y. C. Chen, 841 Chung Shan N. Rd. Sec. 5, Taipei, Taiwan

Filed Aug. 24, 1987, Ser. No. 88,215

Int. Cl.[4] H05B *39/04*

U.S. Cl. 315—153 **4 Claims**



1. An illumination control system comprising:

a plurality of infrared detection systems located in a plurality of areas, wherein each of said areas is adjacent to at least one of another of said areas;

a plurality of light sources, wherein at least one of said light sources is located in each of said areas;

wherein each of said infrared detection systems has coupled thereto at least one of said lights sources from each of at least two adjacent said areas;

wherein each of said infrared detection systems is provided with a means to detect infrared radiation and a means to activate at least one light source in response to said detection of infrared radiation;

whereby as an infrared radiation emitting body travels through said areas, a light source is activated in an area in which said body is located as well as in at least one area adjacent to said area in which said body is located.

4,843,284

METHOD FOR DRIVING A PICTURE TUBE WITH FRONT PANE OF DIFFERING THICKNESS AND CIRCUIT ASSEMBLY FOR EXECUTING THE METHOD

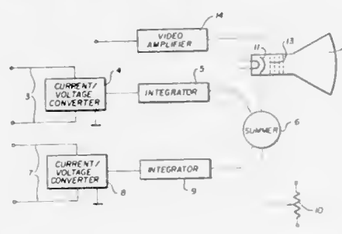
Roland Schmitt, Erlangen, and Rudolf Beuter, Furth, both of Fed. Rep. of Germany, assignors to TA-TRIUMPH-ADLER Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 27, 1988, Ser. No. 212,333

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1987, 3721326

Int. Cl.[4] H01J *29/56*

U.S. Cl. 315—371 **4 Claims**



1. A method for driving a picture tube, the picture tube having a front pane which has a vertical as well as a horizontal glass thickness which varies in accordance with a known function, the method comprising the steps of:

applying a voltage difference, consisting of a d.c. voltage level determining the background brightness and the video signal voltage, to the electrodes which determine the beam current of the cathode beam;

generating a first correction signal such that the level of the first correction signal during the horizontal deflection of the cathode beam shows a progress which is approximately proportional to the progress of the thickness of the glass along the horizontal line through the center of the front pane;

generating a second correction signal such that the level of the second correction signal during the vertical deflection of the cathode beam shows a progress which is approximately proportional to the progress of the thickness of the glass along the vertical line through the center of the front pane;

summing the first correction signal and the second correction signal together to obtain the correction voltage; and

superimposing the correction voltage on the voltage difference during bright-up scanning, the level of the correction voltage being automatically adjustable, responsive to the respective place on the video screen where the cathode beam is located during its vertical or horizontal deflection, depending on the thickness of the glass prevalent there.

4,843,285

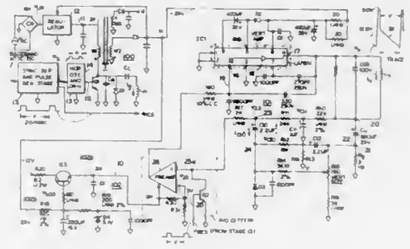
VERTICAL TRACKING CIRCUIT

Lin T. Chin, Hsin Chu, Taiwan, and James A. Wilber, Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Princeton, N.J.

Filed Jul. 5, 1988, Ser. No. 215,184

Int. Cl.[4] H01J *29/76, 29/70*

U.S. Cl. 315—408 **23 Claims**



1. A television deflection apparatus, comprising:

a source of a first supply voltage;

a horizontal deflection circuit coupled to said first supply voltage for generating a horizontal deflection current in a horizontal deflection winding at an amplitude that changes when a change in said first supply voltage occurs;

means for generating a first control voltage that is indicative of an amplitude of said horizontal deflection current and that changes when said change in said horizontal deflection current occurs;

a vertical deflection circuit responsive to a second control voltage that varies with the change in said horizontal deflection current for generating a vertical deflection current in a vertical deflection winding at an amplitude that is determined in accordance with the change in said amplitude of said horizontal deflection current, such that a change in said second control voltage causes said vertical deflection current to proportionally change by an amount that is different from the proportional change in said second control voltage; and

means responsive to said first control voltage for generating said second control voltage such that when said change in said horizontal deflection current occurs, the proportional change in said second control voltage is different from the proportional change in said horizontal deflection current, the difference between the proportional change of said horizontal deflection current and that of said second control voltage compensating for the difference between the proportional change of said vertical deflection current and that of said second control voltage.

4,843,286

VEHICLE WINDOW WIPER WITH THREE BRUSH MOTOR AND SPEED LIMITING

John R. Suriano, Kettering; Patrick J. Staarmann, Hamilton; Steven L. Tracht, Centerville, and Dennis L. Mueller, Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

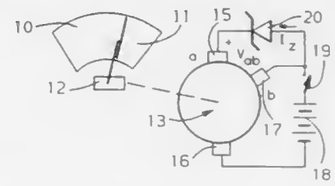
Continuation of Ser. No. 234,993, Aug. 22, 1988, abandoned. This application Dec. 21, 1988, Ser. No. 287,672

Int. Cl.[4] H02P *7/06*

U.S. Cl. 318—443 **10 Claims**

1. In a window wiper apparatus for a motor vehicle having a wiper driven by a three brush permanent magnet motor in a repeating pattern across the vehicle window, the motor having a low speed brush and common brush 180 electrical degrees apart to drive the wiper at a low speed when provided with a predetermined voltage thereacross and further having a high speed brush at an offset electrical angle from the low speed brush to drive the wiper at a high speed with a lower torque with the predetermined voltage applied across the high speed and common brushes, the motor being effective to generate at the low speed brush, when the predetermined voltage is applied across the high speed and common brushes, a voltage which increases with respect to the voltage at the high speed brush as the motor speed increases due to decreasing motor torque, the improvement comprising:

a zener diode characterized by a predetermined zener breakdown voltage and having a cathode connected to the low speed brush and an anode connected to the high speed brush so as to conduct from the low speed brush to the high speed brush when the voltage at the low speed brush exceeds the voltage at the high speed brush by the zener breakdown voltage, the zener breakdown voltage having a value less than the peak value of voltage from the low speed brush to the high speed brush during a wipe cycle on a wet window with the predetermined voltage applied across the high speed brush and common brush so as to provide reverse conduction through the zener diode and resulting motor and wiper speed limiting at least once during each wipe cycle of the apparatus during high speed wiper operation on a wet window.



4,843,287

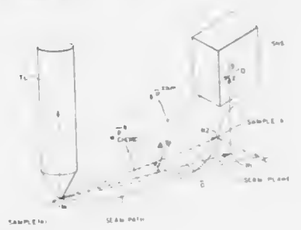
PATH CONTRIVING SYSTEM FOR LOOK-AHEAD SENSOR IN A ROBOTIC CONTROL SYSTEM

Jeffrey D. Taft, Plum Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 31, 1987, Ser. No. 140,262

Int. Cl.[4] G05B *19/42*

U.S. Cl. 318—568.16 **2 Claims**



1. In a robotic system controlling about position coordinate and orientation axes an effector end;

said orientation axes including a yaw axis;

the robotic system including:

a look-ahead seam sensor mounted on said effector end a distance therefrom;

said effector end being movable into position about said coordinate axes and orientable in relation to said orientation axes;

said look-ahead sensor being movable with said effector end at said distance about said yaw axis;

said look-ahead seam sensor being adapted, when tracking a

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seam path for said effector end, to sense seam path locations at said distance away from the effector end; and

the coordinates characterizing each sensed seam path location being stored successively to provide seam path location indicative samples;

the combination of:

means for controlling the effector end from a present operative position to a new operative position corresponding to one of said sensed seam path locations and to one of said seam path stored location indicative samples;

said look-ahead seam sensor and effector end having for said present operative position a common orientation about said yaw axis in accordance with a previous controlling operation of said robotic system upon said effector end;

means responsive to the location of said effector end in terms of said coordinate axes for said present operative position and to the contemporaneously sensed and stored seam path location sample for determining the chord across the seam path between said present operative position and said contemporaneously sensed sample;

means for determining in relation to said chord and said common orientation the yaw angle therebetween; and

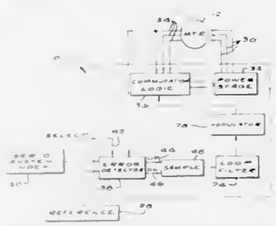
means operative upon said effector end concurrently with said controlling means for minimizing said yaw angle, whereby the look-ahead sensor is contrived to follow the seam path at said distance ahead of the effector end.

4,843,288

PHASE LOCKED MOTOR CONTROL SYSTEM FOR MULTIPLE DISK DRIVE UNITS

Le Roy A. Volz, Northridge, and Daniel R. Vigil, Panorama City, both of Calif., assignors to Rigidyne Corporation, Simi Valley, Calif.

Filed Mar. 28, 1988, Ser. No. 174,079
Int. Cl.[4] H02P 5/16
U.S. Cl. 318—599 30 Claims



1. A phase and frequency locked motor control system for controlling phase and frequency operation of a disk drive spindle motor, said system comprising:

means for driving the spindle motor, said driving means including a motor power stage for supply power to the motor, and a commutation logic for controlling operation of said power stage;

means for generating a motor signal representative of motor rotating frequency and phase;

means for generating a reference signal representative of a reference rotating frequency and phase;

means for comparing said motor signal with said reference signal, said comparing means including means for generating an error signal representative of error between said motor signal frequency and phase and said reference signal frequency and phase;

said comparing means comprising an error detector having means for generating a first output error signal when said motor signal frequency trails said reference signal frequency, a second output error signal when said motor signal frequency leads said reference signal frequency, a third output error signal when said motor signal frequency substantially matches said frequency signal frequency and said motor signal phase trails said reference signal phase, and a fourth output error signal when said motor signal frequency substantially matches said reference signal frequency and said motor signal phase leads said reference signal phase, said error detector generating said first through fourth output signals one at a time in accordance with frequency and phase of the motor signal relative to the reference signal; and

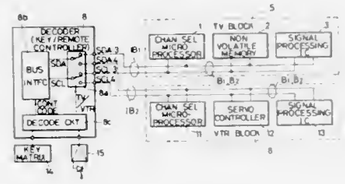
means responsive to said error signal for generating a pulse width modulated motor control signal having a duty cycle representative of said error, and for coupling said motor control signal to said commutation logic for regulating operation of said power stage to drive the motor in phase and frequency locked relation with said reference signal.

4,843,289

DIGITAL CONTROL BUS SYSTEM

Takao Mogi; Keiji Yuzawa; Yoshinori Komiya; Masayuki Suematsu, and Fujio Tagami, all of Tokyo, Japan, assignors to Sony Corp., Tokyo, Japan

Continuation of Ser. No. 881,326, Jul. 2, 1986, abandoned. This application Feb. 23, 1988, Ser. No. 161,316
Claims priority, application Japan, Jul. 20, 1985, 60-161004
Int. Cl.[4] H04Q 3/00
U.S. Cl. 318—600 7 Claims



1. A digital control bus system for electronic apparatus including at least three function blocks, said system comprising:

first control bus means for connecting a first group of said function blocks in parallel for transmitting data among the function blocks in said first group, said first group including at least first, second and third ones of said function blocks;

second control bus means for connecting a second group of at least two of said function blocks exclusive of said third function block in parallel for transmitting data among the function blocks in said second group, said second group including said first and second function blocks;

each of said first and second control bus means including a data line and a clock line;

bus interface means included in each of said function blocks in said second group; and

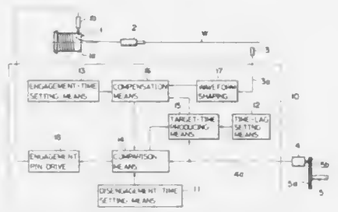
switch means including a respective switch connected between the bus interface means in each function block in said second group and said first and second control bus means for connecting each said bus interface means to a same selected one of said first and second control bus means, whereby said third function block is selectively disconnectable from data transmission to and from the function block in said second group while data transmission is permitted among the function blocks in said second group.

4,843,290

CONTROL SYSTEM FOR ENGAGEMENT PIN IN DURM-TYPE WEFT STORAGE UNIT

Tsutomu Sainen, Kanazawa, and Kensuke Wakamatsu, Matsuto, both of Japan, assignors to Tsudakoma Kogyo Kabushiki Kaisha, Ishikawa, Japan

Filed Dec. 24, 1986, Ser. No. 947,413
Claims priority, application Japan, Dec. 28, 1985, 60-297873
Int. Cl.[4] G05B 1/02
U.S. Cl. 318—603 17 Claims



1. In a control system for an engagement pin employed in a drum-type weft storage unit, including a drum for storing a weft in its outer peripheral surface on whicih the weft is wound and an engagement pin movable toward and away from the peripheral surface of the drum for selectively engaging and disengaging the left with the drum, the improvement comprising: a disengagement-time setting means connected to receive a rotation-angle signal representative of a mechanical rotational angle of a loom and a weft-arrival signal representative of the arrival of the weft at that side of a woven cloth which is opposite a weft entering side thereof for setting a disengagement time of said engagement pin from said drum, said disengagement-time setting means being operable to generate an output signal representative of the disengagement time thus et; an engagement-time setting means for setting an initial value of the engagement time of said engagement pin; a time-lag setting means for setting a normal time lag between the engagement time of said engagement pin and the weft-arrival time; a comparison means for comparing the rotation-angle signal with the output signal of said disengagement-time setting means and the output signal of a later-memtioned compensation means for determining a drivin gtime at which said engagement pin is driven to operate; a target-time generating means for generating a target time which is dlayed frm the engagment time of said engagement pin by the normal time lag; and said compensation means compensating for the engagement tim eof said engagement pin based on a difference in time between the target time and the arrival time of the weft, said compensation means being operable to generate an output signal representative of a compensation amount of the engagement time.

4,843,291

DIGITAL TO SYNCHRO CONVERTER

Joseph P. Predina, Fort Wayne, Ind., assignor to ITT Aerospace Optical, a division of ITT Corporation, Fort Wayne, Ind.

Filed Feb. 12, 1988, Ser. No. 155,463
Int. Cl.[4] G05B 19/31
U.S. Cl. 318—605 7 Claims

1. A precision rotary shaft control system comprising:

a resolver type position transducer;

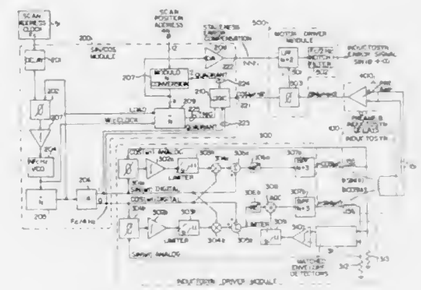
a motor driver circuit;

an address signal circuit; and

a resolver type position transducer drive circuit comprising first means for generating a drive signal for said resolver type position transducer and second means for providing precision feedback to said first means; and

wherein said second means comprises precision phase detector means in the current path of said drive signal for comparing the phase of said drive signal with the phase of an address signal provided by said address signal circuit; and

wherein said second means further comprises precision current sensing resister means in said current path and connected between a reference potential and said resolver type position transducer whereby said phase detector means detects said drive signal with precision.

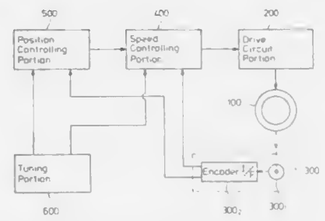


4,843,292

DIRECT DRIVE MOTOR SYSTEM

Yutaka Ono; Yayoi Tsuchiya; Yutaka Koizumi; Hitoshi Morimoto; Hideo Banzai; Yasuhiko Muramatsu; Syotoro Shindo; Toshihiro Kanehara; Norihiko Hatano; Susumu Ohta, and Mitsuhiro Nikaido, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Tokyo, Japan

Filed Feb. 25, 1999, Ser. No. 160,557
Claims priority, application Japan, Mar. 2, 1987, 62-47151; Mar. 2, 1987, 62-47152; Mar. 2, 1987, 62-47153; Mar. 2, 1987, 62-47154; Mar. 2, 1987, 62-47155; Nov. 26, 1987, 62-298354
Int. Cl.[4] G05B 1/01
U.S. Cl. 318—606 16 Claims



1. A direct drive motor system comprising

motor means of an inductor type comprising a rotor, a stator and a coil;

rotation detecting means for detecting rotation of said stator;

position control means for obtaining a first difference between an instruction signal of a rotational position of said rotor and a detection signal from said rotation detecting means, and for outputting a control signal depending upon said obtained first difference by using a tertiary servo system;

speed control means for obtaining a second difference between said output signal from said position control means and said detection signal from said rotation detecting means, and for outputting a control signal depending upon said obtained second difference;

driving means for detecting an exciting current passing through said coil for obtaining a third difference between a detection signal from said exciting current and said output signal from said speed control means, and for

controlling said exciting current depending upon said obtained third difference; and

tuning means for adjusting said tertiary servo system of said speed control means and said position control means.

4,843,293

APPARATUS FOR CONTROLLING SERVO SYSTEM EMPLOYING PIEZO-ELECTRIC ACTUATOR

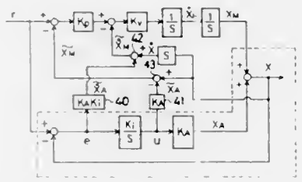
Shigeru Futami, 1-21-3NS-1-601, Ninomya, Yatabe-cho, Tsukuba-gun, Ibaraki 305, Japan, assignor to Research Development Corporation, Tokyo and Shigeru Futami, Ibaraki, both of, Japan

Filed Jan. 28, 1988, Ser. No. 149,452

Claims priority, application Japan, Feb. 2, 1987, 62-21976; Mar. 11, 1987, 62-56065

Int. Cl.[4] G05D *1/36*

U.S. Cl. 318—609 **6 Claims**



1. An apparatus for controlling a piezoelectric actuator double servo system in which a first servo system which feeds back at least a position signal and a speed signal and a second servo system which effects integral control by feeding back position are connected in series, said two servo systems having a mutual feedback control system employing a single position detector, said apparatus comprising:

first means for adding a feedback displacement signal obtained by multiplying an output of an integral controller of said second servo system by a first gain, which is smaller than zero, to the position feedback signal of said first servo system; and

second means for adding a feedback speed signal obtained by multiplying an input of the integral controller of said second servo system by a second gain which is smaller than zero to the speed feedback signal of said first servo system,

wherein a dynamic interference between said first and second servo systems is eliminated and said two servo systems are activated simultaneously.

4,843,294

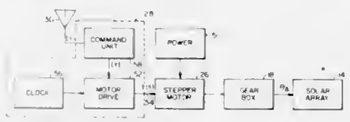
SOLAR ARRAY STEPPING TO MINIMIZE ARRAY EXCITATION

Mahabaleshwar K. P. Bhat, San Jose; Tung Y. Liu, Union City, and Carl T. Plescia, Sunnyvale, all of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Dec. 1, 1987, Ser. No. 127,344

Int. Cl.[4] H02P *5/00*

U.S. Cl. 318—696 **6 Claims**



1. A method for controlling induced torsional oscillations in a device excited by a stepper motor, said device having a characteristic torsional mode of oscillation with an oscillation period, said method comprising the steps of:

applying a first step signal to said stepper motor at a first time to induce a first step movement of said device in a first direction; and

applying a second step signal to said stepper motor to induce a second step movement in said first direction at a fixed second time following said first time by one-half of said oscillation period of said device, said second step movement for canceling induced oscillations of said device.

4,843,295

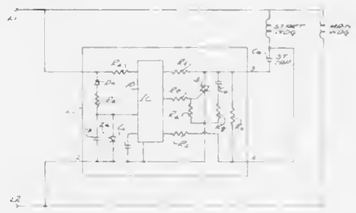
METHOD AND APPARATUS FOR STARTING SINGLE PHASE MOTORS

Herbert A. Thompson, Cumberland, R.I.; Paul R. Tomlinson, Dallas, Tex.; Kevin J Dropps, Berkley, MA, and Ronald A. Mancini, Leo, Ind., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 4, 1987, Ser. No. 57,996

Int. Cl.[4] A02P *1/44*

U.S. Cl. 318—786 **26 Claims**



1. A system for starting an electric motor having a main winding and a start winding comprising,

a solid state switch having a gate and having a first and second main terminals connectable in series with the start winding to control energization thereof,

control apparatus comprising

a power supply for providing a DC bias voltage,

trigger means coupled to the gate for providing a signal to the gate to turn on the switch and energize the start winding, the trigger means turning on the switch upon energization of the motor from an at rest condition,

measuring means to continuously measure a wave form of one of the main winding current and start winding voltage, the measuring means integrating the entire value of each half cycle of one polarity, the measuring means including an operational amplifier, a transfer gate having an output connected to an input of the operational amplifier, a first capacitor coupled to the transfer gate, means to take a plurality of differential samples of one half cycle of the wave form and apply the samples to the first capacitor, a second capacitor connected between an input of the operational amplifier and its output and means after each differential sample to turn on the gate connecting the first capacitor to the second capacitor to transfer the charge on the first capacitor to the second capacitor while the wave form is of one polarity so that at the end of the half cycle the output of the operational amplifier equals the integration of the entire half cycle,

calibration means for storing a first integrated value as a calibration value, and

comparison means for comparing the continuing integrated values to the calibration value, the trigger means interrupting the signal to the gate to turn off the switch and de-energize the start winding when the continuing integrated values reaches a threshold value which is a selected proportion of the calibration value.

4,843,296

AC MOTOR DRIVE APPARATUS

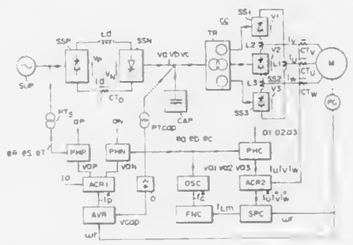
Shigeru Tanaka, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 17, 1987, Ser. No. 63,230

Claims priority, application Japan, Jun. 23, 1986, 61-144911; Jul. 21, 1986, 61-171190

Int. Cl.[4] H02P *5/40*

U.S. Cl. 318—800 **26 Claims**



1. An AC motor drive apparatus comprising:

a DC/AC power converter having a DC terminal coupled to a DC power source;

a capacitor coupled to an AC terminal of said DC/AC power converter;

a circulating current cycloconverter having an input terminal coupled to said capacitor and an output terminal coupled to an AC motor;

a first control means coupled to said DC/AC power converter, responsive to a predetermined crest value Vcap*, to control said DC/AC power converter such that a crest value Vcap of a voltage on said capacitor substantially matches said predetermined crest value Vcap*; and

a second control means coupled to said cycloconverter, responsive to a current supplied from said cycloconverter to said AC motor and to a reference signal having a given frequency and phase, to control said cycloconverter such that a frequency and phase of the voltage on said capacitor substantially match the frequency and phase of said reference signal respectively.

4,843,297

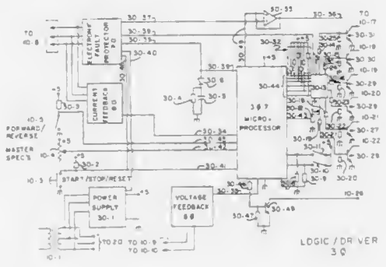
MICROPROCESSOR SPEED CONTROLLER

Paul J. Landino, New Haven, and Michael J. Ramadei, Bethany, both of Conn., assignors to Zycron Systems, Inc., West Haven, Conn.

Continuation of Ser. No. 670,817, Nov. 13, 1984, abandoned. This application Sep. 2, 1986, Ser. No. 902,501

Int. Cl.[4] H02P *5/40*

U.S. Cl. 318—811 **3 Claims**



1. In a speed and torque controller for an AC motor having at least one winding and wherein power from a source of high DC voltage power is applied to the winding through power switches whose conduction intervals are controlled by pulse duratoin variable pulses with the power switches coupled to the winding and with the enabling of the power switches being controlled by a square wave whose frequency is representative of a desired speed of the AC motor and with the duration of the variable pulses, during which current is supplied to the winding by the power switches, being representative of a desired output voltage to the winding of the AC motor, the improvement comprising:

means which is DC coupled to said AC motor winding for producing a feedback signal representative of the output voltage to said AC motor winding:

means for producing and storing a plurality of values representative of output voltages as a function of said feedback voltage and producing a feedback signal that is linearized with respect to frequency in response to said feedback voltage;

means responsive to the linearized feedback signal for establishing a desired duration of the duration variable pulses, commensurate with the frequency of the square wave signals and a desired voltage per hertz relationship at the AC motor winding;

means for determining whether the AC motor speed is within a low speed boost region and producing a low speed signal indicative thereof; and

means responsive to the low speed signal for generating a boost signal representative of a desired output voltage to the AC motor winding, said boost signal generating means including means for producing a plurality of look-up tables composed of values for the boost signal at predetermined speed ranges of the AC motor.

4,843,298

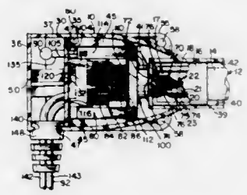
FLASHLIGHT BATTERY CHARGER

Robert K. Brauch, Colorado Springs, Colo., and Raymond L. Sharrah, Collegeville, Pa., assignors to Streamlight, Inc., Norristown, Pa.

Filed Aug. 29, 1986, Ser. No. 902,469

Int. Cl.[4] H02J *7/00;* **H01M** *10/46;* **F21L** *1/00*

U.S. Cl. 320—2 **15 Claims**



1. A flashlight battery charger for recharging batteries contained within a flashlight, the flashlight having an electrical terminal connector that is connected with the batteries to permit recharging of the batteries within the flashlight, the charger comprising:

(A) a casing having a flashlight charging area for receiving the flashlight to permit recharging, said casing including (a) a main case having a generally hollow interior and supports on opposite sides of the interior of the main case and (b) a cover for enclosing the main case having a support brace projecting inwardly toward the hollow interior of the main case;

(B) electrical terminal means in the charging area for electrically coupling with the terminal connector of the flashlight when the flashlight is positioned at the charging area for recharging;

(C) a transformer supported within the casing having a primary winding and a secondary winding for converting A.C. voltage supplied to the primary winding to a desired A.C. voltage at the secondary winding;

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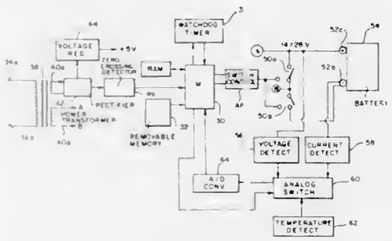
(D) input means electrically connected with the primary winding of the transformer for connection to a source of A.C. power to enable the A.C. power to be supplied to the primary winding of the transformer;
(E) rectifier means connected with the secondary winding of the transformer and the electrical terminal means of the charger for rectifying A.C. current from the secondary winding of the transformer to provide a D.C. current at the electrical terminals means of the charger to enable D.C. current to flow to the terminal connector of the flashlight to recharge the batteries when the flashlight is positioned at the charging area for recharging; and
(F) a printed circuit board for selected charger circuitry internally supported in the casing wherein the supports on the opposite sides of the interior of the main case provide generally planar support ledges for the printed circuit board at opposite sides of the interior of the main case and wherein the support brace on the cover provides a generally planar support surface spaced apart from and oriented generally parallel with the support ledges for holding and supporting the printed circuit board therebetween so that said circuit board is held in position within the casing between the supports on the opposite sides of the interior of the main case and the support brace on the cover when the cover is secured to the main case.

4,843,299

UNIVERSAL BATTERY CHARGING SYSTEM AND A METHOD

Phillip D. Hutchings, Calne, United Kingdom, assignor to Power-Tech Systems Corporation, Kent Conn.

Filed Jun. 1, 1987, Ser. No. 55,795
Int. Cl.[4] H02J 7/04
U.S. Cl. 320—31 **4 Claims**



1. A battery charger comprising:
a source of alternating current;
a microprocessor;
a watchdog timer circuit to reset said microprocessor upon the failure of said microprocessor to provide a predetermined signal within a predetermined interval of time;
a zero crossing detector for providing a signal to said microprocessor whenever the voltage of said alternating current is approximately zero;
power distribution means controlled by said microprocessor to supply a desired one-directional portion of said alternating current to the terminals of a battery being charged, said power distribution means including an interlock signal to prevent the supply of said portion to the terminals until specified by said microprocessor;
battery connection sensing means to provide to said microprocessor a signal indicative of the attachment of the terminals of the battery to the battery charger;
a current sensing circuit to provide an analog signal responsive to said portion;
a voltage sensing circuit to provide an analog signal responsively to the amount of voltage potential across the terminals of the battery;
a temperature sensing circuit to provide an analog signal responsively to a temperature;
analog switch means having plural input terminals, operatively connected to the analog signals provided by the current sensing circuit, voltage sensing circuit and temperature sensing circuit and being controlled by said microprocessor to provide an output analog signal responsively to the analog signal appearing at a selected one of the input terminals; and
an analog to digital converter operatively connected to the output analog signal of the analog switch means and providing to the microprocessor a digital signal responsively to the output analog signal.

4,843,300

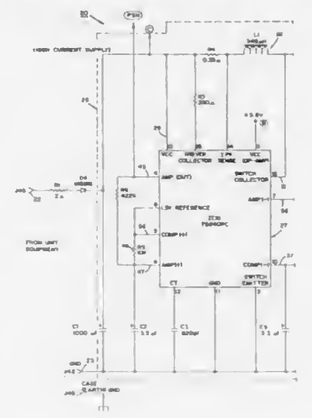
IMPROVED POWER SUPPLY FOR INTERMITTENTLY ENERGIZING AN EXTERNAL DEVICE REQUIRING HIGH POWER DURING INTERMITTENT PERIODS OF TIME FROM AN INPUT POWER SOURCE WITH RELATIVELY LOWER INSTANTANEOUS POWER CAPABILITY

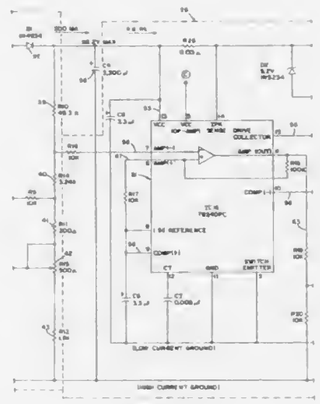
Arnold N. Alderman, El Segundo, Calif., assignor to Dual-Lite Manufacturing, Inc., Naguabo, P.R.

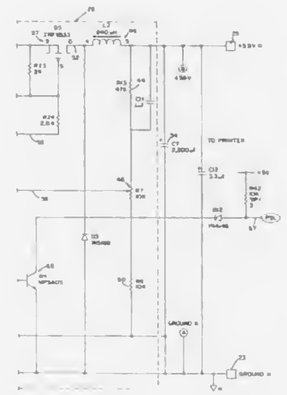
Filed Jan. 19, 1988, Ser. No. 145,225
Int. Cl.[4] G05F 1/618
U.S. Cl. 323—224 **27 Claims**

1. An improved power supply for intermittently energizing an external device that requires, during intermittent periods of time associated with the external device's active operation, relatively high power at a substantially uniform first voltage, wherein the power supply is powered by an input source of power having an instantaneous power capability less than that required by the external device during the external device's active operation, said input source of power operating at a voltage that may vary widely, comprising:
(A) step-up voltage regulating means for increasing and regulating the voltage of the source of power at an output of said means, said means including a first voltage regulator and a first inductor, the first voltage regulator having an output for controlling the voltage induced across the first inductor, said induced voltage driving the output of said means, said step-up voltage regulating means further having means connected to the first voltage regulator for sensing the output voltage of the step-up voltage regulating means for controlling the output of the first voltage regulator;
(B) a capacitor connected to the output of the step-up regulating means for storing sufficient electrical energy to supply the relatively high power required by the external device for each intermittent period of time;
(C) step-down voltage regulator means connected to the output of the energy storage capacitor, said step-down means having an output substantially less than the output voltage of the step-up voltage regulating means, said output of the step-down means for driving the external device, and step-down voltage regulating means including a second inductor, a second voltage regulator and a field effect transistor having its gate controlled by an output of the second voltage regulator with the source and drain of the field effect transistor connected in series between the output of the energy storage capacitor and one end of the second inductor so as to control the current flow through the second inductor, said second inductor connected to the output of the power supply so as to generate the first voltage, said first voltage controlled by the step-down regulator at a current level sufficient to generate the relatively high power required by the external device for each intermittent period of time, said step-down voltage regulating means further having means connected to the second voltage regulator for sensing the output voltage of the

power supply for controlling the output of the second voltage regulator; and
(D) a second capacitor connected to the other end of the







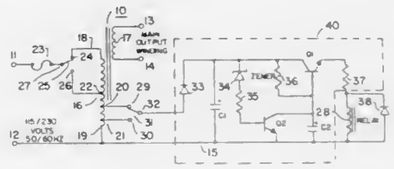
second inductor for smoothing the output voltage to the external device.

4,843,301

POWER SUPPLY WITH SWITCHING MEANS RESPONSIVE TO LINE VOLTAGE

Ernest D. Belanger, Bloomsbury, N.J., assignor to OPT Industries, Inc., Phillipsburg, N.J.

Filed Oct. 6, 1988, Ser. No. 254,285
Int. Cl.[4] G05F 5/00
U.S. Cl. 323—299 **7 Claims**



1. A circuit for supplying power to a load, said circuit being capable of operating from power sources which may have substantially different line voltages, said circuit comprising:
first and second input terminals adapted to be connected to a power source which may have a line voltages in a predetermined high range or a predetermined low range;
first and second output terminals adapted to be connected to a load;
a power transformer with (i) a primary winding having first and second portions and at least three terminals, (ii) line voltage sampling means comprising at least two terminals for providing a voltage sample having a value corresponding to the voltage applied between two selected terminals of said primary winding; and (iii) output winding means having two terminals connected to corresponding ones of said output terminals;
bistable switching means comprising a relay having an actuating coil, said switching means having a first switching portion connected in circuit between at least one of said input terminals and at least two terminals of said primary winding, so that (i) when said switching means is in a first state said input terminals are coupled across at least one portion of said primary winding in a configuration such that the voltage at said output terminals is in a desired output range when said line voltage is in said predetermined high range, and (ii) when said switching means is in a second state said input terminals are coupled across at least one portion of said primary winding in a configuration such that the voltage at said output terminals is in said desired output range when said line voltage is in said predetermined low range; and
a voltage sensing circuit coupled to said at least two terminals of said line voltage sampling means and connected to said switching means for (i) causing said switching means to be in said first state when said voltage sample has a value corresponding to a value of said line voltage in said predetermined high range, and (ii) causing said switching means to be in said second state when said voltage sample has a value corresponding to a value of said line voltage in said predetermined low range, said voltage sensing circuit comprising:
a first transistor having two main electrodes and a control electrode, said coil being connected in series with said main electrodes for actuating said relay when said first transistor is conductive between the main electrodes thereof;
a capacitor connected to the control electrode of said first transistor for initially limiting the voltage at said control electrode to a value insufficient to render said first

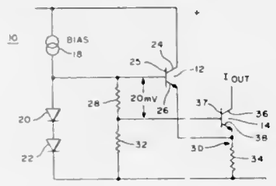
transistor conductive between the main electrodes thereof;
means coupled between said line voltage sampling means and said capacitor for charging said capacitor; and
means coupled to said line voltage sampling means for discharging said capacitor when the value of said voltage sample corresponds to a line voltage in said predetermined high voltage range, to limit the voltage at said control electrode to a value insufficient to render said first transistor conductive between the main electrodes thereof, so long as said line voltage is in said predetermined high voltage range thereof,
whereby the voltage at said output terminals is maintained within said desired output range regardless of whether said line voltage is in said predetermined high range or said predetermined low range.

4,843,302

NON-LINEAR TEMPERATURE GENERATOR CIRCUIT

Robert C. Dobkin, and Carl T. Nelson, both of San Jose, Calif., assignors to Linear Technology, Milpitas, Calif.

Filed May 2, 1988, Ser. No. 189,479
Int. Cl.[4] G05F *3/08*
U.S. Cl. 323—312 **9 Claims**



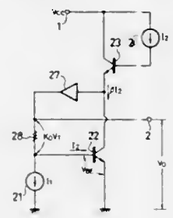
4. A non-linear current generation circuit comprising
at least a pair of transistors electrically connected to a common biasing current having a negative temperature coefficient, and
a negative temperature coefficient voltage applied between the bases of said transistors so as to generate from one of said transistors a non linear output current or voltage with respect to temperature where said output has an inflection point.

4,843,303

VOLTAGE REGULATOR CIRCUIT

Norio Shoji, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 7, 1988, Ser. No. 216,148
Claims priority, application Japan, Jul. 16, 1987, 62-178026
Int. Cl.[4] G05F *3/22*
U.S. Cl. 323—313 **10 Claims**



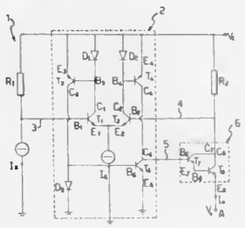
1. A voltage regulator circuit comprising:
(a) a first current source for generating a predetermined current;
(b) a first transistor supplied at its base with the predetermined current from said first current source and for generating an emitter current which is β times as large as said predetermined current;
(c) a second transistor having a collector connected with said emitter of said first transistor and of which the emitter is grounded;
(d) a second current source connected at its one end to the base of said second transistor and one end of a resistor which generates a reference voltage; and
(e) a buffer amplifier connected between the emitter of said first transistor and the other end of said resistor, wherein a predetermined voltage is derived at the other end of said resistor.

4,843,304

HIGH CAPACITY CURRENT MIRROR CIRCUIT

Mauro Merlo, Villasanta, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Agrate Brianza

Filed May 19, 1987, Ser. No. 52,606
Claims priority, application Italy, May 20, 1986, 20493 A/86
Int. Cl.[4] G05F *3/20*
U.S. Cl. 323—316 **4 Claims**



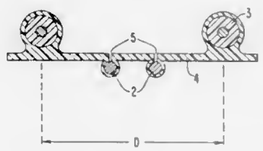
1. A high capacity current mirror circuit comprising: an operational amplifier, of the transconductance type, having one input connected to both a reference current source and a power supply pole through a first resistor, and having another input connected to said power supply pole through a second, feedback resistor, and having its output connected to the base of a first npn type transistor, thereby supplying a reflected current proportional to the reference current, the transistor having its collector connected to said power supply pole through said feedback resistor.

4,843,305

SPACER-SEPARATED LIQUID LEAKAGE SENSOR

Juji Akiba, Hitaka, Japan, assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Sep. 2, 1988, Ser. No. 240,874
Claims priority, application Japan, Apr. 9, 1987, 62-136052[U]
Int. Cl.[4] G01R *27/00;* **G01B** *21/00*
U.S. Cl. 324—65 P **5 Claims**



1. A liquid leakage sensor comprising:

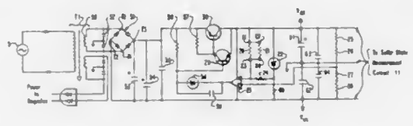
(a) a strip of insulative material;
(b) a spaced apart pair of insulated spacers attached to one side of said strip,
(c) a spaced apart pair of insulated conductors attached to the opposite side of said strip, the position of said pair of conductors lying generally between and nearer the center of said strip than said pair of spacers; and
(d) a series of regularly spaced apertures through said strip of insulation between each of said conductors and the opposite surface of said strip.

4,843,306

REPLACEABLE RESISTORS FOR CALIBRATING A WATTHOUR METER

Markus E. Meuller, Zug, Switzerland, assignor to Landis & Gyr Metering, Inc., Lafayette, Ind.

Filed Sep. 21, 1987, Ser. No. 99,258
Int. Cl.[4] G01R *11/17*
U.S. Cl. 324—74 **5 Claims**



1. A solid-state watthour meter for registering AC electrical energy consumption by a load connected to a source of AC load current and AC line voltage, comprising:
voltage sensing means for producing a first signal corresponding to the line voltage;
current sensing means for producing a second signal corresponding to the load current;
a solid-state measurement circuit having an input for receiving said first and second signals, an output, and means for producing a third signal at said output corresponding to the AC electrical energy consumption of the load;
a power supply, including a regulator circuit having a first resistor, for providing a DC voltage to said measurement circuit, said DC voltage being dependent on the impedance of said first resistor, and
means for calibrating the registration of said meter including means in said measurement circuit for relating the registration of said meter to said DC voltage, and further including means for readily removably electrically connecting said first resistor in said regulator circuit.

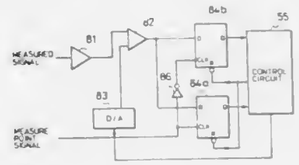
4,843,307

VOLTAGE DIFFERENCE MEASURING EQUIPMENT

Hiroshi Ichijyo, Kawasaki, Japan, assignor to Kabushiki Kaisha Kenwood, Kanagawa, Japan

Filed Apr. 21, 1987, Ser. No. 40,824
Claims priority, application Japan, Apr. 24, 1986, 61-93425; May 7, 1986, 61-103155; Jan. 10, 1987, 62-2615; Jan. 24, 1987, 62-013350
Int. Cl.[4] G01R *19/16, 13/20*
U.S. Cl. 324—103 P **2 Claims**

1. A measuring circuit of measuring a value of an analog input signal at a selected position, the circuit comprising:
means for receiving a periodic analog input signal for a predetermined period;
means for generating a digital signal which advances by a predetermined digital value step for every said predetermined period;
means for converting said digital signal into an analog reference signal for every said predetermined period;
means for comparing the input analog signal with the converted analog reference signal;
means for generating a timing acquisition signal in a preselected position for every said predetermined period; and



means responsive to said timing acquisition signal for registering the value of the digital signal as a measuring value when the comparison in said comparing means has a specific result.

4,843,308

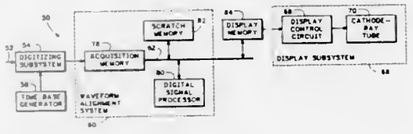
ELECTRONIC INTEGRATOR CIRCUITRY FOR PIEZOELECTRIC AND OTHER SENSORS

John M. Frame, Pullman, Wash., assignor to Washington State University Research Foundation, Inc., Pullman, Wash.

Continuation-in-part of Ser. No. 866,875, May 23, 1986, Pat. No. 4,703,217. This application Oct. 26, 1987, Ser. No. 113,815
Int. Cl.[4] G01R *19/26;* **G01B** *7/18;* **H01L** *41/08*
U.S. Cl. 324—120 **15 Claims**

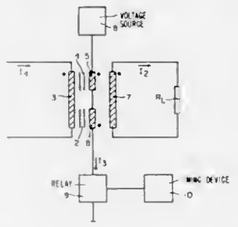
1. A digital sensor circuit for indicating the real time condition of a sensor which produces a time variable current output which is indicative of a condition being sensed by the sensor, comprising:
means for converting time variable electrical current from the sensor into approximately proportional changes in voltage, to produce a time variable voltage signal;
means for producing an absolute value signal which is approximately proportional in value to an absolute value of said voltage signal;
means for detecting whether said voltage signal is positive or negative and electrical output means therefrom indicating whether said voltage signal is positive or negative;
means for producing a frequency variable signal having a frequency approximately proportional to the value of the absolute value signal; and
digital counter means for counting cycles of the frequency variable signal; said counter means counting positively for cycles occurring during periods when the electrical current from the sensor flows in a first direction; said counter means counting negatively when the electrical current from the sensor flows in a second direction opposite to said first direction; the digital counter means registering an accumulated cycle count which is the integral of the electrical current from the sensor with time to thus indicate the real time condition of the sensor.

4,843,309
WAVEFORM TIMING ALIGNMENT SYSTEM FOR DIGITAL OSCILLOSCOPES
Arif Kareem; George S. Walker, and Daniel G. Knierim, all of Beaverton, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.
Filed Mar. 21, 1988, Ser. No. 171,060
Int. Cl.[4] G01R *25/00, 25/04*
U.S. Cl. 324—121 R **12 Claims**



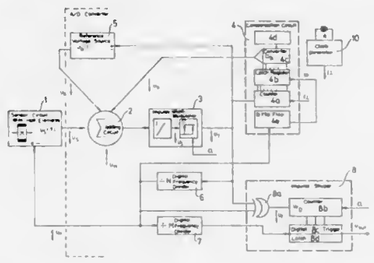
10. A digital oscilloscope, comprising:
a digitizing subsystem that acquires first and second data records that represent respective first and second similar waveforms of a periodic signal;
a display subsystem that forms in accordance with the first and second data records an image that represents the periodic signal; and misalignment
waveform alignment means for detecting a timing misalignment between the first and second waveforms and for aligning the first and second waveforms whenever such timing misalignment is detected including means for generating an autocorrelation value in connection with the first waveform; for generating a first cross-correlation value in connection with the first and second waveforms; and for comparing the autocorrelation value and the first cross-correlation value to determine whether they differ by more than a preselected tolerance, thereby to determine whether there is a timing misalignment between the first and second waveforms.

4,843,310
ELECTRICITY METER WITH ARRANGEMENT FOR MONITORING CORE SATURATION INCIDENTS
Richard Friedl, Braunschweig, Fed. Rep. of Germany, assignor to LGZ Landis & GYR ZUG AG, Zug, Switzerland
Filed May 9, 1986, Ser. No. 861,600
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1985, 3521546
Int. Cl.[4] G01R *1/20; G08B 21/00; H02H 7/045*
U.S. Cl. 324—127 **9 Claims**



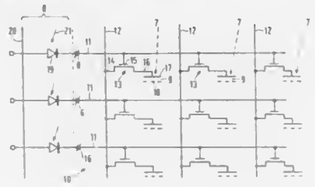
1. In an electricity meter, an arrangement comprising:
at least one current transformer including at least one magnetic core, a first winding surrounding said magnetic core and operable for carrying a primary current to be measured, and a second winding surrounding said magnetic core and operable for carrying a secondary current; and
means for determining measurement errors due to saturation of said magnetic core including detecting means operable for indicating each occurrence of saturation of said magnetic core and accumulating means for accumulating the durations of the occurrences of saturation of said magnetic core.

4,843,311
WATTMETER COMPRISING A HALL SENSOR AND AN A/D CONVERTER
Miro Rozman, Bled, and Silvo Zlebir, Cerklje, both of Yugoslavia, assignors to Iskra-Sozd Elektrokovinske Industrije n .sol.o., Ljubljana, Yugoslavia
Filed Jul. 15, 1987, Ser. No. 73,477
Claims priority, application Yugoslavia, Jul. 15, 1986, 1257/86
Int. Cl.[4] G01R *21/08, 1/02*
U.S. Cl. 324—142 **13 Claims**



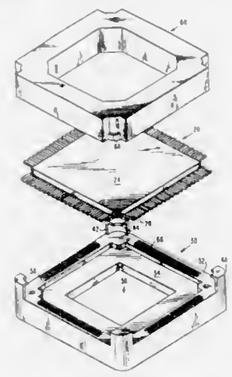
1. Wattmeter including a Hall sensor circuit and an A/D converter, said Hall sensor including a plurality of Hall elements for producing a plurality of sensor voltages, said A/D converter comprising an impulse-width delta modulator, an impulse shaper, first and second frequency dividers with division ratios N and M, respectively, said frequency dividers connected to said impulse shaper, a compensation circuit for generating a compensation voltage, an adding circuit which receives said plurality of sensor voltages, a reference voltage, and said compensation voltage, a source for producing said reference voltage, said adding circuit producing an output signal fed to the input of said modulator, and a clock generator for generating clock pulse and first and second output signals,
said modulator generating an output signal fed to the input of a counter forming part of the compensation circuit and also fed to the input of the impulse shaper,
an inverted output of the modulator being connected to the input of the first frequency divider, the inverted output and a non-inverted output of the modulator being connected to first and second sets, respectively, of control terminals of adding circuit control switches in the adding circuit,
and the sensor circuit includes a plurality of sensor switches being interconnected to a bridge with the sensor elements in a diagonal between two output terminals of each of said sensor elements, feeding terminals of said sensor elements being parallel-connected and a mains phase terminal being connected to a first input terminal of the bridge through a resistor, whereas a mains zero terminal of said sensor circuit being mass connected.

4,843,312
TEST METHOD FOR LCD ELEMENTS
Robert A. Hartman, and Hans P. Peloschek, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 29, 1988, Ser. No. 174,564
Claims priority, application Netherlands, Apr. 21, 1987, 8700933
Int. Cl.[4] G01R *31/26*
U.S. Cl. 324—158 R **14 Claims**



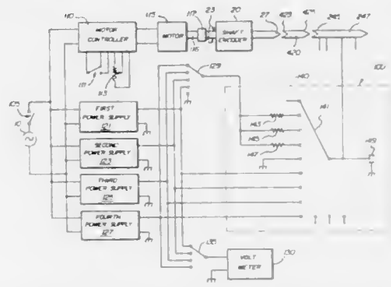
1. A method of testing display devices during construction, said display devices including portions of at least one display element, at least one drive line, and at least one switching element connected between said portions of said display elements and said drive lines, said method comprising the steps of
scanning at least one of said switching elements or said portions of said display elements by an energy beam, and
detecting presence or flow of charges on said at least one of said switching elements or portions of said display elements to determine operation of said switching elements and portions of said display elements.

4,843,313
INTEGRATED CIRCUIT PACKAGE CARRIER AND TEST DEVICE
R. Thomas Walton, Torrance, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Dec. 26, 1984, Ser. No. 686,324
Int. Cl.[4] G01R *31/02; H01R 9/09*
U.S. Cl. 324—158 F **5 Claims**



1. A carrier for an integrated circuit package having protruding leads, said carrier comprising:
a base suitable for receiving the integrated circuit package such that the leads extend over base support surfaces having openings therethrough;
a cover having surfaces in alignment with said base support surfaces;
elastomeric connector material disposed in said openings in said base support surfaces and extending therethrough; and
means for maintaining pressure across said cover and base;
whereby the leads of an integrated circuit package suitably disposed between said base and said cover are secured in position by the elastomeric connector material which forms itself partially around each of the leads in response to the pressure across said base and said cover and the elastomeric material protruding from the bottom of said base is adapted for use in electrical testing of the integrated circuit.

4,843,314
TESTING UNIT FOR ROTARY SHAFT ENCODERS
Craig Barnaby, 25346 Schoolcraft, Redford, Mich. 48239-2627
Filed Apr. 25, 1988, Ser. No. 185,882
Int. Cl.[4] G01R *31/02; H03K 13/02*
U.S. Cl. 324—158 R **20 Claims**



1. A testing apparatus for testing rotary shaft encoders having a rotatable shaft mounted within an encoder body and a plurality of connection wires comprising:
a mounting means adapted to hold the encoder body of a rotary shaft encoder in a predetermined location and orientation;
a shaft rotation means for generating rotary torque in an operator selected direction at an operator selected speed;
a shaft coupling means adapted to couple the rotatable shaft of a rotary shaft encoder whose encoder body is held in said predetermined location and orientation by said mounting means and connected to said shaft rotation means for transmitting said rotary torque to the rotatable shaft of the rotary shaft encoder;
a multiple wire connector adapted for connection to the plurality of connection wires of the rotary shaft encoder;
a plurality of operator selectable load switch means, each connected to a corresponding wire of said multiple wire connector, for operator selected connection one of a predetermined set of voltages and loads to said corresponding wire of said multiple wire connector; and
a plurality of output terminals, each connected to a corresponding wire of said multiple wire connector, for permitting connection to the corresponding wire of said multiple wire connector, thereby permitting the signal on the corresponding connection wire of the rotary shaft encoder to be monitored.

4,843,315

CONTACT PROBE ARRANGEMENT FOR ELECTRICALLY CONNECTING A TEST SYSTEM TO THE CONTACT PADS OF A DEVICE TO BE TESTED

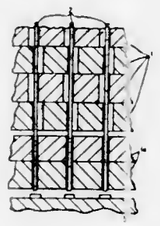
Thomas Bayer, Sindelfingen; Michael Elsasser, Herrenberg; Johann Greschner, Pliezhausen; Heinrich Schmid, Tiefenbronn; Roland Stiller, Nufringen; Olaf Wolter, Schonaich, and Jürgen Wittlinger, Böblingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 14, 1988, Ser. No. 167,676

Claims priority, application European Pat. Off., Mar. 27, 1987, 87104577.9

Int. Cl.[4] G01R *1/073, 1/067*

U.S. Cl. 324—158 P 10 Claims



1. Contact probe arrangement for electrically connecting a test system with contact pads on a device to be tested, the contact probes, for ensuring a low contact resistance, being pressed vertically onto the contact pads and buckling laterally in order to adapt to height differences of the contact pads caused by irregularities of the surface of the device to be tested, comprising, in combination:

a plurality of contact probes;

a plurality of stacked first perforated plates with said probes passing therethrough; the perforations of said first perforated plates are shaped and positioned to assure that one of said contact probes is positioned vertically in each perforation;

a plurality of stacked second perforated plates (1) with the perforation therethrough larger than the cross section of said probes and larger than the perforation in said first perforated plate with alternate second perforated plates being offset with respect to adjacent second perforated plates in such a manner that each said contact probe is maintained in a vertical attitude by part of the lower edge of the upper of two adjacent second perforated plates and part of the upper edge of the lower of two adjacent second perforated plates whereby application of axial pressure on said probes will cause said probes to buckle within the perforations in said second perforated plates at points between the surfaces of said second perforated plates.

4,843,316

NONDESTRUCTIVE M-H HYSTERESIS TESTERS FOR MAGNETIC DISCS FOR COMPUTER DISC DRIVES

Victor W. Hesterman, Los Altos Hills, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 879,670, Jun. 27, 1986, abandoned.

This application Jan. 13, 1988, Ser. No. 144,690

Int. Cl.[4] G01R *33/14, 35/00;* G01N *27/72*

U.S. Cl. 324—210 5 Claims

1. An apparatus for measuring the M-H magnetic hysteresis loop characteristics of a magnetic data storage disc under test including a substrate and a magnetic film layer mounted to the substrate, where M is a magnetization characteristic of the magnetic film and H is a magnetic field intensity characteristic of a magnetic field inducing the magnetization M of the magnetic film, the apparatus comprising

a. a generator means,

i. for generating and applying a magnetic field having a known intensity H to a magnetic disc to be characterized,

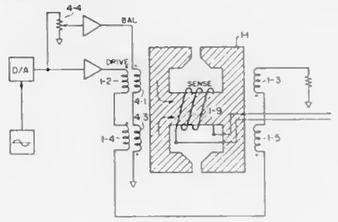
ii. positioned close enough to the disc so that the generated magnetic field H induces a desired magnetization M in the disc, the magnetization including

(1) a desired component induced in the magnetic film, and

(2) an undesired component in the form of a plurality of eddy currents induced in the substrate, the eddy currents in turn inducing undesirable eddy magnetic fields that interefere with a correct determination of M;

b. a sensor means

i. for determining the magnetization M of the magnetic film alone,



ii. including a cancelling means for removing the effects of the eddy magnetic fields,

iii. positioned to magnetically interact with the magnetic field associated with the magnetization of the magnetic film, and

iv. magnetically isolated from interacting with the magnetic field produced by the generator means;

c. a regulating means, coupled for varying the applied magnetic field intensity H generated by the generator means, the generator means, the sensor means and the regulator means thereby cooperating to determine the M-H data points in sufficient number to define the hysteresis loop associated with the particular magnetic disc under test, thereby characterizing the M and the H characteristics of the disc.

4,843,317

METHOD AND APPARATUS FOR MEASURING CASING WALL THICKNESS USING A FLUX GENERATING COIL WITH RADIAL SENSING COILS AND FLUX LEAKAGE SENSING COILS

Edward G. Dew, Houston, Tex., assignor to Conoco Inc., Ponca City, Okla.

Filed Oct. 18, 1988, Ser. No. 259,953

Int. Cl.[4] G01B *7/10;* G01R *33/12;* G01N *27/72, 27/82*

U.S. Cl. 324—221 11 Claims

1. A casing wall inspection device controlled at an earth surface position for continual testing of well casing, comprising:

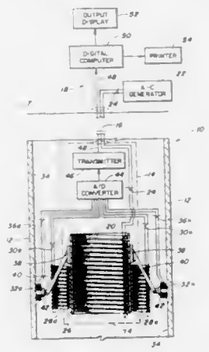
a main coil axially aligned with the casing axis;

means for energizing said main coil with an alternating current voltage to produce a primary flux distribution enveloping the casing adjacent said main coil;

a plurality of radial sensing coils disposed in equi-spaced circumfery with each radial sensing coil placed radially outward from said main coil and providing a radial output;

a plurality of flux leakage sensing coils supported in equal spacing in surround of said radial sensing coils and springurged against said casing wall with each providing a flux leakage output;

transmitter means receiving input of said plural radial outputs and plural flux leakage outputs and transmitting a signal containing the radial and flux leakage outputs; and



control means at said earth surface position for receiving said signal for processing to derive a continual evaluation of casing wall thickness.

4,843,318

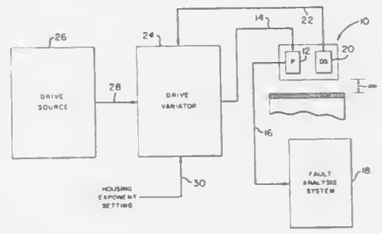
DISTANCE COMPENSATION IN MAGNETIC PROBE TESTING SYSTEMS WHEREIN OBJECT TO PROBE SPACING IS EMPLOYED AS AN EXPONENT IN EXCITINGS PROBES OR PROCESSING PROBE OUTPUTS

Stanley Greenblatt, Bronx; Richard H. Colman, New Rochelle, and Edward D. Spierer, Belle Harbor, all of N.Y., assignors to Magnetic Analysis Corporation, Mount Vernon, N.Y.

Filed Jul. 15, 1987, Ser. No. 73,703

Int. Cl.[4] G01N *27/72, 27/82;* G01R *33/00*

U.S. Cl. 324—225 19 Claims



1. A system for nondestructive object testing comprising:

(a) magnetic probe means responsive to an excitation signal for generating a magnetic field and thereby inducing eddy-currents in said object, said probe means further providing an output signal indicative of the presence of a flaw in said object;

(b) distance sensing means for generating an output signal indicative of the spacing of said probe means from said object; and

(c) circuit means for receiving said distance sensing means output signal and responsive thereto to supply said excitation signal to said probe means, said circuit means employing the spacing indication in said sensing means output signal as an exponent in generating said excitation signal for controlling the amplitude of said excitation signal.

4,843,319

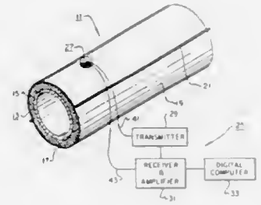
TRANSIENT ELECTROMAGNETIC METHOD FOR DETECTING CORROSION ON CONDUCTIVE CONTAINERS HAVING VARIATIONS IN JACKET THICKNESS

Pedro F. Lara, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 17, 1987, Ser. No. 134,224

Int. Cl.[4] G01N *27/82;* G01R *33/12;* G01B *7/10*

U.S. Cl. 324—240 10 Claims



1. A method of detecting corrosion in walls of container means, said walls being electrically conductive and having near surface and far surfaces, comprising the steps of:

a. placing transmitting antenna means and receiving antenna means in proximity of the near surface of that portion of the container means wall which is to be investigated for corrosion;

b. energizing the transmitting antenna means with current;

c. abruptly de-energizing the transmitting antenna means so as to induce current into the container means wall portion;

d. detecting the presence of and the decay of said induced current in said container means wall portion with the receiving antenna means;

e. creating a record of the decay of said induced current in said container means wall portion over a period of time, said record having intermediate and late time ranges, wherein said record of said induced current is influenced by variations in distance between said transmitting antenna means and said receiving antenna means and said container means wall caused by moving said transmitting antenna means and said receiving antenna means from one location to another location on said container means wall;

f. determining from the record with respect to time the derivative of the decay of said induced current, said derivative having intermediate and late portions corresponding to the intermediate and late time ranges of the record;

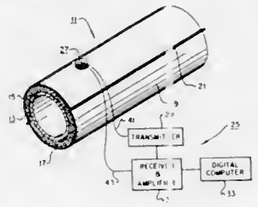
g. examining the derivative of the decay of the record and comparing the intermediate and late time portions of the derivative to intermediate and late time portions of the derivative to intermediate and late time portions of a derivative of a reference record to determine the wall thickness of said investigated container means wall portion, said reference record obtained from a reference container means with known wall thickness, wherein said wall thickness determination of said investigated container means wall portion is unaffected by said variations in distance and wherein the presence or absence of corrosion on said investigated container means wall portion can be inferred.

4,843,320

TRANSIENT ELECTROMAGNETIC METHOD FOR DETECTING CORROSION ON CONDUCTIVE CONTAINERS

Brian R. Spies, McKinney, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 17, 1987, Ser. No. 134,368
Int. Cl.[4] G01N *27/82*; G01R *33/12*; G01B *7/10*
U.S. Cl. 324—240 29 Claims



1. A method of detecting corrosion on walls of container means, said walls being electrically conductive and having near surfaces and far surfaces, comprising the steps of:
a. placing transmitting antenna means and receiving antenna means in proximity with the near surface of that portion of the container means wall which is to be investigated for corrosion;
b. energizing the transmitting antenna means with current;
c. abruptly de-energizing the transmitting antenna means so as to induce current into the container means wall portion;
d. detecting the presence of and the decay of said induced current in said container means wall portion with the receiving antenna means;
e. creating a record of the decay with said induced current in said container means wall portion over a period of time;
f. examining said record to determine the decay of said induced current and comparing the decay of the induced current to the decays of induced current of reference records, said reference records being obtained from reference container means with known wall thicknesses, wherein the presence or absence of corrosion on the container means wall portion can be inferred from said indicated thickness.

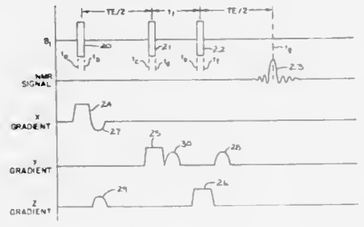
4,843,321

METHOD FOR VOLUME LOCALIZED SPECTRAL EDITING OF NMR SIGNALS PRODUCED BY METABOLITES CONTAINING COUPLED SPINS

Christopher H. Sotak, Alameda, Calif., assignor to General Electric Company, Milwaukee, Wis.

Filed Apr. 15, 1988, Ser. No. 181,956
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 5 Claims

1. A method for producing an NMR signal which indicates the in vivo proton spectra of metabolites, the steps comprising:
(a) applying a polarizing magnetic field to the region of interest;
(b) applying a first RF excitation field pulse in the presence of a magnetic field gradient to produce transverse magnetization in the region of interest
(c) applying a second RF excitation field pulse in the presence of a magnetic field gradient to produce longitudinal magnetization in the region of interest at a time period (TE/2) after the first pulse, which time period (TE/2) has a value which is a function of the spin-spin coupling constant (j) of the metabolite molecule;
(d) applying a third RF excitation field pulse in the presence of a magnetic field gradient to restore transverse magnetization in the region of interest at a time period (t_1) after the second pulse, which time period (t_1) has a value which is a function of the zero quantum modulation frequency (ZQMF) of the metabolite molecule;
(e) acquiring the echo NMR signal which is produced at a time period (TE/2) after the third pulse;



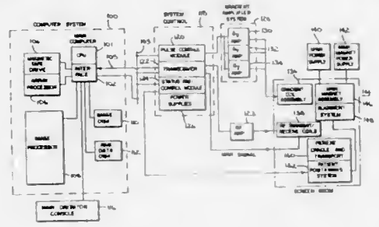
(f) repeating steps (a) through (e) with a different value for the second time period (t_1); and
(g) producing a difference signal by subtracting one of the acquired echo NMR signals from the other acquired echo NMR signal.

4,843,322

METHOD FOR PRODUCING MULTI-SLICE NMR IMAGES

Gary H. Glover, Delafield, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Aug. 15, 1988, Ser. No. 234,721
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—309 2 Claims



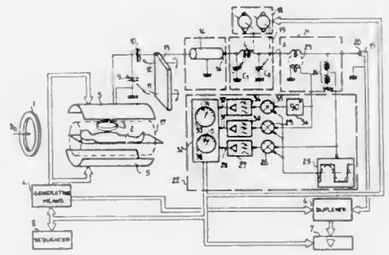
1. In an NMR system for producing images by Fourier transformation of an NMR data set acquired from a set of NMR pulse sequences in which a phase encoding magnetic field gradient is stepped through a corresponding set of discrete values, the improved method comprising:
applying a composite RF excitation pulse during each NMR pulse sequence which contains a plurality of pulse envelope terms multiplied by a sequence number dependent phase factor, and which excites spins in a plurality of slices which are selected by the frequency of a respective one of said plurality of pulse envelope terms in the composite RF excitation pulse;
performing a Fourier transform on the NMR data set which is acquired by the set of NMR pulse sequences to produce an image array; and
separating the slice imgges contained in the image array to produce a separate image array for each of said plurality of slices.

4,843,323

DEVICE AND METHOD FOR ADJUSTING A RADIOFREQUENCY ANTENNA OF A NUCLEAR MAGNETIC RESONANCE APPARATUS

Robert Encellaz, Beynes, and Yong C. H. Ng Tong, Pantin, both of France, assignors to Thomson-CGR, Paris, France

Continuation of Ser. No. 935,391, Nov. 26, 1986, abandoned.
This application Apr. 8, 1988, Ser. No. 180,688
Claims priority, application France, Nov. 29, 1985, 85 17722
Int. Cl.[4] G01N *24/02*
U.S. Cl. 324—313 5 Claims



1. A device for adjusting a nuclear magnetic resonance apparatus having an antenna comprising:
a first length of high frequency line connected to said apparatus's emissive/receptive means;
an antenna tuning circuit connected to said first length of high frequency line for tuning said antenna;
a sensor interposed between said apparatus's emissive/receptive means and said tuning circuit for measuring the amount of tuning;
measuring means coupled to said sensor for measuring the real part of admittance by multiplying the antenna signal by a square signal synchronous with the antenna signal and for measuring the phase shift between the current and voltage of the antenna signal; and
a second length of high frequency line coupled to said tuning circuit on one end and said antenna at the other end.

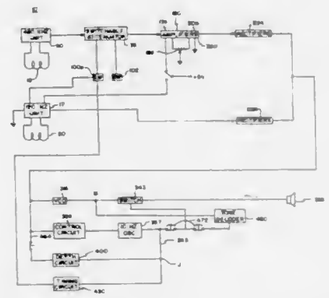
4,843,324

APPARATUS FOR DETERMINING THE LOCATION AND DISTANCE TO A CONCEALED CONDUCTIVE STRUCTURE

Thomas G. Humphreys, Jr.; George G. Plosser, and Michael D. Ryan, Jr., all of Birmingham, Ala., assignors to R. Donald Plosser, Birmingham, Ala.

Continuation-in-part of Ser. No. 806,545, Dec. 9, 1985, abandoned. This application Apr. 14, 1988, Ser. No. 181,442
Int. Cl.[4] G01V *3/08*
U.S. Cl. 324—326 23 Claims

1. A system for locating a concealed conductive structure comprising:
means for impressing a periodic electrical signal on a said concealed, conductive structure from which said signal is reradiated;
sensing means, movable from one position to another and at different distances from a surface of concealment of a said concealed structure, for sensing said periodic signal and providing an output signal which varies with the sensed amplitude of said periodic signal;
first signal means having an input and output, and said input being responsive to said output signal of said sensing means and including level changing means for selectively effecting (a) one factor of change in level between said input and output and providing a first signal output, or (b) a selected multiple of said one factor of change between said input and output and providing a second signal output;
detection means responsive to said first and second signal outputs and including:
(a) reference means responsive to said first signal output for providing a first, reference, signal under conditions of said sensing means being positioned adjacent said surface of concealment;
(b) second signal means responsive to a said second signal output for providing a second signal under conditions of said level changing means effecting a said selected multiple of said one factor of change, and
(c) comparison means responsive to said first and second signals for providing a selected output signal state when



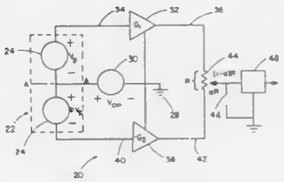
there is a selected relation between said first and second signals;
whereby, with said sensing means being moved away from said surface of concealment, a position is reached wherein said second signal bears a selected relation with said first signal, and the then distance between said sensing means and said surface is a distinctive factor of the distance of said structure from said surface, and thus the latter distance is calculatable; and
indicating means coupled to said comparison means and responsive to said selected output signal state for indicating the occurrence of said selected relation.

4,843,325

COMPLEMENTARY SENSING DEVICE FOR MINIMIZING THE EFFECTS OF COMMON MODE VOLTAGES

Charles B. McKee, Jr., Fort Collins, Colo., assignor to In-Situ, Inc., Laramie, Wyo.

Filed Jan. 29, 1988, Ser. No. 150,017
Int. Cl.[4] G01N *27/02*
U.S. Cl. 324—439 24 Claims



1. A measurement apparatus for reducing common mode effects, comprising:
first means and second means symmetrically located relative to a sample voltage of fluid for sensing a parameter associated with the sample volume, said first and second means having respective first and second impedances;
third means communicating with said first means for generating a first common mode signal;

fourth means communicating with said second means for generating a second common mode signal; and

fifth means for combining said first and second common mode signals for reducing common mode effects.

4,843,326

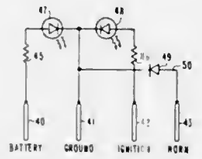
ELECTRICAL TESTING DEVICE FOR THE POWER INPUT TO AUTOMOBILE TELEPHONE INSTALLATIONS

Robert H. Smythe, 918 Maplebrook Dr., Noblesville, Ind. 46060

Filed Aug. 17, 1987, Ser. No. 86,306

Int. Cl.[4] G01R 31/02

U.S. Cl. 324—503 **5 Claims**



1. A testing device for testing the input to an automobile telephone installation at the junction between the installation and terminals electrically connected to the battery, ignition, ground and horn circuits of the automobile's electrical system, said testing device comprising:

a body adapted to mate with the junction;

electrical contact means, carried by said body, for making electrical contact with the terminals at the junction when said body is mated with the junction to indicate the condition of the battery, ignition, ground and horn circuits, said contact means including;

a first light source illuminated only when the battery and ground circuits are functioning;

a second light source illuminated only when the ignition and ground circuits are functioning, whereby neither said first nor second light sources is illuminated when the ground circuit is faulty;

battery, ignition, ground, and horn pins for contacting the terminals for the battery, ignition, ground and horn circuits of the automobile, respectively;

a first resistor connected between said battery pin and a first terminal of said first light source;

a ground wire connected between said ground pin and a second terminal of said first light source;

a second resistor connected between said ignition pin and a first terminal of said second light source;

a ground wire connected between said ignition pin and a second terminal of said second light source; and

second means to connect said horn pin to said ground pin, whereby the automobile horn sounds when said contact means is contacting the terminals at the junction, said second means including a diode between said horn pin and said ground pin oriented to allow current to flow only from said horn pin to said ground pin.

4,843,327

BRANCHED SENSOR SYSTEM

Heinrich Koppitsch, Menlo Park, and Francis C. Sparling, Sunnyvale, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Jun. 3, 1987, Ser. No. 57,459

Int. Cl.[4] G01R 31/08

U.S. Cl. 324—525 **16 Claims**

1. Apparatus suitable for use in detecting and obtaining information about an event, the apparatus comprising

(A) a power source;

(B) a voltage measuring device; and

(C) an elongate sensor cable comprising

(1) a trunk line cable which follows an elongate trunk path having a near end and a far end; and

(2) at least one branch line cable which extends from the trunk line cable at an intermediate point along the trunk path and follows an elongate branch path from the intermediate point to a distant point;

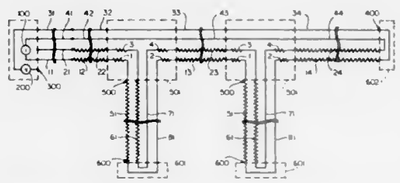
the trunk line cable comprising first, second, third and fourth elongate electrically conductive members which, at least in the absence of an event, are insulated from each other along the length of the trunk line cable;

the branch line cable comprising fifth, sixth, seventh and eighth elongate electrically conductive members which, in the absence of an event, are insulated from each other along the length of the branch line cable, the fifth and sixth members being such that there are locations along the branch line cable at which, upon occurrence of an event, the fifth and sixth members become electrically connected;

the first member being electrically connected (a) at the near end of the trunk path, to the power source and to the voltage-measuring device, and (b) at the far end of the trunk path, to the third member;

the third member being electrically connected (a) at the near end of the trunk path, to the voltage-measuring device, and (b) at the far end of the trunk path, to the first member;

the fourth member being electrically connected (a) at the near end of the trunk path, to the power source, and (b) at the far end of the trunk path, to the second member;



the first and second members being discontinuous at the intermediate point so that each has an incoming end nearer the near end of the trunk path and an outgoing end nearer the far end of the trunk path;

each of the fifth, sixth, seventh and eighth members being connected at the intermediate point to one of the incoming and outgoing ends of the first and second members, the fifth member being connected at the distant point of the branch line cable to the seventh or eighth member, and the sixth member being connected at the distant point of the branch line cable to the eighth member if the fifth member is connected to the seventh member and to the seventh member if the fifth member is connected to the eighth member, so that the incoming and outgoing ends of the first member are electrically connected to each other through the branch line, the incoming and outgoing ends of the second member are electrically connected to each other through the branch line cable, and, in the absence of an event, the first and second members are insulated from each other along the length of the sensor cable;

the second member and the members of the branch line cable connected between the incoming and outgoing ends of the second member together forming a source member;

the first member and the members of the branch line cable connected between the incoming and outgoing ends of the first member together forming a locating member which is insulated from the source member along the length of the sensor cable in the absence of an event but which, upon occurrence of an event, becomes electrically connected to the source member at a connection point, which has an impedance Z_{total} between the near end and the far end of the trunk path, and whose impedance between the near end of the trunk path and any point on the locating member to which the source member can be connected upon occurrence of an event is characteristic of the event;

the apparatus being such that, when an event causes the locating member and the source member to become electrically connected to each other at a connection point, the apparatus comprises a test circuit and a reference circuit, the test circuit being one in which a current of known size flows and which comprises

(a) that part of the locating member which lies between the near end of the trunk path and the connection point,

(b) the connection,

(c) that part of the source member which lies between the connection point and the far end of the trunk path, said part of the source member having an impedance which is substantially equal to the difference between T_{total} and the impedance of said part (a),

(d) the fourth member of the trunk cable, and

(e) the power source,

and the reference circuit being one which comprises

(a) the locating member,

(b) the third member, and

(c) the voltage-measuring device;

whereby the voltage measured by the voltage-measuring device can be used to determine the location of the connection point.

4,843,328

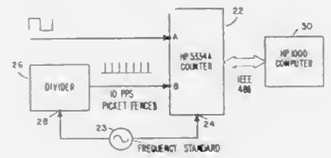
APPARATUS FOR USING A TIME INTERVAL COUNTER TO MEASURE FREQUENCY STABILITY

Charles A. Greenhall, South Pasadena, Calif., assignor to The United States of America as represented by the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 21, 1988, Ser. No. 184,235

Int. Cl.[4] G01R 23/02

U.S. Cl. 324—78 Z **3 Claims**



1. Apparatus for measuring the relative stability of two signals comprising means for mixing said two signals down to a beat note sine wave, and for producing a beat note square wave whose upcrossings are the same as said beat frequency sine wave; a source of reference frequency; a clock divider; an interval counter; means for supplying said reference frequency to said clock divider and interval counter to synchronize them and to generate a picket fence for providing a time reference grid of period shorter than the period of said beat note; means for making a preliminary measurement in said interval counter between successive upcrossings of said beat note square wave for providing the approximate time interval therebetween as a reference period; means for supplying said beat note square wave and said picket fence to said interval counter to provide an output consisting of the time difference between the upcrossing of each beat note square wave cycle and the next picket fence pulse, such that said counter is ready for each upcrossing and dead time is avoided; and computer means containing an algorithm for calculatin the exact times of said beat note upcrossings from the output of said counter.

4,843,329

METHOD FOR CONTACTLESS TESTING FOR ELECTRICAL OPENS AND SHORT CIRCUITS IN CONDUCTING PATHS IN A SUBSTRATE

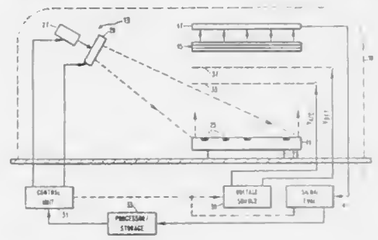
Johannes G. Beha, Waedenswil; Armin U. Blacha, Rueschlikon; Rolf Clanberg, Gattikon, and Hugo K. Seitz, Wollerau, all of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 9, 1987, Ser. No. 107,433

Claims priority, application European Pat. Off., Oct. 23, 1986, 84114711.4

Int. Cl.[4] G01R 15/12

U.S. Cl. 324—73 PC **18 Claims**



1. A method of testing the integrity of conducting paths within or on a circuit substrate consisting of nonconducting material, each said conducting path being connected to at least two uncovered pads on any one face of said substrate, comprising:

(a) generating charges in at least one selected pad on one face of said substrate by focusing an optical beam onto said selected pad, the energy of said beam being sufficient to cause photoelectron emission from each selected pad but insufficient to cause photoelectron emission from said nonconducting substrate material, said photoelectron emission inducing a specific voltage level in each selected pad and in each nonselected pad which is electrically connected to said selected pad;

(b) thereafter, causing voltage-dependent photoelectron emission from pads on any one face of said substrate by irradiating said face with a flooding optical beam, of sufficient energy to cause said voltage-dependent photoelectron emission, the magnitude of said voltage-dependent photoelectron emission from each pad depends on the voltage thereon; and

(c) detecting said voltage dependent photoelectron emission to distinguish pads in electrical connection with said at least one selected pad.

4,843,330

ELECTRON BEAM CONTACTLESS TESTING SYSTEM WITH GRID BIAS SWITCHING

Steven D. Golladay, Hopewell Junction; Fritz J. Hohn, Somers, both of N.Y., and Hans C. Pfeiffer, Ridgefield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1986, Ser. No. 925,764

Int. Cl.[4] G01R 31/00, 31/02

U.S. Cl. 324—158 R **13 Claims**

1. A system for contactless testing of electrical conductors disposed in and terminating on at least one surface of an insulating material specimen, comprising:

(a) a first electron beam generator for irradiating said one surface of said specimen at a first beam potential;

(b) said first electron beam generator comprising a flood beam generator,

(c) a scanning electron beam generator for irradiating selected portions of said one surface of said specimen at a second beam potential;

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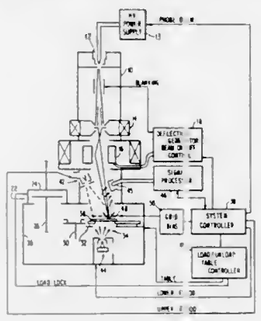
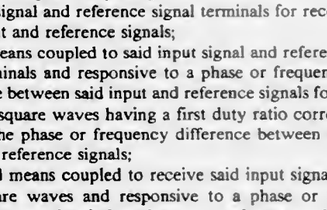
(d) a conductive grid mounted above said one surface of said specimen substantially parallel thereto and closedly spaced to said one surface;
(e) bias means connected to said grid for
(1) applying a negative, first grid potential thereto while said electrical conductors are irradiated by an electron beam from said first electron beam generator at said first beam potential, and
(2) then applying a second potential to said grid while said selected electrical conductors are irradiated by an electron beam from said scanning electron beam generator at said second potential;
(f) detector means for sensing secondary electrons emitted from said one surface of said specimen;
(g) said first electron beam generator comprises a flood beam generator; and
(h) said first beam potential being less than the second cross-over potential of the material forming said electrical conductors and greater than said second beam potential.



4. A method for the contactless testing of electrical conductors disposed in and terminating on at least one surface of an insulating material specimen, comprising:
(a) irradiating said one surface of said specimen with an electron beam while applying a positive bias potential to an entire conductive grid comprised of a plurality of conductive wires disposed above said one surface substantially parallel thereto and closely spaced to said one surface, whereby a uniform potential is applied to said one surface of said specimen;
(b) irradiating selected portions of said one surface of said specimen with an electron beam at a first beam potential while said grid is biased at a negative potential;
(c) irradiating selected portions of said one surface of said specimen with an electron beam at a second beam potential while said grid is biased at a potential greater than or equal to zero volts; and
(d) detecting any change in potential of said electrical conductors irradiated by said electron beam at said second beam potential.

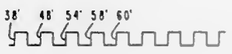
4,843,331
COHERENT DIGITAL SIGNAL BLANKING, BIPHASE MODULATION AND FREQUENCY DOUBLING CIRCUIT AND METHODOLOGY
Steve S. Yang, Chatsworth, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Aug. 28, 1987, Ser. No. 90,821
Int. Cl.[4] H03K *7/10, 19/00*
U.S. Cl. 328—20 **33 Claims**

1. A circuit for selectively blanking, biphase modulating and frequency doubling an object signal comprising:
digital circuit means for doubling the frequency of said object signal;
digital circuit means for generating a biphase modulated signal, said digital circuit means for generating said biphase modulated signal being coupled to said digital circuit means for doubling said object signal, wherein said object signal is doubled in frequency and biphase modulated;
digital circuit means for blanking a signal, said digital circuit means for blanking being coupled to said digital circuit



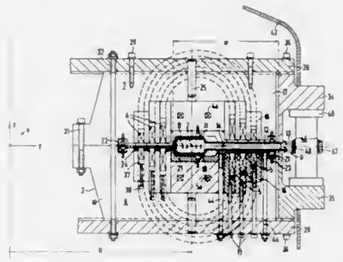
means for doubling and to said digital circuit means for generating said biphase modulated signal, wherein said frequency doubled biphase modulated signal is selectively blanked,
whereby a simple digital circuit is provided for selectively blanking, biphase modulating and frequency doubling said object signal.

4,843,332
WIDE RANGE DIGITAL PHASE/FREQUENCY DETECTOR
Steven P. Cok, 6310 NE. 192nd Ct., Seattle, Wash. 98155, and Robert J. Lewandowski, 673 NW. 178th Pl., Seattle, Wash. 98177
Continuation of Ser. No. 727,980, Apr. 29, 1985, abandoned. This application Aug. 17, 1987, Ser. No. 105,468
Int. Cl.[4] H03K *5/13, 5/22*
U.S. Cl. 328—133 **4 Claims**



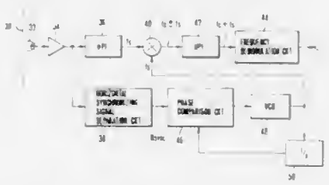
1. A digital phase/frequency detector circuit for detecting differences in phase or frequency between an input signal and a reference signal comprising:
input signal and reference signal terminals for receiving the input and reference signals;
first means coupled to said input signal and reference signal terminals and responsive to a phase or frequency difference between said input and reference signals for generating square waves having a first duty ratio corresponding to the phase or frequency difference between said input and reference signals;
second means coupled to receive said input signal and said square waves and responsive to a phase or frequency difference that is less than or equal to a predetermined difference for generating first output square waves having said first duty ratio; and
third means coupled to receive said input signal and said square waves and responsive to said phase or frequency difference that is greater than the predetermined difference for generating second output square waves having a duty ratio that is a sum of the first duty ratio and a second repetitive duty ratio that is repetitive with successive cycles of phase or frequency difference between said input and reference signals.

4,843,333
SYNCHROTRON RADIATION SOURCE HAVING ADJUSTABLE FIXED CURVED COIL WINDINGS
Helmut Marsing, Neunkirchen, and Andreas Jahnke, Forchheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany
Filed Jan. 19, 1988, Ser. No. 145,229
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1987, 3702388
Int. Cl.[4] H05H *13/04*
U.S. Cl. 328—235 **20 Claims**



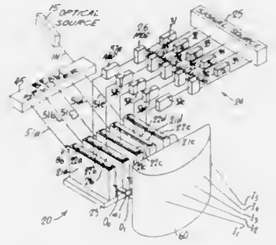
1. A synchrotron radiation source having a particle track with at least one curved section and comprising in said curved section:
(a) a beam guiding chamber, surrounding the particle track, said chamber having at least one exit opening for synchrotron radiation leading in an outward direction;
(b) a magnetic device having superconducting coil windings located on both sides of the particle track, said device having a peripheral outer rim; and
(c) a device for the mechanical fixing of the superconducting windings, including:
(i) at least one means for support located at the peripheral outer rim of the magnetic device and spaced further radially outward from said at least one exit opening for the synchrotron radiation, said at least one means for support supporting forces perpendicularly to the direction of the radiation; and
(ii) means for absorbing radiation located to shield said at least one means for support from said radiation.

4,843,334
FREQUENCY DEMODULATOR OPERABLE WITH LOW FREQUENCY MODULATION CARRIERS
Hisashi Ishikawa, and Katsuji Yoshimura, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 2, 1987, Ser. No. 127,658
Claims priority, application Japan, Dec. 9, 1986, 61-291519; Dec. 9, 1986, 61-291520
Int. Cl.[4] H03D *3/00*
U.S. Cl. 329—122 **12 Claims**



1. A frequency demodulating device comprising:
(a) an analog multiplying circuit for receiving a frequency modulated signal as one of its input signal;
(b) signal genrating means for generating another input signal of said analog multiplying circuit;
(c) a high-pass filter for receiving a signal produced from said analog multiplying circuit; and
(d) a frequency demodulation circuit for receiving a singla produced from said high-pass filter, said frequency demodulation circuit including a full-wave differentiation circuit which is arranged to receive the output signal of said high-pass filter.

4,843,335
ACOUSTOOPTIC MODULATION DEVICE CAPABLE OF AVOIDING IMPEDANCE MISMATCHING OVER A WIDE FREQUENCY BAND
Satoru Amano, Yamanashi, Japan, assignor to Hoya Corporation, Tokyo, Japan
Continuation of Ser. No. 59,001, Jun. 8, 1987, abandoned. This application Feb. 2, 1988, Ser. No. 151,445
Claims priority, application Japan, Jul. 28, 1983, 58-138458
Int. Cl.[4] G02F *1/33;* **G02B** *5/18, 27/10*
U.S. Cl. 332—751 **11 Claims**



1. An acoustooptic modulation device response to a single incident light beam for producting a predetermined number of outgoing modulated light beams subjected to acoustooptic modulation, said acoustooptic modulation device comprising:
beam splitting means for splitting said incident light beam into a plurality of split beams n in number;
a plurality of electric signal producing circuits, n in number, each being for producing an electric data signal;
a plurality of carrier signal producing circuits, n in number, each being for producing a carrier signal having a carrier frequency in a frequency band different from one another, the highest carrier frequency being less than twice the lowest carrier frequency;
a plurality of electrically modulating circuits, n in number, which are responsive to said electric data signals and said carrier signals for electrically modulating said carrier signals by said electric data signals to produce a plurality of modulated electric signals, n in number; and
a plurality of acoustooptic modulation elements, n in number, for individually carrying out acoustooptic modulation of said split light beams in response to said modulated electric signals to produce acoustooptically modulated light beams as said outgoing modulated light beams, respectively, said split light beams being incident onto said acoustooptic modulation elements at optimum Bragg angles determined by said carrier frequencies, respectively.

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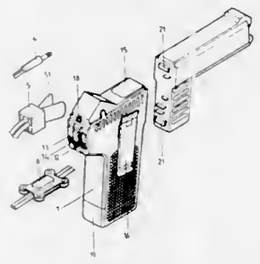
4,843,336

DETACHABLE MULTI-PURPOSE SELF-DEFENDING DEVICE

Shen-Shaon Kuo, 2FL., No. 157, Sec. 2 Hsin Hai Rd., Taipei, Taiwan

Filed Dec. 11, 1987, Ser. No. 131,661
Int. Cl.[4] G08B *19/00;* H01G *3/00;* F41F *27/00*
U.S. Cl. 340—521 2 Claims



1. A detachable multi-purpose self-defending device comprising:

a grip provided with a plurality of slots formed within an inner surface thereof,

a light switch for controlling a flashlight mounted on a top surface thereof, a strobe light switch for controlling a strobe light located beside the flashlight, and a pizo siren switch for controlling a pizo siren located on one side of said grip, a detachable hook member located on an opposing side of said grip for releasably mounting said self-defending device to a user's clothing

; and

a barrel having a front end,

two electrodes mounted on said front end of said barrel defining a pair of electrical discharging components, a switch connecting said electrodes with a high voltage oscillating circuit disposed in the barrel for passing a high voltage electrical charge to said electrodes and a plurality of protruding members adapted to engage with corresponding slots of the grip for releasably coupling said barrel to said grip, said grip including a room for receiving a battery electrically coupled to said high voltage oscillating circuit.

4,843,337

DRIVEWAY SAFETY LIGHT

Roy S. Conn, Jr., 1404 James St., Cedar Hill, Tex. 75104, and George Spector, 233 Broadway, 3815 Woolworth Building, New York, N.Y. 10007

Filed Nov. 2, 1987, Ser. No. 115,380
Int. Cl.[4] G08G *1/07*
U.S. Cl. 340—906 5 Claims

1. A driveway safety light system which comprises:

(a) a transmitter located within a first motor vehicle on a driveway, said transmitter activated by means within the first motor vehicle responsive to ignition operation;

(b) a lamp positioned at a corner end of the driveway; and

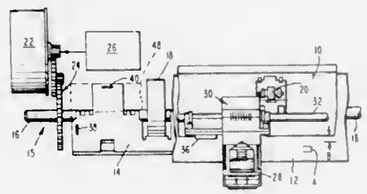
(c) a receiver located within said lamp, said receiver activated by a signal from said transmitter, to illuminate said lamp so as to indicate a warning to anyone driving in a second motor vehicle down a road, which communicates with the driveway, that the first motor vehicle is about to exit from the driveway.

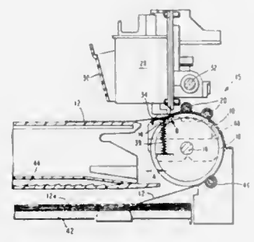
4,843,338

INK-SET PRINTHEAD-TO-PAPER REFERENCING SYSTEM

Steve O. Rasmussen; Larry A. Jackson, and David W. Pinkernell, all of Vancouver, Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 23, 1987, Ser. No. 113,035
Int. Cl.[4] G01D *15/18, 15/34;* B41J *11/20*
U.S. Cl. 346—140 R 25 Claims





1. An improved ink-jet printer including a print cartridge (**28**) having a printhead (**34**) thereon and secured in a carriage (**30**), said printer further including a carriage guide (**10**), a platen (**14**, for supporting a print medium (**12**) at least through a print zone (A), and means (**15**) for moving said print medium beneath said carriage guide and onto said platen, the improvement comprising:

(a) said carriage guide including means for creating a reverse bow (B) in said print medium, parallel to the direction of printing, which causes said print medium to lie substantially flat on said platen;

(b) said means for moving (**15**) and said carriage (**30**) having means (**36,18**) for referencing said carriage and said print medium to said carriage guide; and

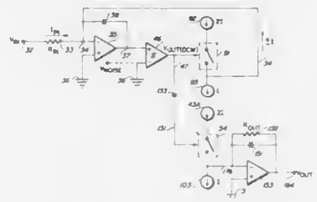
(c) said platen including means (**39**) for permitting said platen to move to accommodate varying thicknesses of said print medium.

4,843,339

ISOLATION AMPLIFIER INCLUDING PRECISION VOLTAGE-TO-DUTY-CYCLE CONVERTER AND LOW RIPPLE, HIGH BANDWIDTH CHARGE BALANCE DEMODULATOR

Rodney T. Burt, and Robert M. Stitt, II, both of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

Filed Oct. 28, 1987, Ser. No. 114,654
Int. Cl.[4] H03F *3/38*
U.S. Cl. 330—10 38 Claims



1. A modulator/demodulator circuit comprising in combination:

(a) a modulator circuit including

i. means for receiving an analog input current;

ii. first switching means for producing a first current that is switched between positive and negative values in response to a signal on a first conductor;

iii. first integrating circuit means for integrating an algebraic sum of the analog input current and the first current to produce an output voltage that increases or decreases in accordance with whether the algebraic sum of the input current and the first current is positive or negative;

means for producing a duty-cycle modulated signal on the first conductor having a first level if the output voltage exceeds a reference voltage sional that is synchronized with a noise signal;

(b) means for coupling the first conductor second conductor; and

(c) a demodulator including

i. second switching means for producing a second current that is switched between positive and negative levels in response to the duty cycle modulated signal on the second conductor;

ii. second integrating means for integrating the second current to produce an analog output signal that is accurately representative of the analog input current.

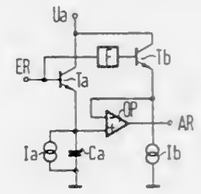
4,843,340

MONOLITHICALLY INTEGRABLE CONTROLLER CIRCUIT

Josef Fenk, Eching/Ottenburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 18, 1988, Ser. No. 220,614
Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723752
Int. Cl.[4] H03F *3/68*
U.S. Cl. 330—126 10 Claims

1. Monolithically integrable controller circuit, particularly for amplitude control in oscillator amplifiers, providing an actual-value detection by rectification, an input signal mean-value suppression with a differential amplifier, and a set-point setting, comprising first and second transistors each having an emitter contact, a collector contact and a base contact, an operational amplifier having two inputs and an output, a signal input of the controller circuit connected to the base contact of said first transistor, a low-pass filter connected to the base contact of said second transistor and to said signal input, the collector contacts of said first and second transistors being connected to a potential, the emitter contact of said first transistor being connected to one of said inputs of said operational amplifier, a first capacitor connected between the emitter contact of said first transistor and reference potential, a first contact current source connected between the emitter contact of said first transistor and reference potential, the emitter contact of said second transistor being connected to the other



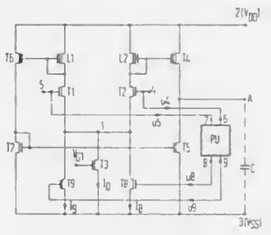
of said inputs of said operational amplifier, a second constant current source connected between the emitter contact of said second transistor and the reference potential, and an output of the controller connected to said output of said operational amplifier, whereby the ratio of the current of said second constant current source to the current of said first constant current source provides set-point setting.

4,843,341

DIFFERENTIAL AMPLIFIER HAVING CONTROLLABLE POWER CONSUMPTION

Bedrich J. Hosticka, Duisburg; Roland Klinke, Dortmund, and Hans-Joerg Pfleiderer, Zorneding, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 24, 1987, Ser. No. 137,606
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1987, 3701791
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—253 14 Claims



1. A differential amplifier having two parallel circuit branches lying between a first circuit node and a first supply voltage terminal, each of these parallel circuit branches containing a load element and a field effect transistor, having a further circuit branch lying between said first circuit node and a second supply voltage terminal, said further circuit branch having a constant current source whereby a quiescent current supplied by the latter is divided onto both parallel circuit branches, and having two, further field effect transistors serving as controllable current sources and connected parallel to the constant current source, these further field effect transistors supplying auxiliary currents amplifying the quiescent current, whereby gate terminals of the field effect transistors in the parallel circuit branches receive an input signal, and an output signal can be taken at the junctions between the load elements and the field effect transistors in the parallel circuit branches, comprising the field effect transistors in the parallel circuit branches and the further field effect transistors are of an

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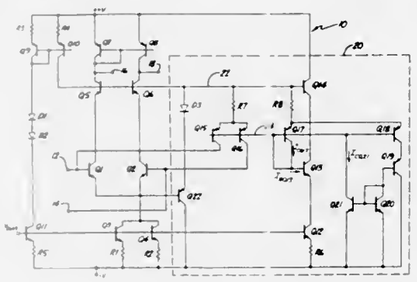
n-channel type; type; and a level-conve ting circuit having an input side connected to gate terminals of the field effect transistors in the parallel circuit branches, sai l level-converting circuit converting a d.c. component of an nput signal to a lower output level, an output side of said le vel-converting circuit wired to gate terminals of the further f eld effect transistors.

4,843,342

DIFFERENTIAL AMPLIFIER W TH INPUT BIAS CURRENT CANCELL ATION

Richard E. Hester, and Tuan V. Ngo, both of Eden Prairie, Minn., assignors to VTC Incorporate', Bloomington, Minn.

Filed Dec. 9, 1987, Ser. N . 130,526
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—257 **16 Claims**



1. An amplifier with input bias cu rent cancellation, the amplifier comprising:

first and second inputs;

first and second NPN transistors hav ng emitters connected together, and bases connected t the first and second inputs, respectively;

first and second PNP transistors h aving bases connected together, and having collectors co nnected to the bases of the first and second NPN transisto rs respectively;

a third NPN transistor having an em tter, a collector, and a base;

current source means connected to th e collectors of the first and second NPN transistors;

a third PNP transistor having a base an emitter, and a collector, the base and collector of th e third PNP transistor being connected together and co nnected to the bases of the first and second PNP transisto s and to the base of the third NPN transistor, the third PN P transistor being connected to the first and second P NP transistors so that collector currents of the first and second PNP transistors mirror collector current of the thi rd PNP transistor;

a fourth PNP transistor having an emitter, a base and a collector, the emitter being conne ted to an emitter of the third PNP transistor and the base being connected to the bases of each of the first, second and third PNP transistors; the fourth PNP transistor pr oviding a collector current that mirrors collector current s of the first and second PNP transistors; and

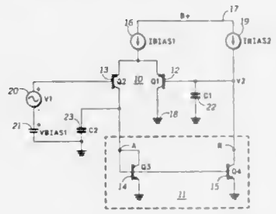
means connected to the collector an d the base of the fourth PNP transistor for providing a co rrection current to cancel effects of base currents of the first, second, third and fourth PNP transistors so that the collector current of the third PNP transistor is equal to the base current of the third NPN transistor.

4,843,343

ENHANCED Q CURRENT MODE ACTIVE FILTER

Gary L. Pace, Boca Raton, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 4, 1988, Ser. No. 140,454
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—257 **14 Claims**



1. An enhanced Q, current mode active filter comprising:

a differential amplifier having first and second inputs and a single output;

a current mirror coupled into a feedback loop wherein the output of the current mirror is connected to the first input of the differential amplifier;

input means coupled to the second input of the differential amplifier; and

phase shift control means coupled to the feedback loop for providing a predetermined filtering action on signals supplied to said input means, said phase shift control means comprising:

bias means coupled to said active filter for biasing said differential amplifier and said current mirror into the predetermined filtering action;

a first capacitor having a first terminal coupled to the first input of the differential amplifier and a second terminal coupled to a reference potential; and

a second capacitor having a first terminal coupled to an input of the current mirror and a second terminal coupled to a reference potential.

4,843,344

HIGH VOLTAGE AMPLIFIER

Mason F. Cox, Shelby, N.Y., assignor to Monroe Electronics, Inc., Lyndonville, N.Y.

Continuation of Ser. No. 106,652, Oct. 9, 1987, which is a continuation-in-part of Ser. No. 917,144, Oct. 9, 1986. This application Aug. 8, 1988, Ser. No. 229,785
Int. Cl.[4] H03F *3/16*
U.S. Cl. 330—264 **6 Claims**

1. A high voltage amplifier, coupled to a high voltage power supply terminal and having input and output terminals, for amplifying an input voltage signal supplied to said input terminal, said amplifier comprising:

control means, coupled to said input terminal, for generating an output current signal proportional to said input voltage signal; and

load means, coupled to said control means and to said high voltage power supply terminal, for producing an output voltage signal from said output current, said output voltage signal being proportional to said input voltage signal, said load means including a plurality of MOSFET circuits connected in cascade between said control means and said high voltage power supply terminal, said MOSFET circuits each including a MOSFET having a gate, a source and a drain, and biased in the linear region;

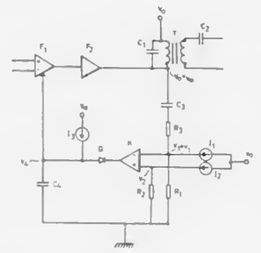
said MOSFET circuits being connected such that the voltage drop across each of said MOSFET circuits is substantially equal.

4,843,345

OUTPUT STAGE WITH AUTOMATIC LEVEL CONTROL FOR POWER LINE SIGNALLING

Leif E. Söderström, Linköping, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Nov. 2, 1987, Ser. No. 115,880
Claims priority, application Sweden, Nov. 11, 1986, 8604821
Int. Cl.[4] H03G *3/20*
U.S. Cl. 330—282 **6 Claims**



1. An output stage with automatic level control for power line signalling, comprising:

controlled amplifier means, having a control input for receiving a control signal for amplifying an input signal and producing at least one output signal, said output signal having a direct voltage component and an alternating voltage component,

feedback means for sensing said output signal of the output stage and supplying said control signal to said controlled amplifier means, said feedback means further comprising;

a first capacitive element connected to said

control input for supplying said control signal,

voltage varying means for changing the voltage across said first capacitive element including a comparator means for comparing the sum of a first direct reference voltage and an alternating voltage which is proportional to said alternating voltage component with a second direct voltage, and a first current source,

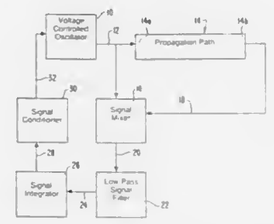
whereby said voltage across said capacitive element is changed in one direction when said sum is less than said second direct reference voltage and in the other direction when said sum is greater than said second direct reference voltage to thereby maintain the voltage amplitude of said alternating voltage component at a substantially constant value as determined by said first and said second direct reference voltages.

4,843,346

RADIO FREQUENCY STRAIN MONITOR

Joseph S. Heyman, Williamsburg; Robert S. Rogowski, Hampton, and Milford S. Holben, Jr., Williamsburg, all of Va., assignors to Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 7, 1988, Ser. No. 203,177
Int. Cl.[4] G01N *27/00*
U.S. Cl. 331—65 **18 Claims**



1. An apparatus for measuring strain in a structure, comprising:

signal generation means for generating an oscillating signal;

propagation path means, associated with the structure and operatively connected to said signal generation means, for defining a path, excluding a substantial portion of the structure, for propagation of the oscillating signal to produce a propagated signal;

detection means, receiving the oscillating signal from said signal generation means and the propagated signal from said propagation path means, for detecting a phase difference between the oscillating signal and the propagated signal; and

control means for controlling the frequency of the oscillating signal generated by said signal generation means in dependence upon the phase difference and for indicating strain in the structure in dependence upon change in the frequency of the oscillating signal.

4,843,347

PASSIVE STABILIZER FOR A SIGNAL GENERATING SOURCE

Bernard E. Sigmon, Tempe, and Lawrence J. Schmacher, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

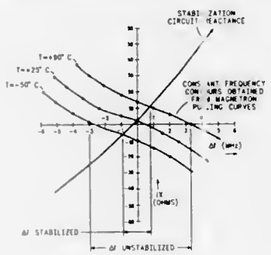
Filed May 27, 1988, Ser. No. 199,547
Int. Cl.[4] H03B *9/10*
U.S. Cl. 331—88 **22 Claims**

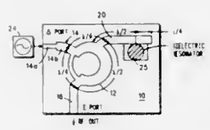
1. A passive stabilizer for use with a signal generating source comprising:

a ring circuit means for stabilizing the signal generating source having an operating frequency and including a ring with an input arm, an output arm, and a third arm, each having one end attached to the ring, the attached ends of the input and output arms being spaced apart approximately one-quarter wavelength of the operating frequency, the attached ends of the input and third arms being spaced apart approximately one-quarter wavelength

of the operating frequency, and the attached ends of the output and third arms being spaced apart approximately one-half wavelength of the operating frequency;

a resonator means for determining said operating frequency,





said resonator means coupled to the third arm of said ring circuit means and having a resonant frequency at approximately the operating frequency; and

said ring circuit means being constructed to present at the input arm a predetermined impedance locus.

4,843,348

MONOLITHICALLY INTEGRABLE, AMPLITUDE-CONTROLLABLE OSCILLATOR AMPLIFIER CIRCUIT

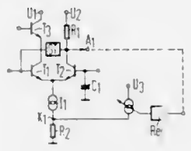
Josef Fenk, Eching/Ottenburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich Fed. Rep. of Germany

Filed Jul. 18, 1988, Ser. No. 220,564

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723753

Int. Cl.⁴ H03L 5/00

U.S. Cl. 331—109 **14 Claims**



1. Monolithically integrable amplitude-controllable oscillator amplifier circuit, comprising a differential amplifier including first, second and third transistors each having an emitter contact, a collector contact and a base contact; said emitter contacts of said first and said second transistors being interconnected, a frequency-determining circuit element connected to said base contact of said first transistor, said base contacts of said first, said second and said third transistors being acted upon by a direct voltage, a first capacitor connecting said base contact of said second transistor to a reference potential, said frequency-determining circuit element being connected to said collector contact of said second transistor, said frequency-determining circuit element being connected to the oscillator amplifier, said collector contact of said first transistor being connected directly to said emitter contact of said third transistor forming a cascode circuit, said collector contact of said third transistor being connected to a first potential, said collector contact of said second transistor forming a first amplifier output providing a first output signal, a first resistor connected between said collector contact of said second transistor and a second potential; a first current source connected between said interconnected emitter contacts of said first and said second transistors and the reference potential, said first current source being formed of a series circuit of a second current source, a first constant current source and a circuit node connected between said second current source and said first constant current source; and a control circuit for the oscillator amplifier controlling amplitude as a function of the output signal, said control circuit including a control element having a first voltage-controlled current source with a control voltage input, a current input and a current output; a controller feeding a control variable to said control voltage input of said first voltage-controlled current source, said current input of said first voltage-controlled current source being connected to a third potential, and said current output of said first voltage-controlled current source being connected to said first circuit node.

4,843,349

UHF CRYSTAL OSCILLATOR

John L. Nugent, Essex, and Norman G. Matthews, Sparks, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 27, 1988, Ser. No. 186,867

Int. Cl.⁴ H03B 5/30

U.S. Cl. 331—116 R **11 Claims**

1. A crystal controlled oscillator operable at a direct UHF frequency comprising:

an amplifier having first, second and third terminals, said third terminal being an output terminal;

a tuning circuit connected between said amplifier first and second terminals, said tuning circuit receiving a preselected value of voltage for biasing said amplifier;

piezoelectric crystal means having a first terminal connected to said amplifier first terminal and a second terminal;

said piezoelectric crystal means being capable of operating at a first UHF frequency mode and a second, VHF frequency mode;

an impedance network connected between said piezoelectric crystal means second terminal and said amplifier second terminal to provide an impedance load for said crystal means;

said impedance network and said crystal means forming a feedback circuit between said amplifier first and second terminals operable to establish a preselected frequency of oscillation for said crystal means; and

said impedance load having an overall inductive characteristic to provide that said preselected frequency of oscillation of said crystal means takes place at said first, UHF frequency mode.

4,843,350

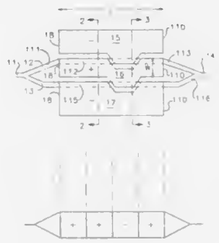
CODED SEQUENCE TRAVELLING-WAVE OPTICAL MODULATOR

Moshe Nazarathy, Mountain View; David W. Dolfi, Los Altos, and Roger L. Jungerman, Petaluma, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 20, 1987, Ser. No. 4,996

Int. Cl.⁴ H01S 3/00; G02B 6/26

U.S. Cl. 332—7.51 **10 Claims**



1. An improved travelling wave modulator of the type having a waveguide for carrying a first travelling wave, said modulator being responsive to a second travelling wave, travelling substantially parallel to the first travelling wave, to alter the phase velocity of the first travelling wave by an amount that, at each time and distance along the waveguide, is proportional to the second travelling wave at that time and distance along the waveguide, said improvement comprising:

means for reversing the polarity of the second travelling wave in a spatial pattern along the waveguide, wherein the pattern consists of a sequence of contiguous segments of substantially equal length and of total length L in each of which the polarity is defined by a spread spectrum code that produces an increase of at least 1.5 in 5 dB bandwidth-to-voltage ratios compared to an equivalent modulator in which all of the segments have the same polarity.

4,843,351

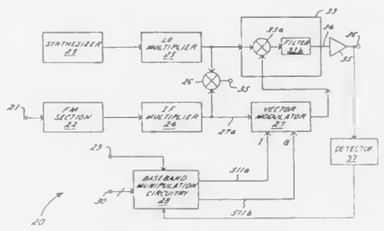
VECTOR MODULATION SIGNAL GENERATOR

Allen P. Edwards, Palo Alto, and David R. Gildea, Menlo Park, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 28, 1987, Ser. No. 90,624

Int. Cl.⁴ H03C 5/00

U.S. Cl. 332—17 **20 Claims**



1. A signal generator comprising: means for receiving an input signal indicating a desired output frequency within a broad range of possible output frequencies;

means for providing a first signal;

means for vector modulating said first signal;

means for providing a second signal having a desired frequency with a broad range of possible frequencies, said second signal frequency being determined in response to said input signal indicating a desired output frequency; and

means for mixing said vector modulated first signal and said second signal, providing a vector modulated output signal having said desired output frequency.

4,843,352

MODULATOR FOR GENERATING A BURST-LIKE MODULATED WAVE

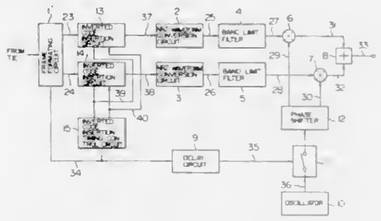
Tadayuki Kamisaka; Kazuo Yagi; Yasufumi Takahashi, all of Yokohama, and Shigeki Nakamura, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 8, 1988, Ser. No. 179,303

Claims priority, application Japan, Apr. 9, 1987, 62-85696

Int. Cl.⁴ H04L 27/20

U.S. Cl. 332—22 **5 Claims**



1. A modulator for generating a burst-like modulated wave used in a multi-carrier transmission type communication system in which a plurality of modulated waves including at least one burst-like modulated wave exist on the same transmission line and the frequency band occupied by energy of each of said plurality of modulated waves is limited, said modulator comprising:

formatting means responsive to a digital data signal to be transmitted to generate a bit stream formatted in accordance with a predetermined frame format;

means connected to said formatting means, for converting said bit stream into a band limited base band signal;

means for generating a carrier;

means connected to said converting means and said carrier generating means, for mixing said carrier with said base band signal;

means connected to said carrier generating means and responsive to a carrier on/off signal, for controlling timings for supply and supply-stop of said carrier to said mixing means; and

means connected between said formatting means and said converting means, for so setting polarities of transmission code signals, which appear before and after either of supply timing and supply-stop timing of said carrier to said mixing means, as to be inverted to each other.

4,843,353

DIELECTRIC SLAB TRANSISTIONS AND POWER COUPLERS

Hermann B. Sequeira, Baltimore, Md., assignor to Martin Marietta Corporation, Bethesda, Md.

Continuation-in-part of Ser. No. 683,535, Dec. 19, 1984, Pat. No. 4,677,404. This application Nov. 27, 1985, Ser. No. 801,535

The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.

Int. Cl.⁴ H01P 5/00

U.S. Cl. 333—34 **10 Claims**

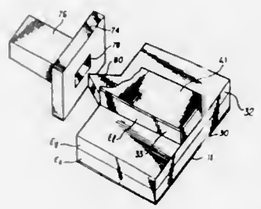
1. An electromagnetic wave transmission line comprising:

(a) a dielectric substrate layer of permittivity ϵ_s and having first and second parallel surfaces;

(b) a conducting coating on said substrate layer second surface;

(c) a dielectric guiding slab layer of permittivity ϵ_g where $\epsilon_g > \epsilon_s$ having first and second parallel surfaces of a predetermined dimension, said guiding slab layer having its second surface attached to said substrate layer first surface;

(d) an elongated dielectric strip of permittivity ϵ_l where $\epsilon_g > \epsilon_l$ having first and second parallel surfaces where are substantially narrower than said predetermined dimension, said dielectric strip having its second surface contiguous to said first surface of said guiding slab layer, the



elongated dimension of said dielectric strip defining the electromagnetic wave direction of transmission;

(e) a conducting coating on said dielectric strip first surface, whereby single mode propagation is permitted over a relatively wide band and propagation of undesired modes in said substrate layer is suppressed and the characteristic impedance varies relatively little over a wide frequency range; and

(f) means in contact with said guiding slab layer for coupling electromagnetic energy to and from an external device.

4,843,354

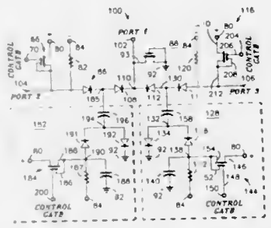
BROAD BAND MICROWAVE BIASING NETWORKS SUITABLE FOR BEING PROVIDED IN MONOLITHIC INTEGRATED CIRCUIT FORM

Ronald D. Fuller, Mesa; Richard M. Dougherty; Craig L. Fullerton, both of Scottsdale, and Hugh R. Malone, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 138,165, Dec. 28, 1987, abandoned. This application Nov. 18, 1988, Ser. No. 273,647

Int. Cl.[4] H01P *1/22, 1/15*

U.S. Cl. 333—81 A **32 Claims**



1. A circuit for providing an impedance of a controlled magnitude between an input terminal and an output terminal, including in combination:

a first diode responsive to changes in bias signals to provide impedances of different magnitudes, said first diode having first and second electrodes coupled between the input terminal and the output terminal;

first bias means coupled to said first diode for selectively biasing said first diode in a relatively nonconductive state so that the input terminal is thereby isolated from the output terminal;

means for providing control signals; and

second bias means including a field effect transistor having first electrode, second electrode and control electrode, said control electrode being coupled to said means for providing control signals to selectively render said field effect transistor conductive, said first electrode being coupled to said first diode for providing bias signals for selectively rendering said first diode relatively conductive in response to said controls signals so that the input terminal is selectively coupled to the output terminal in response to said control signals.

4,843,355

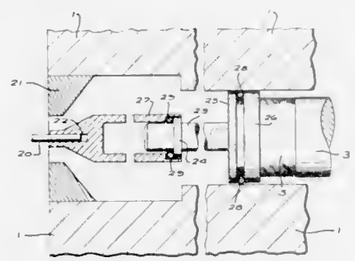
PROGRAMMABLE MECHANICAL DELAY LINE

Siegfried G. Knorr, Los Angeles, Calif., assignor to Colby Instruments, Inc., Santa Monica, Calif.

Filed Jun. 14, 1988, Ser. No. 207,070

Int. Cl.[4] H01P *9/00, 1/18*

U.S. Cl. 333—160 **12 Claims**



1. For use in an electrical circuit, a device for providing an adjustable delay line and comprising:

a plurality of generally axially extending lengths of semirigid coaxial cables, each being of the type having a generally central, generally axially extending, inner conductor surrounded by a generally circumferential, generally axially extending, outer conductor;

a like plurality of cable-encompassing cavities, each being dimensioned to loosely accept the axially movable selected end of a respective coaxial cable, each cavity including an electrically conductive inner wall portion;

a like plurality of coaxial connectors, each having central connector means adapted to be electrically coupled to a respective inner coaxial conductor, and each further including outer connector means adapted to be coupled to a respective outer coaxial conductor, each of the outer connector means being electrically coupled to the electrically conductive inner wall of the respective cavity;

means for coupling selected inner connector means together to serially connect the inner conductors of respective coaxial cables, and for coupling the related outer connector means together to serially connect the outer conductors of the respective coaxial cables;

means for moving the plurality of coaxial cable lengths axially;

a like plurality of conductor-accepting receptacles electrically coupled to the inner connector means of each coaxial connector, each receptacle having a conductor-accepting cavity dimensioned to loosely accept the axially movable inner coaxial conductor;

first electrically conductive torroidal spring means circumventing the outer coaxial conductor and having an outer radial dimension sized for sliding contact with the electrically conductive inner wall portion of the cable-encompassing cavity to electrically couple the outer coaxial conductor thereto, the first torroidal spring means being fixedly positioned on the axially movable outer conductor for electrical coupling thereto, and being relatively thin in the axial direction to minimize sliding friction therewith during axial movement of the coaxial cable; and

second electrically conductive torroidal spring means circumventing the inner coaxial conductor and having an outer radial dimension sized to contact the inner wall of the conductor-accepting cavity to electrically couple the inner coaxial conductor thereto, the second torroidal spring means having an inner radial dimension permitting sliding contact with the axially movable inner conductor, and being relatively thin in the axial direction to minimize sliding friction therewith during axial movement of the coaxial cable.

4,843,356

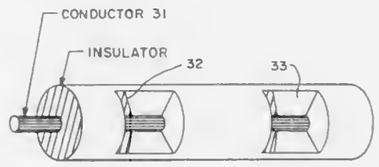
ELECTRICAL CABLE HAVING IMPROVED SIGNAL TRANSMISSION CHARACTERISTICS

Bruce B. Lusignan, and Simos D. Dadakarides, both of Stanford, Calif., assignors to Stanford University, Stanford, Calif.

Filed Aug. 25, 1986, Ser. No. 899,714

Int. Cl.[4] H01P *3/02*

U.S. Cl. 333—236 **3 Claims**



1. An electrical cable having improved signal transmission characteristics comprising a conductor, an insulative material abutting said conductor and providing shunt capacitance to said conductor, and means for providing inductance along with said capacitance and offsetting shunt capacitance thereby reducing the attenuation of a signal within said cable, and means for providing inductance including particles of low-loss magnetic material distributed in alternately high and low concentrations of particles in longitudinally displaced portions in said insulative material.

4,843,357

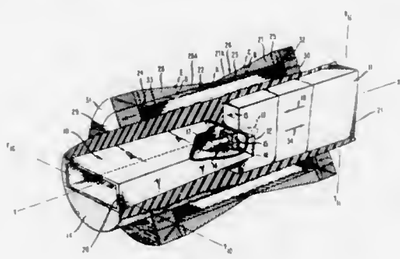
TETRAHEDRAL JUNCTION WAVEGUIDE SWITCH

Richard A. Stern, Allenwood, and Herbert A. Leupold, Eatontown, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 20, 1988, Ser. No. 260,550

Int. Cl.[4] H01P *1/11*

U.S. Cl. 333—258 **7 Claims**



1. A tetrahedral junction waveguide switch comprising first and second lengths of hollow rectangular waveguide, each of said waveguide lengths being tapered along the longitudinal axis thereof to form an end thereon having a reduced width;

means for mounting said first and second waveguide lengths with the longitudinal axes thereof aligned with each other, the major transverse axes thereof orthogonally disposed with respect to each other and the reduced width ends thereof abutting each other to form an aperture communicating with each of said waveguide lengths;

a ferrite rod having tapered ends mounted in said aperture with the longitudinal axis of the rod aligned with the longitudinal axes of said waveguide lengths, said ferrite rod cooperating with said reduced width ends of said waveguide lengths to permit transmission of millimeter wave electromagnetic wave energy through said aperture from one of said waveguide lengths to the other of said waveguide lengths when said rod is in a first magnetic state in which a first unidirectional magnetic field is applied along the longitudinal axis of the rod and to cut off said transmission of said wave energy when said rod is in a second magnetic state in which said first magnetic field is not applied to said rod;

a permanent magnet structure for magnetically biasing said ferrite rod into said first magnetic state, said magnet structure having

a hollow cylindrical permanent magnet surrounding said waveguide lengths and having the longitudinal axis thereof aligned with the longitudinal axes of said waveguide lengths, said cylindrical magnet being axially magnetized to have a longitudinal magnetic polarity to produce said first magnetic field along the longitudinal axis of said rod, and

a cladding permanent magnet surrounding a substantial portion of the length of said cylindrical magnet for reducing magnetic flux leakage from said cylindrical magnet and enhancing said first magnetic field, said cladding magnet being radially magnetized to have a generally radial magnetic polarity transverse to the longitudinal magnetic polarity of said cylindrical magnet and having a constant magnetic potential on its outer exterior surface equal to the magnetic potential on the outer surface of said cylindrical magnet at a circumferential portion between the ends of said cylindrical magnet; and

selectively operable helical coil means surrounding said waveguide lengths and being coaxial therewith for applying a second unidirectional magnetic field of substantially equal magnitude to said first magnetic field along the longitudinal axis of said rod in opposition to said first magnetic field to place said rod in said second magnetic state.

4,843,358

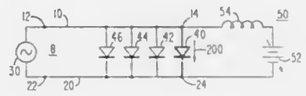
ELECTRICALLY POSITIONABLE SHORT-CIRCUITS

William H. Meise, Wrightstown, Pa.; Arye Rosen, Cherry Hill, N.J., and Paul J. Stabile, Langhorne, Pa., assignors to General Electric Company, Princeton, N.J.

Continuation of Ser. No. 51,423, May 19, 1987, abandoned. This application Jun. 20, 1988, Ser. No. 211,102

Int. Cl.[4] H01P *1/00*

U.S. Cl. 333—263 **17 Claims**



1. An electrically-positionable short circuit for presenting a short circuit to a source of alternating current which short circuit is controllable in position in response to the magnitude

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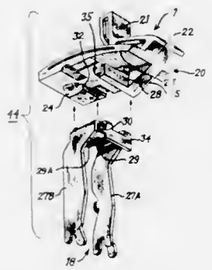
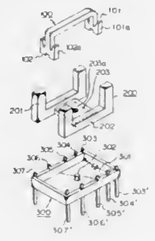
of an electrical bias produced by a bias source which is independent of said alternating current source, comprising:
first and second approximately parallel conductive means;
first connection means coupled to said first and second conductive means, said first connection means being adapted for coupling said first and second conductive means to said source of alternating current;
semiconductor means physically positioned between and extending between said first and second conductive means at least frist and second pairs of distinct locations thereon, one of each pair of locations being associated with one of said first and second conductive means, and the other of each pair of locations being associated with the other of said first and second conductive means, said semiconductor means being responsive to the magnitude of said electrical bias in such a manner that at a first magnitude of said electrical bias of a given polarity, a short circuit path is established, at least for said alternating currents, between said first pair of distinct locations and a high impedance path is established, at least for said alternating currents, between said second pair of physically distinct locations, and such that, at a second magnitude, greater than said first magnitude, of said electrical bias, and of said given polarity, a short circuit path is established, at least for said alternating currents, between said second pair of distinct locations; and
second connection means coupled to said semiconductor means, said second connection means being adapted for coupling said semiconductor means to said bias source for coupling said electrical bias to said semiconductor means for establishing, by the magnitude of said electrical bias of said given polarity, the impedance, at least for said alternating current, between said second pair of distnct locations.

4,843,359
MOLDED CASE CIRCUIT BREAKER HANDLE FOR AUTOMATED ASSEMBLY
Robert A. Morris, Burlington, and Roger N. Castonguay, Terryville, both of Conn., assignors to General Electric Company, New York, N.Y.
Filed Apr. 11, 1988, Ser. No. 179,809
Int. Cl.[4] H01H *75/10*
U.S. Cl. 335—6 **14 Claims**



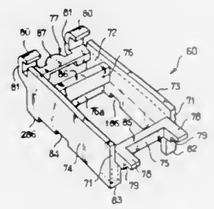
1. A molded case circuit breaker operating handle assembly comprising:
a molded plastic handle including a handle post extending from a top surface thereon;
a hook member integrally formed with and extending from one end of a bottom surface of said plastic handle;
a flexible arm supported on an opposite end of said bottom surface and extending parallel with said bottom surface; and
a projection on an end of said arm extending a predetermined distance from said arm.

4,843,360
POLARIZED ELECTROMAGNETIC RELAY
Kosei Yoshino, Nagano; Hirobumi Saso, and Masayuki Matsumoto, both of Saku, all of Japan, assignors to Takamisawa Electric Co., Ltd., Tokyo, Japan
Filed Feb. 2, 1988, Ser. No. 151,664
Claims priority, application Japan, Feb. 5, 1987, 62-23519; Oct. 9, 1987, 62-154135[U]
Int. Cl.[4] H01H *51/22*
U.S. Cl. 335—80 **7 Claims**



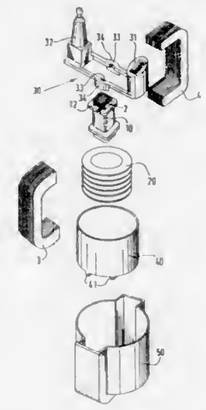
1. A relay comprising:
a base block having a supporting stud protruded from a center of a recess portion of said base block;
an H-shaped armature block including a pair of armatures mounted in parallel and a coupling member, made of at least one permanent magnet, for coupling said armatures with each other, said coupling member having a hole at the center thereof, said H-shaped armature block being rotatably mounted on said base block by inserting said stud of said base block into said hole of said H-shaped armature block; and
a core having a winding wound thereon, said core having two magnetic pole legs on both sides thereof to form an approximate U-shape, said core being mounted on said base block and being located above said H-shaped armature block by fixing lower sides of said magnetic pole legs to said base block between said armatures, so that faces of said magnetic pole legs oppose said armatures.

4,843,361
ELECTROMAGNET WITH PERMANENT MAGNET HELD BY A CAGE
Jean-Francois Couvreur, Sartrouville, and Jacques Olifant, Nanterre, both of France, assignors to La Telemecanique Electrique, Nanterre Cedex, France
Filed Jul. 8, 1988, Ser. No. 218,111
Claims priority, application France, Jul. 16, 1987, 87 10057
Int. Cl.[4] H01F *7/08*
U.S. Cl. 335—229 **12 Claims**



1. Electromagnet comprising an induction winding and first and second magnetic devices movable relative to each other, the first device comprising a core surrounded by the winding, the second device comprising an internal pole piece, relatively close to the winding and an external pole piece relatively far from the winding, a permanent magnet interposed between the external and internal pole pieces, the core bearing on at least one side of the winding a pole flange disposed in an air gap which is defined between the internal and external pole pieces, wherein an amagnetic cage is snap fastened on the external pole piece and comprises for the permanent magnet and for the internal pole piece respective recesses defined by means for positioning and retention with respect to displacements transverse to the magnetic axis of the permanent magnet.

4,843,362
IGNITION COIL FOR INTERNAL COMBUSTION ENGINE
Pierre Heritier-Best, Issoire, France, assignor to Equipements Automobiles Marchal, Issy-les-Moulineaux, France
Filed Mar. 1, 1988, Ser. No. 162,710
Claims priority, application France, Mar. 4, 1987, 87 02910; Oct. 21, 1987, 87 14514
Int. Cl.[4] H01F *27/02, 27/08*
U.S. Cl. 336—61 **11 Claims**



1. An ignition coil, particularly for use in an automotive internal combustion engine, comprising:
a central magnetic core member surrounded coaxially by a primary winding and a secondary winding;
the assembly formed by said central magnetic core member and said primary and secondary windings being arranged within an inner insulating casing with an end of said central magnetic core member confronting a bottom wall of said inner insulated casing;
a first synthetic resin filling said inner insulating casing and stabilizing therein said assembly and electrically insulating the elements thereof;
first and second magnetic current return circuit members positioned about said inner insulating casing on opposite sides of said central magnetic core member;
said bottom wall of said inner insulating casing having on the exterior thereof means for aligning first ends of said first and second magnetic current return circuit members in confronting arrangement at a position confronting said end of said central magnetic core member and separated therefrom by said bottom wall of said inner insulating casing, such that the thickness of said bottom wall defines an air gap between said end of said central magnetic core member and said first ends of said first and second magnetic current return circuit members;
said assembly with said first and second magnetic current return circuit members being arranged within an outer insulating casing; and
a second synthetic resin filling said outer insulating casing and stabilizing and entirely enclosing therein said assembly and said first and second magnetic current return circuit members, said second synthetic resin having good heat conducting properties and an expansion coefficient that is compatible with that of said first and second magnetic current return circuit members.

4,843,363
THREE-PHASE THERMAL PROTECTOR
Susumu Ubukata, 549-banchi, Nakasuna-cho, Tempaku-ku, Aichi-ken; Yasukazu Mizutani, and Syozo Iyoda, both of Nagoya-shi, all of Japan, assignors to Susumu Ubukata, Nagoya, Japan
Filed Sep. 28, 1988, Ser. No. 250,087
Claims priority, application Japan, Oct. 7, 1987, 62-253401
Int. Cl.[4] H01H *61/08, 37/12, 37/54*
U.S. Cl. 337—94 **3 Claims**

1. A three-phase thermal protector comprising:
(a) a metallic header plate having two apertures formed therein;
(b) two terminal pins secured in the apertures of said header plate by an insulating sealant material applied therebetween, respectively;
(c) a support plate secured to said header plate;
(d) two fixed contacts directly secured to one ends of said terminal pins so as to be opposite to said support plate on one and the same plane, respectively;
(e) an elastic member provided so as to be approximately parallel to said support plate, said elastic member having two ends, one of which ends being secured to said support plate;
(f) a thermally responsive element secured at one end thereof to the other end of said elastic member so as to be opposite to said elastic member, said thermally responsive member having an approximately central shallow dish-shaped portion so as to move and return with snap action in response to temperature change;
(g) two movable contacts secured to portions of said thermally responsive element, respectively, the portions of said thermally responsive element corresponding to two tops forming a triangle together with a top on said thermally responsive element on which top said elastic member is secured;
(h) a pivot mounted on a stationary member either at the header plate side or at the support plate side so that the surface of a connecting portions of said thermally responsive element and said elastic member is engaged therewith; and
(i) an operative temperature calibrating mechanism provided on said pivot for exerting an approximately uniform contact pressure between said two movable contacts and said two fixed contacts and between the connecting portions of said thermally responsive element and said elastic member and said pivot, thereby pushing the dish-shaped portion of said thermally responsive element, said operative temperature calibrating mechanism including a means

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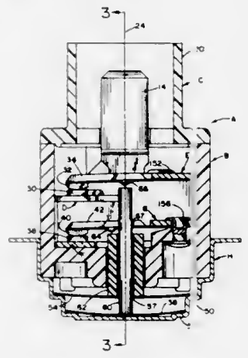
for controlling the pressure against the dish-shaped portion of said thermally responsive element.

4,843,364

THERMOSTATIC ELECTRIC SWITCH

Donald E. Place, and Ronald L. Holden, both of Mansfield, Ohio, assignors to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Sep. 4, 1987, Ser. No. 93,294
Int. Cl.[4] H01H *37/52, 1/00*
U.S. Cl. 337—333 **18 Claims**



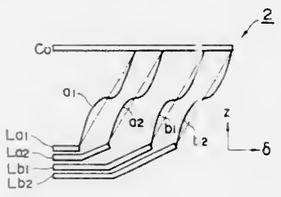
6. In a thermostat having a generally hollow cylindrical housing containing a pair of switches each having a pair of contacts and a terminal member connected with each contact, each said terminal member having a connector terminal projecting externally of said housing, said connector terminals being aligned along a common axis, each said terminal member being directly connected with its respective switch contacts, each said pair of contacts in each of said switches having open and closed positions, and thermal responsive means for moving said contacts between said positions.

4,843,365

MAGNETORESISTANCE ELEMENT

Yuzo Seo, Kamakura, Japan, assignor to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Feb. 25, 1988, Ser. No. 160,190
Claims priority, application Japan, Mar. 2, 1987, 62-045172
Int. Cl.[4] H01L *43/00*
U.S. Cl. 338—32 R **10 Claims**



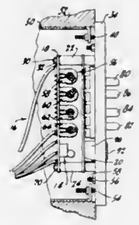
1. A magnetoresistance element for detecting displacement of a moving object by detecting the change in magnitude of the magnetic field produced by a plurality of opposite magnetic poles alternately arranged on said object to be detected, comprising at least one magnetoresistor provided adjacent to said magnetic poles for detecting the change in magnitude of the magnetic field, each of said magnetoresistor exhibiting a sensitivity which is distributed along the displacing direction of said object and which has at least one peak value, said sensitivity distribution being determined by the shape of said magnetoresistor which varies in the displacing direction, the length of said magnetoresistor parallel with the displacing direction being a multiple of one pitch of said magnetic poles.

4,843,366

CONTROLLER FOR USE WITH DIMMER MODULE

Robert F. Smalley, Louisville, and James Tobor, Dallas, both of Tex., assignors to Prescolite Inc., San Leandro, Calif.

Filed Feb. 18, 1988, Ser. No. 157,744
Int. Cl.[4] H01C *10/16*
U.S. Cl. 338—128 **4 Claims**



1. A wall box mounted voltage controller for use with a dimmer module for controlling multiple loads comprising:

a. a printer circuit board structure;

b. a multiplicity of control operations, each of said multiplicity of operators being movable and extending from said printed circuit board structure.

c. a multiplicity of potentiometers supported by said printed circuit board structure each of said multiplicity of potentiometers being connected to one of said multiplicity of operators for adjusting the electrical output of each of said multiplicity of potentiometers, means for generating an electrical signal from the electrical output of each of said multiplicity of potentiometers for transmission to the dimmer module, each of said electrical signals having electrical output referenced to said electrical output of one of said multiplicity of potentiometers, said electrical signal generating means being mounted on said printed circuit board structure;

e. means for independently mechanically trimming the low output of each of said electrical signals from each of said multiplicity of potentiometers.

f. means for independently mechanically trimming the high output of each of said electrical signals from each of said multiplicity of potentiometers; each of said high and low electrical signal trimming means being supported on said printed circuit board structure.

4,843,367

CAR'S BACK-UP ALARM FITTED WITH SPEECH FUNCTION

Masayuki Saito, Tokyo, Japan, assignor to Yamaguchi Electric Ind., Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1988, Ser. No. 171,124
Claims priority, application Japan, Jun. 25, 1987, 62-97881
Int. Cl.[4] B60Q *1/26*
U.S. Cl. 340—463 **1 Claim**

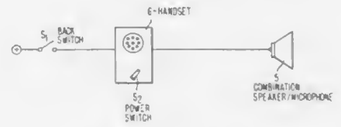
1. In a vehicle having a body, a source of electric power and a transmission, a vehicular back-up alarm with two-way speech function, comprising:

a combination speaker/microphone provided in the rear of the vehicle body;

a handset provided at a driver's seat of the vehicle, the handset having a transmitter/receiver, and interrupted wave generating circuit, a preamplifier, a power amplifier, a duplexing circuit and a power stabilizing wave circuit,

the handset being operably connected with the source of electric power and with the combination speaker/microphone by an electrical circuit;

a back-up switch operably connected with the vehicle transmission and placed in the electrical circuit between the source of electrical power and the handset, the back-up switch being actuable upon engaging of a reverse gear of the vehicle transmission for supplying electrical power to the handset to cause the handset to generate an alarm signal to the combination speaker/microphone;



a power switch means provided at the handset and actuable for operably connecting the combination speaker/microphone with the handset for permitting speech at the combination speaker/microphone to be heard at the handset; and

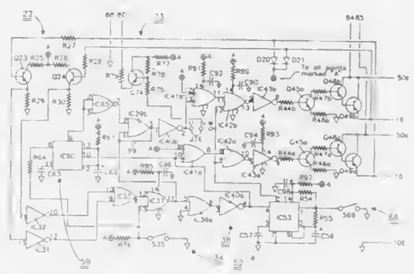
a transmit switch means provided at the handset and actuable for operably connecting the handset with the combination speaker/microphone for permitting speech at the handset to be heard at the combination speaker/microphone.

4,843,368

ENHANCED DECELERATION CONDITION DISCLOSING DEVICE

Vincent M. Poulos, 675 Golden Rd., Fallbrook, Calif. 92028

Filed Apr. 10, 1987, Ser. No. 37,247
Int. Cl.[4] B60Q *1/44*
U.S. Cl. 340—464 **9 Claims**



1. A device for imposition solely in a vehicular brake light electric circuit, whether of the single-wire type or of the double-wire type, to generate a signal disclosing the achievement of an enhanced degree of vehicular deceleration for display in the brake lights, comprising:

(a) a first means for receiving incoming energy applied through the brake light electric circuit for continuously developing an output logic pattern in response thereto that distinguishes between one of the brake lights being used as a turn signal and both lights simultaneously being used as brake lights;

(b) a second means for continuously receiving the output logic patterns from said first means and including an automatically re-settable inertia-actuated switch that is activated when the vehicle has undergone an enhanced degree of deceleration, said second means producing one continuous logic pattern when said switch is not activated and a different logic pattern when said switch is activated;

(c) a third means for receiving the output of the logic patterns produced and developed in said second means, and in response thereto, causing the appropriate incoming energy to be connected to the respective brake light for displaying the appropriate use as a turn signal or as a brake light; and,

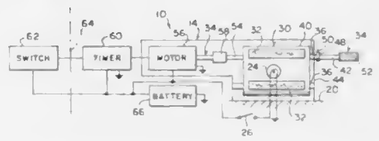
(d) a fourth means interconnected said second means and said third means and activated by the logic pattern developed in said second means when said inertia switch closes for generating a separate warning signal, in the form of a sequence of energy pulses, to input to said third means at a pulse rate that, coupled with the persistence of the incandescent brake light generally used in the vehicular brake light electric circuit, produces an attention-getting flashing, for passage through said third means to the respective brake lights to warn those following the vehicle that the vehicle is undergoing an enhanced degree of deceleration.

4,843,369

AUTO BRAKE LIGHT

Francisco G. Jimenez, G.P.O. Box 4805, San Juan, P.R. 00936, and George Spector, 233 Broadway RM 3815, New York, N.Y. 10007

Filed Feb. 1, 1988, Ser. No. 150,841
Int. Cl.[4] B60Q *01/00*
U.S. Cl. 340—479 **1 Claim**



1. An auxiliary brake light for a motor vehicle which comprises:

(a) a housing having a light transmitting front opening in its front wall, said housing disposed on a rear shelf behind rear windshield of the motor vehicle;

(b) a light source operably disposed within said housing and constructed for selective activation by a braking system of the motor vehicle, said light source being in alignment with said front opening;

(c) a magnification lens integral with said housing for covering said front opening;

(d) a sign belt assembly having a plurality of indicia panels thereon with each of said indicia panels permitting passage of light rays therethrough, said sign belt assembly rotatably supported in said housing between said light source and said magnification lens; and

(e) means for rotating said sign belt assembly for allowing one of said indicia panels to be in alignment between said light source and said magnification lens so that said indicia panel can be viewed from the rear of the motor vehicle; wherein said sign belt assembly includes:

(a) upper and lower shafts vertically spaced apart and rotatably supported in said housing;

(b) a pair of pulleys each secured onto one of said shafts; and

(c) a continuous transparent belt having each of said indicia panels affixed thereto in spaced relationship and extending around said pullies; wherein said rotating means includes:

(a) said upper shaft of said sign belt assembly having a first extension segment extending outwardly from one side of said housing;

(b) a plurality of setting marks radially placed on the side of said housing around said first extension segment;

(c) a collar having a pointer thereon, said collar affixed onto said first extension segment adjacent said setting marks; and

(d) a control know affixed to distal end of said first extension segment whereby said control knob can be manually operated allowing for moving one of said indicia panels on

said transparent belt to a position in alignment between said light source and said magnification lens as indicated by placing the pointer of said collar to one of said setting marks on said housing; wherein said rotating means further includes:

(a) said upper shaft of said sign belt assembly having a second extension segment extending inwardly into said housing;

(b) an electric motor for automatically driving said second extension segment of said upper shaft and preselectively moving each of said indicia panels on said transparent belt to a position in alignment between said light source and said magnification lens; and

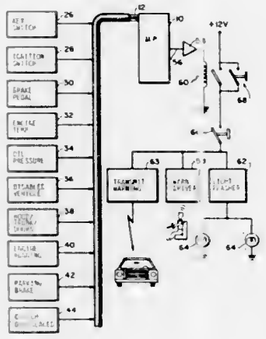
(c) a clutch mechanism disposed between said electric motor and said transparent belt on said second extension segment of said upper shaft for disengaging said electric motor when wanting to manually operate said transparent belt.

4,843,370

INTELLIGENT, AUTOMATIC HAZARD LIGHT FOR A MOTOR VEHICLE

Karl F. Milde, Jr., Mahopac, N.Y., assignor to V-Tronics Corporation, Mahopac, N.Y.

Filed Nov. 18, 1987, Ser. No. 122,189
Int. Cl.[4] B60Q *1/0*
U.S. Cl. 340—466 **20 Claims**



1. In apparatus for automatically controlling a hazard warning system of a motor vehicle comprising control means for automatically actuating said hazard warning system in response to at least one condition indicating a hazard to other vehicles in the vicinity, said at least one condition of response including the fall of the speed of said vehicle below a prescribed speed threshold for a prescribed period of time, the improvement wherein said control means comprises means for sensing the driving environment of said motor vehicle and for changing said condition of response in dependence upon the sensed driving environment.

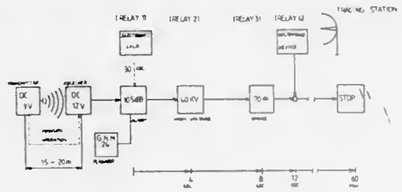
4,843,371

BURGLAR-ALARM SYSTEM FOR BRIEFCASE

Liu C. Kuei, No. 36, Jen Ai Hsin Village, Division 2, Hsin She Village, Chu Pei Hsiang, Hsin Chu Hsien; Chen C. Shui, No. 1, Lane 19, Wan Lung Street, Division 39, Wan Lung Li, Ching Mei District, Taipei, and Huang C. Lung, No. 175, Sec. 1, Chung Shan Road, Division 15, Ju i Sui Hsiang, Hualien Hsien, all of Taiwan

Continuation-in-part of Ser. No. 16,772, Feb. 20, 1987, abandoned. This application Feb. 5, 1988, Ser. No. 152,677
Int. Cl.[4] G08B *1/08, 13/14*
U.S. Cl. 340—539 **1 Claim**

1. A burglar-alarm system for a briefcase comprising a portable wireless transmitter and a control device mounted in the briefcase, said control device being constituted by a wireless receiver, a rechargeable battery, an electronic combination lock, a main controller, a high-voltage generator, an alarm, a smoking circuit, a smoking can, an intense transmitter, a flasher and a destroying device, said rechargeable battery being to provide a power source for all components, said control device having an inspecting portion constituted by the wireless receiver and the electronic combination lock, said wireless receiver being associated with the wireless transmitter to form a distance-measuring device so that when the distance between



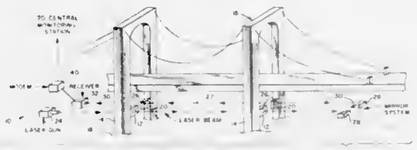
the wireless receiver and the wireless transmitter exceeds effective range of the wireless receiver, the output of the wireless receiver will be changed which in turn will trigger the main controller, whereby in case of theft or incorrectly dialing the electronic combination lock, the burglar-alarm system will work thereby generating high voltage on the surface of the briefcase to force the thief to throw away the briefcase, giving an alarming sound, emitting brilliant flashes of light, evolving colored smokes to arouse attention of pedestrians and destroying articles in the briefcase.

4,843,372

BRIDGE SWAY AND DEFLECTION DETECTION SYSTEM

Thomas Savino, 57 Chestnut St., Westbury, N.Y. 11590

Filed Jan. 21, 1988, Ser. No. 146,563
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—540 **4 Claims**



1. A bridge sway and deflection detection system, comprising, a first pair of aperture plates and a second pair of aperture plates mounted to a bridge, for passage of a laser beam emitted by a laser gun, mirror system means provided for cooperation with said laser beam in reflecting said laser beam to a laser receiver of said system, and processing circuitry and a modem coupled in said system, for feeding data by telephone line means to a central monitoring station, for visual read-out and actuation of alarm mean in said central monitoring station,

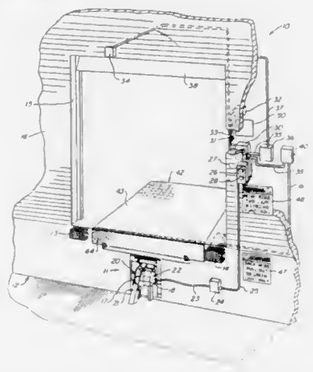
wherein said first pair of aperture plates are fixedly secured to one side of a first vertical column and a second vertical column of said bridge and are aligned with each other and a first mirror of said mirror system means, and said second pair of aperture plates are fixedly secured to another side of said first vertical column and said second vertical column of said bridge and are aligned with each other and a second mirror of said mirror system means, providing for forward and reverse passage of said laser beam for detection means.

4,843,373

LOADING DOCK SIGNAL AND CONTROL SYSTEM

Glen Trickle, Racine, and Michael A. Swessel, Cudahy, both of Wis., assignors to Rite-Hite Corporation, Milwaukee, Wis.

Filed Dec. 10, 1987, Ser. No. 131,196
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—540 **26 Claims**



1. A loading dock signalling and control system for a dock facility which includes a loading dock, an electrically controllable locking device operative to receive and retain a parked vehicle and condition sensing means associated with said locking device, said system comprising: green and red outside light means for positioning on the outside of the facility, green and red inside light means, inside manually operable lock and unlock switch means accessible to dock personnel, a control unit having input and output terminals, said terminals including first input terminals coupled to said condition sensing means, second input terminals coupled to said switch means, first output terminals coupled to said locking device and second output terminals coupled to said inside and outside signal light means, said control unit being programmed to periodically check the conditions of said input terminals and to effect programmed operations which include control of said first output terminals in accordance with the status of said first and second input terminals for operating said device in accordance with the condition thereof and in accordance with signals from said lock and unlock switch means and which include control of said second output terminals in accordance with the status of said first input terminals to operate said inside and outside light means as a function of the condition of said locking device, said locking device being arranged for cooperable operation with associated equipment at said facility, said terminals further including third input terminals for connection to associated equipment, and said programmed operations further including control of first output terminals as a function of status of said third input terminals.

4,843,374

DOOR ANNUNCIATOR

Michael J. Sansky, 10 Hughes St., #A-101, Irvine, Calif. 92718

Filed Mar. 30, 1988, Ser. No. 175,201
Int. Cl.[4] G08B *13/08*
U.S. Cl. 340—547 **7 Claims**

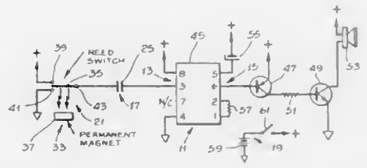
1. A door annunciator comprising:

alarm means responsive to an energizing input signal to provide a perceptible alarm signal;

energizing means operable to provide an energizing input signal to the alarm means for a limited interval of time;

a battery; and

switch means operative to couple the battery to the energizing means upon location of a door in an open position with respect to the switch means and to decouple the battery from the energizing means upon location of the door in a closed position whereby the alarm means provides the



alarm signal upon opening of the door but not upon closing thereof and whereby there is no energy drainage from the battery in the closed position of the door.

4,843,375

ROLL-UP ALARM SCREEN ASSEMBLY AND SHIPPING CONTAINER THEREFOR

Dennis E. Riordan, Los Angeles, Calif.

Filed Feb. 3, 1987, Ser. No. 10,345
Int. Cl.[4] G08B *13/08*
U.S. Cl. 340—550 **7 Claims**

1. A roll-up alarm screen assembly for use in a frame having a first magnet disposed in its bottom portion and a second magnet disclosed in its top portion, said roll-up alarm screen assembly comprising:

a. a screen mesh;

b. a conductive wire which is mechanically coupled to said screen mesh;

c. roll-up means for rolling up and down said screem mesh;

d. first magnetic coupling means for electrically coupling severed ends of said conductive wire when said first magnetic coupling means is disposed adjacent to said first magnet; and

e. second magnetic coupling means for electrically coupling severed ends of said conductive wire whereby said second magnetic coupling means is mechanically coupled to said roll-up means and may be positioned so that said second magnetic coupling means is disposed adjacent to said second magnetic in order to detect any movement of either said roll-up means or said screen mesh.

4,843,376

BOAT DRAIN PLUG WARNING APPARATUS

Leland J. Wagner, 601 S. Commercial, Emporia, Kans. 66801, and Harry E. O'Mara, Route 2, Box 100, Reading, Kans. 66868

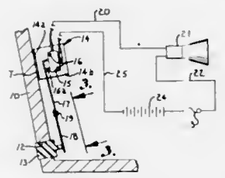
Filed Apr. 11, 1988, Ser. No. 180,311
Int. Cl.[4] G08B *21/00*
U.S. Cl. 340—568 **5 Claims**

1. Apparatus for a boat for sensing and signaling the absence

of a drain plug from the boat drain opening as the boat is launched, said apparatus comprising

a paddle having a portion positioned adjacent said opening to be engaged and displaced by water flowing through said opening;

means supporting said paddle for movement between a first position and a second position, said second position representing the displaced condition for the paddle;



sensing means for sensing movement of said paddle to said second position; and

signal means operated by said sensing means in response to movement of said paddle to said second position to emit a warning signal indicating the absence of a plug in said opening.

4,843,377

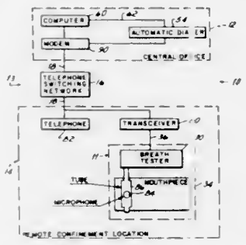
REMOTE CONFINEMENT SYSTEM

Kip L. Fuller, Denver, Colo., and Donald W. Collier, Chicago, Ill., assignors to Guardian Technologies, Inc., Cincinnati, Ohio

Filed Apr. 21, 1987, Ser. No. 41,698

Int. Cl.[4] G08B *23/00*; A61B *5/08*; H04N *7/18*; G06K *9/00*

U.S. Cl. 340—573 **216 Claims**



1. A method for determining from a central office the presence of a specified prisoner at a remote location where the prisoner is in unsupervised confinement, and for ascertaining the prisoner's compliance with a substance abuse restriction, said method comprising the steps of:

performing on a person at the remote location an unsupervised test for the effects of use of the restricted substance;

generating at the remote location a signal carrying information of a result of said test;

generating at the remote location a signal carrying information of the identity of the tested person; and

transmitting the generated signals from the remote location to the central office.

4,843,378

FAILURE ALARM DEVICE FOR AN APPLIANCE

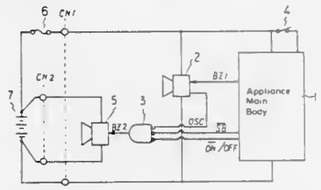
Kozo Kimura, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 22, 1987, Ser. No. 99,731

Claims priority, application Japan, Sep. 22, 1986, 61-223982

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—635 **1 Claim**



1. An alarm system for indicating fault conditions of an appliance comprising:

first alarm means for generating a first alarm signal in response to a first control signal indicative of fault conditions of an appliance, and generating an alarm failure signal when said first alarm means cannot generate said first alarm signal;

Means for generating a second alarm signal in response to both the fault conditions in said appliance and said alarm failure signal;

control means within said appliance for generating and applying said first control signal to said first alarm means and for generating a second control signal independently from said first control signal in response to the occurrence of fault conditions in said appliance, said first control signal and second control signal being generated synchronously at separate times and in opposite logic states with respect to each other;

ON/OFF circuit means for generating an ON signal when the appliance is energized with electrical power; and

AND gate means having first input coupled to said first alarms means for receiving said alarm failure signal, a second input for receiving said second control signal and a third input for receiving said ON signal, said AND gate means generating an output signal to cause said second alarm means to generate said second alarm signal only when said alarm failure signal, second control signal and ON signal are of the same logic state and are simultaneously applied to the first, second and third inputs thereof.

4,843,379

COLOR DISPLAYS

Peter W. Stansfield, Herts, England, assignor to Crosfield Electronics (USA) Limited, England

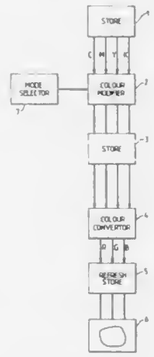
Filed Jun. 27, 1986, Ser. No. 879,740

Claims priority, application United Kingdom, Jun. 27, 1985, 8516232

Int. Cl.[4] G03F *3/08*

U.S. Cl. 340—701 **6 Claims**

1. A method of displaying an image on a monitor having a gamut of colours normally displayable thereon and wherein at least one image colour lies outside said gamut, said method comprising the step of applying a predetermined algorithm to all image colours in said image so as to desaturate all said image colours, including any image colour lying outside said gamut, while leaving hue and intensity unaffected, such that any out of gamut colour is represented by a respective different equivalent colour falling within said gamut.



4,843,380

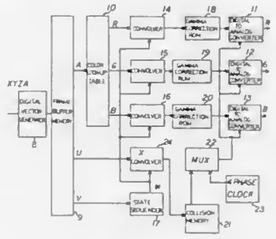
ANTI-ALIASING RASTER SCAN DISPLAY SYSTEM

David Oakley, and Donald I. Parsons, both of San Diego, Calif., assignors to Megatek Corporation, San Diego, Calif.

Filed Jul. 13, 1987, Ser. No. 72,757

Int. Cl.[4] G09G *1/06*

U.S. Cl. 340—723 **3 Claims**



1. In combination with a raster-scan display system in which the path of a writing beam over an array of a displayed image forming pixels is controlled by means of a analog cartesian deflection signals, a video signal processor for smoothing oblique and circular lines, which comprises:

a digital vector generator for generating digital data corresponding to vector locations defined by a display list, including intensity data and fractional address data respectively comprising a set of additional bits of precision corresponding to a first axis of displacement and a set of additional bits of precision corresponding to a second axis of displacement for each pixel;

a frame buffer memory for storing said digital data, including said intensity data and fractional address data;

means for assigning a plurality of fundamental colors to said intensity data;

means for convolving said intensity data with at least one kernel comprising weights function of a state controlled by the fractional addresses corresponding to said second axis of displacement, designed to transform said intensity data from one resolution in said frame-buffer memory to a different resolution in the displayed image, said means for convolving said intensity data further convolving said fractional address data corresponding to said first axis of displacement with said kernel in said state, said means for convolving said intensity data being also designed to determine boundaries between said pixels as a function of said fractional addresses corresponding to said first axis of displacement, on either side of said boundaries, said means for convolving said intensity data being related to the outputs of said means for assigning fundamental colors, wherein each of said means for convolving said intensity data for each of said axes of displacement further includes:

first means for delaying by one line period said digital data;

means for weighting said digital data delayed by said first means for delaying; and

means for summing said digital data after said data have been weighted by said means for weighting; and

wherein said means for convolving said intensity data for said first axis of displacement further comprises second means for delaying by one line period digital data corresponding to said first axis of displacement and for separating said data in left output data associated with the left boundary between said pixels and right output data associated with the right boundary between said pixels;

means for gamma correcting the outputs of each of said means for convolving said intensity data, said means for gamma correcting being related to the output of each of said means for convolving said intensity data;

a plurality of digital-to-analog converting means, each of which is placed at the output of each of said means for gamma correcting, for generating said analog deflection signals corresponding to each fundamental color signal in frame of said raster scan display system; and

means for synchronizing and timing, said means being connected to the input of said digital-to-analog converting means.

4,843,381

FIELD SEQUENTIAL COLOR LIQUID CRYSTAL DISPLAY AND METHOD

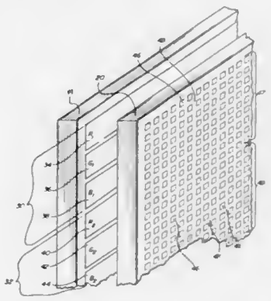
Yair Baron, Southfield, Mich., assignor to Ovonic Imaging Systems, Inc., Troy, Mich.

Continuation of Ser. No. 834,085, Feb. 26, 1986, abandoned.

This application Nov. 16, 1988, Ser. No. 274,638

Int. Cl.[4] G09G *3/36*

U.S. Cl. 340—784 **8 Claims**



1. A liquid crystal display for providing a color image from a plurality of primary colors, said display comprising:

a first image generating array of liquid crystal pixels arranged in a plurality of rows and columns, said pixels capable of being continuously and sequentially addressed for providing a continuously progressing sequence of frames of image fields, each frame including at least two image fields, each image field corresponding to a primary color;

a second color-providing array of liquid crystal pixels, said second array including a plurality of substantially parallel,

spacedly disposed, elongated pixel strips; each strip being substantially coextensive in length to one dimension of the first array and having one color filter associated therewith, each color filter corresponding to one of said primary colors, said pixel strips capable of being continuously and sequentially addressed for providing a continuously progressing sequence of primary color fields to said continuously progressing image fields;

a first light diffuser operatively disposed between said image generating array and said color-providing array, said light diffuser adapted to diffuse colored light from a single strip of said second array over at least two rows of pixels of said first array; and

a light source adapted to project uniform light onto said second array, thereby sequentially transmitting light fields of said primary colors onto the first light diffuser and the liquid crystal pixels of said first array in a continuously progressing sequence of image fields.

4,843,382

METHOD FOR MONITORING A DIGITAL TRANSMISSION LINE

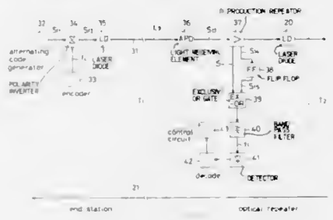
Hidenori Oda, and Hiroaki Yano, both of Tokyo, Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1986, Ser. No. 917,638

Claims priority, application Japan, Oct. 18, 1985, 60-230929

Int. Cl.[4] H04Q *9/00*

U.S. Cl. 340—825.060 **4 Claims**



1. A method for monitoring an optical digital transmission line including a plurality of repeaters disposed at predetermined intervals along a pair of optical fiber cables connected between two end stations, comprising transferring controlling information through said optical digital transmission line from one of said end stations, said controlling information comprising a first signal α repeated at a predetermined period $1/f_c$ for selectively identifying each of said repeaters, said first signal including a first alternating code S_{11} with a mark density of $\frac{1}{2}$ and a second alternating code S_{12} having a polarity inverted with respect to that of said first alternating code S_{11}, and a second signal β constituting a continuation of said first alternating code;

controlling each said repeater according to said controlling information by detecting and decoding the controlling information received thereby by extracting a frequency f_c with a first exclusive OR gate and a band pass filter coupled thereto in the respective repeater;

returning said first signal α from the respective repeater to said one end station at a repetition frequency f_m that is a function of said respective repeater; and

monitoring said repeaters and said optical digital transmission line at said one end station by extracting the frequency f_m from said returned first signal α with a second exlusive OR gate and a low pass filter coupled thereto in said end station.

4,843,383

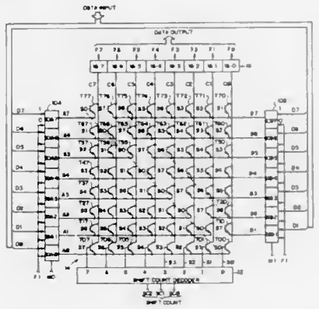
TRANSISTOR MATRIX SHIFTER

Scott Roberts, Puyallup; Steven Tibbitts, Spanaway, and Warren Snyder, Puyallup, all of Wash., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jan. 13, 1988, Ser. No. 143,774

Int. Cl.[4] H04Q *1/00*

U.S. Cl. 340—825.9 **7 Claims**



1. A matrix shifter for shifting the bits of a data word as the data passes between a set of input lines and a set of output lines, the matrix shifter comprising:

(a) a plurality of switching transistors arranged in a matrix, said matrix having rows, columns, and diagonals, one of said diagonals being a major diagonal of said matrix, each of said transistors having two electrodes and a control element, each row being associated with a particular input data bit, each column being associated with a particular output bit, and each row of said matrix being divided into first and second parts along said major diagonal;

(b) first multiplexer means for supplying to one of said two electrodes each transistor in said first part of said matrix either the associated input data bit or a fill signal;

(c) second multiplexer means for supplying to one of said two electrodes of each transistor in said second part of said matrix either the associated input data bit or a fill signal; and

(d) control means for supplying different control signals to the control element of all transistors along each of said diagonals of said matrix;

whereby data can be shifted right, left, or rotated between said input and said output depending on whether data or fill is supplied by said first and second multiplexers.

4,843,384

WIRELESS REMOTE CONTROL SYSTEM

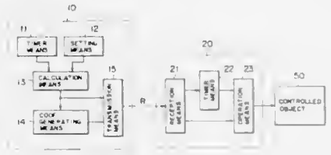
Yuichi Ide; Harunobu Nukushina, both of Fuji, and Naoki Ichien, Shizuoka, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 19, 1988, Ser. No. 195,903

Claims priority, application Japan, May 29, 1987, 62-133666

Int. Cl.[4] H04Q *1/00*

U.S. Cl. 340—825.69 **4 Claims**



1. A wireless remote control system having a hold-type wireless remote controller and a fixedly mounted main controller,

said wireless remote controller comprising:

clock means for providing a current time;

setting means for setting an operation time of a controlled object;

calculation means for calculating a difference between an operation time set by said setting means and a current time provided by said clock means and outputting the difference as a setting time;

code generating means for generating a first code representative of the setting time calculated by said calculation means and a second code for operating the controlled object; and

transmission means for transmitting the first code when said setting means sets the operation time, and the second code when the current time becomes the operation time; and

said main controller comprising:

reception means for receiving the codes from said transmission means;

timer means which is set by the first code received by said reception means; and

operation means for operating the controlled object if a logical OR condition is satisfied between a first signal indicating that said reception means has received the second code and a second signal indicating that said timer means has timed up.

4,843,385

ELECTRONIC LOCK SYSTEM FOR A TWO-WAY RADIO

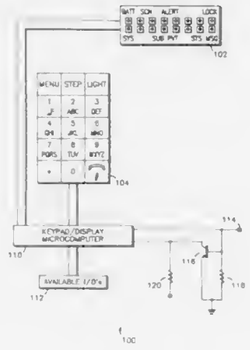
Jaime A. Borras, Hialeah, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 881,422, Jul. 2, 1986, abandoned. This application May 19, 1988, Ser. No. 198,713

The portion of the term of this patent subsequent to Jun. 2, 2004, has been disclaimed.

Int. Cl.[4] G06F *7/04*

U.S. Cl. 340—825.320 **5 Claims**



1. A two-way radio for use in a radio communication system, the radio having a receiver and a transmitter means and including an electronic lock system comprising:

keypad means for entering a security code for selectively locking and unlocking the radio,

memory means for retaining a programmed security code and radio identity information,

means, operatively connected to the keypad means and the memory means, for comparing the entered security code with the programmed security code, wherein when the radio is locked and the entered and programmed security codes match, the radio unlocks and when the codes do not match, the radio transmitter means is actuated to transmit a message including the radio identity information and indicating that an improper code has been entered.

4,843,386

REMOTE CONTROL UNIT WITH HIERARCHICAL SELECTION

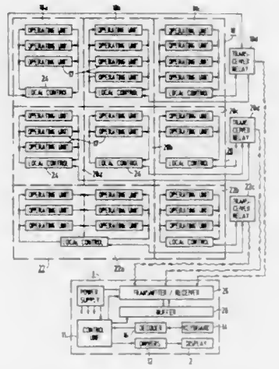
Johann Wolf, Pentling, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 8, 1987, Ser. No. 47,890

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1986, 3615953

Int. Cl.[4] H04Q *7/00, 9/00*; H04B *1/20*

U.S. Cl. 340—825.690 **17 Claims**



1. A remote control unit for a system having a plurality of remote operating units organized into groups, said control unit comprising:

wireless transmitter means for sending signals to the operating units;

a keyboard including a plurality of manually actuatable control keys;

selection means for selecting which of said operating units is to be subject to a control operation, said selection means comprising hierarchical selection means wherein each activation of a manually actuatable stop key operatively coupled to said hierarchical selection means calls up related and progressively smaller groups of said operating units and wherein each activation of a manually actuatable sequencing key operatively coupled to said hierarchical selection means calls up a predetermined sequence of operating units within each group of operating units; and

control means responsive to said control keys for generating, in response to signals from said control keys, control signals for modifying the operating state of one of said operating units selected in accordance with signals from said selection means, said control means being operatively connected to said transmitter means for transmitting said control signals to said one of said operating units via said transmitter means.

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4,843,387

VARIABLE CAPACITANCE TYPE ENCODER

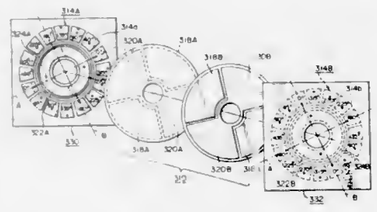
Yoshihiro Arai, Tokyo; Kouji Sasaki, and Takanori Ohsaki, both of Kanagawa, all of Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Division of Ser. No. 866,787, May 23, 1986, abandoned, which is a continuation of Ser. No. 185,348, Apr. 20, 1988. This application Apr. 20, 1988, Ser. No. 183,975

Claims priority, application Japan, May 23, 1985, 60-111826; May 23, 1985, 60-111827; May 27, 1985, 60-114474

Int. Cl.[4] G01D *5/243*; G01B *7/30*

U.S. Cl. 340—870.37 3 Claims



1. A variable capacitance type encoder comprising:

a rotary disc which is rotatably mounted on a frame body and rotates in accordance with the amount of movement of a probe; and

first and second fixed plates which are secured to said frame body such as to be opposed to each other with said rotary disc therebetween;

wherein at least one of said first and second fixed plates is provided with a first transmitting electrode composed of a plurality of electrode elements to which alternating voltages of different phases are applied and which are annularly arranged at regular intervals in the circumferential direction of said at least one of said fixed plates;

wherein at least one of said first and second fixed plates is provided with a second transmitting electrode which is composed of a plurality of electrode elements to each of which is applied an alternating voltage 180° out-of-phase with respect to that applied to each electrode element of said first transmitting electrode in the same circumferential location about the fixed plate and which are annularly arranged at regular intervals in the circumferential direction of said at least one of said fixed plates;

wherein said rotary disc is provided with first and second receiving electrodes which are opposed to said first and second transmitting electrodes, respectively, and which receive signals of a common phase by electrostatic coupling;

wherein an output electrode is provided on a surface of at least one of said fixed plates for fetching the receiving signals from said first and second receiving electrodes, whereby the rotary displacement of the rotary disc is detected on the basis of the output signal of said output electrode which varies in accordance with the rotation of said rotary disc;

wherein said first fixed plate is provided with said first transmitting electrode and said output electrode comprises a first output electrode which is disposed on the inside of said first transmitting electrode through a shield ring;

wherein said second fixed plate is provided with said second transmitting electrode and a second output electrode disposed on the inside of said second transmitting electrode through a shield ring;

wherein said rotary disk is provided with said first receiving electrode which is provided extendingly in the radial direction such as to be opposed to both said first transmitting electrode and said first output electrode and said second receiving electrode which is provided extendingly in the radial direction such as to be opposed to both said second transmitting electrode and said second output electrode; and

wherein said first and second receiving electrodes are opposed to respective predetermined electrode elements of the first and second transmitting electrodes to which alternating voltages of a common phase are applied.

4,843,388

ROTARY ENCODER, AND METHOD OF MANUFACTURING SAME

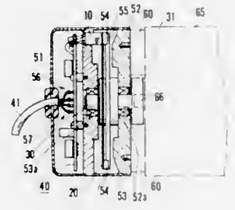
Takehiko Miyamoto, 6-19, Shimoshakujii 1-chome, Neriam-ku, Tokyo, Japan

Filed May 6, 1987, Ser. No. 46,931

Claims priority, application Japan, May 12, 1986, 61-106765; Jul. 7, 1986, 61-157980

Int. Cl.[4] H03M *1/24*

U.S. Cl. 341—15 13 Claims



1. A rotary encoder for controlling the movement and stopping position of an object under control of said rotary encoder which is adapted to be controlled by said rotary encoder comprising:

a rotary disk having a magnetic surface area deposited thereon for recording signals, and having a drive shaft for said rotary disk being adapted for rotating said rotary disk by an amount proportional to movement of an object under control of said rotary encoder; and

a write/read head means arranged at a position opposing said rotary disk on a radius of rotation thereof for writing signals indicative of disk position information on the surface of said rotary disk and for reading written information from the rotary disk as magnetic graduations indicative of positional information which can be read by said write/read head means;

control point writing means for writing at least one control movement and stopping position information signal on said magnetic surface area for controlling the object to be controlled by said rotary encoder including a writing portion of said write/read magnetic head positioned at a corresponding writing position for said rotary disk, said write/read head means being constructed and adapted for reading after a control movement and stopping position information signal is written to read the information supplied by the said movement and stopping position information signal by a reading portion of said write/read magnetic head means, thereby detecting arrival at a control position of the object to be controlled by said rotary encoder when said object is coupled to said drive shaft of the rotary encoder.

4,843,389

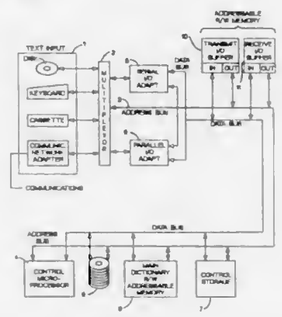
TEXT COMPRESSION AND EXPANSION METHOD AND APPARATUS

Ronald J. Lisle, Austin, Tex.; Enal A. Moss, Raleigh, and John H. Ryder, Durham, both of N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 4, 1986, Ser. No. 937,799

Int. Cl.[4] H03M *7/42*

U.S. Cl. 341—106 3 Claims



1. A method of data compression, comprising steps of:

separating an uncompressed, coded data stream into units;

comparing said units against at least one user-selected dictionary of units having compressed code equivalents for each unit stored in association with the uncompressed encoded units; and

outputting a header for compressed data comprising indications for defining the identity of each of said user-selected dictionaries used in compressing said data;

outputting the compressed code equivalents for incoming units for which a true comparison is found in said comparing step and outputting the uncompressed encoded character stream for any said unit for which no true comparison is found; and

arranging the entries in said dictionaries for said units in an order of merit which is the weighted frequency of use established by multiplying the average frequency of occurrence of each said unit in the language in which it is used by its length in characters and arranging the resulting products of said multiplying in decreasing order of magnitude.

4,843,390

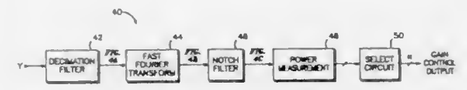
OVERSAMPLED A/D CONVERTER HAVING DIGITAL ERROR CORRECTION

Nicholas R. van Bavel, and Tim A. Williams, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 24, 1988, Ser. No. 159,858

Int. Cl.[4] H03M *1/18*

U.S. Cl. 341—139 7 Claims



1. An oversampled A/D converter having digital error correction for converting an analog input signal to a digital output signal, said converter having a plurality of quantization loops, each of the loops comprising:

an integrator for integrating a difference between an input terminal signal and a feedback signal, an integrator of a first quantization loop having a first predetermined gain; and

a quantizer for quantizing an output from the integrator and providing a loop output signal;

said converter further comprising:

gain means coupled to a quantizer of a second quantization loop for amplifying the output of the second quantization loop by a second predetermined gain;

means for combining the loop output signals of the plurality of quantization loops to form the digital output signal; and

control means coupled to gain means for selectively varying the second predetermined gain in response to the output signal, said control means setting the second predetermined gain equal to a value which results in the first predetermined gain being substantially equal to a reciprocal of the second predetermined gain.

4,843,391

SYSTEM FOR ANALOG-DIGITAL-ANALOG CONVERSION

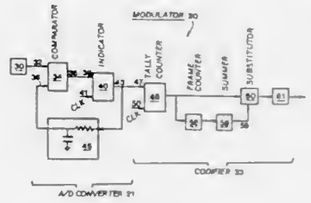
George O. Lersout, 320 Campus Parkway, Chatham, Ontario N7L 5A8, Canada

Filed Aug. 10, 1987, Ser. No. 83,277

Claims priority, application United Kingdom, Aug. 11, 1986, 8619500

Int. Cl.[4] H03M *3/02*

U.S. Cl. 341—143 6 Claims



1. in a system comprising an a-to-d means for converting an analogue signal into a corresponding stream of high and low pulses, and a d-to-a means for converting a stream of pulses into a corresponding analogue signal;

a method for modifying the stream of pulses to enhance the transmissibility and storability thereof, which comprises the steps: in a codifying means:

1. of receiving the stream of pulses from the said a-to-d means;
2. of counting off a batch number (B) of the pulses in the stream;
3. of computing how many (herein termed a tally value, T) of the pulses in the batch are of one of the levels;
4. of generating a group of bits, N bits long, the value of which corresponds to T;
5. and of outputting successive groups of N bits as a bit-stream;

and, in a de-codifying means:

1. of receivng the bit-stream;
2. of counting off a group of N bits in the stream;
3. of computing the tally value T of that group of N bits;
4. of generating a batch of B pulses, T of which are of the said first kind;
5. and of passing the successive batches of B pulses to the d-to-a means;

wherein the numbers B and N of the codifying means correspond to numbers B and N of the de-codifying means;

and wherein the number N is substantially smaller than the number B;

the method further comprising:

a method for effecting a change of gain in the converters, which comprises the steps:

of detecting whether the respective tally value T of the

VOL 1103 ISS 4 JE 27 1989 UMI

batches of pulses is an extreme value, or is a median value, or is neither;

of providing respective, operable gain-change means, one in each of the two converters, which are effective, when operated to make a predetermined corresponding change in the gains of the two converters;

of operating the two gain-change means in response to the tally value T being an extreme value;

and of de-operating the two gain-change means in response to the tally value T of the batches being a median value.

4,843,392

DIGITAL-TO-ANALOG CONVERTER WITH DIGITAL CORRECTION

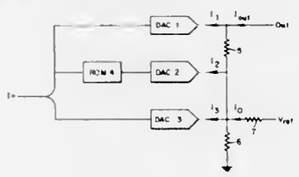
Zdzislaw Gulczynski, P.O. Box 441, Winchester, Mass. 01890

Continuation of Ser. No. 858,701, May 2, 1986. This application Mar. 23, 1988, Ser. No. 177,864

Claims priority, application Fed. Rep. of Germany, May 3, 1985, 3516005

Int. Cl.[4] H03M *1/66*

U.S. Cl. 341—145 **6 Claims**



1. Digital-to-analog converter having output, for converting digital input code, having most and least significant bits, into analog output signal, comprising:

a first digital-to-analog converter means coupled to the output of the digital-to-analog converter for converting the most significant bits into a first current;

a programmable memory means for converting the most significant bits into a digital correction code;

a second digital-to-analog converter means having an output, for converting the digital correction code into a second current;

a third digital-to-analog converter means coupled to the output of the second digital-to-analog converter means for converting the least significant bits into a third current,

wherein the first, second and third currents have essentially equal weights;

a source means for providing a fourth current; and

a resistive means for coupling the output of the second digital-to-analog converter means and the source means to the output of the digital-to-analog converter.

4,843,393

D/A CONVERTER

Yoshiaki Kuraishi, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation of Ser. No. 38,951, Apr. 15, 1987, abandoned. This application Aug. 24, 1988, Ser. No. 235,771

Claims priority, application Japan, Apr. 17, 1986, 61-88639

Int. Cl.[4] H03M *1/80*

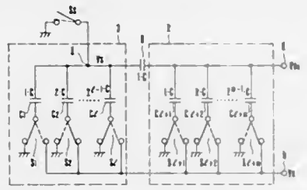
U.S. Cl. 341—150 **3 Claims**

1. A D/A converter converting a (l+m)-bit digital input signal to an analog signal, where both l and m are natural numbers, the D/A converter comprising:

a first stage capacitor ladder which converts the less significant l bits of the (l+m)-bit digital input signal and includes l capacitors having one side electrodes thereof commonly connected to a first point and capacitances binary-increased from $2^0\times C$ to $2^{l-1}\times C$, where C is a unit capacitance;

a second stage capacitor ladder which converts the more significant m bits of the (l+m)-bit digital input signal and includes m capacitors having one side electrodes thereof commonly connected to a second point and capacitances binary-increased from $2^0\times C$ to $2^{m-1}\times C$;

a coupling capacitor having a capacitance of $1\times C$ and connected between said first and second points;



(l+m) switches connected with another side electrodes of said (l+m) capacitors in one-to-one correspondence for selectively connecting the another side electrodes of said (l+m) capacitors to a first or second reference voltage in response to the (l+m)-bit digital input signal; and

a short-circuiting switch connected between the first reference voltage and said first point of said first stage capacitor ladder.

4,843,394

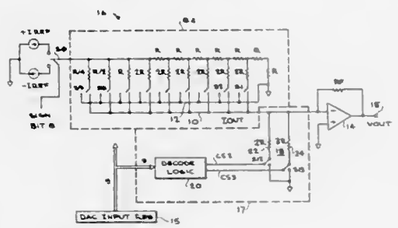
DIGITAL-TO-ANALOG CONVERTER WITH NO OFFSET-INDUCED ERRORS

Alfredo R. Lioz; Joe W. Peterson, and Velayudhan V. Nair, all of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jan. 21, 1988, Ser. No. 146,459

Int. Cl.[4] H03M *1/78*

U.S. Cl. 341—154 **1 Claim**



1. A digital-to-analog converter network for converting a digital input signal having a plurality of binary bits into an analog output signal comprising:

an R-2R ladder array (**8***a*) having 2R elements defining ladder sections corresponding in number to the number of binary bits and 1R elements connecting each of the ladder sections;

a reference current source (IREF) being applied to the input of said ladder array (**8***a*) at the MSB end;

a plurality of switch means (**S1**, **S2**, . . . **S9**) each being associated with one of the ladder sections and being controlled by a respective binary bit of the digital input signal for switching current flowing through its respective ladder sections between an output current summing line (**10**) and a reference line (**12**);

an operational amplifier (**14**) having its inverting input connected to the summing line (**10**), its non-inverting input connected to the reference line (**12**), and its output connected to an output terminal (**15**) to provide the analog output signal;

said ladder array (**8***a*) having an output impedance between the summing line (**10**) and the reference line (**12**) which varies as a function of binary codes of the digital input signal so as to create an offset-induced error current;

equalization means (**17**) operatively connected to the inverting input of said operational amplifier (**14**) for selectively switching in a code-dependent impedance so that the effective output impedance of the ladder array (**8***a*) remains substantially constant with said binary codes;

said equalization means (**17**) including a code-dependent impedance circuit (**18**) connected between the inverting input of said operational amplifier (**14**) and the ground potential and a decode logic circuit (**20**) responsive to the binary codes for generating control signals (CS2, CS3) to said code-dependent impedance circuit (**18**); and

said code-dependent impedance circuit (**18**) including a plurality of resistors (**22**, **24**) and a corresponding number of impedance switches (**S12**, **S13**), each resistor having one end connected to the inverting input of said operational amplifier (**14**) and its other end connected to a respective impedance switch, said impedance switches (S12, S13) being responsive to a corresponding control signal for selectively connecting said corresponding resistor to the ground potential.

4,843,395

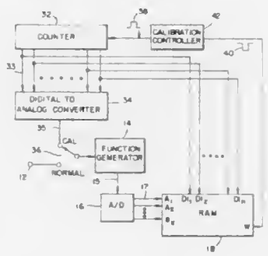
LARGE DYNAMIC RANGE ANALOG TO DIGITAL CONVERTER

Arthur L. Morse, Carlsbad, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 11, 1987, Ser. No. 95,500

Int. Cl.[4] H03M *1/18*

U.S. Cl. 341—156 **15 Claims**



1. A system for converting an analog signal into a digital representation of the analog signal comprising:

function generator means for compressing a dynamic range of an input analog signal, said generator means producing an output analog output signal having a dynamic range which is less than the dynamic range of the input analog signal by a predetermined transfer function;

analog-to-digital converter means for converting the output analog signal into a first digital representation of the output analog signal, said digital representation having a first predetermined number of bits; and

conversion memory means for converting said first digital representation into a second digital representation having a value linearly related to the amplitude of the input analog signal, said second digital representation having a second predetermined number of bits being greater than the first predetermined number of bits.

4,843,396

TRIHEDRAL RADAR REFLECTOR

Arunas Macikunas, Hamilton; Simon Haykin, Ancaster, and Terrence Greenlay, Dundas, all of Canada, assignors to Canadian Patents and Development Limited/Societe Canadienne des Brevets et d'Expolitation Limitée, Ottawa, Canada

Continuation of Ser. No. 798,538, Nov. 15, 1985, abandoned. This application Nov. 16, 1987, Ser. No. 120,722

Claims priority, application Canada, Nov. 21, 1984, 468365

Int. Cl.[4] H01Q *15/18*

U.S. Cl. 342—7 **11 Claims**

1. A passive, non-powered trihedral corner reflector comprising three mutually substantially orthogonal conducting surfaces, a passive, non-powered polarizing grid located parallel to and spaced above one of the conductive surfaces, said non-powered polarizing grid consisting of an array of parallel passive grid conductors, the conductors being oriented parallel to a corner junction of two of the surfaces of the trihedral corner reflector to give symmetrical electromagnetic images of the polarizing grid in the other two orthogonal conducting surfaces, the grid conductors being proportioned and spaced apart so as to reflect a polarization component of an incident signal parallel to said conductors and to permit passage of a polarization component of the incident signal substantially perpendicular to the conductors, the grid conductive surface such that the transmitted component when reflected from the conducting surface is about 180° out of phase with the reflected component and the resulting reflected signal has a polarization substantially 90° different with respect to that of the incident signal.

4,843,397

DISTRIBUTED-ARRAY RADAR SYSTEM COMPRISING AN ARRAY OF INTERCONNECTED ELEMENTARY SATELLITES

Gaspare Galati, and Giacinto Losquadro, both of Rome, Italy, assignors to Selenia Spazio Spa, L'Aquila and Gaspare Galati, Rome, both of, Italy

Filed Mar. 25, 1988, Ser. No. 173,727

Claims priority, application Italy, Mar. 26, 1987, 47772 A/87

Int. Cl.[4] H04B *07/06*

U.S. Cl. 342—59 **20 Claims**

1. A radar system for primary and secondary surveillance of an airspace, comprising:

a plurality of elementary satellites spaced apart in a distributed array in space and each provided with:

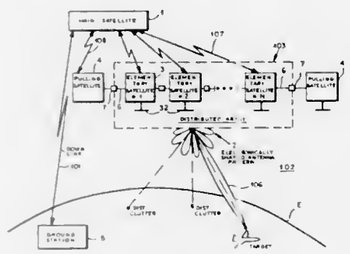
an antenna element forming with the antenna elements of the other elementary satellites of the distributed array a phased array antenna of an area corresponding substantially to the area of said distributed array of elementary satellites,

receiver means connected to said antenna element for receiving radar signals from said airspace,

transmitter means connected to said antenna element for transmitting radar signals into said airspace, and

communication means for receiving signals for controlling the element and transmitting radar signals from the elementary satellite;

a main satellite spaced from said distributed array of elementary satellites in space and provided with communication means in communication with the communication means



of each of said elementary satellites for transmitting signals for controlling the antenna element thereof and for receiving radar signals transmitted from individual ones of said elementary satellites; and

a ground station in wireless communication with said main satellite for receiving radar information from said main satellite corresponding to the radar signals received thereby and transmitted from the individual ones of said elementary satellites.

4,843,398

TRACKING RADAR SYSTEM

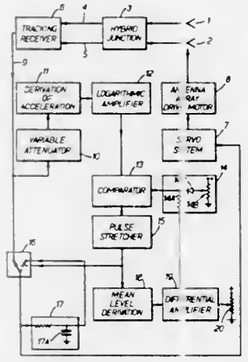
William Houston, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Aug. 5, 1980, Ser. No. 178,854

Claims priority, application United Kingdom, Aug. 7, 1979, 7927496

Int. Cl.⁴ G01S *13/58*

U.S. Cl. 347—74 **10 Claims**



1. A tracking radar system having: an antenna with at least one boresight; means for producing signals indicating an angular difference between the direction of a target and the said one boresight; means for changing said boresight in response to the said signals so as to tend to reduce the difference; control means for preventing said boresight responding to signals indicating that a function of the velocity of the target is greater than a threshold; and means for varying the threshold thereby tending to keep constant the proposition of a time period during which the threshold is exceeded.

4,843,399

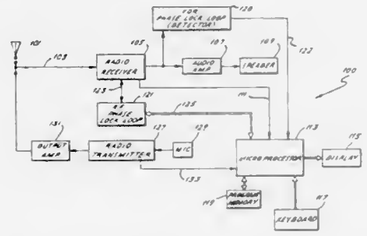
PORTABLE NAVIGATIONAL COMMUNICATIONS TRANSCEIVER

Robert A. Bongiorno, Glenside, and John F. Smith, Warminster, both of Pa., assignors to Narco Avionics, Inc., Fort Washington, Pa.

Filed Jul. 30, 1986, Ser. No. 892,065

Int. Cl.⁴ G01S *1/44*

U.S. Cl. 342—404 **16 Claims**



1. A navigational communications transceiver for providing radio communication, bearing information and a localizer signal indicator, comprising:

antenna connection;

a radio receiver circuit connected to said antenna connection;

an audio amlifier circuit connected to said radio receiver circuit;

a speaker connected to said audio amplifier circuit;

a RF phase lock loop circuit connected to said radio receiver circuit;

a microprocessor connected to said phase lock loop circuit and to said radio receiver circuit;

a display connected to said microprocessor;

a keyboard connected to said microprocessor;

a radio transmitter circuit connected to said microprocessor;

a microphone connected to said radio transmitter circuit;

an output amplifier circuit connected to the output of said radio transmitter circuit, the output of said output amplifier circuit being connected to said antenna connection;

a VOR phase lock loop circuit connected between said radio receiver and said microprocessor; and

a programmable memory connected to said microprocessor and containing instructions:

wherein said memory and the instructions thereof operate in conjunction with said microprocessor to calculate bearing information and to provide the bearing decoder function whereby the phase difference between two signals establishes an electronic counter period wherein pulses received are counted and converted into bearing information by said microprocessor under stored program instructions, this calculation being performed entirely within the microprocessor and memory structure.

4,843,400

APERTURE COUPLED CIRCULAR POLARIZATION ANTENNA

Chich-Hsing Tsao, and Thomas E. Roberts, both of Saratoga, Calif., assignors to Ford Aerospace Corporation, Newport Beach, Calif.

Filed Aug. 9, 1988, Ser. No. 230,107

Int. Cl.⁴ H01Q *1/38*

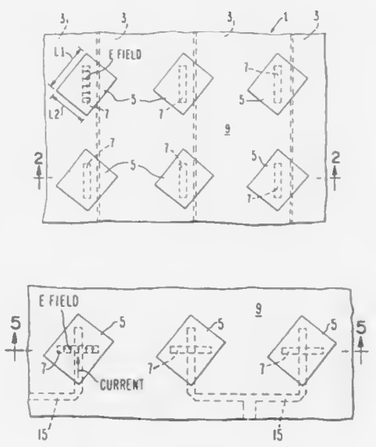
U.S. Cl. 343—700 MS **8 Claims**

1. An antenna element for generating circularly polarized electromagnetic signals, comprising:

a single elongated excitation aperture cut in a planar conductive ground plane;

in spaced parallel relation to the ground plane and completely covering the excitation aperture when viewed from a direction orthogonal to the ground plane, a planar conductive radiating patch havng slightly different dimensions along each of two orthogonal axes, with each said dimension being greater than the length of the excitation aperture; and

a first planar dielectric layer separating the ground plane and the aperture from the radiating patch; wherein



the excitation aperture forms an angle of substantially 45°, viewed from a direction orthogonal to the plane of the radiating patch, with respect to each of the two orthogonal axes of the radiating patch; whereby

exciting the aperture with linearly polarized electromagnetic energy causes the radiating patch to generate a circularly polarized electromagnetic signal consisting of two orthogonal components that have substantially the same amplitude and are 90° offset in phase from each other.

4,843,401

METHOD AND APPARATUS FOR GENERATING AND RADIATING ELECTROMAGNETIC ENERGY

Ronald M. Bass, Houston, Tex., assignor to Atlantic Richfield, Los Angeles, Calif.

Filed Jan. 26, 1988, Ser. No. 148,672

Int. Cl.⁴ H01Q *1/00*

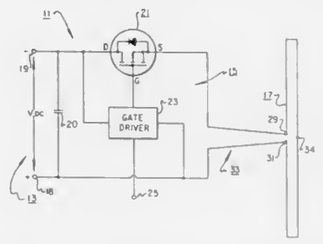
U.S. Cl. 343—701 **20 Claims**

1. An apparatus for generating and radiating electromagnetic energy, comprising:

a. a radiating member having feed inputs and radiating elements, said radiating elements being shorted together at a point away from said feed inputs so as to form a shorted circuit, said radiating member having a resonant frequency;

b. an input port having two terminals across which a single polarity input voltage is applied;

c. switching means for switching the application of said input voltage to said feed inputs on and off, said switching means being connected with one of said feed inputs such that said switching means is connected in series with said radiating member, said switching means and said radiating member being connected across said input port terminals such that said input voltage is applied to said radiating member through said switching means, said switching means alternating betwen a conductive state wherein said radiating member is electrically connected to said input voltage and a non-conductive state wherein said radiating member is electrically disconnected from said input voltage;



d. driver means for operating said switching means so as to cause said switching means to switch alternatively between the conductive and non-conductive states at a frequency which is essentially the same as the resonant frequency of said radiating member, said driver means being connected to said switching means.

4,843,402

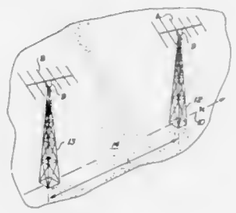
AZIMUTH ARRAY OF ROTORY ANTENNAS WITH SELECTABLE LOBE PATTERNS

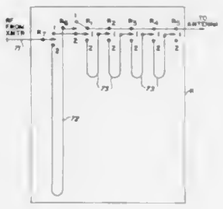
A. J. F. Clement, McFarland, Calif., assignor to Tri-ex Tower Corporation, Visalia, Calif.

Filed Jun. 27, 1986, Ser. No. 879,383

Int. Cl.⁴ H01Q *3/04*

U.S. Cl. 343—758 **2 Claims**





1. A radio transmission antenna system, comprising:

(a) an array of rotatable directional antennas, spaced apart S half-wavelengths at a characteristic design frequency, along a geographic azimuth line having a center, where S is a positive integer at least equal to 2;

(b) means for separately rotating said antennas to direct their respective major lobes along parallel lines in a selected direction relative to said azimuth line;

(c) means for providing first and second phase adjustments

of the phase of identical rf signals fed to each antenna of said array,

(i) a first phase adjustment of 180 electrical degrees in the phase of identical signals fed to adjacent antennas in the array, when required to produce a coherent wave-front in said selected direction,

to establish radiation patterns, in a given azimuthal quadrant, which provide major lobes, established by rotating said antennas, at 0° and 90° relative to said azimuth line and at at least one intermediate angle therebetween, and

(ii) a second phase adjustment in equal, opposite magnitudes of the signals fed to antennas spaced equally from the geographic center of said array,

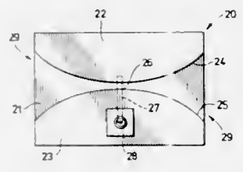
to electrically wobble the direction of the major lobe of said coherent wave-front established by said first adjustment.

4,843,403

BROADBAND NOTCH ANTENNA

Farzin Lalezari; Charles G. Gilbert, both of Louisville, and John M. Rogers, Boulder, all of Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Jul. 29, 1987, Ser. No. 79,182
Int. Cl.[4] H01Q *1/38 13/00*
U.S. Cl. 343—767 **12 Claims**



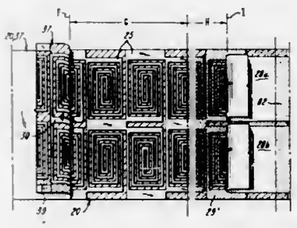
1. An antenna structure for receiving or transmitting electromagnetic waves comprising a substrate having an outer surface, a first conducting radiator disposed on one side of the outer surface of said substrate and having a first curved edge, a second conducting radiator disposed on the other side of the outer surface of said substrate and having a second curved edge, said first and second curved edges being closely related to one another and spaced apart in close proximity at one point to define a feed-point gap therebetween with adjacent curved edges gradually tapering outwardly therefrom to define first and second continuous flared notches interfacing one another and emanating from said feed-point gap.

4,843,404

TAG WEB OF SPIRAL CONDUCTORS

S. Eugene Benge, Middletown, and Robert L. Froning, Kettering, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 912,466, Sep. 29, 1986, Pat. No. 4,717,438. This application Oct. 23, 1987 Ser. No. 111,949
Int. Cl.[4] H01Q *1/36; G08B 13/18*
U.S. Cl. 343—895 **5 Claims**



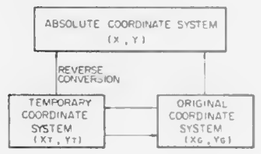
1. A tag web including tags for use in electronic article surveillance systems, the tag web comprising: a first web including first spiral conductors having turns in a first pattern and second spiral conductors having turns in a second pattern, a second web including first spiral conductors having turns in a first pattern and second spiral conductors having turns in a second pattern, wherein the second pattern corresponds in shape to space between and adjacent turns of the first pattern, wherein the first conductors of the first web and the second conductors of the second web are in generally face-to-face alignment but spaced apart and connected in pairs to provide first resonant circuits, and wherein the second conductors of the first web and the first conductors of the second web are in generally face-to-face alignment but spaced apart and connected in pairs to provide second resonant circuits.

4,843,405

METHOD OF CONTROLLING REPRODUCTION OF IMAGE IN BIT-MAP CONTROLLED LASER PRINTER

Takashi Morikawa, and Yoshikazu Ikenoue, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 10, 1988, Ser. No. 204,717
Claims priority, application Japan, Jun. 12, 1987, 62-147606
Int. Cl.[4] G01D *9/00, 9/42; G06F 15/626*
U.S. Cl. 346—1.1 **2 Claims**



1. In a printer apparatus wherein information relating to character patterns to be printed is received from an external source and is analyzed and converted into intermediate coded data, which are stored into a temporary memory and are thereafter successively read from the temporary memory to produce bit-map image data representative of the character patterns to be printed for each page of printed output, whereupon the bit-map image data is stored into a bit-map memory by referring to a font memory and the character patterns are printed on the basis of the bit-map image data read from the bit-map memory for each page of printed output, a method of converting said information into said intermediate coded data and storing the intermediate coded data into said temporary memory, comprising

(a) a step of initially producing a parameter indicating the direction of printing in which character patterns are to be printed along a line, said parameter being given in terms of an angular shift from a predetermined direction of printing,

(b) a step of analyzing said information received from said external source to determine whether or not the direction of printing designated by said information is identical with the direction of printing indicated by said parameter,

(c) a step of updating said parameter if the direction of printing designated by said information is not identical with the direction of printing indicated by the previously set parameter,

(d) a step through which a coordinate value representative of a particular location at which the printing of a character pattern is to be started is transformed from one coordinate system into another on the basis of the updated parameter such that said coordinate value corresponds to a coordinate value in the coordinate system on said bit-map memory, and

(e) a step of storing the updated parameter and the transformed coordinate value into said temporary memory,

(f) said steps (b), (c) and (d) being executed in respect to the information relating to each of said character patterns whereby the intermediate coded data for all of said character patterns are stored into said temporary memory to store the bit-map image data for each of the character patterns into said bit-map memory

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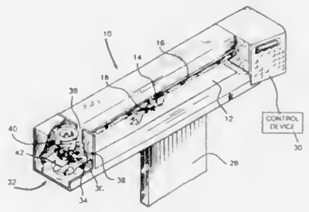
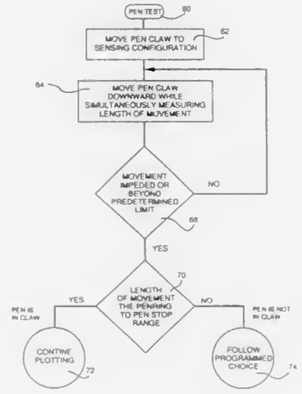
4,843,406

METHOD AND APPARATUS FOR DETECTING THE PRESENCE OR ABSENCE OF A PEN IN PEN RECORDER

Richard A. Murray, San Diego; John White, Escondido, and George K. Branner, San Diego, all of Calif., assignors to Enter Computer, Inc., San Diego, Calif.

Filed Dec. 17, 1987, Ser. No. 134,032
Int. Cl.[4] G01D *9/00, 15/16, 9/30; G06F 15/626*
U.S. Cl. 346—1.1 **15 Claims**





1. A method for sensing whether a pen is in the grasp of a pen claw of a drawing arm of a plotter or other graphics mechanism, the graphics mechanism also having a reference stop, the pen including an annular ring extending therefrom, the pen claw defining a reference ring by systematically positioning said pen so that said annular ring defines a pen reference ring, said pen reference ring being present with respect to the pen claw regardless of the existence of the pen, said pen claw being vertically movable a reference distance between an upward position and a downward position, said method comprising the steps of:

first, positioning the pen claw in the upward position;

second, positioning the drawing arm proximate to the reference stop, so that the reference ring is held by the pen claw above the reference stop;

third, energizing the pen claw to move downward while measuring a test distance that the pen claw has moved from the upward first position until the pen claw is substantially impeded in its downward movement or until the pen claw attains the downward position, whichever occurs first; and

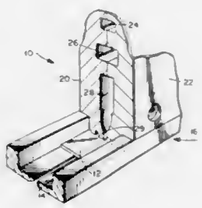
fourth, comparing the test distance that the pen has moved with the reference distance from the upward position to the downward position of the pen claw, to conclude either that the annular ring of the pen has substantially impeded downward movement of the pen claw by contact with the reference stop or that the reference ring has passed unimpeded through the reference stop, thereby confirming either an existence or a lack of a pen in the pen claw.

4,843,407

FLUID DISTRIBUTION BAR FOR FLUID-JET PRINTING

Timothy H. V. Archer, Centerville, and James C. Rouch, Bellbrook, both of Ohio, assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Aug. 18, 1987, Ser. No. 86,491
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—75 **18 Claims**



1. Apparatus for supplying fluid to the orifice plate of a fluid-jet applicator assembly comprising:

a generally horizontally disposed elongated fluid distribution bar having first and second elongated channels extending from adjacent one end of said bar to adjacent the opposite end of said bar, said second channel being disposed above said first channel;

means carried by said bar defining an inlet for supplying fluid to said channels;

means carried by said bar defining an elongated slot for flowing fluid outwardly of said first channel for flow through the orifice plate;

means carried by said bar defining at least one port providing communication between said channels; and

means carried by said bar for directing gases entrained in the fluid in said first channel to said port for flow through said second channel outwardly of said bar.

4,843,408

THERMAL RECORDING DEVICE

Kazuyuki Tanaka, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Aug. 18, 1986, Ser. No. 897,717
Claims priority, application Japan, Aug. 16, 1985, 60-180298
Int. Cl.[4] G01P *15/10; H04N 1/21*
U.S. Cl. 346—76 PH **8 Claims**

1. A thermal recording device of the type wherein each picture element is recorded on a recording paper in the form of a plurality of dots arranged in N rows and M columns (N, M: integer not smaller than 2) and a gradation of the picture element is determined by means of a dot pattern and the density of each dot according to gradation information,

the improvement comprising:

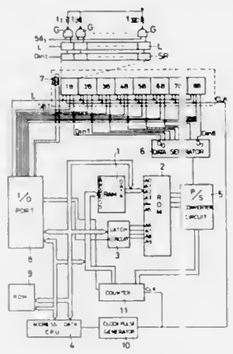
a plurality of heating elements arranged along a line so as to cover entirely the width of a recording paper and divided into a plurality of blocks for recording gradated picture elements;

a circuit for generating data relating to the dot pattern of

each picture element and the density of each dot to be recorded on the basis of the gradation information of each picture element;

memory circuits provided in the respective blocks for storing the data fed from the first-mentioned circuit and assigned to the respective blocks to operate the same; and

a data separator provided for directly distributing the assigned data to the respective memory circuits from the first-mentioned circuit.



4,843,409

THERMAL TRANSFER PRINTER

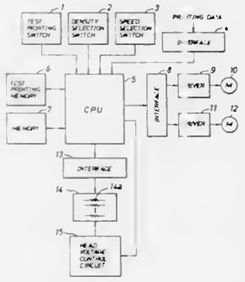
Masatoshi Matsuzaki, Kobe, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1987, Ser. No. 75,646

Claims priority, application Japan Jul. 22, 1986, 61-111516[U]

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH 9 Claims



1. A print testing control apparatus for the thermal transfer printer comprising: print density changing means for changing printing density of the thermal transfer printer, speed changing means for changing printing speed of the thermal transfer printer, and control means for controlling said print density changing means and said speed changing means to perform test printing by changing combinations of the printing density and the printing speed.

4,843,410

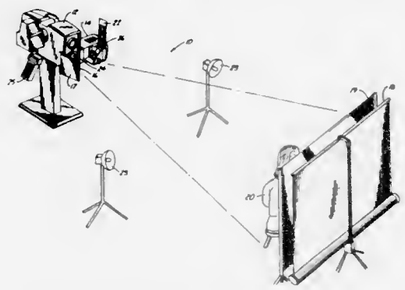
CAMERA AND PROJECTOR ALIGNMENT FOR FRONT SCREEN PROJECTION SYSTEM

Karl J. Kallenberg, Richfield, Minn., assignor to Lifetouch National School Studios Inc., Minneapolis, Minn.

Filed Feb. 4, 1988, Ser. No. 152,249

Int. Cl.[4] G03B *29/00*

U.S. Cl. 354—77 16 Claims



1. A front screen projection system comprising:

a camera with an optical axis;

a projector with an optical axis;

mounting shoe means attached to the camera;

mounting foot means attached to the projector to detachably engage the mounting shoe means for mounting the projector to the camera whereby the optical axis of the camera and the optical axis of the projector are caused to intersect at substantially the same point notwithstanding repeated assembly and disassembly of the system;

quick release lever means for locking the mounting foot means into the mounting shoe means;

beam splitter means for substantially merging the optical axis of the camera and the optical axis of the projector; and

beam splitter support and alignment means for demountably supporting the beam splitter means across the point of intersection of the optical axis of the camera and the optical axis of the projector.

4,843,411

CAMERA CONTAINING A LENS BARRIER THEREIN

Hiroshi Wakabayashi, Yokohama; Daiki Tsukahara, Kawasaki; Kiyosada Machida, Urawa; Yuji Katano, and Hidenori Miyamoto, both of Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Mar. 1, 1988, Ser. No. 162,447

Claims priority, application Japan, Mar. 10, 1987, 62-33890[U]

Int. Cl.[4] G03B *17/04*

U.S. Cl. 354—187 4 Claims

1. A camera comprising:

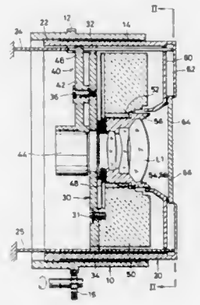
a photo-taking optical system;

a first barrel provided for rotation about the optic axis of said photo-taking optical system;

a second barrel fitted to the inside of said first barrel and holding said photo-taking optical system, said second barrel being responsive to the rotation of said first barrel to be moved along said optic axis between a position protruded from said first barrel and a position retracted from said protruded position into said first barrel;

a lens barrier member held by said second barrel and movable on a plane substantially perpendicular to said optic axis to cover the front of said photo-taking optical system; and

a guide member fixedly provided in said camera and coupled to said second barrel and extending in the direction of said optic axis for guiding said second barrel in the direction of said optic axis without rotating said second barrel, said guide member having a tip end portion adapted to intersect said plane off the locus of movement of said lens barrier member when said second barrel is in said retracted position.



4,843,412

FILM SUPPLYING APPARATUS

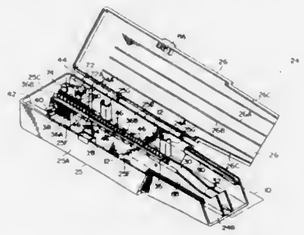
Kaoru Uchiyama; Haruo Takase, both of Tokyo; Kiichiro Sakamoto, Kanagawa; Kazushige Uenaka, Tokyo; Masakazu Kokubu, Tokyo, and Masuo Akimoto, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 39,866, Apr. 20, 1987. This application Jun. 9, 1988, Ser. No. 204,315

Claims priority, application Japan, Apr. 18, 1986, 61-90382; Apr. 18, 1986, 61-90383; Aug. 28, 1986, 61-202553; Aug. 29, 1986, 61-203475; Sep. 1, 1986, 61-205708; Sep. 1, 1986, 61-205710; Sep. 1, 1986, 61-205711

Int. Cl.[4] G03B *17/26, 3/13*

U.S. Cl. 354—275 12 Claims



1. A magazine for consecutively feeding undeveloped films to a developing system from a plurality of cassettes in which said films are accommodated, comprising:

(a) a main body of said magazine which is capable of accommodating a plurality of cassettes;

(b) an openable cover for preventing the light from entering the inside of said main body of said magazine;

(c) an endless body from which projections for engaging with feed openings of leaders respectively connected to said films projecting from said cassettes project at regular intervals; and

(d) a feeding means for receiving a driving force from the outside and moving said endless body at regular intervals, thereby feeding said leaders consecutively to said developing system.

4,843,413

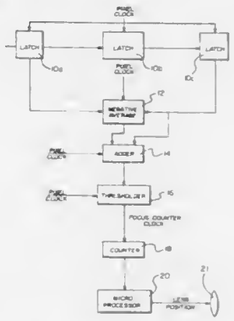
SYSTEM WHICH USES THRESHOLD COUNTS TO ACHIEVE AUTOMATIC FOCUS

Lawrence E. Walther, Macedon, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 28, 1988, Ser. No. 174,302

Int. Cl.[4] G03B *3/00*

U.S. Cl. 354—402 7 Claims



1. Apparatus for generating automatic focus signals for positioning a lens, the apparatus comprising:

a. means for receiving image information which is a function of a position of the lens;

b. means for selecting high frequency components of the image information;

c. means for establishing a selected threshold level;

d. means for choosing those high frequency components which exceed the selected threshold level;

e. means for acquiring a count of high frequency components which exceed the selected threshold level; and

f. means for positioning the lens so that the high frequency component count is a maximum.

4,843,414

IMAGE RECORDING METHOD AND APPARATUS

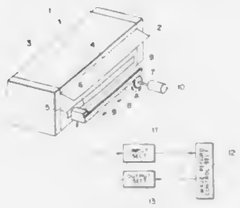
Shigeru Yoshino, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 7, 1988, Ser. No. 178,945

Claims priority, application Japan, Apr. 7, 1987, 62-83770

Int. Cl.[4] G03B *7/24*

U.S. Cl. 354—21 13 Claims



1. An image recording method comprising the following steps:

storing data relating to a photo-sensitive material held in a magazine, in a storage means on said magazine:

reading said data from said storage means by a data detecting means provided in an image recording apparatus;

performing image recording control--based on said data read from said storage means on said magazine by said detecting means: and

recording new data in said data storage means by a data

recording means provided in said image recording apparatus whenever at least one of the following occurs: said photo-sensitive material is subjected to optical exposure and when jamming of said photo-sensitive material occurs before said optical exposure.

4,843,415

AUTOMATIC FOCUS DETECTION SYSTEM

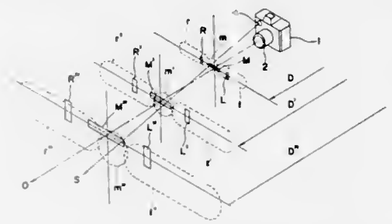
Toru Matsui, Sakai, and Hiroshi Ueda, Habikino, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 22, 1987, Ser. No. 99,725

Claims priority, application Japan, Sep. 22, 1986, 61-224113; Sep. 22, 1986, 61-224114

Int. Cl.[4] G03B 3/00

U.S. Cl. 354—403 **11 Claims**



1. An automatic focus detection system for use in a camera having a camera body and an interchangeable objective lens, comprising;

a first focus condition detecting block including means for re-forming a pair of images using a pair of light rays passed through said objective lens mounted on said camera body, means for receiving said pair of images, and means for detecting the focus condition of the objective lens by calculating the correlation of a pair of images on the light receiving means, the first focus condition detecting block defining an off-axial focus detection area in an object field whose center is deviated from the optical axis of the objective lens; and

first means for projecting light toward the object field, the projected light having an extent in a direction along which the position of the off-axial focus detection area is changed in accordance with the change of the focal length of the objective lens, so that the region of the projected light covers the off-axial focus detection area even if the position of the off-axial focus detection area is changed.

4,843,416

AUTOFOCUS CAMERA SYSTEM

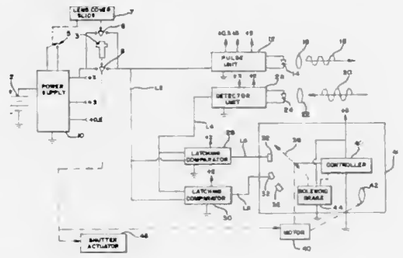
Michael J. Brower, Lombard, Ill., assignor to W. Haking Enterprises Limited, Hong Kong, Hong Kong

Filed Mar. 2, 1988, Ser. No. 163,375

Int. Cl.[4] G03B 3/00

U.S. Cl. 354—403 **14 Claims**

1. In a battery powered camera range sensing system having power terminals adapted for connection to a battery, a light-emitting diode disposed to emit light in a desired range of wavelengths onto objects in the scene to be photographed, pulsing means for energizing said light-emitting diode once responsively to each initial actuation of a shutter release system, photosensing means responsive to scene illumination produced by pulsing said light-emitting diode for providing an object-distance-indicating electrical signal condition, and drive means for adjusting at least one range-dependent camera parameter according to said signal condition, said ranging system being provided with a system voltage derived from said terminals, said light-emitting diode requiring for its proper operation an energization voltage in excess of said system voltage the improvement wherein; said pulsing means includes a plurality of capacitors, a circuit for coupling said terminals to said capacitors, and means for charging said plurality of capacitors in parallel connection from said terminals and means for discharging said plurality of capacitors in series connection through said light-emitting diode until the voltage delivered to said light-emitting diode drops to said energization voltage.



4,843,417

LIGHT MEASURING DEVICE

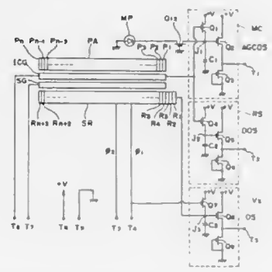
Tokuji Ishida, Daito; Hiroshi Gotsuka, Sakai, and Hiromu Mukai, Kawachinagano, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 14,708, Feb. 13, 1987, Pat. No. 4,791,446. This application Sep. 22, 1988, Ser. No. 248,380

Claims priority, application Japan, Feb. 14, 1986, 61-29960; Feb. 14, 1986, 61-29961; May 2, 1986, 61-102550; May 2, 1986, 61-102551; May 2, 1986, 61-102552; May 2, 1986, 61-102553

Int. Cl.[4] G03B 3/12, 7/093, 7/28

U.S. Cl. 354—408 **2 Claims**



1. An exposure control device for use in a camera having an objective lens, comprising:

focus detecting means including:

light receiving means for receiving light from a predetermined area within a photographing frame for focus detection of said objective lens; and

focus calculating means for calculating the focus condition of said objective lens in accordance with a result of the light received by said light receiving means;

reliability detecting means for detecting a lack of the reliability of the focus detection of the focus detecting means on the basis of a result of the focus detection of the focus detecting means;

brightness calculating means for calculating brightness data in said predetermined area based on an output signal of said focus detecting means;

exposure data calculating means for calculating exposure data based on the brightness data;

exposure control means for controlling an exposure of the camera based on the calculated exposure data; and

exposure inhibiting means for inhibiting the exposure of the camera based on the exposure data, when said reliability detecting means detects the lack of the reliability of the focus detection of the focus detecting means.

4,843,418

PHOTOGRAPHIC CAMERA

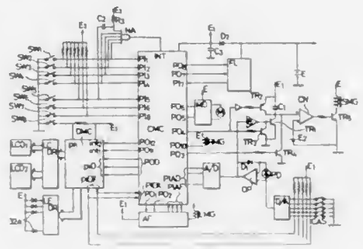
Nobuyuki Taniguchi; Yoshiaki Hata, both of Nishinomiya; Yoshinobu Kudo, Sakai; Manabu Inoue, Kobe; Takeo Hoda, Kawachinagano, and Hiroshi Ueda, Toyokawa, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 895,826, Aug. 12, 1986, Pat. No. 4,780,735. This application Jun. 16, 1988, Ser. No. 207,238

Claims priority, application Japan, Aug. 29, 1985, 60-190520; Aug. 29, 1985, 60-190521; Aug. 29, 1985, 60-190522; Aug. 29, 1985, 60-190523; Aug. 30, 1985, 60-192621; Sep. 10, 1985, 60-201095; Sep. 10, 1985, 60-201096; Nov. 14, 1985, 60-255550; Dec. 19, 1985, 60-286732

Int. Cl.[4] G03B 7/097, 15/05, 17/24

U.S. Cl. 354—419 **2 Claims**



1. A photographic camera having a photographic lens, comprising;

means for selecting a real focal length photographing mode in which a normal range in a frame of a film will be printed on a photographing paper and a pseudo focal length photographing mode in which a range smaller than the normal range in a frame of the film will be printed on a photographing paper;

means for outputting a pseudo focal length signal when the pseudo focal length photographing mode is selected;

means for exposing a film to be photographed on the basis of a predetermined program determining a combination of aperture value and shutter speed according to the brightness of an object to be photographed;

means for determining a limit exposure value in accordance with an exposure time corresponding to the pseudo focal length and to characteristic of the exposing means;

means for measuring light coming from the object to be photographed for calculating an exposure value;

means for comparing the calculated exposure value with the determined limit exposure value to produce a flash signal when the calculated exposure value is smaller than the determined limit exposure value;

means for illuminating the object with flash light emission;

means for controlling the flash means to permit the flash light emission of the flash means in accordance with the flash signal;

means for controlling the exposing means in accordance with the calculated exposure value when the calculated exposure value is larger than the determined limit exposure value and in accordance with the determined limit exposure value when the calculated exposure value is smaller than the determined limit exposure value; and

means for recording a signal corresponding to the pseudo focal length photographing mode when the pseudo focal length photographing mode is selected.

4,843,419

LIGHT QUANTITY MEASURING SYSTEM

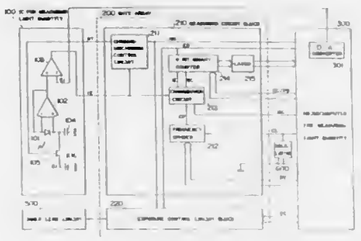
Makoto Sato, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1988, Ser. No. 184,029

Claims priority, application Japan, Apr. 21, 1987, 62-98306; Apr. 21, 1987, 62-98307; Apr. 21, 1987, 62-98308

Int. Cl.[4] G03B 7/091

U.S. Cl. 354—426 **12 Claims**



1. A system for measuring a quantity of light reaching the system from a sensed scene by employing digitized calculation, said system comprising:

photoelectric conversion means for providing a signal, the rate of change of the level of said signal varying in response to the quantity of light received by a light sensitive device arranged therein;

counting means for providing a counted result corresponding to said rate of change of said signal level under preset counting conditions;

counting condition adjusting means for setting said preset counting conditions depending on said counted result of said counting means while monitoring the count operation of said counting means; and

calculating means for calculating the quantity of light received based on said counted result and preset counting conditions at that time.

4,843,420

MIRROR DEVICE FOR A CAMERA

Tsuyoshi Fukuda; Masayuki Suzuki, and Masayoshi Kiuchi, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 27,931, Mar. 19, 1987, abandoned, which is a division of Ser. No. 750,754, Jun. 28, 1985, abandoned. This application Nov. 3, 1988, Ser. No. 267,737

Claims priority, application Japan, Jul. 6, 1984, 59-102158; Jul. 6, 1984, 59-102159; Jul. 11, 1984, 59-104979; Jul. 11, 1984, 59-104980

Int. Cl.[4] G03B 7/099, 19/12

U.S. Cl. 354—479 **14 Claims**

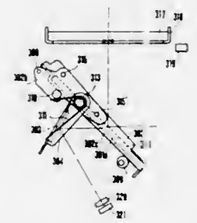
1. A mirror device for a camera having a camera body, comprising:

(a) a first mirror arrangement including a first mirror arranged to swing from a finder-viewing position to an exposure position;

(b) a second mirror-arrangement including a second mirror arranged to swing about a fulcrum on said first mirror arrangement;

(c) bias means for urging said second mirror in a closing direction relative to said first mirror, said bias means being held by at least one of said first mirror and said second mirror, said bias means urging said second mirror in the closing direction at both the finder-viewing position and the exposure position of said first mirror;

(d) at least one abutment portion formed in said camera body;
(e) a first abutment portion formed in said second mirror arrangement, said first abutment portion in contact with said abutment portion formed in said camera body swinging said second mirror in an opening direction as said first mirror swings from the exposure position to the finder-viewing position; and



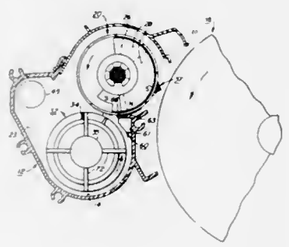
(f) a second abutment portion formed in said second mirror arrangement, said second abutment portion in contact with said abutment portion in said camera body swinging said second mirror in a closing direction as said first mirror swings from the finder-viewing position to the exposure position.

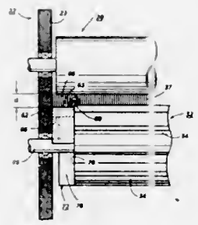
4,843,421

SYSTEM FOR PRIMING THE MAGNETIC BRUSH END SEALS OF COPIER/PRINTER MACHINES

Wayne D. Fox, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 24, 1988, Ser. No. 211,016
Int. Cl.[4] G03G 1./09
U.S. Cl. 355—253 **4 Claims**





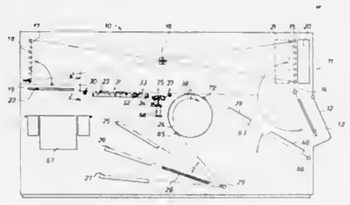
1. In a copying or printing apparatus, the combination of:
(a) a movable photoconductive member on which latent electrostatic images are created for copying or printing;
(b) a housing having a sump for holding a supply of developing material for developing the latent electrostatic images created on said photoconductive member;
(c) a magnetic brush developer roll in said housing providing a magnetic developing brush in operative developing relation with said photoconductive member;
(d) a movable mixing and loading wheel in said housing for mixing said developing material in said sump and loading said developing material onto said developer roll to form said magnetic developing brush;
(e) said housing including a magnet adjacent each end of said developer roll, each of said magnets providing a brush forming surface in opposing spaced relation to said developer roll effective upon the application of developing material thereto to form a magnetic sealing brush for sealing the space between said developer roll and said housing adjacent said developer roll ends; and
(f) priming means effective on startup of said apparatus to draw developing material from said sump and supply said developing material to said brush forming surfaces whereby to promptly form said magnetic sealing brushes at each end of said developer roll to seal said developer housing against leakage,
said priming means continuing to draw developing material from said sump and supply said developing material to said brush forming surfaces while said apparatus is operating whereby to prevent loss or degradation of said magnetic sealing brushes during operation of said apparatus.

4,843,422

ELECTROPHOTOGRAPHIC APPARATUS

Jozef L. Mampaey, Kontich, and Lucien P. Van der Vliet, Hoboken, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed May 25, 1983, Ser. No. 498,159
Claims priority, application United Kingdom, May 26, 1982, 8215315
Int. Cl.[4] G03G 15/00
U.S. Cl. 250—326 **9 Claims**



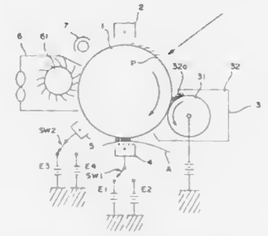
1. Apparatus for use in electrostatically charging the surface of a dielectric element, comprising a corona discharge monofilament wire in the form of a continuous loop running over pulleys, the arc of contact of said wire with each said pulley not exceeding about 180°, means for advancing the wire in one direction along its loop-shaped path, means for connecting said wire to a corona-generating voltage source, and means for causing relative bodily movement between said corona wire and said dielectric element so that said element surface becomes swept by corona discharge from said wire, said loop being formed by knotting together the ends of at least one length of said monofilament wire and each such knot being embedded in an elastically deformable bead which extends onto wire sections on opposite sides of the knot, said bead having a resistance to elastic deformation such as to reduce the sharpness of the bending of the wire on said opposite sides of such knot during its passage around said pulleys, said bead tapering gradually continuously in thickness at both ends thereof, said wire loop advancing means comprising driving means for driving said wire loop via a pulley, said driving means having an energizing circuit causing smooth acceleration and deceleration of said loop at the commencement and termination of its advancement.

4,843,423

POSITIVE/NEGATIVE IMAGE FORMING METHOD AND APPARATUS FOR ELECTROPHOTOGRAPHIC IMAGE FORMING DEVICE

Masatsugu Nakamura, Kitakatsuragi, and Ikuo Itoh, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 11, 1987, Ser. No. 95,164
Claims priority, application Japan, Sep. 12, 1986, 61-216698
Int. Cl.[4] G03G 15/00
U.S. Cl. 355—245 **2 Claims**



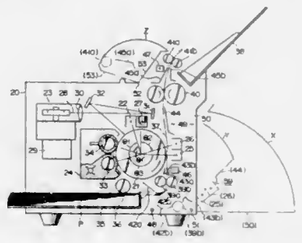
1. An electrophotographic image forming device comprising:
photoreceptor means for forming an electrostatic latent image thereon representative of an original image;
main charger means for charging said photoreceptor means to a specific charge polarity;
exposure means for forming said electrostatic latent image on said photoreceptor means, said electrostatic latent image having a charge polarity the same as the charge polarity of the charge applied by said main charger means to said photoreceptor means;
first and second interchangeable detachable developer units one of said developer units containing positively polarized toner and the other containing negatively polarized toner for developing either a positive or negative toner image on said photoreceptor means;
transference charger means for transferring said toner image from the surface of said photoreceptor means;
charge-removal charger means for erasing residual charge from said photoreceptor means resulting from said transference charger means; and
switch means for automatically changing the polarity of voltage applied to said transference charger means and said charge-removal charger means such that the charge applied by said transference charger means is opposite in polarity to the polarity of the charge of said toner image and the charge applied by said charge-removal charger means is opposite in polarity to the polarity of the voltage applied by said transference charger.

4,843,424

REVERSE DEVELOPING IMAGE FORMING APPARATUS WITH DISTURBING MEANS

Goro Oda, Sagamihara, and Haruhiko Ishida, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 907,312, Nov. 19, 1986, Continuation of Ser. No. 571,800, Jan. 3, 1984, Pat. No. 4,727,395. This application Dec. 29, 1987, Ser. No. 139,837
Claims priority, application Japan, Jan. 20, 1983, 58-7726; Feb. 28, 1983, 58-32429
Int. Cl.[4] G03G 15/08
U.S. Cl. 355—268 **10 Claims**



1. An image forming apparatus comprising a photosensitive member;
charging means for uniformly electrostatically charging the photosensitive member and nay residual toner on said photosensitive member;
exposure means for selectively exposing the electrostatically charged photosensitive member and said residual toner in accordance with data representative of an image, thereby forming an electrostatic latent image corresponding to said image on the photosensitive member;
disturbing means for disturbing the residual toner on said photosensitive member;
reverse developing means having a developing electrode for developing the latent image with toner, said developing means being provided adjacent to the surface of said photosensitive member for causing particles of said toner charged in the same polarity as the electrostatic latent image to adhere to said photosensitive member so as to form a toner image corresponding to the latent image on said photosensitive member and for causing particles of the disturbed residual toner on non-image portions of said photosensitive member which have been charged by said charging means and exposed by said exposure means to be attracted to said developing means to thereby simultaneously develop said latent image and clean said disturbed residual toner from said photosensitive member; and
transfer means for transferring said toner image from said photosensitive member to a sheet-like medium.

4,843,425

IMAGE FORMING METHOD AND APPARATUS

Masahiko Itaya, Akishima; Tetsuya Niitsuma, and Syuzi Okamoto, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 10, 1987, Ser. No. 94,907
Claims priority, application Japan, Sep. 12, 1986, 61-21630; Nov. 13, 1986, 61-270224; Jan. 19, 1987, 62-9754
Int. Cl.[4] G03G 15/01
U.S. Cl. 355—261 **16 Claims**

1. An image forming method for forming an image of toner particle comprising:
charging a surface of a photoreceptor,
exposing the surface of the photoreceptor to exposure light,
developing the surface of the photoreceptor,

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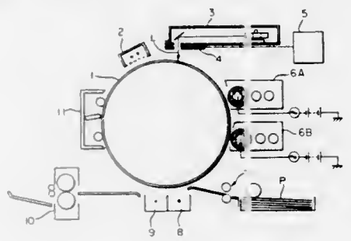
repeating said charging, exposing and developing at least once, and



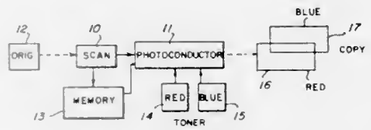
establishing an electric field to prevent toner particles on the surface of the photoreceptor from splasing when said exposing is done in presence of a toner image on the surface of the photoreceptor.

4,843,426

SPECIAL EFFECTS PHOTOCOPIER

Alfred B. Levine, 2924 Terrace Dr., Chevy Chase, Md. 20815

Filed Oct. 15, 1987, Ser. No. 108,644
Int. Cl.[4] G03G *15/01, 21/00*
U.S. Cl. 355—202 **24 Claims**



1. A photocopier for reproducing an image of an object with special effects comprising:
an optical reader for reading an image of an object,
a photosensor medium exposed to the image of the object by the reader to form a first latent image on the medium,
generator means for generating a portion of the same image that is read by the reader and exposing the photosensor to said image portion to form a second latent image on the medium in a predetermined spatial relationship to the first latent image,
and means for developing said first and second latent images with different visually distinguishable characteristics,
said means for generating said second latent image comprising means for analyzing the image being read by the reader and selecting a portion of said image.

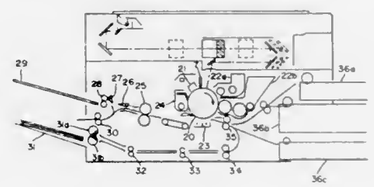
4,843,427

SELECTIVE CHARGE REMOVAL SYSTEM FOR COPIER

Yoshiaki Ibuchi, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 5, 1988, Ser. No. 140,822
Claims priority, application Japan, Jan. 5, 1987, 62-718; Jan. 5, 1987, 62-719
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—218 **3 Claims**

1. In a selective charge removal system for a copier, said copier comprising
a photosensitive body,
charging means for charging said photosensitive body,
developing means for developing an image on said photosensitive body,
light-emitting means disposed between said charging means and said developing means for selectively removing charge either from an electrostatic latent image formed on said photosensitive body or from a specified area on said photosensitive body for forming an electrostatic latent image thereon, and
control means for controlling the operation of said light-emitting means,
the improvement wherein said light-emitting means comprise
a transparent electrochromic display having a plurality of segments or dots arranged thereon, and



a back-lighting unit,
said control means including driving means for driving each of said segments or dots into an intermediate color condition during a wait period prior to a copying operation of said copier, said intermediate color condition being a state between the colored and colorless states of said segments or dots, whereby the display conditions of said electrochromic display can be changed more quickly.

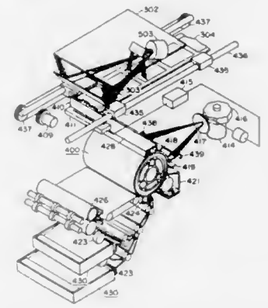
4,843,428

PROCESS APPARATUS FOR PROCESSING MEMORY WHICH STORES INFORMATION

Susumu Sugiura, Yamato; Tadashi Sato, Kokubunji, and Norio Nakajima, Hachioji, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 45,233, May 4, 1987, Pat. No. 4,733,275, Continuation of Ser. No. 910,785, Sep. 23, 1986, abandoned, Continuation of Ser. No. 842,712, Mar. 19, 1986, abandoned, Continuation of Ser. No. 775,116, Sep. 12, 1985, abandoned, Continuation of Ser. No. 706,974, Mar. 1, 1985, abandoned, Continuation of Ser. No. 586,646, Mar. 7, 1984, Pat. No. 4,505,576, Continuation of Ser. No. 390,025, Jun. 18, 1982, abandoned, Continuation of Ser. No. 201,537, Oct. 28, 1980, abandoned. This application Feb. 22, 1988, Ser. No. 159,547
Claims priority, application Japan, Oct. 30, 1979, 54-140783
Int. Cl.[4] G03G *15/00, 15/04*
U.S. Cl. 358—300 **37 Claims**

1. A processing apparatus for processing information stored in an optical memory, comprising:
means for reading out the information from said optical memory, including a photo detection element to convert the information stored in said optical memory from an optical form to an electrical form;
means for driving said optical memory relative to said photo detection element;
means operable for selecting any group of stored information, both the first and last information in said group being selectable; and



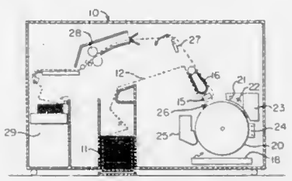
controlling means operable to cause said reading out means to read out from said optical memory the information corresponding to the selected group of information.

4,843,429

METHOD AND APPARATUS FOR PRINTING NEAR PAGE BOUNDARIES

Michael D. Avritt, Boulder; Brent K. Hegerhorst, Berthond, both of Colo., and Peter K. Peterson, Issaquah, Wash., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1988, Ser. No. 188,241
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—274 **8 Claims**



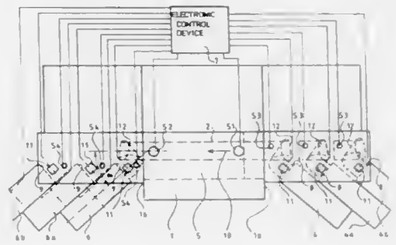
1. In a machine having a member transporting a transferable image and a device for moving a media in the form of a continuous stream of panels intended to receive images from the transporting member at an image transferring station wherein the media panels are separated at a boundary with the machine controls periodically stopping and restarting the media so that an inter-panel boundary is at least briefly positioned at a stop position y to the transfer station, apparatus for permitting image transfer to the media with minimal separation relative to the panel boundaries comprising:
image transferring means at the transferring station, said image transferring means having an image transfer effecting area facing the media surface and extending predetermined distances from the upstream and downstream sides of the panel boundary stop position in the direction of the media movement, and
control means for transferring image information to a media panel in proximity to the trailing boundary of said panel as said trailing boundary initially encounters said upstream image transferring means area and immediately thereafter stopping said media panel with the boundary at the stopping position, said control means further initiating movement of the media as the next image panel on the transferable image transporting member approaches the transfer station for causing the transporting member and the media to reach a common velocity for enabling transfer of the next panel image to the media in said downstream portion of the image transfer area as the leading boundary of said next media panel is in proximity to the downstream edge of said image transfer area.

4,843,430

APPARATUS FOR PROCESSING PHOTOSENSITIVE MATERIAL FROM MOBILE CASSETTES

Leonhard Huber, Glonn, and Bernd Payrhammer, Munich, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 30, 1988, Ser. No. 175,161
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1987, 3713171
Int. Cl.[4] G03B *27/32, 27/52;* **G03D** *17/00*
U.S. Cl. 355—27 **23 Claims**



1. An apparatus for processing photosensitive material, comprising a processing station for such material; at least one station to one side of said processing station designed to accommodate a plurality of carriage-like cassettes for photosensitive material at respective locations of said one station; means for conveying and guiding photosensitive material between said processing station and each of said locations; detecting means for sensing the presence and absence of photosensitive material in the region of each of said locations; and control means operable to activate said conveying and guiding means in response to signals from said detecting means, said control means causing said conveying and guiding means to transport photosensitive material between said processing station and a preselected one of said locations when said detecting means issues a predetermined signal from the region of said preselected location.

4,843,431

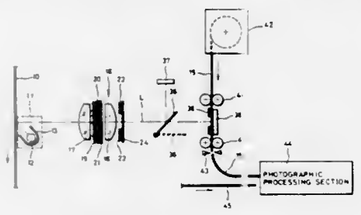
EXPOSURE CONTROL AND COLOR CORRECTING DEVICE

Masashi Horiguchi, and Minoru Yakubo, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 13, 1988, Ser. No. 180,917
Claims priority, application Japan, Apr. 13, 1987, 62-90502
Int. Cl.[4] G03B *27/72*
U.S. Cl. 355—34 **7 Claims**

1. An exposure control device, comprising:
a first filter plate comprising a transparent section and a color filter section;
a first filter holding frame movable in a first direction perpendicular to an optical axis for holding said first filter plate therein;
a pair of aperture blades movable toward and away from each other in a direction perpendicular to said first direction for forming a variable aperture therebetween;
a pair of pins fixed to one of said first filter holding frame and said pair of aperture blades; and
a pair of cam grooves which are formed in the other of said filter holding frame and said pair of aperture blades and engaged by said pair of pins, each cam groove comprising

a straight cam section extending in said first direction for maintaining said pair of aperture blades away from said optical path when said color filter section is out of said optical path and an inclined cam section for moving said



pair of said aperture blades into said optical path when said color filter section is moved in said first direction so as to at least partially traverse said optical path, to thereby vary an aperture size of said aperture.

4,843,432

IMAGE RECORDING APPARATUS

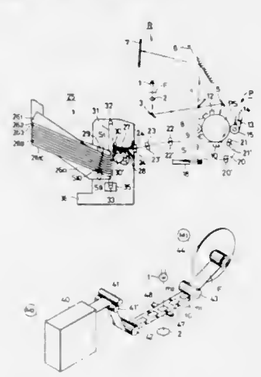
Toshiaki Mizushima, Kawasaki; Shigeo Ozaki, Chigasaki; Yukimasa Shinohara, Funabashi; Tomoo Tsumenari, Tokyo; Yasufumi Takada, and Yasuo Noguchi, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 7, 1987, Ser. No. 1,220

Claims priority, application Japan, Jan. 13, 1986, 61-4696; Jan. 13, 1986, 61-4697; Jan. 14, 1986, 61-5782; Jan. 14, 1986, 61-5783; Jan. 21, 1986, 61-10694

Int. Cl.⁴ G03B *27/52*

U.S. Cl. 355—41 **7 Claims**



I. An image forming apparatus used with an image carrier which has images divided into plural groups, a first mark is provided corresponding to each image, and a second mark is provided corresponding to a predetermined image of each group, comprising:

moving means for moving the image carrier along an image reading position;

recording means for recording onto a sheet the image carried on the image carrier located at said image reading position;

a plurality of bins for storing the sheets recording images conveyed from said recording means;

distribution means for distributing the sheets recording images to said bins;

first detection means for detecting the first marks;

second detection means for detecting the second marks;

moving control means for actuating said moving means to stop the image carrier in accordance with an output signal from said first detection means and for moving said moving means every time recording means records the image once;

recording control means for actuating said recording means to record the image on said image carrier onto the sheet in accordance with the output signal from said first direction means; and

distribution control means for actuating said distribution means in accordance with the output signal from said second detection means to distribute the sheets recording images to the different bins for each of the image groups.

4,843,433

AUTOMATIC DOCUMENT FEEDER

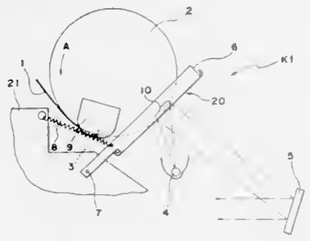
Hisashi Minami, Yamatokoriyama; Hideo Matsuda; Yoichi Shimazawa, both of Nara, and Shinitiro Hiraoka, Yamatotakada, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 849,021, Apr. 7, 1986, abandoned. This application Feb. 19, 1988, Ser. No. 161,339

Claims priority, application Japan, Apr. 10, 1985, 60-53842; Apr. 11, 1985, 60-78009; Apr. 13, 1985, 60-79021; May 27, 1985, 60-114782

Int. Cl.⁴ G03B *27/612*

U.S. Cl. 355—49 **2 Claims**



1. An automatic document feeder for automatically feeding an original sheet, comprising:

a rotary drum rotatable in a copying direction;

a claw provided on a circumferential face of said rotary drum for gripping the original sheet, said claw being rotatable with said rotary drum;

sheet clamping means for clamping the original sheet against the circumferential face of said rotary drum, said sheet clamping means being mounted on a fixed member of said automatic document feeder and including a sheet clamp for clamping said original sheet wound around said circumferential face of said rotary drum, said sheet clamp being pivotably mounted on said fixed member so as to pivot about a shaft member engaged with said fixed member, an urging member for urging said original sheet towards said rotary drum, and a movable member which is movably mounted on said sheet clamp so as to be displaced to a position where said fixed member is gripped between said movable member and said sheet clamp such that said sheet clamping means is mounted on said fixed member by said movable member;

an exposure device for subjecting the original sheet to exposure through said sheet clamping means;

a sheet clamping region defined by said sheet clamping means being held against a predetermined clamping area through which the circumferential face of said rotary drum passes during rotation in the copying direction; and

an exposure region defined by said exposure device being directed at a predetermined exposure area through which the circumferential face of said rotary drum passes during rotation in the copying direction;

whereby said sheet clamping region is slightly spaced away from said exposure region in a directon opposite to the copying direction of said rotary drum such that said sheet clamping region occupies an initial portion of said exposure region for preventing the original sheet from deviating from said rotary drum at said exposure region.

4,843,434

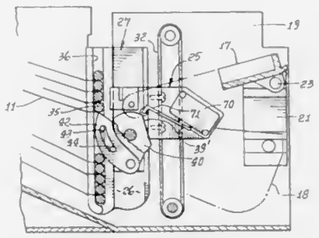
RANDOM ACCESS SHEET RECEIVER

Frederick Lawrence, Tustin, and George M. Cron, Irvine, both of Calif., assignors to Gradco Systems Inc., Irvine, Calif.

Filed Nov. 17, 1987, Ser. No. 122,146

Int. Cl.⁴ G03B *27/58*

U.S. Cl. 355—72 **5 Claims**



1. A sheet receiver comprising a stationary frame structure, a plurality of trays having inner ends mounted in said frame structure for vertical movement, the other ends of said tray being pivotally mounted, said inner ends of said trays normally resting one on the other in closely spaced relation, sheet guide freely vertically shiftably mounted in said frame structure and having sheet infeed means to deliver sheets to said trays, bin opener means associated with said sheet guide and vertically freely movable therewith, shifting means for vertically shifting said sheet guide and said bin opener means vertically to positions adjacent selected closely spaced inner ends of said trays, said bin opener means having a lifter engageable between adjacent closely trays and operable to lift each tray thereabove to form an enlarge bin space between the tray next above and the tray next below said lifter, and means for actuating said lifter when said bin opener mean is in one of said positions.

4,843,435

CONVEYOR OF A COPYING APPARATUS

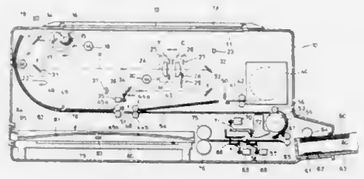
Masashi Horiguchi; Minoru Yakubo, both of Tokyo; Masanori Yokota, and Hideharu Oshima, both of Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 13, 1988, Ser. No. 181,123

Claims priority, application Japan, Apr. 13, 1987, 62-90550

Int. Cl.⁴ G03B *27/30*

U.S. Cl. 355—100 **7 Claims**



1. A conveying apparatus in a copying apparatus of the type using two separate diffusion transfer photographic materials and having a photosensitive material in the form of the roll contained in a magazine, means for exposing a photosensitive sheet formed from said photosensitive material at an exposure station so as to form a latent image thereon, and an image-receiving material in the form of image-receiving sheets contained in a cassette, means for superimposing the image-receiving sheet with the photosensitive sheet at a superposition station so as to form a positive image on the image-receiving sheet using a diffusion transfer process, the conveying apparatus comprising:

means for extracting a foremost one of said plurality of image-receiving sheets from the cassette to a position between said pair of feeding rollers;

a sensor for detecting when said extracted image-receiving sheet is nipped by said pair of feeding rollers;

a pair of feeding rollers disposed proximate to said cassette for nipping an image-receiving sheet which is therebetween and feeding the image-receiving sheet to said superposition station;

withdrawing rollers for withdrawing said photosensitive material out of said magazine; and

a controller for causing said withdrawing rollers to rotate when said sensor detects said extracted image-receiving sheet material and suspending said copying apparatus from performing a copying operation when said sensor does not detect said image-receiving sheet within a predetermined time.

4,843,436

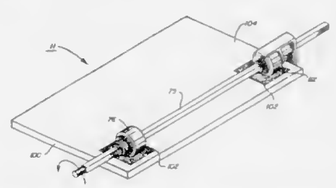
FEED ROLL CLEANER FOR CLEANING AND RENEWING THE FRICTIONAL FEEDING SURFACES OF THE SHEET FEED ROLLS IN A COPY REPRODUCING MACHINE OR PRINTER

Donato D. Evangelista, Webster; Eugene F. Horak, Victor, and Bruce A. Winship, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 29, 1985, Ser. No. 760,008

Int. Cl.⁴ G03B *27/00*

U.S. Cl. 355—133 **6 Claims**



1. A method for cleaning and renewing the frictional surface of a movable sheet feed member which feeds sheets from a sheet supply tray, the steps which comprise:

(a) removing said sheets from said supply tray;

(b) inserting a relatively rigid stationary block like piece having an abrasive surface in opposing relation to said feed member in place of said sheets in said supply tray; and

(c) actuating said sheet feed member to cause said member frictional surface to rub against said abrasive surface whereby to clean and renew said member frictional surface.

4,843,437

COPYING MACHINE

Hiroaki Hamano, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 11, 1988, Ser. No. 192,532

Claims priority, application Japan, May 15, 1987, 62-119749

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 355—206 **3 Claims**

1. A copying machine comprising:

a first unit comprising a platen and image forming means for forming on copy paper an image of a document on said platen;

a second unit provided so as to be capable of opening and

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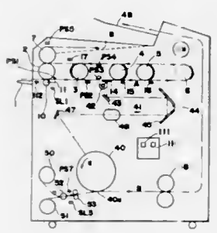
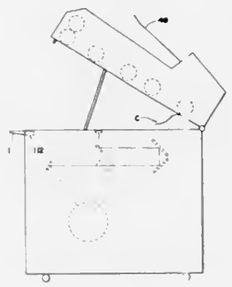
closing relative to said first unit; said second unit comprising transporting means for transporting the document to said platen and drive means for driving said transporting means;

first detecting means for detecting abnormal operation of said driving means;





second detecting means for detecting that the second unit is opened; and

inhibiting means for inhibiting the operation of said first decting means in response to said second detecting means.

4,843,438

THIN FILM TRANSISTOR

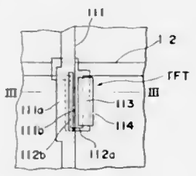
Mitsuhiro Koden, Nara; Hirohisa Tanaka, Gose, and Kohzo Yano, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 57,743, Jun. 3, 1987, abandoned, which is a continuation of Ser. No. 797,660, Nov. 13, 1985, abandoned. This application Aug. 19, 1988, Ser. No. 235,728

Claims priority, application Japan, Nov. 13, 1984, 59-239653; Nov. 13, 1984, 59-239654

Int. Cl.[4] H01L *27/12, 29/78, 23/48*

U.S. Cl. 357—04 **13 Claims**



1. A thin film transistor comprising:

an insulative substrate;

a gate electrode disposed atop said substrate substantially along a first direction and having a branch portion extending in a second direction with respect to said first direction, said branch portion having at least one edge;

a gate insulating film disposed atop said gate electrode and said branch portion;

a semiconductor film disposed on said gate insulating film;

a source electrode, disposed atop said semiconductor film and extending in said second direction, said source electrode having an aperture; and

a drain electrode disposed atop said semiconductor film without intersecting said source electrode, said drain electrode extending over a first portion of said semiconductor film, said first portion of said semiconductor film being disposed above a first portion of said branch portion of said gate electrode;

said source electrode extending over a second portion of said semiconductor film, said second portion of said semiconductor film being disposed above a second portion of said branch portion of said gate electrode, and said aperture of said source electrode being disposed over a third portion of said semiconductor film, said third portion of said semiconductor film and said aperture of said source electrode being disposed above and encompassing substantially the entirety of said one edge.

4,843,439

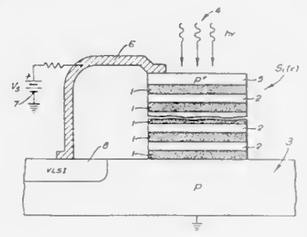
TAILORABLE INFRARED SENSING DEVICE WITH STRAIN LAYER SUPERLATTICE STRUCTURE

Li-Jen Cheng, LaCrescenta, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 901,114, Aug. 28, 1985, abandoned. This application Nov. 25, 1987, Ser. No. 125,676

Int. Cl.[4] H01L *27/12*

U.S. Cl. 357—4 **15 Claims**



1. An infrared photodetector comprising;

a silicon substrate;

a Ge_xSi_{1-x}/Si first supperlattice formed on said silicon substrate, where $0<x\leqq 1.00$, Ge_xSi_{1-x} layers of the first superlattice are doped with a p-type impurity, and Si layers of the first superlattice are intrinsic.

4,843,440

MICROWAVE FIELD EFFECT TRANSISTOR

Ho-Chung Huang, Germantown, Md., assignor to United States of America as represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.

Continuation of Ser. No. 327,659, Dec. 4, 1981, abandoned. This application Nov. 29, 1984, Ser. No. 675,471

Int. Cl.[4] H01L *29/80*

U.S. Cl. 357—22 **11 Claims**

1. A microwave field effect transistor formed in a semiconductor chip comprising:

active and inactive semiconductor regions,

planar source, gate and drain electrodes an said chip with predetermined geometry and spacing therebetween, each having active and inactive segments respectively connected to said active and inactive regions,

impedance matching means including said predetermined geometry and spacing of said inactive segments of at least one of the electrodes for establishing predetermined parasitic shunt capacitances and series inductances to provide substantial impedance matching on said chip to a signal source and/or a load driving and driven by said transistor, respectively.

4,843,441

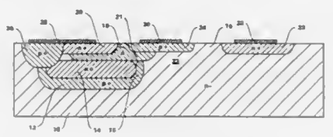
HIGH FREQUENCY, HIGH POWER FIELD EFFECT TRANSISTOR

Jerry W. Willard, Rte. 1, Box 958, Hillsboro, Oreg. 97124

Filed Aug. 10, 1987, Ser. No. 83,180

Int. Cl.[4] H01L *29/80*

U.S. Cl. 357—22 **5 Claims**



1. A lateral field-effect transistor comprising:

a doped semiconductor channel formed in a semiconductor substrate;

a doped semiconductor drift region formed in said semiconductor substrate, laterally adjacent to the channel and less heavily doped than said channel;

a doped semiconductor source formed near a surface of one side of said semiconductor substrate, laterally spaced from the drift region and contacting the channel;

a doped semiconductor drain formed near said surface of said semiconductor substrate, contacting the drift region and laterally spaced from the channel, said channel and said drift region providing a conductive path for current flowing laterally between said source and said drain; and

a conductive gate formed near said surface of said semiconductor substrate, laterally spaced from said source and drain, contacting said channel and drift region and forming a rectifying junction therewith.

4,843,442

METHOD FOR MEMORIZING A DATA BIT IN AN INTEGRATED MOS-TYPE STATIC RANDOM ACCESS MEMORY CELL, A TRANSISTOR FOR PERFORMING THE METHOD, AND AND THE MEMORY SO OBTAINED

Alain Boudou, Vert, and Brian Doyle, Paris, both of France, assignors to Bull S.A., Paris, France

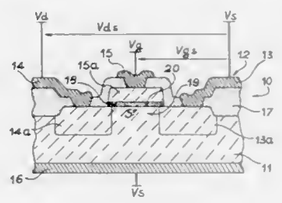
Filed Jul. 29, 1987, Ser. No. 79,040

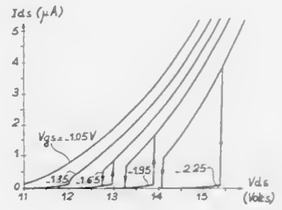
Claims priority, applicstion France, Jul. 30, 1986, 8611029

Int. Cl.[4] H01L *29/78*

U.S. Cl. 357—23.3 **13 Claims**

1. A metal-oxide-semiconductor field effect transistor (MOSFET) (**12**) comprising a semiconductor substrate (**11**), a source region (**13***a*) and a drain region (**14***a*) incorporated in said semiconductor substrate, said source region and said drain region being respectively connected to source and drain potentials (Vs, Vd) and delimiting a doped channel (**19**) therebetween, and a gate **15***a*) overlying said channel (**19**) through a gate oxide layer (**18**) and being connected to a gate potential (Vg), said transistor having a subthreshold conduction condition in which a drain-source current (IDs) shows a hysteresis





cycle when one of said drain potential or gate potential is varied up and down.

4,843,443

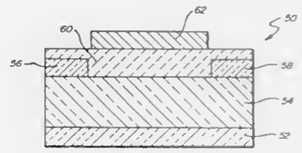
THIN FILM FIELD EFFECT TRANSISTOR AND METHOD OF MAKING SAME

Stanford R. Ovshinsky, Bloomfield Hills, and Stephen J. Hudgens, Southfield, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation of Ser. No. 23,344, Mar. 9, 1987, Pat. No. 4,769,338. This application Aug. 19, 1988, Ser. No. 210,255

Int. Cl.[4] H01L *27/82*

U.S. Cl. 357—23.7 **20 Claims**



1. A thin film field effect transistor comprising:

a body of semiconductor material including at least silicon, said semiconductor material being formed with a structure more ordered than amorphous silicon semiconductor material and less ordered than single crystalline silicon semiconductor material;

a source and a drain operatively disposed in rectifying contact with said body of semiconductor material; and

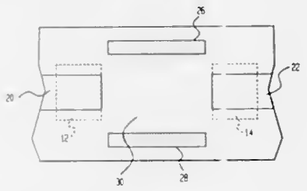
a gate electrode operatively disposed adjacent to and insulated from said body of semiconductor material.

4,843,444

MAGNETIC FIELD SENSOR

Dale L. Partin, Sterling Heights, and Joseph P. Heremans, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 14, 1988, Ser. No. 181,758
Int. Cl.[4] H01L 27/22
U.S. Cl. 357—27 6 Claims



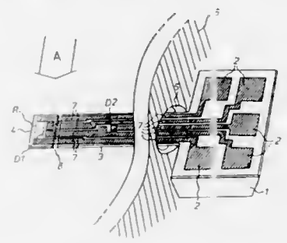
1. A magnetic sensor comprising:
a monocrystalline silicon element whose bulk is of relatively high resistivity and exhibits a relatively low recombination velocity for charge carriers;
a pair of regions of regions of opposite conductivity types and relatively low resistivity spaced apart on one surface of said element for defining there between a central region in which flows the major portion of the charge carriers flowing there between when a forward bias is applied between the two localized regions; and
in said one surface along one side of said central region at least one groove that has been irradiated with ions for increasing the recombination velocity for charge carriers in the portion of the element adjacent such groove.

4,843,445

INTEGRATED SEMICONDUCTOR CIRCUIT AND METHOD FOR PRODUCING IT, AND USE OF SUCH A CIRCUIT FOR PROVIDING A FLOW METER

Nils G. Stemme, Gothenburg, Sweden, assignor to Swema Instrument Aktiebolag, Farsta, Sweden

PCT No. PCT/SE86/00233, § 371 Date Jan. 16, 1987, § 102(e) Date Jan. 16, 1987, PCT Pub. No. WO86/07192, PCT Pub. Date Dec. 4, 1986
PCT Filed May 20, 1986, Ser. No. 14,063
Claims priority, application Sweden, May 21, 1985, 8502479
Int. Cl.[4] H01L 23/56, 29/66
U.S. Cl. 357—28 9 Claims



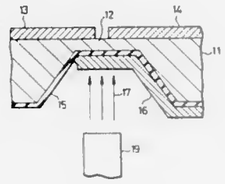
1. A flow meter for measuring the flow velocity of a flowing gaseous or liquid medium, said flow meter comprising an integrated semiconductor circuit having a first wafer part (4) with a plurality of thin conductors thereon and adapted to be heated and disposed in the flowing medium, a second wafer part (3) with a plurality of thin electrical conductors thereon and adapted to be disposed in the flowing medium without being heated, a thermally insulating jointing substance (9) joining the waver parts (3, 4) for holding said first waver part (4) and said second wafer part (3) together such that the first wafer part (4) is supported by the second wafer part (3) by way of the jointing substance, and a plurality of thin electrical conductors (7) connecting electrical conductors on said first wafer part with electrical conductors on said second wafer part and having a limited cross-sectional area in the gap (8) to restrict thermal conduction by the conductors (7) from the first wafer part (4) to the second wafer part (3).

4,843,446

SUPERCONDUCTING PHOTODETECTOR

Tosbikazu Nishino, Kawasaki; Ushio Kawabe, Tokyo, and Shinya Kominami, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 15,029, Feb. 17, 1987, abandoned. This application Sep. 19, 1988, Ser. No. 246,926
Claims priority, application Japan, Feb. 27, 1986, 61-40241; Jul. 25, 1986, 61-173641
Int. Cl.[4] H01L 27/14
U.S. Cl. 357—30 24 Claims



1. A superconducting photodetector comprising:
a semiconductor substrate;
at least two superconducting electrodes formed on a first surface of said semiconductor substrate spaced apart from one another wherein a superconducting weak coupling through said semiconductor substrate is formed between said spaced apart electrodes;
an electrode means for accumulating a predetermined quantity of carriers in said semiconductor substrate between said superconducting electrodes to cause a critical superconducting current to flow between said superconducting electrodes; and
means for radiating light to said semiconductor substrate between said superconducting electrodes so as to vary the number of carriers between said superconducting electrodes by excitation and to control superconducting current flowing between said superconducting electrodes.

4,843,447

HOT CHARGE-CARRIER TRANSISTORS

Jeffrey J. Harris, Haywards Heath; John M. Shannon, Whyteleafe, and John M. Woodcock, Tunbridge Wells, all of England, assignors to U.S. Philips Corp., New York, N.Y.

Filed May 22, 1987, Ser. No. 53,768
Claims priority, application United Kingdom, May 23, 1986, 8612605
Int. Cl.[4] H01L 29/205, 29/72
U.S. Cl. 357—34 7 Claims

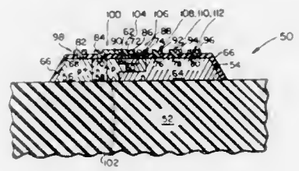
1. A hot charge-carrier transistor comprising a base region through which current flow is by hot majority charge-carriers of one conductivity type, barrier-forming means which forms a base-collector barrier with said base region, an emitter region, and an emitter-base barrier region adjacent said emitter region and which is doped with impurity of the opposite conductivity type and which is sufficiently thin as to form with a part of the base region of said one conductivity type a bulk unipolar diode for injection of the hot charge-carriers of said one conductivity type into the base region during operation of the transistor, wherein the emitter-base barrier region is of different bandgap semiconductor material than an adjacent part of the base region so as to form a heterojunction, and comprising means for determining the barrier height of the emitter-base barrier region for the hot charge-carriers of said one conductivity type partly by the impurity of said opposite conductivity type and partly by the heterojunction, said one conductivity type being n type to provide a hot electron transistor and a valence band step occurring at said heterojunction such that the valence band edge in the emitter base barrier region is at a higher hole energy than the valence band edge in the adjacent part of the base region.

4,843,448

THIN-FILM INTEGRATED INJECTION LOGIC

Graham A. Garcia, and Ronald E. Reedy, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 18, 1988, Ser. No. 183,965
Int. Cl.[4] H01L 29/72
U.S. Cl. 357—36 24 Claims



10. An integrated injection logic semiconductor device comprising:
an insulating substrate;
a first region of a semiconductor of a first conductivity type position on said insulating substrate;
a second region of said semiconductor of the opposite conductivity type positioned on said insulating substrate in contact with said first region so as to form a first lateral semiconductor junction therewith;
a third region of said semiconductor of said first conductivity type having a portion thereof positioned on said substrate, in-contact with said second region so as to form a second lateral semiconductor junction therewith;
a fourth region of said semiconductor of said opposite conductivity type, encompassed by and on top of said third region, so as to form a first vertical semiconductor junction therewith; and
a fifth region of said semiconductor of said opposite conductivity type positioned on said insulating substrate, in contact with and at least partially underlying said third region so as to form a second vertical semiconductor junction therewith.

4,843,449

CONTROLLABLE POWER SEMICONDUCTOR

André Jaecklin, Ennetbaden; Peter Roggwiller, Riedt-Neerach; Rudolf Veitz, Baden, and Thomas Vlasak, Birr, all of Switzerland, assignors to BBC Brown Boveri AG, Baden, Switzerland

Filed Feb. 4, 1988, Ser. No. 152,417
Claims priority, application Switzerland, Feb. 24, 1987, 691/87
Int. Cl.[4] H01L 29/74
U.S. Cl. 357—38 9 Claims

1. A gate turn-off thyristor comprising:
a plurality of differently doped layers including a p-type emitter, an n-type base, a p-type base, and an n-type emitter arranged one above another in a semiconductor substrate between an anode and a cathode;
said n-type emitter comprising plural finger-like individual elements surrounded by portions of the p-base immerging on a cathode-side surface, said plural finger-like elements in association with the p-type base, n-type base and p-type emitter defining a plurality of parallel-connected individual thyristor elements;
gate contacts in the form of a metallization provided on the p-type base immerging on the cathode-side surface for controlling said thyristor;
a common gate connected to the gate contacts of each said individual thyristor elements; and
means for compensating for a difference in line resistances between said common gate and the respective gate contacts of the individual thyristor elements, comprising a resistance which changes over the area of the gate turn-off thyristor in dependence on the distance of said finger element from the common gate, said resistance formed in the p-type base between the respective gate contact and the finger-like element of the n-type emitter.

4,843,450

COMPOUND SEMICONDUCTOR INTERFACE CONTROL

Peter D. Kirchner, Garrison; Alan C. Warren, Peekskill; Jerry M. Woodall, Bedford Hills, and Steven L. Wright, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1986, Ser. No. 874,738
Int. Cl.[4] H01L 29/78
U.S. Cl. 357—52 11 Claims

1. In a compound semiconductor metal oxide field effect type transistor device having source and drain high conductivity electrodes separated by a channel with a metal over oxide type gate in current influencing proximity to said channel and wherein the anionic ingredient of said compound semiconductor is arsenic, the improvement comprising:
said channel being of compound semiconductor material, and
said oxide being a water and light generated binary cationic ingredient oxide of said compound semiconductor material sufficiently free of anionic species to permit unpinning of the Fermi level of said compound semiconductor.

4,843,451

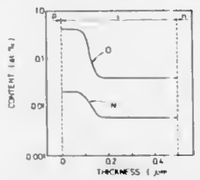
PHOTOVOLTAIC DEVICE WITH O AND N DOPING

Kaneo Watanabe; Tsugufumi Matsuoka; Yukio Nakashima, all of Hirakata, and Hisao Haku, Neyagawa, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Continuation of Ser. No. 842,636, Mar. 21, 1986, abandoned. This application Jul. 29, 1988, Ser. No. 228,796
Claims priority, application Japan, Mar. 28, 1985, 60-64185
Int. Cl.[4] H01L 29/167
U.S. Cl. 357—63 8 Claims

1. A photovoltaic device comprising at least one set of amorphous semiconductor layers which form a p-i-n junction structure, said semiconductor layers including a p-layer, an intrinsic i-layer, and an n-layer, at least one layer of said semiconductor layers having a given thickness and being doped simultaneously with nitrogen and oxygen so that both nitrogen and

oxygen are present together in said at least one layer to a depth forming at least part of said given thickness, and so that said



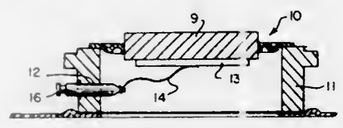
doped layer contains nitrogen with the range of 0.01 to 3.0 at.% and oxygen within the range of 0.05 to 5.0 at.%.

4,843,452

THYRISTER HOUSING GATE LEAD AND METHOD OF MANUFACTURING SAME

Richard J. Luttner, and Ronald J. Yuzko, both of County of Westmoreland, Pa., assignors to Latronics Corporation, Latrobe, Pa.

Filed Nov. 2, 1987, Ser. No. 115,397
Int. Cl.[4] H01L *23/48, 29/40, 29/44*
U.S. Cl. 357—68 **7 Claims**



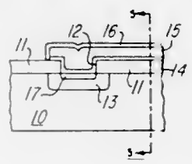
1. An apparatus comprising a thyristor housing, a bore in said housing, a semiconductor located within said housing, and a gate lead assembly, said gate lead assembly comprising a hollow metal tube extending through said bore to the interior of said housing, the interior portion of said gate lead assembly being closed, said closed portion comprising a solderable surface for a gate electrode wire from said semiconductor, said gate electrode wire being directly connected to said solderable surface.

4,843,453

METAL CONTACTS AND INTERCONNECTIONS FOR VLSI DEVICES

Robert C. Hooper, Houston; Bobby F. Roane, Manvel, and Douglas P. Verret, Sugar Land, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 732,547, May 10, 1985, Pat. No. 4,742,014. This application Aug. 13, 1987, Ser. No. 84,958
Int. Cl.[4] H01L *23/48;* **B05D** *3/04*
U.S. Cl. 357—71 **6 Claims**



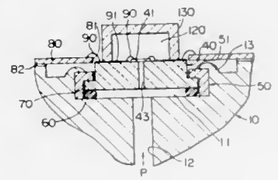
1. A semiconductor device comprising:
a selected contact region on a face of a semiconductor body,
an insulator coating on said face having a contact hole over said region, said contact hole having substantially vertical sidewalls,
a first coating of conformally deposited refractory metal at least on said sidewalls,
a metal strip composed of copper extending along said face over said insulator and also extending into said contact hole over said first coating,
and a second coating of conformally deposited refractory metal covering the top and sidewalls of said metal strip.

4,843,454

SEMICONDUCTOR PRESSURE TRANSDUCER

Yukihiro Kato, Kariya; Hiroshi Okada, Hekinan; Yoshifumi Watanabe; Osamu Ina, both of Anjo; Osamu Ito, and Iwao Yokomori, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 25, 1986, Ser. No. 934,847
Claims priority, application Japan, Nov. 26, 1985, 60-266987; Sep. 3, 1986, 61-207206
Int. Cl.[4] H01L *23/12, 23/04, 21/447*
U.S. Cl. 357—79 **22 Claims**



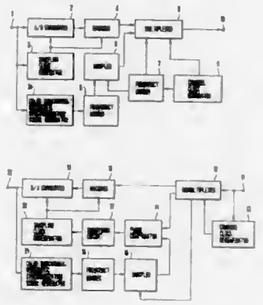
1. A semiconductor pressure transducer, comprising:
a housing having wall means defining a recess therein, said wall means including a bottom wall perimetrically surrounded by a sidewall to define said recess;
a generally cylindrical basee having a larger diameter portion axially adjoining a smaller diameter portion, said smaller diameter portion providing a smaller diameter end surface, said larger diameter portion providing a larger diameter end surface, and an axially-facing annular shoulder being defined on said base between said larger diameter portion and said smaller diameter portion;
said larger diameter portion of said base being recieved in said recess and supported therein with said larger diameter end surface positioned in confronting adjacent relationship to said bottom wall of said recess;
an annular collar having a radially inwardly projecting annular flange means, said annular flange means having an inner diameter which is smaller than the outer diameter of said larger diameter portion of said base, but larger than the outer diameter of said smaller diameter portion of said base;
said annular collar being received in said recess and supported on said housing by said wall means defining said recess, with said annular flange means spacedly circumferentially surrounding said smaller diameter portion of said base and axially engaging said annular shoulder;
a press-fit portion attached to said housing, said press-fit portion being press fit radially inwardly into axially pressing engagement with said annular collar, for urging said generally cylindrical base, via said radially inwardly projecting flange means and said axially facing annular shoulder of said base, axially towards said bottom wall of said recess and thereby firmly mounting said base to said housing in said recess;
a sensor chip for generating an electric signal in response to pressure in a medium for measuring said pressure, said sensor chip being mounted onto said smaller diameter end surface of said generally cylindrical base; and
means for transmitting pressure from said medium to said chip through said housing.

4,843,455

COLOR TELEVISION SIGNAL SAMPLING CLOCK PHASE CONTROL SYSTEM

Norio Suzuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 19, 1988, Ser. No. 234,057
Claims priority, application Japan, Aug. 20, 1987, 62-205079; Aug. 20, 1987, 62-205082; Jul. 19, 1988, 63-181271
Int. Cl.[4] H04N *11/04*
U.S. Cl. 358—13 **6 Claims**



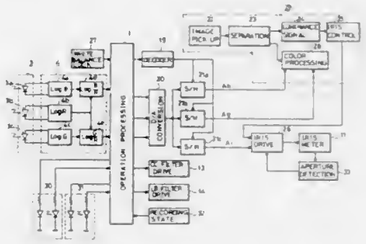
1. A sampling clock phase control system comprising:
a transmitter section, comprising:
means for generating at least a first color burst phase reference signal phase-locked with a color burst of an input color television signal;
first sampling means for sampling at least the first color burst phase reference signal every predetermined period obtained by frequency-dividing a channel clock; and
means for multiplexing and transmitting at least the first color burst phase reference signal and encoded data obtained by encoding the color television signal sampled by a first sampling clock; and
a receiver section comprising:
means for regenerating a color television signal by decoding the encoded data of the color television signal received by using a second sampling clock;
means for generating at least a second color burst phase reference signal phase-locked with a color burst of the decoded color television signal;
second sampling means for sampling at least the second color burst phase reference signal every period in which at least the first color burst phase reference signal is transmitted;
means for obtaining a phase difference signal by adaptively comparing a phase of at least the second color burst reference signal output from said second sampling means with a phase of at least the first color burst phase reference signal, smoothing the phase difference signal, and outputting the smoothed signal; and
means for generating the second sampling clock while performing feedback control so as to keep a predetermined phase relationship between at least the first phase reference signal and at least the second phase reference signal by changing an oscillation frequency in accordance with a magnitude of the smoothed phase difference signal.

4,843,456

WHITE BALANCE ADJUSTING DEVICE FOR A COLOR VIDEO CAMERA

Takashi Iida, Kyoto; Masatoshi Itoh, Takatsuki; Hidenori Fukuoka, Toyonaka; Takeya Tsukamoto, Amagasaki, and Takashi Kondo, Izumi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 22, 1987, Ser. No. 76,696
Claims priority, application Japan, Jul. 24, 1986, 61-174326; Jul. 24, 1986, 61-174327; Oct. 21, 1986, 61-251161; Oct. 21, 1986, 61-251160
Int. Cl.[4] H04N *9/73, 9/04*
U.S. Cl. 358—29 **11 Claims**



1. A white balance adjusting device for a color video camera, comprising:
image pickup means for picking up an image of an object,
color measuring means for outputting color information corresponding to a color temperature of ambient light,
correction means for electrically correcting an output of said image pickup means based on the color information outputted from said color measuring means, thereby to perform a white balance adjustment,
optical filter means selectively interposable in an optical path of said image pickup mean and used for optically modifying light incident on said image pickup means,
drive means for moving said optical filter means into or from said optical path based on the color information,
recording state detection means for detecting whether the video camera is in a recording state or a non-recording state, and
control means for controlling said drive means and said correction means to forbid operation of said drive means and to permit operation of said correction means in response to detection of the recording state by said recording detection means, and to permit operation of said drive means and operation of said correction means in response to detection of the non-recording state by said recording detection means.

4,843,457

DROP-OUT CORRECTING LUMINANCE-CHROMINANCE SIGNAL SEPARATION CIRCUIT

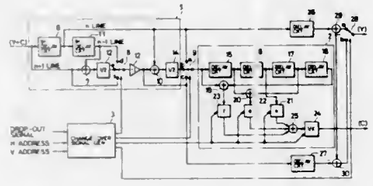
Kenji Yamagata, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 941,869, Dec. 15, 1986, abandoned. This application Jan. 9, 1989, Ser. No. 298,231
Claims priority, application Japan, Dec. 17, 1985, 60-284162
Int. Cl.[4] H04N *9/78, 9/88*
U.S. Cl. 358—31 **5 Claims**

1. A luminance-chrominance signal separation circuit for separating a digitized video signal into a luminance signal and chrominance signal, in which a possible drop-out is detected for every sample of data forming said digitized video signal and a drop-out detection signal is produced for each of said samples for which a drop-out is detected, comprising:
means for selecting those data samples of said digitized video

signal having a phase correlated to the chrominance components of said digitized video signal and for which no drop-outs have been detected; and

means for linearly combining said selected data samples to produce a luminance signal and a chrominance signal separated from each other, said combining means operating in response to said drop-out detection signals for said data samples;



wherein said data samples of said digitized video signal are arranged in a two-dimensional matrix;

wherein said combining means multiplies a plurality of said data samples occurring over two dimensions of said matrix by corresponding coefficients to obtain respective products and adds said products; and

wherein said selecting means selects values of said coefficients dependent on said drop-out detection signals.

4,843,458

METHOD OF PROCESSING IMAGE INFORMATION

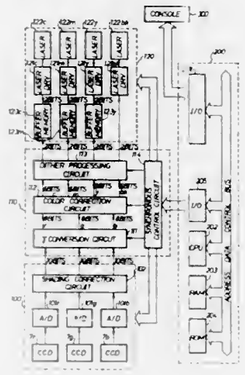
Takanori Ito, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 201,852

Claims priority, application Japan, Jun. 5, 1987, 62-140059; Jun. 30, 1987, 62-161103

Int. Cl.[4] H04N 1/46

U.S. Cl. 358—80 **6 Claims**



1. A method of processing image information of an object to be reproduced, comprising the steps of:

separating light from the object into a plurality of colors;

generating electrical color image signals having levels which represent the quantities of light of the separated colors, respectively; and

converting said color image signals to signals having values substantially proportional to the cubic root of the quantities of light from the object with respect to the respective separated colors.

4,843,459

METHOD AND DEVICE FOR THE DISPLAY OF TARGETS AND/OR TARGET POSITIONS USING DATA ACQUISITION MEANS OF A WEAPONS SYSTEM

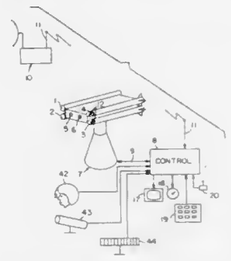
Jacques Perrin, Montigny-Le-Bretonneux, and Pascal Sinaud, Wissous, both of France, assignors to Thomson-LSF, Paris, France

Filed Aug. 31, 1987, Ser. No. 91,591

Claims priority, application France, Sep. 9, 1986, 86 12618

Int. Cl.[4] H04N 7/18

U.S. Cl. 358—93 **12 Claims**



1. A system for launching a missile with a homing head, comprising

a launching platform (7);

a plurality of sensors (5,6,10) coupled to the platform (7);

a missile (1-4), having a homing head (12), mounted on the platform (7);

display means (17) for displaying target position and missile position and orientation information, and

control means (8), communicating with and receiving target position information from said homing head (12), for displaying said target position information on said display means (17),

whereby said system can be aimed, when said sensors (5,6,10) coupled to the platform are disabled, by using information communicated by said homing head (12).

4,843,460

ELECTRO- OPTICAL DEVICE AND PROCESS FOR REAL TIME MEASUREMENT OF THE MOTION OF A MOBILE RIGID STRUCTURE UNDER THE INFLUENCE OF A FLUID

Pierre-Loïc Le Guet, Bures-Sur-Yvette; Christine Lempereur, and Jean-Michel Mathé, both of Toulouse, all of France, assignors to Etat Francais, Armees, France

Filed Oct. 14, 1987, Ser. No. 111,497

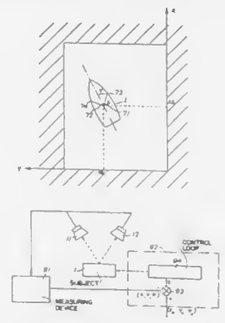
Claims priority, application France, Oct. 20, 1986, 86 14567

Int. Cl.[4] H04N 7/18

U.S. Cl. 358—107 **13 Claims**

1. An electro-optical device for performing real time measurement of the motion of a mobile, rigid structure under the influence of a fluid, wherein said device comprises at least four bright spots at predetermined unaligned positions on the structure under study, at least two synchronized video cameras whose positions are defined in a fixed frame of reference in such a way that at least three of said bright spots lie within the common field of view of said at least two cameras, wherein the dimensions of each bright spot are such that the image of each spot intercepts approximately five to fifteen scanning lines in the focal plane of each video camera, wherein the video signals provided by said cameras are supplied to a processing unit comprising a number of analog circuits capable of extracting synchronization signals and acquiring image coordinates of singular points whose brightness is above a preset level (n_1), wherein said processsing unit further comprises counter and memory circuits to count and record coordinates and lengths of scan line segments intercepted by said bright spots in each

said camera, and control and interface circuits connected to a computer to determine the image coordinates of the barycenters of said bright spots in the focal plane of each camera,



whereby the barycenter coordinates of the bright spots are defined with respect to a fixed frame of reference to derive the three translational and three rotational motions of the said structure from the variation of said barycenter coordinates.

4,843,461

OVER-DOOR INTERPHONE SYSTEM PROVIDED WITH A NIGHT-VISION MONITORING DEVICE

Yoshikazu Tatsumi, and Tsuyoshi Hisano, both of Hirakata, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

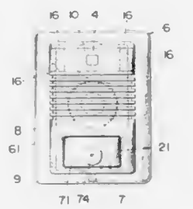
PCT No. PCT/JP86/00323, § 371 Date Feb. 6, 1987, § 102(e) Date Feb. 6, 1987, PCT Pub. No. WO87/00384, PCT Pub. Date Jan. 15, 1987

PCT Filed Jun. 25, 1986, Ser. No. 26,368

Claims priority, application Japan, Jun. 25, 1985, 60-138557; Aug. 14, 1985, 60-178850; Aug. 14, 1985, 60-178851; Aug. 14, 1985, 60-178852

Int. Cl.[4] H04N 7/18, 7/14, 5/33

U.S. Cl. 358—108 **12 Claims**



1. An over-door interphone system provided with a night-vision monitoring device comprising:

a master station unit located inside of a house;

a remote station unit located outside of an entrance door of the house, said remote station unit being connected to the master station unit for telecommunication between a visitor and a dweller, said remote station unit including

a housing,

a television camera mounted within the housing to comprise an optical unit including a solid state camera sensitive to infrared light and optical lens means disposed in front thereof,

control circuit means mounted adjacent to the optical unit for controlling the optical unit,

call switch means within the housing for calling the master station unit, and

telecommunication means within the housing for telephonic intercommunication between the master and remote station units; said

master station unit including a video display for monitoring an image of the visitor picked up by said television camera;

an infrared light emitting illumination means located adjacent the remote station unit; and

an illumination control means for providing a driving output to said infrared light emitting illumination means to actuate the same for producing the infrared light intermittently in synchronism with the operation of said television camera after determining that illuminance of an object image is lower than predetermined level.

4,843,462

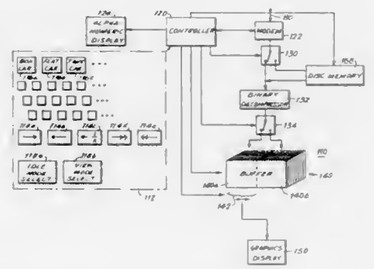
REMOTE VIDEO OBSERVATION SYSTEMS

Bernard J. J. Roy; Lorne D. O'Connor, both of Laval; Phillipe F. Rioux, Boucherville, all of Canada; Donald A. Dingle, Burlingame, Calif., and Andre L. Raymond, Therese, Canada, assignors to ADT Security Systems, Inc., Parsippany, N.J.

Filed Sep. 4, 1987, Ser. No. 93,241

Int. Cl.[4] H04N 7/18, 7/04

U.S. Cl. 358—108 **16 Claims**



1. The method of transmitting video images from a sender to a receiver comprising the steps of:

encoding at the sender each image as a plurality of digitally coded pixels;

transmitting from the sender to the receiver a first portion of the data for each pixel, said first portion having the same significance for all pixels;

displaying at the receiver the portion of the image represented by said first portions; and

transmitting from the sender to the receiver a second portion of the data for each pixel only if said portion of the image represented by said first portions is not sufficient information about the original image, said second portions having the same significance for all pixels.

4,843,463

LAND VEHICLE MOUNTED AUDIO-VISUAL TRIP RECORDER

Joseph A. Michetti, 1646 Swift Ave., Ventura, Calif. 93003

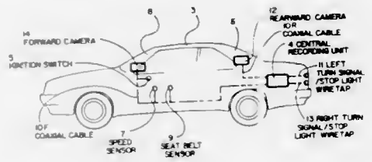
Filed May 23, 1988, Ser. No. 197,673

Int. Cl.[4] H04N 7/18

U.S. Cl. 358—108 **7 Claims**

1. An audio-video system having multiple cameras to provide signals representing scenes inside and outside of a land

vehicle to be recorded simultaneously on one video tape each sharing a portion of the screen on replay the simultaneous



recording being accomplished by a central recording unit located within the vehicle.

4,843,464

DEVICE FOR AUTOMATIC SENSING OF TELEVIEWING DISTANCE

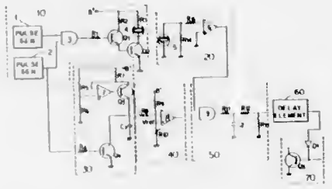
Hyun J. Choi, Kumi, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed May 14, 1987, Ser. No. 49,507

Claims priority, application Rep. of Korea, May 15, 1986, 6765/1986

Int. Cl.⁴ H04N *5/60*

U.S. Cl. 358—112 **9 Claims**



1. Apparatus for automatically sensing the distance an object is located away from the front of a television set and deactivating the video portion of the television set when the object is within a predetermined close distance of the television set for a specified length of time, comprising:

an ultrasonic transmitter located on the television set and including circuit means for generating and transmitting ultrasonic pulse signals toward said object;

an ultrasonic receiver located on the television set and including circuit means for receiving and detecting said ultrasonic pulse signals transmitted from said transmitter and reflected from said object and generating an output pulse corresponding to the elapsed time between transmission and reception of said ultrasonic pulse signals, said output pulse being indicative of the distance between said object and said television set;

first circuit means coupled to and synchronized with the transmitter for generating an elapsed time signal of a predetermined signal width indicative of a predetermined close distance away from the television set;

second circuit means coupled to said receiver and said first circuit means and being responsive to said receiver output pulse and said elapsed time signal for providing a close distance output signal when said output pulse is present within said predetermined signal width; and

third circuit means coupled to said second circuit means and being responsive to said close distance output signal to deactivate the video portion of the television set when a predetermined number of said close distance output signals occur within a predetermined time period.

4,843,465

PICTURE TRANSMISSION SYSTEM USING SECONDARY DIFFERENTIAL VARIABLE SAMPLING RATE CODING

Hiroyoshi Yuasa, Hirakata, and Koichi Omura, Osaka, both of Japan, assignors to Matsushita Electric Works Ltd., Osaka, Japan

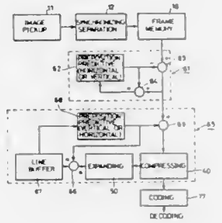
Continuation of Ser. No. 726,717, Apr. 24, 1985, Pat. No. 4,703,348. This application Oct. 7, 1987, Ser. No. 106,079

Claims priority, application Japan, Apr. 25, 1984, 59-83146; Jun. 25, 1984, 59-130582; Jun. 25, 1984, 59-130583

The portion of the term of this patent subsequent to Oct. 27, 2004, has been disclaimed.

Int. Cl.⁴ H04N *7/12*

U.S. Cl. 358—133 **16 Claims**



1. A picture transmission system for sampling and compressing picture data in a television frame so as to code and transmit the same, said system comprising:

scanning means for scanning data on successive horizontal scanning lines in a vertical direction to obtain said picture data;

differential value forming means responsive to said picture data for generating differential values between scanning lines forming primary predicted values and for generating differential values in the direction of scanning lines forming secondary predicted values;

compression-coding means for performing compression-coding based on said secondary predicted values from said differential value forming means to provide compression-coded differential values; and

expansion-decoding means for expansion-decoding said compression-coded differential values from said compression-coding means to obtain expansion-decoded differential values.

4,843,466

METHOD AND SYSTEM FOR DECOMPRESSING COLOR VIDEO SLOPE ENCODED DATA

John Music, Irvine; Gordon H. Smith, Santa Ana, and James L. Thomas, Placentia, all of Calif., assignors to Universal Video Communications Corp., Irvine, Calif.

Filed Apr. 27, 1988, Ser. No. 186,575

Int. Cl.⁴ H04N *11/02, 11/04*

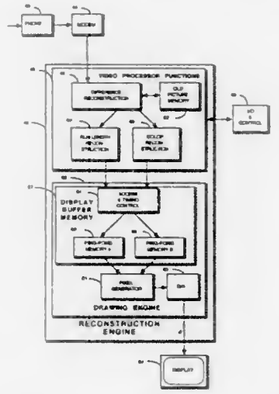
U.S. Cl. 358—133 **65 Claims**

1. A method of decompressing color video data in a video information communication system utilizing a plurality of digitized signals having a portion representing run length and a portion representing color of at least a portion of a plurality of scan lines of a video picture frame, said digitized signals being of a first digital word size, said run length portion of said digitized signal being of a second digital word size, and said color portion of said digitized signal being of a third digital word size, comprising:

(a) storing said run length portion and said color portion in an array in a memory means of run length data and color component data representing said plurality of pixels in said plurality of scan lines in said video picture frames;

(b) converting said color portion of said digitized signal into three digital color component signals of fourth, fifth and sixth digital word sizes, respectively; and

(c) generating a color video display signal from said run length and associated color components for the scan lines of said picture frame for each pixel of said picture frame,



by mapping a starting pixel for a run length according to the associated color components, and mapping the remaining pixels in said run length by interpolating a smooth color transition to an ending pixel of said run length, for each said scan line to be mapped.

4,843,467

METHOD AND APPARATUS FOR IMPROVING THE PICTURE QUALITY IN MULTI-DIMENSIONAL DIFFERENTIAL PULSE CODE MODULATION

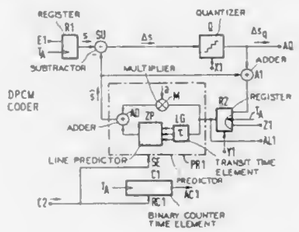
Udo Reimann, Munich, and Werner Liegl, Schwabhausen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 795,311, Nov. 5, 1985, abandoned. This application May 24, 1988, Ser. No. 201,394

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1984, 3440517

Int. Cl.⁴ H04N *7/13*

U.S. Cl. 358—135 **5 Claims**



1. A method for improving the picture quality in multidimensional DPCM coding of line scanned video signals comprising, the steps of computing at a transmitter an estimated signal value s at a present point from at least adjacent scanning signal values (B, C, D) in a preceding picture line which has previously been scanned and wherein one of the scanning signal values (D) is for a point after said present point, calculating at said transmitter an associated DPCM-value signal (Δs) from a current scanning signal value (X) for said present point and from said estimated signal value (s), and transmitting said associated DPCM-value signal (Δs), receiving said transmitted associated DPCM-value signal (Δs), calculating at a receiver said estimated signal values (s) and reconstructed scanning signal values (B_r, C_r, A_r, X_r . . .) wherein during said calculation of said receiver estimated signal values (s) and said reconstructed scanning signal values, at least reconstructed signal values (B_r, C_r, D_r) for adjacent points in a preceding line and said associated DPCM-value signals (Δs) are used and for calculating a last reconstructed scanning signal value (X_r) of the picture line the associated DPCM-value signal (Δs) and at least said reconstructed adjacent scanning signal values (B_r, C_r) and an auxiliary scanning signal value (Hc) of the preceding picture line are used wherein said auxiliary scanning signal value (H_c) corresponds to a point after the end of each preceding picture line (AZ) and is occuring in a blanking gap, and wherein for said coding of corresponding line scanned video signals at the transmitter and for calculating and reconstructing the last scanning signal value (X_r) of the picture line at the receiver the same said auxiliary scanning values (H_c) are used.

4,843,468

SCANNING TECHNIQUES USING HIERARCHICAL SET OF CURVES

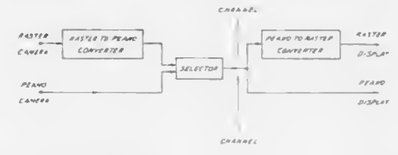
John O. Drewery, Sutton, United Kingdom, assignor to British Broadcasting Corporation, London, England

Filed Jul. 14, 1987, Ser. No. 72,889

Claims priority, application United Kingdom, Jul. 14, 1986, 8617076

Int. Cl.⁴ H04N *7/01, 5/30, 3/30, 7/00*

U.S. Cl. 358—140 **14 Claims**



1. A method of scanning an image to produce a signal for transmission and display, comprising scanning an image in a coordinate sequence defined by one order of a hierarchical set of fractal curves.

4,843,469

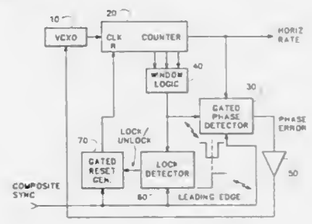
RAPID SIGNAL ACQUISITION AND PHASE AVERAGED HORIZONTAL TIMING FROM COMPOSITE SYNC

Rory W. Boyce, Fair Oaks, Calif., assignor to The Grass Valley Group, Inc., Grass Valley, Calif.

Filed Apr. 13, 1987, Ser. No. 37,365

Int. Cl.⁴ H04N *5/04*

U.S. Cl. 358—148 **7 Claims**



1. A circuit for locking to an input video signal from a source, the input video signal having a composite sync component, comprising:

means for generating an output signal at a rate corresponding to the sync rate of the composite sync component;

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means for phase averaging the output signal with respect to the composite sync component to adjust for variations in the sync rate of the composite sync component; and

means for rapidly locking to the composite sync component of a new input video signal having a phase difference greater than a predetermined value from the output signal when the source of the input video signal changes.

4,843,470

INTEGRATED SYNCHRONIZING SIGNAL SEPARATING CIRCUIT FOR GENERATING A BURST GATE PULSE

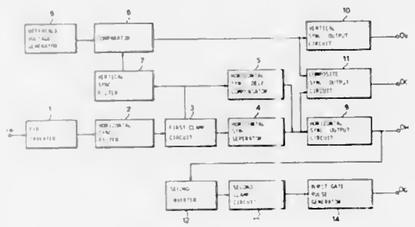
Jang Y. Wook, Seoul; Kim Y. Saeng, Buchon, and C. Shin Myung, Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed May 20, 1988, Ser. No. 196,246

Claims priority, application Rep. of Korea, May 23, 1987, 1987/5178

Int. Cl.[4] H04N *5/08, 9/455*

U.S. Cl. 358—153 **1 Claim**



1. An integrated circuit for supplying a burst gate pulse in addition to a horizontal synchronizing signal, a vertical synchronizing signal and a composite synchronizing signal being separated from a composite video signal input, comprising:

a first inverter for inverting in phase a composite video signal input;

a horizontal synchronizing filter for eliminating a high frequency component from output of said first inverter forming an inverted composite video signal;

a first clamp circuit for clamping output of said horizontal synchronizing filter to a fixed voltage to ease separation of a horizontal synchronizing signal therefrom;

horizontal synchronizing separation means for separating the horizontal synchronizing signal from clamped output of said first clamp circuit;

horizontal synchronizing delay compensation means for compensating delay of said clamped output;

horizontal synchronizing output means for receiving the horizontal synchronizing signal from said horizontal synchronizing separation means and the compensated output of said horizontal synchronizing delay means, and thereby supplying the horizontal synchronizing signal having a specified level;

a vertical synchronizing filter for eliminating the horizontal synchronizing signal and an equalizing pulse from the clamped output of said first clamp signal;

a comparator for comparing the output of said vertical synchronizing filter with a reference voltage and thereby separating a vertical synchronizing signal;

reference voltage generating means for supplying said reference voltage to said comparator;

vertical synchronizing output means for receiving said vertical synchronizing signal and therefrom supplying the vertical synchronizing signal having a specified level;

composite synchronizing output means for supplying a composite synchronizing signal having a specified level by composing said vertical synchronizing signal of said comparator and the compensated horizontal synchronizing signal;

a second inverter for inverting in phase said horizontal synchronizing signal of said horizontal synchronizing output means;

a second clamp circuit for clamping the inverted horizontal synchronizing signal of said second inverter to a fixed voltage; and

burst gate pulse generating means for supplying a burst gate pulse from the clamped horizontal synchronizing signal of said second clamp circuit.

4,843,471

VIDEO IMAGE STORAGE DEVICE

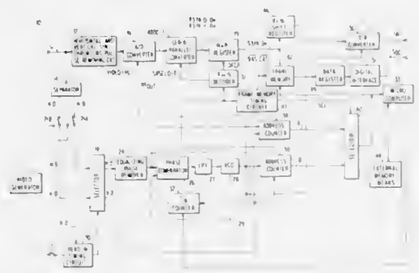
Yoshiyuki Yazawa; Hirofumi Ohnishi; Taizo Akimoto, all of Kanagawa; Susumu Washizu, and Tsuyoshi Shoji, both of Tokyo, all of Japan, assignors to Fuji Photo Equipment Co., Ltd., Kanagawa, Japan

Filed Dec. 11, 1987, Ser. No. 131,682

Claims priority, application Japan, Dec. 11, 1986, 61-295634

Int. Cl.[4] H04N *5/14*

U.S. Cl. 358—160 **14 Claims**



1. A video image storage device, comprising: an image signal input means converting image signals in input video signals having various types of scanning lines into digital image signals by analog-to-digital conversion;

a frame memory means memorizing the converted image signals;

a signal output means outputting the memorized image signals in the form of digital signals when required;

an input timing signal generating means which generates sampling clock signals synchronized with horizontal synchronizing pulses of the input video signals;

an output timing signal generating means which causes the frame memory means to output the memorized image signals; and

a frame memory control means which controls signal memory function of the image signals from the signal input means to the frame memory means in accordance with signals from the input timing signal generating means and controls signal output function of the image signals from the frame memory means to the signal output means in accordance with signals from the output timing signal generating means.

4,843,472

PROCESSOR FOR EMPHASIZING EDGES OF A VIDEO SIGNAL

Toru Shinada, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 7, 1987, Ser. No. 129,773

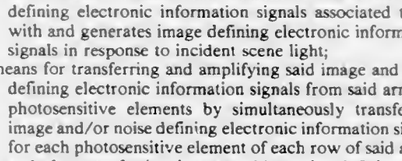
Claims priority, application Japan, Dec. 22, 1986, 61-303852

Int. Cl.[4] H04N *5/202, 5/57*

U.S. Cl. 358—164 **12 Claims**

1. A processing apparatus for emphasizing edges of a non-linear video signal which is supplied thereto and which is non-linear relative to density or luminance levels represented therein to produce a non-linear edge emphasized video signal, comprising:

linear converting means for converting the non-linear video signal into a linear video signal;



edge emphasizing means for applying edge emphasis to the linear video signal to produce a linear edge-emphasized video signal; and

non-linear converting means for applying non-linear processing to the linear edge-emphasized video signal to produce the non-linear edge emphasized video signal.

4,843,473

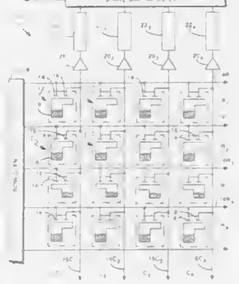
CHARGE INJECTION DEVICE WITH LOW NOISE READOUT

Selim S. Beocuya, Newton, Mass.; Gerald J. Michon, Waterford; Jerome J. Tiemann, Schenectady, both of N.Y.; James R. Toker, Cambridge, Mass., and Thomas L. Vogelsong, Schenectady, N.Y., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 21, 1988, Ser. No. 170,938

Int. Cl.[4] H04N *3/15*

U.S. Cl. 358—213.18 **9 Claims**



1. A charge injection device comprising:

a two-dimensional array of photosensitive elements arranged in rows and columns each element of which has noise defining electronic information signals associated therewith and generates image defining electronic information signals in response to incident scene light;

means for transferring and amplifying said image and noise defining electronic information signals from said array of photosensitive elements by simultaneously transferring image and/or noise defining electronic information signals for each photosensitive element of each row of said array, and also transferring image and/or noise defining electronic information signals in succeeding order for each photosensitive element along each column wherein a portion of said element defining electronic information signals for each photosensitive element are transferred outside of said succeeding order in correlation with the transfer of image and noise defining electronic information signals for photosensitive element spaced apart therefrom along their respective columns;

a plurality of groups of serially connected storage elements connected to receive said amplified image and noise defining electronic information signals in said succeeding order from each column, respectively, each of said groups of said storage elements being structured to simultaneously store image and/or noise defining electronic information signals for each said photosensitive element in each row in the order in which said signals are transferred from their respective columns;

means for advancing said image and noise defining electronic information signals for each photosensitive element in each row through said groups of serially connected storage elements, respectively, in the order in which said signals are transferred from their respective columns and in a manner whereby each of said storage elements stores a respective one of the image and/or noise defining electronic information signals for each photosensitive element for a determined time interval; and

means for simultaneously retrieving selected image and noise defining electronic information signals for each photosensitive element in each row in succeeding order from their respective columns including said portions of said noise defining electronic information signals transferred outside said succeeding order from selected ones of said serially connected storage elements of each of said groups at select succeeding one of said determined time intervals to provide image defining electronic information signals for each succeeding photosensitive element from which the noise defining electronic information signals are automatically cancelled.

4,843,474

ELECTRONIC STILL CAMERA AND METHOD OF DETERMINING EXPOSURE TIME THEREOF

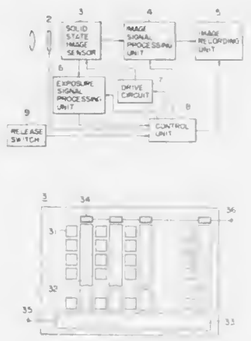
Nobuo Suzuki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 30, 1987, Ser. No. 139,831

Claims priority, application Japan, Jan. 5, 1987, 62-270

Int. Cl.[4] H04N *5/238*

U.S. Cl. 358—213.19 **4 Claims**



1. An electronic still camera including:

a solid state image sensor comprising a plurality of photosensitive pixels arranged on a two-dimensional plane, transfer means for transferring charges produced in said photosensitive pixels in a predetermined direction, and first and second terminals for outputting charges transferred by said transfer means;

said transfer means comprising a plurality of vertical charge couple devices (CCDs) for transferring the charges produced in the respective pixels in a first direction and in a second direction opposite said first direction, a horizontal CCD for transferring the charges have been transferred in said first direction by said plurality of vertical CCDs in a third direction vertical to said first direction, and a drain for collecting charges

having been transferred in said second direction by said vertical CCDs, said first terminal being connected to the terminating portion of said horizontal CCD, and said second terminal being connected to said drain;

a shutter for controlling a light incident to said photosensitive pixels;

an image signal processing unit for forming a pictorial image on the basis of the charges outputted from said first terminal of said solid state image sensor;

an image recording unit for recording the pictorial image formed in said image signal processing unit;

an exposure signal processing unit for determining an exposure time on the basis of the charges outputted from said second terminal of said solid state image sensor; and

a control unit for controlling said transfer means of said solid state image sensor so as to output, from said second terminal, the charges produced in said photosensitive pixels for the exposure time period from a predetermined measurement start time after the shutter has been opened to a predetermined time at which a predetermined exposure measurement time elapses, and so as to output, from said first terminal, the charges produced in said photosensitive pixels for the exposure time period from a predetermined exposure start time subsequent thereto to a time in which the exposure time given by said exposure signal processing unit elapses.

4,843,475

IMAGE PICKUP DEVICE

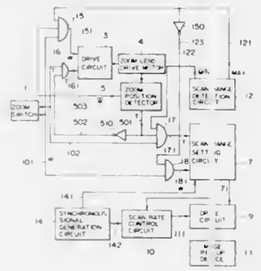
Kunio Imai, Hachioji, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 821,354, Mar. 3, 1987, abandoned. This application Dec. 1, 1988, Ser. No. 279,247

Claims priority, application Japan, Mar. 11, 1986, 61-51502

Int. Cl.⁴ H04N *5/30*

U.S. Cl. 358—225 **37 Claims**



1. An image pickup apparatus comprising:

(a) image pickup means for pickup up the image of a subject, said image pickup means having a surface;

(b) a zoom lens for changing a magnification of the image of the subject picked up by said image pickup means; and

(c) range changing means for changing a readout range of said surface of said image pickup means substantially at the time the image is picked up by said image pickup means; and

control means for controlling the operation of both said zoom leans and said range changing means to enlarge or reduce an image signal in accordance with a predetermined algorithm.

4,843,476

SYSTEM FOR CONTROLLING THE AMOUNT OF LIGHT REACHING AN IMAGE PICK-UP APPARATUS BASED ON A BRIGHTNESS/DARKNESS RATIO WEIGHING

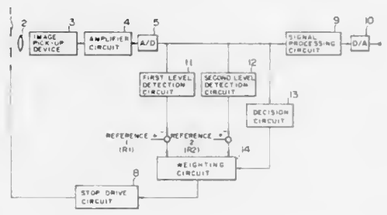
Atsushi Fujioka, Neyagawa; Atsushi Morimura, Nara; Yoshinori Kitamura, and Hiroki Matsuoka, both of Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 20, 1987, Ser. No. 123,539

Claims priority, application Japan, Nov. 25, 1986, 61-280171; Apr. 10, 1987, 62-89438

Int. Cl.⁴ H04N *5/235, 5/238*

U.S. Cl. 358—228 **27 Claims**



1. A light signal control circuit for an image pick-up apparatus comprising:

an image pick-up device producing image pick-up signals;

an average value detection circuit for detecting a value which is substantially an average value of image pick-up signals corresponding to the brightness of a sensing area and producing a first signal corresponding to the detected substantially average value;

a peak value detection circuit for detecting a value which is substantially a peak value of the image pick-up signals and producing a second signal corresponding to the detected substantially peak value;

a decision circuit for detecting one of a ratio and a difference between the detected substantially average value and the detected substantially peak value of the image pick-up signals and producing a third signal corresponding to said one of the ratio and the difference;

a switching circuit for determining which one of a fourth signal corresponding to the first signal and a fifth signal corresponding to the second signal should be outputted on the basis of the third signal;

control means for controlling a magnitude of a light signal applied to said image pick-up device; and

a drive circuit for driving said control means on the basis of an output of said switching circuit.

4,843,477

VEHICLE TELEVISION RECEIVER SYSTEM

Junichi Mizutani; Ryoichi Muroi; Chikahisa Hayashi; Yoshio Sano, all of Aichi, and Moriyuki Komatsu, Osaka, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai and Matsushita Electric Indutrial Co., Ltd., Kadoma, both of, Japan

Filed Nov. 25, 1987, Ser. No. 125,367

Claims priority, application Japan, Nov. 25, 1986, 280490

Int. Cl.⁴ H04N *5/64, 5/655*

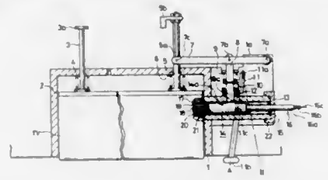
U.S. Cl. 358—248 **3 Claims**

2. A vehicle television receiver installation system comprising:

an open-front housing for attachment to a vehicle and for receiving and holding a television receiver;

means associated with said housing for automatically locking a television receiver therein when the receiver is installed in said housing through said open-front, said

locking means including connectors for supplying electromagnetic waves to the receiver; and



manually operable means for unlocking said locking means to permit removal of the receiver from said housing.

4,843,478

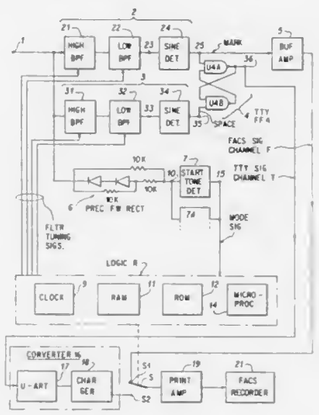
TUNABLE FILTER CIRCUIT FOR FACSIMILE RECORDERS

Scott Nowell, Brookline, N.H., assignor to Alden Electronics, Inc., Westboro, Mass.

Filed Dec. 9, 1987, Ser. No. 131,920

Int. Cl.⁴ H04N *1/21, 1/40, 1/32*

U.S. Cl. 358—257 **16 Claims**



1. An electronic processor of graphic signals for application to a facsimile recorder comprising:

a primary input for signals in either of two different modes of frequency modulation;

demodulation means including first and second filter channels coupled to the primary input and respectively passing different frequency bands of the input signal and having two filtered outputs corresponding to the different passed bands;

a pulse shaper with a square wave output and with two inputs respectively coupled to the two filtered outputs and responsive thereto to produce a square wave signal corresponding to both filtered outputs;

a first signal channel for coupling the output of one filter channel to a facsimile recorder; and

a second signal channel for coupling the output of the shaper to the recorder, whereby input signals of two modulation modes are converted to a common mode of facsimile marking modulation.

4,843,479

DATA COMMUNICATION APPARATUS

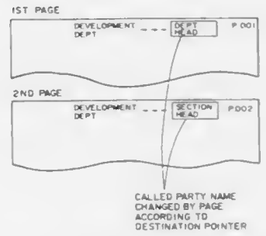
Motoaki Yoshino; Tsunehiro Watanabe; Shigeo Miura, all of Tokyo; Takeshi Toyama, Hiratsuka, and Masatomo Takahashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 21, 1987, Ser. No. 75,981

Claims priority, application Japan, Jul. 23, 1986, 61-174051

Int. Cl.⁴ H04N *1/32*

U.S. Cl. 358—257 **14 Claims**



1. A data communication apparatus comprising:

data communication means for communicating data including communication data;

memory means for storing called party name data to designate a called party that is to receive the data; and

control means for causing the called party name data stored in said memory means to be added to the communication data to be communicated and for controlling said data communication means to communicate the communication data with the called party name data.

4,843,480

IMAGE READING APPARATUS FOR REMOVING DISTURBANCES IN OUTPUT IMAGES

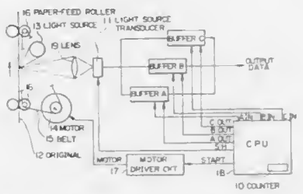
Masaaki Nishikawa, Yokohama, and Satoshi Shimizu, Ohmiya, both of Japan, assignors to Canoon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 2, 1987, Ser. No. 92,190

Claims priority, application Japan, Sep. 12, 1986, 61-215091

Int. Cl.⁴ H04N *1/10, 1/12*

U.S. Cl. 358—293 **7 Claims**



1. An image reading apparatus comprising:

means for feeding a recording medium on which image information is recorded;

means for reading the image information as image data;

storage means for storing therein the image data read by said reading means;

output delay means for allowing output of the image data to be delayed in response to a delay time in the response of said feeding means; and

means for controlling said feeding means, said reading means, and said storage means, wherein said control means also controls said output delay means such that disturbance of the output of the image data due to the

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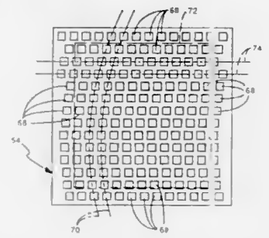
delay time in the response of said feeding means can be prevented by the delay in the output of the image data.

4,843,481

CCD SCANNING APPARATUS FOR USE WITH ROTARY HEAD PRINTER

William T. Plummer, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 30, 1987, Ser. No. 126,402
Int. Cl.[4] H04N *1/04, 1/10, 1/23*
U.S. Cl. 358—296 2 Claims



1. In a CCD pixel array for sensing an image for subsequent recording by a rotary head printer of the type which prints a series of record tracks on a print media wherein each of the record tracks represents a curved line segment of the image, the improvement comprising:

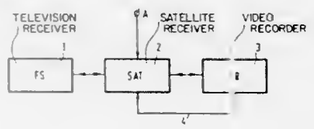
a two-dimensional pattern of pixels defined by a plurality of spaced rows of pixels, each of said rows of pixels comprising a plurality of spaced pixels lying on a curve geometrically proportional to the curved line segment of the image to be printed.

4,843,482

DEVICE FOR RECORDING SATELLITE TV BROADCASTS

Max Hegendörfer, Forchheim, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 27, 1987, Ser. No. 78,333
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1986, 3625382
Int. Cl.[4] H04N *7/0*
U.S. Cl. 358—335 6 Claims



1. A device for recording satellite TV broadcasts, comprising

a satellite receiver for processing satellite television signal,

a video recorder for recording the satellite television signal, and

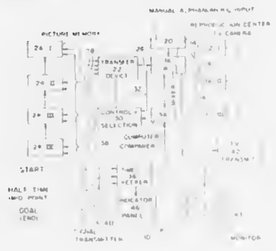
a storage device which controls the video recorder, which device stores the data of the broadcast to be recorded, characterized in that before the beginning of the broadcast to be recorded a control signal is applied from the storage device to the satellite receiver (2), which control signal switches the satellite receiver (2) from a stand-by condition to a switched-on condition and to a desired satellite broadcast and after termination of the broadcast to be recorded a further control signal is applied to said receiver to switch the satellite receiver from the switchedon condition to a stand-by condition or, if desired, to a subsequent broadcast to be recorded.

4,843,483

METHOD FOR THE SIMULTANEOUS DEPICTION OF AT LEAST TWO TEMPORALLY SEQUENTIAL EVENTS ON TELEVISION, AND EQUIPMENT FOR IMPLEMENTING THIS METHOD

Willy Bogner, Sankt-Veit-Strasse 4, D-800 München 80, Fed. Rep. of Germany

Filed Jun. 30, 1987, Ser. No. 68,058
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1986, 3622618
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—335 20 Claims



1. A method for the simultaneous displaying of at least two temporally sequential events of the same type on respective adjoining picture surfaces of at least one picture screen for viewer comparison therebetween, comprising

storing a video signal of at least a first one of said sequential events in at least one picture memory, and storing in conjunction with said video signal at least one first-event-marker signal indicating the start of at least one respective part of said first event, and

subsequently simultaneously displaying in said respective adjoining picture surfaces a second one of said sequential events and said first one of said sequential events from at least one of said at least one picture memories, by means of electronic switching procedures and use of a respective video signal of said second event and at least one respective second-event-marker signal for at least one respective part of said second event corresponding to said at least one part of said first event,

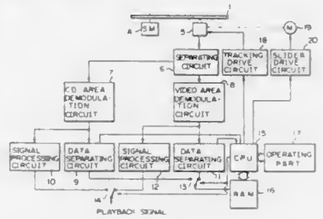
wherein said simultaneously displaying of said two events of the same type in said adjoining picture surfaces of said at least one picture screen is provided so that the respective events are displayed in at least one of temporally synchronous and spatially parallel modes for said comparison of said two events, by starting the replay of said stored video signal of said first event from at least one of said at least one picture memory at respective points of said stored video signal, each said point of starting replay being determined in accordance with a respective one of said first-event-marker signals corresponding to each respective one of said at least one second-event-marker signal, as each said second-event-marker signal occurs.

4,843,484

INFORMATION RECORDING DISC WITH COMPOSITE INDEX CODES AND ITS PLAYBACK METHOD

Hitoshi Kanamaru; Tsuyoshi Watanabe; Takahumi Shiba, and Shoichi Katagiri, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 18, 1987, Ser. No. 63,439
Claims priority, application Japan, Sep. 12, 1986, 61-216800; Sep. 12, 1986, 61-216801
Int. Cl.[4] H04N *5/76*
U.S. Cl. 358—342 4 Claims



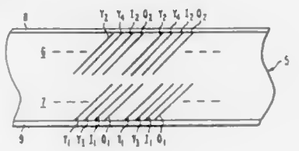
1. An information recording disc, comprising first and second recording areas in one surface thereof, only a digital signal being recorded in said first recording area and a frequency modulated video signal and a digital signal superimposed on said frequency modulated video signal being recorded in said second recording area, said first and second recording areas respectively having a lead-in area in which first and second index code groups respectively made up of index codes relating to information recorded in corresponding one of said first and second recording areas are recorded, wherein each of said index codes of said first and second index code groups includes identification information indicating the recording area to which the index code itself belongs, and wherein said index codes of said first and second index code groups are mixed with each other in each lead-in area of said first and second recording areas.

4,843,485

MULTIPLE FORMAT DIGITAL VIDEO TAPE RECORD AND REPLAY SYSTEM

Glenn A. Reitmeier, Trenton, N.J., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 564,832, Dec. 23, 1983, abandoned, which is a continuation of Ser. No. 311,796, Oct. 15, 1981, abandoned. This application Oct. 16, 1986, Ser. No. 920,896
Int. Cl.[4] H04N *5/78*
U.S. Cl. 360—9.1 14 Claims



1. A recording system for recording on a magnetic tape a digital television signal containing a picture scene made up of pixels of information, comprising:

a plurality of transducers disposed to scan a plurality of helical tracks on said magnetic tape in a plurality of longitudinal tape segments which divide the width of said tape along its length;

a source of said television signal;

a plurality of controllable switches coupled to said source for directing respective ones of said pixels to respective ones of said plurality of transducers through respective ones of said switches; and

a control circuit coupled to said plurality of controllable switches and responsive to syncronizing information of said television signal for synchronously controlling the switching operation of said plurality of switches to record, in each of said plurality of longitudinal tape segments, recorded video lines that provide in each tape segment a recorded picture scene representative of the full picture scene contained in said television signal and made up of a plurality of recorded pixels representing pixels of the picture scene contained in said television signal that are located at points distributed over the entire area of the picture scene contained in said television signal, with the recorded pixel resolution being a lesser fraction of the pixel resolution of said television signal,

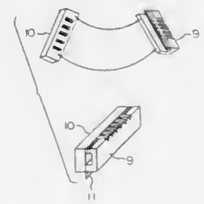
Werein said control circuit is responsive to horizontal line synchronizing information of said television signal for synchronously controlling the switching operation of said plurality of switches to record pixels from each horizontal video line of said television signal in each of said plurality of longitudinal tape segments in a manner that reduces the number of pixels recorded in each video line relative to the number of pixels availabe in the corresponding video line of said television signal.

4,843,486

MULTI-ELEMENT MAGNETIC HEAD AND METHOD OF FABRICATING THE SAME

Toshikane Yoshimatsu, Odawara; Yoshiki Hagiwara, Hadano; Yoshikazu Tsuji, Kanagawa, and Kazuhiro Momata, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 3, 1987, Ser. No. 33,733
Claims priority, application Japan, Apr. 3, 1986, 61-77490
Int. Cl.[4] G11B *5/265, 5/29*
U.S. Cl. 360—121 7 Claims



5. A multi-element magnetic head core having a plurality of magnetic circuits, wherein a plurality of first grooves adjacent ones of which delimit a predetermined track width of a multi-element magnetic head are formed parallel to each other in a surface of a block which is made of a magnetic material, and are filled with a non-magnetic material to form head portions of the magnetic circuits and to separate said head portions from each other, wherein a second groove is formed in said surface of said block in a direction perpendicular to said first grooves and is filled with said non-magnetic material to define the length of said magnetic circuits in a recording-medium running direction, and wherein a third groove is formed in said block from that surface thereof which is perpendicular to the surface having said first grooves and said second groove therein and which surface is parallel and proximate to the second groove to separate end portions of said magnetic circuits from each other by said non-magnetic material with which said first grooves and said second groove are filled.

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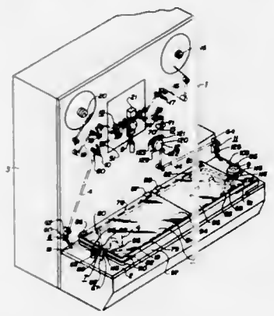
4,843,487

TAPE TRANSPORTING DEVICE

John E. Gantzhorn, Jr., Hockessin, De., and Koichi Sota, Tokyo, Japan, assignors to Otari Electri : Company, Ltd, Tokyo, Japan

Filed Oct. 7, 1987, Ser. N). 104,040
Claims priority, application Japan, Nov. 15, 1986, 61-272594
Int. Cl.[4] G11B *5/86, 15/58*
U.S. Cl. 360—17 **10 Claims**



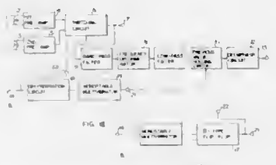
1. A tape transporting device for tr nsporting a copy tape between a pair of reel frames close to a master tape characterized by an endless loop, comprising: a feeding reel frame for feeding the copy tape; a winding reel frame for winding the copy tape which is fed from the feedi g reel frame; a backup roller for supporting the copy tape clos : to the master tape; the frames and roller for transporting an e lge of the tapes in substantially a first plane: a loop bin for storing a portion of the master tape in a zigzag configuratio and transporting the master tape edge substantially in a seco nd, different plane; and directional switch means for switchin the plane of transport of the edge of the master tape from said first plane to said second plane, and for switching the p ane of transport of the edge of the master tape from said se ond plane to said first plane.

4,843,488

NOISE ELIMINATION CIRCUIT FOR REPRODUCTION OF AUDIO SIGNALS IN A MAGNETIC TAPE RECORDING AND REPRODUCING APPARATUS

Yoshizumi Watatani, and Shigeyuki Ito, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 14, 1981, Ser. No. 283,186
Claims priority, application Japan, Jul. 14, 1980, 55-95100; Sep. 3, 1980, 55-121050; Sep. 3, 1980, 55-121051; Apr. 22, 1981, 56-59872; Apr. 22, 1981, 56-59870; Apr. 22, 1981, 56-59871
Int. Cl.[4] H04N *5/78;* **G11B** *5/04, 15/12*
U.S. Cl. 360—19.1 **5 Claims**



1. A noise elimination circuit in com ination with a magnetic tape recording and reproducing appara tus including a plurality of signal reproducing rotary heads for reproducing frequency modulated video signal and frequency nodulated audio signals from a magnetic tape on which said video and audio signals have been previously recorded along tracks disposed transversely of the direction of movemen of said magnetic tape; means for rotating said heads to scan said magnetic tape along said tracks for said reproduction; switching means connected to receive the outputs of said plurality of rotary heads for changing over said outputs periodically; filter means connected to receive the output of said switching means for separating frequency modulated audio signals from frequency modulated video signals; and discriminator means connected to receive the frequency modulated audio signals from said filter means for demodulating said modulated audio signals; the noise elimination circuit comprising:

means for receiving a track switching signal representative of the phase of rotation of said rotating heads and a horizontal sync signal contained in said frequency modulated video signals and for generating in accordance with said track switching signal and said horizontal sync signal a track switching synchronizing signal for synchronizing the changeover operation of said switching means with the phase of said horizontal sync signal;

holding means connected to receive the output of said discriminator means for holding the level of said output of said discriminator means in response to an applied control signal;

means for generating said control signal for controlling said holding means to effect synchronization of the holding operation of said holding means with the phase of said track switching synchronizing signal and for adjustment of the duration of time of said holding operation;

means for supplying said track switching synchronizing signal from said track switching signal generating means to said switching means; and

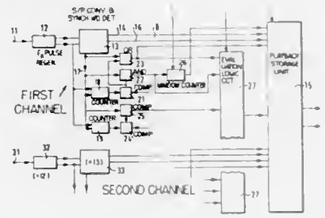
means for supplying said control signal from said control signal generating means to said holding means.

4,843,489

DETECTION AND VERIFICATION OF LAPSES OR SHIFTS OF SYNCH WORDS IN PCM DATA

Josef Sochor, Dieburg, and Werner Staude, Reinheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 25, 1987, Ser. No. 125,374
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1986, 3642636
Int. Cl.[4] G11B *5/09*
U.S. Cl. 360—51 **4 Claims**



1. Method of detecting synchronization words in a PCM serial data stream having a sampling frequency and checking the timing of said words for marking, as erroneous, a block of data following a missed or mutilated synchronization word, comprising:

checking, by reference to sampling frequency counting, the equidistance of successive synchronization words, and providing a check signal for each correctly timed synchronization word;

in the event recognition of an expected synchronization word is missed in the said checking, then providing a provisional check signal and marking following data signals as dubious;

following every said check signal, checking the timing of the afternext synchronization word to produce a verifying signal in the case of correct timing;

in the event a said verifying signal follows a said provisional check signal by one synchronization word equidistance period, removing said marking of data signals as dubious, and

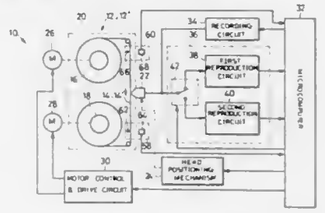
in the event no said verifying signal follows a said provisional check signal by one synchronization word equidistance period, identifying said dubious-marked data signals as erroneous, for further processing.

4,843,490

SYSTEM FOR DISCRIMINATING BETWEEN TWO TAPE ASSEMBLIES OF DIFFERENT RECORDING CHARACTERISTICS TO BE LOADED INTERCHANGEABLY IN DATA TRANSFER APPARATUS

Tamotsu Hiragushi, Musashino, Japan, assignor to Teac Corporation, Tokyo, Japan

Filed Mar. 21, 1988, Ser. No. 170,826
Claims priority, application Japan, Mar. 27, 1987, 62-75076
Int. Cl.[4] G11B *5/02, 5/03*
U.S. Cl. 360—69 **9 Claims**



1. An apparatus capable of selective data transfer with first and second tape assemblies on which data are recorded in different ways, the first tape assembly including a length of tape having an aperture formed therein at a first prescribed distance from an optically detectable starting position thereof, the second tape assembly including a length of tape having an aperture formed therein at a second prescribed distance, different from the first prescribed distance, from an optically detectable starting position thereof, the first and second tape assemblies being interchangeably loaded in and unloaded from the apparatus, the apparatus comprising:

(a) a transducer for data transfer with the loaded first or second tape assembly;

(b) tape transport means for transporting the tape of the loaded first or second tape assembly past the transducer;

(c) data reproduction circuit means connected to the transducer for selective data reproduction from the first and second tape assemblies;

(d) a tape select switch included in the data reproduction circuit means for selectively conditioning the same for data reproduction from the first or second tape assembly;

(e) sensor means for optically detecting the aperture and starting position of the tape of the loaded first or second tape assembly, the sensor means producing an electric output indicative of the spacing between the starting position of the tape and the aperture therein; and

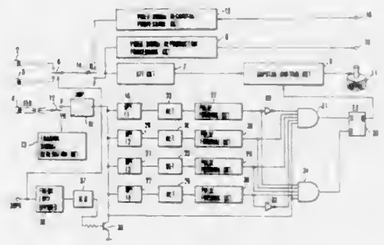
(f) a control circuit responsive to the output from the sensor means for identifying the loaded first or second tape assembly on the basis of the spacing between the starting position of the tape of the loaded tape assembly and the aperture therein, the control circuit being connected to the tape select switch for actuating the same to condition the data reproduction circuit means for data reproduction from the loaded first or second tape assembly that has been identified as such.

4,843,491

RECORDING AND REPRODUCING APPARATUS WITH TRACK PITCH DETECTION

Mitsuhiro Otokawa, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1986, Ser. No. 911,907
Claims priority, application Japan, Sep. 26, 1985, 60-210970
Int. Cl.[4] G11B *15/52*
U.S. Cl. 360—73.07 **16 Claims**



13. A reproducing apparatus arranged to reproduce an information signal from a record bearing medium on which pilot signals of four different kinds are recorded along with said information signal, one in each of recording tracks formed selectively at some of a plurality of different track pitches, comprising:

(a) a first rotary head arranged to reproduce the information signal from the record bearing medium;

(b) a second rotary head the width of which is wider than that of said first rotary head; and

(c) discrimination means for discriminating the pitch of recording tracks formed on said recording medium, said discrimination means including four separating means arranged to separate said pilot signals of four different frequencies from a signal reproduced by said second rotating head, and detecting means arranged to detect, by using signals separated by said four separating means, that said pilot signals of all the four different frequencies are being simultaneously reproduced by said second rotating head.

4,843,492

AUTOMATIC CASSETTE TAPE RECORDER STOP MECHANISM FOR USE WITH A PLURALITY OF TAPES

Satoru Koizumi; Daisuke Teshima, and Yoshio Katayama, all of HigashiHiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 851,465, Apr. 14, 1986, Pat. No. 4,698,704. This application Jul. 8, 1987, Ser. No. 71,173
Claims priority, application Japan, Apr. 17, 1985, 60-57120
The portion of the term of this patent subsequent to Oct. 6, 2004, has been disclaimed.
Int. Cl.[4] G11B *15/22*
U.S. Cl. 360—74.1 **6 Claims**

1. In a tape recorder capable of accommodating a plurality of magnetic tapes and driving each tape individually or two or more tapes simultaneously, an automatic stop apparatus for automatically stopping the magnetic tape operation, comprising:

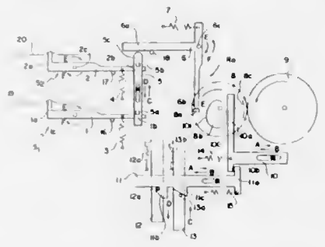
lock means which is locked when at least one tape is being driven;

sensor means provided for each of the tapes to detect the state of the tape;

means for unlocking said lock means to stop the tape operation in response to the output of said sensor means;

said unlocking means including a single trigger member provided for all of said plurality of magnetic tapes to stop the operation of the tape recorder in response to the tape end detecting output of said sensor means; and

output prohibiting means provided for each of the sensor means to prevent the output of said sensor means from



being transmitted to said unlocking means when the tape is running.

4,843,493

ROTARY HEAD TYPE MAGNETIC RECORDING AND REPRODUCING APPARATUS AND METHOD OF PRODUCING TRACKING CONTROL SIGNALS THEREFOR

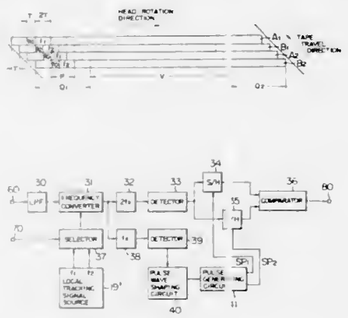
Takashi Furubata; Yasufumi Yumde; Fujio Okamura; Takaharu Noguchi; Toshifumi Shibuya, all of Yokohama; Katsuo Mohri, Yokosuka; Takao Arai, Yokohama, and Toshimichi Terada, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 659,695, Oct. 11, 1984, abandoned. This application Mar. 12, 1986, Ser. No. 838,958

Claims priority, application Japan, Oct. 14, 1983, 58-190766; Nov. 9, 1983, 58-209085; Nov. 9, 1983, 58-209087; Dec. 2, 1983, 58-226875

Int. Cl.[4] G11B 5/584

U.S. Cl. 360—77.15 **25 Claims**



8. A method of producing a tracking control signal in a rotary head type magnetic recording and reproducing apparatus having a plurality of rotary heads arranged for scanning parallel, oblique tracks of a magnetic tape for signal recording and reproduction with a predetermined displacement distance between the track scanning start ends of two adjacent tracks as measured in a direction perpendicular to the longitudinal direction of the tracks, the method comprising the steps of:

recording a first record position detecting signal and a first tracking signal on a first portion and a second portion, respectively, of a series of first tracks, said first tracks being predetermined ones of said parallel, oblique tracks which are spaced from one another, said first record position detecting signal and said first tracking signal having frequencies different from each other, said first and second portions of said first tracks being at different locations so as to not overlap each other, and recording a second record position detecting signal and a second tracking signal on a first portion and a second portion, respectively, of a series of second tracks, said second tracks being other predetermined ones of said parallel, oblique tracks which are spaced from one another so as to be interleaved with said first tracks so that said first tracks are adjacent to said second tracks, said second record position detecting signal and said second tracking signal having frequencies different from each other, said first and second portions of said second tracks being at different locations so as to not overlap each other, wherein at least parts of the first portions of two tracks of one of said first and second tracks which are adjacent to any one of the other of said second and first tracks do not overlap with each other as viewed in said direction perpendicular to the track longitudinal direction, at least parts of the second portions of the two tracks of one of said first and second tracks which are adjacent to any one of the other of said second and first tracks do not overlap with each other as viewed in said direction perpendicular to the track longitudinal direction, at least a part of the first portion one of any one of said first and second tracks on which first portion one of said first and second record position detecting signals is recorded is not farther from the track scanning start ends than one of the non-overlapping parts of the second portions of two adjacent tracks which non-overlapping part is nearer to the track scanning start ends as viewed in said direction perpendicular to the track longitudinal direction, one of said first and second tracking signals being recorded on said second portions;

scanning said first tracks to reproduce the recorded first record position detecting signal and to reproduce first and second crosstalk signals of the recorded second tracking signal from the two adjacent second tracks, and scanning said second tracks to reproduce the recorded second record position detecting signal and to reproduce third and fourth crosstalk signals of the recorded first tracking signal signal from the two adjacent first tracks; and

detecting the difference of the levels between said first and second crosstalk signals with first timing based upon the reproduction of the recorded first record position detecting signal from said first tracks to generate a first tracking error signal, and detecting the difference of the levels between said third and fourth crosstalk signals with second timing based upon the reproduction of the recorded second record position detecting signal from said second tracks to generate a second tracking error signal, said first and second tracking error signals being alternately used for said first and second tracks to constitute said tracking control signal.

4,843,494

DATA STORAGE APPARATUS USING OPTICAL SERVO TRACKS

David V. Cronin, Peabody; John M. Guerra, Concord; Paul F. Sullivan, Westwood; Patricia A. Mokry, Medford; Peter P. Clark, Acton, and Vincent L. Cocco, Wakefield, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 15, 1987, Ser. No. 109,289

Int. Cl.[4] G11B 13/00

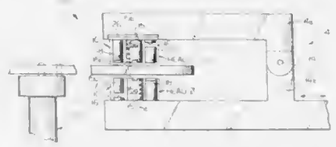
U.S. Cl. 360—77.03 **32 Claims**

1. A data storage apparatus for use with a double sided data storage medium of the type including a transparent support, a light transmissive data storage layer on each of respective opposite sides of the support, and an optical grating formed on or in the support between the storage layers for defining locations of data storage tracks in the storage layers, said apparatus comprising:

mean for supporting and moving such a medium for data read and/or write operations;

first and second heads each including a data recording and/or reading transducer, a light source, and a detector, including a reference grating, responsive to light transmitted through the medium for modulation by the medium grating formed on or in the support and thereafter incident upon said reference grating for providing position error signals indicative of the position of an asspcoated transducer relative to a selected track;

a head carriage configured for cross track movement relative to the medium and mounting said first and second heads thereon in complementary alignment on opposite sides of the medium such that said transducers are each in



recording and/or reading relation to an adjacent one of the storage layers, said light source on said first head is positioned to direct its light output through the medium and onto said reference grating of said detector on said second head, and said light source on said second head is positioned to direct its light output through the medium and onto said reference grating of said detector on said first head for providing said position error signals; and

means responsive to said position error signals for moving said head carriage to maintain a selected one of said transducers in aligned relation to a selected track.

4,843,495

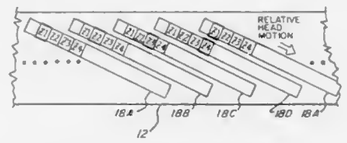
CYCLICAL SERVO ZONE TRACKING METHOD AND APPARATUS FOR HELICAL SCAN RECORDING DEVICES

Steven P. Georgis; Kelly J. Beavers, both of Boulder, and Steve E. Haugland, Longmont, all of Colo., assignors to Exabyte Corporation, Boulder, Colo.

Filed May 11, 1987, Ser. No. 57,296

Int. Cl.[4] G11B 15/467, 5/588

U.S. Cl. 560—77.15 **34 Claims**



1. A tracking system for a recording/playback device utilizing recording of data by helical stripes on magnetic tape, said system comprising:

servo signal generating means for generating a servo signal at a preselected frequency;

recording and pickup means positionable contiguous to said magnetic tape for recording said servo signal thereon in a WRITE mode and for detection of said servo signal on said tape during a READ mode;

means for transmitting said servo signal generated by said servo generating means to said recording and pickup means;

processing means for processing said servo signal detected at said magnetic tape by said recording and pickup means;

control means for allocating a portion of each stripe for servo tracking purposes, said allocated portion of each stripe comprising a predetermined plurality of at least three servo zones, each servo zone being an interval on said stripe over which said servo signal is recordable, each of said servo zones being located in corresponding positions on each stripe, wherein during said WRITE mode said control means causes said servo signal to be recorded in only one of said servo zones for each stripe whereby, for a group of stripes comprised of said predetermined number of adjacent stripes, the particular one of said zones wherein said servo signal is recorded differs from the zones wherein said servo signal is recorded on other stripes in said group, and wherein said control means causes said processing means to provide an output indicative of said servo signal detected on two adjacent stripes during said READ mode; and

error detecting means for receiving said output indicative of said servo signal from said processing means and responsive thereto and for developing an error signal indicative of sensed misalignment between said recording and pickup means and said stripes on said magnetic tape.

4,843,496

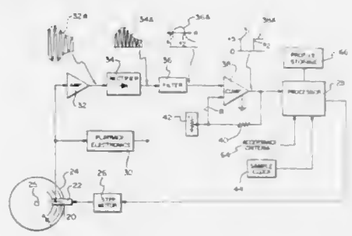
TRACK-FINDING SERVOMECHANISM UTILIZING THE SAMPLED OUTPUT OF AN ENVELOPE COMPARISON

Jay D. Marchetti, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 29, 1986, Ser. No. 924,541

Int. Cl.[4] G11D 5/596

U.S. Cl. 360—77.06 **7 Claims**



1. Apparatus for finding an optimum location for a transducer relative to a prerecorded track on a rotary magnetic medium, said apparatus including means for rotating the medium at a predetermined velocity, and means for positioning the transducer in a plurality of positions relative to the prerecorded track so that the transducer traces a plurality of trajectories over the medium, said apparatus comprising:

means responsive to the output of the transducer for generating an amplitude signal;

means for comparing said amplitude signal to a predetermined reference level and generating an output signal that switches between two output levels depending on the relation of its input level to the reference level;

sampling means for generating a plurality of samples from the output of said comparing means;

means for accumulating the frequency of samples exceeding to the reference level for each of the plurality of trajectories; and

means for selecting a particular trajectory according to a sampled frequency that corresponds to a particular amplitude level.

4,843,497

LEAD SCREW SERVO SYSTEM CONTROLLED BY A CONTROL TRACK

Robin D. Leyden, 3387 Denise La., Canoga Park, Calif. 91304

Filed Feb. 20, 1987, Ser. No. 17,223

Int. Cl.[4] G11B 31/00

U.S. Cl. 360—79 **12 Claims**

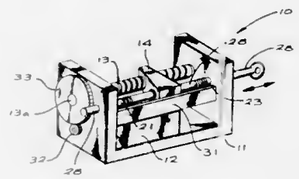
1. Apparatus for providing at least one linear mechanical movement in response to pre-recorded control signals repro-

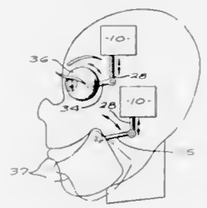
duced from a first recorded track on a magnetic recording medium and sound representing signals recorded on a second track on said recording medium synchronously with respect to said control signals, comprising:

first means for recovering and applying said sound representing signals to an electric-to-sound transducer;

second means for recovering said control signals and for generating corresponding analog control signals; and

third means including a servomechanism responsive to said analog control signals, including a motor, means for generating a feedback signal as a function of a performance





parameter of said servomechanism and means for comparing said analog and feedback signals and for controlling a motor to achieve said performance parameter, said servomechanism including a spiral grooves lead screw, a thrust rod for outputting a linear motion from said servomechanism, a carriage member having a dog element engaging said spiral groove lead screw, to move said carriage axially along said lead screw in response to rotation of said lead screw, said thrust rod being attached to said carriage to move along with said carriage and said motor being coupled to said lead screw to effect rotation thereof.

4,843,498

DICTATING MACHINE ARRANGED LIKE A TELEPHONE HANDSET

Helmut Graf von Zedlitz und Trützschler, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 814,479, Dec. 30, 1985, abandoned. This application Jan. 14, 1988, Ser. No. 145,683

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1985, 3500280

Int. Cl.[4] G11B *15/00, 31/00*

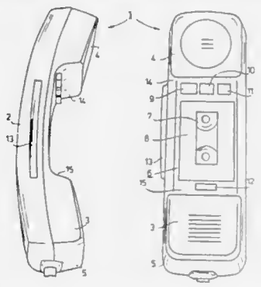
U.S. Cl. 360—93 **16 Claims**

1. A device for electronic information technology, and constituting a dictating machine, comprising

an elongated housing, having a mouth piece and an ear piece remote from each other at respective ends of the housing, said pieces being disposed on a same side of said housing and facing in a same general direction so that the mouth piece may be adjacent a user's mouth when the ear piece is held against a user's ear; and a handgrip between said ear piece and mouth piece having a surface on said side,

a tape cassette deck arranged in said handgrip on said same side, facing in said direction for access thereto through said surface, and

a plurality of control keys arranged at least adjacent said handgrip, for controlling operation of said deck for recording of information spoken into said mouth piece and



for playback of information through said ear piece, and located for engagement by flanges of said user on a hand which is gripping the handgrip.

4,843,499

TAPE WINDING DIRECTION SWITCH DEVICE OF CASSETTE TAPE RECORDER

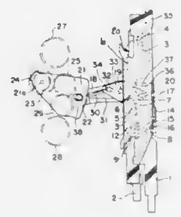
Hisashi Ogawa, Tokyo, Japan, assignor to Shinwa Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1987, Ser. No. 100,025

Claims priority, application Japan, Oct. 3, 1986, 61-235768

Int. Cl.[4] G11B *15/10*

U.S. Cl. 360—96.3 **8 Claims**



1. A tape winding direction switch device for a cassette tape recorder of the type having a pair of rotatable tape reel mounting members and a gear engagement clutch plate (21) mounted thereon for movement in opposite directions for selectively engaging gear driving means to rotate either one or the other of said reel mounting members in fast forward or fast rewind directions, said switch device comprising:

a frame;

a fast forward lever (1) mounted on said frame for movement to a fast forward position;

a fast rewind lever (2) mounted on said frame for movement to a fast rewind position;

a switching operation member (18) mounted on said frame for reciprocal movement and having a pair of ends, a first engaging means (17, 20) connecting one of said ends to said fast forward and fast rewind levers and a second engaging means (22) connecting said other end to said clutch plate (21);

a tape winding direction switch plate (35) mounted on said frame for movement between forward and reverse playback channel positions; and

a switching rotary member (33) mounted on said frame for movement relative thereto and having a first connection means (36, 37) for engaging said switching plate (35) and a second connection means (32, 34) for elastically engaging said switching operating member (18);

whereby said fast forward and rewind levers can be alternately moved to their respective fast forward and rewind positions to reciprocate said switching operation member (18) and move said clutch plate (21) in opposite directions without moving said rotating member (33) and said tape direction switch plate (35) connected thereto.

4,843,500

DISK STORAGE DRIVE

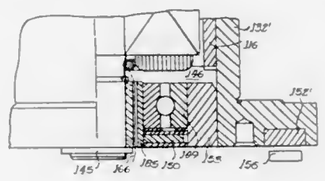
Dieter Elsässer, St. Georgen, and Johann von Der Heide, Schramberg, both of Fed. Rep. of Germany, assignors to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 767,671, Aug. 21, 1985, Pat. No. 4,658,312, which is a continuation of Ser. No. 412,093, Aug. 27, 1982, abandoned. This application Apr. 14, 1989, Ser. No. 38,049

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1981, 3135385

Int. Cl.[4] G11B *5/012;* **H02K** *17/00*

U.S. Cl. 360—97.02 **16 Claims**



1. A disk memory drive comprising: a brushless drive motor having an internal space defined therein and a stator including winding means defining magnetically active parts of the drive motor and having a given axial extension, the motor having an outer rotor coaxially encircling the stator and a substantially cylindrical air gap defined between the stator and the rotor, the rotor including a hub and including permanent magnet means having a predetermined axial extension fixedly connected therewith for magnetic interaction with said winding means; a disk mounting section provided on the hub for accommodating at least one storage disk located in a clean chamber surrounding said rotor, the mounting section along its axial length being adapted to extend through a central aperture of the storage disk, the winding means and the magnet means interacting therewith being disposed for at least half of the axial extension thereof within a space surrounded by the disk mounting section of the hub; and bearing means on a stationary shaft rotatably mounting the rotor and the hub on the shaft, the rotor also including rotational position indicator means interacting with stationary rotational position sensor means for determining the rotational position of the rotor, the internal space of said motor including the internal portions thereof with the bearing means and being sealed off against the clean chamber containing the disk, and the rotational position sensor means being located outside the sealed off internal space of the motor.

4,843,501

DISC HANDLING APPARATUS

Shigeki Okauchi, Tokyo, and Masaya Maeda, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 554,838, Nov. 23, 1983, abandoned. This application Aug. 21, 1987, Ser. No. 88,978

Claims priority, application Japan, Nov. 25, 1982, 57-206362

Int. Cl.[4] G11B *5/016*

U.S. Cl. 360—99.06 **33 Claims**

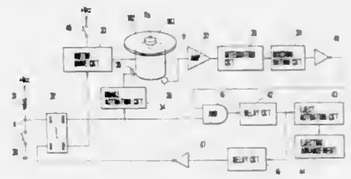
1. An apparatus for handling a disc, comprising:

(A) a loading station for loading thereon said disc;

(B) rotating means for rotating said disc, said rotating means being coupled with said disc when the disc is loaded on said station, and being arranged to generate pulses corresponding to the rotation caused by said rotating means;

(C) ejecting means for ejecting said disc from said station;

(D) brake means for braking said rotating means to stop the rotation of said disc by said rotating means; and



(E) detecting means for detecting that the rotating means is stopped by said brake means, said detecting means producing a charcteristic output representing the stoppage of said disc, wherein said ejecting means operating after said characteristic output is produced and in response thereto, said detecting means being arranged to integrate signals corresponding to said pulses and to detect the stoppage.

4,843,502

MAGNETIC HEAD SLIDER LOADING MECHANISM FOR MAGNETIC DISK APPARATUS

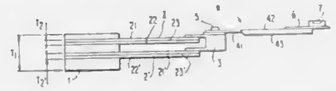
Norio Tagawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 27, 1987, Ser. No. 112,926

Claims priority, application Japan, Oct. 27, 1986, 61-255481

Int. Cl.[4] G11B *5/592, 21/12, 21/21*

U.S. Cl. 360—105 **9 Claims**



1. A magnetic head loading mechanism comprising:

a negative pressure head slider including an air bearing surface facing a surface of a magnetic disk, said negative pressure head slider being subjected to a first force so as to cause the slider to move toward said surface of said magnetic disk by an air flow generated by the rotation of said magnetic disk when a space between said air bearing surface and the magnetic disk surface is less than a first value;

a suspension element for supporting said negative pressure head slider above said magnetic disk surface at one end;

a pair of bimorph electromechanical transducers, provided substantially parallel to said magnetic disk surface;

a mount member for supporting said bimorph electromechanical transducers at respective fixed ends so as to be substantially parallel to each other;

a binder member connected to respective free ends of said bimorph electromechanical transducers, the other end of said suspension element being fixed only to said binder member so that said air bearing surface of said negative pressure lead slider is substantially parallel to said magnetic disk surface; and

drive means for applying a drive voltage to said bimorph electromechanical transducers so as to move said negative pressure head slider in a direction substantially perpendicular to said magnetic disk surface;

said bimorph electromechanical transducers holding said negative pressure head slider at an unloading position where said space is greater than said first value when said drive voltage is not applied, and said bimorph electromechanical transducers moving said negative pressure head

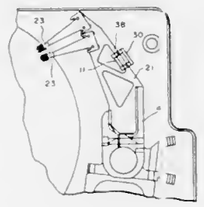
slider to a loading position where said space is less than said first value while maintaining said air beaming surface of said negative pressure head slider substantially parallel to said magnetic disk surface when said drive voltage is applied.

4,843,503

HEAD ARM DAMPING DEVICE FOR DISC DRIVE ACTUATORS

Henry B. Hazebrouck, Sunnyvale, and Joseph T. Castagna, San Jose, both of Calif., assignors to Prian Corporation, San Jose, Calif.

Filed Dec. 17, 1987, Ser. No. 133,946
Int. Cl.[4] G11B *5/55, 21/10, 21/16*
U.S. Cl. 360—106 **12 Claims**



1. In an information storage system having a housing that contains a spindle motor assembly about which a plurality of data storage discs may be journaled, a plurality of spaced apart aligned head arms that each carry at least one magnetic head for transferring data between an associated one of said discs and an external system, and a servo control system for selectively positioning said heads relative to said discs, the improvement comprising:

a damping device adapted for insertion between at least two adjacent head arms, the damping device including a side rib that extends along one side of the aligned head arms and a plurality of compressible fingers that protrude from said side rib into the spaces between said adjacent head arms to mechanically connect the adjacent head arms,

whereby the damping device damps both the absolute motions of the connected head arms and the relative motions between the connected head arms

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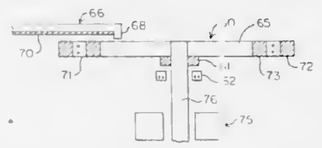
4,843,504

SUPERCONDUCTOR DEVICES USEFUL FOR DISK DRIVES AND THE LIKE

Frank S. Barnes, Boulder, Colo., assignor to University of Colorado Foundation, Inc., Boulder, Colo.

Filed Feb. 12, 1988, Ser. No. 155,192
Int. Cl.[4] G11B *5/55;* **H01K** *41/00*
U.S. Cl. 360—106 **14 Claims**



1. Apparatus for exchanging information with a circular media and which includes a drive mechanism for radially positioning a head relative to the media with the head including structure for imparting information to the media, for detecting information on the media, or both, comprising:

an arm having at least one head attached thereto wherein said head is capable of interchanging information with the media, and

bearing means for suspending said arm, said bearing means including a superconductor layer element, a magnetic field source element and means mounting one of said elements on said arm and the other said element in interfacing relationship to said one of said elements so that said interfacing relationship is maintained throughout the radial travel of said arm.

11. A drive for exchanging information between a circular media mounted on a spindle and a head comprising

an elongated arm having the head attached thereto and a layer of superconductor material on one side thereof, said arm being radially positionable over the surface of the circular media,

an annular magnet means in peripheral relation to the circular media and oriented to direct a magnetic field towards said arm superconductor layer for maintaining a relatively constant spacing between said arm and the media throughout the radial travel of said arm relative to the circular media,

a bearing assembly including a second annular magnet means and an annular ring of superconductor material in interfacing relation and attached for supporting said circular media in concentric relation to the media spindle,

a motor constructed at least in part of superconductor material and coupled for imparting rotary motion to the media spindle, and

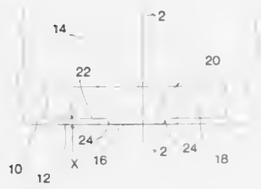
means controlling the environment of said drive for maintaining all said superconductor materials in their superconducting state.

4,843,505

MAGNETORESISTIVE SENSING ELEMENT WITH A PROJECTION FOR ENHANCED DATA READING

Gregory S. Mowry, Burnsville, Minn., assignor to Magnetic Peripherals Inc., Minnetonka, Minn.

Filed Apr. 25, 1988, Ser. No. 185,636
Int. Cl.[4] G11B *5/39*
U.S. Cl. 360—113 **5 Claims**



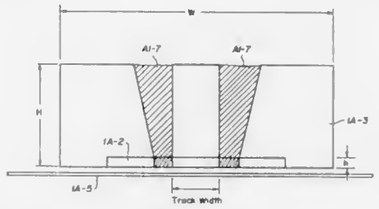
1. In a thin film magnetic data transducer of the type having for writing at least one deposited pole of preselected width projecting toward and approximately flush with a bearing surface of the transducer along which during use a magnetic medium for recording magnetic flux patterns moves; a deposited winding encircling the pole for carrying write current and generating write flux thereby; and a magnetoresistive flux sensing element underlying the deposited pole for reading data encoded in previously written magnetic data patterns on the medium, an improvement to the magnetoresistive flux sensing element comprising under the deposited pole a projection of the magnetoresistive flux sensing element toward the bearing surface, said projection having a width less than the preselected width of the deposited pole and a length dimension normal to the plane of the bearing surface no greater than approximately 1.5 μm.

4,843,506

SHIELDS OF MAGNETORESISTIVE TRANSDUCERS

Hardayal S. Gill, Los Altos, Calif., and Ralph F. Simmons, Jr., Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 913,164, Sep. 29, 1986, abandoned. This application Jun. 30, 1988, Ser. No. 214,801
Int. Cl.[4] G11B *5/39*
U.S. Cl. 360—113 **10 Claims**



1. An apparatus comprising:

a magnetoresistive field sensing transducer having a long axis and a height; and

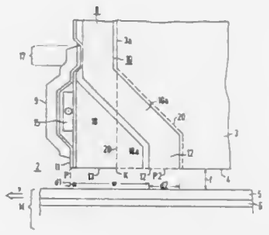
shielding means located adjacent to said field sensing transducer for exposing said transducer to one stable magnetic domain of said shielding means, the shielding means comprising material exhibiting uniaxial anisotropy cut so that its long axis is parallel its magnetic easy, where the shielding means' magnetic easy axis is parallel with the long axis of the field sensing transducer and its height is four times the height of the field sensing transducer.

4,843,507

MAGNETIC HEAD WITH LAMINATED STRUCTURE

Herbert Schewe, Herzogenaurach; Dietrich Stephani, Erlangen, and Armin Lenhart, Neunkirchen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Nov. 30, 1987, Ser. No. 126,771
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1986, 3641196; Dec. 3, 1986, 3641222
Int. Cl.[4] G11B *5/187, 5/31/5/127*
U.S. Cl. 360—125 **11 Claims**



1. A laminated magnetic head for perpendicularly or vertically magnetizing a recording medium, comprising:

a non-magnetic substrate;

a magnetic conductor body for carrying magnetic flux, said conductor body having first and second magnetic legs disposed on one side of said substrate;

a thin main pole formed on said magnetic conductor body at a first end piece thereof, said first end piece including said first magnetic leg;

an auxiliary pole formed on said magnetic conductor body at a second end piece thereof, said second end piece including said second magnetic leg, said first and second end pieces being aligned behind each other along a direction of travel of said head;

an insulating gap layer positioned between said first and second end pieces and extending at least 5 μm between said end pieces;

a read/write coil winding coil having conductor windings extending between said legs; and

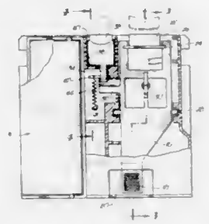
a recess in said substrate into which at least said second end piece of said second magnetic leg forming said auxiliary pole, at least one further part of said second leg and at least a part of said gap layer are received.

4,843,508

CLEANING CARTRIDGE FOR CLEANING THE DRIVE HEAD/DRIVE WHEEL OF A CARTRIDGE TAPE DRIVE SYSTEM

Lee R. Mannheimer, Westlake Village, and DeRidder, A. Lody, Carson, both of Calif., assignors to Perfectdata Corporation, Chatsworth, Calif.

Filed Jun. 10, 1987, Ser. No. 60,229
Int. Cl.[4] G11B *5/41*
U.S. Cl. 360—128 **11 Claims**



1. A cleaning cartridge for use with a cartridge tape drive system having a drive wheel and a plurality of magnetic heads arranged along a tape path, comprising:

a cartridge housing that is adapted for insertion into the drive system and includes a first opening that is adjacent to the heads when the cartridge is inserted into the drive system and a second opening that is adjacent to the drive wheel when the cartridge is inserted into the drive system;

a first cleaning pad mounted in the cartridge, which pad is adapted for contacting each of the heads when the cartridge is inserted into the drive system;

a second cleaning pad mounted in the cartridge, which pad is adapted for moving upon actuation thereof into contact with the drive wheel after the cartridge is inserted into the drive system; and

an actuator secured within the cartridge for simultaneously moving the first cleaning pad in a direction that is substantially perpendicular to the tape path and for actuating the second cleaning pad into contact with the drive wheel, thereby causing the first cleaning pad to clean the heads, and the second cleaning pad to clean the drive wheel.

4,843,509

APPARATUS FOR DEMAGNETIZING THE MAGNETIC HEAD OF A CASSETTE TAPE RECORDING AND/OR REPRODUCING DEVICE

Sam Andreas, Conshohocken, Pa., assignor to Recoton Corporation, Long Island City, N.Y.

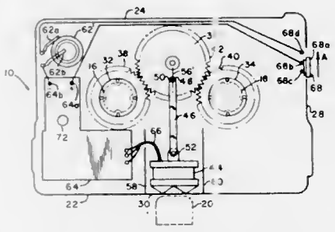
Filed Feb. 5, 1988, Ser. No. 152,915
Int. Cl.[4] G11B *5/465*
U.S. Cl. 360—128 **18 Claims**

1. Apparatus for demagnetizing a magnetic head of a cassette tape recording and/or reproducing device of the type having holding means capable of holding a cassette in predetermined relation to said head when said head is at an operative position,

and tape transport means including first and second spaced reel drive spindles, the apparatus comprising:

a cassette-shaped housing adapted to be held by said holding means and having a portion of a wall adjacent said head at said operative position when said housing is held by said holding means;

hub members rotatably mounted in said housing and adapted to be driven in rotation by at least one of said drive spindles;



electromagnet means including an electromagnet and operative electrical connection therefor for producing an alternating magnetic field having flux peaks of constant magnitude, said electromagnet means being positionable at said wall portion; and

mechanical coupling means for coupling said electromagnet means to said hub members so that said electromagnet means is rectilinearly reciprocated with respect to said wall portion along a path within said housing substantially perpendicular to said wall portion in response to rotation of said hub members.

4,843,510

MAGNETIC TAPE CASSETTE WITH TAPE PROTECTIVE CLOSURE AND LOCK MECHANISM

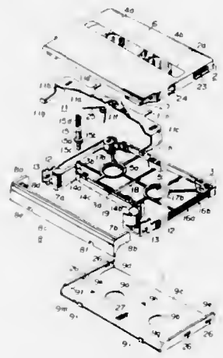
Hiroshi Meguro, Miyagi; Yoshinori Yamamoto, Kanagawa; Masao Ohyama, Tokyo; Kenichi Horikawa, Tokyo; Shigeru Mizusawa, Tokyo, and Kenji Kawakami, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 25, 1985, Ser. No. 704,943

Claims priority, application Japan, Mar. 7, 1984, 59-43574

Int. Cl.[4] G11B *15/32, 23/04*

U.S. Cl. 360—132 **24 Claims**



1. A magnetic tape cassette comprising:

a cassette casing having a mouth through which a magnetic tape is accessible, said mouth including a first opening in a front end face of said casing and a second opening in a lower section of the casing adjacent the front end face;

a pivotal lid covering and exposing said first opening of said mouth;

a sliding shutter member slidable with respect to the lower section of said cassette casing and having a planar section covering and exposing said second opening of said mouth, said shutter member being movable between a first position in which it covers second opening and a second position in which it exposes said second opening;

a movable locking pin formed independently of, but cooperating with, said cassette casing and disposed within said cassette casing to have a motion axis substantially perpendicular to said planar section so as to move along said motion axis, said locking pin normally positioned at a locking position and holding said shutter member in said first position while said cassette is not in use, and movable to a releasing position allowing said shutter member to move to said second position when said cassette is inserted into an associated recording and reproducing apparatus; and

a coil spring associated with said locking pin to constantly bias said locking pin in order to position said locking pin at said locking position to hold said shutter member in said first position.

4,843,511

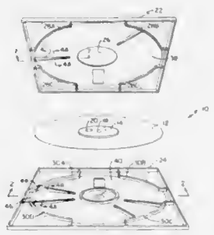
MAGNETIC DISK CASSETTE HAVING INTERNAL BIASING RIBS

Rogers B. Downey, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 781,060, Sep. 27, 1985, abandoned. This application Jul. 5, 1988, Ser. No. 215,371

Int. Cl.[4] G11B *23/03*

U.S. Cl. 360—133 **2 Claims**



1. A disk cassette comprising:

a substantially thin casing having a pair of opposed and spaced inwardly facing major surfaces;

a flexible disk adapted to have information recorded on at least one side thereof and/or retrieved therefrom, said disk being disposed between said pair of major surfaces for rotation relative thereto in a given plane;

a pair of liners for respectively cleaning opposite sides of said disk, each of said liners being disposed between one of said major surfaces and a corresponding facing side of said disk, said liners being attached to said casing and being configured to wipe a corresponding side of a said disk when urged into contact therewith while the disk is caused to rotate within said casing;

at least one set of cooperating generally radially extending ribs for engaging and urging said liners into selective engagement with the opposite sides of the disk therebetween, said set of ribs including a pair of angularly spaced ribs on one of said major surfaces and a single rib on said opposite major surface located between said pair of ribs circumferentially, said ribs serving to apply a deforming force to said liners and disk which induces a U-shaped bend therein that displaces a portion of said disk from said given plane in the vicinity of said rib set to facilitate disk cleaning and enhance stability of the disk in a direction transverse to the direction of disk rotation, said ribs being tapered so as to project gradually increasing distances away from said major casing surfaces toward said disk the further the said ribs extend radially outwardly of said casing, whereby said tapered ribs serve to exert a substantially uniform drag force radially across said disk when it is caused to rotate within said casing.

4,843,512

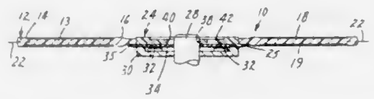
RECORDING DISK CENTERING HUB

Larry D. Moore, Weatherford, Okla.; Vernon J. Leonard, Minneapolis, and David M. Perry, Moundsview, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 28, 1987, Ser. No. 90,547

Int. Cl.[4] G11B *23/03*

U.S. Cl. 360—133 **24 Claims**



1. The combination of a recording medium disk and a hub having a center hole, the sides of which circumscribe a cylinder, and which is, at least in part, bounded by three flexure members arranged in a triangular configuration, wherein:

(a) a portion of each flexure member contacts said circumscribed cylinder; said portions being substantially coplanar;

(b) the flexure member plane of contact is the plane defined by said portions of the three flexure members if they are points or by the center points of said portions if they are lines or areas of contact;

(c) said flexure member plane of contact and the cross section center line of the recording medium disk are substantially in alignment; and

(d) said cross section center line is defined as the line perpendicular to the recording medium disk axis which bisects the cross section of the recording medium disk, excluding the hub, into two equal halves.

4,843,513

METHOD AND ARRANGEMENT FOR PROTECTING TURBINE GENERATORS AGAINST SUBSYNCHRONOUS RESONANCES OCCURRING IN POWER TRANSMISSION SYSTEMS

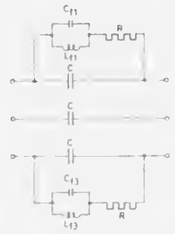
Abdel-Aty O. M. Edris, Västerås, Sweden, assignor to Asea Brown Boveri AB, Vasteras, Sweden

Filed Mar. 28, 1988, Ser. No. 174,164

Claims priority, application Sweden, May 6, 1987, 8701860

Int. Cl.[4] H02H *7/06*

U.S. Cl. 361—20 **12 Claims**



1. A method for protecting a turbine generator connected to a three-phase power line network, comprising producing an impedance asymmetry in at least one, preferably two, of the phase conductors, such that an inductance and a capacitance corresponding thereto are arranged in such a way that the inductive contribution of the inductance with respect to the phase conductor concerned and to the system frequency of the power line is compensated by the capacitive contribution of the capacitance, so that all of said phase conductors will exhibit symmetrically substantially the same impedance value for the system frequency, and so that at least one of the phase conductors will exhibit an impedance different from said other phase conductors for other frequencies.

4,843,514

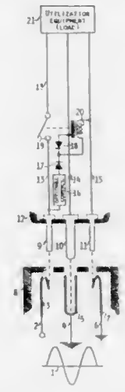
ELECTRICAL CONNECTION SENTRY SYSTEM

Lawrence E. Bodkin, 1149 Molokai Rd., Jacksonville, Fla. 32216

Filed Nov. 21, 1988, Ser. No. 273,834

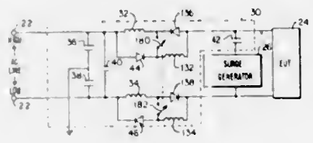
Int. Cl.[4] H02H *3/04, 5/10*

U.S. Cl. 361—50 **12 Claims**



1. In a system for connecting electrical utilization equipment (21) to a current source means (1), and having ungrounded (2), grounded (6) and grounding (4) conductors, relay means between said source means (1) and said equipment (21) to protect against hazardous misconnections, said relay means comprising an electromagnetic relay (20) having a coil and normally open contacts (19) that interrupt a conductor (13) to said equipment (21) which is correctly connectable to said ungrounded conductor (2), means for providing a source of pulsating direct current (23, 17) to said coil, said coil being coupled between conductors (14, 15) which are correctly connectable to respective grounding and grounded conductors (4, 6), a unidirectional blocking means (18) in series with said coil for blocking passage of said pulsating current to said conductor (14) which is correctly connectable to said grounding conductor (4) and to pass an inductive current generated in said coil between pulses in said pulsating current, said inductive current being passed through said grounding and grounded conductors (14, 15) and their common service grounding connection from one side of said coil to the other side thereof, said pulsating current and said inductive current being sufficient, only in combination, to cause closure of said contacts (19), and to thus pass energizing current from said source means (1) to said equipment (21), passage of said inductive current being interrupted and thus closure of said contacts (19) and use of said equipment (21) being prevented by the absence of a grounding conductor (4) or by a conductor reversal in which said ungrounded conductor (2) is incorrectly connected to said conductor (15) which is correctly connectable to said grounded conductor (6).

4,843,515
SURGE UNDERSHOOT ELIMINATOR
Peter L. Richman, Lexington, Mass., assignor to KeyTek Instrument Corp., Wilmington, Mass.
Continuation-in-part of Ser. No. 40,320, Apr. 20, 1987, abandoned. This application Aug. 18, 1987, Ser. No. 86,895
Int. Cl.[4] H02H 9/00
U.S. Cl. 361—58 **24 Claims**



19. In apparatus for applying a test electrical surge from a surge generator to equipment under test, said apparatus comprising a coupler/filter for connecting said equipment to said generator and to an electrical line having at least high and low polar sides for connecting said equipment to a source of electrical line power, the improvement

wherein said coupler/filter includes:

first inductive means connected in series in said high side of said electrical line and formed of at least first and second inductors:

second inductive means connected in series in said low side of said electrical line and formed of at least third and fourth inductors:

said apparatus further including means for dissipating at least the major portion of the energy stored in said inductive means during said test surge so as to prevent application of said stored energy to said equipment, said means for dissipating comprising first and second electrical power rectifier means each respectively connected in series with said first and second inductors, and third and fourth electrical power rectifier means each respectively connected in series with said third and fourth inductors;

first switch means disposed for connecting the junction of said first rectifier means and said first inductor to the junction of said second rectifier means and said second inductor;

second switch means disposed for connecting the junction of said third rectifier means and said third inductor with the junction of said fourth rectifier means and said fourth inductor;

each of said rectifier means being poled so that substantially all of the energy stored in said inductive means due to application of said surges to said equipment cannot exit said inductive means except into said rectifier means.

4,843,516
DEMAGNETIZING APPARATUS AND METHOD
Joseph A. Armond, River Grove, and Jaunito Rodenas, Carol Stream, both of Ill., assignors to Electro-Matic Products Co.
Filed Sep. 21, 1987, Ser. No. 100,997
Int. Cl.[4] B25B 11/00
U.S. Cl. 361—145 **9 Claims**

1. Chuck control apparatus for controlling a chuck having an electric permanent magnet therein comprising,

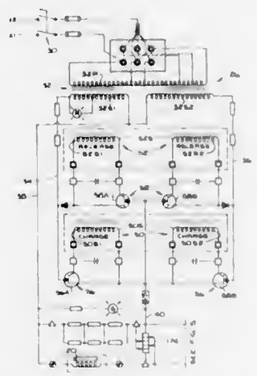
circuitry including a power circuit with a source of power therein, and a control circuit,

the power circuit including an electric permanent chuck,

a power transformer including power secondaries in the power circuit and control secondary in the control circuit, and operable for charging the chuck,

magnetizing control transformers having primaries in the control circuit and secondaries in the power circuit and operable for controlling the charging of the chuck,

means acting through the control secondary in the control circuit for energizing the magnetizing control transformers and the magnetizing control transformers thereby being operable for completing circuit between the power secondaries and the chuck and consequently charging the chuck, and



a selectively manually pre-settable charging timer operable, at the expiration of a predetermined set time interval, for disabling the magnetizing control transformers, and thereby terminating the charging of the chuck.

4,843,517
FILM CAPACITOR
Kazumasa Maruyama; Tobru Chiba, and Minoru Takamizawa, all of Niigata, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Dec. 6, 1988, Ser. No. 280,475
Claims priority, application Japan, Dec. 7, 1987, 62-309170
Int. Cl.[4] H01G 4/02; H01B 3/18
U.S. Cl. 361—323 **3 Claims**

1. A film capacitor of which the dielectric film is formed of an organopolysiloxane represented by the average unit formula

$$R^1_aR^2_bSiO_{(4-a-b)/2},$$

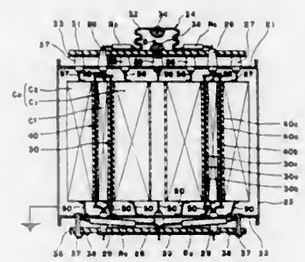
in which R^1 is a cyanoalkyl group having 3 to 5 carbon atoms, R^2 is a hydrogen atom, monovalent hydrocarbon group or halogenated monovalent hydrocarbon group, the subscript a is a positive number in the range from 0.8 to 1.8 and the subscript b is zero or a positive number not exceeding 1.0 with the proviso that a+b is in the range from 1.1 to 1.98.

4,843,518
COAXIAL TYPE CAPACITOR FOR PULSE GENERATOR
Mitsunao Okumura, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan
Filed Mar. 22, 1988, Ser. No. 171,559
Claims priority, application Japan, Mar. 23, 1987, 62-042928[U]; Dec. 21, 1987, 62-194342[U]
Int. Cl.[4] H01G 4/38; H03K 3/00
U.S. Cl. 361—330 **10 Claims**

1. A coaxial type capacitor for a pulse generator including at least a first capacitor for discharging charge accumulated therein when a pulse is generated and a second capacitor for adjusting a waveform of a pulse to be outputted,

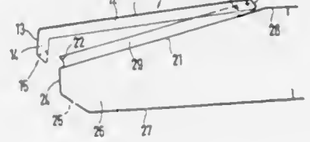
wherein said coaxial type capacitor includes at least first, second and third capacitors which are arranged coaxially and adjacently with each other,

wherein said first and third capacitors between which said second capacitor is arranged are connected in parallel so as to form the discharging capacitor of the pulse generator while said second capacitor is used as the waveform adjusting capacitor, and



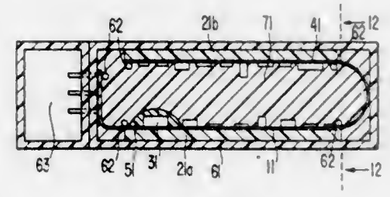
wherein currents in said first and third capacitors flow oppositely in direction to that of a current in said second capacitor when a pulse is generated.

4,843,519
SWITCHING PANEL WITH DESK-LIKE CASING
Lothar Lehr, Burbach-Oberdresselndorf, Fed. Rep. of Germany, assignor to Rittal-Werk Rudolf Loh GmbH & Co. KG, Stutzelberg, Fed. Rep. of Germany
Filed Mar. 7, 1988, Ser. No. 164,528
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1987, 3707390
Int. Cl.[4] H02B 1/08
U.S. Cl. 361—356 **8 Claims**



1. In a switching panel having a desk-like casing part with a casing opening, an open upper side with a peripheral sealing flange, said upper side inclined downwardly toward a forward wall, a lid closing said casing opening, said lip supported and hinged in an upper area of a horizontal side of said casing opening, said lid having peripheral rounded edge sections, in a closed position of said lid, said peripheral rounded edge sections enclosing said peripheral sealing flange, a forward edge section of said lid extending over said peripheral rounded edge sections and a portion of said forward wall of said casing part, the improvement comprising: a forward edge section (13) of said peripheral rounded edge sections having a lower free end bent inwardly at an acute angle forming an inclined first handle section (16) extending between free edges of each of two laterally adjacent edge sections (14) of said lid (10), said free end further bent downwardly at an acute angle with respect to said first handle section (16) forming a second handle section (17) which follows a vertical free edge, of each said laterally adjacent edge sections (14) forming a handle opening (15); said forward edge section (13), said first handle section (16) and said second handle section (17) forming a one-piece handle with said lid, said handle opening (15) having a generally inverted V-shaped cross section.

4,843,520
ELECTRONIC CIRCUIT MODULE
Yoshio Nakatani, Toyonaka; Tooru Tamura, Ikeda; Mikio Nozu, Yamatokouriyama, and Takahiro Manabe, Katano, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan
Filed Feb. 3, 1988, Ser. No. 151,904
Claims priority, application Japan, Feb. 3, 1987, 62-22751; Apr. 13, 1987, 62-90208
Int. Cl.[4] H05K 1/14
U.S. Cl. 361—395 **14 Claims**



1. An electronic circuit module comprising:

a case;

first and second substrates respectively disposed on opposite inner walls of said case with a predetermined gap therebetween;

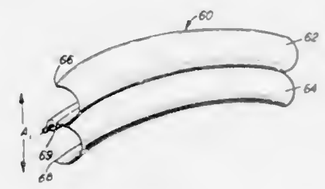
a flexible film having thereon a circuit pattern, wherein said flexible film has a part affixed to said first substrate and has another part affixed to said second substrate;

a first group of electronic components mounted on said flexible film at said part affixed to said first substrate, wherein said first group of electronic components includes a heat generating component;

a second group of electronic components mounted on said flexible film at said another part affixed to said second substrate, wherein said second group of electronic components includes a low-heat-resistive component; and

a resin layer having a low heat conductivity, said resin layer filling a gap betweensaid first group of electronic components and said second group of electronic components so that heat generated by said heat-generating component is not transferred to said low-heat-resistive component.

4,843,521
REFLECTOR WITH CURVED DUAL INVOLUTE SURFACES
Fred A. Plofchan, 11006 W. Jefferson, River Rouge, Mich. 48218
Filed Mar. 21, 1988, Ser. No. 170,887
Int. Cl.[4] G03B 15/02
U.S. Cl. 362—16 **27 Claims**



1. In a flash assembly having a source of light and a light reflective surface the improvement comprising:

first and second involute surfaces having edge boundaries thereon joined to form a cusp;

each of said involutes surfaces being bent horizontally to

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locate the cusp therebetween in an arcuate path in a plane intersecting the involute surfaces

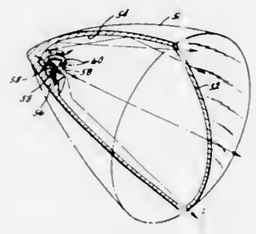
light means located adjacent said cusp operable to direct light against the involute surfaces for producing a reflected light dispersion pattern established by the vertical extent of the individual involute surfaces and the curvature of each of the individual involute surfaces so as to spread the light source for fully exposing the perimeter regions of photosensitive material exposed to such reflected light patterns.

4,843,522

VEHICULAR LAMP WITH MOVING LIGHT SOURCE

Burton A. Rosenberg, 1089 Hanley Ave., Los Angeles, Calif. 90049

Filed Mar. 6, 1984, Ser. No. 586,809
Int. Cl.⁴ F21V *19/00*
U.S. Cl. 362—61 **2 Claims**



1. A vehicle lamp for mounting on a vehicle and providing a moving and variable light intensity display, including,

a lamp body including a display area for visually displaying light energy provided within the lamp body,

a source of light energy located with the lamp body,

means operatively coupled to the source of light and supported by the lamp body for directing the light energy produced by light source at and thru the display area,

means operatively coupled to the source of light and the directing means for providing relative movement between the source of light and the directing means for producing variations in the direction of the light energy at the display area to provide a moving and variable light intensity at and thru the display area,

the means for providing relative movement including a resilient mounting responsive to natural forces produced when the vehicle is operated,

the resilient mounting having a natural frequency within a visibly observable range and approximating the fundamental, subharmoic, or harmonic frequencies of at least one of the natural forces produced when the vehicle is operated to provide oscillation of the resilient mounting at its natural frequency when the vehicle is operated and thereby provide an enhancement of the movement and variable intensity of the light display, and

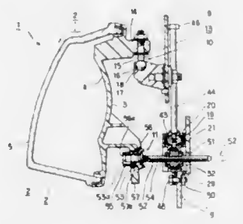
wherein the source of light is a filament and the means for providing relative movement is a resilient mounting for the filament to provide for movement of the filament in response to natural forces produces when vehicle is operated.

4,843,523

HEADLIGHT DEVICE

Yasuhiro Nakamura, Shimizu, Japan, assignor to Koito Seisakusho Co. Ltd., Tokyo, Japan

Filed Jun. 14, 1988, Ser. No. 206,447
Claims priority, application Japan, Mar. 31, 1988, 63-43151[U]
Int. Cl.⁴ B60Q *1/10*
U.S. Cl. 362—69 **8 Claims**



1. A headlight device including a movable member connected to a stationary supporting member at spaced apart three points, at two of said three points said movable member being connected to the stationary supporting member through respective aiming mechanisms which enable changing the space between the supporting member and the movable member.

each of said aiming mechanisms comprises an adjusting rod and a gear unit,

said gear unit comprises a casing mounted on the supporting member, a worm gear, a worm wheel meshing with the worm gear, a pinion gear co-axial with the worm gear, a driving gear meshing with the pinion gear, with the axis of the driving gear being arranged orthogonal to the axis of the worm wheel, and an adjusting rod connected to the driving gear and projecting out of the casing,

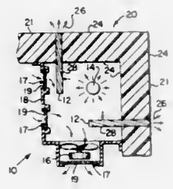
said adjusting rod having one end rotatably connected to the movable member and screw-threads being formed in an intermediate portion thereof for engaging with a threaded bore in the worm wheel of the gear unit.

4,843,524

ILLUMINATED DECORATIONS FOR FURNISHINGS AND OTHER LIKE STRUCTURES

Edward D. Krent, 207 Hampton Rd., Sharon, Mass. 02067, and Nicholas B. Paffett, 250 Whitwell St., #3, Quincy, Mass. 02169

Filed May 6, 1988, Ser. No. 191,307
Int. Cl.⁴ A47B *97/00*
U.S. Cl. 362—127 **23 Claims**



1. A structure having an illuminated design formed on an upper surface thereof, said structure comprising:

a light opaque structural member, said structural member having the upper surface formed thereon and a lower surface;

an element formed of a light transparent, fluorescent substance containing material extending through said structural member from said lower surface to said upper surface, said element having an edge disposed generally flush with said upper surface and a lower portion extending from said lower surface away from said upper surface;

means disposed on a side of said structural member adjacent said lower surface for illuminating said lower portion; and

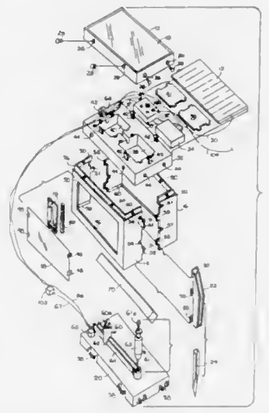
a housing surrounding at least a portion of said lower portion of said element and said illuminating means to prevent light from said illuminating means from being visible except along said edge of said element.

4,843,525

SOLAR POWERED YARD MARKER

Lloyd E. Williams, West Monroe, La., assignor to Power Plus, Inc., West Monroe, La.

Continuation-in-part of Ser. No. 34,709, Apr. 6, 1987, Pat. No. 4,751,622. This application Jan. 11, 1988, Ser. No. 141,822
Int. Cl.⁴ F21S *9/00*
U.S. Cl. 362—157 **16 Claims**



1. A self charging illuminated yard marker assembly comprising, in combination:

a. An indicia display assembly comprising:

(1) a pair of light emitting assembly enclosing halves which are matingly and abuttingly engaged with one another along opposed vertical, peripheral edge portions to define an interior chamber therebetween, one of said halves having transparent window means therein for displaying indicia means, each of said halves having a top end, an bottom end, and a plurality of holes therein for receipt of fastener means,

(2) connecting means for connecting said halves together,

(3) light emitting assembly means located in said interior chamber of said halves,

b. a top assembly for holding solar cell means comprising:

(1) a generally rectangular top for connection to the top ends of said halves, said rectangular top having a transparent sheet in the upper portion thereof,

(2) solar cell means located in said top beneath and adjacent to said transparent screen,

(3) holder means located in said top beneath said solar cell means for holding and supporting said solar cell means,

c. solar cell means connected to said holder means,

d. rechargeable storage battery means connected to said holder means,

e. base means connectable to said bottom ends of said halves for receiving and holding said light emitting assembly means,

f. means for electrically connecting said storage battery means to said light emitting assembly means, and

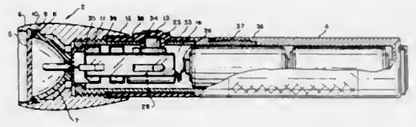
g. means for electrically connecting said solar cell means to said storage battery means.

4,843,526

FLASHLIGHT WITH SWITCH ASSEMBLY

George T. Price, III, 2223 E. 37th St., Los Angeles, Calif. 90058

Filed Oct. 13, 1987, Ser. No. 107,781
Int. Cl.⁴ F21L *15/02*
U.S. Cl. 362—187 **9 Claims**



1. A flashlight comprising:

a switch body having a top wall, a bottom wall, two side walls and two ends;

a first hole in the first end of the body, for receiving a first bulb lead;

a second hole in the first end of the body, for receiving a second bulb lead;

a first contact on the second end of the body;

a second contact on one of the walls of the body;

a cylindrical member around the top, bottom, and side walls of the body, said member engaging the second contact;

a flexible sleeve around the outer surface of the cylindrical member, said sleeve having a circular protrusion formed in the end thereof;

a head threadably attached to one end of the cylindrical member, with part of the head frictionally engaging the circular protrusion, to maintain a selected focus adjustment; and

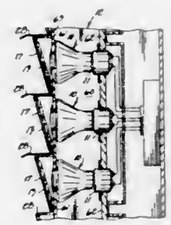
a battery unit threadably attached to the other end of the cylindrical member.

4,843,527

MATRIX LAMP BANK DISPLAY AND LIGHT FILTERING ASSEMBLY

Ira Britt, Spokane, Wash., assignor to American Sign & Indicator Corporation, Spokane, Wash.

Filed Jan. 7, 1988, Ser. No. 141,695
Int. Cl.⁴ F21V *9/08*
U.S. Cl. 362—231 **25 Claims**



1. A matrix lamp bank display for presenting a desired two dimensional pattern of lighted or unlighted light sources to a viewer, comprising:

an upright planar array of light sources directed parallel to one another in a common forward direction within a rectangular matrix in which the light sources are arranged in horizontal rows and vertical columns;

a corresponding array of light filtering assemblies located immediately forward of the light sources;

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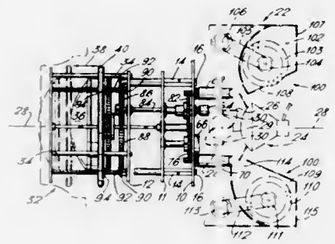
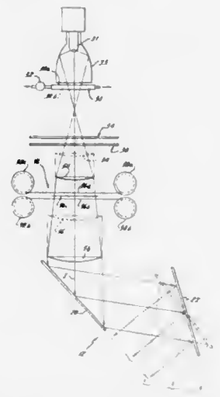
each light filtering assembly including:
an individual solid lens covering the front of one light source, each lens being individually inclined at an angle extending forwardly and upwardly from the planar array of light sources;
and individual frame means surrounding each lens, the frame means extending between each lens and the array of light sources for holding the lens in a location forward of one light source in the array;
the individual frame means each including a ventilated top wall extending rearwardly from the lens surrounded thereby.

4,843,528
ILLUMINATION LAMP APPARATUS
Peter R. Pearce-Harvey; Ernest V. Thomlinson, both of London, and Raymond French, Rochester, all of England, assignors to Tasco Limited, London, England
Filed Sep. 10, 1987, Ser. No. 95,093
Claims priority, application United Kingdom, Sep. 11, 1986, 8621883
Int. Cl.⁴ F21P 5/04
U.S. Cl. 362—277 **9 Claims**



1. An illumination lamp apparatus comprising:
a frame,
an illumination source mounted on said frame,
beam producing means mounted on said frame and associated with said source for projecting a beam of light from said illumination source along a main axis of the apparatus,
a shutter mounted on said frame and being selectively movable to block said beam of light
a gobo disk mounted on said frame forwardly of said illumination source in the direction of said beam of light and being rotatable about an axis extending parallel to said main axis and including a plurality of shaped apertures distributed circumferentially about said gobo disk, said shaped apertures being selectively positionable in said beam of light,
an iris mounted on said frame forwardly of said gobo disk in the direction of said beam of light, said iris extending in a plane at a predetermined spacing from said gobo disk along said main axis of said beam of light,
a lens assembly mounted for movement along a lens axis on said frame forwardly of said iris in the direction of said beam of light for creating a focal point of said beam of light,
controllable mechanically operable means for moving said lens assembly physically and selectively as a whole from a first position where said focal point of said lens assembly lies on said main axis and in the plane of said gobo disk, and a second position where said focal point of said lens assembly lies on said main axis and in the plane of said iris,
said means for moving said lens assembly including:
guides extending parallel to said main axis of the apparatus to allow movement of said lens assembly therealong,
a ring gear rotatable about the lens axis of said lens assembly,
a plurality of circumferentially spaced pinions engaging with and supporting said ring gear for rotation,
threaded rods associated one with each of said plurality of circumferentially spaced pinions, and
threaded apertures in said lens assembly, each threaded aperture threadingly engaging said threaded rods so that when said ring gear is rotated about the lens axis of said lens assembly, said plurality of circumferentially spaced pinions rotate and said threaded rods rotate to cause said lens assembly to move axially along said main axis.

4,843,529
STAGE LIGHTING APPARATUS
George C. Izenour, Stony Creek, Conn., assignor to Lehigh University, Bethlehem, Pa.
Division of Ser. No. 909,498, Sep. 19, 1986. This application Dec. 16, 1987, Ser. No. 133,316
Int. Cl.⁴ F21V 13/00
U.S. Cl. 362—284 **11 Claims**

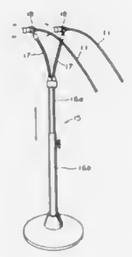


1. A stage lighting unit including a beam former for providing a beam and a beam redirector for aiming the beam from the beam former selectively to areas over a large expanse of the stage, said beam former including a lamp for providing a spectrum of visible light and a reflector for forming the light from the lamp into a beam of substantial cross-section and means for focusing the beam as a spot when projected onto a stage, said beam redirector being secured to said beam former for adjustment about the axis of the beam from the beam former, said beam redirector including a first mirror and a second mirror, said first mirror being disposed to intercept the beam from the beam former and reflect it to the second mirror, and said second mirror being arranged to reflect the beam from the first mirror as an output beam, the axes of the beam from the beam former and of the successively reflected portions of the beam being in a common plane, the second mirror being mounted for adjustment about an axis perpendicular to said common plane.

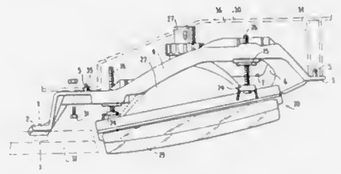
4,843,530
LIGHT RAY RADIATION STAND
Kei Mori, and Kazuyoshi Hara, both of Tokyo, Japan, assignors to Kei Mori, Tokyo, Japan
Filed Apr. 15, 1988, Ser. No. 181,888
Claims priority, application Japan, Dec. 28, 1987, 62-199831[U]
Int. Cl.⁴ F21S 1/12; F21V 8/00
U.S. Cl. 362—413 **7 Claims**

1. A light ray radiation device for holding an optical conductor comprising an upright foundation stand which is generally

vertically disposed when in use, said stand having two elongated members longitudinally slidable one within the other to thereby provide for height adjustment of the stand, said stand having an upper end portion, elongated deformable flexible conduit means extending from said upper end portion, said conduit means having outer ends, optical cable holding means mounted on said outer ends for holding an optical cable such that said flexible conduit means enable said optical cable to be moved to various positions so that light rays transmitted through said optical cable can be directed in different directions, said holding means comprising to semi-cylindrical bodies each having a semi-circular cross-sectional configuration and each having a longitudinal extending axis at the center of the respective semi-circular cross-sections, each of said bodies having elongated lateral edge portions extending generally parallel to the respective longitudinal axis, and hinge means pivotably connecting said two lateral edge portions of said two bodies such that said two bodies are pivotable to a closed position wherein said two lateral edge portions abut one another and said two bodies cooperate to define a closed cylinder for holding said optical cable.

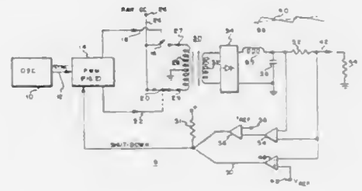


4,843,531
HOUSING FOR VEHICULAR LAMP ASSEMBLY
Hideharu Mochizuki, and Junji Toki, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan
Filed Mar. 23, 1988, Ser. No. 172,686
Claims priority, application Japan, Nov. 4, 1987, 62-277360
Int. Cl.⁴ F21M 3/00
U.S. Cl. 362—421 **7 Claims**



1. In a vehicular lamp assembly housing for supporting the body of a vehicular lamp assembly such as a headlamp assembly adjustably in the mounting angle of said lamp assembly body, said housing being fixed to a vehicle body in a predetermined position, the improvement characterized in that:
(A) the housing is constituted as an annular structure in a plane shape thereof wherein there is centrally formed therethrough a hole which permits insertion therein of the rear end portion of the vehicular lamp assembly, and at least a portion of said housing extends in the depth direction to form a surface curved in three dimensions;
(B) the inner and outer peripheral portions of the annular structure are respectively formed with annular, inner and outer peripheral edges bent backwards approximately perpendicularly to the surface of the annular structure;
(C) an annular or generally annular, continuous reinforcing rib is erected between said inner and outer peripheral edges and a multitude of connecting ribs are formed at appropriate intervals in a crossing relation to said reinforcing rib; and
(D) said annular structure is obtained by integral molding using a fiber-reinforced synthetic resin.

4,843,532
REGULATING PULSE WIDTH MODULATOR FOR POWER SUPPLY WITH HIGH SPEED SHUTOFF
David D. Freedman, Cinnaminson, N.J., assignor to General Electric Company, Moorestown, N.J.
Filed Jul. 1, 1988, Ser. No. 213,954
Int. Cl.⁴ H02M 3/335
U.S. Cl. 363—26 **5 Claims**



1. A pulse width modulator for a switching power supply intended for operation at a recurrence rate, which power supply includes first and second controllable switches, each including a control input terminal, and adapted to be coupled to a source of power and to a transformer including a primary winding and a secondary winding, said pulse width modulator controlling said controllable switches for applying pulses of power to said primary winding of said transformer for generating a direct output voltage, said pulse width modulator comprising:
a first conjunction gate including an output terminal adapted to be coupled to said control input terminal of said first controllable switch and also including first, second and third input terminals;
a second conjunction gate including an output terminal adapted to be coupled to said control input terminal of said second controllable switch and also including first, second and third input terminals;
a binary divider including an input terminal and first and second mutually antiphase output terminals, said first output terminal of said binary divider being coupled to said first input terminal of said first conjunction gate, and said second output terminal of said binary divider being coupled to said first input terminal of said second conjunction gate for alternately assuming first and second operating states for alternately enabling said first input terminals of said first and second conjunction gates;
a controllable flip-flop including J, K, clock and reset input terminals, and also including an output terminal coupled to said input terminal of said binary divider and also coupled to said second input terminals of said first and second conjunction gates, said controllable flip-flop assuming a first operating state in response to a transition of a first polarity at its clock input terminal when said J input terminal is at a first of two logic levels and its K input terminal is at a second of said two logic levels, said flip-flop assuming a second operating state (a) in response to a transition of said first polarity at said clock input terminal when said J input terminal is at said second logic level and said K input terminal is at said first logic level, and (b) upon application of a reset signal to said reset input terminal, whereby in said second operating state of said controllable

flip-flop neither of said first and second conjunction gates is enabled and in said first state of said controllable flip-flop that one of said first and second conjunction gates may be enabled which is enabled by said binary divider;

a gated oscillator including a gating input terminal adapted to be coupled for receiving a synchronizing signal for establishing a recurrence rate of said power supply and also including an undelayed output terminal coupled to said clock input terminal of said controllable flip-flop and also including mutually antiphase first and second delayed output terminals, said first delayed output terminal being coupled to said J input terminal of said controllable flip-flop, and said second delayed output terminal being coupled to said K input terminal of said controllable flip-flop, said oscillator operating at a frequency such that at least one and one-half complete operating cycles occur during each gating interval of said synchronizing signal, for producing a first operating state preceded by a first transition of said first polarity at said undelayed output terminal and a second operating state preceded by a second transition of a second polarity at said undelayed output terminal during each complete cycle, said first delayed output terminal being at said second logic level and said second delayed output terminal being at said first logic level after said first transition of each gating interval at said undelayed output terminal, which causes said controllable flip-flop to assume said second operating state for disabling both said first and second conjunction gates for maintaining both said first and second power switches nonconductive, and for causing said binary divider to change operating states if said controllable flip-flop changes its operating state in response to said first transition, and, in response to said second transition of said second polarity of said first cycle of said gated oscillator, changing the state of said mutually antiphase delayed output terminals, whereby said K input terminal of said controllable flip-flop assumes said second logic level and said J input terminal of said controllable flip-flop assumes said first logic level, and whereby in response to said third transition at said undelayed output terminal of said gated oscillator, said controllable flip-flop assumes said first state to thereby enable said second input terminals of said first and second conjunction gates, whereby that one of said first and second conjunction gates which also has said first input terminal enabled by said binary divider is enabled at said first and second input terminals; and;

a conductor connected to said third input terminals of said conjunction gates and to said reset input terminal of said controllable flip-flop, said reset input terminal of said controllable flip-flop being adapted to receive a shutdown signal which includes a position at said first logic level which enables said third input terminals of said first and second conjunction gates, and which also includes a transition to said second logic level in response to at least a comparison of said output voltage of said power supply with a reference voltage for thereby both directly disabling said first and second conjunction gates and resetting said controllable flip-flop for indirectly disabling said first and second conjunction gates

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4,843,533

TRANSIENT RIDE-THROUGH AC INVERTER

Richard W. Roof, Lexington, and G. Marshall Horne, Elgin, both of S.C., assignors to Square D Company, Palatine, Ill.

Filed Jan. 15, 1986, Ser. No. 819,169

Int. Cl.[4] H02H *7/122*

U.S. Cl. 363—55 **16 Claims**

1. A transient protection circuit for an inverter, comprising:

a rectifier capable of supplying direct current (DC) from an alternating current (AC) power source;

a DC bus fed by said rectifier;

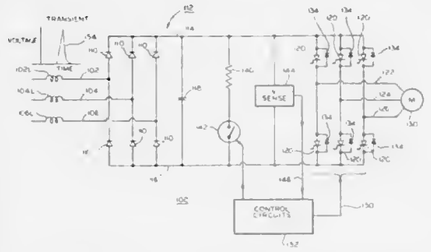
a bus capacitor connected across said DC bus;

solid state switches for supplying alternating current to a load;

means for sensing the voltage on said DC bus;

a resistor;

means responsive to said voltage on said DC bus for connecting said resistor in parallel with said bus capacitor if said DC bus voltage exceeds a predetermined voltage; and, means, responsive to said voltage on said DC bus, for



turning off said solid state switches if said DC bus voltage exceeds said predetermined voltage, and for turning on said solid state switches and disconnecting said resistor from parallel connection with said bus capacitor if said DC bus voltage is somewhat below said predetermined voltage, whereby said solid state switches are protected from a DC bus overvoltage caused by a transient voltage rise in said AC power source.

4,843,534

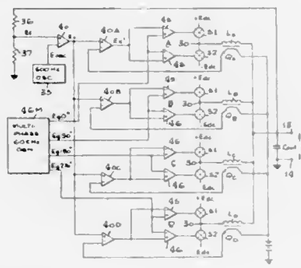
DC TO AC SWITCHING CONVERTER WITH PHASED DELAYED PARALLEL SWITCHERS

Fausto V. Taddeo, and Mark A. Woodward, both of Huntington Beach, Calif., assignors to Pacific Power Source Corp., Huntington Beach, Calif.

Filed Nov. 13, 1987, Ser. No. 120,122

Int. Cl.[4] H02M *7/519, 7/527*

U.S. Cl. 363—71 **11 Claims**



1. A switching type DC to AC power converter comprising:

a source of DC power;

output means to which a load, to which AC power is to be supplied, is connectible;

n separate sets of switch means, each set comprising a pair of switchers having a common junction, n being an integer not less than 2;

control means including modulation means coupled to the pairs of switchers of said n sets for controlling the switchers of each set to switch between On and Off states, whereby a substantially square wave shaped signal at a switch frequency definable as f_s at a controlled percent modulation appears at the set's common junction and

further controlling said switchers so that the n square wave shaped signals are at a synchronous preselected phase delay with respect to one another;

filter means connected to said n junctions and to said output means for filtering switching energy at said n junctions at said frequency f_s; and

means for sensing the currents flowing to and from said n junctions and for affecting said modulation means to control the percentages of modulations of the square wave shaped signals from said n sets to minimize the flow of currents between said n sets, independent of the average current flowing to said output means from said n sets.

4,843,535

SWITCHING POWER SUPPLY

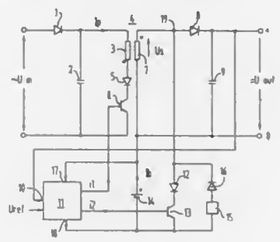
Erich Fuchs, Paderborn, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Sep. 26, 1988, Ser. No. 249,476

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1987, 3736372

Int. Cl.[4] H02J *9/00;* **H02M** *7/00*

U.S. Cl. 363—71 **29 Claims**



1. In a switched power supply of the type including a transformer (4) having a primary winding (3) and a secondary winding (7, 37), a first switching transistor (6) connected in series with the primary winding (3) and a rectified a.c. voltage supplied to the primary winding (3) wherein the first switching transistor (6) is periodically switched on by a first set of control pulses to thereby induce current pulses in the secondary winding (7, 37), the energy of which current pulses is used to generate an output d.c. voltage, and a battery branch circuit including a second switching transistor (13, 43) periodically switched on by a second set of control pulses to generate the output d.c. voltage in the event of a mains failure, the improvement comprising:

said battery branch circuit being connected in parallel with said secondary winding (7, 37) of the transformer (4) and having a polarity corresponding to the current pulses induced in said secondary winding (7, 37); and

control means (11) for switching on said second switching transistor (13, 43) during the time interval when said first switching transistor is switched on but wherein said second switching transistor is switched on after said first switching transistor is switched on and is switched off before said first switching transistor is switched off.

4,843,536

AC INPUT FREE POWER SOURCE

Kenji Watanabe, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 16, 1987, Ser. No. 3,841

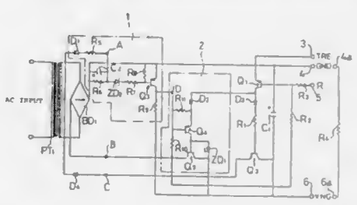
Claims priority, application Japan, Jan. 17, 1986, 61-8331

Int. Cl.[4] H02M *7/04;* **G05F** *5/00*

U.S. Cl. 363—89 **4 Claims**

3. The AC input free power source as defined in claim 1, wherein said primary voltage detection means includes:

Zener diode means for detecting whether the AC voltage at a center point of said power transformer means is above



said predetermined voltage level or below said predetermined voltage level; and

output transistor means for outputting the control signal.

4,843,537

CONTROL SYSTEM

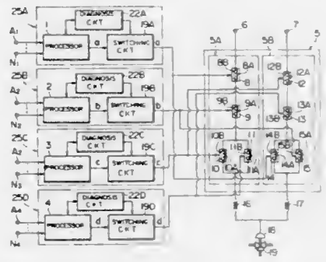
Setsuo Arita, Hitachiota; Shunsuke Utena, Hitachi; Fumio Murata, Katsuta; Atomi Noguchi, Hitachi; Shigeru Izumi, Tokyo; Satoshi Suzuki, Mito, and Fumiyasu Ookido, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 2, 1987, Ser. No. 69,046

Claims priority, application Japan, Jul. 4, 1986, 61-156071; Jan. 14, 1987, 62-4834

Int. Cl.[4] G21C *17/00;* **G06F** *11/00*

U.S. Cl. 364—187 **18 Claims**



1. A control system, comprising:

sensors installed in a quadruple array;

first, second, third and fourth signal processing channels provided in parallel and each including signal processing means for receiving output signals from said sensors for producing a trip signal;

a pair of actuating means operable independent of each other;

an apparatus controlled through operation of said pair of actuating means; and switch means operatively connected to said first, second, third and fourth processing channels for activating said two actuating means in response to application of trip signals produced by at least two of said signal processing channels;

wherein said signal processing means includes:

(a) decision means for receiving status quantity signals produced by said sensors to determine wheher said status quantity signals exceed a predetermined value;

(b) 2-out-of-4 logic means providing in a number n equal to that of said sensors for producing the status quntity of different types and receiving a first output signal from said decision means which corresponds to four same type status quantity signals; and

(c) 1-out-of-n logic means having inputs supplied with second output signals from all of said 2-out-of-4 logic means to produce said trip signal when at least one of said second output signal exceeds the predetermined value.

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4,843,538

MULTI-LEVEL DYNAMIC MENU WHICH SUPPRESSES DISPLAY OF ITEMS PREVIOUSLY DESIGNATED AS NON-SELECTABLE

Leslie A. Lane, Santa Clara; Lynn V. Eybeck, Moss Beach; David S. Perloff, Sunnyvale, and Chester L. Mallory, Campbell, all of Calif., assignors to Prometrix Corporation, Santa Clara, Calif.

Division of Ser. No. 864,024, May 16, 1986, Pat. No. 4,805,089, which is a continuation-in-part of Ser. No. 729,153, Apr. 30, 1985, Pat. No. 4,679,137. This application Jun. 20, 1988, Ser. No. 208,965

The portion of the term of this patent subsequent to Jul. 7, 2004, has been disclaimed.

Int. Cl.[4] G06F *15/46*

U.S. Cl. 364—188 9 Claims

1. In a method for displaying and selecting menu items on a computer display device, the steps of:

establishing at least three separate menu display regions on said computer display device, each being capable of displaying multiple menu items and an associated selectably positionable pointer to an individual menu item;

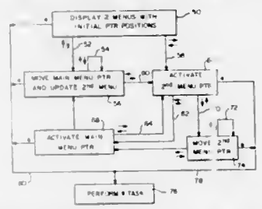
defining a plurality of separate main menu items;

defining a plurality of separate groups of auxiliary menu items, each group being associated with at least one of said main menu items;

defining a plurality of groups of tertiary menu items, each group being associated with at least one of said auxiliary menu items;

defining and storing for each said main menu item an availability denoting value which denotes whether said main menu item is enabled or disabled for selection; said availability denoting value also denoting whether each of said auxiliary menu items is enabled or disabled for selection;

displaying in a first one of said menu display regions at least a plurality of said main menu items which are denoted in said availability denoting value as being enabled for selection, together with said associated pointer positioned at one of said displayed main menu items;



displaying simultaneously in a second one of said menu display regions at least a portion of one of said groups of auxiliary menu items associated with the main menu item being pointed at in said first menu display region together with said associated pointer positioned at one of said displayed auxiliary menu items, the auxiliary menu items being displayed including only auxiliary menu items which are denoted by said availability denoting value as being enabled for selection;

automatically responding to a position change of said pointer in said first menu display region to point at a new main menu item by altering said second menu display region to display at least a portion of one of said groups of auxiliary menu items associated with the new main menu item being pointed at; and

displaying simultaneously in a third one of said menu display regions at least a portion of one of said groups of tertiary menu items associated with said auxiliary menu item being pointed at in said second menu display regions together with said associated pointer positioned at one of said displayed tertiary menu items;

wherein

said step of automatically responding to a position change of said pointer in said first menu display region further includes the step of simultaneously altering said third menu display region to display at least a portion of one of said groups of tertiary menu items associated with said second menu item being pointed at in said second display region; and

said method further includes the step of automatically responding to a position change of said pointer in said second menu display region without a position change of said pointer in said first menu display region by simultaneously altering said third menu display region to display at least a portion of one of said groups of tertiary menu items associated with said new secondary menu item being pointed at in said second display region.

4,843,539

INFORMATION TRANSFER SYSTEM FOR TRANSFERRING BINARY INFORMATION

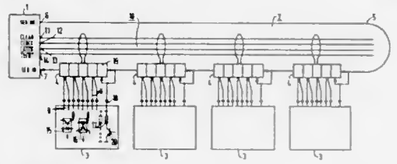
Joachim Bury, Amberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 29, 1987, Ser. No. 8,783

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1986, 3603751

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—200 22 Claims



1. An information transfer system for transferring binary information between a central unit and a plurality of modular peripheral assemblies via a bus system, wherein the bus system comprises a serial ring, and further comprises an interface unit comprising a shift register of said serial ring associated with each peripheral assembly which permits parallel tranfer of the binary information between each peripheral assembly and the bus system, each said interface unit being disposed in the serial ring and having parallel outputs and inputs coupled to a respective peripheral assembly, said bus system further comprising a plurality of control lines for controlling said interface units, each said interface unit comprising two sub-units, each sub-unit comprising four information bits, and further comprising first switching means provided at terminal ends of each interface unit allowing serial outputs and inputs of said interface units to be coupled together to form a ring shift register, and further comprising second switching means provided at said terminal ends for coupling said interface units together to form an enlarged ring shift register.

4,843,540

PARALLEL PROCESSING METHOD

Salvatore J. Stolfo, Ridgewood, N.J., assignor to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Sep. 2, 1986, Ser. No. 903,031

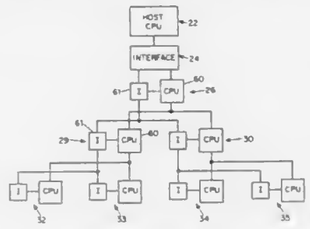
Int. Cl.[4] G06F *3/00, 7/38, 9/00*

U.S. Cl. 364—200 7 Claims

1. In a data processing system comprising a binary tree of data processing elements, each including a central processing unit, and an interface unit having registers, including a first register, an output register coupled to a corresponding input register in the interface unit of an adjoining higher order data processing element and input registers coupled to corresponding output registers of adjoining lower order data processing elements in said binary tree, a method for selecting one of said data processing elements, comprising the steps of:

setting selected values in said registers;

comparing in said registers in each higher order interface unit the selected values in said output registers for adjoining lower order interface units with the selected value in said first register of said higher order interface unit to select according to a selected logic order one of said data processing elements having an interface unit register value with a desired value characteristic;



inactivating the data processing elements, except for the selecting one;

substituting the register value with the desired value characteristic for the output register value of said higher order interface unit; and

repeating said comparing, inactivating and substituting steps until all but one data processing element of said binary tree of data processing elements is activated.

4,843,541

LOGICAL RESOURCE PARTITIONING OF A DATA PROCESSING SYSTEM

George H. Bean, Kingston; Terry L. Borden, Poughkeepsie; Mark S. Farrell, Pleasant Valley; Peter H. Gum, Poughkeepsie; Roger E. Hough, Highland; Francis E. Johnson, Poughkeepsie; Donald W. McCauley, Hopewell Junction; Mark E. Rakhmilevich, Kingston; John C. Rathjen, Rhinebeck; Casper A. Scalzi, Poughkeepsie; John F. Scanlon, Hyde Park, and Leslie W. Wyman, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 29, 1987, Ser. No. 79,314

Int. Cl.[4] G06F *15/16*

U.S. Cl. 364—200 27 Claims

27. A method of restricting guest operations in a data processing system to system resources assigned to a guest, the system resources in the system including one or more real CPUs, a system main storage (MS), an optional system extended storage (ES), and a plurality of I/O channels usng I/O processors for connecting to the system a plurality of I/O device control units with their I/O devices, a host hypervisor (host) which includes software, the host supervising plural software control programs (guests) capable of concurrently and independently operating in the system and the guests may be the same or different types of control programs, subchannels (SCHs) for representing I/O devices to the host and to the guests, each guest being restricted to using an assigned subset (partition) of system resources, the method for restricting guest operations comprising:

providing a plurality of partition sets in system storage for defining partitions of system resources, each partition set defining a particular subset of system resources available to a guest assigned to use the partition, each partition set comprised of a plurality of items for specifying the system resources assigned to the partition and the items being enterable by a human operator, the items assignable to each partition set including indicators for: a partition identifier unique to each partition set, a MS zone of contiguous main storage which can be located anywhere in MS and bounded by upper and lower limit MS addresses, none or one or plural SCHs, and an optional ES zone located anywhere in ES and bounded by upper and lower limit ES addresses,

having a control block in system storage for each SCH, each SCH having an identifier for an I/O interruption queue assigned to the SCH, each SCH being capable of being associated with none, one or plural partition sets,

also having a plurality of state description control blocks (SDs) in system storage for representing logical CPUs in the system, each SD containing fields with parameters for defining a logical CPU,

binding a logical CPU to a particular partition by associating a respective partition set with the SD representing the logical CPU,

assigning a logical CPU to a particular guest by entering parameters of the guest into the SD of the logical CPU,

dispatching a logical CPU for a guest on a selected real CPU in the data processing system by the host executing a start interpretive execution (SIE) isntruction on the real CPU to start execution of the logical CPU for the guest,

assigning an I/O device to a guest by associating an SCH of the I/O device with the guest's partition set and with the SD of a logical CPU which is to be used by the guest,

setting a pass-through indicator in the SCH of an I/O device assigned to a guest to enable the direct routing of I/O instructions from, and of pending I/O interruptions to, the logical CPU of the guest in order to allow each guest to directly control guest assigned I/O devices without host assistance during normal exeuction of I/O operations by a guest's logical CPU,

allowing a guest to directly instruct, and to directly handle I/O interruptions for, an I/O device assigned to the guest by determining that the SCH of the I/O device is associated with the SD of the logical CPU dispatched for the guest to allow the guest to control its assigned I/O devices without host intervention, while restricting each guest to using only the SCHs and other system resources defined in the partition set assigned to the guest.

4,843,542

VIRTUAL MEMORY CACHE FOR USE IN MULTI-PROCESSING SYSTEMS

Stephen R. Dashiell, Pasadena; Bindiganavele A. Prasad, Torrance; Ronald E. Rider, Menlo Park, and James A. Steffen, Long Beach, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 12, 1986, Ser. No. 930,172

Int. Cl.[4] G06F *12/00, 12/06, 13/00*

U.S. Cl. 364—200 12 Claims

1. A parallel data processor system for maintaining the consistency of data blocks, each block containing a plurality of bits of data and a master flag bit, said means for maintaining comprising:

a main memory for storing blocks of data,

a plurality of caches, each storing a plurality of addressable data blocks, each cache comprising a first and second data

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port and each data block comprising data and a master flag bit.

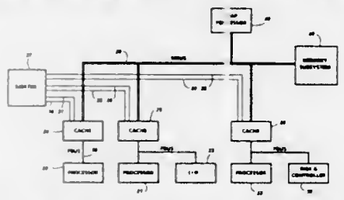
one data bus connecting the main memory and the first port of all caches,

a processor associated with each cache and connected to the second port of its associated cache,

means in each cache for allowing the processor to write into an addressed data block comprising,

(a) if the block is contained in the associated cache, means for setting the master flag in that cache, means for writing into any other cache that is sharing the block, means for resetting the master flag in all other caches, and means for allowing the processor to write into the block of the associated cache, or

(b) if the block is not contained in the associated cache, means for reading the block from another cache if any



other cache has the block with the master flag set for that block, or from main memory otherwise, means for setting the master flag in the associated cache and resetting the master flag in all other caches, and

(c) means for allowing the processor to write into the block of the associated cache, and

means each cache for allowing the processor to read from an addressed block comprising,

(a) if the block is in the associated cache, means for allowing the associated processor to read from the block, or

(b) if the block is not in the associated cache, means for reading it into the associated cache from the cache having the block in which the master flag is set, or for reading it from memory otherwise, and

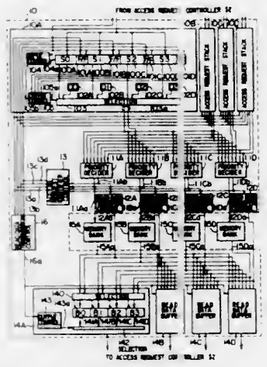
(c) means for allowing the associated processor to read from the block.

4,843,543

STORAGE CONTROL METHOD AND APPARATUS

Tadaaki Isobe, Hadano, Japan, assignor to 501 Hitachi, Ltd., Tokyo, Japan

Filed Apr. 21, 1987, Ser. No. 40,931
Claims priority, application Japan, Apr. 25, 1986, 61-96560
Int. Cl.[4] G06F *13/16*
U.S. Cl. 364—200 **10 Claims**



1. A storage control apparatus, connected between a storage device, said storage device including a plurality of independently accessible memory units, and a plurality of access request control units, each of said plurality of access request control units being operative to issue, to said storage device, access requests corresponding to elements of data, said storage control apparatus sequentially transmitting selected ones of said access requests issued from said plurality of access request control units to corresponding memory units designated by said access requests, said storage control apparatus comprising:

a plurality of identifier transmission means for dividing said access requests issued from said plurality of access request control units into a plurality of groups based on the order of issuance from said access request control units wherein each identifier transmission means is associated with one of said access request units and divides said access requests from said associated access request unit, and wherein each identifier transmission means further adds access requests in each group with access request identifiers, and wherein each identifier transmission means further transmits a plurality of access requests with access request identifiers added thereto;

a plurality of access request decider means, each access request decider means being provided in correspondence to one of said plurality of memory units, for receiving the plurality of access requests with access request identifiers sent from said identifier transmission means and serially supplying to the corresponding memory units the received access requests one by one; and

means, connected to said plurality of access request decider means, for detecting that all access requests with the same access request identifier have been transmitted from said plurality of access request decider means to said corresponding memory units, said means for detecting further sending to all of said identifier transmission means information indicative of the detection that all access requests with the same access request identifier have been transmitted from said plurality of access request decider means to said corresponding memory units which permits said same access request identifier to be used for new access requests.

4,843,544

METHOD AND APPARATUS FOR CONTROLLING DATA TRANSFERS THROUGH MULTIPLE BUFFERS

Keith B. DuLac, Derby, and Bret S. Weber, Wichita, both of Kans., assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 25, 1987, Ser. No. 101,354
Int. Cl.[4] G06F *13/00*
U.S. Cl. 364—200 **8 Claims**

1. A method for controlling the transfer of data between a SCSI bus and a disk memory using a finite state machine and a plurality of data buffers comprising the steps of:

a. initializing the finite state machine to a pause state indicating there is no data to be transferred;

b. determining if an input command to send data to the SCSI bus has occurred and if it has not then returning to step a;

c. resetting the finite state machine from the pause state indicating that the data transfer is occurring and starting the data transfer;

d. determining if a disk-data-in-buffer input command has occurred and if it has not, then advancing to step n;

e. transferring from the SCSI bus to a first counter the number of blocks of data to be transferred and transferring to a second counter the number of bytes in each block to be transferred to a first of the plurality of data buffers;

f. decrementing the byte count in the second counter by one;

g. determining if a subsystem error has occurred on the SCSI bus, and if the subsystem error has occurred, returning to step a;

h. determining if a SCSI bus request has occurred, and if the SCSI bus request has not occurred returning to step g;

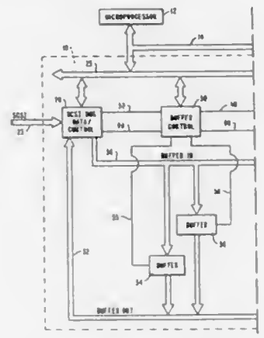
i. writing a byte of data from the SCSI bus to the first data buffer;

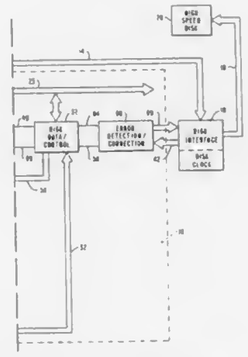
j. determining if the number of bytes remaining to be transferred in the block of data is equal to zero, and if the number of bytes in the block remaining to be transferred is not equal to zero returning to step f;

k. decrementing the block count in the first counter;

l. determining if disk data available for transfer awaits in the first data buffer and if not so advancing to step o;

m. rotating to a second data buffer of the plurality of data buffers, indicating that the second data buffer does not have disk data available for transfer and that the first data buffer is available to receive disk data;





n. determining if the end of the data transfer procedure has occurred and if so returning to step a, and if not so returning to step e; and

o. determining if a terminate data transfer with disk memory input indication has occurred, and if not so returning to step a.

4,843,545

COMPILE METHOD USING COPY PROPAGATION OF A VARIABLE

Sumio Kikuchi, Machida, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

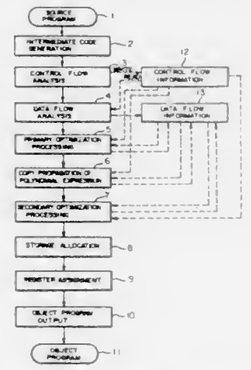
Filed Jul. 14, 1987, Ser. No. 72,966
Claims priority, application Japan, Jul. 18, 1986, 61-167915
Int. Cl.[4] G06F *9/44*
U.S. Cl. 364—300 **6 Claims**

1. A compile method to be effected in a digital computer comprising the following steps of:

(a) detecting among statements in source program codes to be compiled a first statement defining a first variable by a polynomial of a plurality of other variables and a second statement including the first variable so as to use the first variable defined by the first statement;

(b) judging whether or not the detected second statement satisfies a predetermined copy propagation condition;

(c) replacing the first variable included in the second statement by the polynomial and eliminating the first statement, when a result of the judgement indicates the condition is satisfied by the second statement; and



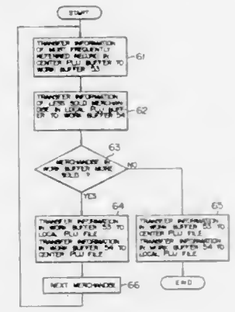
(d) generating object program codes from source program codes after said step (c).

4,843,546

POS SYSTEM WITH MEANS FOR AUTOMATICALLY RECONFIGURING THE CENTER PLU AND LOCAL FILES

Kazufumi Yoshida, Hadano; Tohru Ishikawa, Isehara, and Mikio Nogami, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 8, 1987, Ser. No. 35,754
Claims priority, application Japan, Apr. 9, 1986, 61-79918
Int. Cl.[4] G06F *15/24*
U.S. Cl. 364—403 **18 Claims**



1. A POS system having POS terminals and hierarchy merchandise files comprising:

a first POS terminal including,

a center file means for holding merchandise data representative of merchandise codes and merchandise names of items within a first group of merchandise,

a local file means for holding merchandise data representative of merchandise codes and merchandise names of items within a second group of merchandise,

a first counter means for holding first count data representative of a frequency of sales of items within the first group of merchandise, and

a second counter means for holding second count data representative of a frequency of sales of items within the second group of merchandise;

a plurality of second POS terminals, each including,

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a local buffer means for holding a copy of said local file means,

means for searching at least one of said local buffer means or said center file means based on an externally inputted merchandise code to retrieve a merchandise name corresponding to the externally inputted merchandise code, and

means for communicating data representative of a sale of a selected item of one of said first and second groups of merchandise to said first POS terminal,

means for incrementing the first count data of said first counter means when the selected item belongs to the first group of merchandise, and

means for incrementing the second count data of said second counter means when the selected item belongs to the second group of merchandise; and

said first POS terminal further including,

registration means for selectively comparing said first count data and said second count data,

the registration means including means for selectively updating said local file means with data representative of sales of merchandise in the first group of merchandise in the event that an item in the first group of merchandise has a larger frequency of sales than that of an item in the second group of merchandise as a result of a comparison of said first and second count data, and

means for selectively communicating data within the local file means to the local buffer means of each of the plurality of second POS terminals.

11. A method of point of sale merchandise data inquiry management comprising the steps of:

storing, in a first POS terminal, first merchandise data representative of merchandise codes and merchandise names of items within a first group of merchandise;

storing, in the first POS terminal, second merchandise data representative of merchandise codes and merchandise names of items within a second group of merchandise;

storing, in the first POS terminal, first count data representative of a frequency of sales of items within the first group of merchandise;

storing, in the first POS terminal, second count data representative of a frequency of sales of items within the second group of merchandise;

storing, in a second POS terminal, a copy of the second merchandise data;

receiving an externally inputted merchandise code into the second POS terminal;

searching at least one of the first merchandise data or the second merchandise data based on the externally inputted merchandise code;

retrieving a merchandise name corresponding to the externally inputted merchandise code in accordance with the searching;

communicating data representative of a sale of a selected item of one of the first and second groups of merchandise from the second POS terminal to the first POS terminal;

amending the first count data when the selected item belongs to the first group of merchandise;

amending the second count data when the selected item belongs to the second group of merchandise;

selectively comparing the first count data and the second count data;

selectively updating, as a result of the comparing, the second merchandise data with the first merchandise data in the event that an item in the first group of merchandise has a larger frequency of sales than that of an item in the second group of merchandise; and

selectively communicating the second merchandise data from the first POS terminal to the second POS terminal.

4,843,547

CASH REGISTER WITH A MULTI-WINDOW DISPLAY

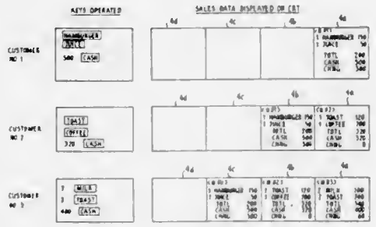
Seiji Fuyama; Tokio Mori; Mitsuhiro Kodama; Takashi Minato, and Yasuhiro Takaoka, all of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jun. 19, 1986, Ser. No. 876,199

Claims priority, application Japan, Jun. 19, 1985, 60-133263

Int. Cl.⁴ G07G *1/12*

U.S. Cl. 364—405 **5 Claims**



1. A cash register comprising:

a keyboard having a plurality of sales item keys for generating sales data for each of a plurality of customers and a plurality of control keys;

memory means having a plurality of storage areas corresponding respectively to said customers;

calculating means;

a controller means for addressing said storage areas to store said sales data of said customers into said storage areas and causing said calculating means to calculate the sales data stored in each of said storage areas in response to operation of one of said control keys; and

display means having a plurality of display windows respectively corresponding to said storage areas and connected to said controller means for displaying in the corresponding display windows a plurality of sales data stored in said storage areas and a plurality of data resulting from the calculation by said calculating means.

4,843,548

SYSTEM FOR INTEGRATING RELATED NUMERICAL FUNCTIONS

Robert Carpenter, 15 Willis Dr., Cumberland, R.I. 02864

Filed Apr. 30, 1987, Ser. No. 44,281

Int. Cl.⁴ G06F *15/21, 15/30*

U.S. Cl. 364—406 **2 Claims**

1. A method for integrating a large number of related numerical relationships in a computer system, which comprise the steps of:

defining a number of satellite functions, said satellite functions containing one or more data manipulation algorithms each requiring a number of input variables; and

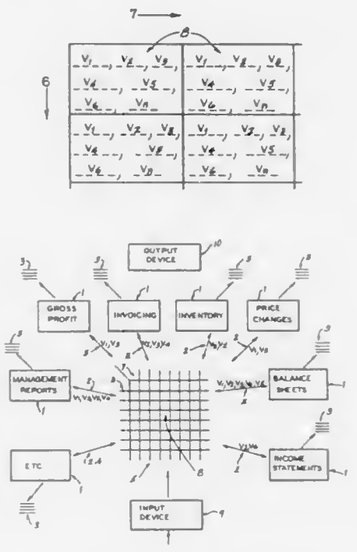
arranging said input variables by reformatting said data manipulation algorithms so as to develop a common set of input data variables such that said common set of input data variables provide all of the required input data for said data manipulation algorithms; and

arranging for said common set of input data variables to be entered into a tabular form of horizontal rows for each category of independent items such as inventory items; and

establishing a set of columns for said horizontal rows of independent items wherein each of said columns represents a unique level of activity such as selling volume and is defined as a sell level, and wherein the intersection of each of said rows and columns are designated as a cell; and

formatting each cell with predefined cell locations for each of said input variables such that all cells are pre-formatted in an identical manner to all other cells and specific input variables of like kind such as cost of goods is found in the identical location in each cell; and

integrating the said satellite functions and said cells containing the common set of input data variables such that a transaction such as a sale of an inventory item is entered into said computing system by a keyboard or other input device and all required data manipulations in all of the affected said satellite functions are executed at the time of



the said transaction and output reports or output report files are generated at the time of said transaction.

2. A method as recited in claim 1 wherein:

said satellite functions constitute a financial management system and;

said horizontal rows are arranged to represent inventory items or groups of items and;

said columns represent the sell levels for each inventory item or items.

4,843,549

METHOD OF DETERMINING THE SPECTRAL DISTRIBUTION OF THE NUCLEAR MAGNETIZATION IN A LIMITED VOLUME, AND DEVICE FOR PERFORMING THE METHOD

Graeme C. McKinnon, Ellerau, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 17, 1987, Ser. No. 15,416

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1986, 3605547; May 17, 1986, 3616749

Int. Cl.⁴ G01N *27/00*

U.S. Cl. 364—413.13 **8 Claims**

1. A method of determining the spectral distribution of nuclear magnetization in a limited volume comprising the steps of:

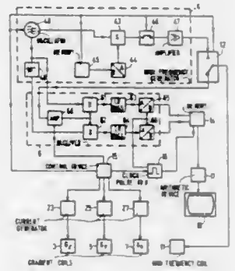
producing a steady, uniform magnetic field in an examination zone;

acting on said examination zone by means of repetitive sequences of three high frequency pulses spaced apart by predetermined time intervals, the pulses occurring during respective time intervals t1, t3 and t5;

producing a directional magnetic gradient field in conjunction with each of said pulses, the direction of the gradient of said magnetic gradient field being varied 90° from each of said high frequency pulses to the next;

generating a stimulated echo signal during an echo time interval following said third pulse, said echo signal occurring in said examination zone in response to said three pulses and said fields;

producing a directional magnetic gradient field during each time interval t2 and t4 between the first and second pulses and between the second and third pulses, respectively, as well as during a time interval t6 between the third pulse and the stimulated echo signal, the gradient of the gradient field produced in the time interval t2 after the first high



frequency pulse and in the time interval t6 after the third high frequency pulse extending in the same direction, the time integral of the gradient in the time interval t2 being substantially equal to the time integral of the gradient in the time interval t6, the direction, duration and intensity of the gradient field produced during the interval t4 being selected to suppress residual spin echo signals substantially without affecting said stimulated echo signal;

sampling said stimulated echo signal; and

processing said sampled signal by Fourier transformation to produce the spectral distribution of nuclear magnetization in said limited volume.

4,843,550

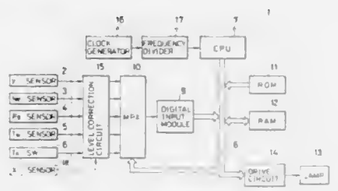
METHOD OF INDICATING A SHIFT OPERATION OF A MANUAL GEARBOX OF A VEHICLE

Tomohiko Kawanabe; Masahiko Asakura; Noritaka Kushida; Shin'ichi Kubota; Yukihiro Matsumoto; Yasuhisa Arai, and Takefumi Hosaka, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1987, Ser. No. 12,320

Int. Cl.⁴ G06F *7/02*

U.S. Cl. 364—424.1 **6 Claims**



1. A method of indicating to an operator when a manual gearbox of a motor vehicle should be shifted, comprising the steps of:

(a) determining the cumulative running time of the vehicle;

(b) setting reference values for a plurality of vehicle reference speeds based on the determined cumulative vehicle running time;

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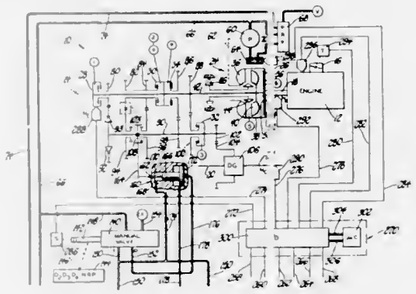
(c) detecting a vehicle speed;
(d) determining an operational parameter of an engine of the vehicle;
(e) selecting one of said plurality of vehicle reference speeds based on the determined operational parameter of the engine;
(f) comparing said detected vehicle speed with said selected vehicle reference speed; and
(g) indicating to the operator that the manual gearbox should be shifted based on the result of the comparison.

4,843,551

FAILURE MODE SHIFT PATTERN ALTERATION FOR AN ELECTRONICALLY CONTROLLED TRANSMISSION

Rimas S. Milunas, Royal Oak, Mich., assignor to Saturn Corporation, Troy, Mich.

Filed Sep. 28, 1987, Ser. No. 101,940
Int. Cl.[4] B60K *41/08*; G60F *15/50*
U.S. Cl. 364—424.1 **4 Claims**



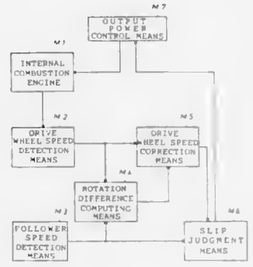
1. Shift pattern control apparatus for a motor vehicle transmission shiftable between successively engageable forward speed ratios including a lowermost speed ratio, an uppermost speed ratio, and one or more intermediate speed ratios, the apparatus comprising:
electrically alterable memory means having stored therein as a function of speed ratio and driver demand previously determined information corresponding to a vehicle speed at which a transmission shift from said speed ratio should occur;
look-up means for retrieving previously determined speed information from said memory means pertaining to the current speed ratio and driver demand for comparison with an indication of the actual vehicle speed to schedule shifting from said current speed ratio; and
override means effective in response to the detection of a failure of an intermediate speed ratio for electrically altering the speed information stored in said memory means such that the previously determined information used to schedule shifting between such failed intermediate speed ratio and successively higher and lower speed ratios is replaced with new speed information determined according to an arithmetic combination thereof, whereby further shifting between such successively higher and lower speed ratios is scheduled in accordance with the new speed information.

4,843,552

WHEEL SLIP CONTROL SYSTEM

Takafumi Inagaki, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jun. 2, 1986, Ser. No. 869,372
Claims priority, application Japan, Jun. 8, 1985, 60-124894
Int. Cl.[4] B60T *8/58*
U.S. Cl. 364—426.03 **8 Claims**



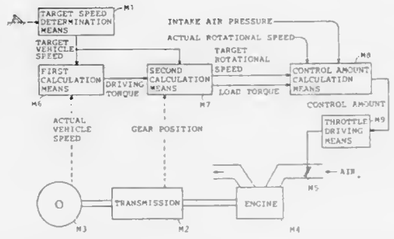
1. A wheel slip control system comprising:
a drive wheel speed detection means for detecting a speed of drive wheels;
a follower speed detection means for detecting a speed of non-driven follower wheels;
a rotation difference computing means for computing the ratio of a detected value of said drive wheel speed detection means to a detected value of said follower speed detection means during a steady state running condition;
a drive wheel speed correction means for correcting said detected value of said drive wheel speed detection means using said wheel speed ratio determined by said rotation difference computing means;
a slip determination means for determining if slippage of said drive wheels is occurring by comparing the value of the drive wheel speed corrected by said drive wheel speed correction means with a value based on the detected value of said follower speed detection means; and
an output power control means for improving traction output according to the determination of said slip determination means when the vehicle is in a non-steady state running condition.

4,843,553

SPEED CONTROL SYSTEM FOR A VEHICLE

Akira Ohata, Mishima, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 21, 1988, Ser. No. 209,439
Claims priority, application Japan, Jul. 16, 1987, 62-178117
Int. Cl.[4] B60K *31/00*
U.S. Cl. 364—426.04 **8 Claims**



1. A speed control system for a vehicle having an internal

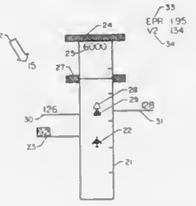
combustion engine, an output power thereof is adjusted by a throttle valve and is transmitted via a transmission to a driving wheel in order to control a vehicle speed, the control system comprising:
target speed determination means for determining a target vehicle speed based on at least a command from a driver of the vehicle;
first calculation means responsive to an actual vehicle speed and the target vehicle speed for calculating a driving torque at an output side of the transmission necessary to bring the actual vehicle speed to the target vehicle speed utilizing predetermined first parameters, the first parameters being determined based on a first physical model describing the behavior of the vehicle utilizing the vehicle speed as a state variable;
second calculation means responsive to the driving torque, the target vehicle speed and a gear position of the transmission for calculating a target rotational speed and a load torque of the engine;
control amount calculation means responsive to the target rotational speed, the load torque, an actual rotational speed of the engine and an intake air pressure of the engine for calculating a control amount of the throttle valve necessary to bring the actual rotational speed of the engine to the target rotational speed utilizing predetermined second parameters, the second parameters being determined based on a second physical model describing the behavior of the engine utilizing said actual rotational speed of the engine and said intake air pressure of the engine as state variables; and
throttle driving means responsive to the control amount for driving the throttle valve of the internal combustion engine.

4,843,554

AIRPLANE TAKEOFF AND LANDING PERFORMANCE MONITORING SYSTEM

David B. Middleton, Yorktown; Raghavachari Srivatsan, Newport News, and Lee H. Person, Yorktown, all of Va., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 6, 1987, Ser. No. 82,766
Int. Cl.[4] G06F *16/48*; G06G *7/70*
U.S. Cl. 364—427 **25 Claims**



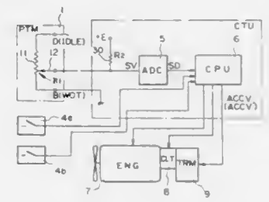
1. In an airplane takeoff and landing performance monitoring system including a display for graphically and continuously depicting the position of an airplane on a runway from and during takeoff relative to where particular events are predicted to occur, the improvement comprising:
transducer means for continuously sensing ambient conditions and airplane loading and acceleration information and generating information signals representative thereof;
computer means responsive to said information signals for generating an acceleration history curve and predicting future airplane performance from and during takeoff and landing based on said acceleration history curve and said information signals; and
display means responsive to said computer means for continuously depicting said airplane's position on the runway from and during takeoff and for depicting the predicted location on the runway where said airplane will achieve any particular speed.

4,843,555

SIGNAL PROCESSING SYSTEM FOR VEHICULAR ACCELERATION SENSOR

Toshihiro Hattori, Ayase; Masaki Ishihara, Fujisawa; Hitoshi Kasai, and Yasuyoshi Asagi, both of Kawasaki, all of Japan, assignors to Isuzu Motors Limited, Tokyo and Fujitsu Limited, Kawasaki, both of, Japan

Continuation of Ser. No. 686,544, Dec. 26, 1984, abandoned.
This application Sep. 16, 1987, Ser. No. 97,399
Int. Cl.[4] G06F *3/00, 15/353*; F02D *41/10*
U.S. Cl. 364—431.07 **6 Claims**



1. A signal processing device for accelerating or decelerating a motor vehicle in response to a signal corresponding to a measured extent of depression of an accelerator pedal, said device comprising:
an accelerator pedal sensor coupled to the accelerator pedal and detecting the extent of depression of the accelerator pedal, said accelerator pedal sensor comprising a fixed resistance having a value R2 and a potentiometer including a sliding contact connected to a power supply outputting a voltage E, said fixed resistance being connected in series with said potentiometer sliding contact forming an output node, and an output signal being produced at the output node; and
correction means, coupled to said accelerator pedal sensor, for correcting the output signal produced by said accelerator pedal sensor, the correction changing nonlinearly depending upon the extent of depression of said accelerator pedal to produce a corrected accelerator signal which varies linearly with respect to the actual accelerator pedal displacement, said correction means including:
an analog-to-digital converter for converting said output signal to a digital voltage value SD; and
means for producing a corrected acceleration signal ACCV as a function of said digital voltage value SD, the value R2 of the fixed resistance R2, the value of the voltage E, and a constant C according to the following formula;

$$ACCV=C\times R2\times SD/(10\times E-SD).$$

4,843,556

METHOD AND APPARATUS FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE

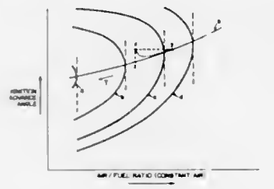
Anthony C. Wakeman, Bromsgrove; John M. Ironside; Michael Holmes, both of Birmingham, and Simon C. Barnard, Kenilworth, all of England, assignors to Lucas Industries public limited company, Birmingham, England

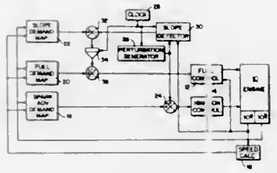
Filed Jul. 22, 1986, Ser. No. 888,067

Claims priority, application United Kingdom, Jul. 23, 1985, 8518593; Feb. 20, 1986, 8604259; Feb. 20, 1986, 8604260

Int. Cl.[4] F02D *5/02, 5/04*

U.S. Cl. 364—431.08 **61 Claims**





I. A method of operating a power producing engine having two control inputs, both of which affect an engine output, said method comprising the steps of:

periodically perturbing one of said inputs about a base value which is established in accordance with the engine operating conditions;

monitoring said engine output;

determining the slope of engine output with respect to said one input; and

controlling the other input so as to obtain a desired value of said slope.

4,843,557

OVERALL DIAGNOSIS APPARATUS FOR VEHICLE-MOUNTED CONTROL DEVICES

Katsuhiro Ina, Okazaki; Yuji Hirabayashi, Aichi; Kazuaki Minami, Anjo; Katsunori Ito, Aichi; Susumu Akiyama, Kariya, and Hidemichi Tanabe, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 6, 1987, Ser. No. 740

Claims priority, application Japan, Jan. 9, 1986, 61-1316

Int. Cl.[4] G06F *11/00, 11/32;* **G08B** *26/00*

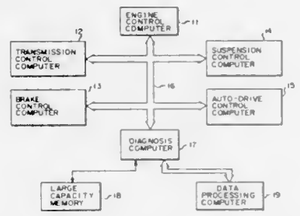
U.S. Cl. 364—431.77 **15 Claims**

I. An overall diagnosis apparatus for vehicle mounted control devices comprising:

a plurality of control computers respectively provided for a plurality of electronic control systems mounted on a vehicle, said control computers respectively executing the controls exclusively for these control systems;

data transfer means for linking all of said control computers to allow data communication among said control computers; and

a diagnosis computer connected to said transfer means, said diagnosis computer diagnosing operation of at least one of



said electronic control systems to produce a diagnostic result, diagnosis of each said at least one electronic control system being on the basis of related data transferred through said transfer means from at least two of said control computers.

4,843,558

REGULATION FOR A GAS ENGINE

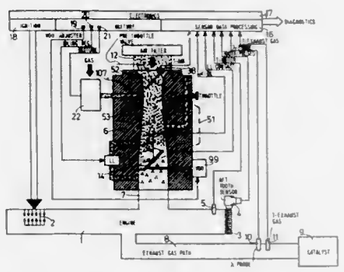
Horst Bergmann, Esslingen; Helmut Daudel, Schorndorf; Burkhard Brandner, Werdohl, and Klemens Kloeppel, Neuenrade, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft and Atlas Fahrzeugtechnik GmbH, both of, Fed. Rep. of Germany

Filed Jun. 29, 1987, Ser. No. 67,276

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1986, 3621500

Int. Cl.[4] F02D *5/145, 43/00*

U.S. Cl. 364—431.03 **17 Claims**



I. A control system for an internal combustion engine provided with an ignition pulse generator having adjustable ignition angle characteristics comprising:

(a) adjustment means for receiving a control signal and for adjusting the ignition angle of the ignition pulse generator in response thereto;

(b) means for determining engine rotational speed;

(c) means for determining engine load;

(d) means for determining a base ignition angle as a function of engine load and engine rotational speed;

(e) means for determining an actual lambda-value during operation of the internal combustion engine;

(f) means for determining a desired lambda-value as a function of engine rotational speed and engine load;

(g) means for determining a lambda-difference value by comparing the magnitude of the actual lambda-value with the magnitude of the desired lambda-value;

(h) means for determining a correction of the base ignition angle as a function of the magnitude of the lambda-difference value and the engine load; and

(i) means for producing the control signal as a function of the corrected base ignition angle and for supplying the control signal to the adjustment means.

4,843,559

Patent Not Issued For This Number

4,843,560

COST COUNTER WITH A COST METER CAPABLE OF READING STORED DATA

Kiyomichi Ichikawa, Tokyo, Japan, assignor to Autostamp Institution Limited, Tokyo, Japan

Filed Oct. 16, 1986, Ser. No. 919,876

Int. Cl.[4] G06F *15/20, 3/00*

U.S. Cl. 364—464.02 **1 Claim**

1. In a cost counter comprising a printing drum which at each transaction prints a consumed amount of money, and a costing mechanism wherein there is set an amount to be consumed at each transaction, said costing mechanism subtracting said amount to be consumed from a preset balance with a display of a resulting balance after each subtraction, the improvement comprising said costing mechanism being equipped with

a calculating section including an electronic memory,

means for introducing a balance amount into said electronic memory,

an electromechanical displaying section operable to display said balance amount,

a consumed amount section capable of being set to a specific amount,

said consumed amount section being further capable of delivering an electric signal indicative of a transaction of a magnitude of said specific amount,

said calculating section further being capable of sequentially subtracting at each transaction a consumed amount from said balance amount,

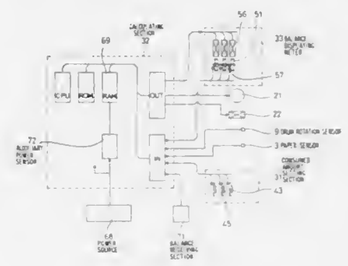
said calculating section being still further capable of communicating the balance amount after each transaction to said displaying section; and

balance display information detecting means for detecting an information being displayed,

said detecting means including communication means to return information from said display to said calculating section upon loss of said information from said electronic memory,

said balance display information detecting means further comprising at least one number ring, rotation-detecting means for detecting an intermittent rotation of the number ring, and position-detecting means for detecting an absolute reference position of the number ring,

said rotation-detecting means of the detecting means including a transmission type rotation-detecting sensor and rotation-detecting apertures formed in the number ring and being of a half number of a displayed number of light apertures, and detecting a single ON-OFF cycle by means of said transmission type sensor which detects the intermittent rotation per pitch of the number ring, while the position-detecting means of the detecting means is provided with at least one position-detecting aperture formed in the number ring and a transmission type position-detecting sensor which detects an ON-OFF position for detecting a single rotation of the number ring, and



an auxiliary power source operable to supply an alternate power in the event of a regular power failure.

4,843,561

APPARATUS FOR LOCATING AND MANIPULATING AGRICULTURAL PRODUCTS

Bernard R. Larson, Spring Lake, Mich., assignor to Sun Controls Design, Inc., Grand Haven, Mich.

Filed May 1, 1985, Ser. No. 729,409

Int. Cl.[4] G06F *15/64;* **H04N** *7/18;* **B07C** *5/342*

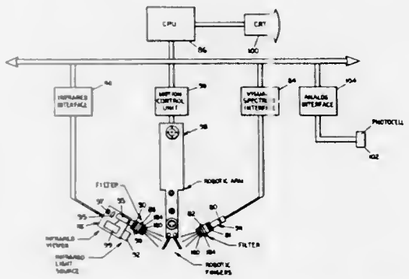
U.S. Cl. 364—478 **14 Claims**

10. Apparatus for locating agricultural products such as fruits or vegetables or the like that emit or reflect distinctive radiation characteristics in a non-visible frequency range comprising:

detection means for detecting and producing digitized im-

ages of the products based on non-visible radiation in a predetermined frequency range received from a given viewing area, the radiation being in a frequency range that includes the frequency range of the distinctive radiation characteristics for the products to be located in relation to surrounding vegetation;

product locator means for receiving the digitized images as input, extracting a stored digitized definition of the products to be selected, comparing characteristics of the digitized input with the stored digitized definition of products to be selected, identifying the products conforming to the



definition, and generating an output signal usable for directing an output device relative to the products; and

picking means for picking products located in response to the output signal, the picking means including a central processing unit for directing movement of a motor driven gripper mechanism to the location detected by the product locator and manipulating the product with the gripper mechanism, the product locator means comprising its own central processing unit for comparing detected images with know product characteristics and generating a position indicating signal for products that are located.

4,843,562

BROADCAST INFORMATION CLASSIFICATION SYSTEM AND METHOD

Stephen C. Kenyon, Stafford, Va.; Laura J. Simkins, Clarksburg, Md., and Richard L. Sebastian, Lorton, Va., assignors to Broadcast Data Systems Limited Partnership, New York, N.Y.

Filed Jun. 24, 1987, Ser. No. 66,106
Int. Cl.[4] G06F *15/31*; H04N *7/00*
U.S. Cl. 364—487 **66 Claims**

1. A method of classifying broadcast information, comprising the steps of:

receiving broadcast information;

performing a spectral analysis of said information and providing a plurality of analyzed waveforms corresponding thereto;

generating a spectragram from said waveforms;

comparing the generated spectragram with a plurality of predetermined first stage reference spectragrams;

queueing the first stage reference spectragrams in order of their similarity to said generated spectragram;

correlating at least one of a plurality of predetermined second stage reference patterns which correspond to said first stage reference spectragrams with one of said analyzed waveforms in the queueing order established in the queueing step to provide a correlation value for each of the correlated second stage reference patterns;

monitoring said correlating step to determine when one of said correlation values exceeds a threshold correlation value;

identifying the second stage reference pattern which corresponds to the correlation value which exceeds said threshold value; and

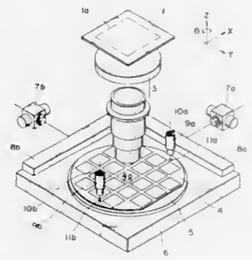
classifying the broadcast information as similar to the identified second stage reference pattern.

4,843,563

STEP-AND-REPEAT ALIGNMENT AND EXPOSURE METHOD AND APPARATUS

Kazuo Takahashi, Kawasaki, and Masao Kosugi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 843,219, Mar. 24, 1986, abandoned. This application Aug. 24, 1988, Ser. No. 237,620
Claims priority, application Japan, Mar. 25, 1985, 60-58535; Apr. 30, 1985, 60-90891
Int. Cl.[4] G01B *11/00*; H01L *12/30*
U.S. Cl. 364—490 **25 Claims**



1. An alignment and exposure method comprising:

effecting exposures relative to a first object in a step-and-repeat manner;

detecting a positional error of each of actually exposed areas on the first object with respect to corresponding ones of reference positions set for the first object; and

effecting exposures relative to a second object in the step-and-repeat manner while correcting an amount of stepwise movement set for the second object as predicted by calculation made to said set amount of stepwise movement with use of an approximating function related to the positional errors of the first object.

4,843,564

APPARATUS AND METHOD FOR MEASURING FREQUENCY OF COHERENT COMPONENT OF A COMPOSITE SIGNAL

Leslie M. Jenson, St. Paul, Minn., assignor to TSI Incorporated, St. Paul, Minn.

Filed Apr. 23, 1987, Ser. No. 41,417
Int. Cl.[4] G01P *3/36*
U.S. Cl. 364—510 **24 Claims**

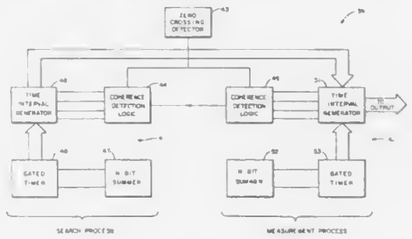
1. Apparatus for measuring velocity of flowing particles, comprising

(a) means for generating a light beam;

(b) means for splitting the light beam into separate light beams;

(c) means for focusing the separate light beams in a crossing and focusing area providing a measuring volume having alternate regions of high and low light intensity, respectively, said flowing particles moving through said measuring volume normal to said regions of light intensity to produce variations in the intensity of scattered light; (d) means for sensing said scattered light and for producing an electrical signal having a frequency corresponding to said variations in the intensity of scattered light which is proportional to the velocity at which a particle moves through said measuring volume, said signal having a segment thereof at a zero crossing of a particle through said measuring volume; and

(e) signal processor means for processing said electrical signal and including means for tracking an individual zero crossing of a particle to produce real time information about a coherent component of the signal, said tracking means including



(1) a zero crossing detector for generating zero crossing pulses during a selected time period,

(2) coherence detection logic means for receiving said zero crossing pulses and for providing a signal for a zero crossing at a selected time interval of said time period;

(3) first time interval generator means for setting time intervals of the signal;

(4) n-bit summer means for counting the signals for a zero crossing at a selected time interval; and

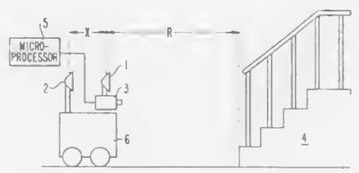
(5) gated timer means controlled by said summer means to allow an output signal after a selected number of signals have been counted during the selected time interval.

4,843,565

RANGE DETERMINATION METHOD AND APPARATUS

David W. Rose, Bowie, Md., assignor to American Electronics, Inc., Lanham, Md.

Filed Jul. 30, 1987, Ser. No. 79,440
Int. Cl.[4] G06F *15/20*; G01C *3/08*
U.S. Cl. 364—513 **44 Claims**



1. An apparatus for the detrmination of range information comprising:

carrier means;

illumination intensity measuring means mounted on said carrier means;

a first light source mounted on said carrier means at a known distance from said illumination intensity measuring means, wherein said first light source is capable of controlled activation and inactivation;

a second light source mounted on said carrier means displaced by a predetermined baseline distance from said first light source and said illumination intensity measuring means substantially on a line along the center axis of said illumination intensity measuring means, wherein said second light source is capable of controlled activation and inactivation; and

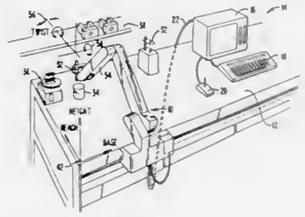
a microprocessor capable of controlling the activation and inactivation of said first and second light sources, collecting data from said illumination intensity measuring means, and manipulating said data to obtain the approximate distance between said carrier means and obstacles in the path of said carrier means.

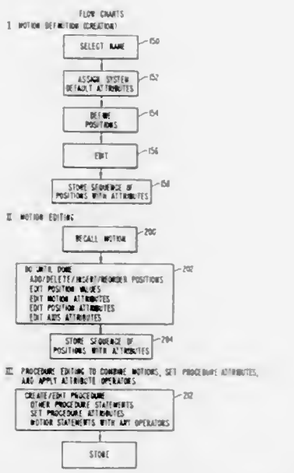
4,843,566

ROBOT MOTION CONTROL SYSTEM

Gary B. Gordon, Saratoga, and Joseph C. Roark, Menlo Park, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 837,614, Mar. 7, 1986, abandoned. This application Apr. 29, 1988, Ser. No. 188,658
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—513 **19 Claims**





1. A method for controlling a mechanical manipulator using a controller, the method comprising:

storing in the controller a procedure which includes an ordered sequence of motions, each motion including an ordered sequence of positions, each position including coordinates which define a location relative to each axis of movement for the mechanical manipulator, each of said procedure, motions, positions and coordinates defining an attribute level;

storing a first and a second attribute operator, said two attribute operators pertaining to different attribute levels and affecting two or more attribute levels, said first attribute operator having a higher rank than the second according to a predetermined ranking rule based on a ranking of the attribute levels;

comparing the attribute operators stored and selecting the attribute operator having a higher rank from a pair of attribute operators when the pair have conflicting influence on the procedure; and

executing the stored procedure according to the stored attribute operators, except for any non-selected attribute operator when the selecting step occurs.

4,843,567

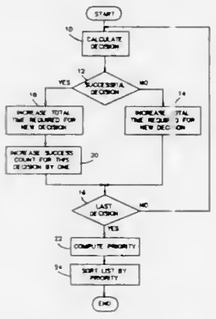
DEVICE TO ASSIST ADAPTIVE REORDERING OF SEQUENTIAL DECISIONS

Amar Mukherjee, Maitland, Fla.; Kadathur S. Natarajan, Somers, and Harold S. Stone, Chappaqua, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jul. 30, 1987, Ser. No. 79,721

Int. Cl.[4] G06F *15/46, 15/18*

U.S. Cl. 364—513 **4 Claims**



1. In a system for the adaptive reordering of sequential decisions in the search of a data base so that the average time to execute the decisions is minimized, said system including computing means for computing each decision the ratio p/c where p is the probability of a successful outcome of the decision and c is the cost of computation to make that decision, said computing means comprising:

means for estimating the logarithms of the probability p and the cost c for each decision;

means for subtracting the logarithm of from the logarithm p to produce a ratio of p/c for each decision;

means for comparing the ratios of p/c to produce a priority value for each decision; and

means for reordering said decisions based on the priority value assigned to each decision.

4,843,568

REAL TIME PERCEPTION OF AND RESPONSE TO THE ACTIONS OF AN UNENCUMBERED PARTICIPANT/USER

Myron W. Krueger, 55 Edith Rd., Vernon, Conn. 06066; Katrin Hinrichsen, and Thomas S. Gionfriddo, both of 81 Willington Oaks, Storrs, Conn. 06268

Filed Apr. 11, 1986, Ser. No. 850,770

Int. Cl.[4] H04N *7/18*

U.S. Cl. 364—518 **39 Claims**

1. A device for perceiving, processing and responding in real time to a demonstrative behavior of at least one unmarked participant, said device comprising:

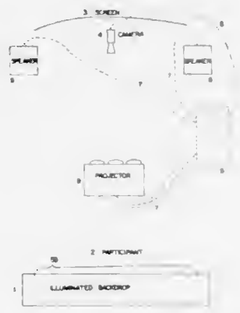
means spaced from at least one unmarked participant for distinguishing the participant from a background;

means for imaging each distinguished participant and providing an image thereof;

means for digitizing said image provided by said means for imaging;

means connected to said means for digitizing for ascertaining features of the digitized image;

means connected to said means for ascertaining for identifying at least one characteristic of at least one of said ascertained features, each of the identified characteristics being a selected one of a location and a movement of a respective ascertained feature, said means for identifying providing a control parameter in response to the at least one identified characteristic;



means responsive to said control parameter for processing said ascertained features of said digitized image to provide a signal indicative of a demonstrative behavior of said participant; and

means for responding in real time to said signal indicative of a demonstrative behavior of said participant.

4,843,569

DATA INPUT APPARATUS FOR PICTURE DATA BASE MANAGEMENT SYSTEM

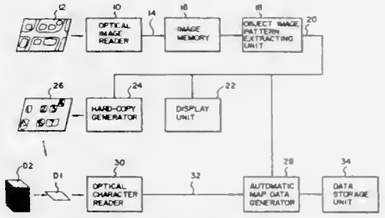
Nobuo Sawada, Atsugi, and Hiroko Asai, Hamamatsu, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 22, 1987, Ser. No. 99,596

Claims priority, application Japan, Sep. 25, 1986, 61-226745

Int. Cl.[4] G06F *3/00*

U.S. Cl. 364—518 **14 Claims**



1. A picture data base input apparatus comprising:

(a) image input means for optically reading an original picture image having picture objects drawn by closed loop lines, and producing an electrical image signal representing a corresponding digitized image;

(b) vector data generation means, connected to said image input means, for receiving said image signal, for executing a digital image processing to extract said picture objects from said digitized image, for producing vector data constituted by a series of coordinate data streams that define a geometric shape of each extracted object, and for affixing said vector data with an identification label to specify said vector data;

(c) image presentation means for outputting a reference image at least partially including said extracted objects affixed with identification labels, based on said vector data affixed with said identification label;

(d) attribute data input means for optically reading an attribute data list document prepared by referring to said reference image and for producing an electrical character data signal representing plural sets of attribute data corresponding to said extracted objects, each of said plural sets of attribute data being affixed with said identification label referring to said reference picture image; and

(e) automatic data merging means, connected to said vector data generation means and said attribute data input means, for automatically merging said plural sets of vector data of said extracted picture objects with said plural sets of attribute data through said identification labels in such a manner that one set of attribute data is combined with vector data having the same identification label as said one set of attribute data, thereby building a picture data base.

4,843,570

BLOCK PROCESSING APPARATUS

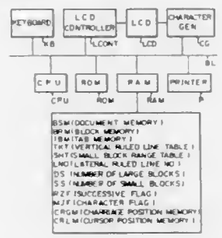
Kazunori Sugitani, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1985, Ser. No. 816,041

Claims priority, application Japan, Dec. 29, 1984, 59-279901; Dec. 29, 1984, 59-279902; Dec. 29, 1984, 59-279903; Dec. 29, 1984, 59-279904; Dec. 29, 1984, 59-279905; Dec. 29, 1984, 59-279906; Dec. 29, 1984, 59-279907; Dec. 29, 1984, 59-279908; Dec. 29, 1984, 59-279909

Int. Cl.[4] G03B *15/00; G06F 3/00*

U.S. Cl. 364—518 **8 Claims**



1. An information processing apparatus comprising:

memory means for storing a character information sequence;

format input means for inputting character arrangement format information in the character information sequence, said character arrangement format determining the character format arrangement of the character information sequence;

display means for displaying the character information sequence stored in said memory means in a first character arrangement format;

discrimination means, connected to said memory means, for discriminating the character arrangement format information in the character information sequence stored in said memory means; and

print means for printing the character information sequence in the first character arrangement format and in a second character arrangement format different from the first character arrangement format in response to the discriminating by said discrimination means.

4,843,571

OFFICE AUTOMATION SYSTEMS

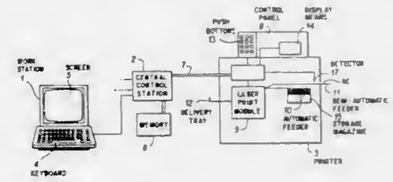
Ronald M. W. Notermans, JV Velden; Paulus W. E. Verhelst, PV Venlo; Charles Lapoutre, TB Nuenen, and Hendricus W. H. M. Kessels, AN Venlo, all of Netherlands, assignors to OCE-Nederland B. V., Venlo, Netherlands

Filed Jun. 26, 1986, Ser. No. 879,062

Claims priority, application Netherlands, Jul. 1, 1985, 8501888

Int. Cl.[4] G06F *3/09, 15/02*

U.S. Cl. 364—519 **4 Claims**



1. In an office automation system having memory means for storing coded information for a print job, a printer including a print station for printing a print job of text information on receiving material after the supply of corresponding coded information, at least one command input means for inputting control commands, and a control means connected to said command inputting means for creating a print job after the supply of a first control command, connected to said printer for controlling a print job in response to the first control command and further connected to said memory means for obtaining coded print job information during a print job, the improvement in combination therewith comprising a detection means connected to said print station for providing a detection signal upon detection of an operator action at said print station in response to a second control command added to the first control command to postpone a print job until the occurrence of said operator action, said detection signal being transferred to said control means for commencing the operation of said printer.

4,843,572

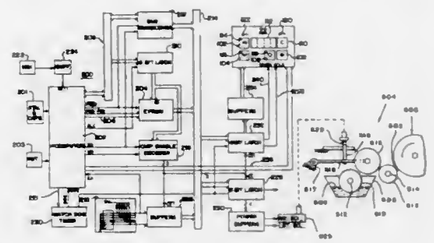
INKING CONTROL METHOD AND APPARATUS FOR A MAILING MACHINE

William J. Linkowski, Poughquag, N.Y., and John J. Stelben, Greenwich, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed May 14, 1987, Ser. No. 49,876

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—519 **34 Claims**



1. In a mailing machine including postage indicia printing means, means for applying ink to the printing means, a supply of ink, means for transferring ink from the supply to the ink applying means and means for controlling the ink transferring

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means to transfer ink during a time inte: val, the improvement wherein the controlling mean comprise :

a. means for displaying the magnitud of said time interval; and

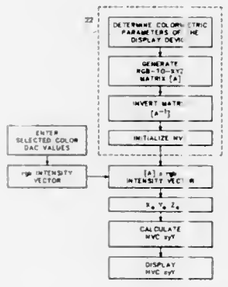
b. means for changing the magnitud of said time interval from a first predetermined value to a second predetermined value.

4,843,573

DISPLAY-BASED COLOR SYSTEM

Joann M. Taylor, Beaverton; Paul A. McManus, Sherwood; Gerald M. Murch, Portland; Roxanna F. Rochat, and Novia A. Weiman, both of Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 26, 1987, Ser. No. 113,029
Int. Cl.[4] G06F *15/6. 6*
U.S. Cl. 364—521 **8 Claims**



1. A method for defining an improved perceptually uniform color space for a display device, the improved perceptually uniform color space having coordinates H, V, and C, which are based upon CIELUV coordinates L*, v* and u*, the method comprising the steps of:

(a) determining the maximum CIELUV chroma $C^*_{uv}=(u^{*2}+v^{*2})^{\frac{1}{2}}$ producible by a display device that has a plurality of color-producing primaries, the luminous intensity of the primaries being adjustable between minimum and maximum levels to produce a gamut of colors;

(b) establishing a maximum numerical value for the C coordinate;

(c) dividing the maximum C value by the determined maximum CIELUV chroma to yield a chroma factor C_f; and

(d) defining the improved color space coordinates as:

$$H=\arctan(v^*/u^*)+K,$$

where

$K=0°$ for $u^*>0$ and $v^*>0$;

$K=90°$ for $u^*<0$ and $v^*>0$;

$K=180°$ for $u^*<0$ and $v^*<0$;

$K=270°$ for $u^*>0$ and $v^*<0$;

$$V=L^*;$$

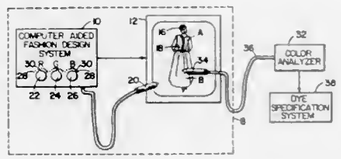
$$C=C^*_{uv}(V)(C_f).$$

4,843,574

APPARATUS AND METHOD FOR DETERMINING A COLOR FOR USE IN A FASHION DESIGN

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Scientific, Inc., South Windsor, Conn.

Continuation of Ser. No. 760,816, Jul. 31, 1985, abandoned. This application Dec. 7, 1987, Ser. No. 129,852
Int. Cl.[4] G01J *3/51*
U.S. Cl. 364—526 **6 Claims**



1. An apparatus for determining a color for use in a fashion design, said apparatus comprising:

a light emitting visual color display screen,

means for creating a colored image of a fashion design on said screen,

means for varying the color of at least part of said image until an acceptable color for said part is attained, and

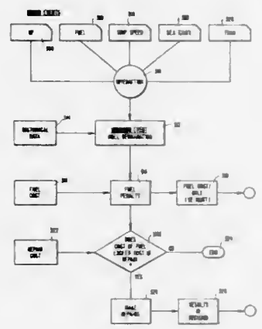
means for capturing light emitted from the portion of said display screen corresponding to said part of said image and for measuring the color of said captured light to provide a set of values describing said color of said part of said image and which values can be subsequently used to specify the color for the corresponding part of an actual article patterned on said fashion design image.

4,843,575

INTERACTIVE DYNAMIC REAL-TIME MANAGEMENT SYSTEM

Harold E. Crane, 328 Celeste, River Ridge, La. 70123

Continuation-in-part of Ser. No. 435,648, Oct. 21, 1982, Pat. No. 4,584,654. This applicatioo Feb. 3, 1986, Ser. No. 825,648
Int. Cl.[4] G06F *15/20;* G01L *3/26*
U.S. Cl. 364—550 **21 Claims**



1. A dynamic real-time management system for managing the operation of a powered system, comprising:

(a) a microprocessor for sensing a plurality of real-time parameters associated with said powered system and having means for receiving operation information related to the operation of said powered system;

(b) a memory for storing sensed values of said real-time parameters and storing a plurality of programs for defining relationships between certain of said sensed values of said real-time parameters;

(c) a terminal with a display for communicating with said microprocessor; and

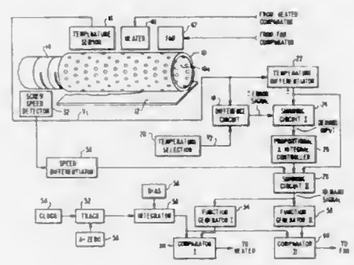
(d) wherein said microprocessor is programmed to automatically determine a plurality of unknown conditions of said powered system as a function of said sensed values of said real-time parameters and said operation information by individually selecting said unknown conditions to be determined, selecting the real-time parameters necessary to determined said selected unknown conditions, determining interactions between said sensed values of said selected parameters using said stored programs and producing an interaction indication result, relating said interaction indication result to said operation information using said stored programs, producing a condition output indicative of the relationship of said operation information and said interaction indication result, sand displaying said condition output on said terminal, and wherein said microprocessor is programmed to determine said interactions by commanding that certain of said real-time parameters be held constant to act as comparators in order to sense changes in other of said real-time parameters.

4,843,576

TEMPERATURE CONTROL ARRANGEMENT FOR AN EXTRUDING PROCESS

William J. Smith, Verona; Jin Takayama, Cheswick; Frank J. Varisco, Norristown, and Jeffery J. Williams, Spring City, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 15, 1987, Ser. No. 38,371
Int. Cl.[4] G06G *7/30;* F25B *29/00*
U.S. Cl. 364—557 **14 Claims**



1. A temperature control apparatus for use with a surface coating system, comprisiing:

means for extruding a coating material onto said surface, said coating material being dispersed onto said surface to a thickness determined as a function of the operating temperature of said extruding means;

means for determining a rate of change of said operating temperature;

means for comparing said operating temperature to a set point temperature and outputting a difference signal representing the difference therebetween;

means for summing said difference signal and said change of temperature rate such that a first sum results therefrom;

means for developing a control signal as a function of said first sum, said control signal acting in a manner such that, as said change of temperature rate decreases during an overshoot condition, said control signal increases in magnitude thereby varying inversely with said operating temperature;

means for generating a demand signal using at least said control signal and said change of temperature rate which has been fed forward from said determining means, said demand signal representing a summation of at least said change of temperature rate and said control signal which increases as said change of temperature rate decreases during such overshoot condition; and

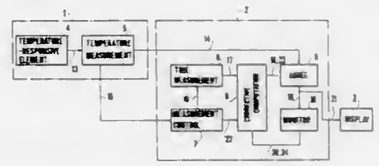
means for comparing said demand signal to a waveform of a predetermined shape and outputting a variable frequency pulse in relation to such comparison.

4,843,577

ELECTRONIC CLINICAL THERMOMETER

Yutaka Muramoto, Fujinomiya, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1987, Ser. No. 21,775
Claims priority, application Japan, Mar. 4, 1986, 61-45326
Int. Cl.[4] G01K *1/00, 3/00*
U.S. Cl. 364—557 **4 Claims**



1. An electronic clinical thermometer comprising:

temperature sensing means for sensing body temperature at a prescribed part of a body;

predicting arithmetic means for predicting a final, stable temperature based on the sensed body temperature;

arithmetic means for calculating a difference value between the sensed body temperature and the predicted final, stable temperature;

memory means for storing a weighting function, in which elapsed measurement time is a variable, prescribing a change in weighting applied to the difference value;

weighting means coupled to the memory means and a control means for obtaining a set of display temperatures for a plurality of sampling instants each of which display temperatures is derived by selecting a weight based on the weighing function and the elapsed time at a sampling instant, applying the selected weight to the difference value, and adding the weighted difference value to the sensed body temperature;

said control means clocks elapsed measurement time for controlling said temperature sensing means and said weighting means at said plurality of sampling instants; and

display means for displaying the obtained set of display temperatures.

4,843,578

VEHICLE SPEED MONITORING AND LOGGING MEANS

Ted R. Wade, 202 Rolling Ridge Cir., Garner, N.C. 27529

Continuation of Ser. No. 656,681, Oct. 1, 1984, abandoned. This application Jul. 27, 1987, Ser. No. 77,750
Int. Cl.[4] G01P *3/56;* G06M *7/00;* B60Q *1/00;* G06F *15/14*
U.S. Cl. 364—565 **5 Claims**

1. An apparatus for monitoring the speed of a vehicle comprising:

(a) data storage means operatively mounted in said vehicle for storing a plurality of predetermined speed levels, said data storage means including means for representing said speed levels as electrical signals;

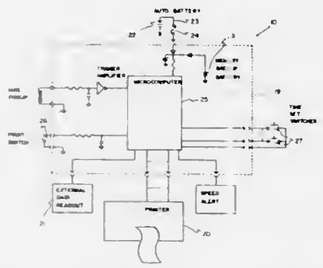
(b) means for sensing the speed of said vehicle and converting the same to an electrical signal indicative of the speed of said vehicle;

(c) signal processing means for continuously comparing the speed of said vehicle with each of said speed levels during the operation of said vehicle to determine each occurance

in which a vehicle accelerates beyond each particular speed level;

(d) a number of separate registers equal to the number of preset speed levels so that every register is independently paired with a single speed level, each register incremented by said signal processing means when vehicle speed accelerates past the speed level paired with that register, so that said registers store the number of times the vehicle accelerates past each speed level; and

(e) means for retrieving such stored information from said registers whereby the cumulative incremental speed performance of said vehicle can be determined.

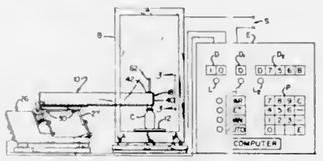


4,843,579

WEIGHING AND FILLING METHOD AND APPARATUS

James S. Andrews, Westminster, and Daniel Cooper, Parker, both of Colo., assignors to Hierath & Andrews Corp., Wheat Ridge, Colo.

Filed Mar. 10, 1986, Ser. No. 838,315
Int. Cl.[4] G09F 9/32
U.S. Cl. 364—567 **31 Claims**



15. In an apparatus for weighing and filling powdered materials from a feeder having a trough in which said powdered material is deposited, drive means for vibrating said trough to advance said powdered material toward a discharge end thereof, and weight sensing means for weighing material deposited into a receptacle from said discharge end wherein a target weight represents the cumulative weight of powdered material to be deposited over a fill cycle within a predetermined fill tolerance and a feed rate is established which represents the weight of material to be deposited with respect to time during each fill cycle, the improvement comprising:

orifice means provided with a downwardly directed opening for depositing material from the discharge end of said trough, and an elongated shaker rod extending downwardly through the opening in said orifice means, said drive means imparting vertically directed, reciprocal motion to said rod via said trough,

said weight sensing means weighing the cumulative amount of material deposited at predetermined time intervals during each fill cycle; and

programmable control means responsive to the cumulative weight of material deposited with respect to time during each fill cycle for determining at each said predetermined time interval the additional weight of material to be deposited and time required to deposit until the cumulative weight of material deposited reaches said target weight in each fill cycle.

29. The method of weighing and filling powdered materials wherein said powdered materials are dispensed from a vibratory feeder, said feeder having drive means for oscillating said feeder at a predetermined drive level, and a weight sensor is provided together with a computer for continuously weighing the materials dispensed by said feeder into a container and for determining when a desired weight of material has been dispensed into the container over a fill cycle, the steps comprising:

(1) entering into said computer the desired weight to be filled in a fill cycle (W), entering the fill tolerance (F) representing the permissible variation between the actual weight filled (W') and the desired weight to be filled (W) and establishing a predetermined drive level (D) at which said feeder is to be oscillated during said fill cycle;

(2) calibrating said feeder prior to a fill cycle for each diferent type of powdered material by determining the feed rate for a given material when said feeder is driven at the predetermined drive level (B);

(3) initiating a fill cycle in which said feeder is oscillated at the predetermined drive level over a predetermined time interval necessary to dispense the desired weight (W);

(4) deactivating said drive means and weighing the material dispensed at the end of each step (3) until a stable weight reading is obtained;

(5) activating said drive means at the predetermined drive level over a time duration representing predetermined percentage of the time required to dispense a additional quantity of material necessary to each the desired weight (W);

(6) determining the cumulative weight of material dispensed and comparing the cumulative weight thereof recorded with the desired weight (W);

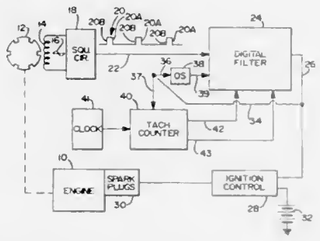
(7) repeating steps (5) and (6) until the actual weight dispensed is at least equal to the desired weight (W) less the fill tolerance (F).

4,843,580

NOISE IMMUNE CRANKSHAFT PULSE POSITION DEVELOPING APPARATUS

Frank E. Ridoux, Kokomo, and Michael A. Neuhalfen, Galveston, both of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Jun. 24, 1987, Ser. No. 65,956
Int. Cl.[4] H03K 5/13
U.S. Cl. 364—569 **6 Claims**



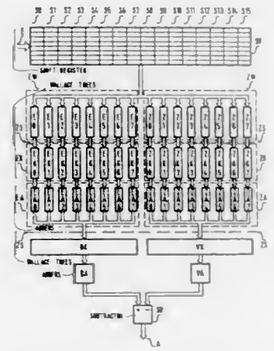
1. A digital system for providing a series of voltage pulses that occur at predetermined angular positions of the crankshaft of an internal combustion engine comprising, an engine having a crankshaft, sensor means including means driven by said crankshaft for developing a square wave signal that has a plurality of high level voltage pulses that occur at predetermined angular positions of the crankshaft separated by low level periods, the spacing between corresponing edges of said pulses corresponding to a predetermined amount of angular rotation of said crankshaft, said high level voltage pulses and said low level periods lasting for predetermined time periods that vary with variation in engine speed, digital filter means having an input and an output, said input of said digital filter means coupled to said sensor means, said digital filter means comprising means for determining whether or not the time periods of said high level pulses or said low level periods exceed predetermined time periods, means coupled to said determining means for preventing a high level voltage pulse of said square wave signal from being passed to said output when said high level voltage pulse has a time period that was determined to be less than said predetermined time period, and means coupled to said determining means for passing a high to low level transition of said square wave to said output when just prior to said transition said square wave had a high level period that was longer than said predetermined time period.

4,843,582

DIGITAL FILTER IN WHICH LINEAR COMBINATIONS OF POWERS OF TWO ARE CONVERTED TO BINARY NUMBERS USING WALLACE TREES

Berthold Heck, and Joachim Speidel, both of Nürnberg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 5, 1987, Ser. No. 58,294
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1986, 3619425
Int. Cl.[4] G06F 15/31
U.S. Cl. 364—724.16 **5 Claims**



1. A digital filter for processing W-bit input code words using K coefficients represented as P-digit code words in CSD code, comprising:

a. a W-bit wide shift register (SR) having K stages (SO, S1, . . . ,S15) for shifting the input code words;

b. a first plurality of Wallace trees (E0, E1, . . . ,E7), including one Wallace tree for each respective p, w pair, where w=0, 1, . . . ,W-1 and p=0, 1, . . . ,P-1, each of the first plurality of Wallace trees including:

i. respective input means connected to bit position w of stage k of the shift register, if bit position p of coefficient k is +1, where k=0, 1, . . . K-1; and

ii. a respective output for providing a number represented as a linear combination of P powers of two;

c. a second plurality of Wallac Trees (Z0, Z1, . . . ,Z7), including one Wallace tree for each respective p,w pair, each of the second plurality of Wallace trees including:

i. respective input means connected to bit positions w of stage k of the shift register, if bit position p of coefficient k is -1; and

ii. a respective output for providing a number represented as a linear combination of P powers of two;

d. a third plurality of Wallace trees (EK0), EK1, . . . ,EK7), in cascade with the first plurality of Wallace trees, for performing a first stage of converting the numbers at the ouptuts of the first plurality of Wallace trees into respective binary numbers;

e. a first plurality of adders (EA0, EA1, . . . ,EA7) one for each of the third plurality of Wallace trees, for adding the binary numbers provided at the outputs of the third plurality of Wallace trees and thereby performing a second stage of converting the numbers at the outputs of the first plurality of Wallace trees into respective binary numbers, represented as linear combinations of powers of two;

f. a fourth plurality of Wallace trees (ZK0, ZK1, . . . ZK7), in cascade with the second plurality of Wallace trees, for performing the first stage of converting the numbers at the outputs of the second plurality of Wallace trees into respective binary numbers;

g. a second plurality of adders (ZA0, ZA1, . . . ,ZA) one for each of the fourth plurality of Wallace trees, for adding

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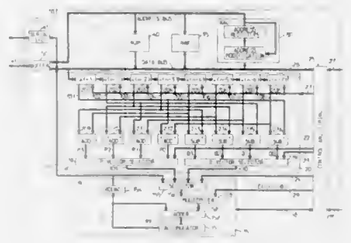
4,843,581

DIGITAL SIGNAL PROCESSOR ARCHITECTURE

Robert L. Cupo, Eatontown, and Cecil W. Farrow, Highlands, both of N.J., assignors to American Telephone and Telegraph Company, New York, N.Y. and AT&T Information Systems Inc., Morristown, N.J.

Filed May 11, 1987, Ser. No. 48,189
Int. Cl.[4] G06F 15/31
U.S. Cl. 364—724.01 **8 Claims**



1. A linear-phase finite impulse response digital filter comprising

means for storing a plurality of filter tap coefficients each having a predetermined magnitude,

means for receiving a sequence of digital samples of a signal, each of said samples being associated with a respective one of said coefficients,

means for combining said samples into pairs of samples such that the coefficients associated with the samples in a pair of samples are of equal magnitude, and

means for generating and outputting a digitally filtered representation of said samples as a function of each of said pairs of samples and the magnitude of one of their respective coefficients, said filtered representation being symmetrical when the samples in each of said pairs of samples are summed and being antisymmetrical when one sample is subtracted from the other.

the binary numbers provided at the outputs of the fourth plurality of Wallace trees and thereby performing a second stage of converting the numbers at the outputs of the second plurality of Wallace trees into respective binary numbers, represented as linear combinations of powers of two;

h. a fifth plurality of Wallace trees (DK) for performing a first stage of converting the numbers provided by the first plurality of adders into combined binary numbers;

i. a third adder (DA), at an output of the fifth plurality of Wallace trees, for performing a second stage of converting the numbers provided by the first plurality of adders into combined binary numbers;

j. a sixth plurality of Wallace trees (VK) for performing a first stage of converting the numbers provided by the second plurality of adders into combined binary numbers;

k. a fourth adder (VA), at an output of the sixth plurality of Wallace trees, for performing a second stage of converting the numbers provided by the second plurality of adders into combined binary numbers; and

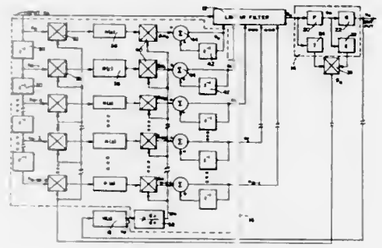
l. a subtracter SU for subtracting numbers appearing at outputs of the third and fourth adders.

4,843,583

NONLINEAR ADAPTIVE FILTER

Stanley A. White, Orange, and Visvaldis A. Vitols, Anaheim, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 15, 1985, Ser. No. 787,811
Int. Cl.[4] G06F *1 i/31*
U.S. Cl. 364—724.19 **18 Claims**



1. A signal processor comprising:

a nonlinear processor having an input and an output, wherein said nonlinear processor maps a sequence of first signal samples from said input into a sequence of second signal samples, each said second signal sample having a value representing the amplitude distribution function of the value of said corresponding first signal sample, each said second signal sample being mapped into a corresponding output signal sample, each output signal sample having an output signal value representing the inverse of the desired output amplitude-distribution function of each corresponding second signal sample; and,

each first signal sample being mapped into a corresponding first control signal sample, each first control signal sample having a value representing the amplitude density function of the value of each corresponding first signal sample;

each second signal sample being mapped into a corresponding second control signal sample, each second control signal sample having a value representing the derivative of the inverse of the desired output amplitude-distribution function of the value of each respective second signal sample;

a combiner having first input responsive to said first control signal, a second input responsive to said second control signal and an output providing a corresponding gain control signal;

an adjustable linear filter having a sample signal input, a plurality of tap weight inputs and an output wherein:

the sample signal input of said adjustable linear filter is coupled to the input of the signal processor and receives sample input signals;

the output of said adjustable linear filter providing said sequence of first signal samples to said nonlinear processor input; and

said adjustable linear filter being characterized to perform a predictive deconvolution on a signal applied to said linear filter input with respect to the spectrum-shaped output signal; and to provide said first signal to said nonlinear processor input;

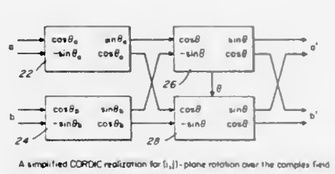
a parameter computer having inputs coupled to the output of said nonlinear signal processor, to said combiner output and to the input to said adjustable linear filter, for computing the weights for said adjustable linear filter from said gain control signals, said sample input signals, and said output signal samples and for applying tap weight input signals to corresponding adjustable linear filter tap weight inputs.

4,843,584

CORDIC IMPLEMENTATION OF MULTI-DIMENSIONAL PLANE ROTATION OVER THE COMPLEX FIELD

Malaiperumal Sundaramurthy, 4 Coventry Wood Rd., Bolton, Mass. 01740

Filed Feb. 5, 1987, Ser. No. 11,316
Int. Cl.[4] G06F *15/332*
U.S. Cl. 364—735 **15 Claims**



A simplified CORDIC realization for R_{ij}-plane rotation over the complex field

1. An apparatus for implementing Cordic rotations on at least two complex numbers defining a vector, comprising:

a plurality of cordic rotation blocks, arranged in at least first and second stages, each block having at least two inputs and including means for operating on the inputs to rotate the vector defined by the inputs by a selected angle, and to provide at least two outputs corresponding to the rotated vector;

said first stage including first and second Cordic blocks for receiving said two complex numbers as inputs, and supplying first and second pairs of intermediate Cordic rotated outputs to a second stage;

said second stage including at least third and fourth Cordic blocks;

said third block for receiving as a first input a first intermediate Cordic rotation output of said first block and for receiving as a second input a first intermediate Cordic rotation output of said second block, and for supplying an angle theta signal to said fourth block to command Cordic rotation of the inputs to said fourth block based on said angle theta signal;

said fourth Cordic block receiving as a first input a second intermediate Cordic rotation output of said first block and for receiving as a second input a second intermediate Cordic rotation output of said second block; and

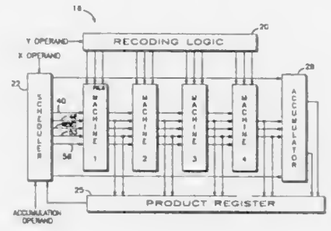
said third and fourth blocks generating, based on said angel theta signal, at least two pair of Cordic rotation outputs which, when combined, establish Cordic rotation values for said complex numbers.

4,843,585

PIPELINEABLE STRUCTURE FOR EFFICIENT MULTIPLICATION AND ACCUMULATION OPERATIONS

Tim A. Williams, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 14, 1987, Ser. No. 96,867
Int. Cl.[4] G06F *7/52*
U.S. Cl. 364—759 **6 Claims**



1. A pipelineable array multiplier for multiplying first and second input operands and providing an output product, said array multiplier utilizing a predetermined recoding algorithm to implement a multiplication operation with X rows and Y columns of partial product bits which when summed provide the output product, where X and Y are integers, comprising:

X columns of summing means for adding the partial product bits of the array to form the output product, each of the X columns of summing means adding the partial product bits of a predetermined one of the X rows in a time overlapping operation between successive columns and during successive time periods, and each column of summing means except a first selectively coupled to a previous column for receiving partial product input bits from the previous column, each column of summing means comprising a predetermined number of pairs of adder circuits, each pair being series-connected and said predetermined number of pairs of adder circuits in each column being determined by a ratio of carry bit input to output and sum bit input and output propagation delays of the adder circuits when forming output sum and carry bits; and

control means coupled to the X columns of summing means for controlling the time overlapping successive additions of each of the X columns of summing means.

4,843,586

DISTRIBUTED SAMPLING OF ELECTRICAL AND OPTICAL SIGNALS USING CODED SWITCHED ELECTRODE TRAVELLING WAVE MODULATORS

Moshe Nazarathy, Mountain View; David W. Dolfi, Los Altos, and Brian H. Kolner, Woodside, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 28, 1987, Ser. No. 43,506
Int. Cl.[4] G06G *9/00*; G01B *9/02*
U.S. Cl. 364—822 **19 Claims**

1. A sampler comprising:

a test input for a signal to be sampled;

an output; and

modulation means, responsive to a set of R reference signals $R_r(t)$ (r=0, . . . , R−1) and to a test signal S(t) applied to the test input, for producing at the output an output signal O(t) proportional to

$$\sum_{r=0}^{R-1} R_r(t) \bullet [h^r(t) \quad S(t)]$$

where [8 $h^r(t)S_2(t)$]][$h^r(t)S(t)$] denotes the convolution of $h^r(t)$ with S(t), where • denotes the correlation of $R_r(t)$ with [[$h^r(t)S_2(t)$]][$h^r(t)S(t)$], where $h^r(t)$ is the impulse response function of the sampler when S(t) and $R^s(t)$ (for $s \neq r$) are constant and $R^r(t)$ is a delta function, and where

$$\sum_{r=0}^{R-1} R_r(t) \bullet h^r(t))$$

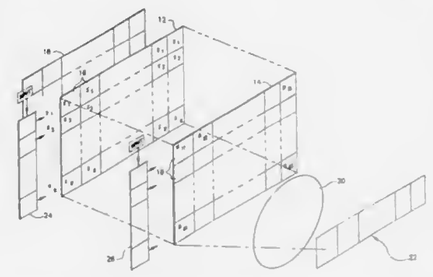
is substantially equal to a delta function plus an error function that has a peak amplitude much smaller than the integral of the delta function.

4,843,587

PROCESSING SYSTEM FOR PERFORMING MATRIX MULTIPLICATION

Richard S. Schlunt, Loma Linda, and Stephen W. Decker, Sunland, both of Calif., assignors to General Dynamics Pomona Division, Pomona, Calif.

Filed Dec. 10, 1987, Ser. No. 131,478
Int. Cl.[4] G06G *7/16, 9/00*
U.S. Cl. 364—841 **10 Claims**



1. An optical processing system for performing matrix multiplication, comprising:

two optically transmissive masks each including a plurality of individual elements disposed in a two dimensional matrix, the matrices being of equivalent size and the masks being aligned in series such that elements of the first mask are in registration with corresponding elements of the second mask;

data input means for controlling the optical transmittance of each element of one of the masks in accordance with a set of values of a vector x, and controlling the optical transmittance of each element of the other mask in accordance with corresponding values of a matrix M;

light source means for uniformly illuminating the outer face of the first mask; and

photodetection means positioned to receive light transmitted through the two masks for determining the intensity of light received and for producing an output signal representative of the product of said vector x with said matrix M.

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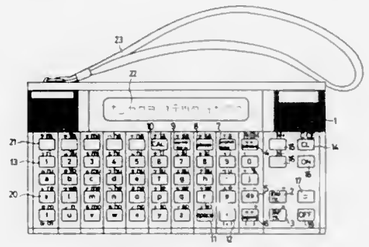
4,843,588
PROGRAMMABLE RADIO FREQUENCY COMMUNICATIONS DEVICE CAPABLE OF PROGRAMMING A SIMILAR DEVICE
Patrick J. Flynn, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.
Continuation of Ser. No. 419,391, Sep. 17, 1982, abandoned. This application Sep. 22, 1986, Ser. No. 910,353
Int. Cl.[4] G06F *13/00*; H04B *1/16*
U.S. Cl. 364—900 40 Claims

1. A first computer-controlled digital radio communications device having functional characteristics determined, at least in part, by characteristic-defining stored digital data and having the ability to automatically transmit/receive said characteristic-defining digital data to and from another computer-controlled digital radio device to provide said first and another digital radio communications devices with digital programming defining substantially identical functional characteristics, and first digital radio communications device comprising:
digital data processor means for performing control functions in response to digital data,
digital data memory means connected to said data processor means for storing said characteristic-defining digital data and for determining, at least in part, said control functions to be performed by said data processor means,
data input, output and control connections between said data processor means and an external multi-conductor connector,
said data processor means being programmed to selectively operate in either of the following special operational modes:
(a) to read and output via said connection said characteristic-defining digital data to said another digital radio communications device, or
(b) to accept and store via said connections said characteristic-defining digital data provided by said another digital radio communications device; and
a unidirectional data transfer wiring harness means for interconnection between said external multi-conductor connector and the external multi-conductor connector of said another digital radio communications device, said wiring harness means for transferring said characteristic-defining stored digital data between said digital data memory means and said another digital radio communications device so as to cause both said first and said another digital radio communications devices to operate substantially identically, said wiring harness means comprising:
a data receiving end connector;
a data transmitting end connector, each of said data transmitting end connector and data receiving end connector capable of being electrically connected to either of said first digital radio communications device and said another digital radio communications device; and
internal electrical conductors connected to said control connections of at least one of said data transmitting end connector and said data receiving end connector, said data processor means including means for electrically distinguishing said data transmitting end connector from said data receiving end connector.

4,843,589
WORD STORAGE DEVICE FOR USE IN LANGUAGE INTERPRETER
Hideo Yoshida, Kashihara, and Shigenobu Yanagiuchi, Tenri, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Continuation of Ser. No. 135,449, Mar. 31, 1980, abandoned. This application Sep. 17, 1982, Ser. No. 419,535
Claims priority, application Japan, Mar. 30, 1979, 54-39212
Int. Cl.[4] H03M *7/30*
U.S. Cl. 364—900 10 Claims

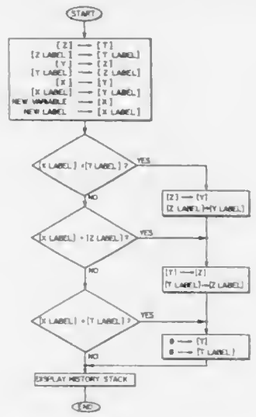


1. In an electronic dictionary and language interpreter device wherein a first word or words represented in a first language are entered for retrieving a second word or words represented in a second language equivalent to the first word or words or for retrieving the definition of a word in either language, the improvement comprising:
input means for entering a specific entry word;
abbreviation memory means for storing a plurality of words in a word block in alphabetic order, said plurality of alphabetized words having letters in common forming common repeating parts of said plurality of words, wherein said plurality of words in the word block are stored in an abbreviated code format comprising abbreviated code information representing said common repeating parts of said plurality of words and additional data representing other letters of said plurality of words;
retrieval means responsive to the input means for retrieving abbreviated code information and additional data to construct a retrieved word related to the specific entry word; and
display means responsive to said retrieval means for displaying said retrieved word.

4,843,590
HISTORY STACK
Susan L. Wechsler; Eric A. Evett, and Pamela F. Raby, all of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed May 29, 1986, Ser. No. 868,405
Int. Cl.[4] G06F *7/00, 15/02*
U.S. Cl. 364—900 4 Claims

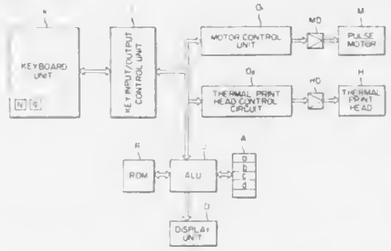
1. In a calculating device an improvement comprising: value storing means for storing a plurality of values;
label storing means for storing a label for each value in the plurality of values;
display means for displaying a first value from the plurality of values and a first label, the first label being a label for the first value;
value entry means for causing the display means to display a new value and a new label, the new label being a label for the new value, wherein the value entry means compares the first label to the new label and causes the display means to display the new value and the new label simultaneous to the displaying of the first value and the first label when the first label is different than the new label, and

wherein the value entry means causes the display means to display the new value and the new label but not the first



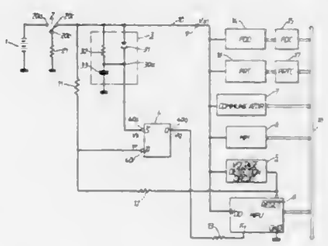
value and the first label when the first label is the same as the new label.

4,843,591
ELECTRONIC EQUIPMENT WITH A PRINTER
Shigeru Toyomura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 851,281, Apr. 10, 1986, abandoned, which is a continuation of Ser. No. 367,721, Apr. 12, 1982, abandoned. This application Jun. 17, 1987, Ser. No. 63,759
Claims priority, application Japan, Apr. 13, 1981, 56-55201
Int. Cl.[4] G06F *3/12*
U.S. Cl. 364—900 31 Claims



1. Electronic equipment with a printer, comprising:
input means for inputting numeric data into said equipment;
instruction means for producing an instruction signal that instructs graphic printing based on the numeric data input into said equipment by said input means;
converting means responsive to the instruction signal produced by said instruction means for iteratively converting the numeric data input by said input means to a bar graph pattern which represents the numeric data, which iterations form separate complete groups of a predetermined number of dots indicating a predetermined plural number, respectively, a final iteration forming an incomplete group of dots indicating a number less than the predetermined plural number; and
print means for printing the bar graph pattern to which the input numeric data is converted by said converting means.

4,843,592
MICROCOMPUTER CONTROLLED APPARATUS PROVIDED WITH A BATTERY VOLTAGE DETECTION CIRCUIT
Hajime Tsuaki, Gifu, and Tomio Sugimura, Aichi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Apr. 9, 1987, Ser. No. 36,222
Claims priority, application Japan, Apr. 10, 1986, 61-82984
Int. Cl.[4] G06F *11/00*
U.S. Cl. 364—900 10 Claims

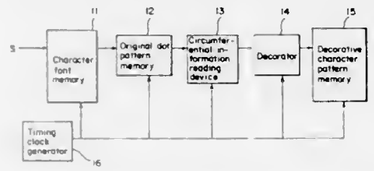


1. A microcomputer controlled apparatus employing battery voltage as a main power supply, said apparatus comprising:
voltage monitoring means for monitoring output voltage of the main power supply and comparing the output voltage with a previously set specified voltage, said voltage monitoring means generating a first signal when the output voltage is lower than the previously set specified voltage and generating a second signal when the output voltage is not lower than the previously set specified voltage;
detection result memory means for memorizing information representing occurrence of a voltage drip when the first signal is received form said voltage monitoring means; and
system control means for controlling execution of a program, said system control means stopping execution of the program when the first signal is received from said voltage monitoring means, said system control means restarting execution of the program, after said system control means has stopped execution of the program, when the second signal is received from said voltage monitoring means;
said system control means investigating whether or not the information representing occurrence of the voltage drop has been memorized in said detection result memory means after said system control means has restarted execution of the program;
said system control means further stopping execution of the program after determining that the information representing occurrence of the voltage drop has been memorized in said detection result memory means.

4,843,593
WORD PROCESSOR WITH DECORATIVE CHARACTER PRINTER
Hirofumi Yanaru, Ikoma, and Hiroki Maruido, Tenri, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Aug. 21, 1986, Ser. No. 898,620
Claims priority, application Japan, Aug. 23, 1985, 60-186309
Int. Cl.[4] G06F *3/12*; G09G *1/06*
U.S. Cl. 364—900 3 Claims

1. A word processor for editing and printing out word data in a document in a prescribed format according to format data, comprising:
means for selecting one of format data input mode and word data input mode;
means for inputting word data in response to word data input mode being selected by said selection means, said word data being input to form lines, each line having a head and tail, said means for inputting also inputting for-

mat data in response to the selection of the format data input mode, said format data controlling said word data;
means for storing the inputted format data and word data;
means for determining whether said word data stored in said means for storing includes decorative character-related data, said decorative character-related data being at one of the head and tail of a line of word data; and
means for developing decorative characters from the word data in said line of word data when said determination means determines that the format data which controls the word in said line of word data has decorative data, an amount of word data being controlled by said format data being smaller than or equal to said line of word data, and when said word processor prints out the word data stored



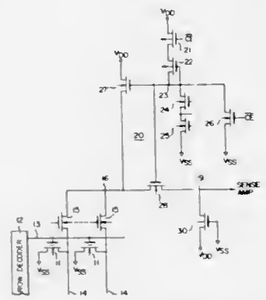
in said means for storing and said means for determining determines that the head or tail of a line of word data includes said decorative character-related data, said means for developing causes said word processor to print out said line of word data in a changed format from word data without decorative character-related data at the head or tail of the line thereof, said line of word data being printed out according to said decorative data in said which controls said line of word data format data in at least one of stereoscopically decorated black characters, stereoscopically decorated white characters, white decorative characters and thick decorative characters, whereby lines of said document can be in different formats while said document is continuously printed out by said word processor.

4,843,594

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE WITH A BIAS CIRCUIT

Sumio Tanaka, and Shigeru Atsumi, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawaski, Japan

Continuation of Ser. No. 888,513, Jul. 23, 1986, abandoned. This application Aug. 23, 1988, Ser. No. 235,780
Claims priority, application Japan, Aug. 1, 1985, 60-170021
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—185 **3 Claims**



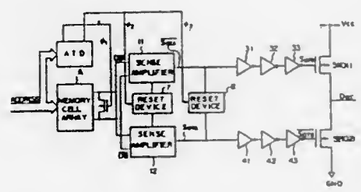
1. A nonvolatile semiconductor memory device with a bias circuit for use with a data sense mean comprising:
a bit line;
an input node for said data sense means;
a memory cell transistor forming a nonvolatile memory cell, the drain of said transistor being connected to said bit line;
a first MOS transistor having a channel of a first conductivity type and having a threshold voltage, the drain and gate of said first transistor being connected to a node, and the source of said first transistor being coupled to a power source potential;
second and third MOS transistors, each having a channel of a second conductivity type and a threshold voltage, connected in series between said node and a reference potential, the drain and gate of said second transistor being interconnected, and the drain and gate of said third transistor being interconnected;
a fourth MOS transistor, having a channel of said second conductivity type and a threshold voltage, for controlling charging of said bit line, said fourth MOS transistor having a threshold voltage substantially equal to that of said second MOS transistor, one terminal of the drain-source path of said fourth transistor being connected to said power source potential and the other terminal of the drain-source path being coupled to said bit line, and the gate of said fourth transistor being connected to said node; and
a fifth transistor, connected between said bit line and said input node, having a channel of said second conductivity type and a threshold voltage substantially equal to that of each of said second and fourth MOS transistors, the gate of said fifth transistor being connected to said node, wherein the threshold voltage of said third MOS transistor is different from that of each of said second, fourth, and fifth MOS transistors.

4,843,595

DATA READING CIRCUIT FOR SEMICONDUCTOR MEMORY DEVICE

Atsushi Suzuki, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Jan. 20, 1987, Ser. No. 4,950
Claims priority, application Japan, Jan. 20, 1986, 61-007953
Int. Cl.[4] G11C *7/00, 11/40*
U.S. Cl. 365—189.01 **4 Claims**



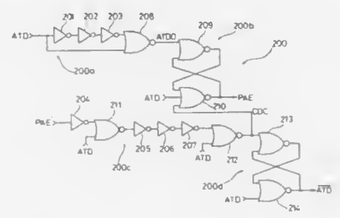
1. A data reading circuit for a semiconductor memory device comprising:
a first input terminal and a second input terminal each receiving complementary signals;
a first and a second current mirror type sense amplifiers, each of said current mirror type sense amplifiers including,
a reference node,
an output terminal,
a first transistor connected with said reference node, and
a second transistor connected with said output terminal, a gate of said first transistor of said first current mirror type sense amplifier and a gate of said second transistor of said second current mirror type sense amplifier being connected to said first input terminal, and a gate of said second transistor of said first current mirror type sense amplifier and a gate of said first transistor of said second current mirror type sense amplifier being connected to said second input terminal; and
a first short-circuiting transistor connected between the reference nodes of both said first and said second current mirror type sense amplifiers, said first short-circuiting transistor being able to conduct therethrough temporarily by receiving a clock signal at a gate.

4,843,596

SEMICONDUCTOR MEMORY DEVICE WITH ADDRESS TRANSITION DETECTION AND TIMING CONTROL

Hideshi Miyatake; Masaki Kumanoya; Hideto Hidaka; Yasuhiro Konishi; Katsumi Dosaka; Hiroyuki Yamasaki; Masaki Shimoda; Yuto Ikeda, and Kazuhiro Tsukamoto, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Nov. 24, 1987, Ser. No. 124,554
Claims priority, application Japan, Nov. 29, 1986, 61-284849
Int. Cl.[4] G11C *8/00*
U.S. Cl. 365—233.5 **1 Claim**



1. A semiconductor memory device receiving an address signal providing data on an I/O line, said memory device comprising:
a first detection circuit for detecting an address transition and for generating a short-width first pulse signal in response;
a column decoder-activating signal generator for detecting the start of generation of said first pulse signal and for generating a column decoder-activating signal in response;
a second detection circuit for detecting the conclusion of said first pulse signal and for generating a second pulse siganl in response;
a preamplifier-activating signal generator for generating a preamplifier-activating signal to activate a preamplifier which amplifies and latches the data on said I/O line upon receipt of said second pulse signal; and
a reset signal generator for generating a reset signal to deactivate said column decoder-activating signal and to delay said preamplifier-activating signal;
said preamplifier-activating signal generator and said reset signal generator being reset while said first pulse signal is output.

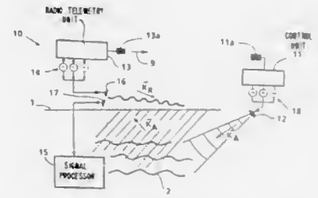
4,843,597

SYSTEM FOR MARINE SEISMIC EXPLORATION

Dag K. T. Gjessing, Skogfaret 54,, 2020 Skedsmokorset, Norway; Jens F. Hjelmstad, Hurdalsgt. 41A, 2000 Lillestrom, Norway, and Andreas Tonning, Steinhaugen 20, 7000 Trondheim, Norway

PCT No. PCT/NO87/00004, § 371 Date Oct. 2, 1987, § 102(e) Date Oct. 2, 1987, PCT Pub. No. WO87/04258, PCT Pub. Date Jul. 16, 1987
PCT Filed Jan. 12, 1987, Ser. No. 102,200
Claims priority, application Norway, Jan. 13, 1986, 860093
Int. Cl.[4] G01V *1/38*
U.S. Cl. 367—15 **15 Claims**

1. A system for marine seismic exploration of underground structures beneath the sea bottom being covered by a mass of water having a water surface, comprising a transmitter means having an array of acoustic transducers for generating acoustic waves in the water, and a receiver means for detecting an acoustic wave pattern formed on the water surface by the acoustic waves reflected from said underground structures,
wherein said acoustic transducers are mutually phase locked sine-wave generators producing a number of mutually coherent monochromatic acoustic waves of different frequencies, and
wherein said receiver means comprises a continuous wave radar illuminating said acoustic wave pattern with monochromatic electromagnetic waves of at least one frequency adapted to be reflected by the acoustic wave pattern;



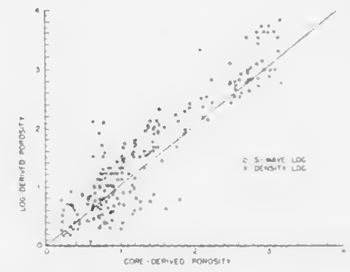
and wherein said continuous wave radar comprises narrow-band receiver circuits tuned to at least one frequency corresponding to a frequency shift imparted to reflected electromagnetic waves in relation to said illuminating electromagnetic waves du to the Doppler effect caused by motion of said acoustic wave pattern along said water surface, said receiver means further comprising a processor unit adapted to determine phase and relative amplitudes of said reflected acoustic waves on the basis of said reflected, frequency-shifted electromagnetic waves, so as to thereby obtain a recording of said underground structures.

4,843,598

METHOD OF SHEAR WAVE POROSITY LOGGING OF A SUBSURFACE FORMATION SURROUNDING A CASED WELL

W. L. Medlin, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 3, 1988, Ser. No. 189,880
Int. Cl.[4] G01V *1/40, 1/28*
U.S. Cl. 367—27 **3 Claims**



1. A method for porosity logging of a formation surrounding a cased well, comprising the steps of:
(a) generating asymmetric acoustic energy within a cased well,

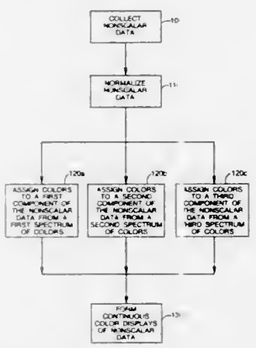
(b) receiving acoustic energy after it has traveled through the formation surrounding said cased well,
(c) determined from said received acoustic energy the velocity of acoustic shear wave energy through said formation, and
(d) determining the porosity of said formation in accordance with a predetermined correlation between log-derived values of the reciprocal of acoustic shear wave velocity and core-derived porosity for the type of formation traversed by said cased well.

4,843,599

METHOD FOR CONTINUOUS COLOR MAPPING OF SEISMIC DATA

Rhoda H. Bucker, Tulsa, Okla., assignor to Amoco Corporation, Chicago, Ill.

Filed Sep. 28, 1987, Ser. No. 101,915
Int. Cl.[4] G01V *1/34*; G09G *1/28*
U.S. Cl. 367—70 **15 Claims**



11. A method for producing continuous color displays of at least two separate sets of seismic data comprising the steps of:
(a) creating a color coordinate system having at least two color axes, wherein each color axis of the color coordinate system has a unique spectrum of colors for both positive and negative values along each color axis and the colors assigned to positive values along each color axis are complementary to the colors assigned to negative values along each axis
(b) assigning unique colors to each component of the seismic data according to one of the color axes of the color coordinate system; and
(c) forming continuous color displays of the seismic data by chromatic vector addition of the assigned colors.

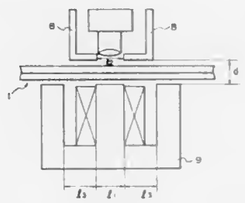
4,843,600

RECORDING HEAD FOR MAGNETO-OPTICAL INFORMATION RECORDING APPARATUS

Yoshikazu Miyajima, Kawasaki, and Makoto Shiho, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1986, Ser. No. 904,453
Int. Cl.[4] G11B *11/14*; *13/04*
U.S. Cl. 369—13 **11 Claims**

1. A magneto-optical information recording apparatus comprising:
an objective for condensing a light beam on a magneto-optical recording medium;
bias magnetic field producing means including a yoke provided on the opposite side of said objective with respect to said magneto-optical recording medium for applying a magnetic field from outside to said magneto-optical recording medium near the condensed point of said light beam, said yoke having a central protruding portion disposed at a location opposed to said objective and an outer protruding portion disposed away from said central protruding portion along the surface of the recording medium; and
a protective outer frame containing said objective therein and having an opening for transmitting said light beam



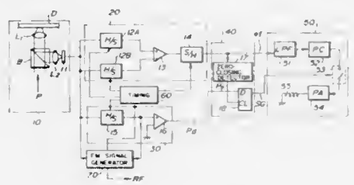
therethrough at a location opposed to said magneto-optical recording medium, at least that portion of said protective outer frame which is opposed to said recording medium being formed of a ferromagnetic material so that said portion of said protective outer frame, said central protruding portion and said outer protruding portion lie in a closed magnetic flux loop.

4,843,601

TRACKING SERVO SYSTEM FOR OPTICAL DISK PLAYRE APPARATUS

Naoya Eguchi, Tokyo, and Norio Nishida, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 11, 1987, Ser. No. 131,574
Claims priority, application Japan, Dec. 15, 1986, 61-296644
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—44 **13 Claims**



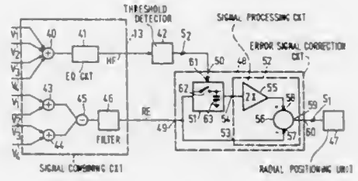
1. A tracking servo system for an optical disk player for reproducing and/or recording data on a plurality of coaxially formed recording tracks on an optical disk which has a pair of servo pits and a clock pit on each of said recording tracks, said pair of servo pits being arranged in a circumferentially spaced manner at a known distance and radially offset from a track center of the associated recording track so as to be placed at opposite sides of said track center at a known distance, comprising:
a laser beam generator means for irradiating a laser beam onto said optical disk for scanning the recording tracks;
a laser beam driving means for causing a shift of an irradiating point of said laser beam in a radial direction;
a tracking servo circuit means for controlling said laser beam driving means, said tracking servo circuit means being operable for operating said laser beam driving means to cause radial shifting of said laser beam irradiating point and operable in a feedback manner for adjusting said laser beam irradiating point on the center of said recording track;
a light receiving means for receiving a light beam reflected from the laser beam irradiating point and producing a light intensity indicative signal;
a first signal processing means for receiving said light intensity indicative signal respectively representative of the light intensity of the light beam reflected from respective servo pits for deriving a tracking error signal based on values of the light intensity indicative signal;
a second signal processing means for receiving said light intensity indicative signal representative of the light intensity of the light beam reflected from said clock pit, detecting a shifting direction of the laser beam irradiating points in a radial direction, and the producing a state indicative signal indicative of the shifting state of said laser beam irradiating point shifting away from said track center and approaching said track center; and
third signal processing means for receiving said track error signal to detect a zero-closing of said track error signal value for producing a zero-closing indicative signal and deriving a servo control signal for enabling and disabling said feedback mode tracking servo control of said tracking servo circuit means based on said state indicative signal and said zero-closing indicative signal.

4,843,602

APPARATUS PROVIDING EXTENDED RANGE OF PROPORTIONAL CONTROL OF THE RADIAL EXCURSION OF A WRITE/READ LIGHT SPOT ON THE TRACKS OF A DISC-SHAPED RECORD CARRIER

Philip J. L. McGee, Eindhoven, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Apr. 6, 1987, Ser. No. 34,968
Claims priority, application Netherlands, Nov. 17, 1986, 8602911
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—44 **10 Claims**



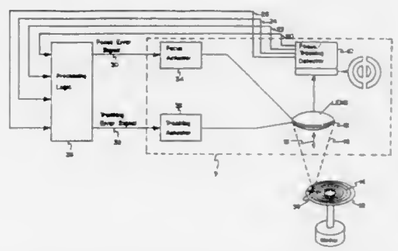
1. An apparatus for writing and/or reading information in substantially concentric tracks on a disc-shaped record carrier, which apparatus comprises:
a light source for generating a light beam;
an objective system for focusing the light beam to form a light spot on the record carrier;
means for scanning said light spot across said tracks so as to produce a reflected beam therefrom having an intensity corresponding to the radial excursion of the light spot relative to a track;
first detection means responsive to the reflected beam to generate a radial error signal which varies substantially proportionally to the radial excursion of the light spot relative to a track over a control range of p/4 to either side of such track, p being the track pitch; and
radial positioning means for controlling the radial position of the light spot on a track;
characterized in that said first detection means comprises an error signal correction circuit for deriving from said error signal a first control signal which is the same as said error signal for excursions of said light spot up to p/4 from a track, and which is a mirror-inverted replica of said error signal for excursions of said light spot exceeding p/4 from a track; said correction circuit having an output supplying said first control signal to said radial positioning means to control the radial position of said light spot on a track in accordance with such signal.

4,843,603

CONCENTRIC PHOTODETECTOR ARRANGEMENT FOR FOCUSING AND TRACKING

Ivan Prikryl, Colorado Springs, Colo., assignor to Optotech, Inc., Colorado Springs, Colo.

Filed Mar. 11, 1988, Ser. No. 166,679
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—45 **30 Claims**



1. For use in conjunction with an optical data storage system of the type having an optical disk with information bearing tracks, laser means for providing a beam of radiation, and an objective lens for focusing the beam of radiation onto the information bearing tracks, a tracking and focusing detector for providing signals as a function of tracking and focus errors of the objective lens with respect to the information tracks on the optical disk, including:
a first detector section positioned on a first side of an axis and having a radiation sensitive surface for detecting radiation modulated by the information carrying surface, and for providing a first signal representative thereof;
a second detector section having a radiation sensitive surface positioned on a second side of the axis adjacent and electrically isolated from the first detector section, for detecting radiation modulated by the information carrying surface and for providing a second signal representative thereof, the radiation sensitive surfaces of the first and second detector sections capturing central portions of the radiation beam;
a third detector section having a radiation sensitive surface positioned on the first side of the axis about a periphery of and electrically isolated from the first detector section, for detecting radiation modulated by the information carrying surface and for providing a third signal representative thereof;
a fourth detector section having a radiation sensitive surface positioned on the second side of the axis about a periphery of and electrically isolated from the second detector section, for detecting radiation modulated by the information carrying surface and for providing a fourth signal representation thereof, the radiation sensitive surfaces of the third and fourth detector sections capturing peripheral portions of the radiation beam.

4,843,604

BEAM CONTROLLER FOR MAGNETO-OPTICAL DISC MEMORY SYSTEM

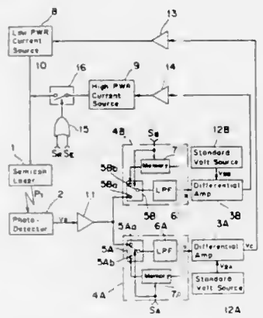
Tetsuo Fujiwara; Hiroshi Fuji; Takashi Iwaki, all of Tenri; Toshihisa Deguchi, and Shozou Kobayashi, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 16, 1986, Ser. No. 919,672

Claims priority, application Japan, Oct. 16, 1985, 60-230544; Nov. 30, 1985, 60-270476

Int. Cl.[4] G11B 11/12

U.S. Cl. 369—116 4 Claims



1. A beam controller for controlling a semiconductor laser included in an optical recording and play-back apparatus including optical memory means and which comprises:

a first current source for driving said semiconductor laser at a relatively low level for playing back data memorized in said optical memory means;

a second current source for driving said semiconductor laser at a relatively high level for recording and/or erasing data into and from said optical memory means,

a first sample and hold circuit for receiving and holding data corresponding to a beam intensity from said semiconductor laser and being detected when playing back data stored on said optical memory means,

first control means for controlling the output of said first current source in response to the output from the first sample and hold circuit in a first type control when recording and/or erasing data in the optical memory means, and in a second type control when playing back data in the optical memory means,

a second sample and hold circuit for receiving and holding data corresponding to a beam intensity from said semiconductor laser and being detected when erasing stored on said optical memory means; and

second control means for controlling the output current of said second source in response to the output from the second sample and hold circuit in a first type control when recording data in the optical memory means and in a second type control when erasing data in the optical memory means.

4,843,605

NODE APPARATUS FOR COMMUNICATION NETWORK HAVING MULTI-CONJUNCTION ARCHITECTURE

Kazunori Hoshi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 22, 1988, Ser. No. 171,798

Claims priority, application Japan, Mar. 26, 1987, 62-70284

Int. Cl.[4] H04J 3/24

U.S. Cl. 370—60 7 Claims

1. A node apparatus for a communication network having a multi-conjunction architecture, said communication network having a plurality of transmission paths each coupling one node apparatus to another node apparatus or a terminal device, said node apparatus comprising:

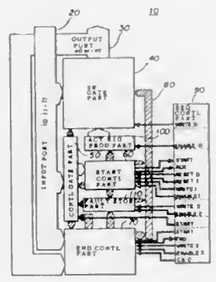
an input port comprising a plurality of input channels connected to the transmission paths;

an output port comprising a plurality of output channels connected to the transmission paths;

a switching gate part for coupling said input and output channels of said input and output ports; and

control means comprising first and second control parts for controlling said switching gate part to selectively couple said input and output channels, said first control part being coupled to said input port and detecting a first receiving input channel which receives a sending signal first out of said input channels, said second control part being coupled to said input and output ports and controlling said switching gate part based on a time supervision of a signal presence at said input and output channels of said input and output ports,

said first control part controlling said switching gate part responsive to the detection of said first receiving input channel so that all of said input channels other than said first receiving input channel are disconnected from said output channels, thereby transferring the sending signal received by said first receiving input channel to all of said output channels other than an output channel having a



channel number corresponding to that of said first receiving input channel,

said first control part detecting a predetermined input channel which receives a returning signal out of said input channels other than said first receiving input channel, said first control part controlling said switching gate part responsive to the detection of said predetermined input channel so that said predetermined input channel is connected to the output channel having a channel number corresponding to that of said first receiving input channel and said first receiving input channel is connected to an output channel having a channel number corresponding to that of said predetermined input channel, thereby fixing a communication path between said input and output ports,

said second control part controlling said switching gate part to disconnect and release the fixed communication path when a certain logic state of the signal continues at said input and output channels of said input and output ports for a predetermined time period after the communication path is fixed, said predetermined time period being variable, said second control part having a circuit part for determining said predetermined time period depending on a characteristic of the sending signal for at least one of said first receiving input channel and the corresponding output channel.

4,843,606

LOCAL AREA COMMUNICATION SYSTEM FOR INTEGRATED SERVICES BASED ON A TOKEN-RING TRANSMISSION MEDIUM

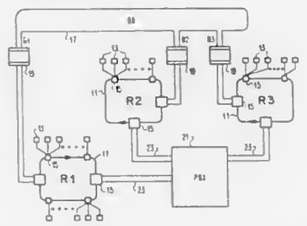
Werner K. Bux, Richterswil; Felix H. Closs, Adliswil; Johann R. Mueller, Langnau am Albis; Harmen R. Van As, Langnau am Albis, and Pitro A. Zafiropulo, Ruschlikon, all of Switzerland, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 3, 1986, Ser. No. 937,591

Claims priority, application European Pat. Off., Dec. 23, 1985, 85116504

Int. Cl.[4] H04J 3/16

U.S. Cl. 370—89 14 Claims



1. A communications system having at least one transmission facility in which data are transmitted in asynchronously circulating frames, in which access to said at least one transmission facility is regulated by a token, and in which a priority token for marking a priority frame is released at quasi-regular intervals by a synchronous bandwidth manager (SBM) unit provided for said at least one transmission facility,

characterized in that for transmission and switching of information blocks requiring synchronous transfer:

a common time division multiplex (TDM) switching unit is provided and is connected to the transmission facility by a SBM unit (57); said

SBM unit includes means (61 . . . 73, 79 . . . 89) for extracting all information blocks from each priority frame and for inserting them into buffers (75) readable by said TDM switching unit, and for extracting information blocks from buffers (77) writable from said TDM switching unit and inserting them into priority frames it transmits on its associated transmission facility, each said priority frame having a plurality of time slots (V1 . . . Vn) for information blocks; and that

each station which participates in the exchange of information blocks requiring synchronous transfer, has means (101 . . . 109) for receiving such an information block from, and transmitting such an information block in, at least one predetermined slot of each said priority frame.

4,843,607

MULTIPLE ERROR TRAPPING

Po Tong, Alameda, Calif., assignor to Cyclotomics, Inc., Berkeley, Calif.

Filed Dec. 17, 1987, Ser. No. 134,137

Int. Cl.[4] G06F 11/10

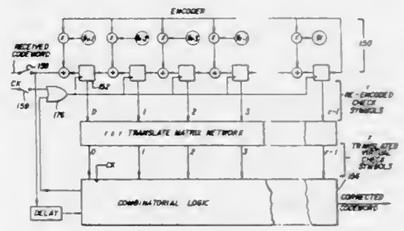
U.S. Cl. 371—37 16 Claims

1. An error trapping decoder adapted to decode a received codeword having r redundant check symbols in r predetermined check locations in said received codeword, said error trapping decoder comprising:

means responsive to specification of a given set of r virtual check locations different from said r check locations, for computing r virtual check symbols corresponding to said given set of r virtual check locations;

permuting means for specifying to said computing means successive sets of r virtual check locations so that said computing means computes successive sets of r virtual check symbols; and

means, responsive whenever said permuting means specifies a particular set of r virtual check locations for which the corresponding r virtual check symbols are all zero except



for no more than predetermined number, for adding the non-zero ones of said particular set of r virtual check symbols to symbols occupying the corresponding virtual check locations in said received codeword, whereby to generate a corrected codeword.

4,843,608

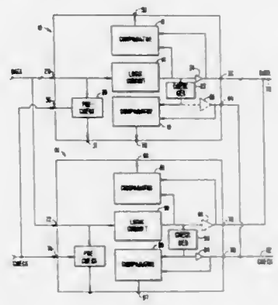
CROSS-COUPLED CHECKING CIRCUIT

Peter L. Fu, Sunnyvale, and Daniel E. Lenoski, Mountain View, both of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Filed Apr. 16, 1987, Ser. No. 39,565

Int. Cl.[4] G06F 11/16

U.S. Cl. 371—68 15 Claims



1. In a circuit for generating digital output data and digital check symbol data, a cross-coupled checking circuit for checking the output data and the check symbol data, said circuit comprising:

a first

integrated circuit comprising:

an off-chip data output;

an off-chip check symbol input;

first logic means coupled to the off-chip data output for generating output data at the off-chip data output;

first check symbol generating means connected to the first logic means for receiving the output data and generating the check symbol data from the output data; and

a first comparator having one input coupled to the first check symbol generating means and having a second input coupled to the off-chip check symbol input;

a second integrated circuit comprising:

second logic means for generating output data;

an off-chip check symbol output;

an off-chip data input;

second check symbol generating means coupled to the second logic means for receiving the output data and for generating the check symbol data from the output data at the off-chip check symbol output; and

a second comparator having one input coupled to the second logic means and having a second input coupled to the off-chip data input;

means for coupling the off-chip data output of the first integrated circuit to the off-chip data input of the second integrated circuit; and

means for coupling the off-chip check symbol output of the second integrated circuit to the off-chip check symbol input of the first integrated circuit; whereby said first integrated circuit drives the data output and checks the check symbol output and said second integrated circuit drives the check symbol output and checks the data output.

4,843,609

OPTICAL INTEGRATED CIRCUIT FOR HETERODYNE DETECTION

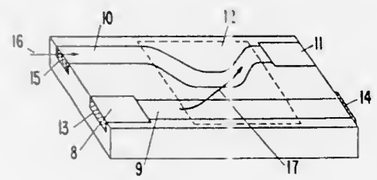
Jun Ohya, Osaka, and Yasushi Matsui, Suita, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 28, 1987, Ser. No. 138,086

Claims priority, application Japan, Dec. 26, 1986, 61-312007

Int. Cl.⁴ H01S *3/098*

U.S. Cl. 372—18 **5 Claims**



5. An optical integrated circuit for heterodyne detection, comprising:

a semiconductor substrate having a planar surface, a first end, and a second end opposite said first end;

an active region of a semiconductor laser, containing at least one active layer and at least one cladding layer, formed on said planar surface at said first end;

a first optical waveguide formed on said planar surface coupled to said active region and extending to said second end, wherein said first optical waveguide guides emission of light from said active region

a second optical waveguide formed on said planar surface extending from said first end to said second end, wherein said second optical waveguide guides light entering said first end;

a photodetector formed on said planar surface at said second end and coupled to one of said first and second optical waveguides, wherein a laser cavity extends from said active region to the other of said first and second optical waveguides at said second end

an optical coupler composed of portions of said first and second optical waveguides,

whereby said emission of light from said active region is synthesized as local oscillation light with said light entering said first end, and is conveyed through said optical coupler, and is detected by said photodetector.

4,843,610

SEMICONDUCTOR LASER APPARATUS

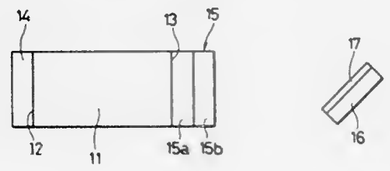
Tsunekazu Okada, and Nozomu Yamaguchi, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 25, 1988, Ser. No. 198,216

Claims priority, application Japan, May 27, 1987, 62-130368

Int. Cl.⁴ H01S *3/13*

U.S. Cl. 372—31 **4 Claims**



1. A semiconductor laser apparatus comprising, a semiconductor laser element which has first and second output end faces, first and second end face protection films formed, respectively, on said first and second end faces, output light emitted as a laser beam from said first output end face, a light-receiving element for detecting the laser beam emitted from said second output end face so as to control the power of the output light, wherein said first and second end face protection films each have a thickness such that the temperature dependency of the power of the laser beam transmitted through each of said end face protection films and the temperature dependency of the detected power of said light-receiving element have characteristics which are inverse to each other.

4,843,611

SUPERLUMINESCENT DIODE AND SINGLE MODE LASER

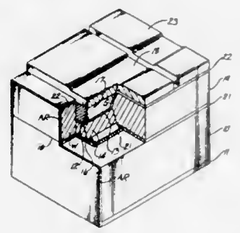
Sze-Keung Kwong, Long Beach; Kam Y. Lau, Glendale; Nadav Bar-Chaim, Pasadena, and Israel Ury, Los Angeles, all of Calif., assignors to Ortel Corporation, Alhambra, Calif.

Continuation of Ser. No. 78,367, Jul. 27, 1987, Pat. No. 4,764,934. This application Aug. 12, 1988, Ser. No. 232,505

The portion of the term of this patent subsequent to Aug. 16, 2005, has been disclaimed.

Int. Cl.⁴ H01S *3/19*

U.S. Cl. 372—46 **13 Claims**



1. A buried heterostructure superluminescent diode comprising:

an elongated active gain layer having an output end and a non-output end;

a first n-type cladding layer on one face of the gain layer and a second p-type cladding layer on the other face of the gain layer for pumping the active gain layer, the cladding layer having a lower index of refraction than the active gain layer;

a blocking layer having a lower index of refraction than the active gain layer along each longitudinal edge of the active gain layer; and

a light absorbing medium at the non-output end of the active gain layer.

4,843,612

METHOD FOR JAM-RESISTANT COMMUNICATION TRANSMISSION

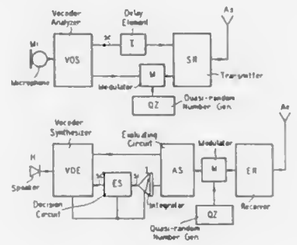
Josef Brusch, Unterhaching; Manfred Hanni, Puchheim, and Kurt Hechfellner, Taufkirchen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlio and Munich, Fed. Rep. of Germany

Filed Jun. 8, 1981, Ser. No. 274,142

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1980, 3023375

Int. Cl.⁴ H04B *1/10*

U.S. Cl. 375—1 **2 Claims**



1. In a method for jam-resistant communication of useful signals between transmitting means of a transmitting station and receiving means of a receiving station in which a speech signal to be transmitted is fed to the transmitting means via a vocoder analyzer and in which the received signal is fed from the receiving means via a vocoder synthesizer to a receiver output, and in which the system operates with frame clock pulses, the improvement therein comprising the steps of:

generating a first information signal in the vocoder analyzer indicating whether a speech signal is present or absent within a frame period;

applying the first information signal to the transmitting means to switch the same on during the presence of a useful signal to transmit the coded useful signal to the receiving means and off during the time that a useful signal is not present during a respective time element of a frame period;

receiving the transmitted signal;

deriving from the signals received a second information signal indicating the presence or absence of a useful signal at the transmitting station; and

applying the second information signal to the vocoder analyzer to switch the same on or off, respectively, when a useful signal is present or not present.

4,843,613

DIGITALLY IMPLEMENTED MODULATORS

Brian Crowle, Oakley, England, assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 6, 1986, Ser. No. 826,700

Claims priority, application United Kingdom, Mar. 4, 1985, 8505527

Int. Cl.⁴ H04L *27/20*

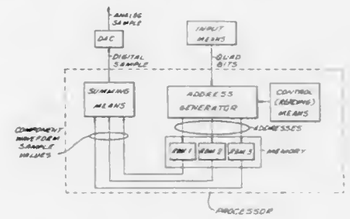
U.S. Cl. 375—59 **16 Claims**

10. A digitally implemented modulator apparatus for generating a band-limited modulated output signal from an inputted binary data signal, comprising:

(a) look-up table memory means having a multiplicity of sets of digital component waveform sample values stored therein;

(b) means for retrieving digital component waveform sample values from said memory means in succession; and

(c) means for forming successive digital samples of said band-limited modulated output signal by summing a predetermined number of successively retrieved component waveform sample values retrieved from said memory means and then summing the next said predetermined number of successively retrieved component waveform sample values retrieved from said memory means.



4,843,614

METALLURGICAL VESSEL

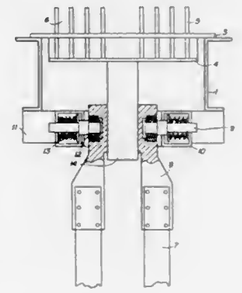
Heinz Guido, Duisberg, Fed. Rep. of Germany, assignor to Man Gutehoffnungshuette GmbH, Fed. Rep. of Germany

Filed Jan. 21, 1988, Ser. No. 146,325

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1986, 3701678

Int. Cl.⁴ H05B *7/11*

U.S. Cl. 373—72 **7 Claims**



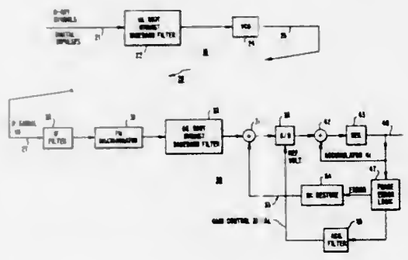
1. An electrical metallurgical furnace comprising: a vessel; a bottom electrode positioned in the bottom of said vessel; at least one counter contact connected to said bottom electrode; a support anchored to said vessel; a tension frame; insulation mounting means connected to said support for insulative mounting of said tension frame relative to said support; at least one current cable positioned on a side of said counter contact; pivot means connected to said tension frame for pivotally supporting said at least one current cable with respect to said tension frame; and, biasing means for urging said pivotally supported at least one current cable into contact with said counter contact.

4,843,615

CPFSK COMMUNICATION SYSTEM EMPLOYING NYQUIST-FILTERED MODULATOR/DEMODULATOR

Robert C. Davis, Indialantic, Fla., assignor to Harris Corp., Melbourne, Fla.

Filed May 8, 1987, Ser. No. 47,149
Int. Cl.[4] H04L 27/14; H03K 9/06
U.S. Cl. 375—80 16 Claims



1. For use in a communication system wherein frequency modulated signals, representative of information signals that have been transmitted from a transmitter site over a communications link, are demodulated at a receiver, a method of enhancing the characteristics of the recovered information signals comprising the steps of:

(a) filtering the demodulated information signals by way of a Nyquist filtering mechanism; and

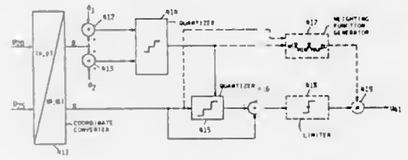
(b) accumulating successive samples of the filtered demodulated signals, so as to derive information output signals having reduced noise signal content.

4,843,616

METHOD OF OBTAINING A PHASE DIFFERENCE SIGNAL

Michael Hoffmann, Backnang, Fed. Rep. of Germany, assignor to Ant Nachrichtentechnik GmbH, Backnang, Fed. Rep. of Germany

Filed Mar. 8, 1988, Ser. No. 165,715
Claims priority, application European Pat. Off., Mar. 10, 1987, 87103453.4
Int. Cl.[4] H03D 3/24
U.S. Cl. 375—81 11 Claims



1. A method of obtaining a signal representing the phase angle difference between a local oscillator signal and the carrier of an amplitude and/or phase shift keyed received signal having a plurality of possible signal states, said method comprising the steps of:

(a) dividing the received signal into a pair of cartesian coordinate signal components which are a function of the phase angle difference and which are in quadrature relationship to one another, with the two signal components together representing one of the possible signal states;

(b) converting the pair of cartesian coordinate signal components into a corresponding pair of polar coordinate signal components, with a first of said pair of polar signal components representing the amplitude (R) of a signal state vector formed by the pair of cartesian coordinate signal components, and with the second of said pair of polar signal components representing the phase angle (α) for this signal state vector;

(c) forming an upper limit value (R_{max}) by adding a value (d_2) to said first polar signal component representing the amplitude (R), and forming a lower limit value (R_{min}) by subtracting a value (d_1) from said first polar signal component representing the amplitude (R);

(d) providing a first quantizer which contains a set or supply of predetermined amplitude values derived from all possible, true signal states, with said predetermined amplitude values being staggered such that a predetermined value of said set is disposed below and above each possibly occurring amplitude value;

(e) feeding said upper limit value (R_{max}) and the lower limit value (R_{min}) to the first quantizer and utilizing the first quantizer to determine all those amplitude values from said set of predetermined amplitude values which lie between the highest predetermined amplitude value below or at said lower limit value (R_{min}), and the lowest predetermined amplitude value above or at said upper limit value (R_{max});

(f) providing a second quantizer which contains a set or supply of predetermined phase angle values derived from all possible, true signals states;

(g) feeding said second polar signal component corresponding to the phase angle (α) of the received signal to the second quantizer and utilizing the second quantizer to determine which phase angle value, selected from said set of predetermined phase angle values and belonging to all signal state vectors having the amplitude values determined in step (e), comes closest to the phase angle represented by said second polar signal component derived from the input signal; and

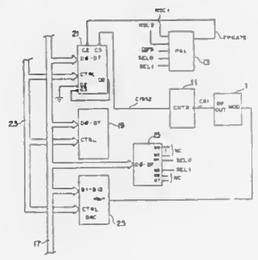
(h) determining the difference between the phase angle value determined in step (g) and the phase angle represented by said second polar signal component derived from the input signal, with said difference being proportional to the phase angle difference between the local oscillator signal and the carrier of the keyed received signal.

4,843,617

APPARATUS AND METHOD FOR SYNCHRONIZING A COMMUNICATION SYSTEM

Scott Marshall, Stittsville; Thanh Tran, Ottawa, and A. David Milton, Kanata, all of Canada, assignors to Mitel Corporation, Kanata, Canada

Filed Dec. 2, 1987, Ser. No. 127,700
Claims priority, application Canada, Dec. 15, 1986, 525389
Int. Cl.[4] H04L 7/00
U.S. Cl. 375—118 18 Claims



1. Apparatus for synchronizing a local clock signal with a remote clock signal, comprised of:

(a) a voltage controlled master oscillator for generating a master oscillator signal, and a digital counter for receiving and frequency dividing said master oscillator signal and in response generating a phase increment signal having a frequency which is a multiple of the local clock signal frequency such that a predetermined number of phase increment signal cycles are generated during each local clock signal cycle,

(b) a programmable logic device for receiving a plurality of clock signals from external sources and in response generating said remote clock signal derived from a predetermined selected one of said plurality of clock signals,

(c) means for receiving said remote and phase increment signals and generating a count value corresponding to the number of cycles of said phase increment signal received during each received cycle of said remote clock signal,

(d) means for receiving said count value and decreasing said local clock signal frequency in the event said count value is greater than said predetermined number of phase increment signal cycles, and increasing said local clock signal frequency in the event said count value is lower than said predetermined number of cycles, thereby synchronizing said local clock signal with said remote clock signal in both phase and frequency, said means for receiving said count value being further comprised of:

(e) a microprocessor for comparing said count value with a predetermined acceptable range of stored values and generating a digital correction signal in response thereto, said correction signal being graded such that a large phase error produces a large amplitude correction signal while a small phase error produces a proportionately smaller amplitude correction signal,

(f) a digital-to-analog converter for receiving said digital correction signal and in response generating an analog control voltage signal, and

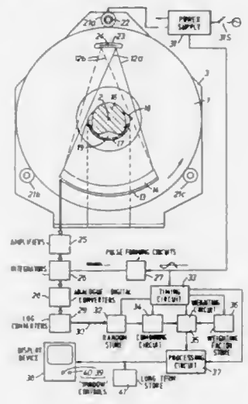
(g) said voltage controlled master oscillator for receiving said control voltage signal and in response generating said master oscillator signal having frequency proportional to the magnitude of said control voltage signal.

4,843,618

RADIOGRAPHY

John E. Best, Oxon; Christopher A. G. LeMay, Osterley; Godfrey N. Hounsfield, Newark, and Robert J. Froggatt, Southall, all of England, assignors to EMI Limited, Hayes, England

Continuation of Ser. No. 936,880, Aug. 25, 1978, Continuation of Ser. No. 773,761, Mar. 2, 1977, abandoned. This application Apr. 19, 1983, Ser. No. 486,375
Claims priority, application United Kingdom, Mar. 4, 1976, 8648/76
Int. Cl.[4] H05G 1/60
U.S. Cl. 378—4 5 Claims



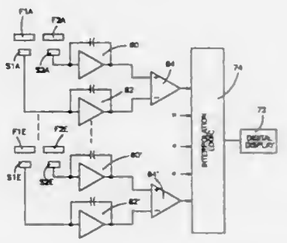
1. Radiographic apparatus including a source of penetrating radiation, such as x-radiation, fanning out from said source to simultaneously follow n mutually divergent beams, support means constraining said source to project said radiation through a cross-sectional slice of the body of a patient with said n beams distributed across substantially the entire width of said slice, scanning means for moving said support means, and with it said source, angularly around the body about an axis intersecting said slice, causing said radiation to project through said slice from different directions, detector means for receiving radiation emergent from said slice along each of said beams from each of said directions, said detector means being supported by said support means and moved angularly around said body by said scanning means, sampling means for sampling said detector means during the angular movement of said source and said detector means around the body, to derive therefrom output samples relating to respective paths followed by said beams through said slice, the scanning means and the sampling means being adapted to produce output samples relating to a total of m beam paths, and processing means for operating upon said output signals to combine the samples into groups to thereby provide an absorption value applicable to each designated beam path of a set of at least n parallel and substantially equally spaced designated beam paths disposed at each of at least p angles with respect to said body, m exceeding the product np at least five-fold, and said processing means combining a respective plurality of said output samples to produce each of said absorption values.

4,843,619

APPARATUS FOR MEASURING THE PEAK VOLTAGE APPLIED TO A RADIATION SOURCE

Terrence E. Sheridan, North Bloomfield, Ohio, assignor to Keithley Instruments Inc., Solon, Ohio

Filed Apr. 22, 1988, Ser. No. 185,138
Int. Cl.[4] G01D 18/00
U.S. Cl. 378—207 13 Claims



1. Apparatus for measuring the peak voltage applied to an X-ray radiation source operating at an unknown input voltage comprising:

a set of radiation absorbing filters, the set including a first filter which includes at least a first chemical element that exhibits a known K-absorption edge and a second filter which includes at least a second chemical element;

said elements being chosen so that said filters exhibit essentially the same radiation absorption characteristics for photon energies below said known K-absorption edge of said first element, but substantially different characteristics above the known K-absorption edge;

said filters adapted to be positioned so that said first and second filters are irradiated by said radiation source with the radiation impinging upon a surface of each said filter and partially absorbed thereby as it passes therethrough so as to exit therefrom as attenuated radiation; and,

detector means positioned for receiving the said attenuated radiation passed by said first and second filters and providing an output indication when the radiation passed by said filters is differently attenuated representative that the input voltage has exceeded the said known K-absorption

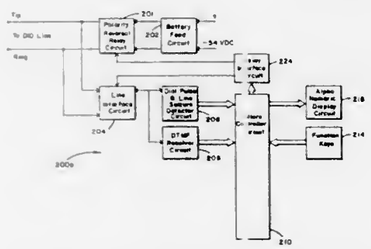
edge of said first element and thereby providing an indication of the magnitude of said input voltage.

4,843,620

HAND-HELD TELEPHONE LINE SIGNALING TEST INSTRUMENT

Guenter E. Hagedorn, Minnetonka, Minn., assignor to Nicollet Technologies, Inc., Eden Prairie, Minn.

Filed Jun. 29, 1988, Ser. No. 212,958
Int. Cl.[4] H04M *1/24, 3/32*
U.S. Cl. 379—21 10 Claims



1. A hand-held signal and test instrument for testing a DID trunk (swap) telephone line, comprising:

connection means for connecting to the telephone line;

relay means including a talk battery source connected to said connection means for selectively sourcing talk battery voltage and for selectively producing a reverse battery wink;

line seizure detection means connected to said connection means for detecting when a line seizure occurs on the telephone line;

dialing receiver means connected to said connection means for receiving dialing code digits and for producing therefrom binary digits corresponding to said dialing code digits; and

control means, having a memory and an indicator, connected to said relay means, said line seizure detection means and said dialing receiver means for measuring and timing the telephone line wink protocol, for measuring and timing the duration of the dialed digits, for producing therefrom measured values, for comparing said measured values to standard values stored in said memory, for producing comparison values therefrom, and for indicating said values on said indicator.

4,843,621

SPEAKERPHONE USING DIGITALLY COMPRESSED AUDIO TO DETECT ACOUSTIC FEEDBACK

Bryan A. Potratz, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 42,143, Apr. 24, 1987, Pat. No. 4,741,018. This application Apr. 18, 1988, Ser. No. 182,810
Int. Cl.[4] H04Q *7/04;* H04M *1/00, 11/00*
U.S. Cl. 379—58 12 Claims

1. A speakerphone for a radiotelephone for communciating voice signals by way of a radio channel, said radiotelephone including radio means for transmitting a first signal including voice signals on the radio channel and receiving a second signal including voice signals from the radio channel, said speakerphone comprising:

microphone means for producing the first signal;

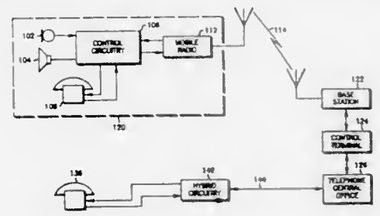
speaker means for emitting the second signal;

first amplifying means having an input coupled to said microphone means and an output coupled to said radio means and being responsive to first digital control signals for selecting one of a plurality of gain settings and amplifying the first signal;

second amplifying means having an input coupled to said radio means and an output coupled to said speaker means and being responsive to second digital control signals for selecting one of a plurality of gain settings and amplifying the second signal;

converting means for producing first and second digital samples of the output of the first amplifying means and the input of the second amplifying means, respectively; and

processing means coupled to the first and second digital samples of said converting means for deteecting voice signals in the first and second signals, respectively, and, in



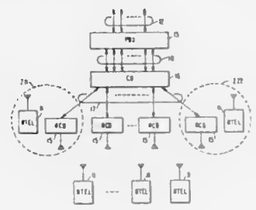
response to detection of voice signals in one of the first and second signals, producing the first and second digital control signals for adjusting the gain settings of said first amplifying means and said second amplifying means such that the gain setting for said one of the first and second signals is increased to a nominal gain and the gain setting of the other of the first and second signals is decreased by a first predetermined gain, and said processing means monitoring a predetermined number of consecutive second digital samples and reducing the first predetermined gain by a second predetermined gain if the predetermined number of consecutive second digital samples have magnitudes differing by less than a third predetermined gain.

4,843,622

COMMUNICATION CONTROL SYSTEM CAPABLE OF SEARCHING A CALLED TELEPHONE SET IN A MOBILE RADIO TELEPHONE NETWORK

Akio Yotsutani; Yukihiro Sako, both of Tokyo; Toshihiko Shibata, and Yoshitoshi Murata, both of Kanagawa, all of Japan, assignors to NEC Corporation; Kabushiki Kaisha Toshiba; Matsushita Communication Industrial Co., Ltd. and Nippon Telegraph and Telephone Corporation, Japan

Filed Apr. 4, 1988, Ser. No. 177,272
Claims priority, application Japan, Apr. 3, 1987, 62-83591
Int. Cl.[4] H01Q *7/04*
U.S. Cl. 379—59 4 Claims



1. For use in a mobile radio telephone network comprising a telephone line, a plurality of radio telephone sets movable in an area divided into a predetermined number of zones, and a

plurality of radio communication devices assigned to the respective zones, a communication control system including:

a memory for memorizing, in correspondence to said radio telephone sets, location information signals indicative of the radio communication devices assigned to the zones in which said radio telephone sets are present at a time;

selecting means coupled to said telephone line and said memory for selecting, in response to an arrival signal arriving at said telephone line and specifying a specific telephone set among said radio telephone sets, one of said radio communication devices as a specific communication device that is indicated by one of said location information signals that, in turn, is in correspondence to said specific telephone set; and

communicating means coupled to said radio communication devices and said selecting means for sending said arrival signal as a call signal to said specific communication device for transmission to said specific telephone set, said specific telephone set transmitting a response signal to said specific communication device in response to said call signal for reception by said communicating means when said specific telephone set is present in one of said zones that is assigned with said specific communication device; and

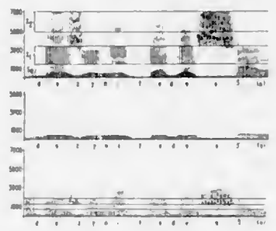
searching means coupled to said radio communication devices and said communicating means for searching a different one of said radio communication devices as a searched communication device by transmitting, if said communicating means does not receive said response signal, said call signal to said radio communication devices in a predetermined manner until said communicating means receives said response signal through said searched communication device.

4,843,623

HEARING AID DEVICES IN WHICH HIGH FREQUENCY SIGNAL PORTIONS ARE TRANSPOSED IN LOW FREQUENCY COMPENSTION SIGNAL PORTIONS

Jean-Claude Lafon, and Tijani Gharbi, both of Besancon, France, assignors to University De Franche-Comte, France

Filed May 22, 1987, Ser. No. 53,298
Claims priority, application France, May 23, 1986, 86 07408
Int. Cl.[4] H04R *25/00*
U.S. Cl. 381—68.2 6 Claims



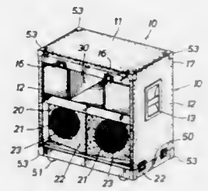
1. Hearing aid device comprising transducer means for transforming the acoustic signals to be processed into electrical signals, means for sampling at least two preselected frequency ranges defined as slices, x_i, of the order i, of each of said electrical signals, each said slice defined by a predetermined range of high frequencies ranging from $f_{i\,min}$ to $f_{i\,max}$, i being an integer of 2 to 3 and increasing in the same direction as the frequencies of said slices, means for processing each of said slices x_i to obtain a compensation signal S_i, each said compensation signal S_i disposed within a range of low frequencies comprised between $F_{i\,min}$ and $F_{i\,max}$, said low frequency ranges corresponding to different compensation signals S_i being distinct from one another, means for adding said compensation signals S_i thus obtained to achieve a sum-signal, and transducer means for transforming said sum-signal into a signal applicable to the deaf person to be assisted so as to be perceptible by him, wherein said means for processing each compensation signal S_i comprise means for multiplying the corresponding slice of signal x_i by a signal x'_i which is related to said slice x_i, so as to form a product-signal X_i, and means for sampling, in said product-signal X_i, by means of a band-pass filter, the portion of said product-signal whose low frequency is comprised within the frequency ranges $F_{i\,min}$ to $F_{i\,max}$, which portion constitutes the desired compensation signal S_i.

4,843,624

PORTABLE ENCLOSURE SYSTEM FOR AUDIO EQUIPMENT

Glen D. Rashak, The Woodlands, Tex., assignor to Rashak Enclosures, The Woodlands, Tex.

Filed Jan. 13, 1988, Ser. No. 143,459
Int. Cl.[4] H04R *27/00*
U.S. Cl. 381—91 7 Claims



1. An audio equipment enclosure comprising

a body,

a compartment means in the body for enclosing audio equipment the compartment means including a shelf connected to the body member and supporting enclosed audio equipment,

the compartment means having a speaker compartment for enclosing and supporting one or more audio speakers,

a tray releasably secured to the body, the tray having rotatable wheels mounted on its bottom for facilitating the movement of the enclosure,

the body having a body bottom and a pedestal protruding from the body bottom and extending across the body bottom, and

the tray having a tray recess fashioned to receive and hold the pedestal means of the body, the pedestal means and tray recess for firmly positioning the enclosure on the tray.

4,843,625

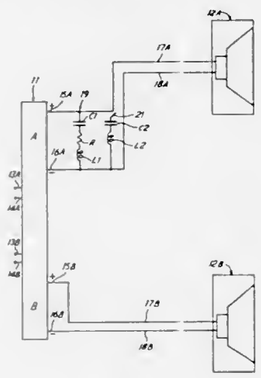
SOUND REPRODUCTION SYSTEMS

Brian M. King, Bay Lodge, Hampton Court, Surrey, United Kingdom (KT8 9DA)

PCT No. PCT/GB87/00191, § 371 Date Nov. 16, 1987, § 102(e) Date Nov. 16, 1987, PCT Pub. No. WO87/05774, PCT Pub. Date Sep. 24, 1987
PCT Filed Mar. 18, 1987, Ser. No. 130,456
Claims priority, application United Kingdom, Mar. 18, 1986, 86 06646
Int. Cl.[4] H03G *5/00*
U.S. Cl. 381—98 9 Claims

1. A bypass connected to at least one of a loudspeaker and an amplifier output, said bypass comprising: a circuit having a resistance, a capacitance and an inductance, said inductance being in series with each of said resistance and said capacitance, said resistance being within about 5% of 6600 ohms divided by N_1, where N_1 is an integer of from 1 to 12, said capacitance being within about 5% of 0.152 Microfarad multi-

plied by N_2, where N_2 is either an integer of from 1 to 8 or such an integer increased by one half or one third, and said induc-



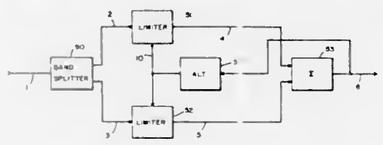
tance being within about 5% of 24 Microhenrys divided by N_3, where N_3 is an integer of from 1 to 15.

4,843,626

MULTIBAND LIMITER WITH AUTOMATIC LIMITING THRESHOLD (ALT) COMPENSATION

Donn R. Werrbach, 627 E. Magnolia Blvd., Apt. E, Burbank, Calif. 91501

Filed Jul. 10, 1986, Ser. No. 884,211
Int. Cl.[4] H03G *3/00*
U.S. Cl. 381—107 **15 Claims**



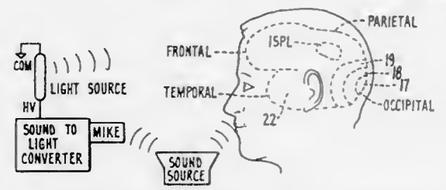
1. A multiband audio frequency signal limiter comprising:
a. band splitting means for splitting an input signal into two or more frequency bands;
b. limiter means coupled to said band splitting means for receiving the outputs of each frequency band;
c. said limiter means acting to independently and separately limit the level of each band output to a common limiter reference level and output each limited band separately; d. an automatic limit threshold (ALT) circuit for controlling the limiter means; and
e. band summing means for summing together the outputs of the limiter means to produce an amplitude limited output signal,
f. said ALT circuit receiving and comparing the limited output signal from said band summing means to a fixed reference and outputting an automatically adjusted limiter reference voltage to said limiter means;
g. whereby a multiband audio frequency signal limiter is realized which maintains a constant output level regardless of the relative energy content of the individual limiter bands.

4,843,627

CIRCUIT AND METHOD FOR PROVIDING A LIGHT ENERGY RESPONSE TO AN EVENT IN REAL TIME

Russell T. Stebbins, 112 Ferne Ave., Palo Alto, Calif. 94306

Filed Aug. 5, 1986, Ser. No. 893,483
Int. Cl.[4] H03G *3/20*
U.S. Cl. 381—110 **38 Claims**



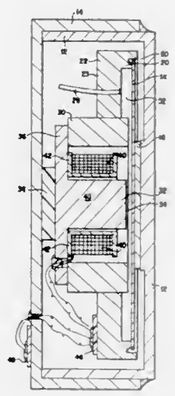
1. A sound-to-light converter for converting a signal from a sound source to visible light energy in real time, the sound-to-light converter comprising:
a light source;
a power supply for illuminating the light source;
means for monitoring the sound source signal comprising
(a) a voltage controlled pulse generator which generates a pulsed output signal having a pulse repetition frequency corresponding to the intensity of the sound source signal; and
(b) a burst oscillator which receives the pulsed output signal and generates first and second alternating voltage bursts in response thereto, the duty cycle of the alternating bursts corresponding to the pulse repetition frequency of the pulsed output signal; and
a power driver connected between the power supply and the light source, the power driver being responsive to the first and second alternating voltage bursts to control the power provided to the light source by the power supply such that the intensity of light energy provided by the light source varies in real time with changes in the intensity of the sound source signal.

4,843,628

INERTIAL MICROPHONE/RECEIVER WITH EXTENDED FREQUENCY RESPONSE

Alan Hofer, Wantagh, N.Y., assignor to Stanton Magnetics, Inc., Plainview, N.Y.

Filed Jul. 10, 1986, Ser. No. 883,985
Int. Cl.[4] H04R *11/00, 9/02, 1/28*
U.S. Cl. 381—200 **7 Claims**



1. In an inertial transducer of the type comprising a housing;

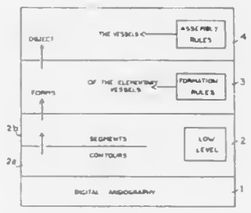
a non-perforated spring-diaphragm mounted within said housing; a magnetic circuit within said housing including an armature mounted to said housing and one side of said diaphragm, and a pole piece on the opposite side of said diaphragm; and a coil extending about said pole piece; wherein relative movement of said pole piece toward said armature causes a current to be induced in said coil the improvement comprising a first tuned cavity defined on one side of said diaphragm, a second tuned cavity defined on the opposite side of said diaphragm and means interconnecting the first and second tuned cavities wherein said first and second cavities are tuned to frequencies within the acoustic band which are different from each other and different from the resonant frequency of said spring diaphragm.

4,843,629

METHOD OF LOCATING PAIRS OF CURVED PARALLEL LINES IN AN IMAGE

Denis Mischler, Acigne, and Jean Yves Cairos, Rennes, both of France, assignors to Thomson-CSF, France

Continuation of Ser. No. 903,575, Nov. 14, 1986, abandoned. This application Aug. 1, 1988, Ser. No. 228,798
Claims priority, application France, Nov. 15, 1985, 85 16939
Int. Cl.[4] G06K *9/00*
U.S. Cl. 382—6 **9 Claims**



1. A method of locating pairs of parallel curved lines in an image, comprising the steps of:
representing the image in the form of straight line segments,
forming these segments into elementary sections of parallel segments, said step of forming elementary sections, including selecting two segments able to form a section when, simultaneously, the luminance values are substantially identical, the orientations θ_1 and θ_2 are equal within $k\pi$ and they do not have any common point, the orthogonal projections of one on the other overlap, they have an average spacing between the minimum and maximum diameter values tolerated for a vessel, they are disposed so that the segments are one at the left of the other, and they have a mean luminance value less than the mean luminance value which is proper to them,
assembling the related elementary sections so as to form vessels or vessel portions, and
filtering the vessels thus formed for eliminating parasite vessels.

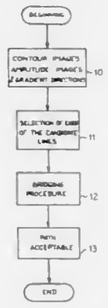
4,843,630

METHOD OF BRIDGING BETWEEN CONTOUR ELEMENTS IN AN IMAGE

Jean Yves Catros, Rennes, and Francois Malo-Renault, Cesson Sevigne, both of France, assignors to Thomson -CGR, Paris, France

Filed Nov. 24, 1986, Ser. No. 933,922
Claims priority, application France, Nov. 26, 1985, 85 17476
Int. Cl.[4] G06F *15/70;* **A61B** *1/04;* **G06K** *9/48*
U.S. Cl. 382—6 **7 Claims**

1. A digital processing method for bridging facing ends of disjointed contour elements in an image defined by pixel elements having intensity values stored in a digital image memory, comprising the steps of:
defining a search window in a portion of the digital image memory defining points between each of the facing ends of the disjointed contour elements;
intersecting said points in the portion of the digital image memory defining the search window by lines and columns so as to form a graph for measuring a luminance gradient of the pixel element intensity values stored in the portion of the digital image memory defining points located at crossing points of the lines and columns inside the search window;



forming in the portion of the digital image memory defining said search window an elementary path connecting each crossing point to each of its neighboring crossing points;
computing an elementary coding cost for each elementary path between neighboring crossing points depending on the luminance gradient of the points located in the portion of the digital image memory defining the search window;
computing an optimum path for linking the facing ends of the disjointed contour elements by following, from one end of one contour element, a line linking all elementary paths having a minimum coding cost, and storing the optimum path in the portion of the digital image memory defining said points between facing ends of the digital contour elements.

4,843,631

PATTERN RECOGNITION PROCESS

Dietmar Steinpichler, Stadtplatz 23/10, A-3400 Klosterneuburg, and Gerhard W. Österreicher, Kirchstetterngasse 44/22, A-1160 Wien, both of Austria

PCT No. PCT/AT86/00077, § 371 Date Aug. 13, 1987, § 102(e) Date Aug. 13, 1987, PCT Pub. No. WO87/03981, PCT Pub. Date Jul. 2, 1987
PCT Filed Dec. 22, 1986, Ser. No. 98,621
Claims priority, application Austria, Dec. 20, 1985, 3702/85
Int. Cl.[4] G06K *9/36*
U.S. Cl. 382—43 **20 Claims**

1. A method for analyzing a two dimensional image in an original image plane, for the purpose of determining a probability of identity, a twist angle, and an enlargement factor, between known reference patterns and contents or portions of the image, irrespective of at what position or positions of the image to be analyzed the contents or portions of the image are located, comprising;
storing and processing the image to be analyzed in digital form;
subjecting the stored image to a two-dimensional Fourier transformation operation to generate a Fourier transform of the image;
determining a separated-off amplitude distribution or another amplitude distribution which can be ascertained

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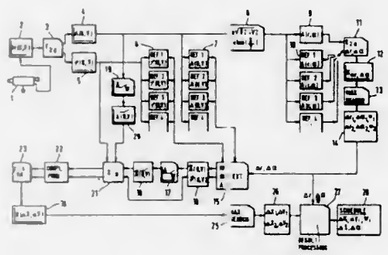
from said separated-off amplitude distribution of said Fourier transform of the image;

comparing, in a Fourier range, said separated-off amplitude distribution, or said other amplitude distribution, to separated-off amplitude distributions or other amplitude distributions which can be determined therefrom of the reference patterns which are stored digitally;

ascertaining the respective probability of identity, the twist angle and the enlargement factor as between the reference pattern and the image content or portion;



locating an image content or portion in the image which is identical with a stored reference pattern with the ascertained degree of probability of identity by assimilating the reference pattern, or the Fourier transform of the reference pattern, to the image content or portion in respect of size and orientation by inverse rotary extension with said ascertained twist angle and enlargement factor and by then establishing the position or positions at which the reference pattern, when converted by inverse rotary extension, has maximum identity with a section of the image being analyzed.

4,843,632

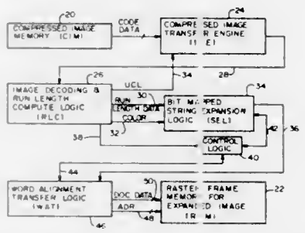
COMPRESSED IMAGE EXPANSION SYSTEM

Jeffery H. Lee, Cupertiono, and Yee S. Chin, San Jose, both of Calif., assignors to Prodigy Systems Corporation, Mountain View, Calif.

Filed May 9, 1986, Ser. No. 861,500

Int. Cl.⁴ G06K *9/36;* **H04N** *1/419*

U.S. Cl. 382—56 **19 Claims**



1. An apparatus for expanding a compression image stored as codes which define the original image pixel content comprising:

first means for retrieving said codes;

second means for decoding said codes into run length numbers which represent number of consecutive pixels of the same color including means for reading said codes from said first means in parallel format words which have boundaries which may or may not coincide with code boundaries and means for breaking said words at code boundaries and assembling complete codes including means for recognizing complete codes and for signalling the locations of each code's boundaries; and

third means for converting said run lengths into strings of pixel data corresponding to the strings of pixel data in the original image which were encoded into said codes which gave rise to said run length number including a raster frame memory and means for breaking said strings of pixel data into words and for writing these words into said raster frame memory.

4,843,633

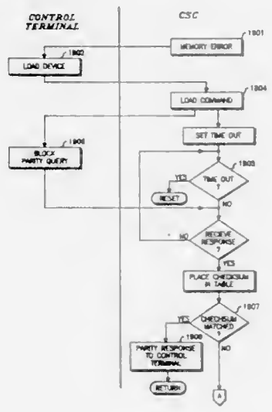
INTERFACE METHOD AND APPARATUS FOR A CELLULAR SYSTEM SITE CONTROLLER

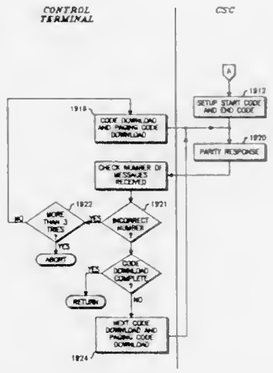
Barry J. Menich, Chicago; Daniel E. Wood, Algonquin; Daniel R. Tayloe, Rolling Meadows; Jeff D. Bonta, Arlington Heights, and Valy Lev, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 830,390, Jan. 18, 1986, Pat. No. 4,730,187. This application Dec. 9, 1987, Ser. No. 130,855

Int. Cl.⁴ H04B *7/00*

U.S. Cl. 455—33 **4 Claims**





1. A method of correcting a portion of the control program of a cell site controller in a cellular radiotelephone system by conveying a corrected portion of the control program between a central controller and the cell site controller, comprising the steps of:

determining that a memory error has occurred in a stored portion of the control program starting at a first memory address and ending at a second memory address of the cell site controller;

transmitting said first memory address and said second memory address and an associated first checksum from the central controller to the cell site controller;

calculating a second checksum for said stored portion of the control program at the cell site controller starting at said first memory address and ending at said second memory address;

comparing said first calculated checksum to said second calculated checksum at the cell site controller; and

transmitting said control program starting at said first memory address and ending at said second memory address from the central controller to the cell site controller if said comparison yields a substantial mismatch.

4,843,634

HIGH POWER SYSTEMS AND METHOD OF TUNING SAME

Tudor D. Pike, Essex, United Kingdom, assignor to The Marconi Company Limited, Stanmore, United Kingdom

Filed Mar. 17, 1987, Ser. No. 26,681

Claims priority, application United Kingdom, Mar. 19, 1986, 8606786

Int. Cl.⁴ H04B *17/034;* **H03H** *7/40*

U.S. Cl. 455—121 **18 Claims**

13. An apparatus for tuning a high power system, comprising:

(a) a component selecting means for selecting one of a plurality of components in the system, each of the components having an adjustable reactance;

(b) a location selecting means for selecting a point in the system for monitoring a signal level, said location selecting means including a signal level monitoring means for monitoring the signal level at said selected point in the system;

(c) a reactance changing means for changing the value of the reactance of the component in one direction;

(d) an evaluating means for evaluating a direction of change in magnitude of the monitored signal caused by a change in the value of said reactance of said component and for determining a required direction of change of the value of said reactance of said component;

(e) a control means for iteratively controlling said component selecting means, said location selecting means, said evaluating means, and said reactance changing means to separately adjust a plurality of components in the system, said control means causing said component selecting means to select one of the plurality of components in the system;

said control means causing said evaluating means to determine a required direction of change of said reactance of said component; said control means causing said reactance changing means to adjust the magnitude of the value of said reactance of the selected component in said required direction of change from an initial value to vary the monitored signal level from an initial level through one of a maximum and a minimum level until a first reactance value of said component is reached at which said monitored signal level has a first reference level having a predetermined property;

said control means causing said reactance changing means to re-adjust the value of the reactance of said component in a reverse direction to vary the monitored signal level back through said one of said maximum and minimum level until a second reactance value is reached at which said monitored signal level equals said first reference;

said control means causing said reactance adjusting means to reset the reactance of the component to a value which is mid-way between said first and second values; whereby the reactance of a plurality of components in the system can be separately adjusted to tune the system.

4,843,635

CHANNEL SELECTING PANEL HOLDER FOR TELEVISION SET

Masanori Okazaki, Ohtawara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 810,846, Dec. 20, 1985, Pat. No. 4,709,405. This application Aug. 18, 1987, Ser. No. 86,477

Int. Cl.⁴ H04B *1/08;* **H04N** *5/64*

U.S. Cl. 455—151 **4 Claims**

1. A channel selecting panel holder housing comprising:

a cabinet having a front face;

a storage section provided in the front face of said cabinet;

operating means rotatably attached within said storage section, said operating means being rotatable between an open state and a closed state, and said operating means having an obverse face forming a substantially continuous surface with the front face of the cabinet when the operating means is in the closed state;

engaging means for maintaining said operating means in a closed state;

shaft means for stressing and engaging the engaging means, the shaft means being spring biased by an elastic material;

stopper means for maintaining said operating means in an open state;

rotation means for rotating said operating means; and

a remote control transmitter for performing channel selection, said remote control transmitter being removably stored in said operating means, said remote control transmitter being hidden from view by said obverse face when said remote control transmitter is stored in said operating means and said operating means is in a closed state.

4,843,636

TELEVISION RECEIVER HAVING AN AUTOMATIC RADIOFREQUENCY RESONANT CIRCUIT ADJUSTMENT CIRCUIT

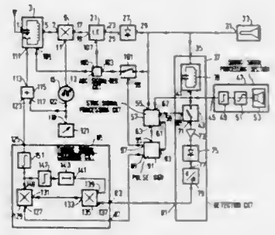
Johannes H. Hendriks; Johannes H. A. Brekelmans, and Johannes J. Bos, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 775,067, Sep. 11, 1985, abandoned. This application Mar. 14, 1988, Ser. No. 170,568

Claims priority, application Netherlands, Sep. 20, 1984, 8402880

Int. Cl.⁴ H04B *11/16*

U.S. Cl. 455—192 **16 Claims**



1. A television receiver comprising a radio frequency section having a radio frequency resonant circuit; and an automatic adjustment circuit for adjusting said radio frequency resonant circuit, said automatic adjustment circuit having outputs coupled to inputs of said radio frequency resonant circuit and producing a setting signal, and a detection circuit coupled to an output of said radio frequency section, said radio frequency resonant circuit being correctly adjusted in response to said setting signal with the aid of two carriers, applied to said radio

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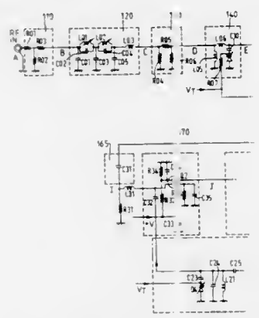
frequency section, and by an output signal of said detection circuit, characterized in that the detection circuit comprises means, coupled to inputs of said detection circuit, for causing the setting signal to substantially correspond to the product of the amplitudes of the two carriers, said automatic adjustment circuit adjusting said setting signal to a maximum value.

4,843,637
TUNER CIRCUIT
Toshio Shimura, Fukaya; Masahiko Yamada, Takasaki; Yoshiteru Ishii, and Fuminobu Tamase, both of Fukaya, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Nov. 28, 1986, Ser. No. 935,849
Claims priority, application Japan, Nov. 28, 1985, 60-266016
Int. Cl.[4] H04B 1/10
U.S. Cl. 455—200 1 Claim



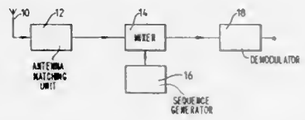
1. A tuner circuit comprising an input terminal for inputting a received radio fequency signal, a first attenuating circuit connected to the input terminal, a low-pass filter connected with the first attenuating circuit, a second attenuator for attenuating ripple components of the filtered signal from the low-pass filter, a tuned filter connected to the second attenuator for passing therethrough at least a prescribed frequency band, an amplifier connected to the tuned filter for amplifying the tuned signal from the tuned filter, a local oscillation circuit for generating a local frequency signal, a mixer circuit for converting the frequency of the amplified signal from the amplifier into a corresponding channel frequency under the influence of the local frequency signal from the local oscillation circuit, and an output terminal for outputting a frequency-converted signal by the mixer circuit, whereby a fixed quantity of a signal leaked to the input terminal side is attenuated irrespective of isolation operation of the amplifier to suppress deterioration of the noise figure of a forward signal and a distortion signal at the output terminal.

4,843,638
RECEIVER FOR FREQUENCY HOPPED SIGNALS
Nigel J. Walters, Coolham, England, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jul. 31, 1987, Ser. No. 80,114
Claims priority, application United Kingdom, Oct. 21, 1983, 8328161
Int. Cl.[4] G01R 23/16; H04B 1/26; H04K 1/04
U.S. Cl. 455—318 7 Claims

1. A receiver for frequency hopped signals in which an information signal is modulated on one of a plurality of equally frequency-spaced carrier signals, comprising:

a short pseudo-random bit sequence generator for generating a signal having a comb spectrum with a frequency spacing equal to said equally frequency spaced carrier signals;

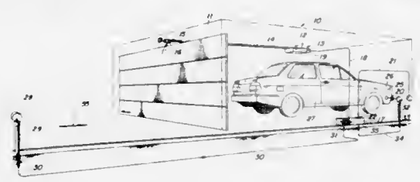
a mixer for receiving on one input said frequency hopped signals, and another input for receiving said generator signal having a comb spectrum with a frequency spacing equal to said equally spaced frequency signals, whereby a plurality of auxiliary signals are generated having a frequency spacing equal to said plurality of equally spaced carrier frequency signals, and auxiliary signals having the same frequency and spacing from each other for each of



said plurality of equally frequency spaced input signals; and,

demodulating means for separating one of said auxiliary signals modulated with said information signal from the remaining auxiliary signals, whereby a signal which remains constant in frequency modulation with said information signal is provided for demodulating said information signal.

4,843,639
FULLY AUTOMATIC GARAGE DOOR OPENER
Richard G. Beals, 2119 Canary Dr., Ponca City, Okla. 74604
Filed Mar. 17, 1988, Ser. No. 169,281
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—603 5 Claims



1. In an enclosure for a vehicle, said enclosure having an automatically movable closure apparatus, an electrical control for moving said closure apparatus to an open or closed position and a switch means for initiating the operation of said control, an improvement comprising:

(a) light transmission means mounted on said vehicle for generating a light beam;

(b) an ignition switch and means for simultaneously operating said light transmission means when said ignition switch is turned to start said vehicle;

(c) a first light receiving means mounted in said enclosure for receiving said generated light beam when said vehicle is positioned in said enclosure so that it can no longer be struck by said closure apparatus, and for generating an output signal to said switch means;

(d) a second light receiving means mounted outside said enclosure in the path of said vehicle entering or leaving said enclosure, said second light receiving means generating a second signal when receiving light from said light transmission means said second light receiving means mounted at least the length of said vehicle from said closure apparatus; and,

(e) means for communicating said second signal from said second light receiving means to said switch means;

whereby when said vehicle is at said first light receiving means or passes said second light receiving means said switch means will be operated.

4,843,640
INDUSTRIAL IDENTIFICATION TRANSPONDER
Richard O. Juengel, Romeo, Mich., assignor to GTE Valeron Corporation, Troy, Mich.
Filed Apr. 24, 1986, Ser. No. 855,415
Int. Cl.[4] H04B 9/00
U.S. Cl. 455—664 15 Claims

9. A method of identifying a device comprising:

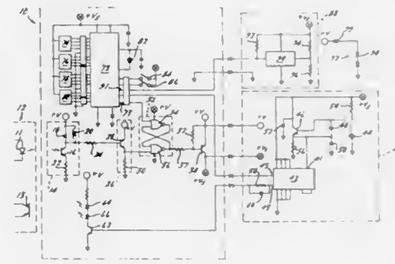
mounting a battery operated transponder onto the device, said transponder including battery control means for selectively coupling power from the battery to user programmable microprocessor controlled code generating circuitry;

setting at least one switching device to program a selected code;

energizing a flash tube to transmit a flash of infrared light from an interrogator to the transponder;

employing circuit means for detecting light having a predetermined rapid rise time to thereby distinguish the flash of light from other light sources, and using the battery control means to couple power from the battery to the microprocessor controlled code generating circuitry in response to the detection by the circuit means of the flash of light;

transmitting said selected code from the microprocessor controlled code generating circuitry in response to the application of battery power for a predetermined period of time; and



ceasing further transmission in response to a signal from the microprocessor controlled code generating means, whereby power from the battery is decoupled until another flash of light from the interrogator is detected.

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DESIGN PATENTS

GRANTED JUN. 27, 1989

ERRATA

For CLASS	See PATENT NO.
D14-163	301,846

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DESIGNS

JUNE 27, 1989

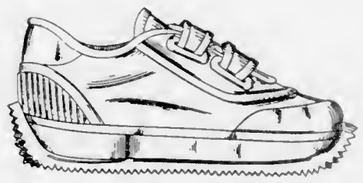
301,794
FOOD STUFF
Alberto Ballerini, 207 Lennox Street, Richmond, Victoria, 3121, Australia
Filed May 31, 1984, Ser. No. 615,549
The portion of the term of this patent subsequent to Nov. 27, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D1—107

301,795
PANCAKE
Richard L. Vitacco, 1653 Thurston Ave., Racine, Wis. 53405
Filed Jan. 30, 1986, Ser. No. 824,226
Term of patent 14 years
U.S. Cl. D1—108

301,796
BUNTING BAG
Elie M. Sildva, 75 Parkview Hill Crescent, Toronto, Ontario, Canada (M4B 1R1)
Filed Feb. 3, 1986, Ser. No. 825,315
Term of patent 14 years
U.S. Cl. D2—25

301,797
COMBINED HOODED JACKET WITH VEST
Judith Lariviere, Montreal, Canada, assignor to Flacgrant LTEE, Montreal, Canada
Filed Mar. 17, 1986, Ser. No. 845,033
Term of patent 14 years
U.S. Cl. D2—185

301,798
SHOE
Joanne M. Jonah, Brookline, Mass., assignor to The Keds Corporation, Cambridge, Mass.
Filed Jun. 26, 1986, Ser. No. 879,090
Term of patent 14 years
U.S. Cl. D2—309



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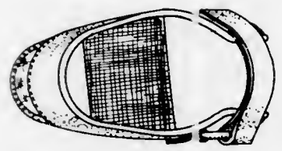
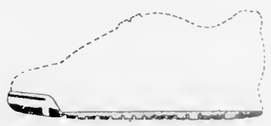
301,799
INNERBOOT FOR ATHLETIC SHOE
Raymond F. Tonkel, St. Louis, Mo., assignor to Kangaroos U.S.A., Inc., Chesterfield, Mo.
Filed Apr. 14, 1986, Ser. No. 851,682
Term of patent 14 years
U.S. Cl. D2—314

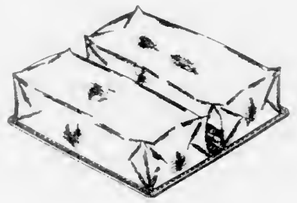


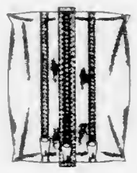
301,800
SHOE SOLE
Shigeyuki Mitsui, Kobe, Japan, assignor to Asics Corporation, Kobe, Japan
Filed Jun. 4, 1986, Ser. No. 870,692
Claims priority, application Japan, Dec. 27, 1985, 60-54424
Term of patent 14 years
U.S. Cl. D2—320

301,801
SHOE SOLE
Mona McCrea, Portland, Oreg., assignor to Avia Group International, Inc., Portland, Oreg.
Filed Aug. 9, 1988, Ser. No. 230,118
Term of patent 14 years
U.S. Cl. D2—320



301,802
FOLDABLE TRAVEL KIT
Raymond W. Young, West Bend, Wis., assignor to Amity Leather Products Co., West Bend, Wis.
Filed Jan. 29, 1987, Ser. No. 8,412
Term of patent 14 years
U.S. Cl. D3—39





301,804
CAMOUFLAGE FABRIC
Marybeth A. McIlhinney, Doylestown, Pa., assignor to New Happenin, Ltd., Devon, Pa.
Filed Jan. 13, 1987, Ser. No. 2,917
Term of patent 14 years
U.S. Cl. D5—62

301,803
CAMOUFLAGE FABRIC
Marybeth A. McIlhinney, Doylestown, Pa., assignor to New Happenin, Ltd., Devon, Pa.
Filed Jan. 13, 1987, Ser. No. 2,916
Term of patent 14 years
U.S. Cl. D5—62

301,805
CAMOUFLAGE FABRIC
Marybeth A. McIlhinney, 700 Pebble Hill Rd., Doylestown, Pa. 18901
Filed Jan. 15, 1987, Ser. No. 3,693
Term of patent 14 years
U.S. Cl. D5—62

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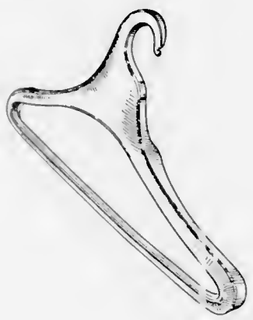
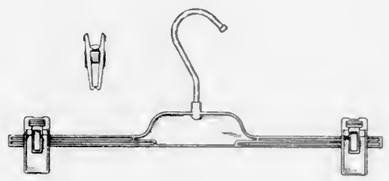
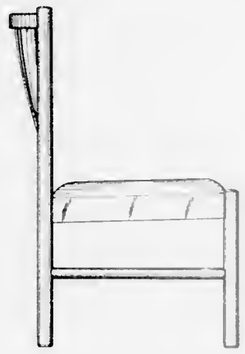
301,806
GARMENT HANGER
Ronald M. Wilson, Black Rock, Australia, assignor to Spotless Plastics Pty. Ltd., Moorabbin, Australia
Filed May 27, 1987, Ser. No. 54,813
Term of patent 14 years
U.S. Cl. D6—319



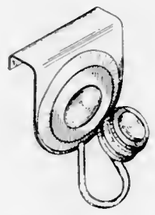
301,808
GARMENT HANGER
David J. Marshall, East Doncaster, Australia, assignor to Spotless Plastics Pty. Ltd., Victoria, Australia
Filed Sep. 29, 1987, Ser. No. 102,598
Claims priority, application Australia, Aug. 7, 1987, 2826/87
Term of patent 14 years
U.S. Cl. D6—326



301,809
SIDE CHAIR "B"
Davis B. Allen, 136 E. 56th St., New York, N.Y. 10022
Filed Dec. 16, 1985, Ser. No. 809,001
The portion of the term of this patent subsequent to Jun. 7, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—370

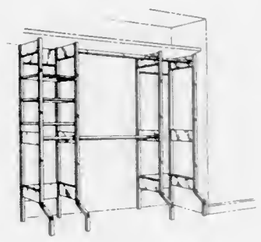


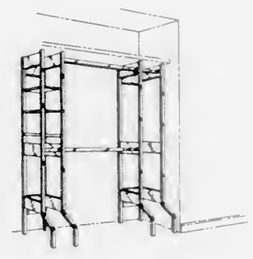
301,807
COAT HOOK
Frank A. Friedman, San Francisco, Calif. assignor to Herman Miller, Inc., Zeeland, Mich.
Filed Aug. 3, 1987, Ser. No. 81,103
Term of patent 14 years
U.S. Cl. D6—323



301,810
CHAIR
Warren H. Snodgrass, 223 Woodland Rd., Kentfield, Calif. 94904
Filed Jun. 18, 1985, Ser. No. 746,208
Term of patent 14 years
U.S. Cl. D6—373

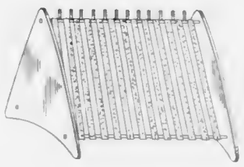
301,812
CLOSET ORGANIZER
Milton E. Handler, Northbrook; Richard Sylvan, Glenview, and Herbert Baisch, Palatine, all of Ill., assignors to Hirsh Company, Skokie, Ill.
Filed Aug. 1, 1986, Ser. No. 892,692
Term of patent 14 years
U.S. Cl. D6—462





301,811
TABLE FOR USE IN MANUFACTURING ROOF TRUSSES
Thomas J. Moloney, Pompano Beach, Fla., assignor to Alpine Engineered Products, Inc., Pompano Beach, Fla.
Filed Oct. 1, 1986, Ser. No. 914,602
Term of patent 14 years
U.S. Cl. D6—400

301,813
JEWELRY DISPLAY STAND
Louise M. Manhart, 800 Grand AG-8, Carlsba, Calif. 92008
Filed Jul. 1, 1986, Ser. No. 881,175
Term of patent 14 years
U.S. Cl. D6—467



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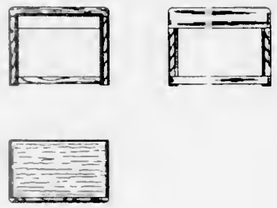
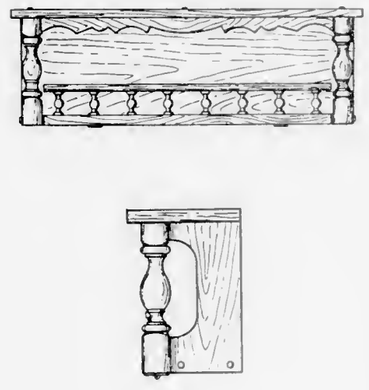
301,814
TABLE OR SIMILAR ARTICLE
Paul S. Bush, Lakewood, N.Y.; Richard Bova, Corry, Pa., and Bruce Anderson, Jamestown, N.Y., assignors to Bush Industries, Inc., Jamestown, N.Y.
Filed Mar. 3, 1986, Ser. No. 835,453
Term of patent 14 years
U.S. Cl. D6—484

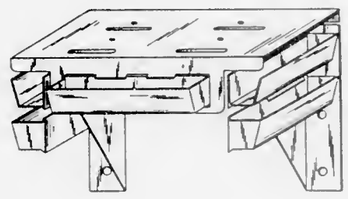


301,815
HEADBOARD FOR A BED
Daniel D. Wistehuff, Hickory, N.C., assignor to Ladd Furniture, Inc., High Point, N.C.
Filed Apr. 10, 1986, Ser. No. 851,378
Term of patent 14 years
U.S. Cl. D6—505

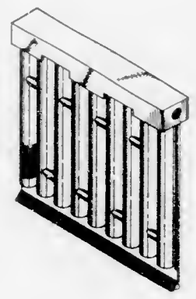
301,816
VIDEOCASSETTE SHELF UNIT
Richard V. Laliberte, Jr., 4208 Longtin, Lincoln Park, Mich. 48146
Filed Aug. 21, 1986, Ser. No. 898,943
Term of patent 14 years
U.S. Cl. D6—567



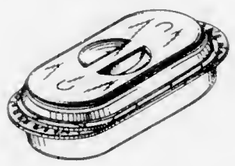
301,817
DESIGN FOR A WALL-MOUNTED SUPPORT FOR A GRINDING MACHINE OR THE LIKE
Lennart Olofsson, Axtorpsvägen 56, S-902 34 Umeå, Sweden
Filed Mar. 27, 1987, Ser. No. 30,991
Claims priority, application Swedeo, Oct. 1, 1986, 86-2259
Term of patent 14 years
U.S. Cl. D6—574



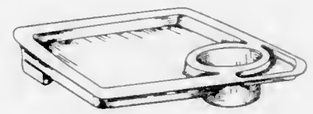
301,818
INFLATABLE RETRACTABLE SOLAR SHADE
Craig J. Froeter, 1402 8th Ave., Sterling, Ill. 61081
Filed Feb. 18, 1986, Ser. No. 834,045
Term of patent 14 years
U.S. Cl. D6—575



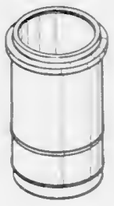
301,819
COMBINED MEAL PLATE AND CLOSURE
Roy Watson, Mt. Kisco, N.Y., and Ernest F. Thomson, Fairfield, Conn., assignors to General Foods Corporation, White Plains, N.Y.
Filed Jan. 21, 1986, Ser. No. 820,039
Term of patent 14 years
U.S. Cl. D7—18



301,820
HORS D'OEUVRE TRAY
Steven Wasserman, Baltimore, Md., assignor to Artform Industries, Baltimore, Md.
Filed Dec. 1, 1986, Ser. No. 936,658
Term of patent 14 years
U.S. Cl. D7—38



301,821
INSULATING JACKET FOR LIQUID-CONTAINING BOTTLE
Jerry Bartolo, 21 Bradwick Drive, Unit #5, Concord, Ontario, Canada (L4K 1K6)
Filed Jun. 5, 1986, Ser. No. 871,570
Term of patent 14 years
U.S. Cl. D7—77



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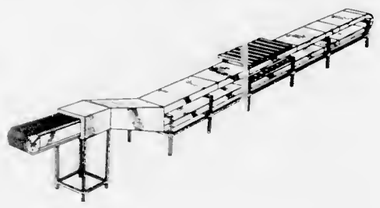
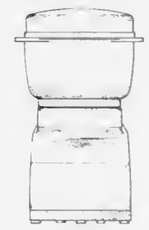
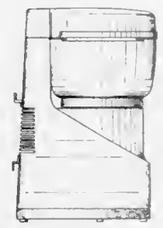
301,822
PROCESSING PLANT FOR PREPARATION OF FOOD AND PHARMACEUTICAL PRODUCTS
Lennart Stenström, Daggstigen 22, 141 38 Huddinge, and Lennart Wahlström, Blockvägen 13, 147 00 Tumba, both of Sweden
Filed Aug. 19, 1985, Ser. No. 766,680
Claims priority, application Sweden, Feb. 18, 1985, 85-0389
Term of patent 14 years
U.S. Cl. D7—368

301,823
PROCESSING PLANT FOR PREPARATION OF FOOD AND PHARMACEUTICAL PRODUCTS
Lennart Stenström, Daggstigen 22, 141 38 Huddinge, and Lennart Wahlström, Blockvägen 13, 147 00 Tumba, both of Sweden
Filed Aug. 19, 1985, Ser. No. 766,705
Claims priority, application Sweden, Feb. 18, 1985, 85-0388
Term of patent 14 years
U.S. Cl. D7—368



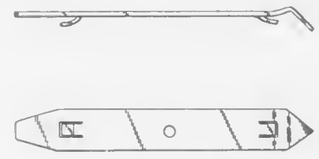
301,824
FOOD PROCESSING MACHINE
Robert M. Machuron, Saint Vailler, France, assignor to Ronic S.A., Nice, France
Filed Feb. 19, 1986, Ser. No. 834,057
Term of patent 14 years
U.S. Cl. D7—384



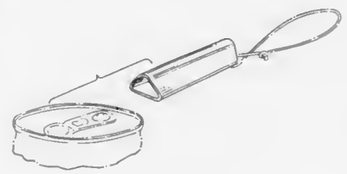


301,825
FRUIT PICKER TOOL HEAD
Onni R. Kilpelainen, 2871 Vista Elevada, Santa Barbara, Calif. 93105
Filed Mar. 2, 1988, Ser. No. 163,343
Term of patent 14 years
U.S. Cl. D8—7

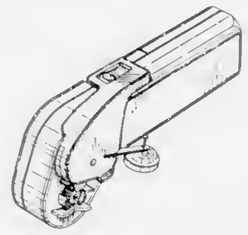
301,826
COMBINATION UTILITY TOOL
Julia B. Tucker, Pop-Eze, P.O. Box 613, Sandston, Va. 23150
Filed Sep. 4, 1986, Ser. No. 903,433
Term of patent 14 years
U.S. Cl. D8—18



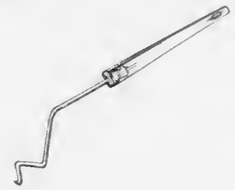
301,827
POP TOP CAN OPENER
Herbert C. Schulze, P.O. Box 6070, Incline Village, Nev. 89450
Filed Oct. 6, 1986, Ser. No. 916,055
Term of patent 14 years
U.S. Cl. D8—18



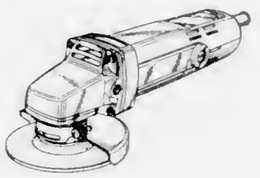
301,828
ELECTRICALLY-OPERATED, HAND-HELD CAN OPENER
Yan K. Wong, Kowloon, Hong Kong, assignor to Dorlop Industrial Limited, Kowloon, Hong Kong
Filed Jul. 15, 1986, Ser. No. 886,144
Claims priority, application United Kingdom, Feb. 20, 1986, 1032358
Term of patent 14 years
U.S. Cl. D8—36



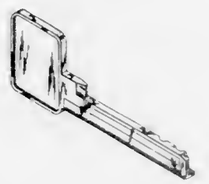
301,829
CAP REMOVER UTENSIL
Paul E. Kunna, and Sadie A. Kunna, both of 11145 Normandy Cir., #3, Temple Terrace, Fla. 33617
Filed Nov. 19, 1986, Ser. No. 932,540
Term of patent 14 years
U.S. Cl. D8—40

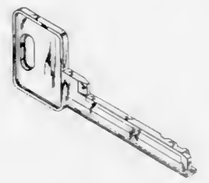


301,830
ELECTRIC GRINDER
Yasunori Ogawa, and Juro Kobayashi, both of Ibaragi, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan
Filed Feb. 12, 1987, Ser. No. 13,804
Term of patent 14 years
U.S. Cl. D8—62



301,831
KEY FOR DOOR LOCKS
Eugene McCaa, Garden Grove, Calif., assignor to Masco Building Products Corp., Taylor, Mich.
Filed Jul. 20, 1987, Ser. No. 75,855
Term of patent 14 years
U.S. Cl. D8—347





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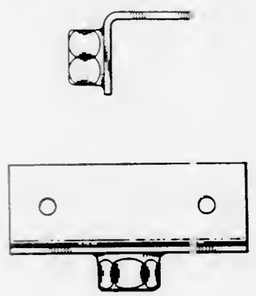
301,832
STRUT RETENTION DI VICE
Richard C. Hathaway, Greenville, Ohio, assignor to C. R. & I., Inc., Greenville, Ohio
Filed Jun. 19, 1986, Ser. No 876,359
Term of patent 14 years
U.S. Cl. D8—349

301,833
MOUNTING BRACKET FOR ROD OR SIMILAR ARTICLE
Robert J. Hoover, Rte. 7 Box 352A, Spartanburg, S.C. 29303
Filed Apr. 21, 1986, Ser. No. 856,131
Term of patent 14 years
U.S. Cl. D8—354



301,834
CORD RETAINING REEL OR SIMILAR ARTICLE
Isaac B. Soltes, 1923 S. McPherrin Ave., Monterey Park, Calif. 91754
Filed Apr. 11, 1986, Ser. No. 851,662
Term of patent 14 years
U.S. Cl. D8—358

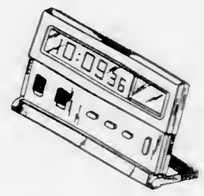
301,835
CONFECTION PACKAGE
Jeffrey B. Gorman, and Marilyn Katz, both of Los Angeles, Calif., assignors to Elphany, Inc., Los Angeles, Calif.
Filed Jnl. 7, 1986, Ser. No. 882,612
Term of patent 14 years
U.S. Cl. D7—314

301,836
CONTAINER WITH FLEXIBLE NECK
Klaas J. van Lit, Amstelveen, Netherlands, assignor to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Mar. 31, 1986, Ser. No. 847,603
Term of patent 14 years
U.S. Cl. D9—375

301,837
BOTTLE OR SIMILAR ARTICLE
Ronald A. Peterson, Fairfield County, Conn., and Heidi Mohrmann-Tidwell, New York County, N.Y., assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Dec. 20, 1985, Ser. No. 811,265
Term of patent 14 years
U.S. Cl. D9—377

301,838
BOTTLE WITH A CAP
James Miyakawa, Aberdeen, N.J., assignor to Guest Supply, Inc., North Brunswick, N.J.
Filed Jun. 3, 1986, Ser. No. 870,339
Term of patent 14 years
U.S. Cl. D9—403

301,839
DIGITAL TRAVEL ALARM AND TABLE CLOCK
John T. Houlihan, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.
Filed Aug. 18, 1986, Ser. No. 897,469
Term of patent 14 years
U.S. Cl. D10—15



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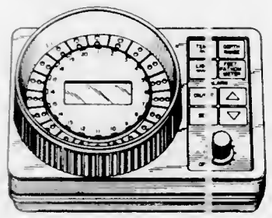
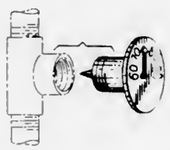
301,840
SPEED COMPUTING WRISTWATCH
John T. Houlihan, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.
Filed Sep. 25, 1986, Ser. No. 911,684
Term of patent 14 years
U.S. Cl. D10—30

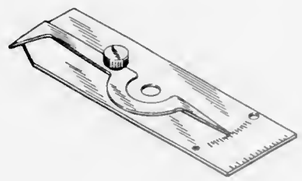
301,841
DEPTH FINDER
Kazuyoshi Imazeki, Tokyo, Japan, assignor to General Research of Electronics, Inc., Tokyo, Japan
Filed Jan. 27, 1986, Ser. No. 822,732
Term of patent 14 years
U.S. Cl. D10—46



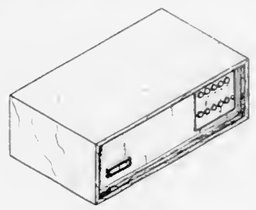
301,842
WATER TEMPERATURE GAUGE
Natal Pepitone, 97-23 84th St., Ozone Park, Queens, N.Y. 11416
Filed Oct. 30, 1986, Ser. No. 925,123
Term of patent 14 years
U.S. Cl. D10—57



301,843
WELDING GAGE
Goodwin A. Lycan, P.O. Box 23A, Stevensville, Mich. 49127
Filed Oct. 14, 1986, Ser. No. 918,804
Term of patent 14 years
U.S. Cl. D10—70

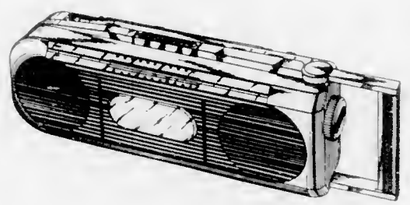


301,844
CENTRAL CONTROL UNIT FOR AN ALARM SYSTEM
Frank Schwarz, Stamford, Conn.; Richard H. Nielson, Frederick, Md., and Kent Chen, Taipei, Taiwan, assignors to National Industrial Security Corp., St. Louis, Mo.
Filed Feb. 12, 1986, Ser. No. 833,495
Term of patent 14 years
U.S. Cl. D10—109

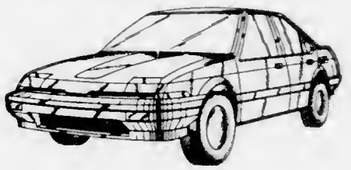


301,845
JEWELRY PENDANT OR SIMILAR ARTICLE
Takashi Yoshida, Tokyo, Japan, assignor to Heiwado Trading Company, Ltd., Japan
Filed Dec. 9, 1986, Ser. No. 939,672
Claims priority, application Japan, Sep. 5, 1986, 61-34717
Term of patent 14 years
U.S. Cl. D11—79

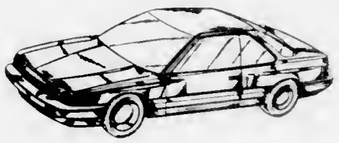
301,846
PORTABLE RADIO
Eric L. Beyer, Fayetteville, N.Y., assignor to RCA Licensing Corporation, Princeton, N.J.
Filed Sep. 23, 1986, Ser. No. 910,702
Term of patent 14 years
U.S. Cl. D14—163



301,847
AUTOMOBILE
Yutaka Ikeda; Takeshi Nishimura, and Yoshinao Fujimura, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan
Filed Aug. 1, 1986, Ser. No. 892,507
Claims priority, application Japan, Feb. 3, 1986, 61-3584
Term of patent 14 years
U.S. Cl. D12—92



301,848
AUTOMOBILE
Yukio Kurosu; Shigeo Ueno, and Toshiki Nakatsuka, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan
Filed Oct. 23, 1986, Ser. No. 922,557
Claims priority, application Japan, Aug. 26, 1986, 61-33228
Term of patent 14 years
U.S. Cl. D12—92



301,849
FOUR WHEEL VEHICLE
Yasuhiro Oba, 160-1, Tsurugaoka, Tsurugashimamachi, Irumgun, Saitama-ken; Mitsuru Yamamoto, 38-11, Sekizawa 3-chome, Fujimi-shi, Saitama-ken, and Akira Watanabe, 32-5, Taishido 2-chome, Setagaya-ku, all of Japan
Filed Apr. 8, 1986, Ser. No. 850,898
Claims priority, application Japan, Oct. 14, 1985, 60-42940
Term of patent 14 years
U.S. Cl. D12—87

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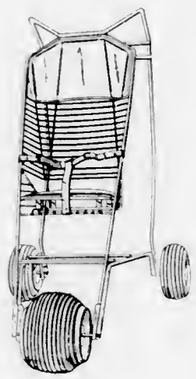
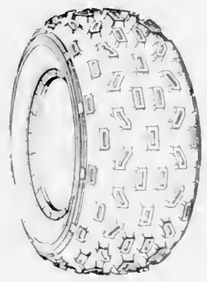
301,850
STROLLER
Alexandre Clement, Bois-Colombe; Laure Debrosse, Marseille; Francois Mallet, Tramblay-les-Gonesses; Francis De Saint-Denis, Paris, and Jacques Sorin, Massy, all of France, assignors to l'Ecole Nationale Superieure de Creation Industrielle, Paris, France
Filed Jun. 13, 1986, Ser. No. 875,012
Claims priority, application France, Dec. 13, 1985, 85 5948
Term of patent 14 years
U.S. Cl. D12—129



301,851
MOTORCYCLE TIRE
Hiroshi Tomoda, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Inc., Hyogo, Japan
Filed Jun. 19, 1986, Ser. No. 876,358
Claims priority, application Japan, Apr. 7, 1986, 61-12771
Term of patent 14 years
U.S. Cl. D12—140

301,852
AUTOMOBILE TIRE
Tetsushi Fujiki, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Sep. 12, 1986, Ser. No. 906,761
Claims priority, application Japan, Mar. 12, 1986, 61-9153
Term of patent 14 years
U.S. Cl. D12—146

301,853
VEHICLE TIRE
Toshinori Furusawa, Osaka, and Kohtaroh Tsutsumi, Tokyo, both of Japan, assignors to The Ohtsu Tire & Rubber Co., Ltd., Osaka, Japan
Filed Nov. 19, 1986, Ser. No. 932,531
Claims priority, application Japan, May 30, 1986, 61-21023
Term of patent 14 years
U.S. Cl. D12—146



301,854
MOTORCYCLE TIRE
Sadahiko Matsumura, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Jun. 19, 1986, Ser. No. 876,258
Claims priority, application Japan, Apr. 7, 1986, 61-12770
Term of patent 14 years
U.S. Cl. D12—147

301,855
AUTOMOBILE TIRE
Masaharu Ono, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Jul. 24, 1986, Ser. No. 888,951
Claims priority, application Japan, May 19, 1986, 61-18813
Term of patent 14 years
U.S. Cl. D12—147

301,856
AUTOMOBILE TIRE
Masayuki Kato, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Sep. 17, 1986, Ser. No. 908,526
Claims priority, application Japan, Mar. 19, 1986, 61-10197
Term of patent 14 years
U.S. Cl. D12—147

301,857
TIRE
Ronald I. Clunk, Monroe Falls, and Bill J. Wallet, Marshallville, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio
Filed Nov. 24, 1986, Ser. No. 934,533
Term of patent 14 years
U.S. Cl. D12—147

301,858
AUTOMOBILE TIRE
Yasuo Igarashi, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Jun. 19, 1986, Ser. No. 876,351
Claims priority, application Japan, Apr. 22, 1986, 61-15274
Term of patent 14 years
U.S. Cl. D12—151

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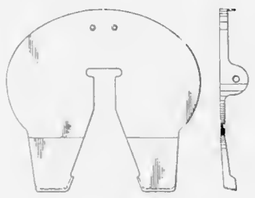
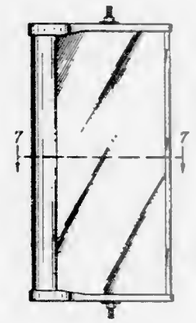
AUTOMOBILE TIRE
Yasuo Igarashi, Hyogo, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan
Filed Aug. 18, 1986, Ser. No. 897,365
Claims priority, application Japan, May 28, 1986, 61-20743
Term of patent 14 years
U.S. Cl. D12—151

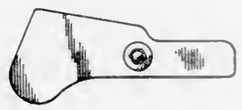
301,860
LUBRICATING PAD FOR FIFTH WHEEL
Glenn O. Severson, 2725 S.E. Hollyhock Ct., Hillsboro, Oreg. 97123
Filed Nov. 6, 1986, Ser. No. 928,114
Term of patent 14 years
U.S. Cl. D12—161



301,861
VEHICLE DOOR GUARD
George M. Muschette, 9108 Friar Rd., Ft. Washington, Md. 20744
Filed Jun. 29, 1987, Ser. No. 67,443
Term of patent 14 years
U.S. Cl. D12—167

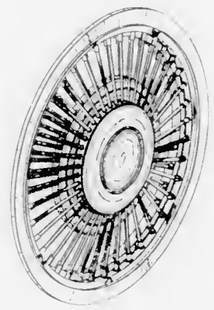
301,862
MIRROR UNIT FOR TRUCKS OR THE LIKE
M. Thomas Braun, Marion, and Jerry L. Couch, Jonesboro, both of Ind., assignors to Brauaco, Inc., Marion, Ind.
Filed Aug. 7, 1987, Ser. No. 82,663
Term of patent 14 years
U.S. Cl. D12—187



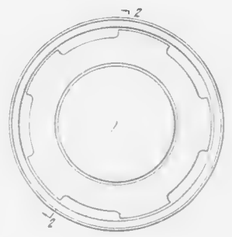


301,863
COMBINED LICENSE PLATE FRAME AND DISPLAY UNIT
Marc R. Iacovelli; Pierre Charet, and Duke Kraai, all of Miami, Fla., assignors to Rally Manufacturing, Inc., Miami, Fla.
Filed May 7, 1986, Ser. No. 860,763
Term of patent 14 years
U.S. Cl. D12—193

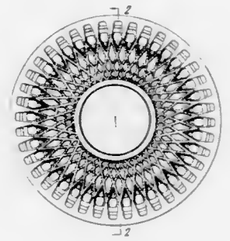
301,864
SIMULATED WIRE WHEEL COVER
Heinrich J. Hempelmann, Livonia, Mich., assignor to NI Industries, Inc., Novi, Mich.
Filed Jun. 19, 1987, Ser. No. 65,005
Term of patent 14 years
U.S. Cl. D12—205



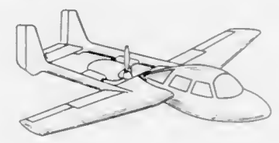
301,865
WHEEL COVER
David S. McIntosh, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Sep. 14, 1987, Ser. No. 95,938
Term of patent 14 years
U.S. Cl. D12—209



301,866
WHEEL COVER
Leif H. Chapman, Sylvan Lake, and Richard F. Ruzzin, Grosse Pointe, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Sep. 14, 1987, Ser. No. 95,937
Term of patent 14 years
U.S. Cl. D12—211



301,867
AIRCRAFT
Marlin D. Street, 4111 Lincoln Blvd. #442, Marina Del Rey, Calif. 90292
Filed Feb. 22, 1985, Ser. No. 707,011
Term of patent 14 years
U.S. Cl. D12—339



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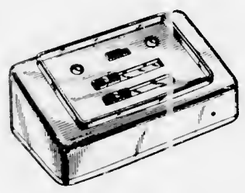
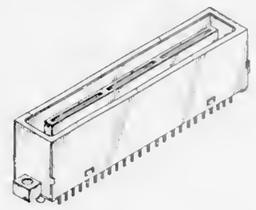
301,868
LIGHTING CONTROL PLUG-IN RECEIVER
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed Oct. 28, 1986, Ser. No. 924,086
Term of patent 14 years
U.S. Cl. D13—12

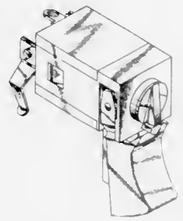
301,869
SOUND-ACTUATED CONTROL SYSTEM
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed Oct. 28, 1986, Ser. No. 924,087
Term of patent 14 years
U.S. Cl. D13—12



301,870
ELECTRICAL CONNECTOR
Yasuji Shibano, Izumisano, Japan, assignor to Hosiden Electronics Co., Ltd., Yao, Japan
Filed Feb. 11, 1986, Ser. No. 828,422
Claims priority, application Japan, Oct. 7, 1985, 60-42067
Term of patent 14 years
U.S. Cl. D13—24

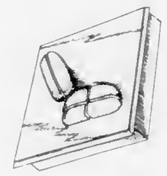


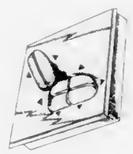
301,871
TRIGGER ACTUATED SWITCH
Kazuhiro Yamaguchi, and Hiroji Fujimoto, both of Yokohama, Japan, assignors to Satori Switch Industry Co., Ltd., Kanagawa, Japan
Filed Nov. 26, 1985, Ser. No. 821,147
Term of patent 14 years
U.S. Cl. D13—32



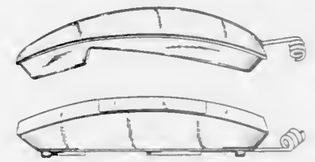
301,872
LIGHT SWITCH PROTECTIVE SHIELD
A. Eugene Copeland, 1074 Windmoore Dr., Palm Harbor, Fla. 34685
Filed Dec. 11, 1987, Ser. No. 132,540
Term of patent 14 years
U.S. Cl. D13—32

301,873
AUTOMOTIVE POWER SEAT SWITCH
Robert F. Gutman, Detroit, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.
Filed Sep. 10, 1986, Ser. No. 905,611
Term of patent 14 years
U.S. Cl. D13—38





301,874
TELEPHONE SET FOR DESK OR WALL EMPLACEMENT
George P. Roegner, Far Hills, N.J., assignor to Andrew G. Lowinger and Ronald J. Lowinger, both of Brooklyn, N.Y.
Filed Nov. 30, 1987, Ser. No. 126,966
Term of patent 14 years
U.S. Cl. D14—148



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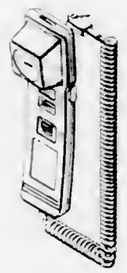
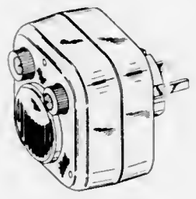
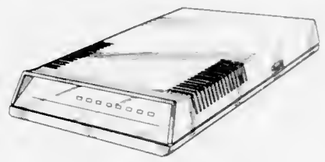
301,875
HANDSET FOR A MOBILE TELEPHONE SET
Minoru Hotsumi, and Yasuhito Nagaki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan
Filed Sep. 25, 1987, Ser. No. 101,335
Claims priority, application Japan, Mar. 25, 1987, 62-11424
Term of patent 14 years
U.S. Cl. D14—217



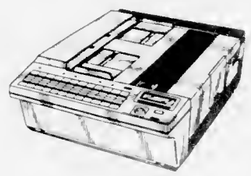
301,876
RADIO
Hein Wilke, Stammham-Westerhofen, Fed. Rep. of Germany, assignor to Brunnquell GmbH Fabrik Electrotechnischer Apparate, Ingolstadt, Fed. Rep. of Germany
Filed Oct. 6, 1986, Ser. No. 915,725
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1986, 11 AR 260/86; Apr. 14, 1986, 11 AR 282/86
Term of patent 14 years
U.S. Cl. D14—190



301,877
MODEM CABINET
Howard L. Greenberg, Rosemont, and Robert L. Neumann, Hatboro, both of Pa., assignors to Oki Electric Industry Company, Tokyo, Japan
Filed Sep. 2, 1986, Ser. No. 902,955
Term of patent 14 years
U.S. Cl. D14—107

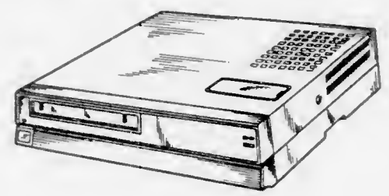


301,878
FACSIMILE MACHINE
Haruki Noma, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed May 21, 1986, Ser. No. 865,471
Claims priority, application Japan, Nov. 22, 1985, 60-48727
Term of patent 14 years
U.S. Cl. D14—118

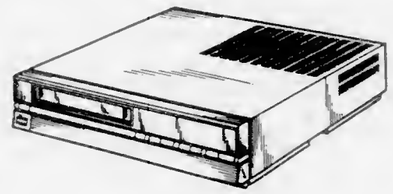


301,879
FACSIMILE
Yoshihisa Ooie, and Masakazu Sugiyama, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jun. 10, 1986, Ser. No. 872,761
Claims priority, application Japan, Dec. 18, 1985, 60-52769
Term of patent 14 years
U.S. Cl. D14—118

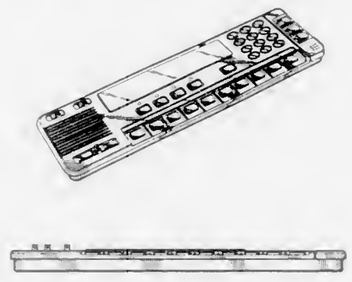
301,880
VIDEO CASSETTE RECORDER
Jae J. Shim, Kyungki, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Jun. 9, 1986, Ser. No. 872,468
Claims priority, application Rep. of Korea, Dec. 10, 1985, 17459/1985
Term of patent 14 years
U.S. Cl. D14—135



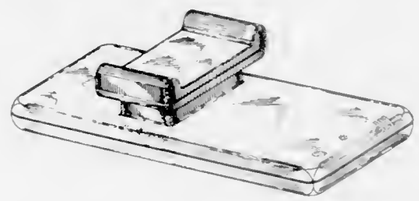
301,881
VIDEO CASSETTE RECORDER
Doo S. Yang, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Jul. 10, 1986, Ser. No. 884,272
Claims priority, application Rep. of Korea, Feb. 5, 1986, 1359/86
Term of patent 14 years
U.S. Cl. D14—135

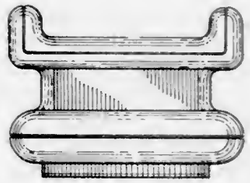


301,882
AUTOMOTIVE TELEPHONE CONTROL UNIT
Katsuhito Watanabe, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed May 23, 1988, Ser. No. 197,399
Term of patent 14 years
U.S. Cl. D14—140

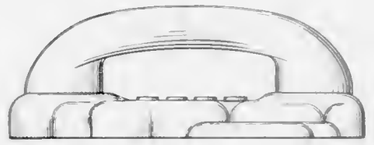


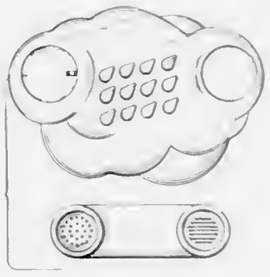
301,883
CRADLE FOR A TELEPHONE HANDSET OR SIMILAR ARTICLE
Rudolph W. Kroplopp, Barrington Hills, Ill., and Duke Larsen, Lake Geneva, Wis., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 7, 1987, Ser. No. 129,611
Term of patent 14 years
U.S. Cl. D14—142





301,884
TELEPHONE SET
Kash Gobindram, Farmingdale, N.Y., assignor to Kash 'N' Gold Ltd., Ronkonkoma, N.Y.
Filed Apr. 9, 1987, Ser. No. 36,246
Term of patent 14 years
U.S. Cl. D14—143





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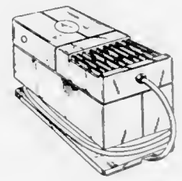
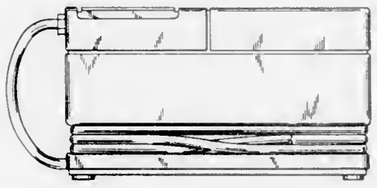
301,885
HAND HELD ELECTRONIC DIALER
Keiko Takemata, Tokyo, and Osamu Murakami, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 12, 1987, Ser. No. 84,115
Claims priority, application Japan, Feb. 16, 1987, 62-5632
Term of patent 14 years
U.S. Cl. D14—245

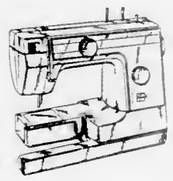
301,886
DESK-TOP POWER SUPPLY FOR MOBILE RADIO
David L. George, and Steven M. Schatz both of Indianapolis, Ind., assignors to Uniden Corporation of America, Ft. Worth, Tex.
Filed Jan. 24, 1986, Ser. No. 822,400
Term of patent 14 years
U.S. Cl. D14—299

301,887
AIR COMPRESSOR OR SIMILAR ARTICLE
Scott D. Price, and Robert I. Somers, both of Raleigh, N.C., assignors to Black & Decker Inc., Newark, Del.
Filed Oct. 29, 1985, Ser. No. 792,354
Term of patent 14 years
U.S. Cl. D15—7

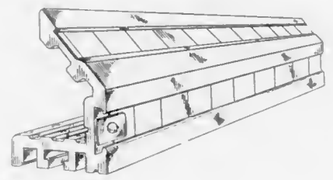




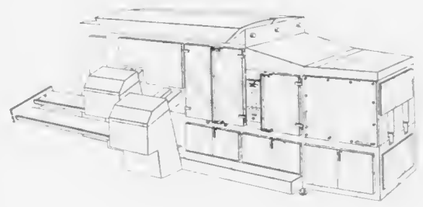
301,888
SEWING MACHINE
Nobufusa Kuroki, Machida, and Shigeru Sato, Hachioji, both of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan
Filed Jun. 30, 1986, Ser. No. 880,002
The portion of the term of this patent subsequent to May 12, 2001, has been disclaimed.
Term of patent 14 years
U.S. Cl. D15—69



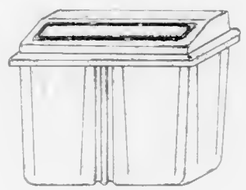
301,889
ACCESSORY FENCE
T. David Price, 648 Turin St., So. St. Paul, Minn. 55075
Filed Apr. 24, 1986, Ser. No. 852,938
Term of patent 14 years
U.S. Cl. D15—133



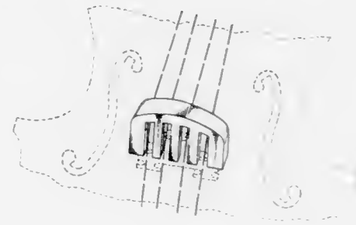
301,890
PACKAGING MACHINE
Jonnie Silbersky, Malmö , Sweden, assignor to AB Tetra Pak, Lund, Sweden
Filed Oct. 20, 1986, Ser. No. 920,674
Claims priority, application Sweden, Apr. 18, 1986, 860957
Term of patent 14 years
U.S. Cl. D15—145



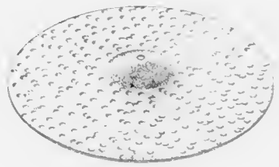
301,891
HOUSING FOR A SILVER RECOVERY UNIT OR THE LIKE
Michael C. Hill, and Marcia E. Hill, both of P.O. Box 186, Edmond, Okla. 73083
Filed May 31, 1988, Ser. No. 200,739
Term of patent 14 years
U.S. Cl. D15—199



301,892
MUSICAL STRING INSTRUMENT MUTE
Vincent Jablonski, 500 Park Blvd., South, Venice, Fla. 33595
Filed Mar. 11, 1986, Ser. No. 844,273
Term of patent 14 years
U.S. Cl. D17—20



301,893
CYMBAL
James V. Hargrove, Meductic, Canada, assignor to Sabian Ltd., New Brunswick, Canada
Filed May 12, 1986, Ser. No. 862,576
Term of patent 14 years
U.S. Cl. D17—22



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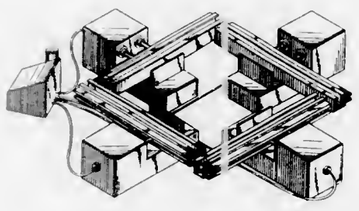
301,894
CASH REGISTER
Akira Tsukada, and Tooru Makidera both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Feb. 21, 1986, Ser. No. 835,312
Claims priority, application Japan, Aug. 22, 1985, 60-35705
Term of patent 14 years
U.S. Cl. D18—4

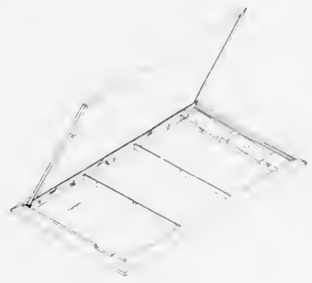
301,895
ELECTRONIC CALCULATOR
Masaki Hayashi, Hino, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Mar. 5, 1986, Ser. No. 841,742
Claims priority, application Japan, Sep. 19, 1985, 60-39508
Term of patent 14 years
U.S. Cl. D18—7

301,896
FABRIC STRETCHER UNIT FOR SCREEN MATERIAL OR THE LIKE
Randy L. Adams, 17514 Autumn Trail Dr., Houston, Tex. 77084
Filed May 27, 1986, Ser. No. 818,679
Term of patent 14 years
U.S. Cl. D18—13

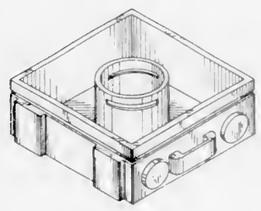


301,897
PAPER CLIP OR SIMILAR ARTICLE
Hans R. Wagner, 25 Woodale La., Santa Barbara, Calif. 93103
Filed Apr. 25, 1986, Ser. No. 857,778
Term of patent 14 years
U.S. Cl. D19—65

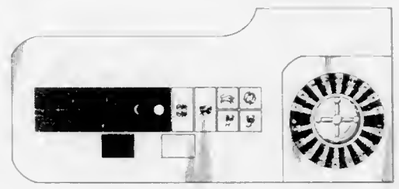
301,898
DESK TOP ORGANIZER
Frederick J. Galvez, 617 Edmond St., Pittsburgh, Pa. 15224
Filed Feb. 18, 1986, Ser. No. 833,468
Term of patent 14 years
U.S. Cl. D19—75



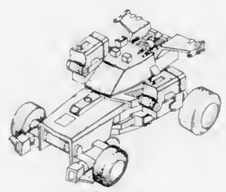
301,899
OBJECT TOSS SKILL GAME
Alvy Cook, 4030 Jackson Blvd., Rapid City, S. Dak. 57702
Filed Feb. 18, 1986, Ser. No. 834,054
Term of patent 14 years
U.S. Cl. D21—5

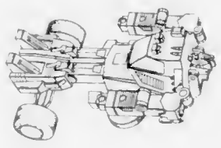


301,900
GAME BOARD
David G. de Keller, c/o The East India & Sports Club 16, St. James' Square, Loadon SW1, England
Filed Jan. 22, 1986, Ser. No. 820,810
Term of patent 14 years
U.S. Cl. D21—40

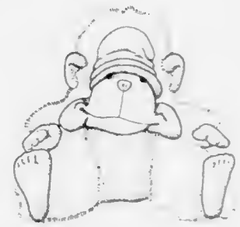


301,901
RECONFIGURABLE TOY VEHICLE
Takayoshi Doi, Ichikawa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Dec. 29, 1986, Ser. No. 947,536
Claims priority, application Japan, Nov. 5, 1986, 61-43674
Term of patent 14 years
U.S. Cl. D21—150





301,902
PLUSH TOY ANIMAL FIGURE
Kazuo Yajima, Tokyo, Japan, assignor to The Wow! Company, Inc., Honolulu, Hi.
Filed Sep. 5, 1986, Ser. No. 904,249
Term of patent 14 years
U.S. Cl. D21—156



301,903
TOY DOLL
Mark C. Caraway, 7649 Vineyard Ave., Rancho Cucamonga, Calif. 91730
Filed Mar. 1, 1986, Ser. No. 858,505
Term of patent 14 years
U.S. Cl. D21—161

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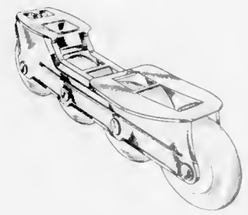
301,904
DOLL
Ruth E. Mower, 1400 29th Ave., #6, and Shirley J. Sarvis, 419 Cherry Ave., both of Altoona, Pa. 16501
Filed Feb. 18, 1986, Ser. No. 834,049
Term of patent 14 years
U.S. Cl. D21—171

301,905
MOUSE-SHAPED TOY OR SIMILAR ARTICLE
Ken Havelock, 1401 W. 14th St., Sault Ste. Marie, Mich. 49783
Filed Jan. 16, 1986, Ser. No. 819,377
Term of patent 14 years
U.S. Cl. D21—188

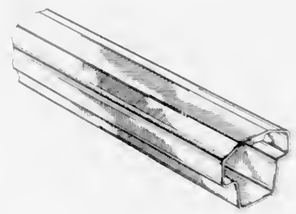
301,906
HOCKEY TRAINING AID OR SIMILAR ARTICLE
Antonius A. C. Coolen, Beekstraat 22, Nuenen, Netherlands
Filed Jun. 19, 1986, Ser. No. 876,337
Term of patent 14 years
U.S. Cl. D21—199

301,907
GOLF CLUB HEAD
Yasumori Muta, Higashikurume, Japan, assignor to Daiwa Golf Co., Ltd., Tokyo, Japan
Filed Dec. 23, 1985, Ser. No. 812,637
Claims priority, application Japan, Jun. 21, 1985, 60-26455
Term of patent 14 years
U.S. Cl. D21—220

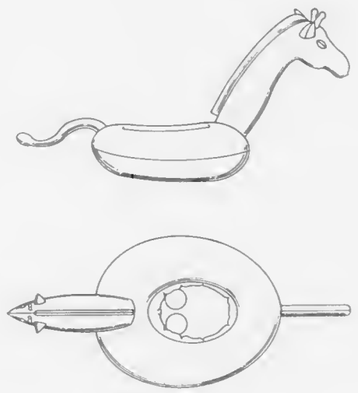
301,908
ROLLER SKATE
Brennan J. Olson, Eden Prairie, and Charles R. Frigard, Deephaven, both of Minn., assignors to North American Sports Training Corporation, Minneapolis, Minn.
Filed May 27, 1987, Ser. No. 51,713
Term of patent 14 years
U.S. Cl. D21—226



301,909
DECORATIVE DIVIDER CAP FOR BOWLING LANES
Will Heddon, 2000 Dundee Rd., Winter Haven, Fla. 33880
Filed Aug. 8, 1986, Ser. No. 894,766
Term of patent 14 years
U.S. Cl. D21—233



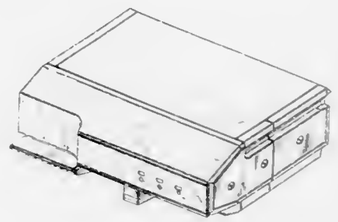
301,910
FLOAT
Henry S. Wolfe, Clearwater, Fla., assignor to The Frenry Company, Clearwater, Fla.
Filed Oct. 24, 1986, Ser. No. 923,728
Term of patent 14 years
U.S. Cl. D21—237



301,911
SMALL REVOLVER WITH HAMMER
William B. Ruger, Croydon Turnpike, Croydon, N.H. 03773, and Lawrence L. Larson, 90 Turtle Bay Dr., Branford, Conn. 06405
Filed Mar. 2, 1987, Ser. No. 20,821
Term of patent 14 years
U.S. Cl. D22—104

301,912
DEER SCENT HOLDER
Lynwood W. Ward, 5410 Eidson Trail, Union City, Ga. 30291
Filed Sep. 22, 1986, Ser. No. 910,195
Term of patent 14 years
U.S. Cl. D22—125

301,913
WATER PURIFIER UNIT
Barry M. Brown, Baldwinsville, and Martin B. Wilson, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 27, 1987, Ser. No. 126,143
Term of patent 14 years
U.S. Cl. D23—207



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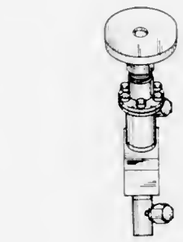
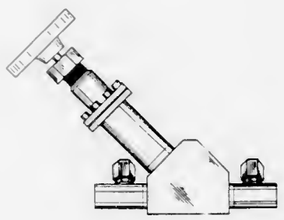
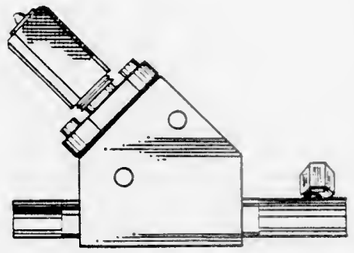
301,914
PRESSURE GOVERNOR WITH FILTER
Yoshinari Ogasawara, Kasugai, and Yoshiichi Muto, Kagamihara, both of Japan, assignors to CKD Kabushiki Kaisha, Komaki, Japan
Filed Jul. 3, 1986, Ser. No 882,624
Claims priority, application Japan, Feb. 10, 1986, 4486/1986
Term of patent 14 years
U.S. Cl. D23—209

301,915
VALVE
Randall E. Fisher, Morro Bay; David L. Martindale, Los Osos, and Joseph H. Nichols, San Luis Obispo, all of Calif., assignors to Cryolab, Inc., San Luis Obispo, Calif.
Filed Mar. 24, 1986, Ser. No. 845,767
Term of patent 14 years
U.S. Cl. D23—233

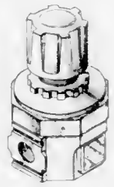




301,916
VALVE
Randall E. Fisher, Morro Bay; David L. Martindale, Los Osos, and Joseph H. Nichols, San Luis Obispo, all of Calif., assignors to Cryolab, Inc., San Luis Obispo, Calif.
Filed Mar. 24, 1986, Ser. No. 845,768
Term of patent 14 years
U.S. Cl. D23—233

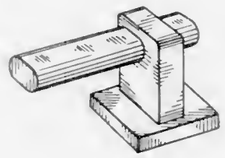


301,917
PRESSURE GOVERNOR
Yoshinari Ogasawara, Kasugai, and Yoshiichi Muto, Kagamihara, both of Japan, assignors to CKD Kabushiki Kaisha, Komaki, Japan
Filed Jul. 3, 1986, Ser. No. 882,622
Claims priority, application Japan, Feb. 5, 1986, 60-3782
Term of patent 14 years
U.S. Cl. D23—235

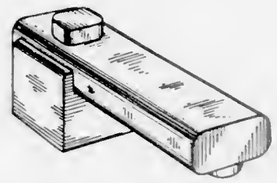


301,918
COMBINED SPOUT AND CONTROL HANDLES
Wolfgang Fabian, Mannheim, Fed. Rep. of Germany, assignor to American Standard Inc., New York, N.Y.
Filed Aug. 25, 1986, Ser. No. 902,325
Term of patent 14 years
U.S. Cl. D23—242

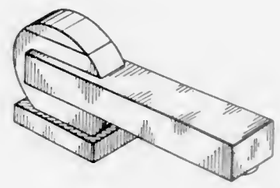
301,919
LAVATORY HANDLE
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.
Division of Ser. No. 29,853, Mar. 24, 1987. This application Jun. 30, 1988, Ser. No. 214,104
Term of patent 14 years
U.S. Cl. D23—252



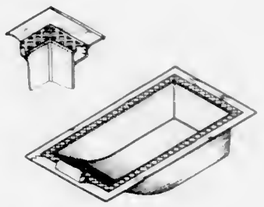
301,920
LAVATORY SPOUT
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.
Division of Ser. No. 29,853, Mar. 24, 1987. This application Jun. 30, 1988, Ser. No. 214,105
Term of patent 14 years
U.S. Cl. D23—255



301,921
LAVATORY SPOUT
Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.
Division of Ser. No. 46,501, May 4, 1987. This application Jul. 5, 1988, Ser. No. 215,445
Term of patent 14 years
U.S. Cl. D23—257



301,922
BATHTUB
Jean-Claude Delepine, 23, rue Clapeyron, 75008 Paris, France
Filed Jul. 9, 1986, Ser. No. 883,831
Claims priority, application Int'l Pat. Institute, Jan. 27, 1986, DM/006395
Term of patent 14 years
U.S. Cl. D23—281



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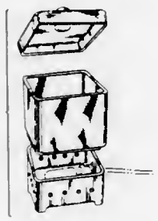
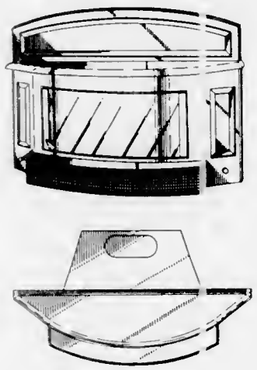
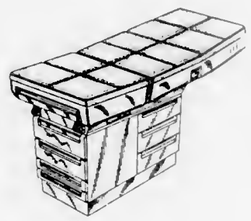
301,923
BABY WIPE WARMER
Louise D. Koschuta, 13904 Fiji Way, Suite 336, Marina del Rey, Calif. 90292
Filed Jnn. 22, 1987, Ser. No. 64,790
Term of patent 14 years
U.S. Cl. D23—332



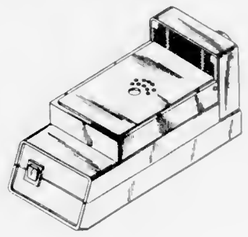
301,924
FIREPLACE INSERT
Richard D. Craver, Marshallville, Ohio, assignor to Orrville Products, Inc., Orrville, Ohio
Filed Jul. 20, 1987, Ser. No. 75,320
The portion of the term of this patent subsequent to Jun. 13, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—344



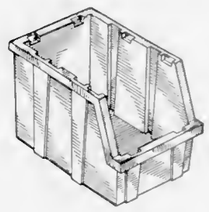
301,925
EXAMINATION TABLE
Terry J. Simpkins, Snowmass Village, Colo., and Richard L. Turner, Coldwater, Ohio, assignors to Midmark Corporation, Versailles, Ohio
Filed Oct. 9, 1986, Ser. No. 917,321
Term of patent 14 years
U.S. Cl. D24—3



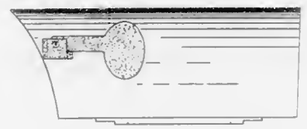
301,926
DENTAL ROUTER
Bernard Weissman, New York, N.Y., assignor to IPCO Corporation, White Plains, N.Y.
Filed Feb. 13, 1987, Ser. No. 14,648
Term of patent 14 years
U.S. Cl. D24—10



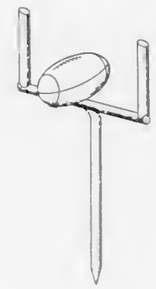
301,927
STACKABLE BIN BOX
Jr. Williams, 19 Port Norfolk St., Boston, Mass. 02122-3609
Filed Aug. 23, 1985, Ser. No. 768,710
Term of patent 14 years
U.S. Cl. D34—40



301,928
MAILBOX
James D. Hogge, 928 Bentwood Ln., Port Orange, Fla. 32019
Filed Jan. 14, 1986, Ser. No. 820,959
Term of patent 14 years
U.S. Cl. D99—29



301,929
MAIL BOX
Kenneth L. Evans, 1011 Lancewood Dr., Knoxville, Tenn. 37920
Filed Aug. 26, 1986, Ser. No. 901,163
Term of patent 14 years
U.S. Cl. D99—30



301,930
COMBINED SCOOP AND COIN WRAPPER FILLER
Gloria L. Cantu, 2255 Johnson Rd., Germantown, Tenn. 38138
Filed Oct. 2, 1986, Ser. No. 914,798
Term of patent 14 years
U.S. Cl. D99—34

301,931
TOY MONEY BANK
Wilson Leung, Kowloon, Hong Kong, assignor to Spalding & Evenflo Companies, Inc., Tampa, Fla.
Filed May 27, 1986, Ser. No. 867,705
Term of patent 14 years
U.S. Cl. D99—38

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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF JUNE, 1989

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

: *See—*
Zettervall, Ettmar; and , 4,841,662, Cl. 43-25.200.

A. Ahlstrom Corporation: *See—*
Engstrom, Folke; and Kuivalainen, Reijo, 4,841,884, Cl. 110-298.000.
Gullichsen, Johan; and Hynninen, Pertti, 4,842,688, Cl. 162-29.000.

A. & M. Cousin Etablissements Cousin Freres: *See—*
Pipon, Yves; and Droulon, Georges, 4,842,232, Cl. 248-395.000.

A. Nattermann & CIE GmbH: *See—*
Durr, Manfred; Fribolin, Hans U.; Harhausen, Ekkerhard; and Seidel, Jurgen, 4,842,865, Cl. 424-456.000.

A. W. Showell (Surgicraft) Limited: *See—*
Ransford, Andrew O., 4,841,959, Cl. 128-192.0YM.

Aarding B.V.: *See—*
Versleeg, Gijsbert, 4,842,220, Cl. 244-50.000.

AB Tetra Pak: *See—*
Ekdahl, Gert; and Nystrom, Tommy, 4,842,906, Cl. 428-34.200.

Abbott Laboratories: *See—*
Pastrone, John, 4,842,584, Cl. 604-50.000.

Abbott Laboratories Ltd.: *See—*
Horder, odney; Banks, Michael; and Hoadley, Thomas H., 4,842,866, Cl. 424-468.000.

Abe, Hideo: *See—*
Kusaba, Takashi; Abe, Hideo; Torao, Akira; Furukawa, Kusuo; Yanagimoto, Takayuki; and Sasaki, Hiroaki, 4,841,611, Cl. 29-121.200.

Abe, Hiroshi, to Asahi Seiko Kabushiki Kaisha. Sensor coil for discriminating coin acceptor or rejector. 4,842,119, Cl. 194-317.000.

Abe, Kumiko: *See—*
Sugisawa, Ko; Matsumura, Yasushi; Okamoto, Hidefumi; and Abe, Kumiko, 4,842,872, Cl. 426-46.000.

Abe, Yasuaki: *See—*
Okada, Taiiti; and Abe, Yasuaki, 4,842,775, Cl. 260-396.00R.

Abe, Yoshihiro, to Canon Kabushiki Kaisha. Pull up or pull down electronic device. 4,843,262, Cl. 307-475.000.

Abeyama, Shozo: *See—*
Kato, Tetsuo; Abeyama, Shozo; and Saito, Makoto, 4,842,818, Cl. 420-100.000.

Abu-Isa, Ismat A.; Eusebi, Elio; Jaynes, Craig B.; Moran, Susan C.; and Roy, Michael A., to General Motors Corporation. Vehicle seat suspension component and its method of manufacture. 4,842,257, Cl. 267-133.000.

Accudent, Inc.: *See—*
Brown, Stephen J.; and Pond, Stanley L., 4,841,987, Cl. 128-777.000.

Ackeret, Peter, to IDN Inventions and Development of Novelties AG. Container for the storage of magnetic-tape cassettes of other recording media. 4,842,348, Cl. 312-12.000.

Adalet/Scott Fetzer Company: *See—*
Shramo, Daniel J., 4,843,269, Cl. 310-208.000.

Adams, Jeffrey S.: *See—*
Elson, Donald E.; Gerke, Burton E., Jr.; Bitzel, Michael E.; Wilder, Bruce A.; Rodowsky, Stanley J., Jr.; Lessig, William R., III; Adams, Jeffrey S.; and Hagan, Todd A., 4,841,594, Cl. 15-344.000.

Adams, Victor J., to Motorola, Inc. Method for forming a cast membrane protected pressure sensor. 4,842,685, Cl. 156-308.200.

ADI Diagnostics Inc.: *See—*
Fuller, Steven A.; and Hurrell, John G. R., 4,842,999, Cl. 435-7.000.

Adlam, Arthur H.: *See—*
Scully, Andrew J.; and Adlam, Arthur H., 4,841,838, Cl. 89-36.080.

Administrator, National Aeronautics and Space Administration: *See—*
Heyman, Joseph S.; Rogowski, Robert S.; and Holben, Milford S., Jr., 4,843,346, Cl. 331-65.000.

ADT Security Systems, Inc.: *See—*
Roy, Bernard J. J.; O'Connor, Lorne D.; Rioux, Phillipe F.; Dingle, Donald A.; and Raymond, Andre L., 4,843,462, Cl. 358-108.000.

Advanced Materials Technology Corp.: *See—*
Basile, Thomas J.; and LaPlante, Jean, 4,842,961, Cl. 428-672.000.

Advanced Micro Devices, Inc.: *See—*
Linz, Alfredo R.; Peterson, Joe W.; and Nair, Velayudhan V., 4,843,394, Cl. 341-154.000.

AE PLC: *See—*
Slee, Roger H., 4,841,927, Cl. 123-193.00C.

AEG Olympia AG: *See—*
Wehking, Hans; and Gottschlich, Manfred, 4,842,429, Cl. 400-157.200.

AEG Olympia Aktiengesellschaft: *See—*
Kloppenburg, Ernst, 4,842,427, Cl. 400-18.000.

Aerovox M, Inc.: *See—*
Hodges, C. Wayne; Henderson, Dennis R.; and Koons, Edwin R., 4,841,608, Cl. 29-25.420.

Afflitto, John: *See—*
Gaffar, Abdul; and Afflitto, John, 4,843,099, Cl. 514-576.000.

Agency of Industrial Science & Technology: *See—*
Yamamoto, Tetsuo; Hayashi, Hiroshi; Muta, Tenshiro; Hori, Yoshisada; and Kubo, Katsushi, 4,842,957, Cl. 428-622.000.

Agency of Industrial Science & Technology, Ministry of International Trade & Industry: *See—*
Azuma, Nobuyuki; Nakamura, Kazuo; Maeda, Minoru; and Yamada, Mamoru, 4,842,840, Cl. 423-345.000.

Agfa-Gevaert Aktiengesellschaft: *See—*
Huber, Leonhard; and Payrhammer, Bernd, 4,843,430, Cl. 355-27.000.
Viehrig, Wolfgang, 4,842,179, Cl. 226-108.000.

Agfa-Gevaert N.V.: *See—*
Mampaey, Jozef L.; and Van der Vliet, Lucien P., 4,843,422, Cl. 250-326.000.
Tavernier, Serge M.; Waterschoot, William C.; and Overmeer, Robert T., 4,842,972, Cl. 430-117.000.

Agner, Bent; and Balsborg, Kaj. Firing mechanism for a semi-automatic arm. 4,841,840, Cl. 89-154.000.

Agnihotri, Chaitanya; and Cobiella, Robert M., to United States of America, U.S. Environmental Protection Agency. Methods for removing volatile substances from water using flash vaporization. 4,842,748, Cl. 210-774.000.

Agostino, Michael. Buoyant and non-buoyant valve. 4,841,580, Cl. 4-393.000.

Ahr, Hans J.: *See—*
Hoederath, Wolfgang; Ahr, Hans J.; Buhner, Klaus; Hegasy, Ahmed; and Winter, Manfred, 4,842,856, Cl. 424-101.000.

Air Products and Chemicals, Inc.: *See—*
Allam, Rodney J.; and Prentice, Alan L., 4,842,625, Cl. 62-22.000.
Graf, Hans-Juergen; Fletcher, Robert E.; Randtke, Peter T.; Rhine, Bruce E.; and Monkowski, J. R., 4,842,827, Cl. 422-112.000.
Lai, Ta-Wang; and Vijayendran, Bheema R., 4,843,118, Cl. 524-555.000.

Aircraft Parts Corp.: *See—*
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Becker, Paul; Edwards, Larry M.; Horner, Patrick J.; Macknick, A. Brian; Moore, Stephen; and Mosso, Ronald J., to Raychem Corporation. Preparation of poly(arylene ether ketones) by sequential oligomerization and polymerization in distinct reaction zones. 4,843,131, Cl. 526-65.000.

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Bedard, Donna L.; and Brennan, Michael J Jr., to General Electric Company. *Alcaligenes eutrophus* for biodegrading PCBs. 4,843,007, Cl. 435-252.100.

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Dorr, Karl H.; Grimm, Hugo; Neumann, Heinz; Fennemann, Wolfgang; and Ohlms, Norbert, to Metallgesellschaft Aktiengesellschaft; and Stadtwerke Munster GmbH. Process of purifying flue gases. 4,842,835, Cl. 423-242.000.
Dorsch, Glenn R., to Vaughan Co., Inc. High head centrifugal slicing slurry pump. 4,842,479, Cl. 415-121.100.
Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
Yatsuhashi, Motoharu; Mochizuki, Masataka; and Sugihara, Shinich, 4,842,053, Cl. 165-104.140.
Dosaka, Katsumi: *See—*
Miyatake, Hideshi; Kumanoya, Masaki; Hidaka, Hideto; Konishi, Yasuhiro; Dosaka, Katsumi; Yamasaki, Hiroyuki; Shimoda, Masaki; Ikeda, Yuto; and Tsukamoto, Kazuhiro, 4,843,596, Cl. 365-233.500.
Doswald, Paul; and von Tobel, Hans-Rudolf, to Sandoz Ltd. Copper complexes of disazo compounds having di- or tri- sulfonaphthol and 6-[2,4-di-(amino or substituted amino)-1,3,5-triazia-6-ylamino-]-1-hydroxy-3-sulfonaphthalene coupling component radicals. 4,843,152, Cl. 534-701.000.
Dotti, Enrico: *See—*
Bortolin, Bruno; and Dotti, Enrico, 4,842,438, Cl. 403-266.000.
Dougherty, Richard M.: *See—*
Fuller, Ronald D.; Dougherty, Richard M.; Fullerton, Craig L.; and Malone, Hugh R., 4,843,354, Cl. 333-81.00A.
Douglas, Robert J.: *See—*
Braithwaite, David; Douglas, Robert J.; Jones, Stanley P.; Poole, James P.; and Rawson, Harold, 4,842,630, Cl. 65-30.140.
Douwes, Marcelles: *See—*
van der Hoorn, Rudolf J. G. A.; and Douwes, Marcelles, 4,841,602, Cl. 17-23.000.
Dow Chemical Company, The: *See—*
Caskey, Terrence L., 4,842,910, Cl. 428-36.300.
Chung, Chan I., 4,843,117, Cl. 524-173.000.
Dorman, Linneaus C.; and Meyers, Paul A., 4,842,604, Cl 623-16.000.
Gould, Gordon E.; and Luecke, Robert A., 4,842,791, Cl. 264-171.000.
Krupp, Stephen P.; Knickerbocker, Edward N.; and Bieser, John O., 4,842,922, Cl. 428-198.000.
Mullins, Michael J., 4,843,180, Cl. 568-689.000.
Otterbacher, Eric W., 4,843,160, Cl. 544-398.000.
Robbins, Lanny A.; and Johnson, Herbert A., 4,842,621, Cl. 55-26.000.
Sabol, John S., Jr.; and Kester, Wayne A., 4,842,762, Cl. 252-109.000.
Smyth, Ronald R.; and Henslee, Walter W., 4,843,045, Cl. 501-120.000.
Dow Corning Corporation: *See—*
Blehm, Lynne M.; and White, William C., 4,842,766, Cl. 252-309.000.
Brown, Paul L.; and Stickles, David L., 4,842,902, Cl. 427-387.000.
Haluska, Loren A.; Michael, Keith W.; and Tarhay, Leo, 4,842,888, Cl. 427-38.000.
Dow Corning, Ltd.: *See—*
Taylor, Richard G.; and White, James W., 4,843,137, Cl. 528-10.000.
Dow Corning Wright Corporation: *See—*
Sasaki, Gordon H.; Jakubczak, Eugene R.; and Gauger, John R. D., 4,841,992, Cl. 128-899.000.
Dow, Julian; and Meyers, Paul F., to Capistrano Labs, Inc. Ultrasonic prostate probe assembly. 4,841,979, Cl. 128-660.100.
Dowell Schlumberger Incorporated: *See—*
Vercaemer, Claude; Lemanczyk, R.; and Piot, Bernard, 4,842,068, Cl. 166-269.000.
Downey, Rogers B., to Polaroid Corporation. Magnetic disk cassette having internal biasing ribs. 4,843,511, Cl. 360-133.000.

Dows Chemical Company, The: *See—*
Tazewell, Joseph H.; Christenson, Christopher P.; Turner, Robert B.; and Gonzales, Manuel, Jr., 4,84 ,138, Cl. 528-52.000.
Doyle, Brian: *See—*
Boudou, Alain; and Doyle, Brian, 4,8 3,442, Cl. 357-23.300.
Doyle, Thomas E.; Edmonds, David P.; McAninch, Michael D.; and Ryan, Patrick M., to Babock & Wilcox Company, The. Method and apparatus for building a workpiece by deposit welding. 4,842,186, Cl. 228-222.000.
Doyle, Walter M., to Laser Precision Corporation. Infrared microscope employing a projected field stop. 4,843,142, Cl. 250-330.000.
Draenert, Klaus, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Materials for implantation comprising a polyacrylate containing spherical tricalcium phosphate particles. 4,842,603, Cl. 623-16.000.
Dragasevich, John, to GAF Corporation. Bag filter. 4,842,747, Cl. 210-767.000.
Drake, Charles A.: *See—*
Byers, Jim D.; and Drake, Charles A. 4,843,178, Cl. 568-469.900.
Dray, Robert F. Mixing device for a feed screw. 4,842,414, Cl. 366-82.000.
Drbohlav, Jaroslav: *See—*
Urbanek, Peter; Farkas, Peter; Cvopa, Rudolf; Faskova , Maria; and Drbohlav, Jaroslav, 4,843,207, Cl. 219-121.600.
Drechsel, Arno. Self-adjusting rotary-arm irrigation sprinkler. 4,842,199, Cl. 239-230.000.
Drent, Eit; Van Leeuwen, Petrus W. N. M.; and Wife, Richard L., to Shell Oil Company. Catalytic polymerization of CO/olefin with ortho polar substituted aryl bidentate p ligand. 4,843,145, Cl. 528-392.000.
Dressler, Gary J.: *See—*
Cameron, Robert W.; Dressler, Gary J.; and Hartline, Jack L., 4,842,100, Cl. 184-6.200.
Drewery, John O., to British Broadcasting Corporation. Scanning techniques using hierarchical set of curves. 4,843,468, Cl. 358-140.000.
Drexel University: *See—*
Koerner, Robert M.; Lord, Arthur E , Jr.; and Brugger, John E., 4,842,448, Cl. 405-258.000.
Drezdzon, Mark A.; Moore, Eric J.; and Kaminsky, Mark P., to Amoco Corporation. Catalysis using pillared hydrotalcites. 4,843,168, Cl. 558-357.000.
Driels, Morris R., to Board of Governors for Higher Education, State of Rhode Island; and Providence Plantations. Computer controlled adaptive compliance assembly workstation. 4,842,475, Cl. 414-730.000.
Driscoll, John N.; and Atwood, Edward S., to HNU Systems, Inc. Method of determining ammonia in a gaseous or liquid sample. 4,842,697, Cl. 204-1.00T.
Dropps, Kevin J: *See—*
Thompson, Herbert A.; Tomlinson, Paul R.; Dropps, Kevin J; and Mancini, Ronald A., 4,843,295, Cl. 318-786.000.
Dross, Joachim: *See—*
Reinehr, Ulrich; Hirsch, Rolf-Burkhard; Dross, Joachim; and Jungverdorben, Hermann-Josef, 4,842,793, Cl. 264-136.000.
Droulon, Georges: *See—*
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Du Pont Canada Inc.: *See—*
Coughlin, Michael C.; Moss, Arthur J.; and Stevens, Kenneth E., 4,842,741, Cl. 210-500.360.
Dual-Lite Manufacturing, Inc.: *See—*
Alderman, Arnold N., 4,843,300, Cl. 323-224.000.
Dubief, Claude: *See—*
Grollier, Jean F.; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; Mondet, Jean; and Cauvet, Daniele, 4,842,849, Cl. 424-70.000.
Grollier, Jean F.; and Dubief, Claude , 4,842,851, Cl. 424-70.000.
Dubrul, William R.: *See—*
Bauer, Bruce S.; Dubrul, William R.; and Allen, Tor E., 4,841,948, Cl. 128-897.000.
Ducassou, Didier, to Societe de Fabrication D'Instruments de Mesure (S.F.I.M.). Ultralight-weight mirror and method of manufacturing it. 4,842,398, Cl. 350-641.000.
Duda, C. Richard, to ILC Technology, Inc. Dual detector laser beam power monitor. 4,842,404, Cl. 356-218.000.
Duffy, Frank H. Spatial trajectory analysis in brain electrical activity mapping. 4,841,983, Cl. 128-731.000.
Duffy, Richard: *See—*
Sessa, Eugene D.; and Duffy, Richard J, 4,842,890, Cl. 427-47.000.
Dufour, Marcel; and Piat, Jacques, to Asten Group, Inc. Process to manufacture a felt with flap and a felt produced thereby. 4,842,925, Cl. 428-223.000.
Dufour, Marcel; and Piat, Jacques, to Asten Group, Inc. Papermaker's wet press felt with predensified batt thereon. 4,842,929, Cl. 428-300.000.
Dugger, Ben A. Deburring drill bit. 4,84 ,451, Cl. 408-21.000.
DuLac, Keith B.; and Weber, Bret S., to NCR Corporation. Method and apparatus for controlling data transfers through multiple buffers. 4,843,544, Cl. 364-200.000.
Dumas, William V.: *See—*
Foust, Donald F.; Dumas, William V.; Lamby, Edward J.; and Karas, Bradley R., 4,842,946, Cl. 428-458.000.
Dunkers, Karl R. Method and apparatus for filtration using washable filter bag for water and wastewater treatment. 4,842,751, Cl. 210-798.000.
Dunn, Adrian, to Exxon Chemical Patents Inc. Marine lubricating composition. 4,842,755, Cl. 252-32.70E
Dunn, Richard L.; Gibson, John W.; Eddy, Carlton A.; and Laufe, Leonard E., to Southern Research Institute; and Texas Health Science Center, a part interest. Antithrombotic/thrombolytic suture and methods of making and using the same. 4,841,968, Cl. 128-335.500.
Dupont, Daniel. Analogue simulator for control circuits, actuated from operating station or cockpit. 4,842,520, Cl. 434-30.000.
Du Pont de Nemours, E. I., and Company: *See—*
D'Amore, Michael B.; and Pande, Nutan K., 4,843,057, Cl. 502-263.000.
Gumprecht, William H.; Manzer, Leo E.; and Rao, V. N. Mallikarjuna, 4,843,181, Cl. 570-169.000.
Judge, Ronald J., 4,842,503, Cl. 425-72.200.
Pasteris, Robert J., 4,842,639, Cl. 71-91.000.
Verhoeven, Laurentius M., 4,843,190, Cl. 174-68.500.
Durr Dental GmbH & Co: *See—*
Durr, Walter S.; Hofmann, Hans-Joachim; and Bollmann, Andreas B., 4,842,478, Cl. 415-169.200.
Durr, Manfred; Fribolin, Hans U.; Harhausen, Ekkerhard; and Seidel, Jurgen, to A. Nattermann & CIE GmbH. Use of glycofurol for the liquidization of pharmaceutical preparations to be filled into soft gelatine capsules. 4,842,865, Cl. 424-456.000.
Durr, Walter S.; Hofmann, Hans-Joachim; and Bollmann, Andreas B., to Durr Dental GmbH & Co. Dental suction apparatus. 4,842,478, Cl. 415-169.200.
Dussault, David R.; and Dussault, Richard E. Dri-Pc humidity and temperature controller. 4,841,733, Cl. 62-93.000.
Dussault, Richard E.: *See—*
Dussault, David R.; and Dussault, Richard E., 4,841,733, Cl. 62-93.000.
Dworkin, Jeffrey. Intraoral appliance and method of treating patient. 4,842,519, Cl. 433-215.000.
Dwyer Instruments, Inc.: *See—*
Buchanan, Steven O., 4,841,782, Cl. 73-861.740.
Dwyer, Stephen M.: *See—*
Spenadel, Lawrence; Grosser, Joel H.; and Dwyer, Stephen M., 4,843,129, Cl. 525-240.000.
Dyonics, Inc.: *See—*
Johnson, Lanny L.; and Brissette, Robert E., 4,842,578, Cl. 604-22.000.
E.C.H. Will GmbH: *See—*
Besemann, Alfred, 4,842,125, Cl. 198-457.000.
Peter, Jurgen; and Schlottke, Karl-Heinz, 4,842,573, Cl. 493-412.000.
E.C.V. Company: *See—*
Restivo, David J., 4,841,592, Cl. 15-210.00R.
E.G.O. Elektro-Gerate Blanc u. Fischer: *See—*
Schreder, Felix, 4,843,217, Cl. 219-458.000.
E. I. Du Pont de Neumours and Company: *See—*
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E & M Lamort: *See—*
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E. R. Squibb & Sons, Inc.: *See—*
Biller, Scott A.; and Misra, Raj N., 4,843,082, Cl. 514-311.000.
Meyers, Edward; and Parker, William L., 4,842,857, Cl. 424-116.000.
Eastern Company, The: *See—*
Weinerman, Lee S.; Mayo, Steven A.; Vargus, Joel T.; Albris, Frank R.; Russell, Richard H.; McLinden, Thomas V.; O'Grady, Richard M.; and Wentzell, Timothy H., 4,841,755, Cl. 70-208.000.
Eastman Kodak Company: *See—*
Bagrodia, Shriram; and Phillips, Bobby M., 4,842,792, Cl. 264-130.000.
Hochgraf, Neil A., 4,843,222, Cl. 235-470.000.
Marchetti, Jay D., 4,843,496, Cl. 360-77.060.
Schmidt, John D.; and Maurinus, Martin A., 4,843,036, Cl. 437-224.000.
Walther, Lawrence E., 4,843,413, Cl. 354-402.000.
Eaton Corporation: *See—*
Class, Walter H.; and Smith, James F., 4,842,703, Cl. 204-192.120.
Cote, William F.; and Smyth, Robert R., 4,843,559, Cl. 364-424.050.
Eden, J. Gary; King, Kevin K.; and Tavitian, Viken, 4,843,030, Cl. 437-88.000.
Hampton, Keith; Krzysik, Don J.; and Lilley, Glen R., 4,841,924, Cl. 123-90.150.
Torrence, Robert J., 4,841,734, Cl. 62-115.000.
Eddy, Carlton A.: *See—*
Dunn, Richard L.; Gibson, John W.; Eddy, Carlton A.; and Laufe, Leonard E., 4,841,968, Cl. 128-335.500.
Eden, J. Gary; King, Kevin K.; and Tavitian, Viken, to Eaton Corporation. Semiconductor processing by a combination of photolytic, pyrolytic and catalytic processes. 4,843,030, Cl. 437-88.000.
Edgecomb, Robert K.; Rose, Maurice T.; and Smith, Rodney B., to General Motors Corporation. Locking mechanism. 4,842,010, Cl. 137-343.000.
Edmonds, David P.: *See—*
Doyle, Thomas E.; Edmonds, David P.; McAninch, Michael D.; and Ryan, Patrick M., 4,842,186, Cl. 228-222.000.
Edris, Abdel-Aty O. M., to Asea Brown Boveri AB. Method and arrangement for protecting turbine generators against subsynchronous resonances occurring in power transmission systems. 4,843,513, Cl. 361-20.000.
Edwards, Allen P.; and Gildea, David R., to Hewlett-Packard Company. Vector modulation signal generator. 4,843,351, Cl. 332-17.000.

Edwards, Carl K., III: *See—*
Jacobs, Martin J.; Edwards, Carl K., III; and Myers-Keith, Paula, 4,842,862, Cl. 424-422.000.
Edwards, Larry M.: *See—*
Becker, Paul; Edwards, Larry M.; Horner, Patrick J.; Macknick, A. Brian; Moore, Stephen; and Mosso, Ronald J., 4,843,131, Cl. 526-65.000.
Edwards, Susan M.: *See—*
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Effland, Richard C.: *See—*
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Efron, Uzi: *See—*
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Efuesukei Kabushiki Kaisha: *See—*
Sakashita, Hitoshi; Mineura, Yoshihisa; and Sato, Toshihiko, 4,841,652, Cl. 40-299.000.
EG&G Chandler Engineering: *See—*
Mayeaux, Donald P., 4,842,709, Cl. 204-402.000.
Eger, Georg; and Pross, Walter, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Floor group for a vehicle, especially for a motor vehicle. 4,842,193, Cl. 237-12.30A.
Egner, Ronald J., to Ryder International Corporation. Thread forming nut with locking portion. 4,842,437, Cl. 403-24.000.
EgoKiefer AG: *See—*
Liebl, Rudolf; and Bosshard, Ernst, 4,842,571, Cl. 474-204.000.
Eguchi, Naoya; and Nishida, Norio, to Sony Corporation. Tracking servo system for optical disk playre apparatus. 4,843,601, Cl. 369-44.000.
Ehrman, Ernest W. Articles of foldable furniture. 4,841,882, Cl. 108-115.000.
Eichelberger, Charles W.: *See—*
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Eilingsfeld, Heinz; Etzbach, Karl-Heinz; Hansen, Guenter; and Reichelt, Helmut, to BASF Aktiengesellschaft. Azo dyes containing thienothiophene radicals as radicals of the diazo component. 4,843,153, Cl. 534-752.000.
Eisler, Gyula. Apparatus for adjusting the angular position of optical elements. 4,842,397, Cl. 350-634.000.
Ek, Kurt L., to Nestec S.A. Apparatus and process for rolling a sheet of pastry material. 4,842,879, Cl. 426-297.000.
Ekdahl, Gert; and Nystrom, Tommy, to AB Tetra Pak. Packing laminate for the manufacture of liquid-tight packing containers and use of such laminate. 4,842,906, Cl. 428-34.200.
Elder, James W.; and Parker, Robert A., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Majesty's Government of the. Track link adhesion pad assembly. 4,842,345, Cl. 305-35.00R.
Electrical Generation Technology, Inc.: *See—*
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Electricity Council, The: *See—*
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Electro-Biology, Inc.: *See—*
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Electro-Matic Products Co.: *See—*
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Eli Lilly and Company: *See—*
Rao, R. Nagaraja; and Stanzak, Richard K., 4,843,002, Cl. 435-172.300.
Elkhart Door, Incorporated: *See—*
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Ellefson, Jerry K.: *See—*
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Ellegaard, Mogens: *See—*
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Ellingsworth, Larry: *See—*
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Ellison, Richard P., to Boat America Corporation. Boat fender. 4,841,893, Cl. 114-219.000.
Elopak Systems A.G.: *See—*
Lisiecki, Robert E., 4,842,188, Cl. 229-123.300.
Elsasser, Dieter; and von Der Heide, Johann, to Papst-Motoren GmbH & Co. KG. Disk storage drive. 4,843,500, Cl. 360-97.020.
Elsasser, Michael: *See—*
Bayer, Thomas; Elsasser, Michael; Greschner, Johann; Schmid, Heinrich; Stohr, Roland; Wolter, Olaf; and Wittlinger, Jurgen, 4,843,315, Cl. 324-158.00P.
El-Sherif, Mahmoud. Process for producing a grating on an optical fiber. 4,842,405, Cl. 350-320.000.
Elson, Donald E.; Gerke, Burton E., Jr.; Bitzel, Michael E.; Wilder, Bruce A.; Rodowsky, Stanley J., Jr.; Lessig, William R., III; Adams, Jeffrey S.; and Hagan, Todd A., to Black & Decker, Inc. Cordless vacuum cleaner with power brush. 4,841,594, Cl. 15-344.000.
Elson, Robert J.: *See—*
Ludwig, Howard R.; Haidler, John W.; Yuan, Mark S. C.; and Elson, Robert J., 4,842,106, Cl. 188-266.000.
Eltek S.p.A.: *See—*
Fornasari, Paolo, 4,842,167, Cl. 222-249.000.
Elzer, Albert; Sanner, Axel; Schupp, Hans; and Beck, Erich, to BASF Aktiengesellschaft. Photosensitive element for producing printing plates or resist images. 4,842,987, Cl. 430-281.000.
EMI Limited: *See—*
Best, John E.; LeMay, Christopher A. G.; Hounsfield, Godfrey N.; and Froggatt, Robert J., 4,843,618, Cl. 378-4.000.
Emil Freiwald: *See—*
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Emitec Gesellschaft fur Emissionstechnologie mbH: *See—*
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Riemscheid, Helmut; and Schwarz, Engelbert, 4,841,679, Cl. 51-281.00C.
Emo, Stephen M.; and Kinney, Terrance R., to Allied-Signal Inc. Optic switch and speed sensor. 4,843,232, Cl. 250-225.000.
EMU-ESU Industrial Co., Ltd.: *See—*
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Encellaz, Robert; and Ng Tong, Yong C. H., to Thomson-CGR. Device and method for adjusting a radiofrequency antenna of a nuclear magnetic resonance apparatus. 4,843,323, Cl. 324-313.000.
Endo, Takayoshi; and Yamada, Satoshi, to Yazaki Corporation. Connector housing and method for producing same. 4,842,540, Cl. 439-271.000.
Energy Conversion Devices, Inc.: *See—*
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Engdahl, Roger A.: *See—*
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Engicom Naamloze Vennootschap: *See—*
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Engle, Thomas H.: *See—*
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Englisch, Wolfgang: *See—*
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Englund, Rolf A.: *See—*
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Engstrom, Folke; and Kuivalainen, Reijo, to A. Ahlstrom Corporation. Distributor plate for fluidized bed reactor. 4,841,884, Cl. 110-298.000.
Enichem Augusta S.p.A.: *See—*
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Enter Computer, Inc.: *See—*
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Enterprise Paris Quest: *See—*
Grimaud, Alain, 4,841,703, Cl. 52-334.000.
Entzminger, William W. Variable ratio lever arm mechanism. 4,841,799, Cl. 74-522.000.
Enzo Biochem, Inc.: *See—*
Stavrianopoulos, Jannis G., 4,843,122, Cl. 525-61.000.
Eppig, Christopher P.: *See—*
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EPRI: *See—*
French, Thomas J.; Harrell, Lester R.; and Dellinger, Anthony L., 4,843,208, Cl. 219-121.390.
Equipements Automobiles Marchal: *See—*
Heritier-Best, Pierre, 4,843,362, Cl. 336-61.000.
Erametsa, Henrik; Kuvaja, Kari; Maki-Kihnia, Kalevi; and Terava, Jorma, to Rauma-Repola Oy. Method and device for collecting objects from the seabed. 4,842,336, Cl. 299-8.000.
Erickson, David J., II; Naylor, Michael G.; and Knobloch, Robert R., to Dexter Corporation, The. Electrical floating bond assembly. 4,842,530, Cl. 439-98.000.
Eriksson, Jan E.: *See—*
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Ernst Winter & Sohn (GmbH & CO.): *See—*
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Ersfeld, Dean A.; and Hansen, Paul E., to Minnesota Mining and Manufacturing Company. Nonwoven orthopedic casting materials with apertures. 4,841,958, Cl. 128-90.000.
Erstad, Troels: *See—*
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Escribano-Crespo, Maria J.; and Burtin, Pierre, to Centre National de la Recherche Scientifique. Immunoassay for detecting acino-foetal differention protein associated with cancer of the pancreas. 4,843,019, Cl. 436-501.000.
Essex Specialty Products, Inc.: *See—*
Rizk, Sidky D.; Shah, Navinchandra B.; and Powers, John W., 4,842,938, Cl. 428-416.000.

Eszakmagyaroszagi Vegyimuvek: *See*—
Matolcsy, Gyorgy; Bordas, Barna; G mesi, Antal; Kovacs, Magdolna; and Tuske, Marton, 4,843,17 , Cl. 564-209.000.
Etat Francais: *See*—
Le Guet, Pierre-Loic; Lempereur, C hristine; and Mathe, Jean-Michel, 4,843,460, Cl. 358-107.000.
Ethicon: *See*—
Annis, David; and Berry, John P., 4,842,505, Cl. 425-174.80E.
Etou, Isamu: *See*—
Nishida, Mitsuhiro; Etou, Isamu; and Morishita, Etsuo, 4,842,499, Cl. 418-55.000.
Etzbach, Karl-Heinz: *See*—
Eilingsfeld, Heinz; Etzbach, Karl-Heinz; Hansen, Guenter; and Reichelt, Helmut, 4,843,153, Cl. 534-752.000.
European Atomic Energy (EURATOM): *See*—
Raimondi, Tullio; Presle, Pierre; Gal iati, Leandro; and de Burbure, Stephane, 4,843,213, Cl. 219-1 9.000.
Eusebi, Elio: *See*—
Abu-Isa, Ismat A.; Eusebi, Elio; Jayne , Craig B.; Moran, Susan C.; and Roy, Michael A., 4,842,257, Cl 267-133.000.
Evangelista, Donato D.; Horak, Eugene F ; and Winship, Bruce A., to Xerox Corporation. Feed roll cleaner fo cleaning and renewing the frictional feeding surfaces of the sheet fed rolls in a copy reproducing machine or printer. 4,843,436, Cl. 35-133.000.
Evans, Joseph M.; and Moore, E. Rex, to Kinetic Technology, Inc. Chiropractic adjustor. 4,841,955, Cl. 128-52.000.
Eventoff, Arnold T.; and Newman, Wyatt S., to North American Philips Corporation. Ultrasonic scanning device with elastic pumper. 4,841,978, Cl. 128-660.090.
Evett, Eric A.: *See*—
Wechsler, Susan L.; Evett, Eric A.; and Raby, Pamela F., 4,843,590, Cl. 364-900.000.
Evstatiev, Michail G.; Fakirov, Stoyko C ; and Schultz, Jerold M., to University of Delaware. Preparation of high-modulus, high-strength linear polycondensates. 4,842,789, Cl. 264-101.000.
Ex-Cell-O Corporation: *See*—
Farris, John R., 4,841,725, Cl. 60-261.000.
Exabyte Corporation: *See*—
Georgis, Steven P.; Beavers, Kelly J.; and Haugland, Steve E., 4,843,495, Cl. 360-77.150.
Exxon Chemical Patents Inc.: *See*—
Dunn, Adrian, 4,842,755, Cl. 252-32.7 E.
Exxon Research & Engineering Company *See*—
Spenadel, Lawrence; Grosser, Joel F.; and Dwyer, Stephen M., 4,843,129, Cl. 525-240.000.
F. J. Engineering, Inc.: *See*—
Jolly, Frank H., 4,841,809, Cl. 74-714 000.
F. Korbel and Bros.: *See*—
Baker, Daniel C.; Stashak, Robert M.; Owens, William P.; and Gessner, Gregory B., 4,841,848, Cl 99-277.200.
F. Wieland Elektrische Industrie GmbH: *See*—
Schrauder, Franz, 4,842,361, Cl. 350-96.200.
Faeth, Warren P., to Tokheim Corporation. Vapor passage fuel blockage removal. 4,842,027, Cl. 141-45.000.
FAG Kugelfischer Georg Schafer (KGaA): *See*—
Leurer, Erwin, 4,841,784, Cl. 73-862.08O.
Niebling, Peter, 4,842,570, Cl. 474-11 .000.
Faggian, Lucio; Castellano, Maurizio; Platone, Edoardo; and Franco, Cosimo, to Emiricerche S.p.A.; and Enichem Augusta S.p.A. Process for extracting paraffins from their mixtures with paraffinsulfonic acids. 4,843,184, Cl. 585-864.000.
Fakirov, Stoyko C.: *See*—
Evstatiev, Michail G.; Fakirov, Stoyko C.; and Schultz, Jerold M., 4,842,789, Cl. 264-101.000.
Fanuc Ltd.: *See*—
Gamo, Gotaro; and Kinoshita, Mitsuo, 4,843,203, Cl. 219-69.120.
Torii, Nobutoshi; Mizuno, Hitoshi; and Iwasaki, Kyoji, 4,842,474, Cl. 414-680.000.
Fanuc Ltd: *See*—
Kamiguchi, Masao; and Umemoto, Hiroshi, 4,842,801, Cl. 264-40.100.
Farkas, Peter: *See*—
Urbanek, Peter; Farkas, Peter; Cvopa, Rudolf; Faskova , Maria; and Drbohlav, Jaroslav, 4,843,207, Cl. 219-121.600.
Farler, Charles W. Anti-bounce-out dart. 4,842,285, Cl. 273-420.000.
Farmitalia Carlo Erba S.p.A.: *See*—
Temperilli, Aldemio; Brambilla, Enzo; Gobbini, Mauro; and Cervini, Maria A., 4,843,073, Cl. 514-2 8.000.
Farrar, Timothy J.: *See*—
Boyko, James G.; and Farrar, Timothy J., 4,842,313, Cl. 292-341.160.
Farrell, Mark S.: *See*—
Bean, George H.; Borden, Terry L.; Farrell, Mark S.; Gum, Peter H.; Hough, Roger E.; Johnson, Francis E.; McCauley, Donald W.; Rakhmilevich, Mark E.; Rathjen, John C.; Scalzi, Casper A.; Scanlon, John F.; and Wyman, Leslie W., 4,843,541, Cl. 364-200.000.
Farris, John R., to Ex-Cell-O Corporation. Fuel spray device for gas turbine augmentor or afterburner. 4,841,725, Cl. 60-261.000.
Farris, Richard J.; Cohen, Yachin; and DeTeresa, Steven J. Novel compositions based on reinforcement with microfibrillar networks of rigid-rod polymers. 4,842,924, Cl. 428-221.000.
Farrow, Cecil W.: *See*—
Cupo, Robert L.; and Farrow, Cecil W., 4,843,581, Cl. 364-724.010.
Faskova , Maria: *See*—
Urbanek, Peter; Farkas, Peter; Cvopa, Rudolf; Faskova , Maria; and Drbohlav, Jaroslav, 4,843,207, Cl. 219-121.600.
Faure, Bruno: *See*—
Rocher, Xavier; Faure, Bruno; and Legallais, Lucien, 4,842,445, Cl. 405-172.000.
Favreau, Danny W.; and Furr, Clen H. Gasoline superheater. 4,841,943, Cl. 123-557.000.
Feaster, Fred T. Intraocular lens with variable circumference encircling haptic. 4,842,600, Cl. 623-6.000.
Fecht, David C.; Ferguson, Thomas B.; Crouther, Ronald; and Ranford, Alan B., to Sherwood Medical Company. Intercavity catheter. 4,842,589, Cl. 604-280.000.
Fedaravichjus, Algimantas Y.; Kazla, Algis A.; Rimshyalis, Klemensas K.; and Ragulskis, Kazimeras M. Apparatus for threading a wire through magnetic cores of a memory matrix. 4,841,629, Cl. 29-737.000.
Fehling, Paul, to Walter Just Gesellschaft m.b.H. Self-inking stamp for performing an inking upstroke. 4,841,860, Cl. 101-334.000.
Feingold, David S.: *See*—
Youngner, Julius S.; Feingold, David S.; and Keleti, Georg, 4,842,855, Cl. 424-95.000.
Feldmaier, Douglas A., to General Motors Corporation. Acoustic emission automotive crash sensor. 4,842,301, Cl. 280-735.000.
Feldmuhle AG: *See*—
Lamort, Jean-Pierre, 4,842,777, Cl. 261-79.200.
Fenk, Josef, to Siemens Aktiengesellschaft. Monolithically integrable controller circuit. 4,843,340, Cl. 330-126.000.
Fenk, Josef, to Siemens Aktiengesellschaft. Monolithically integrable, amplitude-controllable oscillator amplifier circuit. 4,843,348, Cl. 331-109.000.
Fennemann, Wolfgang: *See*—
Dorr, Karl H.; Grimm, Hugo; Neumann, Heinz; Fennemann, Wolfgang; and Ohlms, Norbert, 4,842,835, Cl. 423-242.000.
Ferag AG: *See*—
Meier, Jacques, 4,841,714, Cl. 53-429.000.
Ferguson, James A. Flusing adaptor and method of manufacture. 4,842,002, Cl. 134-167.00R.
Ferguson, James M. Process and apparatus for manufacturing tube bends. 4,841,760, Cl. 72-133.000.
Ferguson, Stewart. Four-way skeleton pallet. 4,841,879, Cl. 108-51.100.
Ferguson, Stewart. Skeleton four-way pallet. 4,841,880, Cl. 108-51.100.
Ferguson, Thomas B.: *See*—
Fecht, David C.; Ferguson, Thomas B.; Crouther, Ronald; and Ranford, Alan B., 4,842,589, Cl. 604-280.000.
Fero, Arnold H.; and Anderson, Stanwood L., Jr., to Westinghouse Electric Corp. Support stand for top access reactor cavity dosimetry. 4,842,807, Cl. 376-254.000.
Ferreira-Godinho, Manuel. Organizational aid for paper sheets, especially EDP paper sheets. 4,842,434, Cl. 402-34.000.
Ferrer Internacional S.A.: *See*—
Foguet, Rafael; Forne, Ernesto; Sacristan, Aurelio; Castello, Josep M.; and Ortiz, Jose A., 4,843,165, Cl. 548-341.000.
Ferri, Giampiero. Toy firearm for firing projectiles by compressed air, with the piston of the cylinder-piston system attached to the hammer of the firearm. 4,841,655, Cl. 42-58.000.
Fetter, Richard W.; Gadsby, Peter D.; and Kabachinski, Jeffery L., to Marquette Electronics, Inc. Microwave hyperthermia probe. 4,841,988, Cl. 128-804.000.
Feuer, Hank O.: *See*—
Touchet, Paul; Rodriguez, Gumersindo; Gatza, Paul E.; Butler, Daniel P.; Crawford, Dawn; Teets, Alan R.; Feuer, Hank O.; and Flanagan, David P., 4,843,114, Cl. 524-87.000.
Fick, Herbert J., to Bergquist Company, The. Interfacing for heat sinks. 4,842,911, Cl. 428-40.000.
Fiedler, Volker-Bernd: *See*—
Rosentreter, Ulrich; Boshagen, Horst; Lieb, Folker; Oediger, Hermann; Fiedler, Volker-Bernd; Perzborn, Elisabeth; and Seuter, Friedel, 4,843,091, Cl. 514-419.000.
Field, Nathaniel L.: *See*—
Donovan, David A.; and Field, Nathaniel L., 4,842,450, Cl. 408-1.00R.
Fields, Harold T.: *See*—
Crawford, Delmar E.; and Fields, Harold T., 4,842,895, Cl. 427-116.000.
Fillmore-Piru Citrus Association: *See*—
Creason, Kenneth C.; Salka, John A.; and Holland, Ralph R., 4,842,880, Cl. 426-303.000.
Filonov, Oleg V.: *See*—
Shneerov, Yakov A.; Vikhlevschuk, Valery A.; Asnis, Arkady E.; Kondrashkin, Vitaly A.; Filonov, Oleg V.; Gurov, Vadim N.; Gutman, Lia M.; Poklady, Vadim R.; Zhilinsky, Vasily V.; Polyakov, Valery A.; Nikitenko, Valery I.; Bashmakov, Jury V.; Burshtein, Vladislav B.; Anastasiadi, Emanuil F.; Krainik, Yaroslav I.; Demerly, Konstantin P.; Ignatchenko, Pavel V.; Kozachenko, Dmitry E.; and Piptjuk, Vitaly P., 4,843,212, Cl. 219-146.230.
Filterwerk Mann & Hummel GmbH: *See*—
Zundel, Fritz, 4,842,623, Cl. 55-262.000.
Fine, David H., to Thermedics Inc. Detection system and method. 4,843,016, Cl. 436-106.000.
Fink, Martha M.: *See*—
Fink, Michael P., 4,841,596, Cl. 16-114.00B.
Fink, Michael P., to Fink, Nellie M.; Fink, Martha M.; and Edwards, Susan M. Handle with shaped recesses to support flimsy bag straps. 4,841,596, Cl. 16-114.00B.

Fink, Nellie M.: *See*—
Fink, Michael P., 4,841,596, Cl. 16-114.00B.
Finke, Juergen; and Bartmann, Martin, to Huels Aktiengesellschaft. Moldable high molecular weight aromatic polyamide from poly arylene oxy diamine. 4,843,139, Cl. 528-125.000.
Fiquet, Claire: *See*—
Grollier, Jean F.; Fiquet, Claire; Fourcadier, Chantal; Dubief, Claude; Mondet, Jean; and Cauwet, Daniele, 4,842,849, Cl. 424-70.000.
Firestone Tire & Rubber Company, The: *See*—
Tazewell, Joseph H.; Christenson, Christopher P.; Turner, Robert B.; and Gonzales, Manuel, Jr., 4,843,138, Cl. 528-52.000.
Fis, Joelle Y.; Lidy, Werner A.; Phillips, Brian D.; and Thomas, David B., to BP Chemicals Limited. Modified polymer polyols. 4,843,106, Cl. 521-107.000.
Fischer, Artur, to fischerwerke Artur Fischer GmbH & Co KG. Anchoring assembly. 4,842,461, Cl. 411-55.000.
Fischer, Gerhard: *See*—
Grubisic, Vatroslav; and Fischer, Gerhard, 4,842,338, Cl. 301-9.0DN.
Fischer, Helmut. Device for a hardness measuring instrument. 4,841,764, Cl. 73-81.000.
Fischer, Rolf: *See*—
Schulz, Bernhard; and Fischer, Rolf, 4,843,171, Cl. 560-262.000.
fischerwerke Artur Fischer GmbH & Co KG: *See*—
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Fisher Controls International, Inc.: *See*—
Rice, Donald D.; and Hood, Mark E., 4,842,013, Cl. 137-484.400.
Fitzgerald, John M.; and Workman, Gary L., to Deslauriers, Inc. Lightweight plastic concrete mold. 4,842,241, Cl. 249-50.000.
Flanagan, David P.: *See*—
Touchet, Paul; Rodriguez, Gumersindo; Gatza, Paul E.; Butler, Daniel P.; Crawford, Dawn; Teets, Alan R.; Feuer, Hank O.; and Flanagan, David P., 4,843,114, Cl. 524-87.000.
Flanders, Staunton O.; and Ness, William A., to Haven Energy, Ltd. Furnace control system. 4,842,044, Cl. 165-12.000.
Flanigen, Edith M.: *See*—
Lok, Brent M.; Cannan, Thomas R.; and Flanigen, Edith M., 4,842,836, Cl. 423-328.000.
Flasck, Richard A.; Irwin, Benny; and Holmberg, Scott H., to Alphasil, Inc. Method of illuminating flat panel displays to provide CRT appearing displays. 4,842,378, Cl. 350-345.000.
Flashinski, Stanley J.: *See*—
Demarest, Scott W.; Martin, John; Hainze, John H.; and Flashinski, Stanley J., 4,841,669, Cl. 43-131.000.
Fleckles, Karen: *See*—
Fleckles, Logan N.; and Fleckles, Karen, 4,841,899, Cl. 114-347.000.
Fleckles, Logan N.; and Fleckles, Karen. Kayak, folding. 4,841,899, Cl. 114-347.000.
Fletcher, Edward A.: *See*—
Lerche, Nolan C.; Fletcher, Edward A.; and Twedell, Michael H., 4,842,093, Cl. 180-287.000.
Fletcher, Richard N. Robber deterrent apparatus. 4,841,752, Cl. 109-20.000.
Fletcher, Robert E.: *See*—
Graf, Hans-Juergen; Fletcher, Robert E.; Randtke, Peter T.; Rhine, Bruce E.; and Monkowski, J. R., 4,842,827, Cl. 422-112.000.
Flight Dynamics, Inc.: *See*—
Wood, Robert B.; Thomas, Mark A.; Valimont, James L.; Littell, H. Edward, Jr.; and Freeman, Glenn E., 4,842,389, Cl. 350-3.700.
Floren, Carl E.; and Logman, Timothy M., to Mueller Co. Valve seat configuration. 4,842,246, Cl. 251-333.000.
Flowe, Robert C.: *See*—
Grubbs, John R., Jr.; Sarathy, Aravamuthan P.; and Flowe, Robert C., 4,843,015, Cl. 436-103.000.
Flynn, Patrick J., to General Electric Company. Programmable radio frequency communications device capable of programming a similar device. 4,843,588, Cl. 364-900.000.
Fobbe, Fritz: *See*—
Schmidt, Martin; Mayr, Karl-Heinz; and Fobbe, Fritz, 4,841,617, Cl. 29-157.3AH.
Fogg, James L.: *See*—
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Foguet, Rafael; Forne, Ernesto; Sacristan, Aurelio; Castello, Josep M.; and Ortiz, Jose A., to Ferrer Internacional S.A. Process for preparing a 2,3-dihydro-1H-imidazolyl-ethoxy indene antithrombotic agent and its pharmaceutically acceptable salts. 4,843,165, Cl. 548-341.000.
Foley, Geoffrey M. T.: *See*—
Badesha, Santokh S.; Cherin, Paul; Foley, Geoffrey M. T.; Lees, Barry A.; and Wozniak, John, 4,842,973, Cl. 430-128.000.
Foller, Dieter; and Tews, Jurgen, to Battelle-Institut e.V. Sound protection snit. 4,842,913, Cl. 428-71.000.
Fomin, Alexandr S.: *See*—
Galiakbarov, Vil F.; Sannikov, Rashit K.; Mavljutov, Midkhat R.; Fomin, Alexandr S.; Baranovsky, Vladimir D.; Galiev, Radil A.; and Sedakov, Rinat G., deceased, 4,842,066, Cl. 166-265.000.
Ford Aerospace & Communications Corporation: *See*—
Bhat, Mahabaleshwar K. P.; Liu, Tung Y.; and Plescia, Carl T., 4,843,294, Cl. 318-696.000.
Ford Aerospace Corporation: *See*—
Garrett, Harold E., 4,841,867, Cl. 102-520.000.
Tsao, Chich-Hsing; and Roberts, Thomas E., 4,843,400, Cl. 343-700.0MS.
Ford Motor Company: *See*—
Demirvont, Hulya, 4,842,382, Cl. 350-357.000.
Donovan, David A.; and Field, Nathaniel L., 4,842,450, Cl. 408-1.00R.
Logothetis, Eleftherios M.; Hetrick, Robert E.; Soltis, Richard E.; and Vassell, William C., 4,841,934, Cl. 123-440.000.
Roulinson, Daniel A., 4,842,339, Cl. 301-37.00S.
Forest Line of B.P.: *See*—
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Forgacs, Lilla: *See*—
Szantay, Csaba; Soti, Ferenc; Incze, Maria; Balogh nee Kardos, Zsuzsanna; Szombathelyi, Zsolt; Karpati, Egon; Kiss, Bela; Csomor, Katalin; Laszlovszky, Istvan; Lapis, Erzsebet; Forgacs, Lilla; Kuthi, Csaba; and Szporny, Laszlo , 4,843,080, Cl. 514-285.000.
Forino, Vincent. Method for making fermented beverages. 4,842,869, Cl. 426-8.000.
Fornasari, Paolo, to Eltek S.p.A. Liquid dispensing device which delivers a pre-set, constant volume independent of the pressure and volume of the liquid supplied to it. 4,842,167, Cl. 222-249.000.
Forne, Ernesto: *See*—
Foguet, Rafael; Forne, Ernesto; Sacristan, Aurelio; Castello, Josep M.; and Ortiz, Jose A., 4,843,165, Cl. 548-341.000.
Forrer, Christian. Automatic solid food dispenser for domestic animals. 4,841,913, Cl. 119-51.120.
Forschungs-& Entwicklungs-KG: *See*—
Schulz, Peter, 4,841,786, Cl. 73-864.250.
Forster, Adrian; Geyer, Stefan; Schulmeyr, Josef; Schmidt, Roland; and Gehrig, Manfred, to Hopfen-Extraktion HVG Bart, Raiser & Co. Process for the extraction of nonpolar constituents of hops. 4,842,878, Cl. 426-286.000.
Fort, Emil M.; and Simmonds, Leonard B., to Westinghouse Electric Corp. Strand-to-strand short circuit tester. 4,842,539, Cl. 439-262.000.
Foseco International Limited: *See*—
Brown, John R.; Graham, Nigel K.; and King, Russell A., 4,842,037, Cl. 164-45.000.
Fourcadier, Chantal: *See*—
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Foust, Donald F.; Dumas, William V.; Lamby, Edward J.; and Karas, Bradley R., to General Electric Company. Method for treating a polyimide surface to improve the adhesion of metal deposited thereon, and articles produced thereby. 4,842,946, Cl. 428-458.000.
Fowler, David E.; and McIlvaine, Eugene T., to Quadrex Hps Inc. Method of removing toxic agents for trichlorotrifluoroethane. 4,842,746, Cl. 210-689.000.
Fox, Roger H.: *See*—
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Fox, Wayne D., to Xerox Corporation. System for priming the magnetic brush end seals of copier/printer machines. 4,843,421, Cl. 355-253.000.
Framatome: *See*—
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Cauquelin, Claude; and Poitrenaud, Pierre, 4,842,815, Cl. 376-463.000.
Desfontaines, Guy; and Millot, Jean P., 4,842,813, Cl. 376-353.000.
Frame, John M., to Washington State University Research Foundation, Inc. Electronic integrator circuitry for piezoelectric and other sensors. 4,843,308, Cl. 324-120.000.
Franchi, Sergio, to SEAC Engineering S.R.L. Device for automatic reading of cheques, bills and the like and for electronic management of the data detected. 4,843,219, Cl. 235-379.000.
Franco, Cosimo: *See*—
Faggian, Lucio; Castellano, Maurizio; Platone, Edoardo; and Franco, Cosimo, 4,843,184, Cl. 585-864.000.
Franke, Heinz, to Spanset Inter AG. Edge protector angle piece. 4,842,914, Cl. 428-99.000.
Franke, Wolfgang: *See*—
Kullen, Albrecht; Klawuhn, Manfred; Hickel, Sigrun; and Franke, Wolfgang, 4,842,416, Cl. 366-314.000.
Frantz, Robert H., to AMP Incorporated. Solder post retention means. 4,842,528, Cl. 439-80.000.
Frantz, Robert H.; and Whiteman, Robert N., Jr., to AMP Incorporated. Connector with two-piece ground strap. 4,842,529, Cl. 439-95.000.
Frantz, Robert H., to AMP Incorporated. Tolerance forgiving boardlock. 4,842,552, Cl. 439-557.000.
Franz Grumme Landmaschinenfabrik GmbH & Co. KG *See*—
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Fred Hutchinson Cancer Research Center: *See*—
Henikoff, Steven; and Gelinas, Richard E., 4,843,003, Cl. 435-91.000.
Freedman, David D., to General Electric Company. Regulating pulse width modulator for power supply with high speed shutoff. 4,843,532, Cl. 363-26.000.
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Freller, Helmut; and Schack, Peter, to Siemens Aktiengesellschaft. Method of making mixed nitride films with at least two metals. 4,842,710, Cl. 204-192.380.

French, Raymond: *See—*
Pearce-Harvey, Peter R.; Thomlinson, Ernest V.; and French, Raymond, 4,843,528, Cl. 362-277.000.

French, Thomas J.; Harrell, Lester R.; and Dellinger, Anthony L., to EPRI. Plasma torch. 4,843,208, Cl. 219-121.390.

Frenzel, Bertram; Grenzendorfer, Dietmar; Kemter, Heinz; Wuensch, Wolfgang; and Zeisberg, Peter, to VEB Kombinat Textima. Warp-knitting machine, especially sewing-knitting machine, and method for the production of warp-knit fabric with oblique and diagonal filling threads. 4,841,747, Cl. 66-84.00A.

Freti, Silvano; and Buxmann, Kurt, to Swiss Aluminium Ltd. Method of measurement of the rate of oxidation of a metal melt. 4,842,674, Cl. 156-601.000.

Fribolin, Hans U.: *See—*
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Fridman, Boris S.: *See—*
Gainutdinova, Raisa V.; Petrova, Vera M.; Blokhina, Alevtina I.; Fridman, Boris S.; and Gamer, Pinkhos U., 4,841,991, Cl. 128-833.000.

Friedl, Richard, to LGZ Landis & GYR ZUG AG. Electricity meter with arrangement for monitoring core saturation incidents. 4,843,310, Cl. 324-127.000.

Friedman, Robert H.; and Surles, Billy W., to Texaco Inc. Sand consolidation methods. 4,842,072, Cl. 166-295.000.

Friedmann, Eric H., to Norzon Management Limited. Processing of biological products. 4,841,850, Cl. 99-472.000.

Frink America, Inc.: *See—*
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Frith, Andrew P.: *See—*
McHale, Anthony; and Frith, Andrew P., 4,841,933, Cl. 123-419.000.

Fritz, Peter J.; and Nnebedum, Joseph C., to Minnesota Mining and Manufacturing Company. Glass polishing article. 4,842,619, Cl. 51-295.000.

Froggatt, Robert J.: *See—*
Best, John E.; LeMay, Christopher A. C.; Hounsfield, Godfrey N.; and Froggatt, Robert J., 4,843,618, Cl. 378-4.000.

Froning, Robert L.: *See—*
Benge, S. Eugene; and Froning, Robert L., 4,843,404, Cl. 343-895.000.

Fry, Rupert J., Jr.; and Silbernagel, Raymond A., to Molex Incorporated. Integrally molded environmentally protected strain relief backshell. 4,842,550, Cl. 439-471.000.

Fu, Peter L.; and Lenoski, Daniel E., to Tandem Computers Incorporated. Cross-coupled checking circuit. 4,843,608, Cl. 371-68.000.

Fuchs, Erich, to Nixdorf Computer AG. Switching power supply. 4,843,535, Cl. 363-71.000.

Fuel Tech, Inc.: *See—*
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Fuelock, Inc.: *See—*
Castro, Felix, 4,842,092, Cl. 180-287.000.

Fuerst, Arpad; and Wingen, Bernhard, to Webasto AG Fahrzeugtechnik. Device for controlling movements of covers in sliding and lifting roofs, and sliding and lifting roof utilizing same. 4,841,812, Cl. 74-810.000.

Fuhrer, John P. R., to 698315 Ontario, Ltd. Reinforced cementitious panel. 4,841,705, Cl. 52-410.000.

Fuji, Hiroshi: *See—*
Fujiwara, Tetsuo; Fuji, Hiroshi; Iwaki, Takashi; Deguchi, Toshihisa; and Kobayashi, Shozou, 4,843,604, Cl. 369-116.000.

Fuji Jikogyo Kabushiki Kaisha: *See—*
Ochiai, Katsumi, 4,841,789, Cl. 74-15.60.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Oshita, Saiichiro; Mouri, Toyohiko; and Takahashi, Tsutomu, 4,842,088, Cl. 180-79.100.
Sakamoto, Masanori; and Morozumi, Takuro, 4,841,939, Cl. 123-494.000.
Satoh, Keiji, 4,841,814, Cl. 74-866.000.
Takahashi, Mitsuo, 4,842,297, Cl. 280-675.000.

Fuji Photo Equipment Co., Ltd.: *See—*
Yazawa, Yoshiyuki; Ohnishi, Hirofumi; Akimoto, Taizo; Washizu, Susumu; and Shoji, Tsuyoshi, 4,843,471, Cl. 358-160.000.

Fuji Photo Film Co., Ltd.: *See—*
Hasegawa, Akira, 4,842,983, Cl. 430-175.000.
Horiguchi, Masashi; and Yakubo, Minoru, 4,843,431, Cl. 355-34.000.
Horiguchi, Masashi; Yakubo, Minoru; Yokota, Masanori; and Oshima, Hideharu, 4,843,435, Cl. 358-100.000.
Ishige, Sadao; Usami, Toshimasa; Kamikawa, Hiroshi; and Tanaka, Toshiharu, 4,842,979, Cl. 430-138.00.
Ishikawa, Shunichi, 4,842,978, Cl. 430-138.000.
Kakimi, Fujio, 4,842,977, Cl. 430-138.000.
Kato, Eiichi; Ishii, Kazuo; Ishibashi, Hiroshi; Dan, Shigeyuki; and Sera, Hidefumi, 4,842,975, Cl. 430-137.000.
Kubota, Kazuo; and Sakaguchi, Masaaki, 4,842,210, Cl. 242-67.10R.
Matsuda, Nobuaki; Kokubo, Tadayoshi; Aoai, Toshiaki; Umehara, Akira; and Aotani, Yoshimasa, 4,842,986, Cl. 430-270.000.
Miyamoto, Kimiaki, 4,842,900, Cl. 427-348.000.
Nakajima, Nobuyoshi, 4,843,240, Cl. 250-327.200.
Oishi, Hisao; Yanagihara, Kazuhiko; Miyakawa, Tadashi; Nakamura, Takeshi; Akimoto, Kazuhiko; and Shioji, Mitsuaki, 4,842,379, Cl. 350-347.00E.
Ono, Mitsunori; Tamoto, Koji; Mihayashi, Keiji; Ichijima, Seiji; Itoh, Isamu; and Nakamura, Yoshisada, 4,842,985, Cl. 430-226.000.
Sakanoue, Kei; and Ichijima, Seiji, 4,842,994, Cl. 430-543.000.
Saotome, Shigeru; and Ishida, Masamitsu, 4,843,241, Cl. 250-327.200.
Seshimoto, Osamu; Terashima, Masaaki; and Saito, Yoshio, 4,842,712, Cl. 204-416.000.
Shinada, Toru, 4,843,472, Cl. 358-164.000.
Takayanagi, Takashi; and Kawaguchi, Hideo, 4,842,380, Cl. 350-351.000.
Uchiyama, Kaoru; Takase, Haruo; Sakamoto, Kiichiro; Uenaka, Kazushige; Kokubu, Masakazu; and Akimoto, Masno, 4,843,412, Cl. 354-275.000.
Yagihara, Morio; Fujimoto, Hiroshi; Ishikawa, Takatoshi; and Andoh, Kazuto, 4,842,993, Cl. 430-380.000.
Yoshino, Shigeru, 4,843,414, Cl. 354-21.000.

Fujie, Hiroshi: *See—*
Matsui, Hideo; and Fujie, Hiroshi, 4,842,796, Cl. 264-184.000.

Fujie, Tohru; and Hirose, Yoshio, to Atsugi Motor Parts Company, Limited. Vane pump with positioning pins for cam ring. 4,842,500, Cl. 418-133.000.

Fujii, Toshiro; Suzuki, Shinichi; and Nakamoto, Akira, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method for controlling a displacement changing mechanism of a variable displacement refrigerant compressor for a car air-conditioner. 4,841,737, Cl. 62-133.000.

Fujii, Yoshihalu: *See—*
Araki, Yasuo; Itoh, Tetsuya; Iwai, Shougo; and Fujii, Yoshihalu, 4,842,205, Cl. 241-34.000.

Fujikura Ltd.: *See—*
Yatsuhashi, Motoharu; Mochizuki, Masataka; and Sugihara, Shinich, 4,842,053, Cl. 165-104.140.

Fujikura, Takashi; Matsumoto, Yuzo; and Asano, Masharu, to Yamanouchi Pharmaceutical Co., Ltd. Pyridine derivatives, process for production thereof and pharmaceutical compositions useful as anti-arhytmics. 4,843,085, Cl. 514-356.000.

Fujimoto, Hiroshi: *See—*
Yagihara, Morio; Fujimoto, Hiroshi; Ishikawa, Takatoshi; and Andoh, Kazuto, 4,842,993, Cl. 430-380.000.

Fujino, Kiyoshi; and Ueno, Toyoaki, to UBE Industries, Inc. Injection method of die casting machine. 4,842,038, Cl. 164-80.000.

Fujio, Junichi: *See—*
Nishizawa, Tsutomu; Yamada, Yasuyuki; Fujio, Junichi; and Hosonuma, Shin, 4,842,781, Cl. 264-1.300.

Fujioka, Atsushi; Morimura, Atsushi; Kitamura, Yoshinori; and Matsuoka, Hiroki, to Matsushita Electric Industrial Co., Ltd. System for controlling the amount of light reaching an image pick-up apparatus based on a brightness/darkness ratio weighing. 4,843,476, Cl. 358-228.000.

Fujisawa, Katsuya: *See—*
Kawatsuki, Nobuhiro; Fujisawa, Katsuya; Matsuzaki, Ichiro; and Uetsuki, Masao, 4,842,969, Cl. 430-5.000.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Takenawa, Seishi; Ueda, Mikio; and Takeda, Hideki, 4,842,873, Cl. 426-49.000.

Fujitsu Limited: *See—*
Hattori, Toshihiro; Ishihara, Masaki; Kasai, Hitoshi; and Asagi, Yasuyoshi, 4,843,555, Cl. 364-431.070.
Suzuki, Atsushi, 4,843,595, Cl. 365-189.010.

Fujitsubo Giken Co., Ltd.: *See—*
Fujitsubo, Isamu, 4,842,096, Cl. 181-252.000.

Fujitsubo, Isamu, to Fujitsubo Giken Co., Ltd. Automobile muffler. 4,842,096, Cl. 181-252.000.

Fujiwara, Kenzo: *See—*
Tokuda, Yasunori; and Fujiwara, Kenzo, 4,843,032, Cl. 437-129.000.

Fujiwara, Kunihiko: *See—*
Yabumoto, Toshiaki; and Fujiwara, Kunihiko, 4,842,831, Cl. 422-198.000.

Fujiwara, Takuji; Ishii, Kozo; and Mizobe, Tatsutoshi, to Mazda Motor Corporation. Oil pressure circuit for an automatic transmission. 4,841,813, Cl. 74-866.000.

Fujiwara, Tetsuo; Fuji, Hiroshi; Iwaki, Takashi; Deguchi, Toshihisa; and Kobayashi, Shozou, to Sharp Kabushiki Kaisha. Beam controller for magneto-optical disc memory system. 4,843,604, Cl. 369-116.000.

Fukahori, Naoyuki: *See—*
Terada, Hiromu; Sakunaga, Kenichi; and Fukahori, Naoyuki, 4,842,365, Cl. 350-96.240.

Fukasawa, Yoshiharu; Kawai, Mituo; Ishihara, Hideo; and Yamanobe, Takashi, to Kabushiki Kaisha Toshiba. Sputtering target. 4,842,706, Cl. 204-298.000.

Fukayama, Yukio; and Kuramoto, Atsushi, to Babcock-Hitachi Kabushiki Kaisha. Boiler control system. 4,841,918, Cl. 122-406.0ST.

Fukazawa, Tokuumi: *See—*
Ohno, Tomoyuki; Shiroishi, Yoshihiro; Hishiyama, Sadao; Suzuki, Hiroyuki; Shirakura, Takaaki; Matsuoka, Shinya; Sano, Makoto; Nakamura, Takao; Takagi, Kazumasa; Fukazawa, Tokuumi; and Susa, Kenzo, 4,842,917, Cl. 428-141.000.

Fukuda, Hiroya: *See—*
Sawa, Eiji; Moriya, Susumu; Fukuda, Hiroya; and Ohashi, Takashi, 4,842,926, Cl. 428-224.000.

Fukuda, Hiroyuki, to Olympus Optical Co., Ltd. Bending device for an endoscope. 4,841,950, Cl. 128-4.000.

Fukuda, Shigeo: *See—*
Saito, Hisashi; Ohnaka, Shinji; and Fukuda, Shigeo, 4,843,173, Cl. 562-531.000.

Fukuda, Tsuyoshi; Suzuki, Masayuki; and Kiuchi, Masayoshi, to Canon Kabushiki Kaisha. Mirror device for a camera. 4,843,420, Cl. 354-479.000.

Fukui, Masayuki: *See—*
Matsumoto, Shinichi; Miyoshi, Naoto; Muraki, Hideaki; Sobukawa, Hideo; Fukui, Masayuki; Kimura, Mareo; and Shinjoh, Hirofumi, 4,843,056, Cl. 502-302.000.

Fukumura, Sadafumi: *See—*
Misaka, Toru; and Fukumura, Sadafumi, 4,842,258, Cl. 267-140.100.

Fukuoka, Hidenori: *See—*
Iida, Takashi; Itoh, Masatoshi; Fukuoka, Hidenori; Tsukamoto, Takeya; and Kondo, Takashi, 4,843,456, Cl. 358-29.000.

Fukuoka, Shingoro: *See—*
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Fukushima, Hirotaka, to Kabushiki Kaisha Daikin Seisakusho. Flywheel assembly. 4,842,116, Cl. 192-106.200.

Fukushima, Hirotaka, to Kabushiki Kaisha Daikin Seisakusho. Flywheel assembly. 4,842,117, Cl. 192-106.200.

Fuller, John E.: *See—*
Coupard, Donald N.; Chang, Andrew K.; Fuller, John E.; and Mauriello, Angelo J., 4,841,692, Cl. 52-173.00R.

Fuller, Kip L.; and Collier, Donald W., to Guardian Technologies, Inc. Remote confinement system. 4,843,377, Cl. 340-573.000.

Fuller, Ronald D.; Dougherty, Richard M.; Fullerton, Craig L.; and Malone, Hugh R., to Motorola, Inc. Broad band microwave biasing networks suitable for being provided in monolithic integrated circuit form. 4,843,354, Cl. 333-81.00A.

Fuller, Steven A.; and Hurrell, John G. R., to ADI Diagnostics Inc. Canine heartworm vaccine and diagnostic test. 4,842,999, Cl. 435-7.000.

Fullerton, Craig L.: *See—*
Fuller, Ronald D.; Dougherty, Richard M.; Fullerton, Craig L.; and Malone, Hugh R., 4,843,354, Cl. 333-81.00A.

Fulmer Yarsley Ltd.: *See—*
Brook, Michael G., 4,842,597, Cl. 604-368.000.

Fumioka, Jun: *See—*
Ito, Yasushi; Imamura, Masaaki; Kato, Yoshiki; and Fumioka, Jun, 4,842,618, Cl. 51-293.000.

Funato, Yasumichi: *See—*
Hamano, Hideo; Funato, Yasumichi; and Ida, Shuichiro, 4,841,803, Cl. 74-665.0GE.

Furr, Clen H.: *See—*
Favreau, Danny W.; and Furr, Clen H., 4,841,943, Cl. 123-557.000.

Furuhata, Takashi; Yumde, Yasufumi; Okamura, Fujio; Noguchi, Takaharu; Shibuya, Toshifumi; Mohri, Katsuo; Arai, Takao; and Terada, Toshimichi, to Hitachi, Ltd. Rotary head type magnetic recording and reproducing apparatus and method of producing tracking control signals therefor. 4,843,493, Cl. 360-77.150.

Furukawa Electric Co., Ltd., The: *See—*
Maeda, Ryu; Fukuoka, Shingoro; and Yatabe, Hiroshi, 4,842,959, Cl. 428-630.000.
Yabumoto, Toshiaki; and Fujiwara, Kunihiko, 4,842,831, Cl. 422-198.000.

Furukawa, Hideki: *See—*
Matsui, Hideo; Yamaguchi, Yuji; and Furukawa, Hideki, 4,841,582, Cl. 4-420.100.

Furukawa, Kusuo: *See—*
Kusaba, Takashi; Abe, Hideo; Torao, Akira; Furukawa, Kusuo; Yanagimoto, Takayuki; and Sasaki, Hiroaki, 4,841,611, Cl. 29-121.200.

Furumura, Kyozaburo; and Matsunaga, Shigeki, to Nippon Seiko Kabushiki Kaisha. Bearing assembly. 4,842,426, Cl. 384-478.000.

Furuya, Tamio; Tazaki, Yuichi; Kinugasa, Toshiyuki; Ishige, Yoshiki; and Tsuchimoto, Yuichi, to Honda Giken Kogyo Kabushiki Kaisha. Method of manufacturing an electrocast shell having permeability. 4,841,618, Cl. 29-423.000.

Fury, Tommy J. Beach submarine. 4,841,896, Cl. 114-312.000.

Fussnegger, Wolfgang; Rieth, Egon; Koucky, Antonin; and Hector, Bernd, to Daimler-Benz Aktiengesellschaft. Motor car seat guide rail support system. 4,842,318, Cl. 296-65.100.

Fust, Peter: *See—*
Bartschi, Peter; and Fust, Peter, 4,842,213, Cl. 242-125.100.

Futami, Shigeru, to Research Development Corporation; and Futami, Shigeru. Apparatus for controlling servo system employing piezoelectric actuator. 4,843,293, Cl. 318-609.000.

Fuyama, Seiji; Mori, Tokio; Kodama, Mitsuhiro; Minato, Takashi; and Takaoka, Yasuhiro, to Matsushita Electric Industrial Co., Ltd. Cash register with a multi-window display. 4,843,547, Cl. 364-405.000.

G A O Gesellschaft fur Automation und Organisation mbH: *See—*
Hoppe, Joachim, 4,843,225, Cl. 235-492.000.

G-C Dental Industrial Corporation: *See—*
Kubota, Takao; Sakuma, Tetsuro; and Nakazato, Ryoji, 4,843,110, Cl. 522-14.000.

Gadsby, Peter D.: *See—*
Fetter, Richard W.; Gadsby, Peter D.; and Kabachinski, Jeffery L., 4,841,988, Cl. 128-804.000.

GAF Corporation: *See—*
Dragasevich, John, 4,842,747, Cl. 210-767.000.
Gonsalves, Kenneth E., 4,842,641, Cl. 75-0.5AA.
Tracy, David J.; Hashem, Mohamed M.; and Logiu, Robert B., 4,842,858, Cl. 424-150.000.

Gaffar, Abdul; and Afflitto, John, to Colgate-Palmolive Company. Device and composition for treatment of the gums. 4,843,099, Cl. 514-576.000.

Gagel, John J.: *See—*
Biemann, Klaus; and Gagel, John J., 4,843,243, Cl. 250-341.000.

Gagliani, John; and Long, John V. Methods and compositions for producing polyimide coatings. 4,842,948, Cl. 428-473.500.

Gagliani, John; and Long, John V. Methods and compositions for producing polyimide adhesive bonds. 4,842,949, Cl. 428-473.500.

Gainutdinova, Raisa V.; Petrova, Vera M.; Blokhina, Alevtina I.; Fridman, Boris S.; and Gamer, Pinkhos U., to Nauchno-Proizvodstvennoe Obiedinenie "Medinstrument". Intrauterine contraceptive device. 4,841,991, Cl. 128-833.000.

Gajary, Antal: *See—*
Balogh, Gyula; Boros nee Gundar, Iren; Gajary, Antal; Hidasi, Gyorgy; Rappi, Andras; Rakoczi, Jozsef; Soos, Rudolf; Szekely, Istvan; and Zoltan, Sandor, 4,843,174, Cl. 562-506.000.

Galati, Gaspare; and Losquadro, Giacinto, to Selenia Spazio Spa; and Gaspare Galati. Distributed-array radar system comprising an array of interconnected elementary satellites. 4,843,397, Cl. 342-59.000.

Galbiati, Leandro: *See—*
Raimondi, Tullio; Presle, Pierre; Galbiati, Leandro; and de Burbure, Stephane, 4,843,213, Cl. 219-159.000.

Galbraith, Douglas C., to Visic, Inc. Dynamic sense amplifier for CMOS static RAM. 4,843,264, Cl. 307-530.000.

Galiakbarov, Vil F.; Sannikov, Rashit K.; Mavljutov, Midkhat R.; Fomin, Alexandr S.; Baranovsky, Vladimir D.; Galiev, Radil A.; and Sedakov, Rinat G., deceased (by Sedakova, Tatyana Pavlovna, Elvira Rinatovna Sedakova, Boris Rinatovich Sedakov, administrators), to Ufimsky Neftyanoi Institut. Method for isolation of intake beds in drill holes and a device for carrying same into effect. 4,842,066, Cl. 166-265.000.

Galiev, Radil A.: *See—*
Galiakbarov, Vil F.; Sannikov, Rashit K.; Mavljutov, Midkhat R.; Fomin, Alexandr S.; Baranovsky, Vladimir D.; Galiev, Radil A.; and Sedakov, Rinat G., deceased, 4,842,066, Cl. 166-265.000.

Gallagher, Karen A., executrix: *See—*
Akkapeddi, Murali K.; Bradley, David E.; and Gallagher, Thomas D., deceased, 4,843,127, Cl. 525-183.000.

Gallagher, Robert E., Sr., to AMP Incorporated. High density magazine for electrical connectors. 4,842,137, Cl. 206-328.000.

Gallagher, Thomas D., deceased: *See—*
Akkapeddi, Murali K.; Bradley, David E.; and Gallagher, Thomas D., deceased, 4,843,127, Cl. 525-183.000.

Gallo, Robert C.: *See—*
Sarngadharan, Mangalasseril G.; di Marzo Veronese, Fulvia; and Gallo, Robert C., 4,843,011, Cl. 435-240.270.

Galloway, John L., to Racal-Guardall (Scotland) Limited. Security sensors. 4,843,244, Cl. 250-342.000.

Galloway, Michael D.; Rose, William H.; and Shaffer, David T., to AMP Incorporated. Electrical connector assembly for antiskid braking system. 4,842,525, Cl. 439-34.000.

Gamblin, Rodger L., to Saranda Consolidated Limited Partnership. Substantive dyes, inks and dye baths. 4,842,646, Cl. 106-22.000.

Gamer, Pinkhos U.: *See—*
Gainutdinova, Raisa V.; Petrova, Vera M.; Blokhina, Alevtina I.; Fridman, Boris S.; and Gamer, Pinkhos U., 4,841,991, Cl. 128-833.000.

Gamo, Gotaro; and Kinoshita, Mitsuo, to Fanuc Ltd. Taper cutting control method and control system in wire-cut electric discharge machine. 4,843,203, Cl. 219-69.120.

Ganbarg, David: *See—*
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Gannaway, Edwin L., to Tecumseh Products Company. Compressor discharge muffler having cover plate. 4,842,492, Cl. 417-312.000.

Gantzhorn, John E., Jr.; and Sota, Koichi, to Otari Electric Company, Ltd. Tape transporting device. 4,843,487, Cl. 360-17.000.

Gantzhorn, Walter: *See—*
Zweigart, Gerhard; Belke, Werner; Gunther, Ewald; and Gantzhorn, Walter, 4,842,328, Cl. 296-214.000.

Garcia, Graham A.; and Reedy, Ronald E., to United States of America, Navy. Thin-film integrated injection logic. 4,843,448, Cl. 357-36.000.

Gardner, Arthur M. N.; and Fox, Roger H., to Electro-Biology, Inc. Apparatus for inducing venous-return flow from the leg. 4,841,956, Cl. 128-64.000.

Garland, Steven B., to W. R. Grace & Co.-Conn. Inter-ply adhesion between saran and linear ethylene copolymers. 4,842,952, Cl. 428-518.000.

Garner, Eric T. Method and apparatus for interosseous bone fixation. 4,841,960, Cl. 128-92.0YF.

Garrett, Harold E., to Ford Aerospace Corporation. Discarding sabot projectile. 4,841,867, Cl. 102-520.000.

Gaspare Galati: *See—*
Galati, Gaspare; and Losquadro, Giacinto, 4,843,397, Cl. 342-59.000.

Gatza, Paul E.: *See—*
Touchet, Paul; Rodriguez, Gumersindo; Gatza, Paul E.; Butler, Daniel P.; Crawford, Dawn; Teets, Alan R.; Feuer, Hank O.; and Flanagan, David P., 4,843,114, Cl. 524-87.000.

Gaudiana, Russell A.; Rogers, Howard G.; and Sinta, Roger F., to Polaroid Corporation, Patent Department. Melt-processable aromatic polyesteramide having repeating 2,2'-substituted biphenylene radicals. 4,843,141, Cl. 528-183.000.

Gauger, John R. D.: *See—*
Sasaki, Gordon H.; Jakubczak, Eugene R.; and Gauger, John R. D., 4,841,992, Cl. 128-899.000.

Gaustad, Charles A.: *See—*
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Gavezotti, Piero: *See—*
Scarati, Mario A.; Re, Alberto; Tognoni, Carlo; and Gavezotti, Piero, 4,842,939, Cl. 428-421.000.
Gazda, Imre I., to Otis Engineering Corporation. Well testing apparatus and methods. 4,842,064, Cl. 166-250.000.
Gazdik, Lawrence E.; and Allard, Edward F., to Kamyr, Inc. Mixing chlorine gas into paper pulp slurries. 4,842,690, Cl. 162-57.000.
Geary, Edwin S. Propeller and coupling member. 4,842,483, Cl. 416-93.00A.
Gebauer, Helmut; and Kreuzer, Franz-Heinrich, to Consortium fur Elektrochemische. Solid which releases a fragrant substance and/or a disinfectant. 4,842,853, Cl. 424-76.100.
Geekie, James, to Siliconix Incorporated. Method of fabricating a high value semiconductor resistor. 4,843,027 Cl. 437-63.000.
Gehrig, Manfred: *See—*
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Geick, Kenneth S.: *See—*
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Gelinas, Richard E.: *See—*
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General Dynamics Pomona Division: *See—*
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General Electric Company: *See—*
Beberman, Julie A.; Goldman, Ira B.; Larkin, Harold F.; and Hibbert, David A., 4,842,533, Cl. 439-213.000.
Bedard, Donna L.; and Brennan, Michael J., Jr., 4,843,007, Cl. 435-252.100.
Bjorge, Robert W., 4,841,722, Cl. 60-39.182.
Bopp, Lawrence H., 4,843,009, Cl. 435-253.300.
Bopp, Richard C., 4,843,116, Cl. 524-102.000.
Crawford, Delmar E.; and Fields, Harold T., 4,842,895, Cl. 427-116.000.
Devins, John C.; Reed, Clive W.; and Rzad, Stefan J., 4,842,941, Cl. 428-412.000.
Dole, Stephen L.; Arendt, Ronald H.; and Pasco, Wayne D., 4,843,042, Cl. 501-96.000.
Flynn, Patrick J., 4,843,588, Cl. 364-900.000.
Foust, Donald F.; Dumas, William V.; Lamby, Edward J.; and Karas, Bradley R., 4,842,946, Cl. 428-458.000.
Freedman, David D., 4,843,532, Cl. 363-26.000.
Glover, Gary H., 4,843,322, Cl. 324-309.000.
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Huang, Shyh-Chin; and Gigliotti, Michael F. X., Jr., 4,842,820, Cl. 420-418.000.
Johnson, Kenneth O., 4,842,484, Cl. 416-127.000.
Lau, Monica M.; and Coffinberry, George A., 4,841,723, Cl. 60-204.000.
Meise, William H.; Rosen, Arye; and Stabile, Paul J., 4,843,358, Cl. 333-263.000.
Morris, Robert A.; and Castonguay, Roger N., 4,843,359, Cl. 335-6.000.
Perkins, Roger J.; and Smith, Murray S., Jr., 4,842,953, Cl. 428-553.000.
Reitmeier, Glenn A., 4,843,485, Cl. 360-9.100.
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Smith, Peter H., deceased; and Reising, Flavian, Jr., 4,843,202, Cl. 219-10.55B.
Sotak, Christopher H., 4,843,321, Cl 324-309.000.
Stowell, William R., 4,842,477, Cl. 4 5-118.000.
Walles, Erik W.; Crivello, James V.; and Lupinski, John H., 4,842,800, Cl. 264-272.130.
Wojnarowski, Robert J.; and Eichelberger, Charles W., 4,842,677, Cl. 156-643.000.
General Kinematics Corporation: *See—*
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General Motors Corporation: *See—*
Abu-Isa, Ismat A.; Eusebi, Elio; Jaynes, Craig B.; Moran, Susan C.; and Roy, Michael A., 4,842,257, Cl. 267-133.000.
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Feldmaier, Douglas A., 4,842,301, Cl. 280-735.000.
Goding, David J.; and Rassaian, Mostafa, 4,841,873, Cl. 105-168.000.
Hawkins, Gene R., 4,842,295, Cl. 28 -661.000.
Kaminski, Brian D.; and Bandyopadhyay, Pulak, 4,841,820, Cl. 82-1.110.
Kimbrough, Scott S.; and Hallman, Steven J., 4,842,089, Cl. 180-79.100.
Koromilas, Constantinos A., 4,841,9 0, Cl. 123-246.000.
Maines, James R.; and Arnold, David , 4,842,656, Cl. 148-302.000.
Nietert, James E., 4,842,419, Cl. 374 145.000.
Partin, Dale L.; and Heremans, Joseph P., 4,843,444, Cl. 357-27.000.
Puzio, Daniel; Georges, William H.; and Bevilacqua, Gary L., 4,842,118, Cl. 192-150.000.
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Snavely, Gary L.; and Pelachyk, Richard, 4,841,832, Cl. 81-57.370.
Suriano, John R.; Staarmann, Patrick J.; Tracht, Steven L.; and Mueller, Dennis L., 4,843,286, Cl. 318-443.000.
Williston, Scott L.; and Sweigart, Mark A., 4,841,790, Cl. 74-89.150.
General Signal Corporation: *See—*
Vaughn, Lawrence E.; Rojecki, Walter E.; and Engle, Thomas H., 4,842,341, Cl. 303-37.000.
Genetic Systems Corporation: *See—*
Nowinski, Robert C.; and Hoffman, Allan S., 4,843,010, Cl. 435-7.000.
Genetics Institute, Inc.: *See—*
DeBonville, David A.; and Riedel, Gerard E., 4,843,012, Cl. 435-270.000.
Genvention, Inc.: *See—*
Towsend, Marvin S., 4,842,175, Cl. 224-275.000.
Geo-Centers, Inc.: *See—*
Darrah, Shirley D.; DiGiusseppe, Thomas G.; Marram, Edward P.; Kamin, Richard A.; Nowack, Clarence; and Steendal, Rolf, 4,842,410, Cl. 356-357.000.
Geoflow International Pty. Limited: *See—*
Kelsey, Christopher G., 4,842,245, Cl. 251-212.000.
Geophysical Engineering Company: *See—*
Assaf, Gad, 4,841,740, Cl. 62-271.000.
Georges, William H.: *See—*
Puzio, Daniel; Georges, William H.; and Bevilacqua, Gary L., 4,842,118, Cl. 192-150.000.
Georgis, Steven P.; Beavers, Kelly J.; and Haugland, Steve E., to Exabyte Corporation. Cyclical servo zone tracking method and apparatus for helical scan recording devices. 4,843,495, Cl. 560-77.150.
Gerasimova, Galina A.: *See—*
Babaian, Eduard A.; Gerasimova, Galina A.; Davydov, Anatoly B.; Utyamyshev, Rustam I.; Khromov, Gennady L.; Metelitsa, Vladimir I.; Vikhert, Anatoly M.; Savvateev, Konstantin L.; Piotrovsky, Vladimir K.; and Novikova, Elizaveta B., 4,842,854, Cl. 424-81.000.
Gerber, Heinz J., to Gerber Scientific, Inc. Cutter head and knife for cutting sheet material. 4,841,822, Cl. 83-174.000.
Gerber, Heinz J., to Gerber Scientific, Inc. Apparatus and method for determining a color for use in a fashion design. 4,843,574, Cl. 364-526.000.
Gerber Scientific, Inc.: *See—*
Gerber, Heinz J., 4,841,822, Cl. 83-174.000.
Gerber, Heinz J., 4,843,574, Cl. 364-526.000.
Gerd Und Bernd Vieler KG: *See—*
Stenemann, Bruno, 4,842,349, Cl. 312-116.000.
Gerhart, Tobin N.; and Hayes, Wilson C., to Beth Israel Hospital Association, The. Bioerodable implant composition. 4,843,112, Cl. 523-114.000.
Gerke, Burton E., Jr.: *See—*
Elson, Donald E.; Gerke, Burton E., Jr.; Bitzel, Michael E.; Wilder, Bruce A.; Rodowsky, Stanley J., Jr.; Lessig, William R., III; Adams, Jeffrey S.; and Hagan, Todd A., 4,841,594, Cl. 15-344.000.
Gerold, Gregory L.; and Dickerhoof, Bruce W., to Tonka Corporation. Cap-firing mechanism for a toy. 4,842,564, Cl. 446-297.000.
Gershuni, Alexandr N.; Maisotsenko, Valery S.; Zaripov, Vladilen K.; and Semena, Mikhail G., to Kievsky Politekhnichesky Institut. Cooler. 4,842,052, Cl. 165-104.110.
Gessner, Gregory B.: *See—*
Baker, Daniel C.; Stashak, Robert M.; Owens, William P.; and Gessner, Gregory B., 4,841,848, Cl. 99-277.200.
Geyer, Stefan: *See—*
Forster, Adrian; Geyer, Stefan; Schulmeyr, Josef; Schmidt, Roland; and Gehrig, Manfred, 4,842,878, Cl. 426-286.000.
Gharbi, Tijani: *See—*
Lafon, Jean-Claude; and Gharbi, Tijani, 4,843,623, Cl. 381-68.200.
Gibbs, Roger H.; and Lowrie, David J., to PDR Microelectronics Limited. Infra-red rework station. 4,843,216, Cl. 219-354.000.
Gibson, George A.: *See—*
Landa, Benzion; Ben-Auraham, Peretz; Hall, Joseph; and Gibson, George A., 4,842,974, Cl. 430-137.000.
Gibson, John W.: *See—*
Dunn, Richard L.; Gibson, John W.; Eddy, Carlton A.; and Laufe, Leonard E., 4,841,968, Cl. 128-335.500.
Gietzen, Staas: *See—*
Hain, Klaus; Beer, Michael; and Gietzen, Staas, 4,841,926, Cl. 123-146.50A.
Gigliotti, Michael F. X., Jr.: *See—*
Huang, Shyh-Chin; and Gigliotti, Michael F. X., Jr., 4,842,819, Cl. 420-418.000.
Huang, Shyh-Chin; and Gigliotti, Michael F. X., Jr., 4,842,820, Cl. 420-418.000.
Shyh-Chin, Huang; and Gigliotti, Michael F. X., Jr., 4,842,817, Cl. 420-418.000.
Gilbert, Charles G.: *See—*
Lalezari, Farzin; Gilbert, Charles G.; and Rogers, John M., 4,843,403, Cl. 343-767.000.
Gilbert, Everett E., to United States of America, Army. Polyvinylazidonitrate. 4,843,121, Cl. 525-56.000.

Gildea, David R.: *See—*
Edwards, Allen P.; and Gildea, David R., 4,843,351, Cl. 332-17.000.
Gill, Hardayal S.; and Simmons, Ralph F., Jr., to Hewlett-Packard Company. Shields of magnetoresistive transducers. 4,843,506, Cl. 360-113.000.
Gimesi, Antal: *See—*
Matolcsy, Gyorgy; Bordas, Barna; Gimesi, Antal; Kovacs, Magdolna; and Tuske, Marton, 4,843,177, Cl. 564-209.000.
Gingrich, Bryan R.: *See—*
Wilson, Harold R.; Haworth, Richard G.; and Gingrich, Bryan R., 4,841,699, Cl. 52-221.000.
Ginley, David S.: *See—*
Butler, Michael A.; and Ginley, David S., 4,841,778, Cl. 73-800.000.
Gionfriddo, Thomas S.: *See—*
Krueger, Myron W.; Hinrichsen, Katrin; and Gionfriddo, Thomas S., 4,843,568, Cl. 364-518.000.
Gisler, Anton; and Rauber, Walter, to Schweizerische Eidgeno-senschaft vertreten durch die Eidg. Munitionsfabrik Thun der Gruppe fur Rustungsdienste. Pyrotechnical delay elements for delayed-action fuse and uses thereof. 4,841,856, Cl. 102-202.130.
Gjessing, Dag K. T.; Hjelmstad, Jens F.; and Tonning, Andreas. System for marine seismic exploration. 4,843,597, Cl. 367-15.000.
GKN Axles Limited: *See—*
Cerrington, Brian E.; Arrindell, Michael W.; Cooper, Kenneth E.; and Isaacson, Philip G., 4,841,797, Cl. 74-467.000.
Glaeser, Linda C.; and Brazdil, James F., Jr., to Standard Oil Company, The. Catalyst system for ammoxidation of paraffins. 4,843,055, Cl. 502-202.000.
Glas-Craft, Inc.: *See—*
Kukesh, Timothy S.; and Huber, Larry G., 4,841,768, Cl. 73-168.000.
Glass Technology Development Corp.: *See—*
Bolin, James A.; and Powers, Irving, 4,842,637, Cl. 65-265.000.
Glaverbel: *See—*
Baudin, Pol, 4,842,664, Cl. 156-102.000.
Gleixner, Richard A.: *See—*
Bibler, James R.; and Gleixner, Richard A., 4,842,040, Cl. 164-429.000.
Glitsch, Inc.: *See—*
Chen, Gilbert; Holmes, Timothy L.; Mastrodomenico, Augusto; and Binkley, Michael J., 4,842,778, Cl. 261-97.000.
Gloede, Joerg: *See—*
Seeboth, Arno; Gloede, Joerg; Koswig, Hans-Dieter; Ladwig, Horst; Obernik, Hartwin; and Seeboth, Helmuth, 4,842,375, Cl. 350-339.00R.
Glover, Alfred H.; and Lawless, Daniel F., to Chrysler Motors Corporation. Fuel level sensor. 4,841,771, Cl. 73-317.000.
Glover, Alfred H.: *See—*
Betterton, Joseph T.; Glover, Alfred H.; and Hepler, Bruce, 4,842,425, Cl. 384-440.000.
Glover, Gary H., to General Electric Company. Method for producing multi-slice NMR images. 4,843,322, Cl. 324-309.000.
GM of Canada Limited: *See—*
Hepp, Ludwig K., 4,842,114, Cl. 192-56.00F.
Gmitter, Thomas J.: *See—*
Yablonovitch, Eli; and Gmitter, Thomas J., 4,843,037, Cl. 437-235.000.
Gobbini, Mauro: *See—*
Temperilli, Aldemio; Brambilla, Enzo; Gobbini, Mauro; and Cervini, Maria A., 4,843,073, Cl. 514-288.000.
Goding, David J.; and Rassaian, Mostafa, to General Motors Corporation. Railway locomotive and stabilized self steering truck therefor. 4,841,873, Cl. 105-168.000.
Goetz, George W.: *See—*
Ziomek, Joseph F.; Dick, Joseph G.; and Goetz, George W., 4,842,300, Cl. 280-732.000.
Goins, Jeffrey L.: *See—*
Noble, Noel L.; Bluthardt, Edward A.; and Goins, Jeffrey L., 4,842,574, Cl. 493-421.000.
Gojny, Francis J.: *See—*
Greene, Guy S.; Gojny, Francis J.; and McGrath, Paul L., 4,843,205, Cl. 219-78.120.
Gold, Peter. Automotive window retention system and retention element therefor. 4,841,698, Cl. 52-208.000.
Gold, Randy; and Smith, Darren E., to Halliburton Logging Services, Inc. Multichannel optical rotary joint for well logging usage. 4,842,355, Cl. 350-96.200.
Gold Star Co., Ltd.: *See—*
Choi, Hyun J., 4,843,464, Cl. 358-112.000.
Goldberg, Thomas R.: *See—*
Deffner, Gary W.; and Goldberg, Thomas R., 4,841,800, Cl. 74-531.000.
Golden, Martin P., to United States of America, Energy. Pyramiding tumuli waste disposal site and method of construction thereof. 4,842,774, Cl. 252-633.000.
Golden Needles Knitting & Glove Co., Inc.: *See—*
Miller, Acie B.; Simpson, Ralph H., Jr.; and Luffman, Jimmy W., 4,842,661, Cl. 156-88.000.
Golden Trade S.r.l.: *See—*
Ricci, Francesco, 4,841,751, Cl. 68-29.000.
Goldman, Ira B.: *See—*
Beberman, Julie A.; Goldman, Ira B.; Larkin, Harold F.; and Hibbert, David A., 4,842,533, Cl. 439-213.000.
Golladay, Steven D.; Hohn, Fritz J.; and Pfeiffer, Hans C., to International Business Machines Corporation. Electron beam contactless testing system with grid bias switching. 4,843,330, Cl. 324-158.00R.
Gonsalves, Kenneth E., to GAF Corporation. Synthesis of iron-cobalt powders. 4,842,641, Cl. 75-0.5AA.
Gonthier, Emile: *See—*
Daigle, Clement; and Gonthier, Emile, 4,842,785, Cl. 269-35.000.
Gonzales, Manuel, Jr.: *See—*
Tazewell, Joseph H.; Christenson, Christopher P.; Turner, Robert B.; and Gonzales, Manuel, Jr., 4,843,138, Cl. 528-52.000.
Goodman, Barry I. Vertical blind slats, and assemblies and components thereof. 4,842,036, Cl. 160-166.100.
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Halasa, Adel F.; Gross, Bill B.; Cox, Joel L.; and Balogh, George F., 4,843,120, Cl. 525-53.000.
Nguyen, Gia V., 4,842,033, Cl. 152-541.000.
Ogata, Naoya, 4,843,053, Cl. 502-159.000.
Gordon, Gary B.; and Roark, Joseph C., to Hewlett-Packard Company. Robot motion control system. 4,843,566, Cl. 364-513.000.
Gordon, Harry W.; and Chung, Kenneth, to Del Laboratories, Inc. Depilatory compositions and methods. 4,842,610, Cl. 8-160.000.
Gorman, Michael A.; Sterling, Mark H.; Kiehn, Robert M.; and Wood, Lowell T., to University of Houston-University Park Cuspated lens. 4,842,393, Cl. 350-432.000.
Gors, Heinrich C.: *See—*
Jansons, Viktors; and Gors, Heinrich C., 4,843,179, Cl. 568-322.000.
Gotanda, Kotaro: *See—*
Yasuda, Kikuo; Shibata, Kenyu; Honma, Seijiro; Seki, Toshimi; Hasumi, Kohichi; Masuda, Takeshi; Izumi, Akihiro; Ishimori, Tsutomu; Gotanda, Kotaro; and Uno, Masako, 4,843,072, Cl. 514-247.000.
Goto, Masahiro: *See—*
Kuge, Tsukasa; Goto, Masahiro; and Sakane, Isamu, 4,842,944, Cl. 428-451.000.
Gottschalk, Peter; Neckers, Douglas C.; and Schuster, Gary B., to Mead Corporation, The. Photosensitive materials containing ionic dye compounds as initiators. 4,842,980. Cl. 430-138.000.
Gottschlich, Manfred: *See—*
Wehking, Hans; and Gottschlich, Manfred, 4,842,429, Cl. 400-157.200.
Gould, Gordon E.; and Luecke, Robert A., to Dow Chemical Company, The. Extrusion apparatus and process for production of multilayer film containing an inner barrier layer. 4,842,791, Cl. 264-171.000.
Grabher Indosa-Macschinentou AG: *See—*
Grabher, Werner, 4,842,468, Cl. 413-12.000.
Grabher, Werner, to Grabher Indosa-Macschinentou AG. Process for forming a closure diaphragm for a container. 4,842,468, Cl. 413-12.000.
Grace, Fred I., to United States of America, Army. Controlled explosively formed penetrator. 4,841,864, Cl. 102-307.000.
Gradco Systems Inc.: *See—*
Lawrence, Frederick; and Cron, George M., 4,843,434, Cl. 355-72.000.
Thogersen, Klaus; and Lawrence, Frederick J., 4,842,261, Cl. 271-6.000.
Gradeff, Peter S., to Rhone Poulenc Inc. Method of preserving wood with lanthanide derivatives lanthanide derivatives. 4,842,898, Cl. 427-297.000.
Graf, Hans-Juergen; Fletcher, Robert E.; Randtke, Peter T.; Rhine, Bruce E.; and Monkowski, J. R., to Air Products and Chemicals, Inc. Vacuum vapor transport control. 4,842,827, Cl. 422-112.000.
Graf von Zedlitz und Trutzschler, Helmut, to U.S Philips Corporation. Dictating machine arranged like a telephone handset. 4,843,498, Cl. 360-93.000.
Graf, Werner: *See—*
Merrem, Hans-Joachim; and Graf, Werner, 4,842,901, Cl. 427-387.000.
Graham, Nigel K.: *See—*
Brown, John R.; Graham, Nigel K.; and King, Russell A., 4,842,037, Cl. 164-45.000.
Gramatte, Winfried: *See—*
Kunz, Willfried; Gramatte, Winfried; Schmitt, Rolf-Erhard; and Pohl, Udo, 4,842,773, Cl. 252-628.000.
Grambling, William D. Pneumatic actuators with liquid seals for oil and gas well swabs. 4,841,846, Cl. 92-60.000.
Grammer Sitzsysteme GmbH: *See—*
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Gramse, Harold E.; Jamrozy, Richard E.; and Wilczynski, James M., to Thrall Car Manufacturing Company. Railroad container transporting car of increased weight carrying capacity. 4,841,876, Cl. 105-406.100.
Graney, Frank X. Hand operated portable band saw for cutting boards from a log. 4,841,639, Cl. 30-380.000.
Granquist, Victor M.: *See—*
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Grass, Alfred, to Alfred Grass Ges. mbH. Metallwarenfabrik. Furniture hinge. 4,841,598, Cl. 16-251.000.
Grass Valley Group, Inc., The: *See—*
Boyce, Rory W., 4,843,469, Cl. 358-148.000.
Grau, Werner; Kohl, Albert; Kovacs, Jenoe; Balz, Werner; and Muenzer, Wulf, to BASF Aktiengesellschaft. Production of magnetic recording media. 4,842,896, Cl. 427-131.000.
Gravitt, Billy B.: *See—*
Heitzmann, Richard F.; Gravitt, Billy B.; and Sawyer, James L., 4,842,649, Cl. 106-89.000.
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Cobb, Dean L.; and Bleser, Edward M., 4,842,230, Cl. 248-225.200.

Green, Mino, to National Research Deve opment Corp. Electrochromic data recording systems. 4,842,381, C l. 350-357.000.
Green, William P., to Hattan, Mark, a part nterest. Equalization of load in threaded connections. 4,842,464, Cl. 411-307.000.
Greenblatt, Stanley; Colman, Richard H.; and Spierer, Edward D., to Magnetic Analysis Corporation. Distan e compensation in magnetic probe testing systems wherein object to probe spacing is employed as an exponent in excitings probes or processing probe outputs. 4,843,318, Cl. 324-225.000.
Greene, Guy S.; Gojny, Francis J.; and McGrath, Paul L., to Rohr Industries, Inc. Resistance weld joining of high electrical conductivity copper foil. 4,843,205, Cl. 219-78.120.
Greene, Richard F.: *See*—
Lessoff, Howard; and Greene, Richard F., 4,843,060, Cl. 505-1.000.
Greenhall, Charles A., to United States of America, National Aeronautics and Space Administration. Apparatus for using a time interval counter to measure frequency stability. 4,843,328, Cl. 324-78.00Z.
Greenland, H.: *See*—
Warschewski, D.; and Greenland, H., 4,842,767, Cl. 252-525.000.
Greenlay, Terrence: *See*—
Macikunas, Arunas; Haykin, Simon and Greenlay, Terrence, 4,843,396, Cl. 342-7.000.
Greenspan, Harvey P. Centrifuge device. 4,842,738, Cl. 210-380.100.
Greffioz, Andre: *See*—
Tillement, Pierre; and Greffioz, Andre, 4,842,684, Cl. 156-538.000.
Grendahl, Dennis T.: *See*—
Milligan, Russ, 4,843,209, Cl. 219-121.630.
Grenzendorfer, Dietmar: *See*—
Frenzel, Bertram; Grenzendorfer, Dietmar; Kemter, Heinz; Wuensch, Wolfgang; and Zeisberg, Peter, 4,841,747, Cl. 66-84.00A.
Greschner, Johann: *See*—
Bayer, Thomas; Elsasser, Michael; Greschner, Johann; Schmid, Heinrich; Stohr, Roland; Wolter, Olaf; and Wittlinger, Jurgen, 4,843,315, Cl. 324-158.00P.
Griebel, Franz, to Preh, Elecktrofeinmechanische Werke, Jakob Preh, Nachf. GmbH & Co. Process for forming nonlinear resistance tracks. 4,841,626, Cl. 29-620.000.
Griffin, Brian P.: *See*—
Bailey, Derrick S.; Cogswell, Frederic N.; and Griffin, Brian P., 4,843,109, Cl. 521-182.000.
Griffith, James M.; Maciel, Mario; Henry, Walter L.; and Zalesky, Paul J., to Inter Therapy, Inc. Ultra-thin acoustic transducer and balloon catheter using same in imaging array subassembly. 4,841,977, Cl. 128-660.030.
Griffith, John T., to Electricity Council, The. Induction heater coupling control by core saturation. 4,843,201, Cl. 219-10.491.
Griffiths, John M.: *See*—
Litjens, John J.; Griffiths, John M.; and Karls, Michael A., 4,842,559, Cl. 440-1.000.
Grimaud, Alain, to Enterprise Paris Ouest. Floor with co-operation between wood and concrete. 4,841,703, Cl. 52-334.000.
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Dorr, Karl H.; Grimm, Hugo; Neumann, Heinz; Fennemann, Wolfgang; and Ohlms, Norbert, 4,842,835, Cl. 423-242.000.
Grina, Larry D.: *See*—
Liu, Christopher S.; Kapusceinski, Maria M.; Grina, Larry D.; and Jones, Ronald E., 4,842,756, Cl. 252-48.200.
Griss, Elisabeth, legal representative: *See*—
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Griss, Gerhart, deceased (by Griss, Elisabeth, legal representative); Schneider, Claus; Hurnaus, Rudolf; Kobinger, Walter; Pichler, Ludwig; Bauer, Rudolf; Mierau, Joachim; Hinzen, Dieter; and Schingnitz, Gunter, to Boehringer Ingelheim KG. Tetrahydro-benzthiazoles, the preparation thereof and their use as intermediate products or as pharmaceuticals. 4,843,086, Cl. 514-367.000.
Grois, Igor: *See*—
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Grollier, Jean F.; Fiquet, Claire; Fourcade, Chantal; Dubief, Claude; Mondet, Jean; and Cauwet, Daniele, to L'Oreal. Composition intended for the treatment of keratin fibres, based on a cationic polymer and an anionic polymer containing vinylsulphonic groups. 4,842,849, Cl. 424-70.000.
Grollier, Jean F.; and Dubief, Claude, to L'Oreal. Polyamino amides for protecting hair against atmospheric attack, and in particular against light, and process for protecting hair employing such polyaminoamides. 4,842,851, Cl. 424-70.000.
Grootjans, Jacques F.; and Bredael, Pierre J., to Labofina, S.A. Process for dewaxing gas oils. 4,842,717, Cl. 208-118.000.
Gross, Bill B.: *See*—
Halasa, Adel F.; Gross, Bill B.; Cox, Joel L.; and Balogh, George F., 4,843,120, Cl. 525-53.000.
Grosser, Joel H.: *See*—
Spenadel, Lawrence; Grosser, Joel H.; and Dwyer, Stephen M., 4,843,129, Cl. 525-240.000.
Groucutt, Carol J.: *See*—
Carter, Timothy J. N.; Groucutt, Carol J.; Stott, Richard A. W.; Thorpe, Gary H. G. H.; and Whitehead, Thomas P., 4,842,997, Cl. 435-6.000.
Groupement d'Interet Economique dit: Centre International de Recherches Dermatologiques C.I.R.D.: *See*—
Shroot, Braham; Lang, Gerard; Maignan, Jean; Restle, Serge; Hensby, Christopher; and Colin, Michel, 4,843,097, Cl. 514-680.000.
Groutage, Frederick D.; Conjerti, Samuel N.; and Shaw, Lockburn S., to United States of America, Navy. Pivotal mono wing cruise missile with wing deployment and fastener mechanism. 4,842,218, Cl. 244-3.280.
Groves, Michael H.: *See*—
Cane, Michael R.; and Groves, Michael H., 4,842,415, Cl. 366-110.000.
Grubbs, John R., Jr.; Sarathy, Aravamuthan P.; and Flowe, Robert C., to Westvaco Corporation. Method for determining volatile phosphorus in carbon. 4,843,015, Cl. 436-103.000.
Grubisic, Vatroslav; and Fischer, Gerhard. Wheel for a commercial vehicle. 4,842,338, Cl. 301-9.0DN.
Gruden, James M., to United States of America, Air Force. Command operated liquid metal opening switch. 4,841,834, Cl. 89-8.000.
Grumman Aerospace Corporation: *See*—
Leifsen, J. Arthur, Jr., 4,841,904, Cl. 118-50.000.
Grunden, Michael T.; Youtz, Stephen E.; and Mierzwinski, Eugene P., to Hamilton Standard Controls, Inc. Integrated furnace control having ignition and pressure switch diagnostics. 4,842,510, Cl. 431-19.000.
Grundfos International A/S: *See*—
Blad, Thomas; Ellegaard, Mogens; and Jensen, Niels D., 4,842,725, Cl. 210-137.000.
Jensen, Niels D.; and Simonsen, Soren, 4,842,480, Cl. 415-199.100.
Grundhoff, Karl-Josef: *See*—
Wirth, Gunter; Grundhoff, Karl-Josef; and Schurmann, Hartmut, 4,842,653, Cl. 148-12.70B.
Grune, Helmut: *See*—
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GSE, Incorporated: *See*—
Lang, David A., 4,842,085, Cl. 177-164.000.
GTE Products Corporation: *See*—
Anderton, John J., 4,842,362, Cl. 350-96.200.
Barakitis, Nikolaos; and Zaslavsky, Gregory, 4,843,282, Cl. 313-619.000.
Carl, William E.; and McGohon, Ronald W., 4,842,147, Cl. 209-575.000.
Rattray, Kendrick D.; and Plante, Leo J., 4,843,279, Cl. 313-487.000.
GTE Valeron Corporation: *See*—
Juengel, Richard O., 4,843,640, Cl. 455-604.000.
Guala, Piergiacomo, to STA.TE. S.p.A. Disposable device for collecting physiological samples, in particular coprological samples. 4,842,826, Cl. 422-102.000.
Guard Associates, Inc.: *See*—
Kurtz, Richard J., 4,842,007, Cl. 137-223.000.
Guardian Technologies, Inc.: *See*—
Fuller, Kip L.; and Collier, Donald W., 4,843,377, Cl. 340-573.000.
Gubin, Daniel. Combined speedometer and tachometer. 4,841,902, Cl. 116-62.400.
Gueret, Jean-Louis H., to "L'Oreal". Applicator device for a liquid product, nail varnish in particular. 4,841,996, Cl. 132-320.000.
Guerra, John M.: *See*—
Cronin, David V.; Guerra, John M.; Sullivan, Paul F.; Mokry, Patricia A.; Clark, Peter P.; and Cocco, Vincent L., 4,843,494, Cl. 360-77.030.
Guido, Heinz, to Man Gutehoffnungshuette GmbH. Metallurgical vessel. 4,843,614, Cl. 373-72.000.
Guillemet, Alain; Teillaud, Eric; and Reginault, Philippe, to Laboratories D'Hygiene et de Dietetique. Self-adhesive device for the percutaneous administration of an active ingredient. 4,842,864, Cl. 424-448.000.
Gulczynski, Zdzislaw. Digital-to-analog converter with digital correction. 4,843,392, Cl. 341-145.000.
Gullichsen, Johan; and Hynninen, Pertti, to A. Ahlstrom Corporation. Method of removing macromolecular organic dissolved and colloidal material from wood processing industry effluents. 4,842,688, Cl. 162-29.000.
Gum, Peter H.: *See*—
Bean, George H.; Borden, Terry L.; Farrell, Mark S.; Gum, Peter H.; Hough, Roger E.; Johnson, Francis E.; McCauley, Donald W.; Rakhmilevich, Mark E.; Rathjen, John C.; Scalzi, Casper A.; Scanlon, John F.; and Wyman, Leslie W., 4,843,541, Cl. 364-200.000.
Gumbrecht, Walter; Schelter, Wolfgang; Montag, Bernhard; and Hobel, Peter, to Siemens Aktiengesellschaft. Apparatus and method for the examination of a liquid medium. 4,841,974, Cl. 128-635.000.
Gumprecht, William H.; Manzer, Leo E.; and Rao, V. N. Mallikarjuna, to Du Pont de Nemours, E. I., and Company. Process for the manufacture of 1,1,1-trifluorodichloroethane and 1,1,1,2-tetrafluorochloroethane. 4,843,181, Cl. 570-169.000.
Gunji, Keiichiro: *See*—
Namiki, Kou; Mukumoto, Takaji; and Gunji, Keiichiro, 4,841,632, Cl. 29-787.000.
Gunther, Ewald: *See*—
Zweigart, Gerhard; Belke, Werner; Gunther, Ewald; and Gantzhorn, Walter, 4,842,328, Cl. 296-214.000.
Gurov, Vadim N.: *See*—
Shneerov, Yakov A.; Vikhlevschuk, Valery A.; Asnis, Arkady E.; Kondrashkin, Vitaly A.; Filonov, Oleg V.; Gurov, Vadim N.; Gutman, Lia M.; Poklady, Vadim R.; Zhilinsky, Vasily V.; Polyakov, Valery A.; Nikitenko, Valery I.; Bashmakov, Jury V.; Burshtein, Vladislav B.; Anastasiadi, Emanuil F.; Krainik, Yaroslav I.; Demerly, Konstantin P.; Ignatchenko, Pavel V.; Kozachenko, Dmitry E.; and Piptjuk, Vitaly P., 4,843,212, Cl. 219-146.230.
Gustavsson, Axel G. V.; Andersson, Knut M. G.; and Andersson, Karl E. M. Method and an arrangement for the preparation of insert bodies for the artificial rebuilding of teeth and human limbs, etc. 4,842,454, Cl. 409-84.000.
Guthormsen, Oyvind: *See*—
Kalvenes, Bjorn K.; Guthormsen, Oyvind; and Erstad, Troels, 4,842,075, Cl. 166-341.000.
Guthrie, Richard A. Bicycle lock. 4,841,757, Cl. 70-236.000.
Gutman, Lia M.: *See*—
Shneerov, Yakov A.; Vikhlevschuk, Valery A.; Asnis, Arkady E.; Kondrashkin, Vitaly A.; Filonov, Oleg V.; Gurov, Vadim N.; Gutman, Lia M.; Poklady, Vadim R.; Zhilinsky, Vasily V.; Polyakov, Valery A.; Nikitenko, Valery I.; Bashmakov, Jury V.; Burshtein, Vladislav B.; Anastasiadi, Emanuil F.; Krainik, Yaroslav I.; Demerly, Konstantin P.; Ignatchenko, Pavel V.; Kozachenko, Dmitry E.; and Piptjuk, Vitaly P., 4,843,212, Cl. 219-146.230.
H. B. Fuller Company: *See*—
Werenicz, Harald, 4,842,666, Cl. 156-161.000.
Haack, Dietmar, to Continental Aktiengesellschaft. Method and apparatus for checking the concentricity of a pneumatic vehicle tire. 4,841,766, Cl. 73-146.000.
Haak, Wilhelm; Schiwik, Peter; and Rover, Gerd, to WABCO Westinghouse Fahrzeugbremsen GmbH. Check valve. 4,842,015, Cl. 137-543.230.
Haarmann, Bodo, to Harodent-KFO Dental-Vertrieb GmbH. Orthodontic device. 4,842,513, Cl. 433-9.000.
Hafele, Walter, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines including onset of supply control means. 4,842,496, Cl. 417-490.000.
Hafele, Walter; Kramer, Manfred; and Warga, Johann, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,842,497, Cl. 417-499.000.
Haga, Hiroyo: *See*—
Miyasaka, Akihiro; Haga, Hiroyo; and Terasawa, Takeshi, 4,842,816, Cl. 420-84.000.
Hagan, Todd A.: *See*—
Elson, Donald E.; Gerke, Burton E., Jr.; Bitzel, Michael E.; Wilder, Bruce A.; Rodowsky, Stanley J., Jr.; Lessig, William R., III; Adams, Jeffrey S.; and Hagan, Todd A., 4,841,594, Cl. 15-344.000.
Hagedorn, Guenter E., to Nicollet Technologies, Inc. Hand-held telephone line signaling test instrument. 4,843,620, Cl. 379-21.000.
Hagen, Uwe; and Redler, Udo, to Siemens Aktiengesellschaft. Electrode consisting of at least three elements useful for a HF surgical instrument. 4,841,966, Cl. 128-303.130.
Hagiwara, Yoshiki: *See*—
Yoshimatsu, Toshikane; Hagiwara, Yoshiki; Tsuji, Yoshikazu; and Momata, Kazuhiro, 4,843,486, Cl. 360-121.000.
Haidler, John W.: *See*—
Ludwig, Howard R.; Haidler, John W.; Yuan, Mark S. C.; and Elson, Robert J., 4,842,106, Cl. 188-266.000.
Hain, Klaus; Beer, Michael; and Gietzen, Staas, to Dr. Ing h.c.F. Porsche Aktiengesellschaft. Multi-cylinder internal combustion engine with externally applied ignition and with turbocharger. 4,841,926, Cl. 123-146.50A.
Haines, Richard K., to Elkhart Door, Incorporated. Window shade. 4,842,034, Cl. 160-84.100.
Hainze, John H.: *See*—
Demarest, Scott W.; Martin, John; Hainze, John H.; and Flashinski, Stanley J., 4,841,669, Cl. 43-131.000.
Hakemi, Hassan A.; Rasoul, Husam A. A.; and Stackman, Robert W., to S. C. Johnson & Son, Inc. Compatible blends of main chain and side chain thermotropic liquid crystal polymers. 4,842,754, Cl. 252-299.010.
Haku, Hisao: *See*—
Watanabe, Kaneo; Matsuoka, Tsugufumi; Nakashima, Yukio; and Haku, Hisao, 4,843,451, Cl. 357-63.000.
Halasa, Adel F.; Gross, Bill B.; Cox, Joel L.; and Balogh, George F., to Goodyear Tire & Rubber Company, The. Rubber composition. 4,843,120, Cl. 525-53.000.
Halbert, Linda D. Toy road boards. 4,842,194, Cl. 238-10.00B.
Hall, David B., to Litton Systems, Inc. Apparatus and method for optical signal source stabilization. 4,842,358, Cl. 350-96.150.
Hall, E. Winthrop, Jr. Surface-finishing member. 4,841,684, Cl. 51-400.000.
Hall, John M.; Hurd, Roger; and Wright, Geoffrey H. E., to Rolls-Royce plc. Rockets. 4,841,724, Cl. 60-245.000.
Hall, Joseph: *See*—
Landa, Benzion; Ben-Auraham, Peretz; Hall, Joseph; and Gibson, George A., 4,842,974, Cl. 430-137.000.
Hall, Lawrence H., to Litton Systems, Inc. Laser accelerometer. 4,841,774. Cl. 73-517.00R.
Halliburton Company: *See*—
Lubitz, Eric P., 4,842,057, Cl. 166-51.000.
Halliburton Logging Services, Inc.: *See*—
Gold, Randy; and Smith, Darren E., 4,842,355, Cl. 350-96.200.
Tomek, Martin L., 4,842,059, Cl. 166-65.100.
Halliburton Services: *See*—
Himes, Ronald E.; and Vinson, Edward F., 4,842,073, Cl. 166-294.000.
Hallman, Steven J.: *See*—
Kimbrough, Scott S.; and Hallman, Steven J., 4,842,089, Cl. 180-79.100.
Haluska, Loren A.; Michael, Keith W.; and Tarhay, Leo, to Dow Corning Corporation. Ceramic coatings from the pyrolysis in ammonia of mixtures of silicate esters and other metal oxide precursors. 4,842,888, Cl. 427-38.000.
Ham, Mooyoung: *See*—
Yializis, Angelo; Shaw, David G.; Strycker, Donald S.; and Ham, Mooyoung, 4,842,893, Cl. 427-44.000.
Hamada, Chiaki: *See*—
Akiyoshi, Michio; and Hamada, Chiaki, 4,842,343, Cl. 303-103.000.
Hamada, Mitsuo: *See*—
Kobayashi, Hideki; Honma, Hiroshi; and Hamada, Mitsuo, 4,842,943, Cl. 428-447.000.
Hamaguchi, Hiroshi; Takaishi, Hideo; Ohshima, Tetsuji; Konno, Takamichi; Miyagi, Yukio; Shiraiwa Yutaka; and Akita, Takayuki, to Nihon Nohyaku Co., Ltd. Pyrazole oxime derivatives and compositions. 4,843,068, Cl. 514-63.000.
Hamano, Hideo; Funato, Yasumichi; and Ida, Shuichiro, to Toyota Jidosha Kabushiki Kaisha. Lubrication mechanism in power transfer device for four wheel drive. 4,841,803, Cl. 74-665.0GE.
Hamano, Hiroaki, to Minolta Camera Kabushiki Kaisha. Copying machine. 4,843,437, Cl. 355-206.000.
Hamilton, Robert G.; and Van Doore, Frank J. Food composition. 4,842,885, Cl. 426-635.000.
Hamilton Specialty Bar Division of Slater Industries Inc.: *See*—
Bowman, Bradford C., 4,842,642, Cl. 75-10.580.
Hamilton Standard Controls, Inc.: *See*—
Grunden, Michael T.; Youtz, Stephen E.; and Mierzwinski, Eugene P., 4,842,510, Cl. 431-19.000.
Hammel, Joseph J.; Robertson, Walter J.; Marshall, William P.; Barch, Herbert W.; Daas, Balbhadra; Smoot, Michael A.; and Beaver, Richard P., to PPG Industries, Inc. Process of gas enrichment with porous siliceous-containing material. 4,842,620, Cl. 55-16.000.
Hammerle AG: *See*—
Zbornik, Vaclav, 4,842,473, Cl. 414-626.000.
Hampton, Edward J.: *See*—
Porowski, Jan S.; Badlani, Manu L.; O'Donnell, William J.; and Hampton, Edward J., 4,842,655, Cl. 148-130.000.
Hampton, Keith; Krzysik, Don J.; and Lilley, Glen R., to Eaton Corporation. Sealed camshaft phase change device. 4,841,924, Cl. 123-90.150.
Haney, Keith M.: *See*—
Willis, Clyde A.; and Haney, Keith M., 4,842,250, Cl. 254-337.000.
Hanna, Jun-Ichi: *See*—
Takeuchi, Eiji; Hanna, Jun-Ichi; Shimizu, Isamu; Hirooka, Masaaki; Sakai, Akira; and Ueki, Masao, 4,842,897, Cl. 427-255.200.
Hanni, Manfred: *See*—
Brusch, Josef; Hanni, Manfred; and Hechfellner, Kurt, 4,843,612, Cl. 375-1.000.
Hanover Battelle Institut E.V.: *See*—
Kunz, Willfried; Gramatte, Winfried; Schmitt, Rolf-Erhard; and Pohl, Udo, 4,842,773, Cl. 252-628.000.
Hansen, Guenter: *See*—
Eilingsfeld, Heinz; Etzbach, Karl-Heinz; Hansen, Guenter; and Reichelt, Helmut, 4,843,153, Cl. 534-752.000.
Hansen, Mark C. and Manlove, Greg J., to Delco Electronics Corporation. Spark timing control. 4,841,932, Cl. 123-416.000.
Hansen, Paul E.: *See*—
Ersfeld, Dean A.; and Hansen, Paul E., 4,841,958, Cl. 128-90.000.
Hansson, Gunnar C., to Atlas Copco Aktiebolag. Screw joint tightening power tool. 4,842,078, Cl. 173-12.000.
Hara, Kazuyoshi: *See*—
Mori, Kei; and Hara, Kazuyoshi, 4,843,530, Cl. 362-413.000.
Harada, Naoki: *See*—
Kayane, Yutaka; Sawamoto, Hirokazu; Omura, Takashi; Harada, Naoki; and Takeshita, Akira, 4,843,149, Cl. 534-632.000.
Haragushi, Tamotsu, to Teac Corporation. System for discriminating between two tape assemblies of different recording characteristics to be loaded interchangeably in data transfer apparatus. 4,843,490, Cl. 360-69.000.
Harbin, Deborah A.: *See*—
Harbin, Keith E.; and Harbin, Deborah A., 4,841,588, Cl. 5-494.000.
Harbin, Keith E.; and Harbin, Deborah A. Blanket with head and foot retaining pockets. 4,841,588, Cl. 5-494.000.
Hardy, Bryant J.; and Swartz, Charles J., to Conoco Inc. Stable extreme pressure grease. 4,842,752, Cl. 252-17.000.
Harhausen, Ekkerhard: *See*—
Durr, Manfred; Fribolin, Hans U.; Harhausen, Ekkerhard, and Seidel, Jurgen, 4,842,865, Cl. 424-456.000.
Harmer, George A., to Lucas Industries public limited company. Internal shoe drum brake. 4,842,104, Cl. 188-79.510.
Harmon, Troy M.: *See*—
Caro, Richard G.; and Harmon, Troy M., 4,842,360, Cl. 350-96.180.
Harodent-KFO Dental-Vertrieb GmbH: *See*—
Haarmann, Bodo, 4,842,513, Cl. 433-9.000.
Harp, Elwyn V.: *See*—
Roosa, Vernon D., 4,842,011, Cl. 137-414.000.
Harper, Allen D., to Allied-Signal Inc. Heat transfer apparatus and method. 4,842,050, Cl. 165-47.000.
Harper, Stephen D., to Arco Chemical Technology, Inc. Preparation of filterable double metal cyanide complex catalyst for propylene oxide polymerization. 4,843,054, Cl. 502-175.000.

Harrell, Lester R.: *See—*
French, Thomas J.; Harrell, Lester R.; and Dellinger, Anthony L., 4,843,208, Cl. 219-121.390.

Harrington, Robert L.; Larson, Terry G.; and Unger, Richard F., to Thermo King Corporation. Strain relief clamp. 4,842,227, Cl. 248-56.000.

Harris Corp.: *See—*
Davis, Robert C., 4,843,615, Cl. 375-80.000.

Harris, Jeffrey J.; Shannon, John M.; and Woodcock, John M., to U.S. Philips Corp. Hot charge-carrier transistors. 4,843,447, Cl. 357-34.000.

Harris, William G.; and Silva, Douglas J., to Boeing Company, The. Method of generating hydrogen. 4,842,844, Cl. 423-657.000.

Harrop, Kenneth T.; and Carver, Ray T., to Owens - Corning Fiberglass Corp. Adaptor for twist frame forming tube. 4,842,214, Cl. 242-130.000.

Harry, Herbert H., to United States of America, Energy. Shaft adjuster. 4,841,621, Cl. 29-464.000.

Hartline, Jack I.: *See—*
Cameron, Robert W.; Dressler, Gary J.; and Hartline, Jack I., 4,842,100, Cl. 184-6.200.

Hartman, David R., to Owens-Corning Fiberglas Corporation. Ballistic materials. 4,842,923, Cl. 428-219.000.

Hartman, Robert A.; and Peloschek, Hans I., to U.S. Philips Corporation. Test method for LCD elements. 4,843,312, Cl. 324-158.00R.

Hartmann, Dirck T. Enclosed multiple speed drive for low maintenance chain driven bicycles. 4,842,291, Cl. 280-238.000.

Hartmann, Ludwig; Loecher, Engelbert; Ruzek, Ivo; and Weber, Norbert. Tufting base for carpets made of a spunbonded fabric, a method of manufacturing the base, and a tufting carpet. 4,842,915, Cl. 428-95.000.

Hartmann, Werner; Dolata, Hans; and Buchholtz, Jochen, to Stihl, Andreas. Saw chain for a chain saw. 4,841,824, Cl. 83-830.000.

Haruyuki Kawahara: *See—*
Kawahara, Haruyuki; Tanaka, Katsunori; Ashiura, Yasuyuki; and Yoshimura, Motonobu, 4,842,517, Cl. 433-173.000.

Harvard Industries, Inc.: *See—*
Palinchak, Stephen, 4,842,024, Cl. 138-125.000.

Harwood, Joseph T.: *See—*
Hogg, Jeffrey; and Harwood, Joseph T., 4,841,697, Cl. 52-208.000.

Hasegawa, Akira, to Fuji Photo Film Co., Ltd. Light-sensitive compositions and light-sensitive materials with phenolic resol having dibenzylic ether linkages. 4,842,983, Cl. 430-175.000.

Hasenack, Hendrikus J. A., to Shell Oil Company. Process for fuel combustion with low NO_x soot and particulates emission. 4,842,509, Cl. 431-10.000.

Hashem, Mohamed M.: *See—*
Tracy, David J.; Hashem, Mohamed M.; and Login, Robert B., 4,842,858, Cl. 424-150.000.

Hashimoto, Akifumi: *See—*
Nakamura, Hiroyuki; Ito, Masashi; Ito, Toshiki; and Hashimoto, Akifumi, 4,842,392, Cl. 350-247.000.

Hashimoto, Kiyoshi: *See—*
Kawaguchi, Toshiro; Sonoda, Takefumi; and Hashimoto, Kiyoshi, 4,842,507, Cl. 425-382.400.

Hashimoto, Miho; Yokoe, Masaaki; Kurono, Yoshikazu; and Hayashi, Koji, to Brother Kogyo Kabushiki Kaisha. Data processing device and method for a sewing machine. 4,841,391, Cl. 112-262.300.

Hashimura, Yasuhiro; Noguchi, Satoshi; and Minami, Nobuyuki, to Nissha Printing Co., Ltd. Thin-film forming apparatus. 4,841,857, Cl. 101-158.000.

Hasumi, Kohichi: *See—*
Yasuda, Kikuo; Shibata, Kenyu; Honma, Seijiro; Seki, Toshimi; Hasumi, Kohichi; Masuda, Takeshi; Izumi, Akihiro; Ishimori, Tsutomu; Gotanda, Kotaro; and Ueno, Masako, 4,843,072, Cl. 514-247.000.

Hata, Yoshiaki: *See—*
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Hatada, Toshio: *See—*
Kurosawa, Shigekichi; Nagaoka, Yoshikazu; Kannoh, Shinichi; Takemoto, Sadatoshi; Sugimoto, Shigeo; Oouchi, Tomihisa; Hatada, Toshio; Kunugi, Yoshifumi; Kawamura, Hironobu; Kohno, Kyoji; and Machizawa, Kenji, 4,841,744, Cl. 62-475.000.

Hatano, Norihiko: *See—*
Ono, Yutaka; Tsuchiya, Yayoi; Koizumi, Yutaka; Morimoto, Hitoshi; Banzai, Hideo; Muramatsu, Yasuhiko; Shindo, Syotoro; Kanehara, Toshihiro; Hatano, Norihiko; Ohta, Susumu; and Nikaido, Mitsuhiro, 4,843,292, Cl. 318-606.000.

Hatschek, Rudolf A.: *See—*
Hurka, Wilhelm; and Hatschek, Rudolf A., 4,841,964, Cl. 128-203.150.

Hattan, Mark: *See—*
Green, William P., 4,842,464, Cl. 411-307.000.

Hattori, Hideaki: *See—*
Yokoshima, Minoru; Ohkubo, Tetsuo; Hattori, Hideaki; and Kiyomoto, Masayuki, 4,843,111, Cl. 522-42.000.

Hattori, Jun: *See—*
Kitagishi, Nozomu; Nakayama, Hiroki; Suda, Shigeyuki; Hattori, Jun; and Horiuchi, Akihisa, 4,842,38[illegible], Cl. 350-427.000.

Hattori, Toshihiro; Ishihara, Masaki; Kasai, Hitoshi; and Asagi, Yasuyoshi, to Isuzu Motors Limited; and Fujitsu Limited. Signal processing system for vehicular acceleration sensor 4,843,555, Cl. 364-431.070.

Haug, Harald; Kleinhammer, Gerd; and Mattersberger, Johann, to Boehringer Mannheim GmbH. Conjugate for enzyme immuno determinations. 4,843,001, Cl. 435-7.000.

Haugland, Steve E.: *See—*
Georgis, Steven P.; Beavers, Kelly J.; and Haugland, Steve E., 4,843,495, Cl. 560-77.150.

Haun, Marion W., to American Magnetics Corporation. Automatic data capture for multiple form point of sale slip packs. 4,843,220, Cl. 235-380.000.

Hauser, Jeffrey B.: *See—*
Paspek, Stephen C., Jr.; Hauser, Jeffrey B.; Eppig, Christopher P.; and Stalzer, Richard B., 4,842,715, Cl. 208-13.000.

Haven Energy, Ltd.: *See—*
Flanders, Staunton O.; and Ness, William A., 4,842,044, Cl. 165-12.000.

Hawkins, Gene R., to General Motors Corporation. Vehicle wheel suspension. 4,842,295, Cl. 280-661.000.

Haworth, Inc.: *See—*
Wilson, Harold R.; Haworth, Richard G.; and Gingrich, Bryan R., 4,841,699, Cl. 52-221.000.

Haworth, Richard G.: *See—*
Wilson, Harold R.; Haworth, Richard G.; and Gingrich, Bryan R., 4,841,699, Cl. 52-221.000.

Hayakawa, Toshimitsu: *See—*
Murano, Tadao; Hirata, Hisao; Hayakawa, Toshimitsu; and Saito, Takeshi, 4,841,622, Cl. 29-525.000.

Hayashi, Chikahisa: *See—*
Mizutani, Junichi; Muroi, Ryoichi; Hayashi, Chikahisa; Sano, Yoshio; and Komatsu, Moriyuki, 4,843,477, Cl. 358-248.000.

Hayashi, Hiroshi: *See—*
Yamamoto, Tetsuo; Hayashi, Hiroshi; Muta, Tenshiro; Hori, Yoshisada; and Kubo, Katsushi, 4,842,957, Cl. 428-622.000.

Hayashi, Koji: *See—*
Hashimoto, Miho; Yokoe, Masaaki; Kurono, Yoshikazu; and Hayashi, Koji, 4,841,891, Cl. 112-262.300.

Hayashi, Nobuyuki: *See—*
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Hayashibara, Ken: *See—*
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Hayashida, Shigeru: *See—*
Tai, Seiji; Hayashida, Shigeru; and Hayashi, Nobuyuki, 4,842,970, Cl. 430-58.000.

Hayes, Wilson C.: *See—*
Gerhart, Tobin N.; and Hayes, Wilson C., 4,843,112, Cl. 523-114.000.

Haykin, Simon: *See—*
Macikunas, Arunas; Haykin, Simon; and Greenlay, Terrence, 4,843,396, Cl. 342-7.000.

Hayner, Roger E., to Ashland Oil, Inc. Wax, sulfonate, dispersing oil, sepiolite clay compositions for protective soft coatings. 4,842,903, Cl. 427-428.000.

Hazebrouck, Henry B.; and Castagna, Joseph T., to Priam Corporation. Head arm damping device for disc drive actuators. 4,843,503, Cl. 360-106.000.

Hechfellner, Kurt: *See—*
Brusch, Josef; Hanni, Manfred; and Hechfellner, Kurt, 4,843,612, Cl. 375-1.000.

Heck, Berthold; and Speidel, Joachim, to U.S. Philips Corporation. Digital filter in which linear combinations of powers of two are converted to binary numbers using wallace trees. 4,843,582, Cl. 364-724.160.

Hector, Bernd: *See—*
Fussnegger, Wolfgang; Rieth, Egon; Koucky, Antonin; and Hector, Bernd, 4,842,318, Cl. 296-65.100.

Heese, Dieter H. W.: *See—*
Schmid, Karl; Jokisch, Friedrich; Heese, Dieter H. W.; Hillinger, Bruno; Beckmann, Georg; and Heger, Norbert, 4,842,695, Cl. 202-228.000.

Hegasy, Ahmed: *See—*
Hoederath, Wolfgang; Ahr, Hans J.; Buhner, Klaus; Hegasy, Ahmed; and Winter, Manfred, 4,842,856, Cl. 424-101.000.

Hegendorfer, Max, to U.S. Philips Corporation. Device for recording satellite TV broadcasts. 4,843,482, Cl. 358-335.000.

Heger, Norbert: *See—*
Schmid, Karl; Jokisch, Friedrich; Heese, Dieter H. W.; Hillinger, Bruno; Beckmann, Georg; and Heger, Norbert, 4,842,695, Cl. 202-228.000.

Hegerhorst, Brent K.: *See—*
Avritt, Michael D.; Hegerhorst, Brent K.; and Peterson, Peter K., 4,843,429, Cl. 355-274.000.

Heidelberger Druckmaschinen AG: *See—*
Seefried, Karl-Heinz, 4,841,862, Cl. 101-425.000.

Heidrich, Dennis A. Temporary closure for beverage can. 4,842,159, Cl. 220-90.400.

Heilala, Antti-Jussi, to OY Safematic Ltd. Slide ring seal with circumferentially variably-beveled counter-surface on a shrink fitted slide ring thereof. 4,842,286, Cl. 277-38.000.

Heimann, Anthony J. Modular connector assembly for electrical utility box. 4,842,551, Cl. 439-502.000.

Heimbigner, Thomas: *See—*
Tsui, Gary; and Heimbigner, Thomas, 4,841,817, Cl. 76-101.00R.

Heinonen, Jarmo, to Oy Tampella AB. Body construction for a drilling machine. 4,842,079, Cl. 173-105.000.

Heinonen, Jarmo, to Oy Tampella AB. Arrangement for mounting of a rotation element in a drilling machine. 4,842,080, Cl. 173-105.000.

Heitzmann, Richard F.; Gravitt, Billy B.; and Sawyer, James L., to Pyrament, Inc. Cement composition curable at low temperatures. 4,842,649, Cl. 106-89.000.

Helix Technology Corporation: *See—*
Weeks, Alan L., 4,842,287, Cl. 277-53.000.

Helwing, Robert F. Covalently bonded active agents with carbonium ion base groups. 4,842,868, Cl. 424-486.000.

Henderson, Dennis R.: *See—*
Hodges, C. Wayne; Henderson, Dennis R.; and Koons, Edwin R., 4,841,608, Cl. 29-25.420.

Hendriks, Johannes H.; Brekelmans, Johannes H. A.; and Bos, Johannes J., to U.S. Philips Corporation. Television receiver having an automatic radiofrequency resonant circuit adjustment circuit. 4,843,636, Cl. 455-192.000.

Henikoff, Steven; and Gelinas, Richard E., to Fred Hutchinson Cancer Research Center. Process for producing shortened target DNA fragments usable in sequencing large DNA segments. 4,843,003, Cl. 435-91.000.

Henkel Kommanditgesellschaft auf Aktien: *See—*
Rose, David; Lieske, Edgar; and Maak, Norbert, 4,842,612, Cl. 8-411.000.

Hennessy, Robert E., to Cars & Concepts, Inc. Convertible vehicle having dual rear quarter window assembly. 4,842,327, Cl. 296-201.000.

Henriksson, Soren N.: *See—*
Andreasson, Bo C.; Henriksson, Soren N.; and Karreman, Lars-Olof, 4,841,920, Cl. 123-41.660.

Henry, Walter L.: *See—*
Griffith, James M.; Maciel, Mario; Henry, Walter L.; and Zalesky, Paul J., 4,841,977, Cl. 128-660.030.

Hensby, Christopher: *See—*
Shroot, Braham; Lang, Gerard; Maignan, Jean; Restle, Serge; Hensby, Christopher; and Colin, Michel, 4,843,097, Cl. 514-680.000.

Henslee, Walter W.: *See—*
Smyth, Ronald R.; and Henslee, Walter W., 4,843,045, Cl. 501-120.000.

Hepler, Bruce: *See—*
Betterton, Joseph T.; Glover, Alfred H.; and Hepler, Bruce, 4,842,425, Cl. 384-440.000.

Hepp, Ludwig K., to GM of Canada Limited. Air clutch with tool changer. 4,842,114, Cl. 192-56.00F.

Heraeus Amersil, Inc.: *See—*
deGeest, Charles E., Jr., 4,841,906, Cl. 118-500.000.

Heraeus Quarzschmelze GmbH: *See—*
Kreutzer, Karl; Simmat, Fritz; Steinkohl, Anton; and Englisch, Wolfgang, 4,842,628, Cl. 65-3.120.

Herberger, William E.: *See—*
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Hercules Incorporated: *See—*
Anderson, Harry S., 4,842,875, Cl. 426-118.000.

Heremans, Joseph P.: *See—*
Partin, Dale L.; and Heremans, Joseph P., 4,843,444, Cl. 357-27.000.

Heritier-Best, Pierre, to Equipements Automobiles Marchal. Ignition coil for internal combustion engine. 4,843,362, Cl. 336-61.000.

Herman, Richard G.: *See—*
Klier, Kamil; Herman, Richard G.; and Vedage, Gamimi, 4,843,101, Cl. 518-713.000.

Hermann Finckh Maschinenfabrik GmbH & Co.: *See—*
Holz, Emil, 4,842,722, Cl. 209-270.000.

Hermansson, Klas G. I., to Dinol International Aktiebolag. Pivotable nozzle. 4,842,200, Cl. 239-263.000.

Hernandez, David R.: *See—*
Carter, John E.; and Hernandez, David R., 4,841,587, Cl. 5-419.000.

Herndon, Terry O.; and Chapman, Glenn H., to Massachusetts Institute of Technology. Fabrication of interlayer conductive paths in integrated circuits. 4,843,034, Cl. 437-189.000.

Herrington, Fox J.: *See—*
Bullard, Edward M.; and Herrington, Fox J., 4,842,421, Cl. 383-61.000.
DiBiasi, Daniel J.; and Herrington, Fox J., 4,842,420, Cl. 383-6.000.

Herrmann, Heinz; and Schlosser, Hans-Joachim, to Hoechst Aktiengesellschaft. Presensitized waterless planographic printing plate with amorphous silicic acid interlayer and process of making and using. 4,842,988, Cl. 430-14.000.

Herrmann, Heinz; Schlosser, Hans-Joachim; and Billino, Susanne, to Hoechst Aktiengesellschaft. Presensitized negative working waterless planographic printing plate with amorphous silicic acid interlayer and process of making and using. 4,842,990, Cl. 430-272.000.

Hershey, George E.; Lane, Charles E., III; and Wilda, Douglas W., to Honeywell Inc. Pressure transmitter assembly. 4,841,777, Cl. 73-721.000.

Herzog, Hans-Joest; Jorke, Helmut; and Kibbel, Horst, to Icentia Patent-Verwaltungs-GmbH. Method for producing a spatially periodic semiconductor layer structure. 4,843,028, Cl. 437-81.000.

Hess, Stanley R., to Cordis Leads, Inc. Endocardial lead with projections having saw tooth formation. 4,841,971, Cl. 128-419.00P.

Hester, Richard E.; and Ngo, Tuan V., to VTC Incorporated. Differential amplifier with input bias current cancellation. 4,843,342, Cl. 330-257.000.

Hesterman, Victor W., to Hewlett-Packard Company. Nondestructive M-H hysteresis testers for magnetic discs for computer disc drives. 4,843,316, Cl. 324-210.000.

Hetrick, Robert E.: *See—*
Logothetis, Eleftherios M.; Hetrick, Robert E.; Soltis, Richard E.; and Vassell, William C., 4,841,934, Cl. 123-440.000.

Hetzelberger, Rolf: *See—*
Cyron, Theodor; Vierkotter, Manfred; and Hetzelberger, Rolf, 4,842,954, Cl. 428-593.000.

Hewlett-Packard Company: *See—*
Chiu, Kuang Y.; and Hsu, Fu-Chieh, 4,843,023, Cl. 437-34.000.
Edwards, Allen P.; and Gildea, David R., 4,843,351, Cl. 332-17.000.
Gill, Hardayal S.; and Simmons, Ralph F., Jr., 4,843,506, Cl. 360-113.000.
Gordon, Gary B.; and Roark, Joseph C., 4,843,566, Cl. 364-513.000.
Hesterman, Victor W., 4,843,316, Cl. 324-210.000.
Jacobi, John W., 4,842,662, Cl. 156-633.000.
Nazarathy, Moshe; Dolfi, David W.; and Jungerman, Roger L., 4,843,350, Cl. 332-7.510.
Nazarathy, Moshe; Dolfi, David W.; and Kolner, Brian H., 4,843,586, Cl. 364-822.000.
Rasmussen, Steve O.; Jackson, Larry A.; and Pinkernell, David W., 4,843,338, Cl. 346-140.00R.
Wechsler, Susan L.; Evett, Eric A.; and Raby, Pamela F., 4,843,590, Cl. 364-900.000.

Heyman, Joseph S.; Rogowski, Robert S.; and Holben, Milford S., Jr., to Administrator, National Aeronautics and Space Administration. Radio frequency strain monitor. 4,843,346, Cl. 331-65.000.

Heymes, Rene ; and Lutz, Andre , to Roussel Uclaf. Aminothiazolyl acetic acid derivatives. 4,843,164, Cl. 548-194.000.

Hibbert, David A.: *See—*
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Hickel, Sigrun: *See—*
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Hidaka, Hideto: *See—*
Miyatake, Hideshi; Kumanoya, Masaki; Hidaka, Hideto; Konishi, Yasuhiro; Dosaka, Katsumi; Yamasaki, Hiroyuki; Shimoda, Masaki; Ikeda, Yuto; and Tsukamoto, Kazuhiro, 4,843,596, Cl. 365-233.500.

Hidasi, Gyorgy: *See—*
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Hieda, Kazuo: *See—*
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Hierath & Andrews Corp.: *See—*
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Higaki, Yasuo, to Sapporo Alna Co., Ltd. System for drawing the open air indoors. 4,842,048, Cl. 165-45.000.

Higashi, Yuitiro; Nakai, Junji; Kawabuchi, Hidenori; and Kato, Yasuhisa, to Ricoh Company, Ltd. Heat roll type arrangement for electrostatic recording apparatus. 4,843,214, Cl. 219-216.000.

Higashino, Yasushi: *See—*
Ikeda, Kyoichi; Watanabe, Tetsuya; and Higashino, Yasushi, 4,841,775, Cl. 73-704.000.

Higton, David A.: *See—*
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Higuchi, Seijun; Ohga, Tomonari; Katayama, Toshinori; and Yamamoto, Fumio, to Nippon Steel Corporation. Chromate surface treated steel sheet. 4,842,958, Cl. 428-629.000.

Hihara, Toshio; Shimizu, Yukiharu; and Shimizu, Kanzi, to Mitsubushi Chemical Industries Limited. Pyrazolone or pyridone type water soluble disazo colorant containing one or two triazine rings. 4,843,150, Cl. 534-634.000.

Hikishima, Keisaku, to Kanzaki Kokyukoki Mfg. Co., Ltd. Transmission for self-propelled walking mowers. 4,841,794, Cl. 74-371.000.

Hilfiker, Peter: *See—*
Bissig, Josef; and Hilfiker, Peter, 4,843,196, Cl. 200-336.000.

Hill, John E., to Pioneer Hi-Bred International, Inc. Method and inoculant for preserving agricultural products for animal feed. 4,842,871, Cl. 426-44.000.

Hillenbrand, Gary F.: *See—*
Sanders, Frederick W.; Hillenbrand, Gary F.; Arney, Jonathan S.; and Wright, Richard F., 4,842,981, Cl. 430-138.000.

Hillinger, Bruno: *See—*
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Hilton, Carol M. Swing weight for golf club iron. 4,842,280, Cl. 273-194.00B.

Hilton, Roy G. Liquid coolers. 4,841,741, Cl. 62-394.000.

Himes, Ronald E.; and Vinson, Edward F., to Halliburton Services. Fluid additive and method for treatment of subterranean formations. 4,842,073, Cl. 166-294.000.

Hines, Craig D.; Bednarz, Michael J.; and Churchman, Ronald K., to Otis Engineering Corporation. Gas storage well safety system and method. 4,842,074, Cl. 166-305.100.

Hinkle, Jeffery S.; and Lever, O. William, Jr., to Ortho Pharmaceutical Corporation. Isoquinoline derivatives having renal vasodilating properties and/or cardiotonic properties and/or phospbodiesterase inhibiting properties. 4,843,077, Cl. 514-253.000.

Hinrichsen, Katrin: *See—*
Krueger, Myron W.; Hinrichsen, Katrin; and Gionfriddo, Thomas S., 4,843,568, Cl. 364-518.000.

Hinz, Werner; Oesterling, Erwin; and Schlisio Siegfried, to Korber AG. Method of and machine for making filte cigarettes. 4,841,993, Cl. 131-94.000.

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Hirabayashi, Michio: *See—*
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Hirabayashi, Yuji: *See—*
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Hirai, Yoichi; and Ito, Toshikazu, to Tohkai Kogyo Co., Ltd. Deodorizing apparatus. 4,842,829, Cl. 422-186.080.

Hiraide, Hideyuki. Spiral-spring type driving unit. 4,842,567, Cl. 446-464.000.

Hirano, Kouzi: *See—*
Yoshida, Kageo; Nittani, Osamu; Ito, Toshiyobu; Kokura, Makoto; and Hirano, Kouzi, 4,842,743, Cl. 210-63 .000.

Hiraoka, Isamu: *See—*
Shindo, Yasuhiro; Tsujimoto, Yukio; Saito, Isami; Hiraoka, Isamu; and Hirayama, Hiroshi, 4,842,654, Cl. 14 -20.600.

Hiraoka, Shinitiro: *See—*
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Hirata, Hisao: *See—*
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Hirata, Naonori: *See—*
Tomioka, Hiroki; Ooishi, Tadashi; and Hirata, Naonori, 4,843,090, Cl. 514-388.000.

Hirayama, Hiroshi: *See—*
Shindo, Yasuhiro; Tsujimoto, Yukio; Saito, Isami; Hiraoka, Isamu; and Hirayama, Hiroshi, 4,842,654, Cl. 14 -20.600.

Hirayama, Shoji. Air cleaning apparatus and construction of clean room with the same. 4,841,847, Cl. 98-31.500.

Hirokawa, Susumu: *See—*
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Hirooka, Masaaki: *See—*
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Hirose, Yoshio: *See—*
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Hisaka Works, Limited: *See—*
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Hisano, Tsuyoshi: *See—*
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Hitachi Chemical Co., Ltd.: *See—*
Tai, Seiji; Hayashida, Shigeru; and Hayash , Nobuyuki, 4,842,970, Cl. 430-58.000.
Tsuru, Yoshiyuki; Okamura, Toshiro; Okushima, Tetsuya; Ikeda, Masayoshi; and Kawamura, Masahiro, 4,842,899, Cl. 427-309.000.

Hitachi, Ltd.: *See—*
Arita, Setsuo; Utena, Shunsuke; Murata, Fumio; Noguchi, Atomi; Izumi, Shigeru; Suzuki, Satoshi; and Ookido, Fumiyasu, 4,843,537, Cl. 364-187.000.
Furuhata, Takashi; Yumde, Yasufumi; Okamura, Fujio; Noguchi, Takaharu; Shibuya, Toshifumi; Mohri, Katsuo; Arai, Takao; and Terada, Toshimichi, 4,843,493, Cl. 360-7 .150.
Imoto, Katsuyuki; Maeda, Minoru; Kameyama, Masayoshi; Ikuta, Yasushi; Araki, Hiroshi; and Oho, Shigeru, 4,842,359, Cl. 350-96.160.
Ito, Yasushi; Imamura, Masaaki; Kato, Yoshiaki; and Fumioka, Jun, 4,842,618, Cl. 51-293.000.
Kamisaka, Tadayuki; Yagi, Kazuo; Takahashi, Yasufumi; and Nakamura, Shigeki, 4,843,352, Cl. 332-2 .000.
Kawasumi, Ken-ichi; and Inada, Akio, 4,8 2,828, Cl. 422-186.300.
Kikuchi, Sumio, 4,843,545, Cl. 364-300.000.
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Miyazaki, Hiroshi; Homma, Yoshio; and Mukai, Kiichiro, 4,842,891, Cl. 427-35.000.
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Ohno, Tomoyuki; Shiroishi, Yoshihiro; Hishiyama, Sadao; Suzuki, Hiroyuki; Shirakura, Takaaki; Matsuoka Shinya; Sano, Makoto; Nakamura, Takao; Takagi, Kazumasa; Fukazawa, Tokuumi; and Susa, Kenzo, 4,842,917, Cl. 428-141.000.
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Togawa, Eisei; Suzuki, Saburo; Sugimoto, Kenji; and Kuwatsuka, Shunichiro, 4,841,624, Cl. 29-603.000.
Watatani, Yoshizumi; and Ito, Shigeyuki, 4,843,488, Cl. 360-19.100.
Yoshida, Kazufumi; Ishikawa, Tohru; and Nogami, Mikio, 4,843,546, Cl. 364-403.000.
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Hitachi Maxell, Ltd.: *See—*
Urushiwara, Hisashi; Iwamaru, Tugiyasu; Kazehara, Kenya; Watanabe, Osamu; Sawada, Kenichi; Sato, Kiyoshi; Yoshikawa, Hirokazu; Ikenari, Shigeru; Yokoyama, Kenichi; and Uetani, Yoshio, 4,842,965, Cl. 429-56.000.

Hitachi Video Engineering Incorp.: *See—*
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Hitotsuyanagi, Hajime: *See—*
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Hjelmstad, Jens F.: *See—*
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HNU Systems, Inc.: *See—*
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Hoadley, Thomas H.: *See—*
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Hobel, Peter: *See—*
Gumbrecht, Walter; Schelter, Wolfgang; Montag, Bernhard; and Hobel, Peter, 4,841,974, Cl. 128-635.000.

Hochgraf, Neil A., to Eastman Kodak Company. Bar code reader for reading bar code symbols at different distances. 4,843,222, Cl. 235-470.000.

Hochtemperatur-Reaktorbau GmbH: *See—*
Schoening, Josef; Wachholz, Winfried; and Weicht, Ulrich, 4,842,810, Cl. 376-299.000.

Hoda, Takeo: *See—*
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Hodges, C. Wayne; Henderson, Dennis R.; and Koons, Edwin R., to Aerovox M, Inc. Method of forming electrical termination on capacitor tops. 4,841,608, Cl. 29-25.420.

Hodgetts, Graham L., to Rolflor Industries, Inc. Unloading mechanism for trucks and trailers. 4,842,471, Cl. 414-515.000.

Hodgson, Dale; and Stram, John, to American Greetings Corporation. Header for merchandise display fixture and sign assembly therefor. 4,841,654, Cl. 40-642.000.

Hoechst Aktiengesellschaft: *See—*
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Herrmann, Heinz; Schlosser, Hans-Joachim; and Billino, Susanne, 4,842,990, Cl. 430-272.000.
Janocha, Siegfried; Crass, Guenther; Schloegl, Gunter; and Bothe, Lothar, 4,842,187, Cl. 229-87.00F.
Knorr, Harald; and Salbeck, Gerhard, 4,843,167, Cl. 558-6.000.
Merrem, Hans-Joachim; and Graf, Werner, 4,842,901, Cl. 427-387.000.
Schmidt, Manfred; Rupp, Walter; Schneider, Gerhart; and Kohn, Eva M., 4,842,776, Cl. 260-512.00C.
Seibel, Markus; and Kaempf, Guenther, 4,842,982, Cl. 430-156.000.

Hoechst Celanese Corporation: *See—*
Auerbach, Andrew B.; Paul, James L.; and Natarajan, K. M., 4,843,115, Cl. 524-100.000.
Barton, O. Alfred, 4,842,950, Cl. 428-483.000.
Chung, Tai-Shung; Chen, Paul N., Sr.; and Provino, Vincent J., 4,842,740, Cl. 210-500.270.

Hoechst-Roussel Pharmaceuticals, Inc.: *See—*
Shutske, Gregory M.; and Effland, Richard C., 4,843,079, Cl. 514-292.000.

Hoederath, Wolfgang; Ahr, Hans J.; Buhner, Klaus; Hegasy, Ahmed; and Winter, Manfred, to Bayer Aktiengesellschaft. Parenteral solution. 4,842,856, Cl. 424-101.000.

Hoenig, Reinhard: *See—*
Scade, Andreas; Hoenig, Reinhard; and Schniek, Horst-Guenther, 4,843,256, Cl. 307-296.200.

Hofer, Alan, to Stanton Magnetics, Inc. Inertial microphone/receiver with extended frequency response. 4,843,628, Cl. 381-200.000.

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Hoffman, Allan S.: *See—*
Nowinski, Robert C.; and Hoffman, Allan S., 4,843,010, Cl. 435-7.000.

Hoffman, Harmon, Jr.; and Schankereli, Kemal, to Meadox Medicals, Inc. Method for forming impregnated synthetic vascular grafts. 4,842,575, Cl. 600-36.000.

Hoffmann, Michael, to Ant Nachrichtentechnik GmbH. Method of obtaining a phase difference signal. 4,843,616, Cl. 375-81.000.

Hoffstein, Mark F.; and Shinagawa, Takehisa, to Rodel, Inc. Inverted cell pad material for grinding, lapping, shaping and polishing. 4,841,680, Cl. 51-283.00R.

Hofler, Ing. Willy: *See—*
Bertz, Hans-Ulrich, 4,841,644, Cl. 33-179.50R.

Hofmann, Hans-Joachim: *See—*
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Hoftman, Mike: *See—*
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Hogan, John M., to City of Hope National Medical Center. Safety device and method for removal and disposal of medical needles. 4,842,586, Cl. 604-192.000.

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Hogg, Jeffrey; and Harwood, Joseph T., to Town Centre Securities, PLC. Glass panel mounting assembly. 4,841,697, Cl. 52-208.000.

Hohenwarter, Mark, to Serotonin Industries of Charleston. Method and composition for treating obesity, drug abuse, and narcolepsy. 4,843,071, Cl. 514-217.000.

Hohman, Jeffrey L.: *See—*
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Hohmann, Lothar M.: *See—*
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Hohn, Fritz J.: *See—*
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Holben, Milford S., Jr.: *See—*
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Holden, Ronald L.: *See—*
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Holland, Ralph R.: *See—*
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Hollis, Calvin L.; and Taylor, James L. Oil skimming apparatus. 4,842,735, Cl. 210-242.300.

Hollis, John P., Jr. Artificial maple concentrate attractant rodent baits. 4,842,861, Cl. 424-410.000.

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Holmberg, Scott H.: *See—*
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Holmes International Inc.: *See—*
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Holmes, Michael: *See—*
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Holmes, Timothy L.: *See—*
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Holmwood, Graham; Kramer, Wolfgang; Buchel, Karl H.; Reinecke, Paul; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Hydroxyethyl-azole derivatives. 4,843,088, Cl. 514-383.000.

Holmwood, Graham; Kramer, Wolfgang; Buchel, Karl H.; and Plempel, Manfred, to Bayer Aktiengesellschaft. Antimycotic agent. 4,843,089, Cl. 514-383.000.

Holz, Emil, to Hermann Finckh Maschinenfabrik GmbH & Co. Pressure sorter. 4,842,722, Cl. 209-270.000.

Homma, Yoshio: *See—*
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Honda Giken Kogyo Kabushiki Kaisha: *See—*
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Furuya, Tamio; Tazaki, Yuichi; Kinugasa, Toshiyuki; Ishige, Yoshiki; and Tsuchimoto, Yuichi, 4,841,618, Cl. 29-423.000.
Kawanabe, Tomohiko; Asakura, Masahiko; Kushida, Noritaka; Kubota, Shin'ichi; Matsumoto, Yukihiro; Arai, Yasuhisa; and Hosaka, Takefumi, 4,843,550, Cl. 364-424.100.
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Yamaguchi, Takashi; Inoue, Takeshi; and Saito, Masashi, 4,843,046, Cl. 501-136.000.
Inovan GmbH & Co. KG: *See*—
Tilse, Wilhelm, 4,842,545, Cl. 439-393.000.
Institut Francais du Petrole: *See*—
Zaitoun, Alain; and Kohler, Norbert, 4,842,071, Cl. 166-295.000.
Institut Pasteur: *See*—
Huynh-Dinh, Tam; and Igolen, Jean, 4,842,996, Cl. 435-6.000.
Instruments S.A.: *See*—
Thevenon, Alain, 4,842,353, Cl. 350-3.700.
Intel Corporation: *See*—
Ong, Dewitt; and Rider, Scott, 4,843,026, Cl. 437-51.000.
Inter Therapy, Inc.: *See*—
Griffith, James M.; Maciel, Mario; Henry, Walter L.; and Zalesky, Paul J., 4,841,977, Cl. 128-660.030.
Interlock Corporation: *See*—
Mobley, Dewey F.; Peterson, Robert G.; and Collar, Robert S., 4,842,534, Cl. 439-214.000.
Intermec Corporation: *See*—
Caldwell, Edward D.; and Koury, Pamela M., 4,842,439, Cl 403-290.000.
Internal Business Machines Corporation: *See*—
Aulick, Larry O.; and DeCoste Jr., Charles L., 4,842,795, Cl. 264-155.000.
International Business Machines Corporation: *See*—
Anderson, Nathaniel C.; Miner, Marlin E.; Romankiw, Lubomyr T.; and Starcke, Steven F., 4,842,886, Cl. 427-10.000.
Avritt, Michael D.; Hegerhorst, Brent K.; and Peterson, Peter K., 4,843,429, Cl. 355-274.000.
Bayer, Thomas; Elsasser, Michael; Greschner, Johann; Schmid, Heinrich; Stohr, Roland; Wolter, Olaf; and Wittlinger, Jurgen, 4,843,315, Cl. 324-158.00P.
Bean, George H.; Borden, Terry L.; Farrell, Mark S.; Gum, Peter H.; Hough, Roger E.; Johnson, Francis E.; McCauley, Donald W.; Rakhmilevich, Mark E.; Rathjen, John C.; Scalzi, Casper A.; Scanlon, John F.; and Wyman, Leslie W., 4,843,541, Cl. 364-200.000.
Beha, Johannes G.; Blacha, Armin U.; Clauberg, Rolf; and Seitz, Hugo K., 4,843,329, Cl. 324-73.0PC.
Bux, Werner K.; Closs, Felix H.; Mueller, Johann R.; Van As, Harmen R.; and Zafiropulo, Pitro A., 4,843,606, Cl. 370-89.000.
Callender, Bernard L.; Chow, William W.; Osterday, Thomas G.; and Rueger, William J., 4,842,177, Cl. 226-97.000.
Chappell, Barbara A.; Chappell, Terry I.; and Schuster, Stanley E., 4,843,261, Cl. 307-449.000.
Golladay, Steven D.; Hohn, Fritz J.; and Pfeiffer, Hans C., 4,843,330, Cl. 324-158.00R.
Kirchner, Peter D.; Warren, Alan C.; Woodall, Jerry M.; and Wright, Steven L., 4,843,450, Cl. 357-52.000.
Lisle, Ronald J.; Moss, Eual A.; and Ryder, John H., 4,843,389, Cl. 341-106.000.
Mukherjee, Amar; Natarajan, Kadathur S.; and Stone, Harold S., 4,843,567, Cl. 364-513.000.
International Flavors & Fragrances, Inc.: *See*—
Rutherford, Howard J., 4,842,761, Cl. 252-90.000.
International Minerals & Chemical Corp.: *See*—
Jacobs, Martin J.; Edwards, Carl K., III; and Myers-Keith, Paula, 4,842,862, Cl. 424-422.000.

International Partners in Glass Research: *See—*
Braithwaite, David; Douglas, Robert J.; Jones, Stanley P.; Poole, James P.; and Rawson, Harold, 4,842,60 0, Cl. 65-30.140.
Inui, Masaki, to Toyota Jidosha Kabushiki Kaisha. Gear synchronizer for power transmission. 4,842,112, Cl. 192-53.00F.
Inui, Tomoyuki, to Showa Shell Sekiyu Kabushiki Kaisha. Process for producing lower olefinic hydrocarbons from methanol. 4,843,183, Cl. 585-640.000.
Invernizzi, Renzo; Masi, Francesco; and Moalli, Angelo. Catalyst component for polymerizing ethylene or copolymerizing ethylene with an alpha-olefin. 4,843,049, Cl. 502-9.00.
Involvo AG: *See—*
Roth, Oscar, 4,842,572, Cl. 493-357.000.
Ireco, Inc.: *See—*
Jensen, Finn; and Nadherny, Rudolph E., 4,842,459, Cl. 410-97.000.
Irelan, John A., to Coachmen Industries, Inc. Towable camper. 4,842,325, Cl. 296-146.000.
Ironside, John M.: *See—*
Wakeman, Anthony C.; Ironside, John M.; Holmes, Michael; and Barnard, Simon C., 4,843,556, Cl. 364-431.080.
Irvine, Gerald O.: *See—*
Anderson, Marvin L.; and Irvine, Gerald O., 4,842,108, Cl. 191-12.20A.
Irwin, Benny: *See—*
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Isaacson, Philip G.: *See—*
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Ishibashi, Hiroshi: *See—*
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Ishida, Masamitsu: *See—*
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Ishida, Noboru: *See—*
Taniguchi, Masato; Kawamura, Mitsuyoshi; Ishida, Noboru; and Ito, Masaya, 4,841,922, Cl. 123-90.510.
Ishida, Tokuji; Ootsuka, Hiroshi; and Mukai, Hiromu, to Minolta Camera Kabushiki Kaisha. Light measuring device. 4,843,417, Cl. 354-408.000.
Ishige, Sadao; Usami, Toshimasa; Kamikawa, Hiroshi; and Tanaka, Toshiharu, to Fuji Photo Film Co., Ltd. Black color heat-sensitive diazo microcapsule recording material with benzoylacetic amide coupler. 4,842,979, Cl. 430-138.000.
Ishige, Yoshiki: *See—*
Furuya, Tamio; Tazaki, Yuichi; Kinugasa, Toshiyuki; Ishige, Yoshiki; and Tsuchimoto, Yuichi, 4,841,68 8, Cl. 29-423.000.
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Hattori, Toshihiro; Ishihara, Masaki; Kasai, Hitoshi; and Asagi, Yasuyoshi, 4,843,555, Cl. 364-431.070.
Ishii, Kazuo: *See—*
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Ishii, Kenji: *See—*
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Ishii, Yoshiteru: *See—*
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Ishikawa, Hisashi; and Yoshimura, Katsuji, to Canon Kabushiki Kaisha. Frequency demodulator operable with low frequency modulation carriers. 4,843,334, Cl. 329-122.000.
Ishikawa, Shunichi, to Fuji Photo Film Co., Ltd. Process for preparation of light-sensitive microcapsules containing silver halide and polymerizable compound. 4,842,978, Cl. 430-138.000.
Ishikawa, Takatoshi: *See—*
Yagihara, Morio; Fujimoto, Hiroshi; Ishikawa, Takatoshi; and Andoh, Kazuto, 4,842,993, Cl. 430-380.000.
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Ishimura, Tamihiro: *See—*
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Ishizu, Yoshio: *See—*
Tanabe, Susumu; Sekii, Shigekazu; Tsuchida, Kouji; and Ishizu, Yoshio, 4,841,981, Cl. 128-692.000.
Ishizumi, Kikuo; Antoku, Fujio; Maruyama, Isamu; and Kojima, Atsuyuki, to Sumitono Pharmaceutical Company, Limited. Succinimide derivatives, and their production and use. 4,843,078, Cl. 514-253.000.
Iskra-Sozd Elektrokovinske Industrije n.sol.o.: *See—*
Rozman, Miro; and Zlebir, Silvo, 4,843,311, Cl. 324-142.000.
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Isuzu Motors Limited: *See—*
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Ital Idee s.r.l. an Italian Limited Liability Company: *See—*
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Italiano, Anthony J., to MPC Technologies Co. Adjustable cable end coupling. 4,841,805, Cl. 74-501.50R.
Itaya, Masahiko; Niitsuma, Tetsuya; and Okamoto, Syuzi, to Konishiroku Photo Industry Co., Ltd. Image forming method and apparatus. 4,843,425, Cl. 355-261.000.
Itek Graphix Corp.: *See—*
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Ito, Kazuhiko, to Mitsubishi Denki Kabushiki Kaisha. Method of producing a Schottky gate field effect transistor. 4,843,024, Cl. 437-41.000.
Ito, Masashi: *See—*
Nakamura, Hiroyuki; Ito, Masashi; Itoi, Toshiki; and Hashimoto, Akifumi, 4,842,392, Cl. 350-247.000.
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Ito, Osamu: *See—*
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Ito, Takanori, to Ricoh Company, Ltd. Method of processing image information. 4,843,458, Cl. 358-80.000.
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Ito, Toshinobu: *See—*
Yoshida, Kageo; Nittani, Osamu; Ito, Toshinobu; Kokura, Makoto; and Hirano, Kouzi, 4,842,743, Cl. 210-634.000.
Ito, Wataru; and Ito, Satoshi, to Nippon Steel Corporation. Stainless steel coated with thin film of carbon containing specified amount in a state of diamond and having an adjustable black transparent color tone. 4,842,945, Cl. 428-457.000.
Ito, Yasushi; Imamura, Masaaki; Kato, Yoshiki; and Fumioka, Jun, to Hitachi, Ltd. Method of producing magnetic disk. 4,842,618, Cl. 51-293.000.
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Itoh, Isamu: *See—*
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Itoh, Kiichi; and Shibano, Takeshi, to Mitsubishi Petrochemical Company Limited; and Uni-Charm Corporation. Process for preparation of water absorptive composite. 4,842,927, Cl. 428-254.000.
Itoh, Masatoshi: *See—*
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Itoh, Tetsuya: *See—*
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Hope, James E.; Leyerle, John C.; Birzer, Richard; and Hohman, Jeffrey L., 4,842,005, Cl. 137-101.190.
ITT Electro Optical Products, A Division of ITT Corporation: *See—*
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Iu, Stephen C. Vehicle window sunshine shields dot. 4,842,322, Cl. 296-97.700.
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Iwaki, Takashi: *See—*
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Iwasaki, Eiji; and Isomura, Yukio, to Toyota Jidosha Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Door locking knob structure. 4,842,312, Cl. 292-336.300.
Iwasaki, Kyoji: *See—*
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Iwata, Norio; Nakamura, Masao; and Takusagawa, Takashi, to Bridgestone Tire Co., Ltd. Heavy duty low-section pneumatic radial tire and a process for manufacturing the same. 4,842,682, Cl. 156-130.000.
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Iyoda, Syozo: *See—*
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Izenour, George C., to Lehigh University. Stage lighting apparatus. 4,843,529, Cl. 362-284.000.
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Yasuda, Kikuo; Shibata, Kenyu; Honma, Seijiro; Seki, Toshimi; Hasumi, Kohichi; Masuda, Takeshi; Izumi, Akihiro; Ishimori, Tsutomu; Gotanda, Kotaro; and Uno, Masako, 4,843,072, Cl. 514-247.000.
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J. Hirschmann Geratebau GmbH & Co. KG: *See—*
Kaser, Manfred, 4,842,407, Cl. 356-344.000.
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Nelson, Marvin L., 4,842,449, Cl. 406-153.000.
J. M. Huber Corporation: *See—*
Withiam Michael C., 4,842,772, Cl. 252-601.000.
Jachec, Kevin V.; and Becker, Peter D., to Quantum Chemical Corporation. Adhesive blends and composite structures. 4,842,947, Cl. 428-461.000.
Jack Moon Co. Ltd., Taiwan: *See—*
Chen, Chung F., 4,842,364, Cl. 350-96.230.
Jackson, Larry A.: *See—*
Rasmussen, Steve O.; Jackson, Larry A.; and Pinkernell, David W., 4,843,338, Cl. 346-140.00R.
Jackson, Raymond P., to United States of America, Army. Composite long rod penetrator. 4,841,868, Cl. 102-517.000.
Jacobi, John W., to Hewlett-Packard Company. Process for bonding integrated circuit components. 4,842,662, Cl. 156-633.000.
Jacobs, Deborah A. Animal holding and position restoring device employing vacuum holder and mouthpiece. 4,841,965, Cl. 128-303.00B.
Jacobs, Martin J.; Edwards, Carl K., III; and Myers-Keith, Paula, to International Minerals & Chemical Corp. Immunostimulating agents. 4,842,862, Cl. 424-422.000.
Jacobson, Earl B. Glove box for removal of hazardous waste from pipes. 4,842,347, Cl. 312-1.000.
Jacobson, Richard L.; Jeffrey, Frank R.; and Westerberg, Roger K., to Minnesota Mining and Manufacturing Company. Multi-chamber deposition system. 4,841,908, Cl. 118-718.000.
Jacrot, Michel, to U.S. Philips Corporation. Electric incandescent lamp assembly having simplified construction. 4,843,276, Cl. 313-318.000.
Jaecklin, Andre ; Roggwiller, Peter; Veitz, Rudolf; and Vlasak, Thomas, to BBC Brown Boveri AG. Controllable power semiconductor. 4,843,449, Cl. 357-38.000.
Jager, Paul, to Kali-Chemie Aktiengesellschaft. Method for separating barium from water-soluble strontium compounds. 4,842,833, Cl. 423-160.000.
Jager, Sebastian, to Arnold Jager. Device for aerating water. 4,842,779, Cl. 261-122.000.
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Jakubowski, Paul R.; and Boies, Ronald L., to Westinghouse Electric Corp. Tether attachment device. 4,842,219, Cl. 244-31.000.
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James, Darryl G.: *See—*
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James, Francis O. Fishing rod holder. 4,841,660, Cl. 43-21.200.
James, Phillip A.; and Whitehead, Martin A., to U.S. Philips Corporation. Liquid chomatograph apparatus. 4,842,730, Cl. 210-198.200.
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Janocha, Siegfried; Crass, Guenther; Schloegl, Gunter; and Bothe, Lothar, to Hoechst Aktiengesellschaft. Opaque film for candy twist wrapping. 4,842,187, Cl. 229-87.00F.
Jansons, Viktors; and Gors, Heinrich C., to Raychem Corporation. Preparation of 4,4'-diphenoxybenzophenone. 4,843,179, Cl. 568-322.000.
Jarrell, Stephen E. Screed track for concrete slab construction. 4,841,704, Cl. 52-396.000.
Jarvis, Patrick. Sway bar for all terrain vehicle. 4,842,298, Cl. 280-689.000.
Jay, Eric C., to Jay Medical, Ltd. Protective seat cushion. 4,842,330, Cl. 297-4.000.
Jay Medical, Ltd.: *See—*
Jay, Eric C., 4,842,330, Cl. 297-4.000.
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Jean, Jyh-Jian; and Jean, Jyh-Perng, to Jean, Jyb-Jian. Straight through type muffler for generating the exhaust flow from an internal combustion engine. 4,841,728, Cl. 60-312.000.
Jean, Jyh-Perng: *See—*
Jean, Jyh-Jian; and Jean, Jyh-Perng, 4,841,728, Cl. 60-312.000.
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Jenkins, John W., to Bellwether, Inc. Exercise machine. 4,842,268, Cl. 272-73.000.
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Jennings, Joe M. Exercise apparatus. 4,842,272, Cl. 272-132.000.
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Jensen, Niels D.; and Simonsen, Soren, to Grundfos International a/s. Multi-stage inline rotary pump. 4,842,480, Cl. 415-199.100.
Jensen, Niels D.: *See—*
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Jenson, Leslie M., to TSI Incorporated. Apparatus and method for measuring frequency of coherent component of a composite signal. 4,843,564, Cl. 364-510.000.
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Jeunhomme, Luc, to Photonetics S.A. Device for detecting vibrations including a multimode optical fiber as sensitive element. 4,843,233, Cl. 250-227.000.
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Jiang, Ching-Lin, to Dallas Semiconductor Corporation. Temperature compensated monolithic delay circuit. 4,843,265, Cl. 307-591.000.
Jikka, Panu O.; and Virkola, Nils-Erik, to Oy Advanced Forest Automation Ab. Method for controlling sulphite pulping and hydrolytic processes by means of rapid furfural analyzer. 4,842,689, Cl. 162-49.000.
Jimenez, Francisco G.; and Spector, George. Auto brake light. 4,843,369, Cl. 340-479.000.
Jogen, Masao: *See—*
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Johansen, Kenneth L. Visual aid ruler. 4,842,521, Cl. 434-187.000.
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Kawasaki, Yoshio; Horibe, Tatutake; Sasaki, Kenji; and Yamada, Kazuo, to Howa Machinery Ltd. Roving bobbin exchanging method and apparatus for carrying out roving bobbin exchanging method. 4,841,720, Cl. 57-281.000.

Kawasaki, Yosio; and Horibe, Tatutake, to Murata Kikai Kabushiki Kaisha. Automatic yarn end finding device for a spinning bobbin. 4,842,206, Cl. 242-18.00R.

Kawasumi, Ken-ichi; and Inada, Akio, to Hitachi, Ltd. Apparatus for treating surface of object with ultraviolet rays and reaction gas. 4,842,828, Cl. 422-186.300.

Kawatsuki, Nobuhiro; Fujisawa, Katsuya; Matsuzaki, Ichiro; and Uetsuki, Masao, to Kuraray Company, Ltd. Transmittance modulation photomask, process for producing the same, and process for producing diffraction gratings using the same. 4,842,969, Cl. 430-5.000.

Kawneer Company, Inc.: *See*—
Matthews, Thomas E., 4,841,700, Cl. 52-235.000.

Kayaba Kogyo K.K.: *See*—
Toiyama, Yoshiro, 4,842,238, Cl. 248-562.000.

Kayane, Yutaka; Sawamoto, Hirokazu; Omura, Takashi; Harada, Naoki; and Takeshita, Akira, to Sumitomo Chemical Company, Limited. Fiber reactive yellow dye of acetoacetonilide having vinyl sulfone-type reactive group. 4,843,149, Cl. 534-632.000.

Kayane, Yutaka: *See*—
Yamauchi, Noriaki; Imada, Kunihiko; and Kayane, Yutaka, 4,842,614, Cl. 8-564.000.

Kaywood, Roy G.: *See*—
Arnold, Philip D.; and Kaywood, Roy G., 4,841,627, Cl. 29-720.000.

Kazehara, Kenya: *See*—
Urushiwara, Hisashi; Iwamaru, Tugiyasu; Kazehara, Kenya; Watanabe, Osamu; Sawada, Kenichi; Sato, Kiyoshi; Yoshikawa, Hirokazu; Ikenari, Shigeru; Yokoyama, Kenichi; and Uetani, Yoshio, 4,842,965, Cl. 429-56.000.

Kazla, Algis A.: *See*—
Fedaravichjus, Algimantas Y.; Kazla, Algis A.; Rimshyalis, Klemensas K.; and Ragulskis, Kazimieras M., 4,841,629, Cl. 29-737.000.

Kazuno, Kenji: *See*—
Kise, Masahiro; Kitano, Masahiko; Ozaki, Masakuni; Kazuno, Kenji; Shirahase, Ichiro; Tomii, Yoshifumi; and Segawa, Jun, 4,843,070, Cl. 514-210.000.

Kei Mori: *See*—
Mori, Kei; and Hara, Kazuyoshi, 4,843,510, Cl. 362-413.000.

Keil, Michael: *See*—
Kast, Juergen; Keil, Michael; Kolassa, Dieter; Schirmer, Ulrich; Wuerzer, Bruno; Meyer, Norbert; Rademacher, Wilhelm; and Jung, Johann, 4,842,638, Cl. 71-88.000.

Keiper Recaro GmbH & Co.: *See*—
Voss, Hans W.; Cremer, Heinz P.; Cwienania, Harald; and Putsch, Peter-Ulrich, 4,842,334, Cl. 297-338.000.

Keithley Instruments Inc.: *See*—
Sheridan, Terrence E., 4,843,619, Cl. 378-207.000.

Keleti, Georg: *See*—
Youngner, Julius S.; Feingold, David S.; and Keleti, Georg, 4,842,855, Cl. 424-95.000.

Keller, Heimo; and Keppler, Bernhard, to Asta Pharma AG. Medicament formulations containing ruthenium compounds with an antitumoral action. 4,843,069, Cl. 514-184.000.

Kelly, Joseph M.: *See*—
Sestanj, Kazimir; Wrobel, Jay E.; and Kelly, Joseph M., 4,843,062, Cl. 514-4.000.

Kelly, Michael J.: *See*—
Attix, Douglas J.; Kelly, Michael J.; Mason, Fred L.; and Stinnett, Carlton E., 4,842,809, Cl. 376-261.000.

Kelm, Otto. Self-aligning plunger tip. 4,842,039, Cl. 164-312.000.

Kelsey, Christopher G., to Geoflow International Pty. Limited. Valve. 4,842,245, Cl. 251-212.000.

Kemter, Heinz: *See*—
Frenzel, Bertram; Grenzendorfer, Dietmar; Kemter, Heinz; Wuensch, Wolfgang; and Zeisberg, Peter, 4,841,747, Cl. 66-84.00A.

Kent Company, The: *See*—
Wiese, Martin, 4,841,595, Cl. 15-352.000

Kenyon, Stephen C.; Simkins, Laura J.; and Sebastian, Richard L., to Broadcast Data Systems Limited Partnership. Broadcast information classification system and method. 4,843,562, Cl. 364-487.000.

Keppler, Bernhard: *See*—
Keller, Heimo; and Keppler, Bernhard, 4,843,069, Cl. 514-184.000.

Kesling, Christopher K., to TP Orthodontics, Inc. Combination edgewise bracket. 4,842,512, Cl. 433-8.000.

Kesling, Peter C., to TP Orthodontics, Inc. Uprighting spring. 4,842,514, Cl. 433-21.000.

Kessels, Hendricus W. H. M.: *See*—
Notermans, Ronald M. W.; Verhelst, Paulus W. E.; Lapoutre, Charles; and Kessels, Hendricus W. H. M., 4,843,571, Cl. 364-519.000.

Kester, Wayne A.: *See*—
Sabol, John S., Jr.; and Kester, Wayne A., 4,842,762, Cl. 252-109.000.

KeyTek Instrument Corp.: *See*—
Richman, Peter L., 4,843,515, Cl. 361-58.000.

KGT Giessereitechnik GmbH: *See*—
Bardenheuer, Peter, 4,842,256, Cl. 266-197.000.

Khalifa, Mohamed A., to Schlumberger Industries, Inc. Flow rectifier for vortex flowmeter. 4,841,781, Cl. 73-861.220.

Khromov, Gennady L.: *See*—
Babaian, Eduard A.; Gerasimova, Galina A.; Davydov, Anatoly B.; Utyamyshev, Rustam I.; Khromov, Gennady L.; Metelitsa, Vladimir I.; Vikhert, Anatoly M.; Savvateev, Konstantin L.; Piotrovsky, Vladimir K.; and Novikova, Elizaveta B., 4,842,854, Cl. 424-81.000.

Kibbel, Horst: *See*—
Herzog, Hans-Joest; Jorke, Helmut; and Kibbel, Horst, 4,843,028, Cl. 437-81.000.

Kiehn, Robert M.: *See*—
Gorman, Michael A.; Sterling, Mark H.; Kiehn, Robert M.; and Wood, Lowell T., 4,842,393, Cl. 350-432.000.

Kielmeyer, William H., to Johns-Manville Corporation. Loose-fill insulation. 4,842,928, Cl. 428-288.000.

Kielpikowski, David P.; and Uitenbroek, Duane G., to Kimberly-Clark Corporation. Method of making a breathable elastic fabric composite and personal article incorporating same. 4,842,596, Cl. 604-385.200.

Kievsky Politekhnichesky Institut: *See*—
Gershuni, Alexandr N.; Maisotsenko, Valery S.; Zaripov, Vladilen K.; and Semena, Mikhail G., 4,842,052, Cl. 165-104.110.

Kijima, Yasuhiko: *See*—
Isshiki, Tomiya; Kijima, Yasuhiko; Ito, Akira; and Ishii, Kenji, 4,843,170, Cl. 560-261.000.

Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, to Tokyo Keiki Co., Ltd. Applicator for use in hyperthermia. 4,841,989, Cl. 128-804.000.

Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, to Tokyo Keiki Co., Ltd. Applicator for use in hyperthermia. 4,841,990, Cl. 128-804.000.

Kikuchi, Sumio, to Hitachi, Ltd. Compile method using copy propagation of a variable. 4,843,545, Cl. 364-300.000.

Kilham, Peter. Bendable coiled wire bird perch. 4,841,910, Cl. 119-26.000.

Kim, Ernest M.; and Peter, Jack, to Tacan Corporation. Two spherical lens optical coupler. 4,842,391, Cl. 350-96.180.

Kim, Hyunsoo: *See*—
Marshek, Kurt M.; and Kim, Hyunsoo, 4,841,783, Cl. 73-862.480.

Kimberly-Clark Corporation: *See*—
Kielpikowski, David P.; and Uitenbroek, Duane G., 4,842,596, Cl. 604-385.200.

Kimbrough, Scott S.; and Hallman, Steven J., to General Motors Corporation. Four wheel steering system with closed-loop feedback and open-loop feedforward. 4,842,089, Cl. 180-79.100.

Kimura, Kazuo: *See*—
Matsui, Toru; and Kimura, Kazuo, 4,843,227, Cl. 250-201.000.

Kimura, Kozo, to Sharp Kabushiki Kaisha. Failure alarm device for an appliance. 4,843,378, Cl. 340-635.000.

Kimura, Mareo: *See*—
Matsumoto, Shinichi; Miyoshi, Naoto; Muraki, Hideaki; Sobukawa, Hideo; Fukui, Masayuki; Kimura, Mareo; and Shinjoh, Hirofumi, 4,843,056, Cl. 502-302.000.

Kinetic Technology, Inc.: *See*—
Evans, Joseph M.; and Moore, E. Rex, 4,841,955, Cl. 128-52.000.

King, Brian M. Sound reproduction systems. 4,843,625, Cl. 381-98.000.

King, Kevin K.: *See*—
Eden, J. Gary; King, Kevin K.; and Tavitian, Viken, 4,843,030, Cl. 437-88.000.

King, Russell A.: *See*—
Brown, John R.; Graham, Nigel K.; and King, Russell A., 4,842,037, Cl. 164-45.000.

Kingsley, Richard J., to Saturn Corporation. Vehicle exterior sun visor. 4,842,320, Cl. 296-95.100.

Kinnan, Frank R., to Underground Technologies, Inc. Device for detecting and measuring the tension on a cable. 4,842,207, Cl. 242-54.00R.

Kinney, Terrance R.: *See*—
Emo, Stephen M.; and Kinney, Terrance R., 4,843,232, Cl. 250-225.000.

Kinoshita, Akira: *See*—
Sugaiwa, Takayuki; Kinoshita, Akira; and Sawada, Kiyoshi, 4,842,971, Cl. 430-64.000.

Kinoshita, Haruhisa, to Oki Electric Industry Co., Ltd. Dry process apparatus. 4,842,707, Cl. 204-298.000.

Kinoshita, Mitsuo: *See*—
Gamo, Gotaro; and Kinoshita, Mitsuo, 4,843,203, Cl. 219-69.120.

Kinsey, Darrell; and Kinsey, David. Outboard boat motor support device. 4,842,239, Cl. 248-640.000.

Kinsey, David: *See*—
Kinsey, Darrell; and Kinsey, David, 4,842,239, Cl. 248-640.000.

Kinugasa, Toshiyuki: *See*—
Furuya, Tamio; Tazaki, Yuichi; Kinugasa, Toshiyuki; Ishige, Yoshiki; and Tsuchimoto, Yuichi, 4,841,618, Cl. 29-423.000.

Kinugawa, Seiichi, to Sharp Kabushiki Kaisha. Method of mounting electronic parts onto single-sided printed wiring board. 4,841,633, Cl. 29-837.000.

Kirchner, Peter D.; Warren, Alan C.; Woodall, Jerry M.; and Wright, Steven L., to International Business Machines Corporation. Compound semiconductor interface control. 4,843,450, Cl. 357-52.000.

Kirchnerova, Jitka; Skeaff, James M.; and Bale, Christopher W., to Canadian Patents and Development Limited/Societe Canadienne des Brevets et d'Exploitation Limitee. Solid state arsenic probe for use in pyrometallurgical processes. 4,842,698, Cl. 204-1.00T.

Kirk, Chester E. Multi-mode CPM physiotherapy foot manipulating device. 4,842,265, Cl. 128-25.00B.

Kisalus, John C.: *See*—
Kaplan, Morris; and Kisalus, John C., 4,842,716, Cl. 208-48.0AA.

Kise, Masahiro; Kitano, Masahiko; Ozaki, Masakuni; Kazuno, Kenji; Shirahase, Ichiro; Tomii, Yoshifumi; and Segawa, Jun, to Nippon Shinyaku Co., Ltd. Substituted thiazetoquinoline-3-carboxylic acids and pharmaceutically acceptable salts thereof. 4,843,070, Cl. 514-210.000.

Kiss, Bela: *See*—
Szantay, Csaba; Soti, Ferenc; Incze, Maria; Balogh nee Kardos, Zsuzsanna; Szombathelyi, Zsolt; Karpati, Egon; Kiss, Bela; Csomor, Katalin; Laszlovszky, Istvan; Lapis, Erzsebet; Forgacs, Lilla; Kuthi, Csaba; and Szporny, Laszlo 4,843,080, Cl. 514-285.000.

Kistenich, Johann; and Volk, Christian, to Osterreichische Salen-Kunststoffwerk GmbH. Pipe joint connecting plastic pipes and process of making such joint. 4,842,305, Cl. 285-21.000.

Kitagishi, Nozomu; Nakayama, Hiroki; Suda, Shigeyuki; Hattori, Jun; and Horiuchi, Akihisa, to Canon Kabushiki Kaisha. Variable focal length objective. 4,842,386, Cl. 350-427.000.

Kitagishi, Nozomu: *See*—
Sato, Yasuhisa; Kitagishi, Nozomu; Yamada, Yasuyuki; Nakayama, Hiroki; and Oizumi, Kouji, 4,842,395, Cl. 350-519.000.

Kitamura, Fumio, to Kitamura Kiden Co., Ltd. Method and apparatus for manufacturing wound core. 4,842,208, Cl. 242-56.200.

Kitamura, Ikuo: *See*—
Okamura, Kazuo; Kitamura, Ikuo; Aomi, Hideki; Koyama, Satoshi; Tokunaga, Katsushi; Shibuya, Yoshiyuki; and Daimon, Shiego, 4,842,759, Cl. 252-62.510.

Kitamura Kiden Co., Ltd.: *See*—
Kitamura, Fumio, 4,842,208, Cl. 242-56.200.

Kitamura, Yoshinori: *See*—
Fujioka, Atsushi; Morimura, Atsushi; Kitamura, Yoshinori; and Matsuoka, Hiroki, 4,843,476, Cl. 358-228.000.

Kitano, Masahiko: *See*—
Kise, Masahiro; Kitano, Masahiko; Ozaki, Masakuni; Kazuno, Kenji; Shirahase, Ichiro; Tomii, Yoshifumi; and Segawa, Jun, 4,843,070, Cl. 514-210.000.

Kitao, Teijiro: *See*—
Araki, Shingo; Tsuchiya, Kikuo; Inagaki, Masaji; Kudoh, Yumi; and Kitao, Teijiro, 4,843,058, Cl. 503-209.000.

Kiuchi, Masayoshi: *See*—
Fukuda, Tsuyoshi; Suzuki, Masayuki; and Kiuchi, Masayoshi, 4,843,420, Cl. 354-479.000.

Kiyomoto, Masayuki: *See*—
Yokoshima, Minoru; Ohkubo, Tetsuo; Hattori, Hideaki; and Kiyomoto, Masayuki, 4,843,111, Cl. 522-42.000.

KLASI, Nirmal S.: *See*—
Kalsi, Nirmal S., 4,841,954, Cl. 128-36.000.

Klawuhn, Manfred: *See*—
Kullen, Albrecht; Klawuhn, Manfred; Hickel, Sigrun; and Franke, Wolfgang, 4,842,416, Cl. 366-314.000.

Klein, Joachim; Behrens, Wolfgang; and Kurz, Markwart, to Sueddeutsche Zucker-Aktiengesellschaft. Isomaltamines and their N-acyl derivatives, methods for their production, and their uses as surfactants and monomers. 4,843,154, Cl. 536-4.100.

Klein, Siegfried, to Commissariat a L'Energie Atomique; and Klein, Siegfried. Visual apparatus. 4,842,400, Cl. 351-158.000.

Kleineberg, Wolfgang: *See*—
Scheurenbrand, Dieter; Wawra, Helmut; and Kleineberg, Wolfgang, 4,842,006, Cl. 137-202.000.

Kleinevoss, Albert; and Kopia, Jochen, to Didier-Werke AG. Composite refractory member. 4,842,172, Cl. 222-600.000.

Kleinhammer, Gerd: *See*—
Haug, Harald; Kleinhammer, Gerd; and Mattersberger, Johann, 4,843,001, Cl. 435-7.000.

Klier, Kamil; Herman, Richard G.; and Vedage, Gamimi, to Lehigh University. Catalyst and method for producing methanol. 4,843,101, Cl. 518-713.000.

Klinke, Roland: *See*—
Hosticka, Bedrich J.; Klinke, Roland; and Pfleiderer, Hans-Joerg, 4,843,341, Cl. 330-253.000.

Kloppenburg, Ernst, to AEG Olympia Aktiengesellschaft. Plotting mechanism mounted on a ribbon cassette for typewriters or office machines. 4,842,427, Cl. 400-18.000.

Klostermann, Gerd: *See*—
Budecker, Ludwig; and Klostermann, Gerd, 4,843,193, Cl. 200-84.00C.

Klueppel, Klemens: *See*—
Bergmann, Horst; Daudel, Helmut; Brandner, Burkhard; and Klueppel, Klemens, 4,843,558, Cl. 364-431.030.

Knickerbocker, Edward N.: *See*—
Krupp, Stephen P.; Knickerbocker, Edward N.; and Bieser, John O., 4,842,922, Cl. 428-198.000.

Knierim, Daniel G.: *See*—
Kareem, Arif; Walker, George S.; and Knierim, Daniel G., 4,843,309, Cl. 324-121.00R.

Knobloch, Robert R.: *See*—
Erickson, David J., II; Naylor, Michael G.; and Knobloch, Robert R., 4,842,530, Cl. 439-98.000.

Knopp, Kelly G.: *See*—
Rahlwes, William C.; and Knopp, Kelly G., 4,843,050, Cl. 502-41.000.

Knorr, Harald; and Salbeck, Gerhard, to Hoechst Aktiengesellschaft. Process for the preparation of ortho-substituted arylcarboximidoesters. 4,843,167, Cl. 558-6.000.

Knorr, Siegfried G., to Colby Instruments, Inc. Programmable mechanical delay line. 4,843,355, Cl. 333-160.000.

Kobayashi, Hideki; Honma, Hiroshi; and Hamada, Mitsuo, to Toray Silicone Company, Ltd. Unitary molded silicone rubber product from two different silicone rubbers and a method for their manufacture. 4,842,943, Cl. 428-447.000.

Kobayashi, Shozou: *See*—
Fujiwara, Tetsuo; Fuji, Hiroshi; Iwaki, Takashi; Deguchi, Toshihisa; and Kobayashi, Shozou, 4,843,604, Cl. 369-116.000.

Kobayashi, Tadashi, to Canon Kabushiki Kaisha. Opto-magnetic recording medium having three exchange-coupled magnetic layers. 4,842,956, Cl. 428-611.000.

Kobinger, Walter: *See*—
Griss, Gerhart, deceased; Schneider, Claus; Hurnaus, Rudolf; Kobinger, Walter; Pichler, Ludwig; Bauer, Rudolf; Mierau, Joachim; Hinzen, Dieter; and Schingnitz, Gunter, 4,843,086, Cl. 514-367.000.

Kobori, Yasuo: *See*—
Yokoo, Hidejiro; Maruyama, Toshishiro; Toshima, Yasuhide; and Kobori, Yasuo, 4,842,640, Cl. 71-92.000.

Koch, Roger. Method and apparatus for linear braking and chair with linear brake. 4,842,234, Cl. 248-429.000.

Kodama, Mitsuhiro: *See*—
Fuyama, Seiji; Mori, Tokio; Kodama, Mitsuhiro; Minato, Takashi; and Takaoka, Yasuhiro, 4,843,547, Cl. 364-405.000.

Koden, Mitsuhiro; Tanaka, Hirohisa; and Yano, Kohzo, to Sharp Kabushiki Kaisha. Thin film transistor. 4,843,438, Cl. 357-04.000.

Koerner, Robert M.; Lord, Arthur E., Jr.; and Brugger, John E., to Drexel University. Method of removing contaminants from contaminated soil in situ. 4,842,448, Cl. 405-258.000.

Kohl, Albert: *See*—
Grau, Werner; Kohl, Albert; Kovacs, Jenoe; Balz, Werner; and Muenzer, Wulf, 4,842,896, Cl. 427-131.000.

Kohler, Norbert: *See*—
Zaitoun, Alain; and Kohler, Norbert, 4,842,071, Cl. 166-295.000.

Kohn, Eva M.: *See*—
Schmidt, Manfred; Rupp, Walter; Schneider, Gerhart; and Kohn, Eva M., 4,842,776, Cl. 260-512.00C.

Kohno, Kyoji: *See*—
Kurosawa, Shigekichi; Nagaoka, Yoshikazu; Kannoh, Shinichi; Takemoto, Sadatoshi; Sugimoto, Shigeo; Oouchi, Tomihisa; Hatada, Toshio; Kunugi, Yoshifumi; Kawamura, Hironobu; Kohno, Kyoji; and Machizawa, Kenzi, 4,841,744, Cl. 62-475.000.

Koishi, Toshio: *See*—
Teshima, Shinichi; Katsuta, Shigeki; Maeda, Kazuhiko; Yamauchi, Taku; and Koishi, Toshio, 4,842,369, Cl. 350-96.340.

Koito Manufacturing Co., Ltd.: *See*—
Mochizuki, Hideharu; and Toki, Junji, 4,843,531, Cl. 362-421.000.

Koito Seisakusho Co. Ltd.: *See*—
Nakamura, Yasuhiro, 4,843,523, Cl. 362-69.000.

Koizumi, Satoru; Teshima, Daisuke; and Katayama, Yoshio, to Sharp Kabushiki Kaisha. Automatic cassette tape recorder stop mechanism for use with a plurality of tapes. 4,843,492, Cl. 360-74.100.

Koizumi, Yutaka: *See*—
Ono, Yutaka; Tsuchiya, Yayoi; Koizumi, Yutaka; Morimoto, Hitoshi; Banzai, Hideo; Muramatsu, Yasuhiko; Shindo, Syotoro; Kanehara, Toshihiro; Hatano, Norihiko; Obta, Susumu; and Nikaido, Mitsuhiro, 4,843,292, Cl. 318-606.000.

Kojima, Atsuyuki: *See*—
Ishizumi, Kikuo; Antoku, Fujio; Maruyama, Isamu; and Kojima, Atsuyuki, 4,843,078, Cl. 514-253.000.

Kojima, Chiaki; and Shimizu, Hidetoshi, to Sony Corporation. Hologram recording medium. 4,842,968, Cl. 430-1.000.

Kojima, Hidetaka: *See*—
Tanaka, Yasutaka; Kojima, Hidetaka; and Tsuji, Yasuo, 4,843,172, Cl. 562-406.000.

Kojima, Hisano; and Hirabayashi, Michio, to Idec Izumi Corporation. Bush switch and method of production thereof. 4,843,197, Cl. 200-406.000.

Kokubo, Tadayoshi: *See*—
Matsuda, Nobuaki; Kokubo, Tadayoshi; Aoai, Toshiaki; Umehara, Akira; and Aotani, Yoshimasa, 4,842,986, Cl. 430-270.000.

Kokubu, Masakazu: *See*—
Uchiyama, Kaoru; Takase, Haruo; Sakamoto, Kiichiro; Uenaka, Kazushige; Kokubu, Masakazu; and Akimoto, Masuo, 4,843,412, Cl. 354-275.000.
Kokura, Makoto: *See*—
Yoshida, Kageo; Nittani, Osamu; Ito, Toshinobu; Kokura, Makoto; and Hirano, Kouzi, 4,842,743, Cl. 210-634.000.
Kokusai Denshin Denwa Co., Ltd.: *See*—
Oda, Hidenori; and Yano, Hiroaki, 4,84 ,382, Cl. 340-825.060.
Kolassa, Dieter: *See*—
Kast, Juergen; Keil, Michael; Kolassa, Dieter; Schirmer, Ulrich; Wuerzer, Bruno; Meyer, Norbert; Rademacher, Wilhelm; and Jung, Johann, 4,842,638, Cl. 71-88.000.
Koll, Laurel A.; and Watts, John E. Apparatus and methods for directing spray nozzles. 4,842,195, Cl. 239-1.000.
Kolner, Brian H.: *See*—
Nazarathy, Moshe; Dolfi, David W., and Kolner, Brian H., 4,843,586, Cl. 364-822.000.
Kolonia, Robert A. Interchangeable hand tool and handle therefor. 4,841,597, Cl. 16-114.00R.
Komatsu, Moriyuki: *See*—
Mizutani, Junichi; Muroi, Ryoichi; Hayashi, Chikahisa; Sano, Yoshio; and Komatsu, Moriyuki, 4,84 ,477, Cl. 358-248.000.
Kominami, Shinya: *See*—
Nishino, Toshikazu; Kawabe, Ushio; and Kominami, Shinya, 4,843,446, Cl. 357-30.000.
Komiya, Yoshinori: *See*—
Mogi, Takao; Yuzawa, Keiji; Komiya, Yoshinori; Suematsu, Masayuki; and Tagami, Fujio, 4,843,2 9, Cl. 318-600.000.
Komiyama, Hiroshi: *See*—
Inoue, Hakuai; and Komiyama, Hiroshi, 4,842,832, Cl. 423-211.000.
K.G. Coles & Co. Pty. Limited: *See*—
Coles, Kenneth G., 4,841,870, Cl. 104-4 .000.
Komori Printing Machinery Co., Ltd.: *See*—
Watanabe, Hideo, 4,841,859, Cl. 101-23 .000.
Kondo, Takashi: *See*—
Iida, Takashi; Itoh, Masatoshi; Fukuoka, Hidenori; Tsukamoto, Takeya; and Kondo, Takashi, 4,843,4 6, Cl. 358-29.000.
Kondrashkin, Vitaly A.: *See*—
Shneerov, Yakov A.; Vikhlevschuk, Valery A.; Asnis, Arkady E.; Kondrashkin, Vitaly A.; Filonov, Oleg V.; Gurov, Vadim N.; Gutman, Lia M.; Poklady, Vadim R.; Zhilinsky, Vasily V.; Polyakov, Valery A.; Nikitenko, Valery I.; Bashmakov, Jury V.; Burshtein, Vladislav B.; Anastasiadi, Emanuil F.; Krainik, Yaroslav I.; Demerly, Konstantin P.; Ignatchenko, Pavel V.; Kozachenko, Dmitry E.; and Piptjuk, Vitaly P., 4,843,212, Cl. 219-146.230.
Konig, Klaus: *See*—
Ruckes, Andreas; Rasshofer, Werner; Konig, Klaus; and Kopp, Richard, 4,843,107, Cl. 521-155.000.
Ruckes, Andreas; Rasshofer, Werner; Konig, Klaus; and Kopp, Richard, 4,843,108, Cl. 521-155.000.
Konishi, Yasuhiro: *See*—
Miyatake, Hideshi; Kumanoya, Masaki; Hidaka, Hideto; Konishi, Yasuhiro; Dosaka, Katsumi; Yamasaki, Hiroyuki; Shimoda, Masaki; Ikeda, Yuto; and Tsukamoto, Kazuhiro, 4,843,596, Cl. 365-233.500.
Konishiroku Photo Industry Co., Ltd.: *See*—
Itaya, Masahiko; Niitsuma, Tetsuya; and Okamoto, Syuzi, 4,843,425, Cl. 355-261.000.
Matsuzaki, Masatoshi, 4,843,409, Cl. 34 -76.0PH.
Sugaiwa, Takayuki; Kinoshita, Akira; and Sawada, Kiyoshi, 4,842,971, Cl. 430-64.000.
Konno, Takamichi: *See*—
Hamaguchi, Hiroshi; Takaishi, Hideo; Ohshima, Tetsuji; Konno, Takamichi; Miyagi, Yukio; Shirai, Yutaka; and Akita, Takayuki, 4,843,068, Cl. 514-63.000.
Konno, Yutaka; Mitomi, Mitsuo; Sonobe, Takashi; and Yamaguchi, Shumpei, to Yamanouchi Pharmaceutical Co., Ltd. Plaster structural assembly for iontophoresis. 4,842,577, Cl. 604-20.000.
Koons, Edwin R.: *See*—
Hodges, C. Wayne; Henderson, Dennis R.; and Koons, Edwin R., 4,841,608, Cl. 29-25.420.
Kopia, Jochen: *See*—
Kleinevoss, Albert; and Kopia, Jochen, 4,842,172, Cl. 222-600.000.
Kopp, Richard: *See*—
Ruckes, Andreas; Rasshofer, Werner; Konig, Klaus; and Kopp, Richard, 4,843,107, Cl. 521-155.000.
Ruckes, Andreas; Rasshofer, Werner; Konig, Klaus; and Kopp, Richard, 4,843,108, Cl. 521-155.000.
Kopperschmidt-Mueller GmbH & Co. KG: *See*—
Kuhn, Wolfgang; and Juterbock, Karsten, 4,842,203, Cl. 239-705.000.
Koppitsch, Heinrich; and Sparling, Francis C., to Raychem Corporation. Branched sensor system. 4,843,327, Cl. 324-525.000.
Korber AG: *See*—
Hinz, Werner; Oesterling, Erwin; and Sabisio, Siegfried, 4,841,993, Cl. 131-94.000.
Kormos, Vladimir: *See*—
Banai, Endre; Bacsinsky, Tibor; Kormos, Vladimir; and Molnar, Jozsef, 4,842,920, Cl. 428-184.000.
Koromilas, Constantinos A., to General Motors Corporation. Positive displacement rotary mechanism. 4,841,930, Cl. 123-246.000.
Kosaka, Kenji; and Suzuki, Akihiro, to Ikegami Tsushinki Co., Ltd. Sorting machine. 4,842,264, Cl. 271-293.000.
Kostantelou, Costantina: *See*—
Dokuzovic, Zdravko; Bodor, Zoltan; Lewis, Ramola; and Kostantelou, Costantina, 4,842,870, Cl. 426-3.000.
Kosugi, Masao: *See*—
Takahashi, Kazuo; and Kosugi, Masao, 4,843,563, Cl. 364-490.000.
Koswig, Hans-Dieter: *See*—
Seeboth, Arno; Gloede, Joerg; Koswig, Hans-Dieter; Ladwig, Horst; Obernik, Hartwin; and Seeboth, Helmuth, 4,842,375, Cl. 350-339.00R.
Kotera, Nobukazu: *See*—
Yatsuka, Takeshi; Kotera, Nobukazu; and Mizumura, Yutaka, 4,842,942, Cl. 428-425.900.
Kotnour, Thomas A.; Barber, Ronald L.; and Krueger, Walter L., to Minnesota Mining and Manufacturing Company. Acrylate pressure-sensitive adhesives containing insolubles. 4,843,134, Cl. 526-318.400.
Kotsch, Heinz: *See*—
Husslein, Julius; Wittauer, Gunther; and Kotsch, Heinz, 4,843,218, Cl. 219-468.000.
Kotting, Fritz, to Wernicke & Co. GmbH. Device for disengaging a suction mechanism from a lens. 4,841,677, Cl. 51-216.0LP.
Koucky, Antonin: *See*—
Fussnegger, Wolfgang; Rieth, Egon; Koucky, Antonin; and Hector, Bernd, 4,842,318, Cl. 296-65.100.
Kouge, Shinichi: *See*—
Morishita, Mitsuharu; and Kouge, Shinichi, 4,842,087, Cl. 180-79.100.
Kourai, Hiroki; and Yabuhara, Yoshio, to Otsuka Kagaku Kabushiki Kaisha. Antibacterial polymer. 4,843,130, Cl. 525-331.300.
Koury, Pamela M.: *See*—
Caldwell, Edward D.; and Koury, Pamela M., 4,842,439, Cl. 403-290.000.
Kovacs, Jenoe: *See*—
Grau, Werner; Kohl, Albert; Kovacs, Jenoe; Balz, Werner; and Muenzer, Wulf, 4,842,896, Cl. 427-131.000.
Kovacs, Magdolna: *See*—
Matolcsy, Gyorgy; Bordas, Barna; Gimesi, Antal; Kovacs, Magdolna; and Tuske, Marton, 4,843,177, Cl. 564-209.000.
Kovacs, Richard C.; Krambeck, Frederick J.; and Sarli, Michael S., to Mobil Oil Corporation. Fluid catalytic cracking regeneration with reduction of nitrogen emissions. 4,843,051, Cl. 502-42.000.
Koyama, Hiroshi: *See*—
Nishioka, Tadashi; Morimoto, Hiroaki; Mashiko, Yoji; and Koyama, Hiroshi, 4,843,238, Cl. 250-252.100.
Koyama, Satoshi: *See*—
Okamura, Kazuo; Kitamura, Ikuo; Aomi, Hideki; Koyama, Satoshi; Tokunaga, Katsushi; Shibuya, Yoshiyuki; and Daimon, Shiego, 4,842,759, Cl. 252-62.510.
Kozachenko, Dmitry E.: *See*—
Shneerov, Yakov A.; Vikhlevschuk, Valery A.; Asnis, Arkady E.; Kondrashkin, Vitaly A.; Filonov, Oleg V.; Gurov, Vadim N.; Gutman, Lia M.; Poklady, Vadim R.; Zhilinsky, Vasily V.; Polyakov, Valery A.; Nikitenko, Valery I.; Bashmakov, Jury V.; Burshtein, Vladislav B.; Anastasiadi, Emanuil F.; Krainik, Yaroslav I.; Demerly, Konstantin P.; Ignatchenko, Pavel V.; Kozachenko, Dmitry E.; and Piptjuk, Vitaly P., 4,843,212, Cl. 219-146.230.
Krainik, Yaroslav I.: *See*—
Shneerov, Yakov A.; Vikhlevschuk, Valery A.; Asnis, Arkady E.; Kondrashkin, Vitaly A.; Filonov, Oleg V.; Gurov, Vadim N.; Gutman, Lia M.; Poklady, Vadim R.; Zhilinsky, Vasily V.; Polyakov, Valery A.; Nikitenko, Valery I.; Bashmakov, Jury V.; Burshtein, Vladislav B.; Anastasiadi, Emanuil F.; Krainik, Yaroslav I.; Demerly, Konstantin P.; Ignatchenko, Pavel V.; Kozachenko, Dmitry E.; and Piptjuk, Vitaly P., 4,843,212, Cl. 219-146.230.
Krakauer, Merrill, to Rowe International, Inc. Countertop snack vendor. 4,842,161, Cl. 221-76.000.
Krambeck, Frederick J.: *See*—
Kovacs, Richard C.; Krambeck, Frederick J.; and Sarli, Michael S., 4,843,051, Cl. 502-42.000.
Kramer, Leslie D. Steam turbine blade anti-erosion shield and method of turbine blade repair. 4,842,663, Cl. 156-98.000.
Kramer, Manfred: *See*—
Hafele, Walter; Kramer, Manfred; and Warga, Johann, 4,842,497, Cl. 417-499.000.
Kramer, Wolfgang: *See*—
Holmwood, Graham; Kramer, Wolfgang; Buchel, Karl H.; Reinecke, Paul; and Brandes, Wilhelm, 4,843,088, Cl. 514-383.000.
Holmwood, Graham; Kramer, Wolfgang; Buchel, Karl H.; and Plempel, Manfred, 4,843,089, Cl. 514-383.000.
Kranz, Curt; Zahedi, Amir; and Anapliotis, Emmanuel, to Mecron Medizinische Produkte GmbH. Bone implant. 4,842,606, Cl. 623-23.000.
Krause, Daniel F., Sr.: *See*—
Ziegler, John H.; Oakley, Gerald R.; and Krause, Daniel F., Sr., 4,842,319, Cl. 296-91.000.
Krause, Jeffrey J., to Allied-Signal Inc. Electropneumatic jumper cable connectors. 4,842,532, Cl. 439-174.000.
Krauss-Maffei A.G.: *See*—
Schlegl, Eugen, 4,842,346, Cl. 305-38.000.
Kreeger, Elsmer W., to Pinckney Molded Plastics, Inc. Open-front, two-level stacking container. 4,842,142, Cl. 206-505.000.
Krent, Edward D.; and Paffett, Nicholas B. Illuminated decorations for furnishings and other like structures. 4,843,524, Cl. 362-127.000.
Kreutzer, Karl; Simmat, Fritz; Steinkohl, Anton; and Englisch, Wolfgang, to Heraeus Quarzschmelze GmbH. Method of verifying a porous article made out of glass soot and furnace for carrying out the method. 4,842,628, Cl. 65-3.120.
Kreuzer, Franz-Heinrich: *See*—
Gebauer, Helmut; and Kreuzer, Franz-Heinrich, 4,842,853, Cl. 424-76.100.
Krieg, Adrian H. Cylinder containment vessel. 4,842,139, Cl. 206-386.000.
Kriegsman, Elliot. Furniture with appearance changeable top. 4,841,878, Cl. 108-90.000.
Krueger, Myron W.; Hinrichsen, Katrin; and Gionfriddo, Thomas S. Real time perception of and response to the actions of an unencumbered participant/user. 4,843,568, Cl. 364-518.000.
Krueger, Walter L.: *See*—
Kotnour, Thomas A.; Barber, Ronald L.; and Krueger, Walter L., 4,843,134, Cl. 526-318.400.
Kruger, Manfred: *See*—
Zeidler, Siegmund; and Kruger, Manfred, 4,842,306, Cl. 285-104.000.
Krupp Koppers GmbH: *See*—
Schmid, Karl; Jokisch, Friedrich; Heese, Dieter H. W.; Hillinger, Bruno; Beckmann, Georg; and Heger, Norbert, 4,842,695, Cl. 202-228.000.
Krupp, Stephen P.; Knickerbocker, Edward N.; and Bieser, John O., to Dow Chemical Company, The. Polyethylene fibers and spunbonded fabric or web. 4,842,922, Cl. 428-198.000.
Kryazhevskikh, Nikolai F.: *See*—
Shishkin, Viktor V.; Kryazhevskikh, Nikolai F.; and Shapovalov, Jury P., 4,841,843, Cl. 91-459.000.
Krzysik, Don J.: *See*—
Hampton, Keith; Krzysik, Don J.; and Lilley, Glen R., 4,841,924, Cl. 123-90.150.
KSM Fastening Systems Inc.: *See*—
Pease, Charles C.; Schaeffer, Eugene P.; Bernd, Kevin L.; and Higton, David A., 4,842,465, Cl. 411-337.000.
Kubiak, Jim; and Bliven, S. R. Mobile truss-making apparatus. 4,841,852, Cl. 100-100.000.
Kubo, Kanji, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle suspension system for a steerable wheel. 4,842,296, Cl. 280-663.000.
Kubo, Katsushi: *See*—
Yamamoto, Tetsuo; Hayashi, Hiroshi; Muta, Tenshiro; Hori, Yoshisada; and Kubo, Katsushi, 4,842,957, Cl. 428-622.000.
Kubota, Kazuo; and Sakaguchi, Masaaki, to Fuji Photo Film Co., Ltd. Method and device for winding magnetic tape using magnetic alignment. 4,842,210, Cl. 242-67.10R.
Kubota, Shin'ichi: *See*—
Kawanabe, Tomohiko; Asakura, Masahiko; Kushida, Noritaka; Kubota, Shin'ichi; Matsumoto, Yukihiro; Arai, Yasuhisa; and Hosaka, Takefumi, 4,843,550, Cl. 364-424.100.
Kubota, Takao; Sakuma, Tetsuro; and Nakazato, Ryoji, to G-C Dental Industrial Corporation. Light curing compositions for dental restoration. 4,843,110, Cl. 522-14.000.
Kudo, Hajime; Asano, Masami; Toma, Ken; and Takeuchi, Yo, to Mitsubishi Aluminum Co., Ltd. Method of brazing a heat exchanger using a reaction flux. 4,842,185, Cl. 228-183.000.
Kudo, Hiroaki; and Matsui, Sadayoshi, to Sharp Kabushiki Kaisha. Method for the production of semiconductor devices. 4,842,679, Cl. 156-643.000.
Kudo, Yoshihiko, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for producing α-form gypsum hemihydrate. 4,842,842, Cl. 423-554.000.
Kudo, Yoshinobu: *See*—
Taniguchi, Nobuyuki; Hata, Yoshiaki; Kudo, Yoshinobu; Inoue, Manabu; Hoda, Takeo; and Ueda, Hiroshi, 4,843,418, Cl. 354-419.000.
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Knei, Liu C.; Shui, Chen C.; and Lung, Huang C. Burglar-alarm system for briefcase. 4,843,371, Cl. 340-539.000.
Kuge, Tsukasa; Goto, Masahiro; and Sakane, Isamu, to Canon Kabushiki Kaisha. Elastic rotatable member. 4,842,944, Cl. 428-451.000.
Kugler, Ralph W.: *See*—
Rieben, Stuart L.; Kugler, Ralph W.; Scherpenberg, Joseph J.; Wiersema, Dale T.; and Fogg, James L., 4,842,808, Cl. 376-261.000.
Kuhn, Wolfgang; and Juterbock, Karsten, to Kopperschmidt-Mueller GmbH & Co. KG. Nozzle assembly for spray guns. 4,842,203, Cl. 239-705.000.
Kuijpers, Johannes A. M.; van Berkum, Piet; and Huisman, Henk, to VMI EPE Holland B.V. Apparatus for assessing the weld in belt layers for radial pneumatic tires. 4,842,413, Cl. 356-426.000.
Kuivalainen, Reijo: *See*—
Engstrom, Folke; and Kuivalainen, Reijo, 4,841,884, Cl. 110-298.000.
Kukesh, Timothy S.; and Huber, Larry G., to Glas-Craft, Inc. Plural component tester. 4,841,768, Cl. 73-168.000.
Kukin, Ira. Combustion control by addition of magnesium compounds of particular particle sizes. 4,842,617, Cl. 44-51.000.
Kukovich, Charlie, Jr. Shiftable truck bed. 4,841,883, Cl. 108-137.000.
Kullen, Albrecht; Klawuhn, Manfred; Hickel, Sigrun; and Franke, Wolfgang, to Braun Aktiengesellschaft. Agitating and kneading tool. 4,842,416, Cl. 366-314.000.
Kullmann, Bernhard; Remfrey, James; and Schlechtriem, Klaus, to Alfred Teves GmbH. Brake for a vehicle trailer. 4,842,340, Cl. 303-7.000.
Kumanoya, Masaki: *See*—
Miyatake, Hideshi; Kumanoya, Masaki; Hidaka, Hideto; Konishi, Yasuhiro; Dosaka, Katsumi; Yamasaki, Hiroyuki; Shimoda, Masaki; Ikeda, Yuto; and Tsukamoto, Kazuhiro, 4,843,596, Cl. 365-233.500.
Kunishima, Toshiaki, to Canon Kabushiki Kaisha. Cutter. 4,841,642, Cl. 30-303.000.
Kuniya, Jiro: *See*—
Takase, Iwao; Inagaki, Masahisa; Kanno, Masayoshi; Yoshida, Toshimi; Kuniya, Jiro; Masaoka, Isao; Yasuda, Tetsuo; Umehara, Hajime; and Maki, Hideo, 4,842,814, Cl. 376-438.000.
Kunugi, Yoshifumi: *See*—
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Kunz, Willfried; Gramatte, Winfried; Schmitt, Rolf-Erhard; and Pohl, Udo, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH; and Hanover Battelle Institut E.V. Method of producing a solid product containing cement for storing tritium water in an accessible terminal storage facility. 4,842,773, Cl. 252-628.000.
Kuo, Shen-Shaon. Detachable multi-purpose self-defending device. 4,843,336, Cl. 340-521.000.
Kupensky, Thomas J.: *See*—
Miller, Clarence W., 4,841,696, Cl. 52-202.000.
Kuraishi, Yoshiaki, to NEC Corporation. D/A converter. 4,843,393, Cl. 341-150.000.
Kuramoto, Atsushi: *See*—
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Kuraray Company, Ltd.: *See*—
Kawatsuki, Nobuhiro; Fujisawa, Katsuya; Matsuzaki, Ichiro; and Uetsuki, Masao, 4,842,969, Cl. 430-5.000.
Ogawa, Kunihiko; and Noguchi, Yoshio, 4,842,916, Cl. 428-100.000.
Kuratani, Shusei; Uno, Kohichi; Mizuno, Shinya; Sakuramoto, Hisashi; and Nishiyama, Satoshi, to Narumi China Corporation. Black sintered body of aluminum nitride and process for producing the same. 4,843,038, Cl. 501-98.000.
Kurbitz, Gunther; Simon, Karl-Heinz D.; and Weinheimer, Hans-Richard, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Method and apparatus for the detection of helicopters. 4,842,247, Cl. 250-342.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Kudo, Yoshihiko, 4,842,842, Cl. 423-554.000.
Kuribayashi, Kiyoshi; Umetani, Makoto; Monji, Hideto; and Aoki, Masaki, to Matsushita Electric Industrial Co., Ltd. Method of manufacturing molds for molding optical glass elements and diffraction gratings. 4,842,633, Cl. 65-44.000.
Kurihara, Akira, to Jakob Schlaepfer & Co. AG. Apparatus for transferring and placing decorative articles. 4,842,673, Cl. 156-541.000.
Kurita Machinery Manufacturing Company Ltd.: *See*—
Kurita, Tetsuya, 4,842,733, Cl. 210-225.000.
Kurita, Tetsuya, to Kurita Machinery Manufacturing Company Ltd. Filter plate of filter press. 4,842,733, Cl. 210-225.000.
Kuromitsu, Hiromu: *See*—
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Kurono, Yoshikazu: *See*—
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Kurosawa, Shigekichi; Nagaoka, Yoshikazu; Kannoh, Shinichi; Takemoto, Sadatoshi; Sugimoto, Shigeo; Oouchi, Tomihisa; Hatada, Toshio; Kunugi, Yoshifumi; Kawamura, Hironobu; Kohno, Kyoji; and Machizawa, Kenzi, to Hitachi, Ltd.; Osaka Gas Co., Ltd.; and Toho Gas Co., Ltd. Double effect air cooled absorption refrigerating machine. 4,841,744, Cl. 62-475.000.
Kuroshima, Toshihiro: *See*—
Sasaki, Yoshinori; and Kuroshima, Toshihiro, 4,842,352, Cl. 336-83.000.
Kurtz, Richard J., to Guard Associates, Inc. Self-sealing valve for inflated bodies. 4,842,007, Cl. 137-223.000.
Kusaba, Takashi; Abe, Hideo; Torao, Akira; Furukawa, Kusuo; Yanagimoto, Takayuki; and Sasaki, Hiroaki, to Kawasaki Steel Corporation. Work roll with dulled surface having geometrically patterned uneven dulled sections for temper rolling. 4,841,611, Cl. 29-121.200.
Kusayama, Masahiro, to Yoshida Kogyo K. K. Method for injection molding end stops on slide fastener. 4,842,799, Cl. 264-265.000.
Kushida, Noritaka: *See*—
Asakura, Masahiko; Kawanabe, Tomohiko; and Kushida, Noritaka, 4,842,711, Cl. 204-406.000.
Kawanabe, Tomohiko; Asakura, Masahiko; Kushida, Noritaka; Kubota, Shin'ichi; Matsumoto, Yukihiro; Arai, Yasuhisa; and Hosaka, Takefumi, 4,843,550, Cl. 364-424.100.
Kuske, Duane M.: *See*—
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Kuster, Hans-Werner: *See*—
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Kuthi, Csaba: *See—*
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Kuvaja, Kari: *See—*
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Kuwabara, Youhei; Asaoka, Teruo; and Iwasaki, Yasuhiro, to Shizuoka Seiki Co., Ltd. Method for finishing a work. 4,842,702, Cl. 204-129.430.

Kuwana, Kazutaka; Kuromitsu, Hiromu; Takeuchi, Hiroaki; Nakanishi, Nobuyasu; and Hosoda, Tomohiko, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Antiskid apparatus. 4,842,344, Cl. 303-117.000.

Kuwatsuka, Shunichiro: *See—*
Togawa, Eisei; Suzuki, Saburo; Sugimoto, Kenji; and Kuwatsuka, Shunichiro, 4,841,624, Cl. 29-603.000

Kvaerner Engineering A.S.: *See—*
Kalvenes, Bjorn K.; Guthormsen, Oyvind; and Erstad, Troels, 4,842,075, Cl. 166-341.000.

KV33 Corporation: *See—*
Huffman, Ronald E., 4,842,242, Cl. 249-54.000.

Kwong, Sze-Keung; Lau, Kam Y.; Bar-Chaim, Nadav; and Ury, Israel, to Ortel Corporation. Superluminescent diode and single mode laser. 4,843,611, Cl. 372-46.000.

Kyokado Engineering Co., Ltd.: *See—*
Shimada, Shunsuke; and Sato, Takeshi, 4,842,780, Cl. 261-64.300.

Kyowa Chemical Industry Co., Ltd.: *See—*
Miyata, Shigeo; and Takahashi, Hideo, 4,842,645, Cl. 106-14.140.

Kyowa Gas Chemical Industry Co., Ltd.: *See—*
Nakao, Kozo; and Hirokawa, Susumu, 4,842,768, Cl. 252-500.000.

Kyrola, Pentti: *See—*
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L. & C. Steinmuller GmbH: *See—*
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La Telemecanique Electrique: *See—*
Couvreur, Jean-Francois; and Olifan , Jacques, 4,843,361, Cl. 335-229.000.

LaBarge, Beverly C.; and LaBarge, Daniel C. Chess equipment carrying bag. 4,842,133, Cl. 206-315.100.

LaBarge, Daniel C.: *See—*
LaBarge, Beverly C.; and LaBarge, Daniel C., 4,842,133, Cl. 206-315.100.

Labofina, S.A.: *See—*
Grootjans, Jacques F.; and Bredael, Pierre J., 4,842,717, Cl. 208-118.000.

Laboratories D'Hygiene et de Dietetique: *See—*
Guillemet, Alain; Teillaud, Eric; and Reginault, Philippe, 4,842,864, Cl. 424-448.000.

LaCroix, Eugene F. Multi-purpose baton. 4,842,277, Cl. 273-84.0ES.

Lacy, Robert H., to Phillips Petroleum Company. Variable threshold amplifier. 4,843,260, Cl. 307-362.000.

Ladwig, Horst: *See—*
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Lafon, Jean-Claude; and Gharbi, Tijani, to University De Franche-Comte. Hearing aid devices in which high frequency signal portions are transposed in low frequency compenstion signal portions. 4,843,623, Cl. 381-68.200.

Lai, Ta-Wang; and Vijayendran, Bheema R., to Air Products and Chemicals, Inc. Acidized fracturing fluids containing high molecular weight poly(vinylamines) for enbanced oil recovery. 4,843,118, Cl. 524-555.000.

Laidlaw, Gerry A. Chain saw safety structure. 4,841,641, Cl. 30-382.000.

Lalezari, Farzin; Gilbert, Charles G.; and Rogers, John M., to Ball Corporation. Broadband notch antenna. 4,843,403, Cl. 343-767.000.

Lamb, Miles P., to Westinghouse Electric Corp. Elevator system. 4,842,101, Cl. 187-22.000.

Lamborot, Pierre: *See—*
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Lamby, Edward J.: *See—*
Foust, Donald F.; Dumas, William V.; Lamby, Edward J.; and Karas, Bradley R., 4,842,946, Cl. 428-458.000.

Lamort, Jean-Pierre, to E & M Lamort; and Feldmuhle AG. Pressurized mixing injector. 4,842,777, Cl. 261-78.200.

Lamson, William C.: *See—*
Baldwin, Blair F.; and Lamson, William C., 4,842,003, Cl. 135-19.500.

Landa, Benzion; Ben-Auraham, Peretz; Hall, Joseph; and Gibson, George A., to Savin Corporation. Toner for use in compositions for developing latent electrostatic images, method of making the same, and liquid composition using the improved toner. 4,842,974, Cl. 430-137.000.

Landino, Paul J.; and Ramadei, Michael J., to Zycron Systems, Inc. Microprocessor speed controller. 4,843,207, Cl. 318-811.000.

Landis & Gyr Metering, Inc.: *See—*
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Landt, Richard C., to SPS Technologies, Inc. Vibration resistant fasteners. 4,842,463, Cl. 411-188.000.

Lane, Charles E., III: *See—*
Hershey, George E.; Lane, Charles E., III; and Wilda, Douglas W., 4,841,777, Cl. 73-721.000.

Lane, Leslie A.; Lybeck, Lynn V.; Perloff, David S.; and Mallory, Chester L., to Prometrix Corporation. Multi-level dynamic menu which suppresses display of items previously designated as non-selectable. 4,843,538, Cl. 364-188.000.

Lang, David A., to GSE, Incorporated. Multiple range electronic weigh scale. 4,842,085, Cl. 177-164.000.

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Nagai, Yoichiro; Nakano, Taichi; and Oomura, Yutaka, to Ajinomoto Co., Inc. Butyrolactone derivatives, process for production thereof and use therefor. 4,843,093, Cl. 514-473.000.

Nagaishi, Hatsuo, to Nissan Motor Co., Ltd. Air/fuel ratio control system for internal combustion engine with asynchronous fuel delivery control. 4,841,937, Cl. 123-492.000.

Nagao, Akira: *See*—
Yamada, Hideji; Nagao, Akira; Nakajima, Toyohei; Suzaki, Yukihiko; Jogen, Masao; and Tanaka, Akira, 4,841,935, Cl. 123-432.000.

Nagao, Keisuke, to Kabushiki Kaisha Nagao. Eye device for use in a doll. 4,842,566, Cl. 446-345.000.

Nagaoka, Yoshikazu: *See*—
Kurosawa, Shigekichi; Nagaoka, Yoshikazu; Kannoh, Shinichi; Takemoto, Sadatoshi; Sugimoto, Shigeo; Oouchi, Tomihisa; Hatada, Toshio; Kunugi, Yoshifumi; Kawamura, Hironobu; Kohno, Kyoji; and Machizawa, Kenzi, 4,841,744, Cl. 62-475.000.

Nagaoka, Yoshitomi: *See*—
Tanaka, Yasuhiro; Nakajima, Yasuo; and Nagaoka, Yoshitomi, 4,842,388, Cl. 350-432.000.

Nagase, Hiroshi; and Sato, Yasuo, to Takeda Chemical Industries, Ltd. Benzoylureas, their production and use. 4,843,100, Cl. 514-594.000.

Nagel, Ferenc: *See*—
Szanto, Janos; Hollo, Sandor; Nyiri, Balazs; and Nagel, Ferenc, 4,843,266, Cl. 313-25.000.

Nagel, Suzanne R.: *See*—
Barns, Robert L.; Chandross, Edwin A.; and Nagel, Suzanne R., 4,842,626, Cl. 65-2.000.

Nagle, David P., to United Technologies Corporation. Filter replacement mechanism. 4,841,628, Cl. 29-723.000.

Nahum, Kedar, to LSL, Inc. Long shelf life heterozygous tomato plant. 4,843,186, Cl. 800-1.000.

Nair, Velayudhan V.: *See*—
Linz, Alfredo R.; Peterson, Joe W.; and Nair, Velayudhan V., 4,843,394, Cl. 341-154.000.

Naito, Masahiro: *See*—
Noguchi, Yasuhiko; Naito, Masahiro; Morinaga, Kenji; Takahashi, Yohji; and Mitani, Katsuo, 4,843,021, Cl. 436-533.000.

Nakai, Junji: *See*—
Higashi, Yuitiro; Nakai, Junji; Kawabuchi, Hidenori; and Kato, Yasuhisa, 4,843,214, Cl. 219-216.000.

Nakai, Toshikazu: *See*—
Takeda, Kanji; Taguchi, Seiji; Nakai, Toshikazu; and Kato, Haruo, 4,842,253, Cl. 266-44.000.

Nakajima, Masato; Otsuki, Toshiaki; and Ikeda, Atsushi, to Arakawa Chemical Industries, Ltd. Sizing agents in neutral range and sizing methods using the same. 4,842,691, Cl. 162-158.000.

Nakajima, Nobuyoshi, to Fuji Photo Film Co., Ltd. Radiation image recording and read-out apparatus. 4,843,240, Cl. 250-327.200.

Nakajima, Norio: *See*—
Sugiura, Susumu; Sato, Tadashi; and Nakajima, Norio, 4,843,428, Cl. 358-300.000.

Nakajima, Toyohei: *See*—
Yamada, Hideji; Nagao, Akira; Nakajima, Toyohei; Suzaki, Yukihiko; Jogen, Masao; and Tanaka, Akira, 4,841,935, Cl. 123-432.000.

Nakajima, Yasuo: *See*—
Tanaka, Yasuhiro; Nakajima, Yasuo; and Nagaoka, Yoshitomi, 4,842,388, Cl. 350-432.000.

Nakajima, Yukio: *See*—
Sato, Michio; Kambara, Koji; and Nakajima, Yukio, 4,841,952, Cl. 128-6.000.

Nakamoto, Akira: *See—*
Fujii, Toshiro; Suzuki, Shinichi; and Nakamoto, Akira, 4,841,737, Cl. 62-133.000.

Nakamura, Hiroyuki; Ito, Masashi; Itoi, Toshiki; and Hashimoto, Akifumi, to Matsushita Electric Industrial Co., Ltd. Objective lens driving unit. 4,842,392, Cl. 350-247.000.

Nakamura, Katushige, to Mitaka Kohki Company Ltd. Method and apparatus for noncontact automatic focusing. 4,843,228, Cl. 250-201.000.

Nakamura, Kazuo: *See—*
Azuma, Nobuyuki; Nakamura, Kazuo; Maeda, Minoru; and Yamada, Mamoru, 4,842,840, Cl. 423-445.000.

Nakamura, Masao: *See—*
Iwata, Norio; Nakamura, Masao; and Takusagawa, Takashi, 4,842,682, Cl. 156-130.000.

Nakamura, Masatsugu; and Itoh, Ikuo, to Sharp Kabushiki Kaisha. Positive/negative image forming method and apparatus for electrophotographic image forming device. 4,843,423, Cl. 355-245.000.

Nakamura, Shigeki: *See—*
Kamisaka, Tadayuki; Yagi, Kazuo; Takahashi, Yasufumi; and Nakamura, Shigeki, 4,843,352, Cl. 332-22.000.

Nakamura, Takao: *See—*
Ohno, Tomoyuki; Shiroishi, Yoshihiro; Ishiyama, Sadao; Suzuki, Hiroyuki; Shirakura, Takaaki; Matsuoka, Shinya; Sano, Makoto; Nakamura, Takao; Takagi, Kazumasa; Fukazawa, Tokuumi; and Susa, Kenzo, 4,842,917, Cl. 428-141.000.

Nakamura, Takeshi, to Murata Manufacturing Co., Ltd. A method of manufacturing piezoelectric vibrators. 4,841,609, Cl. 29-25.350.

Nakamura, Takeshi: *See—*
Oishi, Hisao; Yanagihara, Kazuhiko; Miyakawa, Tadashi; Nakamura, Takeshi; Akimoto, Kazuhiko; and Shioji, Mitsuaki, 4,842,379, Cl. 350-347.00E.

Nakamura, Yasuhiro, to Koito Seisakusho Co. Ltd. Headlight device. 4,843,523, Cl. 362-69.000.

Nakamura, Yoshisada: *See—*
Ono, Mitsunori; Tamoto, Koji; Mihayashi, Keiji; Ichijima, Seiji; Itoh, Isamu; and Nakamura, Yoshisada, 4,842,985, Cl. 430-226.000.

Nakanishi, Minoru; and Sakurai, Akira, to Kao Corporation. Absorbent article. 4,842,595, Cl. 604-372.000.

Nakanishi, Nobuyasu: *See—*
Kuwana, Kazutaka; Kuromitsu, Hironu; Takeuchi, Hiroaki; Nakanishi, Nobuyasu; and Hosoda, Tomohiko, 4,842,344, Cl. 303-117.000.

Nakano, Minoru. Superoxide dismutase composition for periodontal use. 4,842,846, Cl. 429-50.000.

Nakano, Taichi: *See—*
Nagai, Yoichiro; Nakano, Taichi; and Okamura, Yutaka, 4,843,093, Cl. 514-473.000.

Nakanowatari, Jun, to Alps Electric Co., Ltd. Liquid crystal device having "dummy" thin-film transistors as spacers. 4,842,377, Cl. 350-344.000.

Nakao, Kozo; and Hirokawa, Susumu, to Kyowa Gas Chemical Industry Co., Ltd. Electrically conductive adhesive. 4,842,768, Cl. 252-500.000.

Nakao, Toru; Kawakami, Minoru; Morimoto, Yasuto; Takehara, Shuzo; and Tahara, Tetsuya, to Yoshitomi Pharmaceutical Industries, Ltd. Benzothiopyrano[4,3-c]pyridazine compounds, methods for preparing said compounds and uses of said compounds. 4,843,075, Cl. 514-248.000.

Nakashima, Yukio: *See—*
Watanabe, Kaneo; Matsuoka, Tsugufumi; Nakashima, Yukio; and Haku, Hisao, 4,843,451, Cl. 357-63.000.

Nakatani, Yoshio; Tamura, Tooru; Nozu, Mikio; and Manabe, Takahiro, to Matsushita Electric Industrial Co. Ltd. Electronic circuit module. 4,843,520, Cl. 361-395.000.

Nakayama, Hiroki: *See—*
Kitagishi, Nozomu; Nakayama, Hiroki; Suda, Shigeyuki; Hattori, Jun; and Horiuchi, Akihisa, 4,842,386, Cl. 350-427.000.
Sato, Yasuhisa; Kitagishi, Nozomu; Yamada, Yasuyuki; Nakayama, Hiroki; and Oizumi, Kouji, 4,842,395, Cl. 350-519.000.

Nakayama, Shohei: *See—*
Mitsuhashi, Kenhachi; Ohashi, Yoshinobu; Nakayama, Shohei; and Yamada, Akira, 4,841,779, Cl. 73-826.000.

Nakazato, Hiroshi; and Iijima, Mamoru, to Canon Kabushiki Kaisha. Dust-proof container having improved construction for holding a reticle therein. 4,842,136, Cl. 206-328.000.

Nakazato, Ryoji: *See—*
Kubota, Takao; Sakuma, Tetsuro; and Nakazato, Ryoji, 4,843,110, Cl. 522-14.000.

Naki, Tatsuya: *See—*
Watanabe, Yasushi; Suzuki, Shinichi; Kawaguchi, Masahiro; and Naki, Tatsuya, 4,842,490, Cl. 417-295.000.

Nalco Chemical Company: *See—*
Kaplan, Morris; and Kisalus, John C., 4,842,716, Cl. 208-48.0AA.

Namiki, Kou; Mukumoto, Takaji; and Guruji, Keiichiro, to Honda Giken Kogyo Kabushiki Kaisha. Automatic wheel attachment apparatus. 4,841,632, Cl. 29-787.000.

Naoe, Masahiko: *See—*
Kadokura, Sadao; Honjo, Kazuhiko; Tomie, Takashi; and Naoe, Masahiko, 4,842,708, Cl. 204-298.000.

Narco Avionics, Inc.: *See—*
Bongiorno, Robert A.; and Smith, John F., 4,843,399, Cl. 342-404.000.

Narkon, Glennwood H.; and Orkin, Stanley S., to Kamatics Corporation. Self-aligning track roller. 4,842,424, Cl. 384-203.000.

Narumi China Corporation: *See—*
Kuratani, Shusei; Uno, Kohichi; Mizuno, Shinya; Sakuramoto, Hisashi; and Nishiyama, Satoshi, 4,843,038, Cl. 501-98.000.

Natarajan, K. M.: *See—*
Auerbach, Andrew B.; Paul, James L.; and Natarajan, K. M., 4,843,115, Cl. 524-100.000.

Natarajan, Kadathur S.: *See—*
Mukherjee, Amar; Natarajan, Kadathur S.; and Stone, Harold S., 4,843,567, Cl. 364-513.000.

Nathenson, Richard D.; and Slepian, Robert M., to Westinghouse Electric Corp. Pump/heat exchanger assembly for pool-type reactor. 4,842,054, Cl. 165-104.280.

National Research Development Corporation: *See—*
Carter, Timothy J. N.; Groucutt, Carol J.; Stott, Richard A. W.; Thorpe, Gary H. G. H.; and Whitehead, Thomas P., 4,842,997, Cl. 435-6.000.
Green, Mino, 4,842,381, Cl. 350-357.000.

National Semiconductor Corporation: *See—*
Roberts, Scott; Tibbitts, Steven; and Snyder, Warren, 4,843,383, Cl. 340-825.900.

National Starch and Chemical Corporation: *See—*
D'Amico, Louie R.; Waring, Susan E.; and Lenchin, Julianne M., 4,842,874, Cl. 426-94.000.
Nowak, Frank A., Jr.; Micchelli, Albert L.; and Rouse 3, William M., 4,842,852, Cl. 424-71.000.

Nattel, William, to Commander Electrical Materials, Inc. Electrical outlet box with locating fingers. 4,842,156, Cl. 220-3.900.

Nauchno-Proizvodstvennoe Obiedinenie "Medinstrument": *See—*
Gainutdinova, Raisa V.; Petrova, Vera M.; Blokhina, Alevtina I.; Fridman, Boris S.; and Gamer, Pinkhos U., 4,841,991, Cl. 128-833.000.

Nautilus Sports/Medical Industries, Inc.: *See—*
Vinciguerra, John D., 4,842,271, Cl. 272-118.000.

Navetta, Michael. Moisture deflector flashing strip for a building wall assembly. 4,841,687, Cl. 52-58.000.

Navistar International Transportation Corp.: *See—*
Merkler, Michael B., 4,841,807, Cl. 74-710.000.

Naylor, Michael G.: *See—*
Erickson, David J., II; Naylor, Michael G.; and Knobloch, Robert R., 4,842,530, Cl. 439-98.000.

Nazarathy, Moshe; Dolfi, David W.; and Jungerman, Roger L., to Hewlett-Packard Company. Coded sequence travelling-wave optical modulator. 4,843,350, Cl. 332-7.510.

Nazarathy, Moshe; Dolfi, David W.; and Kolner, Brian H., to Hewlett-Packard Company. Distributed sampling of electrical and optical signals using coded switched electrode travelling wave modulators. 4,843,586, Cl. 364-822.000.

NCR Corporation: *See—*
DuLac, Keith B.; and Weber, Bret S., 4,843,544, Cl. 364-200.000.
Luckhurst, Graham, 4,842,110, Cl. 192-16.000.

Nebhuth, Thomas; and Loehner, Herbert, to Siemens Aktiengesellschaft. Device for protection from the sun. 4,841,672, Cl. 49-25.000.

NEC Corporation: *See—*
Ando, Mitsugu, 4,843,263, Cl. 307-480.000.
Kato, Kaneyuki; Teraji, Kazufumi; Nishino, Seiichi; and Suzuki, Teruo, 4,843,226, Cl. 235-492.000.
Kuraishi, Yoshiaki, 4,843,393, Cl. 341-150.000.
Ono, Yuzo, 4,842,824, Cl. 428-64.000.
Suzuki, Norio, 4,843,455, Cl. 358-13.000.
Tagawa, Norio, 4,843,502, Cl. 360-105.000.
Yotsutani, Akio; Sako, Yukihiro; Shibata, Toshihiko; and Murata, Yoshitoshi, 4,843,622, Cl. 379-59.000.

Neckers, Douglas C.: *See—*
Gottschalk, Peter; Neckers, Douglas C.; and Schuster, Gary B., 4,842,980, Cl. 430-138.000.

Nederlandse Centrale Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek: *See—*
van der Hoorn, Rudolf J. G. A.; and Douwes, Marcelles, 4,841,602, Cl. 17-23.000.

Neef, Guenter; and Vierhufe, Harry, to Schering Aktiengesellschaft. 13alpha-alkylgonan-delta 9(11)-5,10-epoxides. 4,843,157, Cl. 540-76.000.

Negley, Mike. Identification of work pieces. 4,841,653, Cl. 40-625.000.

Nellessen, Peter, Jr. Hull cleaner. 4,841,894, Cl. 114-222.000.

Nelson, Carl T.: *See—*
Dobkin, Robert C.; and Nelson, Carl T., 4,843,302, Cl. 323-312.000.

Nelson, Gary W. Eccentric adjuster for drawer or cabinet track. 4,842,422, Cl. 384-19.000.

Nelson, Marvin L., to J. I. Case Company. Pneumatic evacuator-filler for grain drill hopper. 4,842,449, Cl. 406-153.000.

Ness, Irving S., to Chicopee. Absorbent article with internal wicking means. 4,842,594, Cl. 604-368.000.

Ness, William A.: *See—*
Flanders, Staunton O.; and Ness, William A., 4,842,044, Cl. 165-12.000.

Nestec S.A.: *See—*
Ek, Kurt L., 4,842,879, Cl. 426-297.000.

Neubauer, Hans R., to Siemens Aktiengesellschaft. Method and apparatus for increasing the operating efficiency of a liquid-flow machine. 4,842,486, Cl. 417-53.000.

Neuhalfen, Michael A.: *See—*
Ridoux, Frank E.; and Neuhalfen, Michael A., 4,843,580, Cl. 364-569.000.

Neumann, Heinz: *See—*
Dorr, Karl H.; Grimm, Hugo; Neumann, Heinz; Fennemann, Wolfgang; and Ohlms, Norbert, 4,842,835, Cl. 423-242.000.

Nevels, David L.: *See—*
Baugh, John L.; and Nevels, David L., 4,842,069, Cl. 166-285.000.

Neville, David I.; Herberger, William E.; and Colavito, Dominick M., to Quigley Company, Inc. Refractory composition. 4,843,044, Cl. 501-111.000.

New Jersey Machine, Inc.: *See—*
Voltmer, Helmut; Schwenzer, Alfred F.; and Freakes, Anthony, 4,842,660, Cl. 156-64.000.

Newman, Wyatt S.: *See—*
Eventoff, Arnold T.; and Newman, Wyatt S., 4,841,978, Cl. 128-660.090.

Ng Tong, Yong C. H.: *See—*
Encellaz, Robert; and Ng Tong, Yong C. H., 4,843,323, Cl. 324-313.000.

NGK Insulators, Ltd.: *See—*
Oda, Isao; and Takahashi, Tomonori, 4,843,040, Cl. 501-92.000.
Oda, Isao, 4,843,047, Cl. 501-143.000.

NGK Spark Plug Co., Ltd.: *See—*
Miyata, Shigeru; and Matsubara, Yoshihiro, 4,843,248, Cl. 250-574.000.
Taniguchi, Masato; Kawamura, Mitsuyoshi; Ishida, Noboru; and Ito, Masaya, 4,841,922, Cl. 123-90.510.

Ngo, Tuan V.: *See—*
Hester, Richard E.; and Ngo, Tuan V., 4,843,342, Cl. 330-257.000.

Nguyen, Gia V., to Goodyear Tire & Rubber Company, The. Pneumatic tire having gum strips encasing a carcass turnup. 4,842,033, Cl. 152-541.000.

Nguyen, Tuan A., to Allergan, Inc. Endocapsular intraocular lens. 4,842,602, Cl. 623-6.000.

Niagara Mohawk Power Corporation: *See—*
Panchison, Joseph J., Jr., 4,842,244, Cl. 251-26.000.

Nicolay GmbH: *See—*
Muz, Edwin, 4,842,557, Cl. 439-851.000.

Nicolin, Johannes: *See—*
Corsten, Leonard; Collienne, Franz-Joseph; and Nicolin, Johannes, 4,841,875, Cl. 105-224.050.

Nicollet Technologies, Inc.: *See—*
Hagedorn, Guenter E., 4,843,620, Cl. 379-21.000.

Niebling, Peter, to FAG Kugelfischer Georg Schafer (KGaA). Device for the automatic shifting of a tensioning roller. 4,842,570, Cl. 474-118.000.

Niemeyer, Lutz, to BBC Brown, Boveri AG. Gas-blast circuit breaker. 4,843,199, Cl. 200-148.00R.

Nietert, James E., to General Motors Corporation. Combination temperature sensor and switch assembly. 4,842,419, Cl. 374-145.000.

Nifco Inc.: *See—*
Taima, Hajime, 4,841,601, Cl. 16-361.000.

Nihon Nohyaku Co., Ltd.: *See—*
Hamaguchi, Hiroshi; Takaishi, Hideo; Ohshima, Tetsuji; Konno, Takamichi; Miyagi, Yukio; Shiraiwa Yutaka; and Akita, Takayuki, 4,843,068, Cl. 514-63.000.

Niinivaara, Ensi K. J., to OY GSS General Sea Safety Ltd. Apparatus for underwater working. 4,842,154, Cl. 219-136.000.

Niitsuma, Tetsuya: *See—*
Itaya, Masahiko; Niitsuma, Tetsuya; and Okamoto, Syuzi, 4,843,425, Cl. 355-261.000.

Nikaido, Mitsuhiro: *See—*
Ono, Yutaka; Tsuchiya, Yayoi; Koizumi, Yutaka; Morimoto, Hitoshi; Banzai, Hideo; Muramatsu, Yasuhiko; Shindo, Syotoro; Kanehara, Toshihiro; Hatano, Norihiko; Ohta, Susumu; and Nikaido, Mitsuhiro, 4,843,292, Cl. 318-606.000.

Nikawa, Yoshio: *See—*
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 4,841,989, Cl. 128-804.000.
Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 4,841,990, Cl. 128-804.000.

Nikiforov, Andrey; and Ventrone, Roger, to Research & Consulting Company A.G. Plethysmographic measuring chamber. 4,841,982, Cl. 128-716.000.

Nikitenko, Valery I.: *See—*
Shneerov, Yakov A.; Vikhlevschuk, Valery A.; Asnis, Arkady E.; Kondrashkin, Vitaly A.; Filenov, Oleg V.; Gurov, Vadim N.; Gutman, Lia M.; Poklady, Vadim R.; Zhilinsky, Vasily V.; Polyakov, Valery A.; Nikitenko, Valery I.; Bashmakov, Jury V.; Burshtein, Vladislav B.; Anastasiadi, Emanuil F.; Krainik, Yaroslav I.; Demerly, Konstantin P.; Ignatchenko, Pavel V.; Kozachenko, Dmitry E.; and Piptjuk, Vitaly P., 4,843,212, Cl. 219-146.230.

Nikon Corporation: *See—*
Wakabayashi, Hiroshi; Tsukahara, Daiki; Machida, Kiyosada; Katano, Yuji; and Miyamoto, Hidenori, 4,843,411, Cl. 354-187.090.

Nilsson, Kenth, to Qenico AB. Piezoelectric pump. 4,842,493, Cl. 417-322.000.

Nimbus Water Systems, Inc.: *See—*
Bray, Donald T.; and Simonis, Richard A., 4,842,724, Cl. 210-104.000.

Nippon Kayaku Kabushiki Kaisha: *See—*
Yokoshima, Minoru; Ohkubo, Tetsuo; Hattori, Hideaki; and Kiyomoto, Masayuki, 4,843,111, Cl. 522-42.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Nishio, Hiroaki, 4,843,043, Cl. 501-97.000.

Nippon Oil & Fats Co., Ltd.: *See—*
Satomi, Nobuyuki, 4,842,765, Cl. 252-186.260.

Nippon Paint Co., Ltd.: *See—*
Kashihara, Akio; Ishii, Keizou; and Ishikura, Shinichi, 4,842,936, Cl. 428-407.000.

Nippon Seiko Kabushiki Kaisha: *See—*
Furumura, Kyozaburo; and Matsunaga, Shigeki, 4,842,426, Cl. 384-478.000.

Nippon Shinyaku Co., Ltd.: *See—*
Kise, Masahiro; Kitano, Masahiko; Ozaki, Masakuni; Kazuno, Kenji; Shirahase, Ichiro; Tomii, Yoshifumi; and Segawa, Jun, 4,843,070, Cl. 514-210.000.

Nippon Steel Corporation: *See—*
Higuchi, Seijun; Ohga, Tomonari; Katayama, Toshinori; and Yamamoto, Fumio, 4,842,958, Cl. 428-629.000.
Ito, Wataru; and Ito, Satoshi, 4,842,945, Cl. 428-457.000.
Miyasaka, Akihiro; Haga, Hiroyo; and Terasawa, Takeshi, 4,842,816, Cl. 420-84.000.
Sato, Yuichi; Sato, Takashi; and Yamada, Toshio, 4,842,041, Cl. 164-463.000.

Nippon Telegraph and Telephone Corporation: *See—*
Yotsutani, Akio; Sako, Yukihiro; Shibata, Toshihiko; and Murata, Yoshitoshi, 4,843,622, Cl. 379-59.000.

Nippon Zoki Pharmaceutical Co., Ltd.: *See—*
Yamada, Toshio; and Kageyama, Ken-ichi, 4,843,066, Cl. 514-45.000.

Nippondenso Co., Ltd.: *See—*
Ina, Katsuhiro; Hirabayashi, Yuji; Minami, Kazuaki; Ito, Katsunori; Akiyama, Susumu; and Tanabe, Hidemichi, 4,843,557, Cl. 364-431.770.
Kato, Yukihiro; Okada, Hiroshi; Watanabe, Yoshifumi; Ina, Osamu; Ito, Osamu; and Yokomori, Iwao, 4,843,454, Cl. 357-79.000.

Nishida, Mitsuhiro; Etou, Isamu; and Morishita, Etsuo, to Mitsubishi Denki Kabushiki Kaisha. Scroll-type positive displacement apparatus with oil supply to compression chamber. 4,842,499, Cl. 418-55.000.

Nishida, Norio: *See—*
Eguchi, Naoya; and Nishida, Norio, 4,843,601, Cl. 369-44.000.

Nishikawa, Masaaki; and Shimizu, Satoshi, to Cannon Kabushiki Kaisha. Image reading apparatus for removing disturbances in output images. 4,843,480, Cl. 358-293.000.

Nishimura, Koichiro: *See—*
Shinbo, Toshio; Nishimura, Koichiro; Yamaguchi, Tomohiko; and Sugiura, Masaaki, 4,842,935, Cl. 428-404.000.

Nishimura, Kunio; and Iijima, Hitoshi, to Showa Denko Kabushiki Kaisha. Granular agent for ruminant and production method thereof. 4,842,863, Cl. 424-438.000.

Nishino, Seiichi: *See—*
Kato, Kaneyuki; Teraji, Kazufumi; Nishino, Seiichi; and Suzuki, Teruo, 4,843,226, Cl. 235-492.000.

Nishino, Toshikazu; Kawabe, Ushio; and Kominami, Shinya, to Hitachi, Ltd. Superconducting photodetector. 4,843,446, Cl. 357-30.000.

Nishio, Hiroaki, to Nippon Kokan Kabushiki Kaisha. Method for manufacturing a sintered body with high density. 4,843,043, Cl. 501-97.000.

Nishioka, Tadashi; Morimoto, Hiroaki; Mashiko, Yoji; and Koyama, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Method for identifying a blistered film in layered films. 4,843,238, Cl. 250-252.100.

Nishiyama, Satoshi: *See—*
Kuratani, Shusei; Uno, Kohichi; Mizuno, Shinya; Sakuramoto, Hisashi; and Nishiyama, Satoshi, 4,843,038, Cl. 501-98.000.

Nishizawa, Tsutomu; Yamada, Yasuyuki; Fujio, Junichi; and Hosonuma, Shin, to Mitsui Toatsu Chemicals, Inc. Colored polarizing film and method of making same. 4,842,781, Cl. 264-1.300.

Nissan Chemical Industries Ltd.: *See—*
Seto, Kiyotomo; Sakoda, Ryozo; Matsumoto, Hiroo; Kamikawaji, Yoshimasa; and Tanaka, Sakuya, 4,843,076, Cl. 514-252.000.

Nissan Motor Co., Ltd.: *See—*
Nagaishi, Hatsuo, 4,841,937, Cl. 123-492.000.
Takahashi, Hiroshi, 4,841,815, Cl. 74-866.000.
Takahashi, Hiroshi; and Ishikawa, Yasuki, 4,842,342, Cl. 303-102.000.
Tateyama, Masayuki; and Tsutsui, Ryuji, 4,842,102, Cl. 188-24.210.

Nissha Printing Co., Ltd.: *See—*
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Oohashi, Tamihiro: *See*—
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Ooishi, Tadashi: *See*—
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Arita, Setsuo; Utena, Shunsuke; Murata, Fumio; Noguchi, Atomi; Izumi, Shigeru; Suzuki, Satoshi; and Ookido, Fumiyasu, 4,843,537, Cl. 364-187.000.
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Oosthuizen, Albertus D.; Buczkowski, Janusz K.; Buczkowska, Teresa; and Buczkowska, Joanne A. Exercise apparatus. 4,842,274, Cl. 272-129.000.
Ootsuka, Hiroshi: *See*—
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Considine, Richard, 4,841,710, Cl. 52-74[illegible].000.
Considine, Richard, 4,842,669, Cl. 156-2[illegible]8.000.
Orkin, Stanley S.: *See*—
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Orosz, Miklos J., to Square D Company. Air break contactor. 4,843,194, Cl. 200-144.00C.
Orr, James E., to Recreational Accessoried Corporation. Bicycle transmission having infinitely variable drive ratio. 4,842,569, Cl. 474-83.000.
Orscheln Co.: *See*—
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Ortech Industries, Inc.: *See*—
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Kwong, Sze-Keung; Lau, Kam Y.; Bar Chaim, Nadav; and Ury, Israel, 4,843,611, Cl. 372-46.000.
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Ortho Pharmaceutical Corporation: *See*—
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Ortiz, Jose A.: *See*—
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Osterday, Thomas G.: *See*—
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Oswald, Robert L. Animal feeder. 4,841,912, Cl. 119-53.000.
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Otsuka Kagaku Kabushiki Kaisha: *See*—
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Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., 4,843,176, Cl. 564-292.000.
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Overmeer, Robert T.: *See*—
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Heinonen, Jarmo, 4,842,080, Cl. 173-105.000.
Ozaki, Masakuni: *See*—
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Paik, Ho J., to University of Maryland, College Park. Three-axis superconducting gravity gradiometer. 4,841,772, Cl. 73-382.00G.
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Parietti, Pietro, to Poliauto di Pietro Parietti & C. S.n.c. Pressure reducer for liquid and compressed gases. 4,841,941, Cl. 123-527.000.
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Parker, Jeffrey L.; and Parker, Edward, 4,843,084, Cl. 364-505.000.
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Patterson, Timothy P.; and Hoge, Carl E., to Western Digital Corporation. Integrated circuit chip mounting and packaging assembly. 4,843,188, Cl. 174-52.400.
Patton, John T.; and Shouman, Ahmad R. Very high efficiency hybrid steam/gas turbine power plant wiht bottoming vapor rankine cycle. 4,841,721, Cl. 60-39.050.
Patton, Victor L. Padlock and locking mechanism therefor. 4,841,753, Cl. 70-38.00C.
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Paul, Marius A.; and Paul, Ana. Reciprocal engine with floating liner. 4,841,928, Cl. 123-193.0CP.
Paulucci, Jeno F., to Pillsbury Co., The. Method of making dough crust product. 4,842,882, Cl. 426-439.000.
Paulus, Cecil H. Plastic well with plastic well adapter. 4,842,060, Cl. 166-75.100.
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Pearce-Harvey, Peter R.; Thomlinson, Ernest V.; and French, Raymond, to Tasco Limited. Illumination lamp apparatus. 4,843,528, Cl. 362-277.000.
Pease, Charles C.; Schaeffer, Eugene P.; Bernd, Kevin L.; and Higton, David A., to KSM Fastening Systems Inc. Insulation hanger with locking device. 4,842,465, Cl. 411-337.000.
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Becker, Paul; Edwards, Larry M.; Horner, Patrick J.; Macknick, A. Brian; Moore, Stephen; and Mosso, Ronald J., 4,843,131, Cl. 526-65.000.
Jansons, Viktors; and Gors, Heinrich C., 4,843,179, Cl. 568-322.000.
Koppitsch, Heinrich; and Sparling, Francis C., 4,843,327, Cl. 324-525.000.
Raymond, Andre L.: *See*—
Roy, Bernard J. J.; O'Connor, Lorne D.; Rioux, Phillipe F.; Dingle, Donald A.; and Raymond, Andre L., 4,843,462, Cl. 358-108.000.
Raytheon Company: *See*—
Salmela, Gordon O., 4,842,105, Cl. 188-185.000.
Schloemann, Ernst F. R. A., 4,842,721, Cl. 209-212.000.
Re, Alberto: *See*—
Scarati, Mario A.; Re, Alberto; Tognoni, Carlo; and Gavezotti, Piero, 4,842,939, Cl. 428-421.000.
Reback, Richard L. Valve handle adaptor kit. 4,842,009, Cl. 137-315.000.
Reboa, Paul F.; Mitchell, Frances E.; and Choy, Clement K., to Clorox Company, The. Thickened liquid, improved stability abrasive cleanser. 4,842,757, Cl. 252-76.000.
Recoton Corporation: *See*—
Andreas, Sam, 4,843,509, Cl. 360-128.000.
Recreational Accessoried Corporation: *See*—
Orr, James E., 4,842,569, Cl. 474-83.000.
Redelman, James A.; and Morrow, James W., to General Motors Corporation. Steer mechanism for a steer-by-driving vehicle. 4,841,841, Cl. 91-30.000.
Redler, Udo: *See*—
Hagen, Uwe; and Redler, Udo, 4,841,966, Cl. 128-303.130.
Redmore, Derek: *See*—
Thompson, Neil E. S.; Redmore, Derek; Oude Alink, Bernardus A.; and Outlaw, Benjamin T., 4,843,176, Cl. 564-292.000.
Reduto S.A.: *See*—
Bajulaz, Roger, 4,841,811, Cl. 74-804.000.
Reed, Clayton L., to Pall Corporation. Filter assembly with an expandable shell. 4,842,737, Cl. 210-321.870.
Reed, Clive W.: *See*—
Devins, John C.; Reed, Clive W.; and Rzad, Stefan J., 4,842,941, Cl. 428-412.000.
Reed, Edward W. Three-piece plant pot hanger. 4,841,671, Cl. 47-67.000.
Reed, Joseph; and Caserta, Joseph N., to ITT Electro Optical Products, A Division of ITT Corporation. High light level cutoff apparatus for use with night vision devices. 4,843,229, Cl. 250-213.0VT.
Reedy, Ronald E.: *See*—
Garcia, Graham A.; and Reedy, Ronald E., 4,843,448, Cl. 357-36.000.
Rees, Herbert R. Rain gutter assembly. 4,841,686, Cl. 52-12.000.

Regan, John R.; Barton, Jeffrey N.; Suh, John T.; and Skiles, Jerry W., to Rorer Pharmaceutical Corporation. Aryl and heteroaryl substituted cycloalkyl compounds. 4,843,081, Cl. 514-307.000.
Regan, Raymond D.: *See*—
Dobbins, Bob M.; Regan, Raymond D.; and Zouzoulas, John, 4,842,120, Cl. 194-349.000.
Reginault, Philippe: *See*—
Guillemet, Alain; Teillaud, Eric; and Reginault, Philippe, 4,842,864, Cl. 424-448.000.
Reicbelt, Helmut: *See*—
Eilingsfeld, Heinz; Etzbach, Karl-Heinz; Hansen, Guenter; and Reichelt, Helmut, 4,843,153, Cl. 534-752.000.
Reif, Winfried: *See*—
Banerji, Abinash; and Reif, Winfried, 4,842,821, Cl. 420-528.000.
Reiman, Margaret: *See*—
Burlage, Bonnie; Steinmann, Donna; and Reiman, Margaret, 4,841,961, Cl. 128-876.000.
Reimann, Udo; and Liegl, Werner, to Siemens Aktiengesellschaft. Method and apparatus for improving the picture quality in multidimensional differential pulse code modulation. 4,843,467, Cl. 358-135.000.
Reinecke, Paul: *See*—
Holmwood, Graham; Kramer, Wolfgang; Buchel, Karl H.; Reinecke, Paul; and Brandes, Wilhelm, 4,843,088, Cl. 514-383.000.
Reinehr, Ulrich; Hirsch, Rolf-Burkhard; Dross, Joachim; and Jungverdorben, Hermann-Josef, to Bayer Aktiengesellschaft. Process for wetting thread bundles with liquids. 4,842,793, Cl. 264-136.000.
Reiners, Jurgen; Schlak, Ottfried; Podszun, Wolfgang; and Winkel, Jens, to Bayer Aktiengesellschaft. (Meth)-acrylates of siloxanes containing tricyclodecane groups. 4,843,136, Cl. 526-279.000.
Reinmuller, Donald L., to United States of America, Air Force. Expandable radiator. 4,842,045, Cl. 165-41.000.
Reischl, Artur; and Mack, Kurt, to Bayer Aktiengesellschaft. Process for the preparation of filler-containing, antionically modified polyurethane (urea) compositions, the polyurethane (urea) compositions so-obtained, and the use thereof. 4,843,105, Cl. 521-54.000.
Reising, Flavian, Jr.: *See*—
Smith, Peter H., deceased; and Reising, Flavian, Jr., 4,843,202, Cl. 219-10.55B.
Reitmeier, Glenn A., to General Electric Company. Multiple format digital video tape record and replay system. 4,843,485, Cl. 360-9.100.
Remfrey, James: *See*—
Kullmann, Bernhard; Remfrey, James; and Schlechtriem, Klaus, 4,842,340, Cl. 303-7.000.
Repperger, Daniel W.; and Morris, Augustus, Jr., to United States of America, Air Force. Accurate hand movement assistance. 4,842,607, Cl. 623-24.000.
Resan, Stevan A., to Carlisle Corporation. Non-penetrating fastener for affixing elastomeric sheeting to a roof. 4,841,706, Cl. 52-410.000.
Research & Consulting Company A.G.: *See*—
Nikiforov, Andrey; and Ventrone, Roger, 4,841,982, Cl. 128-716.000.
Research Development Corporation: *See*—
Futami, Shigeru, 4,843,293, Cl. 318-609.000.
Resele, Peter: *See*—
Lanzer, Heribert; and Resele, Peter, 4,842,111, Cl. 192-35.000.
Restivo, David J., to E.C.V. Company. Fan blade cleaning tool. 4,841,592, Cl. 15-210.00R.
Restle, Serge: *See*—
Shroot, Braham; Lang, Gerard; Maignan, Jean; Restle, Serge; Hensby, Christopher; and Colin, Michel, 4,843,097, Cl. 514-680.000.
Reyes, Ruben, Jr. Container handle attachment. 4,842,158, Cl. 220-94.00R.
Reynolds, Graham A., to Rolls-Royce plc. Fluid flow control apparatus. 4,842,017, Cl. 137-601.000.
Rhine, Bruce E.: *See*—
Graf, Hans-Juergen; Fletcher, Robert E.; Randtke, Peter T.; Rhine, Bruce E.; and Monkowski, J. R., 4,842,827, Cl. 422-112.000.
Rhone-Poulenc Agrochimie: *See*—
Yokoo, Hidejiro; Maruyama, Toshishiro; Toshima, Yasuhide; and Kobori, Yasuo, 4,842,640, Cl. 71-92.000.
Rhone Poulenc Inc.: *See*—
Gradeff, Peter S., 4,842,898, Cl. 427-297.000.
Rhone-Poulenc Specialites Chimiques: *See*—
Chevallier, Yvonick, 4,842,838, Cl. 423-339.000.
Ricci, Francesco, to Golden Trade S.r.l. Apparatus for treating fabrics and fabric garments. 4,841,751, Cl. 68-29.000.
Rice, Donald D.; and Hood, Mark E., to Fisher Controls International, Inc. Droop compensated direct acting pressure regulator. 4,842,013, Cl. 137-484.400.
Rice, Paul. Tilting diagnostic table. 4,842,259, Cl. 269-323.000.
Richard, Robert G.: *See*—
Lund, Earl A. E.; Richard, Robert G.; Shankland, Ian R.; and Wilson, David P., 4,842,764, Cl. 252-171.000.
Richman, Peter L., to KeyTek Instrument Corp. Surge undershoot eliminator. 4,843,515, Cl. 361-58.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Szantay, Csaba; Soti, Ferenc; Incze, Maria; Balogh nee Kardos, Zsuzsanna; Szombathelyi, Zsolt; Karpati, Egon; Kiss, Bela; Csomor, Katalin; Laszlovszky, Istvan; Lapis, Erzsebet; Forgacs, Lilla; Kuthi, Csaba; and Szporny, Laszlo . 4,843,080, Cl. 514-285.000.
Ricoh Company, Ltd.: *See*—
Higashi, Yuitiro; Nakai, Junji; Kawabuchi, Hidenori; and Kato, Yasuhisa, 4,843,214, Cl. 219-216.000.
Hoshi, Kazunori, 4,843,605, Cl. 370-60.000.
Ito, Takanori, 4,843,458, Cl. 358-80.000.
Yamazaki, Hideo, 4,842,430, Cl. 400-708.000.
Rider, Ronald E.: *See*—
Dashiell, Stephen R.; Prasad, Bindiganavele A.; Rider, Ronald E.; and Steffen, James A., 4,843,542, Cl. 364-200.000.
Rider, Scott: *See*—
Ong, Dewitt; and Rider, Scott, 4,843,026, Cl. 437-51.000.
Ridoux, Frank E.; and Neuhalfen, Michael A., to Delco Electronics Corporation. Noise immune crankshaft pulse position developing apparatus. 4,843,580, Cl. 364-569.000.
Rieben, Stuart L.; Kugler, Ralph W.; Scherpenberg, Joseph J.; Wiersema, Dale T.; and Fogg, James L., to Westinghouse Electric Corp. Nuclear fuel pellet collating system. 4,842,808, Cl. 376-261.000.
Riedel, Gerard E.: *See*—
DeBonville, David A.; and Riedel, Gerard E., 4,843,012, Cl. 435-270.000.
Riefler, Monte P.: *See*—
Wicks, Harry O.; and Riefler, Monte P., 4,841,872, Cl. 105-4.300.
Riemscheid, Helmut; and Schwarz, Engelbert, to Emitec Gesellschaft fur Emissionstechnologie mbH. Method and apparatus for manufacturing cam elements. 4,841,679, Cl. 51-281.00C.
Rieth, Egon: *See*—
Fussnegger, Wolfgang; Rieth, Egon; Koucky, Antonin; and Hector, Bernd, 4,842,318, Cl. 296-65.100.
Rigidyne Corporation: *See*—
Volz, Le Roy A.; and Vigil, Daniel R., 4,843,288, Cl. 318-599.000.
Rimshyalis, Klemensas K.: *See*—
Fedaravichjus, Algimantas Y.; Kazla, Algis A.; Rimshyalis, Klemensas K.; and Ragulskis, Kazimeras M., 4,841,629, Cl. 29-737.000.
Rinaldi, Anthony W.: *See*—
Linkow, Leonard I.; and Rinaldi, Anthony W., 4,842,518, Cl. 433-174.000.
Rinaldi, Rinaldo, to Riri Italia, S.p.A. Modular pavilion. 4,841,688, Cl. 52-63.000.
Rine, James C. Method of mounting stones in disc or attrition mills. 4,841,623, Cl. 29-525.100.
Ringer, T. Rayman: *See*—
White, Jeffrey A.; Tolledi, Bruno; Ringer, T. Rayman; and Arkuszewski, Andrzej, 4,842,018, Cl. 137-614.110.
Riordan, Dennis E. Roll-up alarm screen assembly and shipping container therefor. 4,843,375, Cl. 340-550.000.
Rioux, Phillipe F.: *See*—
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Riri Italia, S.p.A.: *See*—
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Rite-Hite Corporation: *See*—
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Ritger, Philip L.: *See*—
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Rittal-Werk Rudolf Loh GmbH & Co. KG: *See*—
Lehr, Lothar, 4,843,519, Cl. 361-356.000.
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Rizk, Sidky D.; Shah, Navinchandra B.; and Powers, John W., to Essex Specialty Products, Inc. Metal reinforcing patch and method for reinforcing metal. 4,842,938, Cl. 428-416.000.
Roane, Bobby A.: *See*—
Hooper, Robert C.; Roane, Bobby A.; and Verret, Douglas P., 4,843,453, Cl. 357-71.000.
Roark, Joseph C.: *See*—
Gordon, Gary B.; and Roark, Joseph C., 4,843,566, Cl. 364-513.000.
Robbins, Daniel H., to Itek Graphix Corp. Footed cassette for photosensitive material. 4,842,211, Cl. 242-71.100.
Robbins, Lanny A.; and Johnson, Herbert A., to Dow Chemical Company, The. Recovery process. 4,842,621, Cl. 55-26.000.
Robert Bosch GmbH: *See*—
Hafele, Walter, 4,842,496, Cl. 417-490.000.
Hafele, Walter; Kramer, Manfred; and Warga, Johann, 4,842,497, Cl. 417-499.000.
Sochor, Josef; and Staude, Werner, 4,843,489, Cl. 360-51.000.
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Roberts, Scott; Tibbitts, Steven; and Snyder, Warren, to National Semiconductor Corporation. Transistor matrix shifter. 4,843,383, Cl. 340-825.900.
Roberts, Thomas E.: *See*—
Tsao, Chich-Hsing; and Roberts, Thomas E., 4,843,400, Cl. 343-700.0MS.
Robertshaw Controls Company: *See*—
Lichtenberger, William J., 4,843,198, Cl. 200-61.860
Robertson, Walter J.: *See*—
Hammel, Joseph J.; Robertson, Walter J.; Marshall, William P.; Barch, Herbert W.; Daas, Balbhadra; Smoot, Michael A.; and Beaver, Richard P., 4,842,620, Cl. 55-16.000.
Robertson, William B., to Xerox Corporation. Sheet reversing apparatus. 4,842,263, Cl. 271-186.000.
Robson, Dale L.: *See*—
Kaufman, Stephen B.; and Robson, Dale L., 4,842,028, Cl. 141-114.000.
Rocchetti, Frankie. Space age dog and cat collar. 4,841,915, Cl. 119-106.000.

Rochard, Jean-Claude, to Salomon, S.A. Apparatus for lateral guidance of a ski boot, attached at its front end, to a cross-country ski. 4,842,293, Cl. 280-615.000.

Rochat, Roxanna F.: *See*—
Taylor, Joann M.; McManus, Paul A.; March, Gerald M.; Rochat, Roxanna F.; and Weiman, Novia A., 4,843,573, Cl. 364-521.000.

Rocher, Xavier; Faure, Bruno; and Legallais, Lucien, to Coflexip. Covering structure intended especially to be placed on a conduit or the like laid on the ocean floor. 4,842,445, Cl. 405-172.000.

Rock, Erich; and Hollenstein, Helmut, to Julius Blum Gesellschaft m.b.H. Drawer metal side wall with hooks for connection to drawer bottom plate. 4,842,351, Cl. 312-263.000.

Rocklage, Scott M.; and Quay, Steven C., to Salutar, Inc. Radioactive metal chelates for dipyridoxyl phosphate. 4,842,845, Cl. 424-1.100.

Rockwell International Corporation: *See*—
Peck, David E., 4,841,802, Cl. 74-607.000
White, Stanley A.; and Vitols, Visvaldis A., 4,843,583, Cl. 364-724.190.

Rodel, Inc.: *See*—
Hoffstein, Mark F.; and Shinagawa, Tadehisa, 4,841,680, Cl. 51-283.00R.

Rodenas, Jaunito: *See*—
Armond, Joseph A.; and Rodenas, Jaunito, 4,843,516, Cl. 361-145.000.

Rodowsky, Stanley J., Jr.: *See*—
Elson, Donald E.; Gerke, Burton E., Jr.; Hitzel, Michael E.; Wilder, Bruce A.; Rodowsky, Stanley J., Jr.; Lessig, William R., III; Adams, Jeffrey S.; and Hagan, Todd A., 4,841,594, Cl. 15-344.000.

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Rodriguez, Ricardo P.: *See*—
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Rogers, John M.: *See*—
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Rogowski, Robert S.: *See*—
Heyman, Joseph S.; Rogowski, Robert S ; and Holben, Milford S., Jr., 4,843,346, Cl. 331-65.000.

Rohr Industries, Inc.: *See*—
Greene, Guy S.; Gojny, Francis J.; and McGrath, Paul L., 4,843,205, Cl. 219-78.120.

Rohrback Cosasco Systems, Inc.: *See*—
Waterman, David K., 4,841,787, Cl. 73-66.500.

Rojecki, Walter E.: *See*—
Vaughn, Lawrence E.; Rojecki, Walter E.; and Engle, Thomas H., 4,842,341, Cl. 303-37.000.

Rolflor Industries, Inc.: *See*—
Hodgetts, Graham L., 4,842,471, Cl. 414-515.000.

Rolls-Royce plc: *See*—
Hall, John M.; Hurd, Roger; and Wright, Geoffrey H. E., 4,841,724, Cl. 60-245.000.
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Romankiw, Lubomyr T.: *See*—
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Rommen, Hans: *See*—
Stoy, Erich; Bald, Wilfried; and Rommen, Hans, 4,841,761, Cl. 72-238.000.

Roof, Richard W.; and Horne, G. Marshall, to Square D Company. Transient ride-through AC inverter. 4,843,533, Cl. 363-55.000.

Roosa, Vernon D., to Harp, Elwyn V.; and Baron, Glen H. Flushing means. 4,842,011, Cl. 137-414.000.

Roou, Richard J., to Package Service Company, Inc. Method of producing sealed protective pouchs with premium object enclosed therein. 4,841,712, Cl. 53-412.000.

Rorer Pharmaceutical Corporation: *See*—
Regan, John R.; Barton, Jeffrey N.; Sullivan, John T.; and Skiles, Jerry W., 4,843,081, Cl. 514-307.000.

Rorig, Hans; and Porta, Norbert, to Akzo N.V. Thickened aqueous cleaning compositions. 4,842,771, Cl. 252-547.000.

Rose, David; Lieske, Edgar; and Maak, Norbert, to Henkel Kommanditgesellschaft auf Aktien. Aminophenyl alkylenediamines useful in oxidation hair dyes. 4,842,612, Cl. 8-411.000.

Rose, David W., to American Electronics, Inc. Range determination method and apparatus. 4,843,565, Cl. 364-513.000.

Rose, Maurice T.: *See*—
Edgecomb, Robert K.; Rose, Maurice T.; and Smith, Rodney B., 4,842,010, Cl. 137-343.000.

Rose, William H.: *See*—
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Rosen, Arye: *See*—
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Rosenberg, Burton A. Vehicular lamp with moving light source. 4,843,522, Cl. 362-61.000.

Rosentreter, Ulrich; Boshagen, Horst; Lieb, Folker; Oediger, Hermann; Fiedler, Volker-Bernd; Perzborn, Elisabeth; and Seuter, Friedel, to Bayer Aktiengesellschaft. Indolylpropionic acids, compositions of, and use thereof to inhibit thrombocyte aggregation. 4,843,091, Cl. 514-419.000.

Ross, Philip N., Jr., to United States of America, Energy. Zinc electrode and rechargeable zinc-air battery. 4,842,963, Cl. 429-21.000.

Roth, Oscar, to Involvo AG. Apparatus for subdividing a running web of panels in zig-zag formation into stacks. 4,842,572, Cl. 493-357.000.

Rouch, James C.: *See*—
Archer, Timothy H. V.; and Rouch, James C., 4,843,407, Cl. 346-75.000.

Roulinson, Daniel A., to Ford Motor Company. Vehicle wheel cover and assembly. 4,842,339, Cl. 301-37.00S.

Roumieu, Raymond, to Metaux Speciaux S.A. Apparatus for purifying lithium. 4,842,254, Cl. 266-88.000.

Rouse 3, William M.: *See*—
Nowak, Frank A., Jr.; Micchelli, Albert L.; and Rouse 3, William M., 4,842,852, Cl. 424-71.000.

Rousseau, Isaac: *See*—
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Roussel Uclaf: *See*—
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Rousset, Andre ; and Tardy, Maurice, to Bennes Marrel. Pressure compensator device for proportional type hydraulic distributor and hydraulic distributor incorporating same. 4,842,019, Cl. 137-614.200.

Rover, Gerd: *See*—
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Rowan, Hugh H.: *See*—
Cordova, David S.; Coffin, David R.; Lazarus, Stanley D.; Rowan, Hugh H.; and Marshall, Robert M., 4,842,934, Cl. 428-378.000.

Rowe International, Inc.: *See*—
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Roy, Bernard J. J.; O'Connor, Lorne D.; Rioux, Phillipe F.; Dingle, Donald A.; and Raymond, Andre L., to ADT Security Systems, Inc. Remote video observation systems. 4,843,462, Cl. 358-108.000.

Roy, Michael A.: *See*—
Abu-Isa, Ismat A.; Eusebi, Elio; Jaynes, Craig B.; Moran, Susan C.; and Roy, Michael A., 4,842,257, Cl. 267-133.000.

Roymberg, Erling, to Underhaug A/S. Stretching means for braking a web of plastic sheet which is pulled off a reel. 4,841,716, Cl. 53-556.000.

Rozek, Roy J., to Thomas Industries, Inc. Unitary anti-skid vibration dampening structure. 4,842,095, Cl. 181-207.000.

Rozek, Roy J.: *See*—
Bramstedt, David; and Rozek, Roy J., 4,842,498, Cl. 417-571.000.

Rozman, Miro; and Zlebir, Silvo, to Iskra-Sozd Elektrokovinske Industrije n .sol.o. Wattmeter comprising a hall sensor and an A/D converter. 4,843,311, Cl. 324-142.000.

Rub-Kettenfabrik Rieger & Dietz GmbH & Co.: *See*—
Zenker, Hartwig, 4,842,127, Cl. 198-712.000.

Rubin, David, to Century Laboratories, Inc. Free fatty acids for treatment or propyhlaxis of rheumatoid arthritis arthritis. 4,843,095, Cl. 514-558.000.

Ruckes, Andreas; Rasshofer, Werner; Konig, Klaus; and Kopp, Richard, to Bayer Aktiengesellschaft. Process for the preparation of polyamines and their use for the preparation of polyurethanes. 4,843,107, Cl. 521-155.000.

Ruckes, Andreas; Rasshofer, Werner; Konig, Klaus; and Kopp, Richard, to Bayer Aktiengesellschaft. Process for the production of polyamines. 4,843,108, Cl. 521-155.000.

Rueger, William J.: *See*—
Callender, Bernard L.; Chow, William W.; Osterday, Thomas G.; and Rueger, William J., 4,842,177, Cl. 226-97.000.

Rupp, Walter: *See*—
Schmidt, Manfred; Rupp, Walter; Schneider, Gerhart; and Kohn, Eva M., 4,842,776, Cl. 260-512.00C.

Rushing, James L.; and Rushing, John L. Center soccer two way goal. 4,842,284, Cl. 273-395.000.

Rushing, John L.: *See*—
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Rusin, Mark M., to Dexta Corporation. Lifting mechanism. 4,842,233, Cl. 248-405.000.

Ruska Laboratories, Inc.: *See*—
Martin, Stephen J.; and Worden, Raymond D., 4,842,825, Cl. 422-80.000.

Russell, Gordon K., to Pressers International Products Inc. Inflatable ball with swingable variable internal weight. 4,842,563, Cl. 446-221.000.

Russell, Richard H.: *See*—
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Russell, William K. Drain plug assembly for dishwasher, and the like. 4,841,581, Cl. 4-400.000.

Russo, Vera: *See*—
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Russo, Vincent J.: *See*—
Antony, Kenneth C.; and Russo, Vincent J., 4,842,183, Cl. 228-119.000.

Rutherford, Howard J., to International Flavors & Fragrances, Inc. Compositions and methods for controlled release of fragrance-bearing substances. 4,842,761, Cl. 252-90.000.

Rutschle, Eugen: *See*—
Winkler, Hans-Henning; and Rutschle, Eugen, 4,842,455, Cl. 409-134.000.

Ruzek, Ivo: *See*—
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Ryan, Leslie D.: *See*—
Jordan, William E.; and Ryan, Leslie D., 4,842,593, Cl. 604-360.000.

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Schlumberger Industries, Inc.: *See—*
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Schlunt, Richard S.; and Decker, Stephen W., to General Dynamics Pomona Division. Processing system for performing matrix multiplication. 4,843,587, Cl. 364-841.000.
Schmacher, Lawrence J.: *See—*
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Schmalbach-Lubeca AG: *See—*
Bolte, Georg, 4,842,887, Cl. 427-10.000.
Schmeiss, Reinhard. Variable compression resistance exercise device. 4,842,273, Cl. 272-141.000.
Schmelzer Corporation: *See—*
LaVene, Leon F.; and Palajac, Peter, Jr., 4,842,309, Cl. 285-319.000.
Schmid, Dieter; and Kasberger, Peter, to Lescha Maschinenfabrik GmbH & Co. KG. Device for mechanically receiving empties with moving sensor head. 4,843,230, Cl. 250-223.00B.
Schmid, Heinrich: *See—*
Bayer, Thomas; Elsasser, Michael; Greschner, Johann; Schmid, Heinrich; Stohr, Roland; Wolter, Olaf; and Wittlinger, Jurgen, 4,843,315, Cl. 324-158.00P.
Schmid, Karl; Jokisch, Friedrich; Heese, Dieter H. W.; Hillinger, Bruno; Beckmann, Georg; and Heger, Norbert, to Krupp Koppers GmbH. Arrangement of a dry cooler for coke. 4,842,695, Cl. 202-228.000.
Schmidt, Bodo: *See—*
Weiler, Rolf; Panek, Claus-Peter; and Schmidt, Bodo, 4,842,103, Cl. 188-71.900.
Schmidt, Gunter H. R., to Broken Hill Proprietary Company Limited, The. Device for applying a viscous sealant in annular form onto a substantially flat surface, specifically to a can end. 4,842,469, Cl. 413-60.000.
Schmidt, John D.; and Maurinus, Martin A., to Eastman Kodak Company. Method for encapsulating electronic devices. 4,843,036, Cl. 437-224.000.
Schmidt, Manfred; Rupp, Walter; Schneider, Gerhart; and Kohn, Eva M., to Hoechst Aktiengesellschaft. Styrylaryloxy ether sulfonates, a process for their preparation and their use in the recovery of crude oil. 4,842,776, Cl. 260-512.00C.
Schmidt, Martin; Mayr, Karl-Heinz; and Fobbe, Fritz, to R. & G. Schmole Metallwerke GmbH & Co. KG. Method for producing heat exchanger tubes. 4,841,617, Cl. 29-157.3AH.
Schmidt, Roland: *See—*
Forster, Adrian; Geyer, Stefan; Schulmeyr, Josef; Schmidt, Roland; and Gehrig, Manfred, 4,842,878, Cl. 426-286.000.
Schmitt, Roland; and Beuter, Rudolf, to TA-TRIUMPH-ADLER Aktiengesellschaft. Method for driving a picture tube with front pane of differing thickness and circuit assembly for executing the method. 4,843,284, Cl. 315-371.000.
Schmitt, Rolf-Erhard: *See—*
Kunz, Willfried; Gramatte, Winfried; Schmitt, Rolf-Erhard; and Pohl, Udo, 4,842,773, Cl. 252-628.000.
Schnegg, Julius R.: *See—*
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Schneider, Claus: *See—*
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Schneider, David E.; and Timmerman, Terry D., to Weatherford U.S., Inc. Hydraulic lock alleviation device, well cementing stage tool, and related methods. 4,842,062, Cl. 166-154.000.
Schneider, Gerhart: *See—*
Schmidt, Manfred; Rupp, Walter; Schneider, Gerhart; and Kohn, Eva M., 4,842,776, Cl. 260-512.00C.
Schneider, Hartmut; and Schoberth, Achim, to Siemens Aktiengesellschaft. Method for the manufacture of a preform for drawing glass fibers particularly infrared light waveguides for optical communications technology. 4,842,627, Cl. 65-3.200.
Schneider, Kurt P.: *See—*
Donnerhack, Andreas; and Schneider, Kurt P., 4,841,969, Cl. 128-400.000.
Schneider-Shiley (USA) Inc.: *See—*
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Schnell, Kenneth R.: *See—*
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Schniek, Horst-Guenther: *See—*
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Schnittger, Ernest: *See—*
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Schoening, Josef; Wachholz, Winfried; and Weicht, Ulrich, to Hochtemperatur-Reaktorbau GmbH. Nuclear power plant with a high temperature reactor located eccentrically in a cylindrical prestressed concrete pressure vessel. 4,842,810, Cl. 376-299.000.
Scholefield, John; and Johnston, Robert, to Automated Bacteria Counting Limited. Sample processing unit. 4,841,905, Cl. 118-50.000.
Scholzen, Werner. Disposable flatware. 4,841,637, Cl. 30-125.000.
Schrauder, Franz, to F. Wieland Elektrische Industrie GmbH. Connection clamp and cutting device for fiber optic light guide. 4,842,361, Cl. 350-96.200.
Schreder, Felix, to E.G.O. Elektro-Gerate Blanc u. Fischer. Cooking unit. 4,843,217, Cl. 219-458.000.
Schuierer, Manfred, to Bruckner Apparatebau GmbH. Method and apparatus for stretching tubular material. 4,841,605, Cl. 26-74.000.
Schulmeyr, Josef: *See—*
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Schulte, Richard D.: *See—*
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Schulz, Bernhard; and Fischer, Rolf, to BASF Aktiengesellschaft. 1,1-dialkoxy-2-methyl-4,4-diacyloxy-2-butenes. 4,843,171, Cl. 560-262.000.
Schulz, Harry: *See—*
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Schulz, Peter, to Forschungs-& Entwicklungs-I.G. Specimen distributing system. 4,841,786, Cl. 73-864.250.
Schupp, Hans: *See—*
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Schurmann, Hartmut: *See—*
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Schwarz, Engelbert: *See—*
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Sciarra, Michael. Method for playing a triangular pyramid board game. 4,842,282, Cl. 273-258.000.
Scott, Richmond: *See—*
Borst, Herbert A.; MacHacek, Zdenek; Schnittger, Ernest; Schulte, Richard D.; Scott, Richmond; and Tillman, Paul A., 4,842,135, Cl. 206-328.000.
Scott, Stephen T. Pressurizing closure apparatus for a carbonated beverage bottle. 4,842,151, Cl. 215-228.000.
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Scully, Andrew J.; and Adlam, Arthur H. Arm or retension mechanism having anti-theft means. 4,841,838, Cl. 89-36.080.
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Sedakova, Tatyana Pavlovna, Elvira Rinatovna Sedakova, Boris Rinatovich Sedakov, administrators: *See—*
Galiakbarov, Vil F.; Sannikov, Rashit K.; Mavljutov, Midkhat R.; Fomin, Alexandr S.; Baranovsky, Vladimir D.; Galiev, Radil A.; and Sedakov, Rinat G., deceased, 4,842,066, Cl. 166-265.000.
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Seefried, Karl-Heinz, to Heidelberger Druckmaschinen AG. Device for washing the outer surface of a blanket cylinder of an offset printing machine. 4,841,862, Cl. 101-425.000.
Segal, William J., to Mr. Gasket Company. Package for a number of products and method of using same. 4,842,741, Cl. 206-462.000.
Segawa, Jun: *See—*
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Seibel, Markus; and Kaempf, Guenther, to Hoechst Aktiengesellschaft. Radiation-sensitive recording material having radiation-sensitive recording layer and discontinuous radiation-sensitive covering layer of the same composition. 4,842,982, Cl. 430-156.000.
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Sekino, Yonesaku. Process for producing cloth for stuffed animal toys. 4,841,607, Cl. 28-160.000.
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Selenia Spazio Spa: *See—*
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Senff, Anthony N. Silver recovery method. 4,842,644, Cl. 75-118.00P.
Seo, Yuzo, to Mitsubishi Kasei Corporation. Magnetoresistance element. 4,843,365, Cl. 338-32.00R.
Sequeira, Hermann B., to Martin Marietta Corporation. Dielectric slab transistions and power couplers. 4,843,353, Cl. 333-34.000.
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Serizawa, Hajime; Ojima, Koichi; and Shimizu, Kiyoshi, to Nitto Boseki Co., Ltd. Water soluble photosensitive resin compositions with bisazide compound. 4,842,984, Cl. 430-197.000.
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Sessa, Eugene D.; and Duffy, Richard, to Nylok Fastener Corporation. Method for coating fasteners. 4,842,890, Cl. 427-47.000.
Sestanj, Kazimir; Wrobel, Jay E.; and Kelly, Joseph M., to American Home Products Corporation. N-acyl-N-napthoylglycines as aldose reductase inhibitors. 4,843,062, Cl. 514-4.000.
Seto, Kiyotomo; Sakoda, Ryozo; Matsumoto, Hiroo; Kamikawaji, Yoshimasa; and Tanaka, Sakuya, to Nissan Chemical Industries Ltd. Dihydropyridine-5-phosphonic acid cyclic ester. 4,843,076, Cl. 514-252.000.
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Seyedin, Saeid; Thomas, Thomas; Bentz, Hanne; Ellingsworth, Larry; and Armstrong, Rosa, to Collagen Corporation. Polypeptide cartilage-inducing factors found in bone. 4,843,063, Cl. 514-2.000.
SGS Microelettronica SpA: *See—*
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Shaffer, David E.; and Della Corte, Michael P. Personalized insole kit. 4,841,648, Cl. 36-43.000.
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Shimizu, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Electrically power-assisted four-wheel steering system for vehicles. 4,842,090, Cl. 180-140.000.
Shimizu, Yoshihito; and Yamaguchi, Tatsuya, to Olympus Optical Co., Ltd. Endoscope with a device for raising a medical instrument. 4,841,949, Cl. 128-4.000.
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Shimomura, Nobuo; and Hotta, Tomio, to Kabushiki Kaisha Toshiba. Coffee maker or like beverage making device. 4,841,849, Cl. 99-282.000.
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Balogh, Gyula; Boros neee Gundar, Ilon; Gajary, Antal; Hidasi, Gyorgy; Rappi, Andras; Rakoczi, Josef; Soos, Rudolf; Szekely, Istvan; and Zoltan, Sandor, 4,843,174, Cl. 562-506.000.

Szombathelyi, Zsolt: *See*—
Szantay, Csaba; Soti, Ferenc; Incze, Maria; Balogh nee Kardos, Zsuzsanna; Szombathelyi, Zsolt; Karpati, Egon; Kiss, Bela; Csomor, Katalin; Laszlovszky, Istvan; Lapis, Erzsebet; Forgacs, Lilla; Kuthi, Csaba; and Szporny Laszlo, 4,843,080, Cl. 514-285.000.

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TA-TRIUMPH-ADLER Aktiengesellschaft: *See*—
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Tab Products Company: *See*—
Thomas, Kent; Bullis, Daniel R., Jr.; and Bottelson, Thomas J., 4,842,435, Cl. 402-80.00R.

Tacan Corporation: *See*—
Kim, Ernest M.; and Peter, Jack, 4,843,391, Cl. 350-96.180.

Taddeo, Fausto V.; and Woodward, Mark A., to Pacific Power Source Corp. DC to AC switching converter with phased delayed parallel switchers. 4,843,534, Cl. 363-71.000.

Taft, Jeffrey D., to Westinghouse Electric Corp. Path contriving system for look-ahead sensor in a robotic control system. 4,843,287, Cl. 318-568.160.

Tagami, Fujio: *See*—
Mogi, Takao; Yuzawa, Keiji; Koniya, Yoshinori; Suematsu, Masayuki; and Tagami, Fujio, 4,843,289, Cl. 318-600.000.

Tagawa, Norio, to NEC Corporation. Magnetic head slider loading mechanism for magnetic disk apparatus. 4,843,502, Cl. 360-105.000.

Taguchi, Satcshi; and Utsumi, Wataru, to Sumitomo Chemical Company, Limited. Method of producing a graphite monochromator for X-rays and neutrons. 4,842,665, Cl. 156-55.000.

Taguchi, Seiji: *See*—
Takeda, Kanji; Taguchi, Seiji; Nakai, Toshikazu; and Kato, Haruo, 4,842,253, Cl. 266-44.000.

Tahara, Tetsuya: *See*—
Nakao, Toru; Kawakami, Minoru; Morimoto, Yasuto; Takehara, Shuzo; and Tahara, Tetsuya, 4,843,075, Cl. 514-248.000.

Tai, Seiji; Hayashida, Shigeru; and Hayashi, Nobuyuki, to Hitachi Chemical Co., Ltd. Electrophotographic plate containing a naphthalocyanine compound. 4,842,970, Cl. 430-58.000.

Taima, Hajime, to Nifco Inc. Hinge device with transverse slots. 4,841,601, Cl. 16-361.000.

Takada, Yasufumi: *See*—
Mizushima, Toshiaki; Ozaki, Shigeo; Shinohara, Yukimasa; Tsunenari, Tomoo; Takada, Yasufumi; and Noguchi, Yasuo, 4,843,432, Cl. 355-41.000.

Takafuji, Yutaka: *See*—
Yasuda, Shuhei; and Takafuji, Yutaka, 4,842,371, Cl. 350-333.000.

Takagi, Kazumasa: *See*—
Ohno, Tomoyuki; Shiroishi, Yoshihiro; Hishiyama, Sadao; Suzuki, Hiroyuki; Shirakura, Takaaki; Matsuoka, Shinya; Sano, Makoto; Nakamura, Takao; Takagi, Kazumasa; Fukazawa, Tokuumi; and Susa, Kenzo, 4,842,917, Cl. 428-141.000.

Takahashi, Eizo, to Miyama Kogyo Kabushiki Kaisha. Method of manufacturing a climbing step with embedded reflection plate. 4,842,784, Cl. 264-1.900.

Takahashi, Hideo: *See*—
Miyata, Shigeo; and Takahashi, Hideo, 4,842,645, Cl. 106-14.140.

Takahashi, Hiroshi, to Nissan Motor Co., Ltd. Fuzzy control system for automatic transmission. 4,841,815, Cl. 74-866.000.

Takahashi, Hiroshi; and Ishikawa, Yasuki, to Nissan Motor Co., Ltd. Antiskid brake control system based on fuzzy inference. 4,842,342, Cl. 303-102.000.

Takahashi, Kazuo; and Kosugi, Masao, to Canon Kabushiki Kaisha. Step-and-repeat alignment and exposure method and apparatus. 4,843,563, Cl. 364-490.000.

Takahashi, Kimio; and Saito, Norihisa, to Canon Kabushiki Kaisha. Rotary polygonal mirror and method of making the same. 4,842,354, Cl. 350-6.800.

Takahashi, Masatomo: *See*—
Yoshino, Motoaki; Watanabe, Tsunehiro; Miura, Shigeo; Toyama, Takeshi; and Takahashi, Masatomo, 4,843,479, Cl. 358-257.000.

Takahashi, Mitsuo, to Fuji Jukogyo Kabushiki Kaisha. Suspension system of motor vehicles. 4,842,297, Cl. 280-675.000.

Takahashi, Takeshi, to Toyota Jidosha kabushiki Kaisha. Fuel injection control device of an internal combustion engine. 4,841,936, Cl. 123-447.000.

Takahashi, Tomonori: *See*—
Oda, Isao; and Takahashi, Tomonori, 4,843,040, Cl. 501-92.000.

Takahashi, Tsutomu: *See*—
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Takahashi, Yasufumi: *See*—
Kamisaka, Tadayuki; Yagi, Kazuo; Takahashi, Yasufumi; and Nakamura, Shigeki, 4,843,352, Cl. 332-22.000.

Takahashi, Yohji: *See*—
Noguchi, Yasuhiko; Naito, Masahiro; Morinaga, Kenji; Takahashi, Yohji; and Mitani, Katsuo, 4,843,021, Cl. 436-533.000.

Takahashi, Yuusuke: *See*—
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Takaishi, Hideo: *See*—
Hamaguchi, Hiroshi; Takaishi, Hideo; Ohshima, Tetsuji; Konno, Takamichi; Miyagi, Yukio; Shiraiwa Yutaka; and Akita, Takayuki, 4,843,068, Cl. 514-63.000.

Takami, Masaho. Tape rolling up device of package strapping machine. 4,842,215, Cl. 242-156.000.

Takamisawa Electric Co., Ltd.: *See*—
Yoshino, Kosei; Saso, Hirohumi; and Matsumoto, Masayuki, 4,843,360, Cl. 335-80.000.

Takamizawa, Minoru: *See*—
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Takaoka, Yasuhiro: *See*—
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Uchiyama, Kaoru; Takase, Haruo; Sakamoto, Kiichiro; Uenaka, Kazushige; Kokubu, Masakazu; and Akimoto, Masuo, 4,843,412, Cl. 354-275.000.

Takase, Iwao; Inagaki, Masahisa; Kanno, Masayoshi; Yoshida, Toshimi; Kuniya, Jiro; Masaoka, Isao; Yasuda, Tetsuo; Umehara, Hajime; and Maki, Hideo, to Hitachi, Ltd. Nuclear reactor fuel assembly. 4,842,814, Cl. 376-438.000.

Takashima, Shoji, to Clarion Co., Ltd. Method for connecting elements of a circuit device. 4,843,035, Cl. 437-209.000.

Takayama, Jin: *See*—
Smith, William J.; Takayama, Jin; Varisco, Frank J.; and Williams, Jeffery J., 4,843,576, Cl. 364-557.000.

Takayanagi, Takashi; and Kawaguchi, Hideo, to Fuji Photo Film Co., Ltd. Liquid crystal optical elements. 4,842,380, Cl. 350-351.000.

Takeda Chemical Industries, Ltd.: *See*—
Kanemaru, Toshihiko; Kasai, Hiroshi; and Toyota, Takeshi, 4,842,881, Cl. 426-307.000.
Nagase, Hiroshi; and Sato, Yasuo, 4,843,100, Cl. 514-594.000.
Okada, Taiiti; and Abe, Yasuaki, 4,842,775, Cl. 260-396.00R.
Sano, Yasuo; Shirahama, Kouichi; and Hirono, Takahiko, 4,843,142, Cl. 528-211.000.

Takeda, Hideki: *See*—
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Takeda, Kanji; Taguchi, Seiji; Nakai, Toshikazu; and Kato, Haruo, to Kawasaki Steel Corporation. Method and device for monitoring combustion in furnace. 4,842,253, Cl. 266-44.000.

Takehara, Shuzo: *See*—
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Kurosawa, Shigekichi; Nagaoka, Yoshikazu; Kannoh, Shinichi; Takemoto, Sadatoshi; Sugimoto, Shigeo; Oouchi, Tomihisa; Hatada, Toshio; Kunugi, Yoshifumi; Kawamura, Hironobu; Kohno, Kyoji; and Machizawa, Kenzi, 4,841,744, Cl. 62-475.000.

Takemura, Shigekazu, to Sharp Kabushiki Kaisha. Connector for foldable electronic apparatus. 4,842,531, Cl. 439-165.000.

Takenawa, Seishi; Ueda, Mikio; and Takeda, Hideki, to Fujisawa Pharmaceutical Co., Ltd. Yoghurt like food, and yoghurt like foods manufactured with use of a coagulant. 4,842,873, Cl. 426-49.000.

Takeshita, Akira: *See*—
Kayane, Yutaka; Sawamoto, Hirokazu; Omura, Takashi; Harada, Naoki; and Takeshita, Akira, 4,843,149, Cl. 534-632.000.

Takeuchi, Eiji; Hanna, Jun-Ichi; Shimizu, Isamu; Hirooka, Masaaki; Sakai, Akira; and Ueki, Masao, to Canon Kabushiki Kaisha. Method for forming deposited film. 4,842,897, Cl. 427-255.200.

Takeuchi, Hiroaki: *See*—
Kuwana, Kazutaka; Kuromitsu, Hiromu; Takeuchi, Hiroaki; Nakanishi, Nobuyasu; and Hosoda, Tomohiko, 4,842,344, Cl. 303-117.000.

Takeuchi, Kazuhiro: *See*—
Ohzono, Koubei; Takeuchi, Kazuhiro; and Iwatsuka, Yoshihisa, 4,842,115, Cl. 192-85.00F.

Takeuchi, Toshiyuki; and Tsuneta, Masayuki, to Daifuki, Co., Ltd. Conveyor system utilizing linear motor. 4,841,869, Cl. 104-292.000.

Takeuchi, Yo: *See*—
Kudo, Hajime; Asano, Masami; Toma, Ken; and Takeuchi, Yo, 4,842,185, Cl. 228-183.000.

Takusagawa, Takashi: *See*—
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Tamase, Fuminobu: *See*—
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Tamoto, Koji: *See*—
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Tanabe, Susumu; Sekii, Shigekazu; Tsuchida, Kouji; and Ishizu, Yoshio, to Terumo Corporation. Catheters for measurement of cardiac output and blood flow velocity. 4,841,981, Cl. 128-692.000.

Tanabe, Susumu; and Suzuki, Tatsuo, to Terumo Kabushiki Kaisha. Catheter and method for making. 4,842,590, Cl. 604-282.000.

Tanagawa, Kouzi: *See*—
Ohta, Satoshi; and Tanagawa, Kouzi, 4,843,224, Cl. 235-487.000.

Tanaka, Akira: *See*—
Yamada, Hideji; Nagao, Akira; Nakajima, Toyohei; Suzaki, Yukihiko; Jogen, Masao; and Tanaka, Akira, 4,841,935, Cl. 123-432.000.

Tanaka, Hirohisa: *See*—
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Tanaka, Katsumi: *See*—
Kawahara, Haruyuki; Tanaka, Katsumi; Ashiura, Yasuyuki; and Yoshimura, Motonobu, 4,842,517, Cl. 433-173.000.

Tanaka, Kazuyuki, to Seikosha Co., Ltd. Thermal recording device. 4,843,408, Cl. 346-76.0PH.

Tanaka, Masato; Machida, Syuji; and Uoi, Michitake, to Idemitsu Kosan Company Limited. Process for production of ethylene copolymers. 4,843,135, Cl. 526-169.000.

Tanaka, Sakuya: *See*—
Seto, Kiyotomo; Sakoda, Ryozo; Matsumoto, Hiroo; Kamikawaji, Yoshimasa; and Tanaka, Sakuya, 4,843,076, Cl. 514-252.000.

Tanaka, Shigeru, to Kabushiki Kaisha Toshiba. AC motor drive apparatus. 4,843,296, Cl. 318-800.000.

Tanaka, Sumio; and Atsumi, Shigeru, to Kabushiki Kaisha Toshiba. Nonvolatile semiconductor memory device with a bias circuit. 4,843,594, Cl. 365-185.000.

Tanaka, Toshiharu: *See*—
Ishige, Sadao; Usami, Toshimasa; Kamikawa, Hiroshi; and Tanaka, Toshiharu, 4,842,979, Cl. 430-138.000.

Tanaka, Tsunefumi, to Canon Kabushiki Kaisha. Zoom lens. 4,842,385, Cl. 350-427.000.

Tanaka, Yasuhiro; Nakajima, Yasuo; and Nagaoka, Yoshitomi, to Matsushita Electric Industrial Co., Ltd. Single optical lense with diffraction limit converging capability and wide field angle. 4,842,388, Cl. 350-432.000.

Tanaka, Yasutaka; Kojima, Hidetaka; and Tsuji, Yasuo, to Daicel Chemical Industries, Ltd. Process for preparing α-phenylpropionic acid derivative. 4,843,172, Cl. 562-406.000.

Tanaka, Yoshiaki: *See*—
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Tancs, Tibor L., to SSMC Inc. Thread break indicating device for sewing machines using a photo amplifier. 4,841,890, Cl. 112-273.000.

Tandem Computers Incorporated: *See*—
Fu, Peter L.; and Lenoski, Daniel E., 4,843,608, Cl. 371-68.000.

Tang, Yuan-Ming, to Minnesota Mining and Manufacturing Company. High surface area filter cartridge. 4,842,739, Cl. 210-489.000.

Taniguchi, Ichiro; Hotomi, Hideo; and Osawa, Izumi, to Minolta Camera Kabushiki Kaisha. Resist layer and process for forming resist pattern thereon. 4,842,989, Cl. 430-296.000.

Taniguchi, Masato; Kawamura, Mitsuyoshi; Ishida, Noboru; and Ito, Masaya, to NGK Spark Plug Co., Ltd. Method of making a rocker arm. 4,841,922, Cl. 123-90.510.

Taniguchi, Nobuyuki; Hata, Yoshiaki; Kudo, Yoshinobu; Inoue, Manabu; Hoda, Takeo; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Photographic camera. 4,843,418, Cl. 354-419.000.

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Tansel, David C.; and Collins, Kent. Snagless fishing lure. 4,841,663, Cl. 43-24.000.

Tarbox, Eleanor J.; and Scrivener, Paul L., to Pirelli General plc. Sensing strain and temperature. 4,842,403, Cl. 356-73.000.

Tarcy, Gary P., to Aluminum Company of America. In-situ electrolyte storage for batteries. 4,842,964, Cl. 429-52.000.

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Tarhay, Leo: *See*—
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Tasco Limited: *See*—
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Tateyama, Masayuki; and Tsutsui, Ryuji, to Nissan Motor Co., Ltd. Disc brake for wheeled vehicle or the like. 4,842,102, Cl. 188-24.210.

Tatsukami, Yoshiharu; Inoue, Masakazu; Asai, Kuniaki; and Hieda, Kazuo, to Sumitomo Chemical Company, Limited. Aromatic polysulfone resin composition having excellent plating characteristics. 4,843,113, Cl. 524-425.000.

Tatsumi, Yoshikazu; and Hisano, Tsuyoshi, to Matsushita Electric Works, Ltd. Over-door interphone system provided with a night-vision monitoring device. 4,843,461, Cl. 358-108.000.

Tavernier, Serge M.; Waterschoot, William C.; and Overmeer, Robert T., to Agfa-Gevaert N.V. Process for image production containing the heat-and-pressure fixing of a still wet or moist toner image. 4,842,972, Cl. 430-117.000.

Tavitian, Viken: *See*—
Eden, J. Gary; King, Kevin K.; and Tavitian, Viken, 4,843,030, Cl. 437-88.000.

Tayloe, Daniel R.: *See*—
Menich, Barry J.; Wood, Daniel E.; Tayloe, Daniel R.; Bonta, Jeff D.; and Lev, Valy, 4,843,633, Cl. 455-33.000.

Taylor, James L.: *See*—
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Taylor, Joann M.; McManus, Paul A.; Murch, Gerald M.; Rochat, Roxanna F.; and Weiman, Novia A., to Tektronix, Inc. Display-based color system. 4,843,573, Cl. 364-521.000.

Taylor, Richard G.; and White, James W., to Dow Corning, Ltd. Method for making polysilanes. 4,843,137, Cl. 528-10.000.

Tayon, Jeffrey E.: *See*—
Porter, Curtis H.; Tayon, Jeffrey E.; and Champ, Larry B., 4,841,798, Cl. 74-501.50R.

Tazaki, Yuichi: *See*—
Furuya, Tamio; Tazaki, Yuichi; Kinugasa, Toshiyuki; Ishige, Yoshiki; and Tsuchimoto, Yuichi, 4,841,618, Cl. 29-423.500.

Tazewell, Joseph H.; Christenson, Christopher P.; Turner, Robert B.; and Gonzales, Manuel, Jr., to Firestone Tire & Rubber Company, The; and Dows Chemical Company, The. Polyureaurethanes having improved low temperature properties based on high molecular weight polyether intermediates. 4,843,138, Cl. 528-52.000.

TDK Corporation: *See*—
Sasaki, Yoshinori; and Kuroshima, Toshihiro, 4,842,352, Cl. 336-83.000.

TDS Patent Management, Inc.: *See*—
Buchroeder, Richard A., 4,842,394, Cl. 350-432.000.

Teac Corporation: *See*—
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Teets, Alan R.: *See*—
Touchet, Paul; Rodriguez, Gumersindo; Gatza, Paul E.; Butler, Daniel P.; Crawford, Dawn; Teets, Alan R.; Feuer, Hank O.; and Flanagan, David P., 4,843,114, Cl. 524-87.000.

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Teikoku Hormone Mfg. Co., Ltd.: *See*—
Yasuda, Kikuo; Shibata, Kenyu; Honma, Seijiro; Seki, Toshimi; Hasumi, Kohichi; Masuda, Takeshi; Izumi, Akihiro; Ishimori, Tsutomu; Gotanda, Kotaro; and Uno, Masako, 4,843,072, Cl. 514-247.000.

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Tektronix, Inc.: *See*—
Kareem, Arif; Walker, George S.; and Knierim, Daniel G., 4,843,309, Cl. 324-121.00R.
Stuebing, Carlton, 4,843,255, Cl. 307-273.000.
Taylor, Joann M.; McManus, Paul A.; Murch, Gerald M.; Rochat, Roxanna F.; and Weiman, Novia A., 4,843,573, Cl. 364-521.000.

Teleflex Incorporated: *See*—
Caggiani, Carlos A.; Coneys, Thomas A.; and Larson, Kenneth W., 4,842,592, Cl. 604-283.000.
Spease, Arthur L., 4,841,806, Cl. 74-501.50R.

Telefonaktiebolaget L M Ericsson: *See*—
Djupsjobacka, Anders G., 4,842,367, Cl. 350-96.140.
Soderstrom, Leif E., 4,843,345, Cl. 330-282.000.

Tellam, Mark E., to Motorola, Inc. Contact assembly for interconnecting circuit board and a coaxial connector. 4,842,527, Cl. 439-63.000.
Temperilli, Aldemio; Brambilla, Enzo; Gobbini, Mauro; and Cervini, Maria A., to Farmitalia Carlo Erba S.p.A. 1-t-butyl ergolines useful in the treatment of cerebral insufficiency and senile dementia. 4,843,073, Cl. 514-288.000.
Teng, Clarence W.: *See*—
Chapman, Richard A.; and Teng, Clarence W., 4,842,675, Cl. 156-643.000.
Tennessee Valley Authority: *See*—
Nunnelly, Luther M., 4,842,790, Cl. 264-117.000.
TEPORA Transportsysteme Entwicklings-GmbH: *See*—
Potocnjak, Tomislav, 4,842,150, Cl. 212-147.000.
Terada, Hiromu; Sakunaga, Kenichi; and Fukahori, Naoyuki, to Mitsubishi Rayon Company Ltd. Multifilament type plastic optical fiber and process for preparation thereof. 4,842,365, Cl. 350-96.240.
Terada, Toshimichi: *See*—
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Terada, Tsutomu: *See*—
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Teraji, Kazufumi: *See*—
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Terakawa, Takashige: *See*—
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Kikuchi, Makoto; Mori, Shinsaku; Nikawa, Yoshio; and Terakawa, Takashige, 4,841,990, Cl. 128-804.000
Teramachi, Hiroshi. Ball screw having an axially extending ball deflector. 4,841,796, Cl. 74-459.000.
Teranishi, Hiroshi: *See*—
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Terasaki, Masahiro. Tar removing cigarette holder. 4,841,995, Cl. 131-212.100.
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Terauchi, Kiyoshi, to Sanden Corporation. Slant plate type compressor with variable displacement mechanism. 4,842,488, Cl. 417-222.000.
Terava, Jorma: *See*—
Erametsa, Henrik; Kuvaja, Kari; Maki-Hihnia, Kalevi; and Terava, Jorma, 4,842,336, Cl. 299-8.000.
Terry, Robert L.; and Sallis, Daniel V., to Synergetic Industries, Inc. Water powered rotating shower brush. 4,841,590, Cl. 15-28.000.
Terumo Corporation: *See*—
Tanabe, Susumu; Sekii, Shigekazu; Tsuchida, Kouji; and Ishizu, Yoshio, 4,841,981, Cl. 128-692.000.
Terumo Kabushiki Kaisha: *See*—
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Teshima, Daisuke: *See*—
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Teshima, Shinichi; Katsuta, Shigeki; Maeda, Kazuhiko; Yamauchi, Taku; and Koishi, Toshio, to Asahi Kasei Kogyo Kabushiki Kaisha; and Central Glass Company Limited. Cladding material for plastic optical fiber and plastic optical fiber using the same. 4,842,369, Cl. 350-96.340.
Tews, Jurgen: *See*—
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Noternans, Ronald M. W.; Verhelst, Paulus W. E.; Lapoutre, Charles; and Kessels, Hendricus W. H. M., 4,843,571, Cl. 364-519.000.
Verhille, Marcel, to Sodecim. Method for homogenizing a mixture of aqueous residual liquid or solid fuels. 4,842,616, Cl. 44-51.000.
Verhoeven, Laurentius M., to Du Pont de Nemours, E. I., and Company. Circuit board substrate with gold plated contact elements and a method for mounting gold plated contact elements to the substrate. 4,843,190, Cl. 174-68.500.
Verret, Douglas P.: *See—*
Hooper, Robert C.; Roane, Bobby A.; and Verret, Douglas P., 4,843,453, Cl. 357-71.000.
Versteeg, Gijsbert, to Aarding B.V. Apparatus for moving an aircraft. 4,842,220, Cl. 244-50.000.
Vetco Gray Inc.: *See—*
Nobileau, Philippe C., 4,842,061, Cl. 166-115.000.
Sweeney, Thomas F.; Nobileau, Philippe C.; and Jennings, Charles E., 4,842,307, Cl. 285-140.000.
Viehbock, Franz: *See—*
Benes, Ewald; Viehbock, Franz; Stori, Herbert; Thomas, Friedrich-Werner; and Thorn, Gernot, 4,843,246, Cl. 250-491.100.
Viehrig, Wolfgang, to Agfa-Gevaert Aktiengesellschaft. Wet processing arrangement for photosensitive material. 4,842,179, Cl. 226-108.000.
Vierhufe, Harry: *See—*
Neef, Guenter; and Vierhufe, Harry, 4,843,157, Cl. 540-76.000.
Vierkotter, Manfred: *See—*
Cyron, Theodor; Vierkotter, Manfred; and Hetzelberger, Rolf, 4,842,954, Cl. 428-593.000.
Vigil, Daniel R.: *See—*
Volz, Le Roy A.; and Vigil, Daniel R., 4,843,288, Cl. 318-599.000.
Vijayendran, Bheema R.: *See—*
Lai, Ta-Wang; and Vijayendran, Bheema R., 4,843,118, Cl. 524-555.000.

Vikhert, Anatoly M.: *See—*
Babaian, Eduard A.; Gerasimova, Galina A.; Davydov, Anatoly B.; Utyamyshev, Rustam I.; Khromov, Gennady L.; Metelitsa, Vladimir I.; Vikhert, Anatoly M.; Savvateev, Konstantin L.; Piotrovsky, Vladimir K.; and Novikova, Elizaveta B., 4,842,854, Cl. 424-81.000.
Vikhlevschuk, Valery A.: *See—*
Shneerov, Yakov A.; Vikhlevschuk, Valery A.; Asnis, Arkady E.; Kondrashkin, Vitaly A.; Filonov, Oleg V.; Gurov, Vadim N.; Gutman, Lia M.; Poklady, Vadim R.; Zhilin, Ly, Vasily V.; Polyakov, Valery A.; Nikitenko, Valery I.; Bashmakov, Jury V.; Burshtein, Vladislav B.; Anastasiadi, Emanuil F.; Krainik, Yaroslav I.; Demerly, Konstantin P.; Ignatchenko, Pavel V.; Kovalchenko, Dmitry E.; and Piptjuk, Vitaly P., 4,843,212, Cl. 219-146.230.
Villeneuve, Michel: *See—*
Innus, Andris B.; and Villeneuve, Michel, 4,842,255, Cl. 266-158.000.
Villiers, Gerard, to Souriau et Cie. Device for supporting two connector elements associated respectively with two bases which can be removably assembled together and which are likely to show mutual positioning discrepancies and a connection device using such a support device. 4,842,537, Cl. 439-246.000.
Vinciguerra, John D., to Nautilus Sports/Medical Industries, Inc. Leg extension exercise machine with leg length and exercise motion range adjustment apparatus. 4,842,271, Cl. 272-118.000.
Vining, Curtis G., to Vining, Curtis G. Pitcher dispenser. 4,842,149, Cl. 211-59.200.
Vinson, David A. Self destruct video tape cassette. 4,842,217, Cl. 242-199.000.
Vinson, Edward F.: *See—*
Himes, Ronald E.; and Vinson, Edward F., 4,842,073, Cl. 166-294.000.
Virco Mfg. Corporation: *See—*
Virtue, Julian A., 4,841,877, Cl. 108-36.000.
Virkola, Nils-Erik: *See—*
Jikka, Panu O.; and Virkola, Nils-Erik, 4,842,689, Cl. 162-49.000.
Virtue, Julian A., to Virco Mfg. Corporation. Table. 4,841,877, Cl. 108-36.000.
Viscosuisse SA: *See—*
Bartschi, Peter; and Fust, Peter, 4,842,213, Cl. 242-125.100.
Visic, Inc.: *See—*
Galbraith, Douglas C., 4,843,264, Cl. 307-530.000.
Viskase Corporation: *See—*
Oxley, Jeffery A.; and Wilhoit, Darrel L., 4,842,022, Cl. 138-118.100.
Visser, Friedrich W., to Buhrs-Zaandam B.V. Apparatus for processing objects positioned on a conveyor belt. 4,842,123, Cl. 198-341.000.
Vitols, Visvaldis A.: *See—*
White, Stanley A.; and Vitols, Visvaldis A., 4,843,583, Cl. 364-724.190.
Vlasak, Thomas: *See—*
Jaecklin, Andre ; Roggwiller, Peter; Veitz, Rudolf; and Vlasak, Thomas, 4,843,449, Cl. 357-38.000.
VMI EPE Holland B.V.: *See—*
Kuijpers, Johannes A. M.; van Berkum, Piet; and Huisman, Henk, 4,842,413, Cl. 356-426.000.
Vogel, Ray I. Light switch convertor. 4,842,556, Cl. 439-638.000.
Vogelsong, Thomas L.: *See—*
Bencuya, Selim S.; Michon, Gerald J.; Tiemann, Jerome J.; Toker, James R.; and Vogelsong, Thomas L., 4,843,473, Cl. 358-213.180.
Volk, Christian: *See—*
Kistenich, Johann; and Volk, Christian, 4,842,305, Cl. 285-21.000.
Voltmer, Helmut; Schwenzer, Alfred F.; and Freakes, Anthony, to New Jersey Machine, Inc. Continuous motion pressure sensitive labeling system and method. 4,842,660, Cl. 156-64.000.
Volz, Le Roy A.; and Vigil, Daniel R., to Rigidyne Corporation. Phase locked motor control system for multiple disk drive units. 4,843,288, Cl. 318-599.000.
VonBargen, Kenneth P., to Pacific Scientific Company. Optical instruments for measuring particle sizes. 4,842,406, Cl. 356-336.000.
von Der Heide, Johann: *See—*
Elsasser, Dieter; and von Der Heide, Johann, 4,843,500, Cl. 360-97.020.
VonPhilp, Robert, Sr. Reversible, stuffed doll. 4,842,565, Cl. 446-321.000.
von Tobel, Hans-Rudolf: *See—*
Doswald, Paul; and von Tobel, Hans-Rudolf, 4,843,152, Cl. 534-701.000.
Vorwerk & Co. Interholding GmbH: *See—*
Troger, Wolfgang; and Mesmer, Otto, 4,842,763, Cl. 252-155.000.
Voss, Hans W.; Cremer, Heinz P.; Cwiertnia, Harald; and Putsch, Peter-Ulrich, to Keiper Recaro GmbH & Co. Vehicle seat adjustable both as to height and inclination. 4,842,334, Cl. 297-338.000.
Vsesojuzny Kardiologichesky Nauchny Tsentr Akademii Meditsinskiki Nauk SSR: *See—*
Babaian, Eduard A.; Gerasimova, Galina A.; Davydov, Anatoly B.; Utyamyshev, Rustam I.; Khromov, Gennady L.; Metelitsa, Vladimir I.; Vikhert, Anatoly M.; Savvateev, Konstantin L.; Piotrovsky, Vladimir K.; and Novikova, Elizaveta B., 4,842,854, Cl. 424-81.000.
VSI Corporation: *See—*
Wheeler, Roland A.; and Rath, Jack, 4,842,466, Cl. 411-366.000.
VTC Incorporated: *See—*
Hester, Richard E.; and Ngo, Tuan V., 4,843,342, Cl. 330-257.000.
Vu, Hoang D., to Procter & Gamble Company, The. Hair care compositions. 4,842,850, Cl. 424-70.000.
Vyskumny a vyvojovy ustav sklarsky: *See—*
Urbanek, Peter; Farkas, Peter; Cvopa, Rudolf; Faskova , Maria; and Drbohlav, Jaroslav, 4,843,207, Cl. 219-121.600.
W. Haking Enterprises Limited: *See—*
Brower, Michael J., 4,843,416, Cl. 354-403.000.
W. L. Gore & Associates, Inc.: *See—*
Akiba, Juji, 4,843,305, Cl. 324-65.00P.
Ingram, Glenn B., 4,842,553, Cl. 439-583.000.
W-N Apache Corporation: *See—*
Willis, Clyde A.; and Haney, Keith M., 4,842,250, Cl. 254-337.000.
W. R. Grace & Co.-Conn.: *See—*
Garland, Steven B., 4,842,952, Cl. 428-518.000.
Lussier, Roger J., 4,843,052, Cl. 502-68.000.
WABCO Westinghouse Fahrzeugbremsen GmbH: *See—*
Haak, Wilhelm; Schiwik, Peter; and Rover, Gerd, 4,842,015, Cl. 137-343.230.
Wachholz, Winfried: *See—*
Schoening, Josef; Wachholz, Winfried; and Weicht, Ulrich, 4,842,810, Cl. 376-299.000.
Wade, Ted R. Vehicle speed monitoring and logging means. 4,843,578, Cl. 364-565.000.
Waelti, Werner, to Tschudin Werkzeugmaschinenfabrik. Process and device for producing turned parts from rods or bars. 4,841,682, Cl. 51-289.00R.
Waggonfabrik Talbot: *See—*
Corsten, Leonard; Collienne, Franz-Joseph; and Nicolin, Johannes, 4,841,875, Cl. 105-224.050.
Wagner, Leland J.; and O'Mara, Harry E. Boat drain plug warning apparatus. 4,843,376, Cl. 340-568.000.
Wagner Spray Tech Corporation: *See—*
Snetting, Mark, 4,842,432, Cl. 401-197.000.
Wakabayashi, Hiroshi; Tsukahara, Daiki; Machida, Kiyosada; Katano, Yuji; and Miyamoto, Hidenori, to Nikon Corporation. Camera containing a lens barrier therein. 4,843,411, Cl. 354-187.000.
Wakamatsu, Kensuke: *See—*
Sainen, Tsutomu; and Wakamatsu, Kensuke, 4,843,290, Cl. 318-603.000.
Wakeman, Anthony C.; Ironside, John M.; Holmes, Michael; and Barnard, Simon C., to Lucas Industries public limited company. Method and apparatus for controlling an internal combustion engine. 4,843,556, Cl. 364-431.080.
Walker, Charles W., Jr.: *See—*
Binder, Michael; and Walker, Charles W., Jr., 4,842,967, Cl. 429-101.000.
Walker, George S.: *See—*
Kareem, Arif; Walker, George S.; and Knierim, Daniel G., 4,843,309, Cl. 324-121.00R.
Walker, Raymond M.: *See—*
MacNitt, Donald G.; and Walker, Raymond M., 4,841,614, Cl. 29-156.80B.
Wallace Disposal: *See—*
Wallace, Eugene L., 4,841,853, Cl. 100-245.000.
Wallace, Eugene L., to Wallace Disposal. Apparatus for compacing garbage and salvage. 4,841,853, Cl. 100-245.000.
Walles, Erik W.; Crivello, James V.; and Lupinski, John H., to General Electric Company. Method of encapsulating electronic devices. 4,842,800, Cl. 264-272.130.
Wallner, Rolf, to Sueddeutsche Kuehlerfabrik Julius Fr. Behr BmgH & Co. KG. Automotive air-conditioning system and apparatus. 4,841,739, Cl. 62-174.000.
Walser, Glenn E., to Automated Food Systems, Inc. Apparatus for loading food for alignment with food sticks. 4,842,181, Cl. 227-3.000.
Walter Just Gesellschaft m.b.H.: *See—*
Fehling, Paul, 4,841,860, Cl. 101-334.000.
Walters, Nigel J., to U.S. Philips Corporation. Receiver for frequency hopped signals. 4,843,638, Cl. 455-318.000.
Walther, Lawrence E., to Eastman Kodak Company. System which uses threshold counts to achieve automatic focus. 4,843,413, Cl. 354-402.000.
Walton, R. Thomas, to Hughes Aircraft Company. Integrated circuit package carrier and test device. 4,843,313, Cl. 324-158.00F.
Wamsley, Robert H., Jr. Gas/liquid/solids separator. 4,842,622, Cl. 55-216.000.
Wanamaker, Thomas. Blood drawing apparatus. 4,841,985, Cl. 128-763.000.
Wang, Andrew S.: *See—*
Cheng, David S. K.; and Wang, Andrew S., 4,843,005, Cl. 435-240.490.
Wang, David N.: *See—*
Cheng, David; Maydan, Dan; Somekh, Sasson; Stalder, Kenneth R.; Andrews, Dana L.; Chang, Mei; White, John M.; Wong, Jerry Y. K.; Zeitlin, Vladimir J.; and Wang, David N., 4,842,683, Cl. 156-345.000.
Wang, Fu-Chao. Foldable multipurpose bicycle. 4,842,292, Cl. 280-287.000.
Wankel GmbH: *See—*
Speiser, Josef, 4,842,494, Cl. 417-364.000.
Waples, David G., to Quaker Oats Company, The. Highchair with adjustable removable tray for one-hand operation. 4,842,331, Cl. 297-149.000.
Ward, Michael A. V., to Combustion Electromagnetics, Inc. Enhanced flame ignition for hydrocarbon fuels. 4,841,925, Cl. 123-143.00B.
Ware, James T.; and Minchak, Robert J., to B. F. Goodrich Company, The. Method for enhancing the polymerization activity of crude

cycloolefin monomers for bulk polymerization. 4,843,185, Cl. 585-803.000.

Warga, Johann: *See—*
Hafele, Walter; Kramer, Manfred; and Warga, Johann, 4,842,497, Cl. 417-499.000.

Waring, Susan E.: *See—*
D'Amico, Louie R.; Waring, Susan E.; and Lenchin, Julianne M., 4,842,874, Cl. 426-94.000.

Warner-Lambert Company: *See—*
Dokuzovic, Zdravko; Bodor, Zoltan; Lewis, Ramola; and Kostantelou, Costantina, 4,842,870, Cl. 426-3[illegible]00.
Shaw, James J.; and Sharma, Shri C., 4,843,098, Cl. 514-778.000.
Wright, Arthur P. G.; Wen, Betty P. L.; Schenck, Terry G.; and Maron, Antonina, 4,842,734, Cl. 514-1[illegible]1.000.

Warren, Alan C.: *See—*
Kirchner, Peter D.; Warren, Alan C.; Woodall, Jerry M.; and Wright, Steven L., 4,843,450, Cl. 357-[illegible]2.000.

Warschewski, D.; and Greenland, H., to Colgate-Palmolive Company. Heavy duty built aqueous liquid detergent composition containing stabilized enzymes. 4,842,767, Cl. 252-525.000.

Warshawsky, Jerome. Adjustable friction mounting for lamps. 4,842,231, Cl. 248-316.200.

Washington State University Research Foundation, Inc.: *See—*
Frame, John M., 4,843,308, Cl. 324-120.000.

Washizu, Susumu: *See—*
Yazawa, Yoshiyuki; Ohnishi, Hirofumi; Akimoto, Taizo; Washizu, Susumu; and Shoji, Tsuyoshi, 4,843,471, Cl. 358-160.000.

Watanabe, Chiharu: *See—*
Watanabe, Fumio; Watanabe, Toshio; Watanabe, Chiharu; Watanabe, Yuji; and Watanabe, Yoshinori, 4,841,748, Cl. 66-218.000.

Watanabe, Fumio; Watanabe, Toshio; Watanabe, Chiharu; Watanabe, Yuji; and Watanabe, Yoshinori, to Watanabe Kutsushita Kogyo Co., Ltd. Jacquard circular knitting machine. 4,841,748, Cl. 66-218.000.

Watanabe, Hideo, to Komori Printing Machinery Co., Ltd. Side lay control apparatus for sheet-fed printing press. 4,841,859, Cl. 101-233.000.

Watanabe, Kaneo; Matsuoka, Tsugufumi; Nakashima, Yukio; and Haku, Hisao, to Sanyo Electric Co., Ltd. Photovoltaic device with O and N doping. 4,843,451, Cl. 357-63.000.

Watanabe, Kenji, to Sharp Kabushiki Kaisha. AC input free power source. 4,843,536, Cl. 363-89.000.

Watanabe Kutsushita Kogyo Co., Ltd.: *See—*
Watanabe, Fumio; Watanabe, Toshio; Watanabe, Chiharu; Watanabe, Yuji; and Watanabe, Yoshinori, 4,841,748, Cl. 66-218.000.

Watanabe, Masanori: *See—*
Sugiura, Hisao; and Watanabe, Masanori, 4,842,860, Cl. 424-403.000.

Watanabe, Osamu: *See—*
Urushiwara, Hisashi; Iwamaru, Tugiyasu; Kazehara, Kenya; Watanabe, Osamu; Sawada, Kenichi; Saito, Kiyoshi; Yoshikawa, Hirokazu; Ikenari, Shigeru; Yokoyama, Kenichi; and Uetani, Yoshio, 4,842,965, Cl. 429-56.000.

Watanabe, Tetsuya: *See—*
Ikeda, Kyoichi; Watanabe, Tetsuya; and Higashino, Yasushi, 4,841,775, Cl. 73-704.000.

Watanabe, Toshio: *See—*
Watanabe, Fumio; Watanabe, Toshio; Watanabe, Chiharu; Watanabe, Yuji; and Watanabe, Yoshinori, 4,841,748, Cl. 66-218.000.

Watanabe, Tsunehiro: *See—*
Yoshino, Motoaki; Watanabe, Tsunehiro; Miura, Shigeo; Toyama, Takeshi; and Takahashi, Masatomo, 4,843,479, Cl. 358-257.000.

Watanabe, Tsuyoshi: *See—*
Kanamaru, Hitoshi; Watanabe, Tsuyoshi; Shiba, Takahumi; and Katagiri, Shoichi, 4,843,484, Cl. 358-[illegible]42.000.

Watanabe, Yasushi; Suzuki, Shinichi; Kawaguchi, Masahiro; and Naki, Tatsuya, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Variable displacement vane compressor. 4,842,490, Cl. 417-295.000.

Watanabe, Yoshifumi: *See—*
Kato, Yukihiro; Okada, Hiroshi; Watanabe, Yoshifumi; Ina, Osamu; Ito, Osamu; and Yokomori, Iwao, 4,843,454, Cl. 357-79.000.

Watanabe, Yoshinori: *See—*
Watanabe, Fumio; Watanabe, Toshio; Watanabe, Chiharu; Watanabe, Yuji; and Watanabe, Yoshinori, 4,841,748, Cl. 66-218.000.

Watanabe, Yuji: *See—*
Watanabe, Fumio; Watanabe, Toshio; Watanabe, Chiharu; Watanabe, Yuji; and Watanabe, Yoshinori, 4,841,748, Cl. 66-218.000.

Watatani, Yoshizumi; and Ito, Shigeyuki, to Hitachi, Ltd. Noise elimination circuit for reproduction of audio signals in a magnetic tape recording and reproducing apparatus. 4,843,488, Cl. 360-19.100.

Waterman, David K., to Rohrback Cosasco Systems, Inc. Retractor tool. 4,841,787, Cl. 73-866.500.

Waterschoot, William C.: *See—*
Tavernier, Serge M.; Waterschoot, William C.; and Overmeer, Robert T., 4,842,972, Cl. 430-117.000.

Watkins, Charles W., to Tuftco Corporation. Needle plate for double needle bar loop pile tufting apparatus. 4,841,886, Cl. 112-80.300.

Watkins, Lester, to Watkins, Mable M.; and Norman, Ella N. Apparatus for filling a trench in a paved surface. 4,842,441, Cl. 404-98.000.

Watkins, Mable M.: *See—*
Watkins, Lester, 4,842,441, Cl. 404-98.000.

Watt, Peter R.: *See—*
Davis, Adrian F.; and Watt, Peter R., 4,842,164, Cl. 222-94.000.

Watts, John E.: *See—*
Koll, Laurel A.; and Watts, John E., 4,842,195, Cl. 239-1.000.

Wawra, Helmut: *See—*
Scheurenbrand, Dieter; Wawra, Helmut; and Kleineberg, Wolfgang, 4,842,006, Cl. 137-202.000.

Weatherford U.S., Inc.: *See—*
Schneider, David E.; and Timmerman, Terry D., 4,842,062, Cl. 166-154.000.

Webasto AG Fahrzeugtechnik: *See—*
Fuerst, Arpad; and Wingen, Bernhard, 4,841,812, Cl. 74-810.000.

Weber, Bret S.: *See—*
DuLac, Keith B.; and Weber, Bret S., 4,843,544, Cl. 364-200.000.

Weber, Norbert: *See—*
Hartmann, Ludwig; Loecher, Engelbert; Ruzek, Ivo; and Weber, Norbert, 4,842,915, Cl. 428-95.000.

Wechsler, Susan L.; Evett, Eric A.; and Raby, Pamela F., to Hewlett-Packard Company. History stack. 4,843,590, Cl. 364-900.000.

Wedin, James A.: *See—*
Chess, Henry L., Jr.; Engdahl, Roger A.; and Wedin, James A., 4,842,787, Cl. 264-40.600.

Weeks, Alan L., to Helix Technology Corporation. Helium pressure seal for a cryogenic refrigerator. 4,842,287, Cl. 277-53.000.

Wehking, Hans; and Gottschlich, Manfred, to AEG Olympia AG. Type face striking system in an office writing machine. 4,842,429, Cl. 400-157.200.

Weibler, Wolfgang; and Porth, Wolfgang, to Vdo Adolf Schindling AG. Device for determining the direction of flow. 4,841,938, Cl. 123-494.000.

Weibler, Wolfgang: *See—*
Porth, Wolfgang; and Weibler, Wolfgang, 4,841,769, Cl. 73-204.260.

Weicht, Ulrich: *See—*
Schoening, Josef; Wachholz, Winfried; and Weicht, Ulrich, 4,842,810, Cl. 376-299.000.

Weigand, George R. Spreader type rescue tool. 4,842,249, Cl. 254-93.00R.

Weigel, Rudolf, to Man Guttehoffnungshutte GmbH. Pneumatic-spring bogie. 4,841,874, Cl. 105-199.400.

Weighner, Philip F.: *See—*
Collins, Robert A.; and Weighner, Philip F., 4,843,065, Cl. 514-21.000.

Weiler, Rolf; Panek, Claus-Peter; and Schmidt, Bodo, to Alfred Teves GmbH. Automatic adjusting device for a disc brake with press fit members. 4,842,103, Cl. 188-71.900.

Weiler, Walter; and Belouschek, Peter, to Passavant-Werke AG & Co. KG. Process for separating organic compounds from water by extraction. 4,842,745, Cl. 210-679.000.

Weiman, Novia A.: *See—*
Taylor, Joann M.; McManus, Paul A.; Murch, Gerald M.; Rochat, Roxanna F.; and Weiman, Novia A., 4,843,573, Cl. 364-521.000.

Weinerman, Lee S.; Mayo, Steven A.; Vargus, Joel T.; Albris, Frank R.; Russell, Richard H.; McLinden, Thomas V.; O'Grady, Richard M.; and Wentzell, Timothy H., to Eastern Company, The. Latch and lock assemblies with spring-biased slide bolts. 4,841,755, Cl. 70-208.000.

Weinheimer, Hans-Richard: *See—*
Kurbitz, Gunther; Simon, Karl-Heinz D.; and Weinheimer, Hans-Richard, 4,842,247, Cl. 250-342.000.

Weisshaupt, Bruno, to Baumer Electric AG. Process for the non-contacting detection of eddy current-induced bodies, particularly metal objects, as well as to sensors based on the process. 4,843,259, Cl. 307-308.000.

Weitzberg, Moshe: *See—*
Rzeszotarski, Waclaw J.; Audia, Vicki H.; and Weitzberg, Moshe, 4,843,074, Cl. 514-228.200.

Welker, Brian, to Welker Engineering Company. Vanishing chamber construction for liquid sampler. 4,841,785, Cl. 73-863.840.

Welker Engineering Company: *See—*
Welker, Brian, 4,841,785, Cl. 73-863.840.

Wells, Thomas L., to Randalette, Inc. Device and kit for cleaning lenses of telescopes, cameras and the like. 4,842,132, Cl. 206-229.000.

Welp, Johannes, to Franz Grumme Landmaschinenfabrik GmbH & Co. KG. Potato harvester. 4,842,076, Cl. 171-124.000.

Welsh, Michael J., to UNR, Inc. Particulate material storage structure. 4,841,693, Cl. 52-197.000.

Wen, Betty P. L.: *See—*
Wright, Arthur P. G.; Wen, Betty P. L.; Schenck, Terry G.; and Maron, Antonina, 4,842,734, Cl. 514-191.000.

Wentzell, Timothy H.: *See—*
Weinerman, Lee S.; Mayo, Steven A.; Vargus, Joel T.; Albris, Frank R.; Russell, Richard H.; McLinden, Thomas V.; O'Grady, Richard M.; and Wentzell, Timothy H., 4,841,755, Cl. 70-208.000.

Werenicz, Harald, to H. B. Fuller Company. Process for the permanent joining of stretchable threadlike or small ribbonlike elastic elements to a flat substrate, as well as use thereof for producing frilled sections of film or foil strip. 4,842,666, Cl. 156-161.000.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See—*
Bohler, Erwin; and Bruderer, Werner, 4,841,835, Cl. 89-12.000.
Novet, Hanspeter, 4,841,837, Cl. 89-33.250.

Wermeckes, Bernd: *See—*
Beck, Fritz; Wermeckes, Bernd; and Schulz, Harry, 4,842,700, Cl. 204-59.00R.

Werner, Rainer A.; and Zolk, Ralf, to BASF Aktiengesellschaft. Preparation of homo- and copolymers of propene using a Ziegler-Natta catalyst system. 4,843,132, Cl. 526-125.000.

Wernicke & Co. GmbH: *See—*
Barwasser, Gunter, 4,841,676, Cl. 51-181.00R.
Kotting, Fritz, 4,841,677, Cl. 51-216.0LP.

Werrbach, Donn R. Multiband limiter with automatic limiting threshold (ALT) compensation. 4,843,626, Cl. 381-107.000.

West Products: *See—*
Raines, James G.; and Coleman, Harry, 4,842,453, Cl. 408-89.000.

Westerberg, Roger K.: *See—*
Jacobson, Richard L.; Jeffrey, Frank R.; and Westerberg, Roger K., 4,841,908, Cl. 118-718.000.

Western Digital Corporation: *See—*
Patterson, Timothy P.; and Hoge, Carl E., 4,843,188, Cl. 174-52.400.

Westinghouse Electric Corp.: *See—*
Barber, Ralph R., 4,842,485, Cl. 416-144.000.
Beach, Glenn R.; Wheeler, Myron S.; and Jakubowski, Paul R., 4,842,221, Cl. 244-115.000.
Del Vecchio, Robert M.; and Slepian, Robert M., 4,842,170, Cl. 222-594.000.
Desilva, Sunil G., 4,842,811, Cl. 376-301.000.
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Yamauchi, Noriaki; Imada, Kunihiko; and Kayane, Yutaka, to Sumitomo Chemical Company, Limited. Demineralization of aqueous liquid dye composition. 4,842,614, Cl. 8-564.000.

Yamauchi, Taku: *See*—
Teshima, Shinichi; Katsuta, Shigeki; Maeda, Kazuhiko; Yamauchi, Taku; and Koishi, Toshio, 4,842,369, Cl. 350-96.340.

Yamazaki, Hideo, to Ricoh Company, Ltd. Printing paper reversing device. 4,842,430, Cl. 400-708.000.

Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Method of making fibrous silicon semiconductor by plasma CVD. 4,843,022, Cl. 437-4.000.

Yamazoe, Seigo; and Tsuji, Hiroshi, to Cosmo Oil Co., Ltd. Determination of asphaltene content and device therefor. 4,843,247, Cl. 250-573.000.

Yanagawa, Koyo: *See*—
Ichikawa, Kenji; Nomura, Osamu; Kawabe, Yoichiro; and Yanagawa, Koyo, 4,842,647, Cl. 106-38.200.

Yanagihara, Kazuhiko: *See*—
Oishi, Hisao; Yanagihara, Kazuhiko; Miyakawa, Tadashi; Nakamura, Takeshi; Akimoto, Kazuhiko; and Shioji, Mitsuaki, 4,842,379, Cl. 350-347.00E.

Yanagimoto, Takayuki: *See*—
Kusaba, Takashi; Abe, Hideo; Torao, Akira; Furukawa, Kusuo; Yanagimoto, Takayuki; and Sasaki, Hiroaki, 4,841,611, Cl. 29-121.200.

Yanagiuchi, Shigenobu: *See*—
Yoshida, Hideo; and Yanagiuchi, Shigenobu, 4,843,589, Cl. 364-900.000.

Yanaru, Hirofumi; and Maruido, Hiroki, to Sharp Kabushiki Kaisha. Word processor with decorative character printer. 4,843,593, Cl. 364-900.000.

Yang, Steve S., to Hughes Aircraft Company. Coherent digital signal blanking, biphase modulation and frequency doubling circuit and methodology. 4,843,331, Cl. 328-20.000.

Yang, Sze C.; and Clark, Robert L., to Board of Governors for Higher Education, State of Rhode Island and Providence Plantations. Electrodeless plating method for combining the polymerization and the coating of electrochromic polymers. 4,842,383, Cl. 350-357.000.

Yang, Tai-Her. Two-cycle, dual piston internal combustion engine with air turbine driven fuel/air mixture supply. 4,841,921, Cl. 123-71.00R.

Yanma Agricultural Equipment Company Limited: *See*—
Yahashi, Satoru, 4,842,144, Cl. 209-44.100.

Yano, Hiroaki: *See*—
Oda, Hidenori; and Yano, Hiroaki, 4,843,382, Cl. 340-825.060.

Yano, Kohzo: *See*—
Koden, Mitsuhiro; Tanaka, Hirohisa; and Yano, Kohzo, 4,843,438, Cl. 357-04.000.

Yasuda, Kikuo; Shibata, Kenyu; Honma, Seijiro; Seki, Toshimi; Hasumi, Kohichi; Masuda, Takeshi; Izumi, Akihiro; Ishimori, Tsutomu; Gotanda, Kotaro; and Uno, Masako, to Teikoku Hormone Mfg. Co., Ltd. Antihypertensive pyridazinone aminoisopropanol derivatives. 4,843,072, Cl. 514-247.000.

Yasuda, Shuhei; and Takafuji, Yutaka, to Sharp Kabushiki Kaisha. Liquid crystal display device having interlaced driving circuits for driving rows and columns one-half cycle out of phase. 4,842,371, Cl. 350-333.000.

Yasuda, Tetsuo: *See*—
Takase, Iwao; Inagaki, Masahisa; Kanno, Masayoshi; Yoshida, Toshimi; Kuniya, Jiro; Masaoka, Isao; Yasuda, Tetsuo; Umehara, Hajime; and Maki, Hideo, 4,842,814, Cl. 376-438.000.

Yatabe, Hiroshi: *See*—
Maeda, Ryu; Fukuoka, Shingoro; and Yatabe, Hiroshi, 4,842,959, Cl. 428-630.000.

Yatsuhashi, Motoharu; Mochizuki, Masataka; and Sugihara, Shinich, to Fujikura Ltd.; and Doryokuro Kakunenryo Kaihatsu Jigyodan. Heat exchanger using heat pipes. 4,842,053, Cl. 165-104.140.

Yatsuka, Takeshi; Kotera, Nobukazu; and Mizumura, Yutaka, to Toyo Boseki Kabushiki Kaisha. Magnetic recording medium. 4,842,942, Cl. 428-425.900.

Yazaki Corporation: *See*—
Endo, Takayoshi; and Yamada, Satoshi, 4,842,540, Cl. 439-271.000.

Yazawa, Yoshiyuki; Ohnishi, Hirofumi; Akimoto, Taizo; Washizu, Susumu; and Shoji, Tsuyoshi, to Fuji Photo Equipment Co., Ltd. Video image storage device. 4,843,471, Cl. 358-160.000.

Yeh, Chuen M.: *See*—
Chang, Ming Z.; Yeh, Chuen M.; and Yeh, Chuen Y., 4,841,967, Cl. 128-303.00B.

Yeh, Chuen Y.: *See*—
Chang, Ming Z.; Yeh, Chuen M.; and Yeh, Chuen Y., 4,841,967, Cl. 128-303.00B.

Yializis, Angelo; Shaw, David G.; Strycker, Donald S.; and Ham, Mooyoung, to Spectrum Control, Inc. High speed process for coating substrates. 4,842,893, Cl. 427-44.000.

Yingst, Stephen M.: *See*—
Asick, John C.; and Yingst, Stephen M., 4,842,549, Cl. 439-464.000.

Yokoe, Masaaki: *See*—
Hashimoto, Miho; Yokoe, Masaaki; Kurono, Yoshikazu; and Hayashi, Koji, 4,841,891, Cl. 112-262.300.

Yokogawa Electric Corporation: *See*—
Ikeda, Kyoichi; Watanabe, Tetsuya; and Higashino, Yasushi, 4,841,775, Cl. 73-704.000.
Ono, Yutaka; Tsuchiya, Yayoi; Koizumi, Yutaka; Morimoto, Hitoshi; Banzai, Hideo; Muramatsu, Yasuhiko; Shindo, Syotoro; Kanehara, Toshihiro; Hatano, Norihiko; Ohta, Susumu; and Nikaido, Mitsuhiro, 4,843,292, Cl. 318-606.000.

Yokohama Rubber Co., Ltd., The: *See*—
Mitsuhashi, Kenhachi; Ohashi, Yoshinobu; Nakayama, Shohei; and Yamada, Akira, 4,841,779, Cl. 73-826.000.

Yokomori, Iwao: *See*—
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Yokoo, Hidejiro; Maruyama, Toshihiro; Toshima, Yasuhide; and Kobori, Yasuo, to Rhone-Poulenc Agrochimie. Oxadiazolone derivative, production process thereof, and herbicide containing same. 4,842,640, Cl. 71-92.000.

Yokoshima, Minoru; Ohkubo, Tetsuo; Hattori, Hideaki; and Kiyomoto, Masayuki, to Nippon Kayaku Kabushiki Kaisha. Diesters of (meth)a-

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crylic acid and resin compositions comprising the same. 4,843,111, Cl. 522-42.000.

Yokota, Masanori: *See*—
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Yokoyama, Kenichi: *See*—
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Yonts, James T. Spring-loaded tiedown apparatus for boats, campers and other cargo. 4,842,236, Cl. 248-499.000.

Yoshida, Hideo; and Yanagiuchi, Shigenobu, to Sharp Kabushiki Kaisha. Word storage device for use in language interpreter. 4,843,589, Cl. 364-900.000.

Yoshida, Kageo; Nittani, Osamu; Ito, Toshinobu; Kokura, Makoto; and Hirano, Kouzi, to Asahi Denka Kogyo K.K. Method of removing solvent from chlorinated resin. 4,842,743, Cl. 210-634.000.

Yoshida, Kazufumi; Ishikawa, Tohru; and Nogami, Mikio, to Hitachi, Ltd. POS system with means for automatically reconfiguring the center PLU and local files. 4,843,546, Cl. 364-403.000.

Yoshida Kogyo K. K.: *See*—
Kusayama, Masahiro, 4,842,799, Cl. 264-265.000.

Yoshida, Toshimi: *See*—
Takase, Iwao; Inagaki, Masahisa; Kanno, Masayoshi; Yoshida, Toshimi; Kuniya, Jiro; Masaoka, Isao; Yasuda, Tetsuo; Umehara, Hajime; and Maki, Hideo, 4,842,814, Cl. 376-438.000.

Yoshii, Minoru; Nose, Noriyuki; Niwa, Yukichi; and Okada, Yoshimichi, to Canon Kabushiki Kaisha. Phase shift measuring apparatus utilizing optical meterodyne techniques. 4,842,408, Cl. 356-349.000.

Yoshikawa, Hirokazu: *See*—
Urushiwara, Hisashi; Iwamaru, Tugiyasu; Kazehara, Kenya; Watanabe, Osamu; Sawada, Kenichi; Sato, Kiyoshi; Yoshikawa, Hirokazu; Ikenari, Shigeru; Yokoyama, Kenichi; and Uetani, Yoshio, 4,842,965, Cl. 429-56.000.

Yoshikawa, Kunihiko: *See*—
Sawaragi, Yoshiatsu; Yoshikawa, Kunihiko; and Teranishi, Hiroshi, 4,842,823, Cl. 420-584.000.

Yoshimatsu, Toshikane; Hagiwara, Yoshiki; Tsuji, Yoshikazu; and Momata, Kazuhiro, to Hitachi, Ltd. Multi-element magnetic head and method of fabricating the same. 4,843,486, Cl. 360-121.000.

Yoshimura, Katsuji: *See*—
Ishikawa, Hisashi; and Yoshimura, Katsuji, 4,843,334, Cl. 329-122.000.

Yoshimura, Motonobu: *See*—
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Yoshimura, Tatsushiro; Tomihashi, Nobuyuki; and Terada, Tsutomu, to Daikin Kogyo Co, Ltd,. Electrodeposition coating composition, electrodeposition process and electrodeposited article. 4,842,940, Cl. 428-422.000.

Yoshino, Kosei; Saso, Hirohumi; and Matsumoto, Masayuki, to Takamisawa Electric Co., Ltd. Polarized electromagnetic relay. 4,843,360, Cl. 335-80.000.

Yoshino, Motoaki; Watanabe, Tsunehiro; Miura, Shigeo; Toyama, Takeshi; and Takahashi, Masatomo, to Canon Kabushiki Kaisha. Data communication apparatus. 4,843,475, Cl. 358-257.000.

Yoshino, Shigeru, to Fuji Photo Film Co., Ltd. Image recording method and apparatus. 4,843,414, Cl. 354-21.000.

Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Nakao, Toru; Kawakami, Minoru; Morimoto, Yasuto; Takehara, Shuzo; and Tahara, Tetsuya, 4,843,075, Cl. 514-248.000.

Yotsutani, Akio; Sako, Yukihiro; Shibata, Toshihiko; and Murata, Yoshitoshi, to NEC Corporation; Kabushiki Kaisha Toshiba; Matsushita Communication Industrial Co., Ltd.; and Nippon Telegraph and Telephone Corporation. Communication control system capable of searching a called telephone set in a mobile radio telephone network. 4,843,622, Cl. 379-59.000.

Young, Leland L., to Aluminum Company of America. Carbon baking furnace—refractory construction. 4,842,511, Cl. 432-192.000.

Youngner, Julius S.; Feingold, David S.; and Keleti, Georg, to University of Pittsburgh. Antitumor process using a *Brucella abortus* preparation. 4,842,855, Cl. 424-95.000.

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Yu, Zeng-gi: *See*—
Collins, George J.; McNeil, John R.; and Yu, Zeng-gi, 4,842,704, Cl. 204-192.240.

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Ludwig, Howard R.; Haidler, John W.; Yuan, Mark S. C.; and Elson, Robert J., 4,842,106, Cl. 188-66.000.

Yuasa, Hiroyoshi; and Omura, Koichi, to Matsushita Electric Works Ltd. Picture transmission system using secondary differential variable sampling rate coding. 4,843,465, Cl. 358-133.000.

Yuen, Haison. Adjustable folding ladder. 4,842,098, Cl. 182-22.000.

Yumde, Yasufumi: *See*—
Furuhata, Takashi; Yumde, Yasufumi; Okamura, Fujio; Noguchi, Takaharu; Shibuya, Toshifumi; Mohri, Katsuo; Arai, Takao; and Terada, Toshimichi, 4,843,493, Cl. 360-77.150.

Yurko, Ronald J.: *See*—
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Zabrzanskie Gwarectwo Weglowe Kopalnia Wegla Kamiennego "Zabrze-Bielszowice": *See*—
Jondro, Bolesław; Janik, Jan; and Pyka, Herbert, 4,842,146, Cl. 209-455.000.

Zafiropulo, Pitro A.: *See*—
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Zaitoun, Alain; and Kohler, Norbert, to Institut Francais du Petrole. Process for the selective reduction of water inflows in oil or gas producing wells. 4,842,071, Cl. 166-295.000.

Zajac, Ronald E., to Windings, Inc. Folding cone package design. 4,842,216, Cl. 242-163.000.

Zalesky, Paul J.: *See*—
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Zaripov, Vladilen K.: *See*—
Gershuni, Alexandr N.; Maisotsenko, Valery S.; Zaripov, Vladilen K.; and Semena, Mikhail G., 4,842,052, Cl. 165-104.110.

Zaslavsky, Gregory: *See*—
Barakitis, Nikolaos; and Zaslavsky, Gregory, 4,843,282, Cl. 313-619.000.

Zbornik, Vaclav, to Hammerle AG. Manipulator for sheet-metal pieces to be shaped in a sheet-metal-working machine. 4,842,473, Cl. 414-626.000.

Zeidler, Siegmund; and Kruger, Manfred, to Rasmussen GmbH. Pipe coupling. 4,842,306, Cl. 285-104.000.

Zeisberg, Peter: *See*—
Frenzel, Bertram; Grenzendorfer, Dietmar; Kemter, Heinz; Wuensch, Wolfgang; and Zeisberg, Peter, 4,841,747, Cl. 66-84.00A.

Zeiser, Manfred P. Supporting plate for a dental model and method of making a dental model. 4,842,515, Cl. 433-74.000.

Zeitlin, Vladimir J.: *See*—
Cheng, David; Maydan, Dan; Somekh, Sasson; Stalder, Kenneth R.; Andrews, Dana L.; Chang, Mei; White, John M.; Wong, Jerry Y. K.; Zeitlin, Vladimir J.; and Wang, David N., 4,842,683, Cl. 156-345.000.

Zenker, Hartwig, to Rub-Kettenfabrik Rieger & Dietz GmbH & Co. Chain conveyor. 4,842,127, Cl. 198-712.000.

Zettervall, Ettmar; and . Spinning rod. 4,841,662, Cl. 43-25.200.

Zhilinsky, Vasily V.: *See*—
Shneerov, Yakov A.; Vikhlevschuk, Valery A.; Asnis, Arkady E.; Kondrashkin, Vitaly A.; Filonov, Oleg V.; Gurov, Vadim N.; Gutman, Lia M.; Poklady, Vadim R.; Zhilinsky, Vasily V.; Polyakov, Valery A.; Nikitenko, Valery I.; Bashmakov, Jury V.; Burshtein, Vladislav B.; Anastasiadi, Emanuil F.; Krainik, Yaroslav I.; Demerly, Konstantin P.; Ignatchenko, Pavel V.; Kozachenko, Dmitry E.; and Piptjuk, Vitaly P., 4,843,212, Cl. 219-146.230.

Ziegler, John H.; Oakley, Gerald R.; and Krause, Daniel F., Sr., to Autotron Products, Inc. Deflector shield and guard assembly for motor vehicles. 4,842,319, Cl. 296-91.000.

Ziomek, Joseph F.; Dick, Joseph G.; and Goetz, George W., to TRW Vehicle Safety Systems Inc. Vehicle air bag module with internal reinforcing structure. 4,842,300, Cl. 280-732.000.

Zlebir, Silvo: *See*—
Rozman, Miro; and Zlebir, Silvo, 4,843,311, Cl. 324-142.000.

Zolk, Ralf: *See*—
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Zook, Gerald P. Affixable padding material using gelatinous viscoelastic polymer. 4,842,931, Cl. 428-354.000.

Zorini, Luigi O., to Comez, S.P.A. Control member for threading tube lifters in crochet galloon looms. 4,841,750, Cl. 66-204.000.

Zouzoulas, John: *See*—
Dobbins, Bob M.; Regan, Raymond D.; and Zouzoulas, John, 4,842,120, Cl. 194-349.000.

Zundel, Fritz, to Filterwerk Mann & Hummel GmbH. Soot collector with fluid metering device. 4,842,623, Cl. 55-262.000.

Zweigart, Gerhard; Belke, Werner; Gunther, Ewald; and Gantzhorn, Walter, to Daimler-Benz Aktiegesellschaft. Retaining rail for the end-wise fixing of the inner roof covering. 4,842,328, Cl. 296-214.000.

Zycron Systems, Inc.: *See*—
Landino, Paul J.; and Ramadei, Michael J., 4,843,297, Cl. 318-811.000.

501 Hitachi, Ltd.: *See*—
Isobe, Tadaaki, 4,843,543, Cl. 364-200.000.

698315 Ontario, Ltd.: *See*—
Fuhrer, John P. R., 4,841,705, Cl. 52-410.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF JUNE, 1989

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abon Corporation: *See*—
Hahn, Norbert, Re. 32,968, Cl. 414-401.000.

Automated Packaging Systems, Inc.: *See*—
Lerner, Bernard; and Liebhart, Dana, Re. 32,963, Cl. 53-459.000.

Buckhorn Material Handling Group, Inc.: *See*—
Miller, Daniel R.; and McGlasson, Albert J., Re. 32,966, Cl. 206-328.000.

Chylinski, Victoria S.: *See*—
Trager, Seymour F.; and Chylinski, Victoria S., Re. 32,969, Cl. 424-81.000.

Hahn, Norbert, to Abon Corporation. Vehicle restraint. Re. 32,968, Cl. 414-401.000.

Jones, Stanley C., to Marathon Oil Company. System for measuring the pore volume and permeability of very tight core plugs and method therefor. Re. 32,964, Cl. 73-38.000.

Lerner, Bernard; and Liebhart, Dana, to Automated Packaging Systems, Inc. Packaging apparatus and method. Re. 32,963, Cl. 53-459.000.

Liebhart, Dana: *See*—
Lerner, Bernard; and Liebhart, Dana, Re. 32,963, Cl. 53-459.000.

Lloyd, William A.: *See*—
St. John, Robert P.; and Lloyd, William A., Re. 32,967, Cl. 242-57.100.

Marathon Oil Company: *See*—
Jones, Stanley C., Re. 32,964, Cl. 73-38.000.

McGlasson, Albert J.: *See*—
Miller, Daniel R.; and McGlasson, Albert J., Re. 32,966, Cl. 206-328.000.

Miller, Daniel R.; and McGlasson, Albert J., to Buckhorn Material Handling Group, Inc. Tote box. Re. 32,966, Cl. 206-328.000.

Robert Bosch GmbH: *See*—
Schmid, Walter, Re. 32,965, Cl. 123-503.000.

St. John, Robert P.; and Lloyd, William A., to Xerox Corporation. Web tracking system. Re. 32,967, Cl. 242-57.100.

Schmid, Walter, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. Re. 32,965, Cl. 123-503.000.

Trager, Seymour F.; and Chylinski, Victoria S. Injectionable visoelastic ophthalmic gel. Re. 32,969, Cl. 424-81.000.

Tudek, Arthur L. Level with electronic signals. Re. 32,962, Cl. 33-366.000.

Xerox Corporation: *See*—
St. John, Robert P.; and Lloyd, William A., Re. 32,967, Cl. 242-57.100.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Dabritz, Karl: *See*—
Jacobs, John D.; and Dabritz, Karl, B1 4,733,919, Cl. 303-28.000.

Doherty, John A.; Ward, Billy W.; and Shaver, David C., to Micrion Limited Partnership. Focused ion beam processing. B1 4,639,301, 6-27-89, Cl. 250-251.000.

HWP Group, Inc.: *See*—
Jacobs, John D.; and Dabritz, Karl, B1 4,733,919, Cl. 303-28.000.

Interkal, Inc.: *See*—
McClelland, Robert G.; and Raymond, David W., B1 1,029,635, Cl. 52-9.000.

Jacobs, John D.; and Dabritz, Karl, to HWP Group, Inc. Integrated pressure exhaust valve and fluid coupling. B1 4,733,919, 6-27-89, Cl. 303-28.000.

McClelland, Robert G.; and Raymond, David W., to Interkal, Inc. Row folding seating structure. B1 1,029,635, 6-27-89, Cl. 52-9.000.

Micrion Limited Partnership: *See*—
Doherty, John A.; Ward, Billy W.; and Shaver, David C., B1 4,639,301, Cl. 250-251.000.

Monitor Labs, Incorporated: *See*—
Wright, Steven A.; and Watts, Donald A., B1 4,260,890, Cl. 250-373.000.

Raymond, David W.: *See*—
McClelland, Robert G.; and Raymond, David W., B1 1,029,635, Cl. 52-9.000.

Rodgers, Henry W. Rotating circular airfoil. B1 4,104,822, 6-27-89, Cl. 446-48.000.

Segawa, Takashi, to Shimano Industrial Company Limited. Hub with free wheel for a bicycle. B1 4,145,095, 6-27-89, Cl. 384-545.000.

Shaver, David C.: *See*—
Doherty, John A.; Ward, Billy W.; and Shaver, David C., B1 4,639,301, Cl. 250-251.000.

Shimano Industrial Company Limited: *See*—
Segawa, Takashi, B1 4,145,095, Cl. 384-545.000

Ward, Billy W.: *See*—
Doherty, John A.; Ward, Billy W.; and Shaver, David C., B1 4,639,301, Cl. 250-251.000.

Watts, Donald A.: *See*—
Wright, Steven A.; and Watts, Donald A., B1 4,260,890, Cl. 250-373.000.

Wright, Steven A., and Watts, Donald A., to Monitor Labs, Incorporated. Fluorescent gas analyzer. B1 4,260,890, 6-27-89, Cl. 250-373.000.

LIST OF DESIGN PATENTEES

AB Tetra Pak: *See*—
Silbersky, Jonnie, 301,890, Cl. D15-145.000.

Adams, Randy L. Fabric stretcher unit for screen material or the like. 301,896, 6-27-89, Cl. D18-13.000.

Allen, Davis B. Side chair "B". 301,809, 6-27-89, Cl. D6-370.000.

Alpine Engineered Products, Inc.: *See*—
Moloney, Thomas J., 301,811, Cl. D6-400.000.

American Standard Inc.: *See*—
Fabian, Wolfgang, 301,918, Cl. D23-242.000.

Amity Leather Products Co.: *See*—
Young, Raymond W., 301,802, Cl. D3-39.000.

Anderson, Bruce: *See*—
Bush, Paul S.; Bova, Richard; and Anderson, Bruce, 301,814, Cl. D6-484.000.

Artform Industries: *See*—
Wasserman, Steven, 301,820, Cl. D7-38.000.

Asics Corporation: *See*—
Mitsui, Shigeyuki, 301,800, Cl. D2-320.000.

Avia Group International, Inc.: *See*—
McCrea, Mona, 301,801, Cl. D2-320.000.

Baisch, Herbert: *See*—
Handler, Milton E.; Sylvan, Richard; and Baisch, Herbert, 301,812, Cl. D6-462.000.

Ballerini, Alberto. Food stuff. 301,794, 6-27-89, Cl. D1-107.000.

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Bartolo, Jerry. Insulating jacket for liquid-containing bottle 301,821, 6-27-89, Cl. D7-77.000.
Beyer, Eric L., to RCA Licensing Corporation. Portable radio. 301,846, 6-27-89, Cl. D14-163.000.
Black & Decker Inc.: *See—*
Price, Scott D.; and Somers, Robert I., 301,887, Cl. D15-7.000.
Bova, Richard: *See—*
Bush, Paul S.; Bova, Richard; and Anderson, Bruce, 301,814, Cl. D6-484.000.
Braun, M. Thomas; and Couch, Jerry L., to Braunco, Inc. Mirror unit for trucks or the like. 301,862, 6-27-89, Cl. D12-187.000.
Braunco, Inc.: *See—*
Braun, M. Thomas; and Couch, Jerry L., 301,862, Cl. D12-187.000.
Brown, Barry M.; and Wilson, Martin B., to Eastman Kodak Company. Water purifier unit. 301,913, 6-27-89, Cl. D23-207.000.
Brunnquell GmbH Fabrik electrotechnischer Apparate: *See—*
Wilke, Hein, 301,876, Cl. D14-190.000.
Bush Industries, Inc.: *See—*
Bush, Paul S.; Bova, Richard; and Anderson, Bruce, 301,814, Cl. D6-484.000.
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Stenstrom, Lennart; and Wahlstrom, Lennart. Processing plant for preparation of food and pharmaceutical products. 301,823, 6-27-89, Cl. D7-368.000.
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Wistehuff, Daniel D., to Ladd Furniture, Inc. Headboard for a bed. 301,815, 6-27-89, Cl. D6-505.000.
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Yamaguchi, Kazuhiro; and Fujimoto, Hiroji, to Satori Switch Industry Co., Ltd. Trigger actuated switch. 301,871, 6-27-89, Cl. D13-32.000.
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LIST OF PLANT PATENTEES

Anderson, Neil O.; Ascher, Peter D.; and Widmer, Richard E., to University of Minnesota, Regents of the. Chrysanthemum plant-day Neutral. 6,884, 6-27-89, Cl. 77.000.
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167 R 4,842,002

CLASS 135

19.5 4,842,003

CLASS 137

68.1 4,842,004
101.19 4,842,005
202 4,842,006
223 4,842,007
307 4,842,008
315 4,842,009
343 4,842,010
414 4,842,011
454.2 4,842,012
484.4 4,842,013
527.2 4,842,014
543.23 4,842,015
597 4,842,016
601 4,842,017
614.11 4,842,018
614.2 4,842,019
625.65 4,842,020
884 4,842,021

CLASS 138

118.1 4,842,022
122 4,842,023
125 4,842,024

CLASS 140

119 4,842,025

CLASS 141

1 4,842,026
45 4,842,027
114 4,842,028

CLASS 144

117 R 4,842,029
193 A 4,842,030
251 A 4,842,031

CLASS 148

12.7 B 4,842,652
4,842,653
20.6 4,842,654
130 4,842,655
302 4,842,656
403 4,842,657

CLASS 149

19.2 4,842,659
92 4,842,65[illegible]

CLASS 152

541 4,842,03[illegible]

CLASS 156

64 4,842,66[illegible]
88 4,842,66[illegible]
98 4,842,66[illegible]
102 4,842,66[illegible]
130 4,842,68[illegible]
155 4,842,66[illegible]
161 4,842,66[illegible]
166 4,842,66[illegible]
196 4,842,66[illegible]
288 4,842,66[illegible]
308.2 4,842,68[illegible]
345 4,842,68
382 4,842,67[illegible]
433 4,842,67
497 4,842,67
504 4,842,68
538 4,842,68[illegible]
541 4,842,67
601 4,842,67[illegible]
633 4,842,66[illegible]
636 4,842,67[illegible]
643 4,842,67
4,842,67[illegible]
4,842,67[illegible]
4,842,68[illegible]
4,842,68[illegible]
4,842,68[illegible]

CLASS 160

84.1 4,842,03[illegible]
135 4,842,03[illegible]
166.1 4,842,03[illegible]

CLASS 162

29 4,842,68[illegible]
49 4,842,68[illegible]
57 4,842,69[illegible]
158 4,842,69[illegible]

CLASS 164

45 4,842,03[illegible]
80 4,842,03[illegible]
312 4,842,03[illegible]
429 4,842,04[illegible]
463 4,842,04[illegible]
4,842,04[illegible]
504 4,842,04[illegible]

CLASS 165

12 4,842,04[illegible]
41 4,842,04[illegible]
42 4,842,04[illegible]
43 4,842,04[illegible]
45 4,842,04[illegible]
46 4,842,04[illegible]
47 4,842,04[illegible]
93 4,842,04[illegible]
104.11 4,842,04[illegible]
104.14 4,842,04[illegible]
104.28 4,842,04[illegible]
174 4,842,05[illegible]

CLASS 166

51 4,842,07[illegible]
65.1 4,842,07[illegible]
75.1 4,842,07[illegible]
77 4,842,08
115 4,842,01[illegible]
154 4,842,02[illegible]
250 4,842,04[illegible]
252 4,842,05[illegible]
265 4,842,06[illegible]
269 4,842,08[illegible]
274 4,842,07[illegible]
285 4,842,03[illegible]
4,842,09[illegible]
288 4,842,00[illegible]
292 4,842,06[illegible]
294 4,842,03[illegible]
295 4,842,01[illegible]
4,842,02[illegible]
305.1 4,842,04[illegible]
341 4,842,05[illegible]

CLASS 171

124 4,842,06[illegible]

CLASS 172

599 4,842,07[illegible]

CLASS 173

12 4,842,07[illegible]
105 4,842,07[illegible]
4,842,08[illegible]

CLASS 174

11 R 4,843,187
52.4 4,843,188
53 4,843,189
68.5 4,843,190
88 R 4,843,191

CLASS 175

23 4,842,081
279 4,842,082
325 4,842,083

CLASS 177

145 4,842,084
164 4,842,085

CLASS 180

9.1 4,842,086
79.1 4,842,087
4,842,088
4,842,089
140 4,842,090
219 4,842,091
287 4,842,092
4,842,093

CLASS 181

114 4,842,094
207 4,842,095
252 4,842,096
286 4,842,097

CLASS 182

22 4,842,098
160 4,842,099

CLASS 184

6.2 4,842,100

CLASS 187

22 4,842,101

CLASS 188

24.21 4,842,102
71.9 4,842,103
79.51 4,842,104
185 4,842,105
266 4,842,106
352 4,842,107

CLASS 191

12.2 A 4,842,108

CLASS 192

0.055 4,842,113
8 R 4,842,109
16 4,842,110
35 4,842,111
53 F 4,842,112
56 F 4,842,114
85 F 4,842,115
106.2 4,842,116
4,842,117
150 4,842,118

CLASS 194

317 4,842,119
349 4,842,120

CLASS 198

334 4,842,121
335 4,842,122
341 4,842,123
360 4,842,124
457 4,842,125
666 4,842,126
712 4,842,127
735 4,842,128
790 4,842,129
839 4,842,130

CLASS 200

50 C 4,843,192
61.86 4,843,198
84 C 4,843,193
144 C 4,843,194
148 R 4,843,199
302.3 4,843,195
336 4,843,196
406 4,843,197
553 4,843,200

CLASS 201

23 4,842,692

CLASS 202

154 4,842,693
219 4,842,694
228 4,842,695

CLASS 203

49 4,842,696

CLASS 204

1 T 4,842,697
4,842,698
15 4,842,699
59 R 4,842,700
129.43 4,842,702
180.1 4,842,701
192.12 4,842,703
192.24 4,842,704
192.29 4,842,705
192.38 4,842,710
298 4,842,706
4,842,707
4,842,708
402 4,842,709
406 4,842,711
416 4,842,712
428 4,842,713

CLASS 206

45.15 4,842,131
229 4,842,132
309 4,842,032
315.1 4,842,133
4,842,134
328 Re.32,966
4,842,135
4,842,136
4,842,137
370 4,842,138
386 4,842,139
457 4,842,140
462 4,842,141
505 4,842,142
521.1 4,842,143

CLASS 208

13 4,842,715
48 AA 4,842,716
114 4,842,714
118 4,842,717
308 4,842,718
421 4,842,719
950 4,842,720

CLASS 209

44.1 4,842,144
144 4,842,145
212 4,842,721
270 4,842,722
455 4,842,146
575 4,842,147

CLASS 210

95 4,842,723
104 4,842,724
137 4,842,725
169 4,842,726
4,842,727
180 4,842,728
198.1 4,842,729
198.2 4,842,730
209 4,842,731
220 4,842,732
225 4,842,733
242.3 4,842,735
321.61 4,842,736
321.87 4,842,737
380.1 4,842,738
489 4,842,739
500.27 4,842,740
500.36 4,842,741
634 4,842,743
636 4,842,744
679 4,842,745
689 4,842,746
767 4,842,747
774 4,842,748
783 4,842,749
791 4,842,750
798 4,842,751

CLASS 211

18 4,842,148
59.2 4,842,149

CLASS 212

147 4,842,150

CLASS 215

228 4,842,151
294 4,842,152
365 4,842,153

CLASS 219

10.491 4,843,201
10.55 B 4,843,202
10.55 R 4,843,204
69.12 4,843,203
78.12 4,843,205
119 4,843,206
121.39 4,843,208
121.6 4,843,207
121.63 4,843,209
126 4,843,210
136 4,842,154
137 WM 4,843,211
146.23 4,843,212
159 4,843,213
216 4,843,214
271 4,843,215
354 4,843,216
458 4,843,217
468 4,843,218

CLASS 220

3.6 4,842,155
3.9 4,842,156
90.4 4,842,157
4,842,159
94 R 4,842,158
225 4,842,160

CLASS 221

76 4,842,161

CLASS 222

1 4,842,162
40 4,842,163
94 4,842,164
95 4,842,165
129.2 4,842,166
249 4,842,167
402.2 4,842,168
521 4,842,169
594 4,842,170
595 4,842,171
600 4,842,172

CLASS 224

210 4,842,173
273 4,842,174
275 4,842,175
326 4,842,176

CLASS 226

97 4,842,177
108 4,842,179
113 4,842,178
176 4,842,180

CLASS 227

3 4,842,181

CLASS 228

108 4,842,182
119 4,842,183
180.1 4,842,184
183 4,842,185
222 4,842,186

CLASS 229

87 F 4,842,187
123.3 4,842,188
143 4,842,189

CLASS 235

379 4,843,219
380 4,843,220
441 4,843,221
470 4,843,222
487 4,843,223
4,843,224
492 4,843,225
4,843,226

CLASS 236

11 4,842,190
12.12 4,842,191
68 B 4,842,192

CLASS 237

12.3 A 4,842,193

CLASS 238

10 B 4,842,194

CLASS 239

1 4,842,195
3 4,842,196
5 4,842,197
200 4,842,198
230 4,842,199
263 4,842,200
396 4,842,201
661 4,842,202
705 4,842,203
744 4,842,204

CLASS 241

34 4,842,205

CLASS 242

18 R 4,842,206
54 R 4,842,207
56 R 4,842,209
56.2 4,842,208
57.1 Re.32,967
67.1 R 4,842,210
71.1 4,842,211
96 4,842,212
125.1 4,842,213
130 4,842,214
156 4,842,215
163 4,842,216
199 4,842,217

CLASS 244

3.28 4,842,218
31 4,842,219
50 4,842,220
115 4,842,221
155 R 4,842,222
158 R 4,842,223
159 4,842,224

CLASS 246

439 4,842,225

CLASS 248

56 4,842,227
97 4,842,228
148 4,842,229
225.2 4,842,230
316.2 4,842,231
395 4,842,232
405 4,842,233
429 4,842,234
447.2 4,842,235
499 4,842,236
548 4,842,237
562 4,842,238
640 4,842,239

CLASS 249

18 4,842,240
50 4,842,241
54 4,842,242
124 4,842,243

CLASS 250

201 4,843,227
4,843,228
213 VT 4,843,229
223 B 4,843,230
4,843,231
225 4,843,232
227 4,843,233
4,843,234
231 SE 4,843,236
237 G 4,843,237
237 R 4,843,235
251 B1 4,639,301
252.1 4,843,238
296 4,843,239
326 4,843,422
327.2 4,843,240
4,843,241
330 4,843,242
341 4,843,243
342 4,842,247
4,843,244
367 4,843,245
B1 4,260,890
491.1 4,843,246
573 4,843,247
574 4,843,248

CLASS 251

26 4,842,244
212 4,842,245
333 4,842,246

CLASS 252

8.514 4,842,770
8.6 4,842,769
8.7 4,842,758
8.8 4,842,760
17 4,842,752
32.7 E 4,842,755
42.7 4,842,753
48.2 4,842,756
62.51 4,842,759
76 4,842,757
90 4,842,761
109 4,842,762
155 4,842,763
171 4,842,764
186.26 4,842,765
299.01 4,842,754
309 4,842,766
500 4,842,768
525 4,842,767
547 4,842,771
601 4,842,772
628 4,842,773
633 4,842,774

CLASS 254

29 R 4,842,248
93 R 4,842,249
337 4,842,250
390 4,842,251
420 4,842,252

CLASS 260

396 R 4,842,775
512 C 4,842,776

CLASS 261

64.3 4,842,780
79.2 4,842,777
97 4,842,778
122 4,842,779

CLASS 264

1.3 4,842,781
1.4 4,842,782
4,842,783
1.9 4,842,784
40.1 4,842,786
4,842,801

40.6 4,842,787
68 4,842,788
101 4,842,789
117 4,842,790
130 4,842,792
136 4,842,793
145 4,842,794
155 4,842,795
171 4,842,791
184 4,842,796
203 4,842,797
219 4,842,798
265 4,842,799
272.13 4,842,800
522 4,842,742
530 4,842,802
565 4,842,803

CLASS 266

44 4,842,253
88 4,842,254
149 4,842,643
158 4,842,255
197 4,842,256

CLASS 267

133 4,842,257
140.1 4,842,258

CLASS 269

35 4,842,785
323 4,842,259

CLASS 270

52 4,842,260

CLASS 271

6 4,842,261
186 4,842,262
4,842,263
293 4,842,264

CLASS 272

28 S 4,842,267
69 4,842,266
73 4,842,268
4,842,269
117 4,842,270
118 4,842,271
129 4,842,274
132 4,842,272
141 4,842,273

CLASS 273

1 E 4,842,276
1 R 4,842,275
84 ES 4,842,277
138 A 4,842,278
183 A 4,842,279
194 B 4,842,280
256 4,842,281
258 4,842,282
392 4,842,283
395 4,842,284
420 4,842,285

CLASS 277

38 4,842,286
53 4,842,287

CLASS 279

62 4,842,288

CLASS 280

8 4,842,289
201 4,842,290
238 4,842,291
287 4,842,292
615 4,842,293
4,842,294
661 4,842,295
663 4,842,296
675 4,842,297
689 4,842,298
704 4,842,302
732 4,842,299
4,842,300
735 4,842,301

CLASS 281

38 4,842,303

CLASS 283

81 4,842,304

CLASS 285

21 4,842,305
104 4,842,306
140 4,842,307
261 4,842,308
319 4,842,309
334.5 4,842,310

CLASS 290

53 4,843,249
4,843,250

CLASS 292

85 4,842,311
336.3 4,842,312
341.16 4,842,313

CLASS 294

74 4,842,314
147 4,842,315

CLASS 296

22 4,842,316
36 4,842,317
65.1 4,842,318
91 4,842,319
95.1 4,842,320
97.1 4,842,321
97.7 4,842,322
136 4,842,324
146 4,842,325
196 4,842,326
201 4,842,327
214 4,842,328

CLASS 297

3 4,842,329
4 4,842,330
98 4,842,323
149 4,842,331
214 4,842,332
318 4,842,333
338 4,842,334
349 4,842,335

CLASS 299

8 4,842,336
80 4,842,337

CLASS 301

9 DN 4,842,338
37 S 4,842,339

CLASS 303

7 4,842,340
28 B1 4,733,919
37 4,842,341
102 4,842,342
103 4,842,343
117 4,842,344

CLASS 305

35 R 4,842,345
38 4,842,346

CLASS 307

66 4,843,251
264 4,843,252
266 4,843,253
272.2 4,843,254
273 4,843,255
296.2 4,843,256
4,843,258
296.8 4,843,257
308 4,843,259
362 4,843,260
449 4,843,261
475 4,843,262
480 4,843,263
530 4,843,264
591 4,843,265

CLASS 310

68 D 4,843,267
181 4,843,268
208 4,843,269
4,843,270
217 4,843,271
239 4,843,272
4,843,274
306 4,843,273
334 4,843,275

CLASS 312

1 4,842,347
12 4,842,348
116 4,842,349
228 4,842,350
263 4,842,351

CLASS 313

25 4,843,266
318 4,843,276
346 R 4,843,277
414 4,843,278
487 4,843,279
500 4,843,280
587 4,843,281
619 4,843,282

CLASS 315

153 4,843,283
371 4,843,284
408 4,843,285

CLASS 318

443 4,843,286
568.16 4,843,287
599 4,843,288
600 4,843,289
603 4,843,290
605 4,843,291
606 4,843,292
609 4,843,293
696 4,843,294
786 4,843,295
800 4,843,296
811 4,843,297

CLASS 320

2 4,843,298
31 4,843,299

CLASS 323

224 4,843,300
299 4,843,301
312 4,843,302
313 4,843,303
316 4,843,304

CLASS 324

65 P 4,843,305
73 PC 4,843,329
74 4,843,306
78 Z 4,843,328
103 P 4,843,307
120 4,843,308
121 R 4,843,309
127 4,843,310
142 4,843,311
158 F 4,843,313
158 P 4,843,315
158 R 4,843,312
4,843,314
4,843,330
210 4,843,316
221 4,843,317
225 4,843,318
240 4,843,319
4,843,320
309 4,843,321
4,843,322
313 4,843,323
326 4,843,324
439 4,843,325
503 4,843,326
525 4,843,327

CLASS 325

20 4,843,331
133 4,843,332
235 4,843,333

CLASS 329

122 4,843,334

CLASS 330

10 4,843,339
126 4,843,340
253 4,843,341
257 4,843,342
4,843,343
264 4,843,344
282 4,843,345

CLASS 331

65 4,843,346
88 4,843,347
109 4,843,348
116 R 4,843,349

CLASS 332

7.51 4,843,350
17 4,843,351
22 4,843,352
751 4,843,335

CLASS 333

34 4,843,353
81 A 4,843,354
160 4,843,355
236 4,843,356
258 4,843,357
263 4,843,358

CLASS 335

6 4,843,359
80 4,843,360
229 4,843,361

CLASS 336

61 4,843,362
83 4,842,352

CLASS 337

94 4,843,363
333 4,843,364

CLASS 338

32 R 4,843,365
128 4,843,366

CLASS 340

463 4,843,367
464 4,843,368
466 4,843,370
479 4,843,369
521 4,843,336
539 4,843,371
540 4,843,372
4,843,373
547 4,843,374
550 4,843,375
568 4,843,376
573 4,843,377
635 4,843,378
701 4,843,379
723 4,843,380
784 4,843,381
825.060 4,843,382
825.320 4,843,385
825.69 4,843,384
825.690 4,843,386
825.9 4,843,383
870.37 4,843,387
906 4,843,337

CLASS 341

15 4,843,388
106 4,843,389
139 4,843,390
143 4,843,391
145 4,843,392
150 4,843,393
154 4,843,394
156 4,843,395

CLASS 342

7 4,843,396
59 4,843,397
404 4,843,399

CLASS 343

700 MS 4,843,400
701 4,843,401
758 4,843,402
767 4,843,403
895 4,843,404

CLASS 346

1.1 4,843,405
4,843,406
75 4,843,407
76 PH 4,843,408
4,843,409
140 R 4,843,338

CLASS 347

74 4,843,398

CLASS 350

3.7 4,842,353
4,842,389
6.5 4,842,396
6.8 4,842,354
96.10 4,842,356
96.12 4,842,357
96.14 4,842,367
96.15 4,842,358
4,842,368
4,842,390
96.16 4,842,359
96.18 4,842,360
4,842,391
96.2 4,842,355
96.20 4,842,361
4,842,362
4,842,363
96.21 4,842,364
96.23 4,842,365
96.24 4,842,366
96.30 4,842,369
96.34 4,842,392
247 4,842,405
320 4,842,370
321 4,842,371
333 4,842,372
334 4,842,373
336 4,842,374
337 4,842,375
339 R 4,842,376
342 4,842,377
344 4,842,378
345 4,842,379
347 E 4,842,380
351 4,842,381
357 4,842,382
4,842,383
412 4,842,384
427 4,842,385
4,842,386
429 4,842,387
432 4,842,388
4,842,393
4,842,394
519 4,842,395
634 4,842,397
641 4,842,398

CLASS 351

106 4,842,399
158 4,842,400
221 4,842,401

CLASS 353

74 4,842,402

CLASS 354

21 4,843,414
77 4,843,410
187 4,843,411
275 4,843,412
402 4,843,413
403 4,843,415
4,843,416
408 4,843,417
419 4,843,418
426 4,843,419
479 4,843,420

CLASS 355

27 4,843,430
34 4,843,431
41 4,843,432
49 4,843,433
72 4,843,434
100 4,843,435
133 4,843,436
202 4,843,426
206 4,843,437
218 4,843,427
245 4,843,423
253 4,843,421
261 4,843,425
268 4,843,424
274 4,843,429

CLASS 356

73 4,842,403
218 4,842,404
336 4,842,406
344 4,842,407
349 4,842,408
350 4,842,409
357 4,842,410
376 4,842,411
401 4,842,412
426 4,842,413

CLASS 357

4 4,843,439
04 4,843,438
22 4,843,440
4,843,441
23.3 4,843,442
23.7 4,843,443
27 4,843,444
28 4,843,445
30 4,843,446
34 4,843,447
36 4,843,448
38 4,843,449
52 4,843,450
63 4,843,451
68 4,843,452
71 4,843,453
79 4,843,454

CLASS 358

13 4,843,455
29 4,843,456
31 4,843,457
80 4,843,458
93 4,843,459
107 4,843,460
108 4,843,461
4,843,462
4,843,463
112 4,843,464
133 4,843,465
4,843,466
135 4,843,467
140 4,843,468
148 4,843,469
153 4,843,470
160 4,843,471
164 4,843,472
213.18 4,843,473
213.19 4,843,474
225 4,843,475
228 4,843,476
248 4,843,477
257 4,843,478
4,843,479
293 4,843,480
296 4,843,481
300 4,843,428
335 4,843,482
4,843,483
342 4,843,484

CLASS 360

9.1 4,843,485
17 4,843,487
19.1 4,843,488
51 4,843,489
69 4,843,490
73.07 4,843,491
74.1 4,843,492
77.03 4,843,494
77.06 4,843,496
77.15 4,843,493
79 4,843,497
93 4,843,498
96.3 4,843,499
97.02 4,843,500
99.06 4,843,501
105 4,843,502
106 4,843,503
4,843,504
113 4,843,505
4,843,506
121 4,843,486
125 4,843,507
128 4,843,508
4,843,509
132 4,843,510
133 4,843,511
4,843,512

CLASS 361

20 4,843,513
50 4,843,514
58 4,843,515
145 4,843,516
323 4,843,517
330 4,843,518
356 4,843,519
395 4,843,520

CLASS 362

16 4,843,521
61 4,843,522
69 4,843,523
127 4,843,524
157 4,843,525
187 4,843,526
231 4,843,527
277 4,843,528
284 4,843,529
413 4,843,530
421 4,843,531

CLASS 363

26 4,843,532
55 4,843,533
71 4,843,534
4,843,535
89 4,843,536

CLASS 364

187 4,843,537
188 4,843,538
200 4,843,539
4,843,540
4,843,541
4,843,542
4,843,543
4,843,544
300 4,843,545
403 4,843,546
405 4,843,547
406 4,843,548
413.13 4,843,549
424.05 4,843,559
424.1 4,843,550
4,843,551
426.03 4,843,552
426.04 4,843,553
427 4,843,554
431.03 4,843,558
431.07 4,843,555
431.08 4,843,556
431.77 4,843,557
464.02 4,843,560
478 4,843,561
487 4,843,562
490 4,843,563
505 4,843,084
510 4,843,564
513 4,843,565
4,843,566
4,843,567
518 4,843,568
4,843,569
4,843,570
519 4,843,571
4,843,572
521 4,843,573
526 4,843,574
550 4,843,575
557 4,843,576
4,843,577
4,843,578
567 4,843,579
569 4,843,580
724.01 4,843,581
724.16 4,843,582
724.19 4,843,583
735 4,843,584
759 4,843,585
822 4,843,586
841 4,843,587
900 4,843,588
4,843,589
4,843,590
4,843,591
4,843,592
4,843,593

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CLASS 365

185 4,843,594
189.01 4,843,595
233.5 4,843,596

CLASS 366

82 4,842,414
110 4,842,41[illegible]
314 4,842,41[illegible]

CLASS 367

15 4,843,597
27 4,843,598
70 4,843,599

CLASS 369

13 4,843,600
44 4,843,601
4,843,602
45 4,843,603
116 4,843,604

CLASS 370

60 4,843,605
89 4,843,606

CLASS 371

37 4,843,607
68 4,843,608

CLASS 372

18 4,843,609
31 4,843,610
46 4,843,611

CLASS 373

72 4,843,614

CLASS 374

139 4,842,417
4,842,418
145 4,842,419

CLASS 375

1 4,843,612
59 4,843,613
80 4,843,615
81 4,843,616
118 4,843,617

CLASS 376

203 4,842,804
215 4,842,805
247 4,842,806
254 4,842,807
261 4,842,808
4,842,809
299 4,842,810
301 4,842,811
306 4,842,812
353 4,842,813
438 4,842,814
463 4,842,815

CLASS 378

4 4,843,618
207 4,843,619

CLASS 379

21 4,843,620
58 4,843,621
59 4,843,622

CLASS 381

68.2 4,843,623
91 4,843,624
98 4,843,625
107 4,843,626
110 4,843,627
200 4,843,628

CLASS 382

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43 4,843,631
56 4,843,632

CLASS 383

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61 4,842,421

CLASS 384

19 4,842,422
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203 4,842,424
440 4,842,425
478 4,842,426
545 B1 4,145,095

CLASS 400

18 4,842,427
157.2 4,842,429
183 4,842,457
697 4,842,428
708 4,842,430
719 4,842,431

CLASS 401

197 4,842,432
209 4,842,43[illegible]

CLASS 402

34 4,842,43[illegible]
80 R 4,842,43[illegible]
4,842,43[illegible]

CLASS 403

24 4,842,43[illegible]
266 4,842,43[illegible]
290 4,842,43[illegible]

CLASS 404

90 4,842,44[illegible]
98 4,842,44[illegible]

CLASS 405

31 4,842,44[illegible]
52 4,842,44[illegible]
132 4,842,44[illegible]
172 4,842,44[illegible]
227 4,842,44[illegible]
243 4,842,44[illegible]
258 4,842,44[illegible]

CLASS 406

153 4,842,44[illegible]

CLASS 408

1 R 4,842,45[illegible]
21 4,842,45[illegible]
80 4,842,45[illegible]
89 4,842,45[illegible]

CLASS 409

84 4,842,45[illegible]
134 4,842,45[illegible]
145 4,842,45[illegible]

CLASS 410

3 4,842,45[illegible]
97 4,842,45[illegible]
121 4,842,46[illegible]

CLASS 411

55 4,842,46[illegible]
180 4,842,46[illegible]
188 4,842,46[illegible]
307 4,842,46[illegible]
337 4,842,46[illegible]
366 4,842,46[illegible]
399 4,842,46[illegible]

CLASS 413

12 4,842,46[illegible]
60 4,842,46[illegible]

CLASS 414

401 Re.32,96[illegible]
478 4,842,47[illegible]
515 4,842,47[illegible]
563 4,842,47[illegible]
626 4,842,47[illegible]
680 4,842,47[illegible]
730 4,842,47[illegible]
751 4,842,47[illegible]

CLASS 415

118 4,842,47[illegible]
121.1 4,842,47[illegible]
169.2 4,842,47[illegible]
199.1 4,842,48[illegible]
206 4,842,48[illegible]

CLASS 416

70 R 4,842,48[illegible]
93 A 4,842,48[illegible]
127 4,842,48[illegible]
144 4,842,48[illegible]

CLASS 417

53 4,842,48[illegible]
132 4,842,48[illegible]
222 4,842,48[illegible]
238 4,842,48[illegible]
295 4,842,49[illegible]
312 4,842,49[illegible]
4,842,49[illegible]
322 4,842,49[illegible]
364 4,842,49[illegible]
488 4,842,49[illegible]
490 4,842,49[illegible]
499 4,842,49[illegible]
571 4,842,49[illegible]

CLASS 418

55 4,842,49[illegible]
133 4,842,50[illegible]
201 4,842,50[illegible]

CLASS 420

84 4,842,50[illegible]
100 4,842,50[illegible]
418 4,842,50[illegible]
4,842,50[illegible]
4,842,50[illegible]
528 4,842,50[illegible]
533 4,842,50[illegible]
584 4,842,823

CLASS 422

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102 4,842,826
112 4,842,827
186.08 4,842,829
186.3 4,842,828
193 4,842,830
198 4,842,831

CLASS 423

160 4,842,833
211 4,842,832
235 4,842,834
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328 4,842,836
335 4,842,837
339 4,842,838
342 4,842,839
345 4,842,840
474 4,842,841
554 4,842,842
574 R 4,842,843
657 4,842,844

CLASS 424

1.1 4,842,845
52 4,842,847
63 4,842,848
70 4,842,849
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4,842,851
71 4,842,852
76.1 4,842,853
81 Re.32,969
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95 4,842,856
101 4,842,857
116 4,842,858
150 4,842,859
195.1 4,842,860
403 4,842,861
410 4,842,862
422 4,842,863
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456 4,842,866
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CLASS 425

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72.2 4,842,503
143 4,842,504
174.8 E 4,842,505
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382.4 4,842,507
468 4,842,508

CLASS 426

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8 4,842,869
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46 4,842,872
49 4,842,873
94 4,842,874
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286 4,842,878
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483 4,842,883
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635 4,842,885

CLASS 427

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461 4,842,947
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483 4,842,950
516 4,842,951
518 4,842,952
553 4,842,953
593 4,842,954
606 4,842,955
611 4,842,956
622 4,842,957
629 4,842,958
630 4,842,959
672 4,842,961
690 4,842,960

CLASS 429

12 4,842,962
21 4,842,963
50 4,842,846
52 4,842,964
56 4,842,965
96 4,842,966
101 4,842,967

CLASS 430

1 4,842,968
5 4,842,969
14 4,842,988
58 4,842,970
64 4,842,971
117 4,842,972
128 4,842,973
137 4,842,974
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4,842,979
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175 4,842,983
197 4,842,984
226 4,842,985
270 4,842,986
272 4,842,990
281 4,842,987
296 4,842,989
316 4,842,991
328 4,842,992
380 4,842,993
543 4,842,994

CLASS 431

10 4,842,509
19 4,842,510

CLASS 432

192 4,842,511

CLASS 433

8 4,842,512
9 4,842,513
21 4,842,514
74 4,842,515
132 4,842,516
173 4,842,517
174 4,842,518
215 4,842,519

CLASS 434

30 4,842,520
187 4,842,521
260 4,842,522
371 4,842,523

CLASS 435

5 4,842,995
6 4,842,996
4,842,997
7 4,842,998
4,842,999
4,843,000
4,843,001
4,843,010
91 4,843,003
172.3 4,843,002
4,843,006
240.26 4,843,004
240.27 4,843,011
240.49 4,843,005
252.1 4,843,007
4,843,008
253.3 4,843,009
270 4,843,012

CLASS 436

11 4,843,013
63 4,843,014
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177 4,843,017
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501 4,843,019
518 4,843,020
533 4,843,021

CLASS 437

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34 4,843,023
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63 4,843,027
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235 4,843,037

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42 4,842,526
63 4,842,527
80 4,842,528
95 4,842,529
98 4,842,530
165 4,842,531
174 4,842,532
213 4,842,533
214 4,842,534
232 4,842,535
246 4,842,536
4,842,537
260 4,842,538
262 4,842,539
271 4,842,540
281 4,842,541
357 4,842,542
378 4,842,543
387 4,842,544
393 4,842,545
409 4,842,546
460 4,842,547
461 4,842,548
464 4,842,549
471 4,842,550
502 4,842,551
557 4,842,552
583 4,842,553
609 4,842,554
4,842,555
638 4,842,556
851 4,842,557
863 4,842,558

CLASS 440

1 4,842,559
9 4,842,560
100 4,842,561

CLASS 441

94 4,842,562

CLASS 446

48 B1 4,104,822
221 4,842,563
297 4,842,564
321 4,842,565
345 4,842,566
464 4,842,567

CLASS 455

33 4,843,633
121 4,843,634
151 4,843,635
192 4,843,636
200 4,843,637
318 4,843,638
603 4,843,639
604 4,843,640

CLASS 474

80 4,842,568
83 4,842,569
118 4,842,570
204 4,842,571

CLASS 493

357 4,842,572
412 4,842,573
421 4,842,574

CLASS 501

87 4,843,039
92 4,843,040
95 4,843,041
96 4,843,042
97 4,843,043
98 4,843,038
111 4,843,044
120 4,843,045
136 4,843,046
143 4,843,047
148 4,843,048

CLASS 502

9 4,843,049
41 4,843,050
42 4,843,051
68 4,843,052
159 4,843,053
175 4,843,054
202 4,843,055
263 4,843,057
302 4,843,056

CLASS 503

209 4,843,058

CLASS 505

1 4,843,059
4,843,060

CLASS 512

22 4,843,061

CLASS 514

2 4,843,063
4 4,843,062
12 4,843,064
21 4,843,065
45 4,843,066
54 4,843,067
63 4,843,068
184 4,843,069
191 4,842,734
210 4,843,070
217 4,843,071
228.2 4,843,074
247 4,843,072
248 4,843,075
252 4,843,076
253 4,843,077
4,843,078
285 4,843,080
288 4,843,073
292 4,843,079
307 4,843,081
311 4,843,082
318 4,843,083
356 4,843,085
367 4,843,086
374 4,843,087
383 4,843,088
4,843,089
388 4,843,090
419 4,843,091
450 4,843,092
473 4,843,093
518 4,843,094
558 4,843,095
559 4,843,096
576 4,843,099
594 4,843,100
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778 4,843,098

CLASS 518

713 4,843,101

CLASS 521

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107 4,843,106

155 4,843,107
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182 4,843,109

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14 4,843,110
42 4,843,111

CLASS 523

114 4,843,112

CLASS 524

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100 4,843,115
102 4,843,116
173 4,843,117
425 4,843,113
555 4,843,118
730 4,843,119

CLASS 525

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56 4,843,121
61 4,843,122
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98 4,843,125
162 4,843,126
183 4,843,127
193 4,843,128
240 4,843,129
331.3 4,843,130

CLASS 526

65 4,843,131
125 4,843,132
129 4,843,133
169 4,843,135
279 4,843,136
318.4 4,843,134

CLASS 528

10 4,843,137
52 4,843,138
125 4,843,139
176 4,843,140
183 4,843,141
211 4,843,142
4,843,143
392 4,843,144
4,843,145

CLASS 530

324 4,843,146
391 4,843,147

CLASS 534

598 4,843,148
632 4,843,149
634 4,843,150
643 4,843,151
701 4,843,152
752 4,843,153

CLASS 536

4.1 4,843,154
27 4,843,155
127 4,843,156

CLASS 540

76 4,843,157
469 4,843,158

CLASS 544

198 4,843,159
398 4,843,160

CLASS 546

10 4,843,161
170 4,843,162
194 4,843,163

CLASS 548

341 4,843,164
544 4,843,165
4,843,166

CLASS 558

6 4,843,167
357 4,843,168

CLASS 560

77.15 4,843,495
105 4,843,169
261 4,843,170
262 4,843,171

CLASS 562

406 4,843,172
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531 4,843,173

CLASS 564

209 4,843,177
292 4,843,176
409 4,843,175

CLASS 568

322 4,843,179
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CLASS 570

169 4,843,181
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CLASS 585

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864 4,843,184

CLASS 600

36 4,842,575

CLASS 604

6 4,842,576
20 4,842,577
22 4,842,578
4,842,579
30 4,842,580
38 4,842,581
43 4,842,582
4,842,583
50 4,842,584
51 4,842,588
158 4,842,585
192 4,842,586
198 4,842,587
280 4,842,589
282 4,842,590
283 4,842,591
4,842,592
360 4,842,593
368 4,842,594
4,842,597
372 4,842,595
385.2 4,842,596
891.1 4,842,598

CLASS 623

5 4,842,599
6 4,842,600
4,842,601
4,842,602
16 4,842,603
4,842,604
22 4,842,605
23 4,842,606
24 4,842,607
33 4,842,608

CLASS 800

1 4,843,186

CLASSIFICATION OF DESIGNS

D1— 107 301,794
108 301,795
D2— 25 301,796
185 301,797
309 301,798
314 301,799
320 301,800
301,801
D3— 39 301,802
D5— 62 301,803
301,804
301,805
D6— 319 301,806
323 301,807
326 301,808
370 301,809
373 301,810
400 301,811
462 301,812
467 301,813
484 301,814
505 301,815
567 301,816
574 301,817
575 301,818
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314 301,835
368 301,822
301,823
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36 301,828
40 301,829
62 301,830
347 301,831
349 301,832
354 301,833
358 301,834
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161 301,860
167 301,861
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193 301,863
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32 301,871
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38 301,873
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D19— 65 301,897
75 301,898
D21— 5 301,899
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237 301,910
D22— 104 301,911
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209 301,914
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235 301,917
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255 301,920
257 301,921
281 301,922
332 301,923
344 301,924
D24— 3 301,925
10 301,926
D34— 40 301,927
D99— 29 301,928
30 301,929
34 301,930
38 301,931

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P.— 9 6,875
6,876
66 6,877
68 6,878
74 6,879
6,880
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Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,841,608	4,841,88[illegible]	4,842,453		4,843,316		4,842,330		4,843,487
	4,841,702	4,841,88[illegible]	4,842,458		4,843,321		4,842,444	12 :	4,841,580
	4,841,771	4,841,91[illegible]	4,842,464		4,843,327		4,842,624		4,841,586
	4,841,902	4,841,91[illegible]	4,842,466		4,843,328		4,842,662		4,841,591
	4,841,968	4,841,92[illegible]	4,842,522		4,843,331		4,842,704		4,841,592
	4,842,425	4,841,94[illegible]	4,842,584		4,843,350		4,842,909		4,841,614
	4,842,749	4,841,96[illegible]	4,842,586		4,843,351		4,842,928		4,841,623
	4,842,790	4,841,97[illegible]	4,842,591		4,843,355		4,843,298		4,841,640
	4,843,071	4,841,97[illegible]	4,842,602		4,843,356		4,843,325		4,841,653
	4,843,324	4,841,98[illegible]	4,842,667		4,843,368		4,843,377		4,841,661
04 :	4,841,757	4,841,99[illegible]	4,842,670		4,843,374		4,843,403		4,841,665
	4,842,050	4,841,99[illegible]	4,842,683		4,843,375		4,843,429		4,841,707
	4,842,177	4,842,00[illegible]	4,842,699		4,843,380		4,843,495		4,841,801
	4,842,242	4,842,09[illegible]	4,842,720		4,843,395		4,843,504		4,841,852
	4,842,329	4,842,10[illegible]	4,842,724		4,843,400		4,843,579		4,841,863
	4,842,394	4,842,13[illegible]	4,842,736		4,843,402		4,843,603		4,841,894
	4,842,441	4,842,13[illegible]	4,842,757		4,843,406		4,104,822		4,841,970
	4,842,553	4,842,14[illegible]	4,842,782		4,843,434	09 :	4,841,628		4,841,971
	4,842,599	4,842,14[illegible]	4,842,827		4,843,439		4,841,657		4,842,002
	4,842,685	4,842,15[illegible]	4,842,845		4,843,448		4,841,822		4,842,036
	4,842,893	4,842,16[illegible]	4,842,867		4,843,463		4,841,903		4,842,092
	4,843,026	4,842,17[illegible]	4,842,868		4,843,466		4,842,011		4,842,140
	4,843,339	4,842,17[illegible]	4,842,880		4,843,469		4,842,032		4,842,234
	4,843,347	4,842,19[illegible]	4,842,892		4,843,497		4,842,084		4,842,236
	4,843,354	4,842,20[illegible]	4,842,910		4,843,503		4,842,086		4,842,442
05 :	4,842,272	4,842,22[illegible]	4,842,933		4,843,506		4,842,139		4,842,460
06 :	Re.32,967	4,842,22[illegible]	4,842,948		4,843,508		4,842,183		4,842,527
	4,841,578	4,842,23[illegible]	4,842,949		4,843,522		4,842,280		4,842,539
	4,841,579	4,842,23[illegible]	4,842,963		4,843,526		4,842,424		4,842,565
	4,841,581	4,842,24[illegible]	4,842,998		4,843,534		4,842,482		4,842,581
	4,841,596	4,842,26[illegible]	4,843,000		4,843,538		4,842,533		4,842,587
	4,841,600	4,842,2[illegible]6	4,843,005		4,843,542		4,842,538		4,842,622
	4,841,625	4,842,2[illegible]3	4,843,023		4,843,583		4,842,652		4,842,663
	4,841,645	4,842,2[illegible]2	4,843,027		4,843,586		4,842,834		4,842,746
	4,841,658	4,842,2[illegible]4	4,843,063		4,843,587		4,842,869		4,842,783
	4,841,667	4,842,2[illegible]9	4,843,064		4,843,607		4,843,128		4,842,786
	4,841,671	4,842,2[illegible]0	4,843,095		4,843,608		4,843,229		4,842,882
	4,841,673	4,842,2[illegible]1	4,843,131		4,843,611		4,843,249		4,843,084
	4,841,678	4,842,3[illegible]7	4,843,175		4,843,626		4,843,297		4,843,096
	4,841,685	4,842,3[illegible]5	4,843,179		4,843,627		4,843,359		4,843,343
	4,841,690	4,842,3[illegible]4	4,843,188		4,843,632		4,843,529		4,843,385
	4,841,717	4,842,3[illegible]2	4,843,205		4,260,890		4,843,568		4,843,514
	4,841,730	4,842,3[illegible]8	4,843,209		4,733,919		4,843,574		4,843,567
	4,841,753	4,842,3[illegible]4	4,843,220	08 :	Re.32,964	10 :	4,841,680		4,843,615
	4,841,773	4,842,3[illegible]4	4,843,242		4,841,590		4,842,008	13 :	4,841,620
	4,841,774	4,842,3[illegible]6	4,843,250		4,841,638		4,842,601		4,841,700
	4,841,787	4,842,3[illegible]8	4,843,264		4,841,800		4,842,639		4,841,821
	4,841,809	4,842,3[illegible]4	4,843,280		4,841,810		4,842,741		4,842,229
	4,841,817	4,842,3[illegible]1	4,843,288		4,842,007		4,842,794		4,842,240
	4,841,831	4,842,4[illegible]1	4,843,294		4,842,065		4,842,875		4,842,268
	4,841,848	4,842,4[illegible]4	4,843,300		4,842,070		4,843,057		4,842,317
	4,841,867	4,842,4[illegible]2	4,843,302		4,842,173		4,843,124		4,842,451
	4,841,877	4,842,4[illegible]3	4,843,313		4,842,319		4,843,181		4,843,020

	4,843,566		4,842,097		4,842,089		4,842,169		4,842,946		4,841,681
15 :	4,842,270		4,842,147		4,842,142		4,842,278		4,842,961		4,842,014
	4,842,560		4,842,159		4,842,176		4,842,368		4,842,967		4,842,057
16 :	4,841,961		4,842,279		4,842,188		4,842,465		4,842,973		4,842,073
	4,841,977		4,842,487		4,842,192		4,842,575		4,843,004		4,842,094
17 :	4,841,603		4,842,795		4,842,257		4,842,617		4,843,007		4,842,637
	4,841,634		4,842,903		4,842,295		4,842,626		4,843,009		4,842,694
	4,841,643		4,843,202		4,842,298		4,842,641		4,843,036		4,842,752
	4,841,666	22 :	4,841,929		4,842,300		4,842,659		4,843,042		4,842,770
	4,841,675		4,842,153		4,842,301		4,842,660		4,843,067		4,842,830
	4,841,693		4,842,314		4,842,309		4,842,719		4,843,087		4,842,843
	4,841,696		4,842,350		4,842,327		4,842,726		4,843,104		4,843,133
	4,841,711		4,842,436		4,842,339		4,842,727		4,843,116		4,843,178
	4,841,734		4,842,709		4,842,382		4,842,740		4,843,117		4,843,260
	4,841,742		4,842,735		4,842,419		4,842,748		4,843,122		4,843,268
	4,841,765		4,843,525		4,842,437		4,842,761		4,843,187		4,843,512
	4,841,854		4,843,575		4,842,450		4,842,767		4,843,222		4,843,599
	4,841,873	23 :	4,841,743		4,842,492		4,842,769		4,843,261		4,843,639
	4,841,876		4,842,313		4,842,534		4,842,803		4,843,271	41	4,841,825
	4,841,897	24 :	4,841,594		4,842,562		4,842,852		4,843,274		4,841,866
	4,841,899		4,841,692		4,842,574		4,842,857		4,843,281		4,842,149
	4,841,948		4,841,772		4,842,578		4,842,858		4,843,318		4,842,190
	4,842,005		4,841,836		4,842,604		4,842,874		4,843,330		4,842,207
	4,842,022		4,841,846		4,842,621		4,842,898		4,843,344		4,842,260
	4,842,028		4,842,175		4,842,742		4,842,938		4,843,370		4,842,304
	4,842,035		4,842,219		4,842,766		4,842,950		4,843,372		4,842,389
	4,842,044		4,842,221		4,842,888		4,842,955		4,843,413		4,842,452
	4,842,077		4,842,406		4,842,890		4,843,014		4,843,421		4,842,931
	4,842,109		4,842,417		4,842,895		4,843,037		4,843,436		4,843,255
	4,842,124		4,842,772		4,842,902		4,843,044		4,843,450		4,843,309
	4,842,189		4,842,804		4,842,921		4,843,051		4,843,496		4,843,441
	4,842,230		4,842,960		4,843,092		4,843,062		4,843,541		4,843,573
	4,842,237		4,843,052		4,843,160		4,843,077		4,843,572		4,843,590
	4,842,241		4,843,060		4,843,180		4,843,079		4,843,628	42	Re.32,962
	4,842,246		4,843,074		4,843,189		4,843,081	37	4,841,584		4,841,646
	4,842,249		4,843,123		4,843,314		4,843,082		4,841,589		4,841,763
	4,842,251		4,843,349		4,843,381		4,843,098		4,841,704		4,841,777
	4,842,347		4,843,353		4,843,443		4,843,099		4,841,752		4,841,833
	4,842,363		4,843,426		4,843,444		4,843,115		4,841,834		4,841,864
	4,842,449		4,843,440		4,843,521		4,843,121		4,842,204		4,841,868
	4,842,459		4,843,565		4,843,551		4,843,127		4,842,485		4,841,955
	4,842,508	25	4,841,616		4,843,559		4,843,129		4,842,609		4,841,973
	4,842,516		4,841,639		4,843,561		4,843,162		4,842,613		4,842,054
	4,842,521		4,841,684		4,843,640		4,843,191		4,842,661		4,842,120
	4,842,548		4,841,722		1,029,635		4,843,301		4,842,932		4,842,137
	4,842,550		4,841,732	27 :	4,841,709		4,843,357		4,843,017		4,842,170
	4,842,576		4,841,762		4,841,855		4,843,485		4,843,578		4,842,244
	4,842,579		4,841,925		4,841,908		4,843,532	38 :	4,841,718		4,842,265
	4,842,582		4,841,946		4,841,958		4,843,540		4,842,108		4,842,326
	4,842,598		4,841,983		4,841,976		4,843,581	39 :	Re.32,963		4,842,335
	4,842,692		4,841,997		4,842,227	35	4,841,621		Re.32,966		4,842,362
	4,842,728		4,842,105		4,842,303		4,841,641		4,841,613		4,842,405
	4,842,731		4,842,259		4,842,432		4,841,721		4,841,654		4,842,418
	4,842,884		4,842,262		4,842,619		4,841,778		4,841,670		4,842,448
	4,842,907		4,842,287		4,842,739		4,841,896		4,841,695		4,842,463
	4,842,947		4,842,360		4,842,787	36 :	Re.32,969		4,841,723		4,842,471
	4,843,030		4,842,410		4,842,876		4,841,615		4,841,755		4,842,511
	4,843,168		4,842,526		4,842,886		4,841,635		4,841,943		4,842,525
	4,843,416		4,842,551		4,842,911		4,841,648		4,842,024		4,842,528
	4,843,516		4,842,631		4,842,919		4,841,651		4,842,025		4,842,529
	4,843,621		4,842,697		4,843,134		4,841,664		4,842,040		4,842,542
	4,843,633		4,842,703		4,843,342		4,841,698		4,842,042		4,842,543
18 :	4,841,595		4,842,721		4,843,410		4,841,710		4,842,045		4,842,544
	4,841,656		4,842,738		4,843,505		4,841,749		4,842,051		4,842,547
	4,841,768		4,842,908		4,843,564		4,841,829		4,842,100		4,842,549
	4,841,782		4,842,924		4,843,620		4,841,872		4,842,162		4,842,552
	4,841,807		4,843,012	28	4,842,195		4,841,878		4,842,165		4,842,554
	4,841,816		4,843,013	29 :	4,841,660		4,841,882		4,842,186		4,842,555
	4,841,841		4,843,016		4,841,674		4,841,901		4,842,196		4,842,588
	4,841,932		4,843,034		4,841,712		4,841,904		4,842,285		4,842,620
	4,842,010		4,843,041		4,841,756		4,841,978		4,842,311		4,842,655
	4,842,027		4,843,112		4,841,798		4,842,003		4,842,402		4,842,723
	4,842,034		4,843,161		4,841,823		4,842,004		4,842,484		4,842,807
	4,842,046		4,843,279		4,841,985		4,842,133		4,842,519		4,842,808
	4,842,060		4,843,282		4,842,589		4,842,135		4,842,532		4,842,811
	4,842,217		4,843,392		4,842,732		4,842,211		4,842,564		4,842,812
	4,842,325		4,843,473		4,843,006		4,842,216		4,842,593		4,842,855
	4,842,470		4,843,481		4,843,169		4,842,231		4,842,607		4,842,964
	4,842,477		4,843,494		4,843,176		4,842,275		4,842,646		4,843,054
	4,842,510		4,843,511	30 :	4,841,691		4,842,276		4,842,715		4,843,101
	4,842,512		4,843,515		4,842,030		4,842,283		4,842,791		4,843,118
	4,842,514		4,843,524	31 :	4,841,587		4,842,331		4,842,847		4,843,1[illegible]
	4,842,611		4,843,584		4,841,713		4,842,341		4,842,850		4,843,198
	4,842,636		4,639,301		4,841,912		4,842,420		4,842,889		4,843,211
	4,842,656	26	4,841,588		4,842,912		4,842,421		4,842,923		4,843,275
	4,842,762		4,841,627	32 :	4,842,650		4,842,518		4,842,953		4,843,287
	4,842,862		4,841,659	33 :	4,841,733		4,842,583		4,842,976		4,843,358
	4,843,002		4,841,687		4,842,411		4,842,608		4,842,980		4,843,399
	4,843,232		4,841,699		4,842,530		4,842,610		4,842,981		4,843,452
	4,843,291		4,841,725		4,842,592		4,842,632		4,843,055		4,843,509
	4,843,326		4,841,745		4,843,141		4,842,669		4,843,102		4,843,576
	4,843,580		4,841,790		4,843,243		4,842,677		4,843,120	43 :	4,842,483
19 :	4,841,701		4,841,793		4,843,478		4,842,690		4,843,126		4,843,369
	4,841,819		4,841,802	34 :	4,841,597		4,842,714		4,843,138	44 :	4,841,910
	4,842,871		4,841,806		4,841,630		4,842,737		4,843,143		4,842,383
	4,843,065		4,841,820		4,841,686		4,842,756		4,843,155		4,842,475
20 :	4,841,818		4,841,832		4,841,826		4,842,764		4,843,185		4,843,295
	4,841,883		4,841,838		4,841,890		4,842,774		4,843,234		4,843,548
	4,842,143		4,841,844		4,841,962		4,842,788		4,843,269	45 :	4,841,606
	4,842,524		4,841,909		4,841,967		4,842,800		4,843,286		4,841,636
	4,842,556		4,841,924		4,841,982		4,842,817		4,843,364		4,841,781
	4,842,883		4,841,930		4,842,101		4,842,819		4,843,404		4,841,839
	4,843,251		4,841,934		4,842,118		4,842,820		4,843,407		4,842,214
	4,843,376		4,842,020		4,842,122		4,842,836		4,843,619		4,842,248
	4,843,544		4,842,039		4,842,155		4,842,859	40 :	4,841,576		4,842,594
21	4,841,957		4,842,085		4,842,161		4,842,941		4,841,668		4,842,905

	4,842,952		4,841,953		4,842,355		4,843,050		4,842,822		4,843,010
	4,843,015		4,841,960		4,842,393		4,843,265		4,842,934		4,843,308
	4,843,194		4,841,984		4,842,414		4,843,317		4,843,011		4,843,332
	4,843,208		4,842,013		4,842,446		4,843,319		4,843,114		4,843,338
	4,843,533		4,842,058		4,842,467		4,843,320		4,843,235		4,843,383
47	4,841,647		4,842,059		4,842,491		4,843,337		4,843,346		4,843,527
	4,841,754		4,842,062		4,842,569		4,843,366		4,843,554	54	4,841,915
	4,841,792		4,842,064		4,842,600		4,843,389		4,843,562		4,842,337
	4,841,886		4,842,069		4,842,649		4,843,390		4,843,588	55	Re.32,968
	4,842,031		4,842,072		4,842,675		4,843,394	53 :	4,841,879		4,841,593
	4,842,281		4,842,074		4,842,676		4,843,401		4,841,880		4,841,669
	4,842,792		4,842,083		4,842,680		4,843,453		4,841,947		4,841,805
	4,842,841		4,842,093		4,842,686		4,843,585		4,841,998		4,841,988
48	4,841,663		4,842,132		4,842,687		4,843,598		4,842,198		4,842,095
	4,841,731		4,842,158		4,842,716		4,843,624		4,842,277		4,842,435
	4,841,746		4,842,181		4,842,778	50 :	4,841,650		4,842,320		4,842,498
	4,841,783		4,842,184		4,842,825		4,842,157		4,842,357		4,842,558
	4,841,785		4,842,223		4,842,861	51 :	4,841,683		4,842,439		4,842,559
	4,841,799		4,842,239		4,842,922		4,841,706		4,842,479		4,842,596
	4,841,871		4,842,250		4,842,962		4,841,893		4,842,644		4,842,877
	4,841,887		4,842,252		4,842,991		4,841,987		4,842,681		4,843,322
	4,841,892		4,842,271		4,843,033		4,842,152		4,842,701		4,843,373
	4,841,900		4,842,316		4,843,045		4,842,535		4,842,844	56	4,842,218
	4,841,906		4,842,322		4,843,048		4,842,809		4,843,003		4,842,615

DESIGN PATENTS

06	301,807		301,839		301,883	27 :	301,889		301,919		301,805
	301,810		301,840	18 :	301,862		301,908		301,920		301,877
	301,813		301,844		301,886	29 :	301,799		301,921		301,898
	301,825	12 :	301,811	24 :	301,820	32 :	301,827		301,926		301,904
	301,831		301,829		301,861	33 :	301,911	37 :	301,815	44 :	301,868
	301,834		301,863	25 :	301,798	34 :	301,838		301,887		301,869
	301,835		301,872		301,927		301,874	39 :	301,832	45 :	301,833
	301,867		301,892	26 :	301,816	36 :	301,809		301,857	46 :	301,899
	301,897		301,909		301,843		301,814		301,924	47 :	301,929
	301,903		301,910		301,864		301,819	40 :	301,891		301,930
	301,915		301,928		301,865		301,842	41 :	301,801	48 :	301,896
	301,916		301,912		301,866		301,846		301,860	51 :	301,826
	301,923	13 :	301,812		301,873		301,884	42 :	301,803	55 :	301,795
08	301,925	17 :	301,818		301,905		301,913		301,804		301,802
09	301,837										

PLANT PATENTS

06 :	6,875	6,881	6,885	6,887	09 :	6,888	27 :	6,884
	6,877	6,882						
	6,880	6,883	6,886	6,889	25 :	6,876	42 :	6,890

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